Sun Lakes Village North Specific Plan Amendment No. 5

Traffic Analysis

City of Banning

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12927-05 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
HCM	Highway Capacity Manual
ITE	Institute of Transportation Engineers
LOS	Level of Service
NCHRP	National Cooperative Highway Research Program
PCE	Passenger Car Equivalent
PHF	Peak Hour Factor
Project	Sun Lakes Village North Specific Plan Amendment No. 5
RCTC	Riverside County Transportation Commission
RivTAM	Riverside Transportation Analysis Model
RTP	Regional Transportation Plan
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCS	Sustainable Communities Strategies
SHS	State Highway System
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 Sun Lakes Village North Specific Plan Amendment No. 5 development ("Project"), which is located north of Sun Lakes Boulevard and east of Highland Springs Avenue in the City of Banning, as shown on Exhibit 1-1.

The purpose of this TA is to evaluate the potential deficiencies related to traffic, identify circulation system deficiencies that may result from the development of the proposed Project, and to recommend improvements to resolve identified deficiencies in order to achieve acceptable operational conditions at study area intersections. This TA has been prepared in accordance with the County of Riverside's Traffic Impact Analysis Preparation Guide (August 2008) and the California Department of Transportation (Caltrans) Guide for the Preparation of Traffic Impact Studies. (1) (2)

1.1 SUMMARY OF FINDINGS

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

- Project to install a traffic signal at the intersection of Driveway 3/Country Club Drive & Sun Lakes Boulevard (#8).
- Project to modify the existing median on Sun Lakes Boulevard to provide a minimum 150-feet of storage for the eastbound left turn lane onto Sun Lakes Village Drive.
- According to the City of Banning Circulation Element, Sun Lakes Boulevard and Sun Lakes Village Drive are currently built out to their ultimate half-sections. As such, there are no roadway improvement recommendations. However, curb, gutter, and sidewalk improvements are recommended, as needed for site access along the Project's frontage, consistent with the City's standards.

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

The proposed Project is not anticipated to require the construction of any off-site improvements, however, there are improvement needs identified at off-site intersections for future cumulative traffic analysis scenarios. As such, the Project Applicant's responsibility for the Project's contributions towards deficient off-site intersections is fulfilled through payment of fair share and/or payment into pre-existing fee programs (if applicable) that would be assigned to the future construction of the identified recommended improvements. The Project Applicant would be required to pay requisite fees and/or fair share contributions consistent with the City's requirements (see Section 7 *Local and Regional Funding Mechanisms*).

EXHIBIT 1-1: PRELIMINARY LAND USE PLAN

LEGEND:

RIRO = RIGHT-IN/RIGHT-OUT ONLY ACCESS
FULL = FULL ACCESS
P = PASSENGER CARS ONLY
PT = PASSENGER CARS AND TRUCKS

12927 - land use plan.dwg

1.2 PROJECT OVERVIEW

The Project is proposed to consist of the development of 877,298 square feet of industrial park use, 52,065 square feet of medical office use, and 37,189 square feet of commercial retail use. Vehicular access will be provided via the following driveways:

- Sun Lakes Village Drive via Driveway 1 – Full access for both passenger cars and trucks
- Sun Lakes Village Drive via Driveway 2 – Full access for passenger cars only
- Sun Lakes Boulevard via Driveway 3 – Full access for passenger cars only
- Sun Lakes Boulevard via Driveway 4 – Right-in/Right-out access for passenger cars only

Regional access to the Project site is available from the I-10 Freeway via the Highland Springs Avenue interchange. Exhibit 1-2 depicts the location of the proposed Project in relation to the existing roadway network and the study area intersections.

Trips generated by the Project's proposed land uses have been estimated based on trip generation rates collected by the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition, 2017. (3) The proposed Project is anticipated to generate a total of 5,594 trip-ends per day on a typical weekday with 509 trips during the weekday AM peak hour and 619 trips during the weekday PM peak hour. 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) Conditions
- Existing plus Project (E+P) Conditions
- Horizon Year (2040) Without Project Conditions
- Horizon Year (2040) With Project Conditions

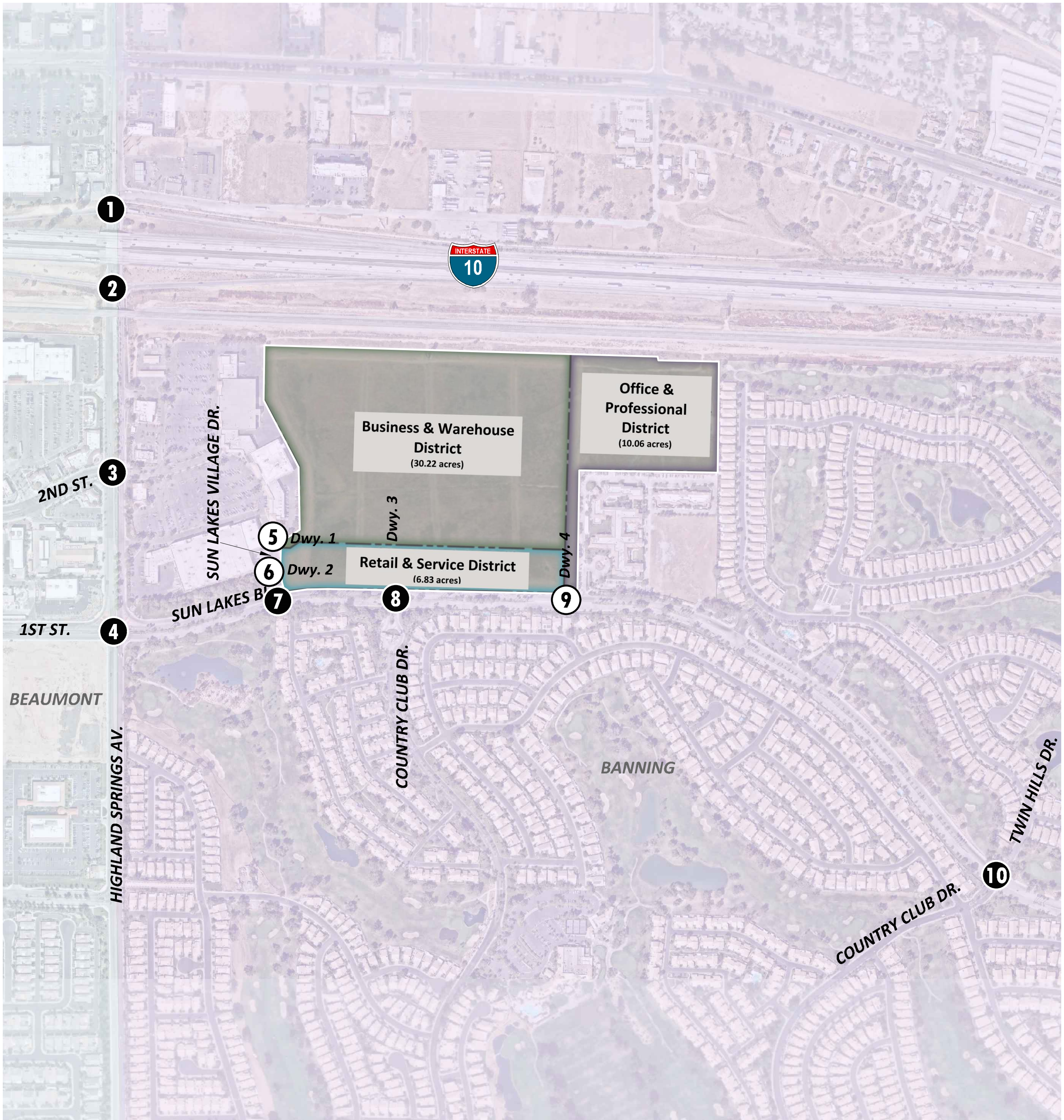
1.3.1 EXISTING (2020) CONDITIONS

Information for Existing (2020) conditions is disclosed to represent the baseline traffic conditions as they existed at the time this report was prepared.

1.3.2 EXISTING PLUS PROJECT CONDITIONS

The Existing plus Project (E+P) analysis determines traffic deficiencies that would occur on the existing roadway system with the addition of Project traffic.

EXHIBIT 1-2: LOCATION MAP



N

LEGEND:

0 = ***EXISTING INTERSECTION ANALYSIS LOCATION***

0 = ***FUTURE INTERSECTION ANALYSIS LOCATION***

12927 - locmap.dwg

URBAN CROSSROADS

1.3.5 HORIZON YEAR (2040) CONDITIONS

Traffic projections for Horizon Year (2040) conditions were derived from the 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 Sun Lakes Boulevard 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 City of Banning (lead agency) General Plan. (4) Each of these regional transportation fee programs are discussed in more detail in Section 7 *Local and Regional Funding Mechanisms*.

1.4 STUDY AREA

The 10 study area intersections shown on Exhibit 1-2 and listed in Table 1-1 were selected for evaluation in this TA based on the study area utilized in the Sun Lakes Village North Specific Plan Amendment #4 Traffic Impact Study (September 30, 2005, prepared by RK Engineering Group, Inc.), referred to hereafter as the "2005 Traffic Study." 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	Highland Springs Av. & I-10 WB Ramps	City of Banning, City of Beaumont, Caltrans	No
2	Highland Springs Av. & I-10 EB Ramps	City of Banning, City of Beaumont, Caltrans	No
3	Highland Springs Av. & 2nd St.	City of Banning, City of Beaumont	No
4	Highland Springs Av. & 1st St./Sun Lakes Bl.	City of Banning, City of Beaumont	No
5	Sun Lakes Village Dr. & Dwy. 1 – Future Intersection	City of Banning	No
6	Sun Lakes Village Dr. & Dwy. 2 – Future Intersection	City of Banning	No
7	Sun Lakes Village Dr. & Sun Lakes Bl.	City of Banning	No
8	Dwy. 3/Country Club Dr. & Sun Lakes Bl.	City of Banning	No
9	Dwy. 4 & Sun Lakes Bl. – Future Intersection	City of Banning	No
10	Twin Hills Dr./Country Club Dr. & Sun Lakes Bl.	City of Banning	No

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. (5) There are no study area intersections identified as a Riverside County CMP facility.

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 *E+P Traffic Conditions* and Section 6 *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 E+P CONDITIONS

Intersections

The study area intersections are anticipated to operate at an acceptable LOS during the peak hours, consistent with Existing (2020) traffic conditions.

Off-Ramp Queues

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

1.5.2 HORIZON YEAR (2040) CONDITIONS

Intersections

The following study area intersections are anticipated to operate at an unacceptable LOS during the peak hours under Horizon Year (2040) Without Project:

- Highland Springs Avenue & I-10 Westbound Ramps (#1) – LOS E AM and PM peak hours
- Highland Springs Avenue & I-10 Eastbound Ramps (#2) – LOS E AM and PM peak hours
- Highland Springs Avenue & 2nd Street (#3) – LOS D AM peak hour only
- Highland Springs Avenue & 1st Street/Sun Lakes Boulevard (#4) – LOS D AM peak hour; LOS E PM peak hour
- Sun Lakes Village Drive & Sun Lakes Boulevard (#7) – LOS F PM peak hour only
- Driveway 3/Country Club Drive & Sun Lakes Boulevard (#8) – LOS F PM peak hour only
- Twin Hills Drive/Country Club Drive & Sun Lakes Boulevard (#10) – LOS F PM peak hour only

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

#	Intersection	Existing (2020)	E+P	Horizon Year (2040) Without Project	Horizon Year (2040) With Project
1	Highland Springs Av. & I-10 WB Ramps	LOS A-C	LOS A-C	LOS D-E	LOS D-E
2	Highland Springs Av. & I-10 EB Ramps	LOS A-C	LOS A-C	LOS D-E	LOS D-E
3	Highland Springs Av. & 2nd St.	LOS A-C	LOS A-C	AM: LOS D-E / PM: LOS A-C	AM: LOS D-E / PM: LOS A-C
4	Highland Springs Av. & 1st St./Sun Lakes Bl.	LOS A-C	LOS A-C	LOS D-E	LOS F
5	Sun Lakes Village Dr. & Dwy. 1	NA	LOS A-C	NA	LOS A-C
6	Sun Lakes Village Dr. & Dwy. 2	NA	LOS A-C	NA	LOS A-C
7	Sun Lakes Village Dr. & Sun Lakes Bl.	LOS A-C	LOS A-C	AM: LOS A-C / PM: LOS F	AM: LOS A-C / PM: LOS F
8	Dwy. 3/Country Club Dr. & Sun Lakes Bl.	LOS A-C	LOS A-C	AM: LOS A-C / PM: LOS F	LOS A-C
9	Dwy. 4 & Sun Lakes Bl.	NA	LOS A-C	NA	LOS A-C
10	Twin Hills Dr./Country Club Dr. & Sun Lakes Bl.	LOS A-C	LOS A-C	AM: LOS A-C / PM: LOS F	AM: LOS A-C / PM: LOS F

Note: the acceptable LOS for the freeway ramps is D

LEGEND:

= AM PEAK HOUR

= PM PEAK HOUR

= LOS A-C

= LOS D-E

= LOS F

NA = NOT AN ANALYSIS LOCATION FOR THIS SCENARIO

There are no additional study area intersections that are anticipated to operate at an unacceptable LOS with the addition of Project traffic. It should be noted, the intersection of Driveway 3/Country Club Drive & Sun Lakes Boulevard (#8) is anticipated to operate at an acceptable LOS during the peak hours with the implementation of the Project design features discussed in Section 1.6 *Recommendations* of this TA.

Off-Ramp Queues

Consistent with Existing (2020) traffic conditions, there are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows under Horizon Year (2040) Without Project and With Project traffic conditions.

1.6 RECOMMENDATIONS

1.6.1 SITE ADJACENT AND SITE ACCESS RECOMMENDATIONS

The following recommendations are based on the minimum improvements needed to accommodate site access and maintain acceptable peak hour operations. The site adjacent recommendations are shown on Exhibit 1-4.

Project to maintain existing control and lane geometrics at the intersection of Sun Lakes Village Drive & Sun Lakes Boulevard (#7).

Recommendation 1 – Sun Lakes Village Drive & Driveway 1 (#5) – The following improvement is necessary to accommodate site access:

- Project to construct a stop control on the westbound approach and a shared left-right turn lane.

Recommendation 2 – Sun Lakes Village Drive & Driveway 2 (#6) – The following improvement is necessary to accommodate site access:

- Project to install a stop control on the westbound approach and a shared left-right turn lane.

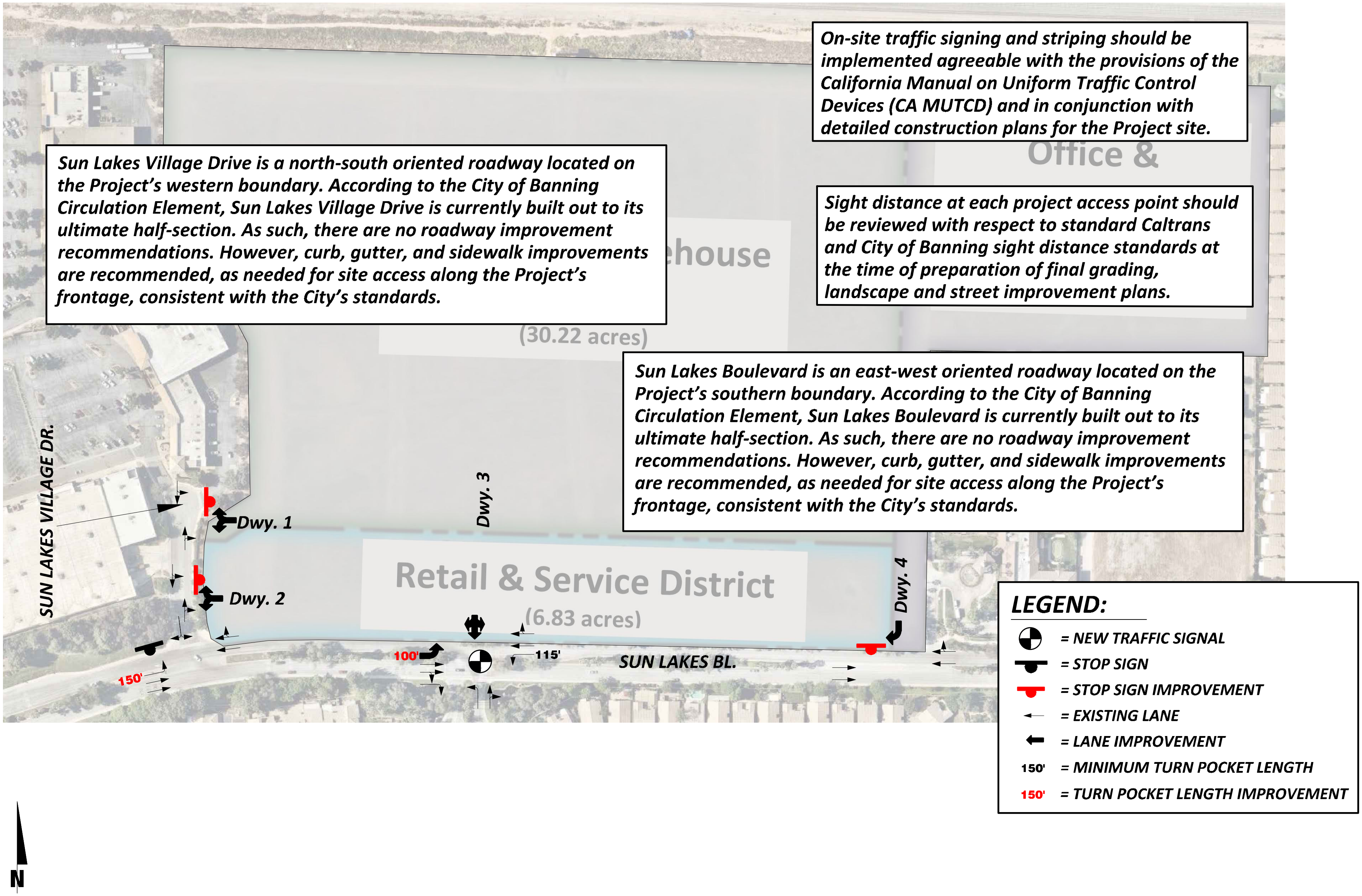
Recommendation 3 – Sun Lakes Village Drive & Sun Lakes Boulevard (#7) – The following improvement is necessary to accommodate site access:

- Project to modify the existing median on Sun Lakes Boulevard to provide a minimum 150-feet of storage for the eastbound left turn lane.

Recommendation 4 – Driveway 3 & Sun Lakes Boulevard (#8) – The following improvements are necessary to accommodate site access:

- Project to install a traffic signal.
- Project to construct a southbound shared left-through-right turn lane.
- Project to construct an eastbound left turn lane with a minimum of 100-feet of storage.

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



Recommendation 5 – Driveway 4 & Sun Lakes Boulevard (#8) – The following improvements are necessary to accommodate site access:

- Project to install a stop control on the southbound approach and a right turn lane. Project should construct the driveway to prohibit left-out turns onto Sun Lakes Boulevard.

Recommendation 6 – Sun Lakes Village Drive is a north-south oriented roadway located on the Project's western boundary. According to the City of Banning Circulation Element, Sun Lakes Village Drive is currently built out to its ultimate half-section. As such, there are no roadway improvement recommendations. However, curb, gutter, and sidewalk improvements are recommended, as needed for site access along the Project's frontage, consistent with the City's standards.

Recommendation 7 – Sun Lakes Boulevard is an east-west oriented roadway located on the Project's southern boundary. According to the City of Banning Circulation Element, Sun Lakes Boulevard is currently built out to its ultimate half-section. As such, there are no roadway improvement recommendations. However, curb, gutter, and sidewalk improvements are recommended, as needed for site access along the Project's frontage, consistent with the City's standards.

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 City of Banning sight distance standards at the time of preparation of final grading, landscape and street improvement plans.

1.6.2 OFF-SITE RECOMMENDATIONS

The recommended improvements needed to address the cumulative deficiencies identified under Existing (2020), E+P, and Horizon Year (2040) traffic conditions are shown in Table 1-2. For those improvements listed in Table 1-2 and not constructed as part of the Project, the Project Applicant's responsibility for the Project's contributions towards deficient intersections is fulfilled through payment of fair share and/or TUMF/DIF program 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 City's requirements (see Section 7 *Local and Regional Funding Mechanisms*).

Table 1-2

Summary of Improvements by Analysis Scenario

#	Intersection Location	Jurisdiction	Recommended Improvements[1]				Improvements in Fee Program?[1]	Project Responsibility[2]	Fair Share %[3]
			Existing (2020)	E+P	2040 Without Project	2040 With Project			
1	Highland Springs Av. & I-10 WB Ramps	Banning, Beaumont, Caltrans	None	None	Add SB free right turn lane	Same	No	Fair Share	22.4%
					Add WB left turn lane	Same	No	Fair Share	
2	Highland Springs Av. & I-10 EB Ramps	Banning, Beaumont, Caltrans	None	None	Add 2nd EB right turn lane	Same	No	Fair Share	29.5%
3	Highland Springs Av. & 2nd St.	Banning, Beaumont	None	None	Restripe the EB approach to provide dual left turn lanes and one shared through-right turn lane	Same	No	Fair Share	32.9%
					Modify the traffic signal to protect the eastbound and westbound left turns and to implement lead-lag operations for the eastbound and westbound left turns, with the eastbound left turn running as lag	Same	No	Fair Share	
4	Highland Springs Av. & 1st St./Sun Lakes Bl.	Banning, Beaumont	None	None	Add 2nd SB left turn lane	Same	No	Fair Share	21.8%
					Add 2nd WB through lane	Same	No	Fair Share	
7	Sun Lakes Village Dr. & Sun Lakes Bl.	Banning	None	None	Install a Traffic Signal	Same	No	Fair Share	34.2%
10	Twin Hills Dr./Country Club Dr. & Sun Lakes Bl.	Banning	None	None	Install a Traffic Signal	Same	No	Fair Share	6.7%

[1] Program improvements constructed by project may be eligible for fee credit. In lieu fee payment is at discretion of City.

[2] Identifies the Project's responsibility to construct an improvement or contribute a fee payment or fair share towards the implementation of the improvements shown.

[3] Represents the fair share percentage for the Project during the most impacted peak hour.

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2 METHODOLOGIES

This section of the report presents the methodologies used to perform the traffic analyses summarized in this report. Since the City of Banning does not have their own traffic study guidelines, the methodologies described are generally consistent with the County of Riverside and Caltrans traffic study guidelines. (1) (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. (6) The HCM uses different procedures depending on the type of intersection control.

2.2.1 SIGNALIZED INTERSECTIONS

The City of Banning and City of Beaumont require signalized intersection operations analysis based on the methodology described in the HCM (6^{th} 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 City of Banning and City of Beaumont. 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 City of Banning and the City of Beaumont. 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. (6)

California Department of Transportation (Caltrans)

Per the Caltrans Guide for the Preparation of Traffic Impact Studies, the traffic modeling and signal timing optimization software package Synchro (Version 10) has also been utilized to analyze signalized intersections under Caltrans' jurisdiction, which include interchange to arterial ramps (i.e. I-10 Freeway ramps at Highland Springs Avenue). (2) Signal timing for the freeway arterial-to-ramp intersections have been obtained from Caltrans District 8 and were utilized for the purposes of this analysis.

2.2.2 UNSIGNALIZED INTERSECTIONS

The City of Banning and the City of Beaumont require the operations of unsignalized intersections be evaluated using the methodology described the HCM. (6) 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. Per the HCM, the highest delay and associated LOS on the minor approach is reported for two-way stop-controlled intersections. For all-way stop controlled intersections, LOS is computed for the intersection as a whole and the average delay is reported (similar to signalized intersections).

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). (7)

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. (7) 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.

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
5	Sun Lakes Village Dr. & Dwy. 1 – Future Intersection	Banning
6	Sun Lakes Village Dr. & Dwy. 2 – Future Intersection	Banning
7	Sun Lakes Village Dr. & Sun Lakes Bl.	Banning
8	Dwy. 3/Country Club Dr. & Sun Lakes Bl.	Banning
10	Twin Hills Dr./Country Club Dr. & Sun Lakes Bl.	Banning

Although unsignalized, traffic signal warrants have not been performed for the intersection of Driveway 4 at Sun Lakes Boulevard 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 *E+P Traffic Conditions* and Section 6 *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-10 Freeway at Highland Springs Avenue. Specifically, the queuing analysis is utilized to identify any potential queuing and "spill back" onto the I-10 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. 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 MINIMUM LEVEL OF SERVICE (LOS)

The definition of an intersection deficiency has been obtained from each of the applicable surrounding jurisdictions.

2.5.1 CITY OF BANNING

The City of Banning has established LOS C as the minimum level of service for all roadways/intersections within the City. Therefore, any City of Banning intersection operating at LOS D, E, or F will be considered deficient for the purposes of this analysis. LOS D is considered acceptable for intersections along Ramsey Street and the I-10 interchange intersections.

2.5.2 CITY OF BEAUMONT

The City of Banning has established LOS D as the minimum level of service for all roadways/intersections within the City (Policy 10 of the General Plan Circulation Element). Therefore, any intersection operating at LOS E or F will be considered deficient for the purposes of this analysis.

2.5.3 CALTRANS

Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D on State Highway System (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 City of Banning minimum LOS of LOS D at the I-10 interchange, LOS D will be used as the target LOS for both arterial-to-freeway ramps and freeway mainline segments and ramp junctions.

2.6 DEFICIENCY CRITERIA

This section outlines the methodology used in this analysis related to identifying circulation system deficiencies. To determine whether the addition of project traffic at a study intersection results in a direct project-related deficiency, the following thresholds will be utilized:

- A project-related traffic deficiency occurs at a study intersection if the addition of project-generated trips reduces the peak hour level of service of the study intersection to change from acceptable level of service (LOS A, B, C or D or LOS A, B, and C for City of Banning) to an unacceptable level of service (LOS E or F or LOS D, E, or F for City of Banning);
- A cumulative traffic deficiency occurs at a study intersection if the Project contributes peak hour trips to an intersection that is anticipated to operate at a deficient LOS without the Project (LOS E or F or LOS D, E, or F for City of Banning).

2.7 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 City Traffic Engineer will determine the appropriate improvements to be implemented by a project (to be identified in the conditions of approval).

The Project's fair share contribution is determined based on the following equations, which are the ratio of Project traffic to net new traffic (where net new traffic is the future traffic less existing traffic):

Project Fair Share % = Project (Long-Range) Traffic / (2040 Total Traffic – Existing Traffic)

3 AREA CONDITIONS

This section provides a summary of the existing circulation network, the City of Banning General Plan Circulation Network, and a review of existing peak hour intersection operations, traffic signal warrant, and off-ramp queuing analyses.

3.1 EXISTING CIRCULATION NETWORK

The study area includes a total of 10 existing and future intersections as shown previously on Exhibit 1-2, where the Project is anticipated to contribute 50 or more peak hour trips, and is consistent with the 2005 Traffic Study. 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 City of Banning. The roadway classifications and planned (ultimate) roadway cross-sections of the major roadways within the study area, as identified on City of Banning General Plan Circulation Element, are described subsequently. Exhibit 3-2 shows the City of Banning General Plan Circulation Element and Exhibit 3-3 illustrates the City of Banning General Plan roadway cross-sections.

Urban Arterials are six-lane divided roadways (typically divided by a raised median or painted two-way turn-lane) with a 134-foot right-of-way and a 110-foot curb-to-curb measurement. These roadways serve both regional through-traffic and inter-city traffic and typically direct traffic onto and off-of the freeways. The following study area roadway within the City of Banning is classified as an Urban Arterial:

- Highland Springs Avenue, south of Wilson Street

Major Roadways are four lane divided roadways and may provide on-street parking. These roadways typically have a 100-foot right-of-way and a 76-foot curb-to-curb measurement. These roadways typically direct traffic through major development areas and serve to move large volumes of inter-city traffic. The following study area roadway within the City of Banning is classified as a Major Roadway:

- Sun Lakes Boulevard

Secondary Streets are four-lane roadways and may include a painted median. These roadways typically have an 88-foot right-of-way and a 64-foot curb-to-curb measurement. These roadways typically direct traffic through major development areas and a lesser capacity than Major Roadways. The following study area roadway within the City of Banning is classified as a Secondary Street:

- Highland Home Road, north of Sun Lakes Boulevard

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

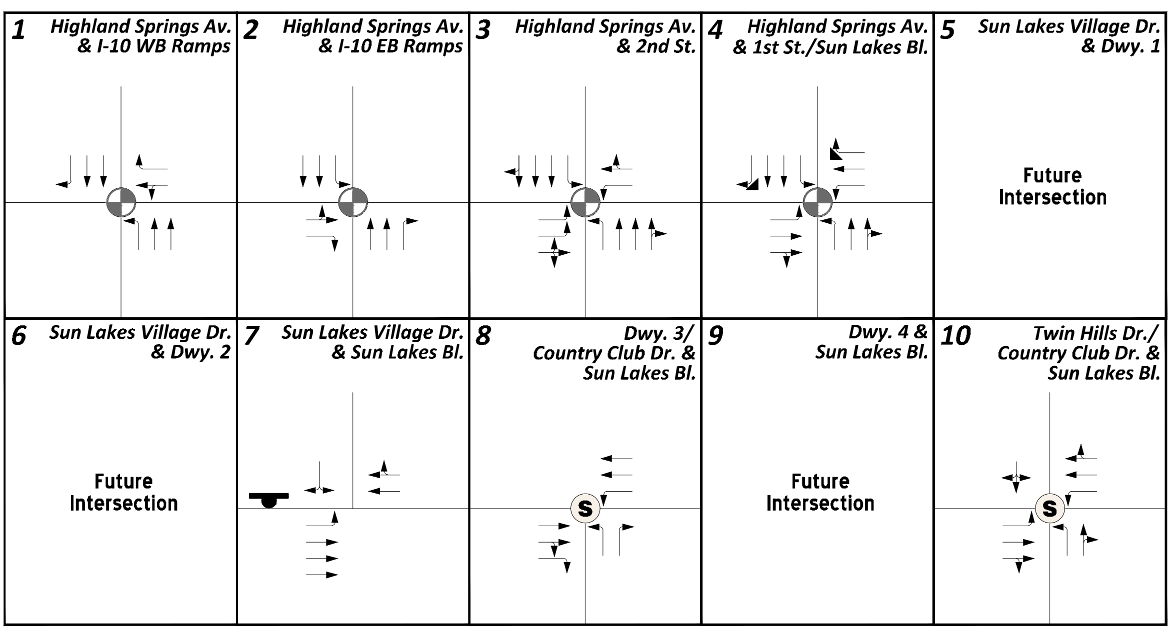

EXHIBIT 3-2: CITY OF BANNING GENERAL PLAN CIRCULATION ELEMENT

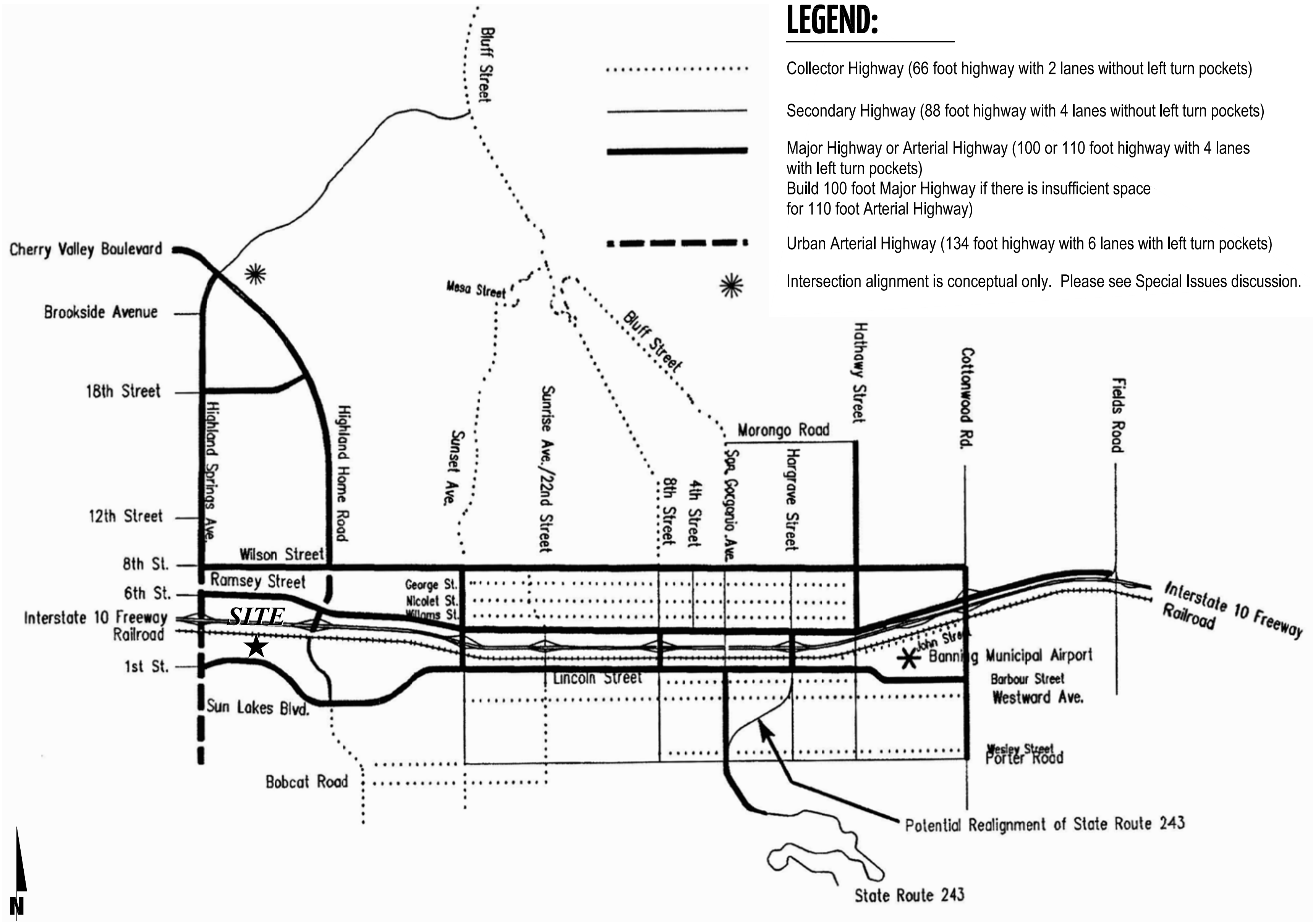

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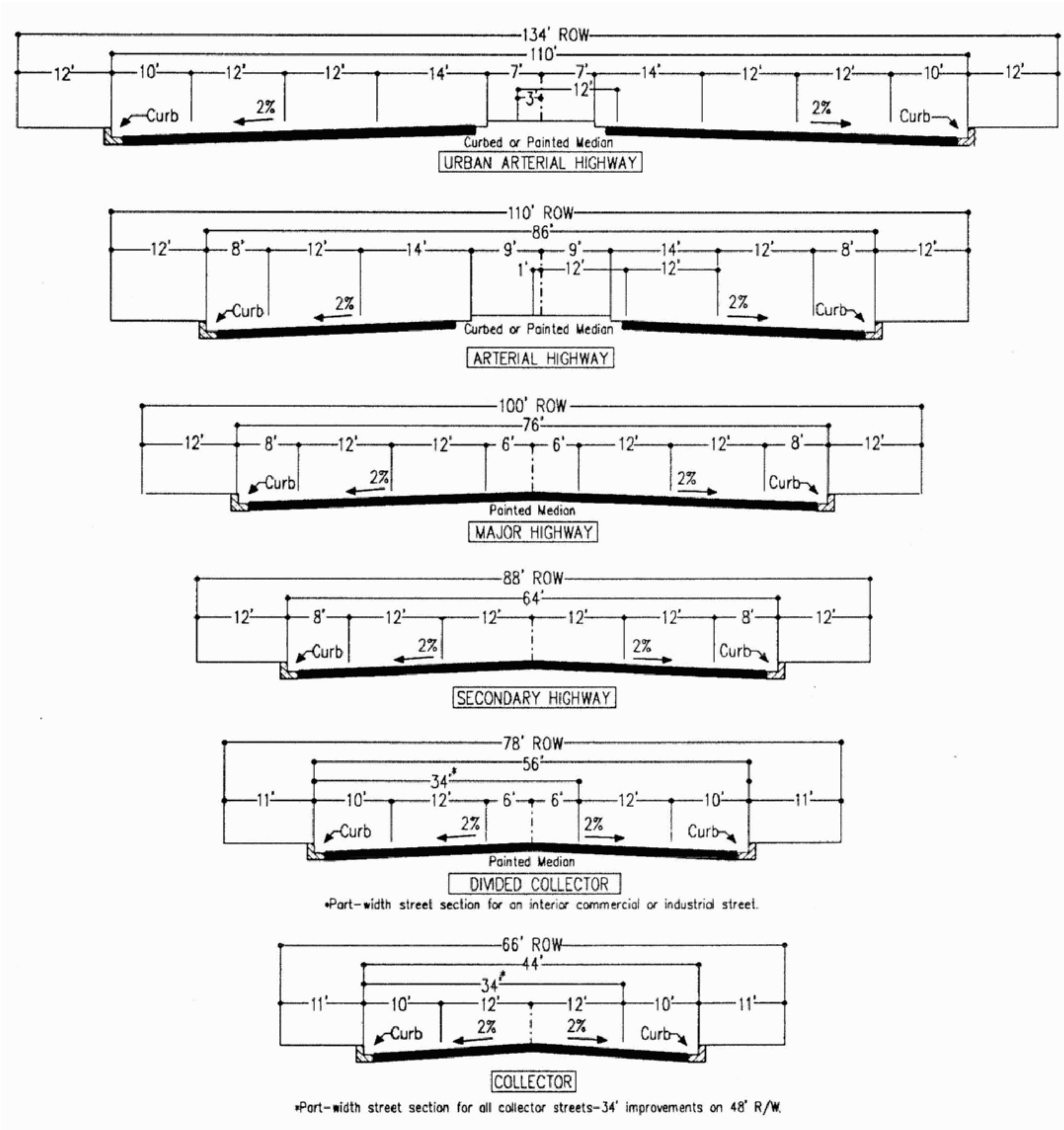
EXHIBIT 3-3: CITY OF BANNING GENERAL PLAN ROADWAY CROSS-SECTIONS



SOURCE: CITY OF BANNING (June 6, 2005)

Collector Streets are two-lane roadways and provide on-street parking on both sides. These roadways typically have a 66-foot right-of-way and a 44-foot curb-to-curb measurement. These roadways provide connections to secondary streets, arterials, and freeways, with most traffic being through-traffic or intra-city traffic. The following study area roadway within the City of Banning is classified as a Collector Street:

- Highland Home Road, south of Sun Lakes Boulevard

3.3 City of Beaumont General Plan Circulation Element

The study area is also partially located within the County of Riverside. Exhibit 3-4 shows the County of Riverside General Plan Circulation Element, and Exhibit 3-5 illustrates the County of Riverside General Plan roadway cross-sections.

3.4 Bicycle & Pedestrian Facilities

The City of Banning General Plan does not include a bike facility exhibit. Exhibit 3-6 illustrates the existing pedestrian facilities, including sidewalks and crosswalks. As shown on Exhibit 3-6, there are existing pedestrian facilities in the vicinity of the Project site that would likely serve pedestrians.

3.5 Transit Service

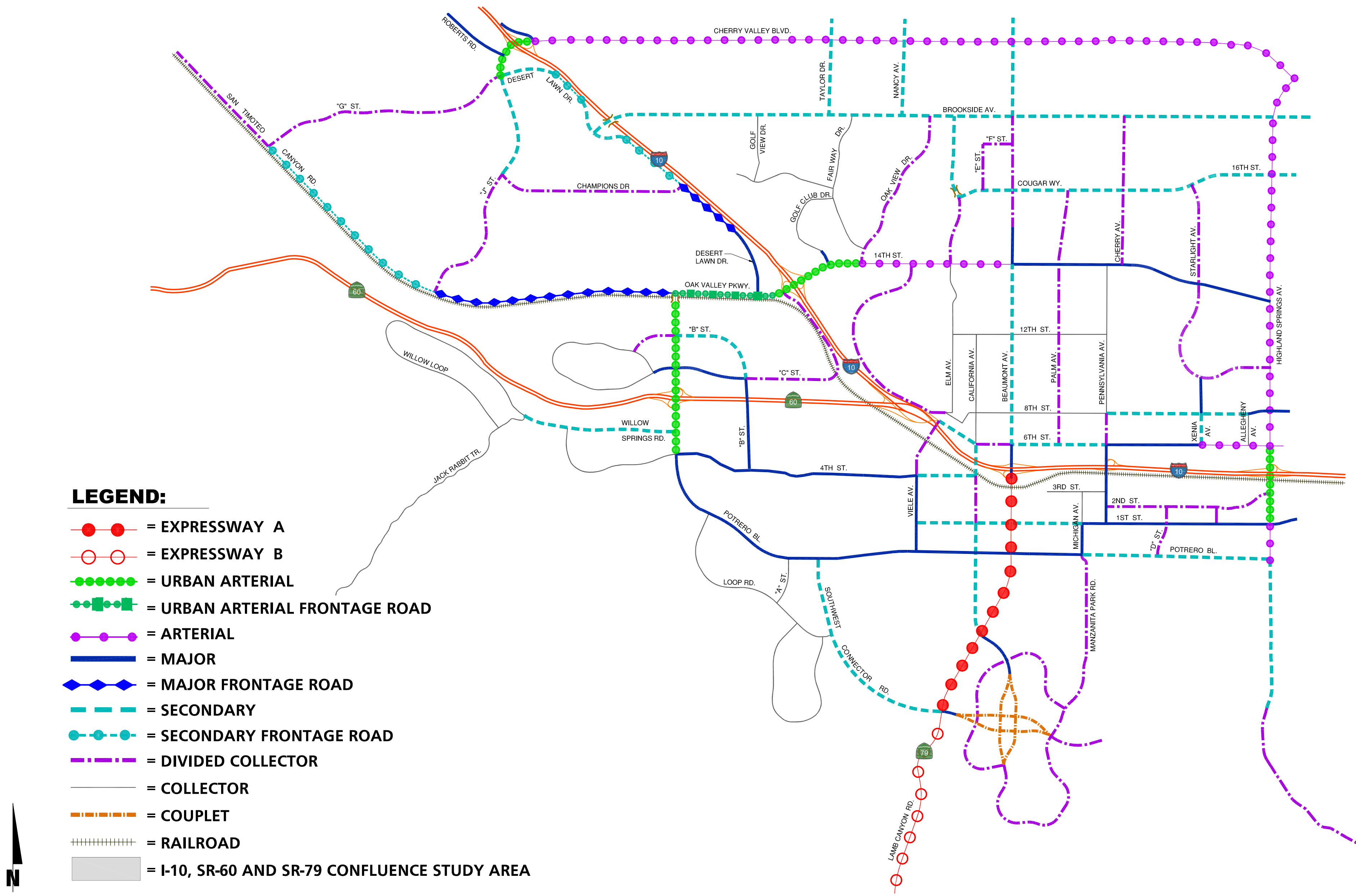
The study area is currently served by the Beaumont Transit with bus services along Highland Springs Avenue, 2nd Street, and 1st Street via Route, Route 4, and Community Link 120/125. The study area is also served by Pass Transit with bus service along Highland Springs Avenue, 2nd Street, and 1st Street via Route 1, Route 5, and Route 6. The transit services are illustrated on Exhibit 3-7. These transit routes could potentially serve the Project. Transit service is reviewed and updated by Beaumont Transit and Pass Transit 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.

3.6 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 May 2018, November 2019, and July 2020. 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 BEAUMONT GENERAL PLAN CIRCULATION ELEMENT



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URBAN CROSSROADS

EXHIBIT 3-5: CITY OF BEAUMONT GENERAL PLAN ROADWAY CROSS-SECTIONS

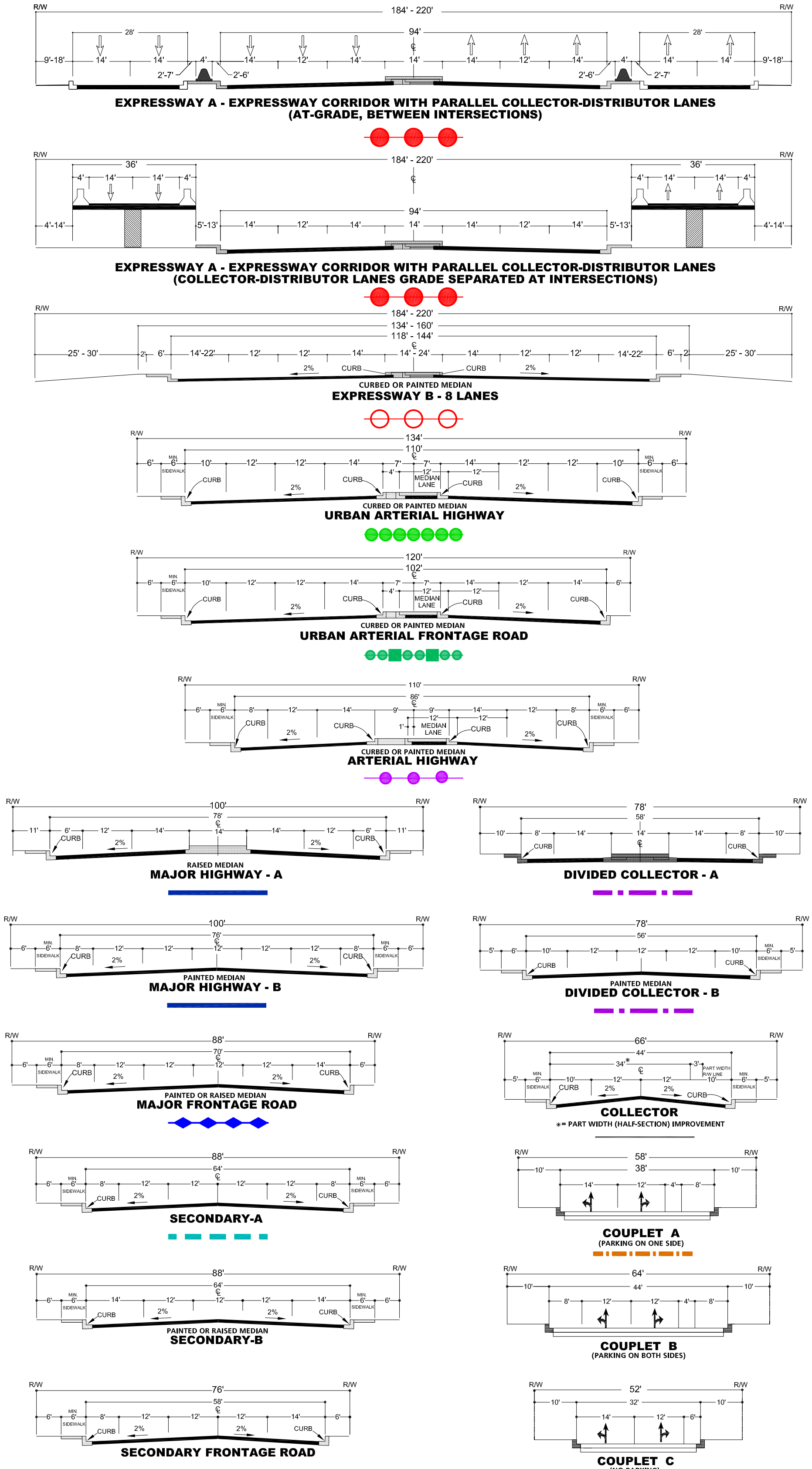


EXHIBIT 3-6: EXISTING PEDESTRIAN FACILITIES

EXHIBIT 3-7: EXISTING TRANSIT ROUTES

Due to the currently ongoing COVID-19 pandemic, schools and businesses within the study area were closed or operating at less than full capacity at the time this study was prepared. As such, historic (2018 and 2019) traffic counts were utilized in conjunction with a 2% growth rate to reflect 2020 conditions. The 2018 and 2019 weekday AM and weekday PM peak hour count data is representative of typical weekday peak hour traffic conditions in the study area. There were no observations made in the field that would indicate atypical traffic conditions on the count dates, such as construction activity or detour routes and near-by schools were in session and operating on normal schedules. For the intersections where historic traffic counts were not readily available, traffic counts were collected in July 2020. A growth rate has been applied to these 2020 traffic counts, based on the growth at other study area intersections, to reflect pre-COVID-19 conditions. 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.

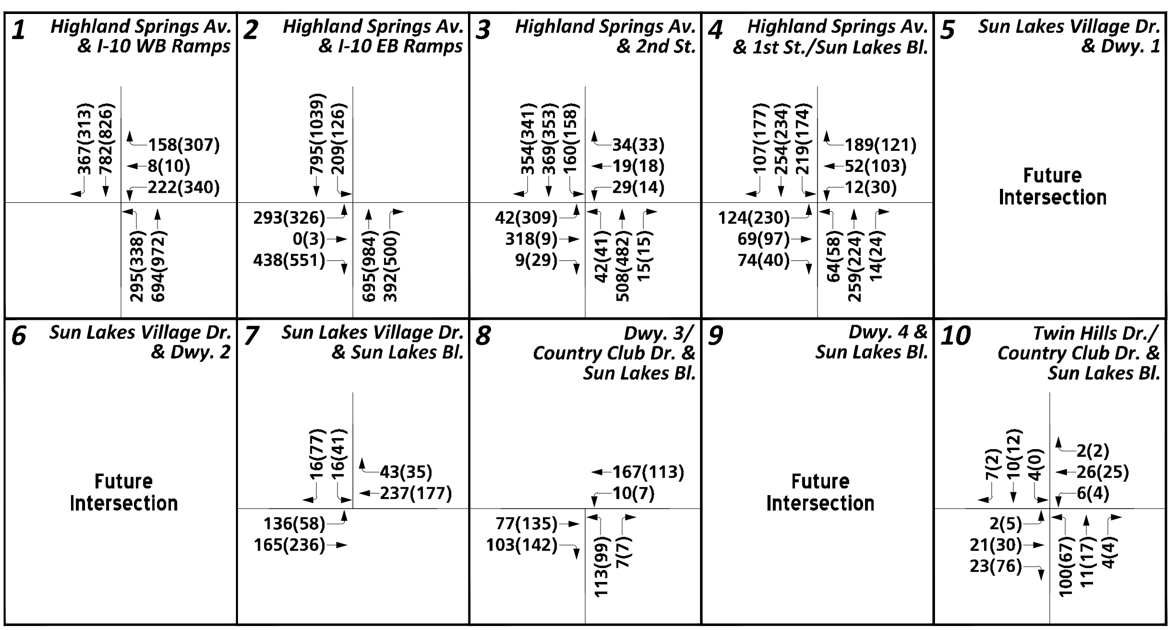
The traffic counts collected in May 2018, November 2019, and July 2020 include the following vehicle classifications: Passenger Cars, 2-Axle Trucks, 3-Axle Trucks, and 4 or More Axle Trucks. To represent the effects large trucks, buses and recreational vehicles have on traffic flow; all trucks were converted 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 much longer than for passenger cars and varies depending on the type of vehicle and number of axles. For the purpose of this analysis, a PCE factor of 1.5 has been applied to 2-axle trucks, 2.0 for 3-axle trucks, and 3.0 for 4+-axle trucks to estimate each turning movement. 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. (8) 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 Average Daily Traffic (ADT) volumes on arterial highways throughout the study area are shown on Exhibit 3-8. 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 13.56 = 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 7.37 percent. As such, the above equation utilizing a factor of 13.56 estimates the ADT volumes on the study area roadway segments assuming a peak-to-daily relationship of approximately 7.37 percent (i.e., 1/0.0737 = 13.56) and was assumed to sufficiently estimate ADT volumes for planning-level analyses. Existing weekday AM and weekday PM peak hour intersection volumes are also shown on Exhibit 3-8.

EXHIBIT 3-8: EXISTING (2020) TRAFFIC VOLUMES (IN PCE)



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3.7 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 the study area intersections are currently operating at an acceptable LOS during the peak hours.

It should be noted, based on field observations, the intersections of I-10 Westbound Ramps & Highland Springs Avenue (#1) and I-10 Eastbound Ramps & Highland Springs Avenue (#2) experienced queuing issues along Highland Springs Avenue during the AM peak hour. The northbound and southbound left turns onto the I-10 Freeway experienced heavy queues on Highland Springs Avenue only (not on the off-ramps). However, the entire length of the northbound and southbound left turn queues cleared each cycle. As such, the intersection operations analysis results shown in Table 3-1 reflect the field conditions at the time the 2019 traffic counts were collected the I-10 Freeway/Highland Springs Avenue interchange ramp-to-arterial intersections.

Consistent with Table 3-1, a summary of the peak hour intersection LOS for Existing conditions is shown on Exhibit 3-10. The intersection operations analysis worksheets are included in Appendix 3.2 of this TA.

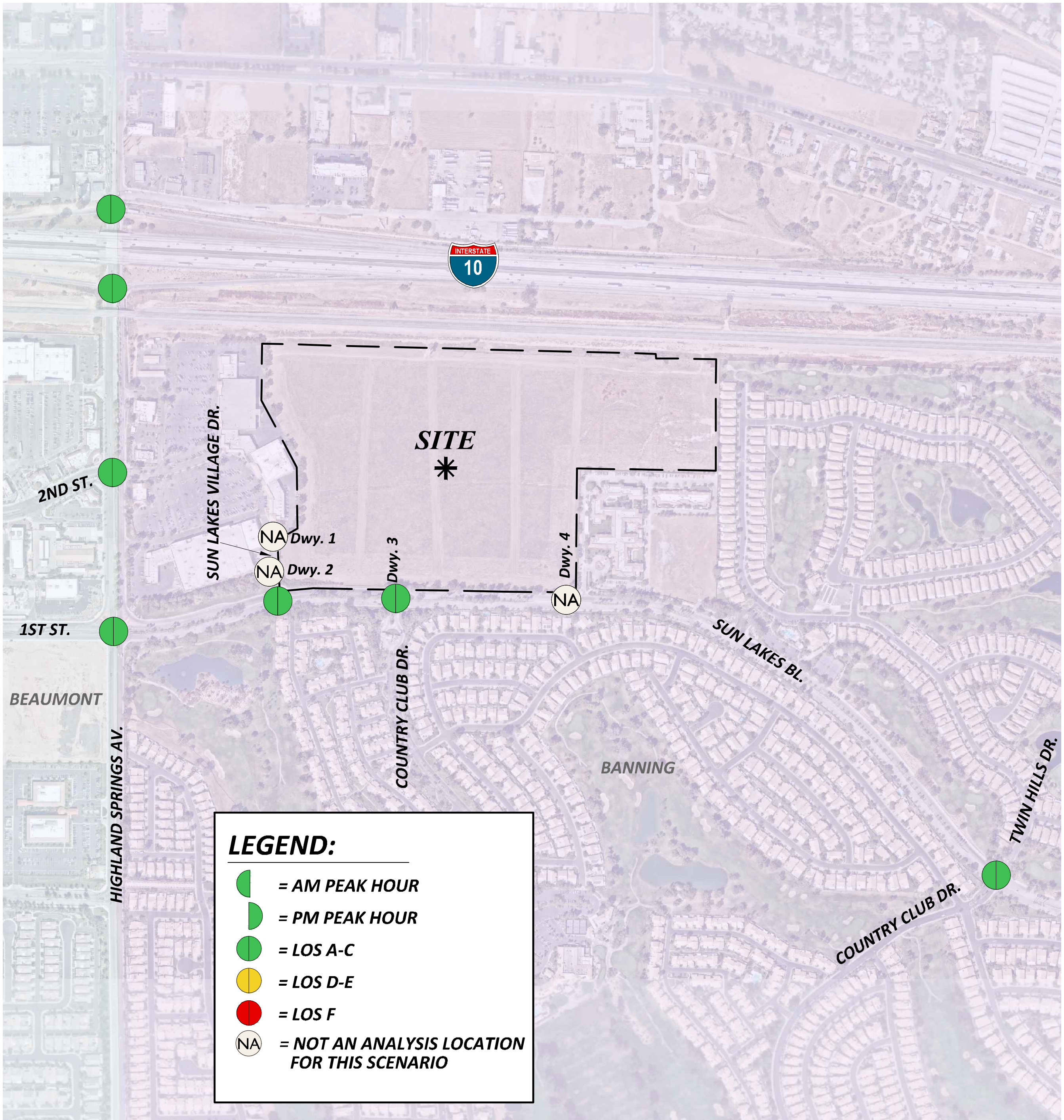
3.8 EXISTING (2020) TRAFFIC SIGNAL WARRANTS ANALYSIS

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 (see Appendix 3.3).

3.9 EXISTING (2020) OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the I-10 Freeway at Highland Springs Avenue interchange 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-10 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 at the I-10 Freeway/Highland Springs Avenue interchange. Worksheets for Existing (2020) traffic conditions off-ramp queuing analysis are provided in Appendix 3.4.

EXHIBIT 3-9: EXISTING (2020) SUMMARY OF LOS



Note: the acceptable LOS for the freeway ramps is D

N

Table 3-1

Intersection Analysis for Existing (2020) Conditions

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (secs.)		Level of Service		Acceptable LOS[4]
			Northbound			Southbound			Eastbound			Westbound							
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM	
1	Highland Springs Av. & I-10 WB Ramps	TS	1	2	0	0	2	1	0	0	0	0	1	1	23.5	31.5	C	C	D
2	Highland Springs Av. & I-10 EB Ramps	TS	0	2	1	1	2	0	0	1	1	0	0	0	23.4	21.5	C	C	D
3	Highland Springs Av. & 2nd St.	TS	1	3	0	1	3	0	2	1	0	1	1	0	23.4	19.5	C	B	C
4	Highland Springs Av. & 1st St./Sun Lakes Bl.	TS	1	2	0	1	2	1>	1	2	0	1	1	1>	25.1	15.4	C	B	C
5	Sun Lakes Village Dr. & Dwy. 1		Future Intersection																
6	Sun Lakes Village Dr. & Dwy. 2		Future Intersection																
7	Sun Lakes Village Dr. & Sun Lakes Bl.	CSS	0	0	0	0	1	0	1	3	0	0	2	0	12.1	10.5	B	B	C
8	Dwy. 3/Country Club Dr. & Sun Lakes Bl.	AWS	1	0	1	0	0	0	0	2	1	1	2	0	8.7	8.2	A	A	C
9	Dwy. 4 & Sun Lakes Bl.		Future Intersection																
10	Twin Hills Dr./Country Club Dr. & Sun Lakes Bl.	AWS	1	1	0	0	1	0	1	2	0	1	2	0	8.6	8.0	A	A	C

* **BOLD** = 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; d= Defacto Right Turn Lane; > = 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 AWS = All-way Stop; CSS = Cross-street Stop; TS = Traffic Signal

4 Minimum acceptable LOS for each applicable jurisdiction.

Table 3-2

Peak Hour Queuing Summary for Existing (2020) Conditions

Intersection	Movement	Available Stacking Distance (Feet)	95th Percentile Queue (Feet)		Acceptable? [1]	
			AM Peak Hour	PM Peak Hour	AM	PM
Highland Springs Av. & I-10 WB Ramps	WBL/T	1,600	263	425 [2]	Yes	Yes
	WBR	350	57	207	Yes	Yes
Highland Springs Av. & I-10 EB Ramps	EBL/T	1,300	278	281	Yes	Yes
	EBR	630	366	559 [2]	Yes	Yes

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided.

[2] 95th percentile volume exceeds capacity, queue may be longer.

[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-10 Freeway mainline.

3.10 EXISTING DEFICIENCIES AND IMPROVEMENTS

3.10.1 IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

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

3.10.2 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-10 Freeway and Highland Springs Avenue interchange for Existing (2020) traffic conditions. As such, no improvements have been identified.

4 PROJECTED FUTURE TRAFFIC

The Project is to consist of 877,298 square feet of industrial park use, 52,065 square feet of medical office use, and 37,189 square feet of commercial retail use. Vehicular access will be provided via the following driveways:

- Sun Lakes Village Drive via Driveway 1 – Full access for both passenger cars and trucks
- Sun Lakes Village Drive via Driveway 2 – Full access for passenger cars only
- Sun Lakes Boulevard via Driveway 3 – Full access for passenger cars only
- Sun Lakes Boulevard via Driveway 4 – Right-in/Right-out access for passenger cars only

Regional access to the Project site is available from the I-10 Freeway via the Highland Springs Avenue interchange.

4.1 PROJECT TRIP GENERATION

4.1.1 PROPOSED PROJECT TRIP GENERATION

Trip generation represents the amount of traffic which is both attracted to and produced by a development. Determining traffic generation for a specific project is therefore based upon forecasting the amount of traffic that is expected to be both attracted to and produced by the specific land uses being proposed for a given development.

In order to develop the traffic characteristics of the proposed Project, trip-generation statistics published in the ITE Trip Generation Manual (10th Edition, 2017) has been used. For purposes of this analysis, the following ITE land use codes and vehicle mixes have been utilized:

- Based on the types of uses anticipated to be developed within the business park area, the trip generation rates for ITE land use code 130 (Industrial Park) have been used to derive site specific trip generation estimates for the proposed industrial use. The vehicle mix has been obtained from the ITE's Trip Generation Manual Supplement (dated February 2020). This study provides the following vehicle mix: AM Peak Hour: 88.0% passenger cars and 12.0% trucks; PM Peak Hour: 90.0% passenger cars and 10.0% trucks; Weekday Daily: 85.0% passenger cars and 15.0% trucks. The truck percentages were further broken down by axle type per the following South Coast Air Quality Management District (SCAQMD) recommended truck mix: 2-Axle = 16.7%; 3-Axle = 20.7%; 4+-Axle = 62.6%.
- A medical-dental office building is a facility that provides diagnoses and outpatient care on a route basis but is unable to provide prolonged in-house medical and surgical care. One or more private physicians or dentists generally operate this type of facility.
- A shopping center is an integrated group of commercial establishments that is planned, developed, owned, and managed as a unit. A shopping center's composition is related to its market area in terms of size, location, and type of store. A shopping center also provides on-site parking facilities sufficient to service its own parking demands.

Internal capture is a percentage reduction that can be applied to the trip generation estimates for individual land uses to account for trips internal to the site. In other words, trips may be made between individual retail uses on-site or between the retail and industrial uses (employees) and can be made either by walking or using internal roadways without using external streets (e.g., restaurant to retail). Internal capture reductions between the proposed land uses have been considered based on the ITE Trip Generation Handbook, 3rd Edition (2017). (3)

Pass-by trips are defined as intermediate stops on the way from an origin to a primary trip destination without a route diversion. Pass-by trips are attracted from traffic passing the site on an adjacent street or roadway that offers direct access to the generator. These types of trips are many times associated with retail uses. As the Project is proposed to include retail uses, applicable pass-by reduction percentages have been obtained and applied from the ITE Trip Generation Handbook, 3rd Edition (2017). (3)

Table 4-1 presents the trip generation rates for each of the land uses above. A summary of the Project's trip generation is shown in Table 4-2 in actual vehicles and in Table 4-3 in PCE. PCE trip generation has been utilized for the purposes of the operations analysis. As shown in Table 4-2, the proposed development is anticipated to generate a net total of 5,594 trip-ends per day on a typical weekday with 509 trips during the weekday AM peak hour and 619 trips during the weekday PM peak hour.

4.1.2 Trip Generation Comparison

The proposed Project trips have been compared to the anticipated trips generated from the 2005 Traffic Study. As shown in Table 4-2, the proposed Project is anticipated to generate 5,234 fewer daily trips, with 238 fewer AM peak hour trips and 437 fewer 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 the retail use, industrial passenger cars, and truck traffic and is generally consistent with the 2005 Traffic Study. The Project trip distribution patterns for the retail use, industrial 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. The future extension of Sun Lakes Boulevard is assumed to be completed for long-range conditions only. As such, separate distributions have been prepared for near-term and long-range conditions.

Trip distribution patterns are shown on the following exhibits:

- Exhibit 4-1: Near-Term Industrial Park Truck
- Exhibit 4-2: Near-Term Industrial Park Passenger Cars
- Exhibit 4-3: Near-Term Retail/Medical Office
- Exhibit 4-4: Long-Range Industrial Park Truck
- Exhibit 4-5: Long-Range Industrial Park Passenger Cars
- Exhibit 4-6: Long-Range Retail/Medical Office

Table 4-1

Trip Generation Rates

Land Use[1]	Units[2]	ITE LU Code	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
Actual Vehicle Trip Generation Rates									
Industrial Park[3]	TSF	130	0.324	0.076	0.400	0.084	0.316	0.400	3.370
Passenger Cars (AM-88.0%; PM-90.0%; Daily-85.0%)			0.285	0.067	0.348	0.076	0.284	0.348	2.865
2-Axle Trucks (AM-2.00%; PM-1.67%; Daily-2.51%)			0.006	0.002	0.009	0.001	0.005	0.009	0.084
3-Axle Trucks (AM-2.48%; PM-2.07%; Daily-3.11%)			0.008	0.002	0.011	0.002	0.007	0.011	0.105
4-Axle+ Trucks (AM-7.51%; PM-6.26%; Daily-9.39%)			0.024	0.006	0.032	0.005	0.020	0.033	0.316
Passenger Car Equivalent (PCE) Trip Generation Rates[4]									
Industrial Park[3]	TSF	130	0.324	0.076	0.400	0.084	0.316	0.400	3.370
Passenger Cars			0.285	0.067	0.352	0.076	0.284	0.360	2.865
2-Axle Trucks (PCE = 1.5)			0.010	0.002	0.012	0.002	0.008	0.010	0.127
3-Axle Trucks (PCE = 2.0)			0.016	0.004	0.020	0.003	0.013	0.017	0.209
4-Axle+ Trucks (PCE = 3.0)			0.073	0.017	0.090	0.016	0.059	0.075	0.949
Medical-Dental Office	720	TSF	2.168	0.612	2.780	0.969	2.491	3.460	34.800
Shopping Center	820	TSF	0.583	0.357	0.940	1.829	1.981	3.810	37.750

[1] Trip Generation Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, Tenth Edition (2017).

[2] TSF = thousand square feet

[3] Vehicle Mix Source: ITE Trip Generation Handbook Supplement (2020), Appendix C.
Truck Mix: South Coast Air Quality Management District's (SCAQMD) recommended truck mix, by axle type.
Normalized % - Without Cold Storage: 16.7% 2-Axle trucks, 20.7% 3-Axle trucks, 62.6% 4-Axle trucks.

[4] PCE factors per SBCTA CMP: 2-axle = 1.5; 3-axle = 2.0; 4+-axle = 3.0.

Table 4-2

Project Trip Generation Summary (Actual Vehicles)

Land Use	Quantity	Units[1]	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Industrial Park	877.298	TSF							
Passenger Cars:			250	59	309	66	250	316	2,514
Truck Trips:									
2-axle:			6	1	7	1	5	6	74
3-axle:			7	2	9	2	6	8	92
4+-axle:			21	5	26	5	17	22	278
- Truck Trips			34	8	42	8	28	36	444
Industrial Park Subtotal			***284***	***67***	***351***	***74***	***278***	***352***	***2,958***
Medical Office	52.065	TSF	113	32	145	50	130	180	1,812
Internal Capture			-4	-7	-11	-1	-5	-6	-62
Office Subtotal			***109***	***25***	***134***	***49***	***125***	***174***	***1,750***
Commercial Retail	37.189	TSF	22	13	35	68	74	142	1,404
Internal Capture			-7	-4	-11	-5	-1	-6	-60
Pass-By (34% PM/Daily)			0	0	0	-21	-21	-43	-458
Retail Subtotal			***15***	***9***	***24***	***42***	***51***	***93***	***886***
TOTAL TRIPS (Actual Vehicles) [2]			**408**	**101**	**509**	**165**	**454**	**619**	**5,594**
Total Trips from Previous Traffic Study			**502**	**245**	**747**	**454**	**602**	**1,056**	**10,828**
Net Difference in Trips			**-94**	**-144**	**-238**	**-289**	**-148**	**-437**	**-5,234**

[1] TSF = thousand square feet

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

Table 4-3

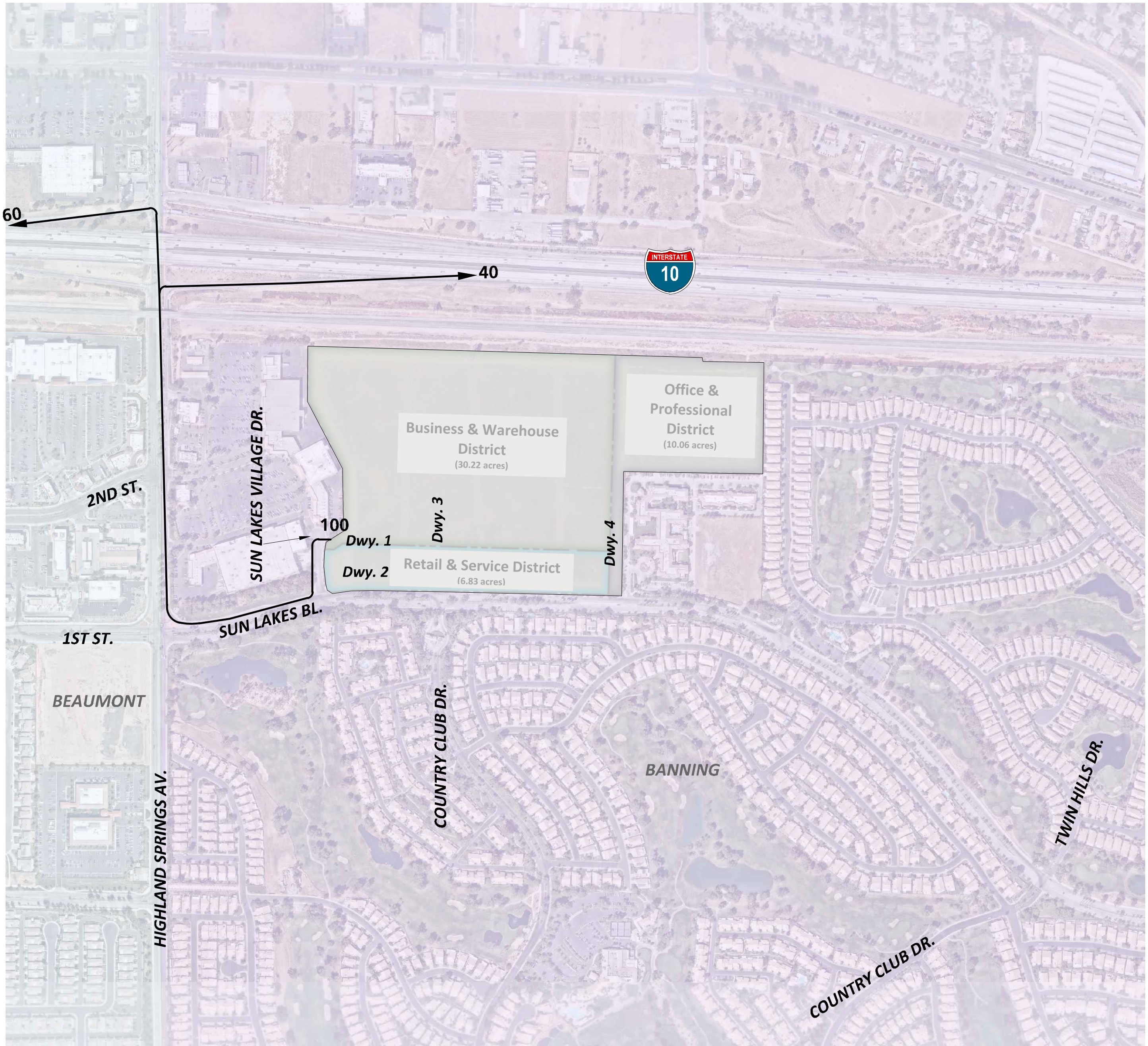
Project Trip Generation Summary (PCE)

Land Use	Quantity	Units[1]	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Industrial Park	877.298	TSF							
Passenger Cars:			250	59	309	66	250	316	2,514
Truck Trips:									
2-axle:			9	2	11	2	7	9	112
3-axle:			14	3	17	3	11	14	184
4+-axle:			64	15	79	14	52	66	834
- Truck Trips			87	20	107	19	70	89	1,130
Industrial Park Subtotal			***337***	***79***	***416***	***85***	***320***	***405***	***3,644***
Medical Office	52.065	TSF	113	32	145	50	130	180	1,812
Internal Capture			-4	-7	-11	-1	-5	-6	-62
Office Subtotal			***109***	***25***	***134***	***49***	***125***	***174***	***1,750***
Commercial Retail	37.189	TSF	22	13	35	68	74	142	1,404
Internal Capture			-7	-4	-11	-5	-1	-6	-60
Pass-By (34% PM/Daily)			0	0	0	-21	-21	-42	-458
Retail Subtotal			***15***	***9***	***24***	***42***	***51***	***93***	***886***
TOTAL TRIPS (PCE) [2]			**461**	**113**	**574**	**176**	**496**	**672**	**6,280**
Total Trips from Previous Traffic Study			**502**	**245**	**747**	**454**	**602**	**1,056**	**10,828**
Net Difference in Trips			**-41**	**-132**	**-173**	**-278**	**-106**	**-384**	**-4,548**

[1] TSF = thousand square feet

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

EXHIBIT 4-1: PROJECT (TRUCK) NEAR-TERM TRIP DISTRIBUTION



LEGEND:

10 *= PERCENT TO/FROM PROJECT*

N

EXHIBIT 4-2: PROJECT (INDUSTRIAL CAR) NEAR-TERM TRIP DISTRIBUTION

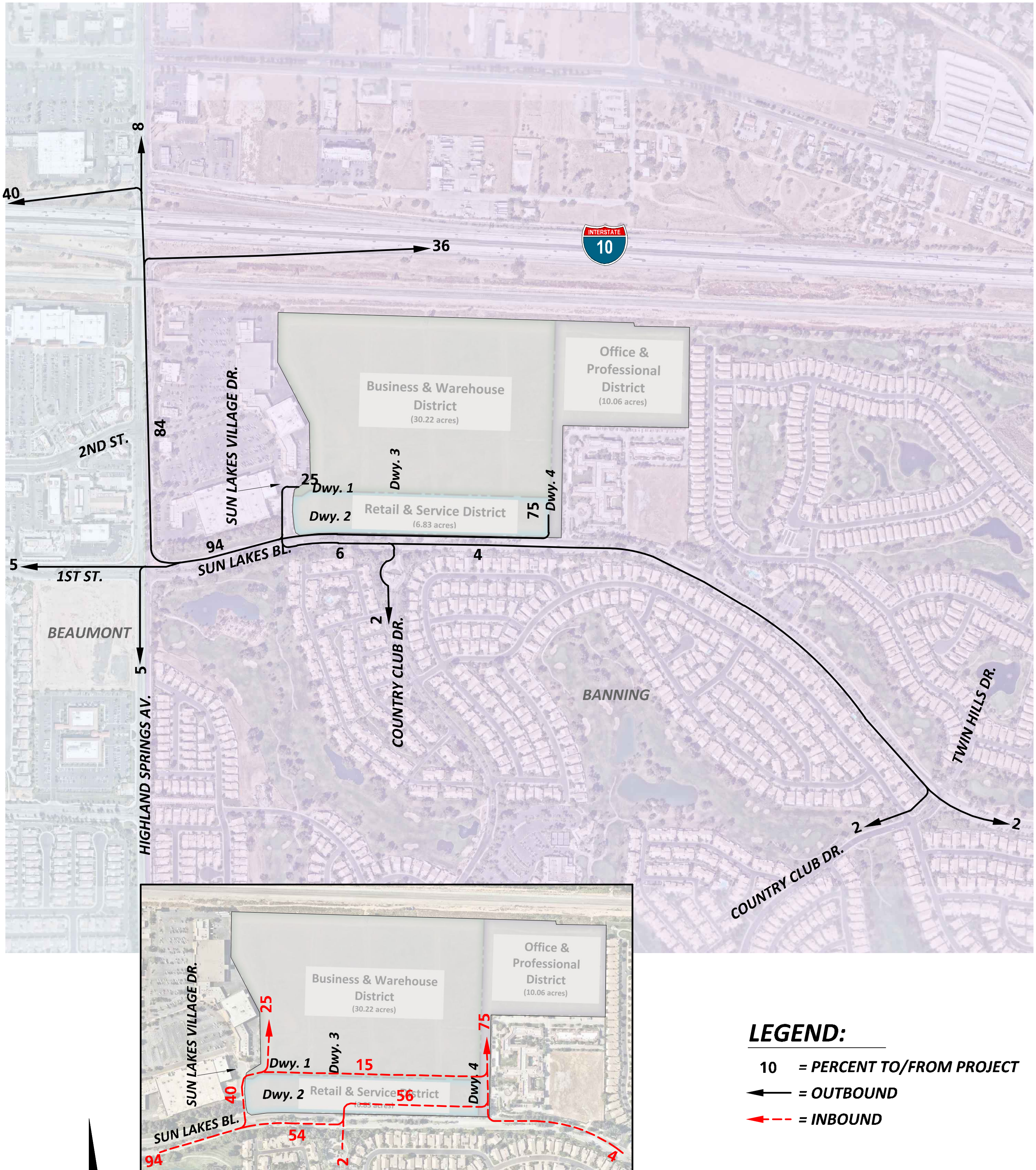


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EXHIBIT 4-3: PROJECT (RETAIL/MEDICAL OFFICE) NEAR-TERM TRIP DISTRIBUTION

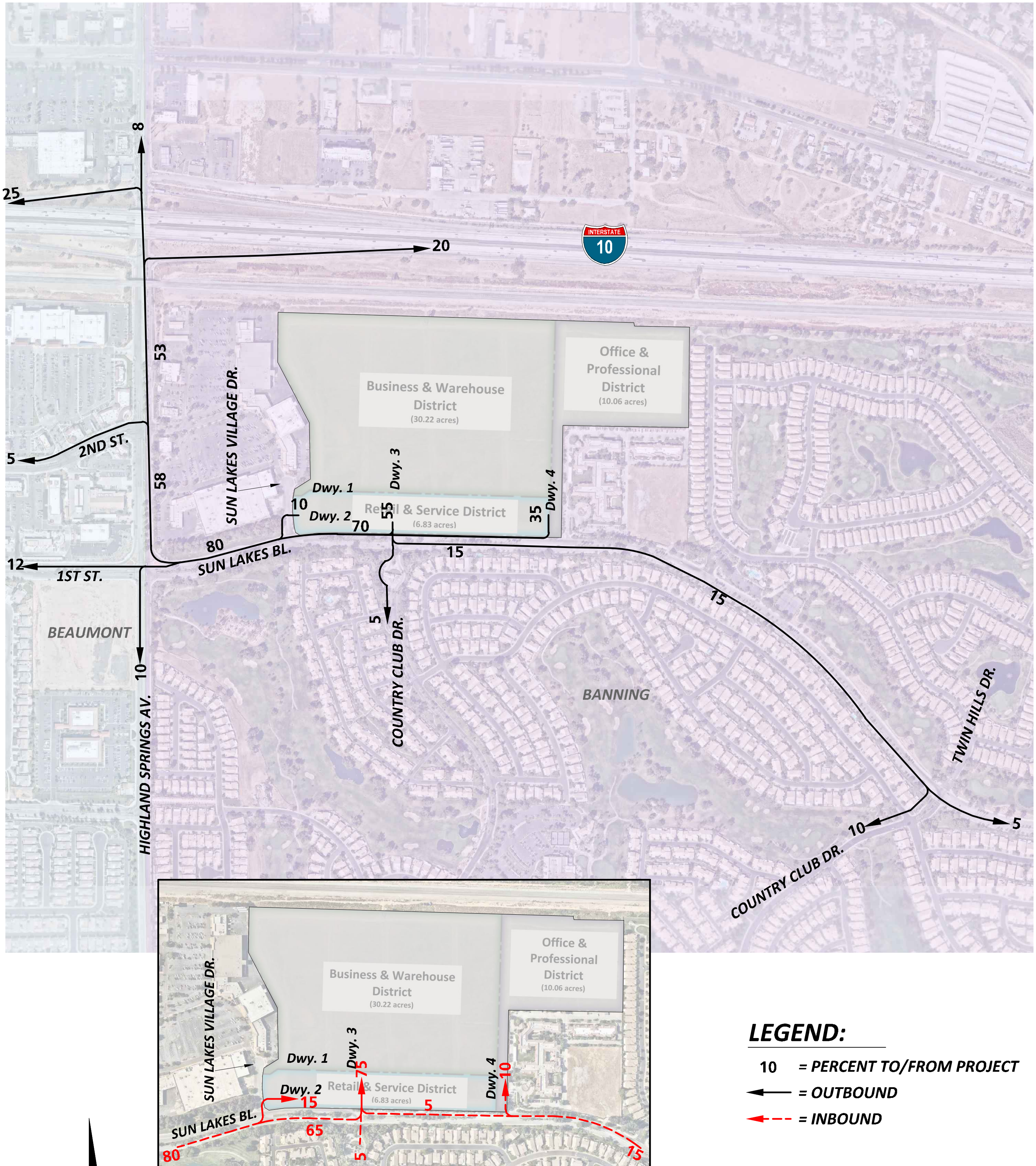
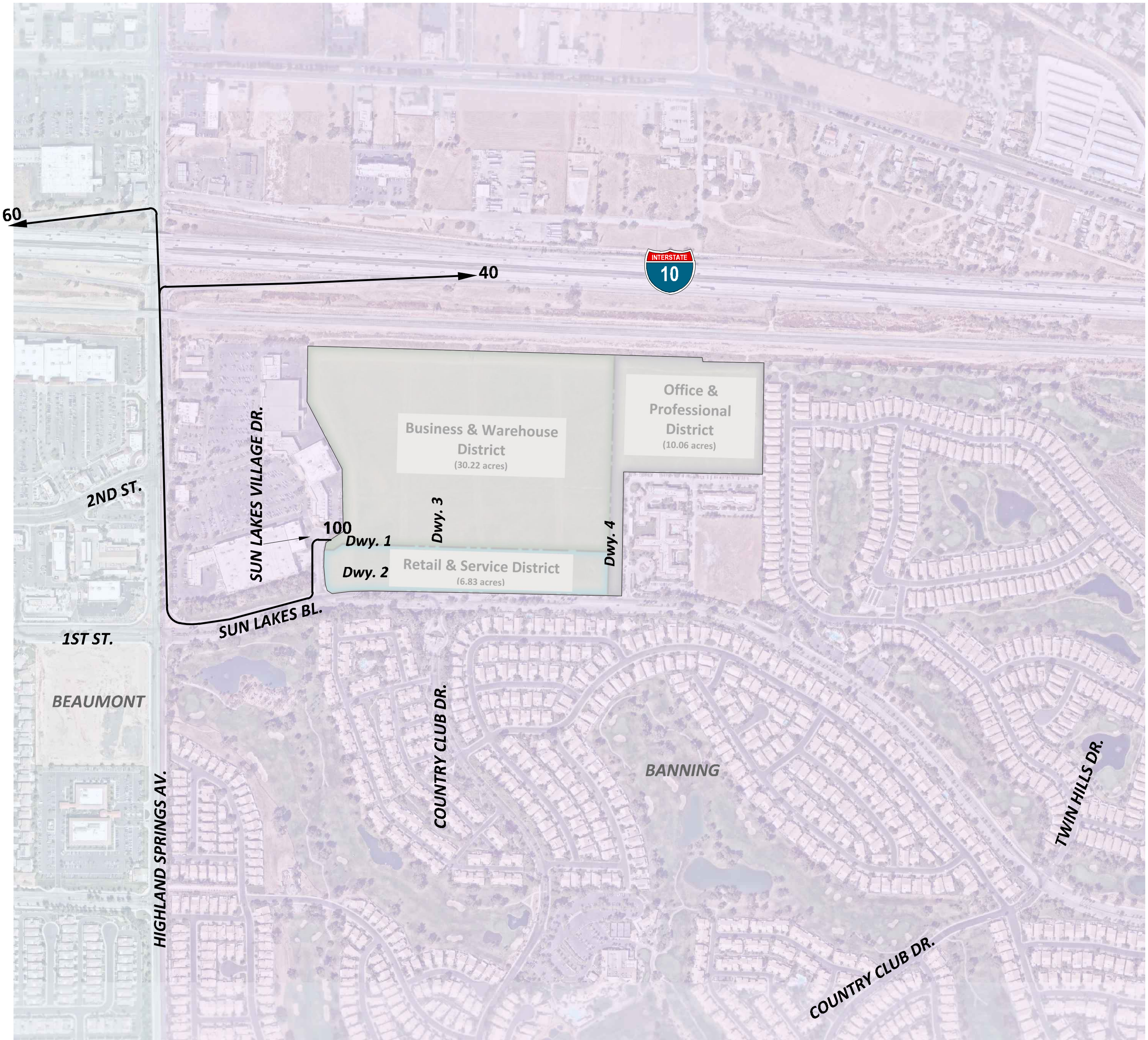


EXHIBIT 4-4: PROJECT (TRUCK) LONG-RANGE TRIP DISTRIBUTION



LEGEND:

10 = *PERCENT TO/FROM PROJECT*

N

EXHIBIT 4-5: PROJECT (INDUSTRIAL CAR) LONG-RANGE TRIP DISTRIBUTION

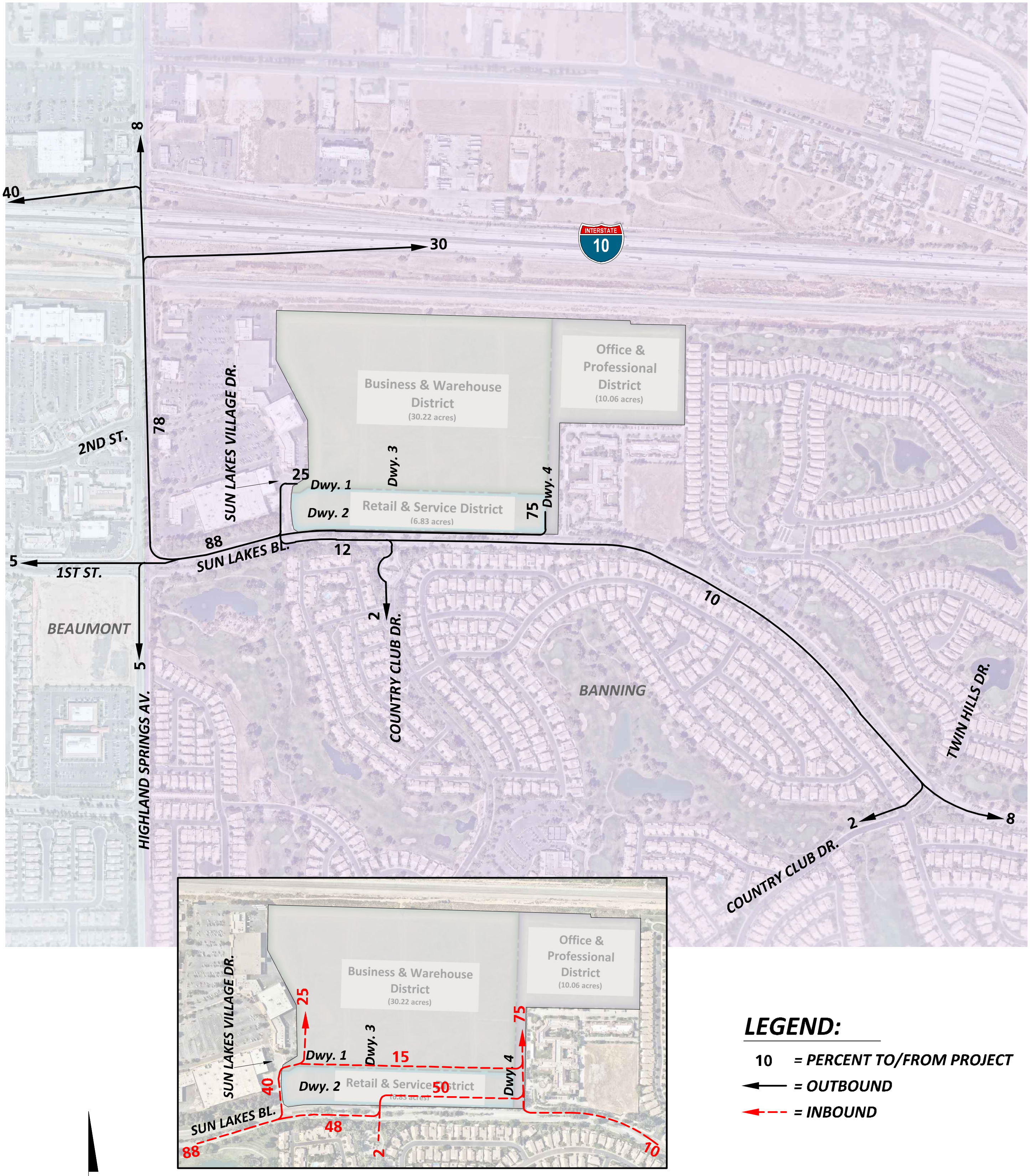
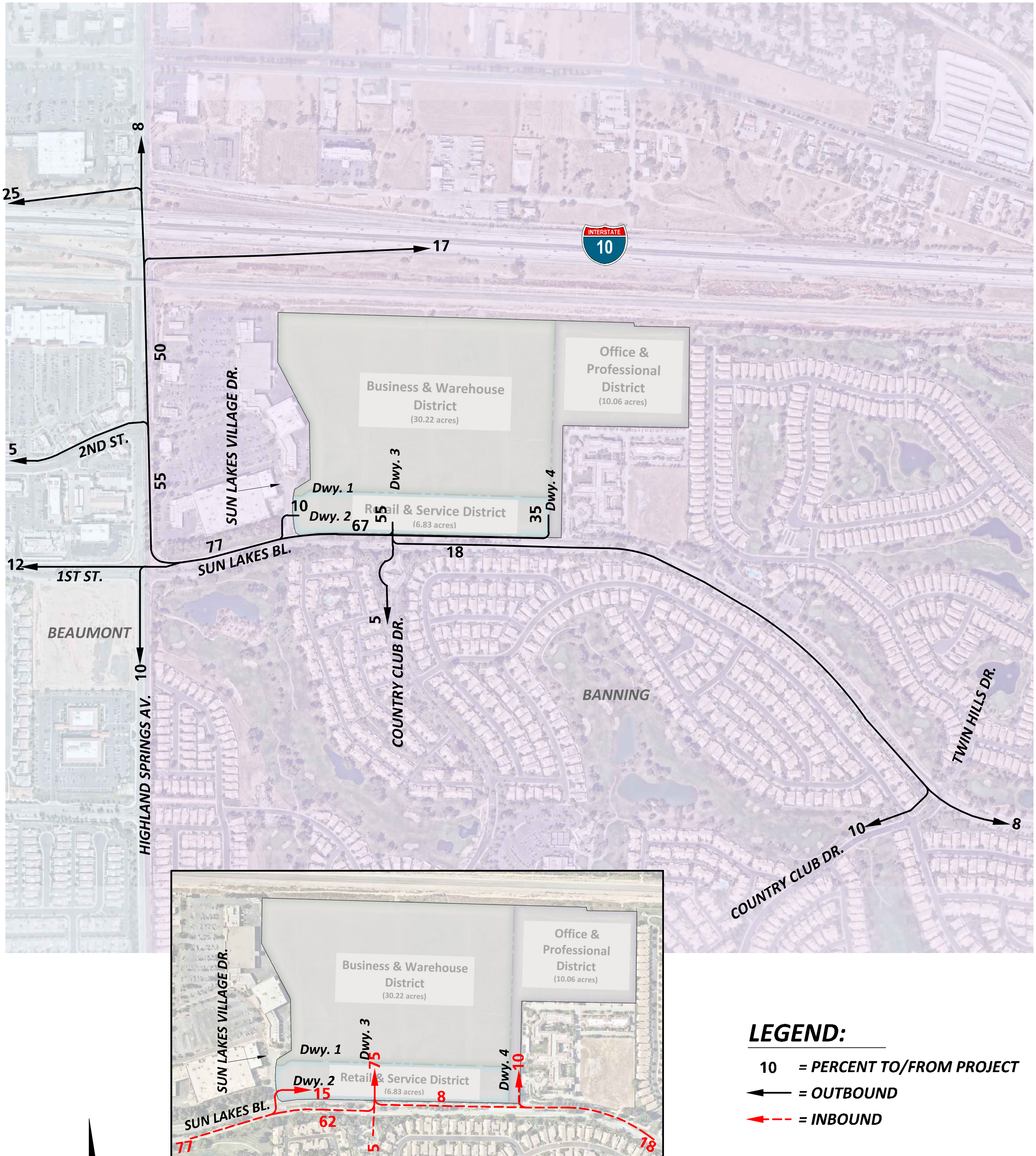


EXHIBIT 4-6: PROJECT (RETAIL/MEDICAL OFFICE) LONG-RANGE TRIP DISTRIBUTION



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.

4.4 PROJECT TRIP ASSIGNMENT

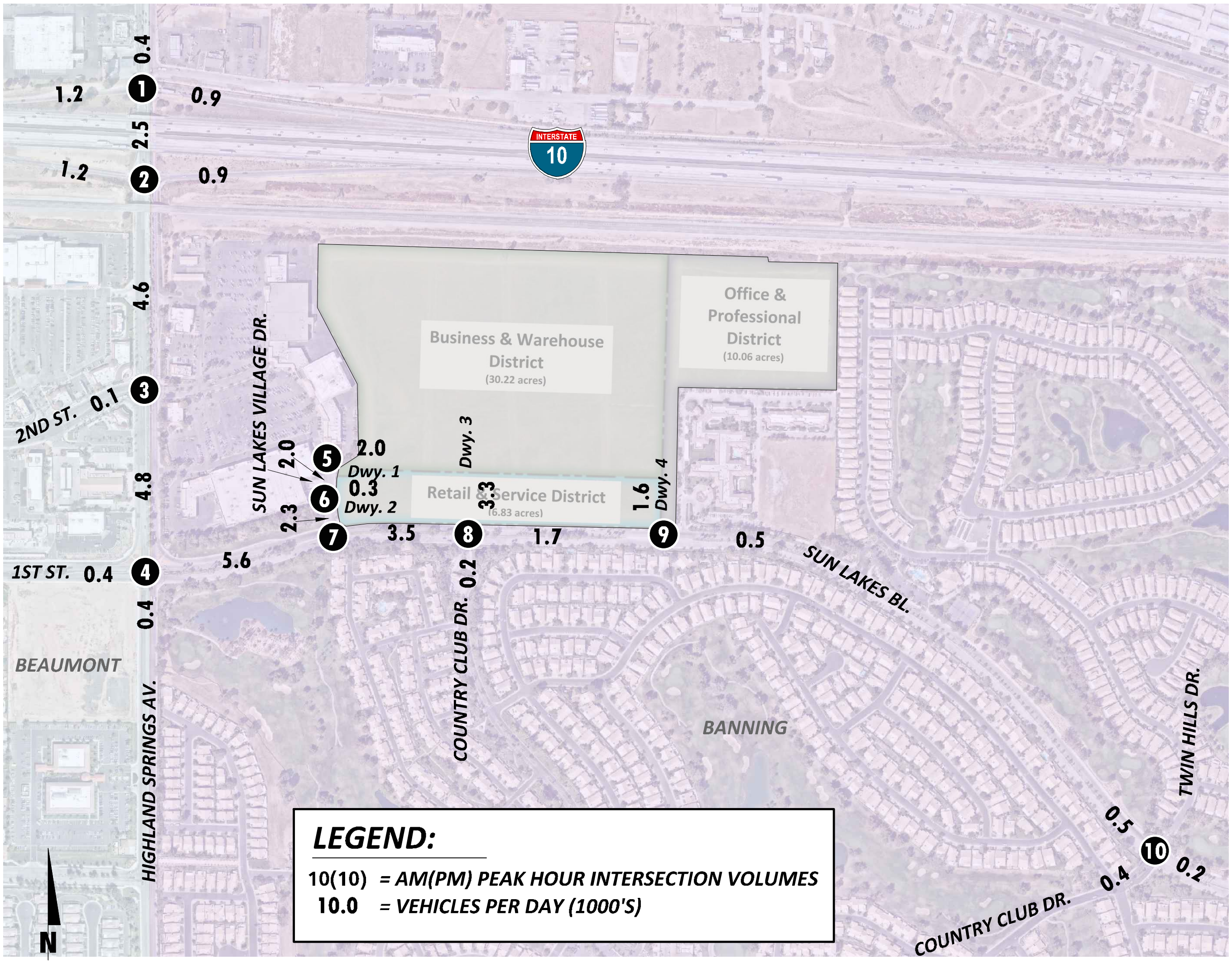
The assignment of traffic from the Project area to the adjoining roadway system is based upon the Project trip generation, trip distribution, and the arterial highway and local street system improvements that would be in place by the time of initial occupancy of the Project. Based on the identified Project traffic generation and trip distribution patterns, the Project only ADT and peak hour intersection turning movement volumes for near-term conditions is shown on Exhibit 4-7 and the Project only ADT and peak hour intersection turning movement volumes for long-range conditions is shown on Exhibit 4-8.

4.5 BACKGROUND TRAFFIC

The adopted Southern California Association of Governments (SCAG) 2020 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) (May 2020) growth forecasts for the City of Banning identifies projected growth in population of 31,000 in 2016 to 41,500 in 2045, or a 33.87% increase over the 29-year period. (9) The change in population equates to roughly a 1.01% growth rate, compounded annually. Similarly, growth over the same 29-year period in households is projected to increase by 47.71%, or a 1.35% annual growth rate. Finally, growth in employment over the same 29-year period is projected to increase by 56.16%, or a 1.55% annual growth rate.

Based on a comparison of Existing (2020) traffic volumes to the Horizon Year (2040) forecasts, the average growth rate is estimated at approximately 1.94%, compounded annually between Existing (2020) and 2040 traffic conditions. The annual growth rate at each individual intersection is not lower than 1.68% compounded annually to as high as 11.92% compounded annually over the same time period. Therefore, the annual growth rate utilized for the purposes of this analysis would appear to conservatively approximate the anticipated regional growth in traffic volumes in the City of Banning for Horizon Year (2040) traffic conditions, especially when considered along with the addition of project-related traffic, which would tend to overstate as opposed to understate the potential effects to traffic and circulation.

EXHIBIT 4-7: PROJECT (NEAR-TERM) ONLY TRAFFIC VOLUMES (IN PCE)



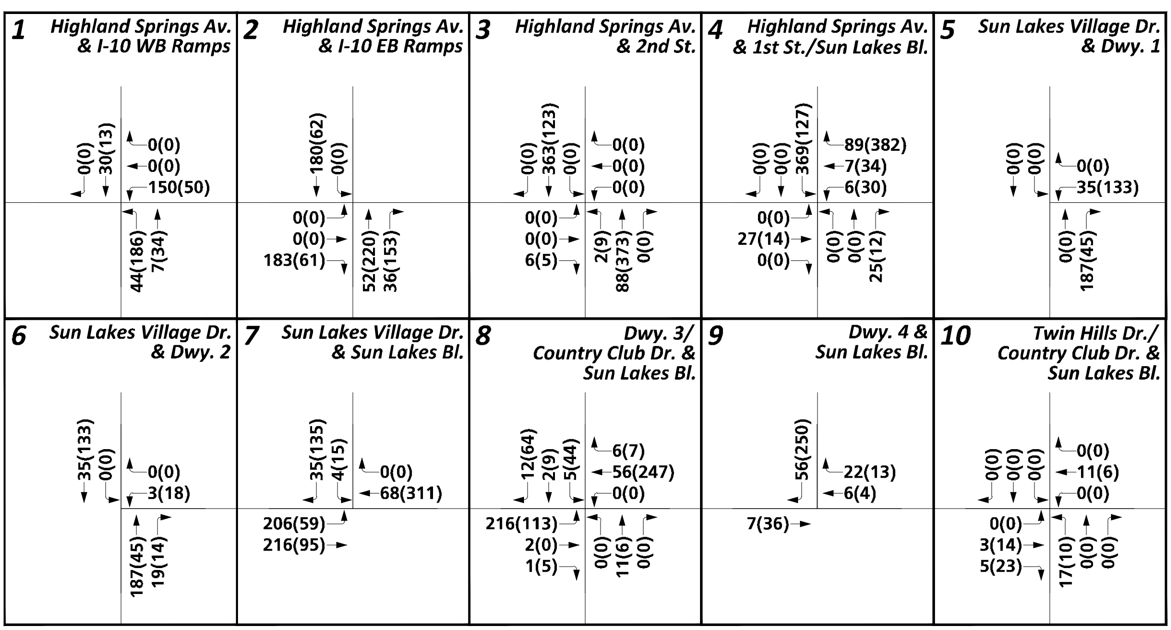


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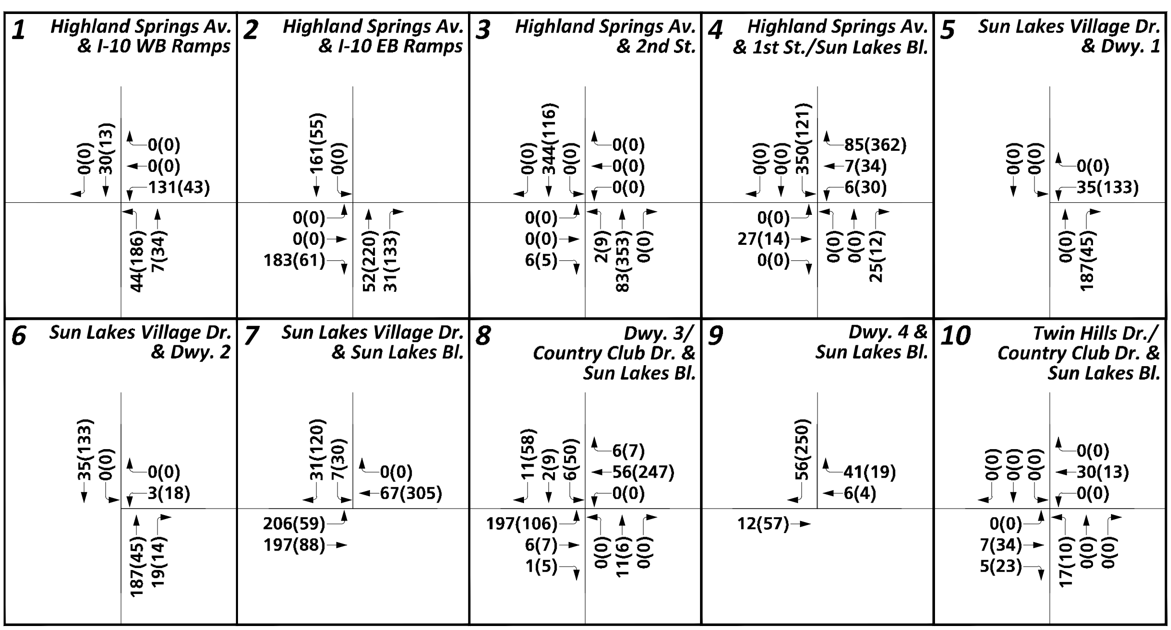
EXHIBIT 4-8: PROJECT (LONG-RANGE) ONLY TRAFFIC VOLUMES (IN PCE)



4.6 HORIZON YEAR TRAFFIC FORECASTS

Traffic projections for Horizon Year conditions were derived from the RivTAM regional model using accepted procedures for model forecast refinement and smoothing. The traffic forecasts reflect the area-wide growth anticipated between Existing and Horizon Year traffic conditions. The base model year for the RivTAM regional model is Year 2012 and the future year model is Year 2040.

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.

The refined future peak hour approach and departure volumes obtained from these calculations 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. However, review of the resulting model growth indicates negative growth for some of the study area intersections. In an effort to conduct a conservative analysis, reductions to traffic forecasts from Existing traffic conditions were not assumed as part of this analysis. As such, 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 Existing volumes in order to ensure a minimum growth as a part of the refinement process. Future estimated peak hour traffic data was used for new intersections and intersections with an anticipated change in travel patterns to further refine the Horizon Year peak hour forecasts. This includes the intersections affected by the future Sun Lakes Boulevard extension.

The future Horizon Year Without Project peak hour turning movements were then reviewed by Urban Crossroads 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 freeway ramp 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. Post-processing worksheets for Horizon Year Without Project traffic conditions are provided in Appendix 4.1.

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5 E+P TRAFFIC CONDITIONS

This section discusses the traffic forecasts for E+P conditions and the resulting intersection operations, traffic signal warrant, and off-ramp queuing analyses.

5.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for E+P 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 E+P conditions only (e.g., intersection and roadway improvements at the Project's frontage and driveways).

5.2 E+P TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes plus Project traffic. The ADT and peak hour intersection turning movement volumes which can be expected for E+P traffic conditions are shown on Exhibit 5-1.

5.3 INTERSECTION OPERATIONS ANALYSIS

5.3.1 E+P CONDITIONS

E+P peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2 *Methodologies* of this TA. The intersection analysis results are summarized in Table 5-1, which indicates that with the addition of Project traffic, the study area intersections are anticipated to continue to operate at an acceptable LOS during the peak hours, consistent with Existing (2020) traffic conditions. A summary of the peak hour intersection LOS for E+P traffic conditions is shown on Exhibit 5-2. The intersection operations analysis worksheets for E+P traffic conditions are included in Appendix 5.1 of this TA.

5.4 TRAFFIC SIGNAL WARRANTS ANALYSIS

The following unsignalized study area intersection is anticipated to meet a peak hour volume-based or planning-level ADT traffic signal warrant with the addition of Project traffic for E+P traffic conditions (see Appendix 5.2):

- Sun Lakes Village Drive & Sun Lakes Boulevard (#7)

EXHIBIT 5-1: E+P TRAFFIC VOLUMES (IN PCE)

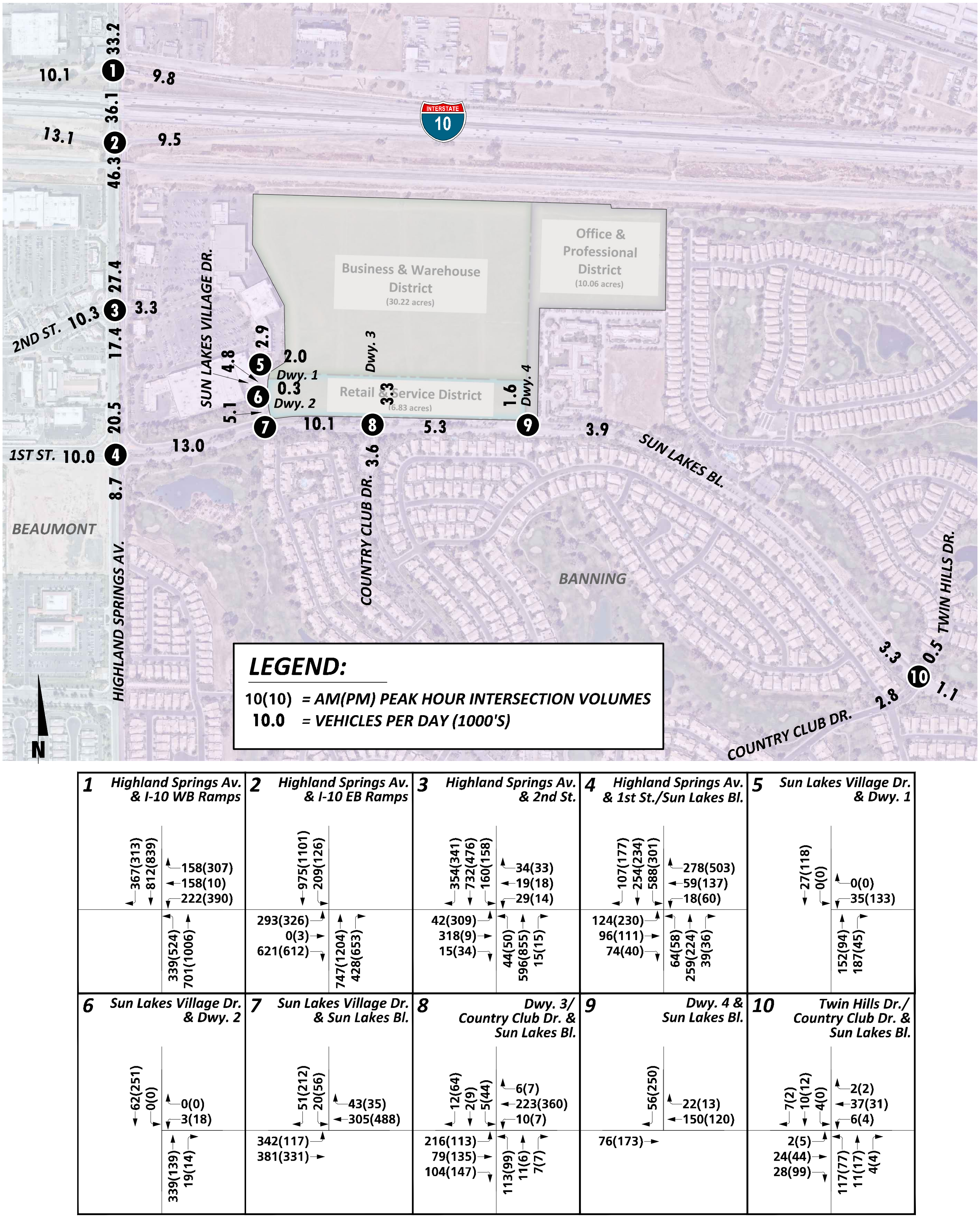

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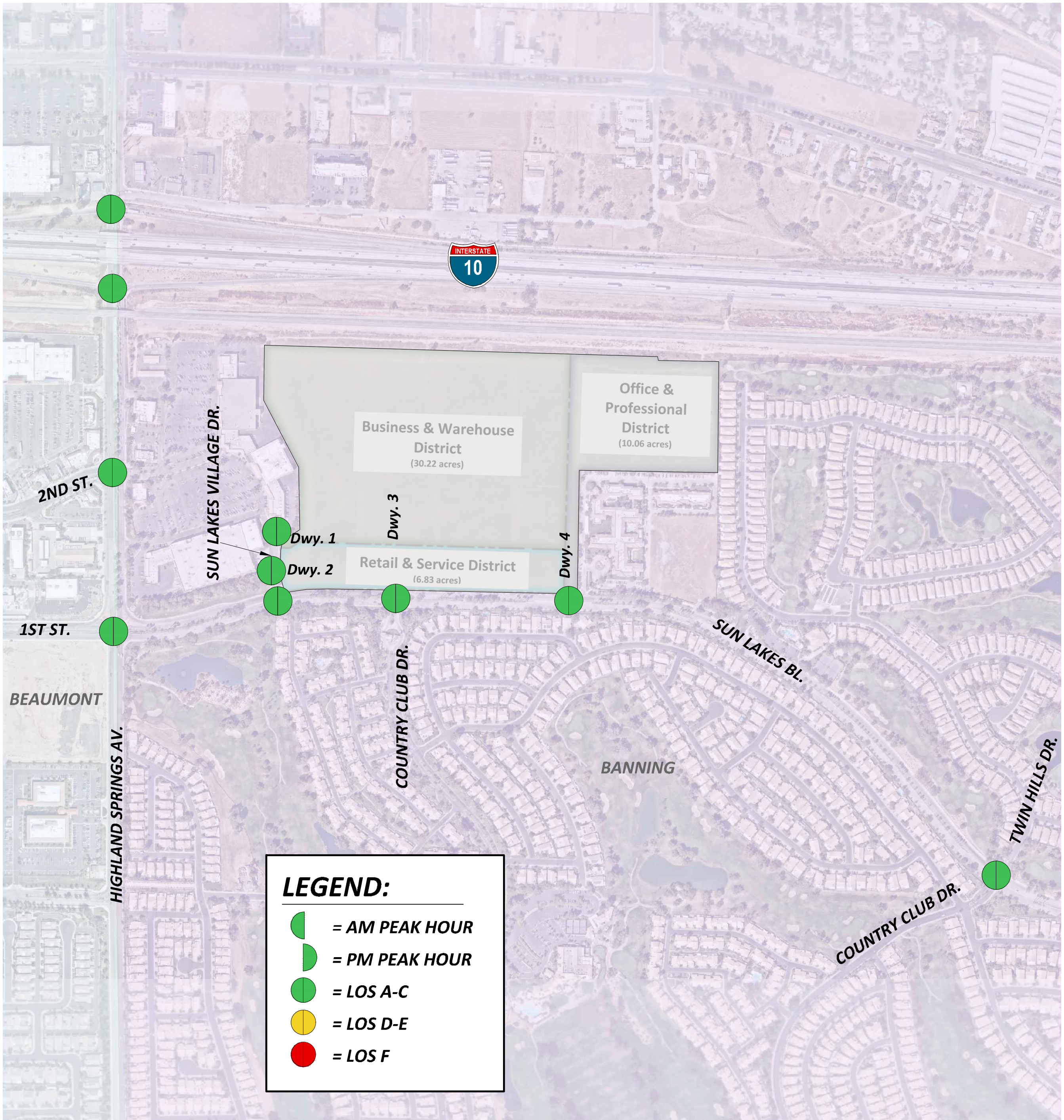
EXHIBIT 5-2: E+P SUMMARY OF LOS



Note: the acceptable LOS for the freeway ramps is D

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Table 5-1

Intersection Analysis for E+P Conditions

#	Intersection	Traffic Control[2]	Existing (2020) Delay[1] (secs.) AM	Existing (2020) Delay[1] (secs.) PM	Existing (2020) Level of Service AM	Existing (2020) Level of Service PM	E+P Delay[1] (secs.) AM	E+P Delay[1] (secs.) PM	E+P Level of Service AM	E+P Level of Service PM	Acceptable LOS[3]
1	Highland Springs Av. & I-10 WB Ramps	TS	23.5	31.5	C	C	34.8	42.0	C	D	D
2	Highland Springs Av. & I-10 EB Ramps	TS	23.4	21.5	C	C	34.6	26.2	C	C	D
3	Highland Springs Av. & 2nd St.	TS	23.4	19.5	C	B	24.8	20.8	C	C	C
4	Highland Springs Av. & 1st St./Sun Lakes Bl.	TS	25.1	15.4	C	B	34.5	18.4	C	B	C
5	Sun Lakes Village Dr. & Dwy. 1	**<u>CSS</u>**	Future Intersection				10.4	11.1	B	B	C
6	Sun Lakes Village Dr. & Dwy. 2	**<u>CSS</u>**	Future Intersection				11.3	11.4	B	B	C
7	Sun Lakes Village Dr. & Sun Lakes Bl.	CSS	12.1	10.5	B	B	16.7	15.7	C	C	C
8	Dwy. 3/Country Club Dr. & Sun Lakes Bl.	AWS/**<u>TS</u>**[4]	8.7	8.2	A	A	17.3	19.0	B	B	C
9	Dwy. 4 & Sun Lakes Bl.	**<u>CSS</u>**	Future Intersection				9.0	10.1	A	B	C
10	Twin Hills Dr./Country Club Dr. & Sun Lakes Bl.	AWS	8.6	8.0	A	A	8.8	8.2	A	A	C

* **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. HCM delay reported in seconds.

2 CSS = Cross-street Stop; AWS = All-way Stop; TS = Traffic Signal; **<u>CSS</u>** = Improvement

3 Minimum acceptable LOS for each applicable jurisdiction.

4 The Project will construct a traffic signal as part of the Project design features.

5.5 OFF-RAMP QUEUING ANALYSIS

Queuing analysis findings for E+P are presented in Table 5-2. As shown in Table 5-2 and consistent with Existing traffic conditions, there are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows with the addition of Project traffic. Worksheets for E+P traffic conditions off-ramp queuing analyses are provided in Appendices 5.3.

5.6 EXISTING DEFICIENCIES AND IMPROVEMENTS

5.6.1 IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

All existing study area intersections are anticipated to continue to operate at an acceptable LOS under E+P traffic conditions; therefore, no improvements have been identified.

5.6.2 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-10 Freeway and Highland Springs Avenue interchange for E+P traffic conditions. As such, no improvements have been identified.

Table 5-2

Peak Hour Queuing Summary for E+P Conditions

Intersection	Movement	Available Stacking Distance (Feet)	Existing (2020)				E+P			
			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
Highland Springs Av. & I-10 WB Ramps	WBL/T	1,600	263	425 [2]	Yes	Yes	520 [2]	517 [2]	Yes	Yes
	WBR	350	57	207	Yes	Yes	57	216	Yes	Yes
Highland Springs Av. & I-10 EB Ramps	EBL/T	1,300	278	281	Yes	Yes	278	281	Yes	Yes
	EBR	630	366	559 [2]	Yes	Yes	771 [2,3]	675 [2,3]	Yes	Yes

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided.

[2] 95th percentile volume exceeds capacity, queue may be longer.

[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-10 Freeway mainline.

6 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 off-ramp queuing analyses.

6.1 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 conditions only (e.g., intersection and roadway improvements along the Project's frontage and driveways).
- Other parallel facilities, that although not evaluated for the purposes of this analysis, are anticipated to be in place for Horizon Year traffic conditions and would affect the travel patterns within the study area.
- The future extension of Sun Lakes Boulevard is assumed to be completed.

6.2 HORIZON YEAR (2040) WITHOUT PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes the refined post-process volumes obtained from the RivTAM (see Section 4.6 *Horizon Year Traffic Forecasts* of this TA for a detailed discussion on the post-processing methodology). 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 Exhibit 6-1.

6.3 HORIZON YEAR (2040) WITH PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes the refined post-process volumes obtained from the RivTAM plus the traffic generated by the proposed Project. 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 Exhibit 6-2.

EXHIBIT 6-1: HORIZON YEAR (2040) WITHOUT PROJECT TRAFFIC VOLUMES (IN PCE)

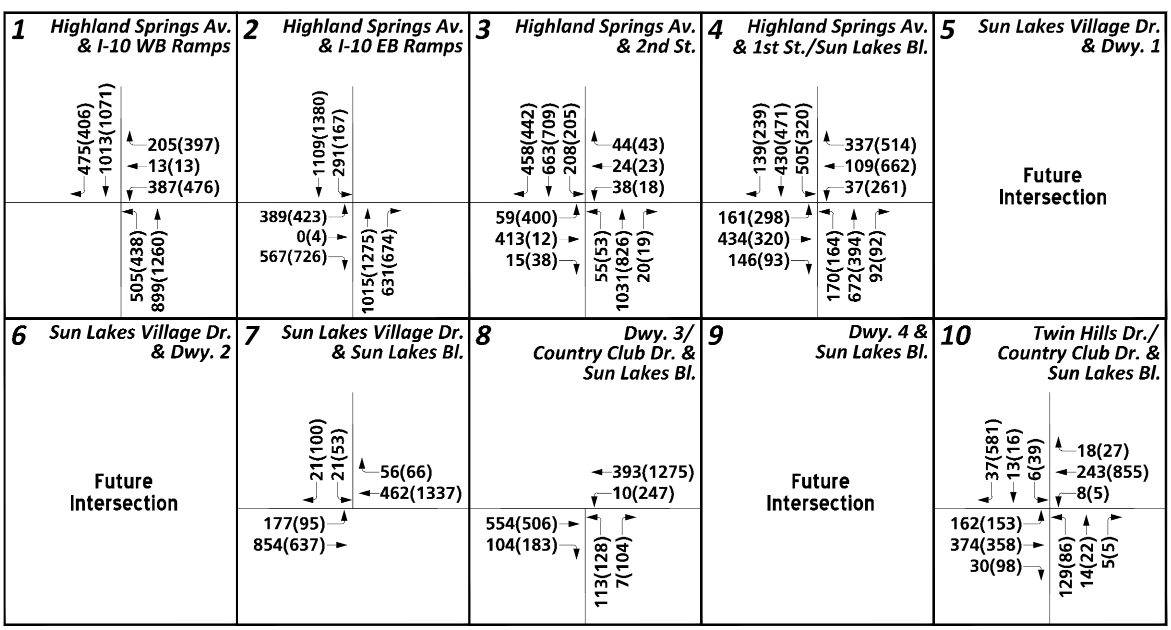

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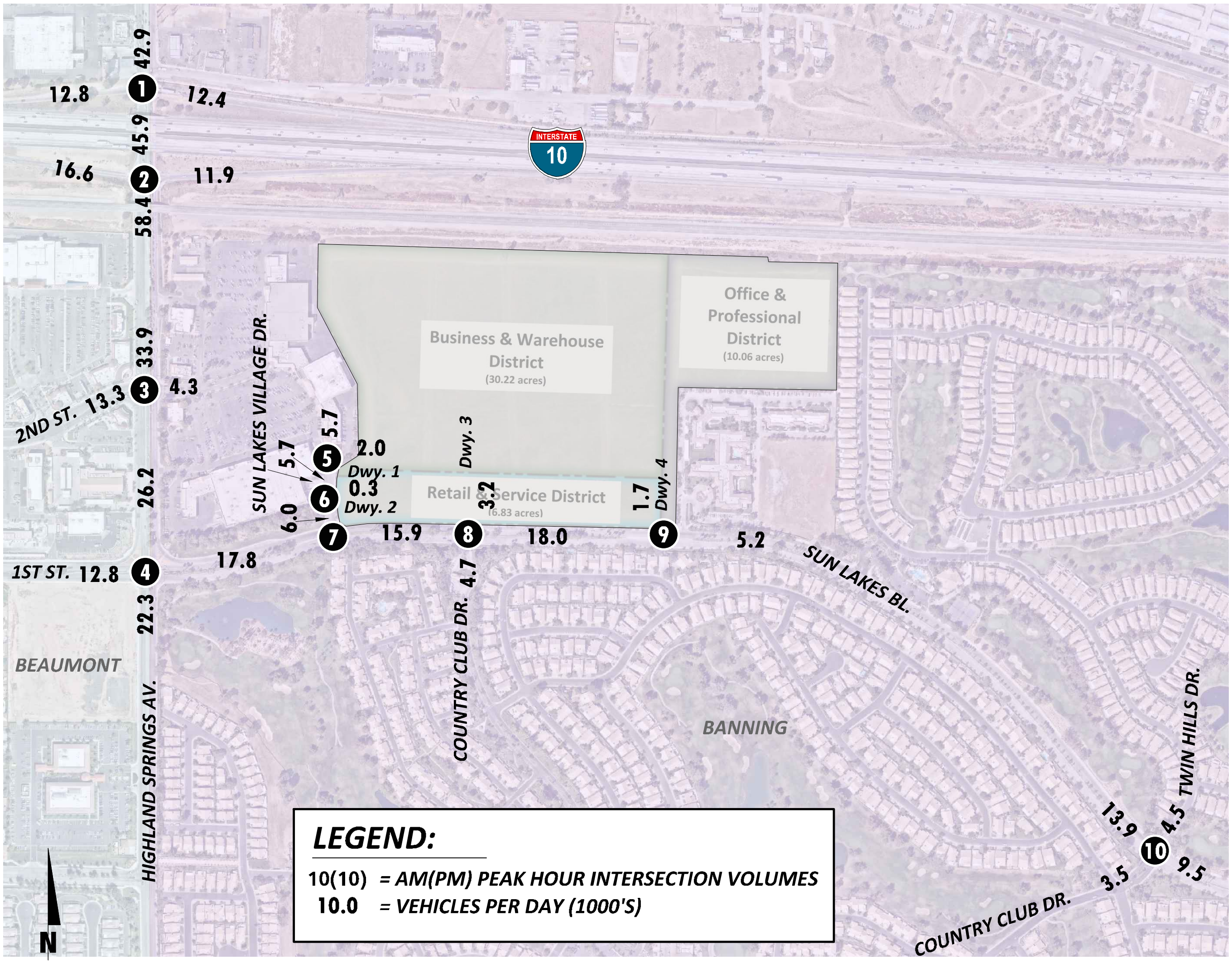
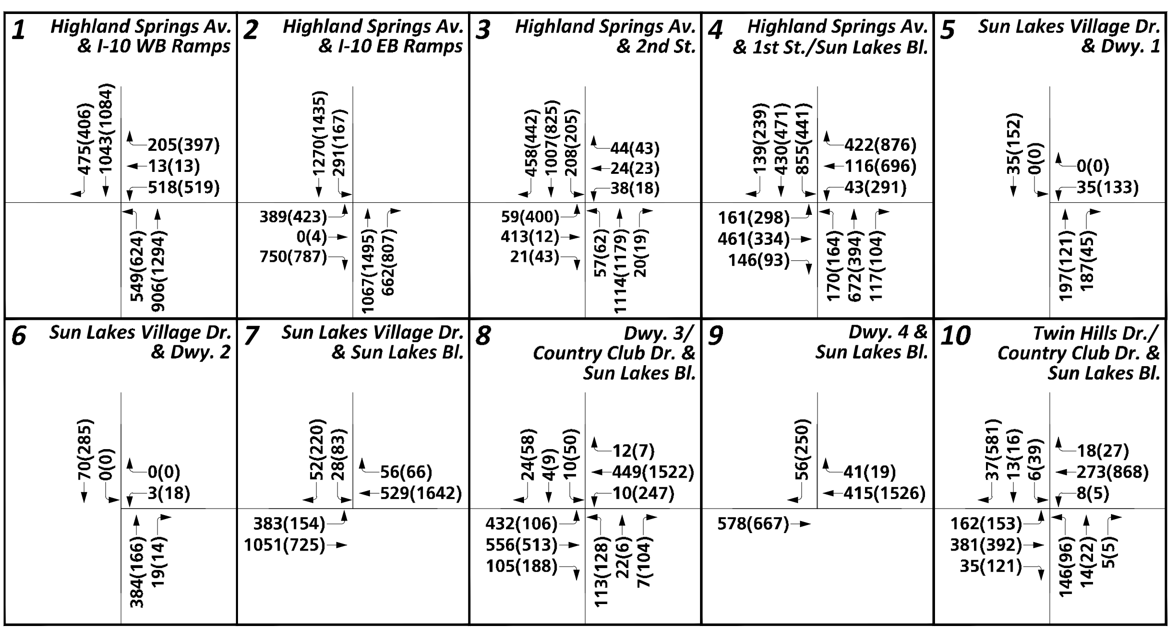
EXHIBIT 6-2: HORIZON YEAR (2040) WITH PROJECT TRAFFIC VOLUMES (IN PCE)





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6.4 INTERSECTION OPERATIONS ANALYSIS

6.4.1 HORIZON YEAR (2040) WITHOUT PROJECT TRAFFIC CONDITIONS

Horizon Year (2040) 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 analysis results are summarized in Table 6-1, which indicate that the following study area intersections are anticipated to operate at an unacceptable LOS during the peak hours under Horizon Year (2040) Without Project:

- Highland Springs Avenue & I-10 Westbound Ramps (#1) – LOS E AM and PM peak hours
- Highland Springs Avenue & I-10 Eastbound Ramps (#2) – LOS E AM and PM peak hours
- Highland Springs Avenue & 2nd Street (#3) – LOS D AM peak hour only
- Highland Springs Avenue & 1st Street/Sun Lakes Boulevard (#4) – LOS D AM peak hour; LOS E PM peak hour
- Sun Lakes Village Drive & Sun Lakes Boulevard (#7) – LOS F PM peak hour only
- Driveway 3/Country Club Drive & Sun Lakes Boulevard (#8) – LOS F PM peak hour only
- Twin Hills Drive/Country Club Drive & Sun Lakes Boulevard (#10) – LOS F PM peak hour only

A summary of the peak hour intersection LOS for Horizon Year (2040) Without Project conditions is shown on Exhibit 6-3. The intersection operations analysis worksheets for Horizon Year (2040) Without Project traffic conditions are included in Appendix 6.1 of this TA.

6.4.2 HORIZON YEAR (2040) WITH PROJECT TRAFFIC CONDITIONS

As shown in Table 6-1 and illustrated on Exhibit 6-4, there are no additional study area intersections that are anticipated to operate at an unacceptable LOS with the addition of Project traffic, in addition to the intersections previously identified under Horizon Year (2040) traffic conditions. It should be noted, the intersection of Driveway 3/Country Club Drive & Sun Lakes Boulevard (#8) is anticipated to operate at an acceptable LOS during the peak hours with the implementation of the Project design features discussed in Section 1.6 *Recommendations* of this TA. The intersection operations analysis worksheets for Horizon Year (2040) With Project traffic conditions are included in Appendix 6.2 of this TA.

6.5 TRAFFIC SIGNAL WARRANTS ANALYSIS

The following unsignalized study area intersections are anticipated to meet a peak hour volume-based or planning-level ADT traffic signal warrant with the addition of Project traffic for Horizon Year (2040) Without Project traffic conditions (see Appendix 6.3):

- Driveway 3/Country Club Drive & Sun Lakes boulevard (#8)
- Twin Hills Drive/Country Club Drive & Sun Lakes Boulevard (#10)

With the addition of Project traffic, there are no additional unsignalized study area intersections that are anticipated to meet a traffic signal warrant for Horizon Year (2040) With Project traffic conditions (see Appendix 6.4).

Table 6-1

Intersection Analysis for Horizon Year (2040) Conditions

#	Intersection	Traffic Control[2]	2040 Without Project Delay[1] (secs.) AM	2040 Without Project Delay[1] (secs.) PM	2040 Without Project Level of Service AM	2040 Without Project Level of Service PM	2040 With Project Delay[1] (secs.) AM	2040 With Project Delay[1] (secs.) PM	2040 With Project Level of Service AM	2040 With Project Level of Service PM	Acceptable LOS[3]
1	Highland Springs Av. & I-10 WB Ramps	TS	**62.4**	**61.9**	**E**	**E**	**70.6**	**72.8**	**E**	**E**	D
2	Highland Springs Av. & I-10 EB Ramps	TS	**58.9**	**62.9**	**E**	**E**	**69.9**	**75.7**	**E**	**E**	D
3	Highland Springs Av. & 2nd St.	TS	**46.5**	22.6	**D**	C	**51.8**	27.8	**D**	C	C
4	Highland Springs Av. & 1st St./Sun Lakes Bl.	TS	**43.1**	**72.5**	**D**	**E**	**107.8**	**143.5**	**F**	**F**	C
5	Sun Lakes Village Dr. & Dwy. 1		Future Intersection				10.9	11.8	B	B	C
6	Sun Lakes Village Dr. & Dwy. 2		Future Intersection				11.8	12.0	B	B	C
7	Sun Lakes Village Dr. & Sun Lakes Bl.	CSS	15.7	**52.1**	C	**F**	24.2	**>100.0**	C	**F**	C
8	Dwy. 3/Country Club Dr. & Sun Lakes Bl.	AWS/**TS**[4]	14.1	**114.0**	B	**F**	20.7	34.6	C	C	C
9	Dwy. 4 & Sun Lakes Bl.	CSS	Future Intersection				10.2	24.3	B	C	C
10	Twin Hills Dr./Country Club Dr. & Sun Lakes Bl.	AWS	12.7	**>200.0**	B	**F**	13.5	**>200.0**	B	**F**	C

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

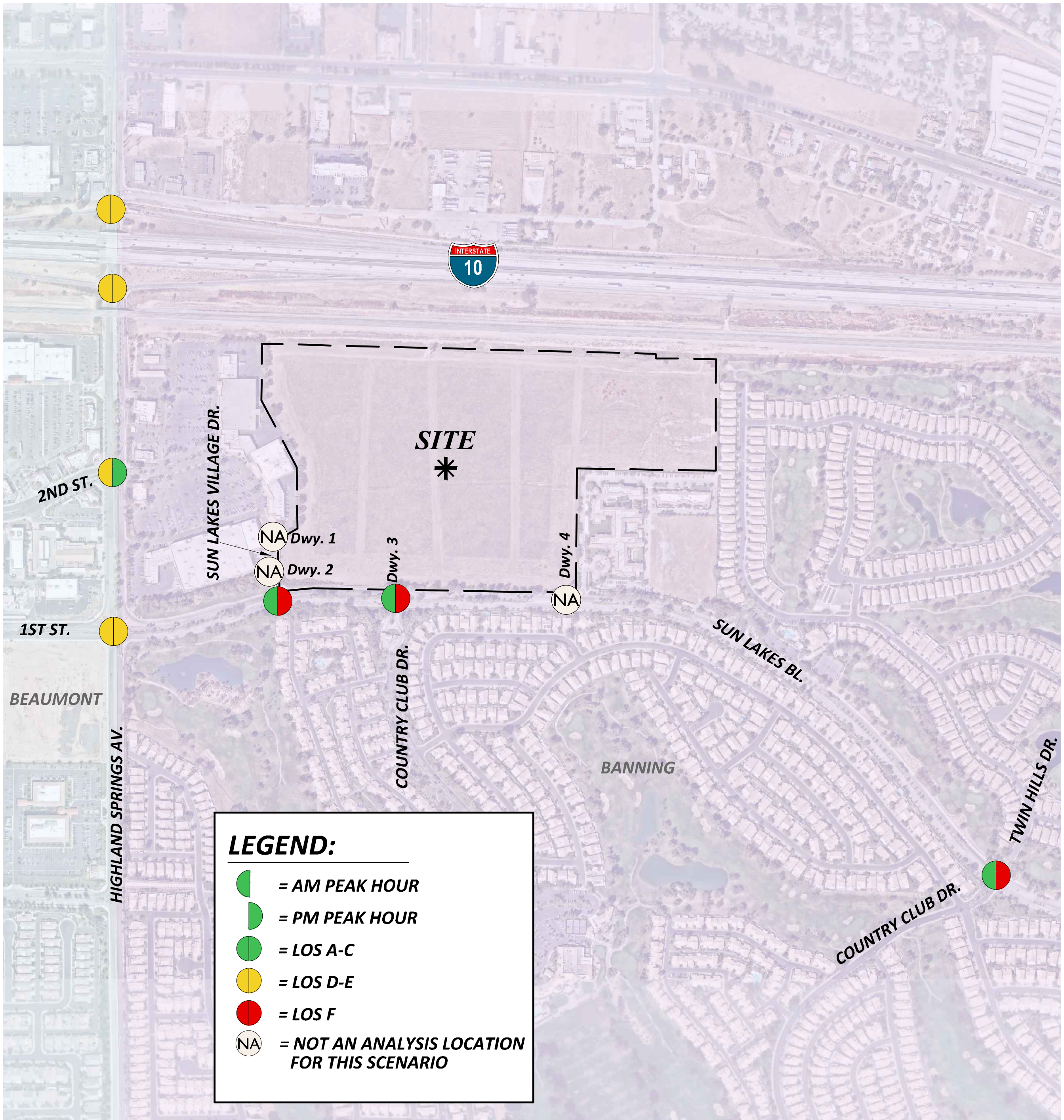
1 Per the Highway Capacity Manual (6th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements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

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

3 Minimum acceptable LOS for each applicable jurisdiction.

4 The Project will construct a traffic signal as part of the Project design features.

EXHIBIT 6-3: HORIZON YEAR (2040) WITHOUT PROJECT SUMMARY OF LOS



Note: the acceptable LOS for the freeway ramps is D

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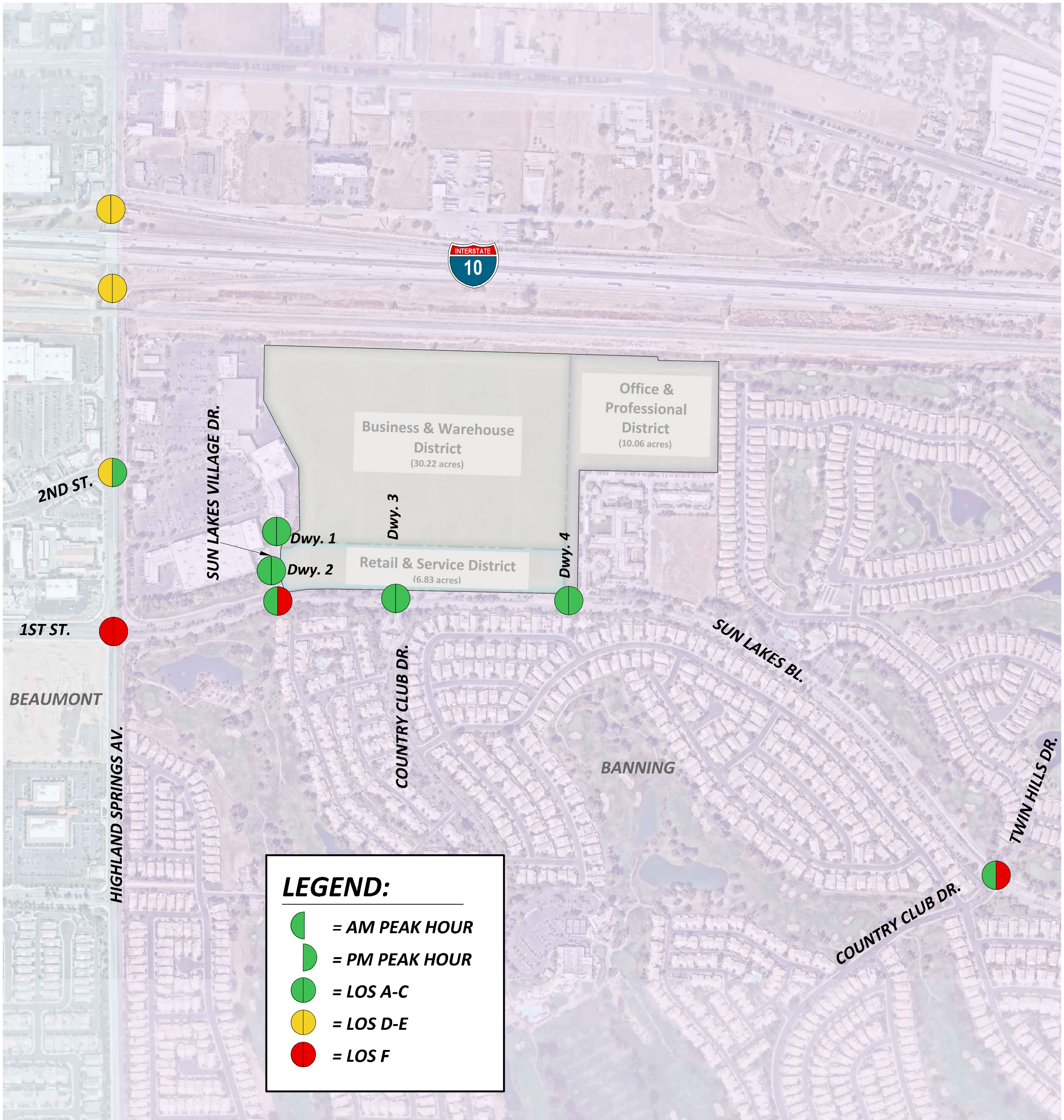
EXHIBIT 6-4: HORIZON YEAR (2040) WITH PROJECT SUMMARY OF LOS



Note: the acceptable LOS for the freeway ramps is D

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6.6 OFF-RAMP QUEUING ANALYSIS

Queuing analysis findings for Horizon Year (2040) Without Project and With Project traffic conditions are presented in Table 6-2. As shown in Table 6-2 and consistent with Existing traffic conditions, there are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows under Horizon Year (2040) Without Project and With Project traffic conditions. Worksheets for Horizon Year (2040) Without Project and With Project traffic conditions off-ramp queuing analyses are provided in Appendices 6.5 and 6.6, respectively.

6.7 DEFICIENCIES AND RECOMMENDED IMPROVEMENTS

This section provides a summary of deficiencies, based on the City of Banning deficiency criteria discussed in Section 2.6 *Deficiency Criteria*, and improvements needed to improve operations back to acceptable levels.

6.7.1 IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

The effectiveness of the identified improvement strategies to address Horizon Year (2040) traffic deficiencies are presented in Table 6-3. The Project Applicant shall contribute to these improvements through construction (with applicable credits), payment DIF/TUMF fees or fair share contribution as identified in Table 1-2. Worksheets for Horizon Year (2040) Without and With Project conditions, with improvements, HCM calculation worksheets are provided in Appendices 6.7 and 6.8, respectively.

6.7.2 IMPROVEMENTS TO ADDRESS DEFICIENCIES ON OFF-RAMP QUEUES

As shown previously in Table 6-2, there are no anticipated peak hour queuing issues at the I-10 Freeway and Highland Springs Avenue interchange for Horizon Year (2040) traffic conditions. As such, no improvements have been identified.

Table 6-2

Peak Hour 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
Highland Springs Av. & I-10 WB Ramps	WBL/T	1,600	557 [2]	591 [2]	Yes	Yes	780 [2]	754 [2]	Yes	Yes
	WBR	350	105	379 [2,3]	Yes	Yes	111	447 [2,3]	Yes	Yes
Highland Springs Av. & I-10 EB Ramps	EBL/T	1,300	385	583 [2]	Yes	Yes	379	590 [2]	Yes	Yes
	EBR	630	689 [2,3]	1,086 [2,3]	Yes	Yes	1019 [2,3]	1205 [2,3]	Yes	Yes

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided.

[2] 95th percentile volume exceeds capacity, queue may be longer.

[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-10 Freeway mainline.

Table 6-3

Intersection Analysis for Horizon Year (2040) Conditions With Improvements

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[1] (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
1	Highland Springs Av. & I-10 WB Ramps																	
	- Without Project	TS	1	2	0	0	2	1>	0	0	0	1	1	1	28.3	34.7	C	C
	- With Project	TS	1	2	0	0	2	1>	0	0	0	1	1	1	37.2	53.8	D	D
2	Highland Springs Av. & I-10 EB Ramps																	
	- Without Project	TS	0	2	1	1	2	0	0	1	2	0	0	0	32.9	29.9	C	C
	- With Project	TS	0	2	1	1	2	0	0	1	2	0	0	0	35.2	33.8	D	C
3	Highland Springs Av. & 2nd St.																	
	- Without Project[4]	TS	1	3	0	1	3	0	2	1	0	1	1	0	28.8	22.9	C	C
	- With Project[4]	TS	1	3	0	1	3	0	2	1	0	1	1	0	30.6	25.2	C	C
4	Highland Springs Av. & 1st St./Sun Lakes Bl.																	
	- Without Project	TS	1	2	0	2	2	1>	1	2	0	1	2	1>	21.2	28.6	C	C
	- With Project	TS	1	2	0	2	2	1>	1	2	0	1	2	1>	30.9	34.5	C	C
7	Sun Lakes Village Dr. & Sun Lakes Bl.																	
	- Without Project	**TS**	0	0	0	0	1	0	1	3	0	0	2	0	7.1	11.1	A	B
	- With Project	**TS**	0	0	0	0	1	0	1	3	0	0	2	0	10.4	27.4	B	C
10	Twin Hills Dr./Country Club Dr. & Sun Lakes Bl.																	
	- Without Project	**TS**	1	1	0	0	1	0	1	2	0	1	2	0	11.6	26.3	B	C
	- With Project	**TS**	1	1	0	0	1	0	1	2	0	1	2	0	11.8	26.6	B	C

BOLD = 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; > = 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

4 Improvement consists of restriping the eastbound approach to provide dual left turn lanes and a shared through-right turn lane, modifying the traffic signal to protect the eastbound and westbound left turns, and modifying the traffic signal to implement lead-lag operations for the eastbound and westbound left turns, with the eastbound left turn running as lag.

7 LOCAL AND REGIONAL FUNDING MECHANISMS

Transportation improvements within the City of Banning 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.

7.1 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. (4) 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.

7.2 CITY OF BANNING DEVELOPMENT IMPACT FEE (DIF) PROGRAM

The City of Banning has created its own local DIF program to impose and collect fees from new residential, commercial and industrial development for the purpose of funding roadways and intersections necessary to accommodate City growth as identified in the City's General Plan Circulation Element. Under the City's DIF program, the City may grant to developers a credit against specific components of fees when those developers construct certain facilities and landscaped medians identified in the list of improvements funded by the DIF program.

The Project Applicant will be subject to the City's DIF fee program and will pay the requisite City DIF fees at the rates then in effect. The Project Applicant's payment of the requisite DIF fees at the rates then in effect pursuant to the DIF Program will mitigate its impacts to DIF-funded facilities.

7.3 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.

7.4 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 7-1 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 7-1

Project Fair Share Calculations

#	Intersection		Existing	Project	2040 With Project	Total New Traffic	Project Fair Share[1]
1	Highland Springs Av. & I-10 WB Ramps						
		AM:	2,525	212	3,709	1,184	17.9%
		PM:	3,106	276	4,337	1,231	**22.4%**
2	Highland Springs Av. & I-10 EB Ramps						
		AM:	2,821	427	4,429	1,608	26.6%
		PM:	3,530	469	5,118	1,588	**29.5%**
3	Highland Springs Av. & 2nd St.						
		AM:	1,899	435	3,463	1,564	27.8%
		PM:	1,801	483	3,271	1,470	**32.9%**
4	Highland Springs Av. & 1st St./Sun Lakes Bl.						
		AM:	1,437	500	3,731	2,294	**21.8%**
		PM:	1,511	573	4,401	2,890	19.8%
7	Sun Lakes Village Dr. & Sun Lakes Bl.						
		AM:	613	508	2,099	1,486	**34.2%**
		PM:	624	602	2,889	2,265	26.6%
10	Twin Hills Dr./Country Club Dr. & Sun Lakes Bl.						
		AM:	216	59	1,098	882	**6.7%**
		PM:	245	80	2,326	2,081	3.8%

* Highest deficient peak hour represented in **BOLD** and shown on Table 1-2.

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8 REFERENCES

1. **Riverside County Transportation Department.** *Traffic Impact Analysis Preparation Guide.* County of Riverside : s.n., April 2008.
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3. **Institute of Transportation Engineers.** *Trip Generation Manual.* 10th Edition. 2017.
4. **Western Riverside Council of Governments.** *TUMF Nexus Study, 2016 Program Update.* July 2017.
5. **Riverside County Transportation Commission.** *2011 Riverside County Congestion Management Program.* County of Riverside : RCTC, December 14, 2011.
6. **Transportation Research Board.** *Highway Capacity Manual (HCM).* 6th Edition. s.l. : National Academy of Sciences, 2016.
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