Viejas Casino & Resort – Phase 3 Project Admin Draft TEIR

Appendix F

Traffic Impact Analysis

Prepared by Linscott, Law & Greenspan, Engineers

July 8, 2016

LINSCOTT
LAW &
GREENSPAN
engineers

TRAFFIC IMPACT ANALYSIS

VIEJAS CASINO & RESORT – PHASE 3

Alpine, California
July 8, 2016

LLG Ref. 3-14-2583

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EXECUTIVE SUMMARY

Linscott, Law and Greenspan, Engineers (LLG) has prepared the following traffic study for the proposed *Viejas Hotel Casino and Resort Phase 3 Project* on the Viejas Indian Reservation. The project proposes to construct and operate a third 170 all-suite rooms hotel, and demolish and reconstruct a portion of the existing Casino and some interior renovations of the existing Casino. There is no net change in gaming space as a result of construction, reconstruction or renovations. A new bus terminal and bus drop off area will be constructed near the Casino's existing northwest entry and a new casino walk will provide access to the proposed hotel. The valet will be relocated to the new hotel porte cochère.

The total project building area is approximately 215,000 square foot (SF). The total project landscaped area is approximately 200,000 SF. All new construction work, renovation and landscaping is to occur on existing developed land within an approximately 280,000 SF project footprint area.

Existing traffic volumes (peak hour and ADT) were obtained for both the weekday and Saturday timeframes. The trip generation rate for the proposed Project was utilized from the County of San Diego document titled *Traffic Needs Assessment of Tribal Development Projects in the San Diego Region (County of San Diego 2003).* The proposed Project is calculated to generate 510 weekday ADT with 36 trips (14 inbound / 22 outbound) during the weekday PM peak hour and 510 weekend ADT with 44 trips (19 inbound / 25 outbound) during the weekend (Saturday) peak hour.

The following scenarios were evaluated:

- Existing
- Existing + Project
- Existing + Project + Cumulative Projects

The intersection and segment analyses were conducted for the scenarios discussed above for both a weekday and Saturday.

No significant direct or cumulative project impacts were identified. Therefore, no mitigation measures are proposed.

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TRAFFIC IMPACT ANALYSIS

VIEJAS CASINO & RESORT – PHASE 3

Alpine, California
July 8, 2016

1.0 INTRODUCTION

1.1 Purpose of the Report

Linscott, Law & Greenspan Engineers (LLG) has been retained to assess the traffic impacts associated with the proposed new hotel and gaming area reconstruction at the *Viejas Casino,* (Phase 3) on the Viejas Indian Reservation. The proposed Project site is located at 5000 Willows Road, on the north side of Interstate 8, east of the Community of Alpine.

The traffic analysis presented in this report includes the following:

- Project Description
- Existing Conditions Assessment
- Traffic Analysis Methodology
- Significance Criteria
- Existing Analysis
- Project Trip Generation/ Distribution/ Assignment
- Cumulative projects
- Near-Term Analysis
- Site Access and Other Issues Discussion
- Significance of Impacts and Mitigation

Figure 1–1 shows the vicinity map. ***Figure 1–2*** shows a more detailed project area map.

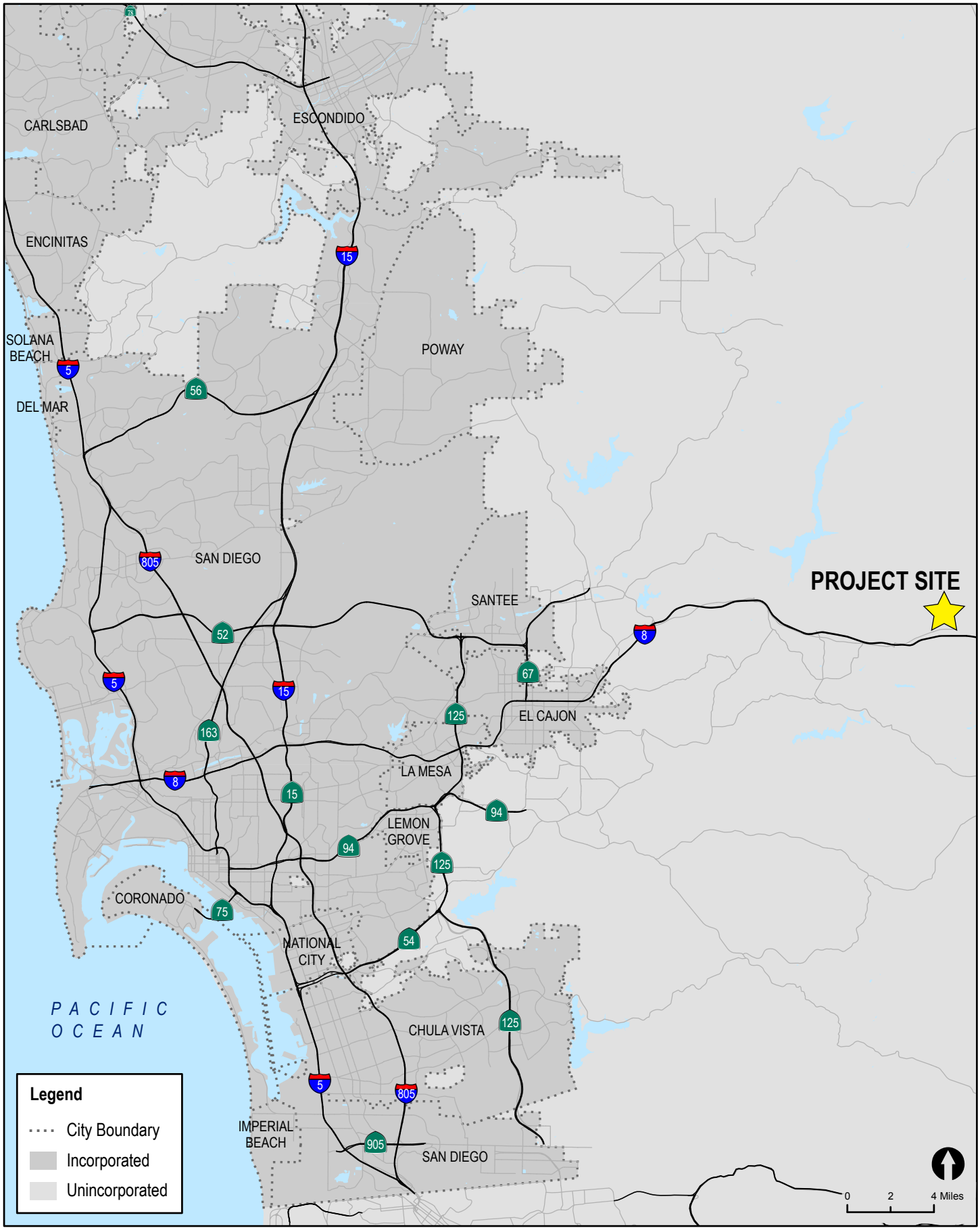

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Figure 1-1

Vicinity Map

VIEJAS CASINO & RESORT - PHASE 3

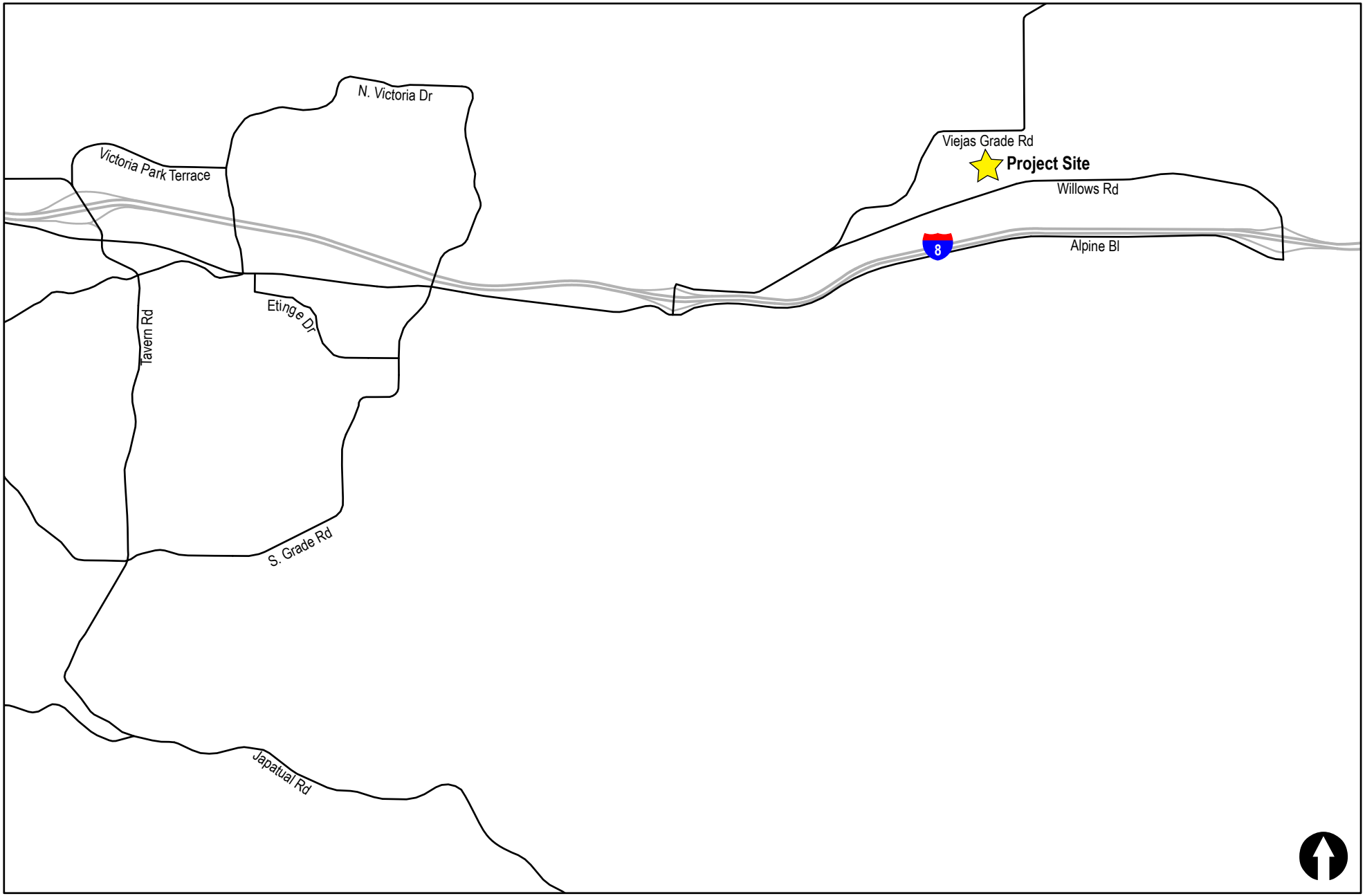

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Figure 1-2

Project Area Map

VIEJAS CASINO & RESORT-PHASE 3

2.0 PROJECT LOCATION AND DESCRIPTION

2.1 Project Location

The proposed Project is located on Willows Road north of Interstate 8 (I-8) on the Viejas Indian Reservation. The I-8 / West Willows Road and East Willows Road interchanges provide regional access to this project.

2.2 Project Description

The proposed project is for the construction and operation of a third hotel, the demolition and reconstruction of a portion of the existing Casino and some interior renovations of the existing Casino. There is no net change in gaming space as a result of construction, reconstruction or renovations.

The proposed five-story hotel will accommodate up to 170 all-suite rooms plus one basement level for back of house functions including service kitchens and offices. Amenities include a full service spa with private pool located at the main level of the hotel and an outside hotel pool with bar service.

A portion of the existing Casino will be demolished and reconstructed in place and another portion will be renovated. Amenities include three restaurant/bar venues.

A new bus terminal and bus drop off area will be constructed near the Casino's existing northwest entry and a new casino walk will provide access to the proposed hotel. The valet will be relocated to the new hotel porte cochère.

The total project building area is approximately 215,000 square foot (SF) consisting of: 165,000 SF of hotel including a 9,000 SF spa; 20,000 SF of demolished and replaced in kind Casino; 20,000 SF of existing Casino renovation; 9,750 SF of restaurants/kitchen; and, a 1,900 SF bus depot. The total project landscaped area is approximately 200,000 SF.

All new construction work, renovation and landscaping will occur on existing developed land (existing parking lot and existing Casino) within an approximately 280,000 SF project footprint area.

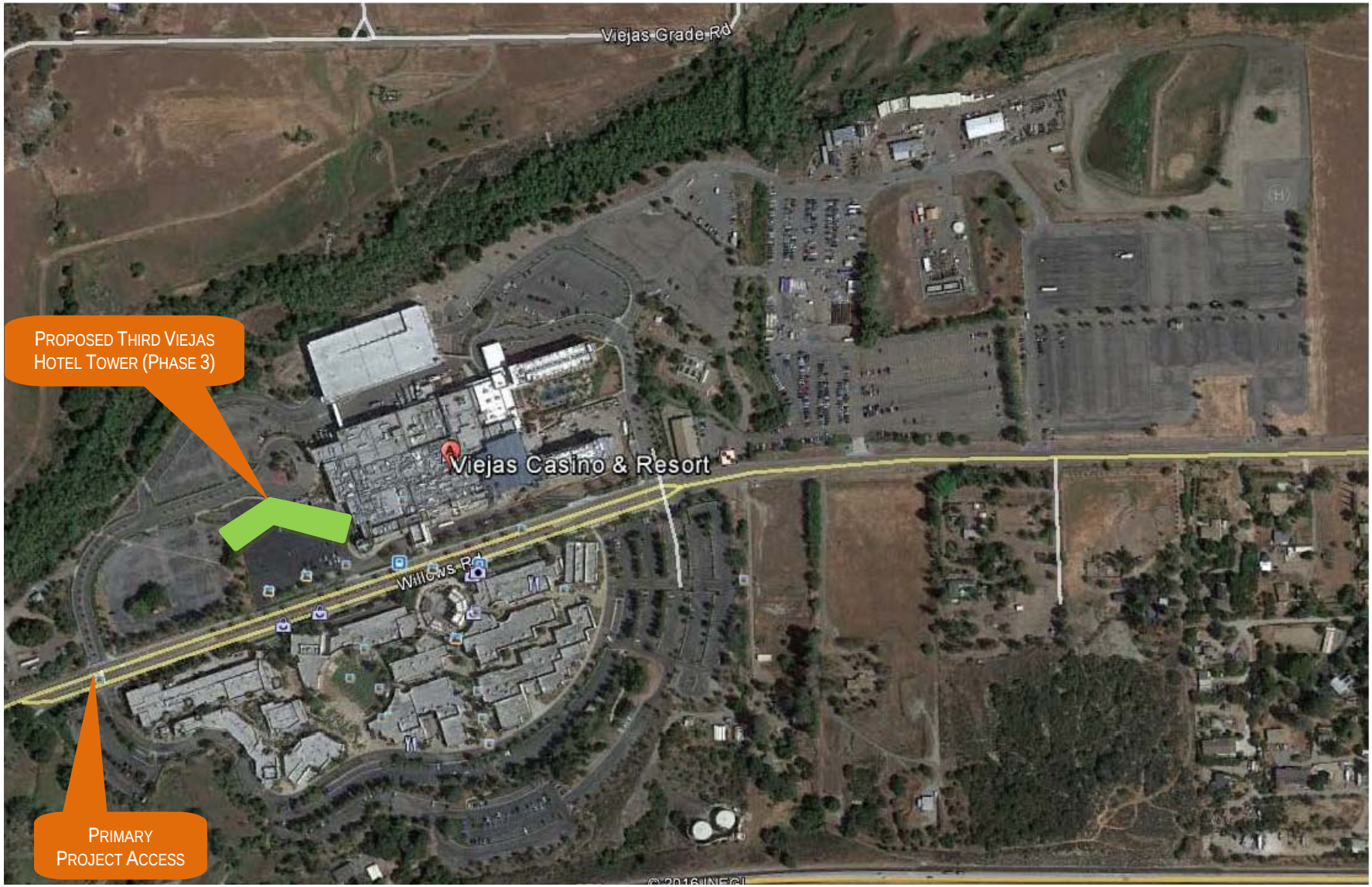
2.3 Project Access

The primary access to the proposed third hotel is the Casino's all-way stop controlled existing northwest entry intersection, located west of the casino on Willows Road.

The Aerial photo in the next page depicts the existing Viejas Hotel and casino complex, and the primary access driveway.

Figure 2–1 depicts the proposed site plan.

EXISTING VIEJAS CASINO



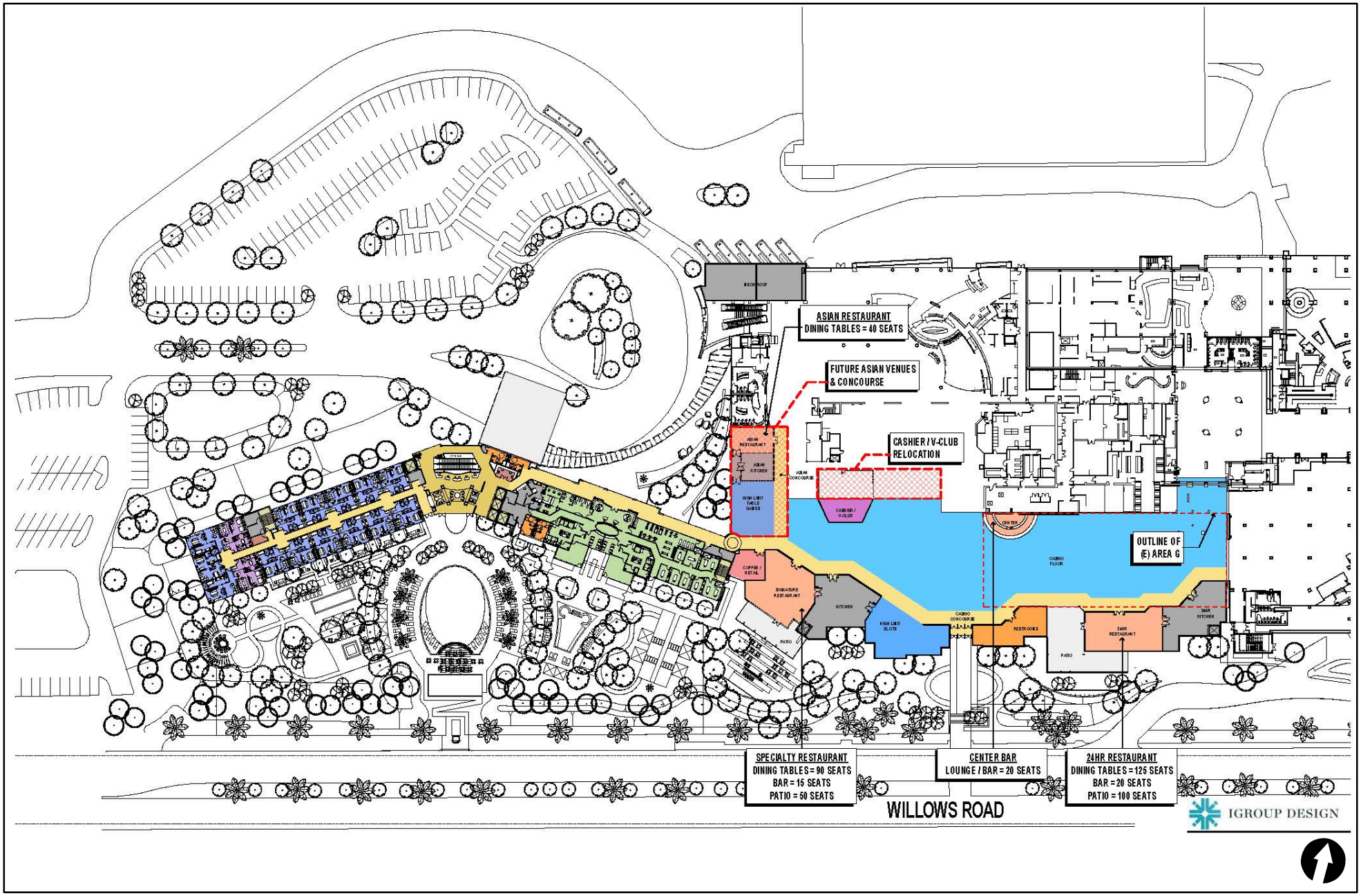


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Figure 2-1

Conceptual Site Plan

VIEJAS HOTEL PHASE 3

3.0 EXISTING CONDITIONS

3.1 Study Area

The study area for this project encompasses areas of anticipated impact related to the proposed Project. The scope of the study area (bi-directional 25-peak hour project trips) was developed based on the guidelines outlined in the "*County of San Diego Guidelines for determining significance – Transportation and Traffic 2011"* manual, existing traffic volumes to the Viejas Casino, the proposed Project distribution, and a working knowledge of the local transportation system based on LLG's prior work in this area.

The intersections and segments included in the study area are listed below. These locations were chosen since they will carry the majority of project traffic.

Intersections

1. Willows Road (West) / I-8 Westbound ramps (Caltrans)
2. Willows Road (West) / I-8 Eastbound ramps (Caltrans)
3. Willows Road (West) / Alpine Boulevard (County)
4. Willows Road / Viejas Grade Road (County)
5. Willows Road / West Viejas Casino Entrance (County)
6. Willows Road / East Viejas Casino Entrance (County)
7. Willows Road (East) / I-8 Westbound ramps (Caltrans)
8. Willows Road (East) / I-8 Eastbound ramps (Caltrans)

Street Segments

1. Willows Road – West of Viejas Casino/ Hotel site (County)
2. Willows Road – East of Viejas Casino/ Hotel site (County)

3.2 Existing Transportation Conditions

The roadways in the vicinity of the site that may be affected by the proposed Project include I-8 and Willows Road. ***Figure 3–1*** depicts the existing roadways and intersection configurations of the proposed Project area. The following provides a brief description of each of these roadways:

Interstate 8 (I-8) is an east/west facility that extends as a freeway from the San Diego area eastward to the California-Arizona border and beyond. It provides three lanes Eastbound and two lanes westbound lanes in the proposed Project area. The posted speed limit of Interstate 8 is 70 mph in the proposed Project area. Local interchanges are provided at Willows Road (west) and Willows Road (east).

Willows Road is constructed as a two lane undivided roadway east and west of casino and as a four-lane roadway along the casino frontage. According to the County of San Diego General Plan (2011), Willows Road is classified as a Light Collector east and west of the casino, and as a Boulevard in the

immediate vicinity of the casino. Passing is allowed on some portions of the roadway. The posted speed limit is 45 mph and 50 mph. Bus stops are provided on West Willows Road. Access to the proposed Project site is via the I-8 interchanges at West Willows Road and East Willows Road only. West Willows Road is identified as an LOS-exempt road in the County General Plan because a) further widening would have caused the community planning group to oppose the General Plan and b) further widening would be unnecessary in the event a proposed neighboring casino was constructed closer to the Viejas Casino because traffic for that casino would come from East Willows Road.

Following are a few images depicting the existing conditions along Willows Road, in the vicinity of the Viejas Resort and Casino.

WILLOWS ROAD EAST OF THE CASINO, LOOKING EAST. CURB, GUTTER AND SIDEWALK ARE PROVIDED ON THE SOUTH SIDE BUT NOT ON THE NORTH SIDE OF WILLOWS ROAD

WILLOWS ROAD ALONG THE CASINO FRONTAGE LOOKING EAST. WILLOWS ROAD IS A FOUR-LANE FACILITY WITH A LANDSCAPED MEDIAN. CURB, GUTTER AND SIDEWALK ARE PROVIDED ON BOTH SIDES OF WILLOWS ROAD

WILLOWS ROAD WEST OF THE CASINO, LOOKING EAST. CURB, GUTTER AND SIDEWALK ARE NOT PROVIDED ON EITHER SIDE OF WILLOWS ROAD

3.3 Existing Traffic Volumes

3.3.1 *Peak Hour Intersection Volumes*

LLG commissioned manual intersection turning movement counts during the weekday (Thursday, February 25, 2016) and weekend (Saturday, February 27, 2016). These timeframes were selected as they represent highest traffic loads due to commuter and casino traffic, respectively.

3.3.2 *Daily Segment Volumes*

Bi-directional daily traffic counts were conducted on the street segments during the weekday (Thursday, February 25, 2016) and weekend (Saturday, February 27, 2016).

Table 3–1 is a summary of the average daily traffic volumes (ADTs). ***Figure 3–2*** depicts the existing weekday and existing Saturday traffic volumes on a PM peak hour and daily basis. ***Appendix A*** contains copies of the intersection manual count sheets and ADT count sheets.

TABLE 3–1
EXISTING TRAFFIC VOLUMES

Street Segment	Weekday	Saturday
Willows Road		
West of Viejas Casino	8,400	13,000
East of Viejas Casino	3,100	3,600

Footnote:

a. Average Daily Traffic Volumes.

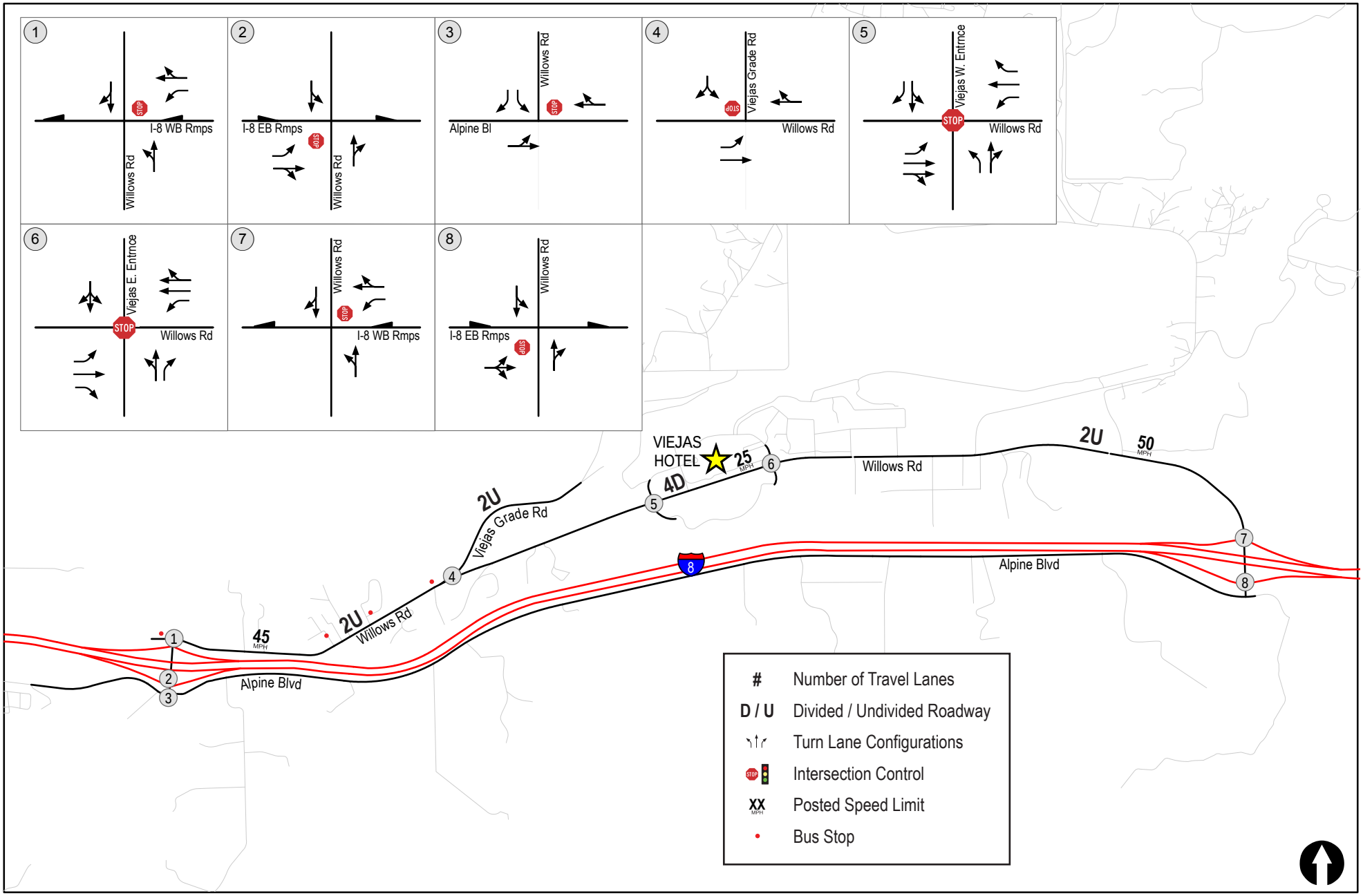

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Figure 3-1

Existing Conditions Diagram

VIEJAS HOTEL PHASE 3

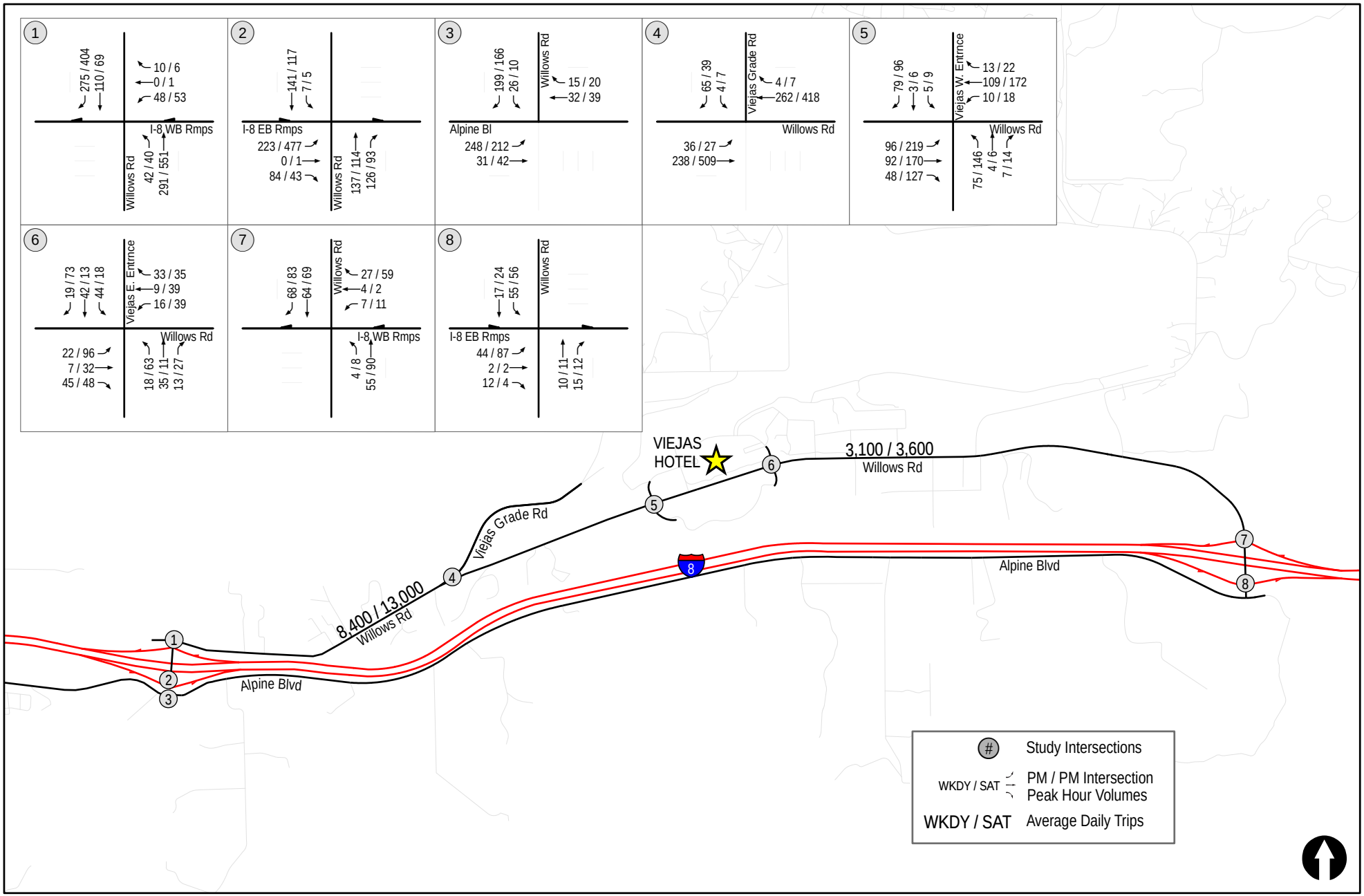

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Figure 3-2

Existing Traffic Volumes

VIEJAS CASINO & RESORT - PHASE 3

4.0 ANALYSIS APPROACH AND METHODOLOGY

There are various methodologies used to analyze signalized intersections, unsignalized intersections, and street segments. The measure of effectiveness for intersection and segment operations is level of service (LOS), which denotes the operating conditions which occur at a given intersection or on a given roadway segment under various traffic volume loads.

LOS is a qualitative measure used to describe a quantitative analysis taking into account factors such as roadway geometries, signal phasing, speed, travel delay, freedom to maneuver, and safety. Level of service provides an index to the operational qualities of a roadway segment or an intersection. Levels of service designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst. Level of service designation is reported differently for signalized and unsignalized intersections, as well as for roadway segments. In the 2010 Highway Capacity Manual (HCM), Level of Service for signalized intersections is defined in terms of delay. The level of service analysis results in seconds of delay expressed in terms of letters A through F. Delay is a measure of driver discomfort, frustration, fuel consumption, and lost travel time.

Table 4–1 summarizes the signalized intersections levels of service descriptions. ***Table 4–2*** depicts the intersection LOS and corresponding delay ranges, which are based on overall intersection delay (signalized intersections) and the average control delay for any particular minor movement (unsignalized intersections), respectively. LOS relative to signalized and unsignalized intersection is further described below.

4.1.1 *Signalized Intersections*

For signalized intersections, level of service criteria is stated in terms of the average control delay per vehicle for a 15-minute analysis period. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay.

Level of service A describes operations with very low delay, (i.e. less than 10.0 seconds per vehicle). This occurs when progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.

Level of service B describes operations with delay in the range 10.1 seconds and 20.0 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of Average delay.

Level of service C describes operations with delay in the range 20.1 seconds and 35.0 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.

TABLE 4–1
INTERSECTION LEVEL OF SERVICE DESCRIPTIONS

Level of Service	Description
A	Occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
B	Generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.
C	Generally results when there is fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear in this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.
D	Generally results in noticeable congestion. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume-to-capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	Considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high volume-to-capacity ratios. Individual cycle failures are frequent occurrences.
F	Considered to be unacceptable to most drivers. This condition often occurs with over saturation i.e. when arrival flow rates exceed the capacity of the intersection. It may also occur at high volume-to-capacity ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels

TABLE 4–2
INTERSECTION LOS & DELAY RANGES

LOS	Delay (seconds/vehicle)	
	Signalized Intersections	Unsignalized Intersections
A	≤ 10.0	≤ 10.0
B	10.1 to 20.0	10.1 to 15.0
C	20.1 to 35.0	15.1 to 25.0
D	35.1 to 55.0	25.1 to 35.0
E	55.1 to 80.0	35.1 to 50.0
F	≥ 80.1	≥ 50.1

Source: 2000 Highway Capacity Manual

Level of service D describes operations with delay in the range 35.1 seconds and 55.0 seconds per vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or higher volume (demand) / capacity (v/c) ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are frequent.

Level of service E describes operations with delay in the range of 55.1 seconds to 80.0 seconds per vehicle. This is considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent occurrences.

Level of service F describes operations with delay in excess of over 80.0 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with over-saturation (i.e., when arrival flow rates exceed the capacity of the intersection). It may also occur at high v/c ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

4.1.2 *Unsignalized Intersections*

For unsignalized intersections, level of service is determined by the computed or measured control delay and is defined for each minor movement: level of service is not defined for the intersection as a whole. Level of Service F exists when there are insufficient gaps of suitable size to allow a side street demand to safely cross through a major street traffic stream. This level of service is generally evident from extremely long control delays experienced by side-street traffic and by queuing on the minor-street approaches. The method, however, is based on a constant critical gap size; that is, the critical gap remains constant no matter how long the side-street motorist waits. LOS F may also appear in the form of side-street vehicles selecting smaller-than-usual gaps. In such cases, safety may be a problem, and some disruption to the major traffic stream may result. It is important to note that LOS F may not always result in long queues but may result in adjustments to normal gap acceptance behavior, which are more difficult to observe in the field than queuing.

4.1.3 *Street Segments*

<u>San Diego County</u>

Street segment analysis for streets within the San Diego County is based upon the comparison of daily traffic volumes (ADTs) to the County of San Diego's *Roadway Classification, Level of Service, and ADT Table*. ***Table 4–3*** is the County of San Diego's *Average Daily Vehicle Trips* table. This table provides segment capacities for different street classifications, based on traffic volumes and roadway characteristics.

TABLE 4–3
AVERAGE DAILY VEHICLE TRIPS – COUNTY OF SAN DIEGO

CIRCULATION ELEMENT ROADS			LEVELS OF SERVICE				
Roadway Classification		**#of Travel Lanes**	**A**	**B**	**C**	**D**	**E**
Expressway (6.1)		6	<36,000	<54,000	<70,000	<86,000	<108,000
Prime Arterial (6.2)		6	<22,200	<37,000	<44,600	<50,000	<57,000
Major Road	(4.1A)	4	<14,800	<24,700	<29,600	<33,400	<37,000
	W/ Intermittent Turn Lanes (4.1B)	4	<13,700	<22,800	<27,400	<30,800	<34,200
Collector		4	<13,700	<22,800	<27,400	<30,800	<34,200
Boulevard	W/ Raised Median (4.2A)	4	<18,000	<21,000	<24,000	<27,000	<30,000
	W/ Intermittent Turn Lanes (4.2B)	4	<16,800	<19,600	<22,500	<25,000	<28,000
Town Collector		2	<3,000	<6,000	<9,500	<13,500	<19,000
Community Collector	W/ Raised Median (2.1)	2	<10,000	<11,700	<13,400	<15,000	<19,000
	W/ Continuous Left-Turn Lane (2.1B)	2	<3,000	<6,000	<9,500	<13,500	<19,000
	W/ Intermittent Turn Lanes (2.1C)	2	<3,000	<6,000	<9,500	<13,500	<19,000
	W/ Passing Lane (2.1D)	2	<3,000	<6,000	<9,500	<13,500	<19,000
	No Median (2.1E)	2	<1,900	<4,100	<7,100	<10,900	<16,200
Light Collector	W/ Raised Median (2.2A)	2	<3,000	<6,000	<9,500	<13,500	<19,000
	W/ Continuous Left-Turn Lane (2.2B)	2	<3,000	<6,000	<9,500	<13,500	<19,000
	W/ Intermittent Turn Lanes (2.2C)	2	<3,000	<6,000	<9,500	<13,500	<19,000
	W/ Passing Lane (2.2D)	2	<3,000	<6,000	<9,500	<13,500	<19,000
	No Median (2.2E)	2	<1,900	<4,100	<7,100	<10,900	<16,200
		2	<1,900	<4,100	<7,100	<10,900	<16,200
	W/ Reduced Shoulder	2	<5,800	<6,800	<7,800	<8,700	<9,700
Rural Collector	Collector	2	<1,900	<4,100	<7,100	<10,900	<16,200
Rural Light Collector		2	<1,900	<4,100	<7,100	<10,900	<16,200
Rural Mountain		2	<1,900	<4,100	<7,100	<10,900	<16,200
Recreational Parkway		2	<1,900	<4,100	<7,100	<10,900	<16,200
Minor Collector	W/ Raised Median (2.3A)	2	<3,000	<6,000	<7,000	<8,000	<9,000
	W/ Intermittent (Turn Lane (2.3B)	2	<3,000	<6,000	<7,000	<8,000	<9,000
	No Median (2.3CE)	2	<1,900	<4,100	<6,000	<7,000	<8,000
NON-CIRCULATION ELEMENT ROADS **			**LEVELS OF SERVICE**				
Residential Collector		2	-	-	<4,500	-	-
Rural Residential Collector ***		2	-	-	<4,500	-	-
Residential Road		2	-	-	<1,500	-	-
Rural Residential Road ***		2	-	-	<1,500	-	-
Residential Cul-de-Sac or Loop Road		2	-	-	<200	-	-

The values shown are subject to adjustment based on the geometry of the roadway side frictions, and other relevant factors as determined by the Director, Department of Public Works.
**Levels of service are not applied to residential streets since their primary purpose is to serve abutting lots, not carry through traffic. Levels of service normally apply to roads carrying through traffic between major trip generators and attractors.
***Rural Residential Collectors and Rural Residential Roads are intended to serve areas with lot sizes of 2 acres or more which do not have a demand for on-street parking. On-street parking is not assured for these cross sections. Additional right-of-way is needed if on-street parking is in paved area.
****See Tables 2A and 28 for roadway surfacing and right-of-way widths.

4.2 Marginal Deficiency

The County General Plan Update (2011) acknowledged that in some circumstances, exempting a road from County LOS standards may be the more preferable choice when a road failure results from only a marginal deficiency in performance, as described in the County General Plan EIR Section 2.15 (2011). Traffic congestion on a small portion of a road may produce a failing LOS for only that short segment while the remainder of the road is acceptable. Due to the short segment length, overall delays may be small in comparison to the travel time along the length of the entire road corridor. In many cases, operational improvements such as synchronized signals and additional turn lanes can alleviate the problem and are more cost effective than adding new travel lanes. Some failing roads are projected to carry a traffic volume that is not significantly higher than the acceptable threshold (LOS D). If the projected volume is not anticipated to affect overall traffic operation, planning for a wider road to accommodate the additional traffic may not be required. Acceptance of a lower LOS is particularly appropriate when underutilized, alternate routes are available.

5.0 GUIDELINES FOR DETERMINATION OF SIGNIFICANCE

For purposes of this TEIR, a significant Transportation/Circulation impact would occur if implementation of the proposed Project would:

a. Cause an increase in off-reservation traffic, which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections);
b. Exceed, either individually or cumulatively, a level of service standard established by the County Congestion Management Agency for designated off-reservation roads or highways;
c. Substantially increase hazards to an off-reservation design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment); or
d. Result in inadequate emergency access for off-Reservation responders.

These criteria to determine significant traffic impacts are part of Exhibit B of the Amended and Restated Viejas-State Compact (2014). County policies have evolved with regard to LOS and traffic increases that are acceptable. For criteria a and b, in general, if project-only traffic impact causes the thresholds identified in ***Table 5–1*** and ***Table 5–2*** to be exceeded, the impacts are considered a potentially direct significant impact unless the impacts are to a LOS exempt roadway or cause only a marginal deficiency. If the proposed Project together with other cumulative projects causes the thresholds to be exceeded, the impact is a potentially cumulative significant impact unless the impacts are to a LOS-exempt roadway or cause only a marginal deficiency.

Criterion d. was addressed in the Initial Study and found to be less than significant. Regarding Criterion c., in order to identify if the proposed Project would contribute traffic to any specific hazardous off-reservation design features, LLG obtained collision data for a period of five years from 2010 through 2014. An analysis of the collision data is included in Section 11.4 in this report.

The following road segments and intersection criteria were utilized to evaluate potential significant impacts, based on the *County of San Diego Guidelines for Determining Significance—Transportation and Traffic*, dated June 30, 2009 with a second modification effective August 24, 2011. The County of San Diego's General Plan Mobility Element discusses the County's Level of Service criteria under Goal M-2. It requires that development projects provide associated road improvements necessary to achieve a level of service of "D" or higher on all Mobility Element roads except for those where a failing level of service has been accepted by the County. The County maintains a list of such roads. West Willows Road, west of Viejas Casino has been accepted at LOS F.

5.1 Road Segments

This section provides guidance for evaluating adverse environmental effects a project may have on street segments. The allowable ADT increases on LOS E/F operation roadways was obtained from County guidelines and are summarized in *Table 5–1*. The thresholds in *Table 5–1* are based upon average operating conditions on County roadways. Exceeding the thresholds in *Table 5–1* would result in a significant impact. It should be noted that these thresholds only establish general

guidelines, and that the specific project location must be taken into account in conducting an analysis of traffic impact from new development.

TABLE 5–1
MEASURES OF SIGNIFICANT PROJECT IMPACTS TO CONGESTION ON
CIRCULATION ELEMENT ROAD SEGMENTS
ALLOWABLE INCREASES ON CONGESTED ROAD SEGMENTS

Level of Service	Two-Lane Road	Four-Lane Road	Six-Lane Road
LOS E	200 ADT	400 ADT	600 ADT
LOS F	100 ADT	200 ADT	300 ADT

General Notes:

1. By adding proposed Project trips to all other trips from a list of projects, this same table must be used to determine if total cumulative impacts are significant. If cumulative impacts are found to be significant, each project that contributes additional trips must mitigate a share of the cumulative impacts.
2. The County may also determine impacts have occurred on roads even when a project's traffic or cumulative impacts do not trigger an unacceptable level of service, when such traffic uses a significant amount of remaining road capacity.
3. If the project exceeds this significance criterion, its impact is not significant if the impacts are to an LOS-exempt roadway or does not cause more than a marginal deficiency.

5.2 Intersections

This section provides guidance for evaluating adverse environmental effects a project may have on signalized and unsignalized intersections. *Table 5–2* was obtained from County guidelines and summarizes the allowable increases in delay or traffic volumes at signalized and unsignalized intersections. Exceeding the thresholds in *Table 5–2* would result in a significant impact.

TABLE 5–2
MEASURES OF SIGNIFICANT PROJECT IMPACTS TO CONGESTION ON INTERSECTIONS
ALLOWABLE INCREASES ON CONGESTED INTERSECTIONS

Level of Service	Signalized	Unsignalized
LOS E	Delay of 2 seconds or less	20 or less peak hour trips on a critical movement
LOS F	Either a Delay of 1 second, or 5 peak hour trips or less on a critical movement	5 or less peak hour trips on a critical movement

General Notes:

1. A critical movement is an intersection movement (right-turn, left-turn, through-movement) that experiences excessive queues, which typically operate at LOS F.
2. By adding proposed Project trips to all other trips from a list of projects, these same tables are used to determine if total cumulative impacts are significant. If cumulative impacts are found to be significant, each project is responsible for mitigating its share of the cumulative impact.
3. The County may also determine impacts have occurred on roads even when a project's traffic or cumulative impacts do not trigger an unacceptable level of service, when such traffic uses a significant amount of remaining road capacity.
4. For determining significance at signalized intersections with LOS F conditions, the analysis must evaluate both the delay ***and*** the number of trips on a critical movement, exceedance of either criteria result in a significant impact.
5. If the project exceeds this significance criterion, its impact is not significant if the impacts are to an LOS-exempt roadway or does not cause more than a marginal deficiency.

Signalized Intersections—Traffic volume increases from public or private projects that result in one or more of the following criteria will have a significant traffic volume or level of service traffic impact on a signalized intersection:

1. The additional or redistributed ADT generated by the proposed Project will significantly increase congestion on a signalized intersection currently operating at LOS E or LOS F, or will cause a signalized intersection to operate at a LOS E or LOS F as identified in *Table 5–2*.
2. Based upon an evaluation of existing accident rates, the signal priority list, intersection geometrics, proximity of adjacent driveways, sight distance or other factors, the proposed Project would significantly impact the operations of the intersection.

Unsignalized Intersections—The operating parameters and conditions for unsignalized intersections differ dramatically from those of signalized intersections. Very small volume increases on one leg or turn and/or through movement of an unsignalized intersection can substantially affect the calculated delay for the entire intersection. Significance criteria for unsignalized intersections are based upon a minimum number of trips added to a critical movement at an unsignalized intersection.

Traffic volume increases from public or private projects that result in one or more of the following criteria will have a significant traffic impact on an unsignalized intersection as listed in *Table 5–2* and described as text below:

1. The additional or redistributed ADT generated by the proposed Project will add 21 or more peak hour trips to a critical movement of an unsignalized intersection, and cause an unsignalized intersection to operate below LOS D, or
2. The additional or redistributed ADT generated by the proposed Project will add 21 or more peak hour trips to a critical movement of an unsignalized intersection currently operating at LOS E, or
3. The additional or redistributed ADT generated by the proposed Project will add 6 or more peak hour trips to a critical movement of an unsignalized intersection, and cause the unsignalized intersection to operate at LOS F, or
4. The additional or redistributed ADT generated by the proposed Project will add 6 or more peak hour trips to a critical movement of an unsignalized intersection currently operating at LOS F, or
5. Based upon an evaluation of existing accident rates, the signal priority list, intersection geometrics, proximity of adjacent driveways, sight distance or other factors, the proposed Project would significantly impact the operations of the intersection.

6.0 ANALYSIS OF EXISTING CONDITIONS

6.1 Daily Peak Hour Intersection Levels of Service

Table 6–1 summarizes the peak hour intersection operations for existing conditions in the study area. As shown, all the study area intersections are calculated to currently operate at acceptable service levels of LOS C or better on both a weekday and Saturday. ***Appendix B*** contains the peak hour calculation sheets for the Existing scenario.

6.2 Daily Segment Levels of Service

Table 6–2 summarizes the existing weekday and Saturday segment operations along the key study area roadways. As shown, Willows Road is calculated to currently operate at acceptable levels of service with the exception of Willows Road – West of Viejas Casino, which is calculated to currently operate at LOS E on Saturday.

TABLE 6–1
EXISTING INTERSECTION OPERATIONS

Intersection	Jurisdiction	Control Type	Peak Period	Delay [a]	LOS [b]
1. Willows Rd (W) / I-8 WB Ramps	Caltrans	MSSC [c]	WD PM	14.5	B
			WE Peak	21.5	C
2. Willows Rd (W) / I-8 EB Ramps	Caltrans	MSSC	WD PM	13.2	B
			WE Peak	24.0	C
3. Willows Rd (W) / Alpine Blvd	San Diego County	MSSC	WD PM	12.3	B
			WE Peak	11.5	B
4. Willows Rd / Viejas Grade Rd	San Diego County	MSSC	WD PM	10.6	B
			WE Peak	13.2	B
5. Willows Rd / W Viejas Casino Entrance	San Diego County	AWSC [d]	WD PM	9.1	A
			WE Peak	12.5	B
6. Willows Rd / E Viejas Casino Entrance	San Diego County	AWSC	WD PM	8.3	A
			WE Peak	9.0	A
7. Willows Rd (E) / I-8 WB Ramps	Caltrans	MSSC	WD PM	8.8	A
			WE Peak	9.1	A
8. Willows Rd (E) / I-8 EB Ramps	Caltrans	MSSC	WD PM	9.6	A
			WE Peak	10.1	B

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. MSSC – Minor Street Stop Controlled intersection. Minor street left turn delay is reported.
d. AWSC – All-Way Stop Controlled intersection.

General Notes:

WD PM – Weekday PM peak hour

WE Peak – Weekend peak hour

UNSIGNALIZED	
Delay	LOS
0.0 ≤ 10.0	A
10.1 to 15.0	B
15.1 to 25.0	C
25.1 to 35.0	D
35.1 to 50.0	E
≥ 50.1	F

TABLE 6–2
EXISTING STREET SEGMENT OPERATIONS

Street Segment	Period	Classification	Capacity (LOS E) [a]	ADT [b]	LOS [c]
Willows Road					
West of Viejas Casino	Weekday	2.2E Light Collector	16,200	8,400	D
	Weekend		16,200	13,000	E
East of Viejas Casino	Weekday	2.2E Light Collector	16,200	3,100	B
	Weekend		16,200	3,600	B

Footnotes:

a. Capacities based on *County of San Diego Roadway Classification Table (*see *Table 4-3*).

b. Average Daily Traffic Volumes.

c. Level of Service.

7.0 PROJECT TRIP GENERATION, DISTRIBUTION, AND ASSIGNMENT

The following is a discussion of the proposed Project trip generation calculations and the proposed Project traffic distribution and assignment through the local network.

7.1 Trip Generation

Project trips consist of vehicular trips on the street system, which begin or end at the proposed Project site and are generated by the proposed development. The proposed Project traffic generation calculations were conducted using the trip generation rates published in the County of San Diego document titled *Traffic Needs Assessment of Tribal Development Projects in the San Diego Region (March 2003).* The document indicates a trip rate of 3 trips per room for a hotel. The above document does not specify different trip rates between weekday and weekend timeframes. Hence, 3 daily trips per room were assumed for both weekdays and weekends.

Table 7–1 summarizes the proposed Project traffic generation.

7.2 Weekday Trip Generation

The total project is calculated to generate approximately 510 ADT on a weekday with 36 trips during the PM peak hour (14 inbound / 22 outbound).

7.3 Weekend Trip Generation

The total project is calculated to generate approximately 510 ADT on a weekend day with 44 trips during the PM peak hour (19 inbound / 25 outbound).

7.4 Trip Distribution/Assignment

Trip distribution is the process of determining traffic percentage splits on the regional and local roadway network from which traffic will access a project site. Trip distribution is dependent upon the land use characteristics of the proposed Project and upon the general location of other land uses to which project trips would originate or terminate.

Given that the hotel is proposed to be located adjacent to the existing Viejas Casino, existing traffic counts were used to deduce the traffic distribution percentages. It is important to note that employees working at the Viejas Indian Reservation are asked to use the East Willows Road interchange to offload traffic on West Willows Road, as reflected in the existing traffic counts. To be conservative, this study assumed all project trips from the west use the I-8/ West Willows Road interchange.

Figure 7–1 shows the proposed Project trip distribution percentages. ***Figure 7–2*** shows the weekday and Saturday project traffic volumes. ***Figure 7–3*** shows Existing + Project traffic volumes on a weekday and Saturday.

TABLE 8-1
PROJECT TRIP GENERATION

Land Use	Quantity	Weekday [a]							Weekend [b]						
		Daily Trip Ends (ADT)		PM Peak Hour					Daily Trip Ends (ADT)		Peak Hour				
				% of ADT	In:Out Split	Volume					% of ADT	In:Out Split	Volume		
		Rate	Volume			In	Out	Total	Rate	Volume			In	Out	Total
Hotel [a]	170 Rooms	3 /Room	510	7%	40:60	14	22	36	3 /Room	510	8.69%	43:57	19	25	44

Footnotes:

a. For hotel, weekday trip rates and peak hour % were obtained from the *Traffic Needs Assessment of Tribal Development Projects in the San Diego Region*, March 2003, published by the County of San Diego.

b. Weekday daily rates were also used for Saturday. Peak hour percent for Saturday was obtained from the ITE *Trip Generation* Land Use 310 - Hotel.

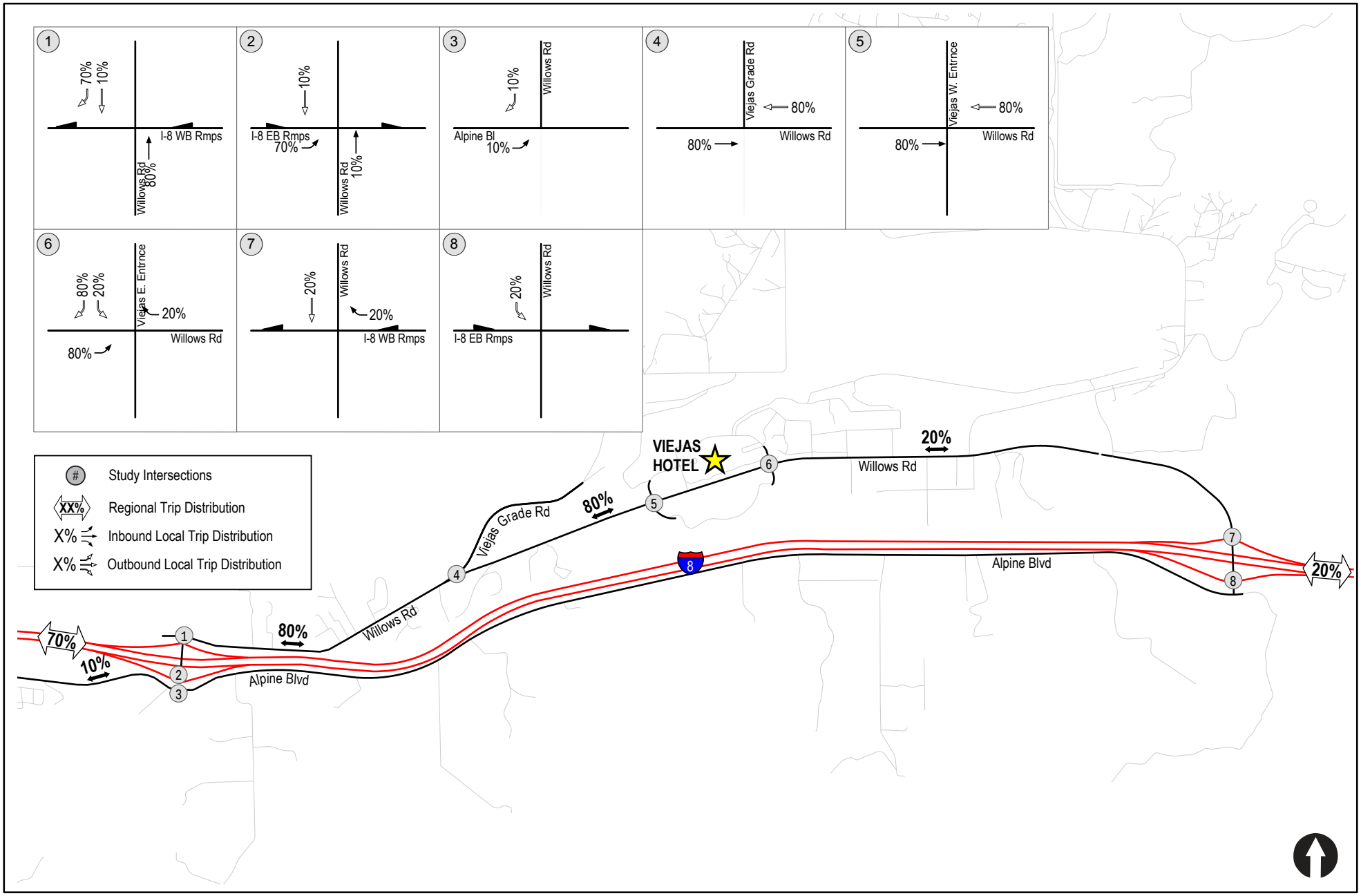

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Figure 7-1

Project Traffic Distribution

VIEJAS CASINO & RESORT - PHASE 3

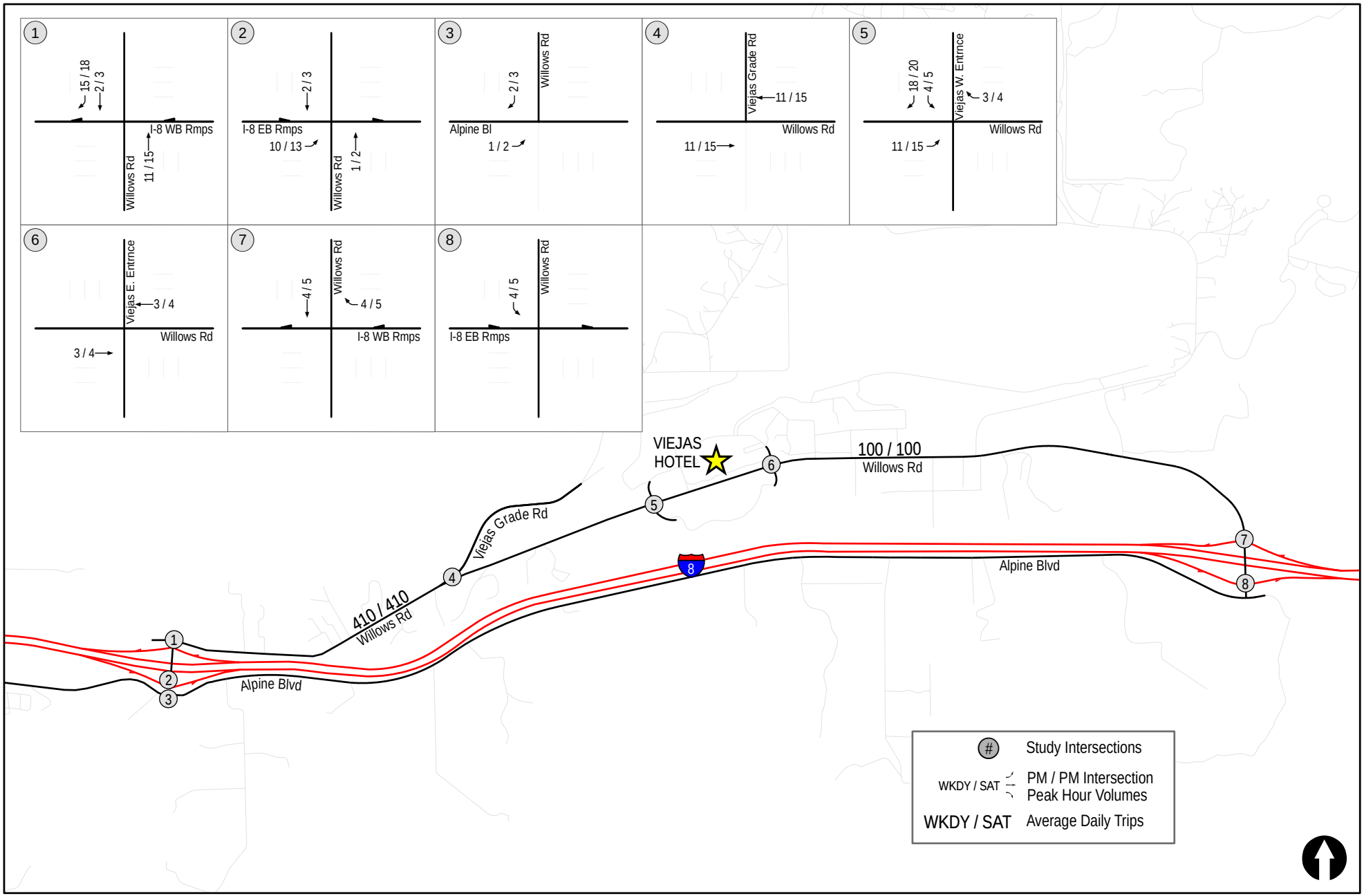

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Figure 7-2

Project Traffic Volumes

VIEJAS CASINO & RESORT - PHASE 3

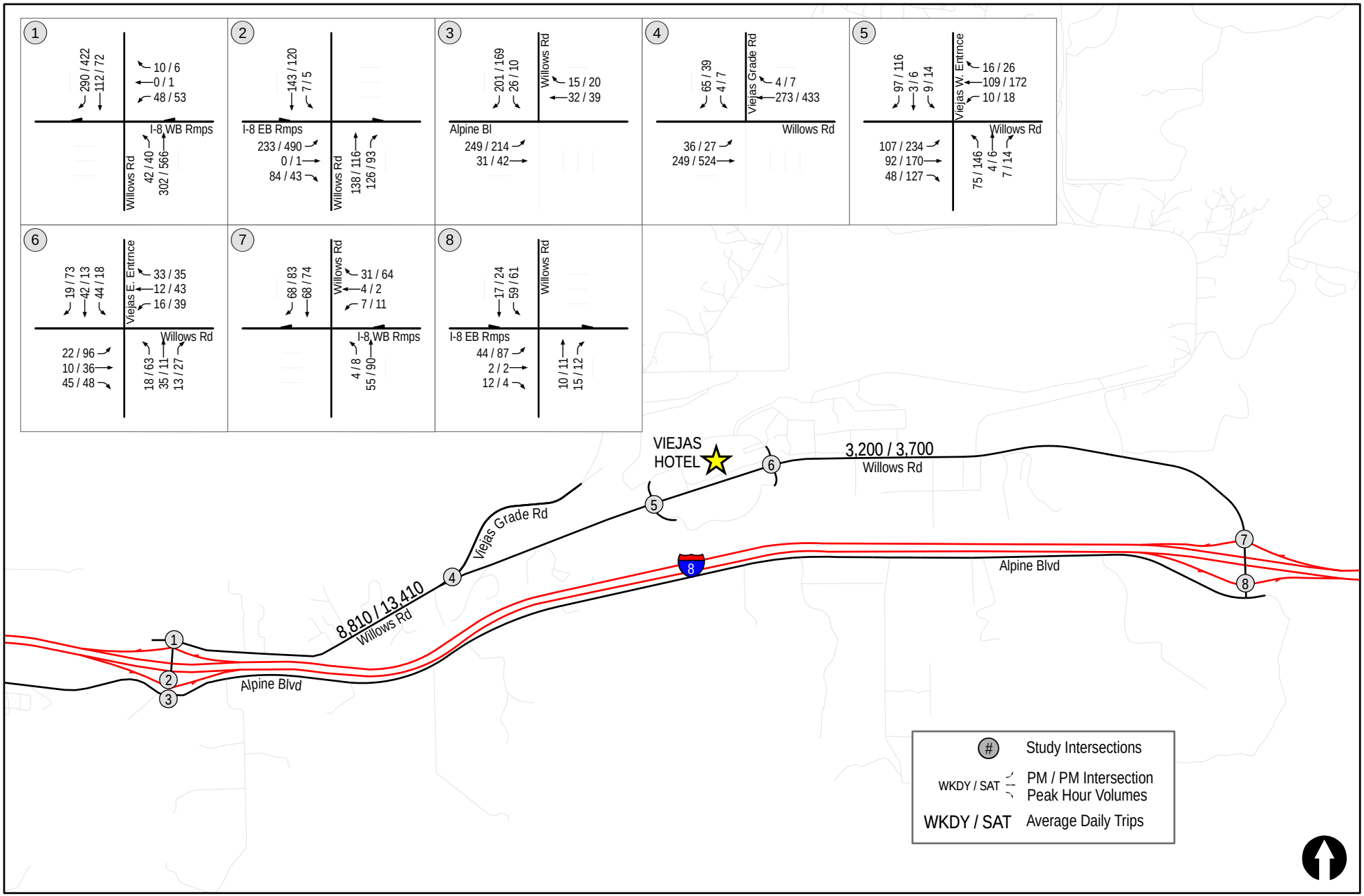

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Figure 7-3

Existing + Project Traffic Volumes

VIEJAS CASINO & RESORT - PHASE 3

8.0 CUMULATIVE PROJECTS

Cumulative projects are other projects in the study area that will add traffic to the local circulation system in the near future. LLG coordinated with the County of San Diego staff regarding the cumulative projects in the proposed Project's study area. The following cumulative projects were included in the traffic study. The north hotel was built at the time the baseline traffic counts were conducted and therefore this project is not a cumulative project.

1. Cronin Light Industrial
2. DGJM Self Storage
3. Alpine Regional Center Expansion
4. Alpine Convalescent
5. Victoria Village
6. Victoria Estates
7. Alpine High School
8. Alpine Library
9. Walker Health Clinic

8.1 Summary of Cumulative Projects Trips

Table 8–1 is a summary of the cumulative project trips generated in and around the proposed Project's vicinity. This table shows that in total, nine (9) cumulative projects are identified, and are predicted to generate 5,955 ADT with 603 total PM peak hour trips in the community of Alpine when constructed. The majority of the cumulative projects are distant from the subject project study area; therefore only a small amount of cumulative trips will be added to the study area.

In order to determine the weekend trip rates, trip rates for weekday and weekend were reviewed for the various types of land uses. It was determined that the weekend trip rates for the Cumulative projects land uses are similar to or lower than that during the weekdays. However, high schools tend to have little to no traffic during the weekends and most Dental (health) offices have limited operations or are closed during the weekends. Thus, to be conservative, the same traffic as the week day PM peak hour was assumed for the weekday peak hour.

Figure 8–1 shows the cumulative project locations and total cumulative project traffic volumes. ***Figure 8–2*** shows the Existing + Project + Cumulative projects traffic volumes on a weekday and Saturday.

TABLE 8–1
CUMULATIVE PROJECTS TRIP GENERATION SUMMARY

Sl. #	Project #	Project Name	Land Use	Quantity		Daily Trips	PM Trips	PM In	PM Out
1	350010-005	Cronin Light Industrial	Industrial Park	33.5	KSF [a]	536	64	13	51
2	3500 03-073-01	DGJM Self Storage	Storage	119.8	KSF	240	22	11	11
3	3500 01-064-01	Alpine Regional Center Expansion	Specialty Retail	25.0	KSF	1,000	90	45	45
			Bank with Drive-Through	2.0	KSF	400	40	20	20
	Sub-Total					*1,400*	*130*	*65*	*65*
4	3300 64-018-04	Alpine Convalescent	Convalescent	29	Beds	87	6	2	4
5	3500 10-022	Victoria Village	Specialty Retail	5.5	KSF	221	20	10	10
			Condominiums	4	DU [b]	32	3	2	1
	Sub-Total					*253*	*23*	*12*	*11*
6	3100 5431	Victoria Estates	Rural Estates	35.0	DU	420	42	29	13
7	N/A [c]	Alpine High School	High School	1,100	Students	1,430	143	57	86
8	N/A	Library	Library	13.0	KSF	650	65	32	33
9	N/A	Walker Health Clinic	Dental & Standard Comm Office	26.4	KSF	939	108	29	79
			Total Cumulative Project Trips			**5,955**	**603**	**250**	**353**

General Notes:

a. KSF – 1,000 Square Feet.

b. DU – Dwelling Units

c. N/A – Not available.

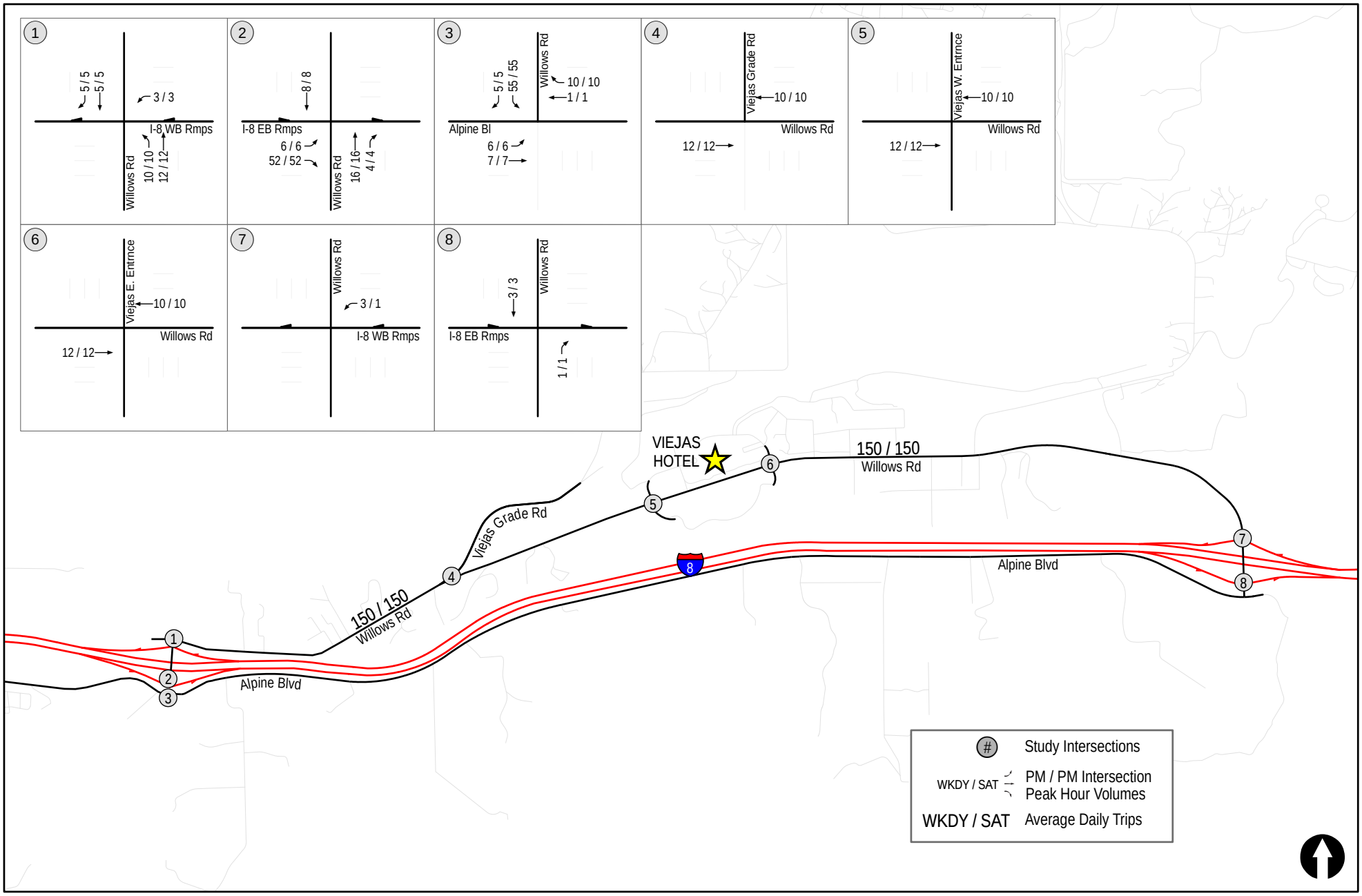

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Figure 8-1

Cumulative Projects Traffic Volumes

VIEJAS CASINO & RESORT - PHASE 3

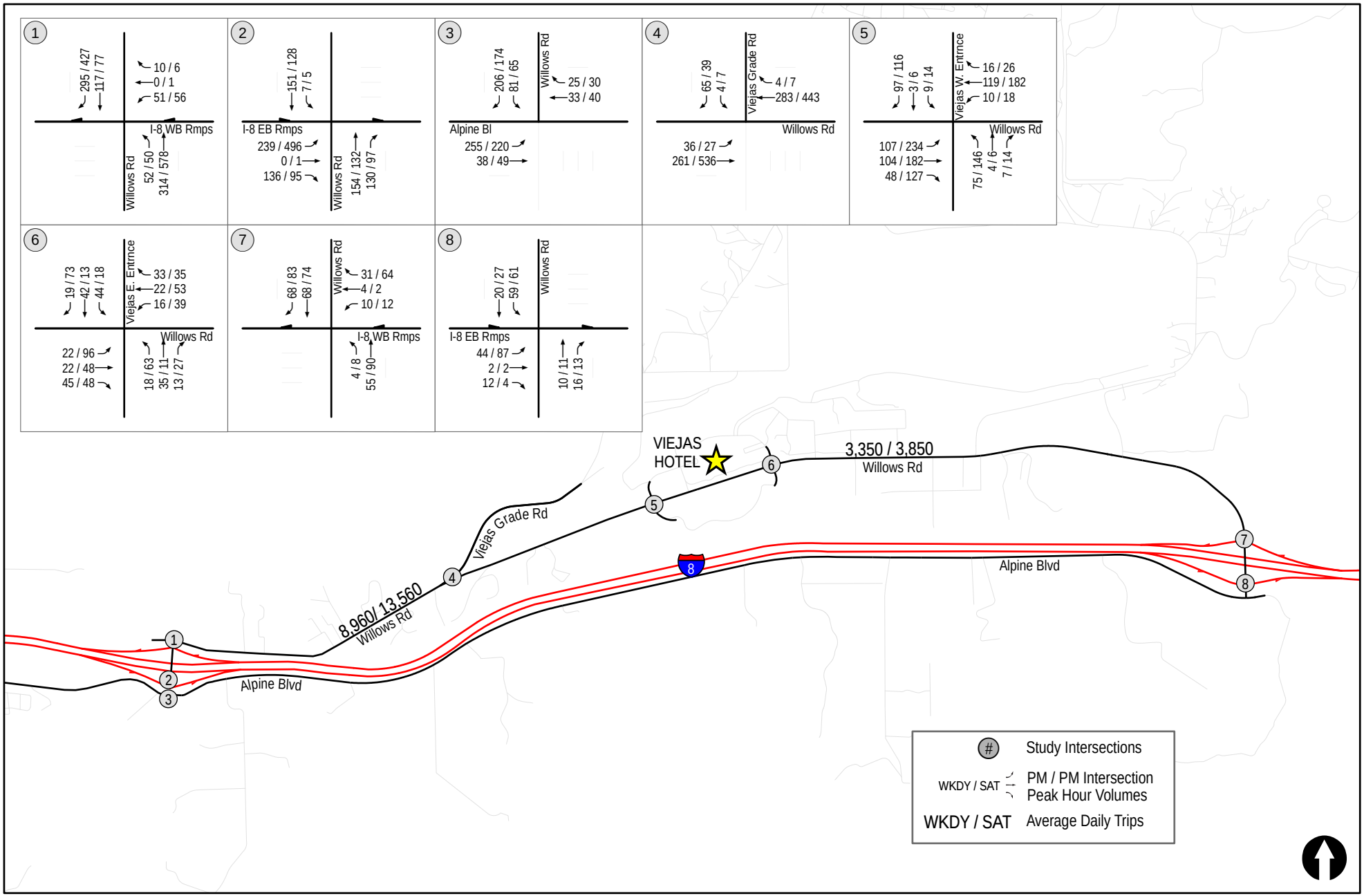

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Figure 8-2

Existing + Project + Cumulative Projects Traffic Volumes

VIEJAS CASINO & RESORT - PHASE 3

9.0 ANALYSIS OF NEAR-TERM SCENARIOS

The following section discusses the intersection and street segment operations for the near-term scenarios: Existing + Project and Existing + Project + Cumulative Projects.

9.1 Existing + Project

9.1.1 *Intersection Analysis*

Table 9–1 summarizes the Weekday PM peak hour intersection operations for Existing + Project conditions. With the addition of the proposed Project traffic, all the study area intersections are calculated to continue to operate at acceptable LOS C or better.

Appendix C contains the peak hour calculation sheets for the Existing + Project scenario.

Table 9–1 also summarizes the Weekend (Saturday) peak hour intersection operations for Existing + Project conditions. With the addition of the proposed Project traffic, all the study area intersections are calculated to continue to operate at acceptable LOS C or better.

9.1.2 *Street Segment Operations*

Table 9–2 summarizes the weekday street segment operations. With the addition of proposed Project traffic, Willows Road is calculated to continue to operate at acceptable LOS D or better. Therefore, no significant traffic impact is anticipated for weekday segment operations.

Table 9–2 also summarizes the Saturday street segment operations. With the addition of proposed Project traffic, Willows Road, West of Viejas Casino is calculated to continue to operate at LOS E. The proposed Project adds 410 ADT on this segment. While this exceeds the threshold of 200 ADT on a 2-lane road at LOS E, there is no significant impact requiring mitigation on Willows Road – West of the casino for the following reasons:

1) According to the County of San Diego General Plan Update Alpine Mobility Element Network, the street segment operations on this portion of Willows Road have been accepted at LOS F and west Willows Road is therefore LOS-exempt; and,
2) It is only a marginal deficiency for the following reasons:
   a). The intersections adjacent to this segment (Willows Road/ I-8 WB ramps and Casino traffic signal) are calculated to operate at LOS D or better. Given the minimal side friction on Willows Road in this stretch, street segment operations may operate better than calculated;
   b). The proposed Project is a low generating ancillary use to the Casino adding 410 ADT and 35 peak hour trips on a weekend (Saturday) on this segment; and,
   c). The impact occurs only on a Saturday. During peak weekday commuter traffic, which is what the County typically analyzes, this segment is calculated to operate at LOS D or better.

9.2 Existing + Project + Cumulative Projects

9.2.1 *Intersection Analysis*

Table 9–1 summarizes the peak hour intersection operations for Existing + Project + Cumulative projects conditions on a weekday. With the addition of the cumulative projects traffic, all the study area intersections are calculated to continue to operate at acceptable LOS C or better.

Appendix D contains the peak hour calculation sheets for the Existing + Project + Cumulative projects scenario.

Table 9–1 summarizes the peak hour intersection operations for Existing + Project + Cumulative projects conditions on a weekend (Saturday). With the addition of the cumulative projects traffic, all the study area intersections are calculated to operate at acceptable service levels of LOS D or better.

Therefore, peak hour intersection operations for Existing + Project + Cumulative projects conditions on a weekday and weekend (Saturday) would continue to operate at acceptable levels of service and would not result in a significant traffic impact.

9.2.2 *Street Segment Operations*

Table 9–2 summarizes the weekday street segment operations. With the addition of proposed Project and cumulative projects traffic, Willows Road is calculated to continue to operate at acceptable LOS D or better.

Table 9–2 summarizes the weekend (Saturday) street segment operations. With the addition of cumulative projects traffic, Willows Road, West of Viejas Casino is calculated to operate at LOS E. The proposed Project plus cumulative development traffic on this segment add 560 ADT. While this exceeds the threshold of 200 ADT on a 2-lane road at LOS E, there is no significant impact requiring mitigation on Willows Road – West of the casino for the reasons described in section 9.1.2 above.

Thus, no cumulative street segment impact would occur for Saturday street segment operations.

9.3 Significant Impacts

9.3.1 *Intersections*

Based on the County's significance criteria, *no significant direct or cumulative intersection impacts were calculated on a weekday or Saturday*.

9.3.2 *Street Segments*

Based on the County's significance criteria, *no significant direct or cumulative street segment impacts are calculated on a weekday or Saturday*.

TABLE 9–1
NEAR-TERM INTERSECTION OPERATIONS (WEEKDAY)

Intersection	Control Type	Peak Hour	Existing		Existing + Project			Impact Type	Existing + Project + Cumulative Projects			Impact Type
			Delay [a]	LOS [b]	Delay	LOS	Δ [c]		Delay	LOS	Δ	
1. Willows Rd (West) / I-8 WB Ramps	MSSC [d]	WD PM	14.5	B	14.8	B	0.3	None	15.8	C	0.3	None
		WE Peak	21.5	C	22.5	C	1.0	None	24.6	C	1.0	None
2. Willows Rd (West) / I-8 EB Ramps	MSSC	WD PM	13.2	B	13.5	B	0.3	None	13.7	B	0.3	None
		WE Peak	24.0	C	26.1	D	2.1	None	28.4	D	2.1	None
3. Willows Rd (West) / Alpine Blvd	MSSC	WD PM	12.3	B	12.4	B	0	None	13.7	B	0	None
		WE Peak	11.5	B	11.5	B	0	None	12.8	B	0	None
4. Willows Rd / Viejas Grade Rd	MSSC	WD PM	10.6	B	10.7	B	0	None	10.8	B	0	None
		WE Peak	13.2	B	13.5	B	0	None	13.7	B	0	None
5. Willows Rd / W Viejas Casino Entrance	AWSC [e]	WD PM	9.1	A	9.4	A	0.3	Direct	9.5	A	0.3	None
		WE Peak	12.5	B	13.1	B	0.6	Direct	13.3	B	0.6	None
6. Willows Rd / E Viejas Casino Entrance	AWSC	WD PM	8.3	A	8.3	A	0.0	None	8.3	A	0.0	None
		WE Peak	9.0	A	9.0	A	0.0	Direct	9.1	A	0.0	None

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TABLE 9–1 (CONTINUED)
NEAR-TERM INTERSECTION OPERATIONS (WEEKDAY)

Intersection	Control Type	Peak Hour	Existing		Existing + Project			Impact Type	Existing + Project + Cumulative Projects			Impact Type
			Delay [a]	LOS [b]	Delay	LOS	Δ[c]		Delay	LOS	Δ	
7. Willows Rd (East) / I-8 WB Ramps	MSSC	WD PM	8.8	A	8.8	A	4	None	8.9	A	4	None
		WE Peak	9.1	A	9.2	A	5	None	9.2	A	5	None
8. Willows Rd (East) / I-8 EB Ramps	MSSC	WD PM	9.6	A	9.7	A	0	None	9.7	A	0	None
		WE Peak	10.1	B	10.2	B	0	None	10.3	B	0	None

Footnotes:
a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. Δ denotes an increase in trips for the critical movement due to the proposed Project in the County and increase in delay for intersection outside the County jurisdiction.
d. MSSC – Two-Way Stop Controlled intersection. Minor street left turn delay is reported.
e. AWSC – All-Way Stop Controlled intersection.

General Notes:
WD PM – Weekday PM peak hour
WE Peak – Weekend peak hour

UNSIGNALIZED

Delay	LOS
0.0 ≤ 10.0	A
10.1 to 15.0	B
15.1 to 25.0	C
25.1 to 35.0	D
35.1 to 50.0	E
≥ 50.1	F

TABLE 9–2
NEAR-TERM STREET SEGMENT OPERATIONS

Street Segment	Day of Week	Classification	Existing Capacity (LOS E)[a]	Existing		Existing + Project			Impact Type	Existing + Project + Cumulative Projects			Impact Type
				ADT[b]	LOS[c]	ADT	LOS	Δ[d]		ADT	LOS	Δ	
Willows Road													
West of Viejas Casino	Weekday	2.2E Light Collector	16,200	8,400	D	8,810	D	410	None	8,960	D	410	None
	Saturday	2.2E Light Collector	16,200	13,000	E	13,410	E	410	None [e]	13,560	E	410	None [e]
East of Viejas Casino	Weekday	2.2E Light Collector	16,200	3,100	B	3,200	B	100	None	3,350	B	100	None
	Saturday	2.2E Light Collector	16,200	3,600	B	3,700	B	100	None	3,850	B	100	None

Footnotes:

a. Capacities based on the *County of San Diego Roadway Classification & LOS table* (See *Table 4-3*).
b. Average Daily Traffic
c. Level of Service
d. Δ denotes a project-induced increase in the average daily traffic.
e. See *Section 9.3.2* for discussion.

10.0 ANALYSIS OF LONG-TERM SCENARIOS

The following section discusses the street segment operations for the Long-Term scenario.

Several sources were considered to obtain long-term volume projections for the study area roadways. Based on a discussion with County Staff, the Forest Conservation Initiative General Plan Amendment (FCI GPA) was determined to be the best source.

A Supplemental Environmental Impact Report (SEIR) was prepared by RBF Consulting for the proposed FCI GPA. The proposed FCI GPA tiers from the current San Diego County General Plan and the General Plan Update Program EIR adopted on August 3, 2011. As part of the FCI GPA, various Community Plan and Subregional Plan Updates, Mobility Element Road Network Changes and San Diego County Zoning Ordinance Amendments were included in the traffic study in order to identify known issues and to ensure proper recommendations.

Table 10–1 shows that 47,736 ADT is forecast on Willows Road west of the casino and 46,656 ADT is forecast on Willows Road east of the casino. *Table 10-1* also shows the segment LOS for three sets of roadway classifications for Willows Road.

1. Existing
2. County General Plan
3. FCI GPA

The FCI GPA recommends that Willows Road east of the Casino be widened to 4 lanes.

As shown in *Table 10–1*, Willows Road – East and West of Viejas Casino is anticipated to operate at LOS F with both the General Plan Update Mobility Element classification and the proposed FCI GPA classification.

The proposed Project would not be responsible for contributing to the future widening of Willows Road to Boulevard standards (east of the casino as recommended in the FCI GPA) since the proposed Project does not cause a significant impact on Willows Road, the proposed Project is a commercial use within a portion of the Reservation designated for commercial uses, and the proposed Project is not part of the FCI GPA.

TABLE 10–1
LONG-TERM STREET SEGMENT OPERATIONS

Street Segment	Forecast ADT[a]	Existing			GPU EIR			FCI GPA		
		Roadway Class [b]	Capacity (LOS E)[b]	LOS [c]	Roadway Class	Capacity (LOS E)	LOS	Roadway Class	Capacity (LOS E)	LOS
Willow Road										
West of Viejas Casino	47,736	2.2E Lt Col	16,200	F	2.2E Lt Col	16,200	**F**	2.2E Lt Col	16,200	**F**
East of Viejas Casino	46,656	2.2E Lt Col	16,200	F	2.2E Lt Col	16,200	**F**	4.2B Blvd	28,000	**F**

Footnotes:

a. Source: FCI GPA SEIR
b. Capacities based on the *County of San Diego Roadway Classification & LOS table* (See *Table 4-3*).
c. Level of Service

11.0 ACCESS AND OTHER ISSUES

The following section discusses the project access, pedestrian circulation and a qualitative construction assessment.

11.1 Project Access

Access to the hotel is proposed via an existing all-way stop controlled intersection on Willows Road, west of the casino. Dedicated left-turn and right-turn lanes are currently provided on Willows Road, thereby increasing overall intersection capacity. With the addition of project traffic, this driveway is expected to operate at LOS B or better, thus providing adequate access to the proposed Hotel Tower, requiring no modification.

11.2 Pedestrian Circulation

With an additional hotel on the Viejas property, pedestrian activity will likely increase between the outlet center on the south side and the casino/ hotel on the north. The existing traffic signal on Willows Road fronting the casino includes a pedestrian crosswalk and push buttons. This signalized intersection and the dedicated pedestrian crosswalk would adequately serve the pedestrian interaction between the various uses on-site. No pedestrian circulation issues are identified; therefore, no improvements are required.

11.3 Collision Analysis

5-year collision data was obtained from the Transportation Injury Mapping System, University of California, Berkeley. ***Table 11-1*** summarizes the type of collisions on Willows Road between the two Willows Road interchanges on I-8. As seen in *Table 11-1*, a total of 20 collisions occurred in a five-year period, with a high of 6 collisions in 2011 to a low of 2 collisions in 2012. The highest number of any one type of collision is rear end, at 8 over the five year period and 4 in one year (2012). There were a total of 20 injury collisions, with 19 injury and one fatality in 2013 resulting in two deaths.

This collision with fatalities in the Year 2013 was a result of improper turning, approximately 2,100 feet east of Viejas Grade Road, on Willows Road. The accident occurred in the eastbound direction on a Sunday at 4:00 PM on a clear day in October. The vehicle overturned.

Based on a review of the Primary Collision Factor (PCF) violation, it is determined that none of the collisions could be prevented by improvements to the conditions and all collisions were a result of driver error. No off-site hazardous design features were identified and it is therefore concluded that the project would not contribute any traffic to any off-site hazardous condition on Willows Road.

TABLE 11-1
5-YEAR COLLISION SUMMARY

Collision Type	2010	2011	2012	2013	2014	Total Each Collision Type
A - Head-On		1				1
B - Sideswipe						0
C - Rear End	1	4		2	1	8
D - Broadside	2			1		3
E - Hit Object			2	1	3	6
F - Overturned				1		1
G - Vehicle/Pedestrian		1				1
Total Collisions	**3**	**6**	**2**	**5**	**4**	**20**
Injury Type						
Injury	3	6	2	4	4	19
Fatality				1		1
Total Injuries	**3**	**6**	**2**	**5**	**4**	**20**

11.4 Project Construction Review

Construction traffic relates to the traffic generated from construction vehicles, which consist primarily of heavy trucks, smaller construction trucks, and worker vehicles. Construction of the proposed Project is expected to begin on June 2017 and be completed by December 2018. The major activities include demolition, site work, construction of foundation, building structures and interior design. Demolition of a portion of an existing building will be done between June 2017 and October 2017. Construction of the hotel tower will begin after the demolition and removal of debris and end December 2018.

The project proposes to remove debris associated with demolition and replacement in kind of approximately 20,000 sq ft of the existing Casino and will utilize 65,000 cubic yards of fill for the hotel. An additional 120 truck trips are anticipated to remove demolition debris from and bring fill to the proposed Project site. This would occur over two or more weeks meaning a maximum of twelve (12) trucks a day would be added to the street system. This amount is less than two trips per hour and the trucks would use East Willows Road.

The analysis in *Section 9.0* shows acceptable LOS D or better operations during the PM commuter peak hour at the key study area intersections for both weekday and Saturday. Additionally, the Viejas reservation is requiring that all construction employees and workers be required to use the east Willows Road interchange to off-load traffic from west Willows Road. The traffic volumes on Willows Road east of the casino are low. Given the above, no construction impacts are anticipated.

It should be noted that construction permits from the County will be required for any work that is done within the County right-of-way; however, no such work is anticipated at this time.

12.0 AREA TRAFFIC IMPROVEMENTS

12.1 Previous Area Traffic Improvements

Viejas has worked with County of San Diego staff and the local community over the years to implement several traffic related improvements in the last few years, which improve safety and reduce traffic loads on Willows Road. The following is a list of those improvements:

- Implemented double yellow striping on West Willows Road.
- Conducted a speed survey on West Willows Road which resulted in an increase in the use of radar detection and enforcement.
- Realigned the West Willows Road/Viejas Grade Road intersection and implemented lighting and guardrails.
- Relocated the bus turnout on West Willows Road.
- Install guardrails along a portion of East Willows Road.
- Require all bus and shuttles oriented to/from the Casino to the use East Willows Road.
- Require all Casino employees to use East Willows Road and implement disciplinary action to those who violate.
- Implemented traffic control procedures during special events that direct the majority of patrons to East Willows Road.

12.2 Proposed Traffic Improvements

The proposed Project will include the following traffic related improvements

- A new bus terminal and bus drop off area will be constructed near the Casino's existing northwest entry
- A new casino walk will provide access to the proposed hotel.
- The existing valet will be relocated to the new hotel porte cochère at the northwest entry.

13.0 SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

13.1 Roadway Segments

13.1.1 *Significant Impacts Prior to Mitigation*

Based on the established significance criteria, *no significant direct or cumulative street segment impacts are calculated*. Hence, no mitigation measure is required.

13.2 Intersections

13.2.1 *Significant Impacts Prior to Mitigation*

Based on the established significance criteria, no direct or cumulative intersection impacts were calculated on a weekday or Saturday. Therefore, no mitigation measure is required.

14.0 REFERENCES AND LIST OF PREPARERS AND ORGANIZATIONS CONTACTED

14.1 References

The following references were utilized in the course of preparing this Traffic Impact Study.

1. County of San Diego *Traffic Needs Assessment of Tribal Development Projects in the San Diego Region*, March 2003.
2. SANDAG *(Not So) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region*, April 2002.
3. County of San Diego *Guidelines for Determining Significance – Transportation and Traffic*, June 30, 2009.
4. *County General Plan Update* (2011)
5. County's *Public Road Standards*, March 3, 2010
6. County of San Diego *Traffic Report Format & Content Requirements*, June 30, 2009.
7. County of San Diego *General Plan Update* for Alpine Community
8. *Highway Capacity Manual* (HCM) 2010
9. *Transportation Injury Mapping System*, University of California, Berkeley

14.2 List of Preparers

The following LLG staff were involved in the preparation of this Traffic Impact Study.

1. John Boarman, P.E., Principal – Linscott, Law & Greenspan, Engineers
2. Narasimha Prasad, Senior Transportation Engineer – Linscott, Law & Greenspan, Engineers

14.3 Organizations Contacted

The following organizations were contacted in the course of preparing this Traffic Impact Study.

1. County of San Diego, Department of Public Works Transportation Division

LINSCOTT
LAW &
GREENSPAN
engineers

TECHNICAL APPENDICES

VIEJAS PHASE 3

San Diego, California
July 8, 2016

LLG Ref. 3-16-2583

**Linscott, Law &
Greenspan, Engineers**
4542 Ruffner Street
Suite 100
San Diego, CA 92111
858.300.8800 T
858.300.8810 F
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APPENDIX A

INTERSECTION AND SEGMENT MANUAL COUNT SHEETS

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

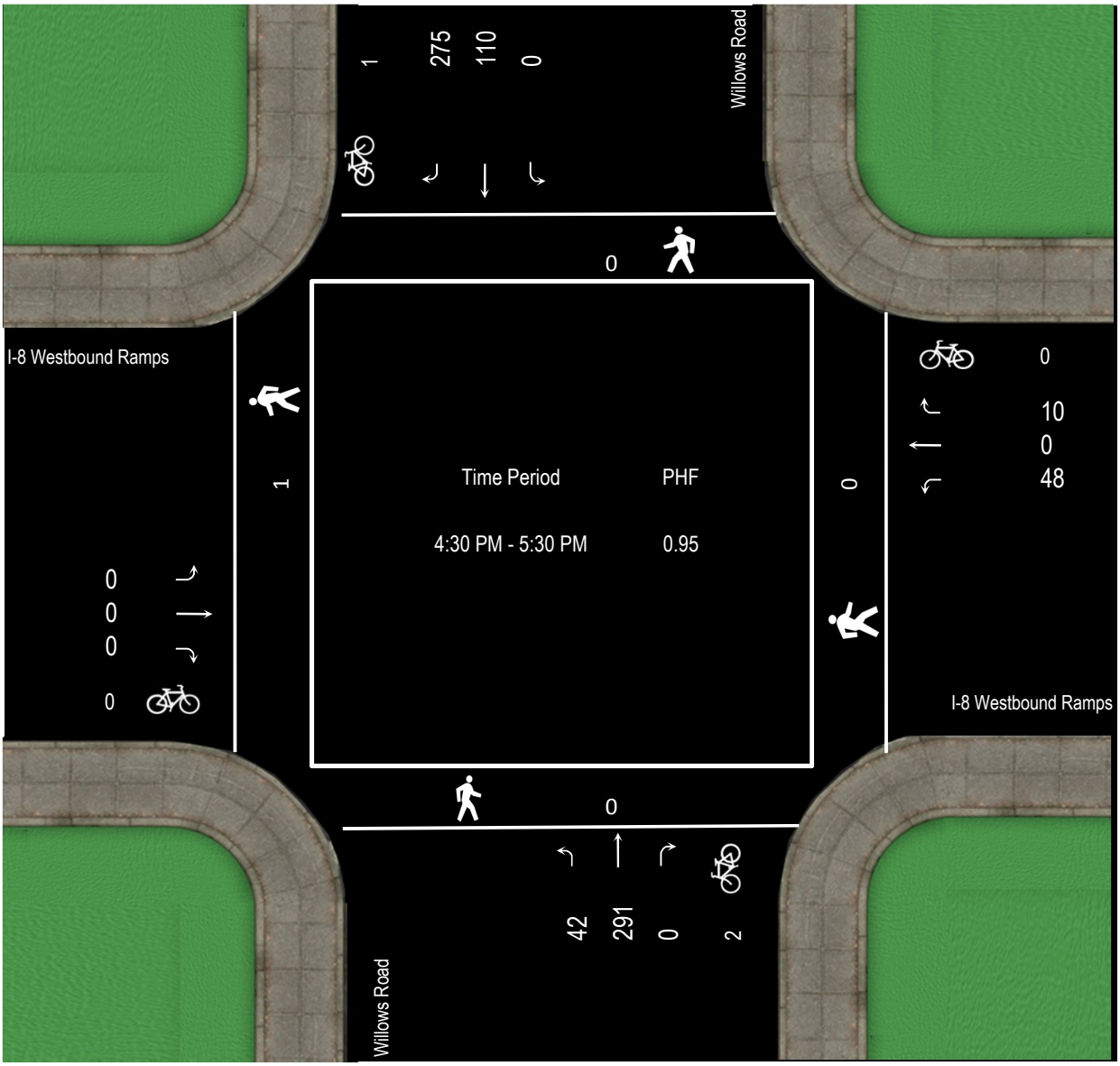
Location: I-8 Westbound Ramps @ Willows Road

Date of Count: *Thursday, February 25, 2016*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *16-0487*



LINSCOTT LAW & GREENSPAN engineers

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: I-8 Westbound Ramps @ Willows Road

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	76	11	0	1	0	18	0	86	5	0	0	0	197
4:15 PM	50	19	0	4	0	14	0	76	7	0	0	0	170
4:30 PM	72	27	0	3	0	13	0	71	7	0	0	0	193
4:45 PM	64	19	0	3	0	15	0	78	5	0	0	0	184
5:00 PM	72	29	0	3	0	9	0	66	15	0	0	0	194
5:15 PM	67	35	0	1	0	11	0	76	15	0	0	0	205
5:30 PM	40	16	0	2	0	14	0	84	10	0	0	0	166
5:45 PM	46	22	0	0	0	12	0	87	7	0	0	0	174
Total	487	178	0	17	0	106	0	624	71	0	0	0	1,483

PM Intersection Peak Hour : **4:30 PM - 5:30 PM**

Intersection PHF : **0.95**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	275	110	0	10	0	48	0	291	42	0	0	0	776
PHF	0.95	0.786	#####	0.833	#####	0.8	#####	0.933	0.7	#####	#####	#####	0.95
Movement PHF		0.94			0.81			0.91			#DIV/0!		0.95

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

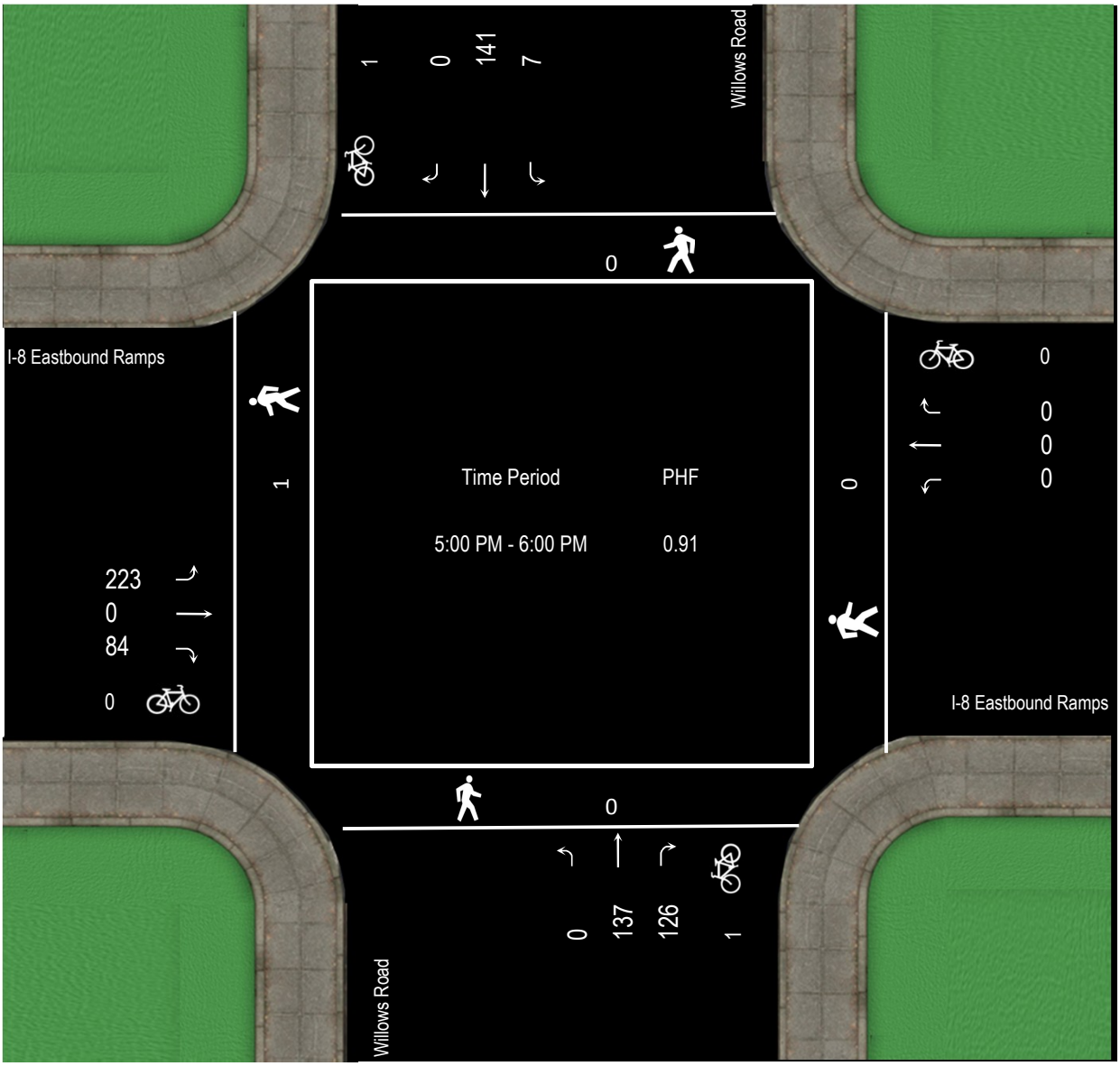
Location: I-8 Eastbound Ramps @ Willows Road

Date of Count: *Thursday, February 25, 2016*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *16-0487*



LINSCOTT LAW & GREENSPAN engineers

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: I-8 Eastbound Ramps @ Willows Road

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	0	29	0	0	0	0	33	29	0	28	0	62	181
4:15 PM	0	32	1	0	0	0	34	31	0	24	0	52	174
4:30 PM	0	39	1	0	0	0	40	23	0	22	0	55	180
4:45 PM	0	33	1	0	0	0	24	19	0	21	1	64	163
5:00 PM	0	37	1	0	0	0	29	32	0	19	0	49	167
5:15 PM	0	44	2	0	0	0	34	38	0	27	0	53	198
5:30 PM	0	28	2	0	0	0	35	31	0	17	0	63	176
5:45 PM	0	32	2	0	0	0	28	36	0	21	0	58	177
Total	0	274	10	0	0	0	257	239	0	179	1	456	1,416

PM Intersection Peak Hour : **5:00 PM - 6:00 PM**

Intersection PHF : **0.91**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	0	141	7	0	0	0	126	137	0	84	0	223	718
PHF	#####	0.801	0.875	#####	#####	#####	0.9	0.901	#####	0.778	#####	0.885	0.91
Movement PHF		0.80			#DIV/0!			0.91			0.96		0.91

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

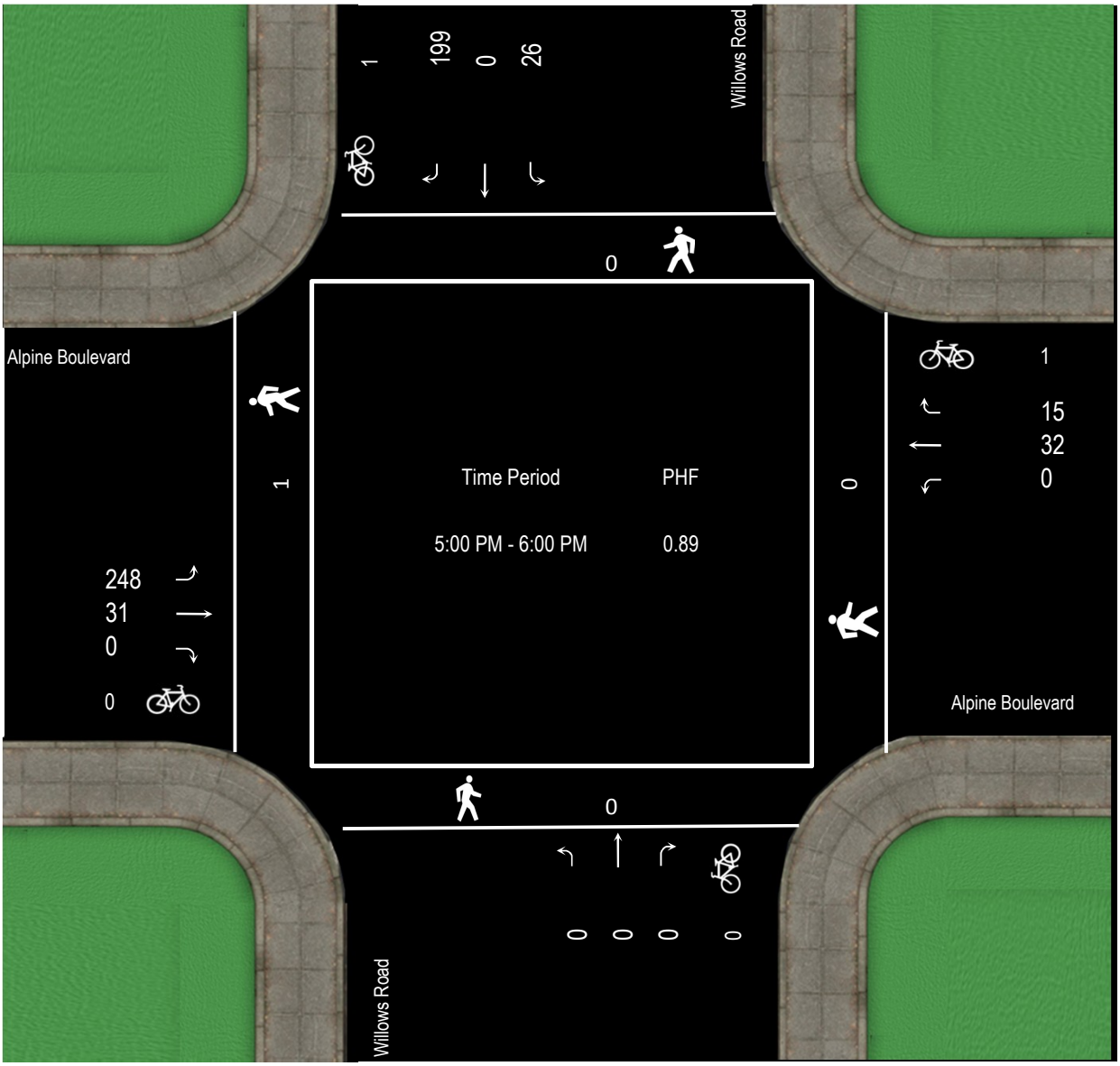
Location: Alpine Boulevard @ Willows Road

Date of Count: *Thursday, February 25, 2016*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *16-0487*



LINSCOTT LAW & GREENSPAN engineers

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Alpine Boulevard @ Willows Road

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	47	0	10	1	10	0	0	0	0	0	10	61	139
4:15 PM	48	0	8	5	6	0	0	0	0	0	7	60	134
4:30 PM	53	0	8	3	6	0	0	0	0	0	12	60	142
4:45 PM	48	0	6	6	8	0	0	0	0	0	6	37	111
5:00 PM	49	0	7	3	8	0	0	0	0	0	6	58	131
5:15 PM	66	0	5	7	5	0	0	0	0	0	7	65	155
5:30 PM	37	0	8	4	7	0	0	0	0	0	11	62	129
5:45 PM	47	0	6	1	12	0	0	0	0	0	7	63	136
Total	395	0	58	30	62	0	0	0	0	0	66	466	1,077

PM Intersection Peak Hour : **5:00 PM - 6:00 PM**

Intersection PHF : **0.89**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	199	0	26	15	32	0	0	0	0	0	31	248	551
PHF	0.75	#####	0.813	0.536	0.667	#####	#####	#####	#####	#####	0.705	0.954	0.89
Movement PHF	0.79			0.90			#DIV/0!			0.96			0.89

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

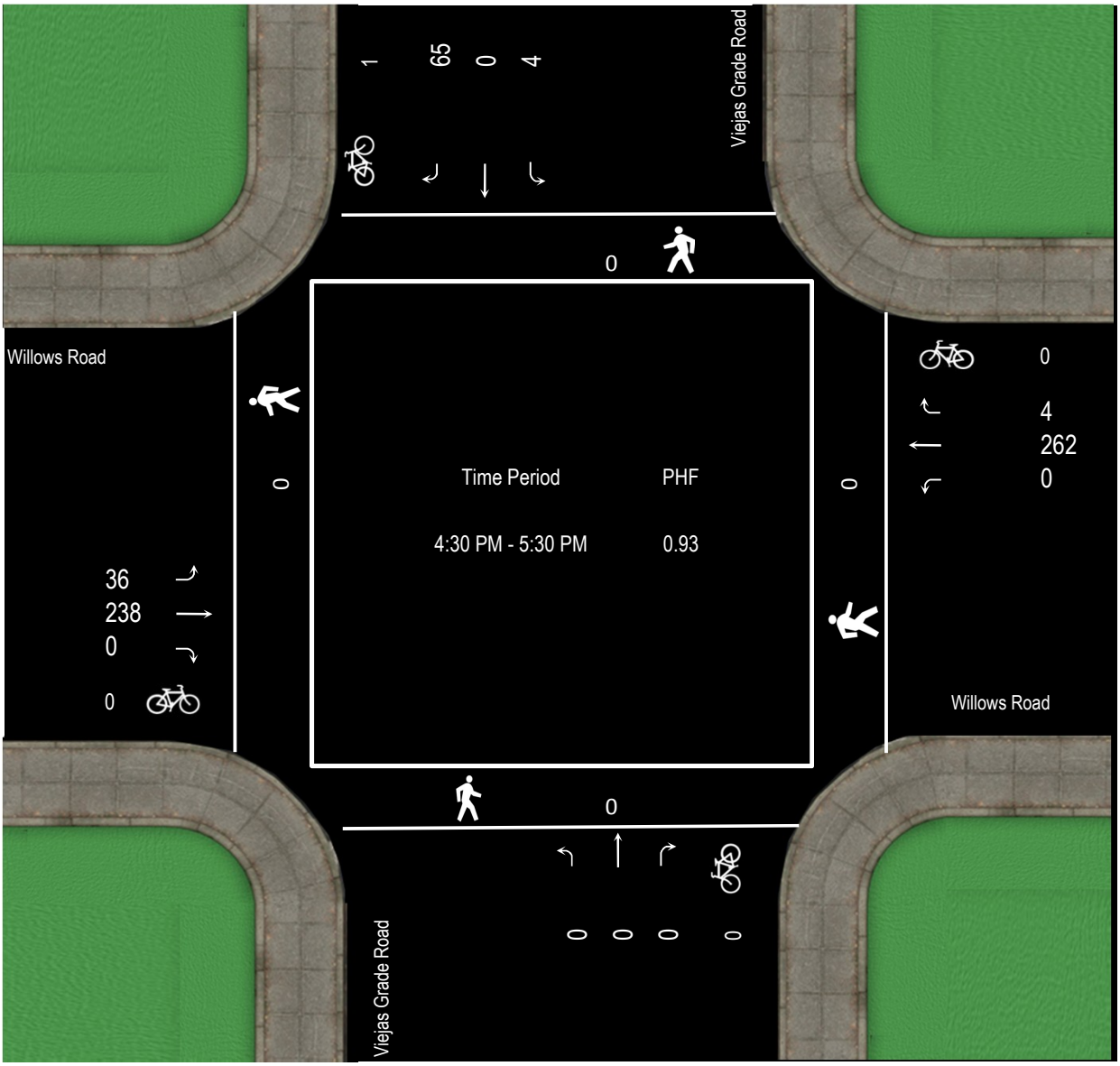
Location: Willows Road @ Viejas Grade Road

Date of Count: *Thursday, February 25, 2016*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *16-0487*



LINSCOTT LAW & GREENSPAN engineers

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Willows Road @ Viejas Grade Road

PM Period (4:00 PM - 6:00 PM)

	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	3	0	2	3	78	0	0	0	0	0	61	14	161
4:15 PM	9	0	1	1	54	0	0	0	0	0	56	19	140
4:30 PM	13	0	3	0	61	0	0	0	0	0	60	8	145
4:45 PM	5	0	0	1	59	0	0	0	0	0	65	9	139
5:00 PM	24	0	0	3	69	0	0	0	0	0	58	8	162
5:15 PM	23	0	1	0	73	0	0	0	0	0	55	11	163
5:30 PM	12	0	0	3	40	0	0	0	0	0	65	7	127
5:45 PM	9	0	0	0	50	0	0	0	0	0	69	13	141
Total	98	0	7	11	484	0	0	0	0	0	489	89	1,178

PM Intersection Peak Hour : **4:30 PM - 5:30 PM**

Intersection PHF : **0.93**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	65	0	4	4	262	0	0	0	0	0	238	36	609
PHF	0.68	#####	0.333	0.333	0.897	#####	#####	#####	#####	#####	0.915	0.818	0.93
Movement PHF		0.72			0.91			#DIV/0!			0.93		0.93

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

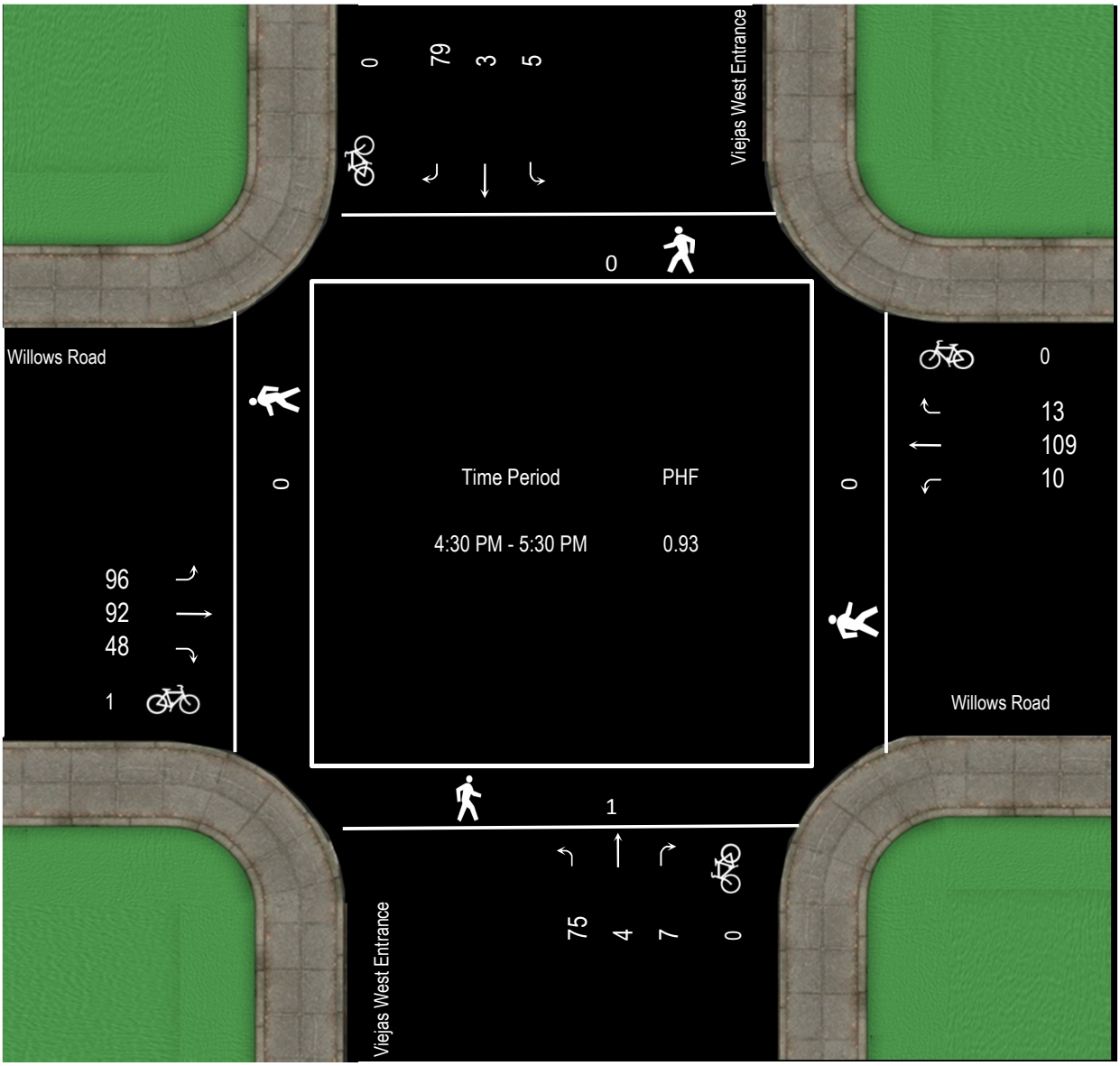
Location: Willows Road @ Viejas West Entrance

Date of Count: *Thursday, February 25, 2016*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *16-0487*



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Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Willows Road @ Viejas West Entrance

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	20	1	3	1	38	4	2	0	17	10	28	24	148
4:15 PM	13	0	2	0	29	4	0	0	11	13	27	17	116
4:30 PM	20	1	1	3	21	0	3	4	21	12	30	21	137
4:45 PM	16	0	2	1	31	2	0	0	12	19	19	27	129
5:00 PM	22	2	2	4	22	6	3	0	29	12	19	25	146
5:15 PM	21	0	0	5	35	2	1	0	13	5	24	23	129
5:30 PM	16	1	2	3	18	5	2	0	7	10	27	27	118
5:45 PM	12	0	1	4	23	3	1	0	14	20	24	27	129
Total	140	5	13	21	217	26	12	4	124	101	198	191	1,052

PM Intersection Peak Hour : **4:30 PM - 5:30 PM**

Intersection PHF : **0.93**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	79	3	5	13	109	10	7	4	75	48	92	96	541
PHF	0.90	0.375	0.625	0.65	0.779	0.417	0.583	0.25	0.647	0.632	0.767	0.889	0.93
Movement PHF		0.84			0.79			0.67			0.91		0.93

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

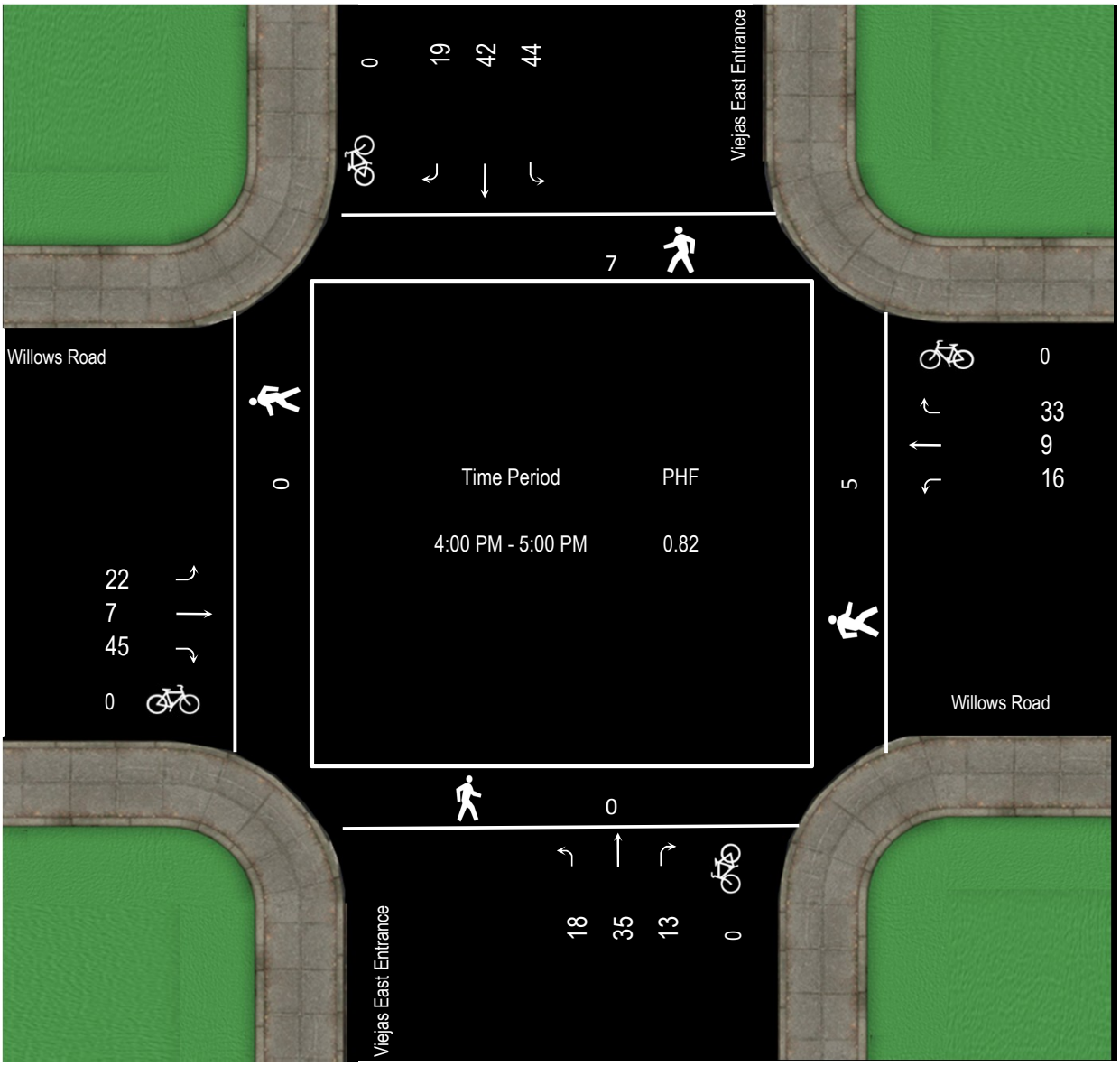
Location: Willows Road @ Viejas East Entrance

Date of Count: *Thursday, February 25, 2016*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *16-0487*



LINSCOTT LAW & GREENSPAN engineers

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Willows Road @ Viejas East Entrance

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	5	11	14	12	1	4	1	11	5	17	2	9	92
4:15 PM	4	13	11	7	3	2	3	6	8	4	1	5	67
4:30 PM	9	11	6	9	1	6	5	10	1	14	3	0	75
4:45 PM	1	7	13	5	4	4	4	8	4	10	1	8	69
5:00 PM	6	5	10	6	1	7	6	12	5	17	2	10	87
5:15 PM	6	8	9	12	3	1	2	13	4	5	4	5	72
5:30 PM	4	6	13	8	1	1	4	11	1	12	3	2	66
5:45 PM	3	7	10	6	1	0	5	10	5	4	0	7	58
Total	38	68	86	65	15	25	30	81	33	83	16	46	586

PM Intersection Peak Hour : **4:00 PM - 5:00 PM**

Intersection PHF : **0.82**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	19	42	44	33	9	16	13	35	18	45	7	22	303
PHF	0.53	0.808	0.786	0.688	0.563	0.667	0.65	0.795	0.563	0.662	0.583	0.611	0.82
Movement PHF		0.88			0.85			0.97			0.66		0.82

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

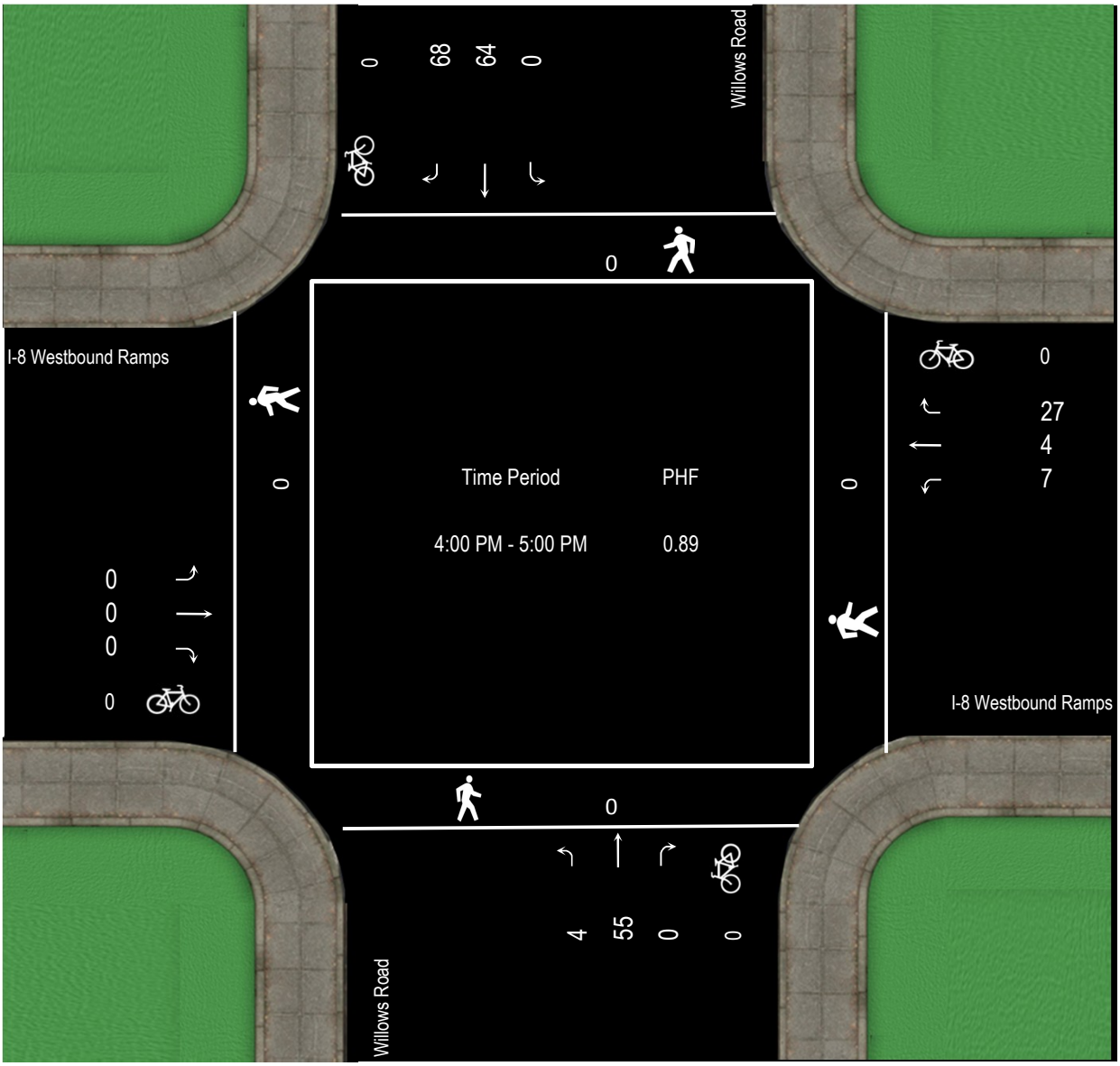
Location: I-8 Westbound Ramps @ Willows Road

Date of Count: *Thursday, February 25, 2016*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *16-0487*



LINSCOTT LAW & GREENSPAN engineers

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: I-8 Westbound Ramps @ Willows Road

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	24	15	0	8	1	2	0	11	1	0	0	0	62
4:15 PM	19	17	0	5	0	2	0	20	1	0	0	0	64
4:30 PM	13	20	0	9	3	1	0	13	1	0	0	0	60
4:45 PM	12	12	0	5	0	2	0	11	1	0	0	0	43
5:00 PM	23	15	0	6	0	3	0	6	1	0	0	0	54
5:15 PM	15	8	0	9	0	1	0	17	0	0	0	0	50
5:30 PM	11	5	0	9	1	3	0	13	2	0	0	0	44
5:45 PM	15	6	0	7	0	3	0	11	0	0	0	0	42
Total	132	98	0	58	5	17	0	102	7	0	0	0	419

PM Intersection Peak Hour : **4:00 PM - 5:00 PM**

Intersection PHF : **0.89**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	68	64	0	27	4	7	0	55	4	0	0	0	229
PHF	0.71	0.8	#####	0.75	0.333	0.875	#####	0.688	1	#####	#####	#####	0.89
Movement PHF		0.85			0.73			0.70			#DIV/0!		0.89

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

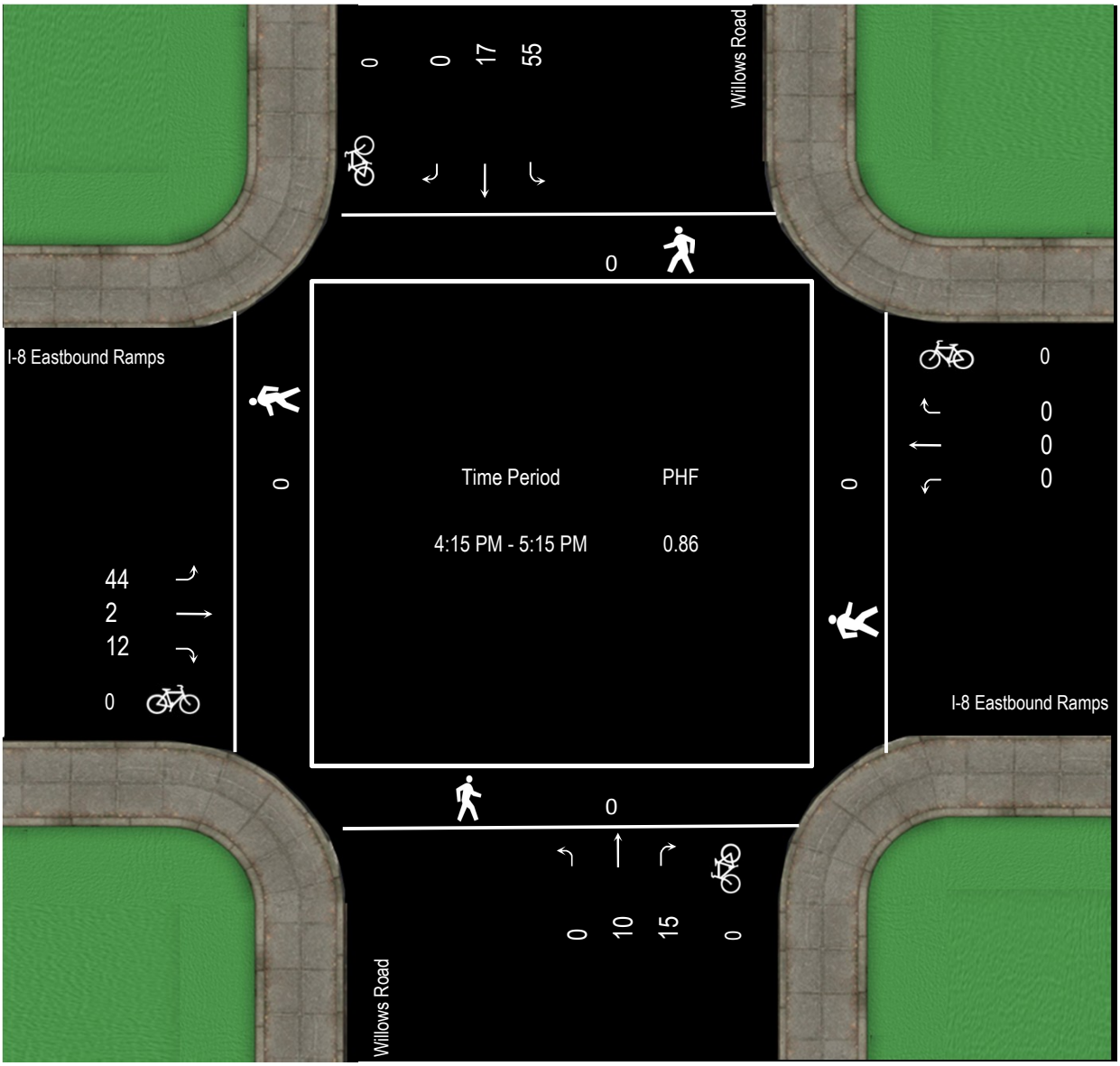
Location: I-8 Eastbound Ramps @ Willows Road

Date of Count: *Thursday, February 25, 2016*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *16-0487*



LINSCOTT LAW & GREENSPAN engineers

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: I-8 Eastbound Ramps @ Willows Road

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	0	5	12	0	0	0	2	4	0	3	0	8	34
4:15 PM	0	4	15	0	0	0	0	3	0	1	0	18	41
4:30 PM	0	4	17	0	0	0	5	2	0	4	1	12	45
4:45 PM	0	4	10	0	0	0	4	3	0	3	0	9	33
5:00 PM	0	5	13	0	0	0	6	2	0	4	1	5	36
5:15 PM	0	3	6	0	0	0	3	3	0	1	2	14	32
5:30 PM	0	3	5	0	0	0	4	3	0	2	0	12	29
5:45 PM	0	5	4	0	0	0	2	0	0	3	1	11	26
Total	0	33	82	0	0	0	26	20	0	21	5	89	276

PM Intersection Peak Hour : **4:15 PM - 5:15 PM**

Intersection PHF : **0.86**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	0	17	55	0	0	0	15	10	0	12	2	44	155
PHF	#####	0.85	0.809	#####	#####	#####	0.625	0.833	#####	0.75	0.5	0.611	0.86
Movement PHF		0.86			#DIV/0!			0.78			0.76		0.86

24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 1. Willow Road: West of Viejas Grade Road

Orientation: *East-West*

Date of Count: *Thursday, February 25, 2016*

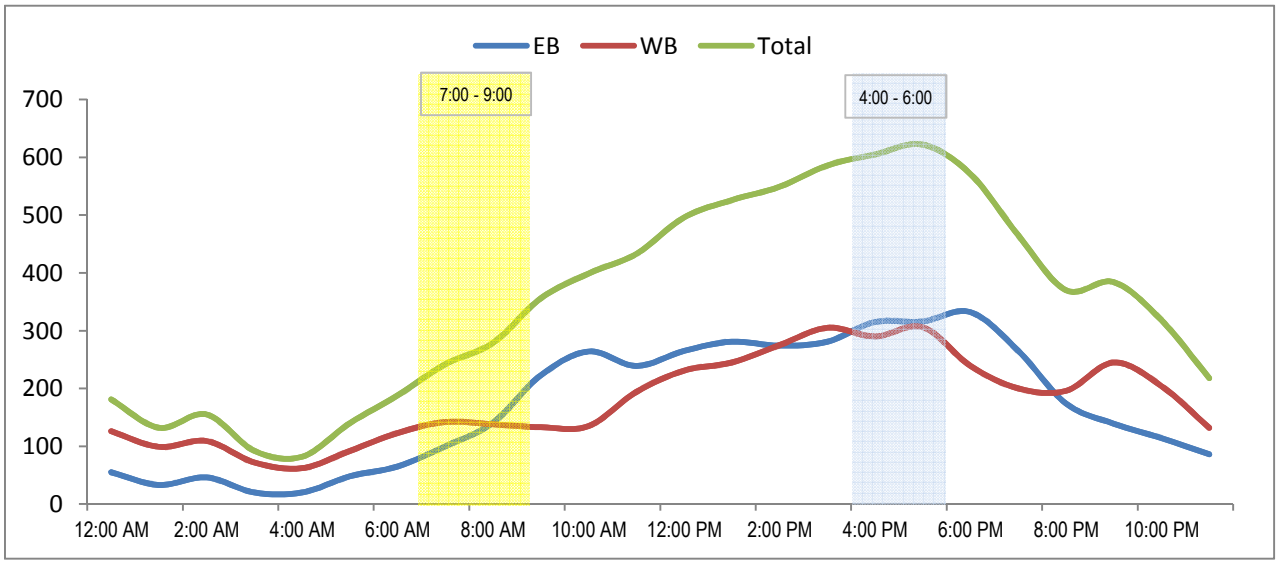
Analysts: *DASH*

Weather: *Sunny*

AVC Proj. No: *16-0487*

24 Hour Segment Volume				*8,389*			
Time	**Hourly Volume**			**Time**	**Hourly Volume**		
	EB	**WB**	**Total**		**EB**	**WB**	**Total**
12:00 AM - 1:00 AM	55	126	181	12:00 PM - 1:00 PM	265	231	496
1:00 AM - 2:00 AM	33	99	132	1:00 PM - 2:00 PM	281	245	526
2:00 AM - 3:00 AM	46	109	155	2:00 PM - 3:00 PM	274	275	549
3:00 AM - 4:00 AM	20	72	92	3:00 PM - 4:00 PM	281	305	586
4:00 AM - 5:00 AM	20	62	82	4:00 PM - 5:00 PM	315	290	605
5:00 AM - 6:00 AM	48	92	140	5:00 PM - 6:00 PM	316	306	622
6:00 AM - 7:00 AM	65	123	188	6:00 PM - 7:00 PM	332	239	571
7:00 AM - 8:00 AM	100	142	242	7:00 PM - 8:00 PM	265	200	465
8:00 AM - 9:00 AM	141	138	279	8:00 PM - 9:00 PM	174	196	370
9:00 AM - 10:00 AM	223	133	356	9:00 PM - 10:00 PM	139	245	384
10:00 AM - 11:00 AM	264	135	399	10:00 PM - 11:00 PM	114	204	318
11:00 AM - 12:00 PM	239	194	433	11:00 PM - 12:00 AM	86	132	218
Total	**1,254**	**1,425**	**2,679**	**Total**	**2,842**	**2,868**	**5,710**

24-Hour	*EB*	*Volume*	*4,096*	*24-Hour*	*WB*	*Volume*	*4,293*



LINSCOTT LAW & GREENSPAN engineers

24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

AVC

Location: 2. Willows Road, East of Viejas East Entrance

Orientation: *East-West*

Date of Count: *Thursday, February 25, 2016*

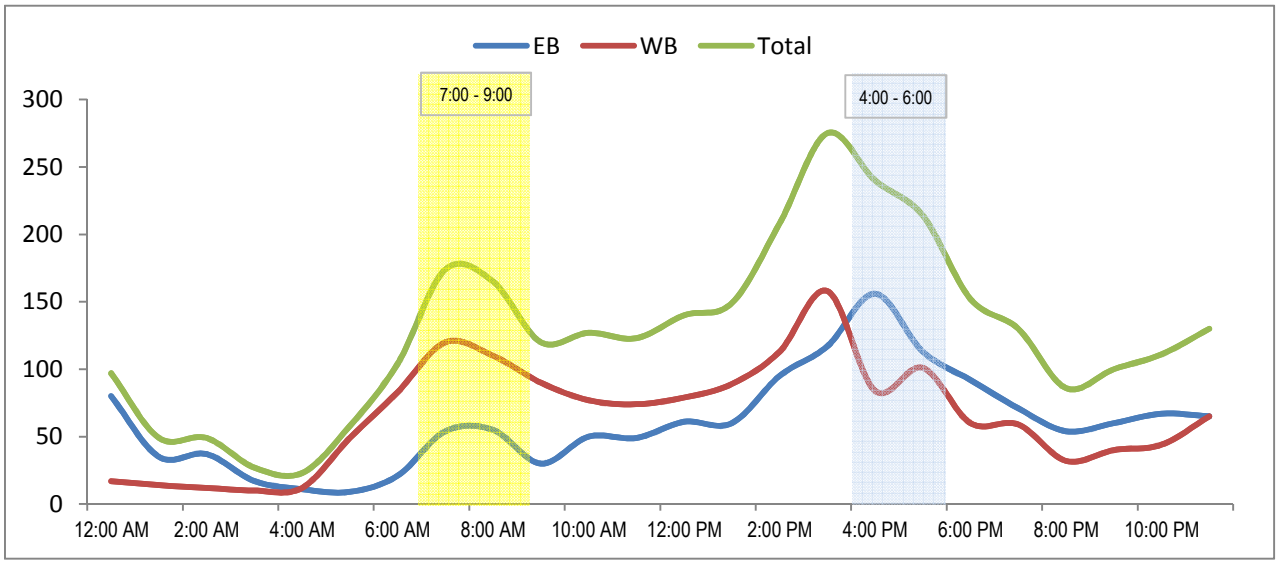
Analysts: *DASH*

Weather: *Sunny*

AVC Proj. No: *16-0487*

24 Hour Segment Volume				*3,051*			
Time	**Hourly Volume**			**Time**	**Hourly Volume**		
	EB	**WB**	**Total**		**EB**	**WB**	**Total**
12:00 AM - 1:00 AM	80	17	97	12:00 PM - 1:00 PM	61	79	140
1:00 AM - 2:00 AM	35	14	49	1:00 PM - 2:00 PM	60	89	149
2:00 AM - 3:00 AM	37	12	49	2:00 PM - 3:00 PM	95	113	208
3:00 AM - 4:00 AM	17	10	27	3:00 PM - 4:00 PM	117	158	275
4:00 AM - 5:00 AM	11	12	23	4:00 PM - 5:00 PM	156	84	240
5:00 AM - 6:00 AM	9	49	58	5:00 PM - 6:00 PM	113	101	214
6:00 AM - 7:00 AM	21	83	104	6:00 PM - 7:00 PM	92	60	152
7:00 AM - 8:00 AM	54	120	174	7:00 PM - 8:00 PM	71	59	130
8:00 AM - 9:00 AM	55	110	165	8:00 PM - 9:00 PM	54	32	86
9:00 AM - 10:00 AM	30	90	120	9:00 PM - 10:00 PM	60	40	100
10:00 AM - 11:00 AM	50	77	127	10:00 PM - 11:00 PM	67	44	111
11:00 AM - 12:00 PM	49	74	123	11:00 PM - 12:00 AM	65	65	130
Total	**448**	**668**	**1,116**	**Total**	**1,011**	**924**	**1,935**

24-Hour	*EB*	*Volume*	*1,459*	*24-Hour*	*WB*	*Volume*	*1,592*



Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

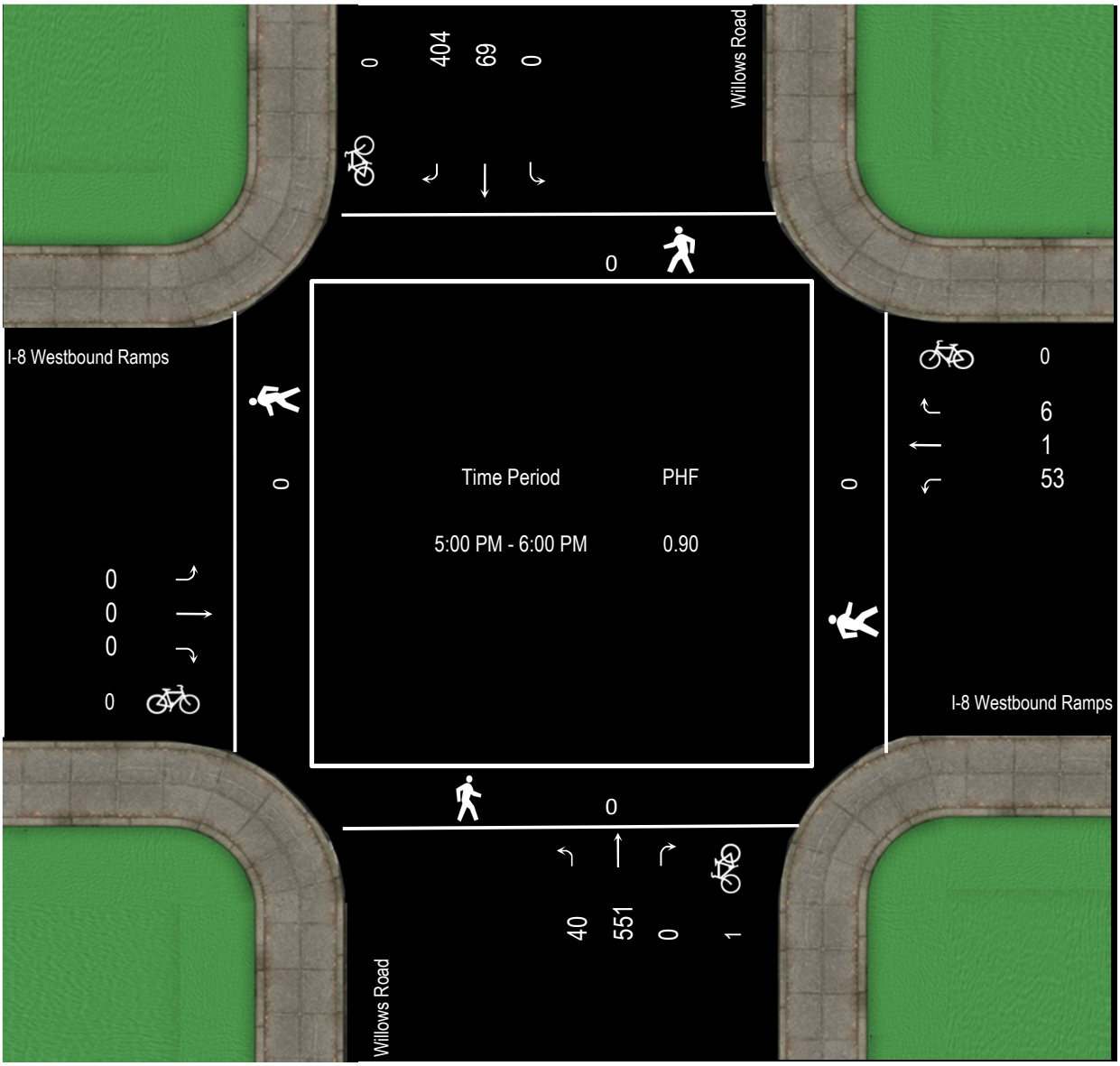
Location: I-8 Westbound Ramps @ Willows Road

Date of Count: *Saturday, February 27, 2016*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *16-0487*



LINSCOTT LAW & GREENSPAN engineers

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: I-8 Westbound Ramps @ Willows Road

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	101	19	0	0	0	15	0	107	17	0	0	0	259
4:15 PM	88	17	0	3	1	17	0	120	9	0	0	0	255
4:30 PM	92	21	0	0	0	17	0	136	7	0	0	0	273
4:45 PM	102	18	0	1	0	8	0	135	10	0	0	0	274
5:00 PM	103	21	0	1	0	14	0	125	7	0	0	0	271
5:15 PM	100	17	0	1	1	13	0	119	8	0	0	0	259
5:30 PM	113	18	0	2	0	13	0	148	19	0	0	0	313
5:45 PM	88	13	0	2	0	13	0	159	6	0	0	0	281
Total	787	144	0	10	2	110	0	1,049	83	0	0	0	2,185

PM Intersection Peak Hour : **5:00 PM - 6:00 PM**

Intersection PHF : **0.90**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	404	69	0	6	1	53	0	551	40	0	0	0	1124
PHF	0.89	0.821	#####	0.75	0.25	0.946	#####	0.866	0.526	#####	#####	#####	0.90
Movement PHF		0.90			1.00			0.88			#DIV/0!		0.90

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

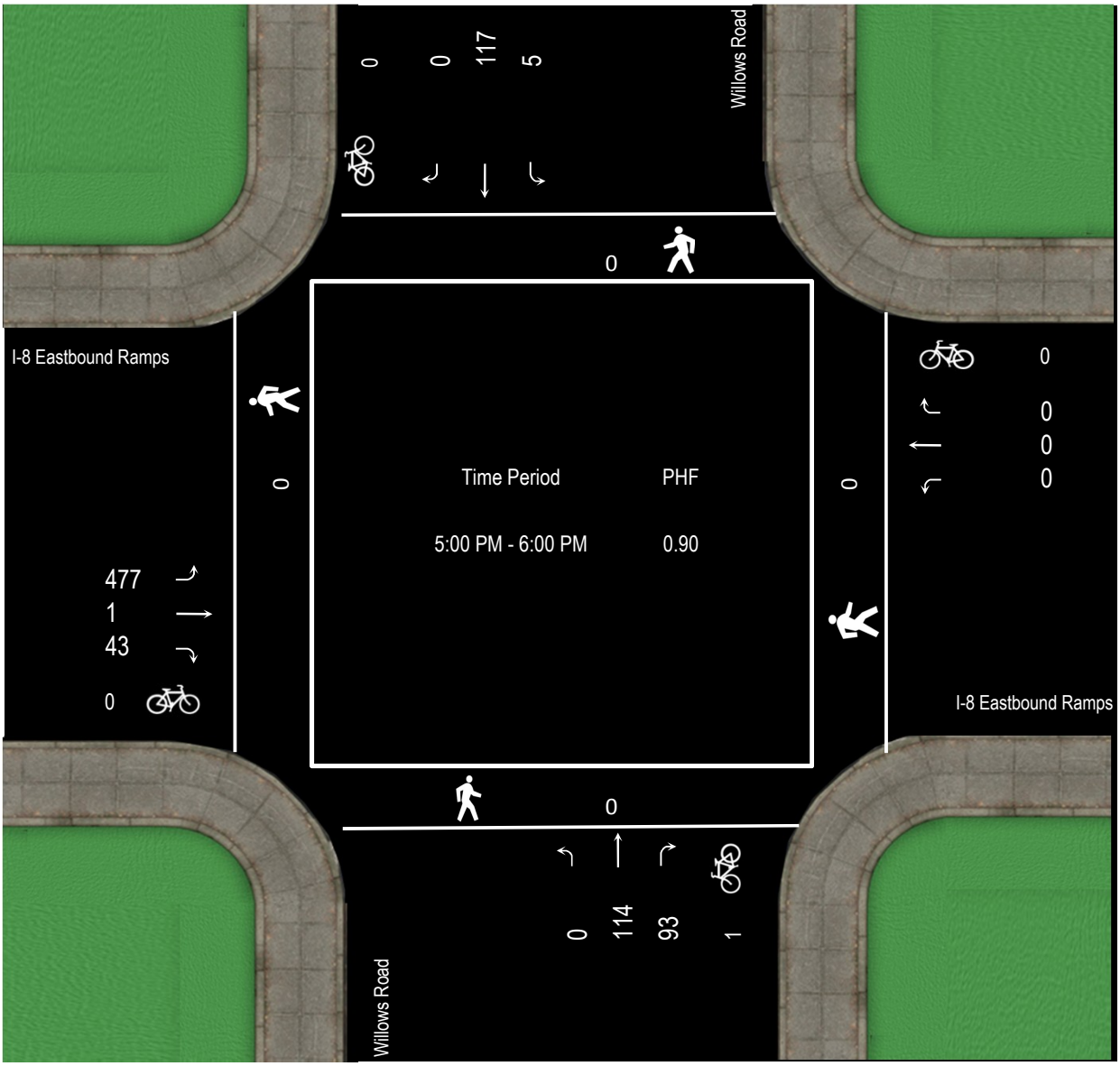
Location: I-8 Eastbound Ramps @ Willows Road

Date of Count: *Saturday, February 27, 2016*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *16-0487*



LINSCOTT LAW & GREENSPAN engineers

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: I-8 Eastbound Ramps @ Willows Road

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	0	32	2	0	0	0	35	34	0	15	1	90	209
4:15 PM	0	32	2	0	0	0	21	29	0	9	0	100	193
4:30 PM	0	37	1	0	0	0	28	29	0	14	1	114	224
4:45 PM	0	25	1	0	0	0	23	33	0	12	0	112	206
5:00 PM	0	33	2	0	0	0	22	26	0	14	0	106	203
5:15 PM	0	27	3	0	0	0	30	20	0	7	0	107	194
5:30 PM	0	31	0	0	0	0	26	34	0	11	1	133	236
5:45 PM	0	26	0	0	0	0	15	34	0	11	0	131	217
Total	0	243	11	0	0	0	200	239	0	93	3	893	1,682

PM Intersection Peak Hour : **5:00 PM - 6:00 PM**

Intersection PHF : **0.90**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	0	117	5	0	0	0	93	114	0	43	1	477	850
PHF	#####	0.886	0.417	#####	#####	#####	0.775	0.838	#####	0.768	0.25	0.897	0.90
Movement PHF		0.87			#DIV/0!			0.86			0.90		0.90

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

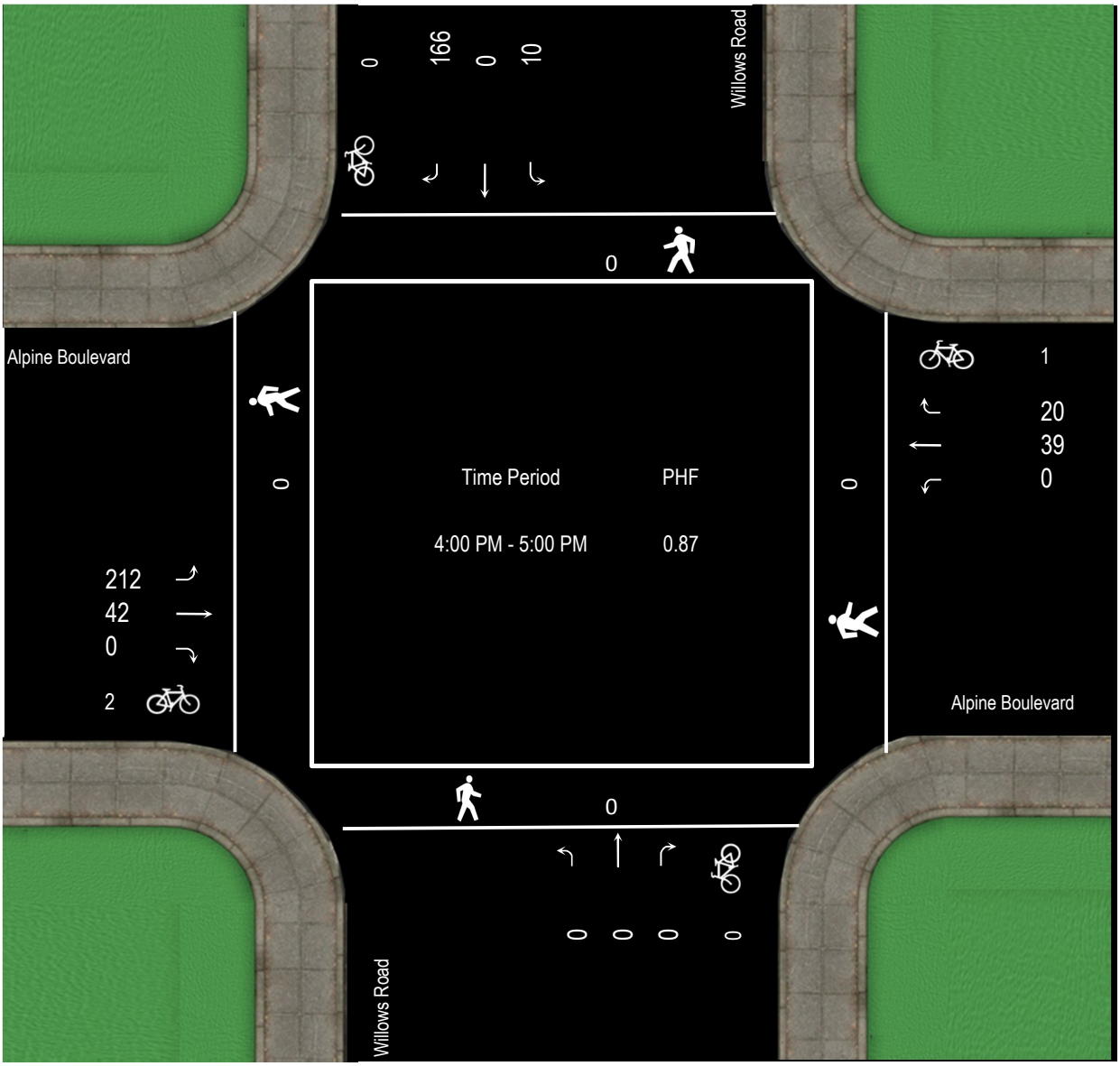
Location: Alpine Boulevard @ Willows Road

Date of Count: *Saturday, February 27, 2016*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *16-0487*



LINSCOTT LAW & GREENSPAN engineers

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Alpine Boulevard @ Willows Road

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	45	0	2	7	14	0	0	0	0	0	10	62	140
4:15 PM	38	0	3	4	11	0	0	0	0	0	9	46	111
4:30 PM	48	0	3	4	7	0	0	0	0	0	10	53	125
4:45 PM	35	0	2	5	7	0	0	0	0	0	13	51	113
5:00 PM	40	0	7	2	7	0	0	0	0	0	8	46	110
5:15 PM	31	0	3	1	7	0	0	0	0	0	0	49	91
5:30 PM	41	0	1	2	8	0	0	0	0	0	5	58	115
5:45 PM	36	0	1	3	3	0	0	0	0	0	11	46	100
Total	314	0	22	28	64	0	0	0	0	0	66	411	905

PM Intersection Peak Hour : **4:00 PM - 5:00 PM**

Intersection PHF : **0.87**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	166	0	10	20	39	0	0	0	0	0	42	212	489
PHF	0.86	#####	0.833	0.714	0.696	#####	#####	#####	#####	#####	0.808	0.855	0.87
Movement PHF	0.86			0.70			#DIV/0!			0.88			0.87

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

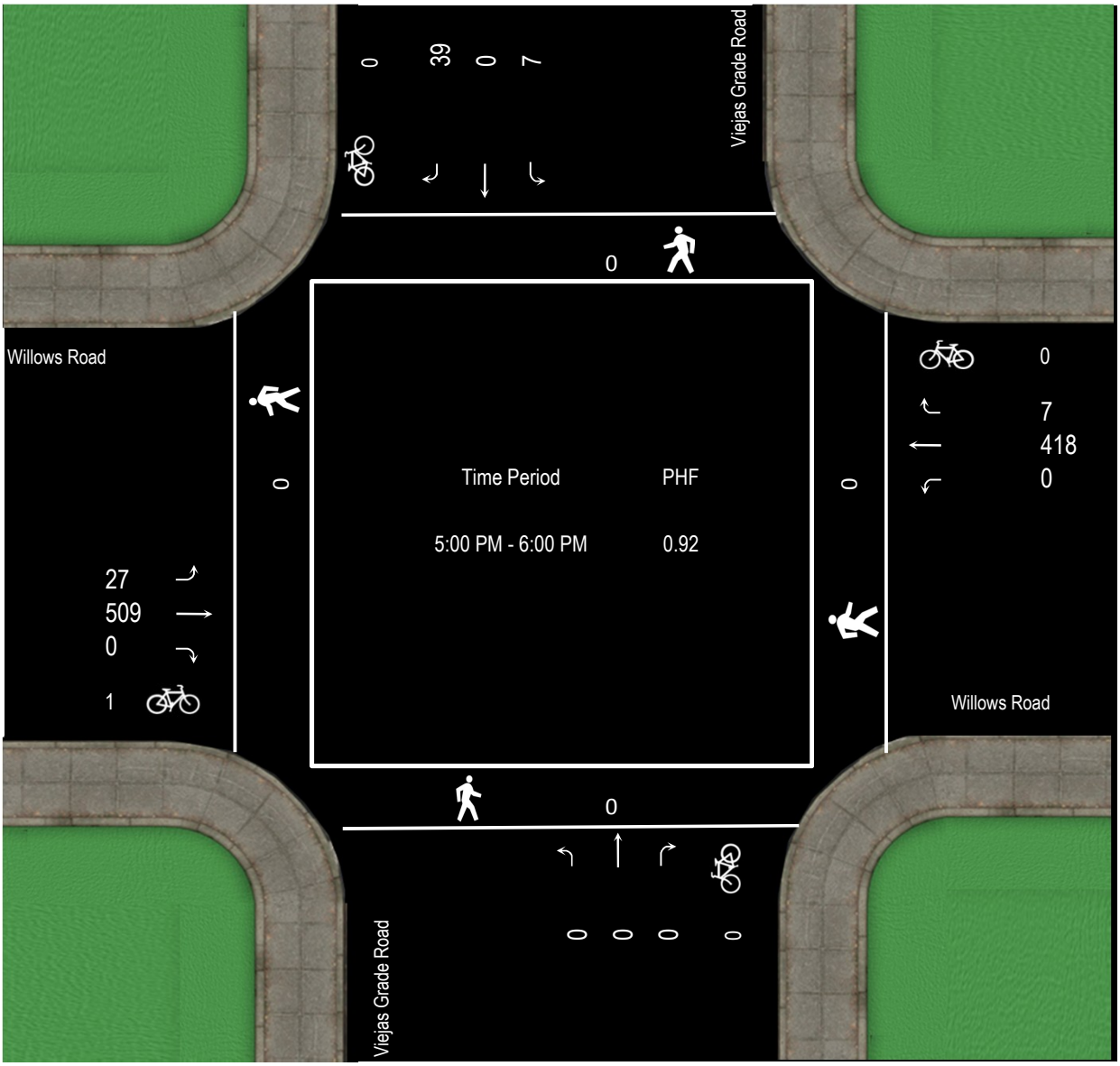
Location: Willows Road @ Viejas Grade Road

Date of Count: *Saturday, February 27, 2016*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *16-0487*



LINSCOTT LAW & GREENSPAN engineers

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Willows Road @ Viejas Grade Road

PM Period (4:00 PM - 6:00 PM)

	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	10	0	1	1	102	0	0	0	0	0	99	11	224
4:15 PM	3	0	1	4	104	0	0	0	0	0	110	5	227
4:30 PM	12	0	0	0	97	0	0	0	0	0	113	9	231
4:45 PM	9	0	0	1	98	0	0	0	0	0	119	11	238
5:00 PM	17	0	2	2	116	0	0	0	0	0	109	9	255
5:15 PM	5	0	2	3	95	0	0	0	0	0	112	5	222
5:30 PM	8	0	2	1	117	0	0	0	0	0	140	7	275
5:45 PM	9	0	1	1	90	0	0	0	0	0	148	6	255
Total	73	0	9	13	819	0	0	0	0	0	950	63	1,927

PM Intersection Peak Hour : **5:00 PM - 6:00 PM**

Intersection PHF : **0.92**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	39	0	7	7	418	0	0	0	0	0	509	27	1007
PHF	0.57	#####	0.875	0.583	0.893	#####	#####	#####	#####	#####	0.86	0.75	0.92
Movement PHF		0.61			0.90			#DIV/0!			0.87		0.92

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

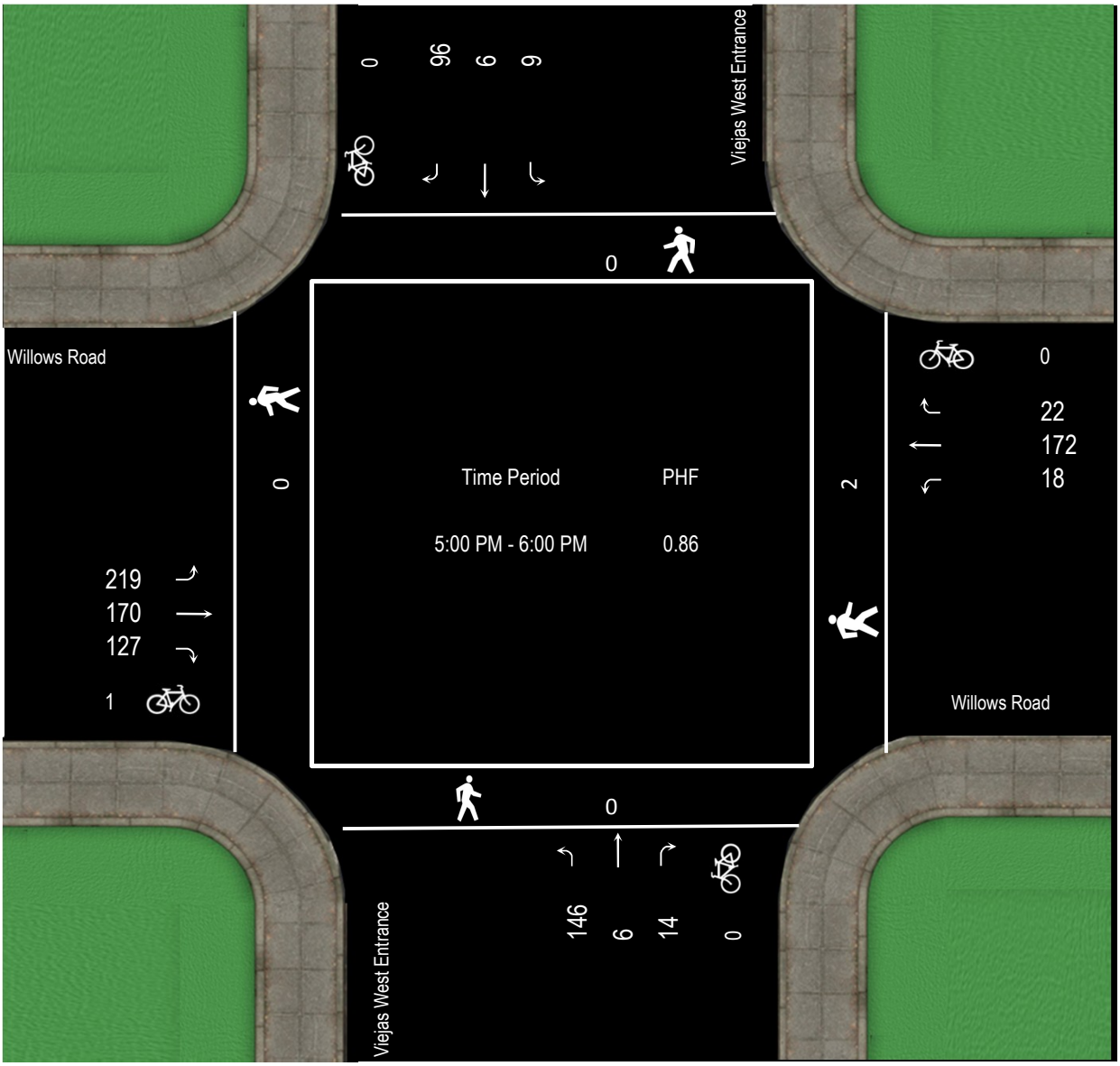
Location: Willows Road @ Viejas West Entrance

Date of Count: *Saturday, February 27, 2016*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *16-0487*



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Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Willows Road @ Viejas West Entrance

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	20	1	0	2	38	7	3	1	39	29	34	37	211
4:15 PM	32	1	2	1	49	6	4	1	24	41	27	42	230
4:30 PM	21	1	2	2	44	6	1	4	28	35	35	42	221
4:45 PM	24	1	0	5	41	8	3	2	31	43	40	35	233
5:00 PM	29	1	0	4	44	4	1	2	37	32	37	46	237
5:15 PM	25	2	6	8	38	4	3	1	36	22	36	50	231
5:30 PM	22	1	3	6	55	9	8	2	42	41	42	60	291
5:45 PM	20	2	0	4	35	1	2	1	31	32	55	63	246
Total	193	10	13	32	344	45	25	14	268	275	306	375	1,900

PM Intersection Peak Hour : **5:00 PM - 6:00 PM**

Intersection PHF : **0.86**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	96	6	9	22	172	18	14	6	146	127	170	219	1005
PHF	0.83	0.75	0.375	0.688	0.782	0.5	0.438	0.75	0.869	0.774	0.773	0.869	0.86
Movement PHF		0.84			0.76			0.80			0.86		0.86

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

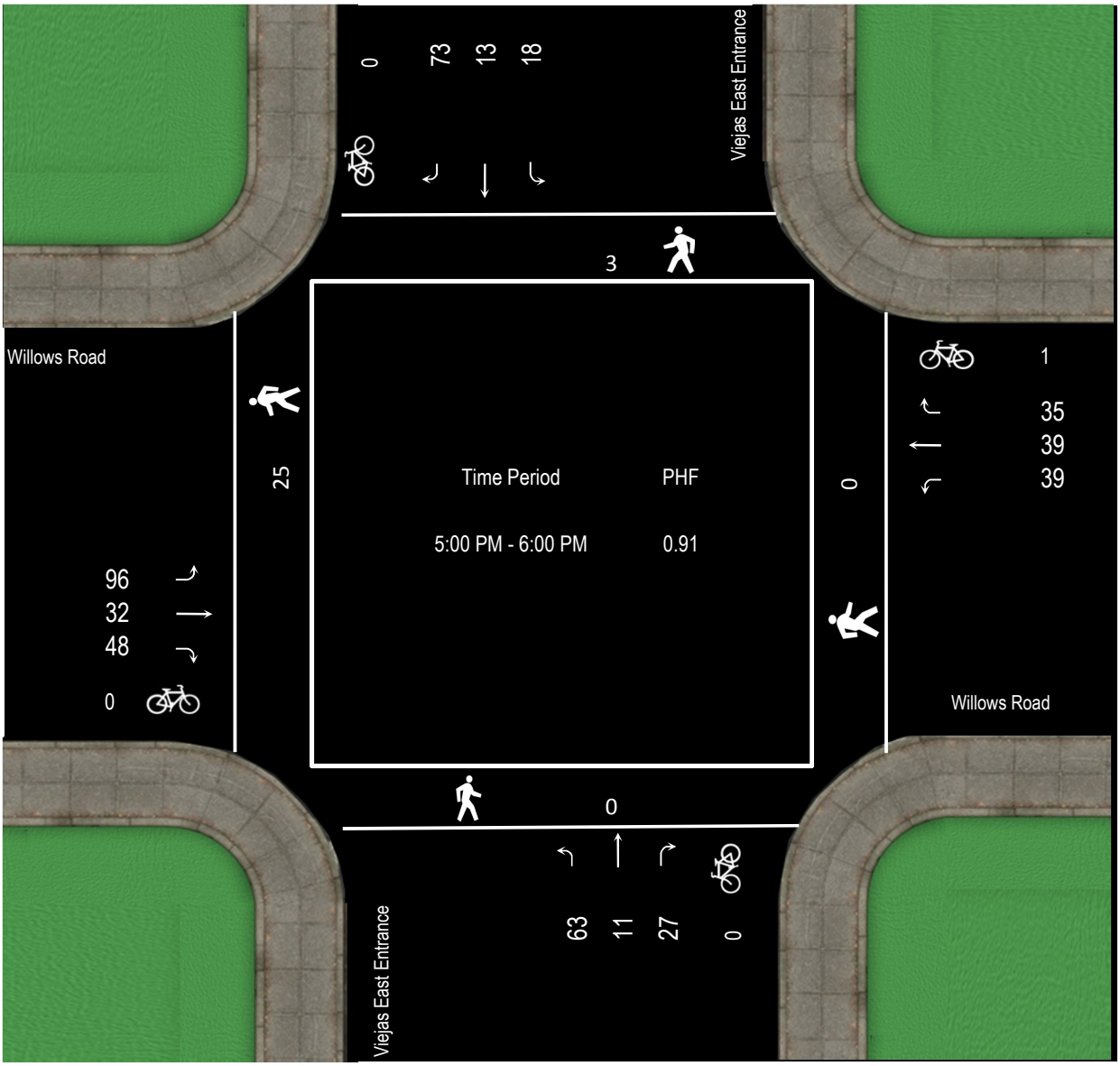
Location: Willows Road @ Viejas East Entrance

Date of Count: *Saturday, February 27, 2016*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *16-0487*



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Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Willows Road @ Viejas East Entrance

PM Period (4:00 PM - 6:00 PM)

	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	9	3	9	7	13	7	26	1	19	9	11	14	128
4:15 PM	16	4	2	9	11	9	10	0	25	6	7	12	111
4:30 PM	12	2	3	4	7	9	15	4	23	3	5	20	107
4:45 PM	12	4	2	8	14	7	12	1	18	8	6	20	112
5:00 PM	14	0	2	9	9	10	11	2	16	11	3	20	107
5:15 PM	20	3	7	11	12	9	6	3	15	14	11	19	130
5:30 PM	22	3	5	10	7	14	6	1	18	10	11	29	136
5:45 PM	17	7	4	5	11	6	4	5	14	13	7	28	121
Total	122	26	34	63	84	71	90	17	148	74	61	162	952

PM Intersection Peak Hour : **5:00 PM - 6:00 PM**

Intersection PHF : **0.91**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	73	13	18	35	39	39	27	11	63	48	32	96	494
PHF	0.83	0.464	0.643	0.795	0.813	0.696	0.614	0.55	0.875	0.857	0.727	0.828	0.91
Movement PHF		0.87			0.88			0.87			0.88		0.91

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

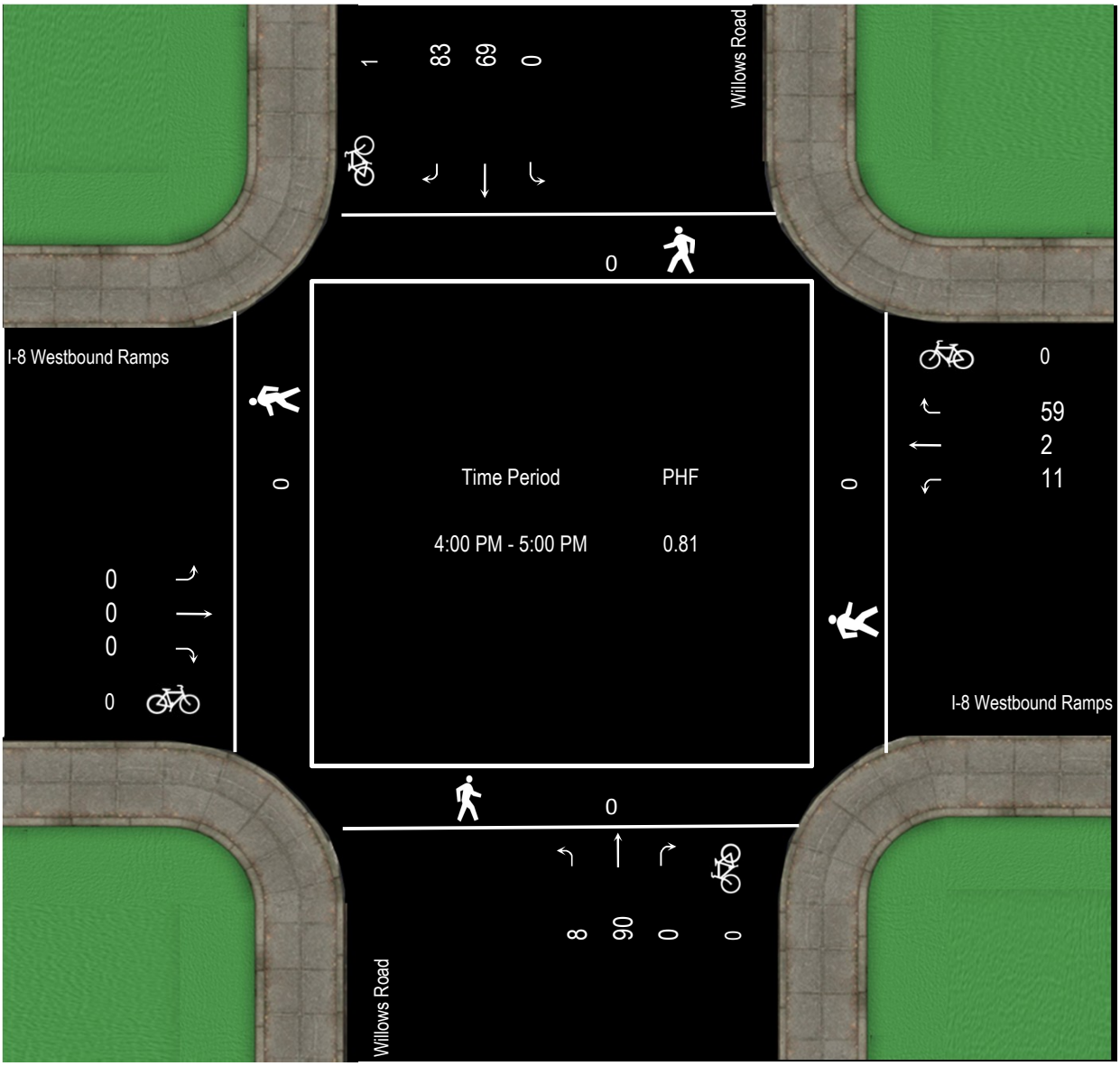
Location: I-8 Westbound Ramps @ Willows Road

Date of Count: *Saturday, February 27, 2016*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *16-0487*



LINSCOTT LAW & GREENSPAN engineers

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: I-8 Westbound Ramps @ Willows Road

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	33	24	0	13	1	2	0	24	2	0	0	0	99
4:15 PM	22	19	0	15	0	4	0	23	4	0	0	0	87
4:30 PM	15	15	0	14	0	2	0	25	1	0	0	0	72
4:45 PM	13	11	0	17	1	3	0	18	1	0	0	0	64
5:00 PM	17	7	0	13	0	6	0	19	3	0	0	0	65
5:15 PM	23	10	0	9	1	3	0	23	1	0	0	0	70
5:30 PM	11	7	0	15	0	4	0	30	1	0	0	0	68
5:45 PM	10	8	0	11	0	1	0	11	1	0	0	0	42
Total	144	101	0	107	3	25	0	173	14	0	0	0	567

PM Intersection Peak Hour : **4:00 PM - 5:00 PM**

Intersection PHF : **0.81**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	83	69	0	59	2	11	0	90	8	0	0	0	322
PHF	0.63	0.719	#####	0.868	0.5	0.688	#####	0.9	0.5	#####	#####	#####	0.81
Movement PHF		0.67			0.86			0.91			#DIV/0!		0.81

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

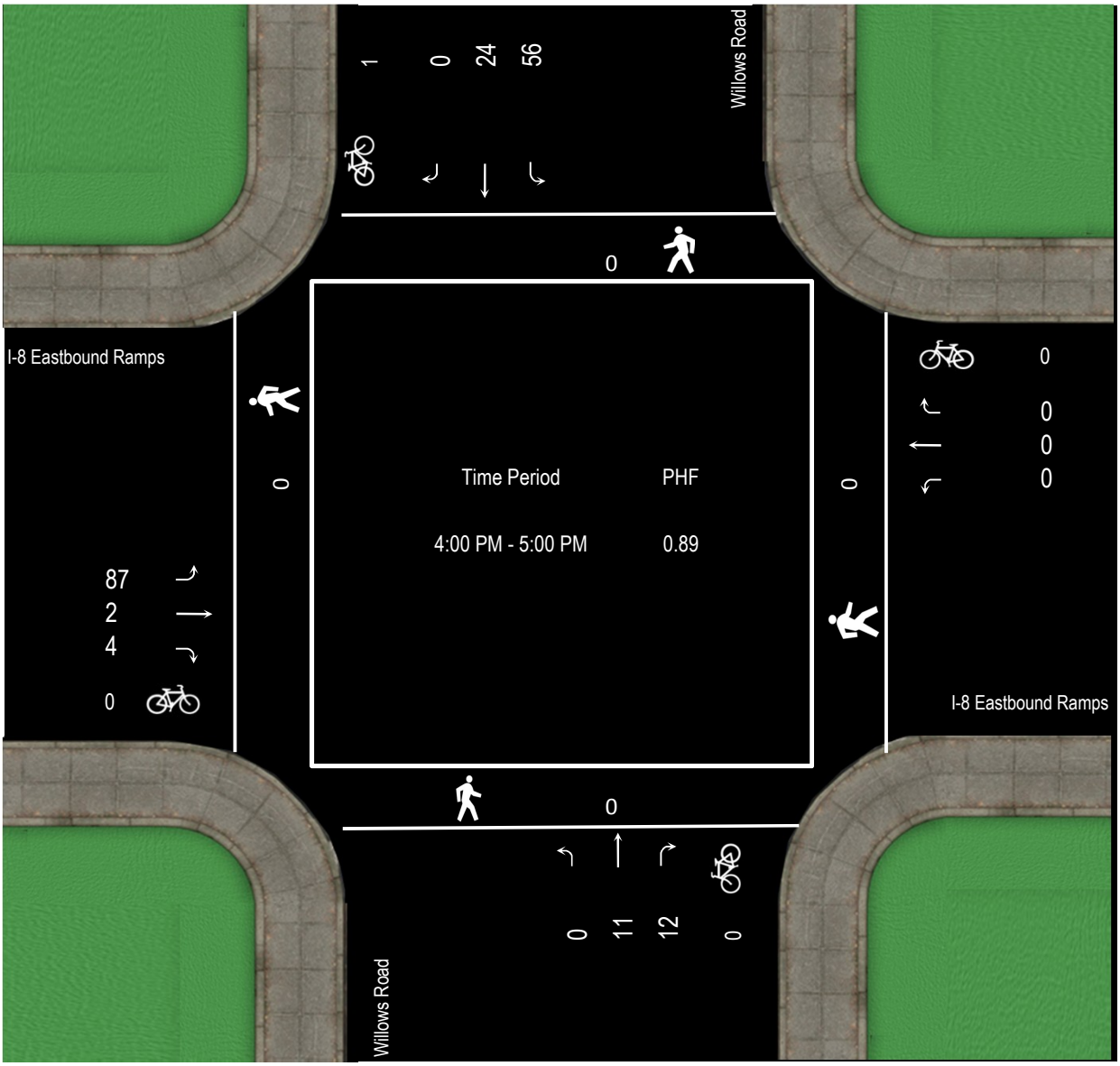
Location: I-8 Eastbound Ramps @ Willows Road

Date of Count: *Saturday, February 27, 2016*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *16-0487*



LINSCOTT LAW & GREENSPAN engineers

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: I-8 Eastbound Ramps @ Willows Road

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	0	10	16	0	0	0	3	1	0	0	0	25	55
4:15 PM	0	7	16	0	0	0	2	2	0	2	0	25	54
4:30 PM	0	3	14	0	0	0	2	4	0	1	1	22	47
4:45 PM	0	4	10	0	0	0	5	4	0	1	1	15	40
5:00 PM	0	6	7	0	0	0	1	4	0	0	0	18	36
5:15 PM	0	4	9	0	0	0	0	0	0	0	1	24	38
5:30 PM	0	4	7	0	0	0	3	3	0	1	1	28	47
5:45 PM	0	2	7	0	0	0	1	0	0	0	1	12	23
Total	0	40	86	0	0	0	17	18	0	5	5	169	340

PM Intersection Peak Hour : **4:00 PM - 5:00 PM**

Intersection PHF : **0.89**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	0	24	56	0	0	0	12	11	0	4	2	87	196
PHF	#####	0.6	0.875	#####	#####	#####	0.6	0.688	#####	0.5	0.5	0.87	0.89
Movement PHF		0.77			#DIV/0!			0.64			0.86		0.89

LINSCOTT LAW & GREENSPAN engineers

24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

AVC

Location: 1. Willow Road: West of Viejas Grade Road

Orientation: *East-West*

Date of Count: *Saturday, February 27, 2016*

Analysts: *DASH*

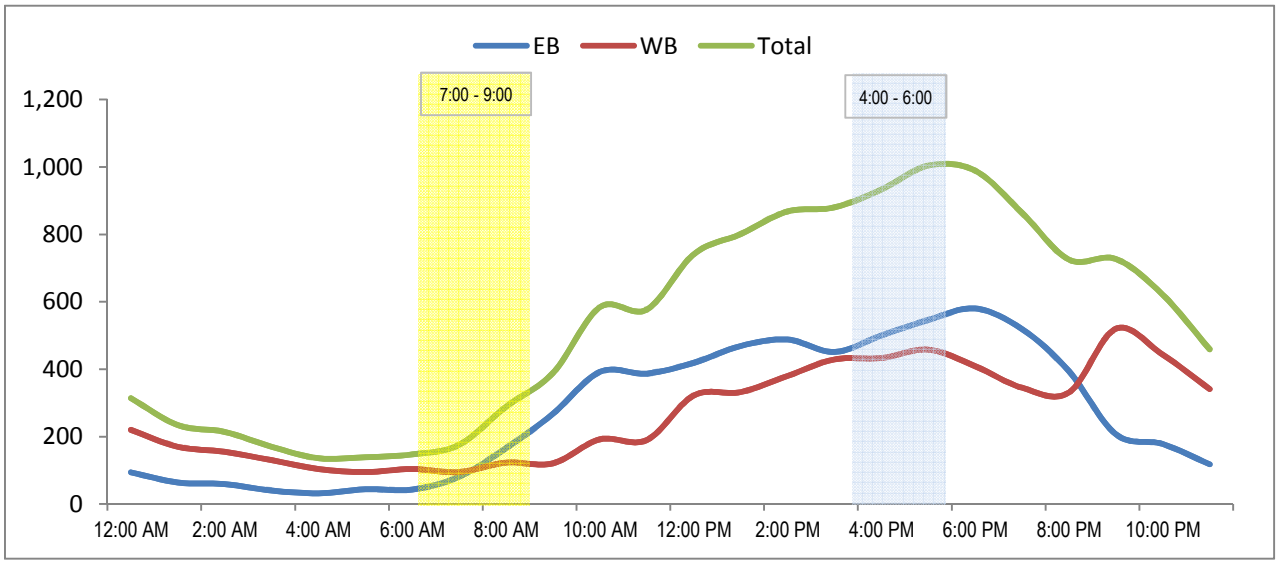
Weather: *Sunny*

AVC Proj. No: *16-0487*

24 Hour Segment Volume ***12,981***

Time	Hourly Volume			Time	Hourly Volume		
	EB	WB	Total		EB	WB	Total
12:00 AM - 1:00 AM	94	220	314	12:00 PM - 1:00 PM	419	322	741
1:00 AM - 2:00 AM	64	170	234	1:00 PM - 2:00 PM	469	332	801
2:00 AM - 3:00 AM	59	155	214	2:00 PM - 3:00 PM	488	380	868
3:00 AM - 4:00 AM	40	130	170	3:00 PM - 4:00 PM	451	429	880
4:00 AM - 5:00 AM	32	104	136	4:00 PM - 5:00 PM	500	433	933
5:00 AM - 6:00 AM	44	95	139	5:00 PM - 6:00 PM	546	458	1,004
6:00 AM - 7:00 AM	43	104	147	6:00 PM - 7:00 PM	580	409	989
7:00 AM - 8:00 AM	81	95	176	7:00 PM - 8:00 PM	519	345	864
8:00 AM - 9:00 AM	166	123	289	8:00 PM - 9:00 PM	394	331	725
9:00 AM - 10:00 AM	268	121	389	9:00 PM - 10:00 PM	207	520	727
10:00 AM - 11:00 AM	392	192	584	10:00 PM - 11:00 PM	178	443	621
11:00 AM - 12:00 PM	387	190	577	11:00 PM - 12:00 AM	118	341	459
Total	**1,670**	**1,699**	**3,369**	**Total**	**4,869**	**4,743**	**9,612**

24-Hour EB Volume 6,539 ***24-Hour WB Volume 6,442***



LINSCOTT LAW & GREENSPAN engineers

24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

AVC

Location: 2. Willows Rd, East of Viejas East Entrance

Orientation: *East-West*

Date of Count: *Saturday, February 27, 2016*

Analysts: *DASH*

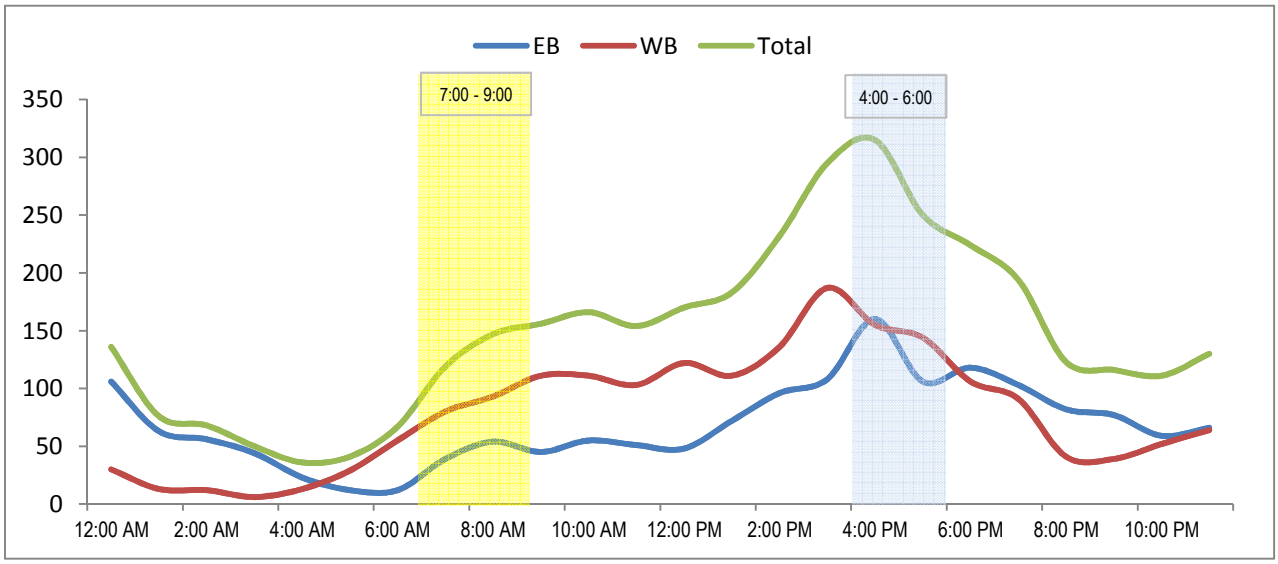
Weather: *Sunny*

AVC Proj. No: *16-0487*

24 Hour Segment Volume ***3,559***

Time	Hourly Volume			Time	Hourly Volume		
	EB	WB	Total		EB	WB	Total
12:00 AM - 1:00 AM	106	30	136	12:00 PM - 1:00 PM	48	122	170
1:00 AM - 2:00 AM	63	13	76	1:00 PM - 2:00 PM	72	111	183
2:00 AM - 3:00 AM	56	12	68	2:00 PM - 3:00 PM	96	136	232
3:00 AM - 4:00 AM	44	6	50	3:00 PM - 4:00 PM	108	187	295
4:00 AM - 5:00 AM	23	13	36	4:00 PM - 5:00 PM	160	155	315
5:00 AM - 6:00 AM	12	29	41	5:00 PM - 6:00 PM	106	144	250
6:00 AM - 7:00 AM	12	55	67	6:00 PM - 7:00 PM	118	106	224
7:00 AM - 8:00 AM	39	80	119	7:00 PM - 8:00 PM	103	91	194
8:00 AM - 9:00 AM	54	93	147	8:00 PM - 9:00 PM	82	41	123
9:00 AM - 10:00 AM	45	111	156	9:00 PM - 10:00 PM	77	39	116
10:00 AM - 11:00 AM	55	111	166	10:00 PM - 11:00 PM	59	52	111
11:00 AM - 12:00 PM	51	103	154	11:00 PM - 12:00 AM	66	64	130
Total	**560**	**656**	**1,216**	**Total**	**1,095**	**1,248**	**2,343**

24-Hour EB Volume 1,655 ***24-Hour WB Volume 1,904***



APPENDIX B

PEAK HOUR INTERSECTION ANALYSIS WORKSHEETS – EXISTING

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	48	0	10	42	291	0	0	110	275
Future Vol, veh/h	0	0	0	48	0	10	42	291	0	0	110	275
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	52	0	11	46	316	0	0	120	299

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	677	826	316	418	0	0	316	0	0
Stage 1	408	408	-	-	-	-	-	-	-
Stage 2	269	418	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	418	307	724	1141	-	-	1244	-	-
Stage 1	671	597	-	-	-	-	-	-	-
Stage 2	776	591	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	398	0	724	1141	-	-	1244	-	-
Mov Cap-2 Maneuver	398	0	-	-	-	-	-	-	-
Stage 1	638	0	-	-	-	-	-	-	-
Stage 2	776	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.5	1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1141	-	-	398	724	1244	-	-
HCM Lane V/C Ratio	0.04	-	-	0.131	0.015	-	-	-
HCM Control Delay (s)	8.3	0	-	15.4	10	0	-	-
HCM Lane LOS	A	A	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	0	0	-	-

Intersection	
Int Delay, s/veh	5.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	223	0	84	0	0	0	0	137	126	7	141	0
Future Vol, veh/h	223	0	84	0	0	0	0	137	126	7	141	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	242	0	91	0	0	0	0	149	137	8	153	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	385	454	153	153	0	0	286	0	0
Stage 1	168	168	-	-	-	-	-	-	-
Stage 2	217	286	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	618	502	893	1428	-	-	1276	-	-
Stage 1	862	759	-	-	-	-	-	-	-
Stage 2	819	675	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	614	0	893	1428	-	-	1276	-	-
Mov Cap-2 Maneuver	614	0	-	-	-	-	-	-	-
Stage 1	856	0	-	-	-	-	-	-	-
Stage 2	819	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.2	0	0.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	SBL	SBT	SBR
Capacity (veh/h)	1428	-	-	614	893	1276	-	-
HCM Lane V/C Ratio	-	-	-	0.395	0.102	0.006	-	-
HCM Control Delay (s)	0	-	-	14.6	9.5	7.8	0	-
HCM Lane LOS	A	-	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	1.9	0.3	0	-	-

Intersection	
Int Delay, s/veh	1.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	32	15	248	31	26	199
Future Vol, veh/h	32	15	248	31	26	199
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	35	16	270	34	28	216

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	559	286	0	0	303	0
Stage 1	286	-	-	-	-	-
Stage 2	273	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	490	753	-	-	1258	-
Stage 1	763	-	-	-	-	-
Stage 2	773	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	478	753	-	-	1258	-
Mov Cap-2 Maneuver	478	-	-	-	-	-
Stage 1	763	-	-	-	-	-
Stage 2	754	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.3	0	0.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	541	1258	-
HCM Lane V/C Ratio	-	-	0.094	0.022	-
HCM Control Delay (s)	-	-	12.3	7.9	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	36	238	262	4	4	65
Future Vol, veh/h	36	238	262	4	4	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	90	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	39	259	285	4	4	71

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	289	0	-	0	624	287
Stage 1	-	-	-	-	287	-
Stage 2	-	-	-	-	337	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1273	-	-	-	449	752
Stage 1	-	-	-	-	762	-
Stage 2	-	-	-	-	723	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1273	-	-	-	435	752
Mov Cap-2 Maneuver	-	-	-	-	435	-
Stage 1	-	-	-	-	762	-
Stage 2	-	-	-	-	701	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	10.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1273	-	-	-	722
HCM Lane V/C Ratio	0.031	-	-	-	0.104
HCM Control Delay (s)	7.9	-	-	-	10.6
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

Intersection	
Intersection Delay, s/veh	9.1
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	96	92	48	0	10	109	13	0	75	4	7
Future Vol, veh/h	0	96	92	48	0	10	109	13	0	75	4	7
Peak Hour Factor	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	101	97	51	0	11	115	14	0	79	4	7
Number of Lanes	0	1	2	0	0	1	1	1	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	3	3	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	2	3
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	2	3
HCM Control Delay	9	9.4	9.8
HCM LOS	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	100%	0%	0%	62%	0%
Vol Thru, %	0%	36%	0%	100%	39%	0%	100%	0%	38%	0%
Vol Right, %	0%	64%	0%	0%	61%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	75	11	96	61	79	10	109	13	8	79
LT Vol	75	0	96	0	0	10	0	0	5	0
Through Vol	0	4	0	61	31	0	109	0	3	0
RT Vol	0	7	0	0	48	0	0	13	0	79
Lane Flow Rate	79	12	101	65	83	11	115	14	8	83
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.137	0.017	0.165	0.097	0.114	0.018	0.178	0.019	0.014	0.117
Departure Headway (Hd)	6.237	5.292	5.886	5.383	4.954	6.093	5.59	4.886	6.087	5.074
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	571	670	606	661	718	584	637	726	584	699
Service Time	4.019	3.073	3.655	3.152	2.723	3.87	3.367	2.663	3.866	2.854
HCM Lane V/C Ratio	0.138	0.018	0.167	0.098	0.116	0.019	0.181	0.019	0.014	0.119
HCM Control Delay	10	8.2	9.8	8.7	8.4	9	9.6	7.8	9	8.5
HCM Lane LOS	A	A	A	A	A	A	A	A	A	A
HCM 95th-tile Q	0.5	0.1	0.6	0.3	0.4	0.1	0.6	0.1	0	0.4

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	5	3	79
Future Vol, veh/h	0	5	3	79
Peak Hour Factor	0.92	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	5	3	83
Number of Lanes	0	0	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	3
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	8.5
HCM LOS	A

Lane

Intersection	
Intersection Delay, s/veh	8.3
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	22	7	45	0	16	9	33	0	18	35	13	0	44	42	19
Future Vol, veh/h	0	22	7	45	0	16	9	33	0	18	35	13	0	44	42	19
Peak Hour Factor	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	23	7	47	0	17	9	35	0	19	37	14	0	46	44	20
Number of Lanes	0	1	1	1	0	1	2	0	0	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	3	3
HCM Control Delay	7.9	7.9	8.2	8.8
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	34%	0%	100%	0%	0%	100%	0%	0%	42%
Vol Thru, %	66%	0%	0%	100%	0%	0%	100%	8%	40%
Vol Right, %	0%	100%	0%	0%	100%	0%	0%	92%	18%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	53	13	22	7	45	16	6	36	105
LT Vol	18	0	22	0	0	16	0	0	44
Through Vol	35	0	0	7	0	0	6	3	42
RT Vol	0	13	0	0	45	0	0	33	19
Lane Flow Rate	56	14	23	7	47	17	6	38	111
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.082	0.017	0.037	0.011	0.059	0.027	0.009	0.048	0.157
Departure Headway (Hd)	5.292	4.422	5.69	5.187	4.483	5.719	5.217	4.571	5.115
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	678	810	631	691	800	627	687	783	702
Service Time	3.017	2.147	3.413	2.911	2.206	3.447	2.944	2.299	2.838
HCM Lane V/C Ratio	0.083	0.017	0.036	0.01	0.059	0.027	0.009	0.049	0.158
HCM Control Delay	8.5	7.2	8.6	8	7.5	8.6	8	7.5	8.8
HCM Lane LOS	A	A	A	A	A	A	A	A	A
HCM 95th-tile Q	0.3	0.1	0.1	0	0.2	0.1	0	0.2	0.6

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	7	4	27	4	55	0	0	64	68
Future Vol, veh/h	0	0	0	7	4	27	4	55	0	0	64	68
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	8	4	29	4	60	0	0	70	74

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	175	211	60	143	0	0	60	0	0
Stage 1	68	68	-	-	-	-	-	-	-
Stage 2	107	143	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	815	686	1005	1440	-	-	1544	-	-
Stage 1	955	838	-	-	-	-	-	-	-
Stage 2	917	779	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	813	0	1005	1440	-	-	1544	-	-
Mov Cap-2 Maneuver	813	0	-	-	-	-	-	-	-
Stage 1	952	0	-	-	-	-	-	-	-
Stage 2	917	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1440	-	-	813	1005	1544	-	-
HCM Lane V/C Ratio	0.003	-	-	0.009	0.034	-	-	-
HCM Control Delay (s)	7.5	0	-	9.5	8.7	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-

Intersection	
Int Delay, s/veh	6.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	44	2	12	0	0	0	0	10	15	55	17	0
Future Vol, veh/h	44	2	12	0	0	0	0	10	15	55	17	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	48	2	13	0	0	0	0	11	16	60	18	0

Major/Minor	Minor2						Major1			Major2		
Conflicting Flow All	157	165	18				18	0	0	27	0	0
Stage 1	138	138	-				-	-	-	-	-	-
Stage 2	19	27	-				-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22				4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-				-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318				2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	834	728	1061				1599	-	-	1587	-	-
Stage 1	889	782	-				-	-	-	-	-	-
Stage 2	1004	873	-				-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	802	0	1061				1599	-	-	1587	-	-
Mov Cap-2 Maneuver	802	0	-				-	-	-	-	-	-
Stage 1	855	0	-				-	-	-	-	-	-
Stage 2	1004	0	-				-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	0	5.6
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR
Capacity (veh/h)	1599	-	-	846	1587	-	-
HCM Lane V/C Ratio	-	-	-	0.075	0.038	-	-
HCM Control Delay (s)	0	-	-	9.6	7.4	0	-
HCM Lane LOS	A	-	-	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	-	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	53	1	6	40	551	0	0	69	404
Future Vol, veh/h	0	0	0	53	1	6	40	551	0	0	69	404
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	58	1	7	43	599	0	0	75	439

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	981	1200	599	514	0	0	599	0	0
Stage 1	686	686	-	-	-	-	-	-	-
Stage 2	295	514	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	277	185	502	1052	-	-	978	-	-
Stage 1	500	448	-	-	-	-	-	-	-
Stage 2	755	535	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	260	0	502	1052	-	-	978	-	-
Mov Cap-2 Maneuver	260	0	-	-	-	-	-	-	-
Stage 1	470	0	-	-	-	-	-	-	-
Stage 2	755	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	21.5	0.6	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1052	-	-	260	502	978	-	-
HCM Lane V/C Ratio	0.041	-	-	0.222	0.015	-	-	-
HCM Control Delay (s)	8.6	0	-	22.7	12.3	0	-	-
HCM Lane LOS	A	A	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.8	0	0	-	-

Intersection	
Int Delay, s/veh	14.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	477	1	43	0	0	0	0	114	93	5	117	0
Future Vol, veh/h	477	1	43	0	0	0	0	114	93	5	117	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	518	1	47	0	0	0	0	124	101	5	127	0

Major/Minor	Minor2						Major1			Major2		
Conflicting Flow All	312	363	127				127	0	0	225	0	0
Stage 1	138	138	-				-	-	-	-	-	-
Stage 2	174	225	-				-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22				4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-				-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318				2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	681	565	923				1459	-	-	1344	-	-
Stage 1	889	782	-				-	-	-	-	-	-
Stage 2	856	718	-				-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	678	0	923				1459	-	-	1344	-	-
Mov Cap-2 Maneuver	678	0	-				-	-	-	-	-	-
Stage 1	885	0	-				-	-	-	-	-	-
Stage 2	856	0	-				-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	24	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	SBL	SBT	SBR
Capacity (veh/h)	1459	-	-	678	923	1344	-	-
HCM Lane V/C Ratio	-	-	-	0.765	0.052	0.004	-	-
HCM Control Delay (s)	0	-	-	25.4	9.1	7.7	0	-
HCM Lane LOS	A	-	-	D	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	7.2	0.2	0	-	-

Intersection	
Int Delay, s/veh	1.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	39	20	212	42	10	166
Future Vol, veh/h	39	20	212	42	10	166
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	42	22	230	46	11	180

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	455	253	0	0	276	0
Stage 1	253	-	-	-	-	-
Stage 2	202	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	563	786	-	-	1287	-
Stage 1	789	-	-	-	-	-
Stage 2	832	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	558	786	-	-	1287	-
Mov Cap-2 Maneuver	558	-	-	-	-	-
Stage 1	789	-	-	-	-	-
Stage 2	825	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.5	0	0.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	619	1287	-
HCM Lane V/C Ratio	-	-	0.104	0.008	-
HCM Control Delay (s)	-	-	11.5	7.8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	27	509	418	7	7	39
Future Vol, veh/h	27	509	418	7	7	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	90	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	29	553	454	8	8	42

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	462	0	-	0	1070	458
Stage 1	-	-	-	-	458	-
Stage 2	-	-	-	-	612	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1099	-	-	-	245	603
Stage 1	-	-	-	-	637	-
Stage 2	-	-	-	-	541	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1099	-	-	-	239	603
Mov Cap-2 Maneuver	-	-	-	-	239	-
Stage 1	-	-	-	-	637	-
Stage 2	-	-	-	-	527	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	13.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1099	-	-	-	490
HCM Lane V/C Ratio	0.027	-	-	-	0.102
HCM Control Delay (s)	8.4	-	-	-	13.2
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

Intersection	
Intersection Delay, s/veh	12.5
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	219	170	127	0	18	172	22	0	146	6	14
Future Vol, veh/h	0	219	170	127	0	18	172	22	0	146	6	14
Peak Hour Factor	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	231	179	134	0	19	181	23	0	154	6	15
Number of Lanes	0	1	2	0	0	1	1	1	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	3	3	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	2	3
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	2	3
HCM Control Delay	12.6	12.6	13.4
HCM LOS	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	100%	0%	0%	60%	0%
Vol Thru, %	0%	30%	0%	100%	31%	0%	100%	0%	40%	0%
Vol Right, %	0%	70%	0%	0%	69%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	146	20	219	113	184	18	172	22	15	96
LT Vol	146	0	219	0	0	18	0	0	9	0
Through Vol	0	6	0	113	57	0	172	0	6	0
RT Vol	0	14	0	0	127	0	0	22	0	96
Lane Flow Rate	154	21	231	119	193	19	181	23	16	101
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.322	0.038	0.435	0.208	0.311	0.039	0.347	0.04	0.033	0.184
Departure Headway (Hd)	7.551	6.558	6.788	6.282	5.792	7.403	6.896	6.185	7.578	6.572
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	473	542	528	569	617	481	518	575	470	542
Service Time	5.336	4.342	4.555	4.049	3.558	5.185	4.677	3.966	5.369	4.363
HCM Lane V/C Ratio	0.326	0.039	0.438	0.209	0.313	0.04	0.349	0.04	0.034	0.186
HCM Control Delay	13.9	9.6	14.7	10.7	11.2	10.5	13.3	9.2	10.6	10.9
HCM Lane LOS	B	A	B	B	B	B	B	A	B	B
HCM 95th-tile Q	1.4	0.1	2.2	0.8	1.3	0.1	1.5	0.1	0.1	0.7

Intersection				
Intersection Delay, s/veh				
Intersection LOS				

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	9	6	96
Future Vol, veh/h	0	9	6	96
Peak Hour Factor	0.92	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	9	6	101
Number of Lanes	0	0	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	3
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	10.9
HCM LOS	B

Lane

Intersection																
Intersection Delay, s/veh	9															
Intersection LOS	A															

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	96	32	48	0	39	39	35	0	63	11	27	0	18	13	73
Future Vol, veh/h	0	96	32	48	0	39	39	35	0	63	11	27	0	18	13	73
Peak Hour Factor	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	101	34	51	0	41	41	37	0	66	12	28	0	19	14	77
Number of Lanes	0	1	1	1	0	1	2	0	0	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	3	3
HCM Control Delay	9.1	8.7	9.2	8.9
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	85%	0%	100%	0%	0%	100%	0%	0%	17%
Vol Thru, %	15%	0%	0%	100%	0%	0%	100%	27%	13%
Vol Right, %	0%	100%	0%	0%	100%	0%	0%	73%	70%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	74	27	96	32	48	39	26	48	104
LT Vol	63	0	96	0	0	39	0	0	18
Through Vol	11	0	0	32	0	0	26	13	13
RT Vol	0	27	0	0	48	0	0	35	73
Lane Flow Rate	78	28	101	34	51	41	27	51	109
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.13	0.039	0.167	0.051	0.066	0.069	0.042	0.071	0.158
Departure Headway (Hd)	6.005	4.88	5.936	5.433	4.728	6.076	5.572	5.058	5.186
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	594	728	601	655	752	586	638	703	687
Service Time	3.776	2.65	3.702	3.198	2.492	3.848	3.344	2.829	2.953
HCM Lane V/C Ratio	0.131	0.038	0.168	0.052	0.068	0.07	0.042	0.073	0.159
HCM Control Delay	9.7	7.9	9.9	8.5	7.8	9.3	8.6	8.2	8.9
HCM Lane LOS	A	A	A	A	A	A	A	A	A
HCM 95th-tile Q	0.4	0.1	0.6	0.2	0.2	0.2	0.1	0.2	0.6

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	11	2	59	8	90	0	0	69	83
Future Vol, veh/h	0	0	0	11	2	59	8	90	0	0	69	83
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	12	2	64	9	98	0	0	75	90

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	235	280	98	165	0	0	98	0	0
Stage 1	115	115	-	-	-	-	-	-	-
Stage 2	120	165	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	753	628	958	1413	-	-	1495	-	-
Stage 1	910	800	-	-	-	-	-	-	-
Stage 2	905	762	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	748	0	958	1413	-	-	1495	-	-
Mov Cap-2 Maneuver	748	0	-	-	-	-	-	-	-
Stage 1	904	0	-	-	-	-	-	-	-
Stage 2	905	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.1	0.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1413	-	-	748	958	1495	-	-
HCM Lane V/C Ratio	0.006	-	-	0.016	0.069	-	-	-
HCM Control Delay (s)	7.6	0	-	9.9	9	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.2	0	-	-

Intersection	
Int Delay, s/veh	6.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	87	2	4	0	0	0	0	11	12	56	24	0
Future Vol, veh/h	87	2	4	0	0	0	0	11	12	56	24	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	95	2	4	0	0	0	0	12	13	61	26	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	166	173	26	26	0	0	25	0	0
Stage 1	148	148	-	-	-	-	-	-	-
Stage 2	18	25	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	824	720	1050	1588	-	-	1589	-	-
Stage 1	880	775	-	-	-	-	-	-	-
Stage 2	1005	874	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	792	0	1050	1588	-	-	1589	-	-
Mov Cap-2 Maneuver	792	0	-	-	-	-	-	-	-
Stage 1	846	0	-	-	-	-	-	-	-
Stage 2	1005	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.1	0	5.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR
Capacity (veh/h)	1588	-	-	801	1589	-	-
HCM Lane V/C Ratio	-	-	-	0.126	0.038	-	-
HCM Control Delay (s)	0	-	-	10.1	7.4	0	-
HCM Lane LOS	A	-	-	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.1	-	-

APPENDIX C

PEAK HOUR INTERSECTION ANALYSIS WORKSHEETS – EXISTING + PROJECT

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	48	0	10	42	302	0	0	112	290
Future Vol, veh/h	0	0	0	48	0	10	42	302	0	0	112	290
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	52	0	11	46	328	0	0	122	315

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	699	857	328	437	0	0	328	0	0
Stage 1	420	420	-	-	-	-	-	-	-
Stage 2	279	437	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	406	295	713	1123	-	-	1232	-	-
Stage 1	663	589	-	-	-	-	-	-	-
Stage 2	768	579	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	386	0	713	1123	-	-	1232	-	-
Mov Cap-2 Maneuver	386	0	-	-	-	-	-	-	-
Stage 1	630	0	-	-	-	-	-	-	-
Stage 2	768	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.8	1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1123	-	-	386	713	1232	-	-
HCM Lane V/C Ratio	0.041	-	-	0.135	0.015	-	-	-
HCM Control Delay (s)	8.3	0	-	15.8	10.1	0	-	-
HCM Lane LOS	A	A	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.5	0	0	-	-

Intersection	
Int Delay, s/veh	5.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	233	0	84	0	0	0	0	138	126	7	143	0
Future Vol, veh/h	233	0	84	0	0	0	0	138	126	7	143	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	253	0	91	0	0	0	0	150	137	8	155	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	389	458	155	155	0	0	287	0	0
Stage 1	171	171	-	-	-	-	-	-	-
Stage 2	218	287	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	615	499	891	1425	-	-	1275	-	-
Stage 1	859	757	-	-	-	-	-	-	-
Stage 2	818	674	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	611	0	891	1425	-	-	1275	-	-
Mov Cap-2 Maneuver	611	0	-	-	-	-	-	-	-
Stage 1	853	0	-	-	-	-	-	-	-
Stage 2	818	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.5	0	0.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	SBL	SBT	SBR
Capacity (veh/h)	1425	-	-	611	891	1275	-	-
HCM Lane V/C Ratio	-	-	-	0.415	0.102	0.006	-	-
HCM Control Delay (s)	0	-	-	15	9.5	7.8	0	-
HCM Lane LOS	A	-	-	C	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	2	0.3	0	-	-

Intersection	
Int Delay, s/veh	1.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	32	15	249	31	26	201
Future Vol, veh/h	32	15	249	31	26	201
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	35	16	271	34	28	218

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	562	287	0	0	304	0
Stage 1	287	-	-	-	-	-
Stage 2	275	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	488	752	-	-	1257	-
Stage 1	762	-	-	-	-	-
Stage 2	771	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	476	752	-	-	1257	-
Mov Cap-2 Maneuver	476	-	-	-	-	-
Stage 1	762	-	-	-	-	-
Stage 2	752	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.4	0	0.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	539	1257	-
HCM Lane V/C Ratio	-	-	0.095	0.022	-
HCM Control Delay (s)	-	-	12.4	7.9	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	36	249	273	4	4	65
Future Vol, veh/h	36	249	273	4	4	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	90	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	39	271	297	4	4	71

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	301	0	-	0	648	299
Stage 1	-	-	-	-	299	-
Stage 2	-	-	-	-	349	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1260	-	-	-	435	741
Stage 1	-	-	-	-	752	-
Stage 2	-	-	-	-	714	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1260	-	-	-	422	741
Mov Cap-2 Maneuver	-	-	-	-	422	-
Stage 1	-	-	-	-	752	-
Stage 2	-	-	-	-	692	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	10.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1260	-	-	-	710
HCM Lane V/C Ratio	0.031	-	-	-	0.106
HCM Control Delay (s)	7.9	-	-	-	10.7
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

Intersection	
Intersection Delay, s/veh	9.4
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	107	92	48	0	10	109	16	0	75	4	7
Future Vol, veh/h	0	107	92	48	0	10	109	16	0	75	4	7
Peak Hour Factor	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	113	97	51	0	11	115	17	0	79	4	7
Number of Lanes	0	1	2	0	0	1	1	1	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	3	3	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	2	3
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	2	3
HCM Control Delay	9.3	9.5	10
HCM LOS	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	100%	0%	0%	75%	0%
Vol Thru, %	0%	36%	0%	100%	39%	0%	100%	0%	25%	0%
Vol Right, %	0%	64%	0%	0%	61%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	75	11	107	61	79	10	109	16	12	97
LT Vol	75	0	107	0	0	10	0	0	9	0
Through Vol	0	4	0	61	31	0	109	0	3	0
RT Vol	0	7	0	0	48	0	0	16	0	97
Lane Flow Rate	79	12	113	65	83	11	115	17	13	102
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.139	0.017	0.187	0.098	0.116	0.018	0.181	0.023	0.022	0.145
Departure Headway (Hd)	6.33	5.384	5.963	5.46	5.03	6.192	5.688	4.984	6.196	5.121
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	561	657	597	651	706	573	624	710	573	692
Service Time	4.127	3.181	3.743	3.24	2.81	3.983	3.479	2.774	3.985	2.91
HCM Lane V/C Ratio	0.141	0.018	0.189	0.1	0.118	0.019	0.184	0.024	0.023	0.147
HCM Control Delay	10.2	8.3	10.1	8.8	8.5	9.1	9.8	7.9	9.1	8.8
HCM Lane LOS	B	A	B	A	A	A	A	A	A	A
HCM 95th-tile Q	0.5	0.1	0.7	0.3	0.4	0.1	0.7	0.1	0.1	0.5

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	9	3	97
Future Vol, veh/h	0	9	3	97
Peak Hour Factor	0.92	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	9	3	102
Number of Lanes	0	0	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	3
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	8.8
HCM LOS	A

Lane

Intersection	
Intersection Delay, s/veh	8.3
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	22	10	45	0	16	12	33	0	18	35	13	0	44	42	19
Future Vol, veh/h	0	22	10	45	0	16	12	33	0	18	35	13	0	44	42	19
Peak Hour Factor	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	23	11	47	0	17	13	35	0	19	37	14	0	46	44	20
Number of Lanes	0	1	1	1	0	1	2	0	0	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	3	3
HCM Control Delay	7.9	7.9	8.2	8.8
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	34%	0%	100%	0%	0%	100%	0%	0%	42%
Vol Thru, %	66%	0%	0%	100%	0%	0%	100%	11%	40%
Vol Right, %	0%	100%	0%	0%	100%	0%	0%	89%	18%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	53	13	22	10	45	16	8	37	105
LT Vol	18	0	22	0	0	16	0	0	44
Through Vol	35	0	0	10	0	0	8	4	42
RT Vol	0	13	0	0	45	0	0	33	19
Lane Flow Rate	56	14	23	11	47	17	8	39	111
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.082	0.017	0.037	0.015	0.059	0.027	0.012	0.05	0.158
Departure Headway (Hd)	5.309	4.439	5.696	5.193	4.489	5.727	5.224	4.596	5.132
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	676	806	629	690	798	626	686	779	700
Service Time	3.035	2.165	3.423	2.92	2.216	3.455	2.952	2.324	2.855
HCM Lane V/C Ratio	0.083	0.017	0.037	0.016	0.059	0.027	0.012	0.05	0.159
HCM Control Delay	8.5	7.2	8.6	8	7.5	8.6	8	7.6	8.8
HCM Lane LOS	A	A	A	A	A	A	A	A	A
HCM 95th-tile Q	0.3	0.1	0.1	0	0.2	0.1	0	0.2	0.6

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	7	4	31	4	55	0	0	68	68
Future Vol, veh/h	0	0	0	7	4	31	4	55	0	0	68	68
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	8	4	34	4	60	0	0	74	74

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	179	216	60	148	0	0	60	0	0
Stage 1	68	68	-	-	-	-	-	-	-
Stage 2	111	148	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	811	682	1005	1434	-	-	1544	-	-
Stage 1	955	838	-	-	-	-	-	-	-
Stage 2	914	775	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	809	0	1005	1434	-	-	1544	-	-
Mov Cap-2 Maneuver	809	0	-	-	-	-	-	-	-
Stage 1	952	0	-	-	-	-	-	-	-
Stage 2	914	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1434	-	-	809	1005	1544	-	-
HCM Lane V/C Ratio	0.003	-	-	0.009	0.038	-	-	-
HCM Control Delay (s)	7.5	0	-	9.5	8.7	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-

Intersection	
Int Delay, s/veh	6.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	44	2	12	0	0	0	0	10	15	59	17	0
Future Vol, veh/h	44	2	12	0	0	0	0	10	15	59	17	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	48	2	13	0	0	0	0	11	16	64	18	0

Major/Minor	Minor2						Major1			Major2		
Conflicting Flow All	166	174	18				18	0	0	27	0	0
Stage 1	147	147	-				-	-	-	-	-	-
Stage 2	19	27	-				-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22				4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-				-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318				2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	824	719	1061				1599	-	-	1587	-	-
Stage 1	880	775	-				-	-	-	-	-	-
Stage 2	1004	873	-				-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	790	0	1061				1599	-	-	1587	-	-
Mov Cap-2 Maneuver	790	0	-				-	-	-	-	-	-
Stage 1	844	0	-				-	-	-	-	-	-
Stage 2	1004	0	-				-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.7	0	5.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR
Capacity (veh/h)	1599	-	-	836	1587	-	-
HCM Lane V/C Ratio	-	-	-	0.075	0.04	-	-
HCM Control Delay (s)	0	-	-	9.7	7.4	0	-
HCM Lane LOS	A	-	-	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	-	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	53	1	6	40	566	0	0	72	422
Future Vol, veh/h	0	0	0	53	1	6	40	566	0	0	72	422
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	58	1	7	43	615	0	0	78	459

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	1010	1239	615	537	0	0	615	0	0
Stage 1	702	702	-	-	-	-	-	-	-
Stage 2	308	537	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	266	175	491	1031	-	-	965	-	-
Stage 1	491	440	-	-	-	-	-	-	-
Stage 2	745	523	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	249	0	491	1031	-	-	965	-	-
Mov Cap-2 Maneuver	249	0	-	-	-	-	-	-	-
Stage 1	460	0	-	-	-	-	-	-	-
Stage 2	745	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	22.5	0.6	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1031	-	-	249	491	965	-	-
HCM Lane V/C Ratio	0.042	-	-	0.231	0.015	-	-	-
HCM Control Delay (s)	8.6	0	-	23.8	12.4	0	-	-
HCM Lane LOS	A	A	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.9	0	0	-	-

Intersection	
Int Delay, s/veh	16.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	490	1	43	0	0	0	0	116	93	5	120	0
Future Vol, veh/h	490	1	43	0	0	0	0	116	93	5	120	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	533	1	47	0	0	0	0	126	101	5	130	0

Major/Minor	Minor2						Major1			Major2		
Conflicting Flow All	318	368	130				130	0	0	227	0	0
Stage 1	141	141	-				-	-	-	-	-	-
Stage 2	177	227	-				-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22				4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-				-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318				2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	675	561	920				1455	-	-	1341	-	-
Stage 1	886	780	-				-	-	-	-	-	-
Stage 2	854	716	-				-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	672	0	920				1455	-	-	1341	-	-
Mov Cap-2 Maneuver	672	0	-				-	-	-	-	-	-
Stage 1	882	0	-				-	-	-	-	-	-
Stage 2	854	0	-				-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	26.1	0	0.3
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	SBL	SBT	SBR
Capacity (veh/h)	1455	-	-	672	920	1341	-	-
HCM Lane V/C Ratio	-	-	-	0.793	0.052	0.004	-	-
HCM Control Delay (s)	0	-	-	27.6	9.1	7.7	0	-
HCM Lane LOS	A	-	-	D	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	7.9	0.2	0	-	-

Intersection	
Int Delay, s/veh	1.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	39	20	214	42	10	169
Future Vol, veh/h	39	20	214	42	10	169
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	42	22	233	46	11	184

Major/Minor	Minor1				Major1		Major2	
Conflicting Flow All	460		255		0	0	278	0
Stage 1	255		-		-	-	-	-
Stage 2	205		-		-	-	-	-
Critical Hdwy	6.42		6.22		-	-	4.12	-
Critical Hdwy Stg 1	5.42		-		-	-	-	-
Critical Hdwy Stg 2	5.42		-		-	-	-	-
Follow-up Hdwy	3.518		3.318		-	-	2.218	-
Pot Cap-1 Maneuver	559		784		-	-	1285	-
Stage 1	788		-		-	-	-	-
Stage 2	829		-		-	-	-	-
Platoon blocked, %					-	-		-
Mov Cap-1 Maneuver	553		784		-	-	1285	-
Mov Cap-2 Maneuver	553		-		-	-	-	-
Stage 1	788		-		-	-	-	-
Stage 2	821		-		-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.5	0	0.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	614	1285	-
HCM Lane V/C Ratio	-	-	0.104	0.008	-
HCM Control Delay (s)	-	-	11.5	7.8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	27	524	433	7	7	39
Future Vol, veh/h	27	524	433	7	7	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	90	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	29	570	471	8	8	42

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	478	0	-	0	1102	474
Stage 1	-	-	-	-	474	-
Stage 2	-	-	-	-	628	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1084	-	-	-	234	590
Stage 1	-	-	-	-	626	-
Stage 2	-	-	-	-	532	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1084	-	-	-	228	590
Mov Cap-2 Maneuver	-	-	-	-	228	-
Stage 1	-	-	-	-	626	-
Stage 2	-	-	-	-	518	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	13.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1084	-	-	-	475
HCM Lane V/C Ratio	0.027	-	-	-	0.105
HCM Control Delay (s)	8.4	-	-	-	13.5
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

Intersection	
Intersection Delay, s/veh	13.1
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	234	170	127	0	18	172	26	0	146	6	14
Future Vol, veh/h	0	234	170	127	0	18	172	26	0	146	6	14
Peak Hour Factor	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	246	179	134	0	19	181	27	0	154	6	15
Number of Lanes	0	1	2	0	0	1	1	1	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	3	3	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	2	3
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	2	3
HCM Control Delay	13.3	13	13.8
HCM LOS	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	100%	0%	0%	70%	0%
Vol Thru, %	0%	30%	0%	100%	31%	0%	100%	0%	30%	0%
Vol Right, %	0%	70%	0%	0%	69%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	146	20	234	113	184	18	172	26	20	116
LT Vol	146	0	234	0	0	18	0	0	14	0
Through Vol	0	6	0	113	57	0	172	0	6	0
RT Vol	0	14	0	0	127	0	0	26	0	116
Lane Flow Rate	154	21	246	119	193	19	181	27	21	122
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.333	0.039	0.473	0.212	0.318	0.04	0.355	0.048	0.046	0.229
Departure Headway (Hd)	7.812	6.824	6.919	6.412	5.921	7.684	7.175	6.463	7.822	6.766
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	463	528	517	555	601	469	505	557	460	534
Service Time	5.518	4.524	4.716	4.208	3.717	5.384	4.875	4.163	5.529	4.472
HCM Lane V/C Ratio	0.333	0.04	0.476	0.214	0.321	0.041	0.358	0.048	0.046	0.228
HCM Control Delay	14.4	9.8	15.9	11	11.5	10.7	13.8	9.5	10.9	11.5
HCM Lane LOS	B	A	C	B	B	B	B	A	B	B
HCM 95th-tile Q	1.4	0.1	2.5	0.8	1.4	0.1	1.6	0.2	0.1	0.9

Intersection				
Intersection Delay, s/veh				
Intersection LOS				

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	14	6	116
Future Vol, veh/h	0	14	6	116
Peak Hour Factor	0.92	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	15	6	122
Number of Lanes	0	0	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	3
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	11.4
HCM LOS	B

Lane

Intersection	
Intersection Delay, s/veh	9
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	96	36	48	0	39	43	35	0	63	11	27	0	18	13	73
Future Vol, veh/h	0	96	36	48	0	39	43	35	0	63	11	27	0	18	13	73
Peak Hour Factor	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	101	38	51	0	41	45	37	0	66	12	28	0	19	14	77
Number of Lanes	0	1	1	1	0	1	2	0	0	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	3	3
HCM Control Delay	9.1	8.7	9.2	9
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	85%	0%	100%	0%	0%	100%	0%	0%	17%
Vol Thru, %	15%	0%	0%	100%	0%	0%	100%	29%	13%
Vol Right, %	0%	100%	0%	0%	100%	0%	0%	71%	70%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	74	27	96	36	48	39	29	49	104
LT Vol	63	0	96	0	0	39	0	0	18
Through Vol	11	0	0	36	0	0	29	14	13
RT Vol	0	27	0	0	48	0	0	35	73
Lane Flow Rate	78	28	101	38	51	41	30	52	109
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.13	0.039	0.167	0.057	0.066	0.069	0.047	0.073	0.158
Departure Headway (Hd)	6.028	4.902	5.946	5.443	4.738	6.084	5.58	5.08	5.209
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	591	724	600	654	750	585	637	699	684
Service Time	3.798	2.672	3.712	3.208	2.502	3.856	3.352	2.851	2.975
HCM Lane V/C Ratio	0.132	0.039	0.168	0.058	0.068	0.07	0.047	0.074	0.159
HCM Control Delay	9.7	7.9	9.9	8.5	7.8	9.3	8.6	8.3	9
HCM Lane LOS	A	A	A	A	A	A	A	A	A
HCM 95th-tile Q	0.4	0.1	0.6	0.2	0.2	0.2	0.1	0.2	0.6

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	11	2	64	8	90	0	0	74	83
Future Vol, veh/h	0	0	0	11	2	64	8	90	0	0	74	83
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	12	2	70	9	98	0	0	80	90

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	241	286	98	171	0	0	98	0	0
Stage 1	115	115	-	-	-	-	-	-	-
Stage 2	126	171	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	747	623	958	1406	-	-	1495	-	-
Stage 1	910	800	-	-	-	-	-	-	-
Stage 2	900	757	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	742	0	958	1406	-	-	1495	-	-
Mov Cap-2 Maneuver	742	0	-	-	-	-	-	-	-
Stage 1	904	0	-	-	-	-	-	-	-
Stage 2	900	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.2	0.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1406	-	-	742	958	1495	-	-
HCM Lane V/C Ratio	0.006	-	-	0.016	0.075	-	-	-
HCM Control Delay (s)	7.6	0	-	9.9	9.1	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.2	0	-	-

Intersection	
Int Delay, s/veh	7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	87	2	4	0	0	0	0	11	12	61	24	0
Future Vol, veh/h	87	2	4	0	0	0	0	11	12	61	24	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	95	2	4	0	0	0	0	12	13	66	26	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	177	184	26	26	0	0	25	0	0
Stage 1	159	159	-	-	-	-	-	-	-
Stage 2	18	25	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	813	710	1050	1588	-	-	1589	-	-
Stage 1	870	766	-	-	-	-	-	-	-
Stage 2	1005	874	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	779	0	1050	1588	-	-	1589	-	-
Mov Cap-2 Maneuver	779	0	-	-	-	-	-	-	-
Stage 1	833	0	-	-	-	-	-	-	-
Stage 2	1005	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.2	0	5.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR
Capacity (veh/h)	1588	-	-	788	1589	-	-
HCM Lane V/C Ratio	-	-	-	0.128	0.042	-	-
HCM Control Delay (s)	0	-	-	10.2	7.4	0	-
HCM Lane LOS	A	-	-	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.1	-	-

APPENDIX D

PEAK HOUR INTERSECTION ANALYSIS WORKSHEETS – EXISTING + CUMULATIVE PROJECTS + PROJECT

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	51	0	10	52	314	0	0	117	295
Future Vol, veh/h	0	0	0	51	0	10	52	314	0	0	117	295
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	55	0	11	57	341	0	0	127	321

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	742	902	341	448	0	0	341	0	0
Stage 1	454	454	-	-	-	-	-	-	-
Stage 2	288	448	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	383	277	701	1112	-	-	1218	-	-
Stage 1	640	569	-	-	-	-	-	-	-
Stage 2	761	573	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	359	0	701	1112	-	-	1218	-	-
Mov Cap-2 Maneuver	359	0	-	-	-	-	-	-	-
Stage 1	600	0	-	-	-	-	-	-	-
Stage 2	761	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.8	1.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1112	-	-	359	701	1218	-	-
HCM Lane V/C Ratio	0.051	-	-	0.154	0.016	-	-	-
HCM Control Delay (s)	8.4	0	-	16.9	10.2	0	-	-
HCM Lane LOS	A	A	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.5	0	0	-	-

Intersection	
Int Delay, s/veh	6.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	239	0	136	0	0	0	0	154	130	7	151	0
Future Vol, veh/h	239	0	136	0	0	0	0	154	130	7	151	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	260	0	148	0	0	0	0	167	141	8	164	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	417	488	164	164	0	0	309	0	0
Stage 1	179	179	-	-	-	-	-	-	-
Stage 2	238	309	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	592	480	881	1414	-	-	1252	-	-
Stage 1	852	751	-	-	-	-	-	-	-
Stage 2	802	660	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	588	0	881	1414	-	-	1252	-	-
Mov Cap-2 Maneuver	588	0	-	-	-	-	-	-	-
Stage 1	846	0	-	-	-	-	-	-	-
Stage 2	802	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.7	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	SBL	SBT	SBR
Capacity (veh/h)	1414	-	-	588	881	1252	-	-
HCM Lane V/C Ratio	-	-	-	0.442	0.168	0.006	-	-
HCM Control Delay (s)	0	-	-	15.9	9.9	7.9	0	-
HCM Lane LOS	A	-	-	C	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	2.3	0.6	0	-	-

Intersection	
Int Delay, s/veh	2.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	33	25	255	38	81	206
Future Vol, veh/h	33	25	255	38	81	206
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	36	27	277	41	88	224

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	698	298	0	0	318	0
Stage 1	298	-	-	-	-	-
Stage 2	400	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	407	741	-	-	1242	-
Stage 1	753	-	-	-	-	-
Stage 2	677	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	374	741	-	-	1242	-
Mov Cap-2 Maneuver	374	-	-	-	-	-
Stage 1	753	-	-	-	-	-
Stage 2	622	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.7	0	2.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	476	1242	-
HCM Lane V/C Ratio	-	-	0.132	0.071	-
HCM Control Delay (s)	-	-	13.7	8.1	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0.2	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	36	261	283	4	4	65
Future Vol, veh/h	36	261	283	4	4	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	90	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	39	284	308	4	4	71

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	312	0	-	0	672	310
Stage 1	-	-	-	-	310	-
Stage 2	-	-	-	-	362	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1248	-	-	-	421	730
Stage 1	-	-	-	-	744	-
Stage 2	-	-	-	-	704	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1248	-	-	-	408	730
Mov Cap-2 Maneuver	-	-	-	-	408	-
Stage 1	-	-	-	-	744	-
Stage 2	-	-	-	-	682	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	10.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1248	-	-	-	698
HCM Lane V/C Ratio	0.031	-	-	-	0.107
HCM Control Delay (s)	8	-	-	-	10.8
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

Intersection	
Intersection Delay, s/veh	9.5
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	107	104	48	0	10	119	16	0	75	4	7
Future Vol, veh/h	0	107	104	48	0	10	119	16	0	75	4	7
Peak Hour Factor	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	113	109	51	0	11	125	17	0	79	4	7
Number of Lanes	0	1	2	0	0	1	1	1	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	3	3	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	2	3
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	2	3
HCM Control Delay	9.4	9.7	10
HCM LOS	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	100%	0%	0%	75%	0%
Vol Thru, %	0%	36%	0%	100%	42%	0%	100%	0%	25%	0%
Vol Right, %	0%	64%	0%	0%	58%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	75	11	107	69	83	10	119	16	12	97
LT Vol	75	0	107	0	0	10	0	0	9	0
Through Vol	0	4	0	69	35	0	119	0	3	0
RT Vol	0	7	0	0	48	0	0	16	0	97
Lane Flow Rate	79	12	113	73	87	11	125	17	13	102
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.142	0.018	0.187	0.111	0.123	0.018	0.199	0.023	0.022	0.147
Departure Headway (Hd)	6.494	5.548	5.988	5.485	5.077	6.321	5.817	5.112	6.355	5.28
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	556	649	594	647	698	570	621	705	567	683
Service Time	4.194	3.248	3.782	3.279	2.87	4.021	3.517	2.812	4.055	2.98
HCM Lane V/C Ratio	0.142	0.018	0.19	0.113	0.125	0.019	0.201	0.024	0.023	0.149
HCM Control Delay	10.3	8.3	10.2	9	8.6	9.1	10	7.9	9.2	8.9
HCM Lane LOS	B	A	B	A	A	A	A	A	A	A
HCM 95th-tile Q	0.5	0.1	0.7	0.4	0.4	0.1	0.7	0.1	0.1	0.5

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	9	3	97
Future Vol, veh/h	0	9	3	97
Peak Hour Factor	0.92	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	9	3	102
Number of Lanes	0	0	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	3
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	8.9
HCM LOS	A

Lane

Intersection	
Intersection Delay, s/veh	8.3
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	22	22	45	0	16	22	33	0	18	35	13	0	44	42	19
Future Vol, veh/h	0	22	22	45	0	16	22	33	0	18	35	13	0	44	42	19
Peak Hour Factor	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	23	23	47	0	17	23	35	0	19	37	14	0	46	44	20
Number of Lanes	0	1	1	1	0	1	2	0	0	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	3	3
HCM Control Delay	7.9	8	8.3	8.9
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	34%	0%	100%	0%	0%	100%	0%	0%	42%
Vol Thru, %	66%	0%	0%	100%	0%	0%	100%	18%	40%
Vol Right, %	0%	100%	0%	0%	100%	0%	0%	82%	18%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	53	13	22	22	45	16	15	40	105
LT Vol	18	0	22	0	0	16	0	0	44
Through Vol	35	0	0	22	0	0	15	7	42
RT Vol	0	13	0	0	45	0	0	33	19
Lane Flow Rate	56	14	23	23	47	17	15	42	111
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.083	0.017	0.037	0.034	0.059	0.027	0.023	0.055	0.159
Departure Headway (Hd)	5.37	4.5	5.723	5.22	4.516	5.758	5.255	4.679	5.191
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	667	795	626	686	793	622	681	765	691
Service Time	3.102	2.232	3.451	2.948	2.243	3.487	2.984	2.408	2.921
HCM Lane V/C Ratio	0.084	0.018	0.037	0.034	0.059	0.027	0.022	0.055	0.161
HCM Control Delay	8.6	7.3	8.7	8.1	7.5	8.6	8.1	7.7	8.9
HCM Lane LOS	A	A	A	A	A	A	A	A	A
HCM 95th-tile Q	0.3	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.6

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	10	4	31	4	55	0	0	68	68
Future Vol, veh/h	0	0	0	10	4	31	4	55	0	0	68	68
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	11	4	34	4	60	0	0	74	74

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	179	216	60	148	0	0	60	0	0
Stage 1	68	68	-	-	-	-	-	-	-
Stage 2	111	148	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	811	682	1005	1434	-	-	1544	-	-
Stage 1	955	838	-	-	-	-	-	-	-
Stage 2	914	775	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	809	0	1005	1434	-	-	1544	-	-
Mov Cap-2 Maneuver	809	0	-	-	-	-	-	-	-
Stage 1	952	0	-	-	-	-	-	-	-
Stage 2	914	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1434	-	-	809	1005	1544	-	-
HCM Lane V/C Ratio	0.003	-	-	0.013	0.038	-	-	-
HCM Control Delay (s)	7.5	0	-	9.5	8.7	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-

Intersection	
Int Delay, s/veh	6.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	44	2	12	0	0	0	0	10	16	59	20	0
Future Vol, veh/h	44	2	12	0	0	0	0	10	16	59	20	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	48	2	13	0	0	0	0	11	17	64	22	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	170	178	22	22	0	0	28	0	0
Stage 1	150	150	-	-	-	-	-	-	-
Stage 2	20	28	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	820	716	1055	1593	-	-	1585	-	-
Stage 1	878	773	-	-	-	-	-	-	-
Stage 2	1003	872	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	786	0	1055	1593	-	-	1585	-	-
Mov Cap-2 Maneuver	786	0	-	-	-	-	-	-	-
Stage 1	842	0	-	-	-	-	-	-	-
Stage 2	1003	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.7	0	5.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR
Capacity (veh/h)	1593	-	-	831	1585	-	-
HCM Lane V/C Ratio	-	-	-	0.076	0.04	-	-
HCM Control Delay (s)	0	-	-	9.7	7.4	0	-
HCM Lane LOS	A	-	-	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	-	-

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	56	1	6	50	578	0	0	77	427
Future Vol, veh/h	0	0	0	56	1	6	50	578	0	0	77	427
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	61	1	7	54	628	0	0	84	464

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	1053	1285	628	548	0	0	628	0	0
Stage 1	737	737	-	-	-	-	-	-	-
Stage 2	316	548	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	251	165	483	1021	-	-	954	-	-
Stage 1	473	425	-	-	-	-	-	-	-
Stage 2	739	517	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	231	0	483	1021	-	-	954	-	-
Mov Cap-2 Maneuver	231	0	-	-	-	-	-	-	-
Stage 1	435	0	-	-	-	-	-	-	-
Stage 2	739	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	24.6	0.7	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1021	-	-	231	483	954	-	-
HCM Lane V/C Ratio	0.053	-	-	0.264	0.016	-	-	-
HCM Control Delay (s)	8.7	0	-	26.1	12.6	0	-	-
HCM Lane LOS	A	A	-	D	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	1	0	0	-	-

Intersection	
Int Delay, s/veh	17.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	496	1	95	0	0	0	0	132	97	5	128	0
Future Vol, veh/h	496	1	95	0	0	0	0	132	97	5	128	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	539	1	103	0	0	0	0	143	105	5	139	0

Major/Minor	Minor2						Major1			Major2		
Conflicting Flow All	346	399	139				139	0	0	249	0	0
Stage 1	150	150	-				-	-	-	-	-	-
Stage 2	196	249	-				-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22				4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-				-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318				2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	651	539	909				1445	-	-	1317	-	-
Stage 1	878	773	-				-	-	-	-	-	-
Stage 2	837	701	-				-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	648	0	909				1445	-	-	1317	-	-
Mov Cap-2 Maneuver	648	0	-				-	-	-	-	-	-
Stage 1	874	0	-				-	-	-	-	-	-
Stage 2	837	0	-				-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	28.4	0	0.3
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	SBL	SBT	SBR
Capacity (veh/h)	1445	-	-	648	909	1317	-	-
HCM Lane V/C Ratio	-	-	-	0.832	0.115	0.004	-	-
HCM Control Delay (s)	0	-	-	32	9.5	7.7	0	-
HCM Lane LOS	A	-	-	D	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	9	0.4	0	-	-

Intersection	
Int Delay, s/veh	2.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	40	30	220	49	65	174
Future Vol, veh/h	40	30	220	49	65	174
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	33	239	53	71	189

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	596	266	0	0	292	0
Stage 1	266	-	-	-	-	-
Stage 2	330	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	466	773	-	-	1270	-
Stage 1	779	-	-	-	-	-
Stage 2	728	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	437	773	-	-	1270	-
Mov Cap-2 Maneuver	437	-	-	-	-	-
Stage 1	779	-	-	-	-	-
Stage 2	683	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.8	0	2.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	537	1270	-
HCM Lane V/C Ratio	-	-	0.142	0.056	-
HCM Control Delay (s)	-	-	12.8	8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0.2	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	27	536	443	7	7	39
Future Vol, veh/h	27	536	443	7	7	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	90	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	29	583	482	8	8	42

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	489	0	-	0	1126	485
Stage 1	-	-	-	-	485	-
Stage 2	-	-	-	-	641	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1074	-	-	-	227	582
Stage 1	-	-	-	-	619	-
Stage 2	-	-	-	-	525	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1074	-	-	-	221	582
Mov Cap-2 Maneuver	-	-	-	-	221	-
Stage 1	-	-	-	-	619	-
Stage 2	-	-	-	-	511	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	13.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1074	-	-	-	466
HCM Lane V/C Ratio	0.027	-	-	-	0.107
HCM Control Delay (s)	8.4	-	-	-	13.7
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

Intersection	
Intersection Delay, s/veh	13.3
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	234	182	127	0	18	182	26	0	146	6	14
Future Vol, veh/h	0	234	182	127	0	18	182	26	0	146	6	14
Peak Hour Factor	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	246	192	134	0	19	192	27	0	154	6	15
Number of Lanes	0	1	2	0	0	1	1	1	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	3	3	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	2	3
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	2	3
HCM Control Delay	13.4	13.5	14
HCM LOS	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	100%	0%	0%	70%	0%
Vol Thru, %	0%	30%	0%	100%	32%	0%	100%	0%	30%	0%
Vol Right, %	0%	70%	0%	0%	68%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	146	20	234	121	188	18	182	26	20	116
LT Vol	146	0	234	0	0	18	0	0	14	0
Through Vol	0	6	0	121	61	0	182	0	6	0
RT Vol	0	14	0	0	127	0	0	26	0	116
Lane Flow Rate	154	21	246	128	198	19	192	27	21	122
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.337	0.04	0.476	0.229	0.328	0.041	0.383	0.049	0.046	0.232
Departure Headway (Hd)	7.891	6.896	7.076	6.568	6.087	7.713	7.205	6.492	7.905	6.847
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	458	521	512	550	595	466	502	553	455	526
Service Time	5.608	4.612	4.776	4.268	3.787	5.432	4.923	4.21	5.623	4.565
HCM Lane V/C Ratio	0.336	0.04	0.48	0.233	0.333	0.041	0.382	0.049	0.046	0.232
HCM Control Delay	14.6	9.9	16	11.2	11.7	10.8	14.3	9.5	11	11.6
HCM Lane LOS	B	A	C	B	B	B	B	A	B	B
HCM 95th-tile Q	1.5	0.1	2.5	0.9	1.4	0.1	1.8	0.2	0.1	0.9

Intersection				
Intersection Delay, s/veh				
Intersection LOS				

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	14	6	116
Future Vol, veh/h	0	14	6	116
Peak Hour Factor	0.92	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	15	6	122
Number of Lanes	0	0	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	3
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	11.5
HCM LOS	B

Lane

Intersection																
Intersection Delay, s/veh	9.1															
Intersection LOS	A															

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	96	48	48	0	39	53	35	0	63	11	27	0	18	13	73
Future Vol, veh/h	0	96	48	48	0	39	53	35	0	63	11	27	0	18	13	73
Peak Hour Factor	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	101	51	51	0	41	56	37	0	66	12	28	0	19	14	77
Number of Lanes	0	1	1	1	0	1	2	0	0	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	3	3
HCM Control Delay	9.2	8.8	9.3	9.1
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	85%	0%	100%	0%	0%	100%	0%	0%	17%
Vol Thru, %	15%	0%	0%	100%	0%	0%	100%	34%	13%
Vol Right, %	0%	100%	0%	0%	100%	0%	0%	66%	70%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	74	27	96	48	48	39	35	53	104
LT Vol	63	0	96	0	0	39	0	0	18
Through Vol	11	0	0	48	0	0	35	18	13
RT Vol	0	27	0	0	48	0	0	35	73
Lane Flow Rate	78	28	101	51	51	41	37	55	109
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.132	0.039	0.168	0.077	0.067	0.07	0.058	0.079	0.16
Departure Headway (Hd)	6.088	4.962	5.972	5.468	4.763	6.114	5.61	5.141	5.268
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	585	714	597	650	745	582	633	690	675
Service Time	3.869	2.743	3.746	3.242	2.536	3.895	3.39	2.921	3.046
HCM Lane V/C Ratio	0.133	0.039	0.169	0.078	0.068	0.07	0.058	0.08	0.161
HCM Control Delay	9.8	7.9	10	8.7	7.9	9.4	8.7	8.4	9.1
HCM Lane LOS	A	A	A	A	A	A	A	A	A
HCM 95th-tile Q	0.5	0.1	0.6	0.2	0.2	0.2	0.2	0.3	0.6

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	12	2	64	8	90	0	0	74	83
Future Vol, veh/h	0	0	0	12	2	64	8	90	0	0	74	83
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	13	2	70	9	98	0	0	80	90

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	241	286	98	171	0	0	98	0	0
Stage 1	115	115	-	-	-	-	-	-	-
Stage 2	126	171	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	747	623	958	1406	-	-	1495	-	-
Stage 1	910	800	-	-	-	-	-	-	-
Stage 2	900	757	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	742	0	958	1406	-	-	1495	-	-
Mov Cap-2 Maneuver	742	0	-	-	-	-	-	-	-
Stage 1	904	0	-	-	-	-	-	-	-
Stage 2	900	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.2	0.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1406	-	-	742	958	1495	-	-
HCM Lane V/C Ratio	0.006	-	-	0.018	0.075	-	-	-
HCM Control Delay (s)	7.6	0	-	9.9	9.1	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.2	0	-	-

Intersection	
Int Delay, s/veh	6.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	87	2	4	0	0	0	0	11	13	61	27	0
Future Vol, veh/h	87	2	4	0	0	0	0	11	13	61	27	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	95	2	4	0	0	0	0	12	14	66	29	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	181	188	29	29	0	0	26	0	0
Stage 1	162	162	-	-	-	-	-	-	-
Stage 2	19	26	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	808	707	1046	1584	-	-	1588	-	-
Stage 1	867	764	-	-	-	-	-	-	-
Stage 2	1004	874	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	774	0	1046	1584	-	-	1588	-	-
Mov Cap-2 Maneuver	774	0	-	-	-	-	-	-	-
Stage 1	831	0	-	-	-	-	-	-	-
Stage 2	1004	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.3	0	5.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR
Capacity (veh/h)	1584	-	-	783	1588	-	-
HCM Lane V/C Ratio	-	-	-	0.129	0.042	-	-
HCM Control Delay (s)	0	-	-	10.3	7.4	0	-
HCM Lane LOS	A	-	-	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.1	-	-