

Tavern Rd Gas Station Expansion

Project Number: PDS 2018-STP-18-012

Environmental Log Number: PDS 2018-ER-18-14-003

1140 Tavern Rd, Alpine, CA

August 15, 2019

Traffic Impact Study

Project Owner:

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Glossary of Terms and Acronyms

ADT	Average Daily Traffic
LOS	Level of Service
MPH.....	Miles per Hour
TIS.....	Traffic Impact Study
V/C	Volume to Capacity Ratio



Executive Summary

Tavern Road Gas Station Expansion (PDS 2017-IC-17-018)

The project is an expansion of the existing Tavern Road gas station located at 1140 Tavern Road in the unincorporated San Diego County community of Alpine, California. The existing uses include a convenience store with gas pumps, a fast food restaurant with drive-through window, and a coffee shop with drive-through window. The project will remove the existing convenience store and fast food restaurant with drive-through window and replace with a slightly larger convenience store, a new fast food restaurant with drive-through window, and a new sit down high turnover restaurant. The coffee shop with drive-through window will remain unchanged.

The project trip generation is calculated based on the increase in building size. The new convenience store will be 155 SF larger than the current convenience store. The fast food restaurant with drive-through will be increased by 2,100 SF over the current fast food restaurant. The new sit down high turnover restaurant will be 2,400 SF. The project traffic consists of pass-by, diverted, and primary trips. The project is calculated to attract pass-by traffic (already on Tavern Road adjacent to the project site) in the amount of 230 ADT, 16 AM peak hour trips, and 49 PM peak hour trips. The project is calculated to attract diverted traffic (already on I-8) in the amount of 700 ADT, 50 AM peak hour trips, and 51 PM peak hour trips. The project is calculated to generate primary traffic (new traffic) in the amount of 951 ADT, 68 AM peak hour trips, and 36 PM peak hour trips.

The project is calculated to have no direct impacts and potential cumulative impacts. A summary of project impacts is shown in **Table E-1**.

TABLE E-1: SUMMARY OF PROJECT IMPACTS AND MITIGATION

Roadway Facility	Direct Impacts (Proposed Mitigation)	Cumulative Impacts (Proposed Mitigation)
Intersections	0 (no mitigation required)	Potential (TIF)
Segments	0 (based on more detailed arterial analysis*) (no mitigation required)	Potential (TIF)

Note: To mitigate potential cumulative impacts, the County has established a Traffic Impact Fee (TIF) program. *An initial segment impact was calculated on two segments of Tavern Road (from I-8 WB ramp to I-8 EB ramp and from I-8 EB Ramp to Alpine Blvd); however, a more detailed arterial analysis of these segments shows acceptable levels of operation (LOS D). Additionally, the intersections along this segment are operating at LOS D or better. Therefore, the project is not considered to have a segment because the intersection and arterial operations show acceptable LOS.



1.0 Introduction

This report describes the existing roadway network in the vicinity of the project site and includes a review of the existing and proposed activities for weekday peak AM and PM periods, and daily traffic conditions when the project is completed. The format of this study includes the following chapters:

- 1.0 Introduction
- 2.0 Existing Conditions
- 3.0 Project Impact Analysis
- 4.0 General Plan Consistency and Build Out Analysis
- 5.0 Summary of Recommended Mitigation Measures
- 6.0 References
- 7.0 List of Preparers and Persons and Organizations Contacted

1.1 Purpose of the Report

The purpose of this Traffic Impact Study (TIS) is to determine and analyze potential traffic impacts for the proposed Tavern Road gas station expansion project.

1.2 Project Location and Description

The project is an expansion of the existing Tavern Road gas station located at 1140 Tavern Road in the unincorporated San Diego County community of Alpine, California. The existing uses include a convenience store with gas pumps, a fast food restaurant with drive-through window, and a coffee shop with drive-through window. The project will remove the existing convenience store and fast food restaurant with drive-through window and replace with a slightly larger convenience store, a new fast food restaurant with drive-through window, and a new sit down high turnover restaurant. The coffee shop with drive-through window will remain unchanged.

Project access is provided from three existing driveways on Tavern Road (one on the north side of the project and two on the east side of the project).

The location of the project is shown in **Figure 1**. The map of the TIS area is shown in **Figure 2**. A preliminary site plan is shown in **Figure 3**.

1.3 Planning Requirements

The project applicant does not propose a General Plan Amendment, does not propose a Specific Plan Amendment, and does not propose a rezone.

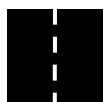


Figure 1: Project Location

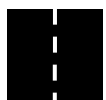
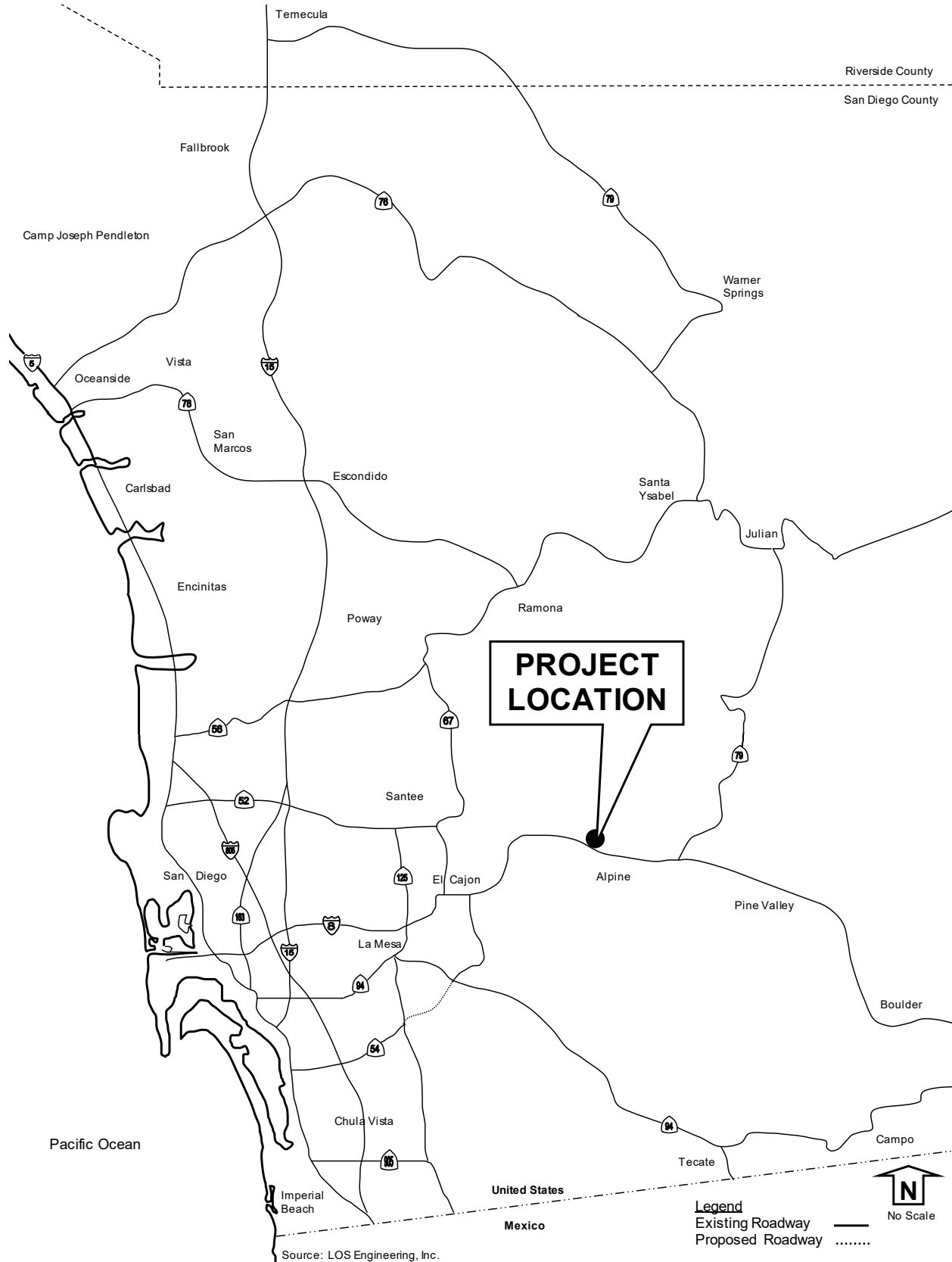
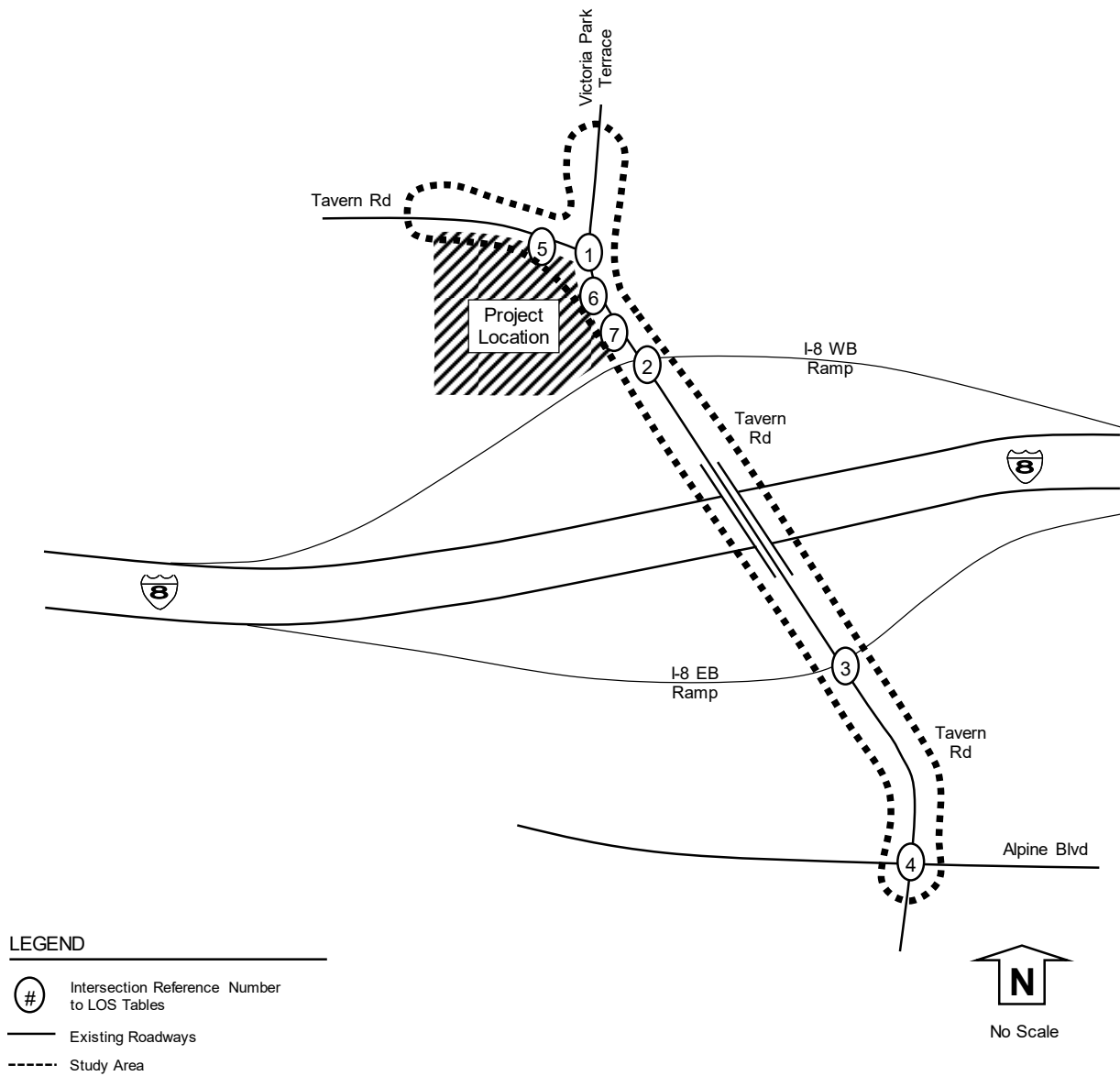


Figure 2: Traffic Impact Study Area



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Traffic and Transportation 4 August 15, 2019

1.4 Significance Criteria

This section describes traffic impact significance criteria applied to this project and the SANDAG Congestion Management Program (CMP) requirements.

1.4.1 County of San Diego Guidelines for Determining Significance

Based on the San Diego County *Report Format & Content Requirements Transportation and Traffic*, dated August 24, 2011, a project may have the following allowable increases on congested roadway segments and intersections as shown in **Table 1**.

TABLE 1: COUNTY OF SAN DIEGO SIGNIFICANT TRAFFIC IMPACT THRESHOLDS

Measures of Significant Project Impacts to Congestion Allowable Increases on Congested Roads and Intersections					
Operations	Road Segments			Intersections	
	2-Lane Road	4-Lane Road	6-Lane Road	Signalized	Un-signalized
LOS E	200 ADT	400 ADT	600 ADT	Delay of 2 seconds or less	20 or less peak hour trips on a critical movement
LOS F	100 ADT	200 ADT	300 ADT	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

Source: County of San Diego *Guidelines for Determining Significance* Tables 1 and 2. Note: A critical movement is one that is experiencing excessive queues. By adding proposed project 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 that contributes any trips must mitigate its share of the cumulative impacts. 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.

A direct impact would occur when the significance criteria are exceeded. If the proposed project exceeds the values provided in the above table, then the individually proposed project would result in a direct traffic impact. Specific improvements to mitigate direct impacts must be identified.

A cumulative impact would occur when two conditions are met: 1) build-out of all near-term projects results in a cumulative traffic impact and 2) the amount of traffic generated by the individual proposed project contributes (even in a small part) to that cumulative impact. Both conditions must be met for an individual project to result in a cumulative traffic impact.

Potential mitigation measures may include traffic signal improvements (i.e. signal coordination), physical road improvements, street re-striping and parking prohibitions, fair-share contributions, and transportation demand management programs.

1.4.2 SANDAG Congestion Management Program Requirements

The San Diego Association of Governments (SANDAG) has the following statement on their website regarding the Congestion Management Program (CMP) - details included in **Appendix A**:

“In October 2009, the San Diego region elected to be exempt from the State CMP and, since this decision, SANDAG has been abiding by 23 CFR 450.320 to ensure the region’s continued compliance with the federal congestion management process.”



2.0 Existing Conditions

This section describes the study area street system, peak hour intersection volumes and daily roadway volumes.

2.1 Existing Transportation Conditions

The study area includes the segments of Tavern Road from immediately west of Victoria Park Terrace down to Alpine Boulevard and Victoria Park Terrace immediately north of Tavern Road.

Tavern Road from west of Victoria Park Terrace down to Alpine Boulevard is classified as a *4.1A Major Road* on the County Mobility Element Network map (a copy of the County Mobility Element map is included in **Appendix B**).

Tavern Road immediately west of Victoria Park Terrace is generally constructed as a two-lane roadway with one travel lane in each direction. This segment was analyzed as a two-lane roadway with reduced shoulder (2.2F).

Tavern Road from Victoria Park Terrace to the westbound I-8 ramp is generally constructed as a two-lane road way with one travel lane in each direction, on-street parking, and intermittent turn lanes. The posted speed limit is 35 Miles per Hour (MPH). This segment was analyzed as a two-lane roadway with intermittent turn lanes (2.2C).

Tavern Road from the westbound I-8 ramp to the eastbound I-8 ramp is constructed as a two-lane road way with one travel lane in each direction and back to back left turn lanes. This segment was analyzed as a two-lane roadway with intermittent turn lanes (2.2C).

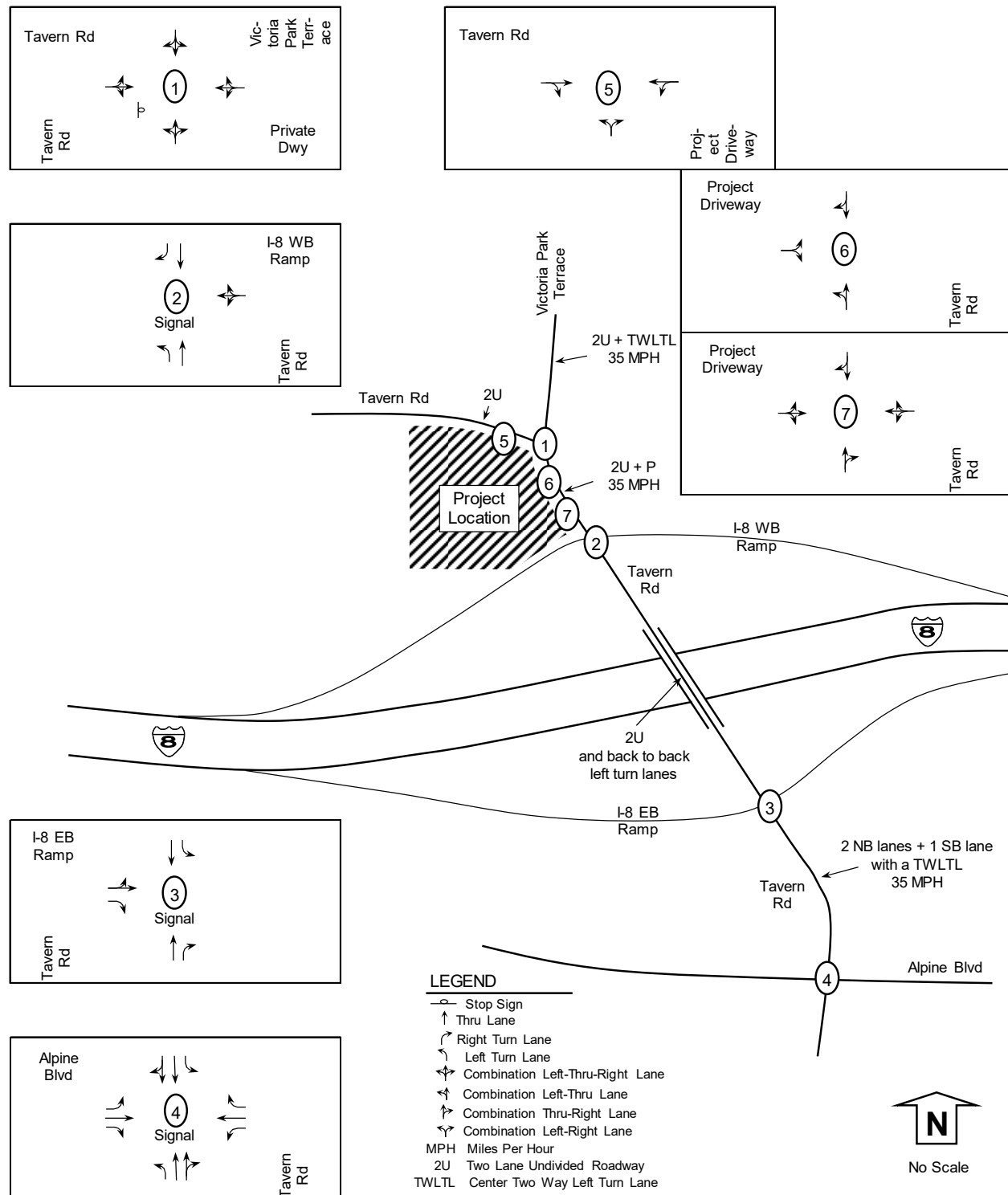
Tavern Road from the eastbound I-8 ramp to Alpine Boulevard is constructed as a three-lane roadway (two northbound lanes and one southbound lane) and a center Two Way Left Turn Lane (TWLTL). The posted speed limit is 35 MPH. This segment was analyzed as a two-lane roadway with continuous left turn lane (2.2B).

Victoria Park Terrace immediately north of Tavern Road is classified as a *2.2A Light Collector* on the County Mobility Element Network map. This segment is generally constructed with one travel lane in each direction and a center TWLTL. The posted speed limit is 35 MPH. This segment was analyzed as a two-lane roadway with continuous left turn lane (2.2B).

The existing roadway conditions are shown in **Figure 4**.



Figure 4: Existing Roadway Conditions



2.1.1 Existing Traffic Volumes and LOS Analyses

Existing peak hour intersection volumes were collected from 7-9 AM and 4-6 PM for the following intersections as noted below:

- 1) Tavern Road/Victoria Park Terrace (Tuesday 11/14/17)
- 2) Tavern Road/I-8 WB Ramp (Tuesday 11/14/17)
- 3) Tavern Road/I-8 EB Ramp (Tuesday 11/14/17)
- 4) Tavern Road/Alpine Blvd (Tuesday 11/14/17)
- 5) Tavern Road/N. Project Driveway (Tuesday 11/14/17)
- 6) Tavern Road/Middle Project Driveway (Tuesday 11/14/17)
- 7) Tavern Road/S. Project Driveway (Tuesday 11/14/17)

Additionally, existing daily traffic volumes were collected on the following segments:

- 1) Tavern Road west of Victoria Park Terrace (Tue 11/14/17 and Wed 11/15/17)
- 2) Tavern Road between Victoria Park Terrace and I-8 WB Ramp (Tue 11/14/17 and Wed 11/15/17)
- 3) Tavern Road between I-8 WB Ramp and I-8 EB Ramp (Tue 11/14/17 and Wed 11/15/17)
- 4) Tavern Road between I-8 EB Ramp and Alpine Blvd (Tue 11/14/17 and Wed 11/15/17)
- 5) Victoria Park Terrace immediately north of Tavern Road (Thur 12/7/17)

The existing AM, PM, and daily volumes are shown on **Figure 5**, with count data and Caltrans signal timing sheets included in **Appendix C**. Intersection, segment, and arterial LOS are shown in **Tables 2, 3 and 4**, respectively.

TABLE 2: EXISTING INTERSECTION LEVEL OF SERVICE

Intersection and (Analysis) ¹	Movement	Study Period	Existing	
			Delay ²	LOS ³
1) Tavern Road at Victoria Park T. (U)	EB LTR	AM	10.0	B
	WB LTR	AM	14.6	B
	EB LTR	PM	9.8	A
	WB LTR	PM	15.0	C
2) Tavern Road at I-8 WB Ramp (S)	All	AM	36.7	D
	All	PM	15.6	B
3) Tavern Road at I-8 EB Ramp (S)	All	AM	16.4	B
	All	PM	24.3	C
4) Tavern Road at Alpine Blvd (S)	All	AM	18.6	B
	All	PM	21.2	C
5) Tavern Road at N. Project Dwy (U)	NB LR	AM	8.8	A
	NB LR	PM	8.6	A
6) Tavern Road at Middle Proj Dwy (U)	EB LTR	AM	10.8	B
	EB LTR	PM	10.0	B
7) Tavern Road at S. Project Dwy (U)	EB LTR	AM	9.7	A
	EB LTR	PM	9.9	A

Notes: 1) Intersection Analysis - (S) Signalized, (U) Unsignalized. 2) Delay - HCM Average Control Delay in seconds. 3) LOS: Level of Service.



Figure 5: Existing Volumes

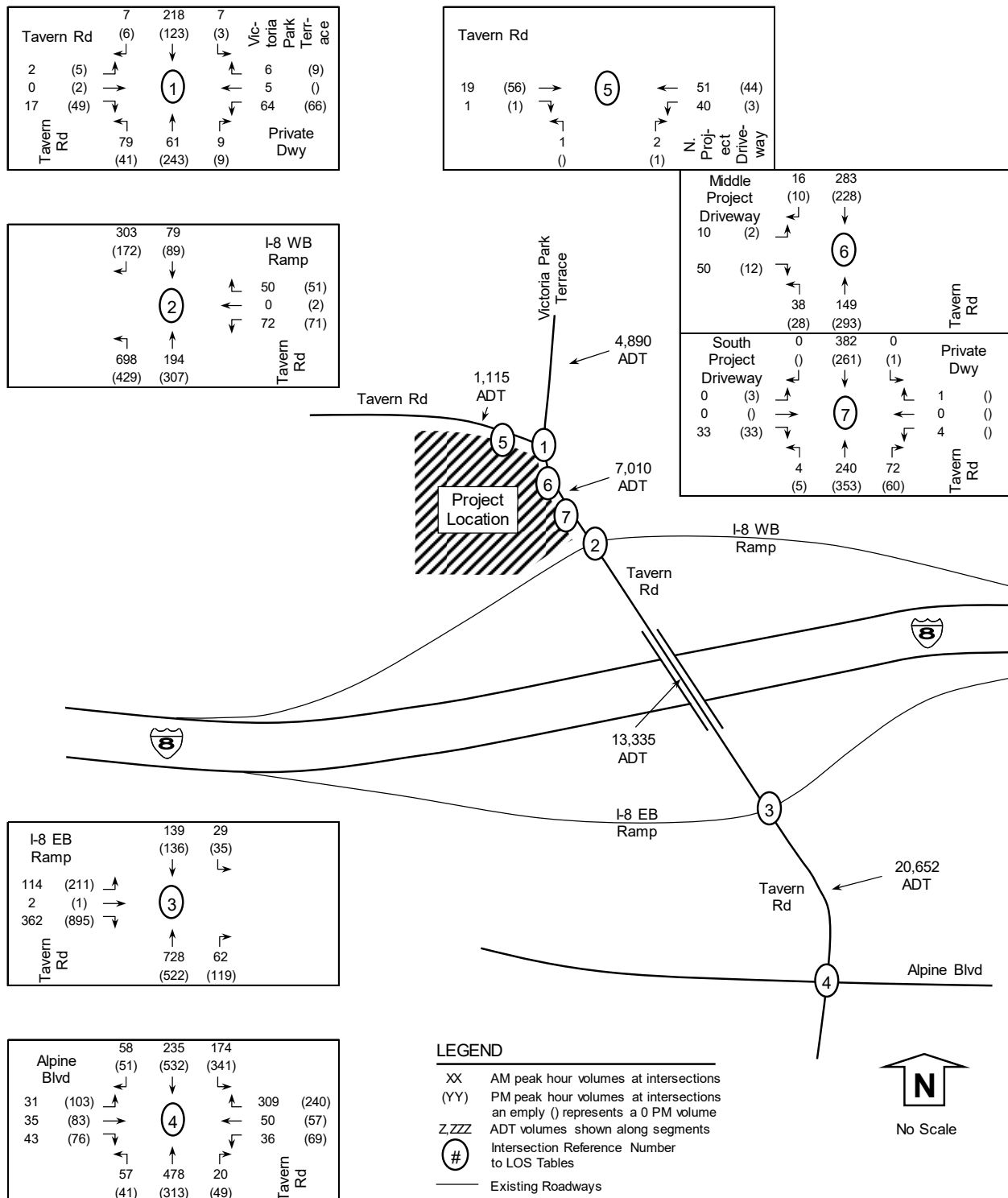


TABLE 3: EXISTING SEGMENT ADT VOLUMES AND LEVEL OF SERVICE

Segment	Mobility/Non-Mobility Classification (as built)	LOS E Capacity	Existing			
			Daily Volume	V/C	LOS	
<u>Tavern Road</u>						
Immediately West of Victoria	Major 4.1A (2.2F)	9,700	1,115	0.115	A	
Victoria to I-8 WB Ramp	Major 4.1A (2.2C)	19,000	7,010	0.369	C	
I-8 WB Ramp to I-8 EB Ramp	Major 4.1A (2.2C)	19,000	13,335	0.702	D	
I-8 EB Ramp to Alpine Blvd	Major 4.1A (2.2B)	19,000	20,652	1.087	F	
<u>Victoria Park Terrace</u>						
Immediately North of Tavern Rd	Light Coll. 2.2A (2.2B)	19,000	4,890	0.257	B	

Notes: Daily volume is a 24 hour volume. LOS: Level of Service. V/C: Volume to Capacity Ratio.

TABLE 4: EXISTING ARTERIAL SPEEDS AND LEVEL OF SERVICE

Arterial and Extent	Peak Period	Direction	Existing Speed (MPH)	LOS
<u>Tavern Road</u>				
From Alpine Blvd to I-8 WB Ramp	AM	NB	16.7	D
		SB	15.0	D
From Alpine Blvd to I-8 WB Ramp	PM	NB	14.8	D
		SB	14.4	D

Notes: MPH-Miles Per Hour. LOS-Level of Service.

Under existing conditions, all study elements were calculated to operate at LOS D or better except for the segment of Tavern Road between I-8 EB ramp and Alpine Blvd (LOS F on a daily basis); however, a more detailed arterial analysis of this segment documents acceptable levels of operation (LOS D). LOS and arterial calculations are included in **Appendix D**.

2.2 Existing Parking, Transit and On-site Circulation

The existing project site has on-site parking and on-site circulation. Current project access is from three existing driveways on Tavern Road (one on the north side of the project and two on the east side of the project).

The Metropolitan Transit System (MTS) shows Bus Route 864 along Alpine Blvd south of I-8 and Bus Route 888 along I-8 and Tavern Road south of I-8 in the vicinity of the project (MTS map included in **Appendix E**).



3.0 Project Impact Analysis

This section describes the traffic analysis methodology.

3.1 Analysis and Methodology

The project study area was based on direction from County staff and guidelines as outlined in the County of San Diego *Guidelines for Determining Significance and Report Format and Content Requirements Transportation and Traffic* dated August 24, 2011.

The traffic analyses prepared for this study were based on the *2010 Highway Capacity Manual* (HCM) operations analysis using Level of Service (LOS) evaluation criteria. The operating conditions of the study intersections, roadway segments, and highway segments are measured using the HCM LOS designations, which range from A through F. LOS A represents the best operating condition and LOS F denotes the worst operating condition. The individual LOS criteria for each roadway component are described below.

3.1.1 Intersections

The study intersections were analyzed based on the **operational analysis** outlined in the 2010 HCM. This process defines LOS in terms of **average control delay** per vehicle, which is measured in seconds. LOS at the intersections were calculated using the computer software program Synchro 10.0 (Trafficware Corporation). The HCM LOS for the range of delay by seconds for un-signalized and signalized intersections is described in **Table 5**.

TABLE 5: INTERSECTION LEVEL OF SERVICE DEFINITIONS (HCM 2010)

Level of Service	Un-Signalized (TWSC and AWSC) Control Delay (seconds/vehicle)	Signalized Control Delay (seconds/vehicle)
A	0-10	≤ 10
B	> 10-15	> 10-20
C	> 15-25	> 20-35
D	> 25-35	> 35-55
E	> 35-50	> 55-80
F	> 50	> 80

TWSC: Two Way Stop Control. AWSC: All Way Stop Control. Source: Highway Capacity Manual 2010 (exhibit 19-1 for two way stop control, exhibit 20-2 for all way stop control, and exhibit 18-4 for signalized intersections).

3.1.2 Street Segments

The street segments were analyzed based on the functional classification of the roadway using the County of San Diego *Average Daily Vehicle Trips* capacity lookup table. The roadway segment capacity and LOS standards used to analyze street segments are summarized in **Table 6**.



TABLE 6: STREET SEGMENT DAILY CAPACITY AND LOS (COUNTY OF SAN DIEGO GENERAL PLAN UPDATE)

Mobility Element Roads Classification		LOS A	LOS B	LOS C	LOS D	LOS E
Expressway	6.1	<36,000	<54,000	<70,000	<86,000	<108,000
Prime Arterial	6.2	<22,200	<37,000	<44,600	<50,000	<57,000
Major Road w/raised median	4.1A	<14,800	<24,700	<29,600	<33,400	<37,000
Major Rd w/intermittent turn lanes	4.1B	<13,700	<22,800	<27,400	<30,800	<34,200
Boulevard w/raised median	4.2A	<18,000	<21,000	<24,000	<27,000	<30,000
Boulevard w/Intermittent turn lanes	4.2B	<16,800	<19,600	<22,500	<25,000	<28,000
Community Collector w/raised median	2.1A	<10,000	<11,700	<13,400	<15,000	<19,000
Community Collector w/cont. turn lane	2.1B	<3,000	<6,000	<9,500	<13,500	<19,000
Community Collector w/intermit. turn lane	2.1C	<3,000	<6,000	<9,500	<13,500	<19,000
Community Collector w/improvement opt.	2.1D	<3,000	<6,000	<9,500	<13,500	<19,000
Community Collector	2.1E	<1,900	<4,100	<7,100	<10,900	<16,200
Light Collector w/raised median	2.2A	<3,000	<6,000	<9,500	<13,500	<19,000
Light Collector w/continuous left turn lane	2.2B	<3,000	<6,000	<9,500	<13,500	<19,000
Light Collector w/intermittent turn lane	2.2C	<3,000	<6,000	<9,500	<13,500	<19,000
Light Collector w/ passing lane	2.2D	<3,000	<6,000	<9,500	<13,500	<19,000
Light Collector - no median	2.2E	<1,900	<4,100	<7,100	<10,900	<16,200
Light Collector w/ reduced shoulder	2.2F	<5,800	<6,800	<7,800	<8,700	<9,700
Minor Collector w/raised median	2.3A	<3,000	<6,000	<7,000	<8,000	<9,000
Minor Collector w/intermittent turn lane	2.3B	<3,000	<6,000	<7,000	<8,000	<9,000
Minor Collector – no median	2.3C	<1,900	<4,100	<6,000	<7,000	<8,000
Non-Mobility Element Roads Classification				LOS C		
Residential Collector 2 lanes				<4,500		

Source: County of San Diego Public Road Standards, March, 2012.

3.1.3 Arterial Analysis

An arterial analysis is calculated using the base free flow speeds outlined in the 2010 HCM. This process defines LOS in terms of travel speeds during AM and PM peak hours using more detailed inputs such as signal timing plans and turning movement data.

3.2 Project Trip Generation

The project trip generation was calculated using the SANDAG *Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region*, April 2002. The trip generation is calculated based on the increase in building size. The new convenience store will be 155 SF larger than the current convenience store. The fast food restaurant with drive-through will be increased by 2,100 SF over the current fast food restaurant. The new sit down high turnover restaurant will be 2,400 SF. The existing, proposed, and change in building SF is shown in **Table 7**.



TABLE 7: PROJECT BUILDING SIZE CHANGES

Land Use	Existing Square Feet	Proposed Square Feet	Change in Square Feet
Convenience Store with Gas Pumps	1,845	2,000	155
Fast Food Restaurant with Drive-Through	640	2,740	2,100
Sit Down High Turnover Restaurant	0	2,400	2,400
Coffee Shop with Drive-Through	316	316	0

Source: ZAAP Architecture + Planning

SANDAG's *Analysis of Trip Diversion*, revised November 1990 documented the percentages of pass-by, diverted, and primary trips for various land uses. Pass-by trips are already the roadway adjacent to the project site (i.e. Tavern Road) and will turn into the project, conduct business, then resume travel on Tavern Road. Diverted trips are vehicles that are on the nearby I-8 that will divert to the project, conduct business, then resume travel on I-8. Primary trips account for the remaining trips that are specific to visiting the project site. The amount of traffic based on SANDAG's pass-by, diverted, and primary percentages applied to the project is as follows:

- 1) The project is calculated to attract pass-by traffic (already on Tavern Road adjacent to the project site) in the amount of 230 ADT, 16 AM peak hour trips (8 inbound and 8 outbound), and 49 PM peak hour trips (25 inbound and 24 outbound).
- 2) The project is calculated to attract diverted traffic (already on I-8) in the amount of 700 ADT, 50 AM peak hour trips (25 inbound and 25 outbound), and 51 PM peak hour trips (27 inbound and 24 outbound).
- 3) The project is calculated to generate primary traffic (new traffic) in the amount of 951 ADT, 68 AM peak hour trips (34 inbound and 34 outbound), and 36 PM peak hour trips (19 inbound and 17 outbound).

The trip generation showing pass-by, diverted, and primary trips is shown in **Table 8**.

TABLE 8: PROJECT TRIP GENERATION

Proposed Land Use	Rate	Size & Units	ADT	Rate	Split	AM				PM					
						IN	OUT	Rate	Split	IN	OUT				
<u>Total Driveway Trips (Pass-by plus Diverted plus Primary)</u>															
Convenience Market with gas pumps	850	/KSF	155	SF	132	6%	0.5	0.5	4	4	7%	0.5	0.5	5	5
Fast Food (with drive-through)	650	/KSF	2,100	SF	1,365	7%	0.5	0.5	48	48	7%	0.5	0.5	48	48
Restaurant (sit down high turnover)	160	/KSF	2,400	SF	<u>384</u>	8%	0.5	0.5	<u>15</u>	<u>15</u>	8%	0.6	0.4	<u>18</u>	<u>12</u>
Total:									1,881					71	65
<u>Pass-By Trips (Existing trips already on adjacent study roadways)</u>															
Conv. Market SANDAG Pass-By Trips = 15% ADT & AM; 50% PM									20					2	2
Fast Food SANDAG Pass-By Trips = 12% ADT & AM; 40% PM									164					19	19
Restaurant SANDAG Pass-By Trips = 12% ADT & AM; 20% PM									<u>46</u>					<u>4</u>	<u>2</u>
Pass-By Totals:									230					25	24
<u>Diverted Trips (Existing trips already on nearby study roadways)</u>															
Conv. Market SANDAG Diverted Trips = 40% ADT & AM & PM									53					2	2
Fast Food SANDAG Diverted Trips = 37% ADT, AM & PM									505					18	18
Restaurant SANDAG Diverted Trips = 37% ADT, AM & PM									<u>142</u>					<u>7</u>	<u>5</u>
Diverted Totals:									700					27	24
<u>Primary Trips (NEW trips added to the study roadways)</u>															
Conv. Market SANDAG Primary Trips = 45% ADT & AM; 10% PM									59					1	1
Fast Food SANDAG Primary Trips = 51% ADT & AM; PM 23%									696					11	11
Restaurant SANDAG Primary Trips = 51% ADT, AM; PM 43%									<u>196</u>					<u>7</u>	<u>5</u>
Primary Totals:									951					19	17

Source: SANDAG Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region, April 2002.

SF - Square Feet; ADT-Average Daily Traffic; Split-percent inbound and outbound., Excel rounding may result in ±1 to above numbers.



3.3 Project Trip Distribution and Assignment

There are three distinct distribution patterns, that include pass-by, diverted, and primary.

The pass-by distribution as shown in **Figure 6** is specific to the adjacent segment of Tavern Road. In other words, vehicles already on Tavern Road will turn into the project site (hence a negative distribution shown at intersections #6 and #7), conduct business, and then resume travel on Tavern Road in their original direction of travel. The assignment of the pass-by trips is shown in **Figure 7**.

The diverted distribution shown in **Figure 8** is specific to I-8 and Tavern Road. That is to say, vehicles near the project site will exit I-8, visit the project site, then resume original travel on I-8. The assignment of the diverted trips is shown in **Figure 9**.

The primary project distribution was based on existing driveway turn moves that provided an overall direction of travel (calculations included in **Appendix F**). Beyond the immediate project driveway, the primary distribution was based on the concentration of residential and other commercial areas. The primary distribution as shown in **Figure 10** covers the entire study area. The assignment of the primary or new trips is shown in **Figure 11**.

The total project assignment that includes pass-by trips, diverted trips, and primary trips are shown in **Figure 12**.



Figure 6: Pass-By Distribution

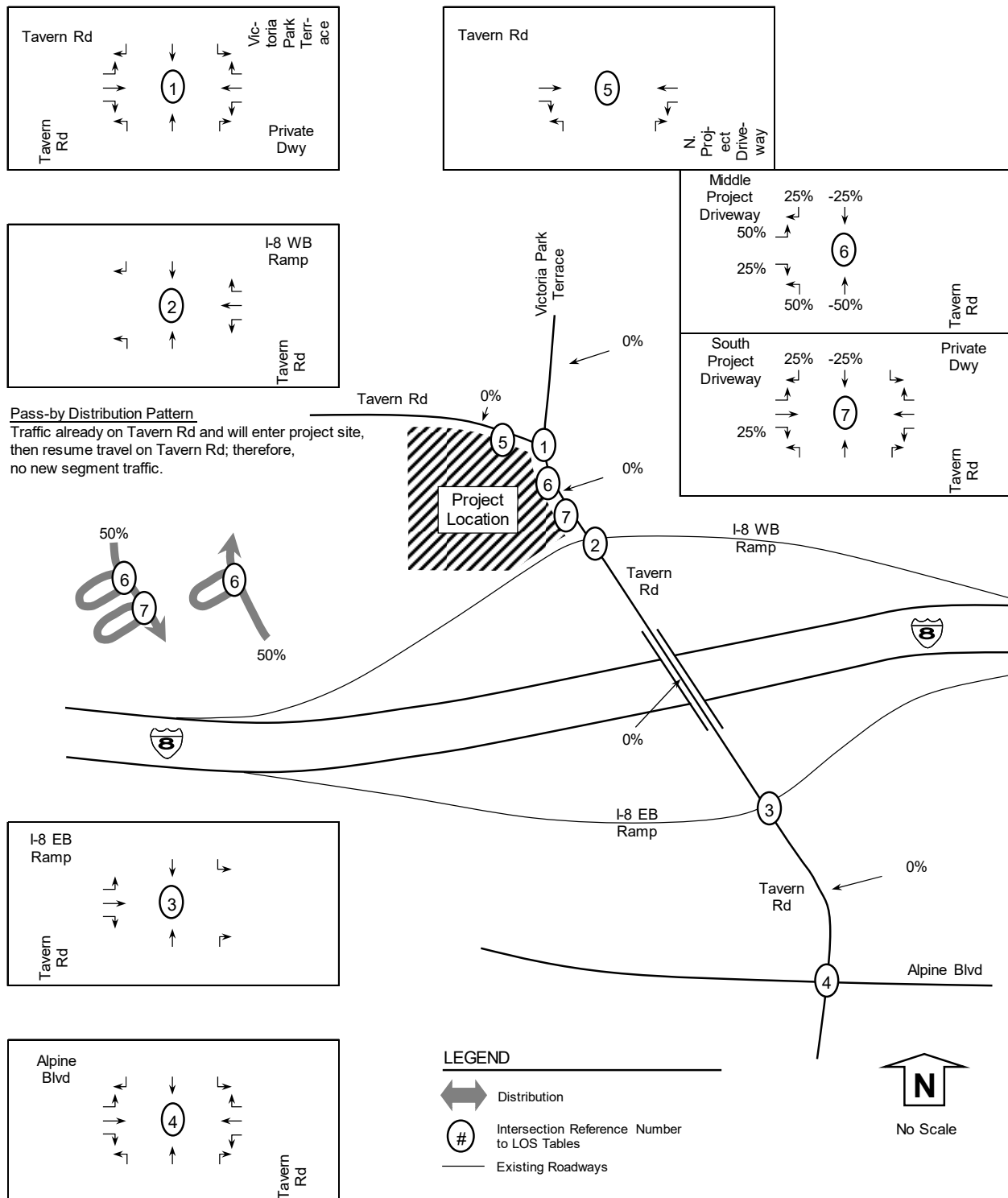


Figure 7: Pass-By Trip Assignment

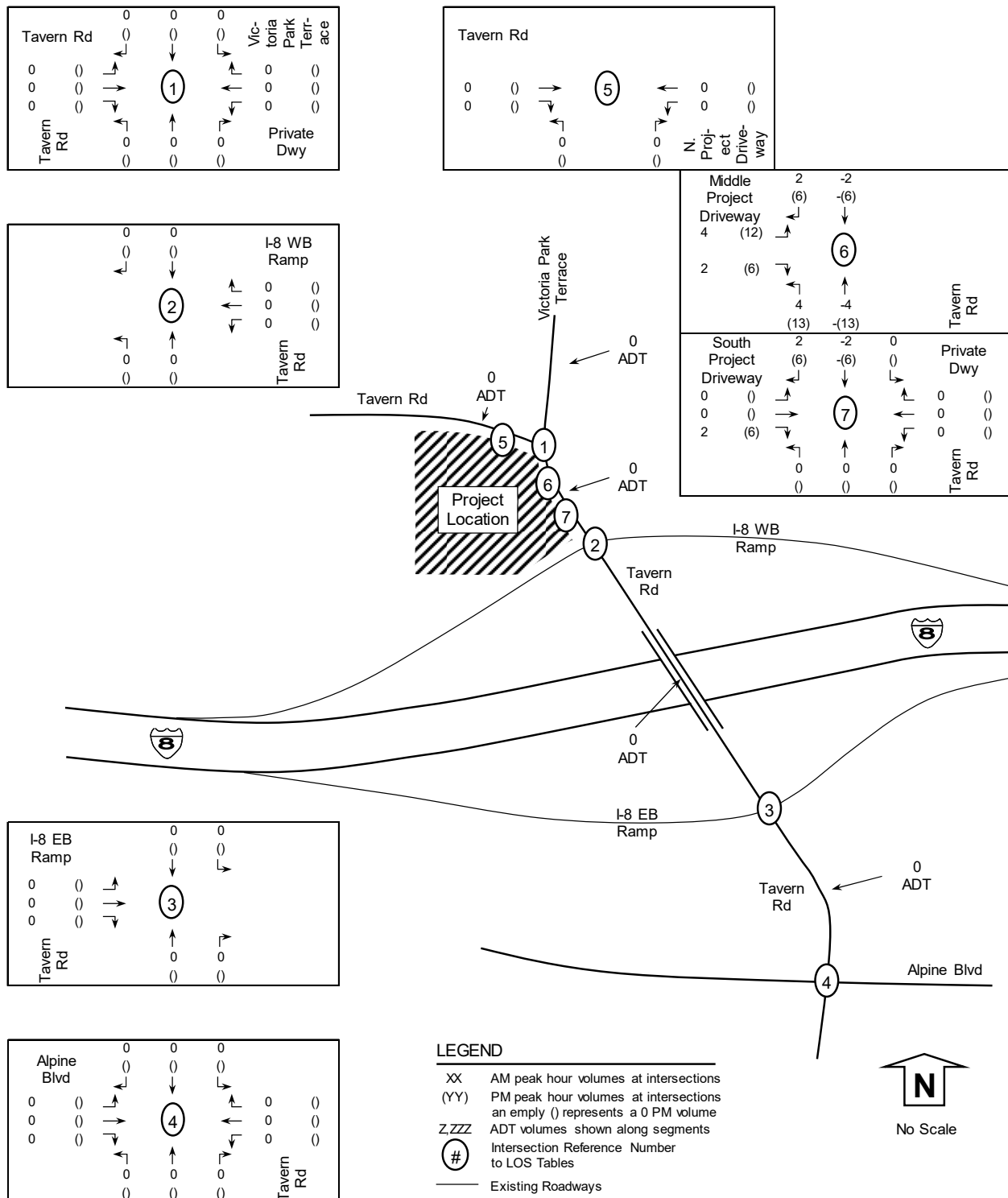
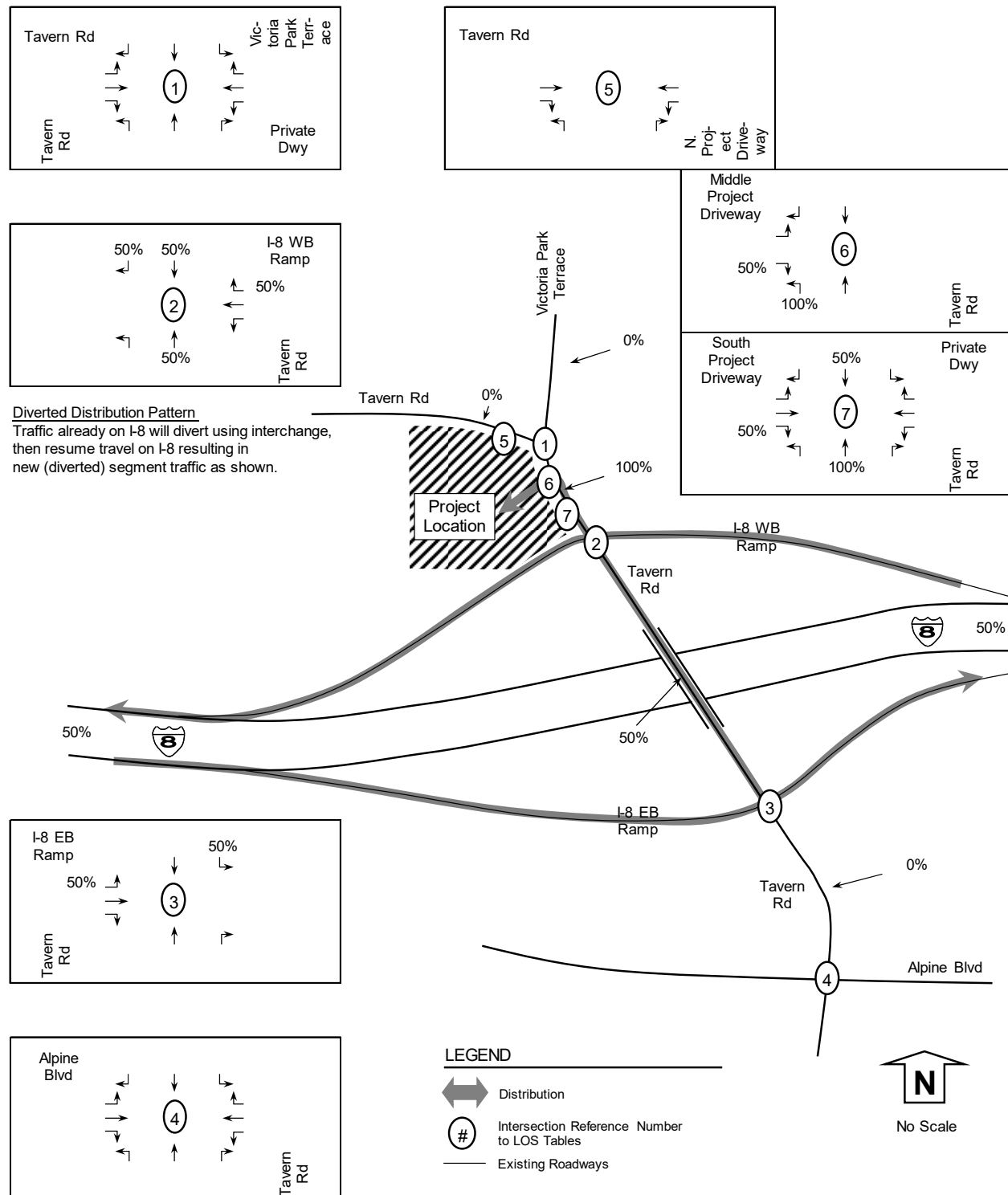


Figure 8: Diverted Distribution



The map illustrates the project location at the intersection of Tavern Rd and I-8. The project area is shaded in hatched lines. The map includes the following details:

- Intersections:** Numbered 1 through 8, representing intersection reference numbers to LOS tables.
- ADT Volumes:**
 - 0 ADT at the intersection of Tavern Rd and Victoria Park Terrace.
 - 700 ADT at the intersection of Tavern Rd and I-8 WB Ramp.
 - 350 ADT at the intersection of Tavern Rd and I-8 EB Ramp.
 - 0 ADT at the intersection of Tavern Rd and Alpine Blvd.
- Segments:** Labeled with ADT volumes: 13 (12), 13 (14), 13 (12), 13 (14), 13 (12), 13 (14), 13 (12), 13 (14).
- Legend:**
 - XX: AM peak hour volumes at intersections
 - (YY): PM peak hour volumes at intersections
 - ZZZ: ADT volumes shown along segments
 - #: Intersection Reference Number to LOS Tables
 - : Existing Roadways
- North Arrow:** Points North, with a note "No Scale".

Intersection Details:

- Intersection 1:** Tavern Rd (0 ADT) and Victoria Park Terrace (0 ADT). Volumes: 0, 0, 0, 0, 0, 0, 0, 0.
- Intersection 2:** Tavern Rd (700 ADT) and I-8 WB Ramp. Volumes: 13 (12), 13 (14), 13 (12), 13 (14).
- Intersection 3:** Tavern Rd (350 ADT) and I-8 EB Ramp. Volumes: 13 (12), 13 (14), 13 (12), 13 (14).
- Intersection 4:** Tavern Rd (0 ADT) and Alpine Blvd. Volumes: 0, 0, 0, 0, 0, 0, 0, 0.
- Intersection 5:** Tavern Rd (0 ADT) and Victoria Park Terrace. Volumes: 0, 0, 0, 0, 0, 0, 0, 0.
- Intersection 6:** Tavern Rd (700 ADT) and I-8 WB Ramp. Volumes: 13 (12), 13 (14), 13 (12), 13 (14).
- Intersection 7:** Tavern Rd (350 ADT) and I-8 EB Ramp. Volumes: 13 (12), 13 (14), 13 (12), 13 (14).
- Intersection 8:** Tavern Rd (0 ADT) and Alpine Blvd. Volumes: 0, 0, 0, 0, 0, 0, 0, 0.

Figure 10: Primary Distribution

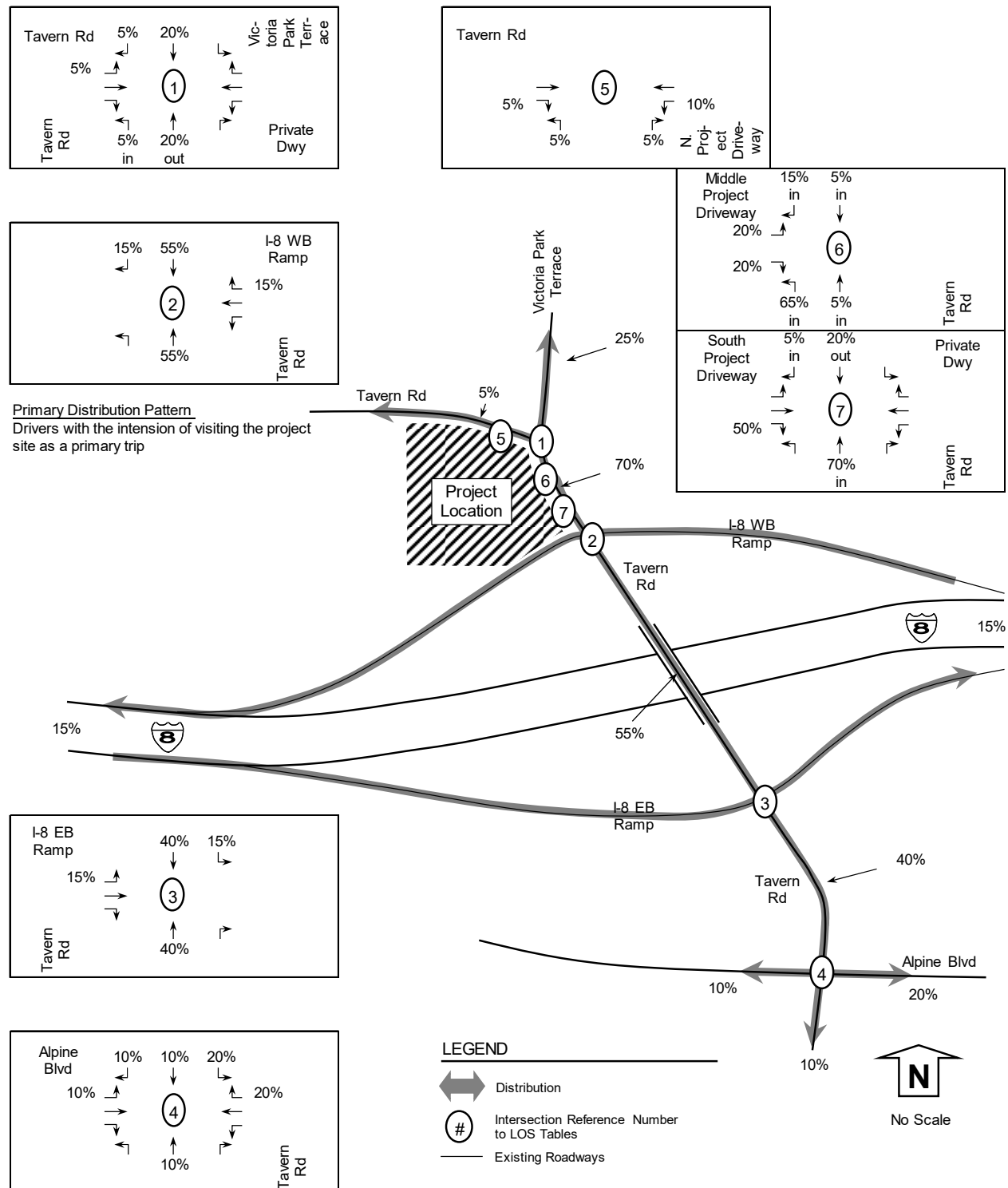
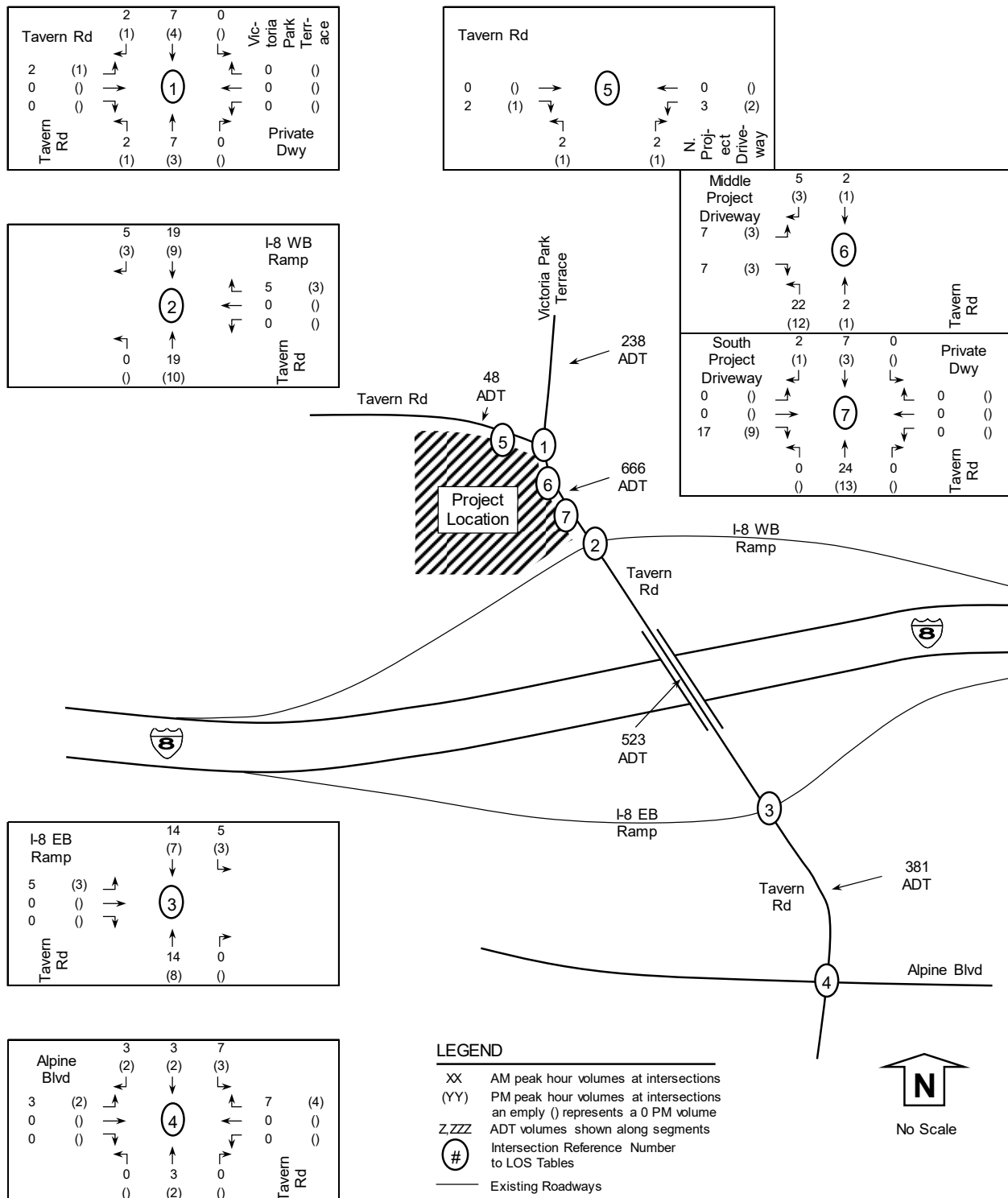


Figure 11: Primary Trip Assignment



The map illustrates the project location at the intersection of Tavern Rd and I-8. The project area is shaded in hatched lines and labeled 'Project Location'. The map shows the following intersections and associated traffic volume data:

- Intersection 1:** Tavern Rd (Northbound) and Victoria Park Terrace (Eastbound). ADT: 48.
- Intersection 2:** Tavern Rd (Southbound) and I-8 WB Ramp. ADT: 1,366.
- Intersection 3:** Tavern Rd (Southbound) and I-8 EB Ramp. ADT: 873.
- Intersection 4:** Tavern Rd (Southbound) and Alpine Blvd. ADT: 381.
- Intersection 5:** Tavern Rd (Northbound) and Private Dwy. ADT: 238.
- Intersection 6:** Middle Project Driveway (Northbound) and Private Dwy. ADT: 11.
- Intersection 7:** South Project Driveway (Northbound) and Private Dwy. ADT: 0.
- Intersection 8:** I-8 WB Ramp and I-8 EB Ramp. ADT: 0.

The map also shows the following traffic volume data (AM peak hour volumes in parentheses, PM peak hour volumes in brackets):

- Intersection 1:** Tavern Rd (Northbound) 2 (1), 0 (0), 0 (0); Victoria Park Terrace (Eastbound) 0 (0), 0 (0), 0 (0); Private Dwy 0 (0), 0 (0), 0 (0).
- Intersection 2:** Tavern Rd (Southbound) 18 (15), 32 (21), 0 (0); I-8 WB Ramp 18 (17), 0 (0), 0 (0); Tavern Rd (Northbound) 32 (24), 0 (0), 0 (0).
- Intersection 3:** Tavern Rd (Southbound) 18 (17), 0 (0), 0 (0); I-8 WB Ramp 14 (7), 18 (15), 0 (0); I-8 EB Ramp 14 (8), 0 (0), 0 (0).
- Intersection 4:** Alpine Blvd 3 (2), 0 (0), 0 (0); Tavern Rd (Southbound) 3 (2), 7 (3), 0 (0); Tavern Rd (Northbound) 3 (2), 0 (0), 0 (0).
- Intersection 5:** Tavern Rd (Northbound) 0 (0), 2 (1), 0 (0); Private Dwy 0 (0), 3 (2), 0 (0); N. Project Driveway 2 (1), 2 (1), 0 (0).
- Intersection 6:** Middle Project Driveway 7 (9), 0 (-5), 0 (0); Private Dwy 22 (21), 51 (52), -2 (-12); Tavern Rd 0 (0), 0 (0), 0 (0).
- Intersection 7:** South Project Driveway 0 (0), 0 (0), 32 (27); Private Dwy 4 (7), 18 (9), 0 (0); Tavern Rd 0 (0), 49 (40), 0 (0).

LEGEND

- XX AM peak hour volumes at intersections
- (YY) PM peak hour volumes at intersections
- an empty () represents a 0 PM volume
- Z.ZZZ ADT volumes shown along segments
- # Intersection Reference Number to LOS Tables
- Existing Roadways

North Arrow

No Scale

3.4 Existing + Project Conditions

This section will summarize the analysis for the addition of project traffic onto the existing background traffic for AM, PM, and daily traffic conditions. The peak hour intersection volumes and daily traffic volumes for this scenario of existing + project are shown in **Figure 13**. The LOS calculated for the intersections, street segments, and arterial operations are shown in **Tables 9, 10, and 11**, respectively.

TABLE 9: EXISTING + PROJECT INTERSECTION LEVEL OF SERVICE

Intersection and (Analysis) ¹	Movement	Study Period	Existing		Existing + Project			
			Delay ²	LOS ³	Delay ²	LOS ³	Delta ⁴	Direct Impact? ⁵
1) Tavern Road at Victoria Park T. (U)	EB LTR	AM	10.0	B	10.5	B	0.5	No
	WB LTR	AM	14.6	B	15.0	C	0.4	No
	EB LTR	PM	9.8	A	9.9	A	0.1	No
	WB LTR	PM	15.0	C	15.2	C	0.2	No
2) Tavern Road at I-8 WB Ramp (S)	All	AM	36.9	D	41.6	D	4.7	No
	All	PM	15.6	B	17.0	B	1.4	No
3) Tavern Road at I-8 EB Ramp (S)	All	AM	16.4	B	18.5	B	2.1	No
	All	PM	24.3	C	26.4	C	2.1	No
4) Tavern Road at Alpine Blvd (S)	All	AM	18.7	B	19.0	B	0.3	No
	All	PM	21.2	C	21.5	C	0.3	No
5) Tavern Road at N. Project Dwy (U)	NB LR	AM	8.8	A	8.9	A	0.1	No
	NB LR	PM	8.6	A	8.8	A	0.2	No
6) Tavern Road at Middle Proj Dwy (U)	EB LTR	AM	10.8	B	11.7	B	0.9	No
	EB LTR	PM	10.0	B	11.4	B	1.4	No
7) Tavern Road at S. Project Dwy (U)	EB R	AM	9.7	A	10.0	B	0.3	No
	EB R	PM	9.9	A	9.9	A	0.0	No

Notes: 1) Intersection Analysis - (S) Signalized, (U) Unsignalized. 2) Delay - HCM Average Control Delay in seconds. 3) LOS: Level of Service. 4) Delta is the increase in delay from project. 5) Direct Impact (yes or no).

TABLE 10: EXISTING + PROJECT SEGMENT ADT VOLUMES AND LEVEL OF SERVICE

Segment	Mobility/Non-Mobility Classification (as built)	Existing + Project										
		Existing			Project		Existing + Project					
		LOS E	Daily		Daily	Daily	Change		Direct			
		Capacity	Volume	V/C	LOS	Volume	Volume	V/C	LOS	in V/C	Impact?	
<u>Tavern Road</u>												
Immediately West of Victoria	Major 4.1A (2.2F)	9,700	1,115	0.115	A	48	1,163	0.120	A	0.005	No	
Victoria to I-8 WB Ramp	Major 4.1A (2.2C)	19,000	7,010	0.369	C	1,366	8,376	0.441	C	0.072	No	
I-8 WB Ramp to I-8 EB Ramp	Major 4.1A (2.2C)	19,000	13,335	0.702	D	873	14,208	0.748	E	0.046	No*	
I-8 EB Ramp to Alpine Blvd	Major 4.1A (2.2B)	19,000	20,652	1.087	F	381	21,033	1.107	F	0.020	No*	
<u>Victoria Park Terrace</u>												
Immediately North of Tavern Rd	Light Coll. 2.2A (2.2B)	19,000	4,890	0.257	B	238	5,128	0.270	B	0.013	No	

Notes: Daily volume is a 24 hour volume. LOS: Level of Service. V/C: Volume to Capacity Ratio. *Not considered an impact because arterial analysis shows acceptable LOS.



Figure 13: Existing + Project Volumes

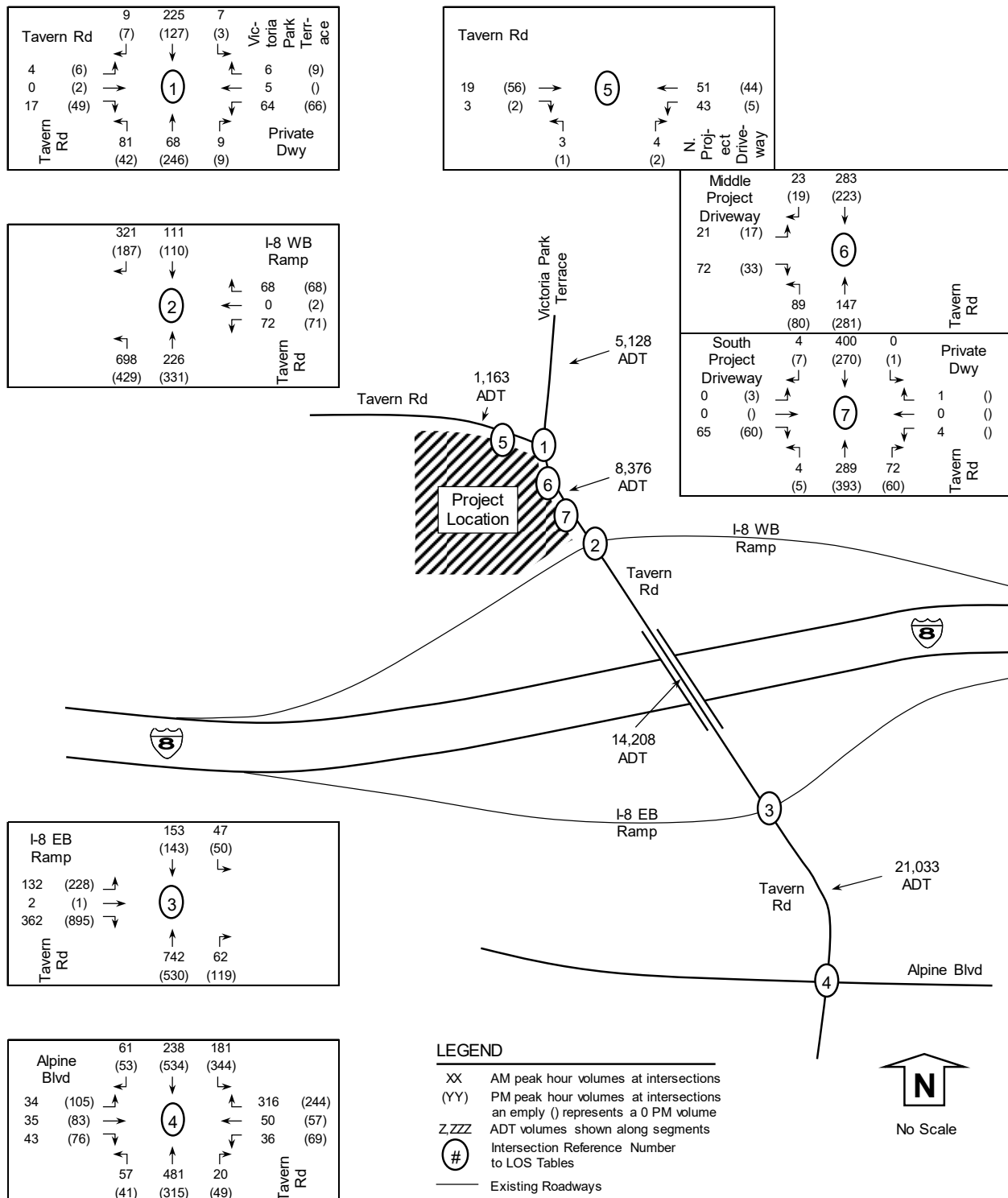


TABLE 11: EXISTING + PROJECT ARTERIAL SPEEDS AND LEVEL OF SERVICE

Arterial and Extent	Peak Period	Direction	Existing Speed (MPH)	Existing LOS	Existing + Project Speed (MPH)	Existing + Project LOS	Change in Speed	Project Impact?
<u>Tavern Road</u>								
From Alpine Blvd to I-8 WB Ramp	AM	NB	16.7	D	16.0	D	-0.7	No
		SB	15.0	D	14.7	D	-0.3	No
From Alpine Blvd to I-8 WB Ramp	PM	NB	14.8	D	14.7	D	-0.1	No
		SB	14.4	D	14.2	D	-0.2	No

Notes: MPH-Miles Per Hour. LOS-Level of Service. Project impact only when operations are at LOS E/F and project reduces speed by more than 1 MPH (SANTEC/ITE Guidelines for San Diego Region).

Under existing + project conditions, all study elements were calculated to operate at LOS D or better except for the segment of Tavern Road between I-8 WB ramp and I-8 EB ramp (LOS E on a daily basis) and I-8 WB ramp and Alpine Blvd (LOS F on a daily basis); however, the more detailed arterial analysis of these segments shows acceptable levels of operation (LOS D). Additionally, the intersections along this segment are operating at LOS D or better. Therefore, the project is not considered to have a segment because the intersection and arterial operations show acceptable LOS. LOS and arterial calculations are included in **Appendix G**.

3.5 Ramps

The adjacent freeway on-ramps are not metered; therefore, an on-ramp meter analysis is not provided.

3.6 Congestion Management Program

The San Diego Association of Governments (SANDAG) has the following statement on their website regarding the Congestion Management Program (CMP) - details included in Appendix A:

“In October 2009, the San Diego region elected to be exempt from the State CMP and, since this decision, SANDAG has been abiding by 23 CFR 450.320 to ensure the region’s continued compliance with the federal congestion management process.”

3.7 Hazards Due To An Existing Transportation Design Feature

Project has frontage on Tavern Road. Any required improvements will be constructed to maintain existing conditions as it relates to existing design features.

3.8 Hazards To Pedestrians or Bicyclists

Project has frontage on Tavern Road. Any required improvements will be constructed to maintain existing conditions as it relates to pedestrian and bicyclists.



3.9 Public Transportation

The Metropolitan Transit System shows Bus Route 864 along Alpine Blvd south of I-8 and 888 along I-8 and Tavern Road south of I-8 in the vicinity of the project site (map within Appendix E).

3.10 Impact Summary Table

The project is calculated to have no direct impacts and the potential for cumulative impacts as summarized in **Table 12**.

TABLE 12: IMPACT SUMMARY TABLE

Roadway Facility	Direct Impacts	Cumulative Impacts
Intersections	0	Potential
Segments	0 (based on more detailed arterial analysis*)	Potential

Note: To mitigate potential cumulative impacts, the County has established a Traffic Impact Fee (TIF) program. *An initial segment impact was calculated on two segments of Tavern Road (from I-8 WB ramp to I-8 EB ramp and from I-8 EB Ramp to Alpine Blvd); however, a more detailed arterial analysis of these segments shows acceptable levels of operation (LOS D). Additionally, the intersections along this segment are operating at LOS D or better. Therefore, the project is not considered to have a segment because the intersection and arterial operations show acceptable LOS.

4.0 General Plan Consistency and Build-out Analysis

The project use is consistent with the existing general plan. The project applicant does not propose a General Plan Amendment, Specific Plan Amendment, or Rezone. Therefore, a build-out analysis is not required.

5.0 Summary of Recommended Mitigation Measures

The project is calculated to have no direct impacts; however, the project may contribute to potential cumulative impacts.

5.1 Cumulative Impacts

Because the proposed project is located within the Alpine TIF area, the project applicant would pay into the TIF program to mitigate any potential cumulative impacts. The County of San Diego has developed an overall programmatic solution that addresses existing and projected future road deficiencies in the unincorporated portion of San Diego County. This program includes the adoption of a TIF program to fund improvements to roadways necessary to mitigate potential



cumulative impacts caused by traffic from future development. Based on SANDAG regional growth and land use forecasts, the SANDAG Regional Transportation Model was utilized to analyze projected build-out development conditions on the existing mobility element roadway network throughout the unincorporated area of the County. Based on the results of the traffic modeling, funding necessary to construct transportation facilities that will mitigate cumulative impacts from new development was identified. Existing roadway deficiencies will be corrected through improvement project funded by other public funding sources, such as TransNet, gas tax, and grants. Potential cumulative impacts to the region's freeways have been addressed in SANDAG's Regional Transportation Plan (RTP). This plan, which considers freeway build-out over the next 30 years, will use funds from TransNET, state, and federal funding to improve freeways to projected level of service objectives in the RTP.

The proposed project is calculated to generate 951 primary daily trips. These trips will be distributed on mobility element roadways in the County that were analyzed by the TIF program, some of which currently are projected to operate at inadequate levels of service. These project trips therefore contribute to a potential significant cumulative impact and mitigation is required. The potential growth represented by this project was included in the growth projections upon which the TIF project is based. The TIF cost is based on the year when building permits are pulled and type of building permit.

5.2 Summary of Impacts, Mitigation, and Project Improvements

The project is calculated to have no direct impacts and potential cumulative impacts. A summary of project impacts and proposed mitigation is shown in **Table 13**.

TABLE 13: SUMMARY OF PROJECT IMPACTS AND MITIGATION

Roadway Facility	Direct Impacts (Proposed Mitigation)	Cumulative Impacts (Proposed Mitigation)
Intersections	0 (no mitigation required)	Potential (TIF)
Segments	0 (based on more detailed arterial analysis*) (no mitigation required)	Potential (TIF)

Note: To mitigate potential cumulative impacts, the County has established a Traffic Impact Fee (TIF) program. *An initial segment impact was calculated on two segments of Tavern Road (from I-8 WB ramp to I-8 EB ramp and from I-8 EB Ramp to Alpine Blvd); however, a more detailed arterial analysis of these segments shows acceptable levels of operation (LOS D). Additionally, the intersections along this segment are operating at LOS D or better. Therefore, the project is not considered to have a segment because the intersection and arterial operations show acceptable LOS.



6.0 References

County of San Diego. August 24, 2011. *Guidelines for Determining Significance and Report Format and Content Requirements Traffic and Transportation*. Print.

San Diego Association of Governments (SANDAG). April 2002. *Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region*. Print.

Trafficware Corporation, 2017. Synchro 10.0 computer software. CD ROM.

Transportation Research Board National Research Council Washington, D.C. 2010. *Highway Capacity Manual 2010*. CD ROM.

7.0 List of Preparers and Persons and Organizations Contacted

7.1 List of Preparers

Justin Rasas, P.E. (RCE 60690), LOS Engineering, Inc. Author

7.2 Organizations Contacted

Applicant/Owner, Tony Shores

CALTRANS, Saiid Noroozi

Counts Unlimited, Kris Campos

ZAAP Architecture + Planning, John Ziebarth and Tom Sheehan



Appendix A

Congestion Management Program SANDAG Position



**BOARD OF DIRECTORS
OCTOBER 23, 2009**

**AGENDA ITEM NO. 09-10-6
ACTION REQUESTED – INFORMATION**

CONGESTION MANAGEMENT PROGRAM PROCESS

File Number 3100400

Introduction

SANDAG, as the Congestion Management Agency (CMA), is required by state law to prepare and regularly update a Congestion Management Program (CMP) for the San Diego region. The last CMP update was adopted by SANDAG in November 2008. On May 8, 2009, the Board of Directors directed staff to work with local jurisdictions that wished to prepare resolutions electing to opt out of the state CMP. A majority of the jurisdictions representing a majority of the population have adopted resolutions electing to be exempt from the state CMP. This informational report also was presented at the October 16, 2009, Transportation Committee meeting.

Discussion

The purposes of the CMP are to monitor the performance of the transportation system, develop programs to address near-term and long-term congestion, and better integrate transportation and land use planning. SANDAG staff evaluated options for future direction of the CMP and discussed these options at multiple meetings of the Cities/County Transportation Advisory Committee and the Regional Planning Technical Working Group. One option was to streamline the SANDAG CMP process and the other was to opt out of the state CMP process. As previously stated, at its May 8, 2009, meeting, the Board of Directors discussed these options and voted to direct staff to work with local jurisdictions that wished to prepare resolutions electing to opt out of the state CMP.

Assembly Bill (AB) 2419, passed in 1996, allows congestion management agencies to “opt out” of the state CMP process. Section 65088.3 of the California Government Code states *“This chapter does not apply in a county in which a majority of local governments, collectively comprised of the city councils and the county board of supervisors, which in total also represent a majority of the population in the county, each adopt resolutions electing to be exempt from the congestion management program.”* Over the past few months 14 out of the 19 local jurisdictions, representing a majority of the population in San Diego County have adopted resolutions electing to be exempt from the state CMP process. The local jurisdictions that adopted resolutions include: Carlsbad, Chula Vista, El Cajon, Escondido, Imperial Beach, La Mesa, Lemon Grove, National City, Oceanside, Poway, City of San Diego, County of San Diego, San Marcos, and Santee.

SANDAG will continue to meet the federal congestion management provisions through existing SANDAG planning and performance monitoring activities, such as the Regional Transportation Plan (RTP) and other multimodal performance monitoring efforts. Federal congestion management provisions are more flexible and utilize the RTP as the primary tool to provide solutions for congestion. The RTP includes identification and evaluation of anticipated performance and expected benefits of appropriate congestion management strategies (demand management, operational improvements, transit improvements, systems management improvements, etc.).

Additionally, appropriate analysis of multimodal strategies and alternatives for corridors is required when an increase in single occupancy vehicle capacity is proposed.

Next Steps

SANDAG staff will notify the California Transportation Commission and State Controller of the region's decision to elect to be exempt from the state CMP.

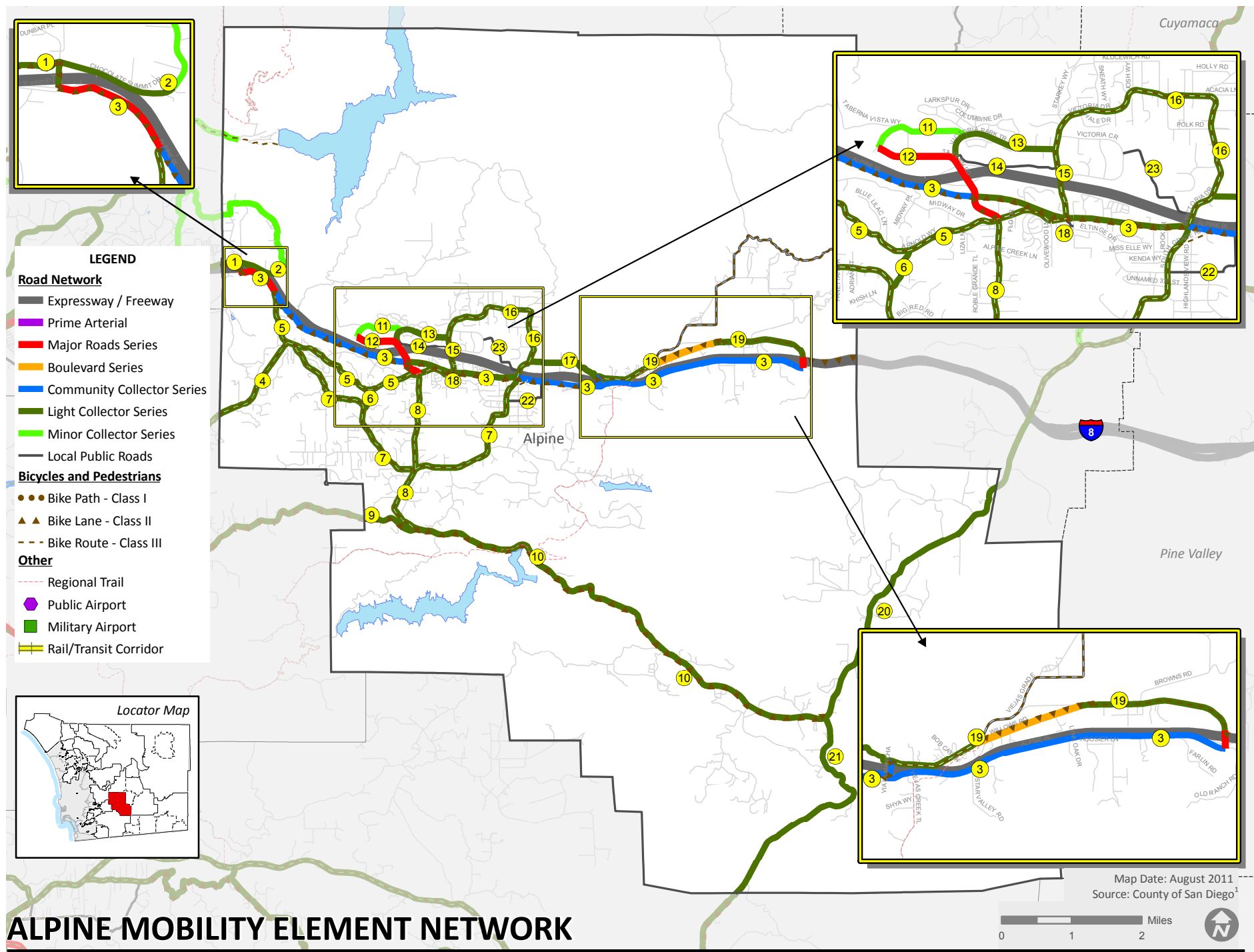
GARY L. GALLEGOS
Executive Director

Key Staff Contact: Heather Werdick, (619) 699-6967, hwe@sandag.org

Funds are budgeted in Work Element #3100400

Appendix B

County of San Diego Mobility Element Excerpts





Mobility Element Network—Alpine Community Planning Area Matrix			
ID ^a	Road Segment	Designation/Improvement #.X = [# of lanes].[roadway classification][improvement]	Special Circumstances
10	Japatul Road (SF 1401.1) <u>Segment:</u> Tavern Road to Japatul Valley Road	2.2F Light Collector Reduced Shoulder	Improvement Option Reduce shoulder width to six feet for use as a bike lane (requires parking prohibition)
11	New Road 11 <u>Segment:</u> Victoria Park Terrace to Tavern Lane	2.3A Minor Collector Raised Median	None
12	Tavern Lane <u>Segment:</u> New Road 11 to Tavern Road	4.1A Major Road Median [Continuous Left Turn Lane]	None
13	Victoria Park Terrace (SC 1985) <u>Segment:</u> Tavern Road (at Tavern Lane) to West Victoria Drive	2.2A Light Collector Raised Median	None
14	New Road 14 <u>Segment:</u> Tavern Road (at Tavern Lane) to West Victoria Drive	Local Public Road	None
15	West Victoria Drive (SC 1990) <u>Segment:</u> Alpine Boulevard to Victoria Park Terrace	2.2E Light Collector	Shoulder as Parking Lane Separate Bike Lane required—Interstate 8 to Alpine Boulevard
16	North / East Victoria Drive (SC 1990) <u>Segment:</u> Victoria Park Terrace to South Grade Road	2.2F Light Collector Reduced Shoulder—Victoria Park Terrace to Otto Avenue 2.2C Light Collector Intermittent Turn Lanes—Otto Avenue to South Grade Road	Improvement Option <u>Segment:</u> Victoria Park Terrace to Otto Avenue—Reduce shoulder width to six feet for use as a bike lane (requires parking prohibition)
17	Otto Avenue <u>Segment:</u> East Victoria Road to West Willows Road	2.2C Light Collector Intermittent Turn Lanes	None

Appendix C

Count Data and Signal Timing Sheets



PO Box 1178
Corona, CA 92878
951-268-6268

Location: County of San Diego
N/S: Tavern Road/Victoria Park
E/W: Tavern Road

Date: 11/14/2017
Day: TUESDAY
Project # 143-17788

TURNING MOVEMENT COUNT

	Tavern Road/Victoria Park Northbound			Tavern Road/Victoria Park Southbound			Tavern Road Eastbound			Tavern Road Westbound			TOTAL
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
7:00 AM	17	20	3	2	66	4	1	0	4	21	1	2	141
7:15 AM	18	12	3	3	50	0	0	0	8	17	1	0	112
7:30 AM	22	13	1	1	51	1	0	0	1	14	1	2	107
7:45 AM	22	16	2	1	51	2	1	0	4	12	2	2	115
8:00 AM	11	18	0	2	42	5	0	0	5	18	2	1	104
8:15 AM	7	18	2	0	56	8	1	0	4	14	0	1	111
8:30 AM	12	28	0	0	54	1	0	0	4	11	0	1	111
8:45 AM	16	27	2	1	57	2	0	0	3	14	0	1	123
TOTAL VOLUMES:	125	152	13	10	427	23	3	0	33	121	7	10	924

AM Peak Hr Begins at: 700 AM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	79	61	9	7	218	7	2	0	17	64	5	6	475

PEAK HR FACTOR:	0.931	0.806	0.594	0.781	0.842
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	Tavern Road/Victoria Park Northbound			Tavern Road/Victoria Park Southbound			Tavern Road Eastbound			Tavern Road Westbound			TOTAL
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
4:00 PM	7	60	2	0	31	1	2	0	8	16	0	0	127
4:15 PM	6	61	3	0	28	1	0	0	8	11	0	2	120
4:30 PM	9	69	3	1	34	1	2	1	6	17	0	3	146
4:45 PM	12	58	4	2	30	2	0	1	12	12	0	4	137
5:00 PM	10	46	2	0	35	1	3	0	20	19	0	1	137
5:15 PM	10	70	0	0	24	2	0	0	11	18	0	1	136
5:30 PM	5	40	0	0	18	2	2	1	2	12	0	2	84
5:45 PM	4	39	2	2	20	3	1	0	6	13	0	3	93
TOTAL VOLUMES:	63	443	16	5	220	13	10	3	73	118	0	16	980

PM Peak Hr Begins at: 430 PM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	41	243	9	3	123	6	5	2	49	66	0	9	556

PEAK HR FACTOR:	0.904	0.917	0.609	0.938	0.952
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PO Box 1178
Corona, CA 92878
951-268-6268

Location: County of San Diego
N/S: Tavern Road
E/W: I-8 Westbound Ramps

Date: 11/14/2017
Day: TUESDAY
Project # 143-17788

TURNING MOVEMENT COUNT

	Tavern Road Northbound			Tavern Road Southbound			I-8 Westbound Ramps Eastbound			I-8 Westbound Ramps Westbound			TOTAL
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
7:00 AM	173	50	0	0	12	92	0	0	0	11	0	11	349
7:15 AM	203	43	0	0	23	73	0	0	0	22	0	16	380
7:30 AM	162	47	0	0	19	75	0	0	0	17	0	13	333
7:45 AM	160	54	0	0	25	63	0	0	0	22	0	10	334
8:00 AM	142	41	0	0	24	49	0	0	0	12	0	7	275
8:15 AM	156	32	0	0	23	67	0	0	0	22	1	16	317
8:30 AM	139	53	0	0	27	60	0	0	0	25	1	10	315
8:45 AM	156	52	0	0	25	74	0	0	0	19	0	18	344
TOTAL VOLUMES:	1291	372	0	0	178	553	0	0	0	150	2	101	2647

AM Peak Hr Begins at: 700 AM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	698	194	0	0	79	303	0	0	0	72	0	50	1396

PEAK HR FACTOR:	0.907	0.918	0.000	0.803	0.918
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	Tavern Road Northbound			Tavern Road Southbound			I-8 Westbound Ramps Eastbound			I-8 Westbound Ramps Westbound			TOTAL
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
4:00 PM	104	70	0	0	28	33	0	0	0	17	0	13	265
4:15 PM	117	79	0	0	14	43	0	0	0	24	0	11	288
4:30 PM	102	83	0	0	22	40	0	0	0	18	0	12	277
4:45 PM	103	76	0	0	21	43	0	0	0	15	1	11	270
5:00 PM	107	69	0	0	32	46	0	0	0	14	1	17	286
5:15 PM	106	83	0	0	26	32	0	0	0	13	0	14	274
5:30 PM	105	63	0	0	15	35	0	0	0	23	0	8	249
5:45 PM	96	55	0	0	20	28	0	0	0	14	0	8	221
TOTAL VOLUMES:	840	578	0	0	178	300	0	0	0	138	2	94	2130

PM Peak Hr Begins at: 415 PM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	429	307	0	0	89	172	0	0	0	71	2	51	1121

PEAK HR FACTOR:	0.939	0.837	0.000	0.886	0.973
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PO Box 1178
Corona, CA 92878
951-268-6268

Location: County of San Diego
N/S: Tavern Road
E/W: I-8 Eastbound Ramps

Date: 11/14/2017
Day: TUESDAY
Project # 143-17788

TURNING MOVEMENT COUNT

	Tavern Road Northbound			Tavern Road Southbound			I-8 Eastbound Ramps Eastbound			I-8 Eastbound Ramps Westbound			TOTAL
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
7:00 AM	0	198	7	2	21	0	25	0	80	0	0	0	333
7:15 AM	0	217	18	9	36	0	25	1	82	0	0	0	388
7:30 AM	0	181	24	4	35	0	30	0	68	0	0	0	342
7:45 AM	0	168	9	11	39	0	34	1	111	0	0	0	373
8:00 AM	0	162	11	5	29	0	25	0	101	0	0	0	333
8:15 AM	0	163	11	2	38	0	20	0	93	0	0	0	327
8:30 AM	0	172	17	14	39	0	28	1	95	0	0	0	366
8:45 AM	0	171	22	5	42	0	33	0	94	0	0	0	367
TOTAL VOLUMES:	0	1432	119	52	279	0	220	3	724	0	0	0	2829

AM Peak Hr Begins at: 715 AM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	728	62	29	139	0	114	2	362	0	0	0	1436

PEAK HR FACTOR:	0.840	0.840	0.818	0.000	0.925
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	Tavern Road Northbound			Tavern Road Southbound			I-8 Eastbound Ramps Eastbound			I-8 Eastbound Ramps Westbound			TOTAL
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
4:00 PM	0	128	29	11	34	0	50	1	197	0	0	0	450
4:15 PM	0	145	24	6	31	0	57	0	194	0	0	0	457
4:30 PM	0	134	22	8	33	0	55	0	231	0	0	0	483
4:45 PM	0	122	29	7	30	0	58	0	249	0	0	0	495
5:00 PM	0	138	33	10	41	0	35	0	204	0	0	0	461
5:15 PM	0	128	35	10	32	0	63	1	211	0	0	0	480
5:30 PM	0	123	38	5	29	0	47	0	217	0	0	0	459
5:45 PM	0	115	25	5	34	0	37	0	203	0	0	0	419
TOTAL VOLUMES:	0	1033	235	62	264	0	402	2	1706	0	0	0	3704

PM Peak Hr Begins at: 430 PM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	522	119	35	136	0	211	1	895	0	0	0	1919

PEAK HR FACTOR:	0.937	0.838	0.901	0.000	0.969
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PO Box 1178
Corona, CA 92878
951-268-6268

Location: County of San Diego
N/S: Tavern Road
E/W: Alpine Boulevard

Date: 11/14/2017
Day: TUESDAY
Project # 143-17788

TURNING MOVEMENT COUNT

	Tavern Road Northbound			Tavern Road Southbound			Alpine Boulevard Eastbound			Alpine Boulevard Westbound			TOTAL
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
7:00 AM	14	119	3	37	53	5	4	7	9	7	11	79	348
7:15 AM	20	147	4	28	55	10	8	12	12	13	14	68	391
7:30 AM	10	114	7	40	65	17	11	10	11	7	12	72	376
7:45 AM	13	98	6	69	62	26	8	6	11	9	13	90	411
8:00 AM	11	89	4	32	56	11	2	6	8	3	10	57	289
8:15 AM	18	95	7	46	63	17	13	10	10	9	16	41	345
8:30 AM	14	99	11	49	63	17	8	15	15	16	27	57	391
8:45 AM	11	80	15	35	55	12	19	20	8	14	30	70	369
TOTAL VOLUMES:	111	841	57	336	472	115	73	86	84	78	133	534	2920

AM Peak Hr Begins at: 700 AM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	57	478	20	174	235	58	31	35	43	36	50	309	1526

PEAK HR FACTOR:	0.811	0.744	0.852	0.882	0.928
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	Tavern Road Northbound			Tavern Road Southbound			Alpine Boulevard Eastbound			Alpine Boulevard Westbound			TOTAL
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
4:00 PM	15	67	12	77	133	12	18	24	13	25	17	61	474
4:15 PM	6	72	10	76	111	5	18	17	12	20	14	61	422
4:30 PM	15	75	10	83	131	15	14	16	16	16	17	59	467
4:45 PM	9	68	9	99	133	14	22	21	19	18	11	61	484
5:00 PM	8	73	11	78	137	16	44	22	23	14	17	69	512
5:15 PM	9	97	19	81	131	6	23	24	18	21	12	51	492
5:30 PM	7	80	16	88	106	5	15	21	13	22	14	60	447
5:45 PM	9	72	15	87	131	8	8	12	13	17	20	48	440
TOTAL VOLUMES:	78	604	102	669	1013	81	162	157	127	153	122	470	3738

PM Peak Hr Begins at: 430 PM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	41	313	49	341	532	51	103	83	76	69	57	240	1955

PEAK HR FACTOR:	0.806	0.939	0.736	0.915	0.955
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PO Box 1178
Corona, CA 92878
951-268-6268

Location: County of San Diego
N/S: Driveway
E/W: Tavern Road

Date: 11/14/2017
Day: TUESDAY
Project # 143-17788

TURNING MOVEMENT COUNT

	Driveway Northbound			Driveway Southbound			Tavern Road Eastbound			Tavern Road Westbound			TOTAL
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
7:00 AM	0	0	0	0	0	0	0	0	0	7	0	0	7
7:15 AM	0	0	2	0	0	0	0	0	0	11	0	0	13
7:30 AM	0	0	0	0	0	0	0	0	1	12	0	0	13
7:45 AM	1	0	0	0	0	0	0	0	0	10	0	0	11
8:00 AM	0	0	0	0	0	0	0	0	0	7	0	0	7
8:15 AM	0	0	0	0	0	0	0	0	0	11	0	0	11
8:30 AM	0	0	1	0	0	0	0	0	0	6	0	0	7
8:45 AM	0	0	0	0	0	0	0	0	0	9	0	0	9
TOTAL VOLUMES:	1	0	3	0	0	0	0	0	1	73	0	0	78

AM Peak Hr Begins at: 715 AM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	1	0	2	0	0	0	0	0	1	40	0	0	44

PEAK HR FACTOR:	0.375	0.000	0.250	0.833	0.846
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	Driveway Northbound			Driveway Southbound			Tavern Road Eastbound			Tavern Road Westbound			TOTAL
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
4:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	1
4:15 PM	0	0	0	0	0	0	0	0	1	0	0	0	1
4:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	1
4:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	1
5:00 PM	0	0	1	0	0	0	0	0	1	0	0	0	2
5:15 PM	0	0	0	0	0	0	0	0	0	1	0	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	1
TOTAL VOLUMES:	0	0	1	0	0	0	0	0	2	5	0	0	8

PM Peak Hr Begins at: 430 PM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	0	1	0	0	0	0	0	1	3	0	0	5

PEAK HR FACTOR:	0.250	0.000	0.250	0.750	0.625
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PO Box 1178
Corona, CA 92878
951-268-6268

Location: County of San Diego
N/S: Tavern Road
E/W: Middle Driveway

Date: 11/14/2017
Day: TUESDAY
Project # 143-17788

TURNING MOVEMENT COUNT

	Tavern Road Northbound			Tavern Road Southbound			Middle Driveway Eastbound			Middle Driveway Westbound			TOTAL
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
7:00 AM	9	0	0	0	0	2	3	0	5	0	0	0	19
7:15 AM	6	0	0	0	0	1	0	0	7	0	0	0	14
7:30 AM	7	0	0	0	0	0	0	0	6	0	0	0	13
7:45 AM	9	0	0	0	0	1	1	0	16	0	0	0	27
8:00 AM	9	0	0	0	0	1	0	0	8	0	0	0	18
8:15 AM	9	0	0	0	0	5	3	0	13	0	0	0	30
8:30 AM	12	0	0	0	0	6	1	0	16	0	0	0	35
8:45 AM	8	0	0	0	0	4	6	0	13	0	0	0	31
TOTAL VOLUMES:	69	0	0	0	0	20	14	0	84	0	0	0	187

AM Peak Hr Begins at: 800 AM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	38	0	0	0	0	16	10	0	50	0	0	0	114

PEAK HR FACTOR:	0.792	0.667	0.789	0.000	0.814
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	Tavern Road Northbound			Tavern Road Southbound			Middle Driveway Eastbound			Middle Driveway Westbound			TOTAL
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
4:00 PM	6	0	0	0	0	5	5	0	2	0	0	0	18
4:15 PM	4	0	0	0	0	4	1	0	5	0	0	0	14
4:30 PM	6	0	0	0	0	3	0	0	2	0	0	0	11
4:45 PM	4	0	0	0	0	1	0	0	2	0	0	0	7
5:00 PM	14	0	0	0	0	2	1	0	3	0	0	0	20
5:15 PM	3	0	0	0	0	0	2	0	3	0	0	0	8
5:30 PM	8	0	0	0	0	0	1	0	3	0	0	0	12
5:45 PM	6	0	0	0	0	0	1	0	2	0	0	0	9
TOTAL VOLUMES:	51	0	0	0	0	15	11	0	22	0	0	0	99

PM Peak Hr Begins at: 415 PM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	28	0	0	0	0	10	2	0	12	0	0	0	52

PEAK HR FACTOR:	0.500	0.625	0.583	0.000	0.650
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PO Box 1178
Corona, CA 92878
951-268-6268

Location: County of San Diego
N/S: Tavern Road
E/W: South Driveway

Date: 11/14/2017
Day: TUESDAY
Project # 143-17788

TURNING MOVEMENT COUNT

	Tavern Road Northbound			Tavern Road Southbound			South Driveway Eastbound			South Driveway Westbound			TOTAL
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
7:00 AM	1	0	19	0	0	0	0	0	6	0	0	0	26
7:15 AM	1	0	21	0	0	0	0	0	6	2	0	0	30
7:30 AM	0	0	15	0	0	0	0	0	13	1	0	1	30
7:45 AM	2	0	17	0	0	0	0	0	7	1	0	0	27
8:00 AM	1	0	10	0	0	0	0	0	4	0	0	0	15
8:15 AM	2	0	15	1	0	0	0	0	9	2	0	0	29
8:30 AM	1	0	9	0	0	0	0	0	4	0	0	0	14
8:45 AM	1	0	20	0	0	0	1	0	12	2	0	1	37
TOTAL VOLUMES:	9	0	126	1	0	0	1	0	61	8	0	2	208

AM Peak Hr Begins at: 700 AM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	4	0	72	0	0	0	0	0	32	4	0	1	113

PEAK HR FACTOR:	0.864	0.000	0.615	0.625	0.942
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	Tavern Road Northbound			Tavern Road Southbound			South Driveway Eastbound			South Driveway Westbound			TOTAL
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
4:00 PM	4	0	11	0	0	0	1	0	5	0	0	0	21
4:15 PM	0	0	19	0	0	0	1	0	7	2	0	0	29
4:30 PM	1	0	11	0	0	0	0	0	7	1	0	1	21
4:45 PM	1	0	11	0	0	1	1	0	6	1	0	2	23
5:00 PM	1	0	16	1	0	0	1	0	8	0	0	0	27
5:15 PM	2	0	17	0	0	0	1	0	7	0	0	0	27
5:30 PM	1	0	15	0	0	0	0	0	9	0	0	0	25
5:45 PM	1	0	12	0	0	0	1	0	9	0	0	0	23
TOTAL VOLUMES:	11	0	112	1	0	1	6	0	58	4	0	3	196

PM Peak Hr Begins at: 500 PM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	5	0	60	1	0	0	3	0	33	0	0	0	102

PEAK HR FACTOR:	0.855	0.250	0.900	0.000	0.944
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County of San Diego
Tavern Road
B/ Interstate 8 Eastbound - Alpine Boulevard

File Name 004
Site Code: 143-17788
24 Hour Directional Volume Count

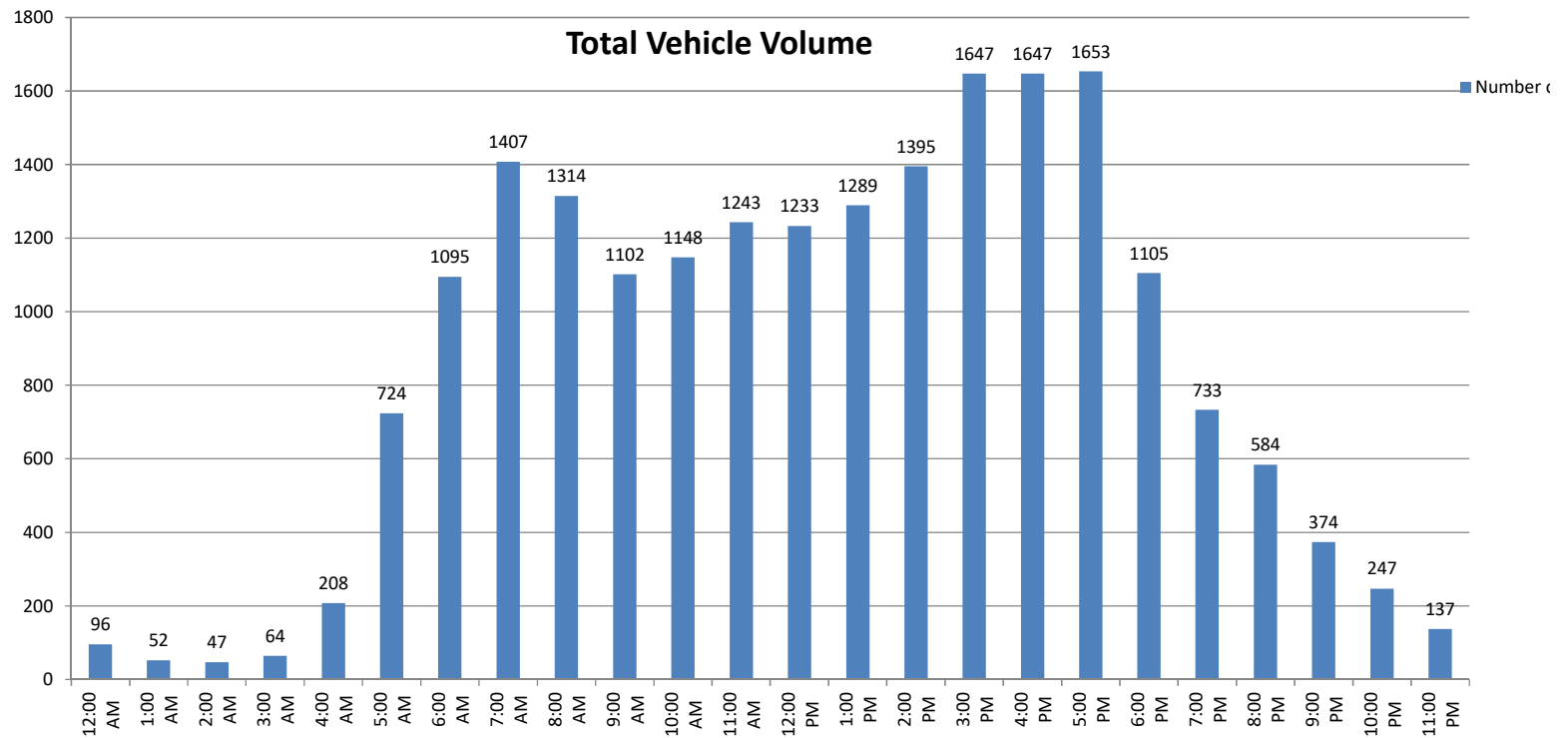
Date:	Northbound				Southbound					
11/14/2017	15 Minute Totals		Hourly Totals		15 Minute Totals		Hourly Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	17	156			9	154				
12:15	14	193			12	167				
12:30	16	148			8	121				
12:45	11	169	58	666	9	125	38	567	96	1233
1:00	13	160			5	191				
1:15	9	160			6	159				
1:30	5	142			5	170				
1:45	7	168	34	630	2	139	18	659	52	1289
2:00	3	165			4	144				
2:15	7	189			7	176				
2:30	6	190			5	148				
2:45	10	238	26	782	5	145	21	613	47	1395
3:00	7	253			8	171				
3:15	7	238			3	156				
3:30	7	216			13	168				
3:45	6	291	27	998	13	154	37	649	64	1647
4:00	6	228			25	147				
4:15	8	251			30	155				
4:30	13	269			47	162				
4:45	15	286	42	1034	64	149	166	613	208	1647
5:00	29	256			99	196				
5:15	29	262			127	175				
5:30	38	242			162	157				
5:45	71	252	167	1012	169	113	557	641	724	1653
6:00	51	217			173	116				
6:15	52	190			189	96				
6:30	97	173			216	89				
6:45	119	149	319	729	198	75	776	376	1095	1105
7:00	120	132			231	76				
7:15	114	124			247	50				
7:30	127	124			197	55				
7:45	172	119	533	499	199	53	874	234	1407	733
8:00	132	108			177	61				
8:15	148	111			170	45				
8:30	144	96			204	53				
8:45	137	78	561	393	202	32	753	191	1314	584
9:00	118	75			175	38				
9:15	112	54			157	45				
9:30	125	64			165	28				
9:45	111	49	466	242	139	21	636	132	1102	374
10:00	99	54			172	29				
10:15	107	54			170	18				
10:30	146	33			131	10				
10:45	155	31	507	172	168	18	641	75	1148	247
11:00	136	22			171	14				
11:15	172	25			161	7				
11:30	145	23			161	20				
11:45	165	16	618	86	132	10	625	51	1243	137
Totals	3358	7243			5142	4801				
Combined Totals		10601				9943				
ADT									20544	
AM Peak Hour	1100	AM			630	AM				
Volume	618				892					
P.H.F.	0.898				0.903					
PM Peak Hour		430	PM			430	PM			
Volume		1073				682				
P.H.F.		0.938				0.870				
Percentage	31.7%	68.3%			51.7%	48.3%				



24 Hour Volume Plot
Tavern Road
B/ Interstate 8 Eastbound - Alpine Boulevard
11/14/2017

Southbound

Start Time	#####
12:00 AM	96
1:00 AM	52
2:00 AM	47
3:00 AM	64
4:00 AM	208
5:00 AM	724
6:00 AM	1095
7:00 AM	1407
8:00 AM	1314
9:00 AM	1102
10:00 AM	1148
11:00 AM	1243
12:00 PM	1233
1:00 PM	1289
2:00 PM	1395
3:00 PM	1647
4:00 PM	1647
5:00 PM	1653
6:00 PM	1105
7:00 PM	733
8:00 PM	584
9:00 PM	374
10:00 PM	247
11:00 PM	137
Total	20544



Volumes represent the combined totals for both directions



County of San Diego
Tavern Road
B/ Interstate 8 Eastbound - Alpine Boulevard

File Name 004
Site Code: 143-17788
24 Hour Directional Volume Count

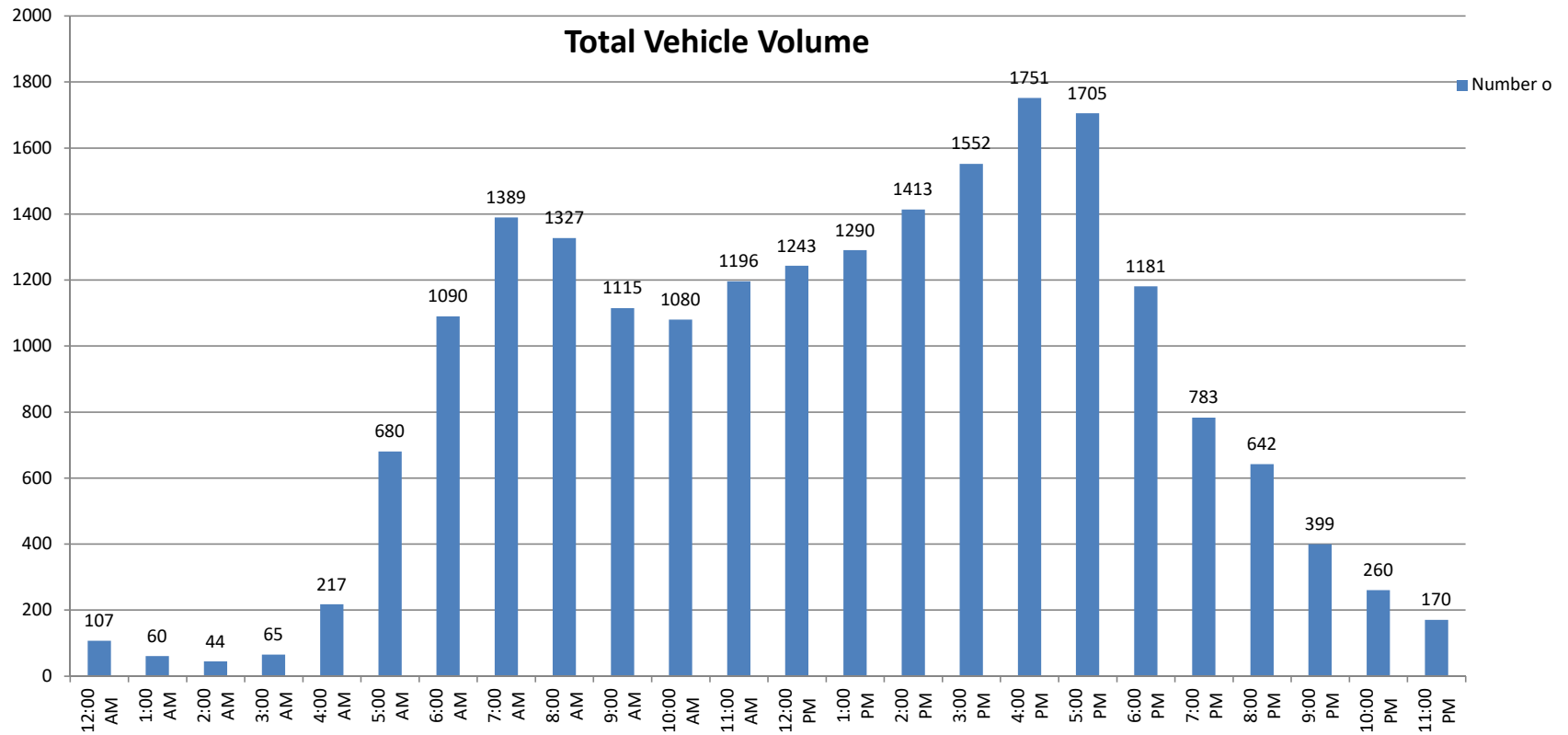
Date:	Northbound				Southbound					
11/15/2017	15 Minute Totals		Hourly Totals		15 Minute Totals		Hourly Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	19	154			12	148				
12:15	19	155			9	133				
12:30	11	174			8	155				
12:45	18	176	67	659	11	148	40	584	107	1243
1:00	11	160			4	197				
1:15	10	147			3	169				
1:30	10	165			4	137				
1:45	11	187	42	659	7	128	18	631	60	1290
2:00	6	163			5	151				
2:15	7	158			6	197				
2:30	5	212			3	154				
2:45	6	235	24	768	6	143	20	645	44	1413
3:00	8	201			5	170				
3:15	5	212			8	157				
3:30	8	221			16	158				
3:45	6	281	27	915	9	152	38	637	65	1552
4:00	8	270			27	165				
4:15	8	298			40	142				
4:30	10	277			40	168				
4:45	16	278	42	1123	68	153	175	628	217	1751
5:00	20	232			101	201				
5:15	28	301			137	174				
5:30	39	276			150	146				
5:45	56	219	143	1028	149	156	537	677	680	1705
6:00	39	240			185	151				
6:15	57	198			227	109				
6:30	71	175			217	99				
6:45	127	145	294	758	167	64	796	423	1090	1181
7:00	120	150			230	86				
7:15	116	147			279	63				
7:30	122	107			219	62				
7:45	140	113	498	517	163	55	891	266	1389	783
8:00	138	125			170	48				
8:15	141	97			179	52				
8:30	142	111			214	63				
8:45	153	96	574	429	190	50	753	213	1327	642
9:00	115	89			178	45				
9:15	123	78			167	46				
9:30	110	43			156	30				
9:45	113	43	461	253	153	25	654	146	1115	399
10:00	146	54			143	29				
10:15	137	49			132	14				
10:30	133	45			120	21				
10:45	118	29	534	177	151	19	546	83	1080	260
11:00	126	34			130	11				
11:15	148	30			182	19				
11:30	137	23			142	30				
11:45	160	12	571	99	171	11	625	71	1196	170
Totals	3277	7385			5093	5004				
Combined Totals		10662				10097				
ADT									20759	
AM Peak Hour	800	AM			645	AM				
Volume	574				895					
P.H.F.	0.938				0.802					
PM Peak Hour		345	PM			430	PM			
Volume		1126				696				
P.H.F.		0.945				0.866				
Percentage	30.7%	69.3%			50.4%	49.6%				



24 Hour Volume Plot
Tavern Road
B/ Interstate 8 Eastbound - Alpine Boulevard
11/15/2017

Southbound

Start Time	#####
12:00 AM	107
1:00 AM	60
2:00 AM	44
3:00 AM	65
4:00 AM	217
5:00 AM	680
6:00 AM	1090
7:00 AM	1389
8:00 AM	1327
9:00 AM	1115
10:00 AM	1080
11:00 AM	1196
12:00 PM	1243
1:00 PM	1290
2:00 PM	1413
3:00 PM	1552
4:00 PM	1751
5:00 PM	1705
6:00 PM	1181
7:00 PM	783
8:00 PM	642
9:00 PM	399
10:00 PM	260
11:00 PM	170
Total	20759



Volumes represent the combined totals for both directions



County of San Diego
Tavern Road
B/ Interstate 8 Eastbound - Alpine Boulevard

File Name 004
Site Code: 143-17788
24 Hour Directional Volume Count

Date:	Northbound				Southbound					
Two Day Average	15 Minute Totals		Hourly Totals		15 Minute Totals		Hourly Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	18	155			11	151				
12:15	17	174			11	150				
12:30	14	161			8	138				
12:45	15	173	63	663	10	137	39	576	102	1238
1:00	12	160			5	194				
1:15	10	154			5	164				
1:30	8	154			5	154				
1:45	9	178	38	645	5	134	18	645	56	1290
2:00	5	164			5	148				
2:15	7	174			7	187				
2:30	6	201			4	151				
2:45	8	237	25	775	6	144	21	629	46	1404
3:00	8	227			7	171				
3:15	6	225			6	157				
3:30	8	219			15	163				
3:45	6	286	27	957	11	153	38	643	65	1600
4:00	7	249			26	156				
4:15	8	275			35	149				
4:30	12	273			44	165				
4:45	16	282	42	1079	66	151	171	621	213	1699
5:00	25	244			100	199				
5:15	29	282			132	175				
5:30	39	259			156	152				
5:45	64	236	155	1020	159	135	547	659	702	1679
6:00	45	229			179	134				
6:15	55	194			208	103				
6:30	84	174			217	94				
6:45	123	147	307	744	183	70	786	400	1093	1143
7:00	120	141			231	81				
7:15	115	136			263	57				
7:30	125	116			208	59				
7:45	156	116	516	508	181	54	883	250	1398	758
8:00	135	117			174	55				
8:15	145	104			175	49				
8:30	143	104			209	58				
8:45	145	87	568	411	196	41	753	202	1321	613
9:00	117	82			177	42				
9:15	118	66			162	46				
9:30	118	54			161	29				
9:45	112	46	464	248	146	23	645	139	1109	387
10:00	123	54			158	29				
10:15	122	52			151	16				
10:30	140	39			126	16				
10:45	137	30	521	175	160	19	594	79	1114	254
11:00	131	28			151	13				
11:15	160	28			172	13				
11:30	141	23			152	25				
11:45	163	14	595	93	152	11	625	61	1220	154
Totals	3318	7314			5118	4903				
Combined Totals		10632				10020				
ADT									20652	
AM Peak Hour	1100	AM			630	AM				
Volume	595				893					
P.H.F.	0.915				0.848					
PM Peak Hour		345	PM			430	PM			
Volume		1083				689				
P.H.F.		0.946				0.868				
Percentage	31.2%	68.8%			51.1%	48.9%				



County of San Diego

Tavern Road

B/ Interstate 8 Westbound - Interstate 8 Eastbound

File Name 003

Site Code: 143-17788

24 Hour Directional Volume Count

Date: 11/14/2017	Northbound				Southbound					
	15 Minute Totals		Hourly Totals		15 Minute Totals		Hourly Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	14	157			3	47				
12:15	13	175			1	46				
12:30	11	140			3	42				
12:45	8	160	46	632	2	41	9	176	55	808
1:00	7	196			3	40				
1:15	6	164			2	36				
1:30	6	184			4	32				
1:45	1	163	20	707	5	30	14	138	34	845
2:00	7	159			2	32				
2:15	6	190			1	32				
2:30	5	168			0	30				
2:45	6	178	24	695	5	40	8	134	32	829
3:00	7	202			2	54				
3:15	7	177			3	47				
3:30	14	180			2	39				
3:45	14	184	42	743	1	50	8	190	50	933
4:00	23	185			4	41				
4:15	37	197			5	38				
4:30	53	197			5	45				
4:45	71	173	184	752	4	36	18	160	202	912
5:00	107	196			12	53				
5:15	131	202			14	38				
5:30	176	169			17	39				
5:45	173	142	587	709	27	29	70	159	657	868
6:00	186	142			19	41				
6:15	197	135			18	31				
6:30	228	119			18	38				
6:45	204	87	815	483	29	23	84	133	899	616
7:00	246	89			34	25				
7:15	242	82			40	23				
7:30	211	88			39	17				
7:45	223	56	922	315	48	14	161	79	1083	394
8:00	192	70			32	18				
8:15	179	70			61	16				
8:30	211	66			53	11				
8:45	195	51	777	257	40	12	186	57	963	314
9:00	192	58			31	11				
9:15	169	59			32	10				
9:30	168	34			41	9				
9:45	147	29	676	180	31	7	135	37	811	217
10:00	181	32			21	13				
10:15	158	30			27	4				
10:30	158	17			33	2				
10:45	148	24	645	103	43	2	124	21	769	124
11:00	170	19			42	1				
11:15	178	9			43	3				
11:30	162	21			56	3				
11:45	132	17	642	66	38	4	179	11	821	77
Totals	5380	5642			996	1295				
Combined Totals	11022				2291					
ADT	13313									
AM Peak Hour	700	AM			745	AM				
Volume	922				194					
P.H.F.	0.937				0.795					
PM Peak Hour		430	PM			300	PM			
Volume		768				190				
P.H.F.		0.950				0.880				
Percentage	48.8%	51.2%			43.5%	56.5%				



24 Hour Volume Plot

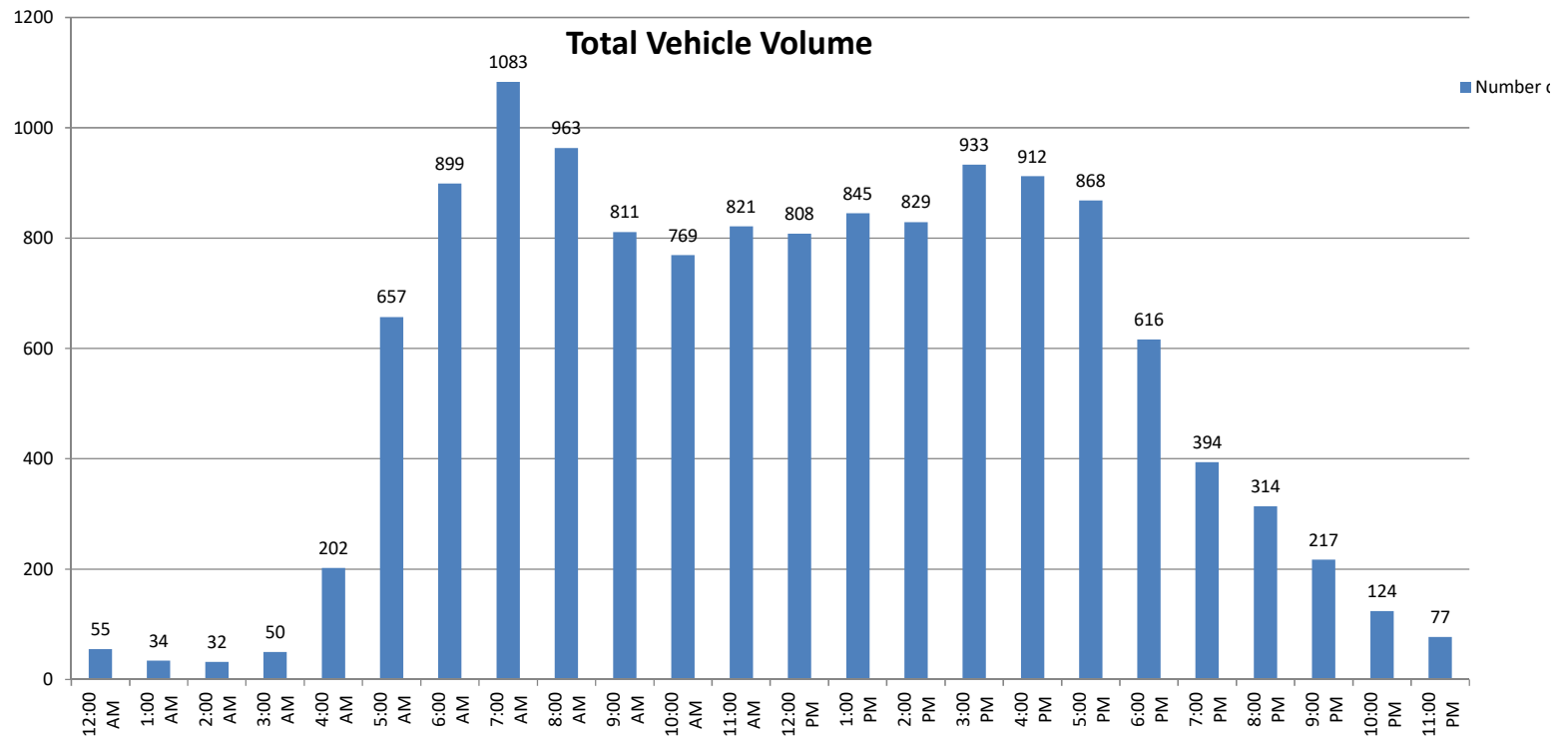
Tavern Road

B/ Interstate 8 Westbound - Interstate 8 Eastbound

11/14/2017

Southbound

Start Time	#####
12:00 AM	55
1:00 AM	34
2:00 AM	32
3:00 AM	50
4:00 AM	202
5:00 AM	657
6:00 AM	899
7:00 AM	1083
8:00 AM	963
9:00 AM	811
10:00 AM	769
11:00 AM	821
12:00 PM	808
1:00 PM	845
2:00 PM	829
3:00 PM	933
4:00 PM	912
5:00 PM	868
6:00 PM	616
7:00 PM	394
8:00 PM	314
9:00 PM	217
10:00 PM	124
11:00 PM	77
Total	13313



Volumes represent the combined totals for both directions



County of San Diego
Tavern Road
B/ Interstate 8 Westbound - Interstate 8 Eastbound

File Name 003
Site Code: 143-17788
24 Hour Directional Volume Count

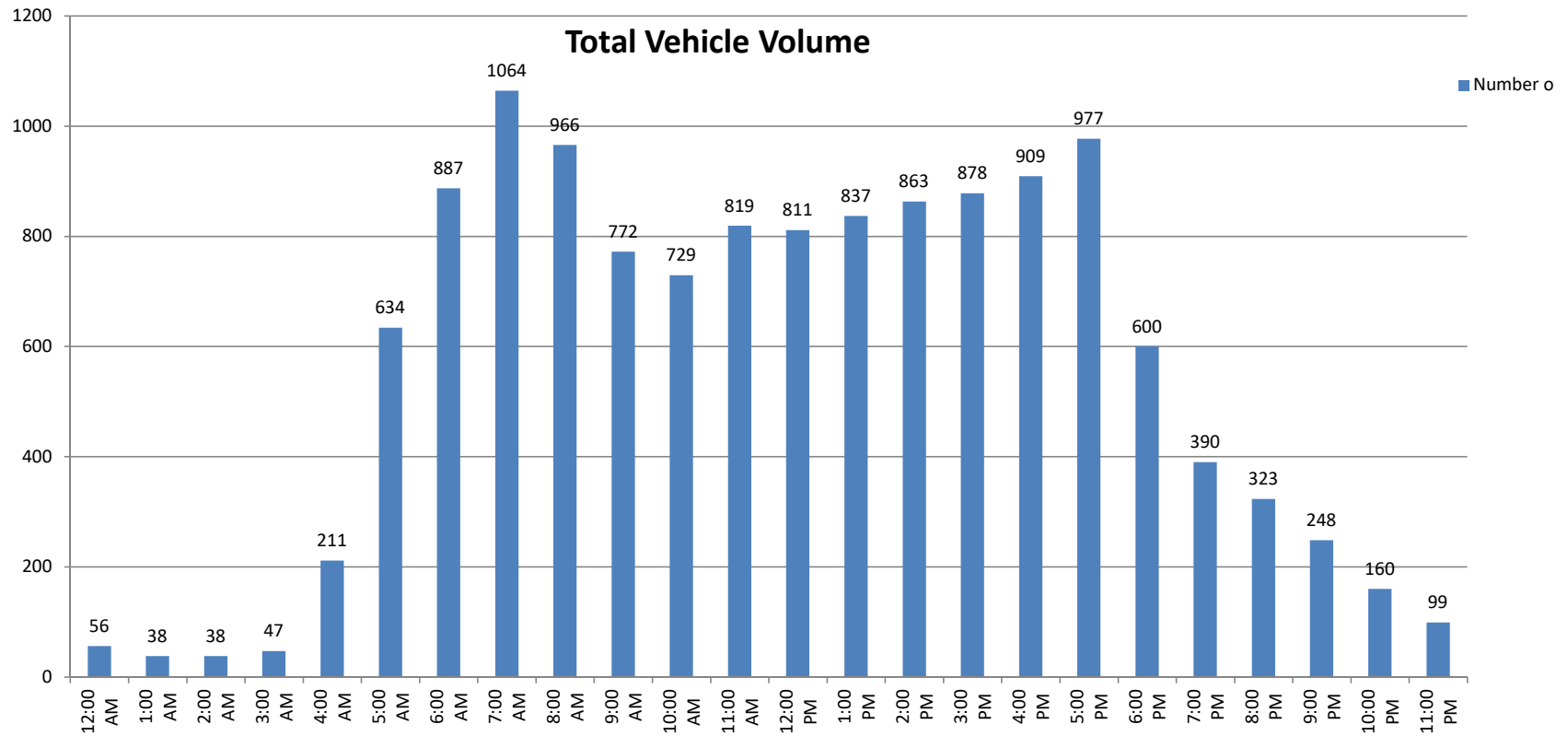
Date: 11/15/2017	Northbound				Southbound					
	15 Minute Totals		Hourly Totals		15 Minute Totals		Hourly Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	11	167			2	46				
12:15	16	146			4	39				
12:30	9	161			1	43				
12:45	9	166	45	640	4	43	11	171	56	811
1:00	7	204			2	50				
1:15	4	179			5	36				
1:30	7	158			2	29				
1:45	6	151	24	692	5	30	14	145	38	837
2:00	7	165			1	22				
2:15	8	210			4	38				
2:30	4	175			0	34				
2:45	7	184	26	734	7	35	12	129	38	863
3:00	6	197			2	41				
3:15	8	174			0	35				
3:30	17	179			2	37				
3:45	9	181	40	731	3	34	7	147	47	878
4:00	26	186			2	44				
4:15	46	170			4	51				
4:30	48	186			5	43				
4:45	72	187	192	729	8	42	19	180	211	909
5:00	101	216			8	49				
5:15	151	209			17	59				
5:30	156	174			19	64				
5:45	161	168	569	767	21	38	65	210	634	977
6:00	186	166			20	32				
6:15	229	131			17	26				
6:30	212	121			21	24				
6:45	176	86	803	504	26	14	84	96	887	600
7:00	235	101			36	18				
7:15	267	74			35	14				
7:30	229	78			46	18				
7:45	174	68	905	321	42	19	159	69	1064	390
8:00	183	70			37	22				
8:15	188	64			51	19				
8:30	211	63			56	10				
8:45	193	65	775	262	47	10	191	61	966	323
9:00	159	63			36	6				
9:15	172	67			27	14				
9:30	157	49			24	5				
9:45	167	35	655	214	30	9	117	34	772	248
10:00	148	45			37	19				
10:15	151	18			32	11				
10:30	128	31			29	8				
10:45	175	24	602	118	29	4	127	42	729	160
11:00	129	16			47	6				
11:15	187	24			38	4				
11:30	144	28			41	2				
11:45	188	19	648	87	45	0	171	12	819	99
Totals	5284	5799			977	1296				
Combined Totals	11083				2273					
ADT	13356									
AM Peak Hour	645	AM			800	AM				
Volume	907				191					
P.H.F.	0.849				0.853					
PM Peak Hour		430	PM			445	PM			
Volume		798				214				
P.H.F.		0.924				0.836				
Percentage	47.7%	52.3%			43.0%	57.0%				



24 Hour Volume Plot
Tavern Road
B/ Interstate 8 Westbound - Interstate 8 Eastbound
11/15/2017

Southbound

Start Time	#####
12:00 AM	56
1:00 AM	38
2:00 AM	38
3:00 AM	47
4:00 AM	211
5:00 AM	634
6:00 AM	887
7:00 AM	1064
8:00 AM	966
9:00 AM	772
10:00 AM	729
11:00 AM	819
12:00 PM	811
1:00 PM	837
2:00 PM	863
3:00 PM	878
4:00 PM	909
5:00 PM	977
6:00 PM	600
7:00 PM	390
8:00 PM	323
9:00 PM	248
10:00 PM	160
11:00 PM	99
Total	13356



Volumes represent the combined totals for both directions



County of San Diego
Tavern Road
B/ Interstate 8 Westbound - Interstate 8 Eastbound

File Name 003
Site Code: 143-17788
24 Hour Directional Volume Count

Date:	Northbound				Southbound				Combined Totals	
Two Day Average	15 Minute Totals		Hourly Totals		15 Minute Totals		Hourly Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	13	162			3	47				
12:15	15	161			3	43				
12:30	10	151			2	43				
12:45	9	163	46	636	3	42	10	174	56	810
1:00	7	200			3	45				
1:15	5	172			4	36				
1:30	7	171			3	31				
1:45	4	157	22	700	5	30	14	142	36	841
2:00	7	162			2	27				
2:15	7	200			3	35				
2:30	5	172			0	32				
2:45	7	181	25	715	6	38	10	132	35	846
3:00	7	200			2	48				
3:15	8	176			2	41				
3:30	16	180			2	38				
3:45	12	183	41	737	2	42	8	169	49	906
4:00	25	186			3	43				
4:15	42	184			5	45				
4:30	51	192			5	44				
4:45	72	180	188	741	6	39	19	170	207	911
5:00	104	206			10	51				
5:15	141	206			16	49				
5:30	166	172			18	52				
5:45	167	155	578	738	24	34	68	185	646	923
6:00	186	154			20	37				
6:15	213	133			18	29				
6:30	220	120			20	31				
6:45	190	87	809	494	28	19	84	115	893	608
7:00	241	95			35	22				
7:15	255	78			38	19				
7:30	220	83			43	18				
7:45	199	62	914	318	45	17	160	74	1074	392
8:00	188	70			35	20				
8:15	184	67			56	18				
8:30	211	65			55	11				
8:45	194	58	776	260	44	11	189	59	965	319
9:00	176	61			34	9				
9:15	171	63			30	12				
9:30	163	42			33	7				
9:45	157	32	666	197	31	8	126	36	792	233
10:00	165	39			29	16				
10:15	155	24			30	8				
10:30	143	24			31	5				
10:45	162	24	624	111	36	3	126	32	749	142
11:00	150	18			45	4				
11:15	183	17			41	4				
11:30	153	25			49	3				
11:45	160	18	645	77	42	2	175	12	820	88
Totals	5332	5721			987	1296				
Combined Totals		11053				2282				
ADT									13335	
AM Peak Hour	700	AM			745	AM				
Volume	914				190					
P.H.F.	0.897				0.848					
PM Peak Hour		430	PM			445	PM			
Volume		783				190				
P.H.F.		0.950				0.922				
Percentage	48.2%	51.8%			43.2%	56.8%				



County of San Diego
Tavern Road
B/ Victoria Park Terrace - Interstate 8 Westbound

File Name 002
Site Code: 143-17788
24 Hour Directional Volume Count

Date:	Northbound				Southbound					
11/14/2017	15 Minute Totals		Hourly Totals		15 Minute Totals		Hourly Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	6	44			5	45				
12:15	4	51			4	49				
12:30	3	41			4	44				
12:45	2	72	15	208	3	51	16	189	31	397
1:00	1	68			3	51				
1:15	1	50			6	55				
1:30	2	49			4	58				
1:45	1	55	5	222	9	55	22	219	27	441
2:00	3	38			4	53				
2:15	1	60			1	69				
2:30	1	63			4	49				
2:45	2	75	7	236	4	50	13	221	20	457
3:00	1	79			5	72				
3:15	4	55			7	59				
3:30	2	52			8	63				
3:45	0	67	7	253	5	55	25	249	32	502
4:00	0	70			14	46				
4:15	9	85			26	51				
4:30	3	92			25	64				
4:45	6	77	18	324	32	62	97	223	115	547
5:00	21	72			44	75				
5:15	23	81			58	53				
5:30	20	52			83	33				
5:45	35	47	99	252	82	38	267	199	366	451
6:00	41	54			100	37				
6:15	16	58			96	26				
6:30	41	51			102	38				
6:45	41	34	139	197	78	25	376	126	515	323
7:00	47	34			99	19				
7:15	43	46			88	23				
7:30	50	40			76	20				
7:45	49	18	189	138	90	17	353	79	542	217
8:00	34	23			65	18				
8:15	43	31			96	26				
8:30	50	36			87	14				
8:45	57	27	184	117	86	11	334	69	518	186
9:00	36	23			56	11				
9:15	40	26			61	14				
9:30	34	12			62	14				
9:45	39	8	149	69	52	10	231	49	380	118
10:00	40	9			56	14				
10:15	40	10			48	6				
10:30	45	11			52	4				
10:45	22	6	147	36	57	2	213	26	360	62
11:00	28	9			53	5				
11:15	56	5			55	5				
11:30	41	8			52	6				
11:45	38	3	163	25	51	7	211	23	374	48
Totals	1122	2077			2158	1672				
Combined Totals	3199				3830					
ADT									7029	
AM Peak Hour	700	AM			545	AM				
Volume	189				380					
P.H.F.	0.945				0.931					
PM Peak Hour		415	PM			430	PM			
Volume		326				254				
P.H.F.		0.886				0.847				
Percentage	35.1%	64.9%			56.3%	43.7%				



24 Hour Volume Plot

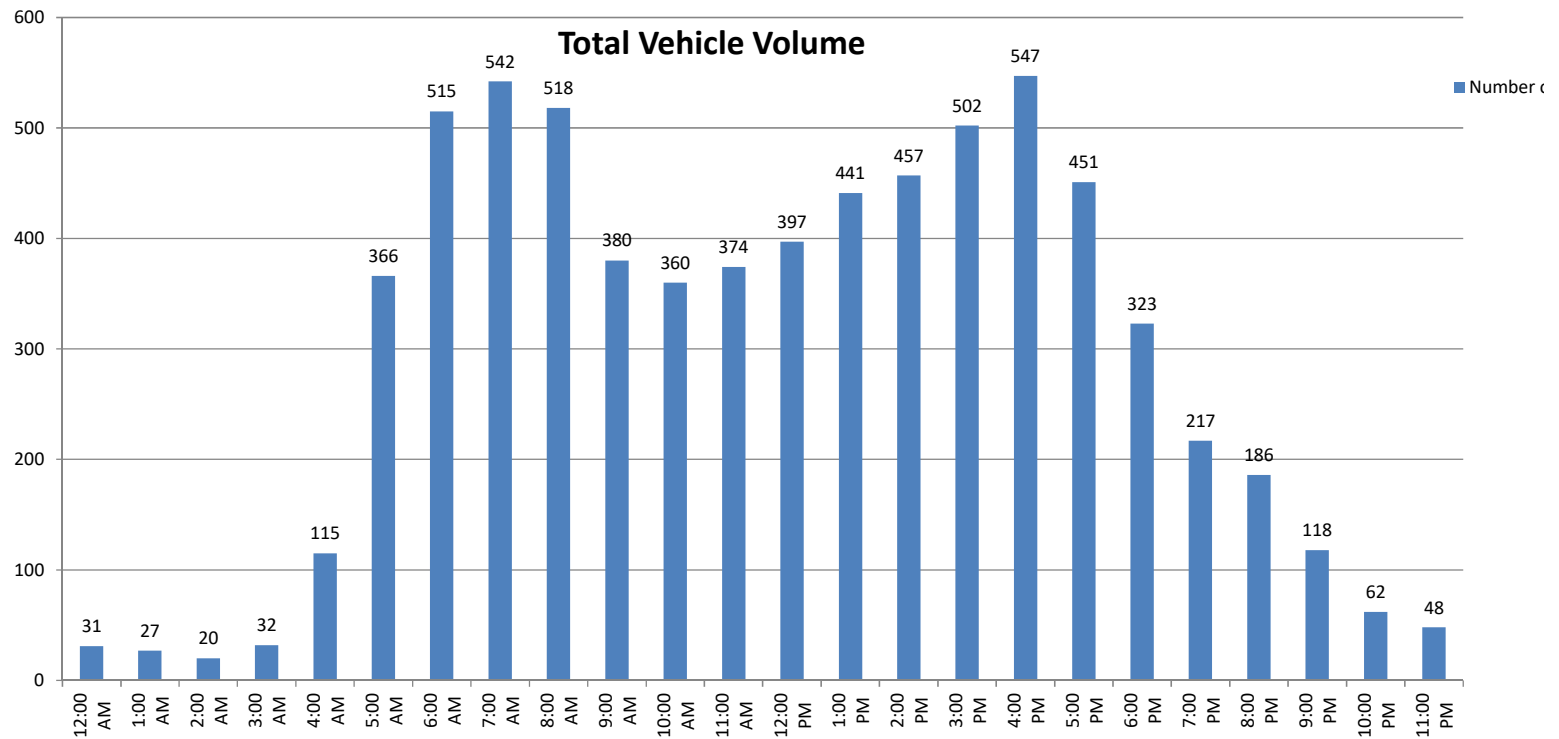
Tavern Road

B/ Victoria Park Terrace - Interstate 8 Westbound

11/14/2017

Southbound

Start Time	#####
12:00 AM	31
1:00 AM	27
2:00 AM	20
3:00 AM	32
4:00 AM	115
5:00 AM	366
6:00 AM	515
7:00 AM	542
8:00 AM	518
9:00 AM	380
10:00 AM	360
11:00 AM	374
12:00 PM	397
1:00 PM	441
2:00 PM	457
3:00 PM	502
4:00 PM	547
5:00 PM	451
6:00 PM	323
7:00 PM	217
8:00 PM	186
9:00 PM	118
10:00 PM	62
11:00 PM	48
Total	7029



Volumes represent the combined totals for both directions



County of San Diego
Tavern Road
B/ Victoria Park Terrace - Interstate 8 Westbound

File Name 002
Site Code: 143-17788
24 Hour Directional Volume Count

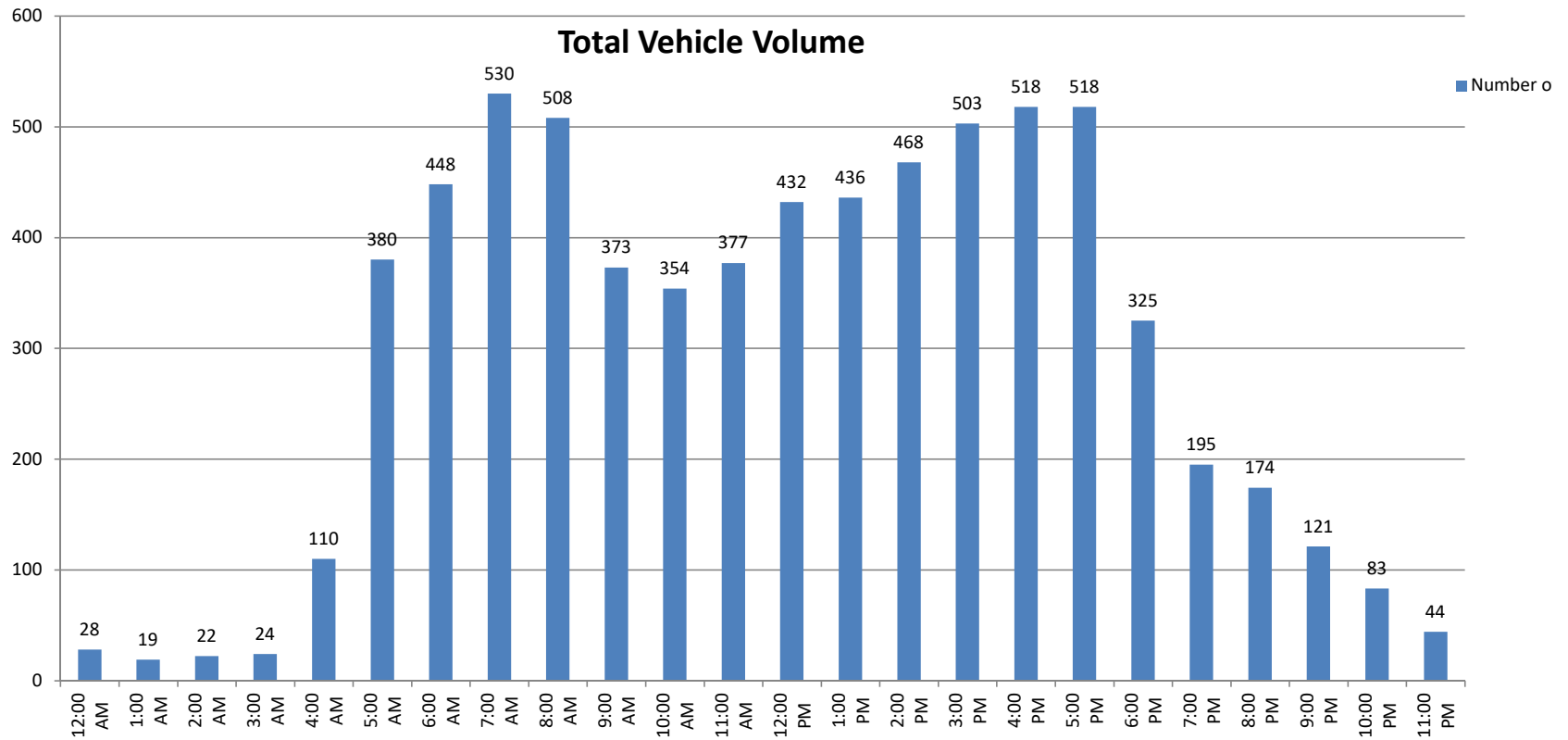
Date:	Northbound				Southbound				Combined Totals	
11/15/2017	15 Minute Totals		Hourly Totals		15 Minute Totals		Hourly Totals			
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	3	47			5	59				
12:15	9	50			2	56				
12:30	4	54			2	56				
12:45	2	60	18	211	1	50	10	221	28	432
1:00	2	61			2	68				
1:15	2	52			5	54				
1:30	3	53			3	50				
1:45	1	55	8	221	1	43	11	215	19	436
2:00	2	56			2	46				
2:15	1	57			3	68				
2:30	1	61			3	60				
2:45	2	69	6	243	8	51	16	225	22	468
3:00	2	75			2	75				
3:15	1	68			2	48				
3:30	1	60			5	59				
3:45	4	73	8	276	7	45	16	227	24	503
4:00	3	69			15	64				
4:15	5	65			21	58				
4:30	7	82			20	48				
4:45	9	83	24	299	30	49	86	219	110	518
5:00	20	80			45	59				
5:15	20	85			55	58				
5:30	36	61			84	59				
5:45	34	69	110	295	86	47	270	223	380	518
6:00	30	56			82	43				
6:15	26	46			82	30				
6:30	25	51			99	32				
6:45	31	49	112	202	73	18	336	123	448	325
7:00	31	39			89	21				
7:15	52	27			80	23				
7:30	47	27			83	16				
7:45	47	27	177	120	101	15	353	75	530	195
8:00	40	34			80	29				
8:15	51	25			72	13				
8:30	38	21			90	11				
8:45	51	29	180	109	86	12	328	65	508	174
9:00	34	26			71	14				
9:15	31	28			59	7				
9:30	37	16			56	6				
9:45	36	12	138	82	49	12	235	39	373	121
10:00	39	15			65	16				
10:15	41	9			51	12				
10:30	31	16			46	4				
10:45	34	7	145	47	47	4	209	36	354	83
11:00	29	9			56	8				
11:15	47	4			61	4				
11:30	30	1			58	5				
11:45	45	9	151	23	51	4	226	21	377	44
Totals	1077	2128			2096	1689				
Combined Totals		3205				3785				
ADT									6990	
AM Peak Hour	715	AM			700	AM				
Volume	186				353					
P.H.F.	0.894				0.874					
PM Peak Hour		430	PM			215	PM			
Volume		330				254				
P.H.F.		0.971				0.847				
Percentage	33.6%	66.4%			55.4%	44.6%				



24 Hour Volume Plot
Tavern Road
B/ Victoria Park Terrace - Interstate 8 Westbound
11/15/2017

Southbound

Start Time	#####
12:00 AM	28
1:00 AM	19
2:00 AM	22
3:00 AM	24
4:00 AM	110
5:00 AM	380
6:00 AM	448
7:00 AM	530
8:00 AM	508
9:00 AM	373
10:00 AM	354
11:00 AM	377
12:00 PM	432
1:00 PM	436
2:00 PM	468
3:00 PM	503
4:00 PM	518
5:00 PM	518
6:00 PM	325
7:00 PM	195
8:00 PM	174
9:00 PM	121
10:00 PM	83
11:00 PM	44
Total	6990



Volumes represent the combined totals for both directions



County of San Diego
Tavern Road
B/ Victoria Park Terrace - Interstate 8 Westbound

File Name 002
Site Code: 143-17788
24 Hour Directional Volume Count

Date:	Northbound				Southbound					
Two Day Average	15 Minute Totals		Hourly Totals		15 Minute Totals		Hourly Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	5	46			5	52				
12:15	7	51			3	53				
12:30	4	48			3	50				
12:45	2	66	17	210	2	51	13	205	30	415
1:00	2	65			3	60				
1:15	2	51			6	55				
1:30	3	51			4	54				
1:45	1	55	7	222	5	49	17	217	23	439
2:00	3	47			3	50				
2:15	1	59			2	69				
2:30	1	62			4	55				
2:45	2	72	7	240	6	51	15	223	21	463
3:00	2	77			4	74				
3:15	3	62			5	54				
3:30	2	56			7	61				
3:45	2	70	8	265	6	50	21	238	28	503
4:00	2	70			15	55				
4:15	7	75			24	55				
4:30	5	87			23	56				
4:45	8	80	21	312	31	56	92	221	113	533
5:00	21	76			45	67				
5:15	22	83			57	56				
5:30	28	57			84	46				
5:45	35	58	105	274	84	43	269	211	373	485
6:00	36	55			91	40				
6:15	21	52			89	28				
6:30	33	51			101	35				
6:45	36	42	126	200	76	22	356	125	482	324
7:00	39	37			94	20				
7:15	48	37			84	23				
7:30	49	34			80	18				
7:45	48	23	183	129	96	16	353	77	536	206
8:00	37	29			73	24				
8:15	47	28			84	20				
8:30	44	29			89	13				
8:45	54	28	182	113	86	12	331	67	513	180
9:00	35	25			64	13				
9:15	36	27			60	11				
9:30	36	14			59	10				
9:45	38	10	144	76	51	11	233	44	377	120
10:00	40	12			61	15				
10:15	41	10			50	9				
10:30	38	14			49	4				
10:45	28	7	146	42	52	3	211	31	357	73
11:00	29	9			55	7				
11:15	52	5			58	5				
11:30	36	5			55	6				
11:45	42	6	157	24	51	6	219	22	376	46
Totals	1100	2103			2127	1681				
Combined Totals		3202				3808				
ADT									7010	
AM Peak Hour	700	AM			545	AM				
Volume	183				365					
P.H.F.	0.943				0.907					
PM Peak Hour		430	PM			215	PM			
Volume		326				247				
P.H.F.		0.937				0.840				
Percentage	34.3%	65.7%			55.9%	44.1%				



County of San Diego
Tavern Road
W/ Victoria Park Terrace

File Name 001
Site Code: 143-17788
24 Hour Directional Volume Count

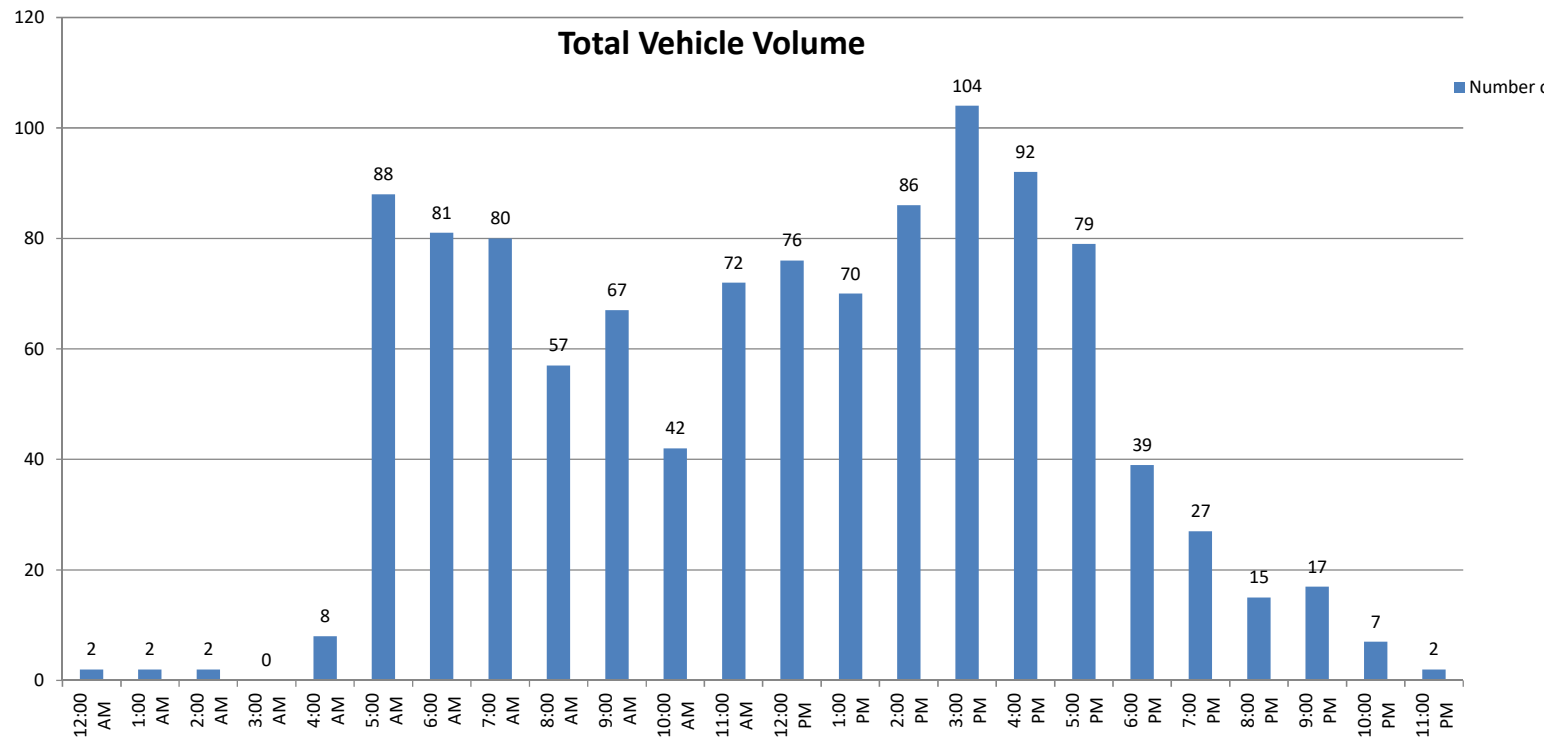
Date: 11/14/2017	Eastbound				Westbound					
	15 Minute Totals		Hourly Totals		15 Minute Totals		Hourly Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	0	6			1	11				
12:15	1	10			0	8				
12:30	0	4			0	13				
12:45	0	12	1	32	0	12	1	44	2	76
1:00	0	5			0	5				
1:15	0	8			0	14				
1:30	0	11			1	8				
1:45	1	6	1	30	0	13	1	40	2	70
2:00	0	13			0	7				
2:15	0	7			0	11				
2:30	1	12			1	12				
2:45	0	7	1	39	0	17	1	47	2	86
3:00	0	19			0	19				
3:15	0	9			0	7				
3:30	0	20			0	10				
3:45	0	12	0	60	0	8	0	44	0	104
4:00	0	12			0	9				
4:15	0	5			0	11				
4:30	0	11			2	11				
4:45	2	13	2	41	4	20	6	51	8	92
5:00	3	27			8	13				
5:15	2	7			17	6				
5:30	23	6			11	8				
5:45	10	6	38	46	14	6	50	33	88	79
6:00	14	11			13	3				
6:15	6	9			7	1				
6:30	6	7			14	0				
6:45	9	7	35	34	12	1	46	5	81	39
7:00	8	8			16	1				
7:15	4	0			13	2				
7:30	2	6			11	2				
7:45	5	5	19	19	21	3	61	8	80	27
8:00	10	4			10	2				
8:15	5	2			5	2				
8:30	6	2			10	1				
8:45	6	1	27	9	5	1	30	6	57	15
9:00	7	9			2	2				
9:15	4	0			14	0				
9:30	8	2			14	0				
9:45	8	3	27	14	10	1	40	3	67	17
10:00	2	0			9	0				
10:15	5	1			4	1				
10:30	5	1			5	2				
10:45	9	1	21	3	3	1	21	4	42	7
11:00	8	0			9	0				
11:15	11	0			9	0				
11:30	7	2			5	0				
11:45	10	0	36	2	13	0	36	0	72	2
Totals	208	329			293	285				
Combined Totals	537				578					
ADT	1115									
AM Peak Hour	530	AM			700	AM				
Volume	53				61					
P.H.F.	0.576				0.726					
PM Peak Hour		300	PM			215	PM			
Volume		60				59				
P.H.F.		0.750				0.776				
Percentage	38.7%	61.3%			50.7%	49.3%				



24 Hour Volume Plot
Tavern Road
W/ Victoria Park Terrace
11/14/2017

Westbound

Start Time	#####
12:00 AM	2
1:00 AM	2
2:00 AM	2
3:00 AM	0
4:00 AM	8
5:00 AM	88
6:00 AM	81
7:00 AM	80
8:00 AM	57
9:00 AM	67
10:00 AM	42
11:00 AM	72
12:00 PM	76
1:00 PM	70
2:00 PM	86
3:00 PM	104
4:00 PM	92
5:00 PM	79
6:00 PM	39
7:00 PM	27
8:00 PM	15
9:00 PM	17
10:00 PM	7
11:00 PM	2
Total	1115



Volumes represent the combined totals for both directions



County of San Diego
Tavern Road
W/ Victoria Park Terrace

File Name 001
Site Code: 143-17788
24 Hour Directional Volume Count

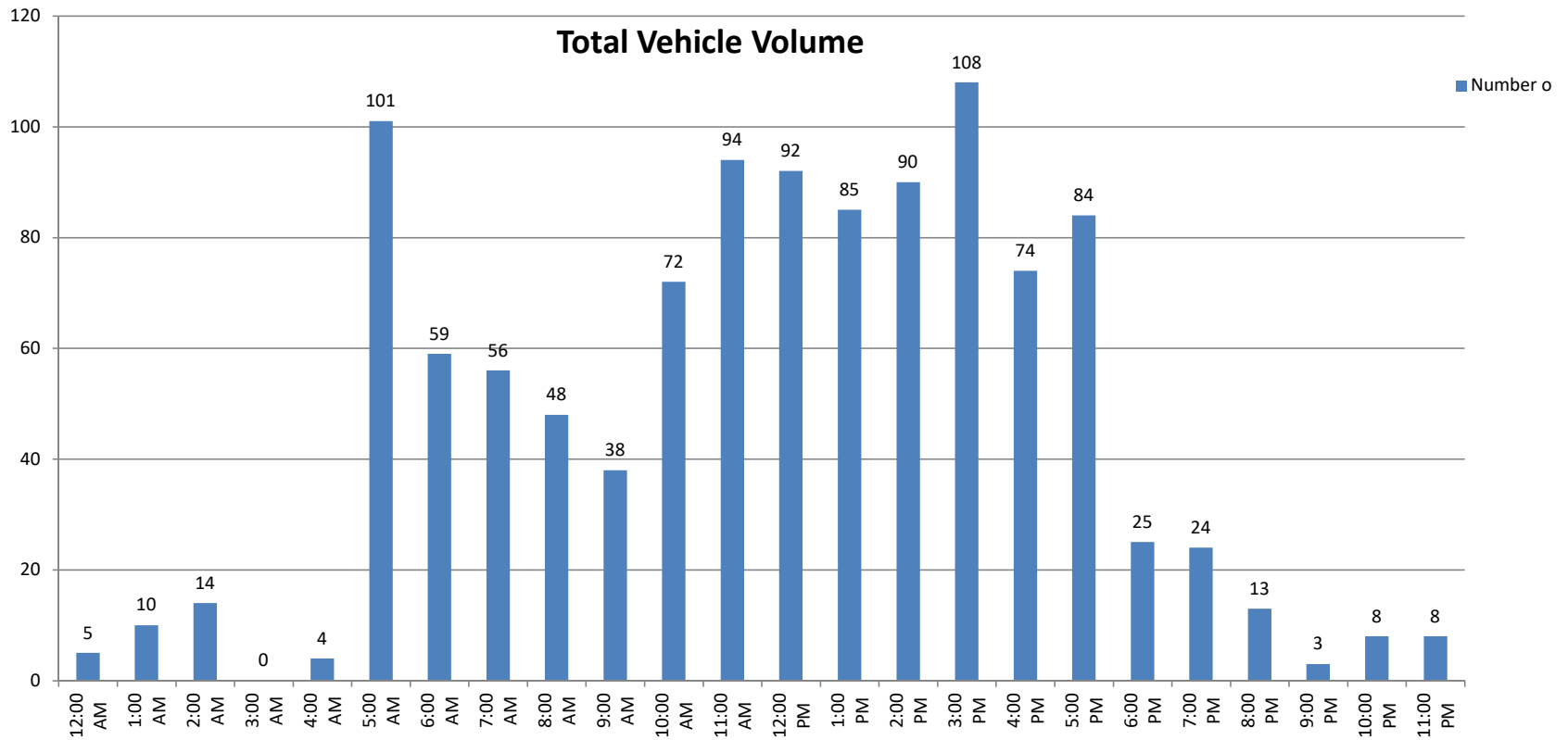
Date: 11/15/2017	Eastbound				Westbound					
	15 Minute Totals		Hourly Totals		15 Minute Totals		Hourly Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	2	14			1	10				
12:15	0	8			1	8				
12:30	1	8			0	9				
12:45	0	12	3	42	0	23	2	50	5	92
1:00	0	18			0	13				
1:15	0	6			0	10				
1:30	2	7			3	17				
1:45	0	9	2	40	5	5	8	45	10	85
2:00	0	16			1	14				
2:15	1	10			1	14				
2:30	0	8			0	10				
2:45	7	6	8	40	4	12	6	50	14	90
3:00	0	12			0	9				
3:15	0	12			0	17				
3:30	0	15			0	16				
3:45	0	12	0	51	0	15	0	57	0	108
4:00	0	11			0	12				
4:15	0	14			0	5				
4:30	0	11			1	7				
4:45	0	8	0	44	3	6	4	30	4	74
5:00	3	18			8	16				
5:15	10	11			19	6				
5:30	12	14			17	5				
5:45	17	7	42	50	15	7	59	34	101	84
6:00	6	6			10	5				
6:15	4	0			4	2				
6:30	8	3			6	1				
6:45	9	4	27	13	12	4	32	12	59	25
7:00	5	4			6	2				
7:15	1	7			16	1				
7:30	3	4			11	0				
7:45	5	6	14	21	9	0	42	3	56	24
8:00	6	9			13	1				
8:15	5	0			8	1				
8:30	4	2			4	0				
8:45	1	0	16	11	7	0	32	2	48	13
9:00	1	0			6	0				
9:15	4	0			8	0				
9:30	3	0			4	2				
9:45	4	1	12	1	8	0	26	2	38	3
10:00	11	3			14	3				
10:15	7	2			10	0				
10:30	9	0			3	0				
10:45	5	0	32	5	13	0	40	3	72	8
11:00	23	6			7	1				
11:15	9	0			8	0				
11:30	13	0			8	0				
11:45	12	0	57	6	14	1	37	2	94	8
Totals	213	324			288	290				
Combined Totals	537				578					
ADT	1115									
AM Peak Hour	1100	AM			515	AM				
Volume	57				61					
P.H.F.	0.620				0.803					
PM Peak Hour		330	PM			2445	PM			
Volume		52				63				
P.H.F.		0.867				0.685				
Percentage	39.7%	60.3%			49.8%	50.2%				



24 Hour Volume Plot
Tavern Road
W/ Victoria Park Terrace
11/15/2017

Westbound

Start Time	#####
12:00 AM	5
1:00 AM	10
2:00 AM	14
3:00 AM	0
4:00 AM	4
5:00 AM	101
6:00 AM	59
7:00 AM	56
8:00 AM	48
9:00 AM	38
10:00 AM	72
11:00 AM	94
12:00 PM	92
1:00 PM	85
2:00 PM	90
3:00 PM	108
4:00 PM	74
5:00 PM	84
6:00 PM	25
7:00 PM	24
8:00 PM	13
9:00 PM	3
10:00 PM	8
11:00 PM	8
Total	1115



Volumes represent the combined totals for both directions



County of San Diego
Tavern Road
W/ Victoria Park Terrace

File Name 001
Site Code: 143-17788
24 Hour Directional Volume Count

Date:	Eastbound				Westbound					
Two Day Average	15 Minute Totals		Hourly Totals		15 Minute Totals		Hourly Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	1	10			1	11				
12:15	1	9			1	8				
12:30	1	6			0	11				
12:45	0	12	2	37	0	18	2	47	4	84
1:00	0	12			0	9				
1:15	0	7			0	12				
1:30	1	9			2	13				
1:45	1	8	2	35	3	9	5	43	6	78
2:00	0	15			1	11				
2:15	1	9			1	13				
2:30	1	10			1	11				
2:45	4	7	5	40	2	15	4	49	8	88
3:00	0	16			0	14				
3:15	0	11			0	12				
3:30	0	18			0	13				
3:45	0	12	0	56	0	12	0	51	0	106
4:00	0	12			0	11				
4:15	0	10			0	8				
4:30	0	11			2	9				
4:45	1	11	1	43	4	13	5	41	6	83
5:00	3	23			8	15				
5:15	6	9			18	6				
5:30	18	10			14	7				
5:45	14	7	40	48	15	7	55	34	95	82
6:00	10	9			12	4				
6:15	5	5			6	2				
6:30	7	5			10	1				
6:45	9	6	31	24	12	3	39	9	70	32
7:00	7	6			11	2				
7:15	3	4			15	2				
7:30	3	5			11	1				
7:45	5	6	17	20	15	2	52	6	68	26
8:00	8	7			12	2				
8:15	5	1			7	2				
8:30	5	2			7	1				
8:45	4	1	22	10	6	1	31	4	53	14
9:00	4	5			4	1				
9:15	4	0			11	0				
9:30	6	1			9	1				
9:45	6	2	20	8	9	1	33	3	53	10
10:00	7	2			12	2				
10:15	6	2			7	1				
10:30	7	1			4	1				
10:45	7	1	27	4	8	1	31	4	57	8
11:00	16	3			8	1				
11:15	10	0			9	0				
11:30	10	1			7	0				
11:45	11	0	47	4	14	1	37	1	83	5
Totals	211	327			291	288				
Combined Totals	537				578					
ADT	1115									
AM Peak Hour	515	AM			515	AM				
Volume	47				58					
P.H.F.	0.671				0.806					
PM Peak Hour		300	PM			245	PM			
Volume		56				54				
P.H.F.		0.793				0.922				
Percentage	39.2%	60.8%			50.3%	49.7%				



County of San Diego
Victoria Boulevard
N/ Tavern Road

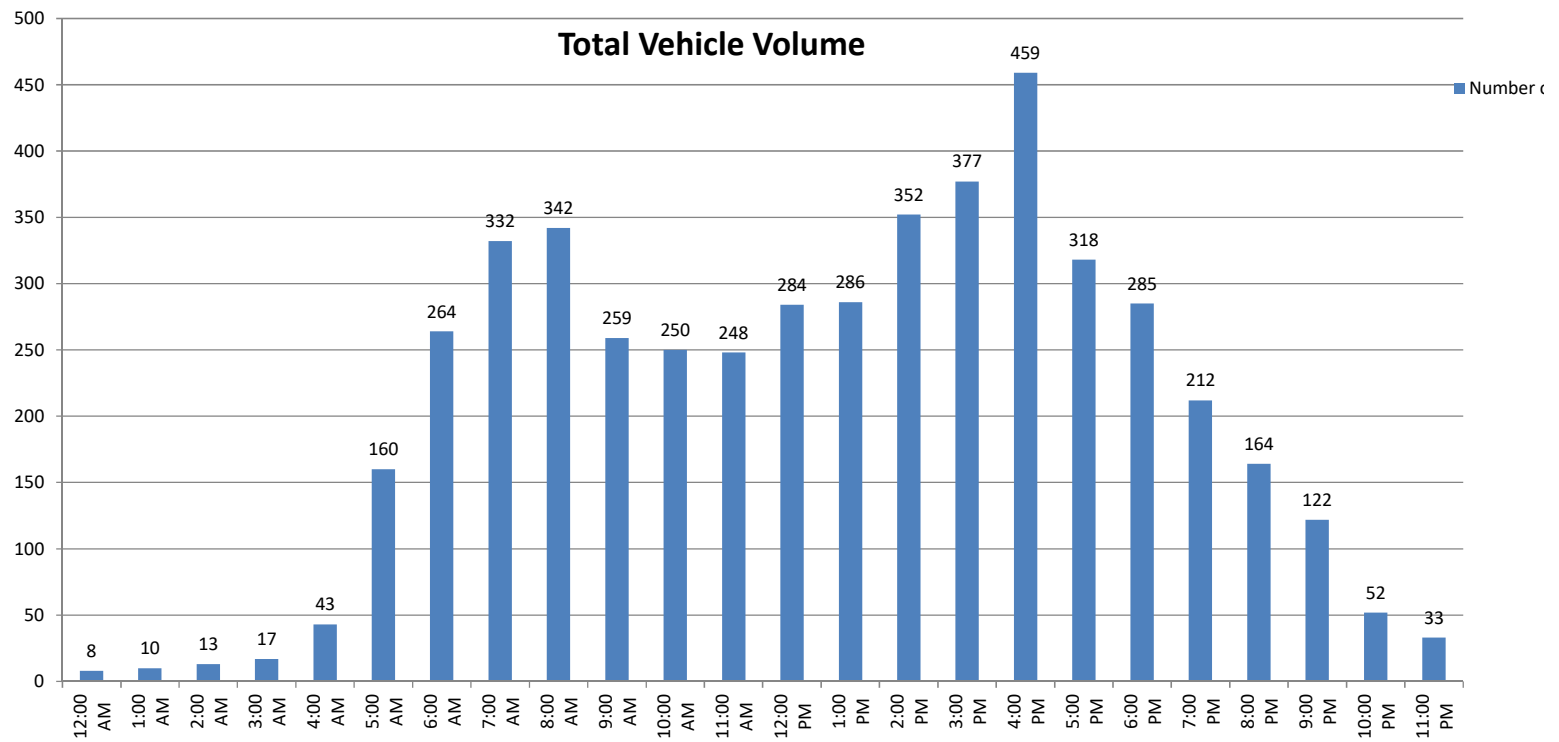
File Name 001
Site Code: 143-17845
24 Hour Directional Volume Count

Date:	Northbound				Southbound					
12/7/2017	15 Minute Totals		Hourly Totals		15 Minute Totals		Hourly Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	1	36			1	29				
12:15	2	36			0	41				
12:30	1	36			1	35				
12:45	1	39	5	147	1	32	3	137	8	284
1:00	2	40			1	30				
1:15	4	34			0	31				
1:30	2	38			1	35				
1:45	0	43	8	155	0	35	2	131	10	286
2:00	2	52			1	35				
2:15	5	52			1	37				
2:30	1	59			2	47				
2:45	0	45	8	208	1	25	5	144	13	352
3:00	0	69			0	25				
3:15	1	55			2	35				
3:30	1	63			5	29				
3:45	1	66	3	253	7	35	14	124	17	377
4:00	0	58			7	50				
4:15	0	81			8	43				
4:30	1	70			16	44				
4:45	0	66	1	275	11	47	42	184	43	459
5:00	2	63			27	34				
5:15	2	40			33	29				
5:30	8	52			34	28				
5:45	6	44	18	199	48	28	142	119	160	318
6:00	3	53			59	42				
6:15	6	39			62	27				
6:30	11	35			66	18				
6:45	10	47	30	174	47	24	234	111	264	285
7:00	26	41			74	21				
7:15	12	46			70	19				
7:30	10	31			63	6				
7:45	24	36	72	154	53	12	260	58	332	212
8:00	18	21			62	13				
8:15	26	29			72	11				
8:30	31	39			53	14				
8:45	23	32	98	121	57	5	244	43	342	164
9:00	34	26			34	7				
9:15	17	27			45	10				
9:30	28	24			40	5				
9:45	26	15	105	92	35	8	154	30	259	122
10:00	30	13			42	4				
10:15	19	8			38	2				
10:30	22	11			40	2				
10:45	29	9	100	41	30	3	150	11	250	52
11:00	25	7			37	2				
11:15	40	6			32	0				
11:30	25	7			33	2				
11:45	23	7	113	27	33	2	135	6	248	33
Totals	561	1846			1385	1098				
Combined Totals	2407				2483					
ADT									4890	
AM Peak Hour	1045	AM			700	AM				
Volume	119				260					
P.H.F.	0.744				0.878					
PM Peak Hour		415	PM			400	PM			
Volume		280				184				
P.H.F.		0.864				0.920				
Percentage	23.3%	76.7%			55.8%	44.2%				



24 Hour Volume Plot
**Victoria Boulevard
N/ Tavern Road**
12/7/2017

Start Time	12/7/2017
12:00 AM	8
1:00 AM	10
2:00 AM	13
3:00 AM	17
4:00 AM	43
5:00 AM	160
6:00 AM	264
7:00 AM	332
8:00 AM	342
9:00 AM	259
10:00 AM	250
11:00 AM	248
12:00 PM	284
1:00 PM	286
2:00 PM	352
3:00 PM	377
4:00 PM	459
5:00 PM	318
6:00 PM	285
7:00 PM	212
8:00 PM	164
9:00 PM	122
10:00 PM	52
11:00 PM	33
Total	4890



Volumes represent the combined totals for both directions

9/26/2017

1-9 → 6
 ← 2 → 6
 ← 7 → 8
 ave

INTERVAL	PHASE TIMING								PRE-EMPTION	F										
	1	2	3	4	5	6	7	8		9	E	0	1	2	3	4	5	6	7	8
WALK	1	1	1	1	1	1	1	1	CLK RST	EV SEL	0	PERMIT	1	2	4	5	6		0	
DONT WALK	1	1	1	1	1	1	1	1		RR1 CLR	15	RED LOCK	1		4	6		1		
MIN GREEN	8	10	1	5	5	10	1	1		EVA DLY	0	YEL LOCK						2		
TYPE 3 DET	0	0	0	0	0	0	0	0		EVA CLR	5	V RECALL	2					3		
ADD/VEH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		EVB DLY	0	P RECALL						4		
PASSAGE	2.0	3.0	0.9	3.0	3.0	3.0	0.9	0.9		EVB CLR	5	PED PHASES						5		
MAX GAP	2.0	3.0	0.9	3.0	3.0	3.0	0.9	0.9		EVC DLY	0	RT OLA		4	5			6		
MIN GAP	2.0	3.0	0.9	3.0	3.0	3.0	0.9	0.9		EVC CLR	5	RT OLB						7		
MAX EXT	20	35	9	25	35	20	9	9		EVD DLY	0	DBL ENTRY						8		
MAX 2									YR	EVD CLR	5	MAX 2 PHASES						9		
MAX 3									MO	MAX EV	255	LAG PHASES	READ ONLY							A
									DAY	RR2 CLR	15	RED REST						B		
REDUCE BY EVERY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	DOW			REST-IN-WALK						C		
YELLOW	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	HR			MAX 3 PHASES						D		
	3.7	4.1	3.0	4.4	4.4	4.1	3.0	3.0	MIN			YEL START UP	2		6			E		
RED	2.5	2.0	0.0	2.0	1.0	2.0	0.0	0.0	SEC			FIRST PHASE		4				F		
PED XING FT													1	2	3	4	5	6	7	8
BIKE XING FT	95							105												

FOC LONG FAILURE	
FOD SHORT FAILURE	
FOE	30
FOF	5

FCO	3
FC1	3
FC2	10
FCA	0.0
FCB	0.0
FCC	0.0
FCD	0.0

FDO TB SELECT	1
FD3 PED SELECT	0
FD4 7 WIRE	0
FD5 PERMISSIVE	0
FD8 OS SEEKING	1

CO5 FLASH TYPE	1
CC2 DOWNLOAD	1

ENTRIES IN THESE LOCATIONS CAN BE CHANGED IN CC1 FLASH ONLY

[illegible]

INTERVAL	PHASE TIMING										PRE-EMPTION		F							
	1	2	3	4	5	6	7	8	9	9	E	9	1	2	3	4	5	6	7	8
0 WALK	1	1	1	1	1	1	1	1	1	1	EV SEL	0	PERMIT	2			5	6		8
1 DONT WALK	1	1	1	1	1	1	1	1			RR1 CLR	15	RED LOCK						8	1
2 MIN GREEN	1	10	1	1	8	7	1	5			EVA DLY	0	YEL LOCK							2
3 TYPE 3 DET	0	0	0	0	0	0	0	0			EVA CLR	5	V RECALL	2		5				3
4 ADD/VEH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			EVB DLY	0	P RECALL							4
5 PASSAGE	0.9	3.0	0.9	0.9	3.0	3.0	0.9	2.0			EVB CLR	5	PED PHASES							5
6 MAX GAP	0.9	3.0	0.9	0.9	3.0	3.0	0.9	2.0			EVC DLY	0	RT OLA							6
7 MIN GAP	0.9	3.0	0.9	0.9	3.0	3.0	0.9	2.0			EVC CLR	5	RT OLB							7
8 MAX EXT	9	60	9	9	52	15	9	15			EVD DLY	0	DBL ENTRY							8
9 MAX 2		68			60			5	YR		EVD CLR	5	MAX 2 PHASES	2		5				9
A MAX 3									MO		MAX EV	255	LAG PHASES	READ ONLY						
B									DAY		RR2 CLR	15	RED REST							A
C REDUCE BY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	DOW				REST-IN-WALK							B
D EVERY	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	HR				MAX 3 PHASES							C
E YELLOW	3.0	4.1	3.0	3.0	3.7	4.1	3.0	4.4	MIN				YEL START UP	2			6			D
F RED	0.0	2.0	0.0	0.0	2.5	1.5	0.0	2.0	SEC				FIRST PHASE							E
5' PED XING FT																			8	F
BIKE XING FT		135						85						1	2	3	4	5	6	7

FOC LONG FAILURE	
FOD SHORT FAILURE	
FOE	30
FOF	5

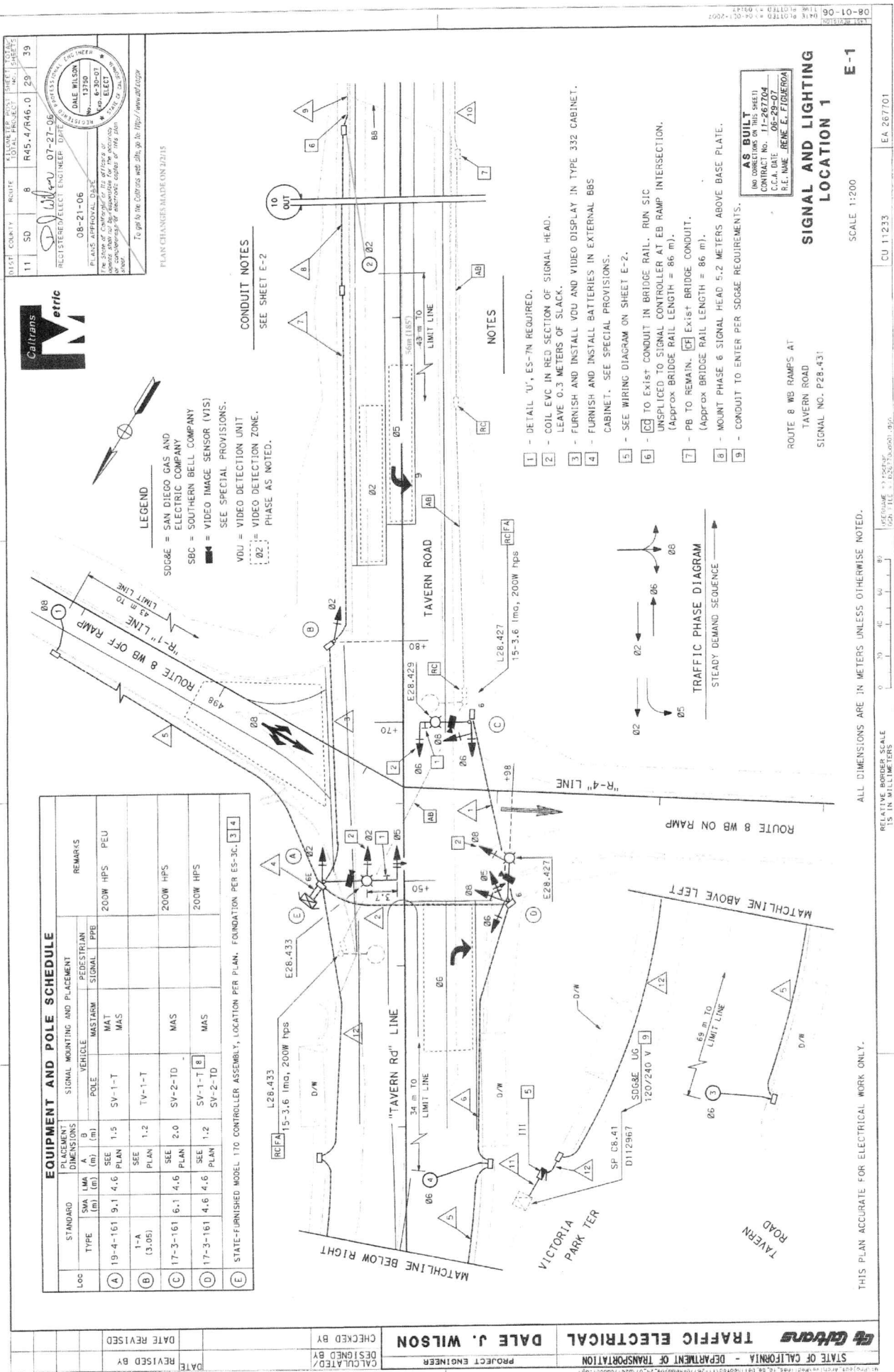
FCO	3
FC1	3
FC2	10
FCA	0.0
FCB	0.0
FCC	0.0
FCD	0.0

FDO TB SELECT	1
FD3 PED SELECT	0
FD4 7 WIRE	0
FD5 PERMISSIVE	0
FD8 OS SEEKING	1

CO5 FLASH TYPE	1
CC2 DOWNLOAD	1

ENTRIES IN THESE LOCATIONS CAN BE CHANGED IN CC1 FLASH ONLY

$\phi 2 \leftarrow$
 $\phi 5 \rightarrow$
 $\phi 2 \leftarrow$
 $\phi 6 \rightarrow$
 $\phi 8$



Appendix D

Existing LOS and Arterial Calculations

AM Existing
1: Tavern Rd & Private Dwy & Victoria Park Terraces

HCM 2010 TWSC

Intersection												
Int Delay, s/veh	4.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	0	17	64	5	6	79	61	9	7	218	7
Future Vol, veh/h	2	0	17	64	5	6	79	61	9	7	218	7
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	2	0	18	70	5	7	86	66	10	8	237	8
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	506	505	241	509	504	71	245	0	0	76	0	0
Stage 1	257	257	-	243	243	-	-	-	-	-	-	-
Stage 2	249	248	-	266	261	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	477	470	798	475	470	991	1321	-	-	1523	-	-
Stage 1	748	695	-	761	705	-	-	-	-	-	-	-
Stage 2	755	701	-	739	692	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	443	435	798	438	435	991	1321	-	-	1523	-	-
Mov Cap-2 Maneuver	443	435	-	438	435	-	-	-	-	-	-	-
Stage 1	697	691	-	709	657	-	-	-	-	-	-	-
Stage 2	693	653	-	718	688	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	10		14.6		4.2		0.2					
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1321	-	-	736	458	1523	-	-				
HCM Lane V/C Ratio	0.065	-	-	0.028	0.178	0.005	-	-				
HCM Control Delay (s)	7.9	0	-	10	14.6	7.4	0	-				
HCM Lane LOS	A	A	-	B	B	A	A	-				
HCM 95th %tile Q(veh)	0.2	-	-	0.1	0.6	0	-	-				

LOS Engineering, Inc.

AM Existing 2: Tavern Rd & I-8 WB Ramp

HCM 2010 Signalized Intersection Summary

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔		↗	↖			↖	↗
Traffic Volume (veh/h)	0	0	0	72	0	50	698	194	0	0	79	303
Future Volume (veh/h)	0	0	0	72	0	50	698	194	0	0	79	303
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1863	1900	1863	1863	0	0	1863	1863
Adj Flow Rate, veh/h				78	0	54	759	211	0	0	86	329
Adj No. of Lanes				0	1	0	1	1	0	0	1	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				0	2	0	2	2	0	0	2	2
Cap, veh/h				99	0	68	804	1409	0	0	430	366
Arrive On Green				0.10	0.00	0.10	0.45	0.76	0.00	0.00	0.23	0.23
Sat Flow, veh/h				999	0	692	1774	1863	0	0	1863	1583
Grp Volume(v), veh/h				132	0	0	759	211	0	0	86	329
Grp Sat Flow(s),veh/h/ln				1691	0	0	1774	1863	0	0	1863	1583
Q Serve(g_s), s				6.6	0.0	0.0	35.2	2.7	0.0	0.0	3.2	17.4
Cycle Q Clear(g_c), s				6.6	0.0	0.0	35.2	2.7	0.0	0.0	3.2	17.4
Prop In Lane				0.59		0.41	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				167	0	0	804	1409	0	0	430	366
V/C Ratio(X)				0.79	0.00	0.00	0.94	0.15	0.00	0.00	0.20	0.90
Avail Cap(c_a), veh/h				286	0	0	922	1576	0	0	484	412
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				38.0	0.0	0.0	22.5	2.9	0.0	0.0	26.7	32.2
Incr Delay (d2), s/veh				8.1	0.0	0.0	16.4	0.0	0.0	0.0	0.2	20.8
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				3.5	0.0	0.0	20.7	1.4	0.0	0.0	1.7	9.7
LnGrp Delay(d),s/veh				46.1	0.0	0.0	38.9	2.9	0.0	0.0	26.9	53.0
LnGrp LOS				D			D	A			C	D
Approach Vol, veh/h					132			970			415	
Approach Delay, s/veh					46.1			31.1			47.6	
Approach LOS					D			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		71.3			45.3	26.0		14.9				
Change Period (Y+Rc), s		6.1			* 6.2	* 6.1		6.4				
Max Green Setting (Gmax), s		72.9			* 45	* 22		14.6				
Max Q Clear Time (g_c+I1), s		4.7			37.2	19.4		8.6				
Green Ext Time (p_c), s		1.3			1.9	0.5		0.3				
Intersection Summary												
HCM 2010 Ctrl Delay				36.9								
HCM 2010 LOS				D								
Notes												

LOS Engineering, Inc.

HCM 2010 analysis does not support custom phasing.

AM Existing 3: Tavern Rd & I-8 EB Ramp

HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	114	2	362	0	0	0	0	728	62	29	139	0
Future Volume (vph)	114	2	362	0	0	0	0	728	62	29	139	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.4	6.4					6.1	6.1	6.2	6.1	
Lane Util. Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1775	1583					1863	1583	1770	1863	
Flt Permitted		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1775	1583					1863	1583	1770	1863	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	124	2	393	0	0	0	0	791	67	32	151	0
RTOR Reduction (vph)	0	0	321	0	0	0	0	0	29	0	0	0
Lane Group Flow (vph)	0	126	72	0	0	0	0	791	38	32	151	0
Turn Type	Split	NA	custom					NA	Perm	Prot	NA	
Protected Phases	4	4	4 3					2 3		1	6	
Permitted Phases			4 3						2 3			
Actuated Green, G (s)		6.1	14.7					31.4	31.4	1.4	28.8	
Effective Green, g (s)		6.1	10.2					31.4	31.4	1.4	28.8	
Actuated g/C Ratio		0.11	0.18					0.56	0.56	0.02	0.51	
Clearance Time (s)		6.4								6.2	6.1	
Vehicle Extension (s)		3.0								3.0	3.0	
Lane Grp Cap (vph)		193	288					1044	887	44	958	
v/s Ratio Prot		c0.07	0.05					c0.42		c0.02	0.08	
v/s Ratio Perm									0.02			
v/c Ratio		0.65	0.25					0.76	0.04	0.73	0.16	
Uniform Delay, d1		23.9	19.6					9.4	5.5	27.1	7.2	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2		7.7	0.5					3.2	0.0	45.3	0.1	
Delay (s)		31.6	20.1					12.6	5.6	72.4	7.3	
Level of Service		C	C					B	A	E	A	
Approach Delay (s)		22.9			0.0			12.0			18.7	
Approach LOS		C			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			16.4		HCM 2000 Level of Service					B		
HCM 2000 Volume to Capacity ratio			0.88									
Actuated Cycle Length (s)			56.0		Sum of lost time (s)					23.2		
Intersection Capacity Utilization			79.6%		ICU Level of Service					D		
Analysis Period (min)			15									
c Critical Lane Group												

AM Existing 3: Tavern Rd & I-8 EB Ramp

HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	114	2	362	0	0	0	0	728	62	29	139	0
Future Volume (vph)	114	2	362	0	0	0	0	728	62	29	139	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.4	6.4					6.1	6.1	6.2	6.1	
Lane Util. Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1775	1583					1863	1583	1770	1863	
Flt Permitted		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1775	1583					1863	1583	1770	1863	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	124	2	393	0	0	0	0	791	67	32	151	0
RTOR Reduction (vph)	0	0	321	0	0	0	0	0	29	0	0	0
Lane Group Flow (vph)	0	126	72	0	0	0	0	791	38	32	151	0
Turn Type	Split	NA	custom					NA	Perm	Prot	NA	
Protected Phases	4	4	4 3					2 3		1	6	
Permitted Phases			4 3						2 3			
Actuated Green, G (s)		6.1	14.7					31.4	31.4	1.4	28.8	
Effective Green, g (s)		6.1	10.2					31.4	31.4	1.4	28.8	
Actuated g/C Ratio		0.11	0.18					0.56	0.56	0.02	0.51	
Clearance Time (s)		6.4								6.2	6.1	
Vehicle Extension (s)		3.0								3.0	3.0	
Lane Grp Cap (vph)		193	288					1044	887	44	958	
v/s Ratio Prot		c0.07	0.05					c0.42		c0.02	0.08	
v/s Ratio Perm									0.02			
v/c Ratio		0.65	0.25					0.76	0.04	0.73	0.16	
Uniform Delay, d1		23.9	19.6					9.4	5.5	27.1	7.2	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2		7.7	0.5					3.2	0.0	45.3	0.1	
Delay (s)		31.6	20.1					12.6	5.6	72.4	7.3	
Level of Service		C	C					B	A	E	A	
Approach Delay (s)		22.9			0.0			12.0			18.7	
Approach LOS		C			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			16.4		HCM 2000 Level of Service					B		
HCM 2000 Volume to Capacity ratio			0.88									
Actuated Cycle Length (s)			56.0		Sum of lost time (s)					23.2		
Intersection Capacity Utilization			79.6%		ICU Level of Service					D		
Analysis Period (min)			15									
c Critical Lane Group												

AM Existing
4: Tavern Rd & Alpine Blvd

HCM 2010 Signalized Intersection Summary

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	35	43	36	50	309	57	478	20	174	235	58
Future Volume (veh/h)	31	35	43	36	50	309	57	478	20	174	235	58
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.95	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	34	38	47	39	54	336	62	520	22	189	255	63
Adj No. of Lanes	1	1	1	1	1	1	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	53	439	362	59	445	588	81	834	35	248	940	227
Arrive On Green	0.03	0.24	0.24	0.03	0.24	0.24	0.05	0.24	0.24	0.14	0.34	0.34
Sat Flow, veh/h	1774	1863	1537	1774	1863	1538	1774	3452	146	1774	2803	676
Grp Volume(v), veh/h	34	38	47	39	54	336	62	266	276	189	159	159
Grp Sat Flow(s),veh/h/ln	1774	1863	1537	1774	1863	1538	1774	1770	1828	1774	1770	1710
Q Serve(g_s), s	1.0	0.8	1.2	1.1	1.2	8.9	1.8	6.9	6.9	5.3	3.4	3.5
Cycle Q Clear(g_c), s	1.0	0.8	1.2	1.1	1.2	8.9	1.8	6.9	6.9	5.3	3.4	3.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.08	1.00		0.40
Lane Grp Cap(c), veh/h	53	439	362	59	445	588	81	427	442	248	593	573
V/C Ratio(X)	0.64	0.09	0.13	0.66	0.12	0.57	0.76	0.62	0.62	0.76	0.27	0.28
Avail Cap(c_a), veh/h	259	598	494	259	598	715	363	913	943	742	1291	1248
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.7	15.3	15.5	24.6	15.3	12.7	24.2	17.4	17.4	21.3	12.5	12.5
Incr Delay (d2), s/veh	12.1	0.1	0.2	12.0	0.1	0.9	13.8	1.5	1.5	4.8	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.4	0.5	0.7	0.6	3.9	1.2	3.5	3.6	2.9	1.7	1.7
LnGrp Delay(d),s/veh	36.8	15.4	15.7	36.5	15.5	13.6	38.0	18.9	18.9	26.1	12.7	12.8
LnGrp LOS	D	B	B	D	B	B	D	B	B	C	B	B
Approach Vol, veh/h	119			429			604			507		
Approach Delay, s/veh	21.6			15.9			20.8			17.7		
Approach LOS	C			B			C			B		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.7	16.9	6.2	16.6	6.8	21.7	6.0	16.8				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	21.5	26.5	7.5	16.5	10.5	37.5	7.5	16.5				
Max Q Clear Time (g_c+I), s	17.3	8.9	3.1	3.2	3.8	5.5	3.0	10.9				
Green Ext Time (p_c), s	0.4	2.9	0.0	0.2	0.1	1.9	0.0	0.8				
Intersection Summary												
HCM 2010 Ctrl Delay			18.7									
HCM 2010 LOS			B									

LOS Engineering, Inc.

Intersection						
Int Delay, s/veh	2.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	19	1	40	51	1	2
Future Vol, veh/h	19	1	40	51	1	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	21	1	43	55	1	2
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	22	0	163	22
Stage 1	-	-	-	-	22	-
Stage 2	-	-	-	-	141	-
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	-	-	1593	-	828	1055
Stage 1	-	-	-	-	1001	-
Stage 2	-	-	-	-	886	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1593	-	805	1055
Mov Cap-2 Maneuver	-	-	-	-	805	-
Stage 1	-	-	-	-	973	-
Stage 2	-	-	-	-	886	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	3.2		8.8		
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	956	-	-	1593	-	
HCM Lane V/C Ratio	0.003	-	-	0.027	-	
HCM Control Delay (s)	8.8	-	-	7.3	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile O(veh)	0	-	-	0.1	-	

Intersection

Int Delay, s/veh 1.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	50	38	149	283	16
Future Vol, veh/h	10	50	38	149	283	16
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	11	54	41	162	308	17

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	561	317	325
Stage 1	317	-	-
Stage 2	244	-	-
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	489	724	1235
Stage 1	738	-	-
Stage 2	797	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	471	724	1235
Mov Cap-2 Maneuver	549	-	-
Stage 1	711	-	-
Stage 2	797	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.8	1.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1235	-	687	-	-
HCM Lane V/C Ratio	0.033	-	0.095	-	-
HCM Control Delay (s)	8	0	10.8	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-

Intersection												
Int Delay, s/veh	0.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	33	4	0	1	4	240	72	0	382	0
Future Vol, veh/h	0	0	33	4	0	1	4	240	72	0	382	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	0	0	36	4	0	1	4	261	78	0	415	0
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	724	762	208	516	723	300	415	0	0	339	0	0
Stage 1	415	415	-	308	308	-	-	-	-	-	-	-
Stage 2	309	347	-	208	415	-	-	-	-	-	-	-
Critical Hdwy	7.33	6.53	6.93	7.33	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.53	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.53	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.519	4.019	3.319	3.519	4.019	3.319	2.219	-	-	2.219	-	-
Pot Cap-1 Maneuver	327	334	799	456	352	739	1142	-	-	1219	-	-
Stage 1	586	592	-	701	660	-	-	-	-	-	-	-
Stage 2	700	634	-	775	592	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	325	333	799	434	351	739	1142	-	-	1219	-	-
Mov Cap-2 Maneuver	325	333	-	434	351	-	-	-	-	-	-	-
Stage 1	584	592	-	698	657	-	-	-	-	-	-	-
Stage 2	696	631	-	740	592	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	9.7		12.7		0.1		0					
HCM LOS	A		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1142	-	-	799	473	1219	-	-				
HCM Lane V/C Ratio	0.004	-	-	0.045	0.011	-	-	-				
HCM Control Delay (s)	8.2	0	-	9.7	12.7	0	-	-				
HCM Lane LOS	A	A	-	A	B	A	-	-				
HCM 95th %tile O(veh)	0	-	-	0.1	0	0	-	-				

PM Existing
1: Tavern Rd & Private Dwy & Victoria Park Terraces

HCM 2010 TWSC

Intersection												
Int Delay, s/veh	3.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	2	49	66	0	9	41	243	9	3	123	6
Future Vol, veh/h	5	2	49	66	0	9	41	243	9	3	123	6
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	5	2	53	72	0	10	45	264	10	3	134	7
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	508	508	138	530	506	269	141	0	0	274	0	0
Stage 1	144	144	-	359	359	-	-	-	-	-	-	-
Stage 2	364	364	-	171	147	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	475	468	910	460	469	770	1442	-	-	1289	-	-
Stage 1	859	778	-	659	627	-	-	-	-	-	-	-
Stage 2	655	624	-	831	775	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	455	449	910	418	450	770	1442	-	-	1289	-	-
Mov Cap-2 Maneuver	455	449	-	418	450	-	-	-	-	-	-	-
Stage 1	827	776	-	635	604	-	-	-	-	-	-	-
Stage 2	623	601	-	778	773	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	9.8		15		1.1		0.2					
HCM LOS	A		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1442	-	-	808	442	1289	-	-				
HCM Lane V/C Ratio	0.031	-	-	0.075	0.184	0.003	-	-				
HCM Control Delay (s)	7.6	0	-	9.8	15	7.8	0	-				
HCM Lane LOS	A	A	-	A	C	A	A	-				
HCM 95th %tile O(veh)	0.1	-	-	0.2	0.7	0	-	-				

LOS Engineering, Inc.

PM Existing
2: Tavern Rd & I-8 WB Ramp

HCM 2010 Signalized Intersection Summary

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	71	2	51	429	307	0	0	89	172
Future Volume (veh/h)	0	0	0	71	2	51	429	307	0	0	89	172
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1863	1900	1863	1863	0	0	1863	1863
Adj Flow Rate, veh/h				77	2	55	466	334	0	0	97	187
Adj No. of Lanes				0	1	0	1	1	0	0	1	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				0	2	0	2	2	0	0	2	2
Cap, veh/h				98	3	70	556	1153	0	0	310	263
Arrive On Green				0.10	0.10	0.10	0.31	0.62	0.00	0.00	0.17	0.17
Sat Flow, veh/h				972	25	694	1774	1863	0	0	1863	1583
Grp Volume(v), veh/h				134	0	0	466	334	0	0	97	187
Grp Sat Flow(s),veh/h/ln				1692	0	0	1774	1863	0	0	1863	1583
Q Serve(g_s), s				3.5	0.0	0.0	10.9	3.7	0.0	0.0	2.0	5.0
Cycle Q Clear(g_c), s				3.5	0.0	0.0	10.9	3.7	0.0	0.0	2.0	5.0
Prop In Lane				0.57		0.41	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				171	0	0	556	1153	0	0	310	263
V/C Ratio(X)				0.78	0.00	0.00	0.84	0.29	0.00	0.00	0.31	0.71
Avail Cap(c_a), veh/h				288	0	0	907	1666	0	0	476	405
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				19.6	0.0	0.0	14.3	3.9	0.0	0.0	16.4	17.6
Incr Delay (d2), s/veh				7.7	0.0	0.0	3.8	0.1	0.0	0.0	0.6	3.5
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				2.0	0.0	0.0	5.9	1.9	0.0	0.0	1.1	2.4
LnGrp Delay(d),s/veh				27.3	0.0	0.0	18.0	4.1	0.0	0.0	16.9	21.1
LnGrp LOS				C			B	A			B	C
Approach Vol, veh/h					134			800			284	
Approach Delay, s/veh					27.3			12.2			19.7	
Approach LOS					C			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		33.7			20.2	13.5		10.9				
Change Period (Y+Rc), s		6.1			* 6.2	* 6.1		6.4				
Max Green Setting (Gmax), s		39.9			* 23	* 11		7.6				
Max Q Clear Time (g_c+I1), s		5.7			12.9	7.0		5.5				
Green Ext Time (p_c), s		2.1			1.1	0.4		0.1				
Intersection Summary												
HCM 2010 Ctrl Delay				15.6								
HCM 2010 LOS				B								
Notes												

LOS Engineering, Inc.

HCM 2010 analysis does not support custom phasing.

PM Existing
3: Tavern Rd & I-8 EB Ramp

HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	211	1	895	0	0	0	0	522	119	35	136	0
Future Volume (vph)	211	1	895	0	0	0	0	522	119	35	136	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.4	6.4					6.1	6.1	6.2	6.1	
Lane Util. Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1774	1583					1863	1583	1770	1863	
Flt Permitted		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1774	1583					1863	1583	1770	1863	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	229	1	973	0	0	0	0	567	129	38	148	0
RTOR Reduction (vph)	0	0	328	0	0	0	0	0	66	0	0	0
Lane Group Flow (vph)	0	230	645	0	0	0	0	567	63	38	148	0
Turn Type	Split	NA	custom					NA	Perm	Prot	NA	
Protected Phases	4	4	4 3					2 3		1	6	
Permitted Phases			4 3						2 3			
Actuated Green, G (s)		16.4	36.6					34.5	34.5	2.6	21.5	
Effective Green, g (s)		16.4	32.1					34.5	34.5	2.6	21.5	
Actuated g/C Ratio		0.23	0.45					0.49	0.49	0.04	0.30	
Clearance Time (s)		6.4								6.2	6.1	
Vehicle Extension (s)		3.0								3.0	3.0	
Lane Grp Cap (vph)		412	719					910	773	65	567	
v/s Ratio Prot		0.13	c0.41					c0.30		0.02	c0.08	
v/s Ratio Perm									0.04			
v/c Ratio		0.56	0.90					0.62	0.08	0.58	0.26	
Uniform Delay, d1		23.9	17.7					13.3	9.6	33.5	18.5	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.6	13.8					1.3	0.0	12.7	0.2	
Delay (s)		25.5	31.5					14.6	9.7	46.2	18.8	
Level of Service		C	C					B	A	D	B	
Approach Delay (s)		30.4			0.0			13.7			24.4	
Approach LOS		C			A			B			C	
Intersection Summary												
HCM 2000 Control Delay			24.3									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			70.6									Sum of lost time (s) 23.2
Intersection Capacity Utilization			73.0%									ICU Level of Service C
Analysis Period (min)			15									
c Critical Lane Group												

PM Existing
4: Tavern Rd & Alpine Blvd

HCM 2010 Signalized Intersection Summary

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	103	83	76	69	57	240	41	313	49	341	532	51
Future Volume (veh/h)	103	83	76	69	57	240	41	313	49	341	532	51
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.94	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	112	90	83	75	62	261	45	340	53	371	578	55
Adj No. of Lanes	1	1	1	1	1	1	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	144	388	319	96	337	665	63	572	88	435	1294	123
Arrive On Green	0.08	0.21	0.21	0.05	0.18	0.18	0.04	0.19	0.19	0.25	0.40	0.40
Sat Flow, veh/h	1774	1863	1534	1774	1863	1529	1774	3048	469	1774	3255	309
Grp Volume(v), veh/h	112	90	83	75	62	261	45	196	197	371	314	319
Grp Sat Flow(s),veh/h/ln	1774	1863	1534	1774	1863	1529	1774	1770	1747	1774	1770	1794
Q Serve(g_s), s	3.7	2.4	2.7	2.5	1.7	7.0	1.5	6.0	6.1	11.8	7.7	7.7
Cycle Q Clear(g_c), s	3.7	2.4	2.7	2.5	1.7	7.0	1.5	6.0	6.1	11.8	7.7	7.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.27	1.00		0.17
Lane Grp Cap(c), veh/h	144	388	319	96	337	665	63	332	328	435	704	713
V/C Ratio(X)	0.78	0.23	0.26	0.78	0.18	0.39	0.72	0.59	0.60	0.85	0.45	0.45
Avail Cap(c_a), veh/h	225	521	429	225	521	816	316	794	784	646	1124	1140
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.6	19.4	19.6	27.6	20.5	11.7	28.2	21.9	22.0	21.3	13.0	13.0
Incr Delay (d2), s/veh	8.7	0.3	0.4	13.0	0.3	0.4	14.2	1.7	1.8	7.2	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	1.3	1.2	1.6	0.9	3.0	1.0	3.0	3.1	6.6	3.8	3.9
LnGrp Delay(d),s/veh	35.3	19.8	20.0	40.6	20.7	12.1	42.3	23.5	23.7	28.4	13.5	13.5
LnGrp LOS	D	B	B	D	C	B	D	C	C	C	B	B
Approach Vol, veh/h	285				398		438				1004	
Approach Delay, s/veh	25.9				18.8		25.6				19.0	
Approach LOS	C				B		C				B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.0	15.6	7.7	16.8	6.6	28.0	9.3	15.2				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	21.5	26.5	7.5	16.5	10.5	37.5	7.5	16.5				
Max Q Clear Time (g_c+1.5), s	13.8	8.1	4.5	4.7	3.5	9.7	5.7	9.0				
Green Ext Time (p_c), s	0.7	2.1	0.0	0.5	0.0	4.0	0.0	0.7				
Intersection Summary												
HCM 2010 Ctrl Delay	21.2											
HCM 2010 LOS	C											

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Intersection

Int Delay, s/veh 0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	56	1	3	44	0	1
Future Vol, veh/h	56	1	3	44	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	61	1	3	48	0	1

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	62
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	1541
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1541
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	8.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1003	-	-	1541	-
HCM Lane V/C Ratio	0.001	-	-	0.002	-
HCM Control Delay (s)	8.6	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	12	28	293	228	10
Future Vol, veh/h	2	12	28	293	228	10
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	2	13	30	318	248	11
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	632	254	259	0	-	0
Stage 1	254	-	-	-	-	-
Stage 2	378	-	-	-	-	-
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	444	785	1306	-	-	-
Stage 1	788	-	-	-	-	-
Stage 2	693	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	432	785	1306	-	-	-
Mov Cap-2 Maneuver	519	-	-	-	-	-
Stage 1	766	-	-	-	-	-
Stage 2	693	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	10	0.7		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1306	-	731	-	-	
HCM Lane V/C Ratio	0.023	-	0.021	-	-	
HCM Control Delay (s)	7.8	0	10	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-	

Intersection												
Int Delay, s/veh	0.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	0	33	0	0	0	5	353	60	1	261	0
Future Vol, veh/h	3	0	33	0	0	0	5	353	60	1	261	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	3	0	36	0	0	0	5	384	65	1	284	0
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	713	745	142	571	713	417	284	0	0	449	0	0
Stage 1	286	286	-	427	427	-	-	-	-	-	-	-
Stage 2	427	459	-	144	286	-	-	-	-	-	-	-
Critical Hdwy	7.33	6.53	6.93	7.33	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.53	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.53	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.519	4.019	3.319	3.519	4.019	3.319	2.219	-	-	2.219	-	-
Pot Cap-1 Maneuver	333	342	880	417	356	635	1277	-	-	1110	-	-
Stage 1	698	674	-	605	584	-	-	-	-	-	-	-
Stage 2	605	566	-	845	674	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	331	340	880	398	354	635	1277	-	-	1110	-	-
Mov Cap-2 Maneuver	331	340	-	398	354	-	-	-	-	-	-	-
Stage 1	695	673	-	602	581	-	-	-	-	-	-	-
Stage 2	602	563	-	810	673	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	9.9		0			0.1			0			
HCM LOS	A		A									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1277	-	-	773	-	1110	-	-				
HCM Lane V/C Ratio	0.004	-	-	0.051	-	0.001	-	-				
HCM Control Delay (s)	7.8	0	-	9.9	0	8.2	0	-				
HCM Lane LOS	A	A	-	A	A	A	A	-				
HCM 95th %tile O(veh)	0	-	-	0.2	-	0	-	-				

Arterial Level of Service: NB Tavern Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Alpine Blvd	III	35	12.5	18.8	31.3	0.09	10.7	E
I-8 EB Ramp	III	35	15.7	15.7	31.4	0.12	13.3	E
I-8 WB Ramp	III	35	26.9	3.5	30.4	0.22	26.5	B
Total	III		55.1	38.0	93.1	0.43	16.7	D

Arterial Level of Service: SB Tavern Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
I-8 WB Ramp	III	35	17.5	36.4	53.9	0.14	9.1	F
I-8 EB Ramp	III	35	26.9	7.7	34.6	0.22	23.3	C
Alpine Blvd	III	35	15.7	10.3	26.0	0.12	16.1	D
Total	III		60.1	54.4	114.5	0.48	15.0	D

Arterial Level of Service: NB Tavern Rd

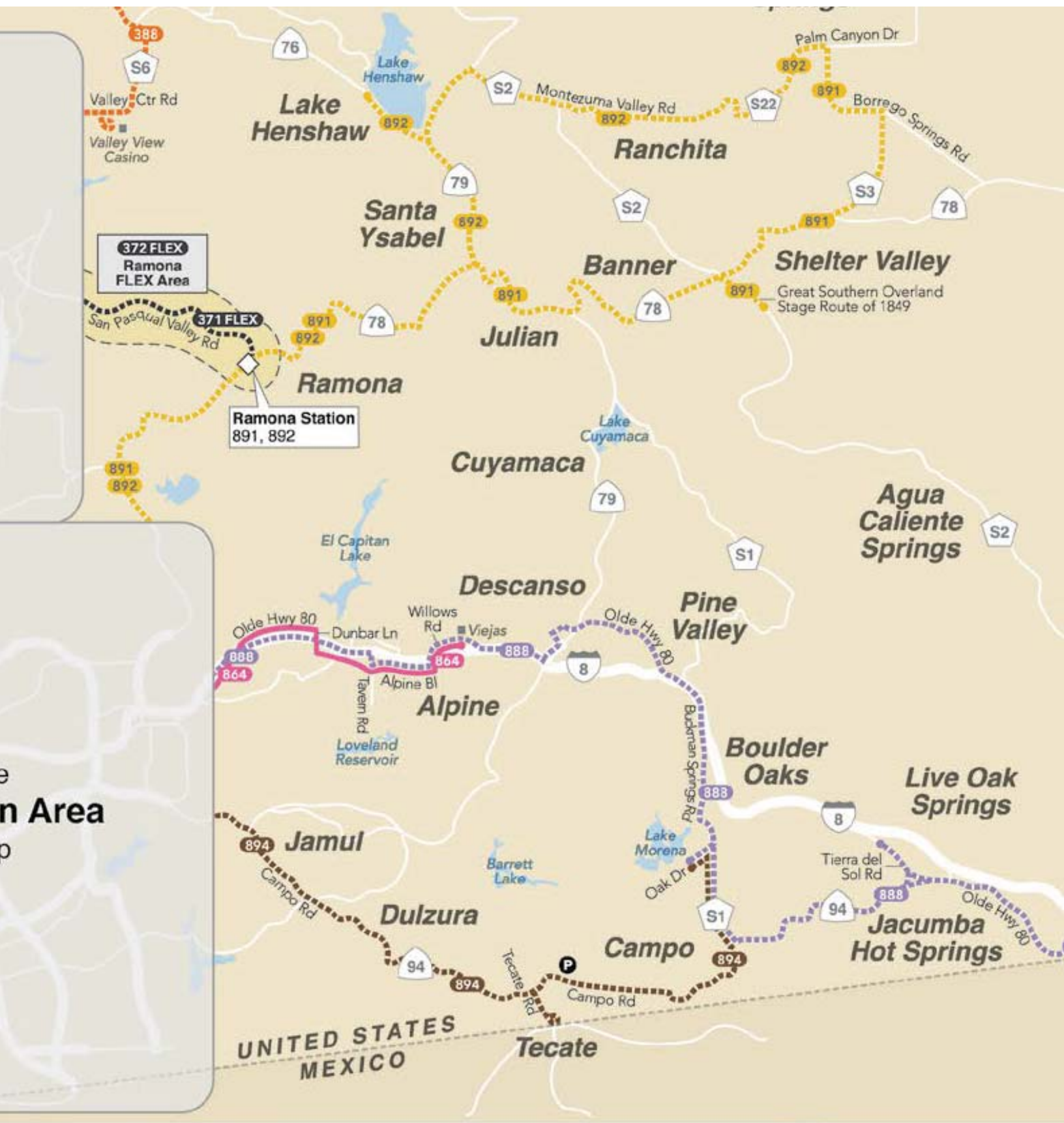
Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Alpine Blvd	III	35	12.5	26.9	39.4	0.09	8.5	F
I-8 EB Ramp	III	35	15.7	18.8	34.5	0.12	12.1	E
I-8 WB Ramp	III	35	26.9	4.7	31.6	0.22	25.5	B
Total	III		55.1	50.4	105.5	0.43	14.8	D

Arterial Level of Service: SB Tavern Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
I-8 WB Ramp	III	35	17.5	23.4	40.9	0.14	12.0	E
I-8 EB Ramp	III	35	26.9	21.0	47.9	0.22	16.8	D
Alpine Blvd	III	35	15.7	15.0	30.7	0.12	13.6	E
Total	III		60.1	59.4	119.5	0.48	14.4	D

Appendix E

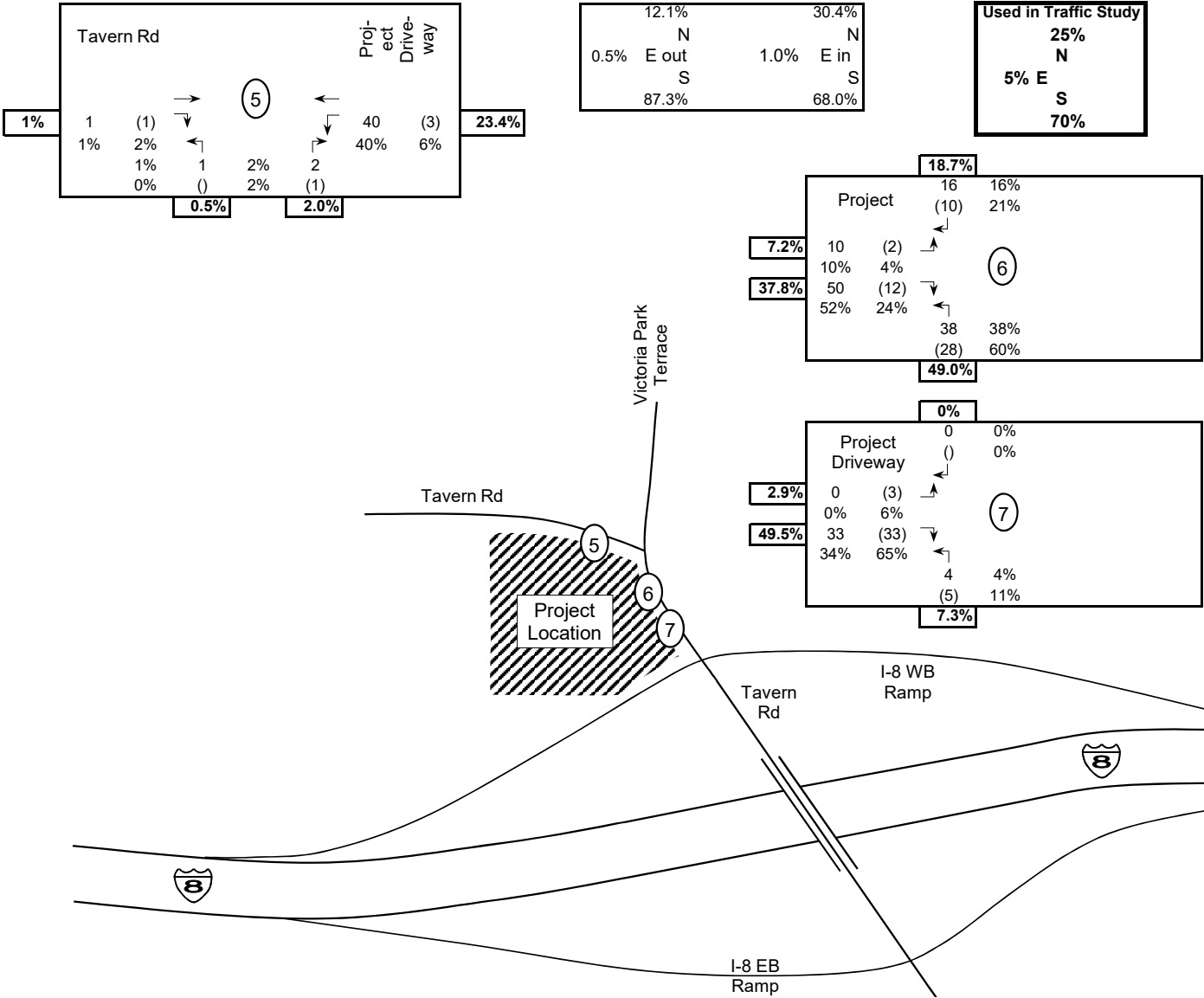
Transit Service Near Project



Appendix F

Trip Distribution Calculations

Project Distribution for Primary Trips (based on existing movements at project driveways)



Appendix G

Existing + Project LOS and Arterial Calculations

AM Existing + Project
1: Tavern Rd & Private Dwy & Victoria Park Terraces

HCM 2010 TWSC

Intersection												
Int Delay, s/veh	4.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	0	17	64	5	6	81	68	9	7	225	9
Future Vol, veh/h	4	0	17	64	5	6	81	68	9	7	225	9
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	4	0	18	70	5	7	88	74	10	8	245	10
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	527	526	250	530	526	79	255	0	0	84	0	0
Stage 1	266	266	-	255	255	-	-	-	-	-	-	-
Stage 2	261	260	-	275	271	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	462	457	789	460	457	981	1310	-	-	1513	-	-
Stage 1	739	689	-	749	696	-	-	-	-	-	-	-
Stage 2	744	693	-	731	685	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	428	422	789	423	422	981	1310	-	-	1513	-	-
Mov Cap-2 Maneuver	428	422	-	423	422	-	-	-	-	-	-	-
Stage 1	687	685	-	696	647	-	-	-	-	-	-	-
Stage 2	681	644	-	710	681	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	10.5		15			4.1			0.2			
HCM LOS	B		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1310	-	-	680	443	1513	-	-				
HCM Lane V/C Ratio	0.067	-	-	0.034	0.184	0.005	-	-				
HCM Control Delay (s)	7.9	0	-	10.5	15	7.4	0	-				
HCM Lane LOS	A	A	-	B	C	A	A	-				
HCM 95th %tile O(veh)	0.2	-	-	0.1	0.7	0	-	-				

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AM Existing + Project
2: Tavern Rd & I-8 WB Ramp

HCM 2010 Signalized Intersection Summary

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	72	0	68	698	226	0	0	111	321
Future Volume (veh/h)	0	0	0	72	0	68	698	226	0	0	111	321
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1863	1900	1863	1863	0	0	1863	1863
Adj Flow Rate, veh/h				78	0	74	759	246	0	0	121	349
Adj No. of Lanes				0	1	0	1	1	0	0	1	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				0	2	0	2	2	0	0	2	2
Cap, veh/h				96	0	91	796	1404	0	0	444	377
Arrive On Green				0.11	0.00	0.11	0.45	0.75	0.00	0.00	0.24	0.24
Sat Flow, veh/h				860	0	816	1774	1863	0	0	1863	1583
Grp Volume(v), veh/h				152	0	0	759	246	0	0	121	349
Grp Sat Flow(s),veh/h/ln				1676	0	0	1774	1863	0	0	1863	1583
Q Serve(g_s), s				8.2	0.0	0.0	38.1	3.5	0.0	0.0	4.9	19.9
Cycle Q Clear(g_c), s				8.2	0.0	0.0	38.1	3.5	0.0	0.0	4.9	19.9
Prop In Lane				0.51		0.49	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				186	0	0	796	1404	0	0	444	377
V/C Ratio(X)				0.82	0.00	0.00	0.95	0.18	0.00	0.00	0.27	0.93
Avail Cap(c_a), veh/h				264	0	0	859	1468	0	0	451	383
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				40.2	0.0	0.0	24.6	3.2	0.0	0.0	28.7	34.4
Incr Delay (d2), s/veh				12.4	0.0	0.0	19.6	0.1	0.0	0.0	0.3	27.8
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				4.4	0.0	0.0	22.9	1.8	0.0	0.0	2.6	11.6
LnGrp Delay(d),s/veh				52.6	0.0	0.0	44.2	3.3	0.0	0.0	29.0	62.2
LnGrp LOS				D			D	A			C	E
Approach Vol, veh/h					152			1005			470	
Approach Delay, s/veh					52.6			34.2			53.7	
Approach LOS					D			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		75.8			47.7	28.1		16.7				
Change Period (Y+Rc), s		6.1			* 6.2	* 6.1		6.4				
Max Green Setting (Gmax), s		72.9			* 45	* 22		14.6				
Max Q Clear Time (g_c+I1), s		5.5			40.1	21.9		10.2				
Green Ext Time (p_c), s		1.5			1.3	0.1		0.3				
Intersection Summary												
HCM 2010 Ctrl Delay				41.6								
HCM 2010 LOS				D								
Notes												

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HCM 2010 analysis does not support custom phasing.

AM Existing + Project 3: Tavern Rd & I-8 EB Ramp

HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	132	2	362	0	0	0	0	742	62	47	153	0
Future Volume (vph)	132	2	362	0	0	0	0	742	62	47	153	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.4	6.4					6.1	6.1	6.2	6.1	
Lane Util. Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1775	1583					1863	1583	1770	1863	
Flt Permitted		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1775	1583					1863	1583	1770	1863	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	143	2	393	0	0	0	0	807	67	51	166	0
RTOR Reduction (vph)	0	0	323	0	0	0	0	0	30	0	0	0
Lane Group Flow (vph)	0	145	70	0	0	0	0	807	37	51	166	0
Turn Type	Split	NA	custom					NA	Perm	Prot	NA	
Protected Phases	4	4	4 3					2 3		1	6	
Permitted Phases			4 3						2 3			
Actuated Green, G (s)		6.1	14.7					31.6	31.6	2.2	29.8	
Effective Green, g (s)		6.1	10.2					31.6	31.6	2.2	29.8	
Actuated g/C Ratio		0.11	0.18					0.55	0.55	0.04	0.52	
Clearance Time (s)		6.4								6.2	6.1	
Vehicle Extension (s)		3.0								3.0	3.0	
Lane Grp Cap (vph)		189	283					1032	877	68	973	
v/s Ratio Prot		c0.08	0.04					c0.43		c0.03	0.09	
v/s Ratio Perm									0.02			
v/c Ratio		0.77	0.25					0.78	0.04	0.75	0.17	
Uniform Delay, d1		24.8	20.1					10.0	5.8	27.1	7.1	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2		16.9	0.5					3.9	0.0	36.6	0.1	
Delay (s)		41.6	20.6					13.9	5.8	63.7	7.2	
Level of Service		D	C					B	A	E	A	
Approach Delay (s)		26.2			0.0			13.3			20.5	
Approach LOS		C			A			B			C	
Intersection Summary												
HCM 2000 Control Delay		18.5										
HCM 2000 Volume to Capacity ratio		0.92										
Actuated Cycle Length (s)		57.0										
Intersection Capacity Utilization		81.9%										
Analysis Period (min)		15										
c Critical Lane Group												

AM Existing + Project

4: Tavern Rd & Alpine Blvd

HCM 2010 Signalized Intersection Summary

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	35	43	36	50	316	57	481	20	181	238	61
Future Volume (veh/h)	34	35	43	36	50	316	57	481	20	181	238	61
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.95	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	37	38	47	39	54	343	62	523	22	197	259	66
Adj No. of Lanes	1	1	1	1	1	1	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	56	444	366	59	446	597	81	830	35	257	945	235
Arrive On Green	0.03	0.24	0.24	0.03	0.24	0.24	0.05	0.24	0.24	0.14	0.34	0.34
Sat Flow, veh/h	1774	1863	1538	1774	1863	1538	1774	3453	145	1774	2784	693
Grp Volume(v), veh/h	37	38	47	39	54	343	62	268	277	197	162	163
Grp Sat Flow(s),veh/h/ln	1774	1863	1538	1774	1863	1538	1774	1770	1829	1774	1770	1707
Q Serve(g_s), s	1.1	0.8	1.3	1.1	1.2	9.3	1.8	7.1	7.1	5.6	3.5	3.6
Cycle Q Clear(g_c), s	1.1	0.8	1.3	1.1	1.2	9.3	1.8	7.1	7.1	5.6	3.5	3.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.08	1.00		0.41
Lane Grp Cap(c), veh/h	56	444	366	59	446	597	81	425	440	257	601	580
V/C Ratio(X)	0.66	0.09	0.13	0.66	0.12	0.57	0.77	0.63	0.63	0.77	0.27	0.28
Avail Cap(c_a), veh/h	254	587	484	254	587	713	356	895	925	728	1267	1222
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.1	15.5	15.7	25.0	15.6	12.8	24.7	17.8	17.8	21.6	12.6	12.6
Incr Delay (d2), s/veh	12.2	0.1	0.2	12.2	0.1	0.9	14.2	1.5	1.5	4.8	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.4	0.5	0.8	0.6	4.0	1.2	3.6	3.7	3.1	1.7	1.8
LnGrp Delay(d),s/veh	37.3	15.6	15.8	37.2	15.7	13.7	39.0	19.3	19.3	26.4	12.8	12.9
LnGrp LOS	D	B	B	D	B	B	D	B	B	C	B	B
Approach Vol, veh/h		122			436			607			522	
Approach Delay, s/veh		22.3			16.0			21.3			17.9	
Approach LOS		C			B			C			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.1	17.1	6.2	17.0	6.9	22.3	6.2	17.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	21.5	26.5	7.5	16.5	10.5	37.5	7.5	16.5				
Max Q Clear Time (g_c+1), s	17.6	9.1	3.1	3.3	3.8	5.6	3.1	11.3				
Green Ext Time (p_c), s	0.4	2.9	0.0	0.2	0.1	1.9	0.0	0.7				
Intersection Summary												
HCM 2010 Ctrl Delay				19.0								
HCM 2010 LOS				B								

LOS Engineering, Inc.

AM Existing + Project
5: N. Project Dwy & Tavern Rd

HCM 2010 TWSC

Intersection

Int Delay, s/veh 3.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	19	3	43	51	3	4
Future Vol, veh/h	19	3	43	51	3	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	21	3	47	55	3	4

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	24
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	1591
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1591
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.4	8.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	924	-	-	1591	-
HCM Lane V/C Ratio	0.008	-	-	0.029	-
HCM Control Delay (s)	8.9	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0.1	-

LOS Engineering, Inc.

AM Existing + Project
6: Tavern Rd & Middle Project Dwy

HCM 2010 TWSC

Intersection						
Int Delay, s/veh	2.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	21	72	89	147	283	23
Future Vol, veh/h	21	72	89	147	283	23
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	23	78	97	160	308	25
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	675	321	333	0	-	0
Stage 1	321	-	-	-	-	-
Stage 2	354	-	-	-	-	-
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	419	720	1226	-	-	-
Stage 1	735	-	-	-	-	-
Stage 2	710	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	383	720	1226	-	-	-
Mov Cap-2 Maneuver	466	-	-	-	-	-
Stage 1	671	-	-	-	-	-
Stage 2	710	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11.7	3.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1226	-	641	-	-	
HCM Lane V/C Ratio	0.079	-	0.158	-	-	
HCM Control Delay (s)	8.2	0	11.7	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0.3	-	0.6	-	-	

LOS Engineering, Inc.

AM Existing + Project
7: Tavern Rd & S. Project Dwy

HCM 2010 TWSC

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	65	4	0	1	4	289	72	0	400	4
Future Vol, veh/h	0	0	65	4	0	1	4	289	72	0	400	4
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	0	0	71	4	0	1	4	314	78	0	435	4
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	799	837	220	579	800	353	439	0	0	392	0	0
Stage 1	437	437	-	361	361	-	-	-	-	-	-	-
Stage 2	362	400	-	218	439	-	-	-	-	-	-	-
Critical Hdwy	7.33	6.53	6.93	7.33	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.53	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.53	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.519	4.019	3.319	3.519	4.019	3.319	2.219	-	-	2.219	-	-
Pot Cap-1 Maneuver	290	302	785	412	317	690	1119	-	-	1165	-	-
Stage 1	569	578	-	657	625	-	-	-	-	-	-	-
Stage 2	656	601	-	765	577	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	289	300	785	374	315	690	1119	-	-	1165	-	-
Mov Cap-2 Maneuver	289	300	-	374	315	-	-	-	-	-	-	-
Stage 1	566	578	-	654	622	-	-	-	-	-	-	-
Stage 2	652	598	-	696	577	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	10		13.9			0.1			0			
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1119	-	-	785	412	1165	-	-				
HCM Lane V/C Ratio	0.004	-	-	0.09	0.013	-	-	-				
HCM Control Delay (s)	8.2	0	-	10	13.9	0	-	-				
HCM Lane LOS	A	A	-	B	B	A	-	-				
HCM 95th %tile O(veh)	0	-	-	0.3	0	0	-	-				

LOS Engineering, Inc.

PM Existing + Project
1: Tavern Rd & Private Dwy & Victoria Park Terraces

HCM 2010 TWSC

Intersection												
Int Delay, s/veh	3.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	2	49	66	0	9	42	246	9	3	127	7
Future Vol, veh/h	6	2	49	66	0	9	42	246	9	3	127	7
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	7	2	53	72	0	10	46	267	10	3	138	8
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	517	517	142	540	516	272	146	0	0	277	0	0
Stage 1	148	148	-	364	364	-	-	-	-	-	-	-
Stage 2	369	369	-	176	152	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	469	462	906	453	463	767	1436	-	-	1286	-	-
Stage 1	855	775	-	655	624	-	-	-	-	-	-	-
Stage 2	651	621	-	826	772	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	448	443	906	411	444	767	1436	-	-	1286	-	-
Mov Cap-2 Maneuver	448	443	-	411	444	-	-	-	-	-	-	-
Stage 1	823	773	-	630	600	-	-	-	-	-	-	-
Stage 2	618	597	-	773	770	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	9.9		15.2		1.1		0.2					
HCM LOS	A		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1436	-	-	792	435	1286	-	-				
HCM Lane V/C Ratio	0.032	-	-	0.078	0.187	0.003	-	-				
HCM Control Delay (s)	7.6	0	-	9.9	15.2	7.8	0	-				
HCM Lane LOS	A	A	-	A	C	A	A	-				
HCM 95th %tile O(veh)	0.1	-	-	0.3	0.7	0	-	-				

LOS Engineering, Inc.

PM Existing + Project
2: Tavern Rd & I-8 WB Ramp

HCM 2010 Signalized Intersection Summary

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	71	2	68	429	331	0	0	110	187
Future Volume (veh/h)	0	0	0	71	2	68	429	331	0	0	110	187
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1863	1900	1863	1863	0	0	1863	1863
Adj Flow Rate, veh/h				77	2	74	466	360	0	0	120	203
Adj No. of Lanes				0	1	0	1	1	0	0	1	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				0	2	0	2	2	0	0	2	2
Cap, veh/h				97	3	93	551	1150	0	0	324	276
Arrive On Green				0.12	0.12	0.12	0.31	0.62	0.00	0.00	0.17	0.17
Sat Flow, veh/h				844	22	811	1774	1863	0	0	1863	1583
Grp Volume(v), veh/h				153	0	0	466	360	0	0	120	203
Grp Sat Flow(s),veh/h/ln				1677	0	0	1774	1863	0	0	1863	1583
Q Serve(g_s), s				4.2	0.0	0.0	11.5	4.3	0.0	0.0	2.7	5.7
Cycle Q Clear(g_c), s				4.2	0.0	0.0	11.5	4.3	0.0	0.0	2.7	5.7
Prop In Lane				0.50		0.48	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				193	0	0	551	1150	0	0	324	276
V/C Ratio(X)				0.79	0.00	0.00	0.85	0.31	0.00	0.00	0.37	0.74
Avail Cap(c_a), veh/h				273	0	0	865	1589	0	0	454	386
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				20.1	0.0	0.0	15.1	4.2	0.0	0.0	17.0	18.3
Incr Delay (d2), s/veh				10.0	0.0	0.0	4.6	0.2	0.0	0.0	0.7	4.5
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				2.4	0.0	0.0	6.3	2.1	0.0	0.0	1.4	2.8
LnGrp Delay(d),s/veh				30.1	0.0	0.0	19.7	4.4	0.0	0.0	17.7	22.8
LnGrp LOS				C			B	A			B	C
Approach Vol, veh/h					153			826			323	
Approach Delay, s/veh					30.1			13.0			20.9	
Approach LOS					C			B			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		35.0			20.7	14.2		11.8				
Change Period (Y+Rc), s		6.1			* 6.2	* 6.1		6.4				
Max Green Setting (Gmax), s		39.9			* 23	* 11		7.6				
Max Q Clear Time (g_c+I1), s		6.3			13.5	7.7		6.2				
Green Ext Time (p_c), s		2.2			1.1	0.5		0.1				
Intersection Summary												
HCM 2010 Ctrl Delay				17.0								
HCM 2010 LOS				B								
Notes												

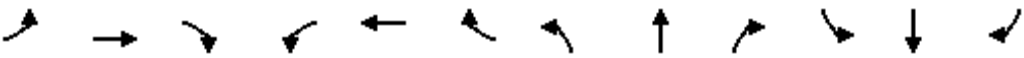
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HCM 2010 analysis does not support custom phasing.

PM Existing + Project

3: Tavern Rd & I-8 EB Ramp

HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↑	↰	↱	↑	
Traffic Volume (vph)	228	1	895	0	0	0	0	530	119	50	143	0
Future Volume (vph)	228	1	895	0	0	0	0	530	119	50	143	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.4	6.4					6.1	6.1	6.2	6.1	
Lane Util. Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1774	1583					1863	1583	1770	1863	
Flt Permitted		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1774	1583					1863	1583	1770	1863	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	248	1	973	0	0	0	0	576	129	54	155	0
RTOR Reduction (vph)	0	0	318	0	0	0	0	0	66	0	0	0
Lane Group Flow (vph)	0	249	655	0	0	0	0	576	63	54	155	0
Turn Type	Split	NA	custom					NA	Perm	Prot	NA	
Protected Phases	4	4	4 3					2 3		1	6	
Permitted Phases			4 3						2 3			
Actuated Green, G (s)		16.7	36.9					34.5	34.5	2.6	21.5	
Effective Green, g (s)		16.7	32.4					34.5	34.5	2.6	21.5	
Actuated g/C Ratio		0.24	0.46					0.49	0.49	0.04	0.30	
Clearance Time (s)		6.4								6.2	6.1	
Vehicle Extension (s)		3.0								3.0	3.0	
Lane Grp Cap (vph)		417	723					906	770	64	564	
v/s Ratio Prot		0.14	c0.41					c0.31		c0.03	0.08	
v/s Ratio Perm									0.04			
v/c Ratio		0.60	0.91					0.64	0.08	0.84	0.27	
Uniform Delay, d1		24.1	17.8					13.5	9.7	33.9	18.8	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2		2.3	14.9					1.5	0.0	60.7	0.3	
Delay (s)		26.4	32.8					15.0	9.8	94.6	19.0	
Level of Service		C	C					B	A	F	B	
Approach Delay (s)		31.5			0.0			14.0			38.6	
Approach LOS		C			A			B			D	
Intersection Summary												
HCM 2000 Control Delay			26.4									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.88									
Actuated Cycle Length (s)			70.9									Sum of lost time (s) 23.2
Intersection Capacity Utilization			73.4%									ICU Level of Service D
Analysis Period (min)			15									
c Critical Lane Group												

PM Existing + Project
4: Tavern Rd & Alpine Blvd

HCM 2010 Signalized Intersection Summary

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	83	76	69	57	244	41	315	49	344	534	53
Future Volume (veh/h)	105	83	76	69	57	244	41	315	49	344	534	53
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.94	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	114	90	83	75	62	265	45	342	53	374	580	58
Adj No. of Lanes	1	1	1	1	1	1	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	146	392	323	96	339	668	63	572	88	437	1291	129
Arrive On Green	0.08	0.21	0.21	0.05	0.18	0.18	0.04	0.19	0.19	0.25	0.40	0.40
Sat Flow, veh/h	1774	1863	1534	1774	1863	1529	1774	3051	467	1774	3238	323
Grp Volume(v), veh/h	114	90	83	75	62	265	45	197	198	374	316	322
Grp Sat Flow(s),veh/h/ln	1774	1863	1534	1774	1863	1529	1774	1770	1748	1774	1770	1791
Q Serve(g_s), s	3.8	2.4	2.7	2.5	1.7	7.1	1.5	6.1	6.2	12.0	7.8	7.8
Cycle Q Clear(g_c), s	3.8	2.4	2.7	2.5	1.7	7.1	1.5	6.1	6.2	12.0	7.8	7.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.27	1.00		0.18
Lane Grp Cap(c), veh/h	146	392	323	96	339	668	63	332	328	437	706	714
V/C Ratio(X)	0.78	0.23	0.26	0.78	0.18	0.40	0.72	0.59	0.61	0.86	0.45	0.45
Avail Cap(c_a), veh/h	223	515	424	223	515	813	312	786	777	640	1113	1126
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.8	19.5	19.7	27.9	20.7	11.8	28.5	22.1	22.2	21.5	13.1	13.1
Incr Delay (d2), s/veh	9.2	0.3	0.4	13.0	0.3	0.4	14.3	1.7	1.8	7.6	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	1.3	1.2	1.6	0.9	3.0	1.0	3.1	3.1	6.7	3.9	3.9
LnGrp Delay(d),s/veh	36.1	19.8	20.1	40.8	20.9	12.2	42.8	23.8	24.0	29.1	13.6	13.6
LnGrp LOS	D	B	C	D	C	B	D	C	C	C	B	B
Approach Vol, veh/h	287				402				440		1012	
Approach Delay, s/veh	26.4				18.9				25.9		19.3	
Approach LOS	C				B				C		B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.2	15.7	7.7	17.0	6.6	28.3	9.4	15.3				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (G_max), s	21.5	26.5	7.5	16.5	10.5	37.5	7.5	16.5				
Max Q Clear Time (g_c+14.0), s	14.0	8.2	4.5	4.7	3.5	9.8	5.8	9.1				
Green Ext Time (p_c), s	0.7	2.1	0.0	0.5	0.0	4.0	0.0	0.7				
Intersection Summary												
HCM 2010 Ctrl Delay			21.5									
HCM 2010 LOS			C									

LOS Engineering, Inc.

PM Existing + Project
5: N. Project Dwy & Tavern Rd

HCM 2010 TWSC

Intersection

Int Delay, s/veh 0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	56	2	5	44	1	2
Future Vol, veh/h	56	2	5	44	1	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	61	2	5	48	1	2

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	63
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	1540
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1540
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	8.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	956	-	-	1540	-
HCM Lane V/C Ratio	0.003	-	-	0.004	-
HCM Control Delay (s)	8.8	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

LOS Engineering, Inc.

Intersection

Int Delay, s/veh 1.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	17	33	80	281	223	19
Future Vol, veh/h	17	33	80	281	223	19
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	18	36	87	305	242	21

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	732	253	263
Stage 1	253	-	-
Stage 2	479	-	-
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	388	786	1301
Stage 1	789	-	-
Stage 2	623	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	357	786	1301
Mov Cap-2 Maneuver	436	-	-
Stage 1	725	-	-
Stage 2	623	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.4	1.8	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1301	-	617	-	-
HCM Lane V/C Ratio	0.067	-	0.088	-	-
HCM Control Delay (s)	8	0	11.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.3	-	-

PM Existing + Project
7: Tavern Rd & S. Project Dwy

HCM 2010 TWSC

Intersection												
Int Delay, s/veh	0.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	0	60	0	0	0	5	393	60	1	270	7
Future Vol, veh/h	3	0	60	0	0	0	5	393	60	1	270	7
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	3	0	65	0	0	0	5	427	65	1	293	8
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	769	801	151	619	773	460	301	0	0	492	0	0
Stage 1	299	299	-	470	470	-	-	-	-	-	-	-
Stage 2	470	502	-	149	303	-	-	-	-	-	-	-
Critical Hdwy	7.33	6.53	6.93	7.33	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.53	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.53	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.519	4.019	3.319	3.519	4.019	3.319	2.219	-	-	2.219	-	-
Pot Cap-1 Maneuver	304	317	869	387	329	600	1258	-	-	1070	-	-
Stage 1	686	666	-	573	559	-	-	-	-	-	-	-
Stage 2	573	541	-	839	663	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	302	315	869	356	327	600	1258	-	-	1070	-	-
Mov Cap-2 Maneuver	302	315	-	356	327	-	-	-	-	-	-	-
Stage 1	682	665	-	570	556	-	-	-	-	-	-	-
Stage 2	570	538	-	775	662	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	9.9		0		0.1		0					
HCM LOS	A		A									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1258	-	-	798	-	1070	-	-	-	-	-	-
HCM Lane V/C Ratio	0.004	-	-	0.086	-	0.001	-	-	-	-	-	-
HCM Control Delay (s)	7.9	0	-	9.9	0	8.4	0	-	-	-	-	-
HCM Lane LOS	A	A	-	A	A	A	A	-	-	-	-	-
HCM 95th %tile Q(veh)	0	-	-	0.3	-	0	-	-	-	-	-	-

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Arterial Level of Service: NB Tavern Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Alpine Blvd	III	35	12.5	20.2	32.7	0.09	10.2	E
I-8 EB Ramp	III	35	15.7	18.5	34.2	0.12	12.2	E
I-8 WB Ramp	III	35	26.9	3.9	30.8	0.22	26.2	B
Total	III		55.1	42.6	97.7	0.43	16.0	D

Arterial Level of Service: SB Tavern Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
I-8 WB Ramp	III	35	17.5	38.5	56.0	0.14	8.8	F
I-8 EB Ramp	III	35	26.9	7.5	34.4	0.22	23.4	C
Alpine Blvd	III	35	15.7	11.0	26.7	0.12	15.7	D
Total	III		60.1	57.0	117.1	0.48	14.7	D

Arterial Level of Service: NB Tavern Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Alpine Blvd	III	35	12.5	27.0	39.5	0.09	8.5	F
I-8 EB Ramp	III	35	15.7	19.2	34.9	0.12	12.0	E
I-8 WB Ramp	III	35	26.9	4.8	31.7	0.22	25.4	B
Total	III		55.1	51.0	106.1	0.43	14.7	D

Arterial Level of Service: SB Tavern Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
I-8 WB Ramp	III	35	17.5	24.2	41.7	0.14	11.8	E
I-8 EB Ramp	III	35	26.9	21.3	48.2	0.22	16.7	D
Alpine Blvd	III	35	15.7	15.0	30.7	0.12	13.6	E
Total	III		60.1	60.5	120.6	0.48	14.2	D