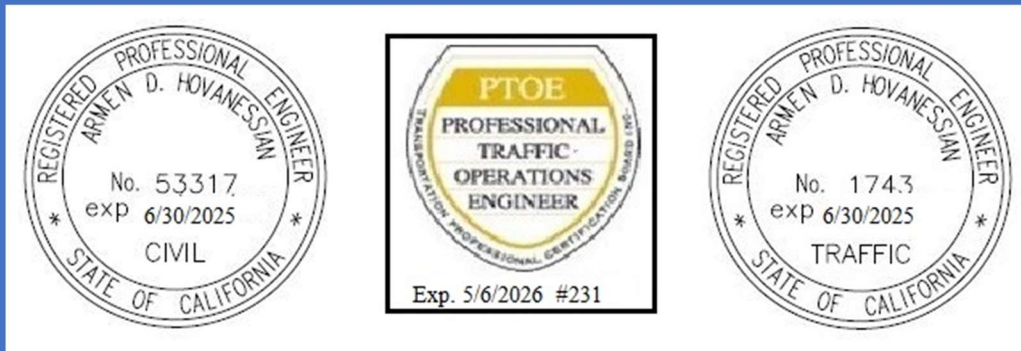




Armen Hovannessian
Transportation Consulting

QUICK QUACK CAR WASH
BRACE ROAD & SIERRA COLLEGE BLVD
LOOMIS CALIFORNIA
TRAFFIC ASSESSMENT REPORT
AUGUST 15, 2023



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INTRODUCTION

This traffic assessment study is prepared for the proposed Quick Quack car wash located on the parcel at the northwest corner of the intersection of Brace Road and Sierra College Boulevard in Loomis California. The methodology and base assumptions used in the analysis were established based on discussions with the Town of Loomis staff. This study evaluates the potential project-specific transportation effects of the proposed project. The analysis focuses on traditional mobility considerations as well as safety, sustainability, smart growth, and the reduction of greenhouse gas emissions.

PROJECT DESCRIPTION

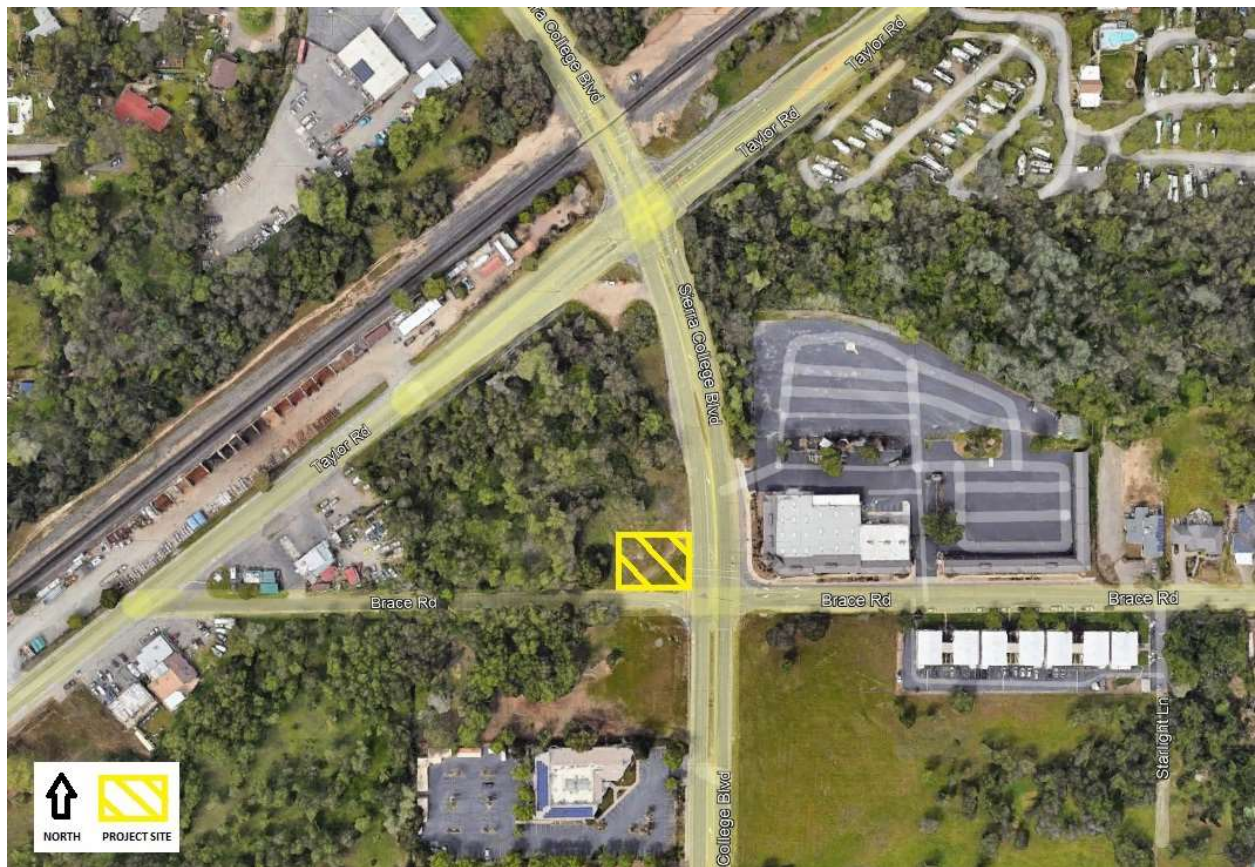
Project Characteristics

The project proposes to construct a Quick Quack automated one tunnel car wash, with a building size of 3,596 square feet on an approximate 172,593 square foot vacant lot.

Project Location

As illustrated in the project area map in Figure 1, the project is located on the northwest corner of the intersection of Brace Road and Sierra College Boulevard, (APN Number 044-122-005-000), south of Taylor Road, and west of Highway 80 in the Town of Loomis. The immediate vicinity of the project location is mainly a low-density area.

Figure 1 – Project Area Map



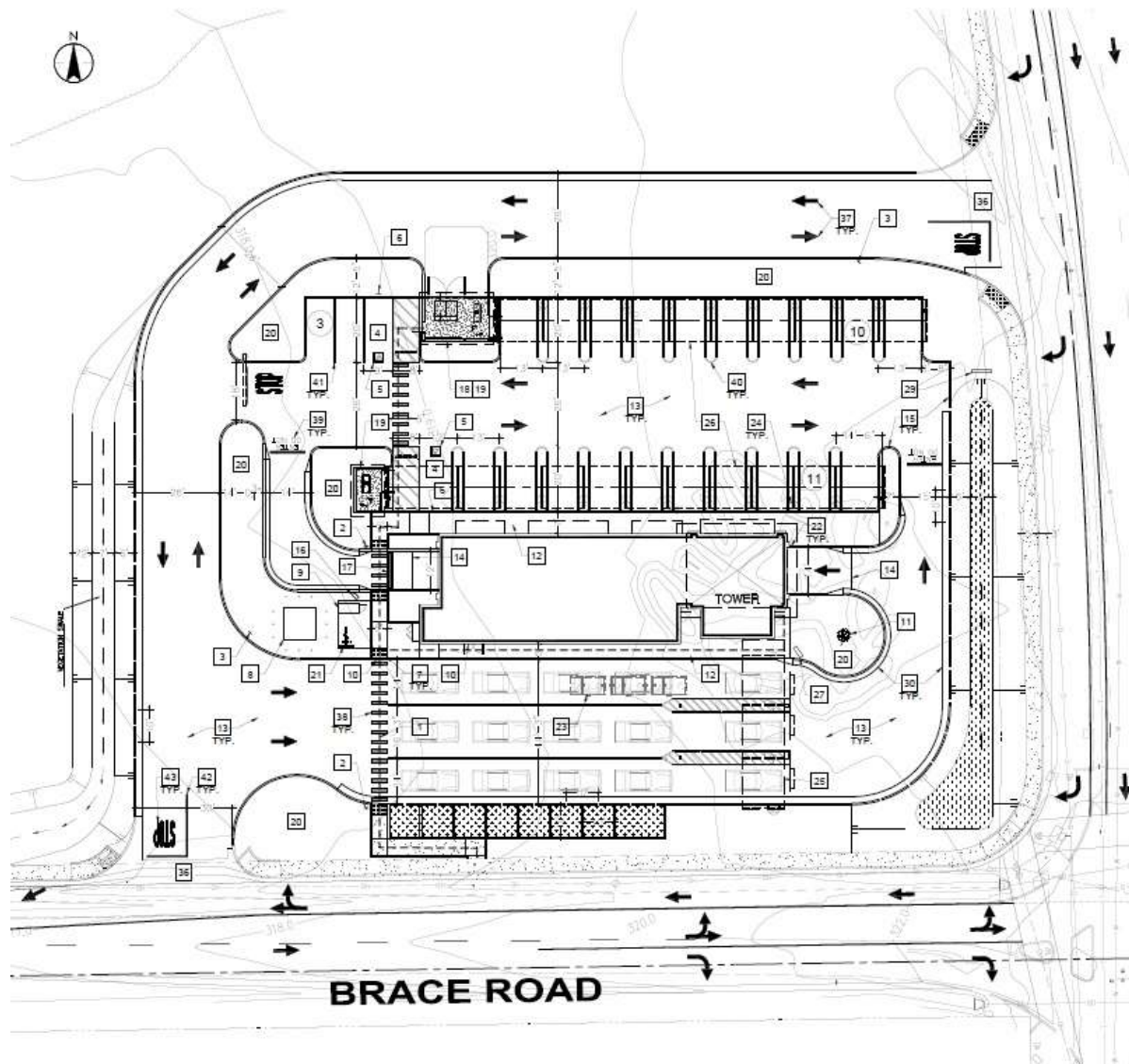
Project Site Plan

Figure 2 illustrates the project site plan showing the location of the proposed project driveways from the nearest intersection of Brace Road and Sierra College Boulevard.

Project Site Vehicle Access

As shown in Figure 2, the project proposes to construct two driveways, one on Brace Road west of Sierra College Boulevard and one on Sierra College Boulevard north of Brace Road to provide ingress and egress access to the project site.

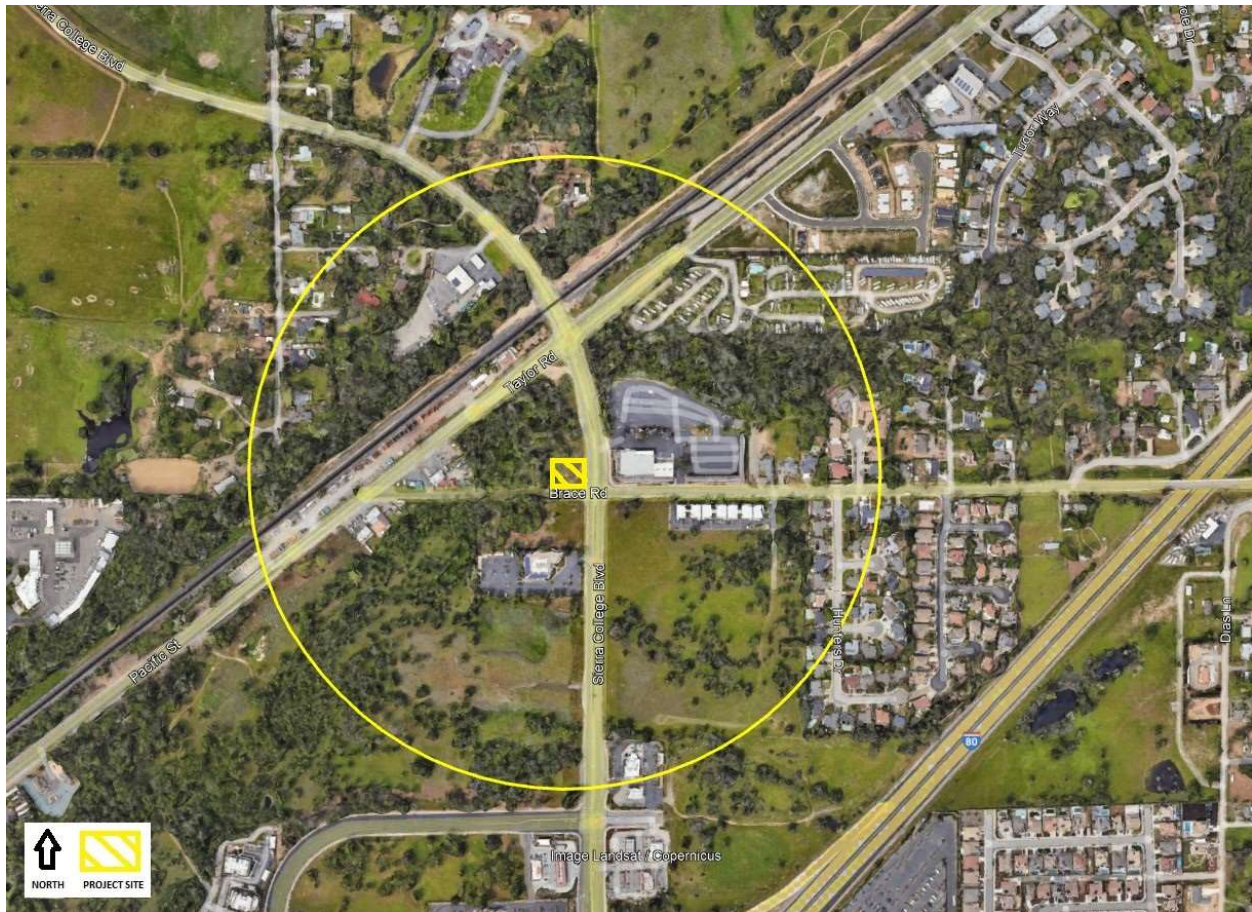
Figure 2 – Project Site Plan



PROJECT CONTEXT

A comprehensive analysis and an inventory of the existing transportation infrastructure and conditions within a ¼ mile radius of the project site, as shown in the aerial map in Figure 3, was collected. The collected data was analyzed to determine the roadway designations, classifications, and modal priorities.

Figure 3 – ¼ Mile Radius Area Map



The following describes the details of the transportation infrastructure in the vicinity of the project:

Non-Vehicular Transportation System

A review of the project area to evaluate the effects of the project on the non-vehicular transportation system for Pedestrian Facilities, Bicycle Facilities, and Transit Services was conducted.

Pedestrian Facilities

A review of the project area was conducted to evaluate the effects of the project on pedestrian activity within a ¼-mile radius of the project. As part of this review, we developed a map of the study area indicating potential pedestrian destinations within 1,320 feet of the edge of the project site, as shown in Figure 3. Within a ¼ mile of the project site there are no sidewalks except for a discontinuous sidewalk on the northeast corner of Brace Road and Sierra College Boulevard. There are crosswalks at the two signalized intersections of Brace Road and Sierra College Boulevard and Taylor Road and Sierra College Boulevard.

Bicycle Facilities

Within a ¼-mile radius of the project site bicycle facilities are installed at the following locations, as shown in Table 1:

Table 1- Bicycle Facilities Inventory

Street Name	Bicycle Facility	Condition
Sierra College Boulevard	Class 2	Good
Taylor Road	Class 2	Good

Transit Services

Transit services in the area are provided by Placer County Transit. The nearest transit stop is located on Granite Drive southwest of Sierra College Boulevard approximately two thirds of a mile from the project site. This transit stop provides access to Placer County Transit line 20. Appendix 1 includes the Placer County Transit route maps.

Vehicular Transportation System

An assessment of the roadway system within ¼ mile radius of the project site was conducted. The assessment included the number of traffic lanes, direction of flow, and the presence of peak period travel lanes affecting roadway travel capacity, the presence of bicycle lanes, and any other significant street information.

Regional Freeway System

The project area is served by Dwight D. Eisenhower Highway 80 (US-80). The project site is located west of Highway 80 (US-80). The segment of Highway 80 (US-80) near the project site generally consists of a divided highway with three mixed-flow travel lanes in each direction. The nearest intersection with Highway 80 (US-80) is located on Sierra College Boulevard.

Area Roadway System

The project area is served by the following surrounding roadways:

- Brace Road
- Taylor Road
- Sierra College Boulevard

Brace Road is a paved roadway with one travel lane in each direction with some curb and gutters and sidewalks but is mostly a paved roadway without curb and gutters or sidewalks. It is classified as a Major Collector roadway per Cal-Trans California Roadway System.

Taylor Road is a paved roadway classified as a Minor Arterial roadway per Cal-Trans California Roadway System. It does not have curb and gutter or sidewalks on either side of the roadway. One travel lane in each direction and a bike lane are provided in both directions with a painted median.

Sierra College Boulevard is a paved roadway classified as an Other Principal Arterial roadway per Cal-Trans California Roadway System. It does not have curb and gutter or sidewalk on either side of the roadway. There are two travel lanes, left turn channelization, and a bike lane in both directions with raised medians. Sierra College Boulevard northbound approach to Taylor Road has one through lane, a left turn pocket and a right turn only lane onto Taylor Road.

None of the above roadways provide continuous curb and gutter or sidewalk, but there are curb and gutter and discontinuous sidewalk on certain segments.

CEQA TRANSPORTATION IMPACT ANALYSIS

This analysis conforms to the requirements of Senate Bill 743 (SB 743) and is consistent with the California Environmental Quality Act (CEQA), requiring the use of Vehicle Miles Traveled (VMT) as the primary metric for evaluating a project’s transportation impacts. Town of Loomis does not have standard of significance for evaluating VMT. Therefore, the analysis refers to the guidance provided by the California Governor's Office of Planning and Research (OPR) in the publication Transportation Impacts (SB 743) CEQA Guidelines Update and Technical Advisory, 2018. OPR's guidance for retail land uses, which the proposed car wash would be classified as, were applied. According to OPR, for retail uses an increase in total regional VMT is considered a significant impact. However, OPR indicates that local-serving retail may generally be presumed to have a less than significant VMT impact and can generally be screened from further VMT analysis. Based on substantial research OPR determined that adding local-serving retail uses typically improves destination accessibility to customers, often reducing trip distances resulting in reduced vehicle miles traveled. This is caused by customers traveling shorter distances than they previously did.

Based on OPR’s analysis, a retail project of 50,000 square feet or more should be considered a regional serving retail. The proposed project is a local serving car wash operation providing service to the local community similar to a small retail operation which would be far below OPR’s regional serving retail threshold. Therefore, the project will have less than significant VMT impact.

NON-CEQA CIRCULATION TRANSPORTATION ANALYSIS

Operational Evaluation

An operational evaluation of the project area was conducted to determine any project impact on access, safety, and circulation on the roadway network in the vicinity of the project.

Study Intersections

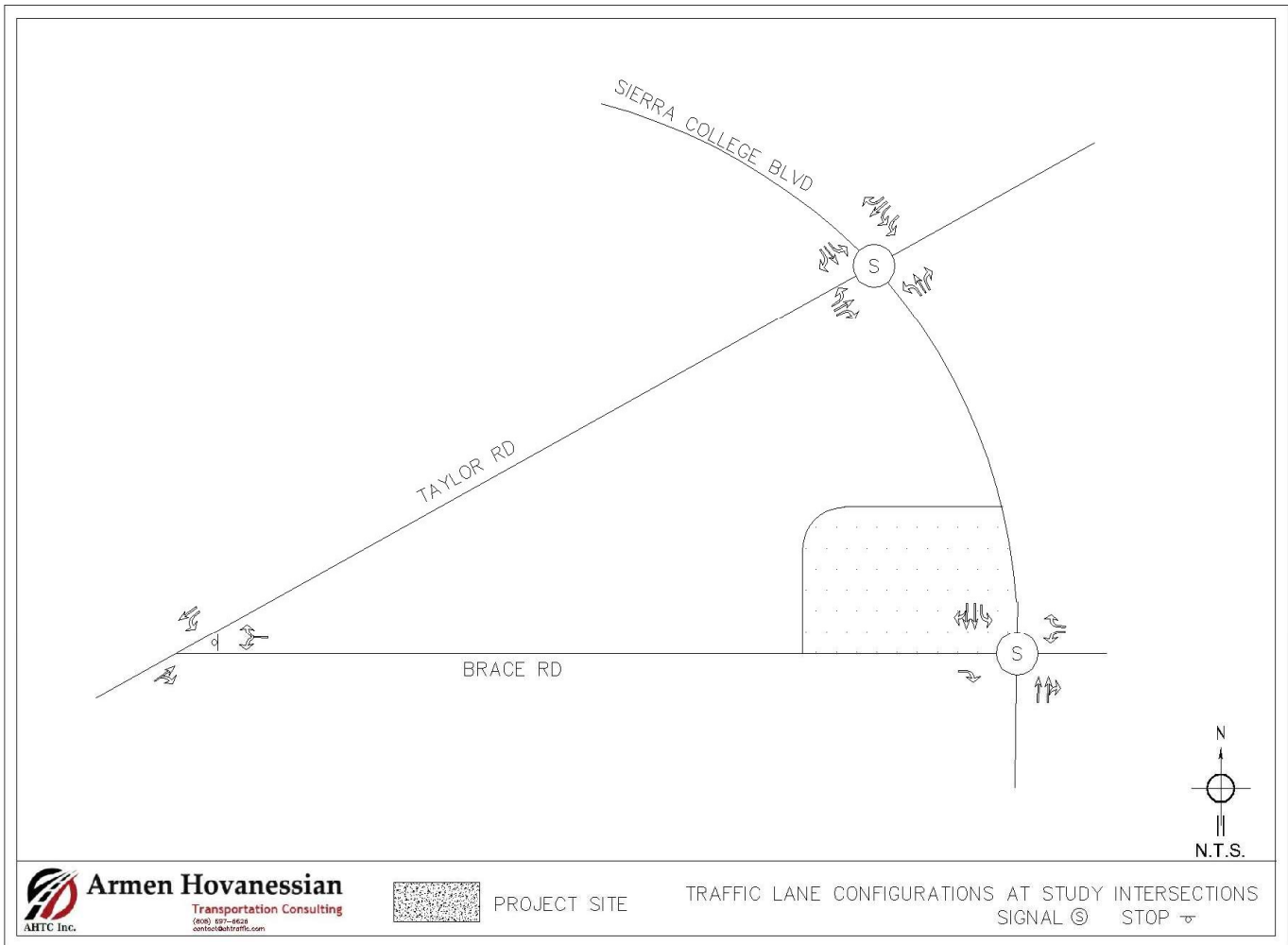
After consultation with the Town of Loomis, it was determined that the following intersections would be analyzed and evaluated for operational assessment, as shown in Table 2 below:

Table 2 – Study Intersections

Intersection(s)	Configuration	Existing Control
Taylor Road & Sierra College Boulevard	4-legged	Traffic Signal Control
Brace Road & Taylor Road	T-intersection	Stop Sign Control
Brace Road & Sierra College Boulevard	4-legged	Traffic Signal Control

Refer to Figure 4 below for a depiction of the configurations of traffic lanes at the approaches to the study intersections.

Figure 4 – Study Intersections Lane Configurations



Traffic Volume Counts

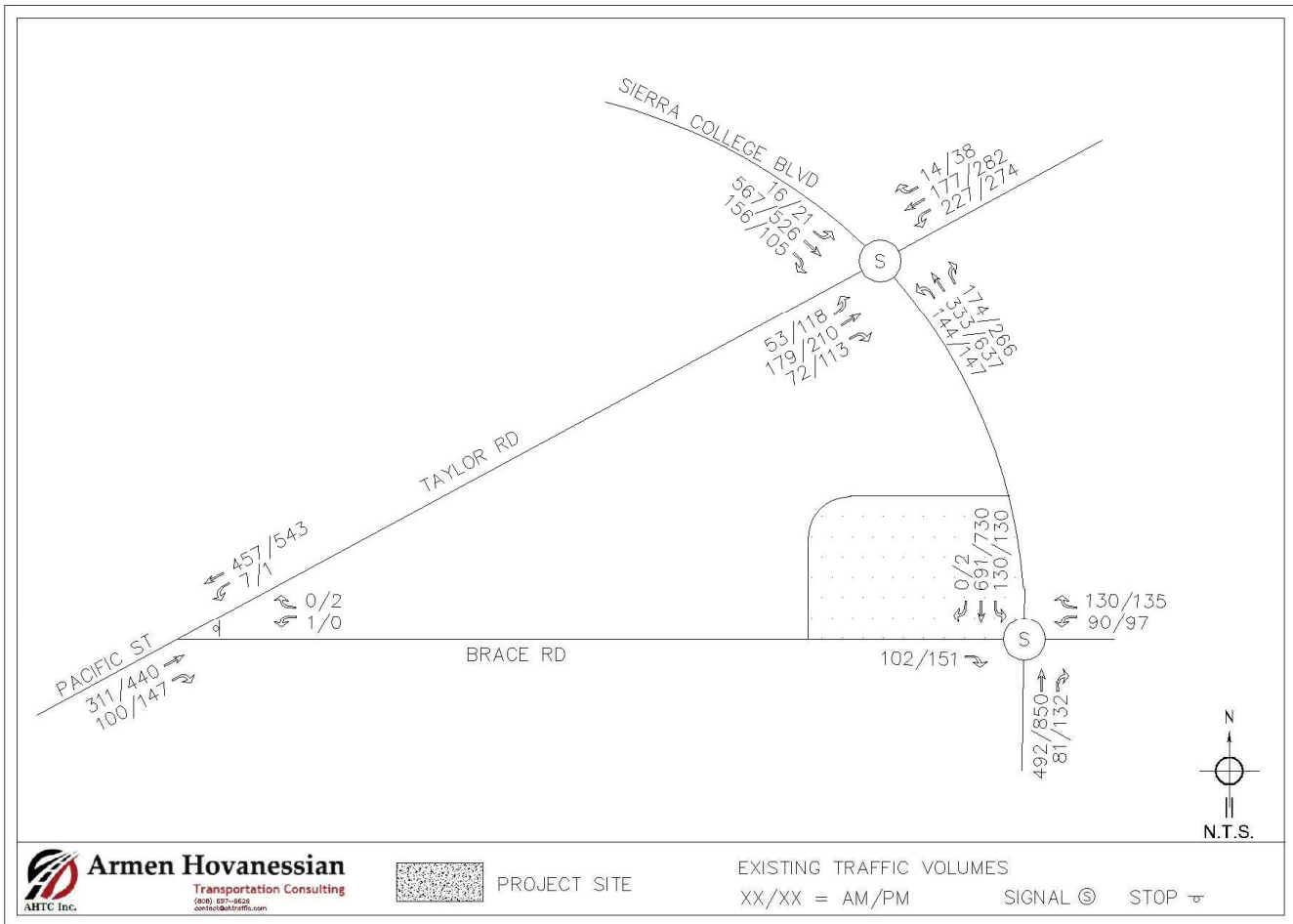
Traffic volume counts were obtained for vehicular turning movements at the following three (3) study intersections:

- Taylor Road and Sierra College Boulevard
- Brace Road and Sierra College Boulevard
- Brace Road and Taylor Road

Vehicular turning movement counts were conducted on Wednesday, May 10, 2023, during the typical commuter hours of 6:00 AM to 10:00 AM and 3:00 PM to 7:00 PM, to obtain existing traffic volumes for the AM and PM peak hours.

Please refer to Appendix 2 for the manual traffic counts, and Figure 5 below for Existing (AM/PM Peak) Traffic Volumes for an illustration of the AM and PM peak-hour turning movement counts used for the study intersections.

Figure 5 – Existing Traffic Volumes at Study Intersections



Project Trip Generation

As previously stated in the project description, the proposed project is a single tunnel automatic car wash with a 3,596 square foot building on an approximate 172,593 square foot vacant lot.

Trip rates from the *Institute of Transportation Engineers (ITE) Trip Generation Manual 11th Edition* were used in this analysis for an Automated Car Wash, ITE code 948 (please see Appendix 3). Automated Car Wash, ITE code 948 trip generation does not provide AM trip generation estimates. Therefore, trip rates for Car Wash and Detail Center, ITE code 949 AM and PM trip generation rate ratio was used to estimate the AM trip rate for the project.

As shown in the project trip generation Table 3 below, the project is forecasted to result in 27 net new AM peak hour trips and 33 net new PM peak hour trips.

Table 3 - Project Trip Generation

	Land Use (ITE Code)	Size	Unit	AM Peak Hour Trips				PM Peak Hour Trips				
				Rate*	Total	In	Out	Rate	Total	In	Out	
Proposed	Automated Car Wash (Code 948)	1.000	Tunnel	71.83	Split	54%	46%	77.5	Split	51%	49%	
					72	39	33			78	40	38
	Pass-by Trips Discount 63% AM & 57% PM **				-45	-24	-21			-44	-23	-22
	Total New Trips				27	14	12		33	17	16	
Existing					Split				Split			
					0	0	0		0	0	0	
	Total Existing Trips				0	0	0		0	0	0	
NET INCREASE/DECREASE TRIPS					27	14	12		33	17	16	

Source: ITE Trip Generation Manual, 11th Edition

* Code 949 am and pm trip generation rate ratio was used to estimate the am trip rate

** ITE trip Generation Manual, 11th Edition, Pass-by Discount for Gasoline station (Code 944) was used

Project Trip Distribution and Assignment

Trip distribution assumptions are used to determine the origin and destination of new vehicle trips associated with the Project. The geographic distribution of project trips is based on the functional classification of streets in the vicinity, the magnitude of traffic volumes, as well as local knowledge of the roadway network. Based on the project trip generation, shown in Table 3, and the regional trip distribution assumptions, a proposed study area for the traffic analysis was derived. The location and the number of the intersections to be analyzed were reviewed and approved by the town staff. Refer to Figures 6 and 7 below for illustrations showing the Project’s Trip Distributions and Assignments at the study intersections.

Figure 6 – Project Trip Distribution

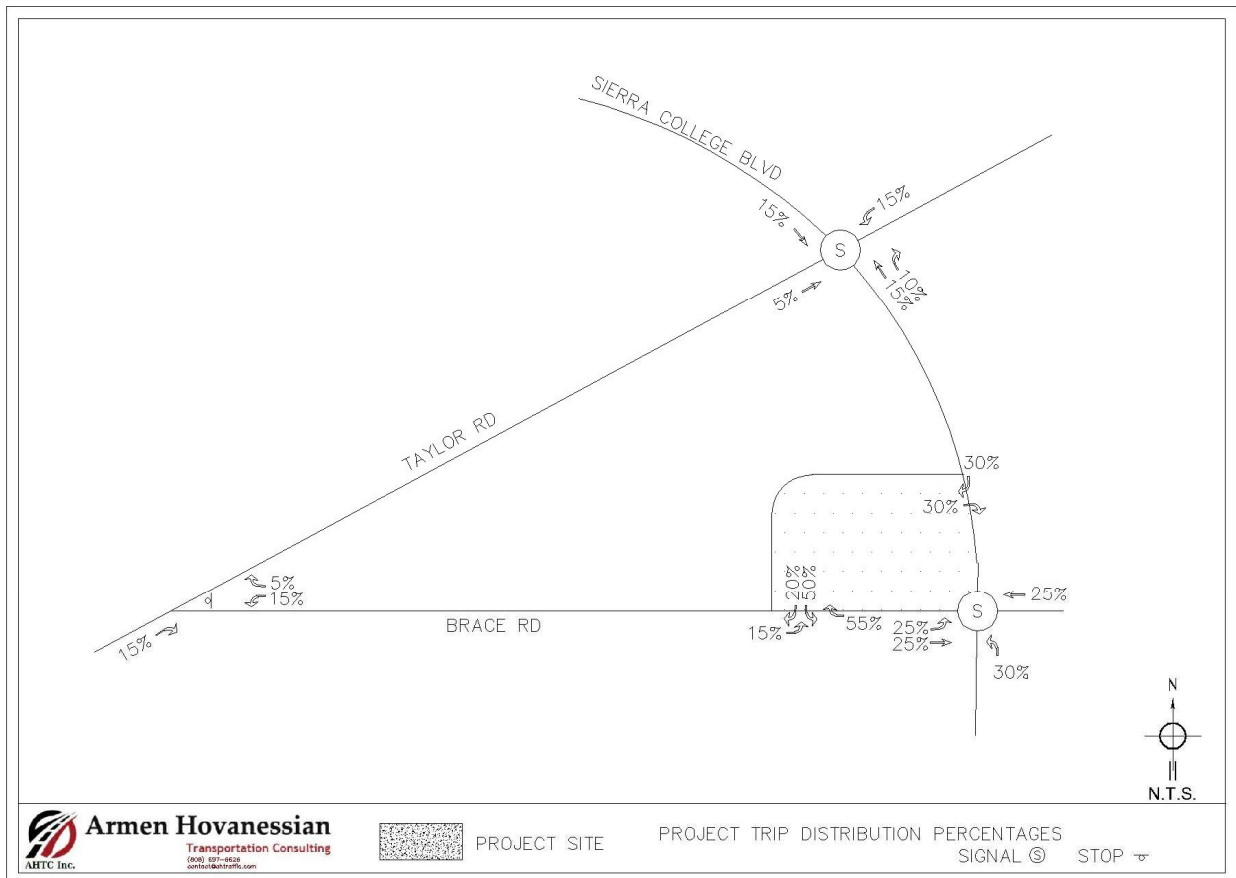
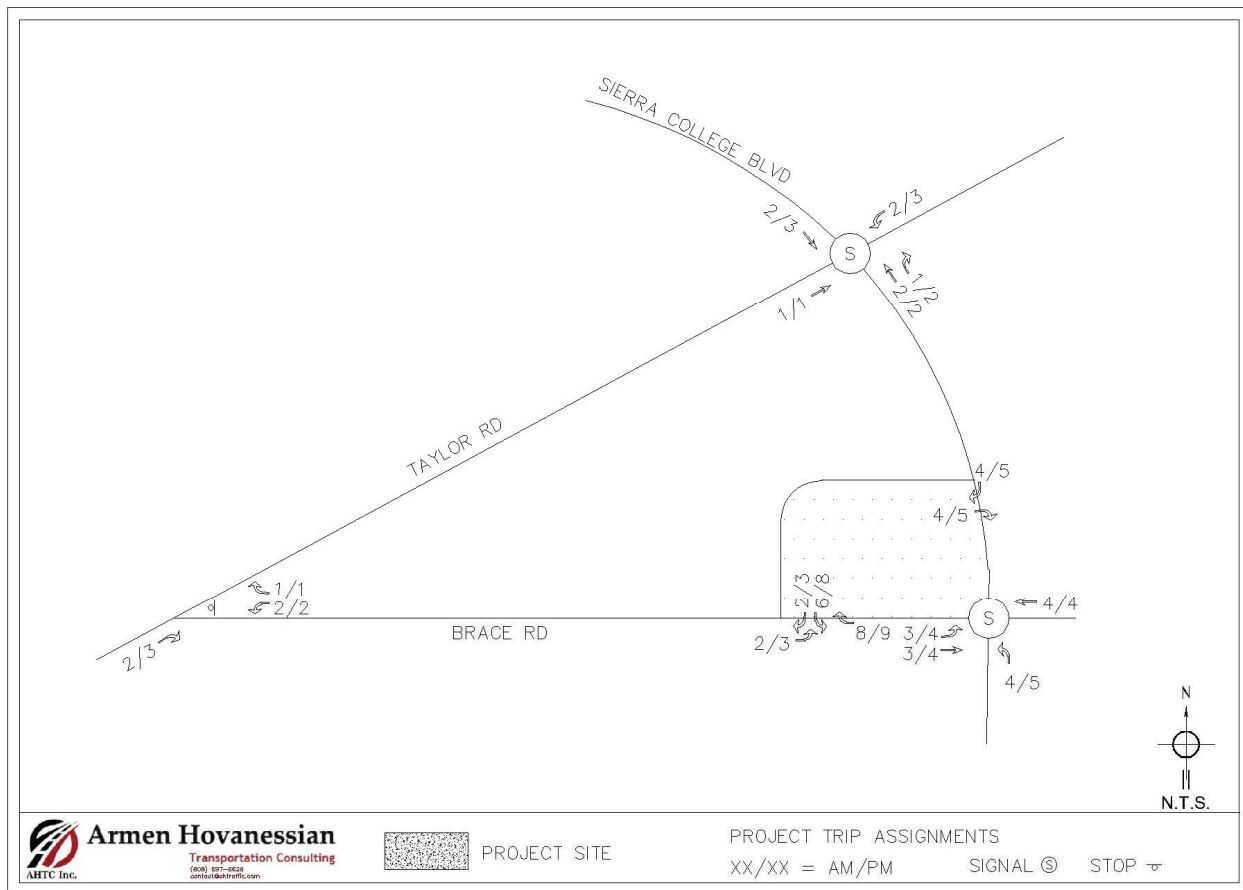


Figure 7 – Project Trip Assignments for AM/PM Peak Hours



Traffic Forecasts

In general, future peak hour traffic projections for the study intersections are estimated to include future growth due to (1) related projects within ¼ to ½ mile of the project site and (2) ambient traffic growth. In this analysis the related projects within one (1) mile of the project site were included.

Related Projects

To understand the relative traffic impacts for the projected year of completion, this traffic study analyzed potential traffic trips due to the development of related projects in the area. One (1) such related project was identified by the Town staff. The Costco Wholesale Warehouse which will be constructed on the southeast corner of the intersection of Brace Road and Sierra College Boulevard. The associated trip volumes were provided by the Town staff as provided from the Costco traffic impact study. A map of the Costco location, with respect to the project site is shown in Figure 8.

The Town’s Sierra College Boulevard and Taylor Road Improvement Project as well as the Costco improvements will be constructed by late 2023, therefore the Costco traffic volumes and intersection improvements to Brace Road and Sierra College Boulevard, and the Town’s improvements to Taylor Road and Sierra College Boulevard were also analyzed and distinguished as an alternate existing condition in the analysis.

Figure 8 – Related Projects Map

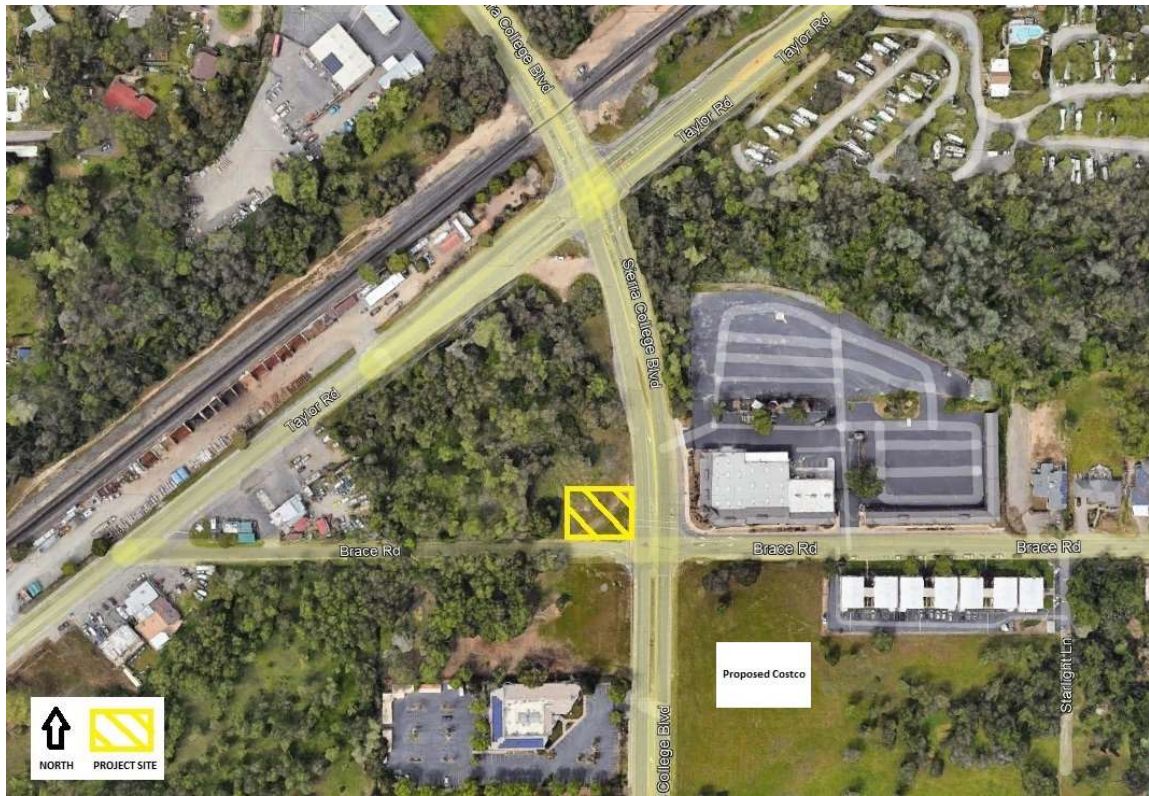
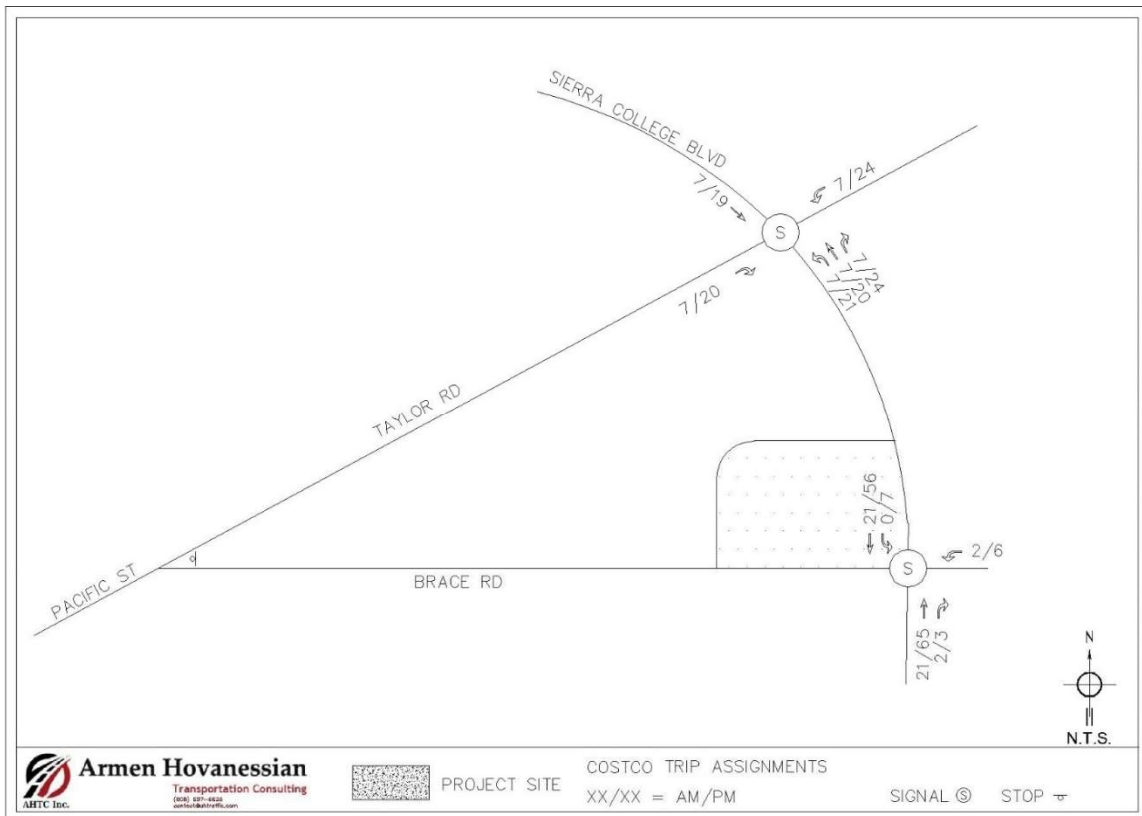


Figure 9 below shows the Costco Trip Assignments at the study intersections.

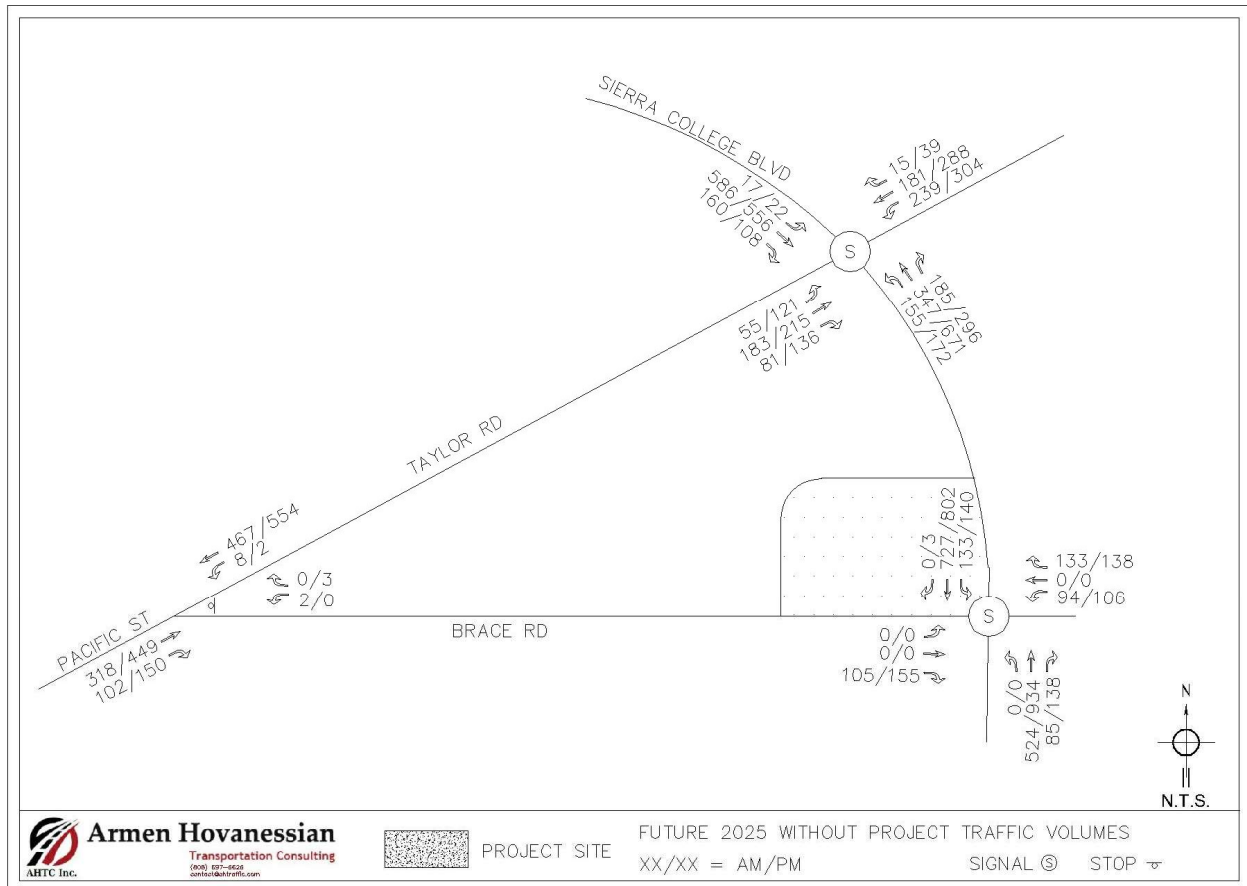
Figure 9 – Costco Trip Assignments for AM/PM Peak Hours



Ambient Traffic Growth

To account for the future ambient traffic growth from intensification of existing developments, and other projects that are located further than a half mile from the project site, the existing traffic volumes were increased by an ambient growth rate of 1% per year to the anticipated year of completion 2025. These values were used in addition to the related project trip generation to forecast future traffic volumes without project traffic volumes as shown in Figure 10.

Figure 10 – Traffic Volumes (AM/PM Peak Hours) for Future (2025) without Project



Operational Analysis

Operational analyses of vehicle average control delays, levels of service, and queueing were conducted at the study intersections for the following conditions and their traffic volumes.

- 1) Existing Traffic Conditions (See Figure 5)
- 2) Existing Plus Project Traffic Conditions (See Figure 11)
- 3) Existing Plus Costco Plus Project Traffic Conditions (See Figure 12)
- 4) Short Term Future (2025) Without Project Traffic Conditions (See Figure 10)
- 5) Short Term Future (2025) Plus Project Traffic Conditions (See Figure 13)
- 6) Long Term Future (2040) Without Project Traffic Conditions (See Figure 14)
- 7) Long Term Future (2040) Plus Project Traffic Conditions (See Figure 15)

Figure 11 – Existing Plus Project Traffic Volumes

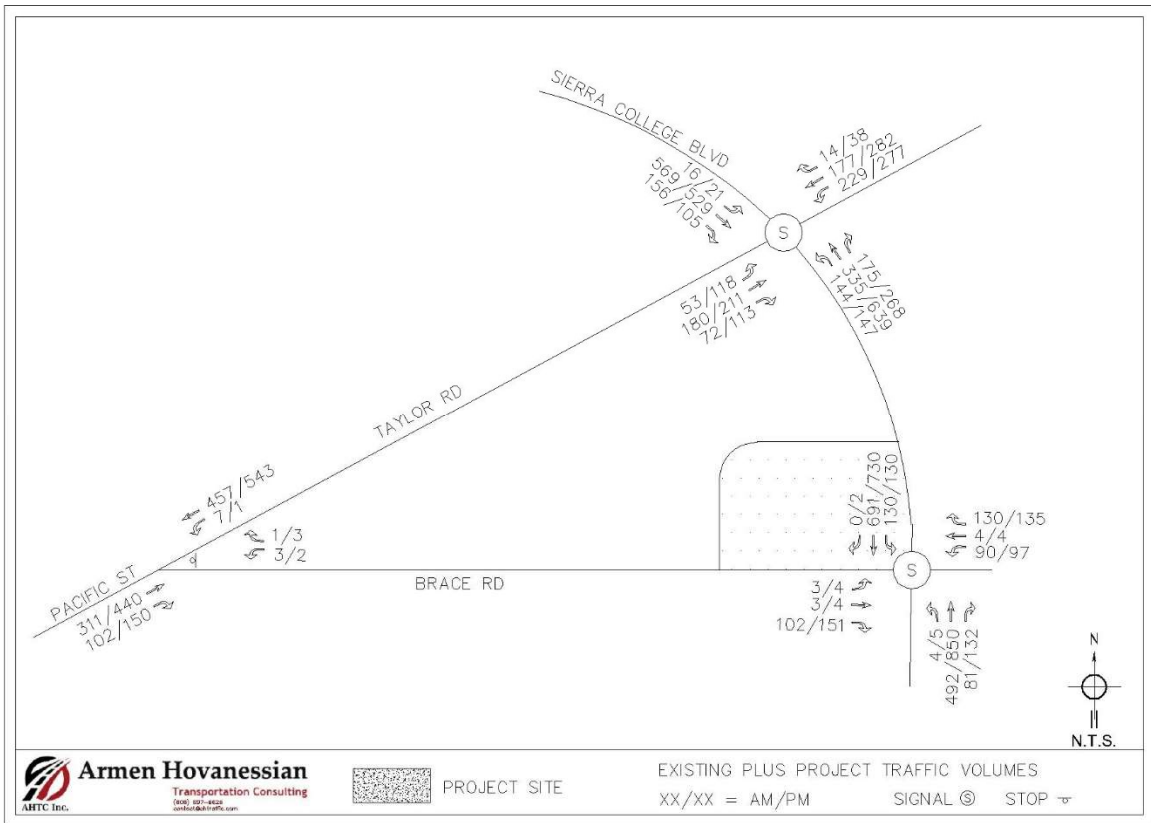


Figure 12 – Existing Plus Costco Plus Project Traffic Volumes

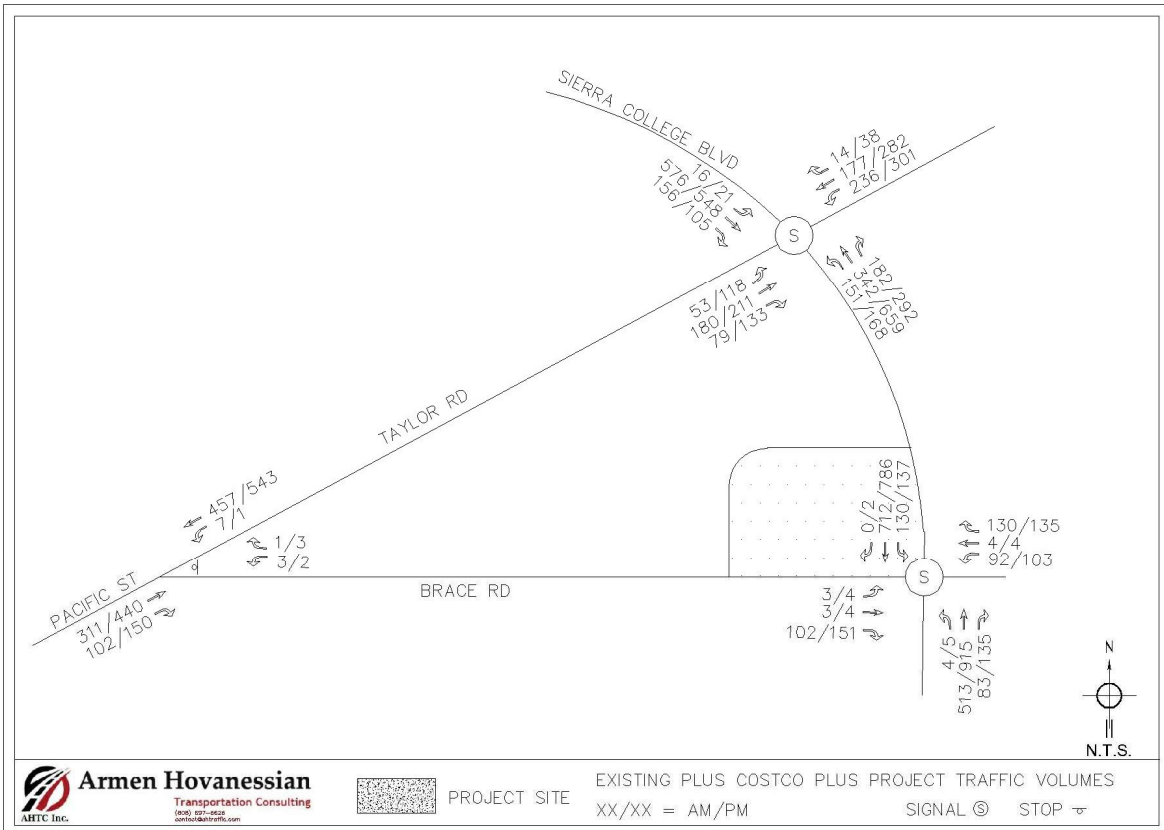


Figure 13 – Traffic Volumes (AM/PM Peak Hours) for Future (2025) Plus Project

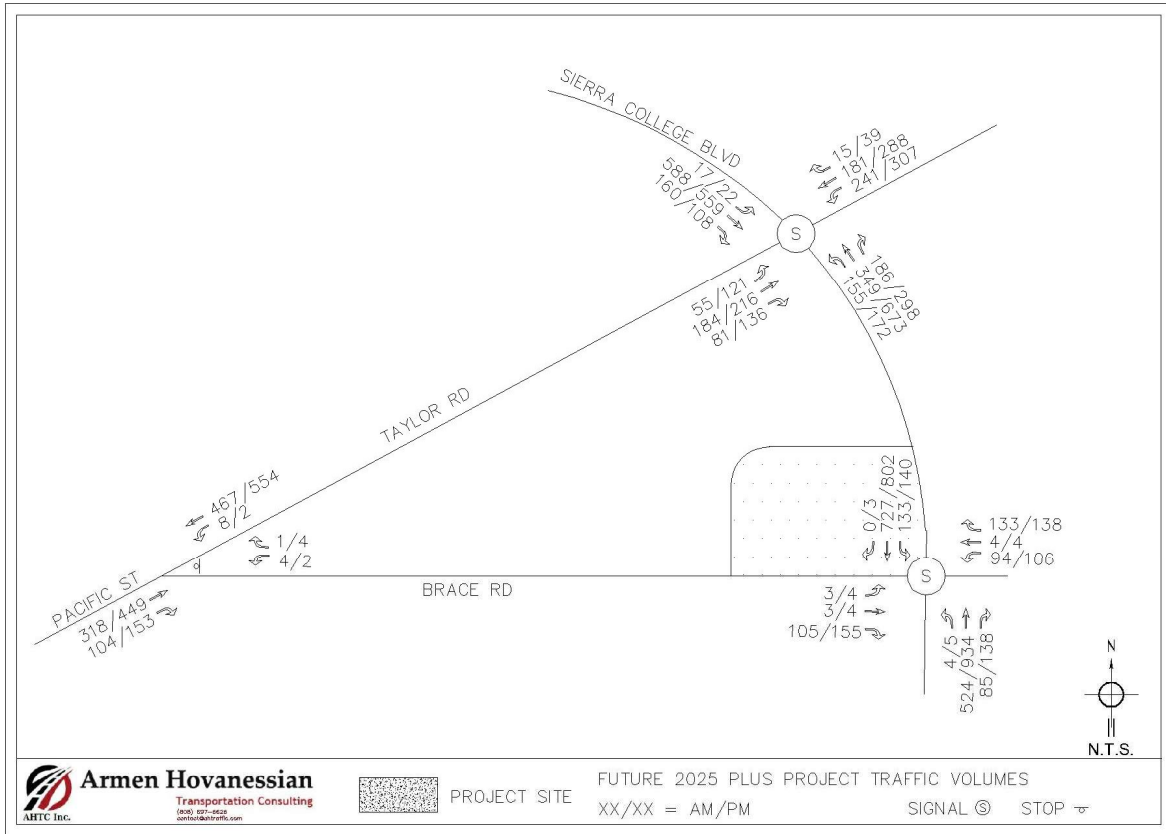


Figure 14 – Traffic Volumes (AM/PM Peak Hours) for Future (2040) without Project

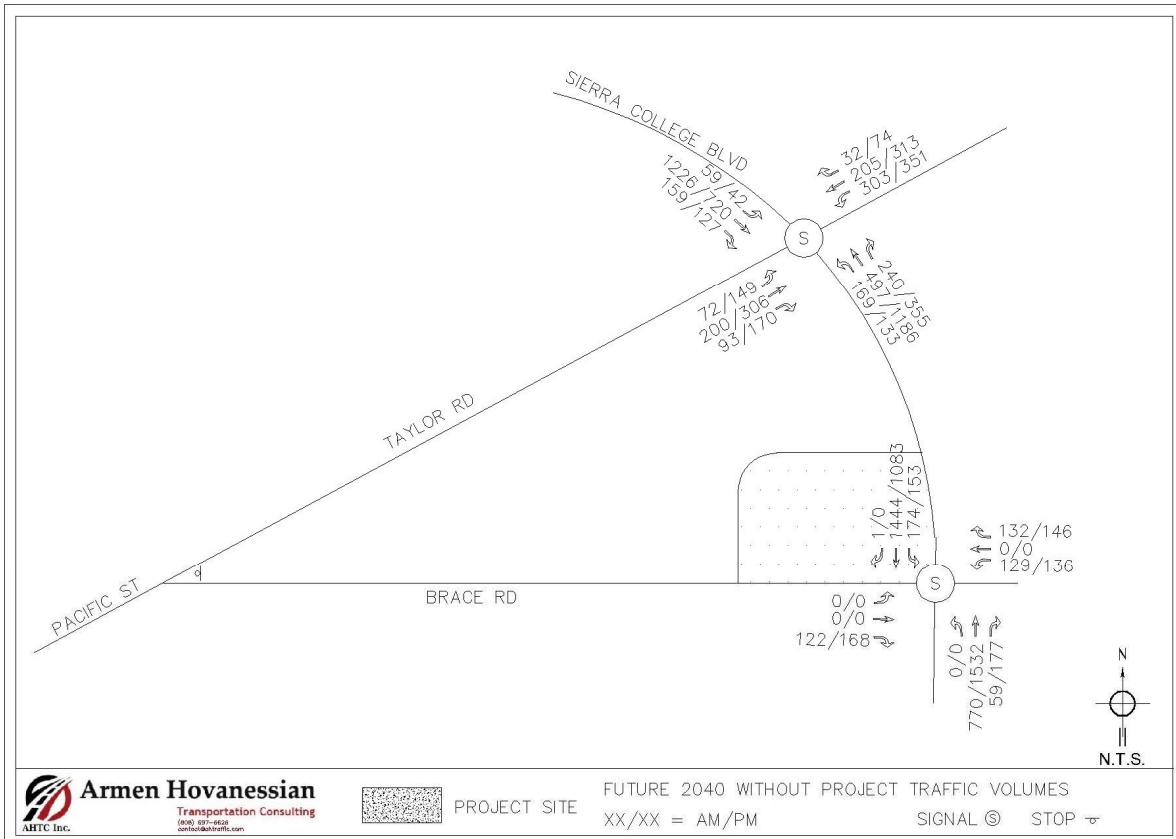
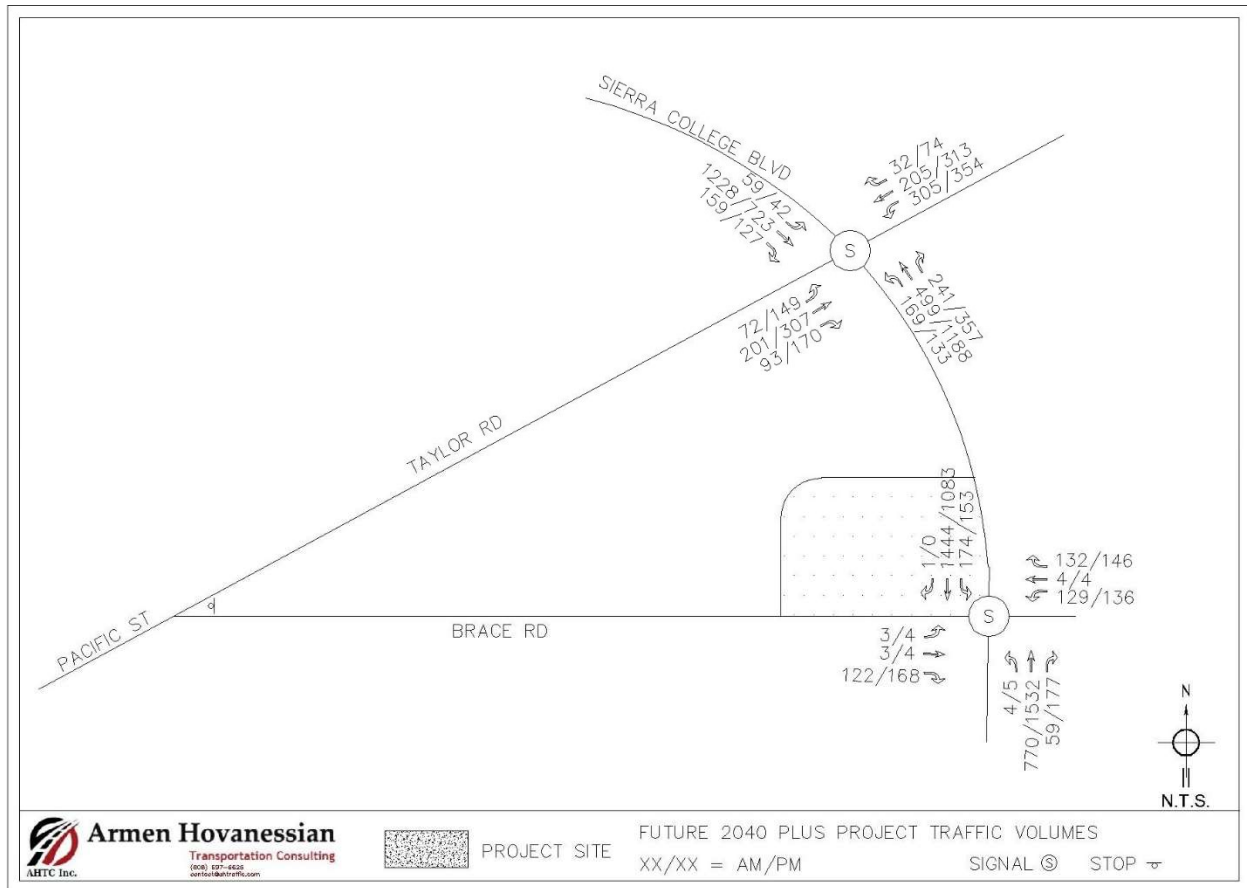


Figure 15 – Traffic Volumes (AM/PM Peak Hours) for Future (2040) Plus Project



Delay and Queueing Methodology

Signalized Intersections

The intersections of Taylor Road and Sierra College Boulevard and Brace Road and Sierra College Boulevard are signalized intersections. For signalized intersections, the Highway Capacity Manual (HCM) operations methodology for performing signalized intersection capacity analysis. This method relies on the determination of a delay or Level of Service (LOS) at each of the study intersections by first determining their corresponding average control delay per vehicle. Control delay includes initial deceleration delay, queue move-up time, stopped delay and final acceleration delay. It is a measure of driver discomfort, frustration, fuel consumption and lost travel time.

Level of Service (LOS) varies from at best LOS A (free flow/excellent) to at worst LOS of F (stop-and-go/failure). Shown below, in Table 4, are the LOS categories and their corresponding HCM average control delay ranges for signalized intersections.

Table 4 - LOS at Signalized Intersection

Level of Service	Average Control Delay per Vehicle (Sec/Veh)
A	0 to 10.00
B	10.01 to 20.00
C	20.01 to 35.00
D	35.01 to 55.00
E	55.01 to 80.00
F	Over 80.00

Unsignalized Intersections

The study intersection of Brace Road and Taylor Road is stop sign controlled on Brace Road. This analysis utilizes the Highway Capacity Manual (HCM) methodologies for performing two-way stop-controlled (TWSC) and all-way Stop-controlled (AWSC) intersection capacity analyses. For TWSC intersection analysis, Level of Service (LOS) is calculated for each movement of the intersection and the most critical LOS is the one that represents the effectiveness of that intersection. For AWSC intersection analysis, LOS is defined by the control delay of the entire intersection. The LOS thresholds for TWSC and AWSC intersections differ from those for signalized intersections to reflect different driver expectations. Table 5 shown below are the LOS categories and their most common corresponding HCM average control delay ranges for TWSC and AWSC intersections.

Table 5 - LOS at Unsignalized Intersections

Level of Service	Average Control Delay per Vehicle (Sec/Veh)
A	0 to 10.00
B	Over 10 to 15
C	Over 15 to 25
D	Over 25 to 35
E	Over 35 to 50
F	Over 50

Level of Service and Queueing Analysis

The results of the operational analyses are summarized in the following tables:

- Table 6: Levels of Service, Delays and Queue Lengths for existing conditions.
- Table 7: Levels of Service, Delays and Queue Lengths for existing plus project conditions.
- Table 8: Levels of Service, Delays and Queue Lengths for existing plus Costco plus project conditions.
- Table 9: Levels of Service, Delays and Queue Lengths for future 2025 without project conditions.
- Table 10: Levels of Service, Delays and Queue Lengths for future 2025 plus project conditions.
- Table 11: Levels of Service, Delays and Queue Lengths for future 2040 without project conditions.
- Table 12: Levels of Service, Delays and Queue Lengths for future 2040 plus project conditions.

Table 6 - LOS Existing Conditions

Study Intersection	Int. Control	Approach	Movement	Existing							
				AM			PM				
				Delay (sec)	LOS	95th % Queue (ft)	Delay (sec)	LOS	95th % Queue (ft)		
Brace Road & Taylor Road	Partial Stop Control	NB	left		A			A			
			through		A			A			
			right		A			A			
		SB	left	8.3	A	0	8.8	A	0		
			through		A			A			
			right		A			A			
		WB	left/right	16.8	C	0	11.8	B	0		
		Brace Road & Sierra College Boulevard	Traffic Signal	NB	left		A			A	
					through	11.5	B	155	14.8	B	347
right	11.5				B		14.8	B			
SB	left			23.70	C	102	33.3	C	131		
	through			5.3	A	99	5.9	A	130		
	right				A			A			
WB	left			15.9	B	77	25.3	C	102		
	through				A			A			
	right			14.7	B	40	20.6	C	46		
EB	left				A			A			
	through				A			A			
	right			13.8	B	0	20.7	C	19		
Taylor Road & Sierra College Boulevard	Traffic Signal			NB	left	51.2	D	196	55.5	E	213
					through	13.9	B	223	29.1	C	620
					right	8.5	A	28	11.1	B	37
		SB	left	43.8	D	29	44.9	D	38		
			through	35.3	D	526	37.1	D	510		
			right	17.1	B	40	18.4	B	25		
		WB	left	40.7	D	0	68.6	E	180		
			through	26.7	C	153	35.9	D	240		
			right	23.3	C	134	25.8	C	0		
		EB	left	42.2	D	68	56.1	E	180		
			through	32.2	C	155	30.5	C	178		
			right	28.5	C	7	28.1	C	33		

Table 7 - LOS Existing + Project Conditions

Study Intersection	Int. Control	Approach	Movement	Existing + Project					
				AM			PM		
				Delay (sec)	LOS	95th % Queue (ft)	Delay (sec)	LOS	95th % Queue (ft)
Brace Road & Taylor Road	Partial Stop Control	NB	left		A			A	
			through		A			A	
			right		A			A	
		SB	left	8.3	A	0	8.8	A	0
			through		A			A	
			right		A			A	
		WB	left/ right	15.4	C	0	15.8	C	0
Brace Road & Sierra College Boulevard	Traffic Signal	NB	left	10	B	162	11.3	B	372
			through	0	A		0	A	
			right	10.4	B		11.8	B	
		SB	left	22.6	C	105	29.7	C	133
			through	4.4	A	102	4.1	A	138
			right	0	A		4.1	A	
		WB	left	13.8	B	81	20.7	C	107
			through	0	A		0	A	
			right	16.2	B	41	23.3	C	46
		EB	left	14.2	B	40	21.9	C	53
			through	0	A		0	A	
			right	0	A		0	A	
Taylor Road & Sierra College Boulevard	Traffic Signal	NB	left	51.4	D	196	55.8	E	213
			through	13.9	B	224	29.2	C	624
			right	8.5	A	28	11.1	B	37
		SB	left	43.9	D	29	45	D	38
			through	35.5	D	529	37.4	D	513
			right	17.1	B	40	18.4	B	25
		WB	left	41.1	D	135	71.6	E	182
			through	26.7	C	153	36.1	D	240
			right	23.3	C	0	25.9	C	0
		EB	left	42.3	D	68	56.4	E	180
			through	32.4	C	156	30.6	C	178
			right	28.6	C	7	28.2	C	33

Table 8 - LOS Existing + Costco + Project Conditions

Study Intersection	Int. Control	Approach	Movement	Existing + Project + Costco							
				AM			PM				
				Delay (sec)	LOS	95th % Queue (ft)	Delay (sec)	LOS	95th % Queue (ft)		
Brace Road & Taylor Road	Partial Stop Control	NB	left		A			A			
			through		A			A			
			right		A			A			
		SB	left	8.3	A	0	8.8	A	0		
			through		A			A			
			right		A			A			
		WB	left/ right	15.4	C	0	15.8	C	0		
		Brace Road & Sierra College Boulevard	Traffic Signal	NB	left	9.4	A	7	9.7	A	8
					through	10.6	B	89	12.1	B	178
right	10.1				B	28	10.8	B	33		
SB	left			23.50	C	92	29.8	C	131		
	through			5.9	A	105	6.1	A	122		
	right			0	A		4.5	A	1		
WB	left			15.5	B	68	22	C	104		
	through			0	A		0	A			
	right			13.5	B	38	18.4	B	50		
EB	left			11.5	B	9	15.8	B	16		
	through			0	A		0	A			
	right			12.7	B	32	18.4	B	50		
Taylor Road & Sierra College Boulevard	Traffic Signal			NB	left	43.8	D	207	45.7	D	248
					through	13.4	B	102	16.1	B	220
					right	9.6	A	29	11	B	39
		SB	left	39.5	D	29	38	D	38		
			through	23.3	C	238	23.8	C	227		
			right	23.4	C		23.9	C	64		
		WB	left	34.9	C	140	46.4	D	201		
			through	22.1	C	149	25.8	C	240		
			right	19.4	B	0	20.1	C	0		
		EB	left	32.1	C	34	31.2	C	64		
			through	27	C	156	27.8	C	178		
			right	24.4	C	12	25.8	C	44		

Table 9 - LOS Future 2025 without Project Conditions

Study Intersection	Int. Control	Approach	Movement	Future w/o Project					
				AM			PM		
				Delay (sec)	LOS	95th % Queue (ft)	Delay (sec)	LOS	95th % Queue (ft)
Brace Road & Taylor Road	Partial Stop Control	NB	left		A			A	
			through		A			A	
			right		A			A	
		SB	left	8.3	A	0	8.9	A	0
			through		A			A	
			right		A			A	
		WB	left		A			A	
			through*	17.3	C	0	12	B	0
			right *		A			A	
Brace Road & Sierra College Boulevard	Traffic Signal	NB	left	0	A		0	A	
			through	10.3	B	92	12.7	B	207
			right	9.8	A	28	11.2	B	37
		SB	left	22.90	C	95	30.5	C	142
			through	5.6	A	107	6.4	A	155
			right	0	A		4.7	A	1
		WB	left	15.2	B	72	23	C	111
			through	0	A		18.5	B	
			right	14	B	38	0	A	46
		EB	left *	0	A		0	A	
			through	0	A		0	A	
			right	13.1	B	0	18.6	B	37
Taylor Road & Sierra College Boulevard	Traffic Signal	NB	left	45.6	D	212	47.2	D	253
			through *	13.4	B	103	16	B	224
			right	9.5	A	29	11	B	39
		SB	left	39.8	D	31	38.3	D	39
			through	23.7	C	245	23.9	C	231
			right	23.8	C		23.9	C	
		WB	left *	35.9	D	143	49.5	D	203
			through	22.8	C	153	26.9	C	245
			right	19.9	B	0	20.6	C	0
		EB	left	32.6	C	35	31.5	C	67
			through	27.8	C	157	28.6	C	182
			right	25.1	C	13	26.4	C	44

Table 10 - LOS Future 2025 + Project Conditions

Study Intersection	Int. Control	Approach	Movement	Future + Project					
				AM			PM		
				Delay (sec)	LOS	95th % Queue (ft)	Delay (sec)	LOS	95th % Queue (ft)
Brace Road & Taylor Road	Partial Stop Control	NB	left		A			A	
			through		A			A	
			right		A			A	
		SB	left	8.3	A	0	8.9	A	0
			through		A			A	
			right		A			A	
		WB	left		A			A	
			through	16.1	C	0.1	15.5	C	0.1
			right		A			A	
Brace Road & Sierra College Boulevard	Traffic Signal	NB	left	9.6	A	7	9.9	A	8
			through	10.9	B	92	12.5	B	184
			right	10.3	B	28	11.1	B	33
		SB	left	23.40	C	97	30.3	C	134
			through	6	A	106	6.2	A	127
			right	0	A		4.6	A	1
		WB	left	15.6	B	72	22.6	C	107
			through	0	A		0	A	
			right	13.6	B	40	18.7	B	50
		EB	left	11.5	B	10	16.1	B	15
			through	0	A		0	A	
			right	12.8	B	34	18.7	B	50
Taylor Road & Sierra College Boulevard	Traffic Signal	NB	left	45.5	D	216	47.1	D	253
			through	13.4	B	106	16	B	225
			right	9.5	A	30	11	B	39
		SB	left	39.8	D	31	38.3	D	39
			through	23.8	C	251	24	C	233
			right	23.9	C		24	C	
		WB	left	36	D	147	51.1	D	206
			through	22.7	C	152	26.8	C	245
			right	19.8	B	0	20.5	C	0
		EB	left	32.5	C	35	31.5	C	67
			through	27.8	C	158	28.6	C	183
			right	25	C	12	26.3	C	44

Table 11 - LOS Future 2040 without Project Conditions

Study Intersection	Int. Control	Approach	Movement	Future 2040 w/o Project					
				AM			PM		
				Delay (sec)	LOS	95th % Queue (ft)	Delay (sec)	LOS	95th % Queue (ft)
Brace Road & Sierra College Boulevard	Traffic Signal	NB	left	0	A		0	A	
			through	13	B	176	18.4	B	396
			right	11.3	B	26	13.6	B	42
		SB	left	37.30	D	174	41.3	D	155
			through	8.6	A	367	8.5	A	232
			right	4.5	A	0	0	A	0
		WB	left	30.7	C	137	33.7	C	149
			through	0	A		0	A	
			right	24.8	C	47	24.9	C	48
		EB	left	0	A		0	A	
			through	0	A		0	A	
			right	24.2	C	81	25.3	C	99
Taylor Road & Sierra College Boulevard	Traffic Signal	NB	left	80.7	F	242	54.7	D	189
			through	14	B	155	28.6	C	523
			right	10	A	34	13.8	B	99
		SB	left	50.3	D	97	47.4	D	67
			through	83	F	692	28.3	C	315
			right	87.3	F		28.3	C	
		WB	left	94.5	F	196	165.2	F	240
			through	29.7	C	174	33.4	C	269
			right	25.4	C	0	24.8	C	7
		EB	left	37.8	D	43	38.4	D	78
			through	36.2	D	170	37	D	263
			right	31.1	C	20	29.3	C	60

Table 12 - LOS Future 2040 + Project Conditions

Study Intersection	Int. Control	Approach	Movement	Future 2040 + Project					
				AM			PM		
				Delay (sec)	LOS	95th % Queue (ft)	Delay (sec)	LOS	95th % Queue (ft)
Brace Road & Sierra College Boulevard	Traffic Signal	NB	left	15.4	B	9	11.9	B	9
			through	13.4	B	167	17.7	B	382
			right	11.6	B	25	13.1	B	41
		SB	left	37.9	D	170	41	D	150
			through	9	A	338	8.1	A	218
			right	4.7	A	0	0	A	0
		WB	left	31.3	C	133	32.9	C	136
			through	0	A		0	A	
			right	24.8	C	50	25.3	C	51
		EB	left	21.8	C	13	22	C	16
			through	0	A		0	A	
			right	24.2	C	81	25.5	C	100
Taylor Road & Sierra College Boulevard	Traffic Signal	NB	left	80.9	F	243	54.8	D	189
			through	14.1	B	156	28.8	C	524
			right	10	B	34	13.9	B	101
		SB	left	50.3	D	97	47.4	D	67
			through	83.7	F	694	28.4	C	316
			right	88.1	F		28.4	C	78
		WB	left	97.5	F	200	169.6	F	241
			through	29.7	C	174	33.4	C	269
			right	25.4	C	0	24.8	C	7
		EB	left	37.9	D	43	38.4	D	78
			through	36.2	D	171	37.1	D	263
			right	31.1	C	20	29.3	C	60

Please refer to Appendix 4 for the (HCM) analysis worksheets for the analyzed intersections.

As shown in the Level of Service comparison Table 13, with the addition of the project traffic to the future traffic, the level of services for all traffic movements at the study intersections will remain substantially the same or experience minor change. Therefore, the project does not add any substantial amount of traffic to the study intersections.

Table 13 - Comparison of LOS- Future to Future + Project Conditions

Study Intersection	Int. Control	Approach	Movement	Comparison of Future To Future + Project									
				AM					PM				
				Delay (sec)	LOS Future	Future + Project	95% Queue	Number of Cars	Delay (sec)	LOS Future	Future + Project	95% Queue	Number of Cars
Brace Road & Taylor Road	Partial Stop Control	NB	left	0	A	A	0	0	0	A	A	0	0
			through	0	A	A	0	0	0	A	A	0	0
			right	0	A	A	0	0	0	A	A	0	0
		SB	left	0	A	A	0	0	0	A	A	0	0
			through	0	A	A	0	0	0	A	A	0	0
			right	0	A	A	0	0	0	A	A	0	0
		WB	left	0	A	A	0	0	0	A	A	0	0
			through	-1.2	C	C	0.1	0.005	3.5	B	C	0.1	0.005
			right	0	A	A	0	0	0	A	A	0	0
Brace Road & Sierra College Boulevard	Traffic Signal	NB	left	9.6	A	A	7	0.35	9.9	A	A	8	0.4
			through	0.6	B	B	0	0	-0.2	B	B	-23	-1.15
			right	0.5	A	B	0	0	-0.1	B	B	-4	-0.2
		SB	left	0.5	C	C	2	0.1	-0.2	C	C	-8	-0.4
			through	0.4	A	A	-1	-0.05	-0.2	A	A	-28	-1.4
			right	0	A	A	0	0	-0.1	A	A	0	0
		WB	left	0.4	B	B	0	0	-0.4	C	C	-4	-0.2
			through	0	A	A	0	0	-18.5	B	A	0	0
			right	-0.4	B	B	2	0.1	18.7	A	B	4	0.2
		EB	left	11.5	A	B	10	0.5	16.1	A	B	15	0.75
			through	0	A	A	0	0	0	A	A	0	0
			right	-0.3	B	B	34	1.7	0.1	B	B	13	0.65
Taylor Road & Sierra College Boulevard	Traffic Signal	NB	left	-0.1	D	D	4	0.2	-0.1	D	D	0	0
			through	0	B	B	3	0.15	0	B	B	1	0.05
			right	0	A	A	1	0.05	0	B	B	0	0
		SB	left	0	D	D	0	0	0	D	D	0	0
			through	0.1	C	C	6	0.3	0.1	C	C	2	0.1
			right	0.1	C	C	0	0	0.1	C	C	0	0
		WB	left	0.1	D	D	4	0.2	1.6	D	D	3	0.15
			through	-0.1	C	C	-1	-0.05	-0.1	C	C	0	0
			right	-0.1	B	B	0	0	-0.1	C	C	0	0
		EB	left	-0.1	C	C	0	0	0	C	C	0	0
			through	0	C	C	1	0.05	0	C	C	1	0.05
			right	-0.1	C	C	-1	-0.05	-0.1	C	C	0	0

Project Driveway Analysis

The two project driveways were analyzed utilizing the Highway Capacity Manual (HCM) methodologies for performing two-way stop-controlled (TWSC) intersection capacity analyses. The driveway on Sierra College Boulevard north of Brace Road will operate with stop sign control for vehicles exiting the property and as a right turn in-right turn out driveway. The driveway on Brace Road west of Sierra College Boulevard will operate without turn restrictions and stop sign control for vehicles exiting the property.

The driveway on Sierra College Boulevard north of Brace Road will operate at (LOS) B with a 12.9 second delay and no queue for the AM peak hour and at (LOS) B with a 13 second delay and no queue for the PM peak hour . The driveway on Brace Road west of Sierra College Boulevard

will operate at (LOS) A with a 9.2 second delay and no queue for the AM peak hour and at (LOS) A with a 9.3 second delay and no queue for the PM peak hour.

Please refer to Appendix 4 for the (HCM) analysis worksheets for the analyzed driveways.

Recommended Actions

The project does not have major adverse effects on access, safety, and circulation on the roadway system within the study area or at the analyzed intersections. Therefore, no additional actions would be needed.

Project Queuing Analysis

In order to determine queuing analysis of the car wash, extensive surveys by observation were conducted at a similar Quick Quack car wash located in Fontana California. The data was collected on typical weekdays as well as Saturday and Sunday between 7 AM to 9 PM. The specific location was selected based on having similarity to the characteristics of the proposed project site.

The following observations were made:

- The vehicles in the entry queue rarely extended beyond the drive-through entrance point.
- On average customers spend 2 minutes to pay for the wash and move through the gate.
- Mean observed waiting/service time per vehicle was 4 minutes and 10 seconds (250 Sec).
- The minimum observed waiting/service time per vehicle was 2 minutes and 10 seconds.
- The maximum observed waiting/service time per vehicle was 6 minutes and 10 seconds.

Table 14 provides the collected data for seven days of field observations at a similar Quick Quack Car Wash:

Table 14 - Survey Data at a Similar Quick Quack Car Wash

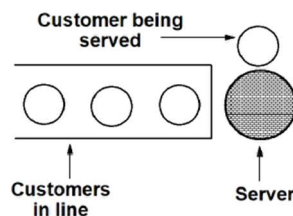
Hours Observed	Number of Vehicles Washed						
	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
7:00 AM	31	42	51	37	35	49	41
8:00 AM	59	52	73	58	56	65	70
9:00 AM	72	51	52	45	52	62	79
10:00 AM	69	62	59	54	48	58	81
11:00 AM	80	75	56	57	72	64	82
12:00 PM	86	85	66	65	55	73	87
1:00 PM	81	80	57	74	67	66	91
2:00 PM	80	80	57	77	60	83	89
3:00 PM	73	71	55	89	69	71	83
4:00 PM	70	66	61	64	67	87	85
5:00 PM	58	65	64	70	73	72	73
6:00 PM	62	65	56	70	69	83	59
7:00 PM	59	52	54	61	54	55	98
8:00 PM	38	40	43	36	42	40	26
Highest Hour	86	85	73	89	73	87	98
Highest Vehicles/Minute	1.43	1.42	1.22	1.48	1.22	1.45	1.63
Mean for Highest Vehicles/Minute	1.41						

According to extensive field observations of a similar Quick Quack car wash operation, it was determined the car wash did not create a queue beyond the queue provided queue storage capacity.

Additionally, the observed numbers of vehicles over the 7-day period ranged from 36 to 98 vehicles which is substantially consistent with ITE’s trip generation rate.

The following describes the formulas used to estimate queuing lengths for a single chamber automated car wash and Figure 16 below is a depiction of a single tunnel car wash serving/washing vehicles with a queue of vehicles:

Figure 16 – Single Tunnel Car Wash



The following notations describe the variables used in the formulas to estimate queue lengths for an automated car wash:

λ = mean highest arrival rate per minute

$W(q)$ = mean waiting time in the system

$L(q)$ = mean number of cars in the queue

There are other factors that must be taken into consideration to estimate the queue lengths such:

- Temporal distribution of traffic
- Time before the payment gate
- Time at the payment gate
- Number of wash chambers

The formulas are based on two inputs:

- Arrival rate (vehicles/hour)
- Service rate (vehicles/hour)

The following is true for queueing analysis:

- Arrival Rate > Service Rate, queue will start to form.
- Arrival Rate < Service Rate, queue will not form.

According to basic queueing formulas, Little's rule provides the following to determine the number of cars in the queue (Ross, 2014):

$$L(q) = \lambda \times W(q)$$

Applying the mathematical method of queue calculation using the above formulas to the proposed projects produced the following results:

According to the field observations the mean waiting time in the system was $W(q) = 4$ minutes and 10 seconds.

Therefore, the number of cars in the queue for this project based on the collected data as depicted in Table 14 is:

$$\lambda_{\text{mean}} = 1.41 \text{ Vehicles/Minute } W(q) = 4 \text{ minutes } 10 \text{ seconds} = 4.1667 \text{ minutes}$$
$$L(q) = \lambda_{\text{mean}} \times W(q) = 1.41 \times 4.1667 = 5.875 = 6 \text{ cars}$$

Assuming an average vehicle length of 20 feet, the queue length would be:

$$\text{Length of Queue} = 6 \times 20 = 120 \text{ feet}$$

As shown in the project site plan in Figure 2, the project is designed to provide three queue lanes of 100 feet/lane or total vehicle lanes of 300 feet. The queueing lanes provide capacity for 15 cars. Based on the field observation of a similar operation and the mathematical calculations, the proposed project queueing demand would not exceed the queueing capacity provided by the proposed project.

Traffic Signal Warrant Analysis

A traffic signal warrant analysis was conducted to determine if the installation of a traffic signal would be warranted at the intersection of Brace Road and Taylor Road. The analysis revealed that the traffic signal warrants were not met. Please refer to Appendix 5 for a copy of the warrant sheets.

Stop Sign Analysis

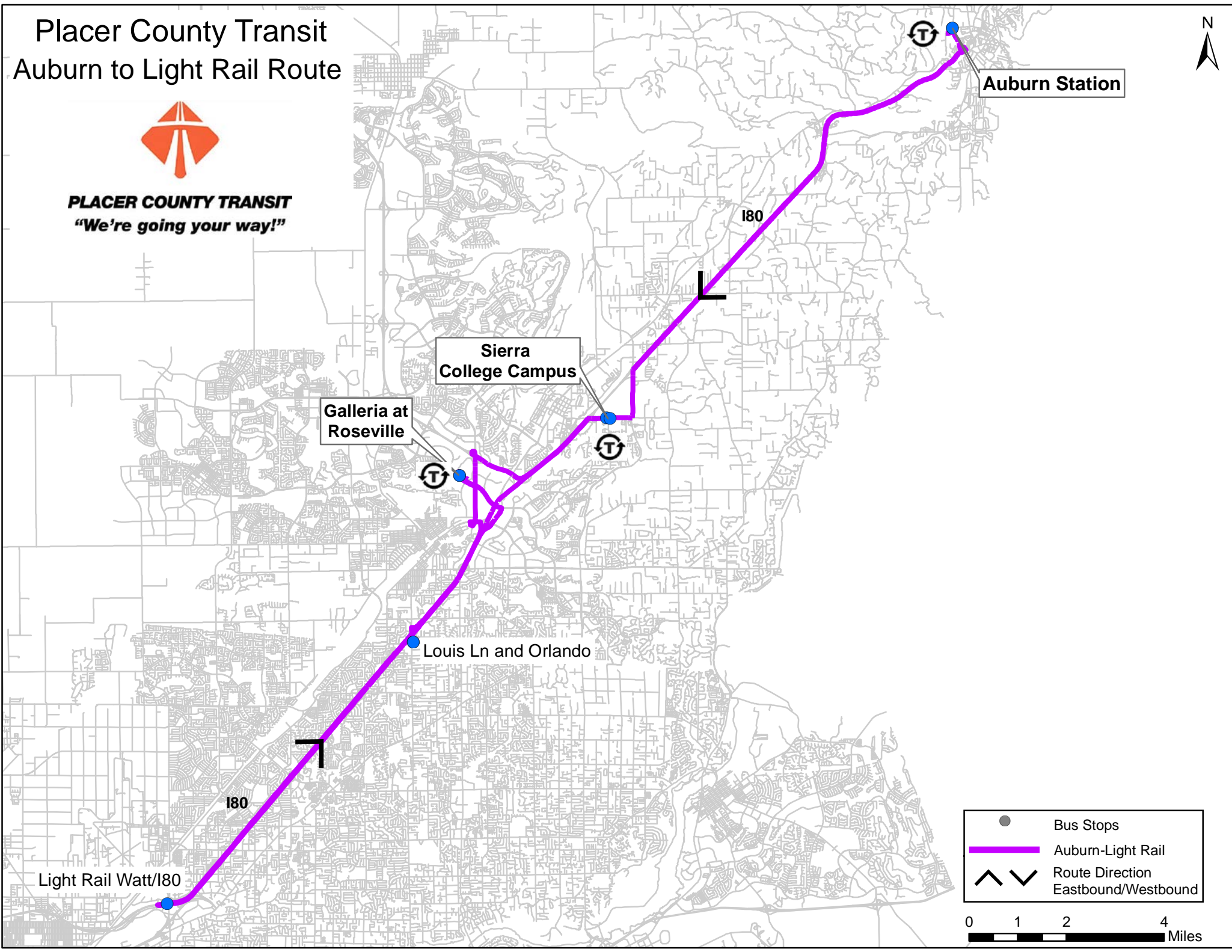
An analysis for all-way stop sign control was conducted to determine if the installation of all way stop sign control would meet the guidelines at the intersection of Brace Road and Taylor Road. The analysis revealed that the stop sign guidelines were not met. Please refer to Appendix 6 for a copy of the guidelines.

Appendix 1 – Transit Related Information

Placer County Transit Auburn to Light Rail Route



PLACER COUNTY TRANSIT
"We're going your way!"



Auburn Station

Sierra College Campus

Galleria at Roseville

Louis Ln and Orlando

Light Rail Watt/I80

- Bus Stops
- Auburn-Light Rail
- ^ Route Direction Eastbound
- v Route Direction Westbound

0 1 2 4 Miles



Placer County Transit Sierra College - Lincoln Route



PLACER COUNTY TRANSIT
"We're going your way!"

Lincoln - 3rd and F

Twelve Bridges
Library

Thunder Valley
Casino

HWY 65

Sunset and
Blue Oaks

Rocklin Commons
(Target)

Rocklin
Crossing
(Walmart)

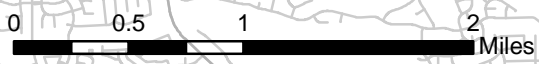
Pacific and Pine




Sunset and
S Whitney

Sierra
College Campus

Galleria

80

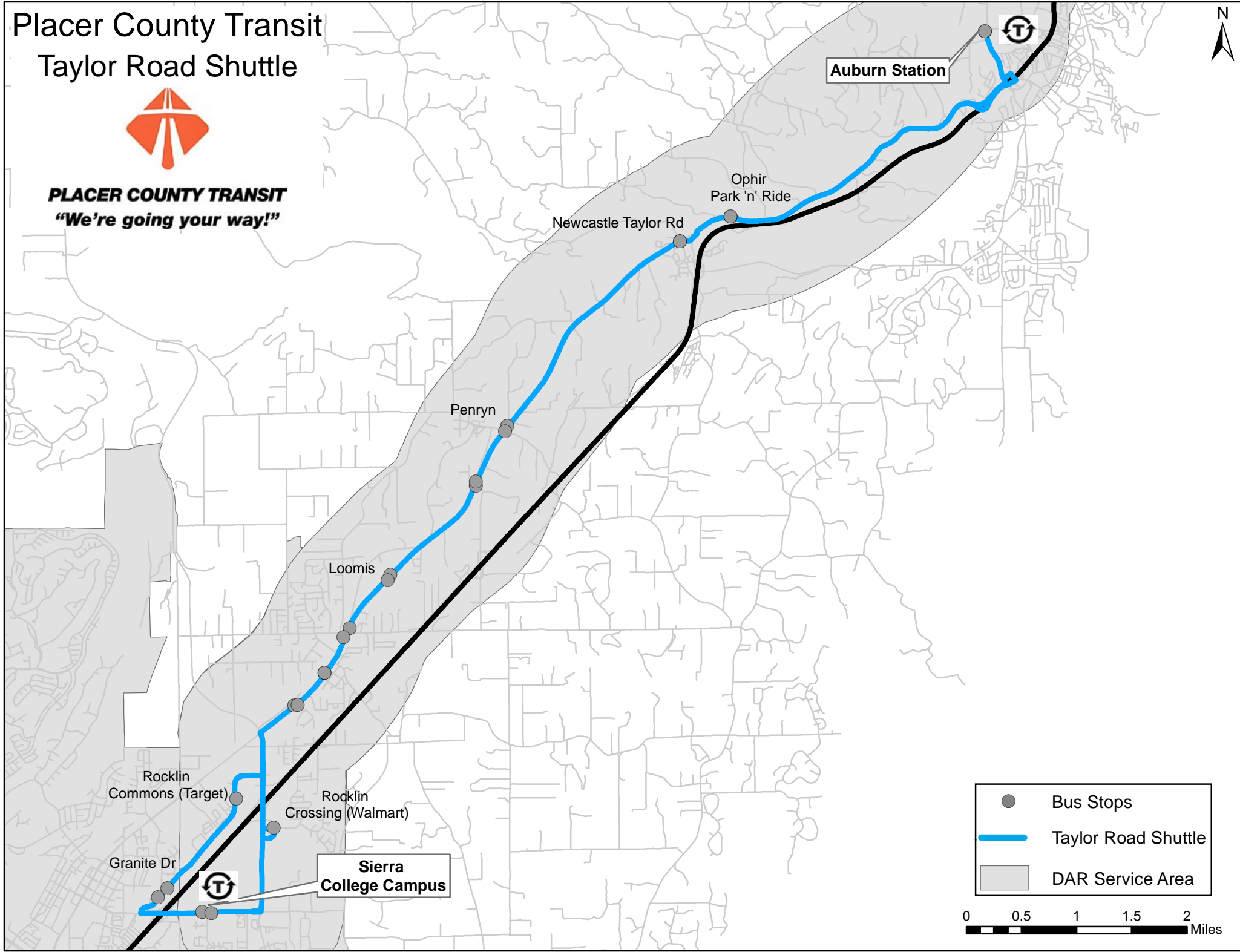


-  Bus Stops
-  Sierra College - Lincoln Route
-  Route Direction

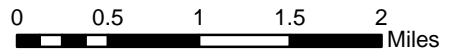
Placer County Transit Taylor Road Shuttle



PLACER COUNTY TRANSIT
"We're going your way!"



	Bus Stops
	Taylor Road Shuttle
	DAR Service Area



Appendix 2 - Manual Traffic Counts

CITY TRAFFIC COUNTERS
WWW.CTCOUNTERS.COM

File Name : SierraCollegeBlvd_BraceRd
 Site Code : 00000000
 Start Date : 5/10/2023
 Page No : 1

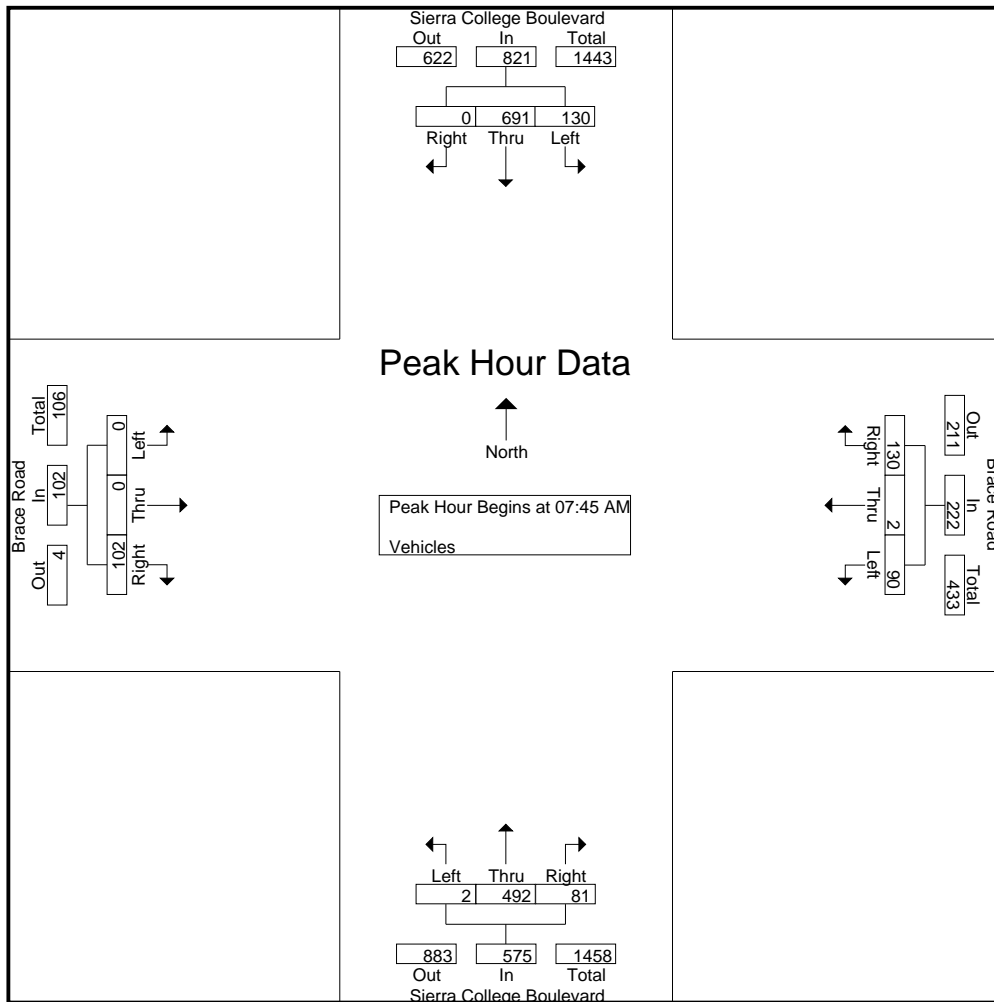
Groups Printed- Vehicles

Start Time	Sierra College Boulevard Southbound			Brace Road Westbound			Sierra College Boulevard Northbound			Brace Road Eastbound			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
06:00 AM	6	69	0	4	0	3	1	59	6	0	0	10	158
06:15 AM	9	65	0	3	1	11	0	62	4	0	0	13	168
06:30 AM	6	93	0	14	1	13	0	89	5	0	0	24	245
06:45 AM	20	90	0	8	0	18	0	122	5	0	0	19	282
Total	41	317	0	29	2	45	1	332	20	0	0	66	853
07:00 AM	19	108	0	13	0	13	0	71	5	0	0	19	248
07:15 AM	16	153	0	8	0	19	1	87	8	0	0	19	311
07:30 AM	33	158	2	31	0	27	0	117	11	0	0	24	403
07:45 AM	30	149	0	16	1	42	2	134	19	0	0	19	412
Total	98	568	2	68	1	101	3	409	43	0	0	81	1374
08:00 AM	35	187	0	24	0	42	0	129	20	0	0	28	465
08:15 AM	35	167	0	30	1	23	0	125	21	0	0	33	435
08:30 AM	30	188	0	20	0	23	0	104	21	0	0	22	408
08:45 AM	28	155	0	26	0	18	0	106	25	0	0	22	380
Total	128	697	0	100	1	106	0	464	87	0	0	105	1688
09:00 AM	18	177	1	19	0	22	0	126	14	0	0	18	395
09:15 AM	19	167	0	22	0	9	1	118	12	0	0	17	365
09:30 AM	8	173	0	18	0	14	0	115	15	0	0	16	359
09:45 AM	8	142	0	19	0	20	0	132	21	0	0	24	366
Total	53	659	1	78	0	65	1	491	62	0	0	75	1485
03:00 PM	32	171	2	34	0	32	0	191	18	0	0	33	513
03:15 PM	20	186	0	30	0	25	0	182	18	0	0	21	482
03:30 PM	31	174	0	19	0	24	0	206	23	0	0	35	512
03:45 PM	33	195	0	22	0	26	0	201	30	0	0	33	540
Total	116	726	2	105	0	107	0	780	89	0	0	122	2047
04:00 PM	34	196	0	24	0	29	0	224	21	0	0	42	570
04:15 PM	37	176	0	26	0	35	0	209	38	0	0	35	556
04:30 PM	26	163	2	25	0	45	0	216	43	0	0	41	561
04:45 PM	26	168	0	27	0	30	0	219	37	0	0	24	531
Total	123	703	2	102	0	139	0	868	139	0	0	142	2218
05:00 PM	29	175	0	39	0	33	0	199	26	0	0	44	545
05:15 PM	27	152	1	17	0	31	0	217	37	0	0	38	520
05:30 PM	43	151	0	24	0	33	0	213	24	0	0	19	507
05:45 PM	28	143	0	26	0	32	0	205	26	0	0	21	481
Total	127	621	1	106	0	129	0	834	113	0	0	122	2053
06:00 PM	29	138	0	15	0	21	0	189	19	0	0	24	435
06:15 PM	18	106	0	15	0	22	0	145	20	0	0	18	344
06:30 PM	15	112	0	27	1	23	0	156	26	0	0	12	372
06:45 PM	17	88	0	14	0	17	0	147	24	0	0	10	317
Total	79	444	0	71	1	83	0	637	89	0	0	64	1468
Grand Total	765	4735	8	659	5	775	5	4815	642	0	0	777	13186
Apprch %	13.9	86	0.1	45.8	0.3	53.9	0.1	88.2	11.8	0	0	100	
Total %	5.8	35.9	0.1	5	0	5.9	0	36.5	4.9	0	0	5.9	

CITY TRAFFIC COUNTERS
WWW.CTCOUNTERS.COM

File Name : SierraCollegeBlvd_BraceRd
 Site Code : 00000000
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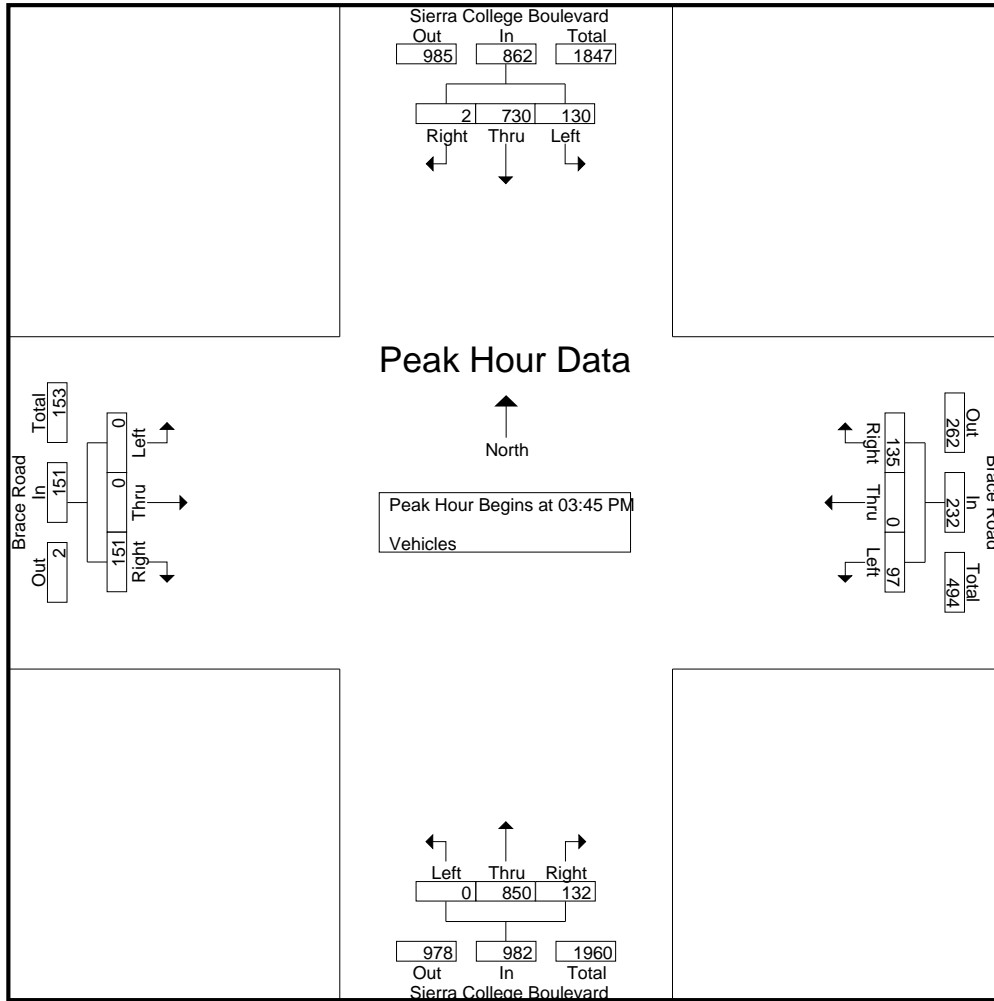
Start Time	Sierra College Boulevard Southbound				Brace Road Westbound				Sierra College Boulevard Northbound				Brace Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 06:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	30	149	0	179	16	1	42	59	2	134	19	155	0	0	19	19	412
08:00 AM	35	187	0	222	24	0	42	66	0	129	20	149	0	0	28	28	465
08:15 AM	35	167	0	202	30	1	23	54	0	125	21	146	0	0	33	33	435
08:30 AM	30	188	0	218	20	0	23	43	0	104	21	125	0	0	22	22	408
Total Volume	130	691	0	821	90	2	130	222	2	492	81	575	0	0	102	102	1720
% App. Total	15.8	84.2	0		40.5	0.9	58.6		0.3	85.6	14.1		0	0	100		
PHF	.929	.919	.000	.925	.750	.500	.774	.841	.250	.918	.964	.927	.000	.000	.773	.773	.925



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Start Time	Sierra College Boulevard Southbound				Brace Road Westbound				Sierra College Boulevard Northbound				Brace Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 03:00 PM to 06:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 03:45 PM																	
03:45 PM	33	195	0	228	22	0	26	48	0	201	30	231	0	0	33	33	540
04:00 PM	34	196	0	230	24	0	29	53	0	224	21	245	0	0	42	42	570
04:15 PM	37	176	0	213	26	0	35	61	0	209	38	247	0	0	35	35	556
04:30 PM	26	163	2	191	25	0	45	70	0	216	43	259	0	0	41	41	561
Total Volume	130	730	2	862	97	0	135	232	0	850	132	982	0	0	151	151	2227
% App. Total	15.1	84.7	0.2		41.8	0	58.2		0	86.6	13.4		0	0	100		
PHF	.878	.931	.250	.937	.933	.000	.750	.829	.000	.949	.767	.948	.000	.000	.899	.899	.977



CITY TRAFFIC COUNTERS
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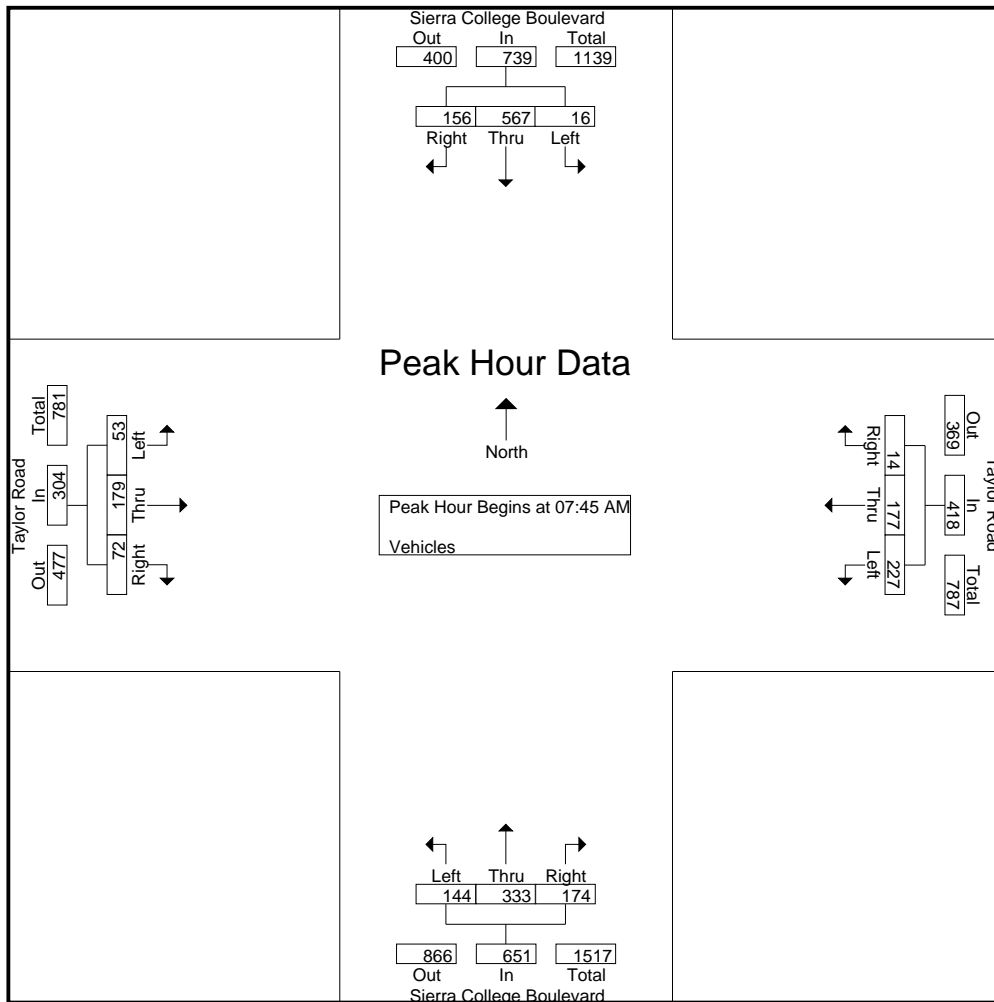
Groups Printed- Vehicles

Start Time	Sierra College Boulevard Southbound			Taylor Road Westbound			Sierra College Boulevard Northbound			Taylor Road Eastbound			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
06:00 AM	0	56	2	14	10	0	20	35	9	6	6	9	167
06:15 AM	0	59	12	12	13	0	25	36	11	2	11	7	188
06:30 AM	1	72	9	21	12	1	20	64	19	6	18	9	252
06:45 AM	8	85	24	17	23	3	35	65	29	7	33	8	337
Total	9	272	47	64	58	4	100	200	68	21	68	33	944
07:00 AM	3	100	12	29	27	0	29	70	23	9	24	5	331
07:15 AM	4	115	20	53	23	1	18	67	25	6	32	10	374
07:30 AM	1	136	22	43	40	4	29	75	49	21	32	22	474
07:45 AM	4	146	33	25	41	2	45	97	46	11	49	16	515
Total	12	497	87	150	131	7	121	309	143	47	137	53	1694
08:00 AM	3	145	34	59	40	5	34	99	47	16	52	23	557
08:15 AM	6	141	41	73	52	3	34	71	44	14	40	13	532
08:30 AM	3	135	48	70	44	4	31	66	37	12	38	20	508
08:45 AM	4	105	19	46	39	7	34	69	34	23	51	15	446
Total	16	526	142	248	175	19	133	305	162	65	181	71	2043
09:00 AM	6	113	19	51	43	3	40	65	39	11	30	28	448
09:15 AM	5	130	25	42	41	2	37	67	30	11	27	28	445
09:30 AM	3	121	17	48	40	7	33	62	51	17	40	24	463
09:45 AM	3	90	15	44	36	6	34	67	71	18	41	16	441
Total	17	454	76	185	160	18	144	261	191	57	138	96	1797
03:00 PM	6	130	24	55	39	13	39	129	62	19	52	21	589
03:15 PM	7	132	23	58	52	11	40	113	69	24	72	18	619
03:30 PM	6	125	24	44	54	12	49	134	66	21	66	23	624
03:45 PM	6	145	30	65	57	4	46	120	74	31	59	28	665
Total	25	532	101	222	202	40	174	496	271	95	249	90	2497
04:00 PM	3	134	23	77	84	10	42	168	60	27	47	36	711
04:15 PM	9	144	24	61	73	10	31	169	68	25	45	22	681
04:30 PM	3	103	28	71	68	14	28	180	64	35	59	27	680
04:45 PM	7	121	31	49	54	5	34	206	42	28	60	24	661
Total	22	502	106	258	279	39	135	723	234	115	211	109	2733
05:00 PM	3	122	28	67	76	10	31	180	54	35	49	23	678
05:15 PM	9	92	20	55	60	11	21	234	48	32	52	20	654
05:30 PM	7	117	21	51	57	3	34	206	37	22	55	15	625
05:45 PM	5	106	19	51	60	7	27	179	40	28	50	16	588
Total	24	437	88	224	253	31	113	799	179	117	206	74	2545
06:00 PM	3	75	35	58	44	5	17	125	52	31	37	14	496
06:15 PM	2	68	14	63	41	4	23	97	35	16	37	8	408
06:30 PM	1	63	20	37	40	9	23	123	45	16	34	11	422
06:45 PM	4	58	14	29	33	5	18	96	33	9	36	12	347
Total	10	264	83	187	158	23	81	441	165	72	144	45	1673
Grand Total	135	3484	730	1538	1416	181	1001	3534	1413	589	1334	571	15926
Apprch %	3.1	80.1	16.8	49.1	45.2	5.8	16.8	59.4	23.8	23.6	53.5	22.9	
Total %	0.8	21.9	4.6	9.7	8.9	1.1	6.3	22.2	8.9	3.7	8.4	3.6	

CITY TRAFFIC COUNTERS
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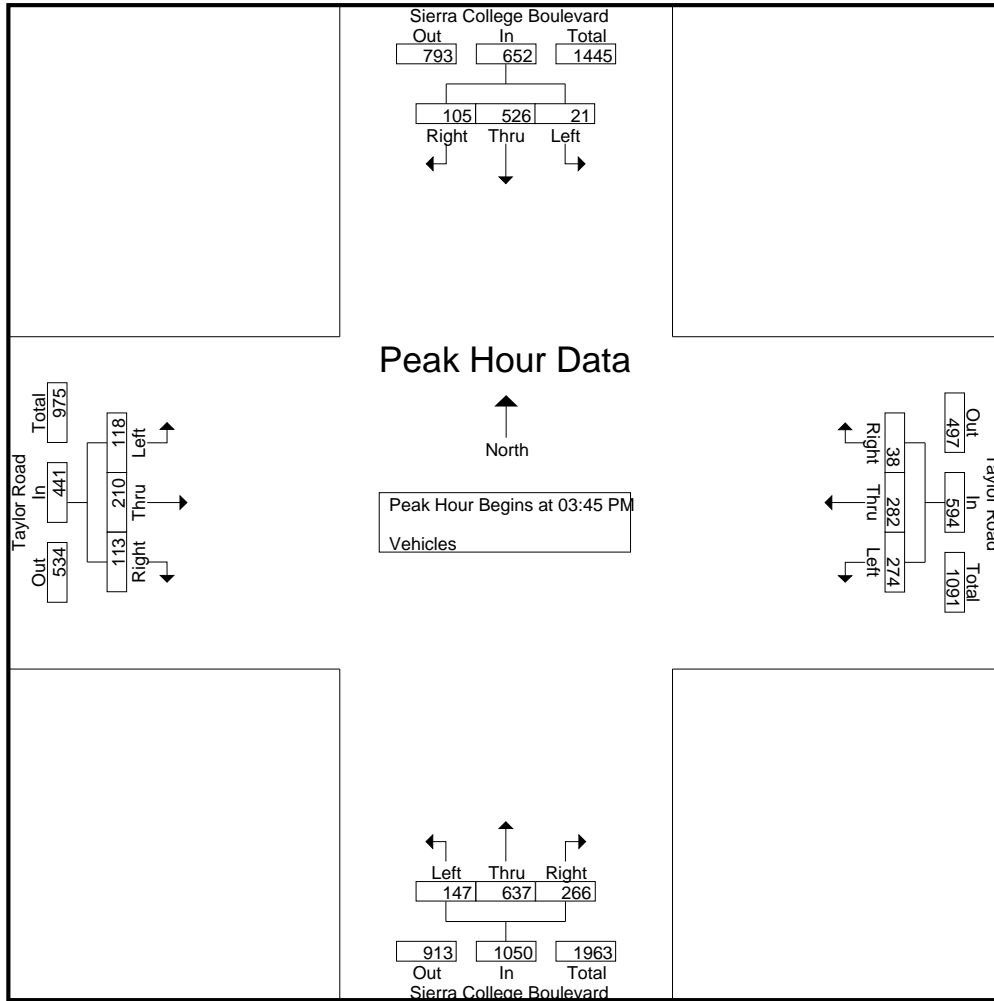
Start Time	Sierra College Boulevard Southbound				Taylor Road Westbound				Sierra College Boulevard Northbound				Taylor Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 06:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	4	146	33	183	25	41	2	68	45	97	46	188	11	49	16	76	515
08:00 AM	3	145	34	182	59	40	5	104	34	99	47	180	16	52	23	91	557
08:15 AM	6	141	41	188	73	52	3	128	34	71	44	149	14	40	13	67	532
08:30 AM	3	135	48	186	70	44	4	118	31	66	37	134	12	38	20	70	508
Total Volume	16	567	156	739	227	177	14	418	144	333	174	651	53	179	72	304	2112
% App. Total	2.2	76.7	21.1		54.3	42.3	3.3		22.1	51.2	26.7		17.4	58.9	23.7		
PHF	.667	.971	.813	.983	.777	.851	.700	.816	.800	.841	.926	.866	.828	.861	.783	.835	.948



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Start Time	Sierra College Boulevard Southbound				Taylor Road Westbound				Sierra College Boulevard Northbound				Taylor Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 03:00 PM to 06:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 03:45 PM																	
03:45 PM	6	145	30	181	65	57	4	126	46	120	74	240	31	59	28	118	665
04:00 PM	3	134	23	160	77	84	10	171	42	168	60	270	27	47	36	110	711
04:15 PM	9	144	24	177	61	73	10	144	31	169	68	268	25	45	22	92	681
04:30 PM	3	103	28	134	71	68	14	153	28	180	64	272	35	59	27	121	680
Total Volume	21	526	105	652	274	282	38	594	147	637	266	1050	118	210	113	441	2737
% App. Total	3.2	80.7	16.1		46.1	47.5	6.4		14	60.7	25.3		26.8	47.6	25.6		
PHF	.583	.907	.875	.901	.890	.839	.679	.868	.799	.885	.899	.965	.843	.890	.785	.911	.962



CITY TRAFFIC COUNTERS
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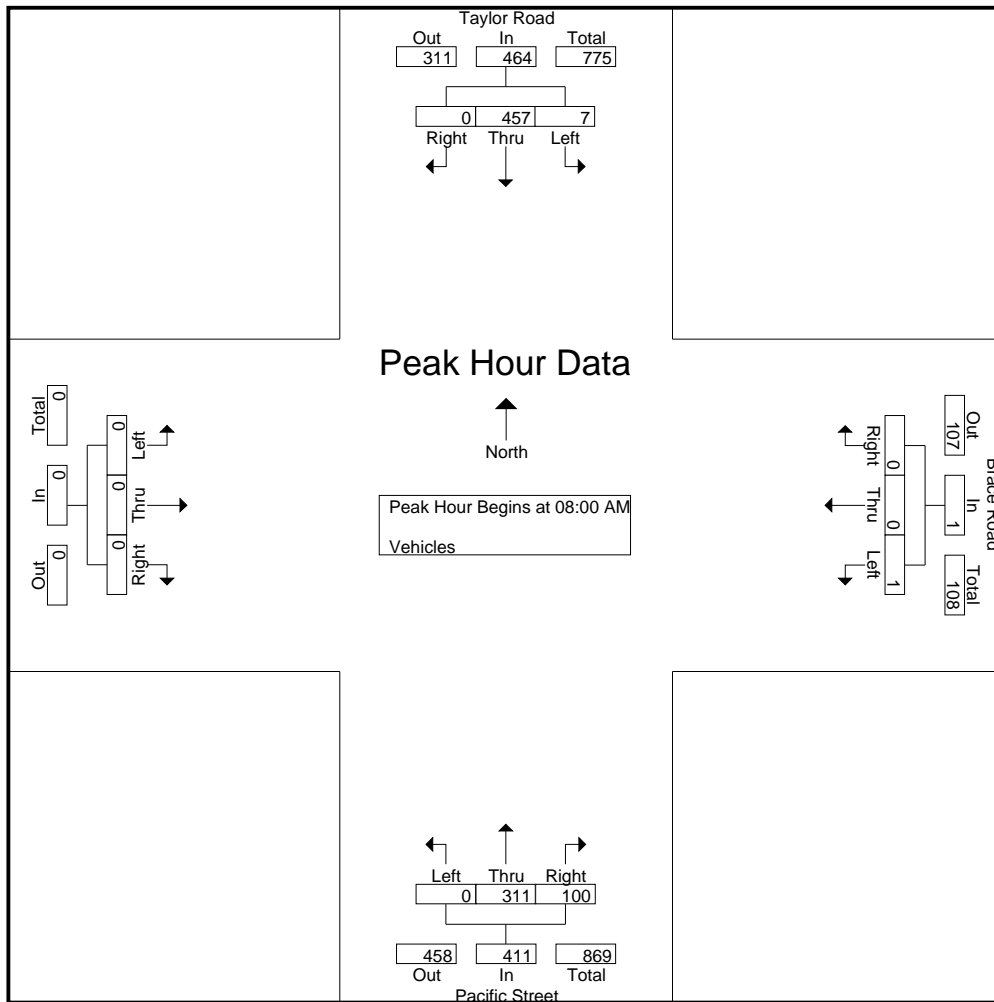
Groups Printed- Vehicles

Start Time	Taylor Road Southbound			Brace Road Westbound			Pacific Street Northbound			Eastbound			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
06:00 AM	0	33	0	0	0	0	0	21	10	0	0	0	64
06:15 AM	0	43	0	1	0	0	0	22	12	0	0	0	78
06:30 AM	1	51	0	1	0	0	0	28	23	0	0	0	104
06:45 AM	0	91	0	0	0	0	0	47	18	0	0	0	156
Total	1	218	0	2	0	0	0	118	63	0	0	0	402
07:00 AM	0	61	0	0	0	0	0	40	18	0	0	0	119
07:15 AM	0	56	0	1	0	0	0	51	21	0	0	0	129
07:30 AM	2	90	0	2	0	0	0	71	23	0	0	0	188
07:45 AM	6	97	0	3	0	0	0	79	14	0	0	0	199
Total	8	304	0	6	0	0	0	241	76	0	0	0	635
08:00 AM	3	108	0	0	0	0	0	90	26	0	0	0	227
08:15 AM	0	128	0	1	0	0	0	74	33	0	0	0	236
08:30 AM	1	124	0	0	0	0	0	61	23	0	0	0	209
08:45 AM	3	97	0	0	0	0	0	86	18	0	0	0	204
Total	7	457	0	1	0	0	0	311	100	0	0	0	876
09:00 AM	2	98	0	0	0	2	0	73	17	0	0	0	192
09:15 AM	0	96	0	0	0	0	0	54	18	0	0	0	168
09:30 AM	1	89	0	0	0	0	0	79	17	0	0	0	186
09:45 AM	2	85	0	0	0	0	0	79	20	0	0	0	186
Total	5	368	0	0	0	2	0	285	72	0	0	0	732
03:00 PM	1	100	0	0	0	2	0	96	32	0	0	0	231
03:15 PM	0	116	0	0	0	0	0	112	22	0	0	0	250
03:30 PM	0	140	0	0	0	0	0	110	37	0	0	0	287
03:45 PM	0	134	0	0	0	0	0	121	32	0	0	0	287
Total	1	490	0	0	0	2	0	439	123	0	0	0	1055
04:00 PM	1	144	0	0	0	0	0	106	40	0	0	0	291
04:15 PM	0	131	0	0	0	0	0	96	36	0	0	0	263
04:30 PM	0	134	0	0	0	2	0	117	39	0	0	0	292
04:45 PM	0	118	0	0	0	0	0	112	23	0	0	0	253
Total	1	527	0	0	0	2	0	431	138	0	0	0	1099
05:00 PM	1	131	0	0	0	0	0	110	44	0	0	0	286
05:15 PM	0	105	0	1	0	0	0	106	38	0	0	0	250
05:30 PM	0	116	0	0	0	0	0	95	21	0	0	0	232
05:45 PM	1	108	0	0	0	0	0	96	19	0	0	0	224
Total	2	460	0	1	0	0	0	407	122	0	0	0	992
06:00 PM	1	89	0	0	0	0	0	85	24	0	0	0	199
06:15 PM	0	71	0	0	0	0	0	58	18	0	0	0	147
06:30 PM	0	90	0	1	0	0	0	62	12	0	0	0	165
06:45 PM	0	63	0	0	0	0	0	61	10	0	0	0	134
Total	1	313	0	1	0	0	0	266	64	0	0	0	645
Grand Total	26	3137	0	11	0	6	0	2498	758	0	0	0	6436
Apprch %	0.8	99.2	0	64.7	0	35.3	0	76.7	23.3	0	0	0	
Total %	0.4	48.7	0	0.2	0	0.1	0	38.8	11.8	0	0	0	

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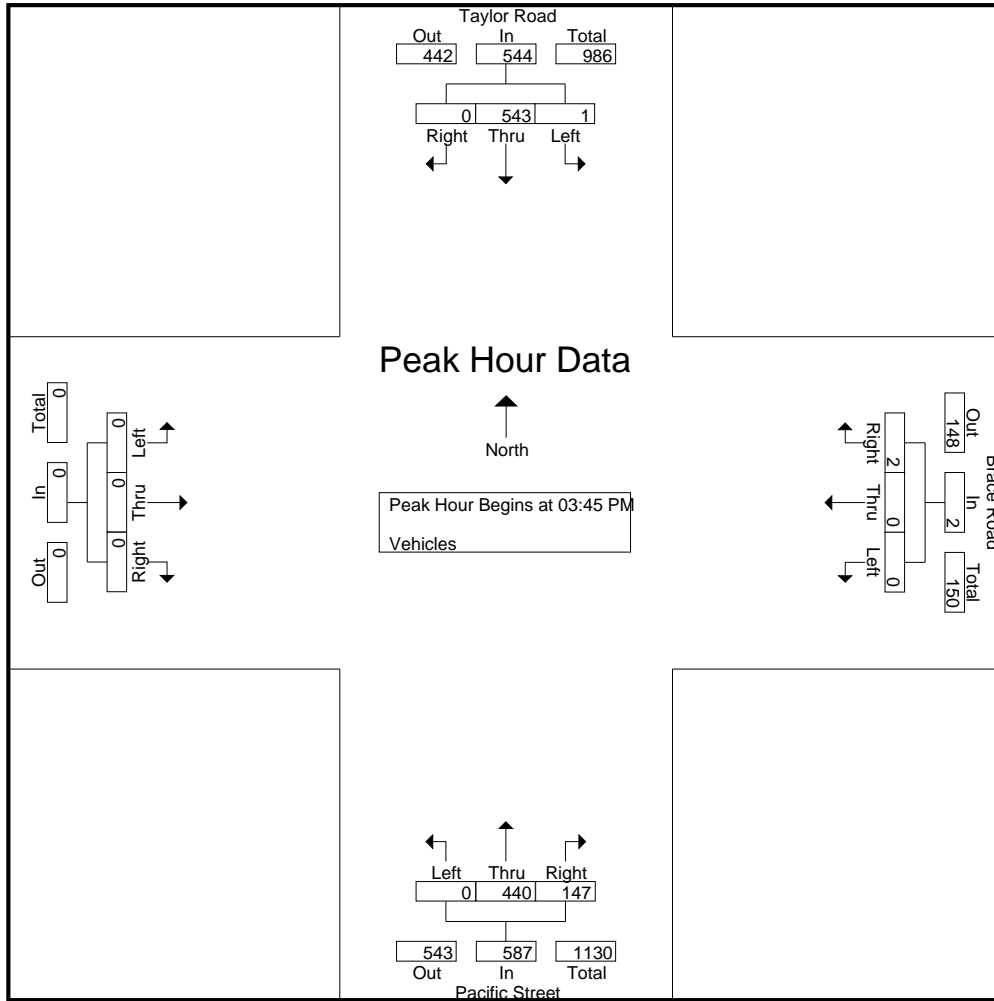
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	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 06:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	3	108	0	111	0	0	0	0	0	90	26	116	0	0	0	0	227
08:15 AM	0	128	0	128	1	0	0	1	0	74	33	107	0	0	0	0	236
08:30 AM	1	124	0	125	0	0	0	0	0	61	23	84	0	0	0	0	209
08:45 AM	3	97	0	100	0	0	0	0	0	86	18	104	0	0	0	0	204
Total Volume	7	457	0	464	1	0	0	1	0	311	100	411	0	0	0	0	876
% App. Total	1.5	98.5	0		100	0	0		0	75.7	24.3		0	0	0		
PHF	.583	.893	.000	.906	.250	.000	.000	.250	.000	.864	.758	.886	.000	.000	.000	.000	.928



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Start Time	Taylor Road Southbound				Brace Road Westbound				Pacific Street Northbound				Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 03:00 PM to 06:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 03:45 PM																	
03:45 PM	0	134	0	134	0	0	0	0	0	121	32	153	0	0	0	0	287
04:00 PM	1	144	0	145	0	0	0	0	0	106	40	146	0	0	0	0	291
04:15 PM	0	131	0	131	0	0	0	0	0	96	36	132	0	0	0	0	263
04:30 PM	0	134	0	134	0	0	2	2	0	117	39	156	0	0	0	0	292
Total Volume	1	543	0	544	0	0	2	2	0	440	147	587	0	0	0	0	1133
% App. Total	0.2	99.8	0		0	0	100		0	75	25		0	0	0		
PHF	.250	.943	.000	.938	.000	.000	.250	.250	.000	.909	.919	.941	.000	.000	.000	.000	.970



**Appendix 3 - Institute of Transportation Engineers (ITE)
Trip Generation Manual 11th Edition**

Land Use: 948

Automated Car Wash

Description

An automated car wash is a facility that allows for the mechanical cleaning of the exterior of vehicles. Manual cleaning service may also be available at the facility. Self-service car wash (Land Use 947) and car wash and detail center (Land Use 949) are related uses.

Additional Data

The sites were surveyed in the 1990s and the 2000s in New Jersey, New York, and Washington.

Source Numbers

552, 555, 585, 599, 954

Automated Car Wash (948)

Vehicle Trip Ends vs: Car Wash Tunnels

On a: Weekday,

Peak Hour of Adjacent Street Traffic,

One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 3

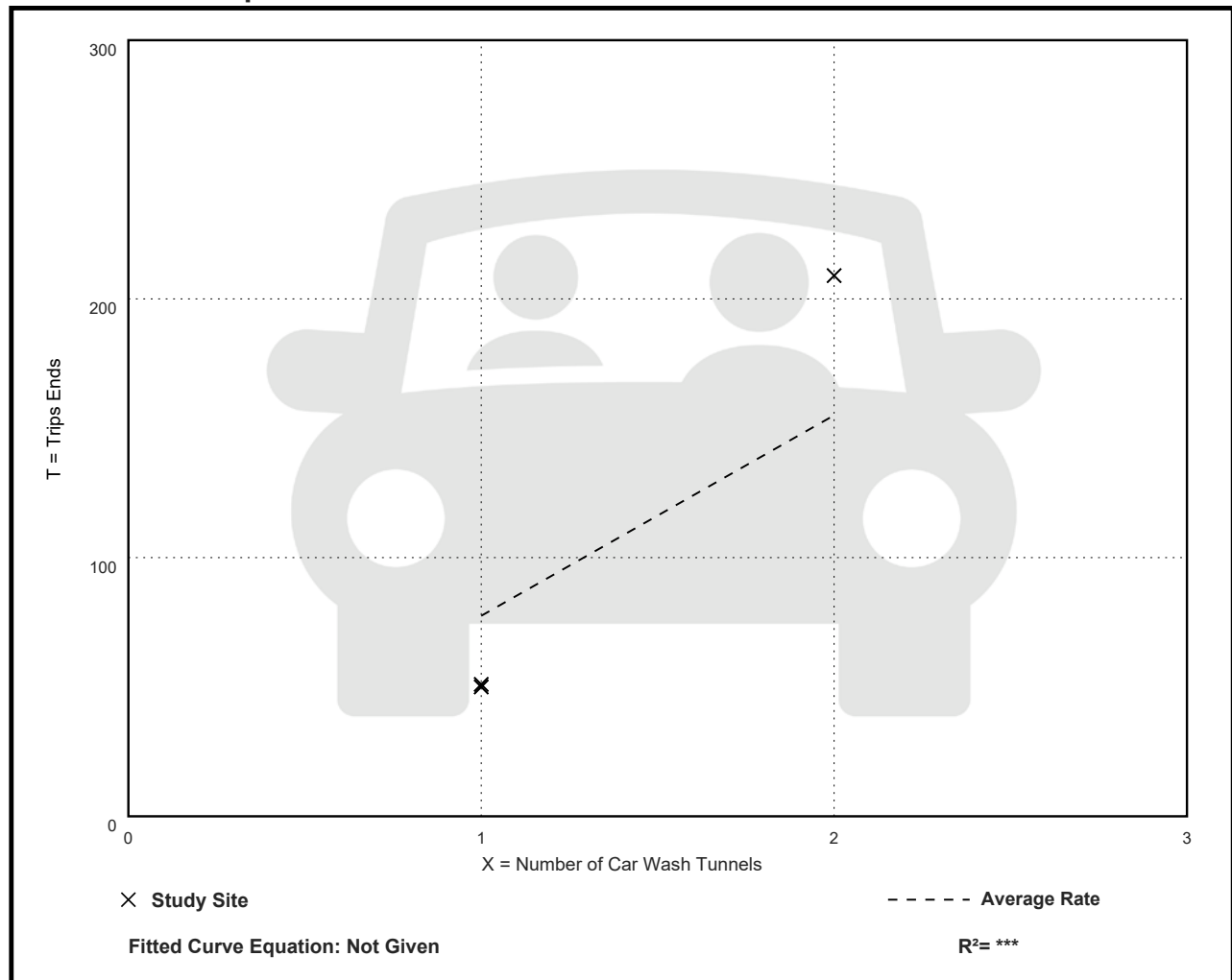
Avg. Num. of Car Wash Tunnels: 1

Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Car Wash Tunnel

Average Rate	Range of Rates	Standard Deviation
77.50	50.00 - 104.50	33.07

Data Plot and Equation



Automated Car Wash (948)

Vehicle Trip Ends vs: Car Wash Tunnels

On a: Saturday, Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 1

Avg. Num. of Car Wash Tunnels: 1

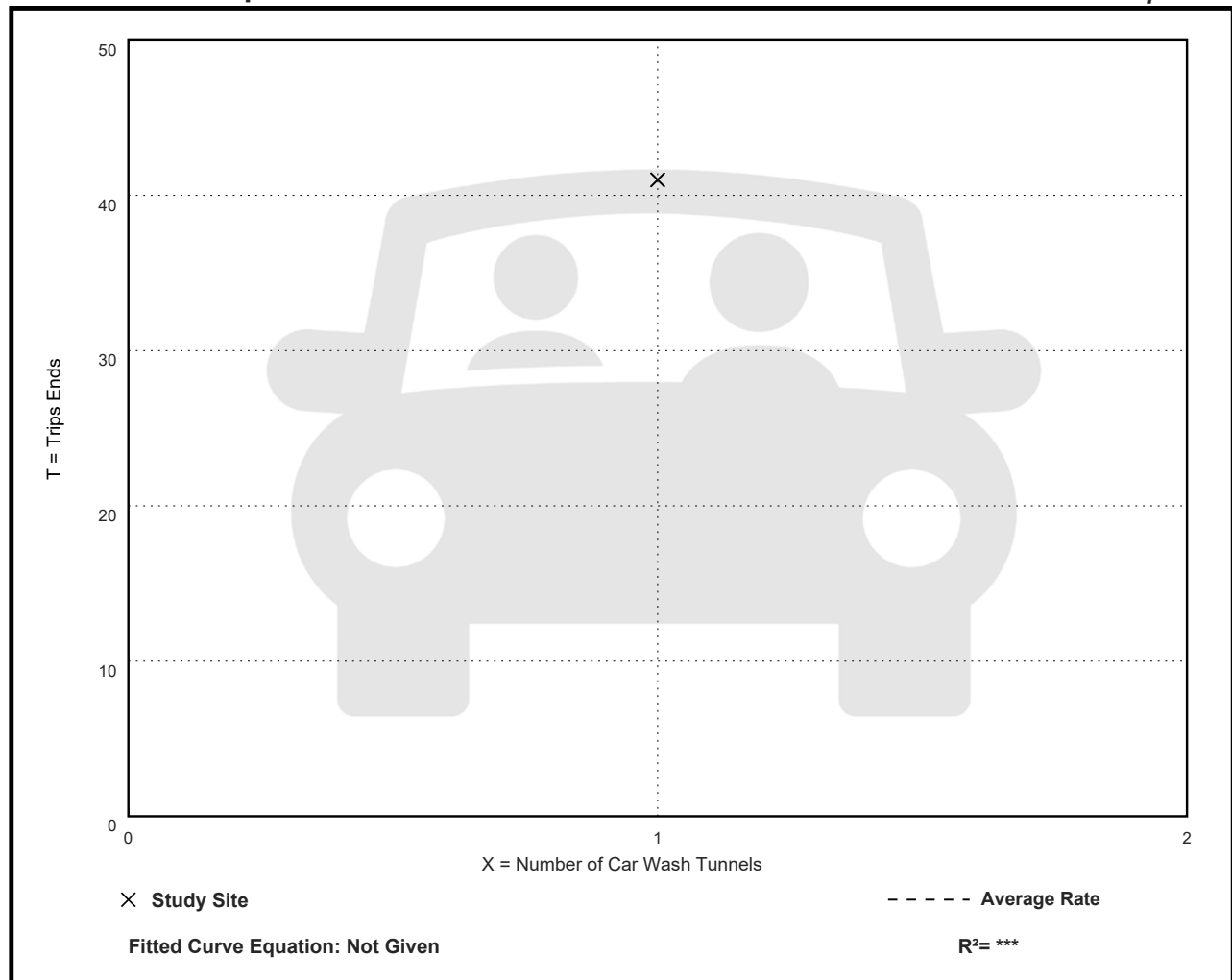
Directional Distribution: 46% entering, 54% exiting

Vehicle Trip Generation per Car Wash Tunnel

Average Rate	Range of Rates	Standard Deviation
41.00	41.00 - 41.00	***

Data Plot and Equation

Caution – Small Sample Size



Automated Car Wash (948)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: **Weekday,**

Peak Hour of Adjacent Street Traffic,

One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 1

Avg. 1000 Sq. Ft. GFA: 2

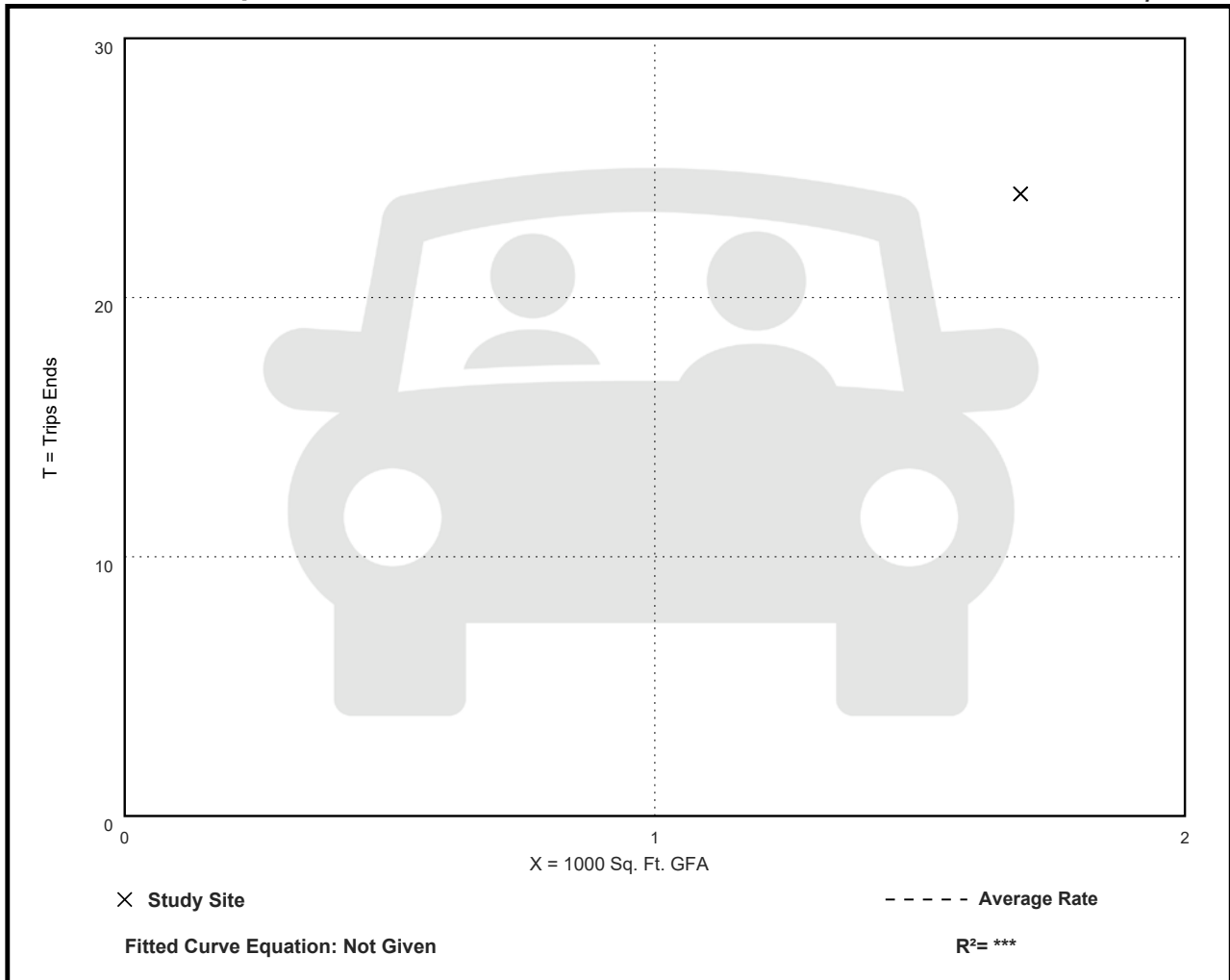
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
14.20	14.20 - 14.20	***

Data Plot and Equation

Caution – Small Sample Size



Automated Car Wash (948)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Weekday,

PM Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 2

Avg. 1000 Sq. Ft. GFA: 5

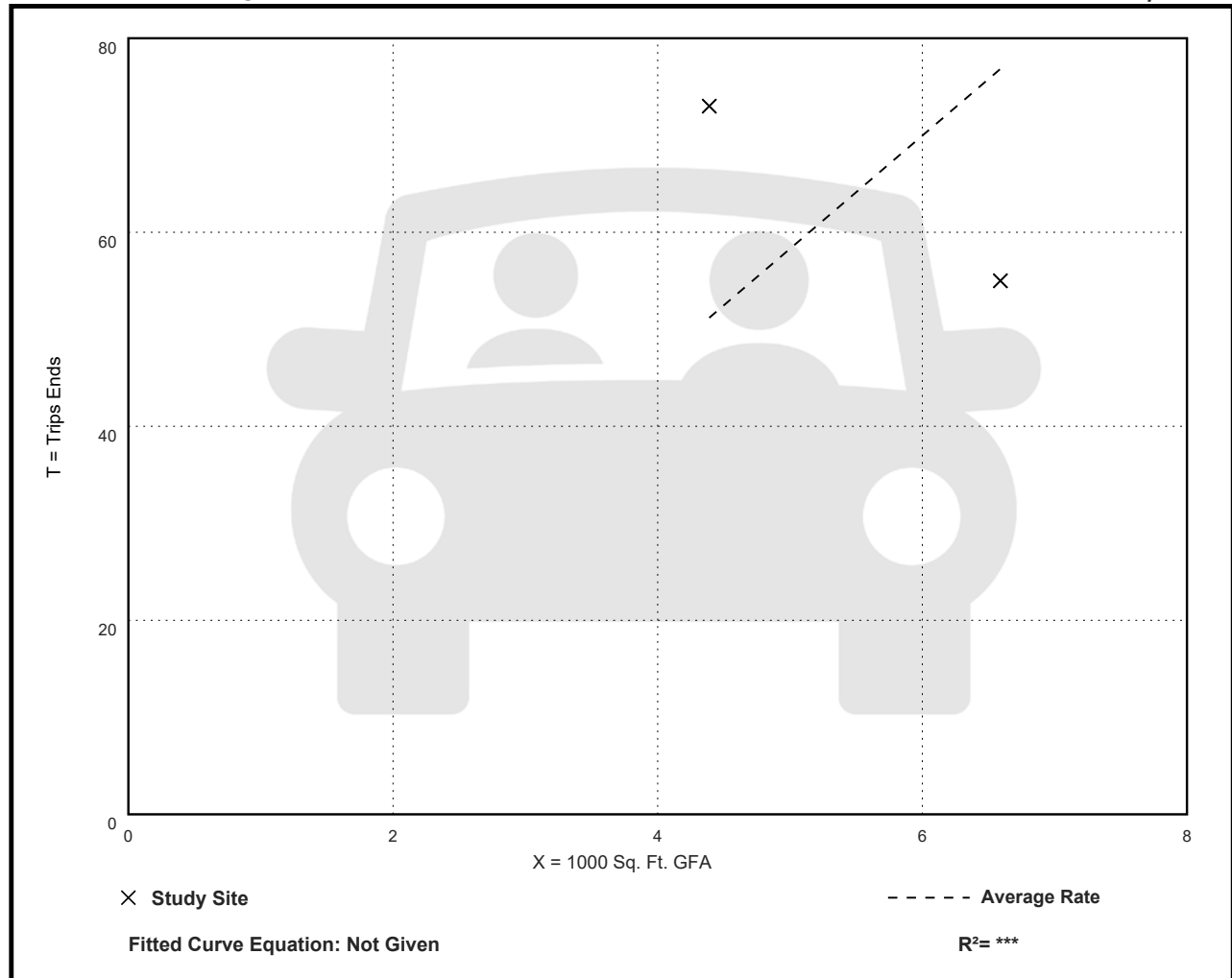
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
11.66	8.35 - 16.63	***

Data Plot and Equation

Caution – Small Sample Size



Automated Car Wash (948)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Saturday, Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 3

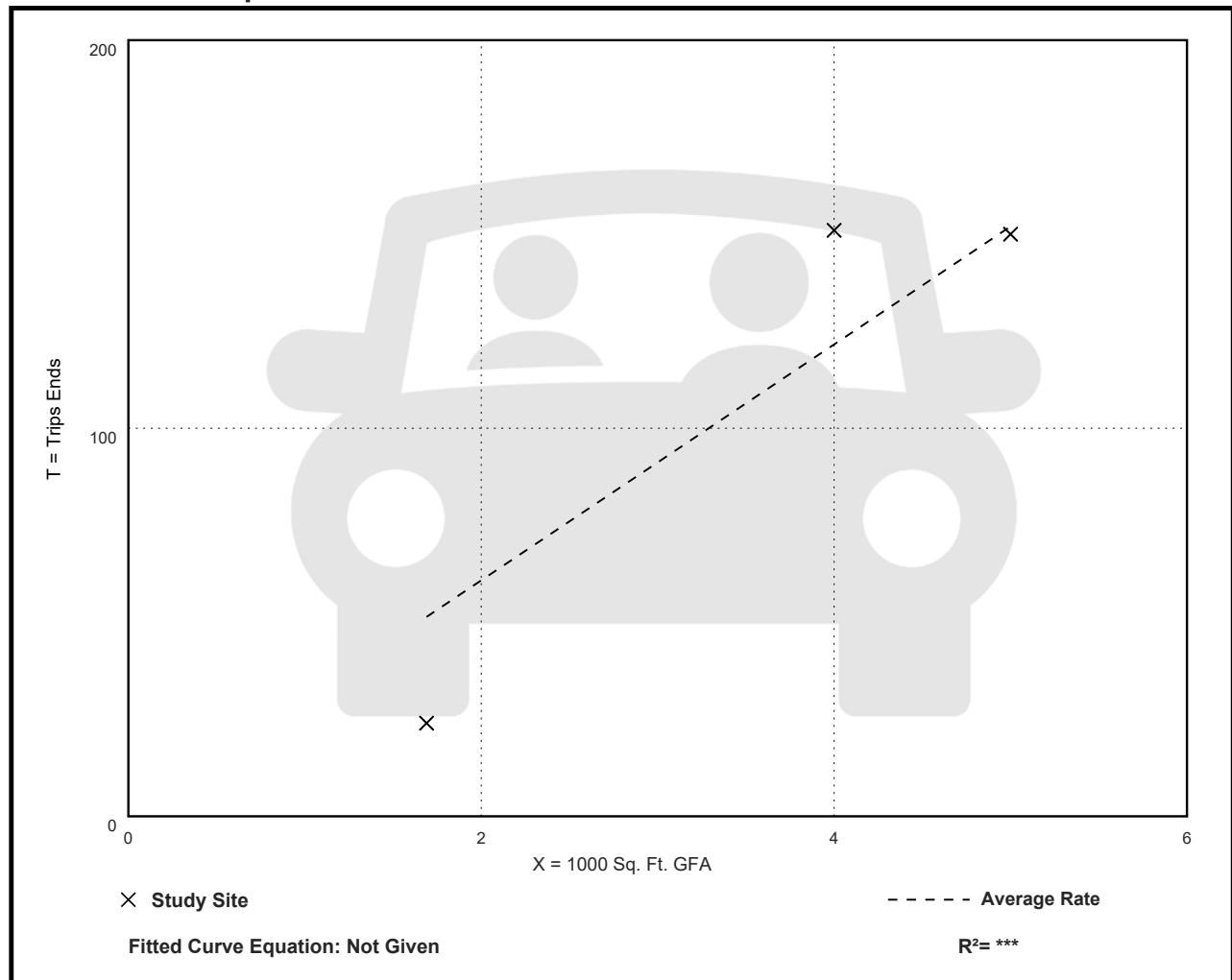
Avg. 1000 Sq. Ft. GFA: 4

Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
30.40	14.20 - 37.75	9.63

Data Plot and Equation



Land Use: 948

Automated Car Wash

Description

An automated car wash is a facility that allows for the mechanical cleaning of the exterior of vehicles. Manual cleaning service may also be available at the facility. Self-service car wash (Land Use 947) and car wash and detail center (Land Use 949) are related uses.

Additional Data

The sites were surveyed in the 1990s and the 2000s in New Jersey, New York, and Washington.

Source Numbers

552, 555, 585, 599, 954

Automated Car Wash (948)

Vehicle Trip Ends vs: Car Wash Tunnels

On a: **Weekday,**

Peak Hour of Adjacent Street Traffic,

One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 3

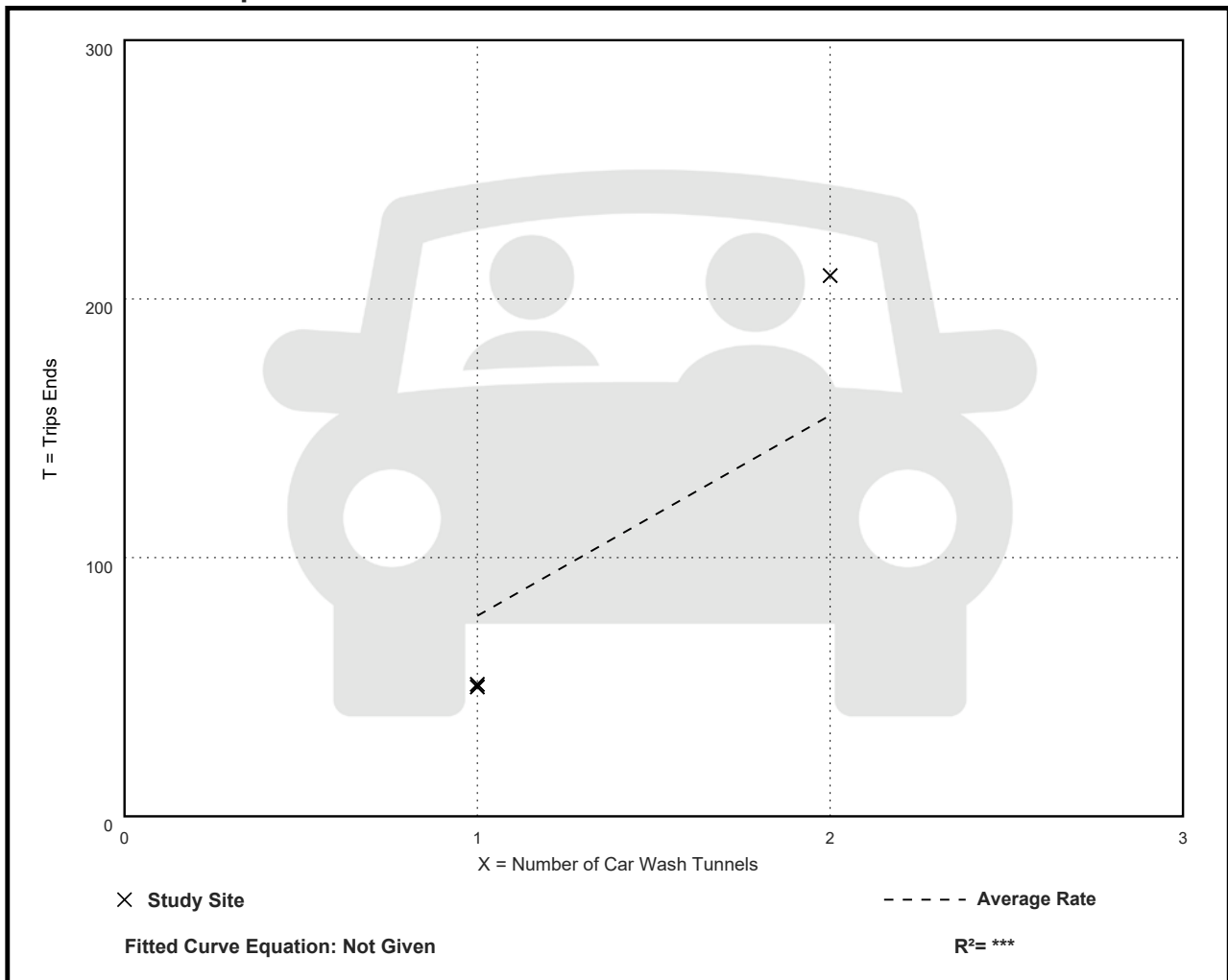
Avg. Num. of Car Wash Tunnels: 1

Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Car Wash Tunnel

Average Rate	Range of Rates	Standard Deviation
77.50	50.00 - 104.50	33.07

Data Plot and Equation



Automated Car Wash (948)

Vehicle Trip Ends vs: Car Wash Tunnels

On a: Saturday, Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 1

Avg. Num. of Car Wash Tunnels: 1

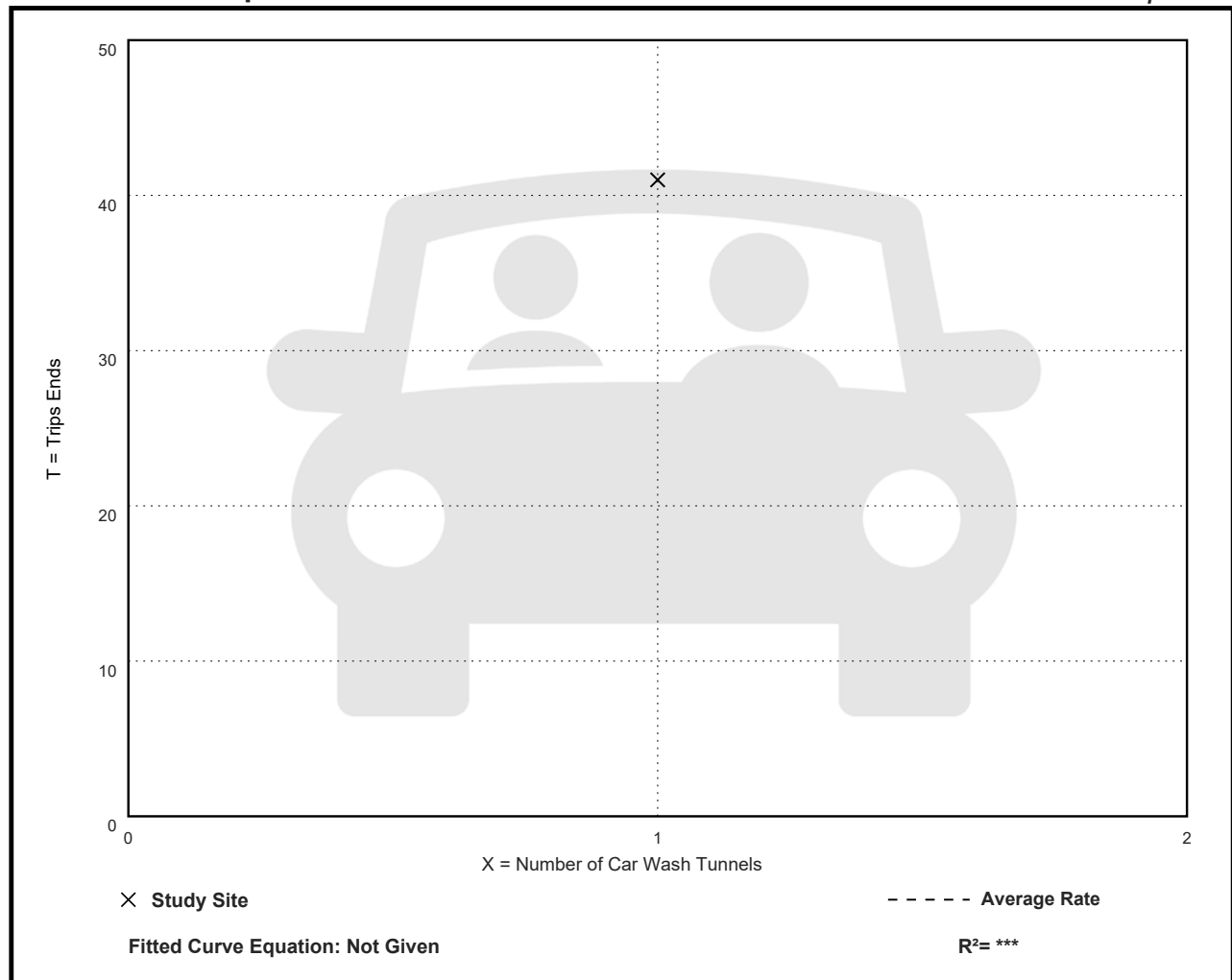
Directional Distribution: 46% entering, 54% exiting

Vehicle Trip Generation per Car Wash Tunnel

Average Rate	Range of Rates	Standard Deviation
41.00	41.00 - 41.00	***

Data Plot and Equation

Caution – Small Sample Size



Automated Car Wash (948)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: **Weekday,**

Peak Hour of Adjacent Street Traffic,

One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 1

Avg. 1000 Sq. Ft. GFA: 2

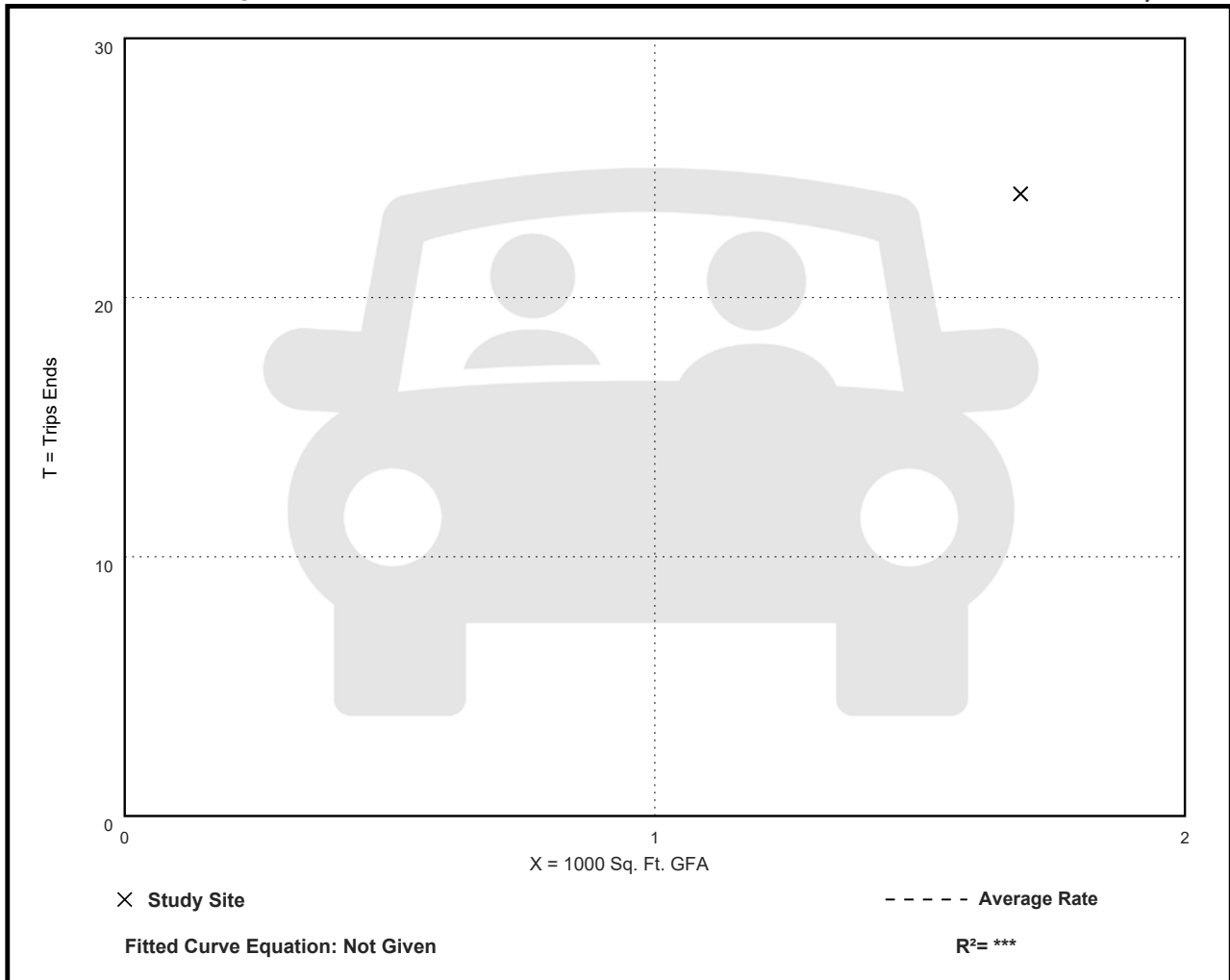
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
14.20	14.20 - 14.20	***

Data Plot and Equation

Caution – Small Sample Size



Automated Car Wash (948)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Weekday,

PM Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 2

Avg. 1000 Sq. Ft. GFA: 5

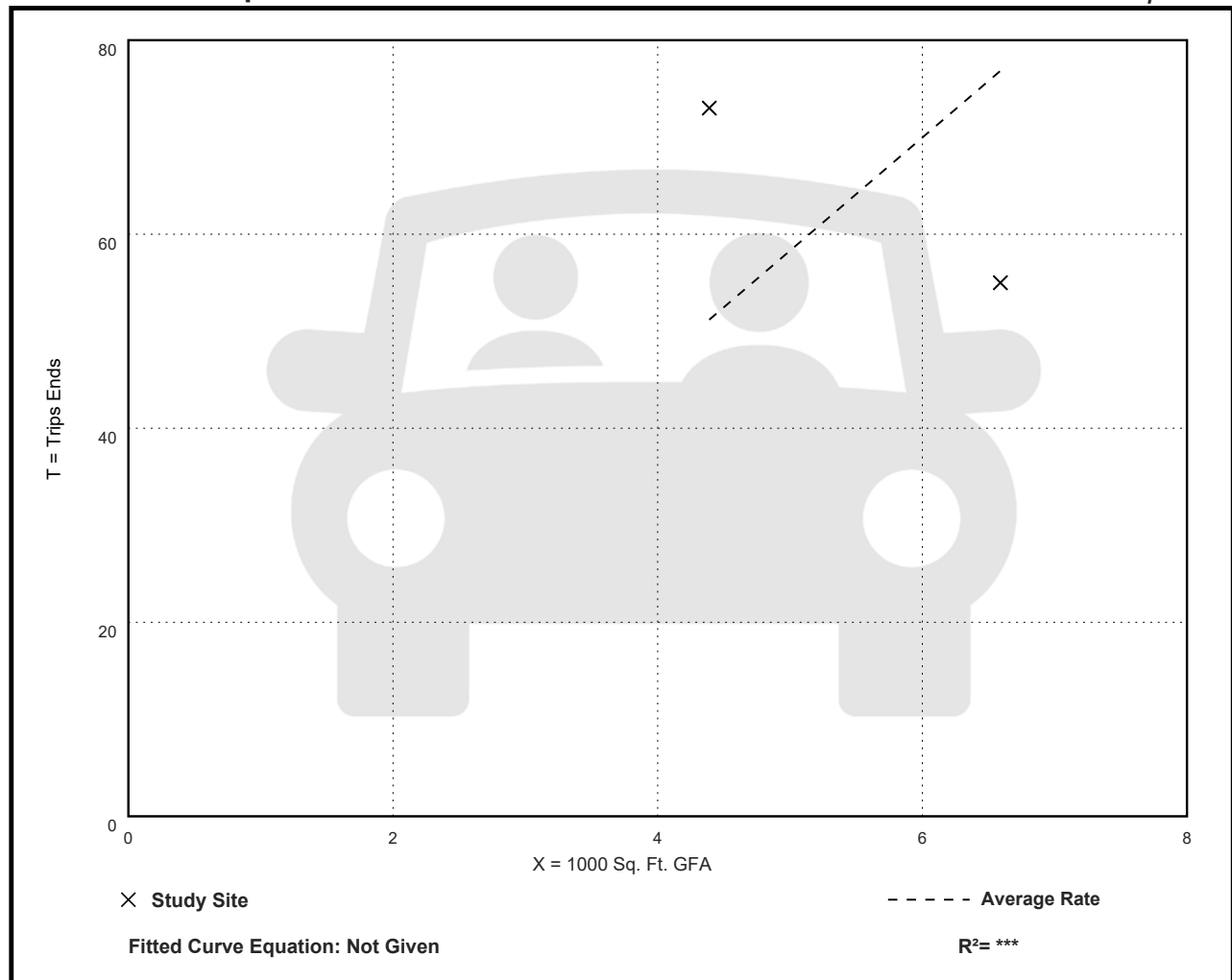
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
11.66	8.35 - 16.63	***

Data Plot and Equation

Caution – Small Sample Size



Automated Car Wash (948)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Saturday, Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 3

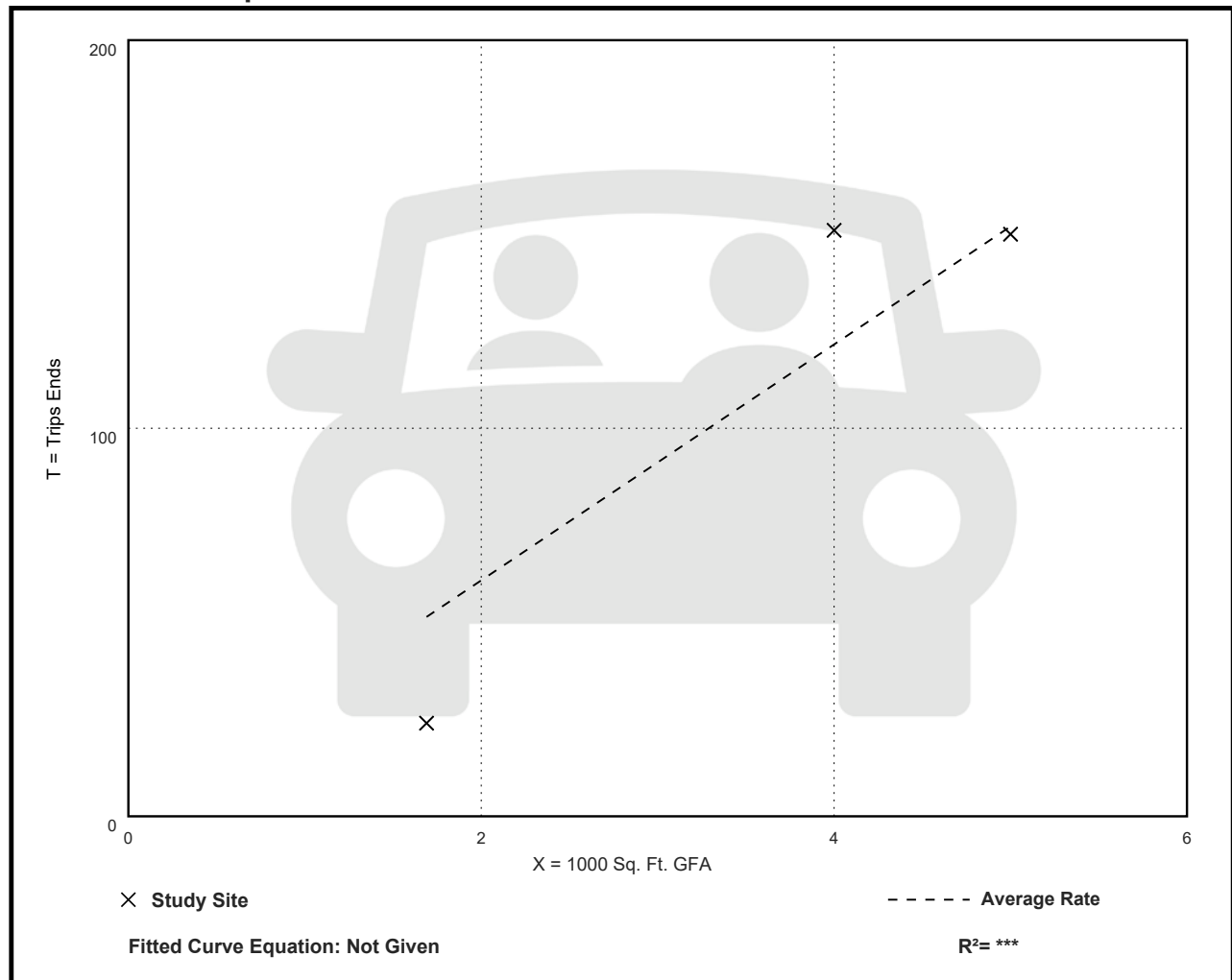
Avg. 1000 Sq. Ft. GFA: 4

Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
30.40	14.20 - 37.75	9.63

Data Plot and Equation



Land Use: 949

Car Wash and Detail Center

Description

A car wash and detail center is a facility that provides for the manual cleaning of the exterior of vehicles as well as interior car-detailing services. Self-service car wash (Land Use 947) and automated car wash (Land Use 948) are related uses.

Additional Data

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (<https://www.ite.org/technical-resources/topics/trip-and-parking-generation/>).

The site was surveyed in the 2010s in Minnesota.

Source Number

866

Car Wash and Detail Center (949)

Vehicle Trip Ends vs: Wash Stalls
On a: Weekday

Setting/Location: General Urban/Suburban

Number of Studies: 1

Avg. Num. of Wash Stalls: 5

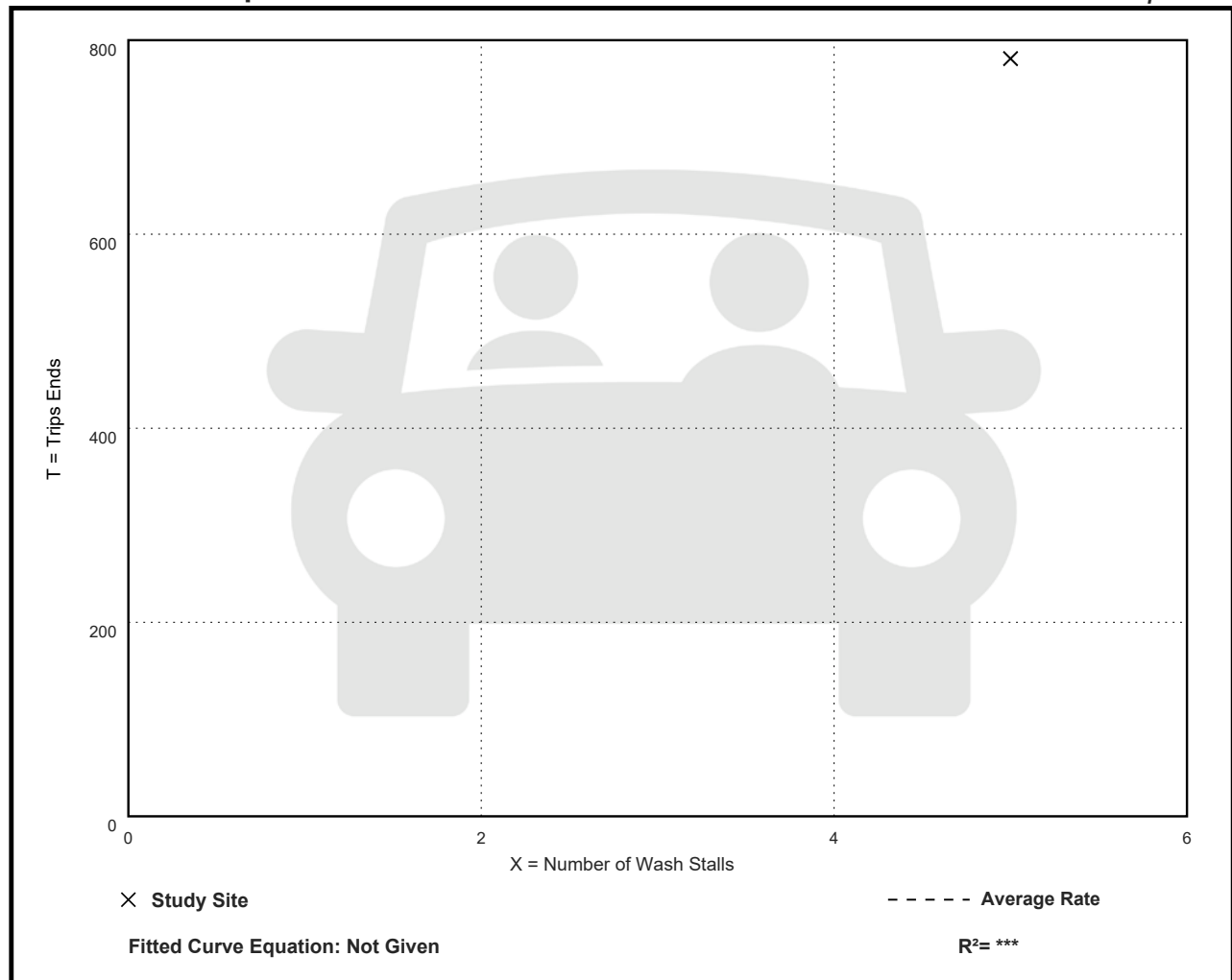
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Wash Stall

Average Rate	Range of Rates	Standard Deviation
156.20	156.20 - 156.20	***

Data Plot and Equation

Caution – Small Sample Size



Car Wash and Detail Center (949)

Vehicle Trip Ends vs: Wash Stalls

On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

Number of Studies: 1

Avg. Num. of Wash Stalls: 5

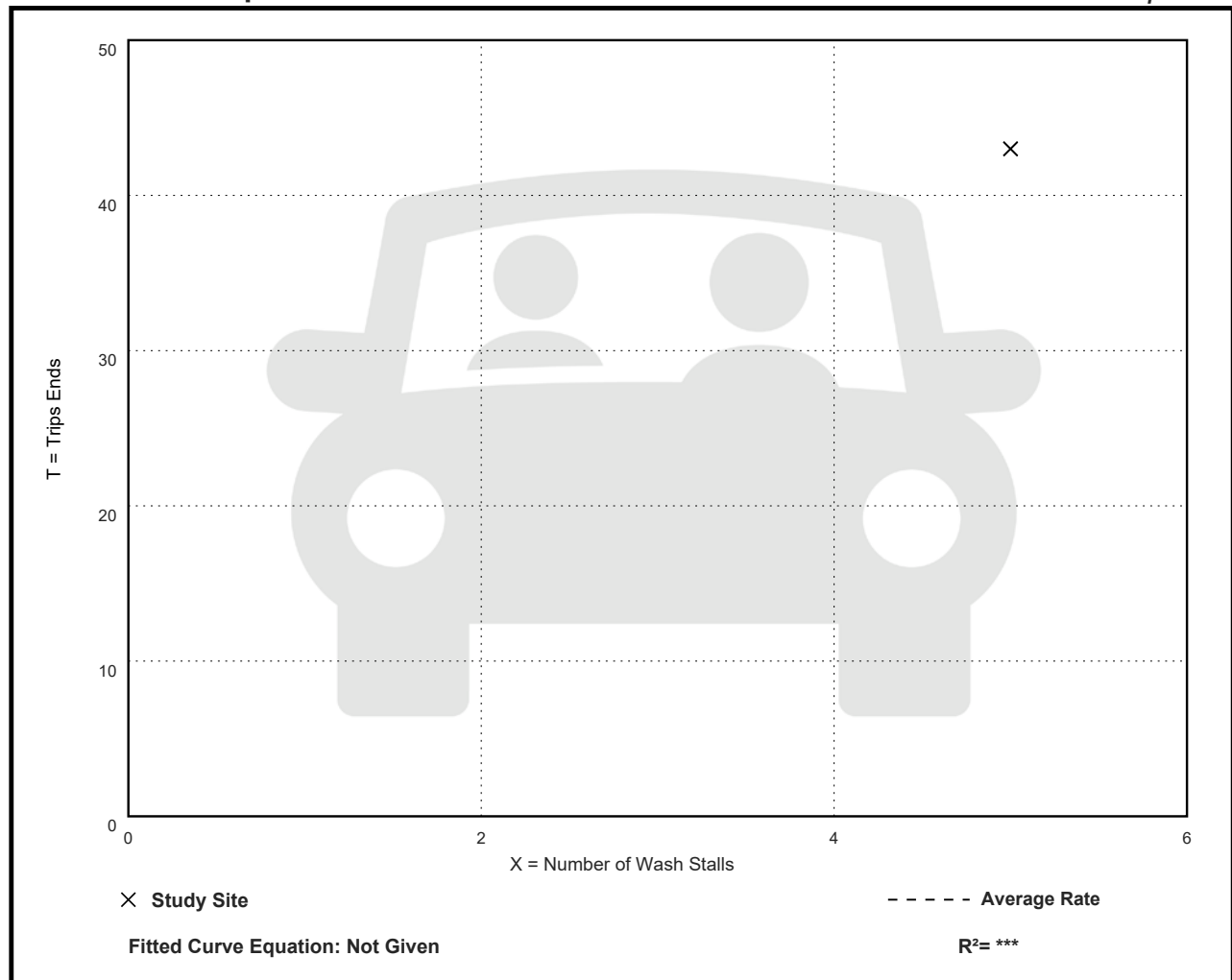
Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Wash Stall

Average Rate	Range of Rates	Standard Deviation
8.60	8.60 - 8.60	***

Data Plot and Equation

Caution – Small Sample Size



Car Wash and Detail Center (949)

Vehicle Trip Ends vs: Wash Stalls

On a: **Weekday,**

Peak Hour of Adjacent Street Traffic,

One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 1

Avg. Num. of Wash Stalls: 5

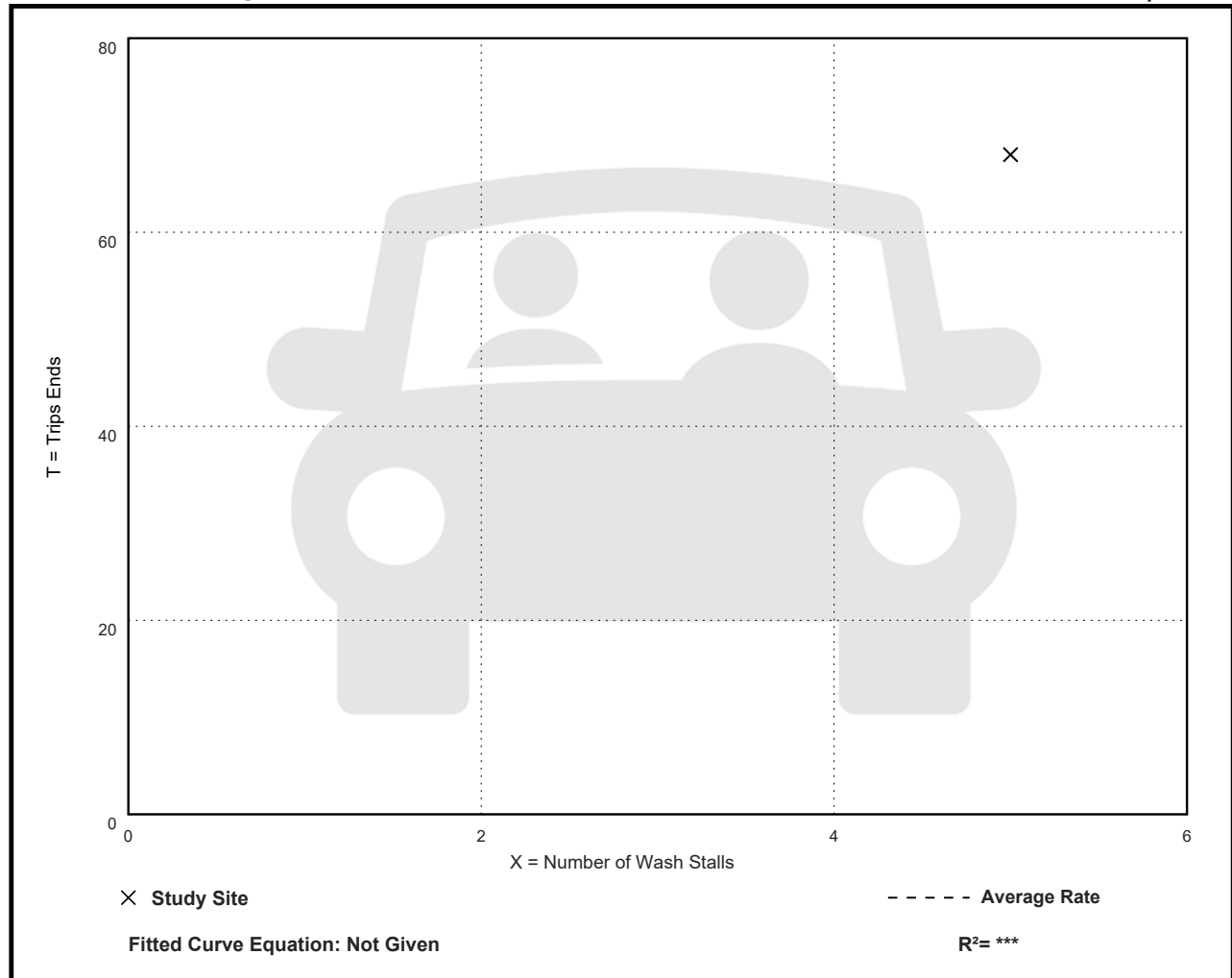
Directional Distribution: 49% entering, 51% exiting

Vehicle Trip Generation per Wash Stall

Average Rate	Range of Rates	Standard Deviation
13.60	13.60 - 13.60	***

Data Plot and Equation

Caution – Small Sample Size



Car Wash and Detail Center (949)

Vehicle Trip Ends vs: Wash Stalls

On a: **Weekday,**
AM Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 1

Avg. Num. of Wash Stalls: 5

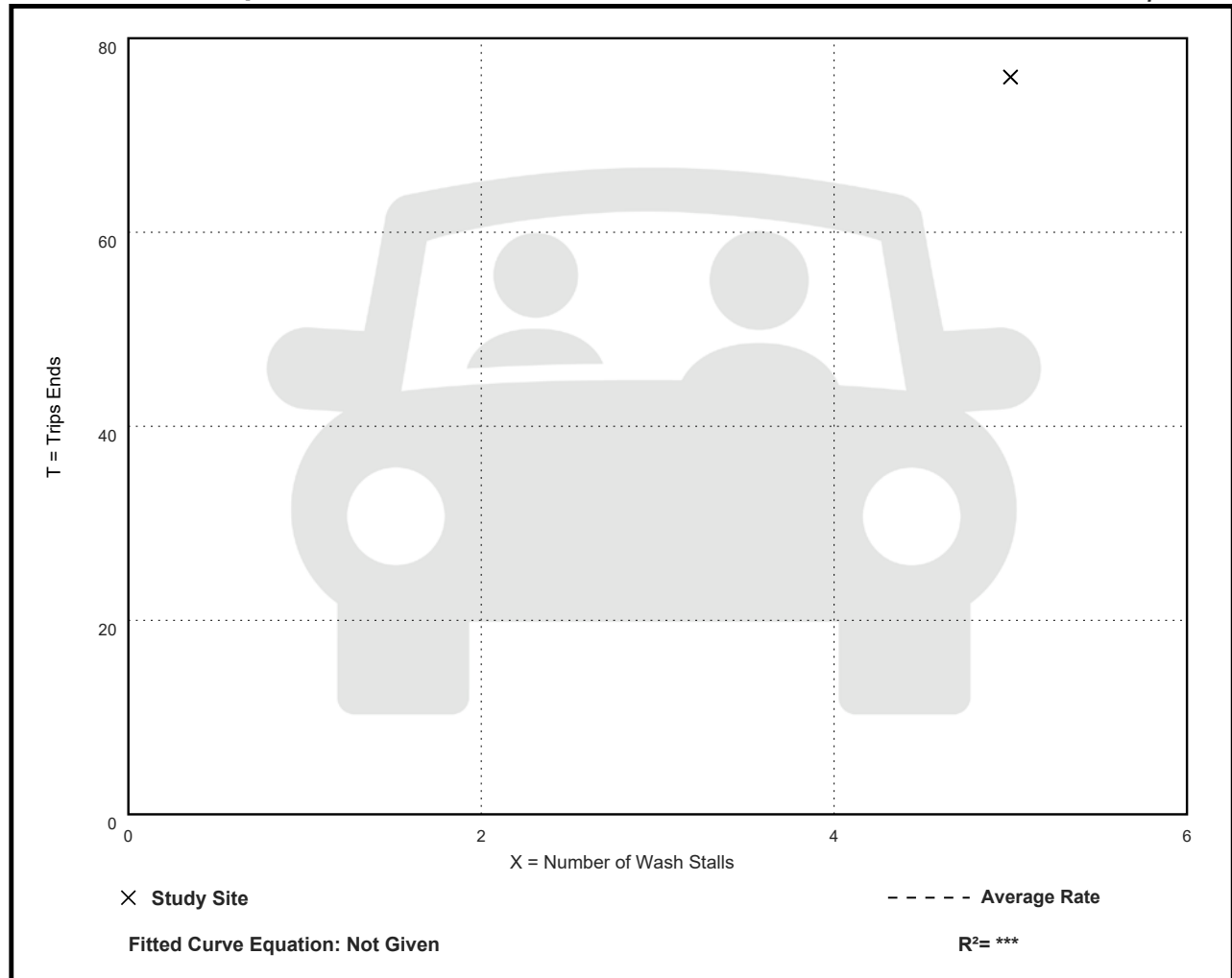
Directional Distribution: 54% entering, 46% exiting

Vehicle Trip Generation per Wash Stall

Average Rate	Range of Rates	Standard Deviation
15.20	15.20 - 15.20	***

Data Plot and Equation

Caution – Small Sample Size



Car Wash and Detail Center (949)

Vehicle Trip Ends vs: Wash Stalls

On a: **Weekday,**

PM Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 1

Avg. Num. of Wash Stalls: 5

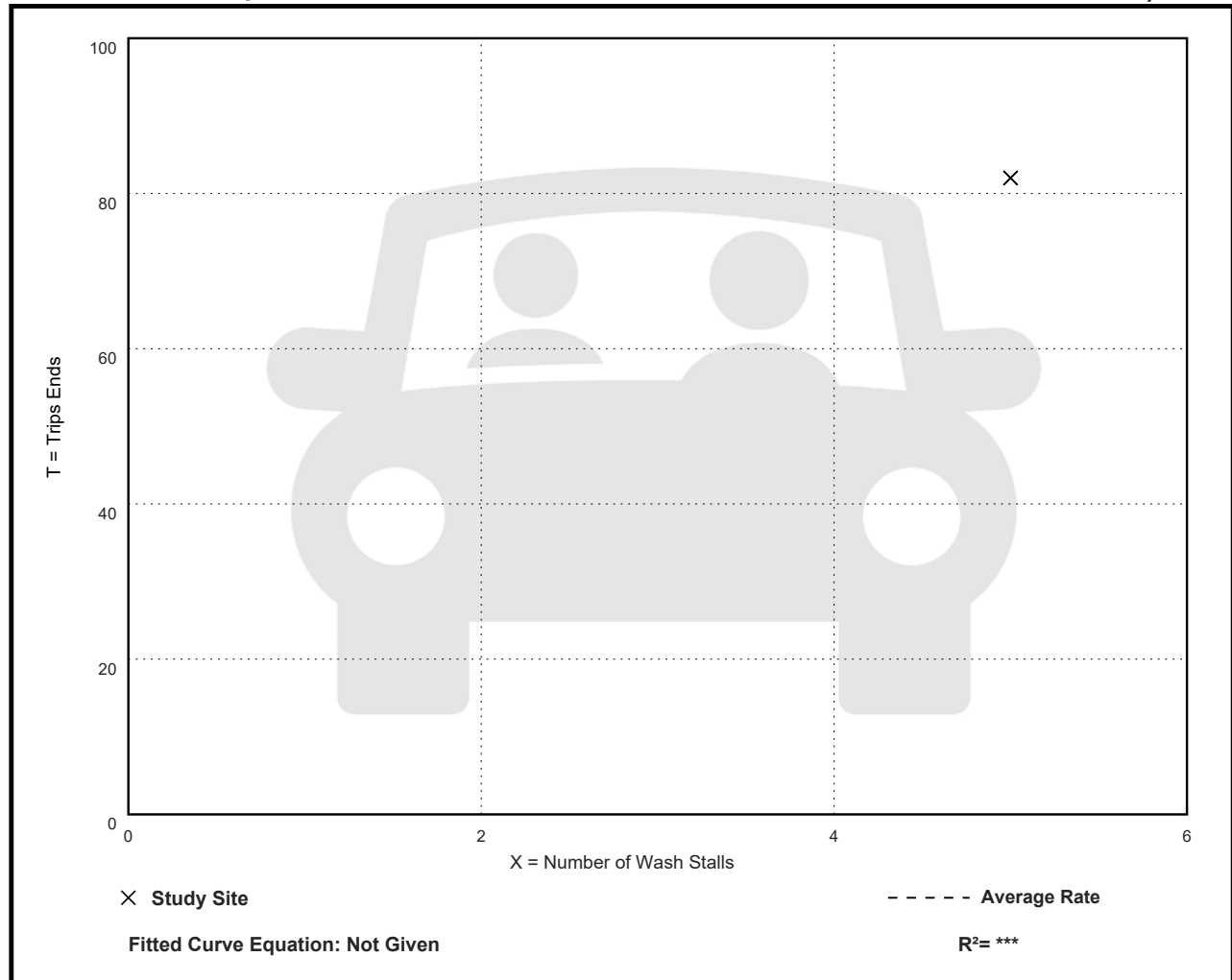
Directional Distribution: 51% entering, 49% exiting

Vehicle Trip Generation per Wash Stall

Average Rate	Range of Rates	Standard Deviation
16.40	16.40 - 16.40	***

Data Plot and Equation

Caution – Small Sample Size



Appendix 4 - (HCM) analysis worksheets

Queues

5: Taylor Road & Sierra College Blvd

08/13/2023



Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Group Flow (vph)	157	362	189	17	616	170	58	195	78	247	192	15
v/c Ratio	0.84	0.38	0.17	0.18	0.88	0.24	0.48	0.58	0.19	0.81	0.42	0.03
Control Delay	73.4	14.8	1.7	42.2	40.7	4.2	49.9	37.3	1.9	58.8	30.5	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.4	14.8	1.7	42.2	40.7	4.2	49.9	37.3	1.9	58.8	30.5	0.1
Queue Length 50th (ft)	78	96	0	8	280	0	29	91	0	63	87	0
Queue Length 95th (ft)	#196	223	28	29	#526	40	68	155	7	#134	153	0
Internal Link Dist (ft)		15			329			957			568	
Turn Bay Length (ft)												
Base Capacity (vph)	189	958	1126	109	699	700	158	555	569	307	555	569
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.38	0.17	0.16	0.88	0.24	0.37	0.35	0.14	0.80	0.35	0.03

Intersection Summary

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

Queues

8: Sierra College Blvd & Brace Road

08/13/2023



























Lane Group	EBT	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	111	98	141	623	141	751
v/c Ratio	0.17	0.25	0.24	0.56	0.41	0.40
Control Delay	0.5	21.8	5.9	18.9	26.5	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.5	21.8	5.9	18.9	26.5	8.2
Queue Length 50th (ft)	0	27	0	95	46	71
Queue Length 95th (ft)	0	77	40	155	102	99
Internal Link Dist (ft)	857	946		318		239
Turn Bay Length (ft)						
Base Capacity (vph)	856	571	786	2395	729	3474
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.17	0.18	0.26	0.19	0.22

Intersection Summary

HCM 6th Signalized Intersection Summary
 5: Taylor Road & Sierra College Blvd

08/13/2023

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	144	333	174	16	567	156	53	179	72	227	177	14
Future Volume (veh/h)	144	333	174	16	567	156	53	179	72	227	177	14
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	157	362	189	17	616	170	58	195	78	247	192	15
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	193	860	881	28	687	582	74	301	255	331	402	341
Arrive On Green	0.11	0.46	0.46	0.02	0.37	0.37	0.04	0.16	0.16	0.10	0.22	0.22
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	1870	1585	3456	1870	1585
Grp Volume(v), veh/h	157	362	189	17	616	170	58	195	78	247	192	15
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1870	1585	1728	1870	1585
Q Serve(g_s), s	6.4	9.7	4.5	0.7	23.2	5.7	2.4	7.3	3.2	5.2	6.7	0.6
Cycle Q Clear(g_c), s	6.4	9.7	4.5	0.7	23.2	5.7	2.4	7.3	3.2	5.2	6.7	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	193	860	881	28	687	582	74	301	255	331	402	341
V/C Ratio(X)	0.81	0.42	0.21	0.60	0.90	0.29	0.79	0.65	0.31	0.75	0.48	0.04
Avail Cap(c_a), veh/h	205	860	881	119	756	641	172	601	509	333	601	509
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(l)	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	32.5	13.5	8.4	36.5	22.3	16.8	35.5	29.4	27.7	32.9	25.6	23.2
Incr Delay (d2), s/veh	18.7	0.4	0.1	7.3	13.0	0.3	6.8	2.8	0.8	7.8	1.1	0.1
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	3.6	3.6	1.3	0.3	11.3	1.9	1.1	3.3	1.2	2.4	2.9	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.2	13.9	8.5	43.8	35.3	17.1	42.2	32.2	28.5	40.7	26.7	23.3
LnGrp LOS	D	B	A	D	D	B	D	C	C	D	C	C
Approach Vol, veh/h		708			803			331			454	
Approach Delay, s/veh		20.7			31.6			33.1			34.2	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.7	39.8	11.7	17.5	12.6	32.9	7.6	21.6				
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5				
Max Green Setting (Gmax), s	5.0	33.8	7.2	24.0	8.6	30.2	7.2	24.0				
Max Q Clear Time (g_c+l1), s	2.7	11.7	7.2	9.3	8.4	25.2	4.4	8.7				
Green Ext Time (p_c), s	0.0	3.3	0.0	1.3	0.0	2.2	0.0	1.0				
Intersection Summary												
HCM 6th Ctrl Delay			29.0									
HCM 6th LOS			C									

HCM 6th Signalized Intersection Summary
 8: Sierra College Blvd & Brace Road

08/13/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↑	↗		↑↑		↘	↑↑	
Traffic Volume (veh/h)	0	0	102	90	0	130	0	492	81	130	691	0
Future Volume (veh/h)	0	0	102	90	0	130	0	492	81	130	691	0
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	1870	0	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	0	111	98	0	141	0	535	88	141	751	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, %	0	2	2	2	2	2	0	2	2	2	2	2
Cap, veh/h	0	0	333	376	0	333	0	1028	168	196	1949	0
Arrive On Green	0.00	0.00	0.21	0.21	0.00	0.21	0.00	0.34	0.34	0.11	0.55	0.00
Sat Flow, veh/h	0	0	1585	919	0	1585	0	3150	501	1781	3647	0
Grp Volume(v), veh/h	0	0	111	98	0	141	0	310	313	141	751	0
Grp Sat Flow(s),veh/h/ln	0	0	1585	919	0	1585	0	1777	1780	1781	1777	0
Q Serve(g_s), s	0.0	0.0	2.3	2.8	0.0	3.0	0.0	5.5	5.6	3.0	4.8	0.0
Cycle Q Clear(g_c), s	0.0	0.0	2.3	5.1	0.0	3.0	0.0	5.5	5.6	3.0	4.8	0.0
Prop In Lane	0.00		1.00	1.00		1.00	0.00		0.28	1.00		0.00
Lane Grp Cap(c), veh/h	0	0	333	376	0	333	0	598	599	196	1949	0
V/C Ratio(X)	0.00	0.00	0.33	0.26	0.00	0.42	0.00	0.52	0.52	0.72	0.39	0.00
Avail Cap(c_a), veh/h	0	0	1008	922	0	1008	0	1740	1744	1042	5922	0
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)	0.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	13.2	15.4	0.0	13.5	0.0	10.5	10.5	16.9	5.1	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.6	0.5	0.0	1.2	0.0	1.0	1.0	6.8	0.2	0.0
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	0.0	0.0	0.8	0.7	0.0	1.0	0.0	1.6	1.6	1.3	0.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	13.8	15.9	0.0	14.7	0.0	11.5	11.5	23.7	5.3	0.0
LnGrp LOS	A	A	B	B	A	B	A	B	B	C	A	A
Approach Vol, veh/h		111			239			623			892	
Approach Delay, s/veh		13.8			15.2			11.5			8.2	
Approach LOS		B			B			B			A	
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	8.3	18.7		12.2		27.1		12.2				
Change Period (Y+Rc), s	4.0	5.5		4.0		5.5		4.0				
Max Green Setting (Gmax), s	23.0	38.5		25.0		65.5		25.0				
Max Q Clear Time (g_c+I1), s	5.0	7.6		4.3		6.8		7.1				
Green Ext Time (p_c), s	0.5	5.7		0.6		8.7		1.3				

Intersection Summary												
HCM 6th Ctrl Delay				10.5								
HCM 6th LOS				B								

HCM 6th TWSC
1: Pacific St/Taylor Road

08/13/2023

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	1	0	311	100	7	457
Future Vol, veh/h	1	0	311	100	7	457
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	-	-	-	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	1	0	338	109	8	497

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	906	393	0	0	447
Stage 1	393	-	-	-	-
Stage 2	513	-	-	-	-
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	307	656	-	-	1113
Stage 1	682	-	-	-	-
Stage 2	601	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	305	656	-	-	1113
Mov Cap-2 Maneuver	305	-	-	-	-
Stage 1	682	-	-	-	-
Stage 2	597	-	-	-	-

Approach	WB	NE	SW
HCM Control Delay, s	16.8	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NERWBLn1	SWL	SWT
Capacity (veh/h)	-	-	305	1113
HCM Lane V/C Ratio	-	-	0.004	0.007
HCM Control Delay (s)	-	-	16.8	8.3
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0	0

Queues

5: Taylor Road & Sierra College Blvd

08/13/2023



Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Group Flow (vph)	160	692	289	23	572	114	128	228	123	298	307	41
v/c Ratio	0.87	0.81	0.27	0.25	0.90	0.18	0.85	0.55	0.27	1.00	0.73	0.09
Control Delay	80.8	31.6	2.2	46.9	45.8	3.3	83.6	34.0	5.4	93.9	41.2	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.8	31.6	2.2	46.9	45.8	3.3	83.6	34.0	5.4	93.9	41.2	0.4
Queue Length 50th (ft)	87	277	0	12	283	0	69	108	0	~89	153	0
Queue Length 95th (ft)	#213	#620	37	38	#510	25	#180	178	33	#180	240	0
Internal Link Dist (ft)		15			329			957			568	
Turn Bay Length (ft)												
Base Capacity (vph)	184	854	1081	107	680	666	154	540	558	298	540	558
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.81	0.27	0.21	0.84	0.17	0.83	0.42	0.22	1.00	0.57	0.07

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues

8: Sierra College Blvd & Brace Road

08/13/2023



























Lane Group	EBT	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	164	105	147	1067	141	795
v/c Ratio	0.29	0.40	0.30	0.74	0.48	0.35
Control Delay	2.8	33.0	7.1	22.4	36.6	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.8	33.0	7.1	22.4	36.6	7.0
Queue Length 50th (ft)	0	43	0	204	61	76
Queue Length 95th (ft)	19	102	46	347	131	130
Internal Link Dist (ft)	857	946		318		239
Turn Bay Length (ft)						
Base Capacity (vph)	687	366	626	1792	543	3039
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.29	0.23	0.60	0.26	0.26

Intersection Summary

HCM 6th Signalized Intersection Summary
 5: Taylor Road & Sierra College Blvd

08/13/2023

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	147	637	266	21	526	105	118	210	113	274	282	38
Future Volume (veh/h)	147	637	266	21	526	105	118	210	113	274	282	38
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	160	692	289	23	572	114	128	228	123	298	307	41
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	196	809	831	36	641	543	160	372	316	319	376	319
Arrive On Green	0.11	0.43	0.43	0.02	0.34	0.34	0.09	0.20	0.20	0.09	0.20	0.20
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	1870	1585	3456	1870	1585
Grp Volume(v), veh/h	160	692	289	23	572	114	128	228	123	298	307	41
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1870	1585	1728	1870	1585
Q Serve(g_s), s	6.9	26.0	8.3	1.0	22.6	4.0	5.5	8.7	5.3	6.7	12.2	1.7
Cycle Q Clear(g_c), s	6.9	26.0	8.3	1.0	22.6	4.0	5.5	8.7	5.3	6.7	12.2	1.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	196	809	831	36	641	543	160	372	316	319	376	319
V/C Ratio(X)	0.82	0.86	0.35	0.64	0.89	0.21	0.80	0.61	0.39	0.94	0.82	0.13
Avail Cap(c_a), veh/h	196	810	832	114	724	613	164	575	487	319	575	487
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	34.0	20.0	10.8	38.0	24.3	18.2	34.8	28.5	27.1	35.2	29.8	25.6
Incr Delay (d2), s/veh	21.5	9.1	0.3	6.9	12.8	0.2	21.3	2.0	0.9	33.4	6.1	0.2
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	4.0	11.9	2.5	0.5	11.1	1.4	3.2	3.8	2.0	4.1	5.8	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.5	29.1	11.1	44.9	37.1	18.4	56.1	30.5	28.1	68.6	35.9	25.8
LnGrp LOS	E	C	B	D	D	B	E	C	C	E	D	C
Approach Vol, veh/h		1141			709			479			646	
Approach Delay, s/veh		28.2			34.3			36.7			50.4	
Approach LOS		C			C			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.1	39.3	11.7	21.0	13.1	32.2	11.5	21.2				
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5				
Max Green Setting (Gmax), s	5.0	33.8	7.2	24.0	8.6	30.2	7.2	24.0				
Max Q Clear Time (g_c+I1), s	3.0	28.0	8.7	10.7	8.9	24.6	7.5	14.2				
Green Ext Time (p_c), s	0.0	3.1	0.0	1.6	0.0	2.1	0.0	1.5				
Intersection Summary												
HCM 6th Ctrl Delay			35.8									
HCM 6th LOS			D									

HCM 6th Signalized Intersection Summary
 8: Sierra College Blvd & Brace Road

08/13/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↑	↗		↑↑		↘	↑↑	
Traffic Volume (veh/h)	0	0	151	97	0	135	0	850	132	130	730	2
Future Volume (veh/h)	0	0	151	97	0	135	0	850	132	130	730	2
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	1870	0	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	0	164	105	0	147	0	924	143	141	793	2
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, %	0	2	2	2	2	2	0	2	2	2	2	2
Cap, veh/h	0	0	357	288	0	357	0	1355	210	191	2233	6
Arrive On Green	0.00	0.00	0.23	0.23	0.00	0.23	0.00	0.44	0.44	0.11	0.61	0.61
Sat Flow, veh/h	0	0	1585	737	0	1585	0	3178	477	1781	3636	9
Grp Volume(v), veh/h	0	0	164	105	0	147	0	532	535	141	387	408
Grp Sat Flow(s),veh/h/ln	0	0	1585	737	0	1585	0	1777	1784	1781	1777	1869
Q Serve(g_s), s	0.0	0.0	5.3	4.8	0.0	4.7	0.0	14.2	14.2	4.5	6.4	6.4
Cycle Q Clear(g_c), s	0.0	0.0	5.3	10.1	0.0	4.7	0.0	14.2	14.2	4.5	6.4	6.4
Prop In Lane	0.00		1.00	1.00		1.00	0.00		0.27	1.00		0.00
Lane Grp Cap(c), veh/h	0	0	357	288	0	357	0	781	784	191	1091	1148
V/C Ratio(X)	0.00	0.00	0.46	0.37	0.00	0.41	0.00	0.68	0.68	0.74	0.36	0.36
Avail Cap(c_a), veh/h	0	0	670	529	0	670	0	1157	1162	693	1969	2071
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(l)	0.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	19.8	24.2	0.0	19.6	0.0	13.3	13.3	25.6	5.6	5.6
Incr Delay (d2), s/veh	0.0	0.0	0.9	1.1	0.0	1.1	0.0	1.5	1.5	7.7	0.3	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	0.0	0.0	1.9	1.4	0.0	1.7	0.0	4.8	4.8	2.1	1.6	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	20.7	25.3	0.0	20.6	0.0	14.8	14.8	33.3	5.9	5.9
LnGrp LOS	A	A	C	C	A	C	A	B	B	C	A	A
Approach Vol, veh/h		164			252			1067				936
Approach Delay, s/veh		20.7			22.6			14.8				10.0
Approach LOS		C			C			B				B
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	10.3	31.5		17.3		41.8		17.3				
Change Period (Y+Rc), s	4.0	5.5		4.0		5.5		4.0				
Max Green Setting (Gmax), s	23.0	38.5		25.0		65.5		25.0				
Max Q Clear Time (g_c+I1), s	6.5	16.2		7.3		8.4		12.1				
Green Ext Time (p_c), s	0.5	9.8		0.9		8.3		1.2				

Intersection Summary		
HCM 6th Ctrl Delay		14.1
HCM 6th LOS		B

HCM 6th TWSC
1: Pacific St/Taylor Road

08/13/2023

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	0	2	440	147	1	543
Future Vol, veh/h	0	2	440	147	1	543
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	-	-	-	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	0	2	478	160	1	590

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1150	558	0	0	638
Stage 1	558	-	-	-	-
Stage 2	592	-	-	-	-
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	219	529	-	-	946
Stage 1	573	-	-	-	-
Stage 2	553	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	219	529	-	-	946
Mov Cap-2 Maneuver	219	-	-	-	-
Stage 1	573	-	-	-	-
Stage 2	552	-	-	-	-

Approach	WB	NE	SW
HCM Control Delay, s	11.8	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NET	NERWBLn1	SWL	SWT
Capacity (veh/h)	-	-	529	946
HCM Lane V/C Ratio	-	-	0.004	0.001
HCM Control Delay (s)	-	-	11.8	8.8
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0	0

Queues

5: Taylor Road & Sierra College Blvd

08/13/2023



Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Group Flow (vph)	157	364	190	17	618	170	58	196	78	249	192	15
v/c Ratio	0.84	0.38	0.17	0.18	0.89	0.24	0.48	0.58	0.19	0.82	0.42	0.03
Control Delay	73.6	14.8	1.7	42.2	41.2	4.2	50.0	37.4	1.9	59.2	30.5	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.6	14.8	1.7	42.2	41.2	4.2	50.0	37.4	1.9	59.2	30.5	0.1
Queue Length 50th (ft)	78	97	0	8	281	0	29	91	0	63	87	0
Queue Length 95th (ft)	#196	224	28	29	#529	40	68	156	7	#135	153	0
Internal Link Dist (ft)		15			329			957			568	
Turn Bay Length (ft)												
Base Capacity (vph)	189	958	1126	109	698	700	158	555	569	306	555	569
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.38	0.17	0.16	0.89	0.24	0.37	0.35	0.14	0.81	0.35	0.03

Intersection Summary

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

Queues

8: Sierra College Blvd & Brace Road

08/13/2023



























Lane Group	EBT	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	117	102	141	627	141	751
v/c Ratio	0.21	0.25	0.24	0.58	0.41	0.40
Control Delay	6.8	22.1	6.0	19.4	27.2	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.8	22.1	6.0	19.4	27.2	8.2
Queue Length 50th (ft)	2	29	0	97	46	71
Queue Length 95th (ft)	40	81	41	162	105	102
Internal Link Dist (ft)	857	946		318		239
Turn Bay Length (ft)						
Base Capacity (vph)	776	591	778	2247	719	3452
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.17	0.18	0.28	0.20	0.22

Intersection Summary

HCM 6th Signalized Intersection Summary

5: Taylor Road & Sierra College Blvd

08/13/2023

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	144	335	175	16	569	156	53	180	72	229	177	14
Future Volume (veh/h)	144	335	175	16	569	156	53	180	72	229	177	14
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	157	364	190	17	618	170	58	196	78	249	192	15
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	193	861	882	28	688	583	74	300	254	332	402	341
Arrive On Green	0.11	0.46	0.46	0.02	0.37	0.37	0.04	0.16	0.16	0.10	0.22	0.22
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	1870	1585	3456	1870	1585
Grp Volume(v), veh/h	157	364	190	17	618	170	58	196	78	249	192	15
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1870	1585	1728	1870	1585
Q Serve(g_s), s	6.4	9.8	4.5	0.7	23.4	5.7	2.4	7.4	3.3	5.3	6.7	0.6
Cycle Q Clear(g_c), s	6.4	9.8	4.5	0.7	23.4	5.7	2.4	7.4	3.3	5.3	6.7	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	193	861	882	28	688	583	74	300	254	332	402	341
V/C Ratio(X)	0.81	0.42	0.22	0.60	0.90	0.29	0.79	0.65	0.31	0.75	0.48	0.04
Avail Cap(c_a), veh/h	205	861	882	119	755	640	171	600	508	332	600	508
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	32.6	13.5	8.4	36.6	22.3	16.8	35.5	29.5	27.7	32.9	25.7	23.3
Incr Delay (d2), s/veh	18.8	0.4	0.1	7.3	13.2	0.3	6.8	2.9	0.8	8.1	1.1	0.1
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	3.6	3.6	1.3	0.3	11.4	1.9	1.1	3.3	1.2	2.4	2.9	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.4	13.9	8.5	43.9	35.5	17.1	42.3	32.4	28.6	41.1	26.7	23.3
LnGrp LOS	D	B	A	D	D	B	D	C	C	D	C	C
Approach Vol, veh/h		711			805			332			456	
Approach Delay, s/veh		20.8			31.8			33.2			34.4	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.7	40.0	11.7	17.5	12.6	33.0	7.6	21.6				
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5				
Max Green Setting (Gmax), s	5.0	33.8	7.2	24.0	8.6	30.2	7.2	24.0				
Max Q Clear Time (g_c+I1), s	2.7	11.8	7.3	9.4	8.4	25.4	4.4	8.7				
Green Ext Time (p_c), s	0.0	3.3	0.0	1.3	0.0	2.2	0.0	1.0				
Intersection Summary												
HCM 6th Ctrl Delay			29.1									
HCM 6th LOS			C									

HCM 6th Signalized Intersection Summary
 8: Sierra College Blvd & Brace Road

08/13/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↑	↗		↑↑		↘	↑↑	
Traffic Volume (veh/h)	3	3	102	90	4	130	4	492	81	130	691	0
Future Volume (veh/h)	3	3	102	90	4	130	4	492	81	130	691	0
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	3	3	111	98	4	141	4	535	88	141	751	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	103	11	256	430	14	269	101	1054	172	197	2034	0
Arrive On Green	0.17	0.17	0.17	0.17	0.17	0.17	0.35	0.35	0.35	0.11	0.57	0.00
Sat Flow, veh/h	17	65	1509	1403	82	1585	5	2984	487	1781	3647	0
Grp Volume(v), veh/h	117	0	0	102	0	141	335	0	292	141	751	0
Grp Sat Flow(s),veh/h/ln	1590	0	0	1485	0	1585	1862	0	1614	1781	1777	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	5.3	2.8	4.2	0.0
Cycle Q Clear(g_c), s	2.4	0.0	0.0	1.8	0.0	3.0	5.2	0.0	5.3	2.8	4.2	0.0
Prop In Lane	0.03		0.95	0.96		1.00	0.01		0.30	1.00		0.00
Lane Grp Cap(c), veh/h	370	0	0	444	0	269	757	0	570	197	2034	0
V/C Ratio(X)	0.32	0.00	0.00	0.23	0.00	0.52	0.44	0.00	0.51	0.72	0.37	0.00
Avail Cap(c_a), veh/h	1174	0	0	1103	0	1076	2026	0	1687	1112	6319	0
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(l)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	13.7	0.0	0.0	13.5	0.0	13.9	9.4	0.0	9.4	15.8	4.3	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.4	0.0	2.2	0.6	0.0	1.0	6.7	0.2	0.0
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	0.8	0.0	0.0	0.6	0.0	1.0	1.5	0.0	1.3	1.2	0.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.2	0.0	0.0	13.8	0.0	16.2	10.0	0.0	10.4	22.6	4.4	0.0
LnGrp LOS	B	A	A	B	A	B	A	A	B	C	A	A
Approach Vol, veh/h		117			243			627			892	
Approach Delay, s/veh		14.2			15.2			10.2			7.3	
Approach LOS		B			B			B			A	
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	8.1	18.5		10.3		26.6		10.3				
Change Period (Y+Rc), s	4.0	5.5		4.0		5.5		4.0				
Max Green Setting (Gmax), s	23.0	38.5		25.0		65.5		25.0				
Max Q Clear Time (g_c+I1), s	4.8	7.3		4.4		6.2		5.0				
Green Ext Time (p_c), s	0.5	5.8		0.6		8.7		1.4				
Intersection Summary												
HCM 6th Ctrl Delay				9.7								
HCM 6th LOS				A								

HCM 6th TWSC
1: Pacific St/Taylor Road

08/13/2023

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations	↔		↔		↔	↔
Traffic Vol, veh/h	3	1	311	102	7	457
Future Vol, veh/h	3	1	311	102	7	457
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	-	-	-	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	3	1	338	111	8	497

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	907	394	0	0	449
Stage 1	394	-	-	-	-
Stage 2	513	-	-	-	-
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	306	655	-	-	1111
Stage 1	681	-	-	-	-
Stage 2	601	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	304	655	-	-	1111
Mov Cap-2 Maneuver	304	-	-	-	-
Stage 1	681	-	-	-	-
Stage 2	597	-	-	-	-

Approach	WB	NE	SW
HCM Control Delay, s	15.4	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NERWBLn1	SWL	SWT
Capacity (veh/h)	-	-	351	1111
HCM Lane V/C Ratio	-	-	0.012	0.007
HCM Control Delay (s)	-	-	15.4	8.3
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0	0

Queues

5: Taylor Road & Sierra College Blvd

08/13/2023



Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Group Flow (vph)	160	695	291	23	575	114	128	229	123	301	307	41
v/c Ratio	0.87	0.81	0.27	0.25	0.90	0.18	0.85	0.55	0.27	1.01	0.73	0.09
Control Delay	81.2	31.8	2.2	46.9	46.0	3.3	83.4	34.1	5.4	96.5	41.3	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.2	31.8	2.2	46.9	46.0	3.3	83.4	34.1	5.4	96.5	41.3	0.4
Queue Length 50th (ft)	87	279	0	12	285	0	69	109	0	~91	153	0
Queue Length 95th (ft)	#213	#624	37	38	#513	25	#180	178	33	#182	240	0
Internal Link Dist (ft)		15			329			957				568
Turn Bay Length (ft)												
Base Capacity (vph)	183	856	1082	106	679	665	153	539	557	298	539	557
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.81	0.27	0.22	0.85	0.17	0.84	0.42	0.22	1.01	0.57	0.07

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues

8: Sierra College Blvd & Brace Road

08/13/2023



























Lane Group	EBT	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	172	109	147	1072	141	795
v/c Ratio	0.34	0.44	0.30	0.77	0.49	0.35
Control Delay	7.5	34.5	6.9	23.9	37.7	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.5	34.5	6.9	23.9	37.7	7.2
Queue Length 50th (ft)	3	47	0	211	63	76
Queue Length 95th (ft)	53	107	46	372	133	138
Internal Link Dist (ft)	857	946		318		239
Turn Bay Length (ft)						
Base Capacity (vph)	636	335	615	1667	530	2985
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.33	0.24	0.64	0.27	0.27

Intersection Summary

HCM 6th Signalized Intersection Summary
 5: Taylor Road & Sierra College Blvd

08/13/2023

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	147	639	268	21	529	105	118	211	113	277	282	38
Future Volume (veh/h)	147	639	268	21	529	105	118	211	113	277	282	38
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	160	695	291	23	575	114	128	229	123	301	307	41
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	196	810	832	36	643	545	160	373	316	318	376	319
Arrive On Green	0.11	0.43	0.43	0.02	0.34	0.34	0.09	0.20	0.20	0.09	0.20	0.20
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	1870	1585	3456	1870	1585
Grp Volume(v), veh/h	160	695	291	23	575	114	128	229	123	301	307	41
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1870	1585	1728	1870	1585
Q Serve(g_s), s	6.9	26.2	8.4	1.0	22.8	4.0	5.5	8.7	5.3	6.8	12.3	1.7
Cycle Q Clear(g_c), s	6.9	26.2	8.4	1.0	22.8	4.0	5.5	8.7	5.3	6.8	12.3	1.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	196	810	832	36	643	545	160	373	316	318	376	319
V/C Ratio(X)	0.82	0.86	0.35	0.64	0.89	0.21	0.80	0.61	0.39	0.95	0.82	0.13
Avail Cap(c_a), veh/h	196	810	832	114	721	611	164	573	486	318	573	486
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(l)	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	34.1	20.0	10.8	38.1	24.4	18.2	34.9	28.6	27.2	35.4	29.9	25.6
Incr Delay (d2), s/veh	21.7	9.2	0.3	6.9	13.1	0.2	21.4	2.0	0.9	36.3	6.2	0.2
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	4.0	12.0	2.6	0.5	11.2	1.4	3.2	3.9	2.0	4.3	5.8	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.8	29.2	11.1	45.0	37.4	18.4	56.4	30.6	28.2	71.6	36.1	25.9
LnGrp LOS	E	C	B	D	D	B	E	C	C	E	D	C
Approach Vol, veh/h		1146			712			480			649	
Approach Delay, s/veh		28.3			34.6			36.8			51.9	
Approach LOS		C			C			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.1	39.4	11.7	21.1	13.1	32.4	11.6	21.2				
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5				
Max Green Setting (Gmax), s	5.0	33.8	7.2	24.0	8.6	30.2	7.2	24.0				
Max Q Clear Time (g_c+I1), s	3.0	28.2	8.8	10.7	8.9	24.8	7.5	14.3				
Green Ext Time (p_c), s	0.0	3.0	0.0	1.6	0.0	2.1	0.0	1.5				
Intersection Summary												
HCM 6th Ctrl Delay			36.3									
HCM 6th LOS			D									

HCM 6th Signalized Intersection Summary
 8: Sierra College Blvd & Brace Road

08/13/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↑	↗		↑↓		↘	↑↓	
Traffic Volume (veh/h)	4	4	151	97	4	135	5	850	132	130	730	2
Future Volume (veh/h)	4	4	151	97	4	135	5	850	132	130	730	2
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	4	4	164	105	4	147	5	924	143	141	793	2
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	73	10	240	331	10	251	72	1425	220	193	2393	6
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.16	0.47	0.47	0.47	0.11	0.66	0.66
Sat Flow, veh/h	14	60	1516	1229	64	1585	3	3015	465	1781	3636	9
Grp Volume(v), veh/h	172	0	0	109	0	147	574	0	498	141	387	408
Grp Sat Flow(s),veh/h/ln	1590	0	0	1293	0	1585	1865	0	1618	1781	1777	1869
Q Serve(g_s), s	0.2	0.0	0.0	0.0	0.0	4.5	0.0	0.0	12.1	4.0	4.9	4.9
Cycle Q Clear(g_c), s	5.3	0.0	0.0	3.9	0.0	4.5	12.1	0.0	12.1	4.0	4.9	4.9
Prop In Lane	0.02		0.95	0.96		1.00	0.01		0.29	1.00		0.00
Lane Grp Cap(c), veh/h	323	0	0	341	0	251	951	0	765	193	1170	1230
V/C Ratio(X)	0.53	0.00	0.00	0.32	0.00	0.59	0.60	0.00	0.65	0.73	0.33	0.33
Avail Cap(c_a), veh/h	836	0	0	741	0	765	1450	0	1203	791	2247	2363
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(l)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.6	0.0	0.0	20.0	0.0	20.2	10.4	0.0	10.4	22.4	3.9	3.9
Incr Delay (d2), s/veh	1.4	0.0	0.0	0.8	0.0	3.1	0.9	0.0	1.3	7.3	0.2	0.2
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	1.9	0.0	0.0	1.1	0.0	1.7	3.8	0.0	3.4	1.8	0.9	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.9	0.0	0.0	20.7	0.0	23.3	11.3	0.0	11.8	29.7	4.1	4.1
LnGrp LOS	C	A	A	C	A	C	B	A	B	C	A	A
Approach Vol, veh/h		172			256			1072			936	
Approach Delay, s/veh		21.9			22.2			11.5			7.9	
Approach LOS		C			C			B			A	
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	9.6	30.0		12.2		39.6		12.2				
Change Period (Y+Rc), s	4.0	5.5		4.0		5.5		4.0				
Max Green Setting (Gmax), s	23.0	38.5		25.0		65.5		25.0				
Max Q Clear Time (g_c+I1), s	6.0	14.1		7.3		6.9		6.5				
Green Ext Time (p_c), s	0.5	10.3		1.0		8.3		1.5				

Intersection Summary												
HCM 6th Ctrl Delay				12.0								
HCM 6th LOS				B								

HCM 6th TWSC
1: Pacific St/Taylor Road

08/13/2023

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	2	3	440	150	1	543
Future Vol, veh/h	2	3	440	150	1	543
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	-	-	-	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	3	478	163	1	590

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1152	560	0	0	641
Stage 1	560	-	-	-	-
Stage 2	592	-	-	-	-
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	219	528	-	-	943
Stage 1	572	-	-	-	-
Stage 2	553	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	219	528	-	-	943
Mov Cap-2 Maneuver	219	-	-	-	-
Stage 1	572	-	-	-	-
Stage 2	552	-	-	-	-

Approach	WB	NE	SW
HCM Control Delay, s	15.8	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NERWBLn1	SWL	SWT
Capacity (veh/h)	-	-	338	943
HCM Lane V/C Ratio	-	-	0.016	0.001
HCM Control Delay (s)	-	-	15.8	8.8
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0	0

Queues

5: Taylor Road & Sierra College Blvd

08/13/2023



Lane Group	NBL	NBT	NBR	SBL	SBT	NEL	NET	NER	SWL	SWT	SWR
Lane Group Flow (vph)	164	372	198	17	796	58	196	86	257	192	15
v/c Ratio	0.79	0.22	0.18	0.17	0.72	0.27	0.54	0.20	0.76	0.36	0.03
Control Delay	62.3	12.9	1.8	40.3	25.6	38.8	33.5	2.6	50.9	26.4	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.3	12.9	1.8	40.3	25.6	38.8	33.5	2.6	50.9	26.4	0.1
Queue Length 50th (ft)	73	45	0	7	154	12	80	0	58	74	0
Queue Length 95th (ft)	#207	102	29	29	238	34	156	12	#140	149	0
Internal Link Dist (ft)		251			329		957			568	
Turn Bay Length (ft)											
Base Capacity (vph)	208	1719	1090	121	1441	338	612	613	338	612	613
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.22	0.18	0.14	0.55	0.17	0.32	0.14	0.76	0.31	0.02

Intersection Summary

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

Queues

8: Sierra College Blvd & Brace Road

08/13/2023


























Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	6	111	100	145	4	558	90	141	774
v/c Ratio	0.01	0.19	0.22	0.24	0.02	0.39	0.18	0.40	0.44
Control Delay	16.5	5.4	18.2	5.5	16.2	17.7	5.6	24.1	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.5	5.4	18.2	5.5	16.2	17.7	5.6	24.1	9.0
Queue Length 50th (ft)	1	0	24	1	1	56	0	41	74
Queue Length 95th (ft)	9	32	68	38	7	89	28	92	105
Internal Link Dist (ft)	857		946		318		239		
Turn Bay Length (ft)									
Base Capacity (vph)	814	810	667	830	488	3721	1182	773	3539
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.14	0.15	0.17	0.01	0.15	0.08	0.18	0.22

Intersection Summary

HCM 6th Signalized Intersection Summary

5: Taylor Road & Sierra College Blvd

08/13/2023

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	151	342	182	16	576	156	53	180	79	236	177	14
Future Volume (veh/h)	151	342	182	16	576	156	53	180	79	236	177	14
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	164	372	198	17	626	170	58	196	86	257	192	15
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	203	1432	799	29	843	228	136	336	285	350	452	383
Arrive On Green	0.11	0.40	0.40	0.02	0.30	0.30	0.04	0.18	0.18	0.10	0.24	0.24
Sat Flow, veh/h	1781	3554	1585	1781	2763	749	3456	1870	1585	3456	1870	1585
Grp Volume(v), veh/h	164	372	198	17	402	394	58	196	86	257	192	15
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1736	1728	1870	1585	1728	1870	1585
Q Serve(g_s), s	6.0	4.7	4.7	0.6	13.6	13.6	1.1	6.4	3.1	4.8	5.8	0.5
Cycle Q Clear(g_c), s	6.0	4.7	4.7	0.6	13.6	13.6	1.1	6.4	3.1	4.8	5.8	0.5
Prop In Lane	1.00		1.00	1.00		0.43	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	203	1432	799	29	542	529	136	336	285	350	452	383
V/C Ratio(X)	0.81	0.26	0.25	0.59	0.74	0.74	0.43	0.58	0.30	0.73	0.42	0.04
Avail Cap(c_a), veh/h	230	1800	964	133	804	785	373	673	570	373	673	570
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(l)	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	28.8	13.3	9.4	32.6	20.8	20.8	31.3	25.1	23.7	29.1	21.4	19.4
Incr Delay (d2), s/veh	15.0	0.1	0.2	6.9	2.4	2.5	0.8	1.9	0.7	5.8	0.8	0.0
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	3.2	1.6	1.4	0.3	5.2	5.1	0.4	2.8	1.1	2.1	2.4	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.8	13.4	9.6	39.5	23.3	23.4	32.1	27.0	24.4	34.9	22.1	19.4
LnGrp LOS	D	B	A	D	C	C	C	C	C	C	C	B
Approach Vol, veh/h		734			813			340			464	
Approach Delay, s/veh		19.2			23.7			27.2			29.1	
Approach LOS		B			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.6	32.4	11.3	17.5	12.1	25.8	7.1	21.6				
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5				
Max Green Setting (Gmax), s	5.0	33.8	7.2	24.0	8.6	30.2	7.2	24.0				
Max Q Clear Time (g_c+I1), s	2.6	6.7	6.8	8.4	8.0	15.6	3.1	7.8				
Green Ext Time (p_c), s	0.0	3.7	0.0	1.3	0.0	4.7	0.0	1.0				
Intersection Summary												
HCM 6th Ctrl Delay			23.9									
HCM 6th LOS			C									

HCM 6th Signalized Intersection Summary
 8: Sierra College Blvd & Brace Road

08/13/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗	↖	↗		↖	↑↑↑	↗	↖	↑↑	↗
Traffic Volume (veh/h)	3	3	102	92	4	130	4	513	83	130	712	0
Future Volume (veh/h)	3	3	102	92	4	130	4	513	83	130	712	0
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	3	3	111	100	4	141	4	558	90	141	774	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	256	209	370	386	10	362	400	1576	489	197	1855	827
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.31	0.31	0.31	0.11	0.52	0.00
Sat Flow, veh/h	502	896	1585	1279	44	1548	696	5106	1585	1781	3554	1585
Grp Volume(v), veh/h	6	0	111	100	0	145	4	558	90	141	774	0
Grp Sat Flow(s),veh/h/ln	1398	0	1585	1279	0	1592	696	1702	1585	1781	1777	1585
Q Serve(g_s), s	0.0	0.0	2.2	2.8	0.0	3.0	0.2	3.3	1.6	3.0	5.2	0.0
Cycle Q Clear(g_c), s	3.0	0.0	2.2	5.8	0.0	3.0	0.2	3.3	1.6	3.0	5.2	0.0
Prop In Lane	0.50		1.00	1.00		0.97	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	466	0	370	386	0	372	400	1576	489	197	1855	827
V/C Ratio(X)	0.01	0.00	0.30	0.26	0.00	0.39	0.01	0.35	0.18	0.72	0.42	0.00
Avail Cap(c_a), veh/h	1077	0	1019	909	0	1024	875	5057	1570	1054	5988	2671
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(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	11.5	0.0	12.3	15.0	0.0	12.6	9.3	10.4	9.8	16.7	5.7	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.4	0.5	0.0	0.9	0.0	0.2	0.3	6.8	0.2	0.0
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	0.0	0.0	0.7	0.7	0.0	0.9	0.0	0.9	0.4	1.3	1.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.5	0.0	12.7	15.5	0.0	13.5	9.4	10.6	10.1	23.5	5.9	0.0
LnGrp LOS	B	A	B	B	A	B	A	B	B	C	A	A
Approach Vol, veh/h		117			245			652			915	
Approach Delay, s/veh		12.7			14.3			10.5			8.6	
Approach LOS		B			B			B			A	
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	8.3	17.5		13.1		25.8		13.1				
Change Period (Y+Rc), s	4.0	5.5		4.0		5.5		4.0				
Max Green Setting (Gmax), s	23.0	38.5		25.0		65.5		25.0				
Max Q Clear Time (g_c+I1), s	5.0	5.3		5.0		7.2		7.8				
Green Ext Time (p_c), s	0.5	6.2		0.3		9.0		1.5				
Intersection Summary												
HCM 6th Ctrl Delay				10.2								
HCM 6th LOS				B								

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	3	1	311	102	7	457
Future Vol, veh/h	3	1	311	102	7	457
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	-	-	-	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	3	1	338	111	8	497

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	907	394	0	0	449
Stage 1	394	-	-	-	-
Stage 2	513	-	-	-	-
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	306	655	-	-	1111
Stage 1	681	-	-	-	-
Stage 2	601	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	304	655	-	-	1111
Mov Cap-2 Maneuver	304	-	-	-	-
Stage 1	681	-	-	-	-
Stage 2	597	-	-	-	-

Approach	WB	NE	SW
HCM Control Delay, s	15.4	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NERWBLn1	SWL	SWT
Capacity (veh/h)	-	-	351	1111
HCM Lane V/C Ratio	-	-	0.012	0.007
HCM Control Delay (s)	-	-	15.4	8.3
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0	0

Queues

5: Taylor Road & Sierra College Blvd

08/13/2023



Lane Group	NBL	NBT	NBR	SBL	SBT	NEL	NET	NER	SWL	SWT	SWR
Lane Group Flow (vph)	183	716	317	23	710	128	229	145	327	307	41
v/c Ratio	0.89	0.48	0.30	0.22	0.70	0.49	0.55	0.31	0.98	0.60	0.08
Control Delay	77.9	18.5	2.2	43.5	27.2	42.5	31.7	6.8	82.3	31.7	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.9	18.5	2.2	43.5	27.2	42.5	31.7	6.8	82.3	31.7	0.3
Queue Length 50th (ft)	85	109	0	10	145	29	94	0	79	129	0
Queue Length 95th (ft)	#248	220	39	38	227	64	178	44	#201	240	0
Internal Link Dist (ft)		251			329		957			568	
Turn Bay Length (ft)											
Base Capacity (vph)	206	1637	1070	120	1431	335	607	613	335	607	609
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.44	0.30	0.19	0.50	0.38	0.38	0.24	0.98	0.51	0.07

Intersection Summary

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

Queues

8: Sierra College Blvd & Brace Road

08/13/2023


























Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	8	164	112	151	5	995	147	149	854	2
v/c Ratio	0.02	0.31	0.31	0.29	0.02	0.53	0.22	0.47	0.40	0.00
Control Delay	25.1	6.8	27.9	7.4	14.6	18.3	3.8	32.9	7.4	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.1	6.8	27.9	7.4	14.6	18.3	3.8	32.9	7.4	0.5
Queue Length 50th (ft)	3	0	38	1	1	115	0	56	84	0
Queue Length 95th (ft)	16	50	104	50	8	178	33	131	122	1
Internal Link Dist (ft)	857			946		318		239		
Turn Bay Length (ft)										
Base Capacity (vph)	623	686	515	678	349	2882	961	599	3242	1451
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.24	0.22	0.22	0.01	0.35	0.15	0.25	0.26	0.00

Intersection Summary

HCM 6th Signalized Intersection Summary
 5: Taylor Road & Sierra College Blvd

08/13/2023

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	168	659	292	21	548	105	118	211	133	301	282	38
Future Volume (veh/h)	168	659	292	21	548	105	118	211	133	301	282	38
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	183	716	317	23	596	114	128	229	145	327	307	41
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	224	1361	781	37	827	158	208	341	289	378	433	367
Arrive On Green	0.13	0.38	0.38	0.02	0.28	0.28	0.06	0.18	0.18	0.11	0.23	0.23
Sat Flow, veh/h	1781	3554	1585	1781	2977	568	3456	1870	1585	3456	1870	1585
Grp Volume(v), veh/h	183	716	317	23	355	355	128	229	145	327	307	41
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1768	1728	1870	1585	1728	1870	1585
Q Serve(g_s), s	6.6	10.2	8.3	0.8	11.9	11.9	2.4	7.5	5.4	6.1	9.9	1.3
Cycle Q Clear(g_c), s	6.6	10.2	8.3	0.8	11.9	11.9	2.4	7.5	5.4	6.1	9.9	1.3
Prop In Lane	1.00		1.00	1.00		0.32	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	224	1361	781	37	494	491	208	341	289	378	433	367
V/C Ratio(X)	0.82	0.53	0.41	0.62	0.72	0.72	0.61	0.67	0.50	0.86	0.71	0.11
Avail Cap(c_a), veh/h	233	1827	988	135	816	812	378	683	579	378	683	579
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(l)	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	28.0	15.7	10.6	31.9	21.4	21.4	30.1	25.0	24.2	28.8	23.2	19.9
Incr Delay (d2), s/veh	17.7	0.4	0.4	6.1	2.4	2.4	1.1	2.8	1.6	17.6	2.6	0.2
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	3.7	3.6	2.4	0.4	4.6	4.6	0.9	3.3	2.0	3.3	4.2	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.7	16.1	11.0	38.0	23.8	23.9	31.2	27.8	25.8	46.4	25.8	20.1
LnGrp LOS	D	B	B	D	C	C	C	C	C	D	C	C
Approach Vol, veh/h		1216			733			502			675	
Approach Delay, s/veh		19.2			24.3			28.1			35.4	
Approach LOS		B			C			C			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.9	30.7	11.7	17.5	12.8	23.8	8.5	20.7				
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5				
Max Green Setting (Gmax), s	5.0	33.8	7.2	24.0	8.6	30.2	7.2	24.0				
Max Q Clear Time (g_c+I1), s	2.8	12.2	8.1	9.5	8.6	13.9	4.4	11.9				
Green Ext Time (p_c), s	0.0	7.1	0.0	1.7	0.0	4.4	0.0	1.7				
Intersection Summary												
HCM 6th Ctrl Delay			25.3									
HCM 6th LOS			C									

HCM 6th Signalized Intersection Summary
 8: Sierra College Blvd & Brace Road

08/13/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗	↖	↗		↖	↑↑↑	↗	↖	↑↑	↗
Traffic Volume (veh/h)	4	4	151	103	4	135	5	915	135	137	786	2
Future Volume (veh/h)	4	4	151	103	4	135	5	915	135	137	786	2
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	4	4	164	112	4	147	5	995	147	149	854	2
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	214	182	367	319	10	359	393	2044	634	204	2095	935
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.40	0.40	0.40	0.11	0.59	0.59
Sat Flow, veh/h	486	785	1585	1217	42	1549	645	5106	1585	1781	3554	1585
Grp Volume(v), veh/h	8	0	164	112	0	151	5	995	147	149	854	2
Grp Sat Flow(s),veh/h/ln	1271	0	1585	1217	0	1591	645	1702	1585	1781	1777	1585
Q Serve(g_s), s	0.0	0.0	4.7	4.6	0.0	4.3	0.2	7.7	3.3	4.3	6.9	0.0
Cycle Q Clear(g_c), s	4.3	0.0	4.7	8.9	0.0	4.3	0.2	7.7	3.3	4.3	6.9	0.0
Prop In Lane	0.50		1.00	1.00		0.97	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	396	0	367	319	0	369	393	2044	634	204	2095	935
V/C Ratio(X)	0.02	0.00	0.45	0.35	0.00	0.41	0.01	0.49	0.23	0.73	0.41	0.00
Avail Cap(c_a), veh/h	751	0	745	609	0	748	602	3695	1147	770	4375	1951
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(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.8	0.0	17.5	21.1	0.0	17.3	9.6	11.9	10.5	22.8	5.9	4.5
Incr Delay (d2), s/veh	0.0	0.0	0.9	0.9	0.0	1.0	0.0	0.3	0.3	7.0	0.2	0.0
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	0.1	0.0	1.7	1.2	0.0	1.5	0.0	2.3	0.9	2.0	1.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.8	0.0	18.4	22.0	0.0	18.4	9.7	12.1	10.8	29.8	6.1	4.5
LnGrp LOS	B	A	B	C	A	B	A	B	B	C	A	A
Approach Vol, veh/h		172			263			1147			1005	
Approach Delay, s/veh		18.2			19.9			12.0			9.6	
Approach LOS		B			B			B			A	
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	10.1	26.8		16.3		36.9		16.3				
Change Period (Y+Rc), s	4.0	5.5		4.0		5.5		4.0				
Max Green Setting (Gmax), s	23.0	38.5		25.0		65.5		25.0				
Max Q Clear Time (g_c+I1), s	6.3	9.7		6.7		8.9		10.9				
Green Ext Time (p_c), s	0.5	11.6		0.5		10.3		1.5				

Intersection Summary

HCM 6th Ctrl Delay	12.3
HCM 6th LOS	B

HCM 6th TWSC
1: Pacific St/Taylor Road

08/13/2023

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	2	3	440	150	1	543
Future Vol, veh/h	2	3	440	150	1	543
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	-	-	-	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	3	478	163	1	590

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1152	560	0	0	641	0
Stage 1	560	-	-	-	-	-
Stage 2	592	-	-	-	-	-
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	219	528	-	-	943	-
Stage 1	572	-	-	-	-	-
Stage 2	553	-	-	-	-	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	219	528	-	-	943	-
Mov Cap-2 Maneuver	219	-	-	-	-	-
Stage 1	572	-	-	-	-	-
Stage 2	552	-	-	-	-	-

Approach	WB	NE	SW
HCM Control Delay, s	15.8	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NERWBLn1	SWL	SWT
Capacity (veh/h)	-	-	338	943
HCM Lane V/C Ratio	-	-	0.016	0.001
HCM Control Delay (s)	-	-	15.8	8.8
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0	0

Queues

5: Taylor Road & Sierra College Blvd

08/13/2023



Lane Group	NBL	NBT	NBR	SBL	SBT	NEL	NET	NER	SWL	SWT	SWR
Lane Group Flow (vph)	168	379	202	18	813	60	200	88	262	197	16
v/c Ratio	0.82	0.24	0.19	0.18	0.73	0.28	0.54	0.21	0.78	0.37	0.03
Control Delay	66.1	14.5	2.0	41.2	26.1	39.4	33.6	2.7	53.0	26.6	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.1	14.5	2.0	41.2	26.1	39.4	33.6	2.7	53.0	26.6	0.1
Queue Length 50th (ft)	75	47	0	8	159	13	83	0	60	77	0
Queue Length 95th (ft)	#216	106	30	31	251	35	158	12	#147	152	0
Internal Link Dist (ft)		251			329		957			568	
Turn Bay Length (ft)											
Base Capacity (vph)	206	1651	1059	120	1428	335	606	609	335	606	609
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.23	0.19	0.15	0.57	0.18	0.33	0.14	0.78	0.33	0.03

Intersection Summary

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

Queues

8: Sierra College Blvd & Brace Road

08/13/2023


























Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	6	114	102	149	4	570	92	145	790
v/c Ratio	0.01	0.20	0.23	0.25	0.02	0.40	0.18	0.41	0.45
Control Delay	17.2	5.6	18.9	5.6	16.2	17.8	5.4	24.5	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.2	5.6	18.9	5.6	16.2	17.8	5.4	24.5	9.0
Queue Length 50th (ft)	1	0	25	1	1	57	0	43	76
Queue Length 95th (ft)	10	34	72	40	7	92	28	97	106
Internal Link Dist (ft)	857			946		318			239
Turn Bay Length (ft)									
Base Capacity (vph)	805	805	661	825	476	3686	1172	766	3526
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.14	0.15	0.18	0.01	0.15	0.08	0.19	0.22

Intersection Summary

HCM 6th Signalized Intersection Summary
 5: Taylor Road & Sierra College Blvd

08/13/2023

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	155	349	186	17	588	160	55	184	81	241	181	15
Future Volume (veh/h)	155	349	186	17	588	160	55	184	81	241	181	15
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	168	379	202	18	639	174	60	200	88	262	197	16
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	207	1450	809	30	852	232	138	332	281	354	448	380
Arrive On Green	0.12	0.41	0.41	0.02	0.31	0.31	0.04	0.18	0.18	0.10	0.24	0.24
Sat Flow, veh/h	1781	3554	1585	1781	2761	751	3456	1870	1585	3456	1870	1585
Grp Volume(v), veh/h	168	379	202	18	411	402	60	200	88	262	197	16
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1735	1728	1870	1585	1728	1870	1585
Q Serve(g_s), s	6.2	4.8	4.8	0.7	14.1	14.1	1.1	6.7	3.3	5.0	6.1	0.5
Cycle Q Clear(g_c), s	6.2	4.8	4.8	0.7	14.1	14.1	1.1	6.7	3.3	5.0	6.1	0.5
Prop In Lane	1.00		1.00	1.00		0.43	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	207	1450	809	30	548	535	138	332	281	354	448	380
V/C Ratio(X)	0.81	0.26	0.25	0.60	0.75	0.75	0.43	0.60	0.31	0.74	0.44	0.04
Avail Cap(c_a), veh/h	226	1774	954	132	793	774	368	663	562	368	663	562
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(l)	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	29.2	13.3	9.3	33.0	21.1	21.1	31.7	25.7	24.3	29.5	21.9	19.8
Incr Delay (d2), s/veh	16.4	0.1	0.2	6.8	2.8	2.9	0.8	2.1	0.8	6.5	0.8	0.1
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	3.4	1.7	1.4	0.3	5.5	5.4	0.5	2.9	1.2	2.2	2.5	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.5	13.4	9.5	39.8	23.8	23.9	32.5	27.8	25.0	36.0	22.7	19.8
LnGrp LOS	D	B	A	D	C	C	C	C	C	D	C	B
Approach Vol, veh/h		749			831			348			475	
Approach Delay, s/veh		19.6			24.2			27.9			29.9	
Approach LOS		B			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.6	33.1	11.4	17.5	12.4	26.4	7.2	21.7				
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5				
Max Green Setting (Gmax), s	5.0	33.8	7.2	24.0	8.6	30.2	7.2	24.0				
Max Q Clear Time (g_c+l1), s	2.7	6.8	7.0	8.7	8.2	16.1	3.1	8.1				
Green Ext Time (p_c), s	0.0	3.8	0.0	1.4	0.0	4.8	0.0	1.1				
Intersection Summary												
HCM 6th Ctrl Delay			24.4									
HCM 6th LOS			C									

HCM 6th Signalized Intersection Summary
 8: Sierra College Blvd & Brace Road

08/13/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗	↖	↗		↖	↑↑↑	↗	↖	↑↑	↗
Traffic Volume (veh/h)	3	3	105	94	4	133	4	524	85	133	727	0
Future Volume (veh/h)	3	3	105	94	4	133	4	524	85	133	727	0
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	3	3	114	102	4	145	4	570	92	145	790	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	256	210	377	386	10	368	393	1559	484	202	1850	825
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.31	0.31	0.31	0.11	0.52	0.00
Sat Flow, veh/h	499	884	1585	1275	43	1549	686	5106	1585	1781	3554	1585
Grp Volume(v), veh/h	6	0	114	102	0	149	4	570	92	145	790	0
Grp Sat Flow(s),veh/h/ln	1382	0	1585	1275	0	1592	686	1702	1585	1781	1777	1585
Q Serve(g_s), s	0.0	0.0	2.3	2.9	0.0	3.1	0.2	3.4	1.7	3.1	5.4	0.0
Cycle Q Clear(g_c), s	3.1	0.0	2.3	6.0	0.0	3.1	0.2	3.4	1.7	3.1	5.4	0.0
Prop In Lane	0.50		1.00	1.00		0.97	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	466	0	377	386	0	378	393	1559	484	202	1850	825
V/C Ratio(X)	0.01	0.00	0.30	0.26	0.00	0.39	0.01	0.37	0.19	0.72	0.43	0.00
Avail Cap(c_a), veh/h	1060	0	1008	894	0	1012	855	5001	1552	1042	5922	2641
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(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	11.5	0.0	12.3	15.1	0.0	12.6	9.5	10.7	10.1	16.8	5.8	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.4	0.5	0.0	0.9	0.0	0.2	0.3	6.6	0.2	0.0
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	0.0	0.0	0.7	0.7	0.0	1.0	0.0	0.9	0.5	1.4	1.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.5	0.0	12.8	15.6	0.0	13.6	9.6	10.9	10.3	23.4	6.0	0.0
LnGrp LOS	B	A	B	B	A	B	A	B	B	C	A	A
Approach Vol, veh/h		120			251			666			935	
Approach Delay, s/veh		12.7			14.4			10.8			8.7	
Approach LOS		B			B			B			A	
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	8.5	17.5		13.3		26.0		13.3				
Change Period (Y+Rc), s	4.0	5.5		4.0		5.5		4.0				
Max Green Setting (Gmax), s	23.0	38.5		25.0		65.5		25.0				
Max Q Clear Time (g_c+I1), s	5.1	5.4		5.1		7.4		8.0				
Green Ext Time (p_c), s	0.5	6.3		0.3		9.3		1.5				
Intersection Summary												
HCM 6th Ctrl Delay				10.4								
HCM 6th LOS				B								

HCM 6th TWSC
1: Pacific St/Taylor Road

08/13/2023

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	4	1	318	104	8	467
Future Vol, veh/h	4	1	318	104	8	467
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	-	-	-	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	4	1	346	113	9	508

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	929	403	0	0	459
Stage 1	403	-	-	-	-
Stage 2	526	-	-	-	-
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	297	647	-	-	1102
Stage 1	675	-	-	-	-
Stage 2	593	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	295	647	-	-	1102
Mov Cap-2 Maneuver	295	-	-	-	-
Stage 1	675	-	-	-	-
Stage 2	588	-	-	-	-

Approach	WB	NE	SW
HCM Control Delay, s	16.1	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NERWBLn1	SWL	SWT
Capacity (veh/h)	-	-	331	1102
HCM Lane V/C Ratio	-	-	0.016	0.008
HCM Control Delay (s)	-	-	16.1	8.3
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Queues

5: Taylor Road & Sierra College Blvd

08/13/2023



Lane Group	NBL	NBT	NBR	SBL	SBT	NEL	NET	NER	SWL	SWT	SWR
Lane Group Flow (vph)	187	732	324	24	725	132	235	148	334	313	42
v/c Ratio	0.92	0.49	0.30	0.24	0.70	0.51	0.56	0.31	1.01	0.61	0.08
Control Delay	83.9	18.7	2.2	44.1	27.3	43.1	32.1	6.7	90.7	32.2	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.9	18.7	2.2	44.1	27.3	43.1	32.1	6.7	90.7	32.2	0.3
Queue Length 50th (ft)	88	113	0	11	150	31	98	0	~84	134	0
Queue Length 95th (ft)	#253	225	39	39	233	67	183	44	#206	245	0
Internal Link Dist (ft)		251			329		957			568	
Turn Bay Length (ft)											
Base Capacity (vph)	204	1623	1073	118	1416	331	600	610	331	600	604
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.45	0.30	0.20	0.51	0.40	0.39	0.24	1.01	0.52	0.07

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Queues

8: Sierra College Blvd & Brace Road

08/13/2023


























Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	8	168	115	154	5	1015	150	152	872	3
v/c Ratio	0.02	0.32	0.33	0.30	0.02	0.54	0.22	0.48	0.40	0.00
Control Delay	25.3	6.8	28.4	7.4	14.8	18.4	3.8	33.4	7.4	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.3	6.8	28.4	7.4	14.8	18.4	3.8	33.4	7.4	1.0
Queue Length 50th (ft)	3	0	40	1	1	119	0	58	86	0
Queue Length 95th (ft)	15	50	107	50	8	184	33	134	127	1
Internal Link Dist (ft)	857			946		318		239		
Turn Bay Length (ft)										
Base Capacity (vph)	614	681	508	673	338	2843	951	591	3218	1440
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.25	0.23	0.23	0.01	0.36	0.16	0.26	0.27	0.00

Intersection Summary

HCM 6th Signalized Intersection Summary
 5: Taylor Road & Sierra College Blvd

08/13/2023

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	172	673	298	22	559	108	121	216	136	307	288	39
Future Volume (veh/h)	172	673	298	22	559	108	121	216	136	307	288	39
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	187	732	324	24	608	117	132	235	148	334	313	42
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	228	1380	787	38	837	161	213	338	286	375	425	361
Arrive On Green	0.13	0.39	0.39	0.02	0.28	0.28	0.06	0.18	0.18	0.11	0.23	0.23
Sat Flow, veh/h	1781	3554	1585	1781	2973	571	3456	1870	1585	3456	1870	1585
Grp Volume(v), veh/h	187	732	324	24	363	362	132	235	148	334	313	42
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1768	1728	1870	1585	1728	1870	1585
Q Serve(g_s), s	6.8	10.5	8.6	0.9	12.2	12.3	2.5	7.8	5.6	6.3	10.3	1.4
Cycle Q Clear(g_c), s	6.8	10.5	8.6	0.9	12.2	12.3	2.5	7.8	5.6	6.3	10.3	1.4
Prop In Lane	1.00		1.00	1.00		0.32	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	228	1380	787	38	500	498	213	338	286	375	425	361
V/C Ratio(X)	0.82	0.53	0.41	0.63	0.72	0.73	0.62	0.70	0.52	0.89	0.74	0.12
Avail Cap(c_a), veh/h	231	1808	978	134	808	804	375	676	573	375	676	573
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(l)	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	28.2	15.7	10.6	32.2	21.5	21.6	30.4	25.5	24.6	29.2	23.8	20.4
Incr Delay (d2), s/veh	18.9	0.4	0.4	6.0	2.4	2.5	1.1	3.1	1.7	21.9	3.0	0.2
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	3.9	3.7	2.5	0.4	4.8	4.8	1.0	3.5	2.1	3.6	4.5	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.1	16.0	11.0	38.3	24.0	24.0	31.5	28.6	26.3	51.1	26.8	20.5
LnGrp LOS	D	B	B	D	C	C	C	C	C	D	C	C
Approach Vol, veh/h		1243			749			515			689	
Approach Delay, s/veh		19.4			24.4			28.7			38.2	
Approach LOS		B			C			C			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.9	31.3	11.7	17.5	13.0	24.2	8.6	20.6				
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5				
Max Green Setting (Gmax), s	5.0	33.8	7.2	24.0	8.6	30.2	7.2	24.0				
Max Q Clear Time (g_c+I1), s	2.9	12.5	8.3	9.8	8.8	14.3	4.5	12.3				
Green Ext Time (p_c), s	0.0	7.3	0.0	1.8	0.0	4.4	0.0	1.7				
Intersection Summary												
HCM 6th Ctrl Delay			26.1									
HCM 6th LOS			C									

HCM 6th Signalized Intersection Summary
 8: Sierra College Blvd & Brace Road

08/13/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗	↖	↗		↖	↑↑↑	↗	↖	↑↑	↗
Traffic Volume (veh/h)	4	4	155	106	4	138	5	934	138	140	802	3
Future Volume (veh/h)	4	4	155	106	4	138	5	934	138	140	802	3
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	4	4	168	115	4	150	5	1015	150	152	872	3
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	213	181	372	317	10	364	386	2049	636	207	2100	937
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.40	0.40	0.40	0.12	0.59	0.59
Sat Flow, veh/h	484	773	1585	1213	41	1550	634	5106	1585	1781	3554	1585
Grp Volume(v), veh/h	8	0	168	115	0	154	5	1015	150	152	872	3
Grp Sat Flow(s),veh/h/ln	1257	0	1585	1213	0	1591	634	1702	1585	1781	1777	1585
Q Serve(g_s), s	0.0	0.0	4.9	4.8	0.0	4.5	0.3	8.1	3.4	4.5	7.3	0.0
Cycle Q Clear(g_c), s	4.5	0.0	4.9	9.3	0.0	4.5	0.3	8.1	3.4	4.5	7.3	0.0
Prop In Lane	0.50		1.00	1.00		0.97	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	394	0	372	317	0	374	386	2049	636	207	2100	937
V/C Ratio(X)	0.02	0.00	0.45	0.36	0.00	0.41	0.01	0.50	0.24	0.73	0.42	0.00
Avail Cap(c_a), veh/h	727	0	727	589	0	730	580	3607	1120	752	4270	1905
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(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.1	0.0	17.8	21.6	0.0	17.7	9.8	12.2	10.8	23.3	6.0	4.6
Incr Delay (d2), s/veh	0.0	0.0	0.9	1.0	0.0	1.0	0.0	0.3	0.3	7.0	0.2	0.0
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	0.1	0.0	1.8	1.3	0.0	1.6	0.0	2.5	1.0	2.1	1.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.1	0.0	18.7	22.6	0.0	18.7	9.9	12.5	11.1	30.3	6.2	4.6
LnGrp LOS	B	A	B	C	A	B	A	B	B	C	A	A
Approach Vol, veh/h		176			269			1170			1027	
Approach Delay, s/veh		18.6			20.4			12.3			9.8	
Approach LOS		B			C			B			A	
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	10.3	27.4		16.8		37.7		16.8				
Change Period (Y+Rc), s	4.0	5.5		4.0		5.5		4.0				
Max Green Setting (Gmax), s	23.0	38.5		25.0		65.5		25.0				
Max Q Clear Time (g_c+I1), s	6.5	10.1		6.9		9.3		11.3				
Green Ext Time (p_c), s	0.5	11.8		0.5		10.6		1.5				
Intersection Summary												
HCM 6th Ctrl Delay				12.5								
HCM 6th LOS				B								

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	2	4	449	153	2	554
Future Vol, veh/h	2	4	449	153	2	554
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	-	-	-	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	4	488	166	2	602

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1177	571	0	0	654
Stage 1	571	-	-	-	-
Stage 2	606	-	-	-	-
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	211	520	-	-	933
Stage 1	565	-	-	-	-
Stage 2	545	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	211	520	-	-	933
Mov Cap-2 Maneuver	211	-	-	-	-
Stage 1	565	-	-	-	-
Stage 2	544	-	-	-	-

Approach	WB	NE	SW
HCM Control Delay, s	15.5	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NERWBLn1	SWL	SWT
Capacity (veh/h)	-	-	349	933
HCM Lane V/C Ratio	-	-	0.019	0.002
HCM Control Delay (s)	-	-	15.5	8.9
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Queues
5: Taylor Road

08/13/2023



Lane Group	NBL	NBT	NBR	SBL	SBT	NEL	NET	NER	SWL	SWT	SWR
Lane Group Flow (vph)	168	377	201	18	811	60	199	88	260	197	16
v/c Ratio	0.82	0.24	0.19	0.18	0.73	0.28	0.54	0.21	0.78	0.37	0.03
Control Delay	66.2	14.3	2.0	40.9	25.7	39.2	33.8	2.8	52.4	26.8	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.2	14.3	2.0	40.9	25.7	39.2	33.8	2.8	52.4	26.8	0.1
Queue Length 50th (ft)	77	46	0	8	160	13	84	0	61	79	0
Queue Length 95th (ft)	#212	103	29	31	245	35	157	13	#143	153	0
Internal Link Dist (ft)		251			329		957			568	
Turn Bay Length (ft)											
Base Capacity (vph)	206	1659	1061	120	1428	335	607	609	335	607	609
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.23	0.19	0.15	0.57	0.18	0.33	0.14	0.78	0.32	0.03

Intersection Summary

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

Queues
8: Brace Road

08/13/2023


























Lane Group	EBT	WBT	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	114	102	145	570	92	145	790
v/c Ratio	0.17	0.25	0.24	0.40	0.18	0.40	0.45
Control Delay	0.6	19.2	5.3	17.9	5.5	24.3	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.6	19.2	5.3	17.9	5.5	24.3	9.0
Queue Length 50th (ft)	0	25	0	57	0	43	76
Queue Length 95th (ft)	0	72	38	92	28	95	107
Internal Link Dist (ft)	857	946		318			239
Turn Bay Length (ft)							
Base Capacity (vph)	879	600	823	3693	1175	768	3535
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.17	0.18	0.15	0.08	0.19	0.22

Intersection Summary

HCM 6th Signalized Intersection Summary

5: Taylor Road













08/13/2023

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	155	347	185	17	586	160	55	183	81	239	181	15
Future Volume (veh/h)	155	347	185	17	586	160	55	183	81	239	181	15
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	168	377	201	18	637	174	60	199	88	260	197	16
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	207	1453	810	30	854	233	138	331	281	352	447	379
Arrive On Green	0.12	0.41	0.41	0.02	0.31	0.31	0.04	0.18	0.18	0.10	0.24	0.24
Sat Flow, veh/h	1781	3554	1585	1781	2759	753	3456	1870	1585	3456	1870	1585
Grp Volume(v), veh/h	168	377	201	18	410	401	60	199	88	260	197	16
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1735	1728	1870	1585	1728	1870	1585
Q Serve(g_s), s	6.2	4.8	4.8	0.7	14.0	14.1	1.1	6.6	3.3	5.0	6.1	0.5
Cycle Q Clear(g_c), s	6.2	4.8	4.8	0.7	14.0	14.1	1.1	6.6	3.3	5.0	6.1	0.5
Prop In Lane	1.00		1.00	1.00		0.43	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	207	1453	810	30	550	537	138	331	281	352	447	379
V/C Ratio(X)	0.81	0.26	0.25	0.60	0.75	0.75	0.43	0.60	0.31	0.74	0.44	0.04
Avail Cap(c_a), veh/h	226	1773	952	131	792	773	367	662	561	367	662	561
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(l)	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	29.2	13.2	9.3	33.1	21.0	21.0	31.8	25.7	24.3	29.6	21.9	19.8
Incr Delay (d2), s/veh	16.4	0.1	0.2	6.8	2.7	2.8	0.8	2.1	0.8	6.3	0.8	0.1
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	3.4	1.7	1.4	0.3	5.6	5.4	0.5	2.9	1.2	2.2	2.5	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.6	13.4	9.5	39.8	23.7	23.8	32.6	27.8	25.1	35.9	22.8	19.9
LnGrp LOS	D	B	A	D	C	C	C	C	C	D	C	B
Approach Vol, veh/h		746			829			347			473	
Approach Delay, s/veh		19.6			24.1			27.9			29.9	
Approach LOS		B			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.6	33.2	11.4	17.5	12.4	26.5	7.2	21.7				
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5				
Max Green Setting (Gmax), s	5.0	33.8	7.2	24.0	8.6	30.2	7.2	24.0				
Max Q Clear Time (g_c+I1), s	2.7	6.8	7.0	8.6	8.2	16.1	3.1	8.1				
Green Ext Time (p_c), s	0.0	3.8	0.0	1.4	0.0	4.9	0.0	1.1				
Intersection Summary												
HCM 6th Ctrl Delay			24.4									
HCM 6th LOS			C									

HCM 6th Signalized Intersection Summary

8: Brace Road

08/13/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↑	↗		↑↑↑	↗	↘	↑↑	↗
Traffic Volume (veh/h)	0	0	105	94	0	133	0	524	85	133	727	0
Future Volume (veh/h)	0	0	105	94	0	133	0	524	85	133	727	0
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	1870	0	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	0	114	102	0	145	0	570	92	145	790	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, %	0	2	2	2	2	2	0	2	2	2	2	2
Cap, veh/h	0	0	345	390	0	345	0	1607	499	203	1895	845
Arrive On Green	0.00	0.00	0.22	0.22	0.00	0.22	0.00	0.31	0.31	0.11	0.53	0.00
Sat Flow, veh/h	0	0	1585	922	0	1585	0	5274	1585	1781	3554	1585
Grp Volume(v), veh/h	0	0	114	102	0	145	0	570	92	145	790	0
Grp Sat Flow(s),veh/h/ln	0	0	1585	922	0	1585	0	1702	1585	1781	1777	1585
Q Serve(g_s), s	0.0	0.0	2.3	2.8	0.0	3.0	0.0	3.3	1.6	3.0	5.1	0.0
Cycle Q Clear(g_c), s	0.0	0.0	2.3	5.1	0.0	3.0	0.0	3.3	1.6	3.0	5.1	0.0
Prop In Lane	0.00		1.00	1.00		1.00	0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	0	345	390	0	345	0	1607	499	203	1895	845
V/C Ratio(X)	0.00	0.00	0.33	0.26	0.00	0.42	0.00	0.35	0.18	0.72	0.42	0.00
Avail Cap(c_a), veh/h	0	0	1039	949	0	1039	0	5155	1600	1074	6103	2722
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)	0.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	12.6	14.7	0.0	12.8	0.0	10.1	9.5	16.3	5.3	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.6	0.5	0.0	1.2	0.0	0.2	0.3	6.6	0.2	0.0
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	0.0	0.0	0.7	0.7	0.0	0.9	0.0	0.9	0.4	1.3	0.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	13.1	15.2	0.0	14.0	0.0	10.3	9.8	22.9	5.6	0.0
LnGrp LOS	A	A	B	B	A	B	A	B	A	C	A	A
Approach Vol, veh/h		114			247			662			935	
Approach Delay, s/veh		13.1			14.5			10.2			8.2	
Approach LOS		B			B			B			A	
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	8.3	17.5		12.3		25.8		12.3				
Change Period (Y+Rc), s	4.0	5.5		4.0		5.5		4.0				
Max Green Setting (Gmax), s	23.0	38.5		25.0		65.5		25.0				
Max Q Clear Time (g_c+I1), s	5.0	5.3		4.3		7.1		7.1				
Green Ext Time (p_c), s	0.5	6.3		0.6		9.3		1.4				
Intersection Summary												
HCM 6th Ctrl Delay			10.0									
HCM 6th LOS			A									

HCM 6th TWSC
1: Pacific St/Taylor Road

08/13/2023

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	2	0	318	102	8	467
Future Vol, veh/h	2	0	318	102	8	467
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	-	-	-	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	0	346	111	9	508

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	928	402	0	0	457
Stage 1	402	-	-	-	-
Stage 2	526	-	-	-	-
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	297	648	-	-	1104
Stage 1	676	-	-	-	-
Stage 2	593	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	295	648	-	-	1104
Mov Cap-2 Maneuver	295	-	-	-	-
Stage 1	676	-	-	-	-
Stage 2	588	-	-	-	-

Approach	WB	NE	SW
HCM Control Delay, s	17.3	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NERWBLn1	SWL	SWT
Capacity (veh/h)	-	-	295	1104
HCM Lane V/C Ratio	-	-	0.007	0.008
HCM Control Delay (s)	-	-	17.3	8.3
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0	0

Queues
5: Taylor Road

08/13/2023



Lane Group	NBL	NBT	NBR	SBL	SBT	NEL	NET	NER	SWL	SWT	SWR
Lane Group Flow (vph)	187	729	322	24	721	132	234	148	330	313	42
v/c Ratio	0.92	0.48	0.30	0.24	0.70	0.51	0.55	0.31	1.00	0.61	0.08
Control Delay	84.4	18.7	2.2	44.3	27.1	43.2	32.1	6.7	88.3	32.3	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	84.4	18.7	2.2	44.3	27.1	43.2	32.1	6.7	88.3	32.3	0.3
Queue Length 50th (ft)	88	113	0	11	149	30	97	0	~81	133	0
Queue Length 95th (ft)	#253	224	39	39	231	67	182	44	#203	245	0
Internal Link Dist (ft)		251			329		957			568	
Turn Bay Length (ft)											
Base Capacity (vph)	204	1619	1073	118	1413	331	598	609	331	598	603
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.45	0.30	0.20	0.51	0.40	0.39	0.24	1.00	0.52	0.07

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Queues
8: Brace Road
























08/13/2023



Lane Group	EBT	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	168	115	150	1015	150	152	872	3
v/c Ratio	0.30	0.39	0.29	0.54	0.22	0.48	0.41	0.00
Control Delay	4.8	30.3	6.6	19.4	4.1	34.5	8.0	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.8	30.3	6.6	19.4	4.1	34.5	8.0	1.3
Queue Length 50th (ft)	0	41	0	119	0	58	86	0
Queue Length 95th (ft)	37	111	46	207	37	142	155	1
Internal Link Dist (ft)	857	946		318			239	
Turn Bay Length (ft)								
Base Capacity (vph)	699	401	663	2804	940	583	3171	1420
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.29	0.23	0.36	0.16	0.26	0.27	0.00
Intersection Summary								

HCM 6th Signalized Intersection Summary
5: Taylor Road

08/13/2023

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	172	671	296	22	556	108	121	215	136	304	288	39
Future Volume (veh/h)	172	671	296	22	556	108	121	215	136	304	288	39
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	187	729	322	24	604	117	132	234	148	330	313	42
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	228	1382	788	38	838	162	213	338	286	374	425	360
Arrive On Green	0.13	0.39	0.39	0.02	0.28	0.28	0.06	0.18	0.18	0.11	0.23	0.23
Sat Flow, veh/h	1781	3554	1585	1781	2970	574	3456	1870	1585	3456	1870	1585
Grp Volume(v), veh/h	187	729	322	24	361	360	132	234	148	330	313	42
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1767	1728	1870	1585	1728	1870	1585
Q Serve(g_s), s	6.8	10.5	8.5	0.9	12.2	12.2	2.5	7.8	5.6	6.3	10.3	1.4
Cycle Q Clear(g_c), s	6.8	10.5	8.5	0.9	12.2	12.2	2.5	7.8	5.6	6.3	10.3	1.4
Prop In Lane	1.00		1.00	1.00		0.32	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	228	1382	788	38	501	499	213	338	286	374	425	360
V/C Ratio(X)	0.82	0.53	0.41	0.63	0.72	0.72	0.62	0.69	0.52	0.88	0.74	0.12
Avail Cap(c_a), veh/h	230	1807	978	134	807	803	374	675	572	374	675	572
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(l)	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	28.2	15.6	10.6	32.3	21.5	21.5	30.4	25.5	24.6	29.2	23.8	20.4
Incr Delay (d2), s/veh	18.9	0.4	0.4	6.0	2.4	2.4	1.1	3.1	1.7	20.3	3.0	0.2
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	3.9	3.7	2.5	0.4	4.8	4.8	1.0	3.4	2.1	3.4	4.5	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.2	16.0	11.0	38.3	23.9	23.9	31.5	28.6	26.4	49.5	26.9	20.6
LnGrp LOS	D	B	B	D	C	C	C	C	C	D	C	C
Approach Vol, veh/h		1238			745			514			685	
Approach Delay, s/veh		19.4			24.3			28.7			37.4	
Approach LOS		B			C			C			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.9	31.3	11.7	17.5	13.0	24.3	8.6	20.6				
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5				
Max Green Setting (Gmax), s	5.0	33.8	7.2	24.0	8.6	30.2	7.2	24.0				
Max Q Clear Time (g_c+I1), s	2.9	12.5	8.3	9.8	8.8	14.2	4.5	12.3				
Green Ext Time (p_c), s	0.0	7.2	0.0	1.8	0.0	4.5	0.0	1.7				
Intersection Summary												
HCM 6th Ctrl Delay			25.9									
HCM 6th LOS			C									

HCM 6th Signalized Intersection Summary

8: Brace Road

08/13/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↑	↗		↑↑↑	↗	↘	↑↑	↗
Traffic Volume (veh/h)	0	0	155	106	0	138	0	934	138	140	802	3
Future Volume (veh/h)	0	0	155	106	0	138	0	934	138	140	802	3
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	1870	0	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	0	168	115	0	150	0	1015	150	152	872	3
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, %	0	2	2	2	2	2	0	2	2	2	2	2
Cap, veh/h	0	0	380	313	0	380	0	2035	632	207	2088	931
Arrive On Green	0.00	0.00	0.24	0.24	0.00	0.24	0.00	0.40	0.40	0.12	0.59	0.59
Sat Flow, veh/h	0	0	1585	759	0	1585	0	5274	1585	1781	3554	1585
Grp Volume(v), veh/h	0	0	168	115	0	150	0	1015	150	152	872	3
Grp Sat Flow(s),veh/h/ln	0	0	1585	759	0	1585	0	1702	1585	1781	1777	1585
Q Serve(g_s), s	0.0	0.0	4.9	4.9	0.0	4.4	0.0	8.2	3.5	4.5	7.4	0.0
Cycle Q Clear(g_c), s	0.0	0.0	4.9	9.8	0.0	4.4	0.0	8.2	3.5	4.5	7.4	0.0
Prop In Lane	0.00		1.00	1.00		1.00	0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	0	380	313	0	380	0	2035	632	207	2088	931
V/C Ratio(X)	0.00	0.00	0.44	0.37	0.00	0.40	0.00	0.50	0.24	0.74	0.42	0.00
Avail Cap(c_a), veh/h	0	0	722	576	0	722	0	3582	1112	746	4241	1891
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(l)	0.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	17.8	21.9	0.0	17.5	0.0	12.4	11.0	23.4	6.2	4.7
Incr Delay (d2), s/veh	0.0	0.0	0.8	1.0	0.0	1.0	0.0	0.3	0.3	7.0	0.2	0.0
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	0.0	0.0	1.8	1.3	0.0	1.5	0.0	2.5	1.0	2.1	1.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	18.6	23.0	0.0	18.5	0.0	12.7	11.2	30.5	6.4	4.7
LnGrp LOS	A	A	B	C	A	B	A	B	B	C	A	A
Approach Vol, veh/h		168			265			1165			1027	
Approach Delay, s/veh		18.6			20.4			12.5			9.9	
Approach LOS		B			C			B			A	
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	10.4	27.4		17.1		37.7		17.1				
Change Period (Y+Rc), s	4.0	5.5		4.0		5.5		4.0				
Max Green Setting (Gmax), s	23.0	38.5		25.0		65.5		25.0				
Max Q Clear Time (g_c+I1), s	6.5	10.2		6.9		9.4		11.8				
Green Ext Time (p_c), s	0.5	11.7		0.9		10.6		1.3				
Intersection Summary												
HCM 6th Ctrl Delay				12.7								
HCM 6th LOS				B								

HCM 6th TWSC
1: Pacific St/Taylor Road

08/13/2023

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations	↔		↔		↔	↔
Traffic Vol, veh/h	0	3	449	150	2	554
Future Vol, veh/h	0	3	449	150	2	554
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	-	-	-	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	0	3	488	163	2	602

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1176	570	0	0	651
Stage 1	570	-	-	-	-
Stage 2	606	-	-	-	-
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	211	521	-	-	935
Stage 1	566	-	-	-	-
Stage 2	545	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	211	521	-	-	935
Mov Cap-2 Maneuver	211	-	-	-	-
Stage 1	566	-	-	-	-
Stage 2	544	-	-	-	-

Approach	WB	NE	SW
HCM Control Delay, s	12	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NET	NERWBLn1	SWL	SWT
Capacity (veh/h)	-	-	521	935
HCM Lane V/C Ratio	-	-	0.006	0.002
HCM Control Delay (s)	-	-	12	8.9
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0	0

Queues

5: Taylor Road & Sierra College Blvd

08/13/2023



Lane Group	NBL	NBT	NBR	SBL	SBT	NEL	NET	NER	SWL	SWT	SWR
Lane Group Flow (vph)	184	542	262	64	1508	78	218	101	332	223	35
v/c Ratio	0.99	0.35	0.25	0.62	1.16	0.37	0.61	0.24	1.10	0.50	0.07
Control Delay	104.5	17.3	2.1	65.6	108.9	42.8	37.8	3.6	119.0	32.1	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	104.5	17.3	2.1	65.6	108.9	42.8	37.8	3.6	119.0	32.1	0.3
Queue Length 50th (ft)	95	96	0	32	~481	20	103	0	~98	101	0
Queue Length 95th (ft)	#243	156	34	#97	#694	43	171	20	#200	174	0
Internal Link Dist (ft)		251			329		957			568	
Turn Bay Length (ft)											
Base Capacity (vph)	186	1550	1046	108	1296	302	547	563	302	547	563
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.99	0.35	0.25	0.59	1.16	0.26	0.40	0.18	1.10	0.41	0.06

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Queues

8: Sierra College Blvd & Brace Road

08/13/2023


























Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	6	133	140	147	4	837	64	189	1570	1
v/c Ratio	0.01	0.30	0.41	0.30	0.04	0.44	0.10	0.55	0.71	0.00
Control Delay	27.2	16.5	31.6	7.7	17.5	18.5	5.2	35.5	11.3	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.2	16.5	31.6	7.7	17.5	18.5	5.2	35.5	11.3	0.0
Queue Length 50th (ft)	2	23	54	1	1	98	0	78	212	0
Queue Length 95th (ft)	13	81	133	50	9	167	25	170	338	0
Internal Link Dist (ft)	857			946		318		239		
Turn Bay Length (ft)										
Base Capacity (vph)	585	589	481	639	159	2696	869	558	3090	1383
Starvation Cap Reductn	0	0	0	0	0	0	0	0	150	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.23	0.29	0.23	0.03	0.31	0.07	0.34	0.53	0.00

Intersection Summary

HCM 6th Signalized Intersection Summary
 5: Taylor Road & Sierra College Blvd

08/13/2023

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	169	499	241	59	1228	159	72	201	93	305	205	32
Future Volume (veh/h)	169	499	241	59	1228	159	72	201	93	305	205	32
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	184	542	262	64	1335	173	78	218	101	332	223	35
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	196	1601	860	82	1224	158	144	291	246	318	385	326
Arrive On Green	0.11	0.45	0.45	0.05	0.39	0.39	0.04	0.16	0.16	0.09	0.21	0.21
Sat Flow, veh/h	1781	3554	1585	1781	3166	408	3456	1870	1585	3456	1870	1585
Grp Volume(v), veh/h	184	542	262	64	745	763	78	218	101	332	223	35
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1797	1728	1870	1585	1728	1870	1585
Q Serve(g_s), s	8.0	7.7	7.1	2.8	30.2	30.2	1.7	8.7	4.5	7.2	8.4	1.4
Cycle Q Clear(g_c), s	8.0	7.7	7.1	2.8	30.2	30.2	1.7	8.7	4.5	7.2	8.4	1.4
Prop In Lane	1.00		1.00	1.00		0.23	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	196	1601	860	82	687	695	144	291	246	318	385	326
V/C Ratio(X)	0.94	0.34	0.30	0.78	1.09	1.10	0.54	0.75	0.41	1.04	0.58	0.11
Avail Cap(c_a), veh/h	196	1601	860	114	687	695	318	574	487	318	574	487
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(l)	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	34.5	13.9	9.8	36.9	24.0	24.0	36.7	31.6	29.8	35.5	28.0	25.2
Incr Delay (d2), s/veh	46.4	0.1	0.2	13.5	59.8	64.2	1.2	4.7	1.3	62.0	1.7	0.2
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	5.8	2.8	2.1	1.4	22.3	23.4	0.7	4.1	1.7	5.6	3.7	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	80.9	14.1	10.0	50.3	83.7	88.1	37.9	36.2	31.1	97.5	29.7	25.4
LnGrp LOS	F	B	B	D	F	F	D	D	C	F	C	C
Approach Vol, veh/h		988			1572			397			590	
Approach Delay, s/veh		25.4			84.5			35.2			67.6	
Approach LOS		C			F			D			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.1	40.7	11.7	17.6	13.1	35.7	7.8	21.6				
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5				
Max Green Setting (Gmax), s	5.0	33.8	7.2	24.0	8.6	30.2	7.2	24.0				
Max Q Clear Time (g_c+I1), s	4.8	9.7	9.2	10.7	10.0	32.2	3.7	10.4				
Green Ext Time (p_c), s	0.0	5.4	0.0	1.4	0.0	0.0	0.0	1.2				
Intersection Summary												
HCM 6th Ctrl Delay			59.7									
HCM 6th LOS			E									

HCM 6th Signalized Intersection Summary
 8: Sierra College Blvd & Brace Road

08/13/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗	↖	↗		↖	↑↑↑	↗	↖	↑↑	↗
Traffic Volume (veh/h)	3	3	122	129	4	132	4	770	59	174	1444	1
Future Volume (veh/h)	3	3	122	129	4	132	4	770	59	174	1444	1
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	3	3	133	140	4	143	4	837	64	189	1570	1
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	187	164	364	289	10	356	215	2290	711	242	2272	1014
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.45	0.45	0.45	0.14	0.64	0.64
Sat Flow, veh/h	492	715	1585	1253	43	1548	327	5106	1585	1781	3554	1585
Grp Volume(v), veh/h	6	0	133	140	0	147	4	837	64	189	1570	1
Grp Sat Flow(s),veh/h/ln	1207	0	1585	1253	0	1592	327	1702	1585	1781	1777	1585
Q Serve(g_s), s	0.0	0.0	5.1	7.8	0.0	5.7	0.6	7.9	1.7	7.5	20.8	0.0
Cycle Q Clear(g_c), s	5.7	0.0	5.1	13.5	0.0	5.7	7.5	7.9	1.7	7.5	20.8	0.0
Prop In Lane	0.50		1.00	1.00		0.97	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	352	0	364	289	0	366	215	2290	711	242	2272	1014
V/C Ratio(X)	0.02	0.00	0.36	0.48	0.00	0.40	0.02	0.37	0.09	0.78	0.69	0.00
Avail Cap(c_a), veh/h	521	0	545	431	0	547	241	2702	839	563	3199	1427
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(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.7	0.0	23.5	29.5	0.0	23.8	15.4	13.2	11.5	30.4	8.5	4.7
Incr Delay (d2), s/veh	0.0	0.0	0.6	1.8	0.0	1.0	0.0	0.1	0.1	7.6	0.5	0.0
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	0.1	0.0	1.9	2.4	0.0	2.1	0.0	2.6	0.5	3.5	5.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.8	0.0	24.2	31.3	0.0	24.8	15.4	13.4	11.6	37.9	9.0	4.7
LnGrp LOS	C	A	C	C	A	C	B	B	B	D	A	A
Approach Vol, veh/h		139			287			905			1760	
Approach Delay, s/veh		24.1			27.9			13.3			12.1	
Approach LOS		C			C			B			B	
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	13.9	38.1		20.7		52.0		20.7				
Change Period (Y+Rc), s	4.0	5.5		4.0		5.5		4.0				
Max Green Setting (Gmax), s	23.0	38.5		25.0		65.5		25.0				
Max Q Clear Time (g_c+I1), s	9.5	9.9		7.7		22.8		15.5				
Green Ext Time (p_c), s	0.6	9.1		0.4		23.8		1.3				

Intersection Summary												
HCM 6th Ctrl Delay				14.5								
HCM 6th LOS				B								

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	0	0	0	0	0	0
Future Vol, veh/h	0	0	0	0	0	0
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	-	-	-	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	0	0	0	0	0	0

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1	0	0	0	0	0
Stage 1	0	-	-	-	-	-
Stage 2	1	-	-	-	-	-
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	1022	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	1022	-	-	-	-	-
Platoon blocked, %						
Mov Cap-1 Maneuver	1022	-	-	-	-	-
Mov Cap-2 Maneuver	1022	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	1022	-	-	-	-	-

Approach	WB	NE	SW
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NET	NERWBLn1	SWL	SWT
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	-	0	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	-

Queues

5: Taylor Road & Sierra College Blvd

08/13/2023



Lane Group	NBL	NBT	NBR	SBL	SBT	NEL	NET	NER	SWL	SWT	SWR
Lane Group Flow (vph)	145	1291	388	46	924	162	334	185	385	340	80
v/c Ratio	0.83	0.87	0.38	0.47	0.80	0.63	0.75	0.37	1.27	0.73	0.16
Control Delay	75.2	32.0	5.8	56.5	31.2	50.1	41.3	8.6	179.7	39.2	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.2	32.0	5.8	56.5	31.2	50.1	41.3	8.6	179.7	39.2	1.6
Queue Length 50th (ft)	80	357	40	25	231	45	170	10	~146	173	0
Queue Length 95th (ft)	#189	#524	101	#67	316	78	263	60	#241	269	7
Internal Link Dist (ft)		251			329		957			568	
Turn Bay Length (ft)											
Base Capacity (vph)	187	1516	1011	108	1299	303	549	580	303	549	564
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.85	0.38	0.43	0.71	0.53	0.61	0.32	1.27	0.62	0.14

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Queues

8: Sierra College Blvd & Brace Road

08/13/2023


























Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	8	183	148	163	5	1665	192	166	1177
v/c Ratio	0.02	0.43	0.49	0.35	0.02	0.72	0.23	0.56	0.50
Control Delay	27.6	17.5	35.9	7.7	16.0	21.7	3.5	40.1	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.6	17.5	35.9	7.7	16.0	21.7	3.5	40.1	7.9
Queue Length 50th (ft)	3	36	69	2	1	241	0	80	132
Queue Length 95th (ft)	16	100	136	51	9	382	41	150	218
Internal Link Dist (ft)	857			946		318			239
Turn Bay Length (ft)									
Base Capacity (vph)	505	545	420	588	206	2349	834	488	2781
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.34	0.35	0.28	0.02	0.71	0.23	0.34	0.42

Intersection Summary

HCM 6th Signalized Intersection Summary
 5: Taylor Road & Sierra College Blvd

08/13/2023

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	133	1188	357	42	723	127	149	307	170	354	313	74
Future Volume (veh/h)	133	1188	357	42	723	127	149	307	170	354	313	74
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	145	1291	388	46	786	138	162	334	185	385	340	80
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	179	1456	792	58	1032	181	238	409	347	310	448	380
Arrive On Green	0.10	0.41	0.41	0.03	0.34	0.34	0.07	0.22	0.22	0.09	0.24	0.24
Sat Flow, veh/h	1781	3554	1585	1781	3021	530	3456	1870	1585	3456	1870	1585
Grp Volume(v), veh/h	145	1291	388	46	462	462	162	334	185	385	340	80
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1775	1728	1870	1585	1728	1870	1585
Q Serve(g_s), s	6.4	27.0	13.0	2.1	18.6	18.6	3.7	13.6	8.3	7.2	13.6	3.2
Cycle Q Clear(g_c), s	6.4	27.0	13.0	2.1	18.6	18.6	3.7	13.6	8.3	7.2	13.6	3.2
Prop In Lane	1.00		1.00	1.00		0.30	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	179	1456	792	58	607	606	238	409	347	310	448	380
V/C Ratio(X)	0.81	0.89	0.49	0.80	0.76	0.76	0.68	0.82	0.53	1.24	0.76	0.21
Avail Cap(c_a), veh/h	191	1497	810	111	669	668	310	559	474	310	559	474
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	35.3	22.0	13.3	38.6	23.5	23.5	36.5	29.8	27.7	36.5	28.3	24.4
Incr Delay (d2), s/veh	19.4	6.8	0.6	8.9	4.9	4.9	1.9	7.2	1.5	133.1	5.1	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	3.6	11.3	4.1	1.0	7.8	7.8	1.5	6.5	3.1	8.6	6.3	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.8	28.8	13.9	47.4	28.4	28.4	38.4	37.1	29.3	169.6	33.4	24.8
LnGrp LOS	D	C	B	D	C	C	D	D	C	F	C	C
Approach Vol, veh/h		1824			970			681			805	
Approach Delay, s/veh		27.7			29.3			35.3			97.7	
Approach LOS		C			C			D			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.1	38.4	11.7	23.1	12.6	32.9	10.0	24.7				
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5				
Max Green Setting (Gmax), s	5.0	33.8	7.2	24.0	8.6	30.2	7.2	24.0				
Max Q Clear Time (g_c+I1), s	4.1	29.0	9.2	15.6	8.4	20.6	5.7	15.6				
Green Ext Time (p_c), s	0.0	3.9	0.0	1.9	0.0	4.3	0.0	1.6				
Intersection Summary												
HCM 6th Ctrl Delay			42.4									
HCM 6th LOS			D									

HCM 6th Signalized Intersection Summary
 8: Sierra College Blvd & Brace Road

08/13/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗	↖	↗		↖	↑↑↑	↗	↖	↑↑	↗
Traffic Volume (veh/h)	4	4	168	136	4	146	5	1532	177	153	1083	0
Future Volume (veh/h)	4	4	168	136	4	146	5	1532	177	153	1083	0
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	4	4	183	148	4	159	5	1665	192	166	1177	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	189	167	390	285	10	382	307	2335	725	214	2238	998
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.46	0.46	0.46	0.12	0.63	0.00
Sat Flow, veh/h	481	679	1585	1196	39	1552	476	5106	1585	1781	3554	1585
Grp Volume(v), veh/h	8	0	183	148	0	163	5	1665	192	166	1177	0
Grp Sat Flow(s),veh/h/ln	1161	0	1585	1196	0	1591	476	1702	1585	1781	1777	1585
Q Serve(g_s), s	0.0	0.0	7.5	9.1	0.0	6.6	0.5	20.1	5.7	6.9	14.1	0.0
Cycle Q Clear(g_c), s	6.6	0.0	7.5	15.7	0.0	6.6	1.3	20.1	5.7	6.9	14.1	0.0
Prop In Lane	0.50		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	356	0	390	285	0	392	307	2335	725	214	2238	998
V/C Ratio(X)	0.02	0.00	0.47	0.52	0.00	0.42	0.02	0.71	0.26	0.78	0.53	0.00
Avail Cap(c_a), veh/h	474	0	517	381	0	519	328	2565	796	534	3037	1354
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(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.0	0.0	24.6	30.9	0.0	24.3	11.9	16.7	12.8	32.7	7.9	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.9	2.1	0.0	1.0	0.0	1.0	0.3	8.3	0.3	0.0
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	0.1	0.0	2.9	2.7	0.0	2.5	0.0	7.0	1.8	3.3	4.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.0	0.0	25.5	32.9	0.0	25.3	11.9	17.7	13.1	41.0	8.1	0.0
LnGrp LOS	C	A	C	C	A	C	B	B	B	D	A	A
Approach Vol, veh/h		191			311			1862			1343	
Approach Delay, s/veh		25.3			28.9			17.2			12.2	
Approach LOS		C			C			B			B	
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	13.2	40.6		22.9		53.8		22.9				
Change Period (Y+Rc), s	4.0	5.5		4.0		5.5		4.0				
Max Green Setting (Gmax), s	23.0	38.5		25.0		65.5		25.0				
Max Q Clear Time (g_c+I1), s	8.9	22.1		9.5		16.1		17.7				
Green Ext Time (p_c), s	0.6	12.9		0.5		16.3		1.2				

Intersection Summary		
HCM 6th Ctrl Delay		16.8
HCM 6th LOS		B

HCM 6th TWSC
1: Pacific St/Taylor Road

08/13/2023

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	0	0	0	0	0	0
Future Vol, veh/h	0	0	0	0	0	0
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	-	-	-	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	0	0	0	0	0	0

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1	0	0	0	0	0
Stage 1	0	-	-	-	-	-
Stage 2	1	-	-	-	-	-
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	1022	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	1022	-	-	-	-	-
Platoon blocked, %						
Mov Cap-1 Maneuver	1022	-	-	-	-	-
Mov Cap-2 Maneuver	1022	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	1022	-	-	-	-	-

Approach	WB	NE	SW
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NET	NERWBLn1	SWL	SWT
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	-	0	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	-

Queues
5: Taylor Road

08/13/2023



Lane Group	NBL	NBT	NBR	SBL	SBT	NEL	NET	NER	SWL	SWT	SWR
Lane Group Flow (vph)	184	540	261	64	1506	78	217	101	329	223	35
v/c Ratio	0.99	0.35	0.25	0.62	1.16	0.37	0.61	0.24	1.09	0.50	0.07
Control Delay	104.4	17.3	2.0	65.6	107.9	42.8	37.8	3.6	115.7	32.1	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	104.4	17.3	2.0	65.6	107.9	42.8	37.8	3.6	115.7	32.1	0.3
Queue Length 50th (ft)	95	95	0	32	~479	20	102	0	~97	101	0
Queue Length 95th (ft)	#242	155	34	#97	#692	43	170	20	#196	174	0
Internal Link Dist (ft)		251			329		957			568	
Turn Bay Length (ft)											
Base Capacity (vph)	186	1550	1046	108	1297	302	547	563	302	547	563
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.99	0.35	0.25	0.59	1.16	0.26	0.40	0.18	1.09	0.41	0.06

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Queues
8: Brace Road
























08/13/2023



Lane Group	EBT	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	133	140	143	837	64	189	1570	1
v/c Ratio	0.29	0.46	0.28	0.44	0.10	0.55	0.72	0.00
Control Delay	16.1	33.4	7.0	19.2	5.5	36.5	11.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.1	33.4	7.0	19.2	5.5	36.5	12.0	0.0
Queue Length 50th (ft)	23	55	0	99	0	78	212	0
Queue Length 95th (ft)	81	137	47	176	26	174	367	0
Internal Link Dist (ft)	857	946		318			239	
Turn Bay Length (ft)								
Base Capacity (vph)	591	411	629	2650	855	550	3042	1362
Starvation Cap Reductn	0	0	0	0	0	0	148	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.34	0.23	0.32	0.07	0.34	0.54	0.00
Intersection Summary								

HCM 6th Signalized Intersection Summary
5: Taylor Road













08/13/2023

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	169	497	240	59	1226	159	72	200	93	303	205	32
Future Volume (veh/h)	169	497	240	59	1226	159	72	200	93	303	205	32
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	184	540	261	64	1333	173	78	217	101	329	223	35
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	196	1603	861	82	1224	158	144	290	245	319	384	325
Arrive On Green	0.11	0.45	0.45	0.05	0.39	0.39	0.04	0.15	0.15	0.09	0.21	0.21
Sat Flow, veh/h	1781	3554	1585	1781	3166	408	3456	1870	1585	3456	1870	1585
Grp Volume(v), veh/h	184	540	261	64	744	762	78	217	101	329	223	35
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1797	1728	1870	1585	1728	1870	1585
Q Serve(g_s), s	8.0	7.7	7.0	2.8	30.2	30.2	1.7	8.7	4.5	7.2	8.4	1.4
Cycle Q Clear(g_c), s	8.0	7.7	7.0	2.8	30.2	30.2	1.7	8.7	4.5	7.2	8.4	1.4
Prop In Lane	1.00		1.00	1.00		0.23	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	196	1603	861	82	687	695	144	290	245	319	384	325
V/C Ratio(X)	0.94	0.34	0.30	0.78	1.08	1.10	0.54	0.75	0.41	1.03	0.58	0.11
Avail Cap(c_a), veh/h	196	1603	861	114	687	695	319	575	487	319	575	487
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(l)	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	34.5	13.9	9.8	36.9	23.9	23.9	36.7	31.6	29.8	35.4	28.0	25.2
Incr Delay (d2), s/veh	46.3	0.1	0.2	13.4	59.1	63.4	1.2	4.7	1.3	59.1	1.7	0.2
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	5.8	2.8	2.1	1.5	22.4	23.5	0.7	4.1	1.7	5.5	3.7	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	80.7	14.0	10.0	50.3	83.0	87.3	37.8	36.2	31.1	94.5	29.7	25.4
LnGrp LOS	F	B	A	D	F	F	D	D	C	F	C	C
Approach Vol, veh/h		985			1570			396			587	
Approach Delay, s/veh		25.4			83.8			35.2			65.8	
Approach LOS		C			F			D			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.1	40.7	11.7	17.6	13.1	35.7	7.8	21.5				
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5				
Max Green Setting (Gmax), s	5.0	33.8	7.2	24.0	8.6	30.2	7.2	24.0				
Max Q Clear Time (g_c+I1), s	4.8	9.7	9.2	10.7	10.0	32.2	3.7	10.4				
Green Ext Time (p_c), s	0.0	5.4	0.0	1.4	0.0	0.0	0.0	1.2				
Intersection Summary												
HCM 6th Ctrl Delay			59.1									
HCM 6th LOS			E									

HCM 6th Signalized Intersection Summary

8: Brace Road

08/13/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↑	↗		↑↑↑	↗	↘	↑↑	↗
Traffic Volume (veh/h)	0	0	122	129	0	132	0	770	59	174	1444	1
Future Volume (veh/h)	0	0	122	129	0	132	0	770	59	174	1444	1
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	1870	0	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	0	133	140	0	143	0	837	64	189	1570	1
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, %	0	2	2	2	2	2	0	2	2	2	2	2
Cap, veh/h	0	0	354	292	0	354	0	2307	716	243	2289	1021
Arrive On Green	0.00	0.00	0.22	0.22	0.00	0.22	0.00	0.45	0.45	0.14	0.64	0.64
Sat Flow, veh/h	0	0	1585	856	0	1585	0	5274	1585	1781	3554	1585
Grp Volume(v), veh/h	0	0	133	140	0	143	0	837	64	189	1570	1
Grp Sat Flow(s),veh/h/ln	0	0	1585	856	0	1585	0	1702	1585	1781	1777	1585
Q Serve(g_s), s	0.0	0.0	5.1	7.6	0.0	5.5	0.0	7.7	1.7	7.3	20.2	0.0
Cycle Q Clear(g_c), s	0.0	0.0	5.1	12.7	0.0	5.5	0.0	7.7	1.7	7.3	20.2	0.0
Prop In Lane	0.00		1.00	1.00		1.00	0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	0	354	292	0	354	0	2307	716	243	2289	1021
V/C Ratio(X)	0.00	0.00	0.38	0.48	0.00	0.40	0.00	0.36	0.09	0.78	0.69	0.00
Avail Cap(c_a), veh/h	0	0	554	450	0	554	0	2747	853	572	3252	1451
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)	0.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	23.6	29.0	0.0	23.7	0.0	12.9	11.2	29.9	8.1	4.5
Incr Delay (d2), s/veh	0.0	0.0	0.7	1.7	0.0	1.1	0.0	0.1	0.1	7.5	0.5	0.0
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	0.0	0.0	1.9	2.3	0.0	2.0	0.0	2.6	0.5	3.4	5.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	24.2	30.7	0.0	24.8	0.0	13.0	11.3	37.3	8.6	4.5
LnGrp LOS	A	A	C	C	A	C	A	B	B	D	A	A
Approach Vol, veh/h		133			283			901			1760	
Approach Delay, s/veh		24.2			27.7			12.9			11.7	
Approach LOS		C			C			B			B	
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	13.8	37.8		20.0		51.6		20.0				
Change Period (Y+Rc), s	4.0	5.5		4.0		5.5		4.0				
Max Green Setting (Gmax), s	23.0	38.5		25.0		65.5		25.0				
Max Q Clear Time (g_c+I1), s	9.3	9.7		7.1		22.2		14.7				
Green Ext Time (p_c), s	0.7	9.0		0.7		23.9		1.3				
Intersection Summary												
HCM 6th Ctrl Delay			14.1									
HCM 6th LOS			B									

HCM 6th TWSC
1: Pacific St/Taylor Road

08/13/2023

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	2	0	318	102	8	467
Future Vol, veh/h	2	0	318	102	8	467
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	-	-	-	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	0	346	111	9	508

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	928	402	0	0	457
Stage 1	402	-	-	-	-
Stage 2	526	-	-	-	-
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	297	648	-	-	1104
Stage 1	676	-	-	-	-
Stage 2	593	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	295	648	-	-	1104
Mov Cap-2 Maneuver	295	-	-	-	-
Stage 1	676	-	-	-	-
Stage 2	588	-	-	-	-

Approach	WB	NE	SW
HCM Control Delay, s	17.3	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NERWBLn1	SWL	SWT
Capacity (veh/h)	-	-	295	1104
HCM Lane V/C Ratio	-	-	0.007	0.008
HCM Control Delay (s)	-	-	17.3	8.3
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0	0

Queues
5: Taylor Road

08/13/2023



Lane Group	NBL	NBT	NBR	SBL	SBT	NEL	NET	NER	SWL	SWT	SWR
Lane Group Flow (vph)	145	1289	386	46	921	162	333	185	382	340	80
v/c Ratio	0.82	0.87	0.38	0.47	0.80	0.63	0.75	0.37	1.26	0.73	0.16
Control Delay	75.0	31.9	5.7	56.5	31.1	50.1	41.2	8.5	175.6	39.2	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.0	31.9	5.7	56.5	31.1	50.1	41.2	8.5	175.6	39.2	1.6
Queue Length 50th (ft)	80	356	40	25	230	45	169	9	~145	173	0
Queue Length 95th (ft)	#189	#523	99	#67	315	78	263	60	#240	269	7
Internal Link Dist (ft)		251			329		957			568	
Turn Bay Length (ft)											
Base Capacity (vph)	187	1516	1012	108	1300	303	549	581	303	549	565
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.85	0.38	0.43	0.71	0.53	0.61	0.32	1.26	0.62	0.14

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Queues
8: Brace Road
























08/13/2023



Lane Group	EBT	WBT	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	183	148	159	1665	192	166	1177
v/c Ratio	0.40	0.64	0.32	0.74	0.24	0.56	0.51
Control Delay	16.5	44.7	6.8	23.4	3.7	41.5	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.5	44.7	6.8	23.4	3.7	41.5	8.8
Queue Length 50th (ft)	36	73	0	254	0	82	143
Queue Length 95th (ft)	99	149	48	396	42	155	232
Internal Link Dist (ft)	857	946		318			239
Turn Bay Length (ft)							
Base Capacity (vph)	543	290	576	2295	819	477	2718
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.51	0.28	0.73	0.23	0.35	0.43
Intersection Summary							

HCM 6th Signalized Intersection Summary
5: Taylor Road













08/13/2023

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	133	1186	355	42	720	127	149	306	170	351	313	74
Future Volume (veh/h)	133	1186	355	42	720	127	149	306	170	351	313	74
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	145	1289	386	46	783	138	162	333	185	382	340	80
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	179	1456	792	58	1032	182	238	409	346	310	448	379
Arrive On Green	0.10	0.41	0.41	0.03	0.34	0.34	0.07	0.22	0.22	0.09	0.24	0.24
Sat Flow, veh/h	1781	3554	1585	1781	3019	532	3456	1870	1585	3456	1870	1585
Grp Volume(v), veh/h	145	1289	386	46	461	460	162	333	185	382	340	80
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1775	1728	1870	1585	1728	1870	1585
Q Serve(g_s), s	6.4	26.9	12.9	2.1	18.5	18.5	3.7	13.6	8.3	7.2	13.5	3.2
Cycle Q Clear(g_c), s	6.4	26.9	12.9	2.1	18.5	18.5	3.7	13.6	8.3	7.2	13.5	3.2
Prop In Lane	1.00		1.00	1.00		0.30	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	179	1456	792	58	607	606	238	409	346	310	448	379
V/C Ratio(X)	0.81	0.89	0.49	0.80	0.76	0.76	0.68	0.82	0.53	1.23	0.76	0.21
Avail Cap(c_a), veh/h	191	1499	811	111	670	669	310	560	475	310	560	475
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	35.3	21.9	13.3	38.5	23.4	23.4	36.4	29.8	27.7	36.5	28.3	24.4
Incr Delay (d2), s/veh	19.4	6.7	0.6	8.9	4.8	4.8	1.9	7.2	1.5	128.7	5.1	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	3.6	11.3	4.1	1.0	7.8	7.8	1.5	6.5	3.1	8.4	6.3	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.7	28.6	13.8	47.4	28.3	28.3	38.4	37.0	29.3	165.2	33.4	24.8
LnGrp LOS	D	C	B	D	C	C	D	D	C	F	C	C
Approach Vol, veh/h		1820			967			680				802
Approach Delay, s/veh		27.5			29.2			35.2				95.3
Approach LOS		C			C			D				F
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.1	38.3	11.7	23.0	12.6	32.9	10.0	24.7				
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5				
Max Green Setting (Gmax), s	5.0	33.8	7.2	24.0	8.6	30.2	7.2	24.0				
Max Q Clear Time (g_c+I1), s	4.1	28.9	9.2	15.6	8.4	20.5	5.7	15.5				
Green Ext Time (p_c), s	0.0	3.9	0.0	1.9	0.0	4.4	0.0	1.6				
Intersection Summary												
HCM 6th Ctrl Delay			41.9									
HCM 6th LOS			D									

HCM 6th Signalized Intersection Summary

8: Brace Road

08/13/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↑	↗		↑↑↑	↗	↘	↑↑	↗
Traffic Volume (veh/h)	0	0	168	136	0	146	0	1532	177	153	1083	0
Future Volume (veh/h)	0	0	168	136	0	146	0	1532	177	153	1083	0
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	1870	0	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	0	183	148	0	159	0	1665	192	166	1177	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, %	0	2	2	2	2	2	0	2	2	2	2	2
Cap, veh/h	0	0	403	281	0	403	0	2309	717	214	2216	988
Arrive On Green	0.00	0.00	0.25	0.25	0.00	0.25	0.00	0.45	0.45	0.12	0.62	0.00
Sat Flow, veh/h	0	0	1585	742	0	1585	0	5274	1585	1781	3554	1585
Grp Volume(v), veh/h	0	0	183	148	0	159	0	1665	192	166	1177	0
Grp Sat Flow(s),veh/h/ln	0	0	1585	742	0	1585	0	1702	1585	1781	1777	1585
Q Serve(g_s), s	0.0	0.0	7.6	9.2	0.0	6.5	0.0	20.6	5.9	7.0	14.5	0.0
Cycle Q Clear(g_c), s	0.0	0.0	7.6	16.8	0.0	6.5	0.0	20.6	5.9	7.0	14.5	0.0
Prop In Lane	0.00		1.00	1.00		1.00	0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	0	403	281	0	403	0	2309	717	214	2216	988
V/C Ratio(X)	0.00	0.00	0.45	0.53	0.00	0.39	0.00	0.72	0.27	0.78	0.53	0.00
Avail Cap(c_a), veh/h	0	0	509	361	0	509	0	2526	784	526	2991	1334
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(l)	0.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	24.5	31.5	0.0	24.0	0.0	17.3	13.3	33.2	8.2	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.8	2.2	0.0	0.9	0.0	1.1	0.3	8.4	0.3	0.0
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	0.0	0.0	2.9	2.7	0.0	2.4	0.0	7.2	1.9	3.4	4.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	25.3	33.7	0.0	24.9	0.0	18.4	13.6	41.6	8.5	0.0
LnGrp LOS	A	A	C	C	A	C	A	B	B	D	A	A
Approach Vol, veh/h		183			307			1857			1343	
Approach Delay, s/veh		25.3			29.2			17.9			12.6	
Approach LOS		C			C			B			B	
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	13.3	40.7		23.8		54.0		23.8				
Change Period (Y+Rc), s	4.0	5.5		4.0		5.5		4.0				
Max Green Setting (Gmax), s	23.0	38.5		25.0		65.5		25.0				
Max Q Clear Time (g_c+I1), s	9.0	22.6		9.6		16.5		18.8				
Green Ext Time (p_c), s	0.6	12.6		1.0		16.3		1.0				
Intersection Summary												
HCM 6th Ctrl Delay				17.3								
HCM 6th LOS				B								

HCM 6th TWSC
1: Pacific St/Taylor Road

08/13/2023

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	2	0	318	102	8	467
Future Vol, veh/h	2	0	318	102	8	467
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	-	-	-	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	0	346	111	9	508

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	928	402	0	0	457
Stage 1	402	-	-	-	-
Stage 2	526	-	-	-	-
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	297	648	-	-	1104
Stage 1	676	-	-	-	-
Stage 2	593	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	295	648	-	-	1104
Mov Cap-2 Maneuver	295	-	-	-	-
Stage 1	676	-	-	-	-
Stage 2	588	-	-	-	-

Approach	WB	NE	SW
HCM Control Delay, s	17.3	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NERWBLn1	SWL	SWT
Capacity (veh/h)	-	-	295	1104
HCM Lane V/C Ratio	-	-	0.007	0.008
HCM Control Delay (s)	-	-	17.3	8.3
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0	0

Intersection						
Int Delay, s/veh	1.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	↷
Traffic Vol, veh/h	6	111	8	21	17	7
Future Vol, veh/h	6	111	8	21	17	7
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	7	121	9	23	18	8

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	32	0	-	0	156 21
Stage 1	-	-	-	-	21 -
Stage 2	-	-	-	-	135 -
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	1580	-	-	-	835 1056
Stage 1	-	-	-	-	1002 -
Stage 2	-	-	-	-	891 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1580	-	-	-	831 1056
Mov Cap-2 Maneuver	-	-	-	-	831 -
Stage 1	-	-	-	-	997 -
Stage 2	-	-	-	-	891 -

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1580	-	-	-	886
HCM Lane V/C Ratio	0.004	-	-	-	0.029
HCM Control Delay (s)	7.3	0	-	-	9.2
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑↑↑	↑↑↑	↗
Traffic Vol, veh/h	0	10	0	622	848	12
Future Vol, veh/h	0	10	0	622	848	12
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	-	-	-	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	0	11	0	676	922	13

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	-	461	-	0	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-
Pot Cap-1 Maneuver	0	468	0	-	-
Stage 1	0	-	0	-	-
Stage 2	0	-	0	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	-	468	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.9	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	468	-	-
HCM Lane V/C Ratio	-	0.023	-	-
HCM Control Delay (s)	-	12.9	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

Intersection						
Int Delay, s/veh	1.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	↷
Traffic Vol, veh/h	6	144	1	22	19	8
Future Vol, veh/h	6	144	1	22	19	8
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	7	157	1	24	21	9

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	25	0	-	0	184
Stage 1	-	-	-	-	13
Stage 2	-	-	-	-	171
Critical Hdwy	4.12	-	-	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	2.218	-	-	-	3.518
Pot Cap-1 Maneuver	1589	-	-	-	805
Stage 1	-	-	-	-	1010
Stage 2	-	-	-	-	859
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1589	-	-	-	801
Mov Cap-2 Maneuver	-	-	-	-	801
Stage 1	-	-	-	-	1005
Stage 2	-	-	-	-	859

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	9.3
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1589	-	-	-	865
HCM Lane V/C Ratio	0.004	-	-	-	0.034
HCM Control Delay (s)	7.3	0	-	-	9.3
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑↑↑	↑↑↑	↗
Traffic Vol, veh/h	0	10	0	622	860	12
Future Vol, veh/h	0	10	0	622	860	12
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	-	-	-	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	0	11	0	676	935	13

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	-	468	-	0	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-
Pot Cap-1 Maneuver	0	463	0	-	-
Stage 1	0	-	0	-	-
Stage 2	0	-	0	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	-	463	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	463	-	-
HCM Lane V/C Ratio	-	0.023	-	-
HCM Control Delay (s)	-	13	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

Appendix 5 – Traffic Signal Warrant Analysis

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 1 of 5)

COUNT DATE 5/10/2023
 CALC _____ DATE _____
 CHK _____ DATE _____

DIST _____ CO _____ RTE _____ PM _____

Major St: TAYLOR ROAD Critical Approach Speed 40 mph
 Minor St: BRACE ROAD Critical Approach Speed _____ mph

Speed limit or critical speed on major street traffic > 40 mph..... }
 or } **RURAL (R)**
 In built up area of isolated community of < 10,000 population..... }
 URBAN (U)

WARRANT 1 - Eight Hour Vehicular Volume SATISFIED YES NO
 (Condition A or Condition B or combination of A and B must be satisfied)

Condition A - Minimum Vehicle Volume 100% SATISFIED YES NO

80% SATISFIED YES NO

APPROACH LANES	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)												
	U		R										
	1	2 or More											
Both Approaches Major Street	500 (400)	350 (280)	600 (480)	420 (336)	337	553	775	659	930	959	869	580	Hour
Highest Approach Minor Street	150 (120)	105 (84)	200 (160)	140 (112)	2	6	1	2	2	2	1	1	

Condition B - Interruption of Continuous Traffic 100% SATISFIED YES NO

80% SATISFIED YES NO

APPROACH LANES	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)												
	U		R										
	1	2 or More											
Both Approaches Major Street	750 (600)	525 (420)	900 (720)	630 (504)	337	553	775	659	930	959	869	580	Hour
Highest Approach Minor Street	75 (60)	53 (42)	100 (80)	70 (56)	2	6	1	2	2	2	1	1	

Combination of Conditions A & B SATISFIED YES NO

REQUIREMENT	CONDITION	✓	FULFILLED
TWO CONDITIONS SATISFIED 80%	A. MINIMUM VEHICULAR VOLUME		Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
	AND, B. INTERRUPTION OF CONTINUOUS TRAFFIC		
AND, AN ADEQUATE TRIAL OF OTHER ALTERNATIVES THAT COULD CAUSE LESS DELAY AND INCONVENIENCE TO TRAFFIC HAS FAILED TO SOLVE THE TRAFFIC PROBLEMS			Yes <input type="checkbox"/> No <input type="checkbox"/>

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 2 of 5)

WARRANT 2 - Four Hour Vehicular Volume

SATISFIED* YES NO

Record hourly vehicular volumes for any four hours of an average day

APPROACH LANES	One	2 or More	Hour			
			8-9 AM	3-4 PM	4-5 PM	5-6 PM
Both Approaches - Major Street	X		775	930	959	869
Higher Approach - Minor Street	X		1	2	2	1

*All plotted points fall above the applicable curve in Figure 4C-1. (URBAN AREAS)	Yes <input type="checkbox"/>	No <input type="checkbox"/>
<u>OR</u> , All plotted points fall above the applicable curve in Figure 4C-2. (RURAL AREAS)	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>

WARRANT 3 - Peak Hour
 (Part A or Part B must be satisfied)

SATISFIED YES NO

PART A

SATISFIED YES NO

(All parts 1, 2, and 3 below must be satisfied for the same one hour, for any four consecutive 15-minute periods)

1. The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach, or five vehicle-hours for a two-lane approach; <u>AND</u>	Yes <input type="checkbox"/>	No <input type="checkbox"/>
2. The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; <u>AND</u>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches.	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

PART B

SATISFIED YES NO

APPROACH LANES	One	2 or More	Hour
			4-5 PM
Both Approaches - Major Street	X		959
Higher Approach - Minor Street	X		2

The plotted point falls above the applicable curve in Figure 4C-3. (URBAN AREAS)	Yes <input type="checkbox"/>	No <input type="checkbox"/>
<u>OR</u> , The plotted point falls above the applicable curve in Figure 4C-4. (RURAL AREAS)	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 3 of 5)

WARRANT 4 - Pedestrian Volume
 (Parts 1 and 2 Must Be Satisfied)

N/A

SATISFIED YES NO

Part 1 (Parts A or B must be satisfied)

Hours -->

A.

Vehicles per hour for any 4 hours				
Pedestrians per hour for any 4 hours				

Figure 4C-5 or Figure 4C-6
 SATISFIED YES NO

Hours -->

B.

Vehicles per hour for any 1 hour				
Pedestrians per hour for any 1 hour				

Figure 4C-7 or Figure 4C-8
 SATISFIED YES NO

Part 2

SATISFIED YES NO

<u>AND</u> , The distance to the nearest traffic signal along the major street is greater than 300 ft	Yes <input type="checkbox"/>	No <input type="checkbox"/>
<u>OR</u> , The proposed traffic signal will not restrict progressive traffic flow along the major street.	Yes <input type="checkbox"/>	No <input type="checkbox"/>

WARRANT 5 - School Crossing
 (Parts A and B Must Be Satisfied)

N/A

SATISFIED YES NO

Part A

Gap/Minutes and # of Children

SATISFIED YES NO

Gaps vs Minutes	Minutes Children Using Crossing	Hour
	Number of Adequate Gaps	
School Age Pedestrians Crossing Street / hr		

Gaps < Minutes YES NO

AND Children > 20/hr YES NO

<u>AND</u> , Consideration has been given to less restrictive remedial measures.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
--	------------------------------	-----------------------------

Part B

SATISFIED YES NO

The distance to the nearest traffic signal along the major street is greater than 300 ft	Yes <input type="checkbox"/>	No <input type="checkbox"/>
<u>OR</u> , The proposed signal will not restrict the progressive movement of traffic.	Yes <input type="checkbox"/>	No <input type="checkbox"/>

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 4 of 5)

WARRANT 6 - Coordinated Signal System
 (All Parts Must Be Satisfied)

SATISFIED YES NO

MINIMUM REQUIREMENTS	DISTANCE TO NEAREST SIGNAL	
≥ 1000 ft	N <u>950</u> ft, S <u>3,560</u> ft, E <u>850</u> ft, W <u> </u> ft	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
On a one-way street or a street that has traffic predominantly in one direction, the adjacent traffic control signals are so far apart that they do not provide the necessary degree of vehicular platooning.		Yes <input type="checkbox"/> No <input type="checkbox"/>
OR, On a two-way street, adjacent traffic control signals do not provide the necessary degree of platooning and the proposed and adjacent traffic control signals will collectively provide a progressive operation.		

WARRANT 7 - Crash Experience Warrant
 (All Parts Must Be Satisfied)

SATISFIED YES NO

Adequate trial of alternatives with satisfactory observance and enforcement has failed to reduce the crash frequency.		Yes <input type="checkbox"/> No <input type="checkbox"/>
REQUIREMENTS	Number of crashes reported within a 12 month period susceptible to correction by a traffic signal, and involving injury or damage exceeding the requirements for a reportable crash.	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
5 OR MORE	<u>0</u>	
REQUIREMENTS	CONDITIONS	✓
ONE CONDITION SATISFIED 80%	Warrant 1, Condition A - Minimum Vehicular Volume	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
	OR, Warrant 1, Condition B - Interruption of Continuous Traffic	
	OR, Warrant 4, Pedestrian Volume Condition Ped Vol ≥ 80% of Figure 4C-5 through Figure 4C-8	

WARRANT 8 - Roadway Network
 (All Parts Must Be Satisfied)

N/A

SATISFIED YES NO

MINIMUM VOLUME REQUIREMENTS	ENTERING VOLUMES - ALL APPROACHES	✓	FULFILLED
1000 Veh/Hr	During Typical Weekday Peak Hour _____ Veh/Hr and has 5-year projected traffic volumes that meet one or more of Warrants 1, 2, and 3 during an average weekday.		Yes <input type="checkbox"/> No <input type="checkbox"/>
	OR During Each of Any 5 Hrs. of a Sat. or Sun _____ Veh/Hr		
CHARACTERISTICS OF MAJOR ROUTES		MAJOR ROUTE A	MAJOR ROUTE B
Hwy. System Serving as Principal Network for Through Traffic			
Rural or Suburban Highway Outside Of, Entering, or Traversing a City			
Appears as Major Route on an Official Plan			
Any Major Route Characteristics Met, Both Streets			Yes <input type="checkbox"/> No <input type="checkbox"/>

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 5 of 5)

WARRANT 9 - Intersection Near a Grade Crossing *N/A* **SATISFIED YES NO**
 (Both Parts A and B Must Be Satisfied)

<p>PART A</p> <p>A grade crossing exists on an approach controlled by a STOP or YIELD sign and the center of the track nearest to the intersection is within 140 feet of the stop line or yield line on the approach. Track Center Line to Limit Line _____ ft</p>	<p>Yes <input type="checkbox"/> No <input type="checkbox"/></p>
<p>PART B</p> <p>There is one minor street approach lane at the track crossing - During the highest traffic volume hour during which rail traffic uses the crossing, the plotted point falls above the applicable curve in Figure 4C-9.</p> <p>Major Street - Total of both approaches: _____ VPH Minor Street - Crosses the track (one direction only, approaching the intersection): _____ VPH X AF (Use Tables 4C-2, 3, & 4 below to calculate AF) = _____ VPH</p> <hr style="border-top: 1px dashed black;"/> <p>OR, There are two or more minor street approach lanes at the track crossing - During the highest traffic volume hour during which rail traffic uses the crossing, the plotted point falls above the applicable curve in Figure 4C-10.</p> <p>Major Street - Total of both approaches : _____ VPH Minor Street - Crosses the track (one direction only, approaching the intersection): _____ VPH X AF (Use Tables 4C-2, 3, & 4 below to calculate AF) = _____ VPH</p>	<p style="text-align: center;"><input type="checkbox"/> <input type="checkbox"/></p> <p>Yes <input type="checkbox"/> No <input type="checkbox"/></p>

The minor street approach volume may be multiplied by up to three following adjustment factors (AF) as described in Section 4C.10.

- 1- Number of Rail Traffic per Day _____ Adjustment factor from table 4C-2 _____
- 2- Percentage of High-Occupancy Buses on Minor Street Approach _____ Adjustment factor from table 4C-3 _____
- 3- Percentage of Tractor-Trailer Trucks on Minor Street Approach _____ Adjustment factor from table 4C-4 _____

NOTE: If no data is available or known, then use AF = 1 (no adjustment)

Appendix 6 – Stop Sign Guideline Analysis

Section 2B.07 Multi-Way Stop Applications

Support:

⁰¹ Multi-way stop control can be useful as a safety measure at intersections if certain traffic conditions exist. Safety concerns associated with multi-way stops include pedestrians, bicyclists, and all road users expecting other road users to stop. Multi-way stop control is used where the volume of traffic on the intersecting roads is approximately equal.

⁰² The restrictions on the use of STOP signs described in Section 2B.04 also apply to multi-way stop applications.

Guidance: ⁰³ *The decision to install multi-way stop control should be based on an engineering study.* ⁰⁴ *The following criteria should be considered in the engineering study for a multi-way STOP sign installation:*

A. Where traffic control signals are justified, the multi-way stop is an interim measure that can be installed quickly to control traffic while arrangements are being made for the installation of the traffic control signal. N/A

B. Five or more reported crashes in a 12-month period that are susceptible to correction by a multi-way stop installation. Such crashes include right-turn and left-turn collisions as well as right-angle collisions. NO

C. Minimum volumes:

- 1. The vehicular volume entering the intersection from the major street approaches (total of both approaches) averages at least 300 vehicles per hour for any 8 hours of an average day; and YES*
- 2. The combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same 8 hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour; but NO, Side street volume is in single digits per hour*
- 3. If the 85th-percentile approach speed of the major-street traffic exceeds 40 mph, the minimum vehicular volume warrants are 70 percent of the values provided in Items 1 and 2. NO*

D. Where no single criterion is satisfied, but where Criteria B, C.1, and C.2 are all satisfied to 80 percent of the minimum values. Criterion C.3 is excluded from this condition. NO

Option: ⁰⁵ *Other criteria that may be considered in an engineering study include:*

A. The need to control left-turn conflicts;

B. The need to control vehicle/pedestrian conflicts near locations that generate high pedestrian volumes;

C. Locations where a road user, after stopping, cannot see conflicting traffic and is not able to negotiate the intersection unless conflicting cross traffic is also required to stop; and NO

D. An intersection of two residential neighborhood collector (through) streets of similar design and operating characteristics where multi-way stop control would improve traffic operational characteristics of the intersection. N/A