

m e m o r a n d u m

DATE: December 4, 2023
TO: Mr. Zed Kekula, P.E., T.E., Principal Civil Engineer
FROM: Deepali Chausalkar
Sandipan Bhattacharjee, PE, TE, AICP, ENV SP
SUBJECT: 2235 S Bristol Starbucks Coffee – Focused Traffic Analysis

Translutions, Inc. (Translutions) is pleased to provide this focused traffic analysis discussing the trip generation, levels of service, sight distance analysis, on-site circulation, Magnolia Avenue bulb-out, queuing analysis and VMT screening for the Starbucks Coffee project to be located at the Northeast corner of S Bristol Street and Warner Avenue in the City of Santa Ana.

Based on the trip generation included in Table A below, a local traffic study should not be required. However, based on discussion with City staff, a focused traffic analysis has been prepared and includes a level of service analysis for four study area intersections. In addition, a sight distance analysis will be conducted at the two project driveways and an intersection analysis will be conducted for the two study intersections on Warner Avenue.

PROJECT DESCRIPTION

The project will include the construction of a 1,220 square foot Starbucks coffee shop with drive through window on a 0.402-acre lot. Access to the project will be provided via two driveways with Driveway 1 on S Bristol Street and Driveway 2 Magnolia Avenue. Both the driveways are unsignalized and provide right-in/right-out access to the project. Figure 1 illustrates the site plan.

STUDY AREA

Based on discussion with City staff, the following study area intersections were evaluated for levels of service:

1. S Bristol Street and Driveway 1;
2. S Bristol Street and Warner Avenue;
3. Magnolia Avenue and Driveway 2;
4. Magnolia Avenue and Warner Avenue;

Figure 2 illustrates the study area intersections.

ANALYSIS SCENARIOS

The following scenarios were included in the analysis:

1. Existing Conditions.
2. Existing With Project Conditions.

PROJECT TRIP GENERATION

Vehicle trips generated by a project site can be separated into two major categories, pass-by trips and primary trips. A pass-by trip is made as an intermediate stop on the way from an origin to a primary trip destination. Pass-by trips are attracted from traffic passing the site on an adjacent street or roadway that offers direct access to a project site. Retail developments such as restaurants, shopping centers, and banks are often located adjacent to busy streets in order to attract motorists already on the street system on their way to a destination. These pass-by trips do not add new traffic to the adjacent street system and may be reduced from the total external trips generated by a project site. In addition, a primary trip is a new trip made for the specific purpose of visiting the generator and is the primary reason for the trip. The trip typically goes from an origin to a destination and then returns to the origin. The trip generation for the project includes pass-by and primary trips and is discussed further below. Based on the scoping agreement approved by the City, trip generation for the project is based on rates for Land Use 937 "Coffee/Donut Shop with Drive-Through Window" from the ITE Trip Generation, 11th Edition. The pass by rates for Land Use 938 "Coffee/Donut Shop With Drive-Through Window and No Indoor Seating" has been applied to the trip generation. Trip generation for the proposed project is included in Table A.

As seen on Table A, the proposed project is forecast to generate 105 a.m. peak hour trips, 48 p.m. peak hour trips, and 651 daily trips. Pass-by trips are 87 a.m. peak hour trips, 40 p.m. peak hour trips, and 540 daily trips. After accounting for pass-by trips, the net trip generation is 18 a.m. peak hour trips, 8 p.m. peak hour trips, and 111 daily trips.

It should be noted that the primary reason for this project is the high customer volume at the Starbucks located at the southeast corner of Warner Avenue & Bristol Street (2303 S Bristol Street, Santa Ana). It is anticipated that many trips to this location will be trips that currently end at the Starbucks at 2303 S Bristol Street, and therefore, the trip generation assumptions above are very conservative.

Table A: Project Trip Generation

Land Use	Units	A.M. Peak Hour			P.M. Peak Hour			Daily
		In	Out	Total	In	Out	Total	
Coffee Shop with Drive-Through Window								
Trip Generation Rates ¹		43.80	42.08	85.88	19.50	19.50	38.99	533.57
Trip Generation	1,220 TSF	53	52	105	24	24	48	651
Pass By Trips ²	83%	(43)	(44)	(87)	(20)	(20)	(40)	(540)
Total Net Trips		10	8	18	4	4	8	111
Total Net New Trip Generation		10	8	18	4	4	8	111

Notes: TSF = Thousand Square Feet

¹ Trip generation based on rates for Land Use 937 - "Coffee/Donut Shop with Drive-Through Window" from Institute of Transportation Engineers' (ITE) *Trip Generation* (11th Edition).

² Pass-By rates based on rates for Land Use 938 "Coffee/Donut Shop with Drive-Through Window and No Indoor Seating" from ITE *Trip Generation Handbook* (3rd Edition).

PROJECT TRIP DISTRIBUTION AND ASSIGNMENT

Project trip distribution patterns for the proposed project were developed based on the location of the project in relation to the surrounding land uses and the regional network. Figures 3 and 4 illustrate the primary project trip distribution and the resulting primary project trips at the study area intersections.

The pass-by trip distribution is based on the existing traffic stream already on the roadway network that is passing by the project. The pass-by trip distribution is shown in Figure 5. The pass-by trips are shown in Figure 6. The total net trip assignment includes the primary trips and pass-by trips and is shown in Figure 7.

VOLUME DEVELOPMENT

Forecast traffic volumes at study intersections were developed for existing and existing plus project conditions. This section discusses the volume development methodology.

Existing Conditions

Existing traffic volumes are based on peak hour intersection turn movement counts collected by Counts Unlimited Inc. on a non-holiday weekday in August 2023. The counts are included in Appendix A. Figure 8 illustrates the existing and with project geometrics and stop control and Figure 9 illustrates the existing peak hour traffic volumes at the study area intersections. Volume development worksheets are included in Appendix B.

Existing With Project Conditions

As recommended by the City the intersection of Magnolia Avenue and Warner Avenue will be modified to prevent vehicles from turning on to Magnolia Avenue. Previously referenced Figure 1 shows a conceptual bulb-out design for the intersection of Magnolia Avenue and Warner Avenue. Therefore, vehicles making a right turn onto Magnolia Avenue have been rerouted to make a right turn onto Bristol Street.

Existing plus project peak hour traffic volumes were developed by adding the project trip assignment to the adjusted existing traffic volumes. Figure 10 shows the existing plus project peak hour traffic volumes at the study intersections. Detailed volume development worksheets are included in Appendix B.

LEVEL OF SERVICE ANALYSIS

Level of service (LOS) is a measure of the quality of operational conditions within a traffic stream and is generally expressed in terms of such measures as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. Levels range from A to F, with LOS A representing excellent (free-flow) conditions and LOS F representing extreme congestion. Consistent to the guidelines, the Highway Capacity Manual (HCM) procedures have been used to evaluate levels of service. This section discusses the LOS definitions, procedures, and thresholds used in this report. The analysis of traffic operations at intersections was conducted according to the Highway Capacity Manual 7th Edition (HCM) delay methodologies, which is described in the Highway Capacity Manual (Transportation Research Board, Washington, D.C., 2022). Under the HCM methodology, LOS for signalized intersections is based on the average delay experienced by vehicles traveling through an intersection, whereas for unsignalized intersections, the LOS is based on the worst approach where the minor leg has a shared lane and on the worst movement where the minor leg has dedicated turn lanes. Table B presents a brief description of each level of service letter grade, as well as the range of delays associated with each grade.

Table B: LOS Criteria

LOS	Description of Drivers' Perception and Traffic Operation	Delay in Seconds	
		Unsignalized	Signalized
A	This level is typically assigned when the volume-to-capacity ratio is low and either progression is exceptionally favorable, or the cycle length is very short. If it is due to favorable progression, most vehicles arrive during the green indication and travel through the intersection without stopping.	≤ 10	≤ 10
B	This level is assigned when the volume-to-capacity ratio is low and either progression is highly favorable, or the cycle length is short. More vehicles stop than with LOS A.	> 10 and ≤ 15	> 10 and ≤ 20
C	This level is typically assigned when progression is favorable, or the cycle length is moderate. Individual cycle failures (i.e., one or more queued vehicles are not able to depart as a result of insufficient capacity during the cycle) may begin to appear at this level. The number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.	> 15 and ≤ 25	> 20 and ≤ 35
D	This level is typically assigned when the volume-to-capacity ratio is high and either progression is ineffective, or the cycle length is long. Many vehicles stop and individual cycle failures are noticeable.	> 25 and ≤ 35	> 35 and ≤ 55
E	This level is typically assigned when the volume-to-capacity ratio is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.	> 35 and ≤ 50	> 55 and ≤ 80
F	This level is typically assigned when the volume-to-capacity ratio is very high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.	> 50	> 80

The City endeavors to maintain LOS D as the minimum level of service standard at intersections of collector or higher classification.

Existing Levels of Service

The levels of service for existing conditions were calculated using the existing lane geometrics and existing traffic volumes. The existing levels of service at the study intersections are shown in Table C. As shown in Table C, all intersections are currently operating at satisfactory levels of service. LOS worksheets are included in Appendix C.

Table C: Existing Without and With Project Levels of Service

Intersection	Jurisdiction	LOS Standard	Control	Without Project				With Project			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1 S Bristol St./Dwy. 1	Santa Ana	D	TWSC		-			13.11	B	19	C
2 S Bristol St./Warner Ave.	Santa Ana	D	Signal	45.1	D	42.7	D	45.7	D	41.3	D
3 Magnolia Ave./Dwy. 2	Santa Ana	D	TWSC		-			8.56	A	8.5	A
4 Magnolia Ave./Warner Ave.	Santa Ana	D	TWSC	20.56	C	15.87	C	26.25	D	17.49	C

Notes:

* Exceeds LOS Standard

LOS = Level of Service

TWSC = Two-Way Stop Control; For TWSC intersections, reported delay is for worst-case movement.

Existing With Project Levels of Service

The levels of service for existing with project conditions were calculated using the existing lane geometrics and existing with project traffic volumes. The existing with project levels of service at the study intersections are shown in Table C. As shown in Table C, all intersections are forecast to operate at satisfactory levels of service. LOS worksheets are included in Appendix C. It should be noted that with the addition of project trips, the peak hour LOS does not degrade from acceptable LOS to unacceptable LOS.

INTERSECTION QUEUING ANALYSIS

The City requested an analysis of vehicle queuing for turn pockets and through lanes at the intersection of Bristol Street and Warner Avenue. The results of the queuing analysis are shown on Table D and queuing reports are included in Appendix D. As seen on Table D, all queues are forecast to fit within the available storage space with the exception of the following:

- The northbound left-turn movement under existing (a.m. peak hour) and existing with project conditions (a.m. and p.m. peak hours).
- The southbound left-turn movement under existing and existing with project conditions. (a.m. and p.m. peak hours).
- The eastbound left-turn movement under existing and existing with project conditions. (a.m. and p.m. peak hours).
- The westbound left-turn movement under existing and existing with project conditions. (a.m. peak hour).
- The westbound right-turn movement under existing and existing with project conditions. (p.m. peak hours).

Table D: Existing Without and With Project Queuing Analysis

Intersection	Movement	Storage Length (In Feet)	Without Project		With Project	
			AM Peak Hour Queue Length ¹	PM Peak Hour Queue Length ¹	AM Peak Hour Queue Length ¹	PM Peak Hour Queue Length ¹
2 S Bristol Street/Warner Avenue						
	NBL	125	119	144	126	144
	NBT	1208	370	580	359	581
	NBR	117	63	87	89	87
	SBL	135	160	166	167	172
	SBT	943	515	226	480	224
	EBL	194	212	265	263	276
	EBT	674	436	236	465	233
	EBR	152	130	51	146	51
	WBL	221	274	166	334	196
	WBT	447	249	315	244	312
	WBR	123	25	127	67	136

Notes:

Bold = Exceeds storage length

¹Queues reported are 95th Percentile queue lengths per movement in feet.

It should be noted that under without and with project conditions, the same turning movements exceed the available storage lengths, with the exception of northbound left-turn movement. The project trips cause the queue to exceed the available storage lengths in the a.m. peak hour for the northbound left-turn movement. For all other movements the project trips do not cause the queues to exceed the available storage lengths.

DRIVE-THROUGH QUEUING ANALYSES

To determine the potential drive-through queue lengths that may be anticipated with the completion of the project, a drive-through queuing analysis was conducted based on the surveys conducted at three existing Starbucks locations in and near the City of Santa Ana. The Starbucks locations were surveyed on a weekday from 7:00 a.m. to 9:00 p.m. Appendix D includes the survey data. Table E shows the observed queues. As shown in Table E, the maximum observed queue was 13 vehicles. The site plan provides queuing space for 16 vehicles in the drive-through lane. Therefore, the project's available storage space in the drive-through lanes is anticipated to accommodate the maximum observed queue length surveyed at the Starbucks locations.

Table E: Starbucks Locations Drive-Through Queues

	City	Address	Maximum Queue Length
1	Anaheim	1134 N. State College Blvd	11
2	Santa Ana	2302 17th Street	13
3	Tustin	2701 N. Bristol St.	10

SIGHT DISTANCE ANALYSIS

An analysis was conducted at the project driveway on S Bristol Street using standards from the American Association of State Highway and Transportation Officials (AASHTO) A Policy on Geometric Design of Highways and Streets (2011). The posted speed limit on S Bristol Street is 40 mph, and a design speed limit of 50 mph (10 mph over the posted limit) was used for this analysis. Table F shows the intersection sight distance required (480 ft) for passenger cars taking a westbound right-turn from the project driveway 1 onto S Bristol Street. The Aerial Survey of the intersection shows visibility of 650 ft with respect to the northbound through traffic measured from the project driveway 1 in the south direction on S. Bristol Street. Therefore, the available sight distance (650 ft) for the right-turn movement is greater than the required sight distance (480 ft).

Table F: Intersection Sight Distance

Intersection	Posted Speed Limit (mph) on Major Road	Design Speed* (mph) on Major Road	Right Turn Maneuver		
			Stopping Sight Distance (feet)	Intersection Sight Distance for Passenger Cars	
				Calculated (feet)	Design (feet)
S Bristol Street/ Driveway 1	40	50	425	477.8	480

* Design Speed = Posted Speed + 10 mph

Major Road = S Bristol Street, Minor Road = Driveway 1

Sight Distances for Right Turn Maneuver are based on AASHTO Table 9-8. Design Intersection Sight Distance - Case B2, Right Turn from Stop, and Case B3, Crossing Maneuver

Magnolia Avenue is a low speed and low volume residential street. The existing driveway spacing on Magnolia Avenue ranges from 20 feet to 60 feet. Magnolia Avenue is straight roadway with minimal curves. Visibility to the northern end of the street (Magnolia Avenue) is available for vehicles taking a eastbound right-turn using Project Driveway 2.

ON-SITE CIRCULATION

On-site circulation for passenger vehicles and waste collection trucks is illustrated in the Figure 12. As seen on the figure, passenger cars and waste collection trucks can make the maneuvers safely.

VMT SCREENING ANALYSIS

VMT analysis is a requirement under CEQA due to the passage of Senate Bill 743 (SB-743). SB-743 was codified in Public Resources Code section 21099, was signed by the Governor in 2013 and directed the Governor's Office of Planning and Research (OPR) to identify alternative metrics for evaluating transportation impacts under CEQA. Pursuant to Section 21099, the criteria for determining the significance of transportation impacts must "promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." Recently adopted changes to the CEQA guidelines in response to Section 21099 include a new section (15064.3) that specifies that Vehicle Miles Traveled (VMT) is the most appropriate measure of transportation impacts. A separate Technical Advisory issued by OPR provides additional technical details on calculating VMT and assessing transportation impacts for various types of projects. The City adopted thresholds of significance and screening thresholds under VMT in February 2019. The City's guidelines include several screening thresholds:

1. **By Type of Project or Land Use.** Projects which serve the local community and have the potential to reduce VMT, such as neighborhood K-12 schools and local-serving retail less than 50,000 sq. ft. Charter schools would be excluded from this criterion. ***The project is a retail project of less than 50,000 square feet and therefore, the project meets the requirements and is screened out.***

2. **Project Location Within a Transit Priority Area.** Projects screened based on being located within a Transit Priority Area (TPA) or High-Quality Transit Areas (HQTAs) are those located within a one-half (0.5) mile from a major transit stop, and therefore is presumed to have a less than significant impact on traffic. Therefore, these projects can be determined to be exempt from having to prepare a project-level VMT analysis. The City's guidelines (Figure 1 of Guidelines) include maps of HQTAs, and the proposed project falls under a HQTA. For HQTA screening, a secondary screening step to verify the proposed project's consistency with the assumptions from the RTP/SCS is required per the City's guidelines. Further, per the guidelines, this consistency can be a land use review (e.g., are the proposed land uses already included in the RTP/SCS) or can be reviewed from a VMT/SP perspective (e.g., does the resulting land use increase or decrease the VMT/SP in the Traffic Analysis Zone (TAZ) compared to the RTP/SCS assumptions). The site is zoned commercial and will not result in a decrease in households, and the land use is consistent with the SCAG RTP/SCS. ***Therefore, the project meets the requirements and is screened out.***
3. **Projects Based on Trip Generation.** The guidelines exempt a project from a VMT analysis if it generates less than 110 daily trips. The proposed project generates 111 daily trips, and therefore, does not meet this requirement.
4. **Project Location Within a Low VMT Area.** Based on the City's Low VMT Area Map (Figure 2 of Guidelines), the project is located in a low VMT area. For low VMT area screening, a secondary screening step to verify that the proposed land use is consistent with the existing land use is required. The project TAZ is generally residential and therefore, this criteria does not apply.

CONCLUSION

Project Description. The project will include the construction of a 1,220 square foot Starbucks coffee shop with drive through window. The two driveways that will provide access to the project will include right-in/right-out access.

Project Trip Generation. The proposed project is forecast to generate 18 net trips during the a.m. peak hour, 8 net trips during the p.m. peak hour, and 111 net new daily trips.

Levels of Service. All intersections are forecast to operate at satisfactory levels of service under existing without and with project conditions.

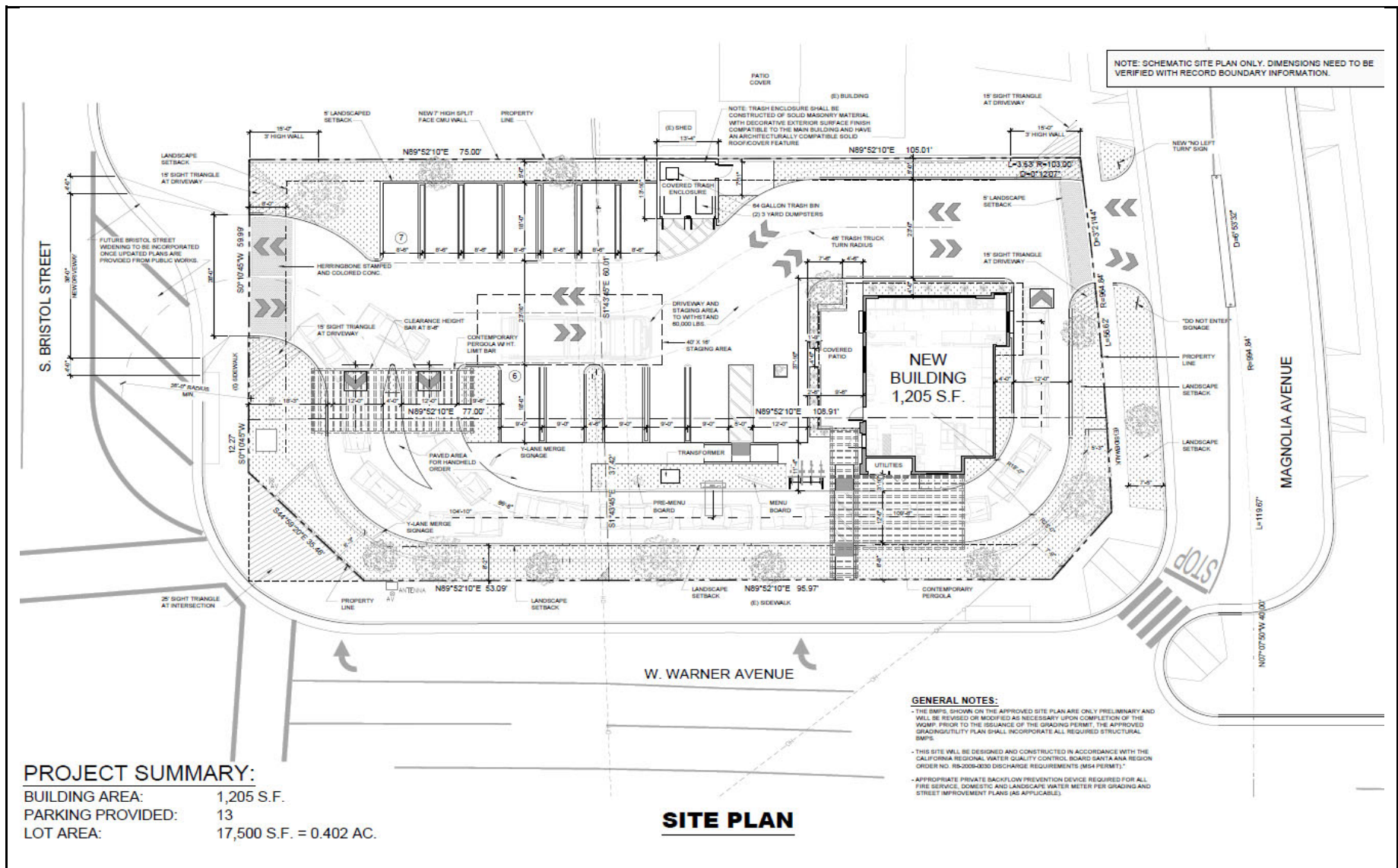
Queuing Analysis. Under without and with project conditions, the same turning movements exceed the available storage lengths except for northbound left-turn movement. The project trips cause the queue to exceed the available storage lengths in the a.m. peak hour for the northbound left-turn movement. For all other movements the project trips do not cause the queues to exceed the available storage lengths.

Drive-Through Queues. The maximum observed queue was 16 vehicles. The site plan provides queuing space for 16 vehicles. Therefore, the project's available storage space in the drive-through lanes is anticipated to accommodate the maximum observed queue length surveyed at the Starbucks locations.

VMT Screening. Based on the VMT thresholds set by the City of Santa Ana, the project is presumed to have a less than significant impact on VMT.

Memorandum: 2235 S Bristol Starbucks Coffee
Focused Traffic Analysis

Figures



Source: Amor Architectural Corporation (08-14-2023)

FIGURE 1

2235 S. Bristol St. Starbucks
Site Plan

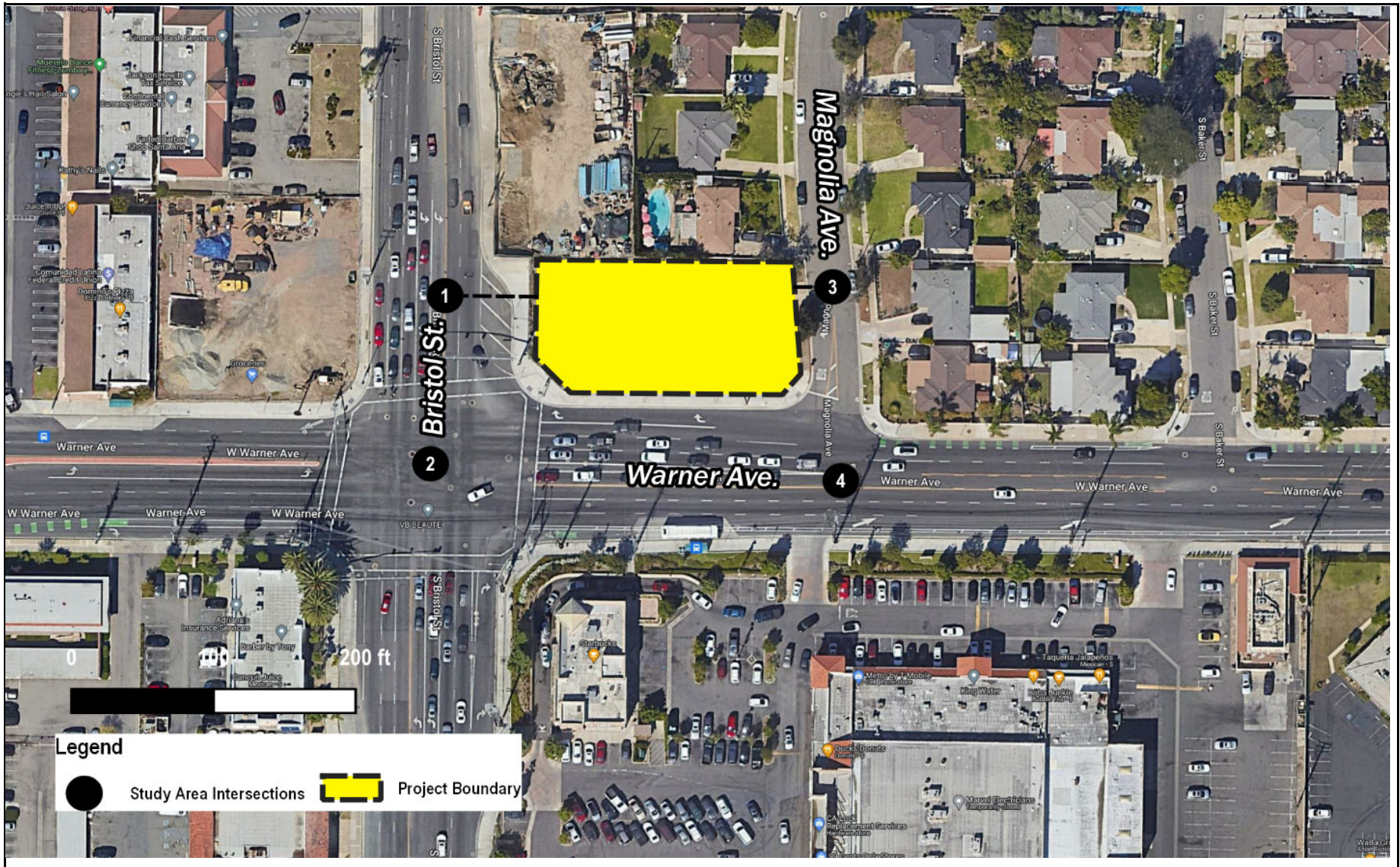


FIGURE 2

2235 S. Bristol St. Starbucks
Study Intersections

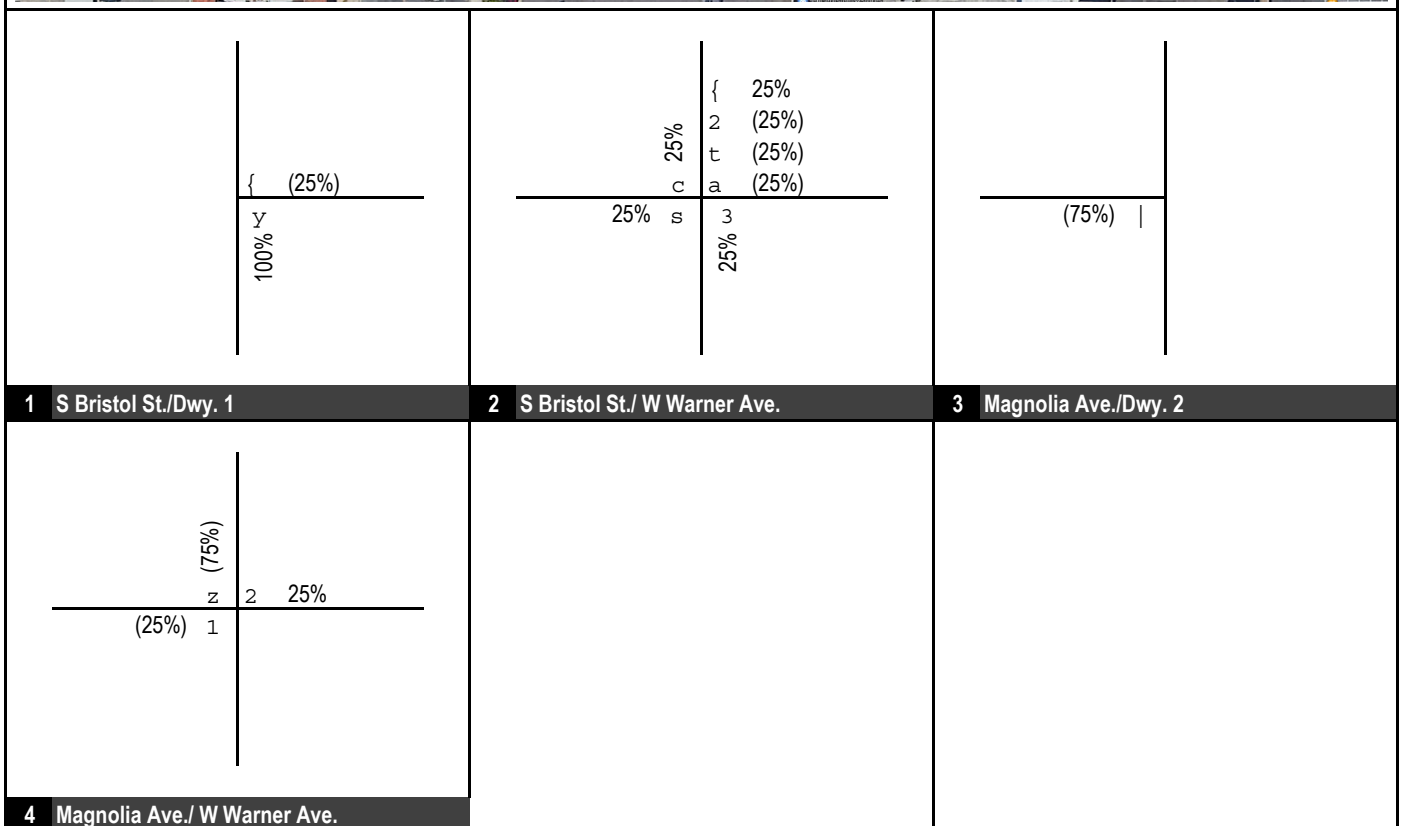
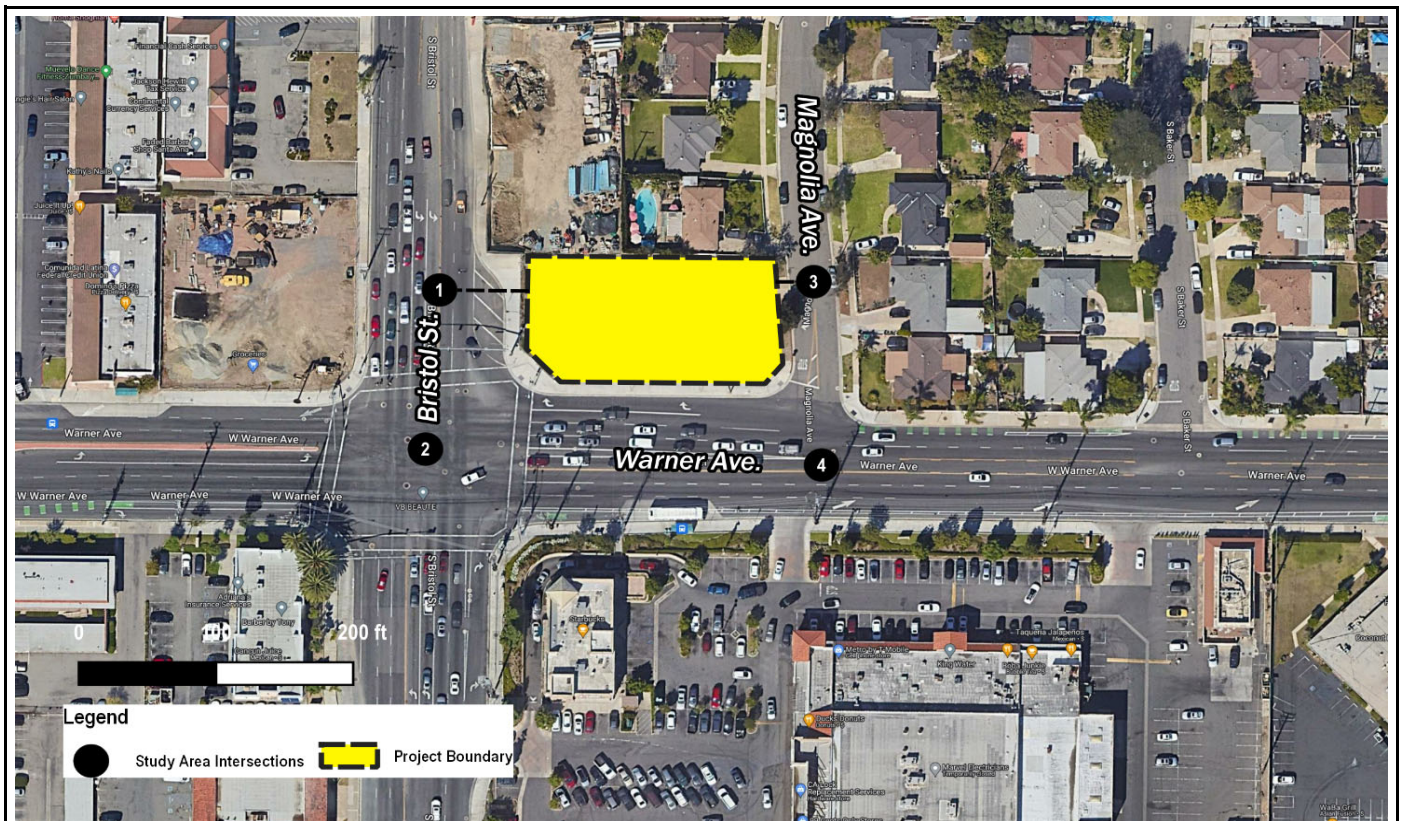
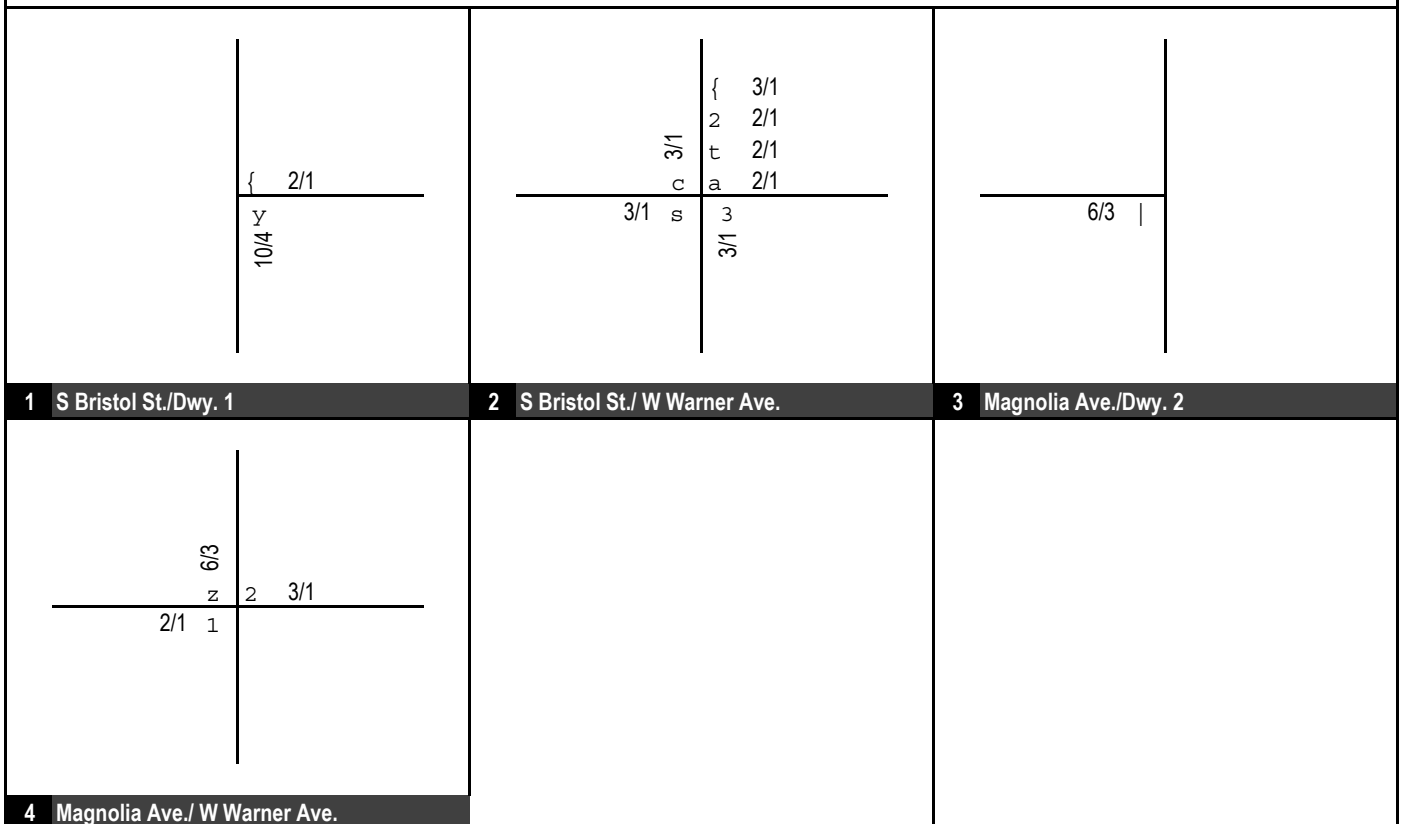
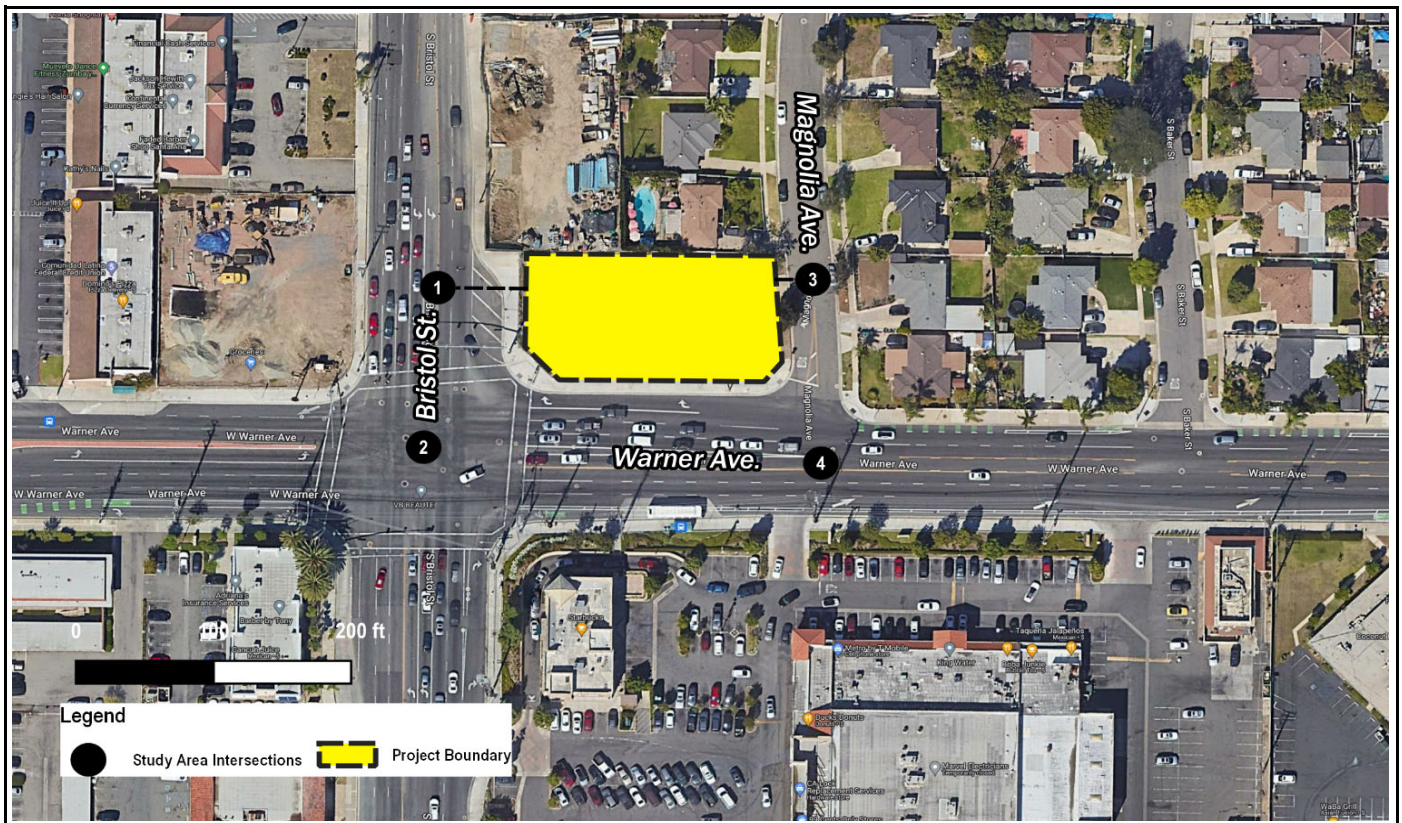


FIGURE 3
2235 S. Bristol St. Starbucks
Project Trip Distribution (Primary)

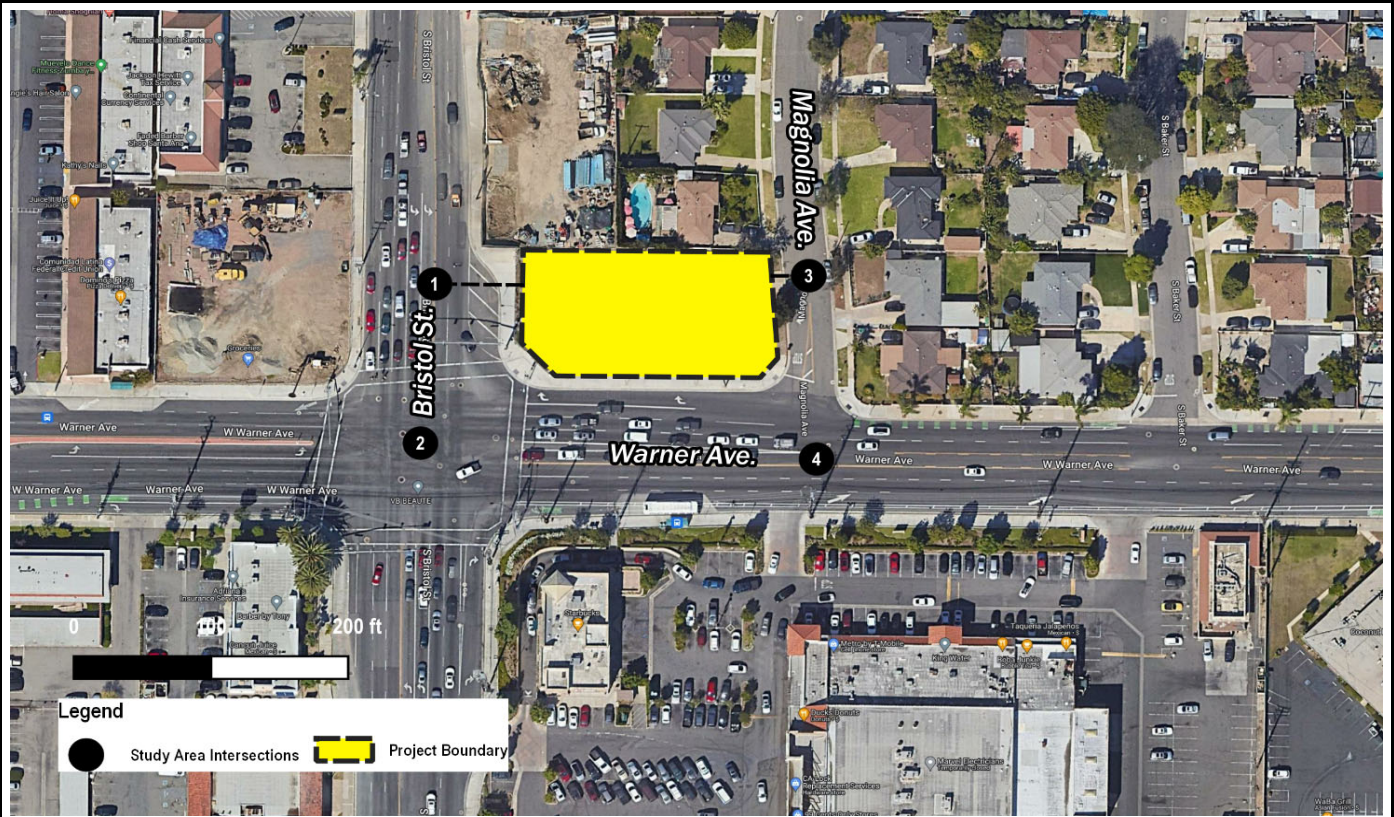
XX%(YY'AM%(PM%) Dist



XX/YY AM/PM Trips



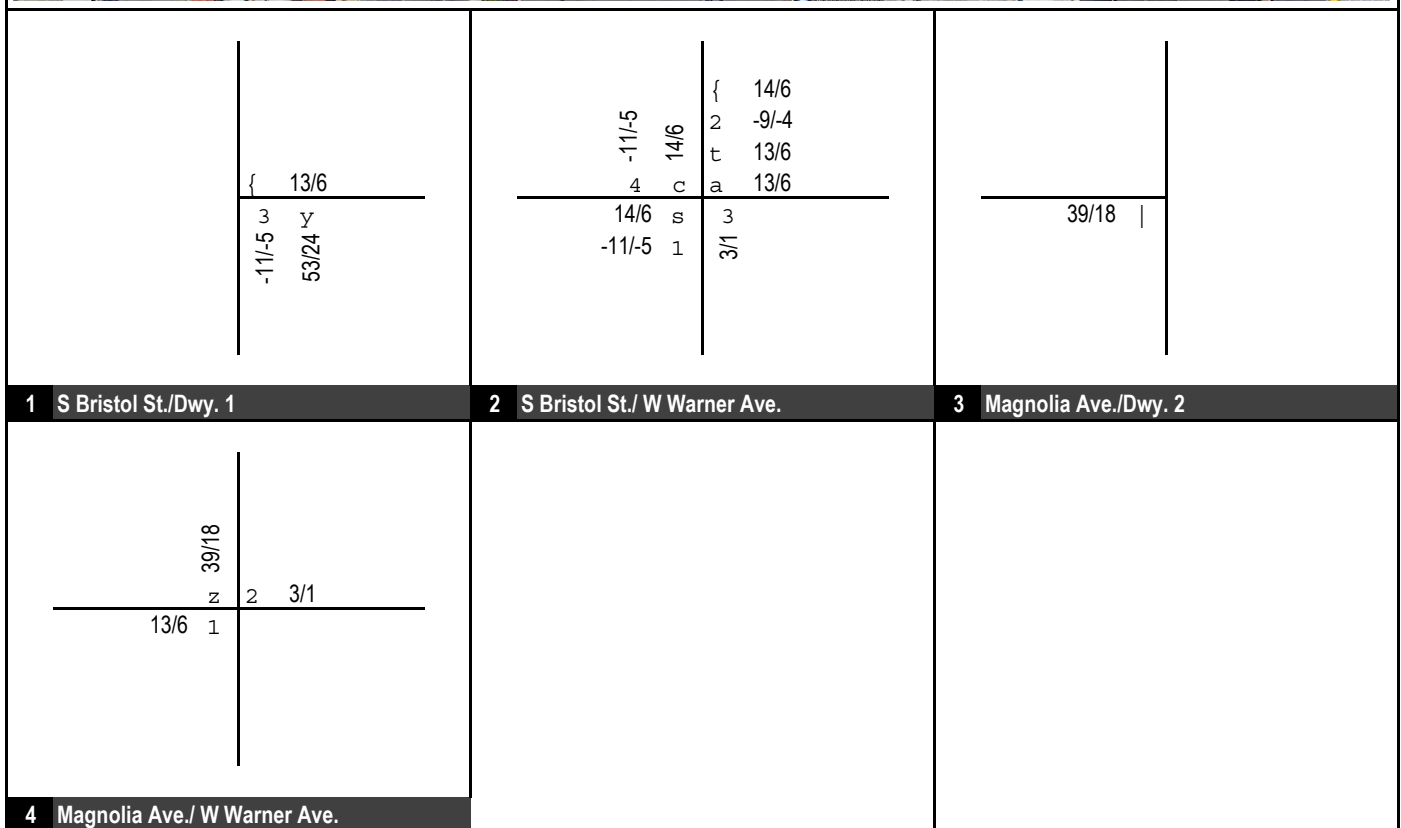
FIGURE 4
2235 S. Bristol St. Starbucks
Project Trip Assignment (Primary)



<div> <div></div> <div>(25%)</div> <div>3</div> <div>-25%</div> <div>100%</div> </div>	<div> <div>-25%</div> <div>4</div> <div>25%</div> <div>-25%</div> <div>1</div> </div> <div> <div>25%</div> <div>2</div> <div>(25%)</div> <div>(25%)</div> </div>	<div> <div>(75%)</div> <div>1</div> </div>
1 S Bristol St./Dwy. 1	2 S Bristol St./ W Warner Ave.	3 Magnolia Ave./Dwy. 2
<div> <div>(75%)</div> <div>z</div> <div>(25%)</div> <div>1</div> </div>		
4 Magnolia Ave./ W Warner Ave.		

FIGURE 5
2235 S. Bristol St. Starbucks
Project Trip Distribution (Pass-By)

XX%(YY'AM%(PM%) Dist



translations
the transportation solutions company...



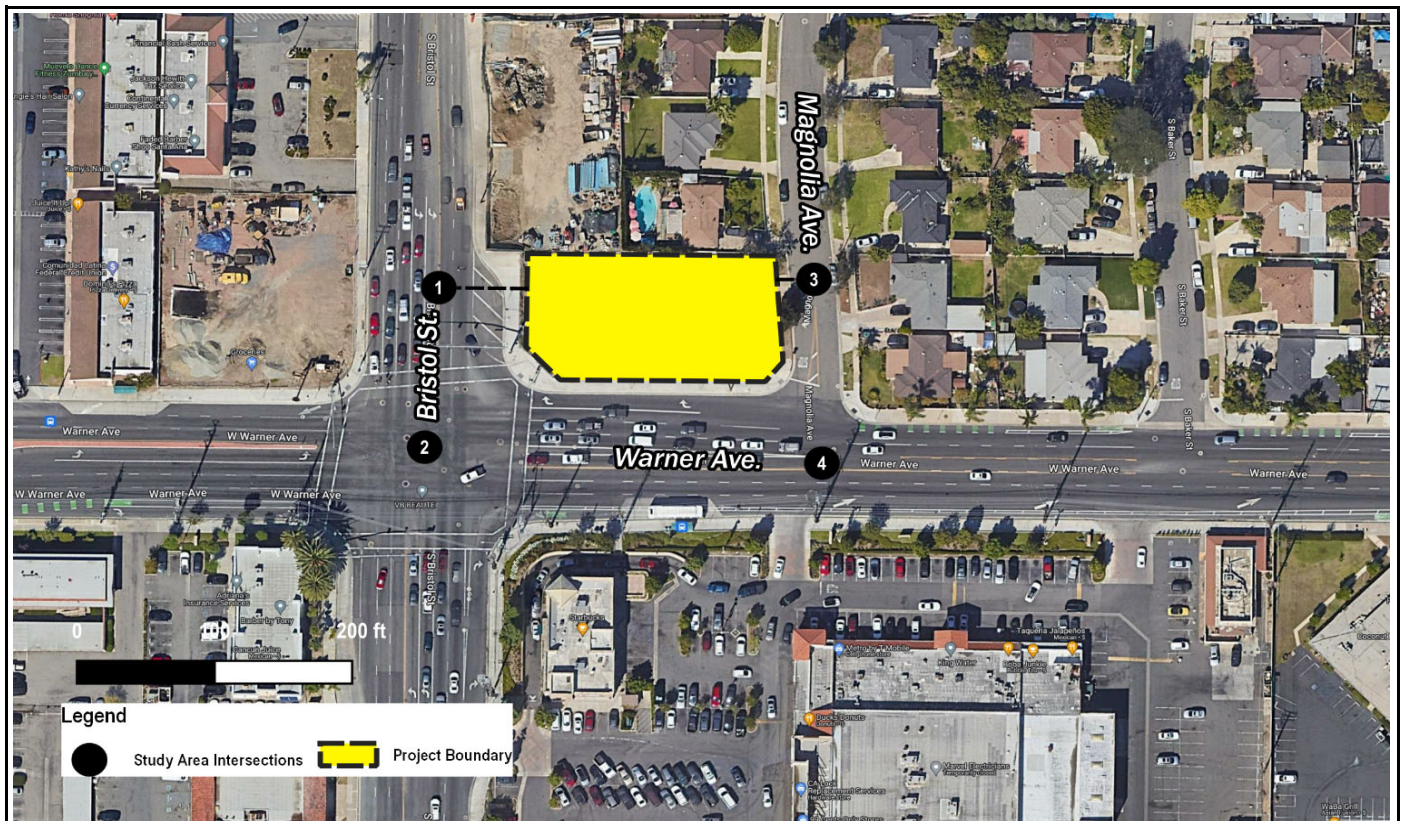
FIGURE 8

Legend

Lanes shown in Red are eliminated under With Project Conditions.

- De-Facto Right Turn
- Signal
- Stop Sign

2235 S. Bristol St. Starbucks Existing and With Project Intersection Geometrics and Stop Control

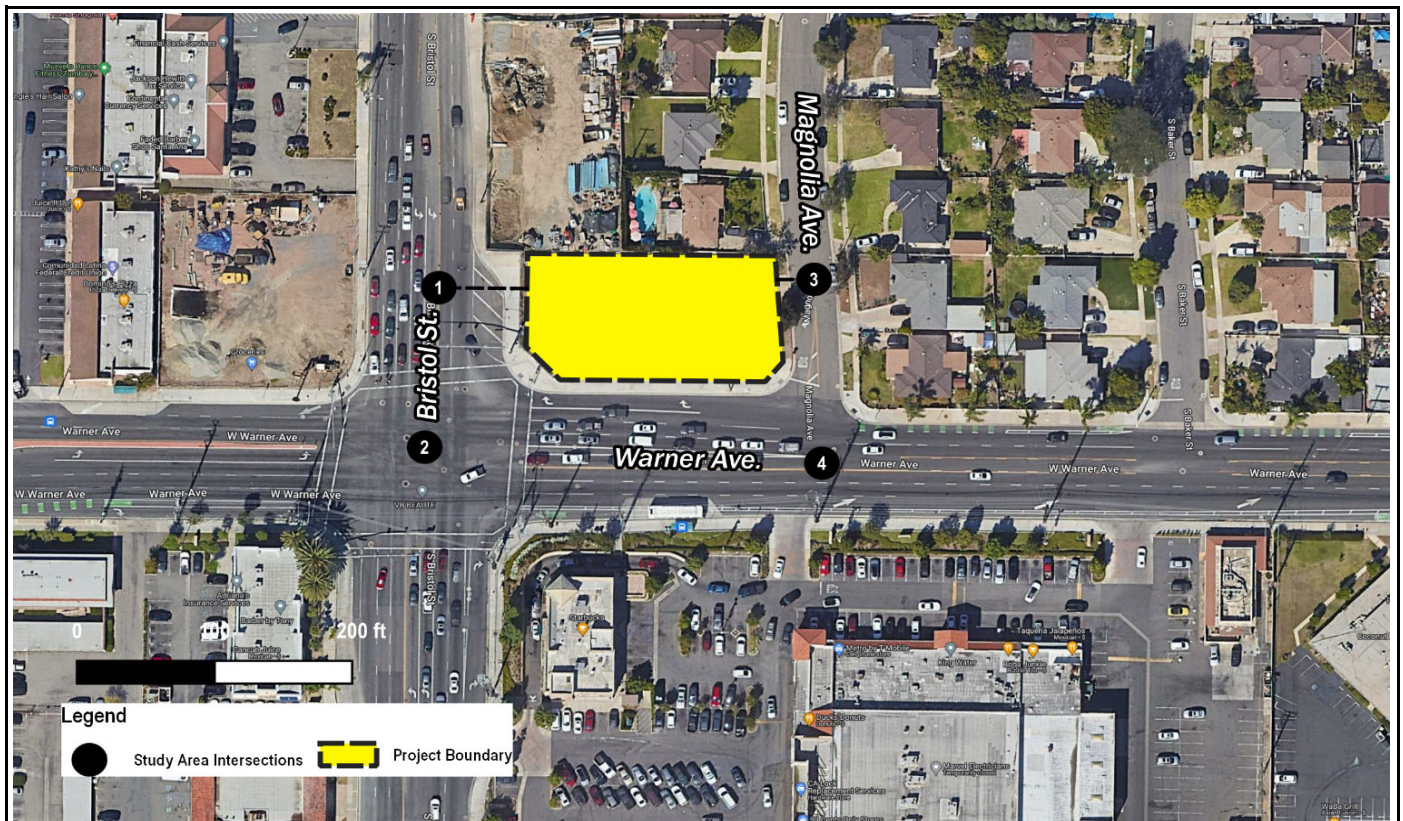


<div> <div>1901/1176</div> <div>4</div> <div>1021/1700</div> <div>3</div> </div>	<div> <div>171/156</div> <div>1446/765</div> <div>284/255</div> <div>z 4 q</div> <div>170/189</div> <div>1145/715</div> <div>219/124</div> <div>s</div> <div>1</div> <div> </div> <div>143/254</div> <div>727/1289</div> <div>176/175</div> <div>r</div> <div>3</div> <div>y</div> <div>124/222</div> <div>702/841</div> <div>176/119</div> <div>t</div> </div>	<div> <div>22/25</div> <div>4</div> <div>4/16</div> <div>3</div> </div>
1 S Bristol St./Dwy. 1	2 S Bristol St./ W Warner Ave.	3 Magnolia Ave./Dwy. 2
<div> <div>22/24</div> <div>z</div> <div>4/1</div> <div>1461/1024</div> <div>140/75</div> <div>0/1</div> <div>q</div> <div>s</div> <div>1</div> <div> </div> <div>{</div> <div>2</div> <div>t</div> <div>r</div> <div>y</div> <div>3/47</div> <div>0/15</div> <div>977/1149</div> <div>23/2</div> </div>		
4 Magnolia Ave./ W Warner Ave.		

XX/YY AM/PM Trips



FIGURE 9
2235 S. Bristol St. Starbucks
Existing Peak Hour Traffic Volumes



<div><div>1901/1176</div><div>4 { 13/6</div><div>1014/17113y53/24</div></div>	<div><div>171/1561435/760298/261</div><div>z4q</div><div>184/195s143/254730/1290176/175</div><div>1134/7101</div><div>219/124 </div><div>{2t</div><div>142/244693/837202/131</div></div>	<div><div>22/25</div><div>4</div><div>39/18 </div></div>
1S Bristol St./Dwy. 1	2S Bristol St./ W Warner Ave.	3Magnolia Ave./Dwy. 2
<div><div>61/420/1</div><div>zq</div><div>4/1s1474/1030140/75</div><div>111</div><div>0/15984/116623/2y31/47</div></div>		
4Magnolia Ave./ W Warner Ave.		

FIGURE 10
2235 S. Bristol St. Starbucks
Existing Plus Project Peak Hour Traffic Volumes

XX/YY AM/PM Trips

Memorandum: 2235 S Bristol Starbucks Coffee
Focused Traffic Analysis

Appendix A: Traffic Counts

City of Santa Ana
N/S: Bristol Street
E/W: Warner Avenue
Weather: Clear

File Name : 01_SNA_Bri_War AM
Site Code : 99923789
Start Date : 8/31/2023
Page No : 1

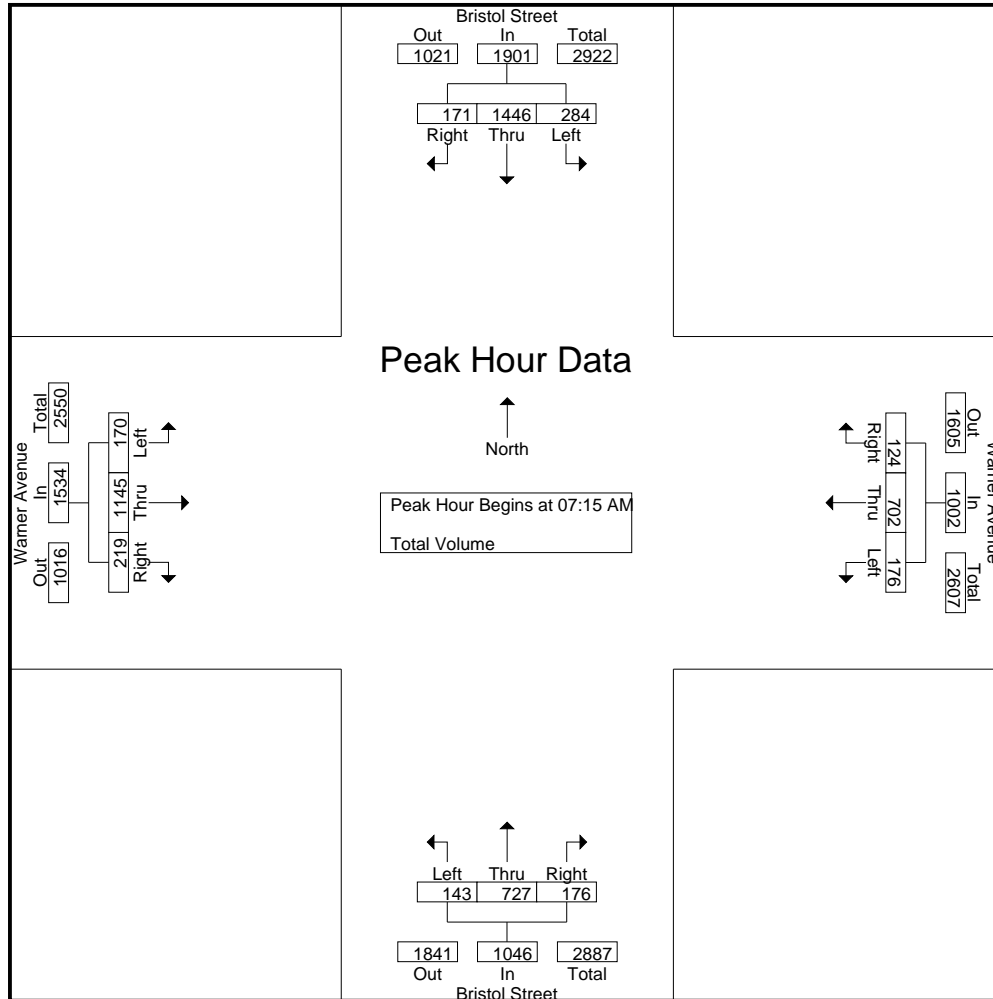
Groups Printed- Total Volume

	Bristol Street Southbound				Warner Avenue Westbound				Bristol Street Northbound				Warner Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	64	357	27	448	18	73	23	114	24	123	28	175	19	176	37	232	969
07:15 AM	84	319	40	443	30	152	27	209	18	171	25	214	37	291	43	371	1237
07:30 AM	77	379	33	489	36	148	27	211	39	203	45	287	44	311	50	405	1392
07:45 AM	51	393	57	501	61	214	29	304	36	182	60	278	46	300	56	402	1485
Total	276	1448	157	1881	145	587	106	838	117	679	158	954	146	1078	186	1410	5083
08:00 AM	72	355	41	468	49	188	41	278	50	171	46	267	43	243	70	356	1369
08:15 AM	64	380	34	478	28	134	34	196	26	164	52	242	41	206	50	297	1213
08:30 AM	60	314	32	406	35	107	26	168	40	140	30	210	46	218	54	318	1102
08:45 AM	58	350	43	451	33	89	21	143	40	201	65	306	43	135	48	226	1126
Total	254	1399	150	1803	145	518	122	785	156	676	193	1025	173	802	222	1197	4810
Grand Total	530	2847	307	3684	290	1105	228	1623	273	1355	351	1979	319	1880	408	2607	9893
Apprch %	14.4	77.3	8.3		17.9	68.1	14		13.8	68.5	17.7		12.2	72.1	15.7		
Total %	5.4	28.8	3.1	37.2	2.9	11.2	2.3	16.4	2.8	13.7	3.5	20	3.2	19	4.1	26.4	

	Bristol Street Southbound				Warner Avenue Westbound				Bristol Street Northbound				Warner Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	84	319	40	443	30	152	27	209	18	171	25	214	37	291	43	371	1237
07:30 AM	77	379	33	489	36	148	27	211	39	203	45	287	44	311	50	405	1392
07:45 AM	51	393	57	501	61	214	29	304	36	182	60	278	46	300	56	402	1485
08:00 AM	72	355	41	468	49	188	41	278	50	171	46	267	43	243	70	356	1369
Total Volume	284	1446	171	1901	176	702	124	1002	143	727	176	1046	170	1145	219	1534	5483
% App. Total	14.9	76.1	9		17.6	70.1	12.4		13.7	69.5	16.8		11.1	74.6	14.3		
PHF	.845	.920	.750	.949	.721	.820	.756	.824	.715	.895	.733	.911	.924	.920	.782	.947	.923

City of Santa Ana
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E/W: Warner Avenue
Weather: Clear

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Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:15 AM				07:30 AM				07:15 AM			
+0 mins.	77	379	33	489	30	152	27	209	39	203	45	287	37	291	43	371
+15 mins.	51	393	57	501	36	148	27	211	36	182	60	278	44	311	50	405
+30 mins.	72	355	41	468	61	214	29	304	50	171	46	267	46	300	56	402
+45 mins.	64	380	34	478	49	188	41	278	26	164	52	242	43	243	70	356
Total Volume	264	1507	165	1936	176	702	124	1002	151	720	203	1074	170	1145	219	1534
% App. Total	13.6	77.8	8.5		17.6	70.1	12.4		14.1	67	18.9		11.1	74.6	14.3	
PHF	.857	.959	.724	.966	.721	.820	.756	.824	.755	.887	.846	.936	.924	.920	.782	.947

City of Santa Ana
N/S: Bristol Street
E/W: Warner Avenue
Weather: Clear

File Name : 01_SNA_Bri_War PM
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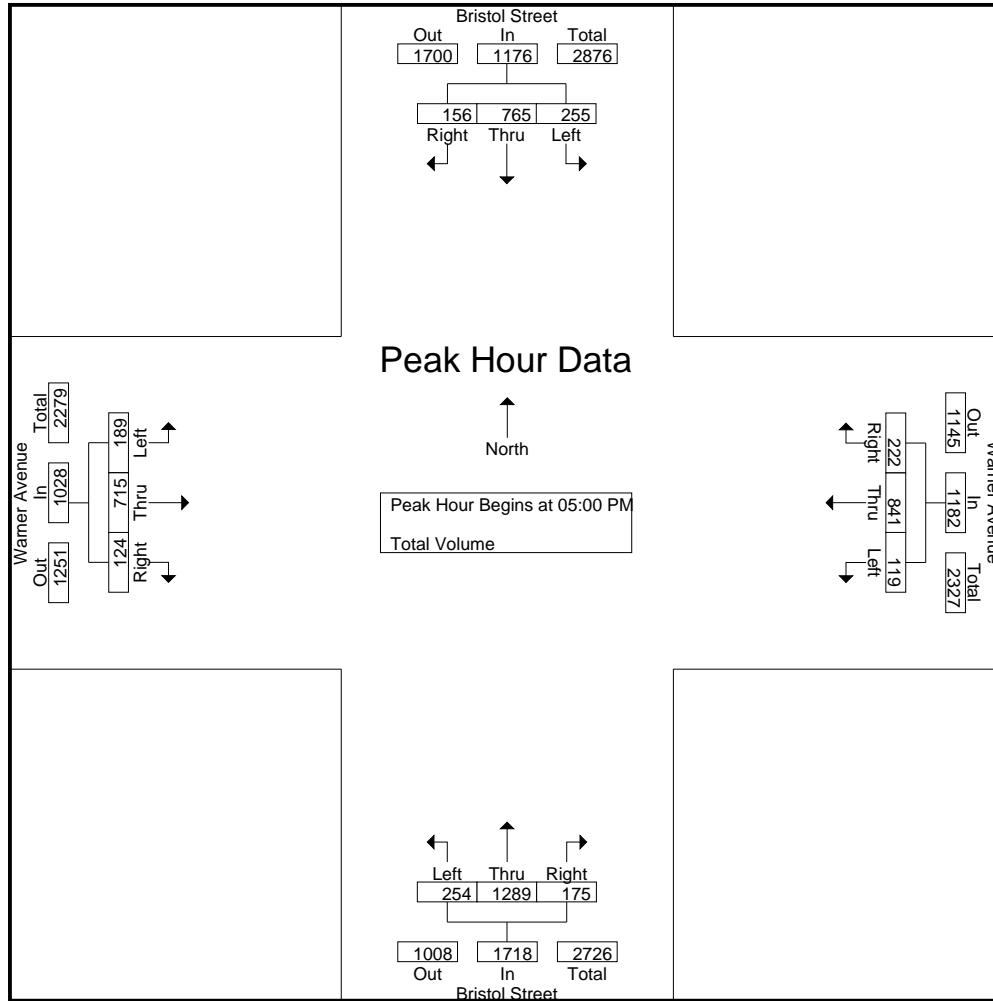
Groups Printed- Total Volume

	Bristol Street Southbound				Warner Avenue Westbound				Bristol Street Northbound				Warner Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	49	188	49	286	32	157	71	260	71	303	34	408	65	154	39	258	1212
04:15 PM	52	202	38	292	26	166	63	255	58	324	36	418	40	167	27	234	1199
04:30 PM	47	178	37	262	16	214	70	300	52	301	42	395	57	174	27	258	1215
04:45 PM	59	216	37	312	22	196	51	269	57	352	43	452	45	157	30	232	1265
Total	207	784	161	1152	96	733	255	1084	238	1280	155	1673	207	652	123	982	4891
05:00 PM	66	158	40	264	32	208	61	301	63	301	54	418	52	196	27	275	1258
05:15 PM	48	199	43	290	23	204	51	278	64	331	34	429	44	175	37	256	1253
05:30 PM	77	203	42	322	37	216	53	306	56	328	40	424	45	170	31	246	1298
05:45 PM	64	205	31	300	27	213	57	297	71	329	47	447	48	174	29	251	1295
Total	255	765	156	1176	119	841	222	1182	254	1289	175	1718	189	715	124	1028	5104
Grand Total	462	1549	317	2328	215	1574	477	2266	492	2569	330	3391	396	1367	247	2010	9995
Apprch %	19.8	66.5	13.6		9.5	69.5	21.1		14.5	75.8	9.7		19.7	68	12.3		
Total %	4.6	15.5	3.2	23.3	2.2	15.7	4.8	22.7	4.9	25.7	3.3	33.9	4	13.7	2.5	20.1	

	Bristol Street Southbound				Warner Avenue Westbound				Bristol Street Northbound				Warner Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	66	158	40	264	32	208	61	301	63	301	54	418	52	196	27	275	1258
05:15 PM	48	199	43	290	23	204	51	278	64	331	34	429	44	175	37	256	1253
05:30 PM	77	203	42	322	37	216	53	306	56	328	40	424	45	170	31	246	1298
05:45 PM	64	205	31	300	27	213	57	297	71	329	47	447	48	174	29	251	1295
Total Volume	255	765	156	1176	119	841	222	1182	254	1289	175	1718	189	715	124	1028	5104
% App. Total	21.7	65.1	13.3		10.1	71.2	18.8		14.8	75	10.2		18.4	69.6	12.1		
PHF	.828	.933	.907	.913	.804	.973	.910	.966	.894	.974	.810	.961	.909	.912	.838	.935	.983

City of Santa Ana
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Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM				05:00 PM				04:45 PM				05:00 PM			
+0 mins.	59	216	37	312	32	208	61	301	57	352	43	452	52	196	27	275
+15 mins.	66	158	40	264	23	204	51	278	63	301	54	418	44	175	37	256
+30 mins.	48	199	43	290	37	216	53	306	64	331	34	429	45	170	31	246
+45 mins.	77	203	42	322	27	213	57	297	56	328	40	424	48	174	29	251
Total Volume	250	776	162	1188	119	841	222	1182	240	1312	171	1723	189	715	124	1028
% App. Total	21	65.3	13.6		10.1	71.2	18.8		13.9	76.1	9.9		18.4	69.6	12.1	
PHF	.812	.898	.942	.922	.804	.973	.910	.966	.938	.932	.792	.953	.909	.912	.838	.935

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City of Santa Ana
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E/W: Warner Avenue
Weather: Clear

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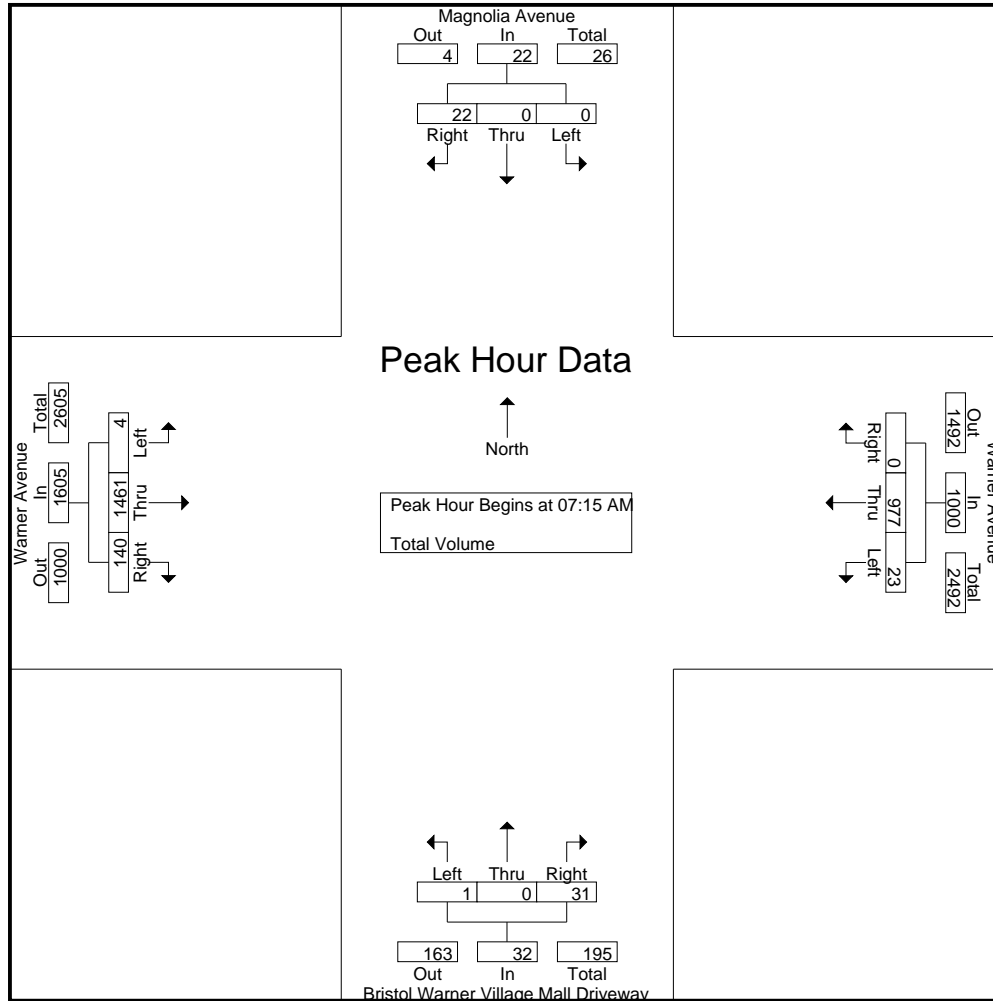
Groups Printed- Total Volume

	Magnolia Avenue Southbound				Warner Avenue Westbound				Bristol Warner Village Mall Driveway Northbound				Warner Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	1	0	4	5	3	118	0	121	0	0	5	5	0	244	27	271	402
07:15 AM	0	0	5	5	7	194	0	201	1	0	11	12	0	353	36	389	607
07:30 AM	0	0	5	5	7	213	0	220	0	0	12	12	0	407	40	447	684
07:45 AM	0	0	9	9	2	287	0	289	0	0	4	4	0	363	37	400	702
Total	1	0	23	24	19	812	0	831	1	0	32	33	0	1367	140	1507	2395
08:00 AM	0	0	3	3	7	283	0	290	0	0	4	4	4	338	27	369	666
08:15 AM	0	0	4	4	4	184	3	191	0	0	7	7	0	281	24	305	507
08:30 AM	0	0	0	0	5	164	1	170	1	0	11	12	0	271	29	300	482
08:45 AM	0	0	2	2	5	127	0	132	0	0	11	11	0	232	24	256	401
Total	0	0	9	9	21	758	4	783	1	0	33	34	4	1122	104	1230	2056
Grand Total	1	0	32	33	40	1570	4	1614	2	0	65	67	4	2489	244	2737	4451
Apprch %	3	0	97		2.5	97.3	0.2		3	0	97		0.1	90.9	8.9		
Total %	0	0	0.7	0.7	0.9	35.3	0.1	36.3	0	0	1.5	1.5	0.1	55.9	5.5	61.5	

	Magnolia Avenue Southbound				Warner Avenue Westbound				Bristol Warner Village Mall Driveway Northbound				Warner Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	0	5	5	7	194	0	201	1	0	11	12	0	353	36	389	607
07:30 AM	0	0	5	5	7	213	0	220	0	0	12	12	0	407	40	447	684
07:45 AM	0	0	9	9	2	287	0	289	0	0	4	4	0	363	37	400	702
08:00 AM	0	0	3	3	7	283	0	290	0	0	4	4	4	338	27	369	666
Total Volume	0	0	22	22	23	977	0	1000	1	0	31	32	4	1461	140	1605	2659
% App. Total	0	0	100		2.3	97.7	0		3.1	0	96.9		0.2	91	8.7		
PHF	.000	.000	.611	.611	.821	.851	.000	.862	.250	.000	.646	.667	.250	.897	.875	.898	.947

City of Santa Ana
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Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:15 AM				08:00 AM				07:15 AM			
+0 mins.	1	0	4	5	7	194	0	201	0	0	4	4	0	353	36	389
+15 mins.	0	0	5	5	7	213	0	220	0	0	7	7	0	407	40	447
+30 mins.	0	0	5	5	2	287	0	289	1	0	11	12	0	363	37	400
+45 mins.	0	0	9	9	7	283	0	290	0	0	11	11	4	338	27	369
Total Volume	1	0	23	24	23	977	0	1000	1	0	33	34	4	1461	140	1605
% App. Total	4.2	0	95.8		2.3	97.7	0		2.9	0	97.1		0.2	91	8.7	
PHF	.250	.000	.639	.667	.821	.851	.000	.862	.250	.000	.750	.708	.250	.897	.875	.898

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City of Santa Ana
N/S: Magnolia Avenue
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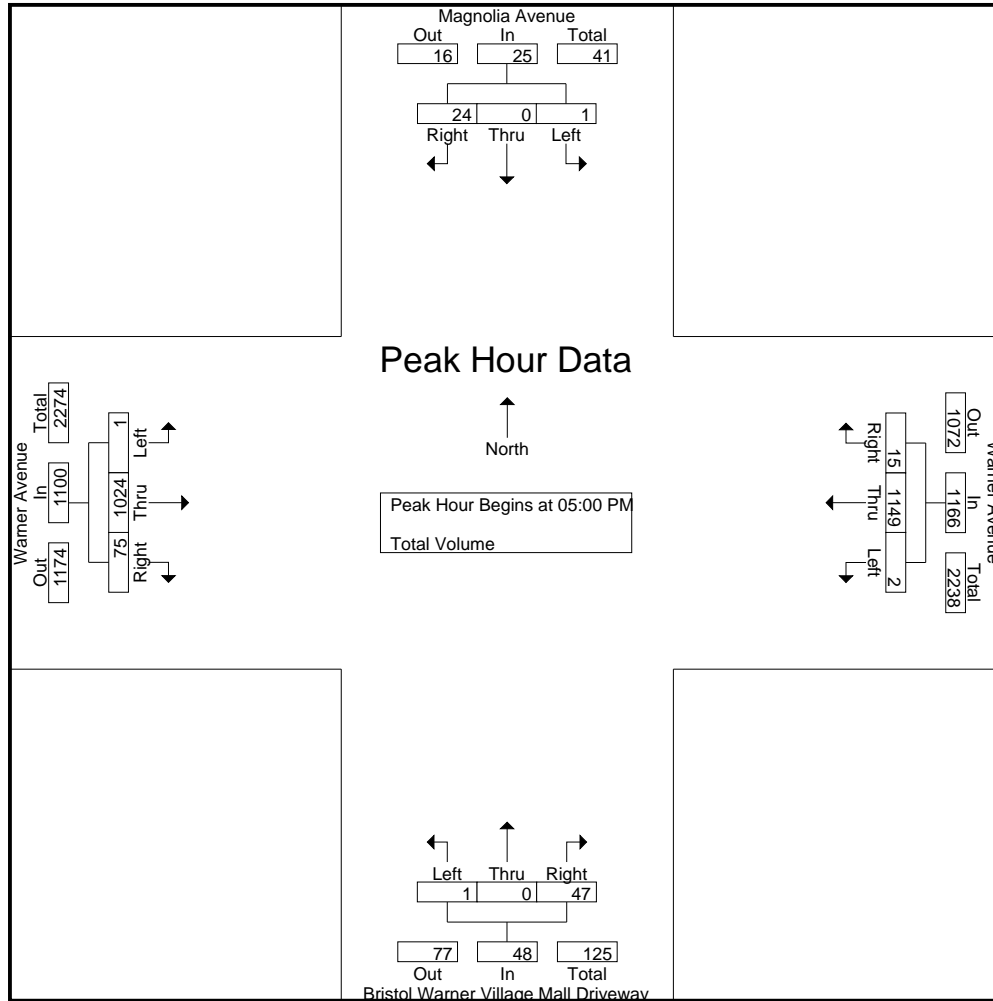
Groups Printed- Total Volume

	Magnolia Avenue Southbound				Warner Avenue Westbound				Bristol Warner Village Mall Driveway Northbound				Warner Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	3	3	3	250	1	254	1	0	18	19	0	208	27	235	511
04:15 PM	0	0	4	4	1	241	0	242	1	0	22	23	0	224	30	254	523
04:30 PM	0	0	3	3	0	299	5	304	2	0	22	24	0	229	22	251	582
04:45 PM	1	0	2	3	5	271	1	277	0	0	12	12	0	225	20	245	537
Total	1	0	12	13	9	1061	7	1077	4	0	74	78	0	886	99	985	2153
05:00 PM	1	0	4	5	0	285	9	294	0	0	16	16	1	294	23	318	633
05:15 PM	0	0	6	6	2	277	3	282	0	0	15	15	0	228	14	242	545
05:30 PM	0	0	7	7	0	313	1	314	0	0	4	4	0	255	13	268	593
05:45 PM	0	0	7	7	0	274	2	276	1	0	12	13	0	247	25	272	568
Total	1	0	24	25	2	1149	15	1166	1	0	47	48	1	1024	75	1100	2339
Grand Total	2	0	36	38	11	2210	22	2243	5	0	121	126	1	1910	174	2085	4492
Apprch %	5.3	0	94.7		0.5	98.5	1		4	0	96		0	91.6	8.3		
Total %	0	0	0.8	0.8	0.2	49.2	0.5	49.9	0.1	0	2.7	2.8	0	42.5	3.9	46.4	

	Magnolia Avenue Southbound				Warner Avenue Westbound				Bristol Warner Village Mall Driveway Northbound				Warner Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	1	0	4	5	0	285	9	294	0	0	16	16	1	294	23	318	633
05:15 PM	0	0	6	6	2	277	3	282	0	0	15	15	0	228	14	242	545
05:30 PM	0	0	7	7	0	313	1	314	0	0	4	4	0	255	13	268	593
05:45 PM	0	0	7	7	0	274	2	276	1	0	12	13	0	247	25	272	568
Total Volume	1	0	24	25	2	1149	15	1166	1	0	47	48	1	1024	75	1100	2339
% App. Total	4	0	96		0.2	98.5	1.3		2.1	0	97.9		0.1	93.1	6.8		
PHF	.250	.000	.857	.893	.250	.918	.417	.928	.250	.000	.734	.750	.250	.871	.750	.865	.924

City of Santa Ana
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Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				04:45 PM				04:00 PM				05:00 PM			
+0 mins.	1	0	4	5	5	271	1	277	1	0	18	19	1	294	23	318
+15 mins.	0	0	6	6	0	285	9	294	1	0	22	23	0	228	14	242
+30 mins.	0	0	7	7	2	277	3	282	2	0	22	24	0	255	13	268
+45 mins.	0	0	7	7	0	313	1	314	0	0	12	12	0	247	25	272
Total Volume	1	0	24	25	7	1146	14	1167	4	0	74	78	1	1024	75	1100
% App. Total	4	0	96		0.6	98.2	1.2		5.1	0	94.9		0.1	93.1	6.8	
PHF	.250	.000	.857	.893	.350	.915	.389	.929	.500	.000	.841	.813	.250	.871	.750	.865

Memorandum: 2235 S Bristol Starbucks Coffee
Focused Traffic Analysis

Appendix B: Volume Development Worksheets

Appendix B - Existing Without & With Project (2023) Peak Hour Volume Summary

	Weekday					
	AM Peak Hour			PM Peak Hour		
	Existing PCE Volumes	Project Trips	Existing With Project Volumes	Existing PCE Volumes	Project Trips	Existing With Project Volumes
1 . S Bristol Street/Driveway 1						
NBU	0	0	0	0	0	0
NBL	0	0	0	0	0	0
NBT	1,021	-11	1014	1,700	-5	1711
NBR	0	53	53	0	24	24
SBU	0	0	0	0	0	0
SBL	0	0	0	0	0	0
SBT	1,901	0	1901	1,176	0	1176
SBR	0	0	0	0	0	0
EBU	0	0	0	0	0	0
EBL	0	0	0	0	0	0
EBT	0	0	0	0	0	0
EBR	0	0	0	0	0	0
WBU	0	0	0	0	0	0
WBL	0	0	0	0	0	0
WBT	0	0	0	0	0	0
WBR	0	13	13	0	6	6
North Leg						
Approach	1,901	0	1,901	1,176	0	1,176
Departure	1,021	2	1,027	1,700	1	1,717
Total	2,922	2	2,928	2,876	1	2,893
South Leg						
Approach	1,021	42	1,067	1,700	19	1,735
Departure	1,901	0	1,901	1,176	0	1,176
Total	2,922	42	2,968	2,876	19	2,911
East Leg						
Approach	0	13	13	0	6	6
Departure	0	53	53	0	24	24
Total	0	66	66	0	30	30
West Leg						
Approach	0	0	0	0	0	0
Departure	0	0	0	0	0	0
Total	0	0	0	0	0	0
Total Approaches						
Approach	2,922	55	2,981	2,876	25	2,917
Departure	2,922	55	2,981	2,876	25	2,917
Total	5,844	110	5,962	5,752	50	5,834

Appendix B - Existing Without & With Project (2023) Peak Hour Volume Summary

	Weekday					
	AM Peak Hour			PM Peak Hour		
	Existing PCE Volumes	Project Trips	Existing With Project Volumes	Existing PCE Volumes	Project Trips	Existing With Project Volumes
2 S Bristol Street/ W Warner Avenue						
NBU	0	0	0	0	0	0
NBL	143	0	143	254	0	254
NBT	727	3	730	1,289	1	1290
NBR	176	0	176	175	0	175
SBU	0	14	14	0	6	6
SBL	284	0	284	255	0	255
SBT	1,446	-11	1435	765	-5	760
SBR	171	0	171	156	0	156
EBU	0	0	0	0	0	0
EBL	170	14	184	189	6	195
EBT	1,145	-11	1134	715	-5	710
EBR	219	0	219	124	0	124
WBU	0	13	13	0	6	6
WBL	176	13	189	119	6	125
WBT	702	-9	693	841	-4	837
WBR	124	14	142	222	6	244
North Leg						
Approach	1,901	3	1,904	1,176	1	1,177
Departure	1,021	45	1,070	1,700	19	1,735
Total	2,922	48	2,974	2,876	20	2,912
South Leg						
Approach	1,046	3	1,049	1,718	1	1,719
Departure	1,841	2	1,843	1,008	1	1,009
Total	2,887	5	2,892	2,726	2	2,728
East Leg						
Approach	1,002	31	1,037	1,182	14	1,212
Departure	1,605	2	1,607	1,145	1	1,146
Total	2,607	33	2,644	2,327	15	2,358
West Leg						
Approach	1,534	3	1,537	1,028	1	1,029
Departure	1,016	-9	1,007	1,251	-4	1,247
Total	2,550	-6	2,544	2,279	-3	2,276
Total Approaches						
Approach	5,483	40	5,527	5,104	17	5,137
Departure	5,483	40	5,527	5,104	17	5,137
Total	10,966	80	11,054	10,208	34	10,274

Appendix B - Existing Without & With Project (2023) Peak Hour Volume Summary

	Weekday					
	AM Peak Hour			PM Peak Hour		
	Existing PCE Volumes	Project Trips	Existing With Project Volumes	Existing PCE Volumes	Project Trips	Existing With Project Volumes
3 Magnolia Avenue/Driveway 2						
NBU	0	0	0	0	0	0
NBL	0	0	0	0	0	0
NBT	4	0	0	16	0	0
NBR	0	0	0	0	0	0
SBU	0	0	0	0	0	0
SBL	0	0	0	0	0	0
SBT	22	0	22	25	0	25
SBR	0	0	0	0	0	0
EBU	0	0	0	0	0	0
EBL	0	0	0	0	0	0
EBT	0	0	0	0	0	0
EBR	0	39	39	0	18	18
WBU	0	0	0	0	0	0
WBL	0	0	0	0	0	0
WBT	0	0	0	0	0	0
WBR	0	0	0	0	0	0
North Leg						
Approach	22	0	22	25	0	25
Departure	4	0	0	16	0	0
Total	26	0	22	41	0	25
South Leg						
Approach	4	0	0	16	0	0
Departure	22	39	61	25	18	43
Total	26	39	61	41	18	43
East Leg						
Approach	0	0	0	0	0	0
Departure	0	0	0	0	0	0
Total	0	0	0	0	0	0
West Leg						
Approach	0	39	39	0	18	18
Departure	0	0	0	0	0	0
Total	0	39	39	0	18	18
Total Approaches						
Approach	26	39	61	41	18	43
Departure	26	39	61	41	18	43
Total	52	78	122	82	36	86

Appendix B - Existing Without & With Project (2023) Peak Hour Volume Summary

	Weekday					
	AM Peak Hour			PM Peak Hour		
	Existing PCE Volumes	Project Trips	Existing With Project Volumes	Existing PCE Volumes	Project Trips	Existing With Project Volumes
4 Magnolia Avenue/ W Warner Avenue						
NBU	0	0	0	0	0	0
NBL	1	0	1	1	0	1
NBT	0	0	0	0	0	0
NBR	31	0	31	47	0	47
SBU	0	0	0	0	0	0
SBL	0	0	0	1	0	1
SBT	0	0	0	0	0	0
SBR	22	39	61	24	18	42
EBU	0	0	0	0	0	0
EBL	4	0	4	1	0	1
EBT	1,461	13	1474	1,024	6	1030
EBR	140	0	140	75	0	75
WBU	0	0	0	0	0	0
WBL	23	0	23	2	0	2
WBT	977	3	984	1,149	1	1166
WBR	0	0	0	15	0	15
North Leg						
Approach	22	39	61	25	18	43
Departure	4	0	4	16	0	16
Total	26	39	65	41	18	59
South Leg						
Approach	32	0	32	48	0	48
Departure	163	0	163	77	0	77
Total	195	0	195	125	0	125
East Leg						
Approach	1,000	3	1,007	1,166	1	1,183
Departure	1,492	13	1,505	1,072	6	1,078
Total	2,492	16	2,512	2,238	7	2,261
West Leg						
Approach	1,605	13	1,618	1,100	6	1,106
Departure	1,000	42	1,046	1,174	19	1,209
Total	2,605	55	2,664	2,274	25	2,315
Total Approaches						
Approach	2,659	55	2,718	2,339	25	2,380
Departure	2,659	55	2,718	2,339	25	2,380
Total	5,318	110	5,436	4,678	50	4,760































Memorandum: 2235 S Bristol Starbucks Coffee
Focused Traffic Analysis

Appendix C: Levels of Service Worksheets

HCM 7th Signalized Intersection Summary

2: S Bristol Street & Warner Avenue

Exist AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 	 		  		
Traffic Volume (veh/h)	170	1145	219	176	702	124	143	727	176	284	1446	171
Future Volume (veh/h)	170	1145	219	176	702	124	143	727	176	284	1446	171
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	185	1245	238	191	763	135	155	790	191	309	1572	186
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	215	1342	417	218	1351	419	195	1252	558	383	1883	222
Arrive On Green	0.12	0.26	0.26	0.12	0.26	0.26	0.06	0.35	0.35	0.11	0.41	0.41
Sat Flow, veh/h	1781	5106	1585	1781	5106	1585	3456	3554	1585	3456	4629	547
Grp Volume(v), veh/h	185	1245	238	191	763	135	155	790	191	309	1155	603
Grp Sat Flow(s),veh/h/ln	1781	1702	1585	1781	1702	1585	1728	1777	1585	1728	1702	1772
Q Serve(g_s), s	12.1	28.2	15.5	12.5	15.3	8.1	5.3	22.0	10.5	10.4	36.2	36.3
Cycle Q Clear(g_c), s	12.1	28.2	15.5	12.5	15.3	8.1	5.3	22.0	10.5	10.4	36.2	36.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.31
Lane Grp Cap(c), veh/h	215	1342	417	218	1351	419	195	1252	558	383	1385	721
V/C Ratio(X)	0.86	0.93	0.57	0.88	0.56	0.32	0.80	0.63	0.34	0.81	0.83	0.84
Avail Cap(c_a), veh/h	319	1354	420	232	1351	419	195	1252	558	684	1385	721
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	51.2	42.7	38.0	51.2	37.8	35.1	55.3	32.0	28.3	51.6	31.6	31.7
Incr Delay (d2), s/veh	14.3	11.2	1.8	27.9	0.5	0.4	20.0	2.4	1.7	4.1	6.1	11.1
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	6.2	12.9	6.1	7.2	6.3	3.1	2.8	9.6	4.2	4.6	15.3	17.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	65.5	53.8	39.8	79.2	38.3	35.5	75.3	34.4	30.0	55.6	37.7	42.8
LnGrp LOS	E	D	D	E	D	D	E	C	C	E	D	D
Approach Vol, veh/h	1668					1089		1136		2067		
Approach Delay, s/veh	53.1					45.1		39.3		41.9		
Approach LOS	D					D		D		D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.7	46.3	19.0	35.7	11.2	52.8	18.8	35.9				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	23.5	31.5	15.5	31.5	6.7	48.3	21.3	25.7				
Max Q Clear Time (g_c+l1), s	12.4	24.0	14.5	30.2	7.3	38.3	14.1	17.3				
Green Ext Time (p_c), s	0.8	3.4	0.1	1.0	0.0	7.2	0.3	3.4				
Intersection Summary												
HCM 7th Control Delay, s/veh	45.1											
HCM 7th LOS	D											



































4: Starbucks Driveway/Magnolia Avenue & Warner Avenue

Intersection												
Int Delay, s/veh	0.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑↑↓			↑↑			↑↓			↑↓		
Traffic Vol, veh/h	4	1461	140	23	977	0	1	0	31	0	0	22
Future Vol, veh/h	4	1461	140	23	977	0	1	0	31	0	0	22
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	1538	147	24	1028	0	1	0	33	0	0	23
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1028	0	0	1685	0	0	2183	-	843	-	-	514
Stage 1	-	-	-	-	-	-	1620	-	-	-	-	-
Stage 2	-	-	-	-	-	-	563	-	-	-	-	-
Critical Hdwy	4.14	-	-	5.34	-	-	6.99	-	7.14	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	7.34	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	3.12	-	-	3.67	-	3.92	-	-	3.32
Pot Cap-1 Maneuver	671	-	-	180	-	-	35	0	264	0	0	505
Stage 1	-	-	-	-	-	-	74	0	-	0	0	-
Stage 2	-	-	-	-	-	-	464	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	671	-	-	180	-	-	27	-	264	-	-	505
Mov Cap-2 Maneuver	-	-	-	-	-	-	27	-	-	-	-	-
Stage 1	-	-	-	-	-	-	73	-	-	-	-	-
Stage 2	-	-	-	-	-	-	359	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s/v	0.03			0.65			20.56			12.47		
HCM LOS							C			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	264	671	-	-	180	-	-	505				
HCM Lane V/C Ratio	0.124	0.006	-	-	0.134	-	-	0.046				
HCM Control Delay (s/veh)	20.6	10.4	-	-	28.1	-	-	12.5				
HCM Lane LOS	C	B	-	-	D	-	-	B				
HCM 95th %tile Q(veh)	0.4	0	-	-	0.5	-	-	0.1				

HCM 7th Signalized Intersection Summary

2: S Bristol Street

Exist PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 	 		  	  	
Traffic Volume (veh/h)	189	715	124	119	841	222	254	1289	175	255	765	156
Future Volume (veh/h)	189	715	124	119	841	222	254	1289	175	255	765	156
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	193	730	127	121	858	227	259	1315	179	260	781	159
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	221	1173	364	148	962	299	323	1569	700	317	1872	378
Arrive On Green	0.12	0.23	0.23	0.08	0.19	0.19	0.09	0.44	0.44	0.09	0.44	0.44
Sat Flow, veh/h	1781	5106	1585	1781	5106	1585	3456	3554	1585	3456	4260	860
Grp Volume(v), veh/h	193	730	127	121	858	227	259	1315	179	260	623	317
Grp Sat Flow(s),veh/h/ln	1781	1702	1585	1781	1702	1585	1728	1777	1585	1728	1702	1716
Q Serve(g_s), s	12.4	15.0	7.8	7.8	19.1	15.8	8.6	38.3	8.3	8.6	14.6	14.8
Cycle Q Clear(g_c), s	12.4	15.0	7.8	7.8	19.1	15.8	8.6	38.3	8.3	8.6	14.6	14.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.50
Lane Grp Cap(c), veh/h	221	1173	364	148	962	299	323	1569	700	317	1496	754
V/C Ratio(X)	0.87	0.62	0.35	0.82	0.89	0.76	0.80	0.84	0.26	0.82	0.42	0.42
Avail Cap(c_a), veh/h	252	1173	364	197	985	306	447	1569	700	341	1496	754
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	50.2	40.4	37.6	52.6	46.2	44.8	51.8	28.9	20.5	52.0	22.4	22.5
Incr Delay (d2), s/veh	24.6	1.0	0.6	17.9	10.2	10.4	7.1	5.5	0.9	13.9	0.9	1.7
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	6.9	6.2	3.0	4.2	8.8	6.9	4.0	16.6	3.2	4.3	5.8	6.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	74.8	41.4	38.2	70.5	56.4	55.2	58.9	34.4	21.4	66.0	23.3	24.2
LnGrp LOS	E	D	D	E	E	E	E	C	C	E	C	C
Approach Vol, veh/h	1050			1206			1753			1200		
Approach Delay, s/veh	47.2			57.6			36.7			32.8		
Approach LOS	D			E			D			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.2	56.0	14.2	31.3	15.4	55.8	19.0	26.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	11.5	51.5	12.9	26.1	15.1	47.9	16.5	22.5				
Max Q Clear Time (g_c+l1), s	10.6	40.3	9.8	17.0	10.6	16.8	14.4	21.1				
Green Ext Time (p_c), s	0.1	6.9	0.1	3.4	0.3	6.7	0.1	0.9				
Intersection Summary												
HCM 7th Control Delay, s/veh	42.7											
HCM 7th LOS	D											

HCM 7th TWSC
4: Starbucks Driveway/Magnolia Avenue

Exist PM

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑↑↓			↑↑↓			↑↓			↑↓		
Traffic Vol, veh/h	1	1024	75	2	1149	15	1	0	47	1	0	24
Future Vol, veh/h	1	1024	75	2	1149	15	1	0	47	1	0	24
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1113	82	2	1249	16	1	0	51	1	0	26
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1265	0	0	1195	0	0	1785	-	597	1709	-	633
Stage 1	-	-	-	-	-	-	1156	-	-	1261	-	-
Stage 2	-	-	-	-	-	-	629	-	-	447	-	-
Critical Hdwy	4.14	-	-	5.34	-	-	6.99	-	7.14	6.99	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	7.34	-	-	6.54	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	-	-	6.74	-	-
Follow-up Hdwy	2.22	-	-	3.12	-	-	3.67	-	3.92	3.67	-	3.32
Pot Cap-1 Maneuver	545	-	-	315	-	-	67	0	382	75	0	423
Stage 1	-	-	-	-	-	-	158	0	-	176	0	-
Stage 2	-	-	-	-	-	-	424	0	-	529	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	545	-	-	315	-	-	62	-	382	64	-	423
Mov Cap-2 Maneuver	-	-	-	-	-	-	62	-	-	64	-	-
Stage 1	-	-	-	-	-	-	158	-	-	174	-	-
Stage 2	-	-	-	-	-	-	394	-	-	457	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s/v	0.01			0.03			15.87			14.08		
HCM LOS							C			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	382	545	-	-	315	-	-	423				
HCM Lane V/C Ratio	0.134	0.002	-	-	0.007	-	-	0.062				
HCM Control Delay (s/veh)	15.9	11.6	-	-	16.5	-	-	14.1				
HCM Lane LOS	C	B	-	-	C	-	-	B				
HCM 95th %tile Q(veh)	0.5	0	-	-	0	-	-	0.2				

HCM 7th TWSC
1: S Bristol Street & Driveway 1
































Exist With P AM

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↕			↕
Traffic Vol, veh/h	0	13	1014	53	0	1901
Future Vol, veh/h	0	13	1014	53	0	1901
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	14	1102	58	0	2066
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	-	580	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	458	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	458	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s/v13.11		0	0			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBT			
Capacity (veh/h)	-	-	458	-		
HCM Lane V/C Ratio	-	-	0.031	-		
HCM Control Delay (s/veh)	-	-	13.1	-		
HCM Lane LOS	-	-	B	-		
HCM 95th %tile Q(veh)	-	-	0.1	-		

HCM 7th Signalized Intersection Summary



2: S Bristol Street & W Warner Avenue

Exist With P AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 	 		 	  	
Traffic Volume (veh/h)	184	1134	219	202	693	142	143	730	176	298	1435	171
Future Volume (veh/h)	184	1134	219	202	693	142	143	730	176	298	1435	171
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	200	1233	238	220	753	154	155	793	191	324	1560	186
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	229	1275	396	236	1295	402	184	1224	546	401	1883	224
Arrive On Green	0.13	0.25	0.25	0.13	0.25	0.25	0.05	0.34	0.34	0.12	0.41	0.41
Sat Flow, veh/h	1781	5106	1585	1781	5106	1585	3456	3554	1585	3456	4625	551
Grp Volume(v), veh/h	200	1233	238	220	753	154	155	793	191	324	1148	598
Grp Sat Flow(s),veh/h/ln	1781	1702	1585	1781	1702	1585	1728	1777	1585	1728	1702	1771
Q Serve(g_s), s	12.6	27.4	15.2	14.0	14.8	9.2	5.1	21.6	10.3	10.5	34.5	34.6
Cycle Q Clear(g_c), s	12.6	27.4	15.2	14.0	14.8	9.2	5.1	21.6	10.3	10.5	34.5	34.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.31
Lane Grp Cap(c), veh/h	229	1275	396	236	1295	402	184	1224	546	401	1386	721
V/C Ratio(X)	0.87	0.97	0.60	0.93	0.58	0.38	0.84	0.65	0.35	0.81	0.83	0.83
Avail Cap(c_a), veh/h	275	1275	396	236	1295	402	184	1224	546	694	1548	806
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	49.0	42.5	37.9	49.2	37.4	35.3	53.7	31.7	28.0	49.4	30.4	30.4
Incr Delay (d2), s/veh	22.1	17.9	2.5	40.0	0.7	0.6	28.1	1.2	0.4	3.9	3.5	6.7
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	6.9	13.2	6.0	8.7	6.1	3.5	2.9	9.1	3.9	4.6	14.1	15.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	71.0	60.4	40.5	89.1	38.1	35.9	81.9	32.9	28.4	53.3	33.9	37.1
LnGrp LOS	E	E	D	F	D	D	F	C	C	D	C	D
Approach Vol, veh/h	1671		1127			1139			2070			
Approach Delay, s/veh	58.8		47.8			38.8			37.9			
Approach LOS	E		D			D			D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.8	44.0	19.7	33.1	10.6	51.1	19.2	33.6				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	23.0	35.2	15.2	28.6	6.1	52.1	17.7	26.1				
Max Q Clear Time (g_c+l1), s	12.5	23.6	16.0	29.4	7.1	36.6	14.6	16.8				
Green Ext Time (p_c), s	0.8	4.5	0.0	0.0	0.0	10.0	0.2	3.7				
Intersection Summary												
HCM 7th Control Delay, s/veh	45.7											
HCM 7th LOS	D											

HCM 7th TWSC
3: Magnolia Avenue & Driveway 2

Exist With P AM

Intersection						
Int Delay, s/veh	5.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	39	0	0	22	0
Future Vol, veh/h	0	39	0	0	22	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	-	-	-	-	-	-
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	42	0	0	24	0
Major/Minor	Minor2		Major2			
Conflicting Flow All	-	24	-	-	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	1053	-	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	1053	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB		SB			
HCM Control Delay, s/v	8.56		0			
HCM LOS	A					
Minor Lane/Major Mvmt	EBLn1	SBT	SBR			
Capacity (veh/h)	1053	-	-			
HCM Lane V/C Ratio	0.04	-	-			
HCM Control Delay (s/veh)	8.6	-	-			
HCM Lane LOS	A	-	-			
HCM 95th %tile Q(veh)	0.1	-	-			

4: Starbucks Driveway/Magnolia Avenue & W Warner Avenue

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑↑↓			↱	↑↑			↕				↱
Traffic Vol, veh/h	4	1474	140	23	984	0	1	0	31	0	0	61
Future Vol, veh/h	4	1474	140	23	984	0	1	0	31	0	0	61
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	1552	147	24	1036	0	1	0	33	0	0	64
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1036	0	0	1699	0	0	2200	2718	849	-	-	518
Stage 1	-	-	-	-	-	-	1634	1634	-	-	-	-
Stage 2	-	-	-	-	-	-	566	1084	-	-	-	-
Critical Hdwy	4.14	-	-	5.34	-	-	6.99	6.54	7.14	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	7.34	5.54	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	-	-	-
Follow-up Hdwy	2.22	-	-	3.12	-	-	3.67	4.02	3.92	-	-	3.32
Pot Cap-1 Maneuver	667	-	-	177	-	-	34	20	261	0	0	503
Stage 1	-	-	-	-	-	-	72	158	-	0	0	-
Stage 2	-	-	-	-	-	-	462	291	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	667	-	-	177	-	-	26	18	261	-	-	503
Mov Cap-2 Maneuver	-	-	-	-	-	-	26	18	-	-	-	-
Stage 1	-	-	-	-	-	-	71	156	-	-	-	-
Stage 2	-	-	-	-	-	-	348	251	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s/v	0.03			0.65			26.25			13.21		
HCM LOS							D			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	203	667	-	-	177	-	-	503				
HCM Lane V/C Ratio	0.166	0.006	-	-	0.137	-	-	0.128				
HCM Control Delay (s/veh)	26.2	10.4	-	-	28.5	-	-	13.2				
HCM Lane LOS	D	B	-	-	D	-	-	B				
HCM 95th %tile Q(veh)	0.6	0	-	-	0.5	-	-	0.4				

HCM 7th TWSC
1: S Bristol Street & Driveway 1
































Exist With P PM

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↗↘			↗↘↗
Traffic Vol, veh/h	0	6	1711	24	0	1176
Future Vol, veh/h	0	6	1711	24	0	1176
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	7	1860	26	0	1278
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	-	943	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	264	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	264	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s/v	19	0		0		
HCM LOS	C					
Minor Lane/Major Mvmt		NBT	NBRWBLn1	SBT		
Capacity (veh/h)		-	-	264	-	
HCM Lane V/C Ratio		-	-	0.025	-	
HCM Control Delay (s/veh)		-	-	19	-	
HCM Lane LOS		-	-	C	-	
HCM 95th %tile Q(veh)		-	-	0.1	-	

HCM 7th Signalized Intersection Summary



2: S Bristol Street & W Warner Avenue

Exist With P PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 	 		 	  	
Traffic Volume (veh/h)	195	710	124	131	837	244	254	1290	175	261	760	156
Future Volume (veh/h)	195	710	124	131	837	244	254	1290	175	261	760	156
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	199	724	127	134	854	249	259	1316	179	266	776	159
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	229	1178	366	162	987	307	327	1499	669	326	1794	364
Arrive On Green	0.13	0.23	0.23	0.09	0.19	0.19	0.09	0.42	0.42	0.09	0.42	0.42
Sat Flow, veh/h	1781	5106	1585	1781	5106	1585	3456	3554	1585	3456	4255	864
Grp Volume(v), veh/h	199	724	127	134	854	249	259	1316	179	266	620	315
Grp Sat Flow(s),veh/h/ln	1781	1702	1585	1781	1702	1585	1728	1777	1585	1728	1702	1715
Q Serve(g_s), s	12.2	14.1	7.5	8.2	18.0	16.7	8.2	37.8	8.2	8.4	14.3	14.5
Cycle Q Clear(g_c), s	12.2	14.1	7.5	8.2	18.0	16.7	8.2	37.8	8.2	8.4	14.3	14.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.50
Lane Grp Cap(c), veh/h	229	1178	366	162	987	307	327	1499	669	326	1436	723
V/C Ratio(X)	0.87	0.61	0.35	0.83	0.86	0.81	0.79	0.88	0.27	0.82	0.43	0.44
Avail Cap(c_a), veh/h	264	1217	378	200	1033	321	469	1646	734	357	1466	739
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	47.6	38.3	35.8	49.7	43.4	42.9	49.3	29.5	20.9	49.4	22.7	22.8
Incr Delay (d2), s/veh	23.1	0.9	0.6	20.2	7.6	14.1	5.9	5.4	0.2	12.7	0.2	0.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.7	5.8	2.9	4.5	8.1	7.6	3.7	16.3	3.0	4.1	5.5	5.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	70.7	39.2	36.3	69.9	51.0	57.1	55.1	34.9	21.2	62.1	22.9	23.2
LnGrp LOS	E	D	D	E	D	E	E	C	C	E	C	C
Approach Vol, veh/h	1050			1237			1754			1201		
Approach Delay, s/veh	44.8			54.3			36.5			31.7		
Approach LOS	D			D			D			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.0	51.4	14.6	30.2	15.0	51.4	18.8	26.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	11.5	51.5	12.5	26.5	15.1	47.9	16.5	22.5				
Max Q Clear Time (g_c+l1), s	10.4	39.8	10.2	16.1	10.2	16.5	14.2	20.0				
Green Ext Time (p_c), s	0.1	7.1	0.1	3.7	0.4	6.7	0.1	1.5				
Intersection Summary												
HCM 7th Control Delay, s/veh	41.3											
HCM 7th LOS	D											

HCM 7th TWSC
3: Magnolia Avenue & Driveway 2

Exist With P PM

Intersection						
Int Delay, s/veh	3.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	18	0	0	25	0
Future Vol, veh/h	0	18	0	0	25	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	-	-	-	-	-	-
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	20	0	0	27	0
Major/Minor	Minor2		Major2			
Conflicting Flow All	-	27	-	-	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	1048	-	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	1048	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB		SB			
HCM Control Delay, s/v	8.5		0			
HCM LOS	A					
Minor Lane/Major Mvmt	EBLn1	SBT	SBR			
Capacity (veh/h)	1048	-	-			
HCM Lane V/C Ratio	0.019	-	-			
HCM Control Delay (s/veh)	8.5	-	-			
HCM Lane LOS	A	-	-			
HCM 95th %tile Q(veh)	0.1	-	-			



































4: Starbucks Driveway/Magnolia Avenue & W Warner Avenue

Intersection												
Int Delay, s/veh	0.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑↑			↱	↑↑			↕				↱
Traffic Vol, veh/h	1	1030	75	2	1166	15	1	0	47	1	0	42
Future Vol, veh/h	1	1030	75	2	1166	15	1	0	47	1	0	42
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1120	82	2	1267	16	1	0	51	1	0	46
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1284	0	0	1201	0	0	1801	2451	601	1730	-	642
Stage 1	-	-	-	-	-	-	1163	1163	-	1280	-	-
Stage 2	-	-	-	-	-	-	638	1288	-	450	-	-
Critical Hdwy	4.14	-	-	5.34	-	-	6.99	6.54	7.14	6.99	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	7.34	5.54	-	6.54	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.74	-	-
Follow-up Hdwy	2.22	-	-	3.12	-	-	3.67	4.02	3.92	3.67	-	3.32
Pot Cap-1 Maneuver	536	-	-	313	-	-	65	31	380	73	0	417
Stage 1	-	-	-	-	-	-	156	267	-	172	0	-
Stage 2	-	-	-	-	-	-	419	233	-	527	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	536	-	-	313	-	-	57	30	380	62	-	417
Mov Cap-2 Maneuver	-	-	-	-	-	-	57	30	-	62	-	-
Stage 1	-	-	-	-	-	-	156	267	-	171	-	-
Stage 2	-	-	-	-	-	-	370	231	-	455	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s/v	0.01			0.03			17.49			14.69		
HCM LOS							C			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	340	536	-	-	313	-	-	417				
HCM Lane V/C Ratio	0.153	0.002	-	-	0.007	-	-	0.11				
HCM Control Delay (s/veh)	17.5	11.7	-	-	16.6	-	-	14.7				
HCM Lane LOS	C	B	-	-	C	-	-	B				
HCM 95th %tile Q(veh)	0.5	0	-	-	0	-	-	0.4				












Lanes, Volumes, Timings

2: S Bristol Street & Warner Avenue

Exist AM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 	 		  	  	
Traffic Volume (vph)	170	1145	219	176	702	124	143	727	176	284	1446	171
Future Volume (vph)	170	1145	219	176	702	124	143	727	176	284	1446	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%				0%				0%			
Storage Length (ft)	194		152	221		123	125		117	135		54
Storage Lanes	1		1	1		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red	Yes				Yes				Yes			
Link Speed (mph)	40				40				40			
Link Distance (ft)	458				284				301			
Travel Time (s)	7.8				4.8				5.1			
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)	0%				0%				0%			
Shared Lane Traffic (%)												
Lane Group Flow (vph)	185	1245	238	191	763	135	155	790	191	309	1758	0
v/c Ratio	0.73	0.93	0.45	0.86	0.61	0.26	0.81	0.68	0.30	0.67	0.86	
Control Delay (s/veh)	65.5	55.9	16.8	85.0	43.1	3.5	85.7	39.3	7.1	56.6	37.8	
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 (s/veh)	65.5	55.9	16.8	85.0	43.1	3.5	85.7	39.3	7.1	56.6	37.8	
Queue Length 50th (ft)	138	346	53	146	193	0	62	279	7	119	447	
Queue Length 95th (ft)	212	#436	130	#274	249	25	#119	370	63	160	515	
Internal Link Dist (ft)	378				204				221			
Turn Bay Length (ft)	194		152	221		123	125		117	135		
Base Capacity (vph)	315	1340	528	229	1250	522	192	1155	635	675	2034	
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	0.59	0.93	0.45	0.83	0.61	0.26	0.81	0.68	0.30	0.46	0.86	
Intersection Summary												
Area Type:	Other											
#	95th percentile volume exceeds capacity, queue may be longer.											
	Queue shown is maximum after two cycles.											

2: S Bristol Street & Warner Avenue




















											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	185	1245	238	191	763	135	155	790	191	309	1758
v/c Ratio	0.73	0.93	0.45	0.86	0.61	0.26	0.81	0.68	0.30	0.67	0.86
Control Delay (s/veh)	65.5	55.9	16.8	85.0	43.1	3.5	85.7	39.3	7.1	56.6	37.8
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 (s/veh)	65.5	55.9	16.8	85.0	43.1	3.5	85.7	39.3	7.1	56.6	37.8
Queue Length 50th (ft)	138	346	53	146	193	0	62	279	7	119	447
Queue Length 95th (ft)	212	#436	130	#274	249	25	#119	370	63	160	515
Internal Link Dist (ft)		378			204			221			65
Turn Bay Length (ft)	194		152	221		123	125		117	135	
Base Capacity (vph)	315	1340	528	229	1250	522	192	1155	635	675	2034
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	0.59	0.93	0.45	0.83	0.61	0.26	0.81	0.68	0.30	0.46	0.86

Intersection Summary

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

Queue shown is maximum after two cycles.































4: Starbucks Driveway/Magnolia Avenue & Warner Avenue

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			 							
Traffic Volume (vph)	4	1461	140	23	977	0	1	0	31	0	0	22
Future Volume (vph)	4	1461	140	23	977	0	1	0	31	0	0	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		59
Storage Lanes	0		0	0		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		284			277			118			141	
Travel Time (s)		6.5			6.3			2.7			3.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1689	0	0	1052	0	0	1	33	0	0	23
Intersection Summary												
Area Type:	Other											

















Lanes, Volumes, Timings

2: S Bristol Street

Exist PM

														
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations		  			  		 	 		  				
Traffic Volume (vph)	189	715	124	119	841	222	254	1289	175	255	765	156		
Future Volume (vph)	189	715	124	119	841	222	254	1289	175	255	765	156		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12		
Grade (%)	0%				0%				0%					
Storage Length (ft)	194			152	221			123	125			117	135	54
Storage Lanes	1			1	1			1	2			1	2	0
Taper Length (ft)	25			25			25			25			25	
Right Turn on Red	Yes				Yes				Yes				Yes	
Link Speed (mph)	40				40				40				40	
Link Distance (ft)	458				284				301				145	
Travel Time (s)	7.8				4.8				5.1				2.5	
Confl. Peds. (#/hr)														
Confl. Bikes (#/hr)														
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98		
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%		
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0		
Parking (#/hr)														
Mid-Block Traffic (%)	0%				0%				0%				0%	
Shared Lane Traffic (%)														
Lane Group Flow (vph)	193	730	127	121	858	227	259	1315	179	260	940	0		
v/c Ratio	0.83	0.65	0.28	0.70	0.89	0.53	0.67	0.86	0.24	0.80	0.45			
Control Delay (s/veh)	78.9	45.4	8.3	73.1	59.9	19.4	59.5	37.6	11.1	71.4	25.0			
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 (s/veh)	78.9	45.4	8.3	73.1	59.9	19.4	59.5	37.6	11.1	71.4	25.0			
Queue Length 50th (ft)	147	190	0	91	240	46	100	478	38	103	183			
Queue Length 95th (ft)	#265	236	51	#166	#315	127	144	580	87	#166	226			
Internal Link Dist (ft)	378		204				221		65					
Turn Bay Length (ft)	194			152	221			123	125			117	135	
Base Capacity (vph)	245	1128	450	192	962	427	435	1532	739	331	2083			
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	0.65	0.28	0.63	0.89	0.53	0.60	0.86	0.24	0.79	0.45			
Intersection Summary														
Area Type:	Other													
#	95th percentile volume exceeds capacity, queue may be longer.													
	Queue shown is maximum after two cycles.													

4: Starbucks Driveway/Magnolia Avenue

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	1024	75	2	1149	15	1	0	47	1	0	24
Future Volume (vph)	1	1024	75	2	1149	15	1	0	47	1	0	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		59
Storage Lanes	0		0	0		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		284			277			118			141	
Travel Time (s)		6.5			6.3			2.7			3.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1196	0	0	1267	0	0	1	51	0	1	26
Intersection Summary												
Area Type:	Other											


































Lanes, Volumes, Timings
1: S Bristol Street & Driveway 1

Exist With P AM












Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	13	1014	53	0	1901
Future Volume (vph)	0	13	1014	53	0	1901
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	0	
Storage Lanes	0	1		0	0	
Taper Length (ft)	25				25	
Link Speed (mph)	30		40			30
Link Distance (ft)	144		145			214
Travel Time (s)	3.3		2.5			4.9
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	14	1160	0	0	2066
Intersection Summary						
Area Type:	Other					

Lanes, Volumes, Timings
2: S Bristol Street & W Warner Avenue

Exist With P AM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 	 		 	  	
Traffic Volume (vph)	184	1134	219	202	693	142	143	730	176	298	1435	171
Future Volume (vph)	184	1134	219	202	693	142	143	730	176	298	1435	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%				0%				0%			
Storage Length (ft)	194		152	221		123	125		117	135		54
Storage Lanes	1		1	1		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red	Yes				Yes				Yes			
Link Speed (mph)	40				40				40			
Link Distance (ft)	757				284				301			
Travel Time (s)	12.9				4.8				5.1			
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)	0%				0%				0%			
Shared Lane Traffic (%)												
Lane Group Flow (vph)	200	1233	238	220	753	154	155	793	191	324	1746	0
v/c Ratio	0.82	1.00	0.49	0.96	0.63	0.32	0.87	0.67	0.31	0.68	0.82	
Control Delay (s/veh)	74.9	69.4	20.4	102.1	44.0	10.8	96.7	37.3	11.1	55.7	33.6	
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 (s/veh)	74.9	69.4	20.4	102.1	44.0	10.8	96.7	37.3	11.1	55.7	33.6	
Queue Length 50th (ft)	151	~370	65	172	197	11	62	270	29	124	416	
Queue Length 95th (ft)	#263	#465	146	#334	244	67	#126	359	89	167	480	
Internal Link Dist (ft)	677				204				221			
Turn Bay Length (ft)	194		152	221		123	125		117	135		
Base Capacity (vph)	267	1238	488	229	1192	475	178	1184	620	672	2234	
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	0.75	1.00	0.49	0.96	0.63	0.32	0.87	0.67	0.31	0.48	0.78	
Intersection Summary												
Area Type:	Other											
~	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.											

2: S Bristol Street & W Warner Avenue

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	200	1233	238	220	753	154	155	793	191	324	1746
v/c Ratio	0.82	1.00	0.49	0.96	0.63	0.32	0.87	0.67	0.31	0.68	0.82
Control Delay (s/veh)	74.9	69.4	20.4	102.1	44.0	10.8	96.7	37.3	11.1	55.7	33.6
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 (s/veh)	74.9	69.4	20.4	102.1	44.0	10.8	96.7	37.3	11.1	55.7	33.6
Queue Length 50th (ft)	151	~370	65	172	197	11	62	270	29	124	416
Queue Length 95th (ft)	#263	#465	146	#334	244	67	#126	359	89	167	480
Internal Link Dist (ft)		677			204			221			65
Turn Bay Length (ft)	194		152	221		123	125		117	135	
Base Capacity (vph)	267	1238	488	229	1192	475	178	1184	620	672	2234
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	0.75	1.00	0.49	0.96	0.63	0.32	0.87	0.67	0.31	0.48	0.78

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.

Lanes, Volumes, Timings
3: Magnolia Avenue & Driveway 2

Exist With P AM





						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	39	0	0	22	0
Future Volume (vph)	0	39	0	0	22	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	0	0			0
Storage Lanes	0	0	0			0
Taper Length (ft)	25		25			
Link Speed (mph)	30			30	30	
Link Distance (ft)	87			141	184	
Travel Time (s)	2.0			3.2	4.2	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	42	0	0	24	0
Intersection Summary						
Area Type:	Other					

4: Starbucks Driveway/Magnolia Avenue & W Warner Avenue

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			  				
Traffic Volume (vph)	4	1474	140	23	984	0	1	0	31	0	0	61
Future Volume (vph)	4	1474	140	23	984	0	1	0	31	0	0	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		59
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		284			347			118			141	
Travel Time (s)		6.5			7.9			0.0			5.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1703	0	24	1036	0	0	34	0	0	0	64
Intersection Summary												
Area Type:	Other											



































Lanes, Volumes, Timings
1: S Bristol Street & Driveway 1

Exist With P PM

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	6	1711	24	0	1176
Future Volume (vph)	0	6	1711	24	0	1176
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	0	
Storage Lanes	0	1		0	0	
Taper Length (ft)	25				25	
Link Speed (mph)	30		40			30
Link Distance (ft)	144		145			214
Travel Time (s)	3.3		2.5			4.9
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	7	1886	0	0	1278
Intersection Summary						
Area Type:	Other					

Lanes, Volumes, Timings
2: S Bristol Street & W Warner Avenue












Exist With P PM

														
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations		  			  		 	 		  	  			
Traffic Volume (vph)	195	710	124	131	837	244	254	1290	175	261	760	156		
Future Volume (vph)	195	710	124	131	837	244	254	1290	175	261	760	156		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12		
Grade (%)	0%				0%				0%					
Storage Length (ft)	194			152	221			123	125			117	135	54
Storage Lanes	1			1	1			1	2			1	2	0
Taper Length (ft)	25			25			25			25				
Right Turn on Red			Yes				Yes				Yes		Yes	
Link Speed (mph)	40				40				40				40	
Link Distance (ft)	757				284				301				145	
Travel Time (s)	12.9				4.8				5.1				2.5	
Confl. Peds. (#/hr)														
Confl. Bikes (#/hr)														
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98		
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%		
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0		
Parking (#/hr)														
Mid-Block Traffic (%)	0%				0%				0%				0%	
Shared Lane Traffic (%)														
Lane Group Flow (vph)	199	724	127	134	854	249	259	1316	179	266	935	0		
v/c Ratio	0.84	0.63	0.28	0.75	0.88	0.56	0.66	0.89	0.25	0.80	0.46			
Control Delay (s/veh)	78.2	44.1	8.3	76.8	57.4	19.6	58.3	39.5	11.2	70.3	25.3			
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 (s/veh)	78.2	44.1	8.3	76.8	57.4	19.6	58.3	39.5	11.2	70.3	25.3			
Queue Length 50th (ft)	152	187	0	102	238	50	100	478	38	105	182			
Queue Length 95th (ft)	#276	233	51	#196	#312	136	144	581	87	#172	224			
Internal Link Dist (ft)	677				204				221				65	
Turn Bay Length (ft)	194			152	221			123	125			117	135	
Base Capacity (vph)	252	1166	461	191	990	448	448	1577	758	341	2094			
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	0.62	0.28	0.70	0.86	0.56	0.58	0.83	0.24	0.78	0.45			
Intersection Summary														
Area Type:	Other													
# 95th percentile volume exceeds capacity, queue may be longer.														
Queue shown is maximum after two cycles.														

Queues

Exist With P PM

2: S Bristol Street & W Warner Avenue

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	199	724	127	134	854	249	259	1316	179	266	935
v/c Ratio	0.84	0.63	0.28	0.75	0.88	0.56	0.66	0.89	0.25	0.80	0.46
Control Delay (s/veh)	78.2	44.1	8.3	76.8	57.4	19.6	58.3	39.5	11.2	70.3	25.3
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 (s/veh)	78.2	44.1	8.3	76.8	57.4	19.6	58.3	39.5	11.2	70.3	25.3
Queue Length 50th (ft)	152	187	0	102	238	50	100	478	38	105	182
Queue Length 95th (ft)	#276	233	51	#196	#312	136	144	581	87	#172	224
Internal Link Dist (ft)		677			204			221			65
Turn Bay Length (ft)	194		152	221		123	125		117	135	
Base Capacity (vph)	252	1166	461	191	990	448	448	1577	758	341	2094
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	0.62	0.28	0.70	0.86	0.56	0.58	0.83	0.24	0.78	0.45




Intersection Summary

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
























Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
3: Magnolia Avenue & Driveway 2

Exist With P PM

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	18	0	0	25	0
Future Volume (vph)	0	18	0	0	25	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	0	0			0
Storage Lanes	0	0	0			0
Taper Length (ft)	25		25			
Link Speed (mph)	30			30	30	
Link Distance (ft)	87			141	184	
Travel Time (s)	2.0			3.2	4.2	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	20	0	0	27	0
Intersection Summary						
Area Type:	Other					

4: Starbucks Driveway/Magnolia Avenue & W Warner Avenue

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			  				
Traffic Volume (vph)	1	1030	75	2	1166	15	1	0	47	1	0	42
Future Volume (vph)	1	1030	75	2	1166	15	1	0	47	1	0	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		59
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		284			347			118			141	
Travel Time (s)		6.5			7.9			0.0			5.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1203	0	2	1283	0	0	52	0	0	1	46
Intersection Summary												
Area Type:	Other											

Memorandum: 2235 S Bristol Starbucks Coffee
Focused Traffic Analysis

Appendix D: Drive Through Stacking Study

ARRİŞVAL/QUEUE SURVEY

LOCATION: Starbucks, 1134 N. State College Blvd
CŞİŞTY: AnaheŞİŞm

DAY: Thursday
DATE: 5/31/2018

TIME PERIOD: 7:00 AM TO 9:00 AM

ARRIVAL TIME	TIME BETWEEN ARRIVALS	Order Board	Pick-up Window	TOTAL
7:02:23	-	1	2	3
7:02:25	0:00:02	2	1	3
7:04:33	0:02:08	1	2	3
7:04:38	0:00:05	2	2	4
7:08:03	0:03:25	1	0	1
7:08:20	0:00:17	2	0	2
7:08:24	0:00:04	3	0	3
7:08:39	0:00:15	3	1	4
7:08:46	0:00:07	4	1	5
7:09:22	0:00:36	4	2	6
7:09:37	0:00:15	5	2	7
7:10:02	0:00:25	5	2	7
7:11:15	0:01:13	5	2	7
7:11:42	0:00:27	5	3	8
7:11:46	0:00:04	6	3	9
7:12:06	0:00:20	6	3	9
7:12:23	0:00:17	7	3	10
7:13:12	0:00:49	6	4	10
7:14:37	0:01:25	5	5	10
7:15:27	0:00:50	6	5	11
7:17:02	0:01:35	5	4	9
7:17:10	0:00:08	5	5	10
7:19:44	0:02:34	3	4	7
7:19:47	0:00:03	4	4	8
7:21:22	0:01:35	4	3	7
7:21:24	0:00:02	5	3	8
7:21:51	0:00:27	4	4	8
7:23:24	0:01:33	3	3	6
7:23:44	0:00:20	3	4	7
7:24:07	0:00:23	4	3	7
7:25:36	0:01:29	4	4	8
7:25:42	0:00:06	5	4	9
7:26:32	0:00:50	4	5	9
7:28:43	0:02:11	2	4	6
7:29:48	0:01:05	2	3	5
7:30:27	0:00:39	1	3	4
7:32:34	0:02:07	1	2	3
7:32:38	0:00:04	2	2	4
7:32:40	0:00:02	3	2	5
7:32:49	0:00:09	4	2	6
7:33:14	0:00:25	4	1	5
7:34:03	0:00:49	4	2	6
7:34:28	0:00:25	4	3	7
7:37:15	0:02:47	2	2	4
7:37:19	0:00:04	2	3	5
7:37:54	0:00:35	3	2	5
7:40:52	0:02:58	1	2	3

ARRIVAL TIME	TIME BETWEEN ARRIVALS	Order Board	Pick-up Window	TOTAL
7:41:19	0:00:27	1	3	4
7:41:22	0:00:03	2	3	5
7:41:25	0:00:03	3	2	5
7:41:29	0:00:04	4	2	6
7:42:18	0:00:49	3	2	5
7:42:23	0:00:05	4	2	6
7:42:52	0:00:29	4	3	7
7:43:32	0:00:40	4	3	7
7:45:01	0:01:29	3	4	7
7:45:40	0:00:39	3	4	7
7:45:47	0:00:07	4	4	8
7:49:11	0:03:24	1	4	5
7:50:30	0:01:19	1	3	4
7:51:28	0:00:58	1	4	5
7:51:59	0:00:31	2	3	5
7:52:27	0:00:28	3	3	6
7:52:48	0:00:21	4	3	7
7:53:42	0:00:54	3	3	6
7:54:16	0:00:34	3	4	7
7:55:46	0:01:30	4	4	8
7:57:07	0:01:21	4	4	8
8:00:21	0:03:14	1	3	4
8:01:21	0:01:00	1	2	3
8:02:37	0:01:16	1	2	3
8:04:27	0:01:50	1	1	2
8:04:29	0:00:02	2	1	3
8:04:46	0:00:17	3	1	4
8:04:51	0:00:05	4	1	5
8:04:53	0:00:02	5	1	6
8:09:41	0:04:48	1	4	5
8:09:50	0:00:09	2	4	6
8:09:52	0:00:02	3	4	7
8:10:18	0:00:26	4	4	8
8:10:26	0:00:08	5	4	9
8:10:42	0:00:16	5	4	9
8:11:19	0:00:37	5	4	9
8:11:51	0:00:32	5	4	9
8:13:17	0:01:26	5	3	8
8:13:23	0:00:06	6	3	9
8:15:14	0:01:51	3	2	5
8:15:32	0:00:18	4	2	6
8:15:35	0:00:03	5	2	7
8:19:36	0:04:01	1	4	5
8:20:39	0:01:03	1	3	4
8:21:42	0:01:03	1	4	5
8:22:01	0:00:19	1	4	5
8:25:12	0:03:11	1	0	1

ARRİŞVAL/QUEUE SURVEY

LOCATION: Starbucks, 1134 N. State College Blvd
CITY: Anaheim

DAY: Thursday
DATE: 5/31/2018

TIME PERIOD: 7:00 AM TO 9:00 AM

[illegible][illegible]

	max am	max pm
order boar	7	5
PU Window	5	5
Total	12	10
max	11	

	max am	max pm
order boar	7	5
PU Window	5	5
Total	12	10

ARRIVAL/QUEUE SURVEY

LOCATION: Starbucks, 1134 N. State College Blvd
CITY: Anaheim

DAY: Thursday
DATE: 5/31/2018

TIME PERIOD: 4:00 PM TO 6:00 PM

ARRIVAL TIME	TIME BETWEEN ARRIVALS	Order Board	Pick-up Window	TOTAL
16:00:40	-	1	3	4
16:01:10	0:00:30	1	3	4
16:01:23	0:00:13	2	3	5
16:03:27	0:02:04	2	4	6
16:05:03	0:01:36	1	4	5
16:06:02	0:00:59	1	4	5
16:06:20	0:00:18	2	4	6
16:07:45	0:01:25	2	4	6
16:10:14	0:02:29	2	4	6
16:11:23	0:01:09	2	5	7
16:12:58	0:01:35	2	4	6
16:13:48	0:00:50	3	4	7
16:14:06	0:00:18	4	4	8
16:16:48	0:02:42	4	4	8
16:17:39	0:00:51	5	4	9
16:19:59	0:02:20	3	5	8
16:26:46	0:06:47	1	4	5
16:27:06	0:00:20	2	4	6
16:29:19	0:02:13	1	4	5
16:32:12	0:02:53	1	2	3
16:32:31	0:00:19	2	2	4
16:34:12	0:01:41	2	2	4
16:34:30	0:00:18	3	2	5
16:34:45	0:00:15	3	3	6
16:35:07	0:00:22	4	3	7
16:35:34	0:00:27	4	4	8
16:38:02	0:02:28	3	5	8
16:44:53	0:06:51	1	4	5
16:47:22	0:02:29	1	4	5
16:47:38	0:00:16	2	4	6
16:47:52	0:00:14	3	4	7
16:49:26	0:01:34	4	3	7
16:51:50	0:02:24	3	4	7
16:51:57	0:00:07	4	4	8
16:54:23	0:02:26	3	4	7
16:54:25	0:00:02	4	4	8
16:55:13	0:00:48	4	5	9
16:57:01	0:01:48	5	5	10
17:01:45	0:04:44	3	5	8
17:04:24	0:02:39	2	5	7
17:08:23	0:03:59	1	4	5
17:12:05	0:03:42	1	4	5
17:14:59	0:02:54	1	3	4
17:21:46	0:06:47	1	0	1
17:21:53	0:00:07	2	0	2
17:23:41	0:01:48	2	1	3
17:24:43	0:01:02	3	1	4

[illegible]

ARRIVAL/QUEUE SURVEY

LOCATION: Starbucks, 2302 17th Street
CITY: Santa Ana

DAY: Wednesday
DATE: 5/30/2018

TIME PERIOD: 7:00 AM TO 9:00 AM

ARRIVAL TIME	TIME BETWEEN ARRIVALS	Order Board	Pick-up Window	TOTAL
7:00:00	-	-	-	0
7:01:00	0:01:00	3	1	4
7:02:43	0:01:43	1	3	4
7:02:46	0:00:03	1	2	3
7:03:32	0:00:46	2	2	4
7:05:12	0:01:40	2	3	5
7:07:16	0:02:04	1	3	4
7:09:55	0:02:39	1	2	3
7:10:27	0:00:32	2	1	3
7:11:19	0:00:52	1	3	4
7:11:23	0:00:04	1	3	4
7:13:27	0:02:04	2	3	5
7:14:41	0:01:14	1	1	2
7:15:22	0:00:41	1	1	2
7:15:52	0:00:30	1	1	2
7:16:33	0:00:41	1	2	3
7:17:45	0:01:12	1	3	4
7:19:44	0:01:59	2	2	4
7:20:24	0:00:40	1	2	3
7:20:44	0:00:20	1	2	3
7:21:50	0:01:06	1	2	3
7:22:14	0:00:24	1	2	3
7:24:25	0:02:11	2	1	3
7:24:29	0:00:04	1	1	2
7:25:20	0:00:51	2	1	3
7:25:23	0:00:03	1	3	4
7:25:33	0:00:10	2	3	5
7:26:48	0:01:15	3	3	6
7:26:52	0:00:04	4	2	6
7:26:58	0:00:06	5	2	7
7:27:05	0:00:07	6	2	8
7:28:28	0:01:23	7	2	9
7:28:35	0:00:07	7	3	10
7:28:55	0:00:20	8	3	11
7:32:02	0:03:07	8	4	12
7:32:05	0:00:03	9	3	12
7:33:04	0:00:59	10	3	13
7:34:03	0:00:59	8	3	11
7:34:55	0:00:52	8	3	11
7:35:36	0:00:41	7	4	11
7:36:36	0:01:00	7	3	10
7:37:10	0:00:34	6	3	9
7:38:52	0:01:42	7	3	10
7:39:16	0:00:24	6	3	9
7:40:22	0:01:06	7	3	10
7:40:34	0:00:12	7	3	10
7:41:15	0:00:41	7	4	11
8:11:57	0:00:05	9	3	12
8:12:04	0:00:07	9	4	13
8:14:08	0:02:04	8	3	11
8:16:19	0:02:11	4	3	7
8:17:12	0:00:53	4	3	7
8:17:53	0:00:41	4	4	8
8:18:26	0:00:33	4	4	8
8:18:40	0:00:14	5	3	8

ARRIVAL TIME	TIME BETWEEN ARRIVALS	Order Board	Pick-up Window	TOTAL
7:42:08	0:00:53	7	3	10
7:42:45	0:00:37	6	3	9
7:44:21	0:01:36	4	3	7
7:45:00	0:00:39	4	3	7
7:45:55	0:00:55	4	3	7
7:46:07	0:00:12	5	3	8
7:46:10	0:00:03	6	3	9
7:47:22	0:01:12	4	4	8
7:47:40	0:00:18	5	4	9
7:48:48	0:01:08	6	3	9
7:50:16	0:01:28	5	3	8
7:50:29	0:00:13	6	3	9
7:51:47	0:01:18	4	3	7
7:51:50	0:00:03	5	3	8
7:52:11	0:00:21	6	3	9
7:52:15	0:00:04	7	3	10
7:53:15	0:01:00	6	3	9
7:54:16	0:01:01	5	2	7
7:54:29	0:00:13	5	3	8
7:55:20	0:00:51	5	3	8
7:55:27	0:00:07	6	3	9
7:56:36	0:01:09	5	3	8
7:56:40	0:00:04	6	3	9
7:56:51	0:00:11	6	4	10
7:57:11	0:00:20	7	3	10
7:57:40	0:00:29	8	3	11
7:58:57	0:01:17	6	3	9
8:00:37	0:01:40	4	3	7
8:01:02	0:00:25	5	3	8
8:01:32	0:00:30	5	3	8
8:01:38	0:00:06	6	3	9
8:03:05	0:01:27	2	3	5
8:03:08	0:00:03	3	3	6
8:06:23	0:03:15	1	2	3
8:06:24	0:00:01	2	2	4
8:06:44	0:00:20	3	2	5
8:07:17	0:00:33	2	3	5
8:07:38	0:00:21	3	3	6
8:07:45	0:00:07	4	3	7
8:08:45	0:01:00	3	3	6
8:09:37	0:00:52	4	3	7
8:09:50	0:00:13	5	3	8
8:09:55	0:00:05	6	3	9
8:09:57	0:00:02	7	3	10
8:09:59	0:00:02	8	3	11
8:10:53	0:00:54	8	3	11
8:11:52	0:00:59	8	3	11
8:55:49	0:02:36	1	2	3
8:56:04	0:00:15	2	2	4
8:56:15	0:00:11	3	2	5
8:56:27	0:00:12	4	1	5
8:57:10	0:00:43	3	2	5
8:57:46	0:00:36	4	2	6
8:57:49	0:00:03	4	3	7
8:58:26	0:00:37	5	3	8

ARRIVAL/QUEUE SURVEY

LOCATION: Starbucks, 2302 17th Street
CITY: Santa Ana

DAY: Wednesday
DATE: 5/30/2018

TIME PERIOD: 7:00 AM TO 9:00 AM

ARRIVAL TIME	TIME BETWEEN ARRIVALS	Order Board	Pick-up Window	TOTAL
8:18:56	0:00:16	5	3	8
8:18:57	0:00:01	6	3	9
8:22:00	0:03:03	4	3	7
8:22:58	0:00:58	5	3	8
8:23:33	0:00:35	6	3	9
8:23:52	0:00:19	5	4	9
8:24:38	0:00:46	5	3	8
8:24:44	0:00:06	6	3	9
8:25:19	0:00:35	6	3	9
8:25:23	0:00:04	7	3	10
8:25:26	0:00:03	8	3	11
8:27:36	0:02:10	6	3	9
8:29:43	0:02:07	4	3	7
8:29:53	0:00:10	5	3	8
8:31:16	0:01:23	3	3	6
8:33:37	0:02:21	2	1	3
8:34:33	0:00:56	1	3	4
8:35:13	0:00:40	1	4	5
8:36:33	0:01:20	2	3	5
8:36:56	0:00:23	3	3	6
8:37:12	0:00:16	4	3	7
8:37:44	0:00:32	3	4	7
8:39:04	0:01:20	3	3	6
8:39:08	0:00:04	4	3	7
8:40:33	0:01:25	2	3	5
8:41:01	0:00:28	3	3	6
8:42:06	0:01:05	1	3	4
8:43:04	0:00:58	2	3	5
8:45:16	0:02:12	1	2	3
8:46:29	0:01:13	1	2	3
8:46:44	0:00:15	2	2	4
8:47:40	0:00:56	1	2	3
8:50:32	0:02:52	1	1	2
8:50:52	0:00:20	2	1	3
8:51:06	0:00:14	2	2	4
8:51:08	0:00:02	3	2	5
8:51:10	0:00:02	4	2	6
8:52:58	0:01:48	1	3	4
8:53:13	0:00:15	2	3	5

[illegible]

ARRIVAL/QUEUE SURVEY

LOCATION: Starbucks, 2302 17th Street
CITY: Santa Ana

DAY: Wednesday
DATE: 5/30/2018

TIME PERIOD: 4:00 PM TO 6:00 PM

ARRIVAL TIME	TIME BETWEEN ARRIVALS	Order Board	Pick-up Window	TOTAL
16:01:57	-	1	0	1
16:02:21	0:00:24	2	0	2
16:05:16	0:02:55	1	1	2
16:05:38	0:00:22	2	1	3
16:06:53	0:01:15	2	2	4
16:09:03	0:02:10	2	2	4
16:13:19	0:04:16	1	1	2
16:13:31	0:00:12	2	1	3
16:13:39	0:00:08	3	1	4
16:14:15	0:00:36	3	2	5
16:17:36	0:03:21	1	3	4
16:19:45	0:02:09	2	2	4
16:22:09	0:02:24	1	3	4
16:22:37	0:00:28	2	3	5
16:24:21	0:01:44	2	3	5
16:25:43	0:01:22	2	3	5
16:26:17	0:00:34	3	2	5
16:30:45	0:04:28	2	2	4
16:35:54	0:05:09	1	1	2
16:36:31	0:00:37	1	2	3
16:37:25	0:00:54	1	3	4
16:39:05	0:01:40	1	2	3
16:39:36	0:00:31	1	3	4
16:40:44	0:01:08	2	3	5
16:43:27	0:02:43	2	3	5
16:45:51	0:02:24	1	2	3
16:47:10	0:01:19	1	2	3
16:48:40	0:01:30	1	2	3
16:48:53	0:00:13	2	2	4
16:49:20	0:00:27	3	2	5
16:56:35	0:07:15	1	0	1
16:56:49	0:00:14	2	0	2
16:56:56	0:00:07	3	0	3
16:58:55	0:01:59	1	2	3
17:00:01	0:01:06	1	3	4
17:00:23	0:00:22	2	3	5
17:06:08	0:05:45	1	3	4
17:10:06	0:03:58	1	0	1
17:11:01	0:00:55	1	1	2
17:15:05	0:04:04	1	0	1
17:18:34	0:03:29	1	0	1
17:19:23	0:00:49	2	0	2
17:19:35	0:00:12	2	1	3
17:20:05	0:00:30	2	2	4
17:24:28	0:04:23	1	0	1
17:26:01	0:01:33	1	1	2
17:28:26	0:02:25	1	0	1

[illegible]

ARRIVAL/QUEUE SURVEY

LOCATION: Starbucks, 2701 N. Bristol St.
CITY: Tustin, CA

DAY: Thursday
DATE: 5/31/2018

TIME PERIOD: 7:00 AM TO 9:00 AM

ARRIVAL TIME	TIME BETWEEN ARRIVALS	Order Board	Pick-up Window	TOTAL
7:01:04	-	4	3	7
7:01:41	0:00:37	4	3	7
7:02:51	0:01:10	4	3	7
7:03:05	0:00:14	5	2	7
7:03:33	0:00:28	5	2	7
7:04:53	0:01:20	3	3	6
7:06:30	0:01:37	4	2	6
7:06:38	0:00:08	4	3	7
7:06:59	0:00:21	4	3	7
7:07:16	0:00:17	4	3	7
7:10:43	0:03:27	2	2	4
7:12:10	0:01:27	2	2	4
7:12:48	0:00:38	2	2	4
7:13:50	0:01:02	2	3	5
7:14:26	0:00:36	2	3	5
7:14:45	0:00:19	3	3	6
7:17:31	0:02:46	1	2	3
7:17:59	0:00:28	2	2	4
7:18:38	0:00:39	1	3	4
7:18:50	0:00:12	2	3	5
7:19:02	0:00:12	3	2	5
7:19:06	0:00:04	3	3	6
7:19:19	0:00:13	4	3	7
7:19:55	0:00:36	4	3	7
7:20:41	0:00:46	4	3	7
7:21:26	0:00:45	4	3	7
7:23:21	0:01:55	2	4	6
7:24:02	0:00:41	2	4	6
7:26:19	0:02:17	1	2	3
7:26:47	0:00:28	1	3	4
7:26:53	0:00:06	2	3	5
7:27:17	0:00:24	2	4	6
7:27:29	0:00:12	3	4	7
7:27:52	0:00:23	4	3	7
7:28:30	0:00:38	4	3	7
7:28:32	0:00:02	5	3	8
7:28:57	0:00:25	6	3	9
7:29:31	0:00:34	6	3	9
7:29:57	0:00:26	7	3	10
7:33:47	0:03:50	4	4	8
7:38:01	0:04:14	1	3	4
7:38:23	0:00:22	1	3	4
7:39:14	0:00:51	2	1	3
7:40:02	0:00:48	1	2	3
7:42:30	0:02:28	1	0	1
7:42:33	0:00:03	2	0	2
7:42:36	0:00:03	3	0	3

ARRIVAL TIME	TIME BETWEEN ARRIVALS	Order Board	Pick-up Window	TOTAL
7:44:14	0:01:38	1	2	3
7:44:43	0:00:29	1	3	4
7:44:53	0:00:10	2	3	5
7:46:27	0:01:34	1	2	3
7:46:45	0:00:18	2	2	4
7:49:05	0:02:20	1	2	3
7:49:13	0:00:08	2	2	4
7:49:32	0:00:19	2	3	5
7:50:04	0:00:32	2	4	6
7:50:33	0:00:29	3	3	6
7:51:05	0:00:32	3	4	7
7:52:32	0:01:27	3	3	6
7:54:31	0:01:59	1	2	3
7:55:31	0:01:00	2	1	3
7:56:16	0:00:45	1	2	3
7:56:48	0:00:32	2	2	4
7:56:50	0:00:02	3	2	5
7:56:55	0:00:05	4	2	6
7:57:07	0:00:12	4	2	6
7:57:19	0:00:12	5	2	7
7:59:37	0:02:18	2	4	6
7:59:55	0:00:18	3	4	7
7:59:57	0:00:02	4	4	8
8:01:12	0:01:15	4	3	7
8:02:05	0:00:53	3	3	6
8:02:08	0:00:03	4	3	7
8:02:32	0:00:24	5	2	7
8:02:55	0:00:23	5	2	7
8:03:04	0:00:09	6	2	8
8:03:07	0:00:03	7	2	9
8:03:49	0:00:42	6	3	9
8:04:03	0:00:14	7	3	10
8:04:57	0:00:54	7	3	10
8:07:24	0:02:27	4	3	7
8:09:05	0:01:41	2	2	4
8:09:35	0:00:30	3	2	5
8:09:52	0:00:17	3	3	6
8:10:20	0:00:28	4	3	7
8:10:31	0:00:11	4	3	7
8:12:19	0:01:48	3	3	6
8:12:33	0:00:14	4	2	6
8:12:43	0:00:10	5	2	7
8:12:52	0:00:09	6	1	7
8:14:19	0:01:27	4	3	7
8:14:28	0:00:09	5	2	7
8:16:05	0:01:37	3	2	5
8:16:09	0:00:04	4	2	5

ARRIVAL/QUEUE SURVEY

LOCATION: Starbucks, 2701 N. Bristol St.
CITY: Tustin, CA

DAY: Thursday
DATE: 5/31/2018

TIME PERIOD: 7:00 AM TO 9:00 AM

ARRIVAL TIME	TIME BETWEEN ARRIVALS	Order Board	Pick-up Window	TOTAL
8:17:40	0:01:31	2	4	6
8:17:42	0:00:02	3	4	7
8:17:44	0:00:02	4	4	8
8:19:17	0:01:33	3	3	6
8:19:22	0:00:05	4	3	7
8:19:25	0:00:03	5	3	8
8:20:05	0:00:40	5	3	8
8:21:02	0:00:57	4	3	7
8:21:08	0:00:06	5	3	8
8:23:19	0:02:11	2	3	5
8:24:29	0:01:10	1	3	4
8:25:12	0:00:43	1	3	4
8:25:52	0:00:40	1	3	4
8:26:38	0:00:46	1	4	5
8:26:42	0:00:04	2	4	6
8:27:51	0:01:09	1	4	5
8:28:10	0:00:19	2	4	6
8:28:12	0:00:02	3	4	7
8:28:16	0:00:04	4	4	8
8:28:20	0:00:04	5	4	9
8:29:24	0:01:04	5	4	9
8:29:36	0:00:12	5	4	9
8:32:19	0:02:43	2	3	5
8:34:30	0:02:11	1	2	3
8:35:46	0:01:16	1	1	2
8:36:04	0:00:18	2	0	2
8:37:07	0:01:03	1	2	3
8:37:14	0:00:07	2	2	4
8:39:07	0:01:53	1	1	2
8:41:13	0:02:06	1	0	1
8:42:22	0:01:09	1	1	2
8:44:21	0:01:59	1	0	1
8:44:45	0:00:24	1	1	2
8:44:55	0:00:10	2	1	3
8:44:59	0:00:04	3	1	4
8:48:00	0:03:01	1	2	3
8:49:47	0:01:47	1	0	1
8:51:57	0:02:10	1	0	1
8:53:26	0:01:29	1	1	2
8:55:44	0:02:18	1	0	1
8:55:47	0:00:03	2	0	2
8:56:55	0:01:08	2	1	3
8:57:10	0:00:15	3	1	4
8:57:47	0:00:37	3	2	5
8:57:59	0:00:12	4	2	6
8:58:14	0:00:15	4	3	7
	0:00:00			

[illegible]

ARRIVAL/QUEUE SURVEY

LOCATION: Starbucks, 2701 N. Bristol St.
CITY: Tustin, CA

DAY: Thursday
DATE: 5/31/2018

TIME PERIOD: 4:00 PM TO 6:00 PM

ARRIVAL TIME	TIME BETWEEN ARRIVALS	Order Board	Pick-up Window	TOTAL	ARRIVAL TIME	TIME BETWEEN ARRIVALS	Order Board	Pick-up Window	TOTAL
16:00:39	-	1	1	2	17:21:58	0:04:23	1	0	1
16:02:41	0:02:02	1	1	2	17:22:30	0:00:32	1	1	2
16:03:01	0:00:20	1	1	2	17:24:06	0:01:36	1	2	3
16:10:11	0:07:10	1	0	1	17:25:23	0:01:17	1	1	2
16:13:11	0:03:00	1	0	1	17:27:04	0:01:41	1	1	2
16:13:19	0:00:08	2	0	2	17:27:27	0:00:23	2	1	3
16:13:38	0:00:19	2	1	3	17:36:17	0:08:50	1	0	1
16:13:40	0:00:02	3	1	4	17:38:43	0:02:26	1	0	1
16:16:26	0:02:46	1	4	5	17:42:45	0:04:02	1	0	1
16:16:49	0:00:23	2	4	6	17:48:31	0:05:46	1	0	1
16:16:53	0:00:04	3	4	7	17:49:43	0:01:12	2	0	2
16:18:00	0:01:07	3	3	6	17:53:43	0:04:00	1	0	1
16:23:12	0:05:12	1	2	3	17:56:23	0:02:40	1	1	2
16:24:06	0:00:54	1	2	3	17:59:28	0:03:05	1	0	1
16:25:35	0:01:29	1	2	3		0:00:00			
16:26:56	0:01:21	1	2	3		0:00:00			
16:29:55	0:02:59	2	0	2		0:00:00			
16:33:03	0:03:08	1	1	2		0:00:00			
16:33:49	0:00:46	1	1	2		0:00:00			
16:34:55	0:01:06	1	2	3		0:00:00			
16:35:23	0:00:28	1	3	4		0:00:00			
16:36:32	0:01:09	1	2	3		0:00:00			
16:39:53	0:03:21	1	1	2		0:00:00			
16:40:25	0:00:32	1	1	2		0:00:00			
16:40:35	0:00:10	2	1	3		0:00:00			
16:42:12	0:01:37	1	2	3		0:00:00			
16:46:02	0:03:50	1	0	1		0:00:00			
16:46:08	0:00:06	2	0	2		0:00:00			
16:46:36	0:00:28	2	1	3		0:00:00			
16:47:44	0:01:08	1	3	4		0:00:00			
16:49:22	0:01:38	1	2	3		0:00:00			
16:50:11	0:00:49	1	3	4		0:00:00			
16:57:19	0:07:08	1	0	1		0:00:00			
16:57:29	0:00:10	2	0	2		0:00:00			
16:57:55	0:00:26	2	1	3		0:00:00			
17:01:09	0:03:14	1	0	1		0:00:00			
17:02:45	0:01:36	1	1	2		0:00:00			
17:02:48	0:00:03	2	1	3		0:00:00			
17:03:54	0:01:06	3	0	3		0:00:00			
17:04:15	0:00:21	4	0	4		0:00:00			
17:04:17	0:00:02	5	0	5		0:00:00			
17:05:26	0:01:09	5	1	6		0:00:00			
17:06:41	0:01:15	4	3	7		0:00:00			
17:07:16	0:00:35	4	3	7		0:00:00			
17:12:38	0:05:22	1	2	3		0:00:00			
17:16:49	0:04:11	1	0	1		0:00:00			
17:17:35	0:00:46	1	1	2		0:00:00			

Memorandum: 2235 S Bristol Starbucks Coffee
Focused Traffic Analysis

Appendix E: VMT Screening

