

**DEVELOPMENT OF REGIONAL IMPACT
(DRI #3799)**

**TRAFFIC STUDY
FOR
REEVES CREEK II MIXED-USE DEVELOPMENT AT
630 FLIPPEN ROAD**

CITY OF STOCKBRIDGE, HENRY COUNTY, GEORGIA



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EXECUTIVE SUMMARY

Traffic impacts were evaluated for the proposed Reeves Creek II mixed-use development located at 630 Flippen Road in the City of Stockbridge, Henry County, Georgia. The development will consist of:

- Single-Family Detached Housing: 328 lots
- Townhomes: 191 units
- Multifamily Housing: 646 units
- Senior Living: 182 units
- Office: 41,000 sf
- Retail: 5,000 sf

The development proposes three full access driveways on Flippen Road, and one full access driveway stubbed for future connection to Davidson Parkway in the north.

Existing and future operations during the AM peak hour (7:00 AM – 9:00 AM) and PM peak hour (4:00 PM – 6:00 PM) before and after completion of the project were analyzed at the following intersections:

1. Flippen Road / Shields Road @ SR 42/SR 138/US 23 (North Henry Boulevard)
2. Flippen Road @ Appleton Boulevard / Site Driveway 1
3. Flippen Road @ Reeves Creek Trail Parking Lot / Site Driveway 2
4. Flippen Road @ Walt Stephens Road / Red Oak Road
5. Flippen Road @ Hudson Bridge Road
6. SR 42/SR 138/US 23 (North Henry Boulevard) @ SR 138 (Lake Spivey Parkway)
7. SR 138 (Lake Spivey Parkway) @ I-675 Northbound Ramps
8. SR 138 (Lake Spivey Parkway) @ I-675 Southbound Ramps
9. SR 138 (Lake Spivey Parkway) @ Mount Zion Road
10. SR 138 (Lake Spivey Parkway) @ I-75 Northbound Ramps
11. SR 138 (Lake Spivey Parkway) @ I-75 Southbound Ramps
12. SR 138 (Lake Spivey Parkway) @ Speer Road / Mount Zion Parkway
13. SR 138 (Lake Spivey Parkway) @ Spivey Road
14. Walt Stephens Road @ Blackhall Road / Speer Road
15. Flippen Road @ Site Driveway 3

Traffic Operations Summary

Table E1 below provides a summary of traffic operations for the “No-Build” and “Build” conditions for the year 2027 with and without system/site improvements. As per GRTA requirements, all approaches that do not meet the level-of-service (LOS) standard (considered failing) are highlighted in Table E1. Intersections 1 (Flippen Road @ N. Henry Boulevard) and 15 (Flippen Road @ Site Driveway 3) were improved to achieve the LOS standard after implementation of the identified site improvements. However, at the other failing intersections, there are a few approaches where there are no feasible improvements for these approaches to meet the LOS standard. Table E-1 also includes the project’s total added trip and the respective percentage of overall total “Build” condition approach traffic volume for all failing LOS approaches after all improvements are completed.

TABLE E1 — FUTURE INTERSECTION OPERATIONS AT FAILING APPROACHES

Intersection		No-Build Condition: LOS (Delay)				Build Condition: LOS (Delay)							
		NO IMPROVEMENTS		SYSTEM IMPROVEMENTS		NO IMPROVEMENTS		SYSTEM / SITE IMPROVEMENTS		SITE VOLUMES AT FAILING APPROACH BUILD WITH IMPROVEMENTS		PRECENT SITE TRIPS OF TOTAL APPROACH TRIPS AT FAILING APPROACHES	
		AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
1	<u>Flippen Rd/Shields Rd @ SR 42 (N Henry Blvd)</u>	<u>C (29.4)</u>	<u>C (29.3)</u>	<u>B (19.1)</u>	<u>C (24.3)</u>	<u>E (68.3)</u>	<u>E (69.6)</u>	<u>C (24.9)</u>	<u>D (41.7)</u>				
	-Eastbound Approach	B (18.9)	C (24.5)	B (14.2)	C (26.8)	D (47.3)	D (51.8)	C (21.7)	D (54.6)	None failing	None failing	None failing	None failing
	-Westbound Approach	C (20.1)	B (16.0)	B (14.7)	B (15.9)	D (53.3)	C (20.6)	B (15.7)	B (19.2)				
	-Northbound Approach	F (86.7)	F (84.9)	D (41.0)	D (36.1)	F (143.5)	F (251.9)	D (50.2)	D (50.0)				
	-Southbound Approach	C (34.4)	E (78.5)	D (47.9)	D (47.5)	C (27.2)	D (47.6)	D (47.9)	D (47.7)				
2	<u>Flippen Rd @ Appleton Blvd/Site Drwy 1 (N)</u>												
	-Eastbound Approach	-	-	-	-	C (22.6)	F (69.1)	C (22.6)	F (69.1)	None failing	89	None failing	100%
	-Westbound Approach	B (12.8)	C (18.7)	B (12.8)	C (18.7)	C (18.8)	F (56.1)	C (18.8)	F (56.1)		0		0%
	-Northbound Left	-	-	-	-	A (8.3)	B (10.2)	A (8.3)	B (10.2)		-		-
	-Southbound Left	A (8.3)	A (8.6)	A (8.3)	A (8.6)	A (8.7)	A (9.0)	A (8.7)	A (9.0)		-		-
3	<u>Flippen Rd @ Site Drwy 2</u>												
	-Eastbound Approach	-	-	-	-	C (19.0)	E (36.0)	C (19.0)	E (36.0)	None failing	24	None failing	100%
	-Westbound Approach	A (0.0)	B (11.4)	A (0.0)	B (11.4)	C (23.8)	C (22.6)	C (23.8)	C (22.6)		-		-
	-Northbound Left	-	-	-	-	A (8.4)	A (9.6)	A (8.4)	A (9.6)		-		-
	-Southbound Left	A (0.0)	A (8.4)	A (0.0)	A (8.4)	A (0.0)	A (9.1)	A (0.0)	A (9.1)		-		-

6	<u>SR 42/SR 138 (N. Henry Blvd) @ SR 138 (Lake Spivey Parkway)</u>	<u>D (46.6)</u>	<u>E (57.5)</u>	<u>D (47.2)</u>	<u>D (52.6)</u>	<u>D (48.3)</u>	<u>E (62.0)</u>	<u>D (47.7)</u>	<u>D (54.0)</u>				
	-Eastbound Approach	D (41.5)	D (52.7)	E (65.4)	E (57.1)	D (36.2)	D (53.4)	E (65.4)	E (59.4)	75	161	12%	11%
	-Westbound Approach	E (77.3)	E (78.4)	E (74.6)	E (65.7)	E (77.3)	E (78.1)	E (74.8)	E (68.2)	0	0	0%	0%
	-Northbound Approach	D (47.6)	E (58.3)	D (45.0)	D (52.8)	D (52.2)	E (71.6)	D (45.3)	D (53.7)	-	-	-	-
	-Southbound Approach	D (40.9)	D (53.4)	D (35.7)	D (41.7)	D (45.0)	D (54.6)	D (38.9)	D (42.9)	-	-	-	-
12	<u>SR 138 (Lake Spivey Pkwy) @ Speer Rd / Mount Zion Parkway</u>	<u>E (58.4)</u>	<u>E (55.2)</u>	<u>C (33.1)</u>	<u>D (39.7)</u>	<u>E (63.4)</u>	<u>E (60.7)</u>	<u>D (44.1)</u>	<u>D (47.0)</u>				
	-Eastbound Approach	E (57.2)	E (55.2)	C (22.0)	D (33.6)	E (60.1)	E (62.0)	C (21.3)	D (33.5)	-	-	-	-
	-Westbound Approach	D (51.0)	D (48.7)	C (29.0)	D (35.4)	E (58.0)	D (54.9)	D (52.0)	D (50.2)	-	-	-	-
	-Northbound Approach	E (71.8)	E (75.1)	E (57.1)	E (57.8)	E (77.1)	E (71.2)	E (56.8)	E (57.9)	102	86	10%	13%
	-Southbound Approach	E (56.7)	E (55.2)	D (54.0)	E (51.2)	E (55.1)	E (63.0)	D (53.5)	D (54.5)	-	-	-	-
15	<u>Flippen Road @ Site Driveway 3 (Southern)</u>							<u>B (15.8)</u>	<u>B (14.2)</u>				
	-Eastbound Approach	-	-	-	-	E (35.9)	F (231.0)	D (46.2)	D (49.3)	None failing	None failing	None failing	None failing
	-Northbound Left/Approach					A (8.8)	B (11.2)	A (5.1)	A (5.8)				
	-Southbound Approach					-	-	A (8.6)	B (10.7)				

The results of future traffic operations show that the following intersections will have LOS “E” or “F” for one or more approaches:

1. Flippen Road / Shields Road @ SR 42/SR 138/US 23 (North Henry Boulevard)
2. Flippen Road @ Appleton Boulevard / Site Driveway 1 (Northern)
3. Flippen Road @ Reeves Creek Trail Parking Lot / Site Driveway 2 (Middle, Retail)
6. SR 42/SR 138/US 23 (North Henry Boulevard) @ SR 138 (Lake Spivey Parkway)
12. SR 138 (Lake Spivey Parkway) @ Speer Road / Mount Zion Parkway
15. Flippen Road @ Site Driveway 3 (Southern)

The table E2 below includes Synchro reported 95th percentile queue lengths for failing level-of-service approaches for the build condition with improvements that had site generated traffic. Queue length reports are included in the Appendix.

TABLE E2 – FUTURE 95 TH PERCENTILE QUEUES FOR FAILING APPROACHES				
Intersection		Available Storage	Queue in feet	
			BUILD with Improvements	
			AM Peak	PM Peak
2	<u>Flippen Rd @ Appleton Blvd/Site Drwy 1 (N)</u>			
	-Eastbound Through / Left	-	35	70
	-Eastbound Right	150'	10	10
3	<u>Flippen Road @ Reeves Creek Trail / Site Drwy 2</u>			
	-Eastbound Approach	-	3	15
6	<u>SR 42/SR 138 @ SR 138 (Lake Spivey Pkwy)</u>			
	-Eastbound Left	(165')	119	218
	-Eastbound Through	-	117	191
	-Eastbound Right	-	359	1303
12	<u>SR 138 (Lake Spivey Pkwy) @ Speer Rd / Mount Zion Pkwy</u>			
	-Northbound Left	195'	73	57
	-Northbound Through	-	143	94
	-Northbound Right	550'	0	458

The eastbound left turn queues at SR 42/SR 138/US 23 (North Henry Boulevard) @ SR 138 (Lake Spivey Parkway) intersection will extend beyond the existing available storage. However, vehicles can be accommodated in the existing two-way left-turn lane. Although the approach level-of-service are failing for the approaches listed in Table E2, the queues do not extend beyond the available storage.

Recommended System Improvements

System improvements address deficiencies that are found within the existing road network for the “No-Build” conditions. These are recommended for the local municipality to use in planning future transportation projects. The following are system improvements that were identified from the “No-Build” condition analysis.

Intersection 1. Flippen Road / Shields Road @ SR 42/SR 138/US 23 (North Henry Boulevard)

- Reconfigure the northbound approach on Flippen Road to consist of a separate left turn lane and a shared through/right-turn lane.
- Provide a ‘Protected-Permissive’ phase for northbound left-turn lane.

Intersection 6. SR 42/SR 138/US 23 (North Henry Boulevard) @ SR 138 (Lake Spivey Parkway)

- Reconfigure the eastbound approach on SR 138 (Lake Spivey Parkway) to consist of one left turn lane, one through lane and one right turn lane.
- Construct a channelized island for the eastbound right turn lane and provide a ‘protected overlap’ phase.
- Change the split phasing for eastbound and westbound approaches to ‘protected-permissive’ phasing for the eastbound and westbound left turn movements.

Intersection 12. SR 138 (Lake Spivey Parkway) @ Speer Road / Mount Zion Parkway

- Convert the northbound right-turn movement from Speer Road onto SR 138 (Lake Spivey Parkway) as a “free” movement by removing the existing striping on SR 138 (Lake Spivey Parkway) and using the existing asphalt as a third receiving lane. The third eastbound lane will become a right-turn lane at I-75 southbound ramp.

With the above improvements, intersection 1. Flippen Road / Shields Road @ SR 42/SR 138/US 23 (North Henry Boulevard) will operate at an overall LOS “C” in the AM and “D” in the PM peak hour.

The two intersections of 6. SR 42/SR 138/US 23 (North Henry Boulevard) @ SR 138 (Lake Spivey Parkway) and 12. SR 138 (Lake Spivey Parkway) @ Speer Road / Mount Zion Parkway will have an overall level-of-service “D” or better in both the AM and PM peak hours. However, some approaches at these intersections will operate at level-of-service “E”. Given the lane geometry, the volumes at the intersections, and the available right-of-way, no further improvements are feasible. Therefore, no other improvements are recommended at these intersections.

Recommended Site Mitigation Improvements

Site mitigation improvements address deficiencies that are caused by site traffic and can be identified as related to the proposed development. The following site improvements were identified in addition to the system improvements discussed in the “Recommended System Improvements” section.

Intersection 15. Flippen Road @ Site Driveway 3 (Southern)

- Install a traffic signal.
- Provide ‘protected-permissive’ phasing for northbound left turn movements on Flippen Road.
- Provide crosswalks on all approaches and other pedestrian facilities at the intersection.
- Provide a sidewalk along the site frontage to gain access to the Reeves Creek Trail.

The future intersection volumes satisfy the threshold for installation of a traffic signal during the AM and PM peak hours. After installation of a signal, the intersection will operate at an overall level-of-service “B” in both the AM and PM peak hours.

The results of future “Build with System & Site Improvements” conditions show one or more approaches of the following intersections will not meet the LOS Standard:

2. Flippen Road @ Appleton Boulevard / Site Driveway 1 (Northern)
3. Flippen Road @ Reeves Creek Trail Parking Lot / Site Driveway 2 (Middle, Retail)
6. SR 42/SR 138/US 23 (North Henry Boulevard) @ SR 138 (Lake Spivey Parkway)
12. SR 138 (Lake Spivey Parkway) @ Speer Road / Mount Zion Parkway

Details of the intersections not meeting the LOS standards are given below:

Intersection 2 & 3 – Stop-Controlled Northern Site Driveways on Flippen Road:

At the two northern site driveway intersections on Flippen Road (intersections # 2 & 3), the stop-controlled minor street approaches will operate at LOS “E” or “F” in the AM and/or PM peak hour. It is not uncommon for stop-controlled side-streets on arterial roadways to experience delays during peak hours as delays are caused by side-street wait times to turn left onto the mainline. Since the intersections do not warrant construction of a signal to improve side-street delays, no improvements are recommended for these driveway intersections outside of the recommended site access configuration.

Intersection 6 & 12 – SR 42/SR 138/US 23 (North Henry Boulevard) @ SR 138 (Lake Spivey Parkway) and SR 138 (Lake Spivey Parkway) @ Speer Road / Mount Zion Parkway:

These intersections will have an overall level-of-service “D” or better in both the AM and PM peak hours. However, some approaches at these intersections will operate at level-of-service “E”. Given the lane geometries and the volumes at the intersections, no further improvements are feasible. Therefore, no other improvements are recommended at these intersections.

Recommendation for Site Access Configuration

The following access configuration is recommended for the site driveway intersections. It is recommended to provide adequate sight distance at each site driveway per AASHTO standards.

- Site Driveway 1: Full access (northern) driveway on Flippen Road, aligned with Appleton Blvd
 - One entering and two (a shared through/left turn and a separate right turn) exiting lanes.
 - Stop-sign controlled on Appleton Boulevard and the driveway approaches with Flippen Road remaining free flow.
 - Left Turn and Right Turn Lanes on Flippen Road for entering traffic.
- Site Driveway 2: Full access (middle) driveway on Flippen Road, for retail, aligned with Reeves Creek Trail
 - One entering and one exiting lane.
 - Stop-sign controlled on Reeves Creek Trail and the site driveway approaches with Flippen Road remaining free flow.
 - Right Turn Lane on Flippen Road for entering traffic.
- Site Driveway 3: Full access (southern) driveway on Flippen Road, south of Site Driveway 2
 - One entering and two (separate left turn and right turn) exiting lanes.
 - Left Turn and Right Turn Lanes on Flippen Road for entering traffic.
 - Installation of a traffic signal with ‘protected-permissive’ phasing for northbound left turn movements from Flippen Road into the site.
 - Provide crosswalks on all approaches and pedestrian facilities to have access to the Reeves Creek Trail through the proposed sidewalk on Flippen Road.

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INTRODUCTION

The purpose of this study is to determine the traffic impact that will result from the proposed Reeves Creek II mixed-use development located at 630 Flippen Road in the City of Stockbridge, Henry County, Georgia. The traffic analysis evaluates the current operations and the future conditions with the traffic generated by the development. The development will consist of:

- Single-Family Detached Housing: 328 lots
- Townhomes: 191 units
- Multifamily Housing: 646 units
- Senior Living: 182 units
- Office: 41,000 sf
- Retail: 5,000 sf



The development proposes accesses at the following locations:

- Site Driveway 1: Full access (northern) driveway on Flippen Road, aligned with Appleton Blvd.
- Site Driveway 2: Full access (middle) driveway on Flippen Road, for retail, aligning with Reeves Creek Trail parking lot.
- Site Driveway 3: Full access (southern) driveway on Flippen Road, south of Site Driveway 2
- Site Driveway 4: Northwestern access south of DriveTime. Road stubbed for future access to Davidson Parkway.

The AM and PM peak hours have been analyzed in this study. This study includes the evaluation of traffic operations at the intersections of:

1. Flippen Road / Shields Road @ SR 42/SR 138/US 23 (North Henry Boulevard)
2. Flippen Road @ Appleton Boulevard / Site Driveway 1
3. Flippen Road @ Reeves Creek Trail Parking Lot / Site Driveway 2
4. Flippen Road @ Walt Stephens Road / Red Oak Road
5. Flippen Road @ Hudson Bridge Road
6. SR 42/SR 138/US 23 (North Henry Boulevard) @ SR 138 (Lake Spivey Parkway)
7. SR 138 (Lake Spivey Parkway) @ I-675 Northbound Ramps
8. SR 138 (Lake Spivey Parkway) @ I-675 Southbound Ramps
9. SR 138 (Lake Spivey Parkway) @ Mount Zion Road
10. SR 138 (Lake Spivey Parkway) @ I-75 Northbound Ramps
11. SR 138 (Lake Spivey Parkway) @ I-75 Southbound Ramps
12. SR 138 (Lake Spivey Parkway) @ Speer Road / Mount Zion Parkway
13. SR 138 (Lake Spivey Parkway) @ Spivey Road
14. Walt Stephens Road @ Blackhall Road / Speer Road
15. Flippen Road @ Site Driveway 3

Recommendations to improve traffic operations have been identified as appropriate and are discussed in detail in the following sections of the report.

STUDY NETWORK DETERMINATION

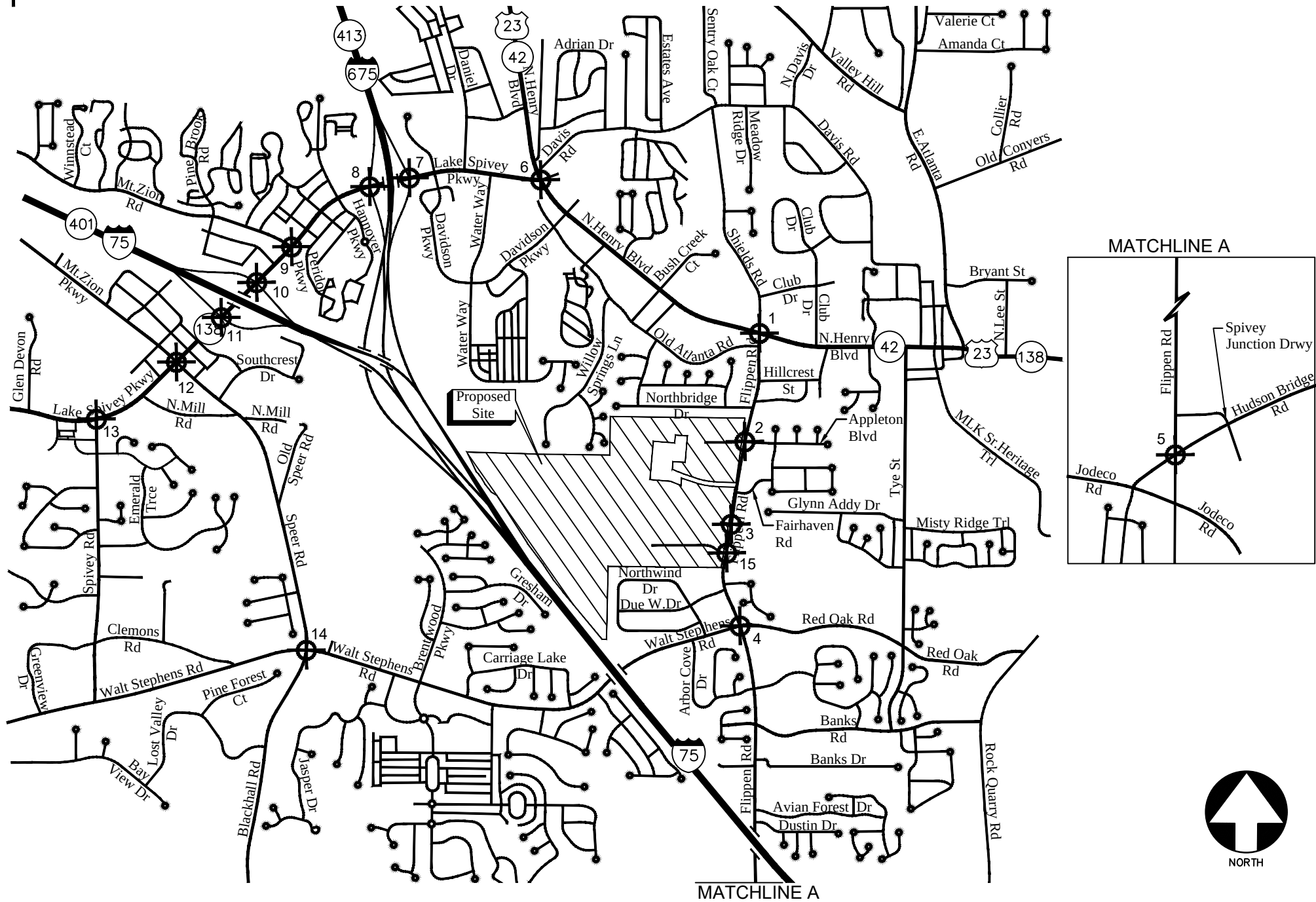
The study network was determined by evaluating the amount of traffic that the proposed development will add to each roadway segment in the area. According to GRTA requirements, a roadway segment carries a “significant” amount of traffic if the project contributes 7% or more trips to the two-way daily service volumes of the roadway at the appropriate level of service standard. Upon agreement with GRTA a level of service standard of “D” was used for determining the study area network.

The traffic generated by the proposed project was then assigned to the area roadways using the trip distribution to determine the site-generated traffic on each roadway segment. The boundaries of the study network extend to the most distant intersections where at least 7% of the service volumes on the segment are attributed to project traffic. The following study intersections fell within the 7% rule and/or have been selected as being suitable for evaluation in discussions with ARC, GRTA, GDOT, Henry County and City of Stockbridge:

1. Flippin Road / Shields Road @ SR 42/SR 138/US 23 (North Henry Boulevard)
2. Flippin Road @ Appleton Boulevard
3. Flippin Road @ Reeves Creek Trail Parking Lot
4. Flippin Road @ Walt Stephens Road / Red Oak Road
5. Flippin Road @ Hudson Bridge Road
6. SR 42/SR 138/US 23 (North Henry Boulevard) @ SR 138 (Lake Spivey Parkway)
7. SR 138 (Lake Spivey Parkway) @ I-675 Northbound Ramps
8. SR 138 (Lake Spivey Parkway) @ I-675 Southbound Ramps
9. SR 138 (Lake Spivey Parkway) @ Mount Zion Road
10. SR 138 (Lake Spivey Parkway) @ I-75 Northbound Ramps
11. SR 138 (Lake Spivey Parkway) @ I-75 Southbound Ramps
12. SR 138 (Lake Spivey Parkway) @ Speer Road / Mount Zion Parkway
13. SR 138 (Lake Spivey Parkway) @ Spivey Road
14. Walt Stephens Road @ Blackhall Road / Speer Road

The location of the development and the surrounding study network is shown in Figure 1. Other intersections within this corridor, such as unsignalized side streets, right-in / right-out driveways or private driveways have not been included in the study network.

 Study Intersection



LOCATION MAP AND STUDY INTERSECTIONS

FIGURE 1

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EXISTING ROADWAY FACILITIES

The following is a brief description of each of the roadway facilities located in proximity to the site:

I-75 (Interstate 75)

I-75 (Interstate 75) is a north-south, eight-lane, median-divided roadway with a posted speed limit of 65 mph in the vicinity of the site. GDOT traffic counts (Station ID's 151-0414 & 151-0416) indicate that the daily traffic volume on I-75 in 2019 was 127,000 vehicles south of SR 138 (Lake Spivey Parkway) and 143,000 vehicles north of SR 138 (Lake Spivey Parkway).

I-675 (Interstate 675)

I-675 (Interstate 675) is a north-south, four-lane, median-divided roadway with a posted speed limit of 65 mph in the vicinity of the site. GDOT traffic counts (Station ID's 063-0367 & 151-0446) indicate that the daily traffic volume on I-675 in 2019 was 67,700 vehicles north of SR 138 (Lake Spivey Parkway) and 55,000 vehicles south of SR 138 (Lake Spivey Parkway).

SR 42/SR 138/US 23 (North Henry Boulevard)

SR 42/SR 138/US 23 (North Henry Boulevard) is an east-west, four-lane roadway with a two-way left turn lane and a posted speed limit of 45 mph in the vicinity of the site. North of Lake Spivey Parkway, North Henry Boulevard is a two-lane, undivided roadway. GDOT traffic counts (Station ID's 151-0361, 151-0363 & 151-0365) indicate that the daily traffic volume on North Henry Boulevard in 2019 was 31,800, 33,400 and 15,500 vehicles per day east of Flippen Road, between Flippen Road and Lake Spivey Parkway, and north of Lake Spivey Parkway, respectively. GDOT classifies North Henry Boulevard as an Urban Principal Arterial roadway. To the north of Lake Spivey Parkway, GDOT classifies North Henry Boulevard as an Urban Minor Arterial roadway.

Flippen Road

Flippen Road is a north-south, two-lane, undivided roadway with a posted speed limit of 35 mph to the north of Fairhaven Road and 45 mph to the south of Fairhaven Road. GDOT traffic counts (Station ID's 151-0247 & 151-0422) indicate that the daily traffic volume on Flippen Road in 2019 was 11,600 vehicles south of Fairhaven Road and 14,600 vehicles north of Hudson Bridge Road. GDOT classifies Flippen Road as an Urban Minor Arterial roadway.

Shields Road

Shields Road is a north-south, two-lane, undivided roadway with a posted speed limit of 35 mph.

Appleton Boulevard

Appleton Boulevard is an east-west, two-lane, undivided roadway with a posted speed limit of 25 mph.

Red Oak Road

Red Oak Road is an east-west, two-lane, undivided roadway with a posted speed limit of 35 mph.

Walt Stephens Road

Walt Stephens Road is an east-west, two-lane, undivided roadway with a posted speed limit of 45 mph in the vicinity of the site. GDOT traffic counts (Station ID's 151-0243 & 151-0245) indicate that the daily traffic volume on Walt Stephens Road in 2019 was 6,120 vehicles west of Blackhall Road/Speer Road and 14,300 vehicles between Blackhall Road/Speer Road and Flippen Road. GDOT classifies Walt Stephens Road as an Urban Minor Arterial roadway.

Hudson Bridge Road

Hudson Bridge Road is an east-west, four-lane, median-divided roadway with a posted speed limit of 45 mph in the vicinity of the site. GDOT traffic counts (Station ID 151-0396) indicate that the daily traffic volume on Hudson Bridge Road in 2019 was 21,900 vehicles east of Flippen Road. GDOT classifies Hudson Bridge Road as an Urban Minor Arterial roadway.

SR 138 (Lake Spivey Parkway)

SR 138 (Lake Spivey Parkway) is an east-west, four-lane roadway with a two-way left turn lane and a posted speed limit of 45 mph in the vicinity of the site. GDOT traffic counts (Station ID's 151-0256, 063-0127, 063-0126, 151-0254 & 151-0252) indicate that the daily traffic volume on SR 138 (Lake Spivey Parkway) in 2019 was 30,100, 33,000, 44,000, 39,500 and 22,100 vehicles per day west of North Henry Boulevard, east of I-675, west of I-675, east of I-75 and east of Spivey Road, respectively. GDOT classifies SR 138 (Lake Spivey Parkway) as an Urban Principal Arterial roadway.

Mt. Zion Road

Mt. Zion Road is a north-south, two-lane, undivided roadway with a posted speed limit of 40 mph in the vicinity of the site. GDOT traffic counts (Station ID 063-0254) indicate that the daily traffic volume on Mt. Zion Road in 2019 was 10,700 vehicles per day east of Reeves Road. GDOT classifies Mt. Zion Road as an Urban Minor Arterial roadway.

Mt. Zion Parkway

Mt. Zion Parkway is a north-south, two-lane, undivided roadway with a posted speed limit of 45 mph.

Speer Road

Speer Road is a north-south, two-lane, undivided roadway with a posted speed limit of 45 mph in the vicinity of the site. GDOT traffic counts (Station ID 151-0485) indicate that the daily traffic volume on Speer Road in 2019 was 14,000 vehicles per day between North Mill Road and Old Speer Road. GDOT classifies Speer Road as an Urban Minor Arterial roadway.

Spivey Road

Spivey Road is a north-south, two-lane, undivided roadway with a posted speed limit of 35 mph to the north of Orchard Road and 40 mph to the south of Orchard Road.

Blackhall Road

Blackhall Road is a north-south, two-lane, undivided roadway with a posted speed limit of 45 mph in the vicinity of the site. GDOT traffic counts (Station ID 151-0221) indicate that the daily traffic volume on Blackhall Road in 2019 was 7,950 vehicles per day. GDOT classifies Blackhall Road as an Urban Minor Arterial roadway.

Existing Bicycle and Pedestrian Facilities

- Sidewalk is present on both sides of SR 42/SR 138/US 23 (North Henry Boulevard) and SR 138 (Lake Spivey Parkway)
- Sidewalk is present on both sides of Hudson Bridge Road
- Crosswalks are present at the signalized intersections of:
 - o SR 138 (Lake Spivey Parkway) and I-75 Southbound Ramps on eastbound and westbound approaches
 - o SR 138 (Lake Spivey Parkway) and I-75 Northbound Ramps on eastbound, westbound and northbound approaches
 - o SR 138 (Lake Spivey Parkway) and Mt. Zion Road on all approaches
 - o SR 138 (Lake Spivey Parkway) and I-675 Southbound Ramps on eastbound, westbound and southbound approaches
 - o SR 138 (Lake Spivey Parkway) and I-675 Northbound Ramps on eastbound and northbound approaches
 - o SR 42/SR 138/US 23 (North Henry Boulevard) and SR 138 (Lake Spivey Parkway) on westbound, northbound and southbound approaches
 - o Flippen Road / Shields Road and SR 42/SR 138/US 23 (North Henry Boulevard) on all approaches
 - o Flippen Road and Walt Stephens Road / Red Oak Road on all approaches
 - o Flippen Road and Hudson Bridge Road on all approaches
- Bike paths are not present in the study network.

Alternative Modes of Transit

The new Henry Transit Bus system has expanded connecting to the existing GRTA Express Bus System serving the region at the Stockbridge transit location on Highway 138 @ I-75. The new coverage routes connect with regional transit systems allowing riders access to job centers via bus making it possible for Henry County residents to go from home to Metro Atlanta job centers with a short drive to stops in Stockbridge. There is a scheduled bus stop at the intersection of Flippen Road and SR 138 which is approximately 0.42 mile from the development. We have therefore taken a 2% reduction modal reduction in our analysis.

The graphic below includes the location of existing sidewalks in the study network.

Existing Alternative Transportation Map



STUDY METHODOLOGY

In this study, the methodology used for evaluating traffic operations at each of the subject intersections is based on the criteria set forth in the Transportation Research Board's Highway Capacity Manual, 6th edition (HCM 6). Synchro software, which utilizes the HCM methodology, was used for the analysis. The following is a description of the methodology employed for the analysis of unsignalized and signalized intersections.

Unsignalized Intersections

For unsignalized intersections controlled by a stop sign on minor streets, the level-of-service (LOS) for motor vehicles with controlled movements is determined by the computed control delay according to the thresholds stated in Table 1 below. LOS is determined for each minor street movement (or shared movement), as well as major street left turns. LOS is not defined for the intersection as a whole or for major street approaches. The LOS of any controlled movement which experiences a volume to capacity ratio greater than 1 is designed as "F" regardless of the control delay.

Control delay for unsignalized intersections includes initial deceleration delay, queue move-up time, stopped delay and final acceleration delay. Several factors affect the control delay for unsignalized intersections, such as the availability and distribution of gaps in the conflicting traffic stream, critical gaps and follow-up time for a vehicle in the queue.

Level-of-service is assigned a letter designation from "A" through "F". Level-of-service "A" indicates excellent operations with little delay to motorists, while level-of-service "F" exists when there are insufficient gaps of acceptable size to allow vehicles on the side street to cross the main road without experiencing long delays.

TABLE 1 — LEVEL-OF-SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS		
Control Delay (sec/vehicle)	LOS by Volume-to-Capacity Ratio*	
	v/c ≤ 1.0	v/c > 1.0
≤ 10	A	F
> 10 and ≤ 15	B	F
> 15 and ≤ 25	C	F
> 25 and ≤ 35	D	F
> 35 and ≤ 50	E	F
> 50	F	F

*The LOS criteria apply to each lane on a given approach and to each approach on the minor street. LOS is not calculated for major-street approaches or for the intersection.

Source: Highway Capacity Manual, 6th edition, Exhibit 20-2 *LOS Criteria: Motorized Vehicle Mode*

Signalized Intersections

According to HCM procedures, LOS can be calculated for the entire intersection, each intersection approach, and each lane group. HCM uses control delay alone to characterize LOS for the entire intersection or an approach. Control delay per vehicle is composed of initial deceleration delay, queue move-up time, stopped delay and final acceleration delay. Both control delay and volume-to-capacity ratio are used to characterize LOS for a lane group. A volume-to-capacity ratio greater than 1.0 for a lane group indicates failure from capacity perspective. Therefore, such a lane group is assigned LOS F regardless of the amount of control delay.

Table 2 below summarizes the LOS criteria from HCM for motorized vehicles at signalized intersections.

TABLE 2 — LEVEL-OF-SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS		
Control Delay (sec/vehicle)*	LOS for Lane Group by Volume-to-Capacity Ratio*	
	v/c ≤ 1.0	v/c > 1.0
≤ 10	A	F
> 10 and ≤ 20	B	F
> 20 and ≤ 35	C	F
> 35 and ≤ 55	D	F
> 55 and ≤ 80	E	F
> 80	F	F

*For approach-based and intersection wide assessments, LOS is defined solely by control delay

Source: Highway Capacity Manual, 6th edition, Exhibit 19-8 *LOS Criteria: Motorized Vehicle Mode*

LOS A is typically assigned when the volume-to-capacity (v/c) ratio is low and either progression is exceptionally favorable, or the cycle length is very short. LOS B is typically assigned when the v/c ratio is low and either progression is highly favorable, or the cycle length is short. However, more vehicles are stopped than with LOS A. LOS C is typically assigned when progression is favorable, or the cycle length is moderate. Individual cycle failures (one or more queued vehicles are not able to depart because of insufficient capacity during the cycle) may begin to appear at this level. Many vehicles still pass through the intersection without stopping, but the number of vehicles stopping is significant. LOS D is typically assigned when the v/c ratio is high and either progression is ineffective, or the cycle length is long. There are many vehicle-stops and individual cycle failures are noticeable. LOS E is typically assigned when the v/c ratio is high, progression is very poor, the cycle length is long, and individual cycle failures are frequent. LOS F is typically assigned when the v/c ratio is very high, progression is very poor, the cycle length is long, and most cycles fail to clear the queue.

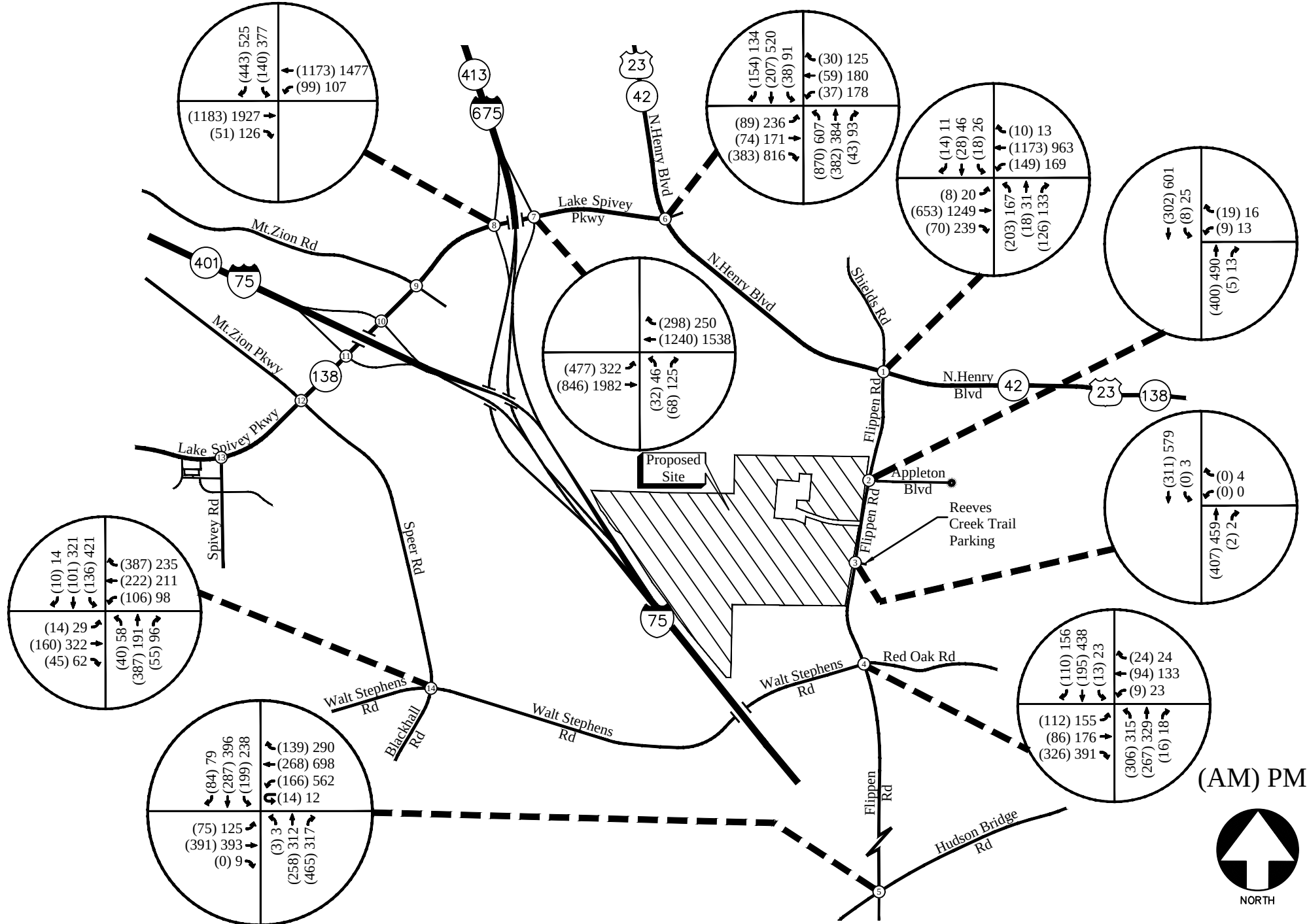
EXISTING TRAFFIC ANALYSIS

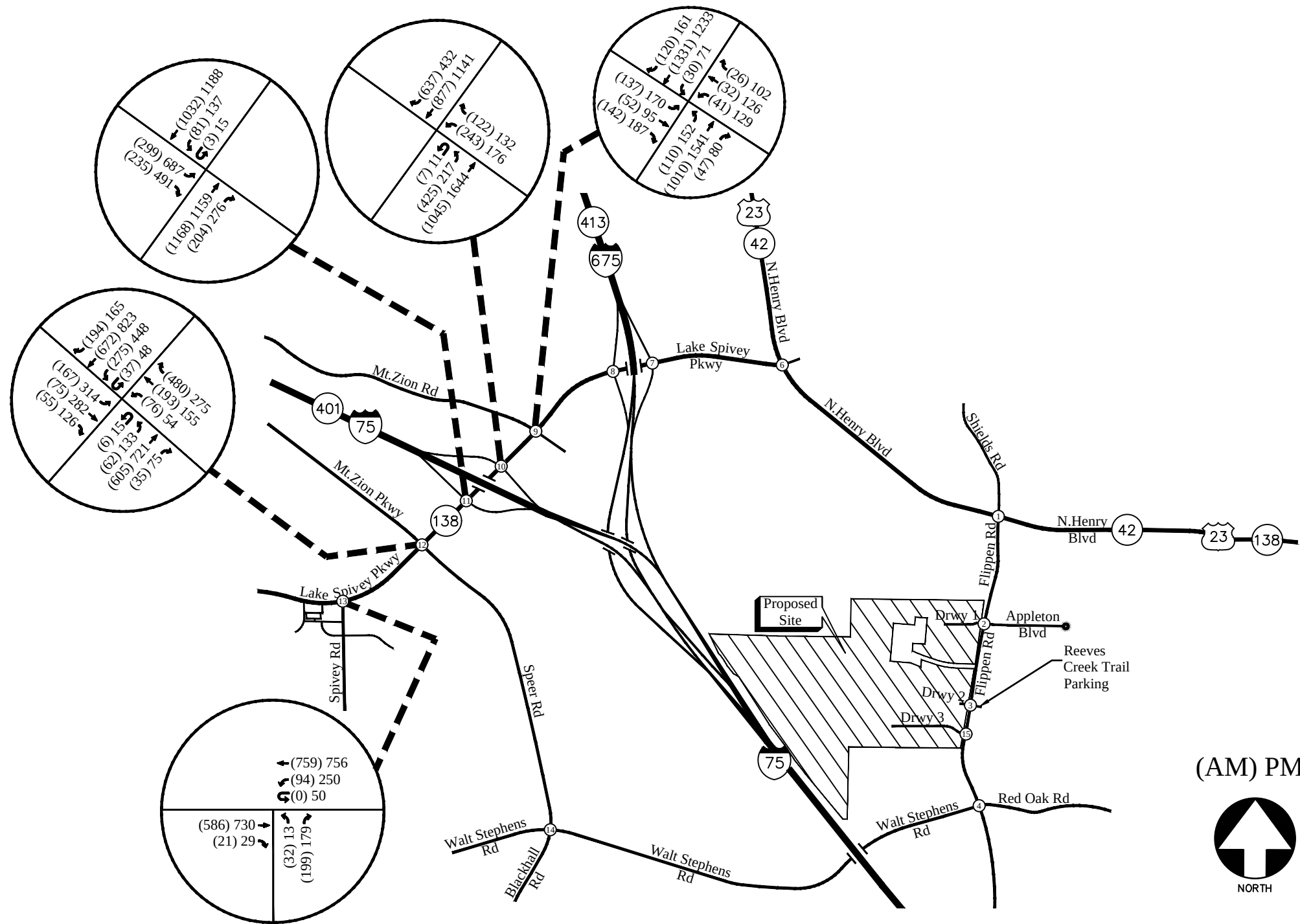
Existing Traffic Volumes

Existing traffic counts were obtained at the following study intersections:

1. Flippen Road / Shields Road @ SR 42/SR 138/US 23 (North Henry Boulevard)
2. Flippen Road @ Appleton Boulevard
3. Flippen Road @ Reeves Creek Trail Parking Lot
4. Flippen Road @ Walt Stephens Road / Red Oak Road
5. Flippen Road @ Hudson Bridge Road
6. SR 42/SR 138/US 23 (North Henry Boulevard) @ SR 138 (Lake Spivey Parkway)
7. SR 138 (Lake Spivey Parkway) @ I-675 Northbound Ramps
8. SR 138 (Lake Spivey Parkway) @ I-675 Southbound Ramps
9. SR 138 (Lake Spivey Parkway) @ Mount Zion Road
10. SR 138 (Lake Spivey Parkway) @ I-75 Northbound Ramps
11. SR 138 (Lake Spivey Parkway) @ I-75 Southbound Ramps
12. SR 138 (Lake Spivey Parkway) @ Speer Road / Mount Zion Parkway
13. SR 138 (Lake Spivey Parkway) @ Spivey Road
14. Walt Stephens Road @ Blackhall Road / Speer Road

Turning movement counts were collected on Wednesday, December 07, 2022 (intersections # 1, 2, 3, 4, 5, 6 and 13), on Thursday, December 08, 2022 (intersections # 10, 11, 12 and 14) and on Tuesday, December 13, 2022 (intersections # 7, 8 and 9). All turning movement counts were recorded during the AM and PM peak hours between 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM, respectively. The four consecutive 15-minute interval volumes that produced the highest volume at the intersections were then determined. These volumes make up the peak hour traffic volumes for the intersections counted and are shown in Figures 2A and 2B. The existing traffic control and lane geometry for the intersections are shown in Figures 3A and 3B.

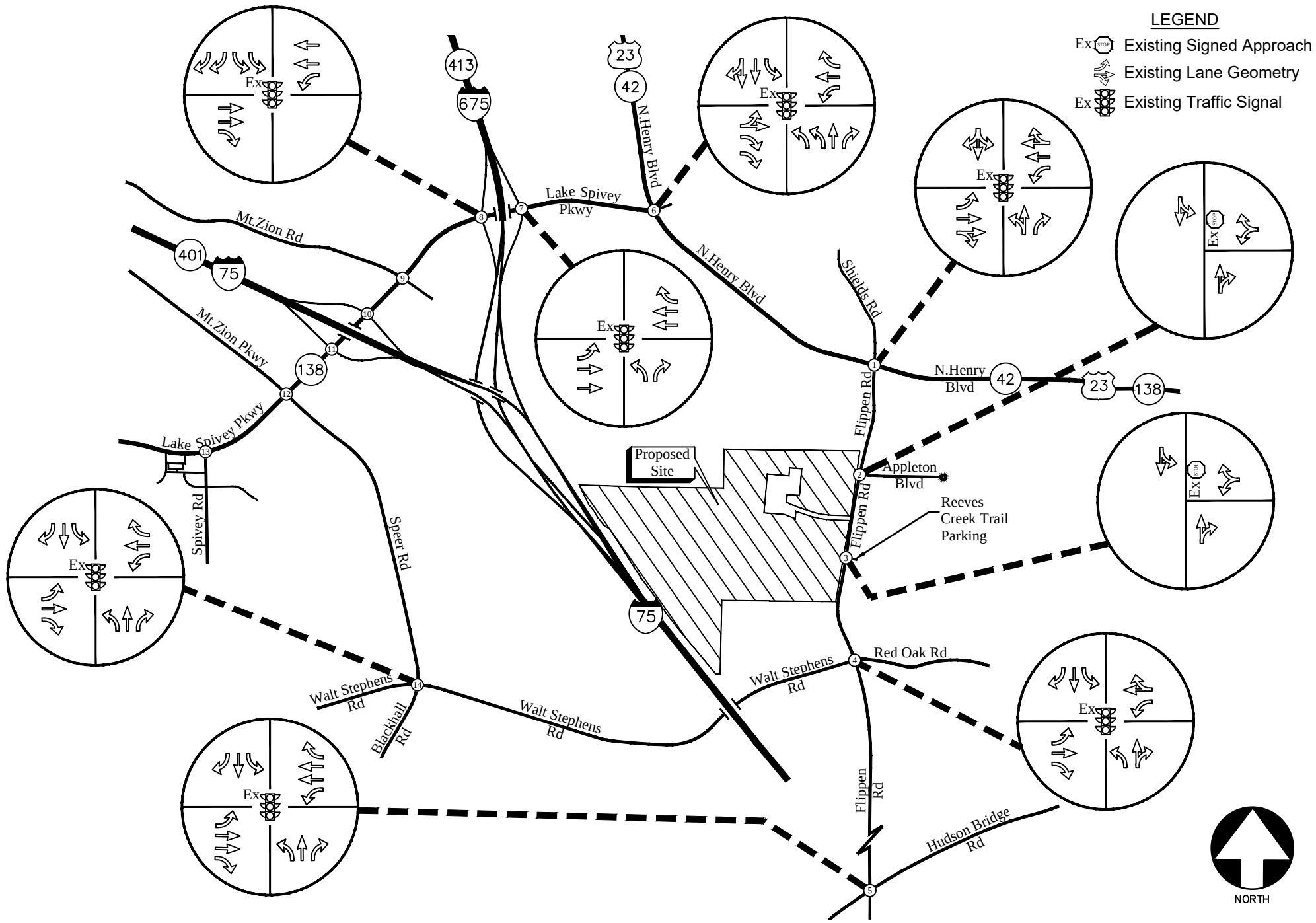




EXISTING WEEKDAY PEAK-HOUR VOLUMES - 2 OF 2

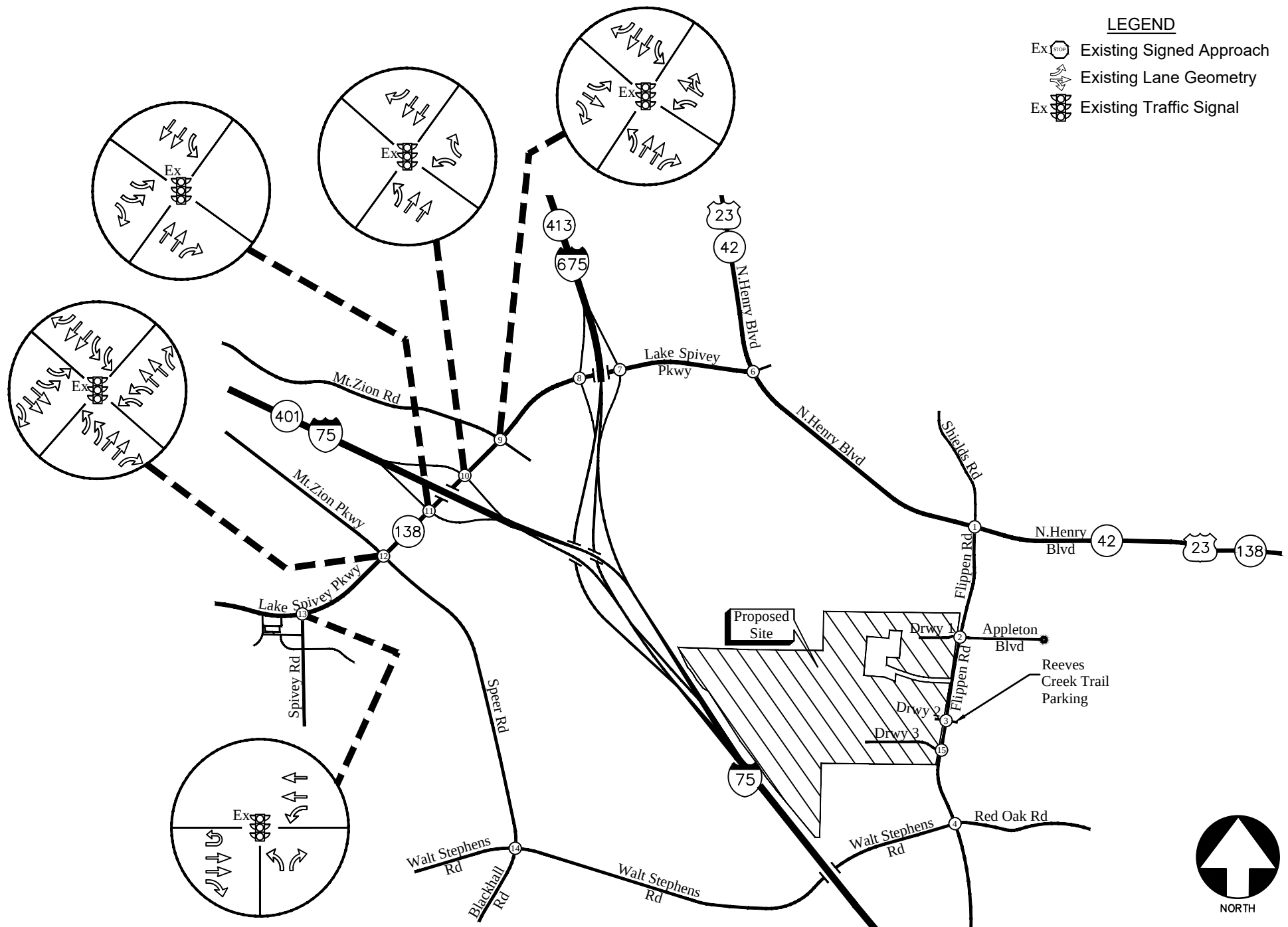
FIGURE 2B

A&R Engineering Inc.



EXISTING TRAFFIC CONTROL AND LANE GEOMETRY - 1 OF 2

FIGURE 3A
A&R Engineering Inc.



EXISTING TRAFFIC CONTROL AND LANE GEOMETRY - 2 OF 2

FIGURE 3B
A&R Engineering Inc.

Existing 2023 Traffic Operations

Existing 2023 traffic operations were analyzed at the study intersections in accordance with the HCM methodology. The results of the analyses are shown in Table 3.

TABLE 3 — EXISTING INTERSECTION OPERATIONS							
Intersection		Traffic Control	AM Peak	PM Peak	LOS Standard		
1	<u>Flippen Road / Shields Road @ SR 42 (N Henry Blvd)</u> -Eastbound Approach -Westbound Approach -Northbound Approach -Southbound Approach	Signalized	<u>C (27.2)</u> B (18.3) B (19.0) E (76.2) C (33.3)	<u>C (26.9)</u> C (29.1) B (16.9) D (47.2) D (43.0)	<u>D/D</u> D/D D/D E/D D/D		
	<u>Flippen Road @ Appleton Boulevard</u> -Westbound Approach -Southbound Left		Stop Controlled on WB Approach	B (12.5) A (8.2)	C (17.6) A (8.5)	D/D D/D	
	<u>Flippen Road @ Reeves Creek Trail</u> -Westbound Approach -Southbound Left		Stop Controlled on WB Approach	A (0.0) A (0.0)	B (11.2) A (8.3)	D/D D/D	
	<u>Flippen Rd @Walt Stephens Rd / Red Oak Rd</u> -Eastbound Approach -Westbound Approach -Northbound Approach -Southbound Approach		Signalized	<u>B (19.9)</u> D (37.8) D (50.1) A (9.5) B (13.7)	<u>C (25.3)</u> D (37.7) D (47.8) B (15.0) C (22.3)	<u>D/D</u> D/D D/D D/D D/D	
	<u>Flippen Road @ Hudson Bridge Road</u> -Eastbound Approach -Westbound Approach -Northbound Approach -Southbound Approach			Signalized	<u>C (32.5)</u> C (30.1) C (24.5) D (50.1) B (18.1)	<u>D (40.1)</u> D (40.3) D (35.2) D (54.9) D (35.4)	<u>D/D</u> D/D D/D D/D D/D
<u>SR 42/SR 138 @ SR 138 (Lake Spivey Pkwy)</u> -Eastbound Approach -Westbound Approach -Northbound Approach -Southbound Approach	Signalized	<u>D (46.4)</u> D (42.1) E (77.5) D (47.2) D (39.5)			<u>E (55.5)</u> D (44.6) E (77.4) E (62.7) D (52.9)	<u>D/E</u> D/D E/E D/E D/D	
<u>SR 138 (Lake Spivey Pkwy) @I-675 NB Ramps</u> -Eastbound Approach -Westbound Approach -Northbound Approach		Signalized			<u>B (19.3)</u> C (20.8) B (15.2) D (51.8)	<u>A (9.3)</u> A (4.0) B (12.8) D (49.3)	<u>D/D</u> D/D D/D D/D
<u>SR 138 (Lake Spivey Pkwy) @ I-675 SB Ramps</u> -Eastbound Approach -Westbound Approach -Southbound Approach					Signalized	<u>B (18.0)</u> C (23.4) A (9.4) D (48.7)	<u>A (5.0)</u> A (1.2) A (0.6) D (44.6)
<u>SR 138 (Lake Spivey Pkwy) @ Mount Zion Road</u> -Eastbound Approach -Westbound Approach -Northbound Approach -Southbound Approach			Signalized			<u>A (7.6)</u> A (1.5) A (1.5) D (46.8) D (44.1)	<u>C (27.0)</u> B (11.7) D (38.0) D (41.1) D (38.0)
Continued on next page.							

10	<u>SR 138 (Lake Spivey Pkwy) @ I-75 NB Ramps</u> -Eastbound Approach -Westbound Approach -Northbound Approach	Signalized	<u>B (11.4)</u> B (11.5) A (0.6) D (50.1)	<u>A (6.3)</u> A (5.7) A (0.5) D (50.8)	<u>D/D</u> D/D D/D D/D
11	<u>SR 138 (Lake Spivey Pkwy) @ I-75 SB Ramps</u> -Eastbound Approach -Westbound Approach -Southbound Approach	Signalized	<u>A (9.8)</u> A (9.2) A (0.8) D (46.0)	<u>C (25.7)</u> B (17.2) C (25.1) D (41.1)	<u>D/D</u> D/D D/D D/D
12	<u>SR 138 (Lake Spivey Pkwy) @ Speer Rd/Mt.Zion Pkwy</u> -Eastbound Approach -Westbound Approach -Northbound Approach -Southbound Approach	Signalized	<u>D (51.1)</u> D (43.3) D (43.3) E (67.9) E (58.8)	<u>D (49.3)</u> D (43.6) D (42.0) E (68.6) E (58.7)	<u>D/D</u> D/D D/D E/E E/E
13	<u>SR 138 (Lake Spivey Parkway) @ Spivey Road</u> -Eastbound Approach -Westbound Approach -Northbound Approach	Signalized	<u>A (3.7)</u> A (4.0) A (1.7) D (53.6)	<u>A (3.3)</u> A (4.5) A (1.9) E (55.7)	<u>D/D</u> D/D D/D D/E
14	<u>Walt Stephens Rd @ Blackhall Rd / Speer Rd</u> -Eastbound Approach -Westbound Approach -Northbound Approach -Southbound Approach	Signalized	<u>C (25.7)</u> B (14.5) B (18.5) D (42.4) C (27.7)	<u>C (27.4)</u> B (17.5) B (18.2) D (47.0) C (33.0)	<u>D/D</u> D/D D/D D/D D/D

The results of existing traffic operations analysis indicate that the following intersections are operating at level-of-service “E” for one or more approaches in the AM and/or PM peak hour:

1. Flippen Road / Shields Road @ SR 42/SR 138/US 23 (North Henry Boulevard)
6. SR 42/SR 138/US 23 (North Henry Boulevard) @ SR 138 (Lake Spivey Parkway)
12. SR 138 (Lake Spivey Parkway) @ Speer Road / Mount Zion Parkway
13. SR 138 (Lake Spivey Parkway) @ Spivey Road

These areas are addressed in the future traffic operations sections.

PROJECT DESCRIPTION

The proposed Reeves Creek II mixed-use development will be located at 630 Flippen Road in the City of Stockbridge, Henry County, Georgia. The development will consist of:

- Single-Family Detached Housing: 328 lots
- Townhomes: 191 units
- Multifamily Housing: 646 units
- Senior Living: 182 units
- Office: 41,000 sf
- Retail: 5,000 sf



The development proposes accesses at the following locations:

- Site Driveway 1: Full access (northern) driveway on Flippen Road, aligned with Appleton Blvd.
- Site Driveway 2: Full access (middle) driveway on Flippen Road, for retail, aligning with Reeves Creek Trail parking lot.
- Site Driveway 3: Full access (southern) driveway on Flippen Road, south of Site Driveway 2
- Site Driveway 4: Northwestern access south of DriveTime. Road stubbed for future access to Davidson Parkway.

Site Plan

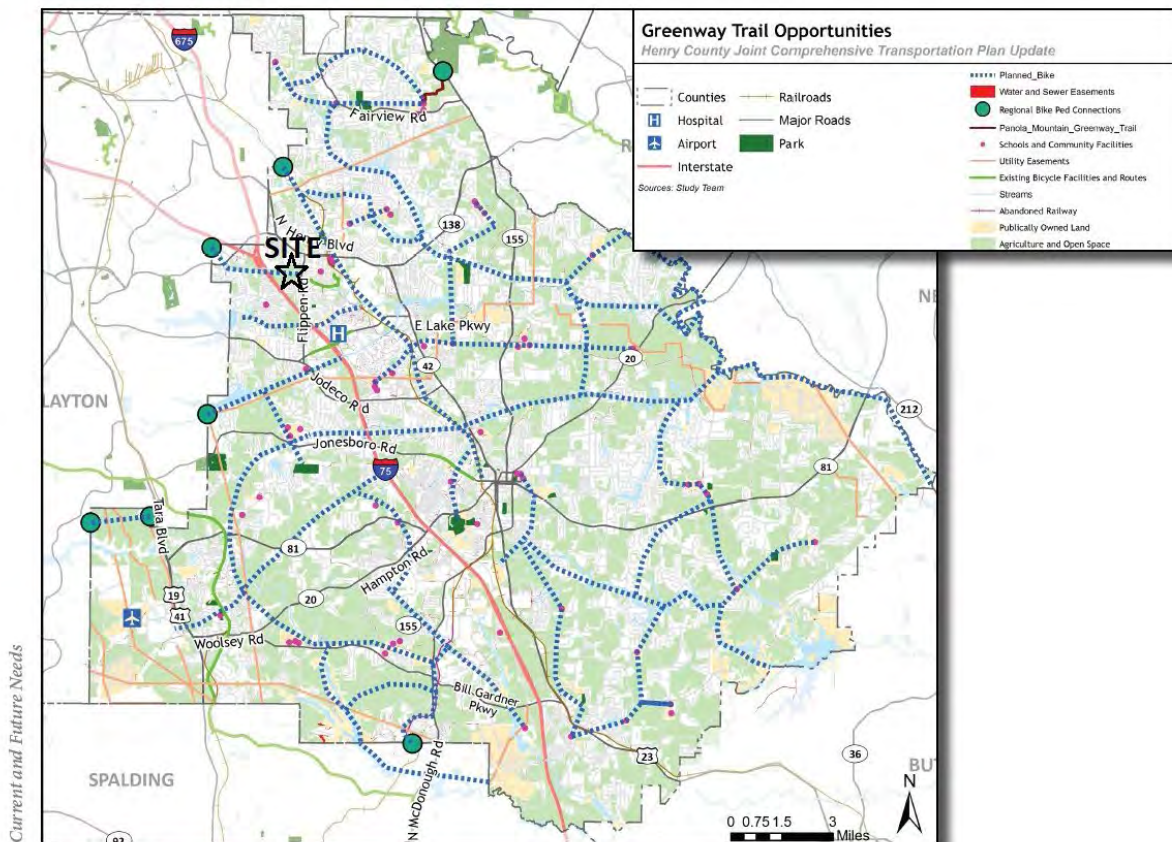
A site plan is shown in Figure 4. A digital copy of the site plan is also provided with this report.

Planned Bicycle and Pedestrian Facilities

Pedestrian sidewalks will be provided throughout the development. The development proposes sidewalk along the frontage of the property on Flippen Road and will provide a crosswalk on Flippen Road to access the Reeves Creek Trail across from the development.

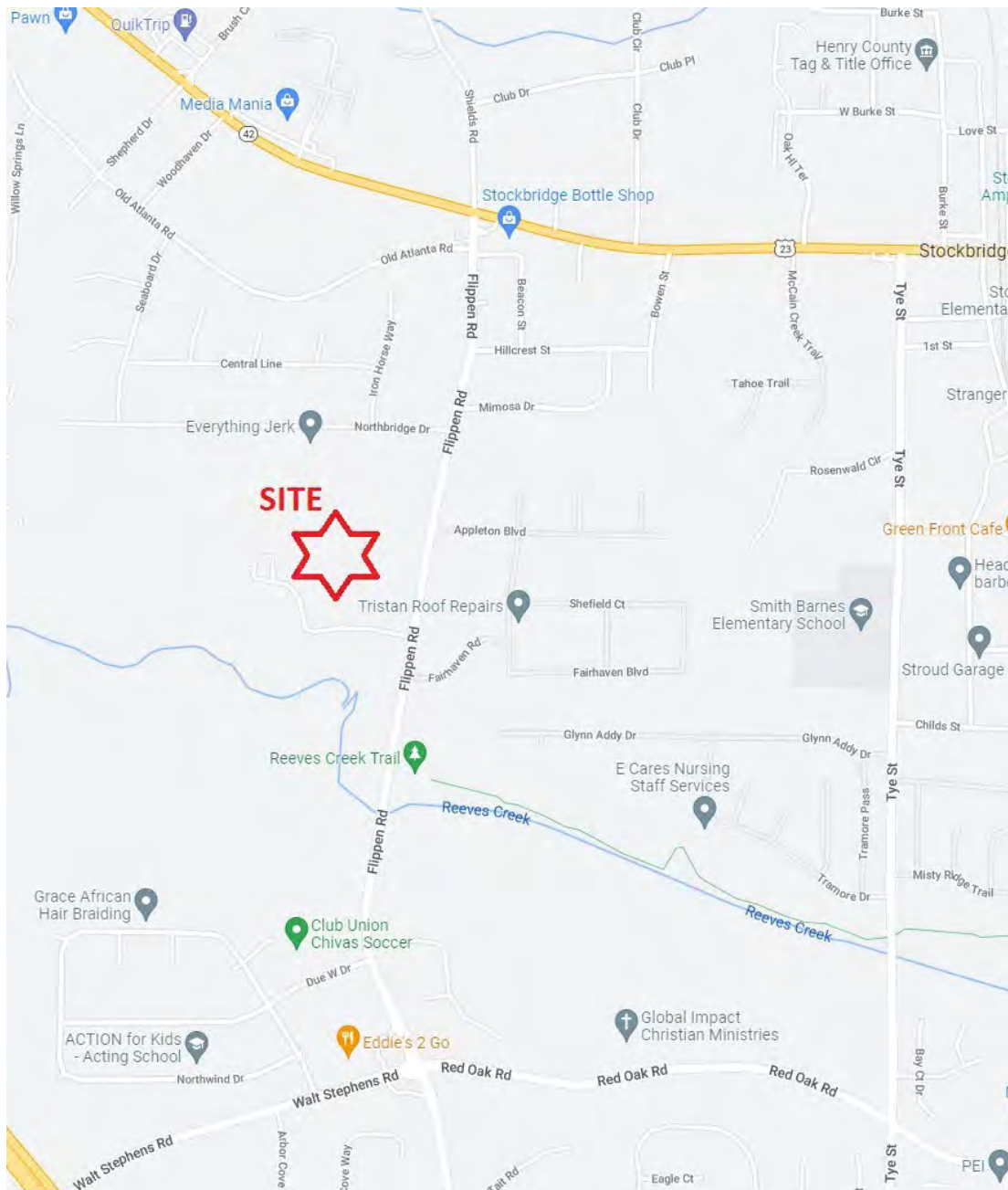
Henry County's Comprehensive Transportation Plan shows two planned bike routes in the vicinity of the development. No further information is available yet.

Figure 20: Greenway Trail Opportunities in Henry County



37 Henry County Comprehensive Transportation Plan

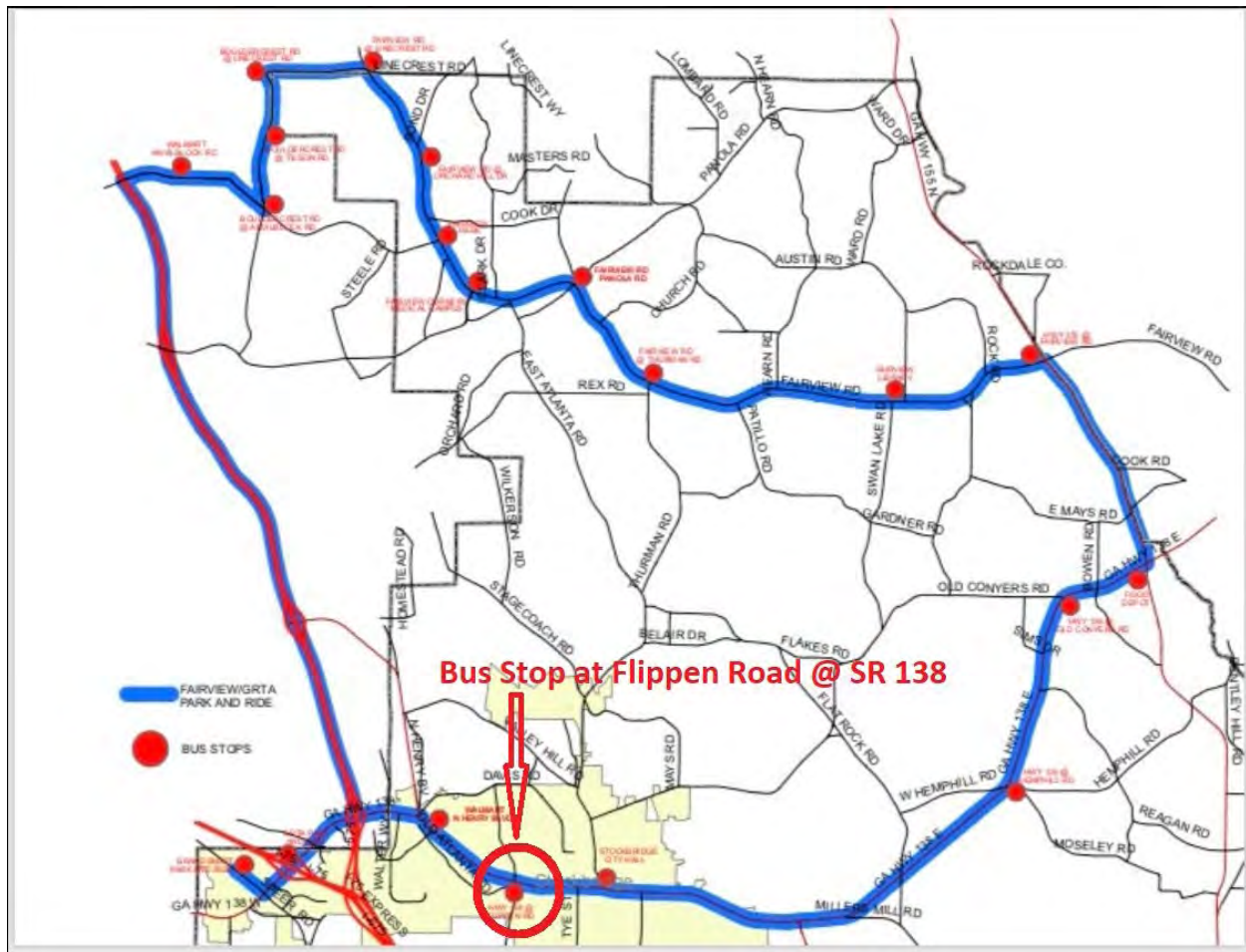
Potential Pedestrian and Bicycle Destinations



- Food: Eddie's 2 Go, Everything Jerk Caterers, Waffle House, Best Breakfast and Wings & Hibachi
- Banks: Truist Bank
- Retail: Grace African Hair Braiding, Action for Kids – Acting School, Media Mania video store, Plaza Beer and Wine, Stockbridge Bottle Shop, Appliances, Moseley Furniture, Aisha African Braiding
- Services: Memorial Park, Tristan Roof Repairs, Integrity Landscape Management, BP gas station, Childcare Network, Sun Emission, Club Union Chivas Soccer, Swim School, Texaco, Beto's X-pert Auto Care, Advanced Wheel Specialist, O'Reilly Auto Parts

Planned Transit Facilities

The new Henry Transit Bus system has expanded connecting to the existing GRTA Express Bus System serving the region at the Stockbridge transit location on Highway 138 @ I-75. The new coverage routes connect with regional transit systems allowing riders access to job enters via bus making it possible for Henry County residents to go from home to metro Atlanta job centers like Hartsfield-Jackson International Airport, Downtown Atlanta, and the Perimeter Center with a short drive to stops in Stockbridge. There is a scheduled bus stop at the intersection of Flippen Road and SR 138 which is approximately 0.42 mile from the development. A map of the bus route is shown below.



Consistency with Adopted Comprehensive Plan

The proposed master planned, mixed-use development will include detached single-family homes, townhomes, multifamily housing, senior living homes, office and retail. The property includes 278.351 acres of land. The site is currently zoned as Residential-Agricultural (RA) and is requesting a rezoning to Planned Unit Development (PUD).

Future Land Use Map

Future Land Use Map Zoning	The development site is being annexed into the City of Stockbridge. City's future land-use map therefore does not show it on the map.
Character Area Definition for City of Stockbridge	Goals: • <i>To provide a variety of housing choices to suit the changing needs and lifestyles of City residents.</i> • <i>To ensure that new developments promote a better sense of place and preserve valued elements of community character.</i> Policies: • <i>Provide a mixture of housing options to attract young professionals, singles and small families.</i> • <i>Work with housing developers to create appropriate residential types to ensure that seniors can age in place.</i> • <i>Preserve and enhance older, existing neighborhoods by promoting rehabilitation of existing housing stock and infill of new development to revitalize established neighborhoods.</i> • <i>Encourage development of a rational network of commercial nodes to meet the service needs of citizens while avoiding unattractive and inefficient strip development along major roadways.</i> • <i>Work with business owners and developers to improve conditions of property and require a consistent look of quality among commercial developments.</i> • <i>Encourage mixed-use development to promote a live, work, play concept.</i> • <i>Support increases in residential density in areas where community design standards, environmental constraints and available infrastructure capacities can satisfactorily accommodate the increased density.</i> • <i>Create a "sense of place" for our community along our major commercial corridors.</i> • <i>Reduce the number of zoning districts included in the zoning ordinance so they match future land use designations.</i>
Relation to Existing Land Use Plans	The proposed Reeves Creek II mixed-use development is consistent with the land use vision and goals listed above.

STOCKBRIDGE FUTURE LAND USE MAP

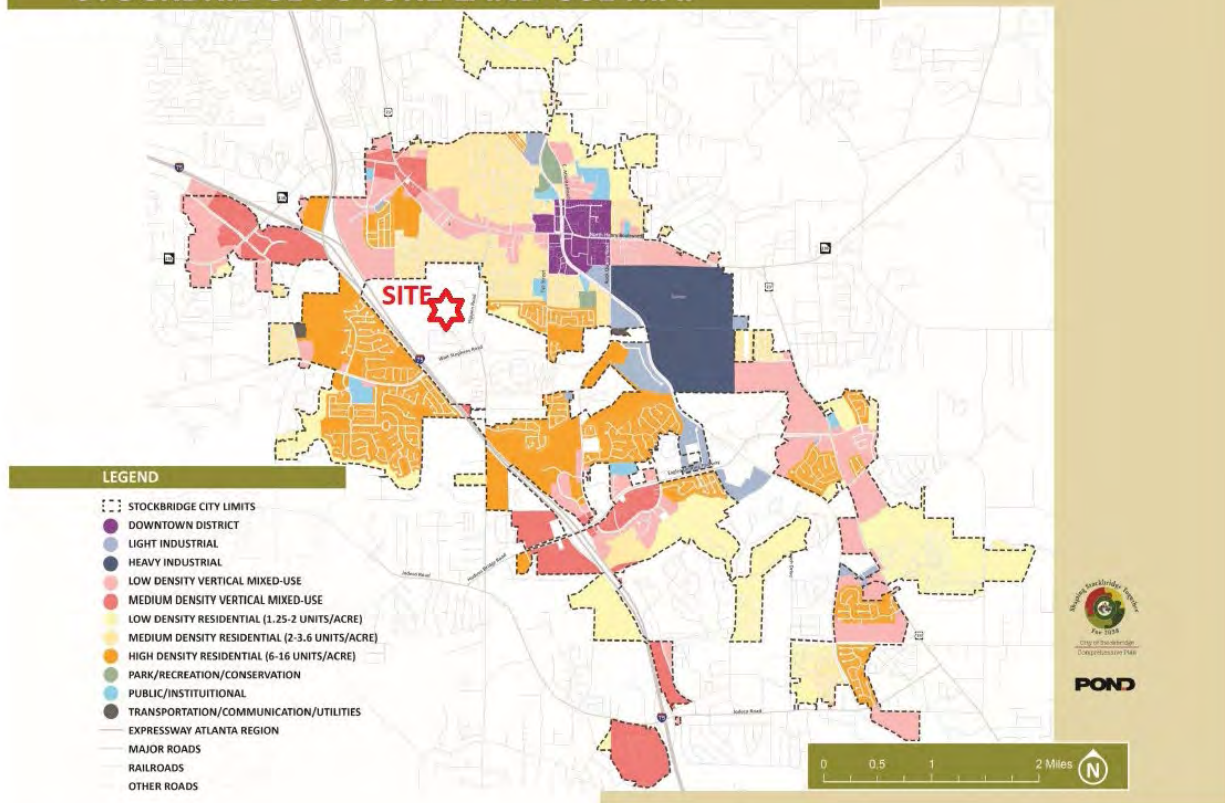
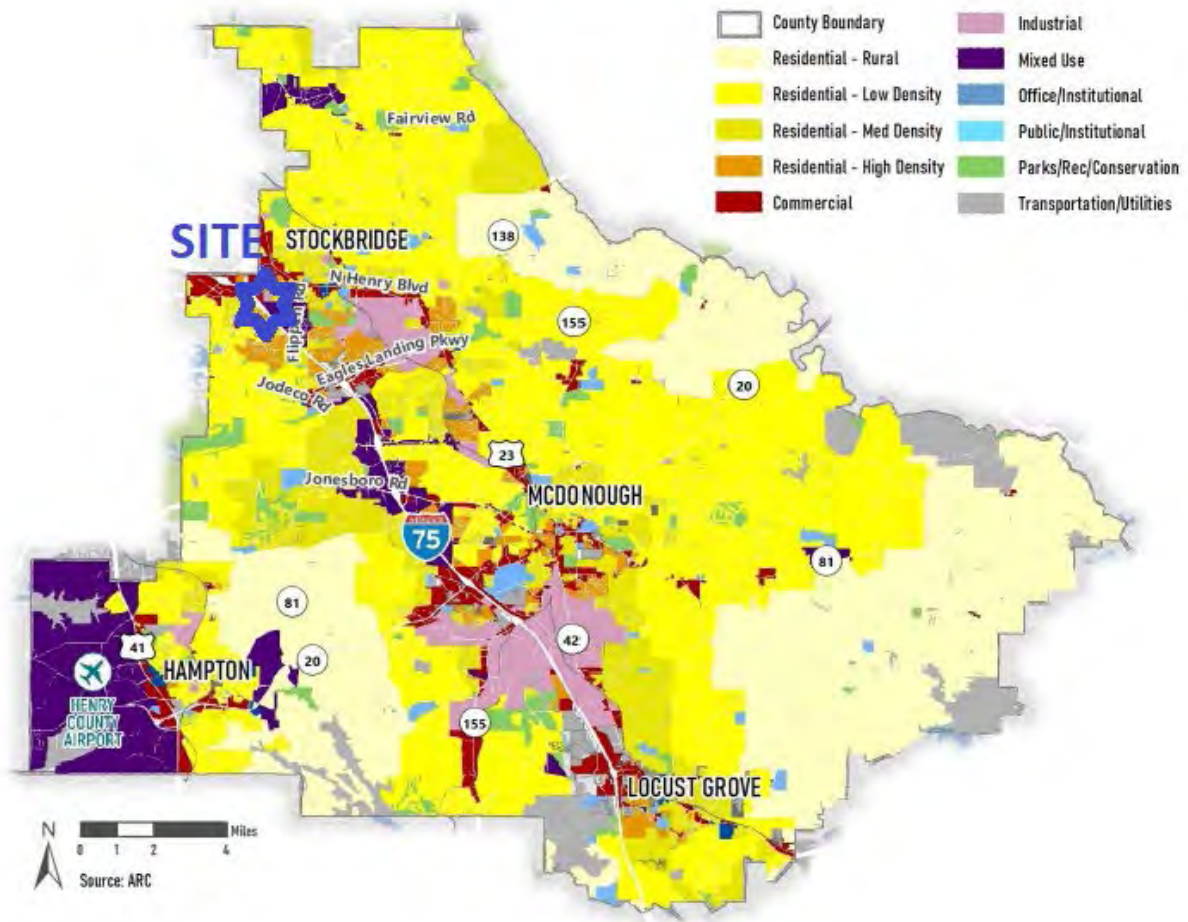


Figure 3.1 Future Land Use Map

Shaping Stockbridge Together For 2038: City of Stockbridge Comprehensive Plan

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FIGURE 3-2: HENRY COUNTY'S FUTURE LAND USE MAP



Project Phasing

This project has been evaluated for the complete build-out of the development in 2027.

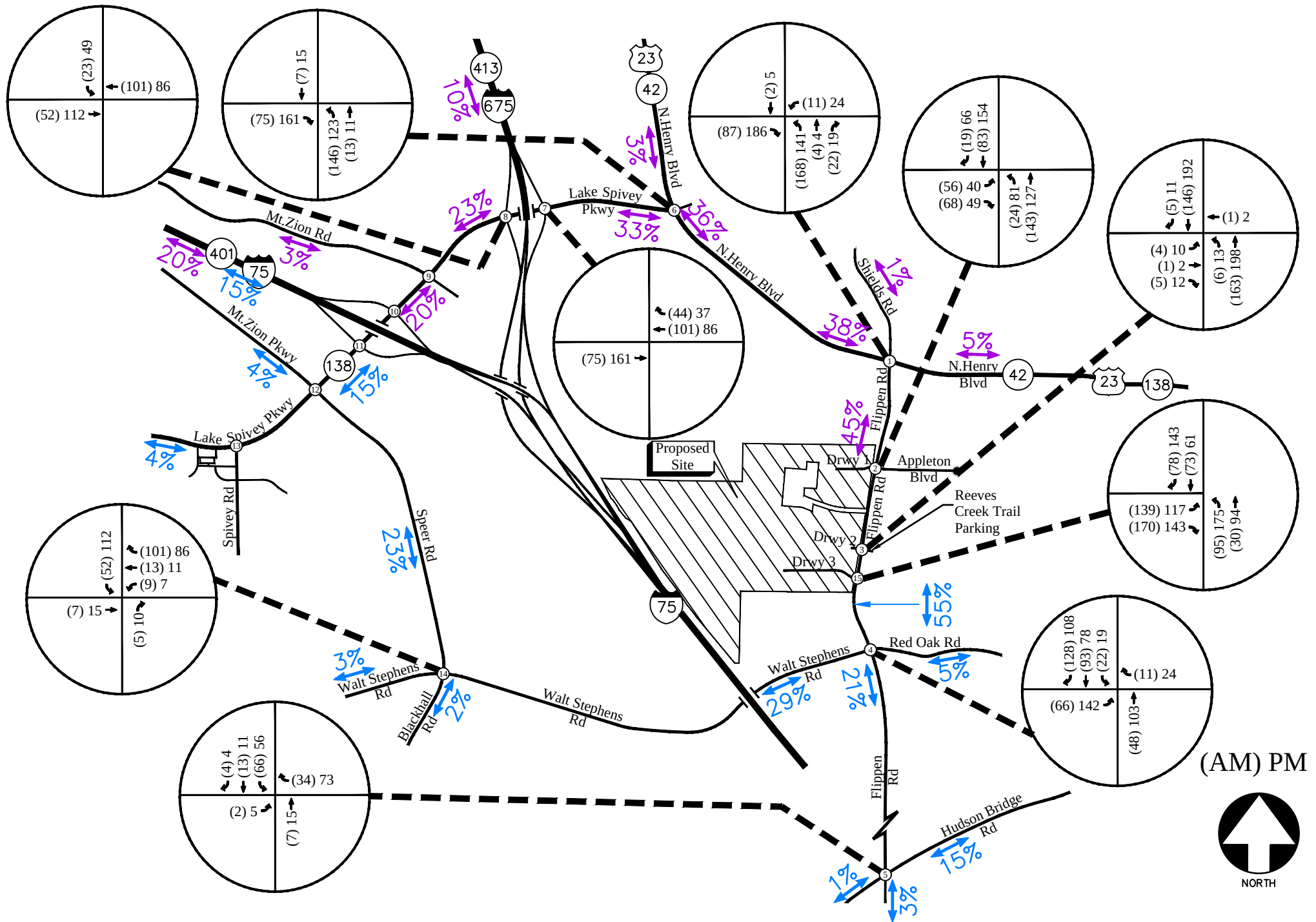
Trip Generation

Trip generation estimates for the project were based on the rates and equations published in the 11th edition of the Institute of Transportation Engineers (ITE) Trip Generation report. This reference contains traffic volume count data collected at similar facilities nationwide. The trip generation was based on the following ITE *Land Uses*: 210 – *Single-Family Detached Housing*, 215 – *Single-Family Attached Housing*, 220 – *Multifamily Housing (Low-Rise) - Not Close to Rail Transit*, 221 – *Multifamily Housing (Mid-Rise) - Not Close to Rail Transit*, 252 – *Senior Adult Housing - Multifamily*, 710 – *General Office Building* and 822 – *Strip Retail Plaza (<40k)*. A 2% alternate mode reduction was also applied. The calculated total trip generation for the proposed development is shown in Table 4.

TABLE 4 – TRIP GENERATION								
Land Use	Size	AM Peak Hour			PM Peak Hour			24 Hour
		Enter	Exit	Total	Enter	Exit	Total	Two-way
210 – Single-Family Detached Housing	328 Units	57	163	220	191	113	304	3,010
215 – Single-Family Attached Housing	191 Units	29	65	94	63	48	111	1,405
220 – Multifamily Housing (Low-Rise) - Not Close to Rail Transit	443 Units	38	122	160	133	78	211	2,915
221 – Multifamily Housing (Mid-Rise) - Not Close to Rail Transit	203 Units	18	60	78	49	31	80	922
252 – Senior Adult Housing – Multifamily	182 Units	12	23	35	26	20	46	551
710 – General Office Building	41,000 SF	68	10	78	13	66	79	534
822 – Strip Retail Plaza (<40k)	5,000 SF	11	7	18	24	24	48	441
Alternate Mode of Reduction (2%)		-5	-9	-14	-10	-8	-18	-196
Total Trips (without Reductions)		233	450	683	499	380	879	9,778
New External Trips (with Reductions)		228	441	669	489	372	861	9,582

Trip Distribution

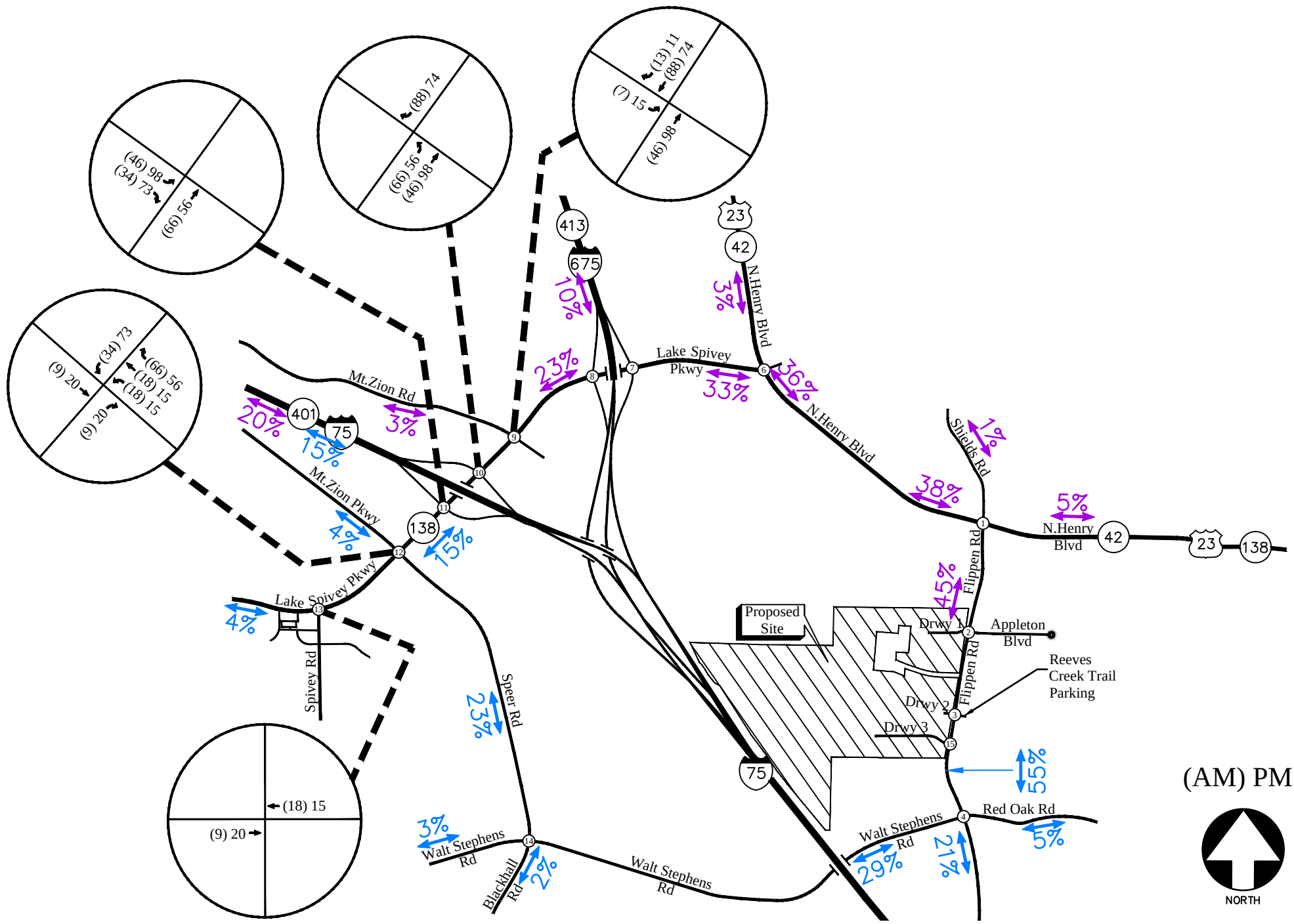
The trip distribution describes how traffic arrives and departs from the site. An overall trip distribution was developed for the site based on a review of GDOT ADT volumes and the locations of major roadways and highways that will serve the development. The site-generated peak hour traffic volumes, shown in Table 4, were assigned to the study area intersections based on this distribution. The outer-leg distribution and AM and PM peak hour new traffic generated by the site are shown in Figures 5A and 5B.



TRIP DISTRIBUTION AND SITE-GENERATED WEEKDAY PEAK HOUR VOLUMES - 1 OF 2

FIGURE 5A

A&R Engineering Inc.



TRIP DISTRIBUTION AND SITE-GENERATED WEEKDAY PEAK HOUR VOLUMES - 2 OF 2

FIGURE 5B

A&R Engineering Inc.

FUTURE 2027 TRAFFIC ANALYSIS

The future 2027 traffic operations are analyzed for the “Build” and “No-Build” conditions. This provides a basis of reference for determining both the contribution of the site to overall traffic conditions and the additional improvements needed to provide sufficient site access and capacity for passing traffic.

Improvements that are identified as “System Improvements” address deficiencies that are found within the existing road network prior to any impacts from the proposed development’s added traffic. Improvements that are identified as “Site Mitigation Improvements” address further impacts that are a result of the proposed development’s added traffic. Note that survey and construction drawings would be needed to verify the feasibility and extent of additional right-of-way required for any recommended improvements.

Future “No-Build” Conditions

The “No-Build” (or background) conditions provide an assessment of how traffic will operate in the study horizon year without the study site being developed as proposed, with projected increases in through traffic volumes due to normal annual growth. The Future “No-Build” volumes consist of the existing traffic volumes plus increases for annual growth of traffic.

Annual Traffic Growth

In order to evaluate future traffic operations in this area, a projection of normal traffic growth was applied to the existing volumes. The Georgia Department of Transportation recorded average daily traffic volumes at several locations in the vicinity of the site. Reviewing the growth over the last three years (2017-2019) revealed growth of approximately 1% in the area. This growth factor was applied to the existing traffic volumes to estimate the future year traffic volumes prior to the addition of site-generated traffic.

A growth rate of 4.0% was used for the intersections of SR 138 at Spivey Road, Speer Road/Mt. Zion Parkway and I-75 northbound and southbound ramps. This increase in background growth traffic from 1% to 4% will account for the increased traffic from the two projects the City of Stockbridge has recently approved.

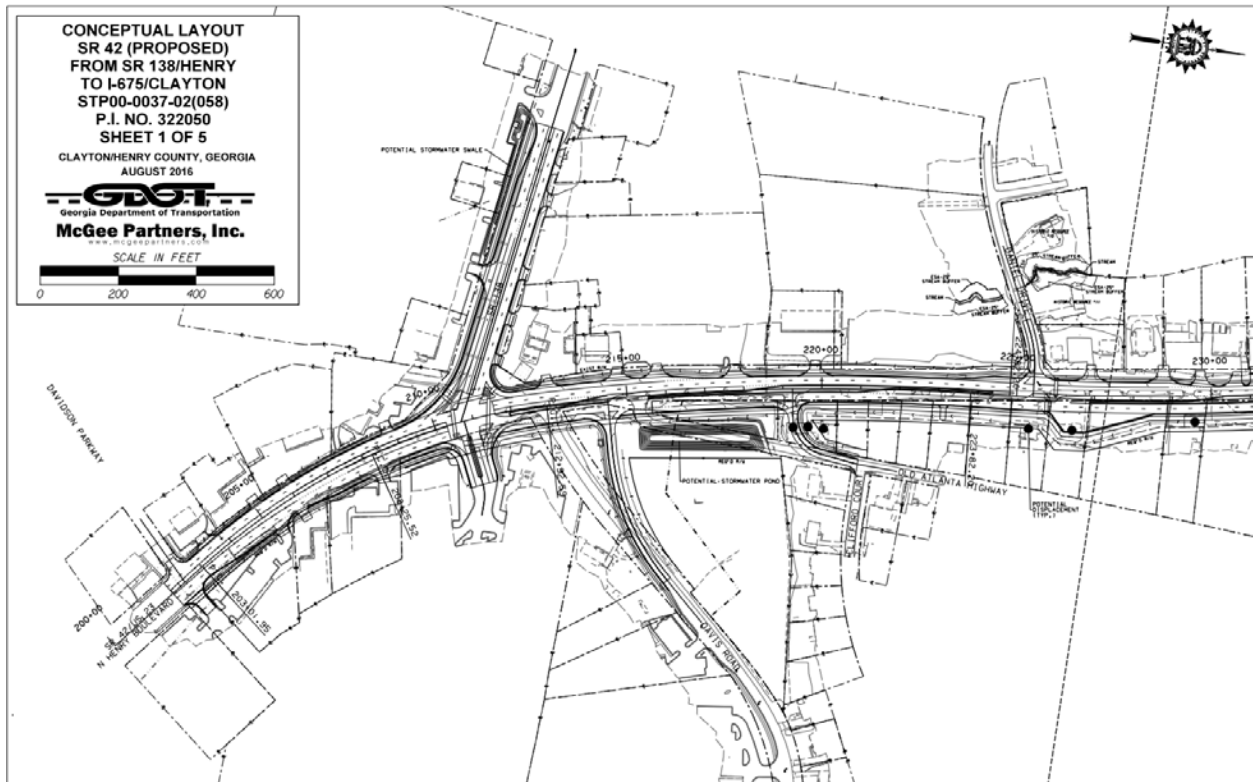
Planned and Programmed Improvements in Study Area

The following improvements have been identified in the Regional Transportation Plan (Plan 2040), GDOT GeoPi, and/or the local comprehensive transportation plan. These improvements are within the vicinity of the proposed development.

TABLE 5 — PLANNED AND PROGRAMMED IMPROVEMENTS								
Item #	Project Name	From / To Points	Sponsor	GDOT PI #	ARC ID #	Design FY	ROW / UTL FY	CST FY
1	US 23 Widening	Widening from 2 lanes to 4 lanes from SR 138 (North Henry Boulevard) to I-675 in Clayton County for 2.5 miles	GDOT	322050-	CL-064	2030	2023	2023
2	East Atlanta Road Widening	From Valley Hill Road to Fairview Road	Henry County	N/A	HE-137	2030	LR 2026-2030	LR 2026-2030
3	Mount Zion Road Widening	from 2 to 4 lanes divided urban highway from Richardson Parkway to SR 138. The project will improve the road alignment, improve safety and relieve congestion in the corridor.	Clayton County	N/A	CL-063	2050	LR 2041-2050	LR 2041-2050
4	Rock Quarry Road Widening	Widening from two to four lanes between north of Eagle Springs Drive and SR 42/SR 138, for a length of 2.43 miles, to address congestion related to the hospital near the I-75 South interchange. This project will feature a 10-foot multi-use path.	Henry County	0015090	HE-161A	2030	2023	2023
5	Rock Quarry Road Extension - New Alignment	Construction of a new two-lane roadway linking US 23 (North Henry Boulevard) with East Atlanta Road at Valley Hill Road	City of Stockbridge	N/A	HE-109	2030	2021	2023
6	I-75 South Express Lanes from C.W. Grant Parkway to SR 138	New express lanes system along I-75 South from C.W. Grant Parkway to SR 138 – A Long Range Program – No Details available yet.	GDOT	0013919	AR-ML-610	2040	LR 2026-2030	LR 2031-2040
7	Clayton County Bus Routes 197 and 198	New bus service in Clayton County - Bus Routes 197 and 198 at Route 197 - I-675 and Clayton/Henry County Line; Route 198 - South Lake Mall to provide East/West connectivity for the residents of Clayton County	MARTA	0017820	M-AR-452	TBD	2023	2023

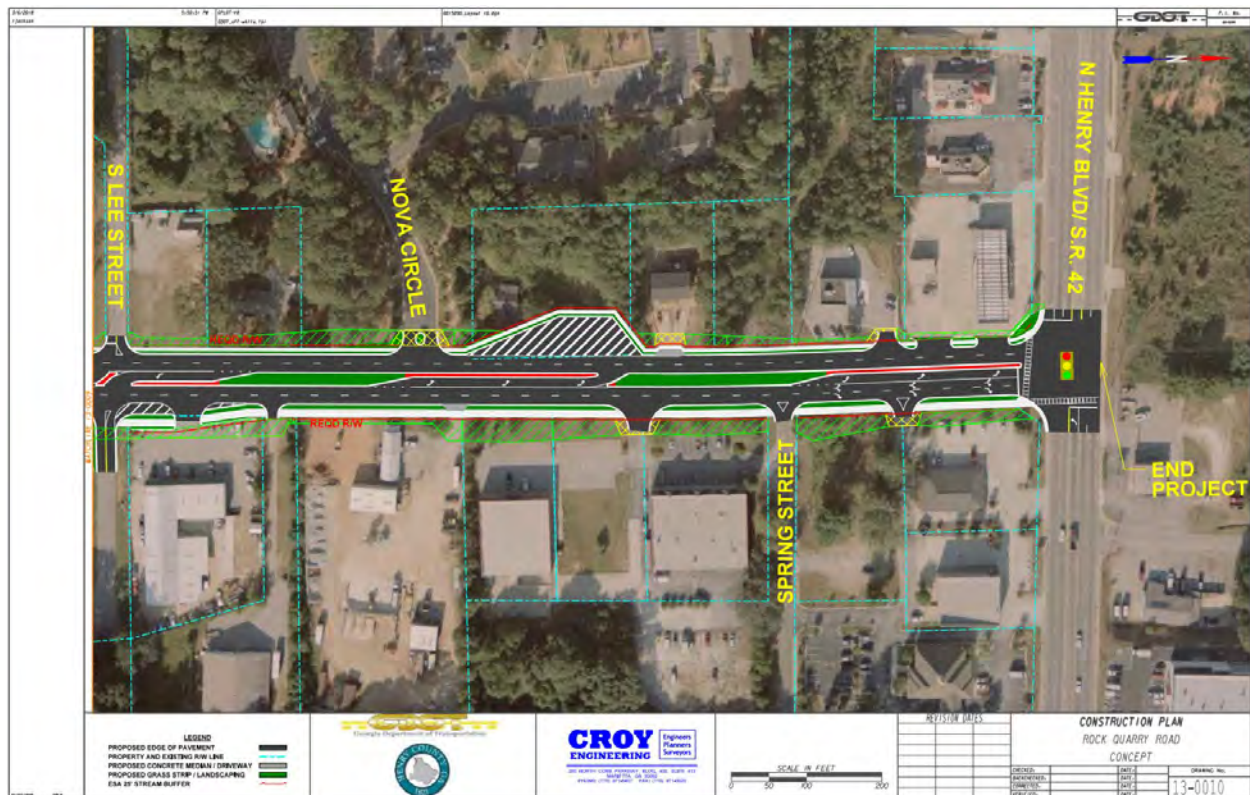
GDOT PI # 322050 – SR 42 FROM 0.15 mi SOUTH OF SR 138/Henry County To I-675 Clayton County

The proposed project would improve SR 42/US3 from SR 138 in Henry County and the City of Stockbridge to I-675 in Clayton County. The existing two-lane roadway would be widened to four 12-foot lanes with 20' raised median with urban shoulders and sidewalks. The bridge culvert at Panther Creek would be replaced with a new quadruple 10'x9' bridge culvert.



GDOT PI # 0015090 – Rock Quarry Road from Eagles Landing Pkwy to SR 42/SR 138:

Rock Quarry Road project is a reconstruction project. Rock Quarry Road will be widened beginning at Eagles Landing Parkway north to SR 42/138. The total mile for the widening project is 2.60 in length. This project is in the 13th Congressional district. Rock Quarry Road in Henry County is classified as an urban minor arterial. It is a two lane north-south facility that connects motorists from SR 42 to Eagles Landing Parkway. Rock Quarry Road has intermittent turn lanes at various locations and has no continuous linear sidewalks. There are many commercial and industrial businesses along the proposed project segment, as well as residential housing. This project is currently identified in the Atlanta Regional Commission's (ARC) Regional Transportation Plan (RTP), Plan 2040, and is included in the Transportation Improvement Program (TIP). This project is located within the Atlanta MPO boundary and is listed in the TIP as HE-161A.



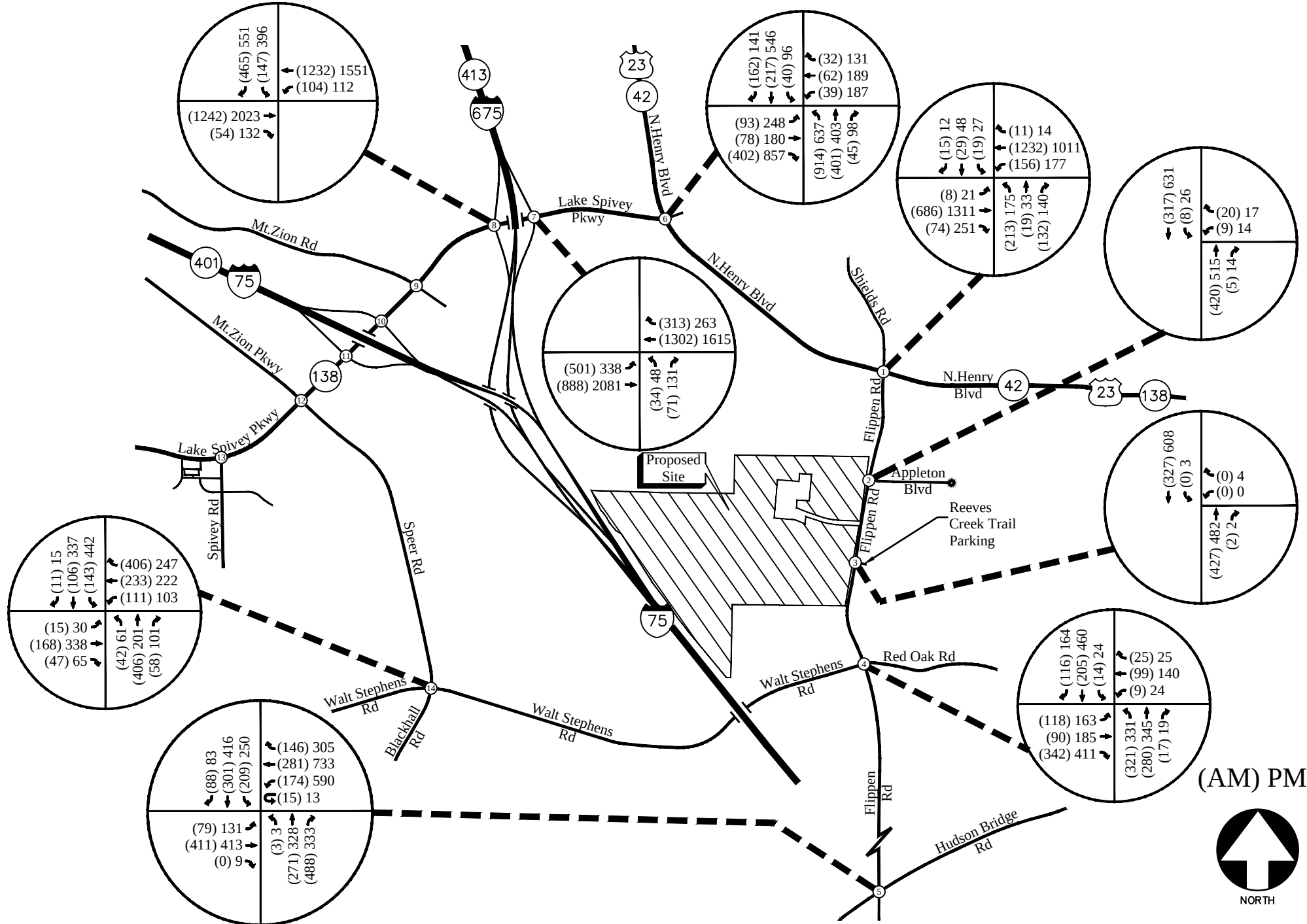
Since the Reeves Creek II project is projected to be completed in 2027 and the programmed projects will be completed after 2027, the programmed projects were not considered in the traffic analysis.

Nearby Planned Developments

The City of Stockbridge informed that they recently approved one residential development in the southwest corner of SR 138 and Spivey Road and one mixed-use development to the north of SR 138. Based on the site plans provided to us by the city, we have estimated trip generation and distributed based on the location of driveways and surrounding roadway network for the 7% rule calculations.

However, since we do not have the traffic studies or full details of those projects, in our DRI Traffic Study, we increased the background traffic growth percentage to 4% at the intersections of SR 138 at Spivey Road, Speer Road/Mt. Zion Parkway and I-75 northbound and southbound ramps. This increase in background growth traffic from 1% to 4% will account for the increased traffic from those two projects.

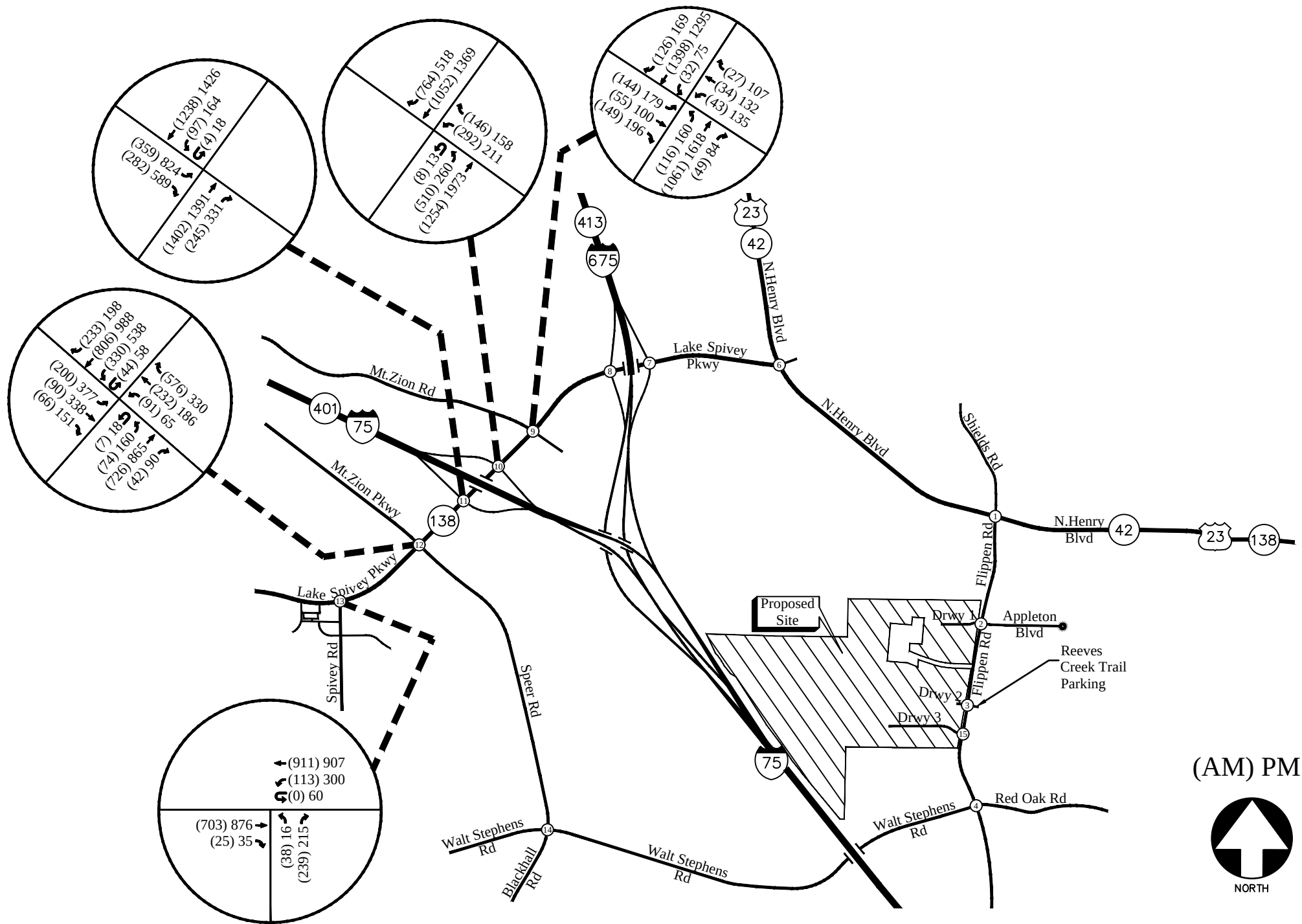
The resulting Future “No-Build” volumes on the roadway are shown in Figures 6A and 6B.



FUTURE (NO-BUILD) WEEKDAY PEAK HOUR VOLUMES - 1 OF 2

FIGURE 6A

A&R Engineering Inc.



FUTURE (NO-BUILD) WEEKDAY PEAK HOUR VOLUMES - 2 OF 2

FIGURE 6B

A&R Engineering Inc.

Future “No-Build” Traffic Operations

The future “No-Build” traffic operations were analyzed using the volumes in Figures 6A and 6B, and the results are shown in Table 6.

TABLE 6 — FUTURE “NO-BUILD” INTERSECTION OPERATIONS					
Intersection		LOS (Delay)			
		NO IMPROVEMENTS		SYSTEM IMPROVEMENTS	
		AM Peak	PM Peak	AM Peak	PM Peak
1	<u>Flippen Road / Shields Road @ SR 42 (North Henry Boulevard)</u>	<u>C (29.4)</u>	<u>C (29.3)</u>	<u>B (19.1)</u>	<u>C (24.3)</u>
	-Eastbound Approach	B (18.9)	C (24.5)	B (14.2)	C (26.8)
	-Westbound Approach	C (20.1)	B (16.0)	B (14.7)	B (15.9)
	-Northbound Approach	F (86.7)	F (84.9)	D (41.0)	D (36.1)
	-Southbound Approach	C (34.4)	E (78.5)	D (47.9)	D (47.5)
2	<u>Flippen Road @ Appleton Boulevard</u>				
	-Westbound Approach	B (12.8)	C (18.7)	-	-
	-Southbound Left	A (8.3)	A (8.6)		
3	<u>Flippen Road @ Reeves Creek Trail Parking Lot</u>				
	-Westbound Approach	A (0.0)	B (11.4)	-	-
	-Southbound Left	A (0.0)	A (8.4)		
4	<u>Flippen Road @ Walt Stephens Road / Red Oak Road</u>	<u>C (20.2)</u>	<u>C (26.5)</u>		
	-Eastbound Approach	D (37.4)	D (38.0)		
	-Westbound Approach	D (49.9)	D (47.6)	-	-
	-Northbound Approach	A (10.0)	B (16.7)		
	-Southbound Approach	B (14.6)	C (24.0)		
5	<u>Flippen Road @ Hudson Bridge Road</u>	<u>C (32.7)</u>	<u>D (44.7)</u>		
	-Eastbound Approach	C (32.7)	D (42.0)		
	-Westbound Approach	C (26.2)	D (45.3)	-	-
	-Northbound Approach	D (48.9)	D (54.5)		
	-Southbound Approach	B (17.2)	D (36.9)		
6	<u>SR 42/SR 138 (N Henry Blvd) @ SR 138 (Lake Spivey Parkway)</u>	<u>D (46.6)</u>	<u>E (57.5)</u>	<u>D (47.2)</u>	<u>D (52.6)</u>
	-Eastbound Approach	D (41.5)	D (52.7)	E (65.4)	E (57.1)
	-Westbound Approach	E (77.3)	E (78.4)	E (74.6)	E (65.7)
	-Northbound Approach	D (47.6)	E (58.3)	D (45.0)	D (52.8)
	-Southbound Approach	D (40.9)	D (53.4)	D (35.7)	D (41.7)
7	<u>SR 138 (Lake Spivey Parkway) @ I-675 Northbound Ramps</u>	<u>C (25.2)</u>	<u>B (10.7)</u>		
	-Eastbound Approach	C (31.8)	A (4.6)		
	-Westbound Approach	B (16.0)	B (15.5)	-	-
	-Northbound Approach	D (51.5)	D (49.1)		
8	<u>SR 138 (Lake Spivey Parkway) @ I-675 Southbound Ramps</u>	<u>B (18.6)</u>	<u>A (4.8)</u>		
	-Eastbound Approach	C (24.3)	A (0.8)		
	-Westbound Approach	A (9.9)	A (0.6)	-	-
	-Southbound Approach	D (48.6)	D (44.3)		
9	<u>SR 138 (Lake Spivey Parkway) @ Mount Zion Road</u>	<u>A (7.8)</u>	<u>C (31.5)</u>		
	-Eastbound Approach	A (1.5)	B (19.8)		
	-Westbound Approach	A (1.8)	D (40.7)	-	-
	-Northbound Approach	D (46.5)	D (40.6)		
	-Southbound Approach	D (43.9)	D (38.3)		

10	<u>SR 138 (Lake Spivey Parkway) @ I-75 Northbound Ramps</u>	<u>B (16.5)</u>	<u>A (9.9)</u>		
	-Eastbound Approach	B (18.2)	A (8.7)	-	-
	-Westbound Approach	A (3.3)	A (5.7)		
	-Northbound Approach	D (53.5)	D (49.6)		
11	<u>SR 138 (Lake Spivey Parkway) @ I-75 Southbound Ramps</u>	<u>B (13.0)</u>	<u>C (31.3)</u>		
	-Eastbound Approach	B (11.8)	C (25.3)	-	-
	-Westbound Approach	A (5.6)	C (31.3)		
	-Southbound Approach	D (45.0)	D (41.6)		
12	<u>SR 138 (Lake Spivey Pkwy) @ Speer Road/Mt Zion Parkway</u>	<u>E (58.4)</u>	<u>E (55.2)</u>	<u>C (33.1)</u>	<u>D (39.7)</u>
	-Eastbound Approach	E (57.2)	E (55.2)	C (22.0)	D (33.6)
	-Westbound Approach	D (51.0)	D (48.7)	C (29.0)	D (35.4)
	-Northbound Approach	E (71.8)	E (75.1)	E (57.1)	E (57.8)
	-Southbound Approach	E (56.7)	E (55.2)	D (54.0)	E (51.2)
13	<u>SR 138 (Lake Spivey Parkway) @ Spivey Road</u>	<u>A (4.0)</u>	<u>A (4.2)</u>		
	-Eastbound Approach	A (4.4)	A (5.4)	-	-
	-Westbound Approach	A (1.9)	A (2.7)		
	-Northbound Approach	D (53.8)	D (54.9)		
14	<u>Walt Stephens Road @ Blackhall Road / Speer Road</u>	<u>C (26.5)</u>	<u>C (28.2)</u>		
	-Eastbound Approach	B (15.4)	B (18.8)	-	-
	-Westbound Approach	B (20.0)	B (19.5)		
	-Northbound Approach	D (42.7)	D (47.5)		
	-Southbound Approach	C (27.5)	C (33.3)		

The results of future “No-Build” traffic operations show that one or more approaches at these intersections do not meet the LOS standard:

1. Flippen Road / Shields Road @ SR 42/SR 138/US 23 (North Henry Boulevard)
6. SR 42/SR 138/US 23 (North Henry Boulevard) @ SR 138 (Lake Spivey Parkway)
12. SR 138 (Lake Spivey Pkwy) @ Speer Road/Mt Zion Parkway

Recommended System Improvements

System improvements address deficiencies that are found within the existing road network for the “No-Build” conditions. These are recommended for the local municipality to use in planning future transportation projects. The following are system improvements that were identified from the “No-Build” condition analysis.

Intersection 1. Flippen Road / Shields Road @ SR 42/SR 138/US 23 (North Henry Boulevard)

- Reconfigure the northbound approach on Flippen Road to consist of a separate left turn lane and a shared through/right-turn lane.
- Provide a ‘Protected-Permissive’ phase for northbound left-turn lane.

Intersection 6. SR 42/SR 138/US 23 (North Henry Boulevard) @ SR 138 (Lake Spivey Parkway)

- Reconfigure the eastbound approach on SR 138 (Lake Spivey Parkway) to consist of one left turn lane, one through lane and one right turn lane.
- Construct a channelized island for the eastbound right turn lane and provide a ‘protected overlap’ phase.

- Change the split phasing for eastbound and westbound approaches to ‘protected-permissive’ phasing for the eastbound and westbound left turn movements.

Intersection 12. SR 138 (Lake Spivey Parkway) @ Speer Road / Mount Zion Parkway

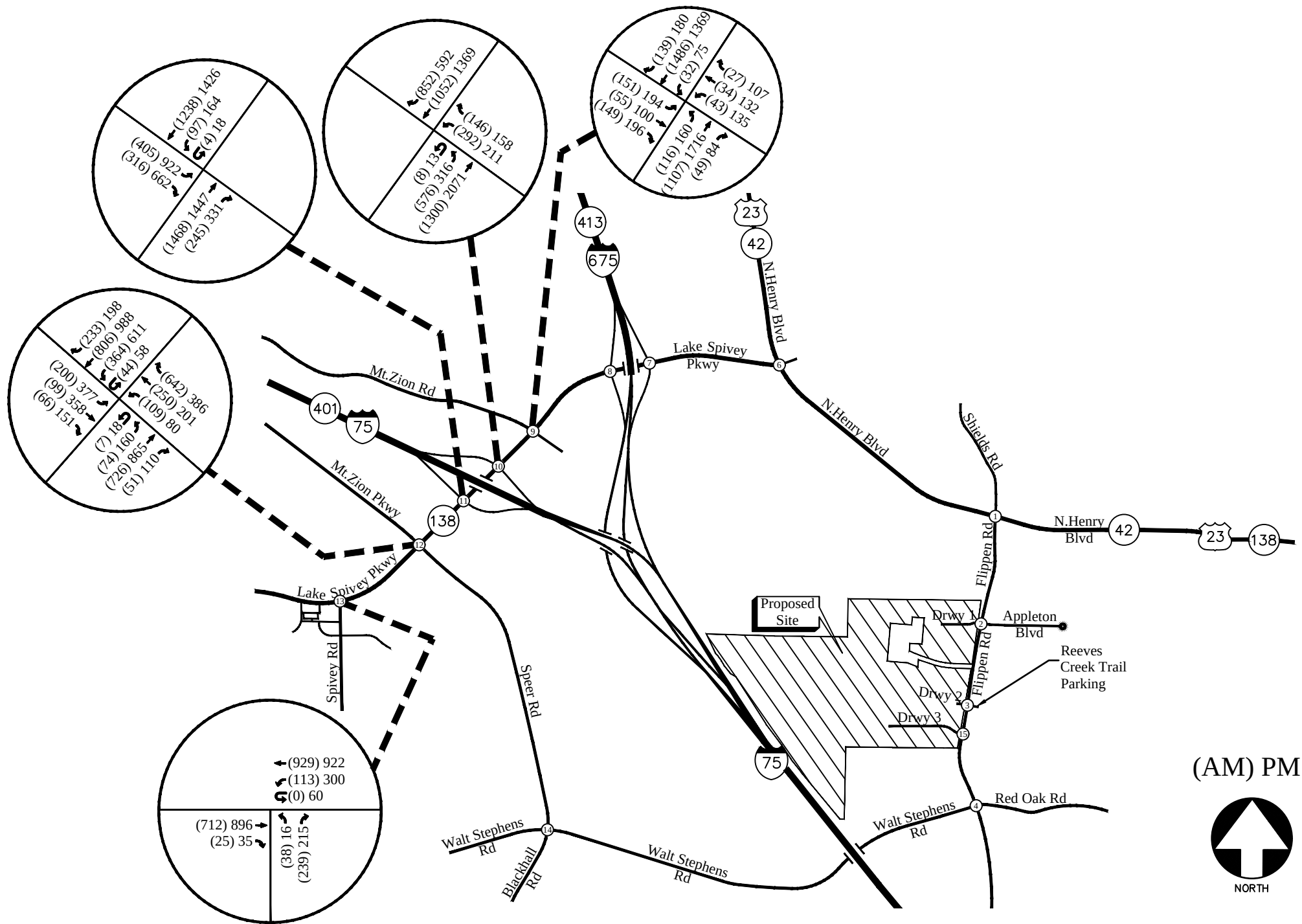
- Convert the northbound right-turn movement from Speer Road onto SR 138 (Lake Spivey Parkway) as a “free” movement by removing the existing striping on SR 138 (Lake Spivey Parkway) and using the existing asphalt as a third receiving lane. The third eastbound lane will become a right-turn lane at I-75 southbound ramp.

With the above improvements, intersection 1. Flippen Road / Shields Road @ SR 42/SR 138/US 23 (North Henry Boulevard) will operate at an overall LOS “C” in the AM and “D” in the PM peak hour.

The two intersections of 6. SR 42/SR 138/US 23 (North Henry Boulevard) @ SR 138 (Lake Spivey Parkway) and 12. SR 138 (Lake Spivey Parkway) @ Speer Road / Mount Zion Parkway will have an overall level-of-service “D” or better in both the AM and PM peak hours. However, some approaches at these intersections will operate at level-of-service “E”. Given the lane geometries, traffic volumes at the intersections, and the available right-of-way, no further improvements are feasible. Therefore, no other improvements are recommended at these intersections.

Future “Build” Conditions

The “Build” or development conditions include the estimated background traffic from the “No-Build” conditions plus the traffic from the proposed development. In order to evaluate future traffic operations in this area, the additional traffic volumes from the site (Figures 5A and 5B) were added to base traffic volumes (Figures 6A and 6B) to calculate the future traffic volumes after the construction of the development. These total future “Build” traffic volumes are shown in Figures 7A and 7B.



FUTURE (BUILD) WEEKDAY PEAK HOUR VOLUMES - 2 OF 2

FIGURE 7B

A&R Engineering Inc.

Auxiliary Lane Analysis

Included below are analyses for left-turn lanes and deceleration lanes for all site driveways per GDOT standards. The analyses below are based off the trip distribution included in the “Trip Distribution” section. According to the trip distribution, the total 24-hour two-way volume entering and exiting the site is 9,778 vehicles.

Left Turn Lane Analysis

For two lane roadways with AADT’s greater than 6,000 vehicles and a posted speed limit of 45 mph, the daily site generated traffic left-turn movements threshold to warrant a left-turn lane is 175 left-turning vehicles a day. The projected left-turn volumes per day for each driveway is included in Table 7.

TABLE 7 – GDOT REQUIREMENTS FOR LEFT TURN LANES

Intersection	Left turn traffic (% total entering)	Left-turn Volume (vehicles/day)	Roadway Speed/ # lanes / ADT	GDOT Threshold (vehicles/ day)	Warrants met?
Flippen Road @ Site Driveway 1 (Northern)	10.45% (Northbound)	501 $(\text{total trips}) \div 2 \times 0.1045 =$ $(9,582^*) \div 2 \times 0.1045 = 501$	45 mph / 2-Lane / > 6,000	175	Yes
Flippen Road @ Site Driveway 2 (Middle)	2.75% (Northbound)	132 $(\text{total trips}) \div 2 \times 0.0275 =$ $(9,582^*) \div 2 \times 0.0275 = 132$	45 mph / 2-Lane / > 6,000	175	No
Flippen Road @ Site Driveway 3 (Southern)	41.8% (Northbound)	2,003 $(\text{total trips}) \div 2 \times 0.418 =$ $(9,582^*) \div 2 \times 0.418 = 2,003$	45 mph / 2-Lane / > 6,000	175	Yes

* Alternate mode reductions not included

Per GDOT standards, a left turn lane is not warranted at Site Driveway 2 (Middle, Retail) but is warranted at Site Driveway 1 (Northern) and Site Driveway 3 (Southern).

Deceleration Turn Lane Analysis

For two lane roadways with AADT's greater than 6,000 vehicles and a posted speed limit of 45 mph, the daily site generated traffic right-turn movements threshold to warrant a deceleration lane is 75 right turning vehicles a day. The projected right-turn volumes per day for each driveway is included in Table 8.

Intersection	Right-turn traffic (% total entering)	Right-turn Volume (vehicles/day)	Roadway Speed/ # lanes / ADT	GDOT Threshold (vehicles/day)	Warrants met?
Flippen Road @ Site Driveway 1 (Northern)	8.55% (Southbound)	410 $(\text{total trips}) \div 2 \times 0.0855 =$ $(9,582^*) \div 2 \times 0.0855 = 410$	45 mph / 2-Lane / > 6,000	75	Yes
Flippen Road @ Site Driveway 2 (Middle)	2.25% (Southbound)	108 $(\text{total trips}) \div 2 \times 0.0225 =$ $(9,582^*) \div 2 \times 0.0225 = 108$	45 mph / 2-Lane / > 6,000	75	Yes
Flippen Road @ Site Driveway 3 (Southern)	34.2% (Southbound)	1,639 $(\text{total trips}) \div 2 \times 0.342 =$ $(9,582^*) \div 2 \times 0.342 = 1,639$	45 mph / 2-Lane / > 6,000	75	Yes

* Alternate mode reductions not included

A deceleration lane is warranted at all the three proposed site driveways per GDOT standards.

Future “Build” Traffic Operations

The future “Build” traffic operations were analyzed using the volumes in Figures 7A and 7B, and the results are shown in Table 9.

TABLE 9 — FUTURE “BUILD” INTERSECTION OPERATIONS					
Intersection		LOS (Delay)			
		NO IMPROVEMENTS		WITH SYSTEM & SITE IMPROVEMENTS	
				AM Peak	PM Peak
1	<u>Flippen Road/Shields Road @ SR 42 (N Henry Blvd)</u>	<u>E (68.3)</u>	<u>E (69.6)</u>	<u>C (24.9)</u>	<u>D (41.7)</u>
	-Eastbound Approach	D (47.3)	D (51.8)	C (21.7)	D (54.6)
	-Westbound Approach	D (53.3)	C (20.6)	B (15.7)	B (19.2)
	-Northbound Approach	F (143.5)	F (251.9)	D (50.2)	D (50.0)
	-Southbound Approach	C (27.2)	D (47.6)	D (47.9)	D (47.7)
2	<u>Flippen Road @ Appleton Boulevard / Site Driveway 1 (N)</u>				
	-Eastbound Approach	C (22.6)	F (69.1)	C (22.6)	F (69.1)
	-Westbound Approach	C (18.8)	F (56.1)	C (18.8)	F (56.1)
	-Northbound Left	A (8.3)	B (10.2)	A (8.3)	B (10.2)
	-Southbound Left	A (8.7)	A (9.0)	A (8.7)	A (9.0)
3	<u>Flippen Road @ Reeves Creek Trail Site Drwy 2 (Retail)</u>				
	-Eastbound Approach	C (19.0)	E (36.0)	C (19.0)	E (36.0)
	-Westbound Approach	C (23.8)	C (22.6)	C (23.8)	C (22.6)
	-Northbound Left	A (8.4)	A (9.6)	A (8.4)	A (9.6)
	-Southbound Left	A (0.0)	A (9.1)	A (0.0)	A (9.1)
4	<u>Flippen Road @ Walt Stephens Road / Red Oak Road</u>	<u>C (22.8)</u>	<u>D (41.1)</u>	<u>C (22.8)</u>	<u>D (41.1)</u>
	-Eastbound Approach	D (40.3)	D (43.9)	D (40.3)	D (43.9)
	-Westbound Approach	D (49.6)	D (46.9)	D (49.6)	D (46.9)
	-Northbound Approach	B (12.5)	D (38.8)	B (12.5)	D (38.8)
	-Southbound Approach	B (17.5)	D (39.9)	B (17.5)	D (39.9)
5	<u>Flippen Road @ Hudson Bridge Road</u>	<u>C (34.8)</u>	<u>D (49.5)</u>	<u>C (34.8)</u>	<u>D (49.5)</u>
	-Eastbound Approach	C (34.5)	D (43.2)	C (34.5)	D (43.2)
	-Westbound Approach	C (27.7)	D (48.5)	C (27.7)	D (48.5)
	-Northbound Approach	D (54.1)	D (54.2)	D (54.1)	D (54.2)
	-Southbound Approach	B (18.0)	D (51.5)	B (18.0)	D (51.5)
6	<u>SR 42/SR 138 (N Henry Blvd) @ SR 138 (Lake Spivey Pkwy)</u>	<u>D (48.3)</u>	<u>E (62.0)</u>	<u>D (47.7)</u>	<u>D (54.0)</u>
	-Eastbound Approach	D (36.2)	D (53.4)	E (65.4)	E (59.4)
	-Westbound Approach	E (77.3)	E (78.1)	E (74.8)	E (68.2)
	-Northbound Approach	D (52.2)	E (71.6)	D (45.3)	D (53.7)
	-Southbound Approach	D (45.0)	D (54.6)	D (38.9)	D (42.9)
7	<u>SR 138 (Lake Spivey Parkway) @ I-675 Northbound Ramps</u>	<u>B (28.8)</u>	<u>B (11.3)</u>	<u>C (28.9)</u>	<u>B (11.6)</u>
	-Eastbound Approach	D (38.3)	A (5.9)	D (38.3)	A (5.9)
	-Westbound Approach	B (17.1)	B (15.9)	B (17.5)	B (16.3)
	-Northbound Approach	D (51.5)	D (49.1)	D (51.5)	D (49.1)
8	<u>SR 138 (Lake Spivey Parkway) @ I-675 Southbound Ramps</u>	<u>B (19.7)</u>	<u>A (7.4)</u>	<u>B (19.7)</u>	<u>A (7.4)</u>
	-Eastbound Approach	C (25.5)	A (5.3)	C (25.5)	A (5.3)
	-Westbound Approach	B (10.9)	A (0.9)	B (10.9)	A (0.9)
	-Southbound Approach	D (48.1)	D (43.5)	D (48.1)	D (43.5)
Continued on Page 2.					

9	<u>SR 138 (Lake Spivey Parkway) @ Mount Zion Road</u>	<u>A (7.8)</u>	<u>D (39.8)</u>	<u>A (7.8)</u>	<u>D (39.8)</u>
	-Eastbound Approach	A (1.6)	D (37.0)	A (1.6)	D (37.0)
	-Westbound Approach	A (2.1)	D (42.8)	A (2.1)	D (42.8)
	-Northbound Approach	D (46.7)	D (40.6)	D (46.7)	D (40.6)
10	<u>SR 138 (Lake Spivey Parkway) @ I-75 Northbound Ramps</u>	<u>C (23.7)</u>	<u>B (14.7)</u>	<u>C (23.7)</u>	<u>B (14.2)</u>
	-Eastbound Approach	C (26.4)	B (11.6)	C (26.4)	B (10.8)
	-Westbound Approach	B (10.6)	B (14.7)	B (10.6)	B (14.7)
	-Northbound Approach	D (53.5)	D (49.6)	D (53.5)	D (49.6)
11	<u>SR 138 (Lake Spivey Parkway) @ I-75 Southbound Ramps</u>	<u>B (14.2)</u>	<u>C (33.6)</u>	<u>B (14.7)</u>	<u>C (33.0)</u>
	-Eastbound Approach	B (12.8)	C (28.2)	B (14.0)	C (26.7)
	-Westbound Approach	A (6.4)	C (32.9)	A (6.4)	C (33.0)
	-Southbound Approach	D (45.3)	D (43.4)	D (45.3)	D (42.6)
12	<u>SR 138 (Lake Spivey Pkwy) @ Speer Road / Mt Zion Pkwy</u>	<u>E (63.4)</u>	<u>E (60.7)</u>	<u>D (44.1)</u>	<u>D (47.0)</u>
	-Eastbound Approach	E (60.1)	E (62.0)	C (21.3)	D (33.5)
	-Westbound Approach	E (58.0)	D (54.9)	D (52.0)	D (50.2)
	-Northbound Approach	E (77.1)	E (71.2)	E (56.8)	E (57.9)
13	<u>SR 138 (Lake Spivey Parkway) @ Spivey Road</u>	<u>A (4.0)</u>	<u>A (4.3)</u>	<u>A (4.1)</u>	<u>A (4.2)</u>
	-Eastbound Approach	A (4.5)	A (5.5)	A (4.5)	A (5.5)
	-Westbound Approach	A (1.9)	A (2.8)	A (2.0)	A (2.6)
	-Northbound Approach	D (53.8)	D (54.9)	D (53.8)	D (54.9)
14	<u>Walt Stephens Road @ Blackhall Road / Speer Road</u>	<u>C (29.4)</u>	<u>C (32.1)</u>	<u>C (29.4)</u>	<u>C (32.1)</u>
	-Eastbound Approach	B (16.3)	C (22.9)	B (16.3)	C (22.9)
	-Westbound Approach	C (24.7)	C (25.1)	C (24.7)	C (25.1)
	-Northbound Approach	D (42.7)	D (47.5)	D (42.7)	D (47.5)
15	<u>Flippen Road @ Site Driveway 3 (Southern)</u>			<u>B (15.8)</u>	<u>B (14.2)</u>
	-Eastbound Approach	E (35.9)	F (231.0)	D (46.2)	D (49.3)
	-Northbound Left/Approach	A (8.8)	B (11.2)	A (5.1)	A (5.8)
	-Southbound Approach	-	-	A (8.6)	B (10.7)

The results of future “Build” traffic operations show that one or more intersections/approaches at these intersections will not meet the LOS standard:

1. Flippen Road / Shields Road @ SR 42/SR 138/US 23 (North Henry Boulevard)
2. Flippen Road @ Appleton Boulevard / Site Driveway 1 (Northern)
3. Flippen Road @ Reeves Creek Trail Parking Lot / Site Driveway 2 (Middle, Retail)
6. SR 42/SR 138/US 23 (North Henry Boulevard) @ SR 138 (Lake Spivey Parkway)
12. SR 138 (Lake Spivey Parkway) @ Speer Road / Mount Zion Parkway
15. Flippen Road @ Site Driveway 3 (Southern)

Recommended Site Mitigation Improvements

Site mitigation improvements address deficiencies that are caused by site traffic and can be identified as related to the proposed development. The following site improvements were identified in addition to the system improvements discussed in the “Recommended System Improvements” section.

Intersection 15. Flippen Road @ Site Driveway 3 (Southern)

- Install a traffic signal.
- Provide ‘protected-permissive’ phasing for northbound left turn movements on Flippen Road.
- Provide crosswalks on all approaches and other pedestrian facilities at the intersection.
- Provide a sidewalk along the site frontage to gain access to the Reeves Creek Trail.

The future intersection volumes satisfy the threshold for installation of a traffic signal during the AM and PM peak hours. After installation of a signal, the intersection will operate at an overall level-of-service “B” in both the AM and PM peak hours.

The results of future “Build with System & Site Improvements” conditions show one or more approaches of the following intersections will not meet the LOS Standard:

2. Flippen Road @ Appleton Boulevard / Site Driveway 1 (Northern)
3. Flippen Road @ Reeves Creek Trail Parking Lot / Site Driveway 2 (Middle, Retail)
6. SR 42/SR 138/US 23 (North Henry Boulevard) @ SR 138 (Lake Spivey Parkway)
12. SR 138 (Lake Spivey Parkway) @ Speer Road / Mount Zion Parkway

Details of the intersections not meeting the LOS standards are given below:

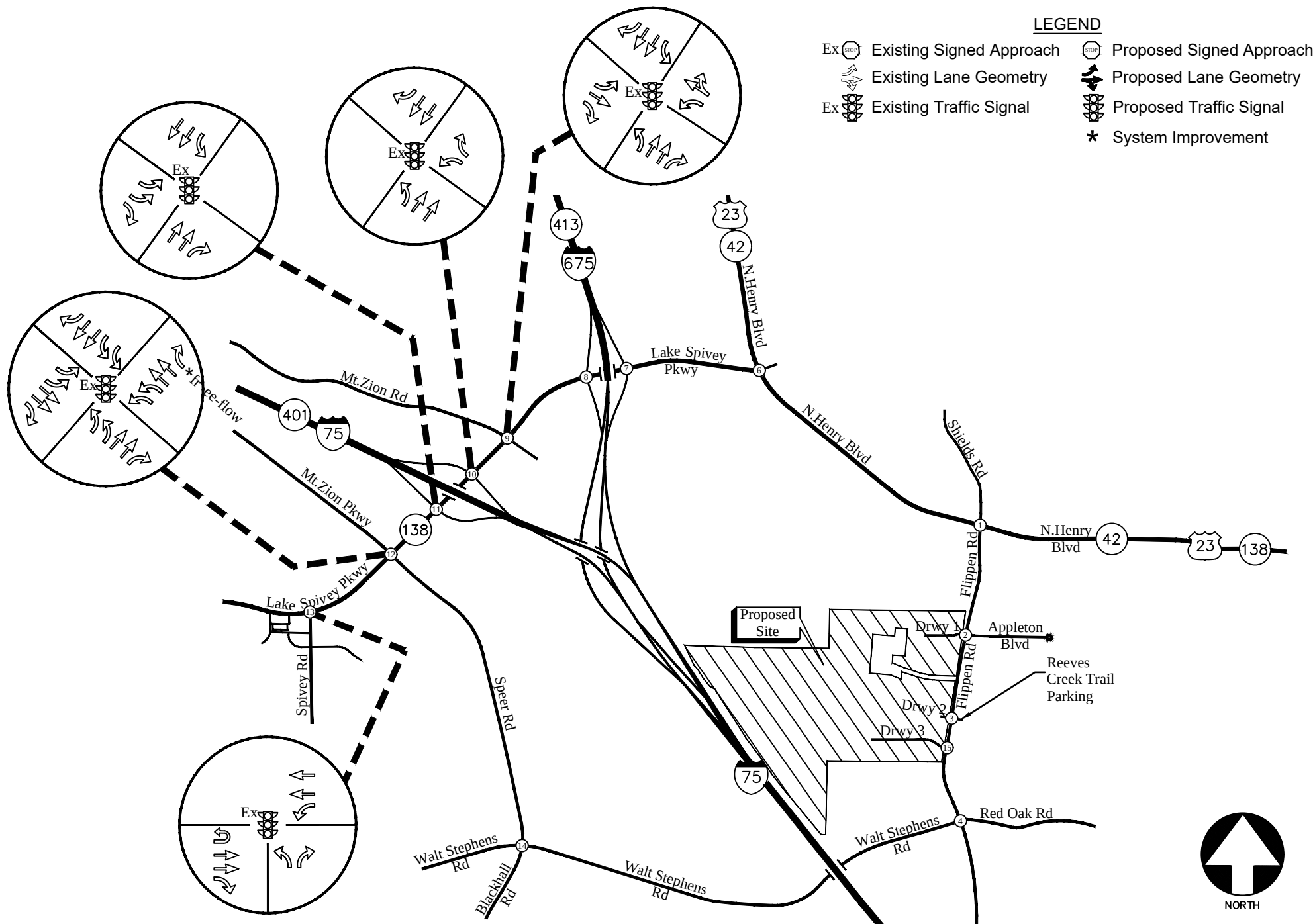
Intersection 2 & 3 – Stop-Controlled Northern Site Driveways on Flippen Road:

At the two northern site driveway intersections on Flippen Road (intersections # 2 & 3), the stop-controlled minor street approaches will operate at LOS “E” or “F” in the AM and/or PM peak hour. It is not uncommon for stop-controlled side-streets on arterial roadways to experience delays during peak hours as delays are caused by side-street wait times to turn left onto the mainline. Since the intersections do not warrant construction of a signal to improve side-street delays, no improvements are recommended for these driveway intersections outside of the recommended site access configuration.

Intersection 6 & 12 – SR 42/SR 138/US 23 (North Henry Boulevard) @ SR 138 (Lake Spivey Parkway) and SR 138 (Lake Spivey Parkway) @ Speer Road / Mount Zion Parkway:

These intersections will have an overall level-of-service “D” or better in both the AM and PM peak hours. However, some approaches at these intersections will operate at level-of-service “E”. Given the lane geometry, traffic volumes at the intersections, and the available right-of-way, no further improvements are feasible. Therefore, no other improvements are recommended at these intersections.

Recommendations for future traffic control and lane geometry are shown in Figures 8A and 8B.



CONCLUSIONS AND RECOMMENDATIONS

Traffic impacts were evaluated for the proposed Reeves Creek II mixed-use development located at 630 Flippen Road in the City of Stockbridge, Henry County, Georgia. The development proposes three full access driveways on Flippen Road, and one full access driveway stubbed for future connection to Davidson Parkway in the north.

The AM and PM peak hours have been analyzed in this study. This study included the evaluation of traffic operations at the intersections of:

1. Flippen Road / Shields Road @ SR 42/SR 138/US 23 (North Henry Boulevard)
2. Flippen Road @ Appleton Boulevard / Site Driveway 1
3. Flippen Road @ Reeves Creek Trail Parking Lot / Site Driveway 2
4. Flippen Road @ Walt Stephens Road / Red Oak Road
5. Flippen Road @ Hudson Bridge Road
6. SR 42/SR 138/US 23 (North Henry Boulevard) @ SR 138 (Lake Spivey Parkway)
7. SR 138 (Lake Spivey Parkway) @ I-675 Northbound Ramps
8. SR 138 (Lake Spivey Parkway) @ I-675 Southbound Ramps
9. SR 138 (Lake Spivey Parkway) @ Mount Zion Road
10. SR 138 (Lake Spivey Parkway) @ I-75 Northbound Ramps
11. SR 138 (Lake Spivey Parkway) @ I-75 Southbound Ramps
12. SR 138 (Lake Spivey Parkway) @ Speer Road / Mount Zion Parkway
13. SR 138 (Lake Spivey Parkway) @ Spivey Road
14. Walt Stephens Road @ Blackhall Road / Speer Road
15. Flippen Road @ Site Driveway 3

The analysis included the evaluation of Future operations for “No-Build” and “Build” conditions, both of which account for increases in annual growth of through traffic. The results of future traffic operations show that the following intersections will have LOS “E” or “F” for one or more approaches:

1. Flippen Road / Shields Road @ SR 42/SR 138/US 23 (North Henry Boulevard)
2. Flippen Road @ Appleton Boulevard / Site Driveway 1 (Northern)
3. Flippen Road @ Reeves Creek Trail Parking Lot / Site Driveway 2 (Middle, Retail)
6. SR 42/SR 138/US 23 (North Henry Boulevard) @ SR 138 (Lake Spivey Parkway)
12. SR 138 (Lake Spivey Parkway) @ Speer Road / Mount Zion Parkway
15. Flippen Road @ Site Driveway 3 (Southern)

Recommended System Improvements

System improvements address deficiencies that are found within the existing road network for the “No-Build” conditions. These are recommended for the local municipality to use in planning future transportation projects. The following are system improvements that were identified from the “No-Build” condition analysis.

Intersection 1. Flippen Road / Shields Road @ SR 42/SR 138/US 23 (North Henry Boulevard)

- Reconfigure the northbound approach on Flippen Road to consist of a separate left turn lane and a shared through/right-turn lane.
- Provide a ‘Protected-Permissive’ phase for northbound left-turn lane.

Intersection 6. SR 42/SR 138/US 23 (North Henry Boulevard) @ SR 138 (Lake Spivey Parkway)

- Reconfigure the eastbound approach on SR 138 (Lake Spivey Parkway) to consist of one left turn lane, one through lane and one right turn lane.
- Construct a channelized island for the eastbound right turn lane and provide a ‘protected overlap’ phase.
- Change the split phasing for eastbound and westbound approaches to ‘protected-permissive’ phasing for the eastbound and westbound left turn movements.

Intersection 12. SR 138 (Lake Spivey Parkway) @ Speer Road / Mount Zion Parkway

- Convert the northbound right-turn movement from Speer Road onto SR 138 (Lake Spivey Parkway) as a “free” movement by removing the existing striping on SR 138 (Lake Spivey Parkway) and using the existing asphalt as a third receiving lane. The third eastbound lane will become a right-turn lane at I-75 southbound ramp.

With the above improvements, intersection 1. Flippen Road / Shields Road @ SR 42/SR 138/US 23 (North Henry Boulevard) will operate at an overall LOS “C” in the AM and “D” in the PM peak hour.

The two intersections of 6. SR 42/SR 138/US 23 (North Henry Boulevard) @ SR 138 (Lake Spivey Parkway) and 12. SR 138 (Lake Spivey Parkway) @ Speer Road / Mount Zion Parkway will have an overall level-of-service “D” or better in both the AM and PM peak hours. However, some approaches at these intersections will operate at level-of-service “E”. Given the lane geometry, traffic volumes at the intersections, and the available right-of-way, no further improvements are feasible. Therefore, no other improvements are recommended at these intersections.

Recommended Site Mitigation Improvements

Site mitigation improvements address deficiencies that are caused by site traffic and can be identified as related to the proposed development. The following site improvements were identified in addition to the system improvements discussed in the “Recommended System Improvements” section.

Intersection 15. Flippen Road @ Site Driveway 3 (Southern)

- Install a traffic signal.
- Provide ‘protected-permissive’ phasing for northbound left turn movements on Flippen Road.
- Provide crosswalks on all approaches and other pedestrian facilities at the intersection.
- Provide a sidewalk along the site frontage to gain access to the Reeves Creek Trail.

The future intersection volumes satisfy the threshold for installation of a traffic signal during the AM and PM peak hours. After installation of a signal, the intersection will operate at an overall level-of-service “B” in both the AM and PM peak hours.

The results of future “Build with System & Site Improvements” conditions show one or more approaches of the following intersections will not meet the LOS Standard:

4. Flippen Road @ Appleton Boulevard / Site Driveway 1 (Northern)
5. Flippen Road @ Reeves Creek Trail Parking Lot / Site Driveway 2 (Middle, Retail)
6. SR 42/SR 138/US 23 (North Henry Boulevard) @ SR 138 (Lake Spivey Parkway)
13. SR 138 (Lake Spivey Parkway) @ Speer Road / Mount Zion Parkway

Details of the intersections not meeting the LOS standards are given below:

Intersection 2 & 3 – Stop-Controlled Northern Site Driveways on Flippen Road:

At the two northern site driveway intersections on Flippen Road (intersections # 2 & 3), the stop-controlled minor street approaches will operate at LOS “E” or “F” in the AM and/or PM peak hour. It is not uncommon for stop-controlled side-streets on arterial roadways to experience delays during peak hours as delays are caused by side-street wait times to turn left onto the mainline. Since the intersections do not warrant construction of a signal to improve side-street delays, no improvements are recommended for these driveway intersections outside of the recommended site access configuration.

Intersection 6 & 12 – SR 42/SR 138/US 23 (North Henry Boulevard) @ SR 138 (Lake Spivey Parkway) and SR 138 (Lake Spivey Parkway) @ Speer Road / Mount Zion Parkway:

These intersections will have an overall level-of-service “D” or better in both the AM and PM peak hours. However, some approaches at these intersections will operate at level-of-service “E”. Given the lane geometries and the volumes at the intersections, no further improvements are feasible. Therefore, no other improvements are recommended at these intersections.

Recommendation for Site Access Configuration

The following access configuration is recommended for the proposed site driveway intersections:

- Site Driveway 1: Full access (northern) driveway on Flippen Road, aligned with Appleton Boulevard
 - One entering and two (a shared through/left turn and a separate right turn) exiting lanes.
 - Stop-sign controlled on Appleton Boulevard and the driveway approaches with Flippen Road remaining free flow.
 - Left Turn and Right Turn Lanes on Flippen Road for entering traffic.
 - Provide adequate sight distance per AASHTO standards.
- Site Driveway 2: Full access (middle) driveway on Flippen Road, for retail, aligned with Reeves Creek Trail
 - One entering and one exiting lane.
 - Stop-sign controlled on Reeves Creek Trail and the site driveway approaches with Flippen Road remaining free flow.
 - Right Turn Lane on Flippen Road for entering traffic.
 - Provide adequate sight distance per AASHTO standards.
- Site Driveway 3: Full access (southern) driveway on Flippen Road, south of Site Driveway 2
 - One entering and two (separate left turn and right turn) exiting lanes.
 - Left Turn and Right Turn Lanes on Flippen Road for entering traffic.
 - Installation of a traffic signal with 'protected-permissive' phasing for northbound left turn movements from Flippen Road into the site.
 - Provide crosswalks on all approaches and pedestrian facilities to have access to the Reeves Creek Trail through the proposed sidewalk on Flippen Road.
 - Provide adequate sight distance per AASHTO standards.

Appendix

Existing Intersection Traffic Counts	
Character Areas.....	
GRTA Letter of Understanding.....	
Linear Regression of Daily Traffic.....	
Fact Sheets for Planned and Programmed Improvements.....	
Existing Intersection Analysis.....	
Future “No-Build” Intersection Analysis	
Future “No-Build” Intersection Analysis with Improvements	
Future “Build” Intersections Analysis	
Future “Build” Intersections Analysis with Improvements.....	
Traffic Volume Worksheets	

Existing Intersection Traffic Counts

A & R Engineering, Inc.

2160 Kingston Court Suite 'O'
Marietta, GA 30067

TMC DATA
Flippen Rd @ SR 42 (North Henry Blvd) -
Shields Rd
7-9 am | 4-6 pm

File Name : 20220513
Site Code : 20220513
Start Date : 12/7/2022
Page No : 1

Groups Printed- Cars,Buses & Trucks

	Flippen Rd Northbound				Shields Rd Southbound				SR 42 (North Henry Blvd) Eastbound				SR 42 (North Henry Blvd) Westbound				
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	33	4	27	64	12	5	5	22	0	145	14	159	30	240	7	277	522
07:15 AM	56	3	31	90	7	8	1	16	2	189	16	207	42	333	4	379	692
07:30 AM	60	2	35	97	3	4	5	12	2	139	20	161	35	314	2	351	621
07:45 AM	42	6	35	83	5	11	4	20	1	168	16	185	37	268	1	306	594
Total	191	15	128	334	27	28	15	70	5	641	66	712	144	1155	14	1313	2429
08:00 AM	45	7	25	77	3	5	4	12	3	157	18	178	35	258	3	296	563
08:15 AM	46	3	39	88	1	4	3	8	0	162	22	184	40	245	2	287	567
08:30 AM	32	2	37	71	8	3	4	15	2	171	21	194	33	255	1	289	569
08:45 AM	25	3	39	67	0	2	7	9	3	139	27	169	31	187	1	219	464
Total	148	15	140	303	12	14	18	44	8	629	88	725	139	945	7	1091	2163
*** BREAK ***																	
04:00 PM	35	7	33	75	3	12	5	20	2	297	60	359	38	233	4	275	729
04:15 PM	42	8	31	81	2	13	2	17	2	282	48	332	28	251	2	281	711
04:30 PM	34	3	29	66	6	7	1	14	8	313	69	390	38	264	2	304	774
04:45 PM	49	13	31	93	6	12	4	22	3	306	55	364	45	248	4	297	776
Total	160	31	124	315	17	44	12	73	15	1198	232	1445	149	996	12	1157	2990
05:00 PM	41	6	36	83	5	13	4	22	6	315	62	383	40	232	4	276	764
05:15 PM	43	9	37	89	9	14	2	25	3	315	53	371	46	219	3	268	753
05:30 PM	43	6	41	90	3	11	4	18	7	310	59	376	38	209	1	248	732
05:45 PM	48	10	35	93	4	9	6	19	1	304	62	367	39	208	1	248	727
Total	175	31	149	355	21	47	16	84	17	1244	236	1497	163	868	9	1040	2976
Grand Total	674	92	541	1307	77	133	61	271	45	3712	622	4379	595	3964	42	4601	10558
Apprch %	51.6	7	41.4		28.4	49.1	22.5		1	84.8	14.2		12.9	86.2	0.9		
Total %	6.4	0.9	5.1	12.4	0.7	1.3	0.6	2.6	0.4	35.2	5.9	41.5	5.6	37.5	0.4	43.6	

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TMC DATA

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Shields Rd
7-9 am | 4-6 pm

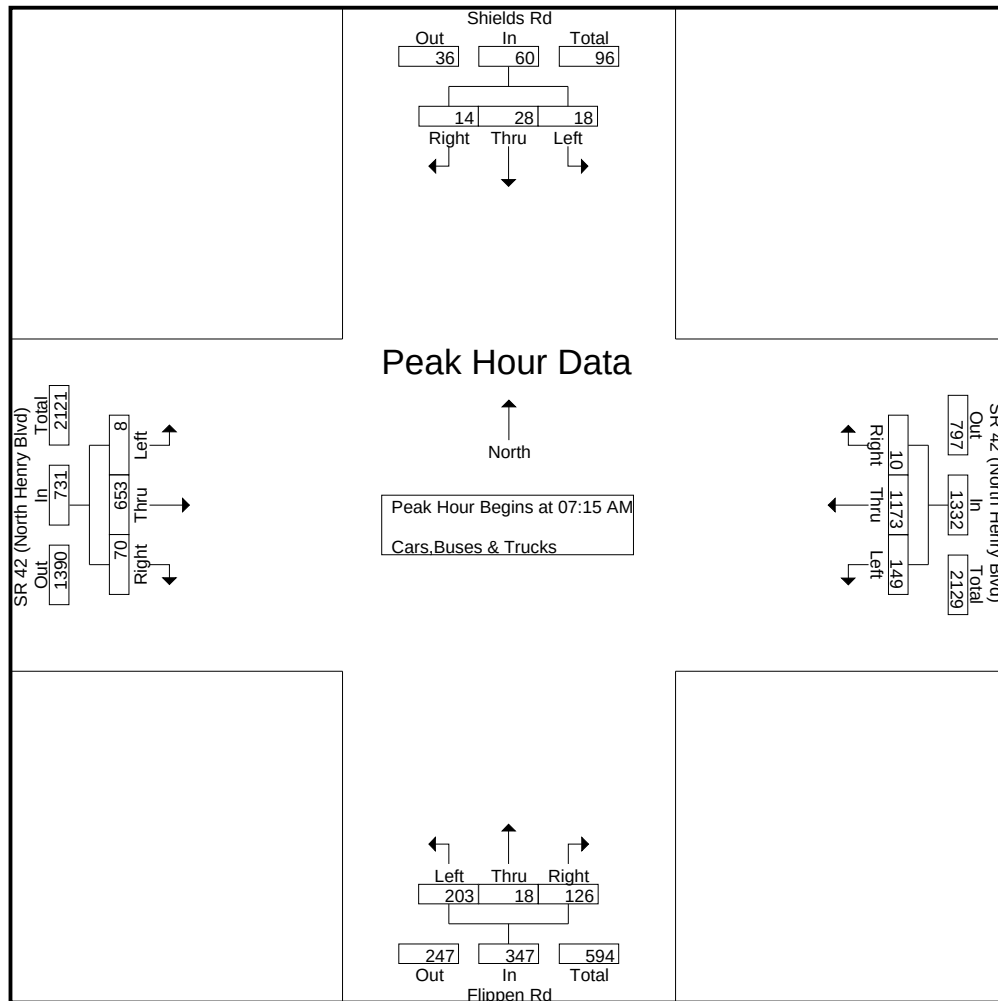
File Name : 20220513

Site Code : 20220513

Start Date : 12/7/2022

Page No : 2

	Flippen Rd Northbound				Shields Rd Southbound				SR 42 (North Henry Blvd) Eastbound				SR 42 (North Henry Blvd) Westbound				
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	56	3	31	90	7	8	1	16	2	189	16	207	42	333	4	379	692
07:30 AM	60	2	35	97	3	4	5	12	2	139	20	161	35	314	2	351	621
07:45 AM	42	6	35	83	5	11	4	20	1	168	16	185	37	268	1	306	594
08:00 AM	45	7	25	77	3	5	4	12	3	157	18	178	35	258	3	296	563
Total Volume	203	18	126	347	18	28	14	60	8	653	70	731	149	1173	10	1332	2470
% App. Total	58.5	5.2	36.3		30	46.7	23.3		1.1	89.3	9.6		11.2	88.1	0.8		
PHF	.846	.643	.900	.894	.643	.636	.700	.750	.667	.864	.875	.883	.887	.881	.625	.879	.892



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Shields Rd

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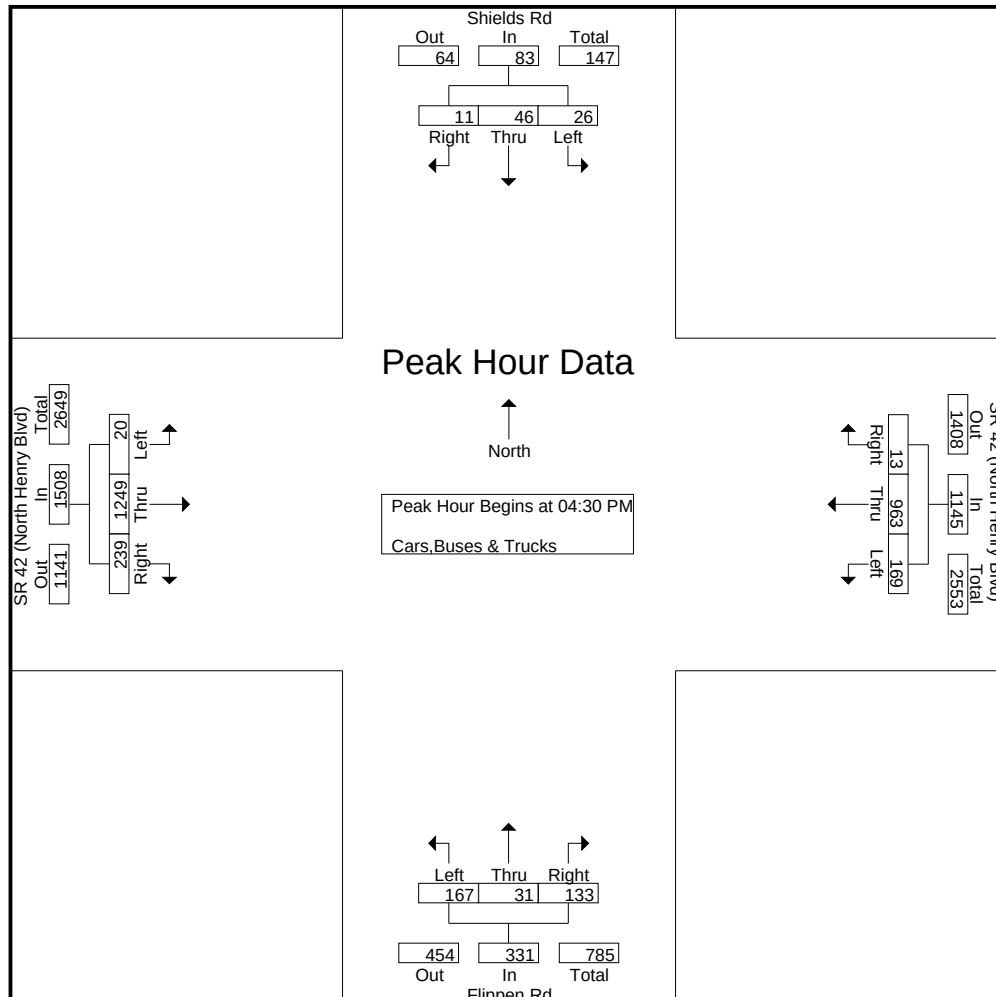
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	Flippen Rd Northbound				Shields Rd Southbound				SR 42 (North Henry Blvd) Eastbound				SR 42 (North Henry Blvd) Westbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	34	3	29	66	6	7	1	14	8	313	69	390	38	264	2	304	774
04:45 PM	49	13	31	93	6	12	4	22	3	306	55	364	45	248	4	297	776
05:00 PM	41	6	36	83	5	13	4	22	6	315	62	383	40	232	4	276	764
05:15 PM	43	9	37	89	9	14	2	25	3	315	53	371	46	219	3	268	753
Total Volume	167	31	133	331	26	46	11	83	20	1249	239	1508	169	963	13	1145	3067
% App. Total	50.5	9.4	40.2		31.3	55.4	13.3		1.3	82.8	15.8		14.8	84.1	1.1		
PHF	.852	.596	.899	.890	.722	.821	.688	.830	.625	.991	.866	.967	.918	.912	.813	.942	.988



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File Name : 20220511
Site Code : 20220511
Start Date : 12/7/2022
Page No : 1

Groups Printed- Cars,Buses & Trucks

	Flippen Rd Northbound				Flippen Rd Southbound				Eastbound				Appleton Blvd Westbound				
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	0	71	0	71	2	47	0	49	0	0	0	0	0	0	4	4	124
07:15 AM	0	89	1	90	3	55	0	58	0	0	0	0	3	0	7	10	158
07:30 AM	0	93	2	95	2	82	0	84	0	0	0	0	4	0	4	8	187
07:45 AM	0	115	2	117	3	68	0	71	0	0	0	0	3	0	7	10	198
Total	0	368	5	373	10	252	0	262	0	0	0	0	10	0	22	32	667
08:00 AM	0	100	0	100	2	77	0	79	0	0	0	0	1	0	6	7	186
08:15 AM	0	92	1	93	1	75	0	76	0	0	0	0	1	0	2	3	172
08:30 AM	0	99	2	101	1	73	0	74	0	0	0	0	1	0	2	3	178
08:45 AM	0	98	2	100	8	72	0	80	0	0	0	0	1	0	7	8	188
Total	0	389	5	394	12	297	0	309	0	0	0	0	4	0	17	21	724
*** BREAK ***																	
04:00 PM	0	101	3	104	9	114	0	123	0	0	0	0	3	0	1	4	231
04:15 PM	0	100	2	102	2	134	0	136	0	0	0	0	4	0	1	5	243
04:30 PM	0	123	3	126	3	124	0	127	0	0	0	0	2	0	4	6	259
04:45 PM	0	103	6	109	8	145	0	153	0	0	0	0	1	0	5	6	268
Total	0	427	14	441	22	517	0	539	0	0	0	0	10	0	11	21	1001
05:00 PM	0	113	4	117	9	161	0	170	0	0	0	0	0	0	4	4	291
05:15 PM	0	136	1	137	7	145	0	152	0	0	0	0	4	0	2	6	295
05:30 PM	0	114	3	117	5	160	0	165	0	0	0	0	4	0	5	9	291
05:45 PM	0	127	5	132	4	135	0	139	0	0	0	0	5	0	5	10	281
Total	0	490	13	503	25	601	0	626	0	0	0	0	13	0	16	29	1158
Grand Total	0	1674	37	1711	69	1667	0	1736	0	0	0	0	37	0	66	103	3550
Apprch %	0	97.8	2.2		4	96	0		0	0	0		35.9	0	64.1		
Total %	0	47.2	1	48.2	1.9	47	0	48.9	0	0	0	0	1	0	1.9	2.9	

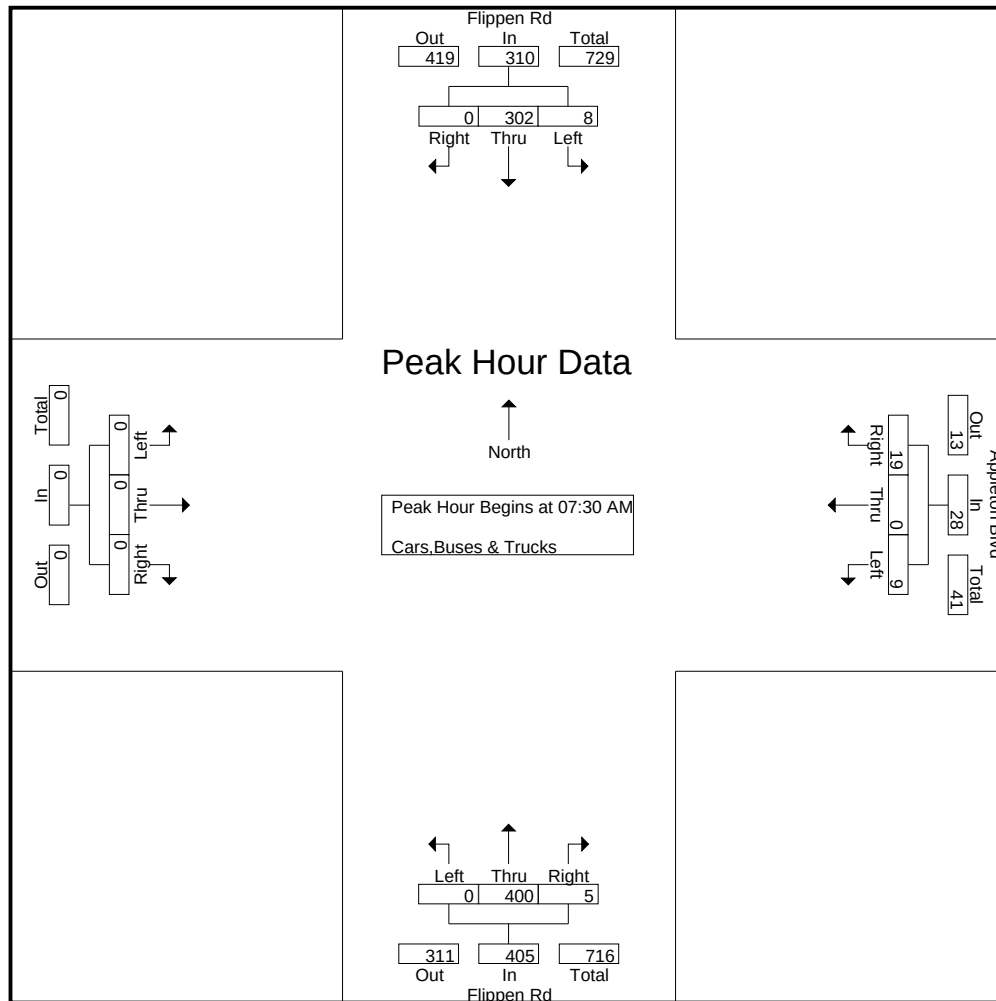
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7-9 am | 4-6 pm

File Name : 20220511
Site Code : 20220511
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Page No : 2

	Flippen Rd Northbound				Flippen Rd Southbound				Eastbound				Appleton Blvd Westbound				
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 07:30 AM																	
07:30 AM	0	93	2	95	2	82	0	84	0	0	0	0	4	0	4	8	187
07:45 AM	0	115	2	117	3	68	0	71	0	0	0	0	3	0	7	10	198
08:00 AM	0	100	0	100	2	77	0	79	0	0	0	0	1	0	6	7	186
08:15 AM	0	92	1	93	1	75	0	76	0	0	0	0	1	0	2	3	172
Total Volume	0	400	5	405	8	302	0	310	0	0	0	0	9	0	19	28	743
% App. Total	0	98.8	1.2		2.6	97.4	0		0	0	0		32.1	0	67.9		
PHF	.000	.870	.625	.865	.667	.921	.000	.923	.000	.000	.000	.000	.563	.000	.679	.700	.938



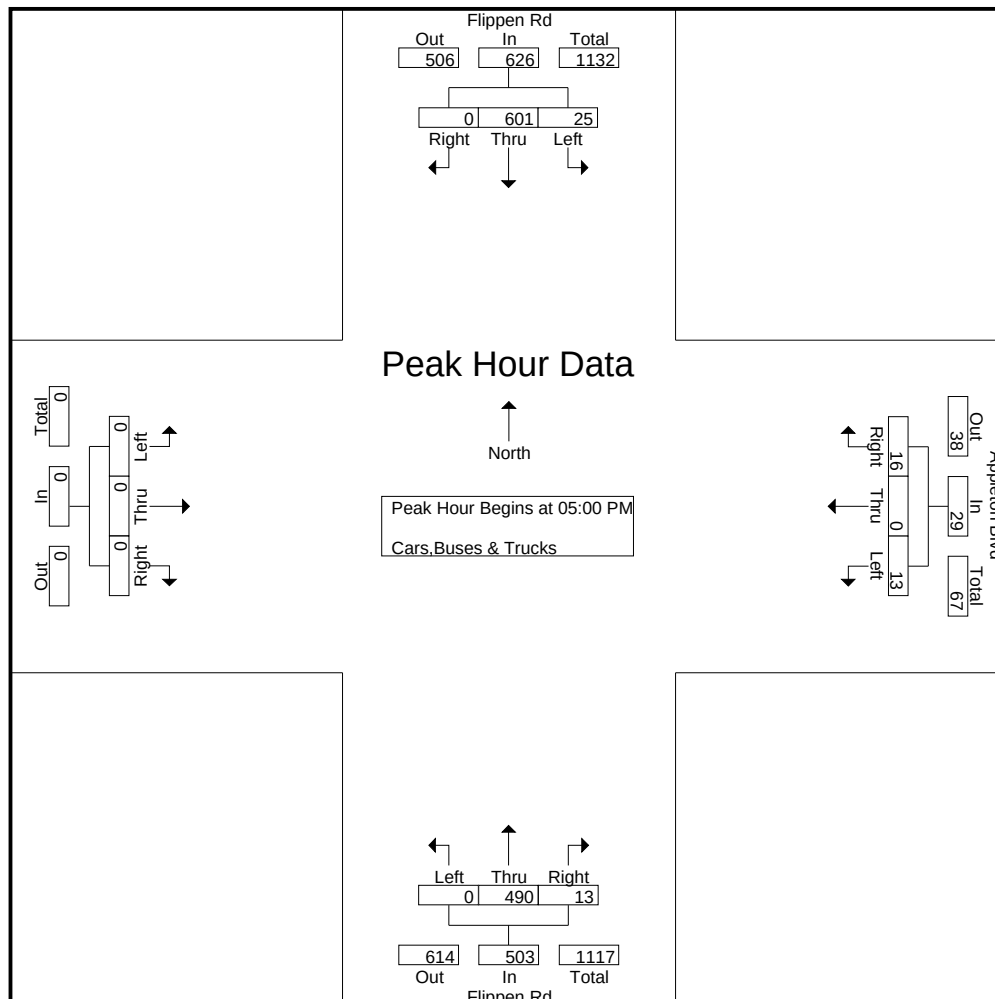
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TMC DATA
Flippen Rd @ Appleton Blvd
7-9 am | 4-6 pm

File Name : 20220511
Site Code : 20220511
Start Date : 12/7/2022
Page No : 3

	Flippen Rd Northbound				Flippen Rd Southbound				Eastbound				Appleton Blvd Westbound				
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	0	113	4	117	9	161	0	170	0	0	0	0	0	0	4	4	291
05:15 PM	0	136	1	137	7	145	0	152	0	0	0	0	4	0	2	6	295
05:30 PM	0	114	3	117	5	160	0	165	0	0	0	0	4	0	5	9	291
05:45 PM	0	127	5	132	4	135	0	139	0	0	0	0	5	0	5	10	281
Total Volume	0	490	13	503	25	601	0	626	0	0	0	0	13	0	16	29	1158
% App. Total	0	97.4	2.6		4	96	0		0	0	0		44.8	0	55.2		
PHF	.000	.901	.650	.918	.694	.933	.000	.921	.000	.000	.000	.000	.650	.000	.800	.725	.981



A & R Engineering, Inc.

2160 Kingston Court Suite 'O'
Marietta, GA 30067

TMC DATA
Flippen Rd @ Reeves Creek Trail Parking
Lot
7-9 am | 4-6 pm

File Name : 20220512
Site Code : 20220512
Start Date : 12/7/2022
Page No : 1

Groups Printed- Cars,Buses & Trucks

	Flippen Rd Northbound				Flippen Rd Southbound				Eastbound				Reeves Creek Trail Parking Lot Westbound				
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	0	73	0	73	0	57	0	57	0	0	0	0	0	0	0	0	130
07:15 AM	0	106	0	106	0	52	0	52	0	0	0	0	0	0	0	0	158
07:30 AM	0	97	0	97	0	84	0	84	0	0	0	0	0	0	0	0	181
07:45 AM	0	108	1	109	0	85	0	85	0	0	0	0	0	0	0	0	194
Total	0	384	1	385	0	278	0	278	0	0	0	0	0	0	0	0	663
08:00 AM	0	98	1	99	0	69	0	69	0	0	0	0	0	0	0	0	168
08:15 AM	0	104	0	104	0	73	0	73	0	0	0	0	0	0	0	0	177
08:30 AM	0	87	0	87	0	72	0	72	0	0	0	0	0	0	0	0	159
08:45 AM	0	84	1	85	0	78	0	78	0	0	0	0	0	0	0	0	163
Total	0	373	2	375	0	292	0	292	0	0	0	0	0	0	0	0	667
*** BREAK ***																	
04:00 PM	0	107	0	107	1	122	0	123	0	0	0	0	0	0	0	0	230
04:15 PM	0	109	0	109	0	141	0	141	0	0	0	0	0	0	1	1	251
04:30 PM	0	118	0	118	0	150	0	150	0	0	0	0	0	0	1	1	269
04:45 PM	0	117	1	118	3	133	0	136	0	0	0	0	0	0	1	1	255
Total	0	451	1	452	4	546	0	550	0	0	0	0	0	0	3	3	1005
05:00 PM	0	115	1	116	0	155	0	155	0	0	0	0	0	0	1	1	272
05:15 PM	0	47	0	47	0	75	0	75	0	0	0	0	1	0	1	2	124
05:30 PM	0	119	0	119	0	140	0	140	0	0	0	0	1	0	0	1	260
05:45 PM	0	125	0	125	1	153	0	154	0	0	0	0	0	0	1	1	280
Total	0	406	1	407	1	523	0	524	0	0	0	0	2	0	3	5	936
Grand Total	0	1614	5	1619	5	1639	0	1644	0	0	0	0	2	0	6	8	3271
Apprch %	0	99.7	0.3		0.3	99.7	0		0	0	0		25	0	75		
Total %	0	49.3	0.2	49.5	0.2	50.1	0	50.3	0	0	0	0	0.1	0	0.2	0.2	

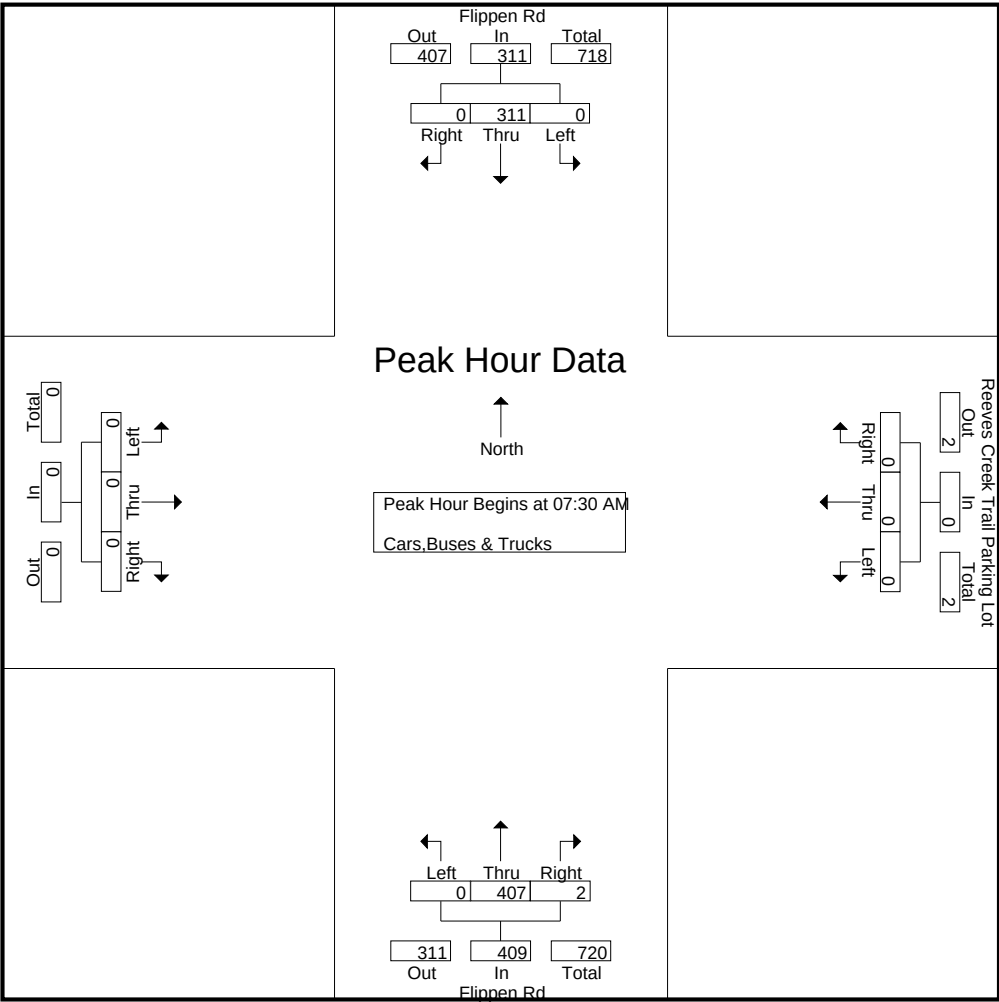
A & R Engineering, Inc.

2160 Kingston Court Suite 'O'
Marietta, GA 30067

TMC DATA
Flippen Rd @ Reeves Creek Trail Parking
Lot
7-9 am | 4-6 pm

File Name : 20220512
Site Code : 20220512
Start Date : 12/7/2022
Page No : 2

	Flippen Rd Northbound				Flippen Rd Southbound				Eastbound				Reeves Creek Trail Parking Lot Westbound				
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 07:30 AM																	
07:30 AM	0	97	0	97	0	84	0	84	0	0	0	0	0	0	0	0	181
07:45 AM	0	108	1	109	0	85	0	85	0	0	0	0	0	0	0	0	194
08:00 AM	0	98	1	99	0	69	0	69	0	0	0	0	0	0	0	0	168
08:15 AM	0	104	0	104	0	73	0	73	0	0	0	0	0	0	0	0	177
Total Volume	0	407	2	409	0	311	0	311	0	0	0	0	0	0	0	0	720
% App. Total	0	99.5	0.5		0	100	0		0	0	0		0	0	0		
PHF	.000	.942	.500	.938	.000	.915	.000	.915	.000	.000	.000	.000	.000	.000	.000	.000	.928



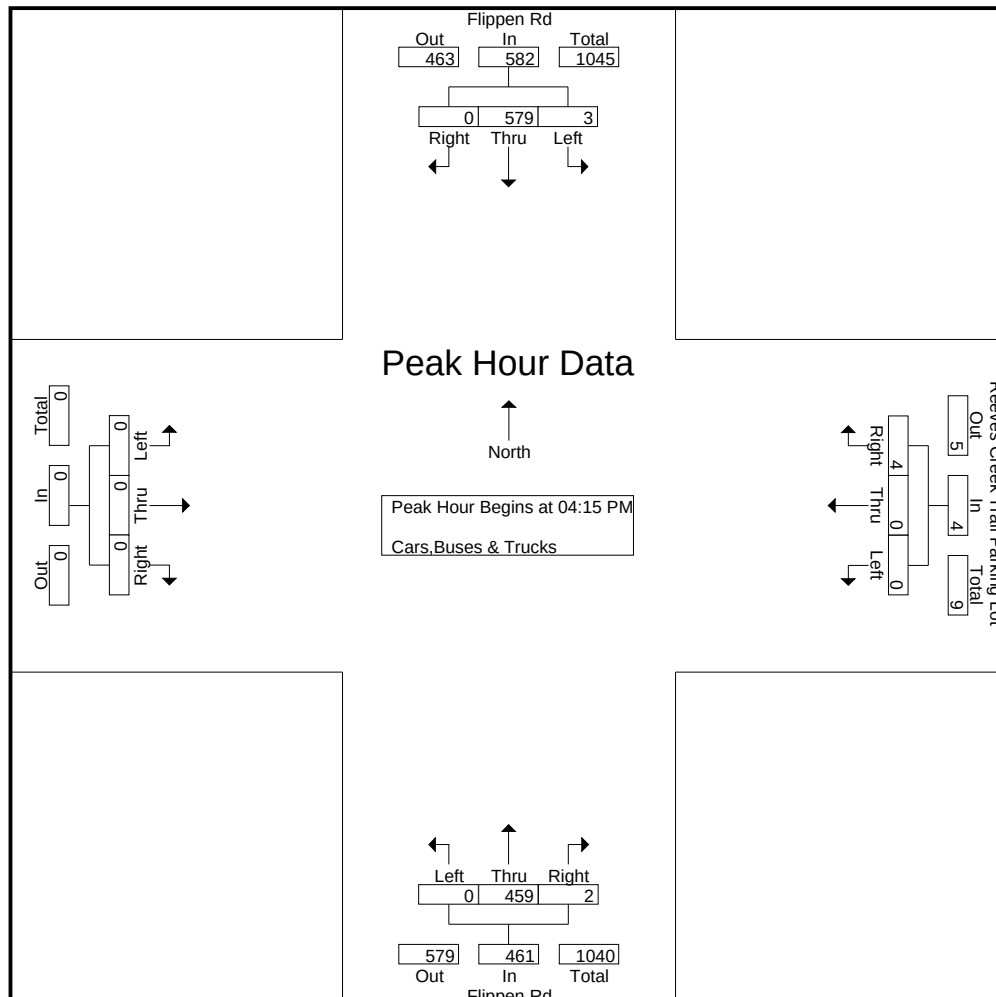
A & R Engineering, Inc.

2160 Kingston Court Suite 'O'
Marietta, GA 30067

TMC DATA
Flippen Rd @ Reeves Creek Trail Parking
Lot
7-9 am | 4-6 pm

File Name : 20220512
Site Code : 20220512
Start Date : 12/7/2022
Page No : 3

	Flippen Rd Northbound				Flippen Rd Southbound				Eastbound				Reeves Creek Trail Parking Lot Westbound				
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 04:15 PM																	
04:15 PM	0	109	0	109	0	141	0	141	0	0	0	0	0	0	1	1	251
04:30 PM	0	118	0	118	0	150	0	150	0	0	0	0	0	0	1	1	269
04:45 PM	0	117	1	118	3	133	0	136	0	0	0	0	0	0	1	1	255
05:00 PM	0	115	1	116	0	155	0	155	0	0	0	0	0	0	1	1	272
Total Volume	0	459	2	461	3	579	0	582	0	0	0	0	0	0	4	4	1047
% App. Total	0	99.6	0.4		0.5	99.5	0		0	0	0		0	0	100		
PHF	.000	.972	.500	.977	.250	.934	.000	.939	.000	.000	.000	.000	.000	.000	1.00	1.00	.962



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2160 Kingston Court Suite 'O'
Marietta, GA 30067

TMC DATA
Flippen Rd @ Walt Stephens Rd-
Red Oak Rd
7-9 am | 4-6 pm

File Name : 20220510
Site Code : 20220510
Start Date : 12/7/2022
Page No : 1

Groups Printed- Cars,Buses & Trucks

	Flippen Rd Northbound				Flippen Rd Southbound				Walt Stephens Rd Eastbound				Red Oak Rd Westbound				
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	79	56	4	139	1	32	31	64	30	27	69	126	2	28	6	36	365
07:15 AM	77	59	4	140	5	55	20	80	28	18	100	146	5	24	9	38	404
07:30 AM	68	80	2	150	5	51	29	85	29	16	91	136	2	23	6	31	402
07:45 AM	82	72	6	160	2	57	30	89	25	25	66	116	0	19	3	22	387
Total	306	267	16	589	13	195	110	318	112	86	326	524	9	94	24	127	1558
08:00 AM	75	71	1	147	4	44	26	74	18	23	51	92	2	19	2	23	336
08:15 AM	49	69	3	121	3	49	28	80	31	22	48	101	1	23	3	27	329
08:30 AM	53	63	5	121	2	60	22	84	29	17	67	113	1	16	3	20	338
08:45 AM	72	38	1	111	4	32	32	68	24	11	57	92	2	20	5	27	298
Total	249	241	10	500	13	185	108	306	102	73	223	398	6	78	13	97	1301
*** BREAK ***																	
04:00 PM	84	71	4	159	6	98	45	149	39	37	86	162	4	19	5	28	498
04:15 PM	79	88	1	168	9	76	35	120	31	30	71	132	3	20	10	33	453
04:30 PM	80	62	5	147	4	99	49	152	42	47	114	203	2	19	6	27	529
04:45 PM	61	80	4	145	7	117	31	155	34	50	85	169	1	37	8	46	515
Total	304	301	14	619	26	390	160	576	146	164	356	666	10	95	29	134	1995
05:00 PM	90	83	3	176	5	106	47	158	49	44	106	199	5	39	8	52	585
05:15 PM	86	85	8	179	3	117	41	161	33	39	95	167	3	29	1	33	540
05:30 PM	78	81	3	162	8	98	37	143	39	43	105	187	14	28	7	49	541
05:45 PM	71	87	4	162	7	102	37	146	38	29	83	150	6	34	3	43	501
Total	325	336	18	679	23	423	162	608	159	155	389	703	28	130	19	177	2167
Grand Total	1184	1145	58	2387	75	1193	540	1808	519	478	1294	2291	53	397	85	535	7021
Apprch %	49.6	48	2.4		4.1	66	29.9		22.7	20.9	56.5		9.9	74.2	15.9		
Total %	16.9	16.3	0.8	34	1.1	17	7.7	25.8	7.4	6.8	18.4	32.6	0.8	5.7	1.2	7.6	

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TMC DATA

Flippen Rd @ Walt Stephens Rd-

Red Oak Rd

7-9 am | 4-6 pm

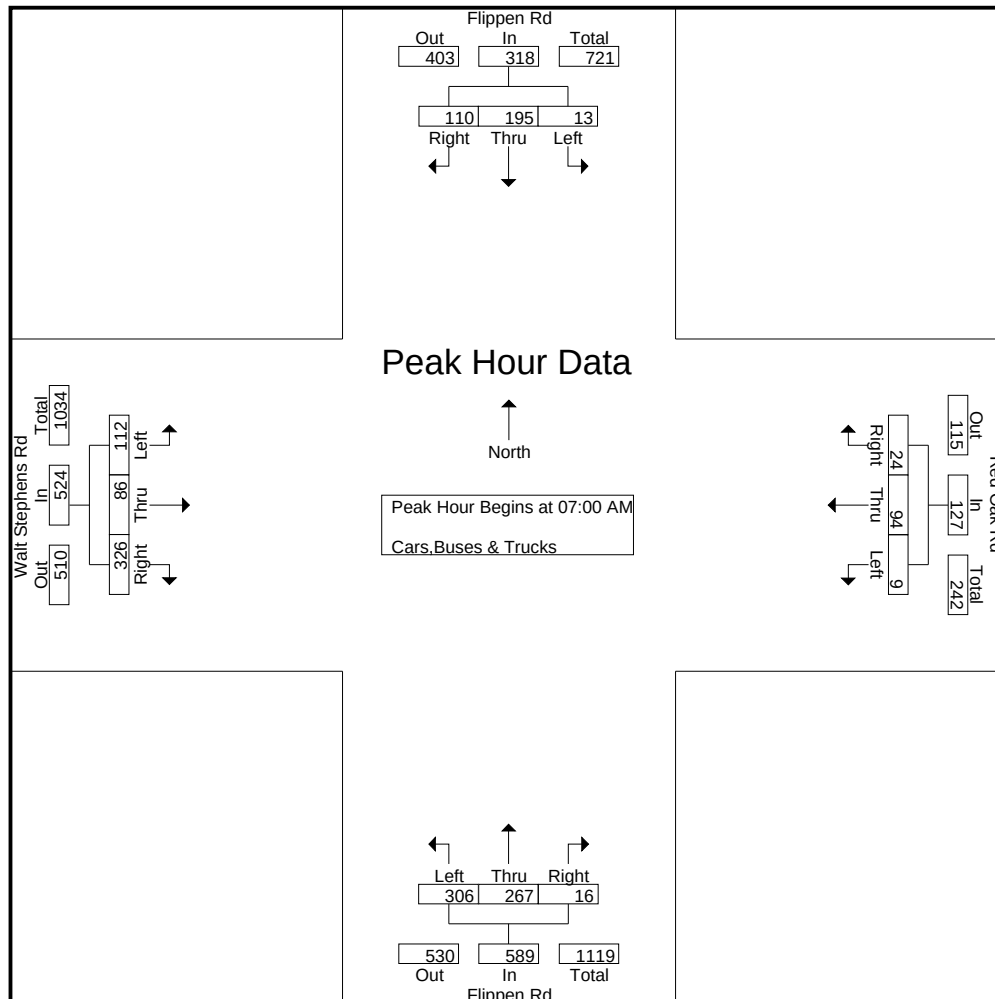
File Name : 20220510

Site Code : 20220510

Start Date : 12/7/2022

Page No : 2

	Flippen Rd Northbound				Flippen Rd Southbound				Walt Stephens Rd Eastbound				Red Oak Rd Westbound				
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 07:00 AM																	
07:00 AM	79	56	4	139	1	32	31	64	30	27	69	126	2	28	6	36	365
07:15 AM	77	59	4	140	5	55	20	80	28	18	100	146	5	24	9	38	404
07:30 AM	68	80	2	150	5	51	29	85	29	16	91	136	2	23	6	31	402
07:45 AM	82	72	6	160	2	57	30	89	25	25	66	116	0	19	3	22	387
Total Volume	306	267	16	589	13	195	110	318	112	86	326	524	9	94	24	127	1558
% App. Total	52	45.3	2.7		4.1	61.3	34.6		21.4	16.4	62.2		7.1	74	18.9		
PHF	.933	.834	.667	.920	.650	.855	.887	.893	.933	.796	.815	.897	.450	.839	.667	.836	.964



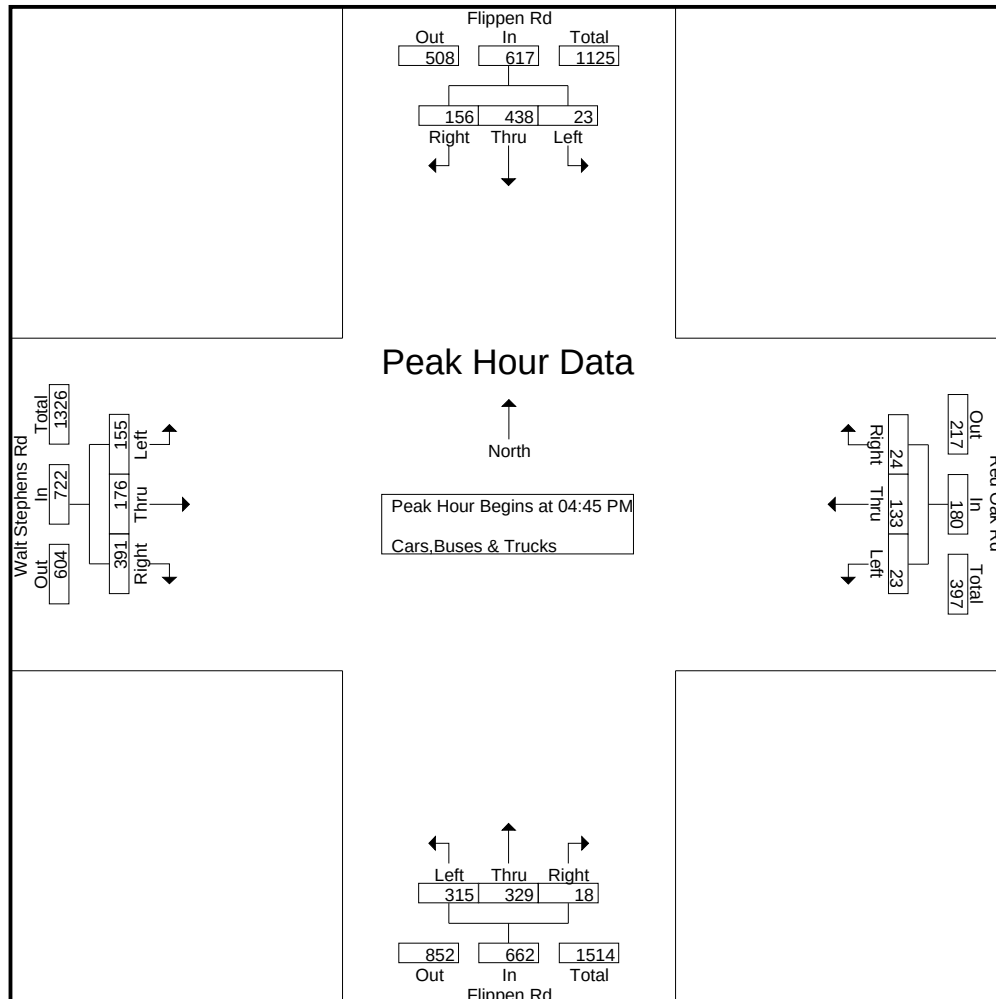
A & R Engineering, Inc.

2160 Kingston Court Suite 'O'
Marietta, GA 30067

TMC DATA
Flippen Rd @ Walt Stephens Rd-
Red Oak Rd
7-9 am | 4-6 pm

File Name : 20220510
Site Code : 20220510
Start Date : 12/7/2022
Page No : 3

	Flippen Rd Northbound				Flippen Rd Southbound				Walt Stephens Rd Eastbound				Red Oak Rd Westbound				
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 04:45 PM																	
04:45 PM	61	80	4	145	7	117	31	155	34	50	85	169	1	37	8	46	515
05:00 PM	90	83	3	176	5	106	47	158	49	44	106	199	5	39	8	52	585
05:15 PM	86	85	8	179	3	117	41	161	33	39	95	167	3	29	1	33	540
05:30 PM	78	81	3	162	8	98	37	143	39	43	105	187	14	28	7	49	541
Total Volume	315	329	18	662	23	438	156	617	155	176	391	722	23	133	24	180	2181
% App. Total	47.6	49.7	2.7		3.7	71	25.3		21.5	24.4	54.2		12.8	73.9	13.3		
PHF	.875	.968	.563	.925	.719	.936	.830	.958	.791	.880	.922	.907	.411	.853	.750	.865	.932



A & R Engineering, Inc.

2160 Kingston Court Suite 'O'
Marietta, GA 30067

TMC DATA

Flippen Rd @ Hudson Bridge Rd

7-9 am | 4-6 pm

File Name : 20220514

Site Code : 20220514

Start Date : 12/7/2022

Page No : 1

Groups Printed- Cars,Buses & Trucks

	Flippen Rd Northbound				Flippen Rd Southbound				Hudson Bridge Rd Eastbound				Hudson Bridge Rd Westbound						
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total	
07:00 AM	1	49	81	131	33	74	21	128	25	109	0	134	42	53	23	2	120	513	
07:15 AM	1	59	108	168	52	113	21	186	16	91	0	107	52	64	20	1	137	598	
07:30 AM	1	64	123	188	51	83	27	161	21	101	0	122	39	54	41	5	139	610	
07:45 AM	1	70	127	198	58	51	22	131	11	96	0	107	39	80	47	6	172	608	
Total	4	242	439	685	194	321	91	606	73	397	0	470	172	251	131	14	568	2329	
08:00 AM	0	65	107	172	38	40	14	92	27	103	0	130	36	70	31	2	139	533	
08:15 AM	0	59	78	137	42	43	9	94	18	80	1	99	31	64	30	10	135	465	
08:30 AM	2	40	66	108	42	54	11	107	17	105	0	122	42	55	38	4	139	476	
08:45 AM	4	48	88	140	46	38	10	94	16	80	0	96	44	61	32	6	143	473	
Total	6	212	339	557	168	175	44	387	78	368	1	447	153	250	131	22	556	1947	
*** BREAK ***																			
04:00 PM	4	104	73	181	44	97	24	165	31	97	1	129	127	147	62	11	347	822	
04:15 PM	3	66	84	153	58	65	19	142	41	110	2	153	128	143	67	2	340	788	
04:30 PM	1	70	97	168	57	71	22	150	34	107	1	142	136	198	74	3	411	871	
04:45 PM	1	81	83	165	74	113	18	205	30	77	2	109	120	155	79	1	355	834	
Total	9	321	337	667	233	346	83	662	136	391	6	533	511	643	282	17	1453	3315	
05:00 PM	0	76	71	147	42	104	20	166	34	91	3	128	156	168	75	4	403	844	
05:15 PM	1	85	66	152	65	108	19	192	27	118	3	148	150	177	62	4	393	885	
05:30 PM	3	73	75	151	60	89	13	162	35	99	0	134	155	165	56	7	383	830	
05:45 PM	0	93	88	181	56	95	30	181	46	91	1	138	135	167	51	6	359	859	
Total	4	327	300	631	223	396	82	701	142	399	7	548	596	677	244	21	1538	3418	
Grand Total	23	1102	1415	2540	818	1238	300	2356	429	1555	14	1998	1432	1821	788	74	4115	11009	
Apprch %	0.9	43.4	55.7		34.7	52.5	12.7		21.5	77.8	0.7		34.8	44.3	19.1	1.8			
Total %	0.2	10	12.9	23.1	7.4	11.2	2.7	21.4	3.9	14.1	0.1	18.1	13	16.5	7.2	0.7	37.4		

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2160 Kingston Court Suite 'O'
Marietta, GA 30067

TMC DATA

Flippen Rd @ Hudson Bridge Rd

7-9 am | 4-6 pm

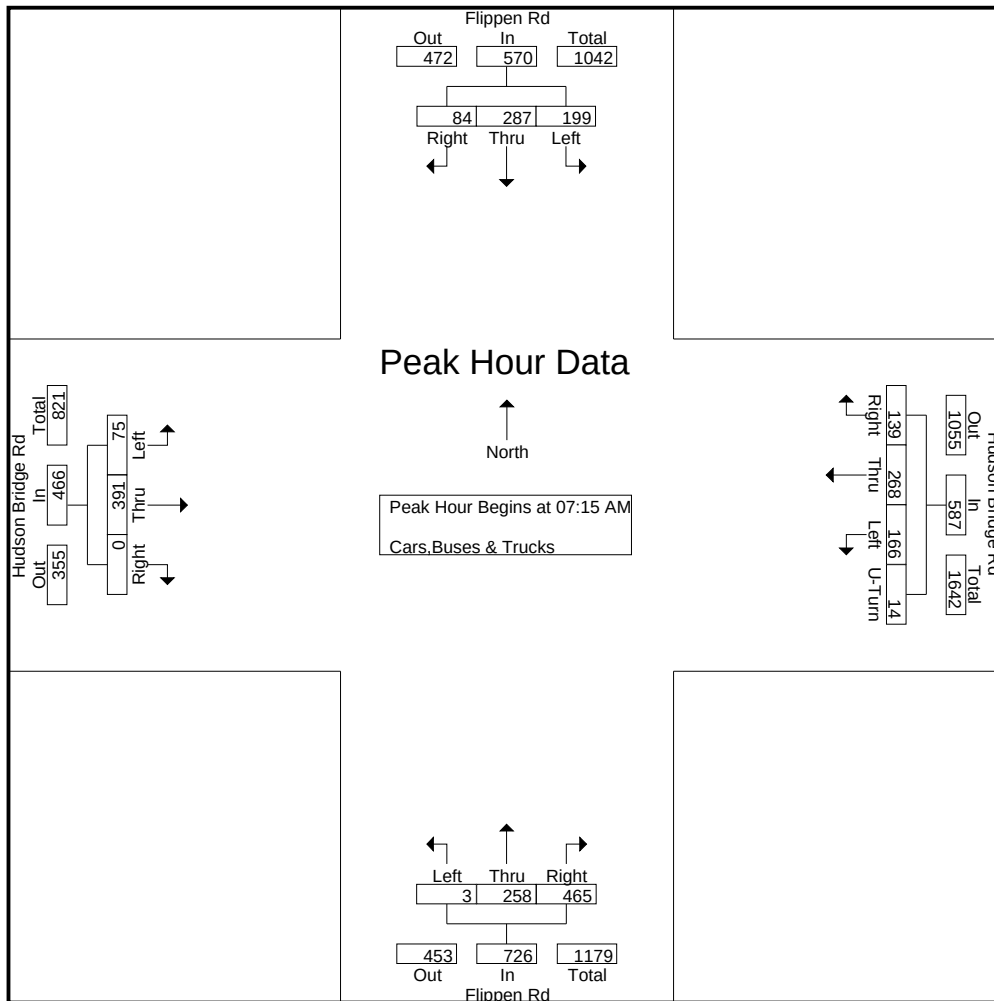
File Name : 20220514

Site Code : 20220514

Start Date : 12/7/2022

Page No : 2

	Flippen Rd Northbound				Flippen Rd Southbound				Hudson Bridge Rd Eastbound				Hudson Bridge Rd Westbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	U-Turn	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	1	59	108	168	52	113	21	186	16	91	0	107	52	64	20	1	137	598
07:30 AM	1	64	123	188	51	83	27	161	21	101	0	122	39	54	41	5	139	610
07:45 AM	1	70	127	198	58	51	22	131	11	96	0	107	39	80	47	6	172	608
08:00 AM	0	65	107	172	38	40	14	92	27	103	0	130	36	70	31	2	139	533
Total Volume	3	258	465	726	199	287	84	570	75	391	0	466	166	268	139	14	587	2349
% App. Total	0.4	35.5	64		34.9	50.4	14.7		16.1	83.9	0		28.3	45.7	23.7	2.4		
PHF	.750	.921	.915	.917	.858	.635	.778	.766	.694	.949	.000	.896	.798	.838	.739	.583	.853	.963



A & R Engineering, Inc.

2160 Kingston Court Suite 'O'
Marietta, GA 30067

TMC DATA

Flippen Rd @ Hudson Bridge Rd

7-9 am | 4-6 pm

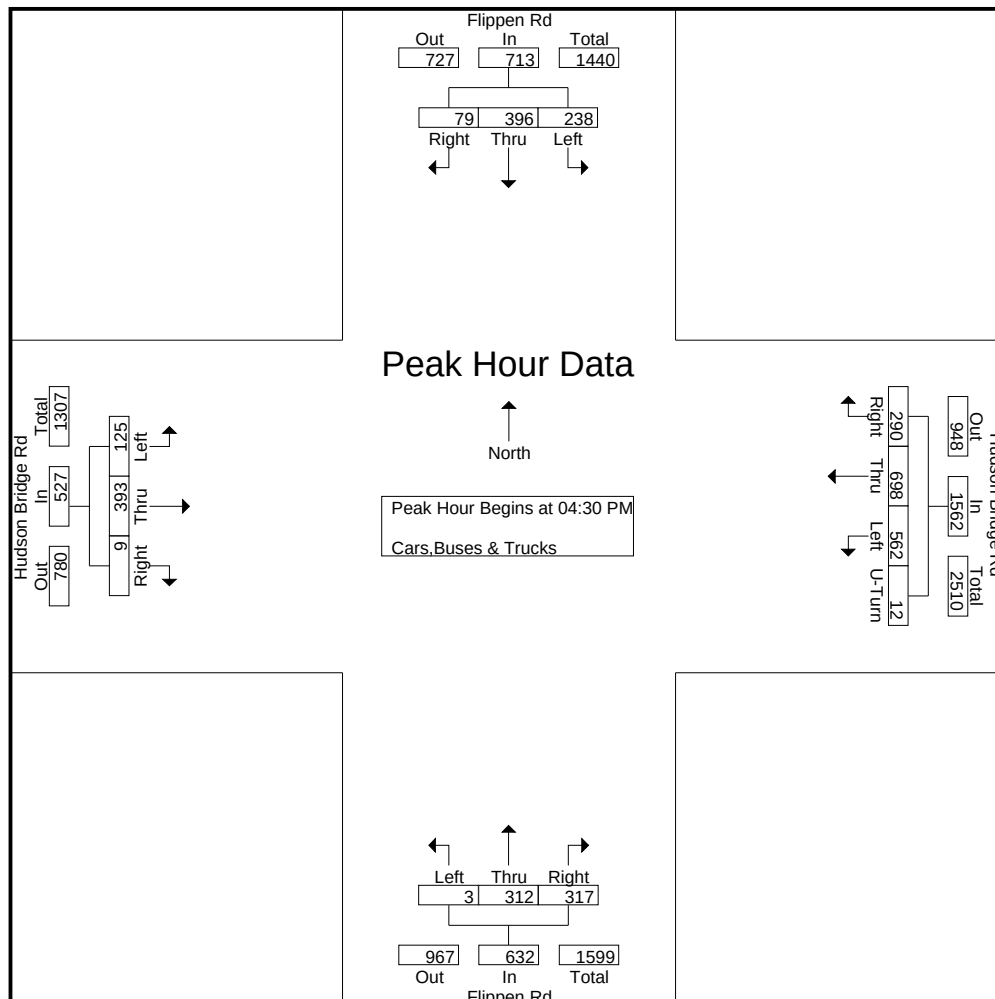
File Name : 20220514

Site Code : 20220514

Start Date : 12/7/2022

Page No : 3

	Flippen Rd Northbound				Flippen Rd Southbound				Hudson Bridge Rd Eastbound				Hudson Bridge Rd Westbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	U-Turn	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 04:30 PM																		
04:30 PM	1	70	97	168	57	71	22	150	34	107	1	142	136	198	74	3	411	871
04:45 PM	1	81	83	165	74	113	18	205	30	77	2	109	120	155	79	1	355	834
05:00 PM	0	76	71	147	42	104	20	166	34	91	3	128	156	168	75	4	403	844
05:15 PM	1	85	66	152	65	108	19	192	27	118	3	148	150	177	62	4	393	885
Total Volume	3	312	317	632	238	396	79	713	125	393	9	527	562	698	290	12	1562	3434
% App. Total	0.5	49.4	50.2		33.4	55.5	11.1		23.7	74.6	1.7		36	44.7	18.6	0.8		
PHF	.750	.918	.817	.940	.804	.876	.898	.870	.919	.833	.750	.890	.901	.881	.918	.750	.950	.970



A & R Engineering, Inc.

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Marietta, GA 30067

TMC DATA
SR 42 (North Henry Blvd) @ SR 138
(Lake Spivey Pkwy)
7-9 am | 4-6 pm

File Name : 20220515
Site Code : 20220515
Start Date : 12/7/2022
Page No : 1

Groups Printed- Cars & Buses - Trucks

	SR 42 (North Henry Blvd) Northbound				SR 42 (North Henry Blvd) Southbound				SR 138 (Lake Spivey Pkwy) Eastbound				Walmart Drwy Westbound				
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	142	61	7	210	5	24	34	63	20	10	89	119	8	13	8	29	421
07:15 AM	194	94	7	295	4	44	28	76	18	9	83	110	5	14	7	26	507
07:30 AM	224	113	12	349	7	52	37	96	22	11	94	127	6	14	5	25	597
07:45 AM	234	97	14	345	9	50	42	101	21	20	91	132	8	15	7	30	608
Total	794	365	40	1199	25	170	141	336	81	50	357	488	27	56	27	110	2133
08:00 AM	208	93	7	308	9	49	38	96	27	23	97	147	8	16	8	32	583
08:15 AM	204	79	10	293	13	56	37	106	19	20	101	140	15	14	10	39	578
08:30 AM	163	72	20	255	6	46	41	93	28	14	114	156	6	23	11	40	544
08:45 AM	182	69	8	259	11	45	38	94	21	28	112	161	13	26	18	57	571
Total	757	313	45	1115	39	196	154	389	95	85	424	604	42	79	47	168	2276
*** BREAK ***																	
04:00 PM	123	77	9	209	24	133	32	189	47	44	239	330	28	48	29	105	833
04:15 PM	167	112	11	290	21	134	26	181	63	43	180	286	39	37	27	103	860
04:30 PM	127	91	25	243	17	131	21	169	60	45	209	314	51	45	32	128	854
04:45 PM	158	93	25	276	23	134	30	187	63	42	193	298	54	57	32	143	904
Total	575	373	70	1018	85	532	109	726	233	174	821	1228	172	187	120	479	3451
05:00 PM	155	96	22	273	25	125	53	203	51	34	197	282	34	42	32	108	866
05:15 PM	167	104	21	292	26	130	30	186	62	50	217	329	39	36	29	104	911
05:30 PM	146	73	20	239	19	111	28	158	79	42	223	344	31	51	24	106	847
05:45 PM	144	80	19	243	22	149	36	207	61	33	189	283	35	40	23	98	831
Total	612	353	82	1047	92	515	147	754	253	159	826	1238	139	169	108	416	3455
Grand Total	2738	1404	237	4379	241	1413	551	2205	662	468	2428	3558	380	491	302	1173	11315
Apprch %	62.5	32.1	5.4		10.9	64.1	25		18.6	13.2	68.2		32.4	41.9	25.7		
Total %	24.2	12.4	2.1	38.7	2.1	12.5	4.9	19.5	5.9	4.1	21.5	31.4	3.4	4.3	2.7	10.4	
Cars & Buses	2662	1361	236	4259	239	1387	545	2171	656	462	2351	3469	377	486	302	1165	11064
% Cars & Buses	97.2	96.9	99.6	97.3	99.2	98.2	98.9	98.5	99.1	98.7	96.8	97.5	99.2	99	100	99.3	97.8
Trucks	76	43	1	120	2	26	6	34	6	6	77	89	3	5	0	8	251
% Trucks	2.8	3.1	0.4	2.7	0.8	1.8	1.1	1.5	0.9	1.3	3.2	2.5	0.8	1	0	0.7	2.2

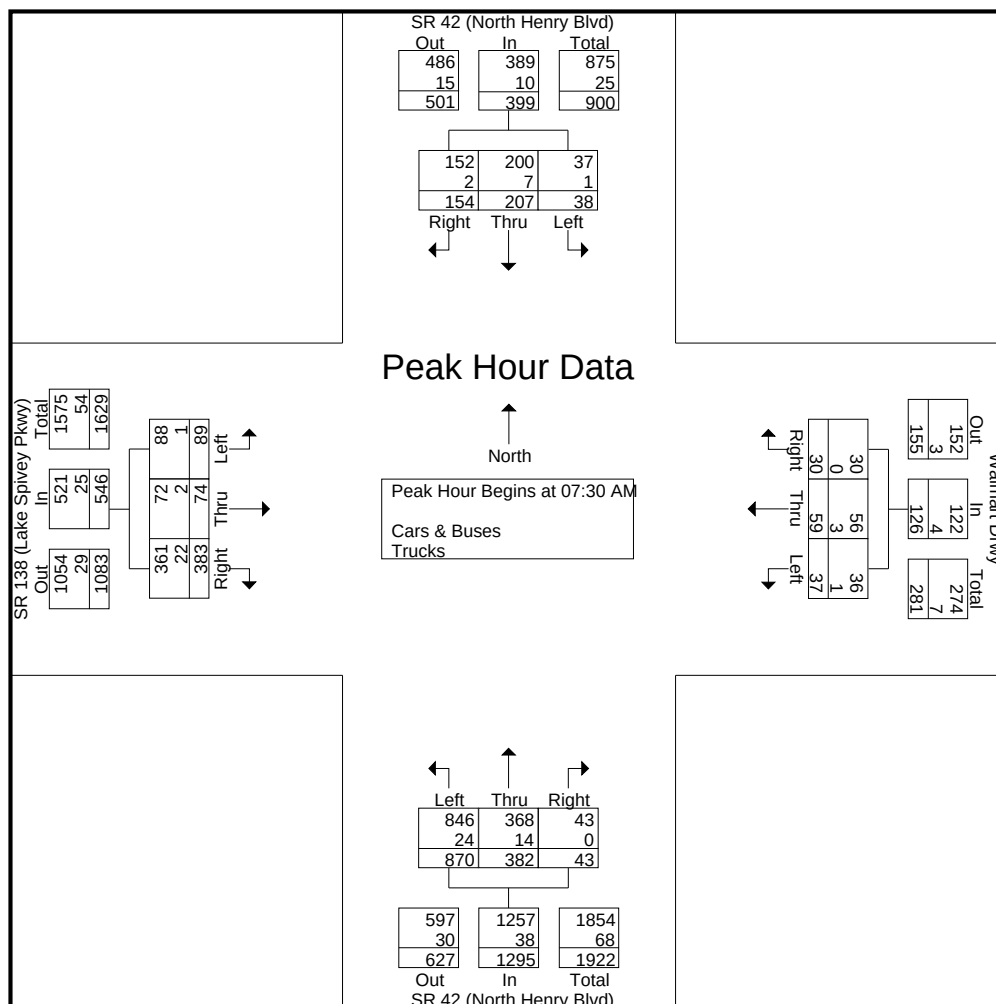
A & R Engineering, Inc.

2160 Kingston Court Suite 'O'
Marietta, GA 30067

TMC DATA
SR 42 (North Henry Blvd) @ SR 138
(Lake Spivey Pkwy)
7-9 am | 4-6 pm

File Name : 20220515
Site Code : 20220515
Start Date : 12/7/2022
Page No : 2

	SR 42 (North Henry Blvd) Northbound				SR 42 (North Henry Blvd) Southbound				SR 138 (Lake Spivey Pkwy) Eastbound				Walmart Drwy Westbound				
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 07:30 AM																	
07:30 AM	224	113	12	349	7	52	37	96	22	11	94	127	6	14	5	25	597
07:45 AM	234	97	14	345	9	50	42	101	21	20	91	132	8	15	7	30	608
08:00 AM	208	93	7	308	9	49	38	96	27	23	97	147	8	16	8	32	583
08:15 AM	204	79	10	293	13	56	37	106	19	20	101	140	15	14	10	39	578
Total Volume	870	382	43	1295	38	207	154	399	89	74	383	546	37	59	30	126	2366
% App. Total	67.2	29.5	3.3		9.5	51.9	38.6		16.3	13.6	70.1		29.4	46.8	23.8		
PHF	.929	.845	.768	.928	.731	.924	.917	.941	.824	.804	.948	.929	.617	.922	.750	.808	.973
Cars & Buses	846	368	43	1257	37	200	152	389	88	72	361	521	36	56	30	122	2289
% Cars & Buses	97.2	96.3	100	97.1	97.4	96.6	98.7	97.5	98.9	97.3	94.3	95.4	97.3	94.9	100	96.8	96.7
Trucks	24	14	0	38	1	7	2	10	1	2	22	25	1	3	0	4	77
% Trucks	2.8	3.7	0	2.9	2.6	3.4	1.3	2.5	1.1	2.7	5.7	4.6	2.7	5.1	0	3.2	3.3



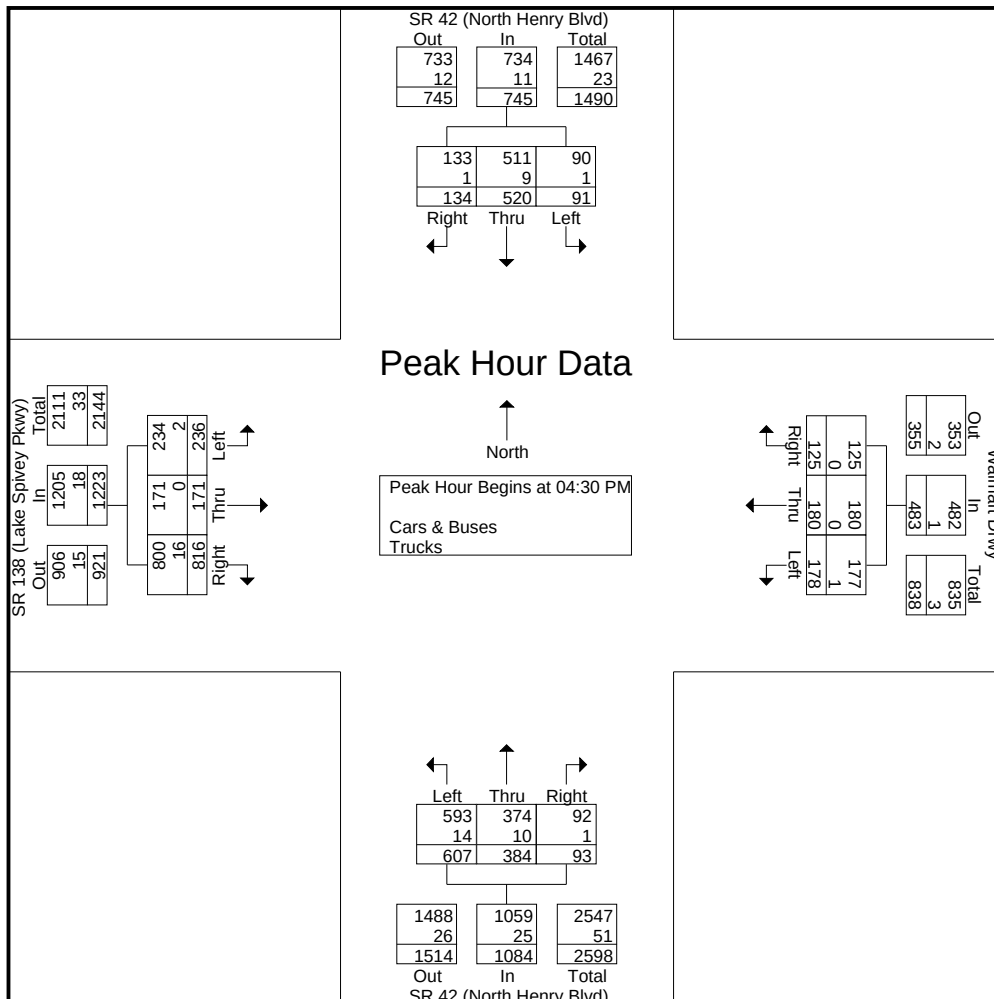
A & R Engineering, Inc.

2160 Kingston Court Suite 'O'
Marietta, GA 30067

TMC DATA
SR 42 (North Henry Blvd) @ SR 138
(Lake Spivey Pkwy)
7-9 am | 4-6 pm

File Name : 20220515
Site Code : 20220515
Start Date : 12/7/2022
Page No : 3

	SR 42 (North Henry Blvd) Northbound				SR 42 (North Henry Blvd) Southbound				SR 138 (Lake Spivey Pkwy) Eastbound				Walmart Drwy Westbound				
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 04:30 PM																	
04:30 PM	127	91	25	243	17	131	21	169	60	45	209	314	51	45	32	128	854
04:45 PM	158	93	25	276	23	134	30	187	63	42	193	298	54	57	32	143	904
05:00 PM	155	96	22	273	25	125	53	203	51	34	197	282	34	42	32	108	866
05:15 PM	167	104	21	292	26	130	30	186	62	50	217	329	39	36	29	104	911
Total Volume	607	384	93	1084	91	520	134	745	236	171	816	1223	178	180	125	483	3535
% App. Total	56	35.4	8.6		12.2	69.8	18		19.3	14	66.7		36.9	37.3	25.9		
PHF	.909	.923	.930	.928	.875	.970	.632	.917	.937	.855	.940	.929	.824	.789	.977	.844	.970
Cars & Buses	593	374	92	1059	90	511	133	734	234	171	800	1205	177	180	125	482	3480
% Cars & Buses	97.7	97.4	98.9	97.7	98.9	98.3	99.3	98.5	99.2	100	98.0	98.5	99.4	100	100	99.8	98.4
Trucks	14	10	1	25	1	9	1	11	2	0	16	18	1	0	0	1	55
% Trucks	2.3	2.6	1.1	2.3	1.1	1.7	0.7	1.5	0.8	0	2.0	1.5	0.6	0	0	0.2	1.6



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TMC DATA

SR 138 (Spivey Lake Pkwy) @ I-675 NB

Ramps

7-9 am | 4-6 pm

File Name : 20220522

Site Code : 20220522

Start Date : 12-13-2022

Page No : 1

Groups Printed- Cars,Buses & Trucks

	I-675 NB Ramps Northbound				I-675 NB Ramps Southbound				SR 138 (Spivey Lake Pkwy) Eastbound				SR 138 (Spivey Lake Pkwy) Westbound				
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	4	0	10	14	0	0	0	0	97	166	0	263	0	218	54	272	549
07:15 AM	10	0	8	18	0	0	0	0	104	147	0	251	0	269	81	350	619
07:30 AM	5	0	19	24	0	0	0	0	121	226	0	347	0	326	85	411	782
07:45 AM	7	0	24	31	0	0	0	0	142	243	0	385	0	348	67	415	831
Total	26	0	61	87	0	0	0	0	464	782	0	1246	0	1161	287	1448	2781
08:00 AM	10	0	17	27	0	0	0	0	110	230	0	340	0	297	65	362	729
08:15 AM	13	0	20	33	0	0	0	0	102	120	0	222	0	201	61	262	517
08:30 AM	13	0	33	46	0	0	0	0	100	210	0	310	0	264	50	314	670
08:45 AM	15	0	24	39	0	0	0	0	71	248	0	319	0	242	57	299	657
Total	51	0	94	145	0	0	0	0	383	808	0	1191	0	1004	233	1237	2573
*** BREAK ***																	
04:00 PM	17	0	37	54	0	0	0	0	98	440	0	538	0	296	47	343	935
04:15 PM	24	0	38	62	0	0	0	0	96	451	0	547	0	288	55	343	952
04:30 PM	11	0	37	48	0	0	0	0	80	483	0	563	0	368	67	435	1046
04:45 PM	7	0	29	36	0	0	0	0	75	509	0	584	0	382	54	436	1056
Total	59	0	141	200	0	0	0	0	349	1883	0	2232	0	1334	223	1557	3989
05:00 PM	13	0	32	45	0	0	0	0	81	501	0	582	0	387	62	449	1076
05:15 PM	15	0	27	42	0	0	0	0	86	489	0	575	0	401	67	468	1085
05:30 PM	10	0	23	33	0	0	0	0	79	467	0	546	0	385	54	439	1018
05:45 PM	8	0	18	26	0	0	0	0	65	462	0	527	0	375	48	423	976
Total	46	0	100	146	0	0	0	0	311	1919	0	2230	0	1548	231	1779	4155
Grand Total	182	0	396	578	0	0	0	0	1507	5392	0	6899	0	5047	974	6021	13498
Apprch %	31.5	0	68.5		0	0	0		21.8	78.2	0		0	83.8	16.2		
Total %	1.3	0	2.9	4.3	0	0	0	0	11.2	39.9	0	51.1	0	37.4	7.2	44.6	

A & R Engineering, Inc.

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Marietta, GA 30067

TMC DATA

SR 138 (Spivey Lake Pkwy) @ I-675 NB

Ramps

7-9 am | 4-6 pm

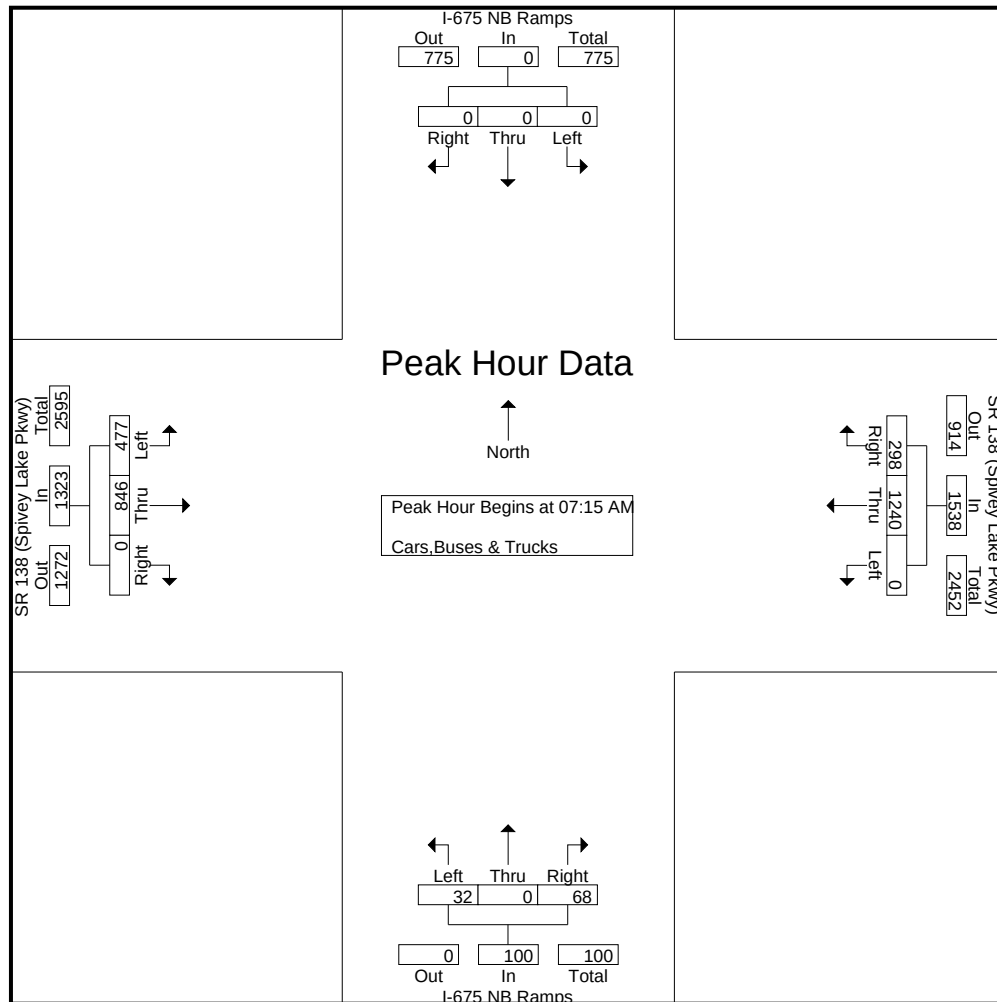
File Name : 20220522

Site Code : 20220522

Start Date : 12-13-2022

Page No : 2

	I-675 NB Ramps Northbound				I-675 NB Ramps Southbound				SR 138 (Spivey Lake Pkwy) Eastbound				SR 138 (Spivey Lake Pkwy) Westbound				
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	10	0	8	18	0	0	0	0	104	147	0	251	0	269	81	350	619
07:30 AM	5	0	19	24	0	0	0	0	121	226	0	347	0	326	85	411	782
07:45 AM	7	0	24	31	0	0	0	0	142	243	0	385	0	348	67	415	831
08:00 AM	10	0	17	27	0	0	0	0	110	230	0	340	0	297	65	362	729
Total Volume	32	0	68	100	0	0	0	0	477	846	0	1323	0	1240	298	1538	2961
% App. Total	32	0	68		0	0	0		36.1	63.9	0		0	80.6	19.4		
PHF	.800	.000	.708	.806	.000	.000	.000	.000	.840	.870	.000	.859	.000	.891	.876	.927	.891



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TMC DATA

SR 138 (Spivey Lake Pkwy) @ I-675 NB

Ramps

7-9 am | 4-6 pm

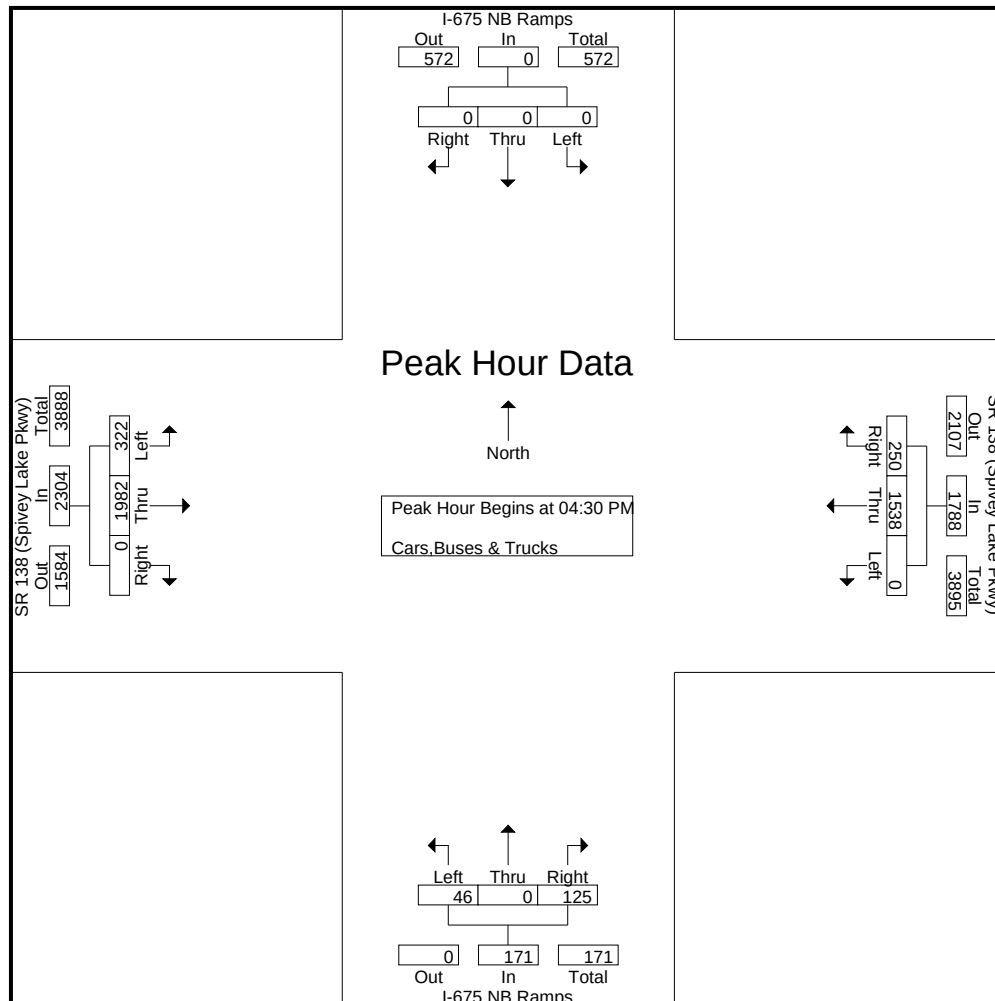
File Name : 20220522

Site Code : 20220522

Start Date : 12-13-2022

Page No : 3

	I-675 NB Ramps Northbound				I-675 NB Ramps Southbound				SR 138 (Spivey Lake Pkwy) Eastbound				SR 138 (Spivey Lake Pkwy) Westbound				
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 04:30 PM																	
04:30 PM	11	0	37	48	0	0	0	0	80	483	0	563	0	368	67	435	1046
04:45 PM	7	0	29	36	0	0	0	0	75	509	0	584	0	382	54	436	1056
05:00 PM	13	0	32	45	0	0	0	0	81	501	0	582	0	387	62	449	1076
05:15 PM	15	0	27	42	0	0	0	0	86	489	0	575	0	401	67	468	1085
Total Volume	46	0	125	171	0	0	0	0	322	1982	0	2304	0	1538	250	1788	4263
% App. Total	26.9	0	73.1		0	0	0		14	86	0		0	86	14		
PHF	.767	.000	.845	.891	.000	.000	.000	.000	.936	.973	.000	.986	.000	.959	.933	.955	.982



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Marietta, GA 30067

TMC DATA

SR 138 (Lake Spivey Pkwy) @ I-675 SB

Ramps

7-9 am | 4-6 pm

File Name : 20220516

Site Code : 20220516

Start Date : 12-13-2022

Page No : 1

Groups Printed- Cars,Buses & Trucks

	I-675 SB Ramps Northbound				I-675 SB Ramps Southbound				SR 138 (Lake Spivey Pkwy) Eastbound				SR 138 (Lake Spivey Pkwy) Westbound				
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	0	0	0	0	28	0	88	116	0	235	9	244	25	197	0	222	582
07:15 AM	0	0	0	0	11	0	89	100	0	240	11	251	27	252	0	279	630
07:30 AM	0	0	0	0	38	0	110	148	0	309	14	323	29	302	0	331	802
07:45 AM	0	0	0	0	38	0	113	151	0	347	14	361	23	332	0	355	867
Total	0	0	0	0	115	0	400	515	0	1131	48	1179	104	1083	0	1187	2881
08:00 AM	0	0	0	0	53	0	131	184	0	287	12	299	20	287	0	307	790
08:15 AM	0	0	0	0	26	0	60	86	0	196	5	201	19	195	0	214	501
08:30 AM	0	0	0	0	44	0	75	119	0	266	12	278	20	257	0	277	674
08:45 AM	0	0	0	0	44	0	87	131	0	275	14	289	13	244	0	257	677
Total	0	0	0	0	167	0	353	520	0	1024	43	1067	72	983	0	1055	2642
*** BREAK ***																	
04:00 PM	0	0	0	0	73	0	140	213	0	465	25	490	22	291	0	313	1016
04:15 PM	0	0	0	0	118	0	168	286	0	429	23	452	20	292	0	312	1050
04:30 PM	0	0	0	0	82	0	117	199	0	481	30	511	22	357	0	379	1089
04:45 PM	0	0	0	0	91	0	126	217	0	493	28	521	26	363	0	389	1127
Total	0	0	0	0	364	0	551	915	0	1868	106	1974	90	1303	0	1393	4282
05:00 PM	0	0	0	0	99	0	135	234	0	483	32	515	28	372	0	400	1149
05:15 PM	0	0	0	0	105	0	147	252	0	470	36	506	31	385	0	416	1174
05:30 PM	0	0	0	0	94	0	121	215	0	452	21	473	25	370	0	395	1083
05:45 PM	0	0	0	0	83	0	111	194	0	444	24	468	22	361	0	383	1045
Total	0	0	0	0	381	0	514	895	0	1849	113	1962	106	1488	0	1594	4451
Grand Total	0	0	0	0	1027	0	1818	2845	0	5872	310	6182	372	4857	0	5229	14256
Apprch %	0	0	0		36.1	0	63.9		0	95	5		7.1	92.9	0		
Total %	0	0	0	0	7.2	0	12.8	20	0	41.2	2.2	43.4	2.6	34.1	0	36.7	

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Marietta, GA 30067

TMC DATA

SR 138 (Lake Spivey Pkwy) @ I-675 SB

Ramps

7-9 am | 4-6 pm

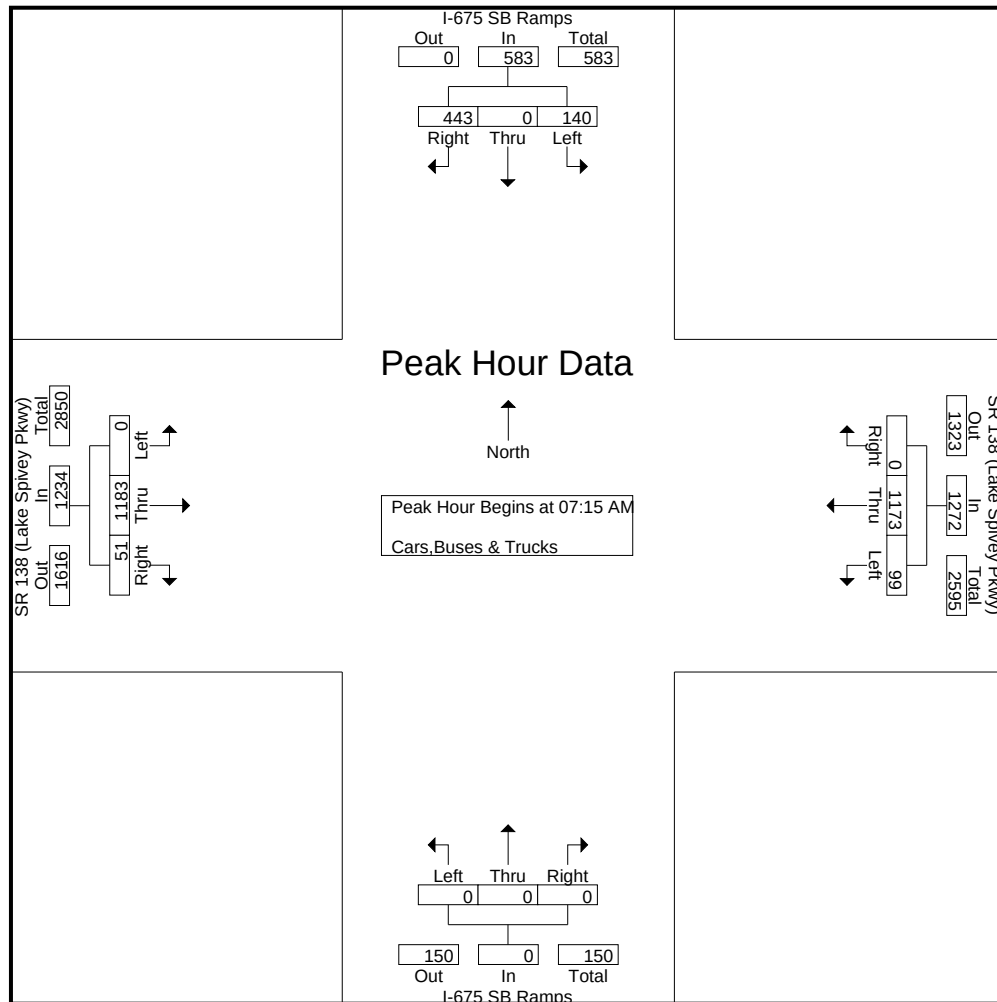
File Name : 20220516

Site Code : 20220516

Start Date : 12-13-2022

Page No : 2

	I-675 SB Ramps Northbound				I-675 SB Ramps Southbound				SR 138 (Lake Spivey Pkwy) Eastbound				SR 138 (Lake Spivey Pkwy) Westbound				
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	0	0	11	0	89	100	0	240	11	251	27	252	0	279	630
07:30 AM	0	0	0	0	38	0	110	148	0	309	14	323	29	302	0	331	802
07:45 AM	0	0	0	0	38	0	113	151	0	347	14	361	23	332	0	355	867
08:00 AM	0	0	0	0	53	0	131	184	0	287	12	299	20	287	0	307	790
Total Volume	0	0	0	0	140	0	443	583	0	1183	51	1234	99	1173	0	1272	3089
% App. Total	0	0	0	0	24	0	76		0	95.9	4.1		7.8	92.2	0		
PHF	.000	.000	.000	.000	.660	.000	.845	.792	.000	.852	.911	.855	.853	.883	.000	.896	.891



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Marietta, GA 30067

TMC DATA

SR 138 (Lake Spivey Pkwy) @ I-675 SB

Ramps

7-9 am | 4-6 pm

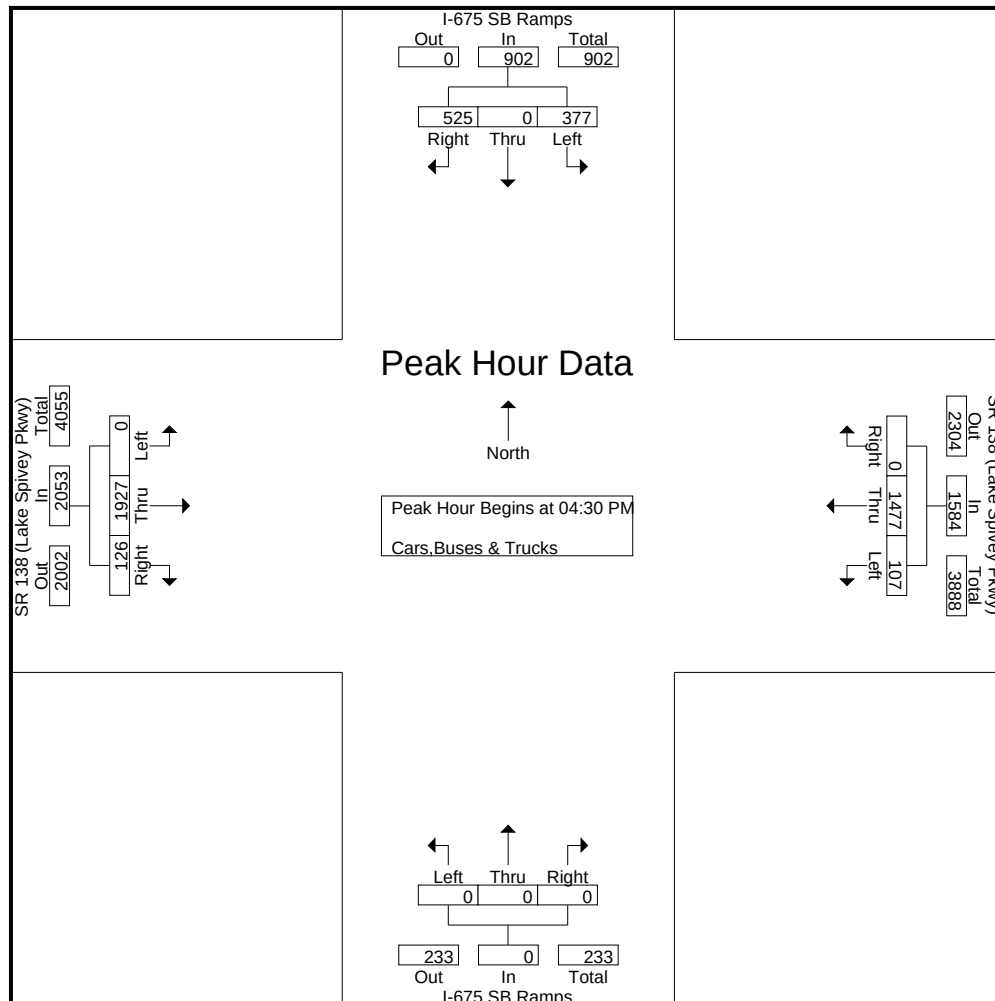
File Name : 20220516

Site Code : 20220516

Start Date : 12-13-2022

Page No : 3

	I-675 SB Ramps Northbound				I-675 SB Ramps Southbound				SR 138 (Lake Spivey Pkwy) Eastbound				SR 138 (Lake Spivey Pkwy) Westbound				
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 04:30 PM																	
04:30 PM	0	0	0	0	82	0	117	199	0	481	30	511	22	357	0	379	1089
04:45 PM	0	0	0	0	91	0	126	217	0	493	28	521	26	363	0	389	1127
05:00 PM	0	0	0	0	99	0	135	234	0	483	32	515	28	372	0	400	1149
05:15 PM	0	0	0	0	105	0	147	252	0	470	36	506	31	385	0	416	1174
Total Volume	0	0	0	0	377	0	525	902	0	1927	126	2053	107	1477	0	1584	4539
% App. Total	0	0	0	0	41.8	0	58.2		0	93.9	6.1		6.8	93.2	0		
PHF	.000	.000	.000	.000	.898	.000	.893	.895	.000	.977	.875	.985	.863	.959	.000	.952	.967



A & R Engineering, Inc.

2160 Kingston Court Suite 'O'
Marietta, GA 30067

TMC DATA

SR 138 (Spivey Lake Pkwy) @ Mt. Zion Rd-
Stockbridge Village Drwy
7-9 am | 4-6 pm

File Name : 20220523
Site Code : 20220523
Start Date : 12-13-2022
Page No : 1

Groups Printed- Cars,Buses & Trucks

	Stockbridge Village Drwy Northbound				Mt. Zion Rd Southbound				SR 138 (Spivey Lake Pkwy) Eastbound				SR 138 (Spivey Lake Pkwy) Westbound				
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	8	5	6	19	28	8	41	77	25	163	9	197	8	261	35	304	597
07:15 AM	12	7	8	27	35	15	43	93	28	194	12	234	6	244	29	279	633
07:30 AM	11	6	6	23	38	14	45	97	30	161	13	204	5	288	33	326	650
07:45 AM	13	8	7	28	35	13	49	97	32	295	9	336	7	328	25	360	821
Total	44	26	27	97	136	50	178	364	115	813	43	971	26	1121	122	1269	2701
08:00 AM	9	6	5	20	41	16	35	92	25	235	15	275	9	372	29	410	797
08:15 AM	8	8	8	24	28	11	27	66	26	224	12	262	8	300	31	339	691
08:30 AM	11	10	6	27	33	12	31	76	27	256	11	294	6	331	35	372	769
08:45 AM	12	11	5	28	36	8	25	69	23	245	16	284	8	271	33	312	693
Total	40	35	24	99	138	47	118	303	101	960	54	1115	31	1274	128	1433	2950
*** BREAK ***																	
04:00 PM	28	28	25	81	43	22	38	103	33	348	15	396	16	370	42	428	1008
04:15 PM	33	33	23	89	38	19	49	106	35	335	18	388	14	284	45	343	926
04:30 PM	29	25	24	78	45	28	45	118	41	389	16	446	18	315	39	372	1014
04:45 PM	31	34	26	91	41	26	44	111	36	376	19	431	19	297	47	363	996
Total	121	120	98	339	167	95	176	438	145	1448	68	1661	67	1266	173	1506	3944
05:00 PM	34	29	28	91	39	23	51	113	39	358	21	418	16	295	41	352	974
05:15 PM	33	28	27	88	46	25	49	120	42	396	22	460	17	320	38	375	1043
05:30 PM	31	35	21	87	44	21	43	108	35	411	18	464	19	321	35	375	1034
05:45 PM	29	31	25	85	36	19	38	93	43	368	23	434	18	329	36	383	995
Total	127	123	101	351	165	88	181	434	159	1533	84	1776	70	1265	150	1485	4046
Grand Total	332	304	250	886	606	280	653	1539	520	4754	249	5523	194	4926	573	5693	13641
Apprch %	37.5	34.3	28.2		39.4	18.2	42.4		9.4	86.1	4.5		3.4	86.5	10.1		
Total %	2.4	2.2	1.8	6.5	4.4	2.1	4.8	11.3	3.8	34.9	1.8	40.5	1.4	36.1	4.2	41.7	

A & R Engineering, Inc.

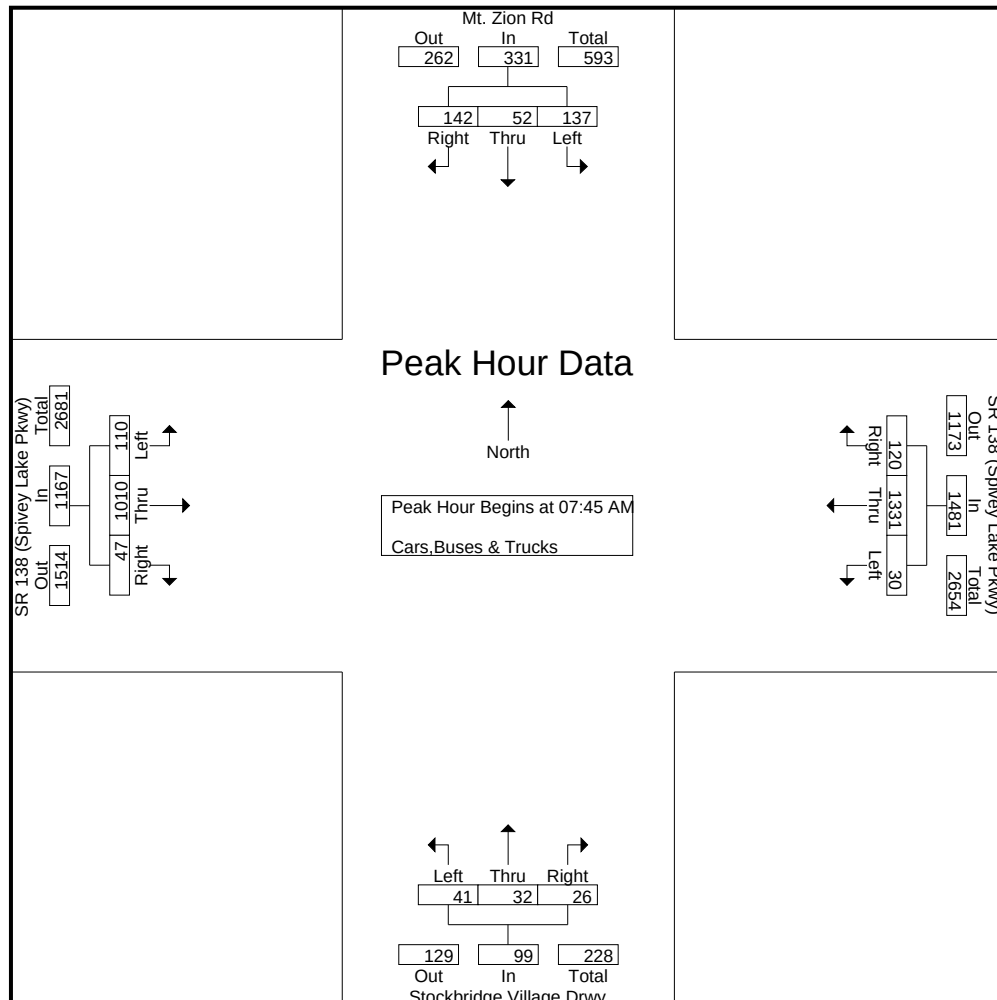
2160 Kingston Court Suite 'O'
Marietta, GA 30067

TMC DATA

SR 138 (Spivey Lake Pkwy) @ Mt. Zion Rd-
Stockbridge Village Drwy
7-9 am | 4-6 pm

File Name : 20220523
Site Code : 20220523
Start Date : 12-13-2022
Page No : 2

	Stockbridge Village Drwy Northbound				Mt. Zion Rd Southbound				SR 138 (Spivey Lake Pkwy) Eastbound				SR 138 (Spivey Lake Pkwy) Westbound				
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 07:45 AM																	
07:45 AM	13	8	7	28	35	13	49	97	32	295	9	336	7	328	25	360	821
08:00 AM	9	6	5	20	41	16	35	92	25	235	15	275	9	372	29	410	797
08:15 AM	8	8	8	24	28	11	27	66	26	224	12	262	8	300	31	339	691
08:30 AM	11	10	6	27	33	12	31	76	27	256	11	294	6	331	35	372	769
Total Volume	41	32	26	99	137	52	142	331	110	1010	47	1167	30	1331	120	1481	3078
% App. Total	41.4	32.3	26.3		41.4	15.7	42.9		9.4	86.5	4		2	89.9	8.1		
PHF	.788	.800	.813	.884	.835	.813	.724	.853	.859	.856	.783	.868	.833	.894	.857	.903	.937



A & R Engineering, Inc.

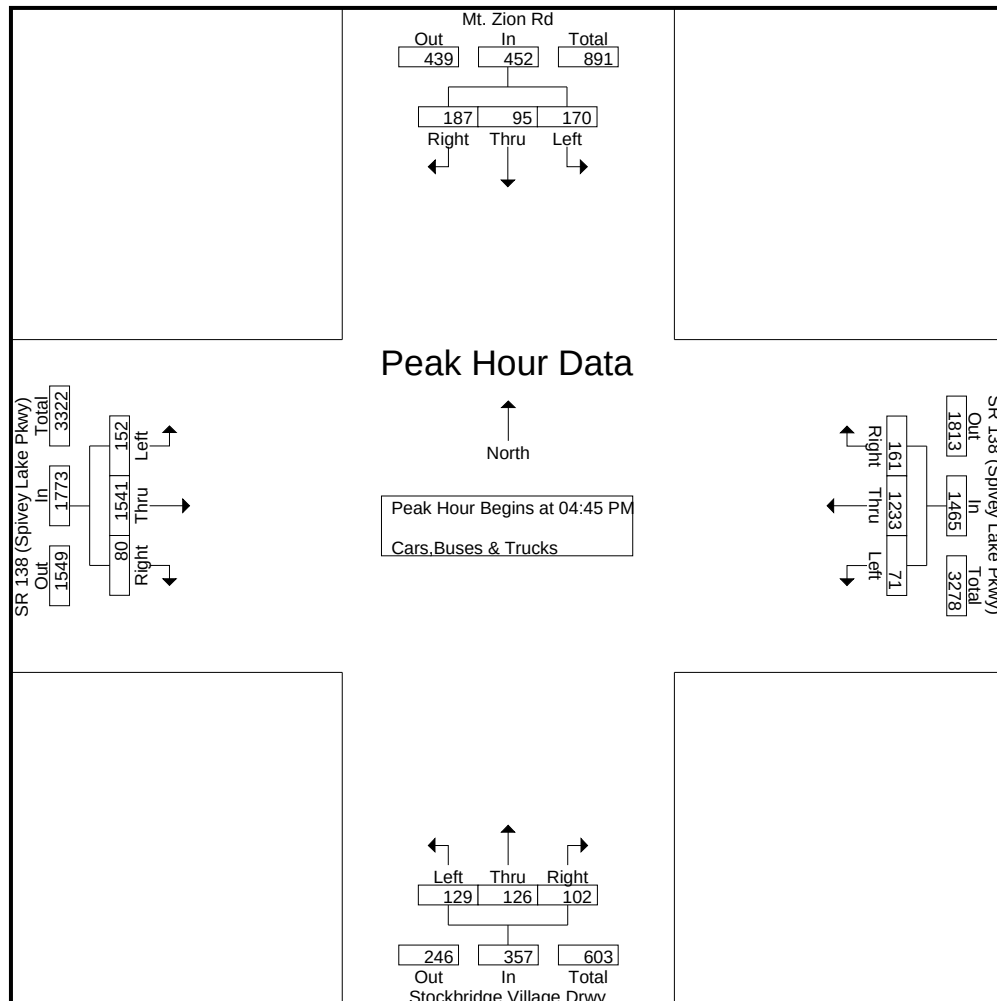
2160 Kingston Court Suite 'O'
Marietta, GA 30067

TMC DATA

SR 138 (Spivey Lake Pkwy) @ Mt. Zion Rd-
Stockbridge Village Drwy
7-9 am | 4-6 pm

File Name : 20220523
Site Code : 20220523
Start Date : 12-13-2022
Page No : 3

	Stockbridge Village Drwy Northbound				Mt. Zion Rd Southbound				SR 138 (Spivey Lake Pkwy) Eastbound				SR 138 (Spivey Lake Pkwy) Westbound				
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 04:45 PM																	
04:45 PM	31	34	26	91	41	26	44	111	36	376	19	431	19	297	47	363	996
05:00 PM	34	29	28	91	39	23	51	113	39	358	21	418	16	295	41	352	974
05:15 PM	33	28	27	88	46	25	49	120	42	396	22	460	17	320	38	375	1043
05:30 PM	31	35	21	87	44	21	43	108	35	411	18	464	19	321	35	375	1034
Total Volume	129	126	102	357	170	95	187	452	152	1541	80	1773	71	1233	161	1465	4047
% App. Total	36.1	35.3	28.6		37.6	21	41.4		8.6	86.9	4.5		4.8	84.2	11		
PHF	.949	.900	.911	.981	.924	.913	.917	.942	.905	.937	.909	.955	.934	.960	.856	.977	.970



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Marietta, GA 30067

TMC DATA
SR 138 (Lake Spivey Pkwy) @ I-75 NB Ramp
7-9 am | 4-6 pm

File Name : 20220520
Site Code : 20220520
Start Date : 12/8/2022
Page No : 1

Groups Printed- Cars,Buses & Trucks

	I-75 NB Ramp Northbound				I-75 NB Ramp Southbound				SR 138 (Lake Spivey Pkwy) Eastbound					SR 138 (Lake Spivey Pkwy) Westbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	52	0	16	68	0	0	0	0	110	181	0	2	293	0	162	148	310	671
07:15 AM	39	0	22	61	0	0	0	0	102	212	0	1	315	0	149	150	299	675
07:30 AM	44	0	16	60	0	0	0	0	115	188	0	1	304	0	186	158	344	708
07:45 AM	53	0	21	74	0	0	0	0	103	315	0	4	422	0	230	160	390	886
Total	188	0	75	263	0	0	0	0	430	896	0	8	1334	0	727	616	1343	2940
08:00 AM	63	0	31	94	0	0	0	0	125	244	0	1	370	0	266	150	416	880
08:15 AM	76	0	34	110	0	0	0	0	110	228	0	1	339	0	183	152	335	784
08:30 AM	51	0	36	87	0	0	0	0	87	258	0	1	346	0	198	175	373	806
08:45 AM	65	0	26	91	0	0	0	0	84	258	0	1	343	0	161	147	308	742
Total	255	0	127	382	0	0	0	0	406	988	0	4	1398	0	808	624	1432	3212
*** BREAK ***																		
04:00 PM	51	0	36	87	0	0	0	0	65	360	0	1	426	0	318	118	436	949
04:15 PM	40	0	30	70	0	0	0	0	66	358	0	2	426	0	256	110	366	862
04:30 PM	33	0	32	65	0	0	0	0	55	414	0	2	471	0	275	114	389	925
04:45 PM	43	0	27	70	0	0	0	0	66	404	0	2	472	0	271	101	372	914
Total	167	0	125	292	0	0	0	0	252	1536	0	7	1795	0	1120	443	1563	3650
05:00 PM	46	0	31	77	0	0	0	0	51	387	0	1	439	0	278	102	380	896
05:15 PM	38	0	39	77	0	0	0	0	62	421	0	5	488	0	283	119	402	967
05:30 PM	40	0	41	81	0	0	0	0	48	423	0	3	474	0	286	109	395	950
05:45 PM	52	0	21	73	0	0	0	0	56	413	0	2	471	0	294	102	396	940
Total	176	0	132	308	0	0	0	0	217	1644	0	11	1872	0	1141	432	1573	3753
Grand Total	786	0	459	1245	0	0	0	0	1305	5064	0	30	6399	0	3796	2115	5911	13555
Apprch %	63.1	0	36.9		0	0	0		20.4	79.1	0	0.5		0	64.2	35.8		
Total %	5.8	0	3.4	9.2	0	0	0	0	9.6	37.4	0	0.2	47.2	0	28	15.6	43.6	

A & R Engineering, Inc.

2160 Kingston Court Suite 'O'
Marietta, GA 30067

TMC DATA

SR 138 (Lake Spivey Pkwy) @ I-75 NB Ramp

7-9 am | 4-6 pm

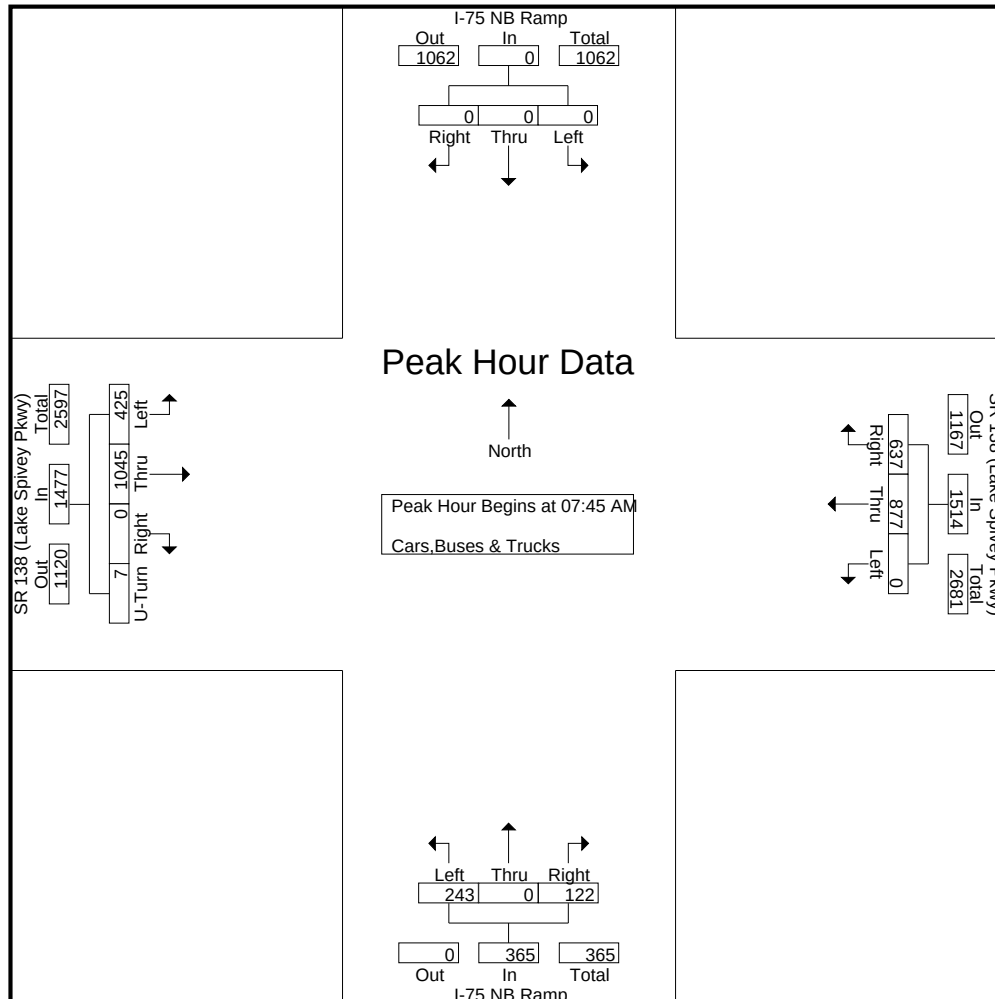
File Name : 20220520

Site Code : 20220520

Start Date : 12/8/2022

Page No : 2

	I-75 NB Ramp Northbound				I-75 NB Ramp Southbound				SR 138 (Lake Spivey Pkwy) Eastbound					SR 138 (Lake Spivey Pkwy) Westbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	U-Turn	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 07:45 AM																		
07:45 AM	53	0	21	74	0	0	0	0	103	315	0	4	422	0	230	160	390	886
08:00 AM	63	0	31	94	0	0	0	0	125	244	0	1	370	0	266	150	416	880
08:15 AM	76	0	34	110	0	0	0	0	110	228	0	1	339	0	183	152	335	784
08:30 AM	51	0	36	87	0	0	0	0	87	258	0	1	346	0	198	175	373	806
Total Volume	243	0	122	365	0	0	0	0	425	1045	0	7	1477	0	877	637	1514	3356
% App. Total	66.6	0	33.4		0	0	0		28.8	70.8	0	0.5		0	57.9	42.1		
PHF	.799	.000	.847	.830	.000	.000	.000	.000	.850	.829	.000	.438	.875	.000	.824	.910	.910	.947



A & R Engineering, Inc.

2160 Kingston Court Suite 'O'
Marietta, GA 30067

TMC DATA

SR 138 (Lake Spivey Pkwy) @ I-75 NB Ramp
7-9 am | 4-6 pm

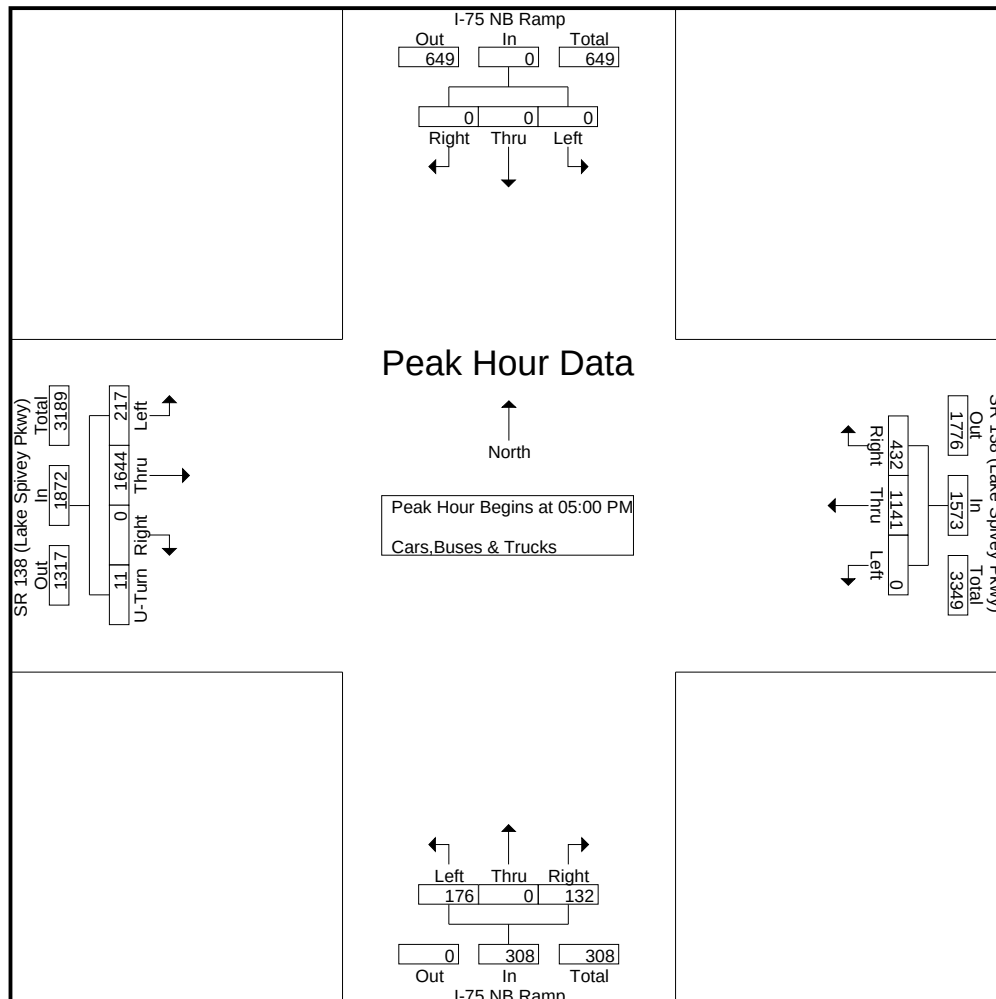
File Name : 20220520

Site Code : 20220520

Start Date : 12/8/2022

Page No : 3

	I-75 NB Ramp Northbound				I-75 NB Ramp Southbound				SR 138 (Lake Spivey Pkwy) Eastbound					SR 138 (Lake Spivey Pkwy) Westbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	U-Turn	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	46	0	31	77	0	0	0	0	51	387	0	1	439	0	278	102	380	896
05:15 PM	38	0	39	77	0	0	0	0	62	421	0	5	488	0	283	119	402	967
05:30 PM	40	0	41	81	0	0	0	0	48	423	0	3	474	0	286	109	395	950
05:45 PM	52	0	21	73	0	0	0	0	56	413	0	2	471	0	294	102	396	940
Total Volume	176	0	132	308	0	0	0	0	217	1644	0	11	1872	0	1141	432	1573	3753
% App. Total	57.1	0	42.9		0	0	0		11.6	87.8	0	0.6		0	72.5	27.5		
PHF	.846	.000	.805	.951	.000	.000	.000	.000	.875	.972	.000	.550	.959	.000	.970	.908	.978	.970



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2160 Kingston Court Suite 'O'
Marietta, GA 30067

TMC DATA

SR 138 (Lake Spivey Pkwy) @ I-75 SB Ramp

7-9 am | 4-6 pm

File Name : 20220521

Site Code : 20220521

Start Date : 12/8/2022

Page No : 1

Groups Printed- Cars,Buses & Trucks

	I-75 SB Ramp Northbound				I-75 SB Ramp Southbound				SR 138 (Lake Spivey Pkwy) Eastbound				SR 138 (Lake Spivey Pkwy) Westbound						
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total	
07:00 AM	0	0	0	0	55	0	40	95	0	235	36	271	18	192	0	1	211	577	
07:15 AM	0	0	0	0	69	0	22	91	0	243	45	288	8	176	0	2	186	565	
07:30 AM	0	0	0	0	50	0	34	84	0	251	48	299	11	213	0	2	226	609	
07:45 AM	0	0	0	0	90	0	63	153	0	326	65	391	26	250	0	2	278	822	
Total	0	0	0	0	264	0	159	423	0	1055	194	1249	63	831	0	7	901	2573	
08:00 AM	0	0	0	0	81	0	46	127	0	288	54	342	26	305	0	0	331	800	
08:15 AM	0	0	0	0	58	0	68	126	0	280	44	324	9	249	0	0	258	708	
08:30 AM	0	0	0	0	70	0	58	128	0	274	41	315	20	228	0	1	249	692	
08:45 AM	0	0	0	0	92	0	56	148	0	249	41	290	23	203	0	1	227	665	
Total	0	0	0	0	301	0	228	529	0	1091	180	1271	78	985	0	2	1065	2865	
*** BREAK ***																			
04:00 PM	0	0	0	0	140	0	94	234	0	284	56	340	21	347	0	1	369	943	
04:15 PM	0	0	0	0	134	0	121	255	0	288	63	351	26	274	0	2	302	908	
04:30 PM	0	0	0	0	196	0	95	291	0	269	64	333	24	281	0	4	309	933	
04:45 PM	0	0	0	0	185	0	115	300	0	282	64	346	18	292	0	3	313	959	
Total	0	0	0	0	655	0	425	1080	0	1123	247	1370	89	1194	0	10	1293	3743	
05:00 PM	0	0	0	0	150	0	119	269	0	286	70	356	26	296	0	2	324	949	
05:15 PM	0	0	0	0	189	0	124	313	0	292	76	368	22	309	0	2	333	1014	
05:30 PM	0	0	0	0	160	0	134	294	0	304	77	381	47	283	0	7	337	1012	
05:45 PM	0	0	0	0	188	0	114	302	0	277	53	330	42	300	0	4	346	978	
Total	0	0	0	0	687	0	491	1178	0	1159	276	1435	137	1188	0	15	1340	3953	
Grand Total	0	0	0	0	1907	0	1303	3210	0	4428	897	5325	367	4198	0	34	4599	13134	
Apprch %	0	0	0		59.4	0	40.6		0	83.2	16.8		8	91.3	0	0.7			
Total %	0	0	0	0	14.5	0	9.9	24.4	0	33.7	6.8	40.5	2.8	32	0	0.3	35		

A & R Engineering, Inc.

2160 Kingston Court Suite 'O'
Marietta, GA 30067

TMC DATA

SR 138 (Lake Spivey Pkwy) @ I-75 SB Ramp

7-9 am | 4-6 pm

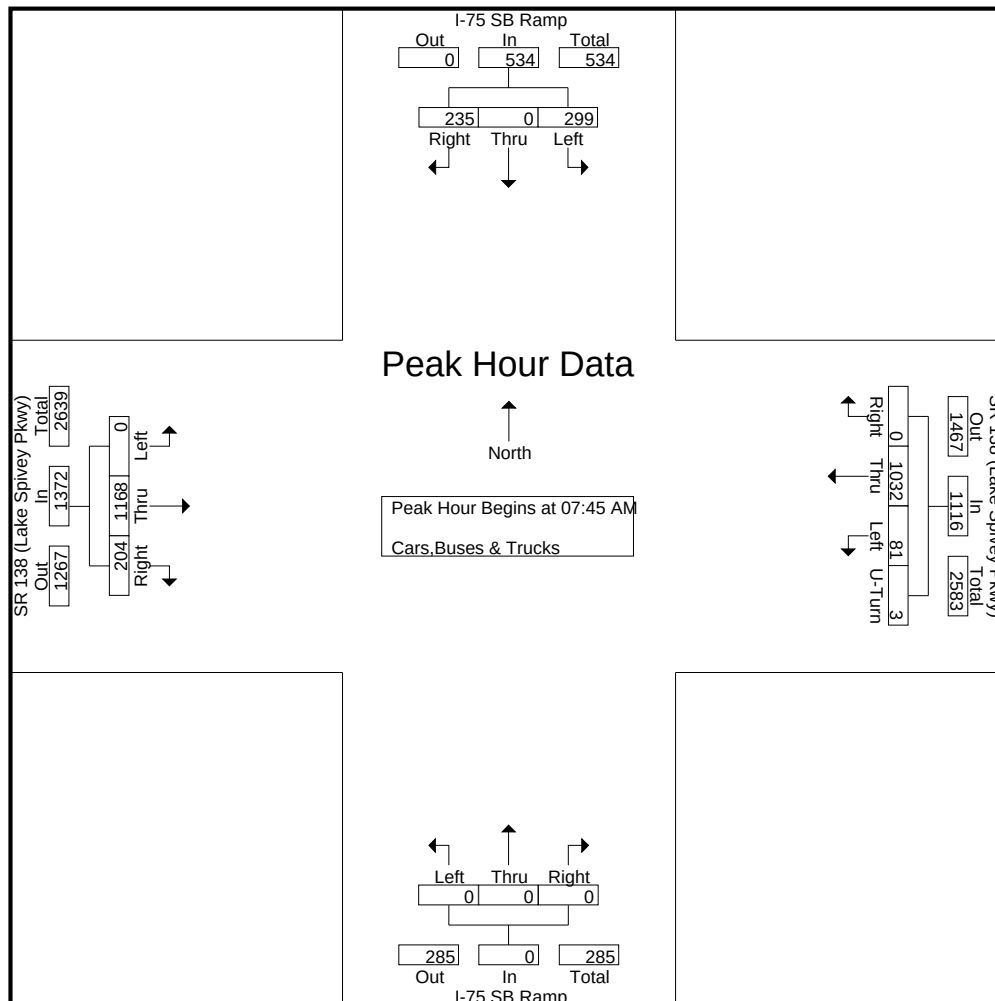
File Name : 20220521

Site Code : 20220521

Start Date : 12/8/2022

Page No : 2

	I-75 SB Ramp Northbound				I-75 SB Ramp Southbound				SR 138 (Lake Spivey Pkwy) Eastbound				SR 138 (Lake Spivey Pkwy) Westbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	U-Turn	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 07:45 AM																		
07:45 AM	0	0	0	0	90	0	63	153	0	326	65	391	26	250	0	2	278	822
08:00 AM	0	0	0	0	81	0	46	127	0	288	54	342	26	305	0	0	331	800
08:15 AM	0	0	0	0	58	0	68	126	0	280	44	324	9	249	0	0	258	708
08:30 AM	0	0	0	0	70	0	58	128	0	274	41	315	20	228	0	1	249	692
Total Volume	0	0	0	0	299	0	235	534	0	1168	204	1372	81	1032	0	3	1116	3022
% App. Total	0	0	0	0	56	0	44		0	85.1	14.9		7.3	92.5	0	0.3		
PHF	.000	.000	.000	.000	.831	.000	.864	.873	.000	.896	.785	.877	.779	.846	.000	.375	.843	.919



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2160 Kingston Court Suite 'O'
Marietta, GA 30067

TMC DATA

SR 138 (Lake Spivey Pkwy) @ I-75 SB Ramp

7-9 am | 4-6 pm

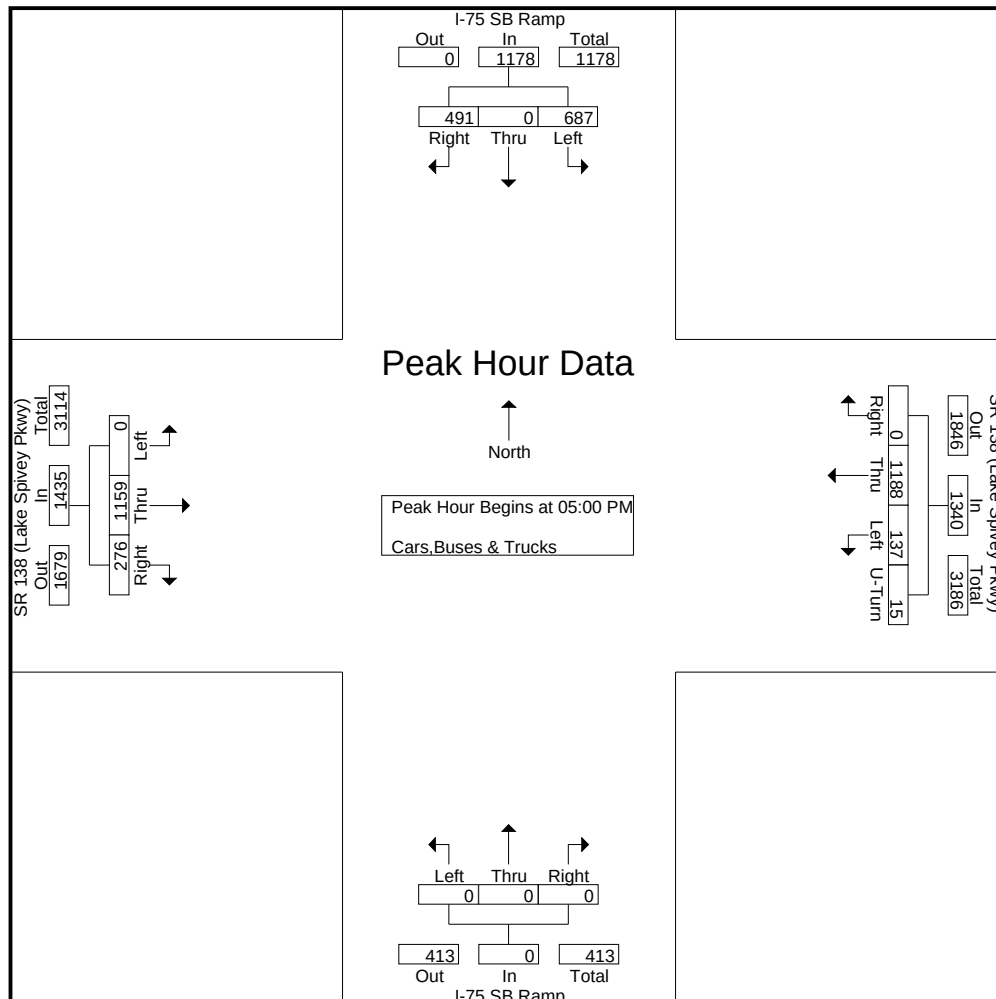
File Name : 20220521

Site Code : 20220521

Start Date : 12/8/2022

Page No : 3

	I-75 SB Ramp Northbound				I-75 SB Ramp Southbound				SR 138 (Lake Spivey Pkwy) Eastbound				SR 138 (Lake Spivey Pkwy) Westbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	U-Turn	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	0	0	0	0	150	0	119	269	0	286	70	356	26	296	0	2	324	949
05:15 PM	0	0	0	0	189	0	124	313	0	292	76	368	22	309	0	2	333	1014
05:30 PM	0	0	0	0	160	0	134	294	0	304	77	381	47	283	0	7	337	1012
05:45 PM	0	0	0	0	188	0	114	302	0	277	53	330	42	300	0	4	346	978
Total Volume	0	0	0	0	687	0	491	1178	0	1159	276	1435	137	1188	0	15	1340	3953
% App. Total	0	0	0	0	58.3	0	41.7		0	80.8	19.2		10.2	88.7	0	1.1		
PHF	.000	.000	.000	.000	.909	.000	.916	.941	.000	.953	.896	.942	.729	.961	.000	.536	.968	.975



A & R Engineering, Inc.

2160 Kingston Court Suite 'O'
Marietta, GA 30067

TMC DATA
SR 138 (Lake Spivey Pkwy) @ Speer Rd -
Mt Zion Pkwy
7-9 am | 4-6 pm

File Name : 20220519
Site Code : 20220519
Start Date : 12/8/2022
Page No : 1

Groups Printed- Cars,Buses & Trucks

	Speer Rd Northbound				Mt Zion Pkwy Southbound				SR 138 (Lake Spivey Pkwy) Eastbound					SR 138 (Lake Spivey Pkwy) Westbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
07:00 AM	13	20	118	151	22	14	5	41	4	123	5	1	133	38	124	23	11	196	521
07:15 AM	22	28	115	165	22	13	4	39	9	143	7	1	160	34	155	29	11	229	593
07:30 AM	27	51	146	224	43	9	8	60	13	161	8	1	183	65	173	41	13	292	759
07:45 AM	20	47	113	180	40	17	22	79	14	167	5	2	188	63	199	59	7	328	775
Total	82	146	492	720	127	53	39	219	40	594	25	5	664	200	651	152	42	1045	2648
08:00 AM	16	47	109	172	44	24	11	79	20	137	16	2	175	74	150	66	11	301	727
08:15 AM	13	48	112	173	40	25	14	79	15	140	6	1	162	73	150	28	6	257	671
08:30 AM	10	25	86	121	40	17	5	62	17	147	9	2	175	50	144	33	6	233	591
08:45 AM	10	35	88	133	34	24	8	66	17	113	13	1	144	70	124	36	13	243	586
Total	49	155	395	599	158	90	38	286	69	537	44	6	656	267	568	163	36	1034	2575
*** BREAK ***																			
04:00 PM	17	42	78	137	67	61	25	153	33	162	21	9	225	112	167	43	23	345	860
04:15 PM	10	43	69	122	78	70	36	184	38	180	13	2	233	111	203	46	16	376	915
04:30 PM	11	35	51	97	67	61	27	155	25	170	21	2	218	115	196	39	14	364	834
04:45 PM	12	38	74	124	68	80	23	171	36	183	22	3	244	117	224	45	16	402	941
Total	50	158	272	480	280	272	111	663	132	695	77	16	920	455	790	173	69	1487	3550
05:00 PM	17	47	59	123	100	74	43	217	35	184	10	4	233	98	183	44	11	336	909
05:15 PM	13	35	72	120	73	62	34	169	36	193	23	5	257	108	208	42	10	368	914
05:30 PM	12	35	70	117	73	66	26	165	26	161	20	3	210	125	208	34	11	378	870
05:45 PM	13	43	51	107	101	84	40	225	23	131	19	5	178	100	183	44	20	347	857
Total	55	160	252	467	347	286	143	776	120	669	72	17	878	431	782	164	52	1429	3550
Grand Total	236	619	1411	2266	912	701	331	1944	361	2495	218	44	3118	1353	2791	652	199	4995	12323
Apprch %	10.4	27.3	62.3		46.9	36.1	17		11.6	80	7	1.4		27.1	55.9	13.1	4		
Total %	1.9	5	11.5	18.4	7.4	5.7	2.7	15.8	2.9	20.2	1.8	0.4	25.3	11	22.6	5.3	1.6	40.5	

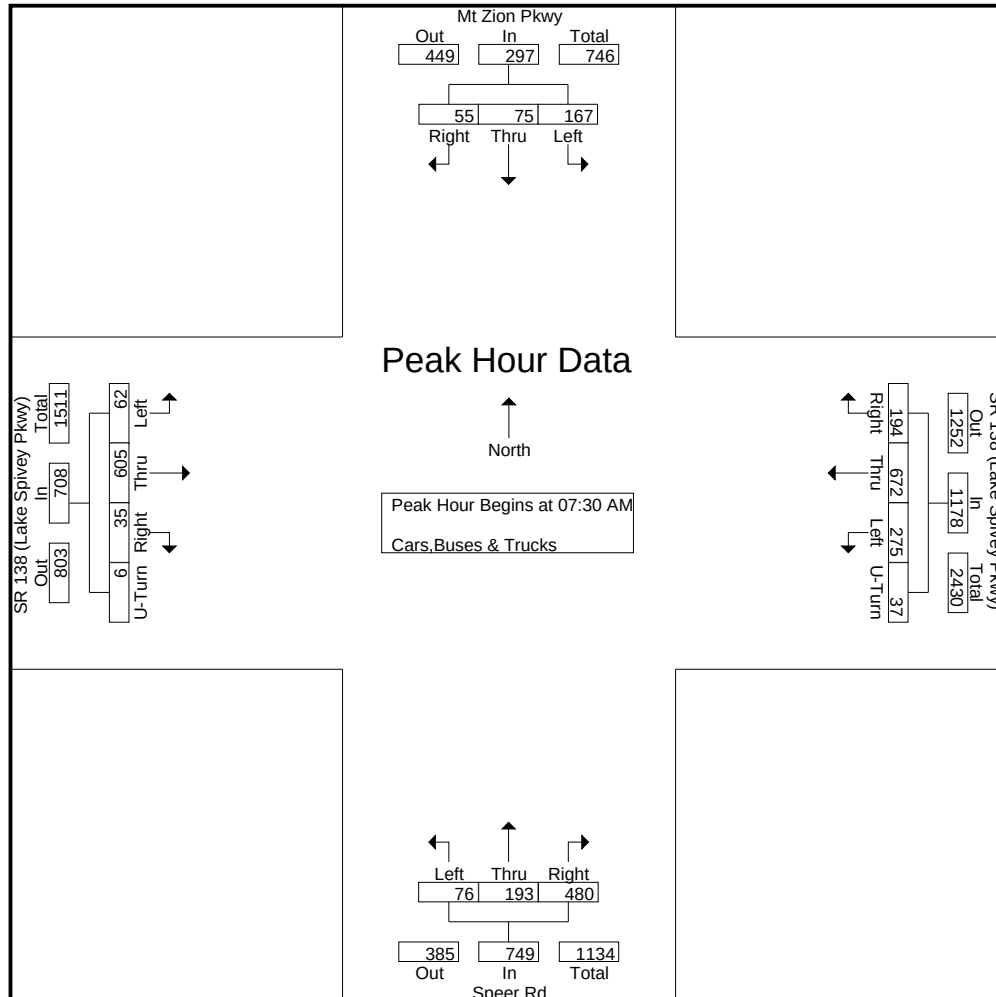
A & R Engineering, Inc.

2160 Kingston Court Suite 'O'
Marietta, GA 30067

TMC DATA
SR 138 (Lake Spivey Pkwy) @ Speer Rd -
Mt Zion Pkwy
7-9 am | 4-6 pm

File Name : 20220519
Site Code : 20220519
Start Date : 12/8/2022
Page No : 2

	Speer Rd Northbound				Mt Zion Pkwy Southbound				SR 138 (Lake Spivey Pkwy) Eastbound					SR 138 (Lake Spivey Pkwy) Westbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	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 07:30 AM																			
07:30 AM	27	51	146	224	43	9	8	60	13	161	8	1	183	65	173	41	13	292	759
07:45 AM	20	47	113	180	40	17	22	79	14	167	5	2	188	63	199	59	7	328	775
08:00 AM	16	47	109	172	44	24	11	79	20	137	16	2	175	74	150	66	11	301	727
08:15 AM	13	48	112	173	40	25	14	79	15	140	6	1	162	73	150	28	6	257	671
Total Volume	76	193	480	749	167	75	55	297	62	605	35	6	708	275	672	194	37	1178	2932
% App. Total	10.1	25.8	64.1		56.2	25.3	18.5		8.8	85.5	4.9	0.8		23.3	57	16.5	3.1		
PHF	.704	.946	.822	.836	.949	.750	.625	.940	.775	.906	.547	.750	.941	.929	.844	.735	.712	.898	.946



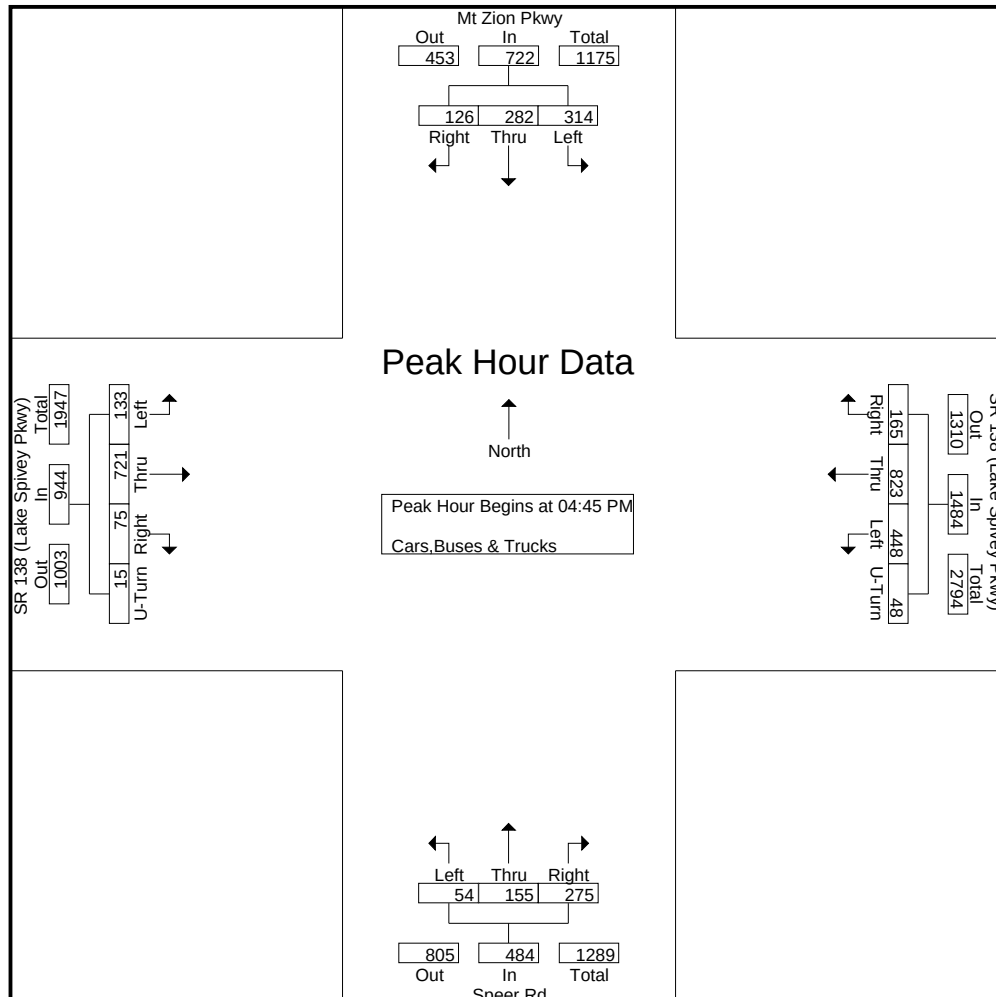
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TMC DATA
SR 138 (Lake Spivey Pkwy) @ Speer Rd -
Mt Zion Pkwy
7-9 am | 4-6 pm

File Name : 20220519
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Page No : 3

	Speer Rd Northbound				Mt Zion Pkwy Southbound				SR 138 (Lake Spivey Pkwy) Eastbound					SR 138 (Lake Spivey Pkwy) Westbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	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 04:45 PM																			
04:45 PM	12	38	74	124	68	80	23	171	36	183	22	3	244	117	224	45	16	402	941
05:00 PM	17	47	59	123	100	74	43	217	35	184	10	4	233	98	183	44	11	336	909
05:15 PM	13	35	72	120	73	62	34	169	36	193	23	5	257	108	208	42	10	368	914
05:30 PM	12	35	70	117	73	66	26	165	26	161	20	3	210	125	208	34	11	378	870
Total Volume	54	155	275	484	314	282	126	722	133	721	75	15	944	448	823	165	48	1484	3634
% App. Total	11.2	32	56.8		43.5	39.1	17.5		14.1	76.4	7.9	1.6		30.2	55.5	11.1	3.2		
PHF	.794	.824	.929	.976	.785	.881	.733	.832	.924	.934	.815	.750	.918	.896	.919	.917	.750	.923	.965



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TMC DATA
Lake Spivey Pkwy @ Spivey Rd
7-9 am | 4-6 pm

File Name : 20220518
Site Code : 20220518
Start Date : 12/7/2022
Page No : 1

Groups Printed- Cars,Buses & Trucks

	Spivey Rd Northbound				Southbound				Lake Spivey Pkwy Eastbound				Lake Spivey Pkwy Westbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
07:00 AM	2	0	50	52	0	0	0	0	0	111	1	112	9	122	0	0	131	295
07:15 AM	7	0	43	50	0	0	0	0	0	93	0	93	17	147	0	1	165	308
07:30 AM	8	0	54	62	0	0	0	0	0	143	5	148	17	178	0	0	195	405
07:45 AM	12	0	60	72	0	0	0	0	0	142	7	149	23	223	0	0	246	467
Total	29	0	207	236	0	0	0	0	0	489	13	502	66	670	0	1	737	1475
08:00 AM	4	0	43	47	0	0	0	0	0	164	1	165	28	187	0	0	215	427
08:15 AM	8	0	42	50	0	0	0	0	0	137	8	145	26	171	0	0	197	392
08:30 AM	7	0	44	51	0	0	0	0	0	122	4	126	19	153	0	0	172	349
08:45 AM	3	0	34	37	0	0	0	0	0	121	3	124	28	131	0	0	159	320
Total	22	0	163	185	0	0	0	0	0	544	16	560	101	642	0	0	743	1488
*** BREAK ***																		
04:00 PM	0	0	58	58	0	0	0	0	0	199	5	204	66	201	0	8	275	537
04:15 PM	5	0	35	40	0	0	0	0	0	158	5	163	56	178	0	12	246	449
04:30 PM	4	0	27	31	0	0	0	0	0	196	11	207	65	170	0	10	245	483
04:45 PM	6	0	36	42	0	0	0	0	0	171	4	175	57	172	0	11	240	457
Total	15	0	156	171	0	0	0	0	0	724	25	749	244	721	0	41	1006	1926
05:00 PM	2	0	52	54	0	0	0	0	0	219	3	222	63	209	0	14	286	562
05:15 PM	5	0	30	35	0	0	0	0	0	181	14	195	57	179	0	20	256	486
05:30 PM	2	0	50	52	0	0	0	0	0	171	7	178	64	187	0	9	260	490
05:45 PM	4	0	47	51	0	0	0	0	0	159	5	164	66	181	0	7	254	469
Total	13	0	179	192	0	0	0	0	0	730	29	759	250	756	0	50	1056	2007
Grand Total	79	0	705	784	0	0	0	0	0	2487	83	2570	661	2789	0	92	3542	6896
Apprch %	10.1	0	89.9		0	0	0		0	96.8	3.2		18.7	78.7	0	2.6		
Total %	1.1	0	10.2	11.4	0	0	0	0	0	36.1	1.2	37.3	9.6	40.4	0	1.3	51.4	

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TMC DATA

Lake Spivey Pkwy @ Spivey Rd

7-9 am | 4-6 pm

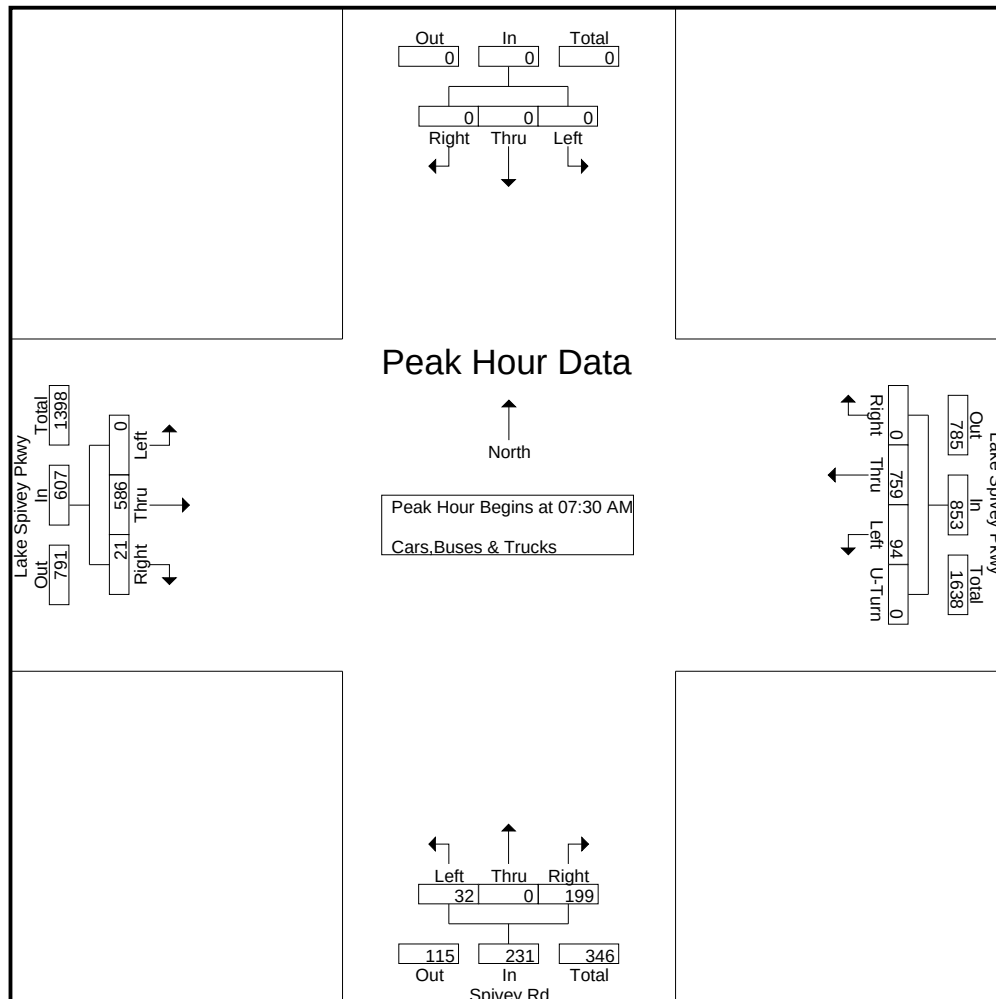
File Name : 20220518

Site Code : 20220518

Start Date : 12/7/2022

Page No : 2

	Spivey Rd Northbound				Southbound				Lake Spivey Pkwy Eastbound				Lake Spivey Pkwy Westbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	U-Turn	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 07:30 AM																		
07:30 AM	8	0	54	62	0	0	0	0	0	143	5	148	17	178	0	0	195	405
07:45 AM	12	0	60	72	0	0	0	0	0	142	7	149	23	223	0	0	246	467
08:00 AM	4	0	43	47	0	0	0	0	0	164	1	165	28	187	0	0	215	427
08:15 AM	8	0	42	50	0	0	0	0	0	137	8	145	26	171	0	0	197	392
Total Volume	32	0	199	231	0	0	0	0	0	586	21	607	94	759	0	0	853	1691
% App. Total	13.9	0	86.1		0	0	0		0	96.5	3.5		11	89	0	0		
PHF	.667	.000	.829	.802	.000	.000	.000	.000	.000	.893	.656	.920	.839	.851	.000	.000	.867	.905



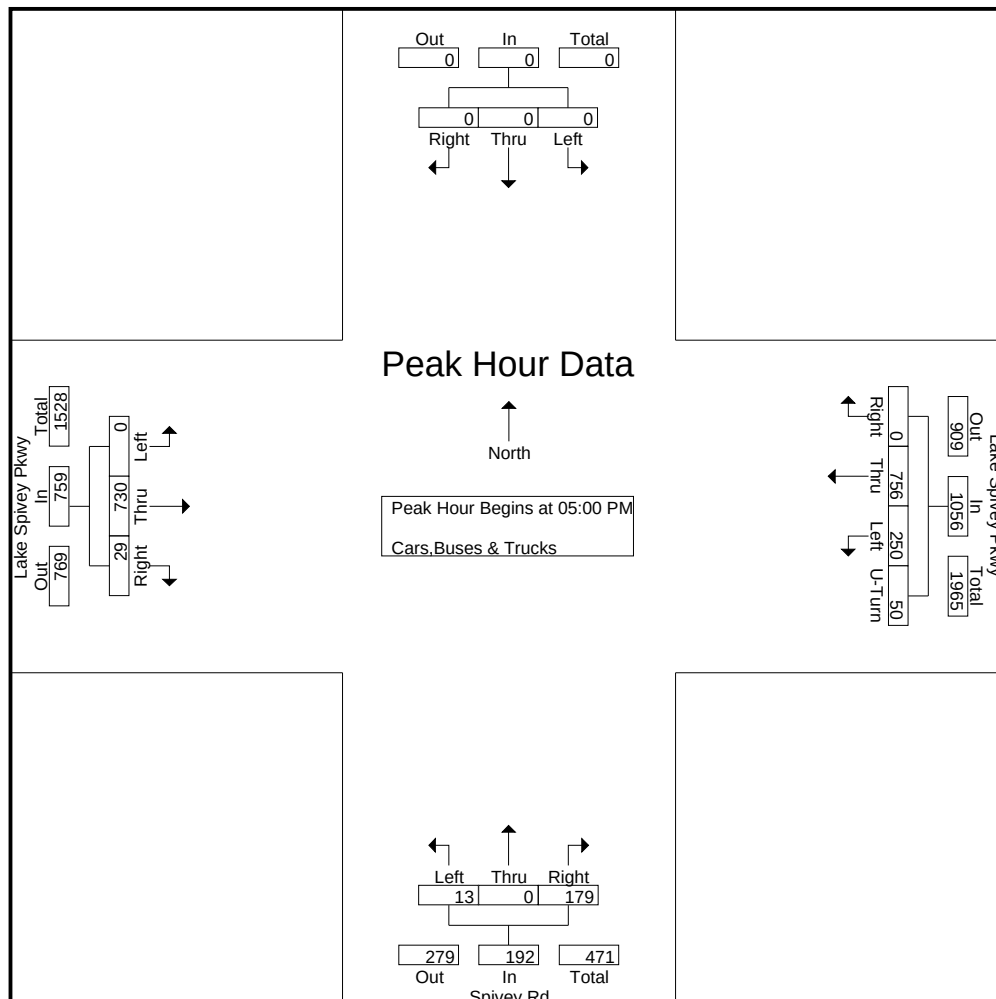
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TMC DATA
Lake Spivey Pkwy @ Spivey Rd
7-9 am | 4-6 pm

File Name : 20220518
Site Code : 20220518
Start Date : 12/7/2022
Page No : 3

	Spivey Rd Northbound				Southbound				Lake Spivey Pkwy Eastbound				Lake Spivey Pkwy Westbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	U-Turn	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	2	0	52	54	0	0	0	0	0	219	3	222	63	209	0	14	286	562
05:15 PM	5	0	30	35	0	0	0	0	0	181	14	195	57	179	0	20	256	486
05:30 PM	2	0	50	52	0	0	0	0	0	171	7	178	64	187	0	9	260	490
05:45 PM	4	0	47	51	0	0	0	0	0	159	5	164	66	181	0	7	254	469
Total Volume	13	0	179	192	0	0	0	0	0	730	29	759	250	756	0	50	1056	2007
% App. Total	6.8	0	93.2		0	0	0		0	96.2	3.8		23.7	71.6	0	4.7		
PHF	.650	.000	.861	.889	.000	.000	.000	.000	.000	.833	.518	.855	.947	.904	.000	.625	.923	.893



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TMC DATA

Walt Stephens Rd @ Speer Rd-Blackhall Rd

7-9 am | 4-6 pm

File Name : 20220517

Site Code : 20220517

Start Date : 12/8/2022

Page No : 1

Groups Printed- Cars,Buses & Trucks

	Blackhall Rd Northbound				Speer Rd Southbound				Walt Stephens Rd Eastbound				Walt Stephens Rd Westbound				
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	6	64	11	81	26	22	0	48	2	27	4	33	13	51	96	160	322
07:15 AM	6	86	13	105	29	17	1	47	2	41	7	50	24	63	117	204	406
07:30 AM	6	118	9	133	36	23	4	63	4	38	16	58	34	51	121	206	460
07:45 AM	15	90	16	121	29	26	3	58	3	43	11	57	21	61	78	160	396
Total	33	358	49	440	120	88	8	216	11	149	38	198	92	226	412	730	1584
08:00 AM	13	93	17	123	42	35	2	79	5	38	11	54	27	47	71	145	401
08:15 AM	12	67	15	94	22	38	0	60	2	42	16	60	21	39	64	124	338
08:30 AM	5	74	20	99	30	24	5	59	3	31	15	49	21	26	60	107	314
08:45 AM	5	42	18	65	39	43	2	84	3	40	6	49	9	37	71	117	315
Total	35	276	70	381	133	140	9	282	13	151	48	212	78	149	266	493	1368
*** BREAK ***																	
04:00 PM	16	53	25	94	94	87	4	185	12	60	12	84	17	38	49	104	467
04:15 PM	15	45	26	86	103	73	4	180	8	71	21	100	30	48	52	130	496
04:30 PM	12	42	31	85	94	72	2	168	12	75	14	101	20	52	60	132	486
04:45 PM	16	57	23	96	109	84	9	202	5	81	19	105	22	56	52	130	533
Total	59	197	105	361	400	316	19	735	37	287	66	390	89	194	213	496	1982
05:00 PM	9	47	24	80	123	74	0	197	6	82	15	103	31	57	61	149	529
05:15 PM	16	46	21	83	89	86	3	178	10	84	15	109	24	50	63	137	507
05:30 PM	17	41	28	86	100	77	2	179	8	75	13	96	21	48	59	128	489
05:45 PM	6	54	31	91	105	83	1	189	5	83	13	101	27	57	54	138	519
Total	48	188	104	340	417	320	6	743	29	324	56	409	103	212	237	552	2044
Grand Total	175	1019	328	1522	1070	864	42	1976	90	911	208	1209	362	781	1128	2271	6978
Apprch %	11.5	67	21.6		54.1	43.7	2.1		7.4	75.4	17.2		15.9	34.4	49.7		
Total %	2.5	14.6	4.7	21.8	15.3	12.4	0.6	28.3	1.3	13.1	3	17.3	5.2	11.2	16.2	32.5	

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TMC DATA

Walt Stephens Rd @ Speer Rd-Blackhall Rd

7-9 am | 4-6 pm

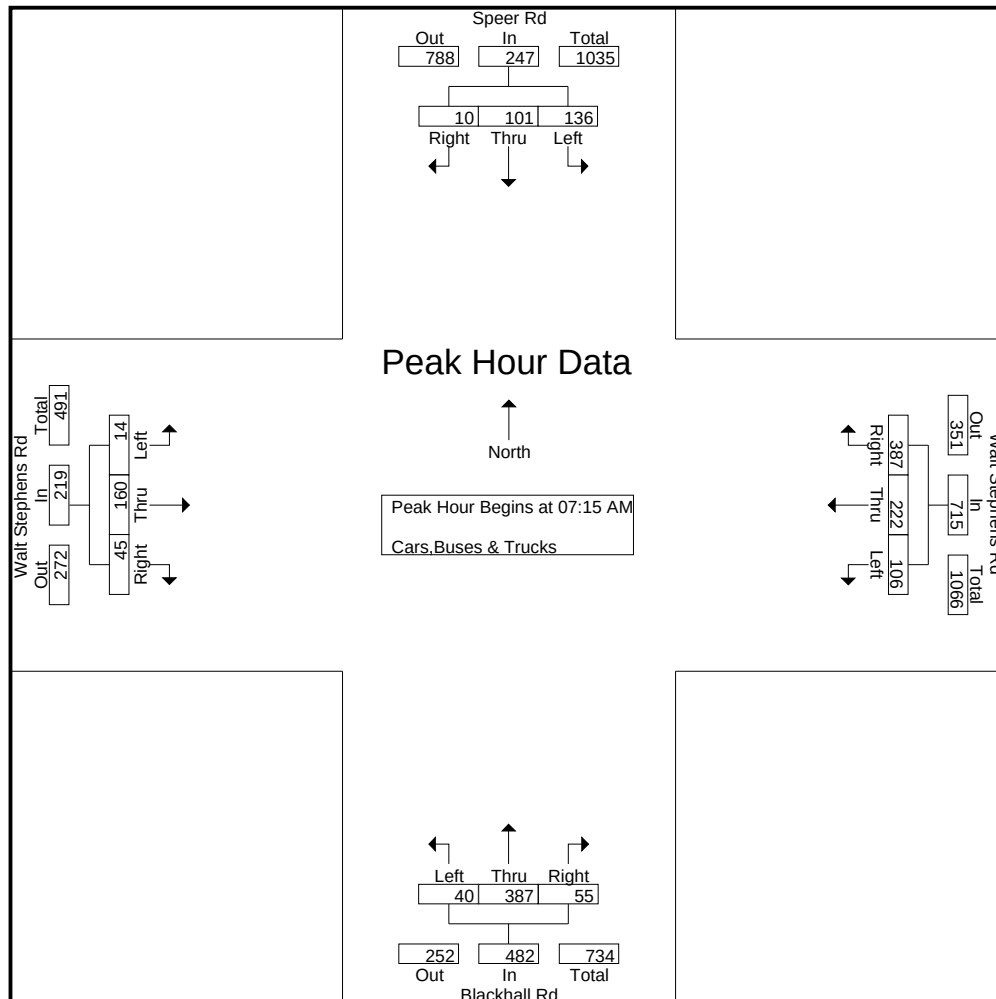
File Name : 20220517

Site Code : 20220517

Start Date : 12/8/2022

Page No : 2

	Blackhall Rd Northbound				Speer Rd Southbound				Walt Stephens Rd Eastbound				Walt Stephens Rd Westbound				
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	6	86	13	105	29	17	1	47	2	41	7	50	24	63	117	204	406
07:30 AM	6	118	9	133	36	23	4	63	4	38	16	58	34	51	121	206	460
07:45 AM	15	90	16	121	29	26	3	58	3	43	11	57	21	61	78	160	396
08:00 AM	13	93	17	123	42	35	2	79	5	38	11	54	27	47	71	145	401
Total Volume	40	387	55	482	136	101	10	247	14	160	45	219	106	222	387	715	1663
% App. Total	8.3	80.3	11.4		55.1	40.9	4		6.4	73.1	20.5		14.8	31	54.1		
PHF	.667	.820	.809	.906	.810	.721	.625	.782	.700	.930	.703	.944	.779	.881	.800	.868	.904



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TMC DATA

Walt Stephens Rd @ Speer Rd-Blackhall Rd

7-9 am | 4-6 pm

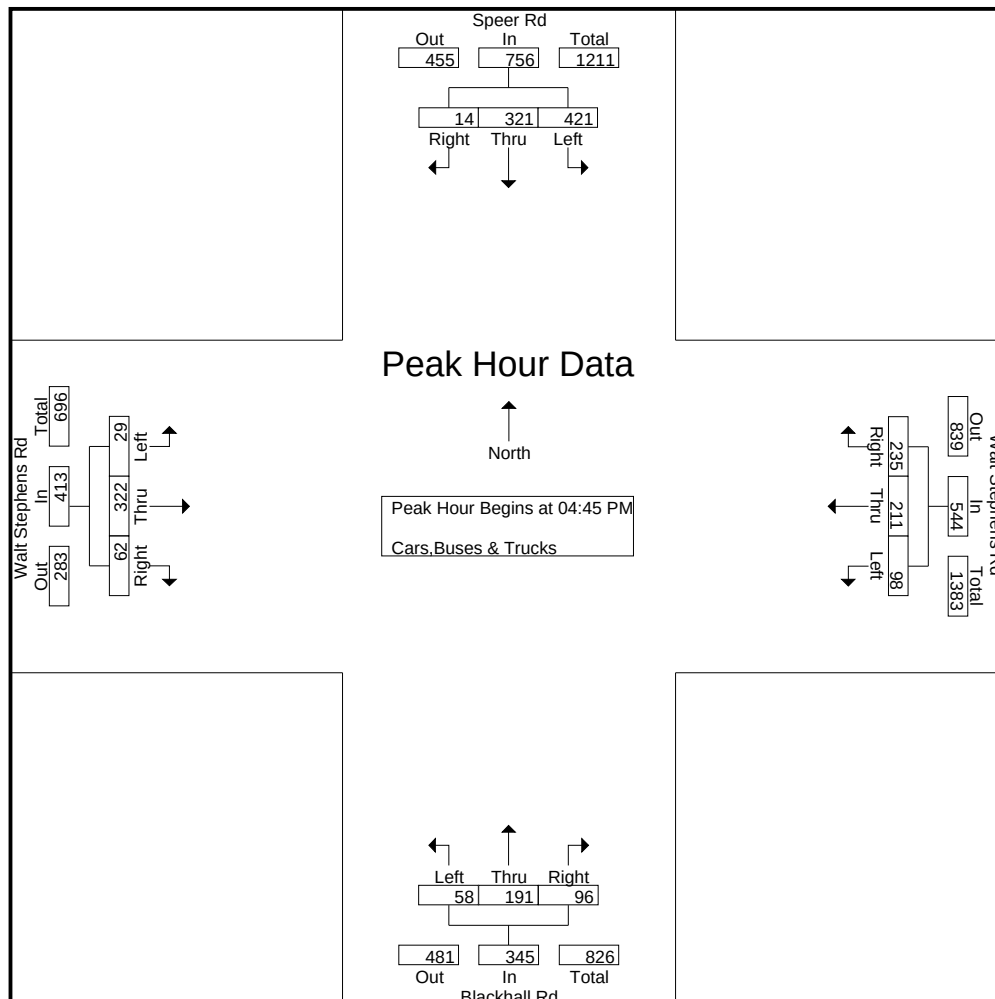
File Name : 20220517

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Start Date : 12/8/2022

Page No : 3

	Blackhall Rd Northbound				Speer Rd Southbound				Walt Stephens Rd Eastbound				Walt Stephens Rd Westbound				
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 04:45 PM																	
04:45 PM	16	57	23	96	109	84	9	202	5	81	19	105	22	56	52	130	533
05:00 PM	9	47	24	80	123	74	0	197	6	82	15	103	31	57	61	149	529
05:15 PM	16	46	21	83	89	86	3	178	10	84	15	109	24	50	63	137	507
05:30 PM	17	41	28	86	100	77	2	179	8	75	13	96	21	48	59	128	489
Total Volume	58	191	96	345	421	321	14	756	29	322	62	413	98	211	235	544	2058
% App. Total	16.8	55.4	27.8		55.7	42.5	1.9		7	78	15		18	38.8	43.2		
PHF	.853	.838	.857	.898	.856	.933	.389	.936	.725	.958	.816	.947	.790	.925	.933	.913	.965



Character Areas

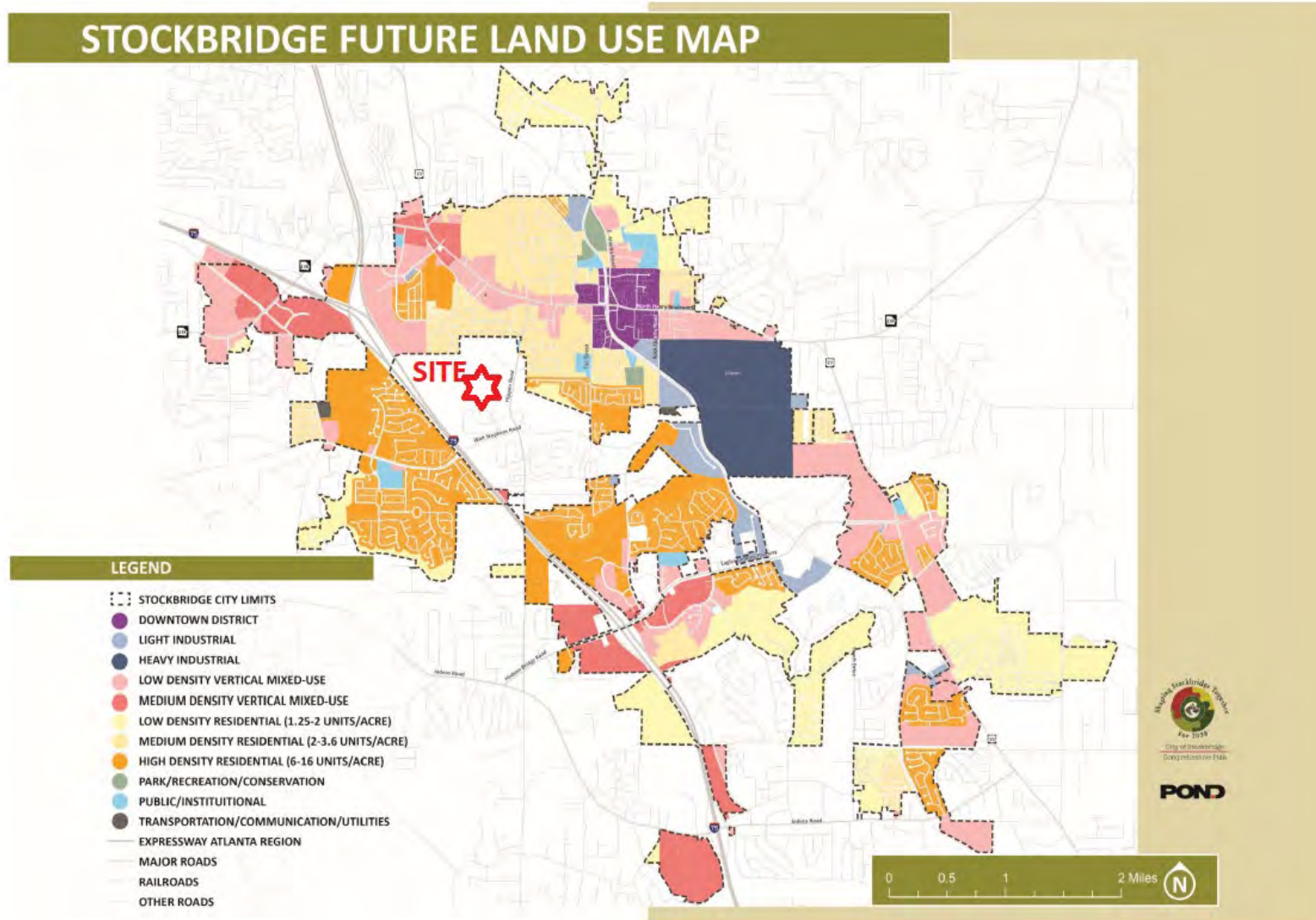
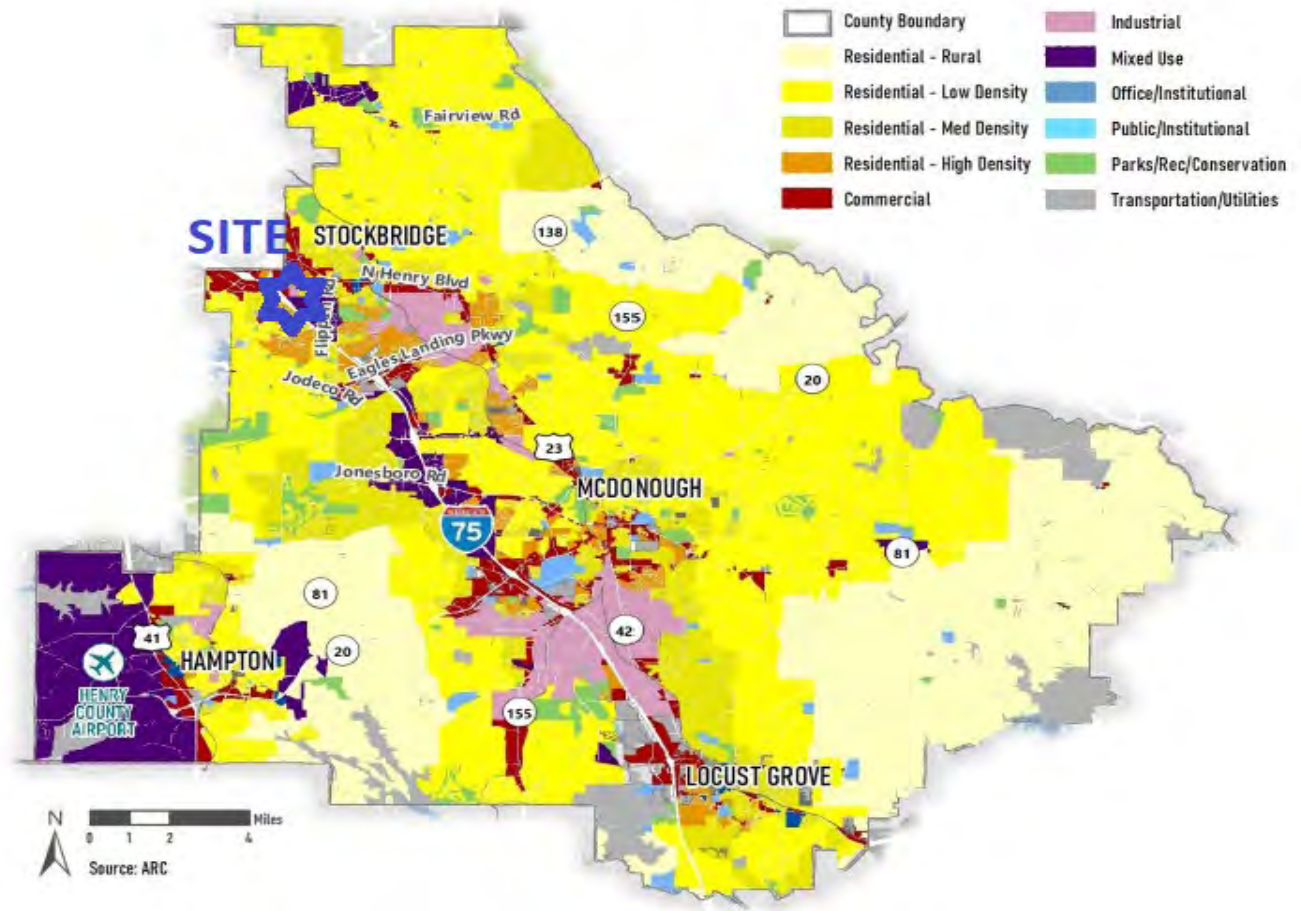


Figure 3.1 Future Land Use Map

FIGURE 3-2: HENRY COUNTY'S FUTURE LAND USE MAP



GRTA Letter of Understanding



LETTER OF UNDERSTANDING

December 5, 2022

Michael Neyhart
Vista Residential Partners
2964 Peachtree Road
Suite 585
Atlanta, GA 30305

RE: **Reeves Creek II (DRI#: 3799)**

Dear Vista Residential Partners:

The purpose of this Letter of Understanding is to document the discussions during the Methodology Meeting held virtually on November 23, 2022 regarding **Reeves Creek II** Development of Regional Impact (DRI). The *GRTA DRI Review Procedures*, as well as the inputs and parameters documented in this Letter of Understanding and the revised Methodology Meeting Packet, shall be adhered to in preparing the GRTA required Transportation Study.

PROJECT OVERVIEW

- The proposed site is located at 630 Flippen Road, Stockbridge, GA 30281.
- The proposed development includes 328 single family lots, 191 townhomes, 646 multifamily units, 182 senior living units, 41,000 square feet of office space, and 5,000 square feet of retail space.
- The projected build-out is one phase to be completed by 2027.
- The proposed development includes three full access site driveways along Flippen Road, and one full access site driveway from the Drive Time parking lot to the northwest of the site.
- The DRI trigger for this development is a Rezoning.
- The vehicular trip generation is estimated to be 9,582 net daily trips based on the *ITE Trip Generation Manual 11th edition*.
- The applicant is applying for approval under GRTA's non-expedited Traffic Impact Study Option review process.

STUDY NETWORK

1. Flippen Road / Shields Road @ SR 42/SR 138/US 23 (North Henry Boulevard)
2. Flippen Road @ Appleton Boulevard
3. Flippen Road @ Reeves Creek Trail Parking Lot
4. Flippen Road @ Walt Stephens Road / Red Oak Road
5. Flippen Road @ Hudson Bridge Road
6. SR 42/SR 138/US 23 (North Henry Boulevard) @ SR 138 (Lake Spivey Parkway)
7. SR 138 (Lake Spivey Parkway) @ I-675 Northbound Ramps
8. SR 138 (Lake Spivey Parkway) @ I-675 Southbound Ramps
9. SR 138 (Lake Spivey Parkway) @ Mount Zion Road
10. SR 138 (Lake Spivey Parkway) @ I-75 Northbound Ramps
11. SR 138 (Lake Spivey Parkway) @ I-75 Southbound Ramps
12. SR 138 (Lake Spivey Parkway) @ Speer Road / Mount Zion Parkway
13. SR 138 (Lake Spivey Parkway) @ Spivey Road
14. Walt Stephens Road @ Blackhall Road / Speer Road

METHODOLOGY MEETING PACKET INPUTS & PARAMETERS

- The Site Plan shall meet all the applicable requirements in Section 7.1 of the *GRTA DRI Review Procedures*.
- All Study Network intersections shall be analyzed during the AM and PM peak hours for (1) existing conditions, (2) future “no-build” conditions, and (3) future “build” conditions as specified in the *GRTA DRI Review Procedures*.
- This DRI shall be modeled and reviewed in one phase to be completed by 2027.
- The Level of Service (LOS) standard for all analysis shall be LOS D unless specified otherwise in Section 3.2.2.1. For example, a LOS E standard is allowed if the existing LOS for the intersection or approach is a LOS F.
- Default values should not be assumed in the traffic modeling. Existing conditions shall be taken into account as required in Section 3.2.2.
- The trip generation calculations in the revised Methodology Meeting Packet shall be used in the Transportation Study. An alternative mode reduction of 2% is allowed for this site. Pass-by reductions shall not exceed 15% of a roadway’s traffic volume standard established in Appendix 7.2.
- The trip assignment approach in the revised Methodology Meeting Packet shall be utilized for all Study Network intersection movements.
- The applicant shall research TIP, STIP, RTP and GDOT’s construction work program, as well as any local government and transit operator plans (SPLOST, CIP, etc.), to determine the open date, sponsor, cost of the project, funding source(s), for future roadway projects in the project vicinity. Programmed transportation projects anticipated to open on or before the Build Out year of the DRI Project shall be modeled as completed in the No-Build and Build conditions unless approved otherwise.
- A 1.0% annual traffic Background Growth Rate shall be used for all roadways.
- Capacity analysis shall be based on turning movement counts collected not more than 12-months prior to the date of the actual DRI submittal to GRTA, unless specified otherwise. As specified in Section 2.3, turning movement counts shall be collected while local schools are in session, on a Tuesday, Wednesday or Thursday (unless approved otherwise) and not during holiday periods (weeks of July 4th, Thanksgiving and +/- 5 days of Christmas).

ADDITIONAL REQUIREMENTS

All applicable requirements of the *GRTA DRI Review Procedures* must be met for the Transportation Study to be considered complete. The *GRTA DRI Review Procedures* are located on GRTA’s DRI website: <https://www.srta.ga.gov/programs-projects/dev-of-regional-impact/> Contact GRTA staff if you have any questions on these requirements.

The Transportation Study shall also include as attachments the native LOS modeling file (i.e., Synchro modeling files) as well as the modeling reports (PDFs) for all Study Network intersections for the Existing, No-Build and Build conditions for all phases. The PDF reports shall be numbered (in page headers) and organized in order according to the Study Network numbering sequence in this Letter of Understanding. The reports shall also be organized in the following sequence: *Existing condition AM, Existing condition PM, No-build condition AM, No-Build condition PM, Build condition AM, Build condition PM*. If improvements are modeled, those PDFs shall be labeled as such and follow the appropriate condition’s applicable peak period.

The Transportation Study appendices shall also include all turning movement count data, regardless of if using historic data or newly collected turning movement counts.

When documenting any Queue Length impacts required in Section 3.2.3.6, the TIS Executive Summary shall also note any individual *movements* not meeting the LOS standard where the DRI Project adds trips in the Build condition and exceeds available storage capacity for that movement.

When identifying mitigations in the existing, no-build and build conditions, the mitigations identified in preceding conditions shall not be modeled as complete when conducting the LOS analysis. The same mitigation may still be proposed as mitigation in the subsequent condition but it shall not be included as completed in the default analysis. For example, a turn lane may be identified as a needed improvement in the no-build condition. The turn lane should not be modeled as completed in the build condition. The turn lane should only be modeled as complete in the no-build with improvements condition and the build with improvements condition.

DRI REVIEW PACKAGE SUBMITTAL

GRTA will begin reviewing the DRI once the DRI Review Package is submitted and deemed complete. The DRI Review Package includes: the permitting Local Government inputting both Department of Community Affairs (DCA) forms into the DCA DRI website; and the **Traffic Engineer submittal of the GRTA Transportation Study (including LOS appendices, traffic count data and any other required attachments) and Site Plan to GRTA staff and ALL stakeholders included in the CC list of this Letter of Understanding.**

All DRI Review Packages shall be submitted electronically via email to all stakeholders in the CC list of the Letter of Understanding. If the DRI Review Package total file size is greater than 10 MB, the DRI Review Package shall be submitted via email with a FTP link provided for downloading the files.

Please contact me if you have any questions about the Letter of Understanding or the *GRTA DRI Review Procedures*.

Sincerely,

Beth Davis
DRI Program Manager

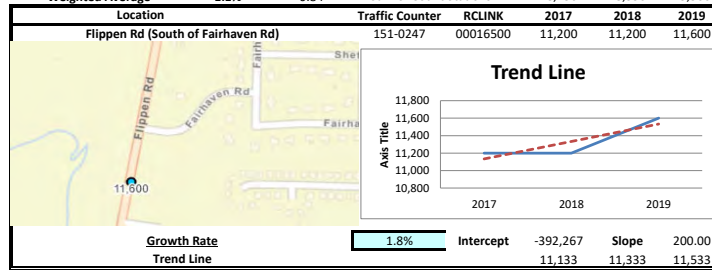
Cc:

December Weir, SRTA/GRTA/ATL
Reginald James, Atlanta Regional Commission
Donald Shockey, Atlanta Regional Commission
Kenta Lanham, Henry County
David Simmons, Henry County
Ryan Anderson, City of Stockbridge
Brecca Carter, City of Stockbridge
Linda Logan, City of Stockbridge
Eric Harris, MARTA
Charles Rosa, MARTA

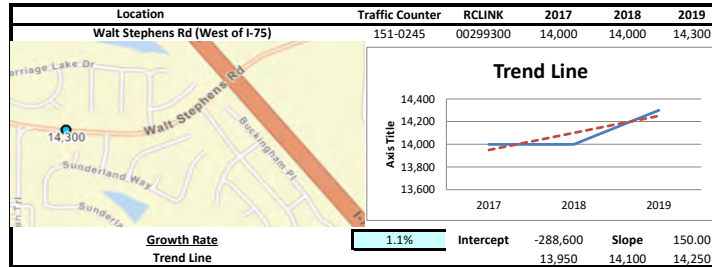
Abdul Amer, A&R Engineering
Naser Omer, A&R Engineering
Michael Neyhart, Vista Residential Partners
Dennis Webb, SGR Law
Kenneth Wood, PEC

Linear Regression of Daily Traffic

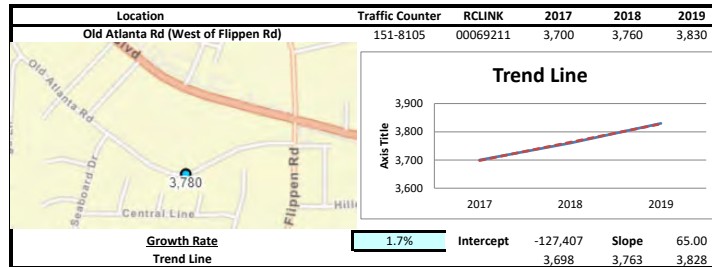
Location	Growth Rate	R Squared	Station ID	Route	2017	2018	2019	2020	2021
Flippen Rd (South of Fairhaven I	1.8%	0.75	151-0247	00016500	11,200	11,200	11,600	10,700	11,600
Walt Stephens Rd (West of I-75)	1.1%	0.75	151-0245	00299300	14,000	14,000	14,300	13,200	14,300
Old Atlanta Rd (West of Flippen	1.7%	1.00	151-8105	00069211	3,700	3,760	3,830	3,560	3,780
Flippen Rd (North of Hudson Bri	0.3%	0.75	151-0422	00016500	14,500	14,500	14,600	12,800	13,800
Banks Rd (West of Tye Rd)	1.8%	1.00	151-8023	00016900	5,050	5,130	5,230	4,860	5,160
Weighted Average	1.1%	0.84	Sum of Count Stations =		48,450	48,590	49,560		



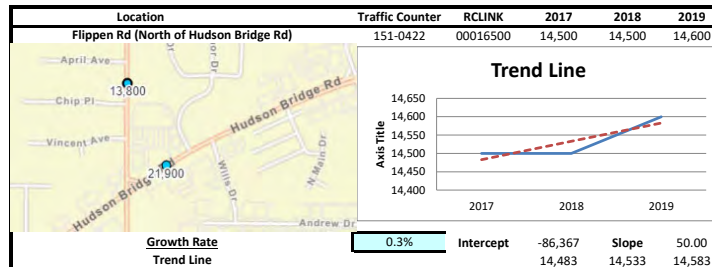
2021
11,600



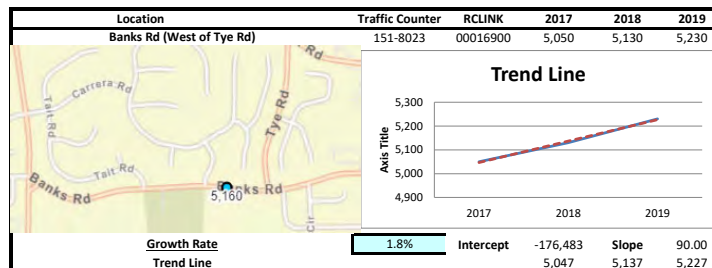
2021
14,300



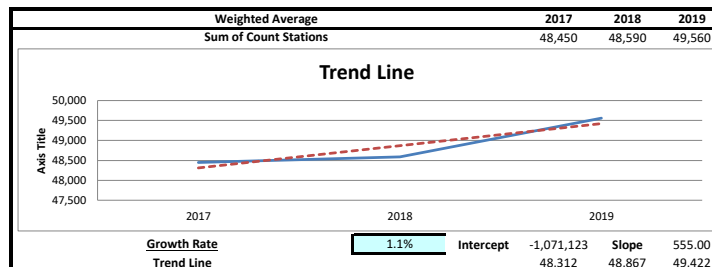
2021
3,780



2021
13,800



2021
5,160



**Fact Sheets for Planned and Programmed
Improvements**

Short Title

US 23 WIDENING FROM SR 138 (NORTH HENRY BOULEVARD) TO I-675 IN CLAYTON COUNTY

GDOT Project No.

322050-

Federal ID No.

STP00-0037-02(056)

Status

Programmed

Service Type

Roadway / General Purpose Capacity

Sponsor

GDOT

Jurisdiction

Clayton County

Analysis Level

In the Region's Air Quality Conformity Analysis

Existing Thru Lane

2

LCI

☐

Planned Thru Lane

4

Flex

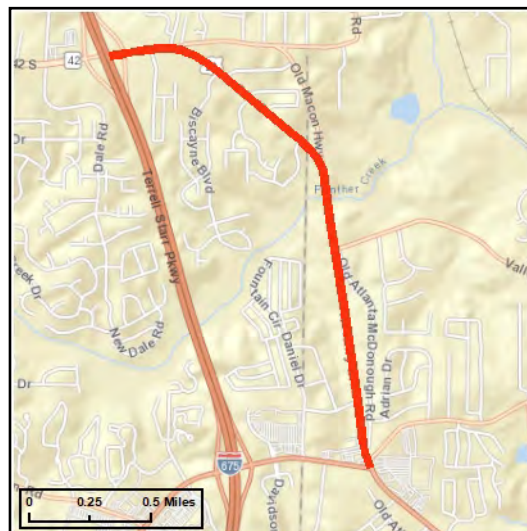
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Network Year

2030

Corridor Length

2.5 miles



Detailed Description and Justification

The project begins at the intersection of SR 138 (North Henry Boulevard/Stockbridge Road) and US 23/SR 42, extends in a northwesterly direction, and ends at the northbound ramps of I-675 north of Stockbridge. From SR 138 to just before Daniel Drive, the existing five-lane section consists of two twelve foot southbound lanes, one left turn lane, a flush median, one northbound lane and a right turn lane. The project will consist of removing the existing turn lane markings between SR 138 and Davis Road and resurfacing and restriping this section to accommodate through traffic. A new right turn lane will also be added in this section. The typical section will have urban shoulders on both sides for the entire length of the project. Urban shoulders will include concrete curb and gutter with a six foot grass strip and a five-foot concrete sidewalk on both sides. The proposed widening and reconstruction of the existing two lane roadway to a four-lane roadway with a twenty-foot raised median will begin approximately 400 feet south of Daniel Drive, continuing north and tying into the existing four lane section approximately 500 feet south of Biscayne Boulevard. Median breaks will be incorporated where deemed necessary at proposed intersecting roadways. The proposed design speed will be 45mph.

Phase Status & Funding Information		Status	FISCAL YEAR	TOTAL PHASE COST	BREAKDOWN OF TOTAL PHASE COST BY FUNDING SOURCE			
					FEDERAL	STATE	BONDS	LOCAL/PRIVATE
PE	STP - Urban (>200K) (ARC)	AUTH	1992	\$1,158,570	\$926,856	\$231,714	\$0,000	\$0,000
PE	STP - Statewide Flexible (GDOT)	AUTH	2013	\$300,000	\$240,000	\$60,000	\$0,000	\$0,000
PE	STP - Statewide Flexible (GDOT)	AUTH	2014	\$1,200,000	\$960,000	\$240,000	\$0,000	\$0,000
PE	Transportation Funding Act (HB 170)	AUTH	2018	\$400,000	\$0,000	\$400,000	\$0,000	\$0,000
PE	Transportation Funding Act (HB 170)	AUTH	2019	\$800,000	\$0,000	\$800,000	\$0,000	\$0,000
ROW	Transportation Funding Act (HB 170)	AUTH	2018	\$11,182,000	\$0,000	\$11,182,000	\$0,000	\$0,000
UTL	Transportation Funding Act (HB 170)		2023	\$6,880,485	\$0,000	\$6,880,485	\$0,000	\$0,000
CST	Transportation Funding Act (HB 170)		2023	\$27,663,237	\$0,000	\$27,663,237	\$0,000	\$0,000
				\$49,584,292	\$2,126,856	\$47,457,436	\$0,000	\$0,000

SCP: Scoping PE: Preliminary engineering / engineering / design / planning PE-OV: GDOT oversight services for engineering ROW: Right-of-way Acquisition
 UTL: Utility relocation CST: Construction / Implementation ALL: Total estimated cost, inclusive of all phases



For additional information about this project, please call (404) 463-3100 or email transportation@atlantaregional.com.



Short Title

EAST ATLANTA ROAD WIDENING FROM VALLEY HILL ROAD TO FAIRVIEW ROAD

GDOT Project No.

N/A

Federal ID No.

Status

Long Range

Service Type

Roadway / General Purpose Capacity

Sponsor

Henry County

Jurisdiction

Henry County

Analysis Level

In the Region's Air Quality Conformity Analysis

Existing Thru Lane

2

LCI

☐

Planned Thru Lane

4

Flex

☐

Network Year

2030

Corridor Length

5.4 miles



Detailed Description and Justification

This project begins at the northern terminus of the Rock Quarry Road Extension (HE-109) and extends north along East Atlanta Road to its terminus at Fairview Road. The project includes the widening of East Atlanta Road from 2 lanes to 4 lanes with a 20-foot raised median. Urban shoulders will have a 5-foot concrete sidewalk on one side and a 10-foot multi-use path on the other side.

Phase Status & Funding Information		Status	FISCAL YEAR	TOTAL PHASE COST	BREAKDOWN OF TOTAL PHASE COST BY FUNDING SOURCE			
					FEDERAL	STATE	BONDS	LOCAL/PRIVATE
ALL	Local Jurisdiction/Municipality Funds		LR 2026-2030	\$39,000,000	\$0,000	\$0,000	\$0,000	\$39,000,000
				\$39,000,000	\$0,000	\$0,000	\$0,000	\$39,000,000

SCP: Scoping PE: Preliminary engineering / engineering / design / planning PE-OV: GDOT oversight services for engineering ROW: Right-of-way Acquisition
 UTL: Utility relocation CST: Construction / Implementation ALL: Total estimated cost, inclusive of all phases



For additional information about this project, please call (404) 463-3100 or email transportation@atlantaregional.com.



Short Title	MOUNT ZION ROAD WIDENING FROM RICHARDSON PARKWAY TO SR 138
GDOT Project No.	N/A
Federal ID No.	N/A
Status	Long Range
Service Type	Roadway / General Purpose Capacity
Sponsor	Clayton County
Jurisdiction	Clayton County
Analysis Level	In the Region's Air Quality Conformity Analysis



Existing Thru Lane	2	LCI	☐	Network Year	2050
Planned Thru Lane	4	Flex	☐	Corridor Length	2.1 miles

Detailed Description and Justification

This project will involve widening Mt. Zion Road from 2 to 4 lanes divided urban highway from Richardson Parkway to SR 138. The project will improve the road alignment, improve safety and relieve congestion in the corridor.

Phase Status & Funding Information		Status	FISCAL YEAR	TOTAL PHASE COST	BREAKDOWN OF TOTAL PHASE COST BY FUNDING SOURCE			
					FEDERAL	STATE	BONDS	LOCAL/PRIVATE
PE	Local Jurisdiction/Municipality Funds	AUTH	2005	\$650,000	\$0,000	\$0,000	\$0,000	\$650,000
ALL	Local Jurisdiction/Municipality Funds		LR 2041-2050	\$14,100,000	\$0,000	\$0,000	\$0,000	\$14,100,000
				\$14,750,000	\$0,000	\$0,000	\$0,000	\$14,750,000

SCP: Scoping PE: Preliminary engineering / engineering / design / planning PE-OV: GDOT oversight services for engineering ROW: Right-of-way Acquisition
 UTL: Utility relocation CST: Construction / Implementation ALL: Total estimated cost, inclusive of all phases



For additional information about this project, please call (404) 463-3100 or email transportation@atlantaregional.com.



Short Title

ROCK QUARRY ROAD EXTENSION - NEW ALIGNMENT
FROM SR 138 / US 23 TO INTERSECTION OF EAST
ATLANTA ROAD AND VALLEY HILL ROAD

GDOT Project No.

N/A

Federal ID No.

N/A

Status

Programmed

Service Type

Roadway / General Purpose Capacity

Sponsor

City of Stockbridge

Jurisdiction

Henry County

Analysis Level

In the Region's Air Quality Conformity Analysis

Existing Thru Lane

0

LCI

☐

Planned Thru Lane

2

Flex

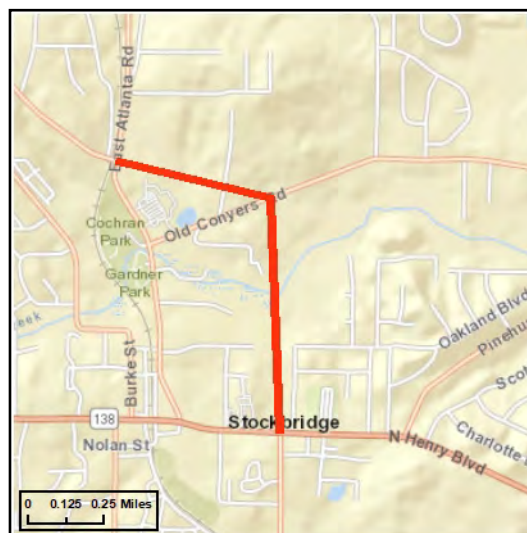
☐

Network Year

2030

Corridor Length

0.8 miles



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Detailed Description and Justification

This project involves construction of a new two-lane roadway linking US 23 (North Henry Boulevard) with East Atlanta Road at Valley Road.

Phase Status & Funding Information		Status	FISCAL YEAR	TOTAL PHASE COST	BREAKDOWN OF TOTAL PHASE COST BY FUNDING SOURCE			
					FEDERAL	STATE	BONDS	LOCAL/PRIVATE
PE	Local Jurisdiction/Municipality Funds	AUTH	2009	\$320,000	\$0,000	\$0,000	\$0,000	\$320,000
ROW	Local Jurisdiction/Municipality Funds	AUTH	2021	\$2,000,000	\$0,000	\$0,000	\$0,000	\$2,000,000
CST	Local Jurisdiction/Municipality Funds		2023	\$3,120,000	\$0,000	\$0,000	\$0,000	\$3,120,000
				\$5,440,000	\$0,000	\$0,000	\$0,000	\$5,440,000

SCP: Scoping PE: Preliminary engineering / engineering / design / planning PE-OV: GDOT oversight services for engineering ROW: Right-of-way Acquisition
UTL: Utility relocation CST: Construction / Implementation ALL: Total estimated cost, inclusive of all phases



For additional information about this project, please call (404) 463-3100 or email transportation@atlantaregional.com.



Short Title

ROCK QUARRY ROAD WIDENING FROM NORTH OF
EAGLE SPRINGS DRIVE TO SR 42 / SR 138

GDOT Project No.

0015090

Federal ID No.

N/A

Status

Programmed

Service Type

Roadway / General Purpose Capacity

Sponsor

Henry County

Jurisdiction

Henry County

Analysis Level

In the Region's Air Quality Conformity Analysis

Existing Thru Lane

2

LCI

☐

Planned Thru Lane

4

Flex

☐

Network Year

2030

Corridor Length

2.43 miles



Detailed Description and Justification

This project will widen Rock Quarry Road from two to four lanes between north of Eagle Springs Drive and SR42/138 to address congestion related to the hospital near the I-75 South interchange. This project will feature a 10-foot multi-use path.

Phase Status & Funding Information		Status	FISCAL YEAR	TOTAL PHASE COST	BREAKDOWN OF TOTAL PHASE COST BY FUNDING SOURCE			
					FEDERAL	STATE	BONDS	LOCAL/PRIVATE
PE	Surface Transportation Block Grant (STBG) Program - Urban (>200K) (ARC)	AUTH	2017	\$1,500,000	~~\$1,200,000~~	~~\$0,000~~	~~\$0,000~~	~~\$300,000~~
ROW	Surface Transportation Block Grant (STBG) Program - Urban (>200K) (ARC)	AUTH	2020	\$7,171,200	~~\$5,600,000~~	~~\$0,000~~	~~\$0,000~~	~~\$1,571,200~~
UTL	Local Jurisdiction/Municipality Funds		2023	\$2,180,000	\$0,000	\$0,000	\$0,000	\$2,180,000
CST	Highway Infrastructure – COVID Supplemental – 23 U.S.C. 133(b) activities in urbanized areas with a population > 200,000 (Z972)		2023	\$33,092,335	\$7,000,000	\$0,000	\$0,000	\$26,092,335
				\$43,943,535	\$13,800,000	\$0,000	\$0,000	\$30,143,535

SCP: Scoping PE: Preliminary engineering / engineering / design / planning PE-OV: GDOT oversight services for engineering ROW: Right-of-way Acquisition
 UTL: Utility relocation CST: Construction / Implementation ALL: Total estimated cost, inclusive of all phases



For additional information about this project, please call (404) 463-3100 or email transportation@atlantaregional.com.



Short Title

I-75 SOUTH EXPRESS LANES FROM C.W. GRANT PARKWAY TO SR 138

GDOT Project No.

0013919

Federal ID No.

N/A

Status

Long Range

Service Type

Roadway / Express Lanes

Sponsor

GDOT

Jurisdiction

Regional - Southeast

Analysis Level

In the Region's Air Quality Conformity Analysis

Existing Thru Lane

0

LCI

☐

Planned Thru Lane

2

Flex

☐

Network Year

2040

Corridor Length

10.6 miles



Detailed Description and Justification

This project will construct an express lanes system along I-75 South from C.W. Grant Parkway to SR 138.

Phase Status & Funding Information		Status	FISCAL YEAR	TOTAL PHASE COST	BREAKDOWN OF TOTAL PHASE COST BY FUNDING SOURCE			
					FEDERAL	STATE	BONDS	LOCAL/PRIVATE
PE	General Federal Aid - 2026-2050		LR 2026-2030	\$12,544,963	\$10,035,970	\$2,508,993	\$0,000	\$0,000
ROW	General Federal Aid - 2026-2050		LR 2026-2030	\$26,129,016	\$20,903,213	\$5,225,803	\$0,000	\$0,000
CST	General Federal Aid - 2026-2050		LR 2031-2040	\$150,788,145	\$120,630,516	\$30,157,629	\$0,000	\$0,000
CST	Public Private Partnership		LR 2031-2040	\$123,372,118	\$0,000	\$0,000	\$123,372,118	\$0,000
				\$312,834,242	\$151,569,699	\$37,892,425	\$123,372,118	\$0,000

SCP: Scoping PE: Preliminary engineering / engineering / design / planning PE-OV: GDOT oversight services for engineering ROW: Right-of-way Acquisition
 UTL: Utility relocation CST: Construction / Implementation ALL: Total estimated cost, inclusive of all phases



For additional information about this project, please call (404) 463-3100 or email transportation@atlantaregional.com.



Short Title

CLAYTON COUNTY BUS ROUTES 197 AND 198 AT
ROUTE 197 - I-675 AND CLAYTON/HENRY COUNTY
LINE; ROUTE 198 - SOUTH LAKE MALL

GDOT Project No.

0017820

Federal ID No.

N/A

Status

Programmed

Service Type

Transit / Operations & Maintenance

Sponsor

MARTA

Jurisdiction

Clayton County

Analysis Level

Exempt from Air Quality Analysis (40 CFR 93)

Existing Thru Lane

N/A

LCI

☐

Planned Thru Lane

N/A

Flex

☒

Network Year

TBD

Corridor Length

N/A miles



Detailed Description and Justification

This project consists of implementing new bus service in Clayton County - Bus Routes 197 and 198. Based on the Clayton County Transit Feasibility Study and forecast ridership, these two new bus routes will provide East/West connectivity for the residents of Clayton County.

Phase Status & Funding Information		Status	FISCAL YEAR	TOTAL PHASE COST	BREAKDOWN OF TOTAL PHASE COST BY FUNDING SOURCE			
					FEDERAL	STATE	BONDS	LOCAL/PRIVATE
CST	Congestion Mitigation & Air Quality Improvement (CMAQ)	AUTH	2021	\$2,500,000	\$2,000,000	\$0,000	\$0,000	\$500,000
CST	Congestion Mitigation & Air Quality Improvement (CMAQ)	AUTH	2022	\$2,500,000	\$2,000,000	\$0,000	\$0,000	\$500,000
CST	Congestion Mitigation & Air Quality Improvement (CMAQ)		2023	\$2,500,000	\$2,000,000	\$0,000	\$0,000	\$500,000
				\$7,500,000	\$6,000,000	\$0,000	\$0,000	\$1,500,000

SCP: Scoping PE: Preliminary engineering / engineering / design / planning PE-OV: GDOT oversight services for engineering ROW: Right-of-way Acquisition
UTL: Utility relocation CST: Construction / Implementation ALL: Total estimated cost, inclusive of all phases



For additional information about this project, please call (404) 463-3100 or email transportation@atlantaregional.com.



Existing Intersection Analysis

Timings

1: Flippen Rd/Shields Rd & SR 42/SR 138/US 23 (N. Henry Blvd)

1a. Existing 2023 AM

01/18/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	8	653	149	1173	203	18	126	18	28
Future Volume (vph)	8	653	149	1173	203	18	126	18	28
Lane Group Flow (vph)	9	813	167	1329	0	248	142	0	67
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	Perm	NA
Protected Phases	1	6	5	2		8			4
Permitted Phases	6		2		8		8	4	
Detector Phase	1	6	5	2	8	8	8	4	4
Switch Phase									
Minimum Initial (s)	5.0	15.0	5.0	15.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	15.0	28.5	15.0	28.5	30.5	30.5	30.5	30.5	30.5
Total Split (s)	15.0	51.0	16.0	52.0	33.0	33.0	33.0	33.0	33.0
Total Split (%)	15.0%	51.0%	16.0%	52.0%	33.0%	33.0%	33.0%	33.0%	33.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5		5.5	5.5		5.5
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	C-Min	None	C-Min	None	None	None	None	None
v/c Ratio	0.04	0.46	0.39	0.60		0.80	0.34		0.18
Control Delay	8.0	17.0	10.0	13.7		54.5	19.1		24.1
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Delay	8.0	17.0	10.0	13.7		54.5	19.1		24.1
Queue Length 50th (ft)	2	165	37	225		134	21		26
Queue Length 95th (ft)	8	237	70	427		248	111		58
Internal Link Dist (ft)		2570		1632		2093			641
Turn Bay Length (ft)	135		210				25		
Base Capacity (vph)	319	1783	445	2219		377	494		442
Starvation Cap Reductn	0	0	0	0		0	0		0
Spillback Cap Reductn	0	0	0	0		0	0		0
Storage Cap Reductn	0	0	0	0		0	0		0
Reduced v/c Ratio	0.03	0.46	0.38	0.60		0.66	0.29		0.15

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Splits and Phases: 1: Flippen Rd/Shields Rd & SR 42/SR 138/US 23 (N. Henry Blvd)



HCM 6th Signalized Intersection Summary

1a. Existing 2023 AM

1: Flippen Rd/Shields Rd & SR 42/SR 138/US 23 (N. Henry Blvd)

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	653	70	149	1173	10	203	18	126	18	28	14
Future Volume (veh/h)	8	653	70	149	1173	10	203	18	126	18	28	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1841	1856	1856	1841	1870	1856	1870	1856	1870	1870	1870
Adj Flow Rate, veh/h	9	734	79	167	1318	11	228	20	142	20	31	16
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	4	3	3	4	2	3	2	3	2	2	2
Cap, veh/h	208	1577	170	416	1951	16	229	14	432	47	64	20
Arrive On Green	0.01	0.50	0.50	0.06	0.55	0.55	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	1781	3185	343	1767	3554	30	582	51	1572	0	232	73
Grp Volume(v), veh/h	9	403	410	167	648	681	248	0	142	67	0	0
Grp Sat Flow(s),veh/h/ln	1781	1749	1779	1767	1749	1835	633	0	1572	304	0	0
Q Serve(g_s), s	0.3	15.1	15.1	4.4	26.6	26.6	0.0	0.0	7.2	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.3	15.1	15.1	4.4	26.6	26.6	27.5	0.0	7.2	27.5	0.0	0.0
Prop In Lane	1.00		0.19	1.00		0.02	0.92		1.00	0.30		0.24
Lane Grp Cap(c), veh/h	208	866	881	416	960	1008	243	0	432	130	0	0
V/C Ratio(X)	0.04	0.47	0.47	0.40	0.68	0.68	1.02	0.00	0.33	0.51	0.00	0.00
Avail Cap(c_a), veh/h	358	866	881	487	960	1008	243	0	432	130	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	14.6	16.6	16.6	11.7	16.2	16.2	40.2	0.0	28.9	29.9	0.0	0.0
Incr Delay (d2), s/veh	0.1	1.8	1.8	0.6	3.8	3.6	63.0	0.0	0.4	3.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	5.9	6.0	1.6	10.3	10.7	10.2	0.0	2.7	1.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.6	18.3	18.3	12.4	20.0	19.8	103.1	0.0	29.3	33.3	0.0	0.0
LnGrp LOS	B	B	B	B	B	B	F	A	C	C	A	A
Approach Vol, veh/h	822				1496				390			
Approach Delay, s/veh	18.3				19.0				76.2			
Approach LOS	B				B				E			
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.6	60.4		33.0	12.0	55.0		33.0				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	9.5	46.5		27.5	10.5	45.5		27.5				
Max Q Clear Time (g_c+I1), s	2.3	28.6		29.5	6.4	17.1		29.5				
Green Ext Time (p_c), s	0.0	12.8		0.0	0.1	10.0		0.0				
Intersection Summary												
HCM 6th Ctrl Delay	27.2											
HCM 6th LOS	C											

Intersection						
Int Delay, s/veh	0.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	9	19	400	5	8	302
Future Vol, veh/h	9	19	400	5	8	302
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	94	94	94	94	94	94
Heavy Vehicles, %	2	2	3	2	2	3
Mvmt Flow	10	20	426	5	9	321

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	768	429	0
Stage 1	429	-	-
Stage 2	339	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	370	626	-
Stage 1	657	-	-
Stage 2	722	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	366	626	-
Mov Cap-2 Maneuver	366	-	-
Stage 1	657	-	-
Stage 2	715	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.5	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	510	1129
HCM Lane V/C Ratio	-	-	0.058	0.008
HCM Control Delay (s)	-	-	12.5	8.2
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.2	0

HCM 6th TWSC
3: Flippen Rd & Reeves Creek Trail Parking Lot

1a. Existing 2023 AM
01/18/2023

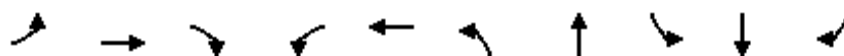
Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	407	2	0	311
Future Vol, veh/h	0	0	407	2	0	311
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	3	2	2	3
Mvmt Flow	0	0	438	2	0	334
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	773	439	0	0	440	0
Stage 1	439	-	-	-	-	-
Stage 2	334	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	367	618	-	-	1120	-
Stage 1	650	-	-	-	-	-
Stage 2	725	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	367	618	-	-	1120	-
Mov Cap-2 Maneuver	367	-	-	-	-	-
Stage 1	650	-	-	-	-	-
Stage 2	725	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	0	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	-	1120	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	-	-	0	0	-	
HCM Lane LOS	-	-	A	A	-	
HCM 95th %tile Q(veh)	-	-	-	0	-	

Timings

4: Flippen Rd & Walt Stephens Rd/Red Oak Rd

1a. Existing 2023 AM

01/18/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	112	86	326	9	94	306	267	13	195	110
Future Volume (vph)	112	86	326	9	94	306	267	13	195	110
Lane Group Flow (vph)	117	90	340	9	123	319	295	14	203	115
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4		3	8	1	6	5	2	
Permitted Phases	4		4	8		6		2		2
Detector Phase	7	4	4	3	8	1	6	5	2	2
Switch Phase										
Minimum Initial (s)	5.0	6.0	6.0	5.0	6.0	5.0	15.0	5.0	15.0	15.0
Minimum Split (s)	15.0	31.5	31.5	15.0	30.5	15.0	31.5	15.0	28.5	28.5
Total Split (s)	15.0	32.0	32.0	15.0	32.0	22.0	38.0	15.0	31.0	31.0
Total Split (%)	15.0%	32.0%	32.0%	15.0%	32.0%	22.0%	38.0%	15.0%	31.0%	31.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
v/c Ratio	0.38	0.21	0.54	0.04	0.56	0.43	0.27	0.03	0.26	0.14
Control Delay	30.2	30.3	8.5	25.9	46.9	10.5	9.5	8.6	18.1	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.2	30.3	8.5	25.9	46.9	10.5	9.5	8.6	18.1	0.5
Queue Length 50th (ft)	51	38	0	4	68	59	54	3	55	0
Queue Length 95th (ft)	85	92	67	16	120	142	141	m9	146	0
Internal Link Dist (ft)		646			1291		2204		704	
Turn Bay Length (ft)	180		345	110		130		120		215
Base Capacity (vph)	310	500	673	316	495	762	1110	622	775	798
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.18	0.51	0.03	0.25	0.42	0.27	0.02	0.26	0.14

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

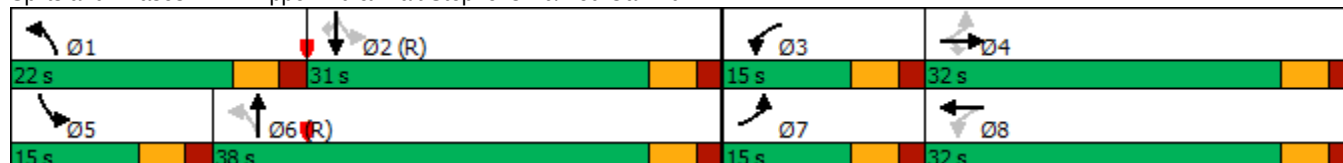
Offset: 96 (96%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Flippen Rd & Walt Stephens Rd/Red Oak Rd



HCM 6th Signalized Intersection Summary

4: Flippen Rd & Walt Stephens Rd/Red Oak Rd

1a. Existing 2023 AM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	112	86	326	9	94	24	306	267	16	13	195	110
Future Volume (veh/h)	112	86	326	9	94	24	306	267	16	13	195	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1870	1900	1856	1870	1870	1856	1900
Adj Flow Rate, veh/h	117	90	0	9	98	25	319	278	17	14	203	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	0	2	0	3	2	2	3	0
Cap, veh/h	237	288		210	132	34	800	1036	63	655	949	
Arrive On Green	0.07	0.15	0.00	0.01	0.09	0.09	0.10	0.60	0.60	0.02	0.51	0.00
Sat Flow, veh/h	1781	1870	1585	1781	1460	373	1810	1731	106	1781	1856	1610
Grp Volume(v), veh/h	117	90	0	9	0	123	319	0	295	14	203	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1833	1810	0	1836	1781	1856	1610
Q Serve(g_s), s	5.7	4.3	0.0	0.5	0.0	6.5	7.8	0.0	7.7	0.4	6.0	0.0
Cycle Q Clear(g_c), s	5.7	4.3	0.0	0.5	0.0	6.5	7.8	0.0	7.7	0.4	6.0	0.0
Prop In Lane	1.00		1.00	1.00		0.20	1.00		0.06	1.00		1.00
Lane Grp Cap(c), veh/h	237	288		210	0	166	800	0	1100	655	949	
V/C Ratio(X)	0.49	0.31		0.04	0.00	0.74	0.40	0.00	0.27	0.02	0.21	
Avail Cap(c_a), veh/h	273	496		359	0	486	912	0	1100	796	949	
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	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	35.9	37.6	0.0	40.6	0.0	44.3	8.5	0.0	9.6	11.2	13.4	0.0
Incr Delay (d2), s/veh	1.6	0.6	0.0	0.1	0.0	6.4	0.3	0.0	0.6	0.0	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	1.9	0.0	0.2	0.0	3.2	2.6	0.0	2.8	0.1	2.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.5	38.2	0.0	40.7	0.0	50.8	8.8	0.0	10.2	11.3	13.9	0.0
LnGrp LOS	D	D		D	A	D	A	A	B	B	B	
Approach Vol, veh/h	207				132				614			
Approach Delay, s/veh	37.8				50.1				9.5			
Approach LOS	D				D				A			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.8	56.7	6.6	20.9	7.1	65.4	13.0	14.5				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	16.5	25.5	9.5	26.5	9.5	32.5	9.5	26.5				
Max Q Clear Time (g_c+I1), s	9.8	8.0	2.5	6.3	2.4	9.7	7.7	8.5				
Green Ext Time (p_c), s	0.5	1.7	0.0	0.3	0.0	3.0	0.0	0.5				

Intersection Summary

HCM 6th Ctrl Delay 19.9

HCM 6th LOS B

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings 5: Flippen Rd & Hudson Bridge Rd

1a. Existing 2023 AM
01/18/2023

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	75	391	180	268	139	3	258	465	199	287	84
Future Volume (vph)	75	391	180	268	139	3	258	465	199	287	84
Lane Group Flow (vph)	78	407	188	279	145	3	269	484	207	299	88
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6	5	2			8		7	4	
Permitted Phases	6		2		2	8		8	4		4
Detector Phase	1	6	5	2	2	8	8	8	7	4	4
Switch Phase											
Minimum Initial (s)	5.0	15.0	5.0	15.0	15.0	6.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	15.0	28.5	15.0	28.5	28.5	36.5	36.5	36.5	15.0	33.5	33.5
Total Split (s)	15.0	30.6	17.0	32.6	32.6	37.4	37.4	37.4	15.0	52.4	52.4
Total Split (%)	15.0%	30.6%	17.0%	32.6%	32.6%	37.4%	37.4%	37.4%	15.0%	52.4%	52.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.15	0.32	0.37	0.19	0.20	0.01	0.69	0.77	0.67	0.45	0.14
Control Delay	14.8	25.9	16.3	21.9	5.1	27.0	44.7	17.3	29.8	21.9	4.0
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	14.8	25.9	16.3	21.9	5.1	27.0	44.7	17.3	29.8	21.9	4.0
Queue Length 50th (ft)	24	97	61	61	0	2	158	61	70	103	1
Queue Length 95th (ft)	56	162	119	107	44	8	221	168	106	146	15
Internal Link Dist (ft)		840		1594			786			834	
Turn Bay Length (ft)	375		390		450	230		365	320		320
Base Capacity (vph)	563	1282	524	1465	741	343	588	758	311	865	789
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	0.14	0.32	0.36	0.19	0.20	0.01	0.46	0.64	0.67	0.35	0.11

Intersection Summary

Cycle Length: 100

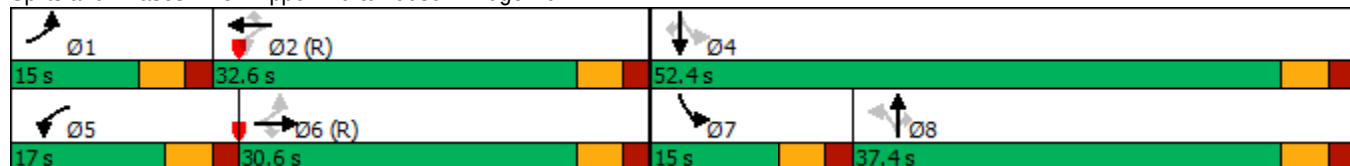
Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

Splits and Phases: 5: Flippen Rd & Hudson Bridge Rd



HCM 6th Signalized Intersection Summary

5: Flippen Rd & Hudson Bridge Rd

1a. Existing 2023 AM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	391	0	180	268	139	3	258	465	199	287	84
Future Volume (veh/h)	75	391	0	180	268	139	3	258	465	199	287	84
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1856	1870	1870	1856	1870
Adj Flow Rate, veh/h	78	407	0	188	279	0	3	269	484	207	299	88
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	3	2	2	3	2
Cap, veh/h	443	970		414	1141		390	592	506	384	869	742
Arrive On Green	0.05	0.27	0.00	0.09	0.32	0.00	0.32	0.32	0.32	0.09	0.47	0.47
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	997	1856	1585	1781	1856	1585
Grp Volume(v), veh/h	78	407	0	188	279	0	3	269	484	207	299	88
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	997	1856	1585	1781	1856	1585
Q Serve(g_s), s	3.1	9.4	0.0	7.3	5.8	0.0	0.2	11.5	29.9	7.5	10.2	3.1
Cycle Q Clear(g_c), s	3.1	9.4	0.0	7.3	5.8	0.0	0.2	11.5	29.9	7.5	10.2	3.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	443	970		414	1141		390	592	506	384	869	742
V/C Ratio(X)	0.18	0.42		0.45	0.24		0.01	0.45	0.96	0.54	0.34	0.12
Avail Cap(c_a), veh/h	531	970		452	1141		390	592	506	386	870	743
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	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.3	29.8	0.0	22.2	25.0	0.0	23.3	27.1	33.4	19.5	16.9	15.0
Incr Delay (d2), s/veh	0.2	1.3	0.0	0.8	0.5	0.0	0.0	0.5	29.4	1.5	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	4.0	0.0	3.0	2.4	0.0	0.0	4.9	14.8	3.0	4.0	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.5	31.2	0.0	23.0	25.5	0.0	23.3	27.7	62.8	21.0	17.1	15.0
LnGrp LOS	C	C		C	C		C	C	E	C	B	B
Approach Vol, veh/h	485			467			756			594		
Approach Delay, s/veh	30.1			24.5			50.1			18.1		
Approach LOS	C			C			D			B		
Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.1	37.6		52.3	14.9	32.8	14.9	37.4				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	9.5	27.1		46.9	11.5	25.1	9.5	31.9				
Max Q Clear Time (g_c+I1), s	5.1	7.8		12.2	9.3	11.4	9.5	31.9				
Green Ext Time (p_c), s	0.0	2.7		1.9	0.1	3.4	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay	32.5											
HCM 6th LOS	C											

Timings

6: SR 42/SR 138/US 23 (N. Henry Blvd) & SR 138 (Lake Spivey Pkwy)

1a. Existing 2023 AM

01/18/2023

	→	↘	↙	←	↖	↗	↑	↘	↙	↓
Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖↗	↖↗	↖	↗	↖↗	↖↗	↗	↖	↖	↖↗
Traffic Volume (vph)	74	383	37	59	30	870	382	43	38	207
Future Volume (vph)	74	383	37	59	30	870	382	43	38	207
Lane Group Flow (vph)	168	395	38	61	31	897	394	44	39	372
Turn Type	NA	pt+ov	Split	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	4	4 1	8	8		1	6		5	2
Permitted Phases					8			6		
Detector Phase	4	4 1	8	8	8	1	6	6	5	2
Switch Phase										
Minimum Initial (s)	6.0		6.0	6.0	6.0	5.0	15.0	15.0	5.0	15.0
Minimum Split (s)	31.5		30.5	30.5	30.5	15.0	28.5	28.5	15.0	31.5
Total Split (s)	31.5		30.5	30.5	30.5	56.0	73.0	73.0	15.0	32.0
Total Split (%)	21.0%		20.3%	20.3%	20.3%	37.3%	48.7%	48.7%	10.0%	21.3%
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5		5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag						Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	None		None	None	None	None	C-Min	C-Min	None	C-Min
v/c Ratio	0.68	0.33	0.31	0.49	0.13	0.86	0.35	0.04	0.38	0.30
Control Delay	75.7	17.8	71.9	79.3	1.1	57.3	17.8	0.1	77.9	27.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.7	17.8	71.9	79.3	1.1	57.3	17.8	0.1	77.9	27.9
Queue Length 50th (ft)	159	102	36	59	0	426	192	0	38	97
Queue Length 95th (ft)	232	93	74	107	0	471	326	0	77	168
Internal Link Dist (ft)	2539			205			2663			944
Turn Bay Length (ft)			100		120	340		300	580	
Base Capacity (vph)	314	1366	292	301	384	1160	1133	1039	117	1247
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.29	0.13	0.20	0.08	0.77	0.35	0.04	0.33	0.30

Intersection Summary

Cycle Length: 150

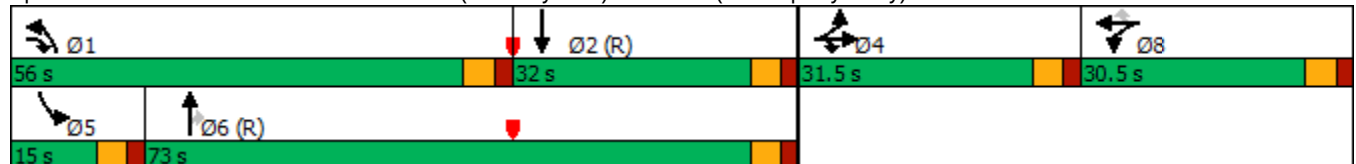
Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green

Natural Cycle: 130

Control Type: Actuated-Coordinated

Splits and Phases: 6: SR 42/SR 138/US 23 (N. Henry Blvd) & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
6: SR 42/SR 138/US 23 (N. Henry Blvd) & SR 138 (Lake Spivey Pkwy)

1a. Existing 2023 AM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	89	74	383	37	59	30	870	382	43	38	207	154
Future Volume (veh/h)	89	74	383	37	59	30	870	382	43	38	207	154
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1856	1811	1856	1826	1900	1856	1841	1900	1856	1856	1885
Adj Flow Rate, veh/h	92	76	395	38	61	0	897	394	0	39	213	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	3	6	3	5	0	3	4	0	3	3	1
Cap, veh/h	124	103	1108	84	87		976	1200		50	1394	
Arrive On Green	0.13	0.13	0.13	0.05	0.05	0.00	0.28	0.65	0.00	0.03	0.40	0.00
Sat Flow, veh/h	989	817	2701	1767	1826	1610	3428	1841	1610	1767	3618	0
Grp Volume(v), veh/h	168	0	395	38	61	0	897	394	0	39	213	0
Grp Sat Flow(s),veh/h/ln	1806	0	1351	1767	1826	1610	1714	1841	1610	1767	1763	0
Q Serve(g_s), s	13.5	0.0	15.2	3.1	4.9	0.0	38.0	14.2	0.0	3.3	5.8	0.0
Cycle Q Clear(g_c), s	13.5	0.0	15.2	3.1	4.9	0.0	38.0	14.2	0.0	3.3	5.8	0.0
Prop In Lane	0.55		1.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	227	0	1108	84	87		976	1200		50	1394	
V/C Ratio(X)	0.74	0.00	0.36	0.45	0.70		0.92	0.33		0.78	0.15	
Avail Cap(c_a), veh/h	313	0	1237	295	304		1154	1200		112	1394	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.96	0.00	0.96	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	63.2	0.0	30.6	69.5	70.4	0.0	52.0	11.6	0.0	72.4	29.2	0.0
Incr Delay (d2), s/veh	5.7	0.0	0.2	3.7	9.8	0.0	10.6	0.7	0.0	22.1	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.4	0.0	5.1	1.5	2.6	0.0	17.4	5.7	0.0	1.8	2.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.9	0.0	30.7	73.3	80.1	0.0	62.6	12.3	0.0	94.5	29.4	0.0
LnGrp LOS	E	A	C	E	F		E	B		F	C	
Approach Vol, veh/h		563			99			1291			252	
Approach Delay, s/veh		42.1			77.5			47.2			39.5	
Approach LOS		D			E			D			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	48.2	64.8		24.3	9.8	103.2		12.6				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	50.5	26.5		26.0	9.5	67.5		25.0				
Max Q Clear Time (g_c+I1), s	40.0	7.8		17.2	5.3	16.2		6.9				
Green Ext Time (p_c), s	2.7	1.9		1.7	0.0	5.1		0.3				

Intersection Summary

HCM 6th Ctrl Delay 46.4

HCM 6th LOS D

Notes

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings 7: I-675 NB Ramps & SR 138 (Lake Spivey Pkwy)

1a. Existing 2023 AM
01/18/2023

						
Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Configurations		 	 			
Traffic Volume (vph)	477	846	1240	298	32	68
Future Volume (vph)	477	846	1240	298	32	68
Lane Group Flow (vph)	536	951	1393	335	36	76
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		3	
Permitted Phases	6			2		8
Detector Phase	1	6	2	2	3	8
Switch Phase						
Minimum Initial (s)	5.0	15.0	15.0	15.0	5.0	6.0
Minimum Split (s)	15.0	28.5	28.5	28.5	15.0	34.5
Total Split (s)	24.0	65.5	41.5	41.5	34.5	34.5
Total Split (%)	24.0%	65.5%	41.5%	41.5%	34.5%	34.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.77	0.32	0.92	0.39	0.27	0.38
Control Delay	15.2	3.7	42.1	5.4	48.0	13.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.2	3.7	42.1	5.4	48.0	13.4
Queue Length 50th (ft)	114	106	~535	13	22	0
Queue Length 95th (ft)	159	81	#657	71	52	35
Internal Link Dist (ft)		706	2539			
Turn Bay Length (ft)	145			270		315
Base Capacity (vph)	699	2973	1507	853	513	520
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.32	0.92	0.39	0.07	0.15

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 55 (55%), Referenced to phase 2:WBT and 6:EBTL, Start of Green

Natural Cycle: 130

Control Type: Actuated-Coordinated

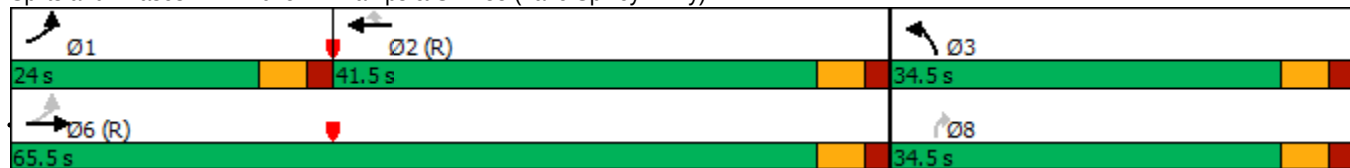
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 7: I-675 NB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
7: I-675 NB Ramps & SR 138 (Lake Spivey Pkwy)

1a. Existing 2023 AM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	477	846	0	0	1240	298	32	0	68	0	0	0
Future Volume (veh/h)	477	846	0	0	1240	298	32	0	68	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1870	1856	0	0	1856	1870	1870	0	1870			
Adj Flow Rate, veh/h	536	951	0	0	1393	0	36	0	76			
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89			
Percent Heavy Veh, %	2	3	0	0	3	2	2	0	2			
Cap, veh/h	522	2903	0	0	2057		119	0	106			
Arrive On Green	0.37	1.00	0.00	0.00	0.58	0.00	0.07	0.00	0.07			
Sat Flow, veh/h	1781	3618	0	0	3618	1585	1781	0	1585			
Grp Volume(v), veh/h	536	951	0	0	1393	0	36	0	76			
Grp Sat Flow(s),veh/h/ln	1781	1763	0	0	1763	1585	1781	0	1585			
Q Serve(g_s), s	18.5	0.0	0.0	0.0	27.2	0.0	1.9	0.0	4.7			
Cycle Q Clear(g_c), s	18.5	0.0	0.0	0.0	27.2	0.0	1.9	0.0	4.7			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	522	2903	0	0	2057		119	0	106			
V/C Ratio(X)	1.03	0.33	0.00	0.00	0.68		0.30	0.00	0.72			
Avail Cap(c_a), veh/h	522	2903	0	0	2057		517	0	460			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.73	0.73	0.00	0.00	0.44	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	16.7	0.0	0.0	0.0	14.3	0.0	44.5	0.0	45.8			
Incr Delay (d2), s/veh	40.5	0.2	0.0	0.0	0.8	0.0	1.4	0.0	8.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	11.2	0.1	0.0	0.0	9.5	0.0	0.9	0.0	2.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.2	0.2	0.0	0.0	15.2	0.0	45.9	0.0	54.6			
LnGrp LOS	F	A	A	A	B		D	A	D			
Approach Vol, veh/h	1487			1393			112					
Approach Delay, s/veh	20.8			15.2			51.8					
Approach LOS	C			B			D					
Timer - Assigned Phs	1	2					6	8				
Phs Duration (G+Y+Rc), s	24.0	63.8					87.8	12.2				
Change Period (Y+Rc), s	5.5	5.5					5.5	5.5				
Max Green Setting (Gmax), s	18.5	36.0					60.0	29.0				
Max Q Clear Time (g_c+I1), s	20.5	29.2					2.0	6.7				
Green Ext Time (p_c), s	0.0	5.8					16.6	0.3				

Intersection Summary

HCM 6th Ctrl Delay 19.3

HCM 6th LOS B

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Timings
8: I-675 SB Ramps & SR 138 (Lake Spivey Pkwy)

1a. Existing 2023 AM

01/18/2023

	→	↘	↙	←	↘	↙
Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Configurations	↑↑	↑	↘	↑↑	↘↘	↘↘
Traffic Volume (vph)	1183	51	99	1173	140	443
Future Volume (vph)	1183	51	99	1173	140	443
Lane Group Flow (vph)	1329	57	111	1318	157	498
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	7	
Permitted Phases		6	2			4
Detector Phase	6	6	5	2	7	4
Switch Phase						
Minimum Initial (s)	15.0	15.0	5.0	15.0	5.0	6.0
Minimum Split (s)	28.5	28.5	15.0	28.5	35.5	35.5
Total Split (s)	49.5	49.5	15.0	64.5	35.5	35.5
Total Split (%)	49.5%	49.5%	15.0%	64.5%	35.5%	35.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Min	C-Min	None	C-Min	None	None
v/c Ratio	0.69	0.06	0.42	0.55	0.23	0.78
Control Delay	15.3	3.2	7.9	4.2	32.9	38.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.3	3.2	7.9	4.2	32.9	38.7
Queue Length 50th (ft)	157	0	16	0	43	139
Queue Length 95th (ft)	296	m10	m11	m508	64	185
Internal Link Dist (ft)	1959			706		
Turn Bay Length (ft)		375	95		520	500
Base Capacity (vph)	1937	913	295	2410	1029	903
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.06	0.38	0.55	0.15	0.55

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 92 (92%), Referenced to phase 2:WBTL and 6:EBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: I-675 SB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
8: I-675 SB Ramps & SR 138 (Lake Spivey Pkwy)

1a. Existing 2023 AM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑					↖↗		↖↗
Traffic Volume (veh/h)	0	1183	51	99	1173	0	0	0	0	140	0	443
Future Volume (veh/h)	0	1183	51	99	1173	0	0	0	0	140	0	443
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1870	1870	1856	0				1870	0	1870
Adj Flow Rate, veh/h	0	1329	57	111	1318	0				157	0	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89				0.89	0.89	0.89
Percent Heavy Veh, %	0	3	2	2	3	0				2	0	2
Cap, veh/h	0	2536	1140	310	2898	0				235	0	
Arrive On Green	0.00	0.24	0.24	0.03	0.55	0.00				0.07	0.00	0.00
Sat Flow, veh/h	0	3618	1585	1781	3618	0				3456	0	2790
Grp Volume(v), veh/h	0	1329	57	111	1318	0				157	0	0
Grp Sat Flow(s),veh/h/ln	0	1763	1585	1781	1763	0				1728	0	1395
Q Serve(g_s), s	0.0	32.8	2.8	1.4	22.4	0.0				4.4	0.0	0.0
Cycle Q Clear(g_c), s	0.0	32.8	2.8	1.4	22.4	0.0				4.4	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2536	1140	310	2898	0				235	0	
V/C Ratio(X)	0.00	0.52	0.05	0.36	0.45	0.00				0.67	0.00	
Avail Cap(c_a), veh/h	0	2536	1140	394	2898	0				1037	0	
HCM Platoon Ratio	1.00	0.33	0.33	0.67	0.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.85	0.85	0.30	0.30	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	23.2	11.8	11.1	9.0	0.0				45.5	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.7	0.1	0.2	0.2	0.0				3.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	15.4	2.8	1.0	9.0	0.0				1.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	23.9	11.8	11.3	9.2	0.0				48.7	0.0	0.0
LnGrp LOS	A	C	B	B	A	A				D	A	
Approach Vol, veh/h	1386		1429							157		
Approach Delay, s/veh	23.4		9.4							48.7		
Approach LOS	C		A							D		
Timer - Assigned Phs	2		4		5	6						
Phs Duration (G+Y+Rc), s	87.7		12.3		10.3	77.4						
Change Period (Y+Rc), s	5.5		5.5		5.5	5.5						
Max Green Setting (Gmax), s	59.0		30.0		9.5	44.0						
Max Q Clear Time (g_c+I1), s	24.4		6.4		3.4	34.8						
Green Ext Time (p_c), s	20.8		0.5		0.1	7.5						
Intersection Summary												
HCM 6th Ctrl Delay	18.0											
HCM 6th LOS	B											

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Timings
9: SR 138 (Lake Spivey Pkwy) & Mt. Zion Rd

1a. Existing 2023 AM
01/18/2023

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	110	1010	47	30	1331	120	41	32	137	52	142
Future Volume (vph)	110	1010	47	30	1331	120	41	32	137	52	142
Lane Group Flow (vph)	117	1074	50	32	1416	128	44	62	146	55	151
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8	7	4	
Permitted Phases	6		6	2		2	8		4		4
Detector Phase	1	6	6	5	2	2	3	8	7	4	4
Switch Phase											
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	6.0	5.0	6.0	6.0
Minimum Split (s)	15.0	28.5	28.5	15.0	34.5	34.5	15.0	38.5	15.0	32.5	32.5
Total Split (s)	15.0	31.5	31.5	15.0	31.5	31.5	15.0	38.5	15.0	38.5	38.5
Total Split (%)	15.0%	31.5%	31.5%	15.0%	31.5%	31.5%	15.0%	38.5%	15.0%	38.5%	38.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None
v/c Ratio	0.49	0.50	0.05	0.10	0.74	0.13	0.20	0.38	0.60	0.24	0.46
Control Delay	32.0	8.3	0.1	6.8	13.1	1.9	31.9	33.3	43.9	43.1	12.0
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	32.0	8.3	0.1	6.8	13.1	1.9	31.9	33.3	43.9	43.1	12.0
Queue Length 50th (ft)	28	85	0	2	130	0	22	21	79	33	0
Queue Length 95th (ft)	94	113	0	m11	#459	18	48	59	129	70	57
Internal Link Dist (ft)		896			1959			388		1031	
Turn Bay Length (ft)	115		140	155		325	35		345		165
Base Capacity (vph)	268	2148	1027	389	1916	949	259	597	247	627	634
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	0.44	0.50	0.05	0.08	0.74	0.13	0.17	0.10	0.59	0.09	0.24

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 7 (7%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 125

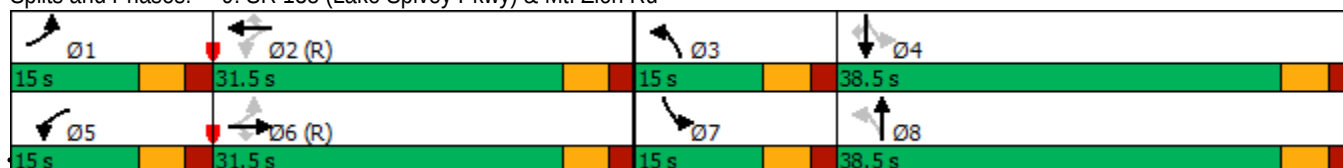
Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: SR 138 (Lake Spivey Pkwy) & Mt. Zion Rd



HCM 6th Signalized Intersection Summary
9: SR 138 (Lake Spivey Pkwy) & Mt. Zion Rd

1a. Existing 2023 AM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	1010	47	30	1331	120	41	32	26	137	52	142
Future Volume (veh/h)	110	1010	47	30	1331	120	41	32	26	137	52	142
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1856	1870	1870	1856	1900	1870	1900	1870	1900	1900	1900
Adj Flow Rate, veh/h	117	1074	0	32	1416	128	44	34	28	146	55	151
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	3	2	2	3	0	2	0	2	0	0	0
Cap, veh/h	356	2105		428	2040	932	208	60	50	275	224	190
Arrive On Green	0.10	1.00	0.00	0.06	1.00	1.00	0.04	0.06	0.06	0.09	0.12	0.12
Sat Flow, veh/h	1810	3526	1585	1781	3526	1610	1781	964	794	1810	1900	1610
Grp Volume(v), veh/h	117	1074	0	32	1416	128	44	0	62	146	55	151
Grp Sat Flow(s),veh/h/ln	1810	1763	1585	1781	1763	1610	1781	0	1757	1810	1900	1610
Q Serve(g_s), s	2.6	0.0	0.0	0.7	0.0	0.0	2.3	0.0	3.4	7.3	2.6	9.1
Cycle Q Clear(g_c), s	2.6	0.0	0.0	0.7	0.0	0.0	2.3	0.0	3.4	7.3	2.6	9.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.45	1.00		1.00
Lane Grp Cap(c), veh/h	356	2105		428	2040	932	208	0	110	275	224	190
V/C Ratio(X)	0.33	0.51		0.07	0.69	0.14	0.21	0.00	0.57	0.53	0.25	0.79
Avail Cap(c_a), veh/h	441	2105		545	2040	932	315	0	580	282	627	531
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.90	0.00	0.76	0.76	0.76	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.1	0.0	0.0	7.6	0.0	0.0	41.7	0.0	45.6	37.3	40.0	42.9
Incr Delay (d2), s/veh	0.5	0.8	0.0	0.1	1.5	0.2	0.5	0.0	4.5	1.8	0.6	7.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.2	0.0	0.2	0.4	0.1	1.0	0.0	1.6	3.2	1.2	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.6	0.8	0.0	7.6	1.5	0.2	42.2	0.0	50.1	39.1	40.6	50.2
LnGrp LOS	A	A		A	A	A	D	A	D	D	D	D
Approach Vol, veh/h	1191		1576				106		352			
Approach Delay, s/veh	1.5		1.5				46.8		44.1			
Approach LOS	A		A				D		D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.3	63.4	9.0	17.3	8.4	65.2	14.6	11.7				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	9.5	26.0	9.5	33.0	9.5	26.0	9.5	33.0				
Max Q Clear Time (g_c+I1), s	4.6	2.0	4.3	11.1	2.7	2.0	9.3	5.4				
Green Ext Time (p_c), s	0.1	18.0	0.0	0.7	0.0	13.3	0.0	0.3				

Intersection Summary

HCM 6th Ctrl Delay	7.6
HCM 6th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Timings
10: I-75 NB Ramps & SR 138 (Lake Spivey Pkwy)

1a. Existing 2023 AM

01/18/2023

						
Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	432	1045	877	637	243	122
Future Volume (vph)	432	1045	877	637	243	122
Lane Group Flow (vph)	455	1100	923	671	256	128
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		3	
Permitted Phases	6			2		8
Detector Phase	1	6	2	2	3	8
Switch Phase						
Minimum Initial (s)	5.0	15.0	15.0	15.0	5.0	6.0
Minimum Split (s)	15.0	28.5	28.5	28.5	15.0	32.5
Total Split (s)	30.0	67.5	37.5	37.5	32.5	32.5
Total Split (%)	30.0%	67.5%	37.5%	37.5%	32.5%	32.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.81	0.45	0.67	0.66	0.74	0.32
Control Delay	23.6	8.6	17.7	6.7	50.2	11.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.6	8.6	17.7	6.7	50.2	11.4
Queue Length 50th (ft)	192	227	168	47	154	13
Queue Length 95th (ft)	#358	279	257	0	222	57
Internal Link Dist (ft)		897	896			
Turn Bay Length (ft)	140			405		510
Base Capacity (vph)	588	2431	1380	1014	477	503
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.45	0.67	0.66	0.54	0.25

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 8 (8%), Referenced to phase 2:WBT and 6:EBTL, Start of Green

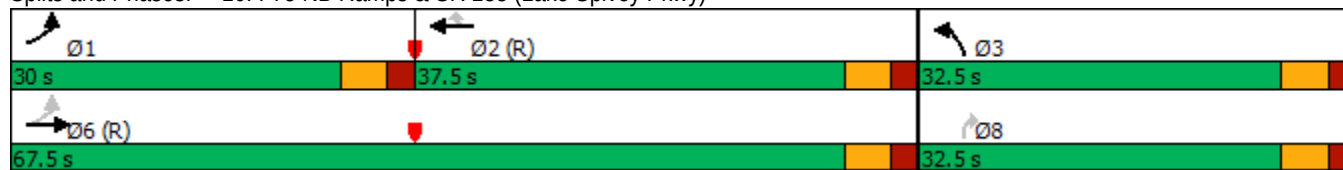
Natural Cycle: 90

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 10: I-75 NB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
10: I-75 NB Ramps & SR 138 (Lake Spivey Pkwy)

1a. Existing 2023 AM
01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Traffic Volume (veh/h)	432	1045	0	0	877	637	243	0	122	0	0	0
Future Volume (veh/h)	432	1045	0	0	877	637	243	0	122	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1870	1856	0	0	1856	1870	1870	0	1870			
Adj Flow Rate, veh/h	455	1100	0	0	923	0	256	0	0			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	2	3	0	0	3	2	2	0	2			
Cap, veh/h	633	2555	0	0	1896		294	0				
Arrive On Green	0.09	0.49	0.00	0.00	1.00	0.00	0.17	0.00	0.00			
Sat Flow, veh/h	1781	3618	0	0	3618	1585	1781	0	1585			
Grp Volume(v), veh/h	455	1100	0	0	923	0	256	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1763	0	0	1763	1585	1781	0	1585			
Q Serve(g_s), s	10.0	20.3	0.0	0.0	0.0	0.0	14.0	0.0	0.0			
Cycle Q Clear(g_c), s	10.0	20.3	0.0	0.0	0.0	0.0	14.0	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	633	2555	0	0	1896		294	0				
V/C Ratio(X)	0.72	0.43	0.00	0.00	0.49		0.87	0.00				
Avail Cap(c_a), veh/h	834	2555	0	0	1896		481	0				
HCM Platoon Ratio	0.67	0.67	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	0.79	0.79	0.00	0.00	0.65	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	6.8	12.3	0.0	0.0	0.0	0.0	40.7	0.0	0.0			
Incr Delay (d2), s/veh	1.6	0.4	0.0	0.0	0.6	0.0	9.4	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	3.6	8.4	0.0	0.0	0.2	0.0	6.6	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.4	12.7	0.0	0.0	0.6	0.0	50.1	0.0	0.0			
LnGrp LOS	A	B	A	A	A		D	A				
Approach Vol, veh/h	1555				923				256			
Approach Delay, s/veh	11.5				0.6				50.1			
Approach LOS	B				A				D			
Timer - Assigned Phs	1	2					6	8				
Phs Duration (G+Y+Rc), s	18.7	59.3					78.0	22.0				
Change Period (Y+Rc), s	5.5	5.5					5.5	5.5				
Max Green Setting (Gmax), s	24.5	32.0					62.0	27.0				
Max Q Clear Time (g_c+I1), s	12.0	2.0					22.3	16.0				
Green Ext Time (p_c), s	1.2	12.7					18.0	0.5				

Intersection Summary

HCM 6th Ctrl Delay	11.4
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Timings
11: I-75 SB Ramps & SR 138 (Lake Spivey Pkwy)

1a. Existing 2023 AM
01/18/2023

	→	↘	↙	←	↘	↙
Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Configurations	↑↑	↑	↘	↑↑	↘↘	↘
Traffic Volume (vph)	1168	204	84	1032	299	235
Future Volume (vph)	1168	204	84	1032	299	235
Lane Group Flow (vph)	1270	222	91	1122	325	255
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	3	
Permitted Phases		6	2			8
Detector Phase	6	6	5	2	3	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	5.0	15.0	5.0	15.0
Minimum Split (s)	28.5	28.5	15.0	28.5	15.0	28.5
Total Split (s)	56.0	56.0	15.0	71.0	29.0	29.0
Total Split (%)	56.0%	56.0%	15.0%	71.0%	29.0%	29.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Min	C-Min	None	C-Min	None	Min
v/c Ratio	0.60	0.21	0.31	0.45	0.53	0.68
Control Delay	15.2	2.2	4.2	5.5	39.8	29.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.2	2.2	4.2	5.5	39.8	29.9
Queue Length 50th (ft)	248	0	0	2	99	85
Queue Length 95th (ft)	393	35	m8	288	131	160
Internal Link Dist (ft)	1158			897		
Turn Bay Length (ft)		980	150		490	
Base Capacity (vph)	2122	1046	326	2487	806	458
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.21	0.28	0.45	0.40	0.56

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

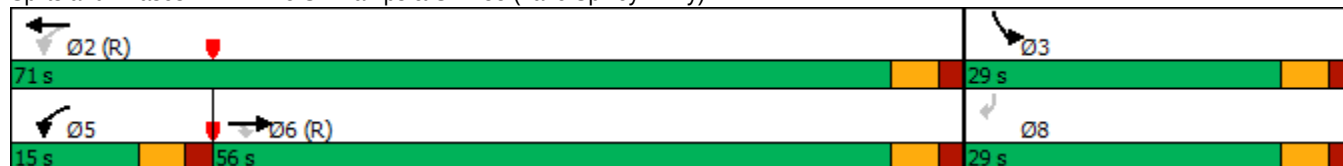
Offset: 46 (46%), Referenced to phase 2:WBTL and 6:EBT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

m Volume for 95th percentile queue is metered by upstream signal.

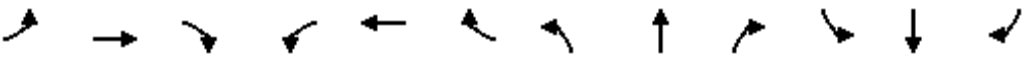
Splits and Phases: 11: I-75 SB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
11: I-75 SB Ramps & SR 138 (Lake Spivey Pkwy)

1a. Existing 2023 AM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑					↖↗		↗
Traffic Volume (veh/h)	0	1168	204	84	1032	0	0	0	0	299	0	235
Future Volume (veh/h)	0	1168	204	84	1032	0	0	0	0	299	0	235
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1870	1870	1856	0				1870	0	1870
Adj Flow Rate, veh/h	0	1270	0	91	1122	0				325	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	3	2	2	3	0				2	0	2
Cap, veh/h	0	2359		364	2715	0				415	0	
Arrive On Green	0.00	0.67	0.00	0.06	1.00	0.00				0.12	0.00	0.00
Sat Flow, veh/h	0	3618	1585	1781	3618	0				3456	0	1585
Grp Volume(v), veh/h	0	1270	0	91	1122	0				325	0	0
Grp Sat Flow(s),veh/h/ln	0	1763	1585	1781	1763	0				1728	0	1585
Q Serve(g_s), s	0.0	18.6	0.0	1.4	0.0	0.0				9.1	0.0	0.0
Cycle Q Clear(g_c), s	0.0	18.6	0.0	1.4	0.0	0.0				9.1	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2359		364	2715	0				415	0	
V/C Ratio(X)	0.00	0.54		0.25	0.41	0.00				0.78	0.00	
Avail Cap(c_a), veh/h	0	2359		452	2715	0				812	0	
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.73	0.00	0.67	0.67	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	8.6	0.0	6.3	0.0	0.0				42.7	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.6	0.0	0.2	0.3	0.0				3.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	5.8	0.0	0.4	0.1	0.0				3.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	9.2	0.0	6.5	0.3	0.0				46.0	0.0	0.0
LnGrp LOS	A	A		A	A	A				D	A	
Approach Vol, veh/h		1270			1213						325	
Approach Delay, s/veh		9.2			0.8						46.0	
Approach LOS		A			A						D	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		82.5			10.1	72.4		17.5				
Change Period (Y+Rc), s		5.5			5.5	5.5		5.5				
Max Green Setting (Gmax), s		65.5			9.5	50.5		23.5				
Max Q Clear Time (g_c+I1), s		2.0			3.4	20.6		11.1				
Green Ext Time (p_c), s		22.0			0.1	18.2		0.9				
Intersection Summary												
HCM 6th Ctrl Delay			9.8									
HCM 6th LOS			A									
Notes												
Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Timings

12: Speer Rd/Mt. Zion Pkwy & SR 138 (Lake Spivey Pkwy)

1a. Existing 2023 AM

01/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	605	35	312	672	194	76	193	480	167	75	55
Future Volume (vph)	68	605	35	312	672	194	76	193	480	167	75	55
Lane Group Flow (vph)	72	637	37	328	707	204	80	203	505	176	79	58
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2			8			4
Detector Phase	1	6	6	5	2	2	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	15.0	46.5	46.5	15.0	47.5	47.5	15.0	46.5	46.5	15.0	45.5	45.5
Total Split (s)	15.0	50.0	50.0	26.0	61.0	61.0	15.0	56.0	56.0	18.0	59.0	59.0
Total Split (%)	10.0%	33.3%	33.3%	17.3%	40.7%	40.7%	10.0%	37.3%	37.3%	12.0%	39.3%	39.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.37	0.42	0.05	0.75	0.40	0.23	0.41	0.27	0.90	0.66	0.09	0.12
Control Delay	73.0	33.3	0.1	73.9	26.4	4.2	74.7	47.8	43.0	79.3	41.3	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.0	33.3	0.1	73.9	26.4	4.2	74.7	47.8	43.0	79.3	41.3	0.5
Queue Length 50th (ft)	35	226	0	161	223	0	39	88	233	87	32	0
Queue Length 95th (ft)	62	351	0	211	350	54	68	108	339	129	47	0
Internal Link Dist (ft)		1890			1158			635			523	
Turn Bay Length (ft)	345		290	290		930	195		550	270		270
Base Capacity (vph)	223	1531	783	489	1773	901	217	1191	722	286	1287	653
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.42	0.05	0.67	0.40	0.23	0.37	0.17	0.70	0.62	0.06	0.09

Intersection Summary

Cycle Length: 150

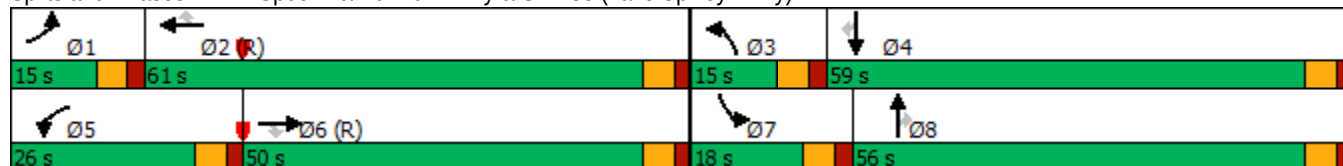
Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Green

Natural Cycle: 125

Control Type: Actuated-Coordinated

Splits and Phases: 12: Speer Rd/Mt. Zion Pkwy & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
12: Speer Rd/Mt. Zion Pkwy & SR 138 (Lake Spivey Pkwy)

1a. Existing 2023 AM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	68	605	35	312	672	194	76	193	480	167	75	55
Future Volume (veh/h)	68	605	35	312	672	194	76	193	480	167	75	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1856	1900	1900	1856	1870	1870	1870	1870	1870	1900	1870
Adj Flow Rate, veh/h	72	637	37	328	707	204	80	203	505	176	79	58
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
Percent Heavy Veh, %	2	3	0	0	3	2	2	2	2	2	0	2
Cap, veh/h	112	1235	564	381	1503	676	122	1173	523	223	1297	570
Arrive On Green	0.03	0.35	0.35	0.11	0.43	0.43	0.04	0.33	0.33	0.06	0.36	0.36
Sat Flow, veh/h	3456	3526	1610	3510	3526	1585	3456	3554	1585	3456	3610	1585
Grp Volume(v), veh/h	72	637	37	328	707	204	80	203	505	176	79	58
Grp Sat Flow(s),veh/h/ln	1728	1763	1610	1755	1763	1585	1728	1777	1585	1728	1805	1585
Q Serve(g_s), s	3.1	21.5	2.3	13.8	21.6	12.7	3.4	6.1	47.0	7.5	2.2	3.7
Cycle Q Clear(g_c), s	3.1	21.5	2.3	13.8	21.6	12.7	3.4	6.1	47.0	7.5	2.2	3.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	112	1235	564	381	1503	676	122	1173	523	223	1297	570
V/C Ratio(X)	0.64	0.52	0.07	0.86	0.47	0.30	0.66	0.17	0.97	0.79	0.06	0.10
Avail Cap(c_a), veh/h	219	1235	564	480	1503	676	219	1196	534	288	1297	570
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.94	0.94	0.94	0.86	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	71.7	38.6	32.4	65.8	30.9	28.3	71.5	35.7	49.4	69.2	31.5	32.0
Incr Delay (d2), s/veh	5.6	1.4	0.2	10.9	0.9	1.0	5.9	0.1	29.9	10.7	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	9.4	0.9	6.7	9.2	4.9	1.6	2.6	22.4	3.6	0.9	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	77.3	40.1	32.6	76.6	31.8	29.3	77.3	35.8	79.3	79.9	31.5	32.0
LnGrp LOS	E	D	C	E	C	C	E	D	E	E	C	C
Approach Vol, veh/h	746			1239			788			313		
Approach Delay, s/veh	43.3			43.3			67.9			58.8		
Approach LOS	D			D			E			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.4	69.4	10.8	59.4	21.8	58.0	15.2	55.0				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	9.5	55.5	9.5	53.5	20.5	44.5	12.5	50.5				
Max Q Clear Time (g_c+I1), s	5.1	23.6	5.4	5.7	15.8	23.5	9.5	49.0				
Green Ext Time (p_c), s	0.1	11.5	0.1	0.6	0.5	7.3	0.1	0.5				
Intersection Summary												
HCM 6th Ctrl Delay	51.1											
HCM 6th LOS	D											

Timings
13: Spivey Rd & SR 138 (Lake Spivey Pkwy)

1a. Existing 2023 AM
01/18/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↑
Traffic Volume (vph)	586	21	94	759	32	199
Future Volume (vph)	586	21	94	759	32	199
Lane Group Flow (vph)	644	23	103	834	35	219
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	8	
Permitted Phases		6	2			8
Detector Phase	6	6	5	2	8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0	6.0
Minimum Split (s)	25.5	25.5	15.0	23.5	31.5	31.5
Total Split (s)	44.0	44.0	18.0	62.0	38.0	38.0
Total Split (%)	44.0%	44.0%	18.0%	62.0%	38.0%	38.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Min	C-Min	None	C-Min	None	None
v/c Ratio	0.26	0.02	0.16	0.30	0.23	0.66
Control Delay	6.5	2.8	3.0	3.0	45.2	15.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.5	2.8	3.0	3.0	45.2	15.8
Queue Length 50th (ft)	70	0	9	50	21	0
Queue Length 95th (ft)	124	9	27	96	49	66
Internal Link Dist (ft)	1639			1890	1094	
Turn Bay Length (ft)		230	535			220
Base Capacity (vph)	2471	1123	688	2823	575	662
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.02	0.15	0.30	0.06	0.33

Intersection Summary

Cycle Length: 100

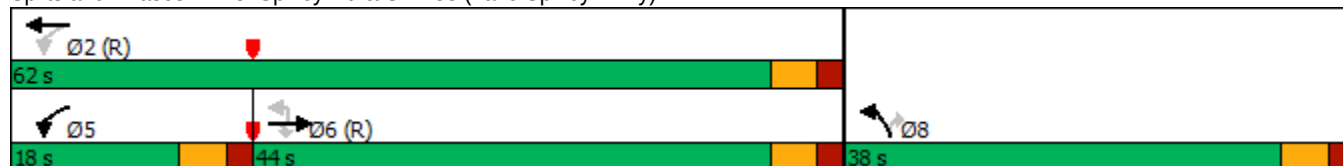
Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTU, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Splits and Phases: 13: Spivey Rd & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary

13: Spivey Rd & SR 138 (Lake Spivey Pkwy)

1a. Existing 2023 AM

01/18/2023



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	⇐	⇑⇑	⇑	⇑	⇑⇑	⇑	⇑
Traffic Volume (veh/h)	0	586	21	94	759	32	199
Future Volume (veh/h)	0	586	21	94	759	32	199
Initial Q (Qb), veh		0	0	0	0	0	0
Ped-Bike Adj(A_pbT)			1.00	1.00		1.00	1.00
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No	No	
Adj Sat Flow, veh/h/ln		1856	1870	1870	1856	1870	1870
Adj Flow Rate, veh/h		644	0	103	834	35	0
Peak Hour Factor		0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %		3	2	2	3	2	2
Cap, veh/h		2646		702	3006	66	
Arrive On Green		0.75	0.00	0.05	0.85	0.04	0.00
Sat Flow, veh/h		3618	1585	1781	3618	1781	1585
Grp Volume(v), veh/h		644	0	103	834	35	0
Grp Sat Flow(s),veh/h/ln		1763	1585	1781	1763	1781	1585
Q Serve(g_s), s		5.6	0.0	1.1	4.6	1.9	0.0
Cycle Q Clear(g_c), s		5.6	0.0	1.1	4.6	1.9	0.0
Prop In Lane			1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h		2646		702	3006	66	
V/C Ratio(X)		0.24		0.15	0.28	0.53	
Avail Cap(c_a), veh/h		2646		841	3006	579	
HCM Platoon Ratio		1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	0.00	0.93	0.93	1.00	0.00
Uniform Delay (d), s/veh		3.8	0.0	2.1	1.4	47.3	0.0
Incr Delay (d2), s/veh		0.2	0.0	0.1	0.2	6.3	0.0
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		1.4	0.0	0.2	0.4	1.0	0.0
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh		4.0	0.0	2.2	1.6	53.6	0.0
LnGrp LOS		A		A	A	D	
Approach Vol, veh/h		644			937	35	
Approach Delay, s/veh		4.0			1.7	53.6	
Approach LOS		A			A	D	
Timer - Assigned Phs		2			5	6	8
Phs Duration (G+Y+Rc), s		90.8			10.2	80.6	9.2
Change Period (Y+Rc), s		5.5			5.5	5.5	5.5
Max Green Setting (Gmax), s		56.5			12.5	38.5	32.5
Max Q Clear Time (g_c+I1), s		6.6			3.1	7.6	3.9
Green Ext Time (p_c), s		13.3			0.1	8.4	0.1

Intersection Summary

HCM 6th Ctrl Delay	3.7
HCM 6th LOS	A

Notes

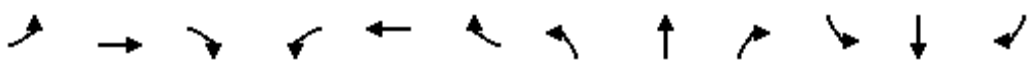
User approved ignoring U-Turning movement.

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Timings
14: Blackhall Rd/Speer Rd & Walt Stephens Rd

1a. Existing 2023 AM

01/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	160	45	106	222	387	40	387	55	136	101	10
Future Volume (vph)	14	160	45	106	222	387	40	387	55	136	101	10
Lane Group Flow (vph)	16	178	50	118	247	430	44	430	61	151	112	11
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	6				2		3		8		7	
Permitted Phases	6		6	2		2	8		8	4		4
Detector Phase	6	6	6	2	2	2	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0	15.0	5.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	23.5	23.5	23.5	23.5	23.5	23.5	15.0	23.5	23.5	15.0	23.5	23.5
Total Split (s)	41.0	41.0	41.0	41.0	41.0	41.0	15.0	44.0	44.0	15.0	44.0	44.0
Total Split (%)	41.0%	41.0%	41.0%	41.0%	41.0%	41.0%	15.0%	44.0%	44.0%	15.0%	44.0%	44.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.03	0.21	0.07	0.22	0.29	0.45	0.09	0.80	0.12	0.52	0.17	0.02
Control Delay	18.9	19.2	1.5	20.3	20.4	5.2	14.7	44.1	2.7	22.6	22.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.9	19.2	1.5	20.3	20.4	5.2	14.7	44.1	2.7	22.6	22.7	0.1
Queue Length 50th (ft)	6	67	0	49	106	30	16	253	0	58	52	0
Queue Length 95th (ft)	21	131	8	87	159	58	30	326	15	82	83	0
Internal Link Dist (ft)	2027				3745			1264		1872		
Turn Bay Length (ft)	110		160	190		250	140		125	315		120
Base Capacity (vph)	469	844	765	535	844	947	535	717	662	295	724	667
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.21	0.07	0.22	0.29	0.45	0.08	0.60	0.09	0.51	0.15	0.02

Intersection Summary

Cycle Length: 100

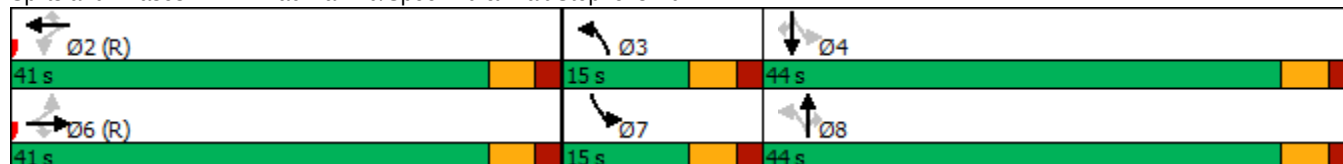
Actuated Cycle Length: 100

Offset: 96 (96%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Splits and Phases: 14: Blackhall Rd/Speer Rd & Walt Stephens Rd



HCM 6th Signalized Intersection Summary

14: Blackhall Rd/Speer Rd & Walt Stephens Rd

1a. Existing 2023 AM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	160	45	106	222	387	40	387	55	136	101	10
Future Volume (veh/h)	14	160	45	106	222	387	40	387	55	136	101	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	16	178	50	118	247	430	44	430	0	151	112	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	390	925	784	581	925	784	469	488		252	571	
Arrive On Green	0.49	0.49	0.49	0.49	0.49	0.49	0.04	0.26	0.00	0.08	0.31	0.00
Sat Flow, veh/h	762	1870	1585	1153	1870	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	16	178	50	118	247	430	44	430	0	151	112	0
Grp Sat Flow(s),veh/h/ln	762	1870	1585	1153	1870	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	1.2	5.3	1.6	6.4	7.7	18.8	1.8	22.1	0.0	6.0	4.4	0.0
Cycle Q Clear(g_c), s	8.9	5.3	1.6	11.7	7.7	18.8	1.8	22.1	0.0	6.0	4.4	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	390	925	784	581	925	784	469	488		252	571	
V/C Ratio(X)	0.04	0.19	0.06	0.20	0.27	0.55	0.09	0.88		0.60	0.20	
Avail Cap(c_a), veh/h	390	925	784	581	925	784	575	720		280	720	
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	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	17.3	14.1	13.2	17.4	14.7	17.5	25.4	35.5	0.0	26.2	25.7	0.0
Incr Delay (d2), s/veh	0.2	0.5	0.2	0.8	0.7	2.8	0.1	8.7	0.0	2.9	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	2.2	0.6	1.7	3.2	6.8	0.7	10.7	0.0	2.6	1.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.5	14.6	13.3	18.2	15.4	20.3	25.5	44.2	0.0	29.2	25.8	0.0
LnGrp LOS	B	B	B	B	B	C	C	D		C	C	
Approach Vol, veh/h	244			795			474			263		
Approach Delay, s/veh	14.5			18.5			42.4			27.7		
Approach LOS	B			B			D			C		
Timer - Assigned Phs	2			3			4			6		
Phs Duration (G+Y+Rc), s	55.0			9.0			36.0			55.0		
Change Period (Y+Rc), s	5.5			5.5			5.5			5.5		
Max Green Setting (Gmax), s	35.5			9.5			38.5			35.5		
Max Q Clear Time (g_c+I1), s	20.8			3.8			6.4			10.9		
Green Ext Time (p_c), s	5.8			0.0			0.5			2.3		
Intersection Summary												
HCM 6th Ctrl Delay	25.7											
HCM 6th LOS	C											

Timings

1b. Existing 2023 PM

1: Flippen Rd/Shields Rd & SR 42/SR 138/US 23 (N. Henry Blvd)

01/18/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	20	1249	169	963	167	31	133	26	46
Future Volume (vph)	20	1249	169	963	167	31	133	26	46
Lane Group Flow (vph)	20	1503	171	986	0	200	134	0	83
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	Perm	NA
Protected Phases	1	6	5	2		8			4
Permitted Phases	6		2		8		8	4	
Detector Phase	1	6	5	2	8	8	8	4	4
Switch Phase									
Minimum Initial (s)	5.0	15.0	5.0	15.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	15.0	28.5	15.0	28.5	30.5	30.5	30.5	30.5	30.5
Total Split (s)	15.0	54.2	15.0	54.2	30.8	30.8	30.8	30.8	30.8
Total Split (%)	15.0%	54.2%	15.0%	54.2%	30.8%	30.8%	30.8%	30.8%	30.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5		5.5	5.5		5.5
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	C-Min	None	C-Min	None	None	None	None	None
v/c Ratio	0.05	0.80	0.71	0.44		0.76	0.36		0.27
Control Delay	6.8	23.5	34.9	11.2		59.5	22.6		31.9
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Delay	6.8	23.5	34.9	11.2		59.5	22.6		31.9
Queue Length 50th (ft)	4	390	51	125		94	16		41
Queue Length 95th (ft)	13	#572	#158	272		211	103		79
Internal Link Dist (ft)		2570		1632		2093			641
Turn Bay Length (ft)	135		210				25		
Base Capacity (vph)	447	1874	253	2247		343	461		394
Starvation Cap Reductn	0	0	0	0		0	0		0
Spillback Cap Reductn	0	0	0	0		0	0		0
Storage Cap Reductn	0	0	0	0		0	0		0
Reduced v/c Ratio	0.04	0.80	0.68	0.44		0.58	0.29		0.21

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

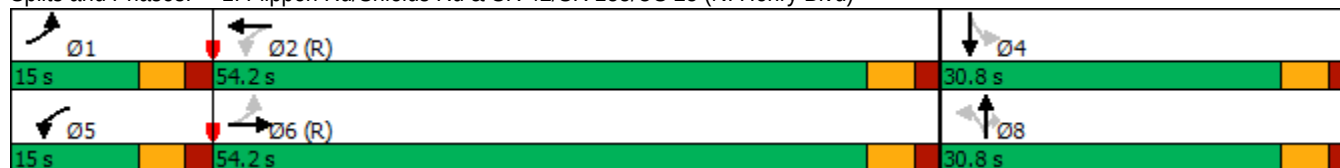
Natural Cycle: 90

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Flippen Rd/Shields Rd & SR 42/SR 138/US 23 (N. Henry Blvd)



HCM 6th Signalized Intersection Summary

1b. Existing 2023 PM

1: Flippen Rd/Shields Rd & SR 42/SR 138/US 23 (N. Henry Blvd)

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	1249	239	169	963	13	167	31	133	26	46	11
Future Volume (veh/h)	20	1249	239	169	963	13	167	31	133	26	46	11
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1841	1856	1856	1841	1870	1856	1870	1856	1870	1870	1870
Adj Flow Rate, veh/h	20	1262	241	171	973	13	169	31	134	26	46	11
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	4	3	3	4	2	3	2	3	2	2	2
Cap, veh/h	335	1518	287	237	1981	26	217	28	398	47	69	11
Arrive On Green	0.02	0.52	0.52	0.06	0.56	0.56	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	1781	2934	555	1767	3534	47	594	109	1572	0	272	42
Grp Volume(v), veh/h	20	747	756	171	481	505	200	0	134	83	0	0
Grp Sat Flow(s),veh/h/ln	1781	1749	1741	1767	1749	1832	703	0	1572	314	0	0
Q Serve(g_s), s	0.5	36.0	37.0	4.4	16.7	16.7	0.0	0.0	7.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.5	36.0	37.0	4.4	16.7	16.7	25.3	0.0	7.0	25.3	0.0	0.0
Prop In Lane	1.00		0.32	1.00		0.03	0.84		1.00	0.31		0.13
Lane Grp Cap(c), veh/h	335	905	901	237	980	1027	244	0	398	127	0	0
V/C Ratio(X)	0.06	0.83	0.84	0.72	0.49	0.49	0.82	0.00	0.34	0.66	0.00	0.00
Avail Cap(c_a), veh/h	466	905	901	291	980	1027	244	0	398	127	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	11.6	20.3	20.6	20.9	13.3	13.3	38.7	0.0	30.5	31.4	0.0	0.0
Incr Delay (d2), s/veh	0.1	8.5	9.2	6.6	1.8	1.7	19.3	0.0	0.5	11.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	15.0	15.5	2.3	6.2	6.5	6.2	0.0	2.6	1.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.6	28.8	29.8	27.5	15.1	15.0	58.0	0.0	31.0	43.0	0.0	0.0
LnGrp LOS	B	C	C	C	B	B	E	A	C	D	A	A
Approach Vol, veh/h	1523			1157			334			83		
Approach Delay, s/veh	29.1			16.9			47.2			43.0		
Approach LOS	C			B			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.6	61.6		30.8	12.0	57.2		30.8				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	9.5	48.7		25.3	9.5	48.7		25.3				
Max Q Clear Time (g_c+I1), s	2.5	18.7		27.3	6.4	39.0		27.3				
Green Ext Time (p_c), s	0.0	13.0		0.0	0.1	8.3		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				26.9								
HCM 6th LOS				C								

Intersection						
Int Delay, s/veh	0.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	13	16	490	13	25	601
Future Vol, veh/h	13	16	490	13	25	601
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	98	98	98	98	98	98
Heavy Vehicles, %	2	2	3	2	2	3
Mvmt Flow	13	16	500	13	26	613
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1172	507	0	0	513	0
Stage 1	507	-	-	-	-	-
Stage 2	665	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	213	566	-	-	1052	-
Stage 1	605	-	-	-	-	-
Stage 2	511	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	205	566	-	-	1052	-
Mov Cap-2 Maneuver	205	-	-	-	-	-
Stage 1	605	-	-	-	-	-
Stage 2	492	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	17.6	0		0.3		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	-	316	1052	-	
HCM Lane V/C Ratio	-	-	0.094	0.024	-	
HCM Control Delay (s)	-	-	17.6	8.5	0	
HCM Lane LOS	-	-	C	A	A	
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-	

HCM 6th TWSC
3: Flippen Rd & Reeves Creek Trail Parking Lot

1b. Existing 2023 PM
01/18/2023

Intersection

Int Delay, s/veh 0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	4	459	2	3	579
Future Vol, veh/h	0	4	459	2	3	579
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	96	96	96	96	96	96
Heavy Vehicles, %	2	2	3	2	2	3
Mvmt Flow	0	4	478	2	3	603

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1088	479	0
Stage 1	479	-	-
Stage 2	609	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	239	587	-
Stage 1	623	-	-
Stage 2	543	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	238	587	-
Mov Cap-2 Maneuver	238	-	-
Stage 1	623	-	-
Stage 2	541	-	-

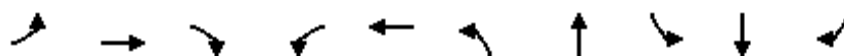
Approach	WB	NB	SB
HCM Control Delay, s	11.2	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	587	1082
HCM Lane V/C Ratio	-	-	0.007	0.003
HCM Control Delay (s)	-	-	11.2	8.3
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0	0

Timings 4: Flippen Rd & Walt Stephens Rd/Red Oak Rd

1b. Existing 2023 PM

01/18/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	155	176	391	23	133	315	329	23	438	156
Future Volume (vph)	155	176	391	23	133	315	329	23	438	156
Lane Group Flow (vph)	167	189	420	25	169	339	373	25	471	168
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4		3	8	1	6	5	2	
Permitted Phases	4		4	8		6		2		2
Detector Phase	7	4	4	3	8	1	6	5	2	2
Switch Phase										
Minimum Initial (s)	5.0	6.0	6.0	5.0	6.0	5.0	15.0	5.0	15.0	15.0
Minimum Split (s)	15.0	31.5	31.5	15.0	30.5	15.0	31.5	15.0	28.5	28.5
Total Split (s)	15.0	31.5	31.5	15.0	31.5	18.0	38.5	15.0	35.5	35.5
Total Split (%)	15.0%	31.5%	31.5%	15.0%	31.5%	18.0%	38.5%	15.0%	35.5%	35.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
v/c Ratio	0.54	0.42	0.60	0.09	0.62	0.69	0.37	0.06	0.77	0.26
Control Delay	30.0	32.3	10.2	24.2	47.3	25.7	16.6	12.4	39.6	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.0	32.3	10.2	24.2	47.3	25.7	16.6	12.4	39.6	5.9
Queue Length 50th (ft)	75	86	53	11	97	119	110	7	244	4
Queue Length 95th (ft)	m106	m141	76	28	152	#283	260	m15	m#441	m25
Internal Link Dist (ft)		646			1291		2204		704	
Turn Bay Length (ft)	180		345	110		130		120		215
Base Capacity (vph)	308	498	731	338	487	489	1005	500	610	646
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.38	0.57	0.07	0.35	0.69	0.37	0.05	0.77	0.26

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 88 (88%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green

Natural Cycle: 95

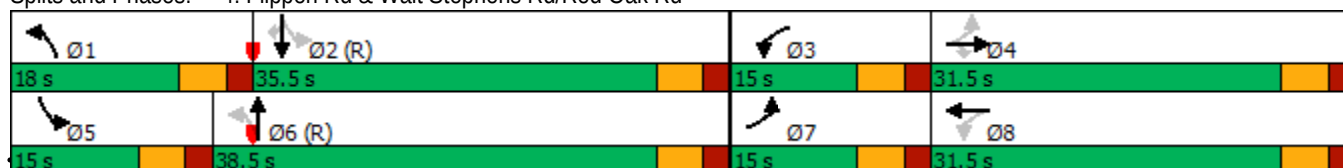
Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Flippen Rd & Walt Stephens Rd/Red Oak Rd



HCM 6th Signalized Intersection Summary

4: Flippen Rd & Walt Stephens Rd/Red Oak Rd

1b. Existing 2023 PM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	155	176	391	23	133	24	315	329	18	23	438	156
Future Volume (veh/h)	155	176	391	23	133	24	315	329	18	23	438	156
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1870	1900	1856	1870	1870	1856	1900
Adj Flow Rate, veh/h	167	189	0	25	143	26	339	354	19	25	471	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	0	2	0	3	2	2	3	0
Cap, veh/h	274	348		229	181	33	532	949	51	549	841	
Arrive On Green	0.09	0.19	0.00	0.03	0.12	0.12	0.12	0.54	0.54	0.03	0.45	0.00
Sat Flow, veh/h	1781	1870	1585	1781	1564	284	1810	1745	94	1781	1856	1610
Grp Volume(v), veh/h	167	189	0	25	0	169	339	0	373	25	471	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1849	1810	0	1839	1781	1856	1610
Q Serve(g_s), s	8.0	9.2	0.0	1.2	0.0	8.9	9.5	0.0	11.6	0.7	18.6	0.0
Cycle Q Clear(g_c), s	8.0	9.2	0.0	1.2	0.0	8.9	9.5	0.0	11.6	0.7	18.6	0.0
Prop In Lane	1.00		1.00	1.00		0.15	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	274	348		229	0	214	532	0	1000	549	841	
V/C Ratio(X)	0.61	0.54		0.11	0.00	0.79	0.64	0.00	0.37	0.05	0.56	
Avail Cap(c_a), veh/h	274	486		354	0	481	548	0	1000	673	841	
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	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.3	36.9	0.0	37.4	0.0	43.0	13.7	0.0	13.0	13.8	20.0	0.0
Incr Delay (d2), s/veh	3.9	1.3	0.0	0.2	0.0	6.3	2.4	0.0	1.1	0.0	2.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	4.1	0.0	0.5	0.0	4.4	3.6	0.0	4.6	0.3	8.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.2	38.2	0.0	37.6	0.0	49.3	16.1	0.0	14.1	13.9	22.7	0.0
LnGrp LOS	D	D		D	A	D	B	A	B	B	C	
Approach Vol, veh/h	356			194			712			496		
Approach Delay, s/veh	37.7			47.8			15.0			22.3		
Approach LOS	D			D			B			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.1	50.8	8.0	24.1	8.0	59.9	15.0	17.1				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	12.5	30.0	9.5	26.0	9.5	33.0	9.5	26.0				
Max Q Clear Time (g_c+I1), s	11.5	20.6	3.2	11.2	2.7	13.6	10.0	10.9				
Green Ext Time (p_c), s	0.1	3.1	0.0	0.7	0.0	3.7	0.0	0.7				

Intersection Summary

HCM 6th Ctrl Delay 25.3

HCM 6th LOS C

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings 5: Flippen Rd & Hudson Bridge Rd

1b. Existing 2023 PM

01/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	393	9	574	698	290	3	312	317	238	396	79
Future Volume (vph)	125	393	9	574	698	290	3	312	317	238	396	79
Lane Group Flow (vph)	129	405	9	592	720	299	3	322	327	245	408	81
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2			8		7	4	
Permitted Phases	6		6	2		2	8		8	4		4
Detector Phase	1	6	6	5	2	2	8	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	6.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	15.0	28.5	28.5	15.0	28.5	28.5	36.5	36.5	36.5	15.0	33.5	33.5
Total Split (s)	15.0	27.0	27.0	36.0	48.0	48.0	39.0	39.0	39.0	18.0	57.0	57.0
Total Split (%)	12.5%	22.5%	22.5%	30.0%	40.0%	40.0%	32.5%	32.5%	32.5%	15.0%	47.5%	47.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.49	0.64	0.02	0.89	0.49	0.36	0.01	0.79	0.54	0.86	0.60	0.12
Control Delay	27.0	50.9	0.1	42.2	28.6	4.3	32.7	57.9	7.3	55.0	33.8	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.0	50.9	0.1	42.2	28.6	4.3	32.7	57.9	7.3	55.0	33.8	1.4
Queue Length 50th (ft)	48	154	0	338	216	0	2	236	0	136	251	0
Queue Length 95th (ft)	93	209	0	#639	300	59	10	319	70	#206	324	10
Internal Link Dist (ft)		840			1594			786			834	
Turn Bay Length (ft)	375		175	390		450	230		365	320		320
Base Capacity (vph)	273	634	425	663	1466	831	271	515	677	286	791	749
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.64	0.02	0.89	0.49	0.36	0.01	0.63	0.48	0.86	0.52	0.11

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 37 (31%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

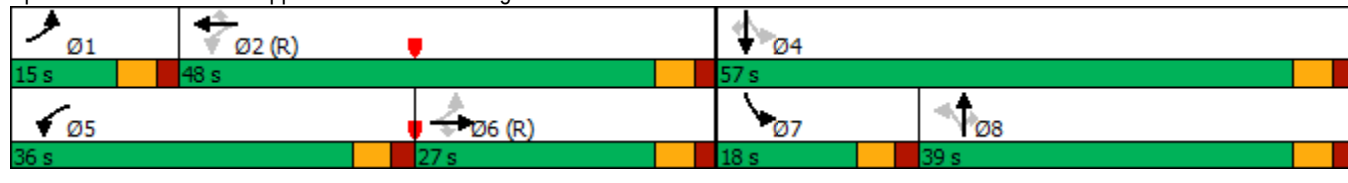
Natural Cycle: 105

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 5: Flippen Rd & Hudson Bridge Rd



HCM 6th Signalized Intersection Summary 5: Flippen Rd & Hudson Bridge Rd

1b. Existing 2023 PM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	393	9	574	698	290	3	312	317	238	396	79
Future Volume (veh/h)	125	393	9	574	698	290	3	312	317	238	396	79
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1856	1870	1870	1856	1870
Adj Flow Rate, veh/h	129	405	0	592	720	0	3	322	327	245	408	81
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	3	2	2	3	2
Cap, veh/h	352	806		638	1458		248	430	367	300	708	605
Arrive On Green	0.07	0.23	0.00	0.25	0.41	0.00	0.23	0.23	0.23	0.10	0.38	0.38
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	907	1856	1585	1781	1856	1585
Grp Volume(v), veh/h	129	405	0	592	720	0	3	322	327	245	408	81
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	907	1856	1585	1781	1856	1585
Q Serve(g_s), s	6.6	11.9	0.0	30.0	18.0	0.0	0.3	19.4	24.0	12.4	20.9	4.0
Cycle Q Clear(g_c), s	6.6	11.9	0.0	30.0	18.0	0.0	3.2	19.4	24.0	12.4	20.9	4.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	352	806		638	1458		248	430	367	300	708	605
V/C Ratio(X)	0.37	0.50		0.93	0.49		0.01	0.75	0.89	0.82	0.58	0.13
Avail Cap(c_a), veh/h	367	806		638	1458		291	518	442	300	796	680
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	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.9	40.5	0.0	24.6	26.2	0.0	37.8	42.9	44.6	31.9	29.4	24.2
Incr Delay (d2), s/veh	0.6	2.2	0.0	20.1	1.2	0.0	0.0	4.9	17.5	15.8	0.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	5.3	0.0	15.2	7.5	0.0	0.1	9.2	10.9	6.4	9.1	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.6	42.7	0.0	44.7	27.4	0.0	37.9	47.8	62.1	47.7	30.2	24.3
LnGrp LOS	C	D		D	C		D	D	E	D	C	C
Approach Vol, veh/h	534			1312			652			734		
Approach Delay, s/veh	40.3			35.2			54.9			35.4		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.0	54.7		51.3	36.0	32.7	18.0	33.3				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	9.5	42.5		51.5	30.5	21.5	12.5	33.5				
Max Q Clear Time (g_c+I1), s	8.6	20.0		22.9	32.0	13.9	14.4	26.0				
Green Ext Time (p_c), s	0.0	8.3		2.6	0.0	2.3	0.0	1.8				

Intersection Summary

HCM 6th Ctrl Delay 40.1

HCM 6th LOS D

Notes

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Timings

6: SR 42/SR 138/US 23 (N. Henry Blvd) & SR 138 (Lake Spivey Pkwy)

1b. Existing 2023 PM

01/18/2023

	→	↘	↙	←	↖	↗	↑	↘	↙	↓
Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↕	↕↕	↙	↕	↕	↕↕	↕	↕	↙	↕↕
Traffic Volume (vph)	171	816	178	180	125	607	384	93	91	520
Future Volume (vph)	171	816	178	180	125	607	384	93	91	520
Lane Group Flow (vph)	419	841	184	186	129	626	396	96	94	674
Turn Type	NA	pt+ov	Split	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	4	4 1	8	8		1	6		5	2
Permitted Phases					8			6		
Detector Phase	4	4 1	8	8	8	1	6	6	5	2
Switch Phase										
Minimum Initial (s)	6.0		6.0	6.0	6.0	5.0	15.0	15.0	5.0	15.0
Minimum Split (s)	31.5		30.5	30.5	30.5	15.0	28.5	28.5	15.0	31.5
Total Split (s)	44.0		30.5	30.5	30.5	35.0	55.5	55.5	20.0	40.5
Total Split (%)	29.3%		20.3%	20.3%	20.3%	23.3%	37.0%	37.0%	13.3%	27.0%
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5		5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag						Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	None		None	None	None	None	C-Min	C-Min	None	C-Min
v/c Ratio	0.91	0.66	0.75	0.72	0.38	0.88	0.56	0.14	0.64	0.74
Control Delay	79.6	19.6	80.7	76.8	10.1	72.6	41.9	6.4	86.3	56.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.6	19.6	80.7	76.8	10.1	72.6	41.9	6.4	86.3	56.2
Queue Length 50th (ft)	398	189	174	176	0	304	313	0	90	323
Queue Length 95th (ft)	#589	234	256	256	52	#426	448	41	153	401
Internal Link Dist (ft)	2539			205			2663			944
Turn Bay Length (ft)			100		120	340		300	580	
Base Capacity (vph)	471	1292	297	316	384	710	709	674	172	907
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.65	0.62	0.59	0.34	0.88	0.56	0.14	0.55	0.74

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 6: SR 42/SR 138/US 23 (N. Henry Blvd) & SR 138 (Lake Spivey Pkwy)

 Ø1 35 s	 Ø2 (R) 40.5 s	 Ø4 44 s	 Ø8 30.5 s
 Ø5 20 s	 Ø6 (R) 55.5 s		

HCM 6th Signalized Intersection Summary
6: SR 42/SR 138/US 23 (N. Henry Blvd) & SR 138 (Lake Spivey Pkwy)

1b. Existing 2023 PM

01/18/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↩	↩↩	↩	↩	↩	↩↩	↩	↩	↩	↩↩	
Traffic Volume (veh/h)	236	171	816	178	180	125	607	384	93	91	520	134
Future Volume (veh/h)	236	171	816	178	180	125	607	384	93	91	520	134
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1900	1870	1885	1900	1900	1870	1856	1885	1885	1870	1885
Adj Flow Rate, veh/h	243	176	841	184	186	0	626	396	0	94	536	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	0	2	1	0	0	2	3	1	1	2	1
Cap, veh/h	273	198	1250	217	229		668	768		115	1011	
Arrive On Green	0.25	0.25	0.25	0.12	0.12	0.00	0.19	0.41	0.00	0.06	0.28	0.00
Sat Flow, veh/h	1071	776	2790	1795	1900	1610	3456	1856	1598	1795	3647	0
Grp Volume(v), veh/h	419	0	841	184	186	0	626	396	0	94	536	0
Grp Sat Flow(s),veh/h/ln	1846	0	1395	1795	1900	1610	1728	1856	1598	1795	1777	0
Q Serve(g_s), s	32.8	0.0	35.7	15.1	14.3	0.0	26.8	23.9	0.0	7.8	19.1	0.0
Cycle Q Clear(g_c), s	32.8	0.0	35.7	15.1	14.3	0.0	26.8	23.9	0.0	7.8	19.1	0.0
Prop In Lane	0.58		1.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	471	0	1250	217	229		668	768		115	1011	
V/C Ratio(X)	0.89	0.00	0.67	0.85	0.81		0.94	0.52		0.82	0.53	
Avail Cap(c_a), veh/h	474	0	1255	299	317		680	768		174	1011	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.63	0.00	0.63	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	53.9	0.0	32.7	64.6	64.3	0.0	59.6	32.8	0.0	69.3	45.2	0.0
Incr Delay (d2), s/veh	12.7	0.0	0.9	15.2	10.6	0.0	20.5	2.5	0.0	16.2	2.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.6	0.0	12.4	7.9	7.7	0.0	13.4	11.0	0.0	4.0	8.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.6	0.0	33.6	79.8	74.9	0.0	80.1	35.2	0.0	85.6	47.2	0.0
LnGrp LOS	E	A	C	E	E		F	D		F	D	
Approach Vol, veh/h	1260				370				1022			
Approach Delay, s/veh	44.6				77.4				62.7			
Approach LOS	D				E				E			
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	34.5	48.2		43.7	15.1	67.6		23.6				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	29.5	35.0		38.5	14.5	50.0		25.0				
Max Q Clear Time (g_c+I1), s	28.8	21.1		37.7	9.8	25.9		17.1				
Green Ext Time (p_c), s	0.2	4.7		0.5	0.1	4.3		1.0				

Intersection Summary

HCM 6th Ctrl Delay 55.5

HCM 6th LOS E

Notes

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings 7: I-675 NB Ramps & SR 138 (Lake Spivey Pkwy)

1b. Existing 2023 PM
01/18/2023

						
Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Configurations		 	 			
Traffic Volume (vph)	322	1982	1538	250	46	125
Future Volume (vph)	322	1982	1538	250	46	125
Lane Group Flow (vph)	329	2022	1569	255	47	128
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		3	
Permitted Phases	6			2		8
Detector Phase	1	6	2	2	3	8
Switch Phase						
Minimum Initial (s)	5.0	15.0	15.0	15.0	5.0	6.0
Minimum Split (s)	15.0	28.5	28.5	28.5	15.0	34.5
Total Split (s)	17.0	65.5	48.5	48.5	34.5	34.5
Total Split (%)	17.0%	65.5%	48.5%	48.5%	34.5%	34.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.62	0.72	0.92	0.29	0.30	0.58
Control Delay	23.2	11.7	34.5	4.0	46.0	27.1
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	23.2	11.8	34.5	4.0	46.0	27.1
Queue Length 50th (ft)	163	385	439	7	29	25
Queue Length 95th (ft)	m187	m454	#706	55	61	79
Internal Link Dist (ft)		706	2539			
Turn Bay Length (ft)	145			270		315
Base Capacity (vph)	533	2807	1706	888	513	520
Starvation Cap Reductn	0	112	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.75	0.92	0.29	0.09	0.25

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 13 (13%), Referenced to phase 2:WBT and 6:EBTL, Start of Green

Natural Cycle: 110

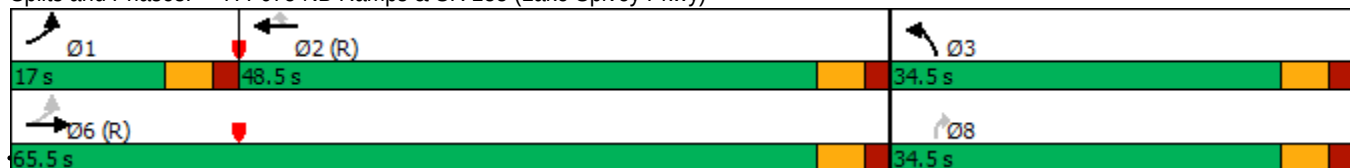
Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: I-675 NB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
7: I-675 NB Ramps & SR 138 (Lake Spivey Pkwy)

1b. Existing 2023 PM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Traffic Volume (veh/h)	322	1982	0	0	1538	250	46	0	125	0	0	0
Future Volume (veh/h)	322	1982	0	0	1538	250	46	0	125	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1870	1856	0	0	1856	1870	1870	0	1870			
Adj Flow Rate, veh/h	329	2022	0	0	1569	0	47	0	128			
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98			
Percent Heavy Veh, %	2	3	0	0	3	2	2	0	2			
Cap, veh/h	359	2776	0	0	2236		183	0	162			
Arrive On Green	0.13	1.00	0.00	0.00	0.63	0.00	0.10	0.00	0.10			
Sat Flow, veh/h	1781	3618	0	0	3618	1585	1781	0	1585			
Grp Volume(v), veh/h	329	2022	0	0	1569	0	47	0	128			
Grp Sat Flow(s),veh/h/ln	1781	1763	0	0	1763	1585	1781	0	1585			
Q Serve(g_s), s	7.6	0.0	0.0	0.0	29.3	0.0	2.4	0.0	7.9			
Cycle Q Clear(g_c), s	7.6	0.0	0.0	0.0	29.3	0.0	2.4	0.0	7.9			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	359	2776	0	0	2236		183	0	162			
V/C Ratio(X)	0.92	0.73	0.00	0.00	0.70		0.26	0.00	0.79			
Avail Cap(c_a), veh/h	388	2776	0	0	2236		517	0	460			
HCM Platoon Ratio	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.16	0.16	0.00	0.00	0.42	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	20.8	0.0	0.0	0.0	12.1	0.0	41.4	0.0	43.8			
Incr Delay (d2), s/veh	5.9	0.3	0.0	0.0	0.8	0.0	0.7	0.0	8.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	5.2	0.1	0.0	0.0	9.6	0.0	1.1	0.0	3.3			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.6	0.3	0.0	0.0	12.8	0.0	42.1	0.0	52.0			
LnGrp LOS	C	A	A	A	B		D	A	D			
Approach Vol, veh/h	2351				1569				175			
Approach Delay, s/veh	4.0				12.8				49.3			
Approach LOS	A				B				D			
Timer - Assigned Phs	1		2		6				8			
Phs Duration (G+Y+Rc), s	15.3		68.9		84.2				15.8			
Change Period (Y+Rc), s	5.5		5.5		5.5				5.5			
Max Green Setting (Gmax), s	11.5		43.0		60.0				29.0			
Max Q Clear Time (g_c+I1), s	9.6		31.3		2.0				9.9			
Green Ext Time (p_c), s	0.2		10.1		47.7				0.4			

Intersection Summary

HCM 6th Ctrl Delay	9.3
HCM 6th LOS	A

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Timings
8: I-675 SB Ramps & SR 138 (Lake Spivey Pkwy)

1b. Existing 2023 PM
01/18/2023

	→	↘	↙	←	↘	↙
Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↘
Traffic Volume (vph)	1927	126	107	1477	377	525
Future Volume (vph)	1927	126	107	1477	377	525
Lane Group Flow (vph)	1987	130	110	1523	389	541
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	7	
Permitted Phases		6	2			4
Detector Phase	6	6	5	2	7	4
Switch Phase						
Minimum Initial (s)	15.0	15.0	5.0	15.0	5.0	6.0
Minimum Split (s)	28.5	28.5	15.0	28.5	35.5	35.5
Total Split (s)	49.5	49.5	15.0	64.5	35.5	35.5
Total Split (%)	49.5%	49.5%	15.0%	64.5%	35.5%	35.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Min	C-Min	None	C-Min	None	None
v/c Ratio	1.06	0.14	0.51	0.65	0.52	0.79
Control Delay	50.7	0.2	35.2	3.5	36.1	39.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.7	0.2	35.2	3.5	36.1	39.5
Queue Length 50th (ft)	~736	0	30	17	112	157
Queue Length 95th (ft)	m#940	m0	m47	m50	145	206
Internal Link Dist (ft)	1959			706		
Turn Bay Length (ft)		375	95		520	500
Base Capacity (vph)	1874	906	246	2347	1029	897
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.06	0.14	0.45	0.65	0.38	0.60

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 24 (24%), Referenced to phase 2:WBTL and 6:EBT, Start of Green

Natural Cycle: 130

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

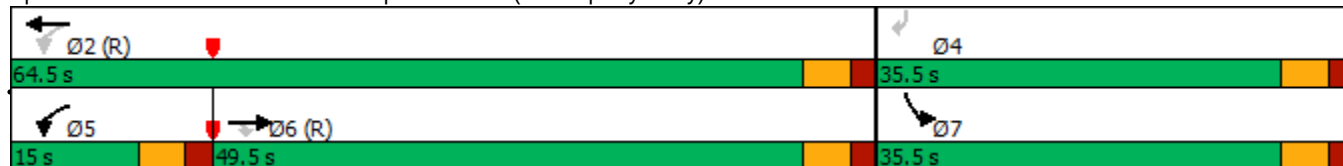
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: I-675 SB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
8: I-675 SB Ramps & SR 138 (Lake Spivey Pkwy)

1b. Existing 2023 PM

01/18/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑					↑↑		↑↑
Traffic Volume (veh/h)	0	1927	126	107	1477	0	0	0	0	377	0	525
Future Volume (veh/h)	0	1927	126	107	1477	0	0	0	0	377	0	525
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1870	1870	1856	0				1870	0	1870
Adj Flow Rate, veh/h	0	1987	130	110	1523	0				389	0	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	3	2	2	3	0				2	0	2
Cap, veh/h	0	2279	1024	281	2641	0				487	0	
Arrive On Green	0.00	1.00	1.00	0.06	1.00	0.00				0.14	0.00	0.00
Sat Flow, veh/h	0	3618	1585	1781	3618	0				3456	0	2790
Grp Volume(v), veh/h	0	1987	130	110	1523	0				389	0	0
Grp Sat Flow(s),veh/h/ln	0	1763	1585	1781	1763	0				1728	0	1395
Q Serve(g_s), s	0.0	0.0	0.0	1.9	0.4	0.0				10.9	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	1.9	0.4	0.0				10.9	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2279	1024	281	2641	0				487	0	
V/C Ratio(X)	0.00	0.87	0.13	0.39	0.58	0.00				0.80	0.00	
Avail Cap(c_a), veh/h	0	2279	1024	365	2641	0				1037	0	
HCM Platoon Ratio	1.00	2.00	2.00	1.33	1.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.24	0.24	0.31	0.31	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	4.3	0.0	0.0				41.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.3	0.1	0.3	0.3	0.0				3.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.4	3.6	0.5	0.1	0.0				4.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	1.3	0.1	4.6	0.3	0.0				44.6	0.0	0.0
LnGrp LOS	A	A	A	A	A	A				D	A	
Approach Vol, veh/h		2117			1633						389	
Approach Delay, s/veh		1.2			0.6						44.6	
Approach LOS		A			A						D	
Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		80.4		19.6	10.3	70.1						
Change Period (Y+Rc), s		5.5		5.5	5.5	5.5						
Max Green Setting (Gmax), s		59.0		30.0	9.5	44.0						
Max Q Clear Time (g_c+I1), s		2.4		12.9	3.9	2.0						
Green Ext Time (p_c), s		33.6		1.2	0.1	36.6						
Intersection Summary												
HCM 6th Ctrl Delay			5.0									
HCM 6th LOS			A									
Notes												
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.												

Timings
9: SR 138 (Lake Spivey Pkwy) & Mt. Zion Rd

1b. Existing 2023 PM

01/18/2023

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	152	1541	80	71	1233	161	129	126	170	95	187
Future Volume (vph)	152	1541	80	71	1233	161	129	126	170	95	187
Lane Group Flow (vph)	157	1589	82	73	1271	166	133	235	175	98	193
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8	7	4	
Permitted Phases	6		6	2		2	8		4		4
Detector Phase	1	6	6	5	2	2	3	8	7	4	4
Switch Phase											
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	6.0	5.0	6.0	6.0
Minimum Split (s)	15.0	28.5	28.5	15.0	34.5	34.5	15.0	38.5	15.0	32.5	32.5
Total Split (s)	15.0	31.5	31.5	15.0	31.5	31.5	15.0	38.5	15.0	38.5	38.5
Total Split (%)	15.0%	31.5%	31.5%	15.0%	31.5%	31.5%	15.0%	38.5%	15.0%	38.5%	38.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None
v/c Ratio	0.60	0.97	0.10	0.35	0.87	0.22	0.35	0.72	0.62	0.31	0.45
Control Delay	39.4	30.4	1.0	13.1	31.5	6.3	27.0	44.0	35.7	37.5	8.3
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	39.4	30.4	1.0	13.1	31.5	6.3	27.0	44.0	35.7	37.5	8.3
Queue Length 50th (ft)	57	~168	0	16	376	24	62	117	84	56	0
Queue Length 95th (ft)	m116	#809	m5	m31	#658	m60	98	183	125	95	54
Internal Link Dist (ft)		896			1959			388		1031	
Turn Bay Length (ft)	115		140	155		325	35		345		165
Base Capacity (vph)	274	1640	819	243	1464	771	382	608	282	627	662
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	0.57	0.97	0.10	0.30	0.87	0.22	0.35	0.39	0.62	0.16	0.29

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 135

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

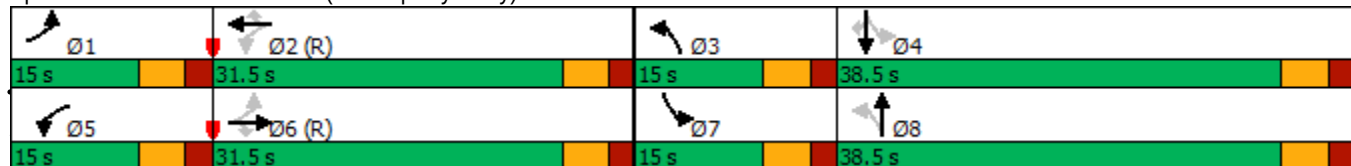
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: SR 138 (Lake Spivey Pkwy) & Mt. Zion Rd



HCM 6th Signalized Intersection Summary
9: SR 138 (Lake Spivey Pkwy) & Mt. Zion Rd

1b. Existing 2023 PM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	152	1541	80	71	1233	161	129	126	102	170	95	187
Future Volume (veh/h)	152	1541	80	71	1233	161	129	126	102	170	95	187
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1856	1870	1870	1856	1900	1870	1900	1870	1900	1900	1900
Adj Flow Rate, veh/h	157	1589	0	73	1271	166	133	130	105	175	98	193
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	3	2	2	3	0	2	0	2	0	0	0
Cap, veh/h	233	1689		242	1607	734	359	158	128	283	338	287
Arrive On Green	0.13	0.96	0.00	0.01	0.15	0.15	0.08	0.16	0.16	0.09	0.18	0.18
Sat Flow, veh/h	1810	3526	1585	1781	3526	1610	1781	973	786	1810	1900	1610
Grp Volume(v), veh/h	157	1589	0	73	1271	166	133	0	235	175	98	193
Grp Sat Flow(s),veh/h/ln	1810	1763	1585	1781	1763	1610	1781	0	1759	1810	1900	1610
Q Serve(g_s), s	4.7	19.1	0.0	2.1	34.8	9.1	6.1	0.0	12.9	7.9	4.5	11.2
Cycle Q Clear(g_c), s	4.7	19.1	0.0	2.1	34.8	9.1	6.1	0.0	12.9	7.9	4.5	11.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.45	1.00		1.00
Lane Grp Cap(c), veh/h	233	1689		242	1607	734	359	0	286	283	338	287
V/C Ratio(X)	0.67	0.94		0.30	0.79	0.23	0.37	0.00	0.82	0.62	0.29	0.67
Avail Cap(c_a), veh/h	285	1689		334	1607	734	386	0	580	283	627	531
HCM Platoon Ratio	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.72	0.72	0.00	0.67	0.67	0.67	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.9	1.5	0.0	15.4	37.9	27.0	31.1	0.0	40.5	31.5	35.6	38.4
Incr Delay (d2), s/veh	3.3	9.1	0.0	0.5	2.8	0.5	0.6	0.0	5.9	4.1	0.5	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	2.9	0.0	0.8	16.8	3.9	2.7	0.0	6.1	3.7	2.1	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.2	10.6	0.0	15.8	40.6	27.4	31.7	0.0	46.4	35.6	36.1	41.1
LnGrp LOS	C	B		B	D	C	C	A	D	D	D	D
Approach Vol, veh/h	1746			1510			368			466		
Approach Delay, s/veh	11.7			38.0			41.1			38.0		
Approach LOS	B			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.2	51.1	13.5	23.3	9.8	53.4	15.0	21.7				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	9.5	26.0	9.5	33.0	9.5	26.0	9.5	33.0				
Max Q Clear Time (g_c+I1), s	6.7	36.8	8.1	13.2	4.1	21.1	9.9	14.9				
Green Ext Time (p_c), s	0.1	0.0	0.0	1.0	0.1	4.5	0.0	1.3				

Intersection Summary

HCM 6th Ctrl Delay	27.0
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Timings
10: I-75 NB Ramps & SR 138 (Lake Spivey Pkwy)

1b. Existing 2023 PM

01/18/2023

						
Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	228	1644	1141	432	176	132
Future Volume (vph)	228	1644	1141	432	176	132
Lane Group Flow (vph)	235	1695	1176	445	181	136
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		3	
Permitted Phases	6			2		8
Detector Phase	1	6	2	2	3	8
Switch Phase						
Minimum Initial (s)	5.0	15.0	15.0	15.0	5.0	6.0
Minimum Split (s)	15.0	28.5	28.5	28.5	15.0	32.5
Total Split (s)	20.0	67.5	47.5	47.5	32.5	32.5
Total Split (%)	20.0%	67.5%	47.5%	47.5%	32.5%	32.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.59	0.66	0.62	0.42	0.66	0.43
Control Delay	11.7	12.6	7.9	1.0	50.8	19.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.7	12.6	7.9	1.0	50.8	19.0
Queue Length 50th (ft)	42	387	61	0	110	28
Queue Length 95th (ft)	m79	627	m113	m0	170	78
Internal Link Dist (ft)		897	896			
Turn Bay Length (ft)	140			405		510
Base Capacity (vph)	437	2575	1910	1065	477	490
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.66	0.62	0.42	0.38	0.28

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

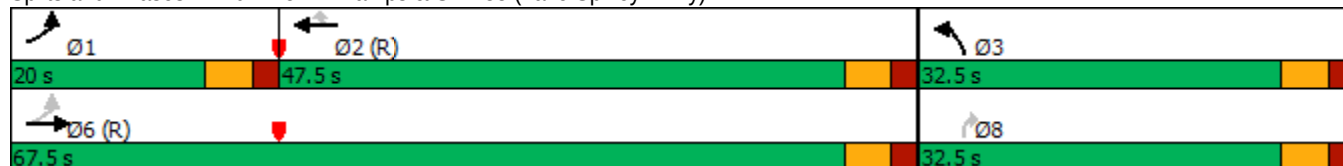
Offset: 98 (98%), Referenced to phase 2:WBT and 6:EBTL, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: I-75 NB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
10: I-75 NB Ramps & SR 138 (Lake Spivey Pkwy)

1b. Existing 2023 PM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	228	1644	0	0	1141	432	176	0	132	0	0	0
Future Volume (veh/h)	228	1644	0	0	1141	432	176	0	132	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1870	1856	0	0	1856	1870	1870	0	1870			
Adj Flow Rate, veh/h	235	1695	0	0	1176	0	181	0	0			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	2	3	0	0	3	2	2	0	2			
Cap, veh/h	496	2706	0	0	2285		218	0				
Arrive On Green	0.06	0.77	0.00	0.00	1.00	0.00	0.12	0.00	0.00			
Sat Flow, veh/h	1781	3618	0	0	3618	1585	1781	0	1585			
Grp Volume(v), veh/h	235	1695	0	0	1176	0	181	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1763	0	0	1763	1585	1781	0	1585			
Q Serve(g_s), s	4.1	21.5	0.0	0.0	0.0	0.0	9.9	0.0	0.0			
Cycle Q Clear(g_c), s	4.1	21.5	0.0	0.0	0.0	0.0	9.9	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	496	2706	0	0	2285		218	0				
V/C Ratio(X)	0.47	0.63	0.00	0.00	0.51		0.83	0.00				
Avail Cap(c_a), veh/h	639	2706	0	0	2285		481	0				
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	0.59	0.59	0.00	0.00	0.54	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	4.2	5.2	0.0	0.0	0.0	0.0	42.9	0.0	0.0			
Incr Delay (d2), s/veh	0.4	0.7	0.0	0.0	0.5	0.0	7.9	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.1	5.0	0.0	0.0	0.1	0.0	4.7	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	4.6	5.9	0.0	0.0	0.5	0.0	50.8	0.0	0.0			
LnGrp LOS	A	A	A	A	A		D	A				
Approach Vol, veh/h	1930		1176			181						
Approach Delay, s/veh	5.7		0.5			50.8						
Approach LOS	A		A			D						
Timer - Assigned Phs	1	2					6	8				
Phs Duration (G+Y+Rc), s	12.0	70.3					82.3	17.7				
Change Period (Y+Rc), s	5.5	5.5					5.5	5.5				
Max Green Setting (Gmax), s	14.5	42.0					62.0	27.0				
Max Q Clear Time (g_c+I1), s	6.1	2.0					23.5	11.9				
Green Ext Time (p_c), s	0.4	19.7					29.2	0.4				
Intersection Summary												
HCM 6th Ctrl Delay			6.3									
HCM 6th LOS			A									

Timings
11: I-75 SB Ramps & SR 138 (Lake Spivey Pkwy)

1b. Existing 2023 PM
01/18/2023

	→	↘	↙	←	↘	↙
Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Configurations	↑↑	↑	↘	↑↑	↘↘	↘
Traffic Volume (vph)	1159	276	152	1188	687	491
Future Volume (vph)	1159	276	152	1188	687	491
Lane Group Flow (vph)	1195	285	157	1225	708	506
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	3	
Permitted Phases		6	2			8
Detector Phase	6	6	5	2	3	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	5.0	15.0	5.0	15.0
Minimum Split (s)	28.5	28.5	15.0	28.5	15.0	28.5
Total Split (s)	45.3	45.3	15.0	60.3	39.7	39.7
Total Split (%)	45.3%	45.3%	15.0%	60.3%	39.7%	39.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Min	C-Min	None	C-Min	None	Min
v/c Ratio	0.79	0.34	0.67	0.61	0.65	0.90
Control Delay	30.5	3.6	31.5	7.5	32.2	47.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.5	3.6	31.5	7.5	32.2	47.5
Queue Length 50th (ft)	359	0	30	228	190	250
Queue Length 95th (ft)	451	50	#119	134	251	#436
Internal Link Dist (ft)	1158			897		
Turn Bay Length (ft)		980	150		490	
Base Capacity (vph)	1506	842	245	2007	1174	598
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.34	0.64	0.61	0.60	0.85

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 35 (35%), Referenced to phase 2:WBTL and 6:EBT, Start of Green

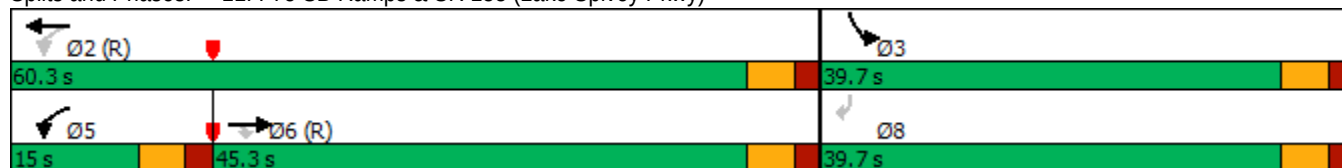
Natural Cycle: 80

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

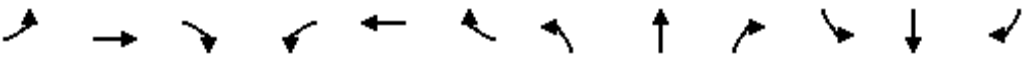
Splits and Phases: 11: I-75 SB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
11: I-75 SB Ramps & SR 138 (Lake Spivey Pkwy)

1b. Existing 2023 PM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↗	↑↑					↙↙		↗
Traffic Volume (veh/h)	0	1159	276	152	1188	0	0	0	0	687	0	491
Future Volume (veh/h)	0	1159	276	152	1188	0	0	0	0	687	0	491
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1870	1870	1856	0				1870	0	1870
Adj Flow Rate, veh/h	0	1195	0	157	1225	0				708	0	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	3	2	2	3	0				2	0	2
Cap, veh/h	0	1904		316	2298	0				823	0	
Arrive On Green	0.00	0.54	0.00	0.02	0.22	0.00				0.24	0.00	0.00
Sat Flow, veh/h	0	3618	1585	1781	3618	0				3456	0	1585
Grp Volume(v), veh/h	0	1195	0	157	1225	0				708	0	0
Grp Sat Flow(s),veh/h/ln	0	1763	1585	1781	1763	0				1728	0	1585
Q Serve(g_s), s	0.0	23.6	0.0	3.6	30.8	0.0				19.6	0.0	0.0
Cycle Q Clear(g_c), s	0.0	23.6	0.0	3.6	30.8	0.0				19.6	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1904		316	2298	0				823	0	
V/C Ratio(X)	0.00	0.63		0.50	0.53	0.00				0.86	0.00	
Avail Cap(c_a), veh/h	0	1904		384	2298	0				1182	0	
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.78	0.00	0.75	0.75	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	16.0	0.0	13.6	25.8	0.0				36.5	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.2	0.0	0.9	0.7	0.0				4.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	8.6	0.0	1.3	14.5	0.0				8.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	17.2	0.0	14.5	26.4	0.0				41.1	0.0	0.0
LnGrp LOS	A	B		B	C	A				D	A	
Approach Vol, veh/h		1195			1382						708	
Approach Delay, s/veh		17.2			25.1						41.1	
Approach LOS		B			C						D	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		70.7			11.2	59.5		29.3				
Change Period (Y+Rc), s		5.5			5.5	5.5		5.5				
Max Green Setting (Gmax), s		54.8			9.5	39.8		34.2				
Max Q Clear Time (g_c+I1), s		32.8			5.6	25.6		21.6				
Green Ext Time (p_c), s		14.3			0.1	10.0		2.2				
Intersection Summary												
HCM 6th Ctrl Delay			25.7									
HCM 6th LOS			C									
Notes												
Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Timings

12: Speer Rd/Mt. Zion Pkwy & SR 138 (Lake Spivey Pkwy)

1b. Existing 2023 PM

01/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	148	721	75	496	823	165	54	155	275	314	282	126
Future Volume (vph)	148	721	75	496	823	165	54	155	275	314	282	126
Lane Group Flow (vph)	154	751	78	517	857	172	56	161	286	327	294	131
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2			8			4
Detector Phase	1	6	6	5	2	2	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	15.0	46.5	46.5	15.0	47.5	47.5	15.0	46.5	46.5	15.0	45.5	45.5
Total Split (s)	17.0	47.0	47.0	32.0	62.0	62.0	16.5	45.5	45.5	25.5	54.5	54.5
Total Split (%)	11.3%	31.3%	31.3%	21.3%	41.3%	41.3%	11.0%	30.3%	30.3%	17.0%	36.3%	36.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.56	0.46	0.09	0.81	0.43	0.18	0.31	0.53	0.72	0.78	0.48	0.34
Control Delay	74.0	30.3	0.2	68.9	20.7	3.0	72.6	71.7	17.4	77.3	59.1	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.0	30.3	0.2	68.9	20.7	3.0	72.6	71.7	17.4	77.3	59.1	9.3
Queue Length 50th (ft)	76	263	0	252	247	0	27	81	0	161	140	0
Queue Length 95th (ft)	112	372	0	306	350	40	51	116	92	215	183	53
Internal Link Dist (ft)		1890			1158			635			523	
Turn Bay Length (ft)	345		290	290		930	195		550	270		270
Base Capacity (vph)	292	1622	843	669	1982	970	251	943	631	457	1179	610
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.46	0.09	0.77	0.43	0.18	0.22	0.17	0.45	0.72	0.25	0.21

Intersection Summary

Cycle Length: 150

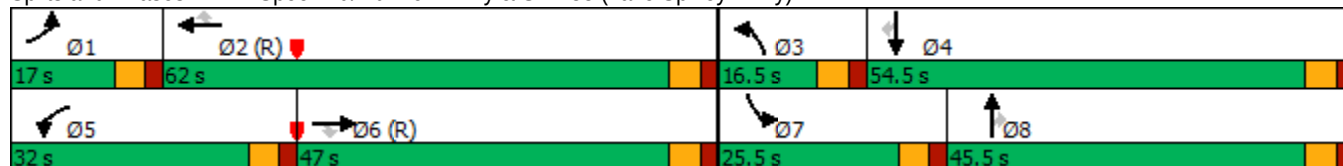
Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Green

Natural Cycle: 135

Control Type: Actuated-Coordinated

Splits and Phases: 12: Speer Rd/Mt. Zion Pkwy & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary 12: Speer Rd/Mt. Zion Pkwy & SR 138 (Lake Spivey Pkwy)

1b. Existing 2023 PM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	148	721	75	496	823	165	54	155	275	314	282	126
Future Volume (veh/h)	148	721	75	496	823	165	54	155	275	314	282	126
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1856	1900	1900	1856	1870	1870	1870	1870	1870	1900	1870
Adj Flow Rate, veh/h	154	751	78	517	857	172	56	161	286	327	294	131
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	3	0	0	3	2	2	2	2	2	0	2
Cap, veh/h	200	1350	616	568	1716	772	104	708	316	378	1005	441
Arrive On Green	0.06	0.38	0.38	0.16	0.49	0.49	0.03	0.20	0.20	0.11	0.28	0.28
Sat Flow, veh/h	3456	3526	1610	3510	3526	1585	3456	3554	1585	3456	3610	1585
Grp Volume(v), veh/h	154	751	78	517	857	172	56	161	286	327	294	131
Grp Sat Flow(s),veh/h/ln	1728	1763	1610	1755	1763	1585	1728	1777	1585	1728	1805	1585
Q Serve(g_s), s	6.6	25.1	4.7	21.7	24.7	9.4	2.4	5.7	26.4	14.0	9.6	9.8
Cycle Q Clear(g_c), s	6.6	25.1	4.7	21.7	24.7	9.4	2.4	5.7	26.4	14.0	9.6	9.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	200	1350	616	568	1716	772	104	708	316	378	1005	441
V/C Ratio(X)	0.77	0.56	0.13	0.91	0.50	0.22	0.54	0.23	0.91	0.87	0.29	0.30
Avail Cap(c_a), veh/h	265	1350	616	620	1716	772	253	948	423	461	1179	518
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	0.91	0.66	0.66	0.66	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	69.7	36.3	30.0	61.8	26.1	22.2	71.7	50.4	58.7	65.7	42.5	42.6
Incr Delay (d2), s/veh	8.6	1.5	0.4	12.0	0.7	0.4	4.3	0.2	18.7	13.7	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	3.1	10.8	1.9	10.5	10.2	3.5	1.1	2.5	12.0	6.8	4.3	3.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	78.3	37.8	30.4	73.8	26.8	22.6	76.0	50.5	77.3	79.4	42.7	42.9
LnGrp LOS	E	D	C	E	C	C	E	D	E	E	D	D
Approach Vol, veh/h	983		1546				503		752			
Approach Delay, s/veh	43.6		42.0				68.6		58.7			
Approach LOS	D		D				E		E			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.2	78.5	10.0	47.3	29.8	62.9	21.9	35.4				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	11.5	56.5	11.0	49.0	26.5	41.5	20.0	40.0				
Max Q Clear Time (g_c+I1), s	8.6	26.7	4.4	11.8	23.7	27.1	16.0	28.4				
Green Ext Time (p_c), s	0.1	13.2	0.0	2.2	0.6	7.1	0.4	1.5				
Intersection Summary												
HCM 6th Ctrl Delay			49.3									
HCM 6th LOS			D									
Notes												

Timings
13: Spivey Rd & SR 138 (Lake Spivey Pkwy)

1b. Existing 2023 PM
01/18/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↑
Traffic Volume (vph)	730	29	300	756	13	179
Future Volume (vph)	730	29	300	756	13	179
Lane Group Flow (vph)	820	33	337	849	15	201
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	8	
Permitted Phases		6	2			8
Detector Phase	6	6	5	2	8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0	6.0
Minimum Split (s)	25.5	25.5	15.0	23.5	31.5	31.5
Total Split (s)	40.4	40.4	28.0	68.4	31.6	31.6
Total Split (%)	40.4%	40.4%	28.0%	68.4%	31.6%	31.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Min	C-Min	None	C-Min	None	None
v/c Ratio	0.37	0.03	0.58	0.30	0.11	0.65
Control Delay	11.0	4.3	6.6	2.9	42.4	16.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.0	4.3	6.6	2.9	42.4	16.3
Queue Length 50th (ft)	107	0	33	46	9	0
Queue Length 95th (ft)	226	15	79	94	27	61
Internal Link Dist (ft)	1639			1890	1094	
Turn Bay Length (ft)		230	535			220
Base Capacity (vph)	2197	1004	706	2838	461	561
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.03	0.48	0.30	0.03	0.36

Intersection Summary

Cycle Length: 100

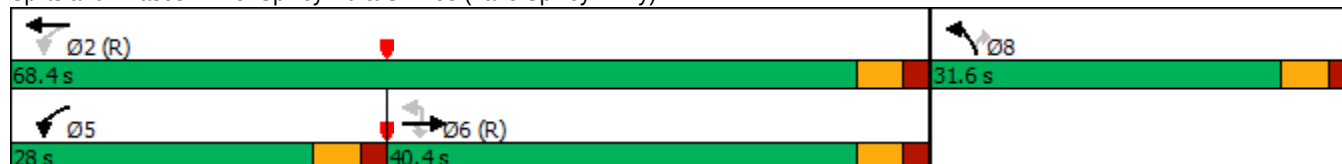
Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTU, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Splits and Phases: 13: Spivey Rd & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary 13: Spivey Rd & SR 138 (Lake Spivey Pkwy)

1b. Existing 2023 PM
01/18/2023

							
Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (veh/h)	0	730	29	300	756	13	179
Future Volume (veh/h)	0	730	29	300	756	13	179
Initial Q (Qb), veh		0	0	0	0	0	0
Ped-Bike Adj(A_pbT)			1.00	1.00		1.00	1.00
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No	No	
Adj Sat Flow, veh/h/ln		1856	1870	1870	1856	1870	1870
Adj Flow Rate, veh/h		820	0	337	849	15	0
Peak Hour Factor		0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %		3	2	2	3	2	2
Cap, veh/h		2634		639	3066	36	
Arrive On Green		0.75	0.00	0.07	0.87	0.02	0.00
Sat Flow, veh/h		3618	1585	1781	3618	1781	1585
Grp Volume(v), veh/h		820	0	337	849	15	0
Grp Sat Flow(s),veh/h/ln		1763	1585	1781	1763	1781	1585
Q Serve(g_s), s		7.7	0.0	3.9	4.1	0.8	0.0
Cycle Q Clear(g_c), s		7.7	0.0	3.9	4.1	0.8	0.0
Prop In Lane			1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h		2634		639	3066	36	
V/C Ratio(X)		0.31		0.53	0.28	0.41	
Avail Cap(c_a), veh/h		2634		920	3066	465	
HCM Platoon Ratio		1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	0.00	0.91	0.91	1.00	0.00
Uniform Delay (d), s/veh		4.2	0.0	2.6	1.1	48.4	0.0
Incr Delay (d2), s/veh		0.3	0.0	0.6	0.2	7.3	0.0
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		1.9	0.0	0.5	0.1	0.4	0.0
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh		4.5	0.0	3.2	1.3	55.7	0.0
LnGrp LOS		A		A	A	E	
Approach Vol, veh/h		820			1186	15	
Approach Delay, s/veh		4.5			1.9	55.7	
Approach LOS		A			A	E	
Timer - Assigned Phs		2			5	6	8
Phs Duration (G+Y+Rc), s		92.5			12.2	80.2	7.5
Change Period (Y+Rc), s		5.5			5.5	5.5	5.5
Max Green Setting (Gmax), s		62.9			22.5	34.9	26.1
Max Q Clear Time (g_c+I1), s		6.1			5.9	9.7	2.8
Green Ext Time (p_c), s		14.0			0.9	10.2	0.0
Intersection Summary							
HCM 6th Ctrl Delay			3.3				
HCM 6th LOS			A				
Notes							
User approved ignoring U-Turning movement.							
Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.							

Timings

14: Blackhall Rd/Speer Rd & Walt Stephens Rd

1b. Existing 2023 PM

01/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	322	62	98	211	235	58	191	96	421	321	14
Future Volume (vph)	29	322	62	98	211	235	58	191	96	421	321	14
Lane Group Flow (vph)	30	335	65	102	220	245	60	199	100	439	334	15
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		6			2		3	8		7	4	
Permitted Phases	6		6	2		2	8		8	4		4
Detector Phase	6	6	6	2	2	2	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0	15.0	5.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	23.5	23.5	23.5	23.5	23.5	23.5	15.0	23.5	23.5	15.0	23.5	23.5
Total Split (s)	39.0	39.0	39.0	39.0	39.0	39.0	15.0	26.0	26.0	35.0	46.0	46.0
Total Split (%)	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	15.0%	26.0%	26.0%	35.0%	46.0%	46.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.07	0.43	0.09	0.29	0.28	0.31	0.21	0.68	0.27	0.73	0.49	0.02
Control Delay	21.6	24.9	0.2	16.4	14.7	2.3	17.4	51.4	3.7	25.4	26.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.6	24.9	0.2	16.4	14.7	2.3	17.4	51.4	3.7	25.4	26.7	0.1
Queue Length 50th (ft)	11	152	0	35	74	9	20	121	0	185	166	0
Queue Length 95th (ft)	34	260	0	m52	m102	m22	35	185	17	231	226	0
Internal Link Dist (ft)		2027			3745			1264			1872	
Turn Bay Length (ft)	110		160	190		250	140		125	315		120
Base Capacity (vph)	447	774	743	346	774	801	331	381	441	635	757	694
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.43	0.09	0.29	0.28	0.31	0.18	0.52	0.23	0.69	0.44	0.02

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

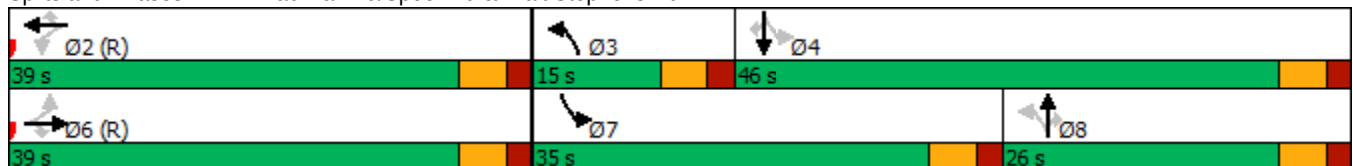
Offset: 98 (98%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: Blackhall Rd/Speer Rd & Walt Stephens Rd



HCM 6th Signalized Intersection Summary
14: Blackhall Rd/Speer Rd & Walt Stephens Rd

1b. Existing 2023 PM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	322	62	98	211	235	58	191	96	421	321	14
Future Volume (veh/h)	29	322	62	98	211	235	58	191	96	421	321	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	30	335	65	102	220	245	60	199	0	439	334	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	447	888	753	427	888	753	279	241		514	598	
Arrive On Green	0.47	0.47	0.47	0.47	0.47	0.47	0.04	0.13	0.00	0.23	0.32	0.00
Sat Flow, veh/h	928	1870	1585	985	1870	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	30	335	65	102	220	245	60	199	0	439	334	0
Grp Sat Flow(s),veh/h/ln	928	1870	1585	985	1870	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	2.0	11.5	2.2	7.4	7.0	9.6	2.9	10.4	0.0	20.3	14.8	0.0
Cycle Q Clear(g_c), s	9.0	11.5	2.2	18.9	7.0	9.6	2.9	10.4	0.0	20.3	14.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	447	888	753	427	888	753	279	241		514	598	
V/C Ratio(X)	0.07	0.38	0.09	0.24	0.25	0.33	0.21	0.82		0.85	0.56	
Avail Cap(c_a), veh/h	447	888	753	427	888	753	376	383		628	757	
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	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	18.3	16.8	14.4	22.8	15.6	16.3	35.7	42.4	0.0	26.5	28.2	0.0
Incr Delay (d2), s/veh	0.3	1.2	0.2	1.3	0.7	1.2	0.4	7.8	0.0	9.5	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	4.8	0.8	1.8	2.9	3.4	1.2	5.1	0.0	9.3	6.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.6	18.0	14.6	24.2	16.3	17.5	36.1	50.3	0.0	36.0	29.0	0.0
LnGrp LOS	B	B	B	C	B	B	D	D		D	C	
Approach Vol, veh/h	430			567			259			773		
Approach Delay, s/veh	17.5			18.2			47.0			33.0		
Approach LOS	B			B			D			C		
Timer - Assigned Phs	2		3	4		6	7	8				
Phs Duration (G+Y+Rc), s	53.0		9.6	37.5		53.0	28.6	18.4				
Change Period (Y+Rc), s	5.5		5.5	5.5		5.5	5.5	5.5				
Max Green Setting (Gmax), s	33.5		9.5	40.5		33.5	29.5	20.5				
Max Q Clear Time (g_c+I1), s	20.9		4.9	16.8		13.5	22.3	12.4				
Green Ext Time (p_c), s	3.9		0.0	1.8		4.1	0.8	0.5				
Intersection Summary												
HCM 6th Ctrl Delay	27.4											
HCM 6th LOS	C											

Future “No-Build” Intersection Analysis

Timings

2a. No-Build 2027 AM

1: Flippen Rd/Shields Rd & SR 42/SR 138/US 23 (N. Henry Blvd)

01/18/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	8	686	156	1232	213	19	132	19	29
Future Volume (vph)	8	686	156	1232	213	19	132	19	29
Lane Group Flow (vph)	9	854	175	1396	0	260	148	0	71
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	Perm	NA
Protected Phases	1	6	5	2		8			4
Permitted Phases	6		2		8		8	4	
Detector Phase	1	6	5	2	8	8	8	4	4
Switch Phase									
Minimum Initial (s)	5.0	15.0	5.0	15.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	15.0	28.5	15.0	28.5	30.5	30.5	30.5	30.5	30.5
Total Split (s)	15.0	51.0	16.0	52.0	33.0	33.0	33.0	33.0	33.0
Total Split (%)	15.0%	51.0%	16.0%	52.0%	33.0%	33.0%	33.0%	33.0%	33.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5		5.5	5.5		5.5
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	C-Min	None	C-Min	None	None	None	None	None
v/c Ratio	0.04	0.48	0.43	0.63		0.82	0.34		0.19
Control Delay	8.1	17.7	10.8	14.6		59.8	22.0		24.3
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Delay	8.1	17.7	10.8	14.6		59.8	22.0		24.3
Queue Length 50th (ft)	2	181	40	252		140	22		28
Queue Length 95th (ft)	8	252	73	463		258	118		61
Internal Link Dist (ft)		2570		1632		2093			641
Turn Bay Length (ft)	135		210				25		
Base Capacity (vph)	299	1761	424	2200		375	494		434
Starvation Cap Reductn	0	0	0	0		0	0		0
Spillback Cap Reductn	0	0	0	0		0	0		0
Storage Cap Reductn	0	0	0	0		0	0		0
Reduced v/c Ratio	0.03	0.48	0.41	0.63		0.69	0.30		0.16

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Splits and Phases: 1: Flippen Rd/Shields Rd & SR 42/SR 138/US 23 (N. Henry Blvd)



HCM 6th Signalized Intersection Summary
1: Flippen Rd/Shields Rd & SR 42/SR 138/US 23 (N. Henry Blvd)

2a. No-Build 2027 AM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	686	74	156	1232	11	213	19	132	19	29	15
Future Volume (veh/h)	8	686	74	156	1232	11	213	19	132	19	29	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1841	1856	1856	1841	1870	1856	1870	1856	1870	1870	1870
Adj Flow Rate, veh/h	9	771	83	175	1384	12	239	21	148	21	33	17
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	4	3	3	4	2	3	2	3	2	2	2
Cap, veh/h	193	1570	169	403	1950	17	228	14	432	47	64	20
Arrive On Green	0.01	0.49	0.49	0.07	0.55	0.55	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	1781	3185	343	1767	3553	31	578	51	1572	0	234	74
Grp Volume(v), veh/h	9	423	431	175	681	715	260	0	148	71	0	0
Grp Sat Flow(s),veh/h/ln	1781	1749	1779	1767	1749	1835	629	0	1572	308	0	0
Q Serve(g_s), s	0.3	16.2	16.2	4.6	28.8	28.8	0.0	0.0	7.5	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.3	16.2	16.2	4.6	28.8	28.8	27.5	0.0	7.5	27.5	0.0	0.0
Prop In Lane	1.00		0.19	1.00		0.02	0.92		1.00	0.30		0.24
Lane Grp Cap(c), veh/h	193	862	877	403	960	1007	242	0	432	131	0	0
V/C Ratio(X)	0.05	0.49	0.49	0.43	0.71	0.71	1.07	0.00	0.34	0.54	0.00	0.00
Avail Cap(c_a), veh/h	342	862	877	470	960	1007	242	0	432	131	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	15.1	17.0	17.0	12.1	16.7	16.7	40.2	0.0	29.0	30.0	0.0	0.0
Incr Delay (d2), s/veh	0.1	2.0	2.0	0.7	4.4	4.2	79.0	0.0	0.5	4.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	6.4	6.5	1.6	11.2	11.7	11.3	0.0	2.8	1.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.2	19.0	18.9	12.8	21.1	20.9	119.2	0.0	29.5	34.4	0.0	0.0
LnGrp LOS	B	B	B	B	C	C	F	A	C	C	A	A
Approach Vol, veh/h		863			1571			408			71	
Approach Delay, s/veh		18.9			20.1			86.7			34.4	
Approach LOS		B			C			F			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.6	60.4		33.0	12.2	54.8		33.0				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	9.5	46.5		27.5	10.5	45.5		27.5				
Max Q Clear Time (g_c+I1), s	2.3	30.8		29.5	6.6	18.2		29.5				
Green Ext Time (p_c), s	0.0	12.0		0.0	0.2	10.5		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				29.4								
HCM 6th LOS				C								

Intersection						
Int Delay, s/veh	0.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	9	20	420	5	8	317
Future Vol, veh/h	9	20	420	5	8	317
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	94	94	94	94	94	94
Heavy Vehicles, %	2	2	3	2	2	3
Mvmt Flow	10	21	447	5	9	337
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	805	450	0	0	452	0
Stage 1	450	-	-	-	-	-
Stage 2	355	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	352	609	-	-	1109	-
Stage 1	642	-	-	-	-	-
Stage 2	710	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	348	609	-	-	1109	-
Mov Cap-2 Maneuver	348	-	-	-	-	-
Stage 1	642	-	-	-	-	-
Stage 2	703	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	12.8	0	0.2			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	494	1109	-	
HCM Lane V/C Ratio	-	-	0.062	0.008	-	
HCM Control Delay (s)	-	-	12.8	8.3	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0.2	0	-	

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	427	2	0	327
Future Vol, veh/h	0	0	427	2	0	327
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	93	93	93	93	93	93
Heavy Vehicles, %	2	2	3	2	2	3
Mvmt Flow	0	0	459	2	0	352

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	812	460	0
Stage 1	460	-	-
Stage 2	352	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	348	601	-
Stage 1	636	-	-
Stage 2	712	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	348	601	-
Mov Cap-2 Maneuver	348	-	-
Stage 1	636	-	-
Stage 2	712	-	-

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

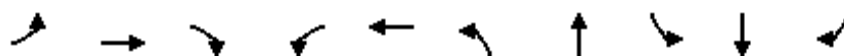
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	1100
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	-	0	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0

Timings

4: Flippen Rd & Walt Stephens Rd/Red Oak Rd

2a. No-Build 2027 AM

01/18/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	118	90	342	9	99	321	280	14	205	116
Future Volume (vph)	118	90	342	9	99	321	280	14	205	116
Lane Group Flow (vph)	123	94	356	9	129	334	310	15	214	121
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4		3	8	1	6	5	2	
Permitted Phases	4		4	8		6		2		2
Detector Phase	7	4	4	3	8	1	6	5	2	2
Switch Phase										
Minimum Initial (s)	5.0	6.0	6.0	5.0	6.0	5.0	15.0	5.0	15.0	15.0
Minimum Split (s)	15.0	31.5	31.5	15.0	30.5	15.0	31.5	15.0	28.5	28.5
Total Split (s)	15.0	32.0	32.0	15.0	32.0	22.0	38.0	15.0	31.0	31.0
Total Split (%)	15.0%	32.0%	32.0%	15.0%	32.0%	22.0%	38.0%	15.0%	31.0%	31.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
v/c Ratio	0.40	0.21	0.55	0.04	0.57	0.46	0.29	0.03	0.28	0.15
Control Delay	30.0	29.9	8.2	25.6	47.1	11.1	10.6	9.0	19.1	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.0	29.9	8.2	25.6	47.1	11.1	10.6	9.0	19.1	0.7
Queue Length 50th (ft)	53	40	0	4	71	63	57	3	58	0
Queue Length 95th (ft)	86	91	45	16	125	152	146	m9	156	0
Internal Link Dist (ft)		646			1291		2204		704	
Turn Bay Length (ft)	180		345	110		130		120		215
Base Capacity (vph)	311	502	687	320	495	745	1060	606	758	786
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.19	0.52	0.03	0.26	0.45	0.29	0.02	0.28	0.15

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

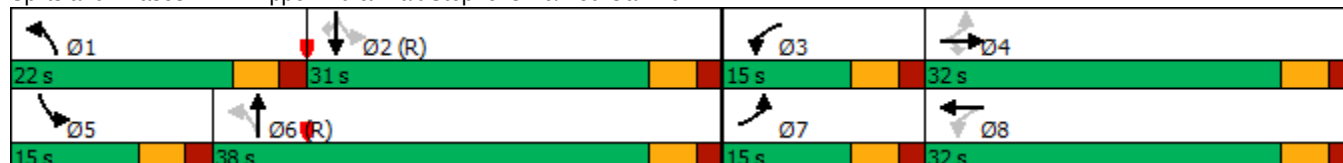
Offset: 96 (96%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Flippen Rd & Walt Stephens Rd/Red Oak Rd



HCM 6th Signalized Intersection Summary

4: Flippen Rd & Walt Stephens Rd/Red Oak Rd

2a. No-Build 2027 AM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	90	342	9	99	25	321	280	17	14	205	116
Future Volume (veh/h)	118	90	342	9	99	25	321	280	17	14	205	116
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1870	1900	1856	1870	1870	1856	1900
Adj Flow Rate, veh/h	123	94	0	9	103	26	334	292	18	15	214	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	0	2	0	3	2	2	3	0
Cap, veh/h	242	300		214	137	35	784	1023	63	636	926	
Arrive On Green	0.08	0.16	0.00	0.01	0.09	0.09	0.11	0.59	0.59	0.02	0.50	0.00
Sat Flow, veh/h	1781	1870	1585	1781	1464	370	1810	1730	107	1781	1856	1610
Grp Volume(v), veh/h	123	94	0	9	0	129	334	0	310	15	214	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1833	1810	0	1836	1781	1856	1610
Q Serve(g_s), s	6.0	4.4	0.0	0.5	0.0	6.9	8.4	0.0	8.3	0.4	6.5	0.0
Cycle Q Clear(g_c), s	6.0	4.4	0.0	0.5	0.0	6.9	8.4	0.0	8.3	0.4	6.5	0.0
Prop In Lane	1.00		1.00	1.00		0.20	1.00		0.06	1.00		1.00
Lane Grp Cap(c), veh/h	242	300		214	0	172	784	0	1086	636	926	
V/C Ratio(X)	0.51	0.31		0.04	0.00	0.75	0.43	0.00	0.29	0.02	0.23	
Avail Cap(c_a), veh/h	273	496		363	0	486	885	0	1086	775	926	
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	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	35.5	37.1	0.0	40.3	0.0	44.2	9.0	0.0	10.0	11.8	14.2	0.0
Incr Delay (d2), s/veh	1.6	0.6	0.0	0.1	0.0	6.4	0.4	0.0	0.7	0.0	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	2.0	0.0	0.2	0.0	3.4	2.8	0.0	3.1	0.2	2.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.2	37.7	0.0	40.3	0.0	50.6	9.3	0.0	10.7	11.8	14.8	0.0
LnGrp LOS	D	D		D	A	D	A	A	B	B	B	
Approach Vol, veh/h	217			138			644			229		
Approach Delay, s/veh	37.4			49.9			10.0			14.6		
Approach LOS	D			D			A			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	16.4	55.4	6.6	21.5	7.2	64.6	13.3	14.9				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	16.5	25.5	9.5	26.5	9.5	32.5	9.5	26.5				
Max Q Clear Time (g_c+I1), s	10.4	8.5	2.5	6.4	2.4	10.3	8.0	8.9				
Green Ext Time (p_c), s	0.5	1.7	0.0	0.3	0.0	3.1	0.0	0.5				

Intersection Summary

HCM 6th Ctrl Delay	20.2
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings

5: Flippen Rd & Hudson Bridge Rd

2a. No-Build 2027 AM

01/18/2023

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	79	411	189	281	146	3	271	488	209	301	88
Future Volume (vph)	79	411	189	281	146	3	271	488	209	301	88
Lane Group Flow (vph)	82	428	197	293	152	3	282	508	218	314	92
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6	5	2			8		7	4	
Permitted Phases	6		2		2	8		8	4		4
Detector Phase	1	6	5	2	2	8	8	8	7	4	4
Switch Phase											
Minimum Initial (s)	5.0	15.0	5.0	15.0	15.0	6.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	15.0	28.5	15.0	28.5	28.5	36.5	36.5	36.5	15.0	33.5	33.5
Total Split (s)	15.0	28.0	17.0	30.0	30.0	39.0	39.0	39.0	16.0	55.0	55.0
Total Split (%)	15.0%	28.0%	17.0%	30.0%	30.0%	39.0%	39.0%	39.0%	16.0%	55.0%	55.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.16	0.36	0.42	0.21	0.21	0.01	0.67	0.79	0.65	0.44	0.14
Control Delay	16.5	28.2	18.7	24.0	5.7	25.3	42.6	19.2	27.5	20.4	3.5
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	16.5	28.2	18.7	24.0	5.7	25.3	42.6	19.2	27.5	20.4	3.5
Queue Length 50th (ft)	26	107	67	66	0	2	166	82	75	109	1
Queue Length 95th (ft)	63	177	136	120	49	8	220	186	107	143	14
Internal Link Dist (ft)		840		1594			786			834	
Turn Bay Length (ft)	375		390		450	230		365	320		320
Base Capacity (vph)	532	1196	486	1380	710	355	618	773	336	913	830
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	0.15	0.36	0.41	0.21	0.21	0.01	0.46	0.66	0.65	0.34	0.11

Intersection Summary

Cycle Length: 100

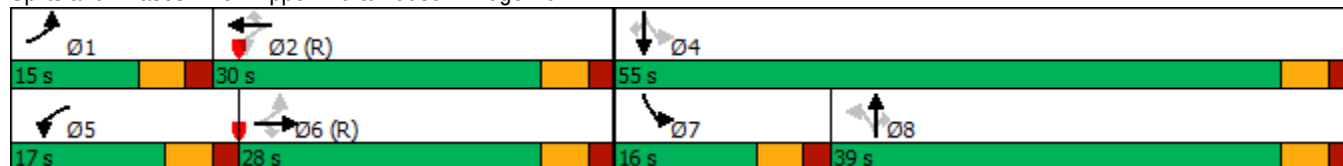
Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

Splits and Phases: 5: Flippen Rd & Hudson Bridge Rd



HCM 6th Signalized Intersection Summary

5: Flippen Rd & Hudson Bridge Rd

2a. No-Build 2027 AM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	411	0	189	281	146	3	271	488	209	301	88
Future Volume (veh/h)	79	411	0	189	281	146	3	271	488	209	301	88
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1856	1870	1870	1856	1870
Adj Flow Rate, veh/h	82	428	0	197	293	0	3	282	508	218	314	92
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	3	2	2	3	2
Cap, veh/h	416	886		390	1066		399	620	530	392	902	771
Arrive On Green	0.05	0.25	0.00	0.10	0.30	0.00	0.33	0.33	0.33	0.10	0.49	0.49
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	979	1856	1585	1781	1856	1585
Grp Volume(v), veh/h	82	428	0	197	293	0	3	282	508	218	314	92
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	979	1856	1585	1781	1856	1585
Q Serve(g_s), s	3.4	10.3	0.0	7.9	6.3	0.0	0.2	11.9	31.4	7.7	10.5	3.2
Cycle Q Clear(g_c), s	3.4	10.3	0.0	7.9	6.3	0.0	0.2	11.9	31.4	7.7	10.5	3.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	416	886		390	1066		399	620	530	392	902	771
V/C Ratio(X)	0.20	0.48		0.51	0.27		0.01	0.45	0.96	0.56	0.35	0.12
Avail Cap(c_a), veh/h	499	886		417	1066		400	622	531	407	918	785
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	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.8	32.0	0.0	23.6	26.7	0.0	22.2	26.1	32.6	18.6	15.9	14.0
Incr Delay (d2), s/veh	0.2	1.9	0.0	1.0	0.6	0.0	0.0	0.5	28.8	1.6	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	4.4	0.0	3.2	2.6	0.0	0.0	5.1	15.4	3.1	4.1	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.1	33.9	0.0	24.6	27.3	0.0	22.2	26.6	61.4	20.1	16.1	14.1
LnGrp LOS	C	C		C	C		C	C	E	C	B	B
Approach Vol, veh/h	510			490			793			624		
Approach Delay, s/veh	32.7			26.2			48.9			17.2		
Approach LOS	C			C			D			B		
Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.4	35.5		54.1	15.4	30.4	15.2	38.9				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	9.5	24.5		49.5	11.5	22.5	10.5	33.5				
Max Q Clear Time (g_c+I1), s	5.4	8.3		12.5	9.9	12.3	9.7	33.4				
Green Ext Time (p_c), s	0.0	2.6		2.1	0.1	3.0	0.1	0.0				

Intersection Summary

HCM 6th Ctrl Delay	32.7
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Timings

6: SR 42/SR 138/US 23 (N. Henry Blvd) & SR 138 (Lake Spivey Pkwy)

2a. No-Build 2027 AM

01/18/2023

	→	↘	↙	←	↖	↗	↑	↘	↙	↓
Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↕	↕↕	↙	↕	↕	↕↕	↕	↕	↙	↕↕
Traffic Volume (vph)	78	402	39	62	32	914	401	45	40	217
Future Volume (vph)	78	402	39	62	32	914	401	45	40	217
Lane Group Flow (vph)	176	414	40	64	33	942	413	46	41	391
Turn Type	NA	pt+ov	Split	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	4	4 1	8	8		1	6		5	2
Permitted Phases					8			6		
Detector Phase	4	4 1	8	8	8	1	6	6	5	2
Switch Phase										
Minimum Initial (s)	6.0		6.0	6.0	6.0	5.0	15.0	15.0	5.0	15.0
Minimum Split (s)	31.5		30.5	30.5	30.5	15.0	28.5	28.5	15.0	31.5
Total Split (s)	31.5		30.5	30.5	30.5	56.0	73.0	73.0	15.0	32.0
Total Split (%)	21.0%		20.3%	20.3%	20.3%	37.3%	48.7%	48.7%	10.0%	21.3%
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5		5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag						Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	None		None	None	None	None	C-Min	C-Min	None	C-Min
v/c Ratio	0.70	0.33	0.32	0.50	0.14	0.87	0.37	0.04	0.40	0.33
Control Delay	76.3	16.8	71.8	79.4	1.2	56.7	18.6	0.1	78.3	29.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.3	16.8	71.8	79.4	1.2	56.7	18.6	0.1	78.3	29.9
Queue Length 50th (ft)	167	102	38	61	0	444	209	0	39	108
Queue Length 95th (ft)	243	93	77	110	0	494	347	0	81	182
Internal Link Dist (ft)	2539			205			2663			944
Turn Bay Length (ft)			100		120	340		300	580	
Base Capacity (vph)	314	1376	292	301	384	1171	1123	1030	118	1194
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.30	0.14	0.21	0.09	0.80	0.37	0.04	0.35	0.33

Intersection Summary

Cycle Length: 150

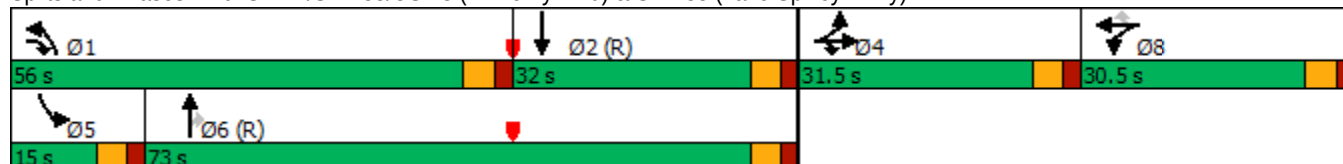
Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green

Natural Cycle: 130

Control Type: Actuated-Coordinated

Splits and Phases: 6: SR 42/SR 138/US 23 (N. Henry Blvd) & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary

6: SR 42/SR 138/US 23 (N. Henry Blvd) & SR 138 (Lake Spivey Pkwy)

2a. No-Build 2027 AM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			 				 				 	
Traffic Volume (veh/h)	93	78	402	39	62	32	914	401	45	40	217	162
Future Volume (veh/h)	93	78	402	39	62	32	914	401	45	40	217	162
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1856	1811	1856	1826	1900	1856	1841	1900	1856	1856	1885
Adj Flow Rate, veh/h	96	80	414	40	64	0	942	413	0	41	224	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	3	6	3	5	0	3	4	0	3	3	1
Cap, veh/h	127	106	1150	88	90		1017	1187		53	1333	
Arrive On Green	0.13	0.13	0.13	0.05	0.05	0.00	0.30	0.65	0.00	0.03	0.38	0.00
Sat Flow, veh/h	985	821	2701	1767	1826	1610	3428	1841	1610	1767	3618	0
Grp Volume(v), veh/h	176	0	414	40	64	0	942	413	0	41	224	0
Grp Sat Flow(s),veh/h/ln	1806	0	1351	1767	1826	1610	1714	1841	1610	1767	1763	0
Q Serve(g_s), s	14.1	0.0	15.6	3.3	5.2	0.0	40.0	15.4	0.0	3.5	6.3	0.0
Cycle Q Clear(g_c), s	14.1	0.0	15.6	3.3	5.2	0.0	40.0	15.4	0.0	3.5	6.3	0.0
Prop In Lane	0.55		1.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	233	0	1150	88	90		1017	1187		53	1333	
V/C Ratio(X)	0.76	0.00	0.36	0.46	0.71		0.93	0.35		0.78	0.17	
Avail Cap(c_a), veh/h	313	0	1270	295	304		1154	1187		112	1333	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.95	0.00	0.95	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	63.1	0.0	29.2	69.3	70.2	0.0	51.1	12.2	0.0	72.3	31.0	0.0
Incr Delay (d2), s/veh	6.7	0.0	0.2	3.7	9.7	0.0	11.7	0.8	0.0	21.2	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	0.0	5.2	1.6	2.7	0.0	18.4	6.2	0.0	1.9	2.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.8	0.0	29.4	73.0	79.9	0.0	62.8	13.0	0.0	93.4	31.2	0.0
LnGrp LOS	E	A	C	E	E		E	B		F	C	
Approach Vol, veh/h		590			104			1355			265	
Approach Delay, s/veh		41.5			77.3			47.6			40.9	
Approach LOS		D			E			D			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	50.0	62.2		24.8	10.0	102.3		12.9				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	50.5	26.5		26.0	9.5	67.5		25.0				
Max Q Clear Time (g_c+I1), s	42.0	8.3		17.6	5.5	17.4		7.2				
Green Ext Time (p_c), s	2.5	2.0		1.7	0.0	5.4		0.3				

Intersection Summary

HCM 6th Ctrl Delay 46.6

HCM 6th LOS D

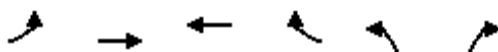
Notes

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings
7: I-675 NB Ramps & SR 138 (Lake Spivey Pkwy)

2a. No-Build 2027 AM

01/18/2023



Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	501	888	1302	313	34	71
Future Volume (vph)	501	888	1302	313	34	71
Lane Group Flow (vph)	563	998	1463	352	38	80
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		3	
Permitted Phases	6			2		8
Detector Phase	1	6	2	2	3	8
Switch Phase						
Minimum Initial (s)	5.0	15.0	15.0	15.0	5.0	6.0
Minimum Split (s)	15.0	28.5	28.5	28.5	15.0	34.5
Total Split (s)	24.0	65.5	41.5	41.5	34.5	34.5
Total Split (%)	24.0%	65.5%	41.5%	41.5%	34.5%	34.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.80	0.34	0.97	0.41	0.28	0.40
Control Delay	16.6	4.0	49.8	6.1	48.1	14.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.6	4.0	49.8	6.1	48.1	14.5
Queue Length 50th (ft)	163	151	~584	20	23	0
Queue Length 95th (ft)	144	62	#707	83	54	38
Internal Link Dist (ft)		706	2539			
Turn Bay Length (ft)	145			270		315
Base Capacity (vph)	700	2970	1503	851	513	520
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.34	0.97	0.41	0.07	0.15

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 55 (55%), Referenced to phase 2:WBT and 6:EBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

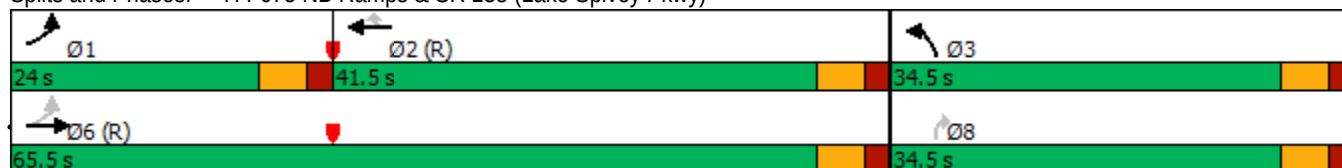
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 7: I-675 NB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
7: I-675 NB Ramps & SR 138 (Lake Spivey Pkwy)

2a. No-Build 2027 AM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	501	888	0	0	1302	313	34	0	71	0	0	0
Future Volume (veh/h)	501	888	0	0	1302	313	34	0	71	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1870	1856	0	0	1856	1870	1870	0	1870			
Adj Flow Rate, veh/h	563	998	0	0	1463	0	38	0	80			
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89			
Percent Heavy Veh, %	2	3	0	0	3	2	2	0	2			
Cap, veh/h	504	2892	0	0	2046		124	0	110			
Arrive On Green	0.37	1.00	0.00	0.00	0.58	0.00	0.07	0.00	0.07			
Sat Flow, veh/h	1781	3618	0	0	3618	1585	1781	0	1585			
Grp Volume(v), veh/h	563	998	0	0	1463	0	38	0	80			
Grp Sat Flow(s),veh/h/ln	1781	1763	0	0	1763	1585	1781	0	1585			
Q Serve(g_s), s	18.5	0.0	0.0	0.0	29.8	0.0	2.0	0.0	4.9			
Cycle Q Clear(g_c), s	18.5	0.0	0.0	0.0	29.8	0.0	2.0	0.0	4.9			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	504	2892	0	0	2046		124	0	110			
V/C Ratio(X)	1.12	0.35	0.00	0.00	0.71		0.31	0.00	0.73			
Avail Cap(c_a), veh/h	504	2892	0	0	2046		517	0	460			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.67	0.67	0.00	0.00	0.43	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	18.0	0.0	0.0	0.0	15.0	0.0	44.2	0.0	45.6			
Incr Delay (d2), s/veh	69.8	0.2	0.0	0.0	0.9	0.0	1.4	0.0	8.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	17.9	0.1	0.0	0.0	10.4	0.0	0.9	0.0	2.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	87.8	0.2	0.0	0.0	16.0	0.0	45.6	0.0	54.3			
LnGrp LOS	F	A	A	A	B		D	A	D			
Approach Vol, veh/h	1561			1463			118					
Approach Delay, s/veh	31.8			16.0			51.5					
Approach LOS	C			B			D					
Timer - Assigned Phs	1	2					6	8				
Phs Duration (G+Y+Rc), s	24.0	63.5					87.5	12.5				
Change Period (Y+Rc), s	5.5	5.5					5.5	5.5				
Max Green Setting (Gmax), s	18.5	36.0					60.0	29.0				
Max Q Clear Time (g_c+I1), s	20.5	31.8					2.0	6.9				
Green Ext Time (p_c), s	0.0	3.8					17.9	0.3				

Intersection Summary

HCM 6th Ctrl Delay 25.2

HCM 6th LOS C

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Timings 8: I-675 SB Ramps & SR 138 (Lake Spivey Pkwy)

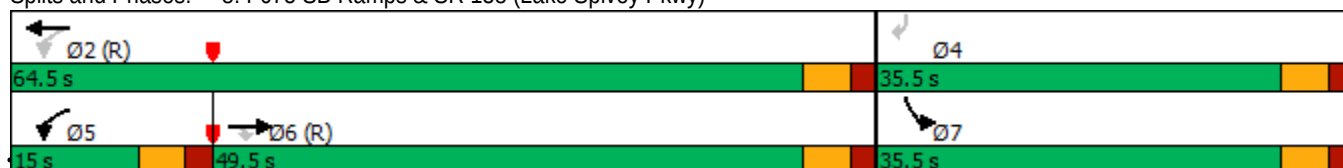
2a. No-Build 2027 AM
01/18/2023

	→	↘	↙	←	↘	↙
Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↘
Traffic Volume (vph)	1242	54	104	1232	147	465
Future Volume (vph)	1242	54	104	1232	147	465
Lane Group Flow (vph)	1396	61	117	1384	165	522
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	7	
Permitted Phases		6	2			4
Detector Phase	6	6	5	2	7	4
Switch Phase						
Minimum Initial (s)	15.0	15.0	5.0	15.0	5.0	6.0
Minimum Split (s)	28.5	28.5	15.0	28.5	35.5	35.5
Total Split (s)	49.5	49.5	15.0	64.5	35.5	35.5
Total Split (%)	49.5%	49.5%	15.0%	64.5%	35.5%	35.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Min	C-Min	None	C-Min	None	None
v/c Ratio	0.74	0.07	0.48	0.58	0.23	0.79
Control Delay	20.5	4.7	12.0	5.6	32.0	39.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.5	4.7	12.0	5.6	32.0	39.4
Queue Length 50th (ft)	231	1	24	0	44	150
Queue Length 95th (ft)	#347	m14	m13	m508	67	196
Internal Link Dist (ft)	1959			706		
Turn Bay Length (ft)		375	95		520	500
Base Capacity (vph)	1889	893	273	2371	1029	897
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.07	0.43	0.58	0.16	0.58

Intersection Summary

Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 92 (92%), Referenced to phase 2:WBTL and 6:EBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

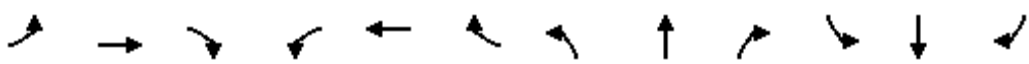
Splits and Phases: 8: I-675 SB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
8: I-675 SB Ramps & SR 138 (Lake Spivey Pkwy)

2a. No-Build 2027 AM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑					↘↗		↗↖
Traffic Volume (veh/h)	0	1242	54	104	1232	0	0	0	0	147	0	465
Future Volume (veh/h)	0	1242	54	104	1232	0	0	0	0	147	0	465
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1870	1870	1856	0				1870	0	1870
Adj Flow Rate, veh/h	0	1396	61	117	1384	0				165	0	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89				0.89	0.89	0.89
Percent Heavy Veh, %	0	3	2	2	3	0				2	0	2
Cap, veh/h	0	2525	1135	292	2888	0				244	0	
Arrive On Green	0.00	0.24	0.24	0.03	0.55	0.00				0.07	0.00	0.00
Sat Flow, veh/h	0	3618	1585	1781	3618	0				3456	0	2790
Grp Volume(v), veh/h	0	1396	61	117	1384	0				165	0	0
Grp Sat Flow(s),veh/h/ln	0	1763	1585	1781	1763	0				1728	0	1395
Q Serve(g_s), s	0.0	34.8	3.0	1.5	24.0	0.0				4.7	0.0	0.0
Cycle Q Clear(g_c), s	0.0	34.8	3.0	1.5	24.0	0.0				4.7	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2525	1135	292	2888	0				244	0	
V/C Ratio(X)	0.00	0.55	0.05	0.40	0.48	0.00				0.68	0.00	
Avail Cap(c_a), veh/h	0	2525	1135	376	2888	0				1037	0	
HCM Platoon Ratio	1.00	0.33	0.33	0.67	0.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.83	0.83	0.19	0.19	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	24.1	12.0	12.7	9.5	0.0				45.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.7	0.1	0.2	0.1	0.0				3.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	16.3	3.0	1.2	9.6	0.0				2.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	24.8	12.0	12.9	9.6	0.0				48.6	0.0	0.0
LnGrp LOS	A	C	B	B	A	A				D	A	
Approach Vol, veh/h		1457			1501						165	
Approach Delay, s/veh		24.3			9.9						48.6	
Approach LOS		C			A						D	
Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		87.4		12.6	10.3	77.1						
Change Period (Y+Rc), s		5.5		5.5	5.5	5.5						
Max Green Setting (Gmax), s		59.0		30.0	9.5	44.0						
Max Q Clear Time (g_c+I1), s		26.0		6.7	3.5	36.8						
Green Ext Time (p_c), s		21.3		0.5	0.1	6.2						
Intersection Summary												
HCM 6th Ctrl Delay			18.6									
HCM 6th LOS			B									
Notes												
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.												

Timings
9: SR 138 (Lake Spivey Pkwy) & Mt. Zion Rd

2a. No-Build 2027 AM

01/18/2023

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	116	1061	49	32	1398	126	43	34	144	55	149
Future Volume (vph)	116	1061	49	32	1398	126	43	34	144	55	149
Lane Group Flow (vph)	123	1129	52	34	1487	134	46	65	153	59	159
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8	7	4	
Permitted Phases	6		6	2		2	8		4		4
Detector Phase	1	6	6	5	2	2	3	8	7	4	4
Switch Phase											
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	6.0	5.0	6.0	6.0
Minimum Split (s)	15.0	28.5	28.5	15.0	34.5	34.5	15.0	38.5	15.0	32.5	32.5
Total Split (s)	15.0	31.5	31.5	15.0	31.5	31.5	15.0	38.5	15.0	38.5	38.5
Total Split (%)	15.0%	31.5%	31.5%	15.0%	31.5%	31.5%	15.0%	38.5%	15.0%	38.5%	38.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None
v/c Ratio	0.53	0.53	0.05	0.11	0.78	0.14	0.20	0.39	0.63	0.25	0.47
Control Delay	35.3	8.4	0.1	7.8	15.9	2.7	31.9	33.3	45.0	43.3	11.9
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	35.3	8.4	0.1	7.8	15.9	2.7	31.9	33.3	45.0	43.3	11.9
Queue Length 50th (ft)	42	95	0	3	190	1	23	22	83	36	0
Queue Length 95th (ft)	105	122	m0	m13	#626	23	50	62	134	74	58
Internal Link Dist (ft)		896			1959			388		1031	
Turn Bay Length (ft)	115		140	155		325	35		345		165
Base Capacity (vph)	260	2142	1024	368	1902	943	260	599	248	627	639
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	0.47	0.53	0.05	0.09	0.78	0.14	0.18	0.11	0.62	0.09	0.25

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 7 (7%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 125

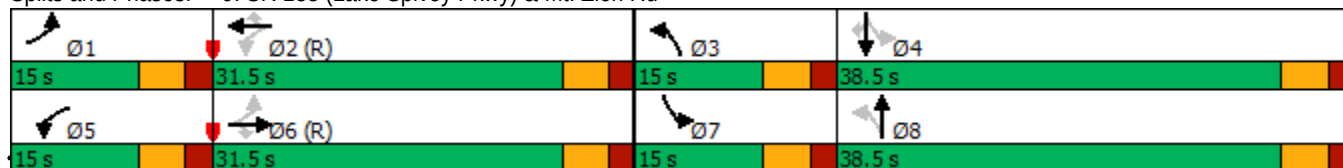
Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: SR 138 (Lake Spivey Pkwy) & Mt. Zion Rd



HCM 6th Signalized Intersection Summary
9: SR 138 (Lake Spivey Pkwy) & Mt. Zion Rd

2a. No-Build 2027 AM

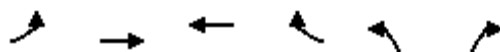
01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	116	1061	49	32	1398	126	43	34	27	144	55	149
Future Volume (veh/h)	116	1061	49	32	1398	126	43	34	27	144	55	149
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1856	1870	1870	1856	1900	1870	1900	1870	1900	1900	1900
Adj Flow Rate, veh/h	123	1129	0	34	1487	134	46	36	29	153	59	159
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	3	2	2	3	0	2	0	2	0	0	0
Cap, veh/h	341	2080		412	2017	921	212	63	51	282	234	199
Arrive On Green	0.10	1.00	0.00	0.06	1.00	1.00	0.04	0.07	0.07	0.09	0.12	0.12
Sat Flow, veh/h	1810	3526	1585	1781	3526	1610	1781	974	785	1810	1900	1610
Grp Volume(v), veh/h	123	1129	0	34	1487	134	46	0	65	153	59	159
Grp Sat Flow(s),veh/h/ln	1810	1763	1585	1781	1763	1610	1781	0	1759	1810	1900	1610
Q Serve(g_s), s	2.8	0.0	0.0	0.8	0.0	0.0	2.4	0.0	3.6	7.6	2.8	9.6
Cycle Q Clear(g_c), s	2.8	0.0	0.0	0.8	0.0	0.0	2.4	0.0	3.6	7.6	2.8	9.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.45	1.00		1.00
Lane Grp Cap(c), veh/h	341	2080		412	2017	921	212	0	114	282	234	199
V/C Ratio(X)	0.36	0.54		0.08	0.74	0.15	0.22	0.00	0.57	0.54	0.25	0.80
Avail Cap(c_a), veh/h	425	2080		527	2017	921	317	0	580	283	627	531
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.82	0.82	0.00	0.73	0.73	0.73	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.3	0.0	0.0	7.8	0.0	0.0	41.5	0.0	45.4	37.0	39.7	42.6
Incr Delay (d2), s/veh	0.5	0.8	0.0	0.1	1.8	0.2	0.5	0.0	4.4	2.1	0.6	7.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.2	0.0	0.3	0.5	0.1	1.1	0.0	1.7	3.4	1.3	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.9	0.8	0.0	7.9	1.8	0.2	42.0	0.0	49.8	39.0	40.2	49.9
LnGrp LOS	A	A		A	A	A	D	A	D	D	D	D
Approach Vol, veh/h		1252			1655			111			371	
Approach Delay, s/veh		1.5			1.8			46.5			43.9	
Approach LOS		A			A			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.3	62.7	9.1	17.8	8.6	64.5	14.9	12.0				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	9.5	26.0	9.5	33.0	9.5	26.0	9.5	33.0				
Max Q Clear Time (g_c+I1), s	4.8	2.0	4.4	11.6	2.8	2.0	9.6	5.6				
Green Ext Time (p_c), s	0.1	18.7	0.0	0.7	0.0	14.0	0.0	0.3				
Intersection Summary												
HCM 6th Ctrl Delay			7.8									
HCM 6th LOS			A									
Notes												
User approved pedestrian interval to be less than phase max green.												
Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.												

Timings 10: I-75 NB Ramps & SR 138 (Lake Spivey Pkwy)

2a. No-Build 2027 AM

01/18/2023



Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	518	1254	1052	764	292	146
Future Volume (vph)	518	1254	1052	764	292	146
Lane Group Flow (vph)	545	1320	1107	804	307	154
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		3	
Permitted Phases	6			2		8
Detector Phase	1	6	2	2	3	8
Switch Phase						
Minimum Initial (s)	5.0	15.0	15.0	15.0	5.0	6.0
Minimum Split (s)	15.0	28.5	28.5	28.5	15.0	32.5
Total Split (s)	30.0	67.5	37.5	37.5	32.5	32.5
Total Split (%)	30.0%	67.5%	37.5%	37.5%	32.5%	32.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.91	0.56	0.99	0.87	0.79	0.37
Control Delay	36.1	8.2	44.8	17.2	51.8	16.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.1	8.2	44.8	17.2	51.8	16.9
Queue Length 50th (ft)	282	301	314	122	185	35
Queue Length 95th (ft)	m#531	306	#498	#621	266	85
Internal Link Dist (ft)		897	896			
Turn Bay Length (ft)	140			405		510
Base Capacity (vph)	598	2352	1121	924	477	490
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.56	0.99	0.87	0.64	0.31

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 8 (8%), Referenced to phase 2:WBT and 6:EBTL, Start of Green

Natural Cycle: 100

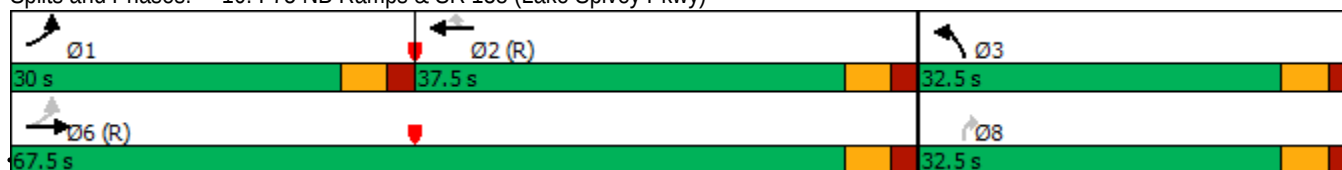
Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: I-75 NB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
10: I-75 NB Ramps & SR 138 (Lake Spivey Pkwy)

2a. No-Build 2027 AM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Traffic Volume (veh/h)	518	1254	0	0	1052	764	292	0	146	0	0	0
Future Volume (veh/h)	518	1254	0	0	1052	764	292	0	146	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1870	1856	0	0	1856	1870	1870	0	1870			
Adj Flow Rate, veh/h	545	1320	0	0	1107	0	307	0	0			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	2	3	0	0	3	2	2	0	2			
Cap, veh/h	591	2455	0	0	1645		345	0				
Arrive On Green	0.12	0.47	0.00	0.00	0.93	0.00	0.19	0.00	0.00			
Sat Flow, veh/h	1781	3618	0	0	3618	1585	1781	0	1585			
Grp Volume(v), veh/h	545	1320	0	0	1107	0	307	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1763	0	0	1763	1585	1781	0	1585			
Q Serve(g_s), s	14.2	26.7	0.0	0.0	5.6	0.0	16.8	0.0	0.0			
Cycle Q Clear(g_c), s	14.2	26.7	0.0	0.0	5.6	0.0	16.8	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	591	2455	0	0	1645		345	0				
V/C Ratio(X)	0.92	0.54	0.00	0.00	0.67		0.89	0.00				
Avail Cap(c_a), veh/h	716	2455	0	0	1645		481	0				
HCM Platoon Ratio	0.67	0.67	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	0.60	0.60	0.00	0.00	0.60	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	13.9	15.2	0.0	0.0	2.0	0.0	39.3	0.0	0.0			
Incr Delay (d2), s/veh	10.4	0.5	0.0	0.0	1.3	0.0	14.2	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	7.0	11.1	0.0	0.0	1.1	0.0	8.3	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.2	15.7	0.0	0.0	3.3	0.0	53.5	0.0	0.0			
LnGrp LOS	C	B	A	A	A		D	A				
Approach Vol, veh/h	1865				1107				307			
Approach Delay, s/veh	18.2				3.3				53.5			
Approach LOS	B				A				D			
Timer - Assigned Phs	1	2					6	8				
Phs Duration (G+Y+Rc), s	22.9	52.2					75.1	24.9				
Change Period (Y+Rc), s	5.5	5.5					5.5	5.5				
Max Green Setting (Gmax), s	24.5	32.0					62.0	27.0				
Max Q Clear Time (g_c+I1), s	16.2	7.6					28.7	18.8				
Green Ext Time (p_c), s	1.2	13.8					20.4	0.6				

Intersection Summary

HCM 6th Ctrl Delay 16.5

HCM 6th LOS B

Notes

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Timings 11: I-75 SB Ramps & SR 138 (Lake Spivey Pkwy)

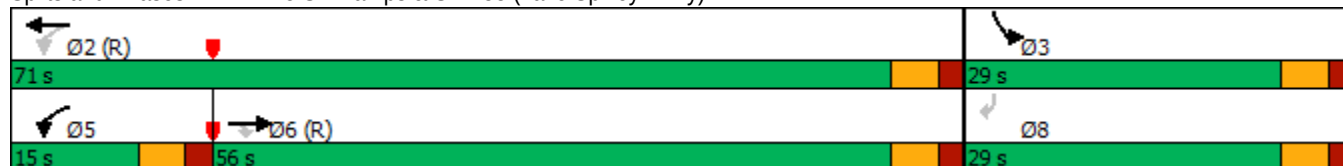
2a. No-Build 2027 AM
01/18/2023

	→	↘	↙	←	↘	↙
Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Configurations	↑↑	↑	↘	↑↑	↘↘	↘
Traffic Volume (vph)	1402	245	101	1238	359	282
Future Volume (vph)	1402	245	101	1238	359	282
Lane Group Flow (vph)	1524	266	110	1346	390	307
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	3	
Permitted Phases		6	2			8
Detector Phase	6	6	5	2	3	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	5.0	15.0	5.0	15.0
Minimum Split (s)	28.5	28.5	15.0	28.5	15.0	28.5
Total Split (s)	56.0	56.0	15.0	71.0	29.0	29.0
Total Split (%)	56.0%	56.0%	15.0%	71.0%	29.0%	29.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Min	C-Min	None	C-Min	None	Min
v/c Ratio	0.78	0.27	0.51	0.56	0.56	0.79
Control Delay	22.3	2.4	16.0	5.2	38.6	41.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.3	2.4	16.0	5.2	38.6	41.3
Queue Length 50th (ft)	391	0	13	130	113	133
Queue Length 95th (ft)	535	39	m11	m399	157	228
Internal Link Dist (ft)	1158			897		
Turn Bay Length (ft)		980	150		490	
Base Capacity (vph)	1942	995	244	2406	806	438
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.27	0.45	0.56	0.48	0.70

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 46 (46%), Referenced to phase 2:WBTL and 6:EBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

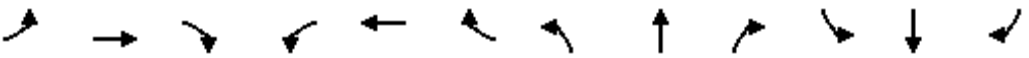
Splits and Phases: 11: I-75 SB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
11: I-75 SB Ramps & SR 138 (Lake Spivey Pkwy)

2a. No-Build 2027 AM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑					↑↑		↑
Traffic Volume (veh/h)	0	1402	245	101	1238	0	0	0	0	359	0	282
Future Volume (veh/h)	0	1402	245	101	1238	0	0	0	0	359	0	282
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1870	1870	1856	0				1870	0	1870
Adj Flow Rate, veh/h	0	1524	0	110	1346	0				390	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	3	2	2	3	0				2	0	2
Cap, veh/h	0	2284		287	2646	0				482	0	
Arrive On Green	0.00	0.65	0.00	0.05	0.75	0.00				0.14	0.00	0.00
Sat Flow, veh/h	0	3618	1585	1781	3618	0				3456	0	1585
Grp Volume(v), veh/h	0	1524	0	110	1346	0				390	0	0
Grp Sat Flow(s),veh/h/ln	0	1763	1585	1781	1763	0				1728	0	1585
Q Serve(g_s), s	0.0	26.8	0.0	1.9	15.4	0.0				10.9	0.0	0.0
Cycle Q Clear(g_c), s	0.0	26.8	0.0	1.9	15.4	0.0				10.9	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2284		287	2646	0				482	0	
V/C Ratio(X)	0.00	0.67		0.38	0.51	0.00				0.81	0.00	
Avail Cap(c_a), veh/h	0	2284		371	2646	0				812	0	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.56	0.00	0.22	0.22	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	10.9	0.0	10.4	5.0	0.0				41.7	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.9	0.0	0.2	0.2	0.0				3.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	8.6	0.0	0.7	3.7	0.0				4.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	11.8	0.0	10.6	5.2	0.0				45.0	0.0	0.0
LnGrp LOS	A	B		B	A	A				D	A	
Approach Vol, veh/h		1524			1456						390	
Approach Delay, s/veh		11.8			5.6						45.0	
Approach LOS		B			A						D	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		80.5			10.3	70.3		19.5				
Change Period (Y+Rc), s		5.5			5.5	5.5		5.5				
Max Green Setting (Gmax), s		65.5			9.5	50.5		23.5				
Max Q Clear Time (g_c+I1), s		17.4			3.9	28.8		12.9				
Green Ext Time (p_c), s		25.9			0.1	16.9		1.0				
Intersection Summary												
HCM 6th Ctrl Delay			13.0									
HCM 6th LOS			B									
Notes												
Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Timings

12: Speer Rd/Mt. Zion Pkwy & SR 138 (Lake Spivey Pkwy)

2a. No-Build 2027 AM

01/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	726	42	374	806	233	91	232	576	200	90	66
Future Volume (vph)	81	726	42	374	806	233	91	232	576	200	90	66
Lane Group Flow (vph)	85	764	44	394	848	245	96	244	606	211	95	69
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2			8			4
Detector Phase	1	6	6	5	2	2	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	15.0	46.5	46.5	15.0	47.5	47.5	15.0	46.5	46.5	15.0	45.5	45.5
Total Split (s)	15.0	42.0	42.0	26.0	53.0	53.0	28.0	62.0	62.0	20.0	54.0	54.0
Total Split (%)	10.0%	28.0%	28.0%	17.3%	35.3%	35.3%	18.7%	41.3%	41.3%	13.3%	36.0%	36.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.43	0.66	0.07	0.81	0.59	0.31	0.44	0.23	0.92	0.69	0.08	0.11
Control Delay	74.8	48.9	0.2	76.0	39.0	5.1	73.5	38.9	47.8	78.3	33.1	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.8	48.9	0.2	76.0	39.0	5.1	73.5	38.9	47.8	78.3	33.1	0.3
Queue Length 50th (ft)	42	353	0	193	350	0	47	94	353	104	33	0
Queue Length 95th (ft)	71	#492	0	#271	476	63	78	117	489	149	51	0
Internal Link Dist (ft)		1890			1158			635			523	
Turn Bay Length (ft)	345		290	290		930	195		550	270		270
Base Capacity (vph)	220	1156	652	503	1440	794	514	1333	763	331	1269	671
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.66	0.07	0.78	0.59	0.31	0.19	0.18	0.79	0.64	0.07	0.10

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Green

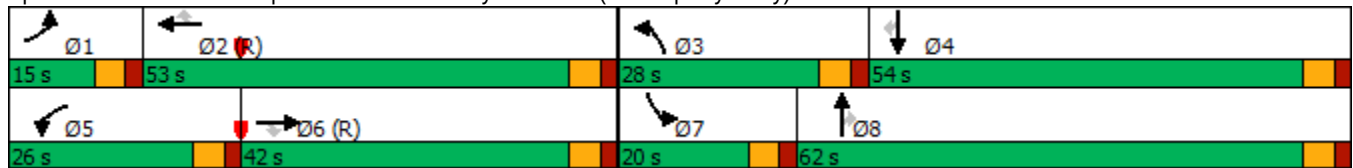
Natural Cycle: 125

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 12: Speer Rd/Mt. Zion Pkwy & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary

12: Speer Rd/Mt. Zion Pkwy & SR 138 (Lake Spivey Pkwy)

2a. No-Build 2027 AM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	81	726	42	374	806	233	91	232	576	200	90	66
Future Volume (veh/h)	81	726	42	374	806	233	91	232	576	200	90	66
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1856	1900	1900	1856	1870	1870	1870	1870	1870	1900	1870
Adj Flow Rate, veh/h	85	764	44	394	848	245	96	244	606	211	95	69
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
Percent Heavy Veh, %	2	3	0	0	3	2	2	2	2	2	0	2
Cap, veh/h	128	973	444	442	1286	578	143	1339	597	259	1481	650
Arrive On Green	0.04	0.28	0.28	0.13	0.36	0.36	0.04	0.38	0.38	0.07	0.41	0.41
Sat Flow, veh/h	3456	3526	1610	3510	3526	1585	3456	3554	1585	3456	3610	1585
Grp Volume(v), veh/h	85	764	44	394	848	245	96	244	606	211	95	69
Grp Sat Flow(s),veh/h/ln	1728	1763	1610	1755	1763	1585	1728	1777	1585	1728	1805	1585
Q Serve(g_s), s	3.6	30.0	3.1	16.6	30.2	17.4	4.1	6.9	56.5	9.0	2.4	4.0
Cycle Q Clear(g_c), s	3.6	30.0	3.1	16.6	30.2	17.4	4.1	6.9	56.5	9.0	2.4	4.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	128	973	444	442	1286	578	143	1339	597	259	1481	650
V/C Ratio(X)	0.67	0.79	0.10	0.89	0.66	0.42	0.67	0.18	1.02	0.82	0.06	0.11
Avail Cap(c_a), veh/h	219	973	444	480	1286	578	518	1339	597	334	1481	650
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	0.91	0.77	0.77	0.77	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	71.3	50.2	40.4	64.6	39.8	35.8	70.9	31.3	46.8	68.4	26.8	27.3
Incr Delay (d2), s/veh	5.4	5.8	0.4	14.4	2.1	1.7	5.4	0.1	40.6	11.4	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	13.8	1.3	8.2	13.2	6.9	1.9	2.9	28.2	4.3	1.0	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	76.7	56.0	40.8	79.0	41.9	37.5	76.3	31.4	87.4	79.8	26.8	27.3
LnGrp LOS	E	E	D	E	D	D	E	C	F	E	C	C
Approach Vol, veh/h	893		1487				946		375			
Approach Delay, s/veh	57.2		51.0				71.8		56.7			
Approach LOS	E		D				E		E			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.0	60.2	11.7	67.0	24.4	46.9	16.7	62.0				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	9.5	47.5	22.5	48.5	20.5	36.5	14.5	56.5				
Max Q Clear Time (g_c+I1), s	5.6	32.2	6.1	6.0	18.6	32.0	11.0	58.5				
Green Ext Time (p_c), s	0.1	9.2	0.2	0.8	0.3	2.8	0.2	0.0				
Intersection Summary												
HCM 6th Ctrl Delay	58.4											
HCM 6th LOS	E											
Notes												

Timings
13: Spivey Rd & SR 138 (Lake Spivey Pkwy)

2a. No-Build 2027 AM
01/18/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↗
Traffic Volume (vph)	703	25	113	911	38	239
Future Volume (vph)	703	25	113	911	38	239
Lane Group Flow (vph)	773	27	124	1001	42	263
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	8	
Permitted Phases		6	2			8
Detector Phase	6	6	5	2	8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0	6.0
Minimum Split (s)	25.5	25.5	15.0	23.5	31.5	31.5
Total Split (s)	44.0	44.0	18.0	62.0	38.0	38.0
Total Split (%)	44.0%	44.0%	18.0%	62.0%	38.0%	38.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Min	C-Min	None	C-Min	None	None
v/c Ratio	0.33	0.03	0.23	0.36	0.27	0.69
Control Delay	7.8	2.9	3.5	3.4	45.2	15.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.8	2.9	3.5	3.4	45.2	15.4
Queue Length 50th (ft)	91	0	12	65	26	0
Queue Length 95th (ft)	161	11	33	129	55	71
Internal Link Dist (ft)	1639			1890	1094	
Turn Bay Length (ft)		230	535			220
Base Capacity (vph)	2366	1077	613	2807	575	692
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.03	0.20	0.36	0.07	0.38

Intersection Summary

Cycle Length: 100

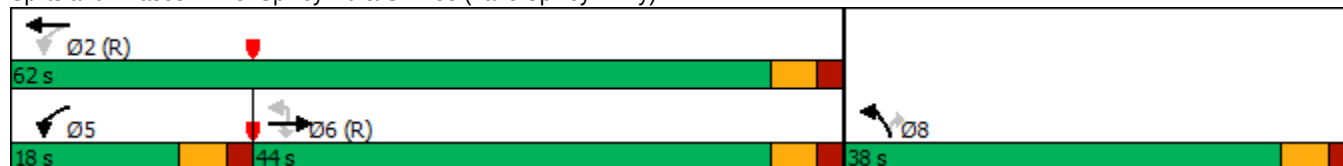
Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTU, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Splits and Phases: 13: Spivey Rd & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
13: Spivey Rd & SR 138 (Lake Spivey Pkwy)

2a. No-Build 2027 AM

01/18/2023



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	⇐	⇑⇑	⇑	⇑	⇑⇑	⇑	⇑
Traffic Volume (veh/h)	0	703	25	113	911	38	239
Future Volume (veh/h)	0	703	25	113	911	38	239
Initial Q (Qb), veh		0	0	0	0	0	0
Ped-Bike Adj(A_pbT)			1.00	1.00		1.00	1.00
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No	No	
Adj Sat Flow, veh/h/ln		1856	1870	1870	1856	1870	1870
Adj Flow Rate, veh/h		773	0	124	1001	42	0
Peak Hour Factor		0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %		3	2	2	3	2	2
Cap, veh/h		2628		628	2992	74	
Arrive On Green		0.75	0.00	0.05	0.85	0.04	0.00
Sat Flow, veh/h		3618	1585	1781	3618	1781	1585
Grp Volume(v), veh/h		773	0	124	1001	42	0
Grp Sat Flow(s),veh/h/ln		1763	1585	1781	1763	1781	1585
Q Serve(g_s), s		7.2	0.0	1.4	6.0	2.3	0.0
Cycle Q Clear(g_c), s		7.2	0.0	1.4	6.0	2.3	0.0
Prop In Lane			1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h		2628		628	2992	74	
V/C Ratio(X)		0.29		0.20	0.33	0.57	
Avail Cap(c_a), veh/h		2628		764	2992	579	
HCM Platoon Ratio		1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	0.00	0.82	0.82	1.00	0.00
Uniform Delay (d), s/veh		4.2	0.0	2.4	1.6	47.1	0.0
Incr Delay (d2), s/veh		0.3	0.0	0.1	0.2	6.8	0.0
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		1.8	0.0	0.2	0.5	1.2	0.0
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh		4.4	0.0	2.5	1.8	53.8	0.0
LnGrp LOS		A		A	A	D	
Approach Vol, veh/h		773			1125	42	
Approach Delay, s/veh		4.4			1.9	53.8	
Approach LOS		A			A	D	
Timer - Assigned Phs		2			5	6	8
Phs Duration (G+Y+Rc), s		90.4			10.3	80.0	9.6
Change Period (Y+Rc), s		5.5			5.5	5.5	5.5
Max Green Setting (Gmax), s		56.5			12.5	38.5	32.5
Max Q Clear Time (g_c+I1), s		8.0			3.4	9.2	4.3
Green Ext Time (p_c), s		17.1			0.2	10.2	0.1

Intersection Summary

HCM 6th Ctrl Delay	4.0
HCM 6th LOS	A

Notes

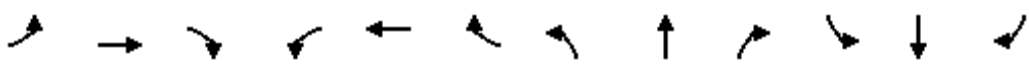
User approved ignoring U-Turning movement.

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Timings
14: Blackhall Rd/Speer Rd & Walt Stephens Rd

2a. No-Build 2027 AM

01/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	168	47	111	233	406	42	406	58	143	106	11
Future Volume (vph)	15	168	47	111	233	406	42	406	58	143	106	11
Lane Group Flow (vph)	17	187	52	123	259	451	47	451	64	159	118	12
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		6			2		3	8		7	4	
Permitted Phases	6		6	2		2	8		8	4		4
Detector Phase	6	6	6	2	2	2	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0	15.0	5.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	23.5	23.5	23.5	23.5	23.5	23.5	15.0	23.5	23.5	15.0	23.5	23.5
Total Split (s)	41.0	41.0	41.0	41.0	41.0	41.0	15.0	44.0	44.0	15.0	44.0	44.0
Total Split (%)	41.0%	41.0%	41.0%	41.0%	41.0%	41.0%	15.0%	44.0%	44.0%	15.0%	44.0%	44.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.04	0.23	0.07	0.24	0.31	0.49	0.09	0.81	0.12	0.55	0.17	0.02
Control Delay	19.5	20.0	1.8	21.4	21.5	6.3	14.2	43.9	3.0	23.0	22.0	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.5	20.0	1.8	21.4	21.5	6.3	14.2	43.9	3.0	23.0	22.0	0.1
Queue Length 50th (ft)	6	72	0	52	112	37	17	265	0	60	54	0
Queue Length 95th (ft)	22	139	10	91	167	73	31	339	17	84	87	0
Internal Link Dist (ft)		2027			3745			1264			1872	
Turn Bay Length (ft)	110		160	190		250	140		125	315		120
Base Capacity (vph)	444	824	748	512	824	926	546	717	662	292	731	673
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.23	0.07	0.24	0.31	0.49	0.09	0.63	0.10	0.54	0.16	0.02

Intersection Summary

Cycle Length: 100

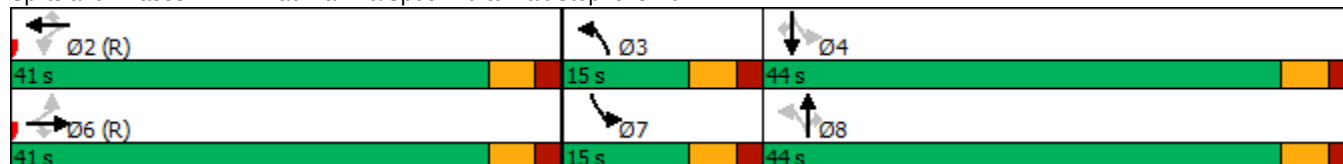
Actuated Cycle Length: 100

Offset: 96 (96%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Splits and Phases: 14: Blackhall Rd/Speer Rd & Walt Stephens Rd



HCM 6th Signalized Intersection Summary

14: Blackhall Rd/Speer Rd & Walt Stephens Rd

2a. No-Build 2027 AM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	168	47	111	233	406	42	406	58	143	106	11
Future Volume (veh/h)	15	168	47	111	233	406	42	406	58	143	106	11
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	17	187	52	123	259	451	47	451	0	159	118	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	366	900	763	555	900	763	483	509		256	594	
Arrive On Green	0.48	0.48	0.48	0.48	0.48	0.48	0.04	0.27	0.00	0.08	0.32	0.00
Sat Flow, veh/h	739	1870	1585	1141	1870	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	17	187	52	123	259	451	47	451	0	159	118	0
Grp Sat Flow(s),veh/h/ln	739	1870	1585	1141	1870	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	1.4	5.8	1.8	7.0	8.3	20.6	1.9	23.1	0.0	6.2	4.6	0.0
Cycle Q Clear(g_c), s	9.8	5.8	1.8	12.7	8.3	20.6	1.9	23.1	0.0	6.2	4.6	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	366	900	763	555	900	763	483	509		256	594	
V/C Ratio(X)	0.05	0.21	0.07	0.22	0.29	0.59	0.10	0.89		0.62	0.20	
Avail Cap(c_a), veh/h	366	900	763	555	900	763	587	720		279	720	
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	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	18.6	15.0	13.9	18.6	15.6	18.8	24.6	34.9	0.0	25.7	24.9	0.0
Incr Delay (d2), s/veh	0.2	0.5	0.2	0.9	0.8	3.4	0.1	9.6	0.0	3.7	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	2.4	0.6	1.9	3.5	7.5	0.8	11.2	0.0	2.7	2.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.8	15.5	14.1	19.5	16.4	22.2	24.6	44.5	0.0	29.4	25.0	0.0
LnGrp LOS	B	B	B	B	B	C	C	D		C	C	
Approach Vol, veh/h	256			833			498			277		
Approach Delay, s/veh	15.4			20.0			42.7			27.5		
Approach LOS	B			B			D			C		
Timer - Assigned Phs	2			3			4			6		
Phs Duration (G+Y+Rc), s	53.6			9.1			37.2			53.6		
Change Period (Y+Rc), s	5.5			5.5			5.5			5.5		
Max Green Setting (Gmax), s	35.5			9.5			38.5			35.5		
Max Q Clear Time (g_c+I1), s	22.6			3.9			6.6			11.8		
Green Ext Time (p_c), s	5.6			0.0			0.6			2.4		

Intersection Summary

HCM 6th Ctrl Delay	26.5
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings

2b. No-Build 2027 PM

1: Flippen Rd/Shields Rd & SR 42/SR 138/US 23 (N. Henry Blvd)

01/18/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	21	1311	177	1011	175	33	140	27	48
Future Volume (vph)	21	1311	177	1011	175	33	140	27	48
Lane Group Flow (vph)	21	1578	179	1035	0	210	141	0	87
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	Perm	NA
Protected Phases	1	6	5	2		8			4
Permitted Phases	6		2		8		8	4	
Detector Phase	1	6	5	2	8	8	8	4	4
Switch Phase									
Minimum Initial (s)	5.0	15.0	5.0	15.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	15.0	28.5	15.0	28.5	30.5	30.5	30.5	30.5	30.5
Total Split (s)	15.0	70.0	18.0	73.0	32.0	32.0	32.0	32.0	32.0
Total Split (%)	12.5%	58.3%	15.0%	60.8%	26.7%	26.7%	26.7%	26.7%	26.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5		5.5	5.5		5.5
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	C-Min	None	C-Min	None	None	None	None	None
v/c Ratio	0.06	0.80	0.75	0.44		0.85	0.39		0.32
Control Delay	6.7	24.7	41.3	11.0		75.5	23.4		40.9
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Delay	6.7	24.7	41.3	11.0		75.5	23.4		40.9
Queue Length 50th (ft)	4	514	71	161		155	44		53
Queue Length 95th (ft)	13	636	#170	290		#265	103		101
Internal Link Dist (ft)		2570		1632		2093			641
Turn Bay Length (ft)	135		210				25		
Base Capacity (vph)	419	1971	260	2346		285	403		313
Starvation Cap Reductn	0	0	0	0		0	0		0
Spillback Cap Reductn	0	0	0	0		0	0		0
Storage Cap Reductn	0	0	0	0		0	0		0
Reduced v/c Ratio	0.05	0.80	0.69	0.44		0.74	0.35		0.28

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

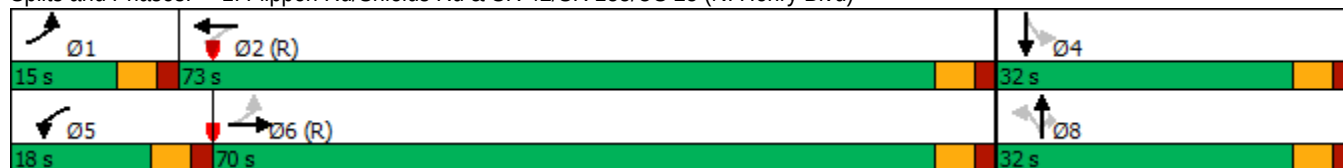
Natural Cycle: 90

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Flippen Rd/Shields Rd & SR 42/SR 138/US 23 (N. Henry Blvd)



HCM 6th Signalized Intersection Summary

2b. No-Build 2027 PM

1: Flippen Rd/Shields Rd & SR 42/SR 138/US 23 (N. Henry Blvd)

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	1311	251	177	1011	14	175	33	140	27	48	12
Future Volume (veh/h)	21	1311	251	177	1011	14	175	33	140	27	48	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1841	1856	1856	1841	1870	1856	1870	1856	1870	1870	1870
Adj Flow Rate, veh/h	21	1324	254	179	1021	14	177	33	141	27	48	12
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	4	3	3	4	2	3	2	3	2	2	2
Cap, veh/h	352	1713	324	237	2192	30	184	24	347	39	58	9
Arrive On Green	0.02	0.58	0.58	0.06	0.62	0.62	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	1781	2934	556	1767	3532	48	585	109	1572	0	262	42
Grp Volume(v), veh/h	21	782	796	179	505	530	210	0	141	87	0	0
Grp Sat Flow(s),veh/h/ln	1781	1749	1741	1767	1749	1832	694	0	1572	304	0	0
Q Serve(g_s), s	0.6	40.4	42.0	4.7	18.5	18.5	0.0	0.0	9.2	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.6	40.4	42.0	4.7	18.5	18.5	26.5	0.0	9.2	26.5	0.0	0.0
Prop In Lane	1.00		0.32	1.00		0.03	0.84		1.00	0.31		0.14
Lane Grp Cap(c), veh/h	352	1021	1016	237	1085	1137	208	0	347	106	0	0
V/C Ratio(X)	0.06	0.77	0.78	0.75	0.47	0.47	1.01	0.00	0.41	0.82	0.00	0.00
Avail Cap(c_a), veh/h	455	1021	1016	319	1085	1137	208	0	347	106	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	10.3	18.8	19.1	23.3	12.1	12.1	50.3	0.0	40.0	41.3	0.0	0.0
Incr Delay (d2), s/veh	0.1	5.5	6.0	6.8	1.4	1.4	64.3	0.0	0.8	37.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	16.2	16.8	3.3	6.9	7.2	10.0	0.0	3.6	3.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.4	24.3	25.2	30.1	13.6	13.5	114.5	0.0	40.8	78.5	0.0	0.0
LnGrp LOS	B	C	C	C	B	B	F	A	D	E	A	A
Approach Vol, veh/h	1599				1214				351			
Approach Delay, s/veh	24.5				16.0				84.9			
Approach LOS	C				B				F			
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.0	80.0		32.0	12.4	75.6		32.0				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	9.5	67.5		26.5	12.5	64.5		26.5				
Max Q Clear Time (g_c+I1), s	2.6	20.5		28.5	6.7	44.0		28.5				
Green Ext Time (p_c), s	0.0	16.6		0.0	0.2	16.5		0.0				
Intersection Summary												
HCM 6th Ctrl Delay	29.3											
HCM 6th LOS	C											

Intersection						
Int Delay, s/veh	0.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	17	515	14	26	631
Future Vol, veh/h	14	17	515	14	26	631
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	98	98	98	98	98	98
Heavy Vehicles, %	2	2	3	2	2	3
Mvmt Flow	14	17	526	14	27	644
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1231	533	0	0	540	0
Stage 1	533	-	-	-	-	-
Stage 2	698	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	196	547	-	-	1028	-
Stage 1	588	-	-	-	-	-
Stage 2	494	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	188	547	-	-	1028	-
Mov Cap-2 Maneuver	188	-	-	-	-	-
Stage 1	588	-	-	-	-	-
Stage 2	474	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	18.7	0	0.3			
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	294	1028	-	
HCM Lane V/C Ratio	-	-	0.108	0.026	-	
HCM Control Delay (s)	-	-	18.7	8.6	0	
HCM Lane LOS	-	-	C	A	A	
HCM 95th %tile Q(veh)	-	-	0.4	0.1	-	

HCM 6th TWSC
3: Flippen Rd & Reeves Creek Trail Parking Lot

2b. No-Build 2027 PM
01/18/2023

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	4	482	2	3	608
Future Vol, veh/h	0	4	482	2	3	608
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	96	96	96	96	96	96
Heavy Vehicles, %	2	2	3	2	2	3
Mvmt Flow	0	4	502	2	3	633

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1142	503	0	0	504
Stage 1	503	-	-	-	-
Stage 2	639	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	222	569	-	-	1061
Stage 1	607	-	-	-	-
Stage 2	526	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	221	569	-	-	1061
Mov Cap-2 Maneuver	221	-	-	-	-
Stage 1	607	-	-	-	-
Stage 2	524	-	-	-	-

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

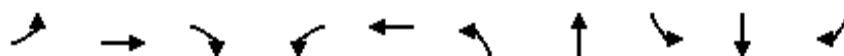
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	569	1061
HCM Lane V/C Ratio	-	-	0.007	0.003
HCM Control Delay (s)	-	-	11.4	8.4
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0	0

Timings

4: Flippen Rd & Walt Stephens Rd/Red Oak Rd

2b. No-Build 2027 PM

01/18/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	163	185	411	24	140	331	345	24	460	164
Future Volume (vph)	163	185	411	24	140	331	345	24	460	164
Lane Group Flow (vph)	175	199	442	26	178	356	391	26	495	176
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4		3	8	1	6	5	2	
Permitted Phases	4		4	8		6		2		2
Detector Phase	7	4	4	3	8	1	6	5	2	2
Switch Phase										
Minimum Initial (s)	5.0	6.0	6.0	5.0	6.0	5.0	15.0	5.0	15.0	15.0
Minimum Split (s)	15.0	31.5	31.5	15.0	30.5	15.0	31.5	15.0	28.5	28.5
Total Split (s)	15.0	31.5	31.5	15.0	31.5	18.0	38.5	15.0	35.5	35.5
Total Split (%)	15.0%	31.5%	31.5%	15.0%	31.5%	18.0%	38.5%	15.0%	35.5%	35.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
v/c Ratio	0.57	0.44	0.61	0.09	0.63	0.70	0.39	0.06	0.90	0.29
Control Delay	30.1	32.0	9.8	23.8	47.4	29.2	17.3	12.4	54.3	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.1	32.0	9.8	23.8	47.4	29.2	17.3	12.4	54.3	5.5
Queue Length 50th (ft)	78	89	52	12	103	143	118	6	301	0
Queue Length 95th (ft)	m110	m146	79	28	159	#337	279	21	#490	47
Internal Link Dist (ft)		646			1291		2204		704	
Turn Bay Length (ft)	180		345	110		130		120		215
Base Capacity (vph)	308	501	749	342	487	511	994	464	553	607
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.40	0.59	0.08	0.37	0.70	0.39	0.06	0.90	0.29

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 88 (88%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green

Natural Cycle: 95

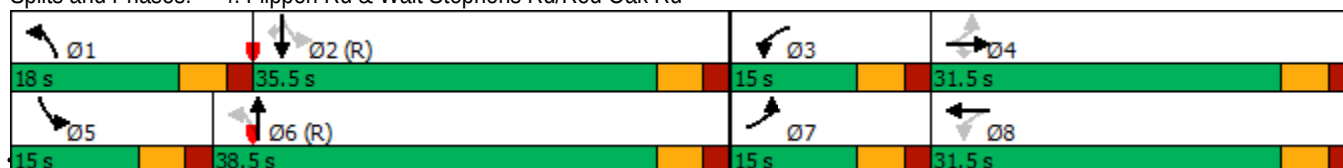
Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Flippen Rd & Walt Stephens Rd/Red Oak Rd



HCM 6th Signalized Intersection Summary

4: Flippen Rd & Walt Stephens Rd/Red Oak Rd

2b. No-Build 2027 PM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	163	185	411	24	140	25	331	345	19	24	460	164
Future Volume (veh/h)	163	185	411	24	140	25	331	345	19	24	460	164
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1870	1900	1856	1870	1870	1856	1900
Adj Flow Rate, veh/h	175	199	0	26	151	27	356	371	20	26	495	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	0	2	0	3	2	2	3	0
Cap, veh/h	274	356		229	190	34	512	939	51	528	820	
Arrive On Green	0.09	0.19	0.00	0.03	0.12	0.12	0.12	0.54	0.54	0.03	0.44	0.00
Sat Flow, veh/h	1781	1870	1585	1781	1569	281	1810	1745	94	1781	1856	1610
Grp Volume(v), veh/h	175	199	0	26	0	178	356	0	391	26	495	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1850	1810	0	1839	1781	1856	1610
Q Serve(g_s), s	8.3	9.6	0.0	1.3	0.0	9.4	10.2	0.0	12.5	0.8	20.3	0.0
Cycle Q Clear(g_c), s	8.3	9.6	0.0	1.3	0.0	9.4	10.2	0.0	12.5	0.8	20.3	0.0
Prop In Lane	1.00		1.00	1.00		0.15	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	274	356		229	0	224	512	0	990	528	820	
V/C Ratio(X)	0.64	0.56		0.11	0.00	0.80	0.70	0.00	0.40	0.05	0.60	
Avail Cap(c_a), veh/h	274	486		352	0	481	517	0	990	652	820	
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	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.1	36.7	0.0	37.0	0.0	42.7	14.8	0.0	13.5	14.4	21.3	0.0
Incr Delay (d2), s/veh	4.9	1.4	0.0	0.2	0.0	6.3	4.0	0.0	1.2	0.0	3.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	4.4	0.0	0.6	0.0	4.6	4.1	0.0	4.9	0.3	8.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.0	38.1	0.0	37.2	0.0	49.1	18.8	0.0	14.7	14.5	24.5	0.0
LnGrp LOS	D	D		D	A	D	B	A	B	B	C	
Approach Vol, veh/h	374			204			747			521		
Approach Delay, s/veh	38.0			47.6			16.7			24.0		
Approach LOS	D			D			B			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.7	49.7	8.1	24.5	8.1	59.3	15.0	17.6				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	12.5	30.0	9.5	26.0	9.5	33.0	9.5	26.0				
Max Q Clear Time (g_c+I1), s	12.2	22.3	3.3	11.6	2.8	14.5	10.3	11.4				
Green Ext Time (p_c), s	0.0	2.9	0.0	0.8	0.0	3.8	0.0	0.7				
Intersection Summary												
HCM 6th Ctrl Delay	26.5											
HCM 6th LOS	C											

Timings

5: Flippen Rd & Hudson Bridge Rd

2b. No-Build 2027 PM

01/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	131	413	9	603	733	305	3	328	333	250	416	83
Future Volume (vph)	131	413	9	603	733	305	3	328	333	250	416	83
Lane Group Flow (vph)	135	426	9	622	756	314	3	338	343	258	429	86
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2			8		7	4	
Permitted Phases	6		6	2		2	8		8	4		4
Detector Phase	1	6	6	5	2	2	8	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	6.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	15.0	28.5	28.5	15.0	28.5	28.5	36.5	36.5	36.5	15.0	33.5	33.5
Total Split (s)	17.0	26.0	26.0	36.0	45.0	45.0	40.0	40.0	40.0	18.0	58.0	58.0
Total Split (%)	14.2%	21.7%	21.7%	30.0%	37.5%	37.5%	33.3%	33.3%	33.3%	15.0%	48.3%	48.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.52	0.71	0.02	0.97	0.53	0.38	0.01	0.80	0.55	0.90	0.61	0.13
Control Delay	28.1	54.1	0.1	57.3	30.7	4.6	32.0	57.1	7.0	61.7	33.4	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.1	54.1	0.1	57.3	30.7	4.6	32.0	57.1	7.0	61.7	33.4	1.7
Queue Length 50th (ft)	52	165	0	394	234	0	2	247	0	143	264	0
Queue Length 95th (ft)	98	223	0	#720	331	63	10	333	70	#234	338	13
Internal Link Dist (ft)		840			1594			786			834	
Turn Bay Length (ft)	375		175	390		450	230		365	320		320
Base Capacity (vph)	286	604	413	643	1414	821	274	530	699	286	807	761
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.71	0.02	0.97	0.53	0.38	0.01	0.64	0.49	0.90	0.53	0.11

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 37 (31%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

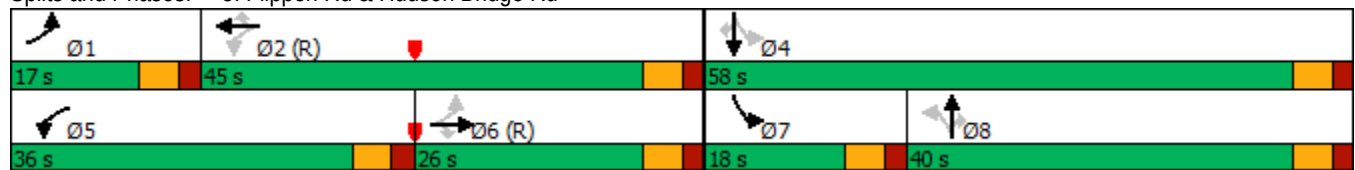
Natural Cycle: 115

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 5: Flippen Rd & Hudson Bridge Rd



HCM 6th Signalized Intersection Summary

5: Flippen Rd & Hudson Bridge Rd

2b. No-Build 2027 PM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	131	413	9	603	733	305	3	328	333	250	416	83
Future Volume (veh/h)	131	413	9	603	733	305	3	328	333	250	416	83
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1856	1870	1870	1856	1870
Adj Flow Rate, veh/h	135	426	0	622	756	0	3	338	343	258	429	86
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	3	2	2	3	2
Cap, veh/h	346	769		618	1408		245	449	383	301	727	621
Arrive On Green	0.07	0.22	0.00	0.25	0.40	0.00	0.24	0.24	0.24	0.10	0.39	0.39
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	886	1856	1585	1781	1856	1585
Grp Volume(v), veh/h	135	426	0	622	756	0	3	338	343	258	429	86
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	886	1856	1585	1781	1856	1585
Q Serve(g_s), s	7.0	12.8	0.0	30.5	19.6	0.0	0.3	20.3	25.1	12.5	21.9	4.2
Cycle Q Clear(g_c), s	7.0	12.8	0.0	30.5	19.6	0.0	4.3	20.3	25.1	12.5	21.9	4.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	346	769		618	1408		245	449	383	301	727	621
V/C Ratio(X)	0.39	0.55		1.01	0.54		0.01	0.75	0.89	0.86	0.59	0.14
Avail Cap(c_a), veh/h	384	769		618	1408		286	533	456	301	812	693
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	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.6	41.8	0.0	27.2	27.8	0.0	37.7	42.2	44.0	32.3	28.9	23.5
Incr Delay (d2), s/veh	0.7	2.9	0.0	37.7	1.5	0.0	0.0	5.0	17.8	21.0	0.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	5.8	0.0	19.3	8.2	0.0	0.1	9.6	11.4	7.1	9.5	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.3	44.7	0.0	64.9	29.3	0.0	37.7	47.2	61.8	53.3	29.8	23.6
LnGrp LOS	C	D		F	C		D	D	E	D	C	C
Approach Vol, veh/h	561			1378			684			773		
Approach Delay, s/veh	42.0			45.3			54.5			36.9		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.4	53.0		52.5	36.0	31.5	18.0	34.5				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	11.5	39.5		52.5	30.5	20.5	12.5	34.5				
Max Q Clear Time (g_c+I1), s	9.0	21.6		23.9	32.5	14.8	14.5	27.1				
Green Ext Time (p_c), s	0.1	7.7		2.8	0.0	1.9	0.0	1.9				

Intersection Summary

HCM 6th Ctrl Delay 44.7

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Timings

6: SR 42/SR 138/US 23 (N. Henry Blvd) & SR 138 (Lake Spivey Pkwy)

2b. No-Build 2027 PM

01/18/2023

	→	↘	↙	←	↖	↗	↑	↘	↙	↓
Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	180	857	187	189	131	637	403	98	96	546
Future Volume (vph)	180	857	187	189	131	637	403	98	96	546
Lane Group Flow (vph)	442	884	193	195	135	657	415	101	99	708
Turn Type	NA	pt+ov	Split	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	4	4 1	8	8		1	6		5	2
Permitted Phases					8			6		
Detector Phase	4	4 1	8	8	8	1	6	6	5	2
Switch Phase										
Minimum Initial (s)	6.0		6.0	6.0	6.0	5.0	15.0	15.0	5.0	15.0
Minimum Split (s)	31.5		30.5	30.5	30.5	15.0	28.5	28.5	15.0	31.5
Total Split (s)	41.5		30.5	30.5	30.5	40.0	55.0	55.0	23.0	38.0
Total Split (%)	27.7%		20.3%	20.3%	20.3%	26.7%	36.7%	36.7%	15.3%	25.3%
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5		5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag						Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	None		None	None	None	None	C-Min	C-Min	None	C-Min
v/c Ratio	1.00	0.68	0.78	0.74	0.39	0.85	0.59	0.15	0.62	0.81
Control Delay	100.0	19.5	82.3	77.9	11.1	67.3	42.5	6.6	82.3	60.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	100.0	19.5	82.3	77.9	11.1	67.3	42.5	6.6	82.3	60.9
Queue Length 50th (ft)	~439	192	183	184	0	311	327	0	95	352
Queue Length 95th (ft)	#669	235	269	268	59	394	477	43	155	#473
Internal Link Dist (ft)	2539			205			2663			944
Turn Bay Length (ft)			100		120	340		300	580	
Base Capacity (vph)	440	1318	297	316	384	800	709	677	208	869
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.67	0.65	0.62	0.35	0.82	0.59	0.15	0.48	0.81

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green

Natural Cycle: 130

Control Type: Actuated-Coordinated

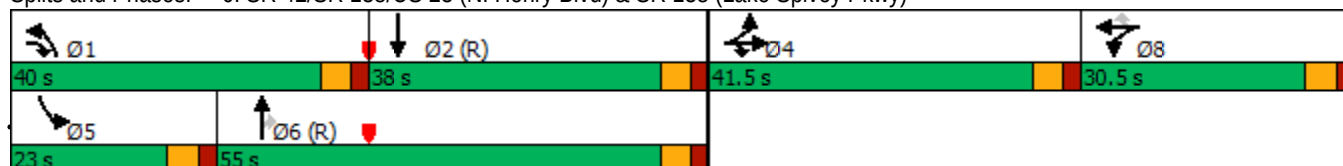
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 6: SR 42/SR 138/US 23 (N. Henry Blvd) & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary

6: SR 42/SR 138/US 23 (N. Henry Blvd) & SR 138 (Lake Spivey Pkwy)

2b. No-Build 2027 PM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	248	180	857	187	189	131	637	403	98	96	546	141
Future Volume (veh/h)	248	180	857	187	189	131	637	403	98	96	546	141
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1900	1870	1885	1900	1900	1870	1856	1885	1885	1870	1885
Adj Flow Rate, veh/h	256	186	884	193	195	0	657	415	0	99	563	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	0	2	1	0	0	2	3	1	1	2	1
Cap, veh/h	257	186	1247	225	238		715	780		121	998	
Arrive On Green	0.24	0.24	0.24	0.13	0.13	0.00	0.21	0.42	0.00	0.07	0.28	0.00
Sat Flow, veh/h	1069	777	2790	1795	1900	1610	3456	1856	1598	1795	3647	0
Grp Volume(v), veh/h	442	0	884	193	195	0	657	415	0	99	563	0
Grp Sat Flow(s),veh/h/ln	1847	0	1395	1795	1900	1610	1728	1856	1598	1795	1777	0
Q Serve(g_s), s	35.9	0.0	36.0	15.8	15.0	0.0	27.9	25.0	0.0	8.2	20.3	0.0
Cycle Q Clear(g_c), s	35.9	0.0	36.0	15.8	15.0	0.0	27.9	25.0	0.0	8.2	20.3	0.0
Prop In Lane	0.58		1.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	443	0	1247	225	238		715	780		121	998	
V/C Ratio(X)	1.00	0.00	0.71	0.86	0.82		0.92	0.53		0.82	0.56	
Avail Cap(c_a), veh/h	443	0	1247	299	317		795	780		209	998	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.58	0.00	0.58	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	57.0	0.0	33.6	64.3	63.9	0.0	58.2	32.4	0.0	69.0	46.1	0.0
Incr Delay (d2), s/veh	31.9	0.0	1.1	16.8	11.8	0.0	14.7	2.6	0.0	12.6	2.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	20.2	0.0	13.4	8.4	8.1	0.0	13.4	11.6	0.0	4.1	9.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	88.8	0.0	34.7	81.1	75.7	0.0	73.0	35.0	0.0	81.6	48.4	0.0
LnGrp LOS	F	A	C	F	E		E	D		F	D	
Approach Vol, veh/h		1326			388			1072			662	
Approach Delay, s/veh		52.7			78.4			58.3			53.4	
Approach LOS		D			E			E			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	36.5	47.6		41.5	15.6	68.6		24.3				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	34.5	32.5		36.0	17.5	49.5		25.0				
Max Q Clear Time (g_c+I1), s	29.9	22.3		38.0	10.2	27.0		17.8				
Green Ext Time (p_c), s	1.1	4.0		0.0	0.1	4.4		1.0				

Intersection Summary

HCM 6th Ctrl Delay 57.5

HCM 6th LOS E

Notes

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings 7: I-675 NB Ramps & SR 138 (Lake Spivey Pkwy)

2b. No-Build 2027 PM
01/18/2023

						
Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	338	2081	1615	263	48	131
Future Volume (vph)	338	2081	1615	263	48	131
Lane Group Flow (vph)	345	2123	1648	268	49	134
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		3	
Permitted Phases	6			2		8
Detector Phase	1	6	2	2	3	8
Switch Phase						
Minimum Initial (s)	5.0	15.0	15.0	15.0	5.0	6.0
Minimum Split (s)	15.0	28.5	28.5	28.5	15.0	34.5
Total Split (s)	17.0	65.5	48.5	48.5	34.5	34.5
Total Split (%)	17.0%	65.5%	48.5%	48.5%	34.5%	34.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.61	0.76	1.01	0.31	0.30	0.59
Control Delay	22.2	12.9	53.0	4.6	45.6	28.0
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	22.2	13.1	53.0	4.6	45.6	28.0
Queue Length 50th (ft)	172	413	505	12	30	29
Queue Length 95th (ft)	m185	m449	#765	62	62	83
Internal Link Dist (ft)		706	2539			
Turn Bay Length (ft)	145			270		315
Base Capacity (vph)	565	2792	1627	858	513	520
Starvation Cap Reductn	0	110	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.79	1.01	0.31	0.10	0.26

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 13 (13%), Referenced to phase 2:WBT and 6:EBTL, Start of Green

Natural Cycle: 120

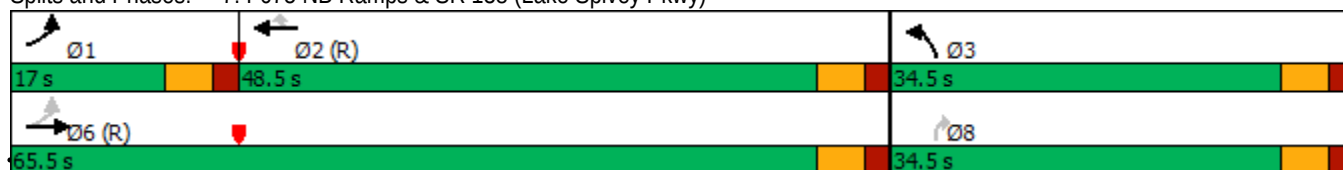
Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: I-675 NB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
7: I-675 NB Ramps & SR 138 (Lake Spivey Pkwy)

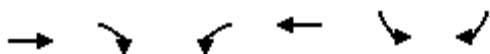
2b. No-Build 2027 PM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	338	2081	0	0	1615	263	48	0	131	0	0	0
Future Volume (veh/h)	338	2081	0	0	1615	263	48	0	131	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1870	1856	0	0	1856	1870	1870	0	1870			
Adj Flow Rate, veh/h	345	2123	0	0	1648	0	49	0	134			
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98			
Percent Heavy Veh, %	2	3	0	0	3	2	2	0	2			
Cap, veh/h	360	2762	0	0	2163		190	0	169			
Arrive On Green	0.15	1.00	0.00	0.00	0.61	0.00	0.11	0.00	0.11			
Sat Flow, veh/h	1781	3618	0	0	3618	1585	1781	0	1585			
Grp Volume(v), veh/h	345	2123	0	0	1648	0	49	0	134			
Grp Sat Flow(s),veh/h/ln	1781	1763	0	0	1763	1585	1781	0	1585			
Q Serve(g_s), s	10.4	0.0	0.0	0.0	33.9	0.0	2.5	0.0	8.3			
Cycle Q Clear(g_c), s	10.4	0.0	0.0	0.0	33.9	0.0	2.5	0.0	8.3			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	360	2762	0	0	2163		190	0	169			
V/C Ratio(X)	0.96	0.77	0.00	0.00	0.76		0.26	0.00	0.79			
Avail Cap(c_a), veh/h	360	2762	0	0	2163		517	0	460			
HCM Platoon Ratio	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.09	0.09	0.00	0.00	0.46	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	24.9	0.0	0.0	0.0	14.0	0.0	41.0	0.0	43.6			
Incr Delay (d2), s/veh	7.0	0.2	0.0	0.0	1.2	0.0	0.7	0.0	8.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	8.2	0.1	0.0	0.0	11.5	0.0	1.1	0.0	3.5			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.9	0.2	0.0	0.0	15.2	0.0	41.8	0.0	51.7			
LnGrp LOS	C	A	A	A	B		D	A	D			
Approach Vol, veh/h	2468		1648				183					
Approach Delay, s/veh	4.6		15.2				49.1					
Approach LOS	A		B				D					
Timer - Assigned Phs	1	2	6				8					
Phs Duration (G+Y+Rc), s	17.0	66.8	83.8				16.2					
Change Period (Y+Rc), s	5.5	5.5	5.5				5.5					
Max Green Setting (Gmax), s	11.5	43.0	60.0				29.0					
Max Q Clear Time (g_c+I1), s	12.4	35.9	2.0				10.3					
Green Ext Time (p_c), s	0.0	6.4	49.7				0.5					
Intersection Summary												
HCM 6th Ctrl Delay	10.6											
HCM 6th LOS	B											

Timings 8: I-675 SB Ramps & SR 138 (Lake Spivey Pkwy)

2b. No-Build 2027 PM
01/18/2023



Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Configurations	↑↑	↑	↵	↑↑	↵↵	↵↵
Traffic Volume (vph)	2023	132	112	1551	396	551
Future Volume (vph)	2023	132	112	1551	396	551
Lane Group Flow (vph)	2086	136	115	1599	408	568
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	7	
Permitted Phases		6	2			4
Detector Phase	6	6	5	2	7	4
Switch Phase						
Minimum Initial (s)	15.0	15.0	5.0	15.0	5.0	6.0
Minimum Split (s)	28.5	28.5	15.0	28.5	35.5	35.5
Total Split (s)	49.5	49.5	15.0	64.5	35.5	35.5
Total Split (%)	49.5%	49.5%	15.0%	64.5%	35.5%	35.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Min	C-Min	None	C-Min	None	None
v/c Ratio	1.13	0.15	0.53	0.69	0.52	0.80
Control Delay	80.1	0.2	35.2	4.1	35.4	39.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.1	0.2	35.2	4.1	35.4	39.4
Queue Length 50th (ft)	~823	0	35	18	117	166
Queue Length 95th (ft)	m#939	m0	m42	m27	150	215
Internal Link Dist (ft)	1959			706		
Turn Bay Length (ft)		375	95		520	500
Base Capacity (vph)	1842	892	242	2313	1029	897
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.13	0.15	0.48	0.69	0.40	0.63

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 24 (24%), Referenced to phase 2:WBTL and 6:EBT, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

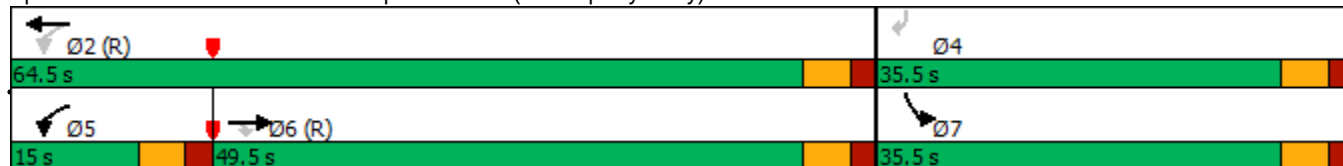
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

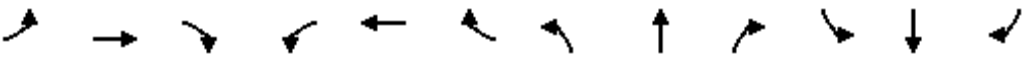
Splits and Phases: 8: I-675 SB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
8: I-675 SB Ramps & SR 138 (Lake Spivey Pkwy)

2b. No-Build 2027 PM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑					↑↑		↑↑
Traffic Volume (veh/h)	0	2023	132	112	1551	0	0	0	0	396	0	551
Future Volume (veh/h)	0	2023	132	112	1551	0	0	0	0	396	0	551
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1870	1870	1856	0				1870	0	1870
Adj Flow Rate, veh/h	0	2086	136	115	1599	0				408	0	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	3	2	2	3	0				2	0	2
Cap, veh/h	0	2257	1015	268	2620	0				508	0	
Arrive On Green	0.00	1.00	1.00	0.06	0.99	0.00				0.15	0.00	0.00
Sat Flow, veh/h	0	3618	1585	1781	3618	0				3456	0	2790
Grp Volume(v), veh/h	0	2086	136	115	1599	0				408	0	0
Grp Sat Flow(s),veh/h/ln	0	1763	1585	1781	1763	0				1728	0	1395
Q Serve(g_s), s	0.0	0.0	0.0	2.0	1.3	0.0				11.4	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	2.0	1.3	0.0				11.4	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2257	1015	268	2620	0				508	0	
V/C Ratio(X)	0.00	0.92	0.13	0.43	0.61	0.00				0.80	0.00	
Avail Cap(c_a), veh/h	0	2257	1015	352	2620	0				1037	0	
HCM Platoon Ratio	1.00	2.00	2.00	1.33	1.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.09	0.09	0.11	0.11	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	4.5	0.2	0.0				41.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.9	0.0	0.1	0.1	0.0				3.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.3	3.8	0.6	0.2	0.0				4.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.9	0.0	4.7	0.3	0.0				44.3	0.0	0.0
LnGrp LOS	A	A	A	A	A	A				D	A	
Approach Vol, veh/h		2222			1714						408	
Approach Delay, s/veh		0.8			0.6						44.3	
Approach LOS		A			A						D	
Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		79.8		20.2	10.3	69.5						
Change Period (Y+Rc), s		5.5		5.5	5.5	5.5						
Max Green Setting (Gmax), s		59.0		30.0	9.5	44.0						
Max Q Clear Time (g_c+I1), s		3.3		13.4	4.0	2.0						
Green Ext Time (p_c), s		35.6		1.3	0.1	37.6						
Intersection Summary												
HCM 6th Ctrl Delay			4.8									
HCM 6th LOS			A									
Notes												
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.												

Timings
9: SR 138 (Lake Spivey Pkwy) & Mt. Zion Rd

2b. No-Build 2027 PM
01/18/2023

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	160	1618	84	75	1295	169	135	132	179	100	196
Future Volume (vph)	160	1618	84	75	1295	169	135	132	179	100	196
Lane Group Flow (vph)	165	1668	87	77	1335	174	139	246	185	103	202
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8	7	4	
Permitted Phases	6		6	2		2	8		4		4
Detector Phase	1	6	6	5	2	2	3	8	7	4	4
Switch Phase											
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	6.0	5.0	6.0	6.0
Minimum Split (s)	15.0	28.5	28.5	15.0	34.5	34.5	15.0	38.5	15.0	32.5	32.5
Total Split (s)	15.0	31.5	31.5	15.0	31.5	31.5	15.0	38.5	15.0	38.5	38.5
Total Split (%)	15.0%	31.5%	31.5%	15.0%	31.5%	31.5%	15.0%	38.5%	15.0%	38.5%	38.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None
v/c Ratio	0.61	1.04	0.11	0.37	0.94	0.23	0.36	0.73	0.66	0.31	0.45
Control Delay	35.2	50.8	1.8	13.0	37.0	6.8	26.6	44.2	36.8	36.9	8.0
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	35.2	50.8	1.8	13.0	37.0	6.8	26.6	44.2	36.8	36.9	8.0
Queue Length 50th (ft)	64	~618	0	15	427	23	65	124	88	58	0
Queue Length 95th (ft)	m99	#884	m2	m34	#723	m62	100	192	130	98	55
Internal Link Dist (ft)		896			1959			388		1031	
Turn Bay Length (ft)	115		140	155		325	35		345		165
Base Capacity (vph)	280	1610	807	244	1421	755	389	608	282	627	668
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	1.04	0.11	0.32	0.94	0.23	0.36	0.40	0.66	0.16	0.30

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 135

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

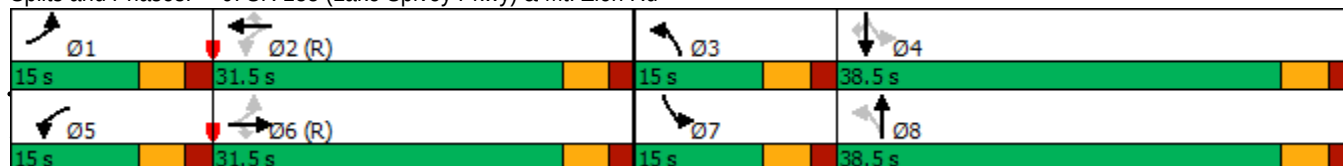
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: SR 138 (Lake Spivey Pkwy) & Mt. Zion Rd



HCM 6th Signalized Intersection Summary
9: SR 138 (Lake Spivey Pkwy) & Mt. Zion Rd

2b. No-Build 2027 PM

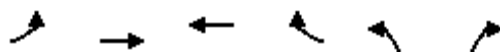
01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	1618	84	75	1295	169	135	132	107	179	100	196
Future Volume (veh/h)	160	1618	84	75	1295	169	135	132	107	179	100	196
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1856	1870	1870	1856	1900	1870	1900	1870	1900	1900	1900
Adj Flow Rate, veh/h	165	1668	0	77	1335	174	139	136	110	185	103	202
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	3	2	2	3	0	2	0	2	0	0	0
Cap, veh/h	226	1664		151	1572	718	363	164	133	283	346	293
Arrive On Green	0.14	0.94	0.00	0.01	0.15	0.15	0.08	0.17	0.17	0.09	0.18	0.18
Sat Flow, veh/h	1810	3526	1585	1781	3526	1610	1781	972	786	1810	1900	1610
Grp Volume(v), veh/h	165	1668	0	77	1335	174	139	0	246	185	103	202
Grp Sat Flow(s),veh/h/ln	1810	1763	1585	1781	1763	1610	1781	0	1758	1810	1900	1610
Q Serve(g_s), s	5.0	47.2	0.0	2.3	36.9	9.6	6.3	0.0	13.5	8.4	4.7	11.7
Cycle Q Clear(g_c), s	5.0	47.2	0.0	2.3	36.9	9.6	6.3	0.0	13.5	8.4	4.7	11.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.45	1.00		1.00
Lane Grp Cap(c), veh/h	226	1664		151	1572	718	363	0	297	283	346	293
V/C Ratio(X)	0.73	1.00		0.51	0.85	0.24	0.38	0.00	0.83	0.65	0.30	0.69
Avail Cap(c_a), veh/h	271	1664		241	1572	718	386	0	580	283	627	531
HCM Platoon Ratio	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.52	0.52	0.00	0.62	0.62	0.62	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.5	2.8	0.0	24.3	39.4	27.7	30.5	0.0	40.1	31.3	35.4	38.3
Incr Delay (d2), s/veh	4.2	16.5	0.0	1.7	3.8	0.5	0.7	0.0	5.8	5.3	0.5	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	4.9	0.0	0.9	18.0	4.2	2.8	0.0	6.3	3.9	2.2	4.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.7	19.4	0.0	25.9	43.2	28.2	31.1	0.0	46.0	36.6	35.8	41.1
LnGrp LOS	C	F		C	D	C	C	A	D	D	D	D
Approach Vol, veh/h		1833			1586			385			490	
Approach Delay, s/veh		19.8			40.7			40.6			38.3	
Approach LOS		B			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.5	50.1	13.7	23.7	9.9	52.7	15.0	22.4				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	9.5	26.0	9.5	33.0	9.5	26.0	9.5	33.0				
Max Q Clear Time (g_c+I1), s	7.0	38.9	8.3	13.7	4.3	49.2	10.4	15.5				
Green Ext Time (p_c), s	0.1	0.0	0.0	1.1	0.1	0.0	0.0	1.4				
Intersection Summary												
HCM 6th Ctrl Delay			31.5									
HCM 6th LOS			C									
Notes												
User approved pedestrian interval to be less than phase max green.												
Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.												

Timings
10: I-75 NB Ramps & SR 138 (Lake Spivey Pkwy)

2b. No-Build 2027 PM

01/18/2023



Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	273	1973	1369	518	211	158
Future Volume (vph)	273	1973	1369	518	211	158
Lane Group Flow (vph)	281	2034	1411	534	218	163
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		3	
Permitted Phases	6			2		8
Detector Phase	1	6	2	2	3	8
Switch Phase						
Minimum Initial (s)	5.0	15.0	15.0	15.0	5.0	6.0
Minimum Split (s)	15.0	28.5	28.5	28.5	15.0	32.5
Total Split (s)	20.0	67.5	47.5	47.5	32.5	32.5
Total Split (%)	20.0%	67.5%	47.5%	47.5%	32.5%	32.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.79	0.81	0.80	0.50	0.70	0.47
Control Delay	27.5	16.5	13.4	2.3	50.5	21.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.5	16.5	13.4	2.3	50.5	21.3
Queue Length 50th (ft)	98	711	105	0	132	42
Queue Length 95th (ft)	m149	m755	m#220	m0	196	97
Internal Link Dist (ft)		897	896			
Turn Bay Length (ft)	140			405		510
Base Capacity (vph)	372	2503	1754	1058	477	490
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.81	0.80	0.50	0.46	0.33

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 98 (98%), Referenced to phase 2:WBT and 6:EBTL, Start of Green

Natural Cycle: 90

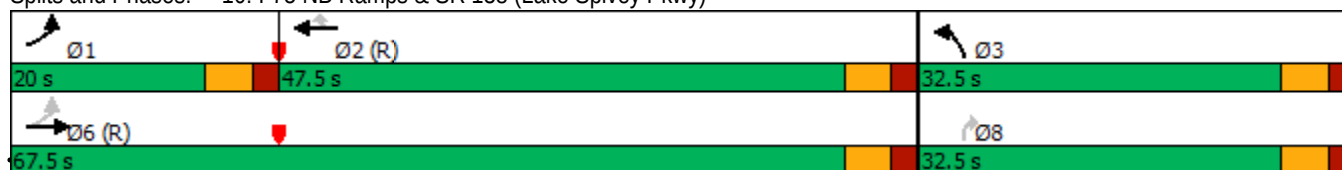
Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: I-75 NB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
10: I-75 NB Ramps & SR 138 (Lake Spivey Pkwy)

2b. No-Build 2027 PM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	273	1973	0	0	1369	518	211	0	158	0	0	0
Future Volume (veh/h)	273	1973	0	0	1369	518	211	0	158	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1870	1856	0	0	1856	1870	1870	0	1870			
Adj Flow Rate, veh/h	281	2034	0	0	1411	0	218	0	0			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	2	3	0	0	3	2	2	0	2			
Cap, veh/h	385	2631	0	0	2160		256	0				
Arrive On Green	0.08	0.75	0.00	0.00	0.81	0.00	0.14	0.00	0.00			
Sat Flow, veh/h	1781	3618	0	0	3618	1585	1781	0	1585			
Grp Volume(v), veh/h	281	2034	0	0	1411	0	218	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1763	0	0	1763	1585	1781	0	1585			
Q Serve(g_s), s	5.4	34.6	0.0	0.0	15.8	0.0	11.9	0.0	0.0			
Cycle Q Clear(g_c), s	5.4	34.6	0.0	0.0	15.8	0.0	11.9	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	385	2631	0	0	2160		256	0				
V/C Ratio(X)	0.73	0.77	0.00	0.00	0.65		0.85	0.00				
Avail Cap(c_a), veh/h	503	2631	0	0	2160		481	0				
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.33	1.33	1.00	1.00	1.00			
Upstream Filter(I)	0.29	0.29	0.00	0.00	0.44	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	11.0	7.6	0.0	0.0	5.1	0.0	41.8	0.0	0.0			
Incr Delay (d2), s/veh	1.1	0.7	0.0	0.0	0.7	0.0	7.8	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.6	8.6	0.0	0.0	3.2	0.0	5.6	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.1	8.3	0.0	0.0	5.7	0.0	49.6	0.0	0.0			
LnGrp LOS	B	A	A	A	A		D	A				
Approach Vol, veh/h	2315			1411			218					
Approach Delay, s/veh	8.7			5.7			49.6					
Approach LOS	A			A			D					
Timer - Assigned Phs	1	2					6	8				
Phs Duration (G+Y+Rc), s	13.4	66.8					80.1	19.9				
Change Period (Y+Rc), s	5.5	5.5					5.5	5.5				
Max Green Setting (Gmax), s	14.5	42.0					62.0	27.0				
Max Q Clear Time (g_c+I1), s	7.4	17.8					36.6	13.9				
Green Ext Time (p_c), s	0.5	17.3					23.1	0.5				

Intersection Summary

HCM 6th Ctrl Delay	9.9
HCM 6th LOS	A

Notes

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Timings
11: I-75 SB Ramps & SR 138 (Lake Spivey Pkwy)

2b. No-Build 2027 PM
01/18/2023

	→	↘	↙	←	↘	↙
Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Configurations	↑↑	↑	↘	↑↑	↘↘	↘
Traffic Volume (vph)	1391	331	182	1426	824	589
Future Volume (vph)	1391	331	182	1426	824	589
Lane Group Flow (vph)	1434	341	188	1470	849	607
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	3	
Permitted Phases		6	2			8
Detector Phase	6	6	5	2	3	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	5.0	15.0	5.0	15.0
Minimum Split (s)	28.5	28.5	15.0	28.5	15.0	28.5
Total Split (s)	45.3	45.3	15.0	60.3	39.7	39.7
Total Split (%)	45.3%	45.3%	15.0%	60.3%	39.7%	39.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Min	C-Min	None	C-Min	None	Min
v/c Ratio	1.02	0.41	0.79	0.77	0.72	1.02
Control Delay	60.9	3.8	38.0	11.9	33.0	70.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.9	3.8	38.0	11.9	33.0	70.1
Queue Length 50th (ft)	~517	0	53	381	241	~354
Queue Length 95th (ft)	#652	53	m88	543	312	#586
Internal Link Dist (ft)	1158			897		
Turn Bay Length (ft)		980	150		490	
Base Capacity (vph)	1401	837	242	1920	1174	598
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.41	0.78	0.77	0.72	1.02

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 35 (35%), Referenced to phase 2:WBTL and 6:EBT, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

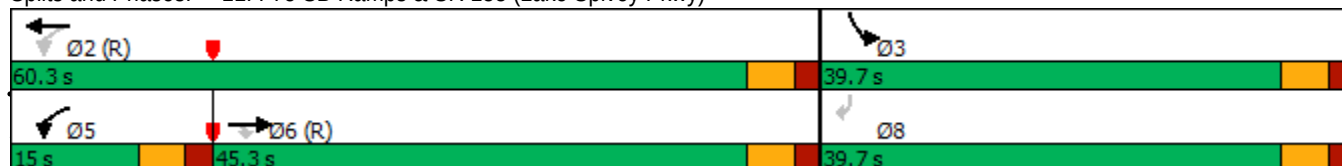
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

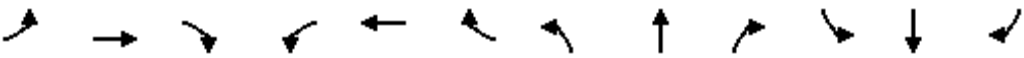
Splits and Phases: 11: I-75 SB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
11: I-75 SB Ramps & SR 138 (Lake Spivey Pkwy)

2b. No-Build 2027 PM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↗	↑↑					↗↗		↗
Traffic Volume (veh/h)	0	1391	331	182	1426	0	0	0	0	824	0	589
Future Volume (veh/h)	0	1391	331	182	1426	0	0	0	0	824	0	589
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1870	1870	1856	0				1870	0	1870
Adj Flow Rate, veh/h	0	1434	0	188	1470	0				849	0	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	3	2	2	3	0				2	0	2
Cap, veh/h	0	1719		246	2158	0				960	0	
Arrive On Green	0.00	0.49	0.00	0.02	0.20	0.00				0.28	0.00	0.00
Sat Flow, veh/h	0	3618	1585	1781	3618	0				3456	0	1585
Grp Volume(v), veh/h	0	1434	0	188	1470	0				849	0	0
Grp Sat Flow(s),veh/h/ln	0	1763	1585	1781	1763	0				1728	0	1585
Q Serve(g_s), s	0.0	35.1	0.0	4.9	38.6	0.0				23.5	0.0	0.0
Cycle Q Clear(g_c), s	0.0	35.1	0.0	4.9	38.6	0.0				23.5	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1719		246	2158	0				960	0	
V/C Ratio(X)	0.00	0.83		0.76	0.68	0.00				0.88	0.00	
Avail Cap(c_a), veh/h	0	1719		292	2158	0				1182	0	
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.62	0.00	0.51	0.51	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	22.1	0.0	22.2	30.9	0.0				34.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	3.1	0.0	5.0	0.9	0.0				7.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	13.6	0.0	2.4	18.2	0.0				10.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	25.3	0.0	27.2	31.8	0.0				41.6	0.0	0.0
LnGrp LOS	A	C		C	C	A				D	A	
Approach Vol, veh/h		1434			1658						849	
Approach Delay, s/veh		25.3			31.3						41.6	
Approach LOS		C			C						D	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		66.7			12.4	54.3		33.3				
Change Period (Y+Rc), s		5.5			5.5	5.5		5.5				
Max Green Setting (Gmax), s		54.8			9.5	39.8		34.2				
Max Q Clear Time (g_c+I1), s		40.6			6.9	37.1		25.5				
Green Ext Time (p_c), s		11.6			0.1	2.4		2.3				
Intersection Summary												
HCM 6th Ctrl Delay			31.3									
HCM 6th LOS			C									
Notes												
Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Timings

12: Speer Rd/Mt. Zion Pkwy & SR 138 (Lake Spivey Pkwy)

2b. No-Build 2027 PM

01/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	178	865	90	596	988	198	65	186	330	377	338	151
Future Volume (vph)	178	865	90	596	988	198	65	186	330	377	338	151
Lane Group Flow (vph)	185	901	94	621	1029	206	68	194	344	393	352	157
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2			8			4
Detector Phase	1	6	6	5	2	2	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	15.0	46.5	46.5	15.0	47.5	47.5	15.0	46.5	46.5	15.0	45.5	45.5
Total Split (s)	28.0	47.5	47.5	33.0	52.5	52.5	15.0	40.5	40.5	29.0	54.5	54.5
Total Split (%)	18.7%	31.7%	31.7%	22.0%	35.0%	35.0%	10.0%	27.0%	27.0%	19.3%	36.3%	36.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.60	0.66	0.13	0.79	0.56	0.22	0.37	0.55	0.78	0.81	0.48	0.35
Control Delay	73.9	42.5	1.8	62.8	27.4	3.6	73.6	69.2	22.4	75.7	54.9	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.9	42.5	1.8	62.8	27.4	3.6	73.6	69.2	22.4	75.7	54.9	8.6
Queue Length 50th (ft)	91	380	0	297	347	0	33	97	30	193	166	0
Queue Length 95th (ft)	130	#569	12	354	508	50	60	131	135	251	201	58
Internal Link Dist (ft)		1890			1158			635			523	
Turn Bay Length (ft)	345		290	290		930	195		550	270		270
Base Capacity (vph)	514	1357	710	783	1828	924	217	825	608	537	1179	622
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.66	0.13	0.79	0.56	0.22	0.31	0.24	0.57	0.73	0.30	0.25

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Green

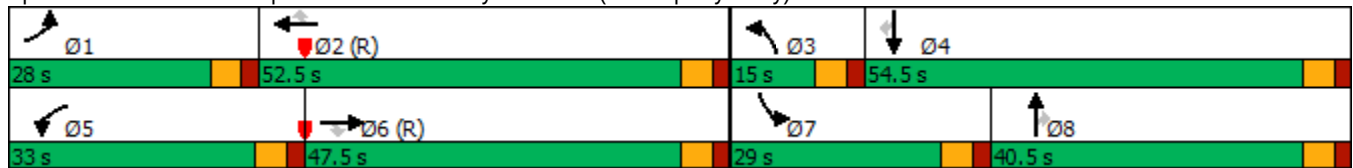
Natural Cycle: 145

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 12: Speer Rd/Mt. Zion Pkwy & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
12: Speer Rd/Mt. Zion Pkwy & SR 138 (Lake Spivey Pkwy)

2b. No-Build 2027 PM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	178	865	90	596	988	198	65	186	330	377	338	151
Future Volume (veh/h)	178	865	90	596	988	198	65	186	330	377	338	151
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1856	1900	1900	1856	1870	1870	1870	1870	1870	1900	1870
Adj Flow Rate, veh/h	185	901	94	621	1029	206	68	194	344	393	352	157
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	3	0	0	3	2	2	2	2	2	0	2
Cap, veh/h	238	1100	502	644	1504	676	108	813	363	446	1179	518
Arrive On Green	0.07	0.31	0.31	0.18	0.43	0.43	0.03	0.23	0.23	0.13	0.33	0.33
Sat Flow, veh/h	3456	3526	1610	3510	3526	1585	3456	3554	1585	3456	3610	1585
Grp Volume(v), veh/h	185	901	94	621	1029	206	68	194	344	393	352	157
Grp Sat Flow(s),veh/h/ln	1728	1763	1610	1755	1763	1585	1728	1777	1585	1728	1805	1585
Q Serve(g_s), s	7.9	35.4	6.4	26.3	35.5	12.9	2.9	6.7	32.1	16.8	10.9	11.1
Cycle Q Clear(g_c), s	7.9	35.4	6.4	26.3	35.5	12.9	2.9	6.7	32.1	16.8	10.9	11.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	238	1100	502	644	1504	676	108	813	363	446	1179	518
V/C Ratio(X)	0.78	0.82	0.19	0.96	0.68	0.30	0.63	0.24	0.95	0.88	0.30	0.30
Avail Cap(c_a), veh/h	518	1100	502	644	1504	676	219	829	370	541	1179	518
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.81	0.81	0.81	0.43	0.43	0.43	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	68.7	47.7	37.7	60.8	34.8	28.4	71.8	47.2	57.0	64.2	37.7	37.7
Incr Delay (d2), s/veh	4.4	5.6	0.7	15.7	1.1	0.5	5.8	0.1	33.4	13.5	0.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	16.0	2.6	12.9	15.0	4.9	1.4	2.9	15.9	8.1	4.8	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.1	53.3	38.4	76.5	35.9	28.9	77.6	47.3	90.3	77.7	37.8	38.1
LnGrp LOS	E	D	D	E	D	C	E	D	F	E	D	D
Approach Vol, veh/h	1180			1856			606			902		
Approach Delay, s/veh	55.2			48.7			75.1			55.2		
Approach LOS	E			D			E			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.8	69.5	10.2	54.5	33.0	52.3	24.9	39.8				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	22.5	47.0	9.5	49.0	27.5	42.0	23.5	35.0				
Max Q Clear Time (g_c+I1), s	9.9	37.5	4.9	13.1	28.3	37.4	18.8	34.1				
Green Ext Time (p_c), s	0.4	7.1	0.0	2.7	0.0	3.3	0.6	0.3				

Intersection Summary

HCM 6th Ctrl Delay 55.2

HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

Timings
13: Spivey Rd & SR 138 (Lake Spivey Pkwy)

2b. No-Build 2027 PM
01/18/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↑
Traffic Volume (vph)	876	35	360	907	16	215
Future Volume (vph)	876	35	360	907	16	215
Lane Group Flow (vph)	984	39	404	1019	18	242
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	8	
Permitted Phases		6	2			8
Detector Phase	6	6	5	2	8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0	6.0
Minimum Split (s)	25.5	25.5	15.0	23.5	31.5	31.5
Total Split (s)	40.4	40.4	28.0	68.4	31.6	31.6
Total Split (%)	40.4%	40.4%	28.0%	68.4%	31.6%	31.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Min	C-Min	None	C-Min	None	None
v/c Ratio	0.53	0.05	0.67	0.36	0.12	0.69
Control Delay	18.5	5.9	13.3	3.3	42.2	16.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.5	5.9	13.3	3.3	42.2	16.1
Queue Length 50th (ft)	196	0	62	60	11	0
Queue Length 95th (ft)	345	20	177	126	30	66
Internal Link Dist (ft)	1639			1890	1094	
Turn Bay Length (ft)		230	535			220
Base Capacity (vph)	1865	860	643	2828	461	592
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.05	0.63	0.36	0.04	0.41

Intersection Summary

Cycle Length: 100

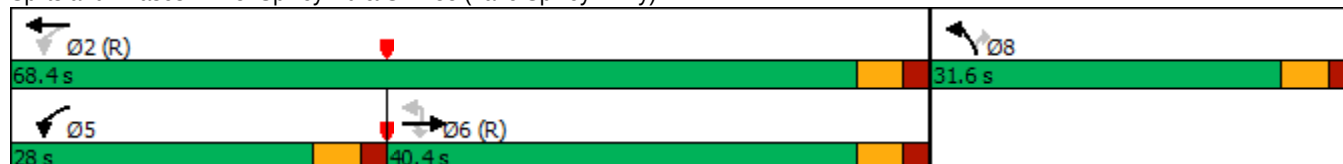
Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTU, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Splits and Phases: 13: Spivey Rd & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary 13: Spivey Rd & SR 138 (Lake Spivey Pkwy)

2b. No-Build 2027 PM
01/18/2023



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	⇐	⇐⇐	⇐	⇐	⇐⇐	⇐	⇐
Traffic Volume (veh/h)	0	876	35	360	907	16	215
Future Volume (veh/h)	0	876	35	360	907	16	215
Initial Q (Qb), veh		0	0	0	0	0	0
Ped-Bike Adj(A_pbT)			1.00	1.00		1.00	1.00
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No	No	
Adj Sat Flow, veh/h/ln		1856	1870	1870	1856	1870	1870
Adj Flow Rate, veh/h		984	0	404	1019	18	0
Peak Hour Factor		0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %		3	2	2	3	2	2
Cap, veh/h		2578		573	3054	42	
Arrive On Green		0.73	0.00	0.08	0.87	0.02	0.00
Sat Flow, veh/h		3618	1585	1781	3618	1781	1585
Grp Volume(v), veh/h		984	0	404	1019	18	0
Grp Sat Flow(s),veh/h/ln		1763	1585	1781	1763	1781	1585
Q Serve(g_s), s		10.4	0.0	4.9	5.4	1.0	0.0
Cycle Q Clear(g_c), s		10.4	0.0	4.9	5.4	1.0	0.0
Prop In Lane			1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h		2578		573	3054	42	
V/C Ratio(X)		0.38		0.70	0.33	0.43	
Avail Cap(c_a), veh/h		2578		831	3054	465	
HCM Platoon Ratio		1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	0.00	0.84	0.84	1.00	0.00
Uniform Delay (d), s/veh		5.0	0.0	4.5	1.3	48.2	0.0
Incr Delay (d2), s/veh		0.4	0.0	1.3	0.2	6.7	0.0
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		2.8	0.0	0.8	0.2	0.5	0.0
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh		5.4	0.0	5.8	1.5	54.9	0.0
LnGrp LOS		A		A	A	D	
Approach Vol, veh/h		984			1423	18	
Approach Delay, s/veh		5.4			2.7	54.9	
Approach LOS		A			A	D	
Timer - Assigned Phs		2			5	6	8
Phs Duration (G+Y+Rc), s		92.1			13.5	78.6	7.9
Change Period (Y+Rc), s		5.5			5.5	5.5	5.5
Max Green Setting (Gmax), s		62.9			22.5	34.9	26.1
Max Q Clear Time (g_c+I1), s		7.4			6.9	12.4	3.0
Green Ext Time (p_c), s		18.2			1.1	11.7	0.0

Intersection Summary

HCM 6th Ctrl Delay	4.2
HCM 6th LOS	A

Notes

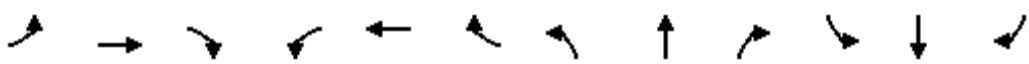
User approved ignoring U-Turning movement.

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Timings 14: Blackhall Rd/Speer Rd & Walt Stephens Rd

2b. No-Build 2027 PM

01/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	338	65	103	222	247	61	201	101	442	337	15
Future Volume (vph)	30	338	65	103	222	247	61	201	101	442	337	15
Lane Group Flow (vph)	31	352	68	107	231	257	64	209	105	460	351	16
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		6			2		3	8		7	4	
Permitted Phases	6		6	2		2	8		8	4		4
Detector Phase	6	6	6	2	2	2	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0	15.0	5.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	23.5	23.5	23.5	23.5	23.5	23.5	15.0	23.5	23.5	15.0	23.5	23.5
Total Split (s)	39.0	39.0	39.0	39.0	39.0	39.0	15.0	26.0	26.0	35.0	46.0	46.0
Total Split (%)	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	15.0%	26.0%	26.0%	35.0%	46.0%	46.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.07	0.47	0.09	0.34	0.31	0.32	0.22	0.70	0.28	0.76	0.50	0.02
Control Delay	22.1	26.1	0.2	16.3	13.9	2.4	17.3	52.0	4.1	26.2	26.5	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.1	26.1	0.2	16.3	13.9	2.4	17.3	52.0	4.1	26.2	26.5	0.1
Queue Length 50th (ft)	12	166	0	35	74	10	20	127	0	190	172	0
Queue Length 95th (ft)	35	274	0	m53	m105	m24	37	195	20	246	239	0
Internal Link Dist (ft)		2027			3745			1264			1872	
Turn Bay Length (ft)	110		160	190		250	140		125	315		120
Base Capacity (vph)	424	755	729	318	755	794	332	381	441	636	756	694
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.47	0.09	0.34	0.31	0.32	0.19	0.55	0.24	0.72	0.46	0.02

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

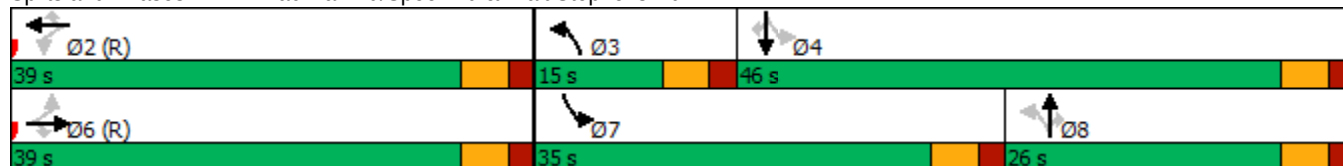
Offset: 98 (98%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: Blackhall Rd/Speer Rd & Walt Stephens Rd



HCM 6th Signalized Intersection Summary
14: Blackhall Rd/Speer Rd & Walt Stephens Rd

2b. No-Build 2027 PM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	338	65	103	222	247	61	201	101	442	337	15
Future Volume (veh/h)	30	338	65	103	222	247	61	201	101	442	337	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	31	352	68	107	231	257	64	209	0	460	351	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	422	863	731	397	863	731	286	251		528	620	
Arrive On Green	0.46	0.46	0.46	0.46	0.46	0.46	0.04	0.13	0.00	0.24	0.33	0.00
Sat Flow, veh/h	908	1870	1585	967	1870	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	31	352	68	107	231	257	64	209	0	460	351	0
Grp Sat Flow(s),veh/h/ln	908	1870	1585	967	1870	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	2.2	12.5	2.4	8.3	7.6	10.4	3.1	10.9	0.0	21.1	15.4	0.0
Cycle Q Clear(g_c), s	9.8	12.5	2.4	20.8	7.6	10.4	3.1	10.9	0.0	21.1	15.4	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	422	863	731	397	863	731	286	251		528	620	
V/C Ratio(X)	0.07	0.41	0.09	0.27	0.27	0.35	0.22	0.83		0.87	0.57	
Avail Cap(c_a), veh/h	422	863	731	397	863	731	380	383		627	757	
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	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	19.6	17.9	15.2	24.8	16.6	17.3	35.1	42.2	0.0	25.9	27.5	0.0
Incr Delay (d2), s/veh	0.3	1.4	0.3	1.7	0.8	1.3	0.4	9.0	0.0	11.2	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	5.3	0.9	2.0	3.2	3.8	1.3	5.4	0.0	9.9	6.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.9	19.3	15.4	26.4	17.3	18.7	35.5	51.2	0.0	37.1	28.3	0.0
LnGrp LOS	B	B	B	C	B	B	D	D		D	C	
Approach Vol, veh/h	451			595			273			811		
Approach Delay, s/veh	18.8			19.5			47.5			33.3		
Approach LOS	B			B			D			C		
Timer - Assigned Phs	2		3	4		6	7	8				
Phs Duration (G+Y+Rc), s	51.6		9.7	38.6		51.6	29.4	18.9				
Change Period (Y+Rc), s	5.5		5.5	5.5		5.5	5.5	5.5				
Max Green Setting (Gmax), s	33.5		9.5	40.5		33.5	29.5	20.5				
Max Q Clear Time (g_c+I1), s	22.8		5.1	17.4		14.5	23.1	12.9				
Green Ext Time (p_c), s	3.7		0.0	1.8		4.2	0.8	0.6				
Intersection Summary												
HCM 6th Ctrl Delay	28.2											
HCM 6th LOS	C											

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

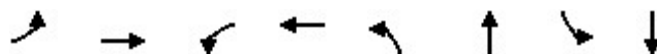
Future “No-Build” Intersection Analysis with Improvements

Timings

2c. No-Build 2027 AM - Improved

1: Flippen Rd/Shields Rd & SR 42/SR 138/US 23 (N. Henry Blvd)

01/23/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	8	686	156	1232	213	19	19	29
Future Volume (vph)	8	686	156	1232	213	19	19	29
Lane Group Flow (vph)	9	854	175	1396	239	169	0	71
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	NA
Protected Phases	1	6	5	2	3	8		4
Permitted Phases	6		2		8		4	
Detector Phase	1	6	5	2	3	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	15.0	5.0	15.0	5.0	6.0	6.0	6.0
Minimum Split (s)	15.0	28.5	15.0	28.5	15.0	30.5	30.5	30.5
Total Split (s)	15.0	39.5	15.0	39.5	15.0	45.5	30.5	30.5
Total Split (%)	15.0%	39.5%	15.0%	39.5%	15.0%	45.5%	30.5%	30.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5		5.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead		Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	C-Min	None	C-Min	None	None	None	None
v/c Ratio	0.04	0.48	0.42	0.62	0.83	0.36		0.47
Control Delay	8.1	17.7	10.3	14.0	59.4	14.3		44.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	8.1	17.7	10.3	14.0	59.4	14.3		44.4
Queue Length 50th (ft)	2	179	39	246	146	13		34
Queue Length 95th (ft)	8	266	74	467	#231	92		75
Internal Link Dist (ft)		2570		1632		2093		641
Turn Bay Length (ft)	135		210					
Base Capacity (vph)	303	1791	429	2249	288	730		390
Starvation Cap Reductn	0	0	0	0	0	0		0
Spillback Cap Reductn	0	0	0	0	0	0		0
Storage Cap Reductn	0	0	0	0	0	0		0
Reduced v/c Ratio	0.03	0.48	0.41	0.62	0.83	0.23		0.18

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

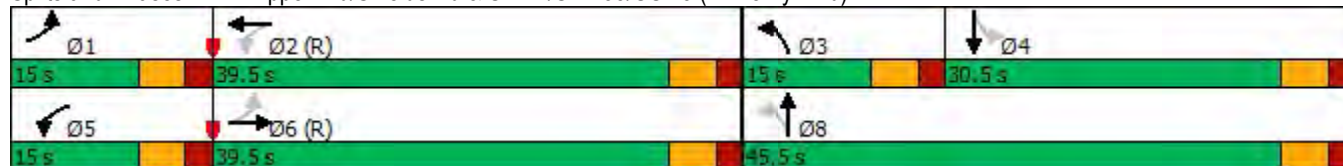
Natural Cycle: 110

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Flippen Rd/Shields Rd & SR 42/SR 138/US 23 (N. Henry Blvd)



HCM 6th Signalized Intersection Summary

2c. No-Build 2027 AM - Improved

1: Flippen Rd/Shields Rd & SR 42/SR 138/US 23 (N. Henry Blvd)

01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	686	74	156	1232	11	213	19	132	19	29	15
Future Volume (veh/h)	8	686	74	156	1232	11	213	19	132	19	29	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1841	1856	1856	1841	1870	1856	1870	1856	1870	1870	1870
Adj Flow Rate, veh/h	9	771	83	175	1384	12	239	21	148	21	33	17
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	4	3	3	4	2	3	2	3	2	2	2
Cap, veh/h	231	1781	192	448	2164	19	345	43	304	70	57	25
Arrive On Green	0.01	0.56	0.56	0.06	0.61	0.61	0.09	0.21	0.21	0.06	0.06	0.06
Sat Flow, veh/h	1781	3185	343	1767	3553	31	1767	201	1415	353	873	386
Grp Volume(v), veh/h	9	423	431	175	681	715	239	0	169	71	0	0
Grp Sat Flow(s),veh/h/ln	1781	1749	1779	1767	1749	1835	1767	0	1616	1611	0	0
Q Serve(g_s), s	0.2	14.1	14.1	4.0	24.9	25.0	9.5	0.0	9.2	2.7	0.0	0.0
Cycle Q Clear(g_c), s	0.2	14.1	14.1	4.0	24.9	25.0	9.5	0.0	9.2	4.2	0.0	0.0
Prop In Lane	1.00		0.19	1.00		0.02	1.00		0.88	0.30		0.24
Lane Grp Cap(c), veh/h	231	978	995	448	1065	1118	345	0	347	151	0	0
V/C Ratio(X)	0.04	0.43	0.43	0.39	0.64	0.64	0.69	0.00	0.49	0.47	0.00	0.00
Avail Cap(c_a), veh/h	380	978	995	508	1065	1118	345	0	646	439	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	11.3	12.8	12.8	9.1	12.5	12.5	39.1	0.0	34.4	45.6	0.0	0.0
Incr Delay (d2), s/veh	0.1	1.4	1.4	0.6	2.9	2.8	5.8	0.0	1.1	2.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	5.2	5.3	1.3	9.0	9.4	6.0	0.0	3.6	1.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.4	14.2	14.2	9.6	15.5	15.3	44.9	0.0	35.5	47.9	0.0	0.0
LnGrp LOS	B	B	B	A	B	B	D	A	D	D	A	A
Approach Vol, veh/h	863			1571			408			71		
Approach Delay, s/veh	14.2			14.7			41.0			47.9		
Approach LOS	B			B			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	8					
Phs Duration (G+Y+Rc), s	6.6	66.4	15.0	12.0	11.6	61.4	27.0					
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5					
Max Green Setting (Gmax), s	9.5	34.0	9.5	25.0	9.5	34.0	40.0					
Max Q Clear Time (g_c+I1), s	2.2	27.0	11.5	6.2	6.0	16.1	11.2					
Green Ext Time (p_c), s	0.0	5.9	0.0	0.3	0.1	8.4	1.0					
Intersection Summary												
HCM 6th Ctrl Delay	19.1											
HCM 6th LOS	B											

Intersection						
Int Delay, s/veh	0.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	9	20	420	5	8	317
Future Vol, veh/h	9	20	420	5	8	317
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	94	94	94	94	94	94
Heavy Vehicles, %	2	2	3	2	2	3
Mvmt Flow	10	21	447	5	9	337

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	805	450	0	0	452
Stage 1	450	-	-	-	-
Stage 2	355	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	352	609	-	-	1109
Stage 1	642	-	-	-	-
Stage 2	710	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	348	609	-	-	1109
Mov Cap-2 Maneuver	348	-	-	-	-
Stage 1	642	-	-	-	-
Stage 2	703	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.8	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	494	1109
HCM Lane V/C Ratio	-	-	0.062	0.008
HCM Control Delay (s)	-	-	12.8	8.3
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.2	0

HCM 6th TWSC
3: Flippen Rd & Reeves Creek Trail Parking Lot

2c. No-Build 2027 AM - Improved
01/23/2023

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	427	2	0	327
Future Vol, veh/h	0	0	427	2	0	327
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	93	93	93	93	93	93
Heavy Vehicles, %	2	2	3	2	2	3
Mvmt Flow	0	0	459	2	0	352
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	812	460	0	0	461	0
Stage 1	460	-	-	-	-	-
Stage 2	352	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	348	601	-	-	1100	-
Stage 1	636	-	-	-	-	-
Stage 2	712	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	348	601	-	-	1100	-
Mov Cap-2 Maneuver	348	-	-	-	-	-
Stage 1	636	-	-	-	-	-
Stage 2	712	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	0	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	-	1100	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	-	-	0	0	-	
HCM Lane LOS	-	-	A	A	-	
HCM 95th %tile Q(veh)	-	-	-	0	-	

Timings 4: Flippen Rd & Walt Stephens Rd/Red Oak Rd

2c. No-Build 2027 AM - Improved
01/23/2023

										
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	118	90	342	9	99	321	280	14	205	116
Future Volume (vph)	118	90	342	9	99	321	280	14	205	116
Lane Group Flow (vph)	123	94	356	9	129	334	310	15	214	121
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4		3	8	1	6	5	2	
Permitted Phases	4		4	8		6		2		2
Detector Phase	7	4	4	3	8	1	6	5	2	2
Switch Phase										
Minimum Initial (s)	5.0	6.0	6.0	5.0	6.0	5.0	15.0	5.0	15.0	15.0
Minimum Split (s)	15.0	31.5	31.5	15.0	30.5	15.0	31.5	15.0	28.5	28.5
Total Split (s)	15.0	32.0	32.0	15.0	32.0	22.0	38.0	15.0	31.0	31.0
Total Split (%)	15.0%	32.0%	32.0%	15.0%	32.0%	22.0%	38.0%	15.0%	31.0%	31.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
v/c Ratio	0.40	0.21	0.55	0.04	0.57	0.46	0.29	0.03	0.28	0.15
Control Delay	30.0	29.9	8.2	25.6	47.1	11.1	10.6	8.4	16.9	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.0	29.9	8.2	25.6	47.1	11.1	10.6	8.4	16.9	1.6
Queue Length 50th (ft)	53	40	0	4	71	63	57	2	79	0
Queue Length 95th (ft)	86	91	45	16	125	152	146	m7	144	6
Internal Link Dist (ft)		646			1291		2204		704	
Turn Bay Length (ft)	180		345	110		130		120		215
Base Capacity (vph)	311	502	687	320	495	745	1060	606	758	786
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.19	0.52	0.03	0.26	0.45	0.29	0.02	0.28	0.15

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

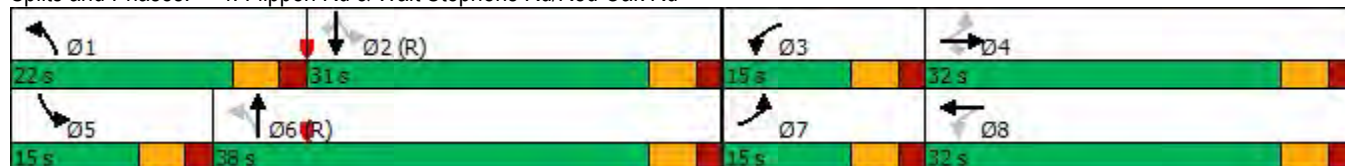
Offset: 96 (96%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Flippen Rd & Walt Stephens Rd/Red Oak Rd



HCM 6th Signalized Intersection Summary 4: Flippen Rd & Walt Stephens Rd/Red Oak Rd

2c. No-Build 2027 AM - Improved
01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	90	342	9	99	25	321	280	17	14	205	116
Future Volume (veh/h)	118	90	342	9	99	25	321	280	17	14	205	116
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1870	1900	1856	1870	1870	1856	1900
Adj Flow Rate, veh/h	123	94	0	9	103	26	334	292	18	15	214	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	0	2	0	3	2	2	3	0
Cap, veh/h	242	300		214	137	35	784	1023	63	636	926	
Arrive On Green	0.08	0.16	0.00	0.01	0.09	0.09	0.11	0.59	0.59	0.02	0.50	0.00
Sat Flow, veh/h	1781	1870	1585	1781	1464	370	1810	1730	107	1781	1856	1610
Grp Volume(v), veh/h	123	94	0	9	0	129	334	0	310	15	214	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1833	1810	0	1836	1781	1856	1610
Q Serve(g_s), s	6.0	4.4	0.0	0.5	0.0	6.9	8.4	0.0	8.3	0.4	6.5	0.0
Cycle Q Clear(g_c), s	6.0	4.4	0.0	0.5	0.0	6.9	8.4	0.0	8.3	0.4	6.5	0.0
Prop In Lane	1.00		1.00	1.00		0.20	1.00		0.06	1.00		1.00
Lane Grp Cap(c), veh/h	242	300		214	0	172	784	0	1086	636	926	
V/C Ratio(X)	0.51	0.31		0.04	0.00	0.75	0.43	0.00	0.29	0.02	0.23	
Avail Cap(c_a), veh/h	273	496		363	0	486	885	0	1086	775	926	
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	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	35.5	37.1	0.0	40.3	0.0	44.2	9.0	0.0	10.0	11.8	14.2	0.0
Incr Delay (d2), s/veh	1.6	0.6	0.0	0.1	0.0	6.4	0.4	0.0	0.7	0.0	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	2.0	0.0	0.2	0.0	3.4	2.8	0.0	3.1	0.2	2.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.2	37.7	0.0	40.3	0.0	50.6	9.3	0.0	10.7	11.8	14.8	0.0
LnGrp LOS	D	D		D	A	D	A	A	B	B	B	
Approach Vol, veh/h	217			138			644			229		
Approach Delay, s/veh	37.4			49.9			10.0			14.6		
Approach LOS	D			D			A			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	16.4	55.4	6.6	21.5	7.2	64.6	13.3	14.9				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	16.5	25.5	9.5	26.5	9.5	32.5	9.5	26.5				
Max Q Clear Time (g_c+I1), s	10.4	8.5	2.5	6.4	2.4	10.3	8.0	8.9				
Green Ext Time (p_c), s	0.5	1.7	0.0	0.3	0.0	3.1	0.0	0.5				
Intersection Summary												
HCM 6th Ctrl Delay	20.2											
HCM 6th LOS	C											

Timings 5: Flippen Rd & Hudson Bridge Rd

2c. No-Build 2027 AM - Improved
01/23/2023

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	79	411	189	281	146	3	271	488	209	301	88
Future Volume (vph)	79	411	189	281	146	3	271	488	209	301	88
Lane Group Flow (vph)	82	428	197	293	152	3	282	508	218	314	92
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6	5	2			8		7	4	
Permitted Phases	6		2		2	8		8	4		4
Detector Phase	1	6	5	2	2	8	8	8	7	4	4
Switch Phase											
Minimum Initial (s)	5.0	15.0	5.0	15.0	15.0	6.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	15.0	28.5	15.0	28.5	28.5	36.5	36.5	36.5	15.0	33.5	33.5
Total Split (s)	15.0	28.0	17.0	30.0	30.0	39.0	39.0	39.0	16.0	55.0	55.0
Total Split (%)	15.0%	28.0%	17.0%	30.0%	30.0%	39.0%	39.0%	39.0%	16.0%	55.0%	55.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.16	0.36	0.42	0.21	0.21	0.01	0.67	0.79	0.65	0.44	0.14
Control Delay	16.5	28.2	18.7	24.0	5.7	25.3	42.6	19.2	26.9	19.8	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.5	28.2	18.7	24.0	5.7	25.3	42.6	19.2	26.9	19.8	3.1
Queue Length 50th (ft)	26	107	67	66	0	2	166	82	72	105	0
Queue Length 95th (ft)	63	177	136	120	49	8	220	186	107	142	14
Internal Link Dist (ft)		840		1594			786			834	
Turn Bay Length (ft)	375		390		450	230		365	320		320
Base Capacity (vph)	532	1196	486	1380	710	355	618	773	336	913	830
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	0.15	0.36	0.41	0.21	0.21	0.01	0.46	0.66	0.65	0.34	0.11

Intersection Summary

Cycle Length: 100

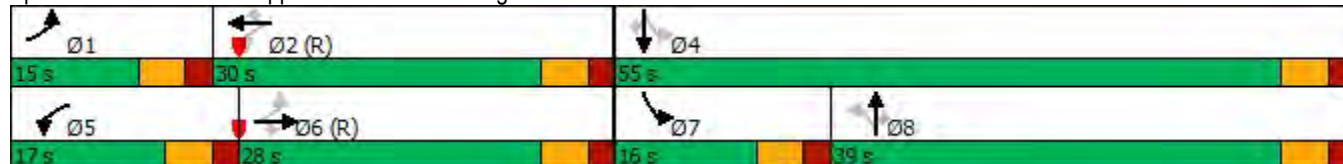
Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

Splits and Phases: 5: Flippen Rd & Hudson Bridge Rd



HCM 6th Signalized Intersection Summary 5: Flippen Rd & Hudson Bridge Rd

2c. No-Build 2027 AM - Improved
01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	411	0	189	281	146	3	271	488	209	301	88
Future Volume (veh/h)	79	411	0	189	281	146	3	271	488	209	301	88
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1856	1870	1870	1856	1870
Adj Flow Rate, veh/h	82	428	0	197	293	0	3	282	508	218	314	92
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	3	2	2	3	2
Cap, veh/h	416	886		390	1066		399	620	530	392	902	771
Arrive On Green	0.05	0.25	0.00	0.10	0.30	0.00	0.33	0.33	0.33	0.10	0.49	0.49
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	979	1856	1585	1781	1856	1585
Grp Volume(v), veh/h	82	428	0	197	293	0	3	282	508	218	314	92
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	979	1856	1585	1781	1856	1585
Q Serve(g_s), s	3.4	10.3	0.0	7.9	6.3	0.0	0.2	11.9	31.4	7.7	10.5	3.2
Cycle Q Clear(g_c), s	3.4	10.3	0.0	7.9	6.3	0.0	0.2	11.9	31.4	7.7	10.5	3.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	416	886		390	1066		399	620	530	392	902	771
V/C Ratio(X)	0.20	0.48		0.51	0.27		0.01	0.45	0.96	0.56	0.35	0.12
Avail Cap(c_a), veh/h	499	886		417	1066		400	622	531	407	918	785
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	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.8	32.0	0.0	23.6	26.7	0.0	22.2	26.1	32.6	18.6	15.9	14.0
Incr Delay (d2), s/veh	0.2	1.9	0.0	1.0	0.6	0.0	0.0	0.5	28.8	1.6	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	4.4	0.0	3.2	2.6	0.0	0.0	5.1	15.4	3.1	4.1	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.1	33.9	0.0	24.6	27.3	0.0	22.2	26.6	61.4	20.1	16.1	14.1
LnGrp LOS	C	C		C	C		C	C	E	C	B	B
Approach Vol, veh/h	510			490			793			624		
Approach Delay, s/veh	32.7			26.2			48.9			17.2		
Approach LOS	C			C			D			B		
Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.4	35.5		54.1	15.4	30.4	15.2	38.9				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	9.5	24.5		49.5	11.5	22.5	10.5	33.5				
Max Q Clear Time (g_c+I1), s	5.4	8.3		12.5	9.9	12.3	9.7	33.4				
Green Ext Time (p_c), s	0.0	2.6		2.1	0.1	3.0	0.1	0.0				

Intersection Summary

HCM 6th Ctrl Delay	32.7
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Timings

2c. No-Build 2027 AM - Improved

6: SR 42/SR 138/US 23 (N. Henry Blvd) & SR 138 (Lake Spivey Pkwy)

01/23/2023

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	93	78	402	39	62	32	914	401	45	40	217
Future Volume (vph)	93	78	402	39	62	32	914	401	45	40	217
Lane Group Flow (vph)	96	80	414	40	64	33	942	413	46	41	391
Turn Type	pm+pt	NA	pt+ov	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	4 1	3	8		1	6		5	2
Permitted Phases	4			8		8			6		
Detector Phase	7	4	4 1	3	8	8	1	6	6	5	2
Switch Phase											
Minimum Initial (s)	6.0	6.0		5.0	6.0	6.0	5.0	15.0	15.0	5.0	14.5
Minimum Split (s)	21.0	42.0		15.0	29.5	29.5	15.0	28.5	28.5	13.0	31.5
Total Split (s)	21.0	42.0		15.0	36.0	36.0	59.0	79.0	79.0	14.0	34.0
Total Split (%)	14.0%	28.0%		10.0%	24.0%	24.0%	39.3%	52.7%	52.7%	9.3%	22.7%
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	None	C-Min
v/c Ratio	0.25	0.20	0.47	0.13	0.21	0.08	0.87	0.40	0.05	0.44	0.39
Control Delay	39.5	48.6	20.0	36.6	52.6	0.4	57.1	22.8	0.1	82.5	34.5
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	39.5	48.6	20.0	36.6	52.6	0.4	57.1	22.8	0.1	82.5	34.5
Queue Length 50th (ft)	69	65	224	28	53	0	442	244	0	39	120
Queue Length 95th (ft)	111	111	266	55	96	0	506	355	0	83	187
Internal Link Dist (ft)		2539			205			2663			944
Turn Bay Length (ft)	165			100		120	340		300	580	
Base Capacity (vph)	400	448	918	317	369	471	1212	1023	965	104	1006
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	0.24	0.18	0.45	0.13	0.17	0.07	0.78	0.40	0.05	0.39	0.39

Intersection Summary

Cycle Length: 150

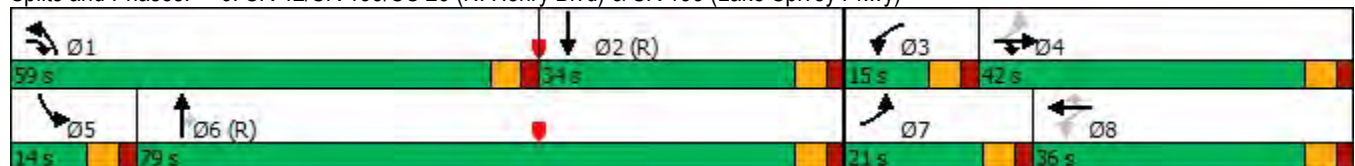
Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green

Natural Cycle: 125

Control Type: Actuated-Coordinated

Splits and Phases: 6: SR 42/SR 138/US 23 (N. Henry Blvd) & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary

2c. No-Build 2027 AM - Improved

6: SR 42/SR 138/US 23 (N. Henry Blvd) & SR 138 (Lake Spivey Pkwy)

01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	93	78	402	39	62	32	914	401	45	40	217	162
Future Volume (veh/h)	93	78	402	39	62	32	914	401	45	40	217	162
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1856	1811	1856	1826	1900	1856	1841	1900	1856	1856	1885
Adj Flow Rate, veh/h	96	80	0	40	64	0	942	413	0	41	224	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	3	6	3	5	0	3	4	0	3	3	1
Cap, veh/h	182	157		155	91		1024	1308		53	1557	
Arrive On Green	0.06	0.08	0.00	0.03	0.05	0.00	0.30	0.71	0.00	0.03	0.44	0.00
Sat Flow, veh/h	1795	1856	1535	1767	1826	1610	3428	1841	1610	1767	3618	0
Grp Volume(v), veh/h	96	80	0	40	64	0	942	413	0	41	224	0
Grp Sat Flow(s),veh/h/ln	1795	1856	1535	1767	1826	1610	1714	1841	1610	1767	1763	0
Q Serve(g_s), s	7.4	6.2	0.0	3.2	5.2	0.0	39.8	12.6	0.0	3.5	5.7	0.0
Cycle Q Clear(g_c), s	7.4	6.2	0.0	3.2	5.2	0.0	39.8	12.6	0.0	3.5	5.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	182	157		155	91		1024	1308		53	1557	
V/C Ratio(X)	0.53	0.51		0.26	0.71		0.92	0.32		0.78	0.14	
Avail Cap(c_a), veh/h	254	452		217	371		1223	1308		100	1557	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.95	0.95	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	60.9	65.7	0.0	65.3	70.2	0.0	50.8	8.1	0.0	72.3	25.0	0.0
Incr Delay (d2), s/veh	2.2	2.4	0.0	0.9	9.6	0.0	10.1	0.6	0.0	21.2	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	3.0	0.0	1.5	2.7	0.0	18.1	4.8	0.0	1.9	2.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.1	68.1	0.0	66.1	79.8	0.0	60.9	8.7	0.0	93.5	25.2	0.0
LnGrp LOS	E	E		E	E		E	A		F	C	
Approach Vol, veh/h	176				104				1355			
Approach Delay, s/veh	65.4				74.6				45.0			
Approach LOS	E				E				D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	50.3	71.7	9.7	18.2	10.0	112.1	15.0	12.9				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	53.5	28.5	9.5	36.5	8.5	73.5	15.5	30.5				
Max Q Clear Time (g_c+I1), s	41.8	7.7	5.2	8.2	5.5	14.6	9.4	7.2				
Green Ext Time (p_c), s	3.0	2.2	0.0	0.3	0.0	5.5	0.1	0.3				
Intersection Summary												
HCM 6th Ctrl Delay	47.2											
HCM 6th LOS	D											
Notes												
User approved pedestrian interval to be less than phase max green.												
Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Timings
7: I-675 NB Ramps & SR 138 (Lake Spivey Pkwy)

2c. No-Build 2027 AM - Improved
01/23/2023

						
Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	501	888	1302	313	34	71
Future Volume (vph)	501	888	1302	313	34	71
Lane Group Flow (vph)	563	998	1463	352	38	80
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		3	
Permitted Phases	6			2		8
Detector Phase	1	6	2	2	3	8
Switch Phase						
Minimum Initial (s)	5.0	15.0	15.0	15.0	5.0	6.0
Minimum Split (s)	15.0	28.5	28.5	28.5	15.0	34.5
Total Split (s)	24.0	65.5	41.5	41.5	34.5	34.5
Total Split (%)	24.0%	65.5%	41.5%	41.5%	34.5%	34.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.80	0.34	0.97	0.41	0.28	0.40
Control Delay	16.6	4.0	49.8	6.1	48.1	14.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.6	4.0	49.8	6.1	48.1	14.5
Queue Length 50th (ft)	163	151	~584	20	23	0
Queue Length 95th (ft)	144	62	#707	83	54	38
Internal Link Dist (ft)		706	2539			
Turn Bay Length (ft)	145			270		315
Base Capacity (vph)	700	2970	1503	851	513	520
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.34	0.97	0.41	0.07	0.15

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 55 (55%), Referenced to phase 2:WBT and 6:EBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

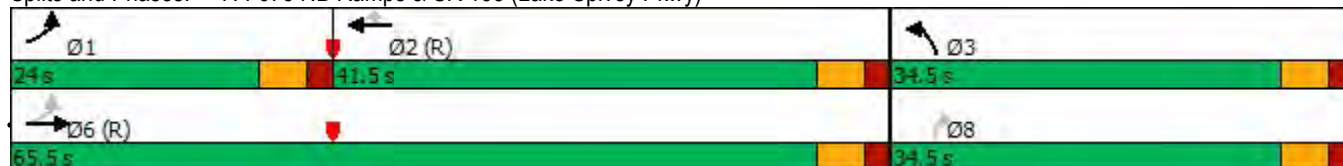
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 7: I-675 NB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
7: I-675 NB Ramps & SR 138 (Lake Spivey Pkwy)

2c. No-Build 2027 AM - Improved
01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	501	888	0	0	1302	313	34	0	71	0	0	0
Future Volume (veh/h)	501	888	0	0	1302	313	34	0	71	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1870	1856	0	0	1856	1870	1870	0	1870			
Adj Flow Rate, veh/h	563	998	0	0	1463	0	38	0	80			
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89			
Percent Heavy Veh, %	2	3	0	0	3	2	2	0	2			
Cap, veh/h	504	2892	0	0	2046		124	0	110			
Arrive On Green	0.37	1.00	0.00	0.00	0.58	0.00	0.07	0.00	0.07			
Sat Flow, veh/h	1781	3618	0	0	3618	1585	1781	0	1585			
Grp Volume(v), veh/h	563	998	0	0	1463	0	38	0	80			
Grp Sat Flow(s),veh/h/ln	1781	1763	0	0	1763	1585	1781	0	1585			
Q Serve(g_s), s	18.5	0.0	0.0	0.0	29.8	0.0	2.0	0.0	4.9			
Cycle Q Clear(g_c), s	18.5	0.0	0.0	0.0	29.8	0.0	2.0	0.0	4.9			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	504	2892	0	0	2046		124	0	110			
V/C Ratio(X)	1.12	0.35	0.00	0.00	0.71		0.31	0.00	0.73			
Avail Cap(c_a), veh/h	504	2892	0	0	2046		517	0	460			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.67	0.67	0.00	0.00	0.46	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	18.0	0.0	0.0	0.0	15.0	0.0	44.2	0.0	45.6			
Incr Delay (d2), s/veh	69.8	0.2	0.0	0.0	1.0	0.0	1.4	0.0	8.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	17.9	0.1	0.0	0.0	10.4	0.0	0.9	0.0	2.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	87.8	0.2	0.0	0.0	16.1	0.0	45.6	0.0	54.3			
LnGrp LOS	F	A	A	A	B		D	A	D			
Approach Vol, veh/h	1561		1463			118						
Approach Delay, s/veh	31.8		16.1			51.5						
Approach LOS	C		B			D						
Timer - Assigned Phs	1	2	6				8					
Phs Duration (G+Y+Rc), s	24.0	63.5	87.5				12.5					
Change Period (Y+Rc), s	5.5	5.5	5.5				5.5					
Max Green Setting (Gmax), s	18.5	36.0	60.0				29.0					
Max Q Clear Time (g_c+I1), s	20.5	31.8	2.0				6.9					
Green Ext Time (p_c), s	0.0	3.8	17.9				0.3					
Intersection Summary												
HCM 6th Ctrl Delay			25.2									
HCM 6th LOS			C									

Timings
8: I-675 SB Ramps & SR 138 (Lake Spivey Pkwy)

2c. No-Build 2027 AM - Improved
01/23/2023

	→	↘	↙	←	↘	↙
Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↘
Traffic Volume (vph)	1242	54	104	1232	147	465
Future Volume (vph)	1242	54	104	1232	147	465
Lane Group Flow (vph)	1396	61	117	1384	165	522
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	7	
Permitted Phases		6	2			4
Detector Phase	6	6	5	2	7	4
Switch Phase						
Minimum Initial (s)	15.0	15.0	5.0	15.0	5.0	6.0
Minimum Split (s)	28.5	28.5	15.0	28.5	35.5	35.5
Total Split (s)	49.5	49.5	15.0	64.5	35.5	35.5
Total Split (%)	49.5%	49.5%	15.0%	64.5%	35.5%	35.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Min	C-Min	None	C-Min	None	None
v/c Ratio	0.74	0.07	0.48	0.58	0.23	0.79
Control Delay	20.5	4.7	12.0	5.6	32.0	39.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.5	4.7	12.0	5.6	32.0	39.4
Queue Length 50th (ft)	231	1	24	0	44	150
Queue Length 95th (ft)	#347	m14	m13	m508	67	196
Internal Link Dist (ft)	1959			706		
Turn Bay Length (ft)		375	95		520	500
Base Capacity (vph)	1889	893	273	2371	1029	897
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.07	0.43	0.58	0.16	0.58

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 92 (92%), Referenced to phase 2:WBTL and 6:EBT, Start of Green

Natural Cycle: 90

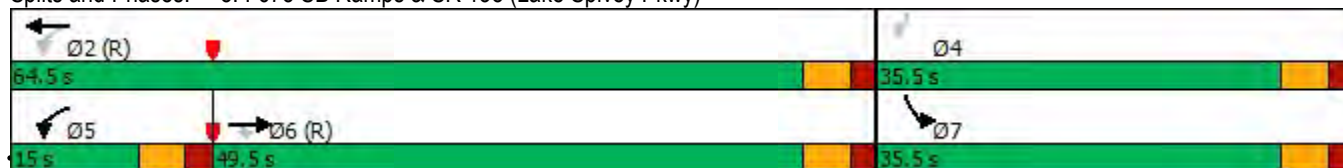
Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: I-675 SB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
8: I-675 SB Ramps & SR 138 (Lake Spivey Pkwy)

2c. No-Build 2027 AM - Improved
01/23/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑					↑↑		↑↑
Traffic Volume (veh/h)	0	1242	54	104	1232	0	0	0	0	147	0	465
Future Volume (veh/h)	0	1242	54	104	1232	0	0	0	0	147	0	465
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1870	1870	1856	0				1870	0	1870
Adj Flow Rate, veh/h	0	1396	61	117	1384	0				165	0	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89				0.89	0.89	0.89
Percent Heavy Veh, %	0	3	2	2	3	0				2	0	2
Cap, veh/h	0	2525	1135	292	2888	0				244	0	
Arrive On Green	0.00	0.24	0.24	0.03	0.55	0.00				0.07	0.00	0.00
Sat Flow, veh/h	0	3618	1585	1781	3618	0				3456	0	2790
Grp Volume(v), veh/h	0	1396	61	117	1384	0				165	0	0
Grp Sat Flow(s),veh/h/ln	0	1763	1585	1781	1763	0				1728	0	1395
Q Serve(g_s), s	0.0	34.8	3.0	1.5	24.0	0.0				4.7	0.0	0.0
Cycle Q Clear(g_c), s	0.0	34.8	3.0	1.5	24.0	0.0				4.7	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2525	1135	292	2888	0				244	0	
V/C Ratio(X)	0.00	0.55	0.05	0.40	0.48	0.00				0.68	0.00	
Avail Cap(c_a), veh/h	0	2525	1135	376	2888	0				1037	0	
HCM Platoon Ratio	1.00	0.33	0.33	0.67	0.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.83	0.83	0.19	0.19	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	24.1	12.0	12.7	9.5	0.0				45.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.7	0.1	0.2	0.1	0.0				3.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	16.3	3.0	1.2	9.6	0.0				2.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	24.8	12.0	12.9	9.6	0.0				48.6	0.0	0.0
LnGrp LOS	A	C	B	B	A	A				D	A	
Approach Vol, veh/h		1457			1501						165	
Approach Delay, s/veh		24.3			9.9						48.6	
Approach LOS		C			A						D	
Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		87.4		12.6	10.3	77.1						
Change Period (Y+Rc), s		5.5		5.5	5.5	5.5						
Max Green Setting (Gmax), s		59.0		30.0	9.5	44.0						
Max Q Clear Time (g_c+I1), s		26.0		6.7	3.5	36.8						
Green Ext Time (p_c), s		21.3		0.5	0.1	6.2						
Intersection Summary												
HCM 6th Ctrl Delay				18.6								
HCM 6th LOS				B								
Notes												
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.												

Timings
9: SR 138 (Lake Spivey Pkwy) & Mt. Zion Rd

2c. No-Build 2027 AM - Improved

01/23/2023

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	116	1061	49	32	1398	126	43	34	144	55	149
Future Volume (vph)	116	1061	49	32	1398	126	43	34	144	55	149
Lane Group Flow (vph)	123	1129	52	34	1487	134	46	65	153	59	159
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8	7	4	
Permitted Phases	6		6	2		2	8		4		4
Detector Phase	1	6	6	5	2	2	3	8	7	4	4
Switch Phase											
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	6.0	5.0	6.0	6.0
Minimum Split (s)	15.0	28.5	28.5	15.0	34.5	34.5	15.0	38.5	15.0	32.5	32.5
Total Split (s)	15.0	31.5	31.5	15.0	31.5	31.5	15.0	38.5	15.0	38.5	38.5
Total Split (%)	15.0%	31.5%	31.5%	15.0%	31.5%	31.5%	15.0%	38.5%	15.0%	38.5%	38.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None
v/c Ratio	0.53	0.53	0.05	0.11	0.78	0.14	0.20	0.39	0.63	0.25	0.47
Control Delay	35.3	8.4	0.1	7.8	15.9	2.7	31.9	33.3	45.0	43.3	11.9
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	35.3	8.4	0.1	7.8	15.9	2.7	31.9	33.3	45.0	43.3	11.9
Queue Length 50th (ft)	42	95	0	3	190	1	23	22	83	36	0
Queue Length 95th (ft)	105	122	m0	m13	#626	23	50	62	134	74	58
Internal Link Dist (ft)		896			1959			388		1031	
Turn Bay Length (ft)	115		140	155		325	35		345		165
Base Capacity (vph)	260	2142	1024	368	1902	943	260	599	248	627	639
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	0.47	0.53	0.05	0.09	0.78	0.14	0.18	0.11	0.62	0.09	0.25

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 7 (7%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 125

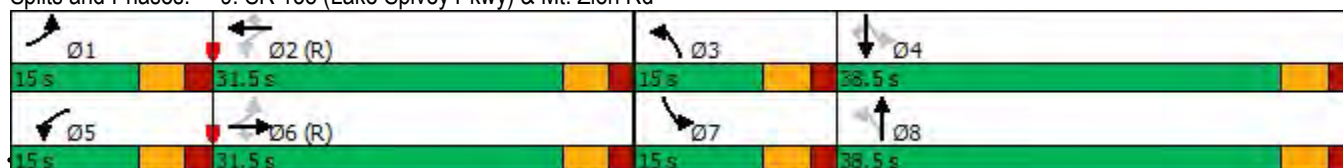
Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: SR 138 (Lake Spivey Pkwy) & Mt. Zion Rd



HCM 6th Signalized Intersection Summary
9: SR 138 (Lake Spivey Pkwy) & Mt. Zion Rd

2c. No-Build 2027 AM - Improved

01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	116	1061	49	32	1398	126	43	34	27	144	55	149
Future Volume (veh/h)	116	1061	49	32	1398	126	43	34	27	144	55	149
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1856	1870	1870	1856	1900	1870	1900	1870	1900	1900	1900
Adj Flow Rate, veh/h	123	1129	0	34	1487	134	46	36	29	153	59	159
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	3	2	2	3	0	2	0	2	0	0	0
Cap, veh/h	341	2080		412	2017	921	212	63	51	282	234	199
Arrive On Green	0.10	1.00	0.00	0.06	1.00	1.00	0.04	0.07	0.07	0.09	0.12	0.12
Sat Flow, veh/h	1810	3526	1585	1781	3526	1610	1781	974	785	1810	1900	1610
Grp Volume(v), veh/h	123	1129	0	34	1487	134	46	0	65	153	59	159
Grp Sat Flow(s),veh/h/ln	1810	1763	1585	1781	1763	1610	1781	0	1759	1810	1900	1610
Q Serve(g_s), s	2.8	0.0	0.0	0.8	0.0	0.0	2.4	0.0	3.6	7.6	2.8	9.6
Cycle Q Clear(g_c), s	2.8	0.0	0.0	0.8	0.0	0.0	2.4	0.0	3.6	7.6	2.8	9.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.45	1.00		1.00
Lane Grp Cap(c), veh/h	341	2080		412	2017	921	212	0	114	282	234	199
V/C Ratio(X)	0.36	0.54		0.08	0.74	0.15	0.22	0.00	0.57	0.54	0.25	0.80
Avail Cap(c_a), veh/h	425	2080		527	2017	921	317	0	580	283	627	531
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.82	0.82	0.00	0.73	0.73	0.73	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.3	0.0	0.0	7.8	0.0	0.0	41.5	0.0	45.4	37.0	39.7	42.6
Incr Delay (d2), s/veh	0.5	0.8	0.0	0.1	1.8	0.2	0.5	0.0	4.4	2.1	0.6	7.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.2	0.0	0.3	0.5	0.1	1.1	0.0	1.7	3.4	1.3	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.9	0.8	0.0	7.9	1.8	0.2	42.0	0.0	49.8	39.0	40.2	49.9
LnGrp LOS	A	A		A	A	A	D	A	D	D	D	D
Approach Vol, veh/h	1252		1655				111		371			
Approach Delay, s/veh	1.5		1.8				46.5		43.9			
Approach LOS	A		A				D		D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.3	62.7	9.1	17.8	8.6	64.5	14.9	12.0				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	9.5	26.0	9.5	33.0	9.5	26.0	9.5	33.0				
Max Q Clear Time (g_c+I1), s	4.8	2.0	4.4	11.6	2.8	2.0	9.6	5.6				
Green Ext Time (p_c), s	0.1	18.7	0.0	0.7	0.0	14.0	0.0	0.3				

Intersection Summary

HCM 6th Ctrl Delay	7.8
HCM 6th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Timings
10: I-75 NB Ramps & SR 138 (Lake Spivey Pkwy)

2c. No-Build 2027 AM - Improved
01/23/2023

						
Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	518	1254	1052	764	292	146
Future Volume (vph)	518	1254	1052	764	292	146
Lane Group Flow (vph)	545	1320	1107	804	307	154
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		3	
Permitted Phases	6			2		8
Detector Phase	1	6	2	2	3	8
Switch Phase						
Minimum Initial (s)	5.0	15.0	15.0	15.0	5.0	6.0
Minimum Split (s)	15.0	28.5	28.5	28.5	15.0	32.5
Total Split (s)	30.0	67.5	37.5	37.5	32.5	32.5
Total Split (%)	30.0%	67.5%	37.5%	37.5%	32.5%	32.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.91	0.56	0.99	0.87	0.79	0.37
Control Delay	36.1	8.2	44.8	17.2	51.8	16.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.1	8.2	44.8	17.2	51.8	16.9
Queue Length 50th (ft)	282	301	314	122	185	35
Queue Length 95th (ft)	m#531	306	#498	#621	266	85
Internal Link Dist (ft)		897	896			
Turn Bay Length (ft)	140			405		510
Base Capacity (vph)	598	2352	1121	924	477	490
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.56	0.99	0.87	0.64	0.31

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 8 (8%), Referenced to phase 2:WBT and 6:EBTL, Start of Green

Natural Cycle: 100

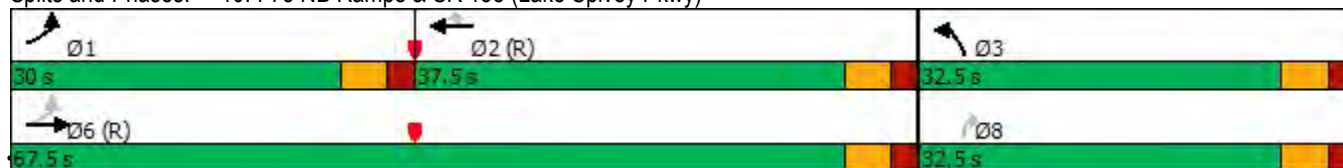
Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: I-75 NB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
10: I-75 NB Ramps & SR 138 (Lake Spivey Pkwy)

2c. No-Build 2027 AM - Improved
01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	518	1254	0	0	1052	764	292	0	146	0	0	0
Future Volume (veh/h)	518	1254	0	0	1052	764	292	0	146	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1870	1856	0	0	1856	1870	1870	0	1870			
Adj Flow Rate, veh/h	545	1320	0	0	1107	0	307	0	0			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	2	3	0	0	3	2	2	0	2			
Cap, veh/h	591	2455	0	0	1645		345	0				
Arrive On Green	0.12	0.47	0.00	0.00	0.93	0.00	0.19	0.00	0.00			
Sat Flow, veh/h	1781	3618	0	0	3618	1585	1781	0	1585			
Grp Volume(v), veh/h	545	1320	0	0	1107	0	307	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1763	0	0	1763	1585	1781	0	1585			
Q Serve(g_s), s	14.2	26.7	0.0	0.0	5.6	0.0	16.8	0.0	0.0			
Cycle Q Clear(g_c), s	14.2	26.7	0.0	0.0	5.6	0.0	16.8	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	591	2455	0	0	1645		345	0				
V/C Ratio(X)	0.92	0.54	0.00	0.00	0.67		0.89	0.00				
Avail Cap(c_a), veh/h	716	2455	0	0	1645		481	0				
HCM Platoon Ratio	0.67	0.67	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	0.60	0.60	0.00	0.00	0.60	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	13.9	15.2	0.0	0.0	2.0	0.0	39.3	0.0	0.0			
Incr Delay (d2), s/veh	10.4	0.5	0.0	0.0	1.3	0.0	14.2	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	7.0	11.1	0.0	0.0	1.1	0.0	8.3	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.2	15.7	0.0	0.0	3.3	0.0	53.5	0.0	0.0			
LnGrp LOS	C	B	A	A	A		D	A				
Approach Vol, veh/h	1865			1107			307					
Approach Delay, s/veh	18.2			3.3			53.5					
Approach LOS	B			A			D					
Timer - Assigned Phs	1	2					6	8				
Phs Duration (G+Y+Rc), s	22.9	52.2					75.1	24.9				
Change Period (Y+Rc), s	5.5	5.5					5.5	5.5				
Max Green Setting (Gmax), s	24.5	32.0					62.0	27.0				
Max Q Clear Time (g_c+I1), s	16.2	7.6					28.7	18.8				
Green Ext Time (p_c), s	1.2	13.8					20.4	0.6				

Intersection Summary

HCM 6th Ctrl Delay	16.5
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Timings
11: I-75 SB Ramps & SR 138 (Lake Spivey Pkwy)

2c. No-Build 2027 AM - Improved
01/23/2023

	→	↘	↙	←	↘	↙
Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Configurations	↑↑	↑	↘	↑↑	↘↘	↘
Traffic Volume (vph)	1402	245	101	1238	359	282
Future Volume (vph)	1402	245	101	1238	359	282
Lane Group Flow (vph)	1524	266	110	1346	390	307
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	3	
Permitted Phases		6	2			8
Detector Phase	6	6	5	2	3	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	5.0	15.0	5.0	15.0
Minimum Split (s)	28.5	28.5	15.0	28.5	15.0	28.5
Total Split (s)	56.0	56.0	15.0	71.0	29.0	29.0
Total Split (%)	56.0%	56.0%	15.0%	71.0%	29.0%	29.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Min	C-Min	None	C-Min	None	Min
v/c Ratio	0.78	0.27	0.51	0.56	0.56	0.79
Control Delay	22.3	2.4	16.0	5.2	38.6	41.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.3	2.4	16.0	5.2	38.6	41.3
Queue Length 50th (ft)	391	0	13	130	113	133
Queue Length 95th (ft)	535	39	m11	m399	157	228
Internal Link Dist (ft)	1158			897		
Turn Bay Length (ft)		980	150		490	
Base Capacity (vph)	1942	995	244	2406	806	438
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.27	0.45	0.56	0.48	0.70

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

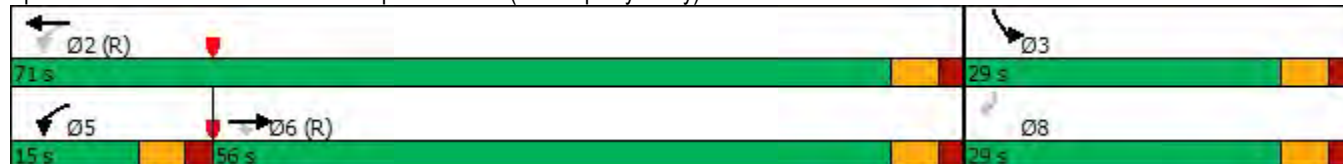
Offset: 46 (46%), Referenced to phase 2:WBTL and 6:EBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

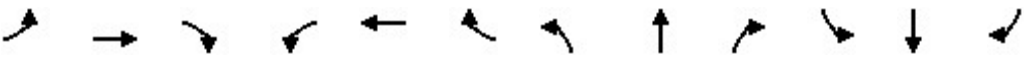
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 11: I-75 SB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
11: I-75 SB Ramps & SR 138 (Lake Spivey Pkwy)

2c. No-Build 2027 AM - Improved
01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑					↖↗		↗
Traffic Volume (veh/h)	0	1402	245	101	1238	0	0	0	0	359	0	282
Future Volume (veh/h)	0	1402	245	101	1238	0	0	0	0	359	0	282
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1870	1870	1856	0				1870	0	1870
Adj Flow Rate, veh/h	0	1524	0	110	1346	0				390	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	3	2	2	3	0				2	0	2
Cap, veh/h	0	2284		287	2646	0				482	0	
Arrive On Green	0.00	0.65	0.00	0.05	0.75	0.00				0.14	0.00	0.00
Sat Flow, veh/h	0	3618	1585	1781	3618	0				3456	0	1585
Grp Volume(v), veh/h	0	1524	0	110	1346	0				390	0	0
Grp Sat Flow(s),veh/h/ln	0	1763	1585	1781	1763	0				1728	0	1585
Q Serve(g_s), s	0.0	26.8	0.0	1.9	15.4	0.0				10.9	0.0	0.0
Cycle Q Clear(g_c), s	0.0	26.8	0.0	1.9	15.4	0.0				10.9	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2284		287	2646	0				482	0	
V/C Ratio(X)	0.00	0.67		0.38	0.51	0.00				0.81	0.00	
Avail Cap(c_a), veh/h	0	2284		371	2646	0				812	0	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.88	0.00	0.22	0.22	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	10.9	0.0	10.4	5.0	0.0				41.7	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.4	0.0	0.2	0.2	0.0				3.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	8.8	0.0	0.7	3.7	0.0				4.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	12.3	0.0	10.6	5.2	0.0				45.0	0.0	0.0
LnGrp LOS	A	B		B	A	A				D	A	
Approach Vol, veh/h		1524			1456						390	
Approach Delay, s/veh		12.3			5.6						45.0	
Approach LOS		B			A						D	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		80.5			10.3	70.3		19.5				
Change Period (Y+Rc), s		5.5			5.5	5.5		5.5				
Max Green Setting (Gmax), s		65.5			9.5	50.5		23.5				
Max Q Clear Time (g_c+I1), s		17.4			3.9	28.8		12.9				
Green Ext Time (p_c), s		25.9			0.1	16.9		1.0				

Intersection Summary

HCM 6th Ctrl Delay 13.2
HCM 6th LOS B

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings

12: Speer Rd/Mt. Zion Pkwy & SR 138 (Lake Spivey Pkwy)

2c. No-Build 2027 AM - Improved

01/23/2023

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑	↗	↔↔	↑↑	↗	↔↔	↑↑	↗	↔↔	↑↑	↗
Traffic Volume (vph)	81	726	42	374	806	233	91	232	576	200	90	66
Future Volume (vph)	81	726	42	374	806	233	91	232	576	200	90	66
Lane Group Flow (vph)	85	764	44	394	848	245	96	244	606	211	95	69
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free	Prot	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2			Free			4
Detector Phase	1	6	6	5	2	2	3	8		7	4	4
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	6.0		5.0	6.0	6.0
Minimum Split (s)	15.0	46.5	46.5	15.0	47.5	47.5	15.0	46.5		15.0	45.5	45.5
Total Split (s)	14.0	38.0	38.0	20.0	44.0	44.0	26.0	42.0		20.0	36.0	36.0
Total Split (%)	11.7%	31.7%	31.7%	16.7%	36.7%	36.7%	21.7%	35.0%		16.7%	30.0%	30.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5		5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None		None	None	None
v/c Ratio	0.36	0.50	0.05	0.68	0.44	0.25	0.38	0.61	0.38	0.60	0.18	0.17
Control Delay	57.0	27.2	0.1	53.5	18.6	2.9	57.1	56.9	0.7	58.5	45.0	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.0	27.2	0.1	53.5	18.6	2.9	57.1	56.9	0.7	58.5	45.0	0.8
Queue Length 50th (ft)	32	222	0	148	206	0	37	96	0	81	34	0
Queue Length 95th (ft)	58	319	0	197	298	44	64	135	0	120	58	0
Internal Link Dist (ft)		1890			1158			635			523	
Turn Bay Length (ft)	345		290	290		930	195		550	270		270
Base Capacity (vph)	260	1527	829	576	1927	980	586	1076	1583	414	917	568
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.50	0.05	0.68	0.44	0.25	0.16	0.23	0.38	0.51	0.10	0.12

Intersection Summary

Cycle Length: 120

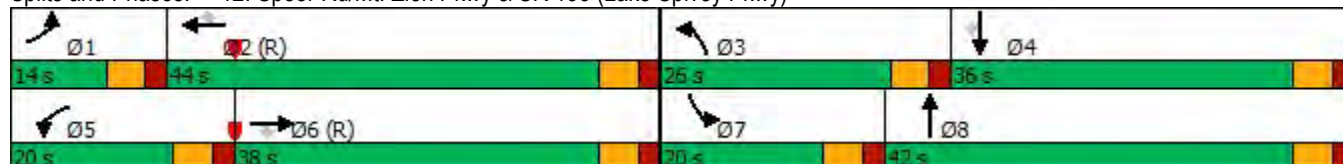
Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Green

Natural Cycle: 125

Control Type: Actuated-Coordinated

Splits and Phases: 12: Speer Rd/Mt. Zion Pkwy & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary

12: Speer Rd/Mt. Zion Pkwy & SR 138 (Lake Spivey Pkwy)

2c. No-Build 2027 AM - Improved
01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	81	726	42	374	806	233	91	232	576	200	90	66
Future Volume (veh/h)	81	726	42	374	806	233	91	232	576	200	90	66
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1856	1900	1900	1856	1870	1870	1870	1870	1870	1900	1870
Adj Flow Rate, veh/h	85	764	44	394	848	245	96	244	0	211	95	69
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
Percent Heavy Veh, %	2	3	0	0	3	2	2	2	2	2	0	2
Cap, veh/h	136	1840	841	424	2128	957	151	337		273	469	206
Arrive On Green	0.04	0.52	0.52	0.12	0.60	0.60	0.04	0.09	0.00	0.08	0.13	0.13
Sat Flow, veh/h	3456	3526	1610	3510	3526	1585	3456	3554	1585	3456	3610	1585
Grp Volume(v), veh/h	85	764	44	394	848	245	96	244	0	211	95	69
Grp Sat Flow(s),veh/h/ln	1728	1763	1610	1755	1763	1585	1728	1777	1585	1728	1805	1585
Q Serve(g_s), s	2.9	15.9	1.6	13.3	15.1	8.7	3.3	8.0	0.0	7.2	2.8	4.8
Cycle Q Clear(g_c), s	2.9	15.9	1.6	13.3	15.1	8.7	3.3	8.0	0.0	7.2	2.8	4.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	136	1840	841	424	2128	957	151	337		273	469	206
V/C Ratio(X)	0.63	0.42	0.05	0.93	0.40	0.26	0.63	0.72		0.77	0.20	0.33
Avail Cap(c_a), veh/h	245	1840	841	424	2128	957	590	1081		418	918	403
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	0.91	0.77	0.77	0.77	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.8	17.5	14.1	52.2	12.4	11.2	56.4	52.8	0.0	54.2	46.6	47.5
Incr Delay (d2), s/veh	4.3	0.6	0.1	22.3	0.4	0.5	4.3	2.9	0.0	4.8	0.2	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	6.2	0.6	7.0	5.5	2.9	1.5	3.6	0.0	3.2	1.3	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.1	18.1	14.2	74.6	12.8	11.6	60.8	55.7	0.0	59.0	46.8	48.4
LnGrp LOS	E	B	B	E	B	B	E	E		E	D	D
Approach Vol, veh/h	893			1487			340			375		
Approach Delay, s/veh	22.0			29.0			57.1			54.0		
Approach LOS	C			C			E			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.2	77.9	10.8	21.1	20.0	68.1	15.0	16.9				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	8.5	38.5	20.5	30.5	14.5	32.5	14.5	36.5				
Max Q Clear Time (g_c+I1), s	4.9	17.1	5.3	6.8	15.3	17.9	9.2	10.0				
Green Ext Time (p_c), s	0.1	11.5	0.2	0.7	0.0	7.1	0.3	1.4				

Intersection Summary

HCM 6th Ctrl Delay	33.1
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Timings
13: Spivey Rd & SR 138 (Lake Spivey Pkwy)

2c. No-Build 2027 AM - Improved
01/23/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↑
Traffic Volume (vph)	703	25	113	911	38	239
Future Volume (vph)	703	25	113	911	38	239
Lane Group Flow (vph)	773	27	124	1001	42	263
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	8	
Permitted Phases		6	2			8
Detector Phase	6	6	5	2	8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0	6.0
Minimum Split (s)	25.5	25.5	15.0	23.5	31.5	31.5
Total Split (s)	44.0	44.0	18.0	62.0	38.0	38.0
Total Split (%)	44.0%	44.0%	18.0%	62.0%	38.0%	38.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Min	C-Min	None	C-Min	None	None
v/c Ratio	0.33	0.03	0.23	0.36	0.27	0.69
Control Delay	7.8	2.9	3.5	3.4	45.2	15.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.8	2.9	3.5	3.4	45.2	15.4
Queue Length 50th (ft)	91	0	12	65	26	0
Queue Length 95th (ft)	161	11	33	129	55	71
Internal Link Dist (ft)	1639			1890	1094	
Turn Bay Length (ft)		230	535			220
Base Capacity (vph)	2366	1077	613	2807	575	692
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.03	0.20	0.36	0.07	0.38

Intersection Summary

Cycle Length: 100

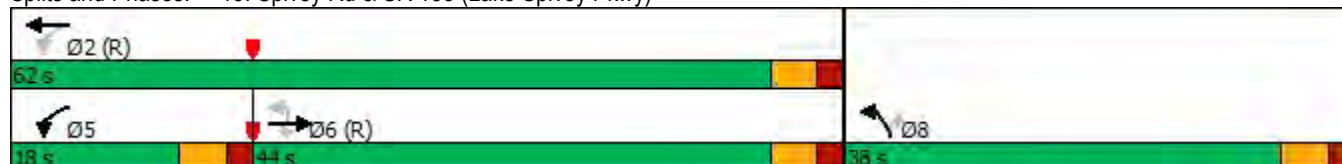
Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTU, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Splits and Phases: 13: Spivey Rd & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
13: Spivey Rd & SR 138 (Lake Spivey Pkwy)

2c. No-Build 2027 AM - Improved
01/23/2023

							
Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (veh/h)	0	703	25	113	911	38	239
Future Volume (veh/h)	0	703	25	113	911	38	239
Initial Q (Qb), veh		0	0	0	0	0	0
Ped-Bike Adj(A_pbT)			1.00	1.00		1.00	1.00
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No	No	
Adj Sat Flow, veh/h/ln		1856	1870	1870	1856	1870	1870
Adj Flow Rate, veh/h		773	0	124	1001	42	0
Peak Hour Factor		0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %		3	2	2	3	2	2
Cap, veh/h		2628		628	2992	74	
Arrive On Green		0.75	0.00	0.05	0.85	0.04	0.00
Sat Flow, veh/h		3618	1585	1781	3618	1781	1585
Grp Volume(v), veh/h		773	0	124	1001	42	0
Grp Sat Flow(s),veh/h/ln		1763	1585	1781	1763	1781	1585
Q Serve(g_s), s		7.2	0.0	1.4	6.0	2.3	0.0
Cycle Q Clear(g_c), s		7.2	0.0	1.4	6.0	2.3	0.0
Prop In Lane			1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h		2628		628	2992	74	
V/C Ratio(X)		0.29		0.20	0.33	0.57	
Avail Cap(c_a), veh/h		2628		764	2992	579	
HCM Platoon Ratio		1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	0.00	0.91	0.91	1.00	0.00
Uniform Delay (d), s/veh		4.2	0.0	2.4	1.6	47.1	0.0
Incr Delay (d2), s/veh		0.3	0.0	0.1	0.3	6.8	0.0
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		1.8	0.0	0.2	0.6	1.2	0.0
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh		4.4	0.0	2.5	1.9	53.8	0.0
LnGrp LOS		A		A	A	D	
Approach Vol, veh/h		773			1125	42	
Approach Delay, s/veh		4.4			1.9	53.8	
Approach LOS		A			A	D	
Timer - Assigned Phs		2			5	6	8
Phs Duration (G+Y+Rc), s		90.4			10.3	80.0	9.6
Change Period (Y+Rc), s		5.5			5.5	5.5	5.5
Max Green Setting (Gmax), s		56.5			12.5	38.5	32.5
Max Q Clear Time (g_c+I1), s		8.0			3.4	9.2	4.3
Green Ext Time (p_c), s		17.1			0.2	10.2	0.1
Intersection Summary							
HCM 6th Ctrl Delay			4.1				
HCM 6th LOS			A				
Notes							
User approved ignoring U-Turning movement.							
Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.							

Timings
14: Blackhall Rd/Speer Rd & Walt Stephens Rd

2c. No-Build 2027 AM - Improved
01/23/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	168	47	111	233	406	42	406	58	143	106	11
Future Volume (vph)	15	168	47	111	233	406	42	406	58	143	106	11
Lane Group Flow (vph)	17	187	52	123	259	451	47	451	64	159	118	12
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		6			2		3	8		7	4	
Permitted Phases	6		6	2		2	8		8	4		4
Detector Phase	6	6	6	2	2	2	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0	15.0	5.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	23.5	23.5	23.5	23.5	23.5	23.5	15.0	23.5	23.5	15.0	23.5	23.5
Total Split (s)	41.0	41.0	41.0	41.0	41.0	41.0	15.0	44.0	44.0	15.0	44.0	44.0
Total Split (%)	41.0%	41.0%	41.0%	41.0%	41.0%	41.0%	15.0%	44.0%	44.0%	15.0%	44.0%	44.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.04	0.23	0.07	0.24	0.31	0.49	0.09	0.81	0.12	0.55	0.17	0.02
Control Delay	19.5	20.0	1.8	21.1	21.2	5.9	14.2	43.9	3.0	23.0	22.0	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.5	20.0	1.8	21.1	21.2	5.9	14.2	43.9	3.0	23.0	22.0	0.1
Queue Length 50th (ft)	6	72	0	51	109	32	17	265	0	60	54	0
Queue Length 95th (ft)	22	139	10	88	161	62	31	339	17	84	87	0
Internal Link Dist (ft)		2027			3745			1264			1872	
Turn Bay Length (ft)	110		160	190		250	140		125	315		120
Base Capacity (vph)	444	824	748	512	824	926	546	717	662	292	731	673
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.23	0.07	0.24	0.31	0.49	0.09	0.63	0.10	0.54	0.16	0.02

Intersection Summary

Cycle Length: 100

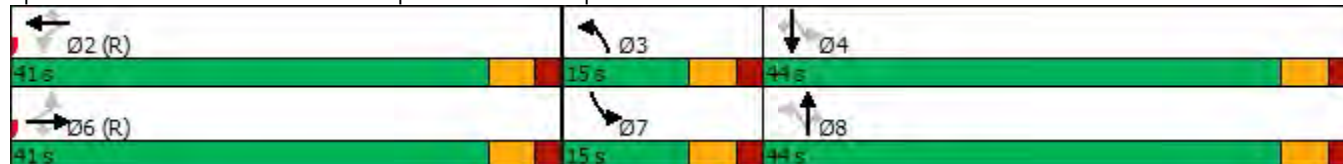
Actuated Cycle Length: 100

Offset: 96 (96%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Splits and Phases: 14: Blackhall Rd/Speer Rd & Walt Stephens Rd



HCM 6th Signalized Intersection Summary

14: Blackhall Rd/Speer Rd & Walt Stephens Rd

2c. No-Build 2027 AM - Improved
01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	168	47	111	233	406	42	406	58	143	106	11
Future Volume (veh/h)	15	168	47	111	233	406	42	406	58	143	106	11
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	17	187	52	123	259	451	47	451	0	159	118	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	366	900	763	555	900	763	483	509		256	594	
Arrive On Green	0.48	0.48	0.48	0.48	0.48	0.48	0.04	0.27	0.00	0.08	0.32	0.00
Sat Flow, veh/h	739	1870	1585	1141	1870	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	17	187	52	123	259	451	47	451	0	159	118	0
Grp Sat Flow(s),veh/h/ln	739	1870	1585	1141	1870	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	1.4	5.8	1.8	7.0	8.3	20.6	1.9	23.1	0.0	6.2	4.6	0.0
Cycle Q Clear(g_c), s	9.8	5.8	1.8	12.7	8.3	20.6	1.9	23.1	0.0	6.2	4.6	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	366	900	763	555	900	763	483	509		256	594	
V/C Ratio(X)	0.05	0.21	0.07	0.22	0.29	0.59	0.10	0.89		0.62	0.20	
Avail Cap(c_a), veh/h	366	900	763	555	900	763	587	720		279	720	
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	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	18.6	15.0	13.9	18.6	15.6	18.8	24.6	34.9	0.0	25.7	24.9	0.0
Incr Delay (d2), s/veh	0.2	0.5	0.2	0.9	0.8	3.4	0.1	9.6	0.0	3.7	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	2.4	0.6	1.9	3.5	7.5	0.8	11.2	0.0	2.7	2.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.8	15.5	14.1	19.5	16.4	22.2	24.6	44.5	0.0	29.4	25.0	0.0
LnGrp LOS	B	B	B	B	B	C	C	D		C	C	
Approach Vol, veh/h	256			833			498			277		
Approach Delay, s/veh	15.4			20.0			42.7			27.5		
Approach LOS	B			B			D			C		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	53.6			37.2			53.6			32.7		
Change Period (Y+Rc), s	5.5			5.5			5.5			5.5		
Max Green Setting (Gmax), s	35.5			38.5			35.5			38.5		
Max Q Clear Time (g_c+l1), s	22.6			6.6			11.8			25.1		
Green Ext Time (p_c), s	5.6			0.6			2.4			0.0		

Intersection Summary

HCM 6th Ctrl Delay	26.5
HCM 6th LOS	C

Notes

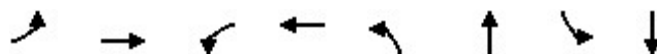
Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings

2d. No-Build 2027 PM - Improved

1: Flippen Rd/Shields Rd & SR 42/SR 138/US 23 (N. Henry Blvd)

01/23/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	21	1311	177	1011	175	33	27	48
Future Volume (vph)	21	1311	177	1011	175	33	27	48
Lane Group Flow (vph)	21	1578	179	1035	177	174	0	87
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	NA
Protected Phases	1	6	5	2	3	8		4
Permitted Phases	6		2		8		4	
Detector Phase	1	6	5	2	3	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	15.0	5.0	15.0	5.0	6.0	6.0	6.0
Minimum Split (s)	15.0	28.5	15.0	28.5	15.0	30.5	30.5	30.5
Total Split (s)	15.0	39.5	15.0	39.5	15.0	45.5	30.5	30.5
Total Split (%)	15.0%	39.5%	15.0%	39.5%	15.0%	45.5%	30.5%	30.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5		5.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead		Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	C-Min	None	C-Min	None	None	None	None
v/c Ratio	0.06	0.93	0.69	0.49	0.60	0.36		0.53
Control Delay	8.9	36.2	31.7	14.1	44.7	16.3		49.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	8.9	36.2	31.7	14.1	44.7	16.3		49.6
Queue Length 50th (ft)	5	488	59	163	98	6		48
Queue Length 95th (ft)	15	#781	133	322	170	100		94
Internal Link Dist (ft)		2570		1632		2093		641
Turn Bay Length (ft)	135		210					
Base Capacity (vph)	397	1703	271	2120	294	733		385
Starvation Cap Reductn	0	0	0	0	0	0		0
Spillback Cap Reductn	0	0	0	0	0	0		0
Storage Cap Reductn	0	0	0	0	0	0		0
Reduced v/c Ratio	0.05	0.93	0.66	0.49	0.60	0.24		0.23

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

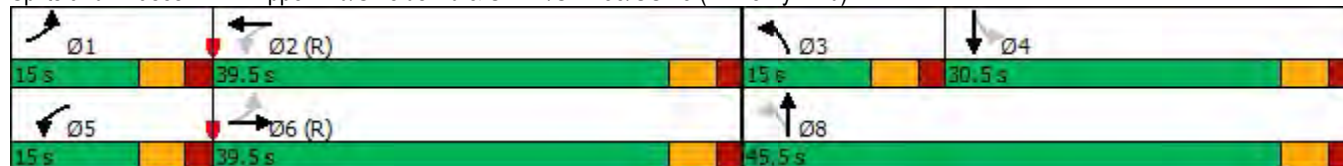
Natural Cycle: 120

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Flippen Rd/Shields Rd & SR 42/SR 138/US 23 (N. Henry Blvd)



HCM 6th Signalized Intersection Summary

2d. No-Build 2027 PM - Improved

1: Flippen Rd/Shields Rd & SR 42/SR 138/US 23 (N. Henry Blvd)

01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	1311	251	177	1011	14	175	33	140	27	48	12
Future Volume (veh/h)	21	1311	251	177	1011	14	175	33	140	27	48	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1841	1856	1856	1841	1870	1856	1870	1856	1870	1870	1870
Adj Flow Rate, veh/h	21	1324	254	179	1021	14	177	33	141	27	48	12
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	4	3	3	4	2	3	2	3	2	2	2
Cap, veh/h	341	1602	304	238	2077	28	350	70	297	76	76	17
Arrive On Green	0.02	0.55	0.55	0.06	0.59	0.59	0.09	0.22	0.22	0.07	0.07	0.07
Sat Flow, veh/h	1781	2934	556	1767	3532	48	1767	310	1323	379	1021	224
Grp Volume(v), veh/h	21	782	796	179	505	530	177	0	174	87	0	0
Grp Sat Flow(s),veh/h/ln	1781	1749	1741	1767	1749	1832	1767	0	1632	1624	0	0
Q Serve(g_s), s	0.5	36.8	38.2	4.3	16.7	16.7	9.0	0.0	9.2	3.5	0.0	0.0
Cycle Q Clear(g_c), s	0.5	36.8	38.2	4.3	16.7	16.7	9.0	0.0	9.2	5.2	0.0	0.0
Prop In Lane	1.00		0.32	1.00		0.03	1.00		0.81	0.31		0.14
Lane Grp Cap(c), veh/h	341	955	951	238	1028	1077	350	0	367	169	0	0
V/C Ratio(X)	0.06	0.82	0.84	0.75	0.49	0.49	0.51	0.00	0.47	0.52	0.00	0.00
Avail Cap(c_a), veh/h	470	955	951	293	1028	1077	350	0	653	443	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	10.3	18.6	19.0	21.0	11.9	11.9	36.5	0.0	33.6	45.1	0.0	0.0
Incr Delay (d2), s/veh	0.1	7.8	8.7	8.3	1.7	1.6	1.2	0.0	1.0	2.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	14.9	15.5	2.7	6.1	6.3	3.9	0.0	3.7	2.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.3	26.4	27.7	29.4	13.6	13.5	37.7	0.0	34.6	47.5	0.0	0.0
LnGrp LOS	B	C	C	C	B	B	D	A	C	D	A	A
Approach Vol, veh/h	1599			1214			351			87		
Approach Delay, s/veh	26.8			15.9			36.1			47.5		
Approach LOS	C			B			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	8					
Phs Duration (G+Y+Rc), s	7.7	64.3	15.0	13.0	11.9	60.1	28.0					
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5					
Max Green Setting (Gmax), s	9.5	34.0	9.5	25.0	9.5	34.0	40.0					
Max Q Clear Time (g_c+I1), s	2.5	18.7	11.0	7.2	6.3	40.2	11.2					
Green Ext Time (p_c), s	0.0	9.1	0.0	0.3	0.1	0.0	1.0					
Intersection Summary												
HCM 6th Ctrl Delay	24.3											
HCM 6th LOS	C											

Intersection						
Int Delay, s/veh	0.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	17	515	14	26	631
Future Vol, veh/h	14	17	515	14	26	631
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	98	98	98	98	98	98
Heavy Vehicles, %	2	2	3	2	2	3
Mvmt Flow	14	17	526	14	27	644
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1231	533	0	0	540	0
Stage 1	533	-	-	-	-	-
Stage 2	698	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	196	547	-	-	1028	-
Stage 1	588	-	-	-	-	-
Stage 2	494	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	188	547	-	-	1028	-
Mov Cap-2 Maneuver	188	-	-	-	-	-
Stage 1	588	-	-	-	-	-
Stage 2	474	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	18.7	0		0.3		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	-	294	1028	-	
HCM Lane V/C Ratio	-	-	0.108	0.026	-	
HCM Control Delay (s)	-	-	18.7	8.6	0	
HCM Lane LOS	-	-	C	A	A	
HCM 95th %tile Q(veh)	-	-	0.4	0.1	-	

HCM 6th TWSC
3: Flippen Rd & Reeves Creek Trail Parking Lot

2d. No-Build 2027 PM - Improved
01/23/2023

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	4	482	2	3	608
Future Vol, veh/h	0	4	482	2	3	608
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	96	96	96	96	96	96
Heavy Vehicles, %	2	2	3	2	2	3
Mvmt Flow	0	4	502	2	3	633
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1142	503	0	0	504	0
Stage 1	503	-	-	-	-	-
Stage 2	639	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	222	569	-	-	1061	-
Stage 1	607	-	-	-	-	-
Stage 2	526	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	221	569	-	-	1061	-
Mov Cap-2 Maneuver	221	-	-	-	-	-
Stage 1	607	-	-	-	-	-
Stage 2	524	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	11.4	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	- 569		1061	-	
HCM Lane V/C Ratio	-	- 0.007		0.003	-	
HCM Control Delay (s)	-	- 11.4		8.4	0	
HCM Lane LOS	-	- B		A	A	
HCM 95th %tile Q(veh)	-	- 0		0	-	

Timings 4: Flippen Rd & Walt Stephens Rd/Red Oak Rd

2d. No-Build 2027 PM - Improved

01/23/2023

										
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	163	185	411	24	140	331	345	24	460	164
Future Volume (vph)	163	185	411	24	140	331	345	24	460	164
Lane Group Flow (vph)	175	199	442	26	178	356	391	26	495	176
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4		3	8	1	6	5	2	
Permitted Phases	4		4	8		6		2		2
Detector Phase	7	4	4	3	8	1	6	5	2	2
Switch Phase										
Minimum Initial (s)	5.0	6.0	6.0	5.0	6.0	5.0	15.0	5.0	15.0	15.0
Minimum Split (s)	15.0	31.5	31.5	15.0	30.5	15.0	31.5	15.0	28.5	28.5
Total Split (s)	15.0	31.5	31.5	15.0	31.5	18.0	38.5	15.0	35.5	35.5
Total Split (%)	15.0%	31.5%	31.5%	15.0%	31.5%	18.0%	38.5%	15.0%	35.5%	35.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
v/c Ratio	0.57	0.44	0.61	0.09	0.63	0.70	0.39	0.06	0.90	0.29
Control Delay	30.1	32.0	9.8	23.8	47.4	29.2	17.3	12.4	49.1	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.1	32.0	9.8	23.8	47.4	29.2	17.3	12.4	49.1	4.7
Queue Length 50th (ft)	78	89	52	12	103	143	118	5	283	3
Queue Length 95th (ft)	m110	m146	79	28	159	#337	279	m12	m#439	m16
Internal Link Dist (ft)		646			1291		2204		704	
Turn Bay Length (ft)	180		345	110		130		120		215
Base Capacity (vph)	308	501	749	342	487	511	994	464	553	607
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.40	0.59	0.08	0.37	0.70	0.39	0.06	0.90	0.29

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 88 (88%), Referenced to phase 2:SBTL and 6:NBT, Start of Green

Natural Cycle: 95

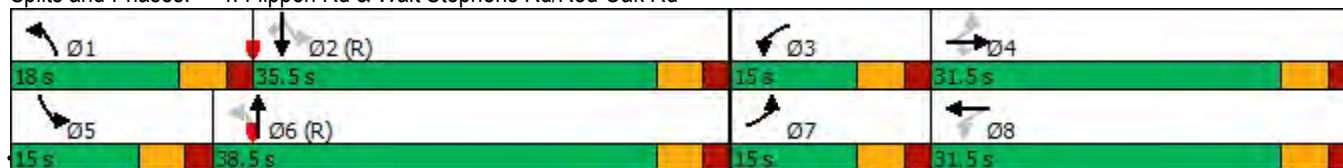
Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Flippen Rd & Walt Stephens Rd/Red Oak Rd



HCM 6th Signalized Intersection Summary

4: Flippen Rd & Walt Stephens Rd/Red Oak Rd

2d. No-Build 2027 PM - Improved

01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	163	185	411	24	140	25	331	345	19	24	460	164
Future Volume (veh/h)	163	185	411	24	140	25	331	345	19	24	460	164
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1870	1900	1856	1870	1870	1856	1900
Adj Flow Rate, veh/h	175	199	0	26	151	27	356	371	20	26	495	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	0	2	0	3	2	2	3	0
Cap, veh/h	274	356		229	190	34	512	939	51	528	820	
Arrive On Green	0.09	0.19	0.00	0.03	0.12	0.12	0.12	0.54	0.54	0.03	0.44	0.00
Sat Flow, veh/h	1781	1870	1585	1781	1569	281	1810	1745	94	1781	1856	1610
Grp Volume(v), veh/h	175	199	0	26	0	178	356	0	391	26	495	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1850	1810	0	1839	1781	1856	1610
Q Serve(g_s), s	8.3	9.6	0.0	1.3	0.0	9.4	10.2	0.0	12.5	0.8	20.3	0.0
Cycle Q Clear(g_c), s	8.3	9.6	0.0	1.3	0.0	9.4	10.2	0.0	12.5	0.8	20.3	0.0
Prop In Lane	1.00		1.00	1.00		0.15	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	274	356		229	0	224	512	0	990	528	820	
V/C Ratio(X)	0.64	0.56		0.11	0.00	0.80	0.70	0.00	0.40	0.05	0.60	
Avail Cap(c_a), veh/h	274	486		352	0	481	517	0	990	652	820	
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	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.1	36.7	0.0	37.0	0.0	42.7	14.8	0.0	13.5	14.4	21.3	0.0
Incr Delay (d2), s/veh	4.9	1.4	0.0	0.2	0.0	6.3	4.0	0.0	1.2	0.0	3.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	4.4	0.0	0.6	0.0	4.6	4.1	0.0	4.9	0.3	8.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.0	38.1	0.0	37.2	0.0	49.1	18.8	0.0	14.7	14.5	24.5	0.0
LnGrp LOS	D	D		D	A	D	B	A	B	B	C	
Approach Vol, veh/h		374			204			747			521	
Approach Delay, s/veh		38.0			47.6			16.7			24.0	
Approach LOS		D			D			B			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.7	49.7	8.1	24.5	8.1	59.3	15.0	17.6				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	12.5	30.0	9.5	26.0	9.5	33.0	9.5	26.0				
Max Q Clear Time (g_c+I1), s	12.2	22.3	3.3	11.6	2.8	14.5	10.3	11.4				
Green Ext Time (p_c), s	0.0	2.9	0.0	0.8	0.0	3.8	0.0	0.7				

Intersection Summary

HCM 6th Ctrl Delay	26.5
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings

5: Flippen Rd & Hudson Bridge Rd

2d. No-Build 2027 PM - Improved

01/23/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	131	413	9	603	733	305	3	328	333	250	416	83
Future Volume (vph)	131	413	9	603	733	305	3	328	333	250	416	83
Lane Group Flow (vph)	135	426	9	622	756	314	3	338	343	258	429	86
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2			8		7	4	
Permitted Phases	6		6	2		2	8		8	4		4
Detector Phase	1	6	6	5	2	2	8	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	6.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	15.0	28.5	28.5	15.0	28.5	28.5	36.5	36.5	36.5	15.0	33.5	33.5
Total Split (s)	17.0	26.0	26.0	36.0	45.0	45.0	40.0	40.0	40.0	18.0	58.0	58.0
Total Split (%)	14.2%	21.7%	21.7%	30.0%	37.5%	37.5%	33.3%	33.3%	33.3%	15.0%	48.3%	48.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.52	0.71	0.02	0.97	0.53	0.38	0.01	0.80	0.55	0.90	0.61	0.13
Control Delay	28.1	54.1	0.1	57.3	30.7	4.6	32.0	57.1	7.0	61.7	33.4	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.1	54.1	0.1	57.3	30.7	4.6	32.0	57.1	7.0	61.7	33.4	1.7
Queue Length 50th (ft)	52	165	0	394	234	0	2	247	0	143	264	0
Queue Length 95th (ft)	98	223	0	#720	331	63	10	333	70	#234	338	13
Internal Link Dist (ft)		840			1594			786			834	
Turn Bay Length (ft)	375		175	390		450	230		365	320		320
Base Capacity (vph)	286	604	413	643	1414	821	274	530	699	286	807	761
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.71	0.02	0.97	0.53	0.38	0.01	0.64	0.49	0.90	0.53	0.11

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 37 (31%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 115

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 5: Flippen Rd & Hudson Bridge Rd



HCM 6th Signalized Intersection Summary 5: Flippen Rd & Hudson Bridge Rd

2d. No-Build 2027 PM - Improved
01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	131	413	9	603	733	305	3	328	333	250	416	83
Future Volume (veh/h)	131	413	9	603	733	305	3	328	333	250	416	83
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1856	1870	1870	1856	1870
Adj Flow Rate, veh/h	135	426	0	622	756	0	3	338	343	258	429	86
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	3	2	2	3	2
Cap, veh/h	346	769		618	1408		245	449	383	301	727	621
Arrive On Green	0.07	0.22	0.00	0.25	0.40	0.00	0.24	0.24	0.24	0.10	0.39	0.39
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	886	1856	1585	1781	1856	1585
Grp Volume(v), veh/h	135	426	0	622	756	0	3	338	343	258	429	86
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	886	1856	1585	1781	1856	1585
Q Serve(g_s), s	7.0	12.8	0.0	30.5	19.6	0.0	0.3	20.3	25.1	12.5	21.9	4.2
Cycle Q Clear(g_c), s	7.0	12.8	0.0	30.5	19.6	0.0	4.3	20.3	25.1	12.5	21.9	4.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	346	769		618	1408		245	449	383	301	727	621
V/C Ratio(X)	0.39	0.55		1.01	0.54		0.01	0.75	0.89	0.86	0.59	0.14
Avail Cap(c_a), veh/h	384	769		618	1408		286	533	456	301	812	693
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	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.6	41.8	0.0	27.2	27.8	0.0	37.7	42.2	44.0	32.3	28.9	23.5
Incr Delay (d2), s/veh	0.7	2.9	0.0	37.7	1.5	0.0	0.0	5.0	17.8	21.0	0.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	5.8	0.0	19.3	8.2	0.0	0.1	9.6	11.4	7.1	9.5	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.3	44.7	0.0	64.9	29.3	0.0	37.7	47.2	61.8	53.3	29.8	23.6
LnGrp LOS	C	D		F	C		D	D	E	D	C	C
Approach Vol, veh/h	561			1378			684			773		
Approach Delay, s/veh	42.0			45.3			54.5			36.9		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.4	53.0		52.5	36.0	31.5	18.0	34.5				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	11.5	39.5		52.5	30.5	20.5	12.5	34.5				
Max Q Clear Time (g_c+l1), s	9.0	21.6		23.9	32.5	14.8	14.5	27.1				
Green Ext Time (p_c), s	0.1	7.7		2.8	0.0	1.9	0.0	1.9				

Intersection Summary

HCM 6th Ctrl Delay 44.7
HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Timings

6: SR 42/SR 138/US 23 (N. Henry Blvd) & SR 138 (Lake Spivey Pkwy)

2d. No-Build 2027 PM - Improved

01/23/2023

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	248	180	857	187	189	131	637	403	98	96	546
Future Volume (vph)	248	180	857	187	189	131	637	403	98	96	546
Lane Group Flow (vph)	256	186	884	193	195	135	657	415	101	99	708
Turn Type	pm+pt	NA	pt+ov	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	4 1	3	8		1	6		5	2
Permitted Phases	4			8		8			6		
Detector Phase	7	4	4 1	3	8	8	1	6	6	5	2
Switch Phase											
Minimum Initial (s)	5.0	6.0		5.0	6.0	6.0	5.0	15.0	15.0	5.0	15.0
Minimum Split (s)	15.0	31.5		15.0	30.5	30.5	15.0	28.5	28.5	15.0	31.5
Total Split (s)	26.0	62.0		18.0	54.0	54.0	41.0	49.0	49.0	21.0	29.0
Total Split (%)	17.3%	41.3%		12.0%	36.0%	36.0%	27.3%	32.7%	32.7%	14.0%	19.3%
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	None	C-Min
v/c Ratio	0.46	0.26	0.87	0.35	0.30	0.20	0.85	0.73	0.17	0.64	1.19
Control Delay	25.1	33.4	33.0	24.1	38.4	2.2	67.2	55.9	2.6	84.9	152.7
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	25.1	33.4	33.0	24.1	38.4	2.2	67.2	55.9	2.6	84.9	152.7
Queue Length 50th (ft)	144	125	647	104	141	0	315	367	0	95	~454
Queue Length 95th (ft)	208	188	907	157	215	19	390	507	18	158	#586
Internal Link Dist (ft)		2539			205			2663			944
Turn Bay Length (ft)	165			100		120	340		300	580	
Base Capacity (vph)	585	719	1032	562	652	671	812	567	586	184	594
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	0.44	0.26	0.86	0.34	0.30	0.20	0.81	0.73	0.17	0.54	1.19

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green

Natural Cycle: 115

Control Type: Actuated-Coordinated

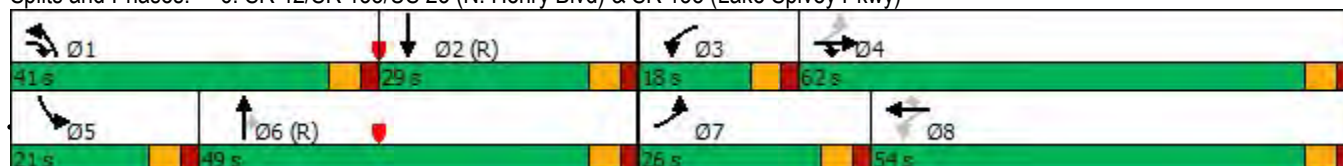
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 6: SR 42/SR 138/US 23 (N. Henry Blvd) & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary

2d. No-Build 2027 PM - Improved

6: SR 42/SR 138/US 23 (N. Henry Blvd) & SR 138 (Lake Spivey Pkwy)

01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	248	180	857	187	189	131	637	403	98	96	546	141
Future Volume (veh/h)	248	180	857	187	189	131	637	403	98	96	546	141
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1900	1870	1885	1900	1900	1870	1856	1885	1885	1870	1885
Adj Flow Rate, veh/h	256	186	0	193	195	0	657	415	0	99	563	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	0	2	1	0	0	2	3	1	1	2	1
Cap, veh/h	316	329		299	231		719	982		121	1381	
Arrive On Green	0.13	0.17	0.00	0.08	0.12	0.00	0.21	0.53	0.00	0.07	0.39	0.00
Sat Flow, veh/h	1795	1900	1585	1795	1900	1610	3456	1856	1598	1795	3647	0
Grp Volume(v), veh/h	256	186	0	193	195	0	657	415	0	99	563	0
Grp Sat Flow(s),veh/h/ln	1795	1900	1585	1795	1900	1610	1728	1856	1598	1795	1777	0
Q Serve(g_s), s	18.2	13.5	0.0	12.5	15.1	0.0	27.9	20.3	0.0	8.2	17.3	0.0
Cycle Q Clear(g_c), s	18.2	13.5	0.0	12.5	15.1	0.0	27.9	20.3	0.0	8.2	17.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	316	329		299	231		719	982		121	1381	
V/C Ratio(X)	0.81	0.56		0.65	0.84		0.91	0.42		0.82	0.41	
Avail Cap(c_a), veh/h	319	716		299	614		818	982		186	1381	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.58	0.58	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	47.8	56.8	0.0	54.0	64.5	0.0	58.1	21.4	0.0	69.1	33.3	0.0
Incr Delay (d2), s/veh	8.9	0.9	0.0	4.8	8.1	0.0	13.7	1.3	0.0	15.4	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.8	6.4	0.0	1.1	7.9	0.0	13.3	8.9	0.0	4.2	7.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.7	57.7	0.0	58.7	72.5	0.0	71.8	22.7	0.0	84.4	34.2	0.0
LnGrp LOS	E	E		E	E		E	C		F	C	
Approach Vol, veh/h		442			388			1072			662	
Approach Delay, s/veh		57.1			65.7			52.8			41.7	
Approach LOS		E			E			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	36.7	63.8	18.0	31.5	15.6	84.9	25.7	23.8				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	35.5	23.5	12.5	56.5	15.5	43.5	20.5	48.5				
Max Q Clear Time (g_c+I1), s	29.9	19.3	14.5	15.5	10.2	22.3	20.2	17.1				
Green Ext Time (p_c), s	1.3	2.0	0.0	1.0	0.1	4.3	0.0	1.2				

Intersection Summary

HCM 6th Ctrl Delay 52.6

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings 7: I-675 NB Ramps & SR 138 (Lake Spivey Pkwy)

2d. No-Build 2027 PM - Improved
01/23/2023

						
Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Configurations		 	 			
Traffic Volume (vph)	338	2081	1615	263	48	131
Future Volume (vph)	338	2081	1615	263	48	131
Lane Group Flow (vph)	345	2123	1648	268	49	134
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		3	
Permitted Phases	6			2		8
Detector Phase	1	6	2	2	3	8
Switch Phase						
Minimum Initial (s)	5.0	15.0	15.0	15.0	5.0	6.0
Minimum Split (s)	15.0	28.5	28.5	28.5	15.0	34.5
Total Split (s)	17.0	65.5	48.5	48.5	34.5	34.5
Total Split (%)	17.0%	65.5%	48.5%	48.5%	34.5%	34.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.61	0.76	1.01	0.31	0.30	0.59
Control Delay	22.2	12.9	53.0	4.6	45.6	28.0
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	22.2	13.1	53.0	4.6	45.6	28.0
Queue Length 50th (ft)	172	413	505	12	30	29
Queue Length 95th (ft)	m185	m449	#765	62	62	83
Internal Link Dist (ft)		706	2539			
Turn Bay Length (ft)	145			270		315
Base Capacity (vph)	565	2792	1627	858	513	520
Starvation Cap Reductn	0	110	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.79	1.01	0.31	0.10	0.26

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 13 (13%), Referenced to phase 2:WBT and 6:EBTL, Start of Green

Natural Cycle: 120

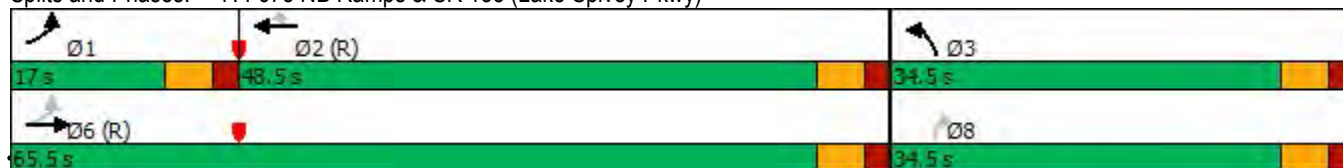
Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: I-675 NB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
7: I-675 NB Ramps & SR 138 (Lake Spivey Pkwy)

2d. No-Build 2027 PM - Improved
01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	338	2081	0	0	1615	263	48	0	131	0	0	0
Future Volume (veh/h)	338	2081	0	0	1615	263	48	0	131	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1870	1856	0	0	1856	1870	1870	0	1870			
Adj Flow Rate, veh/h	345	2123	0	0	1648	0	49	0	134			
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98			
Percent Heavy Veh, %	2	3	0	0	3	2	2	0	2			
Cap, veh/h	360	2762	0	0	2163		190	0	169			
Arrive On Green	0.15	1.00	0.00	0.00	0.61	0.00	0.11	0.00	0.11			
Sat Flow, veh/h	1781	3618	0	0	3618	1585	1781	0	1585			
Grp Volume(v), veh/h	345	2123	0	0	1648	0	49	0	134			
Grp Sat Flow(s),veh/h/ln	1781	1763	0	0	1763	1585	1781	0	1585			
Q Serve(g_s), s	10.4	0.0	0.0	0.0	33.9	0.0	2.5	0.0	8.3			
Cycle Q Clear(g_c), s	10.4	0.0	0.0	0.0	33.9	0.0	2.5	0.0	8.3			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	360	2762	0	0	2163		190	0	169			
V/C Ratio(X)	0.96	0.77	0.00	0.00	0.76		0.26	0.00	0.79			
Avail Cap(c_a), veh/h	360	2762	0	0	2163		517	0	460			
HCM Platoon Ratio	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.09	0.09	0.00	0.00	0.61	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	24.9	0.0	0.0	0.0	14.0	0.0	41.0	0.0	43.6			
Incr Delay (d2), s/veh	7.0	0.2	0.0	0.0	1.6	0.0	0.7	0.0	8.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	8.2	0.1	0.0	0.0	11.6	0.0	1.1	0.0	3.5			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.9	0.2	0.0	0.0	15.6	0.0	41.8	0.0	51.7			
LnGrp LOS	C	A	A	A	B		D	A	D			
Approach Vol, veh/h	2468			1648			183					
Approach Delay, s/veh	4.6			15.6			49.1					
Approach LOS	A			B			D					
Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	17.0	66.8				83.8		16.2				
Change Period (Y+Rc), s	5.5	5.5				5.5		5.5				
Max Green Setting (Gmax), s	11.5	43.0				60.0		29.0				
Max Q Clear Time (g_c+I1), s	12.4	35.9				2.0		10.3				
Green Ext Time (p_c), s	0.0	6.4				49.7		0.5				

Intersection Summary

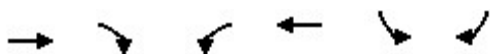
HCM 6th Ctrl Delay	10.7
HCM 6th LOS	B

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Timings 8: I-675 SB Ramps & SR 138 (Lake Spivey Pkwy)

2d. No-Build 2027 PM - Improved
01/23/2023



Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	↓
Traffic Volume (vph)	2023	132	112	1551	396	551
Future Volume (vph)	2023	132	112	1551	396	551
Lane Group Flow (vph)	2086	136	115	1599	408	568
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	7	
Permitted Phases		6	2			4
Detector Phase	6	6	5	2	7	4
Switch Phase						
Minimum Initial (s)	15.0	15.0	5.0	15.0	5.0	6.0
Minimum Split (s)	28.5	28.5	15.0	28.5	35.5	35.5
Total Split (s)	49.5	49.5	15.0	64.5	35.5	35.5
Total Split (%)	49.5%	49.5%	15.0%	64.5%	35.5%	35.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Min	C-Min	None	C-Min	None	None
v/c Ratio	1.13	0.15	0.53	0.69	0.52	0.80
Control Delay	80.1	0.2	35.2	4.1	35.4	39.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.1	0.2	35.2	4.1	35.4	39.4
Queue Length 50th (ft)	~823	0	35	18	117	166
Queue Length 95th (ft)	m#939	m0	m42	m27	150	215
Internal Link Dist (ft)	1959			706		
Turn Bay Length (ft)		375	95		520	500
Base Capacity (vph)	1842	892	242	2313	1029	897
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.13	0.15	0.48	0.69	0.40	0.63

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 24 (24%), Referenced to phase 2:WBTL and 6:EBT, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

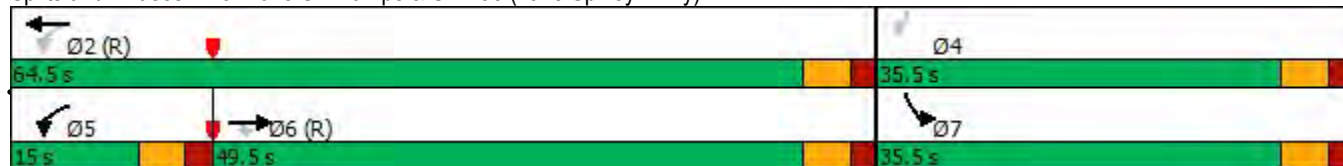
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: I-675 SB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary 8: I-675 SB Ramps & SR 138 (Lake Spivey Pkwy)

2d. No-Build 2027 PM - Improved
01/23/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑					↑↑		↑↑
Traffic Volume (veh/h)	0	2023	132	112	1551	0	0	0	0	396	0	551
Future Volume (veh/h)	0	2023	132	112	1551	0	0	0	0	396	0	551
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1870	1870	1856	0				1870	0	1870
Adj Flow Rate, veh/h	0	2086	136	115	1599	0				408	0	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	3	2	2	3	0				2	0	2
Cap, veh/h	0	2257	1015	268	2620	0				508	0	
Arrive On Green	0.00	1.00	1.00	0.06	0.99	0.00				0.15	0.00	0.00
Sat Flow, veh/h	0	3618	1585	1781	3618	0				3456	0	2790
Grp Volume(v), veh/h	0	2086	136	115	1599	0				408	0	0
Grp Sat Flow(s),veh/h/ln	0	1763	1585	1781	1763	0				1728	0	1395
Q Serve(g_s), s	0.0	0.0	0.0	2.0	1.3	0.0				11.4	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	2.0	1.3	0.0				11.4	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2257	1015	268	2620	0				508	0	
V/C Ratio(X)	0.00	0.92	0.13	0.43	0.61	0.00				0.80	0.00	
Avail Cap(c_a), veh/h	0	2257	1015	352	2620	0				1037	0	
HCM Platoon Ratio	1.00	2.00	2.00	1.33	1.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.09	0.09	0.11	0.11	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	4.5	0.2	0.0				41.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.9	0.0	0.1	0.1	0.0				3.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.3	3.8	0.6	0.2	0.0				4.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.9	0.0	4.7	0.3	0.0				44.3	0.0	0.0
LnGrp LOS	A	A	A	A	A	A				D	A	
Approach Vol, veh/h		2222			1714						408	
Approach Delay, s/veh		0.8			0.6						44.3	
Approach LOS		A			A						D	
Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		79.8		20.2	10.3	69.5						
Change Period (Y+Rc), s		5.5		5.5	5.5	5.5						
Max Green Setting (Gmax), s		59.0		30.0	9.5	44.0						
Max Q Clear Time (g_c+I1), s		3.3		13.4	4.0	2.0						
Green Ext Time (p_c), s		35.6		1.3	0.1	37.6						
Intersection Summary												
HCM 6th Ctrl Delay			4.8									
HCM 6th LOS			A									
Notes												
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.												

Timings
9: SR 138 (Lake Spivey Pkwy) & Mt. Zion Rd

2d. No-Build 2027 PM - Improved
01/23/2023

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↰	↗	↘	↰	↗	↘	↰	↗	↘	↗	↘
Traffic Volume (vph)	160	1618	84	75	1295	169	135	132	179	100	196
Future Volume (vph)	160	1618	84	75	1295	169	135	132	179	100	196
Lane Group Flow (vph)	165	1668	87	77	1335	174	139	246	185	103	202
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8	7	4	
Permitted Phases	6		6	2		2	8		4		4
Detector Phase	1	6	6	5	2	2	3	8	7	4	4
Switch Phase											
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	6.0	5.0	6.0	6.0
Minimum Split (s)	15.0	28.5	28.5	15.0	34.5	34.5	15.0	38.5	15.0	32.5	32.5
Total Split (s)	15.0	31.5	31.5	15.0	31.5	31.5	15.0	38.5	15.0	38.5	38.5
Total Split (%)	15.0%	31.5%	31.5%	15.0%	31.5%	31.5%	15.0%	38.5%	15.0%	38.5%	38.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None
v/c Ratio	0.61	1.04	0.11	0.37	0.94	0.23	0.36	0.73	0.66	0.31	0.45
Control Delay	35.2	50.8	1.8	13.0	37.0	6.8	26.6	44.2	36.8	36.9	8.0
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	35.2	50.8	1.8	13.0	37.0	6.8	26.6	44.2	36.8	36.9	8.0
Queue Length 50th (ft)	64	~618	0	15	427	23	65	124	88	58	0
Queue Length 95th (ft)	m99	#884	m2	m34	#723	m62	100	192	130	98	55
Internal Link Dist (ft)		896			1959			388		1031	
Turn Bay Length (ft)	115		140	155		325	35		345		165
Base Capacity (vph)	280	1610	807	244	1421	755	389	608	282	627	668
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	1.04	0.11	0.32	0.94	0.23	0.36	0.40	0.66	0.16	0.30

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 135

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

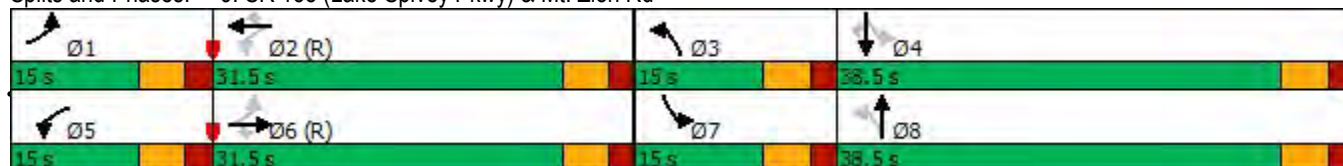
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: SR 138 (Lake Spivey Pkwy) & Mt. Zion Rd



HCM 6th Signalized Intersection Summary

9: SR 138 (Lake Spivey Pkwy) & Mt. Zion Rd

2d. No-Build 2027 PM - Improved

01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	1618	84	75	1295	169	135	132	107	179	100	196
Future Volume (veh/h)	160	1618	84	75	1295	169	135	132	107	179	100	196
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1856	1870	1870	1856	1900	1870	1900	1870	1900	1900	1900
Adj Flow Rate, veh/h	165	1668	0	77	1335	174	139	136	110	185	103	202
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	3	2	2	3	0	2	0	2	0	0	0
Cap, veh/h	226	1664		151	1572	718	363	164	133	283	346	293
Arrive On Green	0.14	0.94	0.00	0.01	0.15	0.15	0.08	0.17	0.17	0.09	0.18	0.18
Sat Flow, veh/h	1810	3526	1585	1781	3526	1610	1781	972	786	1810	1900	1610
Grp Volume(v), veh/h	165	1668	0	77	1335	174	139	0	246	185	103	202
Grp Sat Flow(s),veh/h/ln	1810	1763	1585	1781	1763	1610	1781	0	1758	1810	1900	1610
Q Serve(g_s), s	5.0	47.2	0.0	2.3	36.9	9.6	6.3	0.0	13.5	8.4	4.7	11.7
Cycle Q Clear(g_c), s	5.0	47.2	0.0	2.3	36.9	9.6	6.3	0.0	13.5	8.4	4.7	11.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.45	1.00		1.00
Lane Grp Cap(c), veh/h	226	1664		151	1572	718	363	0	297	283	346	293
V/C Ratio(X)	0.73	1.00		0.51	0.85	0.24	0.38	0.00	0.83	0.65	0.30	0.69
Avail Cap(c_a), veh/h	271	1664		241	1572	718	386	0	580	283	627	531
HCM Platoon Ratio	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.52	0.52	0.00	0.62	0.62	0.62	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.5	2.8	0.0	24.3	39.4	27.7	30.5	0.0	40.1	31.3	35.4	38.3
Incr Delay (d2), s/veh	4.2	16.5	0.0	1.7	3.8	0.5	0.7	0.0	5.8	5.3	0.5	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	4.9	0.0	0.9	18.0	4.2	2.8	0.0	6.3	3.9	2.2	4.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.7	19.4	0.0	25.9	43.2	28.2	31.1	0.0	46.0	36.6	35.8	41.1
LnGrp LOS	C	F		C	D	C	C	A	D	D	D	D
Approach Vol, veh/h	1833				1586				385		490	
Approach Delay, s/veh	19.8				40.7				40.6		38.3	
Approach LOS	B				D				D		D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.5	50.1	13.7	23.7	9.9	52.7	15.0	22.4				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	9.5	26.0	9.5	33.0	9.5	26.0	9.5	33.0				
Max Q Clear Time (g_c+I1), s	7.0	38.9	8.3	13.7	4.3	49.2	10.4	15.5				
Green Ext Time (p_c), s	0.1	0.0	0.0	1.1	0.1	0.0	0.0	1.4				

Intersection Summary

HCM 6th Ctrl Delay	31.5
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Timings
10: I-75 NB Ramps & SR 138 (Lake Spivey Pkwy)

2d. No-Build 2027 PM - Improved
01/23/2023

						
Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	273	1973	1369	518	211	158
Future Volume (vph)	273	1973	1369	518	211	158
Lane Group Flow (vph)	281	2034	1411	534	218	163
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		3	
Permitted Phases	6			2		8
Detector Phase	1	6	2	2	3	8
Switch Phase						
Minimum Initial (s)	5.0	15.0	15.0	15.0	5.0	6.0
Minimum Split (s)	15.0	28.5	28.5	28.5	15.0	32.5
Total Split (s)	20.0	67.5	47.5	47.5	32.5	32.5
Total Split (%)	20.0%	67.5%	47.5%	47.5%	32.5%	32.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.79	0.81	0.80	0.50	0.70	0.47
Control Delay	27.5	16.5	13.4	2.3	50.5	21.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.5	16.5	13.4	2.3	50.5	21.3
Queue Length 50th (ft)	98	711	105	0	132	42
Queue Length 95th (ft)	m149	m755	m#220	m0	196	97
Internal Link Dist (ft)		897	896			
Turn Bay Length (ft)	140			405		510
Base Capacity (vph)	372	2503	1754	1058	477	490
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.81	0.80	0.50	0.46	0.33

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 98 (98%), Referenced to phase 2:WBT and 6:EBTL, Start of Green

Natural Cycle: 90

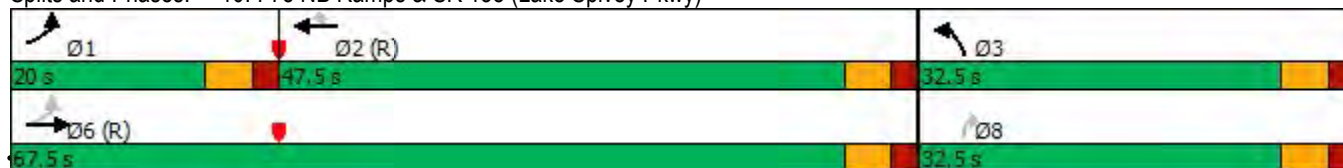
Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: I-75 NB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
10: I-75 NB Ramps & SR 138 (Lake Spivey Pkwy)

2d. No-Build 2027 PM - Improved
01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Traffic Volume (veh/h)	273	1973	0	0	1369	518	211	0	158	0	0	0
Future Volume (veh/h)	273	1973	0	0	1369	518	211	0	158	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1870	1856	0	0	1856	1870	1870	0	1870			
Adj Flow Rate, veh/h	281	2034	0	0	1411	0	218	0	0			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	2	3	0	0	3	2	2	0	2			
Cap, veh/h	385	2631	0	0	2160		256	0				
Arrive On Green	0.08	0.75	0.00	0.00	0.81	0.00	0.14	0.00	0.00			
Sat Flow, veh/h	1781	3618	0	0	3618	1585	1781	0	1585			
Grp Volume(v), veh/h	281	2034	0	0	1411	0	218	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1763	0	0	1763	1585	1781	0	1585			
Q Serve(g_s), s	5.4	34.6	0.0	0.0	15.8	0.0	11.9	0.0	0.0			
Cycle Q Clear(g_c), s	5.4	34.6	0.0	0.0	15.8	0.0	11.9	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	385	2631	0	0	2160		256	0				
V/C Ratio(X)	0.73	0.77	0.00	0.00	0.65		0.85	0.00				
Avail Cap(c_a), veh/h	503	2631	0	0	2160		481	0				
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.33	1.33	1.00	1.00	1.00			
Upstream Filter(I)	0.29	0.29	0.00	0.00	0.44	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	11.0	7.6	0.0	0.0	5.1	0.0	41.8	0.0	0.0			
Incr Delay (d2), s/veh	1.1	0.7	0.0	0.0	0.7	0.0	7.8	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.6	8.6	0.0	0.0	3.2	0.0	5.6	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.1	8.3	0.0	0.0	5.7	0.0	49.6	0.0	0.0			
LnGrp LOS	B	A	A	A	A		D	A				
Approach Vol, veh/h	2315			1411			218					
Approach Delay, s/veh	8.7			5.7			49.6					
Approach LOS	A			A			D					
Timer - Assigned Phs	1	2					6	8				
Phs Duration (G+Y+Rc), s	13.4	66.8					80.1	19.9				
Change Period (Y+Rc), s	5.5	5.5					5.5	5.5				
Max Green Setting (Gmax), s	14.5	42.0					62.0	27.0				
Max Q Clear Time (g_c+I1), s	7.4	17.8					36.6	13.9				
Green Ext Time (p_c), s	0.5	17.3					23.1	0.5				

Intersection Summary

HCM 6th Ctrl Delay	9.9
HCM 6th LOS	A

Notes

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Timings
11: I-75 SB Ramps & SR 138 (Lake Spivey Pkwy)

2d. No-Build 2027 PM - Improved
01/23/2023

	→	↘	↙	←	↘	↙
Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↘
Traffic Volume (vph)	1391	331	182	1426	824	589
Future Volume (vph)	1391	331	182	1426	824	589
Lane Group Flow (vph)	1434	341	188	1470	849	607
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	3	
Permitted Phases		6	2			8
Detector Phase	6	6	5	2	3	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	5.0	15.0	5.0	15.0
Minimum Split (s)	28.5	28.5	15.0	28.5	15.0	28.5
Total Split (s)	45.3	45.3	15.0	60.3	39.7	39.7
Total Split (%)	45.3%	45.3%	15.0%	60.3%	39.7%	39.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Min	C-Min	None	C-Min	None	Min
v/c Ratio	1.02	0.41	0.79	0.77	0.72	1.02
Control Delay	60.9	3.8	38.0	11.9	33.0	70.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.9	3.8	38.0	11.9	33.0	70.1
Queue Length 50th (ft)	~517	0	53	381	241	~354
Queue Length 95th (ft)	#652	53	m88	543	312	#586
Internal Link Dist (ft)	1158			897		
Turn Bay Length (ft)		980	150		490	
Base Capacity (vph)	1401	837	242	1920	1174	598
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.41	0.78	0.77	0.72	1.02

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 35 (35%), Referenced to phase 2:WBTL and 6:EBT, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

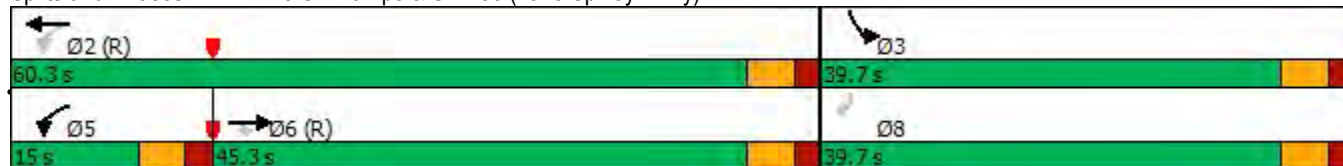
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

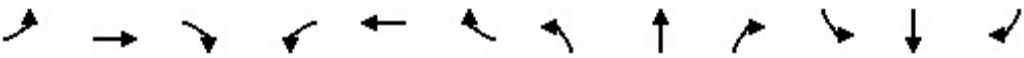
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 11: I-75 SB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
11: I-75 SB Ramps & SR 138 (Lake Spivey Pkwy)

2d. No-Build 2027 PM - Improved
01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑					↖↗		↗
Traffic Volume (veh/h)	0	1391	331	182	1426	0	0	0	0	824	0	589
Future Volume (veh/h)	0	1391	331	182	1426	0	0	0	0	824	0	589
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1870	1870	1856	0				1870	0	1870
Adj Flow Rate, veh/h	0	1434	0	188	1470	0				849	0	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	3	2	2	3	0				2	0	2
Cap, veh/h	0	1719		246	2158	0				960	0	
Arrive On Green	0.00	0.49	0.00	0.02	0.20	0.00				0.28	0.00	0.00
Sat Flow, veh/h	0	3618	1585	1781	3618	0				3456	0	1585
Grp Volume(v), veh/h	0	1434	0	188	1470	0				849	0	0
Grp Sat Flow(s),veh/h/ln	0	1763	1585	1781	1763	0				1728	0	1585
Q Serve(g_s), s	0.0	35.1	0.0	4.9	38.6	0.0				23.5	0.0	0.0
Cycle Q Clear(g_c), s	0.0	35.1	0.0	4.9	38.6	0.0				23.5	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1719		246	2158	0				960	0	
V/C Ratio(X)	0.00	0.83		0.76	0.68	0.00				0.88	0.00	
Avail Cap(c_a), veh/h	0	1719		292	2158	0				1182	0	
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.70	0.00	0.51	0.51	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	22.1	0.0	22.2	30.9	0.0				34.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	3.5	0.0	5.0	0.9	0.0				7.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	13.7	0.0	2.4	18.2	0.0				10.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	25.6	0.0	27.2	31.8	0.0				41.6	0.0	0.0
LnGrp LOS	A	C		C	C	A				D	A	
Approach Vol, veh/h		1434			1658						849	
Approach Delay, s/veh		25.6			31.3						41.6	
Approach LOS		C			C						D	
Timer - Assigned Phs		2			5	6			8			
Phs Duration (G+Y+Rc), s		66.7			12.4	54.3			33.3			
Change Period (Y+Rc), s		5.5			5.5	5.5			5.5			
Max Green Setting (Gmax), s		54.8			9.5	39.8			34.2			
Max Q Clear Time (g_c+I1), s		40.6			6.9	37.1			25.5			
Green Ext Time (p_c), s		11.6			0.1	2.4			2.3			

Intersection Summary

HCM 6th Ctrl Delay	31.4
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings

2d. No-Build 2027 PM - Improved

12: Speer Rd/Mt. Zion Pkwy & SR 138 (Lake Spivey Pkwy)

01/23/2023

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↕	↗	↔↔	↕↕	↗	↔↔	↕↕	↗	↔↔	↕↕	↗
Traffic Volume (vph)	178	865	90	596	988	198	65	186	330	377	338	151
Future Volume (vph)	178	865	90	596	988	198	65	186	330	377	338	151
Lane Group Flow (vph)	185	901	94	621	1029	206	68	194	344	393	352	157
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free	Prot	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2			Free			4
Detector Phase	1	6	6	5	2	2	3	8		7	4	4
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	6.0		5.0	6.0	6.0
Minimum Split (s)	15.0	46.5	46.5	15.0	47.5	47.5	15.0	46.5		15.0	45.5	45.5
Total Split (s)	14.0	28.0	28.0	27.0	41.0	41.0	20.5	36.5		28.5	44.5	44.5
Total Split (%)	11.7%	23.3%	23.3%	22.5%	34.2%	34.2%	17.1%	30.4%		23.8%	37.1%	37.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5		5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None		None	None	None
v/c Ratio	0.54	0.80	0.14	0.75	0.64	0.25	0.30	0.55	0.22	0.73	0.47	0.34
Control Delay	56.9	44.6	0.4	48.4	28.5	4.0	56.6	57.2	0.3	56.4	43.7	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.9	44.6	0.4	48.4	28.5	4.0	56.6	57.2	0.3	56.4	43.7	6.3
Queue Length 50th (ft)	71	333	0	230	313	0	26	76	0	151	130	0
Queue Length 95th (ft)	106	#547	0	286	453	49	49	112	0	197	168	44
Internal Link Dist (ft)		1890			1158			635			523	
Turn Bay Length (ft)	345		290	290		930	195		550	270		270
Base Capacity (vph)	343	1132	672	832	1614	840	429	914	1583	657	1173	631
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.80	0.14	0.75	0.64	0.25	0.16	0.21	0.22	0.60	0.30	0.25

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Green

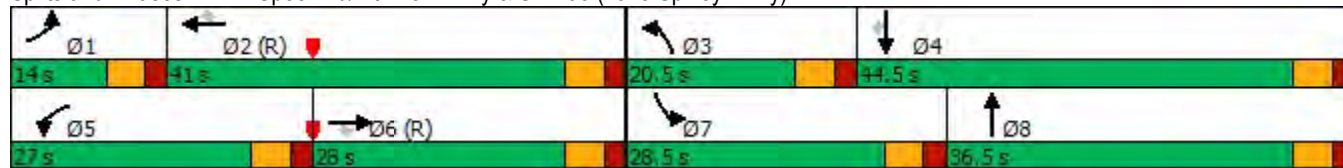
Natural Cycle: 145

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 12: Speer Rd/Mt. Zion Pkwy & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary 12: Speer Rd/Mt. Zion Pkwy & SR 138 (Lake Spivey Pkwy)

2d. No-Build 2027 PM - Improved
01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	178	865	90	596	988	198	65	186	330	377	338	151
Future Volume (veh/h)	178	865	90	596	988	198	65	186	330	377	338	151
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1856	1900	1900	1856	1870	1870	1870	1870	1870	1900	1870
Adj Flow Rate, veh/h	185	901	94	621	1029	206	68	194	0	393	352	157
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	3	0	0	3	2	2	2	2	2	0	2
Cap, veh/h	239	1496	683	629	1884	847	129	278		466	634	279
Arrive On Green	0.07	0.42	0.42	0.18	0.53	0.53	0.04	0.08	0.00	0.13	0.18	0.18
Sat Flow, veh/h	3456	3526	1610	3510	3526	1585	3456	3554	1585	3456	3610	1585
Grp Volume(v), veh/h	185	901	94	621	1029	206	68	194	0	393	352	157
Grp Sat Flow(s),veh/h/ln	1728	1763	1610	1755	1763	1585	1728	1777	1585	1728	1805	1585
Q Serve(g_s), s	6.3	23.7	4.3	21.2	23.0	8.3	2.3	6.4	0.0	13.3	10.7	10.9
Cycle Q Clear(g_c), s	6.3	23.7	4.3	21.2	23.0	8.3	2.3	6.4	0.0	13.3	10.7	10.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	239	1496	683	629	1884	847	129	278		466	634	279
V/C Ratio(X)	0.77	0.60	0.14	0.99	0.55	0.24	0.53	0.70		0.84	0.55	0.56
Avail Cap(c_a), veh/h	245	1496	683	629	1884	847	432	918		662	1173	515
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.81	0.81	0.81	0.43	0.43	0.43	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.9	26.7	21.1	49.1	18.4	15.0	56.7	53.9	0.0	50.7	45.2	45.2
Incr Delay (d2), s/veh	11.5	1.5	0.3	20.5	0.5	0.3	3.3	3.1	0.0	6.9	0.8	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	9.8	1.6	10.8	8.8	0.1	1.0	2.9	0.0	6.1	4.7	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.4	28.2	21.5	69.6	18.9	15.2	60.0	57.1	0.0	57.6	45.9	47.0
LnGrp LOS	E	C	C	E	B	B	E	E		E	D	D
Approach Vol, veh/h	1180			1856			262			902		
Approach Delay, s/veh	33.6			35.4			57.8			51.2		
Approach LOS	C			D			E			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.8	69.6	10.0	26.6	27.0	56.4	21.7	14.9				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	8.5	35.5	15.0	39.0	21.5	22.5	23.0	31.0				
Max Q Clear Time (g_c+I1), s	8.3	25.0	4.3	12.9	23.2	25.7	15.3	8.4				
Green Ext Time (p_c), s	0.0	7.6	0.1	2.6	0.0	0.0	0.9	1.0				

Intersection Summary

HCM 6th Ctrl Delay	39.7
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Timings
13: Spivey Rd & SR 138 (Lake Spivey Pkwy)

2d. No-Build 2027 PM - Improved
01/23/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↗
Traffic Volume (vph)	876	35	360	907	16	215
Future Volume (vph)	876	35	360	907	16	215
Lane Group Flow (vph)	984	39	404	1019	18	242
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	8	
Permitted Phases		6	2			8
Detector Phase	6	6	5	2	8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0	6.0
Minimum Split (s)	25.5	25.5	15.0	23.5	31.5	31.5
Total Split (s)	40.4	40.4	28.0	68.4	31.6	31.6
Total Split (%)	40.4%	40.4%	28.0%	68.4%	31.6%	31.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Min	C-Min	None	C-Min	None	None
v/c Ratio	0.53	0.05	0.67	0.36	0.12	0.69
Control Delay	18.5	5.9	13.3	3.3	42.2	16.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.5	5.9	13.3	3.3	42.2	16.1
Queue Length 50th (ft)	196	0	62	60	11	0
Queue Length 95th (ft)	345	20	177	126	30	66
Internal Link Dist (ft)	1639			1890	1094	
Turn Bay Length (ft)		230	535			220
Base Capacity (vph)	1865	860	643	2828	461	592
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.05	0.63	0.36	0.04	0.41

Intersection Summary

Cycle Length: 100

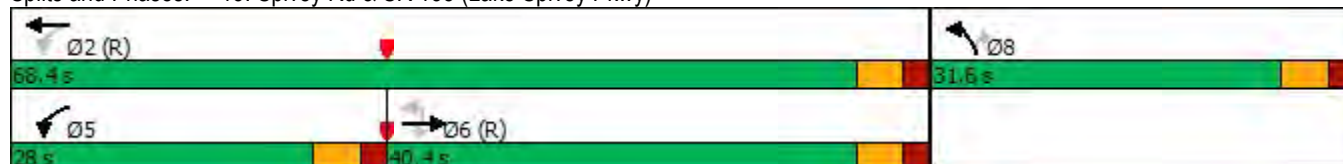
Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTU, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Splits and Phases: 13: Spivey Rd & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
13: Spivey Rd & SR 138 (Lake Spivey Pkwy)

2d. No-Build 2027 PM - Improved
01/23/2023



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	⇐	⇐⇐	⇐	⇐	⇐⇐	⇐	⇐
Traffic Volume (veh/h)	0	876	35	360	907	16	215
Future Volume (veh/h)	0	876	35	360	907	16	215
Initial Q (Qb), veh		0	0	0	0	0	0
Ped-Bike Adj(A_pbT)			1.00	1.00		1.00	1.00
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No	No	
Adj Sat Flow, veh/h/ln		1856	1870	1870	1856	1870	1870
Adj Flow Rate, veh/h		984	0	404	1019	18	0
Peak Hour Factor		0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %		3	2	2	3	2	2
Cap, veh/h		2578		573	3054	42	
Arrive On Green		0.73	0.00	0.08	0.87	0.02	0.00
Sat Flow, veh/h		3618	1585	1781	3618	1781	1585
Grp Volume(v), veh/h		984	0	404	1019	18	0
Grp Sat Flow(s),veh/h/ln		1763	1585	1781	1763	1781	1585
Q Serve(g_s), s		10.4	0.0	4.9	5.4	1.0	0.0
Cycle Q Clear(g_c), s		10.4	0.0	4.9	5.4	1.0	0.0
Prop In Lane			1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h		2578		573	3054	42	
V/C Ratio(X)		0.38		0.70	0.33	0.43	
Avail Cap(c_a), veh/h		2578		831	3054	465	
HCM Platoon Ratio		1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	0.00	0.79	0.79	1.00	0.00
Uniform Delay (d), s/veh		5.0	0.0	4.5	1.3	48.2	0.0
Incr Delay (d2), s/veh		0.4	0.0	1.3	0.2	6.7	0.0
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		2.8	0.0	0.8	0.2	0.5	0.0
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh		5.4	0.0	5.7	1.5	54.9	0.0
LnGrp LOS		A		A	A	D	
Approach Vol, veh/h		984			1423	18	
Approach Delay, s/veh		5.4			2.7	54.9	
Approach LOS		A			A	D	
Timer - Assigned Phs		2			5	6	8
Phs Duration (G+Y+Rc), s		92.1			13.5	78.6	7.9
Change Period (Y+Rc), s		5.5			5.5	5.5	5.5
Max Green Setting (Gmax), s		62.9			22.5	34.9	26.1
Max Q Clear Time (g_c+I1), s		7.4			6.9	12.4	3.0
Green Ext Time (p_c), s		18.2			1.1	11.7	0.0

Intersection Summary

HCM 6th Ctrl Delay	4.2
HCM 6th LOS	A

Notes

User approved ignoring U-Turning movement.

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Timings
14: Blackhall Rd/Speer Rd & Walt Stephens Rd

2d. No-Build 2027 PM - Improved
01/23/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	338	65	103	222	247	61	201	101	442	337	15
Future Volume (vph)	30	338	65	103	222	247	61	201	101	442	337	15
Lane Group Flow (vph)	31	352	68	107	231	257	64	209	105	460	351	16
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		6			2		3	8		7	4	
Permitted Phases	6		6	2		2	8		8	4		4
Detector Phase	6	6	6	2	2	2	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0	15.0	5.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	23.5	23.5	23.5	23.5	23.5	23.5	15.0	23.5	23.5	15.0	23.5	23.5
Total Split (s)	39.0	39.0	39.0	39.0	39.0	39.0	15.0	26.0	26.0	35.0	46.0	46.0
Total Split (%)	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	15.0%	26.0%	26.0%	35.0%	46.0%	46.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.07	0.47	0.09	0.34	0.31	0.32	0.22	0.70	0.28	0.76	0.50	0.02
Control Delay	22.1	26.1	0.2	16.9	14.5	2.3	17.3	52.0	4.1	26.2	26.5	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.1	26.1	0.2	16.9	14.5	2.3	17.3	52.0	4.1	26.2	26.5	0.1
Queue Length 50th (ft)	12	166	0	34	75	10	20	127	0	190	172	0
Queue Length 95th (ft)	35	274	0	m53	m105	m24	37	195	20	246	239	0
Internal Link Dist (ft)		2027			3745			1264			1872	
Turn Bay Length (ft)	110		160	190		250	140		125	315		120
Base Capacity (vph)	424	755	729	318	755	794	332	381	441	636	756	694
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.47	0.09	0.34	0.31	0.32	0.19	0.55	0.24	0.72	0.46	0.02

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

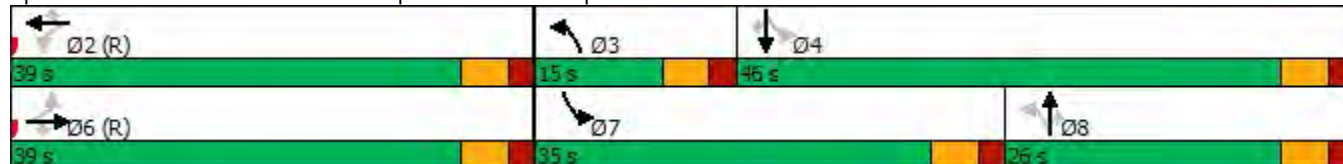
Offset: 98 (98%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: Blackhall Rd/Speer Rd & Walt Stephens Rd



HCM 6th Signalized Intersection Summary 14: Blackhall Rd/Speer Rd & Walt Stephens Rd

2d. No-Build 2027 PM - Improved
01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	338	65	103	222	247	61	201	101	442	337	15
Future Volume (veh/h)	30	338	65	103	222	247	61	201	101	442	337	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	31	352	68	107	231	257	64	209	0	460	351	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	422	863	731	397	863	731	286	251		528	620	
Arrive On Green	0.46	0.46	0.46	0.46	0.46	0.46	0.04	0.13	0.00	0.24	0.33	0.00
Sat Flow, veh/h	908	1870	1585	967	1870	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	31	352	68	107	231	257	64	209	0	460	351	0
Grp Sat Flow(s),veh/h/ln	908	1870	1585	967	1870	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	2.2	12.5	2.4	8.3	7.6	10.4	3.1	10.9	0.0	21.1	15.4	0.0
Cycle Q Clear(g_c), s	9.8	12.5	2.4	20.8	7.6	10.4	3.1	10.9	0.0	21.1	15.4	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	422	863	731	397	863	731	286	251		528	620	
V/C Ratio(X)	0.07	0.41	0.09	0.27	0.27	0.35	0.22	0.83		0.87	0.57	
Avail Cap(c_a), veh/h	422	863	731	397	863	731	380	383		627	757	
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	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	19.6	17.9	15.2	24.8	16.6	17.3	35.1	42.2	0.0	25.9	27.5	0.0
Incr Delay (d2), s/veh	0.3	1.4	0.3	1.7	0.8	1.3	0.4	9.0	0.0	11.2	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	5.3	0.9	2.0	3.2	3.8	1.3	5.4	0.0	9.9	6.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.9	19.3	15.4	26.4	17.3	18.7	35.5	51.2	0.0	37.1	28.3	0.0
LnGrp LOS	B	B	B	C	B	B	D	D		D	C	
Approach Vol, veh/h	451			595			273			811		
Approach Delay, s/veh	18.8			19.5			47.5			33.3		
Approach LOS	B			B			D			C		
Timer - Assigned Phs	2			3			4			6		
Phs Duration (G+Y+Rc), s	51.6			9.7			38.6			51.6		
Change Period (Y+Rc), s	5.5			5.5			5.5			5.5		
Max Green Setting (Gmax), s	33.5			9.5			40.5			33.5		
Max Q Clear Time (g_c+I1), s	22.8			5.1			17.4			14.5		
Green Ext Time (p_c), s	3.7			0.0			1.8			4.2		
Intersection Summary												
HCM 6th Ctrl Delay	28.2											
HCM 6th LOS	C											

Future “Build” Intersections Analysis

Timings

3a. Build 2027 AM

1: Flippen Rd/Shields Rd & SR 42/SR 138/US 23 (N. Henry Blvd)

01/18/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	←	↑↑	←	↑↑		↑↑	←		↑↑
Traffic Volume (vph)	8	686	167	1232	381	23	154	19	31
Future Volume (vph)	8	686	167	1232	381	23	154	19	31
Lane Group Flow (vph)	8	891	176	1309	0	425	162	0	69
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	Perm	NA
Protected Phases	1	6	5	2		8			4
Permitted Phases	6		2		8		8	4	
Detector Phase	1	6	5	2	8	8	8	4	4
Switch Phase									
Minimum Initial (s)	5.0	15.0	5.0	15.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	15.0	28.5	15.0	28.5	30.5	30.5	30.5	30.5	30.5
Total Split (s)	15.0	35.0	15.0	35.0	50.0	50.0	50.0	50.0	50.0
Total Split (%)	15.0%	35.0%	15.0%	35.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5		5.5	5.5		5.5
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	C-Min	None	C-Min	None	None	None	None	None
v/c Ratio	0.05	0.73	0.64	0.78		0.87	0.25		0.11
Control Delay	16.2	33.3	27.9	28.2		49.4	12.1		14.3
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Delay	16.2	33.3	27.9	28.2		49.4	12.1		14.3
Queue Length 50th (ft)	3	267	62	348		275	32		20
Queue Length 95th (ft)	11	#385	#142	#660		382	89		45
Internal Link Dist (ft)		2570		1632		2093			641
Turn Bay Length (ft)	135		210				25		
Base Capacity (vph)	242	1216	280	1673		565	746		694
Starvation Cap Reductn	0	0	0	0		0	0		0
Spillback Cap Reductn	0	0	0	0		0	0		0
Storage Cap Reductn	0	0	0	0		0	0		0
Reduced v/c Ratio	0.03	0.73	0.63	0.78		0.75	0.22		0.10

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

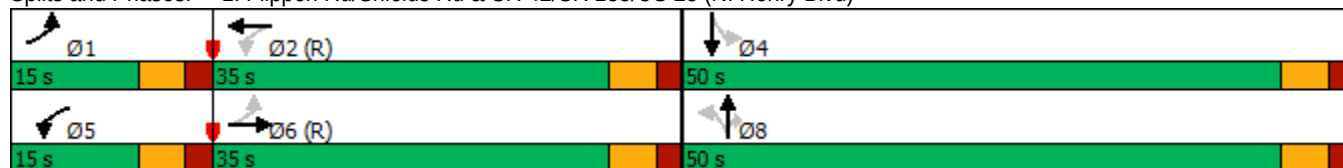
Natural Cycle: 90

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Flippen Rd/Shields Rd & SR 42/SR 138/US 23 (N. Henry Blvd)



HCM 6th Signalized Intersection Summary

3a. Build 2027 AM

1: Flippen Rd/Shields Rd & SR 42/SR 138/US 23 (N. Henry Blvd)

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	686	161	167	1232	11	381	23	154	19	31	15
Future Volume (veh/h)	8	686	161	167	1232	11	381	23	154	19	31	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1841	1856	1856	1841	1870	1856	1870	1856	1870	1870	1870
Adj Flow Rate, veh/h	8	722	169	176	1297	12	401	24	162	20	33	16
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
Percent Heavy Veh, %	2	4	3	3	4	2	3	2	3	2	2	2
Cap, veh/h	99	858	201	262	1349	12	311	14	700	46	68	20
Arrive On Green	0.01	0.30	0.30	0.09	0.38	0.38	0.44	0.44	0.44	0.44	0.44	0.44
Sat Flow, veh/h	1781	2813	658	1767	3551	33	541	32	1572	0	152	46
Grp Volume(v), veh/h	8	449	442	176	639	670	425	0	162	69	0	0
Grp Sat Flow(s),veh/h/ln	1781	1749	1722	1767	1749	1835	573	0	1572	198	0	0
Q Serve(g_s), s	0.3	24.0	24.0	6.5	35.7	35.7	0.0	0.0	6.4	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.3	24.0	24.0	6.5	35.7	35.7	44.5	0.0	6.4	44.5	0.0	0.0
Prop In Lane	1.00		0.38	1.00		0.02	0.94		1.00	0.29		0.23
Lane Grp Cap(c), veh/h	99	533	525	262	665	697	325	0	700	134	0	0
V/C Ratio(X)	0.08	0.84	0.84	0.67	0.96	0.96	1.31	0.00	0.23	0.51	0.00	0.00
Avail Cap(c_a), veh/h	251	533	525	280	665	697	325	0	700	134	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	27.6	32.5	32.5	23.9	30.3	30.3	32.5	0.0	17.2	23.9	0.0	0.0
Incr Delay (d2), s/veh	0.3	14.8	15.1	5.6	26.6	25.8	159.1	0.0	0.2	3.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	11.7	11.6	2.9	18.7	19.4	22.4	0.0	2.3	1.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.0	47.3	47.6	29.5	56.8	56.1	191.6	0.0	17.3	27.2	0.0	0.0
LnGrp LOS	C	D	D	C	E	E	F	A	B	C	A	A
Approach Vol, veh/h	899				1485				587			
Approach Delay, s/veh	47.3				53.3				143.5			
Approach LOS	D				D				F			
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.5	43.5		50.0	14.0	36.0		50.0				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	9.5	29.5		44.5	9.5	29.5		44.5				
Max Q Clear Time (g_c+I1), s	2.3	37.7		46.5	8.5	26.0		46.5				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	2.4		0.0				
Intersection Summary												
HCM 6th Ctrl Delay	68.3											
HCM 6th LOS	E											

Intersection												
Int Delay, s/veh	3.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱	↰	↱			↰	↱
Traffic Vol, veh/h	56	0	68	9	0	20	24	563	5	8	400	19
Future Vol, veh/h	56	0	68	9	0	20	24	563	5	8	400	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	150	-	-	-	235	-	-	-	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	3	2	2	3	2
Mvmt Flow	60	0	72	10	0	21	26	599	5	9	426	20

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1108	1100	426	1144	1118	602	446	0	0	604	0	0
Stage 1	444	444	-	654	654	-	-	-	-	-	-	-
Stage 2	664	656	-	490	464	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	187	212	628	177	207	500	1114	-	-	974	-	-
Stage 1	593	575	-	456	463	-	-	-	-	-	-	-
Stage 2	450	462	-	560	564	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	174	205	628	152	200	500	1114	-	-	974	-	-
Mov Cap-2 Maneuver	174	205	-	152	200	-	-	-	-	-	-	-
Stage 1	579	568	-	446	452	-	-	-	-	-	-	-
Stage 2	421	451	-	490	557	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	22.6		18.8		0.3		0.2	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1114	-	-	174	628	292	974	-	-
HCM Lane V/C Ratio	0.023	-	-	0.342	0.115	0.106	0.009	-	-
HCM Control Delay (s)	8.3	-	-	36.1	11.5	18.8	8.7	0	-
HCM Lane LOS	A	-	-	E	B	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.4	0.4	0.4	0	-	-

Intersection												
Int Delay, s/veh	0.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	↗
Traffic Vol, veh/h	4	1	5	0	1	0	6	590	2	0	473	5
Future Vol, veh/h	4	1	5	0	1	0	6	590	2	0	473	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	3	2	2	3	2
Mvmt Flow	4	1	5	0	1	0	6	634	2	0	509	5

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1157	1157	509	1162	1161	635	514	0	0	636	0	0
Stage 1	509	509	-	647	647	-	-	-	-	-	-	-
Stage 2	648	648	-	515	514	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	173	196	564	172	195	478	1052	-	-	947	-	-
Stage 1	547	538	-	460	467	-	-	-	-	-	-	-
Stage 2	459	466	-	543	535	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	171	194	564	169	193	478	1052	-	-	947	-	-
Mov Cap-2 Maneuver	171	194	-	169	193	-	-	-	-	-	-	-
Stage 1	542	538	-	456	463	-	-	-	-	-	-	-
Stage 2	454	462	-	537	535	-	-	-	-	-	-	-

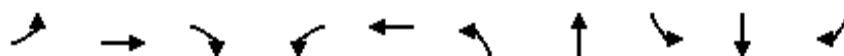
Approach	EB	WB	NB	SB
HCM Control Delay, s	19	23.8	0.1	0
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1052	-	-	267	193	947	-
HCM Lane V/C Ratio	0.006	-	-	0.04	0.006	-	-
HCM Control Delay (s)	8.4	0	-	19	23.8	0	-
HCM Lane LOS	A	A	-	C	C	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	-

Timings 4: Flippen Rd & Walt Stephens Rd/Red Oak Rd

3a. Build 2027 AM

01/18/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	184	90	342	9	99	321	328	36	298	244
Future Volume (vph)	184	90	342	9	99	321	328	36	298	244
Lane Group Flow (vph)	192	94	356	9	141	334	360	38	310	254
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4		3	8	1	6	5	2	
Permitted Phases	4		4	8		6		2		2
Detector Phase	7	4	4	3	8	1	6	5	2	2
Switch Phase										
Minimum Initial (s)	5.0	6.0	6.0	5.0	6.0	5.0	15.0	5.0	15.0	15.0
Minimum Split (s)	15.0	31.5	31.5	15.0	30.5	15.0	31.5	15.0	28.5	28.5
Total Split (s)	15.0	32.0	32.0	15.0	32.0	22.0	38.0	15.0	31.0	31.0
Total Split (%)	15.0%	32.0%	32.0%	15.0%	32.0%	22.0%	38.0%	15.0%	31.0%	31.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
v/c Ratio	0.62	0.20	0.54	0.03	0.60	0.54	0.36	0.07	0.41	0.31
Control Delay	37.4	30.4	9.5	25.1	46.0	16.5	13.2	9.8	20.8	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.4	30.4	9.5	25.1	46.0	16.5	13.2	9.8	20.8	3.0
Queue Length 50th (ft)	98	42	17	4	75	86	91	7	92	0
Queue Length 95th (ft)	m127	m83	m73	15	130	188	182	m18	m219	m13
Internal Link Dist (ft)		646			1291		2204		704	
Turn Bay Length (ft)	180		345	110		130		120		215
Base Capacity (vph)	312	506	689	326	493	645	997	583	753	810
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.19	0.52	0.03	0.29	0.52	0.36	0.07	0.41	0.31

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

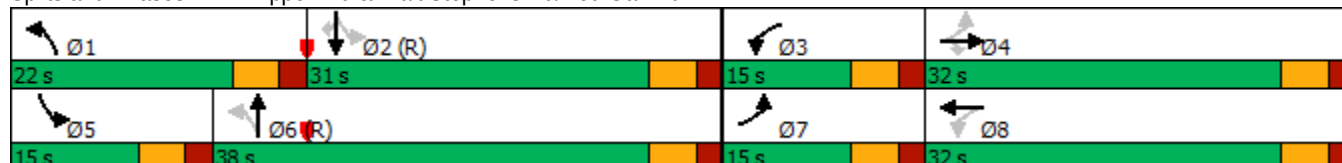
Offset: 96 (96%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Flippen Rd & Walt Stephens Rd/Red Oak Rd



HCM 6th Signalized Intersection Summary

4: Flippen Rd & Walt Stephens Rd/Red Oak Rd

3a. Build 2027 AM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	184	90	342	9	99	36	321	328	17	36	298	244
Future Volume (veh/h)	184	90	342	9	99	36	321	328	17	36	298	244
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1870	1900	1856	1870	1870	1856	1900
Adj Flow Rate, veh/h	192	94	0	9	103	38	334	342	18	38	310	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	0	2	0	3	2	2	3	0
Cap, veh/h	274	347		224	135	50	673	962	51	581	870	
Arrive On Green	0.09	0.19	0.00	0.01	0.10	0.10	0.11	0.55	0.55	0.03	0.47	0.00
Sat Flow, veh/h	1781	1870	1585	1781	1324	488	1810	1747	92	1781	1856	1610
Grp Volume(v), veh/h	192	94	0	9	0	141	334	0	360	38	310	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1812	1810	0	1839	1781	1856	1610
Q Serve(g_s), s	9.5	4.3	0.0	0.5	0.0	7.6	9.0	0.0	10.9	1.1	10.7	0.0
Cycle Q Clear(g_c), s	9.5	4.3	0.0	0.5	0.0	7.6	9.0	0.0	10.9	1.1	10.7	0.0
Prop In Lane	1.00		1.00	1.00		0.27	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	274	347		224	0	184	673	0	1013	581	870	
V/C Ratio(X)	0.70	0.27		0.04	0.00	0.77	0.50	0.00	0.36	0.07	0.36	
Avail Cap(c_a), veh/h	274	496		374	0	480	764	0	1013	692	870	
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	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	34.9	34.9	0.0	39.6	0.0	43.8	10.8	0.0	12.5	12.7	16.9	0.0
Incr Delay (d2), s/veh	7.8	0.4	0.0	0.1	0.0	6.5	0.6	0.0	1.0	0.0	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	1.9	0.0	0.2	0.0	3.7	3.1	0.0	4.3	0.4	4.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.7	35.3	0.0	39.6	0.0	50.2	11.4	0.0	13.5	12.8	18.1	0.0
LnGrp LOS	D	D		D	A	D	B	A	B	B	B	
Approach Vol, veh/h	286			150			694			348		
Approach Delay, s/veh	40.3			49.6			12.5			17.5		
Approach LOS	D			D			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.0	52.4	6.6	24.1	8.8	60.6	15.0	15.7				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	16.5	25.5	9.5	26.5	9.5	32.5	9.5	26.5				
Max Q Clear Time (g_c+I1), s	11.0	12.7	2.5	6.3	3.1	12.9	11.5	9.6				
Green Ext Time (p_c), s	0.5	2.3	0.0	0.3	0.0	3.5	0.0	0.6				
Intersection Summary												
HCM 6th Ctrl Delay	22.8											
HCM 6th LOS	C											

Timings 5: Flippen Rd & Hudson Bridge Rd

3a. Build 2027 AM

01/18/2023

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	81	411	189	281	180	3	278	488	275	314	92
Future Volume (vph)	81	411	189	281	180	3	278	488	275	314	92
Lane Group Flow (vph)	84	428	197	293	188	3	290	508	286	327	96
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6	5	2			8		7	4	
Permitted Phases	6		2		2	8		8	4		4
Detector Phase	1	6	5	2	2	8	8	8	7	4	4
Switch Phase											
Minimum Initial (s)	5.0	15.0	5.0	15.0	15.0	6.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	15.0	28.5	15.0	28.5	28.5	36.5	36.5	36.5	15.0	33.5	33.5
Total Split (s)	15.0	27.0	17.0	29.0	29.0	38.0	38.0	38.0	18.0	56.0	56.0
Total Split (%)	15.0%	27.0%	17.0%	29.0%	29.0%	38.0%	38.0%	38.0%	18.0%	56.0%	56.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.18	0.38	0.44	0.22	0.27	0.01	0.69	0.81	0.78	0.43	0.14
Control Delay	17.9	30.0	20.6	25.4	5.6	25.3	42.9	22.0	36.1	17.8	2.5
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	17.9	30.0	20.6	25.4	5.6	25.3	42.9	22.0	36.1	17.8	2.5
Queue Length 50th (ft)	28	112	70	69	0	2	171	101	89	102	1
Queue Length 95th (ft)	66	180	140	121	54	8	227	207	164	125	11
Internal Link Dist (ft)		840		1594			786			834	
Turn Bay Length (ft)	375		390		450	230		365	320		320
Base Capacity (vph)	504	1116	460	1304	702	340	599	744	368	931	846
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	0.17	0.38	0.43	0.22	0.27	0.01	0.48	0.68	0.78	0.35	0.11

Intersection Summary

Cycle Length: 100

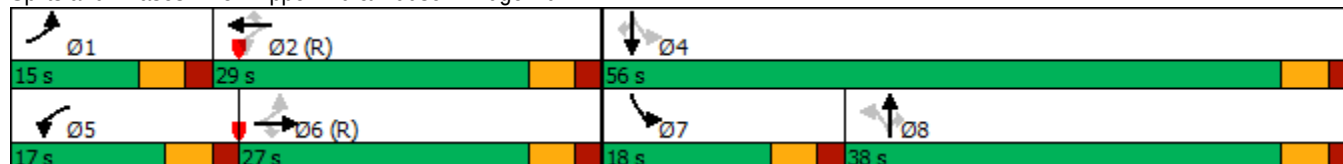
Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

Splits and Phases: 5: Flippen Rd & Hudson Bridge Rd



HCM 6th Signalized Intersection Summary

5: Flippen Rd & Hudson Bridge Rd

3a. Build 2027 AM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	81	411	0	189	281	180	3	278	488	275	314	92
Future Volume (veh/h)	81	411	0	189	281	180	3	278	488	275	314	92
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1856	1870	1870	1856	1870
Adj Flow Rate, veh/h	84	428	0	197	293	0	3	290	508	286	327	96
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	3	2	2	3	2
Cap, veh/h	399	823		374	1003		385	603	515	426	932	796
Arrive On Green	0.05	0.23	0.00	0.10	0.28	0.00	0.33	0.33	0.33	0.12	0.50	0.50
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	964	1856	1585	1781	1856	1585
Grp Volume(v), veh/h	84	428	0	197	293	0	3	290	508	286	327	96
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	964	1856	1585	1781	1856	1585
Q Serve(g_s), s	3.6	10.5	0.0	8.1	6.4	0.0	0.2	12.5	31.8	10.2	10.7	3.2
Cycle Q Clear(g_c), s	3.6	10.5	0.0	8.1	6.4	0.0	0.2	12.5	31.8	10.2	10.7	3.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	399	823		374	1003		385	603	515	426	932	796
V/C Ratio(X)	0.21	0.52		0.53	0.29		0.01	0.48	0.99	0.67	0.35	0.12
Avail Cap(c_a), veh/h	478	823		398	1003		385	603	515	431	937	800
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	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.1	33.6	0.0	24.8	28.1	0.0	22.9	27.0	33.5	18.7	15.0	13.2
Incr Delay (d2), s/veh	0.3	2.3	0.0	1.2	0.7	0.0	0.0	0.6	36.0	4.0	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	4.6	0.0	3.3	2.7	0.0	0.0	5.3	16.5	4.3	4.1	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.3	35.9	0.0	25.9	28.8	0.0	22.9	27.6	69.5	22.7	15.3	13.3
LnGrp LOS	C	D		C	C		C	C	E	C	B	B
Approach Vol, veh/h	512			490			801			709		
Approach Delay, s/veh	34.5			27.7			54.1			18.0		
Approach LOS	C			C			D			B		
Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.6	33.7		55.7	15.6	28.7	17.7	38.0				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	9.5	23.5		50.5	11.5	21.5	12.5	32.5				
Max Q Clear Time (g_c+I1), s	5.6	8.4		12.7	10.1	12.5	12.2	33.8				
Green Ext Time (p_c), s	0.0	2.5		2.2	0.1	2.7	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay 34.8

HCM 6th LOS C

Notes

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Timings

3a. Build 2027 AM

6: SR 42/SR 138/US 23 (N. Henry Blvd) & SR 138 (Lake Spivey Pkwy)

01/18/2023

	→	↘	↙	←	↖	↗	↑	↘	↙	↓
Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↕	↕↕	↙	↕	↕	↕↕	↕	↕	↙	↕↕
Traffic Volume (vph)	78	477	39	62	32	1060	414	45	40	224
Future Volume (vph)	78	477	39	62	32	1060	414	45	40	224
Lane Group Flow (vph)	176	492	40	64	33	1093	427	46	41	398
Turn Type	NA	pm+ov	Split	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	4	1	8	8		1	6		5	2
Permitted Phases		4			8			6		
Detector Phase	4	1	8	8	8	1	6	6	5	2
Switch Phase										
Minimum Initial (s)	6.0	5.0	6.0	6.0	6.0	5.0	15.0	15.0	5.0	15.0
Minimum Split (s)	31.5	15.0	30.5	30.5	30.5	15.0	28.5	28.5	15.0	31.5
Total Split (s)	31.5	56.0	30.5	30.5	30.5	56.0	73.0	73.0	15.0	32.0
Total Split (%)	21.0%	37.3%	20.3%	20.3%	20.3%	37.3%	48.7%	48.7%	10.0%	21.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag		Lead				Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?		Yes				Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min
v/c Ratio	0.74	0.36	0.32	0.50	0.14	0.87	0.38	0.04	0.40	0.38
Control Delay	80.7	14.7	71.8	79.4	1.2	52.0	18.4	0.1	78.3	34.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.7	14.7	71.8	79.4	1.2	52.0	18.4	0.1	78.3	34.5
Queue Length 50th (ft)	168	109	38	61	0	504	215	0	39	122
Queue Length 95th (ft)	243	97	77	110	0	569	362	0	81	198
Internal Link Dist (ft)	2539			205			2663			944
Turn Bay Length (ft)			100		120	340		300	580	
Base Capacity (vph)	314	1371	292	301	384	1267	1137	1042	118	1057
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.36	0.14	0.21	0.09	0.86	0.38	0.04	0.35	0.38

Intersection Summary

Cycle Length: 150

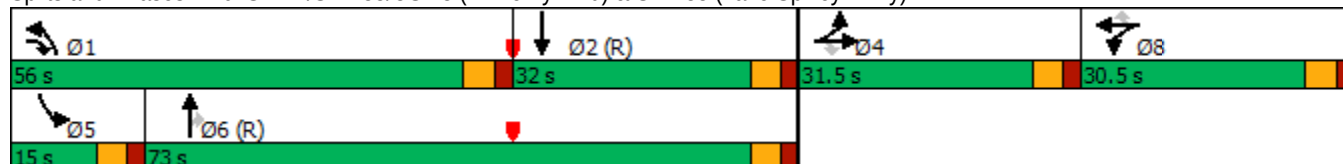
Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

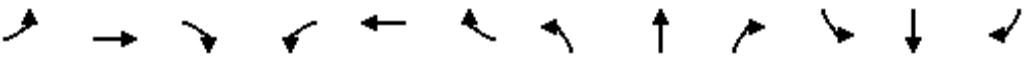
Splits and Phases: 6: SR 42/SR 138/US 23 (N. Henry Blvd) & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
6: SR 42/SR 138/US 23 (N. Henry Blvd) & SR 138 (Lake Spivey Pkwy)

3a. Build 2027 AM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↩	↩↩	↩	↩	↩	↩↩	↩	↩	↩	↩↩	
Traffic Volume (veh/h)	93	78	477	39	62	32	1060	414	45	40	224	162
Future Volume (veh/h)	93	78	477	39	62	32	1060	414	45	40	224	162
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1856	1811	1856	1826	1900	1856	1841	1900	1856	1856	1885
Adj Flow Rate, veh/h	96	80	492	40	64	0	1093	427	0	41	231	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	3	6	3	5	0	3	4	0	3	3	1
Cap, veh/h	140	116	1278	88	90		1137	1164		53	1165	
Arrive On Green	0.14	0.14	0.14	0.05	0.05	0.00	0.33	0.63	0.00	0.03	0.33	0.00
Sat Flow, veh/h	985	821	2701	1767	1826	1610	3428	1841	1610	1767	3618	0
Grp Volume(v), veh/h	176	0	492	40	64	0	1093	427	0	41	231	0
Grp Sat Flow(s),veh/h/ln	1806	0	1351	1767	1826	1610	1714	1841	1610	1767	1763	0
Q Serve(g_s), s	13.9	0.0	17.6	3.3	5.2	0.0	46.9	16.7	0.0	3.5	7.0	0.0
Cycle Q Clear(g_c), s	13.9	0.0	17.6	3.3	5.2	0.0	46.9	16.7	0.0	3.5	7.0	0.0
Prop In Lane	0.55		1.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	256	0	1278	88	90		1137	1164		53	1165	
V/C Ratio(X)	0.69	0.00	0.38	0.46	0.71		0.96	0.37		0.78	0.20	
Avail Cap(c_a), veh/h	313	0	1364	295	304		1154	1164		112	1165	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.94	0.00	0.94	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	61.2	0.0	25.4	69.3	70.2	0.0	49.2	13.2	0.0	72.3	36.0	0.0
Incr Delay (d2), s/veh	4.4	0.0	0.2	3.7	9.7	0.0	17.9	0.9	0.0	21.2	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.6	0.0	5.8	1.6	2.7	0.0	22.3	6.8	0.0	1.9	3.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.6	0.0	25.6	73.0	79.9	0.0	67.1	14.1	0.0	93.4	36.4	0.0
LnGrp LOS	E	A	C	E	E		E	B		F	D	
Approach Vol, veh/h		668			104			1520			272	
Approach Delay, s/veh		36.2			77.3			52.2			45.0	
Approach LOS		D			E			D			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	55.2	55.1		26.8	10.0	100.3		12.9				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	50.5	26.5		26.0	9.5	67.5		25.0				
Max Q Clear Time (g_c+I1), s	48.9	9.0		19.6	5.5	18.7		7.2				
Green Ext Time (p_c), s	0.8	2.1		1.7	0.0	5.6		0.3				

Intersection Summary

HCM 6th Ctrl Delay 48.3

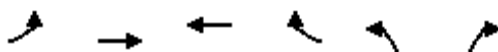
HCM 6th LOS D

Notes

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings
7: I-675 NB Ramps & SR 138 (Lake Spivey Pkwy)

3a. Build 2027 AM
01/18/2023



Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	501	963	1403	357	34	71
Future Volume (vph)	501	963	1403	357	34	71
Lane Group Flow (vph)	563	1082	1576	401	38	80
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		3	
Permitted Phases	6			2		8
Detector Phase	1	6	2	2	3	8
Switch Phase						
Minimum Initial (s)	5.0	15.0	15.0	15.0	5.0	6.0
Minimum Split (s)	15.0	28.5	28.5	28.5	15.0	34.5
Total Split (s)	24.0	65.5	41.5	41.5	34.5	34.5
Total Split (%)	24.0%	65.5%	41.5%	41.5%	34.5%	34.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.80	0.36	1.05	0.47	0.28	0.40
Control Delay	16.6	4.1	69.0	7.4	48.1	14.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.6	4.1	69.0	7.4	48.1	14.5
Queue Length 50th (ft)	163	160	~663	34	23	0
Queue Length 95th (ft)	144	76	#787	109	54	38
Internal Link Dist (ft)		706	2539			
Turn Bay Length (ft)	145			270		315
Base Capacity (vph)	700	2970	1503	862	513	520
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.36	1.05	0.47	0.07	0.15

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 55 (55%), Referenced to phase 2:WBT and 6:EBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

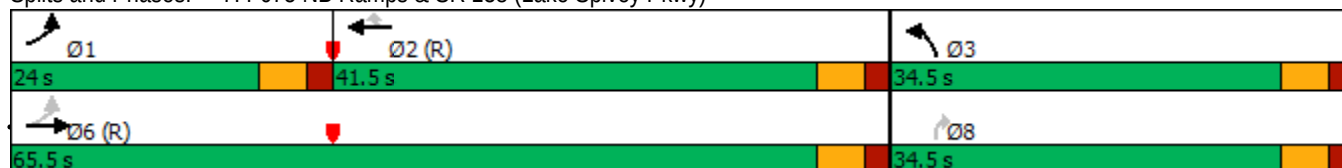
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 7: I-675 NB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
7: I-675 NB Ramps & SR 138 (Lake Spivey Pkwy)

3a. Build 2027 AM

01/18/2023

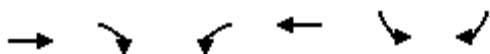
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	501	963	0	0	1403	357	34	0	71	0	0	0
Future Volume (veh/h)	501	963	0	0	1403	357	34	0	71	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1870	1856	0	0	1856	1870	1870	0	1870			
Adj Flow Rate, veh/h	563	1082	0	0	1576	0	38	0	80			
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89			
Percent Heavy Veh, %	2	3	0	0	3	2	2	0	2			
Cap, veh/h	480	2892	0	0	2046		124	0	110			
Arrive On Green	0.37	1.00	0.00	0.00	0.58	0.00	0.07	0.00	0.07			
Sat Flow, veh/h	1781	3618	0	0	3618	1585	1781	0	1585			
Grp Volume(v), veh/h	563	1082	0	0	1576	0	38	0	80			
Grp Sat Flow(s),veh/h/ln	1781	1763	0	0	1763	1585	1781	0	1585			
Q Serve(g_s), s	18.5	0.0	0.0	0.0	33.9	0.0	2.0	0.0	4.9			
Cycle Q Clear(g_c), s	18.5	0.0	0.0	0.0	33.9	0.0	2.0	0.0	4.9			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	480	2892	0	0	2046		124	0	110			
V/C Ratio(X)	1.17	0.37	0.00	0.00	0.77		0.31	0.00	0.73			
Avail Cap(c_a), veh/h	480	2892	0	0	2046		517	0	460			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.64	0.64	0.00	0.00	0.41	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	19.9	0.0	0.0	0.0	15.9	0.0	44.2	0.0	45.6			
Incr Delay (d2), s/veh	91.7	0.2	0.0	0.0	1.2	0.0	1.4	0.0	8.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	20.1	0.1	0.0	0.0	11.9	0.0	0.9	0.0	2.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	111.6	0.2	0.0	0.0	17.1	0.0	45.6	0.0	54.3			
LnGrp LOS	F	A	A	A	B		D	A	D			
Approach Vol, veh/h	1645		1576			118						
Approach Delay, s/veh	38.3		17.1			51.5						
Approach LOS	D		B			D						
Timer - Assigned Phs	1	2	6				8					
Phs Duration (G+Y+Rc), s	24.0	63.5	87.5				12.5					
Change Period (Y+Rc), s	5.5	5.5	5.5				5.5					
Max Green Setting (Gmax), s	18.5	36.0	60.0				29.0					
Max Q Clear Time (g_c+I1), s	20.5	35.9	2.0				6.9					
Green Ext Time (p_c), s	0.0	0.1	20.2				0.3					
Intersection Summary												
HCM 6th Ctrl Delay			28.8									
HCM 6th LOS			C									

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Timings 8: I-675 SB Ramps & SR 138 (Lake Spivey Pkwy)

3a. Build 2027 AM
01/18/2023



Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Configurations	↑↑	↑	↵	↑↑	↵	↵
Traffic Volume (vph)	1294	54	104	1333	170	465
Future Volume (vph)	1294	54	104	1333	170	465
Lane Group Flow (vph)	1454	61	117	1498	191	522
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	7	
Permitted Phases		6	2			4
Detector Phase	6	6	5	2	7	4
Switch Phase						
Minimum Initial (s)	15.0	15.0	5.0	15.0	5.0	6.0
Minimum Split (s)	28.5	28.5	15.0	28.5	35.5	35.5
Total Split (s)	49.5	49.5	15.0	64.5	35.5	35.5
Total Split (%)	49.5%	49.5%	15.0%	64.5%	35.5%	35.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Min	C-Min	None	C-Min	None	None
v/c Ratio	0.77	0.07	0.51	0.63	0.26	0.79
Control Delay	21.2	4.6	14.4	6.7	32.5	39.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.2	4.6	14.4	6.7	32.5	39.4
Queue Length 50th (ft)	242	1	28	534	52	150
Queue Length 95th (ft)	#588	m12	m13	m513	75	196
Internal Link Dist (ft)	1959			706		
Turn Bay Length (ft)		375	95		520	500
Base Capacity (vph)	1889	893	260	2371	1029	897
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.07	0.45	0.63	0.19	0.58

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 92 (92%), Referenced to phase 2:WBTL and 6:EBT, Start of Green

Natural Cycle: 90

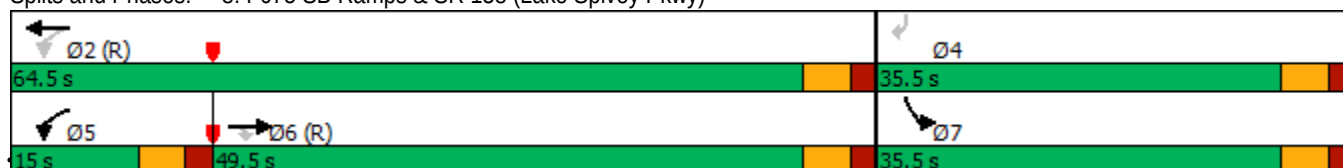
Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

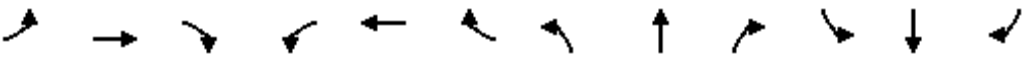
Splits and Phases: 8: I-675 SB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
8: I-675 SB Ramps & SR 138 (Lake Spivey Pkwy)

3a. Build 2027 AM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↗	↑↑					↙↙		↘↘
Traffic Volume (veh/h)	0	1294	54	104	1333	0	0	0	0	170	0	465
Future Volume (veh/h)	0	1294	54	104	1333	0	0	0	0	170	0	465
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1870	1870	1856	0				1870	0	1870
Adj Flow Rate, veh/h	0	1454	61	117	1498	0				191	0	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89				0.89	0.89	0.89
Percent Heavy Veh, %	0	3	2	2	3	0				2	0	2
Cap, veh/h	0	2495	1122	276	2858	0				274	0	
Arrive On Green	0.00	0.23	0.23	0.03	0.54	0.00				0.08	0.00	0.00
Sat Flow, veh/h	0	3618	1585	1781	3618	0				3456	0	2790
Grp Volume(v), veh/h	0	1454	61	117	1498	0				191	0	0
Grp Sat Flow(s),veh/h/ln	0	1763	1585	1781	1763	0				1728	0	1395
Q Serve(g_s), s	0.0	36.6	3.0	1.6	27.1	0.0				5.4	0.0	0.0
Cycle Q Clear(g_c), s	0.0	36.6	3.0	1.6	27.1	0.0				5.4	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2495	1122	276	2858	0				274	0	
V/C Ratio(X)	0.00	0.58	0.05	0.42	0.52	0.00				0.70	0.00	
Avail Cap(c_a), veh/h	0	2495	1122	359	2858	0				1037	0	
HCM Platoon Ratio	1.00	0.33	0.33	0.67	0.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.80	0.80	0.09	0.09	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	25.2	12.3	14.3	10.5	0.0				44.9	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.8	0.1	0.1	0.1	0.0				3.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	17.2	3.0	1.3	10.9	0.0				2.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	26.0	12.4	14.4	10.6	0.0				48.1	0.0	0.0
LnGrp LOS	A	C	B	B	B	A				D	A	
Approach Vol, veh/h		1515			1615						191	
Approach Delay, s/veh		25.5			10.9						48.1	
Approach LOS		C			B						D	
Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		86.6		13.4	10.3	76.3						
Change Period (Y+Rc), s		5.5		5.5	5.5	5.5						
Max Green Setting (Gmax), s		59.0		30.0	9.5	44.0						
Max Q Clear Time (g_c+I1), s		29.1		7.4	3.6	38.6						
Green Ext Time (p_c), s		21.5		0.6	0.1	4.8						
Intersection Summary												
HCM 6th Ctrl Delay			19.7									
HCM 6th LOS			B									
Notes												
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.												

Timings
9: SR 138 (Lake Spivey Pkwy) & Mt. Zion Rd

3a. Build 2027 AM

01/18/2023

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	116	1107	49	32	1486	139	43	34	151	55	149
Future Volume (vph)	116	1107	49	32	1486	139	43	34	151	55	149
Lane Group Flow (vph)	123	1178	52	34	1581	148	46	65	161	59	159
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8	7	4	
Permitted Phases	6		6	2		2	8		4		4
Detector Phase	1	6	6	5	2	2	3	8	7	4	4
Switch Phase											
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	6.0	5.0	6.0	6.0
Minimum Split (s)	15.0	28.5	28.5	15.0	34.5	34.5	15.0	38.5	15.0	32.5	32.5
Total Split (s)	15.0	31.5	31.5	15.0	31.5	31.5	15.0	38.5	15.0	38.5	38.5
Total Split (%)	15.0%	31.5%	31.5%	15.0%	31.5%	31.5%	15.0%	38.5%	15.0%	38.5%	38.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None
v/c Ratio	0.53	0.55	0.05	0.12	0.83	0.16	0.20	0.39	0.66	0.25	0.47
Control Delay	34.6	8.9	0.1	8.6	19.1	3.6	31.9	33.3	46.8	43.3	11.8
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	34.6	8.9	0.1	8.6	19.1	3.6	31.9	33.3	46.8	43.3	11.8
Queue Length 50th (ft)	41	104	0	4	227	3	23	22	88	36	0
Queue Length 95th (ft)	105	131	m0	m14	#695	m29	50	62	140	74	58
Internal Link Dist (ft)		896			1959			388		1031	
Turn Bay Length (ft)	115		140	155		325	35		345		165
Base Capacity (vph)	259	2140	1024	351	1901	943	260	599	247	627	639
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	0.47	0.55	0.05	0.10	0.83	0.16	0.18	0.11	0.65	0.09	0.25

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 7 (7%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 135

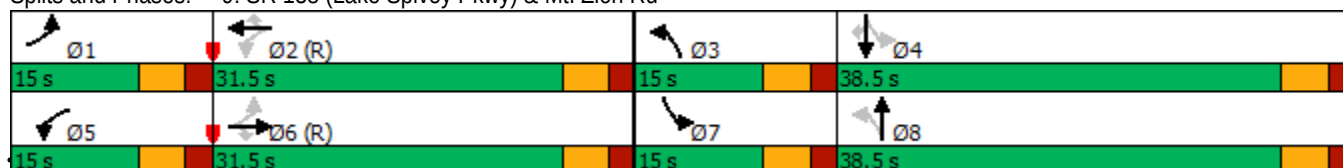
Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: SR 138 (Lake Spivey Pkwy) & Mt. Zion Rd



HCM 6th Signalized Intersection Summary

9: SR 138 (Lake Spivey Pkwy) & Mt. Zion Rd

3a. Build 2027 AM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	116	1107	49	32	1486	139	43	34	27	151	55	149
Future Volume (veh/h)	116	1107	49	32	1486	139	43	34	27	151	55	149
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1856	1870	1870	1856	1900	1870	1900	1870	1900	1900	1900
Adj Flow Rate, veh/h	123	1178	0	34	1581	148	46	36	29	161	59	159
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	3	2	2	3	0	2	0	2	0	0	0
Cap, veh/h	323	2080		399	2017	921	211	63	51	283	234	199
Arrive On Green	0.10	1.00	0.00	0.06	1.00	1.00	0.04	0.06	0.06	0.09	0.12	0.12
Sat Flow, veh/h	1810	3526	1585	1781	3526	1610	1781	974	785	1810	1900	1610
Grp Volume(v), veh/h	123	1178	0	34	1581	148	46	0	65	161	59	159
Grp Sat Flow(s),veh/h/ln	1810	1763	1585	1781	1763	1610	1781	0	1759	1810	1900	1610
Q Serve(g_s), s	2.8	0.0	0.0	0.8	0.0	0.0	2.4	0.0	3.6	8.0	2.8	9.6
Cycle Q Clear(g_c), s	2.8	0.0	0.0	0.8	0.0	0.0	2.4	0.0	3.6	8.0	2.8	9.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.45	1.00		1.00
Lane Grp Cap(c), veh/h	323	2080		399	2017	921	211	0	113	283	234	199
V/C Ratio(X)	0.38	0.57		0.09	0.78	0.16	0.22	0.00	0.57	0.57	0.25	0.80
Avail Cap(c_a), veh/h	407	2080		514	2017	921	316	0	580	283	627	531
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.81	0.81	0.00	0.69	0.69	0.69	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.3	0.0	0.0	7.8	0.0	0.0	41.5	0.0	45.4	37.1	39.7	42.6
Incr Delay (d2), s/veh	0.6	0.9	0.0	0.1	2.2	0.3	0.5	0.0	4.5	2.7	0.6	7.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.3	0.0	0.3	0.6	0.1	1.1	0.0	1.7	3.6	1.3	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.9	0.9	0.0	7.9	2.2	0.3	42.0	0.0	50.0	39.8	40.2	49.9
LnGrp LOS	A	A		A	A	A	D	A	D	D	D	D
Approach Vol, veh/h	1301				1763				111			
Approach Delay, s/veh	1.6				2.1				46.7			
Approach LOS	A				A				D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.3	62.7	9.1	17.8	8.6	64.5	15.0	11.9				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	9.5	26.0	9.5	33.0	9.5	26.0	9.5	33.0				
Max Q Clear Time (g_c+I1), s	4.8	2.0	4.4	11.6	2.8	2.0	10.0	5.6				
Green Ext Time (p_c), s	0.1	19.6	0.0	0.7	0.0	14.6	0.0	0.3				
Intersection Summary												
HCM 6th Ctrl Delay			7.8									
HCM 6th LOS			A									
Notes												
User approved pedestrian interval to be less than phase max green.												
Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.												

Timings
10: I-75 NB Ramps & SR 138 (Lake Spivey Pkwy)

3a. Build 2027 AM

01/18/2023

						
Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	584	1300	1052	852	292	146
Future Volume (vph)	584	1300	1052	852	292	146
Lane Group Flow (vph)	615	1368	1107	897	307	154
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		3	
Permitted Phases	6			2		8
Detector Phase	1	6	2	2	3	8
Switch Phase						
Minimum Initial (s)	5.0	15.0	15.0	15.0	5.0	6.0
Minimum Split (s)	15.0	28.5	28.5	28.5	15.0	32.5
Total Split (s)	30.0	67.5	37.5	37.5	32.5	32.5
Total Split (%)	30.0%	67.5%	37.5%	37.5%	32.5%	32.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	1.03	0.58	0.99	0.98	0.79	0.37
Control Delay	59.3	7.3	43.6	33.5	51.8	16.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.3	7.3	43.6	33.5	51.8	16.9
Queue Length 50th (ft)	~380	224	322	458	185	35
Queue Length 95th (ft)	m#594	324	#498	#514	266	85
Internal Link Dist (ft)		897	896			
Turn Bay Length (ft)	140			405		510
Base Capacity (vph)	598	2352	1121	915	477	490
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.58	0.99	0.98	0.64	0.31

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 8 (8%), Referenced to phase 2:WBT and 6:EBTL, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

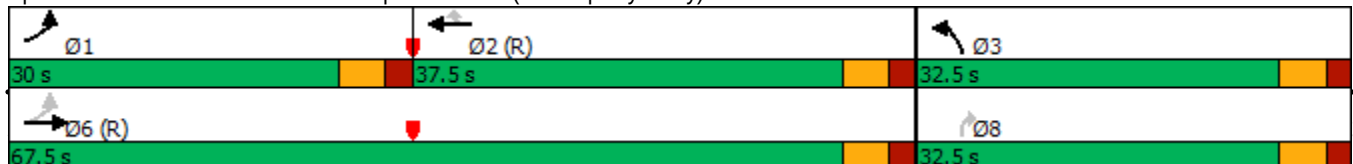
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: I-75 NB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
10: I-75 NB Ramps & SR 138 (Lake Spivey Pkwy)

3a. Build 2027 AM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Traffic Volume (veh/h)	584	1300	0	0	1052	852	292	0	146	0	0	0
Future Volume (veh/h)	584	1300	0	0	1052	852	292	0	146	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1870	1856	0	0	1856	1870	1870	0	1870			
Adj Flow Rate, veh/h	615	1368	0	0	1107	0	307	0	0			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	2	3	0	0	3	2	2	0	2			
Cap, veh/h	621	2455	0	0	1398		345	0				
Arrive On Green	0.16	0.47	0.00	0.00	0.79	0.00	0.19	0.00	0.00			
Sat Flow, veh/h	1781	3618	0	0	3618	1585	1781	0	1585			
Grp Volume(v), veh/h	615	1368	0	0	1107	0	307	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1763	0	0	1763	1585	1781	0	1585			
Q Serve(g_s), s	24.0	28.0	0.0	0.0	17.5	0.0	16.8	0.0	0.0			
Cycle Q Clear(g_c), s	24.0	28.0	0.0	0.0	17.5	0.0	16.8	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	621	2455	0	0	1398		345	0				
V/C Ratio(X)	0.99	0.56	0.00	0.00	0.79		0.89	0.00				
Avail Cap(c_a), veh/h	621	2455	0	0	1398		481	0				
HCM Platoon Ratio	0.67	0.67	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	0.52	0.52	0.00	0.00	0.53	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	25.8	15.6	0.0	0.0	8.1	0.0	39.3	0.0	0.0			
Incr Delay (d2), s/veh	23.5	0.5	0.0	0.0	2.5	0.0	14.2	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	19.2	11.7	0.0	0.0	3.3	0.0	8.3	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.3	16.0	0.0	0.0	10.6	0.0	53.5	0.0	0.0			
LnGrp LOS	D	B	A	A	B		D	A				
Approach Vol, veh/h	1983			1107			307					
Approach Delay, s/veh	26.4			10.6			53.5					
Approach LOS	C			B			D					
Timer - Assigned Phs	1	2					6	8				
Phs Duration (G+Y+Rc), s	30.0	45.1					75.1	24.9				
Change Period (Y+Rc), s	5.5	5.5					5.5	5.5				
Max Green Setting (Gmax), s	24.5	32.0					62.0	27.0				
Max Q Clear Time (g_c+I1), s	26.0	19.5					30.0	18.8				
Green Ext Time (p_c), s	0.0	8.5					20.6	0.6				

Intersection Summary

HCM 6th Ctrl Delay	23.7
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Timings
11: I-75 SB Ramps & SR 138 (Lake Spivey Pkwy)

3a. Build 2027 AM
01/18/2023

	→	↘	↙	←	↘	↙
Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Configurations	↑↑	↑	↘	↑↑	↘↘	↘
Traffic Volume (vph)	1468	245	101	1238	405	316
Future Volume (vph)	1468	245	101	1238	405	316
Lane Group Flow (vph)	1596	266	110	1346	440	343
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	3	
Permitted Phases		6	2			8
Detector Phase	6	6	5	2	3	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	5.0	15.0	5.0	15.0
Minimum Split (s)	28.5	28.5	15.0	28.5	15.0	28.5
Total Split (s)	56.0	56.0	15.0	71.0	29.0	29.0
Total Split (%)	56.0%	56.0%	15.0%	71.0%	29.0%	29.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Min	C-Min	None	C-Min	None	Min
v/c Ratio	0.84	0.27	0.52	0.57	0.60	0.84
Control Delay	25.3	2.4	16.8	5.9	38.8	47.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.3	2.4	16.8	5.9	38.8	47.2
Queue Length 50th (ft)	446	0	11	382	127	155
Queue Length 95th (ft)	#596	39	m12	m399	176	#293
Internal Link Dist (ft)	1158			897		
Turn Bay Length (ft)		980	150		490	
Base Capacity (vph)	1904	981	241	2369	806	438
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.27	0.46	0.57	0.55	0.78

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 46 (46%), Referenced to phase 2:WBTL and 6:EBT, Start of Green

Natural Cycle: 90

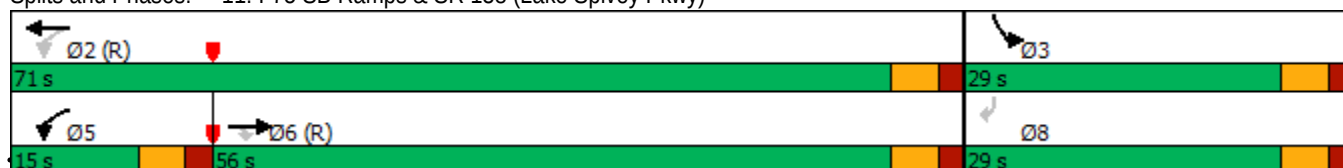
Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

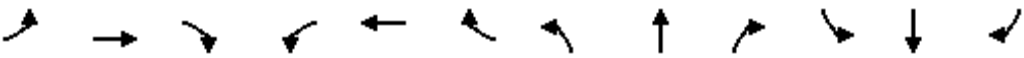
Splits and Phases: 11: I-75 SB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
11: I-75 SB Ramps & SR 138 (Lake Spivey Pkwy)

3a. Build 2027 AM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑					↑↑		↑
Traffic Volume (veh/h)	0	1468	245	101	1238	0	0	0	0	405	0	316
Future Volume (veh/h)	0	1468	245	101	1238	0	0	0	0	405	0	316
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1870	1870	1856	0				1870	0	1870
Adj Flow Rate, veh/h	0	1596	0	110	1346	0				440	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	3	2	2	3	0				2	0	2
Cap, veh/h	0	2232		262	2594	0				533	0	
Arrive On Green	0.00	0.63	0.00	0.05	0.74	0.00				0.15	0.00	0.00
Sat Flow, veh/h	0	3618	1585	1781	3618	0				3456	0	1585
Grp Volume(v), veh/h	0	1596	0	110	1346	0				440	0	0
Grp Sat Flow(s),veh/h/ln	0	1763	1585	1781	1763	0				1728	0	1585
Q Serve(g_s), s	0.0	30.3	0.0	2.0	16.3	0.0				12.3	0.0	0.0
Cycle Q Clear(g_c), s	0.0	30.3	0.0	2.0	16.3	0.0				12.3	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2232		262	2594	0				533	0	
V/C Ratio(X)	0.00	0.72		0.42	0.52	0.00				0.83	0.00	
Avail Cap(c_a), veh/h	0	2232		346	2594	0				812	0	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.26	0.00	0.22	0.22	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	12.3	0.0	12.8	5.6	0.0				41.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.5	0.0	0.2	0.2	0.0				4.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	9.8	0.0	0.9	4.2	0.0				5.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	12.8	0.0	13.0	5.8	0.0				45.3	0.0	0.0
LnGrp LOS	A	B		B	A	A				D	A	
Approach Vol, veh/h		1596			1456						440	
Approach Delay, s/veh		12.8			6.4						45.3	
Approach LOS		B			A						D	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		79.1			10.3	68.8		20.9				
Change Period (Y+Rc), s		5.5			5.5	5.5		5.5				
Max Green Setting (Gmax), s		65.5			9.5	50.5		23.5				
Max Q Clear Time (g_c+I1), s		18.3			4.0	32.3		14.3				
Green Ext Time (p_c), s		25.6			0.1	15.0		1.1				
Intersection Summary												
HCM 6th Ctrl Delay			14.2									
HCM 6th LOS			B									
Notes												
Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Timings

3a. Build 2027 AM

12: Speer Rd/Mt. Zion Pkwy & SR 138 (Lake Spivey Pkwy)

01/18/2023

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑	↗	↔↔	↑↑	↗	↔↔	↑↑	↗	↔↔	↑↑	↗
Traffic Volume (vph)	81	726	51	408	806	233	109	250	642	200	99	66
Future Volume (vph)	81	726	51	408	806	233	109	250	642	200	99	66
Lane Group Flow (vph)	84	748	53	421	831	240	112	258	662	206	102	68
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2			8			4
Detector Phase	1	6	6	5	2	2	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	15.0	46.5	46.5	15.0	47.5	47.5	15.0	46.5	46.5	15.0	45.5	45.5
Total Split (s)	15.0	41.0	41.0	24.0	50.0	50.0	19.0	65.0	65.0	20.0	66.0	66.0
Total Split (%)	10.0%	27.3%	27.3%	16.0%	33.3%	33.3%	12.7%	43.3%	43.3%	13.3%	44.0%	44.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.43	0.90	0.11	0.98	0.78	0.37	0.48	0.18	1.03	0.68	0.07	0.09
Control Delay	75.1	70.5	0.5	102.5	54.1	6.1	73.7	29.4	87.9	77.8	26.3	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.1	70.5	0.5	102.5	54.1	6.1	73.7	29.4	87.9	77.8	26.3	0.2
Queue Length 50th (ft)	41	377	0	214	394	0	55	85	~704	101	31	0
Queue Length 95th (ft)	71	#487	0	#325	478	65	87	119	#949	146	52	0
Internal Link Dist (ft)		1890			1158			635			523	
Turn Bay Length (ft)	345		290	290		930	195		550	270		270
Base Capacity (vph)	217	829	487	431	1062	647	308	1432	640	331	1533	752
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.90	0.11	0.98	0.78	0.37	0.36	0.18	1.03	0.62	0.07	0.09

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Green

Natural Cycle: 145

Control Type: Actuated-Coordinated

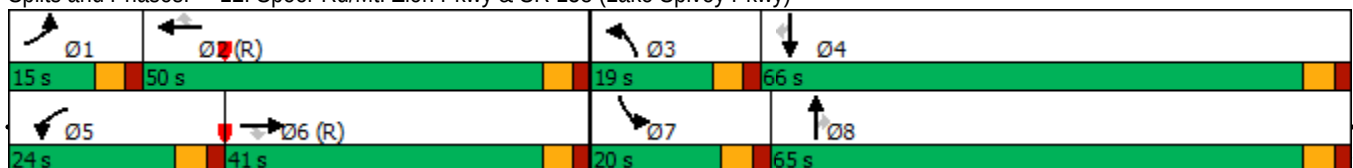
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 12: Speer Rd/Mt. Zion Pkwy & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary 12: Speer Rd/Mt. Zion Pkwy & SR 138 (Lake Spivey Pkwy)

3a. Build 2027 AM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	81	726	51	408	806	233	109	250	642	200	99	66
Future Volume (veh/h)	81	726	51	408	806	233	109	250	642	200	99	66
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1856	1900	1900	1856	1870	1870	1870	1870	1870	1900	1870
Adj Flow Rate, veh/h	84	748	53	421	831	240	112	258	662	206	102	68
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	3	0	0	3	2	2	2	2	2	0	2
Cap, veh/h	126	916	418	433	1222	549	158	1410	629	254	1532	673
Arrive On Green	0.04	0.26	0.26	0.12	0.35	0.35	0.05	0.40	0.40	0.07	0.42	0.42
Sat Flow, veh/h	3456	3526	1610	3510	3526	1585	3456	3554	1585	3456	3610	1585
Grp Volume(v), veh/h	84	748	53	421	831	240	112	258	662	206	102	68
Grp Sat Flow(s),veh/h/ln	1728	1763	1610	1755	1763	1585	1728	1777	1585	1728	1805	1585
Q Serve(g_s), s	3.6	29.9	3.8	17.9	30.2	17.5	4.8	7.1	59.5	8.8	2.5	3.9
Cycle Q Clear(g_c), s	3.6	29.9	3.8	17.9	30.2	17.5	4.8	7.1	59.5	8.8	2.5	3.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	126	916	418	433	1222	549	158	1410	629	254	1532	673
V/C Ratio(X)	0.66	0.82	0.13	0.97	0.68	0.44	0.71	0.18	1.05	0.81	0.07	0.10
Avail Cap(c_a), veh/h	219	916	418	433	1222	549	311	1410	629	334	1532	673
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	0.91	0.74	0.74	0.74	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	71.3	52.1	42.5	65.5	41.9	37.7	70.6	29.4	45.3	68.5	25.6	26.0
Incr Delay (d2), s/veh	5.4	7.3	0.6	30.2	2.3	1.9	5.7	0.1	50.6	10.8	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	13.9	1.6	9.7	13.3	7.0	2.2	3.0	31.3	4.2	1.1	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	76.7	59.5	43.1	95.7	44.2	39.6	76.3	29.5	95.9	79.3	25.6	26.0
LnGrp LOS	E	E	D	F	D	D	E	C	F	E	C	C
Approach Vol, veh/h	885		1492				1032		376			
Approach Delay, s/veh	60.1		58.0				77.1		55.1			
Approach LOS	E		E				E		E			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.0	57.5	12.4	69.1	24.0	44.5	16.5	65.0				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	9.5	44.5	13.5	60.5	18.5	35.5	14.5	59.5				
Max Q Clear Time (g_c+I1), s	5.6	32.2	6.8	5.9	19.9	31.9	10.8	61.5				
Green Ext Time (p_c), s	0.1	7.7	0.1	0.8	0.0	2.3	0.2	0.0				
Intersection Summary												
HCM 6th Ctrl Delay	63.4											
HCM 6th LOS	E											
Notes												

Timings
13: Spivey Rd & SR 138 (Lake Spivey Pkwy)

3a. Build 2027 AM
01/18/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↑
Traffic Volume (vph)	712	25	113	929	38	239
Future Volume (vph)	712	25	113	929	38	239
Lane Group Flow (vph)	782	27	124	1021	42	263
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	8	
Permitted Phases		6	2			8
Detector Phase	6	6	5	2	8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0	6.0
Minimum Split (s)	25.5	25.5	15.0	23.5	31.5	31.5
Total Split (s)	44.0	44.0	18.0	62.0	38.0	38.0
Total Split (%)	44.0%	44.0%	18.0%	62.0%	38.0%	38.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Min	C-Min	None	C-Min	None	None
v/c Ratio	0.33	0.03	0.23	0.36	0.27	0.69
Control Delay	7.8	2.9	3.5	3.5	45.2	15.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.8	2.9	3.5	3.5	45.2	15.4
Queue Length 50th (ft)	92	0	12	67	26	0
Queue Length 95th (ft)	163	11	33	132	55	71
Internal Link Dist (ft)	1639			1890	1094	
Turn Bay Length (ft)		230	535			220
Base Capacity (vph)	2366	1077	610	2807	575	692
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.03	0.20	0.36	0.07	0.38

Intersection Summary

Cycle Length: 100

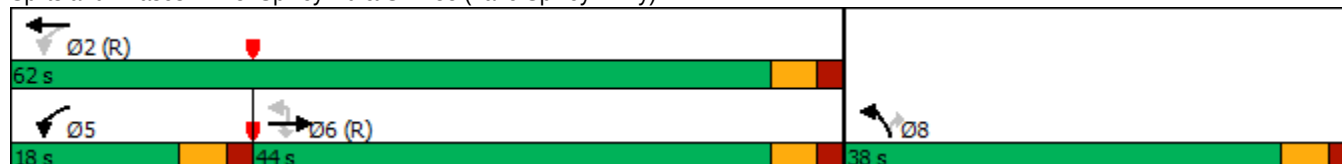
Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTU, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Splits and Phases: 13: Spivey Rd & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary

13: Spivey Rd & SR 138 (Lake Spivey Pkwy)

3a. Build 2027 AM

01/18/2023



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	⇐	⇑⇑	⇑	⇑	⇑⇑	⇑	⇑
Traffic Volume (veh/h)	0	712	25	113	929	38	239
Future Volume (veh/h)	0	712	25	113	929	38	239
Initial Q (Qb), veh		0	0	0	0	0	0
Ped-Bike Adj(A_pbT)			1.00	1.00		1.00	1.00
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No	No	
Adj Sat Flow, veh/h/ln		1856	1870	1870	1856	1870	1870
Adj Flow Rate, veh/h		782	0	124	1021	42	0
Peak Hour Factor		0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %		3	2	2	3	2	2
Cap, veh/h		2628		623	2992	74	
Arrive On Green		0.75	0.00	0.05	0.85	0.04	0.00
Sat Flow, veh/h		3618	1585	1781	3618	1781	1585
Grp Volume(v), veh/h		782	0	124	1021	42	0
Grp Sat Flow(s),veh/h/ln		1763	1585	1781	1763	1781	1585
Q Serve(g_s), s		7.3	0.0	1.4	6.2	2.3	0.0
Cycle Q Clear(g_c), s		7.3	0.0	1.4	6.2	2.3	0.0
Prop In Lane			1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h		2628		623	2992	74	
V/C Ratio(X)		0.30		0.20	0.34	0.57	
Avail Cap(c_a), veh/h		2628		760	2992	579	
HCM Platoon Ratio		1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	0.00	0.65	0.65	1.00	0.00
Uniform Delay (d), s/veh		4.2	0.0	2.4	1.6	47.1	0.0
Incr Delay (d2), s/veh		0.3	0.0	0.1	0.2	6.8	0.0
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		1.9	0.0	0.2	0.5	1.2	0.0
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh		4.5	0.0	2.5	1.8	53.8	0.0
LnGrp LOS		A		A	A	D	
Approach Vol, veh/h		782			1145	42	
Approach Delay, s/veh		4.5			1.9	53.8	
Approach LOS		A			A	D	
Timer - Assigned Phs		2			5	6	8
Phs Duration (G+Y+Rc), s		90.4			10.3	80.0	9.6
Change Period (Y+Rc), s		5.5			5.5	5.5	5.5
Max Green Setting (Gmax), s		56.5			12.5	38.5	32.5
Max Q Clear Time (g_c+I1), s		8.2			3.4	9.3	4.3
Green Ext Time (p_c), s		17.5			0.2	10.3	0.1

Intersection Summary

HCM 6th Ctrl Delay	4.0
HCM 6th LOS	A

Notes

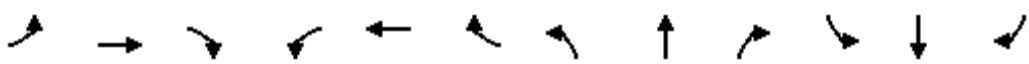
User approved ignoring U-Turning movement.

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Timings 14: Blackhall Rd/Speer Rd & Walt Stephens Rd

3a. Build 2027 AM

01/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	175	47	120	246	507	42	406	63	195	106	11
Future Volume (vph)	15	175	47	120	246	507	42	406	63	195	106	11
Lane Group Flow (vph)	17	194	52	133	273	563	47	451	70	217	118	12
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	6				2		3		8		7	
Permitted Phases	6		6	2		2	8		8	4		4
Detector Phase	6	6	6	2	2	2	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0	15.0	5.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	23.5	23.5	23.5	23.5	23.5	23.5	15.0	23.5	23.5	15.0	23.5	23.5
Total Split (s)	41.0	41.0	41.0	41.0	41.0	41.0	15.0	44.0	44.0	15.0	44.0	44.0
Total Split (%)	41.0%	41.0%	41.0%	41.0%	41.0%	41.0%	15.0%	44.0%	44.0%	15.0%	44.0%	44.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.04	0.24	0.07	0.26	0.33	0.61	0.09	0.81	0.13	0.74	0.17	0.02
Control Delay	19.6	20.2	1.8	21.2	21.0	9.6	14.2	43.9	3.7	33.1	22.0	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.6	20.2	1.8	21.2	21.0	9.6	14.2	43.9	3.7	33.1	22.0	0.1
Queue Length 50th (ft)	6	75	0	53	112	71	17	265	0	84	54	0
Queue Length 95th (ft)	22	144	10	95	168	124	31	339	20	#121	87	0
Internal Link Dist (ft)	2027				3745		1264				1872	
Turn Bay Length (ft)	110		160	190		250	140		125	315		120
Base Capacity (vph)	428	822	747	503	822	925	546	717	662	292	731	673
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.24	0.07	0.26	0.33	0.61	0.09	0.63	0.11	0.74	0.16	0.02

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 96 (96%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

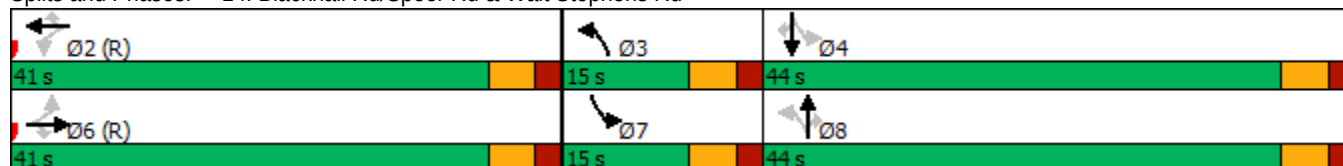
Natural Cycle: 65

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 14: Blackhall Rd/Speer Rd & Walt Stephens Rd



HCM 6th Signalized Intersection Summary 14: Blackhall Rd/Speer Rd & Walt Stephens Rd

3a. Build 2027 AM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	175	47	120	246	507	42	406	63	195	106	11
Future Volume (veh/h)	15	175	47	120	246	507	42	406	63	195	106	11
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	17	194	52	133	273	563	47	451	0	217	118	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	320	875	742	533	875	742	483	509		279	618	
Arrive On Green	0.47	0.47	0.47	0.47	0.47	0.47	0.04	0.27	0.00	0.09	0.33	0.00
Sat Flow, veh/h	657	1870	1585	1134	1870	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	17	194	52	133	273	563	47	451	0	217	118	0
Grp Sat Flow(s),veh/h/ln	657	1870	1585	1134	1870	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	1.7	6.2	1.8	7.9	9.1	29.3	1.9	23.1	0.0	8.5	4.5	0.0
Cycle Q Clear(g_c), s	10.7	6.2	1.8	14.0	9.1	29.3	1.9	23.1	0.0	8.5	4.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	320	875	742	533	875	742	483	509		279	618	
V/C Ratio(X)	0.05	0.22	0.07	0.25	0.31	0.76	0.10	0.89		0.78	0.19	
Avail Cap(c_a), veh/h	320	875	742	533	875	742	588	720		279	720	
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	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	19.9	15.8	14.6	20.0	16.6	21.9	24.6	34.9	0.0	25.3	23.9	0.0
Incr Delay (d2), s/veh	0.3	0.6	0.2	1.1	0.9	7.2	0.1	9.6	0.0	12.9	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	2.6	0.6	2.1	3.8	11.3	0.8	11.2	0.0	4.3	1.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.2	16.4	14.8	21.1	17.5	29.1	24.6	44.5	0.0	38.2	24.1	0.0
LnGrp LOS	C	B	B	C	B	C	C	D		D	C	
Approach Vol, veh/h	263			969			498			335		
Approach Delay, s/veh	16.3			24.7			42.7			33.2		
Approach LOS	B			C			D			C		
Timer - Assigned Phs	2			3			4			6		
Phs Duration (G+Y+Rc), s	52.3			9.1			38.6			52.3		
Change Period (Y+Rc), s	5.5			5.5			5.5			5.5		
Max Green Setting (Gmax), s	35.5			9.5			38.5			35.5		
Max Q Clear Time (g_c+I1), s	31.3			3.9			6.5			12.7		
Green Ext Time (p_c), s	2.7			0.0			0.6			2.4		

Intersection Summary

HCM 6th Ctrl Delay	29.4
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection						
Int Delay, s/veh	8.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	139	170	95	459	400	78
Future Vol, veh/h	139	170	95	459	400	78
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	150	235	-	-	175
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	3	3	2
Mvmt Flow	151	185	103	499	435	85
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1140	435	520	0	-	0
Stage 1	435	-	-	-	-	-
Stage 2	705	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	222	621	1046	-	-	-
Stage 1	653	-	-	-	-	-
Stage 2	490	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	200	621	1046	-	-	-
Mov Cap-2 Maneuver	200	-	-	-	-	-
Stage 1	589	-	-	-	-	-
Stage 2	490	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	35.9	1.5		0		
HCM LOS	E					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1046	-	200	621	-	-
HCM Lane V/C Ratio	0.099	-	0.755	0.298	-	-
HCM Control Delay (s)	8.8	-	63.6	13.2	-	-
HCM Lane LOS	A	-	F	B	-	-
HCM 95th %tile Q(veh)	0.3	-	5.1	1.2	-	-

Timings

3b. Build 2027 PM

1: Flippen Rd/Shields Rd & SR 42/SR 138/US 23 (N. Henry Blvd)

01/18/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	21	1311	201	1011	316	37	159	27	53
Future Volume (vph)	21	1311	201	1011	316	37	159	27	53
Lane Group Flow (vph)	21	1765	203	1035	0	356	161	0	93
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	Perm	NA
Protected Phases	1	6	5	2		8			4
Permitted Phases	6		2		8		8	4	
Detector Phase	1	6	5	2	8	8	8	4	4
Switch Phase									
Minimum Initial (s)	5.0	15.0	5.0	15.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	15.0	28.5	15.0	28.5	30.5	30.5	30.5	30.5	30.5
Total Split (s)	15.0	57.0	15.0	57.0	28.0	28.0	28.0	28.0	28.0
Total Split (%)	15.0%	57.0%	15.0%	57.0%	28.0%	28.0%	28.0%	28.0%	28.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5		5.5	5.5		5.5
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	C-Min	None	C-Min	None	None	None	None	None
v/c Ratio	0.06	1.00	0.86	0.48		1.22	0.38		0.40
Control Delay	6.5	46.1	54.9	12.2		159.3	24.8		36.5
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Delay	6.5	46.1	54.9	12.2		159.3	24.8		36.5
Queue Length 50th (ft)	4	~560	77	148		~274	50		47
Queue Length 95th (ft)	12	#751	#209	271		m#455	m111		96
Internal Link Dist (ft)		2570		1632		2093			641
Turn Bay Length (ft)	135		210				25		
Base Capacity (vph)	405	1761	238	2141		293	420		232
Starvation Cap Reductn	0	0	0	0		0	0		0
Spillback Cap Reductn	0	0	0	0		0	0		0
Storage Cap Reductn	0	0	0	0		0	0		0
Reduced v/c Ratio	0.05	1.00	0.85	0.48		1.22	0.38		0.40

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

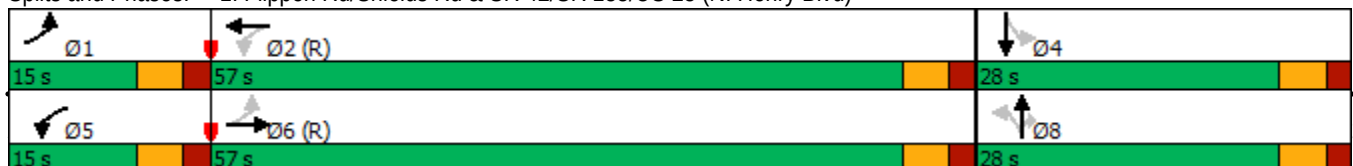
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Flippen Rd/Shields Rd & SR 42/SR 138/US 23 (N. Henry Blvd)



HCM 6th Signalized Intersection Summary

3b. Build 2027 PM

1: Flippen Rd/Shields Rd & SR 42/SR 138/US 23 (N. Henry Blvd)

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	1311	437	201	1011	14	316	37	159	27	53	12
Future Volume (veh/h)	21	1311	437	201	1011	14	316	37	159	27	53	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1841	1856	1856	1841	1870	1856	1870	1856	1870	1870	1870
Adj Flow Rate, veh/h	21	1324	441	203	1021	14	319	37	161	27	54	12
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	4	3	3	4	2	3	2	3	2	2	2
Cap, veh/h	340	1349	433	234	2077	28	202	15	354	46	76	11
Arrive On Green	0.02	0.52	0.52	0.09	0.59	0.59	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	1781	2603	836	1767	3532	48	593	69	1572	0	339	50
Grp Volume(v), veh/h	21	873	892	203	505	530	356	0	161	93	0	0
Grp Sat Flow(s),veh/h/ln	1781	1749	1690	1767	1749	1832	661	0	1572	389	0	0
Q Serve(g_s), s	0.5	48.0	51.8	7.2	16.8	16.8	0.0	0.0	8.8	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.5	48.0	51.8	7.2	16.8	16.8	22.5	0.0	8.8	22.5	0.0	0.0
Prop In Lane	1.00		0.49	1.00		0.03	0.90		1.00	0.29		0.13
Lane Grp Cap(c), veh/h	340	906	876	234	1028	1077	217	0	354	134	0	0
V/C Ratio(X)	0.06	0.96	1.02	0.87	0.49	0.49	1.64	0.00	0.46	0.69	0.00	0.00
Avail Cap(c_a), veh/h	470	906	876	240	1028	1077	217	0	354	134	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	11.2	23.2	24.1	30.1	11.9	11.9	42.3	0.0	33.5	33.2	0.0	0.0
Incr Delay (d2), s/veh	0.1	22.2	35.1	26.4	1.7	1.6	308.0	0.0	0.9	14.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	22.7	26.4	6.4	6.1	6.3	23.9	0.0	3.4	2.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.3	45.4	59.2	56.6	13.6	13.5	350.3	0.0	34.4	47.6	0.0	0.0
LnGrp LOS	B	D	F	E	B	B	F	A	C	D	A	A
Approach Vol, veh/h	1786				1238				517			
Approach Delay, s/veh	51.8				20.6				251.9			
Approach LOS	D				C				F			
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.7	64.3		28.0	14.7	57.3		28.0				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	9.5	51.5		22.5	9.5	51.5		22.5				
Max Q Clear Time (g_c+I1), s	2.5	18.8		24.5	9.2	53.8		24.5				
Green Ext Time (p_c), s	0.0	14.4		0.0	0.0	0.0		0.0				

Intersection Summary

HCM 6th Ctrl Delay 69.6

HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

Intersection												
Int Delay, s/veh	5.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱	↰	↱			↰	↱
Traffic Vol, veh/h	40	0	49	14	0	17	81	642	14	26	785	66
Future Vol, veh/h	40	0	49	14	0	17	81	642	14	26	785	66
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	150	-	-	-	235	-	-	-	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2	2	3	2	2	3	2
Mvmt Flow	41	0	50	14	0	17	83	655	14	27	801	67

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1692	1690	801	1742	1750	662	868	0	0	669	0	0
Stage 1	855	855	-	828	828	-	-	-	-	-	-	-
Stage 2	837	835	-	914	922	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	74	93	384	68	86	462	776	-	-	921	-	-
Stage 1	353	375	-	365	386	-	-	-	-	-	-	-
Stage 2	361	383	-	327	349	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	63	78	384	52	72	462	776	-	-	921	-	-
Mov Cap-2 Maneuver	63	78	-	52	72	-	-	-	-	-	-	-
Stage 1	315	354	-	326	345	-	-	-	-	-	-	-
Stage 2	310	342	-	268	329	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	69.1		56.1		1.1		0.3	
HCM LOS	F		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	776	-	-	63	384	101	921	-	-
HCM Lane V/C Ratio	0.107	-	-	0.648	0.13	0.313	0.029	-	-
HCM Control Delay (s)	10.2	-	-	134.4	15.8	56.1	9	0	-
HCM Lane LOS	B	-	-	F	C	F	A	A	-
HCM 95th %tile Q(veh)	0.4	-	-	2.8	0.4	1.2	0.1	-	-

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	↗
Traffic Vol, veh/h	10	2	12	0	2	4	13	680	2	3	800	11
Future Vol, veh/h	10	2	12	0	2	4	13	680	2	3	800	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	3	2	2	3	2
Mvmt Flow	10	2	13	0	2	4	14	708	2	3	833	11

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1579	1577	833	1589	1587	709	844	0	0	710	0	0
Stage 1	839	839	-	737	737	-	-	-	-	-	-	-
Stage 2	740	738	-	852	850	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	88	110	369	87	108	434	792	-	-	889	-	-
Stage 1	360	381	-	410	425	-	-	-	-	-	-	-
Stage 2	409	424	-	354	377	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	84	106	369	81	104	434	792	-	-	889	-	-
Mov Cap-2 Maneuver	84	106	-	81	104	-	-	-	-	-	-	-
Stage 1	350	379	-	398	413	-	-	-	-	-	-	-
Stage 2	391	412	-	338	375	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	36	22.6	0.2	0
HCM LOS	E	C		

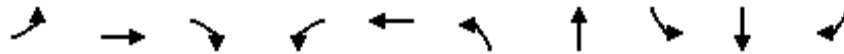
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	792	-	-	141	211	889	-
HCM Lane V/C Ratio	0.017	-	-	0.177	0.03	0.004	-
HCM Control Delay (s)	9.6	0	-	36	22.6	9.1	0
HCM Lane LOS	A	A	-	E	C	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.6	0.1	0	-

Timings

4: Flippen Rd & Walt Stephens Rd/Red Oak Rd

3b. Build 2027 PM

01/18/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	305	185	411	24	140	331	448	43	538	272
Future Volume (vph)	305	185	411	24	140	331	448	43	538	272
Lane Group Flow (vph)	328	199	442	26	204	356	502	46	578	292
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4		3	8	1	6	5	2	
Permitted Phases	4		4	8		6		2		2
Detector Phase	7	4	4	3	8	1	6	5	2	2
Switch Phase										
Minimum Initial (s)	5.0	6.0	6.0	5.0	6.0	5.0	15.0	5.0	15.0	15.0
Minimum Split (s)	15.0	31.5	31.5	15.0	30.5	15.0	31.5	15.0	28.5	28.5
Total Split (s)	20.5	31.5	31.5	20.5	31.5	18.0	33.0	15.0	30.0	30.0
Total Split (%)	20.5%	31.5%	31.5%	20.5%	31.5%	18.0%	33.0%	15.0%	30.0%	30.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
v/c Ratio	0.80	0.34	0.56	0.09	0.68	0.71	0.61	0.14	1.28	0.51
Control Delay	34.5	26.6	8.6	20.4	47.8	30.1	27.9	17.4	175.1	13.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.5	26.6	8.6	20.4	47.8	30.1	27.9	17.4	175.1	13.5
Queue Length 50th (ft)	151	86	54	11	114	145	255	17	~470	34
Queue Length 95th (ft)	m189	m125	m77	26	178	#334	#467	m29	m#598	m59
Internal Link Dist (ft)		646			1291		2204		704	
Turn Bay Length (ft)	180		345	110		130		120		215
Base Capacity (vph)	408	577	795	449	484	498	826	386	452	570
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.34	0.56	0.06	0.42	0.71	0.61	0.12	1.28	0.51

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 88 (88%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green

Natural Cycle: 105

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

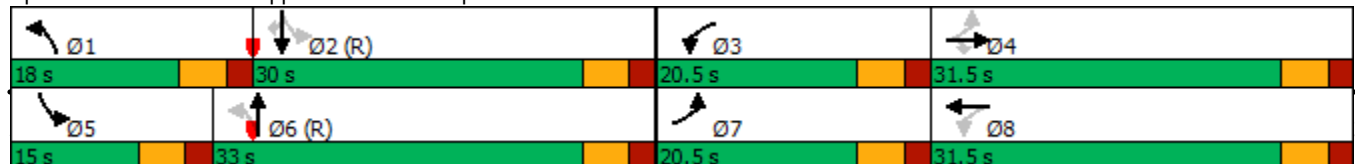
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Flippen Rd & Walt Stephens Rd/Red Oak Rd



HCM 6th Signalized Intersection Summary

4: Flippen Rd & Walt Stephens Rd/Red Oak Rd

3b. Build 2027 PM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	305	185	411	24	140	49	331	448	19	43	538	272
Future Volume (veh/h)	305	185	411	24	140	49	331	448	19	43	538	272
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1870	1900	1856	1870	1870	1856	1900
Adj Flow Rate, veh/h	328	199	0	26	151	53	356	482	20	46	578	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	0	2	0	3	2	2	3	0
Cap, veh/h	373	490		281	185	65	367	807	33	363	682	
Arrive On Green	0.15	0.26	0.00	0.03	0.14	0.14	0.13	0.46	0.46	0.04	0.37	0.00
Sat Flow, veh/h	1781	1870	1585	1781	1344	472	1810	1769	73	1781	1856	1610
Grp Volume(v), veh/h	328	199	0	26	0	204	356	0	502	46	578	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1815	1810	0	1842	1781	1856	1610
Q Serve(g_s), s	15.0	8.8	0.0	1.2	0.0	10.9	11.9	0.0	20.4	1.6	28.6	0.0
Cycle Q Clear(g_c), s	15.0	8.8	0.0	1.2	0.0	10.9	11.9	0.0	20.4	1.6	28.6	0.0
Prop In Lane	1.00		1.00	1.00		0.26	1.00		0.04	1.00		1.00
Lane Grp Cap(c), veh/h	373	490		281	0	250	367	0	841	363	682	
V/C Ratio(X)	0.88	0.41		0.09	0.00	0.82	0.97	0.00	0.60	0.13	0.85	
Avail Cap(c_a), veh/h	373	490		502	0	472	367	0	841	468	682	
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	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.9	30.5	0.0	35.5	0.0	41.9	21.5	0.0	20.3	19.0	29.1	0.0
Incr Delay (d2), s/veh	20.8	0.5	0.0	0.1	0.0	6.4	38.9	0.0	3.1	0.2	12.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.4	3.8	0.0	0.5	0.0	5.2	8.4	0.0	8.7	0.6	14.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.7	31.0	0.0	35.7	0.0	48.3	60.4	0.0	23.4	19.1	41.5	0.0
LnGrp LOS	D	C		D	A	D	E	A	C	B	D	
Approach Vol, veh/h	527			230			858			624		
Approach Delay, s/veh	43.9			46.9			38.8			39.9		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	18.0	42.2	8.1	31.7	9.1	51.1	20.5	19.3				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	12.5	24.5	15.0	26.0	9.5	27.5	15.0	26.0				
Max Q Clear Time (g_c+I1), s	13.9	30.6	3.2	10.8	3.6	22.4	17.0	12.9				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.8	0.0	2.1	0.0	0.8				
Intersection Summary												
HCM 6th Ctrl Delay	41.1											
HCM 6th LOS	D											

Timings

5: Flippen Rd & Hudson Bridge Rd

3b. Build 2027 PM

01/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	136	413	9	603	733	378	3	343	333	306	427	87
Future Volume (vph)	136	413	9	603	733	378	3	343	333	306	427	87
Lane Group Flow (vph)	140	426	9	622	756	390	3	354	343	315	440	90
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2			8		7	4	
Permitted Phases	6		6	2		2	8		8	4		4
Detector Phase	1	6	6	5	2	2	8	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	6.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	15.0	28.5	28.5	15.0	28.5	28.5	36.5	36.5	36.5	15.0	33.5	33.5
Total Split (s)	15.0	24.0	24.0	36.0	45.0	45.0	41.0	41.0	41.0	19.0	60.0	60.0
Total Split (%)	12.5%	20.0%	20.0%	30.0%	37.5%	37.5%	34.2%	34.2%	34.2%	15.8%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.57	0.78	0.02	0.99	0.55	0.46	0.01	0.80	0.54	1.05	0.60	0.13
Control Delay	31.6	59.8	0.1	66.3	32.1	4.8	31.3	56.9	6.8	95.5	31.7	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.6	59.8	0.1	66.3	32.1	4.8	31.3	56.9	6.8	95.5	31.7	1.8
Queue Length 50th (ft)	56	168	0	~422	243	0	2	258	0	~181	264	0
Queue Length 95th (ft)	105	#230	0	#750	331	69	9	346	69	#335	338	15
Internal Link Dist (ft)		840			1594			786			834	
Turn Bay Length (ft)	375		175	390		450	230		365	320		320
Base Capacity (vph)	254	545	390	626	1363	849	279	545	709	299	837	786
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.78	0.02	0.99	0.55	0.46	0.01	0.65	0.48	1.05	0.53	0.11

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 37 (31%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 125

Control Type: Actuated-Coordinated

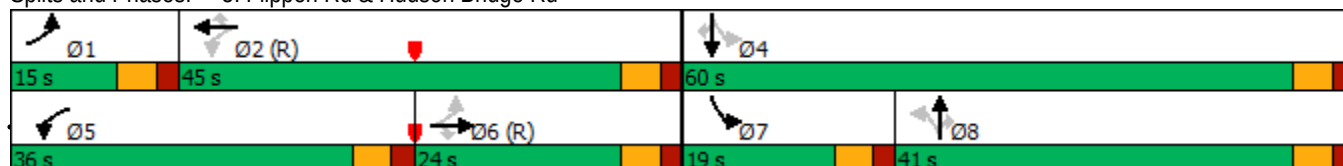
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 5: Flippen Rd & Hudson Bridge Rd



HCM 6th Signalized Intersection Summary

5: Flippen Rd & Hudson Bridge Rd

3b. Build 2027 PM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	136	413	9	603	733	378	3	343	333	306	427	87
Future Volume (veh/h)	136	413	9	603	733	378	3	343	333	306	427	87
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1856	1870	1870	1856	1870
Adj Flow Rate, veh/h	140	426	0	622	756	0	3	354	343	315	440	90
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	3	2	2	3	2
Cap, veh/h	344	735		608	1364		248	451	386	309	745	637
Arrive On Green	0.08	0.21	0.00	0.25	0.38	0.00	0.24	0.24	0.24	0.11	0.40	0.40
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	874	1856	1585	1781	1856	1585
Grp Volume(v), veh/h	140	426	0	622	756	0	3	354	343	315	440	90
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	874	1856	1585	1781	1856	1585
Q Serve(g_s), s	7.3	13.0	0.0	30.5	20.0	0.0	0.3	21.4	25.1	13.5	22.3	4.3
Cycle Q Clear(g_c), s	7.3	13.0	0.0	30.5	20.0	0.0	3.6	21.4	25.1	13.5	22.3	4.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	344	735		608	1364		248	451	386	309	745	637
V/C Ratio(X)	0.41	0.58		1.02	0.55		0.01	0.78	0.89	1.02	0.59	0.14
Avail Cap(c_a), veh/h	347	735		608	1364		294	549	469	309	843	720
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	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.4	42.9	0.0	27.7	28.9	0.0	37.0	42.5	43.8	34.8	28.2	22.8
Incr Delay (d2), s/veh	0.8	3.3	0.0	42.6	1.6	0.0	0.0	6.0	16.4	56.3	0.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	5.9	0.0	19.9	8.5	0.0	0.1	10.2	11.2	11.3	9.6	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.2	46.2	0.0	70.4	30.6	0.0	37.1	48.5	60.2	91.1	29.0	22.9
LnGrp LOS	C	D		F	C		D	D	E	F	C	C
Approach Vol, veh/h	566			1378			700			845		
Approach Delay, s/veh	43.2			48.5			54.2			51.5		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.7	51.6		53.7	36.0	30.3	19.0	34.7				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	9.5	39.5		54.5	30.5	18.5	13.5	35.5				
Max Q Clear Time (g_c+I1), s	9.3	22.0		24.3	32.5	15.0	15.5	27.1				
Green Ext Time (p_c), s	0.0	7.6		2.9	0.0	1.3	0.0	2.1				

Intersection Summary

HCM 6th Ctrl Delay 49.5

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Timings

3b. Build 2027 PM

6: SR 42/SR 138/US 23 (N. Henry Blvd) & SR 138 (Lake Spivey Pkwy)

01/18/2023

	→	↘	↙	←	↖	↗	↑	↘	↓	
Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
Traffic Volume (vph)	180	1018	187	189	131	760	414	98	96	561
Future Volume (vph)	180	1018	187	189	131	760	414	98	96	561
Lane Group Flow (vph)	437	1039	191	193	134	776	422	100	98	716
Turn Type	NA	pt+ov	Split	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	4	4 1	8	8		1	6		5	2
Permitted Phases					8			6		
Detector Phase	4	4 1	8	8	8	1	6	6	5	2
Switch Phase										
Minimum Initial (s)	6.0		6.0	6.0	6.0	5.0	15.0	15.0	5.0	15.0
Minimum Split (s)	31.5		30.5	30.5	30.5	15.0	28.5	28.5	15.0	31.5
Total Split (s)	40.5		30.5	30.5	30.5	39.0	56.0	56.0	23.0	40.0
Total Split (%)	27.0%		20.3%	20.3%	20.3%	26.0%	37.3%	37.3%	15.3%	26.7%
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5		5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag						Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	None		None	None	None	None	C-Min	C-Min	None	C-Min
v/c Ratio	1.02	0.77	0.77	0.73	0.39	0.91	0.58	0.15	0.62	0.88
Control Delay	104.5	21.8	81.9	77.6	11.0	70.2	41.7	6.5	82.2	67.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	104.5	21.8	81.9	77.6	11.0	70.2	41.7	6.5	82.2	67.3
Queue Length 50th (ft)	~452	258	181	182	0	386	329	0	94	351
Queue Length 95th (ft)	#671	313	265	266	57	#540	481	43	154	#457
Internal Link Dist (ft)	2539			205			2663			944
Turn Bay Length (ft)			100		120	340		300	580	
Base Capacity (vph)	428	1342	297	316	384	852	723	687	208	813
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.77	0.64	0.61	0.35	0.91	0.58	0.15	0.47	0.88

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

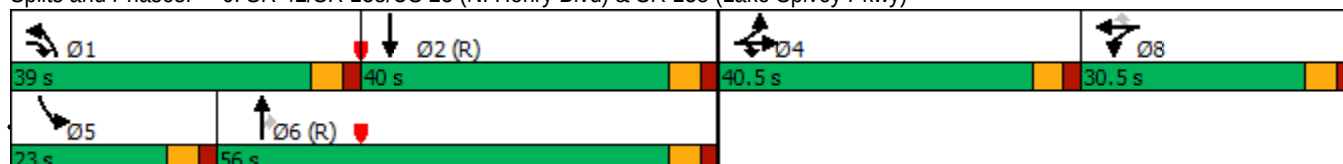
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 6: SR 42/SR 138/US 23 (N. Henry Blvd) & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
6: SR 42/SR 138/US 23 (N. Henry Blvd) & SR 138 (Lake Spivey Pkwy)

3b. Build 2027 PM

01/18/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↩	↩↩	↩	↩	↩	↩↩	↩	↩	↩	↩↩	
Traffic Volume (veh/h)	248	180	1018	187	189	131	760	414	98	96	561	141
Future Volume (veh/h)	248	180	1018	187	189	131	760	414	98	96	561	141
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1900	1870	1885	1900	1900	1870	1856	1885	1885	1870	1885
Adj Flow Rate, veh/h	253	184	1039	191	193	0	776	422	0	98	572	0
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, %	1	0	2	1	0	0	2	3	1	1	2	1
Cap, veh/h	249	181	1274	223	236		772	796		120	968	
Arrive On Green	0.23	0.23	0.23	0.12	0.12	0.00	0.22	0.43	0.00	0.07	0.27	0.00
Sat Flow, veh/h	1069	777	2790	1795	1900	1610	3456	1856	1598	1795	3647	0
Grp Volume(v), veh/h	437	0	1039	191	193	0	776	422	0	98	572	0
Grp Sat Flow(s),veh/h/ln	1847	0	1395	1795	1900	1610	1728	1856	1598	1795	1777	0
Q Serve(g_s), s	35.0	0.0	35.0	15.6	14.8	0.0	33.5	25.2	0.0	8.1	20.9	0.0
Cycle Q Clear(g_c), s	35.0	0.0	35.0	15.6	14.8	0.0	33.5	25.2	0.0	8.1	20.9	0.0
Prop In Lane	0.58		1.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	431	0	1274	223	236		772	796		120	968	
V/C Ratio(X)	1.01	0.00	0.82	0.86	0.82		1.01	0.53		0.82	0.59	
Avail Cap(c_a), veh/h	431	0	1274	299	317		772	796		209	968	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.49	0.00	0.49	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	57.5	0.0	35.3	64.3	64.0	0.0	58.3	31.7	0.0	69.1	47.3	0.0
Incr Delay (d2), s/veh	33.9	0.0	2.1	16.4	11.5	0.0	33.7	2.5	0.0	12.6	2.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	20.0	0.0	16.9	8.3	8.0	0.0	17.9	11.6	0.0	4.1	9.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	91.4	0.0	37.4	80.8	75.5	0.0	92.0	34.2	0.0	81.7	50.0	0.0
LnGrp LOS	F	A	D	F	E		F	C		F	D	
Approach Vol, veh/h		1476			384			1198			670	
Approach Delay, s/veh		53.4			78.1			71.6			54.6	
Approach LOS		D			E			E			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	39.0	46.3		40.5	15.5	69.8		24.2				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	33.5	34.5		35.0	17.5	50.5		25.0				
Max Q Clear Time (g_c+I1), s	35.5	22.9		37.0	10.1	27.2		17.6				
Green Ext Time (p_c), s	0.0	4.4		0.0	0.1	4.6		1.0				

Intersection Summary

HCM 6th Ctrl Delay 62.0

HCM 6th LOS E

Notes

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings
7: I-675 NB Ramps & SR 138 (Lake Spivey Pkwy)

3b. Build 2027 PM

01/18/2023

						
Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	338	2242	1701	300	48	131
Future Volume (vph)	338	2242	1701	300	48	131
Lane Group Flow (vph)	345	2288	1736	306	49	134
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		3	
Permitted Phases	6			2		8
Detector Phase	1	6	2	2	3	8
Switch Phase						
Minimum Initial (s)	5.0	15.0	15.0	15.0	5.0	6.0
Minimum Split (s)	15.0	28.5	28.5	28.5	15.0	34.5
Total Split (s)	17.0	65.5	48.5	48.5	34.5	34.5
Total Split (%)	17.0%	65.5%	48.5%	48.5%	34.5%	34.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.61	0.82	1.07	0.35	0.30	0.59
Control Delay	21.7	14.6	69.8	5.1	45.6	28.0
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0
Total Delay	21.7	14.9	69.8	5.1	45.6	28.0
Queue Length 50th (ft)	170	465	558	18	30	29
Queue Length 95th (ft)	m173	m475	#827	74	62	83
Internal Link Dist (ft)		706	2539			
Turn Bay Length (ft)	145			270		315
Base Capacity (vph)	565	2792	1627	869	513	520
Starvation Cap Reductn	0	103	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.85	1.07	0.35	0.10	0.26

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 13 (13%), Referenced to phase 2:WBT and 6:EBTL, Start of Green

Natural Cycle: 130

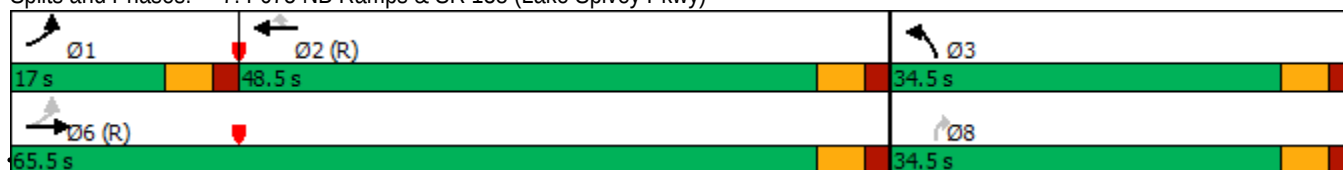
Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: I-675 NB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
7: I-675 NB Ramps & SR 138 (Lake Spivey Pkwy)

3b. Build 2027 PM

01/18/2023

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Traffic Volume (veh/h)	338	2242	0	0	1701	300	48	0	131	0	0	0								
Future Volume (veh/h)	338	2242	0	0	1701	300	48	0	131	0	0	0								
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0											
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00											
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00											
Work Zone On Approach	No			No			No													
Adj Sat Flow, veh/h/ln	1870	1856	0	0	1856	1870	1870	0	1870											
Adj Flow Rate, veh/h	345	2288	0	0	1736	0	49	0	134											
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98											
Percent Heavy Veh, %	2	3	0	0	3	2	2	0	2											
Cap, veh/h	343	2762	0	0	2163		190	0	169											
Arrive On Green	0.15	1.00	0.00	0.00	0.61	0.00	0.11	0.00	0.11											
Sat Flow, veh/h	1781	3618	0	0	3618	1585	1781	0	1585											
Grp Volume(v), veh/h	345	2288	0	0	1736	0	49	0	134											
Grp Sat Flow(s),veh/h/ln	1781	1763	0	0	1763	1585	1781	0	1585											
Q Serve(g_s), s	11.5	0.0	0.0	0.0	37.5	0.0	2.5	0.0	8.3											
Cycle Q Clear(g_c), s	11.5	0.0	0.0	0.0	37.5	0.0	2.5	0.0	8.3											
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00											
Lane Grp Cap(c), veh/h	343	2762	0	0	2163		190	0	169											
V/C Ratio(X)	1.01	0.83	0.00	0.00	0.80		0.26	0.00	0.79											
Avail Cap(c_a), veh/h	343	2762	0	0	2163		517	0	460											
HCM Platoon Ratio	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00											
Upstream Filter(I)	0.09	0.09	0.00	0.00	0.36	0.00	1.00	0.00	1.00											
Uniform Delay (d), s/veh	27.6	0.0	0.0	0.0	14.7	0.0	41.0	0.0	43.6											
Incr Delay (d2), s/veh	15.8	0.3	0.0	0.0	1.2	0.0	0.7	0.0	8.1											
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0											
%ile BackOfQ(50%),veh/ln	9.1	0.1	0.0	0.0	12.6	0.0	1.1	0.0	3.5											
Unsig. Movement Delay, s/veh																				
LnGrp Delay(d),s/veh	43.4	0.3	0.0	0.0	15.9	0.0	41.8	0.0	51.7											
LnGrp LOS	F	A	A	A	B		D	A	D											
Approach Vol, veh/h	2633			1736			183													
Approach Delay, s/veh	5.9			15.9			49.1													
Approach LOS	A			B			D													
Timer - Assigned Phs	1	2					6	8												
Phs Duration (G+Y+Rc), s	17.0	66.8					83.8	16.2												
Change Period (Y+Rc), s	5.5	5.5					5.5	5.5												
Max Green Setting (Gmax), s	11.5	43.0					60.0	29.0												
Max Q Clear Time (g_c+I1), s	13.5	39.5					2.0	10.3												
Green Ext Time (p_c), s	0.0	3.3					52.3	0.5												
Intersection Summary																				
HCM 6th Ctrl Delay													11.5							
HCM 6th LOS													B							
Notes																				
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.																				

Timings 8: I-675 SB Ramps & SR 138 (Lake Spivey Pkwy)

3b. Build 2027 PM

01/18/2023



Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Configurations	↑↑	↑	↑	↑↑	↑↑	↑↑
Traffic Volume (vph)	2135	132	112	1637	445	551
Future Volume (vph)	2135	132	112	1637	445	551
Lane Group Flow (vph)	2201	136	115	1688	459	568
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	7	
Permitted Phases		6	2			4
Detector Phase	6	6	5	2	7	4
Switch Phase						
Minimum Initial (s)	15.0	15.0	5.0	15.0	5.0	6.0
Minimum Split (s)	28.5	28.5	15.0	28.5	35.5	35.5
Total Split (s)	49.5	49.5	15.0	64.5	35.5	35.5
Total Split (%)	49.5%	49.5%	15.0%	64.5%	35.5%	35.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Min	C-Min	None	C-Min	None	None
v/c Ratio	1.19	0.15	0.53	0.73	0.58	0.80
Control Delay	108.6	0.2	33.1	5.2	36.7	39.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	108.6	0.2	33.1	5.2	36.7	39.4
Queue Length 50th (ft)	~907	0	35	18	134	166
Queue Length 95th (ft)	m#953	m0	m38	m29	169	215
Internal Link Dist (ft)	1959			706		
Turn Bay Length (ft)		375	95		520	500
Base Capacity (vph)	1842	889	242	2313	1029	897
Starvation Cap Reductn	0	0	0	16	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.19	0.15	0.48	0.73	0.45	0.63

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 24 (24%), Referenced to phase 2:WBTL and 6:EBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

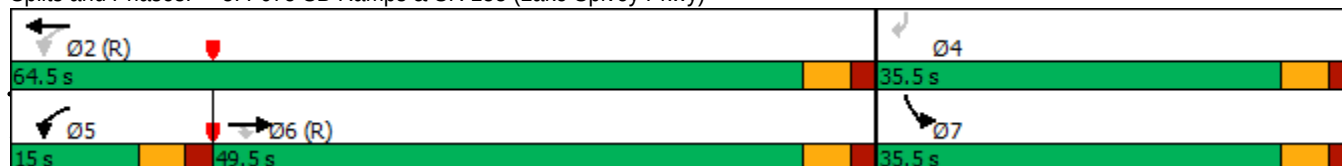
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: I-675 SB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
8: I-675 SB Ramps & SR 138 (Lake Spivey Pkwy)

3b. Build 2027 PM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑					↖↖		↗↗
Traffic Volume (veh/h)	0	2135	132	112	1637	0	0	0	0	445	0	551
Future Volume (veh/h)	0	2135	132	112	1637	0	0	0	0	445	0	551
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1870	1870	1856	0				1870	0	1870
Adj Flow Rate, veh/h	0	2201	136	115	1688	0				459	0	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	3	2	2	3	0				2	0	2
Cap, veh/h	0	2202	990	254	2565	0				561	0	
Arrive On Green	0.00	1.00	1.00	0.06	0.97	0.00				0.16	0.00	0.00
Sat Flow, veh/h	0	3618	1585	1781	3618	0				3456	0	2790
Grp Volume(v), veh/h	0	2201	136	115	1688	0				459	0	0
Grp Sat Flow(s),veh/h/ln	0	1763	1585	1781	1763	0				1728	0	1395
Q Serve(g_s), s	0.0	0.0	0.0	2.1	4.3	0.0				12.8	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	2.1	4.3	0.0				12.8	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2202	990	254	2565	0				561	0	
V/C Ratio(X)	0.00	1.00	0.14	0.45	0.66	0.00				0.82	0.00	
Avail Cap(c_a), veh/h	0	2202	990	338	2565	0				1037	0	
HCM Platoon Ratio	1.00	2.00	2.00	1.33	1.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.09	0.09	0.09	0.09	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	5.0	0.5	0.0				40.5	0.0	0.0
Incr Delay (d2), s/veh	0.0	5.6	0.0	0.1	0.1	0.0				3.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.7	3.8	0.6	0.5	0.0				5.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	5.6	0.0	5.2	0.6	0.0				43.5	0.0	0.0
LnGrp LOS	A	A	A	A	A	A				D	A	
Approach Vol, veh/h	2337				1803				459			
Approach Delay, s/veh	5.3				0.9				43.5			
Approach LOS	A				A				D			
Timer - Assigned Phs	2			4		5		6				
Phs Duration (G+Y+Rc), s	78.3			21.7		10.3		68.0				
Change Period (Y+Rc), s	5.5			5.5		5.5		5.5				
Max Green Setting (Gmax), s	59.0			30.0		9.5		44.0				
Max Q Clear Time (g_c+I1), s	6.3			14.8		4.1		2.0				
Green Ext Time (p_c), s	36.7			1.4		0.1		38.7				
Intersection Summary												
HCM 6th Ctrl Delay			7.4									
HCM 6th LOS			A									
Notes												

Timings
9: SR 138 (Lake Spivey Pkwy) & Mt. Zion Rd

3b. Build 2027 PM

01/18/2023

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	160	1716	84	75	1369	180	135	132	194	100	196
Future Volume (vph)	160	1716	84	75	1369	180	135	132	194	100	196
Lane Group Flow (vph)	165	1769	87	77	1411	186	139	246	200	103	202
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8	7	4	
Permitted Phases	6		6	2		2	8		4		4
Detector Phase	1	6	6	5	2	2	3	8	7	4	4
Switch Phase											
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	6.0	5.0	6.0	6.0
Minimum Split (s)	15.0	28.5	28.5	15.0	34.5	34.5	15.0	38.5	15.0	32.5	32.5
Total Split (s)	15.0	31.5	31.5	15.0	31.5	31.5	15.0	38.5	15.0	38.5	38.5
Total Split (%)	15.0%	31.5%	31.5%	15.0%	31.5%	31.5%	15.0%	38.5%	15.0%	38.5%	38.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None
v/c Ratio	0.61	1.10	0.11	0.37	0.99	0.25	0.36	0.73	0.71	0.31	0.45
Control Delay	32.9	79.1	1.7	12.9	46.5	7.3	26.6	44.2	40.2	36.9	8.0
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	32.9	79.1	1.7	12.9	46.5	7.3	26.6	44.2	40.2	36.9	8.0
Queue Length 50th (ft)	64	~730	0	14	481	24	65	124	97	58	0
Queue Length 95th (ft)	m93	#957	m1	m34	#781	m68	100	192	140	98	55
Internal Link Dist (ft)		896			1959			388		1031	
Turn Bay Length (ft)	115		140	155		325	35		345		165
Base Capacity (vph)	280	1608	806	244	1419	755	389	608	281	627	668
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	1.10	0.11	0.32	0.99	0.25	0.36	0.40	0.71	0.16	0.30

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 145

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

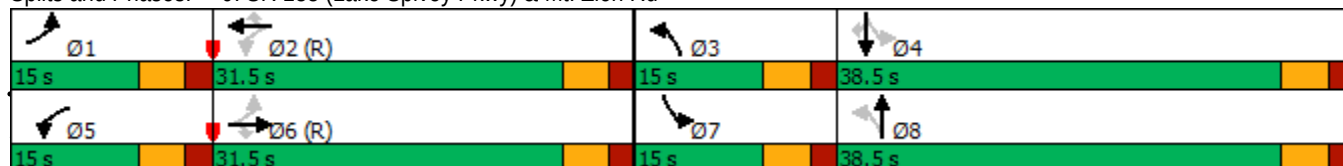
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: SR 138 (Lake Spivey Pkwy) & Mt. Zion Rd



HCM 6th Signalized Intersection Summary
9: SR 138 (Lake Spivey Pkwy) & Mt. Zion Rd

3b. Build 2027 PM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	1716	84	75	1369	180	135	132	107	194	100	196
Future Volume (veh/h)	160	1716	84	75	1369	180	135	132	107	194	100	196
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1900	1856	1870	1870	1856	1900	1870	1900	1870	1900	1900	1900
Adj Flow Rate, veh/h	165	1769	0	77	1411	186	139	136	110	200	103	202
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	3	2	2	3	0	2	0	2	0	0	0
Cap, veh/h	216	1664		151	1572	718	363	164	133	283	346	293
Arrive On Green	0.14	0.94	0.00	0.01	0.15	0.15	0.08	0.17	0.17	0.09	0.18	0.18
Sat Flow, veh/h	1810	3526	1585	1781	3526	1610	1781	972	786	1810	1900	1610
Grp Volume(v), veh/h	165	1769	0	77	1411	186	139	0	246	200	103	202
Grp Sat Flow(s),veh/h/ln	1810	1763	1585	1781	1763	1610	1781	0	1758	1810	1900	1610
Q Serve(g_s), s	5.0	47.2	0.0	2.3	39.3	10.2	6.3	0.0	13.5	9.1	4.7	11.7
Cycle Q Clear(g_c), s	5.0	47.2	0.0	2.3	39.3	10.2	6.3	0.0	13.5	9.1	4.7	11.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.45	1.00		1.00
Lane Grp Cap(c), veh/h	216	1664		151	1572	718	363	0	297	283	346	293
V/C Ratio(X)	0.76	1.06		0.51	0.90	0.26	0.38	0.00	0.83	0.71	0.30	0.69
Avail Cap(c_a), veh/h	261	1664		241	1572	718	386	0	580	283	627	531
HCM Platoon Ratio	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.46	0.46	0.00	0.58	0.58	0.58	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.9	2.8	0.0	24.3	40.4	28.0	30.5	0.0	40.1	31.6	35.4	38.3
Incr Delay (d2), s/veh	5.0	35.3	0.0	1.6	5.2	0.5	0.7	0.0	5.8	7.8	0.5	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	9.2	0.0	0.9	19.5	4.5	2.8	0.0	6.3	4.4	2.2	4.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.9	38.1	0.0	25.8	45.6	28.5	31.1	0.0	46.0	39.4	35.8	41.1
LnGrp LOS	C	F		C	D	C	C	A	D	D	D	D
Approach Vol, veh/h	1934				1674				385			
Approach Delay, s/veh	37.0				42.8				40.6			
Approach LOS	D				D				D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.5	50.1	13.7	23.7	9.9	52.7	15.0	22.4				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	9.5	26.0	9.5	33.0	9.5	26.0	9.5	33.0				
Max Q Clear Time (g_c+I1), s	7.0	41.3	8.3	13.7	4.3	49.2	11.1	15.5				
Green Ext Time (p_c), s	0.1	0.0	0.0	1.1	0.1	0.0	0.0	1.4				

Intersection Summary

HCM 6th Ctrl Delay 39.8

HCM 6th LOS D

Notes

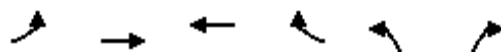
User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Timings
10: I-75 NB Ramps & SR 138 (Lake Spivey Pkwy)

3b. Build 2027 PM

01/18/2023



Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	329	2071	1369	592	211	158
Future Volume (vph)	329	2071	1369	592	211	158
Lane Group Flow (vph)	339	2135	1411	610	218	163
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		3	
Permitted Phases	6			2		8
Detector Phase	1	6	2	2	3	8
Switch Phase						
Minimum Initial (s)	5.0	15.0	15.0	15.0	5.0	6.0
Minimum Split (s)	15.0	28.5	28.5	28.5	15.0	32.5
Total Split (s)	20.0	67.5	47.5	47.5	32.5	32.5
Total Split (%)	20.0%	67.5%	47.5%	47.5%	32.5%	32.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.75	0.85	0.90	0.58	0.70	0.47
Control Delay	28.2	15.6	18.5	3.8	50.5	21.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.2	15.6	18.5	3.8	50.5	21.3
Queue Length 50th (ft)	168	483	128	0	132	42
Queue Length 95th (ft)	m196	m489	m#173	m26	196	97
Internal Link Dist (ft)		897	896			
Turn Bay Length (ft)	140			405		510
Base Capacity (vph)	450	2503	1566	1044	477	490
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.85	0.90	0.58	0.46	0.33

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 98 (98%), Referenced to phase 2:WBT and 6:EBTL, Start of Green

Natural Cycle: 100

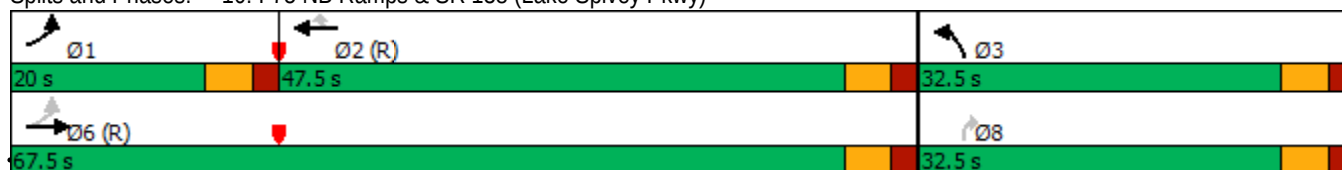
Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: I-75 NB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
10: I-75 NB Ramps & SR 138 (Lake Spivey Pkwy)

3b. Build 2027 PM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	329	2071	0	0	1369	592	211	0	158	0	0	0
Future Volume (veh/h)	329	2071	0	0	1369	592	211	0	158	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No				No				
Adj Sat Flow, veh/h/ln	1870	1856	0	0	1856	1870	1870	0	1870			
Adj Flow Rate, veh/h	339	2135	0	0	1411	0	218	0	0			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	2	3	0	0	3	2	2	0	2			
Cap, veh/h	375	2631	0	0	2074		256	0				
Arrive On Green	0.21	1.00	0.00	0.00	0.59	0.00	0.14	0.00	0.00			
Sat Flow, veh/h	1781	3618	0	0	3618	1585	1781	0	1585			
Grp Volume(v), veh/h	339	2135	0	0	1411	0	218	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1763	0	0	1763	1585	1781	0	1585			
Q Serve(g_s), s	7.9	0.0	0.0	0.0	27.5	0.0	11.9	0.0	0.0			
Cycle Q Clear(g_c), s	7.9	0.0	0.0	0.0	27.5	0.0	11.9	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	375	2631	0	0	2074		256	0				
V/C Ratio(X)	0.90	0.81	0.00	0.00	0.68		0.85	0.00				
Avail Cap(c_a), veh/h	450	2631	0	0	2074		481	0				
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.18	0.18	0.00	0.00	0.35	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	15.5	0.0	0.0	0.0	14.1	0.0	41.8	0.0	0.0			
Incr Delay (d2), s/veh	4.5	0.5	0.0	0.0	0.6	0.0	7.8	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.5	0.2	0.0	0.0	9.5	0.0	5.6	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.1	0.5	0.0	0.0	14.8	0.0	49.6	0.0	0.0			
LnGrp LOS	C	A	A	A	B		D	A				
Approach Vol, veh/h	2474			1411				218				
Approach Delay, s/veh	3.2			14.8				49.6				
Approach LOS	A			B				D				
Timer - Assigned Phs	1	2	6				8					
Phs Duration (G+Y+Rc), s	15.8	64.3	80.1				19.9					
Change Period (Y+Rc), s	5.5	5.5	5.5				5.5					
Max Green Setting (Gmax), s	14.5	42.0	62.0				27.0					
Max Q Clear Time (g_c+I1), s	9.9	29.5	2.0				13.9					
Green Ext Time (p_c), s	0.4	10.1	51.4				0.5					
Intersection Summary												
HCM 6th Ctrl Delay	9.6											
HCM 6th LOS	A											
Notes												

Timings 11: I-75 SB Ramps & SR 138 (Lake Spivey Pkwy)

3b. Build 2027 PM
01/18/2023

	→	↘	↙	←	↘	↙
Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↘
Traffic Volume (vph)	1447	331	182	1426	922	662
Future Volume (vph)	1447	331	182	1426	922	662
Lane Group Flow (vph)	1492	341	188	1470	951	682
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	3	
Permitted Phases		6	2			8
Detector Phase	6	6	5	2	3	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	5.0	15.0	5.0	15.0
Minimum Split (s)	28.5	28.5	15.0	28.5	15.0	28.5
Total Split (s)	46.0	46.0	15.0	61.0	39.0	39.0
Total Split (%)	46.0%	46.0%	15.0%	61.0%	39.0%	39.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Min	C-Min	None	C-Min	None	Min
v/c Ratio	1.05	0.40	0.79	0.76	0.83	1.16
Control Delay	66.9	3.7	50.1	15.9	38.0	118.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.9	3.7	50.1	15.9	38.0	118.3
Queue Length 50th (ft)	~549	0	98	215	284	~480
Queue Length 95th (ft)	#685	53	m122	m258	364	#703
Internal Link Dist (ft)	1158			897		
Turn Bay Length (ft)		980	150		490	
Base Capacity (vph)	1427	847	242	1945	1150	588
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.05	0.40	0.78	0.76	0.83	1.16

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

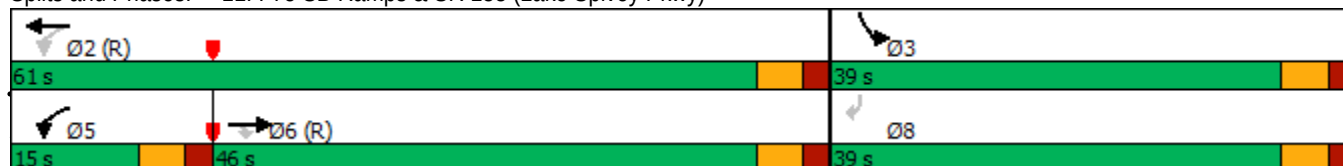
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

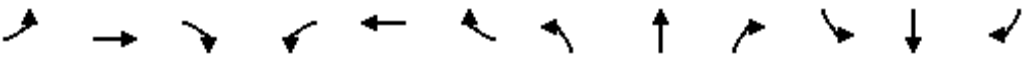
Splits and Phases: 11: I-75 SB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
11: I-75 SB Ramps & SR 138 (Lake Spivey Pkwy)

3b. Build 2027 PM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑					↑↑		↑
Traffic Volume (veh/h)	0	1447	331	182	1426	0	0	0	0	922	0	662
Future Volume (veh/h)	0	1447	331	182	1426	0	0	0	0	922	0	662
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1870	1870	1856	0				1870	0	1870
Adj Flow Rate, veh/h	0	1492	0	188	1470	0				951	0	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	3	2	2	3	0				2	0	2
Cap, veh/h	0	1620		224	2070	0				1047	0	
Arrive On Green	0.00	0.46	0.00	0.02	0.19	0.00				0.30	0.00	0.00
Sat Flow, veh/h	0	3618	1585	1781	3618	0				3456	0	1585
Grp Volume(v), veh/h	0	1492	0	188	1470	0				951	0	0
Grp Sat Flow(s),veh/h/ln	0	1763	1585	1781	1763	0				1728	0	1585
Q Serve(g_s), s	0.0	39.7	0.0	5.2	39.0	0.0				26.5	0.0	0.0
Cycle Q Clear(g_c), s	0.0	39.7	0.0	5.2	39.0	0.0				26.5	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1620		224	2070	0				1047	0	
V/C Ratio(X)	0.00	0.92		0.84	0.71	0.00				0.91	0.00	
Avail Cap(c_a), veh/h	0	1620		263	2070	0				1158	0	
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.24	0.00	0.36	0.36	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	25.3	0.0	23.7	32.4	0.0				33.5	0.0	0.0
Incr Delay (d2), s/veh	0.0	2.9	0.0	7.6	0.8	0.0				9.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	15.5	0.0	2.5	18.3	0.0				11.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	28.2	0.0	31.3	33.1	0.0				43.4	0.0	0.0
LnGrp LOS	A	C		C	C	A				D	A	
Approach Vol, veh/h		1492			1658						951	
Approach Delay, s/veh		28.2			32.9						43.4	
Approach LOS		C			C						D	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		64.2			12.8	51.4		35.8				
Change Period (Y+Rc), s		5.5			5.5	5.5		5.5				
Max Green Setting (Gmax), s		55.5			9.5	40.5		33.5				
Max Q Clear Time (g_c+I1), s		41.0			7.2	41.7		28.5				
Green Ext Time (p_c), s		11.8			0.1	0.0		1.8				
Intersection Summary												
HCM 6th Ctrl Delay			33.6									
HCM 6th LOS			C									
Notes												
Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Timings

3b. Build 2027 PM

12: Speer Rd/Mt. Zion Pkwy & SR 138 (Lake Spivey Pkwy)

01/18/2023

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑	↗	↔↔	↑↑	↗	↔↔	↑↑	↗	↔↔	↑↑	↗
Traffic Volume (vph)	178	865	110	669	988	198	80	201	386	377	358	151
Future Volume (vph)	178	865	110	669	988	198	80	201	386	377	358	151
Lane Group Flow (vph)	182	883	112	683	1008	202	82	205	394	385	365	154
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2			8			4
Detector Phase	1	6	6	5	2	2	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	15.0	46.5	46.5	15.0	47.5	47.5	15.0	46.5	46.5	15.0	45.5	45.5
Total Split (s)	16.0	46.5	46.5	34.0	64.5	64.5	15.0	46.5	46.5	23.0	54.5	54.5
Total Split (%)	10.7%	31.0%	31.0%	22.7%	43.0%	43.0%	10.0%	31.0%	31.0%	15.3%	36.3%	36.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.76	0.92	0.20	0.97	0.71	0.27	0.42	0.22	0.95	0.96	0.31	0.25
Control Delay	88.5	68.3	0.8	87.3	41.3	4.5	74.9	43.5	86.4	101.6	38.9	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	88.5	68.3	0.8	87.3	41.3	4.5	74.9	43.5	86.4	101.6	38.9	6.1
Queue Length 50th (ft)	91	444	0	~366	439	0	40	82	375	196	140	0
Queue Length 95th (ft)	#148	#566	0	#493	523	52	70	117	#573	#302	186	52
Internal Link Dist (ft)		1890			1158			635			523	
Turn Bay Length (ft)	345		290	290		930	195		550	270		270
Base Capacity (vph)	242	958	570	701	1414	759	217	967	432	400	1186	623
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.92	0.20	0.97	0.71	0.27	0.38	0.21	0.91	0.96	0.31	0.25

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Green

Natural Cycle: 145

Control Type: Actuated-Coordinated

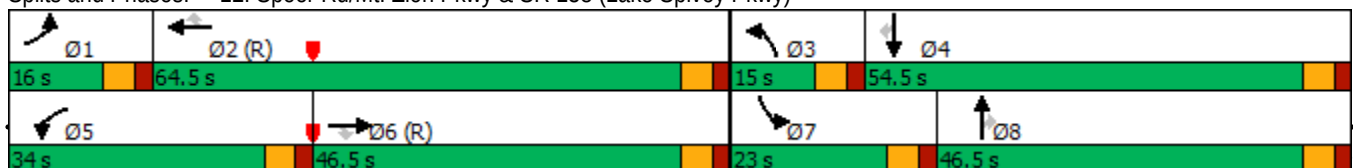
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 12: Speer Rd/Mt. Zion Pkwy & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary

12: Speer Rd/Mt. Zion Pkwy & SR 138 (Lake Spivey Pkwy)

3b. Build 2027 PM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	178	865	110	669	988	198	80	201	386	377	358	151
Future Volume (veh/h)	178	865	110	669	988	198	80	201	386	377	358	151
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1856	1900	1900	1856	1870	1870	1870	1870	1870	1900	1870
Adj Flow Rate, veh/h	182	883	112	683	1008	202	82	205	394	385	365	154
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	3	0	0	3	2	2	2	2	2	0	2
Cap, veh/h	226	1004	458	667	1443	649	124	931	415	403	1237	543
Arrive On Green	0.07	0.28	0.28	0.19	0.41	0.41	0.04	0.26	0.26	0.12	0.34	0.34
Sat Flow, veh/h	3456	3526	1610	3510	3526	1585	3456	3554	1585	3456	3610	1585
Grp Volume(v), veh/h	182	883	112	683	1008	202	82	205	394	385	365	154
Grp Sat Flow(s),veh/h/ln	1728	1763	1610	1755	1763	1585	1728	1777	1585	1728	1805	1585
Q Serve(g_s), s	7.8	35.9	8.0	28.5	35.5	12.9	3.5	6.8	36.6	16.6	11.1	10.6
Cycle Q Clear(g_c), s	7.8	35.9	8.0	28.5	35.5	12.9	3.5	6.8	36.6	16.6	11.1	10.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	226	1004	458	667	1443	649	124	931	415	403	1237	543
V/C Ratio(X)	0.80	0.88	0.24	1.02	0.70	0.31	0.66	0.22	0.95	0.95	0.30	0.28
Avail Cap(c_a), veh/h	242	1004	458	667	1443	649	219	971	433	403	1237	543
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.80	0.80	0.80	0.35	0.35	0.35	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	69.1	51.2	41.2	60.8	36.7	30.0	71.4	43.4	54.4	65.9	36.0	35.9
Incr Delay (d2), s/veh	13.8	9.0	1.0	27.0	1.0	0.4	5.9	0.1	30.0	33.3	0.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	16.7	3.3	14.9	15.1	5.0	1.6	3.0	17.7	9.1	4.9	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	82.9	60.2	42.3	87.7	37.7	30.4	77.3	43.5	84.3	99.1	36.2	36.2
LnGrp LOS	F	E	D	F	D	C	E	D	F	F	D	D
Approach Vol, veh/h	1177				1893				681			
Approach Delay, s/veh	62.0				54.9				71.2			
Approach LOS	E				D				E			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.3	66.9	10.9	56.9	34.0	48.2	23.0	44.8				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	10.5	59.0	9.5	49.0	28.5	41.0	17.5	41.0				
Max Q Clear Time (g_c+I1), s	9.8	37.5	5.5	13.1	30.5	37.9	18.6	38.6				
Green Ext Time (p_c), s	0.0	13.0	0.1	2.8	0.0	2.3	0.0	0.7				

Intersection Summary

HCM 6th Ctrl Delay	60.7
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

Timings
13: Spivey Rd & SR 138 (Lake Spivey Pkwy)

3b. Build 2027 PM
01/18/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↑
Traffic Volume (vph)	896	35	360	922	16	215
Future Volume (vph)	896	35	360	922	16	215
Lane Group Flow (vph)	1007	39	404	1036	18	242
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	8	
Permitted Phases		6	2			8
Detector Phase	6	6	5	2	8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0	6.0
Minimum Split (s)	25.5	25.5	15.0	23.5	31.5	31.5
Total Split (s)	40.4	40.4	28.0	68.4	31.6	31.6
Total Split (%)	40.4%	40.4%	28.0%	68.4%	31.6%	31.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Min	C-Min	None	C-Min	None	None
v/c Ratio	0.54	0.05	0.67	0.37	0.12	0.69
Control Delay	18.9	6.0	14.2	3.3	42.2	16.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.9	6.0	14.2	3.3	42.2	16.1
Queue Length 50th (ft)	204	0	70	61	11	0
Queue Length 95th (ft)	356	20	184	129	30	66
Internal Link Dist (ft)	1639			1890	1094	
Turn Bay Length (ft)		230	535			220
Base Capacity (vph)	1854	856	636	2828	461	592
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.05	0.64	0.37	0.04	0.41

Intersection Summary

Cycle Length: 100

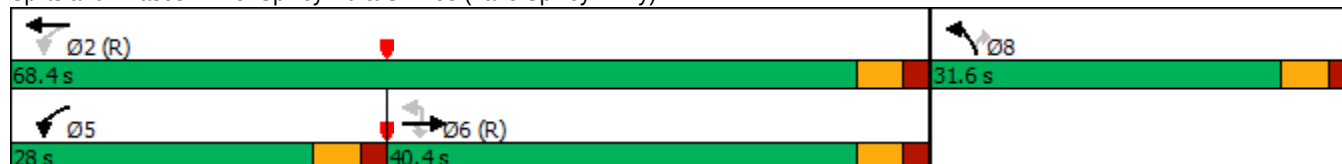
Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTU, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Splits and Phases: 13: Spivey Rd & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary 13: Spivey Rd & SR 138 (Lake Spivey Pkwy)

3b. Build 2027 PM
01/18/2023



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	⇐	⇑⇑	⇑	⇑	⇑⇑	⇑	⇑
Traffic Volume (veh/h)	0	896	35	360	922	16	215
Future Volume (veh/h)	0	896	35	360	922	16	215
Initial Q (Qb), veh		0	0	0	0	0	0
Ped-Bike Adj(A_pbT)			1.00	1.00		1.00	1.00
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No	No	
Adj Sat Flow, veh/h/ln		1856	1870	1870	1856	1870	1870
Adj Flow Rate, veh/h		1007	0	404	1036	18	0
Peak Hour Factor		0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %		3	2	2	3	2	2
Cap, veh/h		2578		564	3054	42	
Arrive On Green		0.73	0.00	0.08	0.87	0.02	0.00
Sat Flow, veh/h		3618	1585	1781	3618	1781	1585
Grp Volume(v), veh/h		1007	0	404	1036	18	0
Grp Sat Flow(s),veh/h/ln		1763	1585	1781	1763	1781	1585
Q Serve(g_s), s		10.7	0.0	4.9	5.6	1.0	0.0
Cycle Q Clear(g_c), s		10.7	0.0	4.9	5.6	1.0	0.0
Prop In Lane			1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h		2578		564	3054	42	
V/C Ratio(X)		0.39		0.72	0.34	0.43	
Avail Cap(c_a), veh/h		2578		822	3054	465	
HCM Platoon Ratio		1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	0.00	0.73	0.73	1.00	0.00
Uniform Delay (d), s/veh		5.1	0.0	4.8	1.3	48.2	0.0
Incr Delay (d2), s/veh		0.4	0.0	1.3	0.2	6.7	0.0
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		2.9	0.0	0.8	0.2	0.5	0.0
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh		5.5	0.0	6.0	1.5	54.9	0.0
LnGrp LOS		A		A	A	D	
Approach Vol, veh/h		1007			1440	18	
Approach Delay, s/veh		5.5			2.8	54.9	
Approach LOS		A			A	D	
Timer - Assigned Phs		2			5	6	8
Phs Duration (G+Y+Rc), s		92.1			13.5	78.6	7.9
Change Period (Y+Rc), s		5.5			5.5	5.5	5.5
Max Green Setting (Gmax), s		62.9			22.5	34.9	26.1
Max Q Clear Time (g_c+I1), s		7.6			6.9	12.7	3.0
Green Ext Time (p_c), s		18.7			1.1	11.8	0.0

Intersection Summary

HCM 6th Ctrl Delay	4.3
HCM 6th LOS	A

Notes

User approved ignoring U-Turning movement.

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Timings

14: Blackhall Rd/Speer Rd & Walt Stephens Rd

3b. Build 2027 PM

01/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	353	65	110	233	333	61	201	111	554	337	15
Future Volume (vph)	30	353	65	110	233	333	61	201	111	554	337	15
Lane Group Flow (vph)	31	368	68	115	243	347	64	209	116	577	351	16
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		6			2		3	8		7	4	
Permitted Phases	6		6	2		2	8		8	4		4
Detector Phase	6	6	6	2	2	2	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0	15.0	5.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	23.5	23.5	23.5	23.5	23.5	23.5	15.0	23.5	23.5	15.0	23.5	23.5
Total Split (s)	39.0	39.0	39.0	39.0	39.0	39.0	15.0	26.0	26.0	35.0	46.0	46.0
Total Split (%)	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	15.0%	26.0%	26.0%	35.0%	46.0%	46.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.08	0.52	0.10	0.42	0.34	0.43	0.22	0.70	0.31	0.88	0.47	0.02
Control Delay	22.6	28.3	0.3	21.8	17.3	2.9	17.2	52.0	5.2	35.4	24.6	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.6	28.3	0.3	21.8	17.3	2.9	17.2	52.0	5.2	35.4	24.6	0.1
Queue Length 50th (ft)	13	180	0	37	77	11	20	127	0	253	166	0
Queue Length 95th (ft)	35	288	0	m69	m122	22	37	195	28	#415	239	0
Internal Link Dist (ft)		2027			3745			1264			1872	
Turn Bay Length (ft)	110		160	190		250	140		125	315		120
Base Capacity (vph)	378	706	691	271	706	816	332	381	441	653	775	709
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.52	0.10	0.42	0.34	0.43	0.19	0.55	0.26	0.88	0.45	0.02

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 98 (98%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 70

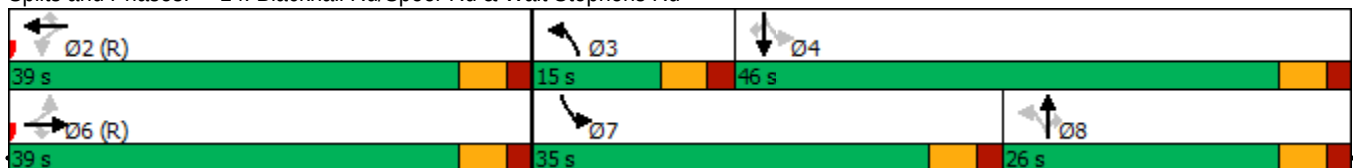
Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: Blackhall Rd/Speer Rd & Walt Stephens Rd



HCM 6th Signalized Intersection Summary

14: Blackhall Rd/Speer Rd & Walt Stephens Rd

3b. Build 2027 PM

01/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	353	65	110	233	333	61	201	111	554	337	15
Future Volume (veh/h)	30	353	65	110	233	333	61	201	111	554	337	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	31	368	68	115	243	347	64	209	0	577	351	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	340	770	653	327	770	653	286	251		616	712	
Arrive On Green	0.41	0.41	0.41	0.41	0.41	0.41	0.04	0.13	0.00	0.29	0.38	0.00
Sat Flow, veh/h	826	1870	1585	953	1870	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	31	368	68	115	243	347	64	209	0	577	351	0
Grp Sat Flow(s),veh/h/ln	826	1870	1585	953	1870	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	2.6	14.4	2.6	10.1	8.8	16.5	3.1	10.9	0.0	26.7	14.3	0.0
Cycle Q Clear(g_c), s	11.4	14.4	2.6	24.5	8.8	16.5	3.1	10.9	0.0	26.7	14.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	340	770	653	327	770	653	286	251		616	712	
V/C Ratio(X)	0.09	0.48	0.10	0.35	0.32	0.53	0.22	0.83		0.94	0.49	
Avail Cap(c_a), veh/h	340	770	653	327	770	653	380	383		627	757	
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	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	23.7	21.5	18.1	30.5	19.9	22.2	35.1	42.2	0.0	24.1	23.6	0.0
Incr Delay (d2), s/veh	0.5	2.1	0.3	3.0	1.1	3.1	0.4	9.0	0.0	21.4	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	6.3	1.0	2.5	3.8	6.2	1.3	5.4	0.0	13.8	6.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.3	23.7	18.4	33.5	21.0	25.2	35.5	51.2	0.0	45.5	24.1	0.0
LnGrp LOS	C	C	B	C	C	C	D	D		D	C	
Approach Vol, veh/h	467			705			273			928		
Approach Delay, s/veh	22.9			25.1			47.5			37.4		
Approach LOS	C			C			D			D		
Timer - Assigned Phs	2		3	4		6	7	8				
Phs Duration (G+Y+Rc), s	46.7		9.7	43.6		46.7	34.4	18.9				
Change Period (Y+Rc), s	5.5		5.5	5.5		5.5	5.5	5.5				
Max Green Setting (Gmax), s	33.5		9.5	40.5		33.5	29.5	20.5				
Max Q Clear Time (g_c+I1), s	26.5		5.1	16.3		16.4	28.7	12.9				
Green Ext Time (p_c), s	3.2		0.0	1.9		4.2	0.2	0.6				

Intersection Summary

HCM 6th Ctrl Delay	32.1
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection						
Int Delay, s/veh	34					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	117	143	175	578	669	143
Future Vol, veh/h	117	143	175	578	669	143
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	150	235	-	-	175
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	3	3	2
Mvmt Flow	127	155	190	628	727	155
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1735	727	882	0	-	0
Stage 1	727	-	-	-	-	-
Stage 2	1008	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	~ 96	424	767	-	-	-
Stage 1	478	-	-	-	-	-
Stage 2	353	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 72	424	767	-	-	-
Mov Cap-2 Maneuver	~ 72	-	-	-	-	-
Stage 1	359	-	-	-	-	-
Stage 2	353	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	231	2.6		0		
HCM LOS	F					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	767	-	72	424	-	-
HCM Lane V/C Ratio	0.248	-	1.766	0.367	-	-
HCM Control Delay (s)	11.2	-	\$ 491	18.3	-	-
HCM Lane LOS	B	-	F	C	-	-
HCM 95th %tile Q(veh)	1	-	11.2	1.7	-	-
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

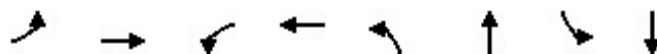
Future “Build” Intersections Analysis with Improvements

Timings

3c. Build 2027 AM - Improved

1: Flippen Rd/Shields Rd & SR 42/SR 138/US 23 (N. Henry Blvd)

01/23/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	8	686	167	1232	381	23	19	31
Future Volume (vph)	8	686	167	1232	381	23	19	31
Lane Group Flow (vph)	9	952	188	1396	428	199	0	73
Turn Type	Perm	NA	pm+pt	NA	pm+pt	NA	Perm	NA
Protected Phases		6	5	2	3	8		4
Permitted Phases	6		2		8		4	
Detector Phase	6	6	5	2	3	8	4	4
Switch Phase								
Minimum Initial (s)	15.0	15.0	5.0	15.0	5.0	6.0	6.0	6.0
Minimum Split (s)	28.5	28.5	15.0	28.5	15.0	30.5	30.5	30.5
Total Split (s)	37.5	37.5	15.0	52.5	22.0	47.5	25.5	25.5
Total Split (%)	37.5%	37.5%	15.0%	52.5%	22.0%	47.5%	25.5%	25.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5		5.5
Lead/Lag	Lag	Lag	Lead		Lead		Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes	Yes
Recall Mode	C-Min	C-Min	None	C-Min	None	None	None	None
v/c Ratio	0.07	0.65	0.54	0.67	1.04	0.34		0.48
Control Delay	24.1	27.0	16.6	16.6	80.6	6.1		45.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	24.1	27.0	16.6	16.6	80.6	6.1		45.3
Queue Length 50th (ft)	3	247	53	308	210	6		36
Queue Length 95th (ft)	17	#377	96	421	#371	36		77
Internal Link Dist (ft)		2570		1632		2093		641
Turn Bay Length (ft)	135		210					
Base Capacity (vph)	132	1456	351	2081	411	775		312
Starvation Cap Reductn	0	0	0	0	0	0		0
Spillback Cap Reductn	0	0	0	0	0	0		0
Storage Cap Reductn	0	0	0	0	0	0		0
Reduced v/c Ratio	0.07	0.65	0.54	0.67	1.04	0.26		0.23

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

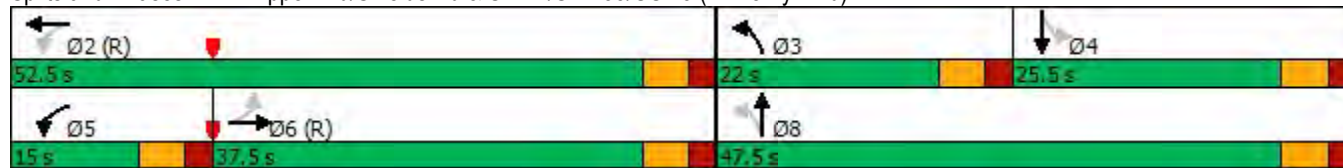
Natural Cycle: 90

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Flippen Rd/Shields Rd & SR 42/SR 138/US 23 (N. Henry Blvd)



HCM 6th Signalized Intersection Summary

3c. Build 2027 AM - Improved

1: Flippen Rd/Shields Rd & SR 42/SR 138/US 23 (N. Henry Blvd)

01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	686	161	167	1232	11	381	23	154	19	31	15
Future Volume (veh/h)	8	686	161	167	1232	11	381	23	154	19	31	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1841	1856	1856	1841	1870	1856	1870	1856	1870	1870	1870
Adj Flow Rate, veh/h	9	771	181	188	1384	12	428	26	173	21	35	17
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	4	3	3	4	2	3	2	3	2	2	2
Cap, veh/h	208	1341	315	363	2147	19	469	60	402	69	59	25
Arrive On Green	0.48	0.48	0.48	0.07	0.60	0.60	0.17	0.29	0.29	0.07	0.07	0.07
Sat Flow, veh/h	387	2811	660	1767	3553	31	1767	211	1406	339	893	374
Grp Volume(v), veh/h	9	480	472	188	681	715	428	0	199	73	0	0
Grp Sat Flow(s),veh/h/ln	387	1749	1722	1767	1749	1835	1767	0	1617	1606	0	0
Q Serve(g_s), s	1.5	19.8	19.8	5.1	25.2	25.3	16.5	0.0	10.0	2.8	0.0	0.0
Cycle Q Clear(g_c), s	14.1	19.8	19.8	5.1	25.2	25.3	16.5	0.0	10.0	4.4	0.0	0.0
Prop In Lane	1.00		0.38	1.00		0.02	1.00		0.87	0.29		0.23
Lane Grp Cap(c), veh/h	208	834	822	363	1057	1109	469	0	462	152	0	0
V/C Ratio(X)	0.04	0.57	0.57	0.52	0.64	0.64	0.91	0.00	0.43	0.48	0.00	0.00
Avail Cap(c_a), veh/h	208	834	822	403	1057	1109	469	0	679	360	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	21.5	18.8	18.8	13.9	12.8	12.8	37.5	0.0	29.1	45.6	0.0	0.0
Incr Delay (d2), s/veh	0.4	2.9	2.9	1.1	3.0	2.9	22.2	0.0	0.6	2.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	7.9	7.8	1.9	9.2	9.6	5.1	0.0	3.9	1.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.9	21.7	21.8	15.0	15.9	15.7	59.7	0.0	29.7	47.9	0.0	0.0
LnGrp LOS	C	C	C	B	B	B	E	A	C	D	A	A
Approach Vol, veh/h	961		1584			627			73			
Approach Delay, s/veh	21.7		15.7			50.2			47.9			
Approach LOS	C		B			D			D			
Timer - Assigned Phs	2		3		4		5		6		8	
Phs Duration (G+Y+Rc), s	65.9		22.0		12.1		12.7		53.2		34.1	
Change Period (Y+Rc), s	5.5		5.5		5.5		5.5		5.5			
Max Green Setting (Gmax), s	47.0		16.5		20.0		9.5		32.0		42.0	
Max Q Clear Time (g_c+I1), s	27.3		18.5		6.4		7.1		21.8		12.0	
Green Ext Time (p_c), s	14.4		0.0		0.2		0.1		6.4		1.2	
Intersection Summary												
HCM 6th Ctrl Delay	24.9											
HCM 6th LOS	C											
Notes												

Intersection												
Int Delay, s/veh	3.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔		↔	↔			↔	↔
Traffic Vol, veh/h	56	0	68	9	0	20	24	563	5	8	400	19
Future Vol, veh/h	56	0	68	9	0	20	24	563	5	8	400	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	150	-	-	-	235	-	-	-	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	3	2	2	3	2
Mvmt Flow	60	0	72	10	0	21	26	599	5	9	426	20

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1108	1100	426	1144	1118	602	446	0	0	604	0	0
Stage 1	444	444	-	654	654	-	-	-	-	-	-	-
Stage 2	664	656	-	490	464	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	187	212	628	177	207	500	1114	-	-	974	-	-
Stage 1	593	575	-	456	463	-	-	-	-	-	-	-
Stage 2	450	462	-	560	564	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	174	205	628	152	200	500	1114	-	-	974	-	-
Mov Cap-2 Maneuver	174	205	-	152	200	-	-	-	-	-	-	-
Stage 1	579	568	-	446	452	-	-	-	-	-	-	-
Stage 2	421	451	-	490	557	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	22.6		18.8		0.3		0.2	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1114	-	-	174	628	292	974	-	-
HCM Lane V/C Ratio	0.023	-	-	0.342	0.115	0.106	0.009	-	-
HCM Control Delay (s)	8.3	-	-	36.1	11.5	18.8	8.7	0	-
HCM Lane LOS	A	-	-	E	B	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.4	0.4	0.4	0	-	-

Intersection												
Int Delay, s/veh	0.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	1	5	0	1	0	6	590	2	0	473	5
Future Vol, veh/h	4	1	5	0	1	0	6	590	2	0	473	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	3	2	2	3	2
Mvmt Flow	4	1	5	0	1	0	6	634	2	0	509	5
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	1157	1157	509	1162	1161	635	514	0	0	636	0	0
Stage 1	509	509	-	647	647	-	-	-	-	-	-	-
Stage 2	648	648	-	515	514	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	173	196	564	172	195	478	1052	-	-	947	-	-
Stage 1	547	538	-	460	467	-	-	-	-	-	-	-
Stage 2	459	466	-	543	535	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	171	194	564	169	193	478	1052	-	-	947	-	-
Mov Cap-2 Maneuver	171	194	-	169	193	-	-	-	-	-	-	-
Stage 1	542	538	-	456	463	-	-	-	-	-	-	-
Stage 2	454	462	-	537	535	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	19		23.8			0.1			0			
HCM LOS	C		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1052	-	-	267	193	947	-	-				
HCM Lane V/C Ratio	0.006	-	-	0.04	0.006	-	-	-				
HCM Control Delay (s)	8.4	0	-	19	23.8	0	-	-				
HCM Lane LOS	A	A	-	C	C	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	-	-				

Timings 4: Flippen Rd & Walt Stephens Rd/Red Oak Rd

3c. Build 2027 AM - Improved

01/23/2023

										
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	184	90	342	9	99	321	328	36	298	244
Future Volume (vph)	184	90	342	9	99	321	328	36	298	244
Lane Group Flow (vph)	192	94	356	9	141	334	360	38	310	254
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4		3	8	1	6	5	2	
Permitted Phases	4		4	8		6		2		2
Detector Phase	7	4	4	3	8	1	6	5	2	2
Switch Phase										
Minimum Initial (s)	5.0	6.0	6.0	5.0	6.0	5.0	15.0	5.0	15.0	15.0
Minimum Split (s)	15.0	31.5	31.5	15.0	30.5	15.0	31.5	15.0	28.5	28.5
Total Split (s)	15.0	32.0	32.0	15.0	32.0	22.0	38.0	15.0	31.0	31.0
Total Split (%)	15.0%	32.0%	32.0%	15.0%	32.0%	22.0%	38.0%	15.0%	31.0%	31.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
v/c Ratio	0.62	0.20	0.54	0.03	0.60	0.54	0.36	0.07	0.41	0.31
Control Delay	37.4	30.4	9.5	25.1	46.0	16.5	13.2	17.4	32.4	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.4	30.4	9.5	25.1	46.0	16.5	13.2	17.4	32.4	12.8
Queue Length 50th (ft)	98	42	17	4	75	86	91	11	125	13
Queue Length 95th (ft)	m127	m83	m73	15	130	188	182	40	273	112
Internal Link Dist (ft)		646			1291		2204		704	
Turn Bay Length (ft)	180		345	110		130		120		215
Base Capacity (vph)	312	506	689	326	493	645	997	583	753	810
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.19	0.52	0.03	0.29	0.52	0.36	0.07	0.41	0.31

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

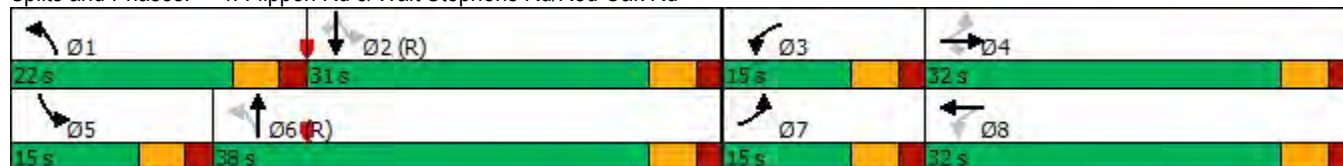
Offset: 96 (96%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Flippen Rd & Walt Stephens Rd/Red Oak Rd



HCM 6th Signalized Intersection Summary

4: Flippen Rd & Walt Stephens Rd/Red Oak Rd

3c. Build 2027 AM - Improved

01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	184	90	342	9	99	36	321	328	17	36	298	244
Future Volume (veh/h)	184	90	342	9	99	36	321	328	17	36	298	244
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1870	1900	1856	1870	1870	1856	1900
Adj Flow Rate, veh/h	192	94	0	9	103	38	334	342	18	38	310	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	0	2	0	3	2	2	3	0
Cap, veh/h	274	347		224	135	50	673	962	51	581	870	
Arrive On Green	0.09	0.19	0.00	0.01	0.10	0.10	0.11	0.55	0.55	0.03	0.47	0.00
Sat Flow, veh/h	1781	1870	1585	1781	1324	488	1810	1747	92	1781	1856	1610
Grp Volume(v), veh/h	192	94	0	9	0	141	334	0	360	38	310	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1812	1810	0	1839	1781	1856	1610
Q Serve(g_s), s	9.5	4.3	0.0	0.5	0.0	7.6	9.0	0.0	10.9	1.1	10.7	0.0
Cycle Q Clear(g_c), s	9.5	4.3	0.0	0.5	0.0	7.6	9.0	0.0	10.9	1.1	10.7	0.0
Prop In Lane	1.00		1.00	1.00		0.27	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	274	347		224	0	184	673	0	1013	581	870	
V/C Ratio(X)	0.70	0.27		0.04	0.00	0.77	0.50	0.00	0.36	0.07	0.36	
Avail Cap(c_a), veh/h	274	496		374	0	480	764	0	1013	692	870	
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	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	34.9	34.9	0.0	39.6	0.0	43.8	10.8	0.0	12.5	12.7	16.9	0.0
Incr Delay (d2), s/veh	7.8	0.4	0.0	0.1	0.0	6.5	0.6	0.0	1.0	0.0	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	1.9	0.0	0.2	0.0	3.7	3.1	0.0	4.3	0.4	4.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.7	35.3	0.0	39.6	0.0	50.2	11.4	0.0	13.5	12.8	18.1	0.0
LnGrp LOS	D	D		D	A	D	B	A	B	B	B	
Approach Vol, veh/h	286			150			694			348		
Approach Delay, s/veh	40.3			49.6			12.5			17.5		
Approach LOS	D			D			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.0	52.4	6.6	24.1	8.8	60.6	15.0	15.7				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	16.5	25.5	9.5	26.5	9.5	32.5	9.5	26.5				
Max Q Clear Time (g_c+I1), s	11.0	12.7	2.5	6.3	3.1	12.9	11.5	9.6				
Green Ext Time (p_c), s	0.5	2.3	0.0	0.3	0.0	3.5	0.0	0.6				
Intersection Summary												
HCM 6th Ctrl Delay	22.8											
HCM 6th LOS	C											

Timings 5: Flippen Rd & Hudson Bridge Rd

3c. Build 2027 AM - Improved
01/23/2023

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	81	411	189	281	180	3	278	488	275	314	92
Future Volume (vph)	81	411	189	281	180	3	278	488	275	314	92
Lane Group Flow (vph)	84	428	197	293	188	3	290	508	286	327	96
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6	5	2			8		7	4	
Permitted Phases	6		2		2	8		8	4		4
Detector Phase	1	6	5	2	2	8	8	8	7	4	4
Switch Phase											
Minimum Initial (s)	5.0	15.0	5.0	15.0	15.0	6.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	15.0	28.5	15.0	28.5	28.5	36.5	36.5	36.5	15.0	33.5	33.5
Total Split (s)	15.0	27.0	17.0	29.0	29.0	38.0	38.0	38.0	18.0	56.0	56.0
Total Split (%)	15.0%	27.0%	17.0%	29.0%	29.0%	38.0%	38.0%	38.0%	18.0%	56.0%	56.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.18	0.38	0.44	0.22	0.27	0.01	0.69	0.81	0.78	0.43	0.14
Control Delay	17.9	30.0	20.6	25.4	5.6	25.3	42.9	22.0	38.3	20.8	3.8
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	17.9	30.0	20.6	25.4	5.6	25.3	42.9	22.0	38.3	20.8	3.8
Queue Length 50th (ft)	28	112	70	69	0	2	171	101	104	119	6
Queue Length 95th (ft)	66	180	140	121	54	8	227	207	164	127	11
Internal Link Dist (ft)		840		1594			786			834	
Turn Bay Length (ft)	375		390		450	230		365	320		320
Base Capacity (vph)	504	1116	460	1304	702	340	599	744	368	931	846
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	0.17	0.38	0.43	0.22	0.27	0.01	0.48	0.68	0.78	0.35	0.11

Intersection Summary

Cycle Length: 100

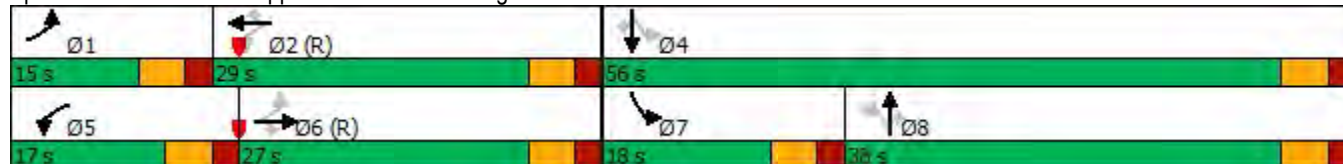
Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

Splits and Phases: 5: Flippen Rd & Hudson Bridge Rd



HCM 6th Signalized Intersection Summary

5: Flippen Rd & Hudson Bridge Rd

3c. Build 2027 AM - Improved

01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	81	411	0	189	281	180	3	278	488	275	314	92
Future Volume (veh/h)	81	411	0	189	281	180	3	278	488	275	314	92
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1856	1870	1870	1856	1870
Adj Flow Rate, veh/h	84	428	0	197	293	0	3	290	508	286	327	96
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	3	2	2	3	2
Cap, veh/h	399	823		374	1003		385	603	515	426	932	796
Arrive On Green	0.05	0.23	0.00	0.10	0.28	0.00	0.33	0.33	0.33	0.12	0.50	0.50
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	964	1856	1585	1781	1856	1585
Grp Volume(v), veh/h	84	428	0	197	293	0	3	290	508	286	327	96
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	964	1856	1585	1781	1856	1585
Q Serve(g_s), s	3.6	10.5	0.0	8.1	6.4	0.0	0.2	12.5	31.8	10.2	10.7	3.2
Cycle Q Clear(g_c), s	3.6	10.5	0.0	8.1	6.4	0.0	0.2	12.5	31.8	10.2	10.7	3.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	399	823		374	1003		385	603	515	426	932	796
V/C Ratio(X)	0.21	0.52		0.53	0.29		0.01	0.48	0.99	0.67	0.35	0.12
Avail Cap(c_a), veh/h	478	823		398	1003		385	603	515	431	937	800
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	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.1	33.6	0.0	24.8	28.1	0.0	22.9	27.0	33.5	18.7	15.0	13.2
Incr Delay (d2), s/veh	0.3	2.3	0.0	1.2	0.7	0.0	0.0	0.6	36.0	4.0	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	4.6	0.0	3.3	2.7	0.0	0.0	5.3	16.5	4.3	4.1	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.3	35.9	0.0	25.9	28.8	0.0	22.9	27.6	69.5	22.7	15.3	13.3
LnGrp LOS	C	D		C	C		C	C	E	C	B	B
Approach Vol, veh/h	512			490			801			709		
Approach Delay, s/veh	34.5			27.7			54.1			18.0		
Approach LOS	C			C			D			B		
Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.6	33.7		55.7	15.6	28.7	17.7	38.0				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	9.5	23.5		50.5	11.5	21.5	12.5	32.5				
Max Q Clear Time (g_c+I1), s	5.6	8.4		12.7	10.1	12.5	12.2	33.8				
Green Ext Time (p_c), s	0.0	2.5		2.2	0.1	2.7	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay 34.8

HCM 6th LOS C

Notes

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Timings

3c. Build 2027 AM - Improved

6: SR 42/SR 138/US 23 (N. Henry Blvd) & SR 138 (Lake Spivey Pkwy)

01/23/2023

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	93	78	477	39	62	32	1060	414	45	40	224
Future Volume (vph)	93	78	477	39	62	32	1060	414	45	40	224
Lane Group Flow (vph)	96	80	492	40	64	33	1093	427	46	41	398
Turn Type	pm+pt	NA	pt+ov	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	4 1	3	8		1	6		5	2
Permitted Phases	4			8		8			6		
Detector Phase	7	4	4 1	3	8	8	1	6	6	5	2
Switch Phase											
Minimum Initial (s)	6.0	6.0		5.0	6.0	6.0	5.0	15.0	15.0	5.0	11.5
Minimum Split (s)	21.0	31.5		15.0	29.5	29.5	15.0	28.5	28.5	15.0	31.5
Total Split (s)	21.0	35.8		15.0	29.8	29.8	62.0	84.2	84.2	15.0	37.2
Total Split (%)	14.0%	23.9%		10.0%	19.9%	19.9%	41.3%	56.1%	56.1%	10.0%	24.8%
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	None	C-Min
v/c Ratio	0.26	0.21	0.54	0.14	0.23	0.08	0.90	0.41	0.05	0.43	0.44
Control Delay	41.5	51.0	19.8	39.3	55.9	0.4	56.4	21.6	0.1	82.2	37.0
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	41.5	51.0	19.8	39.3	55.9	0.4	56.4	21.6	0.1	82.2	37.0
Queue Length 50th (ft)	70	65	256	28	53	0	508	250	0	39	131
Queue Length 95th (ft)	119	117	359	59	102	0	598	343	0	82	187
Internal Link Dist (ft)		2539			205			2663			944
Turn Bay Length (ft)	165			100		120	340		300	580	
Base Capacity (vph)	392	385	948	300	322	433	1280	1036	975	110	910
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	0.24	0.21	0.52	0.13	0.20	0.08	0.85	0.41	0.05	0.37	0.44

Intersection Summary

Cycle Length: 150

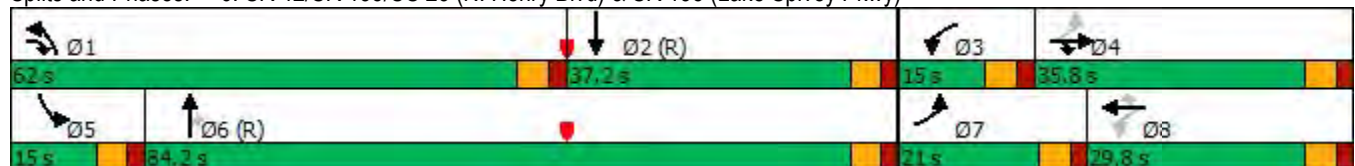
Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

Splits and Phases: 6: SR 42/SR 138/US 23 (N. Henry Blvd) & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary

3c. Build 2027 AM - Improved

6: SR 42/SR 138/US 23 (N. Henry Blvd) & SR 138 (Lake Spivey Pkwy)

01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	93	78	477	39	62	32	1060	414	45	40	224	162
Future Volume (veh/h)	93	78	477	39	62	32	1060	414	45	40	224	162
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1856	1811	1856	1826	1900	1856	1841	1900	1856	1856	1885
Adj Flow Rate, veh/h	96	80	0	40	64	0	1093	427	0	41	231	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	3	6	3	5	0	3	4	0	3	3	1
Cap, veh/h	182	157		154	90		1170	1308		53	1408	
Arrive On Green	0.06	0.08	0.00	0.03	0.05	0.00	0.34	0.71	0.00	0.03	0.40	0.00
Sat Flow, veh/h	1795	1856	1535	1767	1826	1610	3428	1841	1610	1767	3618	0
Grp Volume(v), veh/h	96	80	0	40	64	0	1093	427	0	41	231	0
Grp Sat Flow(s),veh/h/ln	1795	1856	1535	1767	1826	1610	1714	1841	1610	1767	1763	0
Q Serve(g_s), s	7.4	6.2	0.0	3.2	5.2	0.0	46.2	13.1	0.0	3.5	6.3	0.0
Cycle Q Clear(g_c), s	7.4	6.2	0.0	3.2	5.2	0.0	46.2	13.1	0.0	3.5	6.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	182	157		154	90		1170	1308		53	1408	
V/C Ratio(X)	0.53	0.51		0.26	0.71		0.93	0.33		0.78	0.16	
Avail Cap(c_a), veh/h	253	375		216	296		1291	1308		112	1408	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.94	0.94	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	60.9	65.7	0.0	65.3	70.2	0.0	47.8	8.2	0.0	72.3	29.0	0.0
Incr Delay (d2), s/veh	2.2	2.4	0.0	0.9	9.9	0.0	11.8	0.7	0.0	21.2	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	3.0	0.0	1.5	2.7	0.0	21.1	5.0	0.0	1.9	2.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.1	68.1	0.0	66.2	80.1	0.0	59.6	8.8	0.0	93.4	29.2	0.0
LnGrp LOS	E	E		E	F		E	A		F	C	
Approach Vol, veh/h	176			104			1520			272		
Approach Delay, s/veh	65.4			74.8			45.3			38.9		
Approach LOS	E			E			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	56.7	65.4	9.7	18.2	10.0	112.1	15.0	12.9				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	56.5	31.7	9.5	30.3	9.5	78.7	15.5	24.3				
Max Q Clear Time (g_c+l1), s	48.2	8.3	5.2	8.2	5.5	15.1	9.4	7.2				
Green Ext Time (p_c), s	2.9	2.4	0.0	0.3	0.0	5.7	0.1	0.2				

Intersection Summary

HCM 6th Ctrl Delay 47.7

HCM 6th LOS D

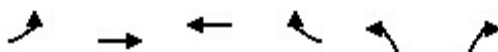
Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings
7: I-675 NB Ramps & SR 138 (Lake Spivey Pkwy)

3c. Build 2027 AM - Improved
01/23/2023



Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	501	963	1403	357	34	71
Future Volume (vph)	501	963	1403	357	34	71
Lane Group Flow (vph)	563	1082	1576	401	38	80
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		3	
Permitted Phases	6			2		8
Detector Phase	1	6	2	2	3	8
Switch Phase						
Minimum Initial (s)	5.0	15.0	15.0	15.0	5.0	6.0
Minimum Split (s)	15.0	28.5	28.5	28.5	15.0	34.5
Total Split (s)	24.0	65.5	41.5	41.5	34.5	34.5
Total Split (%)	24.0%	65.5%	41.5%	41.5%	34.5%	34.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.80	0.36	1.05	0.47	0.28	0.40
Control Delay	16.6	4.1	69.0	7.4	48.1	14.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.6	4.1	69.0	7.4	48.1	14.5
Queue Length 50th (ft)	163	160	~663	34	23	0
Queue Length 95th (ft)	144	76	#787	109	54	38
Internal Link Dist (ft)		706	2539			
Turn Bay Length (ft)	145			270		315
Base Capacity (vph)	700	2970	1503	862	513	520
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.36	1.05	0.47	0.07	0.15

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 55 (55%), Referenced to phase 2:WBT and 6:EBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

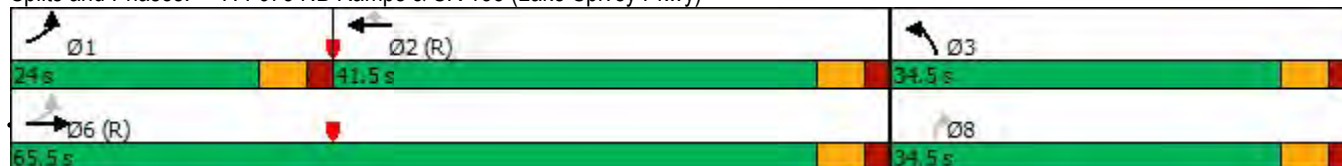
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 7: I-675 NB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
7: I-675 NB Ramps & SR 138 (Lake Spivey Pkwy)

3c. Build 2027 AM - Improved
01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Traffic Volume (veh/h)	501	963	0	0	1403	357	34	0	71	0	0	0
Future Volume (veh/h)	501	963	0	0	1403	357	34	0	71	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1870	1856	0	0	1856	1870	1870	0	1870			
Adj Flow Rate, veh/h	563	1082	0	0	1576	0	38	0	80			
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89			
Percent Heavy Veh, %	2	3	0	0	3	2	2	0	2			
Cap, veh/h	480	2892	0	0	2046		124	0	110			
Arrive On Green	0.37	1.00	0.00	0.00	0.58	0.00	0.07	0.00	0.07			
Sat Flow, veh/h	1781	3618	0	0	3618	1585	1781	0	1585			
Grp Volume(v), veh/h	563	1082	0	0	1576	0	38	0	80			
Grp Sat Flow(s),veh/h/ln	1781	1763	0	0	1763	1585	1781	0	1585			
Q Serve(g_s), s	18.5	0.0	0.0	0.0	33.9	0.0	2.0	0.0	4.9			
Cycle Q Clear(g_c), s	18.5	0.0	0.0	0.0	33.9	0.0	2.0	0.0	4.9			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	480	2892	0	0	2046		124	0	110			
V/C Ratio(X)	1.17	0.37	0.00	0.00	0.77		0.31	0.00	0.73			
Avail Cap(c_a), veh/h	480	2892	0	0	2046		517	0	460			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.64	0.64	0.00	0.00	0.39	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	19.9	0.0	0.0	0.0	15.9	0.0	44.2	0.0	45.6			
Incr Delay (d2), s/veh	91.7	0.2	0.0	0.0	1.1	0.0	1.4	0.0	8.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	20.1	0.1	0.0	0.0	11.9	0.0	0.9	0.0	2.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	111.6	0.2	0.0	0.0	17.1	0.0	45.6	0.0	54.3			
LnGrp LOS	F	A	A	A	B		D	A	D			
Approach Vol, veh/h	1645		1576			118						
Approach Delay, s/veh	38.3		17.1			51.5						
Approach LOS	D		B			D						
Timer - Assigned Phs	1	2	6				8					
Phs Duration (G+Y+Rc), s	24.0	63.5	87.5				12.5					
Change Period (Y+Rc), s	5.5	5.5	5.5				5.5					
Max Green Setting (Gmax), s	18.5	36.0	60.0				29.0					
Max Q Clear Time (g_c+I1), s	20.5	35.9	2.0				6.9					
Green Ext Time (p_c), s	0.0	0.1	20.2				0.3					
Intersection Summary												
HCM 6th Ctrl Delay	28.8											
HCM 6th LOS	C											

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Timings 8: I-675 SB Ramps & SR 138 (Lake Spivey Pkwy)

3c. Build 2027 AM - Improved
01/23/2023

	→	↘	↙	←	↘	↙
Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↘
Traffic Volume (vph)	1294	54	104	1333	170	465
Future Volume (vph)	1294	54	104	1333	170	465
Lane Group Flow (vph)	1454	61	117	1498	191	522
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	7	
Permitted Phases		6	2			4
Detector Phase	6	6	5	2	7	4
Switch Phase						
Minimum Initial (s)	15.0	15.0	5.0	15.0	5.0	6.0
Minimum Split (s)	28.5	28.5	15.0	28.5	35.5	35.5
Total Split (s)	49.5	49.5	15.0	64.5	35.5	35.5
Total Split (%)	49.5%	49.5%	15.0%	64.5%	35.5%	35.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Min	C-Min	None	C-Min	None	None
v/c Ratio	0.77	0.07	0.51	0.63	0.26	0.79
Control Delay	21.2	4.6	14.4	6.7	32.5	39.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.2	4.6	14.4	6.7	32.5	39.4
Queue Length 50th (ft)	242	1	28	534	52	150
Queue Length 95th (ft)	#588	m12	m13	m513	75	196
Internal Link Dist (ft)	1959			706		
Turn Bay Length (ft)		375	95		520	500
Base Capacity (vph)	1889	893	260	2371	1029	897
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.07	0.45	0.63	0.19	0.58

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 92 (92%), Referenced to phase 2:WBTL and 6:EBT, Start of Green

Natural Cycle: 90

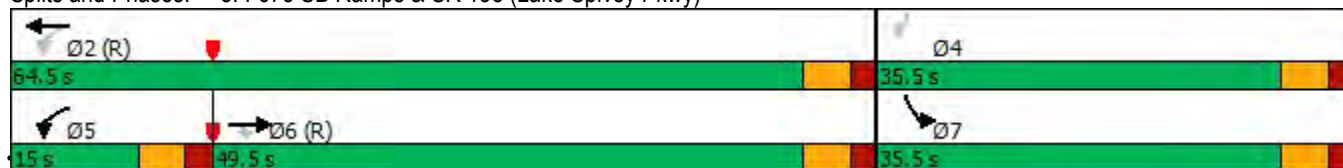
Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

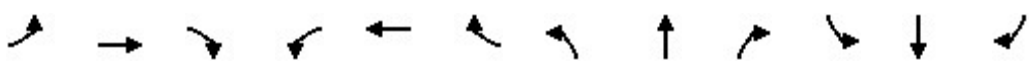
Splits and Phases: 8: I-675 SB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
8: I-675 SB Ramps & SR 138 (Lake Spivey Pkwy)

3c. Build 2027 AM - Improved

01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑					↘↗		↗↖
Traffic Volume (veh/h)	0	1294	54	104	1333	0	0	0	0	170	0	465
Future Volume (veh/h)	0	1294	54	104	1333	0	0	0	0	170	0	465
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1870	1870	1856	0				1870	0	1870
Adj Flow Rate, veh/h	0	1454	61	117	1498	0				191	0	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89				0.89	0.89	0.89
Percent Heavy Veh, %	0	3	2	2	3	0				2	0	2
Cap, veh/h	0	2495	1122	276	2858	0				274	0	
Arrive On Green	0.00	0.23	0.23	0.03	0.54	0.00				0.08	0.00	0.00
Sat Flow, veh/h	0	3618	1585	1781	3618	0				3456	0	2790
Grp Volume(v), veh/h	0	1454	61	117	1498	0				191	0	0
Grp Sat Flow(s),veh/h/ln	0	1763	1585	1781	1763	0				1728	0	1395
Q Serve(g_s), s	0.0	36.6	3.0	1.6	27.1	0.0				5.4	0.0	0.0
Cycle Q Clear(g_c), s	0.0	36.6	3.0	1.6	27.1	0.0				5.4	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2495	1122	276	2858	0				274	0	
V/C Ratio(X)	0.00	0.58	0.05	0.42	0.52	0.00				0.70	0.00	
Avail Cap(c_a), veh/h	0	2495	1122	359	2858	0				1037	0	
HCM Platoon Ratio	1.00	0.33	0.33	0.67	0.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.80	0.80	0.09	0.09	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	25.2	12.3	14.3	10.5	0.0				44.9	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.8	0.1	0.1	0.1	0.0				3.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	17.2	3.0	1.3	10.9	0.0				2.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	26.0	12.4	14.4	10.6	0.0				48.1	0.0	0.0
LnGrp LOS	A	C	B	B	B	A				D	A	
Approach Vol, veh/h		1515			1615						191	
Approach Delay, s/veh		25.5			10.9						48.1	
Approach LOS		C			B						D	
Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		86.6		13.4	10.3	76.3						
Change Period (Y+Rc), s		5.5		5.5	5.5	5.5						
Max Green Setting (Gmax), s		59.0		30.0	9.5	44.0						
Max Q Clear Time (g_c+I1), s		29.1		7.4	3.6	38.6						
Green Ext Time (p_c), s		21.5		0.6	0.1	4.8						
Intersection Summary												
HCM 6th Ctrl Delay				19.7								
HCM 6th LOS				B								
Notes												
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.												

Timings
9: SR 138 (Lake Spivey Pkwy) & Mt. Zion Rd

3c. Build 2027 AM - Improved
01/23/2023

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	116	1107	49	32	1486	139	43	34	151	55	149
Future Volume (vph)	116	1107	49	32	1486	139	43	34	151	55	149
Lane Group Flow (vph)	123	1178	52	34	1581	148	46	65	161	59	159
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8	7	4	
Permitted Phases	6		6	2		2	8		4		4
Detector Phase	1	6	6	5	2	2	3	8	7	4	4
Switch Phase											
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	6.0	5.0	6.0	6.0
Minimum Split (s)	15.0	28.5	28.5	15.0	34.5	34.5	15.0	38.5	15.0	32.5	32.5
Total Split (s)	15.0	31.5	31.5	15.0	31.5	31.5	15.0	38.5	15.0	38.5	38.5
Total Split (%)	15.0%	31.5%	31.5%	15.0%	31.5%	31.5%	15.0%	38.5%	15.0%	38.5%	38.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None
v/c Ratio	0.53	0.55	0.05	0.12	0.83	0.16	0.20	0.39	0.66	0.25	0.47
Control Delay	34.6	8.9	0.1	8.6	19.1	3.6	31.9	33.3	46.8	43.3	11.8
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	34.6	8.9	0.1	8.6	19.1	3.6	31.9	33.3	46.8	43.3	11.8
Queue Length 50th (ft)	41	104	0	4	227	3	23	22	88	36	0
Queue Length 95th (ft)	105	131	m0	m14	#695	m29	50	62	140	74	58
Internal Link Dist (ft)		896			1959			388		1031	
Turn Bay Length (ft)	115		140	155		325	35		345		165
Base Capacity (vph)	259	2140	1024	351	1901	943	260	599	247	627	639
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	0.47	0.55	0.05	0.10	0.83	0.16	0.18	0.11	0.65	0.09	0.25

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 7 (7%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 135

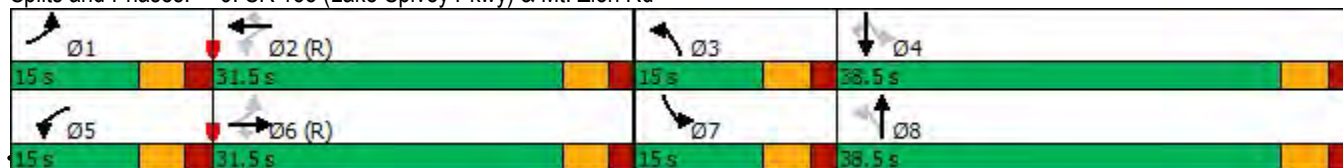
Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: SR 138 (Lake Spivey Pkwy) & Mt. Zion Rd



HCM 6th Signalized Intersection Summary

9: SR 138 (Lake Spivey Pkwy) & Mt. Zion Rd

3c. Build 2027 AM - Improved

01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	116	1107	49	32	1486	139	43	34	27	151	55	149
Future Volume (veh/h)	116	1107	49	32	1486	139	43	34	27	151	55	149
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1856	1870	1870	1856	1900	1870	1900	1870	1900	1900	1900
Adj Flow Rate, veh/h	123	1178	0	34	1581	148	46	36	29	161	59	159
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	3	2	2	3	0	2	0	2	0	0	0
Cap, veh/h	323	2080		399	2017	921	211	63	51	283	234	199
Arrive On Green	0.10	1.00	0.00	0.06	1.00	1.00	0.04	0.06	0.06	0.09	0.12	0.12
Sat Flow, veh/h	1810	3526	1585	1781	3526	1610	1781	974	785	1810	1900	1610
Grp Volume(v), veh/h	123	1178	0	34	1581	148	46	0	65	161	59	159
Grp Sat Flow(s),veh/h/ln	1810	1763	1585	1781	1763	1610	1781	0	1759	1810	1900	1610
Q Serve(g_s), s	2.8	0.0	0.0	0.8	0.0	0.0	2.4	0.0	3.6	8.0	2.8	9.6
Cycle Q Clear(g_c), s	2.8	0.0	0.0	0.8	0.0	0.0	2.4	0.0	3.6	8.0	2.8	9.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.45	1.00		1.00
Lane Grp Cap(c), veh/h	323	2080		399	2017	921	211	0	113	283	234	199
V/C Ratio(X)	0.38	0.57		0.09	0.78	0.16	0.22	0.00	0.57	0.57	0.25	0.80
Avail Cap(c_a), veh/h	407	2080		514	2017	921	316	0	580	283	627	531
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.81	0.81	0.00	0.69	0.69	0.69	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.3	0.0	0.0	7.8	0.0	0.0	41.5	0.0	45.4	37.1	39.7	42.6
Incr Delay (d2), s/veh	0.6	0.9	0.0	0.1	2.2	0.3	0.5	0.0	4.5	2.7	0.6	7.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.3	0.0	0.3	0.6	0.1	1.1	0.0	1.7	3.6	1.3	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.9	0.9	0.0	7.9	2.2	0.3	42.0	0.0	50.0	39.8	40.2	49.9
LnGrp LOS	A	A		A	A	A	D	A	D	D	D	D
Approach Vol, veh/h	1301		1763				111			379		
Approach Delay, s/veh	1.6		2.1				46.7			44.1		
Approach LOS	A		A				D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.3	62.7	9.1	17.8	8.6	64.5	15.0	11.9				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	9.5	26.0	9.5	33.0	9.5	26.0	9.5	33.0				
Max Q Clear Time (g_c+I1), s	4.8	2.0	4.4	11.6	2.8	2.0	10.0	5.6				
Green Ext Time (p_c), s	0.1	19.6	0.0	0.7	0.0	14.6	0.0	0.3				

Intersection Summary

HCM 6th Ctrl Delay	7.8
HCM 6th LOS	A

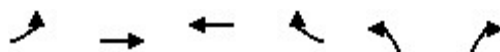
Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Timings 10: I-75 NB Ramps & SR 138 (Lake Spivey Pkwy)

3c. Build 2027 AM - Improved
01/23/2023



Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	584	1300	1052	852	292	146
Future Volume (vph)	584	1300	1052	852	292	146
Lane Group Flow (vph)	615	1368	1107	897	307	154
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		3	
Permitted Phases	6			2		8
Detector Phase	1	6	2	2	3	8
Switch Phase						
Minimum Initial (s)	5.0	15.0	15.0	15.0	5.0	6.0
Minimum Split (s)	15.0	28.5	28.5	28.5	15.0	32.5
Total Split (s)	30.0	67.5	37.5	37.5	32.5	32.5
Total Split (%)	30.0%	67.5%	37.5%	37.5%	32.5%	32.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	1.03	0.58	0.99	0.98	0.79	0.37
Control Delay	59.3	7.3	43.6	33.5	51.8	16.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.3	7.3	43.6	33.5	51.8	16.9
Queue Length 50th (ft)	~380	224	322	458	185	35
Queue Length 95th (ft)	m#594	324	#498	#514	266	85
Internal Link Dist (ft)		897	896			
Turn Bay Length (ft)	140			405		510
Base Capacity (vph)	598	2352	1121	915	477	490
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.58	0.99	0.98	0.64	0.31

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 8 (8%), Referenced to phase 2:WBT and 6:EBTL, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

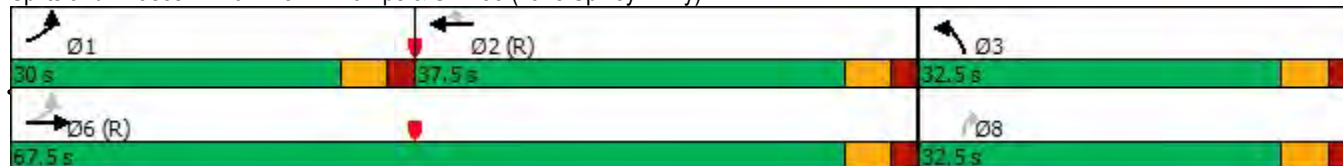
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: I-75 NB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary

10: I-75 NB Ramps & SR 138 (Lake Spivey Pkwy)

3c. Build 2027 AM - Improved

01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	584	1300	0	0	1052	852	292	0	146	0	0	0
Future Volume (veh/h)	584	1300	0	0	1052	852	292	0	146	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1870	1856	0	0	1856	1870	1870	0	1870			
Adj Flow Rate, veh/h	615	1368	0	0	1107	0	307	0	0			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	2	3	0	0	3	2	2	0	2			
Cap, veh/h	621	2455	0	0	1398		345	0				
Arrive On Green	0.16	0.47	0.00	0.00	0.79	0.00	0.19	0.00	0.00			
Sat Flow, veh/h	1781	3618	0	0	3618	1585	1781	0	1585			
Grp Volume(v), veh/h	615	1368	0	0	1107	0	307	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1763	0	0	1763	1585	1781	0	1585			
Q Serve(g_s), s	24.0	28.0	0.0	0.0	17.5	0.0	16.8	0.0	0.0			
Cycle Q Clear(g_c), s	24.0	28.0	0.0	0.0	17.5	0.0	16.8	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	621	2455	0	0	1398		345	0				
V/C Ratio(X)	0.99	0.56	0.00	0.00	0.79		0.89	0.00				
Avail Cap(c_a), veh/h	621	2455	0	0	1398		481	0				
HCM Platoon Ratio	0.67	0.67	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	0.52	0.52	0.00	0.00	0.53	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	25.8	15.6	0.0	0.0	8.1	0.0	39.3	0.0	0.0			
Incr Delay (d2), s/veh	23.5	0.5	0.0	0.0	2.5	0.0	14.2	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	19.2	11.7	0.0	0.0	3.3	0.0	8.3	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.3	16.0	0.0	0.0	10.6	0.0	53.5	0.0	0.0			
LnGrp LOS	D	B	A	A	B		D	A				
Approach Vol, veh/h	1983			1107			307					
Approach Delay, s/veh	26.4			10.6			53.5					
Approach LOS	C			B			D					
Timer - Assigned Phs	1	2					6	8				
Phs Duration (G+Y+Rc), s	30.0	45.1					75.1	24.9				
Change Period (Y+Rc), s	5.5	5.5					5.5	5.5				
Max Green Setting (Gmax), s	24.5	32.0					62.0	27.0				
Max Q Clear Time (g_c+I1), s	26.0	19.5					30.0	18.8				
Green Ext Time (p_c), s	0.0	8.5					20.6	0.6				

Intersection Summary

HCM 6th Ctrl Delay	23.7
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Timings 11: I-75 SB Ramps & SR 138 (Lake Spivey Pkwy)

3c. Build 2027 AM - Improved
01/23/2023

	→	↘	↙	←	↘	↙
Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Configurations	↑↑	↑	↘	↑↑	↘↘	↘
Traffic Volume (vph)	1468	245	101	1238	405	316
Future Volume (vph)	1468	245	101	1238	405	316
Lane Group Flow (vph)	1596	266	110	1346	440	343
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	3	
Permitted Phases		6	2			8
Detector Phase	6	6	5	2	3	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	5.0	15.0	5.0	15.0
Minimum Split (s)	28.5	28.5	15.0	28.5	15.0	28.5
Total Split (s)	56.0	56.0	15.0	71.0	29.0	29.0
Total Split (%)	56.0%	56.0%	15.0%	71.0%	29.0%	29.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Min	C-Min	None	C-Min	None	Min
v/c Ratio	0.84	0.27	0.52	0.57	0.60	0.84
Control Delay	25.3	2.4	16.8	5.9	38.8	47.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.3	2.4	16.8	5.9	38.8	47.2
Queue Length 50th (ft)	446	0	11	382	127	155
Queue Length 95th (ft)	#596	39	m12	m399	176	#293
Internal Link Dist (ft)	1158			897		
Turn Bay Length (ft)		980	150		490	
Base Capacity (vph)	1904	981	241	2369	806	438
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.27	0.46	0.57	0.55	0.78

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 46 (46%), Referenced to phase 2:WBTL and 6:EBT, Start of Green

Natural Cycle: 90

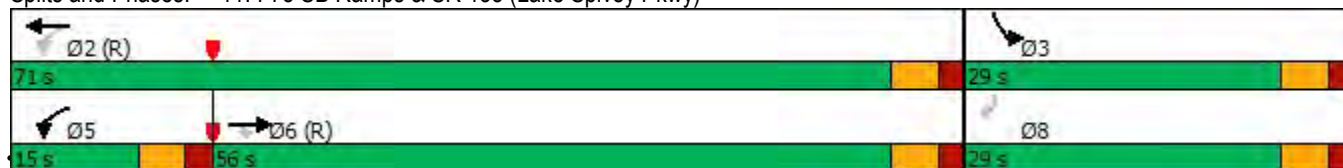
Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

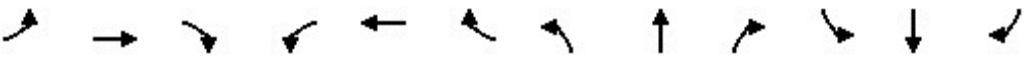
Splits and Phases: 11: I-75 SB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
11: I-75 SB Ramps & SR 138 (Lake Spivey Pkwy)

3c. Build 2027 AM - Improved

01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑					↖↗		↗
Traffic Volume (veh/h)	0	1468	245	101	1238	0	0	0	0	405	0	316
Future Volume (veh/h)	0	1468	245	101	1238	0	0	0	0	405	0	316
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1870	1870	1856	0				1870	0	1870
Adj Flow Rate, veh/h	0	1596	0	110	1346	0				440	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	3	2	2	3	0				2	0	2
Cap, veh/h	0	2232		262	2594	0				533	0	
Arrive On Green	0.00	0.63	0.00	0.05	0.74	0.00				0.15	0.00	0.00
Sat Flow, veh/h	0	3618	1585	1781	3618	0				3456	0	1585
Grp Volume(v), veh/h	0	1596	0	110	1346	0				440	0	0
Grp Sat Flow(s),veh/h/ln	0	1763	1585	1781	1763	0				1728	0	1585
Q Serve(g_s), s	0.0	30.3	0.0	2.0	16.3	0.0				12.3	0.0	0.0
Cycle Q Clear(g_c), s	0.0	30.3	0.0	2.0	16.3	0.0				12.3	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2232		262	2594	0				533	0	
V/C Ratio(X)	0.00	0.72		0.42	0.52	0.00				0.83	0.00	
Avail Cap(c_a), veh/h	0	2232		346	2594	0				812	0	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.85	0.00	0.22	0.22	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	12.3	0.0	12.8	5.6	0.0				41.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.7	0.0	0.2	0.2	0.0				4.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	10.2	0.0	0.9	4.2	0.0				5.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	14.0	0.0	13.0	5.8	0.0				45.3	0.0	0.0
LnGrp LOS	A	B		B	A	A				D	A	
Approach Vol, veh/h		1596			1456						440	
Approach Delay, s/veh		14.0			6.4						45.3	
Approach LOS		B			A						D	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		79.1			10.3	68.8		20.9				
Change Period (Y+Rc), s		5.5			5.5	5.5		5.5				
Max Green Setting (Gmax), s		65.5			9.5	50.5		23.5				
Max Q Clear Time (g_c+I1), s		18.3			4.0	32.3		14.3				
Green Ext Time (p_c), s		25.6			0.1	15.0		1.1				

Intersection Summary

HCM 6th Ctrl Delay	14.7
HCM 6th LOS	B

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings

3c. Build 2027 AM - Improved

12: Speer Rd/Mt. Zion Pkwy & SR 138 (Lake Spivey Pkwy)

01/23/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	726	51	408	806	233	109	250	642	200	99	66
Future Volume (vph)	81	726	51	408	806	233	109	250	642	200	99	66
Lane Group Flow (vph)	85	764	54	429	848	245	115	263	676	211	104	69
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free	Prot	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2			Free			4
Detector Phase	1	6	6	5	2	2	3	8		7	4	4
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	6.0		5.0	6.0	6.0
Minimum Split (s)	15.0	46.5	46.5	15.0	47.5	47.5	15.0	46.5		15.0	45.5	45.5
Total Split (s)	14.0	35.0	35.0	18.0	39.0	39.0	22.0	43.0		24.0	45.0	45.0
Total Split (%)	11.7%	29.2%	29.2%	15.0%	32.5%	32.5%	18.3%	35.8%		20.0%	37.5%	37.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5		5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None		None	None	None
v/c Ratio	0.36	0.57	0.08	0.59	0.45	0.25	0.43	0.62	0.43	0.58	0.20	0.20
Control Delay	57.0	31.7	0.2	47.3	19.4	3.0	57.4	56.7	0.8	57.5	44.8	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.0	31.7	0.2	47.3	19.4	3.0	57.4	56.7	0.8	57.5	44.8	1.8
Queue Length 50th (ft)	32	237	0	158	209	0	44	103	0	81	37	0
Queue Length 95th (ft)	58	335	0	211	311	46	73	143	0	118	62	4
Internal Link Dist (ft)		1890			1158			635			523	
Turn Bay Length (ft)	345		290	290		930	195		550	270		270
Base Capacity (vph)	260	1349	697	724	1899	970	472	1105	1583	529	1188	603
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.57	0.08	0.59	0.45	0.25	0.24	0.24	0.43	0.40	0.09	0.11

Intersection Summary

Cycle Length: 120

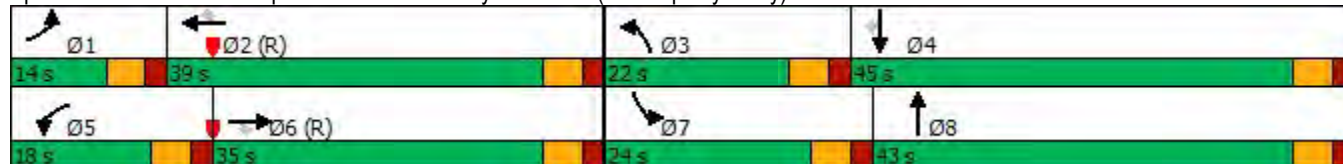
Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Green

Natural Cycle: 125

Control Type: Actuated-Coordinated

Splits and Phases: 12: Speer Rd/Mt. Zion Pkwy & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary

12: Speer Rd/Mt. Zion Pkwy & SR 138 (Lake Spivey Pkwy)

3c. Build 2027 AM - Improved

01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	81	726	51	408	806	233	109	250	642	200	99	66
Future Volume (veh/h)	81	726	51	408	806	233	109	250	642	200	99	66
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1856	1900	1900	1856	1870	1870	1870	1870	1870	1900	1870
Adj Flow Rate, veh/h	85	764	54	429	848	245	115	263	0	211	104	69
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
Percent Heavy Veh, %	2	3	0	0	3	2	2	2	2	2	0	2
Cap, veh/h	136	1873	856	366	2102	945	173	359		277	473	208
Arrive On Green	0.04	0.53	0.53	0.10	0.60	0.60	0.05	0.10	0.00	0.08	0.13	0.13
Sat Flow, veh/h	3456	3526	1610	3510	3526	1585	3456	3554	1585	3456	3610	1585
Grp Volume(v), veh/h	85	764	54	429	848	245	115	263	0	211	104	69
Grp Sat Flow(s),veh/h/ln	1728	1763	1610	1755	1763	1585	1728	1777	1585	1728	1805	1585
Q Serve(g_s), s	2.9	15.6	2.0	12.5	15.3	8.9	3.9	8.6	0.0	7.2	3.1	4.7
Cycle Q Clear(g_c), s	2.9	15.6	2.0	12.5	15.3	8.9	3.9	8.6	0.0	7.2	3.1	4.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	136	1873	856	366	2102	945	173	359		277	473	208
V/C Ratio(X)	0.63	0.41	0.06	1.17	0.40	0.26	0.67	0.73		0.76	0.22	0.33
Avail Cap(c_a), veh/h	245	1873	856	366	2102	945	475	1111		533	1188	522
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	0.91	0.74	0.74	0.74	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.8	16.8	13.6	53.8	12.9	11.6	56.0	52.4	0.0	54.1	46.6	47.4
Incr Delay (d2), s/veh	4.3	0.6	0.1	97.6	0.4	0.5	4.4	2.9	0.0	4.3	0.2	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	6.0	0.7	10.3	5.7	3.0	1.8	3.9	0.0	3.2	1.4	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.1	17.4	13.8	151.4	13.3	12.1	60.4	55.3	0.0	58.4	46.9	48.3
LnGrp LOS	E	B	B	F	B	B	E	E		E	D	D
Approach Vol, veh/h	903			1522			378			384		
Approach Delay, s/veh	21.3			52.0			56.8			53.5		
Approach LOS	C			D			E			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.2	77.1	11.5	21.2	18.0	69.3	15.1	17.6				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	8.5	33.5	16.5	39.5	12.5	29.5	18.5	37.5				
Max Q Clear Time (g_c+I1), s	4.9	17.3	5.9	6.7	14.5	17.6	9.2	10.6				
Green Ext Time (p_c), s	0.1	9.5	0.2	0.8	0.0	6.2	0.4	1.5				

Intersection Summary

HCM 6th Ctrl Delay 44.1

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Timings
13: Spivey Rd & SR 138 (Lake Spivey Pkwy)

3c. Build 2027 AM - Improved
01/23/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↑
Traffic Volume (vph)	712	25	113	929	38	239
Future Volume (vph)	712	25	113	929	38	239
Lane Group Flow (vph)	782	27	124	1021	42	263
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	8	
Permitted Phases		6	2			8
Detector Phase	6	6	5	2	8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0	6.0
Minimum Split (s)	25.5	25.5	15.0	23.5	31.5	31.5
Total Split (s)	44.0	44.0	18.0	62.0	38.0	38.0
Total Split (%)	44.0%	44.0%	18.0%	62.0%	38.0%	38.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Min	C-Min	None	C-Min	None	None
v/c Ratio	0.33	0.03	0.23	0.36	0.27	0.69
Control Delay	7.8	2.9	3.5	3.5	45.2	15.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.8	2.9	3.5	3.5	45.2	15.4
Queue Length 50th (ft)	92	0	12	67	26	0
Queue Length 95th (ft)	163	11	33	132	55	71
Internal Link Dist (ft)	1639			1890	1094	
Turn Bay Length (ft)		230	535			220
Base Capacity (vph)	2366	1077	610	2807	575	692
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.03	0.20	0.36	0.07	0.38

Intersection Summary

Cycle Length: 100

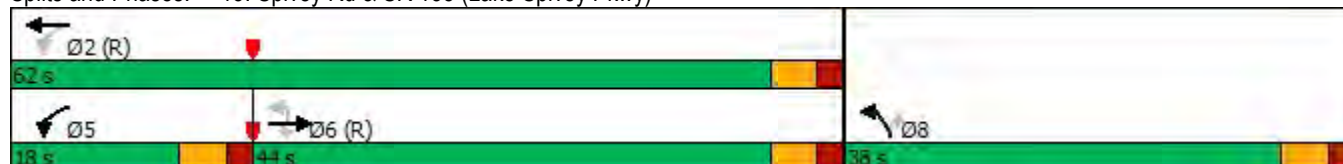
Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTU, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Splits and Phases: 13: Spivey Rd & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary 13: Spivey Rd & SR 138 (Lake Spivey Pkwy)

3c. Build 2027 AM - Improved
01/23/2023

							
Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (veh/h)	0	712	25	113	929	38	239
Future Volume (veh/h)	0	712	25	113	929	38	239
Initial Q (Qb), veh		0	0	0	0	0	0
Ped-Bike Adj(A_pbT)			1.00	1.00		1.00	1.00
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No	No	
Adj Sat Flow, veh/h/ln		1856	1870	1870	1856	1870	1870
Adj Flow Rate, veh/h		782	0	124	1021	42	0
Peak Hour Factor		0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %		3	2	2	3	2	2
Cap, veh/h		2628		623	2992	74	
Arrive On Green		0.75	0.00	0.05	0.85	0.04	0.00
Sat Flow, veh/h		3618	1585	1781	3618	1781	1585
Grp Volume(v), veh/h		782	0	124	1021	42	0
Grp Sat Flow(s),veh/h/ln		1763	1585	1781	1763	1781	1585
Q Serve(g_s), s		7.3	0.0	1.4	6.2	2.3	0.0
Cycle Q Clear(g_c), s		7.3	0.0	1.4	6.2	2.3	0.0
Prop In Lane			1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h		2628		623	2992	74	
V/C Ratio(X)		0.30		0.20	0.34	0.57	
Avail Cap(c_a), veh/h		2628		760	2992	579	
HCM Platoon Ratio		1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	0.00	0.91	0.91	1.00	0.00
Uniform Delay (d), s/veh		4.2	0.0	2.4	1.6	47.1	0.0
Incr Delay (d2), s/veh		0.3	0.0	0.1	0.3	6.8	0.0
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		1.9	0.0	0.2	0.6	1.2	0.0
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh		4.5	0.0	2.5	1.9	53.8	0.0
LnGrp LOS		A		A	A	D	
Approach Vol, veh/h		782			1145	42	
Approach Delay, s/veh		4.5			2.0	53.8	
Approach LOS		A			A	D	
Timer - Assigned Phs		2			5	6	8
Phs Duration (G+Y+Rc), s		90.4			10.3	80.0	9.6
Change Period (Y+Rc), s		5.5			5.5	5.5	5.5
Max Green Setting (Gmax), s		56.5			12.5	38.5	32.5
Max Q Clear Time (g_c+I1), s		8.2			3.4	9.3	4.3
Green Ext Time (p_c), s		17.5			0.2	10.3	0.1
Intersection Summary							
HCM 6th Ctrl Delay			4.1				
HCM 6th LOS			A				
Notes							
User approved ignoring U-Turning movement.							
Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.							

Timings
14: Blackhall Rd/Speer Rd & Walt Stephens Rd

3c. Build 2027 AM - Improved

01/23/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	175	47	120	246	507	42	406	63	195	106	11
Future Volume (vph)	15	175	47	120	246	507	42	406	63	195	106	11
Lane Group Flow (vph)	17	194	52	133	273	563	47	451	70	217	118	12
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	6			2			3			7		
Permitted Phases	6		6	2		2	8		8	4		4
Detector Phase	6	6	6	2	2	2	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0	15.0	5.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	23.5	23.5	23.5	23.5	23.5	23.5	15.0	23.5	23.5	15.0	23.5	23.5
Total Split (s)	41.0	41.0	41.0	41.0	41.0	41.0	15.0	44.0	44.0	15.0	44.0	44.0
Total Split (%)	41.0%	41.0%	41.0%	41.0%	41.0%	41.0%	15.0%	44.0%	44.0%	15.0%	44.0%	44.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.04	0.24	0.07	0.26	0.33	0.61	0.09	0.81	0.13	0.74	0.17	0.02
Control Delay	19.6	20.2	1.8	20.9	20.9	10.0	14.2	43.9	3.7	33.1	22.0	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.6	20.2	1.8	20.9	20.9	10.0	14.2	43.9	3.7	33.1	22.0	0.1
Queue Length 50th (ft)	6	75	0	55	115	85	17	265	0	84	54	0
Queue Length 95th (ft)	22	144	10	95	168	124	31	339	20	#121	87	0
Internal Link Dist (ft)	2027			3745			1264			1872		
Turn Bay Length (ft)	110		160	190		250	140		125	315		120
Base Capacity (vph)	428	822	747	503	822	925	546	717	662	292	731	673
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.24	0.07	0.26	0.33	0.61	0.09	0.63	0.11	0.74	0.16	0.02

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 96 (96%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

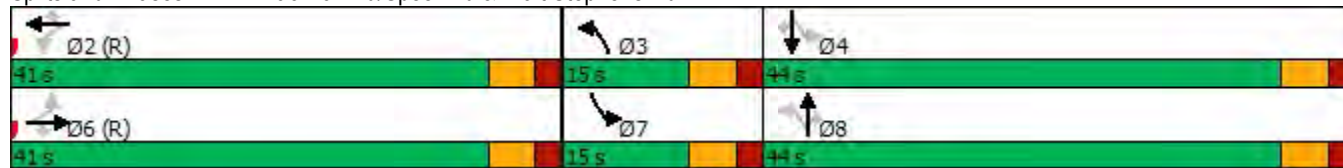
Natural Cycle: 65

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 14: Blackhall Rd/Speer Rd & Walt Stephens Rd



HCM 6th Signalized Intersection Summary

14: Blackhall Rd/Speer Rd & Walt Stephens Rd

3c. Build 2027 AM - Improved

01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	175	47	120	246	507	42	406	63	195	106	11
Future Volume (veh/h)	15	175	47	120	246	507	42	406	63	195	106	11
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	17	194	52	133	273	563	47	451	0	217	118	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	320	875	742	533	875	742	483	509		279	618	
Arrive On Green	0.47	0.47	0.47	0.47	0.47	0.47	0.04	0.27	0.00	0.09	0.33	0.00
Sat Flow, veh/h	657	1870	1585	1134	1870	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	17	194	52	133	273	563	47	451	0	217	118	0
Grp Sat Flow(s),veh/h/ln	657	1870	1585	1134	1870	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	1.7	6.2	1.8	7.9	9.1	29.3	1.9	23.1	0.0	8.5	4.5	0.0
Cycle Q Clear(g_c), s	10.7	6.2	1.8	14.0	9.1	29.3	1.9	23.1	0.0	8.5	4.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	320	875	742	533	875	742	483	509		279	618	
V/C Ratio(X)	0.05	0.22	0.07	0.25	0.31	0.76	0.10	0.89		0.78	0.19	
Avail Cap(c_a), veh/h	320	875	742	533	875	742	588	720		279	720	
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	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	19.9	15.8	14.6	20.0	16.6	21.9	24.6	34.9	0.0	25.3	23.9	0.0
Incr Delay (d2), s/veh	0.3	0.6	0.2	1.1	0.9	7.2	0.1	9.6	0.0	12.9	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	2.6	0.6	2.1	3.8	11.3	0.8	11.2	0.0	4.3	1.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.2	16.4	14.8	21.1	17.5	29.1	24.6	44.5	0.0	38.2	24.1	0.0
LnGrp LOS	C	B	B	C	B	C	C	D		D	C	
Approach Vol, veh/h	263			969			498			335		
Approach Delay, s/veh	16.3			24.7			42.7			33.2		
Approach LOS	B			C			D			C		
Timer - Assigned Phs	2		3	4		6	7	8				
Phs Duration (G+Y+Rc), s	52.3		9.1	38.6		52.3	15.0	32.7				
Change Period (Y+Rc), s	5.5		5.5	5.5		5.5	5.5	5.5				
Max Green Setting (Gmax), s	35.5		9.5	38.5		35.5	9.5	38.5				
Max Q Clear Time (g_c+l1), s	31.3		3.9	6.5		12.7	10.5	25.1				
Green Ext Time (p_c), s	2.7		0.0	0.6		2.4	0.0	2.1				
Intersection Summary												
HCM 6th Ctrl Delay	29.4											
HCM 6th LOS	C											

Timings
15: Flippen Rd & Site Drwy 3 (S)

3c. Build 2027 AM - Improved
01/23/2023

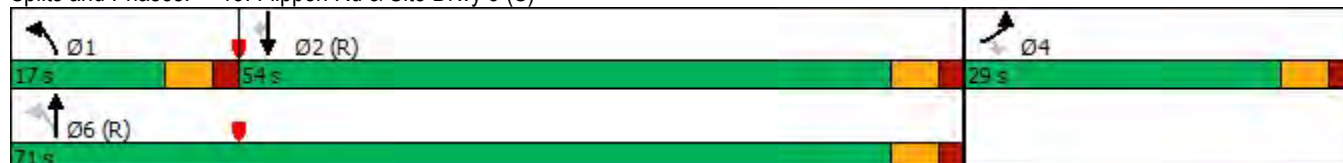


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	139	170	95	459	400	78
Future Volume (vph)	139	170	95	459	400	78
Lane Group Flow (vph)	151	185	103	499	435	85
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		1	6	2	
Permitted Phases		4	6			2
Detector Phase	4	4	1	6	2	2
Switch Phase						
Minimum Initial (s)	6.0	6.0	5.0	15.0	15.0	15.0
Minimum Split (s)	23.5	23.5	15.0	23.5	23.5	23.5
Total Split (s)	29.0	29.0	17.0	71.0	54.0	54.0
Total Split (%)	29.0%	29.0%	17.0%	71.0%	54.0%	54.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Min	C-Min	C-Min
v/c Ratio	0.62	0.49	0.15	0.36	0.37	0.08
Control Delay	51.1	10.2	6.8	8.5	16.6	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.1	10.2	6.8	8.5	16.6	5.3
Queue Length 50th (ft)	92	0	25	136	215	9
Queue Length 95th (ft)	148	57	m46	179	340	m30
Internal Link Dist (ft)	680			692	448	
Turn Bay Length (ft)		150	235			175
Base Capacity (vph)	415	513	701	1387	1171	1035
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.36	0.15	0.36	0.37	0.08

Intersection Summary

Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 15: Flippen Rd & Site Drwy 3 (S)



HCM 6th Signalized Intersection Summary
15: Flippen Rd & Site Drwy 3 (S)

3c. Build 2027 AM - Improved
01/23/2023

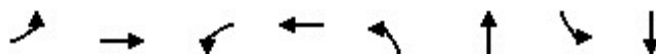
						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	139	170	95	459	400	78
Future Volume (veh/h)	139	170	95	459	400	78
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1870
Adj Flow Rate, veh/h	151	185	103	499	435	85
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	3	3	2
Cap, veh/h	252	224	630	1389	1200	1025
Arrive On Green	0.14	0.14	0.05	0.75	0.65	0.65
Sat Flow, veh/h	1781	1585	1781	1856	1856	1585
Grp Volume(v), veh/h	151	185	103	499	435	85
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1856	1856	1585
Q Serve(g_s), s	8.0	11.3	1.8	9.2	10.8	2.0
Cycle Q Clear(g_c), s	8.0	11.3	1.8	9.2	10.8	2.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	252	224	630	1389	1200	1025
V/C Ratio(X)	0.60	0.83	0.16	0.36	0.36	0.08
Avail Cap(c_a), veh/h	419	372	751	1389	1200	1025
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	40.3	41.7	5.3	4.3	8.2	6.6
Incr Delay (d2), s/veh	2.3	7.5	0.1	0.7	0.9	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	4.9	0.5	2.6	3.8	0.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	42.6	49.2	5.4	5.0	9.0	6.8
LnGrp LOS	D	D	A	A	A	A
Approach Vol, veh/h	336			602	520	
Approach Delay, s/veh	46.2			5.1	8.6	
Approach LOS	D			A	A	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	10.2	70.1		19.6		80.4
Change Period (Y+Rc), s	5.5	5.5		5.5		5.5
Max Green Setting (Gmax), s	11.5	48.5		23.5		65.5
Max Q Clear Time (g_c+I1), s	3.8	12.8		13.3		11.2
Green Ext Time (p_c), s	0.1	6.2		0.8		7.0
Intersection Summary						
HCM 6th Ctrl Delay			15.8			
HCM 6th LOS			B			

Timings

3d. Build 2027 PM - Improved

1: Flippen Rd/Shields Rd & SR 42/SR 138/US 23 (N. Henry Blvd)

01/23/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	←	↑↑	←	↑↑	←	↑	←	↑↑
Traffic Volume (vph)	21	1311	201	1011	316	37	27	53
Future Volume (vph)	21	1311	201	1011	316	37	27	53
Lane Group Flow (vph)	21	1765	203	1035	319	198	0	93
Turn Type	Perm	NA	pm+pt	NA	pm+pt	NA	Perm	NA
Protected Phases		6	5	2	3	8		4
Permitted Phases	6		2		8		4	
Detector Phase	6	6	5	2	3	8	4	4
Switch Phase								
Minimum Initial (s)	15.0	15.0	5.0	15.0	5.0	6.0	6.0	6.0
Minimum Split (s)	28.5	28.5	15.0	28.5	15.0	30.5	30.5	30.5
Total Split (s)	51.0	51.0	14.0	65.0	16.0	35.0	19.0	19.0
Total Split (%)	51.0%	51.0%	14.0%	65.0%	16.0%	35.0%	19.0%	19.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5		5.5
Lead/Lag	Lag	Lag	Lead		Lead		Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes	Yes
Recall Mode	C-Min	C-Min	None	C-Min	None	None	None	None
v/c Ratio	0.08	1.05	0.80	0.46	1.04	0.39		0.56
Control Delay	16.8	63.8	45.6	10.6	96.3	13.1		52.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	16.8	63.8	45.6	10.6	96.3	13.1		52.5
Queue Length 50th (ft)	7	~683	77	172	192	17		53
Queue Length 95th (ft)	22	#824	#221	236	#371	89		102
Internal Link Dist (ft)		2570		1632		2093		641
Turn Bay Length (ft)	135		210					
Base Capacity (vph)	253	1677	254	2248	307	592		210
Starvation Cap Reductn	0	0	0	0	0	0		0
Spillback Cap Reductn	0	0	0	0	0	0		0
Storage Cap Reductn	0	0	0	0	0	0		0
Reduced v/c Ratio	0.08	1.05	0.80	0.46	1.04	0.33		0.44

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

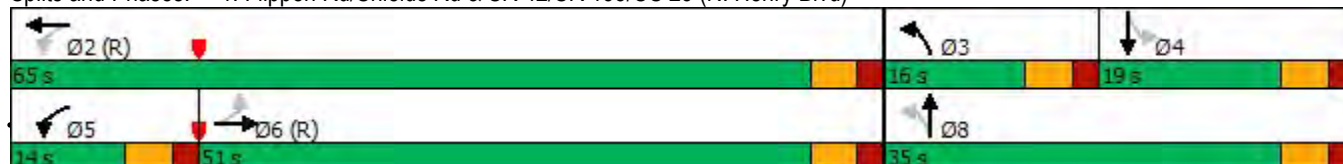
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Flippen Rd/Shields Rd & SR 42/SR 138/US 23 (N. Henry Blvd)



HCM 6th Signalized Intersection Summary

3d. Build 2027 PM - Improved

1: Flippen Rd/Shields Rd & SR 42/SR 138/US 23 (N. Henry Blvd)

01/23/2023

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	21	1311	437	201	1011	14	316	37	159	27	53	12	
Future Volume (veh/h)	21	1311	437	201	1011	14	316	37	159	27	53	12	
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach	No			No			No			No			
Adj Sat Flow, veh/h/ln	1870	1841	1856	1856	1841	1870	1856	1870	1856	1870	1870	1870	
Adj Flow Rate, veh/h	21	1324	441	203	1021	14	319	37	161	27	54	12	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	
Percent Heavy Veh, %	2	4	3	3	4	2	3	2	3	2	2	2	
Cap, veh/h	351	1336	429	222	2308	32	365	72	314	73	82	16	
Arrive On Green	0.51	0.51	0.51	0.09	0.65	0.65	0.10	0.24	0.24	0.08	0.08	0.08	
Sat Flow, veh/h	545	2603	836	1767	3532	48	1767	305	1327	352	1066	210	
Grp Volume(v), veh/h	21	873	892	203	505	530	319	0	198	93	0	0	
Grp Sat Flow(s),veh/h/ln	545	1749	1690	1767	1749	1832	1767	0	1632	1629	0	0	
Q Serve(g_s), s	2.0	48.5	51.3	7.3	14.1	14.1	10.5	0.0	10.5	3.8	0.0	0.0	
Cycle Q Clear(g_c), s	2.1	48.5	51.3	7.3	14.1	14.1	10.5	0.0	10.5	5.5	0.0	0.0	
Prop In Lane	1.00		0.49	1.00		0.03	1.00		0.81	0.29		0.13	
Lane Grp Cap(c), veh/h	351	898	868	222	1142	1197	365	0	386	171	0	0	
V/C Ratio(X)	0.06	0.97	1.03	0.91	0.44	0.44	0.87	0.00	0.51	0.54	0.00	0.00	
Avail Cap(c_a), veh/h	351	898	868	222	1142	1197	365	0	481	263	0	0	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	
Uniform Delay (d), s/veh	12.4	23.7	24.3	30.4	8.5	8.5	39.8	0.0	33.2	45.1	0.0	0.0	
Incr Delay (d2), s/veh	0.3	24.1	38.0	37.6	1.2	1.2	20.1	0.0	1.1	2.7	0.0	0.0	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	0.2	23.4	26.9	7.1	4.7	4.9	4.7	0.0	4.2	2.3	0.0	0.0	
Unsig. Movement Delay, s/veh													
LnGrp Delay(d),s/veh	12.7	47.7	62.3	68.0	9.7	9.6	59.8	0.0	34.2	47.7	0.0	0.0	
LnGrp LOS	B	D	F	E	A	A	E	A	C	D	A	A	
Approach Vol, veh/h	1786			1238				517				93	
Approach Delay, s/veh	54.6			19.2				50.0				47.7	
Approach LOS	D			B				D				D	
Timer - Assigned Phs	2		3	4	5	6	8						
Phs Duration (G+Y+Rc), s	70.8		16.0	13.2	14.0	56.8	29.2						
Change Period (Y+Rc), s	5.5		5.5	5.5	5.5	5.5	5.5						
Max Green Setting (Gmax), s	59.5		10.5	13.5	8.5	45.5	29.5						
Max Q Clear Time (g_c+I1), s	16.1		12.5	7.5	9.3	53.3	12.5						
Green Ext Time (p_c), s	16.1		0.0	0.2	0.0	0.0	1.0						
Intersection Summary													
HCM 6th Ctrl Delay	41.7												
HCM 6th LOS	D												
Notes													

Intersection												
Int Delay, s/veh	5.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱	↰	↱			↰	↱
Traffic Vol, veh/h	40	0	49	14	0	17	81	642	14	26	785	66
Future Vol, veh/h	40	0	49	14	0	17	81	642	14	26	785	66
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	150	-	-	-	235	-	-	-	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2	2	3	2	2	3	2
Mvmt Flow	41	0	50	14	0	17	83	655	14	27	801	67

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1692	1690	801	1742	1750	662	868	0	0	669	0	0
Stage 1	855	855	-	828	828	-	-	-	-	-	-	-
Stage 2	837	835	-	914	922	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	74	93	384	68	86	462	776	-	-	921	-	-
Stage 1	353	375	-	365	386	-	-	-	-	-	-	-
Stage 2	361	383	-	327	349	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	63	78	384	52	72	462	776	-	-	921	-	-
Mov Cap-2 Maneuver	63	78	-	52	72	-	-	-	-	-	-	-
Stage 1	315	354	-	326	345	-	-	-	-	-	-	-
Stage 2	310	342	-	268	329	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	69.1		56.1		1.1		0.3	
HCM LOS	F		F					

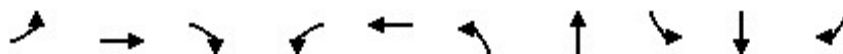
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2WBLn1	SBL	SBT	SBR
Capacity (veh/h)	776	-	-	63	384	101	921	-
HCM Lane V/C Ratio	0.107	-	-	0.648	0.13	0.313	0.029	-
HCM Control Delay (s)	10.2	-	-	134.4	15.8	56.1	9	0
HCM Lane LOS	B	-	-	F	C	F	A	A
HCM 95th %tile Q(veh)	0.4	-	-	2.8	0.4	1.2	0.1	-

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	↔
Traffic Vol, veh/h	10	2	12	0	2	4	13	680	2	3	800	11
Future Vol, veh/h	10	2	12	0	2	4	13	680	2	3	800	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	3	2	2	3	2
Mvmt Flow	10	2	13	0	2	4	14	708	2	3	833	11
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	1579	1577	833	1589	1587	709	844	0	0	710	0	0
Stage 1	839	839	-	737	737	-	-	-	-	-	-	-
Stage 2	740	738	-	852	850	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	88	110	369	87	108	434	792	-	-	889	-	-
Stage 1	360	381	-	410	425	-	-	-	-	-	-	-
Stage 2	409	424	-	354	377	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	84	106	369	81	104	434	792	-	-	889	-	-
Mov Cap-2 Maneuver	84	106	-	81	104	-	-	-	-	-	-	-
Stage 1	350	379	-	398	413	-	-	-	-	-	-	-
Stage 2	391	412	-	338	375	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	36		22.6			0.2			0			
HCM LOS	E		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	792	-	-	141	211	889	-	-				
HCM Lane V/C Ratio	0.017	-	-	0.177	0.03	0.004	-	-				
HCM Control Delay (s)	9.6	0	-	36	22.6	9.1	0	-				
HCM Lane LOS	A	A	-	E	C	A	A	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.6	0.1	0	-	-				

Timings 4: Flippen Rd & Walt Stephens Rd/Red Oak Rd

3d. Build 2027 PM - Improved

01/23/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	305	185	411	24	140	331	448	43	538	272
Future Volume (vph)	305	185	411	24	140	331	448	43	538	272
Lane Group Flow (vph)	328	199	442	26	204	356	502	46	578	292
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4		3	8	1	6	5	2	
Permitted Phases	4		4	8		6		2		2
Detector Phase	7	4	4	3	8	1	6	5	2	2
Switch Phase										
Minimum Initial (s)	5.0	6.0	6.0	5.0	6.0	5.0	15.0	5.0	15.0	15.0
Minimum Split (s)	15.0	31.5	31.5	15.0	30.5	15.0	31.5	15.0	28.5	28.5
Total Split (s)	20.5	31.5	31.5	20.5	31.5	18.0	33.0	15.0	30.0	30.0
Total Split (%)	20.5%	31.5%	31.5%	20.5%	31.5%	18.0%	33.0%	15.0%	30.0%	30.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
v/c Ratio	0.80	0.34	0.56	0.09	0.68	0.71	0.61	0.14	1.28	0.51
Control Delay	34.5	26.6	8.6	20.4	47.8	30.1	27.9	21.0	182.3	26.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.5	26.6	8.6	20.4	47.8	30.1	27.9	21.0	182.3	26.5
Queue Length 50th (ft)	151	86	54	11	114	145	255	25	~485	101
Queue Length 95th (ft)	m189	m125	m77	26	178	#334	#467	m37	#703	178
Internal Link Dist (ft)		646			1291		2204		704	
Turn Bay Length (ft)	180		345	110		130		120		215
Base Capacity (vph)	408	577	795	449	484	498	826	386	452	570
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.34	0.56	0.06	0.42	0.71	0.61	0.12	1.28	0.51

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 88 (88%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green

Natural Cycle: 105

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

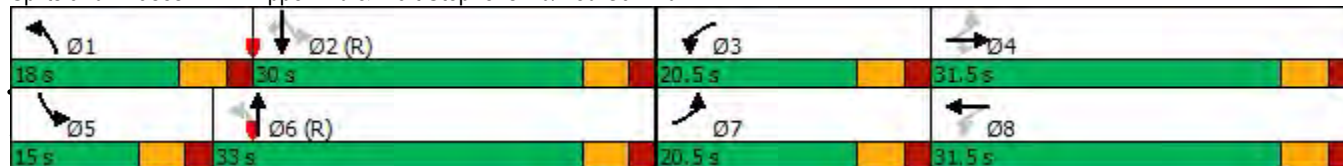
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Flippen Rd & Walt Stephens Rd/Red Oak Rd



HCM 6th Signalized Intersection Summary

4: Flippen Rd & Walt Stephens Rd/Red Oak Rd

3d. Build 2027 PM - Improved

01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	305	185	411	24	140	49	331	448	19	43	538	272
Future Volume (veh/h)	305	185	411	24	140	49	331	448	19	43	538	272
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1870	1900	1856	1870	1870	1856	1900
Adj Flow Rate, veh/h	328	199	0	26	151	53	356	482	20	46	578	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	0	2	0	3	2	2	3	0
Cap, veh/h	373	490		281	185	65	367	807	33	363	682	
Arrive On Green	0.15	0.26	0.00	0.03	0.14	0.14	0.13	0.46	0.46	0.04	0.37	0.00
Sat Flow, veh/h	1781	1870	1585	1781	1344	472	1810	1769	73	1781	1856	1610
Grp Volume(v), veh/h	328	199	0	26	0	204	356	0	502	46	578	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1815	1810	0	1842	1781	1856	1610
Q Serve(g_s), s	15.0	8.8	0.0	1.2	0.0	10.9	11.9	0.0	20.4	1.6	28.6	0.0
Cycle Q Clear(g_c), s	15.0	8.8	0.0	1.2	0.0	10.9	11.9	0.0	20.4	1.6	28.6	0.0
Prop In Lane	1.00		1.00	1.00		0.26	1.00		0.04	1.00		1.00
Lane Grp Cap(c), veh/h	373	490		281	0	250	367	0	841	363	682	
V/C Ratio(X)	0.88	0.41		0.09	0.00	0.82	0.97	0.00	0.60	0.13	0.85	
Avail Cap(c_a), veh/h	373	490		502	0	472	367	0	841	468	682	
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	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.9	30.5	0.0	35.5	0.0	41.9	21.5	0.0	20.3	19.0	29.1	0.0
Incr Delay (d2), s/veh	20.8	0.5	0.0	0.1	0.0	6.4	38.9	0.0	3.1	0.2	12.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.4	3.8	0.0	0.5	0.0	5.2	8.4	0.0	8.7	0.6	14.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.7	31.0	0.0	35.7	0.0	48.3	60.4	0.0	23.4	19.1	41.5	0.0
LnGrp LOS	D	C		D	A	D	E	A	C	B	D	
Approach Vol, veh/h	527			230			858			624		
Approach Delay, s/veh	43.9			46.9			38.8			39.9		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	18.0	42.2	8.1	31.7	9.1	51.1	20.5	19.3				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	12.5	24.5	15.0	26.0	9.5	27.5	15.0	26.0				
Max Q Clear Time (g_c+I1), s	13.9	30.6	3.2	10.8	3.6	22.4	17.0	12.9				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.8	0.0	2.1	0.0	0.8				

Intersection Summary

HCM 6th Ctrl Delay 41.1

HCM 6th LOS D

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings 5: Flippen Rd & Hudson Bridge Rd

3d. Build 2027 PM - Improved
01/23/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	136	413	9	603	733	378	3	343	333	306	427	87
Future Volume (vph)	136	413	9	603	733	378	3	343	333	306	427	87
Lane Group Flow (vph)	140	426	9	622	756	390	3	354	343	315	440	90
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2			8		7	4	
Permitted Phases	6		6	2		2	8		8	4		4
Detector Phase	1	6	6	5	2	2	8	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	6.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	15.0	28.5	28.5	15.0	28.5	28.5	36.5	36.5	36.5	15.0	33.5	33.5
Total Split (s)	15.0	24.0	24.0	36.0	45.0	45.0	41.0	41.0	41.0	19.0	60.0	60.0
Total Split (%)	12.5%	20.0%	20.0%	30.0%	37.5%	37.5%	34.2%	34.2%	34.2%	15.8%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.57	0.78	0.02	0.99	0.55	0.46	0.01	0.80	0.54	1.05	0.60	0.13
Control Delay	31.6	59.8	0.1	66.3	32.1	4.8	31.3	56.9	6.8	95.5	31.7	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.6	59.8	0.1	66.3	32.1	4.8	31.3	56.9	6.8	95.5	31.7	1.8
Queue Length 50th (ft)	56	168	0	~422	243	0	2	258	0	~181	264	0
Queue Length 95th (ft)	105	#230	0	#750	331	69	9	346	69	#335	338	15
Internal Link Dist (ft)		840			1594			786			834	
Turn Bay Length (ft)	375		175	390		450	230		365	320		320
Base Capacity (vph)	254	545	390	626	1363	849	279	545	709	299	837	786
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.78	0.02	0.99	0.55	0.46	0.01	0.65	0.48	1.05	0.53	0.11

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 37 (31%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 125

Control Type: Actuated-Coordinated

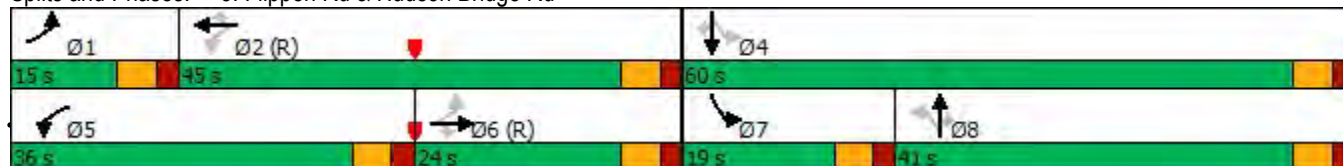
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 5: Flippen Rd & Hudson Bridge Rd



HCM 6th Signalized Intersection Summary

5: Flippen Rd & Hudson Bridge Rd

3d. Build 2027 PM - Improved

01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	136	413	9	603	733	378	3	343	333	306	427	87
Future Volume (veh/h)	136	413	9	603	733	378	3	343	333	306	427	87
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1856	1870	1870	1856	1870
Adj Flow Rate, veh/h	140	426	0	622	756	0	3	354	343	315	440	90
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	3	2	2	3	2
Cap, veh/h	344	735		608	1364		248	451	386	309	745	637
Arrive On Green	0.08	0.21	0.00	0.25	0.38	0.00	0.24	0.24	0.24	0.11	0.40	0.40
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	874	1856	1585	1781	1856	1585
Grp Volume(v), veh/h	140	426	0	622	756	0	3	354	343	315	440	90
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	874	1856	1585	1781	1856	1585
Q Serve(g_s), s	7.3	13.0	0.0	30.5	20.0	0.0	0.3	21.4	25.1	13.5	22.3	4.3
Cycle Q Clear(g_c), s	7.3	13.0	0.0	30.5	20.0	0.0	3.6	21.4	25.1	13.5	22.3	4.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	344	735		608	1364		248	451	386	309	745	637
V/C Ratio(X)	0.41	0.58		1.02	0.55		0.01	0.78	0.89	1.02	0.59	0.14
Avail Cap(c_a), veh/h	347	735		608	1364		294	549	469	309	843	720
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	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.4	42.9	0.0	27.7	28.9	0.0	37.0	42.5	43.8	34.8	28.2	22.8
Incr Delay (d2), s/veh	0.8	3.3	0.0	42.6	1.6	0.0	0.0	6.0	16.4	56.3	0.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	5.9	0.0	19.9	8.5	0.0	0.1	10.2	11.2	11.3	9.6	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.2	46.2	0.0	70.4	30.6	0.0	37.1	48.5	60.2	91.1	29.0	22.9
LnGrp LOS	C	D		F	C		D	D	E	F	C	C
Approach Vol, veh/h	566			1378			700			845		
Approach Delay, s/veh	43.2			48.5			54.2			51.5		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.7	51.6		53.7	36.0	30.3	19.0	34.7				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	9.5	39.5		54.5	30.5	18.5	13.5	35.5				
Max Q Clear Time (g_c+I1), s	9.3	22.0		24.3	32.5	15.0	15.5	27.1				
Green Ext Time (p_c), s	0.0	7.6		2.9	0.0	1.3	0.0	2.1				

Intersection Summary

HCM 6th Ctrl Delay 49.5

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Timings

3d. Build 2027 PM - Improved

6: SR 42/SR 138/US 23 (N. Henry Blvd) & SR 138 (Lake Spivey Pkwy)

01/23/2023

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	248	180	1018	187	189	131	760	414	98	96	561
Future Volume (vph)	248	180	1018	187	189	131	760	414	98	96	561
Lane Group Flow (vph)	251	182	1028	189	191	132	768	418	99	97	709
Turn Type	pm+pt	NA	pt+ov	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	4 1	3	8		1	6		5	2
Permitted Phases	4			8		8			6		
Detector Phase	7	4	4 1	3	8	8	1	6	6	5	2
Switch Phase											
Minimum Initial (s)	5.0	6.0		5.0	6.0	6.0	5.0	15.0	15.0	5.0	15.0
Minimum Split (s)	15.0	31.5		15.0	30.5	30.5	15.0	28.5	28.5	15.0	31.5
Total Split (s)	24.0	59.0		16.0	51.0	51.0	44.0	50.0	50.0	25.0	31.0
Total Split (%)	16.0%	39.3%		10.7%	34.0%	34.0%	29.3%	33.3%	33.3%	16.7%	20.7%
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	None	C-Min
v/c Ratio	0.48	0.27	1.00	0.38	0.32	0.21	0.87	0.67	0.16	0.61	1.18
Control Delay	28.7	35.7	54.3	28.3	41.6	2.2	65.1	49.9	2.2	81.1	149.6
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	28.7	35.7	54.3	28.3	41.6	2.2	65.1	49.9	2.2	81.1	149.6
Queue Length 50th (ft)	151	127	948	109	145	0	373	351	0	93	~430
Queue Length 95th (ft)	218	191	#1303	165	217	17	#462	502	16	151	#563
Internal Link Dist (ft)		2539			205			2663			944
Turn Bay Length (ft)	165			100		120	340		300	580	
Base Capacity (vph)	533	677	1028	505	596	628	881	621	630	232	599
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	0.47	0.27	1.00	0.37	0.32	0.21	0.87	0.67	0.16	0.42	1.18

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green

Natural Cycle: 145

Control Type: Actuated-Coordinated

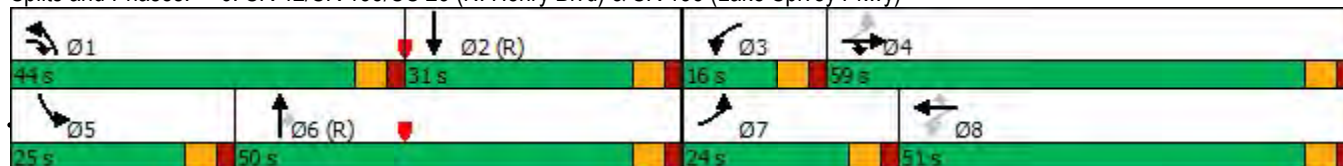
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 6: SR 42/SR 138/US 23 (N. Henry Blvd) & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary

3d. Build 2027 PM - Improved

6: SR 42/SR 138/US 23 (N. Henry Blvd) & SR 138 (Lake Spivey Pkwy)

01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	248	180	1018	187	189	131	760	414	98	96	561	141
Future Volume (veh/h)	248	180	1018	187	189	131	760	414	98	96	561	141
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1900	1870	1885	1900	1900	1870	1856	1885	1885	1870	1885
Adj Flow Rate, veh/h	251	182	0	189	191	0	768	418	0	97	567	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	0	2	1	0	0	2	3	1	1	2	1
Cap, veh/h	295	328		277	227		825	1010		119	1321	
Arrive On Green	0.12	0.17	0.00	0.07	0.12	0.00	0.24	0.54	0.00	0.07	0.37	0.00
Sat Flow, veh/h	1795	1900	1585	1795	1900	1610	3456	1856	1598	1795	3647	0
Grp Volume(v), veh/h	251	182	0	189	191	0	768	418	0	97	567	0
Grp Sat Flow(s),veh/h/ln	1795	1900	1585	1795	1900	1610	1728	1856	1598	1795	1777	0
Q Serve(g_s), s	18.1	13.1	0.0	10.5	14.8	0.0	32.6	19.9	0.0	8.0	17.9	0.0
Cycle Q Clear(g_c), s	18.1	13.1	0.0	10.5	14.8	0.0	32.6	19.9	0.0	8.0	17.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	295	328		277	227		825	1010		119	1321	
V/C Ratio(X)	0.85	0.55		0.68	0.84		0.93	0.41		0.81	0.43	
Avail Cap(c_a), veh/h	295	678		277	576		887	1010		233	1321	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.49	0.49	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	49.4	56.8	0.0	56.7	64.7	0.0	55.9	20.1	0.0	69.1	35.2	0.0
Incr Delay (d2), s/veh	11.3	0.7	0.0	6.7	8.2	0.0	15.5	1.3	0.0	12.5	1.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.9	6.3	0.0	2.3	7.7	0.0	15.7	8.7	0.0	4.0	7.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.7	57.5	0.0	63.4	72.8	0.0	71.4	21.4	0.0	81.6	36.2	0.0
LnGrp LOS	E	E		E	E		E	C		F	D	
Approach Vol, veh/h		433			380			1186			664	
Approach Delay, s/veh		59.4			68.2			53.7			42.9	
Approach LOS		E			E			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	41.3	61.3	16.0	31.4	15.4	87.1	24.0	23.4				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	38.5	25.5	10.5	53.5	19.5	44.5	18.5	45.5				
Max Q Clear Time (g_c+I1), s	34.6	19.9	12.5	15.1	10.0	21.9	20.1	16.8				
Green Ext Time (p_c), s	1.2	2.5	0.0	0.9	0.1	4.5	0.0	1.2				

Intersection Summary

HCM 6th Ctrl Delay 54.0

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings
7: I-675 NB Ramps & SR 138 (Lake Spivey Pkwy)

3d. Build 2027 PM - Improved
01/23/2023

						
Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	338	2242	1701	300	48	131
Future Volume (vph)	338	2242	1701	300	48	131
Lane Group Flow (vph)	345	2288	1736	306	49	134
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		3	
Permitted Phases	6			2		8
Detector Phase	1	6	2	2	3	8
Switch Phase						
Minimum Initial (s)	5.0	15.0	15.0	15.0	5.0	6.0
Minimum Split (s)	15.0	28.5	28.5	28.5	15.0	34.5
Total Split (s)	17.0	65.5	48.5	48.5	34.5	34.5
Total Split (%)	17.0%	65.5%	48.5%	48.5%	34.5%	34.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.61	0.82	1.07	0.35	0.30	0.59
Control Delay	21.7	14.6	69.8	5.1	45.6	28.0
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0
Total Delay	21.7	14.9	69.8	5.1	45.6	28.0
Queue Length 50th (ft)	170	465	558	18	30	29
Queue Length 95th (ft)	m173	m475	#827	74	62	83
Internal Link Dist (ft)		706	2539			
Turn Bay Length (ft)	145			270		315
Base Capacity (vph)	565	2792	1627	869	513	520
Starvation Cap Reductn	0	103	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.85	1.07	0.35	0.10	0.26

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 13 (13%), Referenced to phase 2:WBT and 6:EBTL, Start of Green

Natural Cycle: 130

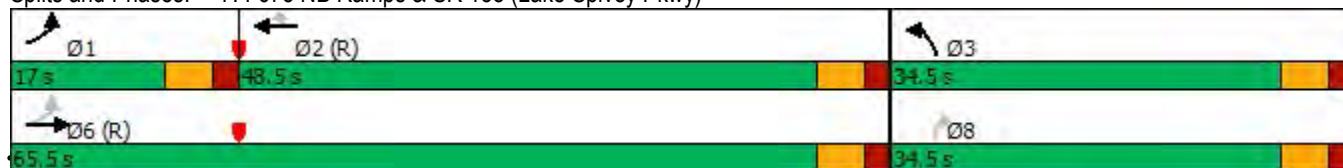
Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: I-675 NB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary

7: I-675 NB Ramps & SR 138 (Lake Spivey Pkwy)

3d. Build 2027 PM - Improved

01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	338	2242	0	0	1701	300	48	0	131	0	0	0
Future Volume (veh/h)	338	2242	0	0	1701	300	48	0	131	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1870	1856	0	0	1856	1870	1870	0	1870			
Adj Flow Rate, veh/h	345	2288	0	0	1736	0	49	0	134			
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98			
Percent Heavy Veh, %	2	3	0	0	3	2	2	0	2			
Cap, veh/h	343	2762	0	0	2163		190	0	169			
Arrive On Green	0.15	1.00	0.00	0.00	0.61	0.00	0.11	0.00	0.11			
Sat Flow, veh/h	1781	3618	0	0	3618	1585	1781	0	1585			
Grp Volume(v), veh/h	345	2288	0	0	1736	0	49	0	134			
Grp Sat Flow(s),veh/h/ln	1781	1763	0	0	1763	1585	1781	0	1585			
Q Serve(g_s), s	11.5	0.0	0.0	0.0	37.5	0.0	2.5	0.0	8.3			
Cycle Q Clear(g_c), s	11.5	0.0	0.0	0.0	37.5	0.0	2.5	0.0	8.3			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	343	2762	0	0	2163		190	0	169			
V/C Ratio(X)	1.01	0.83	0.00	0.00	0.80		0.26	0.00	0.79			
Avail Cap(c_a), veh/h	343	2762	0	0	2163		517	0	460			
HCM Platoon Ratio	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.09	0.09	0.00	0.00	0.56	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	27.6	0.0	0.0	0.0	14.7	0.0	41.0	0.0	43.6			
Incr Delay (d2), s/veh	15.8	0.3	0.0	0.0	1.9	0.0	0.7	0.0	8.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	9.1	0.1	0.0	0.0	12.8	0.0	1.1	0.0	3.5			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.4	0.3	0.0	0.0	16.6	0.0	41.8	0.0	51.7			
LnGrp LOS	F	A	A	A	B		D	A	D			
Approach Vol, veh/h	2633			1736			183					
Approach Delay, s/veh	5.9			16.6			49.1					
Approach LOS	A			B			D					
Timer - Assigned Phs	1	2					6	8				
Phs Duration (G+Y+Rc), s	17.0	66.8					83.8	16.2				
Change Period (Y+Rc), s	5.5	5.5					5.5	5.5				
Max Green Setting (Gmax), s	11.5	43.0					60.0	29.0				
Max Q Clear Time (g_c+I1), s	13.5	39.5					2.0	10.3				
Green Ext Time (p_c), s	0.0	3.3					52.3	0.5				

Intersection Summary

HCM 6th Ctrl Delay 11.7

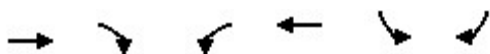
HCM 6th LOS B

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Timings 8: I-675 SB Ramps & SR 138 (Lake Spivey Pkwy)

3d. Build 2027 PM - Improved
01/23/2023



Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	↓
Traffic Volume (vph)	2135	132	112	1637	445	551
Future Volume (vph)	2135	132	112	1637	445	551
Lane Group Flow (vph)	2201	136	115	1688	459	568
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	7	
Permitted Phases		6	2			4
Detector Phase	6	6	5	2	7	4
Switch Phase						
Minimum Initial (s)	15.0	15.0	5.0	15.0	5.0	6.0
Minimum Split (s)	28.5	28.5	15.0	28.5	35.5	35.5
Total Split (s)	49.5	49.5	15.0	64.5	35.5	35.5
Total Split (%)	49.5%	49.5%	15.0%	64.5%	35.5%	35.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Min	C-Min	None	C-Min	None	None
v/c Ratio	1.19	0.15	0.53	0.73	0.58	0.80
Control Delay	107.2	0.2	33.1	5.2	36.7	39.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	107.2	0.2	33.1	5.2	36.7	39.4
Queue Length 50th (ft)	~907	0	35	18	134	166
Queue Length 95th (ft)	m#953	m0	m38	m29	169	215
Internal Link Dist (ft)	1959			706		
Turn Bay Length (ft)		375	95		520	500
Base Capacity (vph)	1842	889	242	2313	1029	897
Starvation Cap Reductn	0	0	0	16	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.19	0.15	0.48	0.73	0.45	0.63

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 24 (24%), Referenced to phase 2:WBTL and 6:EBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

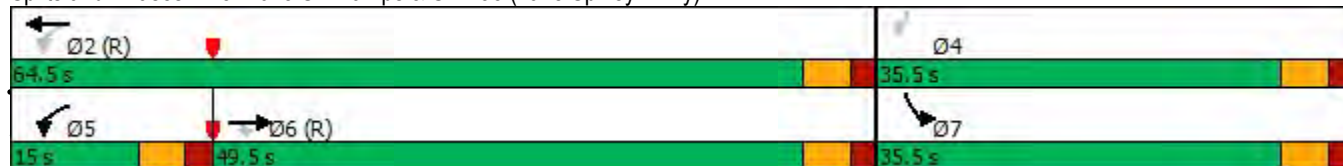
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: I-675 SB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
8: I-675 SB Ramps & SR 138 (Lake Spivey Pkwy)

3d. Build 2027 PM - Improved

01/23/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑					↑↑		↑↑
Traffic Volume (veh/h)	0	2135	132	112	1637	0	0	0	0	445	0	551
Future Volume (veh/h)	0	2135	132	112	1637	0	0	0	0	445	0	551
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1870	1870	1856	0				1870	0	1870
Adj Flow Rate, veh/h	0	2201	136	115	1688	0				459	0	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	3	2	2	3	0				2	0	2
Cap, veh/h	0	2202	990	254	2565	0				561	0	
Arrive On Green	0.00	1.00	1.00	0.06	0.97	0.00				0.16	0.00	0.00
Sat Flow, veh/h	0	3618	1585	1781	3618	0				3456	0	2790
Grp Volume(v), veh/h	0	2201	136	115	1688	0				459	0	0
Grp Sat Flow(s),veh/h/ln	0	1763	1585	1781	1763	0				1728	0	1395
Q Serve(g_s), s	0.0	0.0	0.0	2.1	4.3	0.0				12.8	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	2.1	4.3	0.0				12.8	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2202	990	254	2565	0				561	0	
V/C Ratio(X)	0.00	1.00	0.14	0.45	0.66	0.00				0.82	0.00	
Avail Cap(c_a), veh/h	0	2202	990	338	2565	0				1037	0	
HCM Platoon Ratio	1.00	2.00	2.00	1.33	1.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.09	0.09	0.09	0.09	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	5.0	0.5	0.0				40.5	0.0	0.0
Incr Delay (d2), s/veh	0.0	5.6	0.0	0.1	0.1	0.0				3.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.7	3.8	0.6	0.5	0.0				5.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	5.6	0.0	5.2	0.6	0.0				43.5	0.0	0.0
LnGrp LOS	A	A	A	A	A	A				D	A	
Approach Vol, veh/h		2337			1803						459	
Approach Delay, s/veh		5.3			0.9						43.5	
Approach LOS		A			A						D	
Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		78.3		21.7	10.3	68.0						
Change Period (Y+Rc), s		5.5		5.5	5.5	5.5						
Max Green Setting (Gmax), s		59.0		30.0	9.5	44.0						
Max Q Clear Time (g_c+I1), s		6.3		14.8	4.1	2.0						
Green Ext Time (p_c), s		36.7		1.4	0.1	38.7						
Intersection Summary												
HCM 6th Ctrl Delay				7.4								
HCM 6th LOS				A								
Notes												
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.												

Timings
9: SR 138 (Lake Spivey Pkwy) & Mt. Zion Rd

3d. Build 2027 PM - Improved
01/23/2023

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	160	1716	84	75	1369	180	135	132	194	100	196
Future Volume (vph)	160	1716	84	75	1369	180	135	132	194	100	196
Lane Group Flow (vph)	165	1769	87	77	1411	186	139	246	200	103	202
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8	7	4	
Permitted Phases	6		6	2		2	8		4		4
Detector Phase	1	6	6	5	2	2	3	8	7	4	4
Switch Phase											
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	6.0	5.0	6.0	6.0
Minimum Split (s)	15.0	28.5	28.5	15.0	34.5	34.5	15.0	38.5	15.0	32.5	32.5
Total Split (s)	15.0	31.5	31.5	15.0	31.5	31.5	15.0	38.5	15.0	38.5	38.5
Total Split (%)	15.0%	31.5%	31.5%	15.0%	31.5%	31.5%	15.0%	38.5%	15.0%	38.5%	38.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None
v/c Ratio	0.61	1.10	0.11	0.37	0.99	0.25	0.36	0.73	0.71	0.31	0.45
Control Delay	34.0	74.8	1.8	12.9	46.5	7.3	26.6	44.2	40.2	36.9	8.0
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	34.0	74.8	1.8	12.9	46.5	7.3	26.6	44.2	40.2	36.9	8.0
Queue Length 50th (ft)	64	~691	0	14	481	24	65	124	97	58	0
Queue Length 95th (ft)	m93	#957	m1	m34	#781	m68	100	192	140	98	55
Internal Link Dist (ft)		896			1959			388		1031	
Turn Bay Length (ft)	115		140	155		325	35		345		165
Base Capacity (vph)	280	1608	806	244	1419	755	389	608	281	627	668
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	1.10	0.11	0.32	0.99	0.25	0.36	0.40	0.71	0.16	0.30

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 145

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

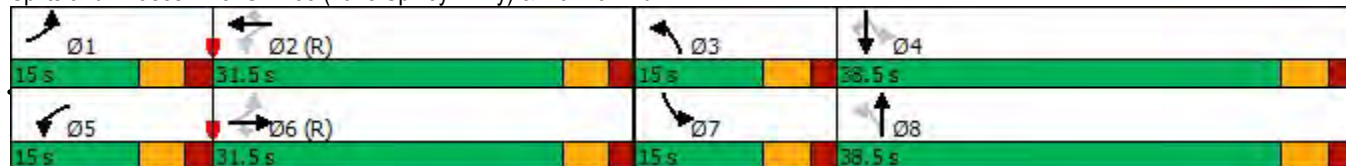
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: SR 138 (Lake Spivey Pkwy) & Mt. Zion Rd



HCM 6th Signalized Intersection Summary

9: SR 138 (Lake Spivey Pkwy) & Mt. Zion Rd

3d. Build 2027 PM - Improved

01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	1716	84	75	1369	180	135	132	107	194	100	196
Future Volume (veh/h)	160	1716	84	75	1369	180	135	132	107	194	100	196
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1856	1870	1870	1856	1900	1870	1900	1870	1900	1900	1900
Adj Flow Rate, veh/h	165	1769	0	77	1411	186	139	136	110	200	103	202
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	3	2	2	3	0	2	0	2	0	0	0
Cap, veh/h	216	1664		151	1572	718	363	164	133	283	346	293
Arrive On Green	0.14	0.94	0.00	0.01	0.15	0.15	0.08	0.17	0.17	0.09	0.18	0.18
Sat Flow, veh/h	1810	3526	1585	1781	3526	1610	1781	972	786	1810	1900	1610
Grp Volume(v), veh/h	165	1769	0	77	1411	186	139	0	246	200	103	202
Grp Sat Flow(s),veh/h/ln	1810	1763	1585	1781	1763	1610	1781	0	1758	1810	1900	1610
Q Serve(g_s), s	5.0	47.2	0.0	2.3	39.3	10.2	6.3	0.0	13.5	9.1	4.7	11.7
Cycle Q Clear(g_c), s	5.0	47.2	0.0	2.3	39.3	10.2	6.3	0.0	13.5	9.1	4.7	11.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.45	1.00		1.00
Lane Grp Cap(c), veh/h	216	1664		151	1572	718	363	0	297	283	346	293
V/C Ratio(X)	0.76	1.06		0.51	0.90	0.26	0.38	0.00	0.83	0.71	0.30	0.69
Avail Cap(c_a), veh/h	261	1664		241	1572	718	386	0	580	283	627	531
HCM Platoon Ratio	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.46	0.46	0.00	0.58	0.58	0.58	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.9	2.8	0.0	24.3	40.4	28.0	30.5	0.0	40.1	31.6	35.4	38.3
Incr Delay (d2), s/veh	5.0	35.3	0.0	1.6	5.2	0.5	0.7	0.0	5.8	7.8	0.5	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	9.2	0.0	0.9	19.5	4.5	2.8	0.0	6.3	4.4	2.2	4.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.9	38.1	0.0	25.8	45.6	28.5	31.1	0.0	46.0	39.4	35.8	41.1
LnGrp LOS	C	F		C	D	C	C	A	D	D	D	D
Approach Vol, veh/h	1934		1674				385		505			
Approach Delay, s/veh	37.0		42.8				40.6		39.4			
Approach LOS	D		D				D		D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.5	50.1	13.7	23.7	9.9	52.7	15.0	22.4				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	9.5	26.0	9.5	33.0	9.5	26.0	9.5	33.0				
Max Q Clear Time (g_c+I1), s	7.0	41.3	8.3	13.7	4.3	49.2	11.1	15.5				
Green Ext Time (p_c), s	0.1	0.0	0.0	1.1	0.1	0.0	0.0	1.4				

Intersection Summary

HCM 6th Ctrl Delay 39.8

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Timings
10: I-75 NB Ramps & SR 138 (Lake Spivey Pkwy)

3d. Build 2027 PM - Improved
01/23/2023

						
Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	329	2071	1369	592	211	158
Future Volume (vph)	329	2071	1369	592	211	158
Lane Group Flow (vph)	339	2135	1411	610	218	163
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		3	
Permitted Phases	6			2		8
Detector Phase	1	6	2	2	3	8
Switch Phase						
Minimum Initial (s)	5.0	15.0	15.0	15.0	5.0	6.0
Minimum Split (s)	15.0	28.5	28.5	28.5	15.0	32.5
Total Split (s)	20.0	67.5	47.5	47.5	32.5	32.5
Total Split (%)	20.0%	67.5%	47.5%	47.5%	32.5%	32.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.75	0.85	0.90	0.58	0.70	0.47
Control Delay	25.6	16.7	18.5	3.8	50.5	21.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.6	16.7	18.5	3.8	50.5	21.3
Queue Length 50th (ft)	130	755	128	0	132	42
Queue Length 95th (ft)	m179	m780	m#173	m26	196	97
Internal Link Dist (ft)		897	896			
Turn Bay Length (ft)	140			405		510
Base Capacity (vph)	450	2503	1566	1044	477	490
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.85	0.90	0.58	0.46	0.33

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 98 (98%), Referenced to phase 2:WBT and 6:EBTL, Start of Green

Natural Cycle: 100

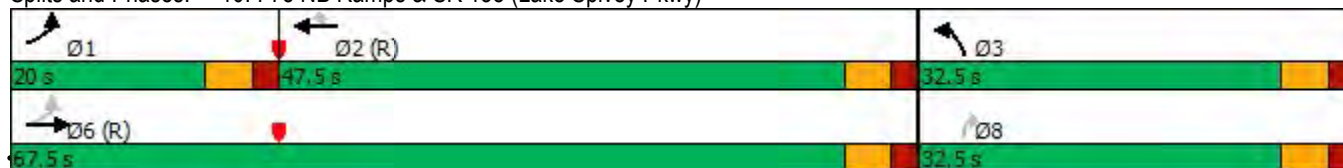
Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: I-75 NB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary

10: I-75 NB Ramps & SR 138 (Lake Spivey Pkwy)

3d. Build 2027 PM - Improved
01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Traffic Volume (veh/h)	329	2071	0	0	1369	592	211	0	158	0	0	0
Future Volume (veh/h)	329	2071	0	0	1369	592	211	0	158	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1870	1856	0	0	1856	1870	1870	0	1870			
Adj Flow Rate, veh/h	339	2135	0	0	1411	0	218	0	0			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	2	3	0	0	3	2	2	0	2			
Cap, veh/h	374	2631	0	0	2076		256	0				
Arrive On Green	0.10	0.75	0.00	0.00	0.59	0.00	0.14	0.00	0.00			
Sat Flow, veh/h	1781	3618	0	0	3618	1585	1781	0	1585			
Grp Volume(v), veh/h	339	2135	0	0	1411	0	218	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1763	0	0	1763	1585	1781	0	1585			
Q Serve(g_s), s	7.8	39.0	0.0	0.0	27.4	0.0	11.9	0.0	0.0			
Cycle Q Clear(g_c), s	7.8	39.0	0.0	0.0	27.4	0.0	11.9	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	374	2631	0	0	2076		256	0				
V/C Ratio(X)	0.91	0.81	0.00	0.00	0.68		0.85	0.00				
Avail Cap(c_a), veh/h	450	2631	0	0	2076		481	0				
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.17	0.17	0.00	0.00	0.35	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	19.7	8.2	0.0	0.0	14.1	0.0	41.8	0.0	0.0			
Incr Delay (d2), s/veh	4.4	0.5	0.0	0.0	0.6	0.0	7.8	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	5.0	9.6	0.0	0.0	9.5	0.0	5.6	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.0	8.7	0.0	0.0	14.7	0.0	49.6	0.0	0.0			
LnGrp LOS	C	A	A	A	B		D	A				
Approach Vol, veh/h	2474			1411			218					
Approach Delay, s/veh	10.8			14.7			49.6					
Approach LOS	B			B			D					
Timer - Assigned Phs	1	2					6	8				
Phs Duration (G+Y+Rc), s	15.7	64.4					80.1	19.9				
Change Period (Y+Rc), s	5.5	5.5					5.5	5.5				
Max Green Setting (Gmax), s	14.5	42.0					62.0	27.0				
Max Q Clear Time (g_c+I1), s	9.8	29.4					41.0	13.9				
Green Ext Time (p_c), s	0.4	10.1					19.8	0.5				

Intersection Summary

HCM 6th Ctrl Delay 14.2
HCM 6th LOS B

Notes

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Timings 11: I-75 SB Ramps & SR 138 (Lake Spivey Pkwy)

3d. Build 2027 PM - Improved
01/23/2023

	→	↘	↙	←	↘	↙
Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↘
Traffic Volume (vph)	1447	331	182	1426	922	662
Future Volume (vph)	1447	331	182	1426	922	662
Lane Group Flow (vph)	1492	341	188	1470	951	682
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	3	
Permitted Phases		6	2			8
Detector Phase	6	6	5	2	3	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	5.0	15.0	5.0	15.0
Minimum Split (s)	28.5	28.5	15.0	28.5	15.0	28.5
Total Split (s)	45.3	45.3	15.0	60.3	39.7	39.7
Total Split (%)	45.3%	45.3%	15.0%	60.3%	39.7%	39.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Min	C-Min	None	C-Min	None	Min
v/c Ratio	1.06	0.41	0.79	0.77	0.81	1.14
Control Delay	73.7	3.8	36.4	9.6	36.5	110.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.7	3.8	36.4	9.6	36.5	110.6
Queue Length 50th (ft)	~557	0	46	220	281	~473
Queue Length 95th (ft)	#694	53	m72	m535	360	#696
Internal Link Dist (ft)	1158			897		
Turn Bay Length (ft)		980	150		490	
Base Capacity (vph)	1401	837	242	1920	1174	598
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.06	0.41	0.78	0.77	0.81	1.14

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 35 (35%), Referenced to phase 2:WBTL and 6:EBT, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

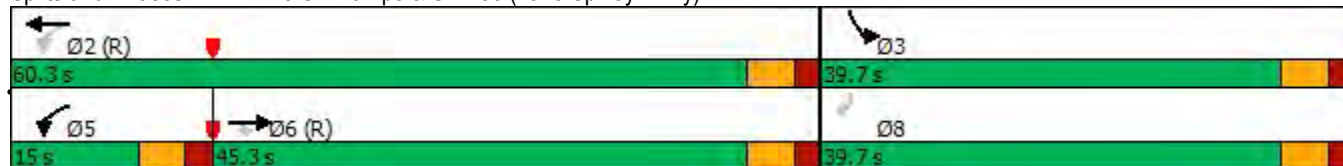
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 11: I-75 SB Ramps & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary
11: I-75 SB Ramps & SR 138 (Lake Spivey Pkwy)

3d. Build 2027 PM - Improved
01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↗	↑↑					↗↗		↗
Traffic Volume (veh/h)	0	1447	331	182	1426	0	0	0	0	922	0	662
Future Volume (veh/h)	0	1447	331	182	1426	0	0	0	0	922	0	662
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1870	1870	1856	0				1870	0	1870
Adj Flow Rate, veh/h	0	1492	0	188	1470	0				951	0	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	3	2	2	3	0				2	0	2
Cap, veh/h	0	1613		223	2065	0				1052	0	
Arrive On Green	0.00	0.46	0.00	0.02	0.19	0.00				0.30	0.00	0.00
Sat Flow, veh/h	0	3618	1585	1781	3618	0				3456	0	1585
Grp Volume(v), veh/h	0	1492	0	188	1470	0				951	0	0
Grp Sat Flow(s),veh/h/ln	0	1763	1585	1781	1763	0				1728	0	1585
Q Serve(g_s), s	0.0	39.8	0.0	5.3	39.0	0.0				26.4	0.0	0.0
Cycle Q Clear(g_c), s	0.0	39.8	0.0	5.3	39.0	0.0				26.4	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1613		223	2065	0				1052	0	
V/C Ratio(X)	0.00	0.93		0.84	0.71	0.00				0.90	0.00	
Avail Cap(c_a), veh/h	0	1613		262	2065	0				1182	0	
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.09	0.00	0.36	0.36	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	25.5	0.0	23.9	32.4	0.0				33.4	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.2	0.0	7.7	0.8	0.0				9.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	15.1	0.0	2.5	18.3	0.0				11.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	26.7	0.0	31.7	33.2	0.0				42.6	0.0	0.0
LnGrp LOS	A	C		C	C	A				D	A	
Approach Vol, veh/h		1492			1658						951	
Approach Delay, s/veh		26.7			33.0						42.6	
Approach LOS		C			C						D	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		64.1			12.8	51.2		35.9				
Change Period (Y+Rc), s		5.5			5.5	5.5		5.5				
Max Green Setting (Gmax), s		54.8			9.5	39.8		34.2				
Max Q Clear Time (g_c+I1), s		41.0			7.3	41.8		28.4				
Green Ext Time (p_c), s		11.3			0.1	0.0		2.0				
Intersection Summary												
HCM 6th Ctrl Delay				33.0								
HCM 6th LOS				C								
Notes												
Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Timings

3d. Build 2027 PM - Improved

12: Speer Rd/Mt. Zion Pkwy & SR 138 (Lake Spivey Pkwy)

01/23/2023

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑	↗	↔↔	↑↑	↗	↔↔	↑↑	↗	↔↔	↑↑	↗
Traffic Volume (vph)	178	865	110	669	988	198	80	201	386	377	358	151
Future Volume (vph)	178	865	110	669	988	198	80	201	386	377	358	151
Lane Group Flow (vph)	185	901	115	697	1029	206	83	209	402	393	373	157
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2			8			4
Detector Phase	1	6	6	5	2	2	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	15.0	46.5	46.5	15.0	47.5	47.5	15.0	46.5	46.5	15.0	45.5	45.5
Total Split (s)	14.0	28.0	28.0	27.0	41.0	41.0	20.5	42.0	42.0	23.0	44.5	44.5
Total Split (%)	11.7%	23.3%	23.3%	22.5%	34.2%	34.2%	17.1%	35.0%	35.0%	19.2%	37.1%	37.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.72	1.37	0.26	0.95	0.92	0.32	0.35	0.21	0.91	0.82	0.28	0.23
Control Delay	70.6	214.4	2.6	71.7	53.2	5.7	56.9	32.9	66.5	64.6	27.3	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.6	214.4	2.6	71.7	53.2	5.7	56.9	32.9	66.5	64.6	27.3	3.7
Queue Length 50th (ft)	73	~485	0	~318	417	0	31	63	290	153	103	0
Queue Length 95th (ft)	#129	#615	12	#439	#566	56	57	94	#458	#220	146	36
Internal Link Dist (ft)		1890			1158			635			523	
Turn Bay Length (ft)	345		290	290		930	195		550	270		270
Base Capacity (vph)	258	657	443	730	1124	648	429	1076	481	500	1337	695
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	1.37	0.26	0.95	0.92	0.32	0.19	0.19	0.84	0.79	0.28	0.23

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Green

Natural Cycle: 145

Control Type: Actuated-Coordinated

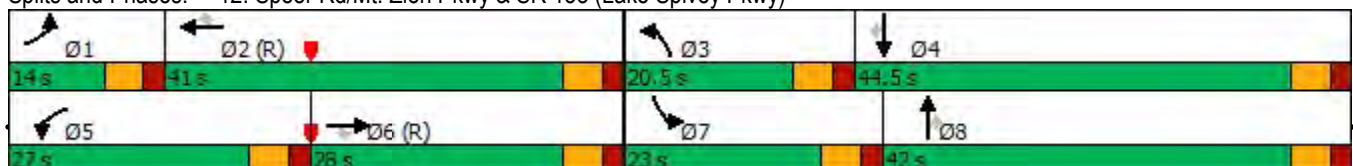
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 12: Speer Rd/Mt. Zion Pkwy & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary

12: Speer Rd/Mt. Zion Pkwy & SR 138 (Lake Spivey Pkwy)

3d. Build 2027 PM - Improved

01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	178	865	110	669	988	198	80	201	386	377	358	151
Future Volume (veh/h)	178	865	110	669	988	198	80	201	386	377	358	151
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1856	1900	1900	1856	1870	1870	1870	1870	1870	1900	1870
Adj Flow Rate, veh/h	185	901	115	697	1029	206	83	209	0	393	373	157
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	3	0	0	3	2	2	2	2	2	0	2
Cap, veh/h	239	1491	681	629	1879	845	135	297		452	634	278
Arrive On Green	0.07	0.42	0.42	0.18	0.53	0.53	0.04	0.08	0.00	0.13	0.18	0.18
Sat Flow, veh/h	3456	3526	1610	3510	3526	1585	3456	3554	1585	3456	3610	1585
Grp Volume(v), veh/h	185	901	115	697	1029	206	83	209	0	393	373	157
Grp Sat Flow(s),veh/h/ln	1728	1763	1610	1755	1763	1585	1728	1777	1585	1728	1805	1585
Q Serve(g_s), s	6.3	23.8	5.3	21.5	23.1	8.4	2.8	6.9	0.0	13.4	11.4	10.9
Cycle Q Clear(g_c), s	6.3	23.8	5.3	21.5	23.1	8.4	2.8	6.9	0.0	13.4	11.4	10.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	239	1491	681	629	1879	845	135	297		452	634	278
V/C Ratio(X)	0.77	0.60	0.17	1.11	0.55	0.24	0.62	0.70		0.87	0.59	0.56
Avail Cap(c_a), veh/h	245	1491	681	629	1879	845	432	1081		504	1173	515
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.80	0.80	0.80	0.35	0.35	0.35	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.9	26.8	21.5	49.3	18.5	15.0	56.8	53.5	0.0	51.1	45.5	45.3
Incr Delay (d2), s/veh	11.4	1.5	0.4	57.4	0.4	0.2	4.5	3.0	0.0	14.0	0.9	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	9.8	2.0	14.1	8.8	0.1	1.3	3.1	0.0	6.5	5.1	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.3	28.3	21.9	106.6	18.9	15.3	61.3	56.6	0.0	65.1	46.4	47.1
LnGrp LOS	E	C	C	F	B	B	E	E		E	D	D
Approach Vol, veh/h	1201			1932			292			923		
Approach Delay, s/veh	33.5			50.2			57.9			54.5		
Approach LOS	C			D			E			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.8	69.4	10.2	26.6	27.0	56.3	21.2	15.5				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	8.5	35.5	15.0	39.0	21.5	22.5	17.5	36.5				
Max Q Clear Time (g_c+I1), s	8.3	25.1	4.8	13.4	23.5	25.8	15.4	8.9				
Green Ext Time (p_c), s	0.0	7.6	0.1	2.7	0.0	0.0	0.3	1.2				

Intersection Summary

HCM 6th Ctrl Delay 47.0

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Timings
13: Spivey Rd & SR 138 (Lake Spivey Pkwy)

3d. Build 2027 PM - Improved
01/23/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↗
Traffic Volume (vph)	896	35	360	922	16	215
Future Volume (vph)	896	35	360	922	16	215
Lane Group Flow (vph)	1007	39	404	1036	18	242
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	8	
Permitted Phases		6	2			8
Detector Phase	6	6	5	2	8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0	6.0
Minimum Split (s)	25.5	25.5	15.0	23.5	31.5	31.5
Total Split (s)	40.4	40.4	28.0	68.4	31.6	31.6
Total Split (%)	40.4%	40.4%	28.0%	68.4%	31.6%	31.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Min	C-Min	None	C-Min	None	None
v/c Ratio	0.54	0.05	0.67	0.37	0.12	0.69
Control Delay	18.9	6.0	14.2	3.3	42.2	16.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.9	6.0	14.2	3.3	42.2	16.1
Queue Length 50th (ft)	204	0	70	61	11	0
Queue Length 95th (ft)	356	20	184	129	30	66
Internal Link Dist (ft)	1639			1890	1094	
Turn Bay Length (ft)		230	535			220
Base Capacity (vph)	1854	856	636	2828	461	592
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.05	0.64	0.37	0.04	0.41

Intersection Summary

Cycle Length: 100

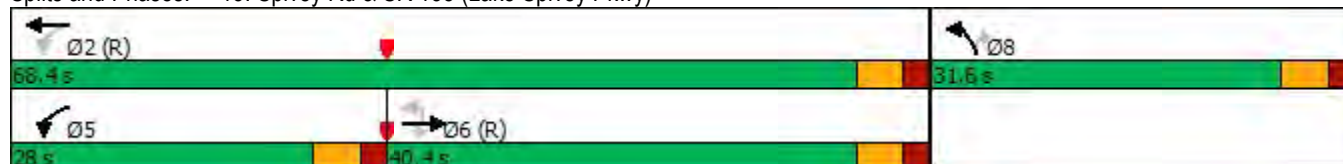
Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTU, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Splits and Phases: 13: Spivey Rd & SR 138 (Lake Spivey Pkwy)



HCM 6th Signalized Intersection Summary 13: Spivey Rd & SR 138 (Lake Spivey Pkwy)

3d. Build 2027 PM - Improved
01/23/2023

							
Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (veh/h)	0	896	35	360	922	16	215
Future Volume (veh/h)	0	896	35	360	922	16	215
Initial Q (Qb), veh		0	0	0	0	0	0
Ped-Bike Adj(A_pbT)			1.00	1.00		1.00	1.00
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No	No	
Adj Sat Flow, veh/h/ln		1856	1870	1870	1856	1870	1870
Adj Flow Rate, veh/h		1007	0	404	1036	18	0
Peak Hour Factor		0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %		3	2	2	3	2	2
Cap, veh/h		2578		564	3054	42	
Arrive On Green		0.73	0.00	0.08	0.87	0.02	0.00
Sat Flow, veh/h		3618	1585	1781	3618	1781	1585
Grp Volume(v), veh/h		1007	0	404	1036	18	0
Grp Sat Flow(s),veh/h/ln		1763	1585	1781	1763	1781	1585
Q Serve(g_s), s		10.7	0.0	4.9	5.6	1.0	0.0
Cycle Q Clear(g_c), s		10.7	0.0	4.9	5.6	1.0	0.0
Prop In Lane			1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h		2578		564	3054	42	
V/C Ratio(X)		0.39		0.72	0.34	0.43	
Avail Cap(c_a), veh/h		2578		822	3054	465	
HCM Platoon Ratio		1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	0.00	0.51	0.51	1.00	0.00
Uniform Delay (d), s/veh		5.1	0.0	4.8	1.3	48.2	0.0
Incr Delay (d2), s/veh		0.4	0.0	0.9	0.2	6.7	0.0
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		2.9	0.0	0.7	0.2	0.5	0.0
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh		5.5	0.0	5.6	1.4	54.9	0.0
LnGrp LOS		A		A	A	D	
Approach Vol, veh/h		1007			1440	18	
Approach Delay, s/veh		5.5			2.6	54.9	
Approach LOS		A			A	D	
Timer - Assigned Phs		2			5	6	8
Phs Duration (G+Y+Rc), s		92.1			13.5	78.6	7.9
Change Period (Y+Rc), s		5.5			5.5	5.5	5.5
Max Green Setting (Gmax), s		62.9			22.5	34.9	26.1
Max Q Clear Time (g_c+I1), s		7.6			6.9	12.7	3.0
Green Ext Time (p_c), s		18.7			1.1	11.8	0.0
Intersection Summary							
HCM 6th Ctrl Delay			4.2				
HCM 6th LOS			A				

Notes

User approved ignoring U-Turning movement.

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Timings
14: Blackhall Rd/Speer Rd & Walt Stephens Rd

3d. Build 2027 PM - Improved

01/23/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	353	65	110	233	333	61	201	111	554	337	15
Future Volume (vph)	30	353	65	110	233	333	61	201	111	554	337	15
Lane Group Flow (vph)	31	368	68	115	243	347	64	209	116	577	351	16
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		6			2		3	8		7	4	
Permitted Phases	6		6	2		2	8		8	4		4
Detector Phase	6	6	6	2	2	2	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0	15.0	5.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	23.5	23.5	23.5	23.5	23.5	23.5	15.0	23.5	23.5	15.0	23.5	23.5
Total Split (s)	39.0	39.0	39.0	39.0	39.0	39.0	15.0	26.0	26.0	35.0	46.0	46.0
Total Split (%)	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	15.0%	26.0%	26.0%	35.0%	46.0%	46.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.08	0.52	0.10	0.42	0.34	0.43	0.22	0.70	0.31	0.88	0.47	0.02
Control Delay	22.6	28.3	0.3	21.4	16.8	3.2	17.2	52.0	5.2	35.4	24.6	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.6	28.3	0.3	21.4	16.8	3.2	17.2	52.0	5.2	35.4	24.6	0.1
Queue Length 50th (ft)	13	180	0	35	73	11	20	127	0	253	166	0
Queue Length 95th (ft)	35	288	0	m69	m122	28	37	195	28	#415	239	0
Internal Link Dist (ft)		2027			3745			1264			1872	
Turn Bay Length (ft)	110		160	190		250	140		125	315		120
Base Capacity (vph)	378	706	691	271	706	816	332	381	441	653	775	709
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.52	0.10	0.42	0.34	0.43	0.19	0.55	0.26	0.88	0.45	0.02

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 98 (98%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 70

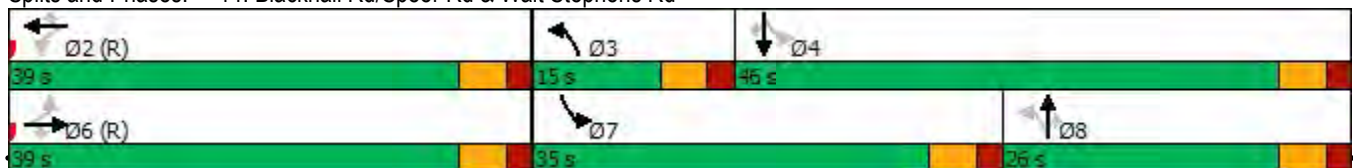
Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: Blackhall Rd/Speer Rd & Walt Stephens Rd



HCM 6th Signalized Intersection Summary

14: Blackhall Rd/Speer Rd & Walt Stephens Rd

3d. Build 2027 PM - Improved

01/23/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	353	65	110	233	333	61	201	111	554	337	15
Future Volume (veh/h)	30	353	65	110	233	333	61	201	111	554	337	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	31	368	68	115	243	347	64	209	0	577	351	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	340	770	653	327	770	653	286	251		616	712	
Arrive On Green	0.41	0.41	0.41	0.41	0.41	0.41	0.04	0.13	0.00	0.29	0.38	0.00
Sat Flow, veh/h	826	1870	1585	953	1870	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	31	368	68	115	243	347	64	209	0	577	351	0
Grp Sat Flow(s),veh/h/ln	826	1870	1585	953	1870	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	2.6	14.4	2.6	10.1	8.8	16.5	3.1	10.9	0.0	26.7	14.3	0.0
Cycle Q Clear(g_c), s	11.4	14.4	2.6	24.5	8.8	16.5	3.1	10.9	0.0	26.7	14.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	340	770	653	327	770	653	286	251		616	712	
V/C Ratio(X)	0.09	0.48	0.10	0.35	0.32	0.53	0.22	0.83		0.94	0.49	
Avail Cap(c_a), veh/h	340	770	653	327	770	653	380	383		627	757	
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	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	23.7	21.5	18.1	30.5	19.9	22.2	35.1	42.2	0.0	24.1	23.6	0.0
Incr Delay (d2), s/veh	0.5	2.1	0.3	3.0	1.1	3.1	0.4	9.0	0.0	21.4	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	6.3	1.0	2.5	3.8	6.2	1.3	5.4	0.0	13.8	6.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.3	23.7	18.4	33.5	21.0	25.2	35.5	51.2	0.0	45.5	24.1	0.0
LnGrp LOS	C	C	B	C	C	C	D	D		D	C	
Approach Vol, veh/h	467			705			273			928		
Approach Delay, s/veh	22.9			25.1			47.5			37.4		
Approach LOS	C			C			D			D		
Timer - Assigned Phs	2			3			4			6		
Phs Duration (G+Y+Rc), s	46.7			9.7			43.6			46.7		
Change Period (Y+Rc), s	5.5			5.5			5.5			5.5		
Max Green Setting (Gmax), s	33.5			9.5			40.5			33.5		
Max Q Clear Time (g_c+I1), s	26.5			5.1			16.3			16.4		
Green Ext Time (p_c), s	3.2			0.0			1.9			4.2		

Intersection Summary

HCM 6th Ctrl Delay	32.1
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings
15: Flippen Rd & Site Drwy 3 (S)

3d. Build 2027 PM - Improved
01/23/2023

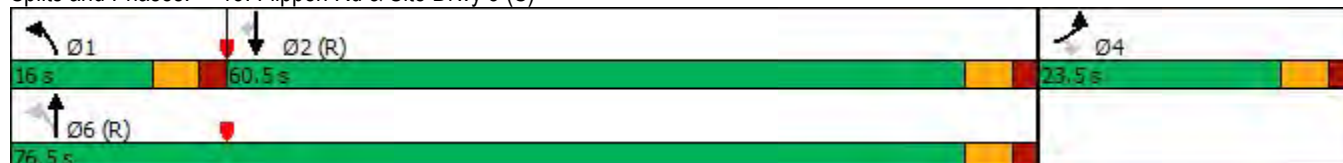


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	117	143	175	578	669	143
Future Volume (vph)	117	143	175	578	669	143
Lane Group Flow (vph)	127	155	190	628	727	155
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		1	6	2	
Permitted Phases		4	6			2
Detector Phase	4	4	1	6	2	2
Switch Phase						
Minimum Initial (s)	6.0	6.0	5.0	15.0	15.0	15.0
Minimum Split (s)	23.5	23.5	15.0	23.5	23.5	23.5
Total Split (s)	23.5	23.5	16.0	76.5	60.5	60.5
Total Split (%)	23.5%	23.5%	16.0%	76.5%	60.5%	60.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Min	C-Min	C-Min
v/c Ratio	0.58	0.47	0.41	0.44	0.64	0.15
Control Delay	51.2	11.1	5.3	4.0	19.1	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.2	11.1	5.3	4.0	19.1	3.6
Queue Length 50th (ft)	78	0	22	78	377	8
Queue Length 95th (ft)	130	54	m42	m130	m495	m25
Internal Link Dist (ft)	680			692	448	
Turn Bay Length (ft)		150	235			175
Base Capacity (vph)	318	412	478	1412	1129	1022
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.38	0.40	0.44	0.64	0.15

Intersection Summary

Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBTL, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 15: Flippen Rd & Site Drwy 3 (S)



HCM 6th Signalized Intersection Summary
15: Flippen Rd & Site Drwy 3 (S)

3d. Build 2027 PM - Improved
01/23/2023

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	117	143	175	578	669	143
Future Volume (veh/h)	117	143	175	578	669	143
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1870
Adj Flow Rate, veh/h	127	155	190	628	727	155
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	3	3	2
Cap, veh/h	214	190	446	1428	1227	1048
Arrive On Green	0.12	0.12	0.05	0.77	0.66	0.66
Sat Flow, veh/h	1781	1585	1781	1856	1856	1585
Grp Volume(v), veh/h	127	155	190	628	727	155
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1856	1856	1585
Q Serve(g_s), s	6.8	9.5	3.2	11.8	21.8	3.7
Cycle Q Clear(g_c), s	6.8	9.5	3.2	11.8	21.8	3.7
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	214	190	446	1428	1227	1048
V/C Ratio(X)	0.59	0.81	0.43	0.44	0.59	0.15
Avail Cap(c_a), veh/h	321	285	538	1428	1227	1048
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	41.7	42.9	8.0	4.0	9.4	6.4
Incr Delay (d2), s/veh	2.6	10.4	0.6	1.0	2.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	4.3	0.9	3.1	7.7	1.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	44.3	53.3	8.6	5.0	11.5	6.7
LnGrp LOS	D	D	A	A	B	A
Approach Vol, veh/h	282			818	882	
Approach Delay, s/veh	49.3			5.8	10.7	
Approach LOS	D			A	B	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	10.9	71.6		17.5		82.5
Change Period (Y+Rc), s	5.5	5.5		5.5		5.5
Max Green Setting (Gmax), s	10.5	55.0		18.0		71.0
Max Q Clear Time (g_c+l1), s	5.2	23.8		11.5		13.8
Green Ext Time (p_c), s	0.2	12.0		0.5		9.8
Intersection Summary						
HCM 6th Ctrl Delay			14.2			
HCM 6th LOS			B			

Traffic Volume Worksheets

22-188 Reeves Creek II Mixed-Use Development (DRI # 3799) - City of Stockbridge
Traffic Volumes

A&R Engineering
 January 2023

1. Flippen @ SR 42 N. Henry

A.M. Peak Hour

Condition	Flippen Road Northbound					Shields Road Southbound					SR 42/SR 138/US 23 (North Henry Boulevard) Eastbound					SR 42/SR 138/US 23 (North Henry Boulevard) Westbound				
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing 2022 Traffic Counts:	0	203	18	126	347	0	18	28	14	60	0	8	653	70	731	0	149	1173	10	1332
Growth Factor (%):	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
No-Build 2027 Volumes:	0	213	19	132	364	0	19	29	15	63	0	8	686	74	768	0	156	1232	11	1399
Total New Trips:	0	168	4	22	194	0	0	2	0	2	0	0	0	87	87	0	11	0	0	11
Future 2027 Traffic Volumes:	0	381	23	154	558	0	19	31	15	65	0	8	686	161	855	0	167	1232	11	1410

P.M. Peak Hour

Condition	Flippen Road Northbound					Shields Road Southbound					SR 42/SR 138/US 23 (North Henry Boulevard) Eastbound					SR 42/SR 138/US 23 (North Henry Boulevard) Westbound				
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing 2022 Traffic Counts:	0	167	31	133	331	0	26	46	11	83	0	20	1249	239	1508	0	169	963	13	1145
Growth Factor (%):	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
No-Build 2027 Volumes:	0	175	33	140	348	0	27	48	12	87	0	21	1311	251	1583	0	177	1011	14	1202
Total New Trips:	0	141	4	19	164	0	0	5	0	5	0	0	0	186	186	0	24	0	0	24
Future 2027 Traffic Volumes:	0	316	37	159	512	0	27	53	12	92	0	21	1311	437	1769	0	201	1011	14	1226

22-188 Reeves Creek II Mixed-Use Development (DRI # 3799) - City of Stockbridge
Traffic Volumes

A&R Engineering
 January 2023

2. Flippen @ Appleton-Drwy 1N
A.M. Peak Hour

Condition	Flippen Road Northbound					Flippen Road Southbound					Site Driveway 1 (Northern) Eastbound					Appleton Boulevard Westbound				
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing 2022 Traffic Counts:	0	0	400	5	405	0	8	302	0	310	0	0	0	0	0	0	9	0	19	28
Growth Factor (%):	1	1	1	1		1	1	1	1		1	1	1	1		1	1	1	1	
No-Build 2027 Volumes:	0	0	420	5	425	0	8	317	0	325	0	0	0	0	0	0	9	0	20	29
Total New Trips:	0	24	143	0	167	0	0	83	19	102	0	56	0	68	124	0	0	0	0	0
Future 2027 Traffic Volumes:	0	24	563	5	592	0	8	400	19	427	0	56	0	68	124	0	9	0	20	29

P.M. Peak Hour

Condition	Flippen Road Northbound					Flippen Road Southbound					Site Driveway 1 (Northern) Eastbound					Appleton Boulevard Westbound				
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing 2022 Traffic Counts:	0	0	490	13	503	0	25	601	0	626	0	0	0	0	0	0	13	0	16	29
Growth Factor (%):	1	1	1	1		1	1	1	1		1	1	1	1		1	1	1	1	
No-Build 2027 Volumes:	0	0	515	14	529	0	26	631	0	657	0	0	0	0	0	0	14	0	17	31
Total New Trips:	0	81	127	0	208	0	0	154	66	220	0	40	0	49	89	0	0	0	0	0
Future 2027 Traffic Volumes:	0	81	642	14	737	0	26	785	66	877	0	40	0	49	89	0	14	0	17	31

22-188 Reeves Creek II Mixed-Use Development (DRI # 3799) - City of Stockbridge
Traffic Volumes

A&R Engineering
 January 2023

3. Flippen @ Creek Parking-Drw2

A.M. Peak Hour

Condition	Flippen Road Northbound					Flippen Road Southbound					Site Driveway 2 (Middle) Eastbound					Reeves Creek Trail Parking Lot Driveway Westbound				
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing 2022 Traffic Counts:	0	0	407	2	409	0	0	311	0	311	0	0	0	0	0	0	0	0	0	0
Growth Factor (%):	1	1	1	1		1	1	1	1		1	1	1	1		1	1	1	1	
No-Build 2027 Volumes:	0	0	427	2	429	0	0	327	0	327	0	0	0	0	0	0	0	0	0	0
Total New Trips:	0	6	163	0	169	0	0	146	5	151	0	4	1	5	10	0	0	1	0	1
Future 2027 Traffic Volumes:	0	6	590	2	598	0	0	473	5	478	0	4	1	5	10	0	0	1	0	1

P.M. Peak Hour

Condition	Flippen Road Northbound					Flippen Road Southbound					Site Driveway 2 (Middle) Eastbound					Reeves Creek Trail Parking Lot Driveway Westbound				
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing 2022 Traffic Counts:	0	0	459	2	461	0	3	579	0	582	0	0	0	0	0	0	0	0	4	4
Growth Factor (%):	1	1	1	1		1	1	1	1		1	1	1	1		1	1	1	1	
No-Build 2027 Volumes:	0	0	482	2	484	0	3	608	0	611	0	0	0	0	0	0	0	0	4	4
Total New Trips:	0	13	198	0	211	0	0	192	11	203	0	10	2	12	24	0	0	2	0	2
Future 2027 Traffic Volumes:	0	13	680	2	695	0	3	800	11	814	0	10	2	12	24	0	0	2	4	6

22-188 Reeves Creek II Mixed-Use Development (DRI # 3799) - City of Stockbridge
Traffic Volumes

A&R Engineering
 January 2023

4. Flippen @ Walt Stephens
A.M. Peak Hour

Condition	Flippen Road Northbound						Flippen Road Southbound						Walt Stephens Road Eastbound						Red Oak Road Westbound					
	U	L	T	R	Tot		U	L	T	R	Tot		U	L	T	R	Tot		U	L	T	R	Tot	
Existing 2022 Traffic Counts:	0	306	267	16	589		0	13	195	110	318		0	112	86	326	524		0	9	94	24	127	
Growth Factor (%):	1	1	1	1			1	1	1	1			1	1	1	1			1	1	1	1		
No-Build 2027 Volumes:	0	321	280	17	618		0	14	205	116	335		0	118	90	342	550		0	9	99	25	133	
Total New Trips:	0	0	48	0	48		0	22	93	128	243		0	66	0	0	66		0	0	0	11	11	
Future 2027 Traffic Volumes:	0	321	328	17	666		0	36	298	244	578		0	184	90	342	616		0	9	99	36	144	

P.M. Peak Hour

Condition	Flippen Road Northbound						Flippen Road Southbound						Walt Stephens Road Eastbound						Red Oak Road Westbound					
	U	L	T	R	Tot		U	L	T	R	Tot		U	L	T	R	Tot		U	L	T	R	Tot	
Existing 2022 Traffic Counts:	0	315	329	18	662		0	23	438	156	617		0	155	176	391	722		0	23	133	24	180	
Growth Factor (%):	1	1	1	1			1	1	1	1			1	1	1	1			1	1	1	1		
No-Build 2027 Volumes:	0	331	345	19	695		0	24	460	164	648		0	163	185	411	759		0	24	140	25	189	
Total New Trips:	0	0	103	0	103		0	19	78	108	205		0	142	0	0	142		0	0	0	24	24	
Future 2027 Traffic Volumes:	0	331	448	19	798		0	43	538	272	853		0	305	185	411	901		0	24	140	49	213	

22-188 Reeves Creek II Mixed-Use Development (DRI # 3799) - City of Stockbridge
Traffic Volumes

A&R Engineering
 January 2023

5. Flippen @ Hudson Bridge
A.M. Peak Hour

Condition	Flippen Road Northbound					Flippen Road Southbound					Hudson Bridge Road Eastbound					Hudson Bridge Road Westbound				
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing 2022 Traffic Counts:	0	3	258	465	726	0	199	287	84	570	0	75	391	0	466	14	166	268	139	587
Growth Factor (%):	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
No-Build 2027 Volumes:	0	3	271	488	762	0	209	301	88	598	0	79	411	0	490	15	174	281	146	616
Total New Trips:	0	0	7	0	7	0	66	13	4	83	0	2	0	0	2	0	0	0	34	34
Future 2027 Traffic Volumes:	0	3	278	488	769	0	275	314	92	681	0	81	411	0	492	15	174	281	180	650

P.M. Peak Hour

Condition	Flippen Road Northbound					Flippen Road Southbound					Hudson Bridge Road Eastbound					Hudson Bridge Road Westbound				
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing 2022 Traffic Counts:	0	3	312	317	632	0	238	396	79	713	0	125	393	9	527	12	562	698	290	1562
Growth Factor (%):	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
No-Build 2027 Volumes:	0	3	328	333	664	0	250	416	83	749	0	131	413	9	553	13	590	733	305	1641
Total New Trips:	0	0	15	0	15	0	56	11	4	71	0	5	0	0	5	0	0	0	73	73
Future 2027 Traffic Volumes:	0	3	343	333	679	0	306	427	87	820	0	136	413	9	558	13	590	733	378	1714

A&R Engineering
January 2023

A.M. Peak Hour

P.M. Peak Hour

Condition	SR 42/SR 138/US 23 (North Henry Boulevard) Northbound					SR 42/US 23 (North Henry Boulevard) Southbound					SR 138 (Lake Spivey Parkway) Eastbound					Walmart Supercenter Driveway Westbound				
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing 2022 Traffic Counts:	0	607	384	93	1084	0	91	520	134	745	0	236	171	816	1223	0	178	180	125	483
Growth Factor (%):	1	1	1	1		1	1	1	1		1	1	1	1		1	1	1	1	
No-Build 2027 Volumes:	0	637	403	98	1138	0	96	546	141	783	0	248	180	857	1285	0	187	189	131	507
Total New Trips:	0	123	11	0	134	0	0	15	0	15	0	0	0	161	161	0	0	0	0	0
Future 2027 Traffic Volumes:	0	760	414	98	1272	0	96	561	141	798	0	248	180	1018	1446	0	187	189	131	507

22-188 Reeves Creek II Mixed-Use Development (DRI # 3799) - City of Stockbridge
Traffic Volumes

A&R Engineering
 January 2023

7. SR 138 @ I-675 NB

A.M. Peak Hour

Condition	I-675 Northbound Off-Ramp					I-675 Northbound On-Ramp					SR 138 (Lake Spivey Parkway)					SR 138 (Lake Spivey Parkway)				
	Northbound					Southbound					Eastbound					Westbound				
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing 2022 Traffic Counts:	0	32	0	68	100	0	0	0	0	0	0	477	846	0	1323	0	0	1240	298	1538
Growth Factor (%):	1	1	1	1		1	1	1	1		1	1	1	1		1	1	1	1	
No-Build 2027 Volumes:	0	34	0	71	105	0	0	0	0	0	0	501	888	0	1389	0	0	1302	313	1615
Total New Trips:	0	0	0	0	0	0	0	0	0	0	0	0	75	0	75	0	0	101	44	145
Future 2027 Traffic Volumes:	0	34	0	71	105	0	0	0	0	0	0	501	963	0	1464	0	0	1403	357	1760

P.M. Peak Hour

Condition	I-675 Northbound Off-Ramp					I-675 Northbound On-Ramp					SR 138 (Lake Spivey Parkway)					SR 138 (Lake Spivey Parkway)				
	Northbound					Southbound					Eastbound					Westbound				
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing 2022 Traffic Counts:	0	46	0	125	171	0	0	0	0	0	0	322	1982	0	2304	0	0	1538	250	1788
Growth Factor (%):	1	1	1	1		1	1	1	1		1	1	1	1		1	1	1	1	
No-Build 2027 Volumes:	0	48	0	131	179	0	0	0	0	0	0	338	2081	0	2419	0	0	1615	263	1878
Total New Trips:	0	0	0	0	0	0	0	0	0	0	0	0	161	0	161	0	0	86	37	123
Future 2027 Traffic Volumes:	0	48	0	131	179	0	0	0	0	0	0	338	2242	0	2580	0	0	1701	300	2001

22-188 Reeves Creek II Mixed-Use Development (DRI # 3799) - City of Stockbridge
Traffic Volumes

A&R Engineering
 January 2023

8. SR 138 @ I-675 SB

A.M. Peak Hour

Condition	I-675 Southbound On-Ramp					I-675 Southbound Off-Ramp					SR 138 (Lake Spivey Parkway)					SR 138 (Lake Spivey Parkway)				
	Northbound					Southbound					Eastbound					Westbound				
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing 2022 Traffic Counts:	0	0	0	0	0	0	140	0	443	583	0	0	1183	51	1234	0	99	1173	0	1272
Growth Factor (%):	1	1	1	1		1	1	1	1		1	1	1	1		1	1	1	1	
No-Build 2027 Volumes:	0	0	0	0	0	0	147	0	465	612	0	0	1242	54	1296	0	104	1232	0	1336
Total New Trips:	0	0	0	0	0	0	23	0	0	23	0	0	52	0	52	0	0	101	0	101
Future 2027 Traffic Volumes:	0	0	0	0	0	0	170	0	465	635	0	0	1294	54	1348	0	104	1333	0	1437

P.M. Peak Hour

Condition	I-675 Southbound On-Ramp					I-675 Southbound Off-Ramp					SR 138 (Lake Spivey Parkway)					SR 138 (Lake Spivey Parkway)				
	Northbound					Southbound					Eastbound					Westbound				
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing 2022 Traffic Counts:	0	0	0	0	0	0	377	0	525	902	0	0	1927	126	2053	0	107	1477	0	1584
Growth Factor (%):	1	1	1	1		1	1	1	1		1	1	1	1		1	1	1	1	
No-Build 2027 Volumes:	0	0	0	0	0	0	396	0	551	947	0	0	2023	132	2155	0	112	1551	0	1663
Total New Trips:	0	0	0	0	0	0	49	0	0	49	0	0	112	0	112	0	0	86	0	86
Future 2027 Traffic Volumes:	0	0	0	0	0	0	445	0	551	996	0	0	2135	132	2267	0	112	1637	0	1749

22-188 Reeves Creek II Mixed-Use Development (DRI # 3799) - City of Stockbridge
Traffic Volumes

A&R Engineering
 January 2023

9. SR 138 @ Mt. Zion Rd
A.M. Peak Hour

Condition	Stockbridge Village Shopping Mall Driveway						Mount Zion Road						SR 138 (Lake Spivey Parkway)						SR 138 (Lake Spivey Parkway)					
	Northbound						Southbound						Eastbound						Westbound					
	U	L	T	R	Tot		U	L	T	R	Tot		U	L	T	R	Tot		U	L	T	R	Tot	
Existing 2022 Traffic Counts:	0	41	32	26	99		0	137	52	142	331		0	110	1010	47	1167		0	30	1331	120	1481	
Growth Factor (%):	1	1	1	1	1		1	1	1	1	1		1	1	1	1	1		1	1	1	1	1	
No-Build 2027 Volumes:	0	43	34	27	104		0	144	55	149	348		0	116	1061	49	1226		0	32	1398	126	1556	
Total New Trips:	0	0	0	0	0		0	7	0	0	7		0	0	46	0	46		0	0	88	13	101	
Future 2027 Traffic Volumes:	0	43	34	27	104		0	151	55	149	355		0	116	1107	49	1272		0	32	1486	139	1657	

P.M. Peak Hour

Condition	Stockbridge Village Shopping Mall Driveway						Mount Zion Road						SR 138 (Lake Spivey Parkway)						SR 138 (Lake Spivey Parkway)					
	Northbound						Southbound						Eastbound						Westbound					
	U	L	T	R	Tot		U	L	T	R	Tot		U	L	T	R	Tot		U	L	T	R	Tot	
Existing 2022 Traffic Counts:	0	129	126	102	357		0	170	95	187	452		0	152	1541	80	1773		0	71	1233	161	1465	
Growth Factor (%):	1	1	1	1	1		1	1	1	1	1		1	1	1	1	1		1	1	1	1	1	
No-Build 2027 Volumes:	0	135	132	107	374		0	179	100	196	475		0	160	1618	84	1862		0	75	1295	169	1539	
Total New Trips:	0	0	0	0	0		0	15	0	0	15		0	0	98	0	98		0	0	74	11	85	
Future 2027 Traffic Volumes:	0	135	132	107	374		0	194	100	196	490		0	160	1716	84	1960		0	75	1369	180	1624	

22-188 Reeves Creek II Mixed-Use Development (DRI # 3799) - City of Stockbridge
Traffic Volumes

A&R Engineering
 January 2023

10. SR 138 @ I-75 NB

A.M. Peak Hour

Condition	I-75 Northbound Off-Ramp					I-75 Northbound On-Ramp					SR 138 (Lake Spivey Parkway)					SR 138 (Lake Spivey Parkway)				
	Northbound					Southbound					Eastbound					Westbound				
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing 2022 Traffic Counts:	0	243	0	122	365	0	0	0	0	0	7	425	1045	0	1477	0	0	877	637	1514
Growth Factor (%):	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
No-Build 2027 Volumes:	0	292	0	146	438	0	0	0	0	0	8	510	1254	0	1772	0	0	1052	764	1816
Total New Trips:	0	0	0	0	0	0	0	0	0	0	0	66	46	0	112	0	0	0	88	88
Future 2027 Traffic Volumes:	0	292	0	146	438	0	0	0	0	0	8	576	1300	0	1884	0	0	1052	852	1904

P.M. Peak Hour

Condition	I-75 Northbound Off-Ramp					I-75 Northbound On-Ramp					SR 138 (Lake Spivey Parkway)					SR 138 (Lake Spivey Parkway)				
	Northbound					Southbound					Eastbound					Westbound				
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing 2022 Traffic Counts:	0	176	0	132	308	0	0	0	0	0	11	217	1644	0	1872	0	0	1141	432	1573
Growth Factor (%):	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
No-Build 2027 Volumes:	0	211	0	158	369	0	0	0	0	0	13	260	1973	0	2246	0	0	1369	518	1887
Total New Trips:	0	0	0	0	0	0	0	0	0	0	0	56	98	0	154	0	0	0	74	74
Future 2027 Traffic Volumes:	0	211	0	158	369	0	0	0	0	0	13	316	2071	0	2400	0	0	1369	592	1961

22-188 Reeves Creek II Mixed-Use Development (DRI # 3799) - City of Stockbridge
Traffic Volumes

A&R Engineering
 January 2023

11. SR 138 @ I-75 SB

A.M. Peak Hour

Condition	I-75 Southbound On-Ramp					I-75 Southbound Off-Ramp					SR 138 (Lake Spivey Parkway)					SR 138 (Lake Spivey Parkway)				
	Northbound					Southbound					Eastbound					Westbound				
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing 2022 Traffic Counts:	0	0	0	0	0	0	299	0	235	534	0	0	1168	204	1372	3	81	1032	0	1116
Growth Factor (%):	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
No-Build 2027 Volumes:	0	0	0	0	0	0	359	0	282	641	0	0	1402	245	1647	4	97	1238	0	1339
Total New Trips:	0	0	0	0	0	0	46	0	34	80	0	0	66	0	66	0	0	0	0	0
Future 2027 Traffic Volumes:	0	0	0	0	0	0	405	0	316	721	0	0	1468	245	1713	4	97	1238	0	1339

P.M. Peak Hour

Condition	I-75 Southbound On-Ramp					I-75 Southbound Off-Ramp					SR 138 (Lake Spivey Parkway)					SR 138 (Lake Spivey Parkway)				
	Northbound					Southbound					Eastbound					Westbound				
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing 2022 Traffic Counts:	0	0	0	0	0	0	687	0	491	1178	0	0	1159	276	1435	15	137	1188	0	1340
Growth Factor (%):	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
No-Build 2027 Volumes:	0	0	0	0	0	0	824	0	589	1413	0	0	1391	331	1722	18	164	1426	0	1608
Total New Trips:	0	0	0	0	0	0	98	0	73	171	0	0	56	0	56	0	0	0	0	0
Future 2027 Traffic Volumes:	0	0	0	0	0	0	922	0	662	1584	0	0	1447	331	1778	18	164	1426	0	1608

22-188 Reeves Creek II Mixed-Use Development (DRI # 3799) - City of Stockbridge
Traffic Volumes

A&R Engineering
 January 2023

12. SR 138 @ Speer-Mt. Zion

A.M. Peak Hour

Condition	Speer Road						Mount Zion Parkway						SR 138 (Lake Spivey Parkway)						SR 138 (Lake Spivey Parkway)					
	Northbound						Southbound						Eastbound						Westbound					
	U	L	T	R	Tot		U	L	T	R	Tot		U	L	T	R	Tot		U	L	T	R	Tot	
Existing 2022 Traffic Counts:	0	76	193	480	749		0	167	75	55	297		6	62	605	35	708		37	275	672	194	1178	
Growth Factor (%):	4	4	4	4	4		4	4	4	4	4		4	4	4	4	4		4	4	4	4	4	
No-Build 2027 Volumes:	0	91	232	576	899		0	200	90	66	356		7	74	726	42	849		44	330	806	233	1413	
Total New Trips:	0	18	18	66	102		0	0	9	0	9		0	0	0	9	9		0	34	0	0	34	
Future 2027 Traffic Volumes:	0	109	250	642	1001		0	200	99	66	365		7	74	726	51	858		44	364	806	233	1447	

P.M. Peak Hour

Condition	Speer Road						Mount Zion Parkway						SR 138 (Lake Spivey Parkway)						SR 138 (Lake Spivey Parkway)					
	Northbound						Southbound						Eastbound						Westbound					
	U	L	T	R	Tot		U	L	T	R	Tot		U	L	T	R	Tot		U	L	T	R	Tot	
Existing 2022 Traffic Counts:	0	54	155	275	484		0	314	282	126	722		15	133	721	75	944		48	448	823	165	1484	
Growth Factor (%):	4	4	4	4	4		4	4	4	4	4		4	4	4	4	4		4	4	4	4	4	
No-Build 2027 Volumes:	0	65	186	330	581		0	377	338	151	866		18	160	865	90	1133		58	538	988	198	1782	
Total New Trips:	0	15	15	56	86		0	0	20	0	20		0	0	0	20	20		0	73	0	0	73	
Future 2027 Traffic Volumes:	0	80	201	386	667		0	377	358	151	886		18	160	865	110	1153		58	611	988	198	1855	

22-188 Reeves Creek II Mixed-Use Development (DRI # 3799) - City of Stockbridge
Traffic Volumes

A&R Engineering
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13. SR 138 @ Spivey Rd

A.M. Peak Hour

Condition	Spivey Road					Nearby Mixed-Use Development Driveway					SR 138 (Lake Spivey Parkway)					SR 138 (Lake Spivey Parkway)					
	Northbound		Southbound			Northbound		Southbound			Eastbound		Westbound			Eastbound		Westbound			
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	
Existing 2022 Traffic Counts:	0	32	0	199	231	0	0	0	0	0	0	0	0	586	21	607	0	94	759	0	853
Growth Factor (%):	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
No-Build 2027 Volumes:	0	38	0	239	277	0	0	0	0	0	0	0	0	703	25	728	0	113	911	0	1024
Total New Trips:	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	9	0	0	18	0	18
Future 2027 Traffic Volumes:	0	38	0	239	277	0	0	0	0	0	0	0	0	712	25	737	0	113	929	0	1042

P.M. Peak Hour

Condition	Spivey Road				Tot	Nearby Mixed-Use Development Driveway				Tot	SR 138 (Lake Spivey Parkway)				Tot
	U	L	T	R		U	L	T	R		U	L	T	R	
Existing 2022 Traffic Counts:	0	13	0	179	192	0	0	0	0	0	0	0	730	29	759
Growth Factor (%):	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
No-Build 2027 Volumes:	0	16	0	215	231	0	0	0	0	0	0	0	876	35	911
Total New Trips:	0	0	0	0	0	0	0	0	0	0	0	0	20	0	20
Future 2027 Traffic Volumes:	0	16	0	215	231	0	0	0	0	0	0	0	896	35	931

Condition	Spivey Road				Tot	Nearby Mixed-Use Development Driveway				Tot	SR 138 (Lake Spivey Parkway)				Tot
	U	L	T	R		U	L	T	R		U	L	T	R	
Existing 2022 Traffic Counts:	0	13	0	179	192	0	0	0	0	0	0	0	730	29	759
Growth Factor (%):	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
No-Build 2027 Volumes:	0	16	0	215	231	0	0	0	0	0	0	0	876	35	911
Total New Trips:	0	0	0	0	0	0	0	0	0	0	0	0	20	0	20
Future 2027 Traffic Volumes:	0	16	0	215	231	0	0	0	0	0	0	0	896	35	931

22-188 Reeves Creek II Mixed-Use Development (DRI # 3799) - City of Stockbridge
Traffic Volumes

A&R Engineering
 January 2023

14. Walt Stephens @ Blackhall

A.M. Peak Hour

Condition	Blackhall Road Northbound					Speer Road Southbound					Walt Stephens Road Eastbound					Walt Stephens Road Westbound				
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing 2022 Traffic Counts:	0	40	387	55	482	0	136	101	10	247	0	14	160	45	219	0	106	222	387	715
Growth Factor (%):	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
No-Build 2027 Volumes:	0	42	406	58	506	0	143	106	11	260	0	15	168	47	230	0	111	233	406	750
Total New Trips:	0	0	0	5	5	0	52	0	0	52	0	0	7	0	7	0	9	13	101	123
Future 2027 Traffic Volumes:	0	42	406	63	511	0	195	106	11	312	0	15	175	47	237	0	120	246	507	873

P.M. Peak Hour

Condition	Blackhall Road Northbound					Speer Road Southbound					Walt Stephens Road Eastbound					Walt Stephens Road Westbound				
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing 2022 Traffic Counts:	0	58	191	96	345	0	421	321	14	756	0	29	322	62	413	0	98	211	235	544
Growth Factor (%):	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
No-Build 2027 Volumes:	0	61	201	101	363	0	442	337	15	794	0	30	338	65	433	0	103	222	247	572
Total New Trips:	0	0	0	10	10	0	112	0	0	112	0	0	15	0	15	0	7	11	86	104
Future 2027 Traffic Volumes:	0	61	201	111	373	0	554	337	15	906	0	30	353	65	448	0	110	233	333	676

A&R Engineering
January 2023

A.M. Peak Hour

Condition	Flippin Road Northbound				Flippin Road Southbound				Site Driveway 3 (Southern)				-				
	U	L	T	Tot	U	L	T	Tot	U	L	T	Tot	U	L	T	Tot	
Existing 2022 Traffic Counts:	0	0	461	0	461	0	0	579	0	579	0	0	0	0	0	0	0
Growth Factor (%):	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
No-Build 2027 Volumes:	0	0	484	0	484	0	0	608	0	608	0	0	0	0	0	0	0
Total New Trips:	0	175	94	0	269	0	0	61	143	204	0	117	0	143	260	0	0
Future 2027 Traffic Volumes:	0	175	578	0	753	0	0	669	143	812	0	117	0	143	260	0	0