

**DEVELOPMENT OF REGIONAL IMPACT
(DRI #2788)
TRAFFIC STUDY
FOR
FOLIA CROSSROADS MIXED-USE DEVELOPMENT
FAYETTEVILLE, GEORGIA**



Prepared for:

**BCM Construction Group LLC
296 South Main Street, Suite 400
Alpharetta, GA 30009**

Prepared By:



A&R Engineering Inc.

2160 Kingston Court, Suite O
Marietta, GA 30067
Tel: (770) 690-9255 Fax: (770) 690-9210
www.areng.com

April 17, 2018
A & R Project # 18-025

EXECUTIVE SUMMARY

Traffic impacts were evaluated for the added traffic from the proposed Folia Crossroads mixed-use development located north of SR 54 (W. Lanier Avenue) between S. Sandy Creek Road and Old Mill Court in Fayetteville, Georgia. The development will consist of:

- 50,000 square feet of office space
- 40 multifamily units
- 260 single-family detached housing units
- 120,000 square feet of retail/restaurant space
- 100-room hotel

The development proposes one full-access driveway on S. Sandy Creek Road and two right-in/right-out driveways on SR 54 (W. Lanier Avenue). Existing and future operations after completion of the project were analyzed at the intersections of:

- SR 54 (W. Lanier Avenue) at Ebenezer Road/Brittany Way
- SR 54 (W. Lanier Avenue) at Tyrone Road
- SR 54 (W. Lanier Avenue) at Veterans Parkway/Lester Road
- SR 54 (W. Lanier Avenue) at Togwatee Village Parkway/Piedmont Fayette Driveway
- SR 54 (W. Lanier Avenue) at S. Sandy Creek Road/Old Norton Road
- SR 54 (W. Lanier Avenue) at Ginger Cake Road/Burch Road
- SR 54 (W. Lanier Avenue) at Brandywine Boulevard/Oak Street
- SR 54 (W. Lanier Avenue) at Grady Avenue/Sharon Drive
- Ginger Cake Road at Hood Avenue
- S. Sandy Creek Road at Piedmont Fayette Driveway
- Veterans Parkway at S. Sandy Creek Road
- Veterans Parkway at Sandy Creek Road

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 the analysis are listed below:

System Recommendations and Improvements

A summary of the system improvements, which address deficiencies that are found within the existing road network for the “No-Build” conditions, is provided below. These are recommended for the local municipality to use in planning future transportation projects.

Summary of Recommended System Improvements

- SR 54 (W. Lanier Avenue) @ Veterans Parkway/Lester Road
 - Create a second westbound left turn lane using the existing striping on SR 54 (W. Lanier Avenue) and install protected left turn signal phasing.
 - Update the signal timing at the intersection.

- SR 54 (W. Lanier Avenue) @ Ebenezer Road/Brittany Way
 - Install permissive + overlap right turn signal phasing for the northbound right turn movement from Ebenezer Road to SR 54 (W. Lanier Avenue).
 - Update the signal timing at the intersection.
- SR 54 (W. Lanier Avenue) @ Ginger Cake Road/Burch Road
 - Create a dedicated southbound right turn lane on Ginger Cake Road.
- SR 54 (W. Lanier Avenue) @ Grady Avenue/Sharon Drive
 - Install permissive + overlap right turn signal phasing for the eastbound right turn movement from SR 54 (W. Lanier Avenue) to Grady Avenue.
 - Restripe the northbound approach (Grady Avenue) to operate with a dedicated left turn lane, shared through/left turn lane, and install a dedicated right turn lane.
 - Install split-phased signal timing on the northbound and southbound approaches.
 - Update the signal timing at the intersection.
- Ginger Cake Road @ Hood Avenue/Hood Road
 - Remove the all-way stop-controlled condition and replace with a mini-roundabout.

Site Access Configuration

The following access configuration was utilized when modeling the proposed site driveway intersections:

- Site Driveway #1: Full-access driveway on S. Sandy Creek Road
 - This driveway is recommended to consist of one entering and two exiting lanes. The westbound (driveway) approach is recommended to have a dedicated left turn lane and a dedicated right turn lane for exiting traffic.
 - The intersection is proposed to be unsignalized with a STOP sign on the westbound approach.
 - Entering left turn movements are assumed to be made from the southbound through lane. No left turn lane is warranted. (See Appendix)
 - It is recommended a northbound right turn lane be installed for entering traffic on S. Sandy Creek Road.
- Site Driveways #2 & #3: Right-in/right-out driveways on SR 54 (W. Lanier Avenue)
 - Each of these driveways are proposed to consist of one entering and one exiting lane. The southbound (driveway) approach is proposed to have only one right turn lane for exiting traffic.
 - Each intersection is proposed to be unsignalized with a STOP sign on the southbound approach.
 - Dedicated westbound right turn lanes are required at each driveway on SR 54 (W. Lanier Avenue) per GDOT standards (250' storage and 100' taper).

Site Mitigation Improvements

Improvements that are identified as mitigation improvements address deficiencies that are caused by site traffic and can be identified as related to the proposed development. A summary of the system improvements is provided below.

Summary of Recommended Site Mitigation Improvements

- SR 54 (W. Lanier Avenue) @ S. Sandy Creek Road/Old Norton Road
 - Reconfigure the southbound (S. Sandy Creek Road) approach to operate with a dedicated left turn lane and a shared through/right turn lane.
 - Install protected + permissive left turn signal phasing for the southbound left turn movement from S. Sandy Creek Road to SR 54 (W. Lanier Avenue).

SR 54 (W. Lanier Avenue) @ Site Driveways #2 and #3

After construction of the proposed development, the proposed right-in/right-out driveways will operate at a level-of-service “E” during the PM peak hour. With fewer than 135 vehicles per hour and less than 1.6 vehicle-hours of total delay from the driveway approaches, the intersections are considered as having “acceptable operations” (peak hour delays of less than 4.0 vehicle-hours) per NCHRP 457. Therefore, no changes have been recommended.

TABLE OF CONTENTS

Item	Page
Executive Summary	
System Recommendations and Improvements	
Site Access Configuration	
Site Mitigation Improvements	
Introduction.....	1
Study Network Determination	3
Existing Roadway Facilities	3
SR 54 (W. Lanier Avenue).....	3
Ebenezer Road	4
Brittany Way	4
Tyrone Road	4
Veterans Parkway	4
Sandy Creek Road	4
Lester Road	4
Togwatee Village Parkway	4
S. Sandy Creek Road.....	4
Old Norton Road	4
Ginger Cake Road.....	5
Burch Road	5
Hood Avenue.....	5
Brandywine Boulevard.....	5
Oak Street	5
Sharon Drive.....	5
Grady Avenue.....	5
Existing Bicycle and Pedestrian Facilities	5
Nearby local or regional trails.....	5
Bicycle paths or sidewalks.....	5
Existing Transit Facilities	6
Study Methodology	8
Unsignalized Intersections	8
Signalized Intersections	8
Existing Traffic Analysis.....	10
Existing Traffic Operations	10
Project Description	14
Site Plan.....	14
Planned Bicycle and Pedestrian Facilities	14
Planned Transit Facilities	14
Consistency with Adopted Comprehensive Plan	14
Project Phasing.....	14
Trip Generation.....	15

Trip Distribution	15
Future Traffic Analysis	18
Future “No-Build” Conditions	18
Annual Traffic Growth.....	18
Planned and Programmed Improvements in Study Area	18
Future “No-Build” Traffic Operations	20
Recommendations for System Improvements	21
Future “Build” Conditions	22
Site Access Configuration.....	22
Future “Build” Traffic Operations	24
Recommendations for Site Mitigation Improvements	25
Conclusions and Recommendations	27
System Recommendations and Improvements	27
Site Access Configuration.....	28
Site Mitigation Improvements	28
Appendix	

LIST OF TABLES

Item	Page
Table 1 – Level-of-service Criteria for Unsignalized Intersections.....	8
Table 2 – Level-of-service Criteria for Signalized Intersections	9
Table 3 – Existing Intersection Operations	10
Table 4 – Trip Generation	15
Table 5 – Planned and Programmed Improvements	18
Table 6 – Future “No-Build” Intersection Operations.....	20
Table 7 – Future “Build” Intersection Operations	24

LIST OF FIGURES

Item	Page
Figure 1 – Location Map and Study Intersections.....	7
Figure 2 – Existing Weekday Peak Hour Volumes.....	12
Figure 3 – Existing Traffic Control and Lane Geometry	13
Figure 4 – Site Plan.....	16
Figure 5 – Outer Leg Trip Distribution and Site-Generated Peak Hour Volumes	17
Figure 6 – Future (No-Build) Peak Hour Volumes	19
Figure 7 – Future (Build) Peak Hour Volumes	23
Figure 8 – Future Traffic Control and Lane Geometry	26

INTRODUCTION

The purpose of this study is to determine the traffic impacts that will result from the proposed Folia Crossroads mixed-use development located north of SR 54 (W. Lanier Avenue) between S. Sandy Creek Road and Old Mill Court in Fayetteville, Georgia. The traffic analysis evaluates the current operations compared to the future conditions with the traffic generated by the development. The proposed development will consist of:

- 50,000 square feet of office space
- 40 multifamily units
- 260 single-family detached housing units
- 120,000 square feet of retail/restaurant space
- 100-room hotel



The development proposes one full-access driveway on S. Sandy Creek Road and two right-in/right-out driveways on SR 54 (W. Lanier Avenue).

The AM and PM peak hours have been analyzed in this study. In addition to the site access points, this study includes the evaluation of traffic operations at the intersections of:

- SR 54 (W. Lanier Avenue) at Ebenezer Road/Brittany Way
- SR 54 (W. Lanier Avenue) at Tyrone Road

- SR 54 (W. Lanier Avenue) at Veterans Parkway/Lester Road
- SR 54 (W. Lanier Avenue) at Togwatee Village Parkway/Piedmont Fayette Driveway
- SR 54 (W. Lanier Avenue) at S. Sandy Creek Road/Old Norton Road
- SR 54 (W. Lanier Avenue) at Ginger Cake Road/Burch Road
- SR 54 (W. Lanier Avenue) at Brandywine Boulevard/Oak Street
- SR 54 (W. Lanier Avenue) at Grady Avenue/Sharon Drive
- Ginger Cake Road at Hood Avenue
- S. Sandy Creek Road at Piedmont Fayette Driveway
- Veterans Parkway at S. Sandy Creek Road
- Veterans Parkway at Sandy Creek Road

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 GRTA, ARC, GDOT, and the City of Fayetteville:

1. SR 54 (W. Lanier Avenue) at Ebenezer Road/Brittany Way
2. SR 54 (W. Lanier Avenue) at Tyrone Road
3. SR 54 (W. Lanier Avenue) at Veterans Parkway/Lester Road
4. SR 54 (W. Lanier Avenue) at Togwatee Village Parkway/Piedmont Fayette Driveway
5. SR 54 (W. Lanier Avenue) at S. Sandy Creek Road/Old Norton Road
6. SR 54 (W. Lanier Avenue) at Ginger Cake Road/Burch Road
7. SR 54 (W. Lanier Avenue) at Brandywine Boulevard/Oak Street
8. SR 54 (W. Lanier Avenue) at Grady Avenue/Sharon Drive
9. Ginger Cake Road at Hood Avenue
10. S. Sandy Creek Road at Piedmont Fayette Driveway
11. Veterans Parkway at S. Sandy Creek Road
12. Veterans Parkway at Sandy Creek 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.

Existing Roadway Facilities

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

SR 54 (W. Lanier Avenue)

SR 54 (W. Lanier Avenue) is an east-west, four-lane, median-divided roadway with a posted speed limit of 55 mph. GDOT traffic counts (Station IDs 1130186, 1130188, 1130191 & 1130193) indicate that the daily traffic volume on SR 54 (W. Lanier Avenue) in 2016 was 26,300 vehicles per day west of Ebenezer Road, 31,600 vehicles per day west of Veterans Parkway, 33,600 vehicles per day east of Ginger Cake Road, and 30,600 vehicles per day east of Grady Avenue. GDOT classifies SR 54 (W. Lanier Avenue) as a Principal Arterial roadway.

Ebenezer Road

Ebenezer Road is a north-south, two-lane roadway with a posted speed limit of 45 mph. GDOT traffic counts (Station ID 1130172) indicate that the daily traffic volume on Ebenezer Road in 2016 was 4,420 vehicles per day south of SR 54 (W. Lanier Avenue). GDOT classifies Ebenezer Road as a Minor Arterial roadway.

Brittany Way

Brittany Way is a north-south, two-lane residential roadway with a posted speed limit of 25 mph.

Tyrone Road

Tyrone Road is a north-south, two-lane, undivided roadway with a posted speed limit of 40 mph. GDOT traffic counts (Station ID 1130178) indicate that the daily traffic volume on Tyrone Road in 2016 was 8,750 vehicles per day north of Flat Creek Trail. GDOT classifies Tyrone Road as a Minor Arterial roadway.

Veterans Parkway

Veterans Parkway is a north-south, four-lane, median-divided roadway between SR 54 (W. Lanier Avenue) and S. Sandy Creek Road and a two-lane, undivided roadway between S. Sandy Creek Road and Sandy Creek Road with a posted speed limit of 45 mph.

Sandy Creek Road

Sandy Creek Road is an east-west, two-lane, undivided roadway with a posted speed limit of 45 mph. GDOT traffic counts (Station ID 1130211) indicate that the daily traffic volume on Sandy Creek Road in 2016 was 5,120 vehicles per day east of Eastin Road. GDOT classifies Sandy Creek Road as a Minor Arterial roadway.

Lester Road

Lester Road is a north-south, four-lane, median-divided roadway with a posted speed limit of 45 mph.

Togwatee Village Parkway

Togwatee Village Parkway is a north-south, four-lane, median-divided roadway with a posted speed limit of 25 mph.

S. Sandy Creek Road

S. Sandy Creek Road is a north-south, two-lane, undivided roadway with a posted speed limit of 45 mph. GDOT traffic counts (Station ID 1130208) indicate that the daily traffic volume on S. Sandy Creek Road in 2016 was 3,540 vehicles per day north of Piedmont Fayette Hospital. GDOT classifies S. Sandy Creek Road as a Minor Arterial roadway.

Old Norton Road

Old Norton Road is a north-south, two-lane, undivided roadway with a posted speed limit of 25 mph.

Ginger Cake Road

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

Burch Road

Burch Road is a north-south, two-lane, undivided roadway with a posted speed limit of 25 mph.

Hood Avenue

Hood Avenue is an east-west, two-lane, undivided roadway with a posted speed limit of 35 mph. GDOT traffic counts (Station ID 1130346) indicate that the daily traffic volume on Hood Avenue in 2016 was 2,640 vehicles per day east of Ginger Cake Road. GDOT classifies Hood Avenue as a Major Collector roadway.

Brandywine Boulevard

Brandywine Boulevard is a north-south, two-lane, undivided roadway with a posted speed limit of 25 mph.

Oak Street

Oak Street is a north-south, two-lane residential roadway with a posted speed limit of 25 mph.

Sharon Drive

Sharon Drive is a north-south, two-lane residential roadway with a posted speed limit of 25 mph.

Grady Avenue

Grady Avenue is a north-south, three-lane, undivided roadway south of SR 54 (W. Lanier Avenue) with a posted speed limit of 35 mph. GDOT traffic counts (Station ID 1137205) indicate that the daily traffic volume on Grady Avenue in 2016 was 9,930 vehicles per day south of SR 54 (W. Lanier Avenue). GDOT classifies Grady Avenue as a Local roadway.

Existing Bicycle and Pedestrian Facilities

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

Nearby local or regional trails

There is no trail located near the study area.

Bicycle paths or sidewalks

Sidewalks and pedestrian facilities are present along the following roadways in the study network:

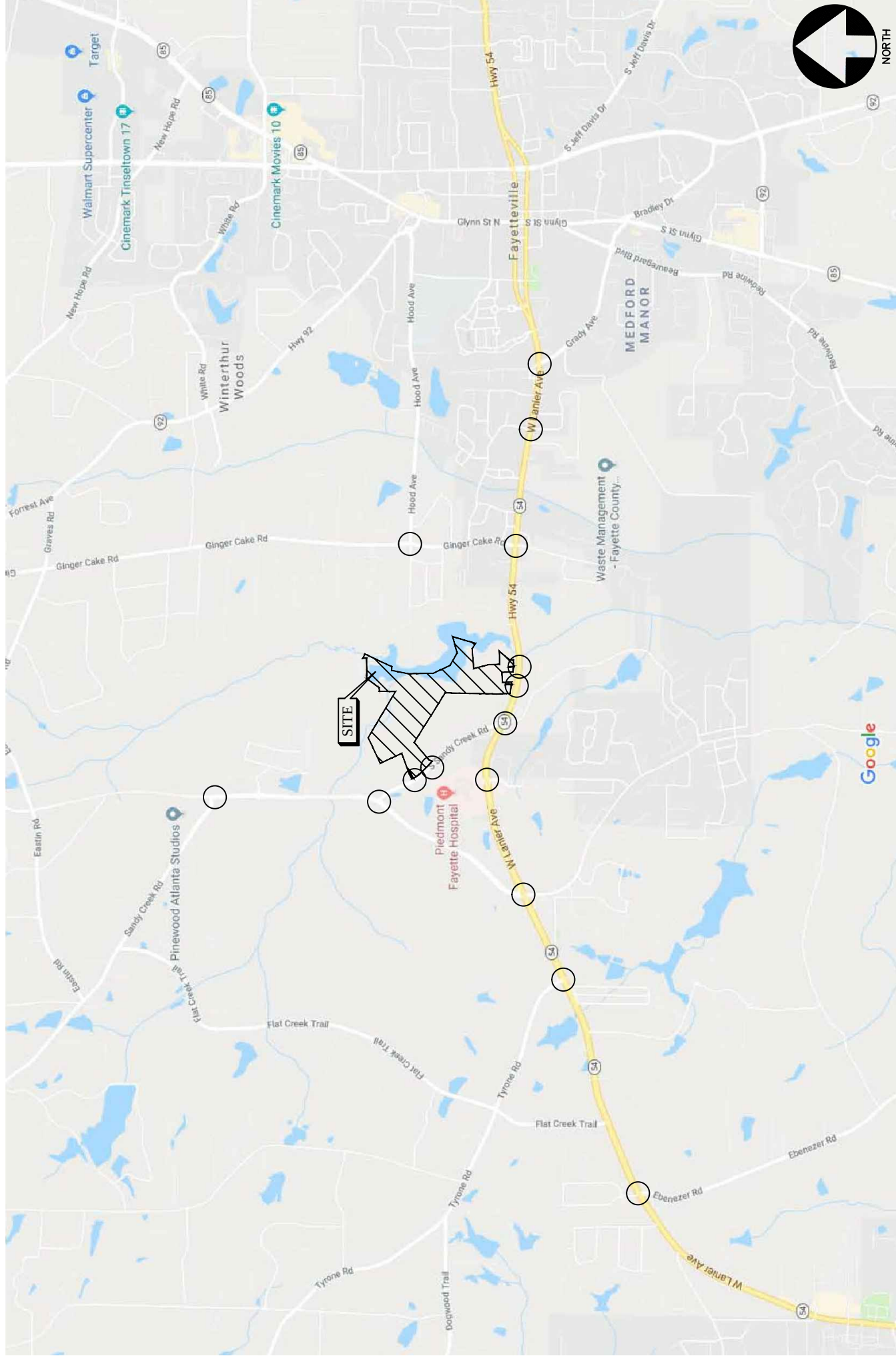
- Veterans Parkway: west side of the road between Hood Road and Sandy Creek Road.
- Togwatee Village Parkway: east side of the road south of SR 54 (W. Lanier Avenue).
- Ginger Cake Road: east side of the road from SR 54 (W. Lanier Avenue) to Devant Street.

- SR 54 (W. Lanier Avenue): south side of the road between Burch Road and Tiger Trail; and some parts of the northern side of the road.
- Brandywine Boulevard: both sides of the road north of SR 54 (W. Lanier Avenue).
- Grady Avenue: both sides of the road south of SR 54 (W. Lanier Avenue).

No bike paths are present in the study network.

Existing Transit Facilities

There is no public transit service near the site.



LOCATION MAP AND STUDY INTERSECTIONS

FIGURE 1

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, 2010 edition (HCM 2010). At specific intersections in which HCM 2010 is unable to report results or where U-Turns are present, HCM 2000 will be used instead. 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 at which the side street or minor street is controlled by a stop sign, the criteria for evaluating traffic operations are the level-of-service (LOS) for the turning movements at the intersection and the level-of-service for the overall intersection. Level-of-service is based on the average controlled delay incurred at the intersection. Controlled delay for unsignalized intersections includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. Several factors affect the controlled 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 safely, resulting in extremely long total delays and long queues. The level-of-service criteria for two-way stop-controlled and all-way stop-controlled (unsignalized) intersections are given in Table 1.

TABLE 1 — LEVEL-OF-SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS	
Level-of-service	Average Delay (sec)
A	≤ 10
B	> 10 and ≤ 15
C	> 15 and ≤ 25
D	> 25 and ≤ 35
E	> 35 and ≤ 50
F	> 50

Source: 2000 and 2010 Highway Capacity Manual

Signalized Intersections

For signalized intersections, it is necessary to evaluate both capacity and level-of-service in order to evaluate the overall operation of the intersection. The capacity analysis of an intersection is performed by comparing the volume of traffic using the various lane groups at the intersection to the capacity of those lane groups. This results in a volume/capacity (v/c) ratio for each lane group. A v/c ratio greater than 1.0 indicates that the volume of traffic has exceeded the capacity available, resulting in a temporary excess of demand. Although the capacity of the entire intersection is not defined, a composite v/c ratio for the sum of the critical lane groups within the intersection is computed. This composite v/c ratio is an indication of the overall intersection sufficiency.

Level-of-service for a signalized intersection is defined in terms of average controlled delay per vehicle, which is composed of initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The level-of-service criteria for signalized intersections, based on average controlled delay, are shown in Table 2. Level-of-service “A” indicates operations with very low controlled delay, while level-of-service “F” describes operations with extremely high average controlled delay. Level-of-service “E” is typically considered to be the limit of acceptable delay, and level-of-service “F” is considered unacceptable by most drivers.

TABLE 2 — LEVEL-OF-SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS	
Level-of-service	Average Control Delay (sec)
A	≤ 10
B	$> 10 \text{ and } \leq 20$
C	$> 20 \text{ and } \leq 35$
D	$> 35 \text{ and } \leq 55$
E	$> 55 \text{ and } \leq 80$
F	> 80

Source: 2000 and 2010 Highway Capacity Manual

EXISTING TRAFFIC ANALYSIS

Existing traffic counts were obtained at the following study intersections:

- SR 54 (W. Lanier Avenue) at Ebenezer Road/Brittany Way
- SR 54 (W. Lanier Avenue) at Tyrone Road
- SR 54 (W. Lanier Avenue) at Veterans Parkway/Lester Road
- SR 54 (W. Lanier Avenue) at Togwatee Village Parkway/Piedmont Fayette Driveway
- SR 54 (W. Lanier Avenue) at S. Sandy Creek Road/Old Norton Road
- SR 54 (W. Lanier Avenue) at Ginger Cake Road/Burch Road
- SR 54 (W. Lanier Avenue) at Brandywine Boulevard/Oak Street
- SR 54 (W. Lanier Avenue) at Grady Avenue/Sharon Drive
- Ginger Cake Road at Hood Avenue
- S. Sandy Creek Road at Piedmont Fayette Driveway
- Veterans Parkway at S. Sandy Creek Road
- Veterans Parkway at Sandy Creek Road

Turning movement counts were collected on Tuesday, Wednesday and Thursday March 6-8, 2018. All turning movement counts were recorded during the AM and PM peak hours between 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m., respectively. The four consecutive 15-minute interval volumes that summed to produce 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 Figure 2.

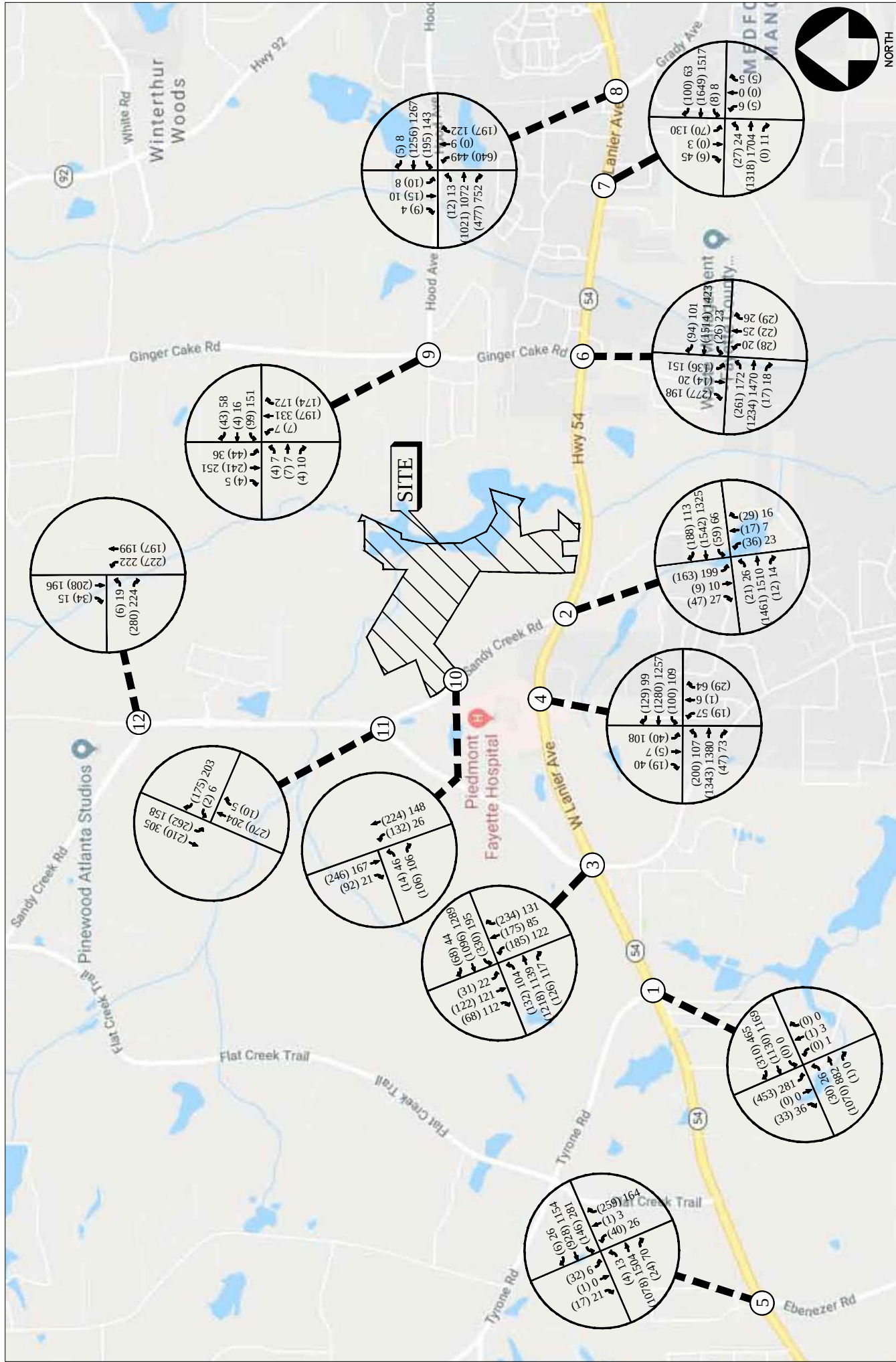
Existing Traffic Operations

Existing traffic operations were analyzed at the study intersections using existing signal timing and in accordance with the HCM methodology, and the results are shown below in Table 3. The existing traffic control and lane geometry for the intersections is shown in Figure 3.

TABLE 3 — EXISTING INTERSECTION OPERATIONS					
Intersection		Traffic Control	AM Peak	PM Peak	LOS Standard
1	<u>SR 54 @ Tyrone Rd</u>	Signalized	<u>C (26.8)</u>	<u>B (16.0)</u>	<u>D / D</u>
	-Eastbound Approach		C (23.6)	B (11.7)	-
	-Westbound Approach		C (21.7)	B (13.1)	-
	-Northbound Approach		C (28.4)	C (32.8)	-
	-Southbound Approach		D (53.6)	D (45.4)	-
2	<u>SR 54 @ S. Sandy Creek Rd/Old Norton Rd</u>	Signalized	<u>B (17.8)</u>	<u>B (19.7)</u>	<u>D / D</u>
	-Eastbound Approach		B (15.5)	B (18.8)	-
	-Westbound Approach		B (14.8)	B (15.6)	-
	-Northbound Approach		D (45.0)	D (41.8)	-
	-Southbound Approach		D (50.5)	D (50.6)	-
3	<u>SR 54 @ Veterans Pkwy/Lester Rd</u>	Signalized	<u>E (75.1)</u>	<u>C (28.3)</u>	<u>E / D</u>
	-Eastbound Approach		E (56.6)	C (22.5)	-
	-Westbound Approach		F (81.6)	C (24.6)	-
	-Northbound Approach		F (104.3)	E (64.2)	-
	-Southbound Approach		E (77.5)	E (60.6)	-
Table continued on next page...					

4	<u>SR 54 @ Togwatee Village Pkwy</u> -Eastbound Approach -Westbound Approach -Northbound Approach -Southbound Approach	Signalized	<u>B (12.1)</u> B (11.1) B (11.0) D (46.5) D (48.1)	<u>B (14.0)</u> B (12.3) B (11.2) D (47.3) D (50.0)	<u>D / D</u> - - - -
5	<u>SR 54 @ Ebenezer Rd/Brittany Way</u> -Eastbound Approach -Westbound Approach -Northbound Approach -Southbound Approach	Signalized	<u>C (20.2)</u> B (19.9) B (10.5) D (51.8) D (41.6)	<u>D (36.1)</u> D (46.4) B (19.9) E (63.6) D (49.9)	<u>D / D</u> - - - -
6	<u>SR 54 @ Ginger Cake Rd/Burch Rd</u> -Eastbound Approach -Westbound Approach -Northbound Approach -Southbound Approach	Signalized	<u>D (44.9)</u> D (38.4) D (40.1) D (54.4) E (78.4)	<u>C (21.7)</u> B (17.6) B (17.7) D (45.0) D (50.5)	<u>D / D</u> - - - -
7	<u>SR 54 @ Brandywine Blvd/Oak St</u> -Eastbound Approach -Westbound Approach -Northbound Approach -Southbound Approach	Signalized	<u>B (10.8)</u> A (7.4) B (11.5) D (44.4) D (46.7)	<u>B (13.7)</u> B (12.0) B (11.9) D (41.9) D (49.0)	<u>D / D</u> - - - -
8	<u>SR 54 @ Grady Ave/Sharon Dr</u> -Eastbound Approach -Westbound Approach -Northbound Approach -Southbound Approach	Signalized	<u>E (75.9)</u> D (36..2) C (22.3) F (291.5) C (28.4)	<u>D (47.7)</u> E (60.5) B (17.6) F (88.5) C (28.0)	<u>E / D</u> - - - -
9	<u>Ginger Cake Rd @ Hood Ave</u> -Eastbound Approach -Westbound Approach -Northbound Approach -Southbound Approach	All-Way Stop Controlled	A (9.9) B (12.8) C (15.5) B (14.6)	B (11.1) C (17.9) E (38.1) C (17.9)	D / D D / D D / E D / D
10	<u>S. Sandy Creek Rd @ Piedmont Drwy</u> -Eastbound Approach -Northbound Left	Stop- Controlled on EB Approach	B (13.8) A (8.4)	B (12.9) A (7.9)	D / D D / D
11	<u>Veterans Pkwy @ S. Sandy Creek Rd</u> -Westbound Approach -Southbound Left	Stop- Controlled on WB Approach	B (13.7) A (9.2)	B (11.9) A (8.2)	D / D D / D
12	<u>Veterans Pkwy @ Sandy Creek Rd</u> -Eastbound Approach -Northbound Left	Stop- Controlled on EB Approach	B (14.1) A (8.6)	B (12.7) A (8.3)	D / D D / D

The results of existing traffic operations analysis indicate that the intersections of SR 54 (W. Lanier Avenue) at Veterans Parkway/Lester Road and SR 54 (W. Lanier Avenue) at Grady Avenue/Sharon Drive are operating below an acceptable level-of-service ("D" or better) during the AM peak hour. These areas are addressed in the "Future Traffic Operations" section.



EXISTING WEEKDAY PEAK HOUR VOLUMES

FIGURE 2

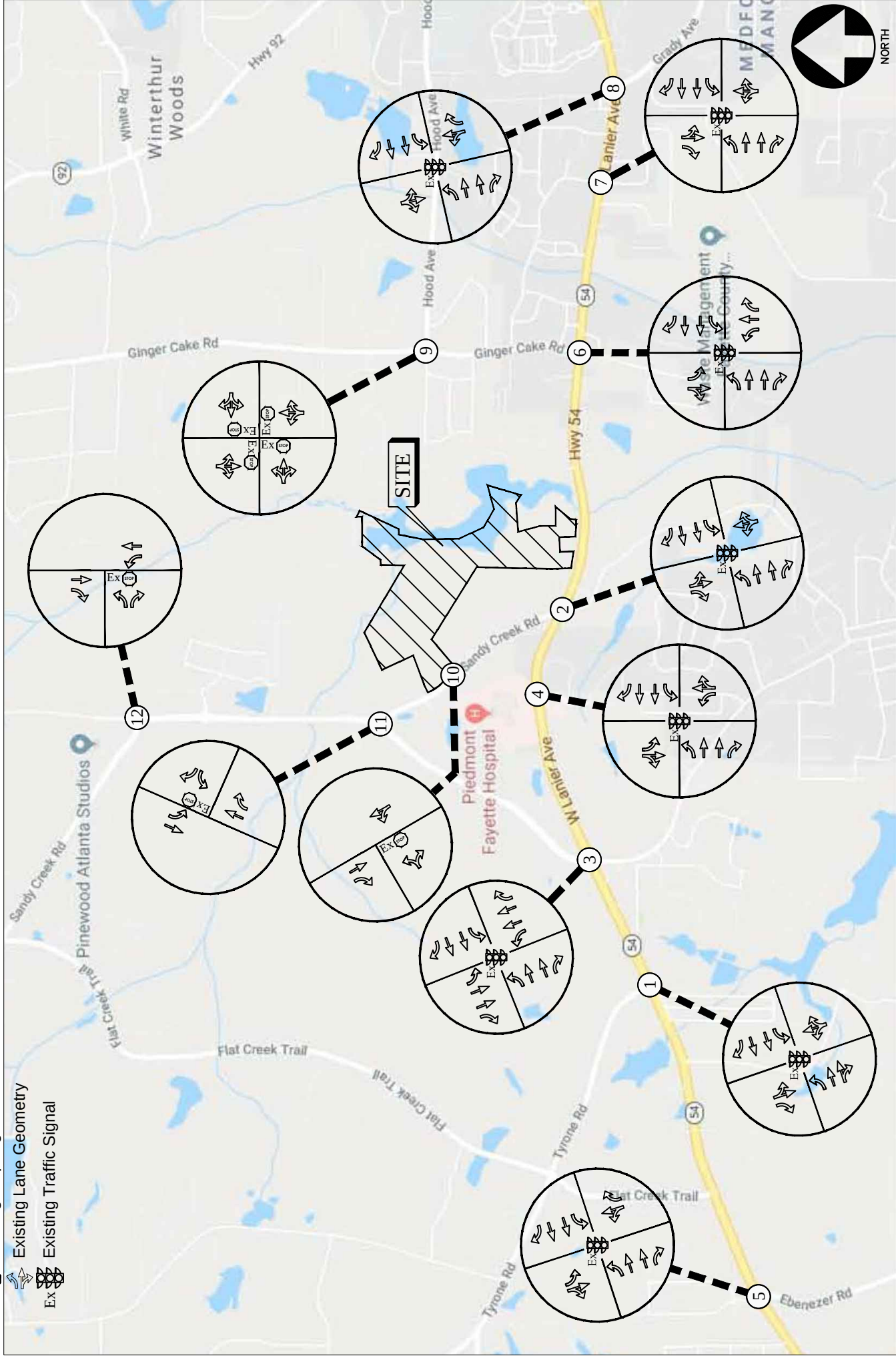
A&R Engineering Inc.

LEGEND

Ex (m) Existing Stop Sign

Existing Lane Geometry

Ex Existing Traffic Signal



EXISTING TRAFFIC CONTROL AND LANE GEOMETRY

FIGURE 3

PROJECT DESCRIPTION

The proposed Folia Crossroads mixed-use development will be located north of SR 54 (W. Lanier Avenue) between S. Sandy Creek Road and Old Mill Court in Fayetteville, Georgia. The development will consist of:

- 50,000 square feet of office space
- 40 multifamily units
- 260 single-family detached housing units
- 120,000 square feet of retail/restaurant space
- 100-room hotel

The development proposes one full-access driveway on S. Sandy Creek Road and two right-in/right-out driveways on SR 54 (W. Lanier Avenue).

Site Plan

A site plan is shown in Figure 4. A larger size drawing and a digital copy of the site plan are also provided with this report.

Planned Bicycle and Pedestrian Facilities

The on and/or off-site provisions for non-motorized travel included in the planned construction of the proposed development are as follows:

- The proposed development will be comprised of residential, retail, and office uses. Pedestrian connections are proposed between the mixed-uses on the site.
- The development plan includes several design elements that enhance the character and quality of the site by incorporating bicycle and pedestrian facilities between the mix of land uses.
- The convenience and flexibility of the site benefit from public access to adjacent streets and internal connectivity between some of the parcels.

Planned Transit Facilities

There is no public transit service near the site.

Consistency with Adopted Comprehensive Plan

The following is an explanation as to how the proposed DRI relates to the local government's Comprehensive Plan, in particular the transportation and capital improvements element, and any transportation improvements listed in the Short-Term Work Program(s) within the vicinity of the DRI. The proposed development is identified as a "Neighborhood Mixed-Use" land use in the City of Fayetteville Future Land Use Map.

Project Phasing

A phasing schedule shall be provided for any proposed DRIs involving multiple phases. The phasing schedule shall include the types and amounts of land uses to be developed and should be identified by phase, the site location of each land use by phase, the amenities to be developed with each phase, and

all transportation elements. The transportation elements shall focus upon infrastructure in place, access to the development, and internal mobility during each phase analyzed. This project has been evaluated for the complete build-out of the development in 2022.

Trip Generation

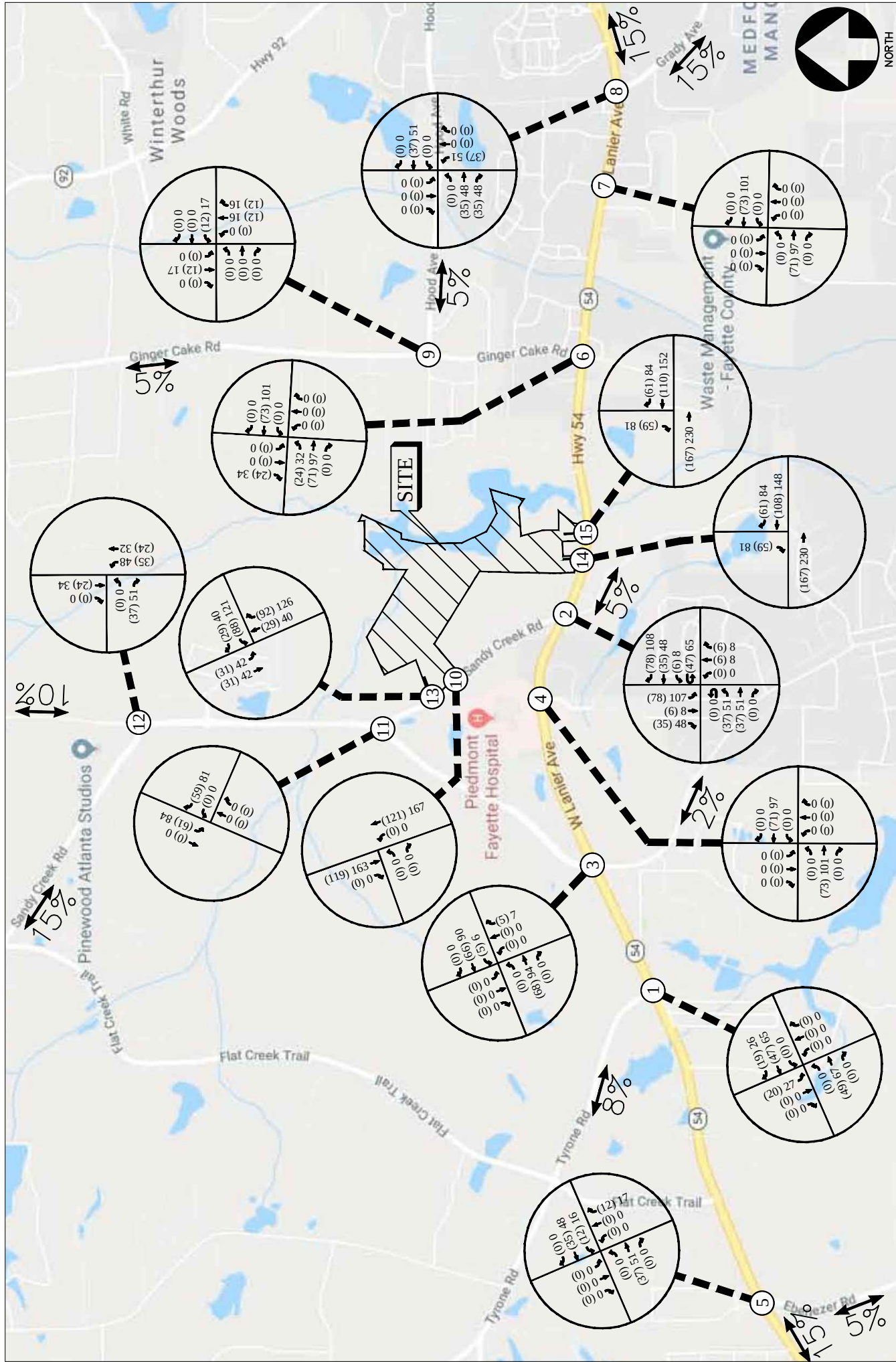
Trip generation estimates were calculated according to the rates and equations published in the 10th edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual. The trip generation for the development was based on the following ITE Land Uses: 210 – *Single-Family Detached Housing*, 231 – *Mid-rise Residential with 1st-Floor Commercial*, 310 – *Hotel*, 710 – *General Office Building* and 820 – *Shopping Center*. Mixed-use reductions and pass-by reductions have also been applied per ITE standards where applicable. The calculated trip generation for the 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
ITE 210 – Single-Family Detached Housing	260 Units	47	142	189	160	94	254	2,504
ITE 231 – Mid-rise Residential with 1st-Floor Commercial	40 Units	3	9	12	10	4	14	138
ITE 310 – Hotel	100 Rooms	26	19	45	25	24	49	702
ITE 710 – General Office Building	50,000 sf	63	10	73	9	50	59	542
ITE 820 – Shopping Center	120,000 sf	131	81	212	299	323	622	6,806
Total Site Trips (without reductions)		270	261	531	503	495	998	10,692
<i>Internal Capture for Single-Family</i>		-7	-9	-16	-30	-20	-50	-513
<i>Internal Capture for Mid-Rise Residential</i>		0	0	0	-2	-1	-3	-28
<i>Internal Capture for Hotel</i>		-3	-3	-6	-8	-6	-14	-144
<i>Internal Capture for Office</i>		-2	-2	-4	-3	-7	-10	-106
<i>Internal Capture for Shopping Center</i>		-14	-12	-26	-33	-42	-75	-781
Total Internal (Mixed-Use) Trip Reductions		-26	-26	-52	-76	-76	-152	-1,572
<i>Pass-by for Shopping Center (0%) 34%</i>		0	0	0	-90	-96	-186	-1,860
Total New External Trips (with reductions)		244	235	479	337	323	660	7,260

*Daily pass-by reduction estimated to be least of the applied PM peak hour pass-by rate or ten times the PM pass-by volume

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 Figure 5.



OUTER LEG TRIP DISTRIBUTION AND SITE-GENERATED PEAK HOUR VOLUMES

FIGURE 5

FUTURE TRAFFIC ANALYSIS

The future traffic operations are analyzed for the “No-Build” and “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. 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.

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.

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 (Figure 2) plus increases for annual growth of through traffic.

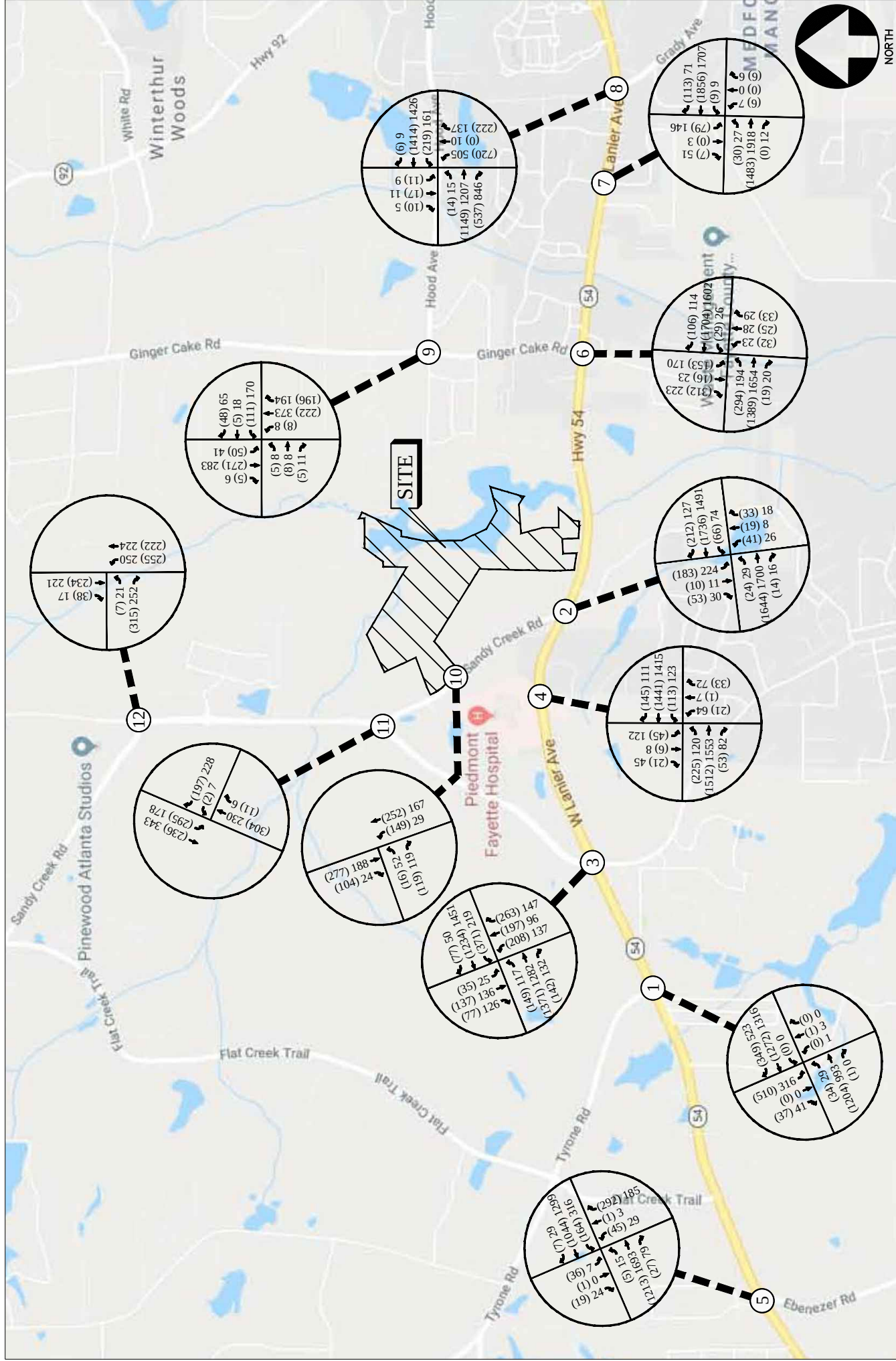
Annual Traffic Growth

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. After reviewing the historical trends, it was found that there was a consistent growth of 3% be used in the surrounding area. This growth factor was applied to the existing traffic volumes between collector and arterial roadways in order to estimate the future year traffic volumes prior to the addition of site-generated traffic. The resulting Future “No-Build” volumes on the roadway are shown in Figure 6.

Planned and Programmed Improvements in Study Area

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

TABLE 5 — PLANNED AND PROGRAMMED IMPROVEMENTS				
ARC#/GDOT#/ Local#	Project	Type of Improvement	Network Year	Source
M004955	SR 54 Pavement Resurfacing from Coweta County Line to McDonough Rd	Maintenance	2018	GDOT
0006903	W. Fayetteville Bypass	New Construction	Long Range	GDOT
0012878/ Fayetteville #5	W. Fayetteville Path from SR 54 to Lester Road	Enhancement/Bike/ Pedestrian Paths	2019	GDOT



FUTURE (NO-BUILD) PEAK HOUR VOLUMES

FIGURE 6

Future “No-Build” Traffic Operations

The future “No-Build” traffic operations were analyzed using the volumes in Figure 6 and the results are shown in Table 6 below. The results of the analyses, including the recommended system improvements, are discussed in detail in the next section.

TABLE 6 — FUTURE “NO-BUILD” INTERSECTION OPERATIONS						
Intersection		No-Build Condition: LOS (Delay)				
		NO IMPROVEMENTS		WITH SYSTEM IMPROVEMENTS		LOS Stnd
		AM Peak	PM Peak	AM Peak	PM Peak	
1	SR 54 @ Tyrone Rd	<u>C (33.8)</u>	<u>B (19.3)</u>	<u>C (33.8)</u>	<u>B (19.3)</u>	<u>D / D</u>
	-Eastbound Approach	C (31.5)	B (14.6)	C (31.5)	B (14.6)	-
	-Westbound Approach	C (28.0)	B (16.9)	C (28.0)	B (16.9)	-
	-Northbound Approach	C (27.1)	C (31.6)	C (27.1)	C (31.6)	-
	-Southbound Approach	E (60.9)	D (46.5)	E (60.9)	D (46.5)	-
2	SR 54 @ S. Sandy Creek Rd	<u>C (22.2)</u>	<u>C (24.9)</u>	<u>C (22.2)</u>	<u>C (24.9)</u>	<u>D / D</u>
	-Eastbound Approach	C (20.2)	C (25.5)	C (20.2)	C (25.5)	-
	-Westbound Approach	B (19.7)	C (20.1)	B (19.7)	C (20.1)	-
	-Northbound Approach	D (44.4)	D (41.0)	D (44.4)	D (41.0)	-
	-Southbound Approach	D (50.9)	D (50.8)	D (50.9)	D (50.8)	-
3	SR 54 @ Veterans Pkwy/Lester Rd	<u>F (110.2)</u>	<u>D (39.1)</u>	<u>E (71.1)</u>	<u>C (30.4)</u>	<u>E / D</u>
	-Eastbound Approach	F (86.0)	C (33.1)	E (66.2)	C (26.6)	-
	-Westbound Approach	F (130.0)	D (36.8)	D (54.9)	C (27.2)	-
	-Northbound Approach	F (127.4)	E (70.7)	F (148.5)	E (60.2)	-
	-Southbound Approach	E (78.0)	E (65.6)	E (55.4)	D (50.1)	-
4	SR 54 @ Togwatee Village Pkwy	<u>B (14.6)</u>	<u>B (16.9)</u>	<u>B (14.6)</u>	<u>B (16.9)</u>	<u>D / D</u>
	-Eastbound Approach	B (13.9)	B (15.5)	B (13.9)	B (15.5)	-
	-Westbound Approach	B (13.3)	B (14.1)	B (13.3)	B (14.1)	-
	-Northbound Approach	D (46.9)	D (47.1)	D (46.9)	D (47.1)	-
	-Southbound Approach	D (48.6)	D (50.2)	D (48.6)	D (50.2)	-
5	SR 54 @ Ebenezer Rd/Brittany Way	<u>C (24.3)</u>	<u>E (72.5)</u>	<u>C (22.5)</u>	<u>D (50.9)</u>	<u>D / D</u>
	-Eastbound Approach	C (25.6)	F (117.9)	C (23.0)	E (57.0)	-
	-Westbound Approach	B (14.0)	C (24.6)	B (13.4)	D (45.9)	-
	-Northbound Approach	D (52.1)	E (68.1)	D (47.9)	D (41.7)	-
	-Southbound Approach	D (41.2)	D (52.7)	D (46.7)	D (49.0)	-
6	SR 54 @ Ginger Cake Rd/Burch Rd	<u>E (65.8)</u>	<u>C (27.3)</u>	<u>D (40.1)</u>	<u>C (21.7)</u>	<u>D / D</u>
	-Eastbound Approach	E (60.5)	C (24.6)	D (40.4)	C (20.2)	-
	-Westbound Approach	D (54.0)	C (23.1)	D (37.8)	B (18.9)	-
	-Northbound Approach	E (72.7)	D (45.2)	D (46.2)	D (41.8)	-
	-Southbound Approach	F (118.6)	D (52.0)	E (55.7)	D (50.4)	-
7	SR 54 @ Brandywine Blvd/Oak St	<u>B (13.1)</u>	<u>B (17.2)</u>	<u>B (13.1)</u>	<u>B (17.2)</u>	<u>D / D</u>
	-Eastbound Approach	A (8.5)	B (16.1)	A (8.5)	B (16.1)	-
	-Westbound Approach	B (14.7)	B (15.1)	B (14.7)	B (15.1)	-
	-Northbound Approach	D (44.7)	D (41.5)	D (44.7)	D (41.5)	-
	-Southbound Approach	D (47.3)	D (49.2)	D (47.3)	D (49.2)	-
8	SR 54 @ Grady Ave/Sharon Dr	<u>F (101.1)</u>	<u>E (69.4)</u>	<u>E (58.1)*</u>	<u>C (28.9)*</u>	<u>E / D</u>
	-Eastbound Approach	D (53.8)	F (91.4)	E (55.6)	C (22.2)	-
	-Westbound Approach	C (29.2)	C (20.5)	D (43.3)	C (22.2)	-
	-Northbound Approach	F (376.6)	F (131.2)	F (86.5)	E (63.2)	-
	-Southbound Approach	C (28.5)	C (28.1)	E (56.8)	E (58.3)	-

9	<u>Ginger Cake Rd @ Hood Ave</u>					
	-Eastbound Approach	B (10.7)	B (12.3)	A (6.7)	A (6.9)	D / D
	-Westbound Approach	B (14.8)	C (23.3)	A (7.9)	B (12.5)	D / D
	-Northbound Approach	C (20.8)	F (86.6)	A (9.0)	B (12.5)	D / E
	-Southbound Approach	C (18.5)	C (24.6)	A (9.6)	B (10.4)	D / D
10	<u>S. Sandy Creek Rd @ Piedmont Drwy</u>					
	-Eastbound Approach	C (15.9)	B (14.2)	C (15.9)	B (14.2)	D / D
	-Northbound Left	A (8.6)	A (8.0)	A (8.6)	A (8.0)	D / D
11	<u>Veterans Pkwy @ S. Sandy Creek Rd</u>					
	-Westbound Approach	C (15.3)	B (12.9)	C (15.3)	B (12.9)	D / D
	-Southbound Left	A (9.7)	A (8.4)	A (9.7)	A (8.4)	D / D
12	<u>Veterans Pkwy @ Sandy Creek Rd</u>					
	-Eastbound Approach	C (16.3)	B (14.1)	C (16.3)	B (14.1)	D / D
	-Northbound Left	A (8.9)	A (8.4)	A (8.9)	A (8.4)	D / D

*Results reported via HCM 2000

Recommendations for System Improvements

A summary of the system improvements, which address deficiencies that are found within the existing road network for the “No-Build” conditions, is provided below. These are recommended for the local municipality to use in planning future transportation projects. A concept design of these improvements is included in the Appendix.

Summary of Recommended System Improvements

- **SR 54 (W. Lanier Avenue) @ Veterans Parkway/Lester Road**
 - Create a second westbound left turn lane using the existing striping on SR 54 (W. Lanier Avenue) and install protected left turn signal phasing.
 - Update the signal timing at the intersection.
- **SR 54 (W. Lanier Avenue) @ Ebenezer Road/Brittany Way**
 - Install permissive + overlap right turn signal phasing for the northbound right turn movement from Ebenezer Road to SR 54 (W. Lanier Avenue).
 - Update the signal timing at the intersection.
- **SR 54 (W. Lanier Avenue) @ Ginger Cake Road/Burch Road**
 - Create a dedicated southbound right turn lane on Ginger Cake Road.
- **SR 54 (W. Lanier Avenue) @ Grady Avenue/Sharon Drive**
 - Install permissive + overlap right turn signal phasing for the eastbound right turn movement from SR 54 (W. Lanier Avenue) to Grady Avenue.
 - Restripe the northbound approach (Grady Avenue) to operate with a dedicated left turn lane, shared through/left turn lane, and install a dedicated right turn lane.
 - Install split-phased signal timing on the northbound and southbound approaches.
 - Update the signal timing at the intersection.
- **Ginger Cake Road @ Hood Avenue/Hood Road**
 - Remove the all-way stop-controlled condition and replace with a mini-roundabout.

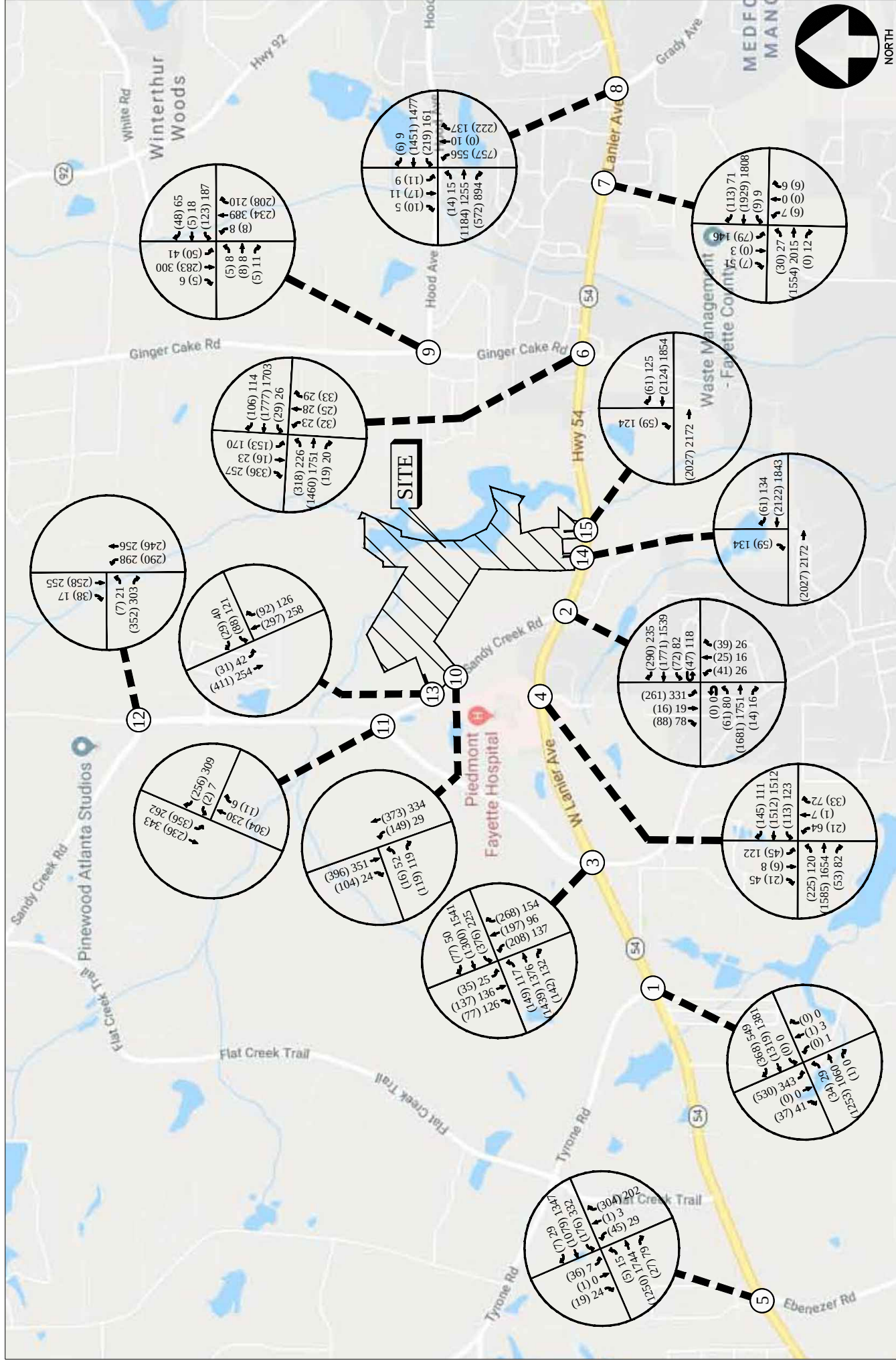
Future “Build” Conditions

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

Site Access Configuration

The following access configuration was utilized when modeling the proposed site driveway intersections:

- Site Driveway #1: Full-access driveway on S. Sandy Creek Road
 - This driveway is recommended to consist of one entering and two exiting lanes. The westbound (driveway) approach is recommended to have a dedicated left turn lane and a dedicated right turn lane for exiting traffic.
 - The intersection is proposed to be unsignalized with a STOP sign on the westbound approach.
 - Entering left turn movements are assumed to be made from the southbound through lane. No left turn lane is warranted. (See Appendix)
 - It is recommended a northbound right turn lane be installed for entering traffic on S. Sandy Creek Road.
- Site Driveways #2 & #3: Right-in/right-out driveways on SR 54 (W. Lanier Avenue)
 - Each of these driveways are proposed to consist of one entering and one exiting lane. The southbound (driveway) approach is proposed to have only one right turn lane for exiting traffic.
 - Each intersection is proposed to be unsignalized with a STOP sign on the southbound approach.
 - Dedicated westbound right turn lanes are required at each driveway on SR 54 (W. Lanier Avenue) per GDOT standards (250’ storage and 100’ taper).



FUTURE (BUILD) PEAK HOUR VOLUMES

FIGURE 7

Future “Build” Traffic Operations

The “Build” conditions are evaluated to determine effectiveness of the recommended system and site mitigation improvements. The results of the “Build” operations analysis with the assumed site access configuration is shown below in Table 7. Recommendations on traffic control and lane geometry are shown graphically in Figure 8. The results of the analysis, including the recommended improvements, are discussed in detail in the next section.

TABLE 7 — FUTURE “BUILD” INTERSECTION OPERATIONS						
Intersection		Build Condition: LOS (Delay)				LOS Std
		NO IMPROVEMENTS		WITH SYSTEM & SITE IMPROVEMENTS		
		AM Peak	PM Peak	AM Peak	PM Peak	
1	<u>SR 54 @ Tyrone Rd</u>	<u>D (35.9)</u>	<u>C (22.1)</u>	<u>D (35.9)</u>	<u>C (22.1)</u>	<u>D / D</u>
	-Eastbound Approach	C (33.3)	B (17.1)	C (33.3)	B (17.1)	-
	-Westbound Approach	C (29.1)	C (20.1)	C (29.1)	C (20.1)	-
	-Northbound Approach	C (27.1)	C (30.7)	C (27.1)	C (30.7)	-
	-Southbound Approach	E (67.4)	D (48.3)	E (67.4)	D (48.3)	-
2	<u>SR 54 @ S. Sandy Creek Rd*</u>	<u>E (57.4)</u>	<u>F (91.9)</u>	<u>D (53.1)</u>	<u>D (54.8)</u>	<u>D / D</u>
	-Eastbound Approach	E (57.9)	F (139.9)	D (52.0)	D (47.7)	-
	-Westbound Approach	E (56.9)	D (52.2)	D (50.0)	C (30.5)	-
	-Northbound Approach	D (47.7)	D (43.2)	F (110.9)	F (81.3)	-
	-Southbound Approach	E (61.1)	F (82.5)	D (54.0)	F (182.1)	-
3	<u>SR 54 @ Veterans Pkwy/Lester Rd</u>	<u>F (125.4)</u>	<u>D (43.5)</u>	<u>E (74.6)</u>	<u>C (33.3)</u>	<u>E / D</u>
	-Eastbound Approach	F (103.9)	D (37.7)	E (56.9)	C (31.3)	-
	-Westbound Approach	F (149.5)	D (42.4)	E (61.4)	C (29.5)	-
	-Northbound Approach	F (127.4)	E (71.7)	F (181.1)	E (60.3)	-
	-Southbound Approach	E (78.0)	E (66.3)	E (60.9)	D (50.2)	-
4	<u>SR 54 @ Togwatee Village Pkwy</u>	<u>B (15.9)</u>	<u>B (18.3)</u>	<u>B (15.9)</u>	<u>B (18.3)</u>	<u>D / D</u>
	-Eastbound Approach	B (15.0)	B (17.3)	B (15.0)	B (17.3)	-
	-Westbound Approach	B (15.0)	B (15.4)	B (15.0)	B (15.4)	-
	-Northbound Approach	D (47.2)	D (47.1)	D (47.2)	D (47.1)	-
	-Southbound Approach	D (48.9)	D (50.2)	D (48.9)	D (50.2)	-
5	<u>SR 54 @ Ebenezer Rd/Brittany Way</u>	<u>C (27.2)</u>	<u>F (92.2)</u>	<u>C (24.5)</u>	<u>D (38.1)</u>	<u>D / D</u>
	-Eastbound Approach	C (30.0)	F (157.0)	C (25.3)	C (33.3)	-
	-Westbound Approach	B (16.1)	C (27.5)	B (16.0)	D (40.3)	-
	-Northbound Approach	D (53.0)	E (72.3)	D (47.6)	D (51.8)	-
	-Southbound Approach	D (41.3)	D (52.8)	D (46.6)	E (57.0)	-
6	<u>SR 54 @ Ginger Cake Rd/Burch Rd</u>	<u>E (78.5)</u>	<u>D (38.0)</u>	<u>D (49.0)</u>	<u>C (26.1)</u>	<u>D / D</u>
	-Eastbound Approach	E (71.6)	C (33.0)	D (54.4)	C (24.2)	-
	-Westbound Approach	E (65.5)	D (38.5)	D (43.1)	C (24.4)	-
	-Northbound Approach	E (72.7)	D (46.5)	D (47.4)	D (42.7)	-
	-Southbound Approach	F (143.0)	E (56.1)	E (57.2)	D (51.5)	-
7	<u>SR 54 @ Brandywine Blvd/Oak St</u>	<u>B (14.2)</u>	<u>B (18.8)</u>	<u>B (14.2)</u>	<u>B (18.8)</u>	<u>D / D</u>
	-Eastbound Approach	A (9.0)	B (18.1)	A (9.0)	B (18.1)	-
	-Westbound Approach	B (16.3)	B (16.6)	B (16.3)	B (16.6)	-
	-Northbound Approach	D (44.7)	D (41.5)	D (44.7)	D (41.5)	-
	-Southbound Approach	D (47.3)	D (49.3)	D (47.3)	D (49.3)	-
Table continued on next page...						

8	<u>SR 54 @ Grady Ave/Sharon Dr</u>	<u>F (113.9)</u>	<u>F (84.1)</u>	<u>E (64.1)*</u>	<u>C (32.4)*</u>	<u>E / D</u>
	-Eastbound Approach	E (63.8)	F (107.3)	E (62.4)	C (23.7)	-
	-Westbound Approach	C (30.3)	C (21.3)	D (43.7)	C (25.5)	-
	-Northbound Approach	F (416.0)	F (175.6)	F (100.0)	E (72.1)	-
	-Southbound Approach	C (28.5)	C (28.1)	E (56.8)	E (58.3)	-
9	<u>Ginger Cake Rd @ Hood Ave</u>					
	-Eastbound Approach	B (11.1)	B (12.8)	A (6.9)	A (7.2)	D / D
	-Westbound Approach	C (16.7)	D (26.3)	A (8.4)	B (13.8)	D / D
	-Northbound Approach	D (26.9)	F (117.8)	A (9.5)	B (13.6)	D / E
	-Southbound Approach	C (21.7)	D (28.0)	B (10.3)	B (11.3)	D / D
10	<u>S. Sandy Creek Rd @ Piedmont Drwy</u>					
	-Eastbound Approach	C (23.9)	D (29.5)	C (23.9)	D (29.5)	D / D
	-Northbound Left	A (9.3)	A (8.9)	A (9.3)	A (8.9)	D / D
11	<u>Veterans Pkwy @ S. Sandy Creek Rd</u>					
	-Westbound Approach	C (18.2)	B (14.7)	C (18.2)	B (14.7)	D / D
	-Southbound Left	B (10.2)	A (8.8)	B (10.2)	A (8.8)	D / D
12	<u>Veterans Pkwy @ Sandy Creek Rd</u>					
	-Eastbound Approach	C (19.5)	C (16.4)	C (19.5)	C (16.4)	D / D
	-Northbound Left	A (9.2)	A (8.8)	A (9.2)	A (8.8)	D / D
13	<u>S. Sandy Creek Rd @ Site Drwy 1</u>					
	-Westbound Approach	C (18.0)	C (15.6)	C (18.0)	C (15.6)	D / D
	-Southbound Through/Left	A (8.0)	A (7.9)	A (8.0)	A (7.9)	D / D
14	<u>SR 54 @ Site Drwy 2</u>					
	-Southbound Right	D (33.1)	E (40.4)	D (33.1)	E (40.4)	D / D
15	<u>SR 54 @ Site Drwy 3</u>					
	-Southbound Right	D (33.3)	E (37.9)	D (33.3)	E (37.9)	D / D

*Results reported via HCM 2000

Recommendations for Site Mitigation Improvements

Improvements that are identified as mitigation improvements address deficiencies that are caused by site traffic and can be identified as related to the proposed development. A summary of the system improvements is provided below. A concept design of these improvements is included in the Appendix.

Summary of Recommended Site Mitigation Improvements

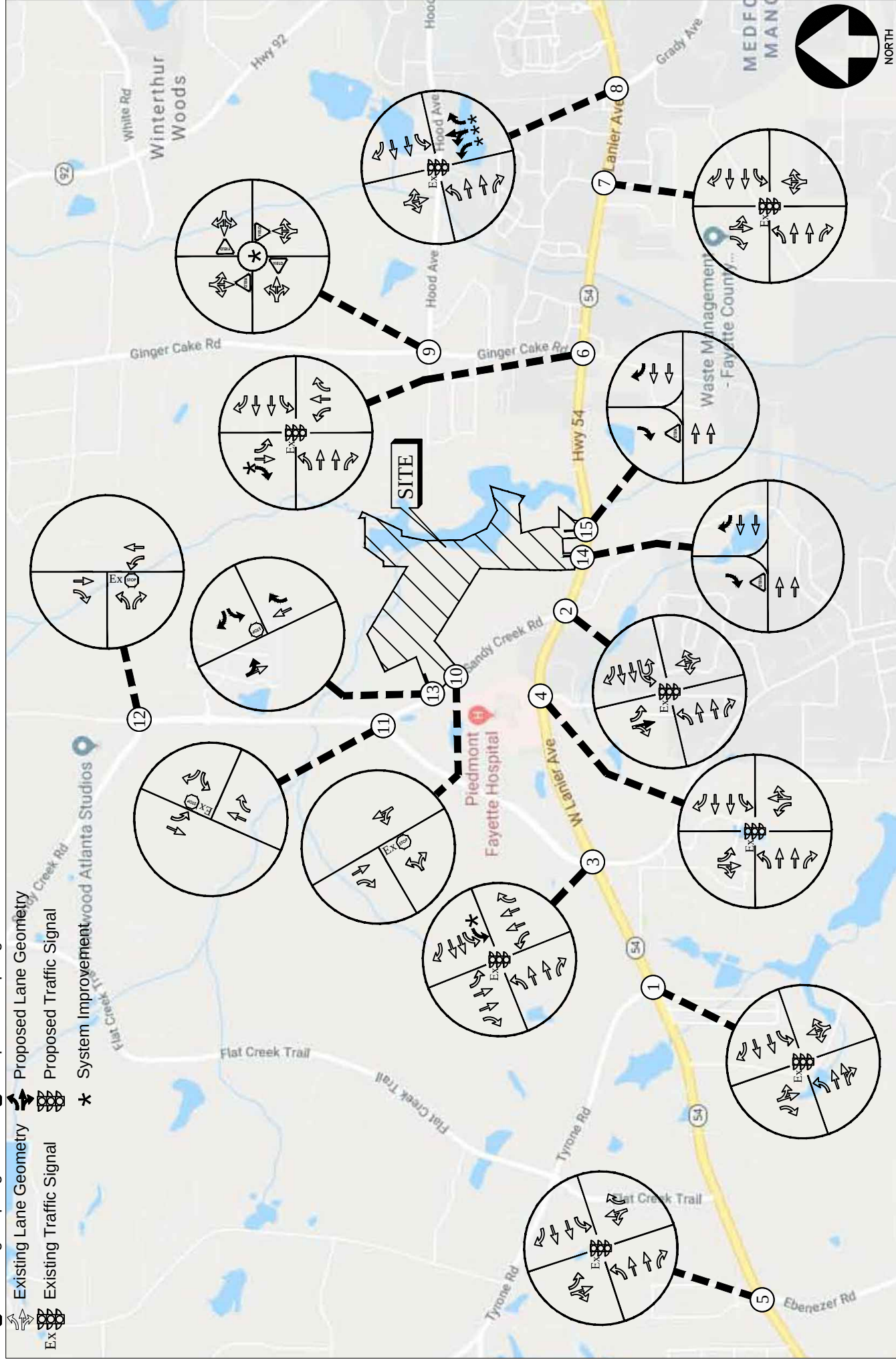
- **SR 54 (W. Lanier Avenue) @ S. Sandy Creek Road/Old Norton Road**
 - Reconfigure the southbound (S. Sandy Creek Road) approach to operate with a dedicated left turn lane and a shared through/right turn lane.
 - Install protected + permissive left turn signal phasing for the southbound left turn movement from S. Sandy Creek Road to SR 54 (W. Lanier Avenue).

SR 54 (W. Lanier Avenue) @ Site Driveways #2 and #3

After construction of the proposed development, the proposed right-in/right-out driveways will operate at a level-of-service "E" during the PM peak hour. With fewer than 135 vehicles per hour and less than 1.6 vehicle-hours of total delay from the driveway approaches, the intersections are considered as having "acceptable operations" (peak hour delays of less than 4.0 vehicle-hours) per NCHRP 457. Therefore, no changes have been recommended.

LEGEND

- Ex (stop) Existing Stop Sign
- Existing Lane Geometry
- Existing Traffic Signal
- Proposed Stop Sign
- Proposed Lane Geometry
- Proposed Traffic Signal
- System Improvement



FUTURE TRAFFIC CONTROL AND LANE GEOMETRY

FIGURE 8

CONCLUSIONS AND RECOMMENDATIONS

Traffic impacts were evaluated for the added traffic from the proposed Folia Crossroads mixed-use development located north of SR 54 (W. Lanier Avenue) between S. Sandy Creek Road and Old Mill Court in Fayetteville, Georgia. The development will consist of:

- 50,000 square feet of office space
- 40 multifamily units
- 260 single-family detached housing units
- 120,000 square feet of retail/restaurant space
- 100-room hotel

The development proposes one full-access driveway on S. Sandy Creek Road and two right-in/right-out driveways on SR 54 (W. Lanier Avenue). Existing and future operations after completion of the project were analyzed at the intersections of:

- SR 54 (W. Lanier Avenue) at Ebenezer Road/Brittany Way
- SR 54 (W. Lanier Avenue) at Tyrone Road
- SR 54 (W. Lanier Avenue) at Veterans Parkway/Lester Road
- SR 54 (W. Lanier Avenue) at Togwatee Village Parkway/Piedmont Fayette Driveway
- SR 54 (W. Lanier Avenue) at S. Sandy Creek Road/Old Norton Road
- SR 54 (W. Lanier Avenue) at Ginger Cake Road/Burch Road
- SR 54 (W. Lanier Avenue) at Brandywine Boulevard/Oak Street
- SR 54 (W. Lanier Avenue) at Grady Avenue/Sharon Drive
- Ginger Cake Road at Hood Avenue
- S. Sandy Creek Road at Piedmont Fayette Driveway
- Veterans Parkway at S. Sandy Creek Road
- Veterans Parkway at Sandy Creek Road

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 the analysis are listed below:

System Recommendations and Improvements

A summary of the system improvements, which address deficiencies that are found within the existing road network for the “No-Build” conditions, is provided below. These are recommended for the local municipality to use in planning future transportation projects.

Summary of Recommended System Improvements

- SR 54 (W. Lanier Avenue) @ Veterans Parkway/Lester Road
 - Create a second westbound left turn lane using the existing striping on SR 54 (W. Lanier Avenue) and install protected left turn signal phasing.
 - Update the signal timing at the intersection.

- SR 54 (W. Lanier Avenue) @ Ebenezer Road/Brittany Way
 - Install permissive + overlap right turn signal phasing for the northbound right turn movement from Ebenezer Road to SR 54 (W. Lanier Avenue).
 - Update the signal timing at the intersection.
- SR 54 (W. Lanier Avenue) @ Ginger Cake Road/Burch Road
 - Create a dedicated southbound right turn lane on Ginger Cake Road.
- SR 54 (W. Lanier Avenue) @ Grady Avenue/Sharon Drive
 - Install permissive + overlap right turn signal phasing for the eastbound right turn movement from SR 54 (W. Lanier Avenue) to Grady Avenue.
 - Restripe the northbound approach (Grady Avenue) to operate with a dedicated left turn lane, shared through/left turn lane, and install a dedicated right turn lane.
 - Install split-phased signal timing on the northbound and southbound approaches.
 - Update the signal timing at the intersection.
- Ginger Cake Road @ Hood Avenue/Hood Road
 - Remove the all-way stop-controlled condition and replace with a mini-roundabout.

Site Access Configuration

The following access configuration was utilized when modeling the proposed site driveway intersections:

- Site Driveway #1: Full-access driveway on S. Sandy Creek Road
 - This driveway is recommended to consist of one entering and two exiting lanes. The westbound (driveway) approach is recommended to have a dedicated left turn lane and a dedicated right turn lane for exiting traffic.
 - The intersection is proposed to be unsignalized with a STOP sign on the westbound approach.
 - Entering left turn movements are assumed to be made from the southbound through lane. No left turn lane is warranted. (See Appendix)
 - It is recommended a northbound right turn lane be installed for entering traffic on S. Sandy Creek Road.
- Site Driveways #2 & #3: Right-in/right-out driveways on SR 54 (W. Lanier Avenue)
 - Each of these driveways are proposed to consist of one entering and one exiting lane. The southbound (driveway) approach is proposed to have only one right turn lane for exiting traffic.
 - Each intersection is proposed to be unsignalized with a STOP sign on the southbound approach.
 - Dedicated westbound right turn lanes are required at each driveway on SR 54 (W. Lanier Avenue) per GDOT standards (250' storage and 100' taper).

Site Mitigation Improvements

Improvements that are identified as mitigation improvements address deficiencies that are caused by site traffic and can be identified as related to the proposed development. A summary of the system improvements is provided below.

Summary of Recommended Site Mitigation Improvements

- SR 54 (W. Lanier Avenue) @ S. Sandy Creek Road/Old Norton Road
 - Reconfigure the southbound (S. Sandy Creek Road) approach to operate with a dedicated left turn lane and a shared through/right turn lane.
 - Install protected + permissive left turn signal phasing for the southbound left turn movement from S. Sandy Creek Road to SR 54 (W. Lanier Avenue).

SR 54 (W. Lanier Avenue) @ Site Driveways #2 and #3

After construction of the proposed development, the proposed right-in/right-out driveways will operate at a level-of-service “E” during the PM peak hour. With fewer than 135 vehicles per hour and less than 1.6 vehicle-hours of total delay from the driveway approaches, the intersections are considered as having “acceptable operations” (peak hour delays of less than 4.0 vehicle-hours) per NCHRP 457. Therefore, no changes have been recommended.

Appendix

Existing Intersection Traffic Counts	
GRTA Letter of Understanding.....	
Linear Regression of Daily Traffic.....	
Fact Sheets for Planned and Programmed Improvements.....	
Existing Intersection Analysis.....	
NCHRP 457 Right Turn Lane Analysis	
Future “No-Build” Intersection Analysis	
Future “No-Build” Improved Intersection Analysis.....	
Future “Build” Intersections Analysis	
Future “Build” Improved Intersections Analysis.....	
Traffic Volume Worksheets	

Existing Intersection Traffic Counts

A & R Engineering, Inc.

2160 Kingston Court, Suite 'O',
Marietta, GA 30067

TMC Data
SR 54 (W. Lanier Ave) at Tyrone Road
07 - 09 AM - 04 - 06 PM

File Name : 20180031
Site Code : 20180031
Start Date : 3/6/2018
Page No : 1

Groups Printed- Unshifted

	Private Driveway Northbound				Tyrone Road Southbound				SR 54 (W. Lanier Avenue) Eastbound				SR 54 (W. Lanier Avenue) 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	102	0	5	107	6	215	0	221	0	235	52	287	615
07:15 AM	0	0	0	0	105	0	4	109	9	221	0	230	0	248	57	305	644
07:30 AM	0	0	0	0	108	0	10	118	8	258	0	266	0	301	68	369	753
07:45 AM	0	0	0	0	117	0	8	125	11	250	0	261	0	310	71	381	767
Total	0	0	0	0	432	0	27	459	34	944	0	978	0	1094	248	1342	2779
08:00 AM	0	0	0	0	110	0	7	117	5	254	0	259	0	226	73	299	675
08:15 AM	0	1	0	1	113	0	8	121	4	250	1	255	0	278	99	377	754
08:30 AM	0	0	0	0	113	0	10	123	10	316	0	326	0	316	67	383	832
08:45 AM	0	0	0	0	94	0	6	100	9	236	0	245	0	289	88	377	722
Total	0	1	0	1	430	0	31	461	28	1056	1	1085	0	1109	327	1436	2983
*** BREAK ***																	
04:00 PM	0	0	0	0	53	0	16	69	7	198	0	205	0	310	88	398	672
04:15 PM	0	0	0	0	47	0	5	52	14	204	0	218	0	296	96	392	662
04:30 PM	0	0	0	0	80	1	9	90	5	194	0	199	0	266	99	365	654
04:45 PM	1	1	0	2	72	0	10	82	4	172	0	176	0	289	105	394	654
Total	1	1	0	2	252	1	40	293	30	768	0	798	0	1161	388	1549	2642
05:00 PM	0	0	0	0	61	0	9	70	8	246	0	254	0	290	141	431	755
05:15 PM	0	2	0	2	81	0	9	90	7	239	0	246	0	312	109	421	759
05:30 PM	0	0	0	0	67	0	8	75	7	225	0	232	0	278	110	388	695
05:45 PM	0	0	0	0	72	0	9	81	13	228	0	241	0	239	67	306	628
Total	0	2	0	2	281	0	35	316	35	938	0	973	0	1119	427	1546	2837
Grand Total	1	4	0	5	1395	1	133	1529	127	3706	1	3834	0	4483	1390	5873	11241
Apprch %	20	80	0		91.2	0.1	8.7		3.3	96.7	0		0	76.3	23.7		
Total %	0	0	0	0	12.4	0	1.2	13.6	1.1	33	0	34.1	0	39.9	12.4	52.2	

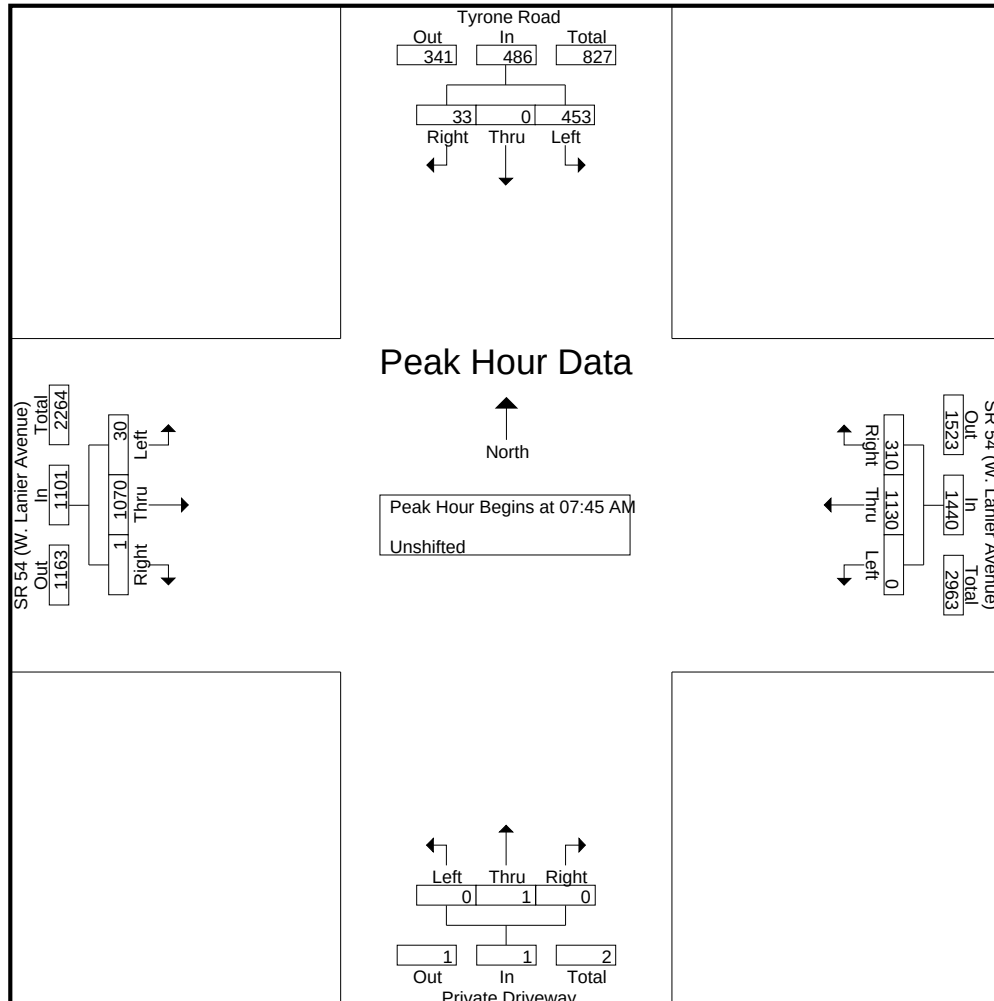
A & R Engineering, Inc.

2160 Kingston Court, Suite 'O',
Marietta, GA 30067

TMC Data
SR 54 (W. Lanier Ave) at Tyrone Road
07 - 09 AM - 04 - 06 PM

File Name : 20180031
Site Code : 20180031
Start Date : 3/6/2018
Page No : 2

	Private Driveway Northbound				Tyrone Road Southbound				SR 54 (W. Lanier Avenue) Eastbound				SR 54 (W. Lanier Avenue) 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 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	0	0	0	117	0	8	125	11	250	0	261	0	310	71	381	767
08:00 AM	0	0	0	0	110	0	7	117	5	254	0	259	0	226	73	299	675
08:15 AM	0	1	0	1	113	0	8	121	4	250	1	255	0	278	99	377	754
08:30 AM	0	0	0	0	113	0	10	123	10	316	0	326	0	316	67	383	832
Total Volume	0	1	0	1	453	0	33	486	30	1070	1	1101	0	1130	310	1440	3028
% App. Total	0	100	0		93.2	0	6.8		2.7	97.2	0.1		0	78.5	21.5		
PHF	.000	.250	.000	.250	.968	.000	.825	.972	.682	.847	.250	.844	.000	.894	.783	.940	.910



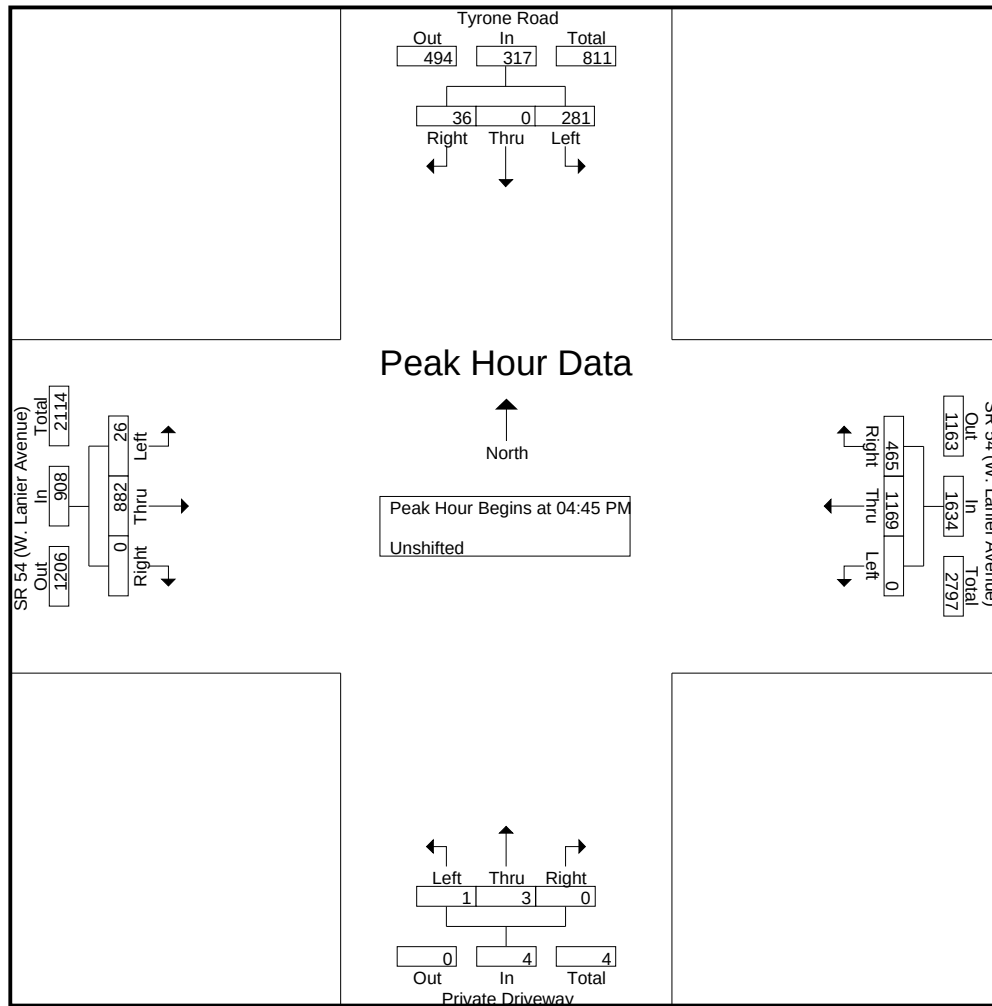
A & R Engineering, Inc.

2160 Kingston Court, Suite 'O',
Marietta, GA 30067

TMC Data
SR 54 (W. Lanier Ave) at Tyrone Road
07 - 09 AM - 04 - 06 PM

File Name : 20180031
Site Code : 20180031
Start Date : 3/6/2018
Page No : 3

	Private Driveway Northbound				Tyrone Road Southbound				SR 54 (W. Lanier Avenue) Eastbound				SR 54 (W. Lanier Avenue) 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 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	1	1	0	2	72	0	10	82	4	172	0	176	0	289	105	394	654
05:00 PM	0	0	0	0	61	0	9	70	8	246	0	254	0	290	141	431	755
05:15 PM	0	2	0	2	81	0	9	90	7	239	0	246	0	312	109	421	759
05:30 PM	0	0	0	0	67	0	8	75	7	225	0	232	0	278	110	388	695
Total Volume	1	3	0	4	281	0	36	317	26	882	0	908	0	1169	465	1634	2863
% App. Total	25	75	0		88.6	0	11.4		2.9	97.1	0		0	71.5	28.5		
PHF	.250	.375	.000	.500	.867	.000	.900	.881	.813	.896	.000	.894	.000	.937	.824	.948	.943



A & R Engineering, Inc.

2160 Kingston Court, Suite 'O',
Marietta, GA 30067

TMC Data
SR 54 (W. Lanier Avenue) at Sandy Creek
Road/Old Norton Road
07 - 09 AM - 04 - 06 PM

File Name : 20180032
Site Code : 20180032
Start Date : 3/6/2018
Page No : 1

Groups Printed- Unshifted

	Old Norton Road Northbound				S Sandy Creek Road Southbound				SR 54 (W. Lanier Avenue) Eastbound				SR 54 (W. Lanier Avenue) 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	2	7	15	39	2	10	51	9	345	4	358	15	385	51	451	875
07:15 AM	9	5	6	20	42	3	9	54	8	366	2	376	13	399	44	456	906
07:30 AM	16	5	9	30	41	1	17	59	1	379	3	383	16	390	49	455	927
07:45 AM	5	5	7	17	41	3	11	55	3	371	3	377	15	368	44	427	876
Total	36	17	29	82	163	9	47	219	21	1461	12	1494	59	1542	188	1789	3584
08:00 AM	3	1	8	12	35	5	11	51	6	336	5	347	17	323	31	371	781
08:15 AM	4	1	5	10	35	4	9	48	7	306	1	314	11	324	35	370	742
08:30 AM	5	0	3	8	18	0	15	33	6	293	5	304	10	379	31	420	765
08:45 AM	10	2	4	16	68	5	8	81	11	328	6	345	21	332	19	372	814
Total	22	4	20	46	156	14	43	213	30	1263	17	1310	59	1358	116	1533	3102
*** BREAK ***																	
04:00 PM	5	2	7	14	42	2	9	53	5	326	2	333	9	329	35	373	773
04:15 PM	2	1	6	9	38	1	8	47	6	335	3	344	10	336	33	379	779
04:30 PM	8	2	5	15	52	1	7	60	7	359	2	368	16	293	30	339	782
04:45 PM	6	2	5	13	41	2	6	49	4	368	7	379	13	324	24	361	802
Total	21	7	23	51	173	6	30	209	22	1388	14	1424	48	1282	122	1452	3136
05:00 PM	6	2	1	9	55	3	4	62	8	380	3	391	18	366	32	416	878
05:15 PM	3	1	5	9	51	4	10	65	7	403	2	412	19	342	27	388	874
05:30 PM	1	1	2	4	25	2	4	31	7	378	3	388	14	272	32	318	741
05:45 PM	2	2	5	9	44	4	8	56	7	314	1	322	15	249	23	287	674
Total	12	6	13	31	175	13	26	214	29	1475	9	1513	66	1229	114	1409	3167
Grand Total	91	34	85	210	667	42	146	855	102	5587	52	5741	232	5411	540	6183	12989
Apprch %	43.3	16.2	40.5		78	4.9	17.1		1.8	97.3	0.9		3.8	87.5	8.7		
Total %	0.7	0.3	0.7	1.6	5.1	0.3	1.1	6.6	0.8	43	0.4	44.2	1.8	41.7	4.2	47.6	

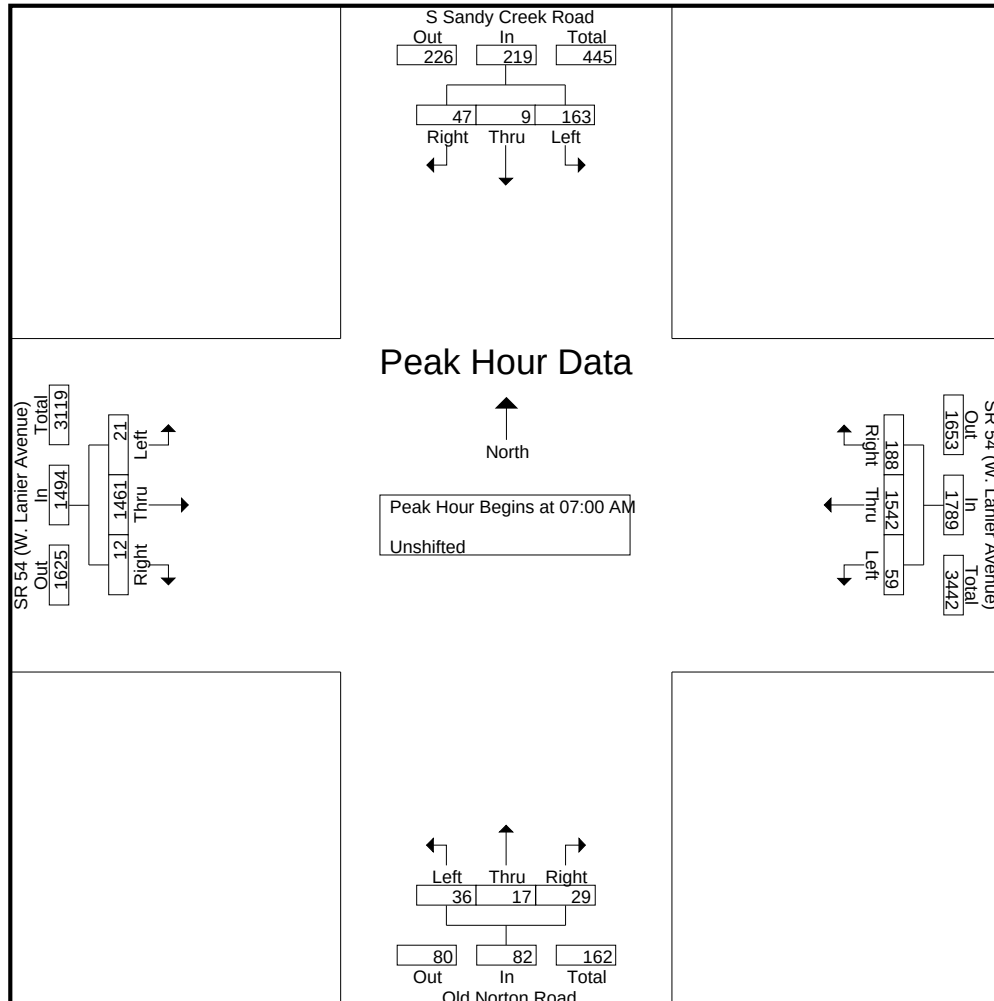
A & R Engineering, Inc.

2160 Kingston Court, Suite 'O',
Marietta, GA 30067

TMC Data
SR 54 (W. Lanier Avenue) at Sandy Creek
Road/Old Norton Road
07 - 09 AM - 04 - 06 PM

File Name : 20180032
Site Code : 20180032
Start Date : 3/6/2018
Page No : 2

	Old Norton Road Northbound				S Sandy Creek Road Southbound				SR 54 (W. Lanier Avenue) Eastbound				SR 54 (W. Lanier Avenue) 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 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	6	2	7	15	39	2	10	51	9	345	4	358	15	385	51	451	875
07:15 AM	9	5	6	20	42	3	9	54	8	366	2	376	13	399	44	456	906
07:30 AM	16	5	9	30	41	1	17	59	1	379	3	383	16	390	49	455	927
07:45 AM	5	5	7	17	41	3	11	55	3	371	3	377	15	368	44	427	876
Total Volume	36	17	29	82	163	9	47	219	21	1461	12	1494	59	1542	188	1789	3584
% App. Total	43.9	20.7	35.4		74.4	4.1	21.5		1.4	97.8	0.8		3.3	86.2	10.5		
PHF	.563	.850	.806	.683	.970	.750	.691	.928	.583	.964	.750	.975	.922	.966	.922	.981	.967



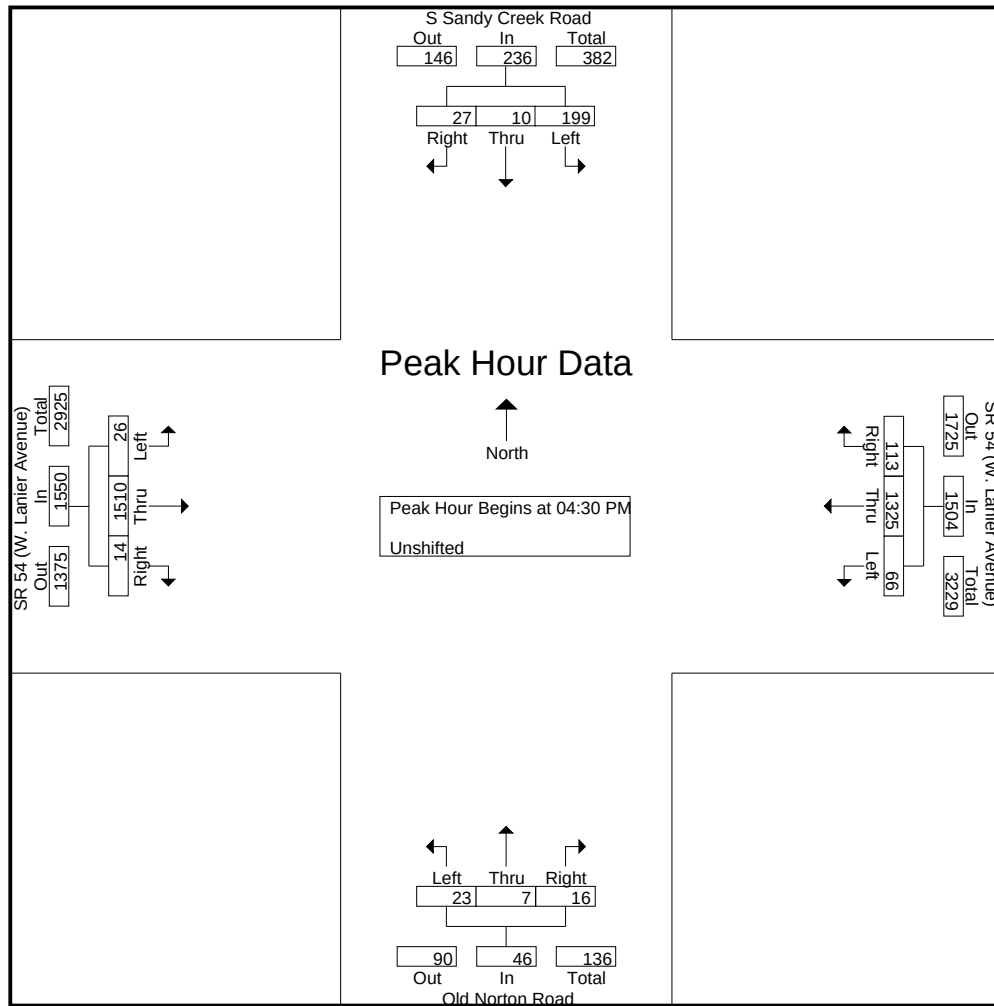
A & R Engineering, Inc.

2160 Kingston Court, Suite 'O',
Marietta, GA 30067

TMC Data
SR 54 (W. Lanier Avenue) at Sandy Creek
Road/Old Norton Road
07 - 09 AM - 04 - 06 PM

File Name : 20180032
Site Code : 20180032
Start Date : 3/6/2018
Page No : 3

	Old Norton Road Northbound				S Sandy Creek Road Southbound				SR 54 (W. Lanier Avenue) Eastbound				SR 54 (W. Lanier Avenue) 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 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	8	2	5	15	52	1	7	60	7	359	2	368	16	293	30	339	782
04:45 PM	6	2	5	13	41	2	6	49	4	368	7	379	13	324	24	361	802
05:00 PM	6	2	1	9	55	3	4	62	8	380	3	391	18	366	32	416	878
05:15 PM	3	1	5	9	51	4	10	65	7	403	2	412	19	342	27	388	874
Total Volume	23	7	16	46	199	10	27	236	26	1510	14	1550	66	1325	113	1504	3336
% App. Total	50	15.2	34.8		84.3	4.2	11.4		1.7	97.4	0.9		4.4	88.1	7.5		
PHF	.719	.875	.800	.767	.905	.625	.675	.908	.813	.937	.500	.941	.868	.905	.883	.904	.950



A & R Engineering, Inc.

2160 Kingston Court, Suite 'O',
Marietta, GA 30067

TMC Data
SR 54 (W. Lanier Avenue) at Veterans Pkwy/
Lester Road
07 - 09 AM - 04 - 06 PM

File Name : 20180033
Site Code : 20180033
Start Date : 3/6/2018
Page No : 1

Groups Printed- Unshifted

	Lester Road Northbound				Veterans Parkway Southbound				SR 54 (W. Lanier Avenue Eastbound				SR 54 (W. Lanier Avenue 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	38	34	36	108	6	26	19	51	31	213	46	290	55	221	9	285	734
07:15 AM	51	37	42	130	7	30	23	60	28	225	52	305	69	232	15	316	811
07:30 AM	69	74	75	218	12	60	21	93	46	361	43	450	114	374	26	514	1275
07:45 AM	33	30	61	124	6	16	10	32	30	300	16	346	105	279	13	397	899
Total	191	175	214	580	31	132	73	236	135	1099	157	1391	343	1106	63	1512	3719
08:00 AM	32	34	56	122	6	16	14	36	28	332	15	375	42	211	14	267	800
08:15 AM	38	27	49	114	7	14	10	31	28	328	11	367	22	255	6	283	795
08:30 AM	14	14	33	61	8	13	11	32	16	327	10	353	24	233	10	267	713
08:45 AM	31	14	25	70	4	10	22	36	24	272	23	319	16	285	6	307	732
Total	115	89	163	367	25	53	57	135	96	1259	59	1414	104	984	36	1124	3040
*** BREAK ***																	
04:00 PM	29	16	29	74	5	21	23	49	15	237	18	270	36	329	15	380	773
04:15 PM	38	26	32	96	4	24	26	54	25	260	19	304	34	310	9	353	807
04:30 PM	39	19	23	81	3	29	25	57	36	226	29	291	30	336	9	375	804
04:45 PM	23	17	15	55	2	25	20	47	19	254	25	298	37	326	12	375	775
Total	129	78	99	306	14	99	94	207	95	977	91	1163	137	1301	45	1483	3159
05:00 PM	26	19	36	81	7	34	28	69	28	274	29	331	60	358	8	426	907
05:15 PM	38	25	28	91	8	26	36	70	36	339	34	409	54	320	13	387	957
05:30 PM	35	24	52	111	5	36	28	69	21	272	29	322	44	285	11	340	842
05:45 PM	26	12	25	63	9	31	29	69	34	270	26	330	35	214	9	258	720
Total	125	80	141	346	29	127	121	277	119	1155	118	1392	193	1177	41	1411	3426
Grand Total	560	422	617	1599	99	411	345	855	445	4490	425	5360	777	4568	185	5530	13344
Apprch %	35	26.4	38.6		11.6	48.1	40.4		8.3	83.8	7.9		14.1	82.6	3.3		
Total %	4.2	3.2	4.6	12	0.7	3.1	2.6	6.4	3.3	33.6	3.2	40.2	5.8	34.2	1.4	41.4	

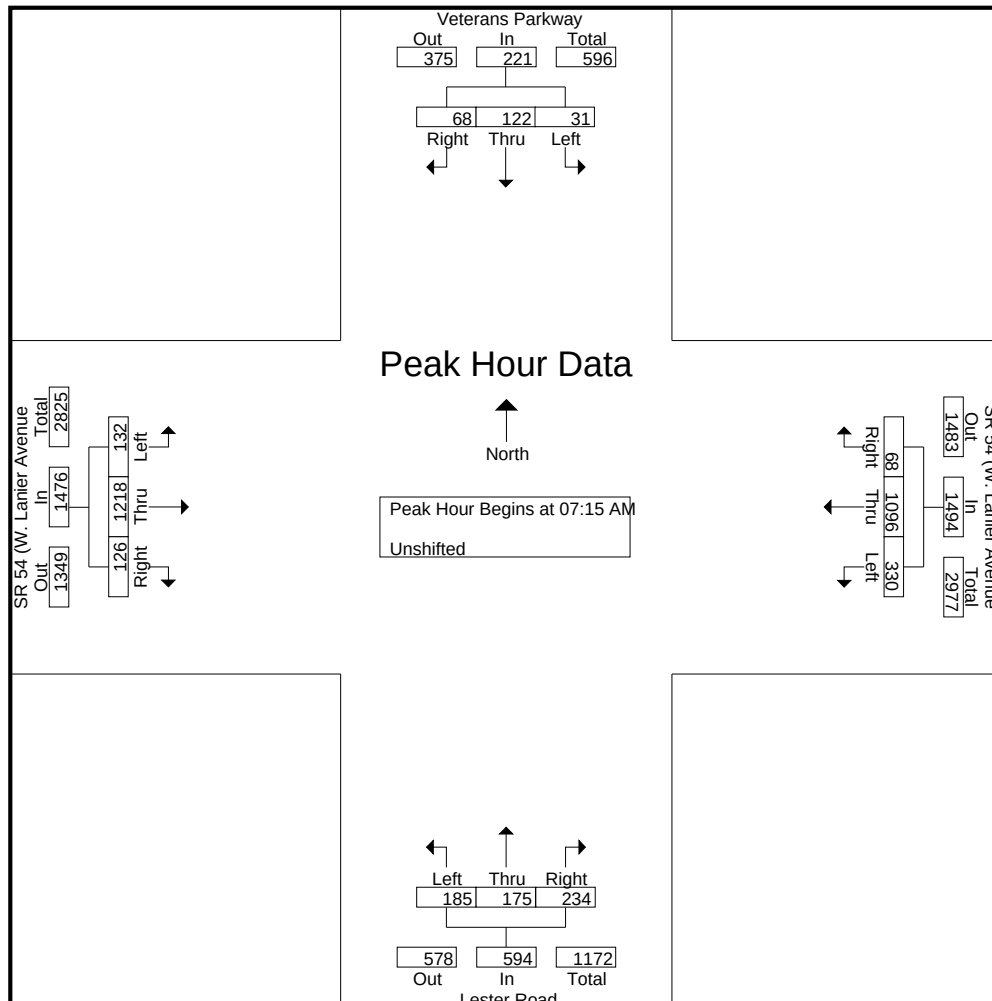
A & R Engineering, Inc.

2160 Kingston Court, Suite 'O',
Marietta, GA 30067

TMC Data
SR 54 (W. Lanier Avenue) at Veterans Pkwy/
Lester Road
07 - 09 AM - 04 - 06 PM

File Name : 20180033
Site Code : 20180033
Start Date : 3/6/2018
Page No : 2

	Lester Road Northbound				Veterans Parkway Southbound				SR 54 (W. Lanier Avenue Eastbound				SR 54 (W. Lanier Avenue 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 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	51	37	42	130	7	30	23	60	28	225	52	305	69	232	15	316	811
07:30 AM	69	74	75	218	12	60	21	93	46	361	43	450	114	374	26	514	1275
07:45 AM	33	30	61	124	6	16	10	32	30	300	16	346	105	279	13	397	899
08:00 AM	32	34	56	122	6	16	14	36	28	332	15	375	42	211	14	267	800
Total Volume	185	175	234	594	31	122	68	221	132	1218	126	1476	330	1096	68	1494	3785
% App. Total	31.1	29.5	39.4		14	55.2	30.8		8.9	82.5	8.5		22.1	73.4	4.6		
PHF	.670	.591	.780	.681	.646	.508	.739	.594	.717	.843	.606	.820	.724	.733	.654	.727	.742



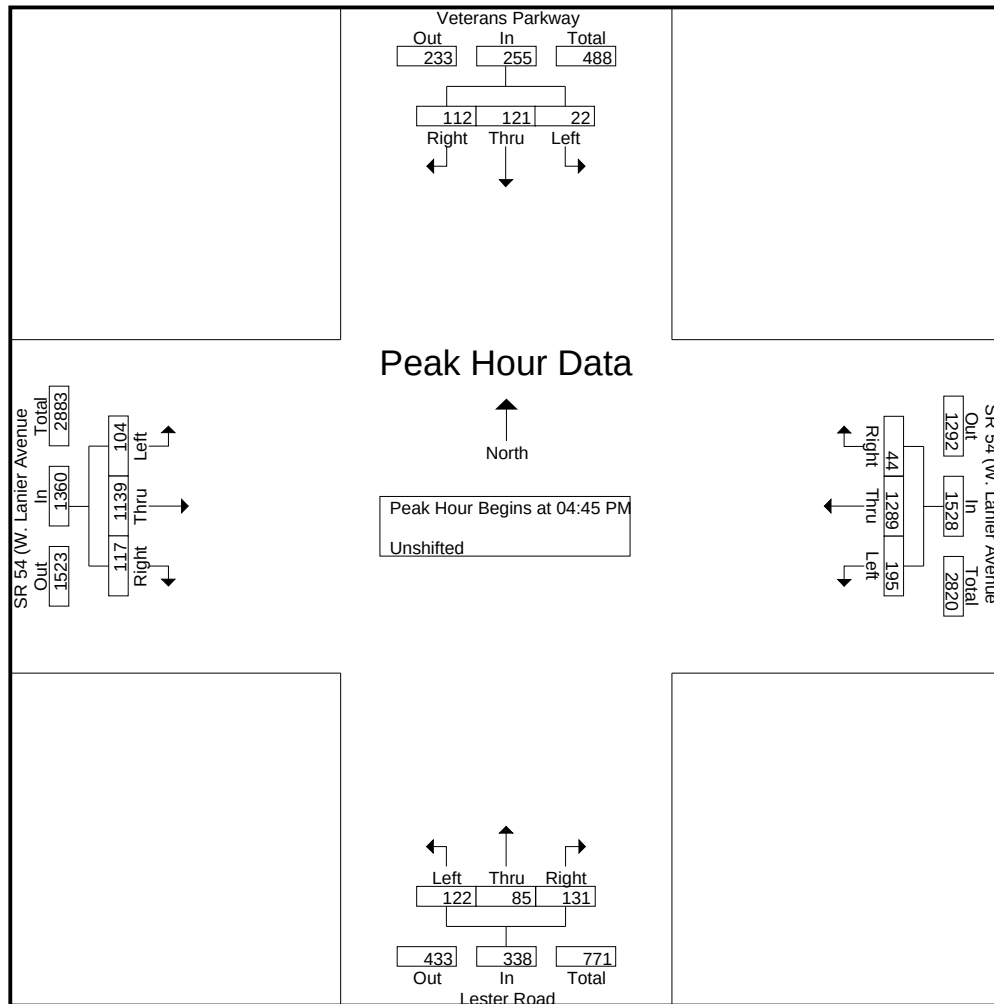
A & R Engineering, Inc.

2160 Kingston Court, Suite 'O',
Marietta, GA 30067

TMC Data
SR 54 (W. Lanier Avenue) at Veterans Pkwy/
Lester Road
07 - 09 AM - 04 - 06 PM

File Name : 20180033
Site Code : 20180033
Start Date : 3/6/2018
Page No : 3

	Lester Road Northbound				Veterans Parkway Southbound				SR 54 (W. Lanier Avenue Eastbound)				SR 54 (W. Lanier Avenue 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 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	23	17	15	55	2	25	20	47	19	254	25	298	37	326	12	375	775
05:00 PM	26	19	36	81	7	34	28	69	28	274	29	331	60	358	8	426	907
05:15 PM	38	25	28	91	8	26	36	70	36	339	34	409	54	320	13	387	957
05:30 PM	35	24	52	111	5	36	28	69	21	272	29	322	44	285	11	340	842
Total Volume	122	85	131	338	22	121	112	255	104	1139	117	1360	195	1289	44	1528	3481
% App. Total	36.1	25.1	38.8		8.6	47.5	43.9		7.6	83.8	8.6		12.8	84.4	2.9		
PHF	.803	.850	.630	.761	.688	.840	.778	.911	.722	.840	.860	.831	.813	.900	.846	.897	.909



A & R Engineering, Inc.

2160 Kingston Court, Suite 'O',
Marietta, GA 30067

TMC Data
SR 54 (W. Lanier Avenue) at Togwatee
Village Pkwy/Piedmont Fayette Driveway
07 09 AM - 04 - 06 PM

File Name : 20180034
Site Code : 20180034
Start Date : 3/6/2018
Page No : 1

Groups Printed- Unshifted

	Togwatee Village Parkway Northbound				Piedmont Fatette Driveway Southbound				SR 54 (W. Lanier Avenue) Eastbound				SR 54 (W. Lanier Avenue) 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	3	0	5	8	5	1	7	13	43	193	6	242	11	235	21	267	530
07:15 AM	5	0	6	11	7	2	6	15	51	215	6	272	12	270	25	307	605
07:30 AM	5	1	9	15	4	2	12	18	46	300	11	357	11	370	31	412	802
07:45 AM	3	0	7	10	8	1	1	10	46	352	8	406	32	360	36	428	854
Total	16	1	27	44	24	6	26	56	186	1060	31	1277	66	1235	113	1414	2791
08:00 AM	6	0	8	14	15	1	3	19	56	369	13	438	28	249	31	308	779
08:15 AM	5	0	5	10	13	1	3	17	52	322	15	389	29	301	31	361	777
08:30 AM	6	1	6	13	17	1	2	20	60	295	15	370	30	315	39	384	787
08:45 AM	5	2	9	16	10	2	3	15	78	261	9	348	44	303	34	381	760
Total	22	3	28	53	55	5	11	71	246	1247	52	1545	131	1168	135	1434	3103
*** BREAK ***																	
04:00 PM	16	1	15	32	36	3	4	43	39	259	12	310	31	299	17	347	732
04:15 PM	16	3	10	29	39	2	15	56	36	268	14	318	21	295	22	338	741
04:30 PM	17	1	9	27	35	1	13	49	26	273	17	316	33	321	25	379	771
04:45 PM	13	2	12	27	28	1	7	36	29	280	11	320	39	336	28	403	786
Total	62	7	46	115	138	7	39	184	130	1080	54	1264	124	1251	92	1467	3030
05:00 PM	11	1	15	27	26	2	12	40	25	352	15	392	28	316	23	367	826
05:15 PM	18	1	20	39	29	2	8	39	24	394	18	436	23	320	25	368	882
05:30 PM	15	2	17	34	25	2	13	40	29	354	29	412	19	285	23	327	813
05:45 PM	11	3	15	29	17	1	16	34	25	299	18	342	14	234	24	272	677
Total	55	7	67	129	97	7	49	153	103	1399	80	1582	84	1155	95	1334	3198
Grand Total	155	18	168	341	314	25	125	464	665	4786	217	5668	405	4809	435	5649	12122
Apprch %	45.5	5.3	49.3		67.7	5.4	26.9		11.7	84.4	3.8		7.2	85.1	7.7		
Total %	1.3	0.1	1.4	2.8	2.6	0.2	1	3.8	5.5	39.5	1.8	46.8	3.3	39.7	3.6	46.6	

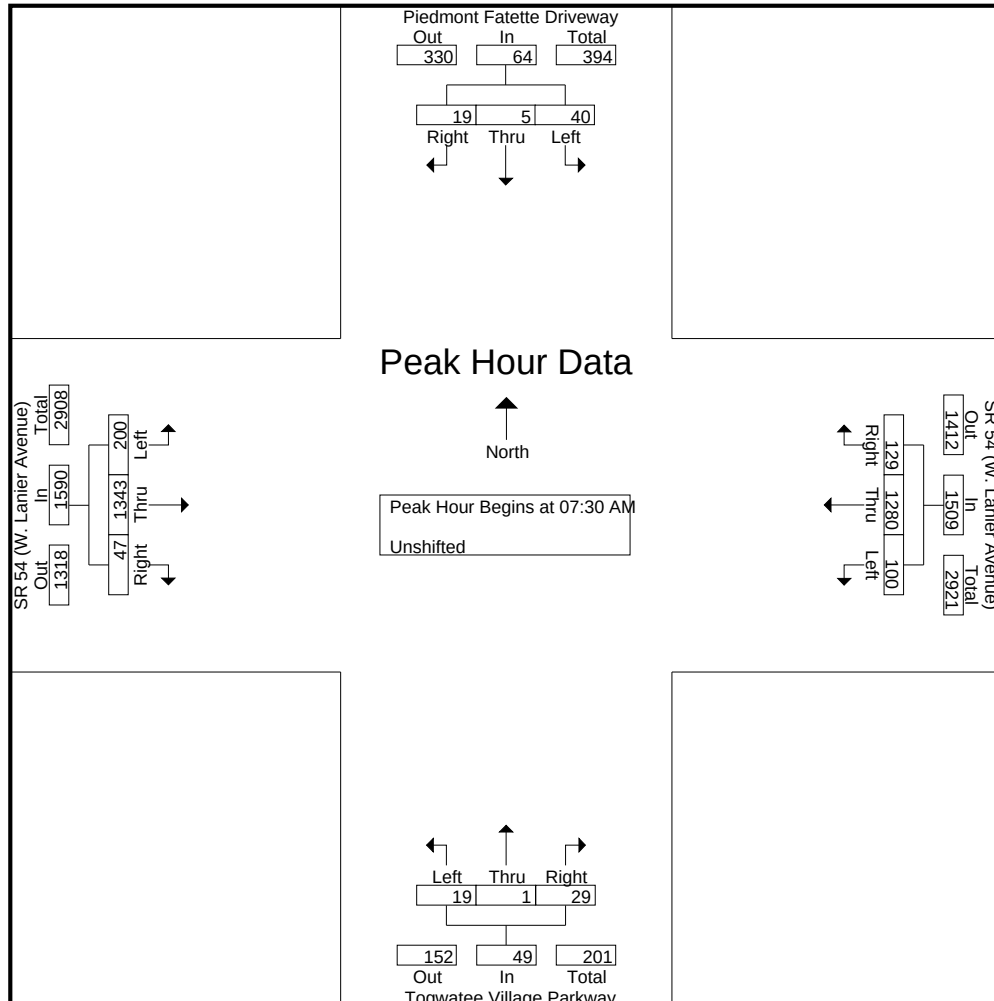
A & R Engineering, Inc.

2160 Kingston Court, Suite 'O',
Marietta, GA 30067

TMC Data
SR 54 (W. Lanier Avenue) at Togwatee
Village Pkwy/Piedmont Fayette Driveway
07 09 AM - 04 - 06 PM

File Name : 20180034
Site Code : 20180034
Start Date : 3/6/2018
Page No : 2

	Togwatee Village Parkway Northbound				Piedmont Fayette Driveway Southbound				SR 54 (W. Lanier Avenue) Eastbound				SR 54 (W. Lanier Avenue) 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 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	5	1	9	15	4	2	12	18	46	300	11	357	11	370	31	412	802
07:45 AM	3	0	7	10	8	1	1	10	46	352	8	406	32	360	36	428	854
08:00 AM	6	0	8	14	15	1	3	19	56	369	13	438	28	249	31	308	779
08:15 AM	5	0	5	10	13	1	3	17	52	322	15	389	29	301	31	361	777
Total Volume	19	1	29	49	40	5	19	64	200	1343	47	1590	100	1280	129	1509	3212
% App. Total	38.8	2	59.2		62.5	7.8	29.7		12.6	84.5	3		6.6	84.8	8.5		
PHF	.792	.250	.806	.817	.667	.625	.396	.842	.893	.910	.783	.908	.781	.865	.896	.881	.940



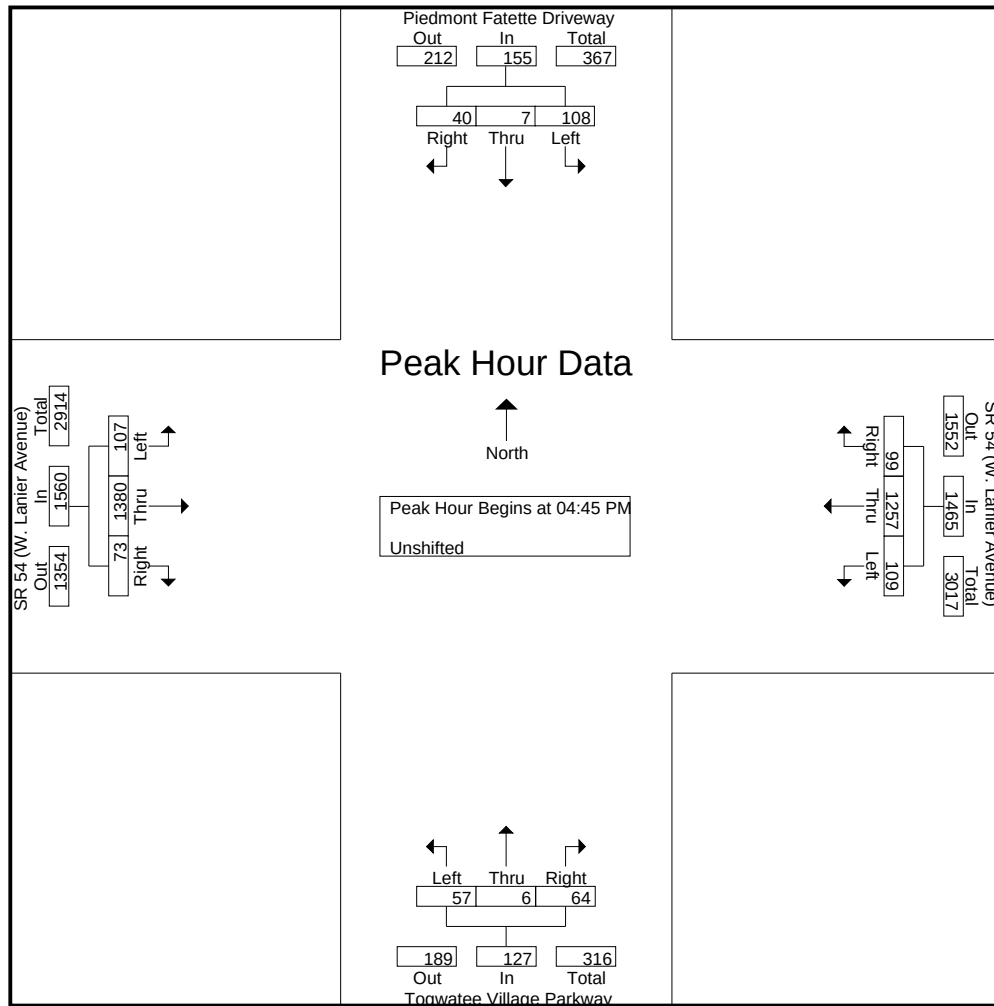
A & R Engineering, Inc.

2160 Kingston Court, Suite 'O',
Marietta, GA 30067

TMC Data
SR 54 (W. Lanier Avenue) at Togwatee
Village Pkwy/Piedmont Fayette Driveway
07 09 AM - 04 - 06 PM

File Name : 20180034
Site Code : 20180034
Start Date : 3/6/2018
Page No : 3

	Togwatee Village Parkway Northbound				Piedmont Fayette Driveway Southbound				SR 54 (W. Lanier Avenue) Eastbound				SR 54 (W. Lanier Avenue) 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 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	13	2	12	27	28	1	7	36	29	280	11	320	39	336	28	403	786
05:00 PM	11	1	15	27	26	2	12	40	25	352	15	392	28	316	23	367	826
05:15 PM	18	1	20	39	29	2	8	39	24	394	18	436	23	320	25	368	882
05:30 PM	15	2	17	34	25	2	13	40	29	354	29	412	19	285	23	327	813
Total Volume	57	6	64	127	108	7	40	155	107	1380	73	1560	109	1257	99	1465	3307
% App. Total	44.9	4.7	50.4		69.7	4.5	25.8		6.9	88.5	4.7		7.4	85.8	6.8		
PHF	.792	.750	.800	.814	.931	.875	.769	.969	.922	.876	.629	.894	.699	.935	.884	.909	.937



A & R Engineering, Inc.

2160 Kingston Court, Suite 'O',
Marietta, GA 30067

TMC Data
SR 54 (W. Lanier Avenue) at
Ebenezer Road/Brittany Way
07 - 09 AM - 04 - 06 PM

File Name : 20180035
Site Code : 20180035
Start Date : 3/7/2018
Page No : 1

Groups Printed- Unshifted

	Ebenezer Road Northbound				Brittany Way Southbound				SR 54 (W. Lanier Avenue) Eastbound				SR 54 (W. Lanier Avenue) 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	0	46	52	2	2	2	6	0	164	7	171	23	143	2	168	397
07:15 AM	8	0	52	60	8	0	5	13	0	192	5	197	32	190	4	226	496
07:30 AM	9	0	56	65	7	1	7	15	2	263	7	272	47	237	2	286	638
07:45 AM	12	0	66	78	9	0	6	15	1	232	3	236	45	246	0	291	620
Total	35	0	220	255	26	3	20	49	3	851	22	876	147	816	8	971	2151
08:00 AM	9	0	66	75	7	0	1	8	0	250	8	258	29	212	4	245	586
08:15 AM	10	1	71	82	9	0	3	12	1	333	6	340	25	233	0	258	692
08:30 AM	7	1	28	36	2	2	5	9	1	218	8	227	36	226	2	264	536
08:45 AM	5	0	46	51	1	0	4	5	0	323	0	323	35	306	2	343	722
Total	31	2	211	244	19	2	13	34	2	1124	22	1148	125	977	8	1110	2536
*** BREAK ***																	
04:00 PM	8	0	33	41	2	0	6	8	2	360	15	377	40	245	3	288	714
04:15 PM	9	0	32	41	3	1	5	9	7	341	10	358	35	341	5	381	789
04:30 PM	4	1	35	40	1	0	2	3	2	333	12	347	53	297	2	352	742
04:45 PM	9	1	31	41	6	2	9	17	6	286	13	305	50	247	5	302	665
Total	30	2	131	163	12	3	22	37	17	1320	50	1387	178	1130	15	1323	2910
05:00 PM	6	1	29	36	1	0	6	7	4	429	14	447	65	318	7	390	880
05:15 PM	6	1	30	37	2	0	1	3	3	437	25	465	84	315	6	405	910
05:30 PM	9	1	59	69	2	0	9	11	4	302	11	317	61	267	5	333	730
05:45 PM	5	0	46	51	1	0	5	6	2	336	20	358	71	254	8	333	748
Total	26	3	164	193	6	0	21	27	13	1504	70	1587	281	1154	26	1461	3268
Grand Total	122	7	726	855	63	8	76	147	35	4799	164	4998	731	4077	57	4865	10865
Apprch %	14.3	0.8	84.9		42.9	5.4	51.7		0.7	96	3.3		15	83.8	1.2		
Total %	1.1	0.1	6.7	7.9	0.6	0.1	0.7	1.4	0.3	44.2	1.5	46	6.7	37.5	0.5	44.8	

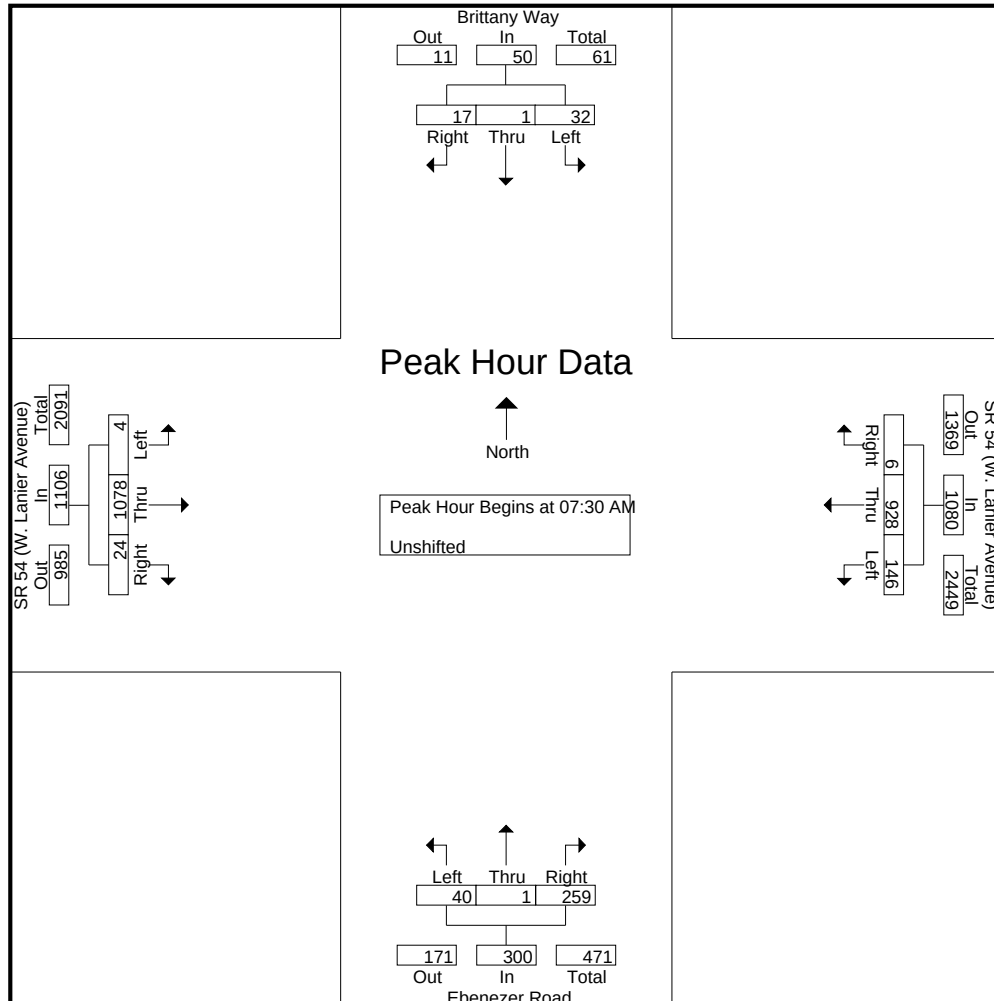
A & R Engineering, Inc.

2160 Kingston Court, Suite 'O',
Marietta, GA 30067

TMC Data
SR 54 (W. Lanier Avenue) at
Ebenezer Road/Brittany Way
07 - 09 AM - 04 - 06 PM

File Name : 20180035
Site Code : 20180035
Start Date : 3/7/2018
Page No : 2

	Ebenezer Road Northbound				Brittany Way Southbound				SR 54 (W. Lanier Avenue) Eastbound				SR 54 (W. Lanier Avenue) 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 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	9	0	56	65	7	1	7	15	2	263	7	272	47	237	2	286	638
07:45 AM	12	0	66	78	9	0	6	15	1	232	3	236	45	246	0	291	620
08:00 AM	9	0	66	75	7	0	1	8	0	250	8	258	29	212	4	245	586
08:15 AM	10	1	71	82	9	0	3	12	1	333	6	340	25	233	0	258	692
Total Volume	40	1	259	300	32	1	17	50	4	1078	24	1106	146	928	6	1080	2536
% App. Total	13.3	0.3	86.3		64	2	34		0.4	97.5	2.2		13.5	85.9	0.6		
PHF	.833	.250	.912	.915	.889	.250	.607	.833	.500	.809	.750	.813	.777	.943	.375	.928	.916



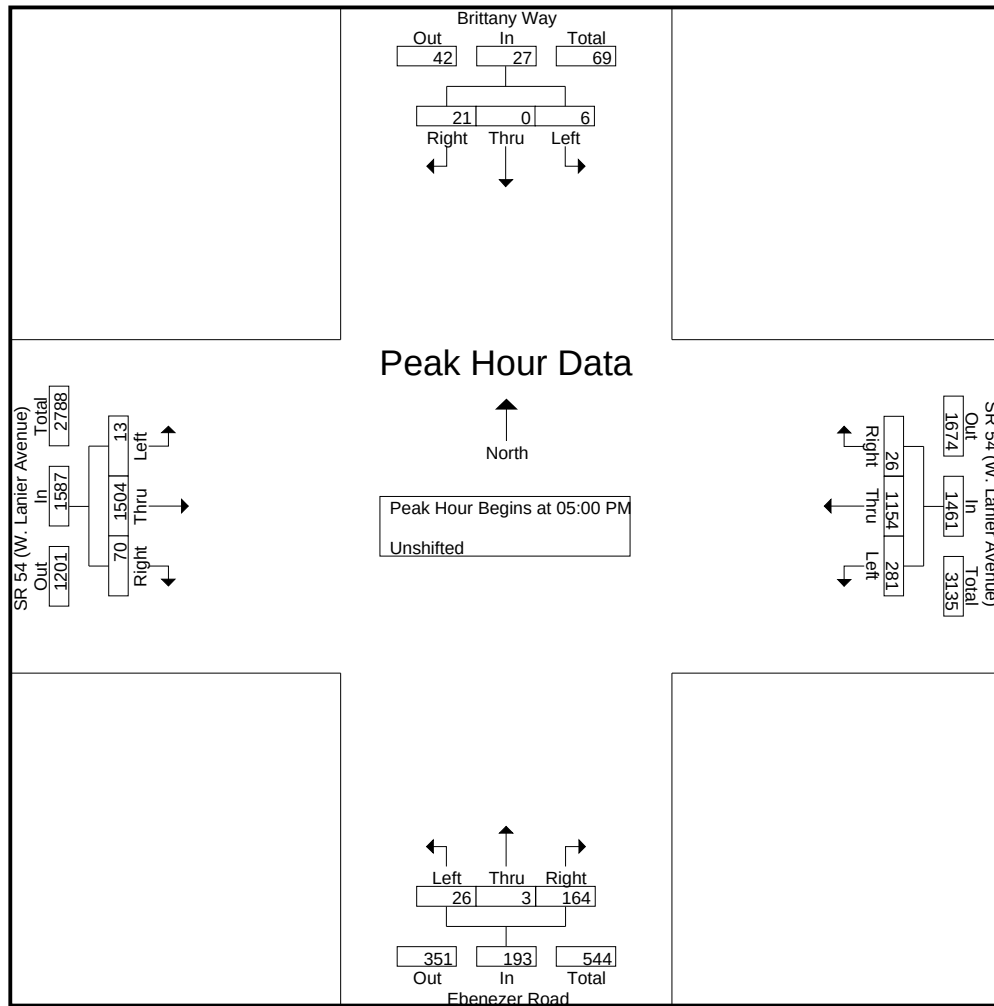
A & R Engineering, Inc.

2160 Kingston Court, Suite 'O',
Marietta, GA 30067

TMC Data
SR 54 (W. Lanier Avenue) at
Ebenezer Road/Brittany Way
07 - 09 AM - 04 - 06 PM

File Name : 20180035
Site Code : 20180035
Start Date : 3/7/2018
Page No : 3

	Ebenezer Road Northbound				Brittany Way Southbound				SR 54 (W. Lanier Avenue) Eastbound				SR 54 (W. Lanier Avenue) 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 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	6	1	29	36	1	0	6	7	4	429	14	447	65	318	7	390	880
05:15 PM	6	1	30	37	2	0	1	3	3	437	25	465	84	315	6	405	910
05:30 PM	9	1	59	69	2	0	9	11	4	302	11	317	61	267	5	333	730
05:45 PM	5	0	46	51	1	0	5	6	2	336	20	358	71	254	8	333	748
Total Volume	26	3	164	193	6	0	21	27	13	1504	70	1587	281	1154	26	1461	3268
% App. Total	13.5	1.6	85		22.2	0	77.8		0.8	94.8	4.4		19.2	79	1.8		
PHF	.722	.750	.695	.699	.750	.000	.583	.614	.813	.860	.700	.853	.836	.907	.813	.902	.898



A & R Engineering, Inc.

2160 Kingston Court, Suite 'O',
Marietta, GA 30067

TMC Data
SR 54 (W. Lanier Avenue) at Ginger Cake
Road/Burch Road
07 09 AM - 04 - 06 PM

File Name : 20180036
Site Code : 20180036
Start Date : 3/7/2018
Page No : 1

Groups Printed- Unshifted

	Burch Road Northbound				Ginger Cake Road Southbound				SR 54 (W. Lanere Road) Eastbound				SR 54 (W. Lanere Road) 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	3	5	2	10	28	2	46	76	54	295	0	349	2	259	12	273	708
07:15 AM	9	9	12	30	32	3	62	97	37	315	3	355	4	343	28	375	857
07:30 AM	5	5	8	18	38	5	89	132	57	310	2	369	4	385	21	410	929
07:45 AM	8	5	7	20	40	3	81	124	84	316	9	409	10	399	17	426	979
Total	25	24	29	78	138	13	278	429	232	1236	14	1482	20	1386	78	1484	3473
08:00 AM	6	3	2	11	26	3	45	74	83	293	3	379	8	387	28	423	887
08:15 AM	5	8	2	15	33	6	44	83	53	288	4	345	6	317	21	344	787
08:30 AM	10	7	6	23	43	3	58	104	56	240	6	302	6	340	38	384	813
08:45 AM	5	6	4	15	40	3	56	99	83	246	3	332	10	321	24	355	801
Total	26	24	14	64	142	15	203	360	275	1067	16	1358	30	1365	111	1506	3288
*** BREAK ***																	
04:00 PM	8	8	7	23	38	5	55	98	65	318	3	386	7	367	29	403	910
04:15 PM	6	5	9	20	43	4	61	108	56	325	5	386	9	356	25	390	904
04:30 PM	7	6	6	19	45	6	57	108	49	342	7	398	8	347	24	379	904
04:45 PM	5	4	8	17	38	5	53	96	46	349	4	399	6	359	22	387	899
Total	26	23	30	79	164	20	226	410	216	1334	19	1569	30	1429	100	1559	3617
05:00 PM	6	7	5	18	35	4	51	90	41	356	3	400	4	353	28	385	893
05:15 PM	5	6	7	18	41	6	48	95	44	391	5	440	7	362	26	395	948
05:30 PM	4	8	6	18	37	5	46	88	41	374	6	421	6	349	25	380	907
05:45 PM	7	5	8	20	32	3	43	78	38	315	3	356	5	325	21	351	805
Total	22	26	26	74	145	18	188	351	164	1436	17	1617	22	1389	100	1511	3553
Grand Total	99	97	99	295	589	66	895	1550	887	5073	66	6026	102	5569	389	6060	13931
Apprch %	33.6	32.9	33.6		38	4.3	57.7		14.7	84.2	1.1		1.7	91.9	6.4		
Total %	0.7	0.7	0.7	2.1	4.2	0.5	6.4	11.1	6.4	36.4	0.5	43.3	0.7	40	2.8	43.5	

A & R Engineering, Inc.

2160 Kingston Court, Suite 'O',
Marietta, GA 30067

TMC Data

SR 54 (W. Lanier Avenue) at Ginger Cake

Road/Burch Road

07 09 AM - 04 - 06 PM

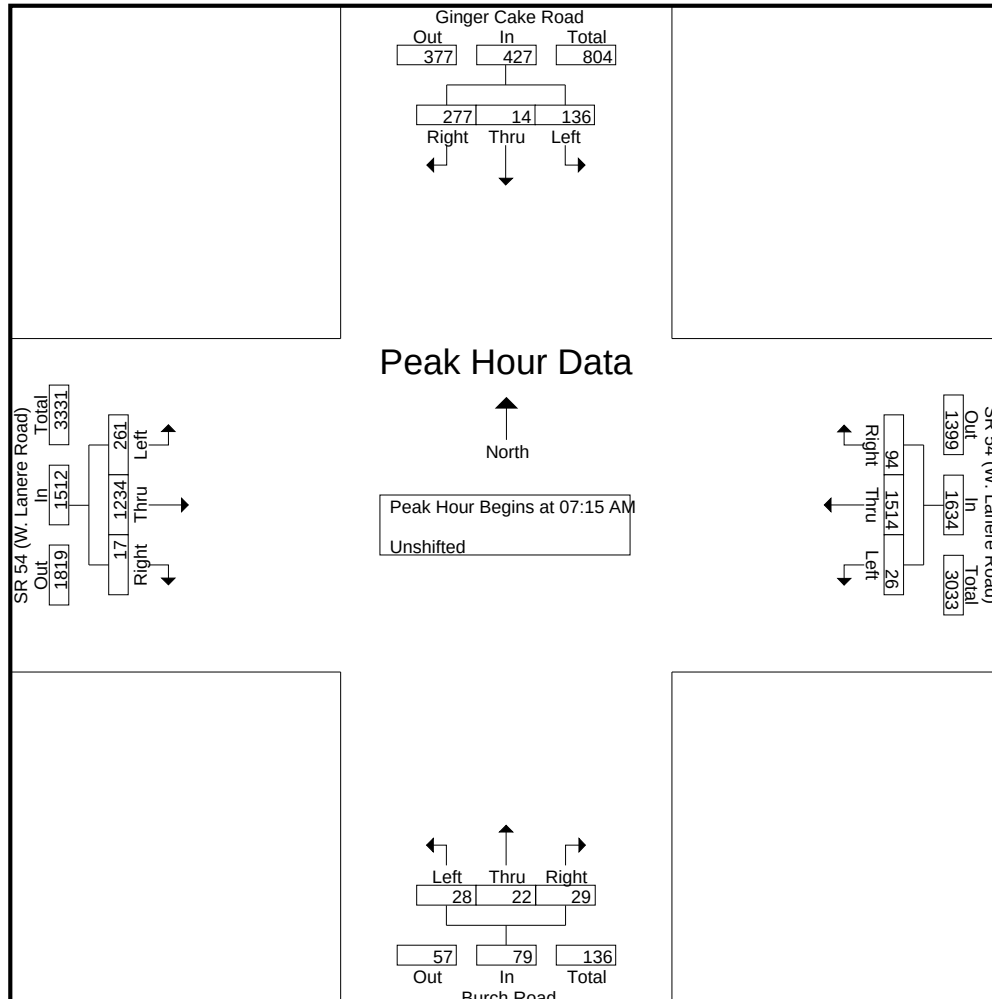
File Name : 20180036

Site Code : 20180036

Start Date : 3/7/2018

Page No : 2

	Burch Road Northbound				Ginger Cake Road Southbound				SR 54 (W. Lanere Road) Eastbound				SR 54 (W. Lanere Road) 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 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	9	9	12	30	32	3	62	97	37	315	3	355	4	343	28	375	857
07:30 AM	5	5	8	18	38	5	89	132	57	310	2	369	4	385	21	410	929
07:45 AM	8	5	7	20	40	3	81	124	84	316	9	409	10	399	17	426	979
08:00 AM	6	3	2	11	26	3	45	74	83	293	3	379	8	387	28	423	887
Total Volume	28	22	29	79	136	14	277	427	261	1234	17	1512	26	1514	94	1634	3652
% App. Total	35.4	27.8	36.7		31.9	3.3	64.9		17.3	81.6	1.1		1.6	92.7	5.8		
PHF	.778	.611	.604	.658	.850	.700	.778	.809	.777	.976	.472	.924	.650	.949	.839	.959	.933



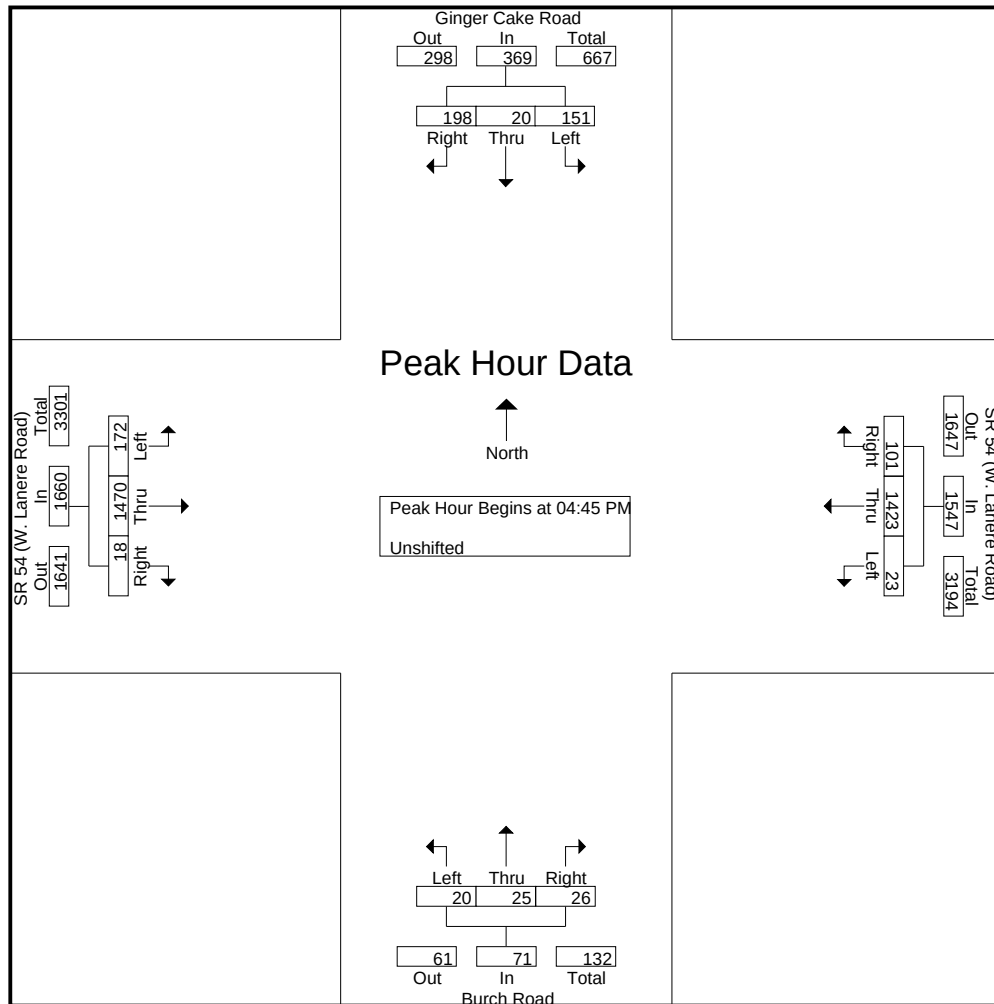
A & R Engineering, Inc.

2160 Kingston Court, Suite 'O',
Marietta, GA 30067

TMC Data
SR 54 (W. Lanier Avenue) at Ginger Cake
Road/Burch Road
07 09 AM - 04 - 06 PM

File Name : 20180036
Site Code : 20180036
Start Date : 3/7/2018
Page No : 3

	Burch Road Northbound				Ginger Cake Road Southbound				SR 54 (W. Lanere Road) Eastbound				SR 54 (W. Lanere Road) 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 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	5	4	8	17	38	5	53	96	46	349	4	399	6	359	22	387	899
05:00 PM	6	7	5	18	35	4	51	90	41	356	3	400	4	353	28	385	893
05:15 PM	5	6	7	18	41	6	48	95	44	391	5	440	7	362	26	395	948
05:30 PM	4	8	6	18	37	5	46	88	41	374	6	421	6	349	25	380	907
Total Volume	20	25	26	71	151	20	198	369	172	1470	18	1660	23	1423	101	1547	3647
% App. Total	28.2	35.2	36.6		40.9	5.4	53.7		10.4	88.6	1.1		1.5	92	6.5		
PHF	.833	.781	.813	.986	.921	.833	.934	.961	.935	.940	.750	.943	.821	.983	.902	.979	.962



A & R Engineering, Inc.

2160 Kingston Court, Suite 'O',
Marietta, GA 30067

TMC Data
SR 54 (W. Lanier Avenue) at
Brandywine Blvd./Oak Street
07 - 09 AM - 04 - 06 PM

File Name : 20180037
Site Code : 20180037
Start Date : 3/7/2018
Page No : 1

Groups Printed- Unshifted

	Oak Street Northbound				Brandywine Blvd. Southbound				SR 54 (W.Lanere Avenue) Eastbound				SR 54 (W.Lanere Avenue) 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	2	0	2	4	17	0	2	19	4	305	1	310	1	284	5	290	623
07:15 AM	3	0	4	7	14	0	4	18	3	325	0	328	2	357	8	367	720
07:30 AM	1	0	1	2	17	0	2	19	7	348	0	355	2	435	14	451	827
07:45 AM	1	0	0	1	15	0	2	17	5	352	0	357	2	452	19	473	848
Total	7	0	7	14	63	0	10	73	19	1330	1	1350	7	1528	46	1581	3018
08:00 AM	3	0	0	3	19	0	1	20	9	306	0	315	2	427	25	454	792
08:15 AM	0	0	4	4	19	0	1	20	6	312	0	318	2	335	42	379	721
08:30 AM	3	0	0	3	16	0	5	21	4	275	0	279	1	385	38	424	727
08:45 AM	3	0	3	6	15	0	0	15	6	263	0	269	1	347	36	384	674
Total	9	0	7	16	69	0	7	76	25	1156	0	1181	6	1494	141	1641	2914
*** BREAK ***																	
04:00 PM	4	0	1	5	18	0	8	26	3	378	4	385	2	376	41	419	835
04:15 PM	3	0	1	4	22	0	6	28	4	385	0	389	2	379	14	395	816
04:30 PM	2	0	2	4	25	1	9	35	5	415	3	423	3	365	12	380	842
04:45 PM	1	0	1	2	35	0	12	47	6	416	1	423	1	373	16	390	862
Total	10	0	5	15	100	1	35	136	18	1594	8	1620	8	1493	83	1584	3355
05:00 PM	2	0	1	3	38	1	14	53	4	425	2	431	2	385	18	405	892
05:15 PM	1	0	2	3	32	1	10	43	6	435	3	444	3	382	15	400	890
05:30 PM	2	0	1	3	25	1	9	35	8	428	5	441	2	377	14	393	872
05:45 PM	1	0	1	2	28	0	8	36	7	426	2	435	4	365	15	384	857
Total	6	0	5	11	123	3	41	167	25	1714	12	1751	11	1509	62	1582	3511
Grand Total	32	0	24	56	355	4	93	452	87	5794	21	5902	32	6024	332	6388	12798
Apprch %	57.1	0	42.9		78.5	0.9	20.6		1.5	98.2	0.4		0.5	94.3	5.2		
Total %	0.3	0	0.2	0.4	2.8	0	0.7	3.5	0.7	45.3	0.2	46.1	0.3	47.1	2.6	49.9	

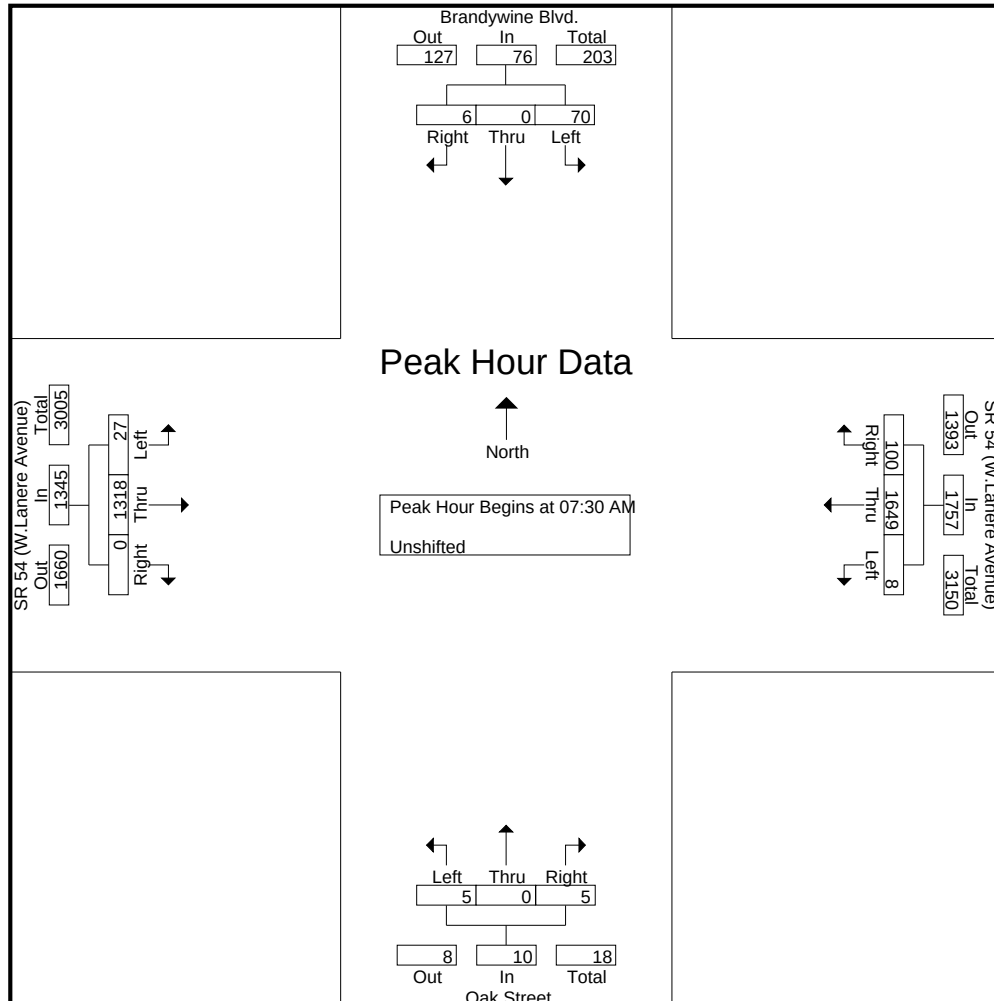
A & R Engineering, Inc.

2160 Kingston Court, Suite 'O',
Marietta, GA 30067

TMC Data
SR 54 (W. Lanier Avenue) at
Brandywine Blvd./Oak Street
07 - 09 AM - 04 - 06 PM

File Name : 20180037
Site Code : 20180037
Start Date : 3/7/2018
Page No : 2

	Oak Street Northbound				Brandywine Blvd. Southbound				SR 54 (W.Lanere Avenue) Eastbound				SR 54 (W.Lanere Avenue) 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 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	1	0	1	2	17	0	2	19	7	348	0	355	2	435	14	451	827
07:45 AM	1	0	0	1	15	0	2	17	5	352	0	357	2	452	19	473	848
08:00 AM	3	0	0	3	19	0	1	20	9	306	0	315	2	427	25	454	792
08:15 AM	0	0	4	4	19	0	1	20	6	312	0	318	2	335	42	379	721
Total Volume	5	0	5	10	70	0	6	76	27	1318	0	1345	8	1649	100	1757	3188
% App. Total	50	0	50		92.1	0	7.9		2	98	0		0.5	93.9	5.7		
PHF	.417	.000	.313	.625	.921	.000	.750	.950	.750	.936	.000	.942	1.00	.912	.595	.929	.940



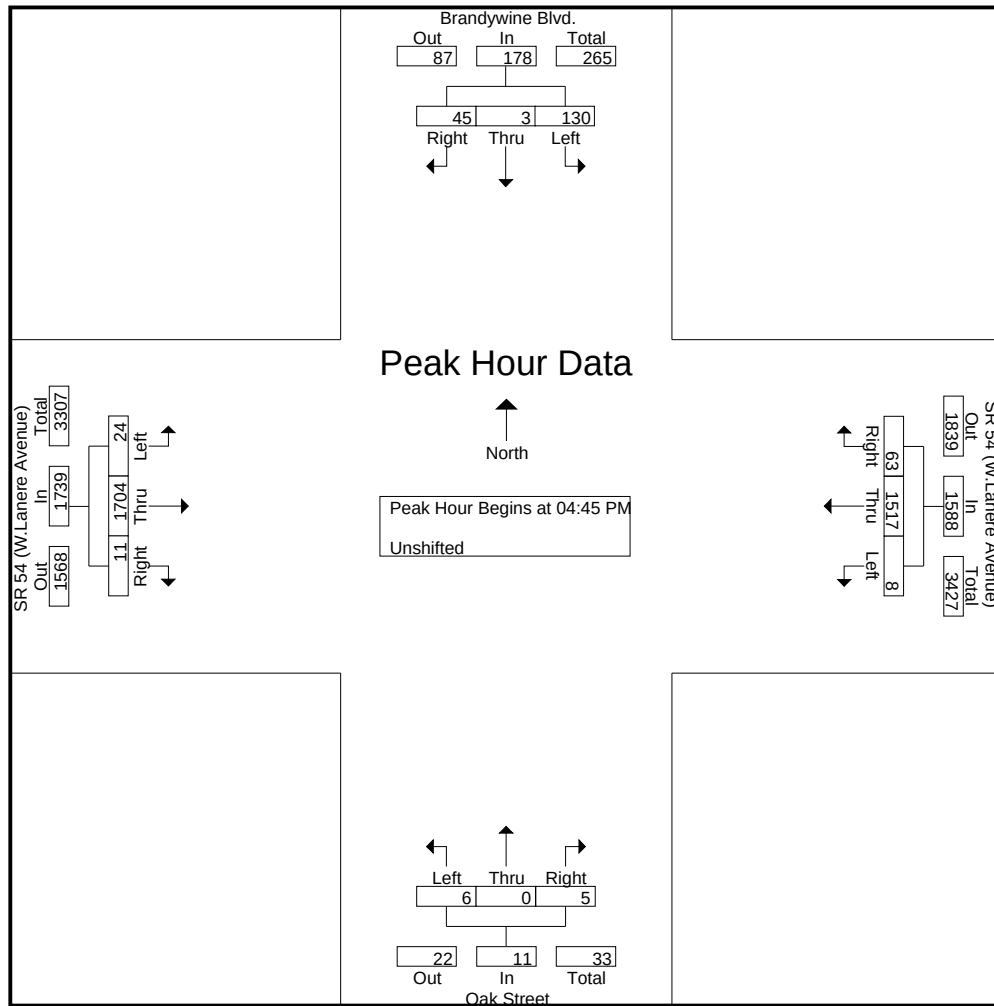
A & R Engineering, Inc.

2160 Kingston Court, Suite 'O',
Marietta, GA 30067

TMC Data
SR 54 (W. Lanier Avenue) at
Brandywine Blvd./Oak Street
07 - 09 AM - 04 - 06 PM

File Name : 20180037
Site Code : 20180037
Start Date : 3/7/2018
Page No : 3

	Oak Street Northbound				Brandywine Blvd. Southbound				SR 54 (W.Lanere Avenue) Eastbound				SR 54 (W.Lanere Avenue) 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 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	1	0	1	2	35	0	12	47	6	416	1	423	1	373	16	390	862
05:00 PM	2	0	1	3	38	1	14	53	4	425	2	431	2	385	18	405	892
05:15 PM	1	0	2	3	32	1	10	43	6	435	3	444	3	382	15	400	890
05:30 PM	2	0	1	3	25	1	9	35	8	428	5	441	2	377	14	393	872
Total Volume	6	0	5	11	130	3	45	178	24	1704	11	1739	8	1517	63	1588	3516
% App. Total	54.5	0	45.5		73	1.7	25.3		1.4	98	0.6		0.5	95.5	4		
PHF	.750	.000	.625	.917	.855	.750	.804	.840	.750	.979	.550	.979	.667	.985	.875	.980	.985



A & R Engineering, Inc.

2160 Kingston Court, Suite 'O',
Marietta, GA 30067

TMC Data
SR 54 (W. Lanier Avenue) at
Grady Avenue/Sharon Drive
07 - 09 AM - 04 -06 PM

File Name : 20180038
Site Code : 20180038
Start Date : 3/7/2018
Page No : 1

Groups Printed- Unshifted

	Grady Avenue Northbound				Sharon Drive Southbound				SR 54 (W. Lanere Avenue) Eastbound				SR 54 (W. Lanere Avenue) 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	70	1	15	86	1	0	0	1	0	158	108	266	36	243	0	279	632
07:15 AM	125	0	37	162	3	2	2	7	5	215	97	317	98	248	1	347	833
07:30 AM	182	0	42	224	2	1	0	3	1	232	144	377	65	303	0	368	972
07:45 AM	171	0	62	233	5	6	3	14	3	293	128	424	36	326	3	365	1036
Total	548	1	156	705	11	9	5	25	9	898	477	1384	235	1120	4	1359	3473
08:00 AM	143	0	46	189	2	5	4	11	3	254	96	353	53	315	0	368	921
08:15 AM	144	0	47	191	1	3	2	6	5	242	109	356	41	312	2	355	908
08:30 AM	133	0	31	164	4	4	0	8	1	205	111	317	39	305	0	344	833
08:45 AM	134	0	40	174	3	2	6	11	0	208	107	315	36	292	3	331	831
Total	554	0	164	718	10	14	12	36	9	909	423	1341	169	1224	5	1398	3493
*** BREAK ***																	
04:00 PM	121	3	49	173	3	4	3	10	2	257	132	391	65	317	4	386	960
04:15 PM	103	3	38	144	1	3	0	4	5	272	166	443	36	315	3	354	945
04:30 PM	115	1	35	151	2	2	1	5	4	262	187	453	43	313	2	358	967
04:45 PM	118	4	28	150	3	2	2	7	3	265	195	463	38	318	1	357	977
Total	457	11	150	618	9	11	6	26	14	1056	680	1750	182	1263	10	1455	3849
05:00 PM	113	1	21	135	2	3	1	6	1	273	204	478	26	321	2	349	968
05:15 PM	89	2	23	114	2	4	2	8	2	293	191	486	43	273	1	317	925
05:30 PM	87	2	20	109	0	1	0	1	5	303	174	482	41	256	1	298	890
05:45 PM	95	3	28	126	3	1	3	7	4	279	162	445	32	235	2	269	847
Total	384	8	92	484	7	9	6	22	12	1148	731	1891	142	1085	6	1233	3630
Grand Total	1943	20	562	2525	37	43	29	109	44	4011	2311	6366	728	4692	25	5445	14445
Apprch %	77	0.8	22.3		33.9	39.4	26.6		0.7	63	36.3		13.4	86.2	0.5		
Total %	13.5	0.1	3.9	17.5	0.3	0.3	0.2	0.8	0.3	27.8	16	44.1	5	32.5	0.2	37.7	

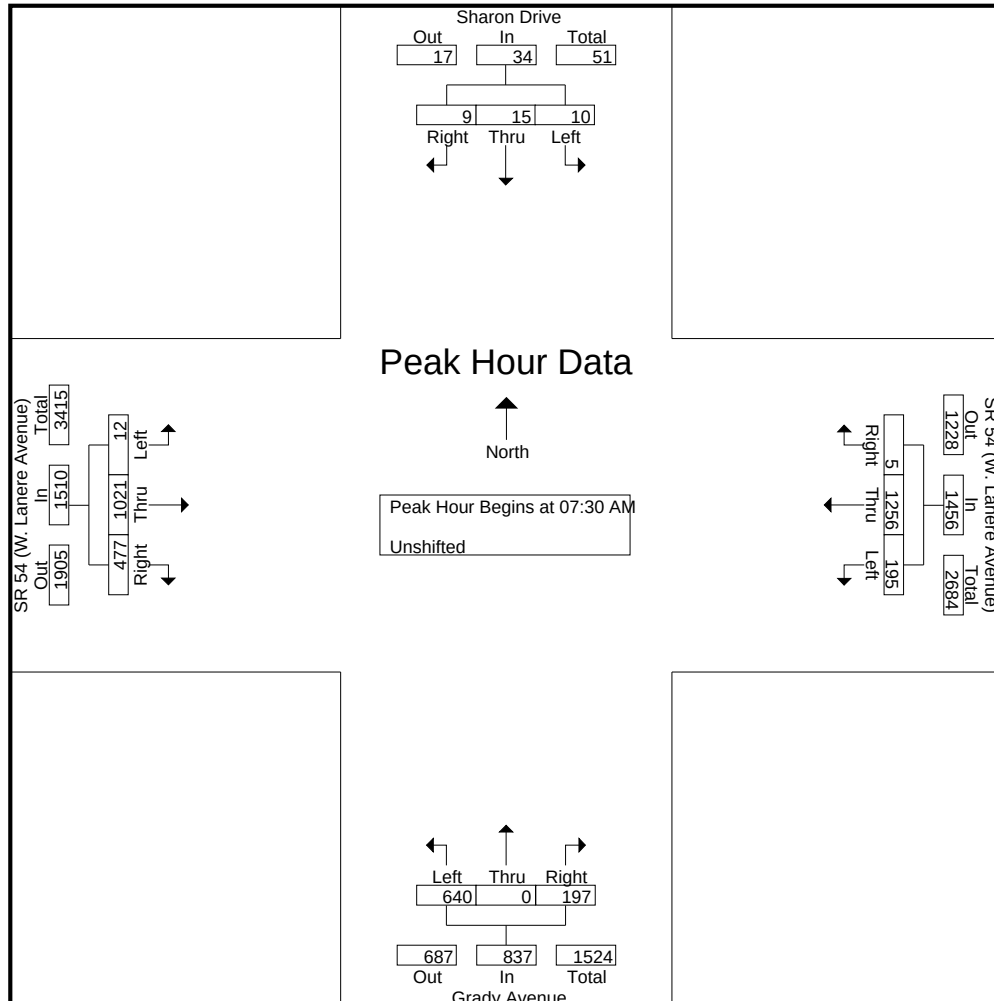
A & R Engineering, Inc.

2160 Kingston Court, Suite 'O',
Marietta, GA 30067

TMC Data
SR 54 (W. Lanier Avenue) at
Grady Avenue/Sharon Drive
07 - 09 AM - 04 -06 PM

File Name : 20180038
Site Code : 20180038
Start Date : 3/7/2018
Page No : 2

	Grady Avenue Northbound				Sharon Drive Southbound				SR 54 (W. Lanere Avenue) Eastbound				SR 54 (W. Lanere Avenue) 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 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	182	0	42	224	2	1	0	3	1	232	144	377	65	303	0	368	972
07:45 AM	171	0	62	233	5	6	3	14	3	293	128	424	36	326	3	365	1036
08:00 AM	143	0	46	189	2	5	4	11	3	254	96	353	53	315	0	368	921
08:15 AM	144	0	47	191	1	3	2	6	5	242	109	356	41	312	2	355	908
Total Volume	640	0	197	837	10	15	9	34	12	1021	477	1510	195	1256	5	1456	3837
% App. Total	76.5	0	23.5		29.4	44.1	26.5		0.8	67.6	31.6		13.4	86.3	0.3		
PHF	.879	.000	.794	.898	.500	.625	.563	.607	.600	.871	.828	.890	.750	.963	.417	.989	.926



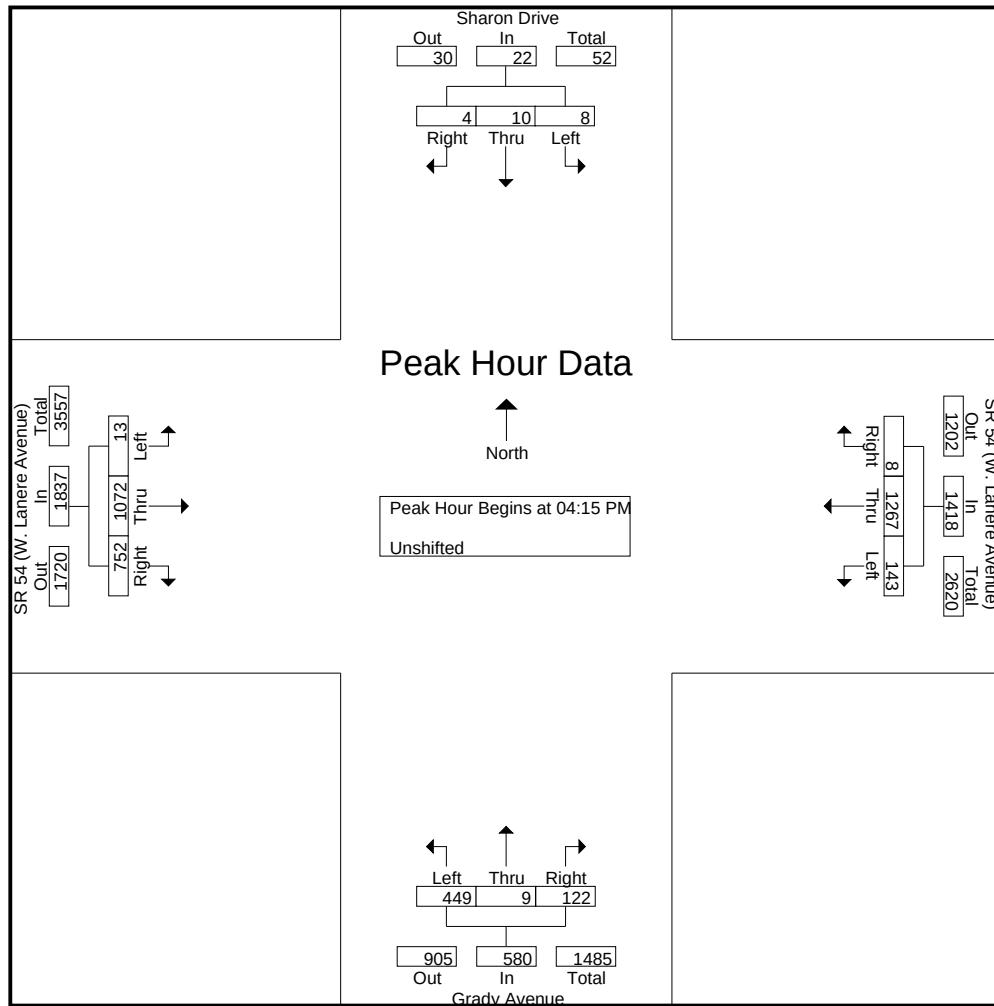
A & R Engineering, Inc.

2160 Kingston Court, Suite 'O',
Marietta, GA 30067

TMC Data
SR 54 (W. Lanier Avenue) at
Grady Avenue/Sharon Drive
07 - 09 AM - 04 -06 PM

File Name : 20180038
Site Code : 20180038
Start Date : 3/7/2018
Page No : 3

	Grady Avenue Northbound				Sharon Drive Southbound				SR 54 (W. Lanere Avenue) Eastbound				SR 54 (W. Lanere Avenue) 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 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	103	3	38	144	1	3	0	4	5	272	166	443	36	315	3	354	945
04:30 PM	115	1	35	151	2	2	1	5	4	262	187	453	43	313	2	358	967
04:45 PM	118	4	28	150	3	2	2	7	3	265	195	463	38	318	1	357	977
05:00 PM	113	1	21	135	2	3	1	6	1	273	204	478	26	321	2	349	968
Total Volume	449	9	122	580	8	10	4	22	13	1072	752	1837	143	1267	8	1418	3857
% App. Total	77.4	1.6	21		36.4	45.5	18.2		0.7	58.4	40.9		10.1	89.4	0.6		
PHF	.951	.563	.803	.960	.667	.833	.500	.786	.650	.982	.922	.961	.831	.987	.667	.990	.987



A & R Engineering, Inc.

2160 Kingston Court, Suite 'O',
Marietta, GA 30067

TMC Data
Ginger Cake Road at Hood Avenue
07 - 09 AM - 04 - 06 PM

File Name : 20180039
Site Code : 20180039
Start Date : 3/8/2018
Page No : 1

Groups Printed- Unshifted

	Ginger Cake Road Northbound				Ginger Cake Road Southbound				Hood Avenue Eastbound				Hood Avenue 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	36	34	70	13	51	1	65	1	2	0	3	15	0	2	17	155
07:15 AM	2	48	19	69	27	66	0	93	1	0	0	1	22	1	15	38	201
07:30 AM	0	35	21	56	14	59	2	75	2	1	0	3	38	0	16	54	188
07:45 AM	2	33	38	73	12	75	0	87	0	3	3	6	44	1	9	54	220
Total	4	152	112	268	66	251	3	320	4	6	3	13	119	2	42	163	764
08:00 AM	1	54	43	98	12	52	1	65	1	4	1	6	17	2	9	28	197
08:15 AM	2	57	48	107	9	58	1	68	1	0	0	1	22	0	12	34	210
08:30 AM	2	53	45	100	11	56	2	69	2	0	0	2	16	1	13	30	201
08:45 AM	2	47	37	86	12	51	1	64	1	0	0	1	15	2	11	28	179
Total	7	211	173	391	44	217	5	266	5	4	1	10	70	5	45	120	787
*** BREAK ***																	
04:00 PM	4	63	31	98	9	52	1	62	1	0	0	1	40	1	17	58	219
04:15 PM	2	72	30	104	8	60	3	71	1	0	0	1	35	2	14	51	227
04:30 PM	2	58	45	105	16	62	0	78	1	1	0	2	38	3	12	53	238
04:45 PM	1	76	46	123	12	66	3	81	0	0	1	1	25	1	13	39	244
Total	9	269	152	430	45	240	7	292	3	1	1	5	138	7	56	201	928
05:00 PM	3	89	47	139	4	52	1	57	3	3	2	8	37	8	18	63	267
05:15 PM	2	93	42	137	9	62	1	72	2	1	2	5	51	3	14	68	282
05:30 PM	1	73	37	111	11	71	0	82	2	3	5	10	38	4	13	55	258
05:45 PM	1	76	42	119	4	52	2	58	1	3	2	6	40	2	12	54	237
Total	7	331	168	506	28	237	4	269	8	10	11	29	166	17	57	240	1044
Grand Total	27	963	605	1595	183	945	19	1147	20	21	16	57	493	31	200	724	3523
Apprch %	1.7	60.4	37.9		16	82.4	1.7		35.1	36.8	28.1		68.1	4.3	27.6		
Total %	0.8	27.3	17.2	45.3	5.2	26.8	0.5	32.6	0.6	0.6	0.5	1.6	14	0.9	5.7	20.6	

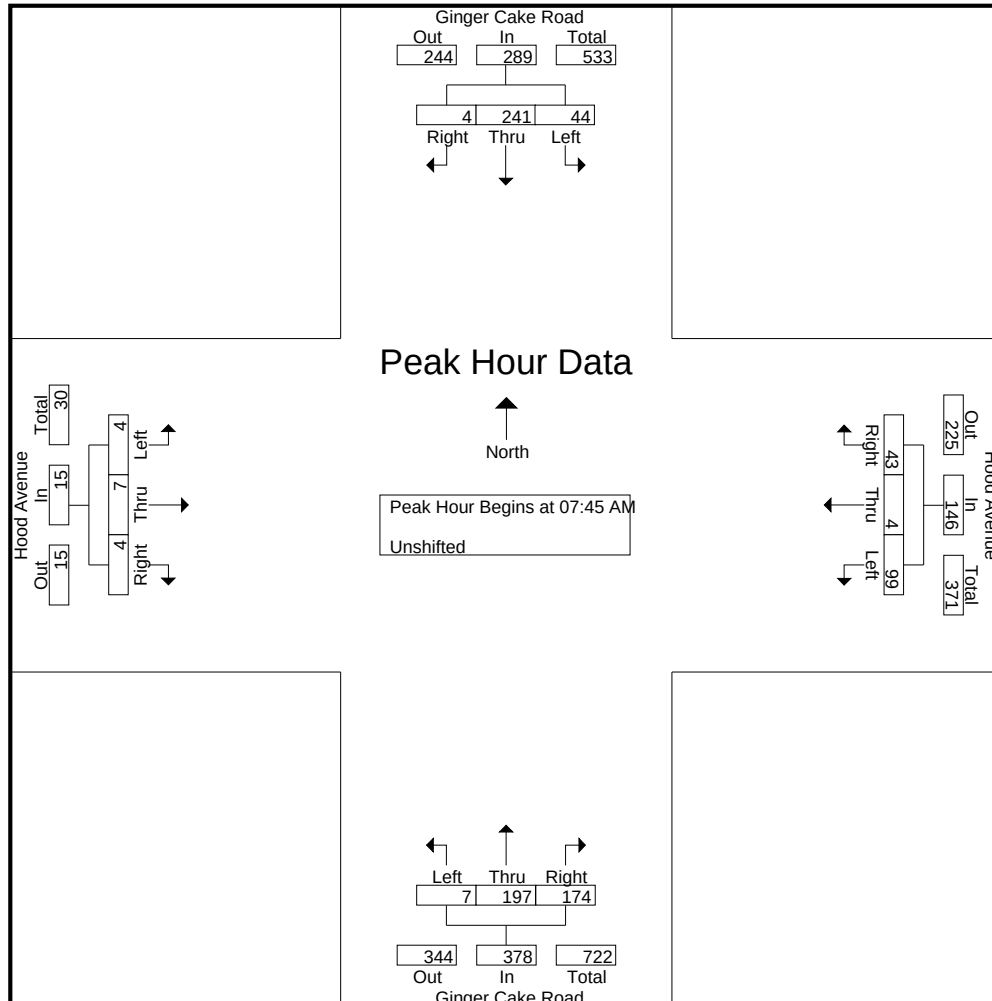
A & R Engineering, Inc.

2160 Kingston Court, Suite 'O',
Marietta, GA 30067

TMC Data
Ginger Cake Road at Hood Avenue
07 - 09 AM - 04 - 06 PM

File Name : 20180039
Site Code : 20180039
Start Date : 3/8/2018
Page No : 2

	Ginger Cake Road Northbound				Ginger Cake Road Southbound				Hood Avenue Eastbound				Hood Avenue 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 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	2	33	38	73	12	75	0	87	0	3	3	6	44	1	9	54	220
08:00 AM	1	54	43	98	12	52	1	65	1	4	1	6	17	2	9	28	197
08:15 AM	2	57	48	107	9	58	1	68	1	0	0	1	22	0	12	34	210
08:30 AM	2	53	45	100	11	56	2	69	2	0	0	2	16	1	13	30	201
Total Volume	7	197	174	378	44	241	4	289	4	7	4	15	99	4	43	146	828
% App. Total	1.9	52.1	46		15.2	83.4	1.4		26.7	46.7	26.7		67.8	2.7	29.5		
PHF	.875	.864	.906	.883	.917	.803	.500	.830	.500	.438	.333	.625	.563	.500	.827	.676	.941



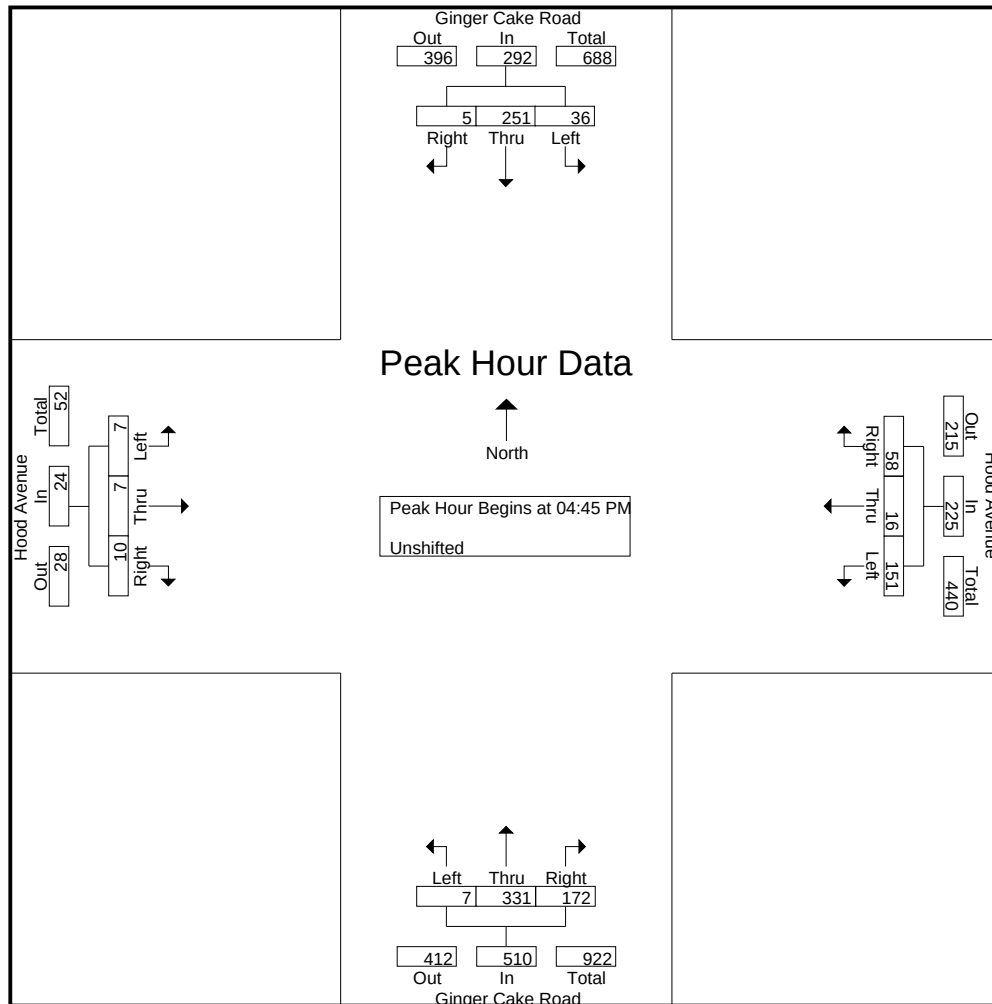
A & R Engineering, Inc.

2160 Kingston Court, Suite 'O',
Marietta, GA 30067

TMC Data
Ginger Cake Road at Hood Avenue
07 - 09 AM - 04 - 06 PM

File Name : 20180039
Site Code : 20180039
Start Date : 3/8/2018
Page No : 3

	Ginger Cake Road Northbound				Ginger Cake Road Southbound				Hood Avenue Eastbound				Hood Avenue 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 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	1	76	46	123	12	66	3	81	0	0	1	1	25	1	13	39	244
05:00 PM	3	89	47	139	4	52	1	57	3	3	2	8	37	8	18	63	267
05:15 PM	2	93	42	137	9	62	1	72	2	1	2	5	51	3	14	68	282
05:30 PM	1	73	37	111	11	71	0	82	2	3	5	10	38	4	13	55	258
Total Volume	7	331	172	510	36	251	5	292	7	7	10	24	151	16	58	225	1051
% App. Total	1.4	64.9	33.7		12.3	86	1.7		29.2	29.2	41.7		67.1	7.1	25.8		
PHF	.583	.890	.915	.917	.750	.884	.417	.890	.583	.583	.500	.600	.740	.500	.806	.827	.932



A & R Engineering, Inc.

2160 Kingston Court, Suite 'O',
Marietta, GA 30067

TMC Data

S. Sandy Creek Road at Piemont Fayette Drwy

07 - 09 AM - 04 - 06 PM

File Name : 20180040

Site Code : 20180040

Start Date : 3/8/2018

Page No : 1

Groups Printed- Unshifted

	S. Sandy Creek Road Northbound				S. Sandy Creek Road Southbound				Piedmont Fayette Driveway Eastbound				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	10	34	0	44	0	24	5	29	2	0	10	12	0	0	1	1	86
07:15 AM	19	40	0	59	0	38	8	46	5	0	35	40	0	0	0	0	145
07:30 AM	35	74	0	109	0	81	26	107	4	0	33	37	0	0	0	0	253
07:45 AM	45	62	0	107	0	71	35	106	3	0	22	25	0	0	0	0	238
Total	109	210	0	319	0	214	74	288	14	0	100	114	0	0	1	1	722
08:00 AM	33	48	0	81	0	56	23	79	2	0	16	18	0	0	0	0	178
08:15 AM	24	33	0	57	0	40	18	58	4	0	14	18	0	0	0	0	133
08:30 AM	17	48	0	65	0	28	10	38	3	0	11	14	0	0	0	0	117
08:45 AM	15	28	0	43	0	26	12	38	1	0	8	9	0	0	0	0	90
Total	89	157	0	246	0	150	63	213	10	0	49	59	0	0	0	0	518
*** BREAK ***																	
04:00 PM	9	23	0	32	0	35	15	50	3	0	9	12	0	0	0	0	94
04:15 PM	2	27	0	29	0	50	6	56	8	0	14	22	0	0	0	0	107
04:30 PM	4	22	0	26	0	26	3	29	11	0	13	24	0	0	0	0	79
04:45 PM	7	21	0	28	0	19	6	25	11	0	30	41	0	0	0	0	94
Total	22	93	0	115	0	130	30	160	33	0	66	99	0	0	0	0	374
05:00 PM	3	39	0	42	0	37	2	39	9	0	24	33	0	0	0	0	114
05:15 PM	6	32	0	38	0	39	6	45	13	1	26	40	0	0	0	0	123
05:30 PM	10	56	0	66	0	72	7	79	13	0	26	39	0	0	0	0	184
05:45 PM	5	28	0	33	0	29	5	34	8	0	12	20	0	0	0	0	87
Total	24	155	0	179	0	177	20	197	43	1	88	132	0	0	0	0	508
Grand Total	244	615	0	859	0	671	187	858	100	1	303	404	0	0	1	1	2122
Apprch %	28.4	71.6	0		0	78.2	21.8		24.8	0.2	75		0	0	100		
Total %	11.5	29	0	40.5	0	31.6	8.8	40.4	4.7	0	14.3	19	0	0	0	0	

A & R Engineering, Inc.

2160 Kingston Court, Suite 'O',
Marietta, GA 30067

TMC Data

S. Sandy Creek Road at Piedmont Fayette Drwy

07 - 09 AM - 04 - 06 PM

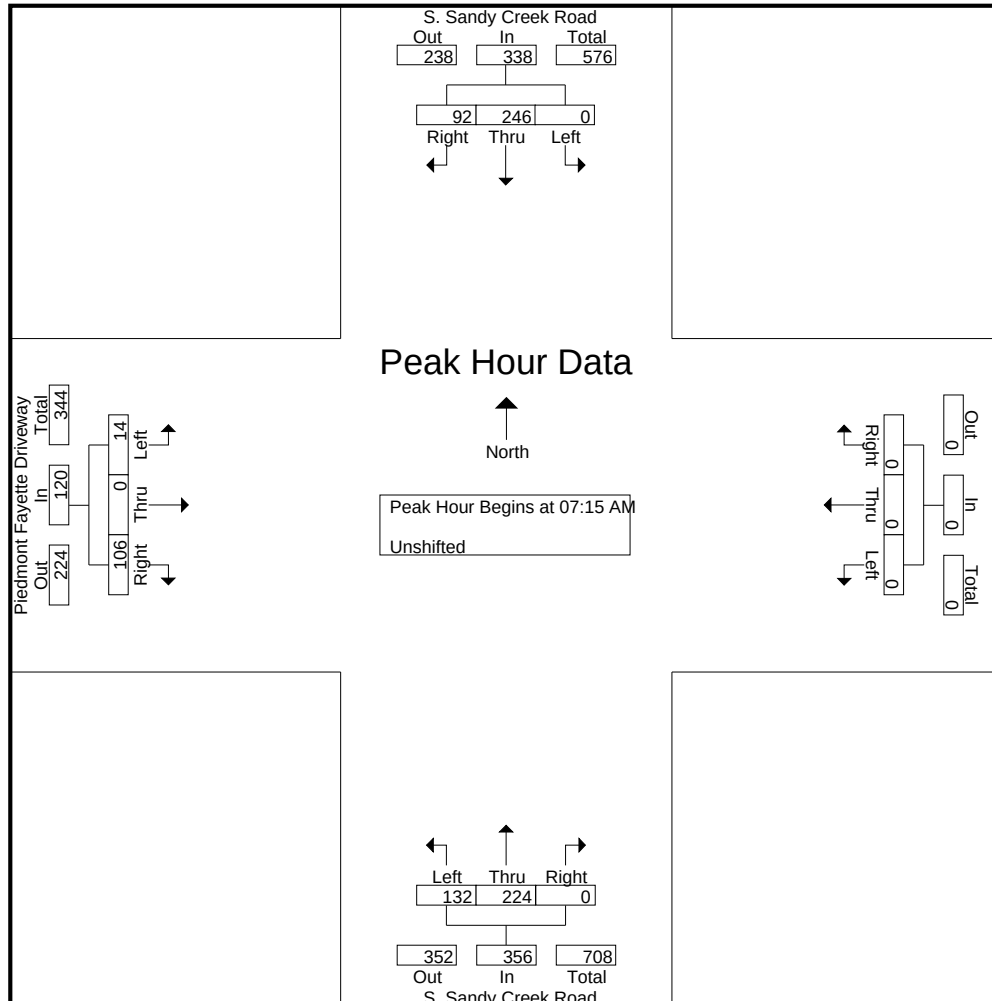
File Name : 20180040

Site Code : 20180040

Start Date : 3/8/2018

Page No : 2

	S. Sandy Creek Road Northbound				S. Sandy Creek Road Southbound				Piedmont Fayette Driveway Eastbound				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 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	19	40	0	59	0	38	8	46	5	0	35	40	0	0	0	0	145
07:30 AM	35	74	0	109	0	81	26	107	4	0	33	37	0	0	0	0	253
07:45 AM	45	62	0	107	0	71	35	106	3	0	22	25	0	0	0	0	238
08:00 AM	33	48	0	81	0	56	23	79	2	0	16	18	0	0	0	0	178
Total Volume	132	224	0	356	0	246	92	338	14	0	106	120	0	0	0	0	814
% App. Total	37.1	62.9	0		0	72.8	27.2		11.7	0	88.3		0	0	0		
PHF	.733	.757	.000	.817	.000	.759	.657	.790	.700	.000	.757	.750	.000	.000	.000	.000	.804



A & R Engineering, Inc.

2160 Kingston Court, Suite 'O',
Marietta, GA 30067

TMC Data

S. Sandy Creek Road at Piedmont Fayette Drwy

07 - 09 AM - 04 - 06 PM

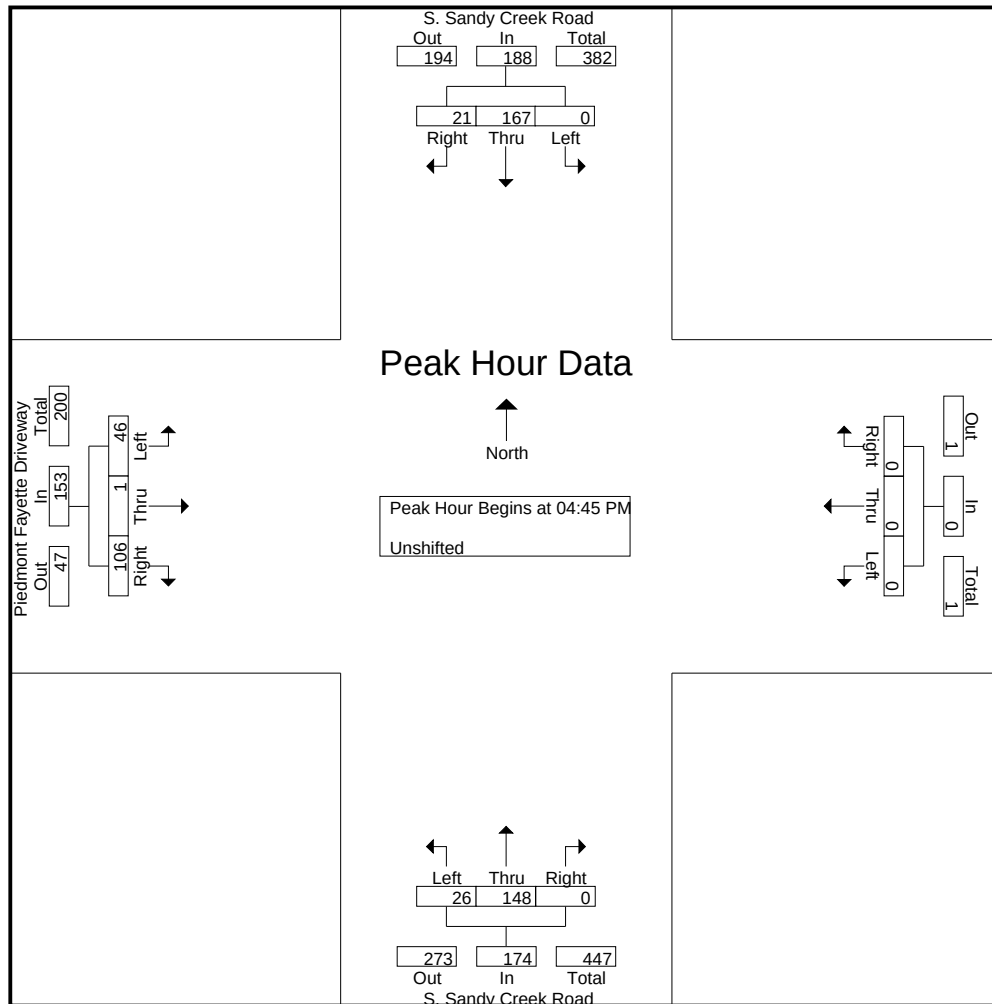
File Name : 20180040

Site Code : 20180040

Start Date : 3/8/2018

Page No : 3

	S. Sandy Creek Road Northbound				S. Sandy Creek Road Southbound				Piedmont Fayette Driveway Eastbound				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 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	7	21	0	28	0	19	6	25	11	0	30	41	0	0	0	0	94
05:00 PM	3	39	0	42	0	37	2	39	9	0	24	33	0	0	0	0	114
05:15 PM	6	32	0	38	0	39	6	45	13	1	26	40	0	0	0	0	123
05:30 PM	10	56	0	66	0	72	7	79	13	0	26	39	0	0	0	0	184
Total Volume	26	148	0	174	0	167	21	188	46	1	106	153	0	0	0	0	515
% App. Total	14.9	85.1	0		0	88.8	11.2		30.1	0.7	69.3		0	0	0		
PHF	.650	.661	.000	.659	.000	.580	.750	.595	.885	.250	.883	.933	.000	.000	.000	.000	.700



A & R Engineering, Inc.

2160 Kingston Court, Suite 'O',
Marietta, GA 30067

TMC Data

Veterans Parkway at S. Sandy Creek Road

07- 09 AM - 04 - 06 PM

File Name : 20180041

Site Code : 20180041

Start Date : 3/8/2018

Page No : 1

Groups Printed- Unshifted

	Veterans Parkway Northbound				Veterans Parkway Southbound				Eastbound				S. Sandy Creek Road 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	57	14	71	36	40	0	76	0	0	0	0	0	0	30	30	177
07:15 AM	0	52	1	53	34	49	0	83	0	0	0	0	0	0	40	40	176
07:30 AM	0	64	1	65	63	52	0	115	0	0	0	0	1	0	62	63	243
07:45 AM	0	91	5	96	85	80	0	165	0	0	0	0	0	0	34	34	295
Total	0	264	21	285	218	221	0	439	0	0	0	0	1	0	166	167	891
08:00 AM	0	59	2	61	62	42	0	104	0	0	0	0	1	0	45	46	211
08:15 AM	0	56	2	58	52	36	0	88	0	0	0	0	0	0	34	34	180
08:30 AM	0	43	1	44	54	32	0	86	0	0	0	0	1	0	25	26	156
08:45 AM	0	41	5	46	49	31	0	80	0	0	0	0	0	0	37	37	163
Total	0	199	10	209	217	141	0	358	0	0	0	0	2	0	141	143	710
*** BREAK ***																	
04:00 PM	0	35	2	37	34	32	0	66	0	0	0	0	0	0	23	23	126
04:15 PM	0	47	1	48	58	45	0	103	0	0	0	0	3	0	47	50	201
04:30 PM	0	41	4	45	39	53	0	92	0	0	0	0	2	0	33	35	172
04:45 PM	0	49	0	49	28	76	0	104	0	0	0	0	3	0	40	43	196
Total	0	172	7	179	159	206	0	365	0	0	0	0	8	0	143	151	695
05:00 PM	0	40	2	42	41	50	0	91	0	0	0	0	3	0	49	52	185
05:15 PM	0	37	1	38	41	63	0	104	0	0	0	0	1	0	54	55	197
05:30 PM	0	62	0	62	50	94	0	144	0	0	0	0	0	0	57	57	263
05:45 PM	0	50	3	53	35	75	0	110	0	0	0	0	3	0	54	57	220
Total	0	189	6	195	167	282	0	449	0	0	0	0	7	0	214	221	865
06:00 PM	0	55	1	56	32	73	0	105	0	0	0	0	2	0	38	40	201
Grand Total	0	879	45	924	793	923	0	1716	0	0	0	0	20	0	702	722	3362
Apprch %	0	95.1	4.9		46.2	53.8	0		0	0	0		2.8	0	97.2		
Total %	0	26.1	1.3	27.5	23.6	27.5	0	51	0	0	0	0	0.6	0	20.9	21.5	

A & R Engineering, Inc.

2160 Kingston Court, Suite 'O',
Marietta, GA 30067

TMC Data

Veterans Parkway at S. Sandy Creek Road

07- 09 AM - 04 - 06 PM

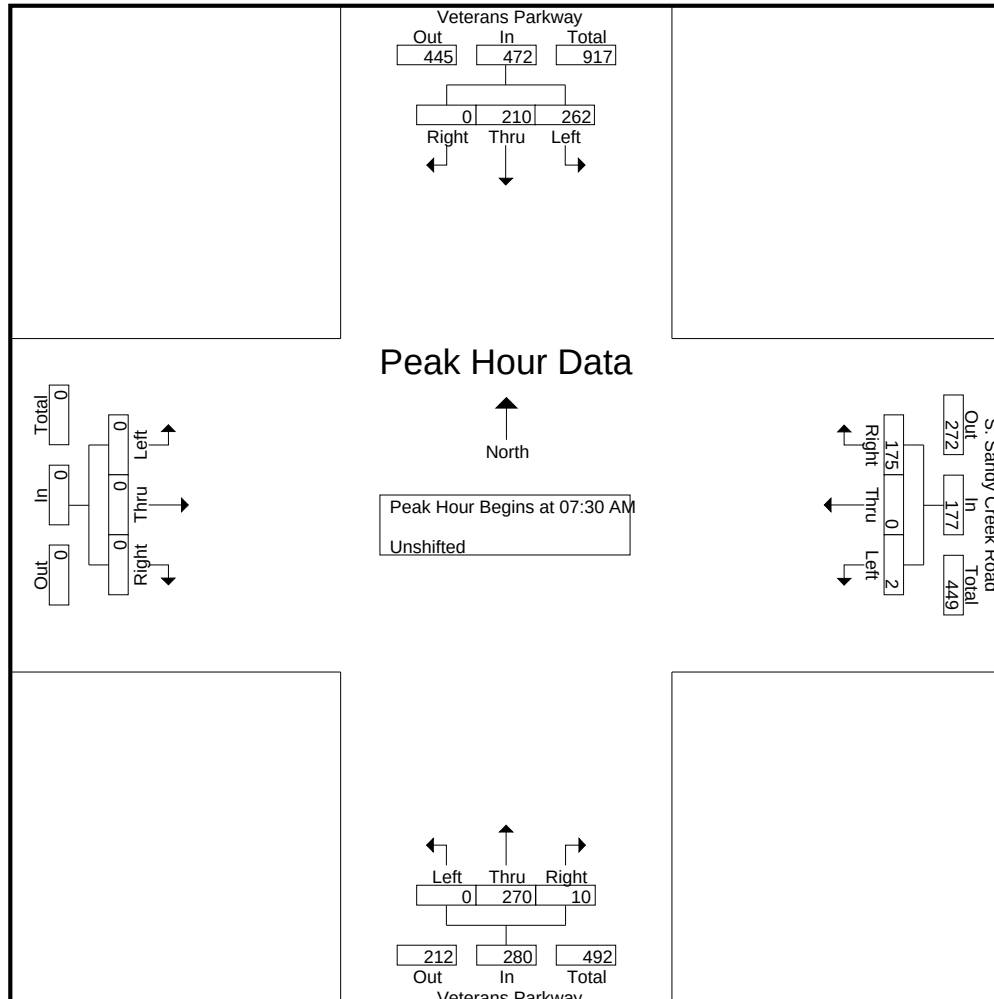
File Name : 20180041

Site Code : 20180041

Start Date : 3/8/2018

Page No : 2

	Veterans Parkway Northbound				Veterans Parkway Southbound				Eastbound				S. Sandy Creek Road 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 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	64	1	65	63	52	0	115	0	0	0	0	1	0	62	63	243
07:45 AM	0	91	5	96	85	80	0	165	0	0	0	0	0	0	34	34	295
08:00 AM	0	59	2	61	62	42	0	104	0	0	0	0	1	0	45	46	211
08:15 AM	0	56	2	58	52	36	0	88	0	0	0	0	0	0	34	34	180
Total Volume	0	270	10	280	262	210	0	472	0	0	0	0	2	0	175	177	929
% App. Total	0	96.4	3.6		55.5	44.5	0		0	0	0		1.1	0	98.9		
PHF	.000	.742	.500	.729	.771	.656	.000	.715	.000	.000	.000	.000	.500	.000	.706	.702	.787



A & R Engineering, Inc.

2160 Kingston Court, Suite 'O',
Marietta, GA 30067

TMC Data

Veterans Parkway at S. Sandy Creek Road

07- 09 AM - 04 - 06 PM

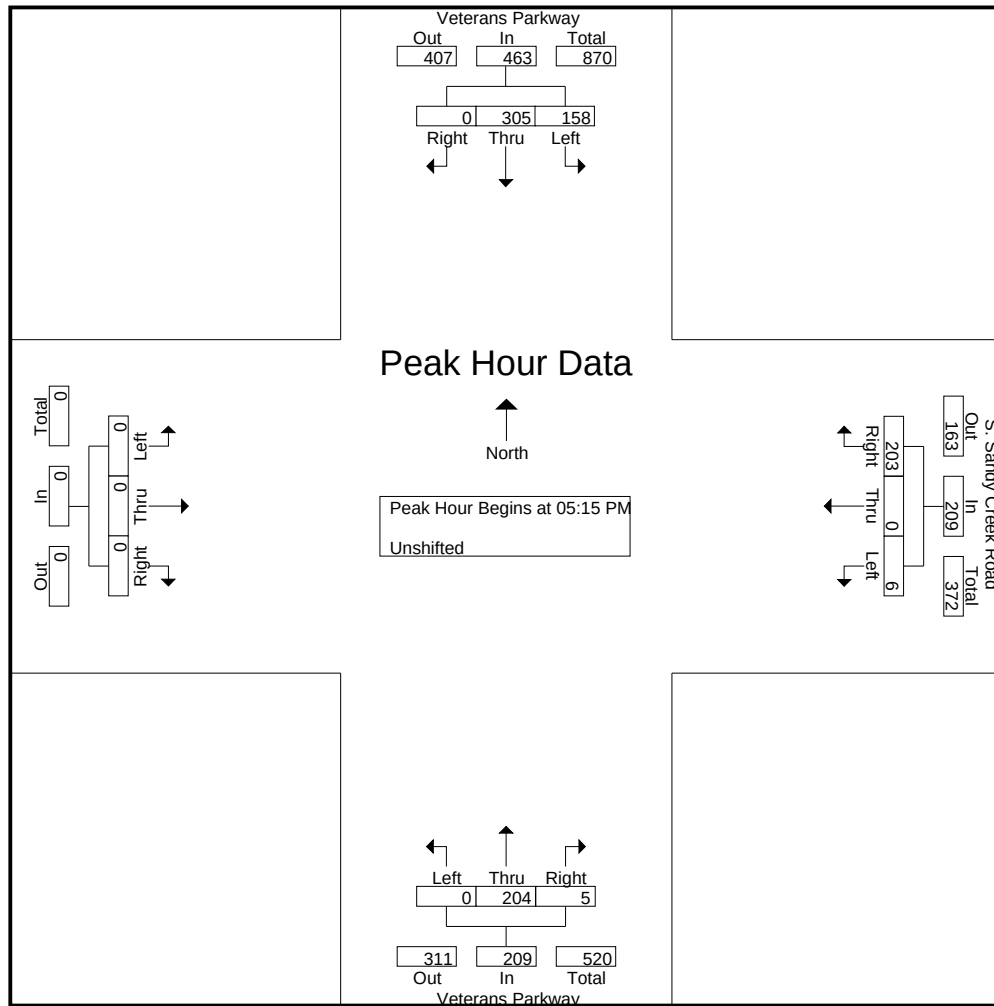
File Name : 20180041

Site Code : 20180041

Start Date : 3/8/2018

Page No : 3

	Veterans Parkway Northbound				Veterans Parkway Southbound				Eastbound				S. Sandy Creek Road 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 12:00 PM to 06:00 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:15 PM																	
05:15 PM	0	37	1	38	41	63	0	104	0	0	0	0	1	0	54	55	197
05:30 PM	0	62	0	62	50	94	0	144	0	0	0	0	0	0	57	57	263
05:45 PM	0	50	3	53	35	75	0	110	0	0	0	0	3	0	54	57	220
06:00 PM	0	55	1	56	32	73	0	105	0	0	0	0	2	0	38	40	201
Total Volume	0	204	5	209	158	305	0	463	0	0	0	0	6	0	203	209	881
% App. Total	0	97.6	2.4		34.1	65.9	0		0	0	0		2.9	0	97.1		
PHF	.000	.823	.417	.843	.790	.811	.000	.804	.000	.000	.000	.000	.500	.000	.890	.917	.837



A & R Engineering, Inc.

2160 Kingston Court, Suite 'O',
Marietta, GA 30067

TMC Data

Veterans Parkway at Sandy Creek Road

07 09 AM - 04 - 06 PM

File Name : 20180042

Site Code : 20180042

Start Date : 3/8/2018

Page No : 1

Groups Printed- Unshifted

	Veterans Parkway Northbound				Veterans Parkway Southbound				Sandy Creek Road Eastbound				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
07:15 AM	36	17	0	53	0	42	2	44	0	0	35	35	0	0	0	0	132
07:30 AM	66	51	0	117	0	53	8	61	2	0	62	64	0	0	0	0	242
07:45 AM	57	58	0	115	0	73	8	81	1	0	87	88	0	0	0	0	284
Total	159	126	0	285	0	168	18	186	3	0	184	187	0	0	0	0	658
08:00 AM	61	59	0	120	0	42	7	49	2	0	71	73	0	0	0	0	242
08:15 AM	43	29	0	72	0	40	11	51	1	0	60	61	0	0	0	0	184
08:30 AM	49	28	0	77	0	38	5	43	2	0	61	63	0	0	0	0	183
08:45 AM	38	31	0	69	0	38	6	44	0	0	54	54	0	0	0	0	167
Total	191	147	0	338	0	158	29	187	5	0	246	251	0	0	0	0	776
*** BREAK ***																	
04:00 PM	41	39	0	80	0	40	10	50	3	0	51	54	0	0	0	0	184
04:15 PM	45	27	0	72	0	33	4	37	7	0	57	64	0	0	0	0	173
04:30 PM	45	53	0	98	0	49	8	57	5	0	58	63	0	0	0	0	218
04:45 PM	57	39	0	96	0	43	1	44	2	0	52	54	0	0	0	0	194
Total	188	158	0	346	0	165	23	188	17	0	218	235	0	0	0	0	769
05:00 PM	61	48	0	109	0	49	4	53	9	0	63	72	0	0	0	0	234
05:15 PM	59	59	0	118	0	55	2	57	3	0	51	54	0	0	0	0	229
05:30 PM	50	46	0	96	0	50	3	53	2	0	35	37	0	0	0	0	186
05:45 PM	46	57	0	103	0	45	5	50	3	0	53	56	0	0	0	0	209
Total	216	210	0	426	0	199	14	213	17	0	202	219	0	0	0	0	858
Grand Total	754	641	0	1395	0	690	84	774	42	0	850	892	0	0	0	0	3061
Apprch %	54.1	45.9	0		0	89.1	10.9		4.7	0	95.3		0	0	0		
Total %	24.6	20.9	0	45.6	0	22.5	2.7	25.3	1.4	0	27.8	29.1	0	0	0	0	

A & R Engineering, Inc.

2160 Kingston Court, Suite 'O',
Marietta, GA 30067

TMC Data

Veterans Parkway at Sandy Creek Road

07 09 AM - 04 - 06 PM

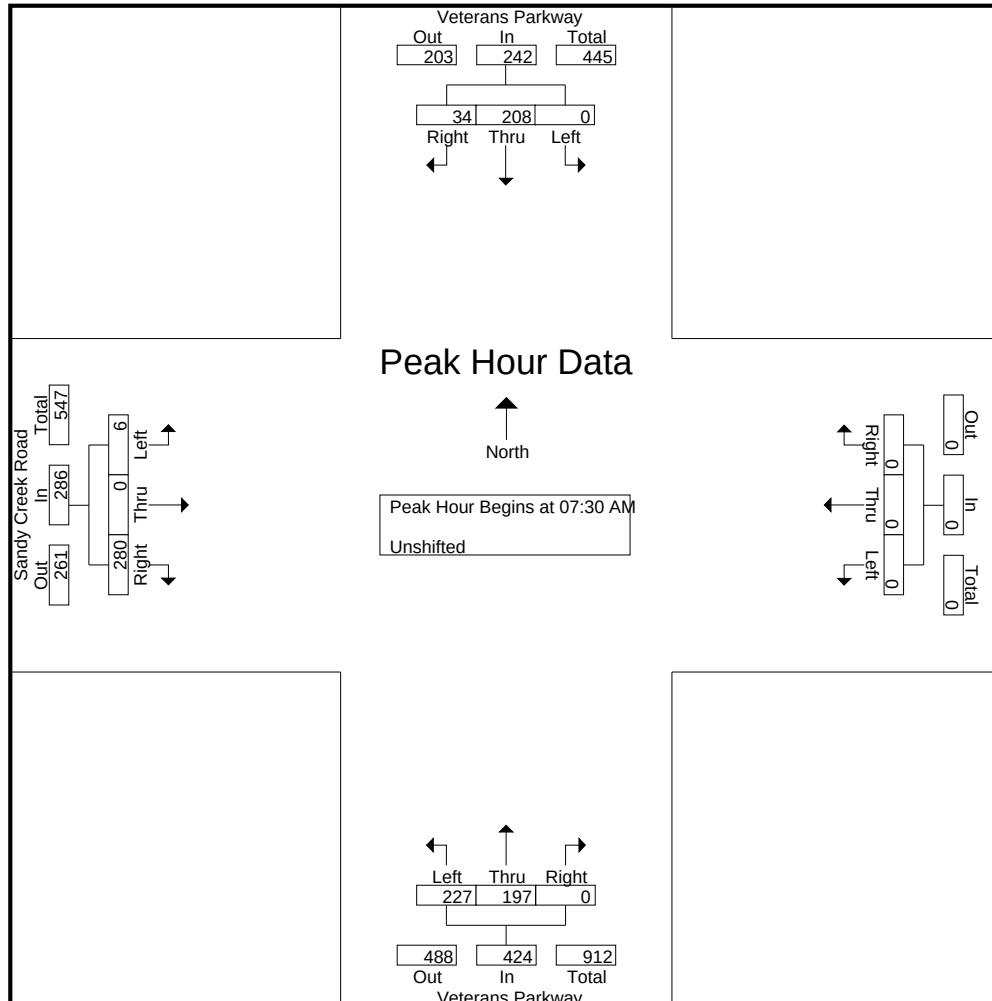
File Name : 20180042

Site Code : 20180042

Start Date : 3/8/2018

Page No : 2

	Veterans Parkway Northbound				Veterans Parkway Southbound				Sandy Creek Road Eastbound				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 07:15 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	66	51	0	117	0	53	8	61	2	0	62	64	0	0	0	0	242
07:45 AM	57	58	0	115	0	73	8	81	1	0	87	88	0	0	0	0	284
08:00 AM	61	59	0	120	0	42	7	49	2	0	71	73	0	0	0	0	242
08:15 AM	43	29	0	72	0	40	11	51	1	0	60	61	0	0	0	0	184
Total Volume	227	197	0	424	0	208	34	242	6	0	280	286	0	0	0	0	952
% App. Total	53.5	46.5	0		0	86	14		2.1	0	97.9		0	0	0		
PHF	.860	.835	.000	.883	.000	.712	.773	.747	.750	.000	.805	.813	.000	.000	.000	.000	.838



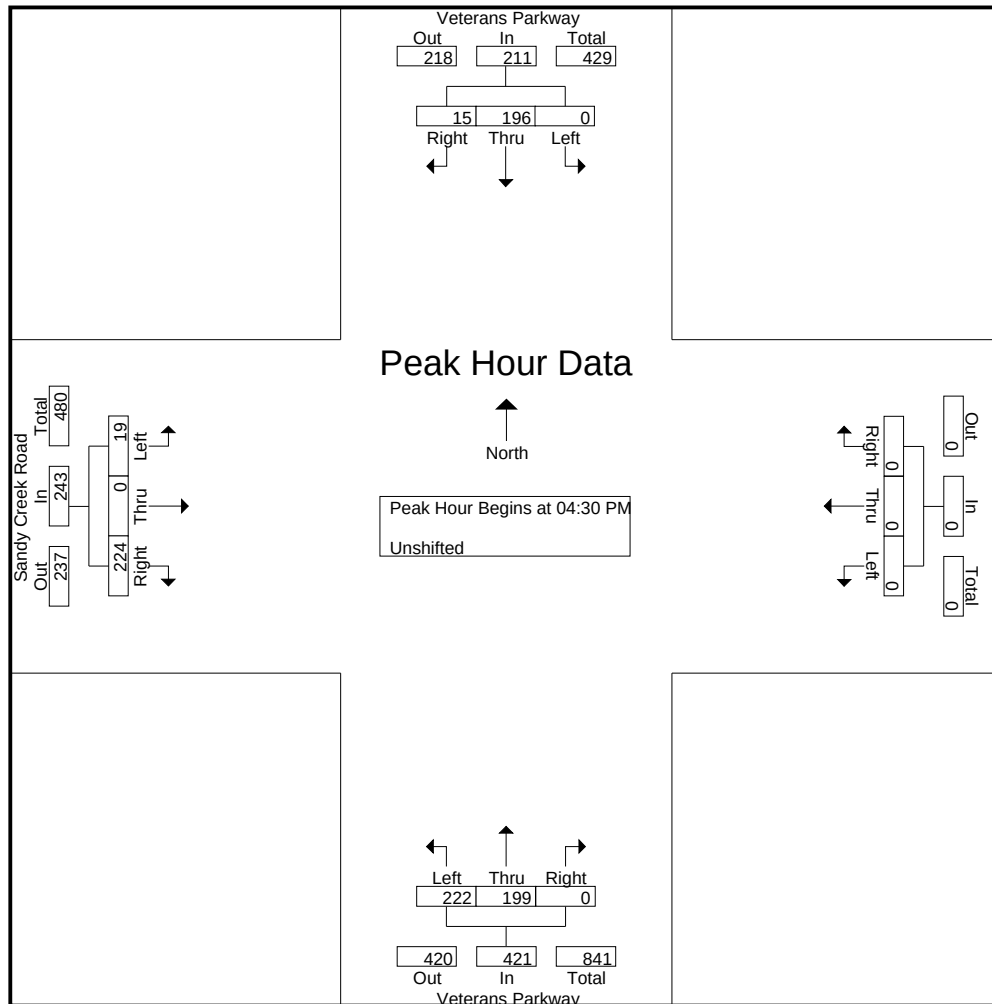
A & R Engineering, Inc.

2160 Kingston Court, Suite 'O',
Marietta, GA 30067

TMC Data
Veterans Parkway at Sandy Creek Road
07 09 AM - 04 - 06 PM

File Name : 20180042
Site Code : 20180042
Start Date : 3/8/2018
Page No : 3

	Veterans Parkway Northbound				Veterans Parkway Southbound				Sandy Creek Road Eastbound				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 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	45	53	0	98	0	49	8	57	5	0	58	63	0	0	0	0	218
04:45 PM	57	39	0	96	0	43	1	44	2	0	52	54	0	0	0	0	194
05:00 PM	61	48	0	109	0	49	4	53	9	0	63	72	0	0	0	0	234
05:15 PM	59	59	0	118	0	55	2	57	3	0	51	54	0	0	0	0	229
Total Volume	222	199	0	421	0	196	15	211	19	0	224	243	0	0	0	0	875
% App. Total	52.7	47.3	0		0	92.9	7.1		7.8	0	92.2		0	0	0		
PHF	.910	.843	.000	.892	.000	.891	.469	.925	.528	.000	.889	.844	.000	.000	.000	.000	.935



GRTA Letter of Understanding



LETTER OF UNDERSTANDING

March 5, 2018

Rob Beecham
BCM Construction Group LLC
296 South Main Street, Ste 400
Alpharetta, GA 30009

RE: **DRI 2788 Folia Crossroads**

Dear Mr. Beecham:

The purpose of this letter is to document the discussions during the Pre-Review and Methodology Meeting held at ARC's office on February 26, 2018 regarding **DRI 2788 Folia Crossroads**. Some of the following items were discussed in this meeting and should assist you and your consultant team in preparing the DRI Review Package.

PROJECT OVERVIEW

- The project is located in the City of Fayetteville, north of SR 54 (W. Lanier Avenue) and east of South Sandy Creek Road.
- The DRI trigger for this development is a rezoning.
- The project is planned as a mixed-use development with 300 residential units (260 single family and 40 condominium units), 100,000 SF of retail, 20,000 SF of restaurant space, 50,000 SF of office, and a 100-room hotel.
- The vehicular trip generation is estimated to be 10,692 gross daily trips based on the *ITE Trip Generation Manual 10th edition*.
- The development site proposes three access driveways. There is one full access driveway on S. Sandy Creek Road and two right-in right outs on SR 54.
- The projected build-out is one phase, to be completed by 2022.
- The applicant is applying for approval under GRTA's non-expedited review process.

STUDY NETWORK

1. SR 54 (W. Lanier Avenue) at Ebenezer Road/Brittany Way
2. SR 54 (W. Lanier Avenue) at Tyrone Road
3. SR 54 (W. Lanier Avenue) at Veterans Parkway/Lester Road
4. SR 54 (W. Lanier Avenue) at Togwatee Village Parkway/Piedmont Fayette Driveway
5. SR 54 (W. Lanier Avenue) at S. Sandy Creek Road/Old Norton Road
6. SR 54 (W. Lanier Avenue) at Ginger Cake Road/Burch Road
7. SR 54 (W. Lanier Avenue) at Brandywine Boulevard/Oak Street
8. SR 54 (W. Lanier Avenue) at Grady Avenue/Sharon Drive
9. Ginger Cake Road at Hood Avenue
10. S. Sandy Creek Road at Piedmont Fayette Driveway
11. Veterans Parkway at S. Sandy Creek Road

- 12. Veterans Parkway at Sandy Creek Road
- 13. All Site Driveways

METHODOLOGY

- All intersections identified as within the study network shall be analyzed during the AM and PM peak hours for (1) existing conditions, (2) future “no-build” conditions [may not be applicable for the site driveways, and (3) future “build” conditions. This DRI shall be reviewed in one phase to be completed by 2022.
- 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. As appropriate, pedestrian counts and heavy vehicle counts shall be collected with vehicle counts and considered within the capacity analysis. Turning movement counts shall be collected while local schools are in session and ordinarily not between the week of Thanksgiving and the second week of January or any week of a major holiday.
- A 3.0% annual background traffic growth rate shall be used for all roadways. Trip generation information for any other major developments currently underway in the study area shall be taken into consideration.
- The Level of Service (LOS) standard for all analyses shall be LOS D.
- No alternate mode trip reductions will be taken for this development.
- Default values should not be assumed in the traffic modeling. Existing conditions shall be taken into account.
- The applicant shall research TIP, STIP, RTP, and GDOT’s construction work program, as well as any local government plans (SPLOST, CIP, etc.), to determine the open-to-traffic date, sponsor, cost of the project, funding source(s), for future roadway projects in the project vicinity. This information shall be included within the traffic analysis.

ADDITIONAL INFORMATION

Every roadway segment and intersection listed above will be analyzed for “required improvements.” If the existing LOS for the segment or intersection is below the applicable level of service for a particular time period (e.g., A.M. peak period, P.M. peak period, etc.), then the measured LOS service for that segment and time periods is the standard by which the “base” and “future” traffic conditions will be designed. For example, if the County’s LOS standard is LOS D, but an intersection or segment currently operates at LOS E for a certain peak period, then the LOS standard for that intersection or segment for “base” and “future” conditions becomes LOS E (only for that intersection and only for that peak period). The “base” is the phase year traffic without the development traffic (also called future “no-build” conditions) and the “future” is the phase year with the development traffic (also called future “build” conditions). As required in the technical guidelines, specific “required improvements” will be identified to bring the “base” LOS and “future” LOS for every roadway segment and intersection up to the applicable LOS standard. If the existing LOS for the segment or intersection is LOS F, then the future “no-build” and future “build” LOS standard will be LOS E. The improvements required to achieve the desired LOS standard will be provided in a table and graphic within the study. The traffic study should indicate the existing roadway laneage at each studied intersection as well as the laneage required (to meet the LOS standard) for future “no-build” and future “build” conditions. The improvements may include both programmed improvements and improvements identified in the study.

The planned and programmed improvement should indicate the project sponsor, the anticipated funding by source (federal, state, city/county, developer, CID, etc.), the year open-to-traffic, and estimate of the total project cost. All other required improvements identified in the study should, to the extent known, identify the cost, sponsor, funding, and timing. If any of these elements are not known, please state as “unknown.”

The future “no-build” and the future “build” analyses should NOT automatically include/assume the additional lanes/capacity associated with planned and programmed improvement projects unless those roadway projects are currently under construction. Instead, the traffic consultant should recommend the additional laneage required to satisfy the level of service standard.

DRI REVIEW PACKAGE CHECKLIST

Please use the DRI Review Package Checklist to help you prepare your GRTA DRI Review Package for expedited review of your application. The Checklist reflects the understandings set forth in this letter, and is incorporated into this letter by reference.

The site plan shall be prepared in accordance with Section 4-104 of the DRI Review Package Technical Guidelines and it shall be dated, and shall be at a scale of 1"= 200' or larger (showing more detail). The site plan shall be consistent with GRTA's Site Plan Information Guidelines, which represents the minimum required information on site plans.

The applicant shall indicate on the site plans all adjacent land uses, current zoning, and future land use as indicated on the future land use map. Additionally, all existing and proposed sidewalks, existing and proposed pedestrian trails, and existing and proposed roadway laneage should be indicated on the site plan.

DRI REVIEW PACKAGE SUBMITTAL

At the time you are ready to submit your DRI Review Package to GRTA, please note the following:

- Provide one (1) paper copy of all materials:
 - Transportation analysis
 - Site Plan
- Provide one (1) CD-ROM with electronic versions of all submittal documents:
 - Provide a PDF of each document
 - Provide the native format for each document
 - .dwg is the preferred CAD format (AutoCAD)
 - .doc is the preferred word processing format (Word)
 - .xls is the preferred spreadsheet format (Excel)
 - .sy8, .sy9 or .sy10 is the preferred capacity analysis format (Synchro)

As part of the completeness certification process, please have your consultant forward one copy of the completed GRTA DRI Review Package (traffic analysis, site plan, CD) to the GDOT District Office, Regional Commission and local government Planning & Development and Transportation group (contact information provided below). GRTA shall be copied on each of the transmittal letters.

GRTA	ATLANTA REGIONAL COMMISSION	CITY OF FAYETTEVILLE	GDOT DISTRICT 3	FAYETTE COUNTY
Emily Estes 245 Peachtree Center Ave. Suite 2200 Atlanta, GA 30303	Andrew Smith International Tower 229 Peachtree Street NE Suite 100 Atlanta, GA 30303	Ray Gibson 240 South Glynn Street Fayetteville, GA 30214	Dan Woods 115 Transportation Boulevard Thomaston, GA 30286	Phil Mallon Public Works 115 McDonough Road Fayetteville, Georgia 30214

If you have any questions, please feel free to contact me directly at 404-893-6171 or eestes@srta.ga.gov.

Sincerely,
Emily Estes
Planner

cc:

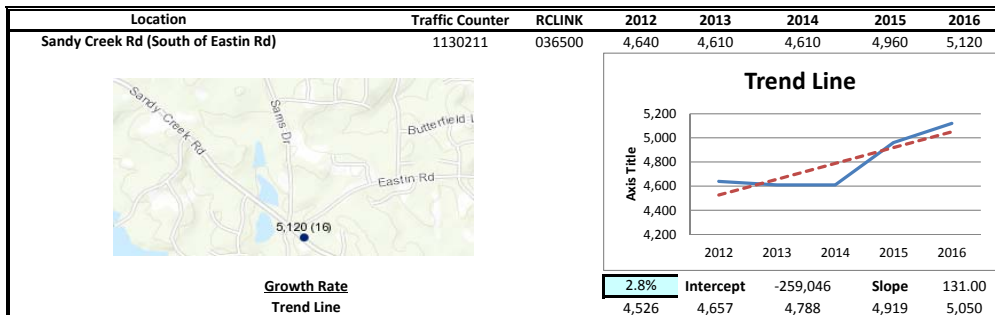
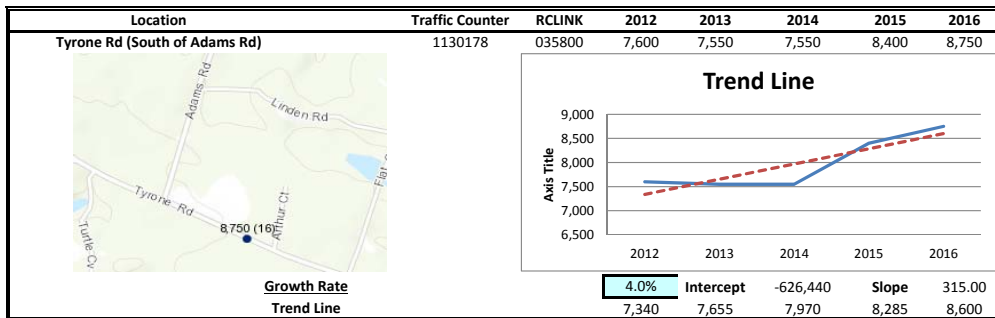
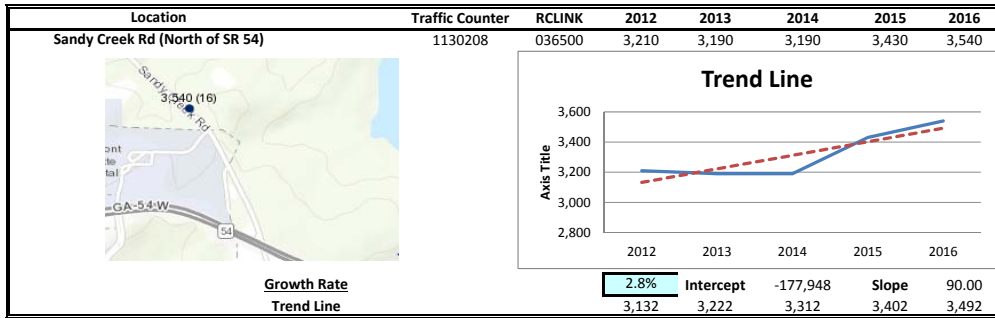
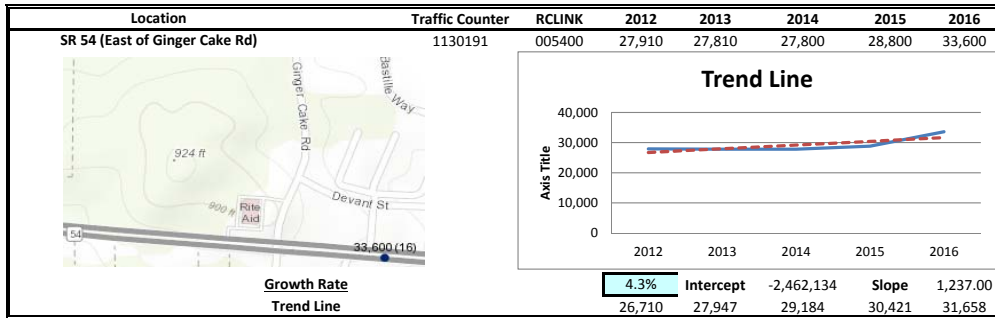
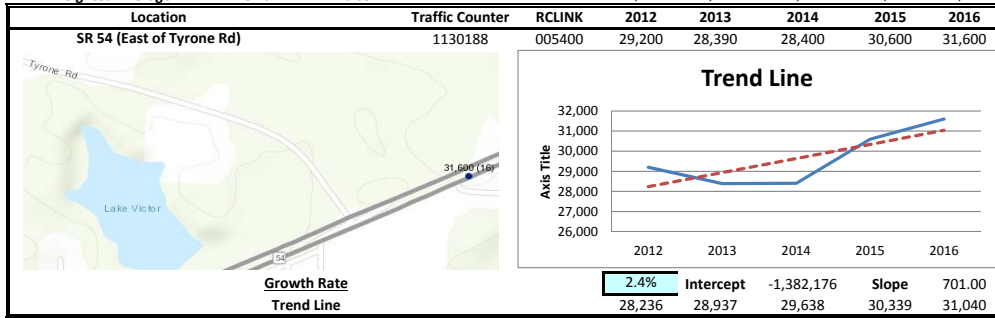
Jon West, DCA
Andrew Smith, ARC
Annie Gillespie, GRTA/SRTA
Dan Woods, GDOT District 3
Tyler Peek, GDOT District 3
Phil Mallon, Fayette County

Abby Rettig, A & R Engineering
Abdul Amer, A & R Engineering
Steve Rowe, AEC, Inc
Sherry Hearn, AEC, Inc

Julie Brown, City of Fayetteville
Ray Gibson, City of Fayetteville
Jahnee Prince, City of Fayetteville
Chris Hindman, City of Fayetteville
Giavani Smith, Union City
Ellis Still, Union City

Linear Regression of Daily Traffic

Location	Growth Rate	R Squared	Station ID	Route	2012	2013	2014	2015	2016
SR 54 (East of Tyrone Rd)	2.4%	0.61	1130188	005400	29,200	28,390	28,400	30,600	31,600
SR 54 (East of Ginger Cake Rd)	4.3%	0.61	1130191	005400	27,910	27,810	27,800	28,800	33,600
Sandy Creek Rd (North of SR 54)	2.8%	0.76	1130208	036500	3,210	3,190	3,190	3,430	3,540
Tyrone Rd (South of Adams Rd)	4.0%	0.77	1130178	035800	7,600	7,550	7,550	8,400	8,750
Sandy Creek Rd (South of Eastin Rd)	2.8%	0.76	1130211	036500	4,640	4,610	4,610	4,960	5,120
Weighted Average	3.4%	0.69	Sum of Count Stations =		72,560	71,550	71,550	76,190	82,610



**Fact Sheets for Planned and Programmed
Improvements**

PRECONSTRUCTION STATUS REPORT

PROJ ID	COUNTY	DESCRIPTION
M004955	Fayette	SR 54 FROM COWETA COUNTY LINE TO MCDONOUGH ROAD
Mgmt Let Date:	2017-09-22	This section of SR 54 has meet the criterior for resurfacing due to deterioration of existing pavement through the COPACES ratings.

PROJ NO:
MPO TIP#:

SPONSOR: GDOT
PROJ MGR: Grant Jr,
Jack

Phase

FY

Approved FY
Estimate*

Fund

Phase Status

MPO: Atlanta TMA
PROJ LENGTH (MI): 13.00
TYPE WORK: Resurface &
Maintenance

DOT DIST: 3
CONG DIST: 003, 013
HOUSE DIST: 063, 071,
072

Construction

2018

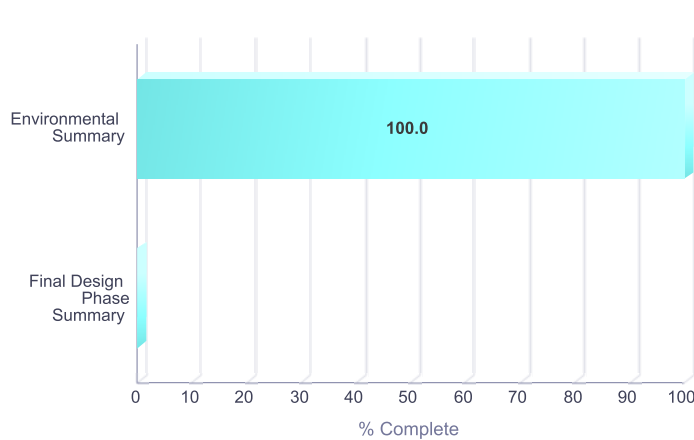
\$14,301,574.12

Z001

AUTHORIZED

LET
RESPONSIBILITY:
BIKE PROVISIONS N
INCLUDED?

SENATE DIST: 016, 034



Activity

Actual Start
DateActual Finish
Date

Final Design Phase Summary

Environmental Summary

2017-05-19

2017-07-06

Right of Way Acquisition Information:
Preliminary Parcel Count:

Total Parcel Count:

Acquired by :

N/R

PROJ ID	COUNTY	DESCRIPTION
0006903	Fayette	W FAYETTEVILLE BYPASS FM SANDY CREEK RD TO HARP/REDWINE RD

<u>Phase</u>	<u>FY</u>	<u>Approved FY</u>	<u>Fund</u>	<u>Phase Status</u>
	<u>Approved</u>	<u>Estimate*</u>		
Engineering	2051	\$50,000.00	Z240	PRECAST
Construction	2051	\$12,849,000.00	Z230	PRECAST
Right of Way	2051	\$2,500,000.00	LOC	PRECAST
Engineering		\$1,100,000.00	LOC	AUTHORIZED

LOC

PRECONSTRUCTION STATUS REPORT

PROJ ID	COUNTY	DESCRIPTION
0012878	Fayette	WEST FAYETTEVILLE PATH FROM SR 54 TO CS 894/LESTER ROAD
Mgmt Let Date:	2019-03-15	The purpose of the project is to provide an improved pedestrian and cycling crossing facility at SR 54. The pedestrian bridge will be located approx. 941' w of Piedmont Fayette Hospital at the intersection of Togwotee Parkway at SR 54. The bridge will be a pre-fab truss bridge 12' wide and approximately 165' long. The bottom of the bridge will be elevated no less than 18' 6" above the pavement surface of SR 54. The shared-use trail will also be 12' wide and will ramp up to the overpass bridge. The proposed trail location north of SR 54 will continue northbound for approx. 380' to connect to Piedmont Fayette Hospital. On the south side of SR 54, the trail will ramp down into existing grade and continue east for approx. 350' along the south side of SR 54, outside of the existing right-of-way, before turning due south. The trail will run through a forested area for approximately 3,700', making at least two stream crossings, and connect to the existing shared-use trail along Lester Road.

PROJ NO:

SPONSOR:

Fayette
County
Saleem,
Ameenah
Bernadette

MPO TIP#:

FA-353

PROJ MGR:

MPO:

Atlanta TMA

DOT DIST:

003, 013

PROJ LENGTH (MI):

0.84

CONG DIST:

063, 064

TYPE WORK:

Bicycle/Ped. Facility

HOUSE DIST:

016

LET

Local Let

SENATE DIST:

016

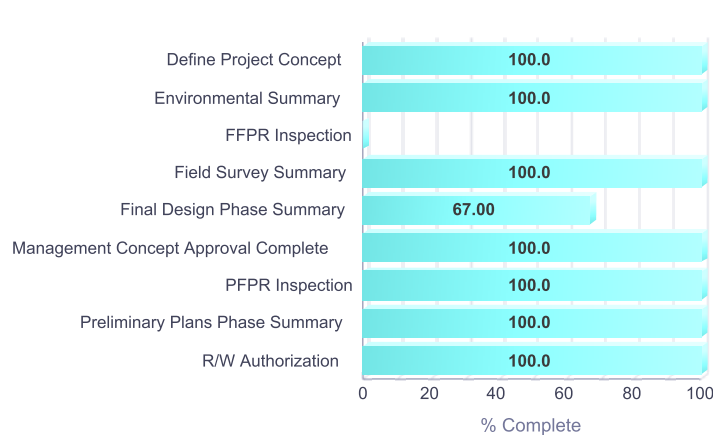
RESPONSIBILITY:

BIKE PROVISIONS

N

INCLUDED?

Phase	FY Approved	Approved FY Estimate*	Fund	Phase Status
Engineering	2014	\$936,250.00	M301	AUTHORIZED
Engineering	2016	\$400,000.00	M301	AUTHORIZED
Construction	2019	\$3,097,565.67	LOC	PRECST
Utility	2019	\$100,000.00	LOC	PRECST
Right of Way	2017	\$840,000.00	M301	AUTHORIZED



Activity	Actual Start Date	Actual Finish Date
R/W Authorization	2017-02-09	2017-02-09
Preliminary Plans Phase Summary	2015-05-28	2016-06-02
PFPR Inspection	2016-04-29	2016-04-29
Environmental Summary	2014-09-26	2016-12-07
Field Survey Summary	2014-09-15	2015-07-23
Final Design Phase Summary	2016-06-02	
Management Concept Approval Complete	2015-05-27	2015-05-27
FFPR Inspection		
Define Project Concept	2014-05-14	2014-11-20

Right of Way Acquisition Information:

Preliminary Parcel Count: 4

Total Parcel Count:

7

Acquired by :

LOC

State Route 54 Multi-Use Bridge Crossing

Project Number: 5

Category: Transportation

Location: SR 54

Proposed Project Year: 2018

Estimated Cost: \$600,000

Project Description:

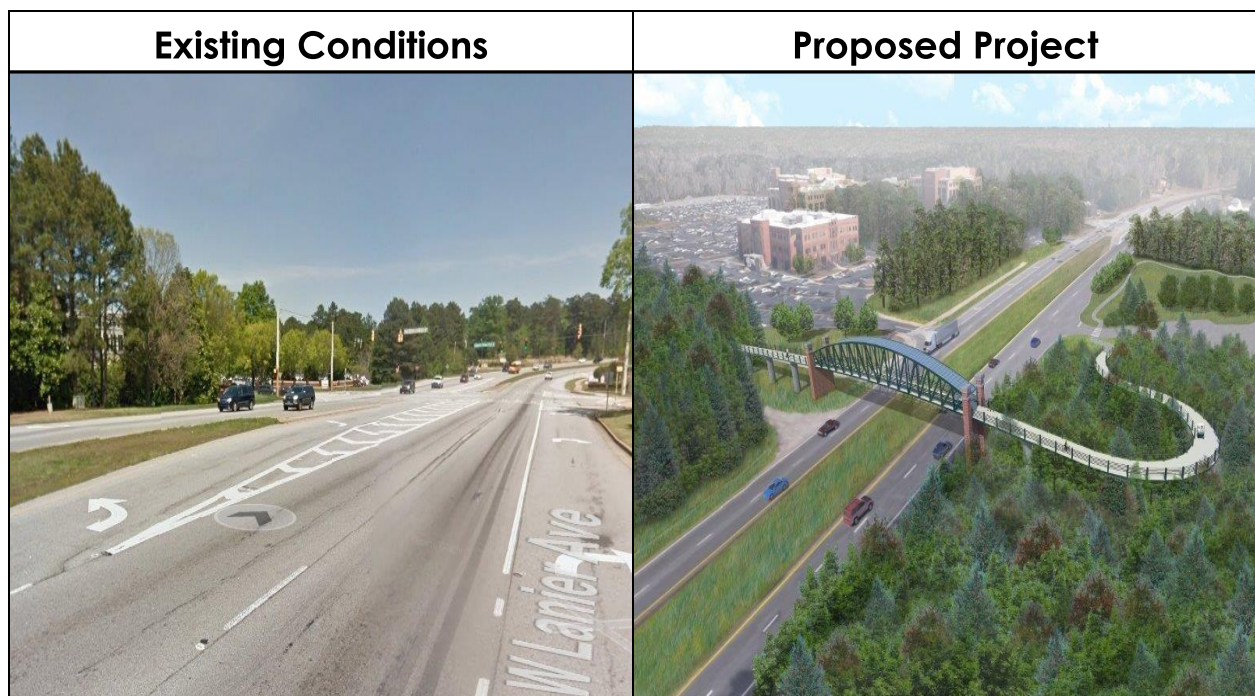
This project will consist of the construction of a multi-use bridge crossing for SR 54 near the hospital to connect the Fayette Piedmont Hospital/West Fayetteville Area to the existing path system, located south of SR 54 at Lester Road. The bridge will provide additional bike/pedestrian accessibility for the area.

Budgeted Funding and Sources:

GDOT grant funds received - \$866,000

Potential GDOT grant - \$1,300,000

Proposed SPLOST - \$600,000



Existing Intersection Analysis

Timings

1: Private Drwy/Tyrone Rd & SR 54

Existing AM

04/16/2018



Lane Group	EBL	EBT	WBT	WBR	NBT	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	30	1070	1130	310	1	453	0	33
Future Volume (vph)	30	1070	1130	310	1	453	0	33
Turn Type	Perm	NA	NA	Perm	NA	Perm	NA	Perm
Protected Phases		2	6		8		4	
Permitted Phases	2			6		4		4
Detector Phase	2	2	6	6	8	4	4	4
Switch Phase								
Minimum Initial (s)	15.0	15.0	15.0	15.0	10.0	10.0	10.0	10.0
Minimum Split (s)	26.0	26.0	25.0	25.0	48.0	44.0	44.0	44.0
Total Split (s)	80.0	80.0	80.0	80.0	60.0	60.0	60.0	60.0
Total Split (%)	57.1%	57.1%	57.1%	57.1%	42.9%	42.9%	42.9%	42.9%
Yellow Time (s)	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	Min	Min	Min	Min	None	None	None	None

Intersection Summary

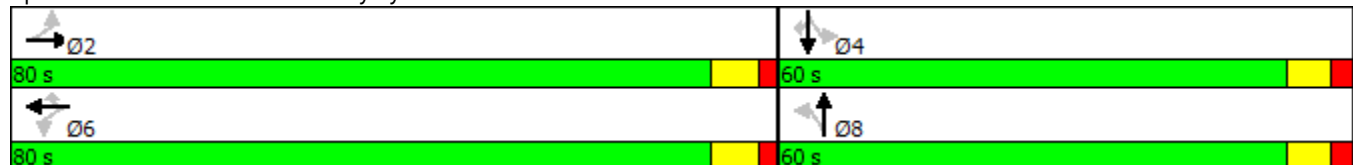
Cycle Length: 140

Actuated Cycle Length: 135

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Splits and Phases: 1: Private Drwy/Tyrone Rd & SR 54



HCM 2010 Signalized Intersection Summary
1: Private Drwy/Tyrone Rd & SR 54

Existing AM
04/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	1070	1	0	1130	310	0	1	0	453	0	33
Future Volume (veh/h)	30	1070	1	0	1130	310	0	1	0	453	0	33
Number	5	2	12	1	6	16	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	44	1259	4	0	1270	397	0	4	0	467	0	0
Adj No. of Lanes	1	2	0	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.68	0.85	0.25	0.92	0.89	0.78	0.92	0.25	0.92	0.97	0.92	0.82
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	141	1977	6	54	1934	865	0	650	0	543	0	552
Arrive On Green	0.55	0.55	0.55	0.00	0.55	0.55	0.00	0.35	0.00	0.35	0.00	0.00
Sat Flow, veh/h	297	3619	11	437	3539	1583	0	1863	0	1401	0	1583
Grp Volume(v), veh/h	44	616	647	0	1270	397	0	4	0	467	0	0
Grp Sat Flow(s),veh/h/ln	297	1770	1861	437	1770	1583	0	1863	0	1401	0	1583
Q Serve(g_s), s	16.5	32.3	32.3	0.0	33.9	20.3	0.0	0.2	0.0	43.3	0.0	0.0
Cycle Q Clear(g_c), s	50.4	32.3	32.3	0.0	33.9	20.3	0.0	0.2	0.0	43.5	0.0	0.0
Prop In Lane	1.00		0.01	1.00		1.00	0.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	141	967	1017	54	1934	865	0	650	0	543	0	552
V/C Ratio(X)	0.31	0.64	0.64	0.00	0.66	0.46	0.00	0.01	0.00	0.86	0.00	0.00
Avail Cap(c_a), veh/h	141	967	1017	54	1934	865	0	739	0	610	0	628
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	0.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	39.3	21.1	21.1	0.0	21.4	18.3	0.0	28.4	0.0	42.6	0.0	0.0
Incr Delay (d2), s/veh	2.7	2.0	1.9	0.0	1.1	0.8	0.0	0.0	0.0	11.0	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	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.6	22.9	23.8	0.0	23.4	13.9	0.0	0.2	0.0	25.6	0.0	0.0
LnGrp Delay(d),s/veh	41.9	23.0	22.9	0.0	22.6	19.2	0.0	28.4	0.0	53.6	0.0	0.0
LnGrp LOS	D	C	C		C	B		C		D		
Approach Vol, veh/h		1307			1667			4			467	
Approach Delay, s/veh		23.6			21.7			28.4			53.6	
Approach LOS		C			C			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		80.0		53.6		80.0		53.6				
Change Period (Y+Rc), s		7.0		7.0		7.0		7.0				
Max Green Setting (Gmax), s		73.0		53.0		73.0		53.0				
Max Q Clear Time (g_c+I1), s		52.4		45.5		35.9		2.2				
Green Ext Time (p_c), s		20.6		1.1		37.0		1.8				
Intersection Summary												
HCM 2010 Ctrl Delay			26.8									
HCM 2010 LOS			C									

Timings

2: Old Norton Rd/S Sandy Creek Rd & SR 54

Existing AM

04/16/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	21	1461	12	59	1542	188	36	17	163	9	47
Future Volume (vph)	21	1461	12	59	1542	188	36	17	163	9	47
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	NA	Perm
Protected Phases	5	2		1	6			8		4	
Permitted Phases	2		2	6		6	8		4		4
Detector Phase	5	2	2	1	6	6	8	8	4	4	4
Switch Phase											
Minimum Initial (s)	6.0	12.0	12.0	6.0	12.0	12.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	12.0	26.0	26.0	13.5	25.0	25.0	46.3	46.3	46.3	46.3	46.3
Total Split (s)	40.0	80.0	80.0	40.0	80.0	80.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	22.2%	44.4%	44.4%	22.2%	44.4%	44.4%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.3	2.3	2.3	2.3
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)	6.0	7.0	7.0	6.0	7.0	7.0		7.3		7.3	7.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag					
Lead-Lag Optimize?											
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None

Intersection Summary

Cycle Length: 180

Actuated Cycle Length: 122.3

Natural Cycle: 110

Control Type: Actuated-Uncoordinated

Splits and Phases: 2: Old Norton Rd/S Sandy Creek Rd & SR 54

Ø1	Ø2	Ø4
40 s	80 s	60 s
Ø5	Ø6	Ø8
40 s	80 s	60 s

HCM 2010 Signalized Intersection Summary

2: Old Norton Rd/S Sandy Creek Rd & SR 54

Existing AM
04/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	1461	12	59	1542	188	36	17	29	163	9	47
Future Volume (veh/h)	21	1461	12	59	1542	188	36	17	29	163	9	47
Number	5	2	12	1	6	16	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	36	1522	16	64	1590	204	64	20	36	168	12	0
Adj No. of Lanes	1	2	1	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.58	0.96	0.75	0.92	0.97	0.92	0.56	0.85	0.81	0.97	0.75	0.69
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	212	2205	986	256	2239	1002	180	60	82	257	14	249
Arrive On Green	0.04	0.62	0.62	0.05	0.63	0.63	0.16	0.16	0.16	0.16	0.16	0.00
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	840	381	523	1255	90	1583
Grp Volume(v), veh/h	36	1522	16	64	1590	204	120	0	0	180	0	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1745	0	0	1345	0	1583
Q Serve(g_s), s	0.8	33.0	0.4	1.4	34.8	6.3	0.0	0.0	0.0	8.1	0.0	0.0
Cycle Q Clear(g_c), s	0.8	33.0	0.4	1.4	34.8	6.3	7.0	0.0	0.0	15.2	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.53		0.30	0.93		1.00
Lane Grp Cap(c), veh/h	212	2205	986	256	2239	1002	322	0	0	271	0	249
V/C Ratio(X)	0.17	0.69	0.02	0.25	0.71	0.20	0.37	0.00	0.00	0.66	0.00	0.00
Avail Cap(c_a), veh/h	668	2224	995	695	2239	1002	770	0	0	677	0	718
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	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	12.6	14.5	8.3	12.4	14.2	9.0	44.2	0.0	0.0	47.7	0.0	0.0
Incr Delay (d2), s/veh	0.4	1.2	0.0	0.5	1.3	0.2	0.7	0.0	0.0	2.8	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	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.7	23.1	0.4	1.3	24.0	5.0	6.4	0.0	0.0	9.8	0.0	0.0
LnGrp Delay(d),s/veh	13.0	15.7	8.4	13.0	15.6	9.2	45.0	0.0	0.0	50.5	0.0	0.0
LnGrp LOS	B	B	A	B	B	A	D			D		
Approach Vol, veh/h		1574			1858			120			180	
Approach Delay, s/veh		15.5			14.8			45.0			50.5	
Approach LOS		B			B			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.2	79.4		25.6	10.1	80.5		25.6				
Change Period (Y+Rc), s	6.0	7.0		* 7.3	6.0	7.0		* 7.3				
Max Green Setting (Gmax), s	34.0	73.0		* 53	34.0	73.0		* 53				
Max Q Clear Time (g_c+I1), s	3.4	35.0		17.2	2.8	36.8		9.0				
Green Ext Time (p_c), s	0.2	37.3		1.1	0.1	36.1		1.1				
Intersection Summary												
HCM 2010 Ctrl Delay				17.8								
HCM 2010 LOS				B								
Notes												

Timings 3: Lester Rd/Veterans Pkwy & SR 54

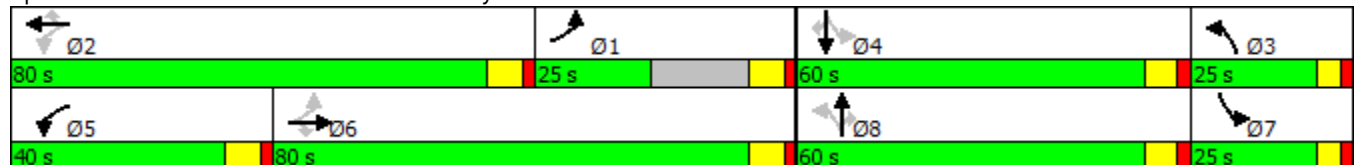
Existing AM
04/16/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	132	1218	126	330	1096	68	185	175	234	31	122	68
Future Volume (vph)	132	1218	126	330	1096	68	185	175	234	31	122	68
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2		2	8		8	4		4
Detector Phase	1	6	6	5	2	2	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	6.0	8.0	8.0	6.0	8.0	8.0
Minimum Split (s)	13.3	42.3	42.3	13.3	42.3	42.3	11.9	48.1	48.1	11.9	49.1	49.1
Total Split (s)	25.0	80.0	80.0	40.0	80.0	80.0	25.0	60.0	60.0	25.0	60.0	60.0
Total Split (%)	12.2%	39.0%	39.0%	19.5%	39.0%	39.0%	12.2%	29.3%	29.3%	12.2%	29.3%	29.3%
Yellow Time (s)	5.3	5.3	5.3	5.3	5.3	5.3	3.9	5.1	5.1	3.9	5.1	5.1
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)	7.3	7.3	7.3	7.3	7.3	7.3	5.9	7.1	7.1	5.9	7.1	7.1
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None

Intersection Summary

Cycle Length: 205
 Actuated Cycle Length: 166.3
 Natural Cycle: 150
 Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Lester Rd/Veterans Pkwy & SR 54



HCM 2010 Signalized Intersection Summary

3: Lester Rd/Veterans Pkwy & SR 54

Existing AM
04/16/2018

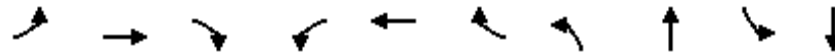
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	132	1218	126	330	1096	68	185	175	234	31	122	68
Future Volume (veh/h)	132	1218	126	330	1096	68	185	175	234	31	122	68
Number	1	6	16	5	2	12	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	183	1450	0	458	1501	0	276	297	0	48	239	0
Adj No. of Lanes	1	2	1	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.72	0.84	0.61	0.72	0.73	0.65	0.67	0.59	0.78	0.65	0.51	0.74
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	393	1542	690	395	1556	696	269	359	161	219	297	133
Arrive On Green	0.19	0.44	0.00	0.20	0.44	0.00	0.12	0.10	0.00	0.10	0.08	0.00
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	183	1450	0	458	1501	0	276	297	0	48	239	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	10.3	64.7	0.0	32.7	68.2	0.0	19.1	13.6	0.0	0.0	11.0	0.0
Cycle Q Clear(g_c), s	10.3	64.7	0.0	32.7	68.2	0.0	19.1	13.6	0.0	0.0	11.0	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	393	1542	690	395	1556	696	269	359	161	219	297	133
V/C Ratio(X)	0.47	0.94	0.00	1.16	0.96	0.00	1.03	0.83	0.00	0.22	0.80	0.00
Avail Cap(c_a), veh/h	393	1557	696	395	1557	696	269	1133	507	250	1133	507
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	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	56.4	44.6	0.0	53.7	45.1	0.0	70.7	72.8	0.0	67.2	74.4	0.0
Incr Delay (d2), s/veh	0.9	11.9	0.0	97.0	15.4	0.0	62.2	4.9	0.0	0.5	5.1	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(95%),veh/ln	11.8	43.7	0.0	51.5	46.6	0.0	30.4	11.2	0.0	3.6	9.5	0.0
LnGrp Delay(d),s/veh	57.3	56.5	0.0	150.6	60.5	0.0	133.0	77.7	0.0	67.7	79.4	0.0
LnGrp LOS	E	E		F	E		F	E		E	E	
Approach Vol, veh/h		1633			1959			573			287	
Approach Delay, s/veh		56.6			81.6			104.3			77.5	
Approach LOS		E			F			F			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	39.3	80.0	25.0	21.0	40.0	79.3	22.1	23.9				
Change Period (Y+Rc), s	7.3	7.3	5.9	7.1	7.3	7.3	5.9	7.1				
Max Green Setting (Gmax), s	17.7	72.7	19.1	52.9	32.7	72.7	19.1	52.9				
Max Q Clear Time (g_c+I1), s	12.3	70.2	21.1	13.0	34.7	66.7	2.0	15.6				
Green Ext Time (p_c), s	5.4	2.5	0.0	0.9	0.0	5.3	1.0	1.2				
Intersection Summary												
HCM 2010 Ctrl Delay				75.1								
HCM 2010 LOS				E								

Timings

Existing AM

4: Togwatee Village Pkwy/Piedmont Fayette & SR 54

04/16/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	200	1343	47	100	1280	129	19	1	40	5
Future Volume (vph)	200	1343	47	100	1280	129	19	1	40	5
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	NA
Protected Phases	1	6		5	2			4		8
Permitted Phases	6		6	2		2	4		8	
Detector Phase	1	6	6	5	2	2	4	4	8	8
Switch Phase										
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.7	33.0	33.0	11.7	32.0	32.0	50.0	50.0	48.0	48.0
Total Split (s)	40.0	80.0	80.0	40.0	80.0	80.0	60.0	60.0	60.0	60.0
Total Split (%)	22.2%	44.4%	44.4%	22.2%	44.4%	44.4%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.7	5.0	5.0	3.7	5.0	5.0	5.0	5.0	5.0	5.0
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)	5.7	7.0	7.0	5.7	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?										
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None

Intersection Summary

Cycle Length: 180

Actuated Cycle Length: 120.6

Natural Cycle: 125

Control Type: Actuated-Uncoordinated

Splits and Phases: 4: Togwatee Village Pkwy/Piedmont Fayette & SR 54

Ø1	Ø2	Ø4
40 s	80 s	60 s
Ø5	Ø6	Ø8
40 s	80 s	60 s

HCM 2010 Signalized Intersection Summary
4: Togwatee Village Pkwy/Piedmont Fayette & SR 54

Existing AM
04/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	1343	47	100	1280	129	19	1	29	40	5	19
Future Volume (veh/h)	200	1343	47	100	1280	129	19	1	29	40	5	19
Number	1	6	16	5	2	12	7	4	14	3	8	18
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	225	1476	0	128	1488	0	24	4	0	60	8	0
Adj No. of Lanes	1	2	1	1	2	1	1	1	0	1	1	0
Peak Hour Factor	0.89	0.91	0.78	0.78	0.86	0.90	0.79	0.25	0.81	0.67	0.62	0.40
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	330	2397	1072	322	2363	1057	183	162	0	186	162	0
Arrive On Green	0.06	0.68	0.00	0.05	0.67	0.00	0.09	0.09	0.00	0.09	0.09	0.00
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	1402	1863	0	1407	1863	0
Grp Volume(v), veh/h	225	1476	0	128	1488	0	24	4	0	60	8	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1402	1863	0	1407	1863	0
Q Serve(g_s), s	4.2	25.1	0.0	2.3	26.2	0.0	1.7	0.2	0.0	4.4	0.4	0.0
Cycle Q Clear(g_c), s	4.2	25.1	0.0	2.3	26.2	0.0	2.2	0.2	0.0	4.6	0.4	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	330	2397	1072	322	2363	1057	183	162	0	186	162	0
V/C Ratio(X)	0.68	0.62	0.00	0.40	0.63	0.00	0.13	0.02	0.00	0.32	0.05	0.00
Avail Cap(c_a), veh/h	777	2397	1072	786	2381	1065	745	910	0	751	910	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	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	13.2	9.7	0.0	8.7	10.3	0.0	46.4	45.3	0.0	47.4	45.4	0.0
Incr Delay (d2), s/veh	2.5	0.7	0.0	0.8	0.8	0.0	0.3	0.1	0.0	1.0	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(95%),veh/ln	8.1	18.1	0.0	2.4	18.7	0.0	1.2	0.2	0.0	3.2	0.4	0.0
LnGrp Delay(d),s/veh	15.7	10.4	0.0	9.5	11.1	0.0	46.7	45.4	0.0	48.4	45.5	0.0
LnGrp LOS	B	B		A	B		D	D		D	D	
Approach Vol, veh/h		1701			1616			28			68	
Approach Delay, s/veh		11.1			11.0			46.5			48.1	
Approach LOS		B			B			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.6	79.4		16.4	11.6	80.5		16.4				
Change Period (Y+Rc), s	* 5.7	7.0		7.0	* 5.7	7.0		7.0				
Max Green Setting (Gmax), s	* 34	73.0		53.0	* 34	73.0		53.0				
Max Q Clear Time (g_c+I1), s	6.2	28.2		4.2	4.3	27.1		6.6				
Green Ext Time (p_c), s	0.7	44.3		0.3	0.4	45.9		0.3				
Intersection Summary												
HCM 2010 Ctrl Delay				12.1								
HCM 2010 LOS				B								
Notes												

Timings 5: Ebenezer Rd/Brittany Way & SR 54

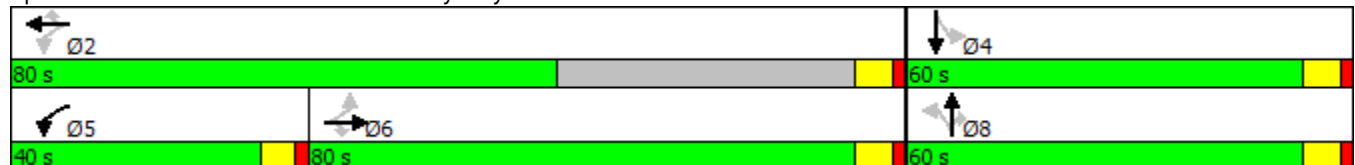
Existing AM
04/16/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	4	1078	24	146	928	6	40	1	259	32	1
Future Volume (vph)	4	1078	24	146	928	6	40	1	259	32	1
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases		6		5	2			8			4
Permitted Phases	6		6	2		2	8		8	4	
Detector Phase	6	6	6	5	2	2	8	8	8	4	4
Switch Phase											
Minimum Initial (s)	15.0	15.0	15.0	8.0	15.0	15.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	26.0	26.0	26.0	14.5	26.0	26.0	48.0	48.0	48.0	43.0	43.0
Total Split (s)	80.0	80.0	80.0	40.0	80.0	80.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	44.4%	44.4%	44.4%	22.2%	44.4%	44.4%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	5.0	5.0	5.0	4.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0
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
Total Lost Time (s)	7.0	7.0	7.0	6.5	7.0	7.0		7.0	7.0	7.0	7.0
Lead/Lag	Lag	Lag	Lag	Lead							
Lead-Lag Optimize?											
Recall Mode	Min	Min	Min	None	Min	Min	None	None	None	None	None

Intersection Summary

Cycle Length: 180
 Actuated Cycle Length: 119.6
 Natural Cycle: 110
 Control Type: Actuated-Uncoordinated

Splits and Phases: 5: Ebenezer Rd/Brittany Way & SR 54



HCM 2010 Signalized Intersection Summary

5: Ebenezer Rd/Brittany Way & SR 54

Existing AM
04/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	1078	24	146	928	6	40	1	259	32	1	17
Future Volume (veh/h)	4	1078	24	146	928	6	40	1	259	32	1	17
Number	1	6	16	5	2	12	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	8	1331	0	187	987	16	48	4	285	36	4	28
Adj No. of Lanes	1	2	1	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.50	0.81	0.75	0.78	0.94	0.38	0.83	0.25	0.91	0.89	0.25	0.61
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	370	1973	883	297	2401	1074	302	23	324	233	41	289
Arrive On Green	0.56	0.56	0.00	0.07	0.68	0.68	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	559	3539	1583	1774	3539	1583	1191	112	1583	1086	202	1412
Grp Volume(v), veh/h	8	1331	0	187	987	16	52	0	285	36	0	32
Grp Sat Flow(s),veh/h/ln	559	1770	1583	1774	1770	1583	1303	0	1583	1086	0	1614
Q Serve(g_s), s	0.8	32.0	0.0	5.1	14.9	0.4	3.5	0.0	20.9	3.5	0.0	1.9
Cycle Q Clear(g_c), s	1.2	32.0	0.0	5.1	14.9	0.4	5.4	0.0	20.9	8.9	0.0	1.9
Prop In Lane	1.00		1.00	1.00		1.00	0.92		1.00	1.00		0.88
Lane Grp Cap(c), veh/h	370	1973	883	297	2401	1074	325	0	324	233	0	330
V/C Ratio(X)	0.02	0.67	0.00	0.63	0.41	0.01	0.16	0.00	0.88	0.15	0.00	0.10
Avail Cap(c_a), veh/h	399	2156	965	675	2401	1074	657	0	700	491	0	714
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	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.1	18.8	0.0	17.5	8.6	6.3	40.7	0.0	46.2	43.8	0.0	38.7
Incr Delay (d2), s/veh	0.0	1.1	0.0	2.2	0.2	0.0	0.2	0.0	7.6	0.3	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(95%),veh/ln	0.2	22.4	0.0	6.0	11.8	0.3	2.6	0.0	14.9	1.9	0.0	1.6
LnGrp Delay(d),s/veh	12.1	19.9	0.0	19.7	8.8	6.3	40.9	0.0	53.8	44.1	0.0	38.8
LnGrp LOS	B	B		B	A	A	D		D	D		D
Approach Vol, veh/h	1339			1190			337			68		
Approach Delay, s/veh	19.9			10.5			51.8			41.6		
Approach LOS	B			B			D			D		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		4		5		6		8			
Phs Duration (G+Y+Rc), s	88.3		31.5		14.5		73.8		31.5			
Change Period (Y+Rc), s	7.0		7.0		6.5		7.0		7.0			
Max Green Setting (Gmax), s	73.0		53.0		33.5		73.0		53.0			
Max Q Clear Time (g_c+I1), s	16.9		10.9		7.1		34.0		22.9			
Green Ext Time (p_c), s	55.7		1.7		0.6		32.8		1.6			
Intersection Summary												
HCM 2010 Ctrl Delay				20.2								
HCM 2010 LOS				C								

Timings
6: Burch Rd/Ginger Cake Rd & SR 54

Existing AM
04/16/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	261	1234	17	26	1514	94	28	22	29	136	14
Future Volume (vph)	261	1234	17	26	1514	94	28	22	29	136	14
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases	1	6		5	2			8			4
Permitted Phases	6		6	2		2	8		8	4	
Detector Phase	1	6	6	5	2	2	8	8	8	4	4
Switch Phase											
Minimum Initial (s)	8.0	12.0	12.0	8.0	12.0	12.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	13.5	31.6	31.6	13.5	26.6	26.6	40.3	40.3	40.3	38.3	38.3
Total Split (s)	25.0	80.0	80.0	25.0	80.0	80.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	17.2%	55.2%	55.2%	17.2%	55.2%	55.2%	27.6%	27.6%	27.6%	27.6%	27.6%
Yellow Time (s)	3.5	4.6	4.6	3.5	4.6	4.6	4.3	4.3	4.3	4.3	4.3
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	6.6	6.6	5.5	6.6	6.6	6.3	6.3	6.3	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag					
Lead-Lag Optimize?											
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None

Intersection Summary

Cycle Length: 145
 Actuated Cycle Length: 133.6
 Natural Cycle: 130
 Control Type: Actuated-Uncoordinated

Splits and Phases: 6: Burch Rd/Ginger Cake Rd & SR 54

		
Ø1	Ø2	Ø4
25 s	80 s	40 s
		
Ø5	Ø6	Ø8
25 s	80 s	40 s

HCM 2010 Signalized Intersection Summary

6: Burch Rd/Ginger Cake Rd & SR 54

Existing AM
04/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	261	1234	17	26	1514	94	28	22	29	136	14	277
Future Volume (veh/h)	261	1234	17	26	1514	94	28	22	29	136	14	277
Number	1	6	16	5	2	12	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	335	1259	36	40	1594	112	36	36	48	160	20	355
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	0
Peak Hour Factor	0.78	0.98	0.47	0.65	0.95	0.84	0.78	0.61	0.60	0.85	0.70	0.78
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	318	2058	921	280	1724	771	60	450	382	348	21	365
Arrive On Green	0.14	0.58	0.58	0.05	0.49	0.49	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	1003	1863	1583	1308	85	1511
Grp Volume(v), veh/h	335	1259	36	40	1594	112	36	36	48	160	0	375
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1003	1863	1583	1308	0	1596
Q Serve(g_s), s	19.5	32.2	1.4	1.5	58.7	5.5	1.2	2.1	3.3	15.0	0.0	32.5
Cycle Q Clear(g_c), s	19.5	32.2	1.4	1.5	58.7	5.5	33.7	2.1	3.3	17.1	0.0	32.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.95
Lane Grp Cap(c), veh/h	318	2058	921	280	1724	771	60	450	382	348	0	385
V/C Ratio(X)	1.05	0.61	0.04	0.14	0.92	0.15	0.60	0.08	0.13	0.46	0.00	0.97
Avail Cap(c_a), veh/h	318	2058	921	448	1861	833	60	450	382	348	0	385
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	46.5	19.0	12.5	17.1	33.4	19.8	69.7	41.0	41.4	47.6	0.0	52.5
Incr Delay (d2), s/veh	64.7	0.8	0.0	0.2	8.6	0.2	15.4	0.1	0.1	0.9	0.0	38.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	32.3	22.5	1.1	1.3	39.7	4.3	2.9	1.9	2.6	9.4	0.0	25.6
LnGrp Delay(d),s/veh	111.2	19.8	12.5	17.3	42.0	19.9	85.0	41.0	41.6	48.5	0.0	91.2
LnGrp LOS	F	B	B	B	D	B	F	D	D	D		F
Approach Vol, veh/h		1630			1746			120			535	
Approach Delay, s/veh		38.4			40.1			54.4			78.4	
Approach LOS		D			D			D			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	25.0	74.6		40.0	11.8	87.8		40.0				
Change Period (Y+Rc), s	5.5	6.6		6.3	5.5	6.6		6.3				
Max Green Setting (Gmax), s	19.5	73.4		33.7	19.5	73.4		33.7				
Max Q Clear Time (g_c+I1), s	21.5	60.7		34.5	3.5	34.2		35.7				
Green Ext Time (p_c), s	0.0	7.3		0.0	0.1	39.1		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				44.9								
HCM 2010 LOS				D								
Notes												

Timings
7: Oak St/Brandywine Blvd & SR 54

Existing AM
04/16/2018

										
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	27	1318	8	1649	100	5	0	70	0	6
Future Volume (vph)	27	1318	8	1649	100	5	0	70	0	6
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	NA	Perm
Protected Phases	5	2	1	6			8		4	
Permitted Phases	2		6		6	8		4		4
Detector Phase	5	2	1	6	6	8	8	4	4	4
Switch Phase										
Minimum Initial (s)	8.0	12.0	8.0	12.0	12.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.5	24.5	13.5	24.5	24.5	39.1	39.1	39.1	39.1	39.1
Total Split (s)	30.0	80.0	30.0	80.0	80.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	20.0%	53.3%	20.0%	53.3%	53.3%	26.7%	26.7%	26.7%	26.7%	26.7%
Yellow Time (s)	3.5	4.5	3.5	4.5	4.5	4.1	4.1	4.1	4.1	4.1
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
Total Lost Time (s)	5.5	6.5	5.5	6.5	6.5		6.1		6.1	6.1
Lead/Lag	Lead	Lag	Lead	Lag	Lag					
Lead-Lag Optimize?										
Recall Mode	None	Min	None	Min	Min	None	None	None	None	None

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 108.1
Natural Cycle: 120
Control Type: Actuated-Uncoordinated

Splits and Phases: 7: Oak St/Brandywine Blvd & SR 54

		
Ø1	Ø2	Ø4
30 s	80 s	40 s
		
Ø5	Ø6	Ø8
30 s	80 s	40 s

HCM 2010 Signalized Intersection Summary
7: Oak St/Brandywine Blvd & SR 54

Existing AM
04/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	1318	0	8	1649	100	5	0	5	70	0	6
Future Volume (veh/h)	27	1318	0	8	1649	100	5	0	5	70	0	6
Number	5	2	12	1	6	16	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	36	1402	0	9	1812	169	12	0	16	76	0	0
Adj No. of Lanes	1	2	1	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.75	0.94	0.92	0.92	0.91	0.59	0.42	0.92	0.31	0.92	0.92	0.75
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	235	2545	1139	305	2432	1088	96	17	85	201	0	144
Arrive On Green	0.05	0.72	0.00	0.02	0.69	0.69	0.09	0.00	0.09	0.09	0.00	0.00
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	514	189	937	1456	0	1583
Grp Volume(v), veh/h	36	1402	0	9	1812	169	28	0	0	76	0	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1640	0	0	1456	0	1583
Q Serve(g_s), s	0.6	19.3	0.0	0.2	34.4	3.9	0.0	0.0	0.0	3.4	0.0	0.0
Cycle Q Clear(g_c), s	0.6	19.3	0.0	0.2	34.4	3.9	1.6	0.0	0.0	5.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.43		0.57	1.00		1.00
Lane Grp Cap(c), veh/h	235	2545	1139	305	2432	1088	198	0	0	201	0	144
V/C Ratio(X)	0.15	0.55	0.00	0.03	0.75	0.16	0.14	0.00	0.00	0.38	0.00	0.00
Avail Cap(c_a), veh/h	561	2545	1139	688	2480	1109	548	0	0	524	0	512
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	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	10.5	6.9	0.0	5.8	10.5	5.7	44.1	0.0	0.0	45.5	0.0	0.0
Incr Delay (d2), s/veh	0.3	0.4	0.0	0.0	1.5	0.1	0.3	0.0	0.0	1.2	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(95%),veh/ln	0.8	14.6	0.0	0.1	23.9	3.1	1.4	0.0	0.0	3.9	0.0	0.0
LnGrp Delay(d),s/veh	10.8	7.3	0.0	5.9	12.0	5.9	44.4	0.0	0.0	46.7	0.0	0.0
LnGrp LOS	B	A		A	B	A	D			D		
Approach Vol, veh/h	1438			1990			28			76		
Approach Delay, s/veh	7.4			11.5			44.4			46.7		
Approach LOS	A			B			D			D		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.3	81.9		15.6	10.7	78.6		15.6				
Change Period (Y+Rc), s	5.5	6.5		6.1	5.5	6.5		6.1				
Max Green Setting (Gmax), s	24.5	73.5		33.9	24.5	73.5		33.9				
Max Q Clear Time (g_c+I1), s	2.2	21.3		7.0	2.6	36.4		3.6				
Green Ext Time (p_c), s	0.0	52.0		0.3	0.1	35.7		0.3				
Intersection Summary												
HCM 2010 Ctrl Delay	10.8											
HCM 2010 LOS	B											

Timings
8: Grady Avenue/Sharon Drive & SR 54

Existing AM
04/16/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	12	1021	477	195	1256	5	640	0	197	10	15
Future Volume (vph)	12	1021	477	195	1256	5	640	0	197	10	15
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases		2		1	6			8			4
Permitted Phases	2		2	6		6	8		8	4	
Detector Phase	2	2	2	1	6	6	8	8	8	4	4
Switch Phase											
Minimum Initial (s)	12.0	12.0	12.0	6.0	12.0	12.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	35.0	35.0	35.0	12.4	31.0	31.0	39.0	39.0	39.0	37.0	37.0
Total Split (s)	51.0	51.0	51.0	20.0	71.0	71.0	39.0	39.0	39.0	39.0	39.0
Total Split (%)	46.4%	46.4%	46.4%	18.2%	64.5%	64.5%	35.5%	35.5%	35.5%	35.5%	35.5%
Yellow Time (s)	5.0	5.0	5.0	4.4	5.0	5.0	5.0	5.0	5.0	5.0	5.0
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
Total Lost Time (s)	7.0	7.0	7.0	6.4	7.0	7.0		7.0	7.0		7.0
Lead/Lag	Lag	Lag	Lag	Lead							
Lead-Lag Optimize?											
Recall Mode	C-Min	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 10 (9%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated

Splits and Phases: 8: Grady Avenue/Sharon Drive & SR 54



HCM 2010 Signalized Intersection Summary
8: Grady Avenue/Sharon Drive & SR 54

Existing AM
04/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	1021	477	195	1256	5	640	0	197	10	15	9
Future Volume (veh/h)	12	1021	477	195	1256	5	640	0	197	10	15	9
Number	5	2	12	1	6	16	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	20	1174	575	260	1308	12	727	0	0	20	24	0
Adj No. of Lanes	1	2	1	1	2	1	0	1	1	0	1	0
Peak Hour Factor	0.60	0.87	0.83	0.75	0.96	0.42	0.88	0.92	0.79	0.50	0.62	0.56
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	205	1475	660	290	2059	921	474	0	461	270	308	0
Arrive On Green	0.42	0.42	0.42	0.11	0.58	0.58	0.29	0.00	0.00	0.29	0.29	0.00
Sat Flow, veh/h	414	3539	1583	1774	3539	1583	1405	0	1583	766	1059	0
Grp Volume(v), veh/h	20	1174	575	260	1308	12	727	0	0	44	0	0
Grp Sat Flow(s),veh/h/ln	414	1770	1583	1774	1770	1583	1405	0	1583	1824	0	0
Q Serve(g_s), s	3.7	31.8	36.6	9.6	27.0	0.4	30.1	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	12.5	31.8	36.6	9.6	27.0	0.4	32.0	0.0	0.0	1.9	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	0.45		0.00
Lane Grp Cap(c), veh/h	205	1475	660	290	2059	921	474	0	461	578	0	0
V/C Ratio(X)	0.10	0.80	0.87	0.90	0.64	0.01	1.53	0.00	0.00	0.08	0.00	0.00
Avail Cap(c_a), veh/h	205	1475	660	320	2059	921	474	0	461	578	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	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	25.4	28.0	29.4	25.9	15.3	9.7	41.0	0.0	0.0	28.3	0.0	0.0
Incr Delay (d2), s/veh	0.9	4.5	14.7	24.9	1.5	0.0	250.5	0.0	0.0	0.1	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	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.9	23.1	25.8	14.8	19.5	0.3	85.2	0.0	0.0	1.8	0.0	0.0
LnGrp Delay(d),s/veh	26.4	32.5	44.1	50.8	16.8	9.7	291.5	0.0	0.0	28.4	0.0	0.0
LnGrp LOS	C	C	D	D	B	A	F			C		
Approach Vol, veh/h		1769			1580			727			44	
Approach Delay, s/veh		36.2			22.3			291.5			28.4	
Approach LOS		D			C			F			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	18.1	52.9		39.0		71.0		39.0				
Change Period (Y+Rc), s	6.4	7.0		7.0		7.0		7.0				
Max Green Setting (Gmax), s	13.6	44.0		32.0		64.0		32.0				
Max Q Clear Time (g_c+I1), s	11.6	38.6		3.9		29.0		34.0				
Green Ext Time (p_c), s	0.2	5.4		3.5		35.0		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				75.9								
HCM 2010 LOS				E								

Intersection

Intersection Delay, s/veh14.4

Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	7	4	99	4	43	7	197	174	44	241	4
Future Vol, veh/h	4	7	4	99	4	43	7	197	174	44	241	4
Peak Hour Factor	0.50	0.44	0.33	0.56	0.50	0.83	0.88	0.86	0.91	0.92	0.80	0.50
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	16	12	177	8	52	8	229	191	48	301	8
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.9	12.8	15.5	14.6
HCM LOS	A	B	C	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	2%	27%	68%	15%
Vol Thru, %	52%	47%	3%	83%
Vol Right, %	46%	27%	29%	1%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	378	15	146	289
LT Vol	7	4	99	44
Through Vol	197	7	4	241
RT Vol	174	4	43	4
Lane Flow Rate	428	36	237	357
Geometry Grp	1	1	1	1
Degree of Util (X)	0.601	0.064	0.391	0.537
Departure Headway (Hd)	5.051	6.392	5.948	5.415
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	711	557	603	664
Service Time	3.099	4.474	4.005	3.466
HCM Lane V/C Ratio	0.602	0.065	0.393	0.538
HCM Control Delay	15.5	9.9	12.8	14.6
HCM Lane LOS	C	A	B	B
HCM 95th-tile Q	4.1	0.2	1.9	3.2

Intersection						
Int Delay, s/veh	3.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	14	106	132	224	246	92
Future Vol, veh/h	14	106	132	224	246	92
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	-	-	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	70	76	73	76	76	66
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	139	181	295	324	139
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	980	324	324	0	-	0
Stage 1	324	-	-	-	-	-
Stage 2	656	-	-	-	-	-
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	277	717	1236	-	-	-
Stage 1	733	-	-	-	-	-
Stage 2	516	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	229	717	1236	-	-	-
Mov Cap-2 Maneuver	229	-	-	-	-	-
Stage 1	733	-	-	-	-	-
Stage 2	426	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	13.8	3.2		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1236	-	566	-	-	
HCM Lane V/C Ratio	0.146	-	0.282	-	-	
HCM Control Delay (s)	8.4	0	13.8	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0.5	-	1.2	-	-	

Intersection						
Int Delay, s/veh	5.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	175	270	10	262	210
Future Vol, veh/h	2	175	270	10	262	210
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	0	250	-	400	225	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	50	71	74	50	77	66
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	246	365	20	340	318
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1364	365	0	0	365	0
Stage 1	365	-	-	-	-	-
Stage 2	999	-	-	-	-	-
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	163	680	-	-	1194	-
Stage 1	702	-	-	-	-	-
Stage 2	356	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	117	680	-	-	1194	-
Mov Cap-2 Maneuver	117	-	-	-	-	-
Stage 1	702	-	-	-	-	-
Stage 2	255	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	13.7	0	4.8			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT		
Capacity (veh/h)	-	- 117 680 1194	-	-		
HCM Lane V/C Ratio	-	- 0.034 0.362 0.285	-	-		
HCM Control Delay (s)	-	- 36.9 13.3 9.2	-	-		
HCM Lane LOS	-	- E B A	-	-		
HCM 95th %tile Q(veh)	-	- 0.1 1.7 1.2	-	-		

Intersection						
Int Delay, s/veh	6.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	280	227	197	208	34
Future Vol, veh/h	6	280	227	197	208	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	115	0	185	-	-	250
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	81	86	83	71	77
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	346	264	237	293	44
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1058	293	293	0	-	0
Stage 1	293	-	-	-	-	-
Stage 2	765	-	-	-	-	-
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	249	746	1269	-	-	-
Stage 1	757	-	-	-	-	-
Stage 2	459	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	197	746	1269	-	-	-
Mov Cap-2 Maneuver	197	-	-	-	-	-
Stage 1	757	-	-	-	-	-
Stage 2	364	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	14.1	4.5		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1269	-	197	746	-	-
HCM Lane V/C Ratio	0.208	-	0.041	0.463	-	-
HCM Control Delay (s)	8.6	-	24	13.9	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.8	-	0.1	2.5	-	-

Timings

1: Private Drwy/Tyrone Rd & SR 54

Existing PM

04/16/2018



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	26	882	1169	465	1	3	281	0	36
Future Volume (vph)	26	882	1169	465	1	3	281	0	36
Turn Type	Perm	NA	NA	Perm	Perm	NA	Perm	NA	Perm
Protected Phases		2	6			8		4	
Permitted Phases	2			6	8		4		4
Detector Phase	2	2	6	6	8	8	4	4	4
Switch Phase									
Minimum Initial (s)	15.0	15.0	15.0	15.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	26.0	26.0	25.0	25.0	48.0	48.0	44.0	44.0	44.0
Total Split (s)	80.0	80.0	80.0	80.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	57.1%	57.1%	57.1%	57.1%	42.9%	42.9%	42.9%	42.9%	42.9%
Yellow Time (s)	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0		7.0		7.0	7.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	Min	Min	Min	Min	None	None	None	None	None

Intersection Summary

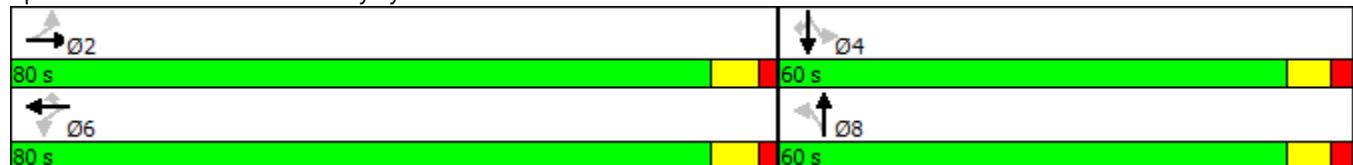
Cycle Length: 140

Actuated Cycle Length: 120

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Splits and Phases: 1: Private Drwy/Tyrone Rd & SR 54



HCM 2010 Signalized Intersection Summary

1: Private Drwy/Tyrone Rd & SR 54

Existing PM
04/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	882	0	0	1169	465	1	3	0	281	0	36
Future Volume (veh/h)	26	882	0	0	1169	465	1	3	0	281	0	36
Number	5	2	12	1	6	16	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	32	980	0	0	1244	567	4	8	0	323	0	0
Adj No. of Lanes	1	2	0	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.81	0.90	0.25	0.92	0.94	0.82	0.25	0.38	0.92	0.87	0.92	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	173	2227	0	62	2227	996	172	325	0	414	0	396
Arrive On Green	0.63	0.63	0.00	0.00	0.63	0.63	0.25	0.25	0.00	0.25	0.00	0.00
Sat Flow, veh/h	258	3632	0	572	3539	1583	521	1299	0	1409	0	1583
Grp Volume(v), veh/h	32	980	0	0	1244	567	12	0	0	323	0	0
Grp Sat Flow(s),veh/h/ln	258	1770	0	572	1770	1583	1820	0	0	1409	0	1583
Q Serve(g_s), s	9.4	16.4	0.0	0.0	23.3	24.0	0.0	0.0	0.0	25.3	0.0	0.0
Cycle Q Clear(g_c), s	32.7	16.4	0.0	0.0	23.3	24.0	0.6	0.0	0.0	25.8	0.0	0.0
Prop In Lane	1.00		0.00	1.00		1.00	0.33		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	173	2227	0	62	2227	996	496	0	0	414	0	396
V/C Ratio(X)	0.19	0.44	0.00	0.00	0.56	0.57	0.02	0.00	0.00	0.78	0.00	0.00
Avail Cap(c_a), veh/h	173	2230	0	63	2230	998	846	0	0	705	0	724
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	0.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	21.6	11.0	0.0	0.0	12.3	12.4	32.8	0.0	0.0	42.2	0.0	0.0
Incr Delay (d2), s/veh	1.1	0.3	0.0	0.0	0.5	1.3	0.0	0.0	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	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.3	12.8	0.0	0.0	16.9	16.1	0.5	0.0	0.0	15.7	0.0	0.0
LnGrp Delay(d),s/veh	22.7	11.3	0.0	0.0	12.8	13.7	32.8	0.0	0.0	45.4	0.0	0.0
LnGrp LOS	C	B			B	B	C			D		
Approach Vol, veh/h		1012			1811			12			323	
Approach Delay, s/veh		11.7			13.1			32.8			45.4	
Approach LOS		B			B			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		79.9		36.0		79.9		36.0				
Change Period (Y+Rc), s		7.0		7.0		7.0		7.0				
Max Green Setting (Gmax), s		73.0		53.0		73.0		53.0				
Max Q Clear Time (g_c+I1), s		34.7		27.8		26.0		2.6				
Green Ext Time (p_c), s		38.2		1.1		46.9		1.2				
Intersection Summary												
HCM 2010 Ctrl Delay			16.0									
HCM 2010 LOS			B									

Timings

Existing PM

2: Old Norton Rd/S Sandy Creek Rd & SR 54

04/16/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	26	1510	14	66	1325	113	23	7	199	10	27
Future Volume (vph)	26	1510	14	66	1325	113	23	7	199	10	27
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	NA	Perm
Protected Phases	5	2		1	6			8		4	
Permitted Phases	2		2	6		6	8		4		4
Detector Phase	5	2	2	1	6	6	8	8	4	4	4
Switch Phase											
Minimum Initial (s)	6.0	12.0	12.0	6.0	12.0	12.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	12.0	26.0	26.0	13.5	25.0	25.0	46.3	46.3	46.3	46.3	46.3
Total Split (s)	40.0	80.0	80.0	40.0	80.0	80.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	22.2%	44.4%	44.4%	22.2%	44.4%	44.4%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.3	2.3	2.3	2.3
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)	6.0	7.0	7.0	6.0	7.0	7.0		7.3		7.3	7.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag					
Lead-Lag Optimize?											
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None

Intersection Summary

Cycle Length: 180

Actuated Cycle Length: 129.7

Natural Cycle: 120

Control Type: Actuated-Uncoordinated

Splits and Phases: 2: Old Norton Rd/S Sandy Creek Rd & SR 54

Ø1	Ø2	Ø4
40 s	80 s	60 s
Ø5	Ø6	Ø8
40 s	80 s	60 s

HCM 2010 Signalized Intersection Summary

2: Old Norton Rd/S Sandy Creek Rd & SR 54

Existing PM
04/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	1510	14	66	1325	113	23	7	16	199	10	27
Future Volume (veh/h)	26	1510	14	66	1325	113	23	7	16	199	10	27
Number	5	2	12	1	6	16	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	32	1606	28	76	1456	128	32	8	20	219	16	0
Adj No. of Lanes	1	2	1	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.81	0.94	0.50	0.87	0.91	0.88	0.72	0.88	0.80	0.91	0.62	0.68
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	230	2135	955	226	2182	976	201	56	106	304	18	286
Arrive On Green	0.03	0.60	0.60	0.05	0.62	0.62	0.18	0.18	0.18	0.18	0.18	0.00
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	857	309	583	1362	99	1583
Grp Volume(v), veh/h	32	1606	28	76	1456	128	60	0	0	235	0	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1750	0	0	1461	0	1583
Q Serve(g_s), s	0.8	39.4	0.9	1.9	32.1	4.0	0.0	0.0	0.0	15.2	0.0	0.0
Cycle Q Clear(g_c), s	0.8	39.4	0.9	1.9	32.1	4.0	3.4	0.0	0.0	18.6	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.53		0.33	0.93		1.00
Lane Grp Cap(c), veh/h	230	2135	955	226	2182	976	363	0	0	322	0	286
V/C Ratio(X)	0.14	0.75	0.03	0.34	0.67	0.13	0.17	0.00	0.00	0.73	0.00	0.00
Avail Cap(c_a), veh/h	676	2159	966	648	2182	976	753	0	0	686	0	697
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	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	12.4	17.2	9.6	16.3	14.9	9.6	41.6	0.0	0.0	47.4	0.0	0.0
Incr Delay (d2), s/veh	0.3	1.8	0.0	0.9	1.1	0.1	0.2	0.0	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	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.7	27.0	0.7	2.1	22.4	3.2	3.1	0.0	0.0	12.5	0.0	0.0
LnGrp Delay(d),s/veh	12.6	19.1	9.6	17.2	16.0	9.7	41.8	0.0	0.0	50.6	0.0	0.0
LnGrp LOS	B	B	A	B	B	A	D			D		
Approach Vol, veh/h		1666			1660			60			235	
Approach Delay, s/veh		18.8			15.6			41.8			50.6	
Approach LOS		B			B			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.5	79.2		28.9	9.9	80.8		28.9				
Change Period (Y+Rc), s	6.0	7.0		* 7.3	6.0	7.0		* 7.3				
Max Green Setting (Gmax), s	34.0	73.0		* 53	34.0	73.0		* 53				
Max Q Clear Time (g_c+I1), s	3.9	41.4		20.6	2.8	34.1		5.4				
Green Ext Time (p_c), s	0.2	30.8		1.0	0.1	38.9		1.0				
Intersection Summary												
HCM 2010 Ctrl Delay				19.7								
HCM 2010 LOS				B								
Notes												

Timings 3: Lester Rd/Veterans Pkwy & SR 54

Existing PM
04/16/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	104	1139	117	195	1289	44	122	85	131	22	121	112
Future Volume (vph)	104	1139	117	195	1289	44	122	85	131	22	121	112
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2		2	8		8	4		4
Detector Phase	1	6	6	5	2	2	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	6.0	8.0	8.0	6.0	8.0	8.0
Minimum Split (s)	13.3	42.3	42.3	13.3	42.3	42.3	11.9	48.1	48.1	11.9	49.1	49.1
Total Split (s)	25.0	80.0	80.0	40.0	80.0	80.0	25.0	60.0	60.0	25.0	60.0	60.0
Total Split (%)	12.2%	39.0%	39.0%	19.5%	39.0%	39.0%	12.2%	29.3%	29.3%	12.2%	29.3%	29.3%
Yellow Time (s)	5.3	5.3	5.3	5.3	5.3	5.3	3.9	5.1	5.1	3.9	5.1	5.1
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)	7.3	7.3	7.3	7.3	7.3	7.3	5.9	7.1	7.1	5.9	7.1	7.1
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None

Intersection Summary

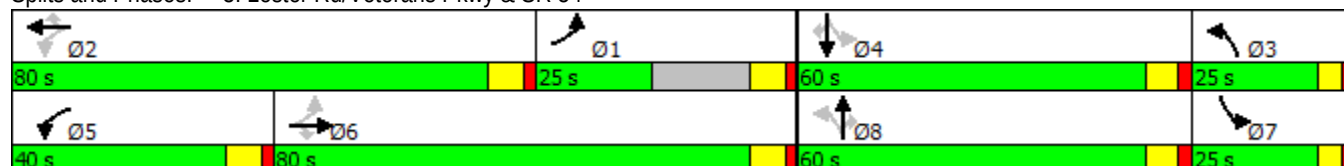
Cycle Length: 205

Actuated Cycle Length: 142.7

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Lester Rd/Veterans Pkwy & SR 54



HCM 2010 Signalized Intersection Summary

3: Lester Rd/Veterans Pkwy & SR 54

Existing PM
04/16/2018

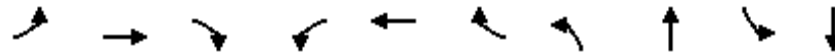
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	104	1139	117	195	1289	44	122	85	131	22	121	112
Future Volume (veh/h)	104	1139	117	195	1289	44	122	85	131	22	121	112
Number	1	6	16	5	2	12	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	144	1356	0	241	1432	0	152	100	0	32	144	0
Adj No. of Lanes	1	2	1	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.72	0.84	0.86	0.81	0.90	0.85	0.80	0.85	0.63	0.69	0.84	0.78
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	343	2015	901	283	1964	879	182	221	99	200	221	99
Arrive On Green	0.11	0.57	0.00	0.10	0.55	0.00	0.06	0.06	0.00	0.06	0.06	0.00
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	144	1356	0	241	1432	0	152	100	0	32	144	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	0.0	34.3	0.0	9.8	38.8	0.0	4.7	3.5	0.0	0.0	5.1	0.0
Cycle Q Clear(g_c), s	0.0	34.3	0.0	9.8	38.8	0.0	4.7	3.5	0.0	0.0	5.1	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	343	2015	901	283	1964	879	182	221	99	200	221	99
V/C Ratio(X)	0.42	0.67	0.00	0.85	0.73	0.00	0.83	0.45	0.00	0.16	0.65	0.00
Avail Cap(c_a), veh/h	389	2015	901	562	2008	898	349	1461	654	366	1461	654
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	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	41.2	19.3	0.0	26.8	21.3	0.0	57.8	58.0	0.0	54.4	58.7	0.0
Incr Delay (d2), s/veh	0.8	1.2	0.0	7.2	1.7	0.0	9.5	1.4	0.0	0.4	3.2	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(95%),veh/ln	8.1	23.7	0.0	9.1	26.6	0.0	9.7	3.2	0.0	1.9	4.7	0.0
LnGrp Delay(d),s/veh	42.1	20.5	0.0	34.0	23.0	0.0	67.3	59.4	0.0	54.7	61.9	0.0
LnGrp LOS	D	C		C	C		E	E		D	E	
Approach Vol, veh/h		1500			1673			252			176	
Approach Delay, s/veh		22.5			24.6			64.2			60.6	
Approach LOS		C			C			E			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	21.7	78.4	13.0	15.1	19.8	80.3	13.0	15.1				
Change Period (Y+Rc), s	7.3	7.3	5.9	7.1	7.3	7.3	5.9	7.1				
Max Green Setting (Gmax), s	17.7	72.7	19.1	52.9	32.7	72.7	19.1	52.9				
Max Q Clear Time (g_c+I1), s	2.0	40.8	6.7	7.1	11.8	36.3	2.0	5.5				
Green Ext Time (p_c), s	12.5	30.4	0.4	0.5	0.7	34.0	0.5	0.4				
Intersection Summary												
HCM 2010 Ctrl Delay			28.3									
HCM 2010 LOS			C									

Timings

Existing PM

4: Togwatee Village Pkwy/Piedmont Fayette & SR 54

04/16/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	107	1380	73	109	1257	99	57	6	108	7
Future Volume (vph)	107	1380	73	109	1257	99	57	6	108	7
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	NA
Protected Phases	1	6		5	2			4		8
Permitted Phases	6		6	2		2	4		8	
Detector Phase	1	6	6	5	2	2	4	4	8	8
Switch Phase										
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.7	33.0	33.0	11.7	32.0	32.0	50.0	50.0	48.0	48.0
Total Split (s)	40.0	80.0	80.0	40.0	80.0	80.0	60.0	60.0	60.0	60.0
Total Split (%)	22.2%	44.4%	44.4%	22.2%	44.4%	44.4%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.7	5.0	5.0	3.7	5.0	5.0	5.0	5.0	5.0	5.0
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)	5.7	7.0	7.0	5.7	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?										
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None

Intersection Summary

Cycle Length: 180

Actuated Cycle Length: 121.4

Natural Cycle: 125

Control Type: Actuated-Uncoordinated

Splits and Phases: 4: Togwatee Village Pkwy/Piedmont Fayette & SR 54

Ø1	Ø2	Ø4
40 s	80 s	60 s
Ø5	Ø6	Ø8
40 s	80 s	60 s

HCM 2010 Signalized Intersection Summary

4: Togwatee Village Pkwy/Piedmont Fayette & SR 54

Existing PM
04/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	107	1380	73	109	1257	99	57	6	64	108	7	40
Future Volume (veh/h)	107	1380	73	109	1257	99	57	6	64	108	7	40
Number	1	6	16	5	2	12	7	4	14	3	8	18
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	116	1568	0	156	1337	0	72	8	0	116	8	0
Adj No. of Lanes	1	2	1	1	2	1	1	1	0	1	1	0
Peak Hour Factor	0.92	0.88	0.63	0.70	0.94	0.88	0.79	0.75	0.80	0.93	0.88	0.77
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	343	2332	1043	287	2336	1045	213	203	0	213	203	0
Arrive On Green	0.05	0.66	0.00	0.05	0.66	0.00	0.11	0.11	0.00	0.11	0.11	0.00
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	1402	1863	0	1402	1863	0
Grp Volume(v), veh/h	116	1568	0	156	1337	0	72	8	0	116	8	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1402	1863	0	1402	1863	0
Q Serve(g_s), s	2.2	30.0	0.0	3.1	22.8	0.0	5.4	0.4	0.0	8.9	0.4	0.0
Cycle Q Clear(g_c), s	2.2	30.0	0.0	3.1	22.8	0.0	5.8	0.4	0.0	9.4	0.4	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	343	2332	1043	287	2336	1045	213	203	0	213	203	0
V/C Ratio(X)	0.34	0.67	0.00	0.54	0.57	0.00	0.34	0.04	0.00	0.55	0.04	0.00
Avail Cap(c_a), veh/h	800	2335	1045	742	2336	1045	731	892	0	731	892	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	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	8.2	11.6	0.0	12.8	10.3	0.0	46.7	44.1	0.0	48.3	44.1	0.0
Incr Delay (d2), s/veh	0.6	1.0	0.0	1.6	0.6	0.0	0.9	0.1	0.0	2.2	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(95%),veh/ln	2.0	21.3	0.0	4.6	16.6	0.0	3.8	0.4	0.0	6.4	0.4	0.0
LnGrp Delay(d),s/veh	8.8	12.6	0.0	14.4	10.8	0.0	47.6	44.2	0.0	50.4	44.2	0.0
LnGrp LOS	A	B		B	B		D	D		D	D	
Approach Vol, veh/h		1684			1493			80			124	
Approach Delay, s/veh		12.3			11.2			47.3			50.0	
Approach LOS		B			B			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.5	80.0		19.1	11.7	79.9		19.1				
Change Period (Y+Rc), s	* 5.7	7.0		7.0	* 5.7	7.0		7.0				
Max Green Setting (Gmax), s	* 34	73.0		53.0	* 34	73.0		53.0				
Max Q Clear Time (g_c+I1), s	4.2	24.8		7.8	5.1	32.0		11.4				
Green Ext Time (p_c), s	0.3	48.1		0.8	0.5	40.9		0.8				
Intersection Summary												
HCM 2010 Ctrl Delay				14.0								
HCM 2010 LOS				B								
Notes												

Timings 5: Ebenezer Rd/Brittany Way & SR 54

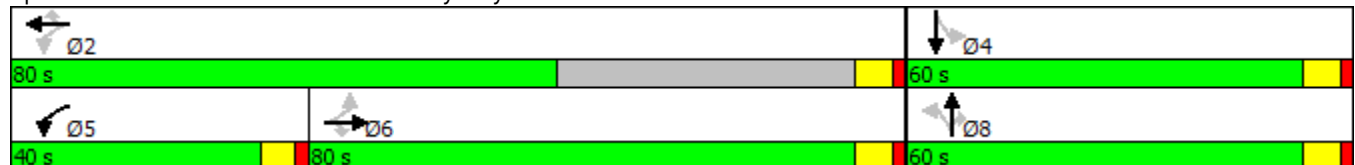
Existing PM
04/16/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	13	1504	70	281	1154	26	26	3	164	6	0
Future Volume (vph)	13	1504	70	281	1154	26	26	3	164	6	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases		6		5	2			8			4
Permitted Phases	6		6	2		2	8		8	4	
Detector Phase	6	6	6	5	2	2	8	8	8	4	4
Switch Phase											
Minimum Initial (s)	15.0	15.0	15.0	8.0	15.0	15.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	26.0	26.0	26.0	14.5	26.0	26.0	48.0	48.0	48.0	43.0	43.0
Total Split (s)	80.0	80.0	80.0	40.0	80.0	80.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	44.4%	44.4%	44.4%	22.2%	44.4%	44.4%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	5.0	5.0	5.0	4.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0
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
Total Lost Time (s)	7.0	7.0	7.0	6.5	7.0	7.0		7.0	7.0	7.0	7.0
Lead/Lag	Lag	Lag	Lag	Lead							
Lead-Lag Optimize?											
Recall Mode	Min	Min	Min	None	Min	Min	None	None	None	None	None

Intersection Summary

Cycle Length: 180
 Actuated Cycle Length: 132.9
 Natural Cycle: 150
 Control Type: Actuated-Uncoordinated

Splits and Phases: 5: Ebenezer Rd/Brittany Way & SR 54



HCM 2010 Signalized Intersection Summary

5: Ebenezer Rd/Brittany Way & SR 54

Existing PM
04/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	1504	70	281	1154	26	26	3	164	6	0	21
Future Volume (veh/h)	13	1504	70	281	1154	26	26	3	164	6	0	21
Number	1	6	16	5	2	12	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	16	1749	0	335	1268	32	36	4	238	8	0	36
Adj No. of Lanes	1	2	1	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.81	0.86	0.70	0.84	0.91	0.81	0.72	0.75	0.69	0.75	0.25	0.58
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	268	1810	810	364	2580	1154	240	24	269	197	0	269
Arrive On Green	0.51	0.51	0.00	0.17	0.73	0.73	0.17	0.17	0.17	0.17	0.00	0.17
Sat Flow, veh/h	422	3539	1583	1774	3539	1583	1120	142	1583	1133	0	1583
Grp Volume(v), veh/h	16	1749	0	335	1268	32	40	0	238	8	0	36
Grp Sat Flow(s),veh/h/ln	422	1770	1583	1774	1770	1583	1262	0	1583	1133	0	1583
Q Serve(g_s), s	2.7	66.3	0.0	20.9	21.0	0.8	3.2	0.0	20.4	0.9	0.0	2.7
Cycle Q Clear(g_c), s	2.7	66.3	0.0	20.9	21.0	0.8	5.8	0.0	20.4	6.7	0.0	2.7
Prop In Lane	1.00		1.00	1.00		1.00	0.90		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	268	1810	810	364	2580	1154	264	0	269	197	0	269
V/C Ratio(X)	0.06	0.97	0.00	0.92	0.49	0.03	0.15	0.00	0.88	0.04	0.00	0.13
Avail Cap(c_a), veh/h	274	1859	832	489	2580	1154	561	0	604	436	0	604
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	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.2	32.8	0.0	46.8	7.9	5.2	51.1	0.0	56.3	53.2	0.0	49.0
Incr Delay (d2), s/veh	0.2	13.9	0.0	18.8	0.3	0.0	0.3	0.0	9.3	0.1	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.6	45.6	0.0	20.8	15.6	0.6	2.5	0.0	14.7	0.5	0.0	2.2
LnGrp Delay(d),s/veh	17.4	46.7	0.0	65.6	8.3	5.2	51.4	0.0	65.6	53.3	0.0	49.2
LnGrp LOS	B	D		E	A	A	D		E	D		D
Approach Vol, veh/h		1765			1635			278			44	
Approach Delay, s/veh		46.4			19.9			63.6			49.9	
Approach LOS		D			B			E			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		108.3		30.6	30.2	78.1		30.6				
Change Period (Y+Rc), s		7.0		7.0	6.5	7.0		7.0				
Max Green Setting (Gmax), s		73.0		53.0	33.5	73.0		53.0				
Max Q Clear Time (g_c+I1), s		23.0		8.7	22.9	68.3		22.4				
Green Ext Time (p_c), s		49.9		1.3	0.8	2.7		1.2				
Intersection Summary												
HCM 2010 Ctrl Delay				36.1								
HCM 2010 LOS				D								

Timings
6: Burch Rd/Ginger Cake Rd & SR 54

Existing PM
04/16/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	172	1470	18	23	1423	101	20	25	26	151	20
Future Volume (vph)	172	1470	18	23	1423	101	20	25	26	151	20
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases	1	6		5	2			8			4
Permitted Phases	6		6	2		2	8		8	4	
Detector Phase	1	6	6	5	2	2	8	8	8	4	4
Switch Phase											
Minimum Initial (s)	8.0	12.0	12.0	8.0	12.0	12.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	13.5	31.6	31.6	13.5	26.6	26.6	40.3	40.3	40.3	38.3	38.3
Total Split (s)	25.0	80.0	80.0	25.0	80.0	80.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	17.2%	55.2%	55.2%	17.2%	55.2%	55.2%	27.6%	27.6%	27.6%	27.6%	27.6%
Yellow Time (s)	3.5	4.6	4.6	3.5	4.6	4.6	4.3	4.3	4.3	4.3	4.3
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	6.6	6.6	5.5	6.6	6.6	6.3	6.3	6.3	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag					
Lead-Lag Optimize?											
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None

Intersection Summary

Cycle Length: 145
Actuated Cycle Length: 125.4
Natural Cycle: 100
Control Type: Actuated-Uncoordinated

Splits and Phases: 6: Burch Rd/Ginger Cake Rd & SR 54

		
Ø1	Ø2	Ø4
25 s	80 s	40 s
		
Ø5	Ø6	Ø8
25 s	80 s	40 s

HCM 2010 Signalized Intersection Summary

6: Burch Rd/Ginger Cake Rd & SR 54

Existing PM
04/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	172	1470	18	23	1423	101	20	25	26	151	20	198
Future Volume (veh/h)	172	1470	18	23	1423	101	20	25	26	151	20	198
Number	1	6	16	5	2	12	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	183	1564	24	28	1452	112	24	32	32	164	24	213
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	0
Peak Hour Factor	0.94	0.94	0.75	0.82	0.98	0.90	0.83	0.78	0.81	0.92	0.83	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	277	2187	978	232	2096	938	116	354	301	294	31	275
Arrive On Green	0.07	0.62	0.62	0.04	0.59	0.59	0.19	0.19	0.19	0.19	0.19	0.19
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	1139	1863	1583	1332	163	1445
Grp Volume(v), veh/h	183	1564	24	28	1452	112	24	32	32	164	0	237
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1139	1863	1583	1332	0	1608
Q Serve(g_s), s	4.8	36.7	0.7	0.7	34.4	3.8	2.5	1.7	2.0	14.0	0.0	17.0
Cycle Q Clear(g_c), s	4.8	36.7	0.7	0.7	34.4	3.8	19.5	1.7	2.0	15.7	0.0	17.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.90
Lane Grp Cap(c), veh/h	277	2187	978	232	2096	938	116	354	301	294	0	305
V/C Ratio(X)	0.66	0.72	0.02	0.12	0.69	0.12	0.21	0.09	0.11	0.56	0.00	0.78
Avail Cap(c_a), veh/h	446	2187	978	446	2143	959	217	518	440	411	0	447
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.8	15.9	9.0	13.4	17.1	10.8	55.9	40.5	40.6	46.9	0.0	46.6
Incr Delay (d2), s/veh	2.7	1.4	0.0	0.2	1.3	0.1	0.9	0.1	0.2	1.7	0.0	5.1
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(95%),veh/ln	6.9	25.2	0.6	0.7	23.9	3.0	1.5	1.6	1.6	9.1	0.0	12.6
LnGrp Delay(d),s/veh	21.5	17.3	9.0	13.6	18.3	11.0	56.7	40.6	40.7	48.6	0.0	51.7
LnGrp LOS	C	B	A	B	B	B	E	D	D	D		D
Approach Vol, veh/h		1771			1592			88			401	
Approach Delay, s/veh		17.6			17.7			45.0			50.5	
Approach LOS		B			B			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.5	78.4		29.3	10.4	81.5		29.3				
Change Period (Y+Rc), s	5.5	6.6		6.3	5.5	6.6		6.3				
Max Green Setting (Gmax), s	19.5	73.4		33.7	19.5	73.4		33.7				
Max Q Clear Time (g_c+I1), s	6.8	36.4		19.0	2.7	38.7		21.5				
Green Ext Time (p_c), s	0.4	35.4		1.7	0.0	34.7		1.6				
Intersection Summary												
HCM 2010 Ctrl Delay				21.7								
HCM 2010 LOS				C								
Notes												

Timings

7: Oak St/Brandywine Blvd & SR 54

Existing PM

04/16/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	24	1704	11	8	1517	63	6	0	130	3	45
Future Volume (vph)	24	1704	11	8	1517	63	6	0	130	3	45
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	NA	Perm
Protected Phases	5	2		1	6			8		4	
Permitted Phases	2		2	6		6	8		4		4
Detector Phase	5	2	2	1	6	6	8	8	4	4	4
Switch Phase											
Minimum Initial (s)	8.0	12.0	12.0	8.0	12.0	12.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.5	24.5	24.5	13.5	24.5	24.5	39.1	39.1	39.1	39.1	39.1
Total Split (s)	30.0	80.0	80.0	30.0	80.0	80.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	20.0%	53.3%	53.3%	20.0%	53.3%	53.3%	26.7%	26.7%	26.7%	26.7%	26.7%
Yellow Time (s)	3.5	4.5	4.5	3.5	4.5	4.5	4.1	4.1	4.1	4.1	4.1
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
Total Lost Time (s)	5.5	6.5	6.5	5.5	6.5	6.5		6.1		6.1	6.1
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag					
Lead-Lag Optimize?											
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 115

Natural Cycle: 110

Control Type: Actuated-Uncoordinated

Splits and Phases: 7: Oak St/Brandywine Blvd & SR 54

		
Ø1	Ø2	Ø4
30 s	80 s	40 s
		
Ø5	Ø6	Ø8
30 s	80 s	40 s

HCM 2010 Signalized Intersection Summary
7: Oak St/Brandywine Blvd & SR 54

Existing PM
04/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	1704	11	8	1517	63	6	0	5	130	3	45
Future Volume (veh/h)	24	1704	11	8	1517	63	6	0	5	130	3	45
Number	5	2	12	1	6	16	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	32	1739	20	12	1548	72	8	0	8	153	4	0
Adj No. of Lanes	1	2	1	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.75	0.98	0.55	0.67	0.98	0.88	0.75	0.92	0.62	0.85	0.75	0.80
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	269	2417	1081	208	2335	1045	147	16	113	246	5	205
Arrive On Green	0.05	0.68	0.68	0.02	0.66	0.66	0.13	0.00	0.13	0.13	0.13	0.00
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	752	120	873	1397	37	1583
Grp Volume(v), veh/h	32	1739	20	12	1548	72	16	0	0	157	0	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1745	0	0	1434	0	1583
Q Serve(g_s), s	0.6	33.5	0.4	0.2	28.9	1.8	0.0	0.0	0.0	10.8	0.0	0.0
Cycle Q Clear(g_c), s	0.6	33.5	0.4	0.2	28.9	1.8	0.9	0.0	0.0	11.7	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.50		0.50	0.97		1.00
Lane Grp Cap(c), veh/h	269	2417	1081	208	2335	1045	275	0	0	250	0	205
V/C Ratio(X)	0.12	0.72	0.02	0.06	0.66	0.07	0.06	0.00	0.00	0.63	0.00	0.00
Avail Cap(c_a), veh/h	586	2417	1081	566	2380	1065	544	0	0	505	0	491
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	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	9.1	10.8	5.6	10.1	11.2	6.6	41.8	0.0	0.0	46.4	0.0	0.0
Incr Delay (d2), s/veh	0.2	1.3	0.0	0.1	0.9	0.1	0.1	0.0	0.0	2.6	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	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.5	23.3	0.4	0.2	20.5	1.4	0.8	0.0	0.0	8.4	0.0	0.0
LnGrp Delay(d),s/veh	9.3	12.1	5.6	10.3	12.2	6.7	41.9	0.0	0.0	49.0	0.0	0.0
LnGrp LOS	A	B	A	B	B	A	D			D		
Approach Vol, veh/h		1791			1632			16			157	
Approach Delay, s/veh		12.0			11.9			41.9			49.0	
Approach LOS		B			B			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.9	81.2		20.2	10.5	78.6		20.2				
Change Period (Y+Rc), s	5.5	6.5		6.1	5.5	6.5		6.1				
Max Green Setting (Gmax), s	24.5	73.5		33.9	24.5	73.5		33.9				
Max Q Clear Time (g_c+I1), s	2.2	35.5		13.7	2.6	30.9		2.9				
Green Ext Time (p_c), s	0.0	37.9		0.5	0.0	41.2		0.6				
Intersection Summary												
HCM 2010 Ctrl Delay				13.7								
HCM 2010 LOS				B								

Timings
8: Grady Avenue/Sharon Drive & SR 54

Existing PM
04/16/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations		 			 						 
Traffic Volume (vph)	13	1072	752	143	1267	8	449	9	122	8	10
Future Volume (vph)	13	1072	752	143	1267	8	449	9	122	8	10
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases		2		1	6			8			4
Permitted Phases	2		2	6		6	8		8	4	
Detector Phase	2	2	2	1	6	6	8	8	8	4	4
Switch Phase											
Minimum Initial (s)	12.0	12.0	12.0	6.0	12.0	12.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	35.0	35.0	35.0	12.4	31.0	31.0	39.0	39.0	39.0	37.0	37.0
Total Split (s)	51.0	51.0	51.0	20.0	71.0	71.0	39.0	39.0	39.0	39.0	39.0
Total Split (%)	46.4%	46.4%	46.4%	18.2%	64.5%	64.5%	35.5%	35.5%	35.5%	35.5%	35.5%
Yellow Time (s)	5.0	5.0	5.0	4.4	5.0	5.0	5.0	5.0	5.0	5.0	5.0
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
Total Lost Time (s)	7.0	7.0	7.0	6.4	7.0	7.0		7.0	7.0		7.0
Lead/Lag	Lag	Lag	Lag	Lead							
Lead-Lag Optimize?											
Recall Mode	C-Min	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 100 (91%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated

Splits and Phases: 8: Grady Avenue/Sharon Drive & SR 54



HCM 2010 Signalized Intersection Summary
8: Grady Avenue/Sharon Drive & SR 54

Existing PM
04/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	1072	752	143	1267	8	449	9	122	8	10	4
Future Volume (veh/h)	13	1072	752	143	1267	8	449	9	122	8	10	4
Number	5	2	12	1	6	16	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	20	1094	817	172	1280	12	473	16	0	12	12	0
Adj No. of Lanes	1	2	1	1	2	1	0	1	1	0	1	0
Peak Hour Factor	0.65	0.98	0.92	0.83	0.99	0.67	0.95	0.56	0.80	0.67	0.83	0.50
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	212	1608	720	237	2059	921	464	14	461	297	282	0
Arrive On Green	0.45	0.45	0.45	0.07	0.58	0.58	0.29	0.29	0.00	0.29	0.29	0.00
Sat Flow, veh/h	425	3539	1583	1774	3539	1583	1373	46	1583	852	968	0
Grp Volume(v), veh/h	20	1094	817	172	1280	12	489	0	0	24	0	0
Grp Sat Flow(s),veh/h/ln	425	1770	1583	1774	1770	1583	1420	0	1583	1820	0	0
Q Serve(g_s), s	3.6	26.8	50.0	5.4	26.1	0.4	31.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	15.6	26.8	50.0	5.4	26.1	0.4	32.0	0.0	0.0	1.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.97		1.00	0.50		0.00
Lane Grp Cap(c), veh/h	212	1608	720	237	2059	921	477	0	461	579	0	0
V/C Ratio(X)	0.09	0.68	1.14	0.72	0.62	0.01	1.02	0.00	0.00	0.04	0.00	0.00
Avail Cap(c_a), veh/h	212	1608	720	334	2059	921	477	0	461	579	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	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	24.8	23.7	30.0	21.8	15.1	9.7	41.0	0.0	0.0	28.0	0.0	0.0
Incr Delay (d2), s/veh	0.9	2.3	77.5	4.6	1.4	0.0	47.5	0.0	0.0	0.0	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	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.8	19.6	67.1	5.2	18.9	0.3	37.4	0.0	0.0	1.0	0.0	0.0
LnGrp Delay(d),s/veh	25.7	26.0	107.5	26.4	16.5	9.7	88.5	0.0	0.0	28.0	0.0	0.0
LnGrp LOS	C	C	F	C	B	A	F			C		
Approach Vol, veh/h		1931			1464			489			24	
Approach Delay, s/veh		60.5			17.6			88.5			28.0	
Approach LOS		E			B			F			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	14.0	57.0		39.0		71.0		39.0				
Change Period (Y+Rc), s	6.4	7.0		7.0		7.0		7.0				
Max Green Setting (Gmax), s	13.6	44.0		32.0		64.0		32.0				
Max Q Clear Time (g_c+I1), s	7.4	52.0		3.0		28.1		34.0				
Green Ext Time (p_c), s	0.2	0.0		2.0		35.9		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			47.7									
HCM 2010 LOS			D									

Intersection

Intersection Delay, s/veh26.8

Intersection LOS D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	7	10	151	16	58	7	331	172	36	251	5
Future Vol, veh/h	7	7	10	151	16	58	7	331	172	36	251	5
Peak Hour Factor	0.58	0.58	0.50	0.74	0.50	0.81	0.58	0.89	0.92	0.75	0.88	0.42
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	12	20	204	32	72	12	372	187	48	285	12
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	11.1	17.9	38.1	17.9
HCM LOS	B	C	E	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	1%	29%	67%	12%
Vol Thru, %	65%	29%	7%	86%
Vol Right, %	34%	42%	26%	2%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	510	24	225	292
LT Vol	7	7	151	36
Through Vol	331	7	16	251
RT Vol	172	10	58	5
Lane Flow Rate	571	44	308	345
Geometry Grp	1	1	1	1
Degree of Util (X)	0.893	0.09	0.564	0.594
Departure Headway (Hd)	5.631	7.329	6.594	6.191
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	645	487	548	583
Service Time	3.671	5.407	4.641	4.238
HCM Lane V/C Ratio	0.885	0.09	0.562	0.592
HCM Control Delay	38.1	11.1	17.9	17.9
HCM Lane LOS	E	B	C	C
HCM 95th-tile Q	10.9	0.3	3.5	3.9

Intersection						
Int Delay, s/veh	3.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	46	106	26	148	167	21
Future Vol, veh/h	46	106	26	148	167	21
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	-	-	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	88	65	66	58	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	52	120	40	224	288	28
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	592	288	288	0	-	0
Stage 1	288	-	-	-	-	-
Stage 2	304	-	-	-	-	-
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	469	751	1274	-	-	-
Stage 1	761	-	-	-	-	-
Stage 2	748	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	452	751	1274	-	-	-
Mov Cap-2 Maneuver	452	-	-	-	-	-
Stage 1	761	-	-	-	-	-
Stage 2	721	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	12.9	1.2		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1274	-	627	-	-	
HCM Lane V/C Ratio	0.031	-	0.275	-	-	
HCM Control Delay (s)	7.9	0	12.9	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0.1	-	1.1	-	-	

Intersection

Int Delay, s/veh 4.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	6	203	204	5	158	305
Future Vol, veh/h	6	203	204	5	158	305
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	0	250	-	400	225	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	50	89	82	42	79	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	228	249	12	200	377

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1026	249	0
Stage 1	249	-	-
Stage 2	777	-	-
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	260	790	-
Stage 1	792	-	-
Stage 2	453	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	221	790	-
Mov Cap-2 Maneuver	221	-	-
Stage 1	792	-	-
Stage 2	384	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.9	0	2.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT
Capacity (veh/h)	-	- 221 790 1317	-	-
HCM Lane V/C Ratio	-	- 0.054 0.289 0.152	-	-
HCM Control Delay (s)	-	- 22.2 11.4 8.2	-	-
HCM Lane LOS	-	- C B A	-	-
HCM 95th %tile Q(veh)	-	- 0.2 1.2 0.5	-	-

Intersection

Int Delay, s/veh 5.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	19	224	222	199	196	15
Future Vol, veh/h	19	224	222	199	196	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	115	0	185	-	-	250
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	53	89	91	84	89	47
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	36	252	244	237	220	32

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	945	220	220
Stage 1	220	-	-
Stage 2	725	-	-
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	291	820	1349
Stage 1	817	-	-
Stage 2	479	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	238	820	1349
Mov Cap-2 Maneuver	238	-	-
Stage 1	817	-	-
Stage 2	392	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.7	4.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1349	-	238	820	-	-
HCM Lane V/C Ratio	0.181	-	0.151	0.307	-	-
HCM Control Delay (s)	8.3	-	22.8	11.3	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.7	-	0.5	1.3	-	-

AASHTO Left Turn Lane Analysis

LEFT TURN LANE ANALYSIS per AASHTO standards

The following left turn lane analysis was used to determine the need for a dedicated turn bay at the proposed site driveway location, which is not located on a state route.

Methodology

M.D. Harmelink utilized a probabilistic model to establish left turn lane warrants for two-lane and four-lane highways at unsignalized T-intersections. These warrants are the basis for AASHTO guidelines for justifying a left-turn lane at an unsignalized intersection. The warrants developed are in the form of sets of different volume combinations, specifically, the advancing volume, the percentage of left-turns in the advancing volume, and the opposing volume. These warrants are based on maximum allowable probabilities that one or more through vehicles are present in the queue formed by the left-turning vehicles that is waiting for a suitable gap. The warrants, as summarized by AASHTO, were developed for the approach speeds of 40, 50 and 60 mph and left turn volumes that are 5%, 10%, 20%, and 30% of the advancing stream.

AASHTO THRESHOLDS (EXHIBIT 9-75, PG 685), 50 MPH				
Opposing Volumes	Advancing Volumes (by left turn %)			
	5%	10.0%	20.0%	30.0%
100	615	445	335	295
200	550	400	300	270
400	430	320	240	210
600	350	260	195	170
800	280	210	165	135

An interpolation of the thresholds is needed for other volumes and percentages that are not in the AASHTO table for left turn percentages that are not represented in the table.

Results

A graphic of the peak hour turning movements for the site, as they relate to the AASHTO criteria are provided in the following figures.

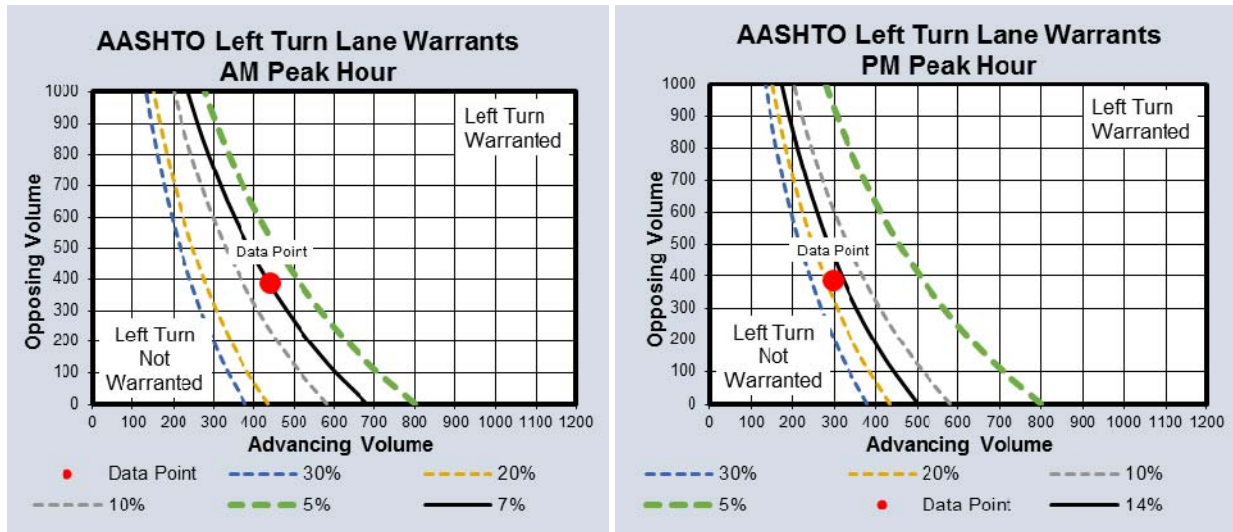


Figure 1 – AASHTO Left Turn Lane Guidelines: Site Driveway 1

Findings

The results of the analysis show that the probability of one or more vehicles queuing behind a waiting left-turn vehicle is slightly above the 2% probability criterion during the AM peak hour. However, the delay for a shared through/left lane approach is anticipated to be very low with a level-of-service "A". Therefore, unless stopping sight distance (360 feet for 45 mph) is obstructed on the southbound approach, a left turn lane is not recommended per AASHTO criteria at Site Driveway #1.

Future “No-Build” Intersection Analysis

Timings

1: Private Drwy/Tyrone Rd & SR 54

Future No-Build AM

04/16/2018



Lane Group	EBL	EBT	WBT	WBR	NBT	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	34	1204	1272	349	1	510	0	37
Future Volume (vph)	34	1204	1272	349	1	510	0	37
Turn Type	Perm	NA	NA	Perm	NA	Perm	NA	Perm
Protected Phases		2	6		8		4	
Permitted Phases	2			6		4		4
Detector Phase	2	2	6	6	8	4	4	4
Switch Phase								
Minimum Initial (s)	15.0	15.0	15.0	15.0	10.0	10.0	10.0	10.0
Minimum Split (s)	26.0	26.0	25.0	25.0	48.0	44.0	44.0	44.0
Total Split (s)	80.0	80.0	80.0	80.0	60.0	60.0	60.0	60.0
Total Split (%)	57.1%	57.1%	57.1%	57.1%	42.9%	42.9%	42.9%	42.9%
Yellow Time (s)	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	Min	Min	Min	Min	None	None	None	None

Intersection Summary

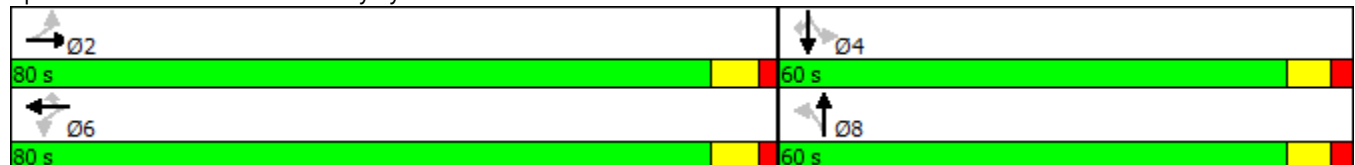
Cycle Length: 140

Actuated Cycle Length: 140

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Splits and Phases: 1: Private Drwy/Tyrone Rd & SR 54



HCM 2010 Signalized Intersection Summary
1: Private Drwy/Tyrone Rd & SR 54

Future No-Build AM
04/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	1204	1	0	1272	349	0	1	0	510	0	37
Future Volume (veh/h)	34	1204	1	0	1272	349	0	1	0	510	0	37
Number	5	2	12	1	6	16	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	50	1416	4	0	1429	447	0	4	0	526	0	0
Adj No. of Lanes	1	2	0	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.68	0.85	0.25	0.92	0.89	0.78	0.92	0.25	0.92	0.97	0.92	0.82
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	99	1888	5	51	1845	826	0	705	0	582	0	599
Arrive On Green	0.52	0.52	0.52	0.00	0.52	0.52	0.00	0.38	0.00	0.38	0.00	0.00
Sat Flow, veh/h	242	3620	10	376	3539	1583	0	1863	0	1402	0	1583
Grp Volume(v), veh/h	50	692	728	0	1429	447	0	4	0	526	0	0
Grp Sat Flow(s),veh/h/ln	242	1770	1861	376	1770	1583	0	1863	0	1402	0	1583
Q Serve(g_s), s	27.6	43.0	43.0	0.0	45.4	26.4	0.0	0.2	0.0	52.1	0.0	0.0
Cycle Q Clear(g_c), s	73.0	43.0	43.0	0.0	45.4	26.4	0.0	0.2	0.0	52.3	0.0	0.0
Prop In Lane	1.00		0.01	1.00		1.00	0.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	99	923	970	51	1845	826	0	705	0	582	0	599
V/C Ratio(X)	0.50	0.75	0.75	0.00	0.77	0.54	0.00	0.01	0.00	0.90	0.00	0.00
Avail Cap(c_a), veh/h	99	923	970	51	1845	826	0	705	0	582	0	599
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	0.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	56.8	26.3	26.3	0.0	26.9	22.3	0.0	27.1	0.0	43.4	0.0	0.0
Incr Delay (d2), s/veh	8.3	4.1	3.9	0.0	2.5	1.3	0.0	0.0	0.0	17.5	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(95%),veh/ln	3.9	29.7	31.0	0.0	30.5	17.3	0.0	0.2	0.0	30.9	0.0	0.0
LnGrp Delay(d),s/veh	65.1	30.5	30.3	0.0	29.4	23.6	0.0	27.1	0.0	60.9	0.0	0.0
LnGrp LOS	E	C	C		C	C		C		E		
Approach Vol, veh/h		1470			1876			4			526	
Approach Delay, s/veh		31.5			28.0			27.1			60.9	
Approach LOS		C			C			C			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		80.0		60.0		80.0		60.0				
Change Period (Y+Rc), s		7.0		7.0		7.0		7.0				
Max Green Setting (Gmax), s		73.0		53.0		73.0		53.0				
Max Q Clear Time (g_c+I1), s		75.0		54.3		47.4		2.2				
Green Ext Time (p_c), s		0.0		0.0		25.6		2.1				
Intersection Summary												
HCM 2010 Ctrl Delay				33.8								
HCM 2010 LOS				C								

Timings

2: Old Norton Rd/S Sandy Creek Rd & SR 54

Future No-Build AM

04/16/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	24	1644	14	66	1736	212	41	19	183	10	53
Future Volume (vph)	24	1644	14	66	1736	212	41	19	183	10	53
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	NA	Perm
Protected Phases	5	2		1	6			8		4	
Permitted Phases	2		2	6		6	8		4		4
Detector Phase	5	2	2	1	6	6	8	8	4	4	4
Switch Phase											
Minimum Initial (s)	6.0	12.0	12.0	6.0	12.0	12.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	12.0	26.0	26.0	13.5	25.0	25.0	46.3	46.3	46.3	46.3	46.3
Total Split (s)	40.0	80.0	80.0	40.0	80.0	80.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	22.2%	44.4%	44.4%	22.2%	44.4%	44.4%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.3	2.3	2.3	2.3
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)	6.0	7.0	7.0	6.0	7.0	7.0		7.3		7.3	7.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag					
Lead-Lag Optimize?											
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None

Intersection Summary

Cycle Length: 180

Actuated Cycle Length: 128.6

Natural Cycle: 130

Control Type: Actuated-Uncoordinated

Splits and Phases: 2: Old Norton Rd/S Sandy Creek Rd & SR 54

		
Ø1	Ø2	Ø4
40 s	80 s	60 s
		
Ø5	Ø6	Ø8
40 s	80 s	60 s

HCM 2010 Signalized Intersection Summary

2: Old Norton Rd/S Sandy Creek Rd & SR 54

Future No-Build AM

04/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	1644	14	66	1736	212	41	19	33	183	10	53
Future Volume (veh/h)	24	1644	14	66	1736	212	41	19	33	183	10	53
Number	5	2	12	1	6	16	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	41	1712	19	72	1790	230	73	22	41	189	13	0
Adj No. of Lanes	1	2	1	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.58	0.96	0.75	0.92	0.97	0.92	0.56	0.85	0.81	0.97	0.75	0.69
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	173	2148	961	208	2177	974	199	64	94	277	15	281
Arrive On Green	0.04	0.61	0.61	0.05	0.62	0.62	0.18	0.18	0.18	0.18	0.18	0.00
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	862	361	528	1230	85	1583
Grp Volume(v), veh/h	41	1712	19	72	1790	230	136	0	0	202	0	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1751	0	0	1315	0	1583
Q Serve(g_s), s	1.0	44.0	0.6	1.8	47.0	7.8	0.0	0.0	0.0	9.9	0.0	0.0
Cycle Q Clear(g_c), s	1.0	44.0	0.6	1.8	47.0	7.8	8.1	0.0	0.0	17.9	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.54		0.30	0.94		1.00
Lane Grp Cap(c), veh/h	173	2148	961	208	2177	974	357	0	0	292	0	281
V/C Ratio(X)	0.24	0.80	0.02	0.35	0.82	0.24	0.38	0.00	0.00	0.69	0.00	0.00
Avail Cap(c_a), veh/h	612	2164	968	632	2177	974	756	0	0	650	0	699
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	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	18.8	17.9	9.3	18.4	17.9	10.3	43.7	0.0	0.0	48.0	0.0	0.0
Incr Delay (d2), s/veh	0.7	2.5	0.0	1.0	3.0	0.3	0.7	0.0	0.0	2.9	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	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.2	29.9	0.5	2.2	31.8	6.2	7.3	0.0	0.0	10.9	0.0	0.0
LnGrp Delay(d),s/veh	19.4	20.3	9.4	19.4	20.9	10.6	44.4	0.0	0.0	50.9	0.0	0.0
LnGrp LOS	B	C	A	B	C	B	D			D		
Approach Vol, veh/h		1772			2092			136			202	
Approach Delay, s/veh		20.2			19.7			44.4			50.9	
Approach LOS		C			B			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.4	79.4		28.5	10.5	80.4		28.5				
Change Period (Y+Rc), s	6.0	7.0		* 7.3	6.0	7.0		* 7.3				
Max Green Setting (Gmax), s	34.0	73.0		* 53	34.0	73.0		* 53				
Max Q Clear Time (g_c+I1), s	3.8	46.0		19.9	3.0	49.0		10.1				
Green Ext Time (p_c), s	0.2	26.5		1.2	0.1	24.0		1.2				
Intersection Summary												
HCM 2010 Ctrl Delay				22.2								
HCM 2010 LOS				C								
Notes												

Timings

3: Lester Rd/Veterans Pkwy & SR 54

Future No-Build AM

04/16/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	149	1371	142	371	1234	77	208	197	263	35	137	77
Future Volume (vph)	149	1371	142	371	1234	77	208	197	263	35	137	77
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2		2	8		8	4		4
Detector Phase	1	6	6	5	2	2	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	6.0	8.0	8.0	6.0	8.0	8.0
Minimum Split (s)	13.3	42.3	42.3	13.3	42.3	42.3	11.9	48.1	48.1	11.9	49.1	49.1
Total Split (s)	25.0	80.0	80.0	40.0	80.0	80.0	25.0	60.0	60.0	25.0	60.0	60.0
Total Split (%)	12.2%	39.0%	39.0%	19.5%	39.0%	39.0%	12.2%	29.3%	29.3%	12.2%	29.3%	29.3%
Yellow Time (s)	5.3	5.3	5.3	5.3	5.3	5.3	3.9	5.1	5.1	3.9	5.1	5.1
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)	7.3	7.3	7.3	7.3	7.3	7.3	5.9	7.1	7.1	5.9	7.1	7.1
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None

Intersection Summary

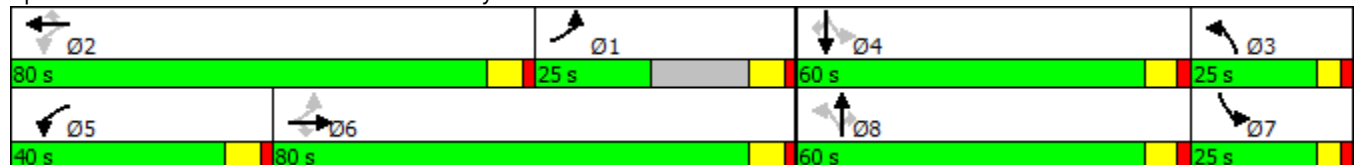
Cycle Length: 205

Actuated Cycle Length: 169.5

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Lester Rd/Veterans Pkwy & SR 54



HCM 2010 Signalized Intersection Summary

3: Lester Rd/Veterans Pkwy & SR 54

Future No-Build AM
04/16/2018

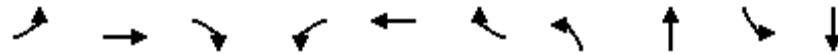
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	149	1371	142	371	1234	77	208	197	263	35	137	77
Future Volume (veh/h)	149	1371	142	371	1234	77	208	197	263	35	137	77
Number	1	6	16	5	2	12	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	207	1632	0	515	1690	0	310	334	0	54	269	0
Adj No. of Lanes	1	2	1	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.72	0.84	0.61	0.72	0.73	0.65	0.67	0.59	0.78	0.65	0.51	0.74
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	389	1535	687	389	1535	687	265	397	178	211	328	147
Arrive On Green	0.20	0.43	0.00	0.20	0.43	0.00	0.11	0.11	0.00	0.09	0.09	0.00
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	207	1632	0	515	1690	0	310	334	0	54	269	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	13.2	72.7	0.0	32.7	72.7	0.0	19.1	15.5	0.0	0.6	12.5	0.0
Cycle Q Clear(g_c), s	13.2	72.7	0.0	32.7	72.7	0.0	19.1	15.5	0.0	0.6	12.5	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	389	1535	687	389	1535	687	265	397	178	211	328	147
V/C Ratio(X)	0.53	1.06	0.00	1.32	1.10	0.00	1.17	0.84	0.00	0.26	0.82	0.00
Avail Cap(c_a), veh/h	389	1535	687	389	1535	687	265	1117	500	245	1117	500
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	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	58.3	47.5	0.0	54.6	47.5	0.0	71.9	73.0	0.0	68.8	74.7	0.0
Incr Delay (d2), s/veh	1.4	41.9	0.0	162.7	55.9	0.0	109.0	4.8	0.0	0.6	5.1	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(95%),veh/ln	13.5	79.8	0.0	63.9	85.1	0.0	36.5	12.5	0.0	4.2	10.5	0.0
LnGrp Delay(d),s/veh	59.7	89.4	0.0	217.3	103.4	0.0	180.9	77.8	0.0	69.4	79.7	0.0
LnGrp LOS	E	F		F	F		F	E		E	E	
Approach Vol, veh/h		1839			2205			644			323	
Approach Delay, s/veh		86.0			130.0			127.4			78.0	
Approach LOS		F			F			F			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	40.0	80.0	25.0	22.6	40.0	80.0	21.7	25.9				
Change Period (Y+Rc), s	7.3	7.3	5.9	7.1	7.3	7.3	5.9	7.1				
Max Green Setting (Gmax), s	17.7	72.7	19.1	52.9	32.7	72.7	19.1	52.9				
Max Q Clear Time (g_c+I1), s	15.2	74.7	21.1	14.5	34.7	74.7	2.6	17.5				
Green Ext Time (p_c), s	2.5	0.0	0.0	1.0	0.0	0.0	1.1	1.3				
Intersection Summary												
HCM 2010 Ctrl Delay			110.2									
HCM 2010 LOS			F									

Timings

4: Togwatee Village Pkwy/Piedmont Fayette & SR 54

Future No-Build AM

04/16/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	225	1512	53	113	1441	145	21	1	45	6
Future Volume (vph)	225	1512	53	113	1441	145	21	1	45	6
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	NA
Protected Phases	1	6		5	2			4		8
Permitted Phases	6		6	2		2	4		8	
Detector Phase	1	6	6	5	2	2	4	4	8	8
Switch Phase										
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.7	33.0	33.0	11.7	32.0	32.0	50.0	50.0	48.0	48.0
Total Split (s)	40.0	80.0	80.0	40.0	80.0	80.0	60.0	60.0	60.0	60.0
Total Split (%)	22.2%	44.4%	44.4%	22.2%	44.4%	44.4%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.7	5.0	5.0	3.7	5.0	5.0	5.0	5.0	5.0	5.0
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)	5.7	7.0	7.0	5.7	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?										
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None

Intersection Summary

Cycle Length: 180

Actuated Cycle Length: 123.5

Natural Cycle: 145

Control Type: Actuated-Uncoordinated

Splits and Phases: 4: Togwatee Village Pkwy/Piedmont Fayette & SR 54

Ø1	Ø2	Ø4
40 s	80 s	60 s
Ø5	Ø6	Ø8
40 s	80 s	60 s

HCM 2010 Signalized Intersection Summary

4: Togwatee Village Pkwy/Piedmont Fayette & SR 54

Future No-Build AM
04/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	225	1512	53	113	1441	145	21	1	33	45	6	21
Future Volume (veh/h)	225	1512	53	113	1441	145	21	1	33	45	6	21
Number	1	6	16	5	2	12	7	4	14	3	8	18
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	253	1662	0	145	1676	0	27	4	0	67	10	0
Adj No. of Lanes	1	2	1	1	2	1	1	1	0	1	1	0
Peak Hour Factor	0.89	0.91	0.78	0.78	0.86	0.90	0.79	0.25	0.81	0.67	0.62	0.40
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	295	2396	1072	279	2339	1046	183	164	0	187	164	0
Arrive On Green	0.07	0.68	0.00	0.05	0.66	0.00	0.09	0.09	0.00	0.09	0.09	0.00
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	1399	1863	0	1407	1863	0
Grp Volume(v), veh/h	253	1662	0	145	1676	0	27	4	0	67	10	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1399	1863	0	1407	1863	0
Q Serve(g_s), s	4.9	31.2	0.0	2.8	33.3	0.0	2.0	0.2	0.0	5.0	0.5	0.0
Cycle Q Clear(g_c), s	4.9	31.2	0.0	2.8	33.3	0.0	2.5	0.2	0.0	5.2	0.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	295	2396	1072	279	2339	1046	183	164	0	187	164	0
V/C Ratio(X)	0.86	0.69	0.00	0.52	0.72	0.00	0.15	0.02	0.00	0.36	0.06	0.00
Avail Cap(c_a), veh/h	728	2396	1072	740	2368	1060	739	905	0	747	905	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	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	20.4	10.7	0.0	12.6	11.9	0.0	46.7	45.4	0.0	47.8	45.6	0.0
Incr Delay (d2), s/veh	7.1	1.1	0.0	1.5	1.3	0.0	0.4	0.1	0.0	1.2	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(95%),veh/ln	9.5	21.8	0.0	4.3	23.2	0.0	1.4	0.2	0.0	3.6	0.5	0.0
LnGrp Delay(d),s/veh	27.5	11.9	0.0	14.1	13.2	0.0	47.1	45.5	0.0	49.0	45.7	0.0
LnGrp LOS	C	B		B	B		D	D		D	D	
Approach Vol, veh/h		1915			1821			31			77	
Approach Delay, s/veh		13.9			13.3			46.9			48.6	
Approach LOS		B			B			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.4	79.1		16.6	11.6	80.8		16.6				
Change Period (Y+Rc), s	* 5.7	7.0		7.0	* 5.7	7.0		7.0				
Max Green Setting (Gmax), s	* 34	73.0		53.0	* 34	73.0		53.0				
Max Q Clear Time (g_c+I1), s	6.9	35.3		4.5	4.8	33.2		7.2				
Green Ext Time (p_c), s	0.8	36.8		0.4	0.4	39.7		0.4				
Intersection Summary												
HCM 2010 Ctrl Delay				14.6								
HCM 2010 LOS				B								
Notes												

Timings 5: Ebenezer Rd/Brittany Way & SR 54

Future No-Build AM

04/16/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	5	1213	27	164	1044	7	45	1	292	36	1
Future Volume (vph)	5	1213	27	164	1044	7	45	1	292	36	1
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases		6		5	2			8			4
Permitted Phases	6		6	2		2	8		8	4	
Detector Phase	6	6	6	5	2	2	8	8	8	4	4
Switch Phase											
Minimum Initial (s)	15.0	15.0	15.0	8.0	15.0	15.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	26.0	26.0	26.0	14.5	26.0	26.0	48.0	48.0	48.0	43.0	43.0
Total Split (s)	80.0	80.0	80.0	40.0	80.0	80.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	44.4%	44.4%	44.4%	22.2%	44.4%	44.4%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	5.0	5.0	5.0	4.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0
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
Total Lost Time (s)	7.0	7.0	7.0	6.5	7.0	7.0		7.0	7.0	7.0	7.0
Lead/Lag	Lag	Lag	Lag	Lead							
Lead-Lag Optimize?											
Recall Mode	Min	Min	Min	None	Min	Min	None	None	None	None	None

Intersection Summary

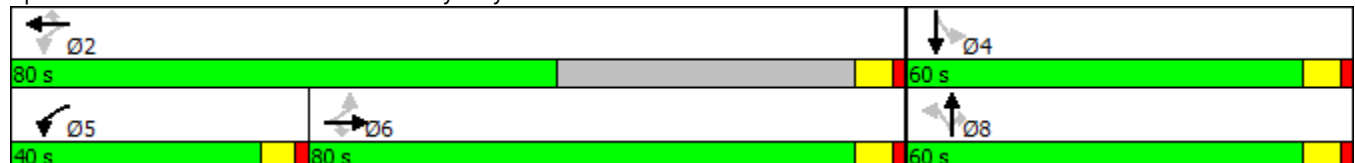
Cycle Length: 180

Actuated Cycle Length: 122.6

Natural Cycle: 120

Control Type: Actuated-Uncoordinated

Splits and Phases: 5: Ebenezer Rd/Brittany Way & SR 54



HCM 2010 Signalized Intersection Summary

5: Ebenezer Rd/Brittany Way & SR 54

Future No-Build AM
04/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	1213	27	164	1044	7	45	1	292	36	1	19
Future Volume (veh/h)	5	1213	27	164	1044	7	45	1	292	36	1	19
Number	1	6	16	5	2	12	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	10	1498	0	210	1111	18	54	4	321	40	4	31
Adj No. of Lanes	1	2	1	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.50	0.81	0.75	0.78	0.94	0.38	0.83	0.25	0.91	0.89	0.25	0.61
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	308	1896	848	253	2336	1045	329	22	360	245	42	324
Arrive On Green	0.54	0.54	0.00	0.07	0.66	0.66	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	497	3539	1583	1774	3539	1583	1199	99	1583	1051	184	1427
Grp Volume(v), veh/h	10	1498	0	210	1111	18	58	0	321	40	0	35
Grp Sat Flow(s),veh/h/ln	497	1770	1583	1774	1770	1583	1298	0	1583	1051	0	1611
Q Serve(g_s), s	1.3	42.3	0.0	6.3	19.3	0.5	4.1	0.0	24.4	4.0	0.0	2.1
Cycle Q Clear(g_c), s	5.2	42.3	0.0	6.3	19.3	0.5	6.2	0.0	24.4	10.2	0.0	2.1
Prop In Lane	1.00		1.00	1.00		1.00	0.93		1.00	1.00		0.89
Lane Grp Cap(c), veh/h	308	1896	848	253	2336	1045	351	0	360	245	0	366
V/C Ratio(X)	0.03	0.79	0.00	0.83	0.48	0.02	0.17	0.00	0.89	0.16	0.00	0.10
Avail Cap(c_a), veh/h	334	2081	931	605	2336	1045	629	0	676	454	0	688
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	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.6	23.2	0.0	25.0	10.5	7.3	40.2	0.0	46.5	43.7	0.0	37.9
Incr Delay (d2), s/veh	0.1	2.4	0.0	6.8	0.3	0.0	0.2	0.0	7.7	0.3	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(95%),veh/ln	0.3	28.8	0.0	7.9	14.6	0.4	3.0	0.0	17.0	2.2	0.0	1.7
LnGrp Delay(d),s/veh	15.7	25.6	0.0	31.8	10.8	7.3	40.4	0.0	54.2	44.0	0.0	38.0
LnGrp LOS	B	C		C	B	A	D		D	D		D
Approach Vol, veh/h		1508			1339			379			75	
Approach Delay, s/veh		25.6			14.0			52.1			41.2	
Approach LOS		C			B			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		88.9		35.2	15.4	73.5		35.2				
Change Period (Y+Rc), s		7.0		7.0	6.5	7.0		7.0				
Max Green Setting (Gmax), s		73.0		53.0	33.5	73.0		53.0				
Max Q Clear Time (g_c+I1), s		21.3		12.2	8.3	44.3		26.4				
Green Ext Time (p_c), s		51.6		1.9	0.6	22.2		1.8				
Intersection Summary												
HCM 2010 Ctrl Delay				24.3								
HCM 2010 LOS				C								

Timings
6: Burch Rd/Ginger Cake Rd & SR 54

Future No-Build AM

04/16/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	294	1389	19	29	1704	106	32	25	33	153	16
Future Volume (vph)	294	1389	19	29	1704	106	32	25	33	153	16
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases	1	6		5	2			8			4
Permitted Phases	6		6	2		2	8		8	4	
Detector Phase	1	6	6	5	2	2	8	8	8	4	4
Switch Phase											
Minimum Initial (s)	8.0	12.0	12.0	8.0	12.0	12.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	13.5	31.6	31.6	13.5	26.6	26.6	40.3	40.3	40.3	38.3	38.3
Total Split (s)	25.0	80.0	80.0	25.0	80.0	80.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	17.2%	55.2%	55.2%	17.2%	55.2%	55.2%	27.6%	27.6%	27.6%	27.6%	27.6%
Yellow Time (s)	3.5	4.6	4.6	3.5	4.6	4.6	4.3	4.3	4.3	4.3	4.3
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	6.6	6.6	5.5	6.6	6.6	6.3	6.3	6.3	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag					
Lead-Lag Optimize?											
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None

Intersection Summary

Cycle Length: 145

Actuated Cycle Length: 140.3

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Splits and Phases: 6: Burch Rd/Ginger Cake Rd & SR 54

		
Ø1	Ø2	Ø4
25 s	80 s	40 s
		
Ø5	Ø6	Ø8
25 s	80 s	40 s

HCM 2010 Signalized Intersection Summary
6: Burch Rd/Ginger Cake Rd & SR 54

Future No-Build AM
04/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	294	1389	19	29	1704	106	32	25	33	153	16	312
Future Volume (veh/h)	294	1389	19	29	1704	106	32	25	33	153	16	312
Number	1	6	16	5	2	12	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	377	1417	40	45	1794	126	41	41	55	180	23	400
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	0
Peak Hour Factor	0.78	0.98	0.47	0.65	0.95	0.84	0.78	0.61	0.60	0.85	0.70	0.78
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	288	2104	941	249	1792	801	50	433	368	328	20	351
Arrive On Green	0.13	0.59	0.59	0.05	0.51	0.51	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	960	1863	1583	1294	87	1510
Grp Volume(v), veh/h	377	1417	40	45	1794	126	41	41	55	180	0	423
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	960	1863	1583	1294	0	1596
Q Serve(g_s), s	19.5	39.3	1.5	1.7	73.4	6.2	0.0	2.5	4.0	18.4	0.0	33.7
Cycle Q Clear(g_c), s	19.5	39.3	1.5	1.7	73.4	6.2	33.7	2.5	4.0	20.9	0.0	33.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.95
Lane Grp Cap(c), veh/h	288	2104	941	249	1792	801	50	433	368	328	0	371
V/C Ratio(X)	1.31	0.67	0.04	0.18	1.00	0.16	0.83	0.09	0.15	0.55	0.00	1.14
Avail Cap(c_a), veh/h	288	2104	941	406	1792	801	50	433	368	328	0	371
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	52.4	19.9	12.2	17.7	35.8	19.2	72.5	43.7	44.3	51.9	0.0	55.7
Incr Delay (d2), s/veh	161.4	1.1	0.0	0.3	21.6	0.2	67.2	0.1	0.2	1.9	0.0	90.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	44.0	26.6	1.2	1.5	73.7	4.9	4.6	2.3	3.2	11.0	0.0	43.5
LnGrp Delay(d),s/veh	213.8	21.0	12.3	18.0	57.4	19.4	139.7	43.8	44.4	53.8	0.0	146.2
LnGrp LOS	F	C	B	B	F	B	F	D	D	D		F
Approach Vol, veh/h		1834			1965			137			603	
Approach Delay, s/veh		60.5			54.0			72.7			118.6	
Approach LOS		E			D			E			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	25.0	80.0		40.0	12.2	92.8		40.0				
Change Period (Y+Rc), s	5.5	6.6		6.3	5.5	6.6		6.3				
Max Green Setting (Gmax), s	19.5	73.4		33.7	19.5	73.4		33.7				
Max Q Clear Time (g_c+I1), s	21.5	75.4		35.7	3.7	41.3		35.7				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.1	32.1		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				65.8								
HCM 2010 LOS				E								
Notes												

Timings

7: Oak St/Brandywine Blvd & SR 54

Future No-Build AM

04/16/2018

										
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	30	1483	9	1856	113	6	0	79	0	7
Future Volume (vph)	30	1483	9	1856	113	6	0	79	0	7
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	NA	Perm
Protected Phases	5	2	1	6			8		4	
Permitted Phases	2		6		6	8		4		4
Detector Phase	5	2	1	6	6	8	8	4	4	4
Switch Phase										
Minimum Initial (s)	8.0	12.0	8.0	12.0	12.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.5	24.5	13.5	24.5	24.5	39.1	39.1	39.1	39.1	39.1
Total Split (s)	30.0	80.0	30.0	80.0	80.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	20.0%	53.3%	20.0%	53.3%	53.3%	26.7%	26.7%	26.7%	26.7%	26.7%
Yellow Time (s)	3.5	4.5	3.5	4.5	4.5	4.1	4.1	4.1	4.1	4.1
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
Total Lost Time (s)	5.5	6.5	5.5	6.5	6.5		6.1		6.1	6.1
Lead/Lag	Lead	Lag	Lead	Lag	Lag					
Lead-Lag Optimize?										
Recall Mode	None	Min	None	Min	Min	None	None	None	None	None

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 111.2

Natural Cycle: 140

Control Type: Actuated-Uncoordinated

Splits and Phases: 7: Oak St/Brandywine Blvd & SR 54

		
Ø1	Ø2	Ø4
30 s	80 s	40 s
		
Ø5	Ø6	Ø8
30 s	80 s	40 s

HCM 2010 Signalized Intersection Summary
7: Oak St/Brandywine Blvd & SR 54

Future No-Build AM
04/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	1483	0	9	1856	113	6	0	6	79	0	7
Future Volume (veh/h)	30	1483	0	9	1856	113	6	0	6	79	0	7
Number	5	2	12	1	6	16	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	40	1578	0	10	2040	192	14	0	19	86	0	0
Adj No. of Lanes	1	2	1	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.75	0.94	0.92	0.92	0.91	0.59	0.42	0.92	0.31	0.92	0.92	0.75
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	205	2538	1135	261	2420	1083	96	17	88	203	0	146
Arrive On Green	0.05	0.72	0.00	0.02	0.68	0.68	0.09	0.00	0.09	0.09	0.00	0.00
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	517	187	956	1464	0	1583
Grp Volume(v), veh/h	40	1578	0	10	2040	192	33	0	0	86	0	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1660	0	0	1464	0	1583
Q Serve(g_s), s	0.6	24.0	0.0	0.2	45.3	4.6	0.0	0.0	0.0	3.9	0.0	0.0
Cycle Q Clear(g_c), s	0.6	24.0	0.0	0.2	45.3	4.6	1.9	0.0	0.0	5.8	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.42		0.58	1.00		1.00
Lane Grp Cap(c), veh/h	205	2538	1135	261	2420	1083	201	0	0	203	0	146
V/C Ratio(X)	0.20	0.62	0.00	0.04	0.84	0.18	0.16	0.00	0.00	0.42	0.00	0.00
Avail Cap(c_a), veh/h	524	2538	1135	639	2469	1104	547	0	0	522	0	509
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	16.5	7.6	0.0	6.7	12.4	6.0	44.3	0.0	0.0	45.9	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.7	0.0	0.1	3.1	0.2	0.4	0.0	0.0	1.4	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(95%),veh/ln	1.2	17.5	0.0	0.2	30.7	3.6	1.6	0.0	0.0	4.5	0.0	0.0
LnGrp Delay(d),s/veh	16.9	8.3	0.0	6.8	15.5	6.2	44.7	0.0	0.0	47.3	0.0	0.0
LnGrp LOS	B	A		A	B	A	D			D		
Approach Vol, veh/h	1618				2242		33				86	
Approach Delay, s/veh	8.5				14.7		44.7				47.3	
Approach LOS	A				B		D				D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.5	82.1		15.8	11.0	78.6		15.8				
Change Period (Y+Rc), s	5.5	6.5		6.1	5.5	6.5		6.1				
Max Green Setting (Gmax), s	24.5	73.5		33.9	24.5	73.5		33.9				
Max Q Clear Time (g_c+I1), s	2.2	26.0		7.8	2.6	47.3		3.9				
Green Ext Time (p_c), s	0.0	47.4		0.4	0.1	24.7		0.4				
Intersection Summary												
HCM 2010 Ctrl Delay	13.1											
HCM 2010 LOS	B											

Timings
8: Grady Avenue/Sharon Drive & SR 54

Future No-Build AM

04/16/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	14	1149	537	219	1414	6	720	0	222	11	17
Future Volume (vph)	14	1149	537	219	1414	6	720	0	222	11	17
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases		2		1	6			8			4
Permitted Phases	2		2	6		6	8		8	4	
Detector Phase	2	2	2	1	6	6	8	8	8	4	4
Switch Phase											
Minimum Initial (s)	12.0	12.0	12.0	6.0	12.0	12.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	35.0	35.0	35.0	12.4	31.0	31.0	39.0	39.0	39.0	37.0	37.0
Total Split (s)	51.0	51.0	51.0	20.0	71.0	71.0	39.0	39.0	39.0	39.0	39.0
Total Split (%)	46.4%	46.4%	46.4%	18.2%	64.5%	64.5%	35.5%	35.5%	35.5%	35.5%	35.5%
Yellow Time (s)	5.0	5.0	5.0	4.4	5.0	5.0	5.0	5.0	5.0	5.0	5.0
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
Total Lost Time (s)	7.0	7.0	7.0	6.4	7.0	7.0		7.0	7.0		7.0
Lead/Lag	Lag	Lag	Lag	Lead							
Lead-Lag Optimize?											
Recall Mode	C-Min	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None

Intersection Summary

Cycle Length: 110

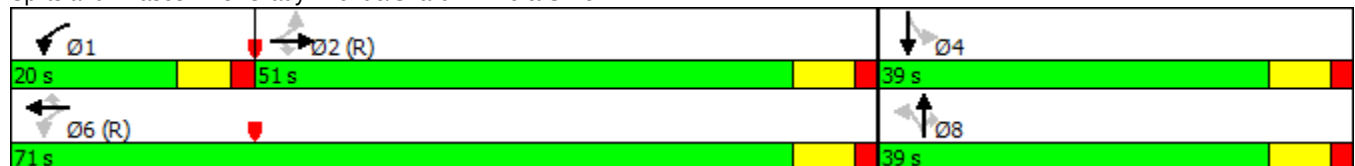
Actuated Cycle Length: 110

Offset: 10 (9%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

Splits and Phases: 8: Grady Avenue/Sharon Drive & SR 54



HCM 2010 Signalized Intersection Summary
8: Grady Avenue/Sharon Drive & SR 54

Future No-Build AM

04/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	1149	537	219	1414	6	720	0	222	11	17	10
Future Volume (veh/h)	14	1149	537	219	1414	6	720	0	222	11	17	10
Number	5	2	12	1	6	16	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	23	1321	647	292	1473	14	818	0	0	22	27	0
Adj No. of Lanes	1	2	1	1	2	1	0	1	1	0	1	0
Peak Hour Factor	0.60	0.87	0.83	0.75	0.96	0.42	0.88	0.92	0.79	0.50	0.62	0.56
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	166	1416	633	294	2059	921	474	0	461	267	311	0
Arrive On Green	0.40	0.40	0.40	0.12	0.58	0.58	0.29	0.00	0.00	0.29	0.29	0.00
Sat Flow, veh/h	353	3539	1583	1774	3539	1583	1404	0	1583	755	1070	0
Grp Volume(v), veh/h	23	1321	647	292	1473	14	818	0	0	49	0	0
Grp Sat Flow(s),veh/h/ln	353	1770	1583	1774	1770	1583	1404	0	1583	1825	0	0
Q Serve(g_s), s	5.5	39.3	44.0	13.4	32.8	0.4	29.9	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	18.3	39.3	44.0	13.4	32.8	0.4	32.0	0.0	0.0	2.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	0.45		0.00
Lane Grp Cap(c), veh/h	166	1416	633	294	2059	921	474	0	461	578	0	0
V/C Ratio(X)	0.14	0.93	1.02	0.99	0.72	0.02	1.73	0.00	0.00	0.08	0.00	0.00
Avail Cap(c_a), veh/h	166	1416	633	294	2059	921	474	0	461	578	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	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	30.2	31.6	33.0	33.4	16.5	9.7	41.0	0.0	0.0	28.4	0.0	0.0
Incr Delay (d2), s/veh	1.7	12.5	41.3	50.3	2.2	0.0	335.6	0.0	0.0	0.1	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	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.1	29.2	47.6	18.9	23.3	0.3	105.3	0.0	0.0	2.0	0.0	0.0
LnGrp Delay(d),s/veh	31.9	44.1	74.3	83.7	18.6	9.7	376.6	0.0	0.0	28.5	0.0	0.0
LnGrp LOS	C	D	F	F	B	A	F			C		
Approach Vol, veh/h		1991			1779			818			49	
Approach Delay, s/veh		53.8			29.2			376.6			28.5	
Approach LOS		D			C			F			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	20.0	51.0		39.0		71.0		39.0				
Change Period (Y+Rc), s	6.4	7.0		7.0		7.0		7.0				
Max Green Setting (Gmax), s	13.6	44.0		32.0		64.0		32.0				
Max Q Clear Time (g_c+I1), s	15.4	46.0		4.1		34.8		34.0				
Green Ext Time (p_c), s	0.0	0.0		4.2		29.2		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			101.1									
HCM 2010 LOS			F									

Intersection

Intersection Delay, s/veh18.3

Intersection LOS C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	8	5	111	5	48	8	222	196	50	271	5
Future Vol, veh/h	5	8	5	111	5	48	8	222	196	50	271	5
Peak Hour Factor	0.50	0.44	0.33	0.56	0.50	0.83	0.88	0.86	0.91	0.92	0.80	0.50
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	18	15	198	10	58	9	258	215	54	339	10
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10.7	14.8	20.8	18.5
HCM LOS	B	B	C	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	2%	28%	68%	15%
Vol Thru, %	52%	44%	3%	83%
Vol Right, %	46%	28%	29%	2%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	426	18	164	326
LT Vol	8	5	111	50
Through Vol	222	8	5	271
RT Vol	196	5	48	5
Lane Flow Rate	483	43	266	403
Geometry Grp	1	1	1	1
Degree of Util (X)	0.715	0.085	0.465	0.64
Departure Headway (Hd)	5.336	7.026	6.296	5.715
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	671	513	567	625
Service Time	3.419	5.026	4.392	3.801
HCM Lane V/C Ratio	0.72	0.084	0.469	0.645
HCM Control Delay	20.8	10.7	14.8	18.5
HCM Lane LOS	C	B	B	C
HCM 95th-tile Q	6	0.3	2.4	4.6

Intersection

Int Delay, s/veh 3.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	16	119	149	252	277	104
Future Vol, veh/h	16	119	149	252	277	104
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	-	-	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	70	76	73	76	76	66
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	157	204	332	364	158

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1104	364	364
Stage 1	364	-	-
Stage 2	740	-	-
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	234	681	1195
Stage 1	703	-	-
Stage 2	472	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	185	681	1195
Mov Cap-2 Maneuver	185	-	-
Stage 1	703	-	-
Stage 2	373	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.9	3.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1195	-	508	-	-
HCM Lane V/C Ratio	0.171	-	0.353	-	-
HCM Control Delay (s)	8.6	0	15.9	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.6	-	1.6	-	-

Intersection						
Int Delay, s/veh	5.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	197	304	11	295	236
Future Vol, veh/h	2	197	304	11	295	236
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	0	250	-	400	225	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	50	71	74	50	77	66
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	277	411	22	383	358
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1535	411	0	0	411	0
Stage 1	411	-	-	-	-	-
Stage 2	1124	-	-	-	-	-
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	128	641	-	-	1148	-
Stage 1	669	-	-	-	-	-
Stage 2	310	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	85	641	-	-	1148	-
Mov Cap-2 Maneuver	85	-	-	-	-	-
Stage 1	669	-	-	-	-	-
Stage 2	207	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	15.3	0	5			
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT		
Capacity (veh/h)	-	- 85 641 1148	-	-		
HCM Lane V/C Ratio	-	- 0.047 0.433 0.334	-	-		
HCM Control Delay (s)	-	- 49.4 14.8 9.7	-	-		
HCM Lane LOS	-	- E B A	-	-		
HCM 95th %tile Q(veh)	-	- 0.1 2.2 1.5	-	-		

Intersection						
Int Delay, s/veh	6.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	315	255	222	234	38
Future Vol, veh/h	7	315	255	222	234	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	115	0	185	-	-	250
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	81	86	83	71	77
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	389	297	267	330	49
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1190	330	330	0	-	0
Stage 1	330	-	-	-	-	-
Stage 2	860	-	-	-	-	-
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	207	712	1229	-	-	-
Stage 1	728	-	-	-	-	-
Stage 2	414	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	157	712	1229	-	-	-
Mov Cap-2 Maneuver	157	-	-	-	-	-
Stage 1	728	-	-	-	-	-
Stage 2	314	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	16.3	4.7		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1229	-	157	712	-	-
HCM Lane V/C Ratio	0.241	-	0.059	0.546	-	-
HCM Control Delay (s)	8.9	-	29.4	16	-	-
HCM Lane LOS	A	-	D	C	-	-
HCM 95th %tile Q(veh)	0.9	-	0.2	3.3	-	-

Timings

1: Private Drwy/Tyrone Rd & SR 54

Future No-Build PM

04/16/2018



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	29	993	1316	523	1	3	316	0	41
Future Volume (vph)	29	993	1316	523	1	3	316	0	41
Turn Type	Perm	NA	NA	Perm	Perm	NA	Perm	NA	Perm
Protected Phases		2	6			8		4	
Permitted Phases	2			6	8		4		4
Detector Phase	2	2	6	6	8	8	4	4	4
Switch Phase									
Minimum Initial (s)	15.0	15.0	15.0	15.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	26.0	26.0	25.0	25.0	48.0	48.0	44.0	44.0	44.0
Total Split (s)	80.0	80.0	80.0	80.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	57.1%	57.1%	57.1%	57.1%	42.9%	42.9%	42.9%	42.9%	42.9%
Yellow Time (s)	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0		7.0		7.0	7.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	Min	Min	Min	Min	None	None	None	None	None

Intersection Summary

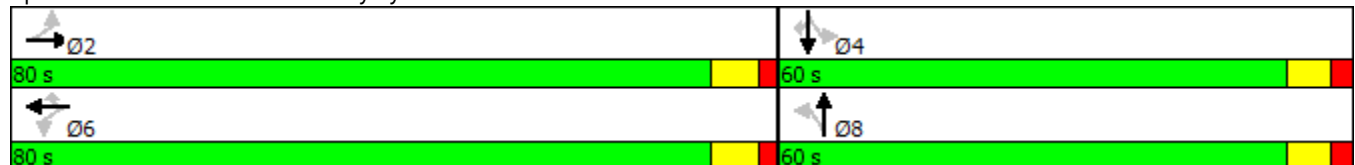
Cycle Length: 140

Actuated Cycle Length: 124.6

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Splits and Phases: 1: Private Drwy/Tyrone Rd & SR 54



HCM 2010 Signalized Intersection Summary

1: Private Drwy/Tyrone Rd & SR 54

Future No-Build PM
04/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	993	0	0	1316	523	1	3	0	316	0	41
Future Volume (veh/h)	29	993	0	0	1316	523	1	3	0	316	0	41
Number	5	2	12	1	6	16	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	36	1103	0	0	1400	638	4	8	0	363	0	0
Adj No. of Lanes	1	2	0	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.81	0.90	0.25	0.92	0.94	0.82	0.25	0.38	0.92	0.87	0.92	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	132	2145	0	60	2145	960	188	358	0	451	0	440
Arrive On Green	0.61	0.61	0.00	0.00	0.61	0.61	0.28	0.28	0.00	0.28	0.00	0.00
Sat Flow, veh/h	207	3632	0	509	3539	1583	533	1288	0	1408	0	1583
Grp Volume(v), veh/h	36	1103	0	0	1400	638	12	0	0	363	0	0
Grp Sat Flow(s),veh/h/ln	207	1770	0	509	1770	1583	1821	0	0	1408	0	1583
Q Serve(g_s), s	16.6	21.5	0.0	0.0	31.0	32.0	0.0	0.0	0.0	29.6	0.0	0.0
Cycle Q Clear(g_c), s	47.6	21.5	0.0	0.0	31.0	32.0	0.6	0.0	0.0	30.2	0.0	0.0
Prop In Lane	1.00		0.00	1.00		1.00	0.33		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	132	2145	0	60	2145	960	546	0	0	451	0	440
V/C Ratio(X)	0.27	0.51	0.00	0.00	0.65	0.66	0.02	0.00	0.00	0.81	0.00	0.00
Avail Cap(c_a), veh/h	132	2146	0	60	2146	960	819	0	0	678	0	697
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	0.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	31.0	13.6	0.0	0.0	15.5	15.7	31.6	0.0	0.0	42.2	0.0	0.0
Incr Delay (d2), s/veh	2.4	0.4	0.0	0.0	1.0	2.3	0.0	0.0	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	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.8	15.9	0.0	0.0	21.7	20.7	0.5	0.0	0.0	18.0	0.0	0.0
LnGrp Delay(d),s/veh	33.3	14.0	0.0	0.0	16.4	18.0	31.6	0.0	0.0	46.5	0.0	0.0
LnGrp LOS	C	B			B	B	C			D		
Approach Vol, veh/h	1139			2038			12			363		
Approach Delay, s/veh	14.6			16.9			31.6			46.5		
Approach LOS	B			B			C			D		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2			4		6		8				
Phs Duration (G+Y+Rc), s	80.0			40.4		80.0		40.4				
Change Period (Y+Rc), s	7.0			7.0		7.0		7.0				
Max Green Setting (Gmax), s	73.0			53.0		73.0		53.0				
Max Q Clear Time (g_c+I1), s	49.6			32.2		34.0		2.6				
Green Ext Time (p_c), s	23.4			1.2		38.9		1.4				
Intersection Summary												
HCM 2010 Ctrl Delay			19.3									
HCM 2010 LOS			B									

Timings

2: Old Norton Rd/S Sandy Creek Rd & SR 54

Future No-Build PM

04/16/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	29	1700	16	74	1491	127	26	8	224	11	30
Future Volume (vph)	29	1700	16	74	1491	127	26	8	224	11	30
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	NA	Perm
Protected Phases	5	2		1	6			8		4	
Permitted Phases	2		2	6		6	8		4		4
Detector Phase	5	2	2	1	6	6	8	8	4	4	4
Switch Phase											
Minimum Initial (s)	6.0	12.0	12.0	6.0	12.0	12.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	12.0	26.0	26.0	13.5	25.0	25.0	46.3	46.3	46.3	46.3	46.3
Total Split (s)	40.0	80.0	80.0	40.0	80.0	80.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	22.2%	44.4%	44.4%	22.2%	44.4%	44.4%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.3	2.3	2.3	2.3
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)	6.0	7.0	7.0	6.0	7.0	7.0		7.3		7.3	7.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag					
Lead-Lag Optimize?											
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None

Intersection Summary

Cycle Length: 180

Actuated Cycle Length: 134.6

Natural Cycle: 130

Control Type: Actuated-Uncoordinated

Splits and Phases: 2: Old Norton Rd/S Sandy Creek Rd & SR 54

 Ø1	 Ø2	 Ø4
40 s	80 s	60 s
 Ø5	 Ø6	 Ø8
40 s	80 s	60 s

HCM 2010 Signalized Intersection Summary

2: Old Norton Rd/S Sandy Creek Rd & SR 54

Future No-Build PM

04/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	1700	16	74	1491	127	26	8	18	224	11	30
Future Volume (veh/h)	29	1700	16	74	1491	127	26	8	18	224	11	30
Number	5	2	12	1	6	16	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	36	1809	32	85	1638	144	36	9	22	246	18	0
Adj No. of Lanes	1	2	1	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.81	0.94	0.50	0.87	0.91	0.88	0.72	0.88	0.80	0.91	0.62	0.68
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	187	2080	931	180	2121	949	221	61	116	330	20	318
Arrive On Green	0.03	0.59	0.59	0.05	0.60	0.60	0.20	0.20	0.20	0.20	0.20	0.00
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	876	301	576	1358	99	1583
Grp Volume(v), veh/h	36	1809	32	85	1638	144	67	0	0	264	0	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1753	0	0	1457	0	1583
Q Serve(g_s), s	1.0	53.0	1.0	2.3	42.5	4.9	0.0	0.0	0.0	17.7	0.0	0.0
Cycle Q Clear(g_c), s	1.0	53.0	1.0	2.3	42.5	4.9	3.8	0.0	0.0	21.6	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.54		0.33	0.93		1.00
Lane Grp Cap(c), veh/h	187	2080	931	180	2121	949	397	0	0	349	0	318
V/C Ratio(X)	0.19	0.87	0.03	0.47	0.77	0.15	0.17	0.00	0.00	0.76	0.00	0.00
Avail Cap(c_a), veh/h	616	2101	940	588	2121	949	739	0	0	667	0	678
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	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	16.9	21.4	10.7	25.4	18.4	10.9	40.8	0.0	0.0	47.5	0.0	0.0
Incr Delay (d2), s/veh	0.5	4.6	0.0	1.9	2.1	0.2	0.2	0.0	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	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.9	35.5	0.8	3.2	28.6	4.0	3.5	0.0	0.0	14.0	0.0	0.0
LnGrp Delay(d),s/veh	17.4	25.9	10.7	27.4	20.5	11.0	41.0	0.0	0.0	50.8	0.0	0.0
LnGrp LOS	B	C	B	C	C	B	D			D		
Approach Vol, veh/h	1877				1867				67		264	
Approach Delay, s/veh	25.5				20.1				41.0		50.8	
Approach LOS	C				C				D		D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	11.7	79.3	32.0		10.2	80.7	32.0					
Change Period (Y+Rc), s	6.0	7.0	* 7.3		6.0	7.0	* 7.3					
Max Green Setting (Gmax), s	34.0	73.0	* 53		34.0	73.0	* 53					
Max Q Clear Time (g_c+I1), s	4.3	55.0	23.6		3.0	44.5	5.8					
Green Ext Time (p_c), s	0.2	17.3	1.1		0.1	28.5	1.2					
Intersection Summary												
HCM 2010 Ctrl Delay			24.9									
HCM 2010 LOS			C									
Notes												

Timings

3: Lester Rd/Veterans Pkwy & SR 54

Future No-Build PM

04/16/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	117	1282	132	219	1451	50	137	96	147	25	136	126
Future Volume (vph)	117	1282	132	219	1451	50	137	96	147	25	136	126
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2		2	8		8	4		4
Detector Phase	1	6	6	5	2	2	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	6.0	8.0	8.0	6.0	8.0	8.0
Minimum Split (s)	13.3	42.3	42.3	13.3	42.3	42.3	11.9	48.1	48.1	11.9	49.1	49.1
Total Split (s)	25.0	80.0	80.0	40.0	80.0	80.0	25.0	60.0	60.0	25.0	60.0	60.0
Total Split (%)	12.2%	39.0%	39.0%	19.5%	39.0%	39.0%	12.2%	29.3%	29.3%	12.2%	29.3%	29.3%
Yellow Time (s)	5.3	5.3	5.3	5.3	5.3	5.3	3.9	5.1	5.1	3.9	5.1	5.1
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)	7.3	7.3	7.3	7.3	7.3	7.3	5.9	7.1	7.1	5.9	7.1	7.1
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None

Intersection Summary

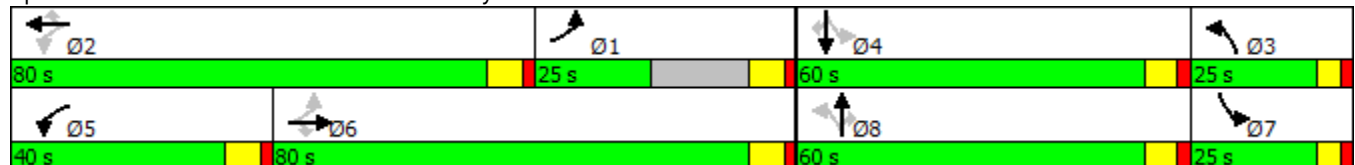
Cycle Length: 205

Actuated Cycle Length: 148.9

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Lester Rd/Veterans Pkwy & SR 54



HCM 2010 Signalized Intersection Summary

3: Lester Rd/Veterans Pkwy & SR 54

Future No-Build PM
04/16/2018

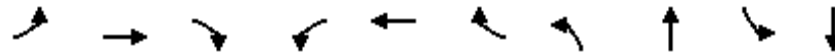
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	1282	132	219	1451	50	137	96	147	25	136	126
Future Volume (veh/h)	117	1282	132	219	1451	50	137	96	147	25	136	126
Number	1	6	16	5	2	12	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	162	1526	0	270	1612	0	171	113	0	36	162	0
Adj No. of Lanes	1	2	1	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.72	0.84	0.86	0.81	0.90	0.85	0.80	0.85	0.63	0.69	0.84	0.78
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	331	1850	828	300	1860	832	199	205	92	228	226	101
Arrive On Green	0.14	0.52	0.00	0.14	0.53	0.00	0.07	0.06	0.00	0.08	0.06	0.00
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	162	1526	0	270	1612	0	171	113	0	36	162	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	4.4	49.9	0.0	16.5	54.7	0.0	7.8	4.3	0.0	0.0	6.2	0.0
Cycle Q Clear(g_c), s	4.4	49.9	0.0	16.5	54.7	0.0	7.8	4.3	0.0	0.0	6.2	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	331	1850	828	300	1860	832	199	205	92	228	226	101
V/C Ratio(X)	0.49	0.82	0.00	0.90	0.87	0.00	0.86	0.55	0.00	0.16	0.72	0.00
Avail Cap(c_a), veh/h	331	1866	835	473	1866	835	314	1358	607	332	1358	607
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	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	50.3	27.6	0.0	42.9	28.5	0.0	61.1	63.2	0.0	56.6	63.3	0.0
Incr Delay (d2), s/veh	1.1	3.6	0.0	13.7	5.0	0.0	13.1	2.3	0.0	0.3	4.2	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(95%),veh/ln	9.5	33.3	0.0	16.8	36.6	0.0	11.5	3.9	0.0	2.3	5.7	0.0
LnGrp Delay(d),s/veh	51.5	31.2	0.0	56.6	33.5	0.0	74.2	65.5	0.0	57.0	67.5	0.0
LnGrp LOS	D	C		E	C		E	E		E	E	
Approach Vol, veh/h		1688			1882			284			198	
Approach Delay, s/veh		33.1			36.8			70.7			65.6	
Approach LOS		C			D			E			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	26.2	79.8	16.1	15.9	26.5	79.4	16.9	15.1				
Change Period (Y+Rc), s	7.3	7.3	5.9	7.1	7.3	7.3	5.9	7.1				
Max Green Setting (Gmax), s	17.7	72.7	19.1	52.9	32.7	72.7	19.1	52.9				
Max Q Clear Time (g_c+I1), s	6.4	56.7	9.8	8.2	18.5	51.9	2.0	6.3				
Green Ext Time (p_c), s	11.1	15.7	0.4	0.6	0.7	20.2	0.6	0.4				
Intersection Summary												
HCM 2010 Ctrl Delay			39.1									
HCM 2010 LOS			D									

Timings

4: Togwatee Village Pkwy/Piedmont Fayette & SR 54

Future No-Build PM

04/16/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	120	1553	82	123	1415	111	64	7	122	8
Future Volume (vph)	120	1553	82	123	1415	111	64	7	122	8
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	NA
Protected Phases	1	6		5	2			4		8
Permitted Phases	6		6	2		2	4		8	
Detector Phase	1	6	6	5	2	2	4	4	8	8
Switch Phase										
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.7	33.0	33.0	11.7	32.0	32.0	50.0	50.0	48.0	48.0
Total Split (s)	40.0	80.0	80.0	40.0	80.0	80.0	60.0	60.0	60.0	60.0
Total Split (%)	22.2%	44.4%	44.4%	22.2%	44.4%	44.4%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.7	5.0	5.0	3.7	5.0	5.0	5.0	5.0	5.0	5.0
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)	5.7	7.0	7.0	5.7	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?										
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None

Intersection Summary

Cycle Length: 180

Actuated Cycle Length: 125.2

Natural Cycle: 145

Control Type: Actuated-Uncoordinated

Splits and Phases: 4: Togwatee Village Pkwy/Piedmont Fayette & SR 54

Ø1	Ø2	Ø4
40 s	80 s	60 s
Ø5	Ø6	Ø8
40 s	80 s	60 s

HCM 2010 Signalized Intersection Summary
4: Togwatee Village Pkwy/Piedmont Fayette & SR 54

Future No-Build PM
04/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	1553	82	123	1415	111	64	7	72	122	8	45
Future Volume (veh/h)	120	1553	82	123	1415	111	64	7	72	122	8	45
Number	1	6	16	5	2	12	7	4	14	3	8	18
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	130	1765	0	176	1505	0	81	9	0	131	9	0
Adj No. of Lanes	1	2	1	1	2	1	1	1	0	1	1	0
Peak Hour Factor	0.92	0.88	0.63	0.70	0.94	0.88	0.79	0.75	0.80	0.93	0.88	0.77
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	294	2296	1027	242	2305	1031	227	225	0	227	225	0
Arrive On Green	0.05	0.65	0.00	0.05	0.65	0.00	0.12	0.12	0.00	0.12	0.12	0.00
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	1400	1863	0	1400	1863	0
Grp Volume(v), veh/h	130	1765	0	176	1505	0	81	9	0	131	9	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1400	1863	0	1400	1863	0
Q Serve(g_s), s	2.7	39.2	0.0	3.7	29.0	0.0	6.1	0.5	0.0	10.2	0.5	0.0
Cycle Q Clear(g_c), s	2.7	39.2	0.0	3.7	29.0	0.0	6.6	0.5	0.0	10.7	0.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	294	2296	1027	242	2305	1031	227	225	0	227	225	0
V/C Ratio(X)	0.44	0.77	0.00	0.73	0.65	0.00	0.36	0.04	0.00	0.58	0.04	0.00
Avail Cap(c_a), veh/h	742	2301	1029	687	2305	1031	719	879	0	719	879	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	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	11.3	13.8	0.0	21.4	11.9	0.0	46.5	43.6	0.0	48.3	43.6	0.0
Incr Delay (d2), s/veh	1.0	1.9	0.0	4.1	0.9	0.0	0.9	0.1	0.0	2.3	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(95%),veh/ln	3.1	26.7	0.0	6.8	20.5	0.0	4.4	0.5	0.0	7.4	0.5	0.0
LnGrp Delay(d),s/veh	12.3	15.7	0.0	25.5	12.8	0.0	47.5	43.7	0.0	50.6	43.7	0.0
LnGrp LOS	B	B		C	B		D	D		D	D	
Approach Vol, veh/h		1895			1681			90			140	
Approach Delay, s/veh		15.5			14.1			47.1			50.2	
Approach LOS		B			B			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.6	80.1		20.6	11.9	79.8		20.6				
Change Period (Y+Rc), s	* 5.7	7.0		7.0	* 5.7	7.0		7.0				
Max Green Setting (Gmax), s	* 34	73.0		53.0	* 34	73.0		53.0				
Max Q Clear Time (g_c+I1), s	4.7	31.0		8.6	5.7	41.2		12.7				
Green Ext Time (p_c), s	0.4	41.9		0.9	0.5	31.6		0.9				
Intersection Summary												
HCM 2010 Ctrl Delay				16.9								
HCM 2010 LOS				B								
Notes												

Timings 5: Ebenezer Rd/Brittany Way & SR 54

Future No-Build PM

04/16/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	15	1693	79	316	1299	29	29	3	185	7	0
Future Volume (vph)	15	1693	79	316	1299	29	29	3	185	7	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases		6		5	2			8			4
Permitted Phases	6		6	2		2	8		8	4	
Detector Phase	6	6	6	5	2	2	8	8	8	4	4
Switch Phase											
Minimum Initial (s)	15.0	15.0	15.0	8.0	15.0	15.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	26.0	26.0	26.0	14.5	26.0	26.0	48.0	48.0	48.0	43.0	43.0
Total Split (s)	80.0	80.0	80.0	40.0	80.0	80.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	44.4%	44.4%	44.4%	22.2%	44.4%	44.4%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	5.0	5.0	5.0	4.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0
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
Total Lost Time (s)	7.0	7.0	7.0	6.5	7.0	7.0		7.0	7.0	7.0	7.0
Lead/Lag	Lag	Lag	Lag	Lead							
Lead-Lag Optimize?											
Recall Mode	Min	Min	Min	None	Min	Min	None	None	None	None	None

Intersection Summary

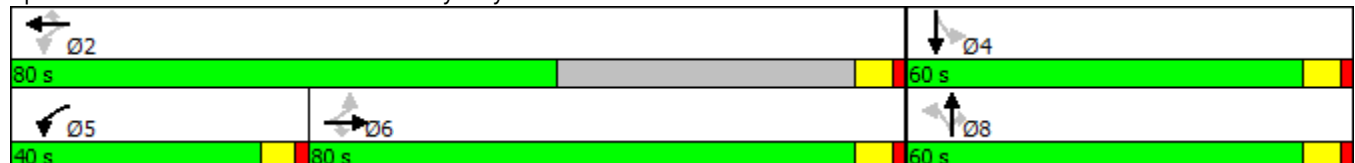
Cycle Length: 180

Actuated Cycle Length: 137.5

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Splits and Phases: 5: Ebenezer Rd/Brittany Way & SR 54



HCM 2010 Signalized Intersection Summary
5: Ebenezer Rd/Brittany Way & SR 54

Future No-Build PM

04/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	1693	79	316	1299	29	29	3	185	7	0	24
Future Volume (veh/h)	15	1693	79	316	1299	29	29	3	185	7	0	24
Number	1	6	16	5	2	12	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	19	1969	0	376	1427	36	40	4	268	9	0	41
Adj No. of Lanes	1	2	1	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.81	0.86	0.70	0.84	0.91	0.81	0.72	0.75	0.69	0.75	0.25	0.58
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	220	1697	759	399	2549	1140	256	24	297	203	0	297
Arrive On Green	0.48	0.48	0.00	0.20	0.72	0.72	0.19	0.19	0.19	0.19	0.00	0.19
Sat Flow, veh/h	361	3539	1583	1774	3539	1583	1122	125	1583	1103	0	1583
Grp Volume(v), veh/h	19	1969	0	376	1427	36	44	0	268	9	0	41
Grp Sat Flow(s),veh/h/ln	361	1770	1583	1774	1770	1583	1247	0	1583	1103	0	1583
Q Serve(g_s), s	4.4	73.0	0.0	27.7	28.8	1.0	3.9	0.0	25.2	1.1	0.0	3.3
Cycle Q Clear(g_c), s	4.4	73.0	0.0	27.7	28.8	1.0	7.1	0.0	25.2	8.2	0.0	3.3
Prop In Lane	1.00		1.00	1.00		1.00	0.91		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	220	1697	759	399	2549	1140	279	0	297	203	0	297
V/C Ratio(X)	0.09	1.16	0.00	0.94	0.56	0.03	0.16	0.00	0.90	0.04	0.00	0.14
Avail Cap(c_a), veh/h	220	1697	759	438	2549	1140	503	0	551	379	0	551
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	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.8	39.6	0.0	52.4	10.0	6.1	54.3	0.0	60.5	56.7	0.0	51.6
Incr Delay (d2), s/veh	0.4	79.2	0.0	27.8	0.5	0.0	0.3	0.0	9.8	0.1	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.8	97.6	0.0	25.7	20.2	0.8	2.9	0.0	17.5	0.6	0.0	2.6
LnGrp Delay(d),s/veh	22.1	118.8	0.0	80.2	10.5	6.1	54.5	0.0	70.3	56.8	0.0	51.8
LnGrp LOS	C	F		F	B	A	D		E	E		D
Approach Vol, veh/h		1988			1839			312			50	
Approach Delay, s/veh		117.9			24.6			68.1			52.7	
Approach LOS		F			C			E			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		116.7		35.6	36.7	80.0		35.6				
Change Period (Y+Rc), s		7.0		7.0	6.5	7.0		7.0				
Max Green Setting (Gmax), s		73.0		53.0	33.5	73.0		53.0				
Max Q Clear Time (g_c+I1), s		30.8		10.2	29.7	75.0		27.2				
Green Ext Time (p_c), s		42.1		1.5	0.5	0.0		1.4				
Intersection Summary												
HCM 2010 Ctrl Delay			72.5									
HCM 2010 LOS			E									

Timings
6: Burch Rd/Ginger Cake Rd & SR 54

Future No-Build PM

04/16/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	194	1654	20	26	1602	114	23	28	29	170	23
Future Volume (vph)	194	1654	20	26	1602	114	23	28	29	170	23
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases	1	6		5	2			8			4
Permitted Phases	6		6	2		2	8		8	4	
Detector Phase	1	6	6	5	2	2	8	8	8	4	4
Switch Phase											
Minimum Initial (s)	8.0	12.0	12.0	8.0	12.0	12.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	13.5	31.6	31.6	13.5	26.6	26.6	40.3	40.3	40.3	38.3	38.3
Total Split (s)	25.0	80.0	80.0	25.0	80.0	80.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	17.2%	55.2%	55.2%	17.2%	55.2%	55.2%	27.6%	27.6%	27.6%	27.6%	27.6%
Yellow Time (s)	3.5	4.6	4.6	3.5	4.6	4.6	4.3	4.3	4.3	4.3	4.3
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	6.6	6.6	5.5	6.6	6.6	6.3	6.3	6.3	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag					
Lead-Lag Optimize?											
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None

Intersection Summary

Cycle Length: 145

Actuated Cycle Length: 130.1

Natural Cycle: 120

Control Type: Actuated-Uncoordinated

Splits and Phases: 6: Burch Rd/Ginger Cake Rd & SR 54

		
Ø1	Ø2	Ø4
25 s	80 s	40 s
		
Ø5	Ø6	Ø8
25 s	80 s	40 s

HCM 2010 Signalized Intersection Summary

6: Burch Rd/Ginger Cake Rd & SR 54

Future No-Build PM
04/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	194	1654	20	26	1602	114	23	28	29	170	23	223
Future Volume (veh/h)	194	1654	20	26	1602	114	23	28	29	170	23	223
Number	1	6	16	5	2	12	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	206	1760	27	32	1635	127	28	36	36	185	28	240
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	0
Peak Hour Factor	0.94	0.94	0.75	0.82	0.98	0.90	0.83	0.78	0.81	0.92	0.83	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	237	2121	949	187	2027	907	116	393	334	316	35	304
Arrive On Green	0.07	0.60	0.60	0.04	0.57	0.57	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	1107	1863	1583	1323	168	1440
Grp Volume(v), veh/h	206	1760	27	32	1635	127	28	36	36	185	0	268
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1107	1863	1583	1323	0	1609
Q Serve(g_s), s	6.3	49.6	0.9	0.9	45.9	4.7	3.1	1.9	2.3	16.4	0.0	19.8
Cycle Q Clear(g_c), s	6.3	49.6	0.9	0.9	45.9	4.7	22.8	1.9	2.3	18.3	0.0	19.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.90
Lane Grp Cap(c), veh/h	237	2121	949	187	2027	907	116	393	334	316	0	339
V/C Ratio(X)	0.87	0.83	0.03	0.17	0.81	0.14	0.24	0.09	0.11	0.59	0.00	0.79
Avail Cap(c_a), veh/h	389	2121	949	387	2075	928	181	501	426	393	0	433
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.3	20.0	10.2	19.2	21.3	12.4	57.6	39.8	39.9	47.1	0.0	46.8
Incr Delay (d2), s/veh	11.2	3.2	0.0	0.4	2.8	0.1	1.1	0.1	0.1	1.7	0.0	7.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	12.3	33.1	0.7	0.9	30.9	3.8	1.8	1.8	1.8	10.2	0.0	14.5
LnGrp Delay(d),s/veh	38.5	23.2	10.2	19.6	24.0	12.6	58.6	39.9	40.0	48.9	0.0	54.2
LnGrp LOS	D	C	B	B	C	B	E	D	D	D		D
Approach Vol, veh/h		1993			1794			100			453	
Approach Delay, s/veh		24.6			23.1			45.2			52.0	
Approach LOS		C			C			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.2	78.3		32.7	10.9	81.6		32.7				
Change Period (Y+Rc), s	5.5	6.6		6.3	5.5	6.6		6.3				
Max Green Setting (Gmax), s	19.5	73.4		33.7	19.5	73.4		33.7				
Max Q Clear Time (g_c+I1), s	8.3	47.9		21.8	2.9	51.6		24.8				
Green Ext Time (p_c), s	0.5	23.7		1.8	0.0	21.8		1.6				
Intersection Summary												
HCM 2010 Ctrl Delay			27.3									
HCM 2010 LOS			C									
Notes												

Timings

7: Oak St/Brandywine Blvd & SR 54

Future No-Build PM

04/16/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	27	1918	12	9	1707	71	7	0	146	3	51
Future Volume (vph)	27	1918	12	9	1707	71	7	0	146	3	51
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	NA	Perm
Protected Phases	5	2		1	6			8		4	
Permitted Phases	2		2	6		6	8		4		4
Detector Phase	5	2	2	1	6	6	8	8	4	4	4
Switch Phase											
Minimum Initial (s)	8.0	12.0	12.0	8.0	12.0	12.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.5	24.5	24.5	13.5	24.5	24.5	39.1	39.1	39.1	39.1	39.1
Total Split (s)	30.0	80.0	80.0	30.0	80.0	80.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	20.0%	53.3%	53.3%	20.0%	53.3%	53.3%	26.7%	26.7%	26.7%	26.7%	26.7%
Yellow Time (s)	3.5	4.5	4.5	3.5	4.5	4.5	4.1	4.1	4.1	4.1	4.1
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
Total Lost Time (s)	5.5	6.5	6.5	5.5	6.5	6.5		6.1		6.1	6.1
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag					
Lead-Lag Optimize?											
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 116.1

Natural Cycle: 130

Control Type: Actuated-Uncoordinated

Splits and Phases: 7: Oak St/Brandywine Blvd & SR 54

		
Ø1	Ø2	Ø4
30 s	80 s	40 s
		
Ø5	Ø6	Ø8
30 s	80 s	40 s

HCM 2010 Signalized Intersection Summary
7: Oak St/Brandywine Blvd & SR 54

Future No-Build PM
04/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	1918	12	9	1707	71	7	0	6	146	3	51
Future Volume (veh/h)	27	1918	12	9	1707	71	7	0	6	146	3	51
Number	5	2	12	1	6	16	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	36	1957	22	13	1742	81	9	0	10	172	4	0
Adj No. of Lanes	1	2	1	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.75	0.98	0.55	0.67	0.98	0.88	0.75	0.92	0.62	0.85	0.75	0.80
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	228	2375	1062	165	2288	1024	150	16	132	264	5	226
Arrive On Green	0.05	0.67	0.67	0.02	0.65	0.65	0.14	0.00	0.14	0.14	0.14	0.00
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	717	112	922	1399	33	1583
Grp Volume(v), veh/h	36	1957	22	13	1742	81	19	0	0	176	0	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1751	0	0	1432	0	1583
Q Serve(g_s), s	0.7	45.3	0.5	0.3	38.2	2.1	0.0	0.0	0.0	12.3	0.0	0.0
Cycle Q Clear(g_c), s	0.7	45.3	0.5	0.3	38.2	2.1	1.1	0.0	0.0	13.3	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.47		0.53	0.98		1.00
Lane Grp Cap(c), veh/h	228	2375	1062	165	2288	1024	298	0	0	268	0	226
V/C Ratio(X)	0.16	0.82	0.02	0.08	0.76	0.08	0.06	0.00	0.00	0.66	0.00	0.00
Avail Cap(c_a), veh/h	532	2375	1062	513	2335	1045	539	0	0	496	0	482
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	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	12.9	13.5	6.1	14.8	13.7	7.3	41.4	0.0	0.0	46.5	0.0	0.0
Incr Delay (d2), s/veh	0.3	2.8	0.0	0.2	1.8	0.1	0.1	0.0	0.0	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(95%),veh/ln	0.8	30.5	0.4	0.3	26.1	1.7	0.9	0.0	0.0	9.3	0.0	0.0
LnGrp Delay(d),s/veh	13.2	16.3	6.1	15.0	15.5	7.4	41.5	0.0	0.0	49.2	0.0	0.0
LnGrp LOS	B	B	A	B	B	A	D			D		
Approach Vol, veh/h	2015		1836				19		176			
Approach Delay, s/veh	16.1		15.1				41.5		49.2			
Approach LOS	B		B				D		D			
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.1	81.3		22.0	10.9	78.5		22.0				
Change Period (Y+Rc), s	5.5	6.5		6.1	5.5	6.5		6.1				
Max Green Setting (Gmax), s	24.5	73.5		33.9	24.5	73.5		33.9				
Max Q Clear Time (g_c+I1), s	2.3	47.3		15.3	2.7	40.2		3.1				
Green Ext Time (p_c), s	0.0	26.1		0.6	0.1	31.9		0.7				
Intersection Summary												
HCM 2010 Ctrl Delay	17.2											
HCM 2010 LOS	B											

Timings
8: Grady Avenue/Sharon Drive & SR 54

Future No-Build PM

04/16/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	15	1207	846	161	1426	9	505	10	137	9	11
Future Volume (vph)	15	1207	846	161	1426	9	505	10	137	9	11
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases		2		1	6			8			4
Permitted Phases	2		2	6		6	8		8	4	
Detector Phase	2	2	2	1	6	6	8	8	8	4	4
Switch Phase											
Minimum Initial (s)	12.0	12.0	12.0	6.0	12.0	12.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	35.0	35.0	35.0	12.4	31.0	31.0	39.0	39.0	39.0	37.0	37.0
Total Split (s)	51.0	51.0	51.0	20.0	71.0	71.0	39.0	39.0	39.0	39.0	39.0
Total Split (%)	46.4%	46.4%	46.4%	18.2%	64.5%	64.5%	35.5%	35.5%	35.5%	35.5%	35.5%
Yellow Time (s)	5.0	5.0	5.0	4.4	5.0	5.0	5.0	5.0	5.0	5.0	5.0
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
Total Lost Time (s)	7.0	7.0	7.0	6.4	7.0	7.0		7.0	7.0		7.0
Lead/Lag	Lag	Lag	Lag	Lead							
Lead-Lag Optimize?											
Recall Mode	C-Min	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 100 (91%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Splits and Phases: 8: Grady Avenue/Sharon Drive & SR 54



HCM 2010 Signalized Intersection Summary
8: Grady Avenue/Sharon Drive & SR 54

Future No-Build PM

04/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	1207	846	161	1426	9	505	10	137	9	11	5
Future Volume (veh/h)	15	1207	846	161	1426	9	505	10	137	9	11	5
Number	5	2	12	1	6	16	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	23	1232	920	194	1440	13	532	18	0	13	13	0
Adj No. of Lanes	1	2	1	1	2	1	0	1	1	0	1	0
Peak Hour Factor	0.65	0.98	0.92	0.83	0.99	0.67	0.95	0.56	0.80	0.67	0.83	0.50
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	173	1582	708	229	2059	921	464	14	461	297	282	0
Arrive On Green	0.45	0.45	0.45	0.08	0.58	0.58	0.29	0.29	0.00	0.29	0.29	0.00
Sat Flow, veh/h	365	3539	1583	1774	3539	1583	1373	46	1583	852	968	0
Grp Volume(v), veh/h	23	1232	920	194	1440	13	550	0	0	26	0	0
Grp Sat Flow(s),veh/h/ln	365	1770	1583	1774	1770	1583	1420	0	1583	1820	0	0
Q Serve(g_s), s	5.2	32.5	49.2	6.2	31.6	0.4	30.9	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	22.0	32.5	49.2	6.2	31.6	0.4	32.0	0.0	0.0	1.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.97		1.00	0.50		0.00
Lane Grp Cap(c), veh/h	173	1582	708	229	2059	921	477	0	461	579	0	0
V/C Ratio(X)	0.13	0.78	1.30	0.85	0.70	0.01	1.15	0.00	0.00	0.04	0.00	0.00
Avail Cap(c_a), veh/h	173	1582	708	313	2059	921	477	0	461	579	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	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	29.2	25.8	30.4	23.7	16.2	9.7	41.0	0.0	0.0	28.0	0.0	0.0
Incr Delay (d2), s/veh	1.6	3.9	145.1	14.4	2.0	0.0	90.2	0.0	0.0	0.0	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	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.1	23.3	89.9	7.0	22.3	0.3	47.5	0.0	0.0	1.0	0.0	0.0
LnGrp Delay(d),s/veh	30.8	29.6	175.5	38.1	18.2	9.7	131.2	0.0	0.0	28.1	0.0	0.0
LnGrp LOS	C	C	F	D	B	A	F			C		
Approach Vol, veh/h	2175				1647				550		26	
Approach Delay, s/veh	91.4				20.5				131.2		28.1	
Approach LOS	F				C				F		C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	14.8	56.2	39.0		71.0		39.0					
Change Period (Y+Rc), s	6.4	7.0	7.0		7.0		7.0					
Max Green Setting (Gmax), s	13.6	44.0	32.0		64.0		32.0					
Max Q Clear Time (g_c+I1), s	8.2	51.2	3.1		33.6		34.0					
Green Ext Time (p_c), s	0.3	0.0	2.3		30.4		0.0					
Intersection Summary												
HCM 2010 Ctrl Delay	69.4											
HCM 2010 LOS	E											

Intersection

Intersection Delay, s/veh51.8

Intersection LOS F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	8	11	170	18	65	8	373	194	41	283	6
Future Vol, veh/h	8	8	11	170	18	65	8	373	194	41	283	6
Peak Hour Factor	0.58	0.58	0.50	0.74	0.50	0.81	0.58	0.89	0.92	0.75	0.88	0.42
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	14	14	22	230	36	80	14	419	211	55	322	14
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	12.3	23.3	86.6	24.6
HCM LOS	B	C	F	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	1%	30%	67%	12%
Vol Thru, %	65%	30%	7%	86%
Vol Right, %	34%	41%	26%	2%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	575	27	253	330
LT Vol	8	8	170	41
Through Vol	373	8	18	283
RT Vol	194	11	65	6
Lane Flow Rate	644	50	346	391
Geometry Grp	1	1	1	1
Degree of Util (X)	1.087	0.109	0.666	0.709
Departure Headway (Hd)	6.079	8.299	7.16	6.767
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	599	434	509	539
Service Time	4.079	6.299	5.16	4.767
HCM Lane V/C Ratio	1.075	0.115	0.68	0.725
HCM Control Delay	86.6	12.3	23.3	24.6
HCM Lane LOS	F	B	C	C
HCM 95th-tile Q	19.1	0.4	4.9	5.7

Intersection						
Int Delay, s/veh	3.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	52	119	29	167	188	24
Future Vol, veh/h	52	119	29	167	188	24
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	-	-	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	88	65	66	58	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	58	135	45	253	324	32
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	666	324	324	0	-	0
Stage 1	324	-	-	-	-	-
Stage 2	342	-	-	-	-	-
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	425	717	1236	-	-	-
Stage 1	733	-	-	-	-	-
Stage 2	719	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	407	717	1236	-	-	-
Mov Cap-2 Maneuver	407	-	-	-	-	-
Stage 1	733	-	-	-	-	-
Stage 2	689	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	14.2	1.2		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1236	-	583	-	-	
HCM Lane V/C Ratio	0.036	-	0.332	-	-	
HCM Control Delay (s)	8	0	14.2	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0.1	-	1.4	-	-	

Intersection						
Int Delay, s/veh	4.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	228	230	6	178	343
Future Vol, veh/h	7	228	230	6	178	343
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	0	250	-	400	225	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	50	89	82	42	79	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	256	280	14	225	423
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1154	280	0	0	280	0
Stage 1	280	-	-	-	-	-
Stage 2	874	-	-	-	-	-
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	218	759	-	-	1283	-
Stage 1	767	-	-	-	-	-
Stage 2	408	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	180	759	-	-	1283	-
Mov Cap-2 Maneuver	180	-	-	-	-	-
Stage 1	767	-	-	-	-	-
Stage 2	336	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	12.9	0	2.9			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT		
Capacity (veh/h)	-	- 180 759 1283	-	-		
HCM Lane V/C Ratio	-	- 0.078 0.338 0.176	-	-		
HCM Control Delay (s)	-	- 26.7 12.1 8.4	-	-		
HCM Lane LOS	-	- D B A	-	-		
HCM 95th %tile Q(veh)	-	- 0.2 1.5 0.6	-	-		

Intersection						
Int Delay, s/veh	6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	21	252	250	224	221	17
Future Vol, veh/h	21	252	250	224	221	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	115	0	185	-	-	250
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	53	89	91	84	89	47
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	40	283	275	267	248	36
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1064	248	248	0	-	0
Stage 1	248	-	-	-	-	-
Stage 2	816	-	-	-	-	-
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	247	791	1318	-	-	-
Stage 1	793	-	-	-	-	-
Stage 2	435	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	195	791	1318	-	-	-
Mov Cap-2 Maneuver	195	-	-	-	-	-
Stage 1	793	-	-	-	-	-
Stage 2	344	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	14.1	4.3		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1318	-	195	791	-	-
HCM Lane V/C Ratio	0.208	-	0.203	0.358	-	-
HCM Control Delay (s)	8.4	-	28.1	12.1	-	-
HCM Lane LOS	A	-	D	B	-	-
HCM 95th %tile Q(veh)	0.8	-	0.7	1.6	-	-

Future “No-Build” Improved Intersection Analysis

Timings

1: Private Drwy/Tyrone Rd & SR 54

Future No-Build AM - Improved

04/17/2018



Lane Group	EBL	EBT	WBT	WBR	NBT	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	34	1204	1272	349	1	510	0	37
Future Volume (vph)	34	1204	1272	349	1	510	0	37
Turn Type	Perm	NA	NA	Perm	NA	Perm	NA	Perm
Protected Phases		2	6		8		4	
Permitted Phases	2			6		4		4
Detector Phase	2	2	6	6	8	4	4	4
Switch Phase								
Minimum Initial (s)	15.0	15.0	15.0	15.0	10.0	10.0	10.0	10.0
Minimum Split (s)	26.0	26.0	25.0	25.0	48.0	44.0	44.0	44.0
Total Split (s)	80.0	80.0	80.0	80.0	60.0	60.0	60.0	60.0
Total Split (%)	57.1%	57.1%	57.1%	57.1%	42.9%	42.9%	42.9%	42.9%
Yellow Time (s)	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	Min	Min	Min	Min	None	None	None	None

Intersection Summary

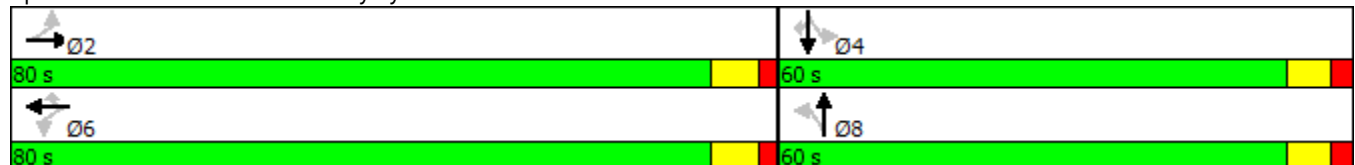
Cycle Length: 140

Actuated Cycle Length: 140

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Splits and Phases: 1: Private Drwy/Tyrone Rd & SR 54



HCM 2010 Signalized Intersection Summary
1: Private Drwy/Tyrone Rd & SR 54

Future No-Build AM - Improved
04/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	1204	1	0	1272	349	0	1	0	510	0	37
Future Volume (veh/h)	34	1204	1	0	1272	349	0	1	0	510	0	37
Number	5	2	12	1	6	16	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	50	1416	4	0	1429	447	0	4	0	526	0	0
Adj No. of Lanes	1	2	0	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.68	0.85	0.25	0.92	0.89	0.78	0.92	0.25	0.92	0.97	0.92	0.82
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	99	1888	5	51	1845	826	0	705	0	582	0	599
Arrive On Green	0.52	0.52	0.52	0.00	0.52	0.52	0.00	0.38	0.00	0.38	0.00	0.00
Sat Flow, veh/h	242	3620	10	376	3539	1583	0	1863	0	1402	0	1583
Grp Volume(v), veh/h	50	692	728	0	1429	447	0	4	0	526	0	0
Grp Sat Flow(s),veh/h/ln	242	1770	1861	376	1770	1583	0	1863	0	1402	0	1583
Q Serve(g_s), s	27.6	43.0	43.0	0.0	45.4	26.4	0.0	0.2	0.0	52.1	0.0	0.0
Cycle Q Clear(g_c), s	73.0	43.0	43.0	0.0	45.4	26.4	0.0	0.2	0.0	52.3	0.0	0.0
Prop In Lane	1.00		0.01	1.00		1.00	0.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	99	923	970	51	1845	826	0	705	0	582	0	599
V/C Ratio(X)	0.50	0.75	0.75	0.00	0.77	0.54	0.00	0.01	0.00	0.90	0.00	0.00
Avail Cap(c_a), veh/h	99	923	970	51	1845	826	0	705	0	582	0	599
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	0.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	56.8	26.3	26.3	0.0	26.9	22.3	0.0	27.1	0.0	43.4	0.0	0.0
Incr Delay (d2), s/veh	8.3	4.1	3.9	0.0	2.5	1.3	0.0	0.0	0.0	17.5	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(95%),veh/ln	3.9	29.7	31.0	0.0	30.5	17.3	0.0	0.2	0.0	30.9	0.0	0.0
LnGrp Delay(d),s/veh	65.1	30.5	30.3	0.0	29.4	23.6	0.0	27.1	0.0	60.9	0.0	0.0
LnGrp LOS	E	C	C		C	C		C		E		
Approach Vol, veh/h		1470			1876			4			526	
Approach Delay, s/veh		31.5			28.0			27.1			60.9	
Approach LOS		C			C			C			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		80.0		60.0		80.0		60.0				
Change Period (Y+Rc), s		7.0		7.0		7.0		7.0				
Max Green Setting (Gmax), s		73.0		53.0		73.0		53.0				
Max Q Clear Time (g_c+I1), s		75.0		54.3		47.4		2.2				
Green Ext Time (p_c), s		0.0		0.0		25.6		2.1				
Intersection Summary												
HCM 2010 Ctrl Delay			33.8									
HCM 2010 LOS			C									

Timings

2: Old Norton Rd/S Sandy Creek Rd & SR 54

Future No-Build AM - Improved

04/17/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	24	1644	14	66	1736	212	41	19	183	10	53
Future Volume (vph)	24	1644	14	66	1736	212	41	19	183	10	53
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	NA	Perm
Protected Phases	5	2		1	6			8		4	
Permitted Phases	2		2	6		6	8		4		4
Detector Phase	5	2	2	1	6	6	8	8	4	4	4
Switch Phase											
Minimum Initial (s)	6.0	12.0	12.0	6.0	12.0	12.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	12.0	26.0	26.0	13.5	25.0	25.0	46.3	46.3	46.3	46.3	46.3
Total Split (s)	40.0	80.0	80.0	40.0	80.0	80.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	22.2%	44.4%	44.4%	22.2%	44.4%	44.4%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.3	2.3	2.3	2.3
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)	6.0	7.0	7.0	6.0	7.0	7.0		7.3		7.3	7.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag					
Lead-Lag Optimize?											
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None

Intersection Summary

Cycle Length: 180

Actuated Cycle Length: 128.6

Natural Cycle: 130

Control Type: Actuated-Uncoordinated

Splits and Phases: 2: Old Norton Rd/S Sandy Creek Rd & SR 54

 Ø1	 Ø2	 Ø4
40 s	80 s	60 s
 Ø5	 Ø6	 Ø8
40 s	80 s	60 s

HCM 2010 Signalized Intersection Summary 2: Old Norton Rd/S Sandy Creek Rd & SR 54

Future No-Build AM - Improved
04/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	1644	14	66	1736	212	41	19	33	183	10	53
Future Volume (veh/h)	24	1644	14	66	1736	212	41	19	33	183	10	53
Number	5	2	12	1	6	16	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	41	1712	19	72	1790	230	73	22	41	189	13	0
Adj No. of Lanes	1	2	1	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.58	0.96	0.75	0.92	0.97	0.92	0.56	0.85	0.81	0.97	0.75	0.69
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	173	2148	961	208	2177	974	199	64	94	277	15	281
Arrive On Green	0.04	0.61	0.61	0.05	0.62	0.62	0.18	0.18	0.18	0.18	0.18	0.00
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	862	361	528	1230	85	1583
Grp Volume(v), veh/h	41	1712	19	72	1790	230	136	0	0	202	0	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1751	0	0	1315	0	1583
Q Serve(g_s), s	1.0	44.0	0.6	1.8	47.0	7.8	0.0	0.0	0.0	9.9	0.0	0.0
Cycle Q Clear(g_c), s	1.0	44.0	0.6	1.8	47.0	7.8	8.1	0.0	0.0	17.9	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.54		0.30	0.94		1.00
Lane Grp Cap(c), veh/h	173	2148	961	208	2177	974	357	0	0	292	0	281
V/C Ratio(X)	0.24	0.80	0.02	0.35	0.82	0.24	0.38	0.00	0.00	0.69	0.00	0.00
Avail Cap(c_a), veh/h	612	2164	968	632	2177	974	756	0	0	650	0	699
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	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	18.8	17.9	9.3	18.4	17.9	10.3	43.7	0.0	0.0	48.0	0.0	0.0
Incr Delay (d2), s/veh	0.7	2.5	0.0	1.0	3.0	0.3	0.7	0.0	0.0	2.9	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	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.2	29.9	0.5	2.2	31.8	6.2	7.3	0.0	0.0	10.9	0.0	0.0
LnGrp Delay(d),s/veh	19.4	20.3	9.4	19.4	20.9	10.6	44.4	0.0	0.0	50.9	0.0	0.0
LnGrp LOS	B	C	A	B	C	B	D			D		
Approach Vol, veh/h		1772			2092			136			202	
Approach Delay, s/veh		20.2			19.7			44.4			50.9	
Approach LOS		C			B			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.4	79.4		28.5	10.5	80.4		28.5				
Change Period (Y+Rc), s	6.0	7.0		* 7.3	6.0	7.0		* 7.3				
Max Green Setting (Gmax), s	34.0	73.0		* 53	34.0	73.0		* 53				
Max Q Clear Time (g_c+I1), s	3.8	46.0		19.9	3.0	49.0		10.1				
Green Ext Time (p_c), s	0.2	26.5		1.2	0.1	24.0		1.2				
Intersection Summary												
HCM 2010 Ctrl Delay				22.2								
HCM 2010 LOS				C								
Notes												

Timings

3: Lester Rd/Veterans Pkwy & SR 54

Future No-Build AM - Improved

04/17/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	149	1371	142	371	1234	77	208	197	263	35	137	77
Future Volume (vph)	149	1371	142	371	1234	77	208	197	263	35	137	77
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6			2	8		8	4		4
Detector Phase	1	6	6	5	2	2	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	6.0	8.0	8.0	6.0	8.0	8.0
Minimum Split (s)	13.3	42.3	42.3	13.3	42.3	42.3	11.9	48.1	48.1	11.9	49.1	49.1
Total Split (s)	20.0	60.0	60.0	25.0	65.0	65.0	15.0	50.0	50.0	15.0	50.0	50.0
Total Split (%)	13.3%	40.0%	40.0%	16.7%	43.3%	43.3%	10.0%	33.3%	33.3%	10.0%	33.3%	33.3%
Yellow Time (s)	5.3	5.3	5.3	5.3	5.3	5.3	3.9	5.1	5.1	3.9	5.1	5.1
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)	7.3	7.3	7.3	7.3	7.3	7.3	5.9	7.1	7.1	5.9	7.1	7.1
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 121.5

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Lester Rd/Veterans Pkwy & SR 54

			
Ø1	Ø2	Ø4	Ø3
20 s	65 s	50 s	15 s
			
Ø6	Ø5	Ø8	Ø7
60 s	25 s	50 s	15 s

HCM 2010 Signalized Intersection Summary

3: Lester Rd/Veterans Pkwy & SR 54

Future No-Build AM - Improved
04/17/2018

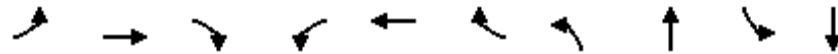
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	149	1371	142	371	1234	77	208	197	263	35	137	77
Future Volume (veh/h)	149	1371	142	371	1234	77	208	197	263	35	137	77
Number	1	6	16	5	2	12	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	207	1632	0	515	1690	0	310	334	0	54	269	0
Adj No. of Lanes	1	2	1	2	2	1	1	2	1	1	2	1
Peak Hour Factor	0.72	0.84	0.61	0.72	0.73	0.65	0.67	0.59	0.78	0.65	0.51	0.74
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	234	1568	702	512	1749	782	224	423	189	169	352	157
Arrive On Green	0.10	0.44	0.00	0.15	0.49	0.00	0.08	0.12	0.00	0.06	0.10	0.00
Sat Flow, veh/h	1774	3539	1583	3442	3539	1583	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	207	1632	0	515	1690	0	310	334	0	54	269	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1721	1770	1583	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	9.6	52.7	0.0	17.7	55.0	0.0	9.1	10.9	0.0	0.0	8.8	0.0
Cycle Q Clear(g_c), s	9.6	52.7	0.0	17.7	55.0	0.0	9.1	10.9	0.0	0.0	8.8	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	234	1568	702	512	1749	782	224	423	189	169	352	157
V/C Ratio(X)	0.88	1.04	0.00	1.01	0.97	0.00	1.38	0.79	0.00	0.32	0.76	0.00
Avail Cap(c_a), veh/h	250	1568	702	512	1749	782	224	1277	571	204	1277	571
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	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.4	33.1	0.0	50.6	29.1	0.0	52.9	50.9	0.0	52.9	52.2	0.0
Incr Delay (d2), s/veh	27.9	34.1	0.0	41.1	14.6	0.0	197.1	3.4	0.0	1.1	3.5	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(95%),veh/ln	13.3	59.6	0.0	20.4	39.3	0.0	35.3	9.4	0.0	3.1	7.9	0.0
LnGrp Delay(d),s/veh	58.3	67.2	0.0	91.8	43.7	0.0	250.0	54.3	0.0	53.9	55.7	0.0
LnGrp LOS	E	F		F	D		F	D		D	E	
Approach Vol, veh/h		1839			2205			644			323	
Approach Delay, s/veh		66.2			54.9			148.5			55.4	
Approach LOS		E			D			F			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	18.9	66.1	15.0	18.9	25.0	60.0	12.6	21.3				
Change Period (Y+Rc), s	7.3	7.3	5.9	7.1	7.3	7.3	5.9	7.1				
Max Green Setting (Gmax), s	12.7	57.7	9.1	42.9	17.7	52.7	9.1	42.9				
Max Q Clear Time (g_c+I1), s	11.6	57.0	11.1	10.8	19.7	54.7	2.0	12.9				
Green Ext Time (p_c), s	0.1	0.7	0.0	1.0	0.0	0.0	0.7	1.3				
Intersection Summary												
HCM 2010 Ctrl Delay			71.1									
HCM 2010 LOS			E									
Notes												

Timings

Future No-Build AM - Improved

4: Togwatee Village Pkwy/Piedmont Fayette & SR 54

04/17/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	225	1512	53	113	1441	145	21	1	45	6
Future Volume (vph)	225	1512	53	113	1441	145	21	1	45	6
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	NA
Protected Phases	1	6		5	2			4		8
Permitted Phases	6		6	2		2	4		8	
Detector Phase	1	6	6	5	2	2	4	4	8	8
Switch Phase										
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.7	33.0	33.0	11.7	32.0	32.0	50.0	50.0	48.0	48.0
Total Split (s)	40.0	80.0	80.0	40.0	80.0	80.0	60.0	60.0	60.0	60.0
Total Split (%)	22.2%	44.4%	44.4%	22.2%	44.4%	44.4%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.7	5.0	5.0	3.7	5.0	5.0	5.0	5.0	5.0	5.0
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)	5.7	7.0	7.0	5.7	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?										
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None

Intersection Summary

Cycle Length: 180

Actuated Cycle Length: 123.5

Natural Cycle: 145

Control Type: Actuated-Uncoordinated

Splits and Phases: 4: Togwatee Village Pkwy/Piedmont Fayette & SR 54

Ø1	Ø2	Ø4
40 s	80 s	60 s
Ø5	Ø6	Ø8
40 s	80 s	60 s

HCM 2010 Signalized Intersection Summary
4: Togwatee Village Pkwy/Piedmont Fayette & SR 54

Future No-Build AM - Improved
04/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	225	1512	53	113	1441	145	21	1	33	45	6	21
Future Volume (veh/h)	225	1512	53	113	1441	145	21	1	33	45	6	21
Number	1	6	16	5	2	12	7	4	14	3	8	18
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	253	1662	0	145	1676	0	27	4	0	67	10	0
Adj No. of Lanes	1	2	1	1	2	1	1	1	0	1	1	0
Peak Hour Factor	0.89	0.91	0.78	0.78	0.86	0.90	0.79	0.25	0.81	0.67	0.62	0.40
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	295	2396	1072	279	2339	1046	183	164	0	187	164	0
Arrive On Green	0.07	0.68	0.00	0.05	0.66	0.00	0.09	0.09	0.00	0.09	0.09	0.00
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	1399	1863	0	1407	1863	0
Grp Volume(v), veh/h	253	1662	0	145	1676	0	27	4	0	67	10	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1399	1863	0	1407	1863	0
Q Serve(g_s), s	4.9	31.2	0.0	2.8	33.3	0.0	2.0	0.2	0.0	5.0	0.5	0.0
Cycle Q Clear(g_c), s	4.9	31.2	0.0	2.8	33.3	0.0	2.5	0.2	0.0	5.2	0.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	295	2396	1072	279	2339	1046	183	164	0	187	164	0
V/C Ratio(X)	0.86	0.69	0.00	0.52	0.72	0.00	0.15	0.02	0.00	0.36	0.06	0.00
Avail Cap(c_a), veh/h	728	2396	1072	740	2368	1060	739	905	0	747	905	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	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	20.4	10.7	0.0	12.6	11.9	0.0	46.7	45.4	0.0	47.8	45.6	0.0
Incr Delay (d2), s/veh	7.1	1.1	0.0	1.5	1.3	0.0	0.4	0.1	0.0	1.2	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(95%),veh/ln	9.5	21.8	0.0	4.3	23.2	0.0	1.4	0.2	0.0	3.6	0.5	0.0
LnGrp Delay(d),s/veh	27.5	11.9	0.0	14.1	13.2	0.0	47.1	45.5	0.0	49.0	45.7	0.0
LnGrp LOS	C	B		B	B		D	D		D	D	
Approach Vol, veh/h		1915			1821			31			77	
Approach Delay, s/veh		13.9			13.3			46.9			48.6	
Approach LOS		B			B			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.4	79.1		16.6	11.6	80.8		16.6				
Change Period (Y+Rc), s	* 5.7	7.0		7.0	* 5.7	7.0		7.0				
Max Green Setting (Gmax), s	* 34	73.0		53.0	* 34	73.0		53.0				
Max Q Clear Time (g_c+I1), s	6.9	35.3		4.5	4.8	33.2		7.2				
Green Ext Time (p_c), s	0.8	36.8		0.4	0.4	39.7		0.4				
Intersection Summary												
HCM 2010 Ctrl Delay				14.6								
HCM 2010 LOS				B								
Notes												

Timings
5: Ebenezer Rd/Brittany Way & SR 54

Future No-Build AM - Improved

04/17/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	5	1213	27	164	1044	7	45	1	292	36	1
Future Volume (vph)	5	1213	27	164	1044	7	45	1	292	36	1
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	pm+ov	Perm	NA
Protected Phases		6		5	2			8	5		4
Permitted Phases	6		6	2		2	8		8	4	
Detector Phase	6	6	6	5	2	2	8	8	5	4	4
Switch Phase											
Minimum Initial (s)	15.0	15.0	15.0	8.0	15.0	15.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	26.0	26.0	26.0	14.5	26.0	26.0	48.0	48.0	14.5	43.0	43.0
Total Split (s)	80.0	80.0	80.0	25.0	105.0	105.0	45.0	45.0	25.0	45.0	45.0
Total Split (%)	53.3%	53.3%	53.3%	16.7%	70.0%	70.0%	30.0%	30.0%	16.7%	30.0%	30.0%
Yellow Time (s)	5.0	5.0	5.0	4.5	5.0	5.0	5.0	5.0	4.5	5.0	5.0
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
Total Lost Time (s)	7.0	7.0	7.0	6.5	7.0	7.0		7.0	6.5	7.0	7.0
Lead/Lag	Lag	Lag	Lag	Lead					Lead		
Lead-Lag Optimize?											
Recall Mode	Min	Min	Min	None	Min	Min	None	None	None	None	None

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 119

Natural Cycle: 120

Control Type: Actuated-Uncoordinated

Splits and Phases: 5: Ebenezer Rd/Brittany Way & SR 54

					
Ø2			Ø4		
105 s			45 s		
					
Ø5	Ø6		Ø8		
25 s	80 s		45 s		

HCM 2010 Signalized Intersection Summary
5: Ebenezer Rd/Brittany Way & SR 54

Future No-Build AM - Improved

04/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	1213	27	164	1044	7	45	1	292	36	1	19
Future Volume (veh/h)	5	1213	27	164	1044	7	45	1	292	36	1	19
Number	1	6	16	5	2	12	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	10	1498	0	210	1111	18	54	4	321	40	4	31
Adj No. of Lanes	1	2	1	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.50	0.81	0.75	0.78	0.94	0.38	0.83	0.25	0.91	0.89	0.25	0.61
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	323	2027	907	259	2428	1086	301	21	435	220	39	299
Arrive On Green	0.57	0.57	0.00	0.06	0.69	0.69	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	497	3539	1583	1774	3539	1583	1189	98	1583	1051	184	1427
Grp Volume(v), veh/h	10	1498	0	210	1111	18	58	0	321	40	0	35
Grp Sat Flow(s),veh/h/ln	497	1770	1583	1774	1770	1583	1287	0	1583	1051	0	1611
Q Serve(g_s), s	1.3	42.1	0.0	6.3	19.3	0.5	4.5	0.0	24.8	4.5	0.0	2.4
Cycle Q Clear(g_c), s	5.4	42.1	0.0	6.3	19.3	0.5	6.9	0.0	24.8	11.3	0.0	2.4
Prop In Lane	1.00		1.00	1.00		1.00	0.93		1.00	1.00		0.89
Lane Grp Cap(c), veh/h	323	2027	907	259	2428	1086	322	0	435	220	0	338
V/C Ratio(X)	0.03	0.74	0.00	0.81	0.46	0.02	0.18	0.00	0.74	0.18	0.00	0.10
Avail Cap(c_a), veh/h	323	2027	907	388	2581	1154	423	0	550	297	0	455
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	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.4	21.3	0.0	24.9	9.7	6.7	45.5	0.0	44.3	49.4	0.0	42.9
Incr Delay (d2), s/veh	0.1	1.8	0.0	7.6	0.3	0.0	0.3	0.0	3.9	0.4	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(95%),veh/ln	0.3	28.4	0.0	8.9	14.6	0.4	3.3	0.0	16.8	2.4	0.0	1.9
LnGrp Delay(d),s/veh	14.4	23.0	0.0	32.5	9.9	6.7	45.8	0.0	48.3	49.8	0.0	43.0
LnGrp LOS	B	C		C	A	A	D		D	D		D
Approach Vol, veh/h		1508			1339			379			75	
Approach Delay, s/veh		23.0			13.4			47.9			46.7	
Approach LOS		C			B			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		99.2		35.2	15.2	84.0		35.2				
Change Period (Y+Rc), s		7.0		7.0	6.5	7.0		7.0				
Max Green Setting (Gmax), s		98.0		38.0	18.5	73.0		38.0				
Max Q Clear Time (g_c+I1), s		21.3		13.3	8.3	44.1		26.8				
Green Ext Time (p_c), s		70.9		1.8	0.4	28.8		1.4				
Intersection Summary												
HCM 2010 Ctrl Delay				22.5								
HCM 2010 LOS				C								
Notes												

Timings
6: Burch Rd/Ginger Cake Rd & SR 54

Future No-Build AM - Improved

04/17/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	294	1389	19	29	1704	106	32	25	33	153	16	312
Future Volume (vph)	294	1389	19	29	1704	106	32	25	33	153	16	312
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases	6		6	2		2	8		8	4		4
Detector Phase	1	6	6	5	2	2	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	8.0	12.0	12.0	8.0	12.0	12.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	13.5	31.6	31.6	13.5	26.6	26.6	40.3	40.3	40.3	38.3	38.3	38.3
Total Split (s)	25.0	80.0	80.0	25.0	80.0	80.0	40.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	17.2%	55.2%	55.2%	17.2%	55.2%	55.2%	27.6%	27.6%	27.6%	27.6%	27.6%	27.6%
Yellow Time (s)	3.5	4.6	4.6	3.5	4.6	4.6	4.3	4.3	4.3	4.3	4.3	4.3
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	6.6	6.6	5.5	6.6	6.6	6.3	6.3	6.3	6.3	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None

Intersection Summary

Cycle Length: 145

Actuated Cycle Length: 134.8

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Splits and Phases: 6: Burch Rd/Ginger Cake Rd & SR 54

		
Ø1	Ø2	Ø4
25 s	80 s	40 s
		
Ø5	Ø6	Ø8
25 s	80 s	40 s

HCM 2010 Signalized Intersection Summary
6: Burch Rd/Ginger Cake Rd & SR 54

Future No-Build AM - Improved
04/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	294	1389	19	29	1704	106	32	25	33	153	16	312
Future Volume (veh/h)	294	1389	19	29	1704	106	32	25	33	153	16	312
Number	1	6	16	5	2	12	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	377	1417	40	45	1794	126	41	41	55	180	23	0
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.78	0.98	0.47	0.65	0.95	0.84	0.78	0.61	0.60	0.85	0.70	0.78
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	332	2240	1002	283	1887	844	286	330	281	260	330	281
Arrive On Green	0.15	0.63	0.63	0.05	0.53	0.53	0.18	0.18	0.18	0.18	0.18	0.00
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	1383	1863	1583	1294	1863	1583
Grp Volume(v), veh/h	377	1417	40	45	1794	126	41	41	55	180	23	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1383	1863	1583	1294	1863	1583
Q Serve(g_s), s	19.5	32.1	1.2	1.4	62.8	5.3	3.3	2.4	3.9	17.8	1.3	0.0
Cycle Q Clear(g_c), s	19.5	32.1	1.2	1.4	62.8	5.3	4.7	2.4	3.9	20.2	1.3	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	332	2240	1002	283	1887	844	286	330	281	260	330	281
V/C Ratio(X)	1.14	0.63	0.04	0.16	0.95	0.15	0.14	0.12	0.20	0.69	0.07	0.00
Avail Cap(c_a), veh/h	332	2240	1002	460	1985	888	397	480	408	364	480	408
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	45.5	14.7	9.0	13.3	28.9	15.5	46.8	45.3	45.9	53.8	44.8	0.0
Incr Delay (d2), s/veh	91.7	0.8	0.0	0.3	11.0	0.2	0.2	0.2	0.3	3.3	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(95%),veh/ln	36.8	22.3	1.0	1.3	42.8	4.2	2.3	2.3	3.1	10.8	1.3	0.0
LnGrp Delay(d),s/veh	137.2	15.5	9.1	13.5	39.9	15.7	47.0	45.5	46.2	57.1	44.9	0.0
LnGrp LOS	F	B	A	B	D	B	D	D	D	E	D	
Approach Vol, veh/h		1834			1965			137			203	
Approach Delay, s/veh		40.4			37.8			46.2			55.7	
Approach LOS		D			D			D			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	25.0	76.4		29.5	11.9	89.4		29.5				
Change Period (Y+Rc), s	5.5	6.6		6.3	5.5	6.6		6.3				
Max Green Setting (Gmax), s	19.5	73.4		33.7	19.5	73.4		33.7				
Max Q Clear Time (g_c+I1), s	21.5	64.8		22.2	3.4	34.1		6.7				
Green Ext Time (p_c), s	0.0	5.0		1.0	0.1	39.3		1.3				
Intersection Summary												
HCM 2010 Ctrl Delay			40.1									
HCM 2010 LOS			D									
Notes												

Timings

7: Oak St/Brandywine Blvd & SR 54

Future No-Build AM - Improved

04/17/2018



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	30	1483	9	1856	113	6	0	79	0	7
Future Volume (vph)	30	1483	9	1856	113	6	0	79	0	7
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	NA	Perm
Protected Phases	5	2	1	6			8		4	
Permitted Phases	2		6		6	8		4		4
Detector Phase	5	2	1	6	6	8	8	4	4	4
Switch Phase										
Minimum Initial (s)	8.0	12.0	8.0	12.0	12.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.5	24.5	13.5	24.5	24.5	39.1	39.1	39.1	39.1	39.1
Total Split (s)	30.0	80.0	30.0	80.0	80.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	20.0%	53.3%	20.0%	53.3%	53.3%	26.7%	26.7%	26.7%	26.7%	26.7%
Yellow Time (s)	3.5	4.5	3.5	4.5	4.5	4.1	4.1	4.1	4.1	4.1
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
Total Lost Time (s)	5.5	6.5	5.5	6.5	6.5		6.1		6.1	6.1
Lead/Lag	Lead	Lag	Lead	Lag	Lag					
Lead-Lag Optimize?										
Recall Mode	None	Min	None	Min	Min	None	None	None	None	None

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 111.2

Natural Cycle: 140

Control Type: Actuated-Uncoordinated

Splits and Phases: 7: Oak St/Brandywine Blvd & SR 54

30 s	80 s	40 s	80 s	40 s	80 s	40 s	80 s
30 s	80 s	40 s	80 s	40 s	80 s	40 s	80 s

HCM 2010 Signalized Intersection Summary
7: Oak St/Brandywine Blvd & SR 54

Future No-Build AM - Improved
04/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	1483	0	9	1856	113	6	0	6	79	0	7
Future Volume (veh/h)	30	1483	0	9	1856	113	6	0	6	79	0	7
Number	5	2	12	1	6	16	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	40	1578	0	10	2040	192	14	0	19	86	0	0
Adj No. of Lanes	1	2	1	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.75	0.94	0.92	0.92	0.91	0.59	0.42	0.92	0.31	0.92	0.92	0.75
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	205	2538	1135	261	2420	1083	96	17	88	203	0	146
Arrive On Green	0.05	0.72	0.00	0.02	0.68	0.68	0.09	0.00	0.09	0.09	0.00	0.00
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	517	187	956	1464	0	1583
Grp Volume(v), veh/h	40	1578	0	10	2040	192	33	0	0	86	0	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1660	0	0	1464	0	1583
Q Serve(g_s), s	0.6	24.0	0.0	0.2	45.3	4.6	0.0	0.0	0.0	3.9	0.0	0.0
Cycle Q Clear(g_c), s	0.6	24.0	0.0	0.2	45.3	4.6	1.9	0.0	0.0	5.8	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.42		0.58	1.00		1.00
Lane Grp Cap(c), veh/h	205	2538	1135	261	2420	1083	201	0	0	203	0	146
V/C Ratio(X)	0.20	0.62	0.00	0.04	0.84	0.18	0.16	0.00	0.00	0.42	0.00	0.00
Avail Cap(c_a), veh/h	524	2538	1135	639	2469	1104	547	0	0	522	0	509
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	16.5	7.6	0.0	6.7	12.4	6.0	44.3	0.0	0.0	45.9	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.7	0.0	0.1	3.1	0.2	0.4	0.0	0.0	1.4	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(95%),veh/ln	1.2	17.5	0.0	0.2	30.7	3.6	1.6	0.0	0.0	4.5	0.0	0.0
LnGrp Delay(d),s/veh	16.9	8.3	0.0	6.8	15.5	6.2	44.7	0.0	0.0	47.3	0.0	0.0
LnGrp LOS	B	A		A	B	A	D			D		
Approach Vol, veh/h		1618			2242			33			86	
Approach Delay, s/veh		8.5			14.7			44.7			47.3	
Approach LOS		A			B			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.5	82.1		15.8	11.0	78.6		15.8				
Change Period (Y+Rc), s	5.5	6.5		6.1	5.5	6.5		6.1				
Max Green Setting (Gmax), s	24.5	73.5		33.9	24.5	73.5		33.9				
Max Q Clear Time (g_c+I1), s	2.2	26.0		7.8	2.6	47.3		3.9				
Green Ext Time (p_c), s	0.0	47.4		0.4	0.1	24.7		0.4				
Intersection Summary												
HCM 2010 Ctrl Delay				13.1								
HCM 2010 LOS				B								

Timings
8: Grady Avenue/Sharon Drive & SR 54

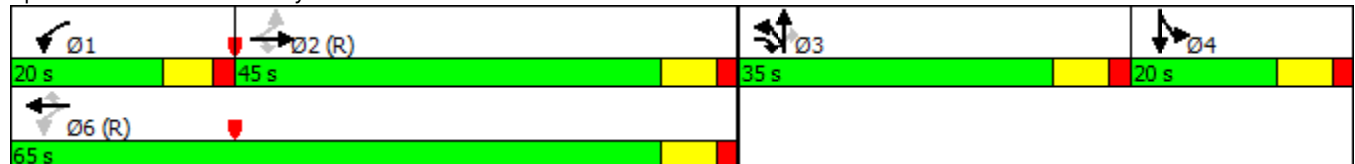
Future No-Build AM - Improved
04/17/2018

										
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT
Lane Configurations										
Traffic Volume (vph)	14	1149	537	219	1414	6	720	0	222	17
Future Volume (vph)	14	1149	537	219	1414	6	720	0	222	17
Turn Type	Perm	NA	pm+ov	pm+pt	NA	Perm	Split	NA	Perm	NA
Protected Phases		2	3	1	6		3	3		4
Permitted Phases	2		2	6		6			3	
Detector Phase	2	2	3	1	6	6	3	3	3	4
Switch Phase										
Minimum Initial (s)	12.0	12.0	8.0	6.0	12.0	12.0	8.0	8.0	8.0	8.0
Minimum Split (s)	35.0	35.0	39.0	12.4	31.0	31.0	39.0	39.0	39.0	37.0
Total Split (s)	45.0	45.0	35.0	20.0	65.0	65.0	35.0	35.0	35.0	20.0
Total Split (%)	37.5%	37.5%	29.2%	16.7%	54.2%	54.2%	29.2%	29.2%	29.2%	16.7%
Yellow Time (s)	5.0	5.0	5.0	4.4	5.0	5.0	5.0	5.0	5.0	5.0
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)	7.0	7.0	7.0	6.4	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lag	Lag	Lead	Lead			Lead	Lead	Lead	Lag
Lead-Lag Optimize?			Yes				Yes	Yes	Yes	Yes
Recall Mode	C-Min	C-Min	None	None	C-Min	C-Min	None	None	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 10 (8%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated

Splits and Phases: 8: Grady Avenue/Sharon Drive & SR 54



HCM Signalized Intersection Capacity Analysis

8: Grady Avenue/Sharon Drive & SR 54

Future No-Build AM - Improved

04/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	1149	537	219	1414	6	720	0	222	11	17	10
Future Volume (vph)	14	1149	537	219	1414	6	720	0	222	11	17	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	6.4	7.0	7.0	7.0	7.0	7.0		7.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00		0.98	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1681	1681	1583		1766	
Flt Permitted	0.11	1.00	1.00	0.08	1.00	1.00	0.95	0.95	1.00		0.98	
Satd. Flow (perm)	207	3539	1583	151	3539	1583	1681	1681	1583		1766	
Peak-hour factor, PHF	0.60	0.87	0.83	0.75	0.96	0.42	0.88	0.92	0.79	0.50	0.62	0.56
Adj. Flow (vph)	23	1321	647	292	1473	14	818	0	281	22	27	18
RTOR Reduction (vph)	0	0	174	0	0	7	0	0	186	0	11	0
Lane Group Flow (vph)	23	1321	473	292	1473	7	409	409	95	0	56	0
Turn Type	Perm	NA	pm+ov	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases		2	3	1	6		3	3		4	4	
Permitted Phases	2		2	6		6			3			
Actuated Green, G (s)	42.9	42.9	70.9	62.9	62.9	62.9	28.0	28.0	28.0		8.1	
Effective Green, g (s)	42.9	42.9	70.9	62.9	62.9	62.9	28.0	28.0	28.0		8.1	
Actuated g/C Ratio	0.36	0.36	0.59	0.52	0.52	0.52	0.23	0.23	0.23		0.07	
Clearance Time (s)	7.0	7.0	7.0	6.4	7.0	7.0	7.0	7.0	7.0		7.0	
Vehicle Extension (s)	5.0	5.0	3.0	3.0	5.0	5.0	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	74	1265	1027	262	1855	829	392	392	369		119	
v/s Ratio Prot		0.37	0.11	c0.13	0.42		c0.24	0.24			c0.03	
v/s Ratio Perm	0.11		0.19	c0.46		0.00			0.06			
v/c Ratio	0.31	1.04	0.46	1.11	0.79	0.01	1.04	1.04	0.26		0.47	
Uniform Delay, d1	27.9	38.5	13.8	37.6	23.3	13.6	46.0	46.0	37.5		53.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	10.6	37.7	0.3	89.9	3.6	0.0	57.2	57.2	0.4		2.9	
Delay (s)	38.5	76.2	14.1	127.4	26.9	13.7	103.2	103.2	37.9		56.8	
Level of Service	D	E	B	F	C	B	F	F	D		E	
Approach Delay (s)		55.6			43.3			86.5			56.8	
Approach LOS		E			D			F			E	
Intersection Summary												
HCM 2000 Control Delay			58.1				HCM 2000 Level of Service		E			
HCM 2000 Volume to Capacity ratio			1.07									
Actuated Cycle Length (s)			120.0				Sum of lost time (s)		27.4			
Intersection Capacity Utilization			93.2%				ICU Level of Service		F			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection				
Intersection Delay, s/veh	8.9			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	43	266	482	403
Demand Flow Rate, veh/h	43	271	491	411
Vehicles Circulating, veh/h	603	282	83	221
Vehicles Exiting, veh/h	29	292	563	332
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	6.7	7.9	9.0	9.6
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	43	271	491	411
Cap Entry Lane, veh/h	618	852	1040	906
Entry HV Adj Factor	0.992	0.981	0.981	0.981
Flow Entry, veh/h	43	266	482	403
Cap Entry, veh/h	613	836	1021	889
V/C Ratio	0.070	0.318	0.472	0.454
Control Delay, s/veh	6.7	7.9	9.0	9.6
LOS	A	A	A	A
95th %tile Queue, veh	0	1	3	2

Intersection						
Int Delay, s/veh	3.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	16	119	149	252	277	104
Future Vol, veh/h	16	119	149	252	277	104
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	-	-	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	70	76	73	76	76	66
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	157	204	332	364	158
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1104	364	364	0	-	0
Stage 1	364	-	-	-	-	-
Stage 2	740	-	-	-	-	-
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	234	681	1195	-	-	-
Stage 1	703	-	-	-	-	-
Stage 2	472	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	185	681	1195	-	-	-
Mov Cap-2 Maneuver	185	-	-	-	-	-
Stage 1	703	-	-	-	-	-
Stage 2	373	-	-	-	-	-
Approach	EB		NB		SB	
HCM Control Delay, s	15.9		3.3		0	
HCM LOS	C					
Minor Lane/Major Mvmt	NBL		NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1195		-	508	-	-
HCM Lane V/C Ratio	0.171		-	0.353	-	-
HCM Control Delay (s)	8.6		0	15.9	-	-
HCM Lane LOS	A		A	C	-	-
HCM 95th %tile Q(veh)	0.6		-	1.6	-	-

Intersection						
Int Delay, s/veh	5.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	197	304	11	295	236
Future Vol, veh/h	2	197	304	11	295	236
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	0	250	-	400	225	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	50	71	74	50	77	66
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	277	411	22	383	358
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1535	411	0	0	411	0
Stage 1	411	-	-	-	-	-
Stage 2	1124	-	-	-	-	-
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	128	641	-	-	1148	-
Stage 1	669	-	-	-	-	-
Stage 2	310	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	85	641	-	-	1148	-
Mov Cap-2 Maneuver	85	-	-	-	-	-
Stage 1	669	-	-	-	-	-
Stage 2	207	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	15.3	0	5			
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT		
Capacity (veh/h)	-	- 85 641 1148	-	-		
HCM Lane V/C Ratio	-	- 0.047 0.433 0.334	-	-		
HCM Control Delay (s)	-	- 49.4 14.8 9.7	-	-		
HCM Lane LOS	-	- E B A	-	-		
HCM 95th %tile Q(veh)	-	- 0.1 2.2 1.5	-	-		

Intersection						
Int Delay, s/veh	6.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	315	255	222	234	38
Future Vol, veh/h	7	315	255	222	234	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	115	0	185	-	-	250
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	81	86	83	71	77
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	389	297	267	330	49
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1190	330	330	0	-	0
Stage 1	330	-	-	-	-	-
Stage 2	860	-	-	-	-	-
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	207	712	1229	-	-	-
Stage 1	728	-	-	-	-	-
Stage 2	414	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	157	712	1229	-	-	-
Mov Cap-2 Maneuver	157	-	-	-	-	-
Stage 1	728	-	-	-	-	-
Stage 2	314	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	16.3	4.7		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1229	-	157	712	-	-
HCM Lane V/C Ratio	0.241	-	0.059	0.546	-	-
HCM Control Delay (s)	8.9	-	29.4	16	-	-
HCM Lane LOS	A	-	D	C	-	-
HCM 95th %tile Q(veh)	0.9	-	0.2	3.3	-	-

Timings

1: Private Drwy/Tyrone Rd & SR 54

Future No-Build PM - Improved

04/17/2018



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	29	993	1316	523	1	3	316	0	41
Future Volume (vph)	29	993	1316	523	1	3	316	0	41
Turn Type	Perm	NA	NA	Perm	Perm	NA	Perm	NA	Perm
Protected Phases		2	6			8		4	
Permitted Phases	2			6	8		4		4
Detector Phase	2	2	6	6	8	8	4	4	4
Switch Phase									
Minimum Initial (s)	15.0	15.0	15.0	15.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	26.0	26.0	25.0	25.0	48.0	48.0	44.0	44.0	44.0
Total Split (s)	80.0	80.0	80.0	80.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	57.1%	57.1%	57.1%	57.1%	42.9%	42.9%	42.9%	42.9%	42.9%
Yellow Time (s)	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0		7.0		7.0	7.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	Min	Min	Min	Min	None	None	None	None	None

Intersection Summary

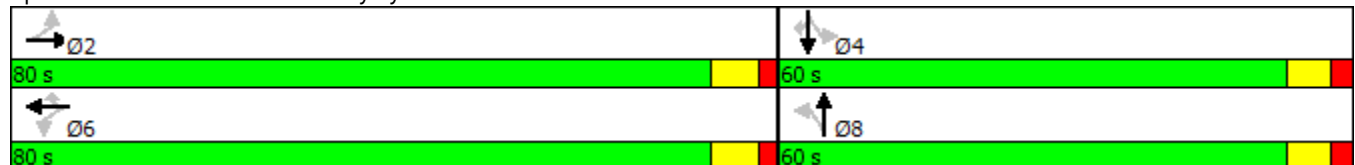
Cycle Length: 140

Actuated Cycle Length: 124.6

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Splits and Phases: 1: Private Drwy/Tyrone Rd & SR 54



HCM 2010 Signalized Intersection Summary
1: Private Drwy/Tyrone Rd & SR 54

Future No-Build PM - Improved
04/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	993	0	0	1316	523	1	3	0	316	0	41
Future Volume (veh/h)	29	993	0	0	1316	523	1	3	0	316	0	41
Number	5	2	12	1	6	16	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	36	1103	0	0	1400	638	4	8	0	363	0	0
Adj No. of Lanes	1	2	0	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.81	0.90	0.25	0.92	0.94	0.82	0.25	0.38	0.92	0.87	0.92	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	132	2145	0	60	2145	960	188	358	0	451	0	440
Arrive On Green	0.61	0.61	0.00	0.00	0.61	0.61	0.28	0.28	0.00	0.28	0.00	0.00
Sat Flow, veh/h	207	3632	0	509	3539	1583	533	1288	0	1408	0	1583
Grp Volume(v), veh/h	36	1103	0	0	1400	638	12	0	0	363	0	0
Grp Sat Flow(s),veh/h/ln	207	1770	0	509	1770	1583	1821	0	0	1408	0	1583
Q Serve(g_s), s	16.6	21.5	0.0	0.0	31.0	32.0	0.0	0.0	0.0	29.6	0.0	0.0
Cycle Q Clear(g_c), s	47.6	21.5	0.0	0.0	31.0	32.0	0.6	0.0	0.0	30.2	0.0	0.0
Prop In Lane	1.00		0.00	1.00		1.00	0.33		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	132	2145	0	60	2145	960	546	0	0	451	0	440
V/C Ratio(X)	0.27	0.51	0.00	0.00	0.65	0.66	0.02	0.00	0.00	0.81	0.00	0.00
Avail Cap(c_a), veh/h	132	2146	0	60	2146	960	819	0	0	678	0	697
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	0.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	31.0	13.6	0.0	0.0	15.5	15.7	31.6	0.0	0.0	42.2	0.0	0.0
Incr Delay (d2), s/veh	2.4	0.4	0.0	0.0	1.0	2.3	0.0	0.0	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	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.8	15.9	0.0	0.0	21.7	20.7	0.5	0.0	0.0	18.0	0.0	0.0
LnGrp Delay(d),s/veh	33.3	14.0	0.0	0.0	16.4	18.0	31.6	0.0	0.0	46.5	0.0	0.0
LnGrp LOS	C	B			B	B	C			D		
Approach Vol, veh/h	1139				2038			12			363	
Approach Delay, s/veh	14.6				16.9			31.6			46.5	
Approach LOS	B				B			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		80.0		40.4		80.0		40.4				
Change Period (Y+Rc), s		7.0		7.0		7.0		7.0				
Max Green Setting (Gmax), s		73.0		53.0		73.0		53.0				
Max Q Clear Time (g_c+I1), s		49.6		32.2		34.0		2.6				
Green Ext Time (p_c), s		23.4		1.2		38.9		1.4				
Intersection Summary												
HCM 2010 Ctrl Delay			19.3									
HCM 2010 LOS			B									

Timings

2: Old Norton Rd/S Sandy Creek Rd & SR 54

Future No-Build PM - Improved

04/17/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	29	1700	16	74	1491	127	26	8	224	11	30
Future Volume (vph)	29	1700	16	74	1491	127	26	8	224	11	30
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	NA	Perm
Protected Phases	5	2		1	6			8		4	
Permitted Phases	2		2	6		6	8		4		4
Detector Phase	5	2	2	1	6	6	8	8	4	4	4
Switch Phase											
Minimum Initial (s)	6.0	12.0	12.0	6.0	12.0	12.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	12.0	26.0	26.0	13.5	25.0	25.0	46.3	46.3	46.3	46.3	46.3
Total Split (s)	40.0	80.0	80.0	40.0	80.0	80.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	22.2%	44.4%	44.4%	22.2%	44.4%	44.4%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.3	2.3	2.3	2.3
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)	6.0	7.0	7.0	6.0	7.0	7.0		7.3		7.3	7.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag					
Lead-Lag Optimize?											
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None

Intersection Summary

Cycle Length: 180

Actuated Cycle Length: 134.6

Natural Cycle: 130

Control Type: Actuated-Uncoordinated

Splits and Phases: 2: Old Norton Rd/S Sandy Creek Rd & SR 54

 Ø1	 Ø2	 Ø4
40 s	80 s	60 s
 Ø5	 Ø6	 Ø8
40 s	80 s	60 s

HCM 2010 Signalized Intersection Summary

2: Old Norton Rd/S Sandy Creek Rd & SR 54

Future No-Build PM - Improved

04/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	1700	16	74	1491	127	26	8	18	224	11	30
Future Volume (veh/h)	29	1700	16	74	1491	127	26	8	18	224	11	30
Number	5	2	12	1	6	16	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	36	1809	32	85	1638	144	36	9	22	246	18	0
Adj No. of Lanes	1	2	1	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.81	0.94	0.50	0.87	0.91	0.88	0.72	0.88	0.80	0.91	0.62	0.68
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	187	2080	931	180	2121	949	221	61	116	330	20	318
Arrive On Green	0.03	0.59	0.59	0.05	0.60	0.60	0.20	0.20	0.20	0.20	0.20	0.00
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	876	301	576	1358	99	1583
Grp Volume(v), veh/h	36	1809	32	85	1638	144	67	0	0	264	0	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1753	0	0	1457	0	1583
Q Serve(g_s), s	1.0	53.0	1.0	2.3	42.5	4.9	0.0	0.0	0.0	17.7	0.0	0.0
Cycle Q Clear(g_c), s	1.0	53.0	1.0	2.3	42.5	4.9	3.8	0.0	0.0	21.6	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.54		0.33	0.93		1.00
Lane Grp Cap(c), veh/h	187	2080	931	180	2121	949	397	0	0	349	0	318
V/C Ratio(X)	0.19	0.87	0.03	0.47	0.77	0.15	0.17	0.00	0.00	0.76	0.00	0.00
Avail Cap(c_a), veh/h	616	2101	940	588	2121	949	739	0	0	667	0	678
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	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	16.9	21.4	10.7	25.4	18.4	10.9	40.8	0.0	0.0	47.5	0.0	0.0
Incr Delay (d2), s/veh	0.5	4.6	0.0	1.9	2.1	0.2	0.2	0.0	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	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.9	35.5	0.8	3.2	28.6	4.0	3.5	0.0	0.0	14.0	0.0	0.0
LnGrp Delay(d),s/veh	17.4	25.9	10.7	27.4	20.5	11.0	41.0	0.0	0.0	50.8	0.0	0.0
LnGrp LOS	B	C	B	C	C	B	D			D		
Approach Vol, veh/h		1877			1867			67			264	
Approach Delay, s/veh		25.5			20.1			41.0			50.8	
Approach LOS		C			C			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.7	79.3		32.0	10.2	80.7		32.0				
Change Period (Y+Rc), s	6.0	7.0		* 7.3	6.0	7.0		* 7.3				
Max Green Setting (Gmax), s	34.0	73.0		* 53	34.0	73.0		* 53				
Max Q Clear Time (g_c+I1), s	4.3	55.0		23.6	3.0	44.5		5.8				
Green Ext Time (p_c), s	0.2	17.3		1.1	0.1	28.5		1.2				
Intersection Summary												
HCM 2010 Ctrl Delay				24.9								
HCM 2010 LOS				C								
Notes												

Timings

3: Lester Rd/Veterans Pkwy & SR 54

Future No-Build PM - Improved

04/17/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	117	1282	132	219	1451	50	137	96	147	25	136	126
Future Volume (vph)	117	1282	132	219	1451	50	137	96	147	25	136	126
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6			2	8		8	4		4
Detector Phase	1	6	6	5	2	2	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	6.0	8.0	8.0	6.0	8.0	8.0
Minimum Split (s)	13.3	42.3	42.3	13.3	42.3	42.3	11.9	48.1	48.1	11.9	49.1	49.1
Total Split (s)	20.0	60.0	60.0	30.0	70.0	70.0	15.0	45.0	45.0	15.0	45.0	45.0
Total Split (%)	13.3%	40.0%	40.0%	20.0%	46.7%	46.7%	10.0%	30.0%	30.0%	10.0%	30.0%	30.0%
Yellow Time (s)	5.3	5.3	5.3	5.3	5.3	5.3	3.9	5.1	5.1	3.9	5.1	5.1
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)	7.3	7.3	7.3	7.3	7.3	7.3	5.9	7.1	7.1	5.9	7.1	7.1
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 120.8

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Lester Rd/Veterans Pkwy & SR 54

			
Ø1	Ø2	Ø4	Ø3
20 s	70 s	45 s	15 s
			
Ø5	Ø6	Ø8	Ø7
30 s	60 s	45 s	15 s

HCM 2010 Signalized Intersection Summary

3: Lester Rd/Veterans Pkwy & SR 54

Future No-Build PM - Improved
04/17/2018

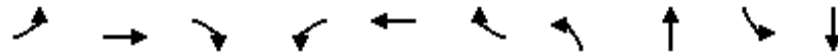
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	1282	132	219	1451	50	137	96	147	25	136	126
Future Volume (veh/h)	117	1282	132	219	1451	50	137	96	147	25	136	126
Number	1	6	16	5	2	12	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	162	1526	0	270	1612	0	171	113	0	36	162	0
Adj No. of Lanes	1	2	1	2	2	1	1	2	1	1	2	1
Peak Hour Factor	0.72	0.84	0.86	0.81	0.90	0.85	0.80	0.85	0.63	0.69	0.84	0.78
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	233	1816	812	351	1955	875	203	261	117	222	261	117
Arrive On Green	0.06	0.51	0.00	0.10	0.55	0.00	0.06	0.07	0.00	0.06	0.07	0.00
Sat Flow, veh/h	1774	3539	1583	3442	3539	1583	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	162	1526	0	270	1612	0	171	113	0	36	162	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1721	1770	1583	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	4.6	40.0	0.0	8.3	40.6	0.0	4.0	3.3	0.0	0.0	4.8	0.0
Cycle Q Clear(g_c), s	4.6	40.0	0.0	8.3	40.6	0.0	4.0	3.3	0.0	0.0	4.8	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	233	1816	812	351	1955	875	203	261	117	222	261	117
V/C Ratio(X)	0.69	0.84	0.00	0.77	0.82	0.00	0.84	0.43	0.00	0.16	0.62	0.00
Avail Cap(c_a), veh/h	330	1816	812	720	2046	915	251	1237	553	270	1237	553
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	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	21.7	22.6	0.0	47.5	19.9	0.0	48.6	48.1	0.0	45.2	48.8	0.0
Incr Delay (d2), s/veh	3.7	4.1	0.0	3.6	3.2	0.0	18.9	1.1	0.0	0.3	2.4	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(95%),veh/ln	4.9	28.0	0.0	7.4	28.0	0.0	10.1	3.0	0.0	1.8	4.4	0.0
LnGrp Delay(d),s/veh	25.4	26.7	0.0	51.0	23.2	0.0	67.5	49.2	0.0	45.5	51.2	0.0
LnGrp LOS	C	C		D	C		E	D		D	D	
Approach Vol, veh/h		1688			1882			284			198	
Approach Delay, s/veh		26.6			27.2			60.2			50.1	
Approach LOS		C			C			E			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.1	67.2	12.1	15.1	18.4	62.9	12.1	15.1				
Change Period (Y+Rc), s	7.3	7.3	5.9	7.1	7.3	7.3	5.9	7.1				
Max Green Setting (Gmax), s	12.7	62.7	9.1	37.9	22.7	52.7	9.1	37.9				
Max Q Clear Time (g_c+I1), s	6.6	42.6	6.0	6.8	10.3	42.0	2.0	5.3				
Green Ext Time (p_c), s	0.2	17.3	0.2	0.6	0.8	10.7	0.4	0.4				
Intersection Summary												
HCM 2010 Ctrl Delay			30.4									
HCM 2010 LOS			C									
Notes												

Timings

4: Togwatee Village Pkwy/Piedmont Fayette & SR 54

Future No-Build PM - Improved

04/17/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	120	1553	82	123	1415	111	64	7	122	8
Future Volume (vph)	120	1553	82	123	1415	111	64	7	122	8
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	NA
Protected Phases	1	6		5	2			4		8
Permitted Phases	6		6	2		2	4		8	
Detector Phase	1	6	6	5	2	2	4	4	8	8
Switch Phase										
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.7	33.0	33.0	11.7	32.0	32.0	50.0	50.0	48.0	48.0
Total Split (s)	40.0	80.0	80.0	40.0	80.0	80.0	60.0	60.0	60.0	60.0
Total Split (%)	22.2%	44.4%	44.4%	22.2%	44.4%	44.4%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.7	5.0	5.0	3.7	5.0	5.0	5.0	5.0	5.0	5.0
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)	5.7	7.0	7.0	5.7	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?										
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None

Intersection Summary

Cycle Length: 180

Actuated Cycle Length: 125.2

Natural Cycle: 145

Control Type: Actuated-Uncoordinated

Splits and Phases: 4: Togwatee Village Pkwy/Piedmont Fayette & SR 54

Ø1	Ø2	Ø4
40 s	80 s	60 s
Ø5	Ø6	Ø8
40 s	80 s	60 s

HCM 2010 Signalized Intersection Summary
4: Togwatee Village Pkwy/Piedmont Fayette & SR 54

Future No-Build PM - Improved
04/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	1553	82	123	1415	111	64	7	72	122	8	45
Future Volume (veh/h)	120	1553	82	123	1415	111	64	7	72	122	8	45
Number	1	6	16	5	2	12	7	4	14	3	8	18
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	130	1765	0	176	1505	0	81	9	0	131	9	0
Adj No. of Lanes	1	2	1	1	2	1	1	1	0	1	1	0
Peak Hour Factor	0.92	0.88	0.63	0.70	0.94	0.88	0.79	0.75	0.80	0.93	0.88	0.77
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	294	2296	1027	242	2305	1031	227	225	0	227	225	0
Arrive On Green	0.05	0.65	0.00	0.05	0.65	0.00	0.12	0.12	0.00	0.12	0.12	0.00
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	1400	1863	0	1400	1863	0
Grp Volume(v), veh/h	130	1765	0	176	1505	0	81	9	0	131	9	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1400	1863	0	1400	1863	0
Q Serve(g_s), s	2.7	39.2	0.0	3.7	29.0	0.0	6.1	0.5	0.0	10.2	0.5	0.0
Cycle Q Clear(g_c), s	2.7	39.2	0.0	3.7	29.0	0.0	6.6	0.5	0.0	10.7	0.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	294	2296	1027	242	2305	1031	227	225	0	227	225	0
V/C Ratio(X)	0.44	0.77	0.00	0.73	0.65	0.00	0.36	0.04	0.00	0.58	0.04	0.00
Avail Cap(c_a), veh/h	742	2301	1029	687	2305	1031	719	879	0	719	879	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	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	11.3	13.8	0.0	21.4	11.9	0.0	46.5	43.6	0.0	48.3	43.6	0.0
Incr Delay (d2), s/veh	1.0	1.9	0.0	4.1	0.9	0.0	0.9	0.1	0.0	2.3	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(95%),veh/ln	3.1	26.7	0.0	6.8	20.5	0.0	4.4	0.5	0.0	7.4	0.5	0.0
LnGrp Delay(d),s/veh	12.3	15.7	0.0	25.5	12.8	0.0	47.5	43.7	0.0	50.6	43.7	0.0
LnGrp LOS	B	B		C	B		D	D		D	D	
Approach Vol, veh/h		1895			1681			90			140	
Approach Delay, s/veh		15.5			14.1			47.1			50.2	
Approach LOS		B			B			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.6	80.1		20.6	11.9	79.8		20.6				
Change Period (Y+Rc), s	* 5.7	7.0		7.0	* 5.7	7.0		7.0				
Max Green Setting (Gmax), s	* 34	73.0		53.0	* 34	73.0		53.0				
Max Q Clear Time (g_c+I1), s	4.7	31.0		8.6	5.7	41.2		12.7				
Green Ext Time (p_c), s	0.4	41.9		0.9	0.5	31.6		0.9				
Intersection Summary												
HCM 2010 Ctrl Delay				16.9								
HCM 2010 LOS				B								
Notes												

Timings
5: Ebenezer Rd/Brittany Way & SR 54

Future No-Build PM - Improved

04/17/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	15	1693	79	316	1299	29	29	3	185	7	0
Future Volume (vph)	15	1693	79	316	1299	29	29	3	185	7	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	pm+ov	Perm	NA
Protected Phases		6		5	2			8	5		4
Permitted Phases	6		6	2		2	8		8	4	
Detector Phase	6	6	6	5	2	2	8	8	5	4	4
Switch Phase											
Minimum Initial (s)	15.0	15.0	15.0	8.0	15.0	15.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	26.0	26.0	26.0	14.5	26.0	26.0	48.0	48.0	14.5	43.0	43.0
Total Split (s)	80.0	80.0	80.0	25.0	105.0	105.0	45.0	45.0	25.0	45.0	45.0
Total Split (%)	53.3%	53.3%	53.3%	16.7%	70.0%	70.0%	30.0%	30.0%	16.7%	30.0%	30.0%
Yellow Time (s)	5.0	5.0	5.0	4.5	5.0	5.0	5.0	5.0	4.5	5.0	5.0
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
Total Lost Time (s)	7.0	7.0	7.0	6.5	7.0	7.0		7.0	6.5	7.0	7.0
Lead/Lag	Lag	Lag	Lag	Lead					Lead		
Lead-Lag Optimize?											
Recall Mode	Min	Min	Min	None	Min	Min	None	None	None	None	None

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 118.8

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Splits and Phases: 5: Ebenezer Rd/Brittany Way & SR 54

					
Ø2			Ø4		
105 s			45 s		
					
Ø5	Ø6		Ø8		
25 s	80 s		45 s		

HCM 2010 Signalized Intersection Summary
5: Ebenezer Rd/Brittany Way & SR 54

Future No-Build PM - Improved
04/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	1693	79	316	1299	29	29	3	185	7	0	24
Future Volume (veh/h)	15	1693	79	316	1299	29	29	3	185	7	0	24
Number	1	6	16	5	2	12	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	19	1969	0	376	1427	36	40	4	268	9	0	41
Adj No. of Lanes	1	2	1	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.81	0.86	0.70	0.84	0.91	0.81	0.72	0.75	0.69	0.75	0.25	0.58
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	250	1924	861	298	2582	1155	234	21	481	184	0	263
Arrive On Green	0.54	0.54	0.00	0.14	0.73	0.73	0.17	0.17	0.17	0.17	0.00	0.17
Sat Flow, veh/h	361	3539	1583	1774	3539	1583	1099	127	1583	1103	0	1583
Grp Volume(v), veh/h	19	1969	0	376	1427	36	44	0	268	9	0	41
Grp Sat Flow(s),veh/h/ln	361	1770	1583	1774	1770	1583	1225	0	1583	1103	0	1583
Q Serve(g_s), s	3.4	73.0	0.0	18.5	24.5	0.8	3.5	0.0	19.1	1.0	0.0	3.0
Cycle Q Clear(g_c), s	3.4	73.0	0.0	18.5	24.5	0.8	6.4	0.0	19.1	7.4	0.0	3.0
Prop In Lane	1.00		1.00	1.00		1.00	0.91		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	250	1924	861	298	2582	1155	255	0	481	184	0	263
V/C Ratio(X)	0.08	1.02	0.00	1.26	0.55	0.03	0.17	0.00	0.56	0.05	0.00	0.16
Avail Cap(c_a), veh/h	250	1924	861	298	2582	1155	418	0	666	313	0	448
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	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.8	30.7	0.0	48.9	8.2	5.0	50.4	0.0	39.2	52.7	0.0	47.9
Incr Delay (d2), s/veh	0.3	26.7	0.0	142.0	0.4	0.0	0.3	0.0	1.0	0.1	0.0	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(95%),veh/ln	0.6	76.8	0.0	41.0	17.7	0.7	2.6	0.0	13.2	0.5	0.0	2.4
LnGrp Delay(d),s/veh	15.0	57.4	0.0	190.9	8.7	5.0	50.7	0.0	40.2	52.8	0.0	48.2
LnGrp LOS	B	F		F	A	A	D		D	D		D
Approach Vol, veh/h		1988			1839			312			50	
Approach Delay, s/veh		57.0			45.9			41.7			49.0	
Approach LOS		E			D			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		105.0		29.3	25.0	80.0		29.3				
Change Period (Y+Rc), s		7.0		7.0	6.5	7.0		7.0				
Max Green Setting (Gmax), s		98.0		38.0	18.5	73.0		38.0				
Max Q Clear Time (g_c+I1), s		26.5		9.4	20.5	75.0		21.1				
Green Ext Time (p_c), s		71.2		1.4	0.0	0.0		1.3				
Intersection Summary												
HCM 2010 Ctrl Delay				50.9								
HCM 2010 LOS				D								
Notes												

Timings
6: Burch Rd/Ginger Cake Rd & SR 54

Future No-Build PM - Improved

04/17/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	194	1654	20	26	1602	114	23	28	29	170	23	223
Future Volume (vph)	194	1654	20	26	1602	114	23	28	29	170	23	223
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases	6		6	2		2	8		8	4		4
Detector Phase	1	6	6	5	2	2	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	8.0	12.0	12.0	8.0	12.0	12.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	13.5	31.6	31.6	13.5	26.6	26.6	40.3	40.3	40.3	38.3	38.3	38.3
Total Split (s)	25.0	80.0	80.0	25.0	80.0	80.0	40.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	17.2%	55.2%	55.2%	17.2%	55.2%	55.2%	27.6%	27.6%	27.6%	27.6%	27.6%	27.6%
Yellow Time (s)	3.5	4.6	4.6	3.5	4.6	4.6	4.3	4.3	4.3	4.3	4.3	4.3
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	6.6	6.6	5.5	6.6	6.6	6.3	6.3	6.3	6.3	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None

Intersection Summary

Cycle Length: 145

Actuated Cycle Length: 130.1

Natural Cycle: 120

Control Type: Actuated-Uncoordinated

Splits and Phases: 6: Burch Rd/Ginger Cake Rd & SR 54

		
Ø1	Ø2	Ø4
25 s	80 s	40 s
		
Ø5	Ø6	Ø8
25 s	80 s	40 s

HCM 2010 Signalized Intersection Summary

6: Burch Rd/Ginger Cake Rd & SR 54

Future No-Build PM - Improved

04/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	194	1654	20	26	1602	114	23	28	29	170	23	223
Future Volume (veh/h)	194	1654	20	26	1602	114	23	28	29	170	23	223
Number	1	6	16	5	2	12	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	206	1760	27	32	1635	127	28	36	36	185	28	0
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.94	0.94	0.75	0.82	0.98	0.90	0.83	0.78	0.81	0.92	0.83	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	249	2212	990	205	2131	953	287	330	281	273	330	281
Arrive On Green	0.07	0.63	0.63	0.04	0.60	0.60	0.18	0.18	0.18	0.18	0.18	0.00
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	1377	1863	1583	1323	1863	1583
Grp Volume(v), veh/h	206	1760	27	32	1635	127	28	36	36	185	28	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1377	1863	1583	1323	1863	1583
Q Serve(g_s), s	5.2	44.3	0.8	0.8	40.9	4.1	2.1	1.9	2.3	16.3	1.5	0.0
Cycle Q Clear(g_c), s	5.2	44.3	0.8	0.8	40.9	4.1	3.6	1.9	2.3	18.2	1.5	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	249	2212	990	205	2131	953	287	330	281	273	330	281
V/C Ratio(X)	0.83	0.80	0.03	0.16	0.77	0.13	0.10	0.11	0.13	0.68	0.08	0.00
Avail Cap(c_a), veh/h	420	2212	990	417	2173	972	431	525	446	412	525	446
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	23.8	16.7	8.5	15.9	17.6	10.3	42.6	41.3	41.4	48.9	41.1	0.0
Incr Delay (d2), s/veh	6.8	2.4	0.0	0.4	2.0	0.1	0.1	0.1	0.2	2.9	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(95%),veh/ln	8.1	30.0	0.6	0.8	27.7	3.3	1.4	1.8	1.8	10.3	1.4	0.0
LnGrp Delay(d),s/veh	30.6	19.1	8.6	16.2	19.6	10.4	42.7	41.4	41.6	51.8	41.2	0.0
LnGrp LOS	C	B	A	B	B	B	D	D	D	D	D	
Approach Vol, veh/h		1993			1794			100			213	
Approach Delay, s/veh		20.2			18.9			41.8			50.4	
Approach LOS		C			B			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.5	78.6		27.5	10.7	81.3		27.5				
Change Period (Y+Rc), s	5.5	6.6		6.3	5.5	6.6		6.3				
Max Green Setting (Gmax), s	19.5	73.4		33.7	19.5	73.4		33.7				
Max Q Clear Time (g_c+I1), s	7.2	42.9		20.2	2.8	46.3		5.6				
Green Ext Time (p_c), s	0.5	29.1		0.9	0.0	27.0		1.2				
Intersection Summary												
HCM 2010 Ctrl Delay			21.7									
HCM 2010 LOS			C									
Notes												

Timings

7: Oak St/Brandywine Blvd & SR 54

Future No-Build PM - Improved

04/17/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	27	1918	12	9	1707	71	7	0	146	3	51
Future Volume (vph)	27	1918	12	9	1707	71	7	0	146	3	51
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	NA	Perm
Protected Phases	5	2		1	6			8		4	
Permitted Phases	2		2	6		6	8		4		4
Detector Phase	5	2	2	1	6	6	8	8	4	4	4
Switch Phase											
Minimum Initial (s)	8.0	12.0	12.0	8.0	12.0	12.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.5	24.5	24.5	13.5	24.5	24.5	39.1	39.1	39.1	39.1	39.1
Total Split (s)	30.0	80.0	80.0	30.0	80.0	80.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	20.0%	53.3%	53.3%	20.0%	53.3%	53.3%	26.7%	26.7%	26.7%	26.7%	26.7%
Yellow Time (s)	3.5	4.5	4.5	3.5	4.5	4.5	4.1	4.1	4.1	4.1	4.1
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
Total Lost Time (s)	5.5	6.5	6.5	5.5	6.5	6.5		6.1		6.1	6.1
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag					
Lead-Lag Optimize?											
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 116.1

Natural Cycle: 130

Control Type: Actuated-Uncoordinated

Splits and Phases: 7: Oak St/Brandywine Blvd & SR 54

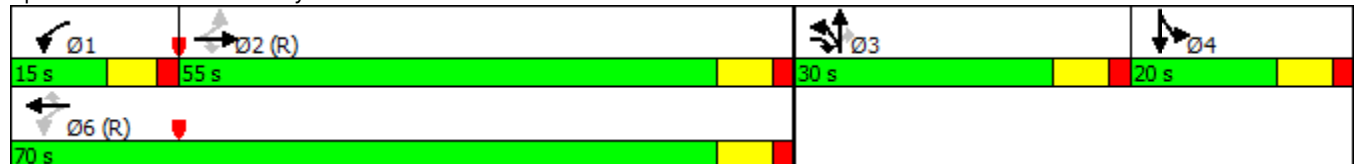
		
Ø1	Ø2	Ø4
30 s	80 s	40 s
		
Ø5	Ø6	Ø8
30 s	80 s	40 s

HCM 2010 Signalized Intersection Summary
7: Oak St/Brandywine Blvd & SR 54

Future No-Build PM - Improved
04/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	1918	12	9	1707	71	7	0	6	146	3	51
Future Volume (veh/h)	27	1918	12	9	1707	71	7	0	6	146	3	51
Number	5	2	12	1	6	16	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	36	1957	22	13	1742	81	9	0	10	172	4	0
Adj No. of Lanes	1	2	1	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.75	0.98	0.55	0.67	0.98	0.88	0.75	0.92	0.62	0.85	0.75	0.80
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	228	2375	1062	165	2288	1024	150	16	132	264	5	226
Arrive On Green	0.05	0.67	0.67	0.02	0.65	0.65	0.14	0.00	0.14	0.14	0.14	0.00
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	717	112	922	1399	33	1583
Grp Volume(v), veh/h	36	1957	22	13	1742	81	19	0	0	176	0	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1751	0	0	1432	0	1583
Q Serve(g_s), s	0.7	45.3	0.5	0.3	38.2	2.1	0.0	0.0	0.0	12.3	0.0	0.0
Cycle Q Clear(g_c), s	0.7	45.3	0.5	0.3	38.2	2.1	1.1	0.0	0.0	13.3	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.47		0.53	0.98		1.00
Lane Grp Cap(c), veh/h	228	2375	1062	165	2288	1024	298	0	0	268	0	226
V/C Ratio(X)	0.16	0.82	0.02	0.08	0.76	0.08	0.06	0.00	0.00	0.66	0.00	0.00
Avail Cap(c_a), veh/h	532	2375	1062	513	2335	1045	539	0	0	496	0	482
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	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	12.9	13.5	6.1	14.8	13.7	7.3	41.4	0.0	0.0	46.5	0.0	0.0
Incr Delay (d2), s/veh	0.3	2.8	0.0	0.2	1.8	0.1	0.1	0.0	0.0	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(95%),veh/ln	0.8	30.5	0.4	0.3	26.1	1.7	0.9	0.0	0.0	9.3	0.0	0.0
LnGrp Delay(d),s/veh	13.2	16.3	6.1	15.0	15.5	7.4	41.5	0.0	0.0	49.2	0.0	0.0
LnGrp LOS	B	B	A	B	B	A	D			D		
Approach Vol, veh/h	2015		1836				19		176			
Approach Delay, s/veh	16.1		15.1				41.5		49.2			
Approach LOS	B		B				D		D			
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.1	81.3		22.0	10.9	78.5		22.0				
Change Period (Y+Rc), s	5.5	6.5		6.1	5.5	6.5		6.1				
Max Green Setting (Gmax), s	24.5	73.5		33.9	24.5	73.5		33.9				
Max Q Clear Time (g_c+I1), s	2.3	47.3		15.3	2.7	40.2		3.1				
Green Ext Time (p_c), s	0.0	26.1		0.6	0.1	31.9		0.7				
Intersection Summary												
HCM 2010 Ctrl Delay	17.2											
HCM 2010 LOS	B											

04/17/2018



HCM Signalized Intersection Capacity Analysis

8: Grady Avenue/Sharon Drive & SR 54

Future No-Build PM - Improved

04/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 						 	
Traffic Volume (vph)	15	1207	846	161	1426	9	505	10	137	9	11	5
Future Volume (vph)	15	1207	846	161	1426	9	505	10	137	9	11	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	6.4	7.0	7.0	7.0	7.0	7.0		7.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.98	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1681	1691	1583		1761	
Flt Permitted	0.14	1.00	1.00	0.10	1.00	1.00	0.95	0.96	1.00		0.98	
Satd. Flow (perm)	261	3539	1583	185	3539	1583	1681	1691	1583		1761	
Peak-hour factor, PHF	0.65	0.98	0.92	0.83	0.99	0.67	0.95	0.56	0.80	0.67	0.83	0.50
Adj. Flow (vph)	23	1232	920	194	1440	13	532	18	171	13	13	10
RTOR Reduction (vph)	0	0	212	0	0	5	0	0	139	0	10	0
Lane Group Flow (vph)	23	1232	708	194	1440	8	277	273	32	0	26	0
Turn Type	Perm	NA	pm+ov	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases		2	3	1	6		3	3		4	4	
Permitted Phases	2		2	6		6			3			
Actuated Green, G (s)	56.3	56.3	78.7	71.3	71.3	71.3	22.4	22.4	22.4		5.3	
Effective Green, g (s)	56.3	56.3	78.7	71.3	71.3	71.3	22.4	22.4	22.4		5.3	
Actuated g/C Ratio	0.47	0.47	0.66	0.59	0.59	0.59	0.19	0.19	0.19		0.04	
Clearance Time (s)	7.0	7.0	7.0	6.4	7.0	7.0	7.0	7.0	7.0		7.0	
Vehicle Extension (s)	5.0	5.0	3.0	3.0	5.0	5.0	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	122	1660	1130	223	2102	940	313	315	295		77	
v/s Ratio Prot		0.35	0.12	0.06	c0.41		c0.16	0.16			c0.02	
v/s Ratio Perm	0.09		0.33	c0.45		0.00			0.02			
v/c Ratio	0.19	0.74	0.63	0.87	0.69	0.01	0.88	0.87	0.11		0.34	
Uniform Delay, d1	18.5	25.9	12.1	21.9	16.7	9.9	47.5	47.4	40.5		55.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	3.4	3.0	1.1	28.3	1.8	0.0	24.3	21.3	0.2		2.7	
Delay (s)	21.9	29.0	13.2	50.2	18.5	9.9	71.9	68.6	40.7		58.3	
Level of Service	C	C	B	D	B	A	E	E	D		E	
Approach Delay (s)		22.2			22.2			63.2			58.3	
Approach LOS		C			C			E			E	
Intersection Summary												
HCM 2000 Control Delay			28.9				HCM 2000 Level of Service		C			
HCM 2000 Volume to Capacity ratio			0.88									
Actuated Cycle Length (s)			120.0				Sum of lost time (s)		27.4			
Intersection Capacity Utilization			87.8%				ICU Level of Service		E			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection				
Intersection Delay, s/veh11.8				
Intersection LOS B				
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	50	346	644	391
Demand Flow Rate, veh/h	50	354	656	398
Vehicles Circulating, veh/h	619	455	84	286
Vehicles Exiting, veh/h	65	285	585	523
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	6.9	12.5	12.5	10.4
Approach LOS	A	B	B	B
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	50	354	656	398
Cap Entry Lane, veh/h	608	717	1039	849
Entry HV Adj Factor	0.995	0.978	0.981	0.981
Flow Entry, veh/h	50	346	644	391
Cap Entry, veh/h	605	701	1019	833
V/C Ratio	0.082	0.494	0.631	0.469
Control Delay, s/veh	6.9	12.5	12.5	10.4
LOS	A	B	B	B
95th %tile Queue, veh	0	3	5	3

Intersection

Int Delay, s/veh 3.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	52	119	29	167	188	24
Future Vol, veh/h	52	119	29	167	188	24
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	-	-	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	88	65	66	58	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	58	135	45	253	324	32

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	666	324	324
Stage 1	324	-	-
Stage 2	342	-	-
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	425	717	1236
Stage 1	733	-	-
Stage 2	719	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	407	717	1236
Mov Cap-2 Maneuver	407	-	-
Stage 1	733	-	-
Stage 2	689	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.2	1.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1236	-	583	-	-
HCM Lane V/C Ratio	0.036	-	0.332	-	-
HCM Control Delay (s)	8	0	14.2	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	1.4	-	-

Intersection

Int Delay, s/veh 4.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	228	230	6	178	343
Future Vol, veh/h	7	228	230	6	178	343
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	0	250	-	400	225	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	50	89	82	42	79	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	256	280	14	225	423

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1154	280	0
Stage 1	280	-	-
Stage 2	874	-	-
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	218	759	-
Stage 1	767	-	-
Stage 2	408	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	180	759	-
Mov Cap-2 Maneuver	180	-	-
Stage 1	767	-	-
Stage 2	336	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.9	0	2.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT
Capacity (veh/h)	-	- 180 759 1283	-	-
HCM Lane V/C Ratio	-	- 0.078 0.338 0.176	-	-
HCM Control Delay (s)	-	- 26.7 12.1 8.4	-	-
HCM Lane LOS	-	- D B A	-	-
HCM 95th %tile Q(veh)	-	- 0.2 1.5 0.6	-	-

Intersection

Int Delay, s/veh 6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	21	252	250	224	221	17
Future Vol, veh/h	21	252	250	224	221	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	115	0	185	-	-	250
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	53	89	91	84	89	47
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	40	283	275	267	248	36

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1064	248	248
Stage 1	248	-	-
Stage 2	816	-	-
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	247	791	1318
Stage 1	793	-	-
Stage 2	435	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	195	791	1318
Mov Cap-2 Maneuver	195	-	-
Stage 1	793	-	-
Stage 2	344	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.1	4.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1318	-	195	791	-	-
HCM Lane V/C Ratio	0.208	-	0.203	0.358	-	-
HCM Control Delay (s)	8.4	-	28.1	12.1	-	-
HCM Lane LOS	A	-	D	B	-	-
HCM 95th %tile Q(veh)	0.8	-	0.7	1.6	-	-

Future “Build” Intersections Analysis

Timings

1: Private Drwy/Tyrone Rd & SR 54

Future Build AM

04/16/2018



Lane Group	EBL	EBT	WBT	WBR	NBT	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	34	1253	1319	368	1	530	0	37
Future Volume (vph)	34	1253	1319	368	1	530	0	37
Lane Group Flow (vph)	50	1478	1482	472	4	0	546	45
Turn Type	Perm	NA	NA	Perm	NA	Perm	NA	Perm
Protected Phases		2	6		8		4	
Permitted Phases	2			6		4		4
Detector Phase	2	2	6	6	8	4	4	4
Switch Phase								
Minimum Initial (s)	15.0	15.0	15.0	15.0	10.0	10.0	10.0	10.0
Minimum Split (s)	26.0	26.0	25.0	25.0	48.0	44.0	44.0	44.0
Total Split (s)	80.0	80.0	80.0	80.0	60.0	60.0	60.0	60.0
Total Split (%)	57.1%	57.1%	57.1%	57.1%	42.9%	42.9%	42.9%	42.9%
Yellow Time (s)	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	Min	Min	Min	Min	None	None	None	None
v/c Ratio	0.75	0.80	0.80	0.50	0.01		1.03	0.07
Control Delay	87.0	31.8	31.8	10.8	27.0		88.5	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	87.0	31.8	31.8	10.8	27.0		88.5	13.1
Queue Length 50th (ft)	34	565	568	113	2		~529	8
Queue Length 95th (ft)	#76	600	655	140	3		#758	30
Internal Link Dist (ft)		559	571		104		335	
Turn Bay Length (ft)	150			175				135
Base Capacity (vph)	67	1845	1845	949	705		532	618
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	0.75	0.80	0.80	0.50	0.01		1.03	0.07

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

~ 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: Private Drwy/Tyrone Rd & SR 54



Baseline

Synchro 9 Report

Page 1

HCM 2010 Signalized Intersection Summary
1: Private Drwy/Tyrone Rd & SR 54

Future Build AM
04/16/2018

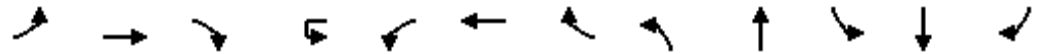
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	1253	1	0	1319	368	0	1	0	530	0	37
Future Volume (veh/h)	34	1253	1	0	1319	368	0	1	0	530	0	37
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	50	1474	4	0	1482	472	0	4	0	546	0	0
Adj No. of Lanes	1	2	0	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.68	0.85	0.25	0.92	0.89	0.78	0.92	0.25	0.92	0.97	0.92	0.82
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	91	1888	5	51	1845	826	0	705	0	582	0	599
Arrive On Green	0.52	0.52	0.52	0.00	0.52	0.52	0.00	0.38	0.00	0.38	0.00	0.00
Sat Flow, veh/h	224	3621	10	356	3539	1583	0	1863	0	1402	0	1583
Grp Volume(v), veh/h	50	720	758	0	1482	472	0	4	0	546	0	0
Grp Sat Flow(s),veh/h/ln	224	1770	1861	356	1770	1583	0	1863	0	1402	0	1583
Q Serve(g_s), s	24.7	46.0	46.0	0.0	48.3	28.5	0.0	0.2	0.0	52.8	0.0	0.0
Cycle Q Clear(g_c), s	73.0	46.0	46.0	0.0	48.3	28.5	0.0	0.2	0.0	53.0	0.0	0.0
Prop In Lane	1.00		0.01	1.00		1.00	0.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	91	923	970	51	1845	826	0	705	0	582	0	599
V/C Ratio(X)	0.55	0.78	0.78	0.00	0.80	0.57	0.00	0.01	0.00	0.94	0.00	0.00
Avail Cap(c_a), veh/h	91	923	970	51	1845	826	0	705	0	582	0	599
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	0.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	60.2	27.0	27.0	0.0	27.6	22.8	0.0	27.1	0.0	44.3	0.0	0.0
Incr Delay (d2), s/veh	11.7	5.0	4.8	0.0	3.0	1.6	0.0	0.0	0.0	23.1	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	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.0	31.7	33.1	0.0	32.3	18.7	0.0	0.2	0.0	33.0	0.0	0.0
LnGrp Delay(d),s/veh	71.9	32.1	31.9	0.0	30.6	24.4	0.0	27.1	0.0	67.4	0.0	0.0
LnGrp LOS	E	C	C		C	C		C		E		
Approach Vol, veh/h		1528			1954			4			546	
Approach Delay, s/veh		33.3			29.1			27.1			67.4	
Approach LOS		C			C			C			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		80.0		60.0		80.0		60.0				
Change Period (Y+Rc), s		7.0		7.0		7.0		7.0				
Max Green Setting (Gmax), s		73.0		53.0		73.0		53.0				
Max Q Clear Time (g_c+I1), s		75.0		55.0		50.3		2.2				
Green Ext Time (p_c), s		0.0		0.0		22.7		2.2				
Intersection Summary												
HCM 2010 Ctrl Delay				35.9								
HCM 2010 LOS				D								

Timings

2: Old Norton Rd/S Sandy Creek Rd & SR 54

Future Build AM

04/16/2018



Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	1681	14	47	72	1771	290	41	25	261	16	88
Future Volume (vph)	61	1681	14	47	72	1771	290	41	25	261	16	88
Lane Group Flow (vph)	105	1751	19	0	129	1826	315	0	150	0	290	128
Turn Type	pm+pt	NA	Perm	pm+pt	pm+pt	NA	Perm	Perm	NA	Perm	NA	Perm
Protected Phases	5	2		1	1	6			8		4	
Permitted Phases	2		2	6	6		6	8		4		4
Detector Phase	5	2	2	1	1	6	6	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	6.0	12.0	12.0	6.0	6.0	12.0	12.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	12.0	26.0	26.0	13.5	13.5	25.0	25.0	46.3	46.3	46.3	46.3	46.3
Total Split (s)	40.0	80.0	80.0	40.0	40.0	80.0	80.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	22.2%	44.4%	44.4%	22.2%	22.2%	44.4%	44.4%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	4.0	5.0	5.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.3	2.3	2.3	2.3
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)	6.0	7.0	7.0		6.0	7.0	7.0		7.3		7.3	7.3
Lead/Lag	Lead	Lag	Lag	Lead	Lead	Lag	Lag					
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	None	None	Min	Min	None	None	None	None	None
v/c Ratio	0.60	1.00	0.02		0.66	1.02	0.38		0.57		0.87	0.24
Control Delay	42.3	59.9	0.1		47.9	63.8	21.1		50.6		75.9	7.0
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0
Total Delay	42.3	59.9	0.1		47.9	63.8	21.1		50.6		75.9	7.0
Queue Length 50th (ft)	49	~952	0		71	~1008	149		114		267	0
Queue Length 95th (ft)	58	#1271	0		153	#1326	264		186		319	15
Internal Link Dist (ft)		459				398			219		387	
Turn Bay Length (ft)	200		185		175		100					235
Base Capacity (vph)	446	1748	813		446	1786	829		323		416	646
Starvation Cap Reductn	0	0	0		0	0	0		0		0	0
Spillback Cap Reductn	0	0	0		0	0	0		0		0	0
Storage Cap Reductn	0	0	0		0	0	0		0		0	0
Reduced v/c Ratio	0.24	1.00	0.02		0.29	1.02	0.38		0.46		0.70	0.20

Intersection Summary

Cycle Length: 180

Actuated Cycle Length: 149

Natural Cycle: 130

Control Type: Actuated-Uncoordinated

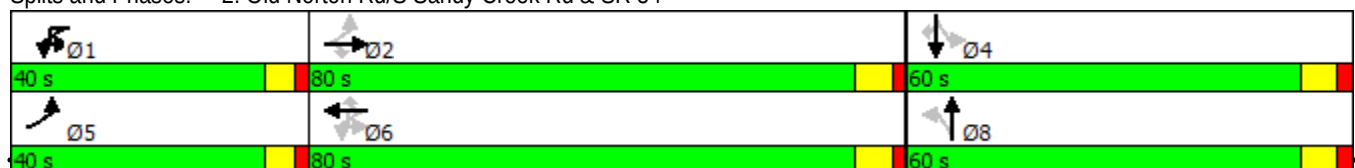
~ Volume exceeds capacity, queue is theoretically infinite.

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: 2: Old Norton Rd/S Sandy Creek Rd & SR 54



Baseline

Synchro 9 Report

Page 4

HCM Signalized Intersection Capacity Analysis

2: Old Norton Rd/S Sandy Creek Rd & SR 54

Future Build AM

04/16/2018

												
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	61	1681	14	47	72	1771	290	41	25	39	261	16
Future Volume (vph)	61	1681	14	47	72	1771	290	41	25	39	261	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	7.0	7.0		6.0	7.0	7.0		7.3			7.3
Lane Util. Factor	1.00	0.95	1.00		1.00	0.95	1.00		1.00			1.00
Frt	1.00	1.00	0.85		1.00	1.00	0.85		0.96			1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00		0.98			0.96
Satd. Flow (prot)	1770	3539	1583		1770	3539	1583		1740			1780
Flt Permitted	0.05	1.00	1.00		0.05	1.00	1.00		0.50			0.63
Satd. Flow (perm)	101	3539	1583		99	3539	1583		884			1168
Peak-hour factor, PHF	0.58	0.96	0.75	0.92	0.92	0.97	0.92	0.56	0.85	0.81	0.97	0.75
Adj. Flow (vph)	105	1751	19	51	78	1826	315	73	29	48	269	21
RTOR Reduction (vph)	0	0	10	0	0	0	31	0	9	0	0	0
Lane Group Flow (vph)	105	1751	9	0	129	1826	284	0	141	0	0	290
Turn Type	pm+pt	NA	Perm	pm+pt	pm+pt	NA	Perm	Perm	NA		Perm	NA
Protected Phases	5	2		1	1	6			8			4
Permitted Phases	2		2	6	6		6	8			4	
Actuated Green, G (s)	84.2	73.6	73.6		87.6	75.3	75.3		42.7			42.7
Effective Green, g (s)	84.2	73.6	73.6		87.6	75.3	75.3		42.7			42.7
Actuated g/C Ratio	0.57	0.49	0.49		0.59	0.51	0.51		0.29			0.29
Clearance Time (s)	6.0	7.0	7.0		6.0	7.0	7.0		7.3			7.3
Vehicle Extension (s)	3.0	5.0	5.0		3.0	5.0	5.0		3.0			3.0
Lane Grp Cap (vph)	175	1749	782		196	1789	800		253			334
v/s Ratio Prot	0.04	0.49			c0.05	c0.52						
v/s Ratio Perm	0.29		0.01		0.33		0.18		0.16			c0.25
v/c Ratio	0.60	1.00	0.01		0.66	1.02	0.36		0.56			0.87
Uniform Delay, d1	33.4	37.7	19.2		39.7	36.8	22.2		45.1			50.4
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00		1.00			1.00
Incremental Delay, d2	5.5	21.8	0.0		7.7	26.6	0.6		2.6			20.5
Delay (s)	38.9	59.4	19.2		47.5	63.4	22.7		47.7			70.9
Level of Service	D	E	B		D	E	C		D			E
Approach Delay (s)		57.9				56.9			47.7			61.1
Approach LOS		E				E			D			E
Intersection Summary												
HCM 2000 Control Delay			57.4			HCM 2000 Level of Service			E			
HCM 2000 Volume to Capacity ratio			0.95									
Actuated Cycle Length (s)			148.9			Sum of lost time (s)			20.3			
Intersection Capacity Utilization			92.8%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
2: Old Norton Rd/S Sandy Creek Rd & SR 54

Future Build AM

04/16/2018

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	88
Future Volume (vph)	88
Ideal Flow (vphpl)	1900
Total Lost time (s)	7.3
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1583
Flt Permitted	1.00
Satd. Flow (perm)	1583
Peak-hour factor, PHF	0.69
Adj. Flow (vph)	128
RTOR Reduction (vph)	91
Lane Group Flow (vph)	37
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	42.7
Effective Green, g (s)	42.7
Actuated g/C Ratio	0.29
Clearance Time (s)	7.3
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	453
v/s Ratio Prot	
v/s Ratio Perm	0.02
v/c Ratio	0.08
Uniform Delay, d1	38.8
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	38.9
Level of Service	D
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Timings

3: Lester Rd/Veterans Pkwy & SR 54

Future Build AM

04/16/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	149	1439	142	376	1300	77	208	197	268	35	137	77
Future Volume (vph)	149	1439	142	376	1300	77	208	197	268	35	137	77
Lane Group Flow (vph)	207	1713	233	522	1781	118	310	334	344	54	269	104
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2		2	8		8	4		4
Detector Phase	1	6	6	5	2	2	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	6.0	8.0	8.0	6.0	8.0	8.0
Minimum Split (s)	13.3	42.3	42.3	13.3	42.3	42.3	11.9	48.1	48.1	11.9	49.1	49.1
Total Split (s)	25.0	80.0	80.0	40.0	80.0	80.0	25.0	60.0	60.0	25.0	60.0	60.0
Total Split (%)	12.2%	39.0%	39.0%	19.5%	39.0%	39.0%	12.2%	29.3%	29.3%	12.2%	29.3%	29.3%
Yellow Time (s)	5.3	5.3	5.3	5.3	5.3	5.3	3.9	5.1	5.1	3.9	5.1	5.1
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)	7.3	7.3	7.3	7.3	7.3	7.3	5.9	7.1	7.1	5.9	7.1	7.1
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None
v/c Ratio	0.54	1.13	0.31	1.35	1.17	0.16	1.02	0.63	0.65	0.27	0.71	0.36
Control Delay	61.5	109.6	18.6	215.5	126.7	9.2	121.7	74.8	12.2	57.3	84.0	7.6
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	61.5	109.6	18.6	215.5	126.7	9.2	121.7	74.8	12.2	57.3	84.0	7.6
Queue Length 50th (ft)	156	~1164	90	~715	~1247	17	~315	193	0	46	155	0
Queue Length 95th (ft)	186	#1202	77	#693	#992	25	295	155	32	62	112	1
Internal Link Dist (ft)		707			648			447			501	
Turn Bay Length (ft)	230		350	235		215	250		250	300		275
Base Capacity (vph)	386	1521	740	386	1521	732	315	1107	731	261	1107	586
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	1.13	0.31	1.35	1.17	0.16	0.98	0.30	0.47	0.21	0.24	0.18

Intersection Summary

Cycle Length: 205

Actuated Cycle Length: 169.2

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

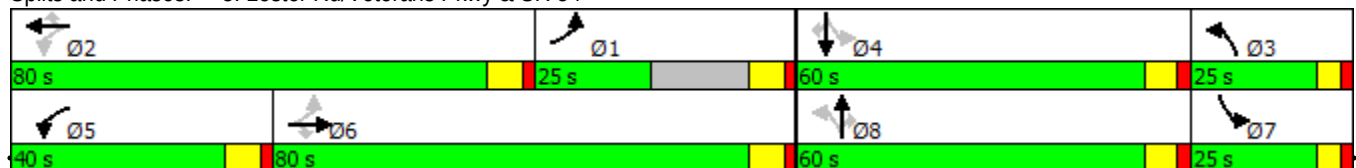
~ Volume exceeds capacity, queue is theoretically infinite.

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: 3: Lester Rd/Veterans Pkwy & SR 54



Baseline

Synchro 9 Report

Page 10

HCM 2010 Signalized Intersection Summary

3: Lester Rd/Veterans Pkwy & SR 54

Future Build AM

04/16/2018

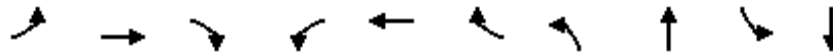
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	149	1439	142	376	1300	77	208	197	268	35	137	77
Future Volume (veh/h)	149	1439	142	376	1300	77	208	197	268	35	137	77
Number	1	6	16	5	2	12	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	207	1713	0	522	1781	0	310	334	0	54	269	0
Adj No. of Lanes	1	2	1	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.72	0.84	0.61	0.72	0.73	0.65	0.67	0.59	0.78	0.65	0.51	0.74
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	389	1535	687	389	1535	687	265	397	178	211	328	147
Arrive On Green	0.20	0.43	0.00	0.20	0.43	0.00	0.11	0.11	0.00	0.09	0.09	0.00
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	207	1713	0	522	1781	0	310	334	0	54	269	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	13.2	72.7	0.0	32.7	72.7	0.0	19.1	15.5	0.0	0.6	12.5	0.0
Cycle Q Clear(g_c), s	13.2	72.7	0.0	32.7	72.7	0.0	19.1	15.5	0.0	0.6	12.5	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	389	1535	687	389	1535	687	265	397	178	211	328	147
V/C Ratio(X)	0.53	1.12	0.00	1.34	1.16	0.00	1.17	0.84	0.00	0.26	0.82	0.00
Avail Cap(c_a), veh/h	389	1535	687	389	1535	687	265	1117	500	245	1117	500
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	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	58.3	47.5	0.0	54.6	47.5	0.0	71.9	73.0	0.0	68.8	74.7	0.0
Incr Delay (d2), s/veh	1.4	61.8	0.0	170.3	79.9	0.0	109.0	4.8	0.0	0.6	5.1	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(95%),veh/ln	13.5	87.4	0.0	65.4	94.3	0.0	36.5	12.5	0.0	4.2	10.5	0.0
LnGrp Delay(d),s/veh	59.7	109.3	0.0	224.9	127.3	0.0	180.9	77.8	0.0	69.4	79.7	0.0
LnGrp LOS	E	F		F	F		F	E		E	E	
Approach Vol, veh/h		1920			2303			644			323	
Approach Delay, s/veh		103.9			149.5			127.4			78.0	
Approach LOS		F			F			F			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	40.0	80.0	25.0	22.6	40.0	80.0	21.7	25.9				
Change Period (Y+Rc), s	7.3	7.3	5.9	7.1	7.3	7.3	5.9	7.1				
Max Green Setting (Gmax), s	17.7	72.7	19.1	52.9	32.7	72.7	19.1	52.9				
Max Q Clear Time (g_c+I1), s	15.2	74.7	21.1	14.5	34.7	74.7	2.6	17.5				
Green Ext Time (p_c), s	2.5	0.0	0.0	1.0	0.0	0.0	1.1	1.3				
Intersection Summary												
HCM 2010 Ctrl Delay			125.4									
HCM 2010 LOS			F									

Timings

4: Togwatee Village Pkwy/Piedmont Fayette & SR 54

Future Build AM

04/16/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	225	1585	53	113	1512	145	21	1	45	6
Future Volume (vph)	225	1585	53	113	1512	145	21	1	45	6
Lane Group Flow (vph)	253	1742	68	145	1758	161	27	45	67	63
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	NA
Protected Phases	1	6		5	2			4		8
Permitted Phases	6		6	2		2	4		8	
Detector Phase	1	6	6	5	2	2	4	4	8	8
Switch Phase										
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.7	33.0	33.0	11.7	32.0	32.0	50.0	50.0	48.0	48.0
Total Split (s)	40.0	80.0	80.0	40.0	80.0	80.0	60.0	60.0	60.0	60.0
Total Split (%)	22.2%	44.4%	44.4%	22.2%	44.4%	44.4%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.7	5.0	5.0	3.7	5.0	5.0	5.0	5.0	5.0	5.0
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)	5.7	7.0	7.0	5.7	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?										
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None
v/c Ratio	0.79	0.76	0.07	0.58	0.84	0.17	0.20	0.23	0.49	0.30
Control Delay	51.5	19.2	3.4	28.6	26.3	8.7	56.2	20.4	66.5	21.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.5	19.2	3.4	28.6	26.3	8.7	56.2	20.4	66.5	21.4
Queue Length 50th (ft)	140	461	2	35	551	33	20	3	51	7
Queue Length 95th (ft)	243	721	17	88	786	83	46	0	77	22
Internal Link Dist (ft)		467			430			239		153
Turn Bay Length (ft)	200		200	300		150			50	
Base Capacity (vph)	542	2283	1042	567	2100	963	574	716	584	731
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	0.47	0.76	0.07	0.26	0.84	0.17	0.05	0.06	0.11	0.09

Intersection Summary

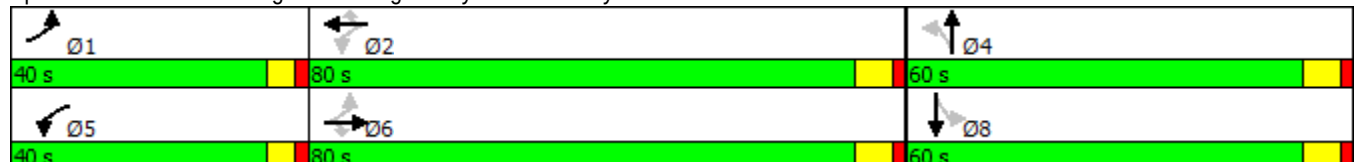
Cycle Length: 180

Actuated Cycle Length: 123.5

Natural Cycle: 145

Control Type: Actuated-Uncoordinated

Splits and Phases: 4: Togwatee Village Pkwy/Piedmont Fayette & SR 54



HCM 2010 Signalized Intersection Summary

4: Togwatee Village Pkwy/Piedmont Fayette & SR 54

Future Build AM
04/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	225	1585	53	113	1512	145	21	1	33	45	6	21
Future Volume (veh/h)	225	1585	53	113	1512	145	21	1	33	45	6	21
Number	1	6	16	5	2	12	7	4	14	3	8	18
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	253	1742	0	145	1758	0	27	4	0	67	10	0
Adj No. of Lanes	1	2	1	1	2	1	1	1	0	1	1	0
Peak Hour Factor	0.89	0.91	0.78	0.78	0.86	0.90	0.79	0.25	0.81	0.67	0.62	0.40
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	292	2401	1074	263	2309	1033	182	164	0	186	164	0
Arrive On Green	0.08	0.68	0.00	0.05	0.65	0.00	0.09	0.09	0.00	0.09	0.09	0.00
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	1399	1863	0	1407	1863	0
Grp Volume(v), veh/h	253	1742	0	145	1758	0	27	4	0	67	10	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1399	1863	0	1407	1863	0
Q Serve(g_s), s	6.0	34.2	0.0	2.9	37.6	0.0	2.0	0.2	0.0	5.0	0.5	0.0
Cycle Q Clear(g_c), s	6.0	34.2	0.0	2.9	37.6	0.0	2.5	0.2	0.0	5.2	0.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	292	2401	1074	263	2309	1033	182	164	0	186	164	0
V/C Ratio(X)	0.87	0.73	0.00	0.55	0.76	0.00	0.15	0.02	0.00	0.36	0.06	0.00
Avail Cap(c_a), veh/h	705	2401	1074	722	2356	1054	735	900	0	743	900	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	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	24.4	11.2	0.0	14.6	13.2	0.0	47.0	45.7	0.0	48.1	45.9	0.0
Incr Delay (d2), s/veh	7.7	1.4	0.0	1.8	1.8	0.0	0.4	0.1	0.0	1.2	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(95%),veh/ln	12.7	23.7	0.0	4.9	25.7	0.0	1.4	0.2	0.0	3.6	0.5	0.0
LnGrp Delay(d),s/veh	32.1	12.5	0.0	16.4	14.9	0.0	47.4	45.8	0.0	49.3	46.0	0.0
LnGrp LOS	C	B		B	B		D	D		D	D	
Approach Vol, veh/h		1995			1903			31			77	
Approach Delay, s/veh		15.0			15.0			47.2			48.9	
Approach LOS		B			B			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.5	78.6		16.6	11.6	81.4		16.6				
Change Period (Y+Rc), s	* 5.7	7.0		7.0	* 5.7	7.0		7.0				
Max Green Setting (Gmax), s	* 34	73.0		53.0	* 34	73.0		53.0				
Max Q Clear Time (g_c+I1), s	8.0	39.6		4.5	4.9	36.2		7.2				
Green Ext Time (p_c), s	0.8	31.9		0.4	0.4	36.8		0.4				
Intersection Summary												
HCM 2010 Ctrl Delay			15.9									
HCM 2010 LOS			B									
Notes												

Timings 5: Ebenezer Rd/Brittany Way & SR 54

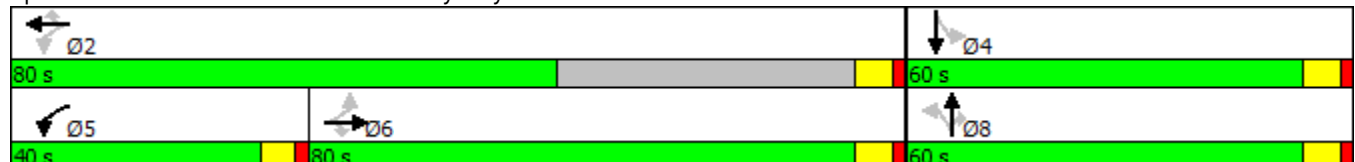
Future Build AM
04/16/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	5	1250	27	176	1079	7	45	1	304	36	1
Future Volume (vph)	5	1250	27	176	1079	7	45	1	304	36	1
Lane Group Flow (vph)	10	1543	36	226	1148	18	0	58	334	40	35
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases		6		5	2			8			4
Permitted Phases	6		6	2		2	8		8	4	
Detector Phase	6	6	6	5	2	2	8	8	8	4	4
Switch Phase											
Minimum Initial (s)	15.0	15.0	15.0	8.0	15.0	15.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	26.0	26.0	26.0	14.5	26.0	26.0	48.0	48.0	48.0	43.0	43.0
Total Split (s)	80.0	80.0	80.0	40.0	80.0	80.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	44.4%	44.4%	44.4%	22.2%	44.4%	44.4%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	5.0	5.0	5.0	4.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0
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
Total Lost Time (s)	7.0	7.0	7.0	6.5	7.0	7.0		7.0	7.0	7.0	7.0
Lead/Lag	Lag	Lag	Lag	Lead							
Lead-Lag Optimize?											
Recall Mode	Min	Min	Min	None	Min	Min	None	None	None	None	None
v/c Ratio	0.04	0.74	0.04	0.62	0.41	0.01		0.48	0.75	0.33	0.20
Control Delay	14.2	22.4	1.0	27.8	4.5	1.0		68.0	16.7	61.4	22.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Delay	14.2	22.4	1.0	27.8	4.5	1.0		68.0	16.7	61.4	22.9
Queue Length 50th (ft)	3	436	0	82	116	0		45	0	30	3
Queue Length 95th (ft)	8	569	0	139	186	0		25	96	70	0
Internal Link Dist (ft)		617			769			306			341
Turn Bay Length (ft)	200		200	200		200					
Base Capacity (vph)	271	2091	961	558	3237	1450		571	870	574	710
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	0.04	0.74	0.04	0.41	0.35	0.01		0.10	0.38	0.07	0.05

Intersection Summary

Cycle Length: 180
 Actuated Cycle Length: 124
 Natural Cycle: 130
 Control Type: Actuated-Uncoordinated

Splits and Phases: 5: Ebenezer Rd/Brittany Way & SR 54



HCM 2010 Signalized Intersection Summary
5: Ebenezer Rd/Brittany Way & SR 54

Future Build AM

04/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	1250	27	176	1079	7	45	1	304	36	1	19
Future Volume (veh/h)	5	1250	27	176	1079	7	45	1	304	36	1	19
Number	1	6	16	5	2	12	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	10	1543	0	226	1148	18	54	4	334	40	4	31
Adj No. of Lanes	1	2	1	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.50	0.81	0.75	0.78	0.94	0.38	0.83	0.25	0.91	0.89	0.25	0.61
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	291	1829	818	259	2317	1037	338	23	372	249	43	335
Arrive On Green	0.52	0.52	0.00	0.09	0.65	0.65	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	480	3539	1583	1774	3539	1583	1204	98	1583	1038	184	1427
Grp Volume(v), veh/h	10	1543	0	226	1148	18	58	0	334	40	0	35
Grp Sat Flow(s),veh/h/ln	480	1770	1583	1774	1770	1583	1302	0	1583	1038	0	1611
Q Serve(g_s), s	1.4	47.5	0.0	8.4	21.1	0.5	4.1	0.0	26.0	4.1	0.0	2.2
Cycle Q Clear(g_c), s	4.9	47.5	0.0	8.4	21.1	0.5	6.3	0.0	26.0	10.4	0.0	2.2
Prop In Lane	1.00		1.00	1.00		1.00	0.93		1.00	1.00		0.89
Lane Grp Cap(c), veh/h	291	1829	818	259	2317	1037	361	0	372	249	0	379
V/C Ratio(X)	0.03	0.84	0.00	0.87	0.50	0.02	0.16	0.00	0.90	0.16	0.00	0.09
Avail Cap(c_a), veh/h	319	2034	910	572	2317	1037	615	0	661	439	0	672
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	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.9	26.3	0.0	30.6	11.2	7.7	40.3	0.0	47.1	43.8	0.0	38.0
Incr Delay (d2), s/veh	0.1	3.7	0.0	9.0	0.4	0.0	0.2	0.0	8.1	0.3	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(95%),veh/ln	0.3	32.1	0.0	13.2	15.6	0.4	3.0	0.0	17.9	2.2	0.0	1.8
LnGrp Delay(d),s/veh	17.0	30.0	0.0	39.5	11.6	7.7	40.5	0.0	55.2	44.1	0.0	38.1
LnGrp LOS	B	C		D	B	A	D		E	D		D
Approach Vol, veh/h		1553			1392			392			75	
Approach Delay, s/veh		30.0			16.1			53.0			41.3	
Approach LOS		C			B			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		90.2		36.9	17.5	72.6		36.9				
Change Period (Y+Rc), s		7.0		7.0	6.5	7.0		7.0				
Max Green Setting (Gmax), s		73.0		53.0	33.5	73.0		53.0				
Max Q Clear Time (g_c+I1), s		23.1		12.4	10.4	49.5		28.0				
Green Ext Time (p_c), s		49.8		2.0	0.7	16.2		1.9				
Intersection Summary												
HCM 2010 Ctrl Delay			27.2									
HCM 2010 LOS			C									

Timings 6: Burch Rd/Ginger Cake Rd & SR 54

Future Build AM

04/16/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	318	1460	19	29	1777	106	32	25	33	153	16
Future Volume (vph)	318	1460	19	29	1777	106	32	25	33	153	16
Lane Group Flow (vph)	408	1490	40	45	1871	126	41	41	55	180	454
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases	1	6		5	2			8			4
Permitted Phases	6		6	2		2	8		8	4	
Detector Phase	1	6	6	5	2	2	8	8	8	4	4
Switch Phase											
Minimum Initial (s)	8.0	12.0	12.0	8.0	12.0	12.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	13.5	31.6	31.6	13.5	26.6	26.6	40.3	40.3	40.3	38.3	38.3
Total Split (s)	25.0	80.0	80.0	25.0	80.0	80.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	17.2%	55.2%	55.2%	17.2%	55.2%	55.2%	27.6%	27.6%	27.6%	27.6%	27.6%
Yellow Time (s)	3.5	4.6	4.6	3.5	4.6	4.6	4.3	4.3	4.3	4.3	4.3
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	6.6	6.6	5.5	6.6	6.6	6.3	6.3	6.3	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag					
Lead-Lag Optimize?											
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None
v/c Ratio	1.34	0.66	0.04	0.19	0.99	0.14	0.76	0.12	0.15	0.70	0.92
Control Delay	208.0	19.3	0.9	10.0	50.6	9.3	120.9	45.6	7.4	66.5	51.3
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	208.0	19.3	0.9	10.0	50.6	9.3	120.9	45.6	7.4	66.5	51.3
Queue Length 50th (ft)	~439	461	0	11	~892	26	35	31	0	152	212
Queue Length 95th (ft)	#547	594	0	19	#1141	58	#78	43	2	221	195
Internal Link Dist (ft)		497			426			210			310
Turn Bay Length (ft)	200		115	200		60	75		100	215	
Base Capacity (vph)	305	2264	1036	382	1891	876	69	457	439	333	568
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	1.34	0.66	0.04	0.12	0.99	0.14	0.59	0.09	0.13	0.54	0.80

Intersection Summary

Cycle Length: 145

Actuated Cycle Length: 137.7

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

~ 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: Burch Rd/Ginger Cake Rd & SR 54

		
Ø1	Ø2	Ø4
25 s	80 s	40 s
		
Ø5	Ø6	Ø8
25 s	80 s	40 s

Baseline

Synchro 9 Report

Page 20

HCM 2010 Signalized Intersection Summary
6: Burch Rd/Ginger Cake Rd & SR 54

Future Build AM
04/16/2018

																		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR						
Lane Configurations																		
Traffic Volume (veh/h)	318	1460	19	29	1777	106	32	25	33	153	16	336						
Future Volume (veh/h)	318	1460	19	29	1777	106	32	25	33	153	16	336						
Number	1	6	16	5	2	12	3	8	18	7	4	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						
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900						
Adj Flow Rate, veh/h	408	1490	40	45	1871	126	41	41	55	180	23	431						
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	0						
Peak Hour Factor	0.78	0.98	0.47	0.65	0.95	0.84	0.78	0.61	0.60	0.85	0.70	0.78						
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2						
Cap, veh/h	288	2104	941	233	1792	801	50	433	368	328	19	352						
Arrive On Green	0.13	0.59	0.59	0.05	0.51	0.51	0.23	0.23	0.23	0.23	0.23	0.23						
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	933	1863	1583	1294	81	1515						
Grp Volume(v), veh/h	408	1490	40	45	1871	126	41	41	55	180	0	454						
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	933	1863	1583	1294	0	1595						
Q Serve(g_s), s	19.5	42.7	1.5	1.7	73.4	6.2	0.0	2.5	4.0	18.4	0.0	33.7						
Cycle Q Clear(g_c), s	19.5	42.7	1.5	1.7	73.4	6.2	33.7	2.5	4.0	20.9	0.0	33.7						
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.95						
Lane Grp Cap(c), veh/h	288	2104	941	233	1792	801	50	433	368	328	0	371						
V/C Ratio(X)	1.42	0.71	0.04	0.19	1.04	0.16	0.83	0.09	0.15	0.55	0.00	1.22						
Avail Cap(c_a), veh/h	288	2104	941	390	1792	801	50	433	368	328	0	371						
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00						
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00						
Uniform Delay (d), s/veh	52.4	20.6	12.2	18.5	35.8	19.2	72.5	43.7	44.3	51.9	0.0	55.7						
Incr Delay (d2), s/veh	206.3	1.4	0.0	0.4	33.9	0.2	67.2	0.1	0.2	1.9	0.0	122.7						
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0						
%ile BackOfQ(95%),veh/ln	50.5	28.6	1.2	1.5	79.2	4.9	4.6	2.3	3.2	11.0	0.0	49.5						
LnGrp Delay(d),s/veh	258.7	22.0	12.3	18.9	69.7	19.4	139.7	43.8	44.4	53.8	0.0	178.4						
LnGrp LOS	F	C	B	B	F	B	F	D	D	D		F						
Approach Vol, veh/h	1938				2042				137		634							
Approach Delay, s/veh	71.6				65.5				72.7		143.0							
Approach LOS	E				E				E		F							
Timer	1	2	3	4	5	6	7	8										
Assigned Phs	1	2			4	5	6	8										
Phs Duration (G+Y+Rc), s	25.0	80.0			40.0	12.2	92.8	40.0										
Change Period (Y+Rc), s	5.5	6.6			6.3	5.5	6.6	6.3										
Max Green Setting (Gmax), s	19.5	73.4			33.7	19.5	73.4	33.7										
Max Q Clear Time (g_c+I1), s	21.5	75.4			35.7	3.7	44.7	35.7										
Green Ext Time (p_c), s	0.0	0.0			0.0	0.1	28.6	0.0										
Intersection Summary																		
HCM 2010 Ctrl Delay	78.5																	
HCM 2010 LOS	E																	
Notes																		

Timings 7: Oak St/Brandywine Blvd & SR 54

Future Build AM
04/16/2018



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	30	1554	9	1929	113	6	0	79	0	7
Future Volume (vph)	30	1554	9	1929	113	6	0	79	0	7
Lane Group Flow (vph)	40	1653	10	2120	192	0	33	0	86	9
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	NA	Perm
Protected Phases	5	2	1	6			8		4	
Permitted Phases	2		6		6	8		4		4
Detector Phase	5	2	1	6	6	8	8	4	4	4
Switch Phase										
Minimum Initial (s)	8.0	12.0	8.0	12.0	12.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.5	24.5	13.5	24.5	24.5	39.1	39.1	39.1	39.1	39.1
Total Split (s)	30.0	80.0	30.0	80.0	80.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	20.0%	53.3%	20.0%	53.3%	53.3%	26.7%	26.7%	26.7%	26.7%	26.7%
Yellow Time (s)	3.5	4.5	3.5	4.5	4.5	4.1	4.1	4.1	4.1	4.1
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
Total Lost Time (s)	5.5	6.5	5.5	6.5	6.5		6.1		6.1	6.1
Lead/Lag	Lead	Lag	Lead	Lag	Lag					
Lead-Lag Optimize?										
Recall Mode	None	Min	None	Min	Min	None	None	None	None	None
v/c Ratio	0.21	0.62	0.04	0.86	0.17		0.15		0.55	0.04
Control Delay	7.0	9.2	3.7	19.3	5.3		3.6		59.8	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0
Total Delay	7.0	9.2	3.7	19.3	5.3		3.6		59.8	0.3
Queue Length 50th (ft)	5	214	1	626	32		0		60	0
Queue Length 95th (ft)	12	515	6	#970	35		8		113	0
Internal Link Dist (ft)		435		402			231		280	
Turn Bay Length (ft)	215		185		150					60
Base Capacity (vph)	440	2647	505	2478	1127		488		418	528
Starvation Cap Reductn	0	0	0	0	0		0		0	0
Spillback Cap Reductn	0	0	0	0	0		0		0	0
Storage Cap Reductn	0	0	0	0	0		0		0	0
Reduced v/c Ratio	0.09	0.62	0.02	0.86	0.17		0.07		0.21	0.02

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 111.2

Natural Cycle: 140

Control Type: Actuated-Uncoordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 7: Oak St/Brandywine Blvd & SR 54



HCM 2010 Signalized Intersection Summary
7: Oak St/Brandywine Blvd & SR 54

Future Build AM
04/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	1554	0	9	1929	113	6	0	6	79	0	7
Future Volume (veh/h)	30	1554	0	9	1929	113	6	0	6	79	0	7
Number	5	2	12	1	6	16	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	40	1653	0	10	2120	192	14	0	19	86	0	0
Adj No. of Lanes	1	2	1	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.75	0.94	0.92	0.92	0.91	0.59	0.42	0.92	0.31	0.92	0.92	0.75
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	195	2538	1135	244	2420	1083	96	17	88	203	0	146
Arrive On Green	0.05	0.72	0.00	0.02	0.68	0.68	0.09	0.00	0.09	0.09	0.00	0.00
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	517	187	956	1464	0	1583
Grp Volume(v), veh/h	40	1653	0	10	2120	192	33	0	0	86	0	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1660	0	0	1464	0	1583
Q Serve(g_s), s	0.6	26.1	0.0	0.2	49.8	4.6	0.0	0.0	0.0	3.9	0.0	0.0
Cycle Q Clear(g_c), s	0.6	26.1	0.0	0.2	49.8	4.6	1.9	0.0	0.0	5.8	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.42		0.58	1.00		1.00
Lane Grp Cap(c), veh/h	195	2538	1135	244	2420	1083	201	0	0	203	0	146
V/C Ratio(X)	0.21	0.65	0.00	0.04	0.88	0.18	0.16	0.00	0.00	0.42	0.00	0.00
Avail Cap(c_a), veh/h	514	2538	1135	622	2469	1104	547	0	0	522	0	509
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	19.5	7.9	0.0	7.2	13.1	6.0	44.3	0.0	0.0	45.9	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.8	0.0	0.1	4.1	0.2	0.4	0.0	0.0	1.4	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(95%),veh/ln	1.4	18.8	0.0	0.2	33.5	3.6	1.6	0.0	0.0	4.5	0.0	0.0
LnGrp Delay(d),s/veh	20.0	8.7	0.0	7.3	17.3	6.2	44.7	0.0	0.0	47.3	0.0	0.0
LnGrp LOS	C	A		A	B	A	D			D		
Approach Vol, veh/h	1693				2322		33				86	
Approach Delay, s/veh	9.0				16.3		44.7				47.3	
Approach LOS	A				B		D				D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.5	82.1		15.8	11.0	78.6		15.8				
Change Period (Y+Rc), s	5.5	6.5		6.1	5.5	6.5		6.1				
Max Green Setting (Gmax), s	24.5	73.5		33.9	24.5	73.5		33.9				
Max Q Clear Time (g_c+I1), s	2.2	28.1		7.8	2.6	51.8		3.9				
Green Ext Time (p_c), s	0.0	45.2		0.4	0.1	20.3		0.4				
Intersection Summary												
HCM 2010 Ctrl Delay			14.2									
HCM 2010 LOS			B									

Timings 8: Grady Avenue/Sharon Drive & SR 54

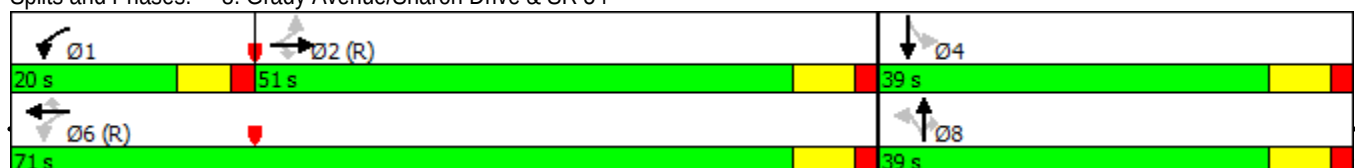
Future Build AM
04/16/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	14	1184	572	219	1451	6	757	0	222	11	17
Future Volume (vph)	14	1184	572	219	1451	6	757	0	222	11	17
Lane Group Flow (vph)	23	1361	689	292	1511	14	0	860	281	0	67
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases		2		1	6			8			4
Permitted Phases	2		2	6		6	8		8	4	
Detector Phase	2	2	2	1	6	6	8	8	8	4	4
Switch Phase											
Minimum Initial (s)	12.0	12.0	12.0	6.0	12.0	12.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	35.0	35.0	35.0	12.4	31.0	31.0	39.0	39.0	39.0	37.0	37.0
Total Split (s)	51.0	51.0	51.0	20.0	71.0	71.0	39.0	39.0	39.0	39.0	39.0
Total Split (%)	46.4%	46.4%	46.4%	18.2%	64.5%	64.5%	35.5%	35.5%	35.5%	35.5%	35.5%
Yellow Time (s)	5.0	5.0	5.0	4.4	5.0	5.0	5.0	5.0	5.0	5.0	5.0
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
Total Lost Time (s)	7.0	7.0	7.0	6.4	7.0	7.0		7.0	7.0		7.0
Lead/Lag	Lag	Lag	Lag	Lead							
Lead-Lag Optimize?											
Recall Mode	C-Min	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None
v/c Ratio	0.23	0.96	0.79	1.02	0.73	0.01		2.23	0.49		0.41
Control Delay	29.2	49.2	19.3	89.3	19.5	0.2		583.6	16.0		32.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Delay	29.2	49.2	19.3	89.3	19.5	0.2		583.6	16.0		32.8
Queue Length 50th (ft)	11	485	185	~162	385	0		~982	62		28
Queue Length 95th (ft)	20	#603	277	#239	472	0		#1221	107		43
Internal Link Dist (ft)		459			478			455			183
Turn Bay Length (ft)	215		165	285		175					
Base Capacity (vph)	100	1415	872	286	2059	937		386	578		165
Starvation Cap Reductn	0	0	0	0	0	0		0	0		0
Spillback Cap Reductn	0	0	0	0	0	0		0	0		0
Storage Cap Reductn	0	0	0	0	0	0		0	0		0
Reduced v/c Ratio	0.23	0.96	0.79	1.02	0.73	0.01		2.23	0.49		0.41

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 10 (9%), Referenced to phase 2:EBTL and 6:WBTL, 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.

Splits and Phases: 8: Grady Avenue/Sharon Drive & SR 54



HCM 2010 Signalized Intersection Summary
8: Grady Avenue/Sharon Drive & SR 54

Future Build AM

04/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	1184	572	219	1451	6	757	0	222	11	17	10
Future Volume (veh/h)	14	1184	572	219	1451	6	757	0	222	11	17	10
Number	5	2	12	1	6	16	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	23	1361	689	292	1511	14	860	0	0	22	27	0
Adj No. of Lanes	1	2	1	1	2	1	0	1	1	0	1	0
Peak Hour Factor	0.60	0.87	0.83	0.75	0.96	0.42	0.88	0.92	0.79	0.50	0.62	0.56
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	157	1416	633	290	2059	921	474	0	461	267	311	0
Arrive On Green	0.40	0.40	0.40	0.12	0.58	0.58	0.29	0.00	0.00	0.29	0.29	0.00
Sat Flow, veh/h	340	3539	1583	1774	3539	1583	1404	0	1583	755	1070	0
Grp Volume(v), veh/h	23	1361	689	292	1511	14	860	0	0	49	0	0
Grp Sat Flow(s),veh/h/ln	340	1770	1583	1774	1770	1583	1404	0	1583	1825	0	0
Q Serve(g_s), s	5.8	41.2	44.0	13.6	34.3	0.4	29.9	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	20.1	41.2	44.0	13.6	34.3	0.4	32.0	0.0	0.0	2.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	0.45		0.00
Lane Grp Cap(c), veh/h	157	1416	633	290	2059	921	474	0	461	578	0	0
V/C Ratio(X)	0.15	0.96	1.09	1.01	0.73	0.02	1.81	0.00	0.00	0.08	0.00	0.00
Avail Cap(c_a), veh/h	157	1416	633	290	2059	921	474	0	461	578	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	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	31.4	32.2	33.0	34.3	16.8	9.7	41.0	0.0	0.0	28.4	0.0	0.0
Incr Delay (d2), s/veh	1.9	16.3	62.0	54.7	2.4	0.0	375.0	0.0	0.0	0.1	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	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.1	31.2	54.1	23.7	24.1	0.3	114.7	0.0	0.0	2.0	0.0	0.0
LnGrp Delay(d),s/veh	33.4	48.5	95.0	89.0	19.1	9.7	416.0	0.0	0.0	28.5	0.0	0.0
LnGrp LOS	C	D	F	F	B	A	F			C		
Approach Vol, veh/h	2073				1817				860		49	
Approach Delay, s/veh	63.8				30.3				416.0		28.5	
Approach LOS	E				C				F		C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	20.0	51.0	39.0		71.0		39.0					
Change Period (Y+Rc), s	6.4	7.0	7.0		7.0		7.0					
Max Green Setting (Gmax), s	13.6	44.0	32.0		64.0		32.0					
Max Q Clear Time (g_c+I1), s	15.6	46.0	4.1		36.3		34.0					
Green Ext Time (p_c), s	0.0	0.0	4.5		27.7		0.0					
Intersection Summary												
HCM 2010 Ctrl Delay	113.9											
HCM 2010 LOS	F											

Intersection

Intersection Delay, s/veh22.3

Intersection LOS C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	8	5	123	5	48	8	234	208	50	283	5
Future Vol, veh/h	5	8	5	123	5	48	8	234	208	50	283	5
Peak Hour Factor	0.50	0.44	0.33	0.56	0.50	0.83	0.88	0.86	0.91	0.92	0.80	0.50
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	18	15	220	10	58	9	272	229	54	354	10
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	11.1	16.7	26.9	21.7
HCM LOS	B	C	D	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	2%	28%	70%	15%
Vol Thru, %	52%	44%	3%	84%
Vol Right, %	46%	28%	27%	1%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	450	18	176	338
LT Vol	8	5	123	50
Through Vol	234	8	5	283
RT Vol	208	5	48	5
Lane Flow Rate	510	43	287	418
Geometry Grp	1	1	1	1
Degree of Util (X)	0.796	0.088	0.525	0.696
Departure Headway (Hd)	5.622	7.338	6.577	5.989
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	647	486	546	602
Service Time	3.622	5.42	4.63	4.037
HCM Lane V/C Ratio	0.788	0.088	0.526	0.694
HCM Control Delay	26.9	11.1	16.7	21.7
HCM Lane LOS	D	B	C	C
HCM 95th-tile Q	7.9	0.3	3	5.5

Intersection

Int Delay, s/veh 4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	16	119	149	373	396	104
Future Vol, veh/h	16	119	149	373	396	104
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	-	-	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	70	76	73	76	76	66
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	157	204	491	521	158

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1420	521	521
Stage 1	521	-	-
Stage 2	899	-	-
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	150	555	1045
Stage 1	596	-	-
Stage 2	397	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	110	555	1045
Mov Cap-2 Maneuver	110	-	-
Stage 1	596	-	-
Stage 2	291	-	-

Approach	EB	NB	SB
HCM Control Delay, s	23.9	2.7	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1045	-	366	-	-
HCM Lane V/C Ratio	0.195	-	0.49	-	-
HCM Control Delay (s)	9.3	0	23.9	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.7	-	2.6	-	-

Intersection

Int Delay, s/veh 7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	256	304	11	356	236
Future Vol, veh/h	2	256	304	11	356	236
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	0	250	-	400	225	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	50	71	74	50	77	66
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	361	411	22	462	358

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1693	411	0
Stage 1	411	-	-
Stage 2	1282	-	-
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	102	641	-
Stage 1	669	-	-
Stage 2	260	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	61	641	-
Mov Cap-2 Maneuver	61	-	-
Stage 1	669	-	-
Stage 2	155	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.2	0	5.8
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT
Capacity (veh/h)	-	- 61 641 1148	-	-
HCM Lane V/C Ratio	-	- 0.066 0.563 0.403	-	-
HCM Control Delay (s)	-	- 68.1 17.6 10.2	-	-
HCM Lane LOS	-	- F C B	-	-
HCM 95th %tile Q(veh)	-	- 0.2 3.5 2	-	-

Intersection						
Int Delay, s/veh	7.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	352	290	246	258	38
Future Vol, veh/h	7	352	290	246	258	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	115	0	185	-	-	250
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	81	86	83	71	77
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	435	337	296	363	49
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1334	363	363	0	-	0
Stage 1	363	-	-	-	-	-
Stage 2	971	-	-	-	-	-
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	170	682	1196	-	-	-
Stage 1	704	-	-	-	-	-
Stage 2	367	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	122	682	1196	-	-	-
Mov Cap-2 Maneuver	122	-	-	-	-	-
Stage 1	704	-	-	-	-	-
Stage 2	264	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	19.5	4.9		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1196	-	122	682	-	-
HCM Lane V/C Ratio	0.282	-	0.077	0.637	-	-
HCM Control Delay (s)	9.2	-	36.9	19.1	-	-
HCM Lane LOS	A	-	E	C	-	-
HCM 95th %tile Q(veh)	1.2	-	0.2	4.6	-	-

Intersection						
Int Delay, s/veh	2.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	88	29	297	92	31	411
Future Vol, veh/h	88	29	297	92	31	411
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	Yield	-	None
Storage Length	0	100	-	150	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	96	32	323	100	34	447
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	837	323	0	0	323	0
Stage 1	323	-	-	-	-	-
Stage 2	514	-	-	-	-	-
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	337	718	-	-	1237	-
Stage 1	734	-	-	-	-	-
Stage 2	600	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	325	718	-	-	1237	-
Mov Cap-2 Maneuver	325	-	-	-	-	-
Stage 1	734	-	-	-	-	-
Stage 2	578	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	18	0	0.6			
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT		
Capacity (veh/h)	-	- 325 718 1237	-	-		
HCM Lane V/C Ratio	-	- 0.294 0.044 0.027	-	-		
HCM Control Delay (s)	-	- 20.6 10.2 8	-	0		
HCM Lane LOS	-	- C B A	-	A		
HCM 95th %tile Q(veh)	-	- 1.2 0.1 0.1	-	-		

Intersection

Int Delay, s/veh 0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↑		↑
Traffic Vol, veh/h	0	2027	2122	61	0	59
Future Vol, veh/h	0	2027	2122	61	0	59
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Yield
Storage Length	-	-	-	250	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	2203	2307	66	0	64

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	-	0	- 0 - 1153
Stage 1	-	-	- - -
Stage 2	-	-	- - -
Critical Hdwy	-	-	- - 6.94
Critical Hdwy Stg 1	-	-	- - -
Critical Hdwy Stg 2	-	-	- - -
Follow-up Hdwy	-	-	- - 3.32
Pot Cap-1 Maneuver	0	-	- 0 0 191
Stage 1	0	-	- 0 0 -
Stage 2	0	-	- 0 0 -
Platoon blocked, %	-	-	
Mov Cap-1 Maneuver	-	-	- - 191
Mov Cap-2 Maneuver	-	-	- - -
Stage 1	-	-	- - -
Stage 2	-	-	- - -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	33.1
HCM LOS			D

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	191
HCM Lane V/C Ratio	-	-	0.336
HCM Control Delay (s)	-	-	33.1
HCM Lane LOS	-	-	D
HCM 95th %tile Q(veh)	-	-	1.4

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↗		↗
Traffic Vol, veh/h	0	2027	2124	61	0	59
Future Vol, veh/h	0	2027	2124	61	0	59
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Yield
Storage Length	-	-	-	250	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	2203	2309	66	0	64
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	-	0	-	0	-	1154
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0	0	190
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	-	190
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		33.3		
HCM LOS	D					
Minor Lane/Major Mvmt	EBT	WBT	SBLn1			
Capacity (veh/h)	-	-	190			
HCM Lane V/C Ratio	-	-	0.338			
HCM Control Delay (s)	-	-	33.3			
HCM Lane LOS	-	-	D			
HCM 95th %tile O(veh)	-	-	1.4			

Timings

1: Private Drwy/Tyrone Rd & SR 54

Future Build PM

04/16/2018



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	29	1060	1381	549	1	3	343	0	41
Future Volume (vph)	29	1060	1381	549	1	3	343	0	41
Lane Group Flow (vph)	36	1178	1469	670	0	12	0	394	46
Turn Type	Perm	NA	NA	Perm	Perm	NA	Perm	NA	Perm
Protected Phases		2	6			8		4	
Permitted Phases	2			6	8		4		4
Detector Phase	2	2	6	6	8	8	4	4	4
Switch Phase									
Minimum Initial (s)	15.0	15.0	15.0	15.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	26.0	26.0	25.0	25.0	48.0	48.0	44.0	44.0	44.0
Total Split (s)	80.0	80.0	80.0	80.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	57.1%	57.1%	57.1%	57.1%	42.9%	42.9%	42.9%	42.9%	42.9%
Yellow Time (s)	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0		7.0		7.0	7.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	Min	Min	Min	Min	None	None	None	None	None
v/c Ratio	0.35	0.58	0.72	0.63		0.02		0.90	0.09
Control Delay	29.9	19.9	23.7	11.1		28.5		66.0	13.8
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0	0.0
Total Delay	29.9	19.9	23.7	11.1		28.5		66.0	13.8
Queue Length 50th (ft)	15	314	446	147		7		309	9
Queue Length 95th (ft)	48	468	658	249		9		444	36
Internal Link Dist (ft)		559	571			104		335	
Turn Bay Length (ft)	150			175					135
Base Capacity (vph)	104	2039	2039	1070		698		584	680
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	0.35	0.58	0.72	0.63		0.02		0.67	0.07

Intersection Summary

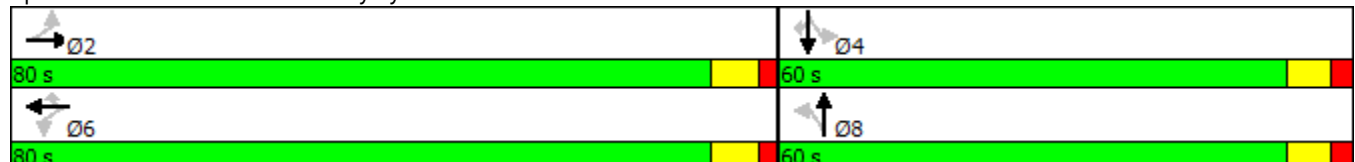
Cycle Length: 140

Actuated Cycle Length: 127.4

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Splits and Phases: 1: Private Drwy/Tyrone Rd & SR 54



HCM 2010 Signalized Intersection Summary

1: Private Drwy/Tyrone Rd & SR 54

Future Build PM
04/16/2018

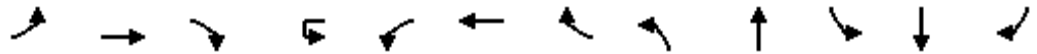
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	1060	0	0	1381	549	1	3	0	343	0	41
Future Volume (veh/h)	29	1060	0	0	1381	549	1	3	0	343	0	41
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	36	1178	0	0	1469	670	4	8	0	394	0	0
Adj No. of Lanes	1	2	0	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.81	0.90	0.25	0.92	0.94	0.82	0.25	0.38	0.92	0.87	0.92	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	113	2081	0	58	2081	931	200	383	0	479	0	474
Arrive On Green	0.59	0.59	0.00	0.00	0.59	0.59	0.30	0.30	0.00	0.30	0.00	0.00
Sat Flow, veh/h	187	3632	0	474	3539	1583	541	1282	0	1407	0	1583
Grp Volume(v), veh/h	36	1178	0	0	1469	670	12	0	0	394	0	0
Grp Sat Flow(s),veh/h/ln	187	1770	0	474	1770	1583	1822	0	0	1407	0	1583
Q Serve(g_s), s	20.8	25.5	0.0	0.0	36.3	37.5	0.0	0.0	0.0	33.2	0.0	0.0
Cycle Q Clear(g_c), s	57.1	25.5	0.0	0.0	36.3	37.5	0.6	0.0	0.0	33.8	0.0	0.0
Prop In Lane	1.00		0.00	1.00		1.00	0.33		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	113	2081	0	58	2081	931	584	0	0	479	0	474
V/C Ratio(X)	0.32	0.57	0.00	0.00	0.71	0.72	0.02	0.00	0.00	0.82	0.00	0.00
Avail Cap(c_a), veh/h	113	2082	0	58	2082	931	799	0	0	658	0	676
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	0.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	38.1	15.8	0.0	0.0	18.0	18.2	30.7	0.0	0.0	42.3	0.0	0.0
Incr Delay (d2), s/veh	3.4	0.6	0.0	0.0	1.4	3.4	0.0	0.0	0.0	6.0	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	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.1	18.4	0.0	0.0	24.9	24.1	0.5	0.0	0.0	20.1	0.0	0.0
LnGrp Delay(d),s/veh	41.5	16.4	0.0	0.0	19.4	21.6	30.7	0.0	0.0	48.3	0.0	0.0
LnGrp LOS	D	B			B	C	C			D		
Approach Vol, veh/h		1214			2139			12			394	
Approach Delay, s/veh		17.1			20.1			30.7			48.3	
Approach LOS		B			C			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		80.0		44.1		80.0		44.1				
Change Period (Y+Rc), s		7.0		7.0		7.0		7.0				
Max Green Setting (Gmax), s		73.0		53.0		73.0		53.0				
Max Q Clear Time (g_c+I1), s		59.1		35.8		39.5		2.6				
Green Ext Time (p_c), s		13.9		1.3		33.4		1.5				
Intersection Summary												
HCM 2010 Ctrl Delay			22.1									
HCM 2010 LOS			C									

Timings

2: Old Norton Rd/S Sandy Creek Rd & SR 54

Future Build PM

04/16/2018



Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	1751	16	118	82	1539	235	26	16	331	19	78
Future Volume (vph)	80	1751	16	118	82	1539	235	26	16	331	19	78
Lane Group Flow (vph)	99	1863	32	0	222	1691	267	0	87	0	395	115
Turn Type	pm+pt	NA	Perm	pm+pt	pm+pt	NA	Perm	Perm	NA	Perm	NA	Perm
Protected Phases	5	2		1	1	6			8		4	
Permitted Phases	2		2	6	6		6	8		4		4
Detector Phase	5	2	2	1	1	6	6	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	6.0	12.0	12.0	6.0	6.0	12.0	12.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	12.0	26.0	26.0	13.5	13.5	25.0	25.0	46.3	46.3	46.3	46.3	46.3
Total Split (s)	40.0	80.0	80.0	40.0	40.0	80.0	80.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	22.2%	44.4%	44.4%	22.2%	22.2%	44.4%	44.4%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	4.0	5.0	5.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.3	2.3	2.3	2.3
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)	6.0	7.0	7.0		6.0	7.0	7.0		7.3		7.3	7.3
Lead/Lag	Lead	Lag	Lag	Lead	Lead	Lag	Lag					
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	None	None	Min	Min	None	None	None	None	None
v/c Ratio	0.61	1.21	0.04		0.82	0.96	0.33		0.28		0.98	0.21
Control Delay	50.5	140.4	0.7		70.7	54.2	20.4		38.8		95.1	14.5
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0
Total Delay	50.5	140.4	0.7		70.7	54.2	20.4		38.8		95.1	14.5
Queue Length 50th (ft)	53	~1302	0		187	917	130		57		430	22
Queue Length 95th (ft)	106	#1561	0		274	#1167	204		114		373	40
Internal Link Dist (ft)		459				398			219		387	
Turn Bay Length (ft)	200		185		175		100					235
Base Capacity (vph)	400	1543	725		397	1762	819		307		405	557
Starvation Cap Reductn	0	0	0		0	0	0		0		0	0
Spillback Cap Reductn	0	0	0		0	0	0		0		0	0
Storage Cap Reductn	0	0	0		0	0	0		0		0	0
Reduced v/c Ratio	0.25	1.21	0.04		0.56	0.96	0.33		0.28		0.98	0.21

Intersection Summary

Cycle Length: 180

Actuated Cycle Length: 167.6

Natural Cycle: 140

Control Type: Actuated-Uncoordinated

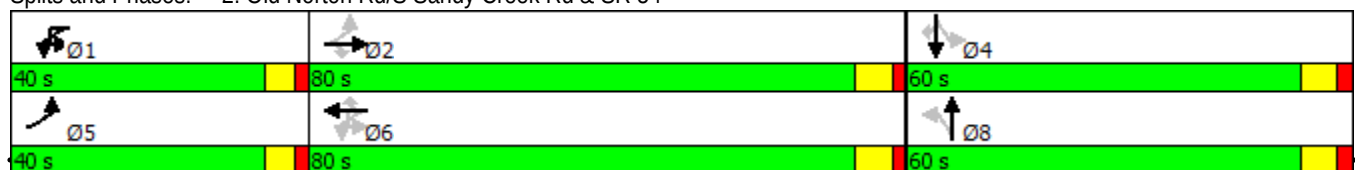
~ Volume exceeds capacity, queue is theoretically infinite.

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: 2: Old Norton Rd/S Sandy Creek Rd & SR 54



Baseline

Synchro 9 Report

Page 4

HCM Signalized Intersection Capacity Analysis

2: Old Norton Rd/S Sandy Creek Rd & SR 54

Future Build PM

04/16/2018

												
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	80	1751	16	118	82	1539	235	26	16	26	331	19
Future Volume (vph)	80	1751	16	118	82	1539	235	26	16	26	331	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	7.0	7.0		6.0	7.0	7.0		7.3			7.3
Lane Util. Factor	1.00	0.95	1.00		1.00	0.95	1.00		1.00			1.00
Frt	1.00	1.00	0.85		1.00	1.00	0.85		0.95			1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00		0.98			0.96
Satd. Flow (prot)	1770	3539	1583		1770	3539	1583		1732			1781
Flt Permitted	0.05	1.00	1.00		0.05	1.00	1.00		0.53			0.69
Satd. Flow (perm)	102	3539	1583		94	3539	1583		939			1286
Peak-hour factor, PHF	0.81	0.94	0.50	0.92	0.87	0.91	0.88	0.72	0.88	0.80	0.91	0.62
Adj. Flow (vph)	99	1863	32	128	94	1691	267	36	18	32	364	31
RTOR Reduction (vph)	0	0	18	0	0	0	31	0	12	0	0	0
Lane Group Flow (vph)	99	1863	14	0	222	1691	236	0	75	0	0	395
Turn Type	pm+pt	NA	Perm	pm+pt	pm+pt	NA	Perm	Perm	NA		Perm	NA
Protected Phases	5	2		1	1	6			8			4
Permitted Phases	2		2	6	6		6	8			4	
Actuated Green, G (s)	84.1	73.1	73.1		100.5	83.5	83.5		52.8			52.8
Effective Green, g (s)	84.1	73.1	73.1		100.5	83.5	83.5		52.8			52.8
Actuated g/C Ratio	0.50	0.44	0.44		0.60	0.50	0.50		0.32			0.32
Clearance Time (s)	6.0	7.0	7.0		6.0	7.0	7.0		7.3			7.3
Vehicle Extension (s)	3.0	5.0	5.0		3.0	5.0	5.0		3.0			3.0
Lane Grp Cap (vph)	160	1543	690		270	1763	788		295			405
v/s Ratio Prot	0.04	c0.53			c0.10	c0.48						
v/s Ratio Perm	0.27		0.01		0.39		0.15		0.08			c0.31
v/c Ratio	0.62	1.21	0.02		0.82	0.96	0.30		0.26			0.98
Uniform Delay, d1	36.1	47.2	26.9		55.4	40.4	24.8		42.8			56.8
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00		1.00			1.00
Incremental Delay, d2	6.9	99.7	0.0		17.9	13.2	0.4		0.5			37.9
Delay (s)	43.1	146.9	26.9		73.3	53.7	25.2		43.2			94.6
Level of Service	D	F	C		E	D	C		D			F
Approach Delay (s)		139.9				52.2			43.2			82.5
Approach LOS		F				D			D			F
Intersection Summary												
HCM 2000 Control Delay			91.9			HCM 2000 Level of Service			F			
HCM 2000 Volume to Capacity ratio			1.08									
Actuated Cycle Length (s)			167.6			Sum of lost time (s)			20.3			
Intersection Capacity Utilization			102.4%			ICU Level of Service			G			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
2: Old Norton Rd/S Sandy Creek Rd & SR 54

Future Build PM

04/16/2018

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	78
Future Volume (vph)	78
Ideal Flow (vphpl)	1900
Total Lost time (s)	7.3
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1583
Flt Permitted	1.00
Satd. Flow (perm)	1583
Peak-hour factor, PHF	0.68
Adj. Flow (vph)	115
RTOR Reduction (vph)	59
Lane Group Flow (vph)	56
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	52.8
Effective Green, g (s)	52.8
Actuated g/C Ratio	0.32
Clearance Time (s)	7.3
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	498
v/s Ratio Prot	
v/s Ratio Perm	0.04
v/c Ratio	0.11
Uniform Delay, d1	40.8
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	40.9
Level of Service	D
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Timings

3: Lester Rd/Veterans Pkwy & SR 54

Future Build PM

04/16/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	117	1376	132	225	1541	50	137	96	154	25	136	126
Future Volume (vph)	117	1376	132	225	1541	50	137	96	154	25	136	126
Lane Group Flow (vph)	163	1638	153	278	1712	59	171	113	244	36	162	162
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2		2	8		8	4		4
Detector Phase	1	6	6	5	2	2	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	6.0	8.0	8.0	6.0	8.0	8.0
Minimum Split (s)	13.3	42.3	42.3	13.3	42.3	42.3	11.9	48.1	48.1	11.9	49.1	49.1
Total Split (s)	25.0	80.0	80.0	40.0	80.0	80.0	25.0	60.0	60.0	25.0	60.0	60.0
Total Split (%)	12.2%	39.0%	39.0%	19.5%	39.0%	39.0%	12.2%	29.3%	29.3%	12.2%	29.3%	29.3%
Yellow Time (s)	5.3	5.3	5.3	5.3	5.3	5.3	3.9	5.1	5.1	3.9	5.1	5.1
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)	7.3	7.3	7.3	7.3	7.3	7.3	5.9	7.1	7.1	5.9	7.1	7.1
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None
v/c Ratio	0.48	0.95	0.19	0.82	0.99	0.07	0.68	0.35	0.66	0.13	0.56	0.58
Control Delay	52.4	50.0	10.9	60.2	58.2	1.3	72.0	70.4	17.1	50.5	75.2	18.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.4	50.0	10.9	60.2	58.2	1.3	72.0	70.4	17.1	50.5	75.2	18.0
Queue Length 50th (ft)	93	803	32	213	~877	0	148	57	0	29	82	0
Queue Length 95th (ft)	136	#1008	79	301	#1231	5	207	91	0	49	121	42
Internal Link Dist (ft)		707			648			447			501	
Turn Bay Length (ft)	230		350	235		215	250		250	300		275
Base Capacity (vph)	438	1726	819	429	1726	819	336	1256	719	341	1256	666
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	0.37	0.95	0.19	0.65	0.99	0.07	0.51	0.09	0.34	0.11	0.13	0.24

Intersection Summary

Cycle Length: 205

Actuated Cycle Length: 149.9

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

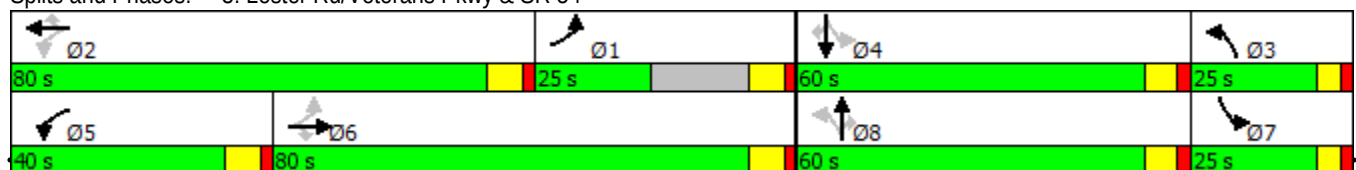
~ Volume exceeds capacity, queue is theoretically infinite.

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: 3: Lester Rd/Veterans Pkwy & SR 54



Baseline

Synchro 9 Report

Page 10

HCM 2010 Signalized Intersection Summary

3: Lester Rd/Veterans Pkwy & SR 54

Future Build PM
04/16/2018

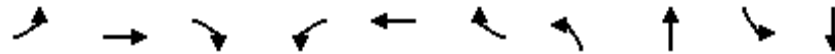
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	1376	132	225	1541	50	137	96	154	25	136	126
Future Volume (veh/h)	117	1376	132	225	1541	50	137	96	154	25	136	126
Number	1	6	16	5	2	12	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	162	1638	0	278	1712	0	171	113	0	36	162	0
Adj No. of Lanes	1	2	1	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.72	0.84	0.86	0.81	0.90	0.85	0.80	0.85	0.63	0.69	0.84	0.78
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	321	1840	823	307	1847	826	199	203	91	228	225	101
Arrive On Green	0.14	0.52	0.00	0.14	0.52	0.00	0.07	0.06	0.00	0.08	0.06	0.00
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	162	1638	0	278	1712	0	171	113	0	36	162	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	6.1	57.6	0.0	17.3	62.4	0.0	7.9	4.3	0.0	0.0	6.3	0.0
Cycle Q Clear(g_c), s	6.1	57.6	0.0	17.3	62.4	0.0	7.9	4.3	0.0	0.0	6.3	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	321	1840	823	307	1847	826	199	203	91	228	225	101
V/C Ratio(X)	0.51	0.89	0.00	0.90	0.93	0.00	0.86	0.56	0.00	0.16	0.72	0.00
Avail Cap(c_a), veh/h	321	1848	827	468	1848	827	310	1345	602	329	1345	602
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	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	52.1	29.9	0.0	43.4	30.8	0.0	61.7	63.9	0.0	57.2	64.0	0.0
Incr Delay (d2), s/veh	1.3	6.2	0.0	14.9	9.0	0.0	13.6	2.4	0.0	0.3	4.3	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(95%),veh/ln	9.7	38.5	0.0	17.4	42.1	0.0	11.6	3.9	0.0	2.3	5.7	0.0
LnGrp Delay(d),s/veh	53.4	36.1	0.0	58.4	39.8	0.0	75.3	66.2	0.0	57.5	68.2	0.0
LnGrp LOS	D	D		E	D		E	E		E	E	
Approach Vol, veh/h		1800			1990			284			198	
Approach Delay, s/veh		37.7			42.4			71.7			66.3	
Approach LOS		D			D			E			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	27.1	79.9	16.2	16.0	27.4	79.7	17.1	15.1				
Change Period (Y+Rc), s	7.3	7.3	5.9	7.1	7.3	7.3	5.9	7.1				
Max Green Setting (Gmax), s	17.7	72.7	19.1	52.9	32.7	72.7	19.1	52.9				
Max Q Clear Time (g_c+I1), s	8.1	64.4	9.9	8.3	19.3	59.6	2.0	6.3				
Green Ext Time (p_c), s	9.5	8.3	0.4	0.6	0.7	12.8	0.6	0.4				
Intersection Summary												
HCM 2010 Ctrl Delay			43.5									
HCM 2010 LOS			D									

Timings

4: Togwatee Village Pkwy/Piedmont Fayette & SR 54

Future Build PM

04/16/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	120	1654	82	123	1512	111	64	7	122	8
Future Volume (vph)	120	1654	82	123	1512	111	64	7	122	8
Lane Group Flow (vph)	130	1880	130	176	1609	126	81	99	131	67
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	NA
Protected Phases	1	6		5	2			4		8
Permitted Phases	6		6	2		2	4		8	
Detector Phase	1	6	6	5	2	2	4	4	8	8
Switch Phase										
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.7	33.0	33.0	11.7	32.0	32.0	50.0	50.0	48.0	48.0
Total Split (s)	40.0	80.0	80.0	40.0	80.0	80.0	60.0	60.0	60.0	60.0
Total Split (%)	22.2%	44.4%	44.4%	22.2%	44.4%	44.4%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.7	5.0	5.0	3.7	5.0	5.0	5.0	5.0	5.0	5.0
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)	5.7	7.0	7.0	5.7	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?										
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None
v/c Ratio	0.53	0.91	0.14	0.70	0.75	0.13	0.42	0.32	0.69	0.23
Control Delay	22.1	31.9	8.4	44.4	21.8	7.3	55.8	14.2	70.6	16.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.1	31.9	8.4	44.4	21.8	7.3	55.8	14.2	70.6	16.8
Queue Length 50th (ft)	24	664	23	84	454	21	60	6	101	6
Queue Length 95th (ft)	97	#1058	38	119	730	59	102	36	180	47
Internal Link Dist (ft)		467			430			239		153
Turn Bay Length (ft)	200		200	300		150			50	
Base Capacity (vph)	562	2077	953	534	2158	988	565	737	550	724
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	0.23	0.91	0.14	0.33	0.75	0.13	0.14	0.13	0.24	0.09

Intersection Summary

Cycle Length: 180

Actuated Cycle Length: 125.2

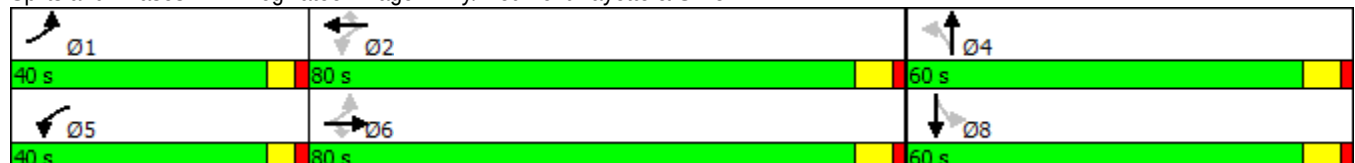
Natural Cycle: 145

Control Type: Actuated-Uncoordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 4: Togwatee Village Pkwy/Piedmont Fayette & SR 54



HCM 2010 Signalized Intersection Summary

4: Togwatee Village Pkwy/Piedmont Fayette & SR 54

Future Build PM
04/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	1654	82	123	1512	111	64	7	72	122	8	45
Future Volume (veh/h)	120	1654	82	123	1512	111	64	7	72	122	8	45
Number	1	6	16	5	2	12	7	4	14	3	8	18
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	130	1880	0	176	1609	0	81	9	0	131	9	0
Adj No. of Lanes	1	2	1	1	2	1	1	1	0	1	1	0
Peak Hour Factor	0.92	0.88	0.63	0.70	0.94	0.88	0.79	0.75	0.80	0.93	0.88	0.77
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	270	2296	1027	222	2305	1031	227	225	0	227	225	0
Arrive On Green	0.05	0.65	0.00	0.05	0.65	0.00	0.12	0.12	0.00	0.12	0.12	0.00
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	1400	1863	0	1400	1863	0
Grp Volume(v), veh/h	130	1880	0	176	1609	0	81	9	0	131	9	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1400	1863	0	1400	1863	0
Q Serve(g_s), s	2.7	44.7	0.0	3.7	32.6	0.0	6.1	0.5	0.0	10.2	0.5	0.0
Cycle Q Clear(g_c), s	2.7	44.7	0.0	3.7	32.6	0.0	6.6	0.5	0.0	10.7	0.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	270	2296	1027	222	2305	1031	227	225	0	227	225	0
V/C Ratio(X)	0.48	0.82	0.00	0.79	0.70	0.00	0.36	0.04	0.00	0.58	0.04	0.00
Avail Cap(c_a), veh/h	719	2301	1029	667	2305	1031	719	879	0	719	879	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	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	13.4	14.8	0.0	24.3	12.5	0.0	46.5	43.6	0.0	48.3	43.6	0.0
Incr Delay (d2), s/veh	1.3	2.8	0.0	6.3	1.2	0.0	0.9	0.1	0.0	2.3	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(95%),veh/ln	3.7	30.3	0.0	7.0	22.9	0.0	4.4	0.5	0.0	7.4	0.5	0.0
LnGrp Delay(d),s/veh	14.7	17.5	0.0	30.5	13.7	0.0	47.5	43.7	0.0	50.6	43.7	0.0
LnGrp LOS	B	B		C	B		D	D		D	D	
Approach Vol, veh/h		2010			1785			90			140	
Approach Delay, s/veh		17.3			15.4			47.1			50.2	
Approach LOS		B			B			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.6	80.1		20.6	11.9	79.9		20.6				
Change Period (Y+Rc), s	* 5.7	7.0		7.0	* 5.7	7.0		7.0				
Max Green Setting (Gmax), s	* 34	73.0		53.0	* 34	73.0		53.0				
Max Q Clear Time (g_c+I1), s	4.7	34.6		8.6	5.7	46.7		12.7				
Green Ext Time (p_c), s	0.4	38.3		0.9	0.5	26.2		0.9				
Intersection Summary												
HCM 2010 Ctrl Delay				18.3								
HCM 2010 LOS				B								
Notes												

Timings

5: Ebenezer Rd/Brittany Way & SR 54

Future Build PM

04/16/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	15	1744	79	332	1347	29	29	3	202	7	0
Future Volume (vph)	15	1744	79	332	1347	29	29	3	202	7	0
Lane Group Flow (vph)	19	2028	113	395	1480	36	0	44	293	9	41
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases		6		5	2			8			4
Permitted Phases	6		6	2		2	8		8	4	
Detector Phase	6	6	6	5	2	2	8	8	8	4	4
Switch Phase											
Minimum Initial (s)	15.0	15.0	15.0	8.0	15.0	15.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	26.0	26.0	26.0	14.5	26.0	26.0	48.0	48.0	48.0	43.0	43.0
Total Split (s)	80.0	80.0	80.0	40.0	80.0	80.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	44.4%	44.4%	44.4%	22.2%	44.4%	44.4%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	5.0	5.0	5.0	4.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0
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
Total Lost Time (s)	7.0	7.0	7.0	6.5	7.0	7.0		7.0	7.0	7.0	7.0
Lead/Lag	Lag	Lag	Lag	Lead							
Lead-Lag Optimize?											
Recall Mode	Min	Min	Min	None	Min	Min	None	None	None	None	None
v/c Ratio	0.11	1.08	0.13	0.81	0.51	0.03		0.43	0.75	0.09	0.23
Control Delay	19.2	77.8	8.2	53.1	4.7	1.4		73.6	18.9	60.0	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Delay	19.2	77.8	8.2	53.1	4.7	1.4		73.6	18.9	60.0	7.9
Queue Length 50th (ft)	8	~1049	20	277	164	2		38	0	8	0
Queue Length 95th (ft)	23	#1181	36	#395	262	8		66	5	22	0
Internal Link Dist (ft)		617			769			306			341
Turn Bay Length (ft)	200		200	200		200					
Base Capacity (vph)	175	1878	870	485	2907	1304		514	790	522	649
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	0.11	1.08	0.13	0.81	0.51	0.03		0.09	0.37	0.02	0.06

Intersection Summary

Cycle Length: 180

Actuated Cycle Length: 137.6

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

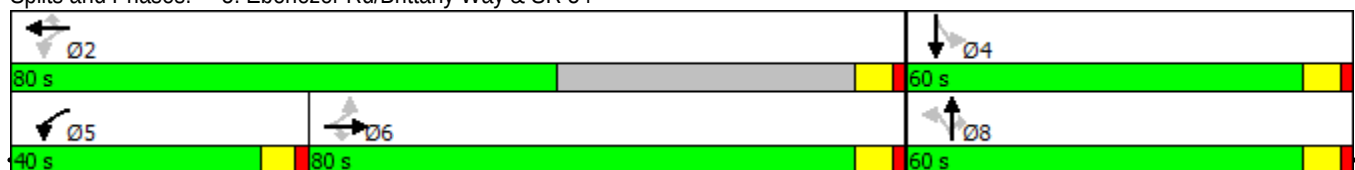
~ Volume exceeds capacity, queue is theoretically infinite.

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: Ebenezer Rd/Brittany Way & SR 54



Baseline

Synchro 9 Report

Page 17

HCM 2010 Signalized Intersection Summary

5: Ebenezer Rd/Brittany Way & SR 54

Future Build PM
04/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	1744	79	332	1347	29	29	3	202	7	0	24
Future Volume (veh/h)	15	1744	79	332	1347	29	29	3	202	7	0	24
Number	1	6	16	5	2	12	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	19	2028	0	395	1480	36	40	4	293	9	0	41
Adj No. of Lanes	1	2	1	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.81	0.86	0.70	0.84	0.91	0.81	0.72	0.75	0.69	0.75	0.25	0.58
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	203	1629	729	413	2509	1122	274	25	321	214	0	321
Arrive On Green	0.46	0.46	0.00	0.21	0.71	0.71	0.20	0.20	0.20	0.20	0.00	0.20
Sat Flow, veh/h	343	3539	1583	1774	3539	1583	1135	125	1583	1078	0	1583
Grp Volume(v), veh/h	19	2028	0	395	1480	36	44	0	293	9	0	41
Grp Sat Flow(s),veh/h/ln	343	1770	1583	1774	1770	1583	1261	0	1583	1078	0	1583
Q Serve(g_s), s	5.0	73.0	0.0	30.8	33.2	1.1	4.0	0.0	28.7	1.1	0.0	3.4
Cycle Q Clear(g_c), s	5.0	73.0	0.0	30.8	33.2	1.1	7.3	0.0	28.7	8.4	0.0	3.4
Prop In Lane	1.00		1.00	1.00		1.00	0.91		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	203	1629	729	413	2509	1122	299	0	321	214	0	321
V/C Ratio(X)	0.09	1.24	0.00	0.96	0.59	0.03	0.15	0.00	0.91	0.04	0.00	0.13
Avail Cap(c_a), veh/h	203	1629	729	420	2509	1122	482	0	529	356	0	529
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	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.4	42.8	0.0	54.4	11.6	6.9	54.4	0.0	61.8	56.8	0.0	51.7
Incr Delay (d2), s/veh	0.4	115.4	0.0	32.3	0.6	0.0	0.2	0.0	13.1	0.1	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.9	111.0	0.0	28.3	22.8	0.9	3.0	0.0	19.8	0.6	0.0	2.7
LnGrp Delay(d),s/veh	24.9	158.2	0.0	86.7	12.1	6.9	54.7	0.0	74.9	56.9	0.0	51.9
LnGrp LOS	C	F		F	B	A	D		E	E		D
Approach Vol, veh/h		2047			1911			337			50	
Approach Delay, s/veh		157.0			27.5			72.3			52.8	
Approach LOS		F			C			E			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		119.4		39.2	39.4	80.0		39.2				
Change Period (Y+Rc), s		7.0		7.0	6.5	7.0		7.0				
Max Green Setting (Gmax), s		73.0		53.0	33.5	73.0		53.0				
Max Q Clear Time (g_c+I1), s		35.2		10.4	32.8	75.0		30.7				
Green Ext Time (p_c), s		37.7		1.6	0.1	0.0		1.5				
Intersection Summary												
HCM 2010 Ctrl Delay				92.2								
HCM 2010 LOS				F								

Timings
6: Burch Rd/Ginger Cake Rd & SR 54

Future Build PM
04/16/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	226	1751	20	26	1703	114	23	28	29	170	23
Future Volume (vph)	226	1751	20	26	1703	114	23	28	29	170	23
Lane Group Flow (vph)	240	1863	27	32	1738	127	28	36	36	185	304
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases	1	6		5	2			8			4
Permitted Phases	6		6	2		2	8		8	4	
Detector Phase	1	6	6	5	2	2	8	8	8	4	4
Switch Phase											
Minimum Initial (s)	8.0	12.0	12.0	8.0	12.0	12.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	13.5	31.6	31.6	13.5	26.6	26.6	40.3	40.3	40.3	38.3	38.3
Total Split (s)	25.0	80.0	80.0	25.0	80.0	80.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	17.2%	55.2%	55.2%	17.2%	55.2%	55.2%	27.6%	27.6%	27.6%	27.6%	27.6%
Yellow Time (s)	3.5	4.6	4.6	3.5	4.6	4.6	4.3	4.3	4.3	4.3	4.3
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	6.6	6.6	5.5	6.6	6.6	6.3	6.3	6.3	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag					
Lead-Lag Optimize?											
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None
v/c Ratio	0.85	0.79	0.02	0.18	0.88	0.14	0.50	0.11	0.11	0.78	0.64
Control Delay	64.8	21.2	0.1	10.2	33.4	8.8	80.5	46.2	2.1	74.1	18.6
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	64.8	21.2	0.1	10.2	33.4	8.8	80.5	46.2	2.1	74.1	18.6
Queue Length 50th (ft)	152	628	0	7	688	24	22	27	0	157	51
Queue Length 95th (ft)	#315	904	0	18	#1006	65	53	50	1	242	115
Internal Link Dist (ft)		497			426			210			310
Turn Bay Length (ft)	200		115	200		60	75		100	215	
Base Capacity (vph)	315	2368	1081	327	1973	912	82	477	456	350	588
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	0.76	0.79	0.02	0.10	0.88	0.14	0.34	0.08	0.08	0.53	0.52

Intersection Summary

Cycle Length: 145

Actuated Cycle Length: 132.3

Natural Cycle: 130

Control Type: Actuated-Uncoordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 6: Burch Rd/Ginger Cake Rd & SR 54

		
Ø1	Ø2	Ø4
25 s	80 s	40 s
		
Ø5	Ø6	Ø8
25 s	80 s	40 s

HCM 2010 Signalized Intersection Summary

6: Burch Rd/Ginger Cake Rd & SR 54

Future Build PM
04/16/2018

																		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR						
Lane Configurations																		
Traffic Volume (veh/h)	226	1751	20	26	1703	114	23	28	29	170	23	257						
Future Volume (veh/h)	226	1751	20	26	1703	114	23	28	29	170	23	257						
Number	1	6	16	5	2	12	3	8	18	7	4	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						
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900						
Adj Flow Rate, veh/h	240	1863	27	32	1738	127	28	36	36	185	28	276						
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	0						
Peak Hour Factor	0.94	0.94	0.75	0.82	0.98	0.90	0.83	0.78	0.81	0.92	0.83	0.93						
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2						
Cap, veh/h	267	2088	934	161	1840	823	107	427	363	337	34	334						
Arrive On Green	0.11	0.59	0.59	0.04	0.52	0.52	0.23	0.23	0.23	0.23	0.23	0.23						
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	1071	1863	1583	1323	148	1458						
Grp Volume(v), veh/h	240	1863	27	32	1738	127	28	36	36	185	0	304						
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1071	1863	1583	1323	0	1606						
Q Serve(g_s), s	12.5	60.2	0.9	1.1	61.2	5.5	3.4	2.0	2.4	16.9	0.0	23.8						
Cycle Q Clear(g_c), s	12.5	60.2	0.9	1.1	61.2	5.5	27.2	2.0	2.4	18.9	0.0	23.8						
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.91						
Lane Grp Cap(c), veh/h	267	2088	934	161	1840	823	107	427	363	337	0	368						
V/C Ratio(X)	0.90	0.89	0.03	0.20	0.94	0.15	0.26	0.08	0.10	0.55	0.00	0.83						
Avail Cap(c_a), veh/h	330	2088	934	348	1966	879	135	475	404	372	0	409						
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00						
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00						
Uniform Delay (d), s/veh	42.4	23.5	11.3	24.3	29.9	16.6	61.4	40.1	40.2	47.5	0.0	48.5						
Incr Delay (d2), s/veh	22.8	5.7	0.0	0.6	10.4	0.2	1.3	0.1	0.1	1.4	0.0	12.1						
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(95%),veh/ln	15.6	40.0	0.8	1.0	41.7	4.4	1.9	1.9	1.9	10.4	0.0	17.4						
LnGrp Delay(d),s/veh	65.2	29.1	11.3	24.9	40.3	16.8	62.7	40.1	40.3	48.9	0.0	60.5						
LnGrp LOS	E	C	B	C	D	B	E	D	D	D		E						
Approach Vol, veh/h	2130				1897				100									
Approach Delay, s/veh	33.0				38.5				46.5									
Approach LOS	C				D				D									
Timer	1	2	3	4	5	6	7	8										
Assigned Phs	1	2			4	5	6	8										
Phs Duration (G+Y+Rc), s	20.3	75.3			36.6	11.0	84.6	36.6										
Change Period (Y+Rc), s	5.5	6.6			6.3	5.5	6.6	6.3										
Max Green Setting (Gmax), s	19.5	73.4			33.7	19.5	73.4	33.7										
Max Q Clear Time (g_c+I1), s	14.5	63.2			25.8	3.1	62.2	29.2										
Green Ext Time (p_c), s	0.3	5.4			1.6	0.0	11.2	1.1										
Intersection Summary																		
HCM 2010 Ctrl Delay	38.0																	
HCM 2010 LOS	D																	
Notes																		

Timings

7: Oak St/Brandywine Blvd & SR 54

Future Build PM

04/16/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	27	2015	12	9	1808	71	7	0	146	3	51
Future Volume (vph)	27	2015	12	9	1808	71	7	0	146	3	51
Lane Group Flow (vph)	36	2056	22	13	1845	81	0	19	0	176	64
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	NA	Perm
Protected Phases	5	2		1	6			8		4	
Permitted Phases	2		2	6		6	8		4		4
Detector Phase	5	2	2	1	6	6	8	8	4	4	4
Switch Phase											
Minimum Initial (s)	8.0	12.0	12.0	8.0	12.0	12.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.5	24.5	24.5	13.5	24.5	24.5	39.1	39.1	39.1	39.1	39.1
Total Split (s)	30.0	80.0	80.0	30.0	80.0	80.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	20.0%	53.3%	53.3%	20.0%	53.3%	53.3%	26.7%	26.7%	26.7%	26.7%	26.7%
Yellow Time (s)	3.5	4.5	4.5	3.5	4.5	4.5	4.1	4.1	4.1	4.1	4.1
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
Total Lost Time (s)	5.5	6.5	6.5	5.5	6.5	6.5		6.1		6.1	6.1
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag					
Lead-Lag Optimize?											
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None
v/c Ratio	0.20	0.87	0.02	0.07	0.81	0.08		0.06		0.74	0.19
Control Delay	8.5	22.9	0.0	6.8	21.4	4.3		0.4		64.4	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0
Total Delay	8.5	22.9	0.0	6.8	21.4	4.3		0.4		64.4	10.9
Queue Length 50th (ft)	7	494	0	2	578	5		0		132	0
Queue Length 95th (ft)	17	#1102	0	7	837	28		0		169	27
Internal Link Dist (ft)		435			402			231		280	
Turn Bay Length (ft)	215		135	185		150					60
Base Capacity (vph)	425	2368	1080	427	2289	1046		480		393	512
Starvation Cap Reductn	0	0	0	0	0	0		0		0	0
Spillback Cap Reductn	0	0	0	0	0	0		0		0	0
Storage Cap Reductn	0	0	0	0	0	0		0		0	0
Reduced v/c Ratio	0.08	0.87	0.02	0.03	0.81	0.08		0.04		0.45	0.13

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 116.1

Natural Cycle: 140

Control Type: Actuated-Uncoordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 7: Oak St/Brandywine Blvd & SR 54

		
30 s	80 s	40 s
		
30 s	80 s	40 s

HCM 2010 Signalized Intersection Summary
7: Oak St/Brandywine Blvd & SR 54

Future Build PM
04/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	2015	12	9	1808	71	7	0	6	146	3	51
Future Volume (veh/h)	27	2015	12	9	1808	71	7	0	6	146	3	51
Number	5	2	12	1	6	16	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	36	2056	22	13	1845	81	9	0	10	172	4	0
Adj No. of Lanes	1	2	1	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.75	0.98	0.55	0.67	0.98	0.88	0.75	0.92	0.62	0.85	0.75	0.80
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	211	2375	1063	150	2288	1024	150	16	132	264	5	226
Arrive On Green	0.05	0.67	0.67	0.02	0.65	0.65	0.14	0.00	0.14	0.14	0.14	0.00
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	717	112	922	1399	33	1583
Grp Volume(v), veh/h	36	2056	22	13	1845	81	19	0	0	176	0	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1751	0	0	1432	0	1583
Q Serve(g_s), s	0.7	50.8	0.5	0.3	42.9	2.1	0.0	0.0	0.0	12.3	0.0	0.0
Cycle Q Clear(g_c), s	0.7	50.8	0.5	0.3	42.9	2.1	1.1	0.0	0.0	13.3	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.47		0.53	0.98		1.00
Lane Grp Cap(c), veh/h	211	2375	1063	150	2288	1024	298	0	0	268	0	226
V/C Ratio(X)	0.17	0.87	0.02	0.09	0.81	0.08	0.06	0.00	0.00	0.66	0.00	0.00
Avail Cap(c_a), veh/h	515	2375	1063	497	2335	1045	539	0	0	496	0	482
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	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	15.1	14.4	6.1	17.2	14.5	7.3	41.4	0.0	0.0	46.5	0.0	0.0
Incr Delay (d2), s/veh	0.4	3.9	0.0	0.2	2.5	0.1	0.1	0.0	0.0	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(95%),veh/ln	0.9	34.2	0.4	0.4	29.2	1.7	0.9	0.0	0.0	9.3	0.0	0.0
LnGrp Delay(d),s/veh	15.5	18.3	6.1	17.4	17.0	7.4	41.5	0.0	0.0	49.3	0.0	0.0
LnGrp LOS	B	B	A	B	B	A	D			D		
Approach Vol, veh/h		2114			1939			19			176	
Approach Delay, s/veh		18.1			16.6			41.5			49.3	
Approach LOS		B			B			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.1	81.3		22.0	10.9	78.5		22.0				
Change Period (Y+Rc), s	5.5	6.5		6.1	5.5	6.5		6.1				
Max Green Setting (Gmax), s	24.5	73.5		33.9	24.5	73.5		33.9				
Max Q Clear Time (g_c+I1), s	2.3	52.8		15.3	2.7	44.9		3.1				
Green Ext Time (p_c), s	0.0	20.7		0.6	0.1	27.2		0.7				
Intersection Summary												
HCM 2010 Ctrl Delay				18.8								
HCM 2010 LOS				B								

Timings 8: Grady Avenue/Sharon Drive & SR 54

Future Build PM

04/16/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	15	1255	894	161	1477	9	556	10	137	9	11
Future Volume (vph)	15	1255	894	161	1477	9	556	10	137	9	11
Lane Group Flow (vph)	23	1281	972	194	1492	13	0	603	171	0	36
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases		2		1	6			8			4
Permitted Phases	2		2	6		6	8		8	4	
Detector Phase	2	2	2	1	6	6	8	8	8	4	4
Switch Phase											
Minimum Initial (s)	12.0	12.0	12.0	6.0	12.0	12.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	35.0	35.0	35.0	12.4	31.0	31.0	39.0	39.0	39.0	37.0	37.0
Total Split (s)	51.0	51.0	51.0	20.0	71.0	71.0	39.0	39.0	39.0	39.0	39.0
Total Split (%)	46.4%	46.4%	46.4%	18.2%	64.5%	64.5%	35.5%	35.5%	35.5%	35.5%	35.5%
Yellow Time (s)	5.0	5.0	5.0	4.4	5.0	5.0	5.0	5.0	5.0	5.0	5.0
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
Total Lost Time (s)	7.0	7.0	7.0	6.4	7.0	7.0		7.0	7.0		7.0
Lead/Lag	Lag	Lag	Lag	Lead							
Lead-Lag Optimize?											
Recall Mode	C-Min	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None
v/c Ratio	0.22	0.87	0.96	0.76	0.72	0.01		1.58	0.30		0.17
Control Delay	28.5	37.2	33.9	41.8	19.2	0.0		302.2	8.9		25.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Delay	28.5	37.2	33.9	41.8	19.2	0.0		302.2	8.9		25.2
Queue Length 50th (ft)	10	434	334	81	377	0		~606	14		13
Queue Length 95th (ft)	22	#580	#677	141	463	0		#406	48		36
Internal Link Dist (ft)		459			478			455			183
Turn Bay Length (ft)	215		165	285		175					
Base Capacity (vph)	104	1478	1009	284	2059	937		382	562		215
Starvation Cap Reductn	0	0	0	0	0	0		0	0		0
Spillback Cap Reductn	0	0	0	0	0	0		0	0		0
Storage Cap Reductn	0	0	0	0	0	0		0	0		0
Reduced v/c Ratio	0.22	0.87	0.96	0.68	0.72	0.01		1.58	0.30		0.17

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 100 (91%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

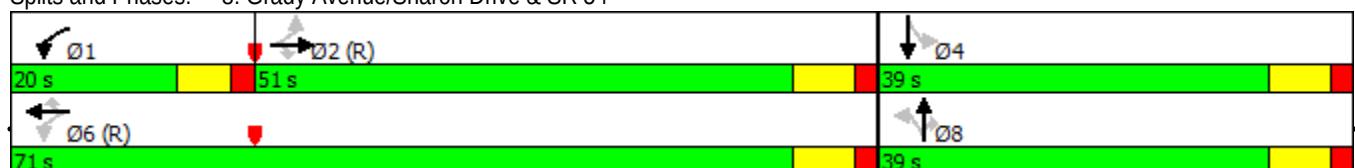
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 8: Grady Avenue/Sharon Drive & SR 54



HCM 2010 Signalized Intersection Summary
8: Grady Avenue/Sharon Drive & SR 54

Future Build PM

04/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	1255	894	161	1477	9	556	10	137	9	11	5
Future Volume (veh/h)	15	1255	894	161	1477	9	556	10	137	9	11	5
Number	5	2	12	1	6	16	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	23	1281	972	194	1492	13	585	18	0	13	13	0
Adj No. of Lanes	1	2	1	1	2	1	0	1	1	0	1	0
Peak Hour Factor	0.65	0.98	0.92	0.83	0.99	0.67	0.95	0.56	0.80	0.67	0.83	0.50
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	162	1577	705	226	2059	921	465	12	461	297	282	0
Arrive On Green	0.45	0.45	0.45	0.08	0.58	0.58	0.29	0.29	0.00	0.29	0.29	0.00
Sat Flow, veh/h	347	3539	1583	1774	3539	1583	1376	42	1583	852	968	0
Grp Volume(v), veh/h	23	1281	972	194	1492	13	603	0	0	26	0	0
Grp Sat Flow(s),veh/h/ln	347	1770	1583	1774	1770	1583	1419	0	1583	1820	0	0
Q Serve(g_s), s	5.6	34.6	49.0	6.4	33.5	0.4	30.9	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	24.2	34.6	49.0	6.4	33.5	0.4	32.0	0.0	0.0	1.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.97		1.00	0.50		0.00
Lane Grp Cap(c), veh/h	162	1577	705	226	2059	921	477	0	461	579	0	0
V/C Ratio(X)	0.14	0.81	1.38	0.86	0.72	0.01	1.26	0.00	0.00	0.04	0.00	0.00
Avail Cap(c_a), veh/h	162	1577	705	307	2059	921	477	0	461	579	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	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	30.8	26.5	30.5	24.7	16.6	9.7	41.0	0.0	0.0	28.0	0.0	0.0
Incr Delay (d2), s/veh	1.8	4.7	179.0	16.3	2.3	0.0	134.6	0.0	0.0	0.0	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	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.1	24.9	101.6	11.1	23.5	0.3	58.1	0.0	0.0	1.0	0.0	0.0
LnGrp Delay(d),s/veh	32.6	31.2	209.5	41.0	18.9	9.7	175.6	0.0	0.0	28.1	0.0	0.0
LnGrp LOS	C	C	F	D	B	A	F			C		
Approach Vol, veh/h	2276			1699			603			26		
Approach Delay, s/veh	107.3			21.3			175.6			28.1		
Approach LOS	F			C			F			C		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	15.0	56.0		39.0		71.0		39.0				
Change Period (Y+Rc), s	6.4	7.0		7.0		7.0		7.0				
Max Green Setting (Gmax), s	13.6	44.0		32.0		64.0		32.0				
Max Q Clear Time (g_c+I1), s	8.4	51.0		3.1		35.5		34.0				
Green Ext Time (p_c), s	0.3	0.0		2.6		28.4		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	84.1											
HCM 2010 LOS	F											

Intersection

Intersection Delay, s/veh67.5

Intersection LOS F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	8	8	11	187	18	65	8	389	210	41	300	6
Future Vol, veh/h	8	8	11	187	18	65	8	389	210	41	300	6
Peak Hour Factor	0.58	0.58	0.50	0.74	0.50	0.81	0.58	0.89	0.92	0.75	0.88	0.42
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	14	14	22	253	36	80	14	437	228	55	341	14
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	12.8	26.3	117.8	28
HCM LOS	B	D	F	D

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	1%	30%	69%	12%
Vol Thru, %	64%	30%	7%	86%
Vol Right, %	35%	41%	24%	2%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	607	27	270	347
LT Vol	8	8	187	41
Through Vol	389	8	18	300
RT Vol	210	11	65	6
Lane Flow Rate	679	50	369	410
Geometry Grp	1	1	1	1
Degree of Util (X)	1.174	0.112	0.708	0.749
Departure Headway (Hd)	6.222	8.684	7.373	6.989
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	591	416	494	521
Service Time	4.226	6.684	5.373	4.989
HCM Lane V/C Ratio	1.149	0.12	0.747	0.787
HCM Control Delay	117.8	12.8	26.3	28
HCM Lane LOS	F	B	D	D
HCM 95th-tile Q	23.4	0.4	5.5	6.4

Intersection						
Int Delay, s/veh	4.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	52	119	29	334	351	24
Future Vol, veh/h	52	119	29	334	351	24
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	-	-	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	88	65	66	58	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	58	135	45	506	605	32
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1200	605	605	0	-	0
Stage 1	605	-	-	-	-	-
Stage 2	595	-	-	-	-	-
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	204	498	973	-	-	-
Stage 1	545	-	-	-	-	-
Stage 2	551	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	191	498	973	-	-	-
Mov Cap-2 Maneuver	191	-	-	-	-	-
Stage 1	545	-	-	-	-	-
Stage 2	516	-	-	-	-	-
Approach	EB		NB		SB	
HCM Control Delay, s	29.5		0.7		0	
HCM LOS	D					
Minor Lane/Major Mvmt	NBL		NBT	EBLn1	SBT	SBR
Capacity (veh/h)	973		-	335	-	-
HCM Lane V/C Ratio	0.046		-	0.578	-	-
HCM Control Delay (s)	8.9		0	29.5	-	-
HCM Lane LOS	A		A	D	-	-
HCM 95th %tile Q(veh)	0.1		-	3.4	-	-

Intersection

Int Delay, s/veh 5.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	309	230	6	262	343
Future Vol, veh/h	7	309	230	6	262	343
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	0	250	-	400	225	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	50	89	82	42	79	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	347	280	14	332	423

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1367	280	0
Stage 1	280	-	-
Stage 2	1087	-	-
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	162	759	-
Stage 1	767	-	-
Stage 2	323	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	120	759	-
Mov Cap-2 Maneuver	120	-	-
Stage 1	767	-	-
Stage 2	239	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.7	0	3.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT
Capacity (veh/h)	-	- 120 759 1283	-	-
HCM Lane V/C Ratio	-	- 0.117 0.457 0.258	-	-
HCM Control Delay (s)	-	- 38.9 13.7 8.8	-	-
HCM Lane LOS	-	- E B A	-	-
HCM 95th %tile Q(veh)	-	- 0.4 2.4 1	-	-

Intersection

Int Delay, s/veh 6.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	21	303	298	256	255	17
Future Vol, veh/h	21	303	298	256	255	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	115	0	185	-	-	250
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	53	89	91	84	89	47
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	40	340	327	305	287	36

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1247	287	287
Stage 1	287	-	-
Stage 2	960	-	-
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	192	752	1275
Stage 1	762	-	-
Stage 2	372	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	143	752	1275
Mov Cap-2 Maneuver	143	-	-
Stage 1	762	-	-
Stage 2	277	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.4	4.6	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1275	-	143	752	-	-
HCM Lane V/C Ratio	0.257	-	0.277	0.453	-	-
HCM Control Delay (s)	8.8	-	39.6	13.7	-	-
HCM Lane LOS	A	-	E	B	-	-
HCM 95th %tile Q(veh)	1	-	1.1	2.4	-	-

Intersection						
Int Delay, s/veh	3.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	121	40	258	126	42	254
Future Vol, veh/h	121	40	258	126	42	254
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	Yield	-	None
Storage Length	0	100	-	150	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	132	43	280	137	46	276
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	647	280	0	0	280	0
Stage 1	280	-	-	-	-	-
Stage 2	367	-	-	-	-	-
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	436	759	-	-	1283	-
Stage 1	767	-	-	-	-	-
Stage 2	701	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	418	759	-	-	1283	-
Mov Cap-2 Maneuver	418	-	-	-	-	-
Stage 1	767	-	-	-	-	-
Stage 2	672	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	15.6	0	1.1			
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT		
Capacity (veh/h)	-	- 418 759 1283			-	
HCM Lane V/C Ratio	-	- 0.315 0.057 0.036			-	
HCM Control Delay (s)	-	- 17.5 10 7.9			0	
HCM Lane LOS	-	- C B A			A	
HCM 95th %tile Q(veh)	-	- 1.3 0.2 0.1			-	

Intersection						
Int Delay, s/veh	1.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↗		↗
Traffic Vol, veh/h	0	2172	1843	134	0	134
Future Vol, veh/h	0	2172	1843	134	0	134
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Yield
Storage Length	-	-	-	250	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	2361	2003	146	0	146
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	-	0	-	0	-	1002
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0	0	241
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	-	241
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		40.4		
HCM LOS				E		
Minor Lane/Major Mvmt	EBT	WBT	SBLn1			
Capacity (veh/h)	-	-	241			
HCM Lane V/C Ratio	-	-	0.604			
HCM Control Delay (s)	-	-	40.4			
HCM Lane LOS	-	-	E			
HCM 95th %tile Q(veh)	-	-	3.5			

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↗		↗
Traffic Vol, veh/h	0	2172	1854	125	0	124
Future Vol, veh/h	0	2172	1854	125	0	124
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Yield
Storage Length	-	-	-	250	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	2361	2015	136	0	135
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	-	0	-	0	-	1008
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0	0	239
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	-	239
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		37.9		
HCM LOS	E					
Minor Lane/Major Mvmt	EBT	WBT	SBLn1			
Capacity (veh/h)	-	-	239			
HCM Lane V/C Ratio	-	-	0.564			
HCM Control Delay (s)	-	-	37.9			
HCM Lane LOS	-	-	E			
HCM 95th %tile Q(veh)	-	-	3.1			

Future “Build” Improved Intersections Analysis

Timings

1: Private Drwy/Tyrone Rd & SR 54

Future Build AM - Improved

04/17/2018



Lane Group	EBL	EBT	WBT	WBR	NBT	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	34	1253	1319	368	1	530	0	37
Future Volume (vph)	34	1253	1319	368	1	530	0	37
Lane Group Flow (vph)	50	1478	1482	472	4	0	546	45
Turn Type	Perm	NA	NA	Perm	NA	Perm	NA	Perm
Protected Phases		2	6		8		4	
Permitted Phases	2			6		4		4
Detector Phase	2	2	6	6	8	4	4	4
Switch Phase								
Minimum Initial (s)	15.0	15.0	15.0	15.0	10.0	10.0	10.0	10.0
Minimum Split (s)	26.0	26.0	25.0	25.0	48.0	44.0	44.0	44.0
Total Split (s)	80.0	80.0	80.0	80.0	60.0	60.0	60.0	60.0
Total Split (%)	57.1%	57.1%	57.1%	57.1%	42.9%	42.9%	42.9%	42.9%
Yellow Time (s)	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	Min	Min	Min	Min	None	None	None	None
v/c Ratio	0.75	0.80	0.80	0.50	0.01		1.03	0.07
Control Delay	87.0	31.8	31.8	10.8	27.0		88.5	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	87.0	31.8	31.8	10.8	27.0		88.5	13.1
Queue Length 50th (ft)	34	565	568	113	2		~529	8
Queue Length 95th (ft)	#76	600	655	140	3		#758	30
Internal Link Dist (ft)		559	571		104		335	
Turn Bay Length (ft)	150			175				135
Base Capacity (vph)	67	1845	1845	949	705		532	618
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	0.75	0.80	0.80	0.50	0.01		1.03	0.07

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

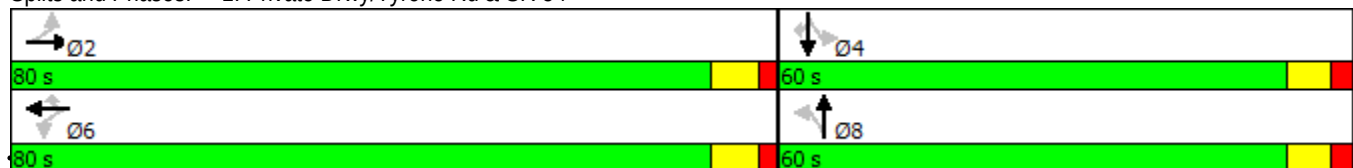
~ Volume exceeds capacity, queue is theoretically infinite.

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: Private Drwy/Tyrone Rd & SR 54



Baseline

Synchro 9 Report

Page 1

HCM 2010 Signalized Intersection Summary

1: Private Drwy/Tyrone Rd & SR 54

Future Build AM - Improved
04/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	1253	1	0	1319	368	0	1	0	530	0	37
Future Volume (veh/h)	34	1253	1	0	1319	368	0	1	0	530	0	37
Number	5	2	12	1	6	16	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	50	1474	4	0	1482	472	0	4	0	546	0	0
Adj No. of Lanes	1	2	0	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.68	0.85	0.25	0.92	0.89	0.78	0.92	0.25	0.92	0.97	0.92	0.82
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	91	1888	5	51	1845	826	0	705	0	582	0	599
Arrive On Green	0.52	0.52	0.52	0.00	0.52	0.52	0.00	0.38	0.00	0.38	0.00	0.00
Sat Flow, veh/h	224	3621	10	356	3539	1583	0	1863	0	1402	0	1583
Grp Volume(v), veh/h	50	720	758	0	1482	472	0	4	0	546	0	0
Grp Sat Flow(s),veh/h/ln	224	1770	1861	356	1770	1583	0	1863	0	1402	0	1583
Q Serve(g_s), s	24.7	46.0	46.0	0.0	48.3	28.5	0.0	0.2	0.0	52.8	0.0	0.0
Cycle Q Clear(g_c), s	73.0	46.0	46.0	0.0	48.3	28.5	0.0	0.2	0.0	53.0	0.0	0.0
Prop In Lane	1.00		0.01	1.00		1.00	0.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	91	923	970	51	1845	826	0	705	0	582	0	599
V/C Ratio(X)	0.55	0.78	0.78	0.00	0.80	0.57	0.00	0.01	0.00	0.94	0.00	0.00
Avail Cap(c_a), veh/h	91	923	970	51	1845	826	0	705	0	582	0	599
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	0.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	60.2	27.0	27.0	0.0	27.6	22.8	0.0	27.1	0.0	44.3	0.0	0.0
Incr Delay (d2), s/veh	11.7	5.0	4.8	0.0	3.0	1.6	0.0	0.0	0.0	23.1	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	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.0	31.7	33.1	0.0	32.3	18.7	0.0	0.2	0.0	33.0	0.0	0.0
LnGrp Delay(d),s/veh	71.9	32.1	31.9	0.0	30.6	24.4	0.0	27.1	0.0	67.4	0.0	0.0
LnGrp LOS	E	C	C		C	C		C		E		
Approach Vol, veh/h		1528			1954			4			546	
Approach Delay, s/veh		33.3			29.1			27.1			67.4	
Approach LOS		C			C			C			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		80.0		60.0		80.0		60.0				
Change Period (Y+Rc), s		7.0		7.0		7.0		7.0				
Max Green Setting (Gmax), s		73.0		53.0		73.0		53.0				
Max Q Clear Time (g_c+I1), s		75.0		55.0		50.3		2.2				
Green Ext Time (p_c), s		0.0		0.0		22.7		2.2				
Intersection Summary												
HCM 2010 Ctrl Delay				35.9								
HCM 2010 LOS				D								

Timings

2: Old Norton Rd/S Sandy Creek Rd & SR 54

Future Build AM - Improved

04/17/2018

											
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	61	1681	14	47	72	1771	290	41	25	261	16
Future Volume (vph)	61	1681	14	47	72	1771	290	41	25	261	16
Lane Group Flow (vph)	105	1751	19	0	129	1826	315	0	150	269	149
Turn Type	pm+pt	NA	Perm	pm+pt	pm+pt	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases	5	2		1	1	6			8	7	4
Permitted Phases	2		2	6	6		6	8		4	
Detector Phase	5	2	2	1	1	6	6	8	8	7	4
Switch Phase											
Minimum Initial (s)	6.0	12.0	12.0	6.0	6.0	12.0	12.0	8.0	8.0	5.0	8.0
Minimum Split (s)	12.0	26.0	26.0	13.5	13.5	25.0	25.0	46.3	46.3	11.0	46.3
Total Split (s)	20.0	85.0	85.0	35.0	35.0	100.0	100.0	30.0	30.0	30.0	60.0
Total Split (%)	11.1%	47.2%	47.2%	19.4%	19.4%	55.6%	55.6%	16.7%	16.7%	16.7%	33.3%
Yellow Time (s)	4.0	5.0	5.0	4.0	4.0	5.0	5.0	5.0	5.0	4.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.3	2.0	2.3
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)	6.0	7.0	7.0		6.0	7.0	7.0		7.3	6.0	7.3
Lead/Lag	Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lag	Lag	Lead	
Lead-Lag Optimize?								Yes	Yes	Yes	
Recall Mode	None	Min	Min	None	None	Min	Min	None	None	None	None
v/c Ratio	0.68	0.95	0.02		0.72	0.97	0.35		0.88	0.67	0.27
Control Delay	59.0	52.6	0.1		63.3	53.9	17.4		111.7	61.1	11.5
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	59.0	52.6	0.1		63.3	53.9	17.4		111.7	61.1	11.5
Queue Length 50th (ft)	68	1020	0		96	1084	142		161	259	18
Queue Length 95th (ft)	70	#1286	0		172	#1302	222		#264	365	44
Internal Link Dist (ft)		459				398			219		387
Turn Bay Length (ft)	200		185		175		100				
Base Capacity (vph)	185	1838	887		331	1886	889		188	401	579
Starvation Cap Reductn	0	0	0		0	0	0		0	0	0
Spillback Cap Reductn	0	0	0		0	0	0		0	0	0
Storage Cap Reductn	0	0	0		0	0	0		0	0	0
Reduced v/c Ratio	0.57	0.95	0.02		0.39	0.97	0.35		0.80	0.67	0.26

Intersection Summary

Cycle Length: 180

Actuated Cycle Length: 174.7

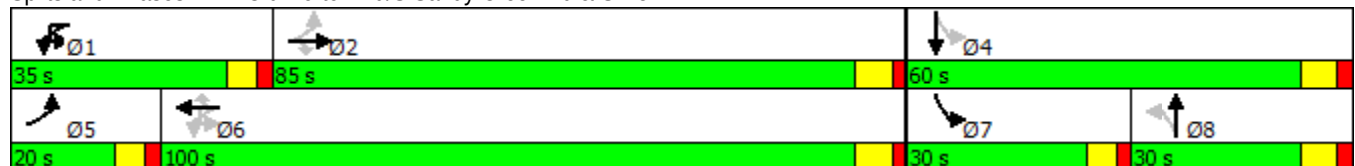
Natural Cycle: 150

Control Type: Actuated-Uncoordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 2: Old Norton Rd/S Sandy Creek Rd & SR 54



HCM Signalized Intersection Capacity Analysis

2: Old Norton Rd/S Sandy Creek Rd & SR 54

Future Build AM - Improved

04/17/2018

												
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	61	1681	14	47	72	1771	290	41	25	39	261	16
Future Volume (vph)	61	1681	14	47	72	1771	290	41	25	39	261	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	7.0	7.0		6.0	7.0	7.0		7.3		6.0	7.3
Lane Util. Factor	1.00	0.95	1.00		1.00	0.95	1.00		1.00		1.00	1.00
Frt	1.00	1.00	0.85		1.00	1.00	0.85		0.96		1.00	0.87
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00		0.98		0.95	1.00
Satd. Flow (prot)	1770	3539	1583		1770	3539	1583		1740		1770	1623
Flt Permitted	0.04	1.00	1.00		0.04	1.00	1.00		0.77		0.54	1.00
Satd. Flow (perm)	82	3539	1583		80	3539	1583		1374		1010	1623
Peak-hour factor, PHF	0.58	0.96	0.75	0.92	0.92	0.97	0.92	0.56	0.85	0.81	0.97	0.75
Adj. Flow (vph)	105	1751	19	51	78	1826	315	73	29	48	269	21
RTOR Reduction (vph)	0	0	9	0	0	0	46	0	10	0	0	91
Lane Group Flow (vph)	105	1751	10	0	129	1826	269	0	140	0	269	58
Turn Type	pm+pt	NA	Perm	pm+pt	pm+pt	NA	Perm	Perm	NA		pm+pt	NA
Protected Phases	5	2		1	1	6			8		7	4
Permitted Phases	2		2	6	6		6	8			4	
Actuated Green, G (s)	101.9	90.8	90.8		106.7	93.2	93.2		20.7		50.2	50.2
Effective Green, g (s)	101.9	90.8	90.8		106.7	93.2	93.2		20.7		50.2	50.2
Actuated g/C Ratio	0.58	0.52	0.52		0.61	0.53	0.53		0.12		0.29	0.29
Clearance Time (s)	6.0	7.0	7.0		6.0	7.0	7.0		7.3		6.0	7.3
Vehicle Extension (s)	3.0	5.0	5.0		3.0	5.0	5.0		3.0		3.0	3.0
Lane Grp Cap (vph)	154	1838	822		179	1886	844		162		392	466
v/s Ratio Prot	0.04	0.49			c0.06	c0.52					c0.09	0.04
v/s Ratio Perm	0.35		0.01		0.38		0.17		c0.10		0.10	
v/c Ratio	0.68	0.95	0.01		0.72	0.97	0.32		0.87		0.69	0.12
Uniform Delay, d1	47.2	40.0	20.3		52.7	39.4	22.9		75.7		53.4	46.0
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00
Incremental Delay, d2	11.8	12.0	0.0		13.3	14.1	0.5		35.2		4.9	0.1
Delay (s)	59.0	51.9	20.3		66.1	53.4	23.4		110.9		58.3	46.2
Level of Service	E	D	C		E	D	C		F		E	D
Approach Delay (s)		52.0				50.0			110.9			54.0
Approach LOS		D				D			F			D
Intersection Summary												
HCM 2000 Control Delay			53.1			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.91									
Actuated Cycle Length (s)			174.8			Sum of lost time (s)			26.3			
Intersection Capacity Utilization			92.0%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	88
Future Volume (vph)	88
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.69
Adj. Flow (vph)	128
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Timings

3: Lester Rd/Veterans Pkwy & SR 54

Future Build AM - Improved

04/17/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	149	1439	142	376	1300	77	208	197	268	35	137	77
Future Volume (vph)	149	1439	142	376	1300	77	208	197	268	35	137	77
Lane Group Flow (vph)	207	1713	233	522	1781	118	310	334	344	54	269	104
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6			2	8		8	4		4
Detector Phase	1	6	6	5	2	2	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	6.0	8.0	8.0	6.0	8.0	8.0
Minimum Split (s)	13.3	42.3	42.3	13.3	42.3	42.3	11.9	48.1	48.1	11.9	49.1	49.1
Total Split (s)	20.0	70.0	70.0	25.0	75.0	75.0	15.0	40.0	40.0	15.0	40.0	40.0
Total Split (%)	13.3%	46.7%	46.7%	16.7%	50.0%	50.0%	10.0%	26.7%	26.7%	10.0%	26.7%	26.7%
Yellow Time (s)	5.3	5.3	5.3	5.3	5.3	5.3	3.9	5.1	5.1	3.9	5.1	5.1
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)	7.3	7.3	7.3	7.3	7.3	7.3	5.9	7.1	7.1	5.9	7.1	7.1
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None
v/c Ratio	0.92	1.03	0.28	1.15	0.99	0.14	1.11	0.58	0.75	0.32	0.66	0.35
Control Delay	81.0	66.1	8.4	140.9	53.0	3.1	134.4	56.7	27.7	47.2	65.0	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	0.0
Total Delay	81.0	66.1	8.4	140.9	53.0	3.1	134.4	56.7	27.7	47.2	65.0	8.3
Queue Length 50th (ft)	126	~821	34	~269	770	0	~306	146	88	37	118	0
Queue Length 95th (ft)	#201	#965	32	#298	703	4	243	123	134	52	93	10
Internal Link Dist (ft)		707			648			447			501	
Turn Bay Length (ft)	230		350	235		215	250		250	300		275
Base Capacity (vph)	224	1659	827	454	1792	863	280	870	570	205	870	485
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	0.92	1.03	0.28	1.15	0.99	0.14	1.11	0.38	0.60	0.26	0.31	0.21

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 133.9

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

~ 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: 3: Lester Rd/Veterans Pkwy & SR 54



Baseline

Synchro 9 Report

Page 10

HCM 2010 Signalized Intersection Summary

3: Lester Rd/Veterans Pkwy & SR 54

Future Build AM - Improved
04/17/2018

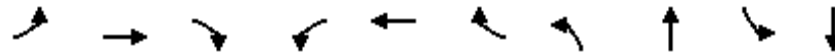
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	149	1439	142	376	1300	77	208	197	268	35	137	77
Future Volume (veh/h)	149	1439	142	376	1300	77	208	197	268	35	137	77
Number	1	6	16	5	2	12	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	207	1713	0	522	1781	0	310	334	0	54	269	0
Adj No. of Lanes	1	2	1	2	2	1	1	2	1	1	2	1
Peak Hour Factor	0.72	0.84	0.61	0.72	0.73	0.65	0.67	0.59	0.78	0.65	0.51	0.74
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	232	1711	766	470	1869	836	205	412	185	150	343	154
Arrive On Green	0.09	0.48	0.00	0.14	0.53	0.00	0.07	0.12	0.00	0.05	0.10	0.00
Sat Flow, veh/h	1774	3539	1583	3442	3539	1583	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	207	1713	0	522	1781	0	310	334	0	54	269	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1721	1770	1583	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	9.9	62.7	0.0	17.7	62.0	0.0	9.1	11.9	0.0	0.0	9.6	0.0
Cycle Q Clear(g_c), s	9.9	62.7	0.0	17.7	62.0	0.0	9.1	11.9	0.0	0.0	9.6	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	232	1711	766	470	1869	836	205	412	185	150	343	154
V/C Ratio(X)	0.89	1.00	0.00	1.11	0.95	0.00	1.51	0.81	0.00	0.36	0.78	0.00
Avail Cap(c_a), veh/h	243	1711	766	470	1869	836	205	898	402	185	898	402
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	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	37.8	33.5	0.0	56.0	29.1	0.0	58.3	55.9	0.0	58.4	57.2	0.0
Incr Delay (d2), s/veh	30.6	22.0	0.0	75.4	11.9	0.0	253.6	3.8	0.0	1.4	3.9	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(95%),veh/ln	14.3	64.2	0.0	23.9	42.7	0.0	39.1	10.1	0.0	3.4	8.5	0.0
LnGrp Delay(d),s/veh	68.4	55.5	0.0	131.4	40.9	0.0	311.9	59.7	0.0	59.8	61.2	0.0
LnGrp LOS	E	F		F	D		F	E		E	E	
Approach Vol, veh/h		1920			2303			644			323	
Approach Delay, s/veh		56.9			61.4			181.1			60.9	
Approach LOS		E			E			F			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.2	75.8	15.0	19.7	25.0	70.0	12.5	22.2				
Change Period (Y+Rc), s	7.3	7.3	5.9	7.1	7.3	7.3	5.9	7.1				
Max Green Setting (Gmax), s	12.7	67.7	9.1	32.9	17.7	62.7	9.1	32.9				
Max Q Clear Time (g_c+I1), s	11.9	64.0	11.1	11.6	19.7	64.7	2.0	13.9				
Green Ext Time (p_c), s	0.1	3.7	0.0	0.9	0.0	0.0	0.7	1.2				
Intersection Summary												
HCM 2010 Ctrl Delay			74.6									
HCM 2010 LOS			E									
Notes												

Timings

Future Build AM - Improved

4: Togwatee Village Pkwy/Piedmont Fayette & SR 54

04/17/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	225	1585	53	113	1512	145	21	1	45	6
Future Volume (vph)	225	1585	53	113	1512	145	21	1	45	6
Lane Group Flow (vph)	253	1742	68	145	1758	161	27	45	67	63
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	NA
Protected Phases	1	6		5	2			4		8
Permitted Phases	6		6	2		2	4		8	
Detector Phase	1	6	6	5	2	2	4	4	8	8
Switch Phase										
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.7	33.0	33.0	11.7	32.0	32.0	50.0	50.0	48.0	48.0
Total Split (s)	40.0	80.0	80.0	40.0	80.0	80.0	60.0	60.0	60.0	60.0
Total Split (%)	22.2%	44.4%	44.4%	22.2%	44.4%	44.4%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.7	5.0	5.0	3.7	5.0	5.0	5.0	5.0	5.0	5.0
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)	5.7	7.0	7.0	5.7	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?										
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None
v/c Ratio	0.79	0.76	0.07	0.58	0.84	0.17	0.20	0.23	0.49	0.30
Control Delay	51.5	19.2	3.4	28.6	26.3	8.7	56.2	20.4	66.5	21.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.5	19.2	3.4	28.6	26.3	8.7	56.2	20.4	66.5	21.4
Queue Length 50th (ft)	140	461	2	35	551	33	20	3	51	7
Queue Length 95th (ft)	243	721	17	88	786	83	46	0	77	22
Internal Link Dist (ft)		467			430			239		153
Turn Bay Length (ft)	200		200	300		150			50	
Base Capacity (vph)	542	2283	1042	567	2100	963	574	716	584	731
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	0.47	0.76	0.07	0.26	0.84	0.17	0.05	0.06	0.11	0.09

Intersection Summary

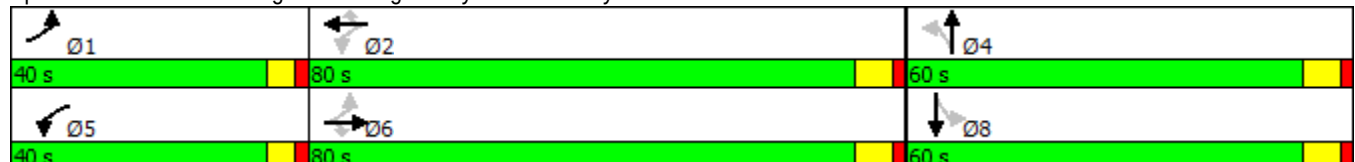
Cycle Length: 180

Actuated Cycle Length: 123.5

Natural Cycle: 145

Control Type: Actuated-Uncoordinated

Splits and Phases: 4: Togwatee Village Pkwy/Piedmont Fayette & SR 54



HCM 2010 Signalized Intersection Summary
4: Togwatee Village Pkwy/Piedmont Fayette & SR 54

Future Build AM - Improved
04/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	225	1585	53	113	1512	145	21	1	33	45	6	21
Future Volume (veh/h)	225	1585	53	113	1512	145	21	1	33	45	6	21
Number	1	6	16	5	2	12	7	4	14	3	8	18
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	253	1742	0	145	1758	0	27	4	0	67	10	0
Adj No. of Lanes	1	2	1	1	2	1	1	1	0	1	1	0
Peak Hour Factor	0.89	0.91	0.78	0.78	0.86	0.90	0.79	0.25	0.81	0.67	0.62	0.40
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	292	2401	1074	263	2309	1033	182	164	0	186	164	0
Arrive On Green	0.08	0.68	0.00	0.05	0.65	0.00	0.09	0.09	0.00	0.09	0.09	0.00
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	1399	1863	0	1407	1863	0
Grp Volume(v), veh/h	253	1742	0	145	1758	0	27	4	0	67	10	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1399	1863	0	1407	1863	0
Q Serve(g_s), s	6.0	34.2	0.0	2.9	37.6	0.0	2.0	0.2	0.0	5.0	0.5	0.0
Cycle Q Clear(g_c), s	6.0	34.2	0.0	2.9	37.6	0.0	2.5	0.2	0.0	5.2	0.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	292	2401	1074	263	2309	1033	182	164	0	186	164	0
V/C Ratio(X)	0.87	0.73	0.00	0.55	0.76	0.00	0.15	0.02	0.00	0.36	0.06	0.00
Avail Cap(c_a), veh/h	705	2401	1074	722	2356	1054	735	900	0	743	900	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	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	24.4	11.2	0.0	14.6	13.2	0.0	47.0	45.7	0.0	48.1	45.9	0.0
Incr Delay (d2), s/veh	7.7	1.4	0.0	1.8	1.8	0.0	0.4	0.1	0.0	1.2	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(95%),veh/ln	12.7	23.7	0.0	4.9	25.7	0.0	1.4	0.2	0.0	3.6	0.5	0.0
LnGrp Delay(d),s/veh	32.1	12.5	0.0	16.4	14.9	0.0	47.4	45.8	0.0	49.3	46.0	0.0
LnGrp LOS	C	B		B	B		D	D		D	D	
Approach Vol, veh/h		1995			1903			31			77	
Approach Delay, s/veh		15.0			15.0			47.2			48.9	
Approach LOS		B			B			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.5	78.6		16.6	11.6	81.4		16.6				
Change Period (Y+Rc), s	* 5.7	7.0		7.0	* 5.7	7.0		7.0				
Max Green Setting (Gmax), s	* 34	73.0		53.0	* 34	73.0		53.0				
Max Q Clear Time (g_c+I1), s	8.0	39.6		4.5	4.9	36.2		7.2				
Green Ext Time (p_c), s	0.8	31.9		0.4	0.4	36.8		0.4				
Intersection Summary												
HCM 2010 Ctrl Delay			15.9									
HCM 2010 LOS			B									
Notes												

Timings 5: Ebenezer Rd/Brittany Way & SR 54

Future Build AM - Improved

04/17/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	5	1250	27	176	1079	7	45	1	304	36	1
Future Volume (vph)	5	1250	27	176	1079	7	45	1	304	36	1
Lane Group Flow (vph)	10	1543	36	226	1148	18	0	58	334	40	35
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	pm+ov	Perm	NA
Protected Phases		6		5	2			8	5		4
Permitted Phases	6		6	2		2	8		8	4	
Detector Phase	6	6	6	5	2	2	8	8	5	4	4
Switch Phase											
Minimum Initial (s)	15.0	15.0	15.0	8.0	15.0	15.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	26.0	26.0	26.0	14.5	26.0	26.0	48.0	48.0	14.5	43.0	43.0
Total Split (s)	80.0	80.0	80.0	25.0	105.0	105.0	45.0	45.0	25.0	45.0	45.0
Total Split (%)	53.3%	53.3%	53.3%	16.7%	70.0%	70.0%	30.0%	30.0%	16.7%	30.0%	30.0%
Yellow Time (s)	5.0	5.0	5.0	4.5	5.0	5.0	5.0	5.0	4.5	5.0	5.0
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
Total Lost Time (s)	7.0	7.0	7.0	6.5	7.0	7.0		7.0	6.5	7.0	7.0
Lead/Lag	Lag	Lag	Lag	Lead					Lead		
Lead-Lag Optimize?											
Recall Mode	Min	Min	Min	None	Min	Min	None	None	None	None	None
v/c Ratio	0.04	0.71	0.04	0.60	0.39	0.01		0.48	0.74	0.33	0.20
Control Delay	11.8	19.4	0.1	25.5	3.9	0.7		66.7	46.0	59.8	22.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Delay	11.8	19.4	0.1	25.5	3.9	0.7		66.7	46.0	59.8	22.1
Queue Length 50th (ft)	3	435	0	74	115	0		45	215	30	3
Queue Length 95th (ft)	7	473	0	131	174	0		23	322	67	0
Internal Link Dist (ft)		617			769			306			341
Turn Bay Length (ft)	200		200	200		200					
Base Capacity (vph)	282	2171	1000	382	2915	1309		425	458	427	536
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	0.04	0.71	0.04	0.59	0.39	0.01		0.14	0.73	0.09	0.07

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 119.6

Natural Cycle: 130

Control Type: Actuated-Uncoordinated

Splits and Phases: 5: Ebenezer Rd/Brittany Way & SR 54

			
Ø2			Ø4
105 s			45 s
			
Ø5	Ø6		Ø8
25 s	80 s		45 s

HCM 2010 Signalized Intersection Summary

5: Ebenezer Rd/Brittany Way & SR 54

Future Build AM - Improved
04/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	1250	27	176	1079	7	45	1	304	36	1	19
Future Volume (veh/h)	5	1250	27	176	1079	7	45	1	304	36	1	19
Number	1	6	16	5	2	12	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	10	1543	0	226	1148	18	54	4	334	40	4	31
Adj No. of Lanes	1	2	1	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.50	0.81	0.75	0.78	0.94	0.38	0.83	0.25	0.91	0.89	0.25	0.61
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	306	1992	891	254	2412	1079	308	21	454	224	40	308
Arrive On Green	0.56	0.56	0.00	0.07	0.68	0.68	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	480	3539	1583	1774	3539	1583	1192	98	1583	1038	184	1427
Grp Volume(v), veh/h	10	1543	0	226	1148	18	58	0	334	40	0	35
Grp Sat Flow(s),veh/h/ln	480	1770	1583	1774	1770	1583	1290	0	1583	1038	0	1611
Q Serve(g_s), s	1.4	46.0	0.0	7.2	20.8	0.5	4.5	0.0	26.0	4.6	0.0	2.4
Cycle Q Clear(g_c), s	6.0	46.0	0.0	7.2	20.8	0.5	6.9	0.0	26.0	11.5	0.0	2.4
Prop In Lane	1.00		1.00	1.00		1.00	0.93		1.00	1.00		0.89
Lane Grp Cap(c), veh/h	306	1992	891	254	2412	1079	329	0	454	224	0	347
V/C Ratio(X)	0.03	0.77	0.00	0.89	0.48	0.02	0.18	0.00	0.74	0.18	0.00	0.10
Avail Cap(c_a), veh/h	306	1992	891	369	2548	1140	418	0	554	290	0	450
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	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.4	23.1	0.0	27.8	10.2	7.0	45.4	0.0	43.9	49.4	0.0	42.8
Incr Delay (d2), s/veh	0.1	2.3	0.0	16.8	0.3	0.0	0.3	0.0	4.0	0.4	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(95%),veh/ln	0.3	30.8	0.0	14.6	15.4	0.4	3.3	0.0	17.5	2.4	0.0	1.9
LnGrp Delay(d),s/veh	15.5	25.4	0.0	44.6	10.5	7.0	45.7	0.0	47.9	49.7	0.0	42.9
LnGrp LOS	B	C		D	B	A	D		D	D		D
Approach Vol, veh/h		1553			1392			392			75	
Approach Delay, s/veh		25.3			16.0			47.6			46.6	
Approach LOS		C			B			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		99.8		36.4	16.2	83.6		36.4				
Change Period (Y+Rc), s		7.0		7.0	6.5	7.0		7.0				
Max Green Setting (Gmax), s		98.0		38.0	18.5	73.0		38.0				
Max Q Clear Time (g_c+I1), s		22.8		13.5	9.2	48.0		28.0				
Green Ext Time (p_c), s		70.0		1.9	0.5	25.0		1.4				
Intersection Summary												
HCM 2010 Ctrl Delay				24.5								
HCM 2010 LOS				C								
Notes												

Timings
6: Burch Rd/Ginger Cake Rd & SR 54

Future Build AM - Improved

04/17/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	318	1460	19	29	1777	106	32	25	33	153	16	336
Future Volume (vph)	318	1460	19	29	1777	106	32	25	33	153	16	336
Lane Group Flow (vph)	408	1490	40	45	1871	126	41	41	55	180	23	431
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases	6		6	2		2	8		8	4		4
Detector Phase	1	6	6	5	2	2	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	8.0	12.0	12.0	8.0	12.0	12.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	13.5	31.6	31.6	13.5	26.6	26.6	40.3	40.3	40.3	38.3	38.3	38.3
Total Split (s)	25.0	80.0	80.0	25.0	80.0	80.0	40.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	17.2%	55.2%	55.2%	17.2%	55.2%	55.2%	27.6%	27.6%	27.6%	27.6%	27.6%	27.6%
Yellow Time (s)	3.5	4.6	4.6	3.5	4.6	4.6	4.3	4.3	4.3	4.3	4.3	4.3
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	6.6	6.6	5.5	6.6	6.6	6.3	6.3	6.3	6.3	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None
v/c Ratio	1.32	0.65	0.04	0.19	0.98	0.14	0.16	0.12	0.16	0.73	0.07	0.90
Control Delay	202.4	18.5	0.9	9.7	47.6	9.2	47.2	46.0	7.5	69.7	44.9	47.1
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	202.4	18.5	0.9	9.7	47.6	9.2	47.2	46.0	7.5	69.7	44.9	47.1
Queue Length 50th (ft)	~420	431	0	10	832	25	31	31	0	152	17	185
Queue Length 95th (ft)	#547	594	0	19	#1141	58	56	43	2	221	32	230
Internal Link Dist (ft)		497			426			210			310	
Turn Bay Length (ft)	200		115	200		60	75		100	215		150
Base Capacity (vph)	308	2286	1046	388	1910	884	342	461	443	337	461	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	1.32	0.65	0.04	0.12	0.98	0.14	0.12	0.09	0.12	0.53	0.05	0.76

Intersection Summary

Cycle Length: 145

Actuated Cycle Length: 136.4

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

~ 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: Burch Rd/Ginger Cake Rd & SR 54



Baseline

Synchro 9 Report

Page 22

HCM 2010 Signalized Intersection Summary

6: Burch Rd/Ginger Cake Rd & SR 54

Future Build AM - Improved
04/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	318	1460	19	29	1777	106	32	25	33	153	16	336
Future Volume (veh/h)	318	1460	19	29	1777	106	32	25	33	153	16	336
Number	1	6	16	5	2	12	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	408	1490	40	45	1871	126	41	41	55	180	23	0
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.78	0.98	0.47	0.65	0.95	0.84	0.78	0.61	0.60	0.85	0.70	0.78
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	317	2256	1009	266	1913	856	284	329	280	258	329	280
Arrive On Green	0.15	0.64	0.64	0.05	0.54	0.54	0.18	0.18	0.18	0.18	0.18	0.00
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	1383	1863	1583	1294	1863	1583
Grp Volume(v), veh/h	408	1490	40	45	1871	126	41	41	55	180	23	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1383	1863	1583	1294	1863	1583
Q Serve(g_s), s	19.5	35.3	1.3	1.4	69.0	5.3	3.4	2.5	4.0	18.2	1.4	0.0
Cycle Q Clear(g_c), s	19.5	35.3	1.3	1.4	69.0	5.3	4.8	2.5	4.0	20.7	1.4	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	317	2256	1009	266	1913	856	284	329	280	258	329	280
V/C Ratio(X)	1.29	0.66	0.04	0.17	0.98	0.15	0.14	0.12	0.20	0.70	0.07	0.00
Avail Cap(c_a), veh/h	317	2256	1009	439	1939	868	387	469	398	355	469	398
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	47.9	15.2	9.0	13.8	30.0	15.4	48.0	46.4	47.0	55.1	46.0	0.0
Incr Delay (d2), s/veh	150.4	1.0	0.0	0.3	15.7	0.2	0.2	0.2	0.3	3.5	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(95%),veh/ln	45.0	24.3	1.0	1.3	47.7	4.2	2.4	2.3	3.2	11.0	1.3	0.0
LnGrp Delay(d),s/veh	198.3	16.2	9.1	14.1	45.7	15.5	48.2	46.6	47.4	58.7	46.1	0.0
LnGrp LOS	F	B	A	B	D	B	D	D	D	E	D	
Approach Vol, veh/h		1938			2042			137			203	
Approach Delay, s/veh		54.4			43.1			47.4			57.2	
Approach LOS		D			D			D			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	25.0	79.0		30.0	12.0	92.0		30.0				
Change Period (Y+Rc), s	5.5	6.6		6.3	5.5	6.6		6.3				
Max Green Setting (Gmax), s	19.5	73.4		33.7	19.5	73.4		33.7				
Max Q Clear Time (g_c+I1), s	21.5	71.0		22.7	3.4	37.3		6.8				
Green Ext Time (p_c), s	0.0	1.4		1.0	0.1	36.0		1.3				
Intersection Summary												
HCM 2010 Ctrl Delay			49.0									
HCM 2010 LOS			D									
Notes												

Timings

7: Oak St/Brandywine Blvd & SR 54

Future Build AM - Improved

04/17/2018



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	30	1554	9	1929	113	6	0	79	0	7
Future Volume (vph)	30	1554	9	1929	113	6	0	79	0	7
Lane Group Flow (vph)	40	1653	10	2120	192	0	33	0	86	9
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	NA	Perm
Protected Phases	5	2	1	6			8		4	
Permitted Phases	2		6		6	8		4		4
Detector Phase	5	2	1	6	6	8	8	4	4	4
Switch Phase										
Minimum Initial (s)	8.0	12.0	8.0	12.0	12.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.5	24.5	13.5	24.5	24.5	39.1	39.1	39.1	39.1	39.1
Total Split (s)	30.0	80.0	30.0	80.0	80.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	20.0%	53.3%	20.0%	53.3%	53.3%	26.7%	26.7%	26.7%	26.7%	26.7%
Yellow Time (s)	3.5	4.5	3.5	4.5	4.5	4.1	4.1	4.1	4.1	4.1
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
Total Lost Time (s)	5.5	6.5	5.5	6.5	6.5		6.1		6.1	6.1
Lead/Lag	Lead	Lag	Lead	Lag	Lag					
Lead-Lag Optimize?										
Recall Mode	None	Min	None	Min	Min	None	None	None	None	None
v/c Ratio	0.21	0.62	0.04	0.86	0.17		0.15		0.55	0.04
Control Delay	7.0	9.2	3.7	19.3	5.3		3.6		59.8	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0
Total Delay	7.0	9.2	3.7	19.3	5.3		3.6		59.8	0.3
Queue Length 50th (ft)	5	214	1	626	32		0		60	0
Queue Length 95th (ft)	12	515	6	#970	35		8		113	0
Internal Link Dist (ft)		435		402			231		280	
Turn Bay Length (ft)	215		185		150					60
Base Capacity (vph)	440	2647	505	2478	1127		488		418	528
Starvation Cap Reductn	0	0	0	0	0		0		0	0
Spillback Cap Reductn	0	0	0	0	0		0		0	0
Storage Cap Reductn	0	0	0	0	0		0		0	0
Reduced v/c Ratio	0.09	0.62	0.02	0.86	0.17		0.07		0.21	0.02

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 111.2

Natural Cycle: 140

Control Type: Actuated-Uncoordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 7: Oak St/Brandywine Blvd & SR 54



HCM 2010 Signalized Intersection Summary
7: Oak St/Brandywine Blvd & SR 54

Future Build AM - Improved

04/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	1554	0	9	1929	113	6	0	6	79	0	7
Future Volume (veh/h)	30	1554	0	9	1929	113	6	0	6	79	0	7
Number	5	2	12	1	6	16	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	40	1653	0	10	2120	192	14	0	19	86	0	0
Adj No. of Lanes	1	2	1	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.75	0.94	0.92	0.92	0.91	0.59	0.42	0.92	0.31	0.92	0.92	0.75
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	195	2538	1135	244	2420	1083	96	17	88	203	0	146
Arrive On Green	0.05	0.72	0.00	0.02	0.68	0.68	0.09	0.00	0.09	0.09	0.00	0.00
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	517	187	956	1464	0	1583
Grp Volume(v), veh/h	40	1653	0	10	2120	192	33	0	0	86	0	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1660	0	0	1464	0	1583
Q Serve(g_s), s	0.6	26.1	0.0	0.2	49.8	4.6	0.0	0.0	0.0	3.9	0.0	0.0
Cycle Q Clear(g_c), s	0.6	26.1	0.0	0.2	49.8	4.6	1.9	0.0	0.0	5.8	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.42		0.58	1.00		1.00
Lane Grp Cap(c), veh/h	195	2538	1135	244	2420	1083	201	0	0	203	0	146
V/C Ratio(X)	0.21	0.65	0.00	0.04	0.88	0.18	0.16	0.00	0.00	0.42	0.00	0.00
Avail Cap(c_a), veh/h	514	2538	1135	622	2469	1104	547	0	0	522	0	509
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	19.5	7.9	0.0	7.2	13.1	6.0	44.3	0.0	0.0	45.9	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.8	0.0	0.1	4.1	0.2	0.4	0.0	0.0	1.4	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(95%),veh/ln	1.4	18.8	0.0	0.2	33.5	3.6	1.6	0.0	0.0	4.5	0.0	0.0
LnGrp Delay(d),s/veh	20.0	8.7	0.0	7.3	17.3	6.2	44.7	0.0	0.0	47.3	0.0	0.0
LnGrp LOS	C	A		A	B	A	D			D		
Approach Vol, veh/h	1693			2322			33			86		
Approach Delay, s/veh	9.0			16.3			44.7			47.3		
Approach LOS	A			B			D			D		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.5	82.1		15.8	11.0	78.6		15.8				
Change Period (Y+Rc), s	5.5	6.5		6.1	5.5	6.5		6.1				
Max Green Setting (Gmax), s	24.5	73.5		33.9	24.5	73.5		33.9				
Max Q Clear Time (g_c+I1), s	2.2	28.1		7.8	2.6	51.8		3.9				
Green Ext Time (p_c), s	0.0	45.2		0.4	0.1	20.3		0.4				
Intersection Summary												
HCM 2010 Ctrl Delay				14.2								
HCM 2010 LOS				B								

Timings 8: Grady Avenue/Sharon Drive & SR 54

Future Build AM - Improved

04/17/2018

										
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT
Lane Configurations										
Traffic Volume (vph)	14	1184	572	219	1451	6	757	0	222	17
Future Volume (vph)	14	1184	572	219	1451	6	757	0	222	17
Lane Group Flow (vph)	23	1361	689	292	1511	14	430	430	281	67
Turn Type	Perm	NA	pm+ov	pm+pt	NA	Perm	Split	NA	Perm	NA
Protected Phases		2	3	1	6		3	3		4
Permitted Phases	2		2	6		6			3	
Detector Phase	2	2	3	1	6	6	3	3	3	4
Switch Phase										
Minimum Initial (s)	12.0	12.0	8.0	6.0	12.0	12.0	8.0	8.0	8.0	8.0
Minimum Split (s)	35.0	35.0	39.0	12.4	31.0	31.0	39.0	39.0	39.0	37.0
Total Split (s)	45.0	45.0	35.0	20.0	65.0	65.0	35.0	35.0	35.0	20.0
Total Split (%)	37.5%	37.5%	29.2%	16.7%	54.2%	54.2%	29.2%	29.2%	29.2%	16.7%
Yellow Time (s)	5.0	5.0	5.0	4.4	5.0	5.0	5.0	5.0	5.0	5.0
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)	7.0	7.0	7.0	6.4	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lag	Lag	Lead	Lead			Lead	Lead	Lead	Lag
Lead-Lag Optimize?			Yes				Yes	Yes	Yes	Yes
Recall Mode	C-Min	C-Min	None	None	C-Min	C-Min	None	None	None	None
v/c Ratio	0.34	1.04	0.58	1.10	0.80	0.02	1.10	1.10	0.52	0.44
Control Delay	48.5	74.8	6.5	117.3	28.0	0.0	117.4	117.4	12.4	51.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.5	74.8	6.5	117.3	28.0	0.0	117.4	117.4	12.4	51.6
Queue Length 50th (ft)	13	~630	89	~209	502	0	~396	~396	32	41
Queue Length 95th (ft)	27	#773	155	#287	650	0	#588	#608	72	55
Internal Link Dist (ft)		459			478			455		183
Turn Bay Length (ft)	215		165	285		175			200	
Base Capacity (vph)	67	1305	1190	265	1895	894	392	392	545	202
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	0.34	1.04	0.58	1.10	0.80	0.02	1.10	1.10	0.52	0.33

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 10 (8%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 145

Control Type: Actuated-Coordinated

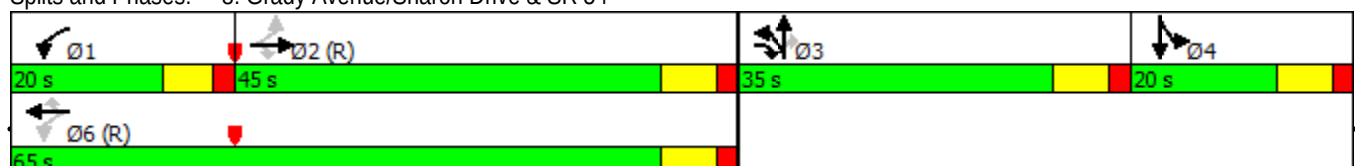
~ Volume exceeds capacity, queue is theoretically infinite.

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: 8: Grady Avenue/Sharon Drive & SR 54



HCM Signalized Intersection Capacity Analysis

8: Grady Avenue/Sharon Drive & SR 54

Future Build AM - Improved

04/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	1184	572	219	1451	6	757	0	222	11	17	10
Future Volume (vph)	14	1184	572	219	1451	6	757	0	222	11	17	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	6.4	7.0	7.0	7.0	7.0	7.0		7.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00		0.98	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1681	1681	1583		1766	
Flt Permitted	0.10	1.00	1.00	0.08	1.00	1.00	0.95	0.95	1.00		0.98	
Satd. Flow (perm)	184	3539	1583	151	3539	1583	1681	1681	1583		1766	
Peak-hour factor, PHF	0.60	0.87	0.83	0.75	0.96	0.42	0.88	0.92	0.79	0.50	0.62	0.56
Adj. Flow (vph)	23	1361	689	292	1511	14	860	0	281	22	27	18
RTOR Reduction (vph)	0	0	174	0	0	7	0	0	176	0	11	0
Lane Group Flow (vph)	23	1361	515	292	1511	7	430	430	105	0	56	0
Turn Type	Perm	NA	pm+ov	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases		2	3	1	6		3	3		4	4	
Permitted Phases	2		2	6		6			3			
Actuated Green, G (s)	42.9	42.9	70.9	62.9	62.9	62.9	28.0	28.0	28.0		8.1	
Effective Green, g (s)	42.9	42.9	70.9	62.9	62.9	62.9	28.0	28.0	28.0		8.1	
Actuated g/C Ratio	0.36	0.36	0.59	0.52	0.52	0.52	0.23	0.23	0.23		0.07	
Clearance Time (s)	7.0	7.0	7.0	6.4	7.0	7.0	7.0	7.0	7.0		7.0	
Vehicle Extension (s)	5.0	5.0	3.0	3.0	5.0	5.0	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	65	1265	1027	262	1855	829	392	392	369		119	
v/s Ratio Prot		0.38	0.12	c0.13	0.43		c0.26	0.26			c0.03	
v/s Ratio Perm	0.13		0.21	c0.46		0.00			0.07			
v/c Ratio	0.35	1.08	0.50	1.11	0.81	0.01	1.10	1.10	0.28		0.47	
Uniform Delay, d1	28.4	38.5	14.3	37.6	23.7	13.6	46.0	46.0	37.8		53.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	14.4	48.4	0.4	89.9	4.1	0.0	74.2	74.2	0.4		2.9	
Delay (s)	42.8	86.9	14.7	127.4	27.8	13.7	120.2	120.2	38.2		56.8	
Level of Service	D	F	B	F	C	B	F	F	D		E	
Approach Delay (s)		62.4			43.7			100.0			56.8	
Approach LOS		E			D			F			E	
Intersection Summary												
HCM 2000 Control Delay			64.1				HCM 2000 Level of Service		E			
HCM 2000 Volume to Capacity ratio			1.08									
Actuated Cycle Length (s)			120.0				Sum of lost time (s)		27.4			
Intersection Capacity Utilization			95.2%				ICU Level of Service		F			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection				
Intersection Delay, s/veh	9.4			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	43	288	510	418
Demand Flow Rate, veh/h	43	293	520	426
Vehicles Circulating, veh/h	640	296	83	243
Vehicles Exiting, veh/h	29	307	600	346
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	6.9	8.4	9.5	10.3
Approach LOS	A	A	A	B
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	43	293	520	426
Cap Entry Lane, veh/h	596	840	1040	886
Entry HV Adj Factor	0.992	0.982	0.980	0.981
Flow Entry, veh/h	43	288	510	418
Cap Entry, veh/h	591	826	1019	869
V/C Ratio	0.072	0.349	0.500	0.481
Control Delay, s/veh	6.9	8.4	9.5	10.3
LOS	A	A	A	B
95th %tile Queue, veh	0	2	3	3

Intersection						
Int Delay, s/veh	4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	16	119	149	373	396	104
Future Vol, veh/h	16	119	149	373	396	104
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	-	-	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	70	76	73	76	76	66
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	157	204	491	521	158
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1420	521	521	0	-	0
Stage 1	521	-	-	-	-	-
Stage 2	899	-	-	-	-	-
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	150	555	1045	-	-	-
Stage 1	596	-	-	-	-	-
Stage 2	397	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	110	555	1045	-	-	-
Mov Cap-2 Maneuver	110	-	-	-	-	-
Stage 1	596	-	-	-	-	-
Stage 2	291	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	23.9	2.7		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1045	-	366	-	-	
HCM Lane V/C Ratio	0.195	-	0.49	-	-	
HCM Control Delay (s)	9.3	0	23.9	-	-	
HCM Lane LOS	A	A	C	-	-	
HCM 95th %tile O(veh)	0.7	-	2.6	-	-	

Intersection

Int Delay, s/veh 7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	256	304	11	356	236
Future Vol, veh/h	2	256	304	11	356	236
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	0	250	-	400	225	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	50	71	74	50	77	66
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	361	411	22	462	358

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1693	411	0
Stage 1	411	-	-
Stage 2	1282	-	-
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	102	641	-
Stage 1	669	-	-
Stage 2	260	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	61	641	-
Mov Cap-2 Maneuver	61	-	-
Stage 1	669	-	-
Stage 2	155	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.2	0	5.8
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT
Capacity (veh/h)	-	- 61 641 1148	-	-
HCM Lane V/C Ratio	-	- 0.066 0.563 0.403	-	-
HCM Control Delay (s)	-	- 68.1 17.6 10.2	-	-
HCM Lane LOS	-	- F C B	-	-
HCM 95th %tile Q(veh)	-	- 0.2 3.5 2	-	-

Intersection

Int Delay, s/veh 7.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	352	290	246	258	38
Future Vol, veh/h	7	352	290	246	258	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	115	0	185	-	-	250
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	81	86	83	71	77
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	435	337	296	363	49

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1334	363	363
Stage 1	363	-	-
Stage 2	971	-	-
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	170	682	1196
Stage 1	704	-	-
Stage 2	367	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	122	682	1196
Mov Cap-2 Maneuver	122	-	-
Stage 1	704	-	-
Stage 2	264	-	-

Approach	EB	NB	SB
HCM Control Delay, s	19.5	4.9	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1196	-	122	682	-	-
HCM Lane V/C Ratio	0.282	-	0.077	0.637	-	-
HCM Control Delay (s)	9.2	-	36.9	19.1	-	-
HCM Lane LOS	A	-	E	C	-	-
HCM 95th %tile Q(veh)	1.2	-	0.2	4.6	-	-

Intersection						
Int Delay, s/veh	2.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	88	29	297	92	31	411
Future Vol, veh/h	88	29	297	92	31	411
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	Yield	-	None
Storage Length	0	100	-	150	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	96	32	323	100	34	447
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	837	323	0	0	323	0
Stage 1	323	-	-	-	-	-
Stage 2	514	-	-	-	-	-
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	337	718	-	-	1237	-
Stage 1	734	-	-	-	-	-
Stage 2	600	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	325	718	-	-	1237	-
Mov Cap-2 Maneuver	325	-	-	-	-	-
Stage 1	734	-	-	-	-	-
Stage 2	578	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	18	0	0.6			
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT		
Capacity (veh/h)	-	- 325 718 1237	-	-		
HCM Lane V/C Ratio	-	- 0.294 0.044 0.027	-	-		
HCM Control Delay (s)	-	- 20.6 10.2 8	-	0		
HCM Lane LOS	-	- C B A	-	A		
HCM 95th %tile Q(veh)	-	- 1.2 0.1 0.1	-	-		

Intersection

Int Delay, s/veh 0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↑		↑
Traffic Vol, veh/h	0	2027	2122	61	0	59
Future Vol, veh/h	0	2027	2122	61	0	59
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Yield
Storage Length	-	-	-	250	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	2203	2307	66	0	64

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	-	0	- 0 - 1153
Stage 1	-	-	- - -
Stage 2	-	-	- - -
Critical Hdwy	-	-	- - 6.94
Critical Hdwy Stg 1	-	-	- - -
Critical Hdwy Stg 2	-	-	- - -
Follow-up Hdwy	-	-	- - 3.32
Pot Cap-1 Maneuver	0	-	- 0 0 191
Stage 1	0	-	- 0 0 -
Stage 2	0	-	- 0 0 -
Platoon blocked, %	-	-	
Mov Cap-1 Maneuver	-	-	- - 191
Mov Cap-2 Maneuver	-	-	- - -
Stage 1	-	-	- - -
Stage 2	-	-	- - -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	33.1
HCM LOS			D

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	191
HCM Lane V/C Ratio	-	-	0.336
HCM Control Delay (s)	-	-	33.1
HCM Lane LOS	-	-	D
HCM 95th %tile Q(veh)	-	-	1.4

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↗		↗
Traffic Vol, veh/h	0	2027	2124	61	0	59
Future Vol, veh/h	0	2027	2124	61	0	59
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Yield
Storage Length	-	-	-	250	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	2203	2309	66	0	64
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	-	0	-	0	-	1154
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0	0	190
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	-	190
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		33.3		
HCM LOS	D					
Minor Lane/Major Mvmt	EBT	WBT	SBLn1			
Capacity (veh/h)	-	-	190			
HCM Lane V/C Ratio	-	-	0.338			
HCM Control Delay (s)	-	-	33.3			
HCM Lane LOS	-	-	D			
HCM 95th %tile O(veh)	-	-	1.4			

Timings

1: Private Drwy/Tyrone Rd & SR 54

Future Build PM - Improved

04/17/2018



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	29	1060	1381	549	1	3	343	0	41
Future Volume (vph)	29	1060	1381	549	1	3	343	0	41
Lane Group Flow (vph)	36	1178	1469	670	0	12	0	394	46
Turn Type	Perm	NA	NA	Perm	Perm	NA	Perm	NA	Perm
Protected Phases		2	6			8		4	
Permitted Phases	2			6	8		4		4
Detector Phase	2	2	6	6	8	8	4	4	4
Switch Phase									
Minimum Initial (s)	15.0	15.0	15.0	15.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	26.0	26.0	25.0	25.0	48.0	48.0	44.0	44.0	44.0
Total Split (s)	80.0	80.0	80.0	80.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	57.1%	57.1%	57.1%	57.1%	42.9%	42.9%	42.9%	42.9%	42.9%
Yellow Time (s)	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0		7.0		7.0	7.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	Min	Min	Min	Min	None	None	None	None	None
v/c Ratio	0.35	0.58	0.72	0.63		0.02		0.90	0.09
Control Delay	29.9	19.9	23.7	11.1		28.5		66.0	13.8
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0	0.0
Total Delay	29.9	19.9	23.7	11.1		28.5		66.0	13.8
Queue Length 50th (ft)	15	314	446	147		7		309	9
Queue Length 95th (ft)	48	468	658	249		9		444	36
Internal Link Dist (ft)		559	571			104		335	
Turn Bay Length (ft)	150			175					135
Base Capacity (vph)	104	2039	2039	1070		698		584	680
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	0.35	0.58	0.72	0.63		0.02		0.67	0.07

Intersection Summary

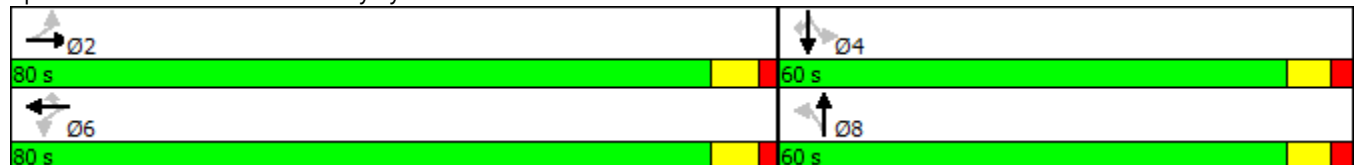
Cycle Length: 140

Actuated Cycle Length: 127.4

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Splits and Phases: 1: Private Drwy/Tyrone Rd & SR 54



HCM 2010 Signalized Intersection Summary

1: Private Drwy/Tyrone Rd & SR 54

Future Build PM - Improved
04/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	1060	0	0	1381	549	1	3	0	343	0	41
Future Volume (veh/h)	29	1060	0	0	1381	549	1	3	0	343	0	41
Number	5	2	12	1	6	16	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	36	1178	0	0	1469	670	4	8	0	394	0	0
Adj No. of Lanes	1	2	0	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.81	0.90	0.25	0.92	0.94	0.82	0.25	0.38	0.92	0.87	0.92	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	113	2081	0	58	2081	931	200	383	0	479	0	474
Arrive On Green	0.59	0.59	0.00	0.00	0.59	0.59	0.30	0.30	0.00	0.30	0.00	0.00
Sat Flow, veh/h	187	3632	0	474	3539	1583	541	1282	0	1407	0	1583
Grp Volume(v), veh/h	36	1178	0	0	1469	670	12	0	0	394	0	0
Grp Sat Flow(s),veh/h/ln	187	1770	0	474	1770	1583	1822	0	0	1407	0	1583
Q Serve(g_s), s	20.8	25.5	0.0	0.0	36.3	37.5	0.0	0.0	0.0	33.2	0.0	0.0
Cycle Q Clear(g_c), s	57.1	25.5	0.0	0.0	36.3	37.5	0.6	0.0	0.0	33.8	0.0	0.0
Prop In Lane	1.00		0.00	1.00		1.00	0.33		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	113	2081	0	58	2081	931	584	0	0	479	0	474
V/C Ratio(X)	0.32	0.57	0.00	0.00	0.71	0.72	0.02	0.00	0.00	0.82	0.00	0.00
Avail Cap(c_a), veh/h	113	2082	0	58	2082	931	799	0	0	658	0	676
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	0.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	38.1	15.8	0.0	0.0	18.0	18.2	30.7	0.0	0.0	42.3	0.0	0.0
Incr Delay (d2), s/veh	3.4	0.6	0.0	0.0	1.4	3.4	0.0	0.0	0.0	6.0	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	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.1	18.4	0.0	0.0	24.9	24.1	0.5	0.0	0.0	20.1	0.0	0.0
LnGrp Delay(d),s/veh	41.5	16.4	0.0	0.0	19.4	21.6	30.7	0.0	0.0	48.3	0.0	0.0
LnGrp LOS	D	B			B	C	C			D		
Approach Vol, veh/h		1214			2139			12			394	
Approach Delay, s/veh		17.1			20.1			30.7			48.3	
Approach LOS		B			C			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		80.0		44.1		80.0		44.1				
Change Period (Y+Rc), s		7.0		7.0		7.0		7.0				
Max Green Setting (Gmax), s		73.0		53.0		73.0		53.0				
Max Q Clear Time (g_c+I1), s		59.1		35.8		39.5		2.6				
Green Ext Time (p_c), s		13.9		1.3		33.4		1.5				
Intersection Summary												
HCM 2010 Ctrl Delay				22.1								
HCM 2010 LOS				C								

Timings

2: Old Norton Rd/S Sandy Creek Rd & SR 54

Future Build PM - Improved

04/17/2018

											
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	80	1751	16	118	82	1539	235	26	16	331	19
Future Volume (vph)	80	1751	16	118	82	1539	235	26	16	331	19
Lane Group Flow (vph)	99	1863	32	0	222	1691	267	0	87	364	146
Turn Type	pm+pt	NA	Perm	pm+pt	pm+pt	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases	5	2		1	1	6			8	7	4
Permitted Phases	2		2	6	6		6	8		4	
Detector Phase	5	2	2	1	1	6	6	8	8	7	4
Switch Phase											
Minimum Initial (s)	6.0	12.0	12.0	6.0	6.0	12.0	12.0	8.0	8.0	5.0	8.0
Minimum Split (s)	12.0	26.0	26.0	13.5	13.5	25.0	25.0	46.3	46.3	11.0	46.3
Total Split (s)	20.0	95.0	95.0	30.0	30.0	105.0	105.0	35.0	35.0	20.0	55.0
Total Split (%)	11.1%	52.8%	52.8%	16.7%	16.7%	58.3%	58.3%	19.4%	19.4%	11.1%	30.6%
Yellow Time (s)	4.0	5.0	5.0	4.0	4.0	5.0	5.0	5.0	5.0	4.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.3	2.0	2.3
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)	6.0	7.0	7.0		6.0	7.0	7.0		7.3	6.0	7.3
Lead/Lag	Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lag	Lag	Lead	
Lead-Lag Optimize?								Yes	Yes	Yes	
Recall Mode	None	Min	Min	None	None	Min	Min	None	None	None	None
v/c Ratio	0.55	0.97	0.03		0.84	0.79	0.27		0.65	1.28	0.35
Control Delay	31.5	50.3	0.1		75.1	28.9	10.7		83.7	199.0	20.9
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	31.5	50.3	0.1		75.1	28.9	10.7		83.7	199.0	20.9
Queue Length 50th (ft)	30	1010	0		181	693	77		77	~496	40
Queue Length 95th (ft)	76	#1319	0		#288	924	144		139	#709	42
Internal Link Dist (ft)		459				398			219		387
Turn Bay Length (ft)	200		185		175		100				
Base Capacity (vph)	223	1926	923		304	2142	997		252	284	552
Starvation Cap Reductn	0	0	0		0	0	0		0	0	0
Spillback Cap Reductn	0	0	0		0	0	0		0	0	0
Storage Cap Reductn	0	0	0		0	0	0		0	0	0
Reduced v/c Ratio	0.44	0.97	0.03		0.73	0.79	0.27		0.35	1.28	0.26

Intersection Summary

Cycle Length: 180

Actuated Cycle Length: 163.3

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

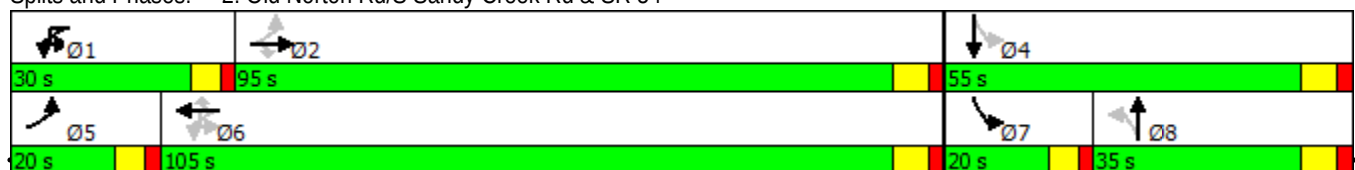
~ Volume exceeds capacity, queue is theoretically infinite.

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: 2: Old Norton Rd/S Sandy Creek Rd & SR 54



Baseline

Synchro 9 Report

Page 4

HCM Signalized Intersection Capacity Analysis

2: Old Norton Rd/S Sandy Creek Rd & SR 54

Future Build PM - Improved

04/17/2018

												
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	80	1751	16	118	82	1539	235	26	16	26	331	19
Future Volume (vph)	80	1751	16	118	82	1539	235	26	16	26	331	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	7.0	7.0		6.0	7.0	7.0		7.3		6.0	7.3
Lane Util. Factor	1.00	0.95	1.00		1.00	0.95	1.00		1.00		1.00	1.00
Frt	1.00	1.00	0.85		1.00	1.00	0.85		0.95		1.00	0.88
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00		0.98		0.95	1.00
Satd. Flow (prot)	1770	3539	1583		1770	3539	1583		1732		1770	1643
Flt Permitted	0.07	1.00	1.00		0.04	1.00	1.00		0.80		0.55	1.00
Satd. Flow (perm)	128	3539	1583		78	3539	1583		1413		1018	1643
Peak-hour factor, PHF	0.81	0.94	0.50	0.92	0.87	0.91	0.88	0.72	0.88	0.80	0.91	0.62
Adj. Flow (vph)	99	1863	32	128	94	1691	267	36	18	32	364	31
RTOR Reduction (vph)	0	0	15	0	0	0	39	0	13	0	0	80
Lane Group Flow (vph)	99	1863	17	0	222	1691	228	0	74	0	364	66
Turn Type	pm+pt	NA	Perm	pm+pt	pm+pt	NA	Perm	Perm	NA		pm+pt	NA
Protected Phases	5	2		1	1	6			8		7	4
Permitted Phases	2		2	6	6		6	8			4	
Actuated Green, G (s)	99.2	89.0	89.0		115.1	98.9	98.9		13.9		33.9	33.9
Effective Green, g (s)	99.2	89.0	89.0		115.1	98.9	98.9		13.9		33.9	33.9
Actuated g/C Ratio	0.61	0.55	0.55		0.70	0.61	0.61		0.09		0.21	0.21
Clearance Time (s)	6.0	7.0	7.0		6.0	7.0	7.0		7.3		6.0	7.3
Vehicle Extension (s)	3.0	5.0	5.0		3.0	5.0	5.0		3.0		3.0	3.0
Lane Grp Cap (vph)	180	1928	862		263	2143	958		120		275	341
v/s Ratio Prot	0.03	c0.53			c0.10	c0.48					c0.11	0.04
v/s Ratio Perm	0.30		0.01		0.49		0.14		0.05		c0.16	
v/c Ratio	0.55	0.97	0.02		0.84	0.79	0.24		0.62		1.32	0.19
Uniform Delay, d1	23.7	35.7	17.1		57.4	24.3	14.8		72.1		64.9	53.4
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00
Incremental Delay, d2	3.6	13.6	0.0		21.2	2.3	0.3		9.1		168.7	0.3
Delay (s)	27.3	49.3	17.1		78.6	26.7	15.1		81.3		233.7	53.7
Level of Service	C	D	B		E	C	B		F		F	D
Approach Delay (s)		47.7				30.5			81.3			182.1
Approach LOS		D				C			F			F
Intersection Summary												
HCM 2000 Control Delay			54.8			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			1.07									
Actuated Cycle Length (s)			163.3			Sum of lost time (s)			26.3			
Intersection Capacity Utilization			101.4%			ICU Level of Service			G			
Analysis Period (min)			15									
c Critical Lane Group												

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	78
Future Volume (vph)	78
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.68
Adj. Flow (vph)	115
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Timings 3: Lester Rd/Veterans Pkwy & SR 54

Future Build PM - Improved

04/17/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	117	1376	132	225	1541	50	137	96	154	25	136	126
Future Volume (vph)	117	1376	132	225	1541	50	137	96	154	25	136	126
Lane Group Flow (vph)	163	1638	153	278	1712	59	171	113	244	36	162	162
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6			2	8		8	4		4
Detector Phase	1	6	6	5	2	2	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	6.0	8.0	8.0	6.0	8.0	8.0
Minimum Split (s)	13.3	42.3	42.3	13.3	42.3	42.3	11.9	48.1	48.1	11.9	49.1	49.1
Total Split (s)	20.0	60.0	60.0	30.0	70.0	70.0	15.0	45.0	45.0	15.0	45.0	45.0
Total Split (%)	13.3%	40.0%	40.0%	20.0%	46.7%	46.7%	10.0%	30.0%	30.0%	10.0%	30.0%	30.0%
Yellow Time (s)	5.3	5.3	5.3	5.3	5.3	5.3	3.9	5.1	5.1	3.9	5.1	5.1
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)	7.3	7.3	7.3	7.3	7.3	7.3	5.9	7.1	7.1	5.9	7.1	7.1
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None
v/c Ratio	0.72	0.94	0.18	0.66	0.93	0.07	0.66	0.25	0.59	0.14	0.51	0.53
Control Delay	46.0	42.1	2.2	58.9	38.0	0.1	57.9	51.6	12.6	40.2	58.7	12.1
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	46.0	42.1	2.2	58.9	38.0	0.1	57.9	51.6	12.6	40.2	58.7	12.1
Queue Length 50th (ft)	72	626	0	110	657	0	118	45	0	23	65	0
Queue Length 95th (ft)	111	#786	21	138	#881	0	164	71	0	39	95	26
Internal Link Dist (ft)		707			648			447			501	
Turn Bay Length (ft)	230		350	235		215	250		250	300		275
Base Capacity (vph)	247	1736	867	646	1839	883	273	1112	664	270	1112	620
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	0.66	0.94	0.18	0.43	0.93	0.07	0.63	0.10	0.37	0.13	0.15	0.26

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 120.8

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: Lester Rd/Veterans Pkwy & SR 54

			
Ø1	Ø2	Ø4	Ø3
20 s	70 s	45 s	15 s
			
Ø5	Ø6	Ø8	Ø7
30 s	60 s	45 s	15 s

HCM 2010 Signalized Intersection Summary

3: Lester Rd/Veterans Pkwy & SR 54

Future Build PM - Improved
04/17/2018

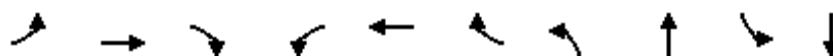
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	1376	132	225	1541	50	137	96	154	25	136	126
Future Volume (veh/h)	117	1376	132	225	1541	50	137	96	154	25	136	126
Number	1	6	16	5	2	12	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	162	1638	0	278	1712	0	171	113	0	36	162	0
Adj No. of Lanes	1	2	1	2	2	1	1	2	1	1	2	1
Peak Hour Factor	0.72	0.84	0.86	0.81	0.90	0.85	0.80	0.85	0.63	0.69	0.84	0.78
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	216	1809	809	359	1956	875	203	261	117	222	261	117
Arrive On Green	0.06	0.51	0.00	0.10	0.55	0.00	0.06	0.07	0.00	0.06	0.07	0.00
Sat Flow, veh/h	1774	3539	1583	3442	3539	1583	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	162	1638	0	278	1712	0	171	113	0	36	162	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1721	1770	1583	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	4.7	45.8	0.0	8.5	45.5	0.0	4.0	3.3	0.0	0.0	4.8	0.0
Cycle Q Clear(g_c), s	4.7	45.8	0.0	8.5	45.5	0.0	4.0	3.3	0.0	0.0	4.8	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	216	1809	809	359	1956	875	203	261	117	222	261	117
V/C Ratio(X)	0.75	0.91	0.00	0.77	0.88	0.00	0.84	0.43	0.00	0.16	0.62	0.00
Avail Cap(c_a), veh/h	312	1809	809	719	2043	914	251	1235	552	270	1235	552
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	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	23.3	24.2	0.0	47.4	21.0	0.0	48.7	48.1	0.0	45.3	48.8	0.0
Incr Delay (d2), s/veh	5.9	7.4	0.0	3.6	4.9	0.0	19.0	1.1	0.0	0.3	2.4	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(95%),veh/ln	5.1	32.2	0.0	7.6	31.4	0.0	10.2	3.0	0.0	1.8	4.4	0.0
LnGrp Delay(d),s/veh	29.3	31.5	0.0	51.0	26.0	0.0	67.6	49.3	0.0	45.6	51.3	0.0
LnGrp LOS	C	C		D	C		E	D		D	D	
Approach Vol, veh/h		1800			1990			284			198	
Approach Delay, s/veh		31.3			29.5			60.3			50.2	
Approach LOS		C			C			E			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.1	67.3	12.1	15.1	18.6	62.8	12.1	15.1				
Change Period (Y+Rc), s	7.3	7.3	5.9	7.1	7.3	7.3	5.9	7.1				
Max Green Setting (Gmax), s	12.7	62.7	9.1	37.9	22.7	52.7	9.1	37.9				
Max Q Clear Time (g_c+I1), s	6.7	47.5	6.0	6.8	10.5	47.8	2.0	5.3				
Green Ext Time (p_c), s	0.2	12.5	0.2	0.6	0.8	4.9	0.4	0.4				
Intersection Summary												
HCM 2010 Ctrl Delay			33.3									
HCM 2010 LOS			C									
Notes												

Timings

Future Build PM - Improved

4: Togwatee Village Pkwy/Piedmont Fayette & SR 54

04/17/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	120	1654	82	123	1512	111	64	7	122	8
Future Volume (vph)	120	1654	82	123	1512	111	64	7	122	8
Lane Group Flow (vph)	130	1880	130	176	1609	126	81	99	131	67
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	NA
Protected Phases	1	6		5	2			4		8
Permitted Phases	6		6	2		2	4		8	
Detector Phase	1	6	6	5	2	2	4	4	8	8
Switch Phase										
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.7	33.0	33.0	11.7	32.0	32.0	50.0	50.0	48.0	48.0
Total Split (s)	40.0	80.0	80.0	40.0	80.0	80.0	60.0	60.0	60.0	60.0
Total Split (%)	22.2%	44.4%	44.4%	22.2%	44.4%	44.4%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.7	5.0	5.0	3.7	5.0	5.0	5.0	5.0	5.0	5.0
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)	5.7	7.0	7.0	5.7	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?										
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None
v/c Ratio	0.53	0.91	0.14	0.70	0.75	0.13	0.42	0.32	0.69	0.23
Control Delay	22.1	31.9	8.4	44.4	21.8	7.3	55.8	14.2	70.6	16.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.1	31.9	8.4	44.4	21.8	7.3	55.8	14.2	70.6	16.8
Queue Length 50th (ft)	24	664	23	84	454	21	60	6	101	6
Queue Length 95th (ft)	97	#1058	38	119	730	59	102	36	180	47
Internal Link Dist (ft)		467			430			239		153
Turn Bay Length (ft)	200		200	300		150			50	
Base Capacity (vph)	562	2077	953	534	2158	988	565	737	550	724
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	0.23	0.91	0.14	0.33	0.75	0.13	0.14	0.13	0.24	0.09

Intersection Summary

Cycle Length: 180

Actuated Cycle Length: 125.2

Natural Cycle: 145

Control Type: Actuated-Uncoordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 4: Togwatee Village Pkwy/Piedmont Fayette & SR 54

Ø1	Ø2	Ø4
40 s	80 s	60 s
Ø5	Ø6	Ø8
40 s	80 s	60 s

HCM 2010 Signalized Intersection Summary
4: Togwatee Village Pkwy/Piedmont Fayette & SR 54

Future Build PM - Improved
04/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	1654	82	123	1512	111	64	7	72	122	8	45
Future Volume (veh/h)	120	1654	82	123	1512	111	64	7	72	122	8	45
Number	1	6	16	5	2	12	7	4	14	3	8	18
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	130	1880	0	176	1609	0	81	9	0	131	9	0
Adj No. of Lanes	1	2	1	1	2	1	1	1	0	1	1	0
Peak Hour Factor	0.92	0.88	0.63	0.70	0.94	0.88	0.79	0.75	0.80	0.93	0.88	0.77
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	270	2296	1027	222	2305	1031	227	225	0	227	225	0
Arrive On Green	0.05	0.65	0.00	0.05	0.65	0.00	0.12	0.12	0.00	0.12	0.12	0.00
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	1400	1863	0	1400	1863	0
Grp Volume(v), veh/h	130	1880	0	176	1609	0	81	9	0	131	9	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1400	1863	0	1400	1863	0
Q Serve(g_s), s	2.7	44.7	0.0	3.7	32.6	0.0	6.1	0.5	0.0	10.2	0.5	0.0
Cycle Q Clear(g_c), s	2.7	44.7	0.0	3.7	32.6	0.0	6.6	0.5	0.0	10.7	0.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	270	2296	1027	222	2305	1031	227	225	0	227	225	0
V/C Ratio(X)	0.48	0.82	0.00	0.79	0.70	0.00	0.36	0.04	0.00	0.58	0.04	0.00
Avail Cap(c_a), veh/h	719	2301	1029	667	2305	1031	719	879	0	719	879	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	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	13.4	14.8	0.0	24.3	12.5	0.0	46.5	43.6	0.0	48.3	43.6	0.0
Incr Delay (d2), s/veh	1.3	2.8	0.0	6.3	1.2	0.0	0.9	0.1	0.0	2.3	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(95%),veh/ln	3.7	30.3	0.0	7.0	22.9	0.0	4.4	0.5	0.0	7.4	0.5	0.0
LnGrp Delay(d),s/veh	14.7	17.5	0.0	30.5	13.7	0.0	47.5	43.7	0.0	50.6	43.7	0.0
LnGrp LOS	B	B		C	B		D	D		D	D	
Approach Vol, veh/h		2010			1785			90			140	
Approach Delay, s/veh		17.3			15.4			47.1			50.2	
Approach LOS		B			B			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.6	80.1		20.6	11.9	79.9		20.6				
Change Period (Y+Rc), s	* 5.7	7.0		7.0	* 5.7	7.0		7.0				
Max Green Setting (Gmax), s	* 34	73.0		53.0	* 34	73.0		53.0				
Max Q Clear Time (g_c+I1), s	4.7	34.6		8.6	5.7	46.7		12.7				
Green Ext Time (p_c), s	0.4	38.3		0.9	0.5	26.2		0.9				
Intersection Summary												
HCM 2010 Ctrl Delay			18.3									
HCM 2010 LOS			B									
Notes												

Timings

5: Ebenezer Rd/Brittany Way & SR 54

Future Build PM - Improved

04/17/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	15	1744	79	332	1347	29	29	3	202	7	0
Future Volume (vph)	15	1744	79	332	1347	29	29	3	202	7	0
Lane Group Flow (vph)	19	2028	113	395	1480	36	0	44	293	9	41
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	pm+ov	Perm	NA
Protected Phases		6		5	2			8	5		4
Permitted Phases	6		6	2		2	8		8	4	
Detector Phase	6	6	6	5	2	2	8	8	5	4	4
Switch Phase											
Minimum Initial (s)	15.0	15.0	15.0	8.0	15.0	15.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	26.0	26.0	26.0	14.5	26.0	26.0	48.0	48.0	14.5	43.0	43.0
Total Split (s)	85.0	85.0	85.0	25.0	110.0	110.0	40.0	40.0	25.0	40.0	40.0
Total Split (%)	56.7%	56.7%	56.7%	16.7%	73.3%	73.3%	26.7%	26.7%	16.7%	26.7%	26.7%
Yellow Time (s)	5.0	5.0	5.0	4.5	5.0	5.0	5.0	5.0	4.5	5.0	5.0
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
Total Lost Time (s)	7.0	7.0	7.0	6.5	7.0	7.0		7.0	6.5	7.0	7.0
Lead/Lag	Lead	Lead	Lead	Lag					Lag		
Lead-Lag Optimize?											
Recall Mode	Min	Min	Min	None	Min	Min	None	None	None	None	None
v/c Ratio	0.10	0.91	0.11	1.22	0.49	0.03		0.42	0.68	0.08	0.20
Control Delay	12.5	28.3	4.1	159.6	4.2	1.1		67.5	45.2	55.4	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Delay	12.5	28.3	4.1	159.6	4.2	1.1		67.5	45.2	55.4	3.3
Queue Length 50th (ft)	6	736	10	~351	162	1		35	191	7	0
Queue Length 95th (ft)	18	855	21	#518	237	6		62	201	20	0
Internal Link Dist (ft)		617			769			306			341
Turn Bay Length (ft)	200		200	200		200					
Base Capacity (vph)	182	2234	1029	325	2996	1345		356	431	362	481
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	0.10	0.91	0.11	1.22	0.49	0.03		0.12	0.68	0.02	0.09

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 124

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

~ 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: Ebenezer Rd/Brittany Way & SR 54



Baseline

Synchro 9 Report

Page 18

HCM 2010 Signalized Intersection Summary

5: Ebenezer Rd/Brittany Way & SR 54

Future Build PM - Improved
04/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	1744	79	332	1347	29	29	3	202	7	0	24
Future Volume (veh/h)	15	1744	79	332	1347	29	29	3	202	7	0	24
Number	1	6	16	5	2	12	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	19	2028	0	395	1480	36	40	4	293	9	0	41
Adj No. of Lanes	1	2	1	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.81	0.86	0.70	0.84	0.91	0.81	0.72	0.75	0.69	0.75	0.25	0.58
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	215	2143	959	323	2843	1272	134	11	367	94	0	139
Arrive On Green	0.61	0.61	0.00	0.14	0.80	0.80	0.09	0.09	0.09	0.09	0.00	0.09
Sat Flow, veh/h	343	3539	1583	1774	3539	1583	919	125	1583	1078	0	1583
Grp Volume(v), veh/h	19	2028	0	395	1480	36	44	0	293	9	0	41
Grp Sat Flow(s),veh/h/ln	343	1770	1583	1774	1770	1583	1044	0	1583	1078	0	1583
Q Serve(g_s), s	4.0	68.2	0.0	18.5	18.2	0.6	3.7	0.0	4.0	1.0	0.0	3.1
Cycle Q Clear(g_c), s	22.3	68.2	0.0	18.5	18.2	0.6	6.8	0.0	4.0	7.8	0.0	3.1
Prop In Lane	1.00		1.00	1.00		1.00	0.91		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	215	2143	959	323	2843	1272	145	0	367	94	0	139
V/C Ratio(X)	0.09	0.95	0.00	1.22	0.52	0.03	0.30	0.00	0.80	0.10	0.00	0.29
Avail Cap(c_a), veh/h	215	2143	959	323	2843	1272	380	0	633	275	0	406
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	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.6	23.5	0.0	53.0	4.3	2.5	57.8	0.0	46.7	60.4	0.0	55.0
Incr Delay (d2), s/veh	0.4	9.9	0.0	124.5	0.3	0.0	1.2	0.0	4.0	0.4	0.0	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.7	45.7	0.0	40.8	13.6	0.5	2.8	0.0	3.7	0.6	0.0	2.5
LnGrp Delay(d),s/veh	20.0	33.4	0.0	177.5	4.6	2.6	59.0	0.0	50.7	60.9	0.0	56.2
LnGrp LOS	B	C		F	A	A	E		D	E		E
Approach Vol, veh/h		2047			1911			337			50	
Approach Delay, s/veh		33.3			40.3			51.8			57.0	
Approach LOS		C			D			D			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		110.5		18.3	25.5	85.0		18.3				
Change Period (Y+Rc), s		7.0		7.0	7.0	* 7		7.0				
Max Green Setting (Gmax), s		103.0		33.0	18.5	* 78		33.0				
Max Q Clear Time (g_c+I1), s		20.2		9.8	20.5	70.2		8.8				
Green Ext Time (p_c), s		76.2		1.5	0.0	7.8		1.5				
Intersection Summary												
HCM 2010 Ctrl Delay				38.1								
HCM 2010 LOS				D								
Notes												

Timings
6: Burch Rd/Ginger Cake Rd & SR 54

Future Build PM - Improved
04/17/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	226	1751	20	26	1703	114	23	28	29	170	23	257
Future Volume (vph)	226	1751	20	26	1703	114	23	28	29	170	23	257
Lane Group Flow (vph)	240	1863	27	32	1738	127	28	36	36	185	28	276
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases	6		6	2		2	8		8	4		4
Detector Phase	1	6	6	5	2	2	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	8.0	12.0	12.0	8.0	12.0	12.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	13.5	31.6	31.6	13.5	26.6	26.6	40.3	40.3	40.3	38.3	38.3	38.3
Total Split (s)	25.0	80.0	80.0	25.0	80.0	80.0	40.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	17.2%	55.2%	55.2%	17.2%	55.2%	55.2%	27.6%	27.6%	27.6%	27.6%	27.6%	27.6%
Yellow Time (s)	3.5	4.6	4.6	3.5	4.6	4.6	4.3	4.3	4.3	4.3	4.3	4.3
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	6.6	6.6	5.5	6.6	6.6	6.3	6.3	6.3	6.3	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None
v/c Ratio	0.85	0.79	0.02	0.18	0.88	0.14	0.12	0.11	0.11	0.78	0.09	0.59
Control Delay	64.8	21.2	0.1	10.2	33.4	8.8	46.7	46.2	2.1	74.1	45.8	14.6
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	64.8	21.2	0.1	10.2	33.4	8.8	46.7	46.2	2.1	74.1	45.8	14.6
Queue Length 50th (ft)	152	628	0	7	688	24	21	27	0	157	21	29
Queue Length 95th (ft)	#315	904	0	18	#1006	65	45	50	1	242	45	115
Internal Link Dist (ft)		497			426			210			310	
Turn Bay Length (ft)	200		115	200		60	75		100	215		150
Base Capacity (vph)	315	2368	1081	327	1973	912	352	477	456	350	477	581
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	0.76	0.79	0.02	0.10	0.88	0.14	0.08	0.08	0.08	0.53	0.06	0.48

Intersection Summary

Cycle Length: 145

Actuated Cycle Length: 132.3

Natural Cycle: 130

Control Type: Actuated-Uncoordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 6: Burch Rd/Ginger Cake Rd & SR 54

		
Ø1	Ø2	Ø4
25 s	80 s	40 s
		
Ø5	Ø6	Ø8
25 s	80 s	40 s

HCM 2010 Signalized Intersection Summary

6: Burch Rd/Ginger Cake Rd & SR 54

Future Build PM - Improved
04/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	226	1751	20	26	1703	114	23	28	29	170	23	257
Future Volume (veh/h)	226	1751	20	26	1703	114	23	28	29	170	23	257
Number	1	6	16	5	2	12	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	240	1863	27	32	1738	127	28	36	36	185	28	0
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.94	0.94	0.75	0.82	0.98	0.90	0.83	0.78	0.81	0.92	0.83	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	271	2225	995	188	2037	911	285	329	280	272	329	280
Arrive On Green	0.10	0.63	0.63	0.04	0.58	0.58	0.18	0.18	0.18	0.18	0.18	0.00
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	1377	1863	1583	1323	1863	1583
Grp Volume(v), veh/h	240	1863	27	32	1738	127	28	36	36	185	28	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1377	1863	1583	1323	1863	1583
Q Serve(g_s), s	9.3	50.3	0.8	0.9	49.9	4.5	2.1	2.0	2.3	16.6	1.5	0.0
Cycle Q Clear(g_c), s	9.3	50.3	0.8	0.9	49.9	4.5	3.6	2.0	2.3	18.6	1.5	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	271	2225	995	188	2037	911	285	329	280	272	329	280
V/C Ratio(X)	0.89	0.84	0.03	0.17	0.85	0.14	0.10	0.11	0.13	0.68	0.09	0.00
Avail Cap(c_a), veh/h	384	2225	995	395	2133	954	423	515	438	404	515	438
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	34.5	17.7	8.5	18.1	21.5	11.9	43.4	42.1	42.2	49.9	41.9	0.0
Incr Delay (d2), s/veh	16.2	3.3	0.0	0.4	3.9	0.1	0.1	0.1	0.2	3.0	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(95%),veh/ln	14.1	33.6	0.6	0.8	33.5	3.6	1.5	1.9	1.9	10.4	1.4	0.0
LnGrp Delay(d),s/veh	50.6	21.0	8.6	18.5	25.4	12.1	43.6	42.2	42.4	52.9	42.0	0.0
LnGrp LOS	D	C	A	B	C	B	D	D	D	D	D	
Approach Vol, veh/h	2130			1897			100			213		
Approach Delay, s/veh	24.2			24.4			42.7			51.5		
Approach LOS	C			C			D			D		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	17.3	76.7	27.8		10.8	83.2	27.8					
Change Period (Y+Rc), s	5.5	6.6	6.3		5.5	6.6	6.3					
Max Green Setting (Gmax), s	19.5	73.4	33.7		19.5	73.4	33.7					
Max Q Clear Time (g_c+I1), s	11.3	51.9	20.6		2.9	52.3	5.6					
Green Ext Time (p_c), s	0.5	18.2	0.9		0.0	21.1	1.2					
Intersection Summary												
HCM 2010 Ctrl Delay	26.1											
HCM 2010 LOS	C											
Notes												

Timings

7: Oak St/Brandywine Blvd & SR 54

Future Build PM - Improved

04/17/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	27	2015	12	9	1808	71	7	0	146	3	51
Future Volume (vph)	27	2015	12	9	1808	71	7	0	146	3	51
Lane Group Flow (vph)	36	2056	22	13	1845	81	0	19	0	176	64
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	NA	Perm
Protected Phases	5	2		1	6			8		4	
Permitted Phases	2		2	6		6	8		4		4
Detector Phase	5	2	2	1	6	6	8	8	4	4	4
Switch Phase											
Minimum Initial (s)	8.0	12.0	12.0	8.0	12.0	12.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.5	24.5	24.5	13.5	24.5	24.5	39.1	39.1	39.1	39.1	39.1
Total Split (s)	30.0	80.0	80.0	30.0	80.0	80.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	20.0%	53.3%	53.3%	20.0%	53.3%	53.3%	26.7%	26.7%	26.7%	26.7%	26.7%
Yellow Time (s)	3.5	4.5	4.5	3.5	4.5	4.5	4.1	4.1	4.1	4.1	4.1
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
Total Lost Time (s)	5.5	6.5	6.5	5.5	6.5	6.5		6.1		6.1	6.1
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag					
Lead-Lag Optimize?											
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None
v/c Ratio	0.20	0.87	0.02	0.07	0.81	0.08		0.06		0.74	0.19
Control Delay	8.5	22.9	0.0	6.8	21.4	4.3		0.4		64.4	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0
Total Delay	8.5	22.9	0.0	6.8	21.4	4.3		0.4		64.4	10.9
Queue Length 50th (ft)	7	494	0	2	578	5		0		132	0
Queue Length 95th (ft)	17	#1102	0	7	837	28		0		169	27
Internal Link Dist (ft)		435			402			231		280	
Turn Bay Length (ft)	215		135	185		150					60
Base Capacity (vph)	425	2368	1080	427	2289	1046		480		393	512
Starvation Cap Reductn	0	0	0	0	0	0		0		0	0
Spillback Cap Reductn	0	0	0	0	0	0		0		0	0
Storage Cap Reductn	0	0	0	0	0	0		0		0	0
Reduced v/c Ratio	0.08	0.87	0.02	0.03	0.81	0.08		0.04		0.45	0.13

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 116.1

Natural Cycle: 140

Control Type: Actuated-Uncoordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 7: Oak St/Brandywine Blvd & SR 54

		
Ø1	Ø2	Ø4
30 s	80 s	40 s
		
Ø5	Ø6	Ø8
30 s	80 s	40 s

HCM 2010 Signalized Intersection Summary
7: Oak St/Brandywine Blvd & SR 54

Future Build PM - Improved
04/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	2015	12	9	1808	71	7	0	6	146	3	51
Future Volume (veh/h)	27	2015	12	9	1808	71	7	0	6	146	3	51
Number	5	2	12	1	6	16	3	8	18	7	4	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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	36	2056	22	13	1845	81	9	0	10	172	4	0
Adj No. of Lanes	1	2	1	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.75	0.98	0.55	0.67	0.98	0.88	0.75	0.92	0.62	0.85	0.75	0.80
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	211	2375	1063	150	2288	1024	150	16	132	264	5	226
Arrive On Green	0.05	0.67	0.67	0.02	0.65	0.65	0.14	0.00	0.14	0.14	0.14	0.00
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	717	112	922	1399	33	1583
Grp Volume(v), veh/h	36	2056	22	13	1845	81	19	0	0	176	0	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1751	0	0	1432	0	1583
Q Serve(g_s), s	0.7	50.8	0.5	0.3	42.9	2.1	0.0	0.0	0.0	12.3	0.0	0.0
Cycle Q Clear(g_c), s	0.7	50.8	0.5	0.3	42.9	2.1	1.1	0.0	0.0	13.3	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.47		0.53	0.98		1.00
Lane Grp Cap(c), veh/h	211	2375	1063	150	2288	1024	298	0	0	268	0	226
V/C Ratio(X)	0.17	0.87	0.02	0.09	0.81	0.08	0.06	0.00	0.00	0.66	0.00	0.00
Avail Cap(c_a), veh/h	515	2375	1063	497	2335	1045	539	0	0	496	0	482
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	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	15.1	14.4	6.1	17.2	14.5	7.3	41.4	0.0	0.0	46.5	0.0	0.0
Incr Delay (d2), s/veh	0.4	3.9	0.0	0.2	2.5	0.1	0.1	0.0	0.0	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(95%),veh/ln	0.9	34.2	0.4	0.4	29.2	1.7	0.9	0.0	0.0	9.3	0.0	0.0
LnGrp Delay(d),s/veh	15.5	18.3	6.1	17.4	17.0	7.4	41.5	0.0	0.0	49.3	0.0	0.0
LnGrp LOS	B	B	A	B	B	A	D			D		
Approach Vol, veh/h	2114			1939			19			176		
Approach Delay, s/veh	18.1			16.6			41.5			49.3		
Approach LOS	B			B			D			D		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.1	81.3		22.0	10.9	78.5		22.0				
Change Period (Y+Rc), s	5.5	6.5		6.1	5.5	6.5		6.1				
Max Green Setting (Gmax), s	24.5	73.5		33.9	24.5	73.5		33.9				
Max Q Clear Time (g_c+I1), s	2.3	52.8		15.3	2.7	44.9		3.1				
Green Ext Time (p_c), s	0.0	20.7		0.6	0.1	27.2		0.7				
Intersection Summary												
HCM 2010 Ctrl Delay	18.8											
HCM 2010 LOS	B											

Timings
8: Grady Avenue/Sharon Drive & SR 54

Future Build PM - Improved

04/17/2018

										
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT
Lane Configurations										
Traffic Volume (vph)	15	1255	894	161	1477	9	556	10	137	11
Future Volume (vph)	15	1255	894	161	1477	9	556	10	137	11
Lane Group Flow (vph)	23	1281	972	194	1492	13	298	305	171	36
Turn Type	Perm	NA	pm+ov	pm+pt	NA	Perm	Split	NA	Perm	NA
Protected Phases		2	3	1	6		3	3		4
Permitted Phases	2		2	6		6			3	
Detector Phase	2	2	3	1	6	6	3	3	3	4
Switch Phase										
Minimum Initial (s)	12.0	12.0	8.0	6.0	12.0	12.0	8.0	8.0	8.0	8.0
Minimum Split (s)	35.0	35.0	39.0	12.4	31.0	31.0	39.0	39.0	39.0	37.0
Total Split (s)	55.0	55.0	30.0	15.0	70.0	70.0	30.0	30.0	30.0	20.0
Total Split (%)	45.8%	45.8%	25.0%	12.5%	58.3%	58.3%	25.0%	25.0%	25.0%	16.7%
Yellow Time (s)	5.0	5.0	5.0	4.4	5.0	5.0	5.0	5.0	5.0	5.0
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)	7.0	7.0	7.0	6.4	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lag	Lag	Lead	Lead			Lead	Lead	Lead	Lag
Lead-Lag Optimize?			Yes				Yes	Yes	Yes	Yes
Recall Mode	C-Min	C-Min	None	None	C-Min	C-Min	None	None	None	None
v/c Ratio	0.21	0.74	0.73	0.92	0.69	0.01	0.93	0.94	0.39	0.27
Control Delay	27.2	29.5	7.4	66.3	19.1	0.0	82.6	86.2	8.9	46.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.2	29.5	7.4	66.3	19.1	0.0	82.6	86.2	8.9	46.4
Queue Length 50th (ft)	11	448	138	87	433	0	241	247	0	19
Queue Length 95th (ft)	23	561	328	#203	545	0	#421	203	39	49
Internal Link Dist (ft)		459			478			455		183
Turn Bay Length (ft)	215		165	285		175			200	
Base Capacity (vph)	112	1726	1327	212	2168	1008	322	323	441	199
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	0.21	0.74	0.73	0.92	0.69	0.01	0.93	0.94	0.39	0.18

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

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

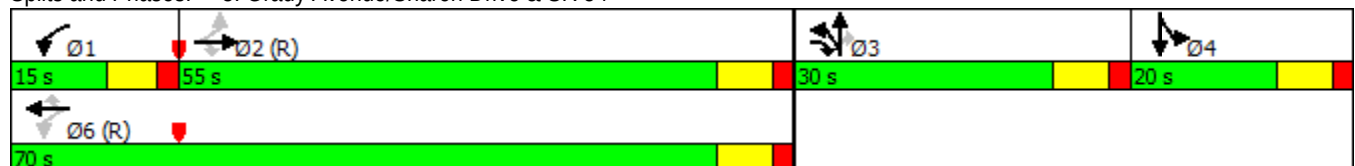
Natural Cycle: 145

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 8: Grady Avenue/Sharon Drive & SR 54



HCM Signalized Intersection Capacity Analysis

8: Grady Avenue/Sharon Drive & SR 54

Future Build PM - Improved

04/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	1255	894	161	1477	9	556	10	137	9	11	5
Future Volume (vph)	15	1255	894	161	1477	9	556	10	137	9	11	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	6.4	7.0	7.0	7.0	7.0	7.0		7.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.98	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1681	1690	1583		1761	
Flt Permitted	0.12	1.00	1.00	0.08	1.00	1.00	0.95	0.96	1.00		0.98	
Satd. Flow (perm)	231	3539	1583	157	3539	1583	1681	1690	1583		1761	
Peak-hour factor, PHF	0.65	0.98	0.92	0.83	0.99	0.67	0.95	0.56	0.80	0.67	0.83	0.50
Adj. Flow (vph)	23	1281	972	194	1492	13	585	18	171	13	13	10
RTOR Reduction (vph)	0	0	209	0	0	5	0	0	138	0	10	0
Lane Group Flow (vph)	23	1281	763	194	1492	8	298	305	33	0	26	0
Turn Type	Perm	NA	pm+ov	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases		2	3	1	6		3	3		4	4	
Permitted Phases	2		2	6		6			3			
Actuated Green, G (s)	55.7	55.7	78.7	70.7	70.7	70.7	23.0	23.0	23.0		5.3	
Effective Green, g (s)	55.7	55.7	78.7	70.7	70.7	70.7	23.0	23.0	23.0		5.3	
Actuated g/C Ratio	0.46	0.46	0.66	0.59	0.59	0.59	0.19	0.19	0.19		0.04	
Clearance Time (s)	7.0	7.0	7.0	6.4	7.0	7.0	7.0	7.0	7.0		7.0	
Vehicle Extension (s)	5.0	5.0	3.0	3.0	5.0	5.0	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	107	1642	1130	208	2085	932	322	323	303		77	
v/s Ratio Prot		0.36	0.13	0.07	c0.42		0.18	c0.18			c0.02	
v/s Ratio Perm	0.10		0.35	c0.48		0.00			0.02			
v/c Ratio	0.21	0.78	0.67	0.93	0.72	0.01	0.93	0.94	0.11		0.34	
Uniform Delay, d1	19.1	27.0	12.8	27.9	17.5	10.2	47.7	47.9	40.0		55.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	4.5	3.7	1.6	43.6	2.1	0.0	31.3	35.4	0.2		2.7	
Delay (s)	23.7	30.8	14.4	71.5	19.6	10.2	79.0	83.3	40.2		58.3	
Level of Service	C	C	B	E	B	B	E	F	D		E	
Approach Delay (s)		23.7			25.5			72.1			58.3	
Approach LOS		C			C			E			E	
Intersection Summary												
HCM 2000 Control Delay			32.4				HCM 2000 Level of Service		C			
HCM 2000 Volume to Capacity ratio			0.94									
Actuated Cycle Length (s)			120.0				Sum of lost time (s)		27.4			
Intersection Capacity Utilization			90.7%				ICU Level of Service		E			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection				
Intersection Delay, s/veh12.8				
Intersection LOS B				
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	50	369	679	410
Demand Flow Rate, veh/h	50	377	693	418
Vehicles Circulating, veh/h	662	474	84	309
Vehicles Exiting, veh/h	65	303	628	542
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	7.2	13.8	13.6	11.3
Approach LOS	A	B	B	B
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	50	377	693	418
Cap Entry Lane, veh/h	583	703	1039	830
Entry HV Adj Factor	0.995	0.980	0.980	0.981
Flow Entry, veh/h	50	369	679	410
Cap Entry, veh/h	580	689	1018	814
V/C Ratio	0.086	0.536	0.667	0.504
Control Delay, s/veh	7.2	13.8	13.6	11.3
LOS	A	B	B	B
95th %tile Queue, veh	0	3	5	3

Intersection						
Int Delay, s/veh	4.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	52	119	29	334	351	24
Future Vol, veh/h	52	119	29	334	351	24
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	-	-	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	88	65	66	58	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	58	135	45	506	605	32
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1200	605	605	0	-	0
Stage 1	605	-	-	-	-	-
Stage 2	595	-	-	-	-	-
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	204	498	973	-	-	-
Stage 1	545	-	-	-	-	-
Stage 2	551	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	191	498	973	-	-	-
Mov Cap-2 Maneuver	191	-	-	-	-	-
Stage 1	545	-	-	-	-	-
Stage 2	516	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	29.5	0.7		0		
HCM LOS	D					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	973	-	335	-	-	
HCM Lane V/C Ratio	0.046	-	0.578	-	-	
HCM Control Delay (s)	8.9	0	29.5	-	-	
HCM Lane LOS	A	A	D	-	-	
HCM 95th %tile Q(veh)	0.1	-	3.4	-	-	

Intersection

Int Delay, s/veh 5.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	309	230	6	262	343
Future Vol, veh/h	7	309	230	6	262	343
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	0	250	-	400	225	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	50	89	82	42	79	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	347	280	14	332	423

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1367	280	0
Stage 1	280	-	-
Stage 2	1087	-	-
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	162	759	-
Stage 1	767	-	-
Stage 2	323	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	120	759	-
Mov Cap-2 Maneuver	120	-	-
Stage 1	767	-	-
Stage 2	239	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.7	0	3.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT
Capacity (veh/h)	-	- 120 759 1283	-	-
HCM Lane V/C Ratio	-	- 0.117 0.457 0.258	-	-
HCM Control Delay (s)	-	- 38.9 13.7 8.8	-	-
HCM Lane LOS	-	- E B A	-	-
HCM 95th %tile Q(veh)	-	- 0.4 2.4 1	-	-

Intersection

Int Delay, s/veh 6.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	21	303	298	256	255	17
Future Vol, veh/h	21	303	298	256	255	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	115	0	185	-	-	250
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	53	89	91	84	89	47
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	40	340	327	305	287	36

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1247	287	287
Stage 1	287	-	-
Stage 2	960	-	-
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	192	752	1275
Stage 1	762	-	-
Stage 2	372	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	143	752	1275
Mov Cap-2 Maneuver	143	-	-
Stage 1	762	-	-
Stage 2	277	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.4	4.6	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1275	-	143	752	-	-
HCM Lane V/C Ratio	0.257	-	0.277	0.453	-	-
HCM Control Delay (s)	8.8	-	39.6	13.7	-	-
HCM Lane LOS	A	-	E	B	-	-
HCM 95th %tile Q(veh)	1	-	1.1	2.4	-	-

Intersection						
Int Delay, s/veh	3.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	121	40	258	126	42	254
Future Vol, veh/h	121	40	258	126	42	254
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	Yield	-	None
Storage Length	0	100	-	150	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	132	43	280	137	46	276
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	647	280	0	0	280	0
Stage 1	280	-	-	-	-	-
Stage 2	367	-	-	-	-	-
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	436	759	-	-	1283	-
Stage 1	767	-	-	-	-	-
Stage 2	701	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	418	759	-	-	1283	-
Mov Cap-2 Maneuver	418	-	-	-	-	-
Stage 1	767	-	-	-	-	-
Stage 2	672	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	15.6	0		1.1		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	418	759	1283	-
HCM Lane V/C Ratio	-	-	0.315	0.057	0.036	-
HCM Control Delay (s)	-	-	17.5	10	7.9	0
HCM Lane LOS	-	-	C	B	A	A
HCM 95th %tile O(veh)	-	-	1.3	0.2	0.1	-

Intersection

Int Delay, s/veh 1.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↑		↑
Traffic Vol, veh/h	0	2172	1843	134	0	134
Future Vol, veh/h	0	2172	1843	134	0	134
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Yield
Storage Length	-	-	-	250	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	2361	2003	146	0	146

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	-	0	- 0 - 1002
Stage 1	-	-	- - -
Stage 2	-	-	- - -
Critical Hdwy	-	-	- - 6.94
Critical Hdwy Stg 1	-	-	- - -
Critical Hdwy Stg 2	-	-	- - -
Follow-up Hdwy	-	-	- - 3.32
Pot Cap-1 Maneuver	0	-	- 0 0 241
Stage 1	0	-	- 0 0 -
Stage 2	0	-	- 0 0 -
Platoon blocked, %	-	-	
Mov Cap-1 Maneuver	-	-	- - 241
Mov Cap-2 Maneuver	-	-	- - -
Stage 1	-	-	- - -
Stage 2	-	-	- - -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	40.4
HCM LOS			E

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	241
HCM Lane V/C Ratio	-	-	0.604
HCM Control Delay (s)	-	-	40.4
HCM Lane LOS	-	-	E
HCM 95th %tile Q(veh)	-	-	3.5

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↑		↑
Traffic Vol, veh/h	0	2172	1854	125	0	124
Future Vol, veh/h	0	2172	1854	125	0	124
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Yield
Storage Length	-	-	-	250	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	2361	2015	136	0	135
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	-	0	-	0	-	1008
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0	0	239
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	-	239
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		37.9		
HCM LOS	E					
Minor Lane/Major Mvmt	EBT	WBT	SBLn1			
Capacity (veh/h)	-	-	239			
HCM Lane V/C Ratio	-	-	0.564			
HCM Control Delay (s)	-	-	37.9			
HCM Lane LOS	-	-	E			
HCM 95th %tile O(veh)	-	-	3.1			

Traffic Volume Worksheets

18-025 Beecham Group Tract - Fayetteville GA
Traffic Volumes
Future Conditions

A&R Engineering
April 2018

1. SR 54 @ Tyrone Rd
A.M. Peak Hour

Condition	Private Driveway					Tyrone Road					SR 54					SR 54				
	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 2018 Volumes:	0	0	1	0	1	0	453	0	33	486	0	30	1070	1	1101	0	0	1130	310	1440
Growth Factor (%):	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
No-Build 2022 Volumes:	0	0	1	0	1	0	510	0	37	547	0	34	1204	1	1239	0	0	1272	349	1621
New Site Trips:	0	0	0	0	0	0	20	0	0	20	0	0	49	0	49	0	0	47	19	66
Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Future 2022 Volumes:	0	0	1	0	1	0	530	0	37	567	0	34	1253	1	1288	0	0	1319	368	1687

P.M. Peak Hour

Condition	Private Driveway					Tyrone Road					SR 54					SR 54				
	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 2018 Volumes:	0	1	3	0	4	0	281	0	36	317	0	26	882	0	908	0	0	1169	465	1634
Growth Factor (%):	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
No-Build 2022 Volumes:	0	1	3	0	4	0	316	0	41	357	0	29	993	0	1022	0	0	1316	523	1839
New Site Trips:	0	0	0	0	0	0	27	0	0	27	0	0	67	0	67	0	0	65	26	91
Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Future 2022 Volumes:	0	1	3	0	4	0	343	0	41	384	0	29	1060	0	1089	0	0	1381	549	1930

18-025 Beecham Group Tract - Fayetteville GA

Traffic Volumes
Future Conditions

A&R Engineering
April 2018

2. SR 54 @ S. Sandy Creek Rd

A.M. Peak Hour

Condition	Old Norton Road					S. Sandy Creek Road					SR 54					SR 54				
	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 2018 Volumes:	0	36	17	29	82	0	163	9	47	219	0	21	1461	12	1494	0	59	1542	188	1789
Growth Factor (%):	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
No-Build 2022 Volumes:	0	41	19	33	93	0	183	10	53	246	0	24	1644	14	1682	0	66	1736	212	2014
New Site Trips:	0	0	6	6	12	0	78	6	35	119	0	37	37	0	74	47	6	35	78	166
Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Future 2022 Volumes:	0	41	25	39	105	0	261	16	88	365	0	61	1681	14	1756	47	72	1771	290	2180

P.M. Peak Hour

Condition	Old Norton Road					S. Sandy Creek Road					SR 54					SR 54				
	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 2018 Volumes:	0	23	7	16	46	0	199	10	27	236	0	26	1510	14	1550	0	66	1325	113	1504
Growth Factor (%):	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
No-Build 2022 Volumes:	0	26	8	18	52	0	224	11	30	265	0	29	1700	16	1745	0	74	1491	127	1692
New Site Trips:	0	0	8	8	16	0	107	8	48	163	0	51	51	0	102	65	8	48	108	229
Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	53	0	0	0	53
Future 2022 Volumes:	0	26	16	26	68	0	331	19	78	428	0	80	1751	16	1847	118	82	1539	235	1974

18-025 Beecham Group Tract - Fayetteville GA
Traffic Volumes
Future Conditions

A&R Engineering
 April 2018

3. SR 54 @ Veterans Pkwy
A.M. Peak Hour

Condition	Lester Road				Veterans Parkway				SR 54				SR 54			
	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	
Existing 2018 Volumes:	0	185	175	234	594	0	31	122	68	221	0	132	1218	126	1476	1494
Growth Factor (%):	3	3	3	3		3	3	3	3		3	3	3	3	3	
No-Build 2022 Volumes:	0	208	197	263	668	0	35	137	77	249	0	149	1371	142	1662	1682
New Site Trips:	0	0	0	5	5	0	0	0	0	0	0	0	68	0	68	71
Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Future 2022 Volumes:	0	208	197	268	673	0	35	137	77	249	0	149	1439	142	1730	1753

P.M. Peak Hour

Condition	Lester Road				Veterans Parkway				SR 54				SR 54			
	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	
Existing 2018 Volumes:	0	122	85	131	338	0	22	121	112	255	0	104	1139	117	1360	1528
Growth Factor (%):	3	3	3	3		3	3	3	3		3	3	3	3	3	
No-Build 2022 Volumes:	0	137	96	147	380	0	25	136	126	287	0	117	1282	132	1531	1720
New Site Trips:	0	0	0	7	7	0	0	0	0	0	0	0	94	0	94	96
Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Future 2022 Volumes:	0	137	96	154	387	0	25	136	126	287	0	117	1376	132	1625	1816

18-025 Beecham Group Tract - Fayetteville GA

Traffic Volumes
Future Conditions

A&R Engineering
April 2018

4. SR 54 @ Piedmont Fayette

A.M. Peak Hour

Condition	Togwaatee Village Pkwy					Piedmont Fayette Driveway					SR 54 Eastbound					SR 54 Westbound				
	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 2018 Volumes:	0	19	1	29	49	0	40	5	19	64	0	200	1343	47	1590	0	100	1280	129	1509
Growth Factor (%):	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
No-Build 2022 Volumes:	0	21	1	33	55	0	45	6	21	72	0	225	1512	53	1790	0	113	1441	145	1699
New Site Trips:	0	0	0	0	0	0	0	0	0	0	0	0	73	0	73	0	0	71	0	71
Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Future 2022 Volumes:	0	21	1	33	55	0	45	6	21	72	0	225	1585	53	1863	0	113	1512	145	1770

P.M. Peak Hour

Condition	Togwaatee Village Pkwy					Piedmont Fayette Driveway					SR 54 Eastbound					SR 54 Westbound				
	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 2018 Volumes:	0	57	6	64	127	0	108	7	40	155	0	107	1380	73	1560	0	109	1257	99	1465
Growth Factor (%):	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
No-Build 2022 Volumes:	0	64	7	72	143	0	122	8	45	175	0	120	1553	82	1755	0	123	1415	111	1649
New Site Trips:	0	0	0	0	0	0	0	0	0	0	0	0	101	0	101	0	0	97	0	97
Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Future 2022 Volumes:	0	64	7	72	143	0	122	8	45	175	0	120	1654	82	1856	0	123	1512	111	1746

18-025 Beecham Group Tract - Fayetteville GA

Traffic Volumes
Future Conditions

A&R Engineering
April 2018

5. SR 54 @ Ebenezer Rd A.M. Peak Hour

Condition	Ebenezer Rd Northbound					Brittany Way Southbound					SR 54 Eastbound					SR 54 Westbound				
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing 2018 Volumes:	0	40	1	259	300	0	32	1	17	50	0	4	1078	24	1106	0	146	928	6	1080
Growth Factor (%):	3	3	3	3		3	3	3	3		3	3	3	3		3	3	3	3	
No-Build 2022 Volumes:	0	45	1	292	338	0	36	1	19	56	0	5	1213	27	1245	0	164	1044	7	1215
New Site Trips:	0	0	0	12	12	0	0	0	0	0	0	0	37	0	37	0	12	35	0	47
Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Future 2022 Volumes:	0	45	1	304	350	0	36	1	19	56	0	5	1250	27	1282	0	176	1079	7	1262

P.M. Peak Hour

Condition	Ebenezer Rd Northbound					Brittany Way Southbound					SR 54 Eastbound					SR 54 Westbound				
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing 2018 Volumes:	0	26	3	164	193	0	6	0	21	27	0	13	1504	70	1587	0	281	1154	26	1461
Growth Factor (%):	3	3	3	3		3	3	3	3		3	3	3	3		3	3	3	3	
No-Build 2022 Volumes:	0	29	3	185	217	0	7	0	24	31	0	15	1693	79	1787	0	316	1299	29	1644
New Site Trips:	0	0	0	17	17	0	0	0	0	0	0	0	51	0	51	0	16	48	0	64
Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Future 2022 Volumes:	0	29	3	202	234	0	7	0	24	31	0	15	1744	79	1838	0	332	1347	29	1708

18-025 Beecham Group Tract - Fayetteville GA

Traffic Volumes
Future Conditions

A&R Engineering
April 2018

6. SR 54 @ Ginger Cake Rd

A.M. Peak Hour

Condition	Burch Rd					Giner Cake Rd					SR 54					SR 54				
	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 2018 Volumes:	0	28	22	29	79	0	136	14	277	427	0	261	1234	17	1512	0	26	1514	94	1634
Growth Factor (%):	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
No-Build 2022 Volumes:	0	32	25	33	90	0	153	16	312	481	0	294	1389	19	1702	0	29	1704	106	1839
New Site Trips:	0	0	0	0	0	0	0	0	24	24	0	24	71	0	95	0	0	73	0	73
Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Future 2022 Volumes:	0	32	25	33	90	0	153	16	336	505	0	318	1460	19	1797	0	29	1777	106	1912

P.M. Peak Hour

Condition	Burch Rd					Giner Cake Rd					SR 54					SR 54				
	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 2018 Volumes:	0	20	25	26	71	0	151	20	198	369	0	172	1470	18	1660	0	23	1423	101	1547
Growth Factor (%):	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
No-Build 2022 Volumes:	0	23	28	29	80	0	170	23	223	416	0	194	1654	20	1868	0	26	1602	114	1742
New Site Trips:	0	0	0	0	0	0	0	0	34	34	0	32	97	0	129	0	0	101	0	101
Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Future 2022 Volumes:	0	23	28	29	80	0	170	23	257	450	0	226	1751	20	1997	0	26	1703	114	1843

18-025 Beecham Group Tract - Fayetteville GA
Traffic Volumes
Future Conditions

A&R Engineering
 April 2018

7. SR 54 @ Brandywine Blvd

A.M. Peak Hour

Condition	Oak St Northbound					Brandywine Blvd Southbound					SR 54 Eastbound					SR 54 Westbound				
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
	0	5	0	5	10	0	70	0	6	76	0	27	1318	0	1345	0	8	1649	100	1757
Existing 2018 Volumes:																				
Growth Factor (%):	3	3	3	3		3	3	3	3		3	3	3	3		3	3	3	3	
No-Build 2022 Volumes:	0	6	0	6	12	0	79	0	7	86	0	30	1483	0	1513	0	9	1856	113	1978
New Site Trips:	0	0	0	0	0	0	0	0	0	0	0	0	71	0	71	0	0	73	0	73
Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Future 2022 Volumes:	0	6	0	6	12	0	79	0	7	86	0	30	1554	0	1584	0	9	1929	113	2051

P.M. Peak Hour

Condition	Oak St Northbound					Brandywine Blvd Southbound					SR 54 Eastbound					SR 54 Westbound				
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
	0	6	0	5	11	0	130	3	45	178	0	24	1704	11	1739	0	8	1517	63	1588
Existing 2018 Volumes:																				
Growth Factor (%):	3	3	3	3		3	3	3	3		3	3	3	3		3	3	3	3	
No-Build 2022 Volumes:	0	7	0	6	13	0	146	3	51	200	0	27	1918	12	1957	0	9	1707	71	1787
New Site Trips:	0	0	0	0	0	0	0	0	0	0	0	0	97	0	97	0	0	101	0	101
Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Future 2022 Volumes:	0	7	0	6	13	0	146	3	51	200	0	27	2015	12	2054	0	9	1808	71	1888

18-025 Beecham Group Tract - Fayetteville GA
Traffic Volumes
Future Conditions

A&R Engineering
April 2018

8. SR 54 @ Grady Ave
A.M. Peak Hour

Condition	Grady Ave Northbound					Sharon Dr Southbound					SR 54 Eastbound					SR 54 Westbound				
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing 2018 Volumes:	0	640	0	197	837	0	10	15	9	34	0	12	1021	477	1510	0	195	1256	5	1456
Growth Factor (%):	3	3	3	3		3	3	3	3		3	3	3	3		3	3	3	3	
No-Build 2022 Volumes:	0	720	0	222	942	0	11	17	10	38	0	14	1149	537	1700	0	219	1414	6	1639
New Site Trips:	0	37	0	0	37	0	0	0	0	0	0	0	35	35	70	0	0	37	0	37
Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Future 2022 Volumes:	0	757	0	222	979	0	11	17	10	38	0	14	1184	572	1770	0	219	1451	6	1676

P.M. Peak Hour

Condition	Grady Ave Northbound					Sharon Dr Southbound					SR 54 Eastbound					SR 54 Westbound				
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing 2018 Volumes:	0	449	9	122	580	0	8	10	4	22	0	13	1072	752	1837	0	143	1267	8	1418
Growth Factor (%):	3	3	3	3		3	3	3	3		3	3	3	3		3	3	3	3	
No-Build 2022 Volumes:	0	505	10	137	652	0	9	11	5	25	0	15	1207	846	2068	0	161	1426	9	1596
New Site Trips:	0	51	0	0	51	0	0	0	0	0	0	0	48	48	96	0	0	51	0	51
Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Future 2022 Volumes:	0	556	10	137	703	0	9	11	5	25	0	15	1255	894	2164	0	161	1477	9	1647

A&R Engineering
April 2018

9. Ginger Cake Rd @ Hood Ave

A.M. Peak Hour

Condition	Ginger Cake Rd Northbound					Ginger Cake Rd Southbound					Hood Rd Eastbound					Hood Ave Westbound				
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing 2018 Volumes:	0	7	197	174	378	0	44	241	4	289	0	4	7	4	15	0	99	4	43	146
Growth Factor (%):	3	3	3	3		3	3	3	3			3	3	3		3	3	3	3	
No-Build 2022 Volumes:	0	8	222	196	426	0	50	271	5	326	0	5	8	5	18	0	111	5	48	164
New Site Trips:	0	0	12	12	24	0	0	12	0	12	0	0	0	0	0	0	12	0	0	12
Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Future 2022 Volumes:	0	8	234	208	450	0	50	283	5	338	0	5	8	5	18	0	123	5	48	176

P.M. Peak Hour

Condition	Ginger Cake Rd Northbound					Ginger Cake Rd Southbound					Hood Rd Eastbound					Hood Ave Westbound				
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing 2018 Volumes:	0	7	331	172	510	0	36	251	5	292	0	7	7	10	24	0	151	16	58	225
Growth Factor (%):	3	3	3	3		3	3	3	3		3	3	3	3		3	3	3	3	
No-Build 2022 Volumes:	0	8	373	194	575	0	41	283	6	330	0	8	8	11	27	0	170	18	65	253
New Site Trips:	0	0	16	16	32	0	0	17	0	17	0	0	0	0	0	0	17	0	0	17
Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Future 2022 Volumes:	0	8	389	210	607	0	41	300	6	347	0	8	8	11	27	0	187	18	65	270

18-025 Beecham Group Tract - Fayetteville GA

Traffic Volumes
Future Conditions

A&R Engineering
April 2018

10. S. Sandy Creek @ Piedmont

A.M. Peak Hour

Condition	S. Sandy Creek Rd Northbound					S. Sandy Creek Rd Southbound					Piedmont Driveway (N) Eastbound					- Westbound				
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing 2018 Volumes:	0	132	224	0	356	0	0	246	92	338	0	14	0	106	120	0	0	0	0	0
Growth Factor (%):	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
No-Build 2022 Volumes:	0	149	252	0	401	0	0	277	104	381	0	16	0	119	135	0	0	0	0	0
New Site Trips:	0	0	121	0	121	0	0	119	0	119	0	0	0	0	0	0	0	0	0	0
Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Future 2022 Volumes:	0	149	373	0	522	0	0	396	104	500	0	16	0	119	135	0	0	0	0	0

P.M. Peak Hour

Condition	S. Sandy Creek Rd Northbound					S. Sandy Creek Rd Southbound					Piedmont Driveway (N) Eastbound					- Westbound				
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing 2018 Volumes:	0	26	148	0	174	0	0	167	21	188	0	46	1	106	153	0	0	0	0	0
Growth Factor (%):	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
No-Build 2022 Volumes:	0	29	167	0	196	0	0	188	24	212	0	52	1	119	172	0	0	0	0	0
New Site Trips:	0	0	167	0	167	0	0	163	0	163	0	0	0	0	0	0	0	0	0	0
Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Future 2022 Volumes:	0	29	334	0	363	0	0	351	24	375	0	52	1	119	172	0	0	0	0	0

18-025 Beecham Group Tract - Fayetteville GA
Traffic Volumes
Future Conditions

A&R Engineering
 April 2018

11. Veterans Pkwy @ S. Sandy Cr

A.M. Peak Hour

Condition	Veterans Parkway Northbound					Veterans Parkway Southbound					- Eastbound					S. Sandy Creek Rd Westbound				
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing 2018 Volumes:	0	0	270	10	280	0	262	210	0	472	0	0	0	0	0	0	2	0	175	177
Growth Factor (%):	3	3	3	3		3	3	3	3		3	3	3	3		3	3	3	3	
No-Build 2022 Volumes:	0	0	304	11	315	0	295	236	0	531	0	0	0	0	0	0	2	0	197	199
New Site Trips:	0	0	0	0	0	0	61	0	0	61	0	0	0	0	0	0	0	0	59	59
Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Future 2022 Volumes:	0	0	304	11	315	0	356	236	0	592	0	0	0	0	0	0	2	0	256	258

P.M. Peak Hour

Condition	Veterans Parkway Northbound					Veterans Parkway Southbound					- Eastbound					S. Sandy Creek Rd Westbound				
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing 2018 Volumes:	0	0	204	5	209	0	158	305	0	463	0	0	0	0	0	0	6	0	203	209
Growth Factor (%):	3	3	3	3		3	3	3	3		3	3	3	3		3	3	3	3	
No-Build 2022 Volumes:	0	0	230	6	236	0	178	343	0	521	0	0	0	0	0	0	7	0	228	235
New Site Trips:	0	0	0	0	0	0	84	0	0	84	0	0	0	0	0	0	0	0	81	81
Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Future 2022 Volumes:	0	0	230	6	236	0	262	343	0	605	0	0	0	0	0	0	7	0	309	316

18-025 Beecham Group Tract - Fayetteville GA
Traffic Volumes
Future Conditions

A&R Engineering
 April 2018

12. Veterans Pkwy @ Sandy Creek
A.M. Peak Hour

Condition	Veterans Pkwy Northbound					Veterans Pkwy Southbound					Sandy Creek Rd Eastbound					Sandy Creek Rd Westbound				
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing 2018 Volumes:	0	227	197	0	424	0	0	208	34	242	0	6	0	280	286	0	0	0	0	0
Growth Factor (%):	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
No-Build 2022 Volumes:	0	255	222	0	477	0	0	234	38	272	0	7	0	315	322	0	0	0	0	0
New Site Trips:	0	35	24	0	59	0	0	24	0	24	0	0	0	37	37	0	0	0	0	0
Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Future 2022 Volumes:	0	290	246	0	536	0	0	258	38	296	0	7	0	352	359	0	0	0	0	0

P.M. Peak Hour

Condition	Veterans Pkwy Northbound					Veterans Pkwy Southbound					Sandy Creek Rd Eastbound					Sandy Creek Rd Westbound				
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing 2018 Volumes:	0	222	199	0	421	0	0	196	15	211	0	19	0	224	243	0	0	0	0	0
Growth Factor (%):	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
No-Build 2022 Volumes:	0	250	224	0	474	0	0	221	17	238	0	21	0	252	273	0	0	0	0	0
New Site Trips:	0	48	32	0	80	0	0	34	0	34	0	0	0	51	51	0	0	0	0	0
Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Future 2022 Volumes:	0	298	256	0	554	0	0	255	17	272	0	21	0	303	324	0	0	0	0	0

18-025 Beecham Group Tract - Fayetteville GA

Traffic Volumes
Future Conditions

A&R Engineering
April 2018

13. S Sandy Creek @ Site Drwy 1

A.M. Peak Hour

Condition	S. Sandy Creek Rd					S. Sandy Creek Rd					-					Site Driveway 1				
	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 2018 Volumes:	0	0	238	0	238	0	0	338	0	338	0	0	0	0	0	0	0	0	0	0
Growth Factor (%):	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
No-Build 2022 Volumes:	0	0	268	0	268	0	0	380	0	380	0	0	0	0	0	0	0	0	0	0
New Site Trips:	0	0	29	92	121	0	31	31	0	62	0	0	0	0	0	0	88	0	29	117
Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Future 2022 Volumes:	0	0	297	92	389	0	31	411	0	442	0	0	0	0	0	0	88	0	29	117

P.M. Peak Hour

Condition	S. Sandy Creek Rd					S. Sandy Creek Rd					-					Site Driveway 1				
	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 2018 Volumes:	0	0	194	0	194	0	0	188	0	188	0	0	0	0	0	0	0	0	0	0
Growth Factor (%):	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
No-Build 2022 Volumes:	0	0	218	0	218	0	0	212	0	212	0	0	0	0	0	0	0	0	0	0
New Site Trips:	0	0	40	126	166	0	42	42	0	84	0	0	0	0	0	0	121	0	40	161
Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Future 2022 Volumes:	0	0	258	126	384	0	42	254	0	296	0	0	0	0	0	0	121	0	40	161

18-025 Beecham Group Tract - Fayetteville GA
Traffic Volumes
Future Conditions

A&R Engineering
 April 2018

14. SR 54 @ Site Drwy 2
A.M. Peak Hour

Condition	Northbound					Site Driveway 2 Southbound					SR 54 Eastbound					SR 54 Westbound				
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing 2018 Volumes:	0	0	0	0	0	0	0	0	0	0	0	0	1653	0	1653	0	0	1789	0	1789
Growth Factor (%):	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
No-Build 2022 Volumes:	0	0	0	0	0	0	0	0	0	0	0	0	1860	0	1860	0	0	2014	0	2014
New Site Trips:	0	0	0	0	0	0	0	0	0	59	0	0	167	0	167	0	0	108	61	169
Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Future 2022 Volumes:	0	0	0	0	0	0	0	0	0	59	0	0	2027	0	2027	0	0	2122	61	2183

P.M. Peak Hour

Condition	Northbound					Site Driveway 2 Southbound					SR 54 Eastbound					SR 54 Westbound				
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing 2018 Volumes:	0	0	0	0	0	0	0	0	0	0	0	0	1725	0	1725	0	0	1504	0	1504
Growth Factor (%):	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
No-Build 2022 Volumes:	0	0	0	0	0	0	0	0	0	0	0	0	1942	0	1942	0	0	1693	0	1693
New Site Trips:	0	0	0	0	0	0	0	0	81	81	0	0	230	0	230	0	0	148	84	232
Pass-by Trips:	0	0	0	0	0	0	0	0	0	53	0	0	0	0	0	0	0	2	50	52
Future 2022 Volumes:	0	0	0	0	0	0	0	0	0	134	0	0	2172	0	2172	0	0	1843	134	1977

18-025 Beecham Group Tract - Fayetteville GA

Traffic Volumes
Future Conditions

A&R Engineering
April 2018

**15. SR 54 @ Site Drwy 3
A.M. Peak Hour**

Condition	Northbound					Site Driveway 3 Southbound					SR 54 Eastbound					SR 54 Westbound				
	-																			
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing 2018 Volumes:	0	0	0	0	0	0	0	0	0	0	0	0	1653	0	1653	0	0	1789	0	1789
Growth Factor (%):	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
No-Build 2022 Volumes:	0	0	0	0	0	0	0	0	0	0	0	0	1860	0	1860	0	0	2014	0	2014
New Site Trips:	0	0	0	0	0	0	0	0	0	59	0	0	167	0	167	0	0	110	61	171
Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Future 2022 Volumes:	0	0	0	0	0	0	0	0	0	59	0	0	2027	0	2027	0	0	2124	61	2185

P.M. Peak Hour

Condition	Northbound					Site Driveway 3 Southbound					SR 54 Eastbound					SR 54 Westbound				
	-																			
	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing 2018 Volumes:	0	0	0	0	0	0	0	0	0	0	0	0	1725	0	1725	0	0	1504	0	1504
Growth Factor (%):	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
No-Build 2022 Volumes:	0	0	0	0	0	0	0	0	0	0	0	0	1942	0	1942	0	0	1693	0	1693
New Site Trips:	0	0	0	0	0	0	0	0	81	81	0	0	230	0	230	0	0	152	84	236
Pass-by Trips:	0	0	0	0	0	0	0	0	43	43	0	0	0	0	0	0	0	9	41	50
Future 2022 Volumes:	0	0	0	0	0	0	0	0	124	124	0	0	2172	0	2172	0	0	1854	125	1979