

**DEVELOPMENT OF REGIONAL IMPACT
(DRI #2527)
TRAFFIC STUDY
FOR
HENRY PROMENADE
MIXED-USE DEVELOPMENT
MCDONOUGH, HENRY COUNTY, GEORGIA**

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EXECUTIVE SUMMARY

Traffic impacts were evaluated for the added traffic from the proposed Henry Promenade mixed-used development located to the east of I-75 between Jonesboro Road and Mt. Carmel Road in McDonough, Georgia. The development will consist of:

- Total Retail: 763,500 sf
- Hotel 1: 120 rooms
- Hotel 2: 100 rooms

The development proposes one full-access driveway as well as two right-in/right-out driveways on Jonesboro Road, and one full-access driveway as well as one right-in/right-out driveway on Mt. Carmel Road. Existing and future operations after completion of the project were analyzed at the intersections of:

- Jonesboro Road @ I-75 Southbound Ramps
- Jonesboro Road @ I-75 Northbound Ramps
- Jonesboro Road @ Foster Drive
- Jonesboro Road @ North Bridges Road/Bojangle's Driveway
- Jonesboro Road @ Mt. Carmel Road
- Jonesboro Road @ Oak Grove Road/Willow Lane
- Jonesboro Road @ Kelly Road
- Mt. Carmel Road @ North Bridges Road/Sterling Place
- Mt. Carmel Road @ Mill 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 and added traffic from other nearby planned developments. The resulting recommendations from each analysis are listed below:

System Recommendations and 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 and are taken under consideration by the local municipality. A summary of the system improvements is provided below with more detailed information on each intersection in the following narratives.

Jonesboro Road @ I-75 SB Ramps

The existing conditions analysis for the intersection of Jonesboro Road at I-75 SB Ramps indicates the southbound approach (I-75 Ramp) is currently operating at a level-of-service "E" in the Saturday peak hour before the addition of site traffic. It is recommended that the existing southbound shared through/left turn lane be restriped to accommodate through/left/right turn movements. This will allow more stacking for the southbound right turn movements.

Jonesboro Road @ I-75 NB Ramps

The queue for the westbound right turn movement is currently extending beyond the available storage in the AM peak hour. In order to accommodate the amount of stacking for the westbound right turn

movement, it is recommended that the existing right turn lane be extended through to the next intersection.

Jonesboro Road@ Foster Drive/Managed Lanes Access

In order to accommodate the extended westbound right turn lane and right turn queue at the adjacent intersection of Jonesboro Road at I-75 NB Ramps, it is recommended that the existing dedicated westbound right turn lane be converted to operate as a shared through/right turn lane.

Jonesboro Road at Oak Grove Road/Willow Lane

The intersection of Jonesboro Road at Oak Grove Road/Willow Lane is currently operating at an acceptable level-of-service ("D" or better) during the AM, PM, and Saturday peak hours. After accounting for growth of background traffic, the intersection will begin to operate at a level-of-service "E" in the AM peak hour. In order to bring the level-of-service to the accepted threshold "D", it is recommended that the southbound approach be shifted to the east in order to accommodate a dedicated right turn lane, and extend the northbound left turn lane storage to 500' of full-width storage by restriping the existing gore area in the median. It is also recommended that protected + permissive signal phasing be installed for the northbound and southbound left turn movements.

Jonesboro Road at N. Bridges Road/Bojangle's Driveway

The side-street approaches to the intersection of Jonesboro Road at N. Bridges Road/Bojangle's Driveway are currently operating below an acceptable level-of-service ("E" or better). As this is an existing condition and the only improvement needed is for the southbound right movement, which is offsite and out of public right-of way, no reasonable improvements have been identified.

Mt. Carmel Road at Mill Road

One or more approaches to the intersection of Mt. Carmel Road at Mill Road will begin to operate below an acceptable level-of-service ("D" or better) after accounting for growth of background traffic. Due to the intersection being all-way stop-controlled, and because queuing on each approach will not block other nearby intersections, no reasonable improvements have been identified at the intersection.

Summary of Recommended System Improvements

- Shift the southbound approach to the intersection of Jonesboro Road at Oak Grove Road/Willow Lane to the east in order to install a dedicated southbound right turn lane with 100' storage and a 75' taper and install protected + permissive signal phasing.
- Extend the northbound left turn lane at the above intersection to 500' of storage by restriping the existing gore area within the median and install protected + permissive signal phasing.
- It is recommended that the existing southbound through/left lane at the intersection of Jonesboro Road at I-75 SB Ramps be restriped to accommodate a through/left/right movement.
- It is recommended the existing westbound right turn lane at the intersection of Jonesboro Road at I-75 NB Ramps be extended through to the next intersection (Jonesboro Road at Foster Drive/Managed Lanes Access), replacing the existing dedicated westbound right turn lane at the Jonesboro Road at Foster Drive/Managed Lanes Access intersection with a shared through/right turn lane.

Site Access Configuration

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

- Site Driveway #1: Full-access driveway on Jonesboro Road
 - This driveway will consist of two entering lanes and two exiting lanes.
 - The intersection will be controlled by an actuated traffic signal with a permissive + protected phase for the eastbound and westbound left turn movements.
 - Entering left turn movements will be made from a dedicated westbound left turn lane.
 - Entering right turn movements will be made from a dedicated eastbound deceleration lane.
- Site Driveway #2: Right-in/right-out driveway on Jonesboro Road
 - This driveway will consist of one entering and one exiting lane.
 - The intersection will be unsignalized with a YIELD sign on the northbound approach.
 - A deceleration lane will be constructed for entering traffic based on local standards.
- Site Driveway #3: Full-access driveway on Mt. Carmel Road
 - This driveway will consist of one entering lane and two exiting lanes. The southbound (driveway) approach will have a left turn and right turn lane for exiting traffic.
 - The intersection will be controlled by an actuated traffic signal.
 - Entering left turn movements will be made from a dedicated eastbound left turn lane.
 - Entering right turn movements will be made from a dedicated westbound deceleration lane.
- Site Driveway #4: Right-in/right-out driveway on Mt. Carmel Road
 - This driveway will consist of one entering lane and one exiting lane.
 - The intersection will be unsignalized with a YIELD sign on the southbound approach.
 - A westbound deceleration lane will be constructed for entering traffic based on local standards.
- Site Driveway #5: Right-in/right-out driveway on Jonesboro Road
 - This driveway will consist of one entering lane and one exiting lane.
 - The intersection will be unsignalized with a YIELD sign on the southbound approach.
 - An eastbound deceleration lane will be constructed for entering traffic based on local standards.

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 site mitigation improvements is provided below, with more detailed information on each intersection in the following narratives.

Jonesboro Road@ Foster Drive/Managed Lanes Access

Because a third eastbound through lane on Jonesboro Road is recommended beginning at this intersection, it is recommended dual rights on the northbound approach (Managed Lanes Access) be reconfigured to operate with one free-flow right turn and one yield-controlled right turn lane. A concept of this recommendation is included in the Appendix.

Jonesboro Road @ Mt. Carmel Road

Due to the large number of northbound right turns after the addition of site traffic, it is recommended that the existing northbound right turn operate with dual right turns and given permissive + overlap signal phasing.

Mt. Carmel Road at Mill Road

One or more approaches to the intersection of Mt. Carmel Road at Mill Road will continue to operate below an acceptable level-of-service ("D" or better) after accounting for site-generated traffic. Due to the intersection being all-way stop-controlled, and because queuing on each approach will not block other nearby intersections, no reasonable improvements have been identified at the intersection.

Jonesboro Road @ Site Driveway 1

The Future "Build" 2020 conditions analysis for Jonesboro Road at Site Driveway 1 indicates the intersection will operate at an overall level-of-service "F" during the PM and Saturday peak hours. It is recommended that dual left turn lanes be constructed for the westbound and northbound approaches and operate with protected signal phasing. To relieve congestion on the eastbound through movement, it is recommended a third through lane be constructed along the site frontage beginning at the intersection of Jonesboro Road at Foster Drive/Managed Lane Access through to drop as a right turn lane at the eastern right-in/right-out driveway (Site Driveway 5) on Jonesboro Road. Although this improvements will not bring the overall level-of-service to within the "D" threshold during the Saturday peak hour, the recommended improvements will reduce the overall delay at the intersection by more than 274 seconds/vehicle. As these delays will only be experienced during one peak hour out of the week, no further improvements are feasible at the intersection.

Summary of Recommended Site Mitigation Improvements

- Recommended system improvements (previous section) are also applicable as mitigation improvements.
- It is recommended a third through lane be constructed on Jonesboro Road along the site frontage beginning at the intersection of Jonesboro Road at Foster Drive/Managed Lanes Access through to drop as a right turn lane at the eastern right-in/right-out driveway (Site Driveway 5) on Jonesboro Road.
- It is recommended the northbound dual rights at the intersection of Jonesboro Road at Foster Drive/Managed Lanes Access be reconfigured to operate with one free-flow right turn and one yield-controlled right turn.
- It is recommended northbound dual right turn lanes be added to the intersection of Jonesboro Road at Mt. Carmel Road and given permissive + overlap signal phasing.
- It is recommended westbound and northbound dual left turn lanes be constructed at the intersection of Jonesboro Road at Site Driveway 1 and given protected signal phasing.

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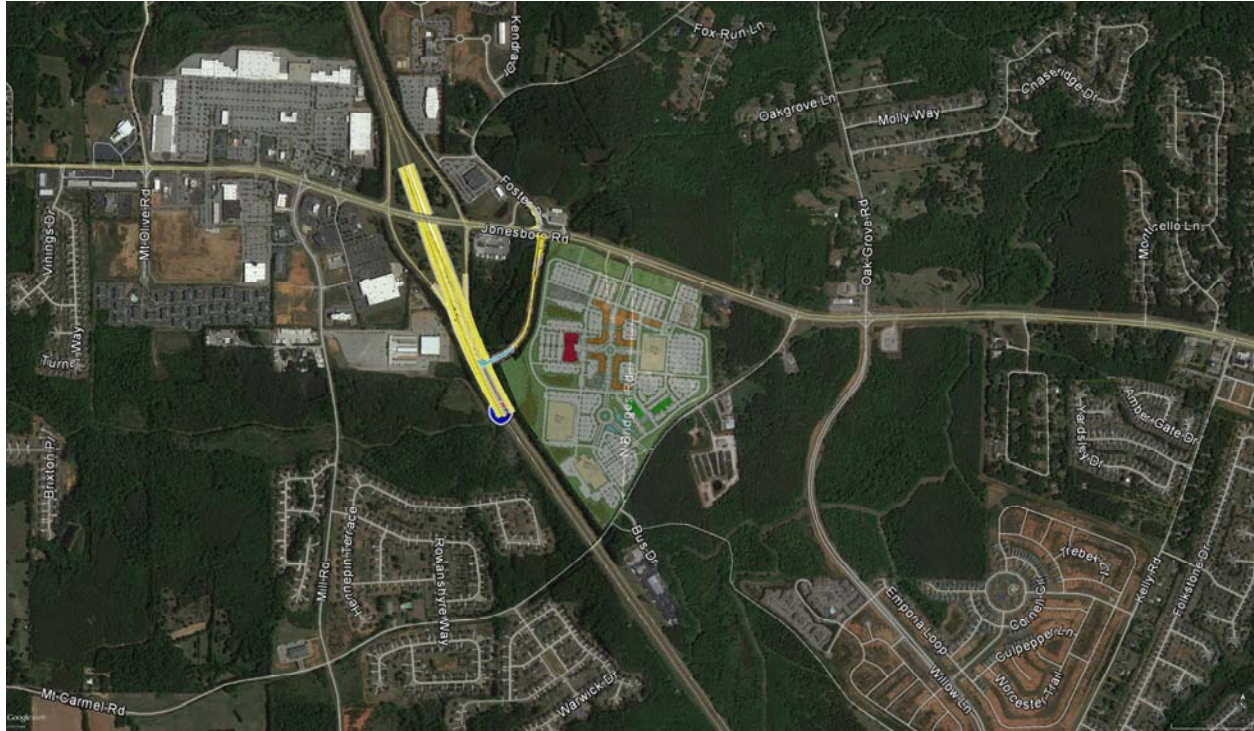
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INTRODUCTION

The purpose of this study is to determine the traffic impact that will result from the proposed Henry County Promenade mixed-used development located to the east of I-75 between Jonesboro Road and Mt. Carmel Road in McDonough, Georgia. The development will consist of:

- Total Retail: 763,500 sf
- Hotel 1: 120 rooms
- Hotel 2: 100 rooms



The development proposes access at the following locations:

- Site Driveway 1: Full-access driveway on Jonesboro Road
- Site Driveway 2: Right-in/right-out driveway on Jonesboro Road
- Site Driveway 3: Full-access driveway on Mt. Carmel Road
- Site Driveway 4: Right-in/right-out driveway on Mt. Carmel Road

The AM, PM, and Saturday 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:

- Jonesboro Road @ I-75 Southbound Ramps
- Jonesboro Road @ I-75 Northbound Ramps
- Jonesboro Road @ Foster Drive
- Jonesboro Road @ North Bridges Road/Bojangle's Driveway
- Jonesboro Road @ Mt. Carmel Road
- Jonesboro Road @ Oak Grove Road/Willow Lane
- Jonesboro Road @ Kelly Road

- Mt. Carmel Road @ North Bridges Road/Sterling Place
- Mt. Carmel Road @ Mill 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, GDOT and Henry County:

1. Jonesboro Road @ I-75 Southbound Ramps
2. Jonesboro Road @ I-75 Northbound Ramps
3. Jonesboro Road @ Foster Drive
4. Jonesboro Road @ North Bridges Road/Bojangle’s Driveway
5. Jonesboro Road @ Mt. Carmel Road
6. Jonesboro Road @ Oak Grove Road/Willow Lane
7. Jonesboro Road @ Kelly Road
8. Mt. Carmel Road @ North Bridges Road/Sterling Place
9. Mt. Carmel Road @ Mill 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:

Jonesboro Road

Jonesboro Road is an east-west, four-lane, median-divided roadway with a posted speed limit of 45 mph in the vicinity of the site. GDOT traffic counts (Station IDs 1510212 & 1510214) indicate that the daily traffic volume on Jonesboro Road is 17,400 vehicles per day east of Vinings Drive and 25,000 vehicles per day west of Mt. Carmel Road. GDOT classifies Jonesboro Road as a Minor Arterial roadway.

Interstate 75

Interstate 75 is a north-south, six-lane, divided roadway with a posted speed limit of 65 mph in the vicinity of the site. GDOT traffic counts (Station IDs 1510406 & 1510408) indicate that the daily traffic volume on Interstate 75 is 124,000 vehicles per day south of Jonesboro Road and 140,000 vehicles per day north of Jonesboro Road.

GDOT Project PI 0009156, paired with GDOT Project PI 0009157, will construct a reversible, barrier-separated, managed lane system and Intelligent Transportation System infrastructure along I-75 in Henry and Clayton Counties. The managed lanes begin approximately 600 feet south of SR 138 (Stockbridge Highway) on I-75 and at SR 138 on I-675, and end at SR 155 on I-75, for a total length of 12.24 miles. From SR 155 to approximately 1 mile south of Mt. Carmel Road, the managed lane system will consist of one reversible lane transitioning to two reversible lanes. As construction of the project will be completed before construction of the proposed development, the modification to the study network has been included in the impact analysis of the Future “No-Build” and Future “Build” conditions.

Foster Drive

Foster Drive is a north-south, two-lane roadway with a posted speed limit of 30 mph in the vicinity of the site.

North Bridges Road

North Bridges Road is a north-south, unpaved roadway with no posted speed limit. The developer has applied for abandonment of North Bridges Road as well as the adjacent Commercial Drive and believes Henry County will consent.

Mt. Carmel Road

Mt. Carmel Road is a north-south, two-lane roadway with a posted speed limit of 45 mph in the vicinity of the site. GDOT traffic counts (Station ID 1517408) indicate that the daily traffic volume on Mt. Carmel Road is 3,720 vehicles per day south of Jonesboro Road. GDOT classifies Mt. Carmel Road as a Major Collector roadway.

As part of the GDOT Projects PI 0009156 and PI 0009157, the Mt. Carmel Road bridge over I-75 will be replaced with a new one. Due to this construction, Mt. Carmel Road is currently closed to all but local traffic between Mill Road and Jonesboro Road. Moreover, after completion of the GDOT project, the existing unsignalized intersection of Jonesboro Road at Mt. Carmel Road will be converted to a signalized intersection.

Oak Grove Road

Oak Grove Road is a north-south, two-lane roadway with a posted speed limit of 45 mph in the vicinity of the site. GDOT traffic counts (Station ID 1510501) indicate that the daily traffic volume on Oak Grove Road is 4,020 vehicles per day south of Foster Drive. GDOT classifies Oak Grove Road as a Major Collector roadway.

Willow Lane

Willow Lane is a north-south, two-lane, median-divided roadway with a posted speed limit of 45 mph in the vicinity of the site.

Kelly Road

Kelly Road is a north-south, two-lane roadway with a posted speed limit of 35 mph in the vicinity of the site.

Mill Road

Mill Road is a north-south, two-lane roadway with a posted speed limit of 45 mph in the vicinity of the site. GDOT traffic counts (Station IDs 1518135 & 1518134) indicate that the daily traffic volume on Mill Road is 7,480 vehicles per day south of Jonesboro Road and 4,770 vehicles per day south of Mt. Carmel Road. GDOT classifies Mill Road as a Local roadway.

Sterling Place

Sterling Place is a north-south, 450 foot, dead-end roadway with no posted speed limit.

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:

- Willow Lane: East side of the road, between Jonesboro Road and Bridges Road.

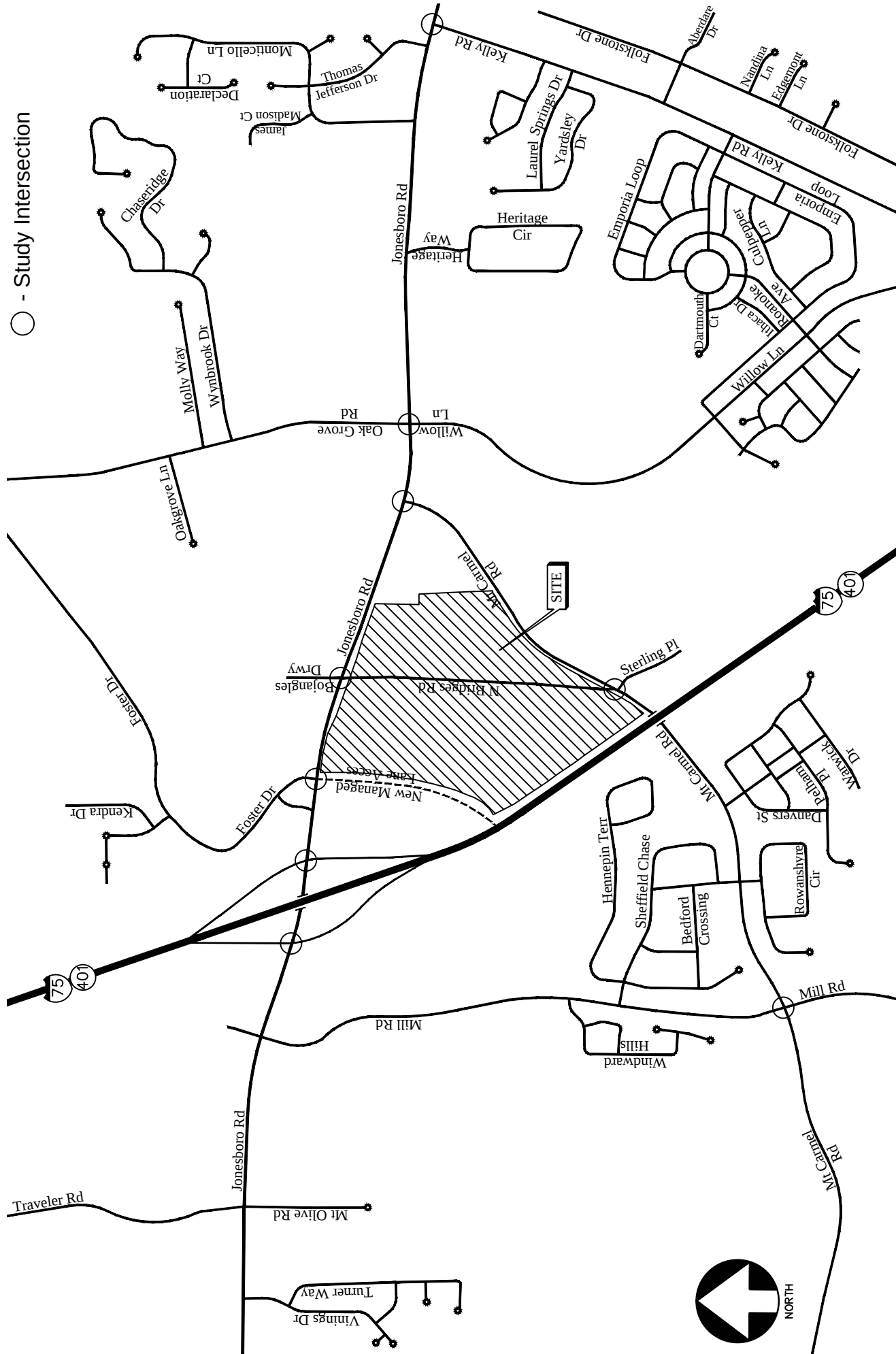
Bike paths are not present in the study area.

Existing Transit Facilities

There is no public transit service near the site.

LEGEND

○ - Study Intersection



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, 2000 edition (HCM 2000). Synchro software, which utilizes the HCM 2000 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 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 Highway Capacity Manual

EXISTING TRAFFIC ANALYSIS

Existing traffic counts and intersection geometric data were obtained at the following study intersections:

- Jonesboro Road @ I-75 Southbound Ramps
- Jonesboro Road @ I-75 Northbound Ramps
- Jonesboro Road @ Foster Drive
- Jonesboro Road @ North Bridges Road/Bojangle's Driveway
- Jonesboro Road @ Mt. Carmel Road
- Jonesboro Road @ Oak Grove Road/Willow Lane
- Jonesboro Road @ Kelly Road
- Mt. Carmel Road @ North Bridges Road/Sterling Place
- Mt. Carmel Road @ Mill Road

Turning movement counts were collected on Thursday, November 19, 2015 and Saturday, November 21, 2015. All weekday 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. All weekend turning movement counts were recorded during the Saturday peak hour between 12:00 p.m. and 2:00 p.m. 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 in accordance with the HCM methodology. A queue length analysis was also performed. The results of the analyses are shown in Tables 3 and 4. The existing traffic control and lane geometry for the intersections are shown in Figure 3.

TABLE 3 — EXISTING INTERSECTION OPERATIONS

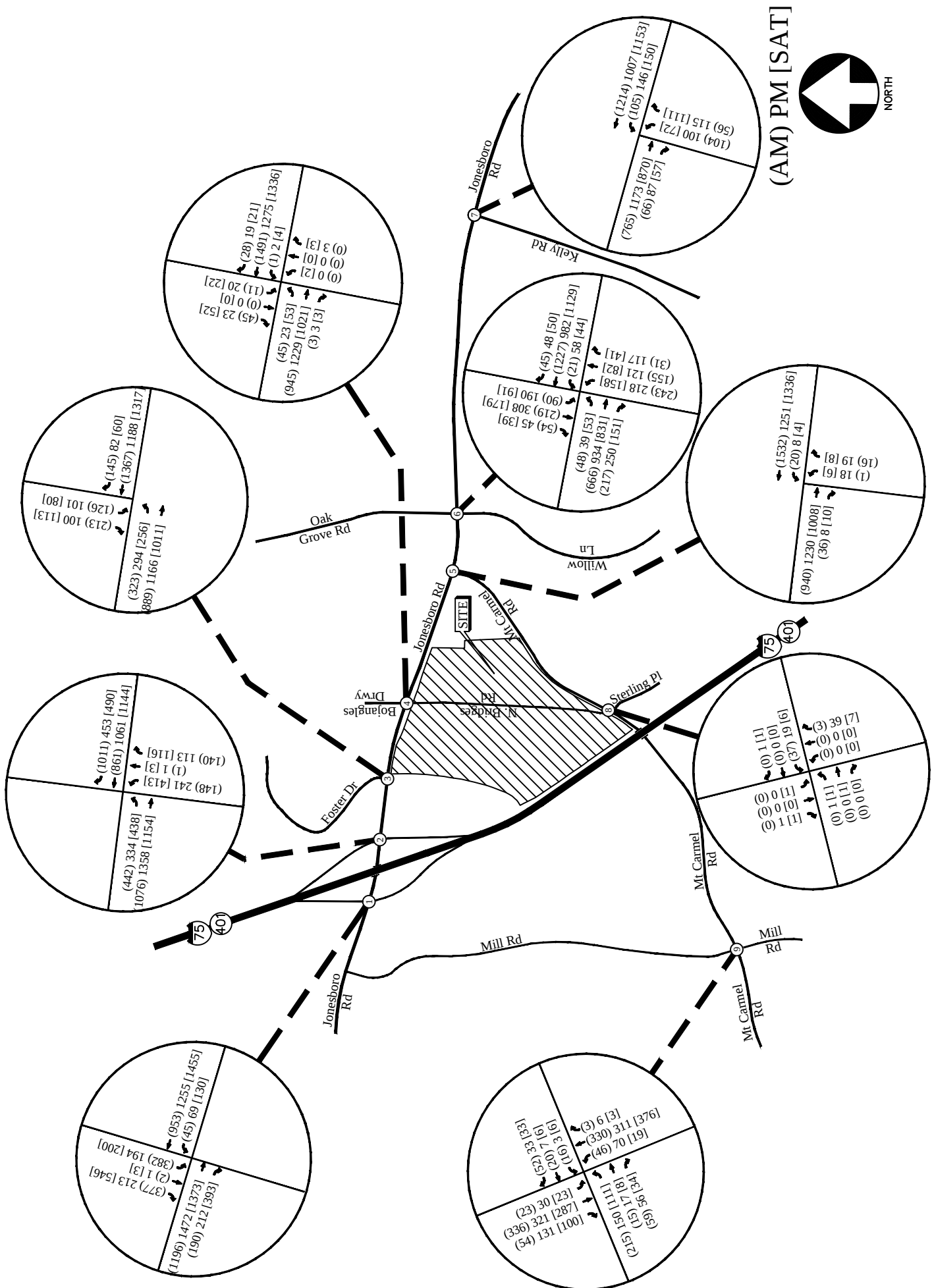
Intersection	Traffic Control	AM Peak	PM Peak	SAT Peak	LOS Standard
		LOS (Delay)	LOS (Delay)	LOS (Delay)	AM/PM/SAT
1 <u>Jonesboro Rd @ I-75 SB Ramps</u> -Eastbound Approach -Westbound Approach -Southbound Approach	Signalized	<u>C (26.4)</u> C (22.1) B (11.1) D (52.3)	<u>B (19.4)</u> B (18.1) A (3.0) E (65.7)	<u>D (41.8)</u> D (41.8) C (28.9) E (66.8)	<u>D / D / D</u> - - -
2 <u>Jonesboro Rd @ I-75 NB Ramps</u> -Eastbound Approach -Westbound Approach -Northbound Approach	Signalized	<u>C (21.5)</u> B (14.0) B (19.5) E (64.3)	<u>B (17.2)</u> B (14.8) A (6.4) E (71.3)	<u>C (28.7)</u> C (25.9) B (14.4) E (75.0)	<u>D / D / D</u> - - -
3 <u>Jonesboro Rd @ Foster Dr</u> -Eastbound Approach -Westbound Approach -Southbound Approach	Signalized	<u>C (21.5)</u> C (20.1) B (12.5) E (58.7)	<u>B (15.7)</u> A (9.2) B (14.9) E (67.0)	<u>B (14.4)</u> A (9.4) B (10.1) E (66.9)	<u>D / D / D</u> - - -
4 <u>Jonesboro Rd @ N Bridges Rd / Bojangle's Drwy</u> -Eastbound Left -Westbound Left -Northbound Approach -Southbound Approach	Stop Controlled on NB/SB	C (15.5) B (10.2) A (0.0) F (170.0)	B (13.4) B (11.4) B (11.7) F (236.1)	B (13.5) B (10.6) F (53.6) F (228.7)	D / D / D D / D / D D / D / E E / E / E
5 <u>Jonesboro Rd @ Mt Carmel Rd</u> -Westbound Left -Northbound Approach	Stop Controlled on NB	B (10.7) C (17.9)	B (12.2) F (55.5)	B (10.9) D (31.5)	D / D / D D / E / D
6 <u>Jonesboro Rd @ Oak Grove Rd / Willow Ln</u> -Eastbound Approach -Westbound Approach -Northbound Approach -Southbound Approach	Signalized	<u>D (36.6)</u> C (31.4) C (31.3) E (63.6) C (34.2)	<u>D (36.7)</u> C (30.4) C (26.8) E (75.6) D (37.2)	<u>C (28.3)</u> B (12.3) B (17.1) F (97.9) D (49.6)	<u>D / D / D</u> - - - -
7 <u>Jonesboro Rd @ Kelly Rd</u> -Eastbound Approach -Westbound Approach -Northbound Approach	Signalized	<u>B (11.1)</u> A (5.2) A (7.1) E (67.9)	<u>B (12.8)</u> A (6.0) A (8.2) E (74.2)	<u>B (13.2)</u> A (6.7) A (6.9) E (74.1)	<u>D / D / D</u> - - -
8 <u>Mt Carmel Rd @ N Bridges Rd / Sterling Pl</u> -Eastbound Left -Westbound Left -Northbound Approach -Southbound Approach	Stop Controlled on NB/SB	A (0.0) A (7.3) A (8.3) A (0.0)	A (7.2) A (6.4) A (8.5) A (8.3)	A (3.6) A (5.4) A (8.4) A (8.7)	D / D / D D / D / D D / D / D D / D / D
9 <u>Mt Carmel Rd @ Mill Rd</u> -Eastbound Approach -Westbound Approach -Northbound Approach -Southbound Approach	All-Way Stop Controlled	C (24.8) B (13.6) D (33.0) E (36.3)	C (18.0) B (11.4) D (25.3) D (33.8)	B (12.1) B (10.0) C (18.5) C (17.3)	D / D / D D / D / D D / D / D E / D / D

TABLE 4 — EXISTING INTERSECTION 95TH PERCENTILE QUEUES

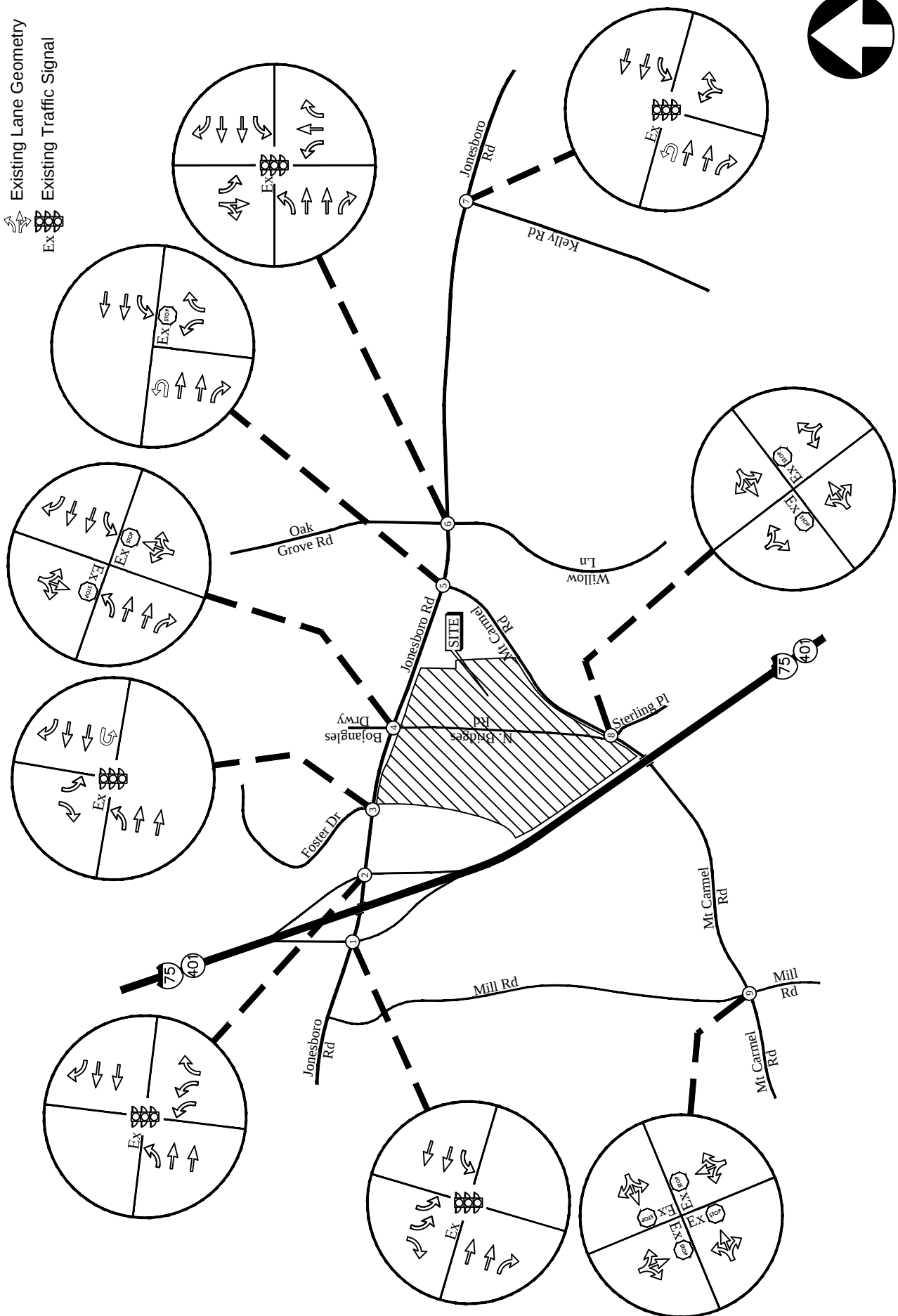
Intersection		Available Storage	AM Peak: feet	PM Peak: feet	SAT Peak: feet
1	<u>Jonesboro Rd @ I-75 SB Ramps</u>	-	584	688	800
	-Eastbound Through	415'	38	38	32
	-Eastbound Right	635'	24	33	204
	-Westbound Left	-	176	57	406
	-Westbound Through	430'	217	145	130
	-Southbound Left	-	132	44	57
	-Southbound Left/Through	700'	386	217	779
	-Southbound Right				
2	<u>Jonesboro Rd @ I-75 NB Ramps</u>	675'	424	344	479
	-Eastbound Left	-	194	447	253
	-Eastbound Through	-	132	163	382
	-Westbound Through	390'	663	0	23
	-Westbound Right	285'	128	211	325
	-Northbound Left	-	38	52	131
	-Northbound Left/Through	350'	61	97	76
	-Northbound Right				
3	<u>Jonesboro Rd @ Foster Dr</u>	275'	401	136	174
	-Eastbound Left	-	168	84	33
	-Eastbound Through	315'	0	0	0
	-Westbound U	-	262	434	156
	-Westbound Through	125'	25	14	12
	-Westbound Right	-	171	169	131
	-Southbound Left	215'	33	53	58
	-Southbound Right				
4	<u>Jonesboro Rd @ N Bridges Rd / Bojangles Drwy</u>	375'	13	8	11
	-Eastbound Left	-	0	0	0
	-Eastbound Through	160'	0	0	0
	-Eastbound Right	250'	0	1	1
	-Westbound Left	-	0	0	0
	-Westbound Through	100'	0	0	0
	-Westbound Right	-	0	1	12
	-Northbound Approach	-	115	108	158
	-Southbound Approach				
5	<u>Jonesboro Rd @ Mt Carmel Rd</u>	300'	0	0	0
	-Eastbound U	300'	3	3	1
	-Westbound Left	100'	4	41	16
	-Northbound Left	-	4	7	3
	-Northbound Right				
6	<u>Jonesboro Rd @ Oak Grove Rd / Willow Ln</u>	300'	55	59	38
	-Eastbound Left	-	303	494	256
	-Eastbound Through	150'	124	185	54
	-Eastbound Right	300'	12	60	24
	-Westbound Left	-	705	575	568
	-Westbound Through	250'	7	33	31
	-Westbound Right	300'	396	364	262
	-Northbound Left				

	-Northbound Through	-	151	113	104
	-Northbound Right	400'	0	43	11
	-Southbound Left	135'	102	197	116
	-Southbound Through/Right	-	280	347	249
7	<u>Jonesboro Rd @ Kelly Rd</u>				
	-Eastbound U	300'	0	0	0
	-Eastbound Through	-	352	123	358
	-Eastbound Right	315'	6	0	10
	-Westbound Left	300'	47	76	73
	-Westbound Through	-	324	283	309
	-Northbound Left/Right	-	199	264	218
8	<u>Mt Carmel Rd @ N Bridges Rd / Sterling Pl</u>				
	-Eastbound Approach	-	0	0	0
	-Westbound Approach	-	2	1	1
	-Northbound Approach	-	1	4	2
	-Southbound Approach	-	0	0	1
9	<u>Mt Carmel Rd @ Mill Rd</u>				
	-Eastbound Approach	-	94	84	45
	-Westbound Approach	-	44	43	36
	-Northbound Approach	-	97	123	66
	-Southbound Approach	-	124	238	154

The results of existing traffic operations analysis indicates that one or more approaches to stop-controlled side-streets are operating at level-of-service "E" or "F" during each peak hour. These areas are addressed in the Future Traffic Operations section.



- LEGEND**
- Ex  Existing Signed Approach
 -  Existing Lane Geometry
 - Ex  Existing Traffic Signal



EXISTING TRAFFIC CONTROL AND LANE GEOMETRY

FIGURE 3

PROJECT DESCRIPTION

The proposed site will be located to the east of I-75 between Jonesboro Road and Mt. Carmel Road in McDonough, Georgia. The development will consist of:

- Total Retail: 763,500 sf
- Hotel 1: 120 rooms
- Hotel 2: 100 rooms

The development proposes access at the following locations:

- Site Driveway 1: Full-access driveway on Jonesboro Road
- Site Driveway 2: Right-in/right-out driveway on Jonesboro Road
- Site Driveway 3: Full-access driveway on Mt. Carmel Road
- Site Driveway 4: Right-in/right-out driveway on Mt. Carmel Road
- Site Driveway 5: Right-in/right-out driveway on Jonesboro Road

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 hotel and retail uses. Pedestrian connections are proposed between the mixed-uses on the site.

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. Henry County lists Jonesboro Road to the west of I-75 as a future road widening or new roadway project in the 2007 Joint County/Cities Comprehensive Transportation Plan (JCTP).

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 2020.

Trip Generation

Trip generation estimates for the project were based on the rates and equations published in the 9th edition of the Institute of Transportation Engineers (ITE) Trip Generation report. This reference contains traffic volume count data collected at similar facilities nationwide. The trip generation was based on the following ITE Land Uses: 310 – *Hotel* and 820 – *Shopping Center*. Due to the nature of the development, pass-by and mixed-use reductions have been applied per ITE standards. The calculated total trip generation for the proposed development is shown in Table 5, and Table 6 shows the total Saturday peak hour trip generation.

TABLE 5 – TRIP GENERATION								
Land Use	Size	AM Peak Hour			PM Peak Hour			24-Hour
		Enter	Exit	Total	Enter	Exit	Total	Two-way
ITE 820 – Shopping Center	763,500 sf	334	205	539	1,123	1,216	2,339	25,454
<i>Mixed-use Reduction</i>		-25	-21	-46	-34	-21	-55	-566
<i>Pass-by Trips (0%) 34%</i>		0	0	0	-370	-406	-776	-7,760
ITE 310 – Hotel	220 rooms	69	48	117	67	65	132	1,596
<i>Mixed-use Reduction</i>		-21	-25	-46	-21	-34	-55	-566
Total Trips (without Reductions)		403	253	656	1,190	1,281	2,471	27,050
New External Trips (with Reductions)		357	207	564	765	820	1,585	18,158

*pass-by trips (AM) PM; 24-hour pass-by trips estimated by considering PM pass-by as 10% of daily

TABLE 6 – TRIP GENERATION (SATURDAY PEAK HOUR)				
Land Use	Size	Saturday Peak Hour		
		Enter	Exit	Total
ITE 820 – Shopping Center	763,500 sf	1,704	1,573	3,277
<i>Mixed-use Reduction</i>		-37	-27	-64
<i>Pass-by Trips 26%</i>		-433	-402	-835
ITE 310 – Hotel	220 rooms	87	69	156
<i>Mixed-use Reduction</i>		-27	-37	-64
Total Trips (without Reductions)		1,791	1,642	3,433
New External Trips (with Reductions)		1,294	1,176	2,470

Trip Distribution

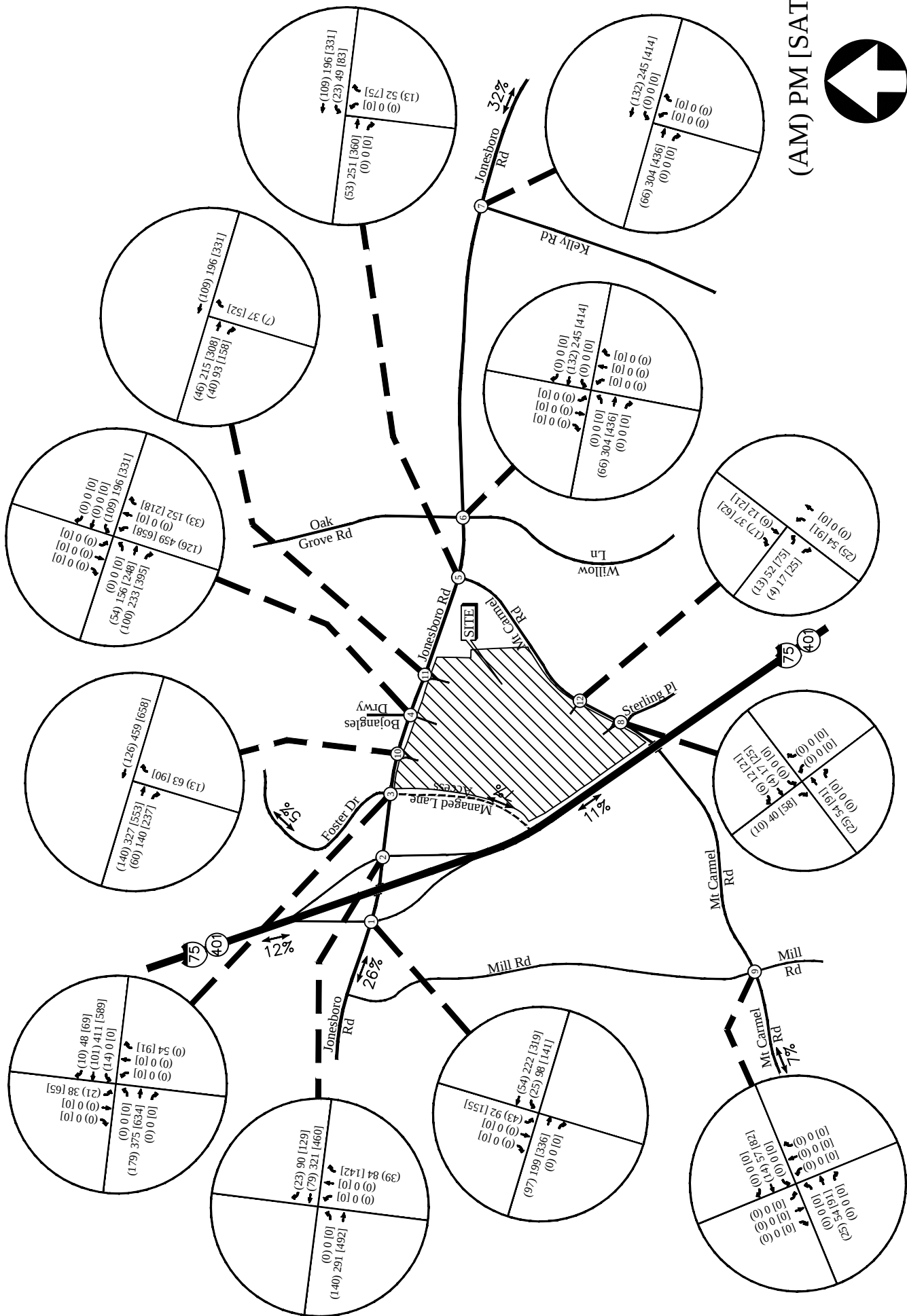
The trip distribution describes how traffic arrives and departs from the site. An overall trip distribution was developed for the site based on a review of the existing travel patterns in the area, and the locations of major roadways and highways that will serve the development. The site-generated peak hour traffic volumes, shown in Tables 5 and 6, were assigned to the study area intersections based on this distribution. The outer-leg distribution as well as the AM, PM, and Saturday peak hour new traffic generated by the site are shown in Figure 5. Pass-by volumes have also been distributed based on existing travel patterns and are shown in Figure 6.



Henry Promenade - Lifestyle McDonough, Georgia PARKING CALCULATIONS					
Retail Parking Ratio: 4.00					
Tenant Description	Sq Ft	Ratio (per 1,000)	Required # of Spaces	Provided # of Spaces	Variance
Anchor Stores					
Retail 1 - Grocery	36,450	5.00	182	200	18
Retail 2 - Fashion Anchor	128,000	4.00	512	600	88
Retail 3 - Recreation - Outdoor Anchor	100,000	4.00	400	600	200
Retail 4 - Membership Club	147,000	4.00	588	600	12
Retail 5 - Theater	53,000	12.25	650	652	2
Subtotal Anchor Stores	464,450	5.36	2,232	2,752	520
Inline GLA					
Retail 6 - 20th Restaurant	30,000	5.20	156	156	-
Retail 7 - 20th Restaurant	30,000	4.80	144	120	-
Retail 8 - 20th Restaurant	14,000	4.00	56	56	-
Retail 9 - 20th Restaurant	28,000	4.80	134	134	-
Retail 10 - 20th Restaurant	22,000	4.00	88	88	-
Retail 11 - 20th Restaurant	22,000	4.00	88	88	-
Retail 12 - 20th Restaurant	22,000	4.00	88	88	-
Retail 13 - 20th Restaurant	22,000	4.00	88	88	-
Subtotal Inline GLA	180,000	4.81	864	864	-
REI - Retail Boxes					
REI-1	18,000	4.00	72	72	-
Subtotal Retail Boxes	18,000	4.00	72	72	-
Power Center					
Box A - Junior Fashion	30,000	4.00	120	120	-
Box B	20,000	4.00	80	80	-
Box C	10,000	4.00	40	40	-
Subtotal Power Center	60,000	4.00	240	240	-
Hospitality					
Hotel 1	150	65.00	144	144	-
Hotel 2	100	60.00	120	120	-
Subtotal Hospitality	250	62.50	264	264	-
TOTAL GLA	887,450	4.79	4,072	4,232	160
Outparcels					
OP-1	1,127	5.000	40	20	-
OP-2	1,26	5.000	40	20	-
OP-3	1,36	5.000	40	20	-
OP-4	1,34	5.000	40	20	-
OP-5	1,24	5.000	40	20	-
Subtotal Outparcels	6,327	5.000	200	100	-



(AM) PM [SAT]



OUTER LEG TRIP DISTRIBUTION AND SITE-GENERATED
PEAK HOUR VOLUMES

FUTURE TRAFFIC ANALYSIS

The future traffic operations are analyzed for the “Build” and “No-Build” conditions. This provides a basis of reference for determining both the contribution of the site to overall traffic conditions and the additional improvements needed to provide sufficient site access and capacity for passing traffic. 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. As GDOT Projects PI 0009156 and PI 0009157 will be completed before construction of the proposed development, projected shifts in traffic along the study network (calculated by GDOT) were included in the Future “No-Build” volumes as well. Moreover, to account for Mt. Carmel Road opening to all traffic with the completion of the GDOT projects, a total of 100 vehicles were added/subtracted to the existing detour route within the study network. The Future “No-Build” volumes consist of the existing traffic volumes (Figure 2) as well as increases for annual growth of through traffic and shifts in existing traffic due to the GDOT project and Mt. Carmel Road re-opening.

Annual Traffic Growth

In order to evaluate future traffic operations in this area, a projection of normal traffic growth was applied to the existing volumes. The Georgia Department of Transportation recorded average daily traffic volumes at several locations in the vicinity of the site. Reviewing the growth over the last several years revealed growth of approximately 1% in the 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 7.

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 7 — PLANNED AND PROGRAMMED IMPROVEMENTS

ARC Number / GDOT Number / Local Number	Route	Type of Improvement	Scheduled Completion Year	Source
HE-920B / 342970 / NA	Jonesboro Rd Widening from US 19/41 (Tara Blvd) in Clayton County to I-75 South in Henry County	General Purpose Roadway Capacity	2030	Plan 2040 GDOT
AR-ML-640 / 0009156, 0009157 / NA	I-75 from Eagles Landing Pkwy to SR 155	Roadway/ Managed Lanes	Under Construction	GDOT
NA / 0007858 / NA	I-75 from I-675 to Jonesboro Rd	Widening	Long Range (LR2)	GDOT
NA / 0007891 / NA	I-75 from Bill Gardner Pkwy to Jonesboro Rd	Widening	Long Range	GDOT

Projects included in the model for the future conditions include:

GDOT Project PI #0009156, PI #0009157: Consists of a reversible, barrier-separated, managed lane system and Intelligent Transportation System infrastructure along I-75 in Henry and Clayton Counties. The managed lanes begin approximately 600 feet south of SR 138 (Stockbridge Highway) on I-75 and at SR 138 on I-675, and end at SR 155 on I-75, for a total length of 12.24 miles. From SR 155 to approximately 1 mile south of Mt. Carmel Road, the managed lane system will consist of one reversible lane transitioning to two reversible lanes.

Recommendations for System 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 and are taken under consideration by the local municipality. A summary of the system improvements is provided below with more detailed information on each intersection in the following narratives.

Jonesboro Road @ I-75 SB Ramps

The existing conditions analysis for the intersection of Jonesboro Road at I-75 SB Ramps indicates the southbound approach (I-75 Ramp) is currently operating at a level-of-service “E” in the Saturday peak hour before the addition of site traffic. It is recommended that the existing southbound shared through/left turn lane be restriped to accommodate through/left/right turn movements. This will allow more stacking for the southbound right turn movements.

Jonesboro Road @ I-75 NB Ramps

The queue for the westbound right turn movement is currently extending beyond the available storage in the AM peak hour. In order to accommodate the amount of stacking for the westbound right turn movement, it is recommended that the existing right turn lane be extended through to the next intersection.

Jonesboro Road@ Foster Drive/Managed Lanes Access

In order to accommodate the extended westbound right turn lane and right turn queue at the adjacent intersection of Jonesboro Road at I-75 NB Ramps, it is recommended that the existing dedicated westbound right turn lane be converted to operate as a shared through/right turn lane.

Jonesboro Road at Oak Grove Road/Willow Lane

The intersection of Jonesboro Road at Oak Grove Road/Willow Lane is currently operating at an acceptable level-of-service (“D” or better) during the AM, PM, and Saturday peak hours. After accounting for growth of background traffic, the intersection will begin to operate at a level-of-service “E” in the AM peak hour. In order to bring the level-of-service to the accepted threshold “D”, it is recommended that the southbound approach be shifted to the east in order to accommodate a dedicated right turn lane, and extend the northbound left turn lane storage to 500’ of full-width storage by restriping the existing gored area in the median. It is also recommended that protected + permissive signal phasing be installed for the northbound and southbound left turn movements.

Jonesboro Road at N. Bridges Road/Bojangle’s Driveway

The side-street approaches to the intersection of Jonesboro Road at N. Bridges Road/Bojangle’s Driveway are currently operating below an acceptable level-of-service (“E” or better). As this is an existing condition and the only improvement needed is for the southbound right movement, which is offsite and out of public right-of way, no reasonable improvements have been identified.

Mt. Carmel Road at Mill Road

One or more approaches to the intersection of Mt. Carmel Road at Mill Road will begin to operate below an acceptable level-of-service (“D” or better) after accounting for growth of background traffic. Due to

the intersection being all-way stop-controlled, and because queuing on each approach will not block other nearby intersections, no reasonable improvements have been identified at the intersection.

Summary of Recommended System Improvements

- Shift the southbound approach to the intersection of Jonesboro Road at Oak Grove Road/Willow Lane to the east in order to install a dedicated southbound right turn lane with 100' storage and a 75' taper and install protected + permissive signal phasing.
- Extend the northbound left turn lane at the above intersection to 500' of storage by restriping the existing gore area within the median and install protected + permissive signal phasing.
- It is recommended that the existing southbound through/left lane at the intersection of Jonesboro Road at I-75 SB Ramps be restriped to accommodate a through/left/right movement.
- It is recommended the existing westbound right turn lane at the intersection of Jonesboro Road at I-75 NB Ramps be extended through to the next intersection (Jonesboro Road at Foster Drive/Managed Lanes Access), replacing the existing dedicated westbound right turn lane at the Jonesboro Road at Foster Drive/Managed Lanes Access intersection with a shared through/right turn lane.

Future “No-Build” Traffic Operations

The future “No-Build” traffic operations were analyzed using the volumes in Figure 7 and the results are shown in Tables 8 and 9 below.

TABLE 8 — FUTURE “NO-BUILD” INTERSECTION OPERATIONS

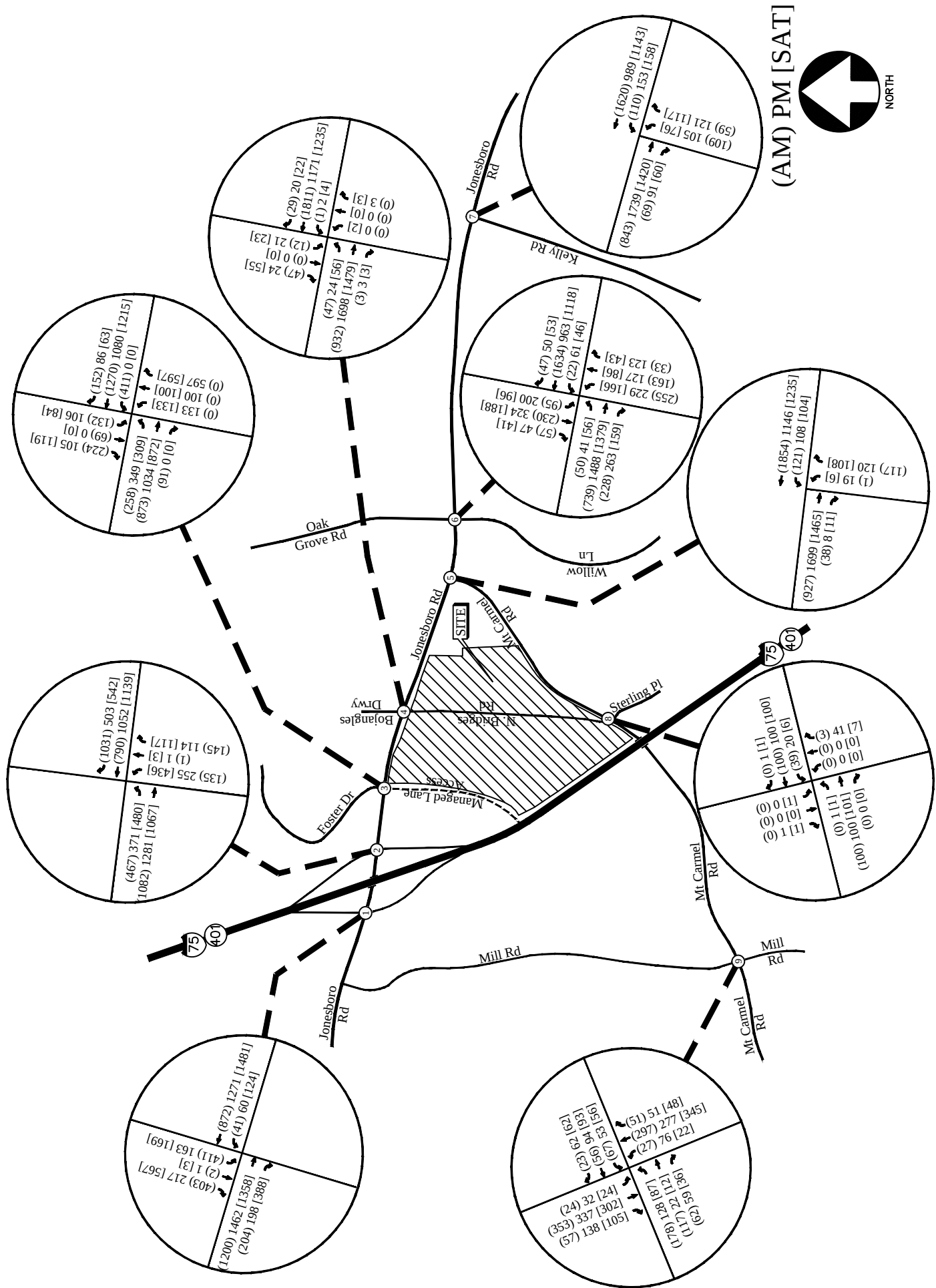
Intersection		No-Build 2020: LOS (Delay)			No-Build 2020 Improved: LOS (Delay)			LOS STD
		AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak	
1	<u>Jonesboro Rd @ I-75 SB Ramps</u>	<u>C (27.5)</u>	<u>B (18.6)</u>	<u>D (38.8)</u>	<u>C (26.4)</u>	<u>B (16.7)</u>	<u>C (24.7)</u>	<u>D/D/D</u>
	-Eastbound Approach	C (23.4)	B (17.0)	D (43.4)	B (19.6)	B (12.7)	C (23.6)	-
	-Westbound Approach	B (10.4)	A (3.3)	B (19.8)	A (8.3)	A (4.0)	A (6.2)	-
	-Southbound Approach	D (51.6)	E (66.1)	E (66.9)	E (55.9)	E (65.1)	E (64.8)	-
2	<u>Jonesboro Rd @ I-75 NB Ramps</u>	<u>C (23.3)</u>	<u>B (18.8)</u>	<u>C (30.3)</u>	<u>C (23.2)</u>	<u>B (18.5)</u>	<u>C (31.6)</u>	<u>D/D/D</u>
	-Eastbound Approach	B (12.8)	B (16.4)	C (27.4)	B (11.7)	B (15.0)	C (27.9)	-
	-Westbound Approach	C (24.3)	A (8.0)	B (15.0)	C (25.0)	A (9.0)	B (17.7)	-
	-Northbound Approach	E (64.5)	E (71.6)	E (78.4)	E (64.5)	E (71.6)	E (78.4)	-
3	<u>Jonesboro Rd @ Foster Dr/Managed Lanes Access</u>	<u>C (30.8)</u>	<u>D (43.9)</u>	<u>D (41.3)</u>	<u>C (30.4)</u>	<u>D (38.3)</u>	<u>D (35.2)</u>	<u>D/D/D</u>
	-Eastbound Approach	C (28.5)	D (36.7)	C (30.8)	C (29.2)	C (27.5)	C (21.7)	-
	-Westbound Approach	C (25.0)	C (33.2)	C (28.8)	C (23.7)	C (26.2)	C (20.5)	-
	-Northbound Approach (PM/SAT ONLY)	-	E (64.6)	E (66.9)	-	E (65.7)	E (66.6)	-
	-Southbound Approach	E (58.2)	E (67.0)	E (66.8)	E (58.2)	E (67.0)	E (66.8)	-
4	<u>Jonesboro Rd @ N Bridges Rd / Bojangle's Drwy</u>							
	-Eastbound Left	C (20.3)	B (12.6)	B (12.7)	C (20.3)	B (12.6)	B (12.7)	D/D/D
	-Westbound Left	A (9.3)	C (15.1)	B (13.8)	A (9.3)	C (15.1)	B (13.8)	D/D/D
	-Northbound Approach	A (0.0)	B (13.0)	F (134.5)	A (0.0)	B (13.1)	F (134.5)	D/D/E
5	<u>Jonesboro Rd @ Mt Carmel Rd</u>	<u>A (4.9)</u>	<u>B (15.7)</u>	<u>C (22.6)</u>	<u>A (5.3)</u>	<u>A (9.0)</u>	<u>C (23.3)</u>	<u>D/D/D</u>
	-Eastbound Approach	A (1.0)	B (10.9)	C (24.2)	A (2.5)	A (5.7)	C (23.3)	-
	-Westbound Approach	A (2.0)	B (12.9)	B (12.6)	A (2.0)	A (6.8)	B (12.3)	-
	-Northbound Approach	E (63.3)	E (67.7)	E (67.7)	E (63.3)	E (68.1)	E (67.7)	-
		<u>E (57.5)</u>	<u>D (54.1)</u>	<u>C (28.8)</u>	<u>D (52.2)</u>	<u>D (54.5)</u>	<u>C (25.8)</u>	<u>D/D/D</u>
6	<u>Jonesboro Rd @ Oak Grove Rd/ Willow Ln</u>							
	-Eastbound Approach	B (19.7)	E (68.1)	B (13.2)	B (12.3)	D (41.0)	A (7.5)	-
	-Westbound Approach	E (76.6)	D (35.8)	C (25.2)	C (27.9)	D (47.4)	C (24.7)	-
	-Northbound Approach	F (87.8)	E (68.3)	F (93.7)	F (211.1)	F (108.8)	E (71.5)	-
7	<u>Jonesboro Rd @ Kelly Rd</u>	<u>B (11.9)</u>	<u>B (19.6)</u>	<u>B (14.0)</u>	<u>B (12.1)</u>	<u>B (19.7)</u>	<u>B (13.9)</u>	<u>D/D/D</u>
	-Eastbound Approach	A (3.2)	A (9.1)	A (6.9)	A (3.9)	A (9.3)	A (6.7)	-
	-Westbound Approach	B (10.2)	C (24.8)	B (10.4)	B (10.2)	C (24.8)	B (10.4)	-
	-Northbound Approach	E (68.1)	E (73.9)	E (74.6)	E (68.1)	E (73.9)	E (74.6)	-
8	<u>Mt Carmel Rd @ N Bridges Rd / Sterling Pl</u>							
	-Eastbound Left	A (0.0)	A (0.3)	A (0.1)	A (0.0)	A (0.3)	A (0.1)	D/D/D
	-Westbound Left	A (2.6)	A (1.7)	A (0.9)	A (2.6)	A (1.7)	A (0.9)	D/D/D
	-Northbound Approach	A (8.8)	A (9.1)	B (10.8)	A (8.8)	A (9.1)	B (10.8)	D/D/D
9	<u>Mt Carmel Rd @ Mill Rd</u>							
	-Eastbound Approach	F (64.1)	D (28.3)	B (14.8)	F (64.1)	D (28.3)	B (14.8)	D/D/D
	-Westbound Approach	C (22.3)	D (33.0)	C (18.7)	C (22.3)	D (33.0)	C (18.7)	D/D/D
	-Northbound Approach	F (63.0)	F (71.5)	E (38.3)	F (63.0)	F (71.5)	E (38.3)	D/D/D
9	-Southbound Approach	F (72.4)	F (70.9)	E (36.2)	F (72.4)	F (70.9)	E (36.2)	E/D/D

TABLE 9 – FUTURE “NO-BUILD” INTERSECTION 95TH PERCENTILE QUEUES

Intersection		Available Storage	No-Build 2020: Queue (feet)			No-Build 2020 Improved: Queue (feet)		
			AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak
1	<u>Jonesboro Rd @ I-75 SB Ramps</u>							
	-Eastbound Through	-	596	670	800	553	565	704
	-Eastbound Right	415'	39	36	33	36	31	29
	-Westbound Left	635'	25	17	145	23	10	57
	-Westbound Through	-	237	6	634	153	5	216
	-Southbound Left	430'	230	123	109	329	214	207
	-Southbound Left/Through	-	140	37	49	169	0	118
	-Southbound Right	700'	405	223	809	242	101	356
2	<u>Jonesboro Rd @ I-75 NB Ramps</u>							
	-Eastbound Left	675'	436	398	520	412	365	604
	-Eastbound Through	-	203	561	673	110	507	623
	-Westbound Through	-	116	171	302	90	162	166
	-Westbound Right	830'	617	9	10	799	55	79
	-Northbound Left	285'	120	222	362	120	222	362
	-Northbound Left/Through	-	36	55	138	36	55	138
	-Northbound Right	350'	68	85	59	68	85	59
3	<u>Jonesboro Rd @ Foster Dr/Managed Lanes Access</u>							
	-Eastbound Left	275'	160	479	473	199	337	386
	-Eastbound Through/Right	-	510	172	37	508	230	41
	-Westbound Left (AM ONLY)	315'	471	0	0	472	0	0
	-Westbound Through	-	591	727	755	-	-	-
	-Westbound Through/Right	-	-	-	-	368	413	428
	-Westbound Right	125'	35	0	3	-	-	-
	-Northbound Left (PM/SAT ONLY)	175'	-	207	207	-	202	197
	-Northbound Through (PM/SAT ONLY)	-	-	160	160	-	156	152
	-Northbound Right (PM/SAT ONLY)	150'	-	236	202	-	230	195
	-Southbound Left	-	180	176	136	180	176	136
	-Southbound Through (AM ONLY)	-	106	-	-	106	-	-
	-Southbound Right	215'	32	24	43	32	24	43
4	<u>Jonesboro Rd @ N Bridges Rd / Bojangles Drwy</u>							
	-Eastbound Left	375'	20	7	11	20	7	11
	-Eastbound Through	-	0	0	0	0	0	0
	-Eastbound Right	160'	0	0	0	0	0	0
	-Westbound Left	250'	0	1	1	0	1	1
	-Westbound Through	-	0	0	0	0	0	0
	-Westbound Right	100'	0	0	0	0	0	0
	-Northbound Approach	-	0	1	26	0	1	26
	-Southbound Approach	-	179	130	197	179	130	197

Table Continued on Next Page...

Intersection		Available Storage	No-Build 2020: Queue (feet)			No-Build 2020 Improved: Queue (feet)		
			AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak
5	<u>Jonesboro Rd @ Mt Carmel Rd</u>							
	-Eastbound U	300'	0	0	0	0	0	0
	-Eastbound Through	-	7	393	601	7	241	797
	-Eastbound Right	250	0	0	7	0	0	11
	-Westbound Left	300'	10	35	64	8	65	74
	-Westbound Through	-	77	39	90	60	28	89
	-Northbound Left	100'	4	45	16	4	46	16
	-Northbound Right	-	14	0	0	14	67	0
6	<u>Jonesboro Rd @ Oak Grove Rd / Willow Ln</u>							
	-Eastbound Left	300'	55	54	43	59	48	12
	-Eastbound Through	-	181	981	362	150	927	163
	-Eastbound Right	150'	35	310	75	8	214	3
	-Westbound Left	300'	9	45	48	7	65	39
	-Westbound Through	-	1,103	507	634	1,051	529	597
	-Westbound Right	250'	2	28	43	2	22	27
	-Northbound Left	300'	471	431	276	-	-	-
	-Northbound Left	500'	-	-	-	496	380	228
	-Northbound Through	-	169	134	107	200	167	128
	-Northbound Right	400'	2	76	11	0	70	0
	-Southbound Left	135'	118	237	118	113	225	121
	-Southbound Through/Right	-	320	420	257	300	446	266
	-Southbound Right	100'	-	-	-	0	0	0
7	<u>Jonesboro Rd @ Kelly Rd</u>							
	-Eastbound U	300'	0	0	0	0	0	0
	-Eastbound Through	-	208	972	92	57	236	276
	-Eastbound Right	315'	0	1	0	0	1	1
	-Westbound Left	300'	50	269	126	50	269	126
	-Westbound Through	-	552	285	316	552	285	316
	-Northbound Left/Right	-	208	278	233	208	278	233
8	<u>Mt Carmel Rd @ N Bridges Rd / Sterling Pl</u>							
	-Eastbound Approach	-	0	0	0	0	0	0
	-Westbound Approach	-	3	1	1	3	1	1
	-Northbound Approach	-	1	5	3	1	5	3
	-Southbound Approach	-	0	0	1	0	0	1
9	<u>Mt Carmel Rd @ Mill Rd</u>							
	-Eastbound Approach	-	170	46	42	152	68	60
	-Westbound Approach	-	86	97	61	71	70	92
	-Northbound Approach	-	134	100	101	134	101	179
	-Southbound Approach	-	258	133	205	176	200	87



FUTURE (NO-BUILD) PEAK HOUR VOLUMES

FIGURE 7

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 (Figure 6) were added to “No-Build” traffic volumes (Figure 7) to calculate the future traffic volumes after the construction of the development. These total future traffic volumes (Figure 8) were used to evaluate the “Build” condition. The results of the “Build” operations analyses with the assumed site access configuration are shown in Tables 10 and 11.

Site Access Configuration

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

- Site Driveway #1: Full-access driveway on Jonesboro Road
 - This driveway will consist of two entering lanes and two exiting lanes.
 - The intersection will be controlled by an actuated traffic signal with a permissive + protected phase for the eastbound and westbound left turn movements.
 - Entering left turn movements will be made from a dedicated westbound left turn lane.
 - Entering right turn movements will be made from a dedicated eastbound deceleration lane.
- Site Driveway #2: Right-in/right-out driveway on Jonesboro Road
 - This driveway will consist of one entering and one exiting lane.
 - The intersection will be unsignalized with a YIELD sign on the northbound approach.
 - A deceleration lane will be constructed for entering traffic based on local standards.
- Site Driveway #3: Full-access driveway on Mt. Carmel Road
 - This driveway will consist of one entering lane and two exiting lanes. The southbound (driveway) approach will have a left turn and right turn lane for exiting traffic.
 - The intersection will be controlled by an actuated traffic signal.
 - Entering left turn movements will be made from a dedicated eastbound left turn lane.
 - Entering right turn movements will be made from a dedicated westbound deceleration lane.
- Site Driveway #4: Right-in/right-out driveway on Mt. Carmel Road
 - This driveway will consist of one entering lane and one exiting lane.
 - The intersection will be unsignalized with a YIELD sign on the southbound approach.
 - A westbound deceleration lane will be constructed for entering traffic based on local standards.
- Site Driveway #5: Right-in/right-out driveway on Jonesboro Road
 - This driveway will consist of one entering lane and one exiting lane.
 - The intersection will be unsignalized with a YIELD sign on the southbound approach.
 - An eastbound deceleration lane will be constructed for entering traffic based on local standards.

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 site mitigation improvements is provided below, with more detailed information on each intersection in the following narratives.

Jonesboro Road@ Foster Drive/Managed Lanes Access

Because a third eastbound through lane on Jonesboro Road is recommended beginning at this intersection, it is recommended dual rights on the northbound approach (Managed Lanes Access) be reconfigured to operate with one free-flow right turn and one yield-controlled right turn lane. A concept of this recommendation is included in the Appendix.

Jonesboro Road @ Mt. Carmel Road

Due to the large number of northbound right turns after the addition of site traffic, it is recommended that the existing northbound right turn operate with dual right turns and given permissive + overlap signal phasing.

Mt. Carmel Road at Mill Road

One or more approaches to the intersection of Mt. Carmel Road at Mill Road will continue to operate below an acceptable level-of-service ("D" or better) after accounting for site-generated traffic. Due to the intersection being all-way stop-controlled, and because queuing on each approach will not block other nearby intersections, no reasonable improvements have been identified at the intersection.

Jonesboro Road @ Site Driveway 1

The Future "Build" 2020 conditions analysis for Jonesboro Road at Site Driveway 1 indicates the intersection will operate at an overall level-of-service "F" during the PM and Saturday peak hours. It is recommended that dual left turn lanes be constructed for the westbound and northbound approaches and operate with protected signal phasing. To relieve congestion on the eastbound through movement, it is recommended a third through lane be constructed along the site frontage beginning at the intersection of Jonesboro Road at Foster Drive/Managed Lane Access through to drop as a right turn lane at the eastern right-in/right-out driveway (Site Driveway 5) on Jonesboro Road. Although this improvements will not bring the overall level-of-service to within the "D" threshold during the Saturday peak hour, the recommended improvements will reduce the overall delay at the intersection by more than 274 seconds/vehicle. As these delays will only be experienced during one peak hour out of the week, no further improvements are feasible at the intersection.

Summary of Recommended Site Mitigation Improvements

- Recommended system improvements (previous section) are also applicable as mitigation improvements.
- It is recommended a third through lane be constructed on Jonesboro Road along the site frontage beginning at the intersection of Jonesboro Road at Foster Drive/Managed Lanes Access

through to drop as a right turn lane at the eastern right-in/right-out driveway (Site Driveway 5) on Jonesboro Road.

- It is recommended the northbound dual rights at the intersection of Jonesboro Road at Foster Drive/Managed Lanes Access be reconfigured to operate with one free-flow right turn and one yield-controlled right turn.
- It is recommended northbound dual right turn lanes be added to the intersection of Jonesboro Road at Mt. Carmel Road and given permissive + overlap signal phasing.
- It is recommended westbound and northbound dual left turn lanes be constructed at the intersection of Jonesboro Road at Site Driveway 1 and given protected signal phasing.

Future “Build” Traffic Operations

The “Build” conditions are evaluated to determine effectiveness of the recommended system and site mitigation improvements. Recommendations on traffic control and lane geometry are shown graphically in Figure 9.

TABLE 1 O — FUTURE “BUILD” INTERSECTION OPERATIONS

Intersection		Build 2020: LOS (Delay)			Build 2020 Improved: LOS (Delay)			LOS STD
		AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak	
1	<u>Jonesboro Rd @ I-75 SB Ramps</u>	<u>C (29.2)</u>	<u>C (26.6)</u>	<u>E (65.5)</u>	<u>C (27.1)</u>	<u>C (24.8)</u>	<u>D (43.0)</u>	<u>D/D/D</u>
	-Eastbound Approach	C (26.4)	C (26.2)	E (74.6)	C (23.7)	C (23.2)	D (46.6)	-
	-Westbound Approach	B (11.4)	B (11.2)	C (33.2)	A (4.2)	A (8.7)	B (16.0)	-
	-Southbound Approach	D (53.0)	E (70.4)	F (114.2)	E (57.2)	E (74.4)	F (92.3)	-
2	<u>Jonesboro Rd @ I-75 NB Ramps</u>	<u>C (32.1)</u>	<u>C (23.9)</u>	<u>D (39.0)</u>	<u>C (30.2)</u>	<u>C (25.2)</u>	<u>D (39.3)</u>	<u>D/D/D</u>
	-Eastbound Approach	B (17.6)	C (25.9)	C (34.5)	B (17.0)	C (24.8)	C (33.2)	-
	-Westbound Approach	D (35.3)	A (8.2)	B (19.4)	C (31.8)	B (12.2)	C (21.2)	-
	-Northbound Approach	E (78.0)	E (78.2)	F (108.3)	E (78.0)	E (78.2)	F (108.3)	-
3	<u>Jonesboro Rd @ Foster Dr/ Managed Lanes Access</u>	<u>D (35.4)</u>	<u>F (88.0)</u>	<u>E (71.0)</u>	<u>D (35.5)</u>	<u>D (40.9)</u>	<u>D (42.0)</u>	<u>D/D/D</u>
	-Eastbound Approach	D (36.0)	E (68.2)	E (60.9)	D (37.2)	D (35.6)	C (33.8)	-
	-Westbound Approach	C (28.7)	F (114.4)	F (86.7)	C (28.4)	E (55.2)	E (56.8)	-
	-Northbound Approach (PM/SAT ONLY)	-	F (86.8)	E (65.1)	-	B (18.5)	B (18.7)	-
	-Southbound Approach	E (58.6)	E (67.3)	D (51.8)	E (57.1)	E (67.3)	E (68.5)	-
4	<u>Jonesboro Rd @ Bojangle’s Drwy</u>	<u>B (16.9)</u>	<u>F (125.1)</u>	<u>F (593.9)</u>	<u>B (17.5)</u>	<u>D (47.6)</u>	<u>F (319.1)</u>	<u>D/D/D</u>
	-Eastbound Approach	B (12.6)	F (115.6)	F (669.6)	A (4.1)	D (54.3)	F (416.4)	-
	-Westbound Approach	B (14.3)	C (21.6)	F (367.0)	C (20.5)	C (27.6)	F (102.7)	-
	-Northbound Approach	E (59.3)	F (327.2)	F (697.4)	E (62.9)	E (61.4)	F (369.1)	-
	-Southbound Approach	E (66.0)	E (71.2)	E (69.0)	E (66.0)	E (71.1)	E (70.2)	-
5	<u>Jonesboro Rd @ Mt Carmel Rd</u>	<u>A (7.6)</u>	<u>B (17.0)</u>	<u>E (56.9)</u>	<u>A (5.8)</u>	<u>B (19.0)</u>	<u>C (32.3)</u>	<u>D/D/D</u>
	-Eastbound Approach	A (7.3)	A (8.6)	E (74.4)	A (5.2)	B (18.2)	C (32.4)	-
	-Westbound Approach	A (5.0)	B (14.5)	D (38.0)	A (2.6)	B (15.9)	C (31.2)	-
	-Northbound Approach	D (52.9)	F (80.1)	E (68.2)	E (62.6)	D (40.1)	D (36.6)	-

6	<u>Jonesboro Rd @ Oak Grove Rd/ Willow Ln</u>	<u>E (70.7)</u>	<u>E (64.0)</u>	<u>C (30.6)</u>	<u>E (57.9)</u>	<u>D (50.9)</u>	<u>C (28.8)</u>	<u>D/D/D</u>
	-Eastbound Approach	B (10.1)	E (59.5)	A (8.6)	B (18.4)	D (35.5)	B (13.5)	-
	-Westbound Approach	E (66.5)	D (40.6)	C (29.7)	D (39.2)	D (36.6)	B (19.6)	-
	-Northbound Approach	F (225.6)	F (140.2)	F (125.9)	F (211.1)	F (138.5)	F (123.0)	-
	-Southbound Approach	E (62.1)	E (68.9)	E (65.5)	E (60.6)	E (63.0)	E (64.4)	-
7	<u>Jonesboro Rd @ Kelly Rd</u>	<u>B (12.4)</u>	<u>C (26.3)</u>	<u>B (18.0)</u>	<u>B (13.0)</u>	<u>C (26.9)</u>	<u>B (20.0)</u>	<u>D/D/D</u>
	-Eastbound Approach	A (2.9)	B (18.8)	A (5.4)	A (4.7)	B (19.8)	A (9.4)	-
	-Westbound Approach	B (11.6)	C (29.5)	C (23.5)	B (11.6)	C (29.5)	C (23.5)	-
	-Northbound Approach	E (68.1)	E (73.9)	E (74.6)	E (68.1)	E (73.9)	E (74.6)	-
8	<u>Mt Carmel Rd @ Site Drwy 4/ Sterling Pl</u>							
	-Eastbound Right	A (0.0)	A (0.2)	A (0.1)	A (0.0)	A (0.2)	A (0.1)	D/D/D
	-Westbound Left	A (2.6)	A (1.7)	A (1.0)	A (2.6)	A (1.7)	A (1.0)	D/D/D
	-Northbound Approach	A (9.0)	A (9.4)	B (14.5)	A (9.0)	A (9.4)	B (14.5)	D/D/D
	-Southbound Right	A (8.9)	A (10.0)	B (11.0)	A (8.9)	A (10.0)	B (11.0)	D/D/D
9	<u>Mt Carmel Rd @ Mill Rd</u>							
	-Eastbound Approach	<u>F (73.3)</u>	<u>F (57.7)</u>	D (27.3)	<u>F (73.3)</u>	<u>F (57.7)</u>	D (27.3)	D/D/D
	-Westbound Approach	D (25.1)	<u>F (76.8)</u>	<u>E (48.0)</u>	D (25.1)	<u>F (76.8)</u>	<u>E (48.0)</u>	D/D/D
	-Northbound Approach	<u>F (70.3)</u>	<u>F (77.1)</u>	<u>F (72.6)</u>	<u>F (70.3)</u>	<u>F (77.1)</u>	<u>F (72.6)</u>	D/D/D
	-Southbound Approach	<u>F (73.0)</u>	<u>F (76.6)</u>	<u>F (72.2)</u>	<u>F (73.0)</u>	<u>F (76.6)</u>	<u>F (72.2)</u>	E/D/D
10	<u>Jonesboro Rd @ Site Drwy 2</u>							
	-Eastbound Right	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)	D/D/D
	-Northbound Right	A (9.9)	B (14.6)	B (15.0)	B (11.3)	B (10.1)	B (12.1)	D/D/D
11	<u>Jonesboro Rd @ Site Drwy 5</u>							
	-Eastbound Right	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)	D/D/D
	-Northbound Right	A (9.5)	B (12.1)	B (11.9)	B (10.1)	B (11.4)	B (11.9)	D/D/D
12	<u>Mt. Carmel Rd @ Site Drwy 3</u>	<u>A (5.3)</u>	<u>B (16.5)</u>	<u>B (16.9)</u>	<u>A (5.6)</u>	<u>B (16.3)</u>	<u>B (16.9)</u>	<u>D/D/D</u>
	-Eastbound Approach	A (1.0)	A (1.8)	A (2.4)	A (1.0)	A (1.8)	A (2.4)	-
	-Westbound Approach	A (2.0)	A (1.3)	A (0.8)	A (2.5)	A (0.8)	A (0.6)	-
	-Southbound Approach	E (71.3)	E (72.3)	E (68.5)	E (71.3)	E (72.3)	E (68.5)	-

TABLE 11 – FUTURE “BUILD” INTERSECTION 95TH PERCENTILE QUEUES

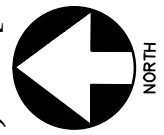
Intersection		Available Storage	Build 2020: Queue (feet)			Build 2020 Improved: Queue (feet)		
			AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak
1	<u>Jonesboro Rd @ I-75 SB Ramps</u>							
	-Eastbound Through	-	653	862	1,158	634	818	1,070
	-Eastbound Right	415'	38	37	77	37	35	46
	-Westbound Left	635'	39	153	350	27	137	291
	-Westbound Through	-	132	185	178	159	5	2
	-Southbound Left	430'	266	197	221	353	266	472
	-Southbound Left/Through	-	157	58	96	187	53	150
	-Southbound Right	700'	425	243	920	278	160	461
2	<u>Jonesboro Rd @ I-75 NB Ramps</u>							
	-Eastbound Left	675'	501	445	477	302	485	519
	-Eastbound Through	-	277	828	754	316	725	728
	-Westbound Through	-	185	141	120	120	176	930
	-Westbound Right	830'	460	0	1	511	69	67
	-Northbound Left	285'	120	220	422	120	220	422
	-Northbound Left/Through	-	36	54	144	36	54	144
	-Northbound Right	350'	156	241	402	156	241	402
3	<u>Jonesboro Rd @ Foster Dr/Managed Lanes Access</u>							
	-Eastbound Left	275'	240	584	582	342	497	494
	-Eastbound Through/Right	-	707	434	747	673	464	659
	-Westbound Left (AM ONLY)	315'	634	-	-	673	-	-
	-Westbound Through	-	401	751	1,127	-	-	-
	-Westbound Through/Right	-	-	-	-	320	704	740
	-Westbound Right	125'	45	26	27	-	-	-
	-Northbound Left (PM/SAT ONLY)	175'	-	215	211	-	215	227
	-Northbound Through (PM/SAT ONLY)	-	-	166	163	-	166	168
	-Northbound Right (PM/SAT ONLY)	150'	-	467	545	-	0	0
	-Southbound Left	-	205	224	217	199	224	217
	-Southbound Through (AM ONLY)	-	106	-	-	102	-	-
	-Southbound Right	215'	34	23	41	31	23	41
4	<u>Jonesboro Rd @ N Bridges Rd / Bojangles Drwy</u>							
	-Eastbound Left	235'	38	10	45	23	15	39
	-Eastbound Through	-	106	1,268	1,462	73	790	800
	-Eastbound Right	175'	4	84	8	2	18	0
	-Westbound Left	235'	13	461	884	87	168	307
	-Westbound Through	-	788	471	521	744	417	467
	-Westbound Right	160'	0	0	0	0	0	0
	-Northbound Left	-	258	1,126	1,302	110	491	615
	-Northbound Right	-	0	149	739	0	0	0
	-Southbound Approach	-	0	0	0	11	0	0

Table Continued on Next Page...

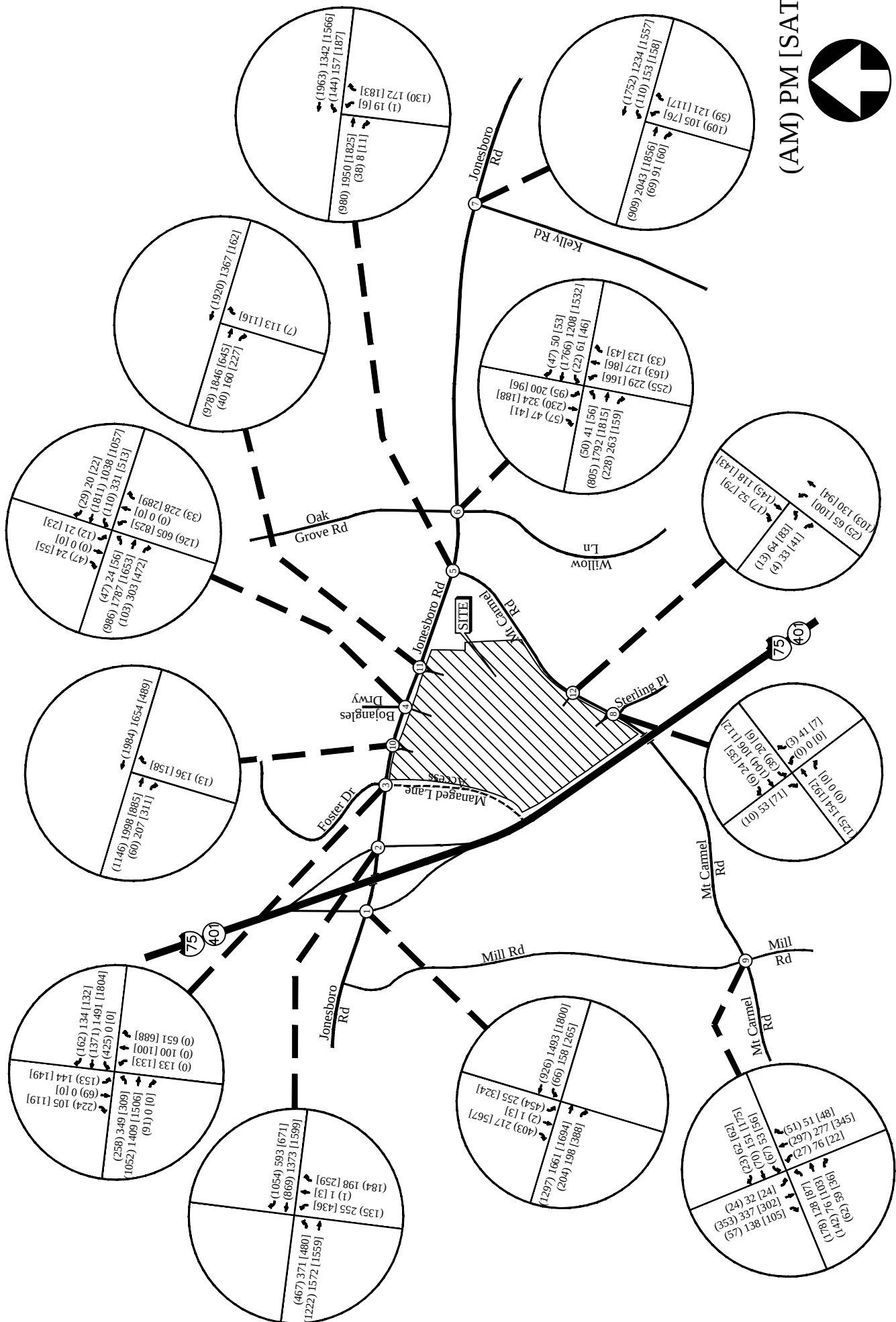
Intersection		Available Storage	Build 2020: Queue (feet)			Build 2020 Improved: Queue (feet)		
			AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak
5	<u>Jonesboro Rd @ Mt Carmel Rd</u>							
	-Eastbound U	300'	0	0	0	0	0	0
	-Eastbound Through	-	126	55	1,054	250	1,247	1,234
	-Eastbound Right	250	3	0	6	8	0	6
	-Westbound Left	300'	11	200	195	24	154	187
	-Westbound Through	-	74	228	328	293	206	248
	-Northbound Left	100'	4	35	14	5	48	18
	-Northbound Right	-	43	41	0	32	73	69
6	<u>Jonesboro Rd @ Oak Grove Rd / Willow Ln</u>							
	-Eastbound Left	300'	49	11	32	42	8	31
	-Eastbound Through	-	56	1,247	324	333	1,231	1,079
	-Eastbound Right	150'	1	18	1	39	29	4
	-Westbound Left	300'	8	53	43	6	57	42
	-Westbound Through	-	1,262	656	852	1,197	651	791
	-Westbound Right	250'	1	18	10	1	18	8
	-Northbound Left	300'	497	442	283	-	-	-
	-Northbound Left	500'	-	-	-	496	404	288
	-Northbound Through	-	189	167	125	200	167	132
	-Northbound Right	400'	0	75	0	0	75	0
	-Southbound Left	135'	106	228	119	113	231	126
	-Southbound Through/Right	-	367	592	307	300	446	266
	-Southbound Right	100'	-	-	-	0	0	0
7	<u>Jonesboro Rd @ Kelly Rd</u>							
	-Eastbound U	300'	0	0	0	0	0	0
	-Eastbound Through	-	54	1,183	1,102	57	1,297	1,103
	-Eastbound Right	315'	0	0	1	0	0	0
	-Westbound Left	300'	50	294	269	50	294	269
	-Westbound Through	-	652	395	525	652	395	525
	-Northbound Left/Right	-	208	278	233	208	278	233
8	<u>Mt Carmel Rd @ Site Drwy 4/ Sterling Pl</u>							
	-Eastbound Through/Right	-	0	0	0	0	0	0
	-Westbound Through/Left	-	3	2	1	3	2	1
	-Northbound Approach	-	1	6	5	1	6	5
	-Southbound Right	-	1	22	35	1	22	35
9	<u>Mt Carmel Rd @ Mill Rd</u>							
	-Eastbound Approach	-	151	114	91	114	108	107
	-Westbound Approach	-	66	112	120	90	118	139
	-Northbound Approach	-	176	109	183	132	110	190
	-Southbound Approach	-	211	285	248	173	181	139
10	<u>Jonesboro Rd @ Site Drwy 2</u>							
	-Eastbound Through	-	0	0	0	0	0	0
	-Eastbound Right	175'	0	0	0	0	0	0
	-Westbound Through	-	0	0	0	0	0	0
	-Northbound Right	-	1	29	35	2	16	25

Table Continued on Next Page...

Intersection		Available Storage	Build 2020: Queue (feet)			Build 2020 Improved: Queue (feet)		
			AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak
11	<u>Jonesboro Rd @ Site Drwy 5</u>							
	-Eastbound Right	175'	0	0	0	0	0	0
	-Northbound Right	-	1	18	18	1	16	18
12	<u>Mt. Carmel Rd @ Site Drwy 3</u>							
	-Eastbound Left	235'	7	21	32	7	21	32
	-Eastbound Through	-	20	37	30	20	37	30
	-Westbound Through	-	42	17	9	50	9	7
	-Westbound Right	175'	3	0	0	6	0	0
	-Southbound Left	-	37	118	142	37	118	142
	-Southbound Right	-	13	37	40	13	37	40

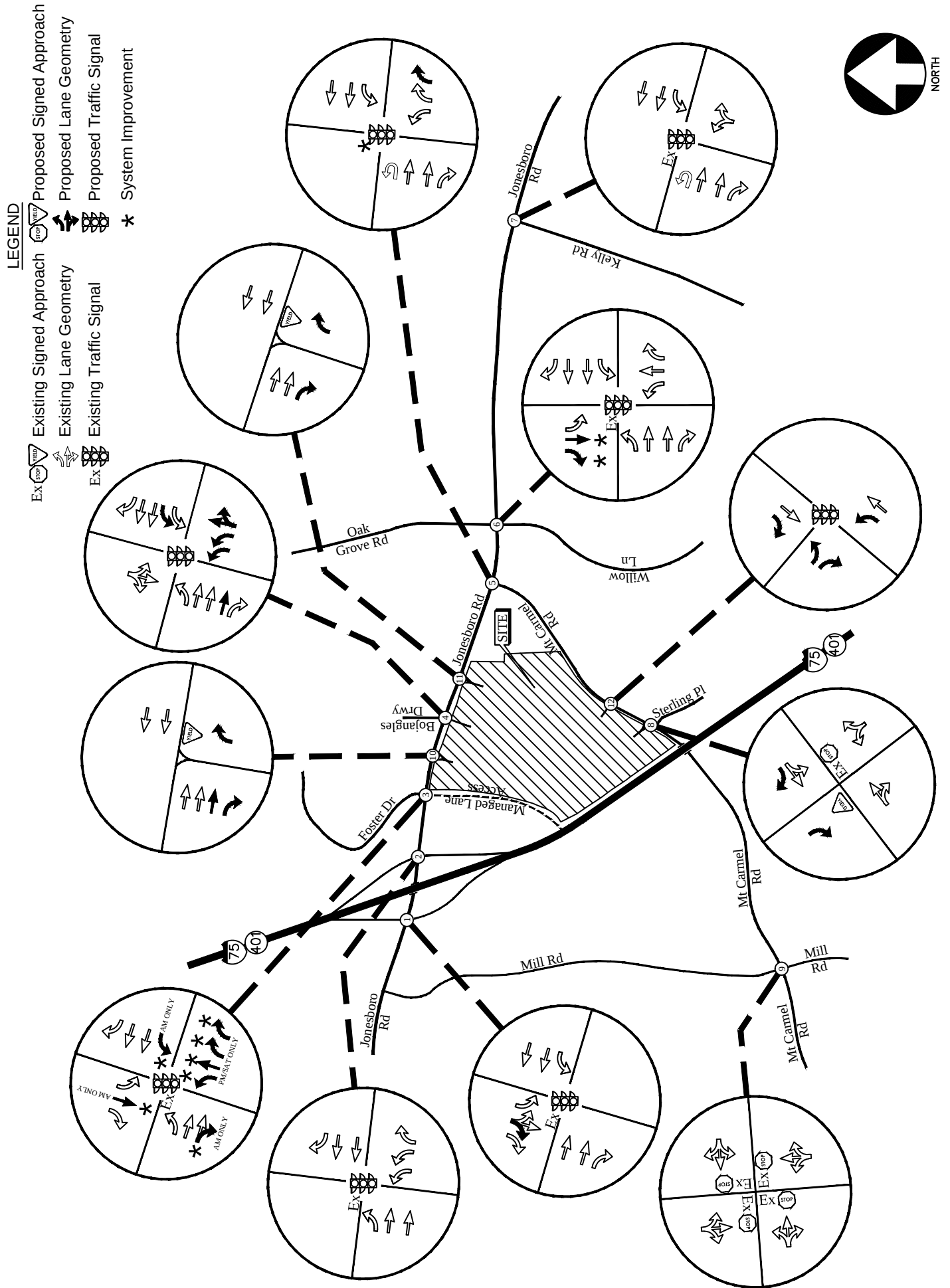


(AM) PM [SAT]



FUTURE (BUILD) PEAK HOUR VOLUMES

FIGURE 8



FUTURE TRAFFIC CONTROL AND LANE GEOMETRY

FIGURE 9

CONCLUSIONS AND RECOMMENDATIONS

Traffic impacts were evaluated for the added traffic from the proposed Henry Promenade mixed-use development that will be located to the east of I-75 between Jonesboro Road and Mt. Carmel Road in McDonough, Georgia. The development will consist of:

- Total Retail: 763,500 sf
- Hotel 1: 120 rooms
- Hotel 2: 100 rooms

The development proposes one full-access driveway as well as two right-in/right-out driveways on Jonesboro Road, and one full-access driveway as well as one right-in/right-out driveway on Mt. Carmel Road. Existing and future operations after completion of the project were analyzed at the intersections of:

- Jonesboro Road @ I-75 Southbound Ramps
- Jonesboro Road @ I-75 Northbound Ramps
- Jonesboro Road @ Foster Drive
- Jonesboro Road @ North Bridges Road/Bojangle's Driveway
- Jonesboro Road @ Mt. Carmel Road
- Jonesboro Road @ Oak Grove Road/Willow Lane
- Jonesboro Road @ Kelly Road
- Mt. Carmel Road @ North Bridges Road/Sterling Place
- Mt. Carmel Road @ Mill 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 and added traffic from other nearby planned developments. The results of the analysis are listed below:

System Recommendations and 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 and are taken under consideration by the local municipality. A summary of the system improvements is provided below with more detailed information on each intersection in the following narratives.

Jonesboro Road @ I-75 SB Ramps

The existing conditions analysis for the intersection of Jonesboro Road at I-75 SB Ramps indicates the southbound approach (I-75 Ramp) is currently operating at a level-of-service "E" in the Saturday peak hour before the addition of site traffic. It is recommended that the existing southbound shared through/left turn lane be restriped to accommodate through/left/right turn movements. This will allow more stacking for the southbound right turn movements.

Jonesboro Road @ I-75 NB Ramps

The queue for the westbound right turn movement is currently extending beyond the available storage in the AM peak hour. In order to accommodate the amount of stacking for the westbound right turn

movement, it is recommended that the existing right turn lane be extended through to the next intersection.

Jonesboro Road@ Foster Drive/Managed Lanes Access

In order to accommodate the extended westbound right turn lane and right turn queue at the adjacent intersection of Jonesboro Road at I-75 NB Ramps, it is recommended that the existing dedicated westbound right turn lane be converted to operate as a shared through/right turn lane.

Jonesboro Road at Oak Grove Road/Willow Lane

The intersection of Jonesboro Road at Oak Grove Road/Willow Lane is currently operating at an acceptable level-of-service ("D" or better) during the AM, PM, and Saturday peak hours. After accounting for growth of background traffic, the intersection will begin to operate at a level-of-service "E" in the AM peak hour. In order to bring the level-of-service to the accepted threshold "D", it is recommended that the southbound approach be shifted to the east in order to accommodate a dedicated right turn lane, and extend the northbound left turn lane storage to 500' of full-width storage by restriping the existing gore area in the median. It is also recommended that protected + permissive signal phasing be installed for the northbound and southbound left turn movements.

Jonesboro Road at N. Bridges Road/Bojangle's Driveway

The side-street approaches to the intersection of Jonesboro Road at N. Bridges Road/Bojangle's Driveway are currently operating below an acceptable level-of-service ("E" or better). As this is an existing condition and the only improvement needed is for the southbound right movement, which is offsite and out of public right-of way, no reasonable improvements have been identified.

Mt. Carmel Road at Mill Road

One or more approaches to the intersection of Mt. Carmel Road at Mill Road will begin to operate below an acceptable level-of-service ("D" or better) after accounting for growth of background traffic. Due to the intersection being all-way stop-controlled, and because queuing on each approach will not block other nearby intersections, no reasonable improvements have been identified at the intersection.

Summary of Recommended System Improvements

- Shift the southbound approach to the intersection of Jonesboro Road at Oak Grove Road/Willow Lane to the east in order to install a dedicated southbound right turn lane with 100' storage and a 75' taper and install protected + permissive signal phasing.
- Extend the northbound left turn lane at the above intersection to 500' of storage by restriping the existing gore area within the median and install protected + permissive signal phasing.
- It is recommended that the existing southbound through/left lane at the intersection of Jonesboro Road at I-75 SB Ramps be restriped to accommodate a through/left/right movement.
- It is recommended the existing westbound right turn lane at the intersection of Jonesboro Road at I-75 NB Ramps be extended through to the next intersection (Jonesboro Road at Foster Drive/Managed Lanes Access), replacing the existing dedicated westbound right turn lane at the Jonesboro Road at Foster Drive/Managed Lanes Access intersection with a shared through/right turn lane.

Site Access Configuration

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

- Site Driveway #1: Full-access driveway on Jonesboro Road
 - This driveway will consist of two entering lanes and two exiting lanes.
 - The intersection will be controlled by an actuated traffic signal with a permissive + protected phase for the eastbound and westbound left turn movements.
 - Entering left turn movements will be made from a dedicated westbound left turn lane.
 - Entering right turn movements will be made from a dedicated eastbound deceleration lane.
- Site Driveway #2: Right-in/right-out driveway on Jonesboro Road
 - This driveway will consist of one entering and one exiting lane.
 - The intersection will be unsignalized with a YIELD sign on the northbound approach.
 - A deceleration lane will be constructed for entering traffic based on local standards.
- Site Driveway #3: Full-access driveway on Mt. Carmel Road
 - This driveway will consist of one entering lane and two exiting lanes. The southbound (driveway) approach will have a left turn and right turn lane for exiting traffic.
 - The intersection will be controlled by an actuated traffic signal.
 - Entering left turn movements will be made from a dedicated eastbound left turn lane.
 - Entering right turn movements will be made from a dedicated westbound deceleration lane.
- Site Driveway #4: Right-in/right-out driveway on Mt. Carmel Road
 - This driveway will consist of one entering lane and one exiting lane.
 - The intersection will be unsignalized with a YIELD sign on the southbound approach.
 - A westbound deceleration lane will be constructed for entering traffic based on local standards.
- Site Driveway #5: Right-in/right-out driveway on Jonesboro Road
 - This driveway will consist of one entering lane and one exiting lane.
 - The intersection will be unsignalized with a YIELD sign on the southbound approach.
 - An eastbound deceleration lane will be constructed for entering traffic based on local standards.

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 site mitigation improvements is provided below, with more detailed information on each intersection in the following narratives.

Jonesboro Road@ Foster Drive/Managed Lanes Access

Because a third eastbound through lane on Jonesboro Road is recommended beginning at this intersection, it is recommended dual rights on the northbound approach (Managed Lanes Access) be reconfigured to operate with one free-flow right turn and one yield-controlled right turn lane. A concept of this recommendation is included in the Appendix.

Jonesboro Road @ Mt. Carmel Road

Due to the large number of northbound right turns after the addition of site traffic, it is recommended that the existing northbound right turn operate with dual right turns and given permissive + overlap signal phasing.

Mt. Carmel Road at Mill Road

One or more approaches to the intersection of Mt. Carmel Road at Mill Road will continue to operate below an acceptable level-of-service ("D" or better) after accounting for site-generated traffic. Due to the intersection being all-way stop-controlled, and because queuing on each approach will not block other nearby intersections, no reasonable improvements have been identified at the intersection.

Jonesboro Road @ Site Driveway 1

The Future "Build" 2020 conditions analysis for Jonesboro Road at Site Driveway 1 indicates the intersection will operate at an overall level-of-service "F" during the PM and Saturday peak hours. It is recommended that dual left turn lanes be constructed for the westbound and northbound approaches and operate with protected signal phasing. To relieve congestion on the eastbound through movement, it is recommended a third through lane be constructed along the site frontage beginning at the intersection of Jonesboro Road at Foster Drive/Managed Lane Access through to drop as a right turn lane at the eastern right-in/right-out driveway (Site Driveway 5) on Jonesboro Road. Although this improvements will not bring the overall level-of-service to within the "D" threshold during the Saturday peak hour, the recommended improvements will reduce the overall delay at the intersection by more than 274 seconds/vehicle. As these delays will only be experienced during one peak hour out of the week, no further improvements are feasible at the intersection.

Summary of Recommended Site Mitigation Improvements

- Recommended system improvements (previous section) are also applicable as mitigation improvements.
- It is recommended a third through lane be constructed on Jonesboro Road along the site frontage beginning at the intersection of Jonesboro Road at Foster Drive/Managed Lanes Access through to drop as a right turn lane at the eastern right-in/right-out driveway (Site Driveway 5) on Jonesboro Road.
- It is recommended the northbound dual rights at the intersection of Jonesboro Road at Foster Drive/Managed Lanes Access be reconfigured to operate with one free-flow right turn and one yield-controlled right turn.
- It is recommended northbound dual right turn lanes be added to the intersection of Jonesboro Road at Mt. Carmel Road and given permissive + overlap signal phasing.
- It is recommended westbound and northbound dual left turn lanes be constructed at the intersection of Jonesboro Road at Site Driveway 1 and given protected signal phasing.

Appendix

Existing Intersection Traffic Counts	
GRTA Letter of Understanding	
Linear Regression of Daily Traffic	
Fact Sheets for Planned and Programmed Improvements	
Existing Intersection Analysis	
GDOT Left Turn Lane Analysis	
GDOT Right Turn Lane Analysis	
Future “No-Build” Intersection Analysis	
Future “No-Build” Intersection Analysis With Improvements	
Future “Build” Intersections Analysis	
Future “Build” Intersections Analysis With Improvements	
Jonesboro Road at Foster Drive Concept	
Traffic Volume Worksheets.....	

Existing Intersection Traffic Counts

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TMC Data
Jonesboro Rd @ I-75 SB Off-Ramp
7-9am | 4-6pm

File Name : 37690001
Site Code : 37690001
Start Date : 11/19/2015
Page No : 1

Groups Printed- Cars, Buses, Trucks

	Northbound					I-75 SB Off-Ramp Southbound					Jonesboro Rd Eastbound					Jonesboro Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	68	0	77	0	145	0	209	14	0	223	9	176	0	0	185	553
07:15 AM	0	0	0	0	0	104	0	55	0	159	0	238	27	0	265	8	219	0	0	227	651
07:30 AM	0	0	0	0	0	123	1	103	0	227	0	312	50	0	362	11	275	0	0	286	875
07:45 AM	0	0	0	0	0	92	0	82	0	174	0	317	55	0	372	14	243	0	0	257	803
Total	0	0	0	0	0	387	1	317	0	705	0	1076	146	0	1222	42	913	0	0	955	2882
08:00 AM	0	0	0	0	0	82	1	110	0	193	0	281	46	0	327	8	228	0	0	236	756
08:15 AM	0	0	0	0	0	85	0	82	0	167	0	286	39	0	325	12	207	0	0	219	711
08:30 AM	0	0	0	0	0	89	0	68	0	157	0	267	31	0	298	14	196	0	0	210	665
08:45 AM	0	0	0	0	0	72	2	60	0	134	0	242	33	0	275	15	173	0	0	188	597
Total	0	0	0	0	0	328	3	320	0	651	0	1076	149	0	1225	49	804	0	0	853	2729
*** BREAK ***																					
04:00 PM	0	0	0	0	0	34	1	43	0	78	0	387	35	0	422	16	252	0	0	268	768
04:15 PM	0	0	0	0	0	28	0	46	0	74	0	317	38	0	355	20	257	0	0	277	706
04:30 PM	0	0	0	0	0	39	0	58	0	97	0	324	42	0	366	15	263	0	0	278	741
04:45 PM	0	0	0	0	0	35	0	35	0	70	0	343	47	0	390	17	287	0	0	304	764
Total	0	0	0	0	0	136	1	182	0	319	0	1371	162	0	1533	68	1059	0	0	1127	2979
05:00 PM	0	0	0	0	0	38	1	35	0	74	0	386	58	0	444	18	296	0	0	314	832
05:15 PM	0	0	0	0	0	64	0	49	0	113	0	367	55	0	422	20	297	0	0	317	852
05:30 PM	0	0	0	0	0	40	0	53	0	93	0	347	52	0	399	18	340	0	0	358	850
05:45 PM	0	0	0	0	0	52	0	76	0	128	0	372	47	0	419	13	322	0	0	335	882
Total	0	0	0	0	0	194	1	213	0	408	0	1472	212	0	1684	69	1255	0	0	1324	3416
Grand Total	0	0	0	0	0	1045	6	1032	0	2083	0	4995	669	0	5664	228	4031	0	0	4259	12006
Apprch %	0	0	0	0		50.2	0.3	49.5	0		0	88.2	11.8	0		5.4	94.6	0	0		
Total %	0	0	0	0	0	8.7	0	8.6	0	17.3	0	41.6	5.6	0	47.2	1.9	33.6	0	0	35.5	

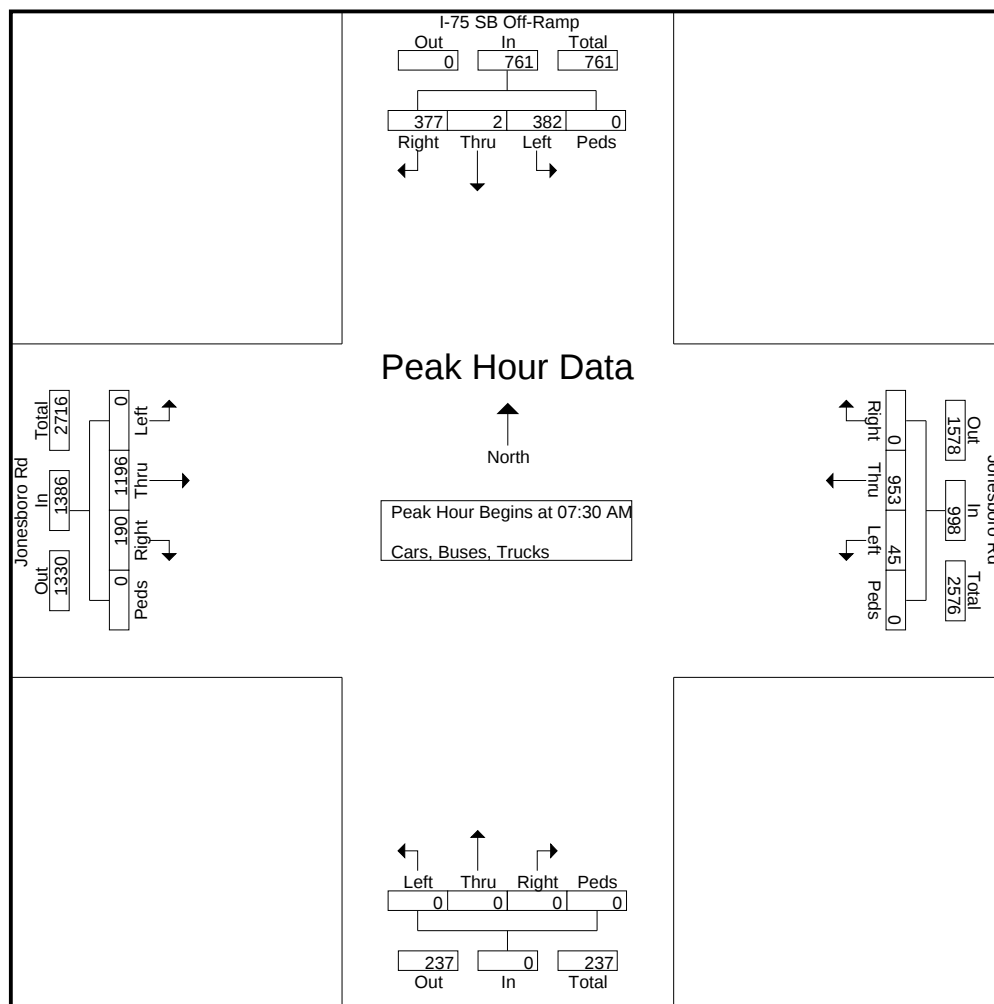
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TMC Data
Jonesboro Rd @ I-75 SB Off-Ramp
7-9am | 4-6pm

File Name : 37690001
Site Code : 37690001
Start Date : 11/19/2015
Page No : 2

	Northbound					I-75 SB Off-Ramp Southbound					Jonesboro Rd Eastbound					Jonesboro Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	0	0	0	0	123	1	103	0	227	0	312	50	0	362	11	275	0	0	286	875
07:45 AM	0	0	0	0	0	92	0	82	0	174	0	317	55	0	372	14	243	0	0	257	803
08:00 AM	0	0	0	0	0	82	1	110	0	193	0	281	46	0	327	8	228	0	0	236	756
08:15 AM	0	0	0	0	0	85	0	82	0	167	0	286	39	0	325	12	207	0	0	219	711
Total Volume	0	0	0	0	0	382	2	377	0	761	0	1196	190	0	1386	45	953	0	0	998	3145
% App. Total	0	0	0	0	0	50.2	0.3	49.5	0		0	86.3	13.7	0		4.5	95.5	0	0		
PHF	.000	.000	.000	.000	.000	.776	.500	.857	.000	.838	.000	.943	.864	.000	.931	.804	.866	.000	.000	.872	.899



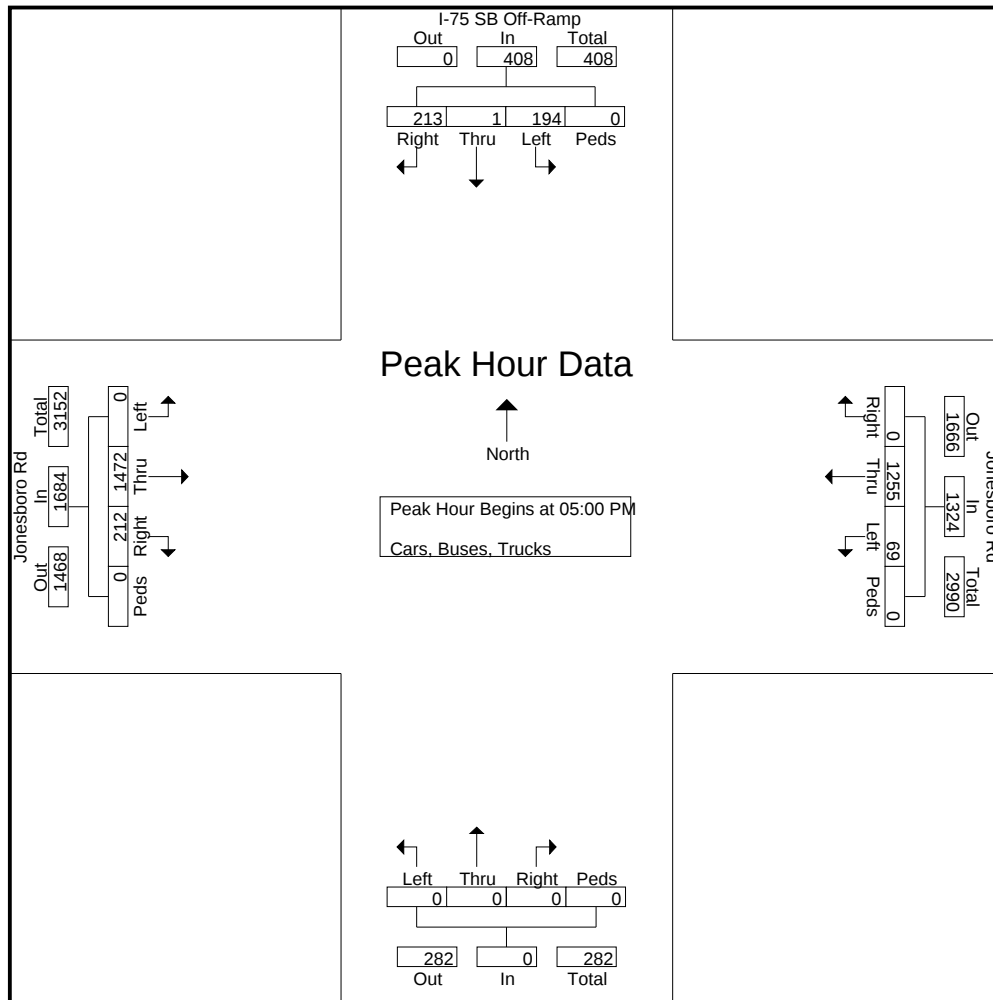
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TMC Data
Jonesboro Rd @ I-75 SB Off-Ramp
7-9am | 4-6pm

File Name : 37690001
Site Code : 37690001
Start Date : 11/19/2015
Page No : 3

	Northbound					I-75 SB Off-Ramp Southbound					Jonesboro Rd Eastbound					Jonesboro Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	0	0	0	0	38	1	35	0	74	0	386	58	0	444	18	296	0	0	314	832
05:15 PM	0	0	0	0	0	64	0	49	0	113	0	367	55	0	422	20	297	0	0	317	852
05:30 PM	0	0	0	0	0	40	0	53	0	93	0	347	52	0	399	18	340	0	0	358	850
05:45 PM	0	0	0	0	0	52	0	76	0	128	0	372	47	0	419	13	322	0	0	335	882
Total Volume	0	0	0	0	0	194	1	213	0	408	0	1472	212	0	1684	69	1255	0	0	1324	3416
% App. Total	0	0	0	0	0	47.5	0.2	52.2	0		0	87.4	12.6	0		5.2	94.8	0	0		
PHF	.000	.000	.000	.000	.000	.758	.250	.701	.000	.797	.000	.953	.914	.000	.948	.863	.923	.000	.000	.925	.968



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TMC Data
Jonesboro Rd @ I-75 SB Off-Ramp
12-2pm Sat

File Name : 37690001-Sat
Site Code : 37690001
Start Date : 11/21/2015
Page No : 1

Groups Printed- Cars, Buses, Trucks

	Northbound					I-75 SB Off-Ramp Southbound					Jonesboro Rd Eastbound					Jonesboro Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
12:00 PM	0	0	0	0	0	58	2	145	0	205	0	361	120	0	481	36	354	0	0	390	1076
12:15 PM	0	0	0	0	0	63	0	122	0	185	0	328	89	0	417	33	365	0	0	398	1000
12:30 PM	0	0	0	0	0	34	0	130	0	164	0	361	84	0	445	22	378	0	0	400	1009
12:45 PM	0	0	0	0	0	45	1	149	0	195	0	323	100	0	423	39	358	0	0	397	1015
Total	0	0	0	0	0	200	3	546	0	749	0	1373	393	0	1766	130	1455	0	0	1585	4100
01:00 PM	0	0	0	0	0	52	1	141	0	194	0	343	96	0	439	30	348	0	0	378	1011
01:15 PM	0	0	0	0	0	51	0	150	0	201	0	350	131	0	481	22	339	0	0	361	1043
01:30 PM	0	0	0	0	0	41	0	149	0	190	0	337	89	0	426	27	380	0	0	407	1023
01:45 PM	0	0	0	0	0	66	0	141	0	207	0	299	95	0	394	26	367	0	0	393	994
Total	0	0	0	0	0	210	1	581	0	792	0	1329	411	0	1740	105	1434	0	0	1539	4071
Grand Total	0	0	0	0	0	410	4	1127	0	1541	0	2702	804	0	3506	235	2889	0	0	3124	8171
Apprch %	0	0	0	0		26.6	0.3	73.1	0		0	77.1	22.9	0		7.5	92.5	0	0		
Total %	0	0	0	0	0	5	0	13.8	0	18.9	0	33.1	9.8	0	42.9	2.9	35.4	0	0	38.2	

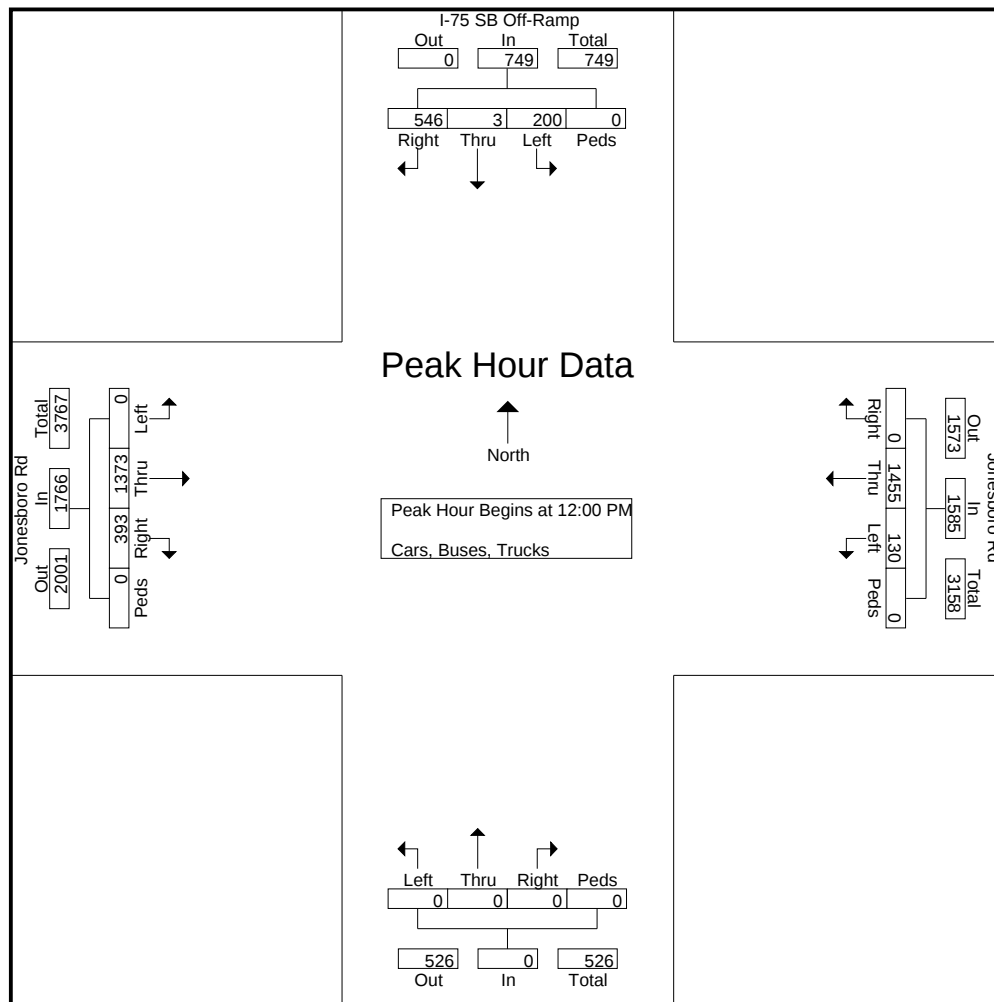
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TMC Data
Jonesboro Rd @ I-75 SB Off-Ramp
12-2pm Sat

File Name : 37690001-Sat
Site Code : 37690001
Start Date : 11/21/2015
Page No : 2

	Northbound					I-75 SB Off-Ramp Southbound					Jonesboro Rd Eastbound					Jonesboro Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 01:45 PM - Peak 1 of 1 Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	0	0	0	0	0	58	2	145	0	205	0	361	120	0	481	36	354	0	0	390	1076
12:15 PM	0	0	0	0	0	63	0	122	0	185	0	328	89	0	417	33	365	0	0	398	1000
12:30 PM	0	0	0	0	0	34	0	130	0	164	0	361	84	0	445	22	378	0	0	400	1009
12:45 PM	0	0	0	0	0	45	1	149	0	195	0	323	100	0	423	39	358	0	0	397	1015
Total Volume	0	0	0	0	0	200	3	546	0	749	0	1373	393	0	1766	130	1455	0	0	1585	4100
% App. Total	0	0	0	0	0	26.7	0.4	72.9	0		0	77.7	22.3	0		8.2	91.8	0	0		
PHF	.000	.000	.000	.000	.000	.794	.375	.916	.000	.913	.000	.951	.819	.000	.918	.833	.962	.000	.000	.991	.953



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TMC Data
Jonesboro Rd @ I-75 NB Off-Ramp
7-9am | 4-6pm

File Name : 37690002
Site Code : 37690002
Start Date : 11/19/2015
Page No : 1

Groups Printed- Cars, Buses, Trucks

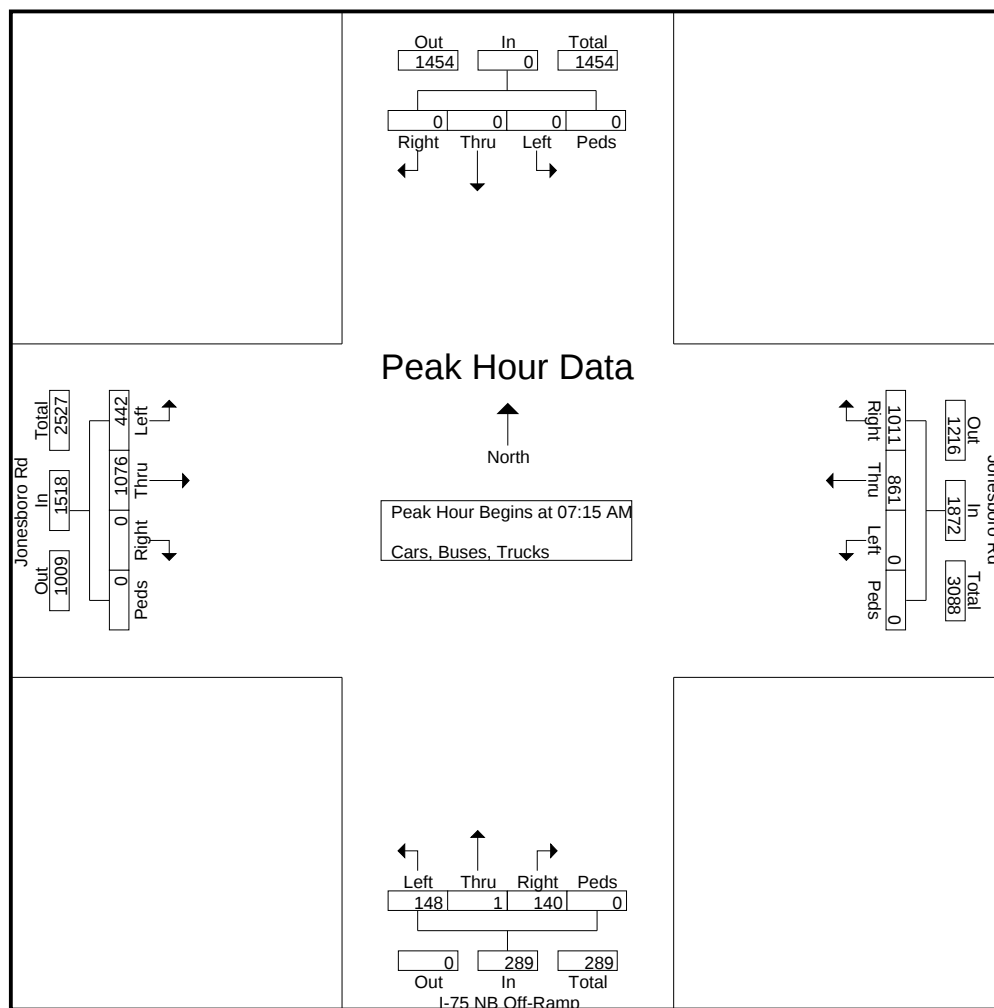
	I-75 NB Off-Ramp Northbound					Southbound					Jonesboro Rd Eastbound					Jonesboro Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	26	0	15	0	41	0	0	0	0	0	110	212	0	0	322	0	155	258	0	413	776
07:15 AM	47	0	46	0	93	0	0	0	0	0	102	238	0	0	340	0	201	260	0	461	894
07:30 AM	32	0	49	0	81	0	0	0	0	0	112	284	0	0	396	0	206	215	0	421	898
07:45 AM	36	0	34	0	70	0	0	0	0	0	116	297	0	0	413	0	240	259	0	499	982
Total	141	0	144	0	285	0	0	0	0	0	440	1031	0	0	1471	0	802	992	0	1794	3550
08:00 AM	33	1	11	0	45	0	0	0	0	0	112	257	0	0	369	0	214	277	0	491	905
08:15 AM	30	1	11	0	42	0	0	0	0	0	129	270	0	0	399	0	157	202	0	359	800
08:30 AM	30	0	16	0	46	0	0	0	0	0	130	230	0	0	360	0	163	214	0	377	783
08:45 AM	22	0	9	0	31	0	0	0	0	0	91	204	0	0	295	0	176	202	0	378	704
Total	115	2	47	0	164	0	0	0	0	0	462	961	0	0	1423	0	710	895	0	1605	3192
*** BREAK ***																					
04:00 PM	56	0	19	0	75	0	0	0	0	0	86	284	0	0	370	0	211	97	0	308	753
04:15 PM	54	2	28	0	84	0	0	0	0	0	91	289	0	0	380	0	258	101	0	359	823
04:30 PM	62	0	29	0	91	0	0	0	0	0	83	294	0	0	377	0	218	103	0	321	789
04:45 PM	56	0	34	0	90	0	0	0	0	0	89	284	0	0	373	0	230	115	0	345	808
Total	228	2	110	0	340	0	0	0	0	0	349	1151	0	0	1500	0	917	416	0	1333	3173
05:00 PM	67	0	22	0	89	0	0	0	0	0	103	329	0	0	432	0	248	124	0	372	893
05:15 PM	54	0	25	0	79	0	0	0	0	0	99	374	0	0	473	0	253	117	0	370	922
05:30 PM	60	0	36	0	96	0	0	0	0	0	59	337	0	0	396	0	276	123	0	399	891
05:45 PM	60	1	30	0	91	0	0	0	0	0	73	318	0	0	391	0	284	89	0	373	855
Total	241	1	113	0	355	0	0	0	0	0	334	1358	0	0	1692	0	1061	453	0	1514	3561
Grand Total	725	5	414	0	1144	0	0	0	0	0	1585	4501	0	0	6086	0	3490	2756	0	6246	13476
Apprch %	63.4	0.4	36.2	0		0	0	0	0		26	74	0	0		0	55.9	44.1	0		
Total %	5.4	0	3.1	0	8.5	0	0	0	0	0	11.8	33.4	0	0	45.2	0	25.9	20.5	0	46.3	

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TMC Data
Jonesboro Rd @ I-75 NB Off-Ramp
7-9am | 4-6pm

File Name : 37690002
Site Code : 37690002
Start Date : 11/19/2015
Page No : 2

	I-75 NB Off-Ramp Northbound					Southbound					Jonesboro Rd Eastbound					Jonesboro Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	47	0	46	0	93	0	0	0	0	0	102	238	0	0	340	0	201	260	0	461	894
07:30 AM	32	0	49	0	81	0	0	0	0	0	112	284	0	0	396	0	206	215	0	421	898
07:45 AM	36	0	34	0	70	0	0	0	0	0	116	297	0	0	413	0	240	259	0	499	982
08:00 AM	33	1	11	0	45	0	0	0	0	0	112	257	0	0	369	0	214	277	0	491	905
Total Volume	148	1	140	0	289	0	0	0	0	0	442	1076	0	0	1518	0	861	1011	0	1872	3679
% App. Total	51.2	0.3	48.4	0		0	0	0	0		29.1	70.9	0	0		0	46	54	0		
PHF	.787	.250	.714	.000	.777	.000	.000	.000	.000	.000	.953	.906	.000	.000	.919	.000	.897	.912	.000	.938	.937



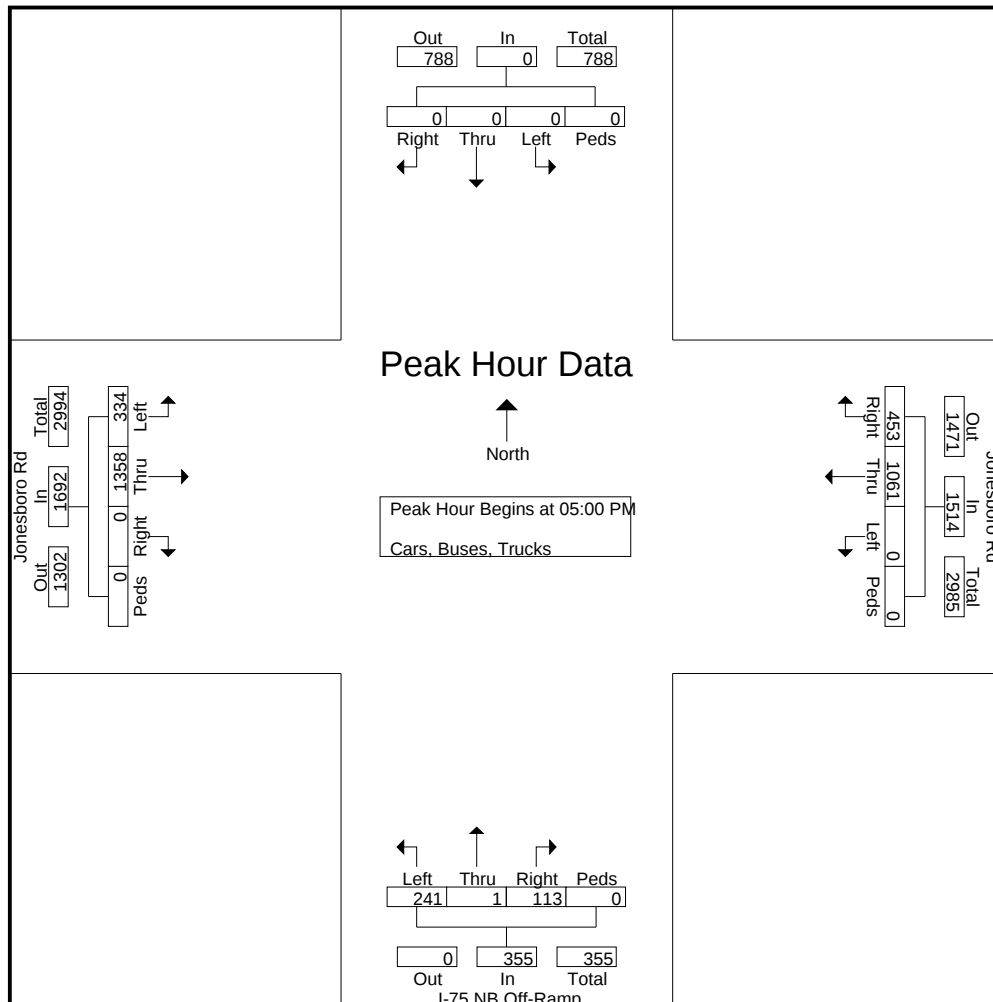
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TMC Data
Jonesboro Rd @ I-75 NB Off-Ramp
7-9am | 4-6pm

File Name : 37690002
Site Code : 37690002
Start Date : 11/19/2015
Page No : 3

	I-75 NB Off-Ramp Northbound					Southbound					Jonesboro Rd Eastbound					Jonesboro Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	67	0	22	0	89	0	0	0	0	0	103	329	0	0	432	0	248	124	0	372	893
05:15 PM	54	0	25	0	79	0	0	0	0	0	99	374	0	0	473	0	253	117	0	370	922
05:30 PM	60	0	36	0	96	0	0	0	0	0	59	337	0	0	396	0	276	123	0	399	891
05:45 PM	60	1	30	0	91	0	0	0	0	0	73	318	0	0	391	0	284	89	0	373	855
Total Volume	241	1	113	0	355	0	0	0	0	0	334	1358	0	0	1692	0	1061	453	0	1514	3561
% App. Total	67.9	0.3	31.8	0		0	0	0	0		19.7	80.3	0	0		0	70.1	29.9	0		
PHF	.899	.250	.785	.000	.924	.000	.000	.000	.000	.000	.811	.908	.000	.000	.894	.000	.934	.913	.000	.949	.966



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TMC Data
Jonesboro Rd @ I-75 NB Off-Ramp
12-2pm Sat

File Name : 37690002-Sat
Site Code : 37690002
Start Date : 11/21/2015
Page No : 1

Groups Printed- Cars, Buses, Trucks

	I-75 NB Off-Ramp Northbound					Southbound					Jonesboro Rd Eastbound					Jonesboro Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
12:00 PM	88	1	30	0	119	0	0	0	0	0	112	316	0	0	428	0	296	115	0	411	958
12:15 PM	124	2	31	0	157	0	0	0	0	0	108	280	0	0	388	0	281	123	0	404	949
12:30 PM	106	0	23	0	129	0	0	0	0	0	116	291	0	0	407	0	290	116	0	406	942
12:45 PM	95	0	32	0	127	0	0	0	0	0	102	267	0	0	369	0	277	136	0	413	909
Total	413	3	116	0	532	0	0	0	0	0	438	1154	0	0	1592	0	1144	490	0	1634	3758
01:00 PM	95	1	24	0	120	0	0	0	0	0	107	296	0	0	403	0	267	106	0	373	896
01:15 PM	79	2	36	0	117	0	0	0	0	0	104	301	0	0	405	0	292	116	0	408	930
01:30 PM	127	1	38	0	166	0	0	0	0	0	99	268	0	0	367	0	287	112	0	399	932
01:45 PM	96	2	32	0	130	0	0	0	0	0	97	289	0	0	386	0	274	87	0	361	877
Total	397	6	130	0	533	0	0	0	0	0	407	1154	0	0	1561	0	1120	421	0	1541	3635
Grand Total	810	9	246	0	1065	0	0	0	0	0	845	2308	0	0	3153	0	2264	911	0	3175	7393
Apprch %	76.1	0.8	23.1	0		0	0	0	0		26.8	73.2	0	0		0	71.3	28.7	0		
Total %	11	0.1	3.3	0	14.4	0	0	0	0	0	11.4	31.2	0	0	42.6	0	30.6	12.3	0	42.9	

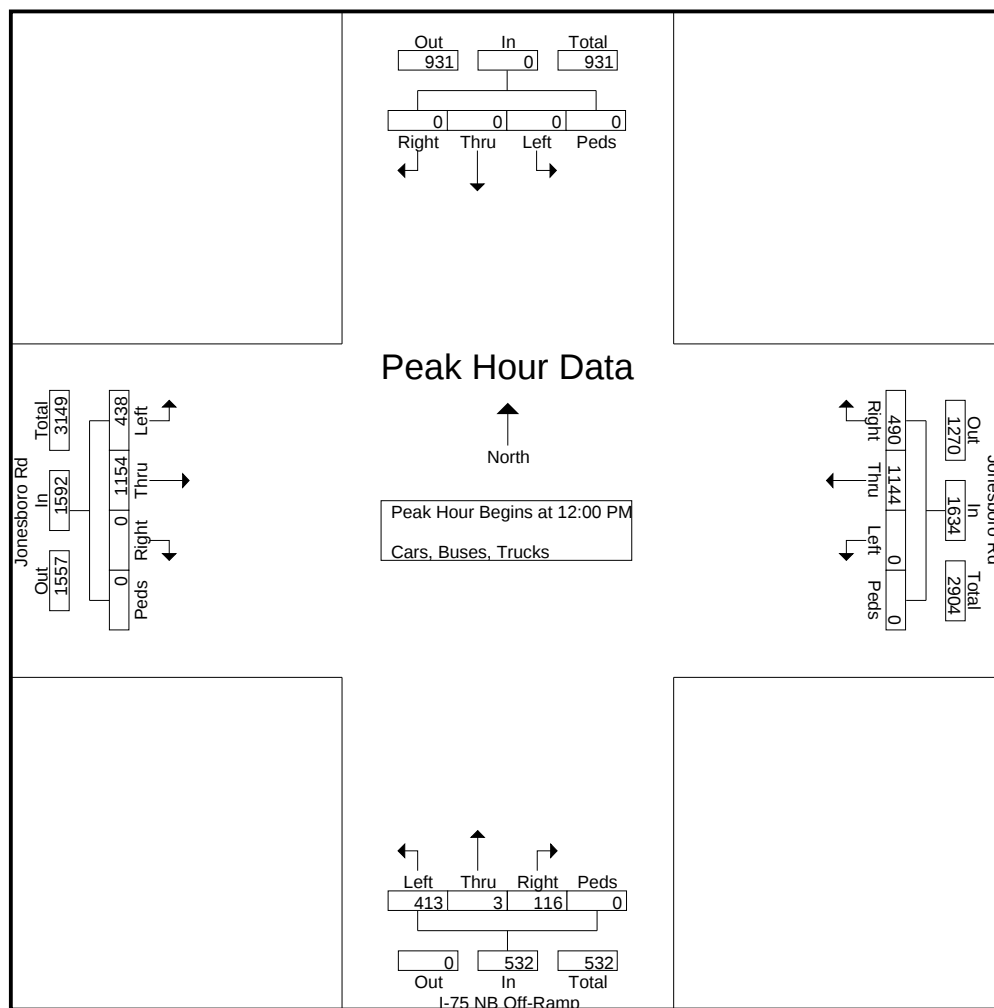
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TMC Data
Jonesboro Rd @ I-75 NB Off-Ramp
12-2pm Sat

File Name : 37690002-Sat
Site Code : 37690002
Start Date : 11/21/2015
Page No : 2

	I-75 NB Off-Ramp Northbound					Southbound					Jonesboro Rd Eastbound					Jonesboro Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 01:45 PM - Peak 1 of 1 Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	88	1	30	0	119	0	0	0	0	0	112	316	0	0	428	0	296	115	0	411	958
12:15 PM	124	2	31	0	157	0	0	0	0	0	108	280	0	0	388	0	281	123	0	404	949
12:30 PM	106	0	23	0	129	0	0	0	0	0	116	291	0	0	407	0	290	116	0	406	942
12:45 PM	95	0	32	0	127	0	0	0	0	0	102	267	0	0	369	0	277	136	0	413	909
Total Volume	413	3	116	0	532	0	0	0	0	0	438	1154	0	0	1592	0	1144	490	0	1634	3758
% App. Total	77.6	0.6	21.8	0		0	0	0	0		27.5	72.5	0	0		0	70	30	0		
PHF	.833	.375	.906	.000	.847	.000	.000	.000	.000	.000	.944	.913	.000	.000	.930	.000	.966	.901	.000	.989	.981



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TMC Data
Jonesboro Rd @ Foster Dr
7-9am | 4-6pm

File Name : 37690003
Site Code : 37690003
Start Date : 11/19/2015
Page No : 1

Groups Printed- Cars, Buses, Trucks

	Northbound					Foster Dr Southbound					Jonesboro Rd Eastbound					Jonesboro Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	11	0	31	0	42	60	176	0	0	236	0	325	18	0	343	621
07:15 AM	0	0	0	0	0	24	0	53	0	77	76	205	0	0	281	0	337	27	0	364	722
07:30 AM	0	0	0	0	0	32	0	36	0	68	89	247	0	0	336	0	360	37	0	397	801
07:45 AM	0	0	0	0	0	45	0	55	0	100	95	239	0	0	334	0	347	62	0	409	843
Total	0	0	0	0	0	112	0	175	0	287	320	867	0	0	1187	0	1369	144	0	1513	2987
08:00 AM	0	0	0	0	0	25	0	69	0	94	63	198	0	0	261	0	323	19	0	342	697
08:15 AM	0	0	0	0	0	18	0	36	0	54	54	227	0	0	281	0	286	17	0	303	638
08:30 AM	0	0	0	0	0	16	0	33	0	49	48	208	0	0	256	0	294	10	0	304	609
08:45 AM	0	0	0	0	0	17	0	32	0	49	42	188	0	0	230	0	274	14	0	288	567
Total	0	0	0	0	0	76	0	170	0	246	207	821	0	0	1028	0	1177	60	0	1237	2511
*** BREAK ***																					
04:00 PM	0	0	0	0	0	20	0	25	0	45	58	274	0	0	332	0	227	10	0	237	614
04:15 PM	0	0	0	0	0	35	0	22	0	57	51	253	0	0	304	0	275	15	0	290	651
04:30 PM	0	0	0	0	0	32	0	23	0	55	54	261	0	0	315	0	258	12	0	270	640
04:45 PM	0	0	0	0	0	20	0	22	0	42	46	284	0	0	330	0	280	13	0	293	665
Total	0	0	0	0	0	107	0	92	0	199	209	1072	0	0	1281	0	1040	50	0	1090	2570
05:00 PM	0	0	0	0	0	28	0	24	0	52	59	300	0	0	359	0	290	22	0	312	723
05:15 PM	0	0	0	0	0	25	0	19	0	44	69	308	0	0	377	0	296	17	0	313	734
05:30 PM	0	0	0	0	0	22	0	28	0	50	70	287	0	0	357	0	308	19	0	327	734
05:45 PM	0	0	0	0	0	26	0	29	0	55	96	271	0	0	367	0	294	24	0	318	740
Total	0	0	0	0	0	101	0	100	0	201	294	1166	0	0	1460	0	1188	82	0	1270	2931
Grand Total	0	0	0	0	0	396	0	537	0	933	1030	3926	0	0	4956	0	4774	336	0	5110	10999
Apprch %	0	0	0	0		42.4	0	57.6	0		20.8	79.2	0	0		0	93.4	6.6	0		
Total %	0	0	0	0	0	3.6	0	4.9	0	8.5	9.4	35.7	0	0	45.1	0	43.4	3.1	0	46.5	

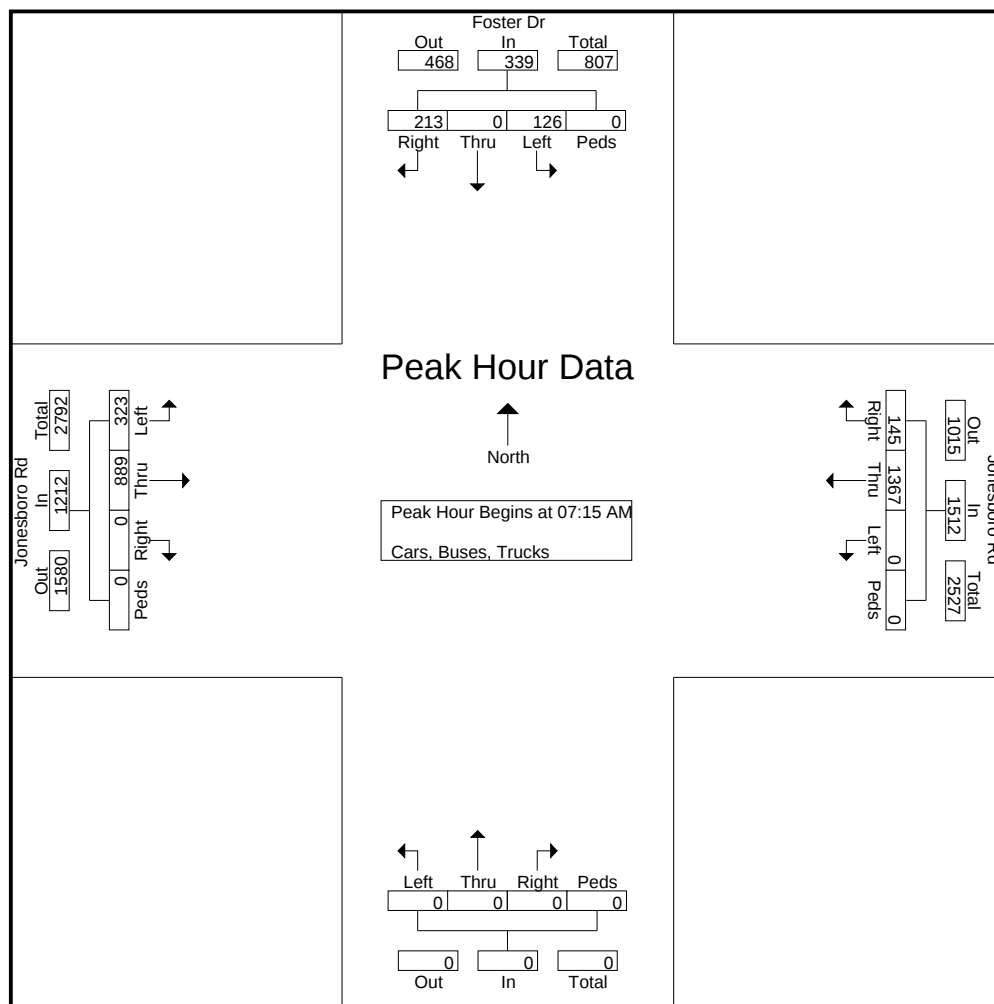
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TMC Data
Jonesboro Rd @ Foster Dr
7-9am | 4-6pm

File Name : 37690003
Site Code : 37690003
Start Date : 11/19/2015
Page No : 2

	Northbound					Foster Dr Southbound					Jonesboro Rd Eastbound					Jonesboro Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	0	0	0	0	24	0	53	0	77	76	205	0	0	281	0	337	27	0	364	722
07:30 AM	0	0	0	0	0	32	0	36	0	68	89	247	0	0	336	0	360	37	0	397	801
07:45 AM	0	0	0	0	0	45	0	55	0	100	95	239	0	0	334	0	347	62	0	409	843
08:00 AM	0	0	0	0	0	25	0	69	0	94	63	198	0	0	261	0	323	19	0	342	697
Total Volume	0	0	0	0	0	126	0	213	0	339	323	889	0	0	1212	0	1367	145	0	1512	3063
% App. Total	0	0	0	0	0	37.2	0	62.8	0		26.7	73.3	0	0		0	90.4	9.6	0		
PHF	.000	.000	.000	.000	.000	.700	.000	.772	.000	.848	.850	.900	.000	.000	.902	.000	.949	.585	.000	.924	.908



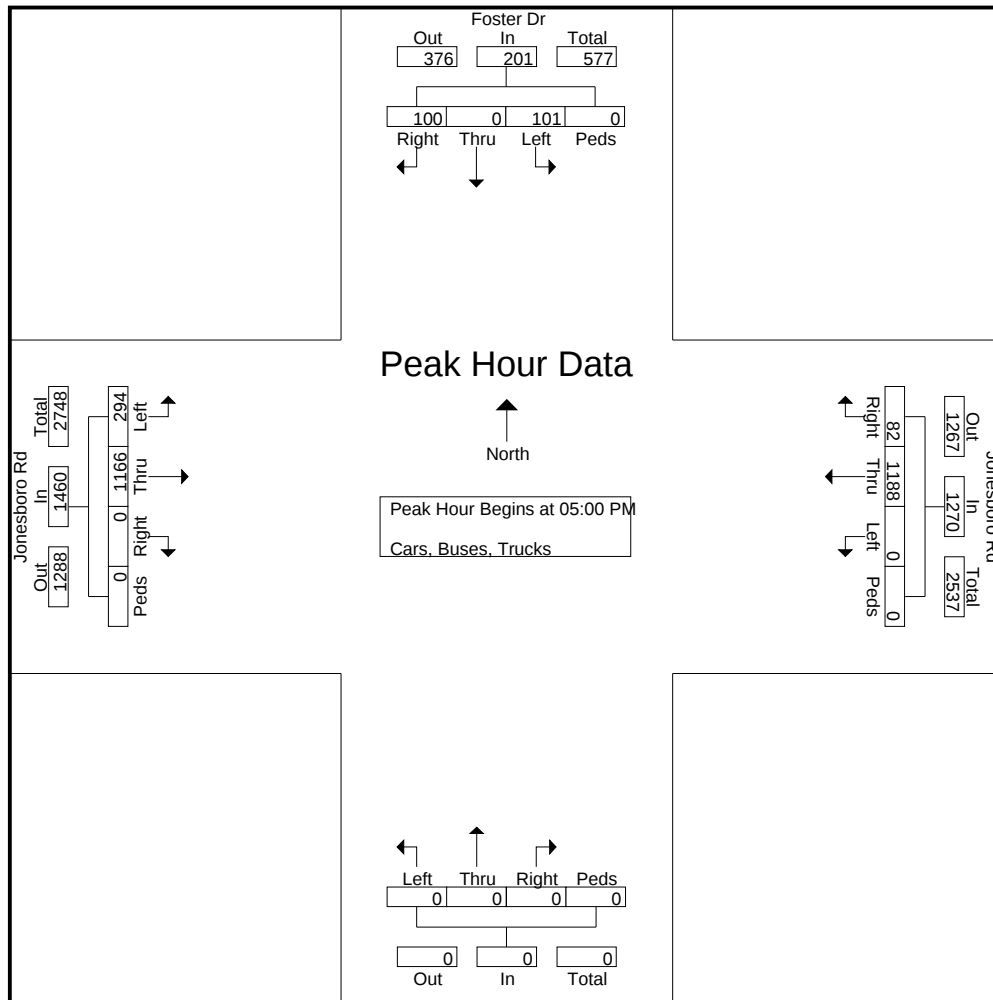
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TMC Data
Jonesboro Rd @ Foster Dr
7-9am | 4-6pm

File Name : 37690003
Site Code : 37690003
Start Date : 11/19/2015
Page No : 3

	Northbound					Foster Dr Southbound					Jonesboro Rd Eastbound					Jonesboro Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	0	0	0	0	28	0	24	0	52	59	300	0	0	359	0	290	22	0	312	723
05:15 PM	0	0	0	0	0	25	0	19	0	44	69	308	0	0	377	0	296	17	0	313	734
05:30 PM	0	0	0	0	0	22	0	28	0	50	70	287	0	0	357	0	308	19	0	327	734
05:45 PM	0	0	0	0	0	26	0	29	0	55	96	271	0	0	367	0	294	24	0	318	740
Total Volume	0	0	0	0	0	101	0	100	0	201	294	1166	0	0	1460	0	1188	82	0	1270	2931
% App. Total	0	0	0	0	0	50.2	0	49.8	0		20.1	79.9	0	0		0	93.5	6.5	0		
PHF	.000	.000	.000	.000	.000	.902	.000	.862	.000	.914	.766	.946	.000	.000	.968	.000	.964	.854	.000	.971	.990



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TMC Data
Jonesboro Rd @ Foster Dr
12-2pm Sat

File Name : 37690003-Sat
Site Code : 37690003
Start Date : 11/21/2015
Page No : 1

Groups Printed- Cars, Buses, Trucks

	Northbound					Foster Dr Southbound					Jonesboro Rd Eastbound					Jonesboro Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
12:00 PM	0	0	0	0	0	28	0	24	0	52	73	261	0	0	334	0	319	14	0	333	719
12:15 PM	0	0	0	0	0	20	0	32	0	52	65	258	0	0	323	0	338	16	0	354	729
12:30 PM	0	0	0	0	0	21	0	28	0	49	60	245	0	0	305	0	334	13	0	347	701
12:45 PM	0	0	0	0	0	11	0	29	0	40	58	247	0	0	305	0	326	17	0	343	688
Total	0	0	0	0	0	80	0	113	0	193	256	1011	0	0	1267	0	1317	60	0	1377	2837
01:00 PM	0	0	0	0	0	23	0	33	0	56	49	268	0	0	317	0	317	12	0	329	702
01:15 PM	0	0	0	0	0	15	0	26	0	41	73	253	0	0	326	0	306	15	0	321	688
01:30 PM	0	0	0	0	0	22	0	34	0	56	59	236	0	0	295	0	299	33	0	332	683
01:45 PM	0	0	0	0	0	15	0	24	0	39	87	250	0	0	337	0	293	28	0	321	697
Total	0	0	0	0	0	75	0	117	0	192	268	1007	0	0	1275	0	1215	88	0	1303	2770
Grand Total	0	0	0	0	0	155	0	230	0	385	524	2018	0	0	2542	0	2532	148	0	2680	5607
Apprch %	0	0	0	0		40.3	0	59.7	0		20.6	79.4	0	0		0	94.5	5.5	0		
Total %	0	0	0	0	0	2.8	0	4.1	0	6.9	9.3	36	0	0	45.3	0	45.2	2.6	0	47.8	

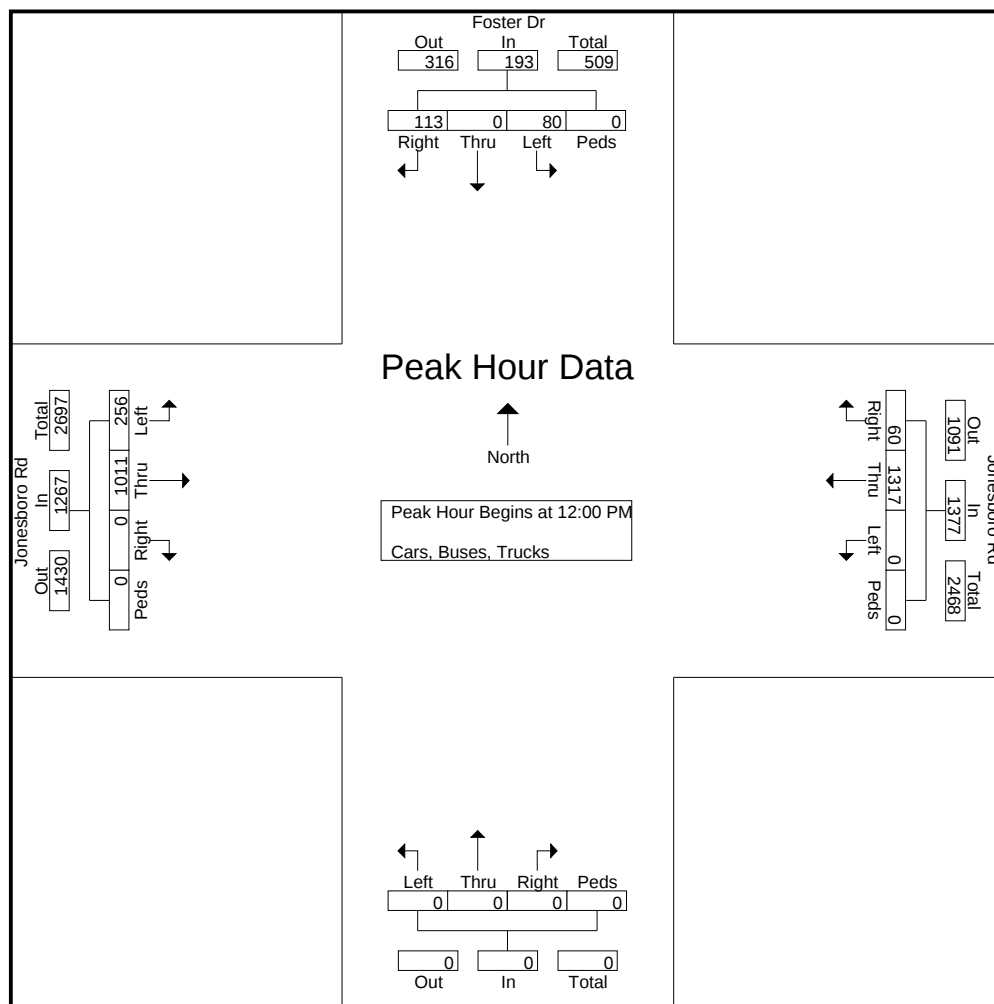
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TMC Data
Jonesboro Rd @ Foster Dr
12-2pm Sat

File Name : 37690003-Sat
Site Code : 37690003
Start Date : 11/21/2015
Page No : 2

	Northbound					Foster Dr Southbound					Jonesboro Rd Eastbound					Jonesboro Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	0	0	0	0	0	28	0	24	0	52	73	261	0	0	334	0	319	14	0	333	719
12:15 PM	0	0	0	0	0	20	0	32	0	52	65	258	0	0	323	0	338	16	0	354	729
12:30 PM	0	0	0	0	0	21	0	28	0	49	60	245	0	0	305	0	334	13	0	347	701
12:45 PM	0	0	0	0	0	11	0	29	0	40	58	247	0	0	305	0	326	17	0	343	688
Total Volume	0	0	0	0	0	80	0	113	0	193	256	1011	0	0	1267	0	1317	60	0	1377	2837
% App. Total	0	0	0	0	0	41.5	0	58.5	0		20.2	79.8	0	0		0	95.6	4.4	0		
PHF	.000	.000	.000	.000	.000	.714	.000	.883	.000	.928	.877	.968	.000	.000	.948	.000	.974	.882	.000	.972	.973



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TMC Data
Jonesboro Rd @ N Bridges Rd
7-9am | 4-6pm

File Name : 37690004
Site Code : 37690004
Start Date : 11/19/2015
Page No : 1

Groups Printed- Cars, Buses, Trucks

	N Bridges Rd Northbound					Bojangles Drwy Southbound					Jonesboro Rd Eastbound					Jonesboro Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	5	0	10	0	15	12	176	1	0	189	1	356	10	0	367	571
07:15 AM	0	0	0	0	0	2	0	13	0	15	10	207	0	0	217	0	372	5	0	377	609
07:30 AM	0	0	0	0	0	3	0	8	0	11	15	267	1	0	283	0	394	6	0	400	694
07:45 AM	0	0	0	0	0	4	0	13	0	17	15	258	1	0	274	0	378	8	0	386	677
Total	0	0	0	0	0	14	0	44	0	58	52	908	3	0	963	1	1500	29	0	1530	2551
08:00 AM	0	0	0	0	0	2	0	11	0	13	5	213	1	0	219	1	347	9	0	357	589
08:15 AM	2	0	0	0	2	8	0	14	0	22	8	225	2	0	235	1	280	13	0	294	553
08:30 AM	1	0	0	0	1	4	0	13	0	17	5	214	0	0	219	1	325	15	0	341	578
08:45 AM	1	0	1	0	2	5	0	17	0	22	9	193	1	0	203	2	260	14	0	276	503
Total	4	0	1	0	5	19	0	55	0	74	27	845	4	0	876	5	1212	51	0	1268	2223
*** BREAK ***																					
04:00 PM	0	0	0	0	0	4	0	5	0	9	6	289	2	0	297	2	224	2	0	228	534
04:15 PM	0	0	2	0	2	3	0	6	0	9	6	286	1	0	293	1	306	6	0	313	617
04:30 PM	2	0	1	0	3	5	0	7	0	12	4	278	0	0	282	1	258	5	0	264	561
04:45 PM	0	0	0	0	0	7	0	4	0	11	3	312	1	0	316	2	299	5	0	306	633
Total	2	0	3	0	5	19	0	22	0	41	19	1165	4	0	1188	6	1087	18	0	1111	2345
05:00 PM	0	0	2	0	2	4	0	7	0	11	11	305	0	0	316	0	291	2	0	293	622
05:15 PM	0	0	0	0	0	4	0	5	0	9	4	312	0	0	316	1	349	8	0	358	683
05:30 PM	0	0	1	0	1	6	0	7	0	13	4	293	2	0	299	1	315	5	0	321	634
05:45 PM	0	0	0	0	0	6	0	4	0	10	4	319	1	0	324	0	320	4	0	324	658
Total	0	0	3	0	3	20	0	23	0	43	23	1229	3	0	1255	2	1275	19	0	1296	2597
Grand Total	6	0	7	0	13	72	0	144	0	216	121	4147	14	0	4282	14	5074	117	0	5205	9716
Apprch %	46.2	0	53.8	0		33.3	0	66.7	0		2.8	96.8	0.3	0		0.3	97.5	2.2	0		
Total %	0.1	0	0.1	0	0.1	0.7	0	1.5	0	2.2	1.2	42.7	0.1	0	44.1	0.1	52.2	1.2	0	53.6	

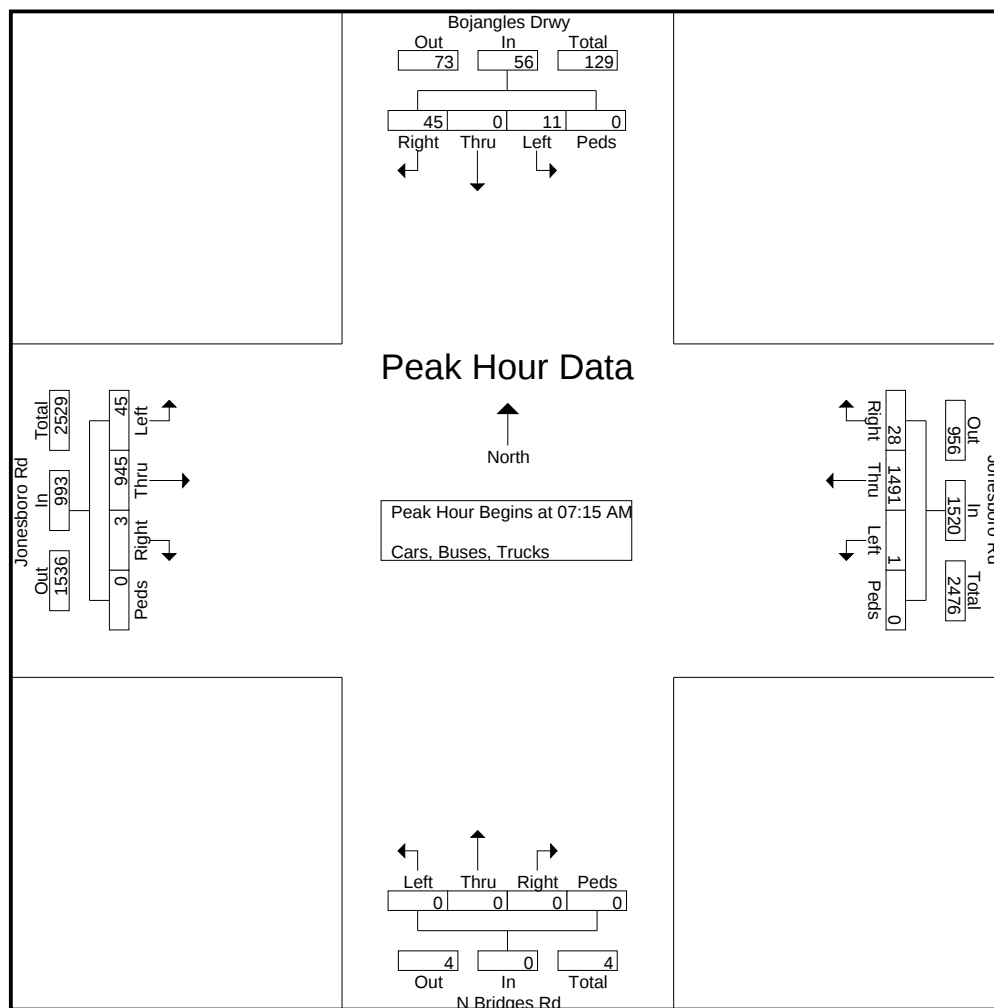
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TMC Data
Jonesboro Rd @ N Bridges Rd
7-9am | 4-6pm

File Name : 37690004
Site Code : 37690004
Start Date : 11/19/2015
Page No : 2

	N Bridges Rd Northbound					Bojangles Drwy Southbound					Jonesboro Rd Eastbound					Jonesboro Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	0	0	0	0	2	0	13	0	15	10	207	0	0	217	0	372	5	0	377	609
07:30 AM	0	0	0	0	0	3	0	8	0	11	15	267	1	0	283	0	394	6	0	400	694
07:45 AM	0	0	0	0	0	4	0	13	0	17	15	258	1	0	274	0	378	8	0	386	677
08:00 AM	0	0	0	0	0	2	0	11	0	13	5	213	1	0	219	1	347	9	0	357	589
Total Volume	0	0	0	0	0	11	0	45	0	56	45	945	3	0	993	1	1491	28	0	1520	2569
% App. Total	0	0	0	0	0	19.6	0	80.4	0		4.5	95.2	0.3	0		0.1	98.1	1.8	0		
PHF	.000	.000	.000	.000	.000	.688	.000	.865	.000	.824	.750	.885	.750	.000	.877	.250	.946	.778	.000	.950	.925



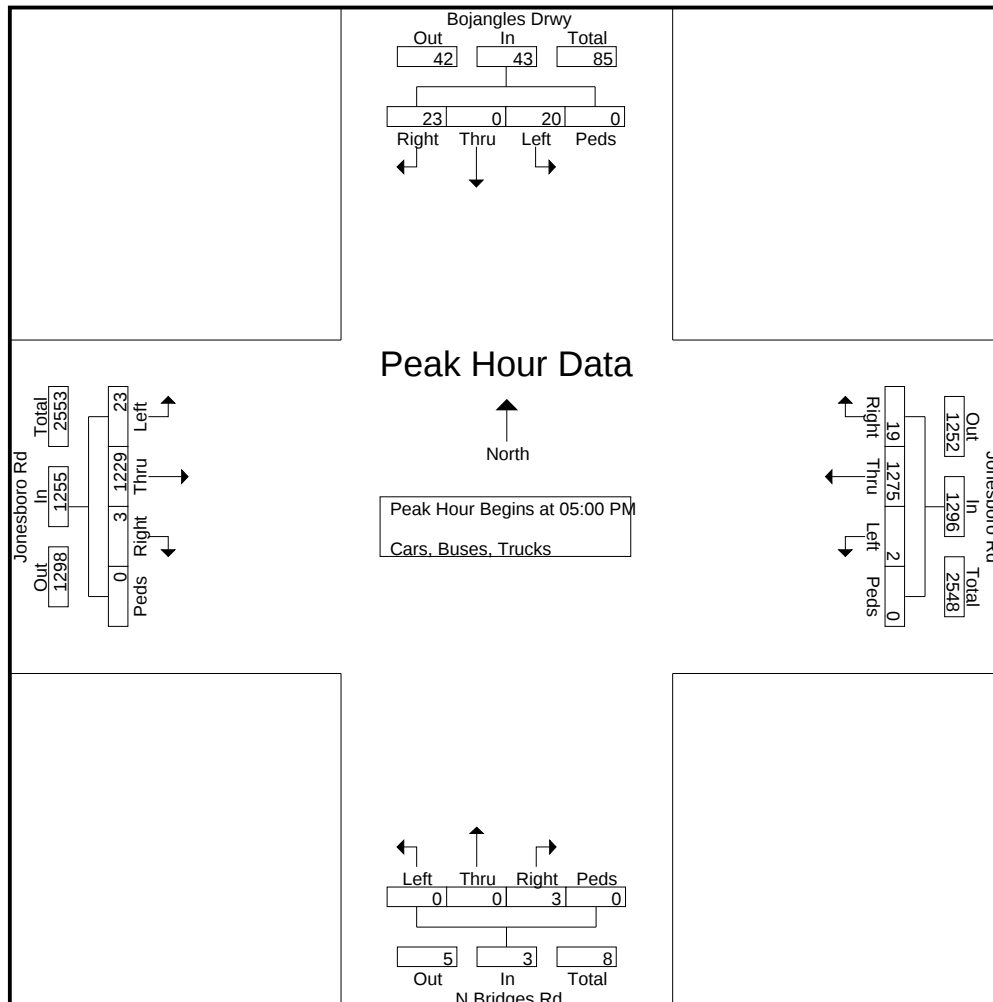
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TMC Data
Jonesboro Rd @ N Bridges Rd
7-9am I 4-6pm

File Name : 37690004
Site Code : 37690004
Start Date : 11/19/2015
Page No : 3

	N Bridges Rd Northbound					Bojangles Drwy Southbound					Jonesboro Rd Eastbound					Jonesboro Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	0	2	0	2	4	0	7	0	11	11	305	0	0	316	0	291	2	0	293	622
05:15 PM	0	0	0	0	0	4	0	5	0	9	4	312	0	0	316	1	349	8	0	358	683
05:30 PM	0	0	1	0	1	6	0	7	0	13	4	293	2	0	299	1	315	5	0	321	634
05:45 PM	0	0	0	0	0	6	0	4	0	10	4	319	1	0	324	0	320	4	0	324	658
Total Volume	0	0	3	0	3	20	0	23	0	43	23	1229	3	0	1255	2	1275	19	0	1296	2597
% App. Total	0	0	100	0		46.5	0	53.5	0		1.8	97.9	0.2	0		0.2	98.4	1.5	0		
PHF	.000	.000	.375	.000	.375	.833	.000	.821	.000	.827	.523	.963	.375	.000	.968	.500	.913	.594	.000	.905	.951



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TMC Data
Jonesboro Rd @ N Bridges Rd
12-2pm Sat

File Name : 37690004-Sat
Site Code : 37690004
Start Date : 11/21/2015
Page No : 1

Groups Printed- Cars, Buses, Trucks

	N Bridges Rd Northbound					Bojangles Drwy Southbound					Jonesboro Rd Eastbound					Jonesboro Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
12:00 PM	1	0	2	0	3	3	0	12	0	15	14	277	3	0	294	2	339	6	0	347	659
12:15 PM	0	0	0	0	0	7	0	11	0	18	12	268	0	0	280	1	342	5	0	348	646
12:30 PM	1	0	1	0	2	6	0	15	0	21	11	246	0	0	257	0	326	8	0	334	614
12:45 PM	0	0	0	0	0	6	0	14	0	20	16	230	0	0	246	1	329	2	0	332	598
Total	2	0	3	0	5	22	0	52	0	74	53	1021	3	0	1077	4	1336	21	0	1361	2517
01:00 PM	0	0	0	0	0	4	0	9	0	13	9	282	2	0	293	4	328	4	0	336	642
01:15 PM	1	0	2	0	3	11	0	12	0	23	12	258	1	0	271	1	280	9	0	290	587
01:30 PM	1	0	1	0	2	3	0	8	0	11	9	237	3	0	249	2	374	0	0	376	638
01:45 PM	0	0	1	0	1	4	0	9	0	13	10	270	2	0	282	2	298	3	0	303	599
Total	2	0	4	0	6	22	0	38	0	60	40	1047	8	0	1095	9	1280	16	0	1305	2466
Grand Total	4	0	7	0	11	44	0	90	0	134	93	2068	11	0	2172	13	2616	37	0	2666	4983
Apprch %	36.4	0	63.6	0		32.8	0	67.2	0		4.3	95.2	0.5	0		0.5	98.1	1.4	0		
Total %	0.1	0	0.1	0	0.2	0.9	0	1.8	0	2.7	1.9	41.5	0.2	0	43.6	0.3	52.5	0.7	0	53.5	

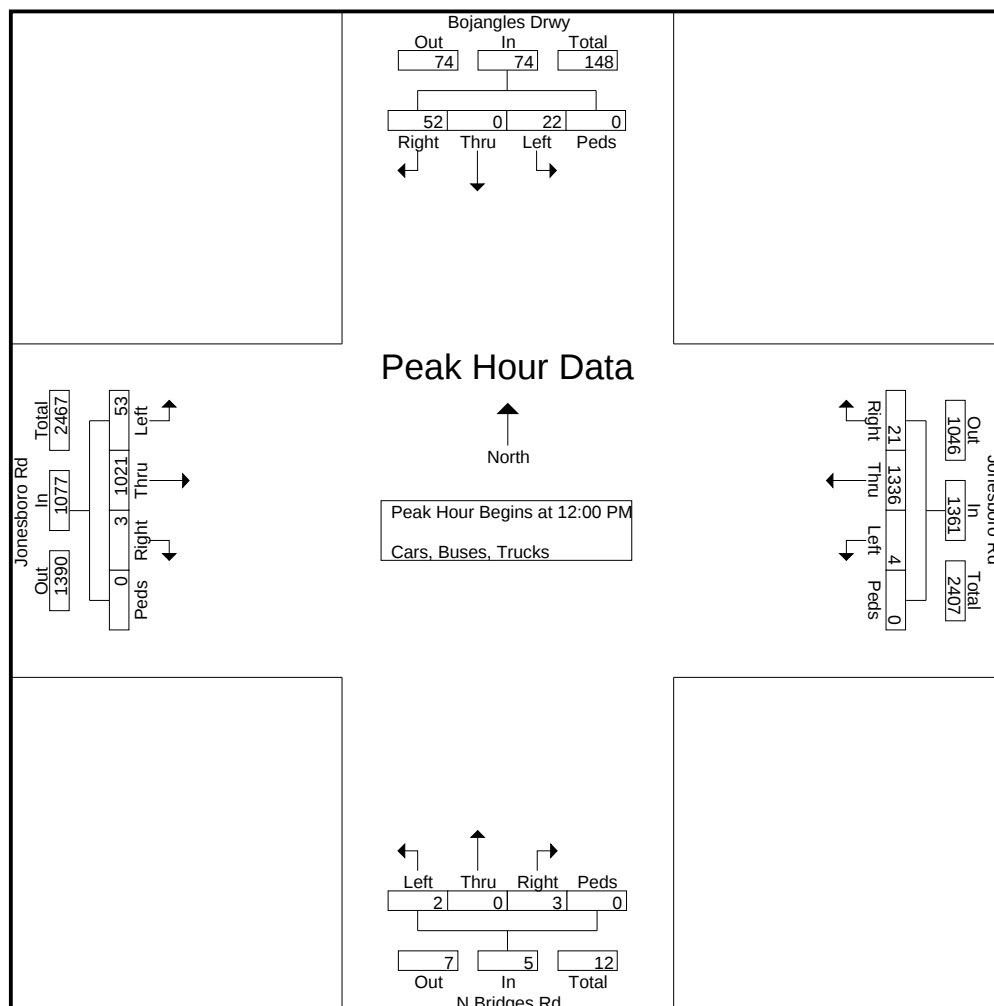
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TMC Data
Jonesboro Rd @ N Bridges Rd
12-2pm Sat

File Name : 37690004-Sat
Site Code : 37690004
Start Date : 11/21/2015
Page No : 2

	N Bridges Rd Northbound					Bojangles Drwy Southbound					Jonesboro Rd Eastbound					Jonesboro Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	1	0	2	0	3	3	0	12	0	15	14	277	3	0	294	2	339	6	0	347	659
12:15 PM	0	0	0	0	0	7	0	11	0	18	12	268	0	0	280	1	342	5	0	348	646
12:30 PM	1	0	1	0	2	6	0	15	0	21	11	246	0	0	257	0	326	8	0	334	614
12:45 PM	0	0	0	0	0	6	0	14	0	20	16	230	0	0	246	1	329	2	0	332	598
Total Volume	2	0	3	0	5	22	0	52	0	74	53	1021	3	0	1077	4	1336	21	0	1361	2517
% App. Total	40	0	60	0		29.7	0	70.3	0		4.9	94.8	0.3	0		0.3	98.2	1.5	0		
PHF	.500	.000	.375	.000	.417	.786	.000	.867	.000	.881	.828	.921	.250	.000	.916	.500	.977	.656	.000	.978	.955



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TMC Data
Jonesboro Rd @ Mt Carmel Rd
7-9am | 4-6pm

File Name : 37690005
Site Code : 37690005
Start Date : 11/19/2015
Page No : 1

Groups Printed- Cars, Buses, Trucks

	Mt Carmel Rd Northbound					Southbound					Jonesboro Rd Eastbound					Jonesboro Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	0	0	3	0	3	0	0	0	0	0	0	176	4	0	180	5	369	0	0	374	557
07:15 AM	0	0	1	0	1	0	0	0	0	0	0	218	9	0	227	3	386	0	0	389	617
07:30 AM	0	0	6	0	6	0	0	0	0	0	0	249	12	0	261	4	418	0	0	422	689
07:45 AM	0	0	5	0	5	0	0	0	0	0	0	263	10	0	273	7	372	0	0	379	657
Total	0	0	15	0	15	0	0	0	0	0	0	906	35	0	941	19	1545	0	0	1564	2520
08:00 AM	1	0	4	0	5	0	0	0	0	0	0	210	5	0	215	6	356	0	0	362	582
08:15 AM	1	0	6	0	7	0	0	0	0	0	0	219	4	0	223	2	287	0	0	289	519
08:30 AM	3	0	3	0	6	0	0	0	0	0	0	214	7	0	221	4	318	0	0	322	549
08:45 AM	1	0	6	0	7	0	0	0	0	0	0	196	4	0	200	0	273	0	0	273	480
Total	6	0	19	0	25	0	0	0	0	0	0	839	20	0	859	12	1234	0	0	1246	2130
*** BREAK ***																					
04:00 PM	13	0	8	0	21	0	0	0	0	0	0	284	3	0	287	7	226	0	0	233	541
04:15 PM	10	0	5	0	15	0	0	0	0	0	0	281	3	0	284	2	302	0	0	304	603
04:30 PM	8	0	10	0	18	0	0	0	0	0	0	278	6	0	284	4	253	0	0	257	559
04:45 PM	6	0	5	0	11	0	0	0	0	0	0	297	6	0	303	4	298	0	0	302	616
Total	37	0	28	0	65	0	0	0	0	0	0	1140	18	0	1158	17	1079	0	0	1096	2319
05:00 PM	6	0	9	0	15	0	0	0	0	0	0	301	4	0	305	5	294	0	0	299	619
05:15 PM	5	0	5	0	10	0	0	0	0	0	0	314	3	0	317	0	346	0	0	346	673
05:30 PM	5	0	4	0	9	0	0	0	0	0	0	283	1	0	284	3	294	0	0	297	590
05:45 PM	2	0	1	0	3	0	0	0	0	0	0	332	0	0	332	0	317	0	0	317	652
Total	18	0	19	0	37	0	0	0	0	0	0	1230	8	0	1238	8	1251	0	0	1259	2534
Grand Total	61	0	81	0	142	0	0	0	0	0	0	4115	81	0	4196	56	5109	0	0	5165	9503
Apprch %	43	0	57	0		0	0	0	0		0	98.1	1.9	0		1.1	98.9	0	0		
Total %	0.6	0	0.9	0	1.5	0	0	0	0	0	0	43.3	0.9	0	44.2	0.6	53.8	0	0	54.4	

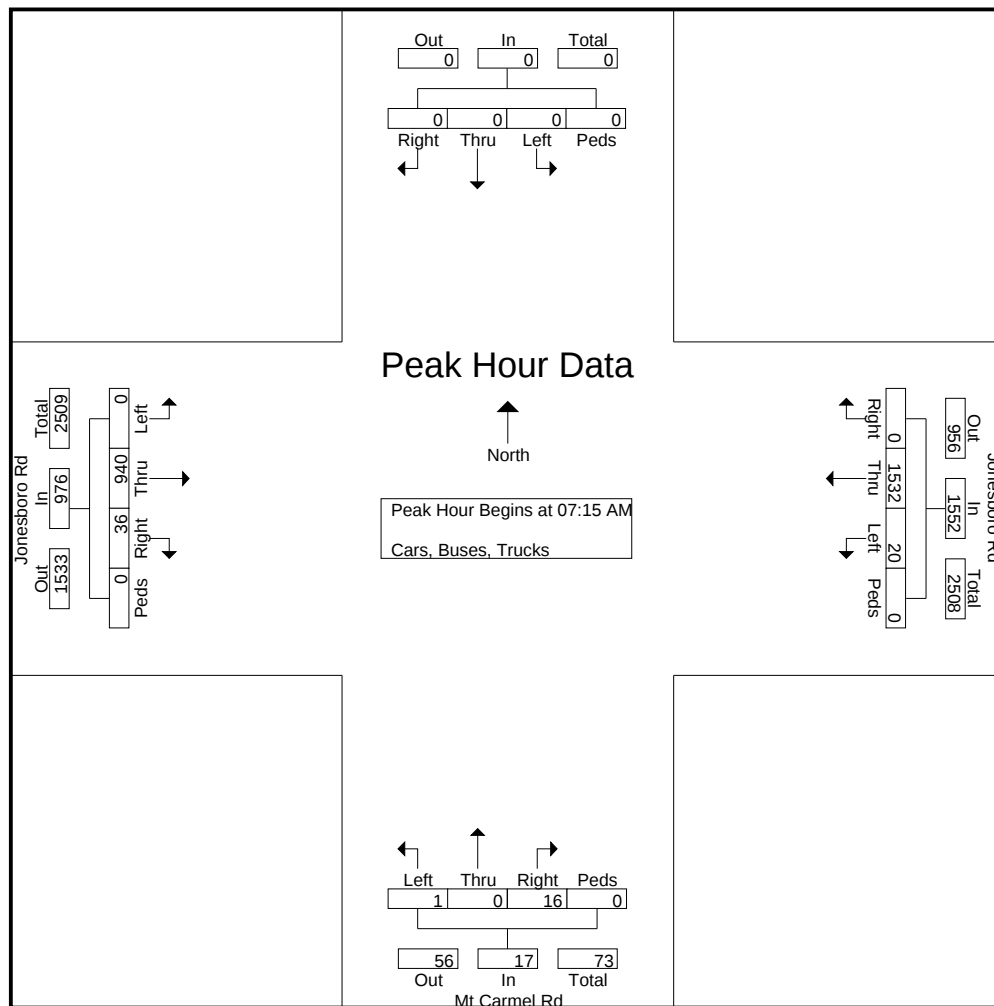
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TMC Data
Jonesboro Rd @ Mt Carmel Rd
7-9am I 4-6pm

File Name : 37690005
Site Code : 37690005
Start Date : 11/19/2015
Page No : 2

	Mt Carmel Rd Northbound					Southbound					Jonesboro Rd Eastbound					Jonesboro Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	0	1	0	1	0	0	0	0	0	0	218	9	0	227	3	386	0	0	389	617
07:30 AM	0	0	6	0	6	0	0	0	0	0	0	249	12	0	261	4	418	0	0	422	689
07:45 AM	0	0	5	0	5	0	0	0	0	0	0	263	10	0	273	7	372	0	0	379	657
08:00 AM	1	0	4	0	5	0	0	0	0	0	0	210	5	0	215	6	356	0	0	362	582
Total Volume	1	0	16	0	17	0	0	0	0	0	0	940	36	0	976	20	1532	0	0	1552	2545
% App. Total	5.9	0	94.1	0		0	0	0	0		0	96.3	3.7	0		1.3	98.7	0	0		
PHF	.250	.000	.667	.000	.708	.000	.000	.000	.000	.000	.000	.894	.750	.000	.894	.714	.916	.000	.000	.919	.923



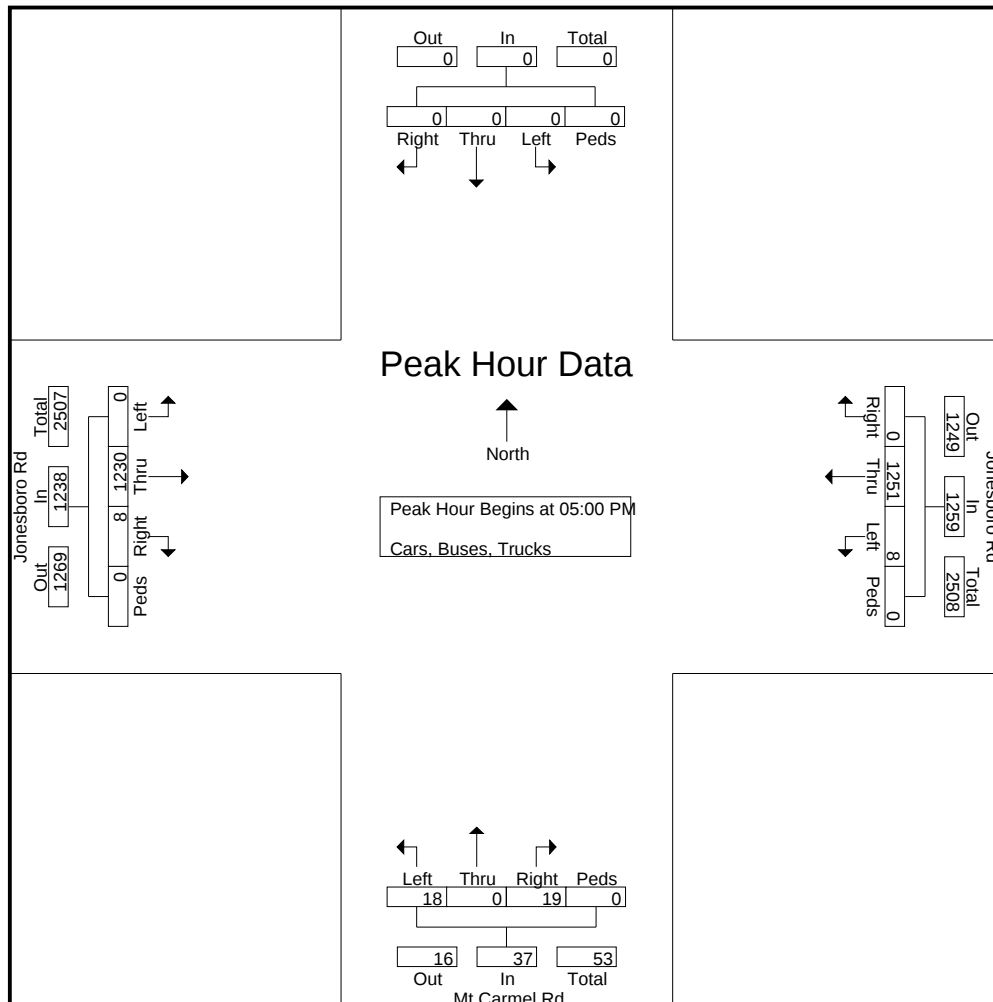
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TMC Data
Jonesboro Rd @ Mt Carmel Rd
7-9am I 4-6pm

File Name : 37690005
Site Code : 37690005
Start Date : 11/19/2015
Page No : 3

	Mt Carmel Rd Northbound					Southbound					Jonesboro Rd Eastbound					Jonesboro Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	6	0	9	0	15	0	0	0	0	0	0	301	4	0	305	5	294	0	0	299	619
05:15 PM	5	0	5	0	10	0	0	0	0	0	0	314	3	0	317	0	346	0	0	346	673
05:30 PM	5	0	4	0	9	0	0	0	0	0	0	283	1	0	284	3	294	0	0	297	590
05:45 PM	2	0	1	0	3	0	0	0	0	0	0	332	0	0	332	0	317	0	0	317	652
Total Volume	18	0	19	0	37	0	0	0	0	0	0	1230	8	0	1238	8	1251	0	0	1259	2534
% App. Total	48.6	0	51.4	0		0	0	0	0		0	99.4	0.6	0		0.6	99.4	0	0		
PHF	.750	.000	.528	.000	.617	.000	.000	.000	.000	.000	.000	.926	.500	.000	.932	.400	.904	.000	.000	.910	.941



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TMC Data
Jonesboro Rd @ Mt Carmel Rd
12-2pm Sat

File Name : 37690005-Sat
Site Code : 37690005
Start Date : 11/21/2015
Page No : 1

Groups Printed- Cars, Buses, Trucks

	Mt Carmel Rd Northbound					Southbound					Jonesboro Rd Eastbound					Jonesboro Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
12:00 PM	0	0	5	0	5	0	0	0	0	0	0	277	4	0	281	0	339	0	0	339	625
12:15 PM	2	0	1	0	3	0	0	0	0	0	0	253	3	0	256	3	342	0	0	345	604
12:30 PM	4	0	2	0	6	0	0	0	0	0	0	248	3	0	251	1	326	0	0	327	584
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	230	0	0	230	0	329	0	0	329	559
Total	6	0	8	0	14	0	0	0	0	0	0	1008	10	0	1018	4	1336	0	0	1340	2372
01:00 PM	1	0	0	0	1	0	0	0	0	0	0	282	1	0	283	0	328	0	0	328	612
01:15 PM	0	0	2	0	2	0	0	0	0	0	0	258	2	0	260	0	280	0	0	280	542
01:30 PM	2	0	3	0	5	0	0	0	0	0	0	237	3	0	240	2	374	0	0	376	621
01:45 PM	5	0	3	0	8	0	0	0	0	0	0	270	0	0	270	2	298	0	0	300	578
Total	8	0	8	0	16	0	0	0	0	0	0	1047	6	0	1053	4	1280	0	0	1284	2353
Grand Total	14	0	16	0	30	0	0	0	0	0	0	2055	16	0	2071	8	2616	0	0	2624	4725
Apprch %	46.7	0	53.3	0		0	0	0	0		0	99.2	0.8	0		0.3	99.7	0	0		
Total %	0.3	0	0.3	0	0.6	0	0	0	0	0	0	43.5	0.3	0	43.8	0.2	55.4	0	0	55.5	

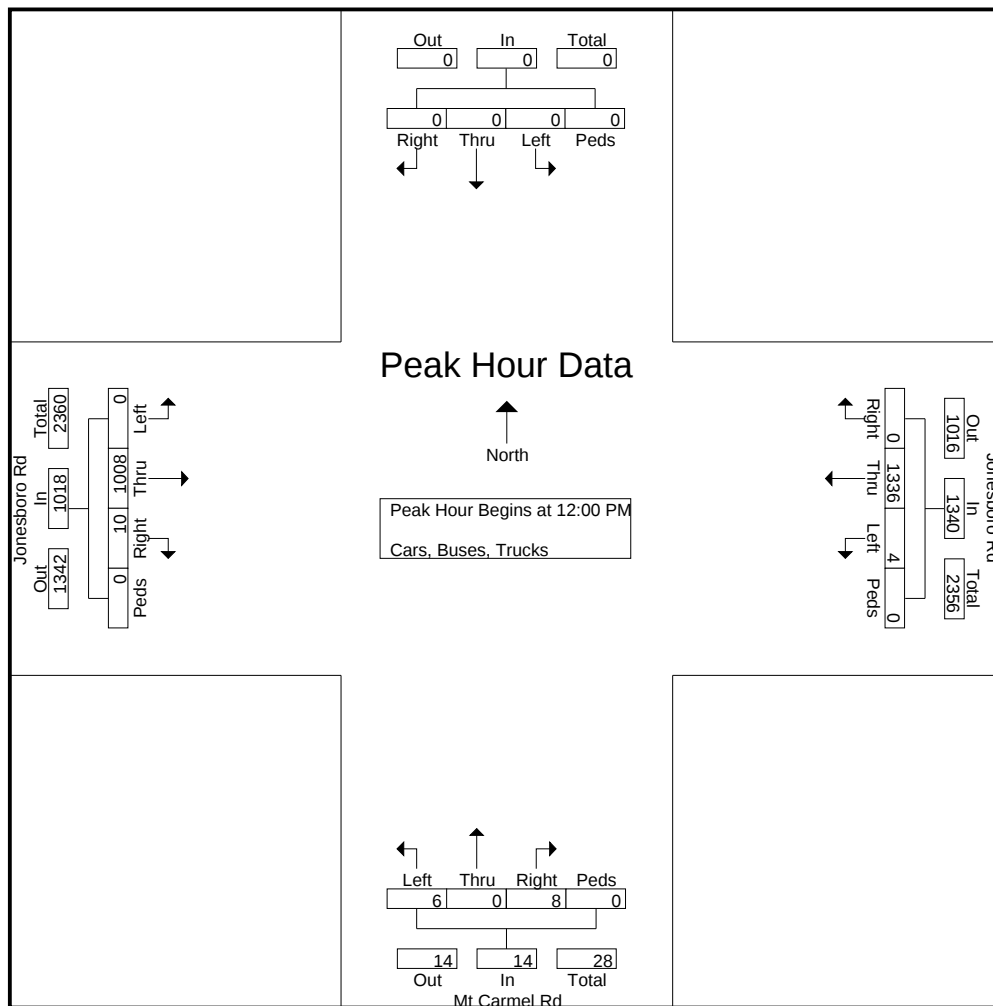
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TMC Data
Jonesboro Rd @ Mt Carmel Rd
12-2pm Sat

File Name : 37690005-Sat
Site Code : 37690005
Start Date : 11/21/2015
Page No : 2

	Mt Carmel Rd Northbound					Southbound					Jonesboro Rd Eastbound					Jonesboro Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	0	0	5	0	5	0	0	0	0	0	0	277	4	0	281	0	339	0	0	339	625
12:15 PM	2	0	1	0	3	0	0	0	0	0	0	253	3	0	256	3	342	0	0	345	604
12:30 PM	4	0	2	0	6	0	0	0	0	0	0	248	3	0	251	1	326	0	0	327	584
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	230	0	0	230	0	329	0	0	329	559
Total Volume	6	0	8	0	14	0	0	0	0	0	0	1008	10	0	1018	4	1336	0	0	1340	2372
% App. Total	42.9	0	57.1	0		0	0	0	0		0	99	1	0		0.3	99.7	0	0		
PHF	.375	.000	.400	.000	.583	.000	.000	.000	.000	.000	.000	.910	.625	.000	.906	.333	.977	.000	.000	.971	.949



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TMC Data
Jonesboro Rd @ Oak Grove Rd/
Willow Lane
7-9am I 4-6pm

File Name : 37690006
Site Code : 37690006
Start Date : 11/19/2015
Page No : 1

Groups Printed- Cars, Buses, Trucks

	Willow Lane Northbound					Oak Grove Rd Southbound					Jonesboro Rd Eastbound					Jonesboro Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	47	13	8	0	68	8	28	10	0	46	5	134	39	0	178	2	316	8	0	326	618
07:15 AM	58	23	6	0	87	16	51	11	0	78	15	147	43	0	205	3	307	8	0	318	688
07:30 AM	49	31	6	0	86	24	51	18	0	93	20	178	65	0	263	5	349	18	0	372	814
07:45 AM	66	45	11	0	122	21	63	10	0	94	11	187	58	0	256	5	308	11	0	324	796
Total	220	112	31	0	363	69	193	49	0	311	51	646	205	0	902	15	1280	45	0	1340	2916
08:00 AM	70	56	8	0	134	29	54	15	0	98	2	154	51	0	207	8	263	8	0	279	718
08:15 AM	46	43	9	0	98	24	64	10	0	98	7	159	75	0	241	6	223	4	0	233	670
08:30 AM	50	39	6	0	95	29	90	11	0	130	5	132	68	0	205	5	255	9	0	269	699
08:45 AM	47	41	12	0	100	33	83	10	0	126	4	149	36	0	189	7	223	6	0	236	651
Total	213	179	35	0	427	115	291	46	0	452	18	594	230	0	842	26	964	27	0	1017	2738
*** BREAK ***																					
04:00 PM	44	21	18	0	83	60	91	7	0	158	10	214	55	0	279	11	169	21	0	201	721
04:15 PM	53	22	24	0	99	43	83	8	0	134	15	217	50	0	282	15	237	11	0	263	778
04:30 PM	37	15	22	0	74	51	75	12	0	138	11	220	53	0	284	12	227	12	0	251	747
04:45 PM	51	27	15	0	93	40	89	5	0	134	14	214	67	0	295	11	233	13	0	257	779
Total	185	85	79	0	349	194	338	32	0	564	50	865	225	0	1140	49	866	57	0	972	3025
05:00 PM	45	30	25	0	100	49	85	15	0	149	12	223	72	0	307	27	221	7	0	255	811
05:15 PM	58	32	29	0	119	52	71	11	0	134	9	245	68	0	322	12	262	16	0	290	865
05:30 PM	52	27	34	0	113	36	84	10	0	130	7	235	58	0	300	10	253	11	0	274	817
05:45 PM	63	32	29	0	124	53	68	9	0	130	11	231	52	0	294	9	246	14	0	269	817
Total	218	121	117	0	456	190	308	45	0	543	39	934	250	0	1223	58	982	48	0	1088	3310
Grand Total	836	497	262	0	1595	568	1130	172	0	1870	158	3039	910	0	4107	148	4092	177	0	4417	11989
Apprch %	52.4	31.2	16.4	0		30.4	60.4	9.2	0		3.8	74	22.2	0		3.4	92.6	4	0		
Total %	7	4.1	2.2	0	13.3	4.7	9.4	1.4	0	15.6	1.3	25.3	7.6	0	34.3	1.2	34.1	1.5	0	36.8	

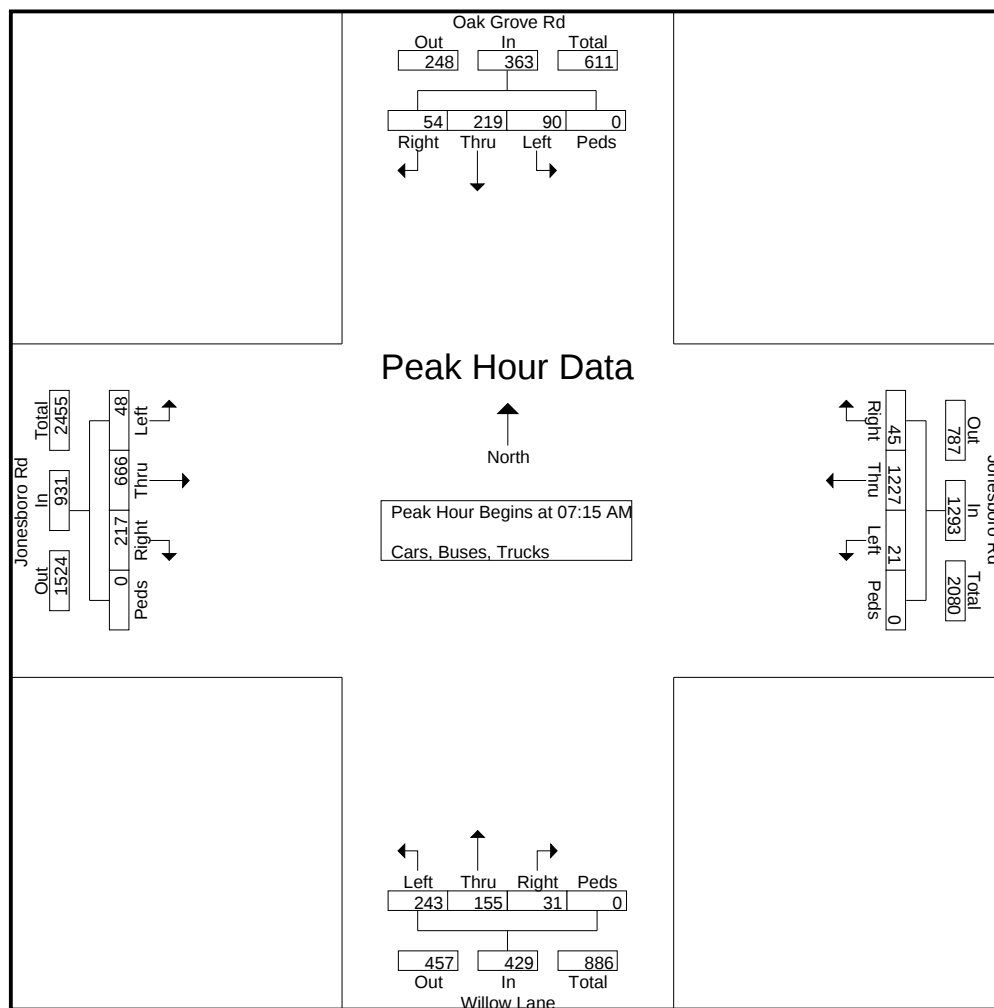
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TMC Data
Jonesboro Rd @ Oak Grove Rd/
Willow Lane
7-9am I 4-6pm

File Name : 37690006
Site Code : 37690006
Start Date : 11/19/2015
Page No : 2

	Willow Lane Northbound					Oak Grove Rd Southbound					Jonesboro Rd Eastbound					Jonesboro Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	58	23	6	0	87	16	51	11	0	78	15	147	43	0	205	3	307	8	0	318	688
07:30 AM	49	31	6	0	86	24	51	18	0	93	20	178	65	0	263	5	349	18	0	372	814
07:45 AM	66	45	11	0	122	21	63	10	0	94	11	187	58	0	256	5	308	11	0	324	796
08:00 AM	70	56	8	0	134	29	54	15	0	98	2	154	51	0	207	8	263	8	0	279	718
Total Volume	243	155	31	0	429	90	219	54	0	363	48	666	217	0	931	21	1227	45	0	1293	3016
% App. Total	56.6	36.1	7.2	0		24.8	60.3	14.9	0		5.2	71.5	23.3	0		1.6	94.9	3.5	0		
PHF	.868	.692	.705	.000	.800	.776	.869	.750	.000	.926	.600	.890	.835	.000	.885	.656	.879	.625	.000	.869	.926



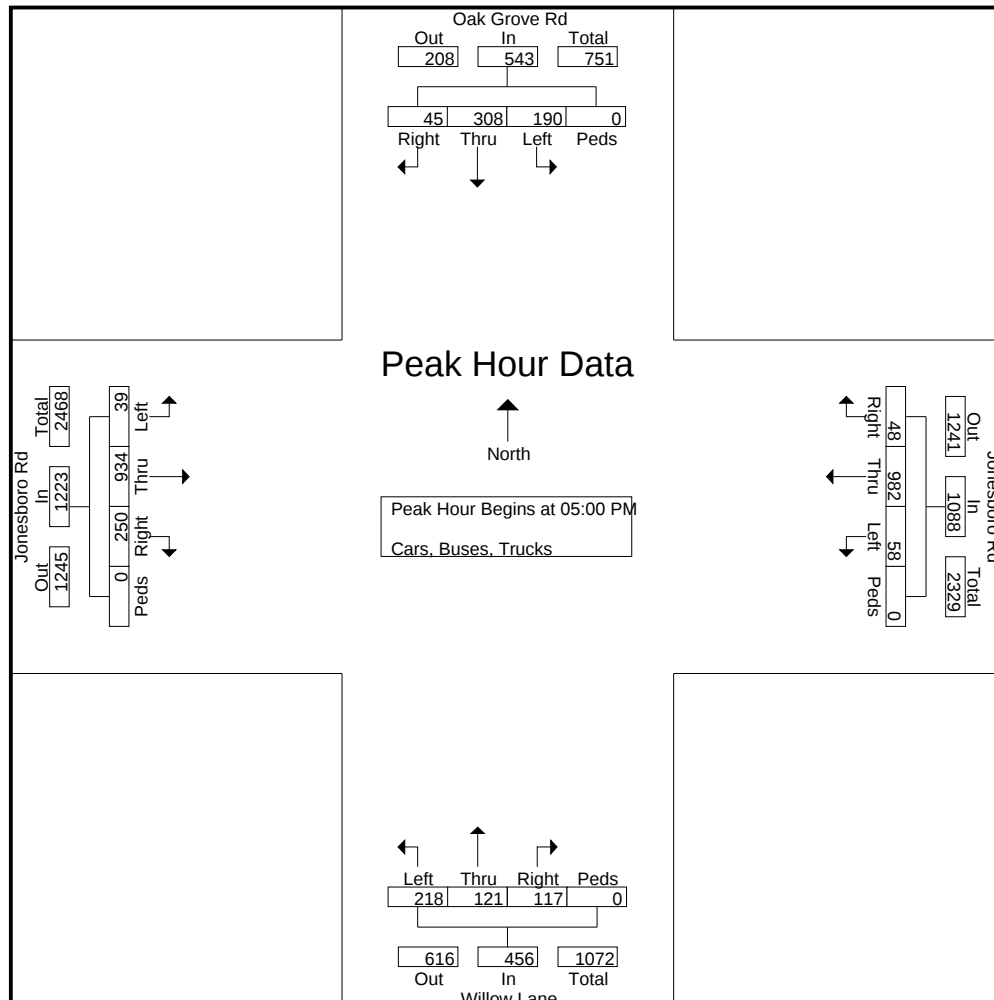
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TMC Data
Jonesboro Rd @ Oak Grove Rd/
Willow Lane
7-9am I 4-6pm

File Name : 37690006
Site Code : 37690006
Start Date : 11/19/2015
Page No : 3

	Willow Lane Northbound					Oak Grove Rd Southbound					Jonesboro Rd Eastbound					Jonesboro Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	45	30	25	0	100	49	85	15	0	149	12	223	72	0	307	27	221	7	0	255	811
05:15 PM	58	32	29	0	119	52	71	11	0	134	9	245	68	0	322	12	262	16	0	290	865
05:30 PM	52	27	34	0	113	36	84	10	0	130	7	235	58	0	300	10	253	11	0	274	817
05:45 PM	63	32	29	0	124	53	68	9	0	130	11	231	52	0	294	9	246	14	0	269	817
Total Volume	218	121	117	0	456	190	308	45	0	543	39	934	250	0	1223	58	982	48	0	1088	3310
% App. Total	47.8	26.5	25.7	0		35	56.7	8.3	0		3.2	76.4	20.4	0		5.3	90.3	4.4	0		
PHF	.865	.945	.860	.000	.919	.896	.906	.750	.000	.911	.813	.953	.868	.000	.950	.537	.937	.750	.000	.938	.957



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TMC Data
Jonesboro Rd @ Oak Grove Rd/
Willow Lane
12-2pm Sat

File Name : 37690006-Sat
Site Code : 37690006
Start Date : 11/21/2015
Page No : 1

Groups Printed- Cars, Buses, Trucks

	Willow Lane Northbound					Oak Grove Rd Southbound					Jonesboro Rd Eastbound					Jonesboro Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
12:00 PM	46	19	7	0	72	23	41	9	0	73	22	211	42	0	275	14	278	10	0	302	722
12:15 PM	47	18	11	0	76	21	46	10	0	77	11	214	34	0	259	11	280	13	0	304	716
12:30 PM	34	22	7	0	63	18	37	13	0	68	15	205	40	0	260	10	278	14	0	302	693
12:45 PM	31	23	16	0	70	29	55	7	0	91	5	201	35	0	241	9	293	13	0	315	717
Total	158	82	41	0	281	91	179	39	0	309	53	831	151	0	1035	44	1129	50	0	1223	2848
01:00 PM	46	21	9	0	76	10	26	11	0	47	17	225	33	0	275	10	269	16	0	295	693
01:15 PM	51	14	8	0	73	11	25	10	0	46	4	217	41	0	262	10	237	14	0	261	642
01:30 PM	41	42	11	0	94	14	32	10	0	56	11	206	43	0	260	19	324	10	0	353	763
01:45 PM	42	23	12	0	77	23	24	12	0	59	12	229	30	0	271	13	248	9	0	270	677
Total	180	100	40	0	320	58	107	43	0	208	44	877	147	0	1068	52	1078	49	0	1179	2775
Grand Total	338	182	81	0	601	149	286	82	0	517	97	1708	298	0	2103	96	2207	99	0	2402	5623
Apprch %	56.2	30.3	13.5	0		28.8	55.3	15.9	0		4.6	81.2	14.2	0		4	91.9	4.1	0		
Total %	6	3.2	1.4	0	10.7	2.6	5.1	1.5	0	9.2	1.7	30.4	5.3	0	37.4	1.7	39.2	1.8	0	42.7	

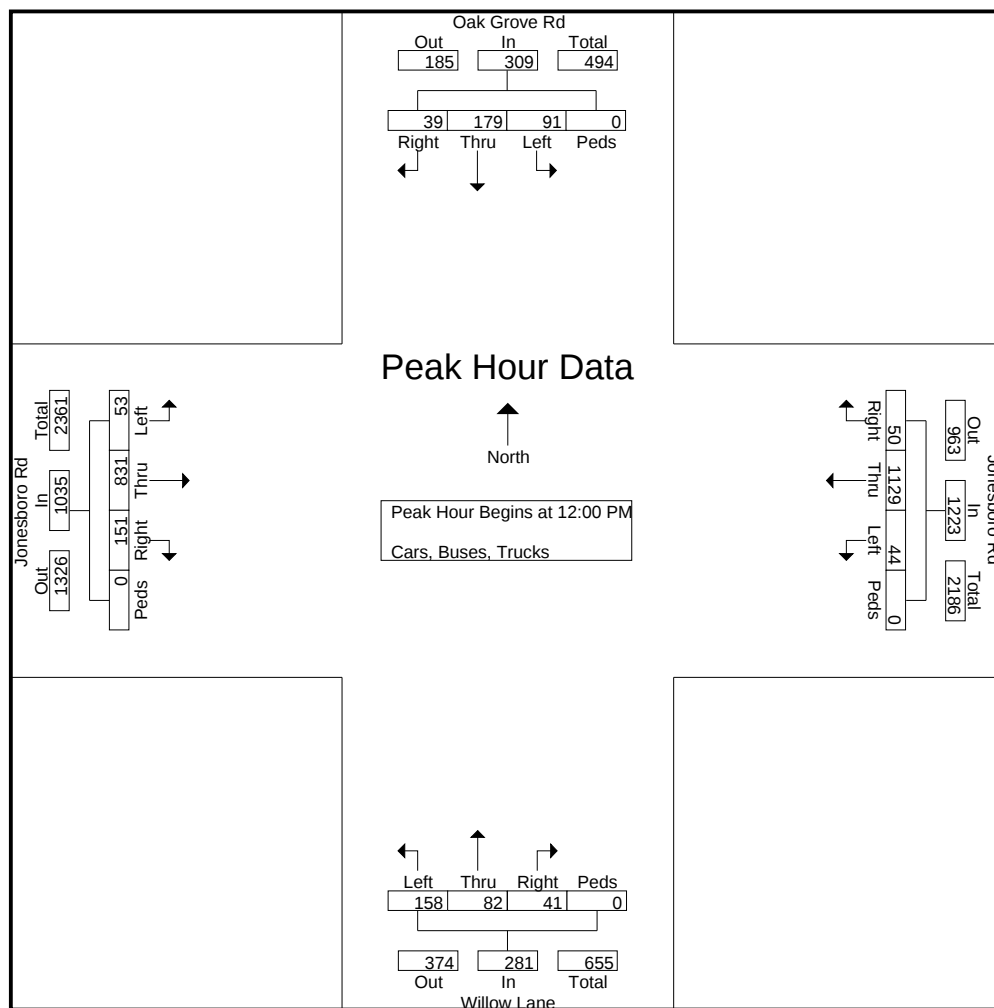
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TMC Data
Jonesboro Rd @ Oak Grove Rd/
Willow Lane
12-2pm Sat

File Name : 37690006-Sat
Site Code : 37690006
Start Date : 11/21/2015
Page No : 2

	Willow Lane Northbound					Oak Grove Rd Southbound					Jonesboro Rd Eastbound					Jonesboro Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	46	19	7	0	72	23	41	9	0	73	22	211	42	0	275	14	278	10	0	302	722
12:15 PM	47	18	11	0	76	21	46	10	0	77	11	214	34	0	259	11	280	13	0	304	716
12:30 PM	34	22	7	0	63	18	37	13	0	68	15	205	40	0	260	10	278	14	0	302	693
12:45 PM	31	23	16	0	70	29	55	7	0	91	5	201	35	0	241	9	293	13	0	315	717
Total Volume	158	82	41	0	281	91	179	39	0	309	53	831	151	0	1035	44	1129	50	0	1223	2848
% App. Total	56.2	29.2	14.6	0		29.4	57.9	12.6	0		5.1	80.3	14.6	0		3.6	92.3	4.1	0		
PHF	.840	.891	.641	.000	.924	.784	.814	.750	.000	.849	.602	.971	.899	.000	.941	.786	.963	.893	.000	.971	.986



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TMC Data
Jonesboro Rd @ Kelly Rd
7-9am | 4-6pm

File Name : 37690007
Site Code : 37690007
Start Date : 11/19/2015
Page No : 1

Groups Printed- Cars, Buses, Trucks

	Kelly Rd Northbound					Southbound					Jonesboro Rd Eastbound					Jonesboro Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	25	0	16	0	41	0	0	0	0	0	0	137	5	0	142	9	270	0	0	279	462
07:15 AM	28	0	11	0	39	0	0	0	0	0	0	172	13	0	185	17	294	0	0	311	535
07:30 AM	26	0	18	0	44	0	0	0	0	0	0	198	13	0	211	38	355	0	0	393	648
07:45 AM	34	0	16	0	50	0	0	0	0	0	0	207	19	0	226	30	300	0	0	330	606
Total	113	0	61	0	174	0	0	0	0	0	0	714	50	0	764	94	1219	0	0	1313	2251
08:00 AM	16	0	11	0	27	0	0	0	0	0	0	188	21	0	209	20	265	0	0	285	521
08:15 AM	18	0	16	0	34	0	0	0	0	0	0	161	16	0	177	19	220	0	0	239	450
08:30 AM	26	0	12	0	38	0	0	0	0	0	0	168	10	0	178	20	241	0	0	261	477
08:45 AM	17	0	14	0	31	0	0	0	0	0	0	177	15	0	192	16	216	0	0	232	455
Total	77	0	53	0	130	0	0	0	0	0	0	694	62	0	756	75	942	0	0	1017	1903
*** BREAK ***																					
04:00 PM	15	0	23	0	38	0	0	0	0	0	0	260	25	0	285	29	214	0	0	243	566
04:15 PM	19	0	31	0	50	0	0	0	0	0	0	245	33	0	278	24	236	0	0	260	588
04:30 PM	15	0	22	0	37	0	0	0	0	0	0	248	26	0	274	18	209	0	0	227	538
04:45 PM	19	0	25	0	44	0	0	0	0	0	0	256	16	0	272	32	255	0	0	287	603
Total	68	0	101	0	169	0	0	0	0	0	0	1009	100	0	1109	103	914	0	0	1017	2295
05:00 PM	30	0	34	0	64	0	0	0	0	0	0	270	17	0	287	33	243	0	0	276	627
05:15 PM	16	0	24	0	40	0	0	0	0	0	0	326	21	0	347	33	283	0	0	316	703
05:30 PM	24	0	26	0	50	0	0	0	0	0	0	293	22	0	315	44	243	0	0	287	652
05:45 PM	30	0	31	0	61	0	0	0	0	0	0	284	27	0	311	36	238	0	0	274	646
Total	100	0	115	0	215	0	0	0	0	0	0	1173	87	0	1260	146	1007	0	0	1153	2628
Grand Total	358	0	330	0	688	0	0	0	0	0	0	3590	299	0	3889	418	4082	0	0	4500	9077
Apprch %	52	0	48	0		0	0	0	0		0	92.3	7.7	0		9.3	90.7	0	0		
Total %	3.9	0	3.6	0	7.6	0	0	0	0	0	0	39.6	3.3	0	42.8	4.6	45	0	0	49.6	

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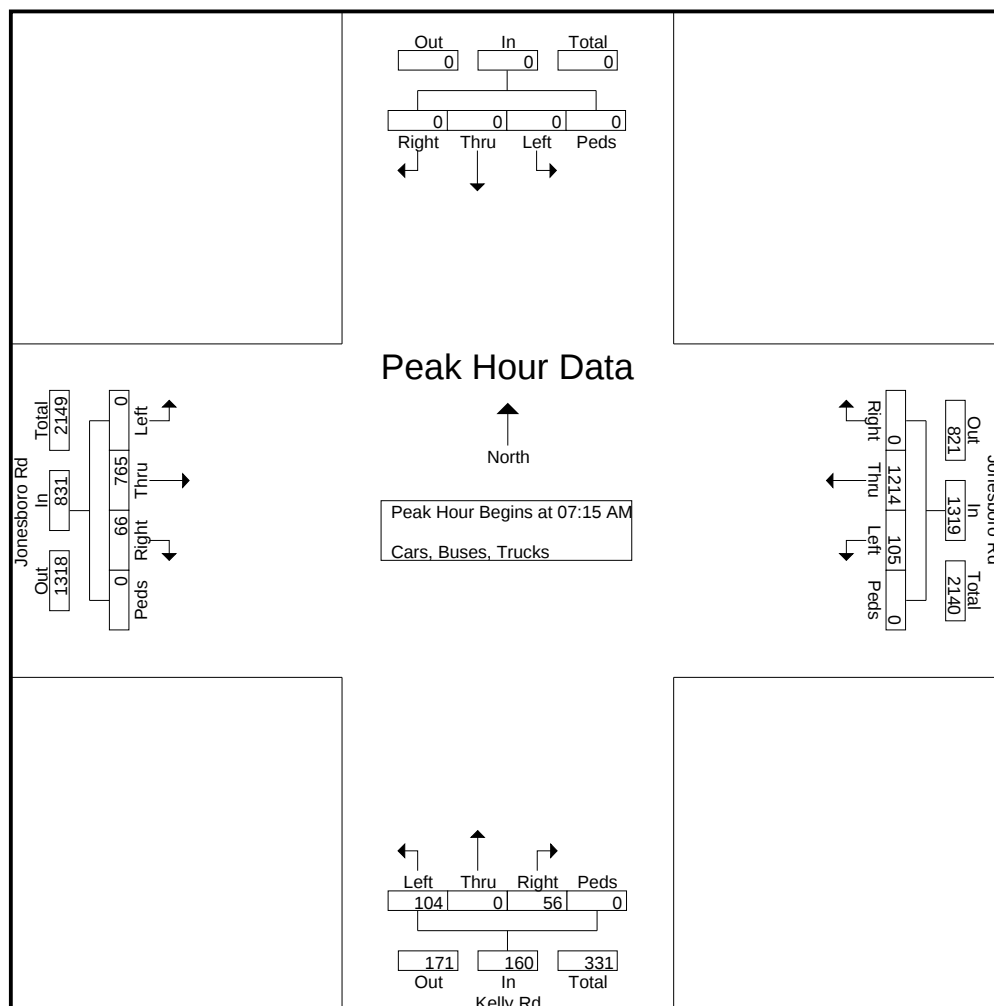
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TMC Data
Jonesboro Rd @ Kelly Rd

7-9am | 4-6pm

File Name : 37690007
Site Code : 37690007
Start Date : 11/19/2015
Page No : 2

	Kelly Rd Northbound					Southbound					Jonesboro Rd Eastbound					Jonesboro Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	28	0	11	0	39	0	0	0	0	0	0	172	13	0	185	17	294	0	0	311	535
07:30 AM	26	0	18	0	44	0	0	0	0	0	0	198	13	0	211	38	355	0	0	393	648
07:45 AM	34	0	16	0	50	0	0	0	0	0	0	207	19	0	226	30	300	0	0	330	606
08:00 AM	16	0	11	0	27	0	0	0	0	0	0	188	21	0	209	20	265	0	0	285	521
Total Volume	104	0	56	0	160	0	0	0	0	0	0	765	66	0	831	105	1214	0	0	1319	2310
% App. Total	65	0	35	0		0	0	0	0		0	92.1	7.9	0		8	92	0	0		
PHF	.765	.000	.778	.000	.800	.000	.000	.000	.000	.000	.000	.924	.786	.000	.919	.691	.855	.000	.000	.839	.891



Reliable Traffic Data Services, LLC

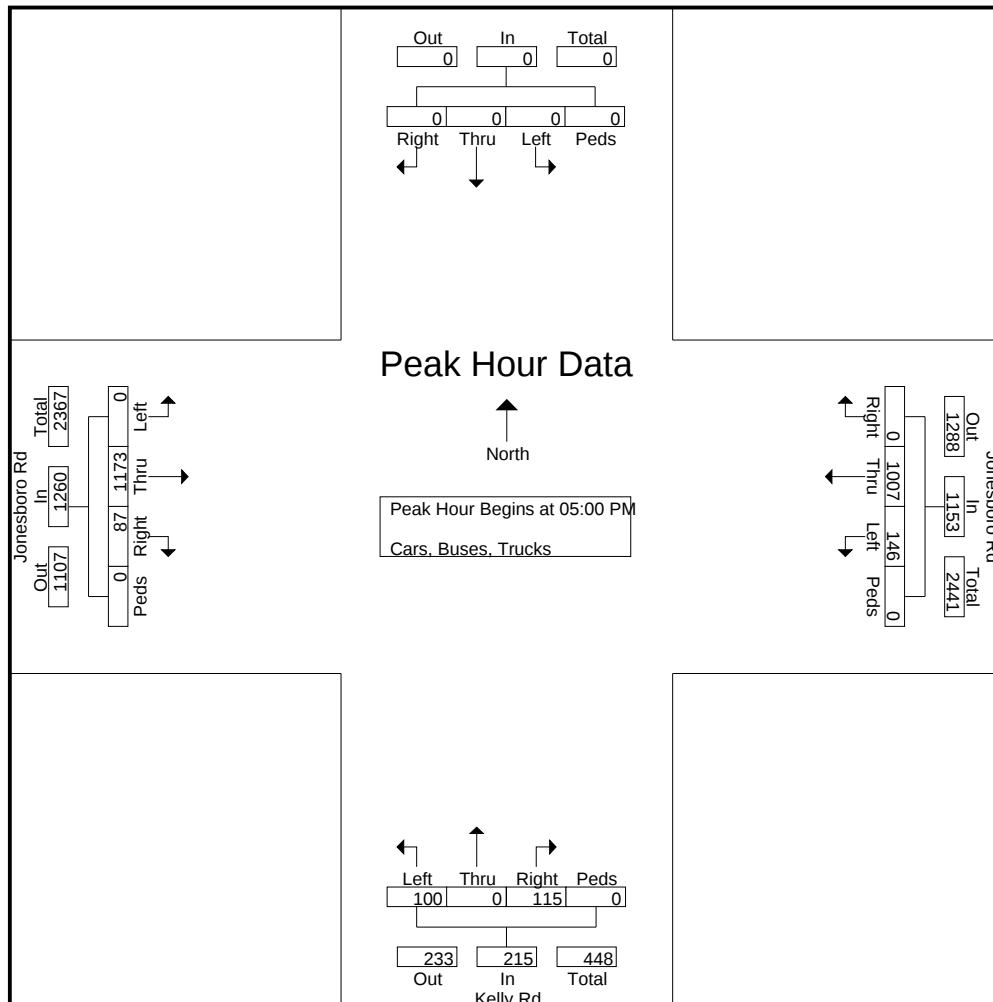
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TMC Data
Jonesboro Rd @ Kelly Rd

7-9am | 4-6pm

File Name : 37690007
Site Code : 37690007
Start Date : 11/19/2015
Page No : 3

	Kelly Rd Northbound					Southbound					Jonesboro Rd Eastbound					Jonesboro Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	30	0	34	0	64	0	0	0	0	0	0	270	17	0	287	33	243	0	0	276	627
05:15 PM	16	0	24	0	40	0	0	0	0	0	0	326	21	0	347	33	283	0	0	316	703
05:30 PM	24	0	26	0	50	0	0	0	0	0	0	293	22	0	315	44	243	0	0	287	652
05:45 PM	30	0	31	0	61	0	0	0	0	0	0	284	27	0	311	36	238	0	0	274	646
Total Volume	100	0	115	0	215	0	0	0	0	0	0	1173	87	0	1260	146	1007	0	0	1153	2628
% App. Total	46.5	0	53.5	0		0	0	0	0		0	93.1	6.9	0		12.7	87.3	0	0		
PHF	.833	.000	.846	.000	.840	.000	.000	.000	.000	.000	.000	.900	.806	.000	.908	.830	.890	.000	.000	.912	.935



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TMC Data
Jonesboro Rd @ Kelly Rd
12-2pm Sat

File Name : 37690007-Sat
Site Code : 37690007
Start Date : 11/21/2015
Page No : 1

Groups Printed- Cars, Buses, Trucks

	Kelly Rd Northbound					Southbound					Jonesboro Rd Eastbound					Jonesboro Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
12:00 PM	29	0	21	0	50	0	0	0	0	0	0	207	11	0	218	41	285	0	0	326	594
12:15 PM	19	0	39	0	58	0	0	0	0	0	0	217	14	0	231	27	283	0	0	310	599
12:30 PM	13	0	20	0	33	0	0	0	0	0	0	223	17	0	240	48	306	0	0	354	627
12:45 PM	17	0	26	0	43	0	0	0	0	0	0	218	12	0	230	38	276	0	0	314	587
Total	78	0	106	0	184	0	0	0	0	0	0	865	54	0	919	154	1150	0	0	1304	2407
01:00 PM	23	0	26	0	49	0	0	0	0	0	0	212	14	0	226	37	288	0	0	325	600
01:15 PM	29	0	20	0	49	0	0	0	0	0	0	215	17	0	232	42	269	0	0	311	592
01:30 PM	17	0	22	0	39	0	0	0	0	0	0	219	16	0	235	36	263	0	0	299	573
01:45 PM	16	0	23	0	39	0	0	0	0	0	0	224	16	0	240	47	267	0	0	314	593
Total	85	0	91	0	176	0	0	0	0	0	0	870	63	0	933	162	1087	0	0	1249	2358
Grand Total	163	0	197	0	360	0	0	0	0	0	0	1735	117	0	1852	316	2237	0	0	2553	4765
Apprch %	45.3	0	54.7	0		0	0	0	0		0	93.7	6.3	0		12.4	87.6	0	0		
Total %	3.4	0	4.1	0	7.6	0	0	0	0	0	0	36.4	2.5	0	38.9	6.6	46.9	0	0	53.6	

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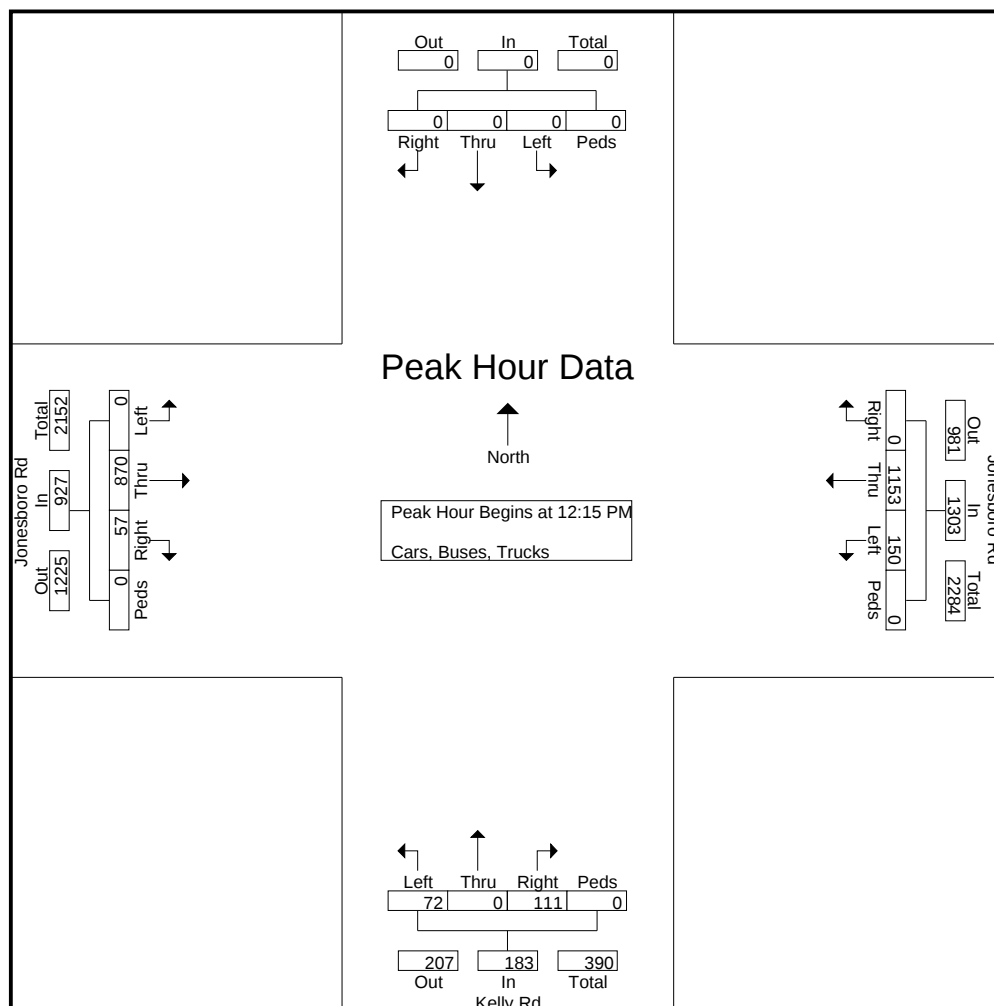
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TMC Data
Jonesboro Rd @ Kelly Rd

12-2pm Sat

File Name : 37690007-Sat
Site Code : 37690007
Start Date : 11/21/2015
Page No : 2

	Kelly Rd Northbound					Southbound					Jonesboro Rd Eastbound					Jonesboro Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:15 PM																					
12:15 PM	19	0	39	0	58	0	0	0	0	0	0	217	14	0	231	27	283	0	0	310	599
12:30 PM	13	0	20	0	33	0	0	0	0	0	0	223	17	0	240	48	306	0	0	354	627
12:45 PM	17	0	26	0	43	0	0	0	0	0	0	218	12	0	230	38	276	0	0	314	587
01:00 PM	23	0	26	0	49	0	0	0	0	0	0	212	14	0	226	37	288	0	0	325	600
Total Volume	72	0	111	0	183	0	0	0	0	0	0	870	57	0	927	150	1153	0	0	1303	2413
% App. Total	39.3	0	60.7	0		0	0	0	0		0	93.9	6.1	0		11.5	88.5	0	0		
PHF	.783	.000	.712	.000	.789	.000	.000	.000	.000	.000	.000	.975	.838	.000	.966	.781	.942	.000	.000	.920	.962



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TMC Data
Mt Carmel Rd @ N Bridges Rd/
Sterling Place
7-9am I 4-6pm

File Name : 37690008
Site Code : 37690008
Start Date : 11/19/2015
Page No : 1

Groups Printed- Cars, Buses, Trucks

	Sterling Pl Northbound					N Bridges Rd Southbound					Mt Carmel Rd Eastbound					Mt Carmel Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	6	0	0	0	6	8
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	10	10
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	9	9
07:45 AM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	12	0	0	0	12	13
Total	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	37	0	0	0	37	40
08:00 AM	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	4
08:15 AM	0	0	6	0	6	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	9
08:30 AM	0	0	3	0	3	0	0	1	0	1	1	0	0	0	1	2	0	0	0	2	7
08:45 AM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	4
Total	0	0	12	0	12	0	0	1	0	1	1	0	0	0	1	10	0	0	0	10	24
*** BREAK ***																					
04:00 PM	0	0	15	0	15	0	0	1	0	1	0	0	0	0	0	4	0	0	0	4	20
04:15 PM	0	0	9	0	9	0	0	0	0	0	0	0	0	0	0	6	0	0	0	6	15
04:30 PM	0	0	12	0	12	0	0	0	0	0	1	0	0	0	1	2	0	1	0	3	16
04:45 PM	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	7	0	0	0	7	10
Total	0	0	39	0	39	0	0	1	0	1	1	0	0	0	1	19	0	1	0	20	61
05:00 PM	0	0	9	0	9	0	0	1	0	1	1	0	0	0	1	5	0	1	0	6	17
05:15 PM	0	0	6	0	6	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	8
05:30 PM	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	5
05:45 PM	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	6
Total	0	0	23	0	23	0	0	1	0	1	1	0	0	0	1	10	0	1	0	11	36
Grand Total	0	0	77	0	77	0	0	3	0	3	3	0	0	0	3	76	0	2	0	78	161
Apprch %	0	0	100	0		0	0	100	0		100	0	0	0		97.4	0	2.6	0		
Total %	0	0	47.8	0	47.8	0	0	1.9	0	1.9	1.9	0	0	0	1.9	47.2	0	1.2	0	48.4	

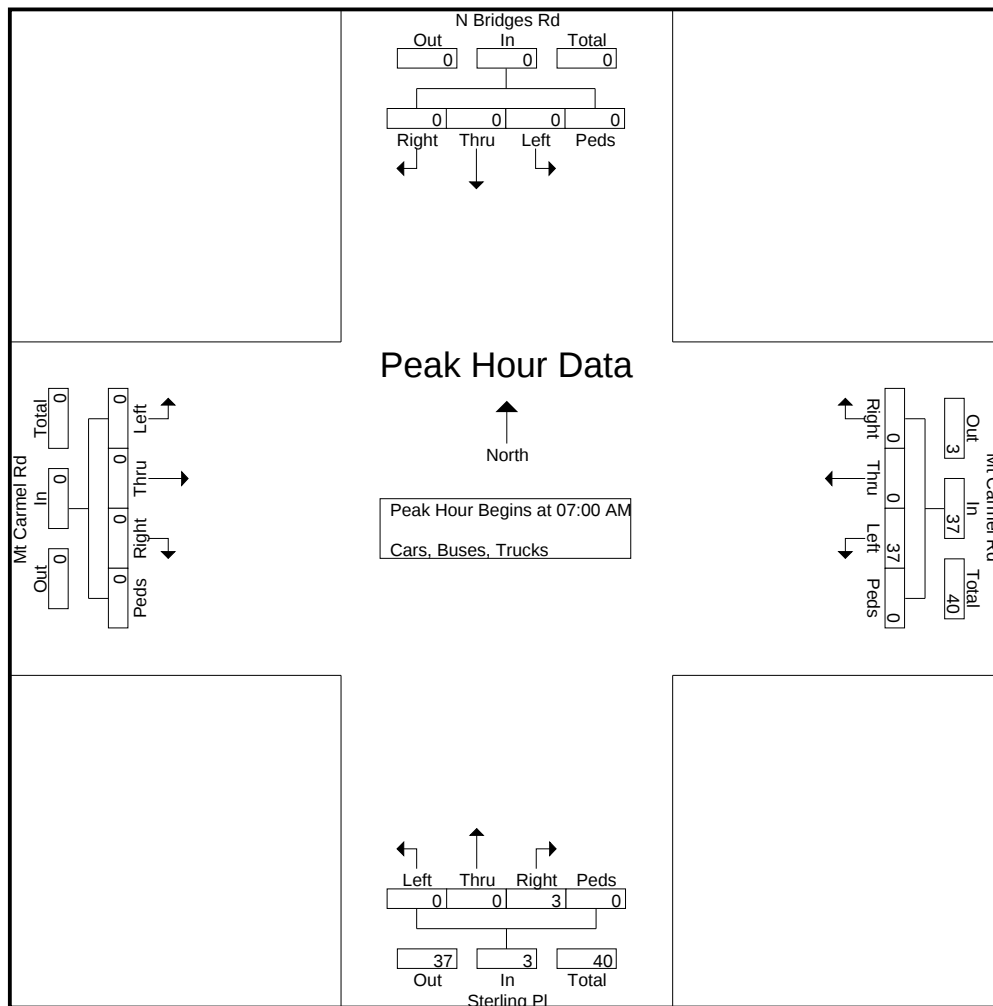
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TMC Data
Mt Carmel Rd @ N Bridges Rd/
Sterling Place
7-9am I 4-6pm

File Name : 37690008
Site Code : 37690008
Start Date : 11/19/2015
Page No : 2

	Sterling Pl Northbound					N Bridges Rd Southbound					Mt Carmel Rd Eastbound					Mt Carmel Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	6	0	0	0	6	8
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	10	10
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	9	9
07:45 AM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	12	0	0	0	12	13
Total Volume	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	37	0	0	0	37	40
% App. Total	0	0	100	0		0	0	0	0		0	0	0	0		100	0	0	0		
PHF	.000	.000	.375	.000	.375	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.771	.000	.000	.000	.771	.769



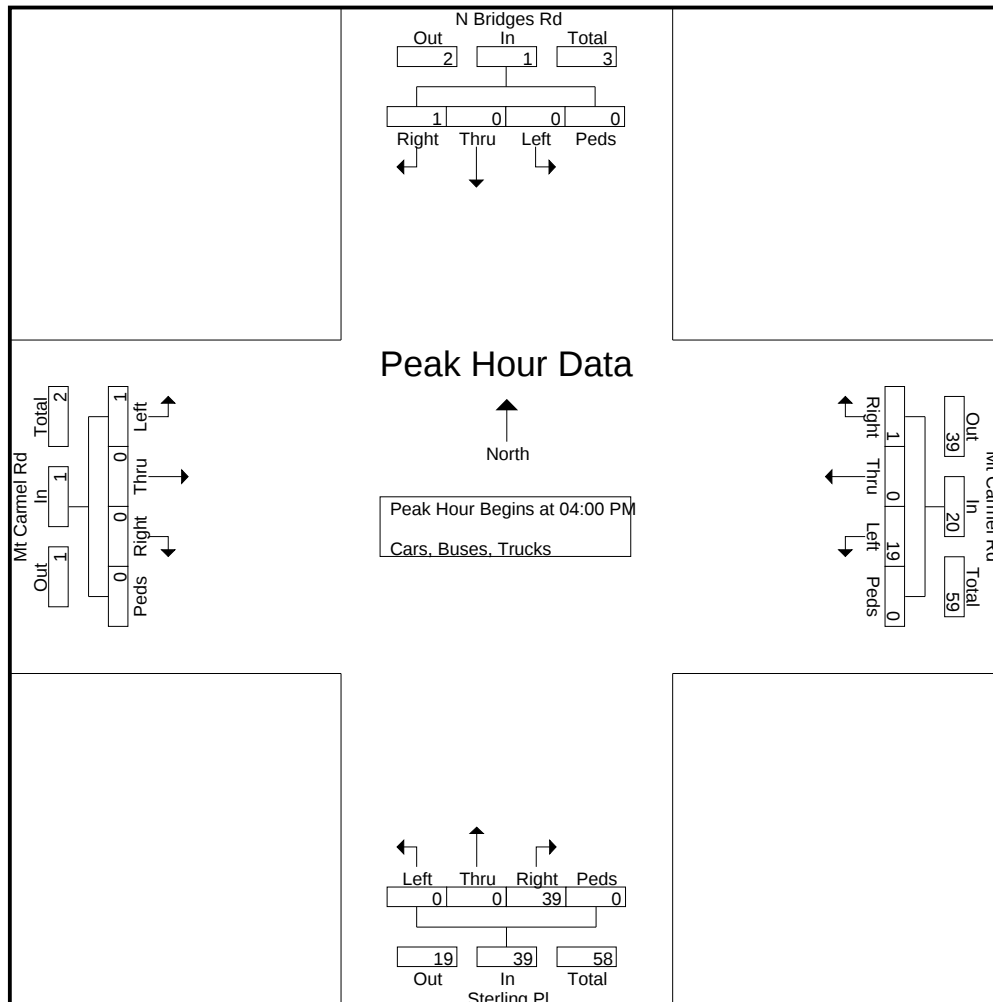
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TMC Data
Mt Carmel Rd @ N Bridges Rd/
Sterling Place
7-9am | 4-6pm

File Name : 37690008
Site Code : 37690008
Start Date : 11/19/2015
Page No : 3

	Sterling Pl Northbound					N Bridges Rd Southbound					Mt Carmel Rd Eastbound					Mt Carmel Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	15	0	15	0	0	1	0	1	0	0	0	0	0	4	0	0	0	4	20
04:15 PM	0	0	9	0	9	0	0	0	0	0	0	0	0	0	0	6	0	0	0	6	15
04:30 PM	0	0	12	0	12	0	0	0	0	0	1	0	0	0	1	2	0	1	0	3	16
04:45 PM	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	7	0	0	0	7	10
Total Volume	0	0	39	0	39	0	0	1	0	1	1	0	0	0	1	19	0	1	0	20	61
% App. Total	0	0	100	0		0	0	100	0		100	0	0	0		95	0	5	0		
PHF	.000	.000	.650	.000	.650	.000	.000	.250	.000	.250	.250	.000	.000	.000	.250	.679	.000	.250	.000	.714	.763



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TMC Data
Mt Carmel Rd @ N Bridges Rd/
Sterling PI
12-2pm Sat

File Name : 37690008-Sat
Site Code : 37690008
Start Date : 11/21/2015
Page No : 1

Groups Printed- Cars, Buses, Trucks

	Sterling PI Northbound					N Bridges Rd Southbound					Mt Carmel Rd Eastbound					Mt Carmel Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
12:00 PM	0	0	1	0	1	1	0	1	0	2	0	0	0	0	0	1	0	0	0	1	4
12:15 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2
12:30 PM	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	3	1	0	0	4	8
12:45 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	7	0	7	1	0	1	0	2	0	0	0	0	0	5	1	0	0	6	15
01:00 PM	0	0	1	0	1	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	3
01:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	2
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
01:45 PM	0	0	6	0	6	1	0	0	0	1	0	0	0	0	0	3	0	1	0	4	11
Total	0	0	7	0	7	1	0	1	0	2	1	1	0	0	2	6	0	1	0	7	18
Grand Total	0	0	14	0	14	2	0	2	0	4	1	1	0	0	2	11	1	1	0	13	33
Apprch %	0	0	100	0		50	0	50	0		50	50	0	0		84.6	7.7	7.7	0		
Total %	0	0	42.4	0	42.4	6.1	0	6.1	0	12.1	3	3	0	0	6.1	33.3	3	3	0	39.4	

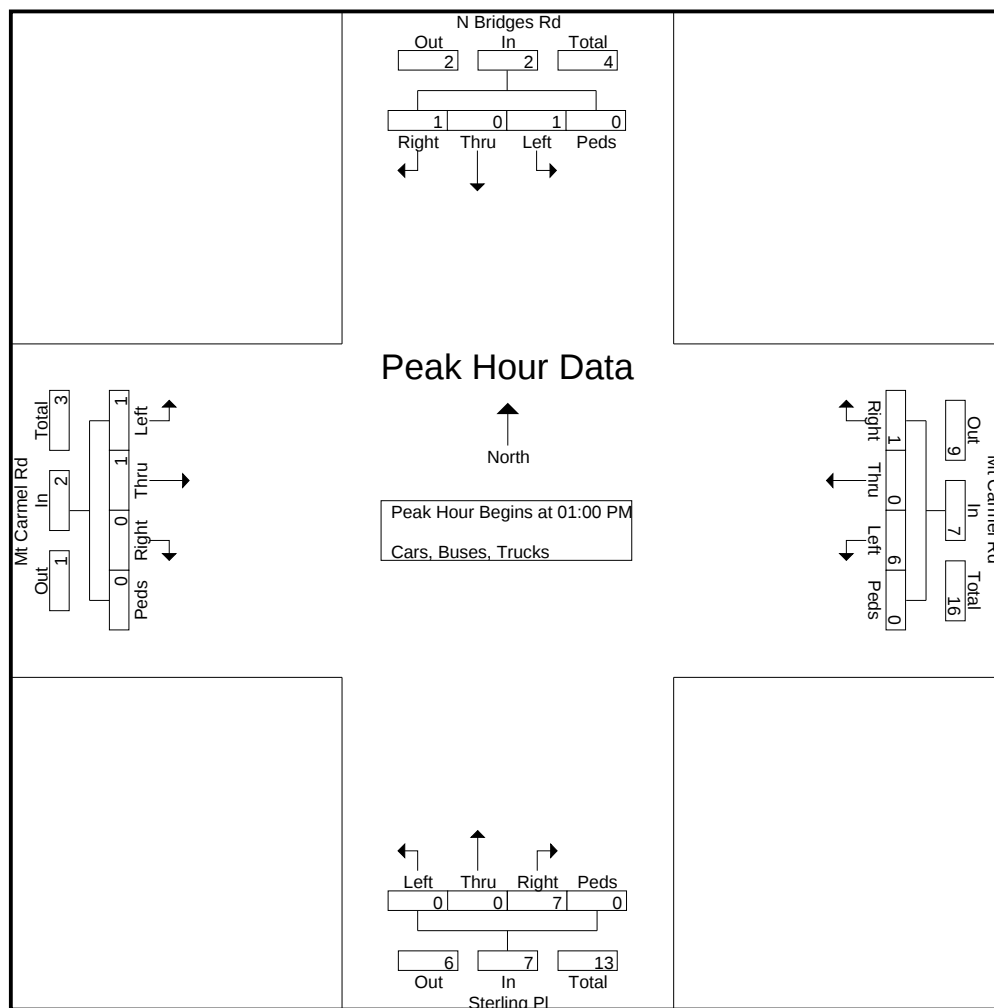
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TMC Data
Mt Carmel Rd @ N Bridges Rd/
Sterling PI
12-2pm Sat

File Name : 37690008-Sat
Site Code : 37690008
Start Date : 11/21/2015
Page No : 2

	Sterling PI Northbound					N Bridges Rd Southbound					Mt Carmel Rd Eastbound					Mt Carmel Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 01:00 PM																					
01:00 PM	0	0	1	0	1	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	3
01:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	2
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
01:45 PM	0	0	6	0	6	1	0	0	0	1	0	0	0	0	0	3	0	1	0	4	11
Total Volume	0	0	7	0	7	1	0	1	0	2	1	1	0	0	2	6	0	1	0	7	18
% App. Total	0	0	100	0		50	0	50	0		50	50	0	0		85.7	0	14.3	0		
PHF	.000	.000	.292	.000	.292	.250	.000	.250	.000	.500	.250	.250	.000	.000	.500	.500	.000	.250	.000	.438	.409



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TMC Data
Mt Carmel Rd @ Mill Rd
7-9am | 4-6pm

File Name : 37690009
Site Code : 37690009
Start Date : 11/19/2015
Page No : 1

Groups Printed- Cars, Buses, Trucks

	Mill Rd Northbound					Mill Rd Southbound					Mt Carmel Rd Eastbound					Mt Carmel Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	7	55	1	0	63	4	86	12	0	102	39	2	11	0	52	6	4	14	0	24	241
07:15 AM	8	57	0	0	65	4	74	8	0	86	64	2	6	0	72	3	6	21	0	30	253
07:30 AM	10	96	0	0	106	6	83	14	0	103	50	3	13	0	66	3	6	18	0	27	302
07:45 AM	12	94	0	0	106	9	85	19	0	113	62	7	16	0	85	4	5	10	0	19	323
Total	37	302	1	0	340	23	328	53	0	404	215	14	46	0	275	16	21	63	0	100	1119
08:00 AM	16	83	3	0	102	4	94	13	0	111	39	3	24	0	66	6	3	3	0	12	291
08:15 AM	8	67	1	0	76	6	70	7	0	83	36	1	10	0	47	1	2	13	0	16	222
08:30 AM	3	59	2	0	64	9	67	17	0	93	34	2	9	0	45	0	1	7	0	8	210
08:45 AM	3	57	0	0	60	3	80	8	0	91	35	3	12	0	50	1	1	8	0	10	211
Total	30	266	6	0	302	22	311	45	0	378	144	9	55	0	208	8	7	31	0	46	934
*** BREAK ***																					
04:00 PM	10	56	2	0	68	4	87	26	0	117	24	2	9	0	35	1	2	5	0	8	228
04:15 PM	13	63	3	0	79	16	92	38	0	146	26	5	10	0	41	2	3	13	0	18	284
04:30 PM	17	59	3	0	79	6	82	32	0	120	26	6	15	0	47	2	0	5	0	7	253
04:45 PM	15	73	4	0	92	12	63	32	0	107	24	2	4	0	30	3	1	9	0	13	242
Total	55	251	12	0	318	38	324	128	0	490	100	15	38	0	153	8	6	32	0	46	1007
05:00 PM	15	78	1	0	94	6	80	28	0	114	47	3	22	0	72	0	1	5	0	6	286
05:15 PM	20	86	0	0	106	5	90	35	0	130	37	4	7	0	48	0	2	4	0	6	290
05:30 PM	27	78	3	0	108	10	84	31	0	125	30	4	17	0	51	2	0	13	0	15	299
05:45 PM	8	69	2	0	79	9	67	37	0	113	36	6	10	0	52	1	4	11	0	16	260
Total	70	311	6	0	387	30	321	131	0	482	150	17	56	0	223	3	7	33	0	43	1135
Grand Total	192	1130	25	0	1347	113	1284	357	0	1754	609	55	195	0	859	35	41	159	0	235	4195
Apprch %	14.3	83.9	1.9	0		6.4	73.2	20.4	0		70.9	6.4	22.7	0		14.9	17.4	67.7	0		
Total %	4.6	26.9	0.6	0	32.1	2.7	30.6	8.5	0	41.8	14.5	1.3	4.6	0	20.5	0.8	1	3.8	0	5.6	

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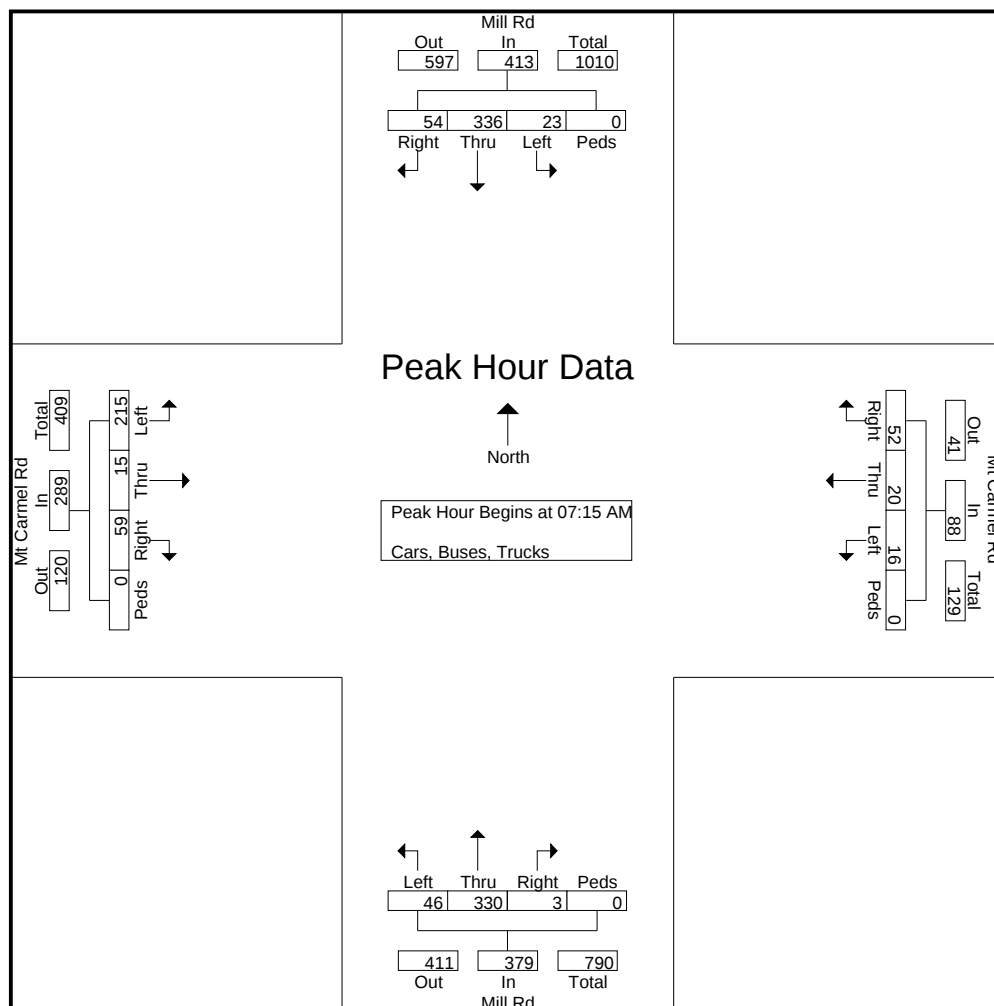
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TMC Data
Mt Carmel Rd @ Mill Rd

7-9am I 4-6pm

File Name : 37690009
Site Code : 37690009
Start Date : 11/19/2015
Page No : 2

	Mill Rd Northbound					Mill Rd Southbound					Mt Carmel Rd Eastbound					Mt Carmel Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	8	57	0	0	65	4	74	8	0	86	64	2	6	0	72	3	6	21	0	30	253
07:30 AM	10	96	0	0	106	6	83	14	0	103	50	3	13	0	66	3	6	18	0	27	302
07:45 AM	12	94	0	0	106	9	85	19	0	113	62	7	16	0	85	4	5	10	0	19	323
08:00 AM	16	83	3	0	102	4	94	13	0	111	39	3	24	0	66	6	3	3	0	12	291
Total Volume	46	330	3	0	379	23	336	54	0	413	215	15	59	0	289	16	20	52	0	88	1169
% App. Total	12.1	87.1	0.8	0		5.6	81.4	13.1	0		74.4	5.2	20.4	0		18.2	22.7	59.1	0		
PHF	.719	.859	.250	.000	.894	.639	.894	.711	.000	.914	.840	.536	.615	.000	.850	.667	.833	.619	.000	.733	.905



Reliable Traffic Data Services, LLC

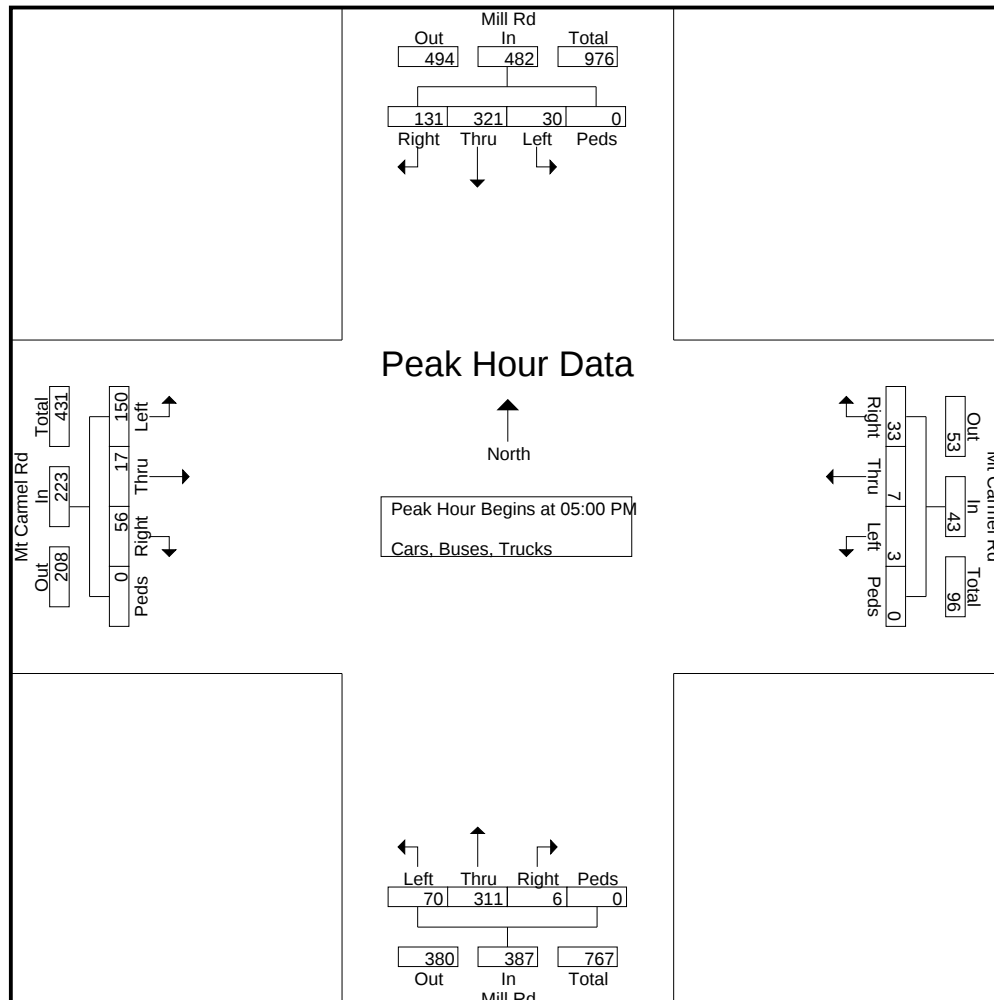
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TMC Data
Mt Carmel Rd @ Mill Rd

7-9am | 4-6pm

File Name : 37690009
Site Code : 37690009
Start Date : 11/19/2015
Page No : 3

	Mill Rd Northbound					Mill Rd Southbound					Mt Carmel Rd Eastbound					Mt Carmel Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	15	78	1	0	94	6	80	28	0	114	47	3	22	0	72	0	1	5	0	6	286
05:15 PM	20	86	0	0	106	5	90	35	0	130	37	4	7	0	48	0	2	4	0	6	290
05:30 PM	27	78	3	0	108	10	84	31	0	125	30	4	17	0	51	2	0	13	0	15	299
05:45 PM	8	69	2	0	79	9	67	37	0	113	36	6	10	0	52	1	4	11	0	16	260
Total Volume	70	311	6	0	387	30	321	131	0	482	150	17	56	0	223	3	7	33	0	43	1135
% App. Total	18.1	80.4	1.6	0		6.2	66.6	27.2	0		67.3	7.6	25.1	0		7	16.3	76.7	0		
PHF	.648	.904	.500	.000	.896	.750	.892	.885	.000	.927	.798	.708	.636	.000	.774	.375	.438	.635	.000	.672	.949



Reliable Traffic Data Services, LLC

Tel: (770) 578-8158 | Fax: (770) 578-8159
info@reliabletraffic.org | www.reliabletraffic.org

TMC Data
Mt Carmel Rd @ Mill Rd

12-2pm Sat

File Name : 37690009-Sat
Site Code : 37690009
Start Date : 11/21/2015
Page No : 1

Groups Printed- Cars, Buses, Trucks

	Mill Rd Northbound					Mill Rd Southbound					Mt Carmel Rd Eastbound					Mt Carmel Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
12:00 PM	6	92	2	0	100	2	63	30	0	95	32	2	8	0	42	2	2	10	0	14	251
12:15 PM	6	106	1	0	113	8	66	21	0	95	29	4	7	0	40	2	1	9	0	12	260
12:30 PM	4	94	0	0	98	5	78	26	0	109	27	1	7	0	35	0	1	6	0	7	249
12:45 PM	3	84	0	0	87	8	80	23	0	111	23	1	12	0	36	2	2	8	0	12	246
Total	19	376	3	0	398	23	287	100	0	410	111	8	34	0	153	6	6	33	0	45	1006
01:00 PM	5	89	3	0	97	3	51	21	0	75	26	1	11	0	38	1	1	9	0	11	221
01:15 PM	5	103	5	0	113	6	63	25	0	94	30	3	4	0	37	2	1	7	0	10	254
01:30 PM	7	88	0	0	95	14	78	20	0	112	32	3	4	0	39	2	1	11	0	14	260
01:45 PM	8	91	4	0	103	7	61	26	0	94	23	1	7	0	31	3	0	7	0	10	238
Total	25	371	12	0	408	30	253	92	0	375	111	8	26	0	145	8	3	34	0	45	973
Grand Total	44	747	15	0	806	53	540	192	0	785	222	16	60	0	298	14	9	67	0	90	1979
Apprch %	5.5	92.7	1.9	0		6.8	68.8	24.5	0		74.5	5.4	20.1	0		15.6	10	74.4	0		
Total %	2.2	37.7	0.8	0	40.7	2.7	27.3	9.7	0	39.7	11.2	0.8	3	0	15.1	0.7	0.5	3.4	0	4.5	

Reliable Traffic Data Services, LLC

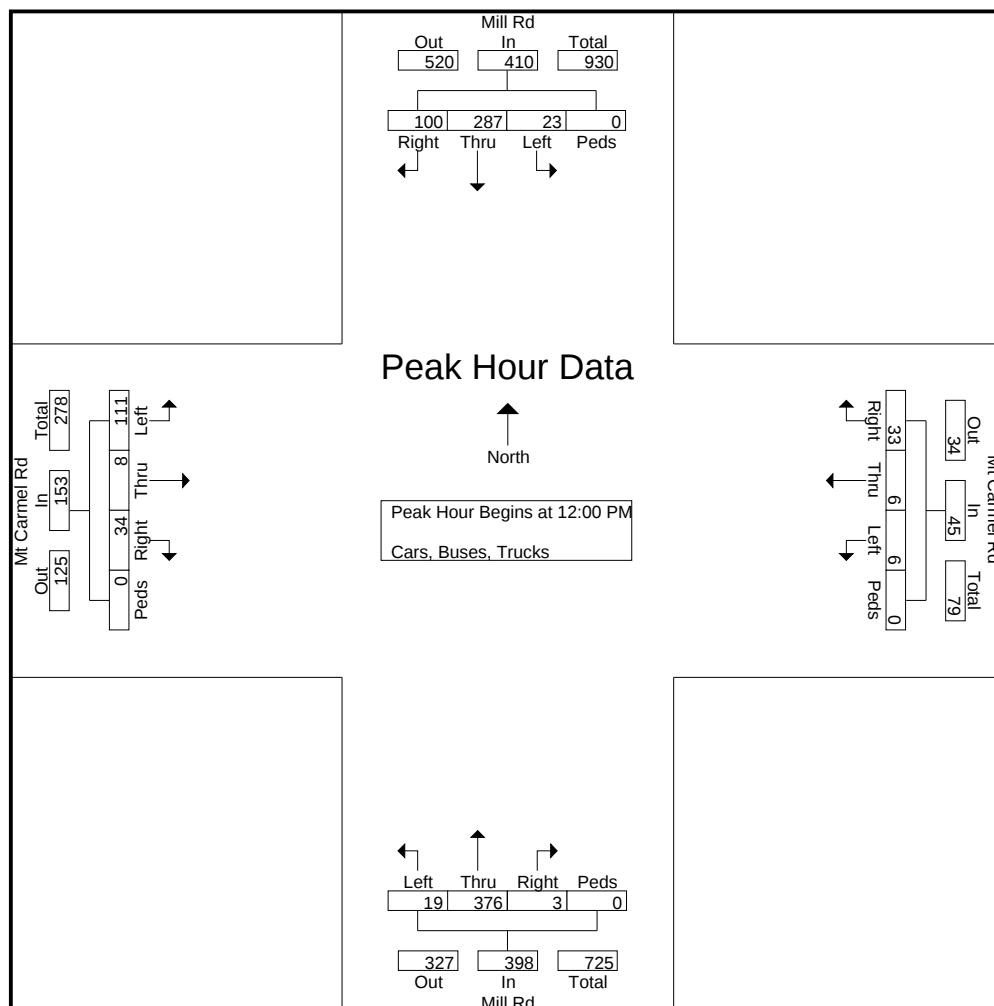
Tel: (770) 578-8158 | Fax: (770) 578-8159
info@reliabletraffic.org | www.reliabletraffic.org

TMC Data
Mt Carmel Rd @ Mill Rd

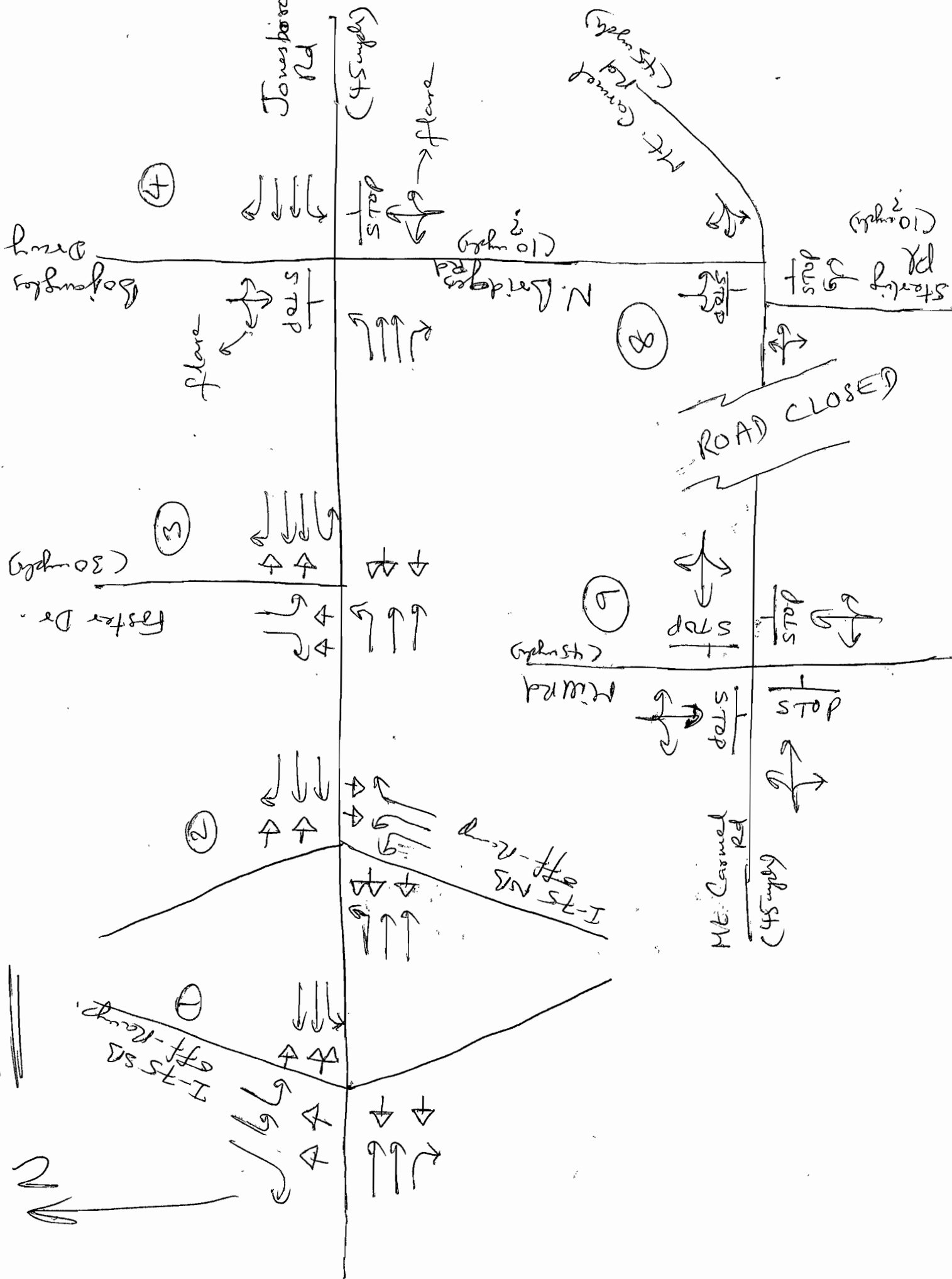
12-2pm Sat

File Name : 37690009-Sat
Site Code : 37690009
Start Date : 11/21/2015
Page No : 2

	Mill Rd Northbound					Mill Rd Southbound					Mt Carmel Rd Eastbound					Mt Carmel Rd Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	6	92	2	0	100	2	63	30	0	95	32	2	8	0	42	2	2	10	0	14	251
12:15 PM	6	106	1	0	113	8	66	21	0	95	29	4	7	0	40	2	1	9	0	12	260
12:30 PM	4	94	0	0	98	5	78	26	0	109	27	1	7	0	35	0	1	6	0	7	249
12:45 PM	3	84	0	0	87	8	80	23	0	111	23	1	12	0	36	2	2	8	0	12	246
Total Volume	19	376	3	0	398	23	287	100	0	410	111	8	34	0	153	6	6	33	0	45	1006
% App. Total	4.8	94.5	0.8	0		5.6	70	24.4	0		72.5	5.2	22.2	0		13.3	13.3	73.3	0		
PHF	.792	.887	.375	.000	.881	.719	.897	.833	.000	.923	.867	.500	.708	.000	.911	.750	.750	.825	.000	.804	.967



3769



N

3769

(5)

Daneshboro Rd

(45 sample)

|||||

↖ ↗
↖ ↗

|||

Ht. Carmel Rd
(45 sample)

Oak Grove Rd

(45 sample)

(6)

↖ ↗
↖ ↗
↖ ↗

↖ ↗

|||||

(7)

↖ ↗
↖ ↗

|||||

Kelly Rd
(35 sample)

GRTA Letter of Understanding



LETTER OF UNDERSTANDING

November 24, 2015

Steve Edwards
Stafford Properties
295 West Crossville Road
Suite 400
Roswell, Georgia 30075

RE: **DRI 2527 Henry Promenade**

Dear Mr. Edwards:

The purpose of this letter is to document the discussions during the Pre-Review and Methodology Meeting held at ARC's office on November 16, 2015 regarding **DRI 2527 Henry Promenade**. 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 Henry County. The proposed development is located on the southern side of Jonesboro Road/SR 920 and east of I-75 with proposed access onto Jonesboro Road and Mount Carmel Road.
- The DRI trigger for this development is a rezoning.
- The proposed development is consisting of approximately 763,500 square feet of commercial retail/shopping center and two hotels totaling 220 rooms.
- The estimated vehicular trip generation is 27,050 gross daily trips based on the ITE *Trip Generation Manual, 9th Edition, 2012*.
- The projected build out for this DRI is 2020 in one phase.
- The applicant is applying for approval under GRTA's non-expedited review process.

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 2020.
- 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 1.0% background traffic growth rate shall be used for all roadways.
- The level of service standard for all analyses shall be LOS D.

- Mixed use and pass-by trip reductions are allowed with no alternative mode reductions.
- 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.

STUDY NETWORK

1. Jonesboro Road (SR920) at I-75 Southbound Ramps
2. Jonesboro Road (SR920) at I-75 Northbound Ramps
3. Jonesboro Road (SR920) at Foster Road/I-75 Managed Lane Access Ramp
4. Jonesboro Road (SR920) at Mount Carmel Road
5. Jonesboro Road (SR920) at Oak Grove Road/Willow Lane
6. Jonesboro Road (SR920) at Kelly Road
7. Mount Carmel Road at Mill Road
8. All site driveways

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:

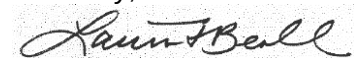
- Provide one (1) paper copy of all materials:
 - Transportation analysis
 - Site Plan
- Provide one (1) CD-ROM with electronic versions of all submittal documents:
 - Provide a PDF of each document
 - Provide the native format for each document
 - .dwg is the preferred CAD format (AutoCAD)
 - .doc is the preferred word processing format (Word)
 - .xls is the preferred spreadsheet format (Excel)
 - .sy6 or .sy7 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.

ATLANTA REGIONAL COMMISSION	GDOT DISTRICT 3	HENRY COUNTY PLANNING AND ZONING	HENRY COUNTY TRANSPORTATION
Jon Tuley 40 Courtland Street, NE Atlanta, GA 30303	Dan Woods 115 Transportation Blvd. Thomaston, GA 30286	Stacey Jordan 140 Henry Parkway McDonough, GA 30253	David Simmons 533 Hampton Road McDonough, GA 30253

We encourage your consultant team to verify the items covered in this letter prior to compiling the submittal materials. If you have any questions, please feel free to contact me directly at 404-463-3068 (lbeall@grta.org).

Sincerely,



Laura F. Beall, AICP
Program Manager

cc:

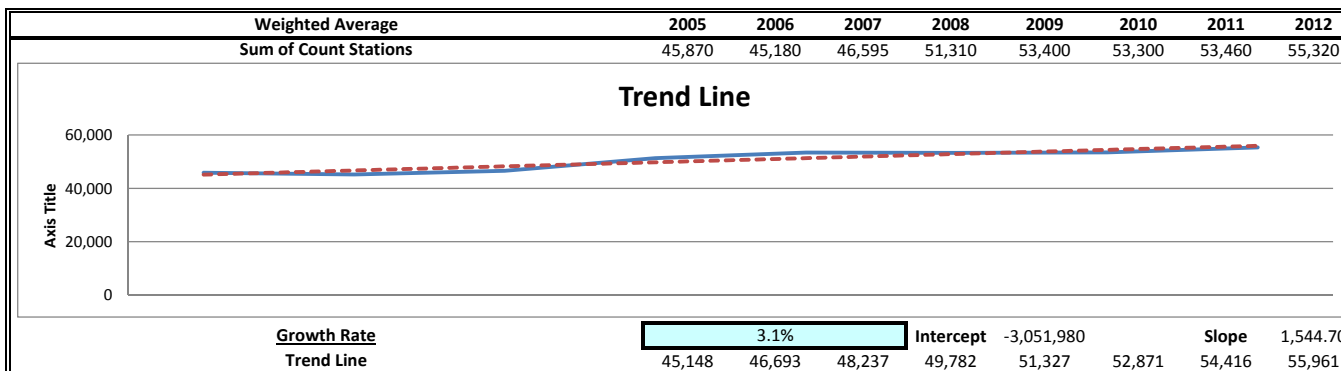
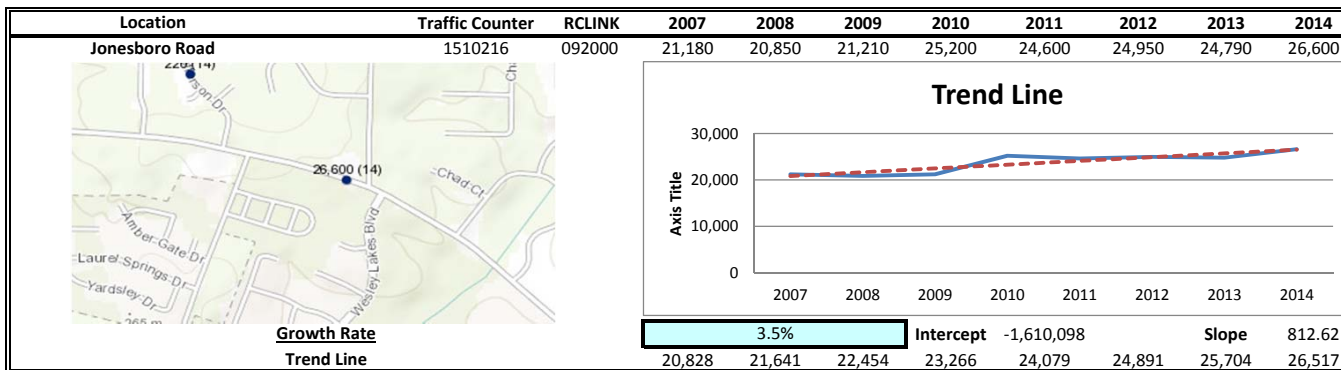
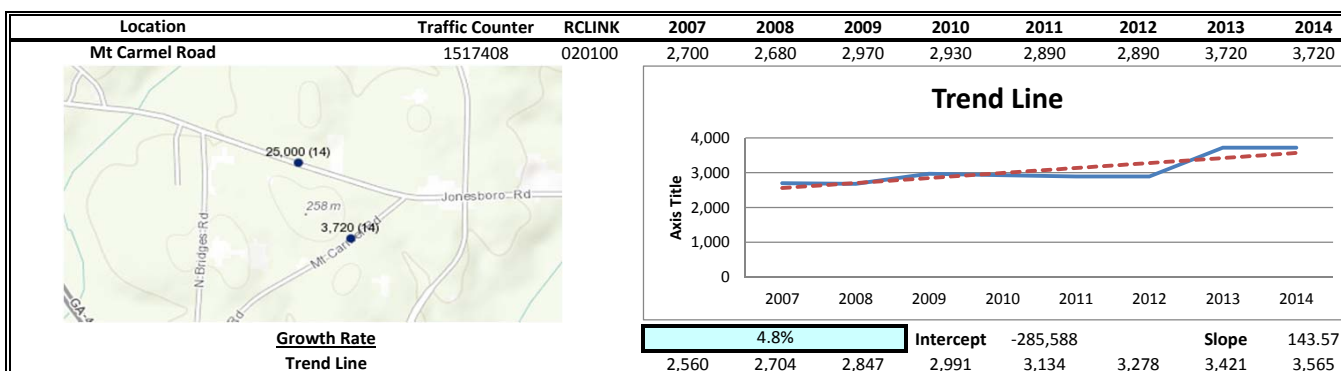
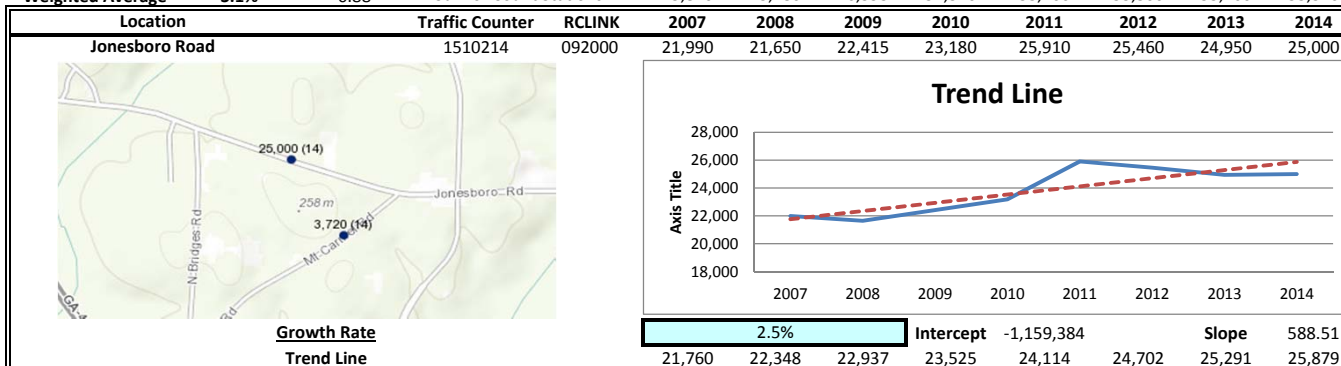
Jon West, DCA
Jon Tuley, ARC
Dan Woods, GDOT District 3
Stacey Jordan, Henry County Planning and Zoning
David Simmons, Henry County Transportation
Rodney Heard, City of McDonough

Richard Bell, ReVest
Geoff Warr, A & R Engineering, Inc.
Joseph McCown, Haines Gipson Associates
Chris Nardone, CNNA Architects

Linear Regression of Daily Traffic

Location	Growth Rate	R Squared	Station ID	Route	2007	2008	2009	2010	2011	2012	2013	2014
Jonesboro Road	2.5%	0.72	1510214	092000	21,990	21,650	22,415	23,180	25,910	25,460	24,950	25,000
Mt Carmel Road	4.8%	0.70	1517408	020100	2,700	2,680	2,970	2,930	2,890	2,890	3,720	3,720
Jonesboro Road	3.5%	0.79	1510216	092000	21,180	20,850	21,210	25,200	24,600	24,950	24,790	26,600

Weighted Average 3.1% 0.88 Sum of Count Stations = 45,870 45,180 46,595 51,310 53,400 53,300 53,460 55,320



**Fact Sheets for Planned and Programmed
Improvements**

Short Title

SR 920 (MCDONOUGH ROAD / JONESBORO ROAD)
WIDENING FROM US 19/41 (TARA BOULEVARD) IN
CLAYTON COUNTY TO I-75 SOUTH IN HENRY COUNTY

GDOT Project No.

342970-

Federal ID No.

STP-1583(12)

Status

Programmed

Service Type

Roadway / General Purpose Capacity

Sponsor

GDOT

Jurisdiction

Regional - Southeast

Analysis Level

In the Region's Air Quality Conformity Analysis

Existing Thru Lane

2

Planned Thru Lane

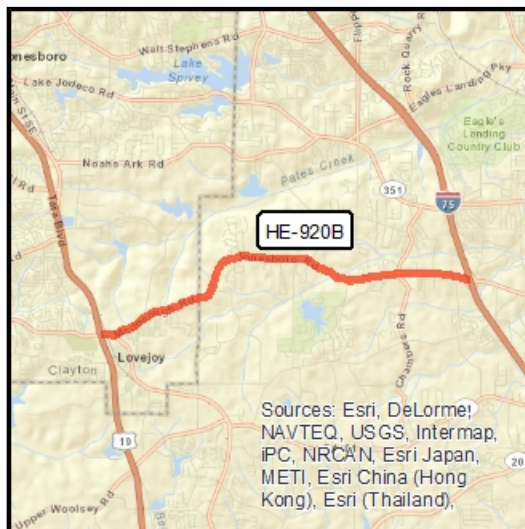
4

Network Year

2030

Corridor Length

7.4 miles



Detailed Description and Justification

The project consists of widening and reconstructing Jonesboro Road from US 19/41 to I-75. The project will widen the existing two-lane roadway to a four-lane facility with a 20' raised median with 12' outside shoulders. The Metro Arterial Connector (MAC) is a network of state highways approximately 180 miles in length encircling the Atlanta region. Roadways comprising the MAC (primarily SR 20 and SR 92) are proposed to have a minimum of four travel lanes along its entire length. At least 30 capacity projects are already planned along the MAC over the timeframe of the RTP. A study will be conducted in 2009 to determine how these individual projects can be engineered and constructed in a holistic and logical manner to maximize the mobility, safety, accessibility and growth management benefits which would best serve multimodal needs (auto, truck, transit, bicycling, walking) and include land use policies, access management regulations, and ITS components to ensure network uniformity.

Phase Status & Funding Information		Status	FISCAL YEAR	TOTAL PHASE COST	BREAKDOWN OF TOTAL PHASE COST BY FUNDING SOURCE			
					FEDERAL	STATE	BONDS	LOCAL/PRIVATE
PE	STP - Statewide Flexible (GDOT)	AUTH	2006	\$1,650,000	\$1,320,000	\$330,000	\$0,000	\$0,000
PE	STP - Statewide Flexible (GDOT)	AUTH	2014	\$500,000	\$400,000	\$100,000	\$0,000	\$0,000
ROW	STP - Statewide Flexible (GDOT)		2018	\$18,651,791	\$14,921,433	\$3,730,358	\$0,000	\$0,000
UTL	General Federal Aid 2020-2040		LR 2020-2030	\$4,364,981	\$3,491,985	\$872,996	\$0,000	\$0,000
CST	General Federal Aid 2020-2040		LR 2020-2030	\$36,856,373	\$29,485,098	\$7,371,275	\$0,000	\$0,000
				\$62,023,145	\$49,618,516	\$12,404,629	\$0,000	\$0,000

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



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



Page 1/1

Milestone	% Complete
Management Concept Approval	100
VE Study Summary	100
Environmental Summary	84
Field Survey Summary	100
Preliminary Plans Summary	83
PFPR Inspection	0
RW Authorization	0
Final Design Summary	0
FFPR Inspection	0

Right of Way Acquisition Information:

Acquired by: DOT

PROJ ID		COUNTY	DESCRIPTION													
0009156		Henry	I-75 FM S OF SR 155 TO EAGLES LANDING PKWY - MANAGED LANES													
Mgmt Let Date:		6/21/2013	PHASE I twinned with 0009157 I-75 fm SR 155 to Eagles Landing - managed lanes ph 1 This project widens I-75 by an additional managed lane in each direction in the median from SR 155 to Eagles Landing Pkwy. The managed concept is HOT 3 or ETL PROPOSED DESIGN BUILD PROJECT Proposed funding is GO bonds.													
PROJ NO:		CSNHS-0009-00(156)	SPONSOR:		GDOT		Phase		FY Approved		Approved FY Estimate *		Fund		Phase Status	
MPO TIP#:		AR-ML-640	PROJ MGR:		Hoenig, Andrew		Engineering		2011		\$0.00		L230S		AUTHORIZED	
MPO:		Atlanta TMA	DOT DIST:		3		Engineering		2011		\$2,000,000.00		LHIP		AUTHORIZED	
PROJ LENGTH (MI):		9.48	CONG DIST:		13, 3		Engineering		2013		\$1,016,934.33		L230S		AUTHORIZED	
TYPE WORK:		Managed Lanes	TYPE WORK:		Managed Lanes		Engineering		2013		\$0.00		M001		AUTHORIZED	
LET RESPONSIBILITY:		GDOT Let	HOUSE DIST:		111,110,109		Right of Way		2014		\$840,000.00		M001		AUTHORIZED	
BIKE PROVISIONS INCLUDED?		N	SENATE DIST:		017,010		Construction		2013		\$83,330,022.84		M001		AUTHORIZED	
							Construction		2013		\$35,382,144.83		M230S		AUTHORIZED	
															AUTHORIZED	
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PROJ ID	COUNTY	DESCRIPTION
0007858	Henry	I-75 FROM I-675 TO SR 920/JONESBORO ROAD
Mgmt Let Date:		
PROJ NO:	CSNHS-0007-00(858)	SPONSOR: GDOT
MPO TIP#:	HE-AR-220	PROJ MGR: Hill, Stanley
MPO:	Atlanta TMA	DOT DIST: 3
PROJ LENGTH (MI):	6.88	CONG DIST: 13, 3
TYPE WORK:	Widening	TYPE WORK: Widening
LET RESPONSIBILITY:	ON HOLD	HOUSE DIST: 078,111,109
BIKE PROVISIONS INCLUDED?	N	SENATE DIST: 010,017
		Phase Construction
		FY Approved LR2
		Approved FY Estimate * \$60,949,721.01
		Fund L050
		Phase Status PRECST
		* Inflation Included in Estimate

Right of Way Acquisition Information:

Preliminary Parcel Count:

Total Parcel Count:

Acquired by:

N/R

Right of Way Acquisition Information:	
Preliminary Parcel Count:	Total Parcel Count:
	Acquired by:
	N/R

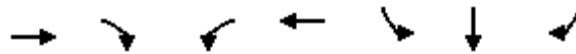
Existing Intersection Analysis

Queues

Existing AM

1: I-75 SB Ramps & Jonesboro Rd

1/13/2016



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations	↑↑	↑	↵	↑↑	↵	↑	↑
Traffic Volume (vph)	1196	190	45	953	382	2	377
Future Volume (vph)	1196	190	45	953	382	2	377
Lane Group Flow (vph)	1272	221	56	1095	245	249	438
Turn Type	NA	Perm	pm+pt	NA	Perm	NA	Perm
Protected Phases	2		1	6		4	
Permitted Phases		2	6		4		4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0	6.0	6.0
Minimum Split (s)	24.0	24.0	11.0	24.0	24.0	24.0	24.0
Total Split (s)	72.0	72.0	12.0	84.0	56.0	56.0	56.0
Total Split (%)	51.4%	51.4%	8.6%	60.0%	40.0%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?							
Recall Mode	C-Min	C-Min	None	C-Min	None	None	None
v/c Ratio	0.64	0.22	0.27	0.49	0.52	0.53	0.87
Control Delay	24.9	3.0	13.6	12.0	44.9	45.2	56.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.9	3.0	13.6	12.0	44.9	45.2	56.3
Queue Length 50th (ft)	425	0	14	147	195	200	316
Queue Length 95th (ft)	584	38	24	176	217	132	386
Internal Link Dist (ft)	520			890		860	
Turn Bay Length (ft)		415	635		430		700
Base Capacity (vph)	1996	989	209	2238	600	602	616
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	0.64	0.22	0.27	0.49	0.41	0.41	0.71

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 14 (10%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Splits and Phases: 1: I-75 SB Ramps & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

Existing AM

1: I-75 SB Ramps & Jonesboro Rd

1/13/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑					↑	↑	↑
Traffic Volume (vph)	0	1196	190	45	953	0	0	0	0	382	2	377
Future Volume (vph)	0	1196	190	45	953	0	0	0	0	382	2	377
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.95	1.00	1.00	0.95					0.95	0.95	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		3539	1583	1770	3539					1681	1687	1583
Flt Permitted		1.00	1.00	0.12	1.00					0.95	0.95	1.00
Satd. Flow (perm)		3539	1583	228	3539					1681	1687	1583
Peak-hour factor, PHF	0.92	0.94	0.86	0.80	0.87	0.92	0.92	0.92	0.92	0.78	0.50	0.86
Adj. Flow (vph)	0	1272	221	56	1095	0	0	0	0	490	4	438
RTOR Reduction (vph)	0	0	98	0	0	0	0	0	0	0	0	57
Lane Group Flow (vph)	0	1272	123	56	1095	0	0	0	0	245	249	381
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)		77.8	77.8	88.6	88.6					39.4	39.4	39.4
Effective Green, g (s)		77.8	77.8	88.6	88.6					39.4	39.4	39.4
Actuated g/C Ratio		0.56	0.56	0.63	0.63					0.28	0.28	0.28
Clearance Time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	3.0	5.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1966	879	197	2239					473	474	445
v/s Ratio Prot		c0.36		0.01	c0.31							
v/s Ratio Perm			0.08	0.17						0.15	0.15	c0.24
v/c Ratio		0.65	0.14	0.28	0.49					0.52	0.53	0.86
Uniform Delay, d1		21.6	15.0	15.4	13.7					42.3	42.4	47.6
Progression Factor		1.00	1.00	0.89	0.75					1.00	1.00	1.00
Incremental Delay, d2		1.7	0.3	0.7	0.7					1.0	1.1	14.8
Delay (s)		23.2	15.3	14.5	10.9					43.3	43.5	62.4
Level of Service		C	B	B	B					D	D	E
Approach Delay (s)		22.1			11.1			0.0			52.3	
Approach LOS		C			B			A			D	

Intersection Summary

HCM 2000 Control Delay	26.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	107.1%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Queues

Existing AM

2: I-75 NB Ramps & Jonesboro Rd

1/13/2016



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations							
Traffic Volume (vph)	442	1076	861	1011	148	1	140
Future Volume (vph)	442	1076	861	1011	148	1	140
Lane Group Flow (vph)	465	1182	957	1111	95	96	197
Turn Type	pm+pt	NA	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	6			8	
Permitted Phases	2			6	8		8
Detector Phase	5	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	15.0	15.0	15.0	6.0	6.0	6.0
Minimum Split (s)	11.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	28.0	116.0	88.0	88.0	24.0	24.0	24.0
Total Split (%)	20.0%	82.9%	62.9%	62.9%	17.1%	17.1%	17.1%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?							
Recall Mode	None	C-Min	C-Min	C-Min	None	None	None
v/c Ratio	0.87	0.41	0.42	0.91	0.60	0.61	0.69
Control Delay	37.1	3.3	7.5	21.6	76.0	76.2	29.3
Queue Delay	0.0	0.0	0.0	1.4	0.0	0.0	0.0
Total Delay	37.1	3.3	7.5	23.0	76.0	76.2	29.3
Queue Length 50th (ft)	230	61	93	174	88	89	40
Queue Length 95th (ft)	#424	194	132	#663	128	38	61
Internal Link Dist (ft)		890	855			694	
Turn Bay Length (ft)	675			390	285		350
Base Capacity (vph)	574	2902	2297	1223	216	217	335
Starvation Cap Reductn	0	0	0	33	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	0.81	0.41	0.42	0.93	0.44	0.44	0.59

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 133 (95%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 2: I-75 NB Ramps & Jonesboro Rd



Baseline

Synchro 9 Report
Page 3

HCM Signalized Intersection Capacity Analysis

2: I-75 NB Ramps & Jonesboro Rd

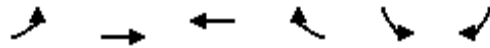
Existing AM
1/13/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	442	1076	0	0	861	1011	148	1	140	0	0	0
Future Volume (vph)	442	1076	0	0	861	1011	148	1	140	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	1770	3539			3539	1583	1681	1689	1583			
Flt Permitted	0.24	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	447	3539			3539	1583	1681	1689	1583			
Peak-hour factor, PHF	0.95	0.91	0.92	0.92	0.90	0.91	0.79	0.25	0.71	0.92	0.92	0.92
Adj. Flow (vph)	465	1182	0	0	957	1111	187	4	197	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	196	0	0	137	0	0	0
Lane Group Flow (vph)	465	1182	0	0	957	915	95	96	60	0	0	0
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Actuated Green, G (s)	114.8	114.8			90.9	90.9	13.2	13.2	13.2			
Effective Green, g (s)	114.8	114.8			90.9	90.9	13.2	13.2	13.2			
Actuated g/C Ratio	0.82	0.82			0.65	0.65	0.09	0.09	0.09			
Clearance Time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Vehicle Extension (s)	3.0	5.0			5.0	5.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	535	2901			2297	1027	158	159	149			
v/s Ratio Prot	c0.11	0.33			0.27							
v/s Ratio Perm	c0.60					0.58	0.06	0.06	0.04			
v/c Ratio	0.87	0.41			0.42	0.89	0.60	0.60	0.40			
Uniform Delay, d1	11.6	3.4			11.8	20.4	60.9	60.9	59.7			
Progression Factor	2.57	0.80			0.54	1.01	1.00	1.00	1.00			
Incremental Delay, d2	11.9	0.4			0.5	9.9	6.3	6.3	1.8			
Delay (s)	41.7	3.1			6.9	30.4	67.2	67.2	61.5			
Level of Service	D	A			A	C	E	E	E			
Approach Delay (s)		14.0			19.5			64.3			0.0	
Approach LOS		B			B			E			A	
Intersection Summary												
HCM 2000 Control Delay		21.5			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.86										
Actuated Cycle Length (s)		140.0			Sum of lost time (s)			18.0				
Intersection Capacity Utilization		107.1%			ICU Level of Service			G				
Analysis Period (min)		15										
c Critical Lane Group												

Queues

3: Jonesboro Rd & Foster Dr

Existing AM
1/13/2016



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	323	889	1367	145	126	213
Future Volume (vph)	323	889	1367	145	126	213
Lane Group Flow (vph)	380	988	1439	250	180	277
Turn Type	pm+pt	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases	2			6	4	4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	5.0	15.0	15.0	15.0	6.0	6.0
Minimum Split (s)	11.0	24.0	34.0	34.0	45.0	45.0
Total Split (s)	31.0	95.0	64.0	64.0	45.0	45.0
Total Split (%)	22.1%	67.9%	45.7%	45.7%	32.1%	32.1%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.93	0.36	0.74	0.27	0.72	0.60
Control Delay	58.6	5.3	13.9	5.9	73.0	11.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.6	5.3	13.9	5.9	73.0	11.2
Queue Length 50th (ft)	194	71	192	21	159	0
Queue Length 95th (ft)	#401	168	262	25	171	33
Internal Link Dist (ft)		855	1103		376	
Turn Bay Length (ft)	275			125		215
Base Capacity (vph)	408	2735	1951	911	493	640
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.36	0.74	0.27	0.37	0.43

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 12 (9%), Referenced to phase 2:EBTL and 6:WBTU, Start of Green
 Natural Cycle: 130
 Control Type: Actuated-Coordinated
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Jonesboro Rd & Foster Dr



HCM Signalized Intersection Capacity Analysis

3: Jonesboro Rd & Foster Dr

Existing AM
1/13/2016



Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	323	889	0	1367	145	126	213
Future Volume (vph)	323	889	0	1367	145	126	213
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95		0.95	1.00	1.00	1.00
Frt	1.00	1.00		1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539		3539	1583	1770	1583
Flt Permitted	0.08	1.00		1.00	1.00	0.95	1.00
Satd. Flow (perm)	155	3539		3539	1583	1770	1583
Peak-hour factor, PHF	0.85	0.90	0.92	0.95	0.58	0.70	0.77
Adj. Flow (vph)	380	988	0	1439	250	180	277
RTOR Reduction (vph)	0	0	0	0	39	0	238
Lane Group Flow (vph)	380	988	0	1439	211	180	39
Turn Type	pm+pt	NA	Perm	NA	Perm	Perm	Perm
Protected Phases	5	2		6			
Permitted Phases	2		6		6	4	4
Actuated Green, G (s)	108.2	108.2		77.2	77.2	19.8	19.8
Effective Green, g (s)	108.2	108.2		77.2	77.2	19.8	19.8
Actuated g/C Ratio	0.77	0.77		0.55	0.55	0.14	0.14
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	5.0		5.0	5.0	3.0	3.0
Lane Grp Cap (vph)	408	2735		1951	872	250	223
v/s Ratio Prot	c0.17	0.28		0.41			
v/s Ratio Perm	c0.55				0.13	c0.10	0.02
v/c Ratio	0.93	0.36		0.74	0.24	0.72	0.18
Uniform Delay, d1	41.4	5.0		23.7	16.3	57.5	52.9
Progression Factor	0.81	0.90		0.49	0.47	1.00	1.00
Incremental Delay, d2	26.3	0.3		1.6	0.4	9.5	0.4
Delay (s)	59.9	4.8		13.3	8.1	67.0	53.3
Level of Service	E	A		B	A	E	D
Approach Delay (s)		20.1		12.5		58.7	
Approach LOS		C		B		E	

Intersection Summary

HCM 2000 Control Delay	21.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	77.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

4: N Bridges Rd/Bojangles Drwy & Jonesboro Rd

Existing AM

1/13/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	945	3	1	1491	28	0	0	0	11	0	45
Future Volume (Veh/h)	45	945	3	1	1491	28	0	0	0	11	0	45
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.75	0.89	0.75	0.25	0.95	0.78	0.92	0.92	0.92	0.69	0.92	0.86
Hourly flow rate (vph)	60	1062	4	4	1569	36	0	0	0	16	0	52
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage veh												
Upstream signal (ft)	1183											
pX, platoon unblocked				0.93			0.93			0.93		
vC, conflicting volume	1605			1062			1974			2795		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1605			905			1892			2778		
tC, single (s)	4.1			4.1			7.5			6.5		
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5			4.0		
p0 queue free %	85			99			100			100		
cM capacity (veh/h)	403			691			29			15		
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1		
Volume Total	60	531	531	4	4	784	784	36	0	68		
Volume Left	60	0	0	0	4	0	0	0	0	16		
Volume Right	0	0	0	4	0	0	0	36	0	52		
cSH	403	1700	1700	1700	691	1700	1700	1700	1700	76		
Volume to Capacity	0.15	0.31	0.31	0.00	0.01	0.46	0.46	0.02	0.00	0.90		
Queue Length 95th (ft)	13	0	0	0	0	0	0	0	0	115		
Control Delay (s)	15.5	0.0	0.0	0.0	10.2	0.0	0.0	0.0	0.0	170.0		
Lane LOS	C				B				A	F		
Approach Delay (s)	0.8				0.0				0.0	170.0		
Approach LOS									A	F		
Intersection Summary												
Average Delay	4.5											
Intersection Capacity Utilization	51.3%			ICU Level of Service			A					
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

5: Mt Carmel Rd & Jonesboro Rd

Existing AM
1/13/2016



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR				
Lane Configurations											
Traffic Volume (veh/h)	0	940	36	20	1532	1	16				
Future Volume (Veh/h)	0	940	36	20	1532	1	16				
Sign Control	Free				Free	Stop					
Grade	0%				0%	0%					
Peak Hour Factor	0.92	0.89	0.75	0.71	0.92	0.25	0.67				
Hourly flow rate (vph)	0	1056	48	28	1665	4	24				
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)											
Median type	None				None						
Median storage (veh)											
Upstream signal (ft)	877										
pX, platoon unblocked	0.00					0.65					
vC, conflicting volume	0				1056	1944	528				
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	0				1056	1376	528				
tC, single (s)	0.0				4.1	6.8	6.9				
tC, 2 stage (s)											
tF (s)	0.0				2.2	3.5	3.3				
p0 queue free %	0				96	95	95				
cM capacity (veh/h)	0				655	85	495				
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	NB 2		
Volume Total	528	528	48	0	28	832	832	4	24		
Volume Left	0	0	0	0	28	0	0	4	0		
Volume Right	0	0	48	0	0	0	0	0	24		
cSH	1700	1700	1700	1700	655	1700	1700	85	495		
Volume to Capacity	0.31	0.31	0.03	0.00	0.04	0.49	0.49	0.05	0.05		
Queue Length 95th (ft)	0	0	0	0	3	0	0	4	4		
Control Delay (s)	0.0	0.0	0.0	0.0	10.7	0.0	0.0	49.6	12.6		
Lane LOS						B				E	B
Approach Delay (s)	0.0					0.2				17.9	
Approach LOS									C		
Intersection Summary											
Average Delay			0.3								
Intersection Capacity Utilization			52.3%		ICU Level of Service			A			
Analysis Period (min)			15								

Queues

Existing AM

6: Willow Lane/Oak Grove Rd & Jonesboro Rd

1/13/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	48	666	217	21	1227	45	243	155	31	90	219
Future Volume (vph)	48	666	217	21	1227	45	243	155	31	90	219
Lane Group Flow (vph)	80	748	261	32	1394	73	279	225	44	115	324
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases	5	2		1	6			8			4
Permitted Phases	2		2	6		6	8		8	4	
Detector Phase	5	2	2	1	6	6	8	8	8	4	4
Switch Phase											
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	11.0	26.0	26.0	11.0	36.0	36.0	46.0	46.0	46.0	44.0	44.0
Total Split (s)	11.0	67.0	67.0	11.0	67.0	67.0	62.0	62.0	62.0	62.0	62.0
Total Split (%)	7.9%	47.9%	47.9%	7.9%	47.9%	47.9%	44.3%	44.3%	44.3%	44.3%	44.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
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	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag					
Lead-Lag Optimize?											
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None
v/c Ratio	0.68	0.42	0.29	0.10	0.84	0.09	0.99	0.33	0.07	0.32	0.49
Control Delay	52.5	26.9	11.9	12.5	34.3	2.7	94.7	32.6	2.2	33.1	34.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.5	26.9	11.9	12.5	34.3	2.7	94.7	32.6	2.2	33.1	34.8
Queue Length 50th (ft)	34	194	48	10	623	11	238	139	0	71	207
Queue Length 95th (ft)	55	303	124	12	705	7	#396	151	0	102	280
Internal Link Dist (ft)		797			4515			905			451
Turn Bay Length (ft)	300		150	300		250	300		400	135	
Base Capacity (vph)	117	1776	899	326	1665	782	309	745	675	400	727
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	0.68	0.42	0.29	0.10	0.84	0.09	0.90	0.30	0.07	0.29	0.45

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 93 (66%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

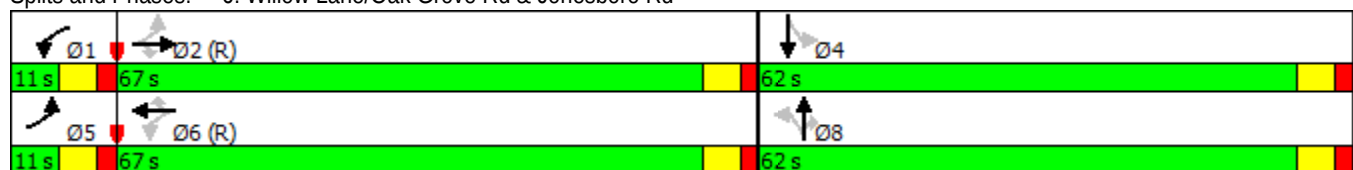
Natural Cycle: 95

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 6: Willow Lane/Oak Grove Rd & Jonesboro Rd



Baseline

HCM Signalized Intersection Capacity Analysis

6: Willow Lane/Oak Grove Rd & Jonesboro Rd

Existing AM
1/13/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	666	217	21	1227	45	243	155	31	90	219	54
Future Volume (vph)	48	666	217	21	1227	45	243	155	31	90	219	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1801	1801
Flt Permitted	0.06	1.00	1.00	0.30	1.00	1.00	0.42	1.00	1.00	0.54	1.00	1.00
Satd. Flow (perm)	111	3539	1583	558	3539	1583	773	1863	1583	1000	1801	1801
Peak-hour factor, PHF	0.60	0.89	0.83	0.66	0.88	0.62	0.87	0.69	0.70	0.78	0.87	0.75
Adj. Flow (vph)	80	748	261	32	1394	73	279	225	44	115	252	72
RTOR Reduction (vph)	0	0	109	0	0	37	0	0	28	0	8	0
Lane Group Flow (vph)	80	748	152	32	1394	36	279	225	16	115	316	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	NA
Protected Phases	5	2		1	6			8				4
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)	72.9	67.9	67.9	68.9	65.9	65.9	51.1	51.1	51.1	51.1	51.1	51.1
Effective Green, g (s)	72.9	67.9	67.9	68.9	65.9	65.9	51.1	51.1	51.1	51.1	51.1	51.1
Actuated g/C Ratio	0.52	0.49	0.49	0.49	0.47	0.47	0.37	0.37	0.37	0.37	0.37	0.37
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	117	1716	767	300	1665	745	282	679	577	365	657	657
v/s Ratio Prot	c0.02	0.21		0.00	c0.39			0.12			0.18	
v/s Ratio Perm	0.33		0.10	0.05		0.02	c0.36		0.01	0.11		
v/c Ratio	0.68	0.44	0.20	0.11	0.84	0.05	0.99	0.33	0.03	0.32	0.48	
Uniform Delay, d1	27.0	23.5	20.5	18.9	32.4	20.1	44.2	32.1	28.5	31.9	34.2	
Progression Factor	1.19	1.09	1.97	0.72	0.88	0.45	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	14.7	0.8	0.6	0.1	4.5	0.1	50.1	0.3	0.0	0.5	0.6	
Delay (s)	46.7	26.4	41.1	13.7	32.9	9.1	94.3	32.4	28.5	32.4	34.8	
Level of Service	D	C	D	B	C	A	F	C	C	C	C	
Approach Delay (s)		31.4			31.3			63.6			34.2	
Approach LOS		C			C			E			C	
Intersection Summary												
HCM 2000 Control Delay			36.6									HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio			0.89									
Actuated Cycle Length (s)			140.0									Sum of lost time (s) 18.0
Intersection Capacity Utilization			83.2%									ICU Level of Service E
Analysis Period (min)			15									
c Critical Lane Group												

Queues
7: Kelly Rd & Jonesboro Rd

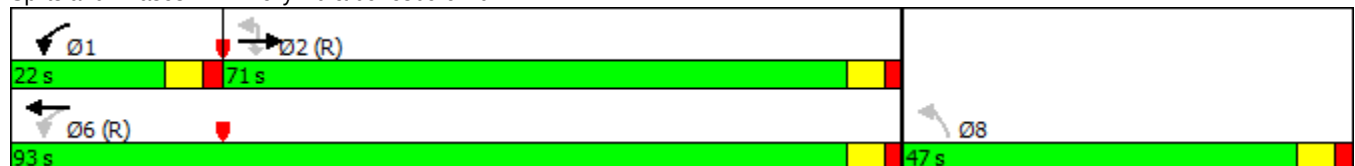
Existing AM
1/13/2016

	→	↘	↙	←	↖
Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations	↑↑	↑	↘	↑↑	↘
Traffic Volume (vph)	765	66	105	1214	104
Future Volume (vph)	765	66	105	1214	104
Lane Group Flow (vph)	832	84	152	1428	207
Turn Type	NA	Perm	pm+pt	NA	Perm
Protected Phases	2		1	6	
Permitted Phases		2	6		8
Detector Phase	2	2	1	6	8
Switch Phase					
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0
Minimum Split (s)	29.0	29.0	11.0	24.0	42.0
Total Split (s)	71.0	71.0	22.0	93.0	47.0
Total Split (%)	50.7%	50.7%	15.7%	66.4%	33.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead		
Lead-Lag Optimize?					
Recall Mode	C-Min	C-Min	None	C-Min	None
v/c Ratio	0.37	0.08	0.30	0.53	0.76
Control Delay	6.0	0.7	6.5	8.0	68.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	6.0	0.7	6.5	8.0	68.4
Queue Length 50th (ft)	22	0	31	236	167
Queue Length 95th (ft)	352	6	47	324	199
Internal Link Dist (ft)	4515			773	731
Turn Bay Length (ft)		315	300		
Base Capacity (vph)	2233	1030	540	2704	516
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.37	0.08	0.28	0.53	0.40

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 43 (31%), Referenced to phase 2:EBTU and 6:WBTL, Start of Green
 Natural Cycle: 85
 Control Type: Actuated-Coordinated

Splits and Phases: 7: Kelly Rd & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

7: Kelly Rd & Jonesboro Rd

Existing AM
1/13/2016



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	⇐	⇑⇑	⇑	⇑	⇑⇑	⇑⇑	
Traffic Volume (vph)	0	765	66	105	1214	104	56
Future Volume (vph)	0	765	66	105	1214	104	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	
Frt		1.00	0.85	1.00	1.00	0.95	
Flt Protected		1.00	1.00	0.95	1.00	0.97	
Satd. Flow (prot)		3539	1583	1770	3539	1719	
Flt Permitted		1.00	1.00	0.28	1.00	0.97	
Satd. Flow (perm)		3539	1583	520	3539	1719	
Peak-hour factor, PHF	0.92	0.92	0.79	0.69	0.85	0.77	0.78
Adj. Flow (vph)	0	832	84	152	1428	135	72
RTOR Reduction (vph)	0	0	31	0	0	16	0
Lane Group Flow (vph)	0	832	53	152	1428	191	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	
Protected Phases		2		1	6		
Permitted Phases	2		2	6		8	
Actuated Green, G (s)		88.4	88.4	107.0	107.0	21.0	
Effective Green, g (s)		88.4	88.4	107.0	107.0	21.0	
Actuated g/C Ratio		0.63	0.63	0.76	0.76	0.15	
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)		5.0	5.0	3.0	5.0	3.0	
Lane Grp Cap (vph)		2234	999	509	2704	257	
v/s Ratio Prot		0.24		0.03	c0.40		
v/s Ratio Perm			0.03	0.20		c0.11	
v/c Ratio		0.37	0.05	0.30	0.53	0.74	
Uniform Delay, d1		12.4	9.8	5.5	6.5	56.9	
Progression Factor		0.41	0.19	1.00	1.00	1.00	
Incremental Delay, d2		0.4	0.1	0.3	0.7	11.0	
Delay (s)		5.5	2.0	5.9	7.3	67.9	
Level of Service		A	A	A	A	E	
Approach Delay (s)		5.2			7.1	67.9	
Approach LOS		A			A	E	
Intersection Summary							
HCM 2000 Control Delay		11.1		HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio		0.59					
Actuated Cycle Length (s)		140.0		Sum of lost time (s)		18.0	
Intersection Capacity Utilization		70.2%		ICU Level of Service		C	
Analysis Period (min)		15					
c Critical Lane Group							

HCM Unsignalized Intersection Capacity Analysis

8: Sterling Pl/N Bridges Rd & Mt Carmel Rd

Existing AM
1/13/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	37	0	0	0	0	3	0	0	0
Future Volume (Veh/h)	0	0	0	37	0	0	0	0	3	0	0	0
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.77	0.92	0.92	0.92	0.92	0.38	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	48	0	0	0	0	8	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0			0			96	96	0	104	96	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			0			96	96	0	104	96	0
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			100	100	99	100	100	100
cM capacity (veh/h)	1623			1623			867	771	1085	850	771	1085
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	0	48	8	0								
Volume Left	0	48	0	0								
Volume Right	0	0	8	0								
cSH	1700	1623	1085	1700								
Volume to Capacity	0.00	0.03	0.01	0.00								
Queue Length 95th (ft)	0	2	1	0								
Control Delay (s)	0.0	7.3	8.3	0.0								
Lane LOS		A	A	A								
Approach Delay (s)	0.0	7.3	8.3	0.0								
Approach LOS			A	A								
Intersection Summary												
Average Delay				7.4								
Intersection Capacity Utilization				13.3%	ICU Level of Service				A			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis 9: Mill Road & Mt Carmel Rd

Existing AM
1/13/2016

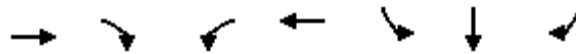
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	215	15	59	16	20	52	46	330	3	23	336	54
Future Volume (vph)	215	15	59	16	20	52	46	330	3	23	336	54
Peak Hour Factor	0.85	0.85	0.85	0.73	0.73	0.73	0.89	0.89	0.89	0.91	0.91	0.91
Hourly flow rate (vph)	253	18	69	22	27	71	52	371	3	25	369	59
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	340	120	426	453								
Volume Left (vph)	253	22	52	25								
Volume Right (vph)	69	71	3	59								
Hadj (s)	0.06	-0.28	0.05	-0.03								
Departure Headway (s)	7.3	7.9	6.9	6.7								
Degree Utilization, x	0.69	0.26	0.81	0.85								
Capacity (veh/h)	458	395	500	517								
Control Delay (s)	24.8	13.6	33.0	36.3								
Approach Delay (s)	24.8	13.6	33.0	36.3								
Approach LOS	C	B	D	E								
Intersection Summary												
Delay				30.3								
Level of Service				D								
Intersection Capacity Utilization				62.8%	ICU Level of Service				B			
Analysis Period (min)				15								

Queues

Existing PM

1: I-75 SB Ramps & Jonesboro Rd

1/13/2016



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations	↑↑	↑	↵	↑↑	↵	↵	↵
Traffic Volume (vph)	1472	212	69	1255	194	1	213
Future Volume (vph)	1472	212	69	1255	194	1	213
Lane Group Flow (vph)	1549	233	80	1364	130	129	304
Turn Type	NA	Perm	pm+pt	NA	Perm	NA	Perm
Protected Phases	2		1	6		4	
Permitted Phases		2	6		4		4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0	6.0	6.0
Minimum Split (s)	24.0	24.0	11.0	24.0	24.0	24.0	24.0
Total Split (s)	91.0	91.0	15.0	106.0	44.0	44.0	44.0
Total Split (%)	60.7%	60.7%	10.0%	70.7%	29.3%	29.3%	29.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?							
Recall Mode	C-Min	C-Min	None	C-Min	None	None	None
v/c Ratio	0.69	0.21	0.38	0.53	0.41	0.41	0.85
Control Delay	20.8	2.1	14.7	2.0	55.7	55.5	66.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.8	2.1	14.7	2.0	55.7	55.5	66.0
Queue Length 50th (ft)	490	0	2	8	118	117	228
Queue Length 95th (ft)	688	38	33	57	145	44	217
Internal Link Dist (ft)	520			890		860	
Turn Bay Length (ft)		415	635		430		700
Base Capacity (vph)	2258	1094	220	2587	425	427	454
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	0.69	0.21	0.36	0.53	0.31	0.30	0.67

Intersection Summary

Cycle Length: 150

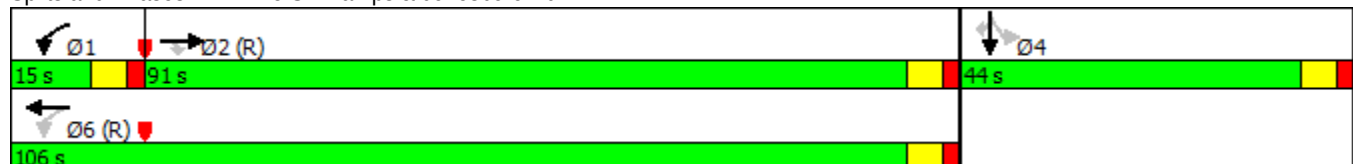
Actuated Cycle Length: 150

Offset: 10 (7%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Splits and Phases: 1: I-75 SB Ramps & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

Existing PM

1: I-75 SB Ramps & Jonesboro Rd

1/13/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑					↑	↑	↑
Traffic Volume (vph)	0	1472	212	69	1255	0	0	0	0	194	1	213
Future Volume (vph)	0	1472	212	69	1255	0	0	0	0	194	1	213
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.95	1.00	1.00	0.95					0.95	0.95	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		3539	1583	1770	3539					1681	1688	1583
Flt Permitted		1.00	1.00	0.09	1.00					0.95	0.95	1.00
Satd. Flow (perm)		3539	1583	172	3539					1681	1688	1583
Peak-hour factor, PHF	0.92	0.95	0.91	0.86	0.92	0.92	0.92	0.92	0.92	0.76	0.25	0.70
Adj. Flow (vph)	0	1549	233	80	1364	0	0	0	0	255	4	304
RTOR Reduction (vph)	0	0	84	0	0	0	0	0	0	0	0	58
Lane Group Flow (vph)	0	1549	149	80	1364	0	0	0	0	130	129	246
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)		95.8	95.8	109.7	109.7					28.3	28.3	28.3
Effective Green, g (s)		95.8	95.8	109.7	109.7					28.3	28.3	28.3
Actuated g/C Ratio		0.64	0.64	0.73	0.73					0.19	0.19	0.19
Clearance Time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	3.0	5.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2260	1011	209	2588					317	318	298
v/s Ratio Prot		c0.44		0.02	c0.39							
v/s Ratio Perm			0.09	0.26						0.08	0.08	c0.16
v/c Ratio		0.69	0.15	0.38	0.53					0.41	0.41	0.83
Uniform Delay, d1		17.4	10.8	14.7	8.8					53.5	53.5	58.5
Progression Factor		1.00	1.00	1.49	0.14					1.00	1.00	1.00
Incremental Delay, d2		1.7	0.3	1.0	0.7					0.9	0.8	16.9
Delay (s)		19.1	11.1	22.9	1.9					54.4	54.3	75.4
Level of Service		B	B	C	A					D	D	E
Approach Delay (s)		18.1			3.0			0.0			65.7	
Approach LOS		B			A			A			E	
Intersection Summary												
HCM 2000 Control Delay			19.4			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			150.0			Sum of lost time (s)				18.0		
Intersection Capacity Utilization			69.5%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

Queues

Existing PM

2: I-75 NB Ramps & Jonesboro Rd

1/13/2016



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations							
Traffic Volume (vph)	334	1358	1061	453	241	1	113
Future Volume (vph)	334	1358	1061	453	241	1	113
Lane Group Flow (vph)	412	1492	1141	498	137	135	143
Turn Type	pm+pt	NA	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	6			8	
Permitted Phases	2			6	8		8
Detector Phase	5	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	15.0	15.0	15.0	6.0	6.0	6.0
Minimum Split (s)	11.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	49.0	122.0	73.0	73.0	28.0	28.0	28.0
Total Split (%)	32.7%	81.3%	48.7%	48.7%	18.7%	18.7%	18.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?							
Recall Mode	None	C-Min	C-Min	C-Min	None	None	None
v/c Ratio	0.78	0.52	0.57	0.45	0.72	0.70	0.56
Control Delay	36.0	7.2	9.7	1.2	84.1	82.9	35.0
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	36.0	7.3	9.7	1.2	84.1	82.9	35.0
Queue Length 50th (ft)	256	175	108	0	137	135	54
Queue Length 95th (ft)	344	447	163	0	211	52	97
Internal Link Dist (ft)		890	855			694	
Turn Bay Length (ft)	675			390	285		350
Base Capacity (vph)	663	2852	2019	1117	246	247	303
Starvation Cap Reductn	0	283	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	0.62	0.58	0.57	0.45	0.56	0.55	0.47

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 145 (97%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Splits and Phases: 2: I-75 NB Ramps & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

2: I-75 NB Ramps & Jonesboro Rd

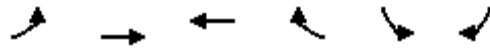
Existing PM
1/13/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	334	1358	0	0	1061	453	241	1	113	0	0	0
Future Volume (vph)	334	1358	0	0	1061	453	241	1	113	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	1770	3539			3539	1583	1681	1688	1583			
Flt Permitted	0.16	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	301	3539			3539	1583	1681	1688	1583			
Peak-hour factor, PHF	0.81	0.91	0.92	0.92	0.93	0.91	0.90	0.25	0.79	0.92	0.92	0.92
Adj. Flow (vph)	412	1492	0	0	1141	498	268	4	143	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	214	0	0	74	0	0	0
Lane Group Flow (vph)	412	1492	0	0	1141	284	137	135	69	0	0	0
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Actuated Green, G (s)	120.9	120.9			85.6	85.6	17.1	17.1	17.1			
Effective Green, g (s)	120.9	120.9			85.6	85.6	17.1	17.1	17.1			
Actuated g/C Ratio	0.81	0.81			0.57	0.57	0.11	0.11	0.11			
Clearance Time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Vehicle Extension (s)	3.0	5.0			5.0	5.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	529	2852			2019	903	191	192	180			
v/s Ratio Prot	c0.15	0.42			0.32							
v/s Ratio Perm	c0.48					0.18	c0.08	0.08	0.04			
v/c Ratio	0.78	0.52			0.57	0.31	0.72	0.70	0.38			
Uniform Delay, d1	25.3	4.9			20.4	16.9	64.1	64.0	61.5			
Progression Factor	1.51	1.25			0.38	0.01	1.00	1.00	1.00			
Incremental Delay, d2	5.8	0.6			1.0	0.8	12.1	11.1	1.3			
Delay (s)	44.1	6.7			8.8	1.1	76.2	75.1	62.9			
Level of Service	D	A			A	A	E	E	E			
Approach Delay (s)		14.8			6.4			71.3			0.0	
Approach LOS		B			A			E			A	
Intersection Summary												
HCM 2000 Control Delay		17.2			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.79										
Actuated Cycle Length (s)		150.0			Sum of lost time (s)			18.0				
Intersection Capacity Utilization		69.5%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

Queues

3: Jonesboro Rd & Foster Dr

Existing PM
1/13/2016



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	294	1166	1188	82	101	100
Future Volume (vph)	294	1166	1188	82	101	100
Lane Group Flow (vph)	382	1227	1238	96	112	116
Turn Type	pm+pt	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases	2			6	4	4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	5.0	15.0	15.0	15.0	6.0	6.0
Minimum Split (s)	11.0	24.0	34.0	34.0	45.0	45.0
Total Split (s)	39.0	105.0	66.0	66.0	45.0	45.0
Total Split (%)	26.0%	70.0%	44.0%	44.0%	30.0%	30.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.74	0.42	0.60	0.10	0.64	0.44
Control Delay	27.9	2.2	16.7	3.7	80.8	15.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.9	2.2	16.7	3.7	80.8	15.2
Queue Length 50th (ft)	156	47	537	6	107	0
Queue Length 95th (ft)	136	84	434	m14	169	53
Internal Link Dist (ft)		855	1103		376	
Turn Bay Length (ft)	275			125		215
Base Capacity (vph)	546	2904	2059	936	460	497
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.42	0.60	0.10	0.24	0.23

Intersection Summary

Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 11 (7%), Referenced to phase 2:EBTL and 6:WBTU, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Jonesboro Rd & Foster Dr



HCM Signalized Intersection Capacity Analysis

3: Jonesboro Rd & Foster Dr

Existing PM
1/13/2016



Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	294	1166	0	1188	82	101	100
Future Volume (vph)	294	1166	0	1188	82	101	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95		0.95	1.00	1.00	1.00
Frt	1.00	1.00		1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539		3539	1583	1770	1583
Flt Permitted	0.14	1.00		1.00	1.00	0.95	1.00
Satd. Flow (perm)	260	3539		3539	1583	1770	1583
Peak-hour factor, PHF	0.77	0.95	0.92	0.96	0.85	0.90	0.86
Adj. Flow (vph)	382	1227	0	1238	96	112	116
RTOR Reduction (vph)	0	0	0	0	15	0	104
Lane Group Flow (vph)	382	1227	0	1238	81	112	12
Turn Type	pm+pt	NA	Perm	NA	Perm	Perm	Perm
Protected Phases	5	2		6			
Permitted Phases	2		6		6	4	4
Actuated Green, G (s)	123.1	123.1		87.3	87.3	14.9	14.9
Effective Green, g (s)	123.1	123.1		87.3	87.3	14.9	14.9
Actuated g/C Ratio	0.82	0.82		0.58	0.58	0.10	0.10
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	5.0		5.0	5.0	3.0	3.0
Lane Grp Cap (vph)	513	2904		2059	921	175	157
v/s Ratio Prot	c0.15	0.35		0.35			
v/s Ratio Perm	c0.46				0.05	c0.06	0.01
v/c Ratio	0.74	0.42		0.60	0.09	0.64	0.07
Uniform Delay, d1	27.5	3.7		20.2	13.8	65.0	61.3
Progression Factor	0.98	0.45		0.72	0.34	1.00	1.00
Incremental Delay, d2	5.1	0.4		1.1	0.2	7.7	0.2
Delay (s)	32.0	2.1		15.6	4.8	72.7	61.5
Level of Service	C	A		B	A	E	E
Approach Delay (s)		9.2		14.9		67.0	
Approach LOS		A		B		E	
Intersection Summary							
HCM 2000 Control Delay		15.7		HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio		0.75					
Actuated Cycle Length (s)		150.0		Sum of lost time (s)		18.0	
Intersection Capacity Utilization		69.7%		ICU Level of Service		C	
Analysis Period (min)		15					
c Critical Lane Group							

HCM Unsignalized Intersection Capacity Analysis

4: N Bridges Rd/Bojangles Drwy & Jonesboro Rd

Existing PM

1/13/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 			 	
Traffic Volume (veh/h)	23	1229	3	2	1275	19	0	0	3	20	0	23
Future Volume (Veh/h)	23	1229	3	2	1275	19	0	0	3	20	0	23
Sign Control	Free				Free				Stop		Stop	
Grade	0%				0%				0%		0%	
Peak Hour Factor	0.52	0.96	0.38	0.50	0.91	0.59	0.92	0.92	0.38	0.83	0.92	0.82
Hourly flow rate (vph)	44	1280	8	4	1401	32	0	0	8	24	0	28
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	1183											
pX, platoon unblocked				0.91			0.91			0.91		
vC, conflicting volume	1433			1280			2076			2809		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1433			1100			1980			2789		
tC, single (s)	4.1			4.1			7.5			6.5		
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5			4.0		
p0 queue free %	91			99			100			100		
cM capacity (veh/h)	470			571			28			15		
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1		
Volume Total	44	640	640	8	4	700	700	32	8	52		
Volume Left	44	0	0	0	4	0	0	0	0	24		
Volume Right	0	0	0	8	0	0	0	32	8	28		
cSH	470	1700	1700	1700	571	1700	1700	1700	549	54		
Volume to Capacity	0.09	0.38	0.38	0.00	0.01	0.41	0.41	0.02	0.01	0.97		
Queue Length 95th (ft)	8	0	0	0	1	0	0	0	1	108		
Control Delay (s)	13.4	0.0	0.0	0.0	11.4	0.0	0.0	0.0	11.7	236.1		
Lane LOS	B				B						B	F
Approach Delay (s)	0.4				0.0						11.7	236.1
Approach LOS										B	F	
Intersection Summary												
Average Delay				4.6								
Intersection Capacity Utilization				51.1%			ICU Level of Service			A		
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

5: Mt Carmel Rd & Jonesboro Rd

Existing PM
1/13/2016



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR			
Lane Configurations										
Traffic Volume (veh/h)	0	1230	8	8	1251	18	19			
Future Volume (Veh/h)	0	1230	8	8	1251	18	19			
Sign Control	Free		Free			Stop				
Grade	0%		0%			0%				
Peak Hour Factor	0.92	0.93	0.50	0.40	0.90	0.75	0.53			
Hourly flow rate (vph)	0	1323	16	20	1390	24	36			
Pedestrians										
Lane Width (ft)										
Walking Speed (ft/s)										
Percent Blockage										
Right turn flare (veh)										
Median type	None				None					
Median storage (veh)										
Upstream signal (ft)	877									
pX, platoon unblocked	0.00					0.78				
vC, conflicting volume	0				1323	2058	662			
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	0				1323	1789	662			
tC, single (s)	0.0				4.1	6.8	6.9			
tC, 2 stage (s)										
tF (s)	0.0				2.2	3.5	3.3			
p0 queue free %	0				96	56	91			
cM capacity (veh/h)	0				518	54	405			
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	NB 2	
Volume Total	662	662	16	0	20	695	695	24	36	
Volume Left	0	0	0	0	20	0	0	24	0	
Volume Right	0	0	16	0	0	0	0	0	36	
cSH	1700	1700	1700	1700	518	1700	1700	54	405	
Volume to Capacity	0.39	0.39	0.01	0.00	0.04	0.41	0.41	0.44	0.09	
Queue Length 95th (ft)	0	0	0	0	3	0	0	41	7	
Control Delay (s)	0.0	0.0	0.0	0.0	12.2	0.0	0.0	116.5	14.8	
Lane LOS						B	F			B
Approach Delay (s)	0.0					0.2	55.5			
Approach LOS						F				
Intersection Summary										
Average Delay			1.3							
Intersection Capacity Utilization			44.6%		ICU Level of Service			A		
Analysis Period (min)			15							

Queues

Existing PM

6: Willow Lane/Oak Grove Rd & Jonesboro Rd

1/13/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	39	934	250	58	982	48	218	121	117	190	308
Future Volume (vph)	39	934	250	58	982	48	218	121	117	190	308
Lane Group Flow (vph)	48	983	287	107	1045	64	253	129	136	211	398
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases	5	2		1	6			8			4
Permitted Phases	2		2	6		6	8		8	4	
Detector Phase	5	2	2	1	6	6	8	8	8	4	4
Switch Phase											
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	11.0	26.0	26.0	11.0	36.0	36.0	46.0	46.0	46.0	44.0	44.0
Total Split (s)	11.0	59.0	59.0	14.0	62.0	62.0	77.0	77.0	77.0	77.0	77.0
Total Split (%)	7.3%	39.3%	39.3%	9.3%	41.3%	41.3%	51.3%	51.3%	51.3%	51.3%	51.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
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	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag					
Lead-Lag Optimize?											
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None
v/c Ratio	0.24	0.62	0.36	0.45	0.61	0.08	1.06	0.18	0.20	0.45	0.57
Control Delay	22.9	33.7	17.3	21.2	30.1	6.9	119.9	29.3	6.2	36.3	38.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.9	33.7	17.3	21.2	30.1	6.9	119.9	29.3	6.2	36.3	38.2
Queue Length 50th (ft)	24	291	85	56	430	10	~263	82	11	151	295
Queue Length 95th (ft)	59	494	185	60	575	33	#364	113	43	197	347
Internal Link Dist (ft)		797			4515			905			451
Turn Bay Length (ft)	300		150	300		250	300		400	135	
Base Capacity (vph)	203	1586	789	238	1707	797	297	881	810	581	865
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.62	0.36	0.45	0.61	0.08	0.85	0.15	0.17	0.36	0.46

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 82 (55%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

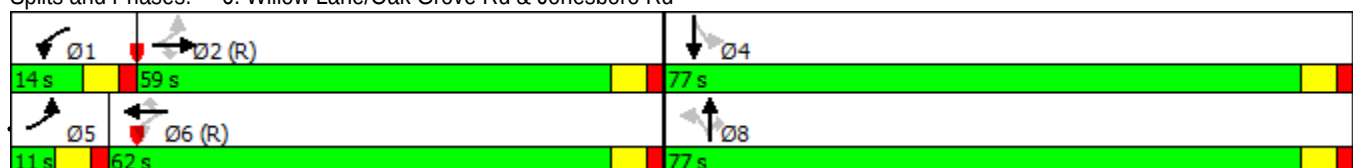
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 6: Willow Lane/Oak Grove Rd & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

6: Willow Lane/Oak Grove Rd & Jonesboro Rd

Existing PM

1/13/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	934	250	58	982	48	218	121	117	190	308	45
Future Volume (vph)	39	934	250	58	982	48	218	121	117	190	308	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1821	
Flt Permitted	0.17	1.00	1.00	0.16	1.00	1.00	0.34	1.00	1.00	0.66	1.00	
Satd. Flow (perm)	323	3539	1583	305	3539	1583	629	1863	1583	1230	1821	
Peak-hour factor, PHF	0.81	0.95	0.87	0.54	0.94	0.75	0.86	0.94	0.86	0.90	0.91	0.75
Adj. Flow (vph)	48	983	287	107	1045	64	253	129	136	211	338	60
RTOR Reduction (vph)	0	0	79	0	0	34	0	0	73	0	5	0
Lane Group Flow (vph)	48	983	208	107	1045	30	253	129	63	211	393	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)	71.3	67.3	67.3	79.1	71.2	71.2	56.8	56.8	56.8	56.8	56.8	
Effective Green, g (s)	71.3	67.3	67.3	79.1	71.2	71.2	56.8	56.8	56.8	56.8	56.8	
Actuated g/C Ratio	0.48	0.45	0.45	0.53	0.47	0.47	0.38	0.38	0.38	0.38	0.38	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	192	1587	710	237	1679	751	238	705	599	465	689	
v/s Ratio Prot	0.01	0.28		c0.02	c0.30			0.07			0.22	
v/s Ratio Perm	0.11		0.13	0.21		0.02	c0.40		0.04	0.17		
v/c Ratio	0.25	0.62	0.29	0.45	0.62	0.04	1.06	0.18	0.11	0.45	0.57	
Uniform Delay, d1	23.5	31.6	26.2	21.9	29.4	21.1	46.6	31.1	30.2	35.0	36.9	
Progression Factor	0.98	0.93	1.05	0.77	0.90	1.07	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.6	1.7	1.0	1.3	1.6	0.1	76.0	0.1	0.1	0.7	1.1	
Delay (s)	23.8	31.2	28.7	18.1	27.9	22.6	122.6	31.2	30.2	35.7	38.1	
Level of Service	C	C	C	B	C	C	F	C	C	D	D	
Approach Delay (s)		30.4			26.8			75.6			37.2	
Approach LOS		C			C			E			D	
Intersection Summary												
HCM 2000 Control Delay			36.7				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			150.0				Sum of lost time (s)			18.0		
Intersection Capacity Utilization			82.3%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

Queues
7: Kelly Rd & Jonesboro Rd

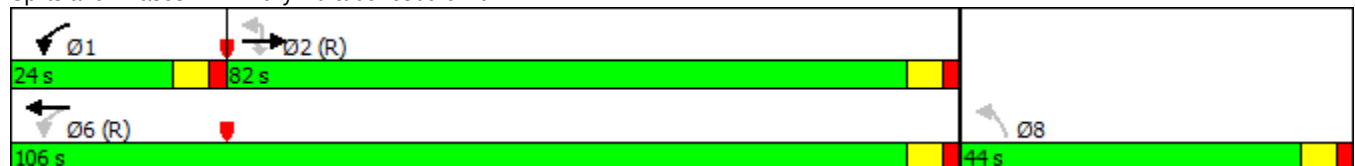
Existing PM
1/13/2016

	→	↘	↙	←	↖
Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations	↑↑	↑	↘	↑↑	↘
Traffic Volume (vph)	1173	87	146	1007	100
Future Volume (vph)	1173	87	146	1007	100
Lane Group Flow (vph)	1303	107	176	1131	255
Turn Type	NA	Perm	pm+pt	NA	Perm
Protected Phases	2		1	6	
Permitted Phases		2	6		8
Detector Phase	2	2	1	6	8
Switch Phase					
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0
Minimum Split (s)	29.0	29.0	11.0	24.0	42.0
Total Split (s)	82.0	82.0	24.0	106.0	44.0
Total Split (%)	54.7%	54.7%	16.0%	70.7%	29.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead		
Lead-Lag Optimize?					
Recall Mode	C-Min	C-Min	None	C-Min	None
v/c Ratio	0.59	0.11	0.53	0.43	0.81
Control Delay	7.0	0.2	12.4	8.0	70.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.0	0.2	12.4	8.0	70.6
Queue Length 50th (ft)	84	0	42	190	211
Queue Length 95th (ft)	123	0	76	283	264
Internal Link Dist (ft)	4515			773	731
Turn Bay Length (ft)		315	300		
Base Capacity (vph)	2190	1018	372	2660	455
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.59	0.11	0.47	0.43	0.56

Intersection Summary

Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 0 (0%), Referenced to phase 2:EBTU and 6:WBTL, Start of Green
 Natural Cycle: 85
 Control Type: Actuated-Coordinated

Splits and Phases: 7: Kelly Rd & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

7: Kelly Rd & Jonesboro Rd

Existing PM
1/13/2016



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	⇐	⇐⇐	⇐	⇐	⇐⇐	⇐	
Traffic Volume (vph)	0	1173	87	146	1007	100	115
Future Volume (vph)	0	1173	87	146	1007	100	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	
Frt		1.00	0.85	1.00	1.00	0.93	
Flt Protected		1.00	1.00	0.95	1.00	0.98	
Satd. Flow (prot)		3539	1583	1770	3539	1690	
Flt Permitted		1.00	1.00	0.14	1.00	0.98	
Satd. Flow (perm)		3539	1583	254	3539	1690	
Peak-hour factor, PHF	0.92	0.90	0.81	0.83	0.89	0.83	0.85
Adj. Flow (vph)	0	1303	107	176	1131	120	135
RTOR Reduction (vph)	0	0	39	0	0	30	0
Lane Group Flow (vph)	0	1303	68	176	1131	225	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	
Protected Phases		2		1	6		
Permitted Phases	2		2	6		8	
Actuated Green, G (s)		92.9	92.9	112.8	112.8	25.2	
Effective Green, g (s)		92.9	92.9	112.8	112.8	25.2	
Actuated g/C Ratio		0.62	0.62	0.75	0.75	0.17	
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)		5.0	5.0	3.0	5.0	3.0	
Lane Grp Cap (vph)		2191	980	331	2661	283	
v/s Ratio Prot		c0.37		c0.05	0.32		
v/s Ratio Perm			0.04	0.35		c0.13	
v/c Ratio		0.59	0.07	0.53	0.43	0.80	
Uniform Delay, d1		17.2	11.4	12.6	6.8	59.9	
Progression Factor		0.31	0.01	1.00	1.00	1.00	
Incremental Delay, d2		1.1	0.1	1.6	0.5	14.2	
Delay (s)		6.4	0.3	14.2	7.3	74.2	
Level of Service		A	A	B	A	E	
Approach Delay (s)		6.0			8.2	74.2	
Approach LOS		A			A	E	

Intersection Summary

HCM 2000 Control Delay	12.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

8: Sterling Pl/N Bridges Rd & Mt Carmel Rd

Existing PM
1/13/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	0	0	19	0	1	0	0	39	0	0	1
Future Volume (Veh/h)	1	0	0	19	0	1	0	0	39	0	0	1
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.25	0.92	0.92	0.68	0.92	0.25	0.92	0.92	0.65	0.92	0.92	0.25
Hourly flow rate (vph)	4	0	0	28	0	4	0	0	60	0	0	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	4			0			70	68	0	126	66	2
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	4			0			70	68	0	126	66	2
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			100	100	94	100	100	100
cM capacity (veh/h)	1618			1623			905	806	1085	789	808	1082
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	4	32	60	4								
Volume Left	4	28	0	0								
Volume Right	0	4	60	4								
cSH	1618	1623	1085	1082								
Volume to Capacity	0.00	0.02	0.06	0.00								
Queue Length 95th (ft)	0	1	4	0								
Control Delay (s)	7.2	6.4	8.5	8.3								
Lane LOS	A	A	A	A								
Approach Delay (s)	7.2	6.4	8.5	8.3								
Approach LOS			A	A								
Intersection Summary												
Average Delay				7.8								
Intersection Capacity Utilization				13.3%	ICU Level of Service				A			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis 9: Mill Road & Mt Carmel Rd

Existing PM
1/13/2016

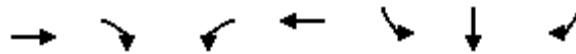
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	150	17	56	3	7	33	70	311	6	30	321	131
Future Volume (vph)	150	17	56	3	7	33	70	311	6	30	321	131
Peak Hour Factor	0.77	0.77	0.77	0.67	0.67	0.67	0.90	0.90	0.90	0.93	0.93	0.93
Hourly flow rate (vph)	195	22	73	4	10	49	78	346	7	32	345	141
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	290	63	431	518								
Volume Left (vph)	195	4	78	32								
Volume Right (vph)	73	49	7	141								
Hadj (s)	0.02	-0.42	0.06	-0.12								
Departure Headway (s)	6.8	7.3	6.2	5.9								
Degree Utilization, x	0.55	0.13	0.75	0.85								
Capacity (veh/h)	487	417	556	589								
Control Delay (s)	18.0	11.4	25.3	33.8								
Approach Delay (s)	18.0	11.4	25.3	33.8								
Approach LOS	C	B	D	D								
Intersection Summary												
Delay				26.4								
Level of Service				D								
Intersection Capacity Utilization				66.1%	ICU Level of Service	C						
Analysis Period (min)				15								

Queues

1: I-75 SB Ramps & Jonesboro Rd

Existing Saturday

1/13/2016



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations	↑↑	↑	↑	↑↑	↑	↑	↑
Traffic Volume (vph)	1373	393	130	1455	200	3	546
Future Volume (vph)	1373	393	130	1455	200	3	546
Lane Group Flow (vph)	1445	479	157	1516	132	129	593
Turn Type	NA	Perm	pm+pt	NA	Perm	NA	Perm
Protected Phases	2		1	6		4	
Permitted Phases		2	6		4		4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0	6.0	6.0
Minimum Split (s)	24.0	24.0	11.0	24.0	24.0	24.0	24.0
Total Split (s)	73.0	73.0	17.0	90.0	60.0	60.0	60.0
Total Split (%)	48.7%	48.7%	11.3%	60.0%	40.0%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?							
Recall Mode	C-Min	C-Min	None	C-Min	None	None	None
v/c Ratio	0.90	0.49	0.88	0.76	0.22	0.22	0.98
Control Delay	47.3	3.8	86.3	22.1	34.8	34.7	74.9
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Total Delay	47.3	3.8	86.3	22.2	34.8	34.7	74.9
Queue Length 50th (ft)	687	0	128	292	94	91	524
Queue Length 95th (ft)	800	32	m#204	406	130	57	#779
Internal Link Dist (ft)	520			890		860	
Turn Bay Length (ft)		415	635		430		700
Base Capacity (vph)	1600	978	179	1999	605	608	611
Starvation Cap Reductn	0	0	0	30	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	0.90	0.49	0.88	0.77	0.22	0.21	0.97

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 141 (94%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 1: I-75 SB Ramps & Jonesboro Rd



Baseline

Synchro 9 Report

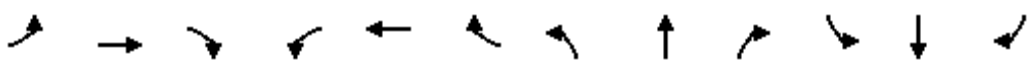
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HCM Signalized Intersection Capacity Analysis

1: I-75 SB Ramps & Jonesboro Rd

Existing Saturday

1/13/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑					↑	↑	↑
Traffic Volume (vph)	0	1373	393	130	1455	0	0	0	0	200	3	546
Future Volume (vph)	0	1373	393	130	1455	0	0	0	0	200	3	546
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.95	1.00	1.00	0.95					0.95	0.95	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (prot)		3539	1583	1770	3539					1681	1690	1583
Flt Permitted		1.00	1.00	0.05	1.00					0.95	0.96	1.00
Satd. Flow (perm)		3539	1583	101	3539					1681	1690	1583
Peak-hour factor, PHF	0.92	0.95	0.82	0.83	0.96	0.92	0.92	0.92	0.92	0.79	0.38	0.92
Adj. Flow (vph)	0	1445	479	157	1516	0	0	0	0	253	8	593
RTOR Reduction (vph)	0	0	262	0	0	0	0	0	0	0	0	42
Lane Group Flow (vph)	0	1445	217	157	1516	0	0	0	0	132	129	551
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)		67.9	67.9	84.8	84.8					53.2	53.2	53.2
Effective Green, g (s)		67.9	67.9	84.8	84.8					53.2	53.2	53.2
Actuated g/C Ratio		0.45	0.45	0.57	0.57					0.35	0.35	0.35
Clearance Time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	3.0	5.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1601	716	178	2000					596	599	561
v/s Ratio Prot		0.41		0.06	c0.43							
v/s Ratio Perm			0.14	c0.43						0.08	0.08	c0.35
v/c Ratio		0.90	0.30	0.88	0.76					0.22	0.22	0.98
Uniform Delay, d1		38.0	26.0	44.4	24.8					33.9	33.8	47.9
Progression Factor		1.00	1.00	1.63	0.80					1.00	1.00	1.00
Incremental Delay, d2		8.7	1.1	26.7	1.8					0.2	0.2	33.3
Delay (s)		46.7	27.1	99.1	21.7					34.1	34.0	81.2
Level of Service		D	C	F	C					C	C	F
Approach Delay (s)		41.8			28.9			0.0			66.8	
Approach LOS		D			C			A			E	
Intersection Summary												
HCM 2000 Control Delay		41.8			HCM 2000 Level of Service			D				
HCM 2000 Volume to Capacity ratio		0.95										
Actuated Cycle Length (s)		150.0			Sum of lost time (s)			18.0				
Intersection Capacity Utilization		84.0%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												

Queues

2: I-75 NB Ramps & Jonesboro Rd

Existing Saturday

1/13/2016



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations							
Traffic Volume (vph)	438	1154	1144	490	413	3	116
Future Volume (vph)	438	1154	1144	490	413	3	116
Lane Group Flow (vph)	466	1268	1179	544	254	252	127
Turn Type	pm+pt	NA	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	6			8	
Permitted Phases	2			6	8		8
Detector Phase	5	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	15.0	15.0	15.0	6.0	6.0	6.0
Minimum Split (s)	11.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	48.0	114.0	66.0	66.0	36.0	36.0	36.0
Total Split (%)	32.0%	76.0%	44.0%	44.0%	24.0%	24.0%	24.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?							
Recall Mode	None	C-Min	C-Min	C-Min	None	None	None
v/c Ratio	0.87	0.48	0.73	0.54	0.86	0.85	0.35
Control Delay	68.8	8.6	20.4	2.1	85.8	84.4	15.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.8	8.6	20.4	2.1	85.8	84.4	15.6
Queue Length 50th (ft)	413	181	386	0	253	250	17
Queue Length 95th (ft)	m479	253	382	23	325	131	76
Internal Link Dist (ft)		890	855			694	
Turn Bay Length (ft)	675			390	285		350
Base Capacity (vph)	582	2632	1609	1009	336	337	401
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	0.80	0.48	0.73	0.54	0.76	0.75	0.32

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 147 (98%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

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

Splits and Phases: 2: I-75 NB Ramps & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

2: I-75 NB Ramps & Jonesboro Rd

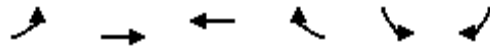
Existing Saturday

1/13/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	438	1154	0	0	1144	490	413	3	116	0	0	0
Future Volume (vph)	438	1154	0	0	1144	490	413	3	116	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	1770	3539			3539	1583	1681	1688	1583			
Flt Permitted	0.10	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	188	3539			3539	1583	1681	1688	1583			
Peak-hour factor, PHF	0.94	0.91	0.92	0.92	0.97	0.90	0.83	0.38	0.91	0.92	0.92	0.92
Adj. Flow (vph)	466	1268	0	0	1179	544	498	8	127	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	289	0	0	87	0	0	0
Lane Group Flow (vph)	466	1268	0	0	1179	255	254	252	40	0	0	0
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Actuated Green, G (s)	111.6	111.6			68.2	68.2	26.4	26.4	26.4			
Effective Green, g (s)	111.6	111.6			68.2	68.2	26.4	26.4	26.4			
Actuated g/C Ratio	0.74	0.74			0.45	0.45	0.18	0.18	0.18			
Clearance Time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Vehicle Extension (s)	3.0	5.0			5.0	5.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	534	2633			1609	719	295	297	278			
v/s Ratio Prot	c0.22	0.36			0.33							
v/s Ratio Perm	c0.43					0.16	c0.15	0.15	0.03			
v/c Ratio	0.87	0.48			0.73	0.35	0.86	0.85	0.14			
Uniform Delay, d1	39.7	7.7			33.4	26.6	60.0	59.9	52.2			
Progression Factor	1.64	1.01			0.50	0.09	1.00	1.00	1.00			
Incremental Delay, d2	9.4	0.4			2.6	1.2	21.8	19.6	0.2			
Delay (s)	74.3	8.1			19.4	3.6	81.8	79.5	52.5			
Level of Service	E	A			B	A	F	E	D			
Approach Delay (s)		25.9			14.4			75.0			0.0	
Approach LOS		C			B			E			A	
Intersection Summary												
HCM 2000 Control Delay		28.7			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.89										
Actuated Cycle Length (s)		150.0			Sum of lost time (s)			18.0				
Intersection Capacity Utilization		84.0%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												

Queues
3: Jonesboro Rd & Foster Dr

Existing Saturday
1/13/2016



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	256	1011	1317	60	80	113
Future Volume (vph)	256	1011	1317	60	80	113
Lane Group Flow (vph)	291	1042	1358	68	113	128
Turn Type	pm+pt	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases	2			6	4	4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	5.0	15.0	15.0	15.0	6.0	6.0
Minimum Split (s)	11.0	24.0	34.0	34.0	45.0	45.0
Total Split (s)	33.0	105.0	72.0	72.0	45.0	45.0
Total Split (%)	22.0%	70.0%	48.0%	48.0%	30.0%	30.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.68	0.36	0.61	0.07	0.64	0.47
Control Delay	31.7	0.9	11.3	3.6	80.9	14.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.7	0.9	11.3	3.6	80.9	14.9
Queue Length 50th (ft)	128	15	411	5	108	0
Queue Length 95th (ft)	174	33	156	m12	131	58
Internal Link Dist (ft)		855	1103		376	
Turn Bay Length (ft)	275			125		215
Base Capacity (vph)	470	2903	2227	1005	460	506
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.36	0.61	0.07	0.25	0.25

Intersection Summary

Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 5 (3%), Referenced to phase 2:EBTL and 6:WBTU, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 m Volume for 95th percentile queue is metered by upstream signal.

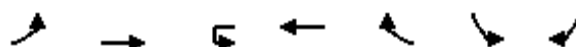
Splits and Phases: 3: Jonesboro Rd & Foster Dr



HCM Signalized Intersection Capacity Analysis

3: Jonesboro Rd & Foster Dr

Existing Saturday
1/13/2016



Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	256	1011	0	1317	60	80	113
Future Volume (vph)	256	1011	0	1317	60	80	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95		0.95	1.00	1.00	1.00
Frt	1.00	1.00		1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539		3539	1583	1770	1583
Flt Permitted	0.13	1.00		1.00	1.00	0.95	1.00
Satd. Flow (perm)	237	3539		3539	1583	1770	1583
Peak-hour factor, PHF	0.88	0.97	0.92	0.97	0.88	0.71	0.88
Adj. Flow (vph)	291	1042	0	1358	68	113	128
RTOR Reduction (vph)	0	0	0	0	9	0	115
Lane Group Flow (vph)	291	1042	0	1358	59	113	13
Turn Type	pm+pt	NA	Perm	NA	Perm	Perm	Perm
Protected Phases	5	2		6			
Permitted Phases	2		6		6	4	4
Actuated Green, G (s)	123.1	123.1		94.5	94.5	14.9	14.9
Effective Green, g (s)	123.1	123.1		94.5	94.5	14.9	14.9
Actuated g/C Ratio	0.82	0.82		0.63	0.63	0.10	0.10
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	5.0		5.0	5.0	3.0	3.0
Lane Grp Cap (vph)	425	2904		2229	997	175	157
v/s Ratio Prot	c0.10	0.29		0.38			
v/s Ratio Perm	c0.46				0.04	c0.06	0.01
v/c Ratio	0.68	0.36		0.61	0.06	0.65	0.08
Uniform Delay, d1	23.3	3.4		16.7	10.7	65.0	61.3
Progression Factor	1.54	0.17		0.56	0.39	1.00	1.00
Incremental Delay, d2	4.1	0.3		1.1	0.1	7.9	0.2
Delay (s)	40.1	0.9		10.4	4.3	72.9	61.6
Level of Service	D	A		B	A	E	E
Approach Delay (s)		9.4		10.1		66.9	
Approach LOS		A		B		E	
Intersection Summary							
HCM 2000 Control Delay		14.4		HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio		0.69					
Actuated Cycle Length (s)		150.0		Sum of lost time (s)		18.0	
Intersection Capacity Utilization		70.6%		ICU Level of Service		C	
Analysis Period (min)		15					
c Critical Lane Group							

HCM Unsignalized Intersection Capacity Analysis

4: N Bridges Rd/Bojangles Drwy & Jonesboro Rd

Existing Saturday

1/13/2016

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations		 			 			 			 			
Traffic Volume (veh/h)	53	1021	3	4	1336	21	2	0	3	22	0	52		
Future Volume (Veh/h)	53	1021	3	4	1336	21	2	0	3	22	0	52		
Sign Control	Free				Free				Stop		Stop			
Grade	0%				0%				0%		0%			
Peak Hour Factor	0.83	0.92	0.25	0.50	0.98	0.66	0.50	0.92	0.38	0.79	0.92	0.87		
Hourly flow rate (vph)	64	1110	12	8	1363	32	4	0	8	28	0	60		
Pedestrians														
Lane Width (ft)														
Walking Speed (ft/s)														
Percent Blockage														
Right turn flare (veh)														
Median type	None			None										
Median storage (veh)														
Upstream signal (ft)	1183													
pX, platoon unblocked				0.93			0.93			0.93	0.93	0.93		
vC, conflicting volume	1395			1110			1936			2649	555	2062	2617	682
vC1, stage 1 conf vol														
vC2, stage 2 conf vol														
vCu, unblocked vol	1395			978			1861			2624	384	1996	2590	682
tC, single (s)	4.1			4.1			7.5			6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)														
tF (s)	2.2			2.2			3.5			4.0	3.3	3.5	4.0	3.3
p0 queue free %	87			99			87			100	99	4	100	85
cM capacity (veh/h)	486			656			32			19	574	29	20	393
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1				
Volume Total	64	555	555	12	8	682	682	32	12	88				
Volume Left	64	0	0	0	8	0	0	0	4	28				
Volume Right	0	0	0	12	0	0	0	32	8	60				
cSH	486	1700	1700	1700	656	1700	1700	1700	86	79				
Volume to Capacity	0.13	0.33	0.33	0.01	0.01	0.40	0.40	0.02	0.14	1.11				
Queue Length 95th (ft)	11	0	0	0	1	0	0	0	12	158				
Control Delay (s)	13.5	0.0	0.0	0.0	10.6	0.0	0.0	0.0	53.6	228.7				
Lane LOS	B				B						F	F		
Approach Delay (s)	0.7				0.1						53.6	228.7		
Approach LOS										F	F			
Intersection Summary														
Average Delay	8.1													
Intersection Capacity Utilization	55.5%			ICU Level of Service					B					
Analysis Period (min)	15													

HCM Unsignalized Intersection Capacity Analysis

5: Mt Carmel Rd & Jonesboro Rd

Existing Saturday
1/13/2016



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR					
Lane Configurations												
Traffic Volume (veh/h)	0	1008	10	4	1336	6	8					
Future Volume (Veh/h)	0	1008	10	4	1336	6	8					
Sign Control	Free				Free	Stop						
Grade	0%				0%	0%						
Peak Hour Factor	0.92	0.91	0.62	0.33	0.98	0.38	0.40					
Hourly flow rate (vph)	0	1108	16	12	1363	16	20					
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)	877											
pX, platoon unblocked	0.00					0.79						
vC, conflicting volume	0	1108				1814	554					
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0	1108				1491	554					
tC, single (s)	0.0	4.1				6.8	6.9					
tC, 2 stage (s)												
tF (s)	0.0	2.2				3.5	3.3					
p0 queue free %	0	98				82	96					
cM capacity (veh/h)	0	626				88	476					
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	NB 2			
Volume Total	554	554	16	0	12	682	682	16	20			
Volume Left	0	0	0	0	12	0	0	16	0			
Volume Right	0	0	16	0	0	0	0	0	20			
cSH	1700	1700	1700	1700	626	1700	1700	88	476			
Volume to Capacity	0.33	0.33	0.01	0.00	0.02	0.40	0.40	0.18	0.04			
Queue Length 95th (ft)	0	0	0	0	1	0	0	16	3			
Control Delay (s)	0.0	0.0	0.0	0.0	10.9	0.0	0.0	54.7	12.9			
Lane LOS						B				F	B	
Approach Delay (s)	0.0					0.1				31.5		
Approach LOS											D	
Intersection Summary												
Average Delay			0.5									
Intersection Capacity Utilization			46.9%		ICU Level of Service			A				
Analysis Period (min)			15									

Queues

Existing Saturday

6: Willow Lane/Oak Grove Rd & Jonesboro Rd

1/13/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	53	831	151	44	1129	50	158	82	41	91	179
Future Volume (vph)	53	831	151	44	1129	50	158	82	41	91	179
Lane Group Flow (vph)	88	857	168	56	1176	56	188	92	64	117	273
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases	5	2		1	6			8			4
Permitted Phases	2		2	6		6	8		8	4	
Detector Phase	5	2	2	1	6	6	8	8	8	4	4
Switch Phase											
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	11.0	26.0	26.0	11.0	36.0	36.0	46.0	46.0	46.0	44.0	44.0
Total Split (s)	15.0	79.0	79.0	11.0	75.0	75.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	10.0%	52.7%	52.7%	7.3%	50.0%	50.0%	40.0%	40.0%	40.0%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
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	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag					
Lead-Lag Optimize?											
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None
v/c Ratio	0.33	0.40	0.17	0.15	0.58	0.06	1.07	0.19	0.14	0.36	0.59
Control Delay	12.2	13.4	5.6	7.0	19.4	3.9	138.9	42.0	8.1	46.5	51.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.2	13.4	5.6	7.0	19.4	3.9	138.9	42.0	8.1	46.5	51.1
Queue Length 50th (ft)	25	143	18	10	397	8	~201	71	0	94	228
Queue Length 95th (ft)	38	256	54	24	568	31	#262	104	11	116	249
Internal Link Dist (ft)		797			4515			905			451
Turn Bay Length (ft)	300		150	300		250	300		400	135	
Base Capacity (vph)	280	2150	1009	370	2031	936	250	670	611	467	657
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	0.31	0.40	0.17	0.15	0.58	0.06	0.75	0.14	0.10	0.25	0.42

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 84 (56%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

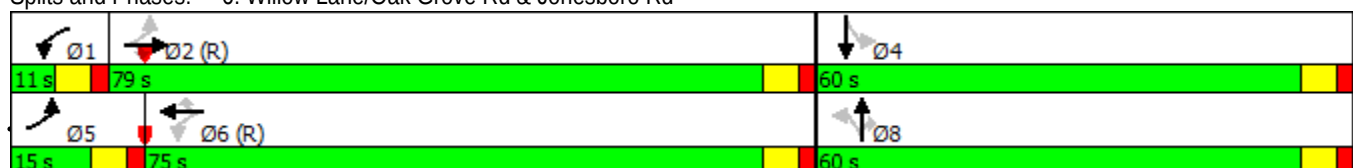
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 6: Willow Lane/Oak Grove Rd & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

6: Willow Lane/Oak Grove Rd & Jonesboro Rd

Existing Saturday

1/13/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	831	151	44	1129	50	158	82	41	91	179	39
Future Volume (vph)	53	831	151	44	1129	50	158	82	41	91	179	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1810	
Flt Permitted	0.16	1.00	1.00	0.29	1.00	1.00	0.37	1.00	1.00	0.70	1.00	
Satd. Flow (perm)	292	3539	1583	542	3539	1583	695	1863	1583	1298	1810	
Peak-hour factor, PHF	0.60	0.97	0.90	0.79	0.96	0.89	0.84	0.89	0.64	0.78	0.81	0.75
Adj. Flow (vph)	88	857	168	56	1176	56	188	92	64	117	221	52
RTOR Reduction (vph)	0	0	49	0	0	24	0	0	48	0	7	0
Lane Group Flow (vph)	88	857	119	56	1176	32	188	92	16	117	266	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)	97.8	90.0	90.0	90.2	86.2	86.2	38.0	38.0	38.0	38.0	38.0	
Effective Green, g (s)	97.8	90.0	90.0	90.2	86.2	86.2	38.0	38.0	38.0	38.0	38.0	
Actuated g/C Ratio	0.65	0.60	0.60	0.60	0.57	0.57	0.25	0.25	0.25	0.25	0.25	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	267	2123	949	358	2033	909	176	471	401	328	458	
v/s Ratio Prot	c0.02	c0.24		0.00	c0.33			0.05			0.15	
v/s Ratio Perm	0.20		0.08	0.09		0.02	c0.27		0.01	0.09		
v/c Ratio	0.33	0.40	0.13	0.16	0.58	0.04	1.07	0.20	0.04	0.36	0.58	
Uniform Delay, d1	13.6	15.8	13.0	12.7	20.3	13.8	56.0	44.0	42.2	46.0	49.0	
Progression Factor	0.83	0.74	0.96	0.54	0.81	1.09	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.7	0.6	0.3	0.2	1.1	0.1	87.1	0.2	0.0	0.7	1.9	
Delay (s)	12.0	12.2	12.7	7.1	17.6	15.2	143.1	44.2	42.3	46.6	50.9	
Level of Service	B	B	B	A	B	B	F	D	D	D	D	
Approach Delay (s)		12.3			17.1			97.9			49.6	
Approach LOS		B			B			F			D	
Intersection Summary												
HCM 2000 Control Delay	28.3			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.71											
Actuated Cycle Length (s)	150.0			Sum of lost time (s)			18.0					
Intersection Capacity Utilization	75.9%			ICU Level of Service			D					
Analysis Period (min)	15											
c Critical Lane Group												

Queues
7: Kelly Rd & Jonesboro Rd

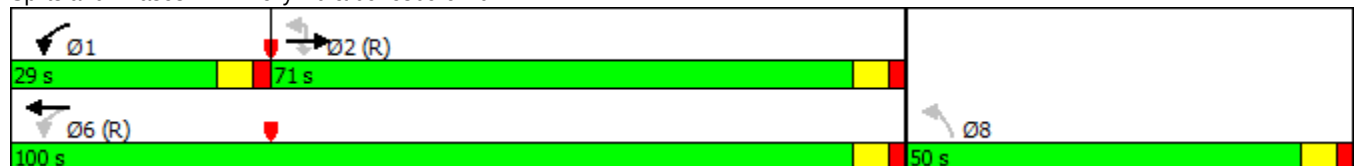
Existing Saturday
1/13/2016

	→	↘	↙	←	↖
Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations	↑↑	↑	↘	↑↑	↘
Traffic Volume (vph)	870	57	150	1153	72
Future Volume (vph)	870	57	150	1153	72
Lane Group Flow (vph)	897	68	192	1227	248
Turn Type	NA	Perm	pm+pt	NA	Perm
Protected Phases	2		1	6	
Permitted Phases		2	6		8
Detector Phase	2	2	1	6	8
Switch Phase					
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0
Minimum Split (s)	29.0	29.0	11.0	24.0	42.0
Total Split (s)	71.0	71.0	29.0	100.0	50.0
Total Split (%)	47.3%	47.3%	19.3%	66.7%	33.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead		
Lead-Lag Optimize?					
Recall Mode	C-Min	C-Min	None	C-Min	None
v/c Ratio	0.40	0.07	0.39	0.45	0.81
Control Delay	7.7	1.2	7.8	7.6	65.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.7	1.2	7.8	7.6	65.6
Queue Length 50th (ft)	153	7	44	200	184
Queue Length 95th (ft)	358	10	73	309	218
Internal Link Dist (ft)	4515			773	731
Turn Bay Length (ft)		315	300		
Base Capacity (vph)	2220	1018	560	2708	532
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.40	0.07	0.34	0.45	0.47

Intersection Summary

Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 24 (16%), Referenced to phase 2:EBTU and 6:WBT, Start of Green
 Natural Cycle: 85
 Control Type: Actuated-Coordinated

Splits and Phases: 7: Kelly Rd & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

7: Kelly Rd & Jonesboro Rd

Existing Saturday
1/13/2016



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	⇐	⇑⇑	⇑	⇑	⇑⇑	⇑	
Traffic Volume (vph)	0	870	57	150	1153	72	111
Future Volume (vph)	0	870	57	150	1153	72	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	
Frt		1.00	0.85	1.00	1.00	0.92	
Flt Protected		1.00	1.00	0.95	1.00	0.98	
Satd. Flow (prot)		3539	1583	1770	3539	1674	
Flt Permitted		1.00	1.00	0.25	1.00	0.98	
Satd. Flow (perm)		3539	1583	474	3539	1674	
Peak-hour factor, PHF	0.92	0.97	0.84	0.78	0.94	0.78	0.71
Adj. Flow (vph)	0	897	68	192	1227	92	156
RTOR Reduction (vph)	0	0	25	0	0	49	0
Lane Group Flow (vph)	0	897	43	192	1227	199	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	
Protected Phases		2		1	6		
Permitted Phases	2		2	6		8	
Actuated Green, G (s)		94.1	94.1	114.8	114.8	23.2	
Effective Green, g (s)		94.1	94.1	114.8	114.8	23.2	
Actuated g/C Ratio		0.63	0.63	0.77	0.77	0.15	
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)		5.0	5.0	3.0	5.0	3.0	
Lane Grp Cap (vph)		2220	993	489	2708	258	
v/s Ratio Prot		0.25		0.04	c0.35		
v/s Ratio Perm			0.03	0.26		c0.12	
v/c Ratio		0.40	0.04	0.39	0.45	0.77	
Uniform Delay, d1		14.0	10.7	6.6	6.3	60.9	
Progression Factor		0.46	0.31	1.00	1.00	1.00	
Incremental Delay, d2		0.5	0.1	0.5	0.5	13.3	
Delay (s)		7.0	3.4	7.1	6.9	74.1	
Level of Service		A	A	A	A	E	
Approach Delay (s)		6.7			6.9	74.1	
Approach LOS		A			A	E	

Intersection Summary

HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	70.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis 8: Sterling Pl/N Bridges Rd & Mt Carmel Rd

Existing Saturday
1/13/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	0	6	0	1	0	0	7	1	0	1
Future Volume (Veh/h)	1	1	0	6	0	1	0	0	7	1	0	1
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.25	0.25	0.92	0.50	0.92	0.25	0.92	0.92	0.29	0.25	0.92	0.25
Hourly flow rate (vph)	4	4	0	12	0	4	0	0	24	4	0	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	4			4			42	40	4	62	38	2
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	4			4			42	40	4	62	38	2
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	98	100	100	100
cM capacity (veh/h)	1618			1618			950	844	1080	905	846	1082
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	8	16	24	8								
Volume Left	4	12	0	4								
Volume Right	0	4	24	4								
cSH	1618	1618	1080	986								
Volume to Capacity	0.00	0.01	0.02	0.01								
Queue Length 95th (ft)	0	1	2	1								
Control Delay (s)	3.6	5.4	8.4	8.7								
Lane LOS	A	A	A	A								
Approach Delay (s)	3.6	5.4	8.4	8.7								
Approach LOS			A	A								
Intersection Summary												
Average Delay				6.9								
Intersection Capacity Utilization				13.3%	ICU Level of Service			A				
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

9: Mill Road & Mt Carmel Rd

Existing Saturday

1/13/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	111	8	34	6	6	33	19	376	3	23	287	100
Future Volume (vph)	111	8	34	6	6	33	19	376	3	23	287	100
Peak Hour Factor	0.91	0.91	0.91	0.80	0.80	0.80	0.88	0.88	0.88	0.92	0.92	0.92
Hourly flow rate (vph)	122	9	37	8	8	41	22	427	3	25	312	109
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	168	57	452	446								
Volume Left (vph)	122	8	22	25								
Volume Right (vph)	37	41	3	109								
Hadj (s)	0.05	-0.37	0.04	-0.10								
Departure Headway (s)	6.4	6.3	5.3	5.2								
Degree Utilization, x	0.30	0.10	0.67	0.65								
Capacity (veh/h)	490	461	647	665								
Control Delay (s)	12.1	10.0	18.5	17.3								
Approach Delay (s)	12.1	10.0	18.5	17.3								
Approach LOS	B	B	C	C								
Intersection Summary												
Delay				16.6								
Level of Service				C								
Intersection Capacity Utilization				51.4%	ICU Level of Service	A						
Analysis Period (min)				15								

GDOT Left Turn Lane Analysis

LEFT TURN LANE ANALYSIS per GDOT standards

The following left turn lane analyses were used to determine the need for dedicated turn bays at the proposed site driveway locations that are located on State Routes.

GDOT standards require the installation of a left lane on state routes at no cost to the department when traffic entering the development meets or exceeds the values shown in the following table.

GDOT REQUIREMENTS FOR LEFT TURN LANES					
Site Driveway	Left Turn Traffic (% Total Entering)	Left Turn Volume (veh/day)	Roadway Speed / # Lanes	GDOT Threshold (veh/day)	Requirement
Jonesboro Road @ Site Drwy 1	31%	4,193	45 mph / 4-Lane	250	235' storage 100' taper
Mt. Carmel Road @ Site Drwy 3	7%	947	45 mph / 2-Lane	250	235' storage 100' taper

Findings

Based on the number of projected daily left turns into the proposed development, Site Driveway 1 and Site Driveway 3 will meet the GDOT requirements for construction of a left turn lane.

GDOT Right Turn Lane Analysis

RIGHT TURN LANE ANALYSIS per GDOT standards

The following right turn lane analyses were used to determine the need for dedicated turn bays at the proposed site driveway locations that are located on State Routes.

GDOT standards require the installation of a deceleration lane on state routes at no cost to the department when traffic entering the development meets or exceeds the values shown in the following table.

GDOT REQUIREMENTS FOR DECELERATION LANES					
Site Driveway	Right Turn Traffic (% Total Entering)	Right Turn Volume (veh/day)	Roadway Speed / # Lanes	GDOT Threshold (veh/day)	Requirement
Jonesboro Road @ Site Drwy 1	31%	4,193	45 mph / 4-Lane	75	175' storage 100' taper
Jonesboro Road @ RIRO Drwy 1	18%	2,435	45 mph / 4-Lane	75	175' storage 100' taper
Jonesboro Road @ RIRO Drwy 2	12%	1,623	45 mph / 4-Lane	75	175' storage 100' taper
Mt. Carmel Road @ Site Drwy 3	5%	676	45 mph / 2-Lane	150	175' storage 100' taper
Mt. Carmel Road @ RIRO Drwy 3	2%	271	45 mph / 2-Lane	150	175' storage 100' taper

Findings

Based on the number of projected daily right turns, all of the site driveways will meet the GDOT requirements for construction of deceleration lane.

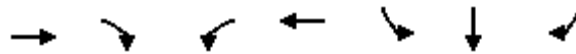
Future “No-Build” Intersection Analysis

Queues

Future No-Build (2020) AM

1/26/2016

1: I-75 SB Ramps & Jonesboro Rd



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations	↑↑	↑	↵	↑↑	↵	↑	↵
Traffic Volume (vph)	1200	204	41	872	411	2	403
Future Volume (vph)	1200	204	41	872	411	2	403
Lane Group Flow (vph)	1277	237	51	1002	263	268	469
Turn Type	NA	Perm	pm+pt	NA	Perm	NA	Perm
Protected Phases	2		1	6		4	
Permitted Phases		2	6		4		4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0	6.0	6.0
Minimum Split (s)	24.0	24.0	11.0	24.0	24.0	24.0	24.0
Total Split (s)	71.0	71.0	12.0	83.0	57.0	57.0	57.0
Total Split (%)	50.7%	50.7%	8.6%	59.3%	40.7%	40.7%	40.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?							
Recall Mode	C-Min	C-Min	None	C-Min	None	None	None
v/c Ratio	0.65	0.24	0.26	0.46	0.53	0.54	0.88
Control Delay	26.4	3.1	13.6	11.1	44.2	44.4	54.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.4	3.1	13.6	11.1	44.2	44.4	54.5
Queue Length 50th (ft)	441	0	9	98	209	213	331
Queue Length 95th (ft)	596	39	25	237	230	140	405
Internal Link Dist (ft)	520			890		860	
Turn Bay Length (ft)		415	635		430		700
Base Capacity (vph)	1952	979	200	2194	612	614	638
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	0.65	0.24	0.26	0.46	0.43	0.44	0.74

Intersection Summary

Cycle Length: 140

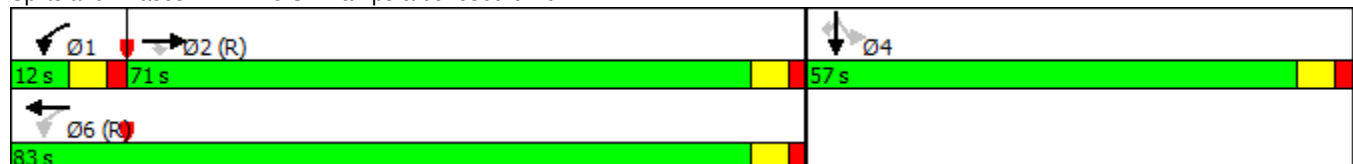
Actuated Cycle Length: 140

Offset: 120 (86%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Splits and Phases: 1: I-75 SB Ramps & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

Future No-Build (2020) AM

1: I-75 SB Ramps & Jonesboro Rd

1/26/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑					↑	↑	↑
Traffic Volume (vph)	0	1200	204	41	872	0	0	0	0	411	2	403
Future Volume (vph)	0	1200	204	41	872	0	0	0	0	411	2	403
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.95	1.00	1.00	0.95					0.95	0.95	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		3539	1583	1770	3539					1681	1687	1583
Flt Permitted		1.00	1.00	0.12	1.00					0.95	0.95	1.00
Satd. Flow (perm)		3539	1583	216	3539					1681	1687	1583
Peak-hour factor, PHF	0.92	0.94	0.86	0.80	0.87	0.92	0.92	0.92	0.92	0.78	0.50	0.86
Adj. Flow (vph)	0	1277	237	51	1002	0	0	0	0	527	4	469
RTOR Reduction (vph)	0	0	108	0	0	0	0	0	0	0	0	68
Lane Group Flow (vph)	0	1277	129	51	1002	0	0	0	0	263	268	401
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)		76.0	76.0	86.8	86.8					41.2	41.2	41.2
Effective Green, g (s)		76.0	76.0	86.8	86.8					41.2	41.2	41.2
Actuated g/C Ratio		0.54	0.54	0.62	0.62					0.29	0.29	0.29
Clearance Time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	3.0	5.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1921	859	187	2194					494	496	465
v/s Ratio Prot		c0.36		0.01	c0.28							
v/s Ratio Perm			0.08	0.16						0.16	0.16	c0.25
v/c Ratio		0.66	0.15	0.27	0.46					0.53	0.54	0.86
Uniform Delay, d1		22.9	15.9	16.4	14.1					41.3	41.5	46.7
Progression Factor		1.00	1.00	0.84	0.68					1.00	1.00	1.00
Incremental Delay, d2		1.8	0.4	0.7	0.6					1.1	1.2	15.0
Delay (s)		24.7	16.3	14.6	10.2					42.4	42.7	61.7
Level of Service		C	B	B	B					D	D	E
Approach Delay (s)		23.4			10.4			0.0			51.6	
Approach LOS		C			B			A			D	

Intersection Summary

HCM 2000 Control Delay	27.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	109.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Queues

2: I-75 NB Ramps & Jonesboro Rd

Future No-Build (2020) AM

1/26/2016



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations							
Traffic Volume (vph)	467	1082	790	1031	135	1	145
Future Volume (vph)	467	1082	790	1031	135	1	145
Lane Group Flow (vph)	492	1189	878	1133	87	88	204
Turn Type	pm+pt	NA	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	6			8	
Permitted Phases	2			6	8		8
Detector Phase	5	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	15.0	15.0	15.0	6.0	6.0	6.0
Minimum Split (s)	11.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	27.0	116.0	89.0	89.0	24.0	24.0	24.0
Total Split (%)	19.3%	82.9%	63.6%	63.6%	17.1%	17.1%	17.1%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?							
Recall Mode	None	C-Min	C-Min	C-Min	None	None	None
v/c Ratio	0.86	0.41	0.38	0.92	0.57	0.58	0.73
Control Delay	34.4	3.2	6.1	26.1	74.9	75.2	34.0
Queue Delay	0.0	0.0	0.0	1.2	0.0	0.0	0.0
Total Delay	34.4	3.2	6.1	27.3	74.9	75.2	34.0
Queue Length 50th (ft)	233	54	68	553	81	82	48
Queue Length 95th (ft)	#436	203	116	#617	120	36	68
Internal Link Dist (ft)		890	855			694	
Turn Bay Length (ft)	675			390	285		350
Base Capacity (vph)	601	2915	2318	1232	216	217	333
Starvation Cap Reductn	0	0	0	24	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	0.82	0.41	0.38	0.94	0.40	0.41	0.61

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 99 (71%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

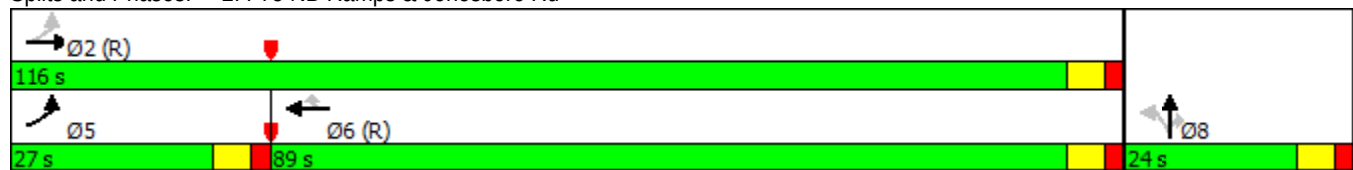
Natural Cycle: 100

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 2: I-75 NB Ramps & Jonesboro Rd



Baseline

HCM Signalized Intersection Capacity Analysis

2: I-75 NB Ramps & Jonesboro Rd

Future No-Build (2020) AM

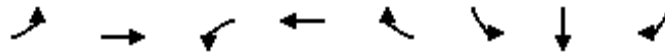
1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	467	1082	0	0	790	1031	135	1	145	0	0	0
Future Volume (vph)	467	1082	0	0	790	1031	135	1	145	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	1770	3539			3539	1583	1681	1689	1583			
Flt Permitted	0.27	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	500	3539			3539	1583	1681	1689	1583			
Peak-hour factor, PHF	0.95	0.91	0.92	0.92	0.90	0.91	0.79	0.25	0.71	0.92	0.92	0.92
Adj. Flow (vph)	492	1189	0	0	878	1133	171	4	204	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	195	0	0	135	0	0	0
Lane Group Flow (vph)	492	1189	0	0	878	938	87	88	69	0	0	0
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Actuated Green, G (s)	115.3	115.3			91.7	91.7	12.7	12.7	12.7			
Effective Green, g (s)	115.3	115.3			91.7	91.7	12.7	12.7	12.7			
Actuated g/C Ratio	0.82	0.82			0.66	0.66	0.09	0.09	0.09			
Clearance Time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Vehicle Extension (s)	3.0	5.0			5.0	5.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	571	2914			2318	1036	152	153	143			
v/s Ratio Prot	c0.11	0.34			0.25							
v/s Ratio Perm	0.60					c0.59	0.05	0.05	0.04			
v/c Ratio	0.86	0.41			0.38	0.91	0.57	0.58	0.48			
Uniform Delay, d1	8.4	3.3			11.1	20.5	61.0	61.1	60.5			
Progression Factor	3.09	0.80			0.47	1.34	1.00	1.00	1.00			
Incremental Delay, d2	10.6	0.3			0.4	11.4	5.1	5.1	2.5			
Delay (s)	36.6	3.0			5.6	38.7	66.2	66.2	63.0			
Level of Service	D	A			A	D	E	E	E			
Approach Delay (s)		12.8			24.3			64.5			0.0	
Approach LOS		B			C			E			A	
Intersection Summary												
HCM 2000 Control Delay		23.3			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.87										
Actuated Cycle Length (s)		140.0			Sum of lost time (s)			18.0				
Intersection Capacity Utilization		109.7%			ICU Level of Service			H				
Analysis Period (min)		15										
c Critical Lane Group												

Queues
3: Managed Lane Ramp/Foster Dr & Jonesboro Rd

Future No-Build (2020) AM

1/26/2016



Lane Group	EBL	EBT	WBL	WBT	WBR	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	258	873	411	1270	152	132	69	224
Future Volume (vph)	258	873	411	1270	152	132	69	224
Lane Group Flow (vph)	304	1069	447	1337	262	189	75	291
Turn Type	pm+pt	NA	Prot	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	1	6			4	
Permitted Phases	2				6	4		4
Detector Phase	5	2	1	6	6	4	4	4
Switch Phase								
Minimum Initial (s)	5.0	15.0	5.0	15.0	15.0	6.0	6.0	6.0
Minimum Split (s)	11.0	24.0	11.0	34.0	34.0	33.0	33.0	33.0
Total Split (s)	34.0	56.0	51.0	73.0	73.0	33.0	33.0	33.0
Total Split (%)	24.3%	40.0%	36.4%	52.1%	52.1%	23.6%	23.6%	23.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag			
Lead-Lag Optimize?								
Recall Mode	None	C-Min	None	C-Min	C-Min	None	None	None
v/c Ratio	0.76	0.69	0.89	0.66	0.27	0.74	0.28	0.61
Control Delay	32.6	32.2	74.5	14.4	3.9	73.7	54.2	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.6	32.2	74.5	14.4	3.9	73.7	54.2	11.0
Queue Length 50th (ft)	106	280	329	322	8	167	62	0
Queue Length 95th (ft)	160	510	471	591	35	180	106	32
Internal Link Dist (ft)		855		1103			376	
Turn Bay Length (ft)	275		315		125			215
Base Capacity (vph)	486	1552	568	2036	957	341	359	540
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	0.63	0.69	0.79	0.66	0.27	0.55	0.21	0.54

Intersection Summary

Cycle Length: 140

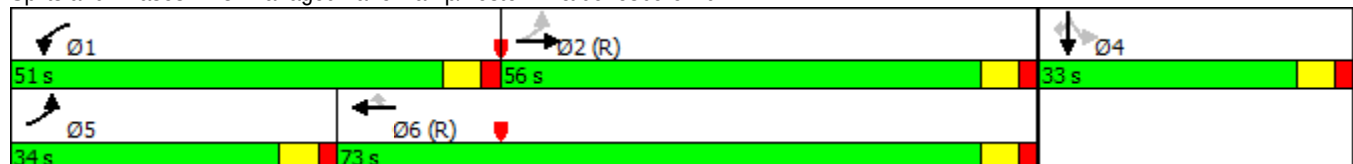
Actuated Cycle Length: 140

Offset: 128 (91%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Splits and Phases: 3: Managed Lane Ramp/Foster Dr & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

3: Managed Lane Ramp/Foster Dr & Jonesboro Rd

Future No-Build (2020) AM

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	258	873	91	411	1270	152	0	0	0	132	69	224
Future Volume (vph)	258	873	91	411	1270	152	0	0	0	132	69	224
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0				6.0	6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00				1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85				1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00				0.95	1.00	1.00
Satd. Flow (prot)	1770	3490		1770	3539	1583				1770	1863	1583
Flt Permitted	0.16	1.00		0.95	1.00	1.00				0.95	1.00	1.00
Satd. Flow (perm)	297	3490		1770	3539	1583				1770	1863	1583
Peak-hour factor, PHF	0.85	0.90	0.92	0.92	0.95	0.58	0.92	0.92	0.92	0.70	0.92	0.77
Adj. Flow (vph)	304	970	99	447	1337	262	0	0	0	189	75	291
RTOR Reduction (vph)	0	5	0	0	0	47	0	0	0	0	0	249
Lane Group Flow (vph)	304	1064	0	447	1337	215	0	0	0	189	75	42
Turn Type	pm+pt	NA		Prot	NA	Perm				Perm	NA	Perm
Protected Phases	5	2		1	6						4	
Permitted Phases	2					6				4		4
Actuated Green, G (s)	83.2	62.1		39.6	80.6	80.6				20.3	20.3	20.3
Effective Green, g (s)	83.2	62.1		39.6	80.6	80.6				20.3	20.3	20.3
Actuated g/C Ratio	0.59	0.44		0.28	0.58	0.58				0.15	0.15	0.15
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0				6.0	6.0	6.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0	5.0				3.0	3.0	3.0
Lane Grp Cap (vph)	398	1548		500	2037	911				256	270	229
v/s Ratio Prot	0.11	0.30		c0.25	0.38						0.04	
v/s Ratio Perm	c0.34					0.14				c0.11		0.03
v/c Ratio	0.76	0.69		0.89	0.66	0.24				0.74	0.28	0.18
Uniform Delay, d1	17.8	31.2		48.2	20.3	14.6				57.3	53.3	52.6
Progression Factor	0.80	0.90		1.20	0.58	0.33				1.00	1.00	1.00
Incremental Delay, d2	7.8	2.3		15.0	1.3	0.5				10.6	0.6	0.4
Delay (s)	22.0	30.3		72.7	13.0	5.3				67.9	53.9	53.0
Level of Service	C	C		E	B	A				E	D	D
Approach Delay (s)		28.5			25.0			0.0			58.2	
Approach LOS		C			C			A			E	
Intersection Summary												
HCM 2000 Control Delay			30.8				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			140.0				Sum of lost time (s)			18.0		
Intersection Capacity Utilization			72.1%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

4: N Bridges Rd/Bojangles Drwy & Jonesboro Rd

Future No-Build (2020) AM

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	47	932	3	1	1811	29	0	0	0	12	0	47
Future Volume (Veh/h)	47	932	3	1	1811	29	0	0	0	12	0	47
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.75	0.89	0.75	0.25	0.95	0.78	0.92	0.92	0.92	0.69	0.92	0.86
Hourly flow rate (vph)	63	1047	4	4	1906	37	0	0	0	17	0	55
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)	6											
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	1183											
pX, platoon unblocked				0.78			0.78			0.78		
vC, conflicting volume	1943			1047			2134			3124		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1943			488			1886			3159		
tC, single (s)	4.1			4.1			7.5			6.5		
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5			4.0		
p0 queue free %	79			100			100			100		
cM capacity (veh/h)	298			833			22			6		
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1		
Volume Total	63	524	524	4	4	953	953	37	0	72		
Volume Left	63	0	0	0	4	0	0	0	0	17		
Volume Right	0	0	0	4	0	0	0	37	0	55		
cSH	298	1700	1700	1700	833	1700	1700	1700	1700	45		
Volume to Capacity	0.21	0.31	0.31	0.00	0.00	0.56	0.56	0.02	0.00	1.61		
Queue Length 95th (ft)	20	0	0	0	0	0	0	0	0	179		
Control Delay (s)	20.3	0.0	0.0	0.0	9.3	0.0	0.0	0.0	0.0	253.5		
Lane LOS	C				A				A	F		
Approach Delay (s)	1.1				0.0				0.0	253.5		
Approach LOS									A	F		
Intersection Summary												
Average Delay	6.2											
Intersection Capacity Utilization	60.1%			ICU Level of Service			B					
Analysis Period (min)	15											

Queues
5: Mt Carmel Rd & Jonesboro Rd

Future No-Build (2020) AM

1/26/2016

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↗
Traffic Volume (vph)	927	38	121	1854	1	117
Future Volume (vph)	927	38	121	1854	1	117
Lane Group Flow (vph)	1042	51	170	2015	4	175
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	3	
Permitted Phases		2	6			3
Detector Phase	2	2	1	6	3	3
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	11.0	24.0	24.0	24.0
Total Split (s)	94.0	94.0	20.0	114.0	26.0	26.0
Total Split (%)	67.1%	67.1%	14.3%	81.4%	18.6%	18.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Recall Mode	C-Min	C-Min	None	C-Min	None	None
v/c Ratio	0.40	0.04	0.36	0.66	0.04	0.69
Control Delay	1.1	0.1	1.1	2.3	60.0	22.7
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay	1.1	0.1	1.1	2.5	60.0	22.7
Queue Length 50th (ft)	26	1	5	42	4	0
Queue Length 95th (ft)	7	m0	m10	m77	4	14
Internal Link Dist (ft)	2065			797	3235	
Turn Bay Length (ft)		250	300		100	
Base Capacity (vph)	2627	1188	508	3035	252	376
Starvation Cap Reductn	0	0	0	289	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.04	0.33	0.73	0.02	0.47

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 89 (64%), Referenced to phase 2:EBTU and 6:WBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Mt Carmel Rd & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

5: Mt Carmel Rd & Jonesboro Rd

Future No-Build (2020) AM

1/26/2016



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰	↑↑	↱	↰	↑↑	↱	↱
Traffic Volume (vph)	0	927	38	121	1854	1	117
Future Volume (vph)	0	927	38	121	1854	1	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	1.00
Frt		1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)		3539	1583	1770	3539	1770	1583
Flt Permitted		1.00	1.00	0.24	1.00	0.95	1.00
Satd. Flow (perm)		3539	1583	438	3539	1770	1583
Peak-hour factor, PHF	0.92	0.89	0.75	0.71	0.92	0.25	0.67
Adj. Flow (vph)	0	1042	51	170	2015	4	175
RTOR Reduction (vph)	0	0	13	0	0	0	165
Lane Group Flow (vph)	0	1042	38	170	2015	4	10
Turn Type	Perm	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases		2		1	6	3	
Permitted Phases	2		2	6			3
Actuated Green, G (s)		103.9	103.9	120.1	120.1	7.9	7.9
Effective Green, g (s)		103.9	103.9	120.1	120.1	7.9	7.9
Actuated g/C Ratio		0.74	0.74	0.86	0.86	0.06	0.06
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		2626	1174	472	3035	99	89
v/s Ratio Prot		0.29		0.03	c0.57	0.00	
v/s Ratio Perm			0.02	0.28			c0.01
v/c Ratio		0.40	0.03	0.36	0.66	0.04	0.11
Uniform Delay, d1		6.6	4.8	2.9	3.3	62.5	62.7
Progression Factor		0.11	0.00	0.52	0.59	1.00	1.00
Incremental Delay, d2		0.3	0.0	0.0	0.1	0.2	0.6
Delay (s)		1.0	0.1	1.6	2.0	62.6	63.3
Level of Service		A	A	A	A	E	E
Approach Delay (s)		1.0			2.0	63.3	
Approach LOS		A			A	E	

Intersection Summary

HCM 2000 Control Delay	4.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	74.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Queues
6: Willow Lane/Oak Grove Rd & Jonesboro Rd

Future No-Build (2020) AM

1/26/2016

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	50	739	228	22	1634	47	255	163	33	95	230
Future Volume (vph)	50	739	228	22	1634	47	255	163	33	95	230
Lane Group Flow (vph)	83	830	275	33	1857	76	293	236	47	122	340
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases	5	2		1	6			8			4
Permitted Phases	2		2	6		6	8		8	4	
Detector Phase	5	2	2	1	6	6	8	8	8	4	4
Switch Phase											
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	11.0	26.0	26.0	11.0	36.0	36.0	46.0	46.0	46.0	44.0	44.0
Total Split (s)	11.0	73.0	73.0	11.0	73.0	73.0	56.0	56.0	56.0	56.0	56.0
Total Split (%)	7.9%	52.1%	52.1%	7.9%	52.1%	52.1%	40.0%	40.0%	40.0%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
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	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag					
Lead-Lag Optimize?											
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None
v/c Ratio	0.72	0.46	0.30	0.11	1.10	0.10	1.13	0.35	0.08	0.35	0.52
Control Delay	65.7	16.0	3.7	10.0	80.5	1.6	137.2	35.1	3.0	36.8	37.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.7	16.0	3.7	10.0	80.5	1.6	137.2	35.1	3.0	36.8	37.8
Queue Length 50th (ft)	35	131	9	7	~1008	6	~309	158	0	81	235
Queue Length 95th (ft)	55	181	35	m9	#1103	2	#471	169	2	118	320
Internal Link Dist (ft)		797			4515			905			451
Turn Bay Length (ft)	300		150	300		250	300		400	135	
Base Capacity (vph)	116	1804	913	298	1693	794	259	665	610	345	650
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	0.72	0.46	0.30	0.11	1.10	0.10	1.13	0.35	0.08	0.35	0.52

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 26 (19%), 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.

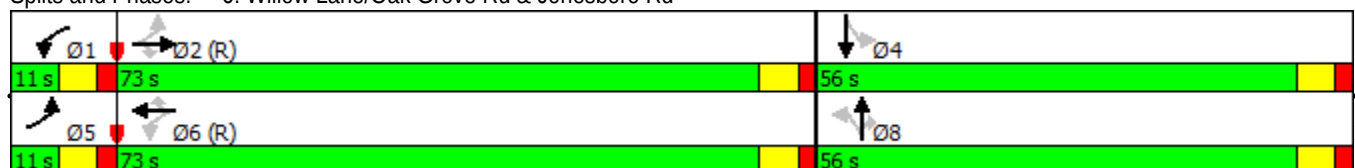
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 6: Willow Lane/Oak Grove Rd & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

6: Willow Lane/Oak Grove Rd & Jonesboro Rd

Future No-Build (2020) AM

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	739	228	22	1634	47	255	163	33	95	230	57
Future Volume (vph)	50	739	228	22	1634	47	255	163	33	95	230	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1800	1800
Flt Permitted	0.06	1.00	1.00	0.26	1.00	1.00	0.39	1.00	1.00	0.52	1.00	1.00
Satd. Flow (perm)	108	3539	1583	493	3539	1583	726	1863	1583	967	1800	1800
Peak-hour factor, PHF	0.60	0.89	0.83	0.66	0.88	0.62	0.87	0.69	0.70	0.78	0.87	0.75
Adj. Flow (vph)	83	830	275	33	1857	76	293	236	47	122	264	76
RTOR Reduction (vph)	0	0	110	0	0	37	0	0	30	0	8	0
Lane Group Flow (vph)	83	830	165	33	1857	40	293	236	17	122	332	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	NA
Protected Phases	5	2		1	6			8				4
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)	74.0	69.0	69.0	70.0	67.0	67.0	50.0	50.0	50.0	50.0	50.0	50.0
Effective Green, g (s)	74.0	69.0	69.0	70.0	67.0	67.0	50.0	50.0	50.0	50.0	50.0	50.0
Actuated g/C Ratio	0.53	0.49	0.49	0.50	0.48	0.48	0.36	0.36	0.36	0.36	0.36	0.36
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	116	1744	780	273	1693	757	259	665	565	345	642	642
v/s Ratio Prot	c0.03	0.23		0.00	c0.52			0.13			0.18	
v/s Ratio Perm	0.35		0.10	0.06		0.02	c0.40		0.01	0.13		
v/c Ratio	0.72	0.48	0.21	0.12	1.10	0.05	1.13	0.35	0.03	0.35	0.52	
Uniform Delay, d1	32.1	23.5	20.1	18.7	36.5	19.5	45.0	33.1	29.2	33.1	35.5	
Progression Factor	1.86	0.66	0.56	0.67	0.81	0.27	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	17.7	0.9	0.6	0.1	50.9	0.1	95.9	0.3	0.0	0.6	0.7	
Delay (s)	77.3	16.5	11.9	12.6	80.6	5.5	140.9	33.5	29.3	33.7	36.2	
Level of Service	E	B	B	B	F	A	F	C	C	C	D	
Approach Delay (s)		19.7			76.6			87.8			35.5	
Approach LOS		B			E			F			D	
Intersection Summary												
HCM 2000 Control Delay			57.5									
HCM 2000 Volume to Capacity ratio			1.09									
Actuated Cycle Length (s)			140.0									
Intersection Capacity Utilization			89.9%									
Analysis Period (min)			15									
c Critical Lane Group												

Queues
7: Kelly Rd & Jonesboro Rd

Future No-Build (2020) AM

1/26/2016

	→	↘	↙	←	↖
Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations	↑↑	↑	↘	↑↑	↘
Traffic Volume (vph)	843	69	110	1620	109
Future Volume (vph)	843	69	110	1620	109
Lane Group Flow (vph)	916	87	159	1906	218
Turn Type	NA	Perm	pm+pt	NA	Perm
Protected Phases	2		1	6	
Permitted Phases		2	6		8
Detector Phase	2	2	1	6	8
Switch Phase					
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0
Minimum Split (s)	29.0	29.0	11.0	24.0	42.0
Total Split (s)	82.0	82.0	16.0	98.0	42.0
Total Split (%)	58.6%	58.6%	11.4%	70.0%	30.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead		
Lead-Lag Optimize?					
Recall Mode	C-Min	C-Min	None	C-Min	None
v/c Ratio	0.40	0.08	0.35	0.71	0.77
Control Delay	3.6	0.3	7.4	11.6	69.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.6	0.3	7.4	11.6	69.0
Queue Length 50th (ft)	22	0	34	420	177
Queue Length 95th (ft)	208	0	50	552	208
Internal Link Dist (ft)	4515			773	731
Turn Bay Length (ft)		315	300		
Base Capacity (vph)	2285	1052	450	2685	455
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.40	0.08	0.35	0.71	0.48

Intersection Summary

Cycle Length: 140

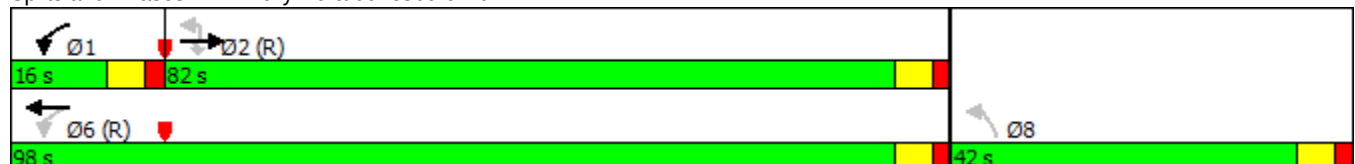
Actuated Cycle Length: 140

Offset: 108 (77%), Referenced to phase 2:EBTU and 6:WBTL, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

Splits and Phases: 7: Kelly Rd & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

7: Kelly Rd & Jonesboro Rd

Future No-Build (2020) AM

1/26/2016



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰	↷	↰	↰	↷	↰	↰
Traffic Volume (vph)	0	843	69	110	1620	109	59
Future Volume (vph)	0	843	69	110	1620	109	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	
Frt		1.00	0.85	1.00	1.00	0.95	
Flt Protected		1.00	1.00	0.95	1.00	0.97	
Satd. Flow (prot)		3539	1583	1770	3539	1719	
Flt Permitted		1.00	1.00	0.25	1.00	0.97	
Satd. Flow (perm)		3539	1583	471	3539	1719	
Peak-hour factor, PHF	0.92	0.92	0.79	0.69	0.85	0.77	0.78
Adj. Flow (vph)	0	916	87	159	1906	142	76
RTOR Reduction (vph)	0	0	31	0	0	16	0
Lane Group Flow (vph)	0	916	56	159	1906	202	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	
Protected Phases		2		1	6		
Permitted Phases	2		2	6		8	
Actuated Green, G (s)		90.4	90.4	106.2	106.2	21.8	
Effective Green, g (s)		90.4	90.4	106.2	106.2	21.8	
Actuated g/C Ratio		0.65	0.65	0.76	0.76	0.16	
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)		5.0	5.0	3.0	5.0	3.0	
Lane Grp Cap (vph)		2285	1022	448	2684	267	
v/s Ratio Prot		0.26		0.02	c0.54		
v/s Ratio Perm			0.04	0.24		c0.12	
v/c Ratio		0.40	0.05	0.35	0.71	0.76	
Uniform Delay, d1		11.9	9.1	6.1	8.8	56.6	
Progression Factor		0.24	0.08	1.00	1.00	1.00	
Incremental Delay, d2		0.5	0.1	0.5	1.6	11.6	
Delay (s)		3.4	0.9	6.6	10.5	68.1	
Level of Service		A	A	A	B	E	
Approach Delay (s)		3.2			10.2	68.1	
Approach LOS		A			B	E	
Intersection Summary							
HCM 2000 Control Delay		11.9		HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio		0.75					
Actuated Cycle Length (s)		140.0		Sum of lost time (s)		18.0	
Intersection Capacity Utilization		81.9%		ICU Level of Service		D	
Analysis Period (min)		15					
c Critical Lane Group							

HCM Unsignalized Intersection Capacity Analysis 8: Sterling Pl/N Bridges Rd & Mt Carmel Rd

Future No-Build (2020) AM
1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	100	0	39	100	0	0	0	3	0	0	0
Future Volume (Veh/h)	0	100	0	39	100	0	0	0	3	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.77	0.92	0.92	0.92	0.92	0.38	0.92	0.92	0.92
Hourly flow rate (vph)	0	109	0	51	109	0	0	0	8	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	109			109			320	320	109	328	320	109
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	109			109			320	320	109	328	320	109
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			100	100	99	100	100	100
cM capacity (veh/h)	1481			1481			616	576	945	604	576	945
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	109	160	8	0								
Volume Left	0	51	0	0								
Volume Right	0	0	8	0								
cSH	1481	1481	945	1700								
Volume to Capacity	0.00	0.03	0.01	0.00								
Queue Length 95th (ft)	0	3	1	0								
Control Delay (s)	0.0	2.6	8.8	0.0								
Lane LOS		A	A	A								
Approach Delay (s)	0.0	2.6	8.8	0.0								
Approach LOS			A	A								
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization			24.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 9: Mill Road & Mt Carmel Rd

Future No-Build (2020) AM

1/26/2016

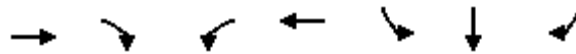
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	178	117	62	67	56	23	27	297	51	24	353	57
Future Volume (vph)	178	117	62	67	56	23	27	297	51	24	353	57
Peak Hour Factor	0.85	0.85	0.85	0.73	0.73	0.73	0.89	0.89	0.89	0.91	0.91	0.91
Hourly flow rate (vph)	209	138	73	92	77	32	30	334	57	26	388	63
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	420	201	421	477								
Volume Left (vph)	209	92	30	26								
Volume Right (vph)	73	32	57	63								
Hadj (s)	0.03	0.03	-0.03	-0.03								
Departure Headway (s)	8.3	9.4	8.2	8.3								
Degree Utilization, x	0.97	0.52	0.96	1.00								
Capacity (veh/h)	420	365	433	477								
Control Delay (s)	64.1	22.3	63.0	72.4								
Approach Delay (s)	64.1	22.3	63.0	72.4								
Approach LOS	F	C	F	F								
Intersection Summary												
Delay			60.9									
Level of Service			F									
Intersection Capacity Utilization			61.2%	ICU Level of Service					B			
Analysis Period (min)			15									

Queues

Future No-Build (2020) PM

1/26/2016

1: I-75 SB Ramps & Jonesboro Rd



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations	↑↑	↑	↵	↑↑	↵	↑	↑
Traffic Volume (vph)	1462	198	60	1271	163	1	217
Future Volume (vph)	1462	198	60	1271	163	1	217
Lane Group Flow (vph)	1539	218	70	1382	109	109	310
Turn Type	NA	Perm	pm+pt	NA	Perm	NA	Perm
Protected Phases	2		1	6		4	
Permitted Phases		2	6		4		4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0	6.0	6.0
Minimum Split (s)	24.0	24.0	11.0	24.0	24.0	24.0	24.0
Total Split (s)	92.0	92.0	13.0	105.0	45.0	45.0	45.0
Total Split (%)	61.3%	61.3%	8.7%	70.0%	30.0%	30.0%	30.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?							
Recall Mode	C-Min	C-Min	None	C-Min	None	None	None
v/c Ratio	0.66	0.20	0.34	0.54	0.33	0.33	0.86
Control Delay	19.4	2.1	7.1	3.3	53.0	52.9	67.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.4	2.1	7.1	3.3	53.0	52.9	67.2
Queue Length 50th (ft)	481	0	5	139	97	97	237
Queue Length 95th (ft)	670	36	m17	6	123	37	223
Internal Link Dist (ft)	520			890		860	
Turn Bay Length (ft)		415	635		430		700
Base Capacity (vph)	2324	1114	205	2569	437	438	461
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	0.66	0.20	0.34	0.54	0.25	0.25	0.67

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 40 (27%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

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

Splits and Phases: 1: I-75 SB Ramps & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

Future No-Build (2020) PM

1: I-75 SB Ramps & Jonesboro Rd

1/26/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑					↑	↑	↑
Traffic Volume (vph)	0	1462	198	60	1271	0	0	0	0	163	1	217
Future Volume (vph)	0	1462	198	60	1271	0	0	0	0	163	1	217
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.95	1.00	1.00	0.95					0.95	0.95	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		3539	1583	1770	3539					1681	1688	1583
Flt Permitted		1.00	1.00	0.10	1.00					0.95	0.95	1.00
Satd. Flow (perm)		3539	1583	181	3539					1681	1688	1583
Peak-hour factor, PHF	0.92	0.95	0.91	0.86	0.92	0.92	0.92	0.92	0.92	0.76	0.25	0.70
Adj. Flow (vph)	0	1539	218	70	1382	0	0	0	0	214	4	310
RTOR Reduction (vph)	0	0	77	0	0	0	0	0	0	0	0	54
Lane Group Flow (vph)	0	1539	141	70	1382	0	0	0	0	109	109	256
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)		97.3	97.3	108.9	108.9					29.1	29.1	29.1
Effective Green, g (s)		97.3	97.3	108.9	108.9					29.1	29.1	29.1
Actuated g/C Ratio		0.65	0.65	0.73	0.73					0.19	0.19	0.19
Clearance Time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	3.0	5.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2295	1026	190	2569					326	327	307
v/s Ratio Prot		c0.43		0.01	c0.39							
v/s Ratio Perm			0.09	0.25						0.06	0.06	c0.16
v/c Ratio		0.67	0.14	0.37	0.54					0.33	0.33	0.83
Uniform Delay, d1		16.4	10.2	13.9	9.2					52.1	52.1	58.1
Progression Factor		1.00	1.00	0.46	0.26					1.00	1.00	1.00
Incremental Delay, d2		1.6	0.3	1.0	0.7					0.6	0.6	17.4
Delay (s)		18.0	10.4	7.4	3.1					52.7	52.7	75.5
Level of Service		B	B	A	A					D	D	E
Approach Delay (s)		17.0			3.3			0.0			66.1	
Approach LOS		B			A			A			E	

Intersection Summary

HCM 2000 Control Delay	18.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	73.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Queues

Future No-Build (2020) PM

2: I-75 NB Ramps & Jonesboro Rd

1/26/2016



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations							
Traffic Volume (vph)	371	1281	1052	503	255	1	114
Future Volume (vph)	371	1281	1052	503	255	1	114
Lane Group Flow (vph)	458	1408	1131	553	144	143	144
Turn Type	pm+pt	NA	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	6			8	
Permitted Phases	2			6	8		8
Detector Phase	5	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	15.0	15.0	15.0	6.0	6.0	6.0
Minimum Split (s)	11.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	52.0	122.0	70.0	70.0	28.0	28.0	28.0
Total Split (%)	34.7%	81.3%	46.7%	46.7%	18.7%	18.7%	18.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?							
Recall Mode	None	C-Min	C-Min	C-Min	None	None	None
v/c Ratio	0.81	0.50	0.60	0.51	0.73	0.73	0.53
Control Delay	33.0	10.6	11.2	1.8	84.9	84.0	29.0
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Total Delay	33.0	10.8	11.2	1.8	84.9	84.0	29.0
Queue Length 50th (ft)	304	296	129	9	145	144	42
Queue Length 95th (ft)	398	561	171	m9	222	55	85
Internal Link Dist (ft)		890	855			694	
Turn Bay Length (ft)	675			390	285		350
Base Capacity (vph)	681	2841	1888	1075	246	247	314
Starvation Cap Reductn	0	629	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	0.67	0.64	0.60	0.51	0.59	0.58	0.46

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

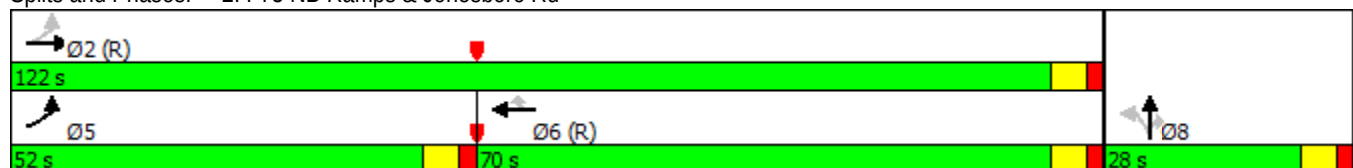
Offset: 8 (5%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

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

Splits and Phases: 2: I-75 NB Ramps & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

2: I-75 NB Ramps & Jonesboro Rd

Future No-Build (2020) PM

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	371	1281	0	0	1052	503	255	1	114	0	0	0
Future Volume (vph)	371	1281	0	0	1052	503	255	1	114	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	1770	3539			3539	1583	1681	1688	1583			
Flt Permitted	0.15	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	280	3539			3539	1583	1681	1688	1583			
Peak-hour factor, PHF	0.81	0.91	0.92	0.92	0.93	0.91	0.90	0.25	0.79	0.92	0.92	0.92
Adj. Flow (vph)	458	1408	0	0	1131	553	283	4	144	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	231	0	0	86	0	0	0
Lane Group Flow (vph)	458	1408	0	0	1131	322	144	143	58	0	0	0
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Actuated Green, G (s)	120.4	120.4			80.0	80.0	17.6	17.6	17.6			
Effective Green, g (s)	120.4	120.4			80.0	80.0	17.6	17.6	17.6			
Actuated g/C Ratio	0.80	0.80			0.53	0.53	0.12	0.12	0.12			
Clearance Time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Vehicle Extension (s)	3.0	5.0			5.0	5.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	566	2840			1887	844	197	198	185			
v/s Ratio Prot	c0.19	0.40			0.32							
v/s Ratio Perm	c0.46					0.20	c0.09	0.08	0.04			
v/c Ratio	0.81	0.50			0.60	0.38	0.73	0.72	0.32			
Uniform Delay, d1	29.8	4.9			24.0	20.5	63.9	63.8	60.7			
Progression Factor	0.99	1.94			0.38	0.12	1.00	1.00	1.00			
Incremental Delay, d2	7.0	0.5			1.1	1.0	13.0	12.2	1.0			
Delay (s)	36.5	9.9			10.2	3.5	77.0	76.1	61.7			
Level of Service	D	A			B	A	E	E	E			
Approach Delay (s)		16.4			8.0			71.6			0.0	
Approach LOS		B			A			E			A	
Intersection Summary												
HCM 2000 Control Delay		18.8			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.82										
Actuated Cycle Length (s)		150.0			Sum of lost time (s)			18.0				
Intersection Capacity Utilization		73.8%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

Queues

Future No-Build (2020) PM

3: Managed Lane Ramp/Foster Dr & Jonesboro Rd

1/26/2016



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBR	Ø1
Lane Configurations										
Traffic Volume (vph)	349	1034	1080	86	133	100	597	106	105	
Future Volume (vph)	349	1034	1080	86	133	100	597	106	105	
Lane Group Flow (vph)	453	1088	1125	101	145	109	649	118	122	
Turn Type	pm+pt	NA	NA	Perm	Perm	NA	Perm	Prot	Perm	
Protected Phases	5	2	6			8		7		1
Permitted Phases	2			6	8		8		7	
Detector Phase	5	2	6	6	8	8	8	7	7	
Switch Phase										
Minimum Initial (s)	5.0	15.0	15.0	15.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	24.0	34.0	34.0	24.0	24.0	24.0	33.0	33.0	11.0
Total Split (s)	39.0	82.0	54.0	54.0	24.0	24.0	24.0	33.0	33.0	11.0
Total Split (%)	26.0%	54.7%	36.0%	36.0%	16.0%	16.0%	16.0%	22.0%	22.0%	7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
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	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?										
Recall Mode	None	C-Min	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	1.03	0.50	0.88	0.15	0.52	0.37	0.85	0.66	0.41	
Control Delay	89.0	15.0	37.4	0.6	64.7	59.9	35.5	81.1	7.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	89.0	15.0	37.4	0.6	64.7	59.9	35.5	81.1	7.7	
Queue Length 50th (ft)	~413	346	562	0	128	94	146	113	0	
Queue Length 95th (ft)	#479	172	#727	0	207	160	236	176	24	
Internal Link Dist (ft)		855	1103			793				
Turn Bay Length (ft)	275			125	175		150		215	
Base Capacity (vph)	438	2197	1277	669	281	296	768	318	410	
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	1.03	0.50	0.88	0.15	0.52	0.37	0.85	0.37	0.30	

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

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

Natural Cycle: 145

Control Type: Actuated-Coordinated

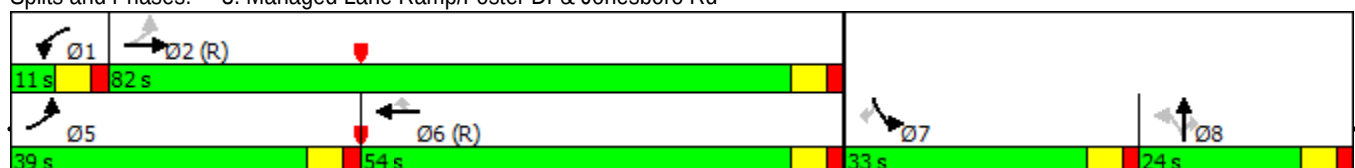
~ Volume exceeds capacity, queue is theoretically infinite.

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: 3: Managed Lane Ramp/Foster Dr & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

3: Managed Lane Ramp/Foster Dr & Jonesboro Rd

Future No-Build (2020) PM

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	349	1034	0	0	1080	86	133	100	597	106	0	105
Future Volume (vph)	349	1034	0	0	1080	86	133	100	597	106	0	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0	6.0		6.0
Lane Util. Factor	1.00	0.95			0.95	1.00	1.00	1.00	0.88	1.00		1.00
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00	0.95		1.00
Satd. Flow (prot)	1770	3539			3539	1583	1770	1863	2787	1770		1583
Flt Permitted	0.07	1.00			1.00	1.00	0.95	1.00	1.00	0.95		1.00
Satd. Flow (perm)	124	3539			3539	1583	1770	1863	2787	1770		1583
Peak-hour factor, PHF	0.77	0.95	0.92	0.92	0.96	0.85	0.92	0.92	0.92	0.90	0.92	0.86
Adj. Flow (vph)	453	1088	0	0	1125	101	145	109	649	118	0	122
RTOR Reduction (vph)	0	0	0	0	0	65	0	0	326	0	0	110
Lane Group Flow (vph)	453	1088	0	0	1125	36	145	109	323	118	0	12
Turn Type	pm+pt	NA		Prot	NA	Perm	Perm	NA	Perm	Prot		Perm
Protected Phases	5	2		1	6			8		7		
Permitted Phases	2					6	8		8			7
Actuated Green, G (s)	93.2	93.2			54.2	54.2	23.5	23.5	23.5	15.3		15.3
Effective Green, g (s)	93.2	93.2			54.2	54.2	23.5	23.5	23.5	15.3		15.3
Actuated g/C Ratio	0.62	0.62			0.36	0.36	0.16	0.16	0.16	0.10		0.10
Clearance Time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0	6.0		6.0
Vehicle Extension (s)	3.0	5.0			5.0	5.0	3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	439	2198			1278	571	277	291	436	180		161
v/s Ratio Prot	c0.23	0.31			0.32			0.06		c0.07		
v/s Ratio Perm	c0.41					0.02	0.08		c0.12			0.01
v/c Ratio	1.03	0.49			0.88	0.06	0.52	0.37	0.74	0.66		0.08
Uniform Delay, d1	49.5	15.5			44.9	31.3	58.1	56.7	60.3	64.8		61.0
Progression Factor	0.86	0.86			0.61	0.17	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	48.8	0.7			8.4	0.2	1.8	0.8	6.5	8.3		0.2
Delay (s)	91.1	14.0			35.7	5.6	59.9	57.5	66.8	73.1		61.2
Level of Service	F	B			D	A	E	E	E	E		E
Approach Delay (s)		36.7			33.2			64.6			67.0	
Approach LOS		D			C			E			E	
Intersection Summary												
HCM 2000 Control Delay			43.9		HCM 2000 Level of Service					D		
HCM 2000 Volume to Capacity ratio			0.95									
Actuated Cycle Length (s)			150.0		Sum of lost time (s)					24.0		
Intersection Capacity Utilization			78.2%		ICU Level of Service					D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

4: N Bridges Rd/Bojangles Drwy & Jonesboro Rd

Future No-Build (2020) PM

1/26/2016

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Traffic Volume (veh/h)	24	1698	3	2	1171	20	0	0	3	21	0	24		
Future Volume (Veh/h)	24	1698	3	2	1171	20	0	0	3	21	0	24		
Sign Control	Free				Free				Stop		Stop			
Grade	0%				0%				0%		0%			
Peak Hour Factor	0.52	0.96	0.38	0.50	0.91	0.59	0.92	0.92	0.38	0.83	0.92	0.82		
Hourly flow rate (vph)	46	1769	8	4	1287	34	0	0	8	25	0	29		
Pedestrians														
Lane Width (ft)														
Walking Speed (ft/s)														
Percent Blockage														
Right turn flare (veh)														
Median type	None			None										
Median storage (veh)														
Upstream signal (ft)	1183													
pX, platoon unblocked				0.83			0.83			0.83	0.83	0.83		
vC, conflicting volume	1321				1769				2512	3190	884	2272	3156	644
vC1, stage 1 conf vol														
vC2, stage 2 conf vol														
vCu, unblocked vol	1321				1522				2415	3228	459	2125	3187	644
tC, single (s)	4.1				4.1				7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)														
tF (s)	2.2				2.2				3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	91				99				100	100	98	0	100	93
cM capacity (veh/h)	519				362				12	7	457	21	8	416
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1				
Volume Total	46	884	884	8	4	644	644	34	8	54				
Volume Left	46	0	0	0	4	0	0	0	0	25				
Volume Right	0	0	0	8	0	0	0	34	8	29				
cSH	519	1700	1700	1700	362	1700	1700	1700	457	44				
Volume to Capacity	0.09	0.52	0.52	0.00	0.01	0.38	0.38	0.02	0.02	1.24				
Queue Length 95th (ft)	7	0	0	0	1	0	0	0	1	130				
Control Delay (s)	12.6	0.0	0.0	0.0	15.1	0.0	0.0	0.0	13.0	361.1				
Lane LOS	B				C						B	F		
Approach Delay (s)	0.3				0.0						13.0	361.1		
Approach LOS										B	F			
Intersection Summary														
Average Delay				6.3										
Intersection Capacity Utilization				62.9%			ICU Level of Service			B				
Analysis Period (min)				15										

Queues
5: Mt Carmel Rd & Jonesboro Rd

Future No-Build (2020) PM

1/26/2016

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↑
Traffic Volume (vph)	1699	8	108	1146	19	120
Future Volume (vph)	1699	8	108	1146	19	120
Lane Group Flow (vph)	1827	16	270	1273	25	226
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	3	
Permitted Phases		2	6			3
Detector Phase	2	2	1	6	3	3
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	11.0	24.0	24.0	24.0
Total Split (s)	94.0	94.0	32.0	126.0	24.0	24.0
Total Split (%)	62.7%	62.7%	21.3%	84.0%	16.0%	16.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Recall Mode	C-Min	C-Min	None	C-Min	None	None
v/c Ratio	0.78	0.02	0.77	0.42	0.24	0.74
Control Delay	12.0	1.5	60.7	1.7	70.7	22.4
Queue Delay	0.3	0.0	0.0	0.2	0.0	3.7
Total Delay	12.3	1.5	60.7	1.8	70.7	26.1
Queue Length 50th (ft)	287	1	200	48	24	0
Queue Length 95th (ft)	393	m0	35	m39	45	0
Internal Link Dist (ft)	2065			797	3235	
Turn Bay Length (ft)		250	300		100	
Base Capacity (vph)	2346	1053	385	3044	212	388
Starvation Cap Reductn	0	0	0	801	0	0
Spillback Cap Reductn	122	0	0	0	0	92
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.02	0.70	0.57	0.12	0.76

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 136 (91%), Referenced to phase 2:EBTU and 6:WBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

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

Splits and Phases: 5: Mt Carmel Rd & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

5: Mt Carmel Rd & Jonesboro Rd

Future No-Build (2020) PM

1/26/2016



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰	↶↷	↰	↰	↶↷	↰	↰
Traffic Volume (vph)	0	1699	8	108	1146	19	120
Future Volume (vph)	0	1699	8	108	1146	19	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	1.00
Frt		1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)		3539	1583	1770	3539	1770	1583
Flt Permitted		1.00	1.00	0.06	1.00	0.95	1.00
Satd. Flow (perm)		3539	1583	104	3539	1770	1583
Peak-hour factor, PHF	0.92	0.93	0.50	0.40	0.90	0.75	0.53
Adj. Flow (vph)	0	1827	16	270	1273	25	226
RTOR Reduction (vph)	0	0	4	0	0	0	213
Lane Group Flow (vph)	0	1827	12	270	1273	25	13
Turn Type	Perm	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases		2		1	6	3	
Permitted Phases	2		2	6			3
Actuated Green, G (s)		99.5	99.5	129.1	129.1	8.9	8.9
Effective Green, g (s)		99.5	99.5	129.1	129.1	8.9	8.9
Actuated g/C Ratio		0.66	0.66	0.86	0.86	0.06	0.06
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		2347	1050	351	3045	105	93
v/s Ratio Prot		0.52		c0.12	0.36	c0.01	
v/s Ratio Perm			0.01	c0.54			0.01
v/c Ratio		0.78	0.01	0.77	0.42	0.24	0.14
Uniform Delay, d1		17.6	8.6	45.5	2.3	67.3	66.9
Progression Factor		0.50	0.22	1.30	0.52	1.00	1.00
Incremental Delay, d2		2.2	0.0	7.7	0.3	1.2	0.7
Delay (s)		11.0	1.9	66.8	1.5	68.5	67.7
Level of Service		B	A	E	A	E	E
Approach Delay (s)		10.9			12.9	67.7	
Approach LOS		B			B	E	

Intersection Summary

HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	72.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Queues

Future No-Build (2020) PM

6: Willow Lane/Oak Grove Rd & Jonesboro Rd

1/26/2016

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	41	1488	263	61	963	50	229	127	123	200	324
Future Volume (vph)	41	1488	263	61	963	50	229	127	123	200	324
Lane Group Flow (vph)	51	1566	302	113	1024	67	266	135	143	222	419
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases	5	2		1	6			8			4
Permitted Phases	2		2	6		6	8		8	4	
Detector Phase	5	2	2	1	6	6	8	8	8	4	4
Switch Phase											
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	11.0	26.0	26.0	11.0	36.0	36.0	46.0	46.0	46.0	44.0	44.0
Total Split (s)	11.0	71.0	71.0	12.0	72.0	72.0	67.0	67.0	67.0	67.0	67.0
Total Split (%)	7.3%	47.3%	47.3%	8.0%	48.0%	48.0%	44.7%	44.7%	44.7%	44.7%	44.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
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	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag					
Lead-Lag Optimize?											
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None
v/c Ratio	0.27	1.02	0.40	0.93	0.64	0.09	1.04	0.18	0.21	0.45	0.56
Control Delay	29.9	72.2	28.3	87.7	30.7	5.4	109.9	29.3	12.8	35.9	37.2
Queue Delay	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.9	73.9	28.3	87.7	30.7	5.4	109.9	29.3	12.8	35.9	37.2
Queue Length 50th (ft)	28	~843	122	62	430	11	~279	84	35	156	308
Queue Length 95th (ft)	m54	#981	310	45	507	28	#431	134	76	237	420
Internal Link Dist (ft)		797			4516			905			451
Turn Bay Length (ft)	300		150	300		250	300		400	135	
Base Capacity (vph)	189	1533	747	121	1609	754	256	757	694	497	744
Starvation Cap Reductn	0	8	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	0.27	1.03	0.40	0.93	0.64	0.09	1.04	0.18	0.21	0.45	0.56

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 89 (59%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 135

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

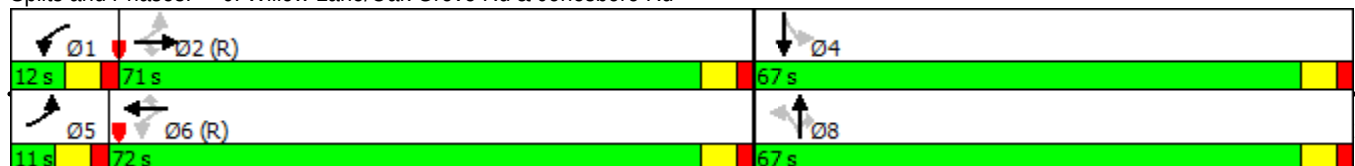
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 6: Willow Lane/Oak Grove Rd & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

6: Willow Lane/Oak Grove Rd & Jonesboro Rd

Future No-Build (2020) PM

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	1488	263	61	963	50	229	127	123	200	324	47
Future Volume (vph)	41	1488	263	61	963	50	229	127	123	200	324	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1821	1821
Flt Permitted	0.16	1.00	1.00	0.06	1.00	1.00	0.34	1.00	1.00	0.66	1.00	1.00
Satd. Flow (perm)	301	3539	1583	111	3539	1583	632	1863	1583	1224	1821	1821
Peak-hour factor, PHF	0.81	0.95	0.87	0.54	0.94	0.75	0.86	0.94	0.86	0.90	0.91	0.75
Adj. Flow (vph)	51	1566	302	113	1024	67	266	135	143	222	356	63
RTOR Reduction (vph)	0	0	62	0	0	36	0	0	50	0	4	0
Lane Group Flow (vph)	51	1566	240	113	1024	31	266	135	93	222	415	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	NA
Protected Phases	5	2		1	6			8				4
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)	69.0	65.0	65.0	73.0	67.0	67.0	61.0	61.0	61.0	61.0	61.0	61.0
Effective Green, g (s)	69.0	65.0	65.0	73.0	67.0	67.0	61.0	61.0	61.0	61.0	61.0	61.0
Actuated g/C Ratio	0.46	0.43	0.43	0.49	0.45	0.45	0.41	0.41	0.41	0.41	0.41	0.41
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	177	1533	685	120	1580	707	257	757	643	497	740	740
v/s Ratio Prot	0.01	c0.44		c0.04	0.29			0.07			0.23	
v/s Ratio Perm	0.12		0.15	0.42		0.02	c0.42		0.06	0.18		
v/c Ratio	0.29	1.02	0.35	0.94	0.65	0.04	1.04	0.18	0.14	0.45	0.56	
Uniform Delay, d1	25.3	42.5	28.4	35.8	32.3	23.4	44.5	28.5	28.0	32.3	34.2	
Progression Factor	1.48	1.17	1.50	0.78	0.90	0.92	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.6	23.9	0.9	60.5	1.9	0.1	65.5	0.1	0.1	0.6	1.0	
Delay (s)	38.1	73.8	43.6	88.4	31.0	21.7	110.0	28.6	28.1	32.9	35.2	
Level of Service	D	E	D	F	C	C	F	C	C	C	D	
Approach Delay (s)		68.1			35.8			68.3			34.4	
Approach LOS		E			D			E			C	
Intersection Summary												
HCM 2000 Control Delay			54.1				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			1.02									
Actuated Cycle Length (s)			150.0				Sum of lost time (s)			18.0		
Intersection Capacity Utilization			97.9%				ICU Level of Service			F		
Analysis Period (min)			15									
c Critical Lane Group												

Queues
7: Kelly Rd & Jonesboro Rd

Future No-Build (2020) PM

1/26/2016



Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations	↑↑	↑	↑	↑↑	↑↑
Traffic Volume (vph)	1739	91	153	989	105
Future Volume (vph)	1739	91	153	989	105
Lane Group Flow (vph)	1932	112	184	1111	269
Turn Type	NA	Perm	pm+pt	NA	Perm
Protected Phases	2		1	6	
Permitted Phases		2	6		8
Detector Phase	2	2	1	6	8
Switch Phase					
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0
Minimum Split (s)	29.0	29.0	11.0	24.0	42.0
Total Split (s)	91.0	91.0	17.0	108.0	42.0
Total Split (%)	60.7%	60.7%	11.3%	72.0%	28.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead		
Lead-Lag Optimize?					
Recall Mode	C-Min	C-Min	None	C-Min	None
v/c Ratio	0.87	0.11	1.02	0.42	0.82
Control Delay	11.0	0.1	114.8	8.4	71.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.0	0.1	114.8	8.4	71.1
Queue Length 50th (ft)	98	0	~139	193	225
Queue Length 95th (ft)	m972	m1	#269	285	278
Internal Link Dist (ft)	4516			773	731
Turn Bay Length (ft)		315	300		
Base Capacity (vph)	2229	1028	180	2630	432
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.87	0.11	1.02	0.42	0.62

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 10 (7%), Referenced to phase 2:EBTU and 6:WBTL, Start of Green

Natural Cycle: 135

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 7: Kelly Rd & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

7: Kelly Rd & Jonesboro Rd

Future No-Build (2020) PM

1/26/2016



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	⇐	⇑⇑	⇑	⇑	⇑⇑	⇑	
Traffic Volume (vph)	0	1739	91	153	989	105	121
Future Volume (vph)	0	1739	91	153	989	105	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	
Frt		1.00	0.85	1.00	1.00	0.93	
Flt Protected		1.00	1.00	0.95	1.00	0.98	
Satd. Flow (prot)		3539	1583	1770	3539	1690	
Flt Permitted		1.00	1.00	0.04	1.00	0.98	
Satd. Flow (perm)		3539	1583	74	3539	1690	
Peak-hour factor, PHF	0.92	0.90	0.81	0.83	0.89	0.83	0.85
Adj. Flow (vph)	0	1932	112	184	1111	127	142
RTOR Reduction (vph)	0	0	31	0	0	29	0
Lane Group Flow (vph)	0	1932	81	184	1111	240	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	
Protected Phases		2		1	6		
Permitted Phases	2		2	6		8	
Actuated Green, G (s)		94.5	94.5	111.5	111.5	26.5	
Effective Green, g (s)		94.5	94.5	111.5	111.5	26.5	
Actuated g/C Ratio		0.63	0.63	0.74	0.74	0.18	
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)		5.0	5.0	3.0	5.0	3.0	
Lane Grp Cap (vph)		2229	997	179	2630	298	
v/s Ratio Prot		0.55		c0.08	0.31		
v/s Ratio Perm			0.05	c0.69		c0.14	
v/c Ratio		0.87	0.08	1.03	0.42	0.81	
Uniform Delay, d1		22.6	10.8	53.3	7.2	59.3	
Progression Factor		0.31	0.01	1.00	1.00	1.00	
Incremental Delay, d2		2.5	0.1	74.8	0.5	14.6	
Delay (s)		9.7	0.2	128.1	7.7	73.9	
Level of Service		A	A	F	A	E	
Approach Delay (s)		9.1			24.8	73.9	
Approach LOS		A			C	E	
Intersection Summary							
HCM 2000 Control Delay			19.6		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			1.00				
Actuated Cycle Length (s)			150.0		Sum of lost time (s)		18.0
Intersection Capacity Utilization			84.8%		ICU Level of Service		E
Analysis Period (min)			15				
c Critical Lane Group							

HCM Unsignalized Intersection Capacity Analysis 8: Sterling Pl/N Bridges Rd & Mt Carmel Rd

Future No-Build (2020) PM
1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	100	0	20	100	1	0	0	41	0	0	1
Future Volume (Veh/h)	1	100	0	20	100	1	0	0	41	0	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.92	0.92	0.68	0.92	0.25	0.92	0.92	0.65	0.92	0.92	0.25
Hourly flow rate (vph)	4	109	0	29	109	4	0	0	63	0	0	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	113			109			290	288	109	349	286	111
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	113			109			290	288	109	349	286	111
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			100	100	93	100	100	100
cM capacity (veh/h)	1476			1481			648	608	945	556	610	942
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	113	142	63	4								
Volume Left	4	29	0	0								
Volume Right	0	4	63	4								
cSH	1476	1481	945	942								
Volume to Capacity	0.00	0.02	0.07	0.00								
Queue Length 95th (ft)	0	1	5	0								
Control Delay (s)	0.3	1.7	9.1	8.8								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.3	1.7	9.1	8.8								
Approach LOS			A	A								
Intersection Summary												
Average Delay			2.7									
Intersection Capacity Utilization			23.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 9: Mill Road & Mt Carmel Rd

Future No-Build (2020) PM

1/26/2016

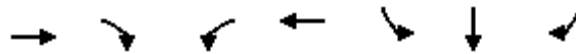
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	128	22	59	53	94	62	76	277	51	32	337	138
Future Volume (vph)	128	22	59	53	94	62	76	277	51	32	337	138
Peak Hour Factor	0.77	0.77	0.77	0.67	0.67	0.67	0.90	0.90	0.90	0.93	0.93	0.93
Hourly flow rate (vph)	166	29	77	79	140	93	84	308	57	34	362	148
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	272	312	449	544								
Volume Left (vph)	166	79	84	34								
Volume Right (vph)	77	93	57	148								
Hadj (s)	-0.01	-0.09	0.00	-0.12								
Departure Headway (s)	8.9	8.6	8.1	8.0								
Degree Utilization, x	0.67	0.75	1.00	1.00								
Capacity (veh/h)	391	402	449	544								
Control Delay (s)	28.3	33.0	71.5	70.9								
Approach Delay (s)	28.3	33.0	71.5	70.9								
Approach LOS	D	D	F	F								
Intersection Summary												
Delay				56.2								
Level of Service				F								
Intersection Capacity Utilization				75.4%	ICU Level of Service	D						
Analysis Period (min)				15								

Queues

Future No-Build (2020) Saturday

1/26/2016

1: I-75 SB Ramps & Jonesboro Rd



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations	↑↑	↑	↑	↑↑	↑	↑	↑
Traffic Volume (vph)	1358	388	124	1481	169	3	567
Future Volume (vph)	1358	388	124	1481	169	3	567
Lane Group Flow (vph)	1429	473	149	1543	111	111	616
Turn Type	NA	Perm	pm+pt	NA	Perm	NA	Perm
Protected Phases	2		1	6		4	
Permitted Phases		2	6		4		4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0	6.0	6.0
Minimum Split (s)	24.0	24.0	11.0	24.0	24.0	24.0	24.0
Total Split (s)	72.0	72.0	16.0	88.0	62.0	62.0	62.0
Total Split (%)	48.0%	48.0%	10.7%	58.7%	41.3%	41.3%	41.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?							
Recall Mode	C-Min	C-Min	None	C-Min	None	None	None
v/c Ratio	0.91	0.49	0.90	0.79	0.18	0.18	0.98
Control Delay	48.9	3.9	70.3	14.6	32.7	32.6	73.6
Queue Delay	0.0	0.0	0.0	0.7	0.0	0.0	0.0
Total Delay	48.9	3.9	70.3	15.4	32.7	32.6	73.6
Queue Length 50th (ft)	683	0	66	574	76	76	547
Queue Length 95th (ft)	#800	33	m#145	634	109	49	#809
Internal Link Dist (ft)	520			890		860	
Turn Bay Length (ft)		415	635		430		700
Base Capacity (vph)	1568	965	166	1945	627	631	631
Starvation Cap Reductn	0	0	0	150	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	0.91	0.49	0.90	0.86	0.18	0.18	0.98

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 52 (35%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 90

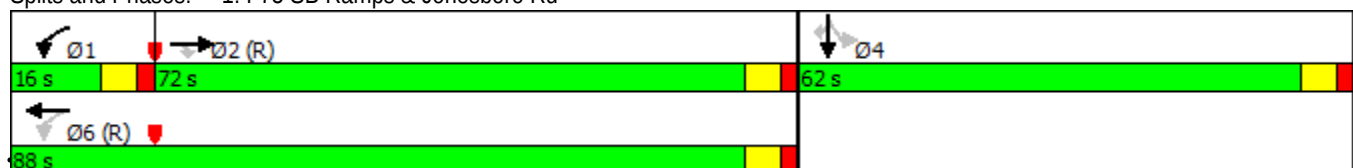
Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 1: I-75 SB Ramps & Jonesboro Rd



Baseline

Synchro 9 Report

Page 1

HCM Signalized Intersection Capacity Analysis

Future No-Build (2020) Saturday

1: I-75 SB Ramps & Jonesboro Rd

1/26/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑					↑	↑	↑
Traffic Volume (vph)	0	1358	388	124	1481	0	0	0	0	169	3	567
Future Volume (vph)	0	1358	388	124	1481	0	0	0	0	169	3	567
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.95	1.00	1.00	0.95					0.95	0.95	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (prot)		3539	1583	1770	3539					1681	1691	1583
Flt Permitted		1.00	1.00	0.06	1.00					0.95	0.96	1.00
Satd. Flow (perm)		3539	1583	103	3539					1681	1691	1583
Peak-hour factor, PHF	0.92	0.95	0.82	0.83	0.96	0.92	0.92	0.92	0.92	0.79	0.38	0.92
Adj. Flow (vph)	0	1429	473	149	1543	0	0	0	0	214	8	616
RTOR Reduction (vph)	0	0	263	0	0	0	0	0	0	0	0	41
Lane Group Flow (vph)	0	1429	210	149	1543	0	0	0	0	111	111	575
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)		66.5	66.5	82.5	82.5					55.5	55.5	55.5
Effective Green, g (s)		66.5	66.5	82.5	82.5					55.5	55.5	55.5
Actuated g/C Ratio		0.44	0.44	0.55	0.55					0.37	0.37	0.37
Clearance Time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	3.0	5.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1568	701	167	1946					621	625	585
v/s Ratio Prot		0.40		0.06	c0.44							
v/s Ratio Perm			0.13	c0.43						0.07	0.07	c0.36
v/c Ratio		0.91	0.30	0.89	0.79					0.18	0.18	0.98
Uniform Delay, d1		39.0	26.8	43.2	26.9					31.9	31.9	46.8
Progression Factor		1.00	1.00	1.11	0.46					1.00	1.00	1.00
Incremental Delay, d2		9.5	1.1	27.6	2.0					0.1	0.1	32.7
Delay (s)		48.5	27.9	75.7	14.4					32.0	32.0	79.5
Level of Service		D	C	E	B					C	C	E
Approach Delay (s)		43.4			19.8			0.0			66.9	
Approach LOS		D			B			A			E	

Intersection Summary

HCM 2000 Control Delay	38.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	87.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Queues

2: I-75 NB Ramps & Jonesboro Rd

Future No-Build (2020) Saturday

1/26/2016



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations							
Traffic Volume (vph)	480	1067	1139	542	436	3	117
Future Volume (vph)	480	1067	1139	542	436	3	117
Lane Group Flow (vph)	511	1173	1174	602	268	265	129
Turn Type	pm+pt	NA	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	6			8	
Permitted Phases	2			6	8		8
Detector Phase	5	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	15.0	15.0	15.0	6.0	6.0	6.0
Minimum Split (s)	11.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	50.0	115.0	65.0	65.0	35.0	35.0	35.0
Total Split (%)	33.3%	76.7%	43.3%	43.3%	23.3%	23.3%	23.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?							
Recall Mode	None	C-Min	C-Min	C-Min	None	None	None
v/c Ratio	0.91	0.45	0.78	0.63	0.89	0.88	0.33
Control Delay	37.5	24.2	20.7	3.1	90.2	87.9	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Total Delay	37.5	24.2	20.7	3.1	90.4	88.0	10.2
Queue Length 50th (ft)	458	606	258	10	268	264	0
Queue Length 95th (ft)	m520	m673	302	10	#362	138	59
Internal Link Dist (ft)		890	855			694	
Turn Bay Length (ft)	675			390	285		350
Base Capacity (vph)	590	2622	1512	961	324	326	410
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	1	1	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.45	0.78	0.63	0.83	0.82	0.31

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 4 (3%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 2: I-75 NB Ramps & Jonesboro Rd



Baseline

HCM Signalized Intersection Capacity Analysis

2: I-75 NB Ramps & Jonesboro Rd

Future No-Build (2020) Saturday

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	480	1067	0	0	1139	542	436	3	117	0	0	0
Future Volume (vph)	480	1067	0	0	1139	542	436	3	117	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	1770	3539			3539	1583	1681	1688	1583			
Flt Permitted	0.09	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	161	3539			3539	1583	1681	1688	1583			
Peak-hour factor, PHF	0.94	0.91	0.92	0.92	0.97	0.90	0.83	0.38	0.91	0.92	0.92	0.92
Adj. Flow (vph)	511	1173	0	0	1174	602	525	8	129	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	286	0	0	106	0	0	0
Lane Group Flow (vph)	511	1173	0	0	1174	316	268	265	23	0	0	0
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Actuated Green, G (s)	111.1	111.1			64.0	64.0	26.9	26.9	26.9			
Effective Green, g (s)	111.1	111.1			64.0	64.0	26.9	26.9	26.9			
Actuated g/C Ratio	0.74	0.74			0.43	0.43	0.18	0.18	0.18			
Clearance Time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Vehicle Extension (s)	3.0	5.0			5.0	5.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	560	2621			1509	675	301	302	283			
v/s Ratio Prot	c0.25	0.33			0.33							
v/s Ratio Perm	c0.43					0.20	c0.16	0.16	0.01			
v/c Ratio	0.91	0.45			0.78	0.47	0.89	0.88	0.08			
Uniform Delay, d1	42.2	7.5			36.9	30.8	60.1	59.9	51.3			
Progression Factor	0.57	3.05			0.46	0.12	1.00	1.00	1.00			
Incremental Delay, d2	12.6	0.3			3.1	1.8	26.2	23.7	0.1			
Delay (s)	36.8	23.3			20.0	5.4	86.3	83.6	51.4			
Level of Service	D	C			B	A	F	F	D			
Approach Delay (s)		27.4			15.0			78.4			0.0	
Approach LOS		C			B			E			A	
Intersection Summary												
HCM 2000 Control Delay			30.3									
HCM 2000 Volume to Capacity ratio			0.93									
Actuated Cycle Length (s)			150.0									
Intersection Capacity Utilization			87.3%									
Analysis Period (min)			15									
c Critical Lane Group												

Queues

3: Managed Lane Ramp/Foster Dr & Jonesboro Rd

Future No-Build (2020) Saturday

1/26/2016



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBR	Ø1
Lane Configurations										
Traffic Volume (vph)	309	872	1215	63	133	100	597	84	119	
Future Volume (vph)	309	872	1215	63	133	100	597	84	119	
Lane Group Flow (vph)	351	899	1253	72	145	109	649	118	135	
Turn Type	pm+pt	NA	NA	Perm	Perm	NA	Perm	Prot	Perm	
Protected Phases	5	2	6			8		7		1
Permitted Phases	2			6	8		8		7	
Detector Phase	5	2	6	6	8	8	8	7	7	
Switch Phase										
Minimum Initial (s)	5.0	15.0	15.0	15.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	24.0	34.0	34.0	24.0	24.0	24.0	33.0	33.0	11.0
Total Split (s)	31.0	82.0	62.0	62.0	24.0	24.0	24.0	33.0	33.0	11.0
Total Split (%)	20.7%	54.7%	41.3%	41.3%	16.0%	16.0%	16.0%	22.0%	22.0%	7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
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	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?										
Recall Mode	None	C-Min	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.99	0.40	0.81	0.09	0.60	0.43	0.86	0.66	0.45	
Control Delay	96.8	2.1	30.8	0.7	70.8	63.5	31.8	81.1	10.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	96.8	2.1	30.8	0.7	70.8	63.5	31.8	81.1	10.6	
Queue Length 50th (ft)	206	20	623	0	133	98	118	113	0	
Queue Length 95th (ft)	#473	37	#755	3	207	160	202	136	43	
Internal Link Dist (ft)		855	1103			793				
Turn Bay Length (ft)	275			125	175		150		215	
Base Capacity (vph)	356	2271	1539	775	257	271	779	318	410	
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	0.99	0.40	0.81	0.09	0.56	0.40	0.83	0.37	0.33	

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 149 (99%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

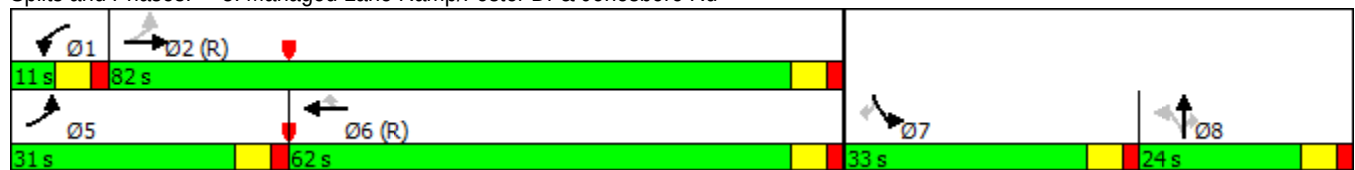
Natural Cycle: 135

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: Managed Lane Ramp/Foster Dr & Jonesboro Rd



Baseline

HCM Signalized Intersection Capacity Analysis

3: Managed Lane Ramp/Foster Dr & Jonesboro Rd

Future No-Build (2020) Saturday

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	309	872	0	0	1215	63	133	100	597	84	0	119
Future Volume (vph)	309	872	0	0	1215	63	133	100	597	84	0	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0	6.0		6.0
Lane Util. Factor	1.00	0.95			0.95	1.00	1.00	1.00	0.88	1.00		1.00
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00	0.95		1.00
Satd. Flow (prot)	1770	3539			3539	1583	1770	1863	2787	1770		1583
Flt Permitted	0.07	1.00			1.00	1.00	0.95	1.00	1.00	0.95		1.00
Satd. Flow (perm)	130	3539			3539	1583	1770	1863	2787	1770		1583
Peak-hour factor, PHF	0.88	0.97	0.92	0.92	0.97	0.88	0.92	0.92	0.92	0.71	0.92	0.88
Adj. Flow (vph)	351	899	0	0	1253	72	145	109	649	118	0	135
RTOR Reduction (vph)	0	0	0	0	0	41	0	0	378	0	0	121
Lane Group Flow (vph)	351	899	0	0	1253	31	145	109	271	118	0	14
Turn Type	pm+pt	NA		Prot	NA	Perm	Perm	NA	Perm	Prot		Perm
Protected Phases	5	2		1	6			8		7		
Permitted Phases	2					6	8		8			7
Actuated Green, G (s)	96.3	96.3			65.3	65.3	20.4	20.4	20.4	15.3		15.3
Effective Green, g (s)	96.3	96.3			65.3	65.3	20.4	20.4	20.4	15.3		15.3
Actuated g/C Ratio	0.64	0.64			0.44	0.44	0.14	0.14	0.14	0.10		0.10
Clearance Time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0	6.0		6.0
Vehicle Extension (s)	3.0	5.0			5.0	5.0	3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	356	2272			1540	689	240	253	379	180		161
v/s Ratio Prot	c0.16	0.25			0.35			0.06		c0.07		
v/s Ratio Perm	c0.47					0.02	0.08		c0.10			0.01
v/c Ratio	0.99	0.40			0.81	0.05	0.60	0.43	0.71	0.66		0.09
Uniform Delay, d1	48.7	12.9			37.0	24.4	61.0	59.5	62.0	64.8		61.0
Progression Factor	1.29	0.12			0.66	1.00	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	41.6	0.5			4.6	0.1	4.2	1.2	6.3	8.3		0.2
Delay (s)	104.6	2.0			29.1	24.5	65.2	60.7	68.3	73.1		61.2
Level of Service	F	A			C	C	E	E	E	E		E
Approach Delay (s)		30.8			28.8			66.9			66.8	
Approach LOS		C			C			E			E	
Intersection Summary												
HCM 2000 Control Delay		41.3			HCM 2000 Level of Service				D			
HCM 2000 Volume to Capacity ratio		0.92										
Actuated Cycle Length (s)		150.0			Sum of lost time (s)			24.0				
Intersection Capacity Utilization		79.7%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

4: N Bridges Rd/Bojangles Drwy & Jonesboro Rd

Future No-Build (2020) Saturday

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 			 	
Traffic Volume (veh/h)	56	1479	3	4	1235	22	2	0	3	23	0	55
Future Volume (Veh/h)	56	1479	3	4	1235	22	2	0	3	23	0	55
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.83	0.92	0.25	0.50	0.98	0.66	0.50	0.92	0.38	0.79	0.92	0.87
Hourly flow rate (vph)	67	1608	12	8	1260	33	4	0	8	29	0	63
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	1183											
pX, platoon unblocked				0.88			0.88			0.88		
vC, conflicting volume	1293			1608			2388			3051		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1293			1424			2307			3058		
tC, single (s)	4.1			4.1			7.5			6.5		
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5			4.0		
p0 queue free %	87			98			71			100		
cM capacity (veh/h)	532			418			14			9		
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1		
Volume Total	67	804	804	12	8	630	630	33	12	92		
Volume Left	67	0	0	0	8	0	0	0	4	29		
Volume Right	0	0	0	12	0	0	0	33	8	63		
cSH	532	1700	1700	1700	418	1700	1700	1700	39	64		
Volume to Capacity	0.13	0.47	0.47	0.01	0.02	0.37	0.37	0.02	0.31	1.44		
Queue Length 95th (ft)	11	0	0	0	1	0	0	0	26	197		
Control Delay (s)	12.7	0.0	0.0	0.0	13.8	0.0	0.0	0.0	134.5	374.7		
Lane LOS	B				B						F	F
Approach Delay (s)	0.5				0.1						134.5	374.7
Approach LOS										F	F	
Intersection Summary												
Average Delay	12.0											
Intersection Capacity Utilization	58.7%			ICU Level of Service						B		
Analysis Period (min)	15											

Queues
5: Mt Carmel Rd & Jonesboro Rd

Future No-Build (2020) Saturday

1/26/2016

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↗
Traffic Volume (vph)	1465	11	104	1235	6	108
Future Volume (vph)	1465	11	104	1235	6	108
Lane Group Flow (vph)	1610	18	315	1260	16	270
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	3	
Permitted Phases		2	6			3
Detector Phase	2	2	1	6	3	3
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	11.0	24.0	24.0	24.0
Total Split (s)	88.0	88.0	37.0	125.0	25.0	25.0
Total Split (%)	58.7%	58.7%	24.7%	83.3%	16.7%	16.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Recall Mode	C-Min	C-Min	None	C-Min	None	None
v/c Ratio	0.71	0.02	0.74	0.41	0.15	0.77
Control Delay	26.8	12.5	50.3	1.6	67.2	22.3
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	26.8	12.5	50.3	1.7	67.2	22.3
Queue Length 50th (ft)	616	4	203	60	15	0
Queue Length 95th (ft)	601	m7	64	90	16	0
Internal Link Dist (ft)	2065			797	3235	
Turn Bay Length (ft)		250	300		100	
Base Capacity (vph)	2257	1014	468	3041	224	436
Starvation Cap Reductn	0	0	0	442	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.02	0.67	0.48	0.07	0.62

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 101 (67%), Referenced to phase 2:EBTU and 6:WBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

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

Splits and Phases: 5: Mt Carmel Rd & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

5: Mt Carmel Rd & Jonesboro Rd

Future No-Build (2020) Saturday

1/26/2016



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↓	↑↑	↑	↑	↑↑	↑	↑
Traffic Volume (vph)	0	1465	11	104	1235	6	108
Future Volume (vph)	0	1465	11	104	1235	6	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	1.00
Frt		1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)		3539	1583	1770	3539	1770	1583
Flt Permitted		1.00	1.00	0.08	1.00	0.95	1.00
Satd. Flow (perm)		3539	1583	152	3539	1770	1583
Peak-hour factor, PHF	0.92	0.91	0.62	0.33	0.98	0.38	0.40
Adj. Flow (vph)	0	1610	18	315	1260	16	270
RTOR Reduction (vph)	0	0	4	0	0	0	254
Lane Group Flow (vph)	0	1610	14	315	1260	16	16
Turn Type	Perm	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases		2		1	6	3	
Permitted Phases	2		2	6			3
Actuated Green, G (s)		95.7	95.7	128.9	128.9	9.1	9.1
Effective Green, g (s)		95.7	95.7	128.9	128.9	9.1	9.1
Actuated g/C Ratio		0.64	0.64	0.86	0.86	0.06	0.06
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		2257	1009	424	3041	107	96
v/s Ratio Prot		0.45		c0.13	0.36	0.01	
v/s Ratio Perm			0.01	c0.50			c0.01
v/c Ratio		0.71	0.01	0.74	0.41	0.15	0.17
Uniform Delay, d1		18.0	9.9	38.6	2.3	66.8	66.9
Progression Factor		1.26	1.59	1.33	0.49	1.00	1.00
Incremental Delay, d2		1.7	0.0	5.9	0.4	0.6	0.8
Delay (s)		24.3	15.8	57.2	1.5	67.4	67.7
Level of Service		C	B	E	A	E	E
Approach Delay (s)		24.2			12.6	67.7	
Approach LOS		C			B	E	

Intersection Summary

HCM 2000 Control Delay	22.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Queues

Future No-Build (2020) Saturday

6: Willow Lane/Oak Grove Rd & Jonesboro Rd

1/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	56	1379	159	46	1118	53	166	86	43	96	188
Future Volume (vph)	56	1379	159	46	1118	53	166	86	43	96	188
Lane Group Flow (vph)	93	1422	177	58	1165	60	198	97	67	123	287
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases	5	2		1	6			8			4
Permitted Phases	2		2	6		6	8		8	4	
Detector Phase	5	2	2	1	6	6	8	8	8	4	4
Switch Phase											
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	11.0	26.0	26.0	11.0	36.0	36.0	46.0	46.0	46.0	44.0	44.0
Total Split (s)	15.0	79.0	79.0	11.0	75.0	75.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	10.0%	52.7%	52.7%	7.3%	50.0%	50.0%	40.0%	40.0%	40.0%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
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	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag					
Lead-Lag Optimize?											
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None
v/c Ratio	0.36	0.68	0.18	0.34	0.59	0.07	1.06	0.19	0.14	0.35	0.58
Control Delay	10.9	15.1	6.3	15.2	27.7	8.6	132.9	40.2	7.7	44.6	49.0
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.9	15.2	6.3	15.2	27.7	8.6	132.9	40.2	7.7	44.6	49.0
Queue Length 50th (ft)	4	532	13	25	461	10	~208	73	0	97	235
Queue Length 95th (ft)	43	362	m75	48	634	m43	#276	107	11	118	257
Internal Link Dist (ft)		797			4516			905			451
Turn Bay Length (ft)	300		150	300		250	300		400	135	
Base Capacity (vph)	271	2090	966	173	1968	909	249	670	612	462	657
Starvation Cap Reductn	0	80	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	0.34	0.71	0.18	0.34	0.59	0.07	0.80	0.14	0.11	0.27	0.44

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 95 (63%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

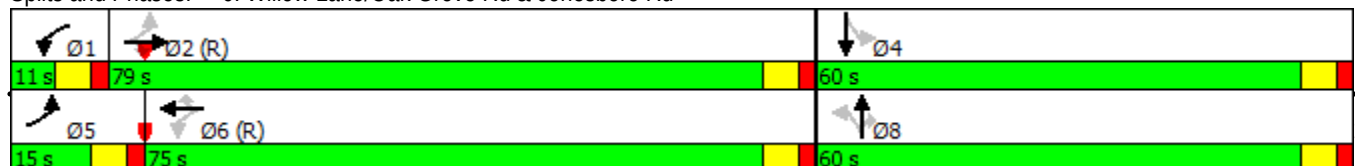
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 6: Willow Lane/Oak Grove Rd & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

6: Willow Lane/Oak Grove Rd & Jonesboro Rd

Future No-Build (2020) Saturday

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	1379	159	46	1118	53	166	86	43	96	188	41
Future Volume (vph)	56	1379	159	46	1118	53	166	86	43	96	188	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1809	1809
Flt Permitted	0.15	1.00	1.00	0.11	1.00	1.00	0.37	1.00	1.00	0.69	1.00	1.00
Satd. Flow (perm)	285	3539	1583	205	3539	1583	693	1863	1583	1286	1809	1809
Peak-hour factor, PHF	0.60	0.97	0.90	0.79	0.96	0.89	0.84	0.89	0.64	0.78	0.81	0.75
Adj. Flow (vph)	93	1422	177	58	1165	60	198	97	67	123	232	55
RTOR Reduction (vph)	0	0	32	0	0	27	0	0	49	0	7	0
Lane Group Flow (vph)	93	1422	145	58	1165	33	198	97	18	123	280	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	NA
Protected Phases	5	2		1	6			8				4
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)	95.4	87.4	87.4	87.4	83.4	83.4	40.6	40.6	40.6	40.6	40.6	40.6
Effective Green, g (s)	95.4	87.4	87.4	87.4	83.4	83.4	40.6	40.6	40.6	40.6	40.6	40.6
Actuated g/C Ratio	0.64	0.58	0.58	0.58	0.56	0.56	0.27	0.27	0.27	0.27	0.27	0.27
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	260	2062	922	161	1967	880	187	504	428	348	489	489
v/s Ratio Prot	c0.02	c0.40		0.01	0.33			0.05				0.16
v/s Ratio Perm	0.21		0.09	0.20		0.02	c0.29		0.01	0.10		
v/c Ratio	0.36	0.69	0.16	0.36	0.59	0.04	1.06	0.19	0.04	0.35	0.57	
Uniform Delay, d1	14.9	21.8	14.4	18.3	22.0	15.1	54.7	42.1	40.4	44.1	47.2	
Progression Factor	0.69	0.58	0.59	0.84	1.09	2.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.6	1.3	0.3	1.2	1.2	0.1	82.2	0.2	0.0	0.6	1.6	
Delay (s)	10.8	13.9	8.8	16.5	25.3	30.3	136.9	42.3	40.4	44.7	48.9	
Level of Service	B	B	A	B	C	C	F	D	D	D	D	
Approach Delay (s)		13.2			25.2			93.7			47.6	
Approach LOS		B			C			F			D	
Intersection Summary												
HCM 2000 Control Delay			28.8			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			150.0			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			83.1%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

Queues
7: Kelly Rd & Jonesboro Rd

Future No-Build (2020) Saturday

1/26/2016

	→	↘	↙	←	↖
Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations	↑↑	↑	↘	↑↑	↘
Traffic Volume (vph)	1420	60	158	1143	76
Future Volume (vph)	1420	60	158	1143	76
Lane Group Flow (vph)	1464	71	203	1216	262
Turn Type	NA	Perm	pm+pt	NA	Perm
Protected Phases	2		1	6	
Permitted Phases		2	6		8
Detector Phase	2	2	1	6	8
Switch Phase					
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0
Minimum Split (s)	29.0	29.0	11.0	24.0	42.0
Total Split (s)	81.0	81.0	27.0	108.0	42.0
Total Split (%)	54.0%	54.0%	18.0%	72.0%	28.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead		
Lead-Lag Optimize?					
Recall Mode	C-Min	C-Min	None	C-Min	None
v/c Ratio	0.69	0.07	0.64	0.45	0.82
Control Delay	7.8	0.2	26.0	8.1	67.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.8	0.2	26.0	8.1	67.4
Queue Length 50th (ft)	74	0	67	208	202
Queue Length 95th (ft)	92	m0	126	316	233
Internal Link Dist (ft)	4516			773	731
Turn Bay Length (ft)		315	300		
Base Capacity (vph)	2124	974	358	2675	442
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.69	0.07	0.57	0.45	0.59

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

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

Natural Cycle: 95

Control Type: Actuated-Coordinated

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

Splits and Phases: 7: Kelly Rd & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

7: Kelly Rd & Jonesboro Rd

Future No-Build (2020) Saturday

1/26/2016



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	⇐	⇐⇐	⇐	⇐	⇐⇐	⇐	
Traffic Volume (vph)	0	1420	60	158	1143	76	117
Future Volume (vph)	0	1420	60	158	1143	76	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	
Frt		1.00	0.85	1.00	1.00	0.91	
Flt Protected		1.00	1.00	0.95	1.00	0.98	
Satd. Flow (prot)		3539	1583	1770	3539	1673	
Flt Permitted		1.00	1.00	0.10	1.00	0.98	
Satd. Flow (perm)		3539	1583	179	3539	1673	
Peak-hour factor, PHF	0.92	0.97	0.84	0.78	0.94	0.78	0.71
Adj. Flow (vph)	0	1464	71	203	1216	97	165
RTOR Reduction (vph)	0	0	24	0	0	45	0
Lane Group Flow (vph)	0	1464	47	203	1216	217	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	
Protected Phases		2		1	6		
Permitted Phases	2		2	6		8	
Actuated Green, G (s)		90.1	90.1	113.4	113.4	24.6	
Effective Green, g (s)		90.1	90.1	113.4	113.4	24.6	
Actuated g/C Ratio		0.60	0.60	0.76	0.76	0.16	
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)		5.0	5.0	3.0	5.0	3.0	
Lane Grp Cap (vph)		2125	950	318	2675	274	
v/s Ratio Prot		c0.41		c0.07	0.34		
v/s Ratio Perm			0.03	0.41		c0.13	
v/c Ratio		0.69	0.05	0.64	0.45	0.79	
Uniform Delay, d1		20.4	12.3	24.6	6.8	60.2	
Progression Factor		0.28	0.03	1.00	1.00	1.00	
Incremental Delay, d2		1.4	0.1	4.2	0.6	14.4	
Delay (s)		7.2	0.4	28.8	7.4	74.6	
Level of Service		A	A	C	A	E	
Approach Delay (s)		6.9			10.4	74.6	
Approach LOS		A			B	E	

Intersection Summary

HCM 2000 Control Delay	14.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	74.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis 8: Sterling Pl/N Bridges Rd & Mt Carmel Rd

Future No-Build (2020) Saturday

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	101	0	6	100	1	0	0	7	1	0	1
Future Volume (Veh/h)	1	101	0	6	100	1	0	0	7	1	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.25	0.92	0.50	0.92	0.25	0.92	0.92	0.29	0.25	0.92	0.25
Hourly flow rate (vph)	4	404	0	12	109	4	0	0	24	4	0	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	113			404			551	549	404	571	547	111
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	113			404			551	549	404	571	547	111
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	96	99	100	100
cM capacity (veh/h)	1476			1155			439	438	647	411	439	942
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	408	125	24	8								
Volume Left	4	12	0	4								
Volume Right	0	4	24	4								
cSH	1476	1155	647	573								
Volume to Capacity	0.00	0.01	0.04	0.01								
Queue Length 95th (ft)	0	1	3	1								
Control Delay (s)	0.1	0.9	10.8	11.4								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.9	10.8	11.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.9									
Intersection Capacity Utilization			19.2%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
9: Mill Road & Mt Carmel Rd

Future No-Build (2020) Saturday

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	87	12	36	56	93	62	22	345	48	24	302	105
Future Volume (vph)	87	12	36	56	93	62	22	345	48	24	302	105
Peak Hour Factor	0.91	0.91	0.91	0.80	0.80	0.80	0.88	0.88	0.88	0.92	0.92	0.92
Hourly flow rate (vph)	96	13	40	70	116	78	25	392	55	26	328	114
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	149	264	472	468								
Volume Left (vph)	96	70	25	26								
Volume Right (vph)	40	78	55	114								
Hadj (s)	0.00	-0.09	-0.03	-0.10								
Departure Headway (s)	8.0	7.4	6.6	6.5								
Degree Utilization, x	0.33	0.54	0.87	0.85								
Capacity (veh/h)	399	450	527	535								
Control Delay (s)	14.8	18.7	38.3	36.2								
Approach Delay (s)	14.8	18.7	38.3	36.2								
Approach LOS	B	C	E	E								
Intersection Summary												
Delay				31.2								
Level of Service				D								
Intersection Capacity Utilization				53.5%	ICU Level of Service	A						
Analysis Period (min)				15								

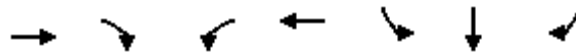
**Future “No-Build” Intersection Analysis
With Improvements**

Queues

Future No-Build (2020) AM - Improved

1: I-75 SB Ramps & Jonesboro Rd

1/26/2016



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations	↑↑	↑	↵	↑↑	↵	↕	↵
Traffic Volume (vph)	1200	204	41	872	411	2	403
Future Volume (vph)	1200	204	41	872	411	2	403
Lane Group Flow (vph)	1277	237	51	1002	348	338	314
Turn Type	NA	Perm	pm+pt	NA	Perm	NA	Perm
Protected Phases	2		1	6		4	
Permitted Phases		2	6		4		4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0	6.0	6.0
Minimum Split (s)	24.0	24.0	11.0	24.0	24.0	24.0	24.0
Total Split (s)	76.0	76.0	12.0	88.0	52.0	52.0	52.0
Total Split (%)	54.3%	54.3%	8.6%	62.9%	37.1%	37.1%	37.1%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?							
Recall Mode	C-Min	C-Min	None	C-Min	None	None	None
v/c Ratio	0.61	0.23	0.23	0.43	0.81	0.81	0.67
Control Delay	22.0	2.7	10.3	8.8	63.0	58.7	35.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.0	2.7	10.3	8.8	63.0	58.7	35.6
Queue Length 50th (ft)	395	0	11	118	314	291	175
Queue Length 95th (ft)	553	36	23	153	329	169	242
Internal Link Dist (ft)	520			890		860	
Turn Bay Length (ft)		415	635		430		700
Base Capacity (vph)	2086	1030	224	2328	552	526	570
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	0.61	0.23	0.23	0.43	0.63	0.64	0.55

Intersection Summary

Cycle Length: 140

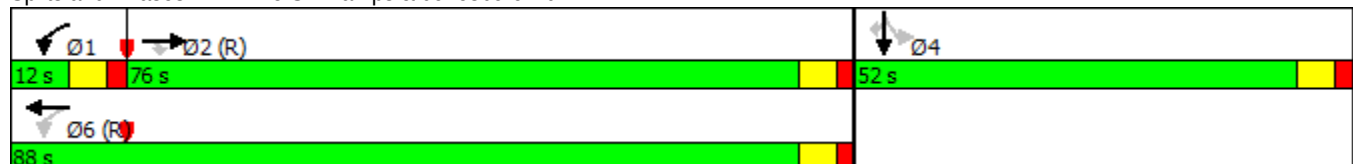
Actuated Cycle Length: 140

Offset: 100 (71%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Splits and Phases: 1: I-75 SB Ramps & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

1: I-75 SB Ramps & Jonesboro Rd

Future No-Build (2020) AM - Improved

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑					↑	↑↑	↑
Traffic Volume (vph)	0	1200	204	41	872	0	0	0	0	411	2	403
Future Volume (vph)	0	1200	204	41	872	0	0	0	0	411	2	403
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.95	1.00	1.00	0.95					0.95	0.91	0.95
Frt		1.00	0.85	1.00	1.00					1.00	0.93	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.97	1.00
Satd. Flow (prot)		3539	1583	1770	3539					1681	1538	1504
Flt Permitted		1.00	1.00	0.13	1.00					0.95	0.97	1.00
Satd. Flow (perm)		3539	1583	243	3539					1681	1538	1504
Peak-hour factor, PHF	0.92	0.94	0.86	0.80	0.87	0.92	0.92	0.92	0.92	0.78	0.50	0.86
Adj. Flow (vph)	0	1277	237	51	1002	0	0	0	0	527	4	469
RTOR Reduction (vph)	0	0	99	0	0	0	0	0	0	0	24	84
Lane Group Flow (vph)	0	1277	138	51	1002	0	0	0	0	348	314	230
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)		81.3	81.3	92.1	92.1					35.9	35.9	35.9
Effective Green, g (s)		81.3	81.3	92.1	92.1					35.9	35.9	35.9
Actuated g/C Ratio		0.58	0.58	0.66	0.66					0.26	0.26	0.26
Clearance Time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	3.0	5.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2055	919	212	2328					431	394	385
v/s Ratio Prot		c0.36		0.01	c0.28							
v/s Ratio Perm			0.09	0.15						c0.21	0.20	0.15
v/c Ratio		0.62	0.15	0.24	0.43					0.81	0.80	0.60
Uniform Delay, d1		19.3	13.5	13.4	11.4					48.8	48.7	45.7
Progression Factor		1.00	1.00	0.78	0.66					1.00	1.00	1.00
Incremental Delay, d2		1.4	0.3	0.6	0.5					10.6	10.7	2.5
Delay (s)		20.7	13.8	11.1	8.1					59.4	59.4	48.2
Level of Service		C	B	B	A					E	E	D
Approach Delay (s)		19.6			8.3			0.0			55.9	
Approach LOS		B			A			A			E	
Intersection Summary												
HCM 2000 Control Delay			26.4			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)				18.0		
Intersection Capacity Utilization			109.7%			ICU Level of Service				H		
Analysis Period (min)			15									
c Critical Lane Group												

Queues

Future No-Build (2020) AM - Improved

2: I-75 NB Ramps & Jonesboro Rd

1/26/2016



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations							
Traffic Volume (vph)	467	1082	790	1031	135	1	145
Future Volume (vph)	467	1082	790	1031	135	1	145
Lane Group Flow (vph)	492	1189	878	1133	87	88	204
Turn Type	pm+pt	NA	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	6			8	
Permitted Phases	2			6	8		8
Detector Phase	5	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	15.0	15.0	15.0	6.0	6.0	6.0
Minimum Split (s)	11.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	27.0	116.0	89.0	89.0	24.0	24.0	24.0
Total Split (%)	19.3%	82.9%	63.6%	63.6%	17.1%	17.1%	17.1%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?							
Recall Mode	None	C-Min	C-Min	C-Min	None	None	None
v/c Ratio	0.86	0.41	0.38	0.92	0.57	0.58	0.73
Control Delay	32.7	2.4	5.3	27.2	74.9	75.2	34.0
Queue Delay	0.0	0.0	0.0	1.4	0.0	0.0	0.0
Total Delay	32.7	2.4	5.3	28.6	74.9	75.2	34.0
Queue Length 50th (ft)	173	63	74	532	81	82	48
Queue Length 95th (ft)	#412	110	90	#799	120	36	68
Internal Link Dist (ft)		890	855			694	
Turn Bay Length (ft)	675			390	285		350
Base Capacity (vph)	601	2915	2318	1232	216	217	333
Starvation Cap Reductn	0	0	0	28	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	0.82	0.41	0.38	0.94	0.40	0.41	0.61

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 87 (62%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 2: I-75 NB Ramps & Jonesboro Rd



Baseline

Synchro 9 Report
Page 3

HCM Signalized Intersection Capacity Analysis

2: I-75 NB Ramps & Jonesboro Rd

Future No-Build (2020) AM - Improved

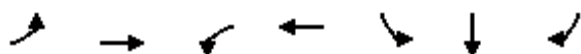
1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	467	1082	0	0	790	1031	135	1	145	0	0	0
Future Volume (vph)	467	1082	0	0	790	1031	135	1	145	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	1770	3539			3539	1583	1681	1689	1583			
Flt Permitted	0.27	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	500	3539			3539	1583	1681	1689	1583			
Peak-hour factor, PHF	0.95	0.91	0.92	0.92	0.90	0.91	0.79	0.25	0.71	0.92	0.92	0.92
Adj. Flow (vph)	492	1189	0	0	878	1133	171	4	204	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	195	0	0	135	0	0	0
Lane Group Flow (vph)	492	1189	0	0	878	938	87	88	69	0	0	0
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Actuated Green, G (s)	115.3	115.3			91.7	91.7	12.7	12.7	12.7			
Effective Green, g (s)	115.3	115.3			91.7	91.7	12.7	12.7	12.7			
Actuated g/C Ratio	0.82	0.82			0.66	0.66	0.09	0.09	0.09			
Clearance Time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Vehicle Extension (s)	3.0	5.0			5.0	5.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	571	2914			2318	1036	152	153	143			
v/s Ratio Prot	c0.11	0.34			0.25							
v/s Ratio Perm	0.60					c0.59	0.05	0.05	0.04			
v/c Ratio	0.86	0.41			0.38	0.91	0.57	0.58	0.48			
Uniform Delay, d1	8.4	3.3			11.1	20.5	61.0	61.1	60.5			
Progression Factor	2.88	0.58			0.40	1.41	1.00	1.00	1.00			
Incremental Delay, d2	10.3	0.3			0.4	11.8	5.1	5.1	2.5			
Delay (s)	34.6	2.2			4.9	40.6	66.2	66.2	63.0			
Level of Service	C	A			A	D	E	E	E			
Approach Delay (s)		11.7			25.0			64.5			0.0	
Approach LOS		B			C			E			A	
Intersection Summary												
HCM 2000 Control Delay		23.2			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.87										
Actuated Cycle Length (s)		140.0			Sum of lost time (s)			18.0				
Intersection Capacity Utilization		109.7%			ICU Level of Service			H				
Analysis Period (min)		15										
c Critical Lane Group												

Queues
3: Managed Lane Ramp/Foster Dr & Jonesboro Rd

Future No-Build (2020) AM - Improved

1/26/2016



Lane Group	EBL	EBT	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	258	873	411	1270	132	69	224
Future Volume (vph)	258	873	411	1270	132	69	224
Lane Group Flow (vph)	304	1069	447	1599	189	75	291
Turn Type	pm+pt	NA	Prot	NA	Perm	NA	Perm
Protected Phases	5	2	1	6		4	
Permitted Phases	2				4		4
Detector Phase	5	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	5.0	15.0	5.0	15.0	6.0	6.0	6.0
Minimum Split (s)	11.0	24.0	11.0	34.0	33.0	33.0	33.0
Total Split (s)	36.0	56.0	51.0	71.0	33.0	33.0	33.0
Total Split (%)	25.7%	40.0%	36.4%	50.7%	23.6%	23.6%	23.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			
Recall Mode	None	C-Min	None	C-Min	None	None	None
v/c Ratio	0.79	0.69	0.89	0.56	0.74	0.28	0.61
Control Delay	44.6	30.0	69.3	12.4	73.7	54.2	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.6	30.0	69.3	12.4	73.7	54.2	11.0
Queue Length 50th (ft)	149	283	340	243	167	62	0
Queue Length 95th (ft)	199	508	472	368	180	106	32
Internal Link Dist (ft)		855		1103		376	
Turn Bay Length (ft)	275		315				215
Base Capacity (vph)	490	1552	568	2844	341	359	540
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	0.62	0.69	0.79	0.56	0.55	0.21	0.54

Intersection Summary

Cycle Length: 140

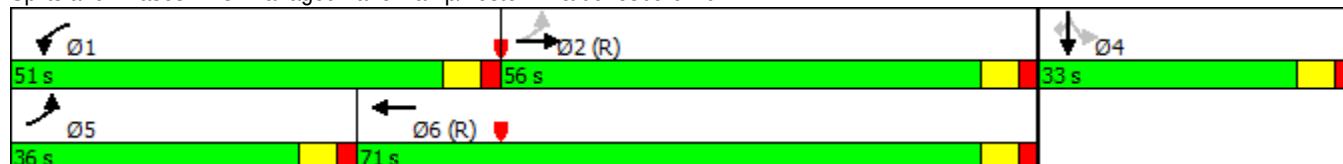
Actuated Cycle Length: 140

Offset: 111 (79%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Splits and Phases: 3: Managed Lane Ramp/Foster Dr & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

3: Managed Lane Ramp/Foster Dr & Jonesboro Rd

Future No-Build (2020) AM - Improved

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	258	873	91	411	1270	152	0	0	0	132	69	224
Future Volume (vph)	258	873	91	411	1270	152	0	0	0	132	69	224
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0					6.0	6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	0.91					1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.98					1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)	1770	3490		1770	4960					1770	1863	1583
Flt Permitted	0.13	1.00		0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)	249	3490		1770	4960					1770	1863	1583
Peak-hour factor, PHF	0.85	0.90	0.92	0.92	0.95	0.58	0.92	0.92	0.92	0.70	0.92	0.77
Adj. Flow (vph)	304	970	99	447	1337	262	0	0	0	189	75	291
RTOR Reduction (vph)	0	5	0	0	17	0	0	0	0	0	0	249
Lane Group Flow (vph)	304	1064	0	447	1582	0	0	0	0	189	75	42
Turn Type	pm+pt	NA		Prot	NA					Perm	NA	Perm
Protected Phases	5	2		1	6						4	
Permitted Phases	2									4		4
Actuated Green, G (s)	83.9	62.1		39.6	79.9					20.3	20.3	20.3
Effective Green, g (s)	83.9	62.1		39.6	79.9					20.3	20.3	20.3
Actuated g/C Ratio	0.60	0.44		0.28	0.57					0.15	0.15	0.15
Clearance Time (s)	6.0	6.0		6.0	6.0					6.0	6.0	6.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0					3.0	3.0	3.0
Lane Grp Cap (vph)	386	1548		500	2830					256	270	229
v/s Ratio Prot	0.12	0.30		c0.25	0.32						0.04	
v/s Ratio Perm	c0.35									c0.11		0.03
v/c Ratio	0.79	0.69		0.89	0.56					0.74	0.28	0.18
Uniform Delay, d1	22.5	31.2		48.2	18.9					57.3	53.3	52.6
Progression Factor	1.04	0.83		1.09	0.57					1.00	1.00	1.00
Incremental Delay, d2	9.4	2.3		15.0	0.6					10.6	0.6	0.4
Delay (s)	32.9	28.2		67.3	11.5					67.9	53.9	53.0
Level of Service	C	C		E	B					E	D	D
Approach Delay (s)		29.2			23.7			0.0			58.2	
Approach LOS		C			C			A			E	
Intersection Summary												
HCM 2000 Control Delay			30.4			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)				18.0		
Intersection Capacity Utilization			72.1%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis 4: N Bridges Rd/Bojangles Drwy & Jonesboro Rd

Future No-Build (2020) AM - Improved

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	47	932	3	1	1811	29	0	0	0	12	0	47
Future Volume (Veh/h)	47	932	3	1	1811	29	0	0	0	12	0	47
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.75	0.89	0.75	0.25	0.95	0.78	0.92	0.92	0.92	0.69	0.92	0.86
Hourly flow rate (vph)	63	1047	4	4	1906	37	0	0	0	17	0	55
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)	6											
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	1183											
pX, platoon unblocked				0.78			0.78			0.78		
vC, conflicting volume	1943			1047			2134			3124		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1943			488			1886			3159		
tC, single (s)	4.1			4.1			7.5			6.5		
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5			4.0		
p0 queue free %	79			100			100			100		
cM capacity (veh/h)	298			833			22			6		
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1		
Volume Total	63	524	524	4	4	953	953	37	0	72		
Volume Left	63	0	0	0	4	0	0	0	0	17		
Volume Right	0	0	0	4	0	0	0	37	0	55		
cSH	298	1700	1700	1700	833	1700	1700	1700	1700	45		
Volume to Capacity	0.21	0.31	0.31	0.00	0.00	0.56	0.56	0.02	0.00	1.61		
Queue Length 95th (ft)	20	0	0	0	0	0	0	0	0	179		
Control Delay (s)	20.3	0.0	0.0	0.0	9.3	0.0	0.0	0.0	0.0	253.5		
Lane LOS	C			A						A F		
Approach Delay (s)	1.1			0.0						0.0 253.5		
Approach LOS										A F		
Intersection Summary												
Average Delay	6.2											
Intersection Capacity Utilization	60.1%			ICU Level of Service						B		
Analysis Period (min)	15											

Queues
5: Mt Carmel Rd & Jonesboro Rd

Future No-Build (2020) AM - Improved

1/26/2016

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↗
Traffic Volume (vph)	927	38	121	1854	1	117
Future Volume (vph)	927	38	121	1854	1	117
Lane Group Flow (vph)	1042	51	170	2015	4	175
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	3	
Permitted Phases		2	6			3
Detector Phase	2	2	1	6	3	3
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	11.0	24.0	24.0	24.0
Total Split (s)	94.0	94.0	20.0	114.0	26.0	26.0
Total Split (%)	67.1%	67.1%	14.3%	81.4%	18.6%	18.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Recall Mode	C-Min	C-Min	None	C-Min	None	None
v/c Ratio	0.40	0.04	0.36	0.66	0.04	0.69
Control Delay	2.8	0.1	1.4	2.2	60.0	22.7
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	2.8	0.1	1.4	2.4	60.0	22.7
Queue Length 50th (ft)	61	1	11	81	4	0
Queue Length 95th (ft)	7	m0	m8	m60	4	14
Internal Link Dist (ft)	2065			797	3235	
Turn Bay Length (ft)		250	300		100	
Base Capacity (vph)	2627	1188	508	3035	252	376
Starvation Cap Reductn	0	0	0	216	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.04	0.33	0.71	0.02	0.47

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 66 (47%), Referenced to phase 2:EBTU and 6:WBTL, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

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

Splits and Phases: 5: Mt Carmel Rd & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

5: Mt Carmel Rd & Jonesboro Rd

Future No-Build (2020) AM - Improved

1/26/2016



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰	↶↷	↷	↰	↶↷	↰	↷
Traffic Volume (vph)	0	927	38	121	1854	1	117
Future Volume (vph)	0	927	38	121	1854	1	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	1.00
Frt		1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)		3539	1583	1770	3539	1770	1583
Flt Permitted		1.00	1.00	0.24	1.00	0.95	1.00
Satd. Flow (perm)		3539	1583	438	3539	1770	1583
Peak-hour factor, PHF	0.92	0.89	0.75	0.71	0.92	0.25	0.67
Adj. Flow (vph)	0	1042	51	170	2015	4	175
RTOR Reduction (vph)	0	0	13	0	0	0	165
Lane Group Flow (vph)	0	1042	38	170	2015	4	10
Turn Type	Perm	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases		2		1	6	3	
Permitted Phases	2		2	6			3
Actuated Green, G (s)		103.9	103.9	120.1	120.1	7.9	7.9
Effective Green, g (s)		103.9	103.9	120.1	120.1	7.9	7.9
Actuated g/C Ratio		0.74	0.74	0.86	0.86	0.06	0.06
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		2626	1174	472	3035	99	89
v/s Ratio Prot		0.29		0.03	c0.57	0.00	
v/s Ratio Perm			0.02	0.28			c0.01
v/c Ratio		0.40	0.03	0.36	0.66	0.04	0.11
Uniform Delay, d1		6.6	4.8	2.9	3.3	62.5	62.7
Progression Factor		0.34	0.04	0.52	0.53	1.00	1.00
Incremental Delay, d2		0.3	0.0	0.1	0.3	0.2	0.6
Delay (s)		2.6	0.2	1.6	2.0	62.6	63.3
Level of Service		A	A	A	A	E	E
Approach Delay (s)		2.5			2.0	63.3	
Approach LOS		A			A	E	

Intersection Summary

HCM 2000 Control Delay	5.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	74.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Queues

Future No-Build (2020) AM - Improved

6: Willow Lane/Oak Grove Rd & Jonesboro Rd

1/26/2016

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	739	228	22	1634	47	255	163	33	95	230	57
Future Volume (vph)	50	739	228	22	1634	47	255	163	33	95	230	57
Lane Group Flow (vph)	83	830	275	33	1857	76	293	236	47	122	264	76
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	3	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	15.0	5.0	5.0	15.0	15.0	5.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	11.0	26.0	11.0	11.0	36.0	36.0	11.0	46.0	46.0	11.0	44.0	44.0
Total Split (s)	11.0	72.0	13.0	11.0	72.0	72.0	13.0	46.0	46.0	11.0	44.0	44.0
Total Split (%)	7.9%	51.4%	9.3%	7.9%	51.4%	51.4%	9.3%	32.9%	32.9%	7.9%	31.4%	31.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
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	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)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	C-Min	None	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.71	0.39	0.24	0.09	0.93	0.08	1.64	0.65	0.12	0.63	0.79	0.20
Control Delay	64.8	9.4	0.8	6.0	30.3	0.6	341.8	60.1	0.6	57.2	71.2	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.8	9.4	0.8	6.0	30.3	0.6	341.8	60.1	0.6	57.2	71.2	2.9
Queue Length 50th (ft)	33	98	0	5	808	1	~358	200	0	87	232	0
Queue Length 95th (ft)	59	150	8	m7	#1051	2	#496	200	0	113	300	0
Internal Link Dist (ft)		797			4515			905			451	
Turn Bay Length (ft)	300		150	300		250	500		400	135		100
Base Capacity (vph)	117	2103	1169	369	1992	942	179	532	535	194	505	514
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	0.71	0.39	0.24	0.09	0.93	0.08	1.64	0.44	0.09	0.63	0.52	0.15

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 14 (10%), 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.

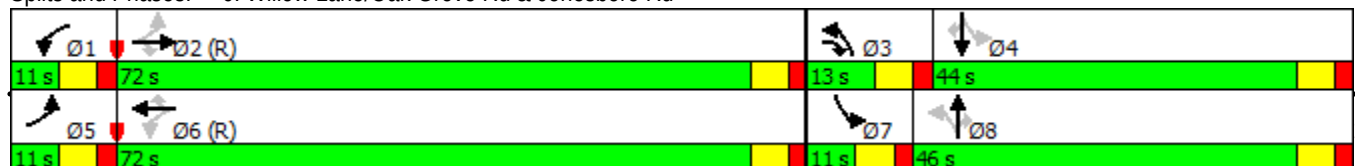
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 6: Willow Lane/Oak Grove Rd & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

6: Willow Lane/Oak Grove Rd & Jonesboro Rd

Future No-Build (2020) AM - Improved

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	739	228	22	1634	47	255	163	33	95	230	57
Future Volume (vph)	50	739	228	22	1634	47	255	163	33	95	230	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.05	1.00	1.00	0.29	1.00	1.00	0.25	1.00	1.00	0.39	1.00	1.00
Satd. Flow (perm)	92	3539	1583	544	3539	1583	468	1863	1583	732	1863	1583
Peak-hour factor, PHF	0.60	0.89	0.83	0.66	0.88	0.62	0.87	0.69	0.70	0.78	0.87	0.75
Adj. Flow (vph)	83	830	275	33	1857	76	293	236	47	122	264	76
RTOR Reduction (vph)	0	0	97	0	0	33	0	0	38	0	0	62
Lane Group Flow (vph)	83	830	178	33	1857	43	293	236	9	122	264	14
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	85.8	80.8	87.8	81.8	78.8	78.8	34.2	27.2	27.2	30.2	25.2	25.2
Effective Green, g (s)	85.8	80.8	87.8	81.8	78.8	78.8	34.2	27.2	27.2	30.2	25.2	25.2
Actuated g/C Ratio	0.61	0.58	0.63	0.58	0.56	0.56	0.24	0.19	0.19	0.22	0.18	0.18
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	5.0	3.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	116	2042	1060	344	1991	891	179	361	307	194	335	284
v/s Ratio Prot	c0.03	0.23	0.01	0.00	c0.52		c0.08	0.13		0.02	0.14	
v/s Ratio Perm	0.41		0.10	0.05		0.03	c0.32		0.01	0.11		0.01
v/c Ratio	0.72	0.41	0.17	0.10	0.93	0.05	1.64	0.65	0.03	0.63	0.79	0.05
Uniform Delay, d1	30.5	16.4	10.9	12.8	28.2	13.7	51.9	52.1	45.7	49.9	54.8	47.5
Progression Factor	1.87	0.53	0.24	0.52	0.78	0.63	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	17.7	0.6	0.1	0.1	7.2	0.1	310.5	4.2	0.0	6.2	11.6	0.1
Delay (s)	74.7	9.2	2.7	6.8	29.0	8.7	362.4	56.3	45.7	56.2	66.5	47.6
Level of Service	E	A	A	A	C	A	F	E	D	E	E	D
Approach Delay (s)		12.3			27.9			211.1			60.6	
Approach LOS		B			C			F			E	
Intersection Summary												
HCM 2000 Control Delay			52.2			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			1.15									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)			24.0			
Intersection Capacity Utilization			86.4%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

Queues
7: Kelly Rd & Jonesboro Rd

Future No-Build (2020) AM - Improved

1/26/2016

	→	↘	↙	←	↖
Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations	↑↑	↑	↘	↑↑	↘
Traffic Volume (vph)	843	69	110	1620	109
Future Volume (vph)	843	69	110	1620	109
Lane Group Flow (vph)	916	87	159	1906	218
Turn Type	NA	Perm	pm+pt	NA	Perm
Protected Phases	2		1	6	
Permitted Phases		2	6		8
Detector Phase	2	2	1	6	8
Switch Phase					
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0
Minimum Split (s)	29.0	29.0	11.0	24.0	42.0
Total Split (s)	82.0	82.0	16.0	98.0	42.0
Total Split (%)	58.6%	58.6%	11.4%	70.0%	30.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead		
Lead-Lag Optimize?					
Recall Mode	C-Min	C-Min	None	C-Min	None
v/c Ratio	0.40	0.08	0.35	0.71	0.77
Control Delay	4.5	0.3	7.4	11.6	69.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	4.5	0.3	7.4	11.6	69.0
Queue Length 50th (ft)	38	0	34	420	177
Queue Length 95th (ft)	57	0	50	552	208
Internal Link Dist (ft)	4515			773	731
Turn Bay Length (ft)		315	300		
Base Capacity (vph)	2285	1052	450	2685	455
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.40	0.08	0.35	0.71	0.48

Intersection Summary

Cycle Length: 140

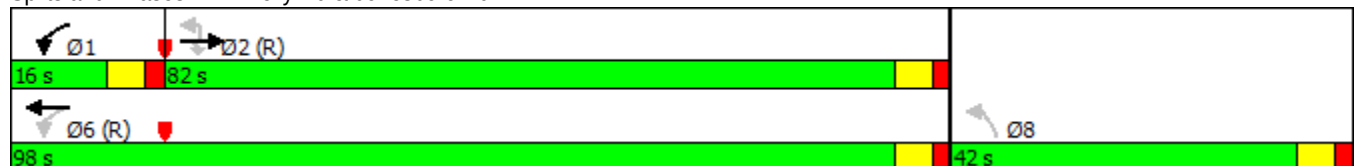
Actuated Cycle Length: 140

Offset: 84 (60%), Referenced to phase 2:EBTU and 6:WBT, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

Splits and Phases: 7: Kelly Rd & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

7: Kelly Rd & Jonesboro Rd

Future No-Build (2020) AM - Improved

1/26/2016



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	⇐	⇐⇐	⇐	⇐	⇐⇐	⇐	
Traffic Volume (vph)	0	843	69	110	1620	109	59
Future Volume (vph)	0	843	69	110	1620	109	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	
Frt		1.00	0.85	1.00	1.00	0.95	
Flt Protected		1.00	1.00	0.95	1.00	0.97	
Satd. Flow (prot)		3539	1583	1770	3539	1719	
Flt Permitted		1.00	1.00	0.25	1.00	0.97	
Satd. Flow (perm)		3539	1583	471	3539	1719	
Peak-hour factor, PHF	0.92	0.92	0.79	0.69	0.85	0.77	0.78
Adj. Flow (vph)	0	916	87	159	1906	142	76
RTOR Reduction (vph)	0	0	31	0	0	16	0
Lane Group Flow (vph)	0	916	56	159	1906	202	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	
Protected Phases		2		1	6		
Permitted Phases	2		2	6		8	
Actuated Green, G (s)		90.4	90.4	106.2	106.2	21.8	
Effective Green, g (s)		90.4	90.4	106.2	106.2	21.8	
Actuated g/C Ratio		0.65	0.65	0.76	0.76	0.16	
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)		5.0	5.0	3.0	5.0	3.0	
Lane Grp Cap (vph)		2285	1022	448	2684	267	
v/s Ratio Prot		0.26		0.02	c0.54		
v/s Ratio Perm			0.04	0.24		c0.12	
v/c Ratio		0.40	0.05	0.35	0.71	0.76	
Uniform Delay, d1		11.9	9.1	6.1	8.8	56.6	
Progression Factor		0.32	0.05	1.00	1.00	1.00	
Incremental Delay, d2		0.5	0.1	0.5	1.6	11.6	
Delay (s)		4.2	0.6	6.6	10.5	68.1	
Level of Service		A	A	A	B	E	
Approach Delay (s)		3.9			10.2	68.1	
Approach LOS		A			B	E	

Intersection Summary

HCM 2000 Control Delay	12.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	81.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis 8: Sterling Pl/N Bridges Rd & Mt Carmel Rd

Future No-Build (2020) AM - Improved

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	100	0	39	100	0	0	0	3	0	0	0
Future Volume (Veh/h)	0	100	0	39	100	0	0	0	3	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.77	0.92	0.92	0.92	0.92	0.38	0.92	0.92	0.92
Hourly flow rate (vph)	0	109	0	51	109	0	0	0	8	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	109			109			320	320	109	328	320	109
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	109			109			320	320	109	328	320	109
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			100	100	99	100	100	100
cM capacity (veh/h)	1481			1481			616	576	945	604	576	945
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	109	160	8	0								
Volume Left	0	51	0	0								
Volume Right	0	0	8	0								
cSH	1481	1481	945	1700								
Volume to Capacity	0.00	0.03	0.01	0.00								
Queue Length 95th (ft)	0	3	1	0								
Control Delay (s)	0.0	2.6	8.8	0.0								
Lane LOS		A	A	A								
Approach Delay (s)	0.0	2.6	8.8	0.0								
Approach LOS			A	A								
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization			24.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 9: Mill Road & Mt Carmel Rd

Future No-Build (2020) AM - Improved

1/26/2016

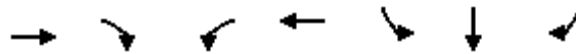
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	178	117	62	67	56	23	27	297	51	24	353	57
Future Volume (vph)	178	117	62	67	56	23	27	297	51	24	353	57
Peak Hour Factor	0.85	0.85	0.85	0.73	0.73	0.73	0.89	0.89	0.89	0.91	0.91	0.91
Hourly flow rate (vph)	209	138	73	92	77	32	30	334	57	26	388	63
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	420	201	421	477								
Volume Left (vph)	209	92	30	26								
Volume Right (vph)	73	32	57	63								
Hadj (s)	0.03	0.03	-0.03	-0.03								
Departure Headway (s)	8.3	9.4	8.2	8.3								
Degree Utilization, x	0.97	0.52	0.96	1.00								
Capacity (veh/h)	420	365	433	477								
Control Delay (s)	64.1	22.3	63.0	72.4								
Approach Delay (s)	64.1	22.3	63.0	72.4								
Approach LOS	F	C	F	F								
Intersection Summary												
Delay				60.9								
Level of Service				F								
Intersection Capacity Utilization				61.2%	ICU Level of Service		B					
Analysis Period (min)				15								

Queues

Future No-Build (2020) PM - Improved

1: I-75 SB Ramps & Jonesboro Rd

1/26/2016



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations	↑↑	↑	↵	↑↑	↵	↕	↵
Traffic Volume (vph)	1462	198	60	1271	163	1	217
Future Volume (vph)	1462	198	60	1271	163	1	217
Lane Group Flow (vph)	1539	218	70	1382	184	174	170
Turn Type	NA	Perm	pm+pt	NA	Perm	NA	Perm
Protected Phases	2		1	6		4	
Permitted Phases		2	6		4		4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0	6.0	6.0
Minimum Split (s)	24.0	24.0	11.0	24.0	24.0	24.0	24.0
Total Split (s)	100.0	100.0	13.0	113.0	37.0	37.0	37.0
Total Split (%)	66.7%	66.7%	8.7%	75.3%	24.7%	24.7%	24.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?							
Recall Mode	C-Min	C-Min	None	C-Min	None	None	None
v/c Ratio	0.62	0.18	0.30	0.50	0.75	0.61	0.59
Control Delay	14.3	1.6	4.8	4.3	79.8	39.3	37.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.3	1.6	4.8	4.3	79.8	39.3	37.5
Queue Length 50th (ft)	405	0	6	140	185	92	83
Queue Length 95th (ft)	565	31	m10	5	214	0	101
Internal Link Dist (ft)	520			890		860	
Turn Bay Length (ft)		415	635		430		700
Base Capacity (vph)	2495	1180	233	2741	347	371	376
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	0.62	0.18	0.30	0.50	0.53	0.47	0.45

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 44 (29%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

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

Splits and Phases: 1: I-75 SB Ramps & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

1: I-75 SB Ramps & Jonesboro Rd

Future No-Build (2020) PM - Improved

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑					↑	↑↑	↑
Traffic Volume (vph)	0	1462	198	60	1271	0	0	0	0	163	1	217
Future Volume (vph)	0	1462	198	60	1271	0	0	0	0	163	1	217
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.95	1.00	1.00	0.95					0.95	0.91	0.95
Frt		1.00	0.85	1.00	1.00					1.00	0.88	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		3539	1583	1770	3539					1681	1478	1504
Flt Permitted		1.00	1.00	0.11	1.00					0.95	0.99	1.00
Satd. Flow (perm)		3539	1583	206	3539					1681	1478	1504
Peak-hour factor, PHF	0.92	0.95	0.91	0.86	0.92	0.92	0.92	0.92	0.92	0.76	0.25	0.70
Adj. Flow (vph)	0	1539	218	70	1382	0	0	0	0	214	4	310
RTOR Reduction (vph)	0	0	66	0	0	0	0	0	0	0	71	71
Lane Group Flow (vph)	0	1539	152	70	1382	0	0	0	0	184	103	99
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)		104.6	104.6	116.2	116.2					21.8	21.8	21.8
Effective Green, g (s)		104.6	104.6	116.2	116.2					21.8	21.8	21.8
Actuated g/C Ratio		0.70	0.70	0.77	0.77					0.15	0.15	0.15
Clearance Time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	3.0	5.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2467	1103	217	2741					244	214	218
v/s Ratio Prot		c0.43		0.01	c0.39							
v/s Ratio Perm			0.10	0.24						c0.11	0.07	0.07
v/c Ratio		0.62	0.14	0.32	0.50					0.75	0.48	0.45
Uniform Delay, d1		12.2	7.6	9.9	6.2					61.5	58.9	58.7
Progression Factor		1.00	1.00	0.43	0.54					1.00	1.00	1.00
Incremental Delay, d2		1.2	0.3	0.7	0.5					12.4	1.7	1.5
Delay (s)		13.4	7.9	5.0	3.9					73.9	60.6	60.2
Level of Service		B	A	A	A					E	E	E
Approach Delay (s)		12.7			4.0			0.0			65.1	
Approach LOS		B			A			A			E	
Intersection Summary												
HCM 2000 Control Delay			16.7			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			150.0			Sum of lost time (s)				18.0		
Intersection Capacity Utilization			73.8%			ICU Level of Service				D		
Analysis Period (min)			15									
c Critical Lane Group												

Queues

Future No-Build (2020) PM - Improved

2: I-75 NB Ramps & Jonesboro Rd

1/26/2016



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations							
Traffic Volume (vph)	371	1281	1052	503	255	1	114
Future Volume (vph)	371	1281	1052	503	255	1	114
Lane Group Flow (vph)	458	1408	1131	553	144	143	144
Turn Type	pm+pt	NA	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	6			8	
Permitted Phases	2			6	8		8
Detector Phase	5	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	15.0	15.0	15.0	6.0	6.0	6.0
Minimum Split (s)	11.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	52.0	122.0	70.0	70.0	28.0	28.0	28.0
Total Split (%)	34.7%	81.3%	46.7%	46.7%	18.7%	18.7%	18.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?							
Recall Mode	None	C-Min	C-Min	C-Min	None	None	None
v/c Ratio	0.81	0.50	0.60	0.53	0.73	0.73	0.53
Control Delay	31.6	9.2	10.9	3.3	84.9	84.0	29.0
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Total Delay	31.6	9.4	10.9	3.3	84.9	84.0	29.0
Queue Length 50th (ft)	280	251	131	14	145	144	42
Queue Length 95th (ft)	365	507	162	55	222	55	85
Internal Link Dist (ft)		890	855			694	
Turn Bay Length (ft)	675			390	285		350
Base Capacity (vph)	681	2841	1888	1044	246	247	314
Starvation Cap Reductn	0	622	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	0.67	0.63	0.60	0.53	0.59	0.58	0.46

Intersection Summary

Cycle Length: 150

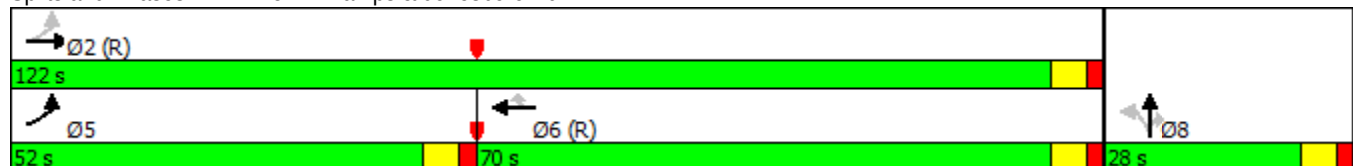
Actuated Cycle Length: 150

Offset: 12 (8%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Splits and Phases: 2: I-75 NB Ramps & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

2: I-75 NB Ramps & Jonesboro Rd

Future No-Build (2020) PM - Improved

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Traffic Volume (vph)	371	1281	0	0	1052	503	255	1	114	0	0	0
Future Volume (vph)	371	1281	0	0	1052	503	255	1	114	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	1770	3539			3539	1583	1681	1688	1583			
Flt Permitted	0.15	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	280	3539			3539	1583	1681	1688	1583			
Peak-hour factor, PHF	0.81	0.91	0.92	0.92	0.93	0.91	0.90	0.25	0.79	0.92	0.92	0.92
Adj. Flow (vph)	458	1408	0	0	1131	553	283	4	144	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	200	0	0	86	0	0	0
Lane Group Flow (vph)	458	1408	0	0	1131	353	144	143	58	0	0	0
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Actuated Green, G (s)	120.4	120.4			80.0	80.0	17.6	17.6	17.6			
Effective Green, g (s)	120.4	120.4			80.0	80.0	17.6	17.6	17.6			
Actuated g/C Ratio	0.80	0.80			0.53	0.53	0.12	0.12	0.12			
Clearance Time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Vehicle Extension (s)	3.0	5.0			5.0	5.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	566	2840			1887	844	197	198	185			
v/s Ratio Prot	c0.19	0.40			0.32							
v/s Ratio Perm	c0.46					0.22	c0.09	0.08	0.04			
v/c Ratio	0.81	0.50			0.60	0.42	0.73	0.72	0.32			
Uniform Delay, d1	29.8	4.9			24.0	21.0	63.9	63.8	60.7			
Progression Factor	0.93	1.66			0.36	0.26	1.00	1.00	1.00			
Incremental Delay, d2	7.0	0.5			1.2	1.3	13.0	12.2	1.0			
Delay (s)	34.6	8.6			10.0	6.9	77.0	76.1	61.7			
Level of Service	C	A			A	A	E	E	E			
Approach Delay (s)		15.0			9.0			71.6			0.0	
Approach LOS		B			A			E			A	
Intersection Summary												
HCM 2000 Control Delay		18.5			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.82										
Actuated Cycle Length (s)		150.0			Sum of lost time (s)			18.0				
Intersection Capacity Utilization		73.8%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

Queues
3: Managed Lane Ramp/Foster Dr & Jonesboro Rd

Future No-Build (2020) PM - Improved

1/26/2016



Lane Group	EBL	EBT	WBT	NBL	NBT	NBR	SBL	SBR	Ø1
Lane Configurations	↰	↱	↰	↰	↱	↰	↰	↰	
Traffic Volume (vph)	349	1034	1080	133	100	597	106	105	
Future Volume (vph)	349	1034	1080	133	100	597	106	105	
Lane Group Flow (vph)	453	1088	1226	145	109	649	118	122	
Turn Type	pm+pt	NA	NA	Perm	NA	Perm	Prot	Perm	
Protected Phases	5	2	6		8		7		1
Permitted Phases	2			8		8		7	
Detector Phase	5	2	6	8	8	8	7	7	
Switch Phase									
Minimum Initial (s)	5.0	15.0	15.0	5.0	5.0	5.0	6.0	6.0	5.0
Minimum Split (s)	11.0	24.0	34.0	24.0	24.0	24.0	33.0	33.0	11.0
Total Split (s)	43.0	79.0	47.0	27.0	27.0	27.0	33.0	33.0	11.0
Total Split (%)	28.7%	52.7%	31.3%	18.0%	18.0%	18.0%	22.0%	22.0%	7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes						Yes
Recall Mode	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.95	0.49	0.68	0.54	0.38	0.86	0.66	0.41	
Control Delay	60.1	15.2	27.7	65.0	59.7	36.4	81.1	7.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	60.1	15.2	27.7	65.0	59.7	36.4	81.1	7.7	
Queue Length 50th (ft)	261	276	342	131	96	148	113	0	
Queue Length 95th (ft)	337	230	413	202	156	230	176	24	
Internal Link Dist (ft)		855	1103		793				
Turn Bay Length (ft)	275			175		150		215	
Base Capacity (vph)	506	2211	1798	290	306	781	318	410	
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	0.90	0.49	0.68	0.50	0.36	0.83	0.37	0.30	

Intersection Summary

Cycle Length: 150

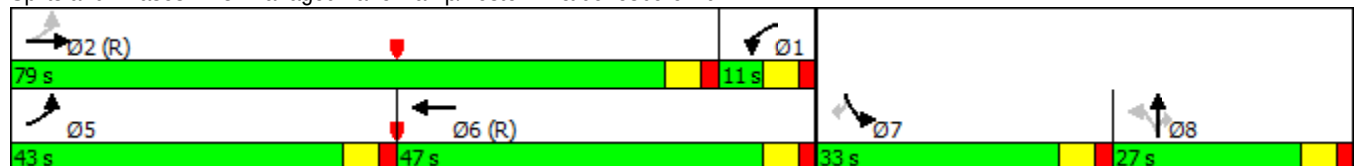
Actuated Cycle Length: 150

Offset: 11 (7%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 125

Control Type: Actuated-Coordinated

Splits and Phases: 3: Managed Lane Ramp/Foster Dr & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

3: Managed Lane Ramp/Foster Dr & Jonesboro Rd

Future No-Build (2020) PM - Improved

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	349	1034	0	0	1080	86	133	100	597	106	0	105
Future Volume (vph)	349	1034	0	0	1080	86	133	100	597	106	0	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0	6.0		6.0
Lane Util. Factor	1.00	0.95			0.91		1.00	1.00	0.88	1.00		1.00
Frt	1.00	1.00			0.99		1.00	1.00	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00	0.95		1.00
Satd. Flow (prot)	1770	3539			5022		1770	1863	2787	1770		1583
Flt Permitted	0.10	1.00			1.00		0.95	1.00	1.00	0.95		1.00
Satd. Flow (perm)	186	3539			5022		1770	1863	2787	1770		1583
Peak-hour factor, PHF	0.77	0.95	0.92	0.92	0.96	0.85	0.92	0.92	0.92	0.90	0.92	0.86
Adj. Flow (vph)	453	1088	0	0	1125	101	145	109	649	118	0	122
RTOR Reduction (vph)	0	0	0	0	6	0	0	0	328	0	0	110
Lane Group Flow (vph)	453	1088	0	0	1220	0	145	109	321	118	0	12
Turn Type	pm+pt	NA		Prot	NA		Perm	NA	Perm	Prot		Perm
Protected Phases	5	2		1	6			8		7		
Permitted Phases	2						8		8			7
Actuated Green, G (s)	93.7	93.7			53.5		23.0	23.0	23.0	15.3		15.3
Effective Green, g (s)	93.7	93.7			53.5		23.0	23.0	23.0	15.3		15.3
Actuated g/C Ratio	0.62	0.62			0.36		0.15	0.15	0.15	0.10		0.10
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0	6.0		6.0
Vehicle Extension (s)	3.0	5.0			5.0		3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	477	2210			1791		271	285	427	180		161
v/s Ratio Prot	c0.22	0.31			0.24			0.06		c0.07		
v/s Ratio Perm	c0.38						0.08		c0.12			0.01
v/c Ratio	0.95	0.49			0.68		0.54	0.38	0.75	0.66		0.08
Uniform Delay, d1	42.9	15.3			41.0		58.6	57.1	60.8	64.8		61.0
Progression Factor	0.78	0.87			0.59		1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	26.3	0.7			2.0		2.0	0.9	7.3	8.3		0.2
Delay (s)	60.0	13.9			26.2		60.6	58.0	68.1	73.1		61.2
Level of Service	E	B			C		E	E	E	E		E
Approach Delay (s)		27.5			26.2			65.7			67.0	
Approach LOS		C			C			E			E	
Intersection Summary												
HCM 2000 Control Delay			38.3				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.90									
Actuated Cycle Length (s)			150.0				Sum of lost time (s)			24.0		
Intersection Capacity Utilization			71.2%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis 4: N Bridges Rd/Bojangles Drwy & Jonesboro Rd

Future No-Build (2020) PM - Improved

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	1698	3	2	1171	20	0	0	3	21	0	24
Future Volume (Veh/h)	24	1698	3	2	1171	20	0	0	3	21	0	24
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.52	0.96	0.38	0.50	0.91	0.59	0.92	0.92	0.38	0.83	0.92	0.82
Hourly flow rate (vph)	46	1769	8	4	1287	34	0	0	8	25	0	29
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	1183											
pX, platoon unblocked				0.83			0.83			0.83		
vC, conflicting volume	1321			1769			2512			3190		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1321			1524			2416			3228		
tC, single (s)	4.1			4.1			7.5			6.5		
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5			4.0		
p0 queue free %	91			99			100			100		
cM capacity (veh/h)	519			362			12			7		
							455			21		
										8		
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1		
Volume Total	46	884	884	8	4	644	644	34	8	54		
Volume Left	46	0	0	0	4	0	0	0	0	25		
Volume Right	0	0	0	8	0	0	0	34	8	29		
cSH	519	1700	1700	1700	362	1700	1700	1700	455	44		
Volume to Capacity	0.09	0.52	0.52	0.00	0.01	0.38	0.38	0.02	0.02	1.24		
Queue Length 95th (ft)	7	0	0	0	1	0	0	0	1	130		
Control Delay (s)	12.6	0.0	0.0	0.0	15.1	0.0	0.0	0.0	13.1	361.7		
Lane LOS	B			C						B		
Approach Delay (s)	0.3			0.0						13.1		
Approach LOS										B		
Intersection Summary												
Average Delay				6.3								
Intersection Capacity Utilization				62.9%			ICU Level of Service			B		
Analysis Period (min)				15								

Queues
5: Mt Carmel Rd & Jonesboro Rd

Future No-Build (2020) PM - Improved

1/26/2016

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↑
Traffic Volume (vph)	1699	8	108	1146	19	120
Future Volume (vph)	1699	8	108	1146	19	120
Lane Group Flow (vph)	1827	16	117	1273	25	130
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	3	
Permitted Phases		2	6			3
Detector Phase	2	2	1	6	3	3
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	11.0	24.0	24.0	24.0
Total Split (s)	109.0	109.0	17.0	126.0	24.0	24.0
Total Split (%)	72.7%	72.7%	11.3%	84.0%	16.0%	16.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Recall Mode	C-Min	C-Min	None	C-Min	None	None
v/c Ratio	0.69	0.01	0.46	0.42	0.26	0.62
Control Delay	6.2	1.0	31.6	1.3	73.5	23.6
Queue Delay	0.1	0.0	0.0	0.2	0.0	0.0
Total Delay	6.2	1.0	31.6	1.5	73.5	23.7
Queue Length 50th (ft)	155	0	35	21	24	0
Queue Length 95th (ft)	241	m0	m65	m28	46	67
Internal Link Dist (ft)	2065			797	3235	
Turn Bay Length (ft)		250	300		100	
Base Capacity (vph)	2650	1189	260	3063	212	304
Starvation Cap Reductn	0	0	0	858	0	0
Spillback Cap Reductn	81	0	0	0	0	2
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.01	0.45	0.58	0.12	0.43

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 115 (77%), Referenced to phase 2:EBTU and 6:WBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

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

Splits and Phases: 5: Mt Carmel Rd & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

5: Mt Carmel Rd & Jonesboro Rd

Future No-Build (2020) PM - Improved

1/26/2016



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰	↶↷	↰	↰	↶↷	↰	↰
Traffic Volume (vph)	0	1699	8	108	1146	19	120
Future Volume (vph)	0	1699	8	108	1146	19	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	1.00
Frt		1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)		3539	1583	1770	3539	1770	1583
Flt Permitted		1.00	1.00	0.08	1.00	0.95	1.00
Satd. Flow (perm)		3539	1583	147	3539	1770	1583
Peak-hour factor, PHF	0.92	0.93	0.50	0.92	0.90	0.75	0.92
Adj. Flow (vph)	0	1827	16	117	1273	25	130
RTOR Reduction (vph)	0	0	4	0	0	0	123
Lane Group Flow (vph)	0	1827	12	117	1273	25	7
Turn Type	Perm	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases		2		1	6	3	
Permitted Phases	2		2	6			3
Actuated Green, G (s)		112.4	112.4	129.9	129.9	8.1	8.1
Effective Green, g (s)		112.4	112.4	129.9	129.9	8.1	8.1
Actuated g/C Ratio		0.75	0.75	0.87	0.87	0.05	0.05
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		2651	1186	251	3064	95	85
v/s Ratio Prot		c0.52		0.04	c0.36	c0.01	
v/s Ratio Perm			0.01	0.37			0.00
v/c Ratio		0.69	0.01	0.47	0.42	0.26	0.08
Uniform Delay, d1		9.7	4.8	14.0	2.1	68.1	67.4
Progression Factor		0.46	0.35	4.78	0.41	1.00	1.00
Incremental Delay, d2		1.2	0.0	1.0	0.3	1.5	0.4
Delay (s)		5.7	1.7	67.9	1.2	69.6	67.8
Level of Service		A	A	E	A	E	E
Approach Delay (s)		5.7			6.8	68.1	
Approach LOS		A			A	E	

Intersection Summary

HCM 2000 Control Delay	9.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	72.1%	ICU Level of Service	C
Analysis Period (min)	15		

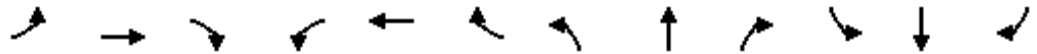
c Critical Lane Group

Queues

Future No-Build (2020) PM - Improved

6: Willow Lane/Oak Grove Rd & Jonesboro Rd

1/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	1488	263	61	963	50	229	127	123	200	324	47
Future Volume (vph)	41	1488	263	61	963	50	229	127	123	200	324	47
Lane Group Flow (vph)	51	1566	302	113	1024	67	266	135	143	222	356	63
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	11.0	26.0	26.0	11.0	36.0	36.0	11.0	46.0	46.0	11.0	44.0	44.0
Total Split (s)	11.0	76.0	76.0	11.0	76.0	76.0	19.0	46.0	46.0	17.0	44.0	44.0
Total Split (%)	7.3%	50.7%	50.7%	7.3%	50.7%	50.7%	12.7%	30.7%	30.7%	11.3%	29.3%	29.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
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	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)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.22	0.88	0.35	1.05	0.56	0.08	1.20	0.31	0.31	0.57	0.87	0.15
Control Delay	21.6	44.2	21.6	121.7	30.8	5.9	162.2	48.6	13.3	44.3	78.4	1.3
Queue Delay	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.6	44.7	21.6	121.7	30.8	5.9	162.2	48.6	13.3	44.3	78.4	1.3
Queue Length 50th (ft)	29	712	135	~73	425	7	~240	109	21	161	337	0
Queue Length 95th (ft)	m48	#927	214	#65	529	22	#380	167	70	225	446	0
Internal Link Dist (ft)		797			4516			905			451	
Turn Bay Length (ft)	300		150	300		250	500		400	135		100
Base Capacity (vph)	235	1774	851	108	1826	869	221	496	506	391	471	482
Starvation Cap Reductn	0	38	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	0.22	0.90	0.35	1.05	0.56	0.08	1.20	0.27	0.28	0.57	0.76	0.13

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 90 (60%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 135

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

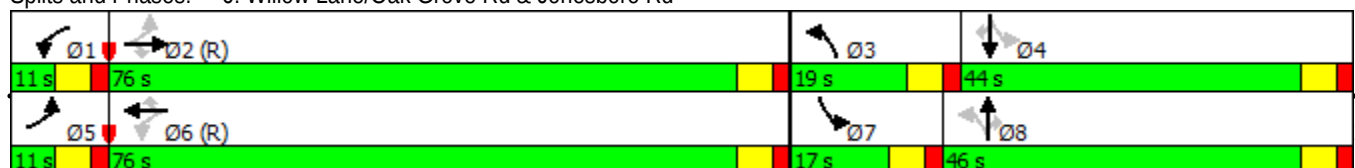
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 6: Willow Lane/Oak Grove Rd & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

6: Willow Lane/Oak Grove Rd & Jonesboro Rd

Future No-Build (2020) PM - Improved

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	1488	263	61	963	50	229	127	123	200	324	47
Future Volume (vph)	41	1488	263	61	963	50	229	127	123	200	324	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.19	1.00	1.00	0.05	1.00	1.00	0.16	1.00	1.00	0.64	1.00	1.00
Satd. Flow (perm)	351	3539	1583	98	3539	1583	291	1863	1583	1198	1863	1583
Peak-hour factor, PHF	0.81	0.95	0.87	0.54	0.94	0.75	0.86	0.94	0.86	0.90	0.91	0.75
Adj. Flow (vph)	51	1566	302	113	1024	67	266	135	143	222	356	63
RTOR Reduction (vph)	0	0	57	0	0	33	0	0	88	0	0	49
Lane Group Flow (vph)	51	1566	245	113	1024	34	266	135	55	222	356	14
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	79.2	75.2	75.2	81.2	76.2	76.2	47.8	34.8	34.8	43.8	32.8	32.8
Effective Green, g (s)	79.2	75.2	75.2	81.2	76.2	76.2	47.8	34.8	34.8	43.8	32.8	32.8
Actuated g/C Ratio	0.53	0.50	0.50	0.54	0.51	0.51	0.32	0.23	0.23	0.29	0.22	0.22
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	223	1774	793	108	1797	804	220	432	367	391	407	346
v/s Ratio Prot	0.01	0.44		c0.03	0.29		c0.10	0.07		0.04	0.19	
v/s Ratio Perm	0.11		0.15	c0.53		0.02	c0.28		0.03	0.12		0.01
v/c Ratio	0.23	0.88	0.31	1.05	0.57	0.04	1.21	0.31	0.15	0.57	0.87	0.04
Uniform Delay, d1	19.4	33.5	22.1	35.5	25.6	18.6	44.7	47.7	45.8	43.5	56.6	46.2
Progression Factor	1.28	1.14	1.44	0.81	1.13	9.88	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	5.1	0.7	95.7	1.2	0.1	128.7	0.4	0.2	1.9	18.4	0.0
Delay (s)	25.3	43.2	32.5	124.3	30.0	183.4	173.4	48.1	46.0	45.4	75.0	46.2
Level of Service	C	D	C	F	C	F	F	D	D	D	E	D
Approach Delay (s)		41.0			47.4			108.8			62.0	
Approach LOS		D			D			F			E	
Intersection Summary												
HCM 2000 Control Delay			54.5									
HCM 2000 Volume to Capacity ratio			1.13									
Actuated Cycle Length (s)			150.0									
Intersection Capacity Utilization			95.0%									
Analysis Period (min)			15									
c Critical Lane Group												

Queues
7: Kelly Rd & Jonesboro Rd

Future No-Build (2020) PM - Improved

1/26/2016



Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations	↑↑	↑	↑	↑↑	↑↑
Traffic Volume (vph)	1739	91	153	989	105
Future Volume (vph)	1739	91	153	989	105
Lane Group Flow (vph)	1932	112	184	1111	269
Turn Type	NA	Perm	pm+pt	NA	Perm
Protected Phases	2		1	6	
Permitted Phases		2	6		8
Detector Phase	2	2	1	6	8
Switch Phase					
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0
Minimum Split (s)	29.0	29.0	11.0	24.0	42.0
Total Split (s)	91.0	91.0	17.0	108.0	42.0
Total Split (%)	60.7%	60.7%	11.3%	72.0%	28.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead		
Lead-Lag Optimize?					
Recall Mode	C-Min	C-Min	None	C-Min	None
v/c Ratio	0.87	0.11	1.02	0.42	0.82
Control Delay	11.0	0.5	114.8	8.4	71.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.0	0.5	114.8	8.4	71.1
Queue Length 50th (ft)	180	1	~139	193	225
Queue Length 95th (ft)	#236	m1	#269	285	278
Internal Link Dist (ft)	4516			773	731
Turn Bay Length (ft)		315	300		
Base Capacity (vph)	2229	1028	180	2630	432
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.87	0.11	1.02	0.42	0.62

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 145 (97%), Referenced to phase 2:EBTU and 6:WBTL, Start of Green

Natural Cycle: 135

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 7: Kelly Rd & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

7: Kelly Rd & Jonesboro Rd

Future No-Build (2020) PM - Improved

1/26/2016



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	⇐	⇑⇑	⇑	⇑	⇑⇑	⇑	
Traffic Volume (vph)	0	1739	91	153	989	105	121
Future Volume (vph)	0	1739	91	153	989	105	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	
Frt		1.00	0.85	1.00	1.00	0.93	
Flt Protected		1.00	1.00	0.95	1.00	0.98	
Satd. Flow (prot)		3539	1583	1770	3539	1690	
Flt Permitted		1.00	1.00	0.04	1.00	0.98	
Satd. Flow (perm)		3539	1583	74	3539	1690	
Peak-hour factor, PHF	0.92	0.90	0.81	0.83	0.89	0.83	0.85
Adj. Flow (vph)	0	1932	112	184	1111	127	142
RTOR Reduction (vph)	0	0	31	0	0	29	0
Lane Group Flow (vph)	0	1932	81	184	1111	240	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	
Protected Phases		2		1	6		
Permitted Phases	2		2	6		8	
Actuated Green, G (s)		94.5	94.5	111.5	111.5	26.5	
Effective Green, g (s)		94.5	94.5	111.5	111.5	26.5	
Actuated g/C Ratio		0.63	0.63	0.74	0.74	0.18	
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)		5.0	5.0	3.0	5.0	3.0	
Lane Grp Cap (vph)		2229	997	179	2630	298	
v/s Ratio Prot		0.55		c0.08	0.31		
v/s Ratio Perm			0.05	c0.69		c0.14	
v/c Ratio		0.87	0.08	1.03	0.42	0.81	
Uniform Delay, d1		22.6	10.8	53.3	7.2	59.3	
Progression Factor		0.29	0.10	1.00	1.00	1.00	
Incremental Delay, d2		3.1	0.1	74.8	0.5	14.6	
Delay (s)		9.7	1.2	128.1	7.7	73.9	
Level of Service		A	A	F	A	E	
Approach Delay (s)		9.3			24.8	73.9	
Approach LOS		A			C	E	

Intersection Summary

HCM 2000 Control Delay	19.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	84.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis 8: Sterling Pl/N Bridges Rd & Mt Carmel Rd

Future No-Build (2020) PM - Improved

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	100	0	20	100	1	0	0	41	0	0	1
Future Volume (Veh/h)	1	100	0	20	100	1	0	0	41	0	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.92	0.92	0.68	0.92	0.25	0.92	0.92	0.65	0.92	0.92	0.25
Hourly flow rate (vph)	4	109	0	29	109	4	0	0	63	0	0	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	113			109			290	288	109	349	286	111
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	113			109			290	288	109	349	286	111
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			100	100	93	100	100	100
cM capacity (veh/h)	1476			1481			648	608	945	556	610	942
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	113	142	63	4								
Volume Left	4	29	0	0								
Volume Right	0	4	63	4								
cSH	1476	1481	945	942								
Volume to Capacity	0.00	0.02	0.07	0.00								
Queue Length 95th (ft)	0	1	5	0								
Control Delay (s)	0.3	1.7	9.1	8.8								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.3	1.7	9.1	8.8								
Approach LOS			A	A								
Intersection Summary												
Average Delay			2.7									
Intersection Capacity Utilization			23.1%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 9: Mill Road & Mt Carmel Rd

Future No-Build (2020) PM - Improved

1/26/2016

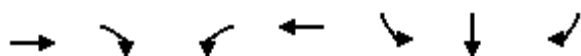
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	128	22	59	53	94	62	76	277	51	32	337	138
Future Volume (vph)	128	22	59	53	94	62	76	277	51	32	337	138
Peak Hour Factor	0.77	0.77	0.77	0.67	0.67	0.67	0.90	0.90	0.90	0.93	0.93	0.93
Hourly flow rate (vph)	166	29	77	79	140	93	84	308	57	34	362	148
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	272	312	449	544								
Volume Left (vph)	166	79	84	34								
Volume Right (vph)	77	93	57	148								
Hadj (s)	-0.01	-0.09	0.00	-0.12								
Departure Headway (s)	8.9	8.6	8.1	8.0								
Degree Utilization, x	0.67	0.75	1.00	1.00								
Capacity (veh/h)	391	402	449	544								
Control Delay (s)	28.3	33.0	71.5	70.9								
Approach Delay (s)	28.3	33.0	71.5	70.9								
Approach LOS	D	D	F	F								
Intersection Summary												
Delay				56.2								
Level of Service				F								
Intersection Capacity Utilization				75.4%	ICU Level of Service	D						
Analysis Period (min)				15								

Queues

Future No-Build (2020) Saturday - Improved

1: I-75 SB Ramps & Jonesboro Rd

1/26/2016



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations	↑↑	↑	↑	↑↑	↑	↑↓	↑
Traffic Volume (vph)	1358	388	124	1481	169	3	567
Future Volume (vph)	1358	388	124	1481	169	3	567
Lane Group Flow (vph)	1429	473	149	1543	193	325	320
Turn Type	NA	Perm	pm+pt	NA	Perm	NA	Perm
Protected Phases	2		1	6		4	
Permitted Phases		2	6		4		4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0	6.0	6.0
Minimum Split (s)	24.0	24.0	11.0	24.0	24.0	24.0	24.0
Total Split (s)	81.0	81.0	20.0	101.0	49.0	49.0	49.0
Total Split (%)	54.0%	54.0%	13.3%	67.3%	32.7%	32.7%	32.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?							
Recall Mode	C-Min	C-Min	None	C-Min	None	None	None
v/c Ratio	0.71	0.43	0.62	0.64	0.49	0.87	0.80
Control Delay	27.7	2.9	29.2	3.6	52.8	70.9	56.9
Queue Delay	0.0	0.0	0.0	0.3	0.0	0.0	0.0
Total Delay	27.7	2.9	29.2	3.9	52.8	70.9	56.9
Queue Length 50th (ft)	525	0	30	0	171	298	251
Queue Length 95th (ft)	704	29	m57	216	207	118	356
Internal Link Dist (ft)	520			890		860	
Turn Bay Length (ft)		415	635		430		700
Base Capacity (vph)	2010	1103	266	2426	481	447	477
Starvation Cap Reductn	0	0	0	320	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	0.71	0.43	0.56	0.73	0.40	0.73	0.67

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 53 (35%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

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

Splits and Phases: 1: I-75 SB Ramps & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis Future No-Build (2020) Saturday - Improved

1: I-75 SB Ramps & Jonesboro Rd

1/26/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑					↑	↑↑	↑
Traffic Volume (vph)	0	1358	388	124	1481	0	0	0	0	169	3	567
Future Volume (vph)	0	1358	388	124	1481	0	0	0	0	169	3	567
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.95	1.00	1.00	0.95					0.95	0.91	0.95
Frt		1.00	0.85	1.00	1.00					1.00	0.86	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		3539	1583	1770	3539					1681	1459	1504
Flt Permitted		1.00	1.00	0.09	1.00					0.95	1.00	1.00
Satd. Flow (perm)		3539	1583	171	3539					1681	1459	1504
Peak-hour factor, PHF	0.92	0.95	0.82	0.83	0.96	0.92	0.92	0.92	0.92	0.79	0.38	0.92
Adj. Flow (vph)	0	1429	473	149	1543	0	0	0	0	214	8	616
RTOR Reduction (vph)	0	0	204	0	0	0	0	0	0	0	31	50
Lane Group Flow (vph)	0	1429	269	149	1543	0	0	0	0	193	294	270
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)		85.3	85.3	102.9	102.9					35.1	35.1	35.1
Effective Green, g (s)		85.3	85.3	102.9	102.9					35.1	35.1	35.1
Actuated g/C Ratio		0.57	0.57	0.69	0.69					0.23	0.23	0.23
Clearance Time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	3.0	5.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2012	900	240	2427					393	341	351
v/s Ratio Prot		c0.40		0.05	c0.44							
v/s Ratio Perm			0.17	0.38						0.11	0.20	0.18
v/c Ratio		0.71	0.30	0.62	0.64					0.49	0.86	0.77
Uniform Delay, d1		23.4	16.8	20.7	13.1					49.7	55.1	53.7
Progression Factor		1.00	1.00	1.58	0.20					1.00	1.00	1.00
Incremental Delay, d2		2.2	0.9	2.9	0.8					1.0	19.4	9.8
Delay (s)		25.6	17.7	35.7	3.3					50.7	74.5	63.5
Level of Service		C	B	D	A					D	E	E
Approach Delay (s)		23.6			6.2			0.0			64.8	
Approach LOS		C			A			A			E	

Intersection Summary

HCM 2000 Control Delay	24.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	87.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Queues

Future No-Build (2020) Saturday - Improved

2: I-75 NB Ramps & Jonesboro Rd

1/26/2016



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations							
Traffic Volume (vph)	480	1067	1139	542	436	3	117
Future Volume (vph)	480	1067	1139	542	436	3	117
Lane Group Flow (vph)	511	1173	1174	602	268	265	129
Turn Type	pm+pt	NA	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	6			8	
Permitted Phases	2			6	8		8
Detector Phase	5	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	15.0	15.0	15.0	6.0	6.0	6.0
Minimum Split (s)	11.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	50.0	115.0	65.0	65.0	35.0	35.0	35.0
Total Split (%)	33.3%	76.7%	43.3%	43.3%	23.3%	23.3%	23.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?							
Recall Mode	None	C-Min	C-Min	C-Min	None	None	None
v/c Ratio	0.91	0.45	0.78	0.66	0.89	0.88	0.33
Control Delay	47.3	20.2	19.1	7.5	90.2	87.9	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.3	20.2	19.1	7.5	90.2	87.9	10.2
Queue Length 50th (ft)	436	451	573	15	268	264	0
Queue Length 95th (ft)	#604	623	166	79	#362	138	59
Internal Link Dist (ft)		890	855			694	
Turn Bay Length (ft)	675			390	285		350
Base Capacity (vph)	590	2622	1512	918	324	326	410
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	0.87	0.45	0.78	0.66	0.83	0.81	0.31

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

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

Natural Cycle: 90

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 2: I-75 NB Ramps & Jonesboro Rd



Baseline

Synchro 9 Report
Page 3

HCM Signalized Intersection Capacity Analysis Future No-Build (2020) Saturday - Improved 2: I-75 NB Ramps & Jonesboro Rd

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	480	1067	0	0	1139	542	436	3	117	0	0	0
Future Volume (vph)	480	1067	0	0	1139	542	436	3	117	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	1770	3539			3539	1583	1681	1688	1583			
Flt Permitted	0.09	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	161	3539			3539	1583	1681	1688	1583			
Peak-hour factor, PHF	0.94	0.91	0.92	0.92	0.97	0.90	0.83	0.38	0.91	0.92	0.92	0.92
Adj. Flow (vph)	511	1173	0	0	1174	602	525	8	129	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	243	0	0	106	0	0	0
Lane Group Flow (vph)	511	1173	0	0	1174	359	268	265	23	0	0	0
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Actuated Green, G (s)	111.1	111.1			64.0	64.0	26.9	26.9	26.9			
Effective Green, g (s)	111.1	111.1			64.0	64.0	26.9	26.9	26.9			
Actuated g/C Ratio	0.74	0.74			0.43	0.43	0.18	0.18	0.18			
Clearance Time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Vehicle Extension (s)	3.0	5.0			5.0	5.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	560	2621			1509	675	301	302	283			
v/s Ratio Prot	c0.25	0.33			0.33							
v/s Ratio Perm	c0.43					0.23	c0.16	0.16	0.01			
v/c Ratio	0.91	0.45			0.78	0.53	0.89	0.88	0.08			
Uniform Delay, d1	42.2	7.5			36.9	31.9	60.1	59.9	51.3			
Progression Factor	0.75	2.52			0.40	0.43	1.00	1.00	1.00			
Incremental Delay, d2	15.4	0.4			3.5	2.6	26.2	23.7	0.1			
Delay (s)	47.3	19.5			18.5	16.2	86.3	83.6	51.4			
Level of Service	D	B			B	B	F	F	D			
Approach Delay (s)		27.9			17.7			78.4			0.0	
Approach LOS		C			B			E			A	
Intersection Summary												
HCM 2000 Control Delay			31.6									
HCM 2000 Volume to Capacity ratio			0.93									
Actuated Cycle Length (s)			150.0									
Intersection Capacity Utilization			87.3%									
Analysis Period (min)			15									
c Critical Lane Group												

Queues

Future No-Build (2020) Saturday - Improved

3: Managed Lane Ramp/Foster Dr & Jonesboro Rd

1/26/2016



Lane Group	EBL	EBT	WBT	NBL	NBT	NBR	SBL	SBR	Ø1
Lane Configurations	←	↑↑	↑↑↑	←	↑	↑↑	←	←	
Traffic Volume (vph)	309	872	1215	133	100	597	84	119	
Future Volume (vph)	309	872	1215	133	100	597	84	119	
Lane Group Flow (vph)	351	899	1325	145	109	649	118	135	
Turn Type	pm+pt	NA	NA	Perm	NA	Perm	Prot	Perm	
Protected Phases	5	2	6		8		7		1
Permitted Phases	2			8		8		7	
Detector Phase	5	2	6	8	8	8	7	7	
Switch Phase									
Minimum Initial (s)	5.0	15.0	15.0	5.0	5.0	5.0	6.0	6.0	5.0
Minimum Split (s)	11.0	24.0	34.0	24.0	24.0	24.0	33.0	33.0	11.0
Total Split (s)	36.0	76.0	51.0	30.0	30.0	30.0	33.0	33.0	11.0
Total Split (%)	24.0%	50.7%	34.0%	20.0%	20.0%	20.0%	22.0%	22.0%	7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes						Yes
Recall Mode	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.86	0.40	0.63	0.59	0.42	0.86	0.66	0.45	
Control Delay	61.3	6.1	22.2	69.1	62.2	32.0	81.1	10.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	61.3	6.1	22.2	69.1	62.2	32.0	81.1	10.6	
Queue Length 50th (ft)	172	78	268	135	99	124	113	0	
Queue Length 95th (ft)	#386	41	428	197	152	195	136	43	
Internal Link Dist (ft)		855	1103		793				
Turn Bay Length (ft)	275			175		150		215	
Base Capacity (vph)	438	2261	2119	302	317	832	318	410	
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	0.80	0.40	0.63	0.48	0.34	0.78	0.37	0.33	

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

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

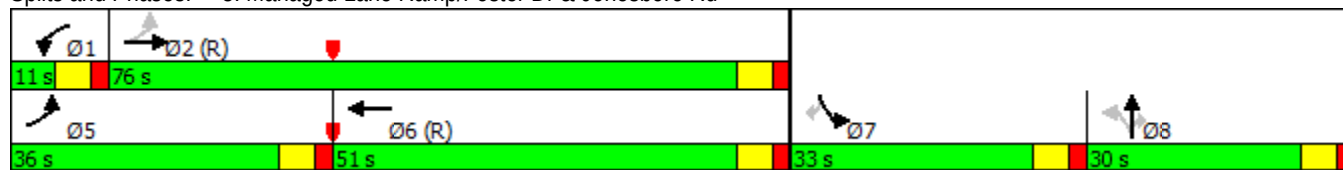
Natural Cycle: 115

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: Managed Lane Ramp/Foster Dr & Jonesboro Rd



Baseline

Synchro 9 Report
Page 5

HCM Signalized Intersection Capacity Analysis Future No-Build (2020) Saturday - Improved

3: Managed Lane Ramp/Foster Dr & Jonesboro Rd

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	309	872	0	0	1215	63	133	100	597	84	0	119
Future Volume (vph)	309	872	0	0	1215	63	133	100	597	84	0	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0	6.0		6.0
Lane Util. Factor	1.00	0.95			0.91		1.00	1.00	0.88	1.00		1.00
Frt	1.00	1.00			0.99		1.00	1.00	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00	0.95		1.00
Satd. Flow (prot)	1770	3539			5044		1770	1863	2787	1770		1583
Flt Permitted	0.10	1.00			1.00		0.95	1.00	1.00	0.95		1.00
Satd. Flow (perm)	194	3539			5044		1770	1863	2787	1770		1583
Peak-hour factor, PHF	0.88	0.97	0.92	0.92	0.97	0.88	0.92	0.92	0.92	0.71	0.92	0.88
Adj. Flow (vph)	351	899	0	0	1253	72	145	109	649	118	0	135
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	371	0	0	121
Lane Group Flow (vph)	351	899	0	0	1322	0	145	109	278	118	0	14
Turn Type	pm+pt	NA		Prot	NA		Perm	NA	Perm	Prot		Perm
Protected Phases	5	2		1	6			8		7		
Permitted Phases	2						8		8			7
Actuated Green, G (s)	95.9	95.9			63.0		20.8	20.8	20.8	15.3		15.3
Effective Green, g (s)	95.9	95.9			63.0		20.8	20.8	20.8	15.3		15.3
Actuated g/C Ratio	0.64	0.64			0.42		0.14	0.14	0.14	0.10		0.10
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0	6.0		6.0
Vehicle Extension (s)	3.0	5.0			5.0		3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	406	2262			2118		245	258	386	180		161
v/s Ratio Prot	c0.15	0.25			0.26			0.06		c0.07		
v/s Ratio Perm	c0.40						0.08		c0.10			0.01
v/c Ratio	0.86	0.40			0.62		0.59	0.42	0.72	0.66		0.09
Uniform Delay, d1	38.0	13.1			34.2		60.6	59.1	61.8	64.8		61.0
Progression Factor	1.24	0.38			0.56		1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	16.0	0.5			1.3		3.8	1.1	6.3	8.3		0.2
Delay (s)	63.1	5.5			20.5		64.4	60.2	68.1	73.1		61.2
Level of Service	E	A			C		E	E	E	E		E
Approach Delay (s)		21.7			20.5			66.6			66.8	
Approach LOS		C			C			E			E	
Intersection Summary												
HCM 2000 Control Delay			35.2				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			150.0				Sum of lost time (s)			24.0		
Intersection Capacity Utilization			71.0%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis Future No-Build (2020) Saturday - Improved

4: N Bridges Rd/Bojangles Drwy & Jonesboro Rd

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	1479	3	4	1235	22	2	0	3	23	0	55
Future Volume (Veh/h)	56	1479	3	4	1235	22	2	0	3	23	0	55
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.83	0.92	0.25	0.50	0.98	0.66	0.50	0.92	0.38	0.79	0.92	0.87
Hourly flow rate (vph)	67	1608	12	8	1260	33	4	0	8	29	0	63
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	1183											
pX, platoon unblocked				0.88			0.88			0.88		
vC, conflicting volume	1293			1608			2388			3051		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1293			1422			2306			3058		
tC, single (s)	4.1			4.1			7.5			6.5		
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5			4.0		
p0 queue free %	87			98			71			100		
cM capacity (veh/h)	532			419			14			9		
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1		
Volume Total	67	804	804	12	8	630	630	33	12	92		
Volume Left	67	0	0	0	8	0	0	0	4	29		
Volume Right	0	0	0	12	0	0	0	33	8	63		
cSH	532	1700	1700	1700	419	1700	1700	1700	39	64		
Volume to Capacity	0.13	0.47	0.47	0.01	0.02	0.37	0.37	0.02	0.31	1.44		
Queue Length 95th (ft)	11	0	0	0	1	0	0	0	26	197		
Control Delay (s)	12.7	0.0	0.0	0.0	13.8	0.0	0.0	0.0	134.5	374.3		
Lane LOS	B				B				F	F		
Approach Delay (s)	0.5				0.1				134.5	374.3		
Approach LOS									F	F		
Intersection Summary												
Average Delay				12.0								
Intersection Capacity Utilization				58.7%			ICU Level of Service			B		
Analysis Period (min)				15								

Queues
5: Mt Carmel Rd & Jonesboro Rd

Future No-Build (2020) Saturday - Improved

1/26/2016

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↑
Traffic Volume (vph)	1465	11	104	1235	6	108
Future Volume (vph)	1465	11	104	1235	6	108
Lane Group Flow (vph)	1610	18	315	1260	16	270
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	3	
Permitted Phases		2	6			3
Detector Phase	2	2	1	6	3	3
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	11.0	24.0	24.0	24.0
Total Split (s)	88.0	88.0	37.0	125.0	25.0	25.0
Total Split (%)	58.7%	58.7%	24.7%	83.3%	16.7%	16.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Recall Mode	C-Min	C-Min	None	C-Min	None	None
v/c Ratio	0.72	0.02	0.74	0.41	0.15	0.77
Control Delay	29.0	10.6	47.9	1.9	67.2	22.3
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	29.0	10.6	47.9	1.9	67.2	22.3
Queue Length 50th (ft)	616	5	210	48	15	0
Queue Length 95th (ft)	797	m11	74	m89	16	0
Internal Link Dist (ft)	2065			797	3235	
Turn Bay Length (ft)		250	300		100	
Base Capacity (vph)	2249	1010	470	3041	224	436
Starvation Cap Reductn	0	0	0	375	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.02	0.67	0.47	0.07	0.62

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 72 (48%), Referenced to phase 2:EBTU and 6:WBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

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

Splits and Phases: 5: Mt Carmel Rd & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

Future No-Build (2020) Saturday - Improved

5: Mt Carmel Rd & Jonesboro Rd

1/26/2016



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰	↑↑	↗	↰	↑↑	↗	↗
Traffic Volume (vph)	0	1465	11	104	1235	6	108
Future Volume (vph)	0	1465	11	104	1235	6	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	1.00
Frt		1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)		3539	1583	1770	3539	1770	1583
Flt Permitted		1.00	1.00	0.08	1.00	0.95	1.00
Satd. Flow (perm)		3539	1583	150	3539	1770	1583
Peak-hour factor, PHF	0.92	0.91	0.62	0.33	0.98	0.38	0.40
Adj. Flow (vph)	0	1610	18	315	1260	16	270
RTOR Reduction (vph)	0	0	4	0	0	0	254
Lane Group Flow (vph)	0	1610	14	315	1260	16	16
Turn Type	Perm	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases		2		1	6	3	
Permitted Phases	2		2	6			3
Actuated Green, G (s)		95.3	95.3	128.9	128.9	9.1	9.1
Effective Green, g (s)		95.3	95.3	128.9	128.9	9.1	9.1
Actuated g/C Ratio		0.64	0.64	0.86	0.86	0.06	0.06
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		2248	1005	426	3041	107	96
v/s Ratio Prot		0.45		c0.14	0.36	0.01	
v/s Ratio Perm			0.01	c0.50			c0.01
v/c Ratio		0.72	0.01	0.74	0.41	0.15	0.17
Uniform Delay, d1		18.3	10.1	38.7	2.3	66.8	66.9
Progression Factor		1.35	1.34	1.27	0.58	1.00	1.00
Incremental Delay, d2		1.7	0.0	5.6	0.3	0.6	0.8
Delay (s)		26.4	13.5	54.6	1.7	67.4	67.7
Level of Service		C	B	D	A	E	E
Approach Delay (s)		26.3			12.3	67.7	
Approach LOS		C			B	E	

Intersection Summary

HCM 2000 Control Delay	23.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Queues

Future No-Build (2020) Saturday - Improved

6: Willow Lane/Oak Grove Rd & Jonesboro Rd

1/26/2016

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	1379	159	46	1118	53	166	86	43	96	188	41
Future Volume (vph)	56	1379	159	46	1118	53	166	86	43	96	188	41
Lane Group Flow (vph)	93	1422	177	58	1165	60	198	97	67	123	232	55
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	11.0	26.0	26.0	11.0	36.0	36.0	11.0	46.0	46.0	11.0	44.0	44.0
Total Split (s)	15.0	78.0	78.0	11.0	74.0	74.0	17.0	49.0	49.0	12.0	44.0	44.0
Total Split (%)	10.0%	52.0%	52.0%	7.3%	49.3%	49.3%	11.3%	32.7%	32.7%	8.0%	29.3%	29.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
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	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)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.36	0.68	0.18	0.34	0.60	0.06	0.92	0.27	0.17	0.44	0.78	0.16
Control Delay	6.4	8.7	0.6	14.1	27.0	4.5	89.5	51.9	2.1	50.0	77.7	1.0
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.4	8.8	0.6	14.1	27.0	4.5	89.5	51.9	2.1	50.0	77.7	1.0
Queue Length 50th (ft)	5	308	1	25	458	5	159	82	0	95	221	0
Queue Length 95th (ft)	12	163	m3	39	597	m27	#228	128	0	121	266	0
Internal Link Dist (ft)		797			4516			905			451	
Turn Bay Length (ft)	300		150	300		250	500		400	135		100
Base Capacity (vph)	269	2080	975	171	1957	924	216	534	531	277	471	482
Starvation Cap Reductn	0	89	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	0.35	0.71	0.18	0.34	0.60	0.06	0.92	0.18	0.13	0.44	0.49	0.11

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 95 (63%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 115

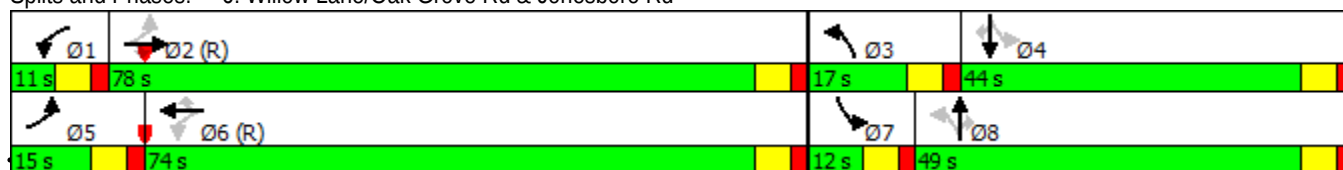
Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 6: Willow Lane/Oak Grove Rd & Jonesboro Rd



Baseline

Synchro 9 Report

Page 10

HCM Signalized Intersection Capacity Analysis

6: Willow Lane/Oak Grove Rd & Jonesboro Rd

Future No-Build (2020) Saturday - Improved

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	1379	159	46	1118	53	166	86	43	96	188	41
Future Volume (vph)	56	1379	159	46	1118	53	166	86	43	96	188	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.15	1.00	1.00	0.11	1.00	1.00	0.24	1.00	1.00	0.69	1.00	1.00
Satd. Flow (perm)	283	3539	1583	203	3539	1583	448	1863	1583	1293	1863	1583
Peak-hour factor, PHF	0.60	0.97	0.90	0.79	0.96	0.89	0.84	0.89	0.64	0.78	0.81	0.75
Adj. Flow (vph)	93	1422	177	58	1165	60	198	97	67	123	232	55
RTOR Reduction (vph)	0	0	46	0	0	27	0	0	54	0	0	46
Lane Group Flow (vph)	93	1422	131	58	1165	33	198	97	13	123	232	9
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	95.0	87.0	87.0	87.0	83.0	83.0	40.0	29.0	29.0	30.0	24.0	24.0
Effective Green, g (s)	95.0	87.0	87.0	87.0	83.0	83.0	40.0	29.0	29.0	30.0	24.0	24.0
Actuated g/C Ratio	0.63	0.58	0.58	0.58	0.55	0.55	0.27	0.19	0.19	0.20	0.16	0.16
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	258	2052	918	159	1958	875	216	360	306	277	298	253
v/s Ratio Prot	c0.02	c0.40		0.01	0.33		c0.07	0.05		0.02	0.12	
v/s Ratio Perm	0.21		0.08	0.20		0.02	c0.18		0.01	0.07		0.01
v/c Ratio	0.36	0.69	0.14	0.36	0.59	0.04	0.92	0.27	0.04	0.44	0.78	0.03
Uniform Delay, d1	15.1	22.1	14.4	18.5	22.3	15.3	50.0	51.5	49.2	51.7	60.4	53.2
Progression Factor	0.33	0.32	0.05	0.80	1.10	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	1.4	0.2	1.3	1.2	0.1	38.6	0.4	0.1	1.1	12.1	0.1
Delay (s)	5.6	8.4	0.9	16.2	25.7	15.4	88.7	51.9	49.3	52.9	72.5	53.3
Level of Service	A	A	A	B	C	B	F	D	D	D	E	D
Approach Delay (s)		7.5			24.7			71.5			64.1	
Approach LOS		A			C			E			E	
Intersection Summary												
HCM 2000 Control Delay	25.8			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.78											
Actuated Cycle Length (s)	150.0			Sum of lost time (s)			24.0					
Intersection Capacity Utilization	80.6%			ICU Level of Service			D					
Analysis Period (min)	15											
c Critical Lane Group												

Queues
7: Kelly Rd & Jonesboro Rd

Future No-Build (2020) Saturday - Improved

1/26/2016

	→	↘	↙	←	↖
Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations	↑↑	↑	↘	↑↑	↘
Traffic Volume (vph)	1420	60	158	1143	76
Future Volume (vph)	1420	60	158	1143	76
Lane Group Flow (vph)	1464	71	203	1216	262
Turn Type	NA	Perm	pm+pt	NA	Perm
Protected Phases	2		1	6	
Permitted Phases		2	6		8
Detector Phase	2	2	1	6	8
Switch Phase					
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0
Minimum Split (s)	29.0	29.0	11.0	24.0	42.0
Total Split (s)	81.0	81.0	27.0	108.0	42.0
Total Split (%)	54.0%	54.0%	18.0%	72.0%	28.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead		
Lead-Lag Optimize?					
Recall Mode	C-Min	C-Min	None	C-Min	None
v/c Ratio	0.69	0.07	0.64	0.45	0.82
Control Delay	7.7	0.2	26.0	8.1	67.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.7	0.2	26.0	8.1	67.4
Queue Length 50th (ft)	75	1	67	208	202
Queue Length 95th (ft)	276	m1	126	316	233
Internal Link Dist (ft)	4516			773	731
Turn Bay Length (ft)		315	300		
Base Capacity (vph)	2124	974	358	2675	442
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.69	0.07	0.57	0.45	0.59

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

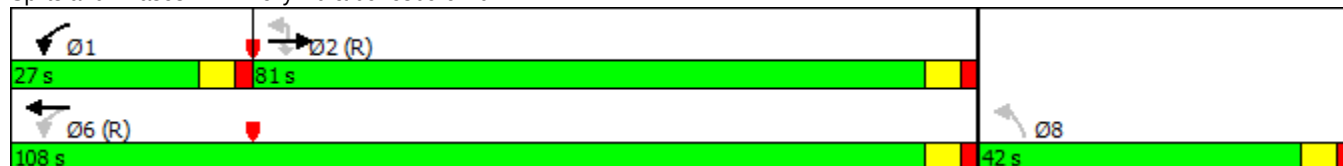
Offset: 8 (5%), Referenced to phase 2:EBTU and 6:WBTL, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

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

Splits and Phases: 7: Kelly Rd & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis Future No-Build (2020) Saturday - Improved

7: Kelly Rd & Jonesboro Rd

1/26/2016



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	⇐	⇐⇐	⇐	⇐	⇐⇐	⇐	
Traffic Volume (vph)	0	1420	60	158	1143	76	117
Future Volume (vph)	0	1420	60	158	1143	76	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	
Frt		1.00	0.85	1.00	1.00	0.91	
Flt Protected		1.00	1.00	0.95	1.00	0.98	
Satd. Flow (prot)		3539	1583	1770	3539	1673	
Flt Permitted		1.00	1.00	0.10	1.00	0.98	
Satd. Flow (perm)		3539	1583	179	3539	1673	
Peak-hour factor, PHF	0.92	0.97	0.84	0.78	0.94	0.78	0.71
Adj. Flow (vph)	0	1464	71	203	1216	97	165
RTOR Reduction (vph)	0	0	24	0	0	45	0
Lane Group Flow (vph)	0	1464	47	203	1216	217	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	
Protected Phases		2		1	6		
Permitted Phases	2		2	6		8	
Actuated Green, G (s)		90.1	90.1	113.4	113.4	24.6	
Effective Green, g (s)		90.1	90.1	113.4	113.4	24.6	
Actuated g/C Ratio		0.60	0.60	0.76	0.76	0.16	
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)		5.0	5.0	3.0	5.0	3.0	
Lane Grp Cap (vph)		2125	950	318	2675	274	
v/s Ratio Prot		c0.41		c0.07	0.34		
v/s Ratio Perm			0.03	0.41		c0.13	
v/c Ratio		0.69	0.05	0.64	0.45	0.79	
Uniform Delay, d1		20.4	12.3	24.6	6.8	60.2	
Progression Factor		0.28	0.01	1.00	1.00	1.00	
Incremental Delay, d2		1.4	0.1	4.2	0.6	14.4	
Delay (s)		7.1	0.2	28.8	7.4	74.6	
Level of Service		A	A	C	A	E	
Approach Delay (s)		6.7			10.4	74.6	
Approach LOS		A			B	E	

Intersection Summary

HCM 2000 Control Delay	13.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	74.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis Future No-Build (2020) Saturday - Improved

8: Sterling Pl/N Bridges Rd & Mt Carmel Rd

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	101	0	6	100	1	0	0	7	1	0	1
Future Volume (Veh/h)	1	101	0	6	100	1	0	0	7	1	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.25	0.92	0.50	0.92	0.25	0.92	0.92	0.29	0.25	0.92	0.25
Hourly flow rate (vph)	4	404	0	12	109	4	0	0	24	4	0	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	113			404			551	549	404	571	547	111
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	113			404			551	549	404	571	547	111
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	96	99	100	100
cM capacity (veh/h)	1476			1155			439	438	647	411	439	942
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	408	125	24	8								
Volume Left	4	12	0	4								
Volume Right	0	4	24	4								
cSH	1476	1155	647	573								
Volume to Capacity	0.00	0.01	0.04	0.01								
Queue Length 95th (ft)	0	1	3	1								
Control Delay (s)	0.1	0.9	10.8	11.4								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.9	10.8	11.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.9									
Intersection Capacity Utilization			19.2%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis Future No-Build (2020) Saturday - Improved

9: Mill Road & Mt Carmel Rd

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	87	12	36	56	93	62	22	345	48	24	302	105
Future Volume (vph)	87	12	36	56	93	62	22	345	48	24	302	105
Peak Hour Factor	0.91	0.91	0.91	0.80	0.80	0.80	0.88	0.88	0.88	0.92	0.92	0.92
Hourly flow rate (vph)	96	13	40	70	116	78	25	392	55	26	328	114
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	149	264	472	468								
Volume Left (vph)	96	70	25	26								
Volume Right (vph)	40	78	55	114								
Hadj (s)	0.00	-0.09	-0.03	-0.10								
Departure Headway (s)	8.0	7.4	6.6	6.5								
Degree Utilization, x	0.33	0.54	0.87	0.85								
Capacity (veh/h)	399	450	527	535								
Control Delay (s)	14.8	18.7	38.3	36.2								
Approach Delay (s)	14.8	18.7	38.3	36.2								
Approach LOS	B	C	E	E								
Intersection Summary												
Delay				31.2								
Level of Service				D								
Intersection Capacity Utilization				53.5%	ICU Level of Service	A						
Analysis Period (min)				15								

Future “Build” Intersections Analysis

Queues

1: I-75 SB Ramps & Jonesboro Rd

Future Build (2020) AM

1/26/2016

	→	↘	↙	←	↘	↓	↙
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↙	↘
Traffic Volume (vph)	1297	204	66	926	454	2	403
Future Volume (vph)	1297	204	66	926	454	2	403
Lane Group Flow (vph)	1380	237	83	1064	291	295	469
Turn Type	NA	Perm	pm+pt	NA	Perm	NA	Perm
Protected Phases	2		1	6		4	
Permitted Phases		2	6		4		4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0	6.0	6.0
Minimum Split (s)	24.0	24.0	11.0	24.0	24.0	24.0	24.0
Total Split (s)	73.0	73.0	13.0	86.0	54.0	54.0	54.0
Total Split (%)	52.1%	52.1%	9.3%	61.4%	38.6%	38.6%	38.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?							
Recall Mode	C-Min	C-Min	None	C-Min	None	None	None
v/c Ratio	0.74	0.25	0.46	0.48	0.59	0.60	0.89
Control Delay	29.7	3.0	23.8	10.8	46.7	46.9	56.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.7	3.0	23.8	10.8	46.7	46.9	56.9
Queue Length 50th (ft)	508	0	17	115	235	238	335
Queue Length 95th (ft)	653	38	39	132	266	157	425
Internal Link Dist (ft)	520			890		860	
Turn Bay Length (ft)		415	635		430		700
Base Capacity (vph)	1875	950	181	2201	576	578	603
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	0.74	0.25	0.46	0.48	0.51	0.51	0.78

Intersection Summary

Cycle Length: 140

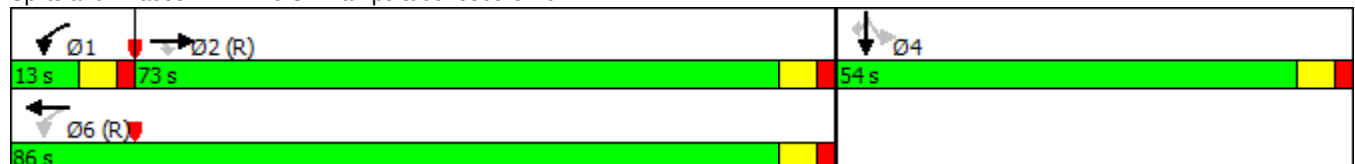
Actuated Cycle Length: 140

Offset: 79 (56%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Splits and Phases: 1: I-75 SB Ramps & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

Future Build (2020) AM

1: I-75 SB Ramps & Jonesboro Rd

1/26/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑					↑	↑	↑
Traffic Volume (vph)	0	1297	204	66	926	0	0	0	0	454	2	403
Future Volume (vph)	0	1297	204	66	926	0	0	0	0	454	2	403
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.95	1.00	1.00	0.95					0.95	0.95	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		3539	1583	1770	3539					1681	1686	1583
Flt Permitted		1.00	1.00	0.09	1.00					0.95	0.95	1.00
Satd. Flow (perm)		3539	1583	162	3539					1681	1686	1583
Peak-hour factor, PHF	0.92	0.94	0.86	0.80	0.87	0.92	0.92	0.92	0.92	0.78	0.50	0.86
Adj. Flow (vph)	0	1380	237	82	1064	0	0	0	0	582	4	469
RTOR Reduction (vph)	0	0	111	0	0	0	0	0	0	0	0	65
Lane Group Flow (vph)	0	1380	126	83	1064	0	0	0	0	291	295	404
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)		74.2	74.2	87.1	87.1					40.9	40.9	40.9
Effective Green, g (s)		74.2	74.2	87.1	87.1					40.9	40.9	40.9
Actuated g/C Ratio		0.53	0.53	0.62	0.62					0.29	0.29	0.29
Clearance Time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	3.0	5.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1875	838	180	2201					491	492	462
v/s Ratio Prot		c0.39		0.02	c0.30							
v/s Ratio Perm			0.08	0.26						0.17	0.17	c0.26
v/c Ratio		0.74	0.15	0.46	0.48					0.59	0.60	0.87
Uniform Delay, d1		25.4	16.8	19.6	14.3					42.4	42.5	47.1
Progression Factor		1.00	1.00	1.33	0.66					1.00	1.00	1.00
Incremental Delay, d2		2.6	0.4	1.7	0.7					1.9	2.0	16.6
Delay (s)		28.0	17.2	27.9	10.1					44.3	44.5	63.7
Level of Service		C	B	C	B					D	D	E
Approach Delay (s)		26.4			11.4			0.0			53.0	
Approach LOS		C			B			A			D	

Intersection Summary

HCM 2000 Control Delay	29.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	111.1%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Queues

2: I-75 NB Ramps & Jonesboro Rd

Future Build (2020) AM

1/26/2016



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations							
Traffic Volume (vph)	467	1222	869	1054	135	1	184
Future Volume (vph)	467	1222	869	1054	135	1	184
Lane Group Flow (vph)	492	1343	966	1158	87	88	259
Turn Type	pm+pt	NA	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	6			8	
Permitted Phases	2			6	8		8
Detector Phase	5	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	15.0	15.0	15.0	6.0	6.0	6.0
Minimum Split (s)	11.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	29.0	116.0	87.0	87.0	24.0	24.0	24.0
Total Split (%)	20.7%	82.9%	62.1%	62.1%	17.1%	17.1%	17.1%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?							
Recall Mode	None	C-Min	C-Min	C-Min	None	None	None
v/c Ratio	0.92	0.48	0.45	0.99	0.44	0.44	0.91
Control Delay	43.8	5.1	12.2	39.4	64.3	64.4	67.5
Queue Delay	0.0	0.0	0.0	3.1	0.0	0.0	0.0
Total Delay	43.8	5.1	12.2	42.5	64.3	64.4	67.5
Queue Length 50th (ft)	311	110	158	~860	77	78	134
Queue Length 95th (ft)	#501	277	185	#460	120	36	156
Internal Link Dist (ft)		890	855			694	
Turn Bay Length (ft)	675			390	285		350
Base Capacity (vph)	557	2820	2142	1170	216	217	302
Starvation Cap Reductn	0	0	0	16	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	0.88	0.48	0.45	1.00	0.40	0.41	0.86

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 57 (41%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 2: I-75 NB Ramps & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

2: I-75 NB Ramps & Jonesboro Rd

Future Build (2020) AM

1/26/2016

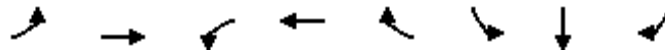
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	467	1222	0	0	869	1054	135	1	184	0	0	0
Future Volume (vph)	467	1222	0	0	869	1054	135	1	184	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	1770	3539			3539	1583	1681	1689	1583			
Flt Permitted	0.23	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	420	3539			3539	1583	1681	1689	1583			
Peak-hour factor, PHF	0.95	0.91	0.92	0.92	0.90	0.91	0.79	0.25	0.71	0.92	0.92	0.92
Adj. Flow (vph)	492	1343	0	0	966	1158	171	4	259	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	212	0	0	101	0	0	0
Lane Group Flow (vph)	492	1343	0	0	966	946	87	88	158	0	0	0
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Actuated Green, G (s)	111.6	111.6			84.8	84.8	16.4	16.4	16.4			
Effective Green, g (s)	111.6	111.6			84.8	84.8	16.4	16.4	16.4			
Actuated g/C Ratio	0.80	0.80			0.61	0.61	0.12	0.12	0.12			
Clearance Time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Vehicle Extension (s)	3.0	5.0			5.0	5.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	535	2821			2143	958	196	197	185			
v/s Ratio Prot	c0.14	0.38			0.27							
v/s Ratio Perm	0.60					c0.60	0.05	0.05	c0.10			
v/c Ratio	0.92	0.48			0.45	0.99	0.44	0.45	0.86			
Uniform Delay, d1	18.3	4.6			15.0	27.1	57.6	57.6	60.6			
Progression Factor	1.95	0.96			0.74	1.16	1.00	1.00	1.00			
Incremental Delay, d2	16.6	0.4			0.6	23.8	1.6	1.6	30.0			
Delay (s)	52.4	4.9			11.6	55.2	59.2	59.2	90.7			
Level of Service	D	A			B	E	E	E	F			
Approach Delay (s)		17.6			35.3			78.0			0.0	
Approach LOS		B			D			E			A	
Intersection Summary												
HCM 2000 Control Delay			32.1									
HCM 2000 Volume to Capacity ratio			0.96									
Actuated Cycle Length (s)			140.0									
Intersection Capacity Utilization			111.1%									
Analysis Period (min)			15									
c Critical Lane Group												

Queues

3: Managed Lane Ramp/Foster Dr & Jonesboro Rd

Future Build (2020) AM

1/26/2016



Lane Group	EBL	EBT	WBL	WBT	WBR	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	258	1052	425	1371	162	153	69	224
Future Volume (vph)	258	1052	425	1371	162	153	69	224
Lane Group Flow (vph)	304	1268	462	1443	279	219	75	291
Turn Type	pm+pt	NA	Prot	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	1	6			4	
Permitted Phases	2				6	4		4
Detector Phase	5	2	1	6	6	4	4	4
Switch Phase								
Minimum Initial (s)	5.0	15.0	5.0	15.0	15.0	6.0	6.0	6.0
Minimum Split (s)	11.0	24.0	11.0	34.0	34.0	33.0	33.0	33.0
Total Split (s)	28.0	61.0	46.0	79.0	79.0	33.0	33.0	33.0
Total Split (%)	20.0%	43.6%	32.9%	56.4%	56.4%	23.6%	23.6%	23.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag			
Lead-Lag Optimize?								
Recall Mode	None	C-Min	None	C-Min	C-Min	None	None	None
v/c Ratio	0.85	0.84	0.93	0.71	0.29	0.79	0.26	0.59
Control Delay	42.0	37.7	84.3	15.5	7.3	75.9	52.5	10.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.0	37.7	84.3	15.5	7.3	75.9	52.5	10.6
Queue Length 50th (ft)	120	455	415	137	16	194	61	2
Queue Length 95th (ft)	m#240	#707	#634	401	45	205	106	34
Internal Link Dist (ft)		855		456			376	
Turn Bay Length (ft)	275		315		125			215
Base Capacity (vph)	380	1512	516	2019	954	341	359	538
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	0.80	0.84	0.90	0.71	0.29	0.64	0.21	0.54

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 90 (64%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 110

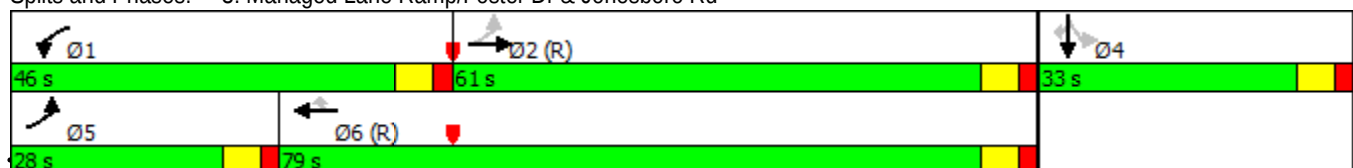
Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 3: Managed Lane Ramp/Foster Dr & Jonesboro Rd



Baseline

Synchro 9 Report

Page 5

HCM Signalized Intersection Capacity Analysis

3: Managed Lane Ramp/Foster Dr & Jonesboro Rd

Future Build (2020) AM

1/26/2016

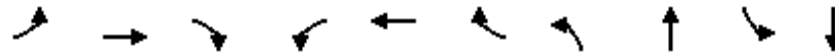
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	258	1052	91	425	1371	162	0	0	0	153	69	224
Future Volume (vph)	258	1052	91	425	1371	162	0	0	0	153	69	224
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0				6.0	6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00				1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85				1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00				0.95	1.00	1.00
Satd. Flow (prot)	1770	3498		1770	3539	1583				1770	1863	1583
Flt Permitted	0.13	1.00		0.95	1.00	1.00				0.95	1.00	1.00
Satd. Flow (perm)	238	3498		1770	3539	1583				1770	1863	1583
Peak-hour factor, PHF	0.85	0.90	0.92	0.92	0.95	0.58	0.92	0.92	0.92	0.70	0.92	0.77
Adj. Flow (vph)	304	1169	99	462	1443	279	0	0	0	219	75	291
RTOR Reduction (vph)	0	4	0	0	0	51	0	0	0	0	0	243
Lane Group Flow (vph)	304	1264	0	462	1443	228	0	0	0	219	75	48
Turn Type	pm+pt	NA		Prot	NA	Perm				Perm	NA	Perm
Protected Phases	5	2		1	6						4	
Permitted Phases	2					6				4		4
Actuated Green, G (s)	80.4	60.3		39.6	79.8	79.8				22.1	22.1	22.1
Effective Green, g (s)	80.4	60.3		39.6	79.8	79.8				22.1	22.1	22.1
Actuated g/C Ratio	0.57	0.43		0.28	0.57	0.57				0.16	0.16	0.16
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0				6.0	6.0	6.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0	5.0				3.0	3.0	3.0
Lane Grp Cap (vph)	356	1506		500	2017	902				279	294	249
v/s Ratio Prot	0.12	0.36		c0.26	0.41						0.04	
v/s Ratio Perm	c0.37					0.14				c0.12		0.03
v/c Ratio	0.85	0.84		0.92	0.72	0.25				0.78	0.26	0.19
Uniform Delay, d1	28.2	35.5		48.7	21.9	15.1				56.7	51.7	51.2
Progression Factor	0.65	0.89		1.37	0.60	0.70				1.00	1.00	1.00
Incremental Delay, d2	15.5	5.0		16.8	1.5	0.4				13.5	0.5	0.4
Delay (s)	33.8	36.5		83.5	14.6	11.0				70.1	52.2	51.6
Level of Service	C	D		F	B	B				E	D	D
Approach Delay (s)		36.0			28.7			0.0			58.6	
Approach LOS		D			C			A			E	
Intersection Summary												
HCM 2000 Control Delay			35.4				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			140.0				Sum of lost time (s)			18.0		
Intersection Capacity Utilization			79.0%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

Queues

4: Site Drwy 1 & Jonesboro Rd

Future Build (2020) AM

1/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	47	986	103	110	1811	29	126	0	12	0
Future Volume (vph)	47	986	103	110	1811	29	126	0	12	0
Lane Group Flow (vph)	63	1108	137	120	1906	37	137	36	0	72
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	NA
Protected Phases	5	2		1	6		3	8		4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	5	2	2	1	6	6	3	8	4	4
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	24.0	24.0	11.0	24.0	24.0	11.0	24.0	24.0	24.0
Total Split (s)	11.0	88.0	88.0	15.0	92.0	92.0	13.0	37.0	24.0	24.0
Total Split (%)	7.9%	62.9%	62.9%	10.7%	65.7%	65.7%	9.3%	26.4%	17.1%	17.1%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
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
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead		Lag	Lag
Lead-Lag Optimize?										
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None
v/c Ratio	0.41	0.47	0.13	0.34	0.79	0.03	0.69	0.10		0.41
Control Delay	30.4	11.3	2.2	4.2	15.3	0.0	71.8	0.5		8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	30.4	11.3	2.2	4.2	15.3	0.0	71.8	0.5		8.9
Queue Length 50th (ft)	31	182	7	6	872	0	111	0		0
Queue Length 95th (ft)	m38	106	m4	m13	788	m0	#258	0		11
Internal Link Dist (ft)		565			794			241		273
Turn Bay Length (ft)	235		175	235		160				
Base Capacity (vph)	153	2340	1086	369	2420	1119	198	464		297
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	0.41	0.47	0.13	0.33	0.79	0.03	0.69	0.08		0.24

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 84 (60%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 4: Site Drwy 1 & Jonesboro Rd

	Ø1		Ø2 (R)		Ø3		Ø4
15 s		88 s		13 s		24 s	
	Ø5		Ø6 (R)		Ø8		
11 s		92 s		37 s			

Baseline

Synchro 9 Report

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HCM Signalized Intersection Capacity Analysis

4: Site Drwy 1 & Jonesboro Rd

Future Build (2020) AM

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	986	103	110	1811	29	126	0	33	12	0	47
Future Volume (vph)	47	986	103	110	1811	29	126	0	33	12	0	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	
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	1.00	0.85			0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1583			1651	
Flt Permitted	0.05	1.00	1.00	0.20	1.00	1.00	0.38	1.00			0.91	
Satd. Flow (perm)	94	3539	1583	381	3539	1583	703	1583			1517	
Peak-hour factor, PHF	0.75	0.89	0.75	0.92	0.95	0.78	0.92	0.92	0.92	0.69	0.92	0.86
Adj. Flow (vph)	63	1108	137	120	1906	37	137	0	36	17	0	55
RTOR Reduction (vph)	0	0	41	0	0	12	0	30	0	0	70	0
Lane Group Flow (vph)	63	1108	96	120	1906	25	137	6	0	0	2	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	97.5	91.4	91.4	101.3	93.3	93.3	22.6	22.6			4.6	
Effective Green, g (s)	97.5	91.4	91.4	101.3	93.3	93.3	22.6	22.6			4.6	
Actuated g/C Ratio	0.70	0.65	0.65	0.72	0.67	0.67	0.16	0.16			0.03	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)	138	2310	1033	355	2358	1054	204	255			49	
v/s Ratio Prot	c0.02	0.31		0.02	c0.54		c0.06	0.00				
v/s Ratio Perm	0.30		0.06	0.23		0.02	c0.05				0.00	
v/c Ratio	0.46	0.48	0.09	0.34	0.81	0.02	0.67	0.02			0.05	
Uniform Delay, d1	19.8	12.3	9.0	7.5	16.9	7.9	53.5	49.4			65.6	
Progression Factor	2.36	0.87	0.88	0.48	0.76	1.00	1.00	1.00			1.00	
Incremental Delay, d2	1.5	0.4	0.1	0.4	2.2	0.0	8.4	0.0			0.4	
Delay (s)	48.3	11.1	8.0	4.0	15.1	7.9	61.9	49.4			66.0	
Level of Service	D	B	A	A	B	A	E	D			E	
Approach Delay (s)		12.6			14.3			59.3			66.0	
Approach LOS		B			B			E			E	
Intersection Summary												
HCM 2000 Control Delay			16.9			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.79									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)			24.0			
Intersection Capacity Utilization			82.9%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

Queues
5: Mt Carmel Rd & Jonesboro Rd

Future Build (2020) AM
1/26/2016

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↗
Traffic Volume (vph)	980	38	144	1963	1	130
Future Volume (vph)	980	38	144	1963	1	130
Lane Group Flow (vph)	1101	51	203	2134	4	141
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	3	
Permitted Phases		2	6			3
Detector Phase	2	2	1	6	3	3
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	11.0	24.0	24.0	24.0
Total Split (s)	98.0	98.0	18.0	116.0	24.0	24.0
Total Split (%)	70.0%	70.0%	12.9%	82.9%	17.1%	17.1%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Recall Mode	C-Min	C-Min	None	C-Min	None	None
v/c Ratio	0.44	0.05	0.41	0.70	0.04	0.64
Control Delay	7.6	3.0	5.6	4.9	60.0	21.6
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	7.6	3.0	5.6	5.0	60.0	21.6
Queue Length 50th (ft)	188	6	13	72	4	13
Queue Length 95th (ft)	126	3	m11	m74	4	43
Internal Link Dist (ft)	1191			797	2491	
Turn Bay Length (ft)		250	300		100	
Base Capacity (vph)	2492	1129	492	3043	227	326
Starvation Cap Reductn	0	0	0	162	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.05	0.41	0.74	0.02	0.43

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 133 (95%), Referenced to phase 2:EBTU and 6:WBTL, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Mt Carmel Rd & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

5: Mt Carmel Rd & Jonesboro Rd

Future Build (2020) AM

1/26/2016



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰	↶↷	↷	↰	↶↷	↰	↷
Traffic Volume (vph)	0	980	38	144	1963	1	130
Future Volume (vph)	0	980	38	144	1963	1	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	1.00
Frt		1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)		3539	1583	1770	3539	1770	1583
Flt Permitted		1.00	1.00	0.21	1.00	0.95	1.00
Satd. Flow (perm)		3539	1583	392	3539	1770	1583
Peak-hour factor, PHF	0.92	0.89	0.75	0.71	0.92	0.25	0.92
Adj. Flow (vph)	0	1101	51	203	2134	4	141
RTOR Reduction (vph)	0	0	15	0	0	0	133
Lane Group Flow (vph)	0	1101	36	203	2134	4	8
Turn Type	Perm	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases		2		1	6	3	
Permitted Phases	2		2	6			3
Actuated Green, G (s)		98.6	98.6	120.4	120.4	7.6	7.6
Effective Green, g (s)		98.6	98.6	120.4	120.4	7.6	7.6
Actuated g/C Ratio		0.70	0.70	0.86	0.86	0.05	0.05
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		2492	1114	492	3043	96	85
v/s Ratio Prot		0.31		0.05	c0.60	0.00	
v/s Ratio Perm			0.02	0.31			c0.00
v/c Ratio		0.44	0.03	0.41	0.70	0.04	0.09
Uniform Delay, d1		8.9	6.3	3.9	3.5	62.7	62.9
Progression Factor		0.75	1.42	3.06	1.21	0.99	0.83
Incremental Delay, d2		0.5	0.0	0.1	0.1	0.2	0.5
Delay (s)		7.2	9.0	12.1	4.3	62.1	52.6
Level of Service		A	A	B	A	E	D
Approach Delay (s)		7.3			5.0	52.9	
Approach LOS		A			A	D	

Intersection Summary

HCM 2000 Control Delay	7.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	77.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Queues

Future Build (2020) AM

6: Willow Lane/Oak Grove Rd & Jonesboro Rd

1/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	50	805	228	22	1766	47	255	163	33	95	230
Future Volume (vph)	50	805	228	22	1766	47	255	163	33	95	230
Lane Group Flow (vph)	83	904	275	33	2007	76	293	236	47	122	340
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	5	2	3	1	6		3	8		7	4
Permitted Phases	2		2	6		6	8		8	4	
Detector Phase	5	2	3	1	6	6	3	8	8	7	4
Switch Phase											
Minimum Initial (s)	5.0	15.0	5.0	5.0	15.0	15.0	5.0	6.0	6.0	5.0	6.0
Minimum Split (s)	11.0	26.0	11.0	11.0	36.0	36.0	11.0	46.0	46.0	11.0	44.0
Total Split (s)	11.0	72.0	13.0	11.0	72.0	72.0	13.0	46.0	46.0	11.0	44.0
Total Split (%)	7.9%	51.4%	9.3%	7.9%	51.4%	51.4%	9.3%	32.9%	32.9%	7.9%	31.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
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	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?											
Recall Mode	None	C-Min	None	None	C-Min	C-Min	None	None	None	None	None
v/c Ratio	0.72	0.46	0.25	0.11	1.08	0.09	1.72	0.55	0.10	0.50	0.85
Control Delay	71.8	5.7	0.6	7.5	70.5	0.7	375.8	51.2	0.5	44.7	69.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.8	5.7	0.6	7.5	70.5	0.7	375.8	51.2	0.5	44.7	69.9
Queue Length 50th (ft)	32	38	1	7	~1084	1	~309	189	0	82	290
Queue Length 95th (ft)	49	56	1	m8	#1262	1	#497	189	0	106	367
Internal Link Dist (ft)		797			4515			905			451
Turn Bay Length (ft)	300		150	300		250	300		400	135	
Base Capacity (vph)	116	1966	1110	307	1855	885	170	532	535	245	495
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	0.72	0.46	0.25	0.11	1.08	0.09	1.72	0.44	0.09	0.50	0.69

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 5 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 135

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

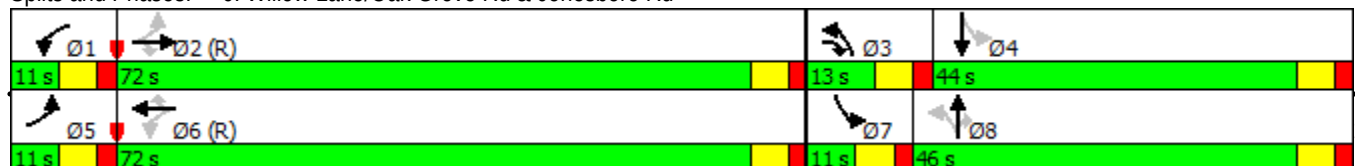
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 6: Willow Lane/Oak Grove Rd & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

6: Willow Lane/Oak Grove Rd & Jonesboro Rd

Future Build (2020) AM

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	805	228	22	1766	47	255	163	33	95	230	57
Future Volume (vph)	50	805	228	22	1766	47	255	163	33	95	230	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1800	1800
Flt Permitted	0.05	1.00	1.00	0.25	1.00	1.00	0.19	1.00	1.00	0.45	1.00	1.00
Satd. Flow (perm)	99	3539	1583	466	3539	1583	354	1863	1583	834	1800	1800
Peak-hour factor, PHF	0.60	0.89	0.83	0.66	0.88	0.62	0.87	0.69	0.70	0.78	0.87	0.75
Adj. Flow (vph)	83	904	275	33	2007	76	293	236	47	122	264	76
RTOR Reduction (vph)	0	0	98	0	0	36	0	0	36	0	8	0
Lane Group Flow (vph)	83	904	177	33	2007	40	293	236	11	122	332	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	NA
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)	80.4	75.4	82.4	76.4	73.4	73.4	39.6	32.6	32.6	35.6	30.6	30.6
Effective Green, g (s)	80.4	75.4	82.4	76.4	73.4	73.4	39.6	32.6	32.6	35.6	30.6	30.6
Actuated g/C Ratio	0.57	0.54	0.59	0.55	0.52	0.52	0.28	0.23	0.23	0.25	0.22	0.22
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	5.0	3.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	116	1906	999	282	1855	829	170	433	368	245	393	393
v/s Ratio Prot	c0.03	0.26	0.01	0.00	c0.57		c0.09	0.13		0.02	0.18	
v/s Ratio Perm	0.38		0.10	0.06		0.03	c0.40		0.01	0.11		
v/c Ratio	0.72	0.47	0.18	0.12	1.08	0.05	1.72	0.55	0.03	0.50	0.85	0.85
Uniform Delay, d1	32.4	20.0	13.2	15.6	33.3	16.3	48.5	47.2	41.5	44.7	52.4	52.4
Progression Factor	2.24	0.24	0.05	0.53	0.77	0.65	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	17.5	0.8	0.1	0.1	43.8	0.1	349.1	1.4	0.0	1.6	15.3	15.3
Delay (s)	90.0	5.7	0.7	8.4	69.6	10.6	397.6	48.6	41.5	46.3	67.7	67.7
Level of Service	F	A	A	A	E	B	F	D	D	D	E	E
Approach Delay (s)		10.1			66.5			225.6			62.1	
Approach LOS		B			E			F			E	
Intersection Summary												
HCM 2000 Control Delay			70.7			HCM 2000 Level of Service			E			
HCM 2000 Volume to Capacity ratio			1.30									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)			24.0			
Intersection Capacity Utilization			93.5%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

Queues
7: Kelly Rd & Jonesboro Rd

Future Build (2020) AM

1/26/2016

	→	↘	↙	←	↖
Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations	↑↑	↑	↘	↑↑	↘
Traffic Volume (vph)	909	69	110	1752	109
Future Volume (vph)	909	69	110	1752	109
Lane Group Flow (vph)	988	87	159	2061	218
Turn Type	NA	Perm	pm+pt	NA	Perm
Protected Phases	2		1	6	
Permitted Phases		2	6		8
Detector Phase	2	2	1	6	8
Switch Phase					
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0
Minimum Split (s)	29.0	29.0	11.0	24.0	42.0
Total Split (s)	82.0	82.0	16.0	98.0	42.0
Total Split (%)	58.6%	58.6%	11.4%	70.0%	30.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead		
Lead-Lag Optimize?					
Recall Mode	C-Min	C-Min	None	C-Min	None
v/c Ratio	0.43	0.08	0.38	0.77	0.77
Control Delay	3.3	0.2	7.8	13.3	69.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.3	0.2	7.8	13.3	69.0
Queue Length 50th (ft)	35	0	34	502	177
Queue Length 95th (ft)	54	0	50	652	208
Internal Link Dist (ft)	4515			773	731
Turn Bay Length (ft)		315	300		
Base Capacity (vph)	2287	1053	420	2685	455
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.43	0.08	0.38	0.77	0.48

Intersection Summary

Cycle Length: 140

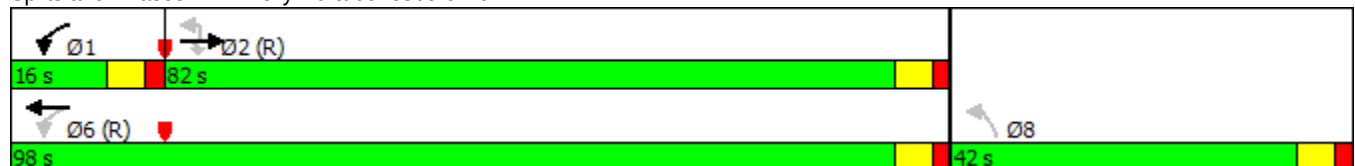
Actuated Cycle Length: 140

Offset: 76 (54%), Referenced to phase 2:EBTU and 6:WBTL, Start of Green

Natural Cycle: 105

Control Type: Actuated-Coordinated

Splits and Phases: 7: Kelly Rd & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

7: Kelly Rd & Jonesboro Rd

Future Build (2020) AM

1/26/2016



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰	↷	↰	↰	↷	↰	↰
Traffic Volume (vph)	0	909	69	110	1752	109	59
Future Volume (vph)	0	909	69	110	1752	109	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	
Frt		1.00	0.85	1.00	1.00	0.95	
Flt Protected		1.00	1.00	0.95	1.00	0.97	
Satd. Flow (prot)		3539	1583	1770	3539	1719	
Flt Permitted		1.00	1.00	0.23	1.00	0.97	
Satd. Flow (perm)		3539	1583	428	3539	1719	
Peak-hour factor, PHF	0.92	0.92	0.79	0.69	0.85	0.77	0.78
Adj. Flow (vph)	0	988	87	159	2061	142	76
RTOR Reduction (vph)	0	0	31	0	0	16	0
Lane Group Flow (vph)	0	988	56	159	2061	202	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	
Protected Phases		2		1	6		
Permitted Phases	2		2	6		8	
Actuated Green, G (s)		90.5	90.5	106.2	106.2	21.8	
Effective Green, g (s)		90.5	90.5	106.2	106.2	21.8	
Actuated g/C Ratio		0.65	0.65	0.76	0.76	0.16	
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)		5.0	5.0	3.0	5.0	3.0	
Lane Grp Cap (vph)		2287	1023	417	2684	267	
v/s Ratio Prot		0.28		0.03	c0.58		
v/s Ratio Perm			0.04	0.26		c0.12	
v/c Ratio		0.43	0.05	0.38	0.77	0.76	
Uniform Delay, d1		12.1	9.1	6.5	9.8	56.6	
Progression Factor		0.21	0.02	1.00	1.00	1.00	
Incremental Delay, d2		0.5	0.1	0.6	2.2	11.6	
Delay (s)		3.1	0.3	7.1	11.9	68.1	
Level of Service		A	A	A	B	E	
Approach Delay (s)		2.9			11.6	68.1	
Approach LOS		A			B	E	
Intersection Summary							
HCM 2000 Control Delay		12.4		HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio		0.80					
Actuated Cycle Length (s)		140.0		Sum of lost time (s)		18.0	
Intersection Capacity Utilization		85.6%		ICU Level of Service		E	
Analysis Period (min)		15					
c Critical Lane Group							

HCM Unsignalized Intersection Capacity Analysis 8: Sterling Pl/Site Drwy 4 & Mt Carmel Rd

Future Build (2020) AM
1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	125	0	39	104	6	0	0	3	0	0	10
Future Volume (Veh/h)	0	125	0	39	104	6	0	0	3	0	0	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.77	0.92	0.92	0.92	0.92	0.38	0.92	0.92	0.92
Hourly flow rate (vph)	0	136	0	51	113	7	0	0	8	0	0	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					733							
pX, platoon unblocked												
vC, conflicting volume	113			136			351	351	136	359	351	113
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	113			136			351	351	136	359	351	113
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			100	100	99	100	100	99
cM capacity (veh/h)	1476			1448			581	553	913	575	553	940
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1							
Volume Total	136	164	7	8	11							
Volume Left	0	51	0	0	0							
Volume Right	0	0	7	8	11							
cSH	1700	1448	1700	913	940							
Volume to Capacity	0.08	0.04	0.00	0.01	0.01							
Queue Length 95th (ft)	0	3	0	1	1							
Control Delay (s)	0.0	2.6	0.0	9.0	8.9							
Lane LOS		A		A	A							
Approach Delay (s)	0.0	2.4		9.0	8.9							
Approach LOS				A	A							
Intersection Summary												
Average Delay			1.8									
Intersection Capacity Utilization			27.5%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 9: Mill Road & Mt Carmel Rd

Future Build (2020) AM
1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	178	142	62	67	70	23	27	297	51	24	353	57
Future Volume (vph)	178	142	62	67	70	23	27	297	51	24	353	57
Peak Hour Factor	0.85	0.85	0.85	0.73	0.73	0.73	0.89	0.89	0.89	0.91	0.91	0.91
Hourly flow rate (vph)	209	167	73	92	96	32	30	334	57	26	388	63
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	449	220	421	477								
Volume Left (vph)	209	92	30	26								
Volume Right (vph)	73	32	57	63								
Hadj (s)	0.03	0.03	-0.03	-0.03								
Departure Headway (s)	8.5	9.6	8.5	8.4								
Degree Utilization, x	1.00	0.58	0.99	1.00								
Capacity (veh/h)	449	366	421	477								
Control Delay (s)	73.3	25.1	70.3	73.0								
Approach Delay (s)	73.3	25.1	70.3	73.0								
Approach LOS	F	D	F	F								
Intersection Summary												
Delay				65.7								
Level of Service				F								
Intersection Capacity Utilization				63.1%	ICU Level of Service	B						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

10: Site Drwy 2 & Jonesboro Rd

Future Build (2020) AM
1/26/2016

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↑↑		↑
Traffic Volume (veh/h)	1146	60	0	1984	0	13
Future Volume (Veh/h)	1146	60	0	1984	0	13
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1246	65	0	2157	0	14
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)	536			645		
pX, platoon unblocked			0.69		0.72	0.69
vC, conflicting volume			1246		2324	623
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			441		114	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	98
cM capacity (veh/h)			764		630	743
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	623	623	65	1078	1078	14
Volume Left	0	0	0	0	0	0
Volume Right	0	0	65	0	0	14
cSH	1700	1700	1700	1700	1700	743
Volume to Capacity	0.37	0.37	0.04	0.63	0.63	0.02
Queue Length 95th (ft)	0	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	9.9
Lane LOS						A
Approach Delay (s)	0.0			0.0		9.9
Approach LOS						A
Intersection Summary						
Average Delay	0.0					
Intersection Capacity Utilization	58.2%		ICU Level of Service		B	
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

11: Site Drwy 5 & Jonesboro Rd

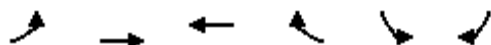
Future Build (2020) AM

1/26/2016

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗		↑↑		↗
Traffic Volume (veh/h)	978	40	0	1920	0	7
Future Volume (Veh/h)	978	40	0	1920	0	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1063	43	0	2087	0	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)	874			1271		
pX, platoon unblocked			0.85		0.25	0.85
vC, conflicting volume			1063		2106	532
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			710		0	82
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			748		255	813
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	532	532	43	1044	1044	8
Volume Left	0	0	0	0	0	0
Volume Right	0	0	43	0	0	8
cSH	1700	1700	1700	1700	1700	813
Volume to Capacity	0.31	0.31	0.03	0.61	0.61	0.01
Queue Length 95th (ft)	0	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	9.5
Lane LOS						A
Approach Delay (s)	0.0			0.0		9.5
Approach LOS						A
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			56.4%		ICU Level of Service	
Analysis Period (min)			15		B	

Queues
12: Mt Carmel Rd & Site Drwy 3

Future Build (2020) AM
1/26/2016



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	25	103	145	17	13	4
Future Volume (vph)	25	103	145	17	13	4
Lane Group Flow (vph)	27	112	158	18	14	4
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	27.0	104.0	77.0	77.0	36.0	36.0
Total Split (%)	19.3%	74.3%	55.0%	55.0%	25.7%	25.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.02	0.06	0.10	0.01	0.16	0.05
Control Delay	1.2	1.0	2.2	0.9	67.5	38.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.2	1.0	2.2	0.9	67.5	38.8
Queue Length 50th (ft)	1	0	21	1	13	0
Queue Length 95th (ft)	7	20	42	m3	37	13
Internal Link Dist (ft)		653	2491		345	
Turn Bay Length (ft)	235			175		
Base Capacity (vph)	1157	1757	1646	1401	379	342
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.06	0.10	0.01	0.04	0.01

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 109 (78%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 12: Mt Carmel Rd & Site Drwy 3

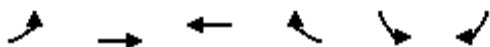


HCM Signalized Intersection Capacity Analysis

12: Mt Carmel Rd & Site Drwy 3

Future Build (2020) AM

1/26/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	25	103	145	17	13	4
Future Volume (vph)	25	103	145	17	13	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1863	1863	1583	1770	1583
Flt Permitted	0.62	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1163	1863	1863	1583	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	112	158	18	14	4
RTOR Reduction (vph)	0	0	0	3	0	4
Lane Group Flow (vph)	27	112	158	15	14	0
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	124.8	124.8	115.3	115.3	3.2	3.2
Effective Green, g (s)	124.8	124.8	115.3	115.3	3.2	3.2
Actuated g/C Ratio	0.89	0.89	0.82	0.82	0.02	0.02
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1051	1660	1534	1303	40	36
v/s Ratio Prot	0.00	c0.06	c0.08		c0.01	
v/s Ratio Perm	0.02			0.01		0.00
v/c Ratio	0.03	0.07	0.10	0.01	0.35	0.00
Uniform Delay, d1	1.0	0.9	2.4	2.2	67.4	66.8
Progression Factor	1.00	1.00	0.82	0.60	1.00	1.00
Incremental Delay, d2	0.0	0.1	0.1	0.0	5.2	0.0
Delay (s)	1.0	1.0	2.1	1.3	72.6	66.9
Level of Service	A	A	A	A	E	E
Approach Delay (s)		1.0	2.0		71.3	
Approach LOS		A	A		E	

Intersection Summary

HCM 2000 Control Delay	5.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.11		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	31.0%	ICU Level of Service	A
Analysis Period (min)	15		

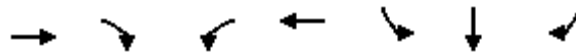
c Critical Lane Group

Queues

1: I-75 SB Ramps & Jonesboro Rd

Future Build (2020) AM

1/26/2016



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations	↑↑	↑	↵	↑↑	↵	↑	↵
Traffic Volume (vph)	1661	198	158	1493	255	1	217
Future Volume (vph)	1661	198	158	1493	255	1	217
Lane Group Flow (vph)	1748	218	184	1623	171	169	310
Turn Type	NA	Perm	pm+pt	NA	Perm	NA	Perm
Protected Phases	2		1	6		4	
Permitted Phases		2	6		4		4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0	6.0	6.0
Minimum Split (s)	24.0	24.0	11.0	24.0	24.0	24.0	24.0
Total Split (s)	91.0	91.0	22.0	113.0	37.0	37.0	37.0
Total Split (%)	60.7%	60.7%	14.7%	75.3%	24.7%	24.7%	24.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?							
Recall Mode	C-Min	C-Min	None	C-Min	None	None	None
v/c Ratio	0.83	0.21	0.81	0.62	0.55	0.54	0.90
Control Delay	29.4	2.3	69.6	3.7	61.9	61.5	74.9
Queue Delay	0.0	0.0	0.0	0.4	0.5	0.5	0.0
Total Delay	29.4	2.3	69.6	4.1	62.4	62.1	74.9
Queue Length 50th (ft)	745	0	108	176	156	154	236
Queue Length 95th (ft)	862	37	m153	185	197	58	243
Internal Link Dist (ft)	520			890		860	
Turn Bay Length (ft)		415	635		430		700
Base Capacity (vph)	2115	1034	242	2601	347	348	378
Starvation Cap Reductn	0	0	0	459	0	0	0
Spillback Cap Reductn	0	0	0	0	33	33	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.21	0.76	0.76	0.54	0.54	0.82

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 38 (25%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

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

Splits and Phases: 1: I-75 SB Ramps & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

Future Build (2020) AM

1: I-75 SB Ramps & Jonesboro Rd

1/26/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑					↑	↑	↑
Traffic Volume (vph)	0	1661	198	158	1493	0	0	0	0	255	1	217
Future Volume (vph)	0	1661	198	158	1493	0	0	0	0	255	1	217
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.95	1.00	1.00	0.95					0.95	0.95	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		3539	1583	1770	3539					1681	1687	1583
Flt Permitted		1.00	1.00	0.05	1.00					0.95	0.95	1.00
Satd. Flow (perm)		3539	1583	86	3539					1681	1687	1583
Peak-hour factor, PHF	0.92	0.95	0.91	0.86	0.92	0.92	0.92	0.92	0.92	0.76	0.25	0.70
Adj. Flow (vph)	0	1748	218	184	1623	0	0	0	0	336	4	310
RTOR Reduction (vph)	0	0	88	0	0	0	0	0	0	0	0	53
Lane Group Flow (vph)	0	1748	130	184	1623	0	0	0	0	171	169	257
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)		89.7	89.7	110.3	110.3					27.7	27.7	27.7
Effective Green, g (s)		89.7	89.7	110.3	110.3					27.7	27.7	27.7
Actuated g/C Ratio		0.60	0.60	0.74	0.74					0.18	0.18	0.18
Clearance Time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	3.0	5.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2116	946	227	2602					310	311	292
v/s Ratio Prot		0.49		c0.08	0.46							
v/s Ratio Perm			0.08	c0.52						0.10	0.10	c0.16
v/c Ratio		0.83	0.14	0.81	0.62					0.55	0.54	0.88
Uniform Delay, d1		24.0	13.2	47.7	9.7					55.5	55.4	59.5
Progression Factor		1.00	1.00	1.39	0.29					1.00	1.00	1.00
Incremental Delay, d2		3.9	0.3	12.5	0.7					2.1	1.9	25.0
Delay (s)		27.8	13.5	79.0	3.5					57.6	57.4	84.5
Level of Service		C	B	E	A					E	E	F
Approach Delay (s)		26.2			11.2			0.0			70.4	
Approach LOS		C			B			A			E	

Intersection Summary

HCM 2000 Control Delay	26.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	80.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Queues

2: I-75 NB Ramps & Jonesboro Rd

Future Build (2020) AM

1/26/2016



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations							
Traffic Volume (vph)	371	1572	1373	593	255	1	198
Future Volume (vph)	371	1572	1373	593	255	1	198
Lane Group Flow (vph)	458	1727	1476	652	144	143	251
Turn Type	pm+pt	NA	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	6			8	
Permitted Phases	2			6	8		8
Detector Phase	5	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	15.0	15.0	15.0	6.0	6.0	6.0
Minimum Split (s)	11.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	45.0	121.0	76.0	76.0	29.0	29.0	29.0
Total Split (%)	30.0%	80.7%	50.7%	50.7%	19.3%	19.3%	19.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?							
Recall Mode	None	C-Min	C-Min	C-Min	None	None	None
v/c Ratio	0.95	0.63	0.84	0.64	0.61	0.60	0.90
Control Delay	57.6	18.1	10.7	2.1	71.7	71.3	80.3
Queue Delay	0.0	1.1	0.1	0.3	0.0	0.0	0.0
Total Delay	57.6	19.3	10.9	2.5	71.7	71.3	80.3
Queue Length 50th (ft)	398	697	148	8	138	137	183
Queue Length 95th (ft)	#445	828	m141	m0	220	54	#241
Internal Link Dist (ft)		890	855			694	
Turn Bay Length (ft)	675			390	285		350
Base Capacity (vph)	508	2758	1750	1023	257	258	297
Starvation Cap Reductn	0	726	17	76	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	0.90	0.85	0.85	0.69	0.56	0.55	0.85

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 144 (96%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 2: I-75 NB Ramps & Jonesboro Rd



Baseline

Synchro 9 Report

Page 3

HCM Signalized Intersection Capacity Analysis

2: I-75 NB Ramps & Jonesboro Rd

Future Build (2020) AM

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	371	1572	0	0	1373	593	255	1	198	0	0	0
Future Volume (vph)	371	1572	0	0	1373	593	255	1	198	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	1770	3539			3539	1583	1681	1688	1583			
Flt Permitted	0.05	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	93	3539			3539	1583	1681	1688	1583			
Peak-hour factor, PHF	0.81	0.91	0.92	0.92	0.93	0.91	0.90	0.25	0.79	0.92	0.92	0.92
Adj. Flow (vph)	458	1727	0	0	1476	652	283	4	251	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	240	0	0	56	0	0	0
Lane Group Flow (vph)	458	1727	0	0	1476	412	144	143	195	0	0	0
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Actuated Green, G (s)	116.9	116.9			74.2	74.2	21.1	21.1	21.1			
Effective Green, g (s)	116.9	116.9			74.2	74.2	21.1	21.1	21.1			
Actuated g/C Ratio	0.78	0.78			0.49	0.49	0.14	0.14	0.14			
Clearance Time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Vehicle Extension (s)	3.0	5.0			5.0	5.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	482	2758			1750	783	236	237	222			
v/s Ratio Prot	c0.23	0.49			0.42							
v/s Ratio Perm	c0.50					0.26	0.09	0.08	c0.12			
v/c Ratio	0.95	0.63			0.84	0.53	0.61	0.60	0.88			
Uniform Delay, d1	48.9	7.1			32.9	25.9	60.6	60.5	63.2			
Progression Factor	0.75	2.32			0.23	0.11	1.00	1.00	1.00			
Incremental Delay, d2	21.9	0.7			2.3	1.1	4.6	4.3	30.1			
Delay (s)	58.6	17.2			10.0	4.0	65.2	64.8	93.3			
Level of Service	E	B			A	A	E	E	F			
Approach Delay (s)		25.9			8.2			78.2			0.0	
Approach LOS		C			A			E			A	
Intersection Summary												
HCM 2000 Control Delay		23.9			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.96										
Actuated Cycle Length (s)		150.0			Sum of lost time (s)			18.0				
Intersection Capacity Utilization		80.6%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

Queues

3: Managed Lane Ramp/Foster Dr & Jonesboro Rd

Future Build (2020) AM

1/26/2016



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBR	Ø1
Lane Configurations										
Traffic Volume (vph)	349	1409	1491	134	133	100	651	144	105	
Future Volume (vph)	349	1409	1491	134	133	100	651	144	105	
Lane Group Flow (vph)	453	1483	1553	158	145	109	708	160	122	
Turn Type	pm+pt	NA	NA	Perm	Perm	NA	Perm	Prot	Perm	
Protected Phases	5	2	6			8		7		1
Permitted Phases	2			6	8		8		7	
Detector Phase	5	2	6	6	8	8	8	7	7	
Switch Phase										
Minimum Initial (s)	5.0	15.0	15.0	15.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	24.0	34.0	34.0	24.0	24.0	24.0	33.0	33.0	11.0
Total Split (s)	30.0	82.0	63.0	63.0	24.0	24.0	24.0	33.0	33.0	11.0
Total Split (%)	20.0%	54.7%	42.0%	42.0%	16.0%	16.0%	16.0%	22.0%	22.0%	7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
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	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes						Yes
Recall Mode	None	C-Min	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	1.36	0.72	1.16	0.23	0.47	0.34	0.99	0.72	0.37	
Control Delay	215.7	18.8	115.7	8.1	63.1	59.5	67.3	80.8	6.4	
Queue Delay	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	215.7	19.0	115.8	8.1	63.1	59.5	67.3	80.8	6.4	
Queue Length 50th (ft)	~524	468	~951	21	129	95	258	153	0	
Queue Length 95th (ft)	#584	434	m#751	m26	215	166	#467	224	23	
Internal Link Dist (ft)		855	456			793				
Turn Bay Length (ft)	275			125	175		150		215	
Base Capacity (vph)	332	2052	1344	696	309	325	716	318	410	
Starvation Cap Reductn	0	98	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	27	0	0	0	0	0	1	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	1.36	0.76	1.18	0.23	0.47	0.34	0.99	0.50	0.30	

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 142 (95%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 145

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

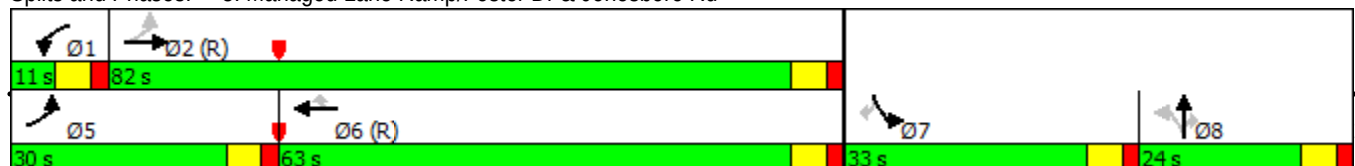
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 3: Managed Lane Ramp/Foster Dr & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

3: Managed Lane Ramp/Foster Dr & Jonesboro Rd

Future Build (2020) AM

1/26/2016

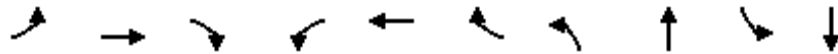
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	349	1409	0	0	1491	134	133	100	651	144	0	105
Future Volume (vph)	349	1409	0	0	1491	134	133	100	651	144	0	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0	6.0		6.0
Lane Util. Factor	1.00	0.95			0.95	1.00	1.00	1.00	0.88	1.00		1.00
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00	0.95		1.00
Satd. Flow (prot)	1770	3539			3539	1583	1770	1863	2787	1770		1583
Flt Permitted	0.06	1.00			1.00	1.00	0.95	1.00	1.00	0.95		1.00
Satd. Flow (perm)	118	3539			3539	1583	1770	1863	2787	1770		1583
Peak-hour factor, PHF	0.77	0.95	0.92	0.92	0.96	0.85	0.92	0.92	0.92	0.90	0.92	0.86
Adj. Flow (vph)	453	1483	0	0	1553	158	145	109	708	160	0	122
RTOR Reduction (vph)	0	0	0	0	0	95	0	0	230	0	0	107
Lane Group Flow (vph)	453	1483	0	0	1553	63	145	109	478	160	0	15
Turn Type	pm+pt	NA		Prot	NA	Perm	Perm	NA	Perm	Prot		Perm
Protected Phases	5	2		1	6			8		7		
Permitted Phases	2					6	8		8			7
Actuated Green, G (s)	87.0	87.0			57.0	57.0	26.2	26.2	26.2	18.8		18.8
Effective Green, g (s)	87.0	87.0			57.0	57.0	26.2	26.2	26.2	18.8		18.8
Actuated g/C Ratio	0.58	0.58			0.38	0.38	0.17	0.17	0.17	0.13		0.13
Clearance Time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0	6.0		6.0
Vehicle Extension (s)	3.0	5.0			5.0	5.0	3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	332	2052			1344	601	309	325	486	221		198
v/s Ratio Prot	c0.22	0.42			0.44			0.06		c0.09		
v/s Ratio Perm	c0.57					0.04	0.08		c0.17			0.01
v/c Ratio	1.36	0.72			1.16	0.11	0.47	0.34	0.98	0.72		0.08
Uniform Delay, d1	51.5	22.8			46.5	30.0	55.6	54.3	61.7	63.1		57.9
Progression Factor	1.03	0.74			1.05	1.63	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	178.1	1.7			72.3	0.1	1.1	0.6	36.2	11.1		0.2
Delay (s)	230.8	18.5			121.1	49.1	56.8	54.9	97.9	74.2		58.1
Level of Service	F	B			F	D	E	D	F	E		E
Approach Delay (s)		68.2			114.4			86.8			67.3	
Approach LOS		E			F			F			E	
Intersection Summary												
HCM 2000 Control Delay		88.0			HCM 2000 Level of Service			F				
HCM 2000 Volume to Capacity ratio		1.22										
Actuated Cycle Length (s)		150.0			Sum of lost time (s)			24.0				
Intersection Capacity Utilization		89.6%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												

Queues

4: Site Drwy 1 & Jonesboro Rd

Future Build (2020) AM

1/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	←	↑↑	→	←	↑↑	→	←	↑	←	→
Traffic Volume (vph)	24	1787	303	331	1038	20	605	0	21	0
Future Volume (vph)	24	1787	303	331	1038	20	605	0	21	0
Lane Group Flow (vph)	46	1861	329	360	1141	34	658	248	0	54
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	NA
Protected Phases	5	2		1	6		3	8		4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	5	2	2	1	6	6	3	8	4	4
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	24.0	24.0	11.0	24.0	24.0	11.0	24.0	24.0	24.0
Total Split (s)	11.0	71.0	71.0	24.0	84.0	84.0	31.0	55.0	24.0	24.0
Total Split (%)	7.3%	47.3%	47.3%	16.0%	56.0%	56.0%	20.7%	36.7%	16.0%	16.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
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
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead		Lag	Lag
Lead-Lag Optimize?										
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None
v/c Ratio	0.16	1.21	0.43	0.82	0.52	0.03	1.85	0.50		0.28
Control Delay	8.7	126.8	6.2	43.3	15.6	0.2	426.0	19.0		3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	8.7	126.8	6.2	43.3	15.6	0.2	426.0	19.0		3.6
Queue Length 50th (ft)	9	~1167	44	232	452	0	~881	60		0
Queue Length 95th (ft)	m10	m#1268	m84	#461	471	0	#1126	149		0
Internal Link Dist (ft)		565			794			241		273
Turn Bay Length (ft)	235		175	235		160				
Base Capacity (vph)	280	1533	772	437	2202	1026	355	632		286
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	0.16	1.21	0.43	0.82	0.52	0.03	1.85	0.39		0.19

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 128 (85%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 4: Site Drwy 1 & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

4: Site Drwy 1 & Jonesboro Rd

Future Build (2020) AM

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	1787	303	331	1038	20	605	0	228	21	0	24
Future Volume (vph)	24	1787	303	331	1038	20	605	0	228	21	0	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	
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	1.00	0.85			0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1583			1689	
Flt Permitted	0.25	1.00	1.00	0.06	1.00	1.00	0.53	1.00			0.73	
Satd. Flow (perm)	464	3539	1583	107	3539	1583	982	1583			1267	
Peak-hour factor, PHF	0.52	0.96	0.92	0.92	0.91	0.59	0.92	0.92	0.92	0.83	0.92	0.82
Adj. Flow (vph)	46	1861	329	360	1141	34	658	0	248	25	0	29
RTOR Reduction (vph)	0	0	88	0	0	13	0	131	0	0	52	0
Lane Group Flow (vph)	46	1861	241	360	1141	21	658	117	0	0	2	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	69.4	63.8	63.8	102.6	91.0	91.0	35.4	35.4			4.4	
Effective Green, g (s)	69.4	63.8	63.8	102.6	91.0	91.0	35.4	35.4			4.4	
Actuated g/C Ratio	0.46	0.43	0.43	0.68	0.61	0.61	0.24	0.24			0.03	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)	263	1505	673	436	2146	960	363	373			37	
v/s Ratio Prot	0.01	c0.53		c0.18	0.32		c0.30	0.07				
v/s Ratio Perm	0.07		0.15	0.38		0.01	c0.13				0.00	
v/c Ratio	0.17	1.24	0.36	0.83	0.53	0.02	1.81	0.31			0.04	
Uniform Delay, d1	22.2	43.1	29.2	46.9	17.1	11.8	56.0	47.3			70.8	
Progression Factor	0.69	0.61	0.33	0.65	0.87	1.00	1.00	1.00			1.00	
Incremental Delay, d2	0.2	110.5	1.0	10.7	0.8	0.0	376.4	0.5			0.5	
Delay (s)	15.4	136.6	10.6	41.3	15.7	11.8	432.5	47.7			71.2	
Level of Service	B	F	B	D	B	B	F	D			E	
Approach Delay (s)		115.6			21.6			327.2			71.2	
Approach LOS		F			C			F			E	
Intersection Summary												
HCM 2000 Control Delay		125.1			HCM 2000 Level of Service			F				
HCM 2000 Volume to Capacity ratio		1.33										
Actuated Cycle Length (s)		150.0			Sum of lost time (s)			24.0				
Intersection Capacity Utilization		122.9%			ICU Level of Service			H				
Analysis Period (min)		15										
c Critical Lane Group												

Queues
5: Mt Carmel Rd & Jonesboro Rd

Future Build (2020) AM

1/26/2016

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↗
Traffic Volume (vph)	1950	8	157	1342	19	172
Future Volume (vph)	1950	8	157	1342	19	172
Lane Group Flow (vph)	2097	16	209	1491	25	325
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	3	
Permitted Phases		2	6			3
Detector Phase	2	2	1	6	3	3
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	11.0	24.0	24.0	24.0
Total Split (s)	103.0	103.0	20.0	123.0	27.0	27.0
Total Split (%)	68.7%	68.7%	13.3%	82.0%	18.0%	18.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Recall Mode	C-Min	C-Min	None	C-Min	None	None
v/c Ratio	0.92	0.02	0.93	0.54	0.11	0.96
Control Delay	9.2	0.0	75.1	4.9	47.0	62.1
Queue Delay	45.6	0.0	0.0	0.0	0.0	7.5
Total Delay	54.8	0.0	75.1	4.9	47.0	69.6
Queue Length 50th (ft)	187	0	170	171	17	94
Queue Length 95th (ft)	m55	m0	m#200	m228	35	41
Internal Link Dist (ft)	1191			797	2491	
Turn Bay Length (ft)		250	300		100	
Base Capacity (vph)	2291	1028	224	2781	247	349
Starvation Cap Reductn	0	0	0	156	0	0
Spillback Cap Reductn	403	0	0	0	0	16
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.11	0.02	0.93	0.57	0.10	0.98

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 2 (1%), Referenced to phase 2:EBTU and 6:WBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 5: Mt Carmel Rd & Jonesboro Rd



Baseline

Synchro 9 Report

Page 9

HCM Signalized Intersection Capacity Analysis

5: Mt Carmel Rd & Jonesboro Rd

Future Build (2020) AM

1/26/2016



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰	↰↰	↰	↰	↰↰	↰	↰
Traffic Volume (vph)	0	1950	8	157	1342	19	172
Future Volume (vph)	0	1950	8	157	1342	19	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	1.00
Frt		1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)		3539	1583	1770	3539	1770	1583
Flt Permitted		1.00	1.00	0.04	1.00	0.95	1.00
Satd. Flow (perm)		3539	1583	72	3539	1770	1583
Peak-hour factor, PHF	0.92	0.93	0.50	0.75	0.90	0.75	0.53
Adj. Flow (vph)	0	2097	16	209	1491	25	325
RTOR Reduction (vph)	0	0	4	0	0	0	129
Lane Group Flow (vph)	0	2097	12	209	1491	25	196
Turn Type	Perm	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases		2		1	6	3	
Permitted Phases	2		2	6			3
Actuated Green, G (s)		97.1	97.1	117.9	117.9	20.1	20.1
Effective Green, g (s)		97.1	97.1	117.9	117.9	20.1	20.1
Actuated g/C Ratio		0.65	0.65	0.79	0.79	0.13	0.13
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		2290	1024	224	2781	237	212
v/s Ratio Prot		0.59		c0.09	0.42	0.01	
v/s Ratio Perm			0.01	c0.64			c0.12
v/c Ratio		0.92	0.01	0.93	0.54	0.11	0.92
Uniform Delay, d1		22.9	9.4	55.4	5.9	57.1	64.2
Progression Factor		0.35	0.00	0.99	0.73	0.81	0.65
Incremental Delay, d2		0.8	0.0	28.7	0.4	0.2	41.0
Delay (s)		8.7	0.0	83.8	4.8	46.5	82.7
Level of Service		A	A	F	A	D	F
Approach Delay (s)		8.6			14.5	80.1	
Approach LOS		A			B	F	

Intersection Summary

HCM 2000 Control Delay	17.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	81.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Queues

Future Build (2020) AM

6: Willow Lane/Oak Grove Rd & Jonesboro Rd

1/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	41	1792	263	61	1208	50	229	127	123	200	324
Future Volume (vph)	41	1792	263	61	1208	50	229	127	123	200	324
Lane Group Flow (vph)	51	1886	302	113	1285	67	266	135	143	222	419
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	5	2	3	1	6		3	8		7	4
Permitted Phases	2		2	6		6	8		8	4	
Detector Phase	5	2	3	1	6	6	3	8	8	7	4
Switch Phase											
Minimum Initial (s)	5.0	15.0	5.0	5.0	15.0	15.0	5.0	6.0	6.0	5.0	6.0
Minimum Split (s)	11.0	26.0	11.0	11.0	36.0	36.0	11.0	46.0	46.0	11.0	44.0
Total Split (s)	12.0	77.0	18.0	11.0	76.0	76.0	18.0	46.0	46.0	16.0	44.0
Total Split (%)	8.0%	51.3%	12.0%	7.3%	50.7%	50.7%	12.0%	30.7%	30.7%	10.7%	29.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
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	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?											
Recall Mode	None	C-Min	None	None	C-Min	C-Min	None	None	None	None	None
v/c Ratio	0.33	1.10	0.30	1.05	0.74	0.08	1.38	0.28	0.29	0.54	0.94
Control Delay	10.8	71.7	1.7	117.8	29.8	3.4	230.6	46.0	14.1	42.4	84.0
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.8	71.8	1.7	117.8	29.8	3.4	230.6	46.0	14.1	42.4	84.0
Queue Length 50th (ft)	7	~1108	13	~72	564	7	~288	105	25	155	395
Queue Length 95th (ft)	m11	#1247	m18	#53	656	18	#442	167	75	228	#592
Internal Link Dist (ft)		797			4515			905			451
Turn Bay Length (ft)	300		150	300		250	300		400	135	
Base Capacity (vph)	157	1711	1005	108	1744	835	193	496	502	413	465
Starvation Cap Reductn	0	35	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	0.32	1.13	0.30	1.05	0.74	0.08	1.38	0.27	0.28	0.54	0.90

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 33 (22%), 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.

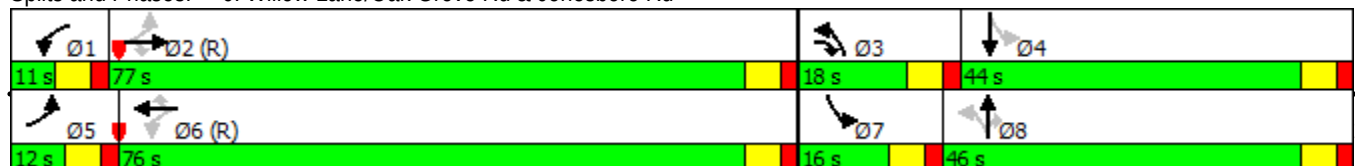
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 6: Willow Lane/Oak Grove Rd & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

6: Willow Lane/Oak Grove Rd & Jonesboro Rd

Future Build (2020) AM

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	1792	263	61	1208	50	229	127	123	200	324	47
Future Volume (vph)	41	1792	263	61	1208	50	229	127	123	200	324	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1821	1821
Flt Permitted	0.10	1.00	1.00	0.06	1.00	1.00	0.11	1.00	1.00	0.65	1.00	1.00
Satd. Flow (perm)	178	3539	1583	102	3539	1583	202	1863	1583	1214	1821	1821
Peak-hour factor, PHF	0.81	0.95	0.87	0.54	0.94	0.75	0.86	0.94	0.86	0.90	0.91	0.75
Adj. Flow (vph)	51	1886	302	113	1285	67	266	135	143	222	356	63
RTOR Reduction (vph)	0	0	55	0	0	35	0	0	81	0	5	0
Lane Group Flow (vph)	51	1886	247	113	1285	32	266	135	62	222	414	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	NA
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)	77.3	72.5	84.5	77.7	72.7	72.7	50.5	38.5	38.5	46.5	36.5	
Effective Green, g (s)	77.3	72.5	84.5	77.7	72.7	72.7	50.5	38.5	38.5	46.5	36.5	
Actuated g/C Ratio	0.52	0.48	0.56	0.52	0.48	0.48	0.34	0.26	0.26	0.31	0.24	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	5.0	3.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	142	1710	955	108	1715	767	193	478	406	413	443	
v/s Ratio Prot	0.01	c0.53	0.02	c0.03	0.36		c0.11	0.07		0.04	0.23	
v/s Ratio Perm	0.17		0.14	0.50		0.02	c0.35		0.04	0.13		
v/c Ratio	0.36	1.10	0.26	1.05	0.75	0.04	1.38	0.28	0.15	0.54	0.94	
Uniform Delay, d1	24.3	38.8	16.7	37.2	31.3	20.3	41.3	44.7	43.1	41.4	55.6	
Progression Factor	0.54	0.50	0.18	0.78	0.86	5.56	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.6	50.3	0.1	93.0	2.6	0.1	199.2	0.3	0.2	1.3	27.1	
Delay (s)	13.7	69.8	3.0	122.1	29.7	113.2	240.5	45.0	43.3	42.7	82.7	
Level of Service	B	E	A	F	C	F	F	D	D	D	F	
Approach Delay (s)		59.5			40.6			140.2			68.9	
Approach LOS		E			D			F			E	
Intersection Summary												
HCM 2000 Control Delay			64.0			HCM 2000 Level of Service			E			
HCM 2000 Volume to Capacity ratio			1.23									
Actuated Cycle Length (s)			150.0			Sum of lost time (s)			24.0			
Intersection Capacity Utilization			98.3%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

Queues
7: Kelly Rd & Jonesboro Rd

Future Build (2020) AM

1/26/2016



Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations	↑↑	↑	↵	↑↑	↵
Traffic Volume (vph)	2043	91	153	1234	105
Future Volume (vph)	2043	91	153	1234	105
Lane Group Flow (vph)	2270	112	184	1387	269
Turn Type	NA	Perm	pm+pt	NA	Perm
Protected Phases	2		1	6	
Permitted Phases		2	6		8
Detector Phase	2	2	1	6	8
Switch Phase					
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0
Minimum Split (s)	29.0	29.0	11.0	24.0	42.0
Total Split (s)	93.0	93.0	15.0	108.0	42.0
Total Split (%)	62.0%	62.0%	10.0%	72.0%	28.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead		
Lead-Lag Optimize?					
Recall Mode	C-Min	C-Min	None	C-Min	None
v/c Ratio	1.00	0.11	1.18	0.53	0.82
Control Delay	22.2	0.3	165.5	9.7	71.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	22.2	0.3	165.5	9.7	71.1
Queue Length 50th (ft)	174	1	~164	272	225
Queue Length 95th (ft)	m#1183	m0	#294	395	278
Internal Link Dist (ft)	4515			773	731
Turn Bay Length (ft)		315	300		
Base Capacity (vph)	2276	1044	156	2630	432
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.00	0.11	1.18	0.53	0.62

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 97 (65%), Referenced to phase 2:EBTU and 6:WBTL, Start of Green

Natural Cycle: 145

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

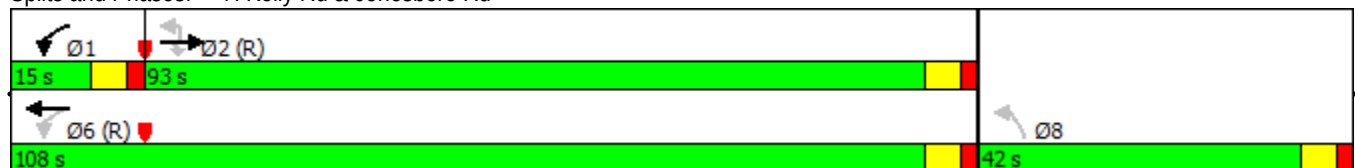
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 7: Kelly Rd & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

7: Kelly Rd & Jonesboro Rd

Future Build (2020) AM

1/26/2016



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	⬇	↑↑	↗	↖	↑↑	↘	
Traffic Volume (vph)	0	2043	91	153	1234	105	121
Future Volume (vph)	0	2043	91	153	1234	105	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	
Frt		1.00	0.85	1.00	1.00	0.93	
Flt Protected		1.00	1.00	0.95	1.00	0.98	
Satd. Flow (prot)		3539	1583	1770	3539	1690	
Flt Permitted		1.00	1.00	0.04	1.00	0.98	
Satd. Flow (perm)		3539	1583	73	3539	1690	
Peak-hour factor, PHF	0.92	0.90	0.81	0.83	0.89	0.83	0.85
Adj. Flow (vph)	0	2270	112	184	1387	127	142
RTOR Reduction (vph)	0	0	26	0	0	29	0
Lane Group Flow (vph)	0	2270	86	184	1387	240	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	
Protected Phases		2		1	6		
Permitted Phases	2		2	6		8	
Actuated Green, G (s)		96.5	96.5	111.5	111.5	26.5	
Effective Green, g (s)		96.5	96.5	111.5	111.5	26.5	
Actuated g/C Ratio		0.64	0.64	0.74	0.74	0.18	
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)		5.0	5.0	3.0	5.0	3.0	
Lane Grp Cap (vph)		2276	1018	156	2630	298	
v/s Ratio Prot		0.64		c0.07	0.39		
v/s Ratio Perm			0.05	c0.81		c0.14	
v/c Ratio		1.00	0.08	1.18	0.53	0.81	
Uniform Delay, d1		26.6	10.1	56.2	8.1	59.3	
Progression Factor		0.35	0.06	1.00	1.00	1.00	
Incremental Delay, d2		10.4	0.1	128.4	0.8	14.6	
Delay (s)		19.7	0.6	184.6	8.9	73.9	
Level of Service		B	A	F	A	E	
Approach Delay (s)		18.8			29.5	73.9	
Approach LOS		B			C	E	

Intersection Summary

HCM 2000 Control Delay	26.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	93.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis 8: Sterling Pl/Site Drwy 4 & Mt Carmel Rd

Future Build (2020) AM
1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	154	0	20	106	24	0	0	41	0	0	53
Future Volume (Veh/h)	1	154	0	20	106	24	0	0	41	0	0	53
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.92	0.92	0.68	0.92	0.25	0.92	0.92	0.65	0.92	0.92	0.25
Hourly flow rate (vph)	4	167	0	29	115	96	0	0	63	0	0	212
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)	733											
pX, platoon unblocked												
vC, conflicting volume	115			167			348	348	167	411	348	115
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	115			167			348	348	167	411	348	115
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			100	100	93	100	100	77
cM capacity (veh/h)	1474			1411			461	562	877	503	562	937
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1							
Volume Total	171	144	96	63	212							
Volume Left	4	29	0	0	0							
Volume Right	0	0	96	63	212							
cSH	1474	1411	1700	877	937							
Volume to Capacity	0.00	0.02	0.06	0.07	0.23							
Queue Length 95th (ft)	0	2	0	6	22							
Control Delay (s)	0.2	1.7	0.0	9.4	10.0							
Lane LOS	A	A		A	A							
Approach Delay (s)	0.2	1.0		9.4	10.0							
Approach LOS				A	A							
Intersection Summary												
Average Delay				4.3								
Intersection Capacity Utilization				28.2%	ICU Level of Service				A			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis 9: Mill Road & Mt Carmel Rd

Future Build (2020) AM

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	128	76	59	53	151	62	76	277	51	32	337	138
Future Volume (vph)	128	76	59	53	151	62	76	277	51	32	337	138
Peak Hour Factor	0.77	0.77	0.77	0.67	0.67	0.67	0.90	0.90	0.90	0.93	0.93	0.93
Hourly flow rate (vph)	166	99	77	79	225	93	84	308	57	34	362	148
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	342	397	449	544								
Volume Left (vph)	166	79	84	34								
Volume Right (vph)	77	93	57	148								
Hadj (s)	0.00	-0.07	0.00	-0.12								
Departure Headway (s)	9.6	9.3	9.3	9.2								
Degree Utilization, x	0.91	1.00	1.00	1.00								
Capacity (veh/h)	368	397	449	544								
Control Delay (s)	57.7	76.8	77.1	76.6								
Approach Delay (s)	57.7	76.8	77.1	76.6								
Approach LOS	F	F	F	F								
Intersection Summary												
Delay				73.1								
Level of Service				F								
Intersection Capacity Utilization				81.1%	ICU Level of Service	D						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

10: Site Drwy 2 & Jonesboro Rd

Future Build (2020) AM
1/26/2016

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↑↑		↑
Traffic Volume (veh/h)	1998	207	0	1654	0	136
Future Volume (Veh/h)	1998	207	0	1654	0	136
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2172	225	0	1798	0	148
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)	536			645		
pX, platoon unblocked			0.70		0.79	0.70
vC, conflicting volume			2172		3071	1086
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1810		2010	250
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	72
cM capacity (veh/h)			234		41	522
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	1086	1086	225	899	899	148
Volume Left	0	0	0	0	0	0
Volume Right	0	0	225	0	0	148
cSH	1700	1700	1700	1700	1700	522
Volume to Capacity	0.64	0.64	0.13	0.53	0.53	0.28
Queue Length 95th (ft)	0	0	0	0	0	29
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	14.6
Lane LOS						B
Approach Delay (s)	0.0			0.0		14.6
Approach LOS						B
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			70.3%	ICU Level of Service		C
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

11: Site Drwy & Jonesboro Rd

Future Build (2020) AM

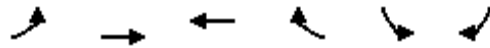
1/26/2016

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↑↑		↑
Traffic Volume (veh/h)	1846	160	0	1367	0	113
Future Volume (Veh/h)	1846	160	0	1367	0	113
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2007	174	0	1486	0	123
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)	874			1271		
pX, platoon unblocked			0.58		0.67	0.58
vC, conflicting volume			2007		2750	1004
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1292		1468	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	80
cM capacity (veh/h)			310		79	631
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	1004	1004	174	743	743	123
Volume Left	0	0	0	0	0	0
Volume Right	0	0	174	0	0	123
cSH	1700	1700	1700	1700	1700	631
Volume to Capacity	0.59	0.59	0.10	0.44	0.44	0.20
Queue Length 95th (ft)	0	0	0	0	0	18
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	12.1
Lane LOS						B
Approach Delay (s)	0.0			0.0		12.1
Approach LOS						B
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			64.7%	ICU Level of Service		C
Analysis Period (min)			15			

Queues
12: Mt Carmel Rd & Site Drwy 3

Future Build (2020) AM

1/26/2016



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	65	130	118	52	64	33
Future Volume (vph)	65	130	118	52	64	33
Lane Group Flow (vph)	71	141	128	57	70	36
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	32.0	99.0	67.0	67.0	51.0	51.0
Total Split (%)	21.3%	66.0%	44.7%	44.7%	34.0%	34.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.07	0.09	0.09	0.05	0.52	0.23
Control Delay	2.3	2.2	2.1	0.0	79.5	21.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.3	2.2	2.1	0.0	79.5	21.5
Queue Length 50th (ft)	9	19	9	0	67	0
Queue Length 95th (ft)	21	37	m17	m0	118	37
Internal Link Dist (ft)		653	2491		345	
Turn Bay Length (ft)	235			175		
Base Capacity (vph)	1129	1619	1448	1243	531	500
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.09	0.09	0.05	0.13	0.07

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 144 (96%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

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

Splits and Phases: 12: Mt Carmel Rd & Site Drwy 3

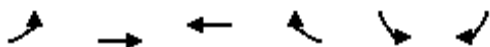


HCM Signalized Intersection Capacity Analysis

12: Mt Carmel Rd & Site Drwy 3

Future Build (2020) AM

1/26/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	65	130	118	52	64	33
Future Volume (vph)	65	130	118	52	64	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1863	1863	1583	1770	1583
Flt Permitted	0.64	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1195	1863	1863	1583	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	71	141	128	57	70	36
RTOR Reduction (vph)	0	0	0	13	0	34
Lane Group Flow (vph)	71	141	128	44	70	2
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	128.0	128.0	115.5	115.5	10.0	10.0
Effective Green, g (s)	128.0	128.0	115.5	115.5	10.0	10.0
Actuated g/C Ratio	0.85	0.85	0.77	0.77	0.07	0.07
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1044	1589	1434	1218	118	105
v/s Ratio Prot	0.00	c0.08	0.07		c0.04	
v/s Ratio Perm	0.06			0.03		0.00
v/c Ratio	0.07	0.09	0.09	0.04	0.59	0.02
Uniform Delay, d1	1.8	1.7	4.3	4.1	68.0	65.4
Progression Factor	1.00	1.00	0.42	0.00	1.00	1.00
Incremental Delay, d2	0.0	0.1	0.1	0.0	7.8	0.1
Delay (s)	1.8	1.9	1.8	0.0	75.8	65.5
Level of Service	A	A	A	A	E	E
Approach Delay (s)		1.8	1.3		72.3	
Approach LOS		A	A		E	

Intersection Summary

HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.13		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	24.4%	ICU Level of Service	A
Analysis Period (min)	15		

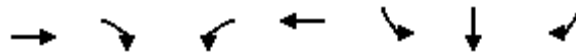
c Critical Lane Group

Queues

1: I-75 SB Ramps & Jonesboro Rd

Future Build (2020) SAT

1/26/2016



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations	↑↑	↑	↑	↑↑	↑	↑	↑
Traffic Volume (vph)	1694	388	265	1800	324	3	567
Future Volume (vph)	1694	388	265	1800	324	3	567
Lane Group Flow (vph)	1783	473	319	1875	209	209	616
Turn Type	NA	Perm	pm+pt	NA	Perm	NA	Perm
Protected Phases	2		1	6		4	
Permitted Phases		2	6		4		4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0	6.0	6.0
Minimum Split (s)	24.0	24.0	11.0	24.0	24.0	24.0	24.0
Total Split (s)	76.0	76.0	23.0	99.0	51.0	51.0	51.0
Total Split (%)	50.7%	50.7%	15.3%	66.0%	34.0%	34.0%	34.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?							
Recall Mode	C-Min	C-Min	None	C-Min	None	None	None
v/c Ratio	1.08	0.50	1.28	0.85	0.41	0.41	1.18
Control Delay	85.5	6.4	177.6	4.6	45.1	45.0	141.7
Queue Delay	0.0	0.0	0.0	0.9	0.2	0.2	0.0
Total Delay	85.5	6.4	177.6	5.6	45.2	45.2	141.7
Queue Length 50th (ft)	~1022	40	~337	157	172	172	~677
Queue Length 95th (ft)	#1158	77	m#350	m178	221	96	#920
Internal Link Dist (ft)	520			890		860	
Turn Bay Length (ft)		415	635		430		700
Base Capacity (vph)	1651	951	250	2194	504	506	520
Starvation Cap Reductn	0	0	0	123	0	0	0
Spillback Cap Reductn	0	0	0	0	35	35	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	0.50	1.28	0.91	0.45	0.44	1.18

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 42 (28%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 1: I-75 SB Ramps & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

Future Build (2020) SAT

1: I-75 SB Ramps & Jonesboro Rd

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑					↑	↑	↑
Traffic Volume (vph)	0	1694	388	265	1800	0	0	0	0	324	3	567
Future Volume (vph)	0	1694	388	265	1800	0	0	0	0	324	3	567
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.95	1.00	1.00	0.95					0.95	0.95	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		3539	1583	1770	3539					1681	1688	1583
Flt Permitted		1.00	1.00	0.05	1.00					0.95	0.95	1.00
Satd. Flow (perm)		3539	1583	98	3539					1681	1688	1583
Peak-hour factor, PHF	0.92	0.95	0.82	0.83	0.96	0.92	0.92	0.92	0.92	0.79	0.38	0.92
Adj. Flow (vph)	0	1783	473	319	1875	0	0	0	0	410	8	616
RTOR Reduction (vph)	0	0	213	0	0	0	0	0	0	0	0	46
Lane Group Flow (vph)	0	1783	260	319	1875	0	0	0	0	209	209	571
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)		70.0	70.0	93.0	93.0					45.0	45.0	45.0
Effective Green, g (s)		70.0	70.0	93.0	93.0					45.0	45.0	45.0
Actuated g/C Ratio		0.47	0.47	0.62	0.62					0.30	0.30	0.30
Clearance Time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	3.0	5.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1651	738	250	2194					504	506	474
v/s Ratio Prot		0.50		c0.14	0.53							
v/s Ratio Perm			0.16	c0.65						0.12	0.12	c0.36
v/c Ratio		1.08	0.35	1.28	0.85					0.41	0.41	1.20
Uniform Delay, d1		40.0	25.5	53.1	23.0					42.0	41.9	52.5
Progression Factor		1.00	1.00	1.26	0.14					1.00	1.00	1.00
Incremental Delay, d2		47.2	1.3	132.7	1.3					0.6	0.5	110.3
Delay (s)		87.2	26.9	199.7	4.6					42.5	42.5	162.8
Level of Service		F	C	F	A					D	D	F
Approach Delay (s)		74.6			32.9			0.0			114.2	
Approach LOS		E			C			A			F	
Intersection Summary												
HCM 2000 Control Delay			65.4			HCM 2000 Level of Service				E		
HCM 2000 Volume to Capacity ratio			1.28									
Actuated Cycle Length (s)			150.0			Sum of lost time (s)				18.0		
Intersection Capacity Utilization			97.9%			ICU Level of Service				F		
Analysis Period (min)			15									
c Critical Lane Group												

Queues

2: I-75 NB Ramps & Jonesboro Rd

Future Build (2020) SAT

1/26/2016



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations	↰	↗↗	↗↗	↰	↰	↗↗	↰
Traffic Volume (vph)	480	1559	1599	671	436	3	259
Future Volume (vph)	480	1559	1599	671	436	3	259
Lane Group Flow (vph)	511	1713	1648	746	268	265	285
Turn Type	pm+pt	NA	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	6			8	
Permitted Phases	2			6	8		8
Detector Phase	5	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	15.0	15.0	15.0	6.0	6.0	6.0
Minimum Split (s)	11.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	43.0	120.0	77.0	77.0	30.0	30.0	30.0
Total Split (%)	28.7%	80.0%	51.3%	51.3%	20.0%	20.0%	20.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?							
Recall Mode	None	C-Min	C-Min	C-Min	None	None	None
v/c Ratio	1.05	0.64	0.98	0.75	1.00	0.98	0.93
Control Delay	67.1	25.0	12.9	3.7	116.7	112.0	83.3
Queue Delay	0.0	1.8	1.1	0.7	0.0	0.0	0.4
Total Delay	67.1	26.8	14.0	4.4	116.7	112.0	83.7
Queue Length 50th (ft)	~485	792	138	9	280	275	220
Queue Length 95th (ft)	m#477	m754	m120	m1	#422	144	#402
Internal Link Dist (ft)		890	855			694	
Turn Bay Length (ft)	675			390	285		350
Base Capacity (vph)	486	2689	1675	991	268	270	307
Starvation Cap Reductn	0	764	10	62	0	0	0
Spillback Cap Reductn	0	64	0	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.05	0.89	0.99	0.80	1.00	0.98	0.93

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 147 (98%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 2: I-75 NB Ramps & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

2: I-75 NB Ramps & Jonesboro Rd

Future Build (2020) SAT

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	480	1559	0	0	1599	671	436	3	259	0	0	0
Future Volume (vph)	480	1559	0	0	1599	671	436	3	259	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	1770	3539			3539	1583	1681	1688	1583			
Flt Permitted	0.05	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	97	3539			3539	1583	1681	1688	1583			
Peak-hour factor, PHF	0.94	0.91	0.92	0.92	0.97	0.90	0.83	0.38	0.91	0.92	0.92	0.92
Adj. Flow (vph)	511	1713	0	0	1648	746	525	8	285	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	242	0	0	55	0	0	0
Lane Group Flow (vph)	511	1713	0	0	1648	504	268	265	230	0	0	0
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Actuated Green, G (s)	114.0	114.0			71.0	71.0	24.0	24.0	24.0			
Effective Green, g (s)	114.0	114.0			71.0	71.0	24.0	24.0	24.0			
Actuated g/C Ratio	0.76	0.76			0.47	0.47	0.16	0.16	0.16			
Clearance Time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Vehicle Extension (s)	3.0	5.0			5.0	5.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	486	2689			1675	749	268	270	253			
v/s Ratio Prot	c0.26	0.48			0.47							
v/s Ratio Perm	c0.54					0.32	c0.16	0.16	0.15			
v/c Ratio	1.05	0.64			0.98	0.67	1.00	0.98	0.91			
Uniform Delay, d1	50.7	8.4			38.9	30.5	63.0	62.8	61.9			
Progression Factor	0.58	2.88			0.19	0.28	1.00	1.00	1.00			
Incremental Delay, d2	38.6	0.4			3.9	0.4	55.0	49.4	33.8			
Delay (s)	68.1	24.5			11.1	9.0	118.0	112.2	95.7			
Level of Service	E	C			B	A	F	F	F			
Approach Delay (s)		34.5			10.5			108.3			0.0	
Approach LOS		C			B			F			A	
Intersection Summary												
HCM 2000 Control Delay		35.0			HCM 2000 Level of Service			D				
HCM 2000 Volume to Capacity ratio		1.06										
Actuated Cycle Length (s)		150.0			Sum of lost time (s)			18.0				
Intersection Capacity Utilization		97.9%			ICU Level of Service			F				
Analysis Period (min)		15										
c Critical Lane Group												

Queues

Future Build (2020) SAT

3: Managed Lane Ramp/Foster Dr & Jonesboro Rd

1/26/2016



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBR	Ø1
Lane Configurations	↰	↰↱	↰↱	↰	↰	↱	↰↱	↰	↰	
Traffic Volume (vph)	309	1506	1804	132	133	100	688	149	119	
Future Volume (vph)	309	1506	1804	132	133	100	688	149	119	
Lane Group Flow (vph)	351	1553	1860	150	145	109	748	210	135	
Turn Type	pm+pt	NA	NA	Perm	Perm	NA	Perm	Prot	Perm	
Protected Phases	5	2	6			8		7		1
Permitted Phases	2			6	8		8		7	
Detector Phase	5	2	6	6	8	8	8	7	7	
Switch Phase										
Minimum Initial (s)	5.0	15.0	15.0	15.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	24.0	34.0	34.0	24.0	24.0	24.0	33.0	33.0	11.0
Total Split (s)	22.0	78.0	67.0	67.0	28.0	28.0	28.0	33.0	33.0	11.0
Total Split (%)	14.7%	52.0%	44.7%	44.7%	18.7%	18.7%	18.7%	22.0%	22.0%	7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
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	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes						Yes
Recall Mode	None	C-Min	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	1.47	0.79	1.29	0.20	0.46	0.33	1.09	0.80	0.37	
Control Delay	266.1	21.5	174.0	5.1	62.1	58.6	101.1	83.5	8.1	
Queue Delay	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	266.1	21.8	174.2	5.1	62.1	58.6	101.1	83.5	8.1	
Queue Length 50th (ft)	~413	816	~1228	7	129	95	~364	200	0	
Queue Length 95th (ft)	m#582	m747	m#1127	m27	211	163	#545	217	41	
Internal Link Dist (ft)		855	456			793				
Turn Bay Length (ft)	275			125	175		150		215	
Base Capacity (vph)	238	1958	1439	734	315	332	684	318	410	
Starvation Cap Reductn	0	67	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	67	0	0	0	0	0	2	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	1.47	0.82	1.36	0.20	0.46	0.33	1.09	0.66	0.33	

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 143 (95%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 135

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

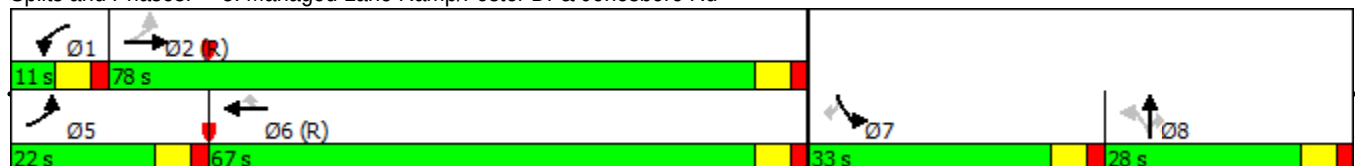
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 3: Managed Lane Ramp/Foster Dr & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

3: Managed Lane Ramp/Foster Dr & Jonesboro Rd

Future Build (2020) SAT

1/26/2016

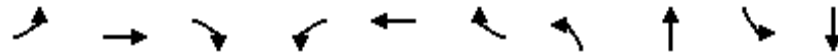
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	309	1506	0	0	1804	132	133	100	688	149	0	119
Future Volume (vph)	309	1506	0	0	1804	132	133	100	688	149	0	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0	6.0		6.0
Lane Util. Factor	1.00	0.95			0.95	1.00	1.00	1.00	0.88	1.00		1.00
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00	0.95		1.00
Satd. Flow (prot)	1770	3539			3539	1583	1770	1863	2787	1770		1583
Flt Permitted	0.06	1.00			1.00	1.00	0.95	1.00	1.00	0.95		1.00
Satd. Flow (perm)	111	3539			3539	1583	1770	1863	2787	1770		1583
Peak-hour factor, PHF	0.88	0.97	0.92	0.92	0.97	0.88	0.92	0.92	0.92	0.71	0.92	0.88
Adj. Flow (vph)	351	1553	0	0	1860	150	145	109	748	210	0	135
RTOR Reduction (vph)	0	0	0	0	0	89	0	0	187	0	0	115
Lane Group Flow (vph)	351	1553	0	0	1860	61	145	109	561	210	0	20
Turn Type	pm+pt	NA		Prot	NA	Perm	Perm	NA	Perm	Prot		Perm
Protected Phases	5	2		1	6			8		7		
Permitted Phases	2					6	8		8			7
Actuated Green, G (s)	83.0	83.0			61.0	61.0	26.7	26.7	26.7	22.3		22.3
Effective Green, g (s)	83.0	83.0			61.0	61.0	26.7	26.7	26.7	22.3		22.3
Actuated g/C Ratio	0.55	0.55			0.41	0.41	0.18	0.18	0.18	0.15		0.15
Clearance Time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0	6.0		6.0
Vehicle Extension (s)	3.0	5.0			5.0	5.0	3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	238	1958			1439	643	315	331	496	263		235
v/s Ratio Prot	c0.16	0.44			0.53			0.06		c0.12		
v/s Ratio Perm	c0.66					0.04	0.08		c0.20			0.01
v/c Ratio	1.47	0.79			1.29	0.09	0.46	0.33	1.13	0.80		0.09
Uniform Delay, d1	50.9	26.7			44.5	27.5	55.2	53.8	61.6	61.7		55.1
Progression Factor	1.16	0.70			1.03	1.21	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	229.5	2.5			136.2	0.2	1.1	0.6	81.3	15.4		0.2
Delay (s)	288.6	21.2			181.9	33.5	56.3	54.4	142.9	77.1		55.2
Level of Service	F	C			F	C	E	D	F	E		E
Approach Delay (s)		70.5			170.8			120.8			68.5	
Approach LOS		E			F			F			E	
Intersection Summary												
HCM 2000 Control Delay		118.3			HCM 2000 Level of Service			F				
HCM 2000 Volume to Capacity ratio		1.31										
Actuated Cycle Length (s)		150.0			Sum of lost time (s)			24.0				
Intersection Capacity Utilization		96.0%			ICU Level of Service			F				
Analysis Period (min)		15										
c Critical Lane Group												

Queues

4: Site Drwy 1 & Jonesboro Rd

Future Build (2020) SAT

1/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	56	1653	472	513	1057	22	825	0	23	0
Future Volume (vph)	56	1653	472	513	1057	22	825	0	23	0
Lane Group Flow (vph)	67	1797	1888	1026	1079	33	1650	761	0	92
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	NA
Protected Phases	5	2		1	6		3	8		4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	5	2	2	1	6	6	3	8	4	4
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	24.0	24.0	11.0	24.0	24.0	11.0	24.0	24.0	24.0
Total Split (s)	12.0	52.0	52.0	33.0	73.0	73.0	41.0	65.0	24.0	24.0
Total Split (%)	8.0%	34.7%	34.7%	22.0%	48.7%	48.7%	27.3%	43.3%	16.0%	16.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
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
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead		Lag	Lag
Lead-Lag Optimize?										
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None
v/c Ratio	0.32	1.66	2.18	2.49	0.63	0.04	3.08	0.95		0.55
Control Delay	22.2	331.2	550.6	699.8	32.8	0.1	961.5	47.0		12.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	22.2	331.2	550.6	699.8	32.8	0.1	961.5	47.0		12.4
Queue Length 50th (ft)	28	~1346	~2571	~1671	447	0	~2661	449		0
Queue Length 95th (ft)	m45	m#1462	8	#884	521	0	#1302	#739		0
Internal Link Dist (ft)		565			794			241		273
Turn Bay Length (ft)	235		175	235		160				
Base Capacity (vph)	210	1085	868	412	1719	825	535	830		171
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	0.32	1.66	2.18	2.49	0.63	0.04	3.08	0.92		0.54

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 8 (5%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 4: Site Drwy 1 & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

4: Site Drwy 1 & Jonesboro Rd

Future Build (2020) SAT

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	1653	472	513	1057	22	825	0	289	23	0	55
Future Volume (vph)	56	1653	472	513	1057	22	825	0	289	23	0	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	
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	1.00	0.85			0.91	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1583			1664	
Flt Permitted	0.24	1.00	1.00	0.08	1.00	1.00	0.48	1.00			0.18	
Satd. Flow (perm)	446	3539	1583	143	3539	1583	903	1583			311	
Peak-hour factor, PHF	0.83	0.92	0.25	0.50	0.98	0.66	0.50	0.92	0.38	0.79	0.92	0.87
Adj. Flow (vph)	67	1797	1888	1026	1079	33	1650	0	761	29	0	63
RTOR Reduction (vph)	0	0	383	0	0	17	0	216	0	0	83	0
Lane Group Flow (vph)	67	1797	1505	1026	1079	16	1650	545	0	0	9	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	51.0	46.0	46.0	82.7	71.7	71.7	55.3	55.3			14.3	
Effective Green, g (s)	51.0	46.0	46.0	82.7	71.7	71.7	55.3	55.3			14.3	
Actuated g/C Ratio	0.34	0.31	0.31	0.55	0.48	0.48	0.37	0.37			0.10	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)	195	1085	485	411	1691	756	535	583			29	
v/s Ratio Prot	0.01	0.51		c0.51	0.30		c0.72	0.34				
v/s Ratio Perm	0.10		c0.95	0.86		0.01	c0.42				0.03	
v/c Ratio	0.34	1.66	3.10	2.50	0.64	0.02	3.08	0.93			0.30	
Uniform Delay, d1	34.0	52.0	52.0	49.4	29.4	20.6	44.9	45.6			63.2	
Progression Factor	0.90	0.92	0.78	1.01	1.03	1.00	1.00	1.00			1.00	
Incremental Delay, d2	1.0	299.4	951.4	680.6	1.9	0.1	942.8	22.3			5.8	
Delay (s)	31.8	347.3	991.9	730.4	32.1	20.7	987.7	68.0			69.0	
Level of Service	C	F	F	F	C	C	F	E			E	
Approach Delay (s)		666.0			367.0			697.4			69.0	
Approach LOS		F			F			F			E	
Intersection Summary												
HCM 2000 Control Delay			592.3									
HCM 2000 Volume to Capacity ratio			3.06									
Actuated Cycle Length (s)			150.0									
Intersection Capacity Utilization			141.5%									
Analysis Period (min)			15									
c Critical Lane Group												

Queues
5: Mt Carmel Rd & Jonesboro Rd

Future Build (2020) SAT
1/26/2016

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↗
Traffic Volume (vph)	1825	11	187	1566	6	183
Future Volume (vph)	1825	11	187	1566	6	183
Lane Group Flow (vph)	2005	18	567	1598	16	458
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	3	
Permitted Phases		2	6			3
Detector Phase	2	2	1	6	3	3
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	11.0	24.0	24.0	24.0
Total Split (s)	83.0	83.0	43.0	126.0	24.0	24.0
Total Split (%)	55.3%	55.3%	28.7%	84.0%	16.0%	16.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Recall Mode	C-Min	C-Min	None	C-Min	None	None
v/c Ratio	1.10	0.02	1.11	0.55	0.09	0.94
Control Delay	81.7	9.4	113.0	5.6	53.8	38.6
Queue Delay	0.2	0.0	0.0	0.1	0.0	1.7
Total Delay	81.9	9.4	113.0	5.7	53.8	40.4
Queue Length 50th (ft)	~1160	3	~616	163	11	13
Queue Length 95th (ft)	m#1054	m6	195	m328	14	0
Internal Link Dist (ft)	1191			797	2491	
Turn Bay Length (ft)		250	300		100	
Base Capacity (vph)	1816	816	513	2887	212	504
Starvation Cap Reductn	0	0	0	300	0	0
Spillback Cap Reductn	100	0	0	0	0	10
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.17	0.02	1.11	0.62	0.08	0.93

Intersection Summary

Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 9 (6%), Referenced to phase 2:EBTU and 6:WBTL, Start of Green
 Natural Cycle: 140
 Control Type: Actuated-Coordinated
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Mt Carmel Rd & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

5: Mt Carmel Rd & Jonesboro Rd

Future Build (2020) SAT

1/26/2016



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰	↶↷	↰	↰	↶↷	↰	↰
Traffic Volume (vph)	0	1825	11	187	1566	6	183
Future Volume (vph)	0	1825	11	187	1566	6	183
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	1.00
Frt		1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)		3539	1583	1770	3539	1770	1583
Flt Permitted		1.00	1.00	0.05	1.00	0.95	1.00
Satd. Flow (perm)		3539	1583	90	3539	1770	1583
Peak-hour factor, PHF	0.92	0.91	0.62	0.33	0.98	0.38	0.40
Adj. Flow (vph)	0	2005	18	567	1598	16	458
RTOR Reduction (vph)	0	0	4	0	0	0	320
Lane Group Flow (vph)	0	2005	14	567	1598	16	138
Turn Type	Perm	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases		2		1	6	3	
Permitted Phases	2		2	6			3
Actuated Green, G (s)		77.0	77.0	122.4	122.4	15.6	15.6
Effective Green, g (s)		77.0	77.0	122.4	122.4	15.6	15.6
Actuated g/C Ratio		0.51	0.51	0.82	0.82	0.10	0.10
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1816	812	514	2887	184	164
v/s Ratio Prot		0.57		c0.29	0.45	0.01	
v/s Ratio Perm			0.01	c0.61			c0.09
v/c Ratio		1.10	0.02	1.10	0.55	0.09	0.84
Uniform Delay, d1		36.5	17.9	50.5	4.6	60.8	66.0
Progression Factor		0.73	0.78	1.13	1.01	0.89	0.54
Incremental Delay, d2		54.8	0.0	64.8	0.5	0.2	30.5
Delay (s)		81.3	14.1	121.8	5.2	54.5	66.4
Level of Service		F	B	F	A	D	E
Approach Delay (s)		80.7			35.8	66.0	
Approach LOS		F			D	E	

Intersection Summary

HCM 2000 Control Delay	58.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	80.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Queues

Future Build (2020) SAT

6: Willow Lane/Oak Grove Rd & Jonesboro Rd

1/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	56	1815	159	46	1532	53	166	86	43	96	188
Future Volume (vph)	56	1815	159	46	1532	53	166	86	43	96	188
Lane Group Flow (vph)	93	1871	177	58	1596	60	198	97	67	123	287
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	5	2	3	1	6		3	8		7	4
Permitted Phases	2		2	6		6	8		8	4	
Detector Phase	5	2	3	1	6	6	3	8	8	7	4
Switch Phase											
Minimum Initial (s)	5.0	15.0	5.0	5.0	15.0	15.0	5.0	6.0	6.0	5.0	6.0
Minimum Split (s)	11.0	26.0	11.0	11.0	36.0	36.0	11.0	46.0	46.0	11.0	44.0
Total Split (s)	12.0	82.0	13.0	11.0	81.0	81.0	13.0	46.0	46.0	11.0	44.0
Total Split (%)	8.0%	54.7%	8.7%	7.3%	54.0%	54.0%	8.7%	30.7%	30.7%	7.3%	29.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
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	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?											
Recall Mode	None	C-Min	None	None	C-Min	C-Min	None	None	None	None	None
v/c Ratio	0.69	0.90	0.16	0.54	0.80	0.06	1.20	0.26	0.16	0.40	0.82
Control Delay	37.6	8.9	0.2	35.2	24.2	1.5	176.0	50.2	2.0	48.1	75.0
Queue Delay	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.6	10.3	0.2	35.2	24.2	1.5	176.0	50.2	2.0	48.1	75.0
Queue Length 50th (ft)	35	112	1	13	655	2	~194	81	0	94	265
Queue Length 95th (ft)	m32	m324	m1	m43	852	m10	#283	125	0	119	307
Internal Link Dist (ft)		797			4515			905			451
Turn Bay Length (ft)	300		150	300		250	300		400	135	
Base Capacity (vph)	135	2069	1087	108	1994	939	165	496	502	304	464
Starvation Cap Reductn	0	76	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	0.69	0.94	0.16	0.54	0.80	0.06	1.20	0.20	0.13	0.40	0.62

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 24 (16%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 135

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

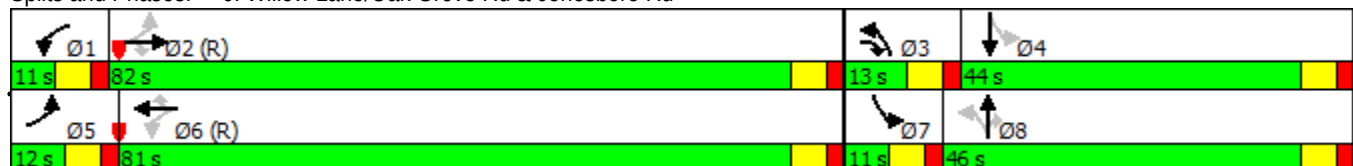
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 6: Willow Lane/Oak Grove Rd & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

6: Willow Lane/Oak Grove Rd & Jonesboro Rd

Future Build (2020) SAT

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	1815	159	46	1532	53	166	86	43	96	188	41
Future Volume (vph)	56	1815	159	46	1532	53	166	86	43	96	188	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1809	
Flt Permitted	0.06	1.00	1.00	0.05	1.00	1.00	0.22	1.00	1.00	0.69	1.00	
Satd. Flow (perm)	112	3539	1583	88	3539	1583	408	1863	1583	1293	1809	
Peak-hour factor, PHF	0.60	0.97	0.90	0.79	0.96	0.89	0.84	0.89	0.64	0.78	0.81	0.75
Adj. Flow (vph)	93	1871	177	58	1596	60	198	97	67	123	232	55
RTOR Reduction (vph)	0	0	28	0	0	26	0	0	53	0	6	0
Lane Group Flow (vph)	93	1871	149	58	1596	34	198	97	14	123	281	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)	92.5	86.5	93.5	88.5	84.5	84.5	37.5	30.5	30.5	33.5	28.5	
Effective Green, g (s)	92.5	86.5	93.5	88.5	84.5	84.5	37.5	30.5	30.5	33.5	28.5	
Actuated g/C Ratio	0.62	0.58	0.62	0.59	0.56	0.56	0.25	0.20	0.20	0.22	0.19	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	5.0	3.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	135	2040	1050	96	1993	891	165	378	321	304	343	
v/s Ratio Prot	c0.03	c0.53	0.01	0.02	0.45		c0.06	0.05		0.01	0.16	
v/s Ratio Perm	0.39		0.09	0.34		0.02	c0.24		0.01	0.08		
v/c Ratio	0.69	0.92	0.14	0.60	0.80	0.04	1.20	0.26	0.04	0.40	0.82	
Uniform Delay, d1	25.5	28.5	11.7	31.0	26.1	14.6	55.1	50.2	48.0	48.9	58.3	
Progression Factor	2.00	0.22	0.03	1.21	0.78	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.3	0.9	0.0	8.2	2.8	0.1	134.0	0.4	0.1	0.9	14.0	
Delay (s)	52.5	7.0	0.3	45.7	23.0	14.7	189.1	50.6	48.1	49.8	72.3	
Level of Service	D	A	A	D	C	B	F	D	D	D	E	
Approach Delay (s)		8.5			23.5			125.9			65.5	
Approach LOS		A			C			F			E	
Intersection Summary												
HCM 2000 Control Delay	28.3			HCM 2000 Level of Service					C			
HCM 2000 Volume to Capacity ratio	1.02											
Actuated Cycle Length (s)	150.0			Sum of lost time (s)					24.0			
Intersection Capacity Utilization	86.8%			ICU Level of Service					E			
Analysis Period (min)	15											
c Critical Lane Group												

Queues
7: Kelly Rd & Jonesboro Rd

Future Build (2020) SAT
1/26/2016



Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations	↑↑	↑	↑	↑↑	↑↑
Traffic Volume (vph)	1856	60	158	1557	76
Future Volume (vph)	1856	60	158	1557	76
Lane Group Flow (vph)	1913	71	203	1656	262
Turn Type	NA	Perm	pm+pt	NA	Perm
Protected Phases	2		1	6	
Permitted Phases		2	6		8
Detector Phase	2	2	1	6	8
Switch Phase					
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0
Minimum Split (s)	29.0	29.0	11.0	24.0	42.0
Total Split (s)	90.0	90.0	18.0	108.0	42.0
Total Split (%)	60.0%	60.0%	12.0%	72.0%	28.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead		
Lead-Lag Optimize?					
Recall Mode	C-Min	C-Min	None	C-Min	None
v/c Ratio	0.85	0.07	1.07	0.62	0.82
Control Delay	7.7	0.1	125.6	10.5	67.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.7	0.1	125.6	10.5	67.4
Queue Length 50th (ft)	47	0	~167	349	202
Queue Length 95th (ft)	#1102	m1	#269	525	233
Internal Link Dist (ft)	4515			773	731
Turn Bay Length (ft)		315	300		
Base Capacity (vph)	2250	1025	190	2675	442
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.85	0.07	1.07	0.62	0.59

Intersection Summary

Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 95 (63%), Referenced to phase 2:EBTU and 6:WBTL, Start of Green
 Natural Cycle: 135
 Control Type: Actuated-Coordinated
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: Kelly Rd & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

7: Kelly Rd & Jonesboro Rd

Future Build (2020) SAT
1/26/2016



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰	↰↰	↰	↰	↰↰	↰	↰
Traffic Volume (vph)	0	1856	60	158	1557	76	117
Future Volume (vph)	0	1856	60	158	1557	76	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	
Frt		1.00	0.85	1.00	1.00	0.91	
Flt Protected		1.00	1.00	0.95	1.00	0.98	
Satd. Flow (prot)		3539	1583	1770	3539	1673	
Flt Permitted		1.00	1.00	0.04	1.00	0.98	
Satd. Flow (perm)		3539	1583	73	3539	1673	
Peak-hour factor, PHF	0.92	0.97	0.84	0.78	0.94	0.78	0.71
Adj. Flow (vph)	0	1913	71	203	1656	97	165
RTOR Reduction (vph)	0	0	19	0	0	45	0
Lane Group Flow (vph)	0	1913	52	203	1656	217	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	
Protected Phases		2		1	6		
Permitted Phases	2		2	6		8	
Actuated Green, G (s)		95.4	95.4	113.4	113.4	24.6	
Effective Green, g (s)		95.4	95.4	113.4	113.4	24.6	
Actuated g/C Ratio		0.64	0.64	0.76	0.76	0.16	
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)		5.0	5.0	3.0	5.0	3.0	
Lane Grp Cap (vph)		2250	1006	190	2675	274	
v/s Ratio Prot		0.54		c0.09	0.47		
v/s Ratio Perm			0.03	c0.71		c0.13	
v/c Ratio		0.85	0.05	1.07	0.62	0.79	
Uniform Delay, d1		21.6	10.3	53.6	8.4	60.2	
Progression Factor		0.20	0.00	1.00	1.00	1.00	
Incremental Delay, d2		2.2	0.0	84.6	1.1	14.4	
Delay (s)		6.6	0.1	138.2	9.5	74.6	
Level of Service		A	A	F	A	E	
Approach Delay (s)		6.3			23.5	74.6	
Approach LOS		A			C	E	

Intersection Summary

HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	86.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis 8: Sterling Pl/Site Drwy 4 & Mt Carmel Rd

Future Build (2020) SAT

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	192	0	6	112	35	0	0	7	1	0	71
Future Volume (Veh/h)	1	192	0	6	112	35	0	0	7	1	0	71
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.25	0.25	0.92	0.50	0.92	0.25	0.92	0.92	0.29	0.25	0.92	0.25
Hourly flow rate (vph)	4	768	0	12	122	140	0	0	24	4	0	284
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	733											
pX, platoon unblocked												
vC, conflicting volume	122			768			922	922	768	946	922	122
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	122			768			922	922	768	946	922	122
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	94	98	100	69
cM capacity (veh/h)	1465			846			172	266	402	224	266	929
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1							
Volume Total	772	134	140	24	288							
Volume Left	4	12	0	0	4							
Volume Right	0	0	140	24	284							
cSH	1465	846	1700	402	890							
Volume to Capacity	0.00	0.01	0.08	0.06	0.32							
Queue Length 95th (ft)	0	1	0	5	35							
Control Delay (s)	0.1	1.0	0.0	14.5	11.0							
Lane LOS	A	A		B	B							
Approach Delay (s)	0.1	0.5		14.5	11.0							
Approach LOS				B	B							
Intersection Summary												
Average Delay				2.7								
Intersection Capacity Utilization				Err%	ICU Level of Service				H			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis 9: Mill Road & Mt Carmel Rd

Future Build (2020) SAT
1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	87	103	36	56	175	62	22	345	48	24	302	105
Future Volume (vph)	87	103	36	56	175	62	22	345	48	24	302	105
Peak Hour Factor	0.91	0.91	0.91	0.80	0.80	0.80	0.88	0.88	0.88	0.92	0.92	0.92
Hourly flow rate (vph)	96	113	40	70	219	78	25	392	55	26	328	114
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	249	367	472	468								
Volume Left (vph)	96	70	25	26								
Volume Right (vph)	40	78	55	114								
Hadj (s)	0.01	-0.06	-0.03	-0.10								
Departure Headway (s)	9.3	8.6	8.3	8.3								
Degree Utilization, x	0.64	0.87	1.00	1.00								
Capacity (veh/h)	374	367	472	468								
Control Delay (s)	27.3	48.0	72.6	72.2								
Approach Delay (s)	27.3	48.0	72.6	72.2								
Approach LOS	D	E	F	F								
Intersection Summary												
Delay				59.4								
Level of Service				F								
Intersection Capacity Utilization				60.1%	ICU Level of Service	B						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

10: Site Drwy 2 & Jonesboro Rd

Future Build (2020) SAT
1/26/2016

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗		↑↑		↗
Traffic Volume (veh/h)	885	311	0	489	0	158
Future Volume (Veh/h)	885	311	0	489	0	158
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	962	338	0	532	0	172
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)	536			645		
pX, platoon unblocked						
vC, conflicting volume			962		1228	481
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			962		1228	481
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	68
cM capacity (veh/h)			711		170	531
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	481	481	338	266	266	172
Volume Left	0	0	0	0	0	0
Volume Right	0	0	338	0	0	172
cSH	1700	1700	1700	1700	1700	531
Volume to Capacity	0.28	0.28	0.20	0.16	0.16	0.32
Queue Length 95th (ft)	0	0	0	0	0	35
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	15.0
Lane LOS						B
Approach Delay (s)	0.0			0.0		15.0
Approach LOS						B
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			40.9%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

11: Site Drwy & Jonesboro Rd

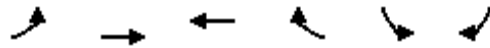
Future Build (2020) SAT
1/26/2016

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗		↑↑		↗
Traffic Volume (veh/h)	645	227	0	162	0	116
Future Volume (Veh/h)	645	227	0	162	0	116
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	701	247	0	176	0	126
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (ft)	874		1271			
pX, platoon unblocked						
vC, conflicting volume			701		789	350
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			701		789	350
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	80
cM capacity (veh/h)			892		328	646
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	350	350	247	88	88	126
Volume Left	0	0	0	0	0	0
Volume Right	0	0	247	0	0	126
cSH	1700	1700	1700	1700	1700	646
Volume to Capacity	0.21	0.21	0.15	0.05	0.05	0.20
Queue Length 95th (ft)	0	0	0	0	0	18
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	11.9
Lane LOS						B
Approach Delay (s)	0.0			0.0		11.9
Approach LOS						B
Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization			31.7%	ICU Level of Service		A
Analysis Period (min)			15			

Queues
12: Mt Carmel Rd & Site Drwy 3

Future Build (2020) SAT

1/26/2016



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	100	94	143	79	83	41
Future Volume (vph)	100	94	143	79	83	41
Lane Group Flow (vph)	109	102	155	86	90	45
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	35.0	100.0	65.0	65.0	50.0	50.0
Total Split (%)	23.3%	66.7%	43.3%	43.3%	33.3%	33.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.11	0.07	0.11	0.07	0.58	0.25
Control Delay	2.8	2.6	1.3	0.0	80.1	19.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.8	2.6	1.3	0.0	80.1	19.1
Queue Length 50th (ft)	15	14	8	0	86	0
Queue Length 95th (ft)	32	30	m9	m0	142	40
Internal Link Dist (ft)		653	2491		345	
Turn Bay Length (ft)	235			175		
Base Capacity (vph)	1086	1550	1386	1199	519	496
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.07	0.11	0.07	0.17	0.09

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 135 (90%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

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

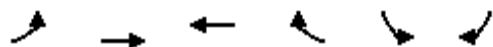
Splits and Phases: 12: Mt Carmel Rd & Site Drwy 3



HCM Signalized Intersection Capacity Analysis

12: Mt Carmel Rd & Site Drwy 3

Future Build (2020) SAT
1/26/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	100	94	143	79	83	41
Future Volume (vph)	100	94	143	79	83	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1863	1863	1583	1770	1583
Flt Permitted	0.63	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1164	1863	1863	1583	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	102	155	86	90	45
RTOR Reduction (vph)	0	0	0	22	0	41
Lane Group Flow (vph)	109	102	155	64	90	4
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	124.9	124.9	111.7	111.7	13.1	13.1
Effective Green, g (s)	124.9	124.9	111.7	111.7	13.1	13.1
Actuated g/C Ratio	0.83	0.83	0.74	0.74	0.09	0.09
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	998	1551	1387	1178	154	138
v/s Ratio Prot	c0.01	0.05	c0.08		c0.05	
v/s Ratio Perm	0.09			0.04		0.00
v/c Ratio	0.11	0.07	0.11	0.05	0.58	0.03
Uniform Delay, d1	2.4	2.2	5.3	5.1	65.8	62.6
Progression Factor	1.00	1.00	0.22	0.01	1.00	1.00
Incremental Delay, d2	0.0	0.1	0.0	0.0	5.6	0.1
Delay (s)	2.4	2.3	1.2	0.0	71.4	62.7
Level of Service	A	A	A	A	E	E
Approach Delay (s)		2.4	0.8		68.5	
Approach LOS		A	A		E	

Intersection Summary

HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.16		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	32.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

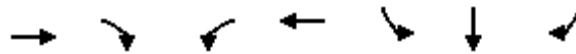
**Future “Build” Intersections Analysis
With Improvements**

Queues

1: I-75 SB Ramps & Jonesboro Rd

Future Build (2020) AM - Improved

1/26/2016



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations	↑↑	↑	↵	↑↑	↵	↕	↵
Traffic Volume (vph)	1297	204	66	926	454	2	403
Future Volume (vph)	1297	204	66	926	454	2	403
Lane Group Flow (vph)	1380	237	83	1064	367	355	333
Turn Type	NA	Perm	pm+pt	NA	Perm	NA	Perm
Protected Phases	2		1	6		4	
Permitted Phases		2	6		4		4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0	6.0	6.0
Minimum Split (s)	24.0	24.0	11.0	24.0	24.0	24.0	24.0
Total Split (s)	75.0	75.0	14.0	89.0	51.0	51.0	51.0
Total Split (%)	53.6%	53.6%	10.0%	63.6%	36.4%	36.4%	36.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?							
Recall Mode	C-Min	C-Min	None	C-Min	None	None	None
v/c Ratio	0.71	0.24	0.41	0.46	0.83	0.83	0.71
Control Delay	26.7	2.8	12.1	3.8	63.9	61.4	39.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.7	2.8	12.1	3.8	63.9	61.4	39.7
Queue Length 50th (ft)	476	0	3	7	330	314	204
Queue Length 95th (ft)	634	37	27	159	353	187	278
Internal Link Dist (ft)	520			890		860	
Turn Bay Length (ft)		415	635		430		700
Base Capacity (vph)	1956	981	207	2300	540	515	551
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	0.71	0.24	0.40	0.46	0.68	0.69	0.60

Intersection Summary

Cycle Length: 140

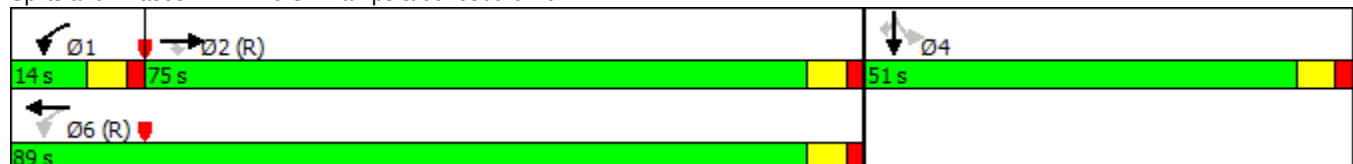
Actuated Cycle Length: 140

Offset: 15 (11%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Splits and Phases: 1: I-75 SB Ramps & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

Future Build (2020) AM - Improved

1: I-75 SB Ramps & Jonesboro Rd

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑					↑	↑↑	↑
Traffic Volume (vph)	0	1297	204	66	926	0	0	0	0	454	2	403
Future Volume (vph)	0	1297	204	66	926	0	0	0	0	454	2	403
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.95	1.00	1.00	0.95					0.95	0.91	0.95
Frt		1.00	0.85	1.00	1.00					1.00	0.94	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.97	1.00
Satd. Flow (prot)		3539	1583	1770	3539					1681	1551	1504
Flt Permitted		1.00	1.00	0.10	1.00					0.95	0.97	1.00
Satd. Flow (perm)		3539	1583	180	3539					1681	1551	1504
Peak-hour factor, PHF	0.92	0.94	0.86	0.80	0.87	0.92	0.92	0.92	0.92	0.78	0.50	0.86
Adj. Flow (vph)	0	1380	237	82	1064	0	0	0	0	582	4	469
RTOR Reduction (vph)	0	0	106	0	0	0	0	0	0	0	18	74
Lane Group Flow (vph)	0	1380	131	83	1064	0	0	0	0	367	337	259
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)		77.4	77.4	91.0	91.0					37.0	37.0	37.0
Effective Green, g (s)		77.4	77.4	91.0	91.0					37.0	37.0	37.0
Actuated g/C Ratio		0.55	0.55	0.65	0.65					0.26	0.26	0.26
Clearance Time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	3.0	5.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1956	875	203	2300					444	409	397
v/s Ratio Prot		c0.39		0.02	c0.30							
v/s Ratio Perm			0.08	0.24						c0.22	0.22	0.17
v/c Ratio		0.71	0.15	0.41	0.46					0.83	0.82	0.65
Uniform Delay, d1		22.9	15.3	17.3	12.3					48.5	48.5	45.8
Progression Factor		1.00	1.00	0.63	0.24					1.00	1.00	1.00
Incremental Delay, d2		2.2	0.4	1.2	0.6					11.9	12.7	3.8
Delay (s)		25.1	15.6	12.1	3.5					60.4	61.2	49.6
Level of Service		C	B	B	A					E	E	D
Approach Delay (s)		23.7			4.2			0.0			57.2	
Approach LOS		C			A			A			E	
Intersection Summary												
HCM 2000 Control Delay			27.1			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)				18.0		
Intersection Capacity Utilization			111.1%			ICU Level of Service				H		
Analysis Period (min)			15									
c Critical Lane Group												

Queues

2: I-75 NB Ramps & Jonesboro Rd

Future Build (2020) AM - Improved

1/26/2016



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations							
Traffic Volume (vph)	467	1222	869	1054	135	1	184
Future Volume (vph)	467	1222	869	1054	135	1	184
Lane Group Flow (vph)	492	1343	966	1158	87	88	259
Turn Type	pm+pt	NA	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	6			8	
Permitted Phases	2			6	8		8
Detector Phase	5	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	15.0	15.0	15.0	6.0	6.0	6.0
Minimum Split (s)	11.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	29.0	116.0	87.0	87.0	24.0	24.0	24.0
Total Split (%)	20.7%	82.9%	62.1%	62.1%	17.1%	17.1%	17.1%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?							
Recall Mode	None	C-Min	C-Min	C-Min	None	None	None
v/c Ratio	0.92	0.48	0.45	0.99	0.44	0.44	0.91
Control Delay	39.7	6.5	7.3	38.6	64.3	64.4	67.5
Queue Delay	0.0	0.0	0.0	6.0	0.0	0.0	0.0
Total Delay	39.7	6.5	7.3	44.6	64.3	64.4	67.5
Queue Length 50th (ft)	240	165	83	~642	77	78	134
Queue Length 95th (ft)	#302	316	120	#511	120	36	156
Internal Link Dist (ft)		890	855			694	
Turn Bay Length (ft)	675			390	285		350
Base Capacity (vph)	557	2820	2142	1170	216	217	302
Starvation Cap Reductn	0	0	0	28	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	0.88	0.48	0.45	1.01	0.40	0.41	0.86

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 115 (82%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 2: I-75 NB Ramps & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

2: I-75 NB Ramps & Jonesboro Rd

Future Build (2020) AM - Improved

1/26/2016

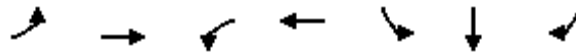
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	467	1222	0	0	869	1054	135	1	184	0	0	0
Future Volume (vph)	467	1222	0	0	869	1054	135	1	184	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	1770	3539			3539	1583	1681	1689	1583			
Flt Permitted	0.23	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	420	3539			3539	1583	1681	1689	1583			
Peak-hour factor, PHF	0.95	0.91	0.92	0.92	0.90	0.91	0.79	0.25	0.71	0.92	0.92	0.92
Adj. Flow (vph)	492	1343	0	0	966	1158	171	4	259	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	212	0	0	101	0	0	0
Lane Group Flow (vph)	492	1343	0	0	966	946	87	88	158	0	0	0
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Actuated Green, G (s)	111.6	111.6			84.8	84.8	16.4	16.4	16.4			
Effective Green, g (s)	111.6	111.6			84.8	84.8	16.4	16.4	16.4			
Actuated g/C Ratio	0.80	0.80			0.61	0.61	0.12	0.12	0.12			
Clearance Time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Vehicle Extension (s)	3.0	5.0			5.0	5.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	535	2821			2143	958	196	197	185			
v/s Ratio Prot	c0.14	0.38			0.27							
v/s Ratio Perm	0.60					c0.60	0.05	0.05	c0.10			
v/c Ratio	0.92	0.48			0.45	0.99	0.44	0.45	0.86			
Uniform Delay, d1	18.3	4.6			15.0	27.1	57.6	57.6	60.6			
Progression Factor	1.66	1.24			0.42	1.03	1.00	1.00	1.00			
Incremental Delay, d2	16.0	0.4			0.6	24.7	1.6	1.6	30.0			
Delay (s)	46.4	6.2			6.9	52.5	59.2	59.2	90.7			
Level of Service	D	A			A	D	E	E	F			
Approach Delay (s)		17.0			31.8			78.0			0.0	
Approach LOS		B			C			E			A	
Intersection Summary												
HCM 2000 Control Delay			30.2									
HCM 2000 Volume to Capacity ratio			0.96									
Actuated Cycle Length (s)			140.0									
Intersection Capacity Utilization			111.1%									
Analysis Period (min)			15									
c Critical Lane Group												

Queues

3: Managed Lane Ramp/Foster Dr & Jonesboro Rd

Future Build (2020) AM - Improved

1/26/2016



Lane Group	EBL	EBT	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	258	1052	425	1371	153	69	224
Future Volume (vph)	258	1052	425	1371	153	69	224
Lane Group Flow (vph)	304	1268	462	1722	219	75	291
Turn Type	pm+pt	NA	Prot	NA	pm+pt	NA	Perm
Protected Phases	5	2	1	6	7	4	
Permitted Phases	2				4		4
Detector Phase	5	2	1	6	7	4	4
Switch Phase							
Minimum Initial (s)	5.0	15.0	5.0	15.0	5.0	6.0	6.0
Minimum Split (s)	11.0	24.0	11.0	34.0	11.0	45.0	45.0
Total Split (s)	30.0	54.0	41.0	65.0	45.0	45.0	45.0
Total Split (%)	21.4%	38.6%	29.3%	46.4%	32.1%	32.1%	32.1%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lead	Lag	Lag			
Lead-Lag Optimize?							
Recall Mode	None	C-Min	None	C-Min	None	None	None
v/c Ratio	0.95	0.79	1.05	0.62	0.76	0.25	0.58
Control Delay	79.0	27.8	89.1	12.7	72.4	51.3	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.0	27.8	89.1	12.7	72.4	51.3	9.9
Queue Length 50th (ft)	219	490	~457	297	193	60	0
Queue Length 95th (ft)	m#342	673	#673	320	199	102	31
Internal Link Dist (ft)		855		514		376	
Turn Bay Length (ft)	275		315				215
Base Capacity (vph)	353	1607	442	2782	493	518	650
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	0.86	0.79	1.05	0.62	0.44	0.14	0.45

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 129 (92%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

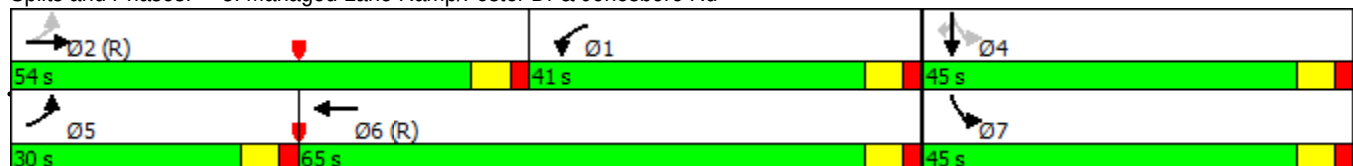
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 3: Managed Lane Ramp/Foster Dr & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

3: Managed Lane Ramp/Foster Dr & Jonesboro Rd

Future Build (2020) AM - Improved

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	258	1052	91	425	1371	162	0	0	0	153	69	224
Future Volume (vph)	258	1052	91	425	1371	162	0	0	0	153	69	224
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0					6.0	6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	0.91					1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.98					1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)	1770	3498		1770	4962					1770	1863	1583
Flt Permitted	0.09	1.00		0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)	174	3498		1770	4962					1770	1863	1583
Peak-hour factor, PHF	0.85	0.90	0.92	0.92	0.95	0.58	0.92	0.92	0.92	0.70	0.92	0.77
Adj. Flow (vph)	304	1169	99	462	1443	279	0	0	0	219	75	291
RTOR Reduction (vph)	0	4	0	0	16	0	0	0	0	0	0	244
Lane Group Flow (vph)	304	1264	0	462	1707	0	0	0	0	219	75	47
Turn Type	pm+pt	NA		Prot	NA					pm+pt	NA	Perm
Protected Phases	5	2		1	6					7	4	
Permitted Phases	2									4		4
Actuated Green, G (s)	64.1	64.1		35.1	78.0					22.8	22.8	22.8
Effective Green, g (s)	64.1	64.1		35.1	78.0					22.8	22.8	22.8
Actuated g/C Ratio	0.46	0.46		0.25	0.56					0.16	0.16	0.16
Clearance Time (s)	6.0	6.0		6.0	6.0					6.0	6.0	6.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0					3.0	3.0	3.0
Lane Grp Cap (vph)	321	1601		443	2764					288	303	257
v/s Ratio Prot	c0.14	0.36		c0.26	0.34					c0.12	0.04	
v/s Ratio Perm	c0.29											0.03
v/c Ratio	0.95	0.79		1.04	0.62					0.76	0.25	0.18
Uniform Delay, d1	42.9	32.2		52.4	20.9					56.0	51.1	50.6
Progression Factor	1.11	0.73		0.80	0.55					1.00	1.00	1.00
Incremental Delay, d2	32.6	3.5		47.1	0.7					11.2	0.4	0.3
Delay (s)	80.3	26.9		88.8	12.2					67.2	51.5	50.9
Level of Service	F	C		F	B					E	D	D
Approach Delay (s)		37.2			28.4			0.0			57.1	
Approach LOS		D			C			A			E	
Intersection Summary												
HCM 2000 Control Delay			35.5			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.91									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)				18.0		
Intersection Capacity Utilization			79.0%			ICU Level of Service				D		
Analysis Period (min)			15									
c Critical Lane Group												

Queues

4: Site Drwy 1 & Jonesboro Rd

Future Build (2020) AM - Improved

1/26/2016

										
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	47	986	103	110	1811	29	126	33	12	0
Future Volume (vph)	47	986	103	110	1811	29	126	33	12	0
Lane Group Flow (vph)	63	1108	137	120	1906	37	137	36	0	72
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	Prot	Perm	Perm	NA
Protected Phases	5	2		1	6		3			4
Permitted Phases	2		2			6		8	4	
Detector Phase	5	2	2	1	6	6	3	8	4	4
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	24.0	24.0	11.0	24.0	24.0	11.0	24.0	24.0	24.0
Total Split (s)	11.0	87.0	87.0	15.0	91.0	91.0	14.0	38.0	24.0	24.0
Total Split (%)	7.9%	62.1%	62.1%	10.7%	65.0%	65.0%	10.0%	27.1%	17.1%	17.1%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
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
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead		Lag	Lag
Lead-Lag Optimize?										
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None
v/c Ratio	0.39	0.33	0.13	0.48	0.77	0.03	0.56	0.11		0.41
Control Delay	24.2	2.6	0.5	68.3	18.5	0.1	72.1	0.6		8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	24.2	2.6	0.5	68.3	18.5	0.1	72.1	0.6		8.9
Queue Length 50th (ft)	9	23	1	55	623	0	62	0		0
Queue Length 95th (ft)	m23	73	m2	87	744	0	#110	0		11
Internal Link Dist (ft)		508			841					273
Turn Bay Length (ft)	235		175	235		160		50		
Base Capacity (vph)	160	3357	1091	259	2473	1141	243	472		299
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	0.39	0.33	0.13	0.46	0.77	0.03	0.56	0.08		0.24

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 108 (77%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 4: Site Drwy 1 & Jonesboro Rd



Baseline

Synchro 9 Report

Page 7

HCM Signalized Intersection Capacity Analysis

4: Site Drwy 1 & Jonesboro Rd

Future Build (2020) AM - Improved

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	986	103	110	1811	29	126	0	33	12	0	47
Future Volume (vph)	47	986	103	110	1811	29	126	0	33	12	0	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0		6.0	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	0.97		1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00		0.85		0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00		0.99	
Satd. Flow (prot)	1770	5085	1583	3433	3539	1583	3433		1583		1651	
Flt Permitted	0.06	1.00	1.00	0.95	1.00	1.00	0.95		1.00		0.92	
Satd. Flow (perm)	106	5085	1583	3433	3539	1583	3433		1583		1534	
Peak-hour factor, PHF	0.75	0.89	0.75	0.92	0.95	0.78	0.92	0.92	0.92	0.69	0.92	0.86
Adj. Flow (vph)	63	1108	137	120	1906	37	137	0	36	17	0	55
RTOR Reduction (vph)	0	0	48	0	0	12	0	0	31	0	70	0
Lane Group Flow (vph)	63	1108	89	120	1906	25	137	0	5	0	2	0
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	Prot		Perm	Perm	NA	
Protected Phases	5	2		1	6		3	8				4
Permitted Phases	2		2			6			8	4		
Actuated Green, G (s)	97.3	91.3	91.3	10.2	95.5	95.5	9.9		20.5		4.6	
Effective Green, g (s)	97.3	91.3	91.3	10.2	95.5	95.5	9.9		20.5		4.6	
Actuated g/C Ratio	0.69	0.65	0.65	0.07	0.68	0.68	0.07		0.15		0.03	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0		6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0		3.0	
Lane Grp Cap (vph)	144	3316	1032	250	2414	1079	242		231		50	
v/s Ratio Prot	0.02	0.22		c0.03	c0.54		c0.04					
v/s Ratio Perm	0.28		0.06			0.02			0.00		c0.00	
v/c Ratio	0.44	0.33	0.09	0.48	0.79	0.02	0.57		0.02		0.05	
Uniform Delay, d1	17.4	10.8	9.0	62.4	15.3	7.2	63.0		51.2		65.6	
Progression Factor	2.01	0.22	0.20	1.00	1.00	1.00	1.00		1.00		1.00	
Incremental Delay, d2	1.5	0.2	0.1	1.5	2.7	0.0	3.0		0.0		0.4	
Delay (s)	36.5	2.6	1.9	63.8	18.0	7.2	66.0		51.2		66.0	
Level of Service	D	A	A	E	B	A	E		D		E	
Approach Delay (s)		4.1			20.5			62.9			66.0	
Approach LOS		A			C			E			E	
Intersection Summary												
HCM 2000 Control Delay			17.5									
HCM 2000 Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			140.0									
Intersection Capacity Utilization			70.3%									
Analysis Period (min)			15									
c Critical Lane Group												

Queues
5: Mt Carmel Rd & Jonesboro Rd

Future Build (2020) AM - Improved

1/26/2016

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↗
Traffic Volume (vph)	980	38	144	1963	1	130
Future Volume (vph)	980	38	144	1963	1	130
Lane Group Flow (vph)	1101	51	157	2134	4	141
Turn Type	NA	Perm	pm+pt	NA	Prot	pm+ov
Protected Phases	2		1	6	3	1
Permitted Phases		2	6			3
Detector Phase	2	2	1	6	3	1
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	11.0	24.0	24.0	11.0
Total Split (s)	109.0	109.0	17.0	126.0	24.0	17.0
Total Split (%)	72.7%	72.7%	11.3%	84.0%	16.0%	11.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead			Lead
Lead-Lag Optimize?						
Recall Mode	C-Min	C-Min	None	C-Min	None	None
v/c Ratio	0.38	0.04	0.31	0.62	0.06	0.35
Control Delay	4.6	1.3	2.1	1.7	71.0	10.4
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	4.6	1.3	2.1	1.8	71.0	10.4
Queue Length 50th (ft)	98	0	0	0	4	0
Queue Length 95th (ft)	250	8	24	293	5	32
Internal Link Dist (ft)	1145			797	2491	
Turn Bay Length (ft)		250	300		100	160
Base Capacity (vph)	2903	1307	511	3450	212	405
Starvation Cap Reductn	0	0	0	168	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.04	0.31	0.65	0.02	0.35

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

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

Natural Cycle: 80

Control Type: Actuated-Coordinated

Splits and Phases: 5: Mt Carmel Rd & Jonesboro Rd

↖ Ø1	↘ Ø2 (R)	↗ Ø3
17 s	109 s	24 s
↙ Ø6 (R)		
126 s		

HCM Signalized Intersection Capacity Analysis

5: Mt Carmel Rd & Jonesboro Rd

Future Build (2020) AM - Improved

1/26/2016



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	⇐	⇑⇑	⇑	⇑	⇑⇑	⇑	⇑⇑
Traffic Volume (vph)	0	980	38	144	1963	1	130
Future Volume (vph)	0	980	38	144	1963	1	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	0.88
Frt		1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)		3539	1583	1770	3539	1770	2787
Flt Permitted		1.00	1.00	0.23	1.00	0.95	1.00
Satd. Flow (perm)		3539	1583	424	3539	1770	2787
Peak-hour factor, PHF	0.92	0.89	0.75	0.92	0.92	0.25	0.92
Adj. Flow (vph)	0	1101	51	157	2134	4	141
RTOR Reduction (vph)	0	0	11	0	0	0	128
Lane Group Flow (vph)	0	1101	40	157	2134	4	13
Turn Type	Perm	NA	Perm	pm+pt	NA	Prot	pm+ov
Protected Phases		2		1	6	3	1
Permitted Phases	2		2	6			3
Actuated Green, G (s)		118.2	118.2	136.6	136.6	1.4	13.8
Effective Green, g (s)		118.2	118.2	136.6	136.6	1.4	13.8
Actuated g/C Ratio		0.79	0.79	0.91	0.91	0.01	0.09
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		2788	1247	497	3222	16	367
v/s Ratio Prot		0.31		0.03	c0.60	c0.00	0.00
v/s Ratio Perm			0.03	0.26			0.00
v/c Ratio		0.39	0.03	0.32	0.66	0.25	0.04
Uniform Delay, d1		4.9	3.5	1.8	1.5	73.8	62.0
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.4	0.0	0.4	1.1	8.1	0.0
Delay (s)		5.3	3.5	2.2	2.6	81.8	62.1
Level of Service		A	A	A	A	F	E
Approach Delay (s)		5.2			2.6	62.6	
Approach LOS		A			A	E	

Intersection Summary

HCM 2000 Control Delay	5.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	77.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Queues

Future Build (2020) AM - Improved

6: Willow Lane/Oak Grove Rd & Jonesboro Rd

1/26/2016

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	805	228	22	1766	47	255	163	33	95	230	57
Future Volume (vph)	50	805	228	22	1766	47	255	163	33	95	230	57
Lane Group Flow (vph)	83	904	275	33	2007	76	293	236	47	122	264	76
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	3	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	15.0	5.0	5.0	15.0	15.0	5.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	11.0	26.0	11.0	11.0	36.0	36.0	11.0	46.0	46.0	11.0	44.0	44.0
Total Split (s)	11.0	72.0	13.0	11.0	72.0	72.0	13.0	46.0	46.0	11.0	44.0	44.0
Total Split (%)	7.9%	51.4%	9.3%	7.9%	51.4%	51.4%	9.3%	32.9%	32.9%	7.9%	31.4%	31.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
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	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)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	C-Min	None	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.71	0.43	0.24	0.10	1.01	0.08	1.64	0.65	0.12	0.63	0.79	0.20
Control Delay	52.1	17.8	2.6	5.9	42.0	0.4	341.8	60.1	0.6	57.2	71.2	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.1	17.8	2.6	5.9	42.0	0.4	341.8	60.1	0.6	57.2	71.2	2.9
Queue Length 50th (ft)	27	245	11	4	~965	1	~358	200	0	87	232	0
Queue Length 95th (ft)	42	333	39	m6	#1197	1	#496	200	0	113	300	0
Internal Link Dist (ft)		797			4515			905			451	
Turn Bay Length (ft)	300		150	300		250	500		400	135		100
Base Capacity (vph)	117	2103	1162	337	1992	942	179	532	535	194	505	514
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	0.71	0.43	0.24	0.10	1.01	0.08	1.64	0.44	0.09	0.63	0.52	0.15

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 24 (17%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 135

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

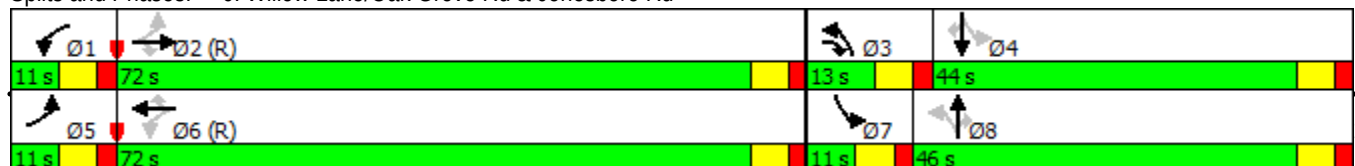
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 6: Willow Lane/Oak Grove Rd & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

6: Willow Lane/Oak Grove Rd & Jonesboro Rd

Future Build (2020) AM - Improved

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	805	228	22	1766	47	255	163	33	95	230	57
Future Volume (vph)	50	805	228	22	1766	47	255	163	33	95	230	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.05	1.00	1.00	0.26	1.00	1.00	0.25	1.00	1.00	0.39	1.00	1.00
Satd. Flow (perm)	92	3539	1583	488	3539	1583	468	1863	1583	732	1863	1583
Peak-hour factor, PHF	0.60	0.89	0.83	0.66	0.88	0.62	0.87	0.69	0.70	0.78	0.87	0.75
Adj. Flow (vph)	83	904	275	33	2007	76	293	236	47	122	264	76
RTOR Reduction (vph)	0	0	89	0	0	33	0	0	38	0	0	62
Lane Group Flow (vph)	83	904	186	33	2007	43	293	236	9	122	264	14
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	85.8	80.8	87.8	81.8	78.8	78.8	34.2	27.2	27.2	30.2	25.2	25.2
Effective Green, g (s)	85.8	80.8	87.8	81.8	78.8	78.8	34.2	27.2	27.2	30.2	25.2	25.2
Actuated g/C Ratio	0.61	0.58	0.63	0.58	0.56	0.56	0.24	0.19	0.19	0.22	0.18	0.18
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	5.0	3.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	116	2042	1060	312	1991	891	179	361	307	194	335	284
v/s Ratio Prot	c0.03	0.26	0.01	0.00	c0.57		c0.08	0.13		0.02	0.14	
v/s Ratio Perm	0.41		0.11	0.06		0.03	c0.32		0.01	0.11		0.01
v/c Ratio	0.72	0.44	0.18	0.11	1.01	0.05	1.64	0.65	0.03	0.63	0.79	0.05
Uniform Delay, d1	33.1	16.8	10.9	13.0	30.6	13.7	51.9	52.1	45.7	49.9	54.8	47.5
Progression Factor	1.00	1.00	1.00	0.51	0.74	0.48	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	18.8	0.7	0.1	0.1	18.1	0.1	310.5	4.2	0.0	6.2	11.6	0.1
Delay (s)	51.9	17.5	11.0	6.7	40.9	6.7	362.4	56.3	45.7	56.2	66.5	47.6
Level of Service	D	B	B	A	D	A	F	E	D	E	E	D
Approach Delay (s)		18.4			39.2			211.1			60.6	
Approach LOS		B			D			F			E	
Intersection Summary												
HCM 2000 Control Delay			57.9			HCM 2000 Level of Service				E		
HCM 2000 Volume to Capacity ratio			1.20									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)			24.0			
Intersection Capacity Utilization			90.0%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

Queues
7: Kelly Rd & Jonesboro Rd

Future Build (2020) AM - Improved

1/26/2016

	→	↘	↙	←	↖
Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations	↑↑	↑	↘	↑↑	↘
Traffic Volume (vph)	909	69	110	1752	109
Future Volume (vph)	909	69	110	1752	109
Lane Group Flow (vph)	988	87	159	2061	218
Turn Type	NA	Perm	pm+pt	NA	Perm
Protected Phases	2		1	6	
Permitted Phases		2	6		8
Detector Phase	2	2	1	6	8
Switch Phase					
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0
Minimum Split (s)	29.0	29.0	11.0	24.0	42.0
Total Split (s)	82.0	82.0	16.0	98.0	42.0
Total Split (%)	58.6%	58.6%	11.4%	70.0%	30.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead		
Lead-Lag Optimize?					
Recall Mode	C-Min	C-Min	None	C-Min	None
v/c Ratio	0.43	0.08	0.38	0.77	0.77
Control Delay	5.4	0.3	7.8	13.3	69.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	5.4	0.3	7.8	13.3	69.0
Queue Length 50th (ft)	38	0	34	502	177
Queue Length 95th (ft)	57	0	50	652	208
Internal Link Dist (ft)	4515			773	731
Turn Bay Length (ft)		315	300		
Base Capacity (vph)	2287	1053	420	2685	455
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.43	0.08	0.38	0.77	0.48

Intersection Summary

Cycle Length: 140

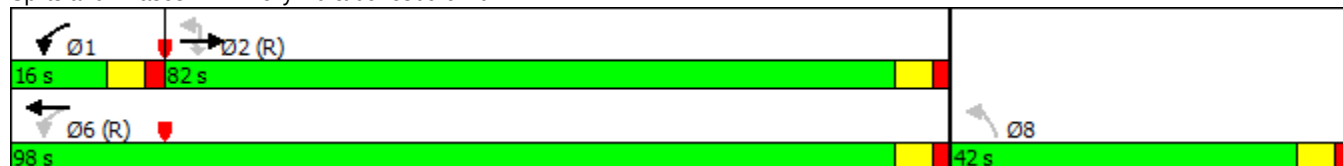
Actuated Cycle Length: 140

Offset: 94 (67%), Referenced to phase 2:EBTU and 6:WBT, Start of Green

Natural Cycle: 105

Control Type: Actuated-Coordinated

Splits and Phases: 7: Kelly Rd & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

7: Kelly Rd & Jonesboro Rd

Future Build (2020) AM - Improved

1/26/2016



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	⇐	⇑⇑	⇐	⇐	⇑⇑	⇐	
Traffic Volume (vph)	0	909	69	110	1752	109	59
Future Volume (vph)	0	909	69	110	1752	109	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	
Frt		1.00	0.85	1.00	1.00	0.95	
Flt Protected		1.00	1.00	0.95	1.00	0.97	
Satd. Flow (prot)		3539	1583	1770	3539	1719	
Flt Permitted		1.00	1.00	0.23	1.00	0.97	
Satd. Flow (perm)		3539	1583	428	3539	1719	
Peak-hour factor, PHF	0.92	0.92	0.79	0.69	0.85	0.77	0.78
Adj. Flow (vph)	0	988	87	159	2061	142	76
RTOR Reduction (vph)	0	0	31	0	0	16	0
Lane Group Flow (vph)	0	988	56	159	2061	202	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	
Protected Phases		2		1	6		
Permitted Phases	2		2	6		8	
Actuated Green, G (s)		90.5	90.5	106.2	106.2	21.8	
Effective Green, g (s)		90.5	90.5	106.2	106.2	21.8	
Actuated g/C Ratio		0.65	0.65	0.76	0.76	0.16	
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)		5.0	5.0	3.0	5.0	3.0	
Lane Grp Cap (vph)		2287	1023	417	2684	267	
v/s Ratio Prot		0.28		0.03	c0.58		
v/s Ratio Perm			0.04	0.26		c0.12	
v/c Ratio		0.43	0.05	0.38	0.77	0.76	
Uniform Delay, d1		12.1	9.1	6.5	9.8	56.6	
Progression Factor		0.37	0.06	1.00	1.00	1.00	
Incremental Delay, d2		0.5	0.1	0.6	2.2	11.6	
Delay (s)		5.1	0.6	7.1	11.9	68.1	
Level of Service		A	A	A	B	E	
Approach Delay (s)		4.7			11.6	68.1	
Approach LOS		A			B	E	

Intersection Summary

HCM 2000 Control Delay	13.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	85.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis 8: Sterling Pl/Site Drwy 4 & Mt Carmel Rd

Future Build (2020) AM - Improved

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	125	0	39	104	6	0	0	3	0	0	10
Future Volume (Veh/h)	0	125	0	39	104	6	0	0	3	0	0	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.77	0.92	0.92	0.92	0.92	0.38	0.92	0.92	0.92
Hourly flow rate (vph)	0	136	0	51	113	7	0	0	8	0	0	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage veh												
Upstream signal (ft)												
733												
pX, platoon unblocked												
vC, conflicting volume	113			136			351	351	136	359	351	113
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	113			136			351	351	136	359	351	113
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			100	100	99	100	100	99
cM capacity (veh/h)	1476			1448			581	553	913	575	553	940
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1							
Volume Total	136	164	7	8	11							
Volume Left	0	51	0	0	0							
Volume Right	0	0	7	8	11							
cSH	1700	1448	1700	913	940							
Volume to Capacity	0.08	0.04	0.00	0.01	0.01							
Queue Length 95th (ft)	0	3	0	1	1							
Control Delay (s)	0.0	2.6	0.0	9.0	8.9							
Lane LOS		A		A	A							
Approach Delay (s)	0.0	2.4		9.0	8.9							
Approach LOS				A	A							
Intersection Summary												
Average Delay			1.8									
Intersection Capacity Utilization			27.5%		ICU Level of Service			A				
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 9: Mill Road & Mt Carmel Rd

Future Build (2020) AM - Improved

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	178	142	62	67	70	23	27	297	51	24	353	57
Future Volume (vph)	178	142	62	67	70	23	27	297	51	24	353	57
Peak Hour Factor	0.85	0.85	0.85	0.73	0.73	0.73	0.89	0.89	0.89	0.91	0.91	0.91
Hourly flow rate (vph)	209	167	73	92	96	32	30	334	57	26	388	63
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	449	220	421	477								
Volume Left (vph)	209	92	30	26								
Volume Right (vph)	73	32	57	63								
Hadj (s)	0.03	0.03	-0.03	-0.03								
Departure Headway (s)	8.5	9.6	8.5	8.4								
Degree Utilization, x	1.00	0.58	0.99	1.00								
Capacity (veh/h)	449	366	421	477								
Control Delay (s)	73.3	25.1	70.3	73.0								
Approach Delay (s)	73.3	25.1	70.3	73.0								
Approach LOS	F	D	F	F								
Intersection Summary												
Delay				65.7								
Level of Service				F								
Intersection Capacity Utilization				63.1%	ICU Level of Service	B						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

10: Site Drwy 2 & Jonesboro Rd

Future Build (2020) AM - Improved

1/26/2016

	→	↘	↙	←	↖	↗	
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	↑↑↑	↗		↑↑		↗	
Traffic Volume (veh/h)	1146	60	0	1984	0	13	
Future Volume (Veh/h)	1146	60	0	1984	0	13	
Sign Control	Free			Free	Stop		
Grade	0%			0%	0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	1246	65	0	2157	0	14	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None		None				
Median storage veh							
Upstream signal (ft)	594		588				
pX, platoon unblocked					0.59		
vC, conflicting volume			1246		2324		415
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol			1246		1853		415
tC, single (s)			4.1		6.8		6.9
tC, 2 stage (s)							
tF (s)			2.2		3.5		3.3
p0 queue free %			100		100		98
cM capacity (veh/h)			554		39		586
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1
Volume Total	415	415	415	65	1078	1078	14
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	65	0	0	14
cSH	1700	1700	1700	1700	1700	1700	586
Volume to Capacity	0.24	0.24	0.24	0.04	0.63	0.63	0.02
Queue Length 95th (ft)	0	0	0	0	0	0	2
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	11.3
Lane LOS							B
Approach Delay (s)	0.0				0.0		11.3
Approach LOS							B
Intersection Summary							
Average Delay			0.0				
Intersection Capacity Utilization			58.2%		ICU Level of Service		B
Analysis Period (min)			15				

HCM Unsignalized Intersection Capacity Analysis

11: Site Drwy 5 & Jonesboro Rd

Future Build (2020) AM - Improved

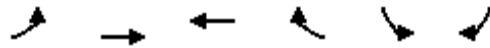
1/26/2016

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗		↑↑		↗
Traffic Volume (veh/h)	978	40	0	1920	0	7
Future Volume (Veh/h)	978	40	0	1920	0	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1063	43	0	2087	0	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)	921			1225		
pX, platoon unblocked			0.88		0.18	0.88
vC, conflicting volume			1063		2106	532
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			805		0	203
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			719		181	709
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	532	532	43	1044	1044	8
Volume Left	0	0	0	0	0	0
Volume Right	0	0	43	0	0	8
cSH	1700	1700	1700	1700	1700	709
Volume to Capacity	0.31	0.31	0.03	0.61	0.61	0.01
Queue Length 95th (ft)	0	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	10.1
Lane LOS						B
Approach Delay (s)	0.0			0.0		10.1
Approach LOS						B
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			56.4%		ICU Level of Service	
Analysis Period (min)			15			
						B

Queues
12: Mt Carmel Rd & Site Drwy 3

Future Build (2020) AM - Improved

1/26/2016



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	25	103	145	17	13	4
Future Volume (vph)	25	103	145	17	13	4
Lane Group Flow (vph)	27	112	158	18	14	4
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	27.0	104.0	77.0	77.0	36.0	36.0
Total Split (%)	19.3%	74.3%	55.0%	55.0%	25.7%	25.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.02	0.06	0.10	0.01	0.16	0.05
Control Delay	1.2	1.0	2.6	1.5	67.5	38.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.2	1.0	2.6	1.5	67.5	38.8
Queue Length 50th (ft)	1	0	14	0	13	0
Queue Length 95th (ft)	7	20	50	6	37	13
Internal Link Dist (ft)		653	2491		345	
Turn Bay Length (ft)	235			175		
Base Capacity (vph)	1157	1757	1646	1401	379	342
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.06	0.10	0.01	0.04	0.01

Intersection Summary

Cycle Length: 140

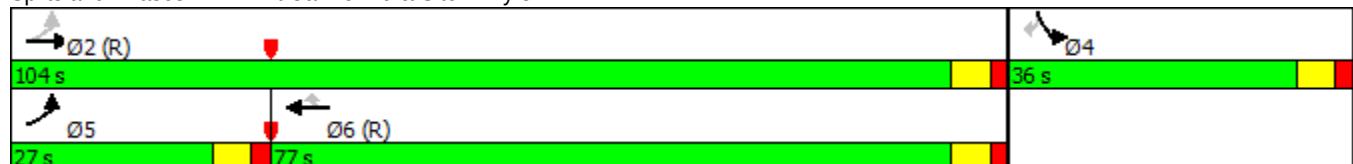
Actuated Cycle Length: 140

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

Natural Cycle: 60

Control Type: Actuated-Coordinated

Splits and Phases: 12: Mt Carmel Rd & Site Drwy 3

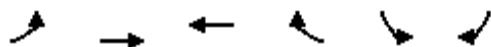


HCM Signalized Intersection Capacity Analysis

12: Mt Carmel Rd & Site Drwy 3

Future Build (2020) AM - Improved

1/26/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	25	103	145	17	13	4
Future Volume (vph)	25	103	145	17	13	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1863	1863	1583	1770	1583
Flt Permitted	0.62	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1163	1863	1863	1583	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	112	158	18	14	4
RTOR Reduction (vph)	0	0	0	3	0	4
Lane Group Flow (vph)	27	112	158	15	14	0
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	124.8	124.8	115.3	115.3	3.2	3.2
Effective Green, g (s)	124.8	124.8	115.3	115.3	3.2	3.2
Actuated g/C Ratio	0.89	0.89	0.82	0.82	0.02	0.02
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1051	1660	1534	1303	40	36
v/s Ratio Prot	0.00	c0.06	c0.08		c0.01	
v/s Ratio Perm	0.02			0.01		0.00
v/c Ratio	0.03	0.07	0.10	0.01	0.35	0.00
Uniform Delay, d1	1.0	0.9	2.4	2.2	67.4	66.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.1	0.1	0.0	5.2	0.0
Delay (s)	1.0	1.0	2.5	2.2	72.6	66.9
Level of Service	A	A	A	A	E	E
Approach Delay (s)		1.0	2.5		71.3	
Approach LOS		A	A		E	

Intersection Summary

HCM 2000 Control Delay	5.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.11		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	31.0%	ICU Level of Service	A
Analysis Period (min)	15		

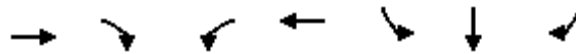
c Critical Lane Group

Queues

1: I-75 SB Ramps & Jonesboro Rd

Future Build (2020) PM - Improved

1/26/2016



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations	↑↑	↑	↵	↑↑	↵	↕	↵
Traffic Volume (vph)	1661	198	158	1493	255	1	217
Future Volume (vph)	1661	198	158	1493	255	1	217
Lane Group Flow (vph)	1748	218	184	1623	225	217	208
Turn Type	NA	Perm	pm+pt	NA	Perm	NA	Perm
Protected Phases	2		1	6		4	
Permitted Phases		2	6		4		4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0	6.0	6.0
Minimum Split (s)	24.0	24.0	11.0	24.0	24.0	24.0	24.0
Total Split (s)	94.0	94.0	23.0	117.0	33.0	33.0	33.0
Total Split (%)	62.7%	62.7%	15.3%	78.0%	22.0%	22.0%	22.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?							
Recall Mode	C-Min	C-Min	None	C-Min	None	None	None
v/c Ratio	0.80	0.21	0.76	0.60	0.84	0.81	0.71
Control Delay	26.1	2.1	64.4	1.1	86.5	76.1	53.6
Queue Delay	0.0	0.0	0.0	0.4	0.0	0.0	0.0
Total Delay	26.1	2.1	64.4	1.5	86.5	76.1	53.6
Queue Length 50th (ft)	696	0	97	5	223	197	140
Queue Length 95th (ft)	818	35	m137	5	266	53	160
Internal Link Dist (ft)	520			890		860	
Turn Bay Length (ft)		415	635		430		700
Base Capacity (vph)	2191	1063	264	2689	302	297	324
Starvation Cap Reductn	0	0	0	516	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	0.80	0.21	0.70	0.75	0.75	0.73	0.64

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 36 (24%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

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

Splits and Phases: 1: I-75 SB Ramps & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

Future Build (2020) PM - Improved

1: I-75 SB Ramps & Jonesboro Rd

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑					↑	↑↑	↑
Traffic Volume (vph)	0	1661	198	158	1493	0	0	0	0	255	1	217
Future Volume (vph)	0	1661	198	158	1493	0	0	0	0	255	1	217
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.95	1.00	1.00	0.95					0.95	0.91	0.95
Frt		1.00	0.85	1.00	1.00					1.00	0.93	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.98	1.00
Satd. Flow (prot)		3539	1583	1770	3539					1681	1536	1504
Flt Permitted		1.00	1.00	0.05	1.00					0.95	0.98	1.00
Satd. Flow (perm)		3539	1583	99	3539					1681	1536	1504
Peak-hour factor, PHF	0.92	0.95	0.91	0.86	0.92	0.92	0.92	0.92	0.92	0.76	0.25	0.70
Adj. Flow (vph)	0	1748	218	184	1623	0	0	0	0	336	4	310
RTOR Reduction (vph)	0	0	83	0	0	0	0	0	0	0	22	55
Lane Group Flow (vph)	0	1748	135	184	1623	0	0	0	0	225	195	153
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)		92.9	92.9	114.0	114.0					24.0	24.0	24.0
Effective Green, g (s)		92.9	92.9	114.0	114.0					24.0	24.0	24.0
Actuated g/C Ratio		0.62	0.62	0.76	0.76					0.16	0.16	0.16
Clearance Time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	3.0	5.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2191	980	243	2689					268	245	240
v/s Ratio Prot		c0.49		c0.08	0.46							
v/s Ratio Perm			0.09	0.50						c0.13	0.13	0.10
v/c Ratio		0.80	0.14	0.76	0.60					0.84	0.80	0.64
Uniform Delay, d1		21.5	11.9	43.4	8.0					61.1	60.6	58.9
Progression Factor		1.00	1.00	1.58	0.06					1.00	1.00	1.00
Incremental Delay, d2		3.1	0.3	8.0	0.6					20.0	16.3	5.5
Delay (s)		24.6	12.2	76.5	1.1					81.2	76.9	64.4
Level of Service		C	B	E	A					F	E	E
Approach Delay (s)		23.2			8.7			0.0			74.4	
Approach LOS		C			A			A			E	
Intersection Summary												
HCM 2000 Control Delay			24.8			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			150.0			Sum of lost time (s)				18.0		
Intersection Capacity Utilization			80.6%			ICU Level of Service				D		
Analysis Period (min)			15									
c Critical Lane Group												

Queues

2: I-75 NB Ramps & Jonesboro Rd

Future Build (2020) PM - Improved

1/26/2016



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations							
Traffic Volume (vph)	371	1572	1373	593	255	1	198
Future Volume (vph)	371	1572	1373	593	255	1	198
Lane Group Flow (vph)	458	1727	1476	652	144	143	251
Turn Type	pm+pt	NA	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	6			8	
Permitted Phases	2			6	8		8
Detector Phase	5	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	15.0	15.0	15.0	6.0	6.0	6.0
Minimum Split (s)	11.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	45.0	121.0	76.0	76.0	29.0	29.0	29.0
Total Split (%)	30.0%	80.7%	50.7%	50.7%	19.3%	19.3%	19.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?							
Recall Mode	None	C-Min	C-Min	C-Min	None	None	None
v/c Ratio	0.95	0.63	0.84	0.66	0.61	0.60	0.90
Control Delay	60.4	15.8	14.2	5.2	71.7	71.3	80.3
Queue Delay	0.0	0.9	0.1	0.4	0.0	0.0	0.0
Total Delay	60.4	16.7	14.3	5.6	71.7	71.3	80.3
Queue Length 50th (ft)	405	596	151	12	138	137	183
Queue Length 95th (ft)	#485	725	176	m69	220	54	#241
Internal Link Dist (ft)		890	855			694	
Turn Bay Length (ft)	675			390	285		350
Base Capacity (vph)	508	2758	1750	992	257	258	297
Starvation Cap Reductn	0	672	17	74	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	0.90	0.83	0.85	0.71	0.56	0.55	0.85

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 148 (99%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 2: I-75 NB Ramps & Jonesboro Rd



Baseline

Synchro 9 Report
Page 3

HCM Signalized Intersection Capacity Analysis

2: I-75 NB Ramps & Jonesboro Rd

Future Build (2020) PM - Improved

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Traffic Volume (vph)	371	1572	0	0	1373	593	255	1	198	0	0	0
Future Volume (vph)	371	1572	0	0	1373	593	255	1	198	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	1770	3539			3539	1583	1681	1688	1583			
Flt Permitted	0.05	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	93	3539			3539	1583	1681	1688	1583			
Peak-hour factor, PHF	0.81	0.91	0.92	0.92	0.93	0.91	0.90	0.25	0.79	0.92	0.92	0.92
Adj. Flow (vph)	458	1727	0	0	1476	652	283	4	251	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	210	0	0	56	0	0	0
Lane Group Flow (vph)	458	1727	0	0	1476	442	144	143	195	0	0	0
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Actuated Green, G (s)	116.9	116.9			74.2	74.2	21.1	21.1	21.1			
Effective Green, g (s)	116.9	116.9			74.2	74.2	21.1	21.1	21.1			
Actuated g/C Ratio	0.78	0.78			0.49	0.49	0.14	0.14	0.14			
Clearance Time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Vehicle Extension (s)	3.0	5.0			5.0	5.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	482	2758			1750	783	236	237	222			
v/s Ratio Prot	c0.23	0.49			0.42							
v/s Ratio Perm	c0.50					0.28	0.09	0.08	c0.12			
v/c Ratio	0.95	0.63			0.84	0.56	0.61	0.60	0.88			
Uniform Delay, d1	48.9	7.1			32.9	26.6	60.6	60.5	63.2			
Progression Factor	0.83	2.01			0.30	0.28	1.00	1.00	1.00			
Incremental Delay, d2	21.4	0.7			3.6	2.0	4.6	4.3	30.1			
Delay (s)	61.8	15.0			13.4	9.6	65.2	64.8	93.3			
Level of Service	E	B			B	A	E	E	F			
Approach Delay (s)		24.8			12.2			78.2			0.0	
Approach LOS		C			B			E			A	
Intersection Summary												
HCM 2000 Control Delay		25.2			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.96										
Actuated Cycle Length (s)		150.0			Sum of lost time (s)			18.0				
Intersection Capacity Utilization		80.6%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

Queues

3: Managed Lane Ramp/Foster Dr & Jonesboro Rd

Future Build (2020) PM - Improved

1/26/2016



Lane Group	EBL	EBT	WBT	NBL	NBT	NBR	SBL	SBR	Ø1
Lane Configurations	↰	↶↷	↶↷↶	↰	↶	↰	↰	↰	
Traffic Volume (vph)	349	1409	1491	133	100	651	144	105	
Future Volume (vph)	349	1409	1491	133	100	651	144	105	
Lane Group Flow (vph)	453	1483	1711	145	109	708	160	122	
Turn Type	pm+pt	NA	NA	Perm	NA	Free	Prot	Perm	
Protected Phases	5	2	6		8		7		1
Permitted Phases	2			8		Free		7	
Detector Phase	5	2	6	8	8	8	7	7	
Switch Phase									
Minimum Initial (s)	5.0	15.0	15.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	11.0	24.0	34.0	24.0	24.0		33.0	33.0	11.0
Total Split (s)	38.0	82.0	55.0	24.0	24.0		33.0	33.0	11.0
Total Split (%)	25.3%	54.7%	36.7%	16.0%	16.0%		22.0%	22.0%	7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lead	Lag	Lag	Lag		Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes						Yes
Recall Mode	None	C-Min	C-Min	None	None		None	None	None
v/c Ratio	1.06	0.66	0.90	0.67	0.48	0.45	0.72	0.37	
Control Delay	100.1	15.3	55.0	78.1	68.0	0.9	80.8	6.4	
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	100.1	15.4	55.0	78.1	68.0	0.9	80.8	6.4	
Queue Length 50th (ft)	~427	260	633	137	100	0	153	0	
Queue Length 95th (ft)	#497	464	m#704	215	166	0	224	23	
Internal Link Dist (ft)		855	515		793				
Turn Bay Length (ft)	275			175		150		215	
Base Capacity (vph)	427	2237	1907	231	243	1583	318	410	
Starvation Cap Reductn	0	122	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	1.06	0.70	0.90	0.63	0.45	0.45	0.50	0.30	

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

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

Natural Cycle: 135

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

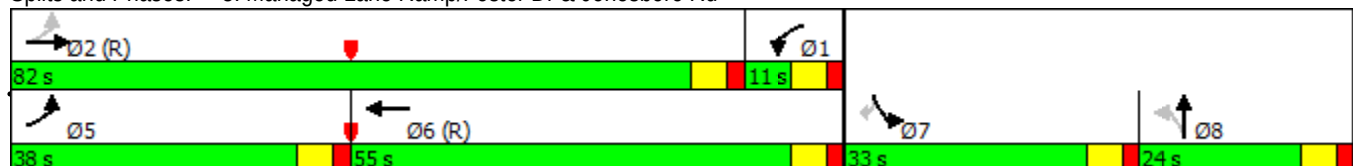
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 3: Managed Lane Ramp/Foster Dr & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

3: Managed Lane Ramp/Foster Dr & Jonesboro Rd

Future Build (2020) PM - Improved

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	349	1409	0	0	1491	134	133	100	651	144	0	105
Future Volume (vph)	349	1409	0	0	1491	134	133	100	651	144	0	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	4.0	6.0		6.0
Lane Util. Factor	1.00	0.95			0.91		1.00	1.00	1.00	1.00		1.00
Frt	1.00	1.00			0.99		1.00	1.00	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00	0.95		1.00
Satd. Flow (prot)	1770	3539			5015		1770	1863	1583	1770		1583
Flt Permitted	0.06	1.00			1.00		0.95	1.00	1.00	0.95		1.00
Satd. Flow (perm)	118	3539			5015		1770	1863	1583	1770		1583
Peak-hour factor, PHF	0.77	0.95	0.92	0.92	0.96	0.85	0.92	0.92	0.92	0.90	0.92	0.86
Adj. Flow (vph)	453	1483	0	0	1553	158	145	109	708	160	0	122
RTOR Reduction (vph)	0	0	0	0	7	0	0	0	0	0	0	107
Lane Group Flow (vph)	453	1483	0	0	1704	0	145	109	708	160	0	15
Turn Type	pm+pt	NA		Prot	NA		Perm	NA	Free	Prot		Perm
Protected Phases	5	2		1	6			8		7		
Permitted Phases	2						8		Free			7
Actuated Green, G (s)	94.9	94.9			56.9		18.3	18.3	150.0	18.8		18.8
Effective Green, g (s)	94.9	94.9			56.9		18.3	18.3	150.0	18.8		18.8
Actuated g/C Ratio	0.63	0.63			0.38		0.12	0.12	1.00	0.13		0.13
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0		6.0		6.0
Vehicle Extension (s)	3.0	5.0			5.0		3.0	3.0		3.0		3.0
Lane Grp Cap (vph)	427	2239			1902		215	227	1583	221		198
v/s Ratio Prot	c0.23	0.42			0.34			0.06		c0.09		
v/s Ratio Perm	c0.44						c0.08		0.45			0.01
v/c Ratio	1.06	0.66			0.90		0.67	0.48	0.45	0.72		0.08
Uniform Delay, d1	50.0	17.4			43.8		63.0	61.4	0.0	63.1		57.9
Progression Factor	1.02	0.74			1.15		1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	54.9	1.2			5.0		8.1	1.6	0.9	11.1		0.2
Delay (s)	105.9	14.1			55.2		71.1	63.0	0.9	74.2		58.1
Level of Service	F	B			E		E	E	A	E		E
Approach Delay (s)		35.6			55.2			18.5			67.3	
Approach LOS		D			E			B			E	
Intersection Summary												
HCM 2000 Control Delay			40.9			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.98									
Actuated Cycle Length (s)			150.0			Sum of lost time (s)			24.0			
Intersection Capacity Utilization			80.2%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Queues

4: Site Drwy 1 & Jonesboro Rd

Future Build (2020) PM - Improved

1/26/2016

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBT	Ø8	
Lane Configurations												
Traffic Volume (vph)	24	1787	303	331	1038	20	605	228	21	0		
Future Volume (vph)	24	1787	303	331	1038	20	605	228	21	0		
Lane Group Flow (vph)	46	1861	797	662	1141	34	658	600	0	54		
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	Prot	Free	pm+pt	NA		
Protected Phases	5	2		1	6		3		7	4	8	
Permitted Phases	2		2			6		Free	4			
Detector Phase	5	2	2	1	6	6	3		7	4		
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	
Minimum Split (s)	11.0	24.0	24.0	11.0	24.0	24.0	11.0		11.0	24.0	24.0	
Total Split (s)	11.0	60.0	60.0	33.0	82.0	82.0	33.0		11.0	24.0	46.0	
Total Split (%)	7.3%	40.0%	40.0%	22.0%	54.7%	54.7%	22.0%		7.3%	16.0%	31%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	
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		
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0		
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead		Lead	Lag	Lag	
Lead-Lag Optimize?												
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None		None	None	None	
v/c Ratio	0.18	0.97	0.98	0.73	0.53	0.03	1.07	0.38		0.27		
Control Delay	11.7	49.3	40.6	48.5	17.3	0.1	112.3	0.7		3.3		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0		
Total Delay	11.7	49.3	40.6	48.5	17.3	0.1	112.3	0.7		3.3		
Queue Length 50th (ft)	10	629	440	301	416	0	~364	0		0		
Queue Length 95th (ft)	15	#790	18	168	417	0	#491	0		0		
Internal Link Dist (ft)		508			841					273		
Turn Bay Length (ft)	235		175	235		160		50				
Base Capacity (vph)	254	1909	813	903	2153	1023	617	1583		311		
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	0.18	0.97	0.98	0.73	0.53	0.03	1.07	0.38		0.17		

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 133 (89%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 4: Site Drwy 1 & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

4: Site Drwy 1 & Jonesboro Rd

Future Build (2020) PM - Improved

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	1787	303	331	1038	20	605	0	228	21	0	24
Future Volume (vph)	24	1787	303	331	1038	20	605	0	228	21	0	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0		4.0		6.0	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	0.97		1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00		0.85		0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00		0.98	
Satd. Flow (prot)	1770	5085	1583	3433	3539	1583	3433		1583		1689	
Flt Permitted	0.25	1.00	1.00	0.95	1.00	1.00	0.95		1.00		0.85	
Satd. Flow (perm)	464	5085	1583	3433	3539	1583	3433		1583		1471	
Peak-hour factor, PHF	0.52	0.96	0.38	0.50	0.91	0.59	0.92	0.92	0.38	0.83	0.92	0.82
Adj. Flow (vph)	46	1861	797	662	1141	34	658	0	600	25	0	29
RTOR Reduction (vph)	0	0	222	0	0	14	0	0	0	0	52	0
Lane Group Flow (vph)	46	1861	575	662	1141	20	658	0	600	0	2	0
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	Prot		Free	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2			6			Free	4		
Actuated Green, G (s)	60.8	55.1	55.1	39.5	88.9	88.9	27.0		150.0		4.4	
Effective Green, g (s)	60.8	55.1	55.1	39.5	88.9	88.9	27.0		150.0		4.4	
Actuated g/C Ratio	0.41	0.37	0.37	0.26	0.59	0.59	0.18		1.00		0.03	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0				6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0				3.0	
Lane Grp Cap (vph)	237	1867	581	904	2097	938	617		1583		43	
v/s Ratio Prot	0.01	c0.37		c0.19	0.32		c0.19					
v/s Ratio Perm	0.07		0.36			0.01			c0.38		0.00	
v/c Ratio	0.19	1.00	0.99	0.73	0.54	0.02	1.07		0.38		0.04	
Uniform Delay, d1	27.2	47.4	47.2	50.4	18.4	12.6	61.5		0.0		70.7	
Progression Factor	0.72	0.74	0.51	0.85	0.89	1.00	1.00		1.00		1.00	
Incremental Delay, d2	0.4	19.0	33.0	2.9	1.0	0.0	55.2		0.7		0.4	
Delay (s)	19.9	54.1	56.9	46.0	17.4	12.6	116.7		0.7		71.1	
Level of Service	B	D	E	D	B	B	F		A		E	
Approach Delay (s)		54.3			27.6			61.4			71.1	
Approach LOS		D			C			E			E	
Intersection Summary												
HCM 2000 Control Delay			47.6				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.92									
Actuated Cycle Length (s)			150.0				Sum of lost time (s)			24.0		
Intersection Capacity Utilization			82.9%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

Queues
5: Mt Carmel Rd & Jonesboro Rd

Future Build (2020) PM - Improved

1/26/2016

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	↓↓
Traffic Volume (vph)	1950	8	157	1342	19	172
Future Volume (vph)	1950	8	157	1342	19	172
Lane Group Flow (vph)	2097	16	393	1491	25	325
Turn Type	NA	Perm	pm+pt	NA	Prot	pm+ov
Protected Phases	2		1	6	3	1
Permitted Phases		2	6			3
Detector Phase	2	2	1	6	3	1
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	11.0	24.0	24.0	11.0
Total Split (s)	93.0	93.0	33.0	126.0	24.0	33.0
Total Split (%)	62.0%	62.0%	22.0%	84.0%	16.0%	22.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead			Lead
Lead-Lag Optimize?						
Recall Mode	C-Min	C-Min	None	C-Min	None	None
v/c Ratio	0.92	0.02	0.90	0.46	0.28	0.42
Control Delay	18.3	0.5	63.0	2.6	86.3	33.8
Queue Delay	29.5	0.0	0.0	0.1	0.0	0.0
Total Delay	47.9	0.5	63.0	2.7	86.3	33.8
Queue Length 50th (ft)	~1166	0	342	90	24	100
Queue Length 95th (ft)	m#1247	m0	154	m206	48	73
Internal Link Dist (ft)	1145			797	2491	
Turn Bay Length (ft)		250	300		100	160
Base Capacity (vph)	2278	1022	435	3245	212	778
Starvation Cap Reductn	0	0	0	574	0	0
Spillback Cap Reductn	304	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.06	0.02	0.90	0.56	0.12	0.42

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 1 (1%), Referenced to phase 2:EBTU and 6:WBTL, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 5: Mt Carmel Rd & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

5: Mt Carmel Rd & Jonesboro Rd

Future Build (2020) PM - Improved

1/26/2016



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	⇐	⇑⇑	⇑	⇑	⇑⇑	⇑	⇑⇑
Traffic Volume (vph)	0	1950	8	157	1342	19	172
Future Volume (vph)	0	1950	8	157	1342	19	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	0.88
Frt		1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)		3539	1583	1770	3539	1770	2787
Flt Permitted		1.00	1.00	0.04	1.00	0.95	1.00
Satd. Flow (perm)		3539	1583	74	3539	1770	2787
Peak-hour factor, PHF	0.92	0.93	0.50	0.40	0.90	0.75	0.53
Adj. Flow (vph)	0	2097	16	392	1491	25	325
RTOR Reduction (vph)	0	0	3	0	0	0	10
Lane Group Flow (vph)	0	2097	13	393	1491	25	315
Turn Type	Perm	NA	Perm	pm+pt	NA	Prot	pm+ov
Protected Phases		2		1	6	3	1
Permitted Phases	2		2	6			3
Actuated Green, G (s)		94.2	94.2	132.8	132.8	5.2	37.8
Effective Green, g (s)		94.2	94.2	132.8	132.8	5.2	37.8
Actuated g/C Ratio		0.63	0.63	0.89	0.89	0.03	0.25
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		2222	994	434	3133	61	813
v/s Ratio Prot		c0.59		c0.20	0.42	0.01	c0.08
v/s Ratio Perm			0.01	0.60			0.03
v/c Ratio		0.94	0.01	0.91	0.48	0.41	0.39
Uniform Delay, d1		25.5	10.5	52.2	1.7	70.9	46.5
Progression Factor		0.46	0.05	0.94	1.29	1.16	0.78
Incremental Delay, d2		6.6	0.0	17.4	0.4	4.4	0.3
Delay (s)		18.3	0.6	66.6	2.6	86.4	36.6
Level of Service		B	A	E	A	F	D
Approach Delay (s)		18.2			15.9	40.1	
Approach LOS		B			B	D	

Intersection Summary

HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	81.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Queues

Future Build (2020) PM - Improved

6: Willow Lane/Oak Grove Rd & Jonesboro Rd

1/26/2016

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	1792	263	61	1208	50	229	127	123	200	324	47
Future Volume (vph)	41	1792	263	61	1208	50	229	127	123	200	324	47
Lane Group Flow (vph)	51	1886	302	113	1285	67	266	135	143	222	356	63
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	3	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	15.0	5.0	5.0	15.0	15.0	5.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	11.0	26.0	11.0	11.0	36.0	36.0	11.0	46.0	46.0	11.0	44.0	44.0
Total Split (s)	12.0	78.0	17.0	11.0	77.0	77.0	17.0	46.0	46.0	15.0	44.0	44.0
Total Split (%)	8.0%	52.0%	11.3%	7.3%	51.3%	51.3%	11.3%	30.7%	30.7%	10.0%	29.3%	29.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
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	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)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	C-Min	None	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.29	1.04	0.29	1.04	0.69	0.08	1.35	0.31	0.32	0.60	0.87	0.15
Control Delay	8.1	44.0	1.6	115.4	26.4	3.3	220.5	48.6	14.7	48.3	78.4	1.3
Queue Delay	0.0	13.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.1	57.5	1.6	115.4	26.4	3.3	220.5	48.6	14.7	48.3	78.4	1.3
Queue Length 50th (ft)	7	~1043	13	~70	533	7	~264	109	26	164	337	0
Queue Length 95th (ft)	m8	#1231	m29	#57	651	18	#404	167	75	231	446	0
Internal Link Dist (ft)		797			4515			905			451	
Turn Bay Length (ft)	300		150	300		250	500		400	135		100
Base Capacity (vph)	177	1821	1041	109	1854	881	197	496	502	367	471	482
Starvation Cap Reductn	0	59	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	0.29	1.07	0.29	1.04	0.69	0.08	1.35	0.27	0.28	0.60	0.76	0.13

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 30 (20%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 135

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 6: Willow Lane/Oak Grove Rd & Jonesboro Rd

														
Ø1	Ø2 (R)		Ø3	Ø4		Ø5	Ø6 (R)		Ø7	Ø8		Ø9	Ø10 (R)	
11 s	78 s		17 s	44 s		12 s	77 s		15 s	46 s		11 s	78 s	

HCM Signalized Intersection Capacity Analysis

6: Willow Lane/Oak Grove Rd & Jonesboro Rd

Future Build (2020) PM - Improved

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	1792	263	61	1208	50	229	127	123	200	324	47
Future Volume (vph)	41	1792	263	61	1208	50	229	127	123	200	324	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.11	1.00	1.00	0.05	1.00	1.00	0.16	1.00	1.00	0.64	1.00	1.00
Satd. Flow (perm)	206	3539	1583	96	3539	1583	291	1863	1583	1198	1863	1583
Peak-hour factor, PHF	0.81	0.95	0.87	0.54	0.94	0.75	0.86	0.94	0.86	0.90	0.91	0.75
Adj. Flow (vph)	51	1886	302	113	1285	67	266	135	143	222	356	63
RTOR Reduction (vph)	0	0	52	0	0	32	0	0	84	0	0	49
Lane Group Flow (vph)	51	1886	250	113	1285	35	266	135	59	222	356	14
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	82.0	77.2	88.2	82.4	77.4	77.4	45.8	34.8	34.8	41.8	32.8	32.8
Effective Green, g (s)	82.0	77.2	88.2	82.4	77.4	77.4	45.8	34.8	34.8	41.8	32.8	32.8
Actuated g/C Ratio	0.55	0.51	0.59	0.55	0.52	0.52	0.31	0.23	0.23	0.28	0.22	0.22
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	5.0	3.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	162	1821	994	108	1826	816	197	432	367	368	407	346
v/s Ratio Prot	0.01	0.53	0.02	c0.03	0.36		c0.10	0.07		0.04	0.19	
v/s Ratio Perm	0.16		0.14	c0.54		0.02	c0.31		0.04	0.13		0.01
v/c Ratio	0.31	1.04	0.25	1.05	0.70	0.04	1.35	0.31	0.16	0.60	0.87	0.04
Uniform Delay, d1	21.2	36.4	14.9	39.3	27.6	18.0	46.8	47.7	46.0	45.6	56.6	46.2
Progression Factor	0.41	0.45	0.16	0.78	0.86	5.59	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	25.1	0.1	93.0	2.0	0.1	187.3	0.4	0.2	2.8	18.4	0.0
Delay (s)	9.3	41.5	2.4	123.6	25.7	100.5	234.0	48.1	46.2	48.4	75.0	46.2
Level of Service	A	D	A	F	C	F	F	D	D	D	E	D
Approach Delay (s)		35.5			36.6			138.5			63.0	
Approach LOS		D			D			F			E	
Intersection Summary												
HCM 2000 Control Delay			50.9			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			1.17									
Actuated Cycle Length (s)			150.0			Sum of lost time (s)			24.0			
Intersection Capacity Utilization			95.4%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

Queues
7: Kelly Rd & Jonesboro Rd

Future Build (2020) PM - Improved

1/26/2016



Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations	↑↑	↑	↑	↑↑	↑↑
Traffic Volume (vph)	2043	91	153	1234	105
Future Volume (vph)	2043	91	153	1234	105
Lane Group Flow (vph)	2270	112	184	1387	269
Turn Type	NA	Perm	pm+pt	NA	Perm
Protected Phases	2		1	6	
Permitted Phases		2	6		8
Detector Phase	2	2	1	6	8
Switch Phase					
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0
Minimum Split (s)	29.0	29.0	11.0	24.0	42.0
Total Split (s)	93.0	93.0	15.0	108.0	42.0
Total Split (%)	62.0%	62.0%	10.0%	72.0%	28.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead		
Lead-Lag Optimize?					
Recall Mode	C-Min	C-Min	None	C-Min	None
v/c Ratio	1.00	0.11	1.18	0.53	0.82
Control Delay	23.3	0.4	165.5	9.7	71.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	23.3	0.4	165.5	9.7	71.1
Queue Length 50th (ft)	1211	1	~164	272	225
Queue Length 95th (ft)	m#1297	m0	#294	395	278
Internal Link Dist (ft)	4515			773	731
Turn Bay Length (ft)		315	300		
Base Capacity (vph)	2276	1044	156	2630	432
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.00	0.11	1.18	0.53	0.62

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 94 (63%), Referenced to phase 2:EBTU and 6:WBTL, Start of Green

Natural Cycle: 135

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 7: Kelly Rd & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

7: Kelly Rd & Jonesboro Rd

Future Build (2020) PM - Improved

1/26/2016



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	⇐	⇑⇑	⇑	⇑	⇑⇑	⇑	
Traffic Volume (vph)	0	2043	91	153	1234	105	121
Future Volume (vph)	0	2043	91	153	1234	105	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	
Frt		1.00	0.85	1.00	1.00	0.93	
Flt Protected		1.00	1.00	0.95	1.00	0.98	
Satd. Flow (prot)		3539	1583	1770	3539	1690	
Flt Permitted		1.00	1.00	0.04	1.00	0.98	
Satd. Flow (perm)		3539	1583	73	3539	1690	
Peak-hour factor, PHF	0.92	0.90	0.81	0.83	0.89	0.83	0.85
Adj. Flow (vph)	0	2270	112	184	1387	127	142
RTOR Reduction (vph)	0	0	26	0	0	29	0
Lane Group Flow (vph)	0	2270	86	184	1387	240	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	
Protected Phases		2		1	6		
Permitted Phases	2		2	6		8	
Actuated Green, G (s)		96.5	96.5	111.5	111.5	26.5	
Effective Green, g (s)		96.5	96.5	111.5	111.5	26.5	
Actuated g/C Ratio		0.64	0.64	0.74	0.74	0.18	
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)		5.0	5.0	3.0	5.0	3.0	
Lane Grp Cap (vph)		2276	1018	156	2630	298	
v/s Ratio Prot		0.64		c0.07	0.39		
v/s Ratio Perm			0.05	c0.81		c0.14	
v/c Ratio		1.00	0.08	1.18	0.53	0.81	
Uniform Delay, d1		26.6	10.1	56.2	8.1	59.3	
Progression Factor		0.34	0.06	1.00	1.00	1.00	
Incremental Delay, d2		11.7	0.1	128.4	0.8	14.6	
Delay (s)		20.8	0.7	184.6	8.9	73.9	
Level of Service		C	A	F	A	E	
Approach Delay (s)		19.8			29.5	73.9	
Approach LOS		B			C	E	
Intersection Summary							
HCM 2000 Control Delay			26.9		HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio			1.13				
Actuated Cycle Length (s)			150.0		Sum of lost time (s)		18.0
Intersection Capacity Utilization			93.2%		ICU Level of Service		F
Analysis Period (min)			15				
c Critical Lane Group							

HCM Unsignalized Intersection Capacity Analysis 8: Sterling Pl/Site Drwy 4 & Mt Carmel Rd

Future Build (2020) PM - Improved

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	154	0	20	106	24	0	0	41	0	0	53
Future Volume (Veh/h)	1	154	0	20	106	24	0	0	41	0	0	53
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.92	0.92	0.68	0.92	0.25	0.92	0.92	0.65	0.92	0.92	0.25
Hourly flow rate (vph)	4	167	0	29	115	96	0	0	63	0	0	212
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage veh												
Upstream signal (ft)												
733												
pX, platoon unblocked												
vC, conflicting volume	115			167			348	348	167	411	348	115
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	115			167			348	348	167	411	348	115
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			100	100	93	100	100	77
cM capacity (veh/h)	1474			1411			461	562	877	503	562	937
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1							
Volume Total	171	144	96	63	212							
Volume Left	4	29	0	0	0							
Volume Right	0	0	96	63	212							
cSH	1474	1411	1700	877	937							
Volume to Capacity	0.00	0.02	0.06	0.07	0.23							
Queue Length 95th (ft)	0	2	0	6	22							
Control Delay (s)	0.2	1.7	0.0	9.4	10.0							
Lane LOS	A	A		A	A							
Approach Delay (s)	0.2	1.0		9.4	10.0							
Approach LOS												
A												
Intersection Summary												
Average Delay												
4.3												
Intersection Capacity Utilization												
28.2%												
ICU Level of Service												
A												
Analysis Period (min)												
15												

HCM Unsignalized Intersection Capacity Analysis 9: Mill Road & Mt Carmel Rd

Future Build (2020) PM - Improved

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	128	76	59	53	151	62	76	277	51	32	337	138
Future Volume (vph)	128	76	59	53	151	62	76	277	51	32	337	138
Peak Hour Factor	0.77	0.77	0.77	0.67	0.67	0.67	0.90	0.90	0.90	0.93	0.93	0.93
Hourly flow rate (vph)	166	99	77	79	225	93	84	308	57	34	362	148
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	342	397	449	544								
Volume Left (vph)	166	79	84	34								
Volume Right (vph)	77	93	57	148								
Hadj (s)	0.00	-0.07	0.00	-0.12								
Departure Headway (s)	9.6	9.3	9.3	9.2								
Degree Utilization, x	0.91	1.00	1.00	1.00								
Capacity (veh/h)	368	397	449	544								
Control Delay (s)	57.7	76.8	77.1	76.6								
Approach Delay (s)	57.7	76.8	77.1	76.6								
Approach LOS	F	F	F	F								
Intersection Summary												
Delay				73.1								
Level of Service				F								
Intersection Capacity Utilization				81.1%	ICU Level of Service	D						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

10: Site Drwy 2 & Jonesboro Rd

Future Build (2020) PM - Improved

1/26/2016

	→	↘	↙	←	↖	↗	
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	↑↑↑	↗		↑↑		↗	
Traffic Volume (veh/h)	1998	207	0	1654	0	136	
Future Volume (Veh/h)	1998	207	0	1654	0	136	
Sign Control	Free			Free	Stop		
Grade	0%			0%	0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	2172	225	0	1798	0	148	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None		None				
Median storage veh							
Upstream signal (ft)	595		588				
pX, platoon unblocked			0.78		0.88		0.78
vC, conflicting volume			2172		3071		724
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol			1531		1712		0
tC, single (s)			4.1		6.8		6.9
tC, 2 stage (s)							
tF (s)			2.2		3.5		3.3
p0 queue free %			100		100		83
cM capacity (veh/h)			338		72		850
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1
Volume Total	724	724	724	225	899	899	148
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	225	0	0	148
cSH	1700	1700	1700	1700	1700	1700	850
Volume to Capacity	0.43	0.43	0.43	0.13	0.53	0.53	0.17
Queue Length 95th (ft)	0	0	0	0	0	0	16
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	10.1
Lane LOS							B
Approach Delay (s)	0.0				0.0		10.1
Approach LOS							B
Intersection Summary							
Average Delay			0.3				
Intersection Capacity Utilization			53.7%		ICU Level of Service		A
Analysis Period (min)			15				

HCM Unsignalized Intersection Capacity Analysis

11: Site Drwy 5 & Jonesboro Rd

Future Build (2020) PM - Improved

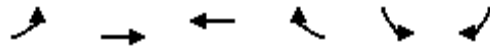
1/26/2016

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗		↑↑		↗
Traffic Volume (veh/h)	1846	160	0	1367	0	113
Future Volume (Veh/h)	1846	160	0	1367	0	113
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2007	174	0	1486	0	123
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)	921			1225		
pX, platoon unblocked			0.63		0.68	0.63
vC, conflicting volume			2007		2750	1004
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1430		2014	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	82
cM capacity (veh/h)			298		35	686
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	1004	1004	174	743	743	123
Volume Left	0	0	0	0	0	0
Volume Right	0	0	174	0	0	123
cSH	1700	1700	1700	1700	1700	686
Volume to Capacity	0.59	0.59	0.10	0.44	0.44	0.18
Queue Length 95th (ft)	0	0	0	0	0	16
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	11.4
Lane LOS						B
Approach Delay (s)	0.0			0.0		11.4
Approach LOS						B
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			64.7%		ICU Level of Service	
Analysis Period (min)			15			
			C			

Queues
12: Mt Carmel Rd & Site Drwy 3

Future Build (2020) PM - Improved

1/26/2016



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	65	130	118	52	64	33
Future Volume (vph)	65	130	118	52	64	33
Lane Group Flow (vph)	71	141	128	57	70	36
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	32.0	99.0	67.0	67.0	51.0	51.0
Total Split (%)	21.3%	66.0%	44.7%	44.7%	34.0%	34.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.07	0.09	0.09	0.05	0.52	0.23
Control Delay	2.3	2.2	1.3	0.0	79.5	21.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.3	2.2	1.3	0.0	79.5	21.5
Queue Length 50th (ft)	9	19	7	0	67	0
Queue Length 95th (ft)	21	37	m9	m0	118	37
Internal Link Dist (ft)		653	2491		345	
Turn Bay Length (ft)	235			175		
Base Capacity (vph)	1129	1619	1448	1243	531	500
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.09	0.09	0.05	0.13	0.07

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 13 (9%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

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

Splits and Phases: 12: Mt Carmel Rd & Site Drwy 3

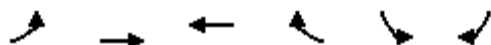


HCM Signalized Intersection Capacity Analysis

12: Mt Carmel Rd & Site Drwy 3

Future Build (2020) PM - Improved

1/26/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	65	130	118	52	64	33
Future Volume (vph)	65	130	118	52	64	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1863	1863	1583	1770	1583
Flt Permitted	0.64	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1195	1863	1863	1583	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	71	141	128	57	70	36
RTOR Reduction (vph)	0	0	0	13	0	34
Lane Group Flow (vph)	71	141	128	44	70	2
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	128.0	128.0	115.5	115.5	10.0	10.0
Effective Green, g (s)	128.0	128.0	115.5	115.5	10.0	10.0
Actuated g/C Ratio	0.85	0.85	0.77	0.77	0.07	0.07
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1044	1589	1434	1218	118	105
v/s Ratio Prot	0.00	c0.08	0.07		c0.04	
v/s Ratio Perm	0.06			0.03		0.00
v/c Ratio	0.07	0.09	0.09	0.04	0.59	0.02
Uniform Delay, d1	1.8	1.7	4.3	4.1	68.0	65.4
Progression Factor	1.00	1.00	0.24	0.00	1.00	1.00
Incremental Delay, d2	0.0	0.1	0.1	0.0	7.8	0.1
Delay (s)	1.8	1.9	1.1	0.0	75.8	65.5
Level of Service	A	A	A	A	E	E
Approach Delay (s)		1.8	0.8		72.3	
Approach LOS		A	A		E	

Intersection Summary

HCM 2000 Control Delay	16.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.13		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	24.4%	ICU Level of Service	A
Analysis Period (min)	15		

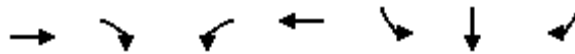
c Critical Lane Group

Queues

Future Build (2020) SAT - Improved

1: I-75 SB Ramps & Jonesboro Rd

1/26/2016



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations	↑↑	↑	↵	↑↑	↵	↕	↵
Traffic Volume (vph)	1694	388	265	1800	324	3	567
Future Volume (vph)	1694	388	265	1800	324	3	567
Lane Group Flow (vph)	1783	473	319	1875	361	340	333
Turn Type	NA	Perm	pm+pt	NA	Perm	NA	Perm
Protected Phases	2		1	6		4	
Permitted Phases		2	6		4		4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0	6.0	6.0
Minimum Split (s)	24.0	24.0	11.0	24.0	24.0	24.0	24.0
Total Split (s)	83.0	83.0	28.0	111.0	39.0	39.0	39.0
Total Split (%)	55.3%	55.3%	18.7%	74.0%	26.0%	26.0%	26.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?							
Recall Mode	C-Min	C-Min	None	C-Min	None	None	None
v/c Ratio	0.98	0.46	1.04	0.76	0.98	0.98	0.87
Control Delay	52.9	4.0	94.1	0.7	99.1	96.7	68.7
Queue Delay	0.0	0.0	0.0	1.2	0.0	0.0	0.0
Total Delay	52.9	4.0	94.1	1.9	99.1	96.7	68.7
Queue Length 50th (ft)	880	17	~278	2	372	340	275
Queue Length 95th (ft)	#1070	46	m#291	m2	#472	150	#461
Internal Link Dist (ft)	520			890		860	
Turn Bay Length (ft)		415	635		430		700
Base Capacity (vph)	1816	1025	308	2477	369	346	381
Starvation Cap Reductn	0	0	0	356	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	0.98	0.46	1.04	0.88	0.98	0.98	0.87

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 42 (28%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 1: I-75 SB Ramps & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

Future Build (2020) SAT - Improved

1: I-75 SB Ramps & Jonesboro Rd

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑					↑	↑↑	↑
Traffic Volume (vph)	0	1694	388	265	1800	0	0	0	0	324	3	567
Future Volume (vph)	0	1694	388	265	1800	0	0	0	0	324	3	567
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.95	1.00	1.00	0.95					0.95	0.91	0.95
Frt		1.00	0.85	1.00	1.00					1.00	0.88	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		3539	1583	1770	3539					1681	1473	1504
Flt Permitted		1.00	1.00	0.05	1.00					0.95	0.99	1.00
Satd. Flow (perm)		3539	1583	90	3539					1681	1473	1504
Peak-hour factor, PHF	0.92	0.95	0.82	0.83	0.96	0.92	0.92	0.92	0.92	0.79	0.38	0.92
Adj. Flow (vph)	0	1783	473	319	1875	0	0	0	0	410	8	616
RTOR Reduction (vph)	0	0	213	0	0	0	0	0	0	0	23	51
Lane Group Flow (vph)	0	1783	260	319	1875	0	0	0	0	361	317	282
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)		77.0	77.0	105.0	105.0					33.0	33.0	33.0
Effective Green, g (s)		77.0	77.0	105.0	105.0					33.0	33.0	33.0
Actuated g/C Ratio		0.51	0.51	0.70	0.70					0.22	0.22	0.22
Clearance Time (s)		6.0	6.0	6.0	6.0					6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	3.0	5.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1816	812	309	2477					369	324	330
v/s Ratio Prot		0.50		c0.15	0.53							
v/s Ratio Perm			0.16	c0.57						0.21	0.22	0.19
v/c Ratio		0.98	0.32	1.03	0.76					0.98	0.98	0.86
Uniform Delay, d1		35.8	21.3	54.7	14.4					58.1	58.2	56.2
Progression Factor		1.00	1.00	1.29	0.01					1.00	1.00	1.00
Incremental Delay, d2		17.2	1.0	35.4	0.6					40.6	43.9	19.0
Delay (s)		53.0	22.3	106.0	0.7					98.7	102.1	75.2
Level of Service		D	C	F	A					F	F	E
Approach Delay (s)		46.6			16.0			0.0			92.3	
Approach LOS		D			B			A			F	
Intersection Summary												
HCM 2000 Control Delay			43.0			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			1.04									
Actuated Cycle Length (s)			150.0			Sum of lost time (s)				18.0		
Intersection Capacity Utilization			97.9%			ICU Level of Service				F		
Analysis Period (min)			15									
c Critical Lane Group												

Queues

2: I-75 NB Ramps & Jonesboro Rd

Future Build (2020) SAT - Improved

1/26/2016



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations							
Traffic Volume (vph)	480	1559	1599	671	436	3	259
Future Volume (vph)	480	1559	1599	671	436	3	259
Lane Group Flow (vph)	511	1713	1648	746	268	265	285
Turn Type	pm+pt	NA	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	6			8	
Permitted Phases	2			6	8		8
Detector Phase	5	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	15.0	15.0	15.0	6.0	6.0	6.0
Minimum Split (s)	11.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	43.0	120.0	77.0	77.0	30.0	30.0	30.0
Total Split (%)	28.7%	80.0%	51.3%	51.3%	20.0%	20.0%	20.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?							
Recall Mode	None	C-Min	C-Min	C-Min	None	None	None
v/c Ratio	1.05	0.64	0.98	0.76	1.00	0.98	0.93
Control Delay	71.5	21.4	25.4	8.6	116.7	112.0	83.3
Queue Delay	0.0	1.6	0.1	0.8	0.0	0.0	0.0
Total Delay	71.5	23.0	25.5	9.4	116.7	112.0	83.3
Queue Length 50th (ft)	~495	702	140	12	280	275	220
Queue Length 95th (ft)	m#519	m728	m#930	m67	#422	144	#402
Internal Link Dist (ft)		890	855			694	
Turn Bay Length (ft)	675			390	285		350
Base Capacity (vph)	486	2689	1675	976	268	270	307
Starvation Cap Reductn	0	741	1	65	0	0	0
Spillback Cap Reductn	0	45	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.05	0.88	0.98	0.82	1.00	0.98	0.93

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

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

Natural Cycle: 120

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 2: I-75 NB Ramps & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

2: I-75 NB Ramps & Jonesboro Rd

Future Build (2020) SAT - Improved

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	480	1559	0	0	1599	671	436	3	259	0	0	0
Future Volume (vph)	480	1559	0	0	1599	671	436	3	259	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	1770	3539			3539	1583	1681	1688	1583			
Flt Permitted	0.05	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	97	3539			3539	1583	1681	1688	1583			
Peak-hour factor, PHF	0.94	0.91	0.92	0.92	0.97	0.90	0.83	0.38	0.91	0.92	0.92	0.92
Adj. Flow (vph)	511	1713	0	0	1648	746	525	8	285	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	227	0	0	55	0	0	0
Lane Group Flow (vph)	511	1713	0	0	1648	519	268	265	230	0	0	0
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Actuated Green, G (s)	114.0	114.0			71.0	71.0	24.0	24.0	24.0			
Effective Green, g (s)	114.0	114.0			71.0	71.0	24.0	24.0	24.0			
Actuated g/C Ratio	0.76	0.76			0.47	0.47	0.16	0.16	0.16			
Clearance Time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Vehicle Extension (s)	3.0	5.0			5.0	5.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	486	2689			1675	749	268	270	253			
v/s Ratio Prot	c0.26	0.48			0.47							
v/s Ratio Perm	c0.54					0.33	c0.16	0.16	0.15			
v/c Ratio	1.05	0.64			0.98	0.69	1.00	0.98	0.91			
Uniform Delay, d1	50.7	8.4			38.9	31.0	63.0	62.8	61.9			
Progression Factor	0.74	2.46			0.27	0.41	1.00	1.00	1.00			
Incremental Delay, d2	36.9	0.3			13.2	3.0	55.0	49.4	33.8			
Delay (s)	74.3	21.0			23.8	15.6	118.0	112.2	95.7			
Level of Service	E	C			C	B	F	F	F			
Approach Delay (s)		33.2			21.2			108.3			0.0	
Approach LOS		C			C			F			A	
Intersection Summary												
HCM 2000 Control Delay		39.3			HCM 2000 Level of Service			D				
HCM 2000 Volume to Capacity ratio		1.06										
Actuated Cycle Length (s)		150.0			Sum of lost time (s)			18.0				
Intersection Capacity Utilization		97.9%			ICU Level of Service			F				
Analysis Period (min)		15										
c Critical Lane Group												

Queues

Future Build (2020) SAT - Improved

3: Managed Lane Ramp/Foster Dr & Jonesboro Rd

1/26/2016



Lane Group	EBL	EBT	WBT	NBL	NBT	NBR	SBL	SBR	Ø1
Lane Configurations									
Traffic Volume (vph)	309	1506	1804	133	100	688	149	119	
Future Volume (vph)	309	1506	1804	133	100	688	149	119	
Lane Group Flow (vph)	351	1553	2010	145	109	748	210	135	
Turn Type	pm+pt	NA	NA	Perm	NA	Free	Prot	Perm	
Protected Phases	5	2	6		8		7		1
Permitted Phases	2			8		Free		7	
Detector Phase	5	2	6	8	8	8	7	7	
Switch Phase									
Minimum Initial (s)	5.0	15.0	15.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	11.0	24.0	34.0	24.0	24.0		33.0	33.0	11.0
Total Split (s)	30.0	82.0	63.0	24.0	24.0		33.0	33.0	11.0
Total Split (%)	20.0%	54.7%	42.0%	16.0%	16.0%		22.0%	22.0%	7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lead	Lag	Lag	Lag		Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes						Yes
Recall Mode	None	C-Min	C-Min	None	None		None	None	None
v/c Ratio	1.06	0.71	0.96	0.71	0.51	0.47	0.80	0.37	
Control Delay	109.5	15.4	56.4	83.3	70.8	1.0	83.5	8.1	
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.1	0.0	0.0	
Total Delay	109.5	15.8	56.4	83.3	70.8	1.1	83.5	8.1	
Queue Length 50th (ft)	~321	580	~735	137	100	0	200	0	
Queue Length 95th (ft)	m#494	m659	m#740	#227	168	0	217	41	
Internal Link Dist (ft)		855	514		793				
Turn Bay Length (ft)	275			175		150		215	
Base Capacity (vph)	332	2182	2101	218	229	1583	318	410	
Starvation Cap Reductn	0	94	0	0	0	0	0	0	
Spillback Cap Reductn	0	219	0	0	0	98	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	1.06	0.79	0.96	0.67	0.48	0.50	0.66	0.33	

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

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

Natural Cycle: 135

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

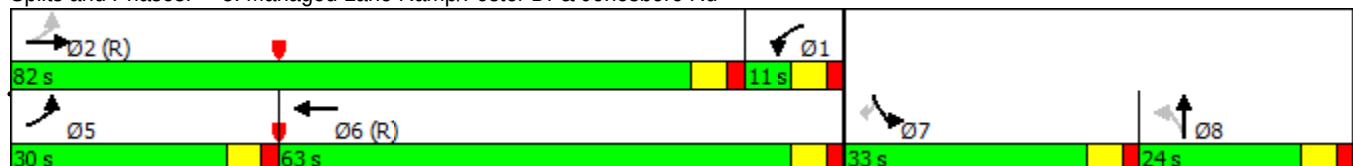
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 3: Managed Lane Ramp/Foster Dr & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

3: Managed Lane Ramp/Foster Dr & Jonesboro Rd

Future Build (2020) SAT - Improved

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	309	1506	0	0	1804	132	133	100	688	149	0	119
Future Volume (vph)	309	1506	0	0	1804	132	133	100	688	149	0	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	4.0	6.0		6.0
Lane Util. Factor	1.00	0.95			0.91		1.00	1.00	1.00	1.00		1.00
Frt	1.00	1.00			0.99		1.00	1.00	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00	0.95		1.00
Satd. Flow (prot)	1770	3539			5028		1770	1863	1583	1770		1583
Flt Permitted	0.06	1.00			1.00		0.95	1.00	1.00	0.95		1.00
Satd. Flow (perm)	109	3539			5028		1770	1863	1583	1770		1583
Peak-hour factor, PHF	0.88	0.97	0.92	0.92	0.97	0.88	0.92	0.92	0.92	0.71	0.92	0.88
Adj. Flow (vph)	351	1553	0	0	1860	150	145	109	748	210	0	135
RTOR Reduction (vph)	0	0	0	0	6	0	0	0	0	0	0	115
Lane Group Flow (vph)	351	1553	0	0	2004	0	145	109	748	210	0	20
Turn Type	pm+pt	NA		Prot	NA		Perm	NA	Free	Prot		Perm
Protected Phases	5	2		1	6			8		7		
Permitted Phases	2						8		Free			7
Actuated Green, G (s)	92.5	92.5			62.5		17.2	17.2	150.0	22.3		22.3
Effective Green, g (s)	92.5	92.5			62.5		17.2	17.2	150.0	22.3		22.3
Actuated g/C Ratio	0.62	0.62			0.42		0.11	0.11	1.00	0.15		0.15
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0		6.0		6.0
Vehicle Extension (s)	3.0	5.0			5.0		3.0	3.0		3.0		3.0
Lane Grp Cap (vph)	332	2182			2095		202	213	1583	263		235
v/s Ratio Prot	c0.17	0.44			0.40			0.06		c0.12		
v/s Ratio Perm	c0.48						c0.08		0.47			0.01
v/c Ratio	1.06	0.71			0.96		0.72	0.51	0.47	0.80		0.09
Uniform Delay, d1	52.0	19.6			42.4		64.1	62.5	0.0	61.7		55.1
Progression Factor	1.18	0.67			1.07		1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	58.0	1.5			11.3		11.5	2.1	1.0	15.4		0.2
Delay (s)	119.3	14.5			56.8		75.6	64.5	1.0	77.1		55.2
Level of Service	F	B			E		E	E	A	E		E
Approach Delay (s)		33.8			56.8			18.7			68.5	
Approach LOS		C			E			B			E	
Intersection Summary												
HCM 2000 Control Delay			42.0			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.99									
Actuated Cycle Length (s)			150.0			Sum of lost time (s)			24.0			
Intersection Capacity Utilization			83.9%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

Queues

4: Site Drwy 1 & Jonesboro Rd

Future Build (2020) SAT - Improved

1/26/2016

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBT	Ø8
Lane Configurations											
Traffic Volume (vph)	56	1653	472	513	1057	22	825	289	23	0	
Future Volume (vph)	56	1653	472	513	1057	22	825	289	23	0	
Lane Group Flow (vph)	67	1797	1888	1026	1079	33	1650	761	0	92	
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	Prot	Free	pm+pt	NA	
Protected Phases	5	2		1	6		3		7	4	8
Permitted Phases	2		2			6		Free	4		
Detector Phase	5	2	2	1	6	6	3		7	4	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	11.0	24.0	24.0	11.0	24.0	24.0	11.0		11.0	24.0	24.0
Total Split (s)	12.0	56.0	56.0	29.0	73.0	73.0	41.0		11.0	24.0	54.0
Total Split (%)	8.0%	37.3%	37.3%	19.3%	48.7%	48.7%	27.3%		7.3%	16.0%	36%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
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	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead		Lead	Lag	Lag
Lead-Lag Optimize?											
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None		None	None	None
v/c Ratio	0.26	1.06	1.78	1.26	0.57	0.04	2.06	0.48		0.46	
Control Delay	17.6	83.6	371.9	173.9	26.8	0.1	509.8	1.0		7.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	
Total Delay	17.6	83.6	371.9	173.9	26.8	0.1	509.8	1.0		7.2	
Queue Length 50th (ft)	22	~707	~2224	~651	390	0	~1306	0		0	
Queue Length 95th (ft)	m39	#800	0	307	467	0	#615	0		0	
Internal Link Dist (ft)		508			841					273	
Turn Bay Length (ft)	235		175	235		160		50			
Base Capacity (vph)	256	1695	1061	812	1890	916	801	1583		316	
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	0.26	1.06	1.78	1.26	0.57	0.04	2.06	0.48		0.29	

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 5 (3%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 4: Site Drwy 1 & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

4: Site Drwy 1 & Jonesboro Rd

Future Build (2020) SAT - Improved

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	1653	472	513	1057	22	825	0	289	23	0	55
Future Volume (vph)	56	1653	472	513	1057	22	825	0	289	23	0	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0		4.0		6.0	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	0.97		1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00		0.85		0.91	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00		0.98	
Satd. Flow (prot)	1770	5085	1583	3433	3539	1583	3433		1583		1664	
Flt Permitted	0.26	1.00	1.00	0.95	1.00	1.00	0.95		1.00		0.89	
Satd. Flow (perm)	493	5085	1583	3433	3539	1583	3433		1583		1511	
Peak-hour factor, PHF	0.83	0.92	0.25	0.50	0.98	0.66	0.50	0.92	0.38	0.79	0.92	0.87
Adj. Flow (vph)	67	1797	1888	1026	1079	33	1650	0	761	29	0	63
RTOR Reduction (vph)	0	0	534	0	0	16	0	0	0	0	89	0
Lane Group Flow (vph)	67	1797	1354	1026	1079	17	1650	0	761	0	3	0
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	Prot		Free	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2			6			Free	4		
Actuated Green, G (s)	56.6	50.0	50.0	35.5	78.9	78.9	35.0		150.0		5.5	
Effective Green, g (s)	56.6	50.0	50.0	35.5	78.9	78.9	35.0		150.0		5.5	
Actuated g/C Ratio	0.38	0.33	0.33	0.24	0.53	0.53	0.23		1.00		0.04	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0				6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0				3.0	
Lane Grp Cap (vph)	242	1695	527	812	1861	832	801		1583		55	
v/s Ratio Prot	0.01	0.35		c0.30	0.30		c0.48					
v/s Ratio Perm	0.09		c0.86			0.01			c0.48		0.00	
v/c Ratio	0.28	1.06	2.57	1.26	0.58	0.02	2.06		0.48		0.06	
Uniform Delay, d1	30.2	50.0	50.0	57.2	24.2	17.0	57.5		0.0		69.8	
Progression Factor	0.92	0.92	0.67	0.99	1.05	1.00	1.00		1.00		1.00	
Incremental Delay, d2	0.6	39.7	711.7	128.4	1.3	0.0	481.3		1.0		0.5	
Delay (s)	28.5	85.6	744.9	185.3	26.7	17.1	538.8		1.0		70.2	
Level of Service	C	F	F	F	C	B	F		A		E	
Approach Delay (s)		416.4			102.7			369.1			70.2	
Approach LOS		F			F			F			E	
Intersection Summary												
HCM 2000 Control Delay			319.1									F
HCM 2000 Volume to Capacity ratio			1.99									
Actuated Cycle Length (s)			150.0									24.0
Intersection Capacity Utilization			91.8%									F
Analysis Period (min)			15									
c Critical Lane Group												

Queues
5: Mt Carmel Rd & Jonesboro Rd

Future Build (2020) SAT - Improved

1/26/2016

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↗↗
Traffic Volume (vph)	1825	11	187	1566	6	183
Future Volume (vph)	1825	11	187	1566	6	183
Lane Group Flow (vph)	2005	18	567	1598	16	458
Turn Type	NA	Perm	pm+pt	NA	Prot	pm+ov
Protected Phases	2		1	6	3	1
Permitted Phases		2	6			3
Detector Phase	2	2	1	6	3	1
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	11.0	24.0	24.0	11.0
Total Split (s)	83.0	83.0	43.0	126.0	24.0	43.0
Total Split (%)	55.3%	55.3%	28.7%	84.0%	16.0%	28.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead			Lead
Lead-Lag Optimize?						
Recall Mode	C-Min	C-Min	None	C-Min	None	None
v/c Ratio	0.93	0.02	1.06	0.48	0.20	0.53
Control Delay	28.0	7.5	102.6	2.0	83.0	34.4
Queue Delay	2.2	0.0	0.0	0.0	0.0	0.0
Total Delay	30.1	7.5	102.6	2.0	83.0	34.4
Queue Length 50th (ft)	420	2	~601	0	16	174
Queue Length 95th (ft)	m#1234	m6	187	m248	18	69
Internal Link Dist (ft)	1145			797	2491	
Turn Bay Length (ft)		250	300		100	160
Base Capacity (vph)	2156	967	534	3348	212	871
Starvation Cap Reductn	0	0	0	158	0	0
Spillback Cap Reductn	75	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.02	1.06	0.50	0.08	0.53

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 11 (7%), Referenced to phase 2:EBTU and 6:WBTL, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 5: Mt Carmel Rd & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

5: Mt Carmel Rd & Jonesboro Rd

Future Build (2020) SAT - Improved

1/26/2016



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰	↶↷	↰	↰	↶↷	↰	↰↷
Traffic Volume (vph)	0	1825	11	187	1566	6	183
Future Volume (vph)	0	1825	11	187	1566	6	183
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	0.88
Frt		1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)		3539	1583	1770	3539	1770	2787
Flt Permitted		1.00	1.00	0.04	1.00	0.95	1.00
Satd. Flow (perm)		3539	1583	79	3539	1770	2787
Peak-hour factor, PHF	0.92	0.91	0.62	0.33	0.98	0.38	0.40
Adj. Flow (vph)	0	2005	18	567	1598	16	458
RTOR Reduction (vph)	0	0	4	0	0	0	6
Lane Group Flow (vph)	0	2005	14	567	1598	16	452
Turn Type	Perm	NA	Perm	pm+pt	NA	Prot	pm+ov
Protected Phases		2		1	6	3	1
Permitted Phases	2		2	6			3
Actuated Green, G (s)		87.8	87.8	134.7	134.7	3.3	44.2
Effective Green, g (s)		87.8	87.8	134.7	134.7	3.3	44.2
Actuated g/C Ratio		0.59	0.59	0.90	0.90	0.02	0.29
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		2071	926	532	3178	38	932
v/s Ratio Prot		0.57		c0.29	0.45	0.01	c0.13
v/s Ratio Perm			0.01	c0.66			0.03
v/c Ratio		0.97	0.02	1.07	0.50	0.42	0.49
Uniform Delay, d1		29.8	13.0	50.9	1.4	72.4	43.5
Progression Factor		0.65	0.68	1.19	1.31	1.14	0.79
Incremental Delay, d2		13.3	0.0	52.4	0.4	7.4	0.4
Delay (s)		32.7	8.9	112.9	2.3	89.6	34.7
Level of Service		C	A	F	A	F	C
Approach Delay (s)		32.4			31.2	36.6	
Approach LOS		C			C	D	

Intersection Summary

HCM 2000 Control Delay	32.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	80.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Queues

Future Build (2020) SAT - Improved

6: Willow Lane/Oak Grove Rd & Jonesboro Rd

1/26/2016

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	1815	159	46	1532	53	166	86	43	96	188	41
Future Volume (vph)	56	1815	159	46	1532	53	166	86	43	96	188	41
Lane Group Flow (vph)	93	1871	177	58	1596	60	198	97	67	123	232	55
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	3	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	15.0	5.0	5.0	15.0	15.0	5.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	11.0	26.0	11.0	11.0	36.0	36.0	11.0	46.0	46.0	11.0	44.0	44.0
Total Split (s)	12.0	82.0	13.0	11.0	81.0	81.0	13.0	46.0	46.0	11.0	44.0	44.0
Total Split (%)	8.0%	54.7%	8.7%	7.3%	54.0%	54.0%	8.7%	30.7%	30.7%	7.3%	29.3%	29.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
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	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)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	C-Min	None	None	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.61	0.86	0.16	0.54	0.76	0.06	1.17	0.30	0.18	0.46	0.78	0.16
Control Delay	31.1	14.0	1.7	38.0	19.8	1.0	168.8	55.0	2.3	53.8	77.7	1.0
Queue Delay	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.1	15.2	1.7	38.0	19.8	1.0	168.8	55.0	2.3	53.8	77.7	1.0
Queue Length 50th (ft)	20	434	15	9	612	2	-197	84	0	98	221	0
Queue Length 95th (ft)	m31	#1079	m4	m42	791	m8	#288	132	0	126	266	0
Internal Link Dist (ft)		797			4515			905			451	
Turn Bay Length (ft)	300		150	300		250	500		400	135		100
Base Capacity (vph)	152	2174	1132	108	2099	983	169	496	502	266	471	482
Starvation Cap Reductn	0	136	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	0.61	0.92	0.16	0.54	0.76	0.06	1.17	0.20	0.13	0.46	0.49	0.11

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 26 (17%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 135

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

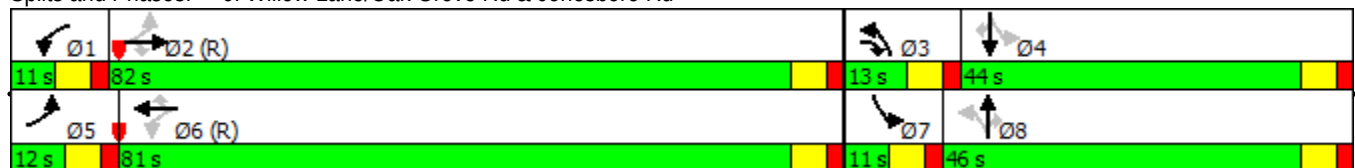
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 6: Willow Lane/Oak Grove Rd & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

6: Willow Lane/Oak Grove Rd & Jonesboro Rd

Future Build (2020) SAT - Improved

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	1815	159	46	1532	53	166	86	43	96	188	41
Future Volume (vph)	56	1815	159	46	1532	53	166	86	43	96	188	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.07	1.00	1.00	0.04	1.00	1.00	0.27	1.00	1.00	0.69	1.00	1.00
Satd. Flow (perm)	134	3539	1583	84	3539	1583	500	1863	1583	1293	1863	1583
Peak-hour factor, PHF	0.60	0.97	0.90	0.79	0.96	0.89	0.84	0.89	0.64	0.78	0.81	0.75
Adj. Flow (vph)	93	1871	177	58	1596	60	198	97	67	123	232	55
RTOR Reduction (vph)	0	0	26	0	0	24	0	0	55	0	0	46
Lane Group Flow (vph)	93	1871	151	58	1596	36	198	97	12	123	232	9
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	97.0	91.0	98.0	93.0	89.0	89.0	33.0	26.0	26.0	29.0	24.0	24.0
Effective Green, g (s)	97.0	91.0	98.0	93.0	89.0	89.0	33.0	26.0	26.0	29.0	24.0	24.0
Actuated g/C Ratio	0.65	0.61	0.65	0.62	0.59	0.59	0.22	0.17	0.17	0.19	0.16	0.16
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	5.0	3.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	152	2146	1097	97	2099	939	169	322	274	265	298	253
v/s Ratio Prot	c0.02	c0.53	0.01	0.02	0.45		c0.05	0.05		0.02	0.12	
v/s Ratio Perm	0.37		0.09	0.36		0.02	c0.20		0.01	0.07		0.01
v/c Ratio	0.61	0.87	0.14	0.60	0.76	0.04	1.17	0.30	0.04	0.46	0.78	0.03
Uniform Delay, d1	21.8	24.6	9.9	27.9	22.6	12.7	57.7	54.1	51.6	52.7	60.4	53.2
Progression Factor	1.72	0.42	0.30	1.44	0.74	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.5	2.7	0.0	7.6	2.1	0.1	122.9	0.5	0.1	1.3	12.1	0.1
Delay (s)	41.1	13.1	3.0	47.7	18.8	12.7	180.6	54.6	51.7	54.0	72.5	53.3
Level of Service	D	B	A	D	B	B	F	D	D	D	E	D
Approach Delay (s)		13.5			19.6			123.0			64.4	
Approach LOS		B			B			F			E	
Intersection Summary												
HCM 2000 Control Delay	28.8			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.96											
Actuated Cycle Length (s)	150.0			Sum of lost time (s)			24.0					
Intersection Capacity Utilization	84.3%			ICU Level of Service			E					
Analysis Period (min)	15											
c Critical Lane Group												

Queues

7: Kelly Rd & Jonesboro Rd

Future Build (2020) SAT - Improved

1/26/2016



Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations	↑↑	↑	↑	↑↑	↑↑
Traffic Volume (vph)	1856	60	158	1557	76
Future Volume (vph)	1856	60	158	1557	76
Lane Group Flow (vph)	1913	71	203	1656	262
Turn Type	NA	Perm	pm+pt	NA	Perm
Protected Phases	2		1	6	
Permitted Phases		2	6		8
Detector Phase	2	2	1	6	8
Switch Phase					
Minimum Initial (s)	15.0	15.0	5.0	15.0	6.0
Minimum Split (s)	29.0	29.0	11.0	24.0	42.0
Total Split (s)	90.0	90.0	18.0	108.0	42.0
Total Split (%)	60.0%	60.0%	12.0%	72.0%	28.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead		
Lead-Lag Optimize?					
Recall Mode	C-Min	C-Min	None	C-Min	None
v/c Ratio	0.85	0.07	1.07	0.62	0.82
Control Delay	10.9	0.2	125.6	10.5	67.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.9	0.2	125.6	10.5	67.4
Queue Length 50th (ft)	664	0	~167	349	202
Queue Length 95th (ft)	#1103	m0	#269	525	233
Internal Link Dist (ft)	4515			773	731
Turn Bay Length (ft)		315	300		
Base Capacity (vph)	2250	1025	190	2675	442
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.85	0.07	1.07	0.62	0.59

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 97 (65%), Referenced to phase 2:EBTU and 6:WBTL, Start of Green

Natural Cycle: 135

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 7: Kelly Rd & Jonesboro Rd



HCM Signalized Intersection Capacity Analysis

7: Kelly Rd & Jonesboro Rd

Future Build (2020) SAT - Improved

1/26/2016



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	⇐	⇐⇐	⇐	⇐	⇐⇐	⇐	
Traffic Volume (vph)	0	1856	60	158	1557	76	117
Future Volume (vph)	0	1856	60	158	1557	76	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	
Frt		1.00	0.85	1.00	1.00	0.91	
Flt Protected		1.00	1.00	0.95	1.00	0.98	
Satd. Flow (prot)		3539	1583	1770	3539	1673	
Flt Permitted		1.00	1.00	0.04	1.00	0.98	
Satd. Flow (perm)		3539	1583	73	3539	1673	
Peak-hour factor, PHF	0.92	0.97	0.84	0.78	0.94	0.78	0.71
Adj. Flow (vph)	0	1913	71	203	1656	97	165
RTOR Reduction (vph)	0	0	19	0	0	45	0
Lane Group Flow (vph)	0	1913	52	203	1656	217	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	
Protected Phases		2		1	6		
Permitted Phases	2		2	6		8	
Actuated Green, G (s)		95.4	95.4	113.4	113.4	24.6	
Effective Green, g (s)		95.4	95.4	113.4	113.4	24.6	
Actuated g/C Ratio		0.64	0.64	0.76	0.76	0.16	
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)		5.0	5.0	3.0	5.0	3.0	
Lane Grp Cap (vph)		2250	1006	190	2675	274	
v/s Ratio Prot		0.54		c0.09	0.47		
v/s Ratio Perm			0.03	c0.71		c0.13	
v/c Ratio		0.85	0.05	1.07	0.62	0.79	
Uniform Delay, d1		21.6	10.3	53.6	8.4	60.2	
Progression Factor		0.34	0.03	1.00	1.00	1.00	
Incremental Delay, d2		2.4	0.1	84.6	1.1	14.4	
Delay (s)		9.8	0.3	138.2	9.5	74.6	
Level of Service		A	A	F	A	E	
Approach Delay (s)		9.4			23.5	74.6	
Approach LOS		A			C	E	

Intersection Summary

HCM 2000 Control Delay	20.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	86.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis 8: Sterling Pl/Site Drwy 4 & Mt Carmel Rd

Future Build (2020) SAT - Improved

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	192	0	6	112	35	0	0	7	1	0	71
Future Volume (Veh/h)	1	192	0	6	112	35	0	0	7	1	0	71
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.25	0.92	0.50	0.92	0.25	0.92	0.92	0.29	0.25	0.92	0.25
Hourly flow rate (vph)	4	768	0	12	122	140	0	0	24	4	0	284
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	122			768			922	922	768	946	922	122
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	122			768			922	922	768	946	922	122
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	94	98	100	69
cM capacity (veh/h)	1465			846			172	266	402	224	266	929
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1							
Volume Total	772	134	140	24	288							
Volume Left	4	12	0	0	4							
Volume Right	0	0	140	24	284							
cSH	1465	846	1700	402	890							
Volume to Capacity	0.00	0.01	0.08	0.06	0.32							
Queue Length 95th (ft)	0	1	0	5	35							
Control Delay (s)	0.1	1.0	0.0	14.5	11.0							
Lane LOS	A	A		B	B							
Approach Delay (s)	0.1	0.5		14.5	11.0							
Approach LOS				B	B							
Intersection Summary												
Average Delay				2.7								
Intersection Capacity Utilization				Err%	ICU Level of Service				H			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis 9: Mill Road & Mt Carmel Rd

Future Build (2020) SAT - Improved

1/26/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	87	103	36	56	175	62	22	345	48	24	302	105
Future Volume (vph)	87	103	36	56	175	62	22	345	48	24	302	105
Peak Hour Factor	0.91	0.91	0.91	0.80	0.80	0.80	0.88	0.88	0.88	0.92	0.92	0.92
Hourly flow rate (vph)	96	113	40	70	219	78	25	392	55	26	328	114
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	249	367	472	468								
Volume Left (vph)	96	70	25	26								
Volume Right (vph)	40	78	55	114								
Hadj (s)	0.01	-0.06	-0.03	-0.10								
Departure Headway (s)	9.3	8.6	8.3	8.3								
Degree Utilization, x	0.64	0.87	1.00	1.00								
Capacity (veh/h)	374	367	472	468								
Control Delay (s)	27.3	48.0	72.6	72.2								
Approach Delay (s)	27.3	48.0	72.6	72.2								
Approach LOS	D	E	F	F								
Intersection Summary												
Delay				59.4								
Level of Service				F								
Intersection Capacity Utilization				60.1%	ICU Level of Service				B			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

10: Site Drwy 2 & Jonesboro Rd

Future Build (2020) SAT - Improved

1/26/2016

	→	↘	↙	←	↖	↗	
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	↑↑↑	↗		↑↑		↗	
Traffic Volume (veh/h)	885	311	0	489	0	158	
Future Volume (Veh/h)	885	311	0	489	0	158	
Sign Control	Free			Free	Stop		
Grade	0%			0%	0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	962	338	0	532	0	172	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None			None			
Median storage veh							
Upstream signal (ft)	594			588			
pX, platoon unblocked							
vC, conflicting volume			962		1228	321	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol			962		1228	321	
tC, single (s)			4.1		6.8	6.9	
tC, 2 stage (s)							
tF (s)			2.2		3.5	3.3	
p0 queue free %			100		100	75	
cM capacity (veh/h)			711		170	675	
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1
Volume Total	321	321	321	338	266	266	172
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	338	0	0	172
cSH	1700	1700	1700	1700	1700	1700	675
Volume to Capacity	0.19	0.19	0.19	0.20	0.16	0.16	0.25
Queue Length 95th (ft)	0	0	0	0	0	0	25
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	12.1
Lane LOS							B
Approach Delay (s)	0.0				0.0		12.1
Approach LOS							B
Intersection Summary							
Average Delay			1.0				
Intersection Capacity Utilization			33.5%		ICU Level of Service		A
Analysis Period (min)			15				

HCM Unsignalized Intersection Capacity Analysis 11: Site Drwy 5 & Jonesboro Rd

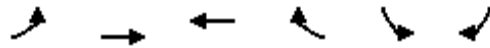
Future Build (2020) SAT - Improved
1/26/2016

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗		↑↑		↗
Traffic Volume (veh/h)	645	227	0	162	0	116
Future Volume (Veh/h)	645	227	0	162	0	116
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	701	247	0	176	0	126
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)	921			1225		
pX, platoon unblocked						
vC, conflicting volume			701		789	350
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			701		789	350
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	80
cM capacity (veh/h)			892		328	646
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	350	350	247	88	88	126
Volume Left	0	0	0	0	0	0
Volume Right	0	0	247	0	0	126
cSH	1700	1700	1700	1700	1700	646
Volume to Capacity	0.21	0.21	0.15	0.05	0.05	0.20
Queue Length 95th (ft)	0	0	0	0	0	18
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	11.9
Lane LOS						B
Approach Delay (s)	0.0			0.0		11.9
Approach LOS						B
Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization			31.7%	ICU Level of Service		A
Analysis Period (min)			15			

Queues
12: Mt Carmel Rd & Site Drwy 3

Future Build (2020) SAT - Improved

1/26/2016



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	100	94	143	79	83	41
Future Volume (vph)	100	94	143	79	83	41
Lane Group Flow (vph)	109	102	155	86	90	45
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	35.0	100.0	65.0	65.0	50.0	50.0
Total Split (%)	23.3%	66.7%	43.3%	43.3%	33.3%	33.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.11	0.07	0.11	0.07	0.58	0.25
Control Delay	2.8	2.6	1.0	0.0	80.1	19.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.8	2.6	1.0	0.0	80.1	19.1
Queue Length 50th (ft)	15	14	7	0	86	0
Queue Length 95th (ft)	32	30	m7	m0	142	40
Internal Link Dist (ft)		653	2491		345	
Turn Bay Length (ft)	235			175		
Base Capacity (vph)	1086	1550	1386	1199	519	496
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.07	0.11	0.07	0.17	0.09

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 24 (16%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

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

Splits and Phases: 12: Mt Carmel Rd & Site Drwy 3

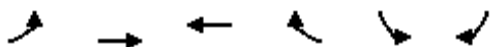


HCM Signalized Intersection Capacity Analysis

12: Mt Carmel Rd & Site Drwy 3

Future Build (2020) SAT - Improved

1/26/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	100	94	143	79	83	41
Future Volume (vph)	100	94	143	79	83	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1863	1863	1583	1770	1583
Flt Permitted	0.63	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1164	1863	1863	1583	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	102	155	86	90	45
RTOR Reduction (vph)	0	0	0	22	0	41
Lane Group Flow (vph)	109	102	155	64	90	4
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	124.9	124.9	111.7	111.7	13.1	13.1
Effective Green, g (s)	124.9	124.9	111.7	111.7	13.1	13.1
Actuated g/C Ratio	0.83	0.83	0.74	0.74	0.09	0.09
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	998	1551	1387	1178	154	138
v/s Ratio Prot	c0.01	0.05	c0.08		c0.05	
v/s Ratio Perm	0.09			0.04		0.00
v/c Ratio	0.11	0.07	0.11	0.05	0.58	0.03
Uniform Delay, d1	2.4	2.2	5.3	5.1	65.8	62.6
Progression Factor	1.00	1.00	0.17	0.00	1.00	1.00
Incremental Delay, d2	0.0	0.1	0.0	0.0	5.6	0.1
Delay (s)	2.4	2.3	0.9	0.0	71.4	62.7
Level of Service	A	A	A	A	E	E
Approach Delay (s)		2.4	0.6		68.5	
Approach LOS		A	A		E	

Intersection Summary

HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.16		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	32.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Jonesboro Road at Foster Drive Concept



Traffic Volume Worksheets

15-123 Henry County Promenade- Henry County Ga
Traffic Volumes
Future Conditions

A&R Engineering
January 2016

1. Jonesboro Rd @ 75 SB Ramp

A.M. Peak Hour

Condition	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing:	0	0	0	0	382	2	377	761	0	1196	190	1386
Growth Factor (%):	1	1	1		1	1	1		1	1	1	
GDOT Project Shifted Volumes:	0	0	0	0	10	0	7	17	0	43	4	47
Mt. Carmel Road Shifted Volumes:	0	0	0	0	0	0	0	0	0	-100	0	-100
No-Build 2020 Volumes:	0	0	0	0	411	2	403	816	0	1200	204	1404
Total New Trips:	0	0	0	0	43	0	0	43	0	97	0	97
Site Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0
Future Build 2020 Traffic Volumes:	0	0	0	0	454	2	403	859	0	1297	204	1501

P.M. Peak Hour

Condition	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing:	0	0	0	0	194	1	213	408	0	1472	212	1684
Growth Factor (%):	1	1	1		1	1	1		1	1	1	
GDOT Project Shifted Volumes:	0	0	0	0	-41	0	-7	-48	0	15	-25	-10
Mt. Carmel Road Shifted Volumes:	0	0	0	0	0	0	0	0	0	-100	0	-100
No-Build 2020 Volumes:	0	0	0	0	163	1	217	381	0	1462	198	1660
Total New Trips:	0	0	0	0	92	0	0	92	0	199	0	199
Site Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0
Future Build 2020 Traffic Volumes:	0	0	0	0	255	1	217	473	0	1661	198	1859

SAT. Peak Hour

Condition	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing:	0	0	0	0	200	3	546	749	0	1373	393	1766
Growth Factor (%):	1	1	1		1	1	1		1	1	1	
GDOT Project Shifted Volumes:	0	0	0	0	-41	0	-7	-48	0	15	-25	-10
Mt. Carmel Road Shifted Volumes:	0	0	0	0	0	0	0	0	0	-100	0	-100
No-Build 2020 Volumes:	0	0	0	0	169	3	567	739	0	1358	388	1746
Total New Trips:	0	0	0	0	155	0	0	155	0	336	0	336
Site Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0
Future Build 2020 Traffic Volumes:	0	0	0	0	324	3	567	894	0	1694	388	2082

15-123 Henry County Promenade- Henry County Ga
Traffic Volumes
Future Conditions

A&R Engineering
January 2016

2. Jonesboro Rd @ 75 NB Ramp

A.M. Peak Hour

Condition	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing:	148	1	140	289	0	0	0	0	442	1076	0	1518
Growth Factor (%):	1	1	1		1	1	1		1	1	1	
GDOT Project Shifted Volumes:	-21	0	-2	-23	0	0	0	0	2	51	0	53
Mt. Carmel Road Shifted Volumes:	0	0	0	0	0	0	0	0	0	-100	0	-100
No-Build 2020 Volumes:	135	1	145	281	0	0	0	0	467	1082	0	1549
Total New Trips:	0	0	39	39	0	0	0	0	0	140	0	140
Site Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0
Future Build 2020 Traffic Volumes:	135	1	184	320	0	0	0	0	467	1222	0	1689

P.M. Peak Hour

Condition	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing:	241	1	113	355	0	0	0	0	334	1358	0	1692
Growth Factor (%):	1	1	1		1	1	1		1	1	1	
GDOT Project Shifted Volumes:	2	0	-5	-3	0	0	0	0	20	-46	0	-26
Mt. Carmel Road Shifted Volumes:	0	0	0	0	0	0	0	0	0	-100	0	-100
No-Build 2020 Volumes:	255	1	114	370	0	0	0	0	371	1281	0	1652
Total New Trips:	0	0	84	84	0	0	0	0	0	291	0	291
Site Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0
Future Build 2020 Traffic Volumes:	255	1	198	454	0	0	0	0	371	1572	0	1943

SAT. Peak Hour

Condition	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing:	413	3	116	532	0	0	0	0	438	1154	0	1592
Growth Factor (%):	1	1	1		1	1	1		1	1	1	
GDOT Project Shifted Volumes:	2	0	-5	-3	0	0	0	0	20	-46	0	-26
Mt. Carmel Road Shifted Volumes:	0	0	0	0	0	0	0	0	0	-100	0	-100
No-Build 2020 Volumes:	436	3	117	556	0	0	0	0	480	1067	0	1547
Total New Trips:	0	0	142	142	0	0	0	0	0	492	0	492
Site Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0
Future Build 2020 Traffic Volumes:	436	3	259	698	0	0	0	0	480	1559	0	2039

15-123 Henry County Promenade- Henry County Ga
Traffic Volumes
Future Conditions

A&R Engineering
January 2016

3, Jonesboro Rd @ Foster Dr

A.M. Peak Hour

Condition	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing:	0	0	0	0	126	0	213	339	323	889	0	1212
Growth Factor (%):	1	1	1		1	1	1		1	1	1	
GDOT Project Shifted Volumes:	0	0	0	0	0	69	0	69	-81	39	91	49
Mt. Carmel Road Shifted Volumes:	0	0	0	0	0	0	0	0	0	-100	0	-100
No-Build 2020 Volumes:	0	0	0	0	132	69	224	425	258	873	91	1222
Total New Trips:	0	0	0	0	21	0	0	21	0	179	0	179
Site Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0
Future Build 2020 Traffic Volumes:	0	0	0	0	153	69	224	446	258	1052	91	1401

P.M. Peak Hour

Condition	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing:	0	0	0	0	101	0	100	201	294	1166	0	1460
Growth Factor (%):	1	1	1		1	1	1		1	1	1	
GDOT Project Shifted Volumes:	133	100	597	830	0	0	0	0	40	-91	0	-51
Mt. Carmel Road Shifted Volumes:	0	0	0	0	0	0	0	0	0	-100	0	-100
No-Build 2020 Volumes:	133	100	597	830	106	0	105	211	349	1034	0	1383
Total New Trips:	0	0	54	54	38	0	0	38	0	375	0	375
Site Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0
Future Build 2020 Traffic Volumes:	133	100	651	884	144	0	105	249	349	1409	0	1758

SAT. Peak Hour

Condition	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing:	0	0	0	0	80	0	113	193	256	1011	0	1267
Growth Factor (%):	1	1	1		1	1	1		1	1	1	
GDOT Project Shifted Volumes:	133	100	597	830	0	0	0	0	40	-91	0	-51
Mt. Carmel Road Shifted Volumes:	0	0	0	0	0	0	0	0	0	-100	0	-100
No-Build 2020 Volumes:	133	100	597	830	84	0	119	203	309	872	0	1181
Total New Trips:	0	0	91	91	65	0	0	65	0	634	0	634
Site Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0
Future Build 2020 Traffic Volumes:	133	100	688	921	149	0	119	268	309	1506	0	1815

15-123 Henry County Promenade- Henry County Ga
Traffic Volumes
Future Conditions

A&R Engineering
January 2016

4. Jonesboro Rd @ Bojangles

A.M. Peak Hour

Condition	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing:	0	0	0	0	11	0	45	56	45	945	3	993
Growth Factor (%):	1	1	1		1	1	1		1	1	1	
GDOT Project Shifted Volumes:	0	0	0	0	0	0	0	0	0	39	0	39
Mt. Carmel Road Shifted Volumes:	0	0	0	0	0	0	0	0	0	-100	0	-100
No-Build 2020 Volumes:	0	0	0	0	12	0	47	59	47	932	3	982
Total New Trips:	126	0	33	159	0	0	0	0	0	54	100	154
Site Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0
Future Build 2020 Traffic Volumes:	126	0	33	159	12	0	47	59	47	986	103	1136

P.M. Peak Hour

Condition	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing:	0	0	3	3	20	0	23	43	23	1229	3	1255
Growth Factor (%):	1	1	1		1	1	1		1	1	1	
GDOT Project Shifted Volumes:	0	0	0	0	0	0	0	0	0	506	0	506
Mt. Carmel Road Shifted Volumes:	0	0	0	0	0	0	0	0	0	-100	0	-100
No-Build 2020 Volumes:	0	0	3	3	21	0	24	45	24	1698	3	1725
Total New Trips:	459	0	152	611	0	0	0	0	0	156	233	389
Site Pass-by Trips:	146	0	73	219	0	0	0	0	0	-67	67	0
Future Build 2020 Traffic Volumes:	605	0	228	833	21	0	24	45	24	1787	303	2114

SAT. Peak Hour

Condition	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing:	2	0	3	5	22	0	52	74	53	1021	3	1077
Growth Factor (%):	1	1	1		1	1	1		1	1	1	
GDOT Project Shifted Volumes:	0	0	0	0	0	0	0	0	0	506	0	506
Mt. Carmel Road Shifted Volumes:	0	0	0	0	0	0	0	0	0	-100	0	-100
No-Build 2020 Volumes:	2	0	3	5	23	0	55	78	56	1479	3	1538
Total New Trips:	658	0	218	876	0	0	0	0	0	248	395	643
Site Pass-by Trips:	165	0	68	233	0	0	0	0	0	-74	74	0
Future Build 2020 Traffic Volumes:	825	0	289	1114	23	0	55	78	56	1653	472	2181

15-123 Henry County Promenade- Henry County Ga
Traffic Volumes
Future Conditions

A&R Engineering
January 2016

5, Jonesboro Rd @ Mt Carmel Rd

A.M. Peak Hour

Condition	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing:	1	0	16	17	0	0	0	0	0	940	36	976
Growth Factor (%):	1	1	1		1	1	1		1	1	1	
GDOT Project Shifted Volumes:	0	0	0	0	0	0	0	0	0	39	0	39
Mt. Carmel Road Shifted Volumes:	0	0	100	100	0	0	0	0	0	-100	0	-100
No-Build 2020 Volumes:	1	0	117	118	0	0	0	0	0	927	38	965
Total New Trips:	0	0	13	13	0	0	0	0	0	53	0	53
Site Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0
Future Build 2020 Traffic Volumes:	1	0	130	131	0	0	0	0	0	980	38	1018

P.M. Peak Hour

Condition	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing:	18	0	19	37	0	0	0	0	0	1230	8	1238
Growth Factor (%):	1	1	1		1	1	1		1	1	1	
GDOT Project Shifted Volumes:	0	0	0	0	0	0	0	0	0	506	0	506
Mt. Carmel Road Shifted Volumes:	0	0	100	100	0	0	0	0	0	-100	0	-100
No-Build 2020 Volumes:	19	0	120	139	0	0	0	0	0	1699	8	1707
Total New Trips:	0	0	52	52	0	0	0	0	0	251	0	251
Site Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0
Future Build 2020 Traffic Volumes:	19	0	172	191	0	0	0	0	0	1950	8	1958

SAT. Peak Hour

Condition	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing:	6	0	8	14	0	0	0	0	0	1008	10	1018
Growth Factor (%):	1	1	1		1	1	1		1	1	1	
GDOT Project Shifted Volumes:	0	0	0	0	0	0	0	0	0	506	0	506
Mt. Carmel Road Shifted Volumes:	0	0	100	100	0	0	0	0	0	-100	0	-100
No-Build 2020 Volumes:	6	0	108	114	0	0	0	0	0	1465	11	1476
Total New Trips:	0	0	75	75	0	0	0	0	0	360	0	360
Site Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0
Future Build 2020 Traffic Volumes:	6	0	183	189	0	0	0	0	0	1825	11	1836

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A.M. Peak Hour

P.M. Peak Hour

SAT. Peak Hour

Condition	Northbound			Southbound			Eastbound			Westbound						
	L	T	Tot	L	T	Tot	L	T	Tot	L	T	Tot				
Existing:	158	82	41	281	91	179	39	309	53	831	151	1035	44	1129	50	1223
Growth Factor (%):	1	1	1		1	1	1		1	1	1		1	1	1	
GDOT Project Shifted Volumes:	0	0	0	0	0	0	0	0	0	506	0	506	0	-69	0	-69
Mt. Carmel Road Shifted Volumes:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No-Build 2020 Volumes:	166	86	43	295	96	188	41	325	56	1379	159	1594	46	1118	53	1217
Total New Trips:	0	0	0	0	0	0	0	0	0	436	0	436	0	414	0	414
Site Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Future Build 2020 Traffic Volumes:	166	86	43	295	96	188	41	325	56	1815	159	2030	46	1552	53	1631

15-123 Henry County Promenade- Henry County Ga
Traffic Volumes
Future Conditions

A&R Engineering
January 2016

7. Jonesboro Rd @ Kelly Rd
A.M. Peak Hour

Condition	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing:	104	0	56	160	0	0	0	0	0	765	66	831
Growth Factor (%):	1	1	1		1	1	1		1	1	1	
GDOT Project Shifted Volumes:	0	0	0	0	0	0	0	0	0	39	0	39
Mt. Carmel Road Shifted Volumes:	0	0	0	0	0	0	0	0	0	0	0	0
No-Build 2020 Volumes:	109	0	59	168	0	0	0	0	0	843	69	912
Total New Trips:	0	0	0	0	0	0	0	0	0	66	0	66
Site Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0
Future Build 2020 Traffic Volumes:	109	0	59	168	0	0	0	0	0	909	69	978

P.M. Peak Hour

Condition	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing:	100	0	115	215	0	0	0	0	0	1173	87	1260
Growth Factor (%):	1	1	1		1	1	1		1	1	1	
GDOT Project Shifted Volumes:	0	0	0	0	0	0	0	0	0	506	0	506
Mt. Carmel Road Shifted Volumes:	0	0	0	0	0	0	0	0	0	0	0	0
No-Build 2020 Volumes:	105	0	121	226	0	0	0	0	0	1739	91	1830
Total New Trips:	0	0	0	0	0	0	0	0	0	304	0	304
Site Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0
Future Build 2020 Traffic Volumes:	105	0	121	226	0	0	0	0	0	2043	91	2134

SAT. Peak Hour

Condition	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing:	72	0	111	183	0	0	0	0	0	870	57	927
Growth Factor (%):	1	1	1		1	1	1		1	1	1	
GDOT Project Shifted Volumes:	0	0	0	0	0	0	0	0	0	506	0	506
Mt. Carmel Road Shifted Volumes:	0	0	0	0	0	0	0	0	0	0	0	0
No-Build 2020 Volumes:	76	0	117	193	0	0	0	0	0	1420	60	1480
Total New Trips:	0	0	0	0	0	0	0	0	0	436	0	436
Site Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0
Future Build 2020 Traffic Volumes:	76	0	117	193	0	0	0	0	0	1856	60	1916

15-123 Henry County Promenade- Henry County Ga
Traffic Volumes
Future Conditions

A&R Engineering
January 2016

8. Mt Carmel Rd @ N Bridges Rd

A.M. Peak Hour

Condition	Northbound				Southbound				Eastbound				Westbound			
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing:	0	0	3	3	0	0	0	0	0	0	0	0	37	0	0	37
Growth Factor (%):	1	1	1		1	1	1		1	1	1		1	1	1	
GDOT Project Shifted Volumes:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mt. Carmel Road Shifted Volumes:	0	0	0	0	0	0	0	0	0	100	0	100	0	100	0	100
No-Build 2020 Volumes:	0	0	3	3	0	0	0	0	0	100	0	100	39	100	0	139
Total New Trips:	0	0	0	0	0	0	10	10	0	25	0	25	0	4	6	10
Site Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Future Build 2020 Traffic Volumes:	0	0	3	3	0	0	10	10	0	125	0	125	39	104	6	149

P.M. Peak Hour

Condition	Northbound				Southbound				Eastbound				Westbound			
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing:	0	0	39	39	0	0	1	1	1	0	0	1	19	0	1	20
Growth Factor (%):	1	1	1		1	1	1		1	1	1		1	1	1	
GDOT Project Shifted Volumes:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mt. Carmel Road Shifted Volumes:	0	0	0	0	0	0	0	0	0	100	0	100	0	100	0	100
No-Build 2020 Volumes:	0	0	41	41	0	0	1	1	1	100	0	101	20	100	1	121
Total New Trips:	0	0	0	0	0	0	40	40	0	54	0	54	0	17	12	29
Site Pass-by Trips:	0	0	0	0	0	0	12	12	0	0	0	0	0	-11	11	0
Future Build 2020 Traffic Volumes:	0	0	41	41	0	0	53	53	1	154	0	155	20	106	24	150

SAT. Peak Hour

Condition	Northbound				Southbound				Eastbound				Westbound			
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing:	0	0	7	7	1	0	1	2	1	1	0	2	6	0	1	7
Growth Factor (%):	1	1	1		1	1	1		1	1	1		1	1	1	
GDOT Project Shifted Volumes:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mt. Carmel Road Shifted Volumes:	0	0	0	0	0	0	0	0	0	100	0	100	0	100	0	100
No-Build 2020 Volumes:	0	0	7	7	1	0	1	2	1	101	0	102	6	100	1	107
Total New Trips:	0	0	0	0	0	0	58	58	0	91	0	91	0	25	21	46
Site Pass-by Trips:	0	0	0	0	0	0	12	12	0	0	0	0	0	-13	13	0
Future Build 2020 Traffic Volumes:	0	0	7	7	1	0	71	72	1	192	0	193	6	112	35	153

A&R Engineering
January 2016

A.M. Peak Hour

P.M. Peak Hour

SAT. Peak Hour

Condition	Northbound				Southbound				Eastbound				Westbound			
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing:	19	376	3	398	23	287	100	410	111	8	34	153	6	6	33	45
Growth Factor (%):	1	1	1		1	1	1		1	1	1		1	1	1	
GDOT Project Shifted Volumes:	2	0	-5	-3	0	0	0	0	20	-46	0	-26	0	37	27	64
Mt. Carmel Road Shifted Volumes:	0	-50	50	0	0	0	0	0	-50	50	0	0	50	50	0	100
No-Build 2020 Volumes:	22	345	48	415	24	302	105	431	87	12	36	135	56	93	62	211
Total New Trips:	0	0	0	0	0	0	0	0	0	91	0	91	0	82	0	82
Site Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Future Build 2020 Traffic Volumes:	22	345	48	415	24	302	105	431	87	103	36	226	56	175	62	293

15-123 Henry County Promenade- Henry County Ga
Traffic Volumes
Future Conditions

A&R Engineering
January 2016

10. Jonesboro Rd @ RIRO Drwy 1

A.M. Peak Hour

Condition	Northbound				Southbound				Eastbound				Westbound					
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot		
Existing:	0	0	0	0	0	0	0	0	0	0	1015	0	1015	0	1536	0	1536	
Growth Factor (%):	1	1	1		1	1	1		1	1	1		1	1	1		1	
GDOT Project Shifted Volumes:	0	0	0	0	0	0	0	0	0	39	0	39	0	344	0	344	0	344
Mt. Carmel Road Shifted Volumes:	0	0	0	0	0	0	0	0	0	-100	0	-100	0	-100	0	-100	0	-100
No-Build 2020 Volumes:	0	0	0	0	0	0	0	0	0	1006	0	1006	0	1858	0	1858	0	1858
Total New Trips:	0	0	13	13	0	0	0	0	0	140	60	200	0	126	0	126	0	126
Site Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Future Build 2020 Traffic Volumes:	0	0	13	13	0	0	0	0	0	1146	60	1206	0	1984	0	1984	0	1984

P.M. Peak Hour

Condition	Northbound				Southbound				Eastbound				Westbound			
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing:	0	0	0	0	0	0	0	0	0	1267	0	1267	0	1298	0	1298
Growth Factor (%):	1	1	1		1	1	1		1	1	1		1	1	1	
GDOT Project Shifted Volumes:	0	0	0	0	0	0	0	0	0	506	0	506	0	-69	0	-69
Mt. Carmel Road Shifted Volumes:	0	0	0	0	0	0	0	0	0	-100	0	-100	0	-100	0	-100
No-Build 2020 Volumes:	0	0	0	0	0	0	0	0	0	1738	0	1738	0	1195	0	1195
Total New Trips:	0	0	63	63	0	0	0	0	0	327	140	467	0	459	0	459
Site Pass-by Trips:	0	0	73	73	0	0	0	0	0	-67	67	0	0	0	0	0
Future Build 2020 Traffic Volumes:	0	0	136	136	0	0	0	0	0	1998	207	2205	0	1654	0	1654

SAT. Peak Hour

Condition	Northbound				Southbound				Eastbound				Westbound			
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Growth Factor (%):	1	1	1		1	1	1		1	1	1		1	1	1	
GDOT Project Shifted Volumes:	0	0	0	0	0	0	0	0	0	506	0	506	0	-69	0	-69
Mt. Carmel Road Shifted Volumes:	0	0	0	0	0	0	0	0	0	-100	0	-100	0	-100	0	-100
No-Build 2020 Volumes:	0	0	0	0	0	0	0	0	0	406	0	406	0	-169	0	-169
Total New Trips:	0	0	90	90	0	0	0	0	0	553	237	790	0	658	0	658
Site Pass-by Trips:	0	0	68	68	0	0	0	0	0	-74	74	0	0	0	0	0
Future Build 2020 Traffic Volumes:	0	0	158	158	0	0	0	0	0	885	311	1196	0	489	0	489

15-123 Henry County Promenade- Henry County Ga
Traffic Volumes
Future Conditions

A&R Engineering
January 2016

11. Jonesboro Rd @ RIRO Drwy 2

A.M. Peak Hour

Condition	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing:	0	0	0	0	0	0	0	0	0	945	0	945
Growth Factor (%):	1	1	1		1	1	1		1	1	1	
GDOT Project Shifted Volumes:	0	0	0	0	0	0	0	0	0	39	0	39
Mt. Carmel Road Shifted Volumes:	0	0	0	0	0	0	0	0	0	-100	0	-100
No-Build 2020 Volumes:	0	0	0	0	0	0	0	0	0	932	0	932
Total New Trips:	0	0	7	7	0	0	0	0	0	46	40	86
Site Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0
Future Build 2020 Traffic Volumes:	0	0	7	7	0	0	0	0	0	978	40	1018

P.M. Peak Hour

Condition	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing:	0	0	3	3	20	0	23	43	0	1229	0	1229
Growth Factor (%):	1	1	1		1	1	1		1	1	1	
GDOT Project Shifted Volumes:	0	0	0	0	0	0	0	0	0	506	0	506
Mt. Carmel Road Shifted Volumes:	0	0	0	0	0	0	0	0	0	-100	0	-100
No-Build 2020 Volumes:	0	0	3	3	21	0	24	45	0	1698	0	1698
Total New Trips:	0	0	37	37	0	0	0	0	0	215	93	308
Site Pass-by Trips:	0	0	73	73	0	0	0	0	0	-67	67	0
Future Build 2020 Traffic Volumes:	0	0	113	113	21	0	24	45	0	1846	160	2006

SAT. Peak Hour

Condition	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing:	0	0	0	0	0	0	0	0	0	0	0	0
Growth Factor (%):	1	1	1		1	1	1		1	1	1	
GDOT Project Shifted Volumes:	0	0	0	0	0	0	0	0	0	506	0	506
Mt. Carmel Road Shifted Volumes:	0	0	0	0	0	0	0	0	0	-100	0	-100
No-Build 2020 Volumes:	0	0	0	0	0	0	0	0	0	406	0	406
Total New Trips:	0	0	52	52	0	0	0	0	0	308	158	466
Site Pass-by Trips:	0	0	64	64	0	0	0	0	0	-69	69	0
Future Build 2020 Traffic Volumes:	0	0	116	116	0	0	0	0	0	645	227	872

15-123 Henry County Promenade- Henry County Ga
Traffic Volumes
Future Conditions

A&R Engineering
January 2016

12. Mt Carmel Rd @ Site Drwy 3

A.M. Peak Hour

Condition	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing:	0	0	0	0	0	0	0	0	0	3	0	3
Growth Factor (%):	1	1	1		1	1	1		1	1	1	
GDOT Project Shifted Volumes:	0	0	0	0	0	0	0	0	0	0	0	0
Mt. Carmel Road Shifted Volumes:	0	0	0	0	0	0	0	0	0	100	0	100
No-Build 2020 Volumes:	0	0	0	0	0	0	0	0	0	103	0	103
Total New Trips:	0	0	0	0	13	0	4	17	25	0	0	25
Site Pass-by Trips:	0	0	0	0	0	0	0	0	0	0	0	0
Future Build 2020 Traffic Volumes:	0	0	0	0	13	0	4	17	25	103	0	128

P.M. Peak Hour

Condition	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing:	0	0	0	0	0	0	0	0	0	39	0	39
Growth Factor (%):	1	1	1		1	1	1		1	1	1	
GDOT Project Shifted Volumes:	0	0	0	0	0	0	0	0	0	0	0	0
Mt. Carmel Road Shifted Volumes:	0	0	0	0	0	0	0	0	0	100	0	100
No-Build 2020 Volumes:	0	0	0	0	0	0	0	0	0	141	0	141
Total New Trips:	0	0	0	0	52	0	17	69	54	0	0	54
Site Pass-by Trips:	0	0	0	0	12	0	16	28	11	-11	0	0
Future Build 2020 Traffic Volumes:	0	0	0	0	64	0	33	97	65	130	0	195

SAT. Peak Hour

Condition	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing:	0	0	0	0	0	0	0	0	0	3	0	3
Growth Factor (%):	1	1	1		1	1	1		1	1	1	
GDOT Project Shifted Volumes:	0	0	0	0	0	0	0	0	0	0	0	0
Mt. Carmel Road Shifted Volumes:	0	0	0	0	0	0	0	0	0	100	0	100
No-Build 2020 Volumes:	0	0	0	0	0	0	0	0	0	103	0	103
Total New Trips:	0	0	0	0	75	0	25	100	91	0	0	91
Site Pass-by Trips:	0	0	0	0	8	0	16	24	9	-9	0	0
Future Build 2020 Traffic Volumes:	0	0	0	0	83	0	41	124	100	94	0	194