

**DEVELOPMENT OF REGIONAL IMPACT
(DRI #2809)
TRAFFIC STUDY
FOR
EQUINOX CORPORATE CAMPUS
ALPHARETTA, GEORGIA**



Prepared for:

***Pope & Land Enterprises, Inc.
3330 Cumberland Boulevard, Suite 300
Atlanta, Georgia 30339***

Prepared By:



A&R Engineering Inc.

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

September 24, 2018
A & R Project # 18-060

EXECUTIVE SUMMARY

Traffic impacts were evaluated for the added traffic from the proposed Equinox Corporate Campus development that will be located in the southwest corner of the intersection of McGinnis Ferry Road at Windward Concourse in Alpharetta, Georgia. The proposed development will consist of 600,000 square feet of office space.

The development proposes to use the existing full-access driveway on McGinnis Ferry Road, which will be converted to a right-in/right-out driveway after construction of the GA 400/McGinnis Ferry Road interchange is completed. Three additional full-access driveways are proposed on Alderman Drive as well as two right-in/right-out driveways on Windward Concourse.

Existing and future operations after completion of the project were analyzed at the intersections of:

- McGinnis Ferry Road at Windward Concourse
- Windward Concourse at Alderman Drive
- Windward Parkway at Windward Concourse/Windward Plaza
- Windward Parkway at Alderman Drive/Windward Plaza

The analysis included the evaluation of Future 2020 operations for “No-Build” and “Build” conditions, both of which account for increases in annual growth of through traffic. The results of the analysis are listed below:

System Recommendations and Improvements

A summary of the system improvements, which address deficiencies in the roadway network and can be considered as benefitting traffic that may or may not include site-generated traffic, is provided below. These are recommended for the local municipality to use in planning future transportation projects.

Summary of Recommended System Improvements

- Windward Concourse @ Alderman Drive
 - Preliminary signal warrants indicate that the intersection will meet warrants for installation of a traffic signal.
 - It is recommended a traffic signal be installed with split phasing given to the eastbound and westbound approaches.
- Windward Parkway @ Windward Concourse/Windward Plaza
 - Install a dedicated northbound left turn lane on Windward Plaza and convert the existing lanes to operate as a dedicated through and dedicated right turn lane.
- Windward Parkway @ Alderman Drive/Windward Plaza
 - Install an additional dedicated northbound left turn lane on Windward Plaza.
 - Install a second dedicated westbound left turn lane on Windward Parkway.

Site Access Configuration

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

- Site Driveway 1: Western full-access driveway on Alderman Drive
 - This driveway is proposed to consist of one entering and one exiting lane.
 - The intersection is proposed to be un-signalized with a STOP sign on the southbound approach.
 - Entering left turn movements are proposed to be made from the eastbound through lane. No dedicated turn bay is warranted. (See Appendix)
 - A westbound right turn lane is warranted for entering right turn movements per GDOT standards. (See Appendix)
- Site Driveway 2: Middle full-access driveway on Alderman Drive
 - This driveway is proposed to consist of one entering and one exiting lane.
 - The intersection is proposed to be un-signalized with a STOP sign on the southbound approach.
 - Entering left turn movements are proposed to be made from the eastbound through lane. No dedicated turn bay is warranted. (See Appendix)
 - Entering right turn movements are proposed to be made from the westbound through lane. No deceleration lane is warranted. (See Appendix)
- Site Driveway 3: Eastern full-access driveway on Alderman Drive
 - This driveway is proposed to consist of one entering and one exiting lane.
 - The intersection is proposed to be un-signalized with a STOP sign on the southbound approach.
 - Entering left turn movements are proposed to be made from the eastbound through lane. No dedicated turn bay is warranted. (See Appendix)
 - Entering right turn movements are proposed to be made from the westbound through lane. No deceleration lane is warranted. (See Appendix)
- Site Driveway 4: Southern right-in/right-out driveway on Windward Concourse
 - This driveway is proposed to consist of one entering and one exiting lane.
 - The intersection is proposed to be un-signalized with a STOP sign on the eastbound approach.
 - A southbound right turn lane is warranted for entering right turn movements per GDOT standards. (See Appendix)
- Site Driveway 5: Northern right-in/right-out driveway on Windward Concourse
 - This driveway is proposed to consist of one entering and one exiting lane.
 - The intersection is proposed to be un-signalized with a STOP sign on the eastbound approach.
 - A southbound right turn lane is warranted for entering right turn movements per GDOT standards. (See Appendix)
- Site Driveway 6: Existing full-access driveway on McGinnis Ferry Road, to be converted to a right-in/right-out driveway with construction of the McGinnis Ferry/GA 400 interchange
 - This driveway is proposed to consist of one entering and one exiting lane.
 - The intersection is proposed to be un-signalized with a STOP sign on the northbound approach.
 - It is recommended a dedicated eastbound right turn lane be constructed for entering traffic after construction of the proposed interchange project is complete.

Site Mitigation Improvements

Improvements that are identified as mitigation improvements are recommended as directly benefitting proposed site-generated traffic. A summary of the mitigation improvements is provided below.

Summary of Recommended Site Mitigation Improvements

- McGinnis Ferry Road @ Windward Concourse
 - Construct a second northbound right turn lane on Windward Concourse and install permissive + overlap right turn signal phasing.
- Windward Concourse @ Alderman Drive
 - Construct an additional dedicated eastbound left turn lane on Alderman Drive.
- Windward Parkway @ Alderman Drive/Windward Plaza
 - Install permissive + overlap right turn signal phasing for the southbound (Alderman Drive) right turn movement.

TABLE OF CONTENTS

Item	Page
Executive Summary	
1.0 Introduction	1
2.0 Study Network Determination.....	2
2.1 Existing Roadway Facilities.....	2
2.1.1 GA 400/US 19.....	2
2.1.2 McGinnis Ferry Road.....	2
2.1.3 Windward Parkway.....	3
2.1.4 Windward Concourse.....	3
2.1.5 Alderman Drive	3
2.1.6 Windward Plaza	3
2.2 Existing Bicycle and Pedestrian Facilities	3
2.2.1 Nearby local or regional trails.....	3
2.2.2 Bicycle paths or sidewalks.....	3
2.3 Existing Transit Facilities	3
3.0 Study Methodology	5
3.1 Unsignalized Intersections	5
3.2 Signalized Intersections	5
4.0 Existing Traffic Analysis.....	7
4.1 Existing Traffic Operations	7
5.0 Project Description	10
5.1 Site Plan.....	10
5.1.1 Planned Bicycle and Pedestrian Facilities	10
5.1.1.1 Planned Transit Facilities	10
5.2 Consistency with Adopted Comprehensive Plan	10
5.3 Project Phasing.....	11
5.4 Trip Generation	11
5.5 Trip Distribution	11
6.0 Future 2020 Traffic Analysis.....	14
6.1 Future “No-Build” 2020 Conditions	14
6.1.1 Annual Traffic Growth.....	14
6.1.2 Planned and Programmed Improvements in Study Area	14
6.2 Future “No-Build” Traffic Operations	17
6.2.1 Recommendations for System Improvements	17
6.3 Future “Build” Conditions	18
6.4 Site Access Configuration.....	18
6.5 Future “Build” Traffic Operations	21
6.5.1 Recommendations for Site Mitigation Improvements	22
7.0 Conclusions and Recommendations.....	24
7.1 System Recommendations and Improvements	24

7.2	Site Access Configuration.....	24
7.3	Site Mitigation Improvements	26
Appendix		

LIST OF TABLES

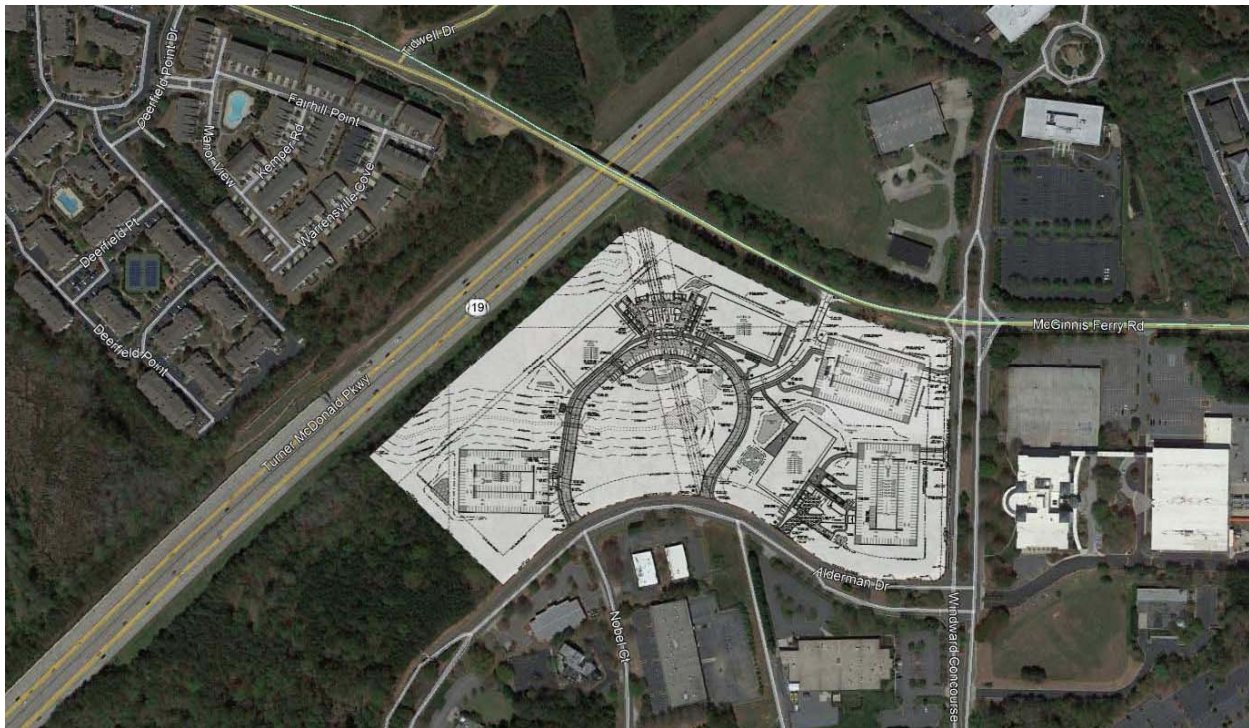
Item	Page
Table 1 – Level-of-service Criteria for Unsignalized Intersections.....	5
Table 2 – Level-of-service Criteria for Signalized Intersections	6
Table 3 – Existing Intersection Operations	7
Table 4 – Trip Generation	11
Table 5 – Planned and Programmed Improvements	14
Table 6 – Future “No-Build” Intersection Operations.....	17
Table 7 – Future “Build” Intersection Operations	21

LIST OF FIGURES

Item	Page
Figure 1 – Location Map and Study Intersections.....	4
Figure 2 – Existing Weekday Peak Hour Volumes.....	8
Figure 3 – Existing Traffic Control and Lane Geometry	9
Figure 4 – Site Plan.....	12
Figure 5 – Outer Leg Trip Distribution and Site-Generated Peak Hour Volumes	13
Figure 6 – Future (No-Build) Peak Hour Volumes	16
Figure 7 – Future (Build) Peak Hour Volumes.....	20
Figure 8 – Future Traffic Control and Lane Geometry	23

1.0 INTRODUCTION

The purpose of this study is to determine the traffic impact that will result from the proposed Equinox Corporate Campus office development located in the southwest corner of the intersection of McGinnis Ferry Road at Windward Concourse in Alpharetta, Georgia. The traffic analysis evaluates the current operations compared to the future conditions with the traffic generated by the development. The proposed development will consist of 600,000 square feet of office space.



The development proposes access at the following locations:

- Site Driveway 1: Western full-access driveway on Alderman Drive
- Site Driveway 2: Middle full-access driveway on Alderman Drive
- Site Driveway 3: Eastern full-access driveway on Alderman Drive
- Site Driveway 4: Southern right-in/right-out driveway on Windward Concourse
- Site Driveway 5: Northern right-in/right-out driveway on Windward Concourse
- Site Driveway 6: Existing full-access driveway on McGinnis Ferry Road, to be converted to a right-in/right-out driveway with construction of the McGinnis Ferry/GA 400 interchange

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

- McGinnis Ferry Road at Windward Concourse
- Windward Concourse at Alderman Drive
- Windward Parkway at Windward Concourse/Windward Plaza
- Windward Parkway at Alderman Drive/Windward Plaza

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

2.0 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, the City of Alpharetta, and Forsyth County:

1. McGinnis Ferry Road at Woodward Concourse
2. Woodward Concourse at Alderman Drive
3. Woodward Parkway at Woodward Concourse
4. Woodward Parkway at Alderman Drive

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.

2.1 Existing Roadway Facilities

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

2.1.1 GA 400/US 19

GA 400/US 19 is a north-south, four-lane, median-divided roadway with a posted speed limit of 65 mph in the vicinity of the site. GDOT traffic counts (Station IDs 1170080 & 1210461) indicate that the daily traffic volume on GA 400 in 2016 was 107,000 vehicles per day north of Union Hill Road and 90,400 vehicles per day north of Woodward Parkway. GDOT classifies GA 400 as a Principal Arterial - Freeways and Expressways roadway.

2.1.2 McGinnis Ferry Road

McGinnis Ferry Road is an east-west, two-lane, undivided roadway with a posted speed limit of 45 mph in the vicinity of the site. GDOT traffic counts (Station ID 1210961) indicate that the daily traffic volume on McGinnis Ferry Road in 2016 was 8,920 vehicles per day south of Ronald Reagan Boulevard. GDOT classifies McGinnis Ferry Road as a Minor Arterial roadway.

GDOT project PI #0007526 proposes to construct a full diamond interchange on SR 400 at McGinnis Ferry Road and to widen McGinnis Ferry Road to a six-lane, median-divided roadway with auxiliary lanes in the vicinity of the site.

2.1.3 Windward Parkway

Windward Parkway is an east-west, four-lane, median-divided roadway with a posted speed limit of 40 mph in the vicinity of the site. GDOT traffic counts (Station IDs 1210928) indicate that the daily traffic volume on Windward Parkway in 2016 was 30,200 vehicles per day east of Marconi Drive. GDOT classifies Windward Parkway as a Minor Arterial roadway.

2.1.4 Windward Concourse

Windward Concourse is a north-south, four-lane, median-divided roadway with a posted speed limit of 35 mph in the vicinity of the site.

2.1.5 Alderman Drive

Alderman Drive is a four-lane, undivided roadway with a posted speed limit of 35 mph in the vicinity of the site. GDOT traffic counts (Station ID 1218747) indicate that the daily traffic volume on Alderman Drive in 2016 was 3,050 vehicles per day west of Windward Concourse. GDOT classifies Alderman Drive as a Local roadway.

2.1.6 Windward Plaza

Windward Plaza is a two-lane, undivided roadway with a posted speed limit of 30 mph.

2.2 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:

2.2.1 Nearby local or regional trails

No trails are located in the study network area.

2.2.2 Bicycle paths or sidewalks

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

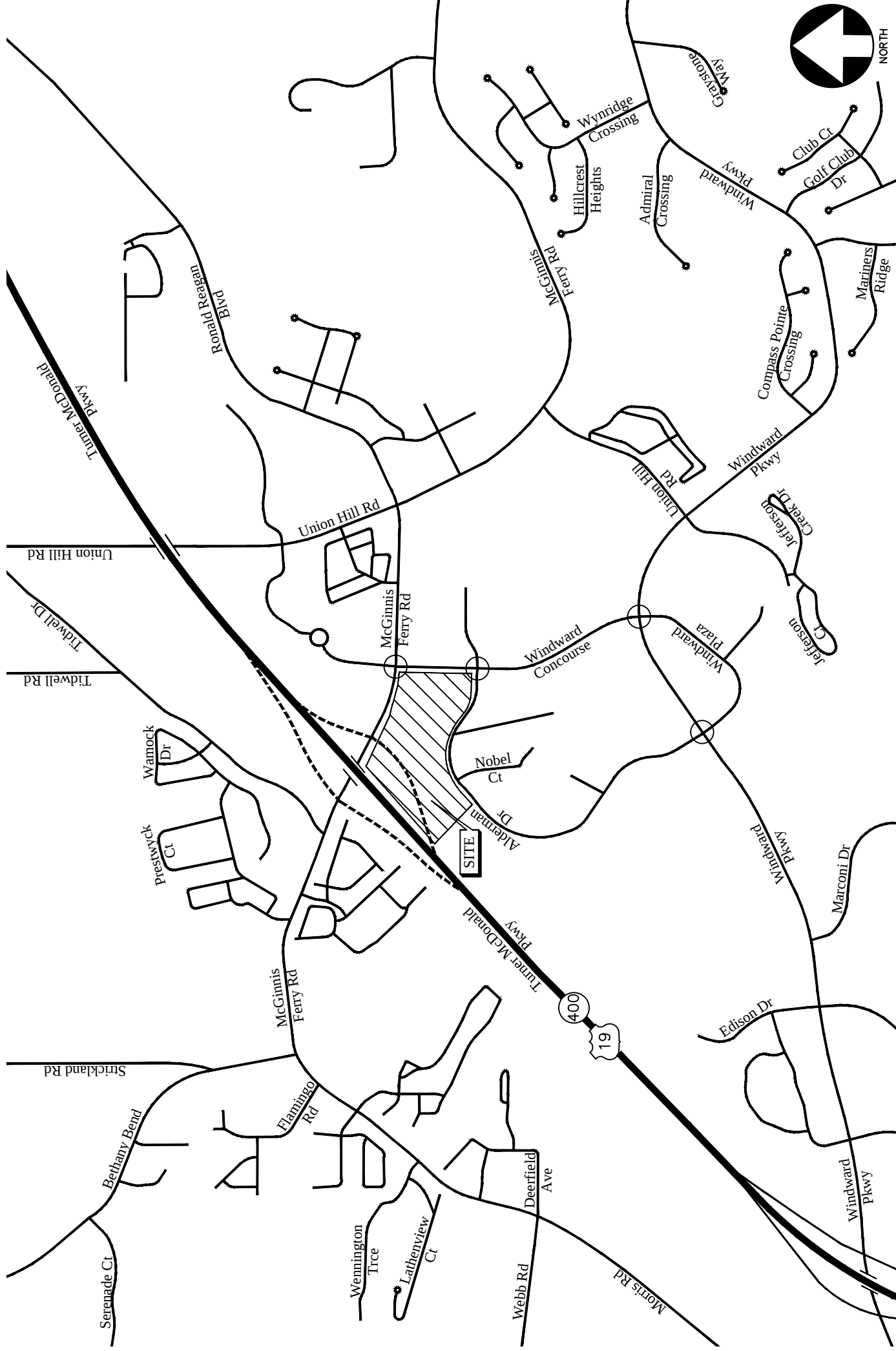
- Windward Parkway: both sides of the roadway
- Alderman Drive: west/north side of the road
- Windward Concourse: east side of the road, between McGinnis Ferry Road and Windward Parkway

Bike paths are present along the following roadways in the study network:

- The “Around Town Short Loop” bike route extends along Windward Parkway from North Point Parkway to Windward Concourse up to McGinnis Ferry Road and along to Morris Road.

2.3 Existing Transit Facilities

MARTA Bus Route 143 has a bus stop on Windward Concourse south of McGinnis Ferry Road. It operates during peak hours only, from the North Springs station to the Windward Park & Ride Lot primarily along GA 400, Windward Parkway, Morris Road, McGinnis Ferry Road, North Point Parkway and Dryden Road. Alternating service via Deerfield Parkway.



LOCATION MAP AND STUDY INTERSECTIONS

FIGURE 1

3.0 STUDY METHODOLOGY

In this study, the methodology used for evaluating traffic operations at each of the subject intersections is based on the criteria set forth in the Transportation Research Board's Highway Capacity Manual, 2010 edition (HCM 2010). Synchro software, which utilizes the HCM methodology, was used for the analysis. At specific intersections in which HCM 2010 is unable to report results, HCM 2000 will be used instead. The following is a description of the methodology employed for the analysis of unsignalized and signalized intersections.

3.1 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: Highway Capacity Manual

3.2 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: Highway Capacity Manual

4.0 EXISTING TRAFFIC ANALYSIS

Existing traffic counts were obtained at the following study intersections:

- McGinnis Ferry Road at Windward Concourse
- Windward Concourse at Alderman Drive
- Windward Parkway at Windward Concourse/Windward Plaza
- Windward Parkway at Alderman Drive/Windward Plaza

Turning movement counts were collected on Tuesday, May 22, 2018 at the intersection of Windward Parkway at Windward Concourse and on Wednesday, May 23, 2018 at the remaining intersections. All turning movement counts were recorded during the AM and PM peak hours between 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m., respectively. The four consecutive 15-minute interval volumes that summed to produce the highest volume at the intersections were then determined. These volumes make up the peak hour traffic volumes for the intersections counted and are shown in Figure 2.

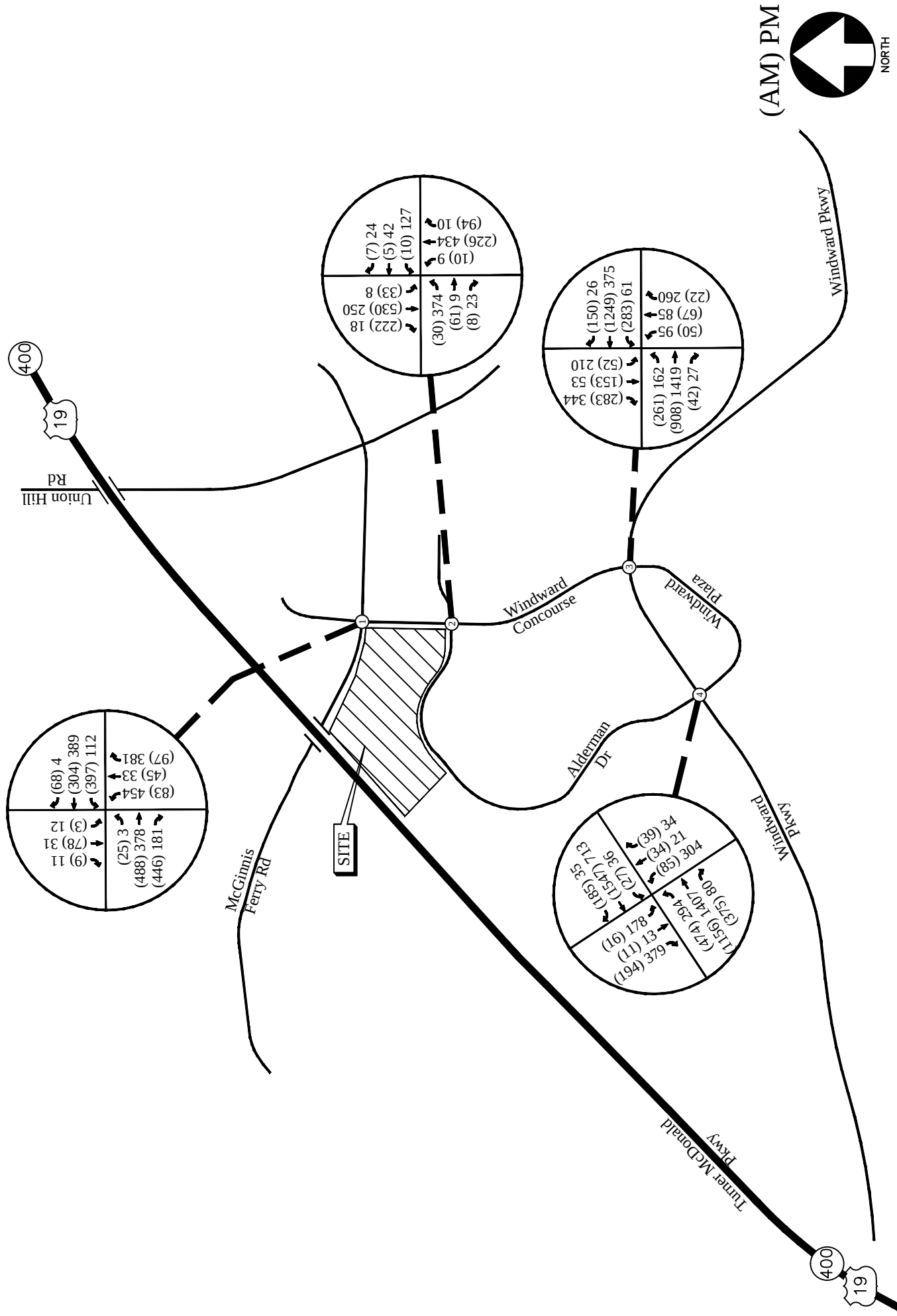
4.1 Existing Traffic Operations

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

TABLE 3 — EXISTING INTERSECTION OPERATIONS					
Intersection		Traffic Control	AM Peak	PM Peak	LOS Standard
1	<u>McGinnis Ferry Rd @ Windward Cncrs*</u>	Signalized	<u>F (97.4)</u>	<u>F (120.1)</u>	<u>E / E</u>
	-Eastbound Approach		F (124.7)	C (21.9)	-
	-Westbound Approach		E (66.5)	B (12.8)	-
	-Northbound Approach		D (45.9)	F (246.8)	-
	-Southbound Approach		F (199.1)	F (110.0)	-
2	<u>Windward Cncrs @ Alderman Dr</u>	All-Way Stop-Controlled	B (11.4)	F (78.8)	E / E
	-Eastbound Approach		B (10.4)	C (22.1)	E / E
	-Westbound Approach		B (10.7)	C (22.0)	E / E
	-Northbound Approach		C (16.8)	C (16.6)	E / E
	-Southbound Approach				
3	<u>Windward Pkwy @ Windward Cncrs*</u>	Signalized	<u>D (43.3)</u>	<u>F (80.0)</u>	<u>E / E</u>
	-Eastbound Approach		C (27.4)	C (30.4)	-
	-Westbound Approach		C (34.2)	C (27.6)	-
	-Northbound Approach		E (74.7)	F (322.5)	-
	-Southbound Approach		F (105.3)	E (75.7)	-
4	<u>Windward Pkwy @ Alderman Dr*</u>	Signalized	<u>D (40.0)</u>	<u>E (76.5)</u>	<u>E / E</u>
	-Eastbound Approach		C (29.3)	B (18.5)	-
	-Westbound Approach		D (44.7)	C (21.0)	-
	-Northbound Approach		E (78.4)	F (320.5)	-
	-Southbound Approach		E (73.2)	F (180.2)	-

*Results reported via HCM 2000

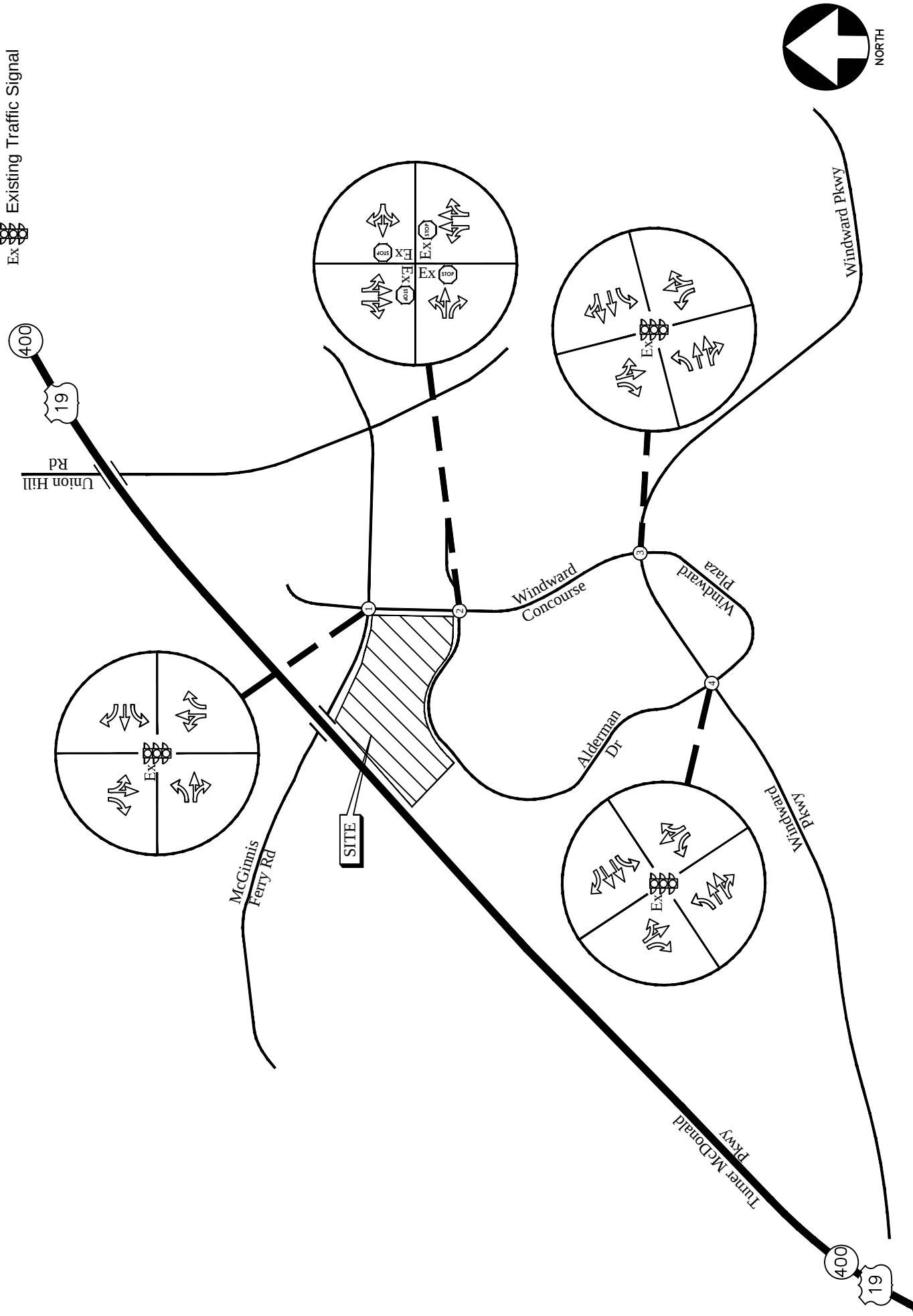
The results of existing traffic operations analysis indicate that several intersections are currently operating below an acceptable level-of-service during the AM and PM peak hours. These areas are addressed in the Future Traffic Operations section.



EXISTING WEEKDAY PEAK HOUR VOLUMES

LEGEND

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



EXISTING TRAFFIC CONTROL AND LANE GEOMETRY

5.0 PROJECT DESCRIPTION

The proposed Equinox Corporate Campus development will be located in the southwest corner of the intersection of McGinnis Ferry Road at Windward Concourse in Alpharetta, Georgia. The development will consist of 600,000 square feet of office space.

The development proposes access at the following locations:

- Site Driveway 1: Western full-access driveway on Alderman Drive
- Site Driveway 2: Middle full-access driveway on Alderman Drive
- Site Driveway 3: Eastern full-access driveway on Alderman Drive
- Site Driveway 4: Southern right-in/right-out driveway on Windward Concourse
- Site Driveway 5: Northern right-in/right-out driveway on Windward Concourse
- Site Driveway 6: Existing full-access driveway on McGinnis Ferry Road, to be converted to a right-in/right-out driveway with construction of the McGinnis Ferry/GA 400 interchange

5.1 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.

5.1.1 *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 several office buildings and separate parking structures. Pedestrian connections are proposed between each building and parking structure on the site.
- The convenience and flexibility of the site benefit from public access to adjacent streets and internal connectivity between the buildings.

5.1.1.1 *Planned Transit Facilities*

The site is not directly served by transit; however, the southeast corner of the property is currently served by MARTA bus route 143.

5.2 Consistency with Adopted Comprehensive Plan

The following is an explanation as to how the proposed DRI relates to the local government's Comprehensive Plan in particular the transportation and capital improvements element, and any transportation improvements listed in the Short-Term Work Program(s) within the vicinity of the DRI. The proposed development is included within the "Windward Activity Center" as outlined in the Alpharetta Comprehensive Plan 2035. This type of development follows the intent of the activity center by emphasizing connectivity and accommodating the unique need of corporate campuses, business parks, and the overall mixed-use environment. The proposed use of the site is in line with the regional employment hub and significant corporate presence seen throughout the area.

5.3 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.

5.4 Trip Generation

Trip generation estimates for the project were based on the rates and equations published in the 10th 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 Use: *710 – General Office Building*.

Due to the development's direct access to a MARTA Route 143 bus stop on Windward Concourse, a multimodal transportation reduction of 2% was applied based on ITE standards. The calculated trip generation for the development is shown in Table 4.

TABLE 4 – TRIP GENERATION								
Land Use	Size	AM Peak Hour			PM Peak Hour			24-Hour
		Enter	Exit	Total	Enter	Exit	Total	Two-way
General Office Building	600,000 sf	508	82	590	100	525	625	6,033
<i>Alternative Mode Reduction (2%)</i>		-10	-2	-12	-2	-11	-13	-121
Total New External Trips (with reductions)		498	80	578	98	514	612	5,912

5.5 Trip Distribution

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

HAINES GIPSON & ASSOCIATES
 CIVIL & STRUCTURAL SERVICES
 1550 NORTH BROWN ROAD, SUITE 100
 LAWRENCEVILLE, GEORGIA 30043
 PHONE: (770) 491-7750
 FAX: (770) 491-7750



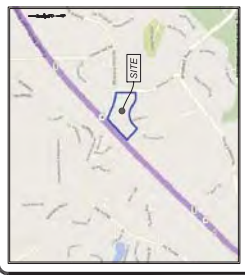
POPE & LAND ENTERPRISES, INC.
 3330 CUMBERLAND BLVD., SUITE 300
 ATLANTA, GEORGIA 30339

PROJECT EQUINOX CORPORATE CAMPUS
 1275 MCINNIS PERRY ROAD
 FULTON COUNTY, ALPHARETTA, GEORGIA 30005

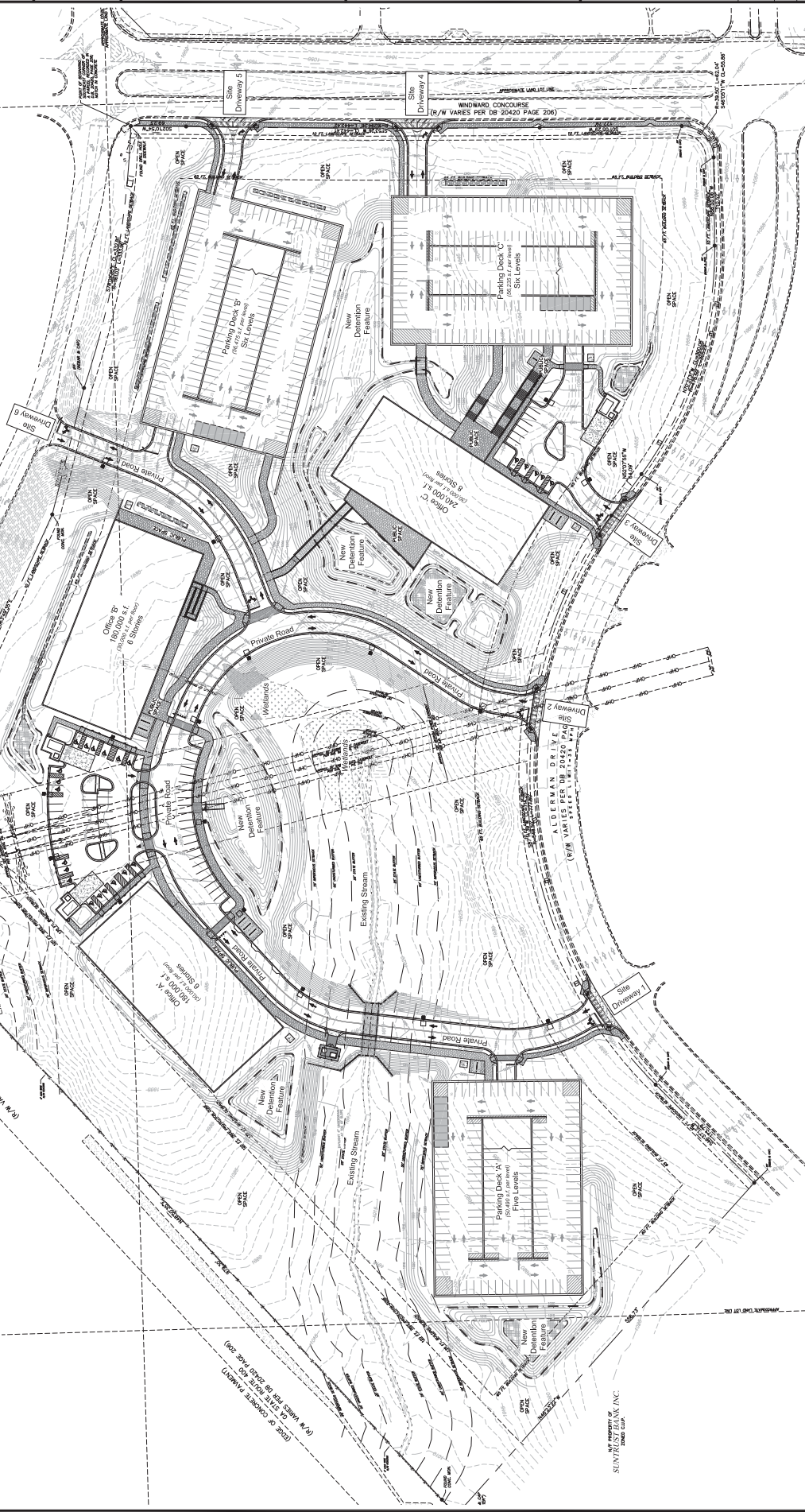
NO.	BY	DATE	DESCRIPTION
103			

DATE	09/24/2018
SHEET TITLE	GRTA DRI SITE PLAN
SHEET NUMBER	DRI-1

1. DEVELOPER
 POPE & LAND ENTERPRISES, INC.
 3330 CUMBERLAND BLVD., SUITE 300
 ATLANTA, GEORGIA 30339
 PHONE: (770) 491-7750
 FAX: (770) 491-7750
 EMAIL: pope@popeandland.com
2. CIVIL ENGINEER
 HAINES GIPSON & ASSOCIATES
 1550 NORTH BROWN ROAD, SUITE 100
 LAWRENCEVILLE, GEORGIA 30043
 CONTACT: VANCE L. FERGUSON
 PHONE: (770) 491-7750
 FAX: (770) 491-7750
 EMAIL: vance@hga.com
3. TRAFFIC ENGINEER
 A&R ENGINEERING, INC.
 1550 NORTH BROWN ROAD, SUITE 100
 LAWRENCEVILLE, GEORGIA 30043
 CONTACT: MARK A. ROSS
 PHONE: (770) 491-7750
 FAX: (770) 491-7750
 EMAIL: mark@ar-engineering.com



LOCATION MAP



GRTA DRI SITE PLAN

TRACT ACRES 26.14 AC

GREEN SPACE 6.7 ACRES 33.3%

EXISTING OPEN SPACE 17.0 ACRES 65.0%

PROPOSED OPEN SPACE 4.4 ACRES 16.7%

TOTAL GREENSPACE 21.4 ACRES 81.7%

PUBLIC SPACE 1.0 ACRES 3.9%

TOTAL BUILDING AND PARKING DECK AREA 233,200 S.F. - 5.8 AC.

TOTAL BUILDING AND PARKING DECK COVERAGE 22.2%

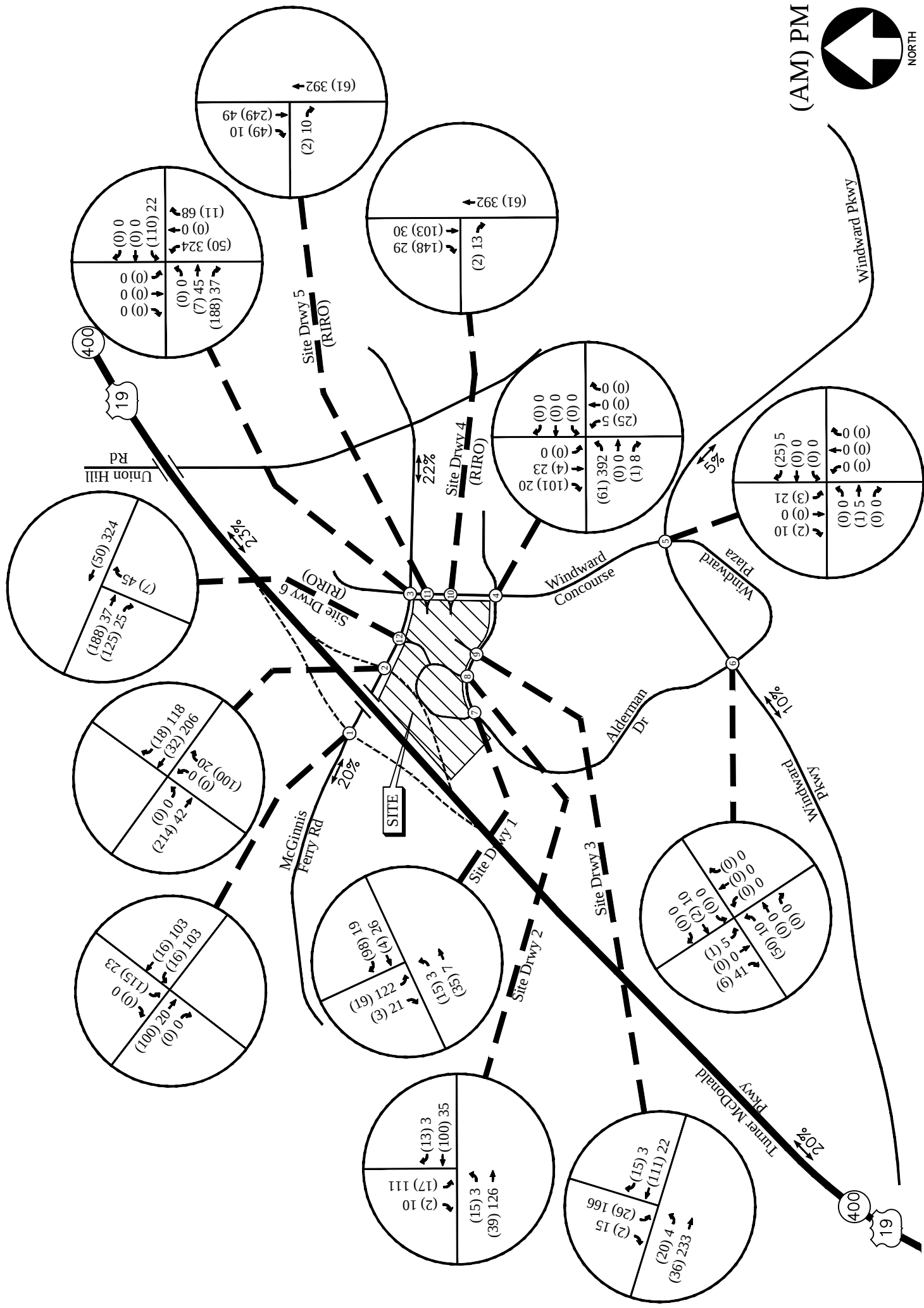
GRAPHIC SCALE
 1" = 100' (BY FEET)
 1" = 100' (BY FEET)

MINIMUM PARKING REQUIREMENTS TO BE PROVIDED BY JURISDICTIONAL REQUIREMENTS:

Site Data				Existing Requirements			
Area	No. of Spaces	Required Parking	Provided Parking	Required	Provided	Required	Provided
		Ratio	Ratio	Ratio	Ratio	Ratio	Ratio
Building	1	1:100	1:100	1:100	1:100	1:100	1:100
Office B	1	1:100	1:100	1:100	1:100	1:100	1:100
Office C	1	1:100	1:100	1:100	1:100	1:100	1:100
Parking Deck A	1	1:100	1:100	1:100	1:100	1:100	1:100
Parking Deck B	1	1:100	1:100	1:100	1:100	1:100	1:100
Parking Deck C	1	1:100	1:100	1:100	1:100	1:100	1:100
Other	1	1:100	1:100	1:100	1:100	1:100	1:100
TOTAL	5	1:100	1:100	1:100	1:100	1:100	1:100

GEORGIA811
 811 Service
 1-800-811-8111
 www.georgia811.com

UNIVERSITY OF GEORGIA
 ATLANTA



6.0 FUTURE 2020 TRAFFIC ANALYSIS

The future traffic operations are analyzed for the “No-Build” and “Build” conditions for the proposed build-out year of 2020. This provides a basis of reference for determining both the contribution of the site to overall traffic conditions and the additional improvements needed to provide sufficient site access and capacity for passing traffic.

Improvements that are identified as “System Improvements” are recommended to address deficiencies in the roadway network and can be considered as benefitting traffic that may or may not include site-generated traffic and are recommended for the municipality to use in future planning efforts. “Site Mitigation Improvements” are recommended as directly benefitting proposed site-generated traffic.

6.1 Future “No-Build” 2020 Conditions

The “No-Build” (or background) conditions provide an assessment of how traffic will operate in the study horizon year without the study site being developed as proposed, with projected increases in through traffic volumes due to normal annual growth. The Future “No-Build” volumes consist of the existing traffic volumes (Figure 2) plus increases for annual growth of through traffic.

6.1.1 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. After reviewing the historical trends, it was found that there was a consistent growth of through traffic for the surrounding area. Because the weighted average of four count locations is above 3% and after several discussions with multiple reviewing agencies, it is recommended that a background growth of 3.5% be used in the analysis. 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.

6.1.2 Planned and Programmed Improvements in Study Area

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

TABLE 5 — PLANNED AND PROGRAMMED IMPROVEMENTS				
ARC#/GDOT#/ Local#	Project	Type of Improvement	Network Year	Source
FT-324/ 0007526	GA 400 Interchange at McGinnis Ferry Road	Interchange	2022	ARC/GDOT
AR-ML-300/ 0001757	Express Lanes on SR 400 from I-285 to McFarland Parkway	Managed Lanes	Long Range (2040)	ARC/GDOT
FN-233A/ 0004634	McGinnis Ferry Road Widening from Union Hill to Sargent Road – Ph. 1	Widening	2030	ARC/GDOT
PEW09	Union Hill Road Widening from SR 400 to McFarland Parkway	Widening	2018	Forsyth County

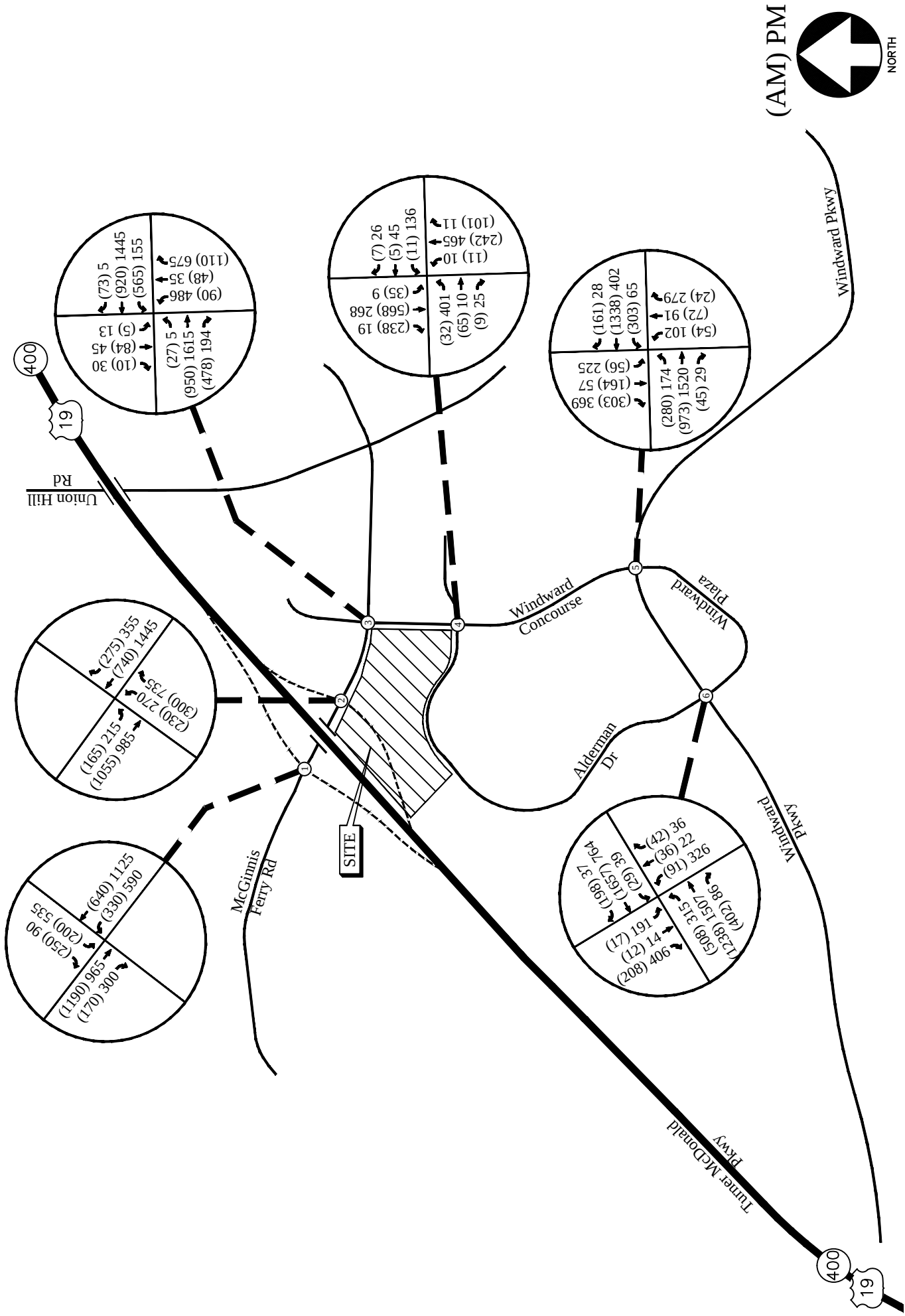
Projects included in the model for the future conditions include:

Project FT-324/0007526 (GDOT PI #0007526) would consist of constructing a full diamond interchange on SR 400 at McGinnis Ferry Road. McGinnis Ferry Road would be widened to four lanes with a 14-foot flush median from Bethany Bend to Deerfield Point Drive; four lanes with a 20-foot raised median from Deerfield Point Drive through the SR 400 interchange; and, six lanes with a 20-foot raised median from SR 400 through the intersection of Union Hill Road onto Ronald Reagan Boulevard to Counselors Way. Additional right-turn lanes and left-turn lanes would be provided along McGinnis Ferry Road at the major intersections of the project.

The project will include the following changes to the study network and are included in the Future “No-Build” and “Build” conditions:

- Widening of McGinnis Ferry Road from two lanes to six lanes with a median
- At the intersection of McGinnis Ferry Road at Windward Concourse:
 - Addition of dual left turn lanes and protected signal phasing on the eastbound and westbound approaches.
 - Addition of a separate right turn lane on the eastbound approach.
 - Removal of the westbound free-flow right turn and installation of a yield condition.
 - Addition of an additional dedicated left turn lane on the northbound approach.
- Existing full-access driveway on McGinnis Ferry Road, east of Windward Concourse, to be converted to a right-in/right-out driveway.

To account for the projected increase in volumes on the study network as part of the interchange project, the GDOT projected traffic volumes for the build year 2020 were obtained. These volumes were compared with the future estimated traffic volumes using the 3.5 percent growth factor and two year build-out. The higher volume was taken as the future 2020 traffic volume prior to addition of site traffic. The resulting Future “No-Build” volumes are shown in Figure 6.



6.2 Future “No-Build” Traffic Operations

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

TABLE 6 — FUTURE “NO-BUILD” INTERSECTION OPERATIONS						
Intersection		No-Build Condition: LOS (Delay)				LOS Standard
		NO IMPROVEMENTS		SYSTEM IMPROVEMENTS		
		AM Peak	PM Peak	AM Peak	PM Peak	
1	<u>GA 400 SB Ramps @ McGinnis Ferry Rd</u>	<u>C (23.8)</u>	<u>C (28.6)</u>	<u>C (23.8)</u>	<u>C (28.6)</u>	<u>E / E</u>
	-Eastbound Approach	B (12.9)	C (28.7)	B (12.9)	C (28.7)	-
	-Westbound Approach	C (23.0)	B (19.4)	C (23.0)	B (19.4)	-
	-Southbound Approach	E (58.0)	D (53.9)	E (58.0)	D (53.9)	-
2	<u>GA 400 NB Ramps @ McGinnis Ferry Rd</u>	<u>B (14.4)</u>	<u>C (25.1)</u>	<u>B (14.4)</u>	<u>C (25.1)</u>	<u>E / E</u>
	-Eastbound Approach	B (13.0)	B (12.9)	B (13.0)	B (12.9)	-
	-Westbound Approach	A (2.6)	C (25.0)	A (2.6)	C (25.0)	-
	-Northbound Approach	E (61.8)	E (60.5)	E (61.8)	E (60.5)	-
3	<u>McGinnis Ferry Rd @ Windward Cncrs*</u>	<u>C (30.7)</u>	<u>D (52.8)</u>	<u>C (30.7)</u>	<u>D (52.8)</u>	<u>E / E</u>
	-Eastbound Approach	C (23.1)	B (18.9)	C (23.1)	B (18.9)	-
	-Westbound Approach	C (31.2)	C (25.6)	C (31.2)	C (25.6)	-
	-Northbound Approach	E (57.7)	F (139.5)	E (57.7)	F (139.5)	-
	-Southbound Approach	E (66.1)	E (66.6)	E (66.1)	E (66.6)	-
4	<u>Windward Cncrs @ Alderman Dr</u>			<u>B (11.0)*</u>	<u>D (40.2)*</u>	<u>E / E*</u>
	-Eastbound Approach	B (11.8)	F (108.4)	D (54.6)	E (56.3)	E / E
	-Westbound Approach	B (10.6)	D (25.1)	E (58.0)	E (59.8)	E / E
	-Northbound Approach	B (11.3)	D (25.2)	A (5.2)	C (26.9)	E / E
	-Southbound Approach	C (19.5)	C (17.9)	A (6.7)	C (24.6)	E / E
5	<u>Windward Pkwy @ Windward Cncrs*</u>	<u>D (48.2)</u>	<u>F (90.6)</u>	<u>D (47.3)</u>	<u>D (51.7)</u>	<u>E / E</u>
	-Eastbound Approach	C (28.3)	C (34.0)	C (28.2)	C (34.2)	-
	-Westbound Approach	D (40.3)	C (29.6)	D (39.1)	C (29.6)	-
	-Northbound Approach	E (76.7)	F (376.8)	E (70.8)	F (100.7)	-
	-Southbound Approach	F (116.4)	E (79.2)	F (116.4)	E (79.2)	-
6	<u>Windward Pkwy @ Alderman Dr*</u>	<u>D (51.3)</u>	<u>F (88.0)</u>	<u>C (31.9)</u>	<u>E (64.4)</u>	<u>E / E</u>
	-Eastbound Approach	D (35.3)	C (20.7)	C (25.1)	C (29.4)	-
	-Westbound Approach	E (63.9)	C (22.8)	C (30.4)	C (23.8)	-
	-Northbound Approach	E (78.6)	F (362.8)	E (76.6)	F (87.4)	-
	-Southbound Approach	E (73.2)	F (215.1)	E (73.2)	F (215.1)	-

*Results reported via HCM 2000

6.2.1 Recommendations for System Improvements

A summary of the system improvements, which address deficiencies in the roadway network and can be considered as benefitting traffic that may or may not include site-generated traffic, is provided below. These are recommended for the local municipality to use in planning future transportation projects.

Summary of Recommended System Improvements

- Windward Concourse @ Alderman Drive
 - Preliminary signal warrants indicate that the intersection will meet warrants for installation of a traffic signal.
 - It is recommended a traffic signal be installed with split phasing given to the eastbound and westbound approaches.
- Windward Parkway @ Windward Concourse/Windward Plaza
 - Install a dedicated northbound left turn lane on Windward Plaza and convert the existing lanes to operate as a dedicated through and dedicated right turn lane.
- Windward Parkway @ Alderman Drive/Windward Plaza
 - Install an additional dedicated northbound left turn lane on Windward Plaza.
 - Install a second dedicated westbound left turn lane on Windward Parkway.

6.3 Future “Build” Conditions

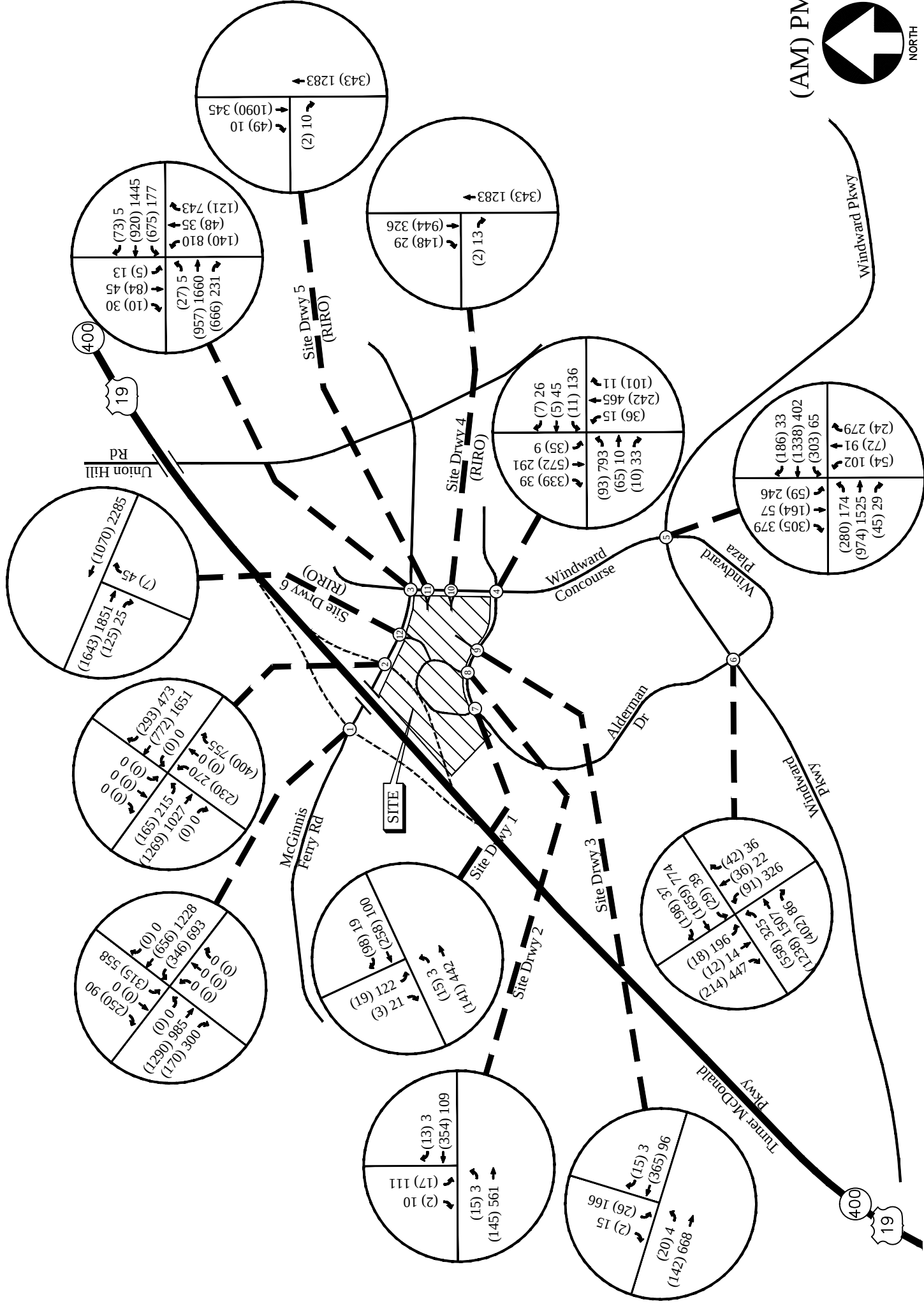
The “Build” or development conditions include the estimated background traffic from the “No-Build” conditions plus the added traffic from the proposed development. In order to evaluate future traffic operations in this area, the additional traffic volumes from the site (Figure 5) were added to base traffic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

6.4 Site Access Configuration

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

- Site Driveway 1: Western full-access driveway on Alderman Drive
 - This driveway is proposed to consist of one entering and one exiting lane.
 - The intersection is proposed to be un-signalized with a STOP sign on the southbound approach.
 - Entering left turn movements are proposed to be made from the eastbound through lane. No dedicated turn bay is warranted. (See Appendix)
 - A westbound right turn lane is warranted for entering right turn movements per GDOT standards. (See Appendix)
- Site Driveway 2: Middle full-access driveway on Alderman Drive
 - This driveway is proposed to consist of one entering and one exiting lane.
 - The intersection is proposed to be un-signalized with a STOP sign on the southbound approach.
 - Entering left turn movements are proposed to be made from the eastbound through lane. No dedicated turn bay is warranted. (See Appendix)
 - Entering right turn movements are proposed to be made from the westbound through lane. No deceleration lane is warranted. (See Appendix)

- Site Driveway 3: Eastern full-access driveway on Alderman Drive
 - This driveway is proposed to consist of one entering and one exiting lane.
 - The intersection is proposed to be un-signalized with a STOP sign on the southbound approach.
 - Entering left turn movements are proposed to be made from the eastbound through lane. No dedicated turn bay is warranted. (See Appendix)
 - Entering right turn movements are proposed to be made from the westbound through lane. No deceleration lane is warranted. (See Appendix)
- Site Driveway 4: Southern right-in/right-out driveway on Windward Concourse
 - This driveway is proposed to consist of one entering and one exiting lane.
 - The intersection is proposed to be un-signalized with a STOP sign on the eastbound approach.
 - A southbound right turn lane is warranted for entering right turn movements per GDOT standards. (See Appendix)
- Site Driveway 5: Northern right-in/right-out driveway on Windward Concourse
 - This driveway is proposed to consist of one entering and one exiting lane.
 - The intersection is proposed to be un-signalized with a STOP sign on the eastbound approach.
 - A southbound right turn lane is warranted for entering right turn movements per GDOT standards. (See Appendix)
- Site Driveway 6: Existing full-access driveway on McGinnis Ferry Road, to be converted to a right-in/right-out driveway with construction of the McGinnis Ferry/GA 400 interchange
 - This driveway is proposed to consist of one entering and one exiting lane.
 - The intersection is proposed to be un-signalized with a STOP sign on the northbound approach.
 - It is recommended a dedicated eastbound right turn lane be constructed for entering traffic after construction of the proposed interchange project is complete.



6.5 Future “Build” Traffic Operations

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

TABLE 7 — FUTURE “BUILD” INTERSECTION OPERATIONS						
Intersection		Build Condition: LOS (Delay)				LOS Standard
		NO IMPROVEMENTS		WITH IMPROVEMENTS		
		AM Peak	PM Peak	AM Peak	PM Peak	
1	<u>GA 400 SB Ramps @ McGinnis Ferry Rd</u>	<u>C (26.3)</u>	<u>C (30.8)</u>	<u>C (26.3)</u>	<u>C (30.8)</u>	<u>E / E</u>
	-Eastbound Approach	B (16.8)	C (32.0)	B (16.8)	C (32.0)	-
	-Westbound Approach	C (24.1)	C (22.1)	C (24.1)	C (22.1)	-
	-Southbound Approach	D (54.8)	D (54.5)	D (54.8)	D (54.5)	-
2	<u>GA 400 NB Ramps @ McGinnis Ferry Rd</u>	<u>B (14.6)</u>	<u>C (22.3)</u>	<u>B (14.6)</u>	<u>C (22.3)</u>	<u>E / E</u>
	-Eastbound Approach	B (12.2)	B (13.0)	B (12.2)	B (13.0)	-
	-Westbound Approach	A (4.1)	C (20.0)	A (4.1)	C (20.0)	-
	-Northbound Approach	E (61.7)	E (60.8)	E (61.7)	E (60.8)	-
3	<u>McGinnis Ferry Rd @ Windward Cncrs*</u>	<u>C (33.1)</u>	<u>F (91.9)</u>	<u>C (32.3)</u>	<u>E (56.3)</u>	<u>E / E</u>
	-Eastbound Approach	C (24.3)	B (18.3)	C (24.3)	B (18.3)	-
	-Westbound Approach	D (35.2)	C (27.1)	D (35.2)	C (27.1)	-
	-Northbound Approach	E (58.3)	F (247.3)	D (48.7)	F (130.9)	-
	-Southbound Approach	E (66.1)	E (66.6)	E (66.1)	E (66.6)	-
4	<u>Windward Cncrs @ Alderman Dr</u>			<u>B (12.6)*</u>	<u>D (43.8)*</u>	<u>E / E*</u>
	-Eastbound Approach	B (14.6)	F (575.6)	E (56.5)	E (56.2)	E / E
	-Westbound Approach	B (11.3)	D (31.5)	E (59.9)	E (60.5)	E / E
	-Northbound Approach	B (12.8)	D (31.9)	A (5.1)	C (27.8)	E / E
	-Southbound Approach	E (41.0)	C (23.7)	A (6.6)	C (25.8)	E / E
5	<u>Windward Pkwy @ Windward Cncrs*</u>	<u>D (49.3)</u>	<u>F (92.3)</u>	<u>D (48.5)</u>	<u>D (53.8)</u>	<u>E / E</u>
	-Eastbound Approach	C (28.4)	C (34.6)	C (28.4)	C (34.7)	-
	-Westbound Approach	D (41.6)	C (29.9)	D (40.4)	C (29.9)	-
	-Northbound Approach	E (76.7)	F (376.8)	E (71.1)	F (100.5)	-
	-Southbound Approach	F (119.9)	F (87.3)	F (119.9)	F (87.3)	-
6	<u>Windward Pkwy @ Alderman Dr*</u>	<u>E (57.1)</u>	<u>F (103.9)</u>	<u>C (31.7)</u>	<u>E (57.4)</u>	<u>E / E</u>
	-Eastbound Approach	D (47.3)	C (21.2)	C (25.6)	C (27.9)	-
	-Westbound Approach	E (64.6)	C (22.9)	C (31.7)	C (26.2)	-
	-Northbound Approach	E (78.6)	F (362.7)	E (76.2)	F (87.3)	-
	-Southbound Approach	E (73.2)	F (299.5)	E (55.8)	F (166.7)	-
7	<u>Alderman Dr @ Site Drwy 1 (W)</u>					
	-Eastbound Left	A (8.1)	A (7.5)	A (8.1)	A (7.5)	E / E
	-Southbound Approach	B (11.7)	B (12.6)	B (11.7)	B (12.6)	E / E
8	<u>Alderman Dr @ Site Drwy 2 (M)</u>					
	-Eastbound Left	A (8.2)	A (7.5)	A (8.2)	A (7.5)	E / E
	-Southbound Approach	B (12.3)	B (13.5)	B (12.3)	B (13.5)	E / E
9	<u>Alderman Dr @ Site Drwy 3 (E)</u>					
	-Eastbound Left	A (8.2)	A (7.4)	A (8.2)	A (7.4)	E / E
	-Southbound Approach	B (12.9)	C (16.1)	B (12.9)	C (16.1)	E / E
Table continued on next page...						

Table continued on next page...

Intersection		NO IMPROVEMENTS		WITH IMPROVEMENTS		LOS Standard
		AM Peak	PM Peak	AM Peak	PM Peak	
10	<u>Windward Concourse @ Site Drwy 4 (S)</u> -Eastbound Right	B (12.1)	A (9.4)	B (12.1)	A (9.4)	E / E
11	<u>Windward Concourse @ Site Drwy 5 (N)</u> -Eastbound Right	B (13.1)	A (9.4)	B (13.1)	A (9.4)	E / E
12	<u>McGinnis Ferry Rd @ Site Drwy 6</u> -Northbound Right	C (20.2)	D (27.8)	C (20.2)	D (27.8)	E / E

**Results reported via HCM 2000*

6.5.1 Recommendations for Site Mitigation Improvements

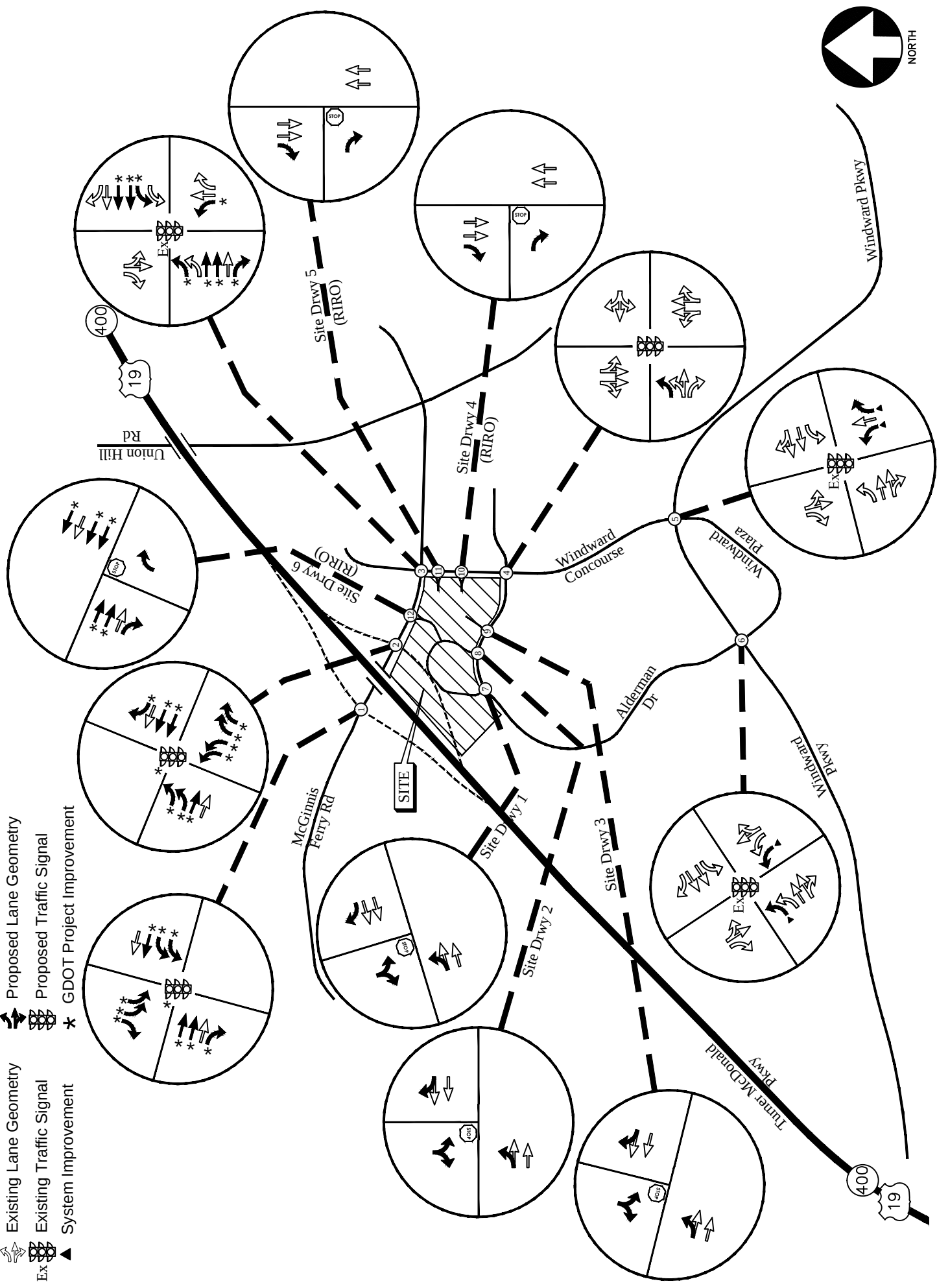
Improvements that are identified as mitigation improvements are recommended as directly benefitting proposed site-generated traffic. A summary of the mitigation improvements is provided below.

Summary of Recommended Site Mitigation Improvements

- **McGinnis Ferry Road @ Windward Concourse**
 - Construct a second northbound right turn lane on Windward Concourse and install permissive + overlap right turn signal phasing.
- **Windward Concourse @ Alderman Drive**
 - Construct an additional dedicated eastbound left turn lane on Alderman Drive.
- **Windward Parkway @ Alderman Drive/Windward Plaza**
 - Install permissive + overlap right turn signal phasing for the southbound (Alderman Drive) right turn movement.

LEGEND

- Ex Existing Signed Approach
- Ex Existing Lane Geometry
- Ex Existing Traffic Signal
- ▲ System Improvement
- Prop Proposed Signed Approach
- Prop Proposed Lane Geometry
- Prop Proposed Traffic Signal
- * GDOT Project Improvement



FUTURE TRAFFIC CONTROL AND LANE GEOMETRY

FIGURE 8

7.0 CONCLUSIONS AND RECOMMENDATIONS

Traffic impacts were evaluated for the added traffic from the proposed Equinox Corporate Campus development that will be located in the southwest corner of the intersection of McGinnis Ferry Road at Windward Concourse in Alpharetta, Georgia. The proposed development will consist of 600,000 square feet of office space.

The development proposes to use the existing full-access driveway on McGinnis Ferry Road, which will be converted to a right-in/right-out driveway after construction of the GA 400/McGinnis Ferry Road interchange is completed. Three additional full-access driveways are proposed on Alderman Drive as well as two right-in/right-out driveways on Windward Concourse.

Existing and future operations after completion of the project were analyzed at the intersections of:

- McGinnis Ferry Road at Windward Concourse
- Windward Concourse at Alderman Drive
- Windward Parkway at Windward Concourse/Windward Plaza
- Windward Parkway at Alderman Drive/Windward Plaza

The analysis included the evaluation of Future 2020 operations for “No-Build” and “Build” conditions, both of which account for increases in annual growth of through traffic. The results of the analysis are listed below:

7.1 System Recommendations and Improvements

A summary of the system improvements, which address deficiencies in the roadway network and can be considered as benefitting traffic that may or may not include site-generated traffic, is provided below. These are recommended for the local municipality to use in planning future transportation projects.

Summary of Recommended System Improvements

- Windward Concourse @ Alderman Drive
 - Preliminary signal warrants indicate that the intersection will meet warrants for installation of a traffic signal.
 - It is recommended a traffic signal be installed with split phasing given to the eastbound and westbound approaches.
- Windward Parkway @ Windward Concourse/Windward Plaza
 - Install a dedicated northbound left turn lane on Windward Plaza and convert the existing lanes to operate as a dedicated through and dedicated right turn lane.
- Windward Parkway @ Alderman Drive/Windward Plaza
 - Install an additional dedicated northbound left turn lane on Windward Plaza.
 - Install a second dedicated westbound left turn lane on Windward Parkway.

7.2 Site Access Configuration

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

- Site Driveway 1: Western full-access driveway on Alderman Drive
 - This driveway is proposed to consist of one entering and one exiting lane.
 - The intersection is proposed to be un-signalized with a STOP sign on the southbound approach.
 - Entering left turn movements are proposed to be made from the eastbound through lane. No dedicated turn bay is warranted. (See Appendix)
 - A westbound right turn lane is warranted for entering right turn movements per GDOT standards. (See Appendix)
- Site Driveway 2: Middle full-access driveway on Alderman Drive
 - This driveway is proposed to consist of one entering and one exiting lane.
 - The intersection is proposed to be un-signalized with a STOP sign on the southbound approach.
 - Entering left turn movements are proposed to be made from the eastbound through lane. No dedicated turn bay is warranted. (See Appendix)
 - Entering right turn movements are proposed to be made from the westbound through lane. No deceleration lane is warranted. (See Appendix)
- Site Driveway 3: Eastern full-access driveway on Alderman Drive
 - This driveway is proposed to consist of one entering and one exiting lane.
 - The intersection is proposed to be un-signalized with a STOP sign on the southbound approach.
 - Entering left turn movements are proposed to be made from the eastbound through lane. No dedicated turn bay is warranted. (See Appendix)
 - Entering right turn movements are proposed to be made from the westbound through lane. No deceleration lane is warranted. (See Appendix)
- Site Driveway 4: Southern right-in/right-out driveway on Windward Concourse
 - This driveway is proposed to consist of one entering and one exiting lane.
 - The intersection is proposed to be un-signalized with a STOP sign on the eastbound approach.
 - A southbound right turn lane is warranted for entering right turn movements per GDOT standards. (See Appendix)
- Site Driveway 5: Northern right-in/right-out driveway on Windward Concourse
 - This driveway is proposed to consist of one entering and one exiting lane.
 - The intersection is proposed to be un-signalized with a STOP sign on the eastbound approach.
 - A southbound right turn lane is warranted for entering right turn movements per GDOT standards. (See Appendix)
- Site Driveway 6: Existing full-access driveway on McGinnis Ferry Road, to be converted to a right-in/right-out driveway with construction of the McGinnis Ferry/GA 400 interchange
 - This driveway is proposed to consist of one entering and one exiting lane.
 - The intersection is proposed to be un-signalized with a STOP sign on the northbound approach.
 - It is recommended a dedicated eastbound right turn lane be constructed for entering traffic after construction of the proposed interchange project is complete.

7.3 Site Mitigation Improvements

Improvements that are identified as mitigation improvements are recommended as directly benefitting proposed site-generated traffic. A summary of the mitigation improvements is provided below.

Summary of Recommended Site Mitigation Improvements

- McGinnis Ferry Road @ Windward Concourse
 - Construct a second northbound right turn lane on Windward Concourse and install permissive + overlap right turn signal phasing.
- Windward Concourse @ Alderman Drive
 - Construct an additional dedicated eastbound left turn lane on Alderman Drive.
- Windward Parkway @ Alderman Drive/Windward Plaza
 - Install permissive + overlap right turn signal phasing for the southbound (Alderman Drive) right turn movement.

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” Improved Intersection Analysis.....	
Future “Build” Intersection Analysis	
Future “Build” Improved Intersection Analysis	
Traffic Volume Worksheets	

EXISTING INTERSECTION TRAFFIC COUNTS

A&R Engineering, Inc.

2160 Kingston Court, Suite O
Marietta, GA 30067

TMC Data

McGinnis Ferry Road at Winward Concourse

07-09am - 04-06pm

File Name : 20180116

Site Code : 20180116

Start Date : 5/23/2018

Page No : 1

Groups Printed- Cars, Buses & Trucks

	Winward Concourse Northbound				Winward Concourse Southbound				McGinnis Ferry Road Eastbound				McGinnis Ferry Road Westbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	14	4	17	35	0	2	4	6	5	67	57	129	67	46	5	118	288
07:15 AM	13	8	10	31	0	1	3	4	2	106	65	173	100	54	15	169	377
07:30 AM	19	16	17	52	0	9	1	10	2	102	96	200	108	73	20	201	463
07:45 AM	23	12	18	53	0	9	1	10	4	96	105	205	116	62	10	188	456
Total	69	40	62	171	0	21	9	30	13	371	323	707	391	235	50	676	1584
08:00 AM	23	10	25	58	1	22	2	25	9	115	108	232	118	68	18	204	519
08:15 AM	17	9	20	46	0	17	1	18	6	124	102	232	104	78	16	198	494
08:30 AM	25	10	20	55	0	24	4	28	6	108	121	235	89	79	17	185	503
08:45 AM	18	16	32	66	2	15	2	19	4	141	115	260	86	79	17	182	527
Total	83	45	97	225	3	78	9	90	25	488	446	959	397	304	68	769	2043
*** BREAK ***																	
04:00 PM	70	8	82	160	4	13	0	17	1	111	31	143	14	87	2	103	423
04:15 PM	71	4	84	159	6	6	6	18	1	91	37	129	24	81	0	105	411
04:30 PM	84	5	88	177	2	13	1	16	1	119	41	161	26	86	1	113	467
04:45 PM	110	9	91	210	2	6	1	9	1	115	41	157	32	82	1	115	491
Total	335	26	345	706	14	38	8	60	4	436	150	590	96	336	4	436	1792
05:00 PM	122	7	116	245	4	9	2	15	1	98	42	141	33	103	1	137	538
05:15 PM	113	11	96	220	1	7	2	10	0	86	39	125	26	108	0	134	489
05:30 PM	109	6	78	193	5	9	6	20	1	79	59	139	21	96	2	119	471
05:45 PM	84	7	67	158	6	9	5	20	1	94	46	141	27	109	1	137	456
Total	428	31	357	816	16	34	15	65	3	357	186	546	107	416	4	527	1954
Grand Total	915	142	861	1918	33	171	41	245	45	1652	1105	2802	991	1291	126	2408	7373
Apprch %	47.7	7.4	44.9		13.5	69.8	16.7		1.6	59	39.4		41.2	53.6	5.2		
Total %	12.4	1.9	11.7	26	0.4	2.3	0.6	3.3	0.6	22.4	15	38	13.4	17.5	1.7	32.7	

A&R Engineering, Inc.

2160 Kingston Court, Suite O
Marietta, GA 30067

TMC Data

Windward Concourse @ Alderman Drive

07-09am - 04-06pm

File Name : 20180115

Site Code : 20180115

Start Date : 5/23/2018

Page No : 1

Groups Printed- Cars, Buses & Trucks

	Winward Course Northbound				Winward Course Southbound				Alderman Drive Eastbound				Private Driveway Westbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	3	30	10	43	1	75	45	121	11	2	0	13	1	1	1	3	180
07:15 AM	3	23	8	34	3	91	50	144	19	11	2	32	1	0	0	1	211
07:30 AM	3	31	16	50	6	103	60	169	16	8	3	27	1	0	1	2	248
07:45 AM	5	46	16	67	3	141	54	198	9	16	5	30	1	2	1	4	299
Total	14	130	50	194	13	410	209	632	55	37	10	102	4	3	3	10	938
08:00 AM	2	52	20	74	7	132	51	190	6	18	4	28	3	1	0	4	296
08:15 AM	3	54	24	81	12	134	60	206	7	13	1	21	3	1	5	9	317
08:30 AM	2	58	27	87	8	135	58	201	8	16	2	26	2	2	1	5	319
08:45 AM	3	62	23	88	6	129	53	188	9	14	1	24	2	1	1	4	304
Total	10	226	94	330	33	530	222	785	30	61	8	99	10	5	7	22	1236
*** BREAK ***																	
04:00 PM	1	92	2	95	2	49	3	54	62	0	5	67	19	8	1	28	244
04:15 PM	2	63	1	66	4	47	5	56	72	7	4	83	23	5	2	30	235
04:30 PM	1	86	3	90	3	73	4	80	75	3	5	83	25	11	1	37	290
04:45 PM	1	88	4	93	3	59	6	68	104	2	3	109	35	9	7	51	321
Total	5	329	10	344	12	228	18	258	313	12	17	342	102	33	11	146	1090
05:00 PM	5	134	1	140	1	67	3	71	97	2	10	109	39	11	9	59	379
05:15 PM	2	126	2	130	1	51	5	57	98	2	5	105	28	11	7	46	338
05:30 PM	1	96	2	99	4	61	2	67	83	1	7	91	25	5	3	33	290
05:45 PM	1	80	1	82	0	51	4	55	61	4	1	66	28	8	1	37	240
Total	9	436	6	451	6	230	14	250	339	9	23	371	120	35	20	175	1247
Grand Total	38	1121	160	1319	64	1398	463	1925	737	119	58	914	236	76	41	353	4511
Apprch %	2.9	85	12.1		3.3	72.6	24.1		80.6	13	6.3		66.9	21.5	11.6		
Total %	0.8	24.9	3.5	29.2	1.4	31	10.3	42.7	16.3	2.6	1.3	20.3	5.2	1.7	0.9	7.8	

A&R Engineering, Inc.

2160 Kingston Court, Suite O
Marietta, GA 30067

TMC Data

Winward Parkway @ Winward Concourse

07-09am - 04-06pm

File Name : 20180114

Site Code : 20180114

Start Date : 5/22/2018

Page No : 1

Groups Printed- Cars, Buses & Trucks

	Winward Concourse Northbound				Winward Concourse Southbound				Winward Parkway Eastbound				Winward Parkway Westbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	6	10	4	20	8	11	37	56	28	103	6	137	43	219	22	284	497
07:15 AM	8	13	3	24	8	15	45	68	66	124	7	197	84	266	35	385	674
07:30 AM	14	15	6	35	10	31	56	97	66	172	26	264	66	291	42	399	795
07:45 AM	13	20	10	43	15	30	74	119	75	197	12	284	68	303	42	413	859
Total	41	58	23	122	41	87	212	340	235	596	51	882	261	1079	141	1481	2825
08:00 AM	14	18	3	35	10	36	82	128	66	228	11	305	68	315	43	426	894
08:15 AM	11	14	4	29	12	42	64	118	54	230	11	295	72	326	34	432	874
08:30 AM	12	15	5	32	15	45	63	123	66	253	8	327	75	305	31	411	893
08:45 AM	13	19	7	39	13	37	66	116	75	216	2	293	78	279	27	384	832
Total	50	66	19	135	50	160	275	485	261	927	32	1220	293	1225	135	1653	3493
*** BREAK ***																	
04:00 PM	15	20	40	75	48	13	74	135	22	330	9	361	13	98	3	114	685
04:15 PM	23	15	21	59	51	6	75	132	27	322	7	356	14	103	3	120	667
04:30 PM	19	19	53	91	59	14	89	162	35	304	3	342	13	96	1	110	705
04:45 PM	21	17	52	90	60	13	88	161	50	323	11	384	14	101	6	121	756
Total	78	71	166	315	218	46	326	590	134	1279	30	1443	54	398	13	465	2813
05:00 PM	21	17	52	90	60	12	90	162	37	399	6	442	23	95	6	124	818
05:15 PM	25	23	77	125	55	15	89	159	39	349	5	393	13	92	8	113	790
05:30 PM	28	28	79	135	35	13	77	125	36	348	5	389	11	87	6	104	753
05:45 PM	51	17	70	138	18	23	61	102	34	303	3	340	12	85	7	104	684
Total	125	85	278	488	168	63	317	548	146	1399	19	1564	59	359	27	445	3045
Grand Total	294	280	486	1060	477	356	1130	1963	776	4201	132	5109	667	3061	316	4044	12176
Apprch %	27.7	26.4	45.8		24.3	18.1	57.6		15.2	82.2	2.6		16.5	75.7	7.8		
Total %	2.4	2.3	4	8.7	3.9	2.9	9.3	16.1	6.4	34.5	1.1	42	5.5	25.1	2.6	33.2	

A&R Engineering, Inc.

2160 Kingston Court, Suite O
Marietta, GA 30067

TMC Data

Winward Parkway Alderman Ddrive

07-09am - 04-06pm

File Name : 20180113

Site Code : 20180113

Start Date : 5/23/2018

Page No : 1

Groups Printed- Cars, Buses & Trucks

	Alderman Drive Northbound				Alderman Drive Southbound				Windward Parkway Eastbound				Windward Parkway Westbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	25	2	9	36	3	0	27	30	63	125	31	219	1	183	21	205	490
07:15 AM	21	9	11	41	2	2	32	36	83	184	52	319	3	257	28	288	684
07:30 AM	18	9	12	39	3	0	43	46	92	249	81	422	3	198	39	240	747
07:45 AM	20	12	13	45	5	6	45	56	104	266	96	466	8	393	49	450	1017
Total	84	32	45	161	13	8	147	168	342	824	260	1426	15	1031	137	1183	2938
08:00 AM	19	10	11	40	4	0	43	47	139	290	116	545	4	335	50	389	1021
08:15 AM	24	5	8	37	3	3	50	56	112	284	74	470	11	421	27	459	1022
08:30 AM	22	7	7	36	4	2	56	62	119	316	89	524	4	398	59	461	1083
08:45 AM	20	4	6	30	5	0	58	63	105	282	87	474	3	389	48	440	1007
Total	85	26	32	143	16	5	207	228	475	1172	366	2013	22	1543	184	1749	4133
*** BREAK ***																	
04:00 PM	51	5	8	64	29	2	88	119	59	324	20	403	5	194	7	206	792
04:15 PM	46	7	9	62	24	3	87	114	47	325	12	384	6	191	7	204	764
04:30 PM	63	5	8	76	30	5	95	130	43	304	20	367	8	183	11	202	775
04:45 PM	70	5	11	86	37	4	91	132	72	336	24	432	13	161	7	181	831
Total	230	22	36	288	120	14	361	495	221	1289	76	1586	32	729	32	793	3162
05:00 PM	92	5	7	104	53	4	112	169	67	382	21	470	8	203	5	216	959
05:15 PM	79	7	7	93	45	3	105	153	87	357	25	469	8	194	9	211	926
05:30 PM	63	4	9	76	43	2	71	116	68	332	10	410	7	155	14	176	778
05:45 PM	45	1	4	50	23	4	44	71	46	310	16	372	3	134	2	139	632
Total	279	17	27	323	164	13	332	509	268	1381	72	1721	26	686	30	742	3295
Grand Total	678	97	140	915	313	40	1047	1400	1306	4666	774	6746	95	3989	383	4467	13528
Apprch %	74.1	10.6	15.3		22.4	2.9	74.8		19.4	69.2	11.5		2.1	89.3	8.6		
Total %	5	0.7	1	6.8	2.3	0.3	7.7	10.3	9.7	34.5	5.7	49.9	0.7	29.5	2.8	33	

GRTA LETTER OF UNDERSTANDING



REVISED LETTER OF UNDERSTANDING

August 27, 2018

Thomas Barranco
Pope and Land
100 City View
3330 Cumberland Boulevard, SE
Suite 300
Atlanta, GA 30339

RE: **DRI 2809 Equinox Corporate Campus**

Dear Mr. Barranco:

The purpose of this letter is to document the discussions during the Pre-Review and Methodology Meetings held at ARC's office on May 7, 2018, a meeting held at GRTA's office on June 21, 2018, and ongoing communication with stakeholders regarding **DRI 2809 Equinox Corporate Campus**. Some of the following items were discussed in this meeting and should assist you and your consultant team in preparing the DRI Review Package.

PROJECT OVERVIEW

- The project is located in the City of Alpharetta southeast of the intersection of McGinnis Ferry Road at Windward Concourse.
- The DRI trigger for this development is a Land Disturbance Permit.
- The project is planned as an office development with 600,000 square feet of office space.
- The vehicular trip generation is estimated to be 6,033 gross daily trips based on the *ITE Trip Generation Manual 10th edition*.
- The development site proposes six access driveways. There will be one driveway on McGinnis Ferry Road, which will exist as a right in right out driveway with construction of the GA 400 interchange beginning in 2019. In addition, there will be three full access driveways on Alderman Drive and two right in right out driveways on Windward Concourse. The applicant team will provide GRTA with the traffic distribution from the access points before submittal of the completed traffic package.
- The projected build-out is one phase, to be completed by 2020.
- The applicant is applying for approval under GRTA's non-expedited review process.

STUDY NETWORK

1. McGinnis Ferry Road at Proposed GA 400 Southbound Ramps
2. McGinnis Ferry Road at Proposed GA 400 Northbound Ramps
3. McGinnis Ferry Road at Windward Concourse
4. Windward Concourse at Alderman Drive
5. Windward Parkway at Windward Concourse
6. Windward Parkway at Alderman Drive
7. All Site Accesses

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. The proposed interchange project (GDOT PI #0007526) at GA 400 and McGinnis Ferry Road will be included for the Future “No-Build” and “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 3.5% annual background traffic growth rate shall be used for all roadways. Trip generation information for any other major developments currently underway in the study area shall be taken into consideration.
- The DRI is currently located in a Major Activity Center as defined by ARC’s Unified Growth Policy Map and therefore, all LOS are reduced to a LOS E.
- An alternate mode reduction of 2% will be taken for this development.
- Default values should not be assumed in the traffic modeling. Existing conditions shall be taken into account.
- The applicant shall research TIP, STIP, RTP, and GDOT’s construction work program, as well as any local government plans (SPLOST, CIP, etc.), to determine the open-to-traffic date, sponsor, cost of the project, funding source(s), for future roadway projects in the project vicinity. This information shall be included within the traffic analysis.

ADDITIONAL INFORMATION

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

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

The future “no-build” and the future “build” analyses should NOT automatically include/assume the additional lanes/capacity associated with planned and programmed improvement projects unless those roadway projects are

currently under construction. Instead, the traffic consultant should recommend the additional laneage required to satisfy the level of service standard.

DRI REVIEW PACKAGE CHECKLIST

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

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

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

DRI REVIEW PACKAGE SUBMITTAL

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

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

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

GRTA	ATLANTA REGIONAL COMMISSION	CITY OF ALPHARETTA	GDOT DISTRICT 1	FORSYTH COUNTY
Emily Estes 245 Peachtree Center Ave. Suite 2200 Atlanta, GA 30303	Andrew Smith International Tower 229 Peachtree Street NE Suite 100 Atlanta, GA 30303	Eric Graves City of Alpharetta 2 Park Plaza Alpharetta, Georgia 30009	Sue Anne Decker 2505 Athens Highway SE Gainesville, GA 30046	Tim Allen 110 East Main Street Suite 120 Cumming, GA 30040

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

Sincerely,
Emily Estes
Planner

cc:

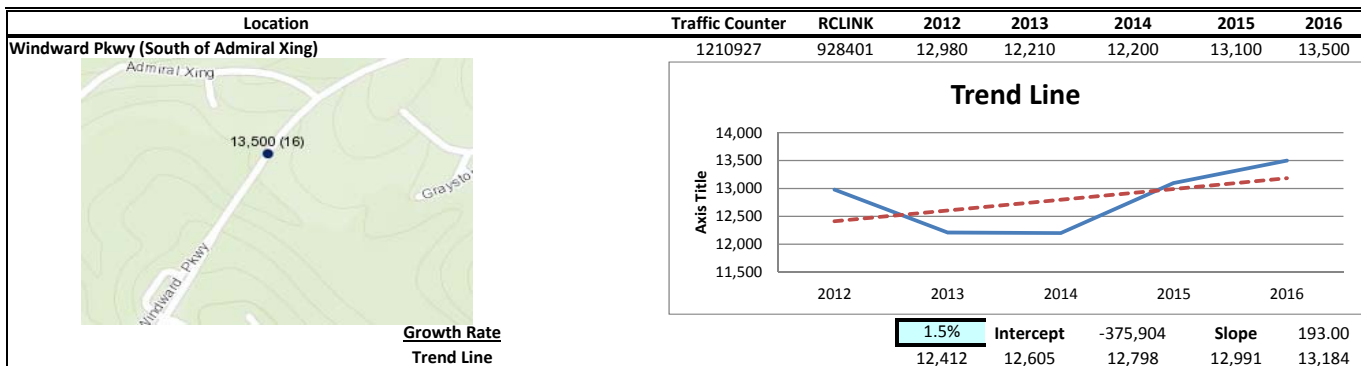
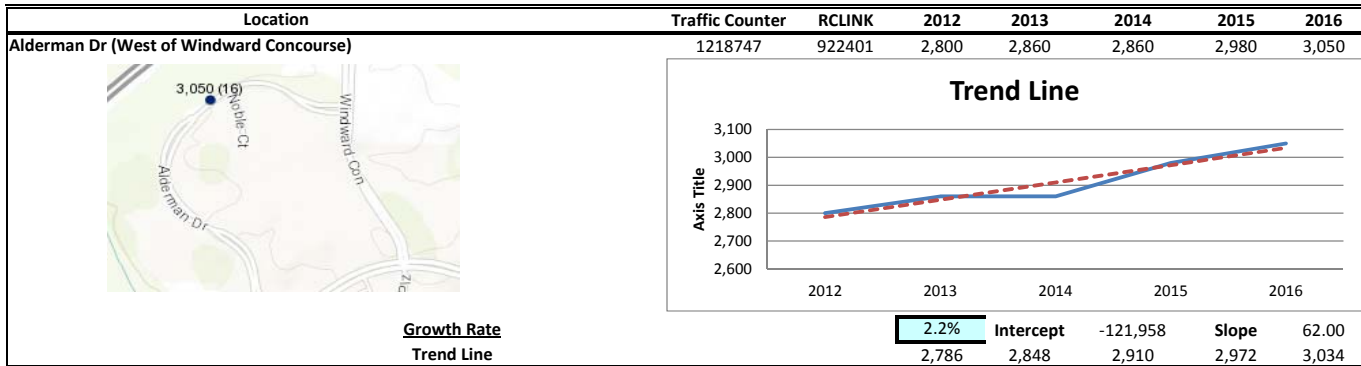
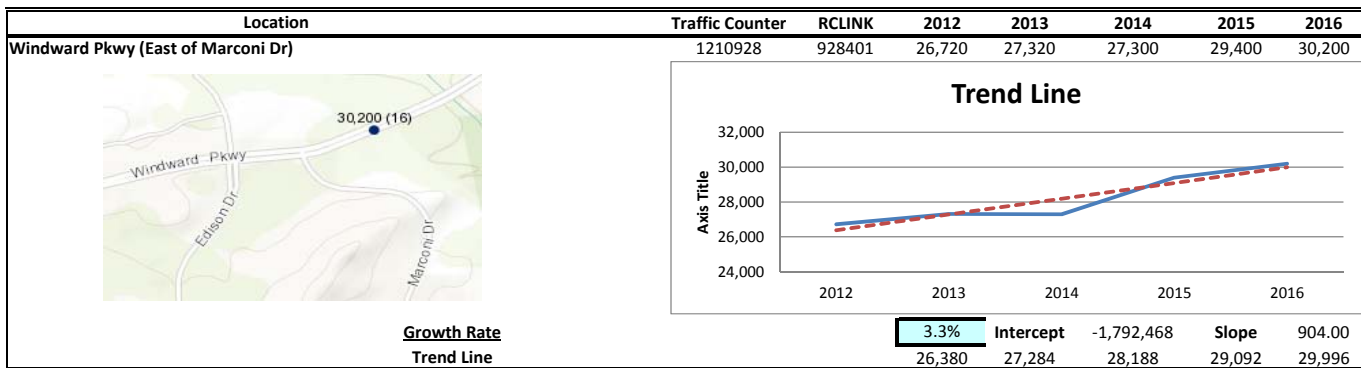
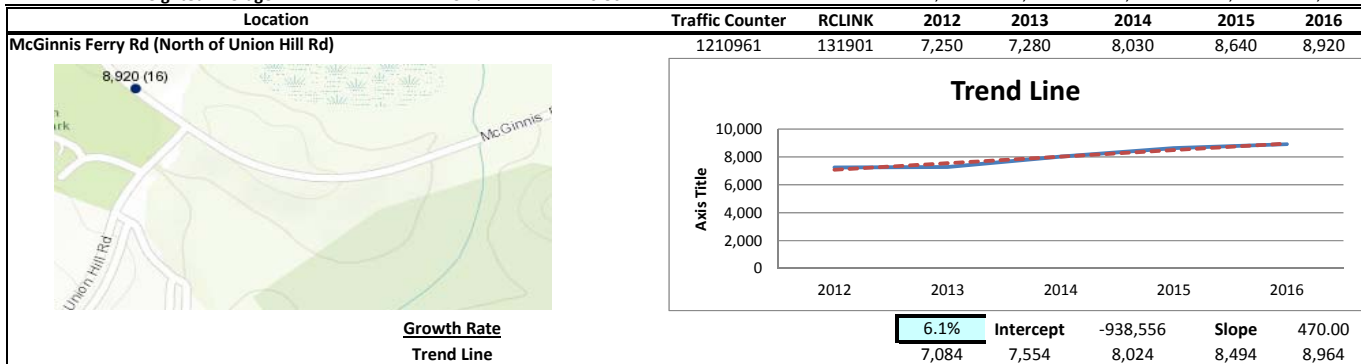
Jon West, DCA
Andrew Smith, ARC
Annie Gillespie, GRTA
Heather Aquino, GRTA

Abby Rettig, A & R Engineering
Abdul Amer, A & R Engineering
Luke Ferguson, Haines Gipson and Associates

Paul DeNard, GDOT District 7
Sue Anne Decker, GDOT District 1
Jonathan Peevy, GDOT District 1
Eric Graves, City of Alpharetta
Brian Borden, City of Alpharetta
Tim Allen, Forsyth County
Greg Floyd, MARTA

LINEAR REGRESSION OF DAILY TRAFFIC

Location	Growth Rate	R Squared	Station ID	Route	2012	2013	2014	2015	2016
McGinnis Ferry Rd (North of Union Hill Rd)	6.1%	0.95	1210961	131901	7,250	7,280	8,030	8,640	8,920
Windward Pkwy (East of Marconi Dr)	3.3%	0.89	1210928	928401	26,720	27,320	27,300	29,400	30,200
Alderman Dr (West of Windward Concourse)	2.2%	0.92	1218747	922401	2,800	2,860	2,860	2,980	3,050
Windward Pkwy (South of Admiral Xing)	1.5%	0.28	1210927	928401	12,980	12,210	12,200	13,100	13,500
Weighted Average	3.2%	0.86	Sum of Count Stations =		49,750	49,670	50,390	54,120	55,670



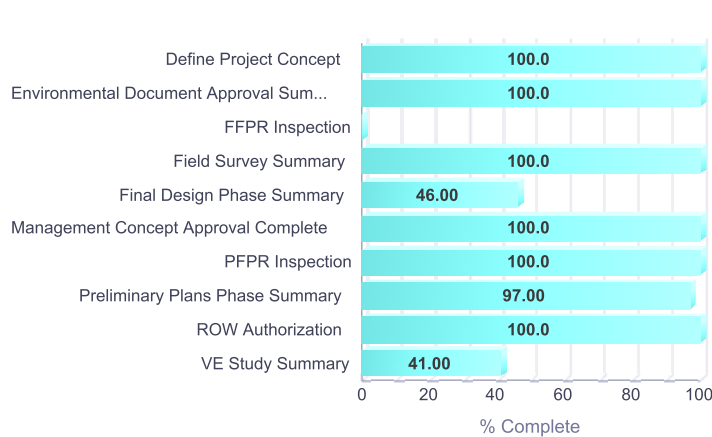
**FACT SHEETS FOR PLANNED AND
PROGRAMMED IMPROVEMENTS**

PRECONSTRUCTION STATUS REPORT

PROJ ID	COUNTY	DESCRIPTION
0007526	Fulton	SR 400 @ MCGINNIS FERRY RD; INC WIDENING & AUXILIARY LANES
Mgmt Let Date:	2019-05-15	This project will consist of construction a full diamond interchange on SR 400 at McGinnis Ferry Road. The project would add northbound and southbound auxiliary lanes on SR 400 south to Windward Parkway ramps and north to McFarland Parkway ramps of the existing McGinnis Ferry Road bridge, which would be replaced. McGinnis Ferry Road would be widened to 4 lanes on the Fulton County side of SR 400 and to six lanes on the Forsyth side of 400 with a typical that would include curb and gutter with 5 foot sidewalks and/or a multi-use path. Right and Left turn lanes would be added and proposed bridge would be designed to span the future managed lanes on SR 400.

PROJ NO:	CSHPP-0007-00(526)	SPONSOR:	Forsyth County
MPO TIP#:	FT-324	PROJ MGR:	Njoku, Achor
MPO:	Atlanta TMA	DOT DIST:	1, 7
PROJ LENGTH (MI):	4.45	CONG DIST:	006, 007
TYPE WORK:	Interchange	HOUSE DIST:	022, 047
LET	GDOT Let	SENATE DIST:	021, 027
RESPONSIBILITY:			
BIKE PROVISIONS INCLUDED?	Y		

Phase	FY	Approved FY	Fund	Phase Status
Right of Way	2018	\$4,330,000.00	HB170	AUTHORIZED
Engineering	2012	\$312,500.00	HY10	AUTHORIZED
SCP	2013	\$2,612,422.00	LY10	AUTHORIZED
Right of Way	2017	\$5,000,000.00	Z230	AUTHORIZED
Construction	2019	\$23,893,514.99	HB170	PRECST
Right of Way	2017	\$3,630,000.00	LOC	AUTHORIZED
Utility	2019	\$3,852,000.00	HB170	PRECST
Construction	2019	\$4,330,000.00	LOC	PRECST



Activity	Actual Start Date	Actual Finish Date
FFPR Inspection		
Field Survey Summary	2015-04-06	2015-06-17
Management Concept Approval Complete	2014-11-19	2014-11-19
Environmental Document Approval Summary (10100 through 18100)	2015-02-16	2017-05-04
Preliminary Plans Phase Summary	2015-08-13	
PFPR Inspection	2016-09-08	2016-09-08
Final Design Phase Summary	2016-09-01	
Define Project Concept	2013-12-04	2014-11-14
ROW Authorization	2017-06-26	2017-06-26
VE Study Summary	2018-02-05	

Right of Way Acquisition Information:
Preliminary Parcel Count: 21

Total Parcel Count: 24

Acquired by : LOC

Short Title

SR 400 - NEW INTERCHANGE INCLUDING WIDENING AND AUXILIARY LANES AT MCGINNIS FERRY ROAD

GDOT Project No.

0007526

Federal ID No.

Status

Programmed

Service Type

Roadway / Interchange Capacity

Sponsor

Forsyth County

Jurisdiction

Forsyth County

Analysis Level

In the Region's Air Quality Conformity Analysis

Existing Thru Lane

N/A

LCI

☐

Planned Thru Lane

N/A

Flex

☐

Network Year

2030

Corridor Length

4.5 miles



Detailed Description and Justification

This project will consist of construction a full diamond interchange on SR 400 at McGinnis Ferry Road. The project would add northbound and southbound auxiliary lanes on SR 400 south to Windward Parkway ramps and north to McFarland Parkway ramps of the existing McGinnis Ferry Road bridge, which would be replaced. McGinnis Ferry Road would be widened to 4 lanes on the Fulton County side of SR 400 and to six lanes on the Forsyth side of 400 with a typical that would include curb and gutter with 5 foot sidewalks and/or a multi-use path. Right and Left turn lanes would be added and proposed bridge would be designed to span the future managed lanes on SR 400.

Phase Status & Funding Information		Status	FISCAL YEAR	TOTAL PHASE COST	BREAKDOWN OF TOTAL PHASE COST BY FUNDING SOURCE			
					FEDERAL	STATE	BONDS	LOCAL/PRIVATE
SCP	Federal Earmark Funding	AUTH	2013	\$2,612,422	\$2,089,938	\$0,000	\$0,000	\$522,484
PE	Federal Earmark	AUTH	2012	\$312,500	\$250,000	\$0,000	\$0,000	\$62,500
ROW	Local Jurisdiction/Municipality Funds	AUTH	2017	\$3,630,000	\$0,000	\$0,000	\$0,000	\$3,630,000
ROW	Surface Transportation Block Grant (STBG) Program - Urban (>200K) (ARC)	AUTH	2017	\$5,000,000	\$4,000,000	\$0,000	\$0,000	\$1,000,000
ROW	Transportation Funding Act (HB 170)	AUTH	2018	\$4,330,000	\$0,000	\$4,330,000	\$0,000	\$0,000
UTL	Transportation Funding Act (HB 170)		2019	\$3,852,000	\$0,000	\$3,852,000	\$0,000	\$0,000
CST	Local Jurisdiction/Municipality Funds		2019	\$4,330,000	\$0,000	\$0,000	\$0,000	\$4,330,000
CST	Transportation Funding Act (HB 170)		2019	\$23,893,515	\$0,000	\$23,893,515	\$0,000	\$0,000
				\$47,960,437	\$6,339,938	\$32,075,515	\$0,000	\$9,544,984

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.



PRECONSTRUCTION STATUS REPORT

PROJ ID	COUNTY	DESCRIPTION			
0001757	Fulton	SR 400 FM I-285/FULTON TO MCFARLAND RD/FORSYTH-EXPRESS LANES			
Mgmt Let Date:		Major Mobility Investment (MMIP); Design-Build-Finance delivery SR 400 is one of the most congested facilities in metro Atlanta. The addition of Express Lanes to this corridor will provide additional reliable capacity from I-285 to McFarland Road. The proposed Express Lanes will be constructed to the inside of the general purpose lanes and will directly connect to the Revive 285 project. This mobility enhancing project would consist of: ¿ Two Express Lanes in each direction along SR 400 between I-285N and McGinnis Ferry Road. ¿ One Express Lane in each direction from McGinnis Ferry Road to McFarland Road. Intermediate access points will be determined as additional coordination, environmental documentation and design activities are completed on the corridor. Estimated Costs*: \$2.4 Billion			
PROJ NO:	MSL00-0001-00(757)	SPONSOR:	GDOT	Phase	FY
MPO TIP#:	AR-ML-300	PROJ MGR:	Lewis, Robert	Approved	Approved FY
MPO:	Atlanta TMA	DOT DIST:	1, 7	Estimate*	Fund
PROJ LENGTH (MI):	17.06	CONG DIST:	006, 007		Phase Status
TYPE WORK:	Managed Lanes	HOUSE DIST:	047, 048, 049, 051, 080	Construction 2025	\$105,000,000.00 Z001 PRECST
LET	GDOT Let	SENATE DIST:	006, 021, 032, 040, 056	Construction 2033	\$120,000,000.00 Z001 PRECST
RESPONSIBILITY:				Construction 2027	\$110,000,000.00 Z001 PRECST
BIKE PROVISIONS INCLUDED?	N			Construction 2040	\$135,000,000.00 Z001 PRECST
				Construction 2059	\$180,000,000.00 Z001 PRECST
				Construction 2050	\$155,000,000.00 Z001 PRECST
				Right of Way 2022	\$22,300,000.00 Z001 PRECST
				Engineering 2017	\$5,000,000.00 HB170 AUTHORIZED
				Construction 2038	\$130,000,000.00 Z001 PRECST
				Construction 2035	\$125,000,000.00 Z001 PRECST
				Construction 2028	\$110,000,000.00 Z001 PRECST
				Engineering 2005	\$461,217.80 Q05 AUTHORIZED
				Construction 2043	\$140,000,000.00 Z001 PRECST
				Construction 2046	\$145,000,000.00 Z001 PRECST
				Engineering 2020	\$15,900,000.00 Z001 PRECST
				Construction 2054	\$165,000,000.00 Z001 PRECST
				Construction 2048	\$150,000,000.00 Z001 PRECST
				Construction 2058	\$175,000,000.00 Z001 PRECST
				Right of Way 2017	\$4,000,000.00 Z001 PRECST
				Construction 2056	\$170,000,000.00 Z001 PRECST
				Right of Way	\$23,400,000.00 Z001 PRECST
				Construction 2049	\$155,000,000.00 Z001 PRECST
				Construction 2052	\$160,000,000.00 Z001 PRECST
				Construction 2037	\$130,000,000.00 Z001 PRECST
				Construction 2044	\$140,000,000.00 Z001 PRECST
				Engineering 2011	\$2,060,253.01 44220 AUTHORIZED
				Engineering 2010	\$728,806.25 LY10S AUTHORIZED
				Engineering 2010	\$171,095.00 HY10 AUTHORIZED
				Construction 2039	\$130,000,000.00 Z001 PRECST
				Construction 2057	\$175,000,000.00 Z001 PRECST
				Construction 2030	\$115,000,000.00 Z001 PRECST
				Engineering 2019	\$40,400,000.00 Z001 PRECST
				Construction 2042	\$140,000,000.00 Z001 PRECST
				Construction 2022	\$55,000,000.00 Z001 PRECST
				Construction 2047	\$150,000,000.00 Z001 PRECST
				Engineering 2005	\$8,538,782.20 L010 AUTHORIZED
				Construction 2032	\$120,000,000.00 Z001 PRECST
				Construction 2045	\$145,000,000.00 Z001 PRECST
				Construction 2041	\$135,000,000.00 Z001 PRECST
				Construction 2053	\$165,000,000.00 Z001 PRECST
				Construction 2021	\$65,000,000.00 HB170 PRECST
				Construction 2055	\$170,000,000.00 Z001 PRECST
				Construction 2051	\$160,000,000.00 Z001 PRECST
				Construction 2029	\$115,000,000.00 Z001 PRECST
				Construction 2034	\$125,000,000.00 Z001 PRECST
				Right of Way 2021	\$4,000,000.00 Z001 PRECST
				Construction 2026	\$110,000,000.00 Z001 PRECST
				Construction 2031	\$115,000,000.00 Z001 PRECST
				Construction 2024	\$37,800,000.00 Z001 PRECST

Short Title

SR 400 EXPRESS LANES FROM I-285 NORTH TO MCFARLAND ROAD

GDOT Project No.

0001757

Federal ID No.

N/A

Status

Programmed

Service Type

Roadway / Express Lanes

Sponsor

GDOT

Jurisdiction

Regional - North

Analysis Level

In the Region's Air Quality Conformity Analysis

Existing Thru Lane

0

LCI

☐

Planned Thru Lane

4

Flex

☐

Network Year

2030

Corridor Length

17.1 miles



Detailed Description and Justification

Project provides travel options and more reliable trip times by adding two new Express lanes in each direction on SR 400 between I-285 and McGinnis Ferry Road and one Express lane in each direction from McGinnis Ferry Road to McFarland Parkway.

Phase Status & Funding Information	Status	FISCAL YEAR	TOTAL PHASE COST	BREAKDOWN OF TOTAL PHASE COST BY FUNDING SOURCE			
				FEDERAL	STATE	BONDS	LOCAL/PRIVATE
PE Interstate Maintenance	AUTH	2005	\$8,538,782	\$7,684,904	\$853,878	\$0,000	\$0,000
PE National Highway System	AUTH	2005	\$461,218	\$368,974	\$92,244	\$0,000	\$0,000
PE Federal Earmark	AUTH	2010	\$171,095	\$136,876	\$34,219	\$0,000	\$0,000
PE Federal Earmark Funding	AUTH	2010	\$728,806	\$583,045	\$145,761	\$0,000	\$0,000
PE SRTA - Toll Revenue	AUTH	2011	\$2,060,253	\$0,000	\$0,000	\$0,000	\$2,060,253
PE Transportation Funding Act (HB 170)	AUTH	2017	\$5,000,000	\$0,000	\$5,000,000	\$0,000	\$0,000
PE National Highway Performance Program (NHPP)	AUTH	2018	\$9,400,000	\$7,520,000	\$1,880,000	\$0,000	\$0,000
PE National Highway Performance Program (NHPP)		2019	\$17,400,000	\$13,920,000	\$3,480,000	\$0,000	\$0,000
PE National Highway Performance Program (NHPP)		2020	\$8,400,000	\$6,720,000	\$1,680,000	\$0,000	\$0,000
PE National Highway Performance Program (NHPP)		2021	\$3,200,000	\$2,560,000	\$640,000	\$0,000	\$0,000
ROW National Highway Performance Program (NHPP)		2019	\$28,500,000	\$21,375,000	\$7,125,000	\$0,000	\$0,000



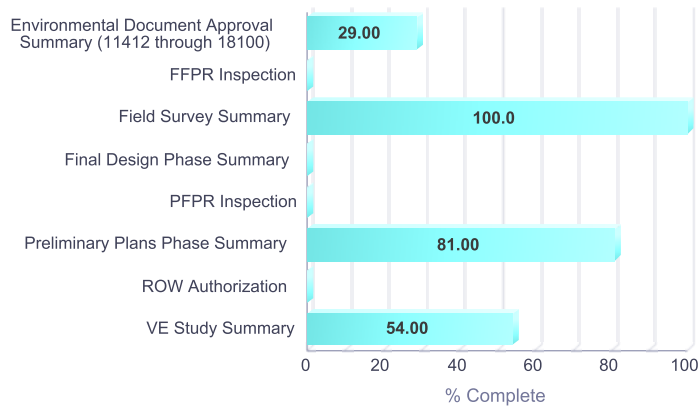
For additional information about this project, please call (404) 463-3100 or email transportation@atlantaregional.com.

PRECONSTRUCTION STATUS REPORT

PROJ ID	COUNTY	DESCRIPTION
0004634	Forsyth	MCGINNIS FERRY ROAD FROM SARGENT ROAD TO UNION HILL ROAD
Mgmt Let Date:	2020-08-15	The proposed project would consist of the widening of McGinnis Ferry Road from Sargent Road to Union Hill Road/Ronald Regan Blvd. located on the Fulton County line in southern Forsyth County. The length of the proposed project is approximately 4.58 miles. The proposed design includes two lanes in each direction with a 20-foot raised median. The design speed is 45 mph. The proposed outside shoulder would be a 16-foot urban shoulder on the north side containing curb and gutter with a 10-foot multi-used path and on the south side would be a 12 foot-urban shoulder containing curb and gutter with 5-foot sidewalks.

PROJ NO: STP00-0004-00(634) **SPONSOR:** Forsyth County
MPO TIP#: FN-233A **PROJ MGR:** Lott, David B.
MPO: Atlanta TMA **DOT DIST:** 1, 7
PROJ LENGTH (MI): 4.58 **CONG DIST:** 006, 007
TYPE WORK: Widening **HOUSE DIST:** 022, 025, 047, 049
LET RESPONSIBILITY: Local Let **SENATE DIST:** 021, 027, 048
BIKE PROVISIONS INCLUDED? Y

Phase	FY	Approved FY	Fund	Phase Status
Engineering	2018	\$1,931,261.12	LOC	PRECST
Right of Way	2018	\$14,702,000.00	LOC	PRECST
Utility	2020	\$3,852,000.00	LOC	PRECST
Construction	2020	\$14,140,764.00	LOC	PRECST
Construction	2020	\$10,000,000.00	HB170	PRECST
Engineering	2018	\$50,000.00	HB170	AUTHORIZED



Activity	Actual Start Date	Actual Finish Date
Environmental Document Approval Summary (11412 through 18100)	2016-08-08	
Preliminary Plans Phase Summary	2016-01-11	
Field Survey Summary	2016-01-12	2016-03-31
FFPR Inspection		
ROW Authorization		
PFPR Inspection		
VE Study Summary	2018-02-05	
Final Design Phase Summary		

Right of Way Acquisition Information:
Preliminary Parcel Count: 200

Total Parcel Count:

Acquired by :

LOC

Short Title

MCGINNIS FERRY ROAD: SEGMENT 1 - WIDENING FROM UNION HILL ROAD TO SARGENT ROAD

GDOT Project No.

0004634

Federal ID No.

N/A

Status

Programmed

Service Type

Roadway / General Purpose Capacity

Sponsor

Forsyth County

Jurisdiction

Fulton County (North)

Analysis Level

In the Region's Air Quality Conformity Analysis

Existing Thru Lane

2

LCI

☐

Planned Thru Lane

4

Flex

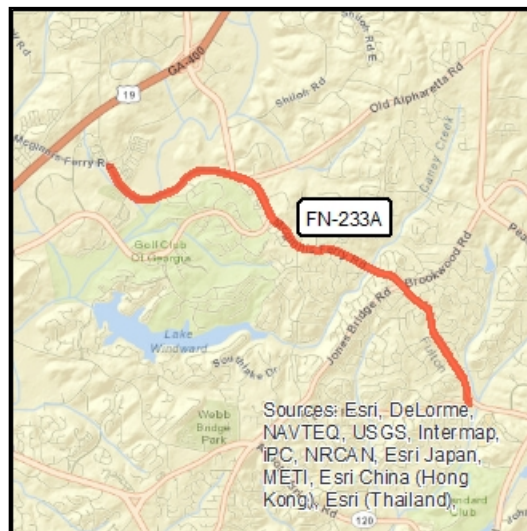
☐

Network Year

2030

Corridor Length

7.8 miles



Detailed Description and Justification

This project includes the widening of McGinnis Ferry Road from Union Hill Road to Sargent Road from 2 to 4 lanes. The project will improve congestion along this corridor.

Phase Status & Funding Information		Status	FISCAL YEAR	TOTAL PHASE COST	BREAKDOWN OF TOTAL PHASE COST BY FUNDING SOURCE			
					FEDERAL	STATE	BONDS	LOCAL/PRIVATE
PE	Local Jurisdiction/Municipality Funds		2018	\$1,931,261	\$0,000	\$0,000	\$0,000	\$1,931,261
PE	Transportation Funding Act (HB 170)	AUTH	2018	\$50,000	\$0,000	\$50,000	\$0,000	\$0,000
ROW	Local Jurisdiction/Municipality Funds		2018	\$14,702,000	\$0,000	\$0,000	\$0,000	\$14,702,000
UTL	Local Jurisdiction/Municipality Funds		2021	\$3,852,000	\$0,000	\$0,000	\$0,000	\$3,852,000
CST	Transportation Funding Act (HB 170)		2021	\$24,140,764	\$0,000	\$10,000,000	\$0,000	\$14,140,764
				\$44,676,025	\$0,000	\$10,050,000	\$0,000	\$34,626,025

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.



Phase:Union Hill Road & Bridge

Project Name	Union Hill Road & Bridge
Project Type	Widening
Project Summary	Project will include 2 lanes in each direction with a 20 foot raised median, shoulders, curb and gutter with :
From	GA 400
To	McFarland Parkway
Mileage	1.89
Phase	Construction Underway
Agency	Forsyth County Engineering, GDOT
Contractor	C. W. Matthews
Estimated Start Date	8/22/2016
Completion Date	6/29/2018, 8:00 PM
Funding Source	SPLOST/Bond/State
Estimated Project Cost	\$19,712,408.43
Contact	Send Email
Project ID	PEW09
Additional Information	

[Zoom to](#)

2mi

120

1000 ft

The
Standard



EXISTING INTERSECTION ANALYSIS

Timings
3: Windward Concourse & McGinnis Ferry Rd

2018 AM Peak
09/21/2018

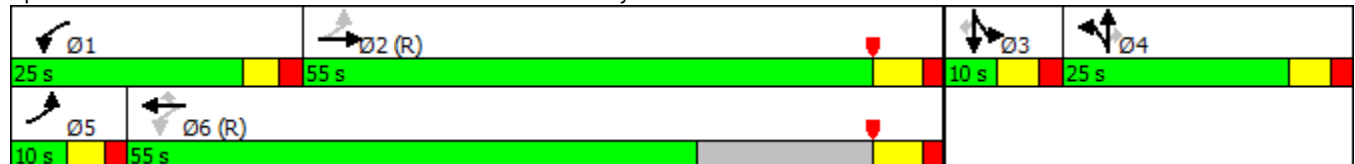


Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	25	488	397	304	68	45	97	78	9
Future Volume (vph)	25	488	397	304	68	45	97	78	9
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA	Perm
Protected Phases	5	2	1	6		4		3	
Permitted Phases	2		6		6		4		3
Detector Phase	5	2	1	6	6	4	4	3	3
Switch Phase	2		6						
Minimum Initial (s)	5.0	20.0	5.0	20.0	20.0	15.0	15.0	5.0	5.0
Minimum Split (s)	15.0	52.5	15.0	26.3	26.3	23.5	23.5	23.5	23.5
Total Split (s)	10.0	55.0	25.0	55.0	55.0	25.0	25.0	10.0	10.0
Total Split (%)	8.7%	47.8%	21.7%	47.8%	47.8%	21.7%	21.7%	8.7%	8.7%
Yellow Time (s)	3.2	4.3	3.2	4.3	4.3	3.6	3.6	3.6	3.6
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	6.3	5.2	6.3	6.3	5.6	5.6	5.6	5.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?									
Recall Mode	None	C-Min	None	C-Min	C-Min	None	None	None	None

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 145
 Control Type: Actuated-Coordinated

Splits and Phases: 3: Windward Concourse & McGinnis Ferry Rd



HCM Signalized Intersection Capacity Analysis

3: Windward Concourse & McGinnis Ferry Rd

2018 AM Peak

09/21/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	488	446	397	304	68	83	45	97	3	78	9
Future Volume (vph)	25	488	446	397	304	68	83	45	97	3	78	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.3		5.2	6.3	6.3		5.6	5.6		5.6	5.6
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frt	1.00	0.93		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00		1.00	1.00
Satd. Flow (prot)	1770	1729		1770	1863	1583		1804	1583		1859	1583
Flt Permitted	0.57	1.00		0.07	1.00	1.00		0.97	1.00		1.00	1.00
Satd. Flow (perm)	1062	1729		129	1863	1583		1804	1583		1859	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	26	503	460	409	313	70	86	46	100	3	80	9
RTOR Reduction (vph)	0	27	0	0	0	28	0	0	86	0	0	9
Lane Group Flow (vph)	26	936	0	409	313	42	0	132	14	0	83	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases	2			6		6			4			3
Actuated Green, G (s)	55.4	52.5		77.5	69.4	69.4		15.6	15.6		4.4	4.4
Effective Green, g (s)	55.4	52.5		77.5	69.4	69.4		15.6	15.6		4.4	4.4
Actuated g/C Ratio	0.48	0.46		0.67	0.60	0.60		0.14	0.14		0.04	0.04
Clearance Time (s)	5.2	6.3		5.2	6.3	6.3		5.6	5.6		5.6	5.6
Vehicle Extension (s)	2.1	5.1		2.1	5.1	5.1		2.1	2.1		2.1	2.1
Lane Grp Cap (vph)	529	789		369	1124	955		244	214		71	60
v/s Ratio Prot	0.00	c0.54		c0.19	0.17			c0.07			c0.04	
v/s Ratio Perm	0.02			0.55		0.03			0.01			0.00
v/c Ratio	0.05	1.19		1.11	0.28	0.04		0.54	0.06		1.17	0.01
Uniform Delay, d1	15.7	31.2		38.9	10.9	9.3		46.4	43.3		55.3	53.2
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	0.0	96.4		79.4	0.6	0.1		1.4	0.1		159.6	0.0
Delay (s)	15.7	127.6		118.3	11.5	9.4		47.8	43.4		214.9	53.2
Level of Service	B	F		F	B	A		D	D		F	D
Approach Delay (s)		124.7			66.5			45.9			199.1	
Approach LOS		F			E			D			F	
Intersection Summary												
HCM 2000 Control Delay	97.4			HCM 2000 Level of Service			F					
HCM 2000 Volume to Capacity ratio	1.06											
Actuated Cycle Length (s)	115.0			Sum of lost time (s)			22.7					
Intersection Capacity Utilization	102.8%			ICU Level of Service			G					
Analysis Period (min)	15											
c Critical Lane Group												

Intersection	
Intersection Delay, s/veh	14.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	61	8	10	5	7	10	226	94	33	530	222
Future Vol, veh/h	30	61	8	10	5	7	10	226	94	33	530	222
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	31	63	8	10	5	7	10	233	97	34	546	229
Number of Lanes	0	1	1	0	1	0	0	2	0	0	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	11.4	10.4	10.7	16.8
HCM LOS	B	B	B	C

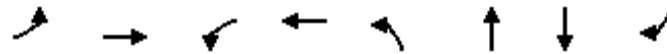
Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	8%	0%	33%	0%	45%	11%	0%
Vol Thru, %	92%	55%	67%	0%	23%	89%	54%
Vol Right, %	0%	45%	0%	100%	32%	0%	46%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	123	207	91	8	22	298	487
LT Vol	10	0	30	0	10	33	0
Through Vol	113	113	61	0	5	265	265
RT Vol	0	94	0	8	7	0	222
Lane Flow Rate	127	213	94	8	23	307	502
Geometry Grp	7	7	7	7	6	7	7
Degree of Util (X)	0.209	0.33	0.188	0.015	0.044	0.466	0.709
Departure Headway (Hd)	5.936	5.573	7.22	6.34	7.041	5.465	5.087
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	605	644	497	565	509	664	713
Service Time	3.669	3.306	4.957	4.077	5.081	3.165	2.787
HCM Lane V/C Ratio	0.21	0.331	0.189	0.014	0.045	0.462	0.704
HCM Control Delay	10.2	11	11.6	9.2	10.4	12.8	19.2
HCM Lane LOS	B	B	B	A	B	B	C
HCM 95th-tile Q	0.8	1.4	0.7	0	0.1	2.5	5.9

Timings

5: Windward Plaza/Windward Concourse & Windward Pkwy

2018 AM Peak

09/21/2018



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	261	908	283	1249	50	67	153	283
Future Volume (vph)	261	908	283	1249	50	67	153	283
Turn Type	Prot	NA	pm+pt	NA	Split	NA	NA	Perm
Protected Phases	5	2	1	6	3	3	4	
Permitted Phases			6					4
Detector Phase	5	2	1	6	3	3	4	4
Switch Phase								
Minimum Initial (s)	4.0	15.0	4.0	15.0	4.0	4.0	4.0	4.0
Minimum Split (s)	15.0	46.2	15.0	50.2	41.0	41.0	22.5	22.5
Total Split (s)	41.0	98.0	22.0	79.0	17.0	17.0	23.0	23.0
Total Split (%)	25.6%	61.3%	13.8%	49.4%	10.6%	10.6%	14.4%	14.4%
Yellow Time (s)	3.0	4.2	3.4	4.2	3.1	3.1	3.6	3.6
All-Red Time (s)	2.5	2.0	2.8	2.0	2.9	2.9	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	6.2	6.2	6.2	6.0	6.0	6.2	6.2
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?								
Recall Mode	Min	C-Min	None	C-Min	None	None	None	None

Intersection Summary

Cycle Length: 160

Actuated Cycle Length: 160

Offset: 144 (90%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Splits and Phases: 5: Windward Plaza/Windward Concourse & Windward Pkwy

Ø1	Ø2 (R)	Ø3	Ø4
22 s	98 s	17 s	23 s
Ø5	Ø6 (R)		
41 s	79 s		

HCM Signalized Intersection Capacity Analysis

5: Windward Plaza/Windward Concourse & Windward Pkwy

2018 AM Peak

09/21/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	261	908	42	283	1249	150	50	67	22	52	153	283
Future Volume (vph)	261	908	42	283	1249	150	50	67	22	52	153	283
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	6.2		6.2	6.2		6.0	6.0			6.2	6.2
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	0.98		1.00	0.96			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	1.00
Satd. Flow (prot)	1770	3516		1770	3482		1770	1794			1839	1583
Flt Permitted	0.95	1.00		0.28	1.00		0.95	1.00			0.99	1.00
Satd. Flow (perm)	1770	3516		515	3482		1770	1794			1839	1583
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	266	927	43	289	1274	153	51	68	22	53	156	289
RTOR Reduction (vph)	0	2	0	0	5	0	0	8	0	0	0	259
Lane Group Flow (vph)	266	968	0	289	1422	0	51	83	0	0	209	30
Turn Type	Prot	NA		pm+pt	NA		Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases				6								4
Actuated Green, G (s)	28.2	95.3		94.4	81.1		10.0	10.0			16.8	16.8
Effective Green, g (s)	28.2	95.3		94.4	81.1		10.0	10.0			16.8	16.8
Actuated g/C Ratio	0.18	0.60		0.59	0.51		0.06	0.06			0.11	0.11
Clearance Time (s)	5.5	6.2		6.2	6.2		6.0	6.0			6.2	6.2
Vehicle Extension (s)	2.1	5.1		2.1	5.1		2.0	2.0			2.0	2.0
Lane Grp Cap (vph)	311	2094		408	1764		110	112			193	166
v/s Ratio Prot	c0.15	0.28		0.06	c0.41		0.03	c0.05			c0.11	
v/s Ratio Perm				0.36								0.02
v/c Ratio	0.86	0.46		0.71	0.81		0.46	0.74			1.08	0.18
Uniform Delay, d1	63.9	18.1		16.3	32.9		72.4	73.7			71.6	65.3
Progression Factor	1.10	0.59		1.00	1.00		0.88	0.87			1.00	1.00
Incremental Delay, d2	16.1	0.6		4.7	4.0		0.9	16.2			88.6	0.2
Delay (s)	86.5	11.2		20.9	36.9		64.5	80.5			160.2	65.5
Level of Service	F	B		C	D		E	F			F	E
Approach Delay (s)		27.4			34.2			74.7			105.3	
Approach LOS		C			C			E			F	
Intersection Summary												
HCM 2000 Control Delay			43.3			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			160.0			Sum of lost time (s)			24.6			
Intersection Capacity Utilization			89.5%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

Timings
6: Windward Plaza/Alderman Dr & Windward Pkwy

2018 AM Peak
09/21/2018

									
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	474	1156	27	1547	185	85	34	11	194
Future Volume (vph)	474	1156	27	1547	185	85	34	11	194
Turn Type	pm+pt	NA	Perm	NA	Perm	Split	NA	NA	Perm
Protected Phases	5	2		6		4	4	3	
Permitted Phases	2		6		6				3
Detector Phase	5	2	6	6	6	4	4	3	3
Switch Phase	2								
Minimum Initial (s)	4.0	20.0	20.0	20.0	20.0	6.0	6.0	6.0	6.0
Minimum Split (s)	15.0	48.8	51.8	51.8	51.8	45.2	45.2	22.5	22.5
Total Split (s)	40.0	121.0	81.0	81.0	81.0	21.0	21.0	18.0	18.0
Total Split (%)	25.0%	75.6%	50.6%	50.6%	50.6%	13.1%	13.1%	11.3%	11.3%
Yellow Time (s)	3.0	4.3	4.3	4.3	4.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.9	2.5	2.5	2.5	2.5	2.9	2.9	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	6.8	6.8	6.8	6.8	6.2	6.2	6.3	6.3
Lead/Lag	Lead		Lag	Lag	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?									
Recall Mode	None	C-Min	C-Min	C-Min	C-Min	None	None	None	None

Intersection Summary

Cycle Length: 160
 Actuated Cycle Length: 160
 Offset: 134 (84%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 145
 Control Type: Actuated-Coordinated

Splits and Phases: 6: Windward Plaza/Alderman Dr & Windward Pkwy

 Ø2 (R)	 Ø3	 Ø4
121 s	18 s	21 s
 Ø5	 Ø6 (R)	
40 s	81 s	

HCM Signalized Intersection Capacity Analysis

6: Windward Plaza/Alderman Dr & Windward Pkwy

2018 AM Peak

09/21/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	474	1156	375	27	1547	185	85	34	39	16	11	194
Future Volume (vph)	474	1156	375	27	1547	185	85	34	39	16	11	194
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	6.8		6.8	6.8	6.8	6.2	6.2			6.3	6.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.92			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.97	1.00
Satd. Flow (prot)	1770	3409		1770	3539	1583	1770	1712			1808	1583
Flt Permitted	0.05	1.00		0.16	1.00	1.00	0.95	1.00			0.97	1.00
Satd. Flow (perm)	93	3409		293	3539	1583	1770	1712			1808	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	494	1204	391	28	1611	193	89	35	41	17	11	202
RTOR Reduction (vph)	0	17	0	0	0	56	0	27	0	0	0	192
Lane Group Flow (vph)	494	1578	0	28	1611	137	89	49	0	0	28	10
Turn Type	pm+pt	NA		Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2			6		4	4		3	3	
Permitted Phases	2			6		6						3
Actuated Green, G (s)	120.9	120.9		74.1	74.1	74.1	11.9	11.9			7.9	7.9
Effective Green, g (s)	120.9	120.9		74.1	74.1	74.1	11.9	11.9			7.9	7.9
Actuated g/C Ratio	0.76	0.76		0.46	0.46	0.46	0.07	0.07			0.05	0.05
Clearance Time (s)	5.9	6.8		6.8	6.8	6.8	6.2	6.2			6.3	6.3
Vehicle Extension (s)	2.0	5.0		5.0	5.0	5.0	2.0	2.0			2.0	2.0
Lane Grp Cap (vph)	498	2575		135	1638	733	131	127			89	78
v/s Ratio Prot	c0.25	0.46			0.46		c0.05	0.03			c0.02	
v/s Ratio Perm	c0.49			0.10		0.09						0.01
v/c Ratio	0.99	0.61		0.21	0.98	0.19	0.68	0.39			0.31	0.13
Uniform Delay, d1	53.5	8.9		25.5	42.3	25.2	72.2	70.6			73.4	72.8
Progression Factor	1.00	1.00		1.06	0.74	1.08	1.02	1.08			1.00	1.00
Incremental Delay, d2	38.0	1.1		2.5	15.4	0.4	6.5	0.4			0.7	0.3
Delay (s)	91.6	10.0		29.5	47.0	27.7	80.0	76.5			74.2	73.0
Level of Service	F	A		C	D	C	F	E			E	E
Approach Delay (s)		29.3			44.7			78.4			73.2	
Approach LOS		C			D			E			E	
Intersection Summary												
HCM 2000 Control Delay			40.0									
HCM 2000 Volume to Capacity ratio			0.94									
Actuated Cycle Length (s)			160.0									
Intersection Capacity Utilization			96.1%									
Analysis Period (min)			15									
c Critical Lane Group												

Timings
3: Windward Concourse & McGinnis Ferry Rd

2018 PM Peak
09/21/2018

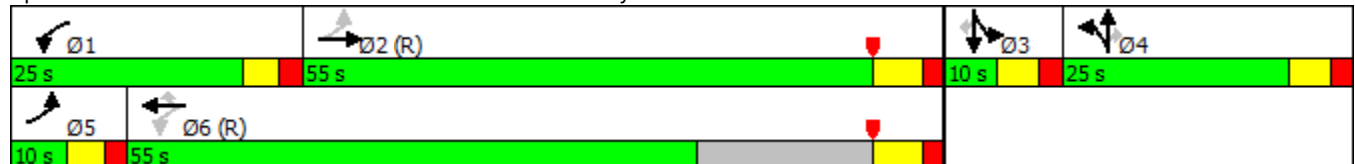


Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	3	378	112	389	4	33	381	31	11
Future Volume (vph)	3	378	112	389	4	33	381	31	11
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA	Perm
Protected Phases	5	2	1	6		4		3	
Permitted Phases	2		6		6		4		3
Detector Phase	5	2	1	6	6	4	4	3	3
Switch Phase	2		6						
Minimum Initial (s)	5.0	20.0	5.0	20.0	20.0	15.0	15.0	5.0	5.0
Minimum Split (s)	15.0	52.5	15.0	26.3	26.3	23.5	23.5	23.5	23.5
Total Split (s)	10.0	55.0	25.0	55.0	55.0	25.0	25.0	10.0	10.0
Total Split (%)	8.7%	47.8%	21.7%	47.8%	47.8%	21.7%	21.7%	8.7%	8.7%
Yellow Time (s)	3.2	4.3	3.2	4.3	4.3	3.6	3.6	3.6	3.6
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	6.3	5.2	6.3	6.3	5.6	5.6	5.6	5.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?									
Recall Mode	None	C-Min	None	C-Min	C-Min	None	None	None	None

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 135
 Control Type: Actuated-Coordinated

Splits and Phases: 3: Windward Concourse & McGinnis Ferry Rd



HCM Signalized Intersection Capacity Analysis

3: Windward Concourse & McGinnis Ferry Rd

2018 PM Peak

09/21/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	378	181	112	389	4	454	33	381	12	31	11
Future Volume (vph)	3	378	181	112	389	4	454	33	381	12	31	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.3		5.2	6.3	6.3		5.6	5.6		5.6	5.6
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frt	1.00	0.95		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.96	1.00		0.99	1.00
Satd. Flow (prot)	1770	1772		1770	1863	1583		1780	1583		1837	1583
Flt Permitted	0.51	1.00		0.26	1.00	1.00		0.96	1.00		0.99	1.00
Satd. Flow (perm)	943	1772		492	1863	1583		1780	1583		1837	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	411	197	122	423	4	493	36	414	13	34	12
RTOR Reduction (vph)	0	12	0	0	0	2	0	0	269	0	0	12
Lane Group Flow (vph)	3	596	0	122	423	2	0	529	145	0	47	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases	2			6		6			4			3
Actuated Green, G (s)	62.5	61.5		74.6	68.4	68.4		19.4	19.4		3.5	3.5
Effective Green, g (s)	62.5	61.5		74.6	68.4	68.4		19.4	19.4		3.5	3.5
Actuated g/C Ratio	0.54	0.53		0.65	0.59	0.59		0.17	0.17		0.03	0.03
Clearance Time (s)	5.2	6.3		5.2	6.3	6.3		5.6	5.6		5.6	5.6
Vehicle Extension (s)	2.1	5.1		2.1	5.1	5.1		2.1	2.1		2.1	2.1
Lane Grp Cap (vph)	519	947		406	1108	941		300	267		55	48
v/s Ratio Prot	0.00	c0.34		c0.02	c0.23			c0.30			c0.03	
v/s Ratio Perm	0.00			0.17		0.00			0.09			0.00
v/c Ratio	0.01	0.63		0.30	0.38	0.00		1.76	0.54		0.85	0.01
Uniform Delay, d1	12.0	18.8		11.1	12.2	9.5		47.8	43.7		55.5	54.1
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	0.0	3.2		0.2	1.0	0.0		356.8	1.3		68.8	0.0
Delay (s)	12.0	21.9		11.3	13.2	9.5		404.6	45.1		124.3	54.1
Level of Service	B	C		B	B	A		F	D		F	D
Approach Delay (s)		21.9			12.8			246.8			110.0	
Approach LOS		C			B			F			F	
Intersection Summary												
HCM 2000 Control Delay	120.1			HCM 2000 Level of Service					F			
HCM 2000 Volume to Capacity ratio	0.85											
Actuated Cycle Length (s)	115.0			Sum of lost time (s)					22.7			
Intersection Capacity Utilization	84.9%			ICU Level of Service					E			
Analysis Period (min)	15											
c Critical Lane Group												

Intersection

Intersection Delay, s/veh	38.3
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰			↰			↰	
Traffic Vol, veh/h	374	9	23	127	42	24	9	434	10	8	250	18
Future Vol, veh/h	374	9	23	127	42	24	9	434	10	8	250	18
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	425	10	26	144	48	27	10	493	11	9	284	20
Number of Lanes	0	1	1	0	1	0	0	2	0	0	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	78.8	22.1	22	16.6
HCM LOS	F	C	C	C

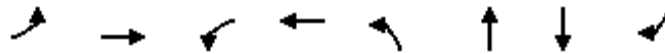
Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	4%	0%	98%	0%	66%	6%	0%
Vol Thru, %	96%	96%	2%	0%	22%	94%	87%
Vol Right, %	0%	4%	0%	100%	12%	0%	13%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	226	227	383	23	193	133	143
LT Vol	9	0	374	0	127	8	0
Through Vol	217	217	9	0	42	125	125
RT Vol	0	10	0	23	24	0	18
Lane Flow Rate	257	258	435	26	219	151	162
Geometry Grp	7	7	7	7	6	7	7
Degree of Util (X)	0.582	0.581	1.036	0.053	0.537	0.36	0.381
Departure Headway (Hd)	8.39	8.337	8.566	7.341	9.07	8.82	8.697
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	434	436	431	493	399	411	416
Service Time	6.09	6.037	6.225	5.001	7.07	6.52	6.397
HCM Lane V/C Ratio	0.592	0.592	1.009	0.053	0.549	0.367	0.389
HCM Control Delay	22.1	22	82.9	10.4	22.1	16.4	16.7
HCM Lane LOS	C	C	F	B	C	C	C
HCM 95th-tile Q	3.6	3.6	13.8	0.2	3.1	1.6	1.8

Timings

5: Windward Plaza/Windward Concourse & Windward Pkwy

2018 PM Peak

09/21/2018



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	162	1419	61	375	95	85	53	344
Future Volume (vph)	162	1419	61	375	95	85	53	344
Turn Type	Prot	NA	pm+pt	NA	Split	NA	NA	Perm
Protected Phases	5	2	1	6	3	3	4	
Permitted Phases			6					4
Detector Phase	5	2	1	6	3	3	4	4
Switch Phase								
Minimum Initial (s)	4.0	15.0	4.0	15.0	4.0	4.0	4.0	4.0
Minimum Split (s)	15.0	46.2	15.0	50.2	41.0	41.0	22.5	22.5
Total Split (s)	30.0	90.0	13.0	73.0	23.0	23.0	34.0	34.0
Total Split (%)	18.8%	56.3%	8.1%	45.6%	14.4%	14.4%	21.3%	21.3%
Yellow Time (s)	3.0	4.2	3.4	4.2	3.1	3.1	3.6	3.6
All-Red Time (s)	2.5	2.0	2.8	2.0	2.9	2.9	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	6.2	6.2	6.2	6.0	6.0	6.2	6.2
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?								
Recall Mode	Min	C-Min	None	C-Min	None	None	None	None

Intersection Summary

Cycle Length: 160

Actuated Cycle Length: 160

Offset: 146 (91%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Splits and Phases: 5: Windward Plaza/Windward Concourse & Windward Pkwy



HCM Signalized Intersection Capacity Analysis

5: Windward Plaza/Windward Concourse & Windward Pkwy

2018 PM Peak

09/21/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	162	1419	27	61	375	26	95	85	260	210	53	344
Future Volume (vph)	162	1419	27	61	375	26	95	85	260	210	53	344
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	6.2		6.2	6.2		6.0	6.0			6.2	6.2
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.99		1.00	0.89			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.96	1.00
Satd. Flow (prot)	1770	3529		1770	3505		1770	1652			1791	1583
Flt Permitted	0.95	1.00		0.08	1.00		0.95	1.00			0.96	1.00
Satd. Flow (perm)	1770	3529		145	3505		1770	1652			1791	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	171	1494	28	64	395	27	100	89	274	221	56	362
RTOR Reduction (vph)	0	1	0	0	3	0	0	70	0	0	0	302
Lane Group Flow (vph)	171	1521	0	64	419	0	100	293	0	0	277	60
Turn Type	Prot	NA		pm+pt	NA		Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases				6								4
Actuated Green, G (s)	19.4	86.4		78.3	73.0		17.0	17.0			26.7	26.7
Effective Green, g (s)	19.4	86.4		78.3	73.0		17.0	17.0			26.7	26.7
Actuated g/C Ratio	0.12	0.54		0.49	0.46		0.11	0.11			0.17	0.17
Clearance Time (s)	5.5	6.2		6.2	6.2		6.0	6.0			6.2	6.2
Vehicle Extension (s)	2.1	5.1		2.1	5.1		2.0	2.0			2.0	2.0
Lane Grp Cap (vph)	214	1905		124	1599		188	175			298	264
v/s Ratio Prot	c0.10	c0.43		0.02	0.12		0.06	c0.18			c0.15	
v/s Ratio Perm				0.23								0.04
v/c Ratio	0.80	0.80		0.52	0.26		0.53	1.68			0.93	0.23
Uniform Delay, d1	68.4	29.8		27.7	26.9		67.7	71.5			65.7	57.7
Progression Factor	1.16	0.71		1.00	1.00		0.94	0.92			1.00	1.00
Incremental Delay, d2	11.9	2.4		1.7	0.4		1.4	327.6			33.3	0.2
Delay (s)	91.0	23.6		29.5	27.3		65.3	393.4			99.0	57.9
Level of Service	F	C		C	C		E	F			F	E
Approach Delay (s)		30.4			27.6			322.5			75.7	
Approach LOS		C			C			F			E	
Intersection Summary												
HCM 2000 Control Delay			80.0			HCM 2000 Level of Service			F			
HCM 2000 Volume to Capacity ratio			0.95									
Actuated Cycle Length (s)			160.0			Sum of lost time (s)			24.6			
Intersection Capacity Utilization			98.9%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

Timings
6: Windward Plaza/Alderman Dr & Windward Pkwy

2018 PM Peak
09/21/2018

									
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	294	1407	36	713	35	304	21	13	379
Future Volume (vph)	294	1407	36	713	35	304	21	13	379
Turn Type	pm+pt	NA	Perm	NA	Perm	Split	NA	NA	Perm
Protected Phases	5	2		6		4	4	3	
Permitted Phases	2		6		6				3
Detector Phase	5	2	6	6	6	4	4	3	3
Switch Phase	2								
Minimum Initial (s)	4.0	20.0	20.0	20.0	20.0	6.0	6.0	6.0	6.0
Minimum Split (s)	15.0	48.8	51.8	51.8	51.8	45.2	45.2	22.5	22.5
Total Split (s)	25.0	113.0	88.0	88.0	88.0	25.0	25.0	22.0	22.0
Total Split (%)	15.6%	70.6%	55.0%	55.0%	55.0%	15.6%	15.6%	13.8%	13.8%
Yellow Time (s)	3.0	4.3	4.3	4.3	4.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.9	2.5	2.5	2.5	2.5	2.9	2.9	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	6.8	6.8	6.8	6.8	6.2	6.2	6.3	6.3
Lead/Lag	Lead		Lag	Lag	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?									
Recall Mode	None	C-Min	C-Min	C-Min	C-Min	None	None	None	None

Intersection Summary

Cycle Length: 160
 Actuated Cycle Length: 160
 Offset: 117 (73%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 145
 Control Type: Actuated-Coordinated

Splits and Phases: 6: Windward Plaza/Alderman Dr & Windward Pkwy

											
Ø2 (R)								Ø3		Ø4	
113 s								22 s		25 s	
											
Ø5				Ø6 (R)							
25 s				88 s							

HCM Signalized Intersection Capacity Analysis

6: Windward Plaza/Alderman Dr & Windward Pkwy

2018 PM Peak

09/21/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	294	1407	80	36	713	35	304	21	34	178	13	379
Future Volume (vph)	294	1407	80	36	713	35	304	21	34	178	13	379
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	6.8		6.8	6.8	6.8	6.2	6.2			6.3	6.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.91			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.96	1.00
Satd. Flow (prot)	1770	3511		1770	3539	1583	1770	1690			1780	1583
Flt Permitted	0.27	1.00		0.11	1.00	1.00	0.95	1.00			0.96	1.00
Satd. Flow (perm)	503	3511		213	3539	1583	1770	1690			1780	1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	323	1546	88	40	784	38	334	23	37	196	14	416
RTOR Reduction (vph)	0	3	0	0	0	18	0	33	0	0	0	249
Lane Group Flow (vph)	323	1631	0	40	784	20	334	27	0	0	210	167
Turn Type	pm+pt	NA		Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2			6		4	4		3	3	
Permitted Phases	2			6		6						3
Actuated Green, G (s)	106.2	106.2		84.3	84.3	84.3	18.8	18.8			15.7	15.7
Effective Green, g (s)	106.2	106.2		84.3	84.3	84.3	18.8	18.8			15.7	15.7
Actuated g/C Ratio	0.66	0.66		0.53	0.53	0.53	0.12	0.12			0.10	0.10
Clearance Time (s)	5.9	6.8		6.8	6.8	6.8	6.2	6.2			6.3	6.3
Vehicle Extension (s)	2.0	5.0		5.0	5.0	5.0	2.0	2.0			2.0	2.0
Lane Grp Cap (vph)	460	2330		112	1864	834	207	198			174	155
v/s Ratio Prot	0.07	c0.46			0.22		c0.19	0.02			c0.12	
v/s Ratio Perm	c0.40			0.19		0.01						0.11
v/c Ratio	0.70	0.70		0.36	0.42	0.02	1.61	0.14			1.21	1.08
Uniform Delay, d1	13.9	16.9		22.1	23.0	18.1	70.6	63.3			72.2	72.2
Progression Factor	1.00	1.00		0.86	0.88	1.00	0.99	0.99			1.00	1.00
Incremental Delay, d2	3.9	1.8		7.9	0.6	0.0	296.9	0.1			134.8	94.6
Delay (s)	17.9	18.7		27.0	20.8	18.2	366.8	63.0			206.9	166.8
Level of Service	B	B		C	C	B	F	E			F	F
Approach Delay (s)		18.5			21.0			320.5			180.2	
Approach LOS		B			C			F			F	
Intersection Summary												
HCM 2000 Control Delay			76.5									
HCM 2000 Volume to Capacity ratio			0.92									
Actuated Cycle Length (s)			160.0									
Intersection Capacity Utilization			98.1%									
Analysis Period (min)			15									
c Critical Lane Group												

GDOT LEFT TURN LANE ANALYSIS

LEFT TURN LANE ANALYSIS per GDOT standards

The following left turn lane analysis was used to determine the need for dedicated turn lanes at the proposed site driveway locations per GDOT standards.

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
Alderman Dr @ Site Drwy 1 (West)	3%	89	35 mph / 4-Lane	400	Not Warranted
Alderman Dr @ Site Drwy 2 (Middle)	3%	89	35 mph / 4-Lane	400	Not Warranted
Alderman Dr @ Site Drwy 3 (East)	4%	118	35 mph / 4-Lane	400	Not Warranted

Findings

Based on the number of projected daily left turns at the site driveways on Alderman Drive, a left turn lane is not required per GDOT standards. Therefore, unless stopping sight distance (415 feet for 35 mph) is obstructed, a left turn lane is not warranted at all three site driveways on Alderman Drive.

GDOT RIGHT TURN LANE ANALYSIS

RIGHT TURN LANE ANALYSIS per GDOT standards

The following right turn lane analysis was used to determine the need for dedicated turn lanes at the proposed site driveway locations per GDOT standards.

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
Alderman Dr @ Site Drwy 1 (West)	19.6%	579	35 mph / 4-Lane	200	100' storage 50' taper
Alderman Dr @ Site Drwy 2 (Middle)	2.6%	77	35 mph / 4-Lane	200	Not Warranted
Alderman Dr @ Site Drwy 3 (East)	3.1%	92	35 mph / 4-Lane	200	Not Warranted
Windward Concourse @ Site Drwy 4 (South)	29.75%	879	35 mph / 4-Lane	200	100' storage 50' taper
Windward Concourse @ Site Drwy 5 (North)	9.75%	288	35 mph / 4-Lane	200	100' storage 50' taper
McGinnis Ferry Rd @ Site Drwy 6 (RIRO)	25.2%	744	45 mph / 6-Lane	75	175' storage 100' taper

Findings

Based on the number of projected daily right turns Site Driveway 1, Site Driveway 4, Site Driveway 5 and Site Driveway 6 will meet the GDOT requirements for construction of a deceleration lane.

A right turn lane is not required at Site Driveway 2 and Site Driveway 3 per GDOT standards. Therefore, unless stopping sight distance (335 feet for 35 mph) is obstructed, a right turn lane is not warranted on the mainline at Site Driveway 2 and Site Driveway 3.

**FUTURE “NO-BUILD” INTERSECTION
ANALYSIS**

Timings

1: GA 400 SB & McGinnis Ferry Rd

2020 No-Build AM Peak

09/24/2018

	→	↘	↙	←	↘	↙
Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Configurations	↑↑↑	↑	↘↙	↑↑	↘↙	↑
Traffic Volume (vph)	1190	170	330	640	200	250
Future Volume (vph)	1190	170	330	640	200	250
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	4.0	15.0	6.0	6.0
Minimum Split (s)	23.5	23.5	15.0	23.5	23.5	23.5
Total Split (s)	55.0	55.0	45.0	100.0	40.0	40.0
Total Split (%)	39.3%	39.3%	32.1%	71.4%	28.6%	28.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Recall Mode	C-Min	C-Min	None	C-Min	None	None

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 40 (29%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Splits and Phases: 1: GA 400 SB & McGinnis Ferry Rd

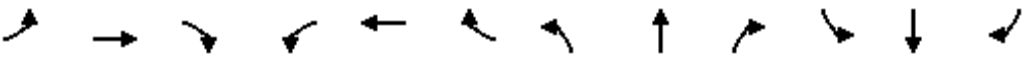


HCM Signalized Intersection Capacity Analysis

2020 No-Build AM Peak

1: GA 400 SB & McGinnis Ferry Rd

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑↑		↑
Traffic Volume (vph)	0	1190	170	330	640	0	0	0	0	200	0	250
Future Volume (vph)	0	1190	170	330	640	0	0	0	0	200	0	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5	5.5	5.5					5.5		5.5
Lane Util. Factor		0.91	1.00	0.97	0.95					0.97		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)		5085	1583	3433	3539					3433		1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		5085	1583	3433	3539					3433		1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	1227	175	340	660	0	0	0	0	206	0	258
RTOR Reduction (vph)	0	0	41	0	0	0	0	0	0	0	0	228
Lane Group Flow (vph)	0	1227	134	340	660	0	0	0	0	206	0	30
Turn Type		NA	Perm	Prot	NA					Prot		Perm
Protected Phases		2		1	6					8		
Permitted Phases			2									8
Actuated Green, G (s)		87.7	87.7	19.3	112.5					16.5		16.5
Effective Green, g (s)		87.7	87.7	19.3	112.5					16.5		16.5
Actuated g/C Ratio		0.63	0.63	0.14	0.80					0.12		0.12
Clearance Time (s)		5.5	5.5	5.5	5.5					5.5		5.5
Vehicle Extension (s)		5.0	5.0	3.0	3.0					5.0		5.0
Lane Grp Cap (vph)		3185	991	473	2843					404		186
v/s Ratio Prot		c0.24		c0.10	0.19					c0.06		
v/s Ratio Perm			0.08									0.02
v/c Ratio		0.39	0.14	0.72	0.23					0.51		0.16
Uniform Delay, d1		12.9	10.7	57.8	3.3					58.0		55.5
Progression Factor		1.00	1.00	1.01	0.64					1.00		1.00
Incremental Delay, d2		0.4	0.3	5.1	0.2					2.1		0.9
Delay (s)		13.2	11.0	63.2	2.3					60.1		56.4
Level of Service		B	B	E	A					E		E
Approach Delay (s)		12.9			23.0			0.0			58.0	
Approach LOS		B			C			A			E	
Intersection Summary												
HCM 2000 Control Delay			23.8			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.45									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)				16.5		
Intersection Capacity Utilization			51.9%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

Timings
2: GA 400 NB & McGinnis Ferry Rd

2020 No-Build AM Peak
09/24/2018

						
Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	165	1055	740	275	230	60
Future Volume (vph)	165	1055	740	275	230	60
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	4.0	15.0	15.0	15.0	6.0	6.0
Minimum Split (s)	15.0	23.5	23.5	23.5	23.5	23.5
Total Split (s)	30.0	90.0	60.0	60.0	50.0	50.0
Total Split (%)	21.4%	64.3%	42.9%	42.9%	35.7%	35.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Recall Mode	None	C-Min	C-Min	C-Min	None	None

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 60 (43%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated

Splits and Phases: 2: GA 400 NB & McGinnis Ferry Rd



HCM Signalized Intersection Capacity Analysis

2: GA 400 NB & McGinnis Ferry Rd

2020 No-Build AM Peak

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	165	1055	0	0	740	275	230	0	60	0	0	0
Future Volume (vph)	165	1055	0	0	740	275	230	0	60	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5			5.5	5.5	5.5		5.5			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.97		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)	3433	3539			5085	1583	3433		1583			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3433	3539			5085	1583	3433		1583			
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	170	1088	0	0	763	284	237	0	62	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	89	0	0	55	0	0	0
Lane Group Flow (vph)	170	1088	0	0	763	195	237	0	7	0	0	0
Turn Type	Prot	NA			NA	Perm	Prot		Perm			
Protected Phases	5	2			6		4					
Permitted Phases						6			4			
Actuated Green, G (s)	12.3	113.8			96.0	96.0	15.2		15.2			
Effective Green, g (s)	12.3	113.8			96.0	96.0	15.2		15.2			
Actuated g/C Ratio	0.09	0.81			0.69	0.69	0.11		0.11			
Clearance Time (s)	5.5	5.5			5.5	5.5	5.5		5.5			
Vehicle Extension (s)	3.0	5.0			5.0	5.0	3.0		3.0			
Lane Grp Cap (vph)	301	2876			3486	1085	372		171			
v/s Ratio Prot	c0.05	c0.31			0.15		c0.07					
v/s Ratio Perm						0.12			0.00			
v/c Ratio	0.56	0.38			0.22	0.18	0.64		0.04			
Uniform Delay, d1	61.3	3.5			8.1	7.9	59.8		55.9			
Progression Factor	1.43	0.17			0.30	0.31	1.00		1.00			
Incremental Delay, d2	2.3	0.4			0.1	0.4	3.6		0.1			
Delay (s)	89.8	1.0			2.6	2.8	63.3		56.0			
Level of Service	F	A			A	A	E		E			
Approach Delay (s)		13.0			2.6			61.8			0.0	
Approach LOS		B			A			E			A	
Intersection Summary												
HCM 2000 Control Delay		14.4			HCM 2000 Level of Service				B			
HCM 2000 Volume to Capacity ratio		0.44										
Actuated Cycle Length (s)		140.0			Sum of lost time (s)				16.5			
Intersection Capacity Utilization		51.9%			ICU Level of Service				A			
Analysis Period (min)		15										
c Critical Lane Group												

Timings
3: Windward Concourse & McGinnis Ferry Rd

2020 No-Build AM Peak

09/24/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	27	950	478	565	920	73	90	48	110	84	10
Future Volume (vph)	27	950	478	565	920	73	90	48	110	84	10
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	NA	Perm
Protected Phases	5	2		1	6		4	4		3	
Permitted Phases			2			6			4		3
Detector Phase	5	2	2	1	6	6	4	4	4	3	3
Switch Phase	2			6							
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	15.0	15.0	15.0	5.0	5.0
Minimum Split (s)	15.0	52.5	52.5	15.0	26.3	26.3	23.6	23.6	23.6	23.6	23.6
Total Split (s)	15.0	54.0	54.0	38.0	77.0	77.0	24.0	24.0	24.0	24.0	24.0
Total Split (%)	10.7%	38.6%	38.6%	27.1%	55.0%	55.0%	17.1%	17.1%	17.1%	17.1%	17.1%
Yellow Time (s)	3.2	4.3	4.3	3.2	4.3	4.3	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	6.3	6.3	5.2	6.3	6.3	5.6	5.6	5.6	5.6	5.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?											
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None

Intersection Summary

Cycle Length: 140

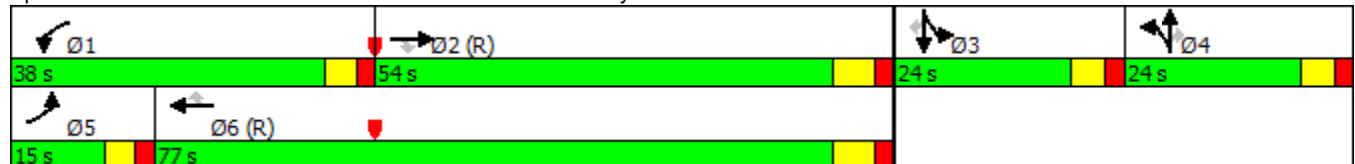
Actuated Cycle Length: 140

Offset: 50 (36%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 125

Control Type: Actuated-Coordinated

Splits and Phases: 3: Windward Concourse & McGinnis Ferry Rd



HCM Signalized Intersection Capacity Analysis

3: Windward Concourse & McGinnis Ferry Rd

2020 No-Build AM Peak

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	950	478	565	920	73	90	48	110	5	84	10
Future Volume (vph)	27	950	478	565	920	73	90	48	110	5	84	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.3	6.3	5.2	6.3	6.3	5.6	5.6	5.6		5.6	5.6
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.95	0.95	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	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.98	1.00		1.00	1.00
Satd. Flow (prot)	3433	5036	1583	3433	5036	1583	1681	1742	1583		1858	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.98	1.00		1.00	1.00
Satd. Flow (perm)	3433	5036	1583	3433	5036	1583	1681	1742	1583		1858	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	28	979	493	582	948	75	93	49	113	5	87	10
RTOR Reduction (vph)	0	0	254	0	0	28	0	0	101	0	0	9
Lane Group Flow (vph)	28	979	239	582	948	47	70	72	12	0	92	1
Heavy Vehicles (%)	2%	3%	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases			2			6			4			3
Actuated Green, G (s)	3.8	63.0	63.0	27.8	87.0	87.0	15.0	15.0	15.0		11.5	11.5
Effective Green, g (s)	3.8	63.0	63.0	27.8	87.0	87.0	15.0	15.0	15.0		11.5	11.5
Actuated g/C Ratio	0.03	0.45	0.45	0.20	0.62	0.62	0.11	0.11	0.11		0.08	0.08
Clearance Time (s)	5.2	6.3	6.3	5.2	6.3	6.3	5.6	5.6	5.6		5.6	5.6
Vehicle Extension (s)	2.1	5.1	5.1	2.1	5.1	5.1	2.1	2.1	2.1		2.1	2.1
Lane Grp Cap (vph)	93	2266	712	681	3129	983	180	186	169		152	130
v/s Ratio Prot	0.01	c0.19		c0.17	0.19		c0.04	0.04			c0.05	
v/s Ratio Perm			0.15			0.03			0.01			0.00
v/c Ratio	0.30	0.43	0.34	0.85	0.30	0.05	0.39	0.39	0.07		0.61	0.01
Uniform Delay, d1	66.8	26.3	25.0	54.1	12.4	10.3	58.2	58.2	56.2		62.1	59.0
Progression Factor	1.16	0.83	0.81	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.8	0.6	1.2	9.9	0.2	0.1	0.6	0.6	0.1		4.8	0.0
Delay (s)	78.4	22.4	21.4	64.1	12.6	10.4	58.8	58.8	56.3		66.9	59.0
Level of Service	E	C	C	E	B	B	E	E	E		E	E
Approach Delay (s)		23.1			31.2			57.7			66.1	
Approach LOS		C			C			E			E	
Intersection Summary												
HCM 2000 Control Delay			30.7			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)			22.7			
Intersection Capacity Utilization			64.7%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection	
Intersection Delay, s/veh	16.5
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	32	65	9	11	5	7	11	242	101	35	568	238
Future Vol, veh/h	32	65	9	11	5	7	11	242	101	35	568	238
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	33	67	9	11	5	7	11	249	104	36	586	245
Number of Lanes	0	1	1	0	1	0	0	2	0	0	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	11.8	10.6	11.3	19.5
HCM LOS	B	B	B	C

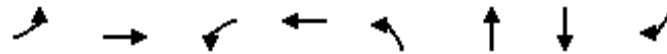
Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	8%	0%	33%	0%	48%	11%	0%
Vol Thru, %	92%	55%	67%	0%	22%	89%	54%
Vol Right, %	0%	45%	0%	100%	30%	0%	46%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	132	222	97	9	23	319	522
LT Vol	11	0	32	0	11	35	0
Through Vol	121	121	65	0	5	284	284
RT Vol	0	101	0	9	7	0	238
Lane Flow Rate	136	229	100	9	24	329	538
Geometry Grp	7	7	7	7	6	7	7
Degree of Util (X)	0.229	0.362	0.205	0.017	0.048	0.505	0.77
Departure Headway (Hd)	6.066	5.702	7.377	6.496	7.222	5.527	5.15
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	592	629	487	551	496	654	705
Service Time	3.806	3.442	5.119	4.237	5.267	3.255	2.878
HCM Lane V/C Ratio	0.23	0.364	0.205	0.016	0.048	0.503	0.763
HCM Control Delay	10.6	11.7	12	9.4	10.6	13.8	23
HCM Lane LOS	B	B	B	A	B	B	C
HCM 95th-tile Q	0.9	1.6	0.8	0.1	0.2	2.9	7.3

Timings

2020 No-Build AM Peak

5: Windward Plaza/Windward Concourse & Windward Pkwy

09/24/2018



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	280	973	303	1338	54	72	164	303
Future Volume (vph)	280	973	303	1338	54	72	164	303
Turn Type	Prot	NA	pm+pt	NA	Split	NA	NA	Perm
Protected Phases	5	2	1	6	3	3	4	
Permitted Phases			6					4
Detector Phase	5	2	1	6	3	3	4	4
Switch Phase								
Minimum Initial (s)	4.0	15.0	4.0	15.0	4.0	4.0	4.0	4.0
Minimum Split (s)	15.0	46.2	15.0	50.2	41.0	41.0	22.5	22.5
Total Split (s)	41.0	98.0	22.0	79.0	17.0	17.0	23.0	23.0
Total Split (%)	25.6%	61.3%	13.8%	49.4%	10.6%	10.6%	14.4%	14.4%
Yellow Time (s)	3.0	4.2	3.4	4.2	3.1	3.1	3.6	3.6
All-Red Time (s)	2.5	2.0	2.8	2.0	2.9	2.9	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	6.2	6.2	6.2	6.0	6.0	6.2	6.2
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?								
Recall Mode	Min	C-Min	None	C-Min	None	None	None	None

Intersection Summary

Cycle Length: 160

Actuated Cycle Length: 160

Offset: 144 (90%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Splits and Phases: 5: Windward Plaza/Windward Concourse & Windward Pkwy

Ø1	Ø2 (R)	Ø3	Ø4
22 s	98 s	17 s	23 s
Ø5	Ø6 (R)		
41 s	79 s		

HCM Signalized Intersection Capacity Analysis

5: Windward Plaza/Windward Concourse & Windward Pkwy

2020 No-Build AM Peak

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	280	973	45	303	1338	161	54	72	24	56	164	303
Future Volume (vph)	280	973	45	303	1338	161	54	72	24	56	164	303
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	6.2		6.2	6.2		6.0	6.0			6.2	6.2
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	0.98		1.00	0.96			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	1.00
Satd. Flow (prot)	1770	3516		1770	3482		1770	1794			1839	1583
Flt Permitted	0.95	1.00		0.25	1.00		0.95	1.00			0.99	1.00
Satd. Flow (perm)	1770	3516		462	3482		1770	1794			1839	1583
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	286	993	46	309	1365	164	55	73	24	57	167	309
RTOR Reduction (vph)	0	2	0	0	6	0	0	7	0	0	0	277
Lane Group Flow (vph)	286	1037	0	309	1523	0	55	90	0	0	224	32
Turn Type	Prot	NA		pm+pt	NA		Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases				6								4
Actuated Green, G (s)	29.5	94.1		93.7	79.5		10.3	10.3			16.8	16.8
Effective Green, g (s)	29.5	94.1		93.7	79.5		10.3	10.3			16.8	16.8
Actuated g/C Ratio	0.18	0.59		0.59	0.50		0.06	0.06			0.11	0.11
Clearance Time (s)	5.5	6.2		6.2	6.2		6.0	6.0			6.2	6.2
Vehicle Extension (s)	2.1	5.1		2.1	5.1		2.0	2.0			2.0	2.0
Lane Grp Cap (vph)	326	2067		386	1730		113	115			193	166
v/s Ratio Prot	c0.16	0.29		0.07	c0.44		0.03	c0.05			c0.12	
v/s Ratio Perm				0.40								0.02
v/c Ratio	0.88	0.50		0.80	0.88		0.49	0.78			1.16	0.20
Uniform Delay, d1	63.5	19.3		17.1	36.0		72.3	73.7			71.6	65.4
Progression Factor	1.12	0.58		1.00	1.00		0.87	0.86			1.00	1.00
Incremental Delay, d2	17.5	0.7		10.8	6.8		0.9	20.6			114.7	0.2
Delay (s)	88.6	11.7		27.9	42.8		63.6	84.1			186.3	65.6
Level of Service	F	B		C	D		E	F			F	E
Approach Delay (s)		28.3			40.3			76.7			116.4	
Approach LOS		C			D			E			F	
Intersection Summary												
HCM 2000 Control Delay			48.2			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.91									
Actuated Cycle Length (s)			160.0			Sum of lost time (s)			24.6			
Intersection Capacity Utilization			94.5%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

Timings
6: Windward Plaza/Alderman Dr & Windward Pkwy

2020 No-Build AM Peak

09/24/2018

									
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	508	1238	29	1657	198	91	36	12	208
Future Volume (vph)	508	1238	29	1657	198	91	36	12	208
Turn Type	pm+pt	NA	Perm	NA	Perm	Split	NA	NA	Perm
Protected Phases	5	2		6		4	4	3	
Permitted Phases	2		6		6				3
Detector Phase	5	2	6	6	6	4	4	3	3
Switch Phase	2								
Minimum Initial (s)	4.0	20.0	20.0	20.0	20.0	6.0	6.0	6.0	6.0
Minimum Split (s)	15.0	48.8	51.8	51.8	51.8	45.2	45.2	22.5	22.5
Total Split (s)	40.0	121.0	81.0	81.0	81.0	21.0	21.0	18.0	18.0
Total Split (%)	25.0%	75.6%	50.6%	50.6%	50.6%	13.1%	13.1%	11.3%	11.3%
Yellow Time (s)	3.0	4.3	4.3	4.3	4.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.9	2.5	2.5	2.5	2.5	2.9	2.9	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	6.8	6.8	6.8	6.8	6.2	6.2	6.3	6.3
Lead/Lag	Lead		Lag	Lag	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?									
Recall Mode	None	C-Min	C-Min	C-Min	C-Min	None	None	None	None

Intersection Summary

Cycle Length: 160

Actuated Cycle Length: 160

Offset: 134 (84%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 145

Control Type: Actuated-Coordinated

Splits and Phases: 6: Windward Plaza/Alderman Dr & Windward Pkwy

	Ø2 (R)		Ø3		Ø4
121 s		18 s		21 s	
	Ø5		Ø6 (R)		
40 s		81 s			

HCM Signalized Intersection Capacity Analysis

6: Windward Plaza/Alderman Dr & Windward Pkwy

2020 No-Build AM Peak

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	508	1238	402	29	1657	198	91	36	42	17	12	208
Future Volume (vph)	508	1238	402	29	1657	198	91	36	42	17	12	208
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	6.8		6.8	6.8	6.8	6.2	6.2			6.3	6.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.92			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.97	1.00
Satd. Flow (prot)	1770	3409		1770	3539	1583	1770	1713			1810	1583
Flt Permitted	0.05	1.00		0.14	1.00	1.00	0.95	1.00			0.97	1.00
Satd. Flow (perm)	93	3409		261	3539	1583	1770	1713			1810	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	529	1290	419	30	1726	206	95	38	44	18	12	217
RTOR Reduction (vph)	0	17	0	0	0	56	0	27	0	0	0	206
Lane Group Flow (vph)	529	1692	0	30	1726	150	95	55	0	0	31	11
Turn Type	pm+pt	NA		Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2			6		4	4		3	3	
Permitted Phases	2			6		6						3
Actuated Green, G (s)	120.4	120.4		74.1	74.1	74.1	12.3	12.3			8.0	8.0
Effective Green, g (s)	120.4	120.4		74.1	74.1	74.1	12.3	12.3			8.0	8.0
Actuated g/C Ratio	0.75	0.75		0.46	0.46	0.46	0.08	0.08			0.05	0.05
Clearance Time (s)	5.9	6.8		6.8	6.8	6.8	6.2	6.2			6.3	6.3
Vehicle Extension (s)	2.0	5.0		5.0	5.0	5.0	2.0	2.0			2.0	2.0
Lane Grp Cap (vph)	493	2565		120	1638	733	136	131			90	79
v/s Ratio Prot	c0.27	0.50			0.49		c0.05	0.03			c0.02	
v/s Ratio Perm	c0.54			0.11		0.09						0.01
v/c Ratio	1.07	0.66		0.25	1.05	0.20	0.70	0.42			0.34	0.14
Uniform Delay, d1	53.9	9.7		26.1	43.0	25.5	72.0	70.5			73.5	72.7
Progression Factor	1.00	1.00		1.11	0.80	1.19	1.03	1.09			1.00	1.00
Incremental Delay, d2	61.5	1.3		3.3	34.2	0.4	5.8	0.4			0.8	0.3
Delay (s)	115.5	11.1		32.2	68.4	30.6	80.0	77.0			74.3	73.0
Level of Service	F	B		C	E	C	E	E			E	E
Approach Delay (s)		35.8			63.9			78.6			73.2	
Approach LOS		D			E			E			E	
Intersection Summary												
HCM 2000 Control Delay			51.3			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			1.02									
Actuated Cycle Length (s)			160.0			Sum of lost time (s)			25.2			
Intersection Capacity Utilization			101.4%			ICU Level of Service			G			
Analysis Period (min)			15									
c Critical Lane Group												

Timings

1: GA 400 SB & McGinnis Ferry Rd

2020 No-Build PM Peak

09/24/2018

	→	↘	↙	←	↘	↙
Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Configurations	↑↑↑	↑	↘↙	↑↑	↘↙	↑
Traffic Volume (vph)	965	300	590	1125	535	90
Future Volume (vph)	965	300	590	1125	535	90
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	4.0	15.0	6.0	6.0
Minimum Split (s)	23.5	23.5	15.0	23.5	23.5	23.5
Total Split (s)	55.0	55.0	45.0	100.0	40.0	40.0
Total Split (%)	39.3%	39.3%	32.1%	71.4%	28.6%	28.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Recall Mode	C-Min	C-Min	None	C-Min	None	None

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 91 (65%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Splits and Phases: 1: GA 400 SB & McGinnis Ferry Rd



HCM Signalized Intersection Capacity Analysis

2020 No-Build PM Peak

1: GA 400 SB & McGinnis Ferry Rd

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑↑		↑
Traffic Volume (vph)	0	965	300	590	1125	0	0	0	0	535	0	90
Future Volume (vph)	0	965	300	590	1125	0	0	0	0	535	0	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5	5.5	5.5					5.5		5.5
Lane Util. Factor		0.91	1.00	0.97	0.95					0.97		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)		5085	1583	3433	3539					3433		1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		5085	1583	3433	3539					3433		1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1049	326	641	1223	0	0	0	0	582	0	98
RTOR Reduction (vph)	0	0	134	0	0	0	0	0	0	0	0	76
Lane Group Flow (vph)	0	1049	192	641	1223	0	0	0	0	582	0	22
Turn Type		NA	Perm	Prot	NA					Prot		Perm
Protected Phases		2		1	6					8		
Permitted Phases			2									8
Actuated Green, G (s)		60.4	60.4	31.7	97.6					31.4		31.4
Effective Green, g (s)		60.4	60.4	31.7	97.6					31.4		31.4
Actuated g/C Ratio		0.43	0.43	0.23	0.70					0.22		0.22
Clearance Time (s)		5.5	5.5	5.5	5.5					5.5		5.5
Vehicle Extension (s)		5.0	5.0	3.0	3.0					5.0		5.0
Lane Grp Cap (vph)		2193	682	777	2467					769		355
v/s Ratio Prot		0.21		c0.19	c0.35					c0.17		
v/s Ratio Perm			0.12									0.01
v/c Ratio		0.48	0.28	0.82	0.50					0.76		0.06
Uniform Delay, d1		28.5	25.8	51.5	9.8					50.7		42.7
Progression Factor		1.00	1.00	0.64	0.84					1.00		1.00
Incremental Delay, d2		0.8	1.0	6.5	0.7					5.1		0.2
Delay (s)		29.3	26.8	39.5	8.9					55.8		42.9
Level of Service		C	C	D	A					E		D
Approach Delay (s)		28.7			19.4			0.0			53.9	
Approach LOS		C			B			A			D	
Intersection Summary												
HCM 2000 Control Delay			28.6			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)				16.5		
Intersection Capacity Utilization			64.5%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

Timings
2: GA 400 NB & McGinnis Ferry Rd

2020 No-Build PM Peak
09/24/2018

						
Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	215	985	1445	355	270	147
Future Volume (vph)	215	985	1445	355	270	147
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	4.0	15.0	15.0	15.0	6.0	6.0
Minimum Split (s)	15.0	23.5	23.5	23.5	23.5	23.5
Total Split (s)	25.0	90.0	65.0	65.0	50.0	50.0
Total Split (%)	17.9%	64.3%	46.4%	46.4%	35.7%	35.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Recall Mode	None	C-Min	C-Min	C-Min	None	None

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 64 (46%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated

Splits and Phases: 2: GA 400 NB & McGinnis Ferry Rd



HCM Signalized Intersection Capacity Analysis

2: GA 400 NB & McGinnis Ferry Rd

2020 No-Build PM Peak

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	215	985	0	0	1445	355	270	0	147	0	0	0
Future Volume (vph)	215	985	0	0	1445	355	270	0	147	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5			5.5	5.5	5.5		5.5			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.97		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)	3433	3539			5085	1583	3433		1583			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3433	3539			5085	1583	3433		1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	234	1071	0	0	1571	386	293	0	160	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	116	0	0	91	0	0	0
Lane Group Flow (vph)	234	1071	0	0	1571	271	293	0	69	0	0	0
Turn Type	Prot	NA			NA	Perm	Prot		Perm			
Protected Phases	5	2			6		4					
Permitted Phases						6			4			
Actuated Green, G (s)	14.8	111.3			91.0	91.0	17.7		17.7			
Effective Green, g (s)	14.8	111.3			91.0	91.0	17.7		17.7			
Actuated g/C Ratio	0.11	0.79			0.65	0.65	0.13		0.13			
Clearance Time (s)	5.5	5.5			5.5	5.5	5.5		5.5			
Vehicle Extension (s)	3.0	5.0			5.0	5.0	3.0		3.0			
Lane Grp Cap (vph)	362	2813			3305	1028	434		200			
v/s Ratio Prot	c0.07	0.30			c0.31		c0.09					
v/s Ratio Perm						0.17			0.04			
v/c Ratio	0.65	0.38			0.48	0.26	0.68		0.35			
Uniform Delay, d1	60.1	4.2			12.4	10.3	58.4		55.9			
Progression Factor	0.87	0.78			1.59	4.30	1.00		1.00			
Incremental Delay, d2	3.3	0.3			0.4	0.5	4.1		1.0			
Delay (s)	55.3	3.6			20.1	45.0	62.5		56.9			
Level of Service	E	A			C	D	E		E			
Approach Delay (s)		12.9			25.0			60.5			0.0	
Approach LOS		B			C			E			A	
Intersection Summary												
HCM 2000 Control Delay		25.1			HCM 2000 Level of Service				C			
HCM 2000 Volume to Capacity ratio		0.52										
Actuated Cycle Length (s)		140.0			Sum of lost time (s)				16.5			
Intersection Capacity Utilization		64.5%			ICU Level of Service				C			
Analysis Period (min)		15										
c Critical Lane Group												

Timings
3: Windward Concourse & McGinnis Ferry Rd

2020 No-Build PM Peak

09/24/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	5	1615	194	155	1445	5	486	35	675	45	30
Future Volume (vph)	5	1615	194	155	1445	5	486	35	675	45	30
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	NA	Perm
Protected Phases	5	2		1	6		4	4		3	
Permitted Phases			2			6			4		3
Detector Phase	5	2	2	1	6	6	4	4	4	3	3
Switch Phase	2			6							
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	15.0	15.0	15.0	5.0	5.0
Minimum Split (s)	15.0	52.5	52.5	15.0	26.3	26.3	23.6	23.6	23.6	23.6	23.6
Total Split (s)	15.0	60.0	60.0	15.0	60.0	60.0	35.0	35.0	35.0	30.0	30.0
Total Split (%)	10.7%	42.9%	42.9%	10.7%	42.9%	42.9%	25.0%	25.0%	25.0%	21.4%	21.4%
Yellow Time (s)	3.2	4.3	4.3	3.2	4.3	4.3	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	6.3	6.3	5.2	6.3	6.3	5.6	5.6	5.6	5.6	5.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?											
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

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

Natural Cycle: 125

Control Type: Actuated-Coordinated

Splits and Phases: 3: Windward Concourse & McGinnis Ferry Rd

			
Ø1	Ø2 (R)	Ø3	Ø4
15 s	60 s	30 s	35 s
			
Ø5	Ø6 (R)		
15 s	60 s		

HCM Signalized Intersection Capacity Analysis

3: Windward Concourse & McGinnis Ferry Rd

2020 No-Build PM Peak

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1615	194	155	1445	5	486	35	675	13	45	30
Future Volume (vph)	5	1615	194	155	1445	5	486	35	675	13	45	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.3	6.3	5.2	6.3	6.3	5.6	5.6	5.6		5.6	5.6
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.95	0.95	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	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.99	1.00
Satd. Flow (prot)	3433	5036	1583	3433	5036	1583	1681	1696	1583		1842	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.99	1.00
Satd. Flow (perm)	3433	5036	1583	3433	5036	1583	1681	1696	1583		1842	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	1755	211	168	1571	5	528	38	734	14	49	33
RTOR Reduction (vph)	0	0	75	0	0	2	0	0	313	0	0	31
Lane Group Flow (vph)	5	1755	136	168	1571	3	280	286	421	0	63	2
Heavy Vehicles (%)	2%	3%	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases			2			6			4			3
Actuated Green, G (s)	1.1	70.2	70.2	9.4	78.5	78.5	29.4	29.4	29.4		8.3	8.3
Effective Green, g (s)	1.1	70.2	70.2	9.4	78.5	78.5	29.4	29.4	29.4		8.3	8.3
Actuated g/C Ratio	0.01	0.50	0.50	0.07	0.56	0.56	0.21	0.21	0.21		0.06	0.06
Clearance Time (s)	5.2	6.3	6.3	5.2	6.3	6.3	5.6	5.6	5.6		5.6	5.6
Vehicle Extension (s)	2.1	5.1	5.1	2.1	5.1	5.1	2.1	2.1	2.1		2.1	2.1
Lane Grp Cap (vph)	26	2525	793	230	2823	887	353	356	332		109	93
v/s Ratio Prot	0.00	c0.35		c0.05	0.31		0.17	0.17			c0.03	
v/s Ratio Perm			0.09			0.00			c0.27			0.00
v/c Ratio	0.19	0.70	0.17	0.73	0.56	0.00	0.79	0.80	1.27		0.58	0.02
Uniform Delay, d1	69.0	26.7	19.0	64.1	19.6	13.5	52.4	52.6	55.3		64.1	62.0
Progression Factor	1.12	0.68	0.50	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.6	1.6	0.5	10.0	0.8	0.0	10.9	11.7	142.6		4.8	0.0
Delay (s)	79.1	19.8	10.0	74.0	20.4	13.5	63.4	64.3	197.9		69.0	62.1
Level of Service	E	B	A	E	C	B	E	E	F		E	E
Approach Delay (s)		18.9			25.6			139.5			66.6	
Approach LOS		B			C			F			E	
Intersection Summary												
HCM 2000 Control Delay			52.8			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)			22.7			
Intersection Capacity Utilization			91.7%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection

Intersection Delay, s/veh	49.1
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	401	10	25	136	45	26	10	465	11	9	268	19
Future Vol, veh/h	401	10	25	136	45	26	10	465	11	9	268	19
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	456	11	28	155	51	30	11	528	13	10	305	22
Number of Lanes	0	1	1	0	1	0	0	2	0	0	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	108.4	25.1	25.2	17.9
HCM LOS	F	D	D	C

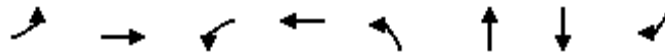
Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	4%	0%	98%	0%	66%	6%	0%
Vol Thru, %	96%	95%	2%	0%	22%	94%	88%
Vol Right, %	0%	5%	0%	100%	13%	0%	12%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	243	244	411	25	207	143	153
LT Vol	10	0	401	0	136	9	0
Through Vol	233	233	10	0	45	134	134
RT Vol	0	11	0	25	26	0	19
Lane Flow Rate	276	277	467	28	235	162	174
Geometry Grp	7	7	7	7	6	7	7
Degree of Util (X)	0.632	0.631	1.132	0.059	0.587	0.392	0.413
Departure Headway (Hd)	8.742	8.688	8.728	7.502	9.465	9.192	9.067
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	416	418	416	477	383	395	400
Service Time	6.442	6.388	6.478	5.251	7.465	6.892	6.767
HCM Lane V/C Ratio	0.663	0.663	1.123	0.059	0.614	0.41	0.435
HCM Control Delay	25.3	25.1	114.3	10.7	25.1	17.7	18
HCM Lane LOS	D	D	F	B	D	C	C
HCM 95th-tile Q	4.2	4.2	17	0.2	3.6	1.8	2

Timings

5: Windward Plaza/Windward Concourse & Windward Pkwy

2020 No-Build PM Peak

09/24/2018



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	174	1520	65	402	102	91	57	369
Future Volume (vph)	174	1520	65	402	102	91	57	369
Turn Type	Prot	NA	pm+pt	NA	Split	NA	NA	Perm
Protected Phases	5	2	1	6	3	3	4	
Permitted Phases			6					4
Detector Phase	5	2	1	6	3	3	4	4
Switch Phase								
Minimum Initial (s)	4.0	15.0	4.0	15.0	4.0	4.0	4.0	4.0
Minimum Split (s)	15.0	46.2	15.0	50.2	41.0	41.0	22.5	22.5
Total Split (s)	30.0	90.0	13.0	73.0	23.0	23.0	34.0	34.0
Total Split (%)	18.8%	56.3%	8.1%	45.6%	14.4%	14.4%	21.3%	21.3%
Yellow Time (s)	3.0	4.2	3.4	4.2	3.1	3.1	3.6	3.6
All-Red Time (s)	2.5	2.0	2.8	2.0	2.9	2.9	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	6.2	6.2	6.2	6.0	6.0	6.2	6.2
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?								
Recall Mode	Min	C-Min	None	C-Min	None	None	None	None

Intersection Summary

Cycle Length: 160

Actuated Cycle Length: 160

Offset: 146 (91%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Splits and Phases: 5: Windward Plaza/Windward Concourse & Windward Pkwy

Ø1	Ø2 (R)	Ø3	Ø4
13 s	90 s	23 s	34 s
Ø5	Ø6 (R)		
30 s	73 s		

HCM Signalized Intersection Capacity Analysis

5: Windward Plaza/Windward Concourse & Windward Pkwy

2020 No-Build PM Peak

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	174	1520	29	65	402	28	102	91	279	225	57	369
Future Volume (vph)	174	1520	29	65	402	28	102	91	279	225	57	369
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	6.2		6.2	6.2		6.0	6.0			6.2	6.2
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.99		1.00	0.89			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.96	1.00
Satd. Flow (prot)	1770	3529		1770	3505		1770	1652			1791	1583
Flt Permitted	0.95	1.00		0.06	1.00		0.95	1.00			0.96	1.00
Satd. Flow (perm)	1770	3529		104	3505		1770	1652			1791	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	183	1600	31	68	423	29	107	96	294	237	60	388
RTOR Reduction (vph)	0	1	0	0	3	0	0	69	0	0	0	321
Lane Group Flow (vph)	183	1630	0	68	449	0	107	321	0	0	297	67
Turn Type	Prot	NA		pm+pt	NA		Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases				6								4
Actuated Green, G (s)	20.2	84.5		77.8	71.4		17.0	17.0			27.5	27.5
Effective Green, g (s)	20.2	84.5		77.8	71.4		17.0	17.0			27.5	27.5
Actuated g/C Ratio	0.13	0.53		0.49	0.45		0.11	0.11			0.17	0.17
Clearance Time (s)	5.5	6.2		6.2	6.2		6.0	6.0			6.2	6.2
Vehicle Extension (s)	2.1	5.1		2.1	5.1		2.0	2.0			2.0	2.0
Lane Grp Cap (vph)	223	1863		117	1564		188	175			307	272
v/s Ratio Prot	c0.10	c0.46		0.02	0.13		0.06	c0.19			c0.17	
v/s Ratio Perm				0.26								0.04
v/c Ratio	0.82	0.87		0.58	0.29		0.57	1.84			0.97	0.25
Uniform Delay, d1	68.1	33.1		31.5	28.1		68.0	71.5			65.8	57.3
Progression Factor	1.11	0.74		1.00	1.00		0.94	0.91			1.00	1.00
Incremental Delay, d2	12.5	3.6		4.9	0.5		2.3	397.0			41.9	0.2
Delay (s)	88.0	28.0		36.5	28.6		66.1	462.1			107.7	57.4
Level of Service	F	C		D	C		E	F			F	E
Approach Delay (s)		34.0			29.6			376.8			79.2	
Approach LOS		C			C			F			E	
Intersection Summary												
HCM 2000 Control Delay			90.6			HCM 2000 Level of Service			F			
HCM 2000 Volume to Capacity ratio			1.03									
Actuated Cycle Length (s)			160.0			Sum of lost time (s)			24.6			
Intersection Capacity Utilization			104.5%			ICU Level of Service			G			
Analysis Period (min)			15									
c Critical Lane Group												

Timings
6: Windward Plaza/Alderman Dr & Windward Pkwy

2020 No-Build PM Peak
09/24/2018

									
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	315	1507	39	764	37	326	22	14	406
Future Volume (vph)	315	1507	39	764	37	326	22	14	406
Turn Type	pm+pt	NA	Perm	NA	Perm	Split	NA	NA	Perm
Protected Phases	5	2		6		4	4	3	
Permitted Phases	2		6		6				3
Detector Phase	5	2	6	6	6	4	4	3	3
Switch Phase	2								
Minimum Initial (s)	4.0	20.0	20.0	20.0	20.0	6.0	6.0	6.0	6.0
Minimum Split (s)	15.0	48.8	51.8	51.8	51.8	45.2	45.2	22.5	22.5
Total Split (s)	30.0	113.0	83.0	83.0	83.0	25.0	25.0	22.0	22.0
Total Split (%)	18.8%	70.6%	51.9%	51.9%	51.9%	15.6%	15.6%	13.8%	13.8%
Yellow Time (s)	3.0	4.3	4.3	4.3	4.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.9	2.5	2.5	2.5	2.5	2.9	2.9	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	6.8	6.8	6.8	6.8	6.2	6.2	6.3	6.3
Lead/Lag	Lead		Lag	Lag	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?									
Recall Mode	None	C-Min	C-Min	C-Min	C-Min	None	None	None	None

Intersection Summary

Cycle Length: 160
 Actuated Cycle Length: 160
 Offset: 117 (73%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 145
 Control Type: Actuated-Coordinated

Splits and Phases: 6: Windward Plaza/Alderman Dr & Windward Pkwy

 Ø2 (R)	 Ø3	 Ø4
113 s	22 s	25 s
 Ø5	 Ø6 (R)	
30 s	83 s	

HCM Signalized Intersection Capacity Analysis

6: Windward Plaza/Alderman Dr & Windward Pkwy

2020 No-Build PM Peak

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	315	1507	86	39	764	37	326	22	36	191	14	406
Future Volume (vph)	315	1507	86	39	764	37	326	22	36	191	14	406
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	6.8		6.8	6.8	6.8	6.2	6.2			6.3	6.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.91			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.96	1.00
Satd. Flow (prot)	1770	3510		1770	3539	1583	1770	1688			1780	1583
Flt Permitted	0.24	1.00		0.09	1.00	1.00	0.95	1.00			0.96	1.00
Satd. Flow (perm)	453	3510		171	3539	1583	1770	1688			1780	1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	346	1656	95	43	840	41	358	24	40	210	15	446
RTOR Reduction (vph)	0	3	0	0	0	20	0	35	0	0	0	262
Lane Group Flow (vph)	346	1748	0	43	840	21	358	29	0	0	225	184
Turn Type	pm+pt	NA		Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2			6		4	4		3	3	
Permitted Phases	2			6		6						3
Actuated Green, G (s)	106.2	106.2		82.5	82.5	82.5	18.8	18.8			15.7	15.7
Effective Green, g (s)	106.2	106.2		82.5	82.5	82.5	18.8	18.8			15.7	15.7
Actuated g/C Ratio	0.66	0.66		0.52	0.52	0.52	0.12	0.12			0.10	0.10
Clearance Time (s)	5.9	6.8		6.8	6.8	6.8	6.2	6.2			6.3	6.3
Vehicle Extension (s)	2.0	5.0		5.0	5.0	5.0	2.0	2.0			2.0	2.0
Lane Grp Cap (vph)	447	2329		88	1824	816	207	198			174	155
v/s Ratio Prot	0.09	c0.50			0.24		c0.20	0.02			c0.13	
v/s Ratio Perm	c0.43			0.25		0.01						0.12
v/c Ratio	0.77	0.75		0.49	0.46	0.03	1.73	0.14			1.29	1.18
Uniform Delay, d1	15.4	18.0		25.1	24.6	19.0	70.6	63.4			72.2	72.2
Progression Factor	1.00	1.00		0.94	0.87	1.00	0.98	0.99			1.00	1.00
Incremental Delay, d2	7.5	2.3		16.4	0.8	0.1	347.2	0.1			167.8	130.4
Delay (s)	22.8	20.3		40.0	22.1	19.1	416.5	62.8			239.9	202.5
Level of Service	C	C		D	C	B	F	E			F	F
Approach Delay (s)		20.7			22.8			362.8			215.1	
Approach LOS		C			C			F			F	
Intersection Summary												
HCM 2000 Control Delay	88.0			HCM 2000 Level of Service					F			
HCM 2000 Volume to Capacity ratio	1.00											
Actuated Cycle Length (s)	160.0			Sum of lost time (s)					25.2			
Intersection Capacity Utilization	102.3%			ICU Level of Service					G			
Analysis Period (min)	15											
c Critical Lane Group												

**FUTURE “NO-BUILD” IMPROVED
INTERSECTION ANALYSIS**

Timings

1: GA 400 SB & McGinnis Ferry Rd

2020 No-Build AM Peak - Improved

09/24/2018

	→	↘	↙	←	↘	↙
Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Configurations	↑↑↑	↑	↘↙	↑↑	↘↙	↑
Traffic Volume (vph)	1190	170	330	640	200	250
Future Volume (vph)	1190	170	330	640	200	250
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	4.0	15.0	6.0	6.0
Minimum Split (s)	23.5	23.5	15.0	23.5	23.5	23.5
Total Split (s)	55.0	55.0	45.0	100.0	40.0	40.0
Total Split (%)	39.3%	39.3%	32.1%	71.4%	28.6%	28.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Recall Mode	C-Min	C-Min	None	C-Min	None	None

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 40 (29%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Splits and Phases: 1: GA 400 SB & McGinnis Ferry Rd



HCM Signalized Intersection Capacity Analysis

1: GA 400 SB & McGinnis Ferry Rd

2020 No-Build AM Peak - Improved

09/24/2018

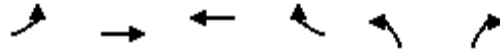
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑↑		↑
Traffic Volume (vph)	0	1190	170	330	640	0	0	0	0	200	0	250
Future Volume (vph)	0	1190	170	330	640	0	0	0	0	200	0	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5	5.5	5.5					5.5		5.5
Lane Util. Factor		0.91	1.00	0.97	0.95					0.97		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)		5085	1583	3433	3539					3433		1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		5085	1583	3433	3539					3433		1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	1227	175	340	660	0	0	0	0	206	0	258
RTOR Reduction (vph)	0	0	41	0	0	0	0	0	0	0	0	228
Lane Group Flow (vph)	0	1227	134	340	660	0	0	0	0	206	0	30
Turn Type		NA	Perm	Prot	NA					Prot		Perm
Protected Phases		2		1	6					8		
Permitted Phases			2									8
Actuated Green, G (s)		87.7	87.7	19.3	112.5					16.5		16.5
Effective Green, g (s)		87.7	87.7	19.3	112.5					16.5		16.5
Actuated g/C Ratio		0.63	0.63	0.14	0.80					0.12		0.12
Clearance Time (s)		5.5	5.5	5.5	5.5					5.5		5.5
Vehicle Extension (s)		5.0	5.0	3.0	3.0					5.0		5.0
Lane Grp Cap (vph)		3185	991	473	2843					404		186
v/s Ratio Prot		c0.24		c0.10	0.19					c0.06		
v/s Ratio Perm			0.08									0.02
v/c Ratio		0.39	0.14	0.72	0.23					0.51		0.16
Uniform Delay, d1		12.9	10.7	57.8	3.3					58.0		55.5
Progression Factor		1.00	1.00	1.01	0.64					1.00		1.00
Incremental Delay, d2		0.4	0.3	5.1	0.2					2.1		0.9
Delay (s)		13.2	11.0	63.2	2.3					60.1		56.4
Level of Service		B	B	E	A					E		E
Approach Delay (s)		12.9			23.0			0.0			58.0	
Approach LOS		B			C			A			E	
Intersection Summary												
HCM 2000 Control Delay			23.8			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.45									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)				16.5		
Intersection Capacity Utilization			51.9%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

Timings

2: GA 400 NB & McGinnis Ferry Rd

2020 No-Build AM Peak - Improved

09/24/2018



Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Configurations	↰↰	↱↱	↰↰↰	↱	↰↰	↱
Traffic Volume (vph)	165	1055	740	275	230	60
Future Volume (vph)	165	1055	740	275	230	60
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	4.0	15.0	15.0	15.0	6.0	6.0
Minimum Split (s)	15.0	23.5	23.5	23.5	23.5	23.5
Total Split (s)	30.0	90.0	60.0	60.0	50.0	50.0
Total Split (%)	21.4%	64.3%	42.9%	42.9%	35.7%	35.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Recall Mode	None	C-Min	C-Min	C-Min	None	None

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 60 (43%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Splits and Phases: 2: GA 400 NB & McGinnis Ferry Rd



HCM Signalized Intersection Capacity Analysis

2: GA 400 NB & McGinnis Ferry Rd

2020 No-Build AM Peak - Improved

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	165	1055	0	0	740	275	230	0	60	0	0	0
Future Volume (vph)	165	1055	0	0	740	275	230	0	60	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5			5.5	5.5	5.5		5.5			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.97		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)	3433	3539			5085	1583	3433		1583			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3433	3539			5085	1583	3433		1583			
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	170	1088	0	0	763	284	237	0	62	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	89	0	0	55	0	0	0
Lane Group Flow (vph)	170	1088	0	0	763	195	237	0	7	0	0	0
Turn Type	Prot	NA			NA	Perm	Prot		Perm			
Protected Phases	5	2			6		4					
Permitted Phases						6			4			
Actuated Green, G (s)	12.3	113.8			96.0	96.0	15.2		15.2			
Effective Green, g (s)	12.3	113.8			96.0	96.0	15.2		15.2			
Actuated g/C Ratio	0.09	0.81			0.69	0.69	0.11		0.11			
Clearance Time (s)	5.5	5.5			5.5	5.5	5.5		5.5			
Vehicle Extension (s)	3.0	5.0			5.0	5.0	3.0		3.0			
Lane Grp Cap (vph)	301	2876			3486	1085	372		171			
v/s Ratio Prot	c0.05	c0.31			0.15		c0.07					
v/s Ratio Perm						0.12			0.00			
v/c Ratio	0.56	0.38			0.22	0.18	0.64		0.04			
Uniform Delay, d1	61.3	3.5			8.1	7.9	59.8		55.9			
Progression Factor	1.43	0.17			0.30	0.31	1.00		1.00			
Incremental Delay, d2	2.3	0.4			0.1	0.4	3.6		0.1			
Delay (s)	89.8	1.0			2.6	2.8	63.3		56.0			
Level of Service	F	A			A	A	E		E			
Approach Delay (s)		13.0			2.6		61.8				0.0	
Approach LOS		B			A		E				A	
Intersection Summary												
HCM 2000 Control Delay		14.4			HCM 2000 Level of Service		B					
HCM 2000 Volume to Capacity ratio		0.44										
Actuated Cycle Length (s)		140.0			Sum of lost time (s)		16.5					
Intersection Capacity Utilization		51.9%			ICU Level of Service		A					
Analysis Period (min)		15										
c Critical Lane Group												

Timings
3: Windward Concourse & McGinnis Ferry Rd

2020 No-Build AM Peak - Improved

09/24/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	27	950	478	565	920	73	90	48	110	84	10
Future Volume (vph)	27	950	478	565	920	73	90	48	110	84	10
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	NA	Perm
Protected Phases	5	2		1	6		4	4		3	
Permitted Phases			2			6			4		3
Detector Phase	5	2	2	1	6	6	4	4	4	3	3
Switch Phase	2			6							
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	15.0	15.0	15.0	5.0	5.0
Minimum Split (s)	15.0	52.5	52.5	15.0	26.3	26.3	23.6	23.6	23.6	23.6	23.6
Total Split (s)	15.0	54.0	54.0	38.0	77.0	77.0	24.0	24.0	24.0	24.0	24.0
Total Split (%)	10.7%	38.6%	38.6%	27.1%	55.0%	55.0%	17.1%	17.1%	17.1%	17.1%	17.1%
Yellow Time (s)	3.2	4.3	4.3	3.2	4.3	4.3	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	6.3	6.3	5.2	6.3	6.3	5.6	5.6	5.6	5.6	5.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?											
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None

Intersection Summary

Cycle Length: 140

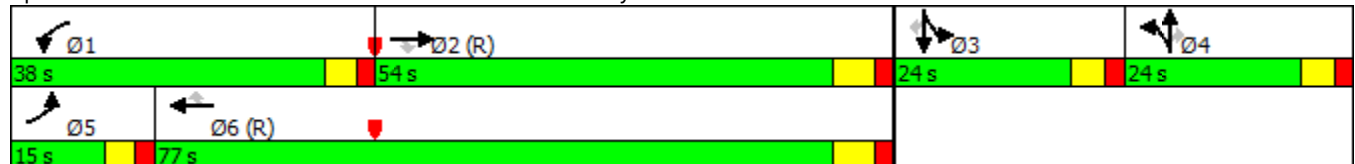
Actuated Cycle Length: 140

Offset: 50 (36%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 125

Control Type: Actuated-Coordinated

Splits and Phases: 3: Windward Concourse & McGinnis Ferry Rd



HCM Signalized Intersection Capacity Analysis

3: Windward Concourse & McGinnis Ferry Rd

2020 No-Build AM Peak - Improved

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	950	478	565	920	73	90	48	110	5	84	10
Future Volume (vph)	27	950	478	565	920	73	90	48	110	5	84	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.3	6.3	5.2	6.3	6.3	5.6	5.6	5.6		5.6	5.6
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.95	0.95	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	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.98	1.00		1.00	1.00
Satd. Flow (prot)	3433	5036	1583	3433	5036	1583	1681	1742	1583		1858	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.98	1.00		1.00	1.00
Satd. Flow (perm)	3433	5036	1583	3433	5036	1583	1681	1742	1583		1858	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	28	979	493	582	948	75	93	49	113	5	87	10
RTOR Reduction (vph)	0	0	254	0	0	28	0	0	101	0	0	9
Lane Group Flow (vph)	28	979	239	582	948	47	70	72	12	0	92	1
Heavy Vehicles (%)	2%	3%	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases			2			6			4			3
Actuated Green, G (s)	3.8	63.0	63.0	27.8	87.0	87.0	15.0	15.0	15.0		11.5	11.5
Effective Green, g (s)	3.8	63.0	63.0	27.8	87.0	87.0	15.0	15.0	15.0		11.5	11.5
Actuated g/C Ratio	0.03	0.45	0.45	0.20	0.62	0.62	0.11	0.11	0.11		0.08	0.08
Clearance Time (s)	5.2	6.3	6.3	5.2	6.3	6.3	5.6	5.6	5.6		5.6	5.6
Vehicle Extension (s)	2.1	5.1	5.1	2.1	5.1	5.1	2.1	2.1	2.1		2.1	2.1
Lane Grp Cap (vph)	93	2266	712	681	3129	983	180	186	169		152	130
v/s Ratio Prot	0.01	c0.19		c0.17	0.19		c0.04	0.04			c0.05	
v/s Ratio Perm			0.15			0.03			0.01			0.00
v/c Ratio	0.30	0.43	0.34	0.85	0.30	0.05	0.39	0.39	0.07		0.61	0.01
Uniform Delay, d1	66.8	26.3	25.0	54.1	12.4	10.3	58.2	58.2	56.2		62.1	59.0
Progression Factor	1.16	0.83	0.81	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.8	0.6	1.2	9.9	0.2	0.1	0.6	0.6	0.1		4.8	0.0
Delay (s)	78.4	22.4	21.4	64.1	12.6	10.4	58.8	58.8	56.3		66.9	59.0
Level of Service	E	C	C	E	B	B	E	E	E		E	E
Approach Delay (s)		23.1			31.2			57.7			66.1	
Approach LOS		C			C			E			E	
Intersection Summary												
HCM 2000 Control Delay			30.7			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)			22.7			
Intersection Capacity Utilization			64.7%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Timings
4: Windward Concourse & Alderman Dr/Private Drwy

2020 No-Build AM Peak - Improved

09/24/2018



Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↕	↗	↔		↕		↕
Traffic Volume (vph)	65	9	5	11	242	35	568
Future Volume (vph)	65	9	5	11	242	35	568
Turn Type	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	4		3		2		6
Permitted Phases		4		2		6	
Detector Phase	4	4	3	2	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	15.0	15.0	15.0	15.0
Minimum Split (s)	23.5	23.5	15.0	23.5	23.5	23.5	23.5
Total Split (s)	35.0	35.0	30.0	55.0	55.0	55.0	55.0
Total Split (%)	29.2%	29.2%	25.0%	45.8%	45.8%	45.8%	45.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	5.5	5.5	5.5		5.5		5.5
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?							
Recall Mode	None	None	None	C-Min	C-Min	C-Min	C-Min

Intersection Summary

Cycle Length: 120

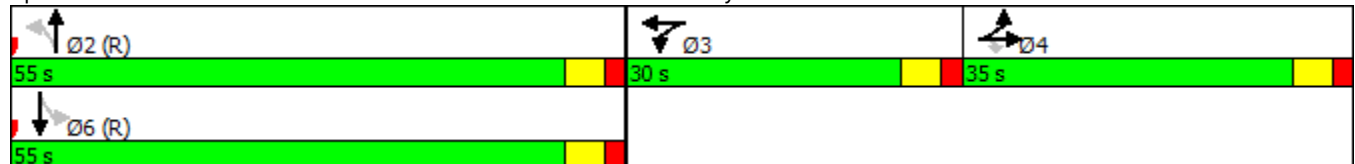
Actuated Cycle Length: 120

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

Natural Cycle: 65

Control Type: Actuated-Coordinated

Splits and Phases: 4: Windward Concourse & Alderman Dr/Private Drwy



HCM Signalized Intersection Capacity Analysis

4: Windward Concourse & Alderman Dr/Private Drwy

2020 No-Build AM Peak - Improved

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	65	9	11	5	7	11	242	101	35	568	238
Future Volume (vph)	32	65	9	11	5	7	11	242	101	35	568	238
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		5.5			5.5			5.5	
Lane Util. Factor		1.00	1.00		1.00			0.95			0.95	
Frt		1.00	0.85		0.96			0.96			0.96	
Flt Protected		0.98	1.00		0.98			1.00			1.00	
Satd. Flow (prot)		1833	1583		1744			3382			3382	
Flt Permitted		0.98	1.00		0.98			0.92			0.92	
Satd. Flow (perm)		1833	1583		1744			3133			3123	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	33	67	9	11	5	7	11	249	104	36	586	245
RTOR Reduction (vph)	0	0	8	0	7	0	0	17	0	0	16	0
Lane Group Flow (vph)	0	100	1	0	16	0	0	348	0	0	851	0
Turn Type	Split	NA	Perm	Split	NA		Perm	NA		Perm	NA	
Protected Phases	4	4		3	3			2			6	
Permitted Phases			4				2			6		
Actuated Green, G (s)		11.9	11.9		4.6			87.0			87.0	
Effective Green, g (s)		11.9	11.9		4.6			87.0			87.0	
Actuated g/C Ratio		0.10	0.10		0.04			0.72			0.72	
Clearance Time (s)		5.5	5.5		5.5			5.5			5.5	
Vehicle Extension (s)		3.0	3.0		3.0			3.0			3.0	
Lane Grp Cap (vph)		181	156		66			2271			2264	
v/s Ratio Prot		c0.05			c0.01							
v/s Ratio Perm			0.00					0.11			c0.27	
v/c Ratio		0.55	0.01		0.25			0.15			0.38	
Uniform Delay, d1		51.5	48.7		56.0			5.1			6.2	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		3.6	0.0		2.0			0.1			0.5	
Delay (s)		55.1	48.7		58.0			5.2			6.7	
Level of Service		E	D		E			A			A	
Approach Delay (s)		54.6			58.0			5.2			6.7	
Approach LOS		D			E			A			A	
Intersection Summary												
HCM 2000 Control Delay			11.0		HCM 2000 Level of Service				B			
HCM 2000 Volume to Capacity ratio			0.39									
Actuated Cycle Length (s)			120.0		Sum of lost time (s)				16.5			
Intersection Capacity Utilization			58.5%		ICU Level of Service				B			
Analysis Period (min)			15									
c Critical Lane Group												

Timings

2020 No-Build AM Peak - Improved

5: Windward Plaza/Windward Concourse & Windward Pkwy

09/24/2018



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	280	973	303	1338	54	72	24	164	303
Future Volume (vph)	280	973	303	1338	54	72	24	164	303
Turn Type	Prot	NA	pm+pt	NA	Split	NA	Perm	NA	Perm
Protected Phases	5	2	1	6	3	3		4	
Permitted Phases			6				3		4
Detector Phase	5	2	1	6	3	3	3	4	4
Switch Phase									
Minimum Initial (s)	4.0	15.0	4.0	15.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	15.0	46.2	15.0	50.2	41.0	41.0	41.0	22.5	22.5
Total Split (s)	41.0	97.0	23.0	79.0	17.0	17.0	17.0	23.0	23.0
Total Split (%)	25.6%	60.6%	14.4%	49.4%	10.6%	10.6%	10.6%	14.4%	14.4%
Yellow Time (s)	3.0	4.2	3.4	4.2	3.1	3.1	3.1	3.6	3.6
All-Red Time (s)	2.5	2.0	2.8	2.0	2.9	2.9	2.9	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	6.2	6.2	6.2	6.0	6.0	6.0	6.2	6.2
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?									
Recall Mode	Min	C-Min	None	C-Min	None	None	None	None	None

Intersection Summary

Cycle Length: 160

Actuated Cycle Length: 160

Offset: 144 (90%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Splits and Phases: 5: Windward Plaza/Windward Concourse & Windward Pkwy

Ø1	Ø2 (R)	Ø3	Ø4
23 s	97 s	17 s	23 s
Ø5	Ø6 (R)		
41 s	79 s		

HCM Signalized Intersection Capacity Analysis

5: Windward Plaza/Windward Concourse & Windward Pkwy

2020 No-Build AM Peak - Improved

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	280	973	45	303	1338	161	54	72	24	56	164	303
Future Volume (vph)	280	973	45	303	1338	161	54	72	24	56	164	303
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	6.2		6.2	6.2		6.0	6.0	6.0		6.2	6.2
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.98		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00		0.99	1.00
Satd. Flow (prot)	1770	3516		1770	3482		1770	1863	1583		1839	1583
Flt Permitted	0.95	1.00		0.25	1.00		0.95	1.00	1.00		0.99	1.00
Satd. Flow (perm)	1770	3516		464	3482		1770	1863	1583		1839	1583
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	286	993	46	309	1365	164	55	73	24	57	167	309
RTOR Reduction (vph)	0	2	0	0	5	0	0	0	23	0	0	277
Lane Group Flow (vph)	286	1037	0	309	1524	0	55	73	1	0	224	32
Turn Type	Prot	NA		pm+pt	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases				6					3			4
Actuated Green, G (s)	29.5	94.8		94.6	80.3		9.5	9.5	9.5		16.8	16.8
Effective Green, g (s)	29.5	94.8		94.6	80.3		9.5	9.5	9.5		16.8	16.8
Actuated g/C Ratio	0.18	0.59		0.59	0.50		0.06	0.06	0.06		0.11	0.11
Clearance Time (s)	5.5	6.2		6.2	6.2		6.0	6.0	6.0		6.2	6.2
Vehicle Extension (s)	2.1	5.1		2.1	5.1		2.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)	326	2083		391	1747		105	110	93		193	166
v/s Ratio Prot	c0.16	0.29		0.07	c0.44		0.03	c0.04			c0.12	
v/s Ratio Perm				0.40					0.00			0.02
v/c Ratio	0.88	0.50		0.79	0.87		0.52	0.66	0.02		1.16	0.20
Uniform Delay, d1	63.5	18.8		16.7	35.3		73.1	73.7	70.8		71.6	65.4
Progression Factor	1.08	0.62		1.00	1.00		0.88	0.89	1.00		1.00	1.00
Incremental Delay, d2	17.7	0.7		9.8	6.3		1.7	8.9	0.0		114.7	0.2
Delay (s)	86.1	12.3		26.5	41.6		66.3	74.1	70.9		186.3	65.6
Level of Service	F	B		C	D		E	E	E		F	E
Approach Delay (s)		28.2			39.1			70.8			116.4	
Approach LOS		C			D			E			F	
Intersection Summary												
HCM 2000 Control Delay			47.3			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.90									
Actuated Cycle Length (s)			160.0			Sum of lost time (s)			24.6			
Intersection Capacity Utilization			93.1%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

Timings
6: Windward Plaza/Alderman Dr & Windward Pkwy

2020 No-Build AM Peak - Improved

09/24/2018

									
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	508	1238	29	1657	198	91	36	12	208
Future Volume (vph)	508	1238	29	1657	198	91	36	12	208
Turn Type	Prot	NA	Perm	NA	Perm	Split	NA	NA	Perm
Protected Phases	5	2		6		4	4	3	
Permitted Phases			6		6				3
Detector Phase	5	2	6	6	6	4	4	3	3
Switch Phase	2								
Minimum Initial (s)	4.0	20.0	20.0	20.0	20.0	6.0	6.0	6.0	6.0
Minimum Split (s)	15.0	48.8	51.8	51.8	51.8	45.2	45.2	22.5	22.5
Total Split (s)	40.0	121.0	81.0	81.0	81.0	21.0	21.0	18.0	18.0
Total Split (%)	25.0%	75.6%	50.6%	50.6%	50.6%	13.1%	13.1%	11.3%	11.3%
Yellow Time (s)	3.0	4.3	4.3	4.3	4.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.9	2.5	2.5	2.5	2.5	2.9	2.9	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	6.8	6.8	6.8	6.8	6.2	6.2	6.3	6.3
Lead/Lag	Lead		Lag	Lag	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?									
Recall Mode	None	C-Min	C-Min	C-Min	C-Min	None	None	None	None

Intersection Summary

Cycle Length: 160

Actuated Cycle Length: 160

Offset: 134 (84%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 145

Control Type: Actuated-Coordinated

Splits and Phases: 6: Windward Plaza/Alderman Dr & Windward Pkwy

	Ø2 (R)		Ø3		Ø4
121 s		18 s		21 s	
	Ø5		Ø6 (R)		
40 s		81 s			

HCM Signalized Intersection Capacity Analysis

6: Windward Plaza/Alderman Dr & Windward Pkwy

2020 No-Build AM Peak - Improved

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	508	1238	402	29	1657	198	91	36	42	17	12	208
Future Volume (vph)	508	1238	402	29	1657	198	91	36	42	17	12	208
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	6.8		6.8	6.8	6.8	6.2	6.2			6.3	6.3
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	0.97	1.00			1.00	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.92			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.97	1.00
Satd. Flow (prot)	3433	3409		1770	3539	1583	3433	1713			1810	1583
Flt Permitted	0.95	1.00		0.14	1.00	1.00	0.95	1.00			0.97	1.00
Satd. Flow (perm)	3433	3409		261	3539	1583	3433	1713			1810	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	529	1290	419	30	1726	206	95	38	44	18	12	217
RTOR Reduction (vph)	0	16	0	0	0	47	0	27	0	0	0	206
Lane Group Flow (vph)	529	1693	0	30	1726	159	95	55	0	0	31	11
Turn Type	Prot	NA		Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2			6		4	4		3	3	
Permitted Phases				6		6						3
Actuated Green, G (s)	28.8	122.8		88.1	88.1	88.1	9.9	9.9			8.0	8.0
Effective Green, g (s)	28.8	122.8		88.1	88.1	88.1	9.9	9.9			8.0	8.0
Actuated g/C Ratio	0.18	0.77		0.55	0.55	0.55	0.06	0.06			0.05	0.05
Clearance Time (s)	5.9	6.8		6.8	6.8	6.8	6.2	6.2			6.3	6.3
Vehicle Extension (s)	2.0	5.0		5.0	5.0	5.0	2.0	2.0			2.0	2.0
Lane Grp Cap (vph)	617	2616		143	1948	871	212	105			90	79
v/s Ratio Prot	c0.15	0.50			c0.49		0.03	c0.03			c0.02	
v/s Ratio Perm				0.11		0.10						0.01
v/c Ratio	0.86	0.65		0.21	0.89	0.18	0.45	0.52			0.34	0.14
Uniform Delay, d1	63.6	8.6		18.3	31.5	18.0	72.4	72.8			73.5	72.7
Progression Factor	1.00	1.00		1.16	0.85	1.31	1.02	1.07			1.00	1.00
Incremental Delay, d2	10.9	1.3		2.2	4.4	0.3	0.3	1.1			0.8	0.3
Delay (s)	74.5	9.8		23.4	31.3	23.8	74.3	79.2			74.3	73.0
Level of Service	E	A		C	C	C	E	E			E	E
Approach Delay (s)		25.1			30.4			76.6			73.2	
Approach LOS		C			C			E			E	
Intersection Summary												
HCM 2000 Control Delay			31.9			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			160.0			Sum of lost time (s)			25.2			
Intersection Capacity Utilization			89.5%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

Timings

1: GA 400 SB & McGinnis Ferry Rd

2020 No-Build PM Peak - Improved

09/24/2018

	→	↘	↙	←	↘	↙
Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Configurations	↑↑↑	↑	↘↙	↑↑	↘↙	↑
Traffic Volume (vph)	965	300	590	1125	535	90
Future Volume (vph)	965	300	590	1125	535	90
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	4.0	15.0	6.0	6.0
Minimum Split (s)	23.5	23.5	15.0	23.5	23.5	23.5
Total Split (s)	55.0	55.0	45.0	100.0	40.0	40.0
Total Split (%)	39.3%	39.3%	32.1%	71.4%	28.6%	28.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Recall Mode	C-Min	C-Min	None	C-Min	None	None

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 91 (65%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Splits and Phases: 1: GA 400 SB & McGinnis Ferry Rd



HCM Signalized Intersection Capacity Analysis

1: GA 400 SB & McGinnis Ferry Rd

2020 No-Build PM Peak - Improved

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	965	300	590	1125	0	0	0	0	535	0	90
Future Volume (vph)	0	965	300	590	1125	0	0	0	0	535	0	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5	5.5	5.5					5.5		5.5
Lane Util. Factor		0.91	1.00	0.97	0.95					0.97		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)		5085	1583	3433	3539					3433		1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		5085	1583	3433	3539					3433		1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1049	326	641	1223	0	0	0	0	582	0	98
RTOR Reduction (vph)	0	0	134	0	0	0	0	0	0	0	0	76
Lane Group Flow (vph)	0	1049	192	641	1223	0	0	0	0	582	0	22
Turn Type		NA	Perm	Prot	NA					Prot		Perm
Protected Phases		2		1	6					8		
Permitted Phases			2									8
Actuated Green, G (s)		60.4	60.4	31.7	97.6					31.4		31.4
Effective Green, g (s)		60.4	60.4	31.7	97.6					31.4		31.4
Actuated g/C Ratio		0.43	0.43	0.23	0.70					0.22		0.22
Clearance Time (s)		5.5	5.5	5.5	5.5					5.5		5.5
Vehicle Extension (s)		5.0	5.0	3.0	3.0					5.0		5.0
Lane Grp Cap (vph)		2193	682	777	2467					769		355
v/s Ratio Prot		0.21		c0.19	c0.35					c0.17		
v/s Ratio Perm			0.12									0.01
v/c Ratio		0.48	0.28	0.82	0.50					0.76		0.06
Uniform Delay, d1		28.5	25.8	51.5	9.8					50.7		42.7
Progression Factor		1.00	1.00	0.64	0.84					1.00		1.00
Incremental Delay, d2		0.8	1.0	6.5	0.7					5.1		0.2
Delay (s)		29.3	26.8	39.5	8.9					55.8		42.9
Level of Service		C	C	D	A					E		D
Approach Delay (s)		28.7			19.4			0.0			53.9	
Approach LOS		C			B			A			D	
Intersection Summary												
HCM 2000 Control Delay			28.6			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)				16.5		
Intersection Capacity Utilization			64.5%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

Timings

2: GA 400 NB & McGinnis Ferry Rd

2020 No-Build PM Peak - Improved

09/24/2018

						
Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Configurations	 	 	  		 	
Traffic Volume (vph)	215	985	1445	355	270	147
Future Volume (vph)	215	985	1445	355	270	147
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	4.0	15.0	15.0	15.0	6.0	6.0
Minimum Split (s)	15.0	23.5	23.5	23.5	23.5	23.5
Total Split (s)	25.0	90.0	65.0	65.0	50.0	50.0
Total Split (%)	17.9%	64.3%	46.4%	46.4%	35.7%	35.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Recall Mode	None	C-Min	C-Min	C-Min	None	None

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 64 (46%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Splits and Phases: 2: GA 400 NB & McGinnis Ferry Rd



HCM Signalized Intersection Capacity Analysis

2: GA 400 NB & McGinnis Ferry Rd

2020 No-Build PM Peak - Improved

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	215	985	0	0	1445	355	270	0	147	0	0	0
Future Volume (vph)	215	985	0	0	1445	355	270	0	147	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5			5.5	5.5	5.5		5.5			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.97		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)	3433	3539			5085	1583	3433		1583			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3433	3539			5085	1583	3433		1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	234	1071	0	0	1571	386	293	0	160	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	116	0	0	91	0	0	0
Lane Group Flow (vph)	234	1071	0	0	1571	271	293	0	69	0	0	0
Turn Type	Prot	NA			NA	Perm	Prot		Perm			
Protected Phases	5	2			6		4					
Permitted Phases						6			4			
Actuated Green, G (s)	14.8	111.3			91.0	91.0	17.7		17.7			
Effective Green, g (s)	14.8	111.3			91.0	91.0	17.7		17.7			
Actuated g/C Ratio	0.11	0.79			0.65	0.65	0.13		0.13			
Clearance Time (s)	5.5	5.5			5.5	5.5	5.5		5.5			
Vehicle Extension (s)	3.0	5.0			5.0	5.0	3.0		3.0			
Lane Grp Cap (vph)	362	2813			3305	1028	434		200			
v/s Ratio Prot	c0.07	0.30			c0.31		c0.09					
v/s Ratio Perm						0.17			0.04			
v/c Ratio	0.65	0.38			0.48	0.26	0.68		0.35			
Uniform Delay, d1	60.1	4.2			12.4	10.3	58.4		55.9			
Progression Factor	0.87	0.78			1.59	4.30	1.00		1.00			
Incremental Delay, d2	3.3	0.3			0.4	0.5	4.1		1.0			
Delay (s)	55.3	3.6			20.1	45.0	62.5		56.9			
Level of Service	E	A			C	D	E		E			
Approach Delay (s)		12.9			25.0		60.5				0.0	
Approach LOS		B			C		E				A	
Intersection Summary												
HCM 2000 Control Delay		25.1			HCM 2000 Level of Service		C					
HCM 2000 Volume to Capacity ratio		0.52										
Actuated Cycle Length (s)		140.0			Sum of lost time (s)		16.5					
Intersection Capacity Utilization		64.5%			ICU Level of Service		C					
Analysis Period (min)		15										
c Critical Lane Group												

Timings
3: Windward Concourse & McGinnis Ferry Rd

2020 No-Build PM Peak - Improved

09/24/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	5	1615	194	155	1445	5	486	35	675	45	30
Future Volume (vph)	5	1615	194	155	1445	5	486	35	675	45	30
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	NA	Perm
Protected Phases	5	2		1	6		4	4		3	
Permitted Phases			2			6			4		3
Detector Phase	5	2	2	1	6	6	4	4	4	3	3
Switch Phase	2			6							
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	15.0	15.0	15.0	5.0	5.0
Minimum Split (s)	15.0	52.5	52.5	15.0	26.3	26.3	23.6	23.6	23.6	23.6	23.6
Total Split (s)	15.0	60.0	60.0	15.0	60.0	60.0	35.0	35.0	35.0	30.0	30.0
Total Split (%)	10.7%	42.9%	42.9%	10.7%	42.9%	42.9%	25.0%	25.0%	25.0%	21.4%	21.4%
Yellow Time (s)	3.2	4.3	4.3	3.2	4.3	4.3	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	6.3	6.3	5.2	6.3	6.3	5.6	5.6	5.6	5.6	5.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?											
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

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

Natural Cycle: 125

Control Type: Actuated-Coordinated

Splits and Phases: 3: Windward Concourse & McGinnis Ferry Rd

			
Ø1	Ø2 (R)	Ø3	Ø4
15 s	60 s	30 s	35 s
			
Ø5	Ø6 (R)		
15 s	60 s		

HCM Signalized Intersection Capacity Analysis

3: Windward Concourse & McGinnis Ferry Rd

2020 No-Build PM Peak - Improved

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1615	194	155	1445	5	486	35	675	13	45	30
Future Volume (vph)	5	1615	194	155	1445	5	486	35	675	13	45	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.3	6.3	5.2	6.3	6.3	5.6	5.6	5.6		5.6	5.6
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.95	0.95	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	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.99	1.00
Satd. Flow (prot)	3433	5036	1583	3433	5036	1583	1681	1696	1583		1842	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.99	1.00
Satd. Flow (perm)	3433	5036	1583	3433	5036	1583	1681	1696	1583		1842	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	1755	211	168	1571	5	528	38	734	14	49	33
RTOR Reduction (vph)	0	0	75	0	0	2	0	0	313	0	0	31
Lane Group Flow (vph)	5	1755	136	168	1571	3	280	286	421	0	63	2
Heavy Vehicles (%)	2%	3%	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases			2			6			4			3
Actuated Green, G (s)	1.1	70.2	70.2	9.4	78.5	78.5	29.4	29.4	29.4		8.3	8.3
Effective Green, g (s)	1.1	70.2	70.2	9.4	78.5	78.5	29.4	29.4	29.4		8.3	8.3
Actuated g/C Ratio	0.01	0.50	0.50	0.07	0.56	0.56	0.21	0.21	0.21		0.06	0.06
Clearance Time (s)	5.2	6.3	6.3	5.2	6.3	6.3	5.6	5.6	5.6		5.6	5.6
Vehicle Extension (s)	2.1	5.1	5.1	2.1	5.1	5.1	2.1	2.1	2.1		2.1	2.1
Lane Grp Cap (vph)	26	2525	793	230	2823	887	353	356	332		109	93
v/s Ratio Prot	0.00	c0.35		c0.05	0.31		0.17	0.17			c0.03	
v/s Ratio Perm			0.09			0.00			c0.27			0.00
v/c Ratio	0.19	0.70	0.17	0.73	0.56	0.00	0.79	0.80	1.27		0.58	0.02
Uniform Delay, d1	69.0	26.7	19.0	64.1	19.6	13.5	52.4	52.6	55.3		64.1	62.0
Progression Factor	1.12	0.68	0.50	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.6	1.6	0.5	10.0	0.8	0.0	10.9	11.7	142.6		4.8	0.0
Delay (s)	79.1	19.8	10.0	74.0	20.4	13.5	63.4	64.3	197.9		69.0	62.1
Level of Service	E	B	A	E	C	B	E	E	F		E	E
Approach Delay (s)		18.9			25.6			139.5			66.6	
Approach LOS		B			C			F			E	
Intersection Summary												
HCM 2000 Control Delay			52.8			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)			22.7			
Intersection Capacity Utilization			91.7%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

Timings
4: Windward Concourse & Alderman Dr/Private Drwy

2020 No-Build PM Peak - Improved

09/24/2018



Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↔	↔	↔		↔		↔
Traffic Volume (vph)	10	25	45	10	465	9	268
Future Volume (vph)	10	25	45	10	465	9	268
Turn Type	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	4		3		2		6
Permitted Phases		4		2		6	
Detector Phase	4	4	3	2	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	15.0	15.0	15.0	15.0
Minimum Split (s)	23.5	23.5	15.0	23.5	23.5	23.5	23.5
Total Split (s)	45.0	45.0	30.0	45.0	45.0	45.0	45.0
Total Split (%)	37.5%	37.5%	25.0%	37.5%	37.5%	37.5%	37.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	5.5	5.5	5.5		5.5		5.5
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?							
Recall Mode	None	None	None	C-Min	C-Min	C-Min	C-Min

Intersection Summary

Cycle Length: 120

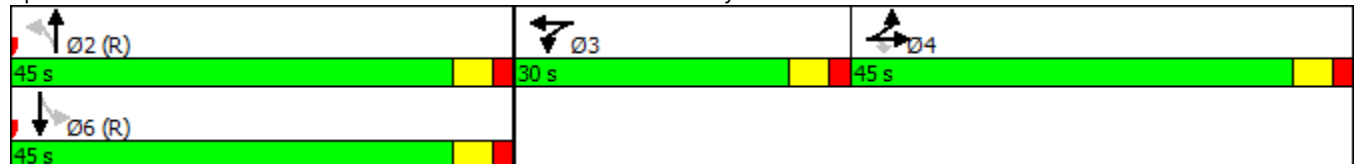
Actuated Cycle Length: 120

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

Natural Cycle: 65

Control Type: Actuated-Coordinated

Splits and Phases: 4: Windward Concourse & Alderman Dr/Private Drwy



HCM Signalized Intersection Capacity Analysis

4: Windward Concourse & Alderman Dr/Private Drwy

2020 No-Build PM Peak - Improved

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	401	10	25	136	45	26	10	465	11	9	268	19
Future Volume (vph)	401	10	25	136	45	26	10	465	11	9	268	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		5.5			5.5			5.5	
Lane Util. Factor		1.00	1.00		1.00			0.95			0.95	
Frt		1.00	0.85		0.98			1.00			0.99	
Flt Protected		0.95	1.00		0.97			1.00			1.00	
Satd. Flow (prot)		1776	1583		1773			3523			3499	
Flt Permitted		0.95	1.00		0.97			0.95			0.94	
Satd. Flow (perm)		1776	1583		1773			3335			3277	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	456	11	28	155	51	30	11	528	12	10	305	22
RTOR Reduction (vph)	0	0	20	0	4	0	0	1	0	0	4	0
Lane Group Flow (vph)	0	467	8	0	232	0	0	551	0	0	333	0
Turn Type	Split	NA	Perm	Split	NA		Perm	NA		Perm	NA	
Protected Phases	4	4		3	3			2			6	
Permitted Phases			4				2			6		
Actuated Green, G (s)		35.4	35.4		20.2			47.9			47.9	
Effective Green, g (s)		35.4	35.4		20.2			47.9			47.9	
Actuated g/C Ratio		0.29	0.29		0.17			0.40			0.40	
Clearance Time (s)		5.5	5.5		5.5			5.5			5.5	
Vehicle Extension (s)		3.0	3.0		3.0			3.0			3.0	
Lane Grp Cap (vph)		523	466		298			1331			1308	
v/s Ratio Prot		c0.26			c0.13							
v/s Ratio Perm			0.01					c0.17			0.10	
v/c Ratio		0.89	0.02		0.78			0.41			0.25	
Uniform Delay, d1		40.5	30.0		47.8			25.9			24.1	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		17.4	0.0		12.1			1.0			0.5	
Delay (s)		57.9	30.0		59.8			26.9			24.6	
Level of Service		E	C		E			C			C	
Approach Delay (s)		56.3			59.8			26.9			24.6	
Approach LOS		E			E			C			C	
Intersection Summary												
HCM 2000 Control Delay			40.2									
HCM 2000 Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			120.0								16.5	
Intersection Capacity Utilization			58.9%								B	
Analysis Period (min)			15									
c Critical Lane Group												

Timings

2020 No-Build PM Peak - Improved

5: Windward Plaza/Windward Concourse & Windward Pkwy

09/24/2018



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	174	1520	65	402	102	91	279	57	369
Future Volume (vph)	174	1520	65	402	102	91	279	57	369
Turn Type	Prot	NA	pm+pt	NA	Split	NA	Perm	NA	Perm
Protected Phases	5	2	1	6	3	3		4	
Permitted Phases			6				3		4
Detector Phase	5	2	1	6	3	3	3	4	4
Switch Phase									
Minimum Initial (s)	4.0	15.0	4.0	15.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	15.0	46.2	15.0	50.2	41.0	41.0	41.0	22.5	22.5
Total Split (s)	30.0	90.0	13.0	73.0	23.0	23.0	23.0	34.0	34.0
Total Split (%)	18.8%	56.3%	8.1%	45.6%	14.4%	14.4%	14.4%	21.3%	21.3%
Yellow Time (s)	3.0	4.2	3.4	4.2	3.1	3.1	3.1	3.6	3.6
All-Red Time (s)	2.5	2.0	2.8	2.0	2.9	2.9	2.9	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	6.2	6.2	6.2	6.0	6.0	6.0	6.2	6.2
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?									
Recall Mode	Min	C-Min	None	C-Min	None	None	None	None	None

Intersection Summary

Cycle Length: 160

Actuated Cycle Length: 160

Offset: 146 (91%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Splits and Phases: 5: Windward Plaza/Windward Concourse & Windward Pkwy



HCM Signalized Intersection Capacity Analysis

5: Windward Plaza/Windward Concourse & Windward Pkwy

2020 No-Build PM Peak - Improved

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	174	1520	29	65	402	28	102	91	279	225	57	369
Future Volume (vph)	174	1520	29	65	402	28	102	91	279	225	57	369
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	6.2		6.2	6.2		6.0	6.0	6.0		6.2	6.2
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00		1.00	0.99		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00		0.96	1.00
Satd. Flow (prot)	1770	3529		1770	3505		1770	1863	1583		1791	1583
Flt Permitted	0.95	1.00		0.06	1.00		0.95	1.00	1.00		0.96	1.00
Satd. Flow (perm)	1770	3529		104	3505		1770	1863	1583		1791	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	183	1600	31	68	423	29	107	96	294	237	60	388
RTOR Reduction (vph)	0	1	0	0	3	0	0	0	129	0	0	321
Lane Group Flow (vph)	183	1630	0	68	449	0	107	96	165	0	297	67
Turn Type	Prot	NA		pm+pt	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases				6					3			4
Actuated Green, G (s)	20.2	84.5		77.8	71.4		17.0	17.0	17.0		27.5	27.5
Effective Green, g (s)	20.2	84.5		77.8	71.4		17.0	17.0	17.0		27.5	27.5
Actuated g/C Ratio	0.13	0.53		0.49	0.45		0.11	0.11	0.11		0.17	0.17
Clearance Time (s)	5.5	6.2		6.2	6.2		6.0	6.0	6.0		6.2	6.2
Vehicle Extension (s)	2.1	5.1		2.1	5.1		2.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)	223	1863		117	1564		188	197	168		307	272
v/s Ratio Prot	c0.10	c0.46		0.02	0.13		0.06	0.05			c0.17	
v/s Ratio Perm				0.26					c0.10			0.04
v/c Ratio	0.82	0.87		0.58	0.29		0.57	0.49	0.98		0.97	0.25
Uniform Delay, d1	68.1	33.1		31.5	28.1		68.0	67.4	71.4		65.8	57.3
Progression Factor	1.10	0.74		1.00	1.00		0.94	0.94	0.87		1.00	1.00
Incremental Delay, d2	12.5	3.7		4.9	0.5		2.3	0.7	63.6		41.9	0.2
Delay (s)	87.7	28.2		36.5	28.6		66.0	63.8	125.4		107.7	57.4
Level of Service	F	C		D	C		E	E	F		F	E
Approach Delay (s)		34.2			29.6			100.7			79.2	
Approach LOS		C			C			F			E	
Intersection Summary												
HCM 2000 Control Delay			51.7			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.93									
Actuated Cycle Length (s)			160.0			Sum of lost time (s)			24.6			
Intersection Capacity Utilization			91.0%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

6: Windward Plaza/Alderman Dr & Windward Pkwy

2020 No-Build PM Peak - Improved

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	315	1507	86	39	764	37	326	22	36	191	14	406
Future Volume (vph)	315	1507	86	39	764	37	326	22	36	191	14	406
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	6.8		6.8	6.8	6.8	6.2	6.2			6.3	6.3
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	0.97	1.00			1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.91			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.96	1.00
Satd. Flow (prot)	3433	3510		1770	3539	1583	3433	1688			1780	1583
Flt Permitted	0.95	1.00		0.10	1.00	1.00	0.95	1.00			0.96	1.00
Satd. Flow (perm)	3433	3510		178	3539	1583	3433	1688			1780	1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	346	1656	95	43	840	41	358	24	40	210	15	446
RTOR Reduction (vph)	0	3	0	0	0	20	0	35	0	0	0	262
Lane Group Flow (vph)	346	1748	0	43	840	21	358	29	0	0	225	184
Turn Type	Prot	NA		Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2			6		4	4		3	3	
Permitted Phases				6		6						3
Actuated Green, G (s)	20.2	106.6		80.5	80.5	80.5	18.4	18.4			15.7	15.7
Effective Green, g (s)	20.2	106.6		80.5	80.5	80.5	18.4	18.4			15.7	15.7
Actuated g/C Ratio	0.13	0.67		0.50	0.50	0.50	0.11	0.11			0.10	0.10
Clearance Time (s)	5.9	6.8		6.8	6.8	6.8	6.2	6.2			6.3	6.3
Vehicle Extension (s)	2.0	5.0		5.0	5.0	5.0	2.0	2.0			2.0	2.0
Lane Grp Cap (vph)	433	2338		89	1780	796	394	194			174	155
v/s Ratio Prot	0.10	c0.50			0.24		c0.10	0.02			c0.13	
v/s Ratio Perm				0.24		0.01						0.12
v/c Ratio	0.80	0.75		0.48	0.47	0.03	0.91	0.15			1.29	1.18
Uniform Delay, d1	67.9	17.8		26.1	25.9	20.0	70.0	63.7			72.2	72.2
Progression Factor	1.00	1.00		0.93	0.86	1.00	0.98	0.99			1.00	1.00
Incremental Delay, d2	9.3	2.2		15.9	0.8	0.1	23.2	0.1			167.8	130.4
Delay (s)	77.2	20.0		40.2	23.2	20.1	91.7	63.1			239.9	202.5
Level of Service	E	B		D	C	C	F	E			F	F
Approach Delay (s)		29.4			23.8			87.4			215.1	
Approach LOS		C			C			F			F	
Intersection Summary												
HCM 2000 Control Delay			64.4				HCM 2000 Level of Service			E		
HCM 2000 Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			160.0				Sum of lost time (s)			25.2		
Intersection Capacity Utilization			95.6%				ICU Level of Service			F		
Analysis Period (min)			15									
c Critical Lane Group												

FUTURE “BUILD” INTERSECTION ANALYSIS

Timings

1: GA 400 SB & McGinnis Ferry Rd

2020 Build AM Peak

09/24/2018

	→	↘	↙	←	↘	↙
Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Configurations	↑↑↑	↑	↘↙	↑↑	↘↙	↑
Traffic Volume (vph)	1290	170	346	656	315	250
Future Volume (vph)	1290	170	346	656	315	250
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	4.0	15.0	6.0	6.0
Minimum Split (s)	23.5	23.5	15.0	23.5	23.5	23.5
Total Split (s)	55.0	55.0	45.0	100.0	40.0	40.0
Total Split (%)	39.3%	39.3%	32.1%	71.4%	28.6%	28.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Recall Mode	C-Min	C-Min	None	C-Min	None	None

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 40 (29%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Splits and Phases: 1: GA 400 SB & McGinnis Ferry Rd



HCM Signalized Intersection Capacity Analysis

2020 Build AM Peak

1: GA 400 SB & McGinnis Ferry Rd

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑↑		↑
Traffic Volume (vph)	0	1290	170	346	656	0	0	0	0	315	0	250
Future Volume (vph)	0	1290	170	346	656	0	0	0	0	315	0	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5	5.5	5.5					5.5		5.5
Lane Util. Factor		0.91	1.00	0.97	0.95					0.97		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)		5085	1583	3433	3539					3433		1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		5085	1583	3433	3539					3433		1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	1330	175	357	676	0	0	0	0	325	0	258
RTOR Reduction (vph)	0	0	42	0	0	0	0	0	0	0	0	217
Lane Group Flow (vph)	0	1330	133	357	676	0	0	0	0	325	0	41
Turn Type		NA	Perm	Prot	NA					Prot		Perm
Protected Phases		2		1	6					8		
Permitted Phases			2									8
Actuated Green, G (s)		81.3	81.3	20.0	106.8					22.2		22.2
Effective Green, g (s)		81.3	81.3	20.0	106.8					22.2		22.2
Actuated g/C Ratio		0.58	0.58	0.14	0.76					0.16		0.16
Clearance Time (s)		5.5	5.5	5.5	5.5					5.5		5.5
Vehicle Extension (s)		5.0	5.0	3.0	3.0					5.0		5.0
Lane Grp Cap (vph)		2952	919	490	2699					544		251
v/s Ratio Prot		c0.26		c0.10	0.19					c0.09		
v/s Ratio Perm			0.08									0.03
v/c Ratio		0.45	0.14	0.73	0.25					0.60		0.16
Uniform Delay, d1		16.7	13.4	57.4	4.9					54.7		50.9
Progression Factor		1.00	1.00	1.02	0.60					1.00		1.00
Incremental Delay, d2		0.5	0.3	5.3	0.2					2.7		0.6
Delay (s)		17.2	13.8	63.7	3.2					57.4		51.5
Level of Service		B	B	E	A					E		D
Approach Delay (s)		16.8			24.1			0.0			54.8	
Approach LOS		B			C			A			D	
Intersection Summary												
HCM 2000 Control Delay			26.3			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)				16.5		
Intersection Capacity Utilization			57.5%			ICU Level of Service				B		
Analysis Period (min)			15									
c Critical Lane Group												

Timings
2: GA 400 NB & McGinnis Ferry Rd

2020 Build AM Peak
09/24/2018

						
Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	165	1269	772	293	230	80
Future Volume (vph)	165	1269	772	293	230	80
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	4.0	15.0	15.0	15.0	6.0	6.0
Minimum Split (s)	15.0	23.5	23.5	23.5	23.5	23.5
Total Split (s)	30.0	90.0	60.0	60.0	50.0	50.0
Total Split (%)	21.4%	64.3%	42.9%	42.9%	35.7%	35.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Recall Mode	None	C-Min	C-Min	C-Min	None	None

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 60 (43%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated

Splits and Phases: 2: GA 400 NB & McGinnis Ferry Rd



HCM Signalized Intersection Capacity Analysis

2: GA 400 NB & McGinnis Ferry Rd

2020 Build AM Peak

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	165	1269	0	0	772	293	230	0	80	0	0	0
Future Volume (vph)	165	1269	0	0	772	293	230	0	80	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5			5.5	5.5	5.5		5.5			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.97		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)	3433	3539			5085	1583	3433		1583			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3433	3539			5085	1583	3433		1583			
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	170	1308	0	0	796	302	237	0	82	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	95	0	0	55	0	0	0
Lane Group Flow (vph)	170	1308	0	0	796	207	237	0	27	0	0	0
Turn Type	Prot	NA			NA	Perm	Prot		Perm			
Protected Phases	5	2			6		4					
Permitted Phases						6			4			
Actuated Green, G (s)	12.3	113.8			96.0	96.0	15.2		15.2			
Effective Green, g (s)	12.3	113.8			96.0	96.0	15.2		15.2			
Actuated g/C Ratio	0.09	0.81			0.69	0.69	0.11		0.11			
Clearance Time (s)	5.5	5.5			5.5	5.5	5.5		5.5			
Vehicle Extension (s)	3.0	5.0			5.0	5.0	3.0		3.0			
Lane Grp Cap (vph)	301	2876			3486	1085	372		171			
v/s Ratio Prot	0.05	c0.37			0.16		c0.07					
v/s Ratio Perm						0.13			0.02			
v/c Ratio	0.56	0.45			0.23	0.19	0.64		0.16			
Uniform Delay, d1	61.3	3.9			8.2	8.0	59.8		56.6			
Progression Factor	1.41	0.47			0.40	0.70	1.00		1.00			
Incremental Delay, d2	2.2	0.5			0.1	0.4	3.6		0.4			
Delay (s)	88.3	2.3			3.4	6.0	63.3		57.0			
Level of Service	F	A			A	A	E		E			
Approach Delay (s)		12.2			4.1			61.7			0.0	
Approach LOS		B			A			E			A	
Intersection Summary												
HCM 2000 Control Delay		14.6			HCM 2000 Level of Service				B			
HCM 2000 Volume to Capacity ratio		0.50										
Actuated Cycle Length (s)		140.0			Sum of lost time (s)				16.5			
Intersection Capacity Utilization		57.5%			ICU Level of Service				B			
Analysis Period (min)		15										
c Critical Lane Group												

Timings
3: Windward Concourse & McGinnis Ferry Rd

2020 Build AM Peak

09/24/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	27	957	666	675	920	73	140	48	121	84	10
Future Volume (vph)	27	957	666	675	920	73	140	48	121	84	10
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	NA	Perm
Protected Phases	5	2		1	6		4	4		3	
Permitted Phases			2			6			4		3
Detector Phase	5	2	2	1	6	6	4	4	4	3	3
Switch Phase	2			6							
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	15.0	15.0	15.0	5.0	5.0
Minimum Split (s)	15.0	52.5	52.5	15.0	26.3	26.3	23.6	23.6	23.6	23.6	23.6
Total Split (s)	15.0	54.0	54.0	38.0	77.0	77.0	24.0	24.0	24.0	24.0	24.0
Total Split (%)	10.7%	38.6%	38.6%	27.1%	55.0%	55.0%	17.1%	17.1%	17.1%	17.1%	17.1%
Yellow Time (s)	3.2	4.3	4.3	3.2	4.3	4.3	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	6.3	6.3	5.2	6.3	6.3	5.6	5.6	5.6	5.6	5.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?											
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 50 (36%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 125

Control Type: Actuated-Coordinated

Splits and Phases: 3: Windward Concourse & McGinnis Ferry Rd

					
Ø1	Ø2 (R)		Ø3	Ø4	
38 s	54 s		24 s	24 s	
					
Ø5	Ø6 (R)				
15 s	77 s				

HCM Signalized Intersection Capacity Analysis

3: Windward Concourse & McGinnis Ferry Rd

2020 Build AM Peak

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	957	666	675	920	73	140	48	121	5	84	10
Future Volume (vph)	27	957	666	675	920	73	140	48	121	5	84	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.3	6.3	5.2	6.3	6.3	5.6	5.6	5.6		5.6	5.6
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.95	0.95	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	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.98	1.00		1.00	1.00
Satd. Flow (prot)	3433	5036	1583	3433	5036	1583	1681	1726	1583		1858	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.98	1.00		1.00	1.00
Satd. Flow (perm)	3433	5036	1583	3433	5036	1583	1681	1726	1583		1858	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	28	987	687	696	948	75	144	49	125	5	87	10
RTOR Reduction (vph)	0	0	261	0	0	29	0	0	111	0	0	9
Lane Group Flow (vph)	28	987	426	696	948	46	95	98	14	0	92	1
Heavy Vehicles (%)	2%	3%	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases			2			6			4			3
Actuated Green, G (s)	3.8	59.2	59.2	31.1	86.5	86.5	15.5	15.5	15.5		11.5	11.5
Effective Green, g (s)	3.8	59.2	59.2	31.1	86.5	86.5	15.5	15.5	15.5		11.5	11.5
Actuated g/C Ratio	0.03	0.42	0.42	0.22	0.62	0.62	0.11	0.11	0.11		0.08	0.08
Clearance Time (s)	5.2	6.3	6.3	5.2	6.3	6.3	5.6	5.6	5.6		5.6	5.6
Vehicle Extension (s)	2.1	5.1	5.1	2.1	5.1	5.1	2.1	2.1	2.1		2.1	2.1
Lane Grp Cap (vph)	93	2129	669	762	3111	978	186	191	175		152	130
v/s Ratio Prot	0.01	0.20		c0.20	0.19		0.06	c0.06			c0.05	
v/s Ratio Perm			c0.27			0.03			0.01			0.00
v/c Ratio	0.30	0.46	0.64	0.91	0.30	0.05	0.51	0.51	0.08		0.61	0.01
Uniform Delay, d1	66.8	29.0	31.9	53.1	12.6	10.5	58.7	58.7	55.8		62.1	59.0
Progression Factor	1.13	0.81	0.56	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.8	0.7	4.4	15.1	0.3	0.1	1.1	1.1	0.1		4.8	0.0
Delay (s)	75.9	24.3	22.1	68.2	12.8	10.6	59.8	59.8	55.9		66.9	59.0
Level of Service	E	C	C	E	B	B	E	E	E		E	E
Approach Delay (s)		24.3			35.2			58.3			66.1	
Approach LOS		C			D			E			E	
Intersection Summary												
HCM 2000 Control Delay			33.1				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.69									
Actuated Cycle Length (s)			140.0				Sum of lost time (s)		22.7			
Intersection Capacity Utilization			79.4%				ICU Level of Service		D			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection

Intersection Delay, s/veh30.6

Intersection LOS D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔			↔			↔	
Traffic Vol, veh/h	93	65	10	11	5	7	36	242	101	35	572	339
Future Vol, veh/h	93	65	10	11	5	7	36	242	101	35	572	339
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	96	67	10	11	5	7	37	249	104	36	590	349
Number of Lanes	0	1	1	0	1	0	0	2	0	0	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	14.6	11.3	12.8	41
HCM LOS	B	B	B	E

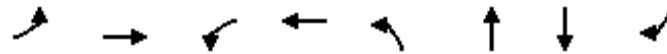
Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	23%	0%	59%	0%	48%	11%	0%
Vol Thru, %	77%	55%	41%	0%	22%	89%	46%
Vol Right, %	0%	45%	0%	100%	30%	0%	54%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	157	222	158	10	23	321	625
LT Vol	36	0	93	0	11	35	0
Through Vol	121	121	65	0	5	286	286
RT Vol	0	101	0	10	7	0	339
Lane Flow Rate	162	229	163	10	24	331	644
Geometry Grp	7	7	7	7	6	7	7
Degree of Util (X)	0.3	0.396	0.355	0.02	0.051	0.545	0.983
Departure Headway (Hd)	6.666	6.225	7.84	6.824	7.802	5.933	5.494
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	537	574	458	523	457	606	657
Service Time	4.432	3.992	5.607	4.59	5.885	3.685	3.245
HCM Lane V/C Ratio	0.302	0.399	0.356	0.019	0.053	0.546	0.98
HCM Control Delay	12.3	13.1	14.9	9.7	11.3	15.6	54.1
HCM Lane LOS	B	B	B	A	B	C	F
HCM 95th-tile Q	1.3	1.9	1.6	0.1	0.2	3.3	14.8

Timings

5: Windward Plaza/Windward Concourse & Windward Pkwy

2020 Build AM Peak

09/24/2018



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	280	974	303	1338	54	72	164	305
Future Volume (vph)	280	974	303	1338	54	72	164	305
Turn Type	Prot	NA	pm+pt	NA	Split	NA	NA	Perm
Protected Phases	5	2	1	6	3	3	4	
Permitted Phases			6					4
Detector Phase	5	2	1	6	3	3	4	4
Switch Phase								
Minimum Initial (s)	4.0	15.0	4.0	15.0	4.0	4.0	4.0	4.0
Minimum Split (s)	15.0	46.2	15.0	50.2	41.0	41.0	22.5	22.5
Total Split (s)	41.0	98.0	22.0	79.0	17.0	17.0	23.0	23.0
Total Split (%)	25.6%	61.3%	13.8%	49.4%	10.6%	10.6%	14.4%	14.4%
Yellow Time (s)	3.0	4.2	3.4	4.2	3.1	3.1	3.6	3.6
All-Red Time (s)	2.5	2.0	2.8	2.0	2.9	2.9	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	6.2	6.2	6.2	6.0	6.0	6.2	6.2
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?								
Recall Mode	Min	C-Min	None	C-Min	None	None	None	None

Intersection Summary

Cycle Length: 160

Actuated Cycle Length: 160

Offset: 144 (90%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Splits and Phases: 5: Windward Plaza/Windward Concourse & Windward Pkwy

Ø1	Ø2 (R)	Ø3	Ø4
22 s	98 s	17 s	23 s
Ø5	Ø6 (R)		
41 s	79 s		

HCM Signalized Intersection Capacity Analysis

5: Windward Plaza/Windward Concourse & Windward Pkwy

2020 Build AM Peak

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	280	974	45	303	1338	186	54	72	24	59	164	305
Future Volume (vph)	280	974	45	303	1338	186	54	72	24	59	164	305
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	6.2		6.2	6.2		6.0	6.0			6.2	6.2
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	0.98		1.00	0.96			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	1.00
Satd. Flow (prot)	1770	3516		1770	3474		1770	1794			1838	1583
Flt Permitted	0.95	1.00		0.25	1.00		0.95	1.00			0.99	1.00
Satd. Flow (perm)	1770	3516		461	3474		1770	1794			1838	1583
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	286	994	46	309	1365	190	55	73	24	60	167	311
RTOR Reduction (vph)	0	2	0	0	6	0	0	7	0	0	0	278
Lane Group Flow (vph)	286	1038	0	309	1549	0	55	90	0	0	227	33
Turn Type	Prot	NA		pm+pt	NA		Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases				6								4
Actuated Green, G (s)	29.5	94.1		93.7	79.5		10.3	10.3			16.8	16.8
Effective Green, g (s)	29.5	94.1		93.7	79.5		10.3	10.3			16.8	16.8
Actuated g/C Ratio	0.18	0.59		0.59	0.50		0.06	0.06			0.11	0.11
Clearance Time (s)	5.5	6.2		6.2	6.2		6.0	6.0			6.2	6.2
Vehicle Extension (s)	2.1	5.1		2.1	5.1		2.0	2.0			2.0	2.0
Lane Grp Cap (vph)	326	2067		386	1726		113	115			192	166
v/s Ratio Prot	c0.16	0.30		0.07	c0.45		0.03	c0.05			c0.12	
v/s Ratio Perm				0.40								0.02
v/c Ratio	0.88	0.50		0.80	0.90		0.49	0.78			1.18	0.20
Uniform Delay, d1	63.5	19.3		17.1	36.5		72.3	73.7			71.6	65.4
Progression Factor	1.12	0.58		1.00	1.00		0.87	0.86			1.00	1.00
Incremental Delay, d2	17.5	0.7		10.8	7.8		0.9	20.6			122.7	0.2
Delay (s)	88.7	11.8		27.9	44.4		63.6	84.1			194.3	65.6
Level of Service	F	B		C	D		E	F			F	E
Approach Delay (s)		28.4			41.6			76.7			119.9	
Approach LOS		C			D			E			F	
Intersection Summary												
HCM 2000 Control Delay			49.3			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.92									
Actuated Cycle Length (s)			160.0			Sum of lost time (s)			24.6			
Intersection Capacity Utilization			95.5%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

Timings
6: Windward Plaza/Alderman Dr & Windward Pkwy

2020 Build AM Peak

09/24/2018

									
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	558	1238	29	1659	198	91	36	12	214
Future Volume (vph)	558	1238	29	1659	198	91	36	12	214
Turn Type	pm+pt	NA	Perm	NA	Perm	Split	NA	NA	Perm
Protected Phases	5	2		6		4	4	3	
Permitted Phases	2		6		6				3
Detector Phase	5	2	6	6	6	4	4	3	3
Switch Phase	2								
Minimum Initial (s)	4.0	20.0	20.0	20.0	20.0	6.0	6.0	6.0	6.0
Minimum Split (s)	15.0	48.8	51.8	51.8	51.8	45.2	45.2	22.5	22.5
Total Split (s)	40.0	121.0	81.0	81.0	81.0	21.0	21.0	18.0	18.0
Total Split (%)	25.0%	75.6%	50.6%	50.6%	50.6%	13.1%	13.1%	11.3%	11.3%
Yellow Time (s)	3.0	4.3	4.3	4.3	4.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.9	2.5	2.5	2.5	2.5	2.9	2.9	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	6.8	6.8	6.8	6.8	6.2	6.2	6.3	6.3
Lead/Lag	Lead		Lag	Lag	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?									
Recall Mode	None	C-Min	C-Min	C-Min	C-Min	None	None	None	None

Intersection Summary

Cycle Length: 160

Actuated Cycle Length: 160

Offset: 134 (84%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 145

Control Type: Actuated-Coordinated

Splits and Phases: 6: Windward Plaza/Alderman Dr & Windward Pkwy

	Ø2 (R)										Ø3						Ø4
	121 s										18 s						21 s
	Ø5										Ø6 (R)						
	40 s										81 s						

HCM Signalized Intersection Capacity Analysis

6: Windward Plaza/Alderman Dr & Windward Pkwy

2020 Build AM Peak

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	558	1238	402	29	1659	198	91	36	42	18	12	214
Future Volume (vph)	558	1238	402	29	1659	198	91	36	42	18	12	214
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	6.8		6.8	6.8	6.8	6.2	6.2			6.3	6.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.92			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.97	1.00
Satd. Flow (prot)	1770	3409		1770	3539	1583	1770	1713			1809	1583
Flt Permitted	0.05	1.00		0.14	1.00	1.00	0.95	1.00			0.97	1.00
Satd. Flow (perm)	93	3409		261	3539	1583	1770	1713			1809	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	581	1290	419	30	1728	206	95	38	44	19	12	223
RTOR Reduction (vph)	0	17	0	0	0	56	0	27	0	0	0	212
Lane Group Flow (vph)	581	1692	0	30	1728	150	95	55	0	0	32	11
Turn Type	pm+pt	NA		Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2			6		4	4		3	3	
Permitted Phases	2			6		6						3
Actuated Green, G (s)	120.4	120.4		74.1	74.1	74.1	12.3	12.3			8.0	8.0
Effective Green, g (s)	120.4	120.4		74.1	74.1	74.1	12.3	12.3			8.0	8.0
Actuated g/C Ratio	0.75	0.75		0.46	0.46	0.46	0.08	0.08			0.05	0.05
Clearance Time (s)	5.9	6.8		6.8	6.8	6.8	6.2	6.2			6.3	6.3
Vehicle Extension (s)	2.0	5.0		5.0	5.0	5.0	2.0	2.0			2.0	2.0
Lane Grp Cap (vph)	493	2565		120	1638	733	136	131			90	79
v/s Ratio Prot	c0.30	0.50			0.49		c0.05	0.03			c0.02	
v/s Ratio Perm	c0.59			0.11		0.09						0.01
v/c Ratio	1.18	0.66		0.25	1.05	0.20	0.70	0.42			0.36	0.14
Uniform Delay, d1	53.9	9.7		26.1	43.0	25.5	72.0	70.5			73.5	72.7
Progression Factor	1.00	1.00		1.12	0.81	1.21	1.03	1.09			1.00	1.00
Incremental Delay, d2	99.7	1.3		3.2	34.5	0.4	5.7	0.4			0.9	0.3
Delay (s)	153.7	11.1		32.4	69.1	31.2	79.9	77.0			74.4	73.0
Level of Service	F	B		C	E	C	E	E			E	E
Approach Delay (s)		47.3			64.6			78.6			73.2	
Approach LOS		D			E			E			E	
Intersection Summary												
HCM 2000 Control Delay			57.1									E
HCM 2000 Volume to Capacity ratio			1.11									
Actuated Cycle Length (s)			160.0									25.2
Intersection Capacity Utilization			104.2%									G
Analysis Period (min)			15									
c Critical Lane Group												

Intersection

Int Delay, s/veh 0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↑↑	
Traffic Vol, veh/h	15	141	258	98	19	3
Future Vol, veh/h	15	141	258	98	19	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	153	280	107	21	3

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	387	0	0 443 193
Stage 1	-	-	- 334 -
Stage 2	-	-	- 109 -
Critical Hdwy	4.14	-	- 6.84 6.94
Critical Hdwy Stg 1	-	-	- 5.84 -
Critical Hdwy Stg 2	-	-	- 5.84 -
Follow-up Hdwy	2.22	-	- 3.52 3.32
Pot Cap-1 Maneuver	1168	-	- 543 816
Stage 1	-	-	- 697 -
Stage 2	-	-	- 903 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1168	-	- 535 816
Mov Cap-2 Maneuver	-	-	- 535 -
Stage 1	-	-	- 697 -
Stage 2	-	-	- 889 -

Approach	EB	WB	SB
HCM Control Delay, s	0.9	0	11.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1168	-	-	-	561
HCM Lane V/C Ratio	0.014	-	-	-	0.043
HCM Control Delay (s)	8.1	0.1	-	-	11.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	15	145	354	13	17	2
Future Vol, veh/h	15	145	354	13	17	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	158	385	14	18	2
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	399	0	-	0	503	199
Stage 1	-	-	-	-	392	-
Stage 2	-	-	-	-	111	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1156	-	-	-	498	809
Stage 1	-	-	-	-	652	-
Stage 2	-	-	-	-	901	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1156	-	-	-	491	809
Mov Cap-2 Maneuver	-	-	-	-	491	-
Stage 1	-	-	-	-	652	-
Stage 2	-	-	-	-	887	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.9	0		12.3		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1156	-	-	-	512	
HCM Lane V/C Ratio	0.014	-	-	-	0.04	
HCM Control Delay (s)	8.2	0.1	-	-	12.3	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.1	

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	20	142	365	15	26	2
Future Vol, veh/h	20	142	365	15	26	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	154	397	16	28	2
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	413	0	-	0	526	207
Stage 1	-	-	-	-	405	-
Stage 2	-	-	-	-	121	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1142	-	-	-	482	799
Stage 1	-	-	-	-	642	-
Stage 2	-	-	-	-	891	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1142	-	-	-	472	799
Mov Cap-2 Maneuver	-	-	-	-	472	-
Stage 1	-	-	-	-	642	-
Stage 2	-	-	-	-	872	-
Approach	EB	WB		SB		
HCM Control Delay, s	1.1	0		12.9		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1142	-	-	-	486	
HCM Lane V/C Ratio	0.019	-	-	-	0.063	
HCM Control Delay (s)	8.2	0.1	-	-	12.9	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2	

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑↑	↑↑	
Traffic Vol, veh/h	0	2	0	343	944	148
Future Vol, veh/h	0	2	0	343	944	148
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	Free
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	2	0	373	1026	161
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	-	513	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	506	0	-	-	0
Stage 1	0	-	0	-	-	0
Stage 2	0	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	-	506	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	12.1	0	0			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	EBLn1	SBT			
Capacity (veh/h)	-	506	-			
HCM Lane V/C Ratio	-	0.004	-			
HCM Control Delay (s)	-	12.1	-			
HCM Lane LOS	-	B	-			
HCM 95th %tile Q(veh)	-	0	-			

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑↑↑	↑↑	
Traffic Vol, veh/h	0	2	0	343	1090	49
Future Vol, veh/h	0	2	0	343	1090	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	Free
Storage Length	-	0	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	2	0	373	1185	53
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	-	592	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	449	0	-	-	0
Stage 1	0	-	0	-	-	0
Stage 2	0	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	-	449	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	13.1	0	0			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	EBLn1	SBT			
Capacity (veh/h)	-	449	-			
HCM Lane V/C Ratio	-	0.005	-			
HCM Control Delay (s)	-	13.1	-			
HCM Lane LOS	-	B	-			
HCM 95th %tile Q(veh)	-	0	-			

Intersection						
Int Delay, s/veh	0.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↗		↑↑↑		↗
Traffic Vol, veh/h	1643	125	0	1070	0	7
Future Vol, veh/h	1643	125	0	1070	0	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Free	-	None	-	Yield
Storage Length	-	100	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1786	136	0	1163	0	8
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	-	-	-	-	893
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	0	0	-	0	244
Stage 1	-	0	0	-	0	-
Stage 2	-	0	0	-	0	-
Platoon blocked, %	-			-		
Mov Cap-1 Maneuver	-	-	-	-	-	244
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0		20.2	
HCM LOS					C	
Minor Lane/Major Mvmt	NBLn1	EBT	WBT			
Capacity (veh/h)	244	-	-			
HCM Lane V/C Ratio	0.031	-	-			
HCM Control Delay (s)	20.2	-	-			
HCM Lane LOS	C	-	-			
HCM 95th %tile Q(veh)	0.1	-	-			

Timings

1: GA 400 SB & McGinnis Ferry Rd

2020 Build PM Peak

09/24/2018

	→	↘	↙	←	↘	↙
Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Configurations	↑↑↑	↑	↘↙	↑↑	↘↙	↑
Traffic Volume (vph)	985	300	693	1228	558	90
Future Volume (vph)	985	300	693	1228	558	90
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	4.0	15.0	6.0	6.0
Minimum Split (s)	23.5	23.5	15.0	23.5	23.5	23.5
Total Split (s)	55.0	55.0	45.0	100.0	40.0	40.0
Total Split (%)	39.3%	39.3%	32.1%	71.4%	28.6%	28.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Recall Mode	C-Min	C-Min	None	C-Min	None	None

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 91 (65%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Splits and Phases: 1: GA 400 SB & McGinnis Ferry Rd



HCM Signalized Intersection Capacity Analysis

2020 Build PM Peak

1: GA 400 SB & McGinnis Ferry Rd

09/24/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑↑		↑
Traffic Volume (vph)	0	985	300	693	1228	0	0	0	0	558	0	90
Future Volume (vph)	0	985	300	693	1228	0	0	0	0	558	0	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5	5.5	5.5					5.5		5.5
Lane Util. Factor		0.91	1.00	0.97	0.95					0.97		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)		5085	1583	3433	3539					3433		1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		5085	1583	3433	3539					3433		1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1071	326	753	1335	0	0	0	0	607	0	98
RTOR Reduction (vph)	0	0	139	0	0	0	0	0	0	0	0	60
Lane Group Flow (vph)	0	1071	187	753	1335	0	0	0	0	607	0	38
Turn Type		NA	Perm	Prot	NA					Prot		Perm
Protected Phases		2		1	6					8		
Permitted Phases			2									8
Actuated Green, G (s)		56.2	56.2	35.4	97.1					31.9		31.9
Effective Green, g (s)		56.2	56.2	35.4	97.1					31.9		31.9
Actuated g/C Ratio		0.40	0.40	0.25	0.69					0.23		0.23
Clearance Time (s)		5.5	5.5	5.5	5.5					5.5		5.5
Vehicle Extension (s)		5.0	5.0	3.0	3.0					5.0		5.0
Lane Grp Cap (vph)		2041	635	868	2454					782		360
v/s Ratio Prot		0.21		c0.22	c0.38					c0.18		
v/s Ratio Perm			0.12									0.02
v/c Ratio		0.52	0.29	0.87	0.54					0.78		0.10
Uniform Delay, d1		31.8	28.4	50.1	10.6					50.7		42.8
Progression Factor		1.00	1.00	0.77	0.69					1.00		1.00
Incremental Delay, d2		1.0	1.2	8.1	0.8					5.7		0.3
Delay (s)		32.7	29.6	46.9	8.1					56.4		43.0
Level of Service		C	C	D	A					E		D
Approach Delay (s)		32.0			22.1			0.0			54.5	
Approach LOS		C			C			A			D	
Intersection Summary												
HCM 2000 Control Delay			30.8			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)				16.5		
Intersection Capacity Utilization			68.5%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

Timings
2: GA 400 NB & McGinnis Ferry Rd

2020 Build PM Peak
09/24/2018

						
Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	215	1027	1651	473	270	151
Future Volume (vph)	215	1027	1651	473	270	151
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	4.0	15.0	15.0	15.0	6.0	6.0
Minimum Split (s)	15.0	23.5	23.5	23.5	23.5	23.5
Total Split (s)	25.0	90.0	65.0	65.0	50.0	50.0
Total Split (%)	17.9%	64.3%	46.4%	46.4%	35.7%	35.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Recall Mode	None	C-Min	C-Min	C-Min	None	None

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 64 (46%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated

Splits and Phases: 2: GA 400 NB & McGinnis Ferry Rd



HCM Signalized Intersection Capacity Analysis

2: GA 400 NB & McGinnis Ferry Rd

2020 Build PM Peak

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	215	1027	0	0	1651	473	270	0	151	0	0	0
Future Volume (vph)	215	1027	0	0	1651	473	270	0	151	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5			5.5	5.5	5.5		5.5			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.97		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)	3433	3539			5085	1583	3433		1583			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3433	3539			5085	1583	3433		1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	234	1116	0	0	1795	514	293	0	164	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	134	0	0	82	0	0	0
Lane Group Flow (vph)	234	1116	0	0	1795	380	293	0	82	0	0	0
Turn Type	Prot	NA			NA	Perm	Prot		Perm			
Protected Phases	5	2			6		4					
Permitted Phases						6			4			
Actuated Green, G (s)	14.8	111.3			91.0	91.0	17.7		17.7			
Effective Green, g (s)	14.8	111.3			91.0	91.0	17.7		17.7			
Actuated g/C Ratio	0.11	0.79			0.65	0.65	0.13		0.13			
Clearance Time (s)	5.5	5.5			5.5	5.5	5.5		5.5			
Vehicle Extension (s)	3.0	5.0			5.0	5.0	3.0		3.0			
Lane Grp Cap (vph)	362	2813			3305	1028	434		200			
v/s Ratio Prot	c0.07	0.32			c0.35		c0.09					
v/s Ratio Perm						0.24			0.05			
v/c Ratio	0.65	0.40			0.54	0.37	0.68		0.41			
Uniform Delay, d1	60.1	4.3			13.3	11.3	58.4		56.3			
Progression Factor	0.85	0.94			1.29	2.53	1.00		1.00			
Incremental Delay, d2	3.2	0.3			0.4	0.6	4.1		1.4			
Delay (s)	54.1	4.4			17.4	29.2	62.5		57.7			
Level of Service	D	A			B	C	E		E			
Approach Delay (s)		13.0			20.0		60.8				0.0	
Approach LOS		B			C		E				A	
Intersection Summary												
HCM 2000 Control Delay		22.3			HCM 2000 Level of Service		C					
HCM 2000 Volume to Capacity ratio		0.57										
Actuated Cycle Length (s)		140.0			Sum of lost time (s)		16.5					
Intersection Capacity Utilization		68.5%			ICU Level of Service		C					
Analysis Period (min)		15										
c Critical Lane Group												

Timings
3: Windward Concourse & McGinnis Ferry Rd

2020 Build PM Peak

09/24/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	5	1660	231	177	1445	5	810	35	743	45	30
Future Volume (vph)	5	1660	231	177	1445	5	810	35	743	45	30
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	NA	Perm
Protected Phases	5	2		1	6		4	4		3	
Permitted Phases			2			6			4		3
Detector Phase	5	2	2	1	6	6	4	4	4	3	3
Switch Phase	2			6							
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	15.0	15.0	15.0	5.0	5.0
Minimum Split (s)	15.0	52.5	52.5	15.0	26.3	26.3	23.6	23.6	23.6	23.6	23.6
Total Split (s)	15.0	60.0	60.0	15.0	60.0	60.0	35.0	35.0	35.0	30.0	30.0
Total Split (%)	10.7%	42.9%	42.9%	10.7%	42.9%	42.9%	25.0%	25.0%	25.0%	21.4%	21.4%
Yellow Time (s)	3.2	4.3	4.3	3.2	4.3	4.3	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	6.3	6.3	5.2	6.3	6.3	5.6	5.6	5.6	5.6	5.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?											
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

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

Natural Cycle: 145

Control Type: Actuated-Coordinated

Splits and Phases: 3: Windward Concourse & McGinnis Ferry Rd

			
Ø1	Ø2 (R)	Ø3	Ø4
15 s	60 s	30 s	35 s
			
Ø5	Ø6 (R)		
15 s	60 s		

HCM Signalized Intersection Capacity Analysis

3: Windward Concourse & McGinnis Ferry Rd

2020 Build PM Peak

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1660	231	177	1445	5	810	35	743	13	45	30
Future Volume (vph)	5	1660	231	177	1445	5	810	35	743	13	45	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.3	6.3	5.2	6.3	6.3	5.6	5.6	5.6		5.6	5.6
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.95	0.95	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	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.99	1.00
Satd. Flow (prot)	3433	5036	1583	3433	5036	1583	1681	1692	1583		1842	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.99	1.00
Satd. Flow (perm)	3433	5036	1583	3433	5036	1583	1681	1692	1583		1842	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	1804	251	192	1571	5	880	38	808	14	49	33
RTOR Reduction (vph)	0	0	87	0	0	2	0	0	313	0	0	31
Lane Group Flow (vph)	5	1804	164	192	1571	3	458	460	495	0	63	2
Heavy Vehicles (%)	2%	3%	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases			2			6			4			3
Actuated Green, G (s)	1.1	69.9	69.9	9.7	78.5	78.5	29.4	29.4	29.4		8.3	8.3
Effective Green, g (s)	1.1	69.9	69.9	9.7	78.5	78.5	29.4	29.4	29.4		8.3	8.3
Actuated g/C Ratio	0.01	0.50	0.50	0.07	0.56	0.56	0.21	0.21	0.21		0.06	0.06
Clearance Time (s)	5.2	6.3	6.3	5.2	6.3	6.3	5.6	5.6	5.6		5.6	5.6
Vehicle Extension (s)	2.1	5.1	5.1	2.1	5.1	5.1	2.1	2.1	2.1		2.1	2.1
Lane Grp Cap (vph)	26	2514	790	237	2823	887	353	355	332		109	93
v/s Ratio Prot	0.00	c0.36		c0.06	0.31		0.27	0.27			c0.03	
v/s Ratio Perm			0.10			0.00			c0.31			0.00
v/c Ratio	0.19	0.72	0.21	0.81	0.56	0.00	1.30	1.30	1.49		0.58	0.02
Uniform Delay, d1	69.0	27.3	19.6	64.2	19.6	13.5	55.3	55.3	55.3		64.1	62.0
Progression Factor	1.16	0.65	0.39	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.6	1.8	0.6	17.8	0.8	0.0	153.3	152.5	236.5		4.8	0.0
Delay (s)	81.7	19.6	8.3	82.0	20.4	13.5	208.6	207.8	291.8		69.0	62.1
Level of Service	F	B	A	F	C	B	F	F	F		E	E
Approach Delay (s)		18.3			27.1			247.3			66.6	
Approach LOS		B			C			F			E	
Intersection Summary												
HCM 2000 Control Delay			91.9			HCM 2000 Level of Service			F			
HCM 2000 Volume to Capacity ratio			0.91									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)			22.7			
Intersection Capacity Utilization			96.8%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection

Intersection Delay, s/veh 273

Intersection LOS F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	793	10	33	136	45	26	15	465	11	9	291	39
Future Vol, veh/h	793	10	33	136	45	26	15	465	11	9	291	39
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	901	11	38	155	51	30	17	528	13	10	331	44
Number of Lanes	0	1	1	0	1	0	0	2	0	0	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	575.6	31.5	31.9	23.7
HCM LOS	F	D	D	C

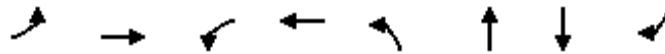
Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	6%	0%	99%	0%	66%	6%	0%
Vol Thru, %	94%	95%	1%	0%	22%	94%	79%
Vol Right, %	0%	5%	0%	100%	13%	0%	21%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	248	244	803	33	207	155	185
LT Vol	15	0	793	0	136	9	0
Through Vol	233	233	10	0	45	146	146
RT Vol	0	11	0	33	26	0	39
Lane Flow Rate	281	277	912	38	235	176	210
Geometry Grp	7	7	7	7	6	7	7
Degree of Util (X)	0.653	0.638	2.27	0.08	0.602	0.428	0.5
Departure Headway (Hd)	11.111	11.044	8.955	7.72	11.954	11.472	11.282
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	329	329	411	465	306	316	323
Service Time	8.811	8.744	6.679	5.444	9.954	9.172	8.982
HCM Lane V/C Ratio	0.854	0.842	2.219	0.082	0.768	0.557	0.65
HCM Control Delay	32.5	31.3	598.8	11.1	31.5	22.5	24.7
HCM Lane LOS	D	D	F	B	D	C	C
HCM 95th-tile Q	4.3	4.1	68.6	0.3	3.6	2.1	2.6

Timings

5: Windward Plaza/Windward Concourse & Windward Pkwy

2020 Build PM Peak

09/24/2018



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	174	1525	65	402	102	91	57	379
Future Volume (vph)	174	1525	65	402	102	91	57	379
Turn Type	Prot	NA	pm+pt	NA	Split	NA	NA	Perm
Protected Phases	5	2	1	6	3	3	4	
Permitted Phases			6					4
Detector Phase	5	2	1	6	3	3	4	4
Switch Phase								
Minimum Initial (s)	4.0	15.0	4.0	15.0	4.0	4.0	4.0	4.0
Minimum Split (s)	15.0	46.2	15.0	50.2	41.0	41.0	22.5	22.5
Total Split (s)	30.0	90.0	13.0	73.0	23.0	23.0	34.0	34.0
Total Split (%)	18.8%	56.3%	8.1%	45.6%	14.4%	14.4%	21.3%	21.3%
Yellow Time (s)	3.0	4.2	3.4	4.2	3.1	3.1	3.6	3.6
All-Red Time (s)	2.5	2.0	2.8	2.0	2.9	2.9	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	6.2	6.2	6.2	6.0	6.0	6.2	6.2
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?								
Recall Mode	Min	C-Min	None	C-Min	None	None	None	None

Intersection Summary

Cycle Length: 160

Actuated Cycle Length: 160

Offset: 146 (91%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Splits and Phases: 5: Windward Plaza/Windward Concourse & Windward Pkwy

Ø1	Ø2 (R)	Ø3	Ø4
13 s	90 s	23 s	34 s
Ø5	Ø6 (R)		
30 s	73 s		

HCM Signalized Intersection Capacity Analysis

5: Windward Plaza/Windward Concourse & Windward Pkwy

2020 Build PM Peak

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	174	1525	29	65	402	33	102	91	279	246	57	379
Future Volume (vph)	174	1525	29	65	402	33	102	91	279	246	57	379
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	6.2		6.2	6.2		6.0	6.0			6.2	6.2
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.99		1.00	0.89			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.96	1.00
Satd. Flow (prot)	1770	3529		1770	3499		1770	1652			1790	1583
Flt Permitted	0.95	1.00		0.06	1.00		0.95	1.00			0.96	1.00
Satd. Flow (perm)	1770	3529		105	3499		1770	1652			1790	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	183	1605	31	68	423	35	107	96	294	259	60	399
RTOR Reduction (vph)	0	1	0	0	4	0	0	69	0	0	0	310
Lane Group Flow (vph)	183	1635	0	68	454	0	107	321	0	0	319	89
Turn Type	Prot	NA		pm+pt	NA		Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases				6								4
Actuated Green, G (s)	20.2	84.2		77.5	71.1		17.0	17.0			27.8	27.8
Effective Green, g (s)	20.2	84.2		77.5	71.1		17.0	17.0			27.8	27.8
Actuated g/C Ratio	0.13	0.53		0.48	0.44		0.11	0.11			0.17	0.17
Clearance Time (s)	5.5	6.2		6.2	6.2		6.0	6.0			6.2	6.2
Vehicle Extension (s)	2.1	5.1		2.1	5.1		2.0	2.0			2.0	2.0
Lane Grp Cap (vph)	223	1857		117	1554		188	175			311	275
v/s Ratio Prot	c0.10	c0.46		0.02	0.13		0.06	c0.19			c0.18	
v/s Ratio Perm				0.26								0.06
v/c Ratio	0.82	0.88		0.58	0.29		0.57	1.84			1.03	0.32
Uniform Delay, d1	68.1	33.5		31.9	28.4		68.0	71.5			66.1	57.9
Progression Factor	1.10	0.74		1.00	1.00		0.94	0.91			1.00	1.00
Incremental Delay, d2	12.4	3.8		4.9	0.5		2.3	397.0			57.8	0.3
Delay (s)	87.5	28.7		36.8	28.9		66.0	462.1			123.9	58.1
Level of Service	F	C		D	C		E	F			F	E
Approach Delay (s)		34.6			29.9			376.8			87.3	
Approach LOS		C			C			F			F	
Intersection Summary												
HCM 2000 Control Delay			92.3			HCM 2000 Level of Service			F			
HCM 2000 Volume to Capacity ratio			1.05									
Actuated Cycle Length (s)			160.0			Sum of lost time (s)			24.6			
Intersection Capacity Utilization			105.8%			ICU Level of Service			G			
Analysis Period (min)			15									
c Critical Lane Group												

Timings
6: Windward Plaza/Alderman Dr & Windward Pkwy

2020 Build PM Peak

09/24/2018

									
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	325	1507	39	774	37	326	22	14	447
Future Volume (vph)	325	1507	39	774	37	326	22	14	447
Turn Type	pm+pt	NA	Perm	NA	Perm	Split	NA	NA	Perm
Protected Phases	5	2		6		4	4	3	
Permitted Phases	2		6		6				3
Detector Phase	5	2	6	6	6	4	4	3	3
Switch Phase	2								
Minimum Initial (s)	4.0	20.0	20.0	20.0	20.0	6.0	6.0	6.0	6.0
Minimum Split (s)	15.0	48.8	51.8	51.8	51.8	45.2	45.2	22.5	22.5
Total Split (s)	30.0	113.0	83.0	83.0	83.0	25.0	25.0	22.0	22.0
Total Split (%)	18.8%	70.6%	51.9%	51.9%	51.9%	15.6%	15.6%	13.8%	13.8%
Yellow Time (s)	3.0	4.3	4.3	4.3	4.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.9	2.5	2.5	2.5	2.5	2.9	2.9	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	6.8	6.8	6.8	6.8	6.2	6.2	6.3	6.3
Lead/Lag	Lead		Lag	Lag	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?									
Recall Mode	None	C-Min	C-Min	C-Min	C-Min	None	None	None	None

Intersection Summary

Cycle Length: 160

Actuated Cycle Length: 160

Offset: 117 (73%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 145

Control Type: Actuated-Coordinated

Splits and Phases: 6: Windward Plaza/Alderman Dr & Windward Pkwy

 Ø2 (R)	 Ø3	 Ø4
113 s	22 s	25 s
 Ø5	 Ø6 (R)	
30 s	83 s	

HCM Signalized Intersection Capacity Analysis

6: Windward Plaza/Alderman Dr & Windward Pkwy

2020 Build PM Peak

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	325	1507	86	39	774	37	326	22	36	196	14	447
Future Volume (vph)	325	1507	86	39	774	37	326	22	36	196	14	447
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	6.8		6.8	6.8	6.8	6.2	6.2			6.3	6.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.91			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.96	1.00
Satd. Flow (prot)	1770	3510		1770	3539	1583	1770	1688			1780	1583
Flt Permitted	0.24	1.00		0.09	1.00	1.00	0.95	1.00			0.96	1.00
Satd. Flow (perm)	444	3510		172	3539	1583	1770	1688			1780	1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	357	1656	95	43	851	41	358	24	40	215	15	491
RTOR Reduction (vph)	0	3	0	0	0	20	0	35	0	0	0	261
Lane Group Flow (vph)	357	1748	0	43	851	21	358	29	0	0	230	230
Turn Type	pm+pt	NA		Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2			6		4	4		3	3	
Permitted Phases	2			6		6						3
Actuated Green, G (s)	106.2	106.2		82.1	82.1	82.1	18.8	18.8			15.7	15.7
Effective Green, g (s)	106.2	106.2		82.1	82.1	82.1	18.8	18.8			15.7	15.7
Actuated g/C Ratio	0.66	0.66		0.51	0.51	0.51	0.12	0.12			0.10	0.10
Clearance Time (s)	5.9	6.8		6.8	6.8	6.8	6.2	6.2			6.3	6.3
Vehicle Extension (s)	2.0	5.0		5.0	5.0	5.0	2.0	2.0			2.0	2.0
Lane Grp Cap (vph)	445	2329		88	1815	812	207	198			174	155
v/s Ratio Prot	0.09	c0.50			0.24		c0.20	0.02			0.13	
v/s Ratio Perm	c0.44			0.25		0.01						c0.15
v/c Ratio	0.80	0.75		0.49	0.47	0.03	1.73	0.14			1.32	1.49
Uniform Delay, d1	15.9	18.0		25.3	25.0	19.2	70.6	63.4			72.2	72.2
Progression Factor	1.00	1.00		0.93	0.86	1.00	0.98	0.99			1.00	1.00
Incremental Delay, d2	9.5	2.3		16.2	0.8	0.1	347.1	0.1			179.2	249.9
Delay (s)	25.4	20.3		39.6	22.3	19.3	416.3	63.0			251.3	322.0
Level of Service	C	C		D	C	B	F	E			F	F
Approach Delay (s)		21.2			22.9			362.7			299.5	
Approach LOS		C			C			F			F	
Intersection Summary												
HCM 2000 Control Delay	103.9			HCM 2000 Level of Service					F			
HCM 2000 Volume to Capacity ratio	1.04											
Actuated Cycle Length (s)	160.0			Sum of lost time (s)					25.2			
Intersection Capacity Utilization	102.3%			ICU Level of Service					G			
Analysis Period (min)	15											
c Critical Lane Group												

Intersection						
Int Delay, s/veh	2.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	442	100	19	122	21
Future Vol, veh/h	3	442	100	19	122	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	88	88	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	502	114	21	133	23
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	134	0	-	0	382	67
Stage 1	-	-	-	-	124	-
Stage 2	-	-	-	-	258	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1448	-	-	-	593	983
Stage 1	-	-	-	-	888	-
Stage 2	-	-	-	-	761	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1448	-	-	-	591	983
Mov Cap-2 Maneuver	-	-	-	-	591	-
Stage 1	-	-	-	-	888	-
Stage 2	-	-	-	-	759	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		12.6		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1448	-	-	-	628	
HCM Lane V/C Ratio	0.002	-	-	-	0.248	
HCM Control Delay (s)	7.5	0	-	-	12.6	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	1	

Intersection						
Int Delay, s/veh	2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	561	109	3	111	10
Future Vol, veh/h	3	561	109	3	111	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	88	88	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	638	124	3	121	11
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	127	0	-	0	450	64
Stage 1	-	-	-	-	125	-
Stage 2	-	-	-	-	325	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1457	-	-	-	538	987
Stage 1	-	-	-	-	887	-
Stage 2	-	-	-	-	705	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1457	-	-	-	536	987
Mov Cap-2 Maneuver	-	-	-	-	536	-
Stage 1	-	-	-	-	887	-
Stage 2	-	-	-	-	703	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		13.5		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1457	-	-	-	557	
HCM Lane V/C Ratio	0.002	-	-	-	0.236	
HCM Control Delay (s)	7.5	0	-	-	13.5	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.9	

Intersection						
Int Delay, s/veh	3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	4	668	96	3	166	15
Future Vol, veh/h	4	668	96	3	166	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	88	88	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	759	109	3	180	16
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	112	0	-	0	499	56
Stage 1	-	-	-	-	111	-
Stage 2	-	-	-	-	388	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1475	-	-	-	501	999
Stage 1	-	-	-	-	901	-
Stage 2	-	-	-	-	655	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1475	-	-	-	498	999
Mov Cap-2 Maneuver	-	-	-	-	498	-
Stage 1	-	-	-	-	901	-
Stage 2	-	-	-	-	652	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		16.1		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1475	-	-	-	520	
HCM Lane V/C Ratio	0.003	-	-	-	0.378	
HCM Control Delay (s)	7.4	0	-	-	16.1	
HCM Lane LOS	A	A	-	-	C	
HCM 95th %tile Q(veh)	0	-	-	-	1.8	

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑↑	↑↑	
Traffic Vol, veh/h	0	13	0	1283	326	29
Future Vol, veh/h	0	13	0	1283	326	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	Free
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	14	0	1395	354	32
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	-	177	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	835	0	-	-	0
Stage 1	0	-	0	-	-	0
Stage 2	0	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	-	835	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	9.4	0	0			
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	EBLn1	SBT			
Capacity (veh/h)	-	835	-			
HCM Lane V/C Ratio	-	0.017	-			
HCM Control Delay (s)	-	9.4	-			
HCM Lane LOS	-	A	-			
HCM 95th %tile Q(veh)	-	0.1	-			

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑↑↑	↑↑	
Traffic Vol, veh/h	0	10	0	1283	345	10
Future Vol, veh/h	0	10	0	1283	345	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	Free
Storage Length	-	0	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	11	0	1395	375	11

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	- 188	- 0	- 0
Stage 1	- -	- -	- -
Stage 2	- -	- -	- -
Critical Hdwy	- 6.94	- -	- -
Critical Hdwy Stg 1	- -	- -	- -
Critical Hdwy Stg 2	- -	- -	- -
Follow-up Hdwy	- 3.32	- -	- -
Pot Cap-1 Maneuver	0 822	0 -	- 0
Stage 1	0 -	0 -	- 0
Stage 2	0 -	0 -	- 0
Platoon blocked, %		- -	- -
Mov Cap-1 Maneuver	- 822	- -	- -
Mov Cap-2 Maneuver	- -	- -	- -
Stage 1	- -	- -	- -
Stage 2	- -	- -	- -

Approach	EB	NB	SB
HCM Control Delay, s	9.4	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT EBLn1	SBT
Capacity (veh/h)	- 822	-
HCM Lane V/C Ratio	- 0.013	-
HCM Control Delay (s)	- 9.4	-
HCM Lane LOS	- A	-
HCM 95th %tile Q(veh)	- 0	-

Intersection

Int Delay, s/veh 0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑		↑↑↑		↑
Traffic Vol, veh/h	1851	25	0	2285	0	45
Future Vol, veh/h	1851	25	0	2285	0	45
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Free	-	None	-	Yield
Storage Length	-	100	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2012	27	0	2484	0	49

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	-	- 1006
Stage 1	-	-	- -
Stage 2	-	-	- -
Critical Hdwy	-	-	- 7.14
Critical Hdwy Stg 1	-	-	- -
Critical Hdwy Stg 2	-	-	- -
Follow-up Hdwy	-	-	- 3.92
Pot Cap-1 Maneuver	-	0	0 - 206
Stage 1	-	0	0 -
Stage 2	-	0	0 -
Platoon blocked, %	-		-
Mov Cap-1 Maneuver	-	-	- 206
Mov Cap-2 Maneuver	-	-	- -
Stage 1	-	-	- -
Stage 2	-	-	- -

Approach	EB	WB	NB
HCM Control Delay, s	0	0	27.8
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	206	-	-
HCM Lane V/C Ratio	0.237	-	-
HCM Control Delay (s)	27.8	-	-
HCM Lane LOS	D	-	-
HCM 95th %tile Q(veh)	0.9	-	-

**FUTURE “BUILD” IMPROVED INTERSECTION
ANALYSIS**

Timings

1: GA 400 SB & McGinnis Ferry Rd

2020 Build AM Peak - Improved

09/24/2018

	→	↘	↙	←	↘	↙
Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Configurations	↑↑↑	↑	↘↙	↑↑	↘↙	↑
Traffic Volume (vph)	1290	170	346	656	315	250
Future Volume (vph)	1290	170	346	656	315	250
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	4.0	15.0	6.0	6.0
Minimum Split (s)	23.5	23.5	15.0	23.5	23.5	23.5
Total Split (s)	55.0	55.0	45.0	100.0	40.0	40.0
Total Split (%)	39.3%	39.3%	32.1%	71.4%	28.6%	28.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Recall Mode	C-Min	C-Min	None	C-Min	None	None

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 40 (29%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Splits and Phases: 1: GA 400 SB & McGinnis Ferry Rd



HCM Signalized Intersection Capacity Analysis

1: GA 400 SB & McGinnis Ferry Rd

2020 Build AM Peak - Improved

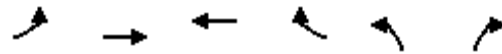
09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑↑		↑
Traffic Volume (vph)	0	1290	170	346	656	0	0	0	0	315	0	250
Future Volume (vph)	0	1290	170	346	656	0	0	0	0	315	0	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5	5.5	5.5					5.5		5.5
Lane Util. Factor		0.91	1.00	0.97	0.95					0.97		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)		5085	1583	3433	3539					3433		1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		5085	1583	3433	3539					3433		1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	1330	175	357	676	0	0	0	0	325	0	258
RTOR Reduction (vph)	0	0	42	0	0	0	0	0	0	0	0	217
Lane Group Flow (vph)	0	1330	133	357	676	0	0	0	0	325	0	41
Turn Type		NA	Perm	Prot	NA					Prot		Perm
Protected Phases		2		1	6					8		
Permitted Phases			2									8
Actuated Green, G (s)		81.3	81.3	20.0	106.8					22.2		22.2
Effective Green, g (s)		81.3	81.3	20.0	106.8					22.2		22.2
Actuated g/C Ratio		0.58	0.58	0.14	0.76					0.16		0.16
Clearance Time (s)		5.5	5.5	5.5	5.5					5.5		5.5
Vehicle Extension (s)		5.0	5.0	3.0	3.0					5.0		5.0
Lane Grp Cap (vph)		2952	919	490	2699					544		251
v/s Ratio Prot		c0.26		c0.10	0.19					c0.09		
v/s Ratio Perm			0.08									0.03
v/c Ratio		0.45	0.14	0.73	0.25					0.60		0.16
Uniform Delay, d1		16.7	13.4	57.4	4.9					54.7		50.9
Progression Factor		1.00	1.00	1.02	0.60					1.00		1.00
Incremental Delay, d2		0.5	0.3	5.3	0.2					2.7		0.6
Delay (s)		17.2	13.8	63.7	3.2					57.4		51.5
Level of Service		B	B	E	A					E		D
Approach Delay (s)		16.8			24.1			0.0			54.8	
Approach LOS		B			C			A			D	
Intersection Summary												
HCM 2000 Control Delay			26.3			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)				16.5		
Intersection Capacity Utilization			57.5%			ICU Level of Service				B		
Analysis Period (min)			15									
c Critical Lane Group												

Timings
2: GA 400 NB & McGinnis Ferry Rd

2020 Build AM Peak - Improved

09/24/2018



Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Configurations	←←	→→	←←←	→	←←	→
Traffic Volume (vph)	165	1269	772	293	230	80
Future Volume (vph)	165	1269	772	293	230	80
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	4.0	15.0	15.0	15.0	6.0	6.0
Minimum Split (s)	15.0	23.5	23.5	23.5	23.5	23.5
Total Split (s)	30.0	90.0	60.0	60.0	50.0	50.0
Total Split (%)	21.4%	64.3%	42.9%	42.9%	35.7%	35.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Recall Mode	None	C-Min	C-Min	C-Min	None	None

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 60 (43%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated

Splits and Phases: 2: GA 400 NB & McGinnis Ferry Rd



HCM Signalized Intersection Capacity Analysis

2: GA 400 NB & McGinnis Ferry Rd

2020 Build AM Peak - Improved

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	165	1269	0	0	772	293	230	0	80	0	0	0
Future Volume (vph)	165	1269	0	0	772	293	230	0	80	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5			5.5	5.5	5.5		5.5			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.97		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)	3433	3539			5085	1583	3433		1583			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3433	3539			5085	1583	3433		1583			
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	170	1308	0	0	796	302	237	0	82	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	95	0	0	55	0	0	0
Lane Group Flow (vph)	170	1308	0	0	796	207	237	0	27	0	0	0
Turn Type	Prot	NA			NA	Perm	Prot		Perm			
Protected Phases	5	2			6		4					
Permitted Phases						6			4			
Actuated Green, G (s)	12.3	113.8			96.0	96.0	15.2		15.2			
Effective Green, g (s)	12.3	113.8			96.0	96.0	15.2		15.2			
Actuated g/C Ratio	0.09	0.81			0.69	0.69	0.11		0.11			
Clearance Time (s)	5.5	5.5			5.5	5.5	5.5		5.5			
Vehicle Extension (s)	3.0	5.0			5.0	5.0	3.0		3.0			
Lane Grp Cap (vph)	301	2876			3486	1085	372		171			
v/s Ratio Prot	0.05	c0.37			0.16		c0.07					
v/s Ratio Perm						0.13			0.02			
v/c Ratio	0.56	0.45			0.23	0.19	0.64		0.16			
Uniform Delay, d1	61.3	3.9			8.2	8.0	59.8		56.6			
Progression Factor	1.41	0.47			0.40	0.70	1.00		1.00			
Incremental Delay, d2	2.2	0.5			0.1	0.4	3.6		0.4			
Delay (s)	88.3	2.3			3.4	6.0	63.3		57.0			
Level of Service	F	A			A	A	E		E			
Approach Delay (s)		12.2			4.1		61.7				0.0	
Approach LOS		B			A		E				A	
Intersection Summary												
HCM 2000 Control Delay		14.6			HCM 2000 Level of Service		B					
HCM 2000 Volume to Capacity ratio		0.50										
Actuated Cycle Length (s)		140.0			Sum of lost time (s)		16.5					
Intersection Capacity Utilization		57.5%			ICU Level of Service		B					
Analysis Period (min)		15										
c Critical Lane Group												

Timings
3: Windward Concourse & McGinnis Ferry Rd

2020 Build AM Peak - Improved

09/24/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	27	957	666	675	920	73	140	48	121	84	10
Future Volume (vph)	27	957	666	675	920	73	140	48	121	84	10
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	pm+ov	NA	Perm
Protected Phases	5	2		1	6		4	4	1	3	
Permitted Phases			2			6			4		3
Detector Phase	5	2	2	1	6	6	4	4	1	3	3
Switch Phase	2			6							
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	15.0	15.0	5.0	5.0	5.0
Minimum Split (s)	15.0	52.5	52.5	15.0	26.3	26.3	23.6	23.6	15.0	23.6	23.6
Total Split (s)	15.0	54.0	54.0	38.0	77.0	77.0	24.0	24.0	38.0	24.0	24.0
Total Split (%)	10.7%	38.6%	38.6%	27.1%	55.0%	55.0%	17.1%	17.1%	27.1%	17.1%	17.1%
Yellow Time (s)	3.2	4.3	4.3	3.2	4.3	4.3	3.6	3.6	3.2	3.6	3.6
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	6.3	6.3	5.2	6.3	6.3	5.6	5.6	5.2	5.6	5.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?											
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None

Intersection Summary

Cycle Length: 140

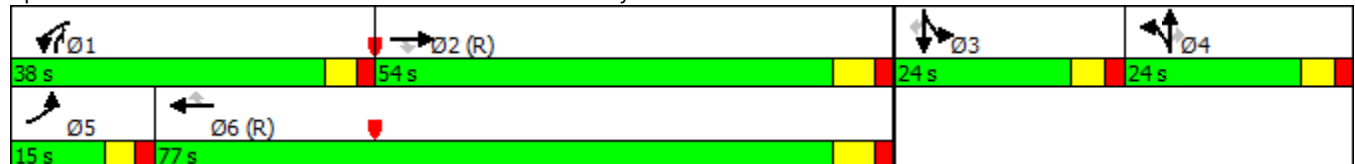
Actuated Cycle Length: 140

Offset: 50 (36%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 125

Control Type: Actuated-Coordinated

Splits and Phases: 3: Windward Concourse & McGinnis Ferry Rd



HCM Signalized Intersection Capacity Analysis

3: Windward Concourse & McGinnis Ferry Rd

2020 Build AM Peak - Improved

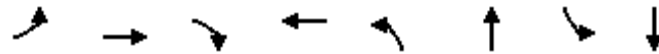
09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	957	666	675	920	73	140	48	121	5	84	10
Future Volume (vph)	27	957	666	675	920	73	140	48	121	5	84	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.3	6.3	5.2	6.3	6.3	5.6	5.6	5.2		5.6	5.6
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.95	0.95	0.88		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	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.98	1.00		1.00	1.00
Satd. Flow (prot)	3433	5036	1583	3433	5036	1583	1681	1726	2787		1858	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.98	1.00		1.00	1.00
Satd. Flow (perm)	3433	5036	1583	3433	5036	1583	1681	1726	2787		1858	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	28	987	687	696	948	75	144	49	125	5	87	10
RTOR Reduction (vph)	0	0	261	0	0	29	0	0	83	0	0	9
Lane Group Flow (vph)	28	987	426	696	948	46	95	98	42	0	92	1
Heavy Vehicles (%)	2%	3%	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	pm+ov	Split	NA	Perm
Protected Phases	5	2		1	6		4	4	1	3	3	
Permitted Phases			2			6			4			3
Actuated Green, G (s)	3.8	59.2	59.2	31.1	86.5	86.5	15.5	15.5	46.6		11.5	11.5
Effective Green, g (s)	3.8	59.2	59.2	31.1	86.5	86.5	15.5	15.5	46.6		11.5	11.5
Actuated g/C Ratio	0.03	0.42	0.42	0.22	0.62	0.62	0.11	0.11	0.33		0.08	0.08
Clearance Time (s)	5.2	6.3	6.3	5.2	6.3	6.3	5.6	5.6	5.2		5.6	5.6
Vehicle Extension (s)	2.1	5.1	5.1	2.1	5.1	5.1	2.1	2.1	2.1		2.1	2.1
Lane Grp Cap (vph)	93	2129	669	762	3111	978	186	191	927		152	130
v/s Ratio Prot	0.01	0.20		c0.20	0.19		0.06	c0.06	0.01		c0.05	
v/s Ratio Perm			c0.27			0.03			0.00			0.00
v/c Ratio	0.30	0.46	0.64	0.91	0.30	0.05	0.51	0.51	0.04		0.61	0.01
Uniform Delay, d1	66.8	29.0	31.9	53.1	12.6	10.5	58.7	58.7	31.6		62.1	59.0
Progression Factor	1.13	0.81	0.56	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.8	0.7	4.4	15.1	0.3	0.1	1.1	1.1	0.0		4.8	0.0
Delay (s)	75.9	24.3	22.1	68.2	12.8	10.6	59.8	59.8	31.6		66.9	59.0
Level of Service	E	C	C	E	B	B	E	E	C		E	E
Approach Delay (s)		24.3			35.2			48.7			66.1	
Approach LOS		C			D			D			E	
Intersection Summary												
HCM 2000 Control Delay			32.3			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.69									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)			22.7			
Intersection Capacity Utilization			79.4%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Timings
4: Windward Concourse & Alderman Dr/Private Drwy

2020 Build AM Peak - Improved

09/24/2018



Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	93	65	10	5	36	242	35	572
Future Volume (vph)	93	65	10	5	36	242	35	572
Turn Type	Split	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	4	4		3		2		6
Permitted Phases			4		2		6	
Detector Phase	4	4	4	3	2	2	6	6
Switch Phase								
Minimum Initial (s)	6.0	6.0	6.0	6.0	15.0	15.0	15.0	15.0
Minimum Split (s)	23.5	23.5	23.5	23.5	23.5	23.5	23.5	23.5
Total Split (s)	35.0	35.0	35.0	23.5	65.0	65.0	65.0	65.0
Total Split (%)	28.3%	28.3%	28.3%	19.0%	52.6%	52.6%	52.6%	52.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5		5.5		5.5
Lead/Lag	Lag	Lag	Lag	Lead				
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min	C-Min

Intersection Summary

Cycle Length: 123.5

Actuated Cycle Length: 123.5

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

Natural Cycle: 75

Control Type: Actuated-Coordinated

Splits and Phases: 4: Windward Concourse & Alderman Dr/Private Drwy

	Ø2 (R)		Ø3		Ø4
65 s		23.5 s		35 s	
	Ø6 (R)				
65 s					

HCM Signalized Intersection Capacity Analysis

4: Windward Concourse & Alderman Dr/Private Drwy

2020 Build AM Peak - Improved

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	65	10	11	5	7	36	242	101	35	572	339
Future Volume (vph)	93	65	10	11	5	7	36	242	101	35	572	339
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5		5.5			5.5			5.5	
Lane Util. Factor	0.95	0.95	1.00		1.00			0.95			0.95	
Frt	1.00	1.00	0.85		0.96			0.96			0.95	
Flt Protected	0.95	0.99	1.00		0.98			1.00			1.00	
Satd. Flow (prot)	1681	1753	1583		1744			3382			3343	
Flt Permitted	0.95	0.99	1.00		0.98			0.80			0.92	
Satd. Flow (perm)	1681	1753	1583		1744			2716			3091	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	96	67	10	11	5	7	37	249	104	36	590	349
RTOR Reduction (vph)	0	0	9	0	7	0	0	15	0	0	31	0
Lane Group Flow (vph)	80	83	1	0	16	0	0	375	0	0	944	0
Turn Type	Split	NA	Perm	Split	NA		Perm	NA		Perm	NA	
Protected Phases	4	4		3	3			2			6	
Permitted Phases			4				2			6		
Actuated Green, G (s)	11.2	11.2	11.2		4.6			91.2			91.2	
Effective Green, g (s)	11.2	11.2	11.2		4.6			91.2			91.2	
Actuated g/C Ratio	0.09	0.09	0.09		0.04			0.74			0.74	
Clearance Time (s)	5.5	5.5	5.5		5.5			5.5			5.5	
Vehicle Extension (s)	3.0	3.0	3.0		3.0			3.0			3.0	
Lane Grp Cap (vph)	152	158	143		64			2005			2282	
v/s Ratio Prot	c0.05	0.05			c0.01							
v/s Ratio Perm			0.00					0.14			c0.31	
v/c Ratio	0.53	0.53	0.01		0.25			0.19			0.41	
Uniform Delay, d1	53.6	53.6	51.1		57.8			4.9			6.1	
Progression Factor	1.00	1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2	3.3	3.1	0.0		2.1			0.2			0.6	
Delay (s)	56.9	56.7	51.1		59.9			5.1			6.6	
Level of Service	E	E	D		E			A			A	
Approach Delay (s)		56.5			59.9			5.1			6.6	
Approach LOS		E			E			A			A	
Intersection Summary												
HCM 2000 Control Delay			12.6									
HCM 2000 Volume to Capacity ratio			0.42									
Actuated Cycle Length (s)			123.5									
Intersection Capacity Utilization			61.9%									
Analysis Period (min)			15									
c Critical Lane Group												

Timings

2020 Build AM Peak - Improved

5: Windward Plaza/Windward Concourse & Windward Pkwy

09/24/2018



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	280	974	303	1338	54	72	24	164	305
Future Volume (vph)	280	974	303	1338	54	72	24	164	305
Turn Type	Prot	NA	pm+pt	NA	Split	NA	Perm	NA	Perm
Protected Phases	5	2	1	6	3	3		4	
Permitted Phases			6				3		4
Detector Phase	5	2	1	6	3	3	3	4	4
Switch Phase									
Minimum Initial (s)	4.0	15.0	4.0	15.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	15.0	46.2	15.0	50.2	41.0	41.0	41.0	22.5	22.5
Total Split (s)	41.0	98.0	22.0	79.0	17.0	17.0	17.0	23.0	23.0
Total Split (%)	25.6%	61.3%	13.8%	49.4%	10.6%	10.6%	10.6%	14.4%	14.4%
Yellow Time (s)	3.0	4.2	3.4	4.2	3.1	3.1	3.1	3.6	3.6
All-Red Time (s)	2.5	2.0	2.8	2.0	2.9	2.9	2.9	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	6.2	6.2	6.2	6.0	6.0	6.0	6.2	6.2
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?									
Recall Mode	Min	C-Min	None	C-Min	None	None	None	None	None

Intersection Summary

Cycle Length: 160

Actuated Cycle Length: 160

Offset: 144 (90%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Splits and Phases: 5: Windward Plaza/Windward Concourse & Windward Pkwy

Ø1	Ø2 (R)	Ø3	Ø4
22 s	98 s	17 s	23 s
Ø5	Ø6 (R)		
41 s	79 s		

HCM Signalized Intersection Capacity Analysis

5: Windward Plaza/Windward Concourse & Windward Pkwy

2020 Build AM Peak - Improved

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	280	974	45	303	1338	186	54	72	24	59	164	305
Future Volume (vph)	280	974	45	303	1338	186	54	72	24	59	164	305
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	6.2		6.2	6.2		6.0	6.0	6.0		6.2	6.2
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.98		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00		0.99	1.00
Satd. Flow (prot)	1770	3516		1770	3474		1770	1863	1583		1838	1583
Flt Permitted	0.95	1.00		0.25	1.00		0.95	1.00	1.00		0.99	1.00
Satd. Flow (perm)	1770	3516		466	3474		1770	1863	1583		1838	1583
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	286	994	46	309	1365	190	55	73	24	60	167	311
RTOR Reduction (vph)	0	2	0	0	6	0	0	0	23	0	0	278
Lane Group Flow (vph)	286	1038	0	309	1549	0	55	73	1	0	227	33
Turn Type	Prot	NA		pm+pt	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases				6					3			4
Actuated Green, G (s)	29.5	95.1		94.3	80.3		9.5	9.5	9.5		16.8	16.8
Effective Green, g (s)	29.5	95.1		94.3	80.3		9.5	9.5	9.5		16.8	16.8
Actuated g/C Ratio	0.18	0.59		0.59	0.50		0.06	0.06	0.06		0.11	0.11
Clearance Time (s)	5.5	6.2		6.2	6.2		6.0	6.0	6.0		6.2	6.2
Vehicle Extension (s)	2.1	5.1		2.1	5.1		2.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)	326	2089		388	1743		105	110	93		192	166
v/s Ratio Prot	c0.16	0.30		0.07	c0.45		0.03	c0.04			c0.12	
v/s Ratio Perm				0.40					0.00			0.02
v/c Ratio	0.88	0.50		0.80	0.89		0.52	0.66	0.02		1.18	0.20
Uniform Delay, d1	63.5	18.7		16.8	35.8		73.1	73.7	70.8		71.6	65.4
Progression Factor	1.06	0.65		1.00	1.00		0.89	0.89	1.00		1.00	1.00
Incremental Delay, d2	17.9	0.7		10.2	7.2		1.7	9.0	0.0		122.7	0.2
Delay (s)	85.3	12.8		27.0	43.0		66.7	74.5	70.9		194.3	65.6
Level of Service	F	B		C	D		E	E	E		F	E
Approach Delay (s)		28.4			40.4			71.1			119.9	
Approach LOS		C			D			E			F	
Intersection Summary												
HCM 2000 Control Delay			48.5			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.91									
Actuated Cycle Length (s)			160.0			Sum of lost time (s)			24.6			
Intersection Capacity Utilization			94.0%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

Timings
6: Windward Plaza/Alderman Dr & Windward Pkwy

2020 Build AM Peak - Improved

09/24/2018

									
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	558	1238	29	1659	198	91	36	12	214
Future Volume (vph)	558	1238	29	1659	198	91	36	12	214
Turn Type	Prot	NA	Perm	NA	Perm	Split	NA	NA	pm+ov
Protected Phases	5	2		6		4	4	3	5
Permitted Phases			6		6				3
Detector Phase	5	2	6	6	6	4	4	3	5
Switch Phase	2								
Minimum Initial (s)	4.0	20.0	20.0	20.0	20.0	6.0	6.0	6.0	4.0
Minimum Split (s)	15.0	48.8	51.8	51.8	51.8	45.2	45.2	22.5	15.0
Total Split (s)	40.0	121.0	81.0	81.0	81.0	21.0	21.0	18.0	40.0
Total Split (%)	25.0%	75.6%	50.6%	50.6%	50.6%	13.1%	13.1%	11.3%	25.0%
Yellow Time (s)	3.0	4.3	4.3	4.3	4.3	3.3	3.3	3.3	3.0
All-Red Time (s)	2.9	2.5	2.5	2.5	2.5	2.9	2.9	3.0	2.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	6.8	6.8	6.8	6.8	6.2	6.2	6.3	5.9
Lead/Lag	Lead		Lag	Lag	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?									
Recall Mode	None	C-Min	C-Min	C-Min	C-Min	None	None	None	None

Intersection Summary

Cycle Length: 160
 Actuated Cycle Length: 160
 Offset: 134 (84%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
 Natural Cycle: 145
 Control Type: Actuated-Coordinated

Splits and Phases: 6: Windward Plaza/Alderman Dr & Windward Pkwy

 Ø2 (R)	 Ø3	 Ø4
121 s	18 s	21 s
 Ø5	 Ø6 (R)	
40 s	81 s	

HCM Signalized Intersection Capacity Analysis

6: Windward Plaza/Alderman Dr & Windward Pkwy

2020 Build AM Peak - Improved

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	558	1238	402	29	1659	198	91	36	42	18	12	214
Future Volume (vph)	558	1238	402	29	1659	198	91	36	42	18	12	214
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	6.8		6.8	6.8	6.8	6.2	6.2			6.3	5.9
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	0.97	1.00			1.00	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.92			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.97	1.00
Satd. Flow (prot)	3433	3409		1770	3539	1583	3433	1713			1809	1583
Flt Permitted	0.95	1.00		0.14	1.00	1.00	0.95	1.00			0.97	1.00
Satd. Flow (perm)	3433	3409		261	3539	1583	3433	1713			1809	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	581	1290	419	30	1728	206	95	38	44	19	12	223
RTOR Reduction (vph)	0	15	0	0	0	48	0	27	0	0	0	52
Lane Group Flow (vph)	581	1694	0	30	1728	158	95	55	0	0	32	171
Turn Type	Prot	NA		Perm	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2			6		4	4		3	3	5
Permitted Phases				6		6						3
Actuated Green, G (s)	31.1	124.3		87.3	87.3	87.3	9.9	9.9			6.5	37.6
Effective Green, g (s)	31.1	124.3		87.3	87.3	87.3	9.9	9.9			6.5	37.6
Actuated g/C Ratio	0.19	0.78		0.55	0.55	0.55	0.06	0.06			0.04	0.24
Clearance Time (s)	5.9	6.8		6.8	6.8	6.8	6.2	6.2			6.3	5.9
Vehicle Extension (s)	2.0	5.0		5.0	5.0	5.0	2.0	2.0			2.0	2.0
Lane Grp Cap (vph)	667	2648		142	1930	863	212	105			73	372
v/s Ratio Prot	c0.17	0.50			c0.49		0.03	c0.03			0.02	c0.09
v/s Ratio Perm				0.11		0.10						0.02
v/c Ratio	0.87	0.64		0.21	0.90	0.18	0.45	0.52			0.44	0.46
Uniform Delay, d1	62.5	7.9		18.7	32.3	18.4	72.4	72.8			75.0	52.5
Progression Factor	1.00	1.00		1.16	0.86	1.32	1.02	1.07			1.00	1.00
Incremental Delay, d2	11.6	1.2		2.2	4.7	0.3	0.3	1.0			1.5	0.3
Delay (s)	74.1	9.1		23.8	32.7	24.5	73.9	78.8			76.5	52.8
Level of Service	E	A		C	C	C	E	E			E	D
Approach Delay (s)		25.6			31.7			76.2			55.8	
Approach LOS		C			C			E			E	
Intersection Summary												
HCM 2000 Control Delay			31.7									
HCM 2000 Volume to Capacity ratio			0.84									
Actuated Cycle Length (s)			160.0									
Intersection Capacity Utilization			89.5%									
Analysis Period (min)			15									
c Critical Lane Group												

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕	↕↕		↕↕	
Traffic Vol, veh/h	15	141	258	98	19	3
Future Vol, veh/h	15	141	258	98	19	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	153	280	107	21	3
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	387	0	-	0	443	193
Stage 1	-	-	-	-	334	-
Stage 2	-	-	-	-	109	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1168	-	-	-	543	816
Stage 1	-	-	-	-	697	-
Stage 2	-	-	-	-	903	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1168	-	-	-	535	816
Mov Cap-2 Maneuver	-	-	-	-	535	-
Stage 1	-	-	-	-	697	-
Stage 2	-	-	-	-	889	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.9	0		11.7		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1168	-	-	-	561	
HCM Lane V/C Ratio	0.014	-	-	-	0.043	
HCM Control Delay (s)	8.1	0.1	-	-	11.7	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.1	

Intersection

Int Delay, s/veh 0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↑↑	
Traffic Vol, veh/h	15	145	354	13	17	2
Future Vol, veh/h	15	145	354	13	17	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	158	385	14	18	2

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	399	0	0 503 199
Stage 1	-	-	- 392 -
Stage 2	-	-	- 111 -
Critical Hdwy	4.14	-	- 6.84 6.94
Critical Hdwy Stg 1	-	-	- 5.84 -
Critical Hdwy Stg 2	-	-	- 5.84 -
Follow-up Hdwy	2.22	-	- 3.52 3.32
Pot Cap-1 Maneuver	1156	-	- 498 809
Stage 1	-	-	- 652 -
Stage 2	-	-	- 901 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1156	-	- 491 809
Mov Cap-2 Maneuver	-	-	- 491 -
Stage 1	-	-	- 652 -
Stage 2	-	-	- 887 -

Approach	EB	WB	SB
HCM Control Delay, s	0.9	0	12.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1156	-	-	-	512
HCM Lane V/C Ratio	0.014	-	-	-	0.04
HCM Control Delay (s)	8.2	0.1	-	-	12.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↑↑	
Traffic Vol, veh/h	20	142	365	15	26	2
Future Vol, veh/h	20	142	365	15	26	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	154	397	16	28	2
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	413	0	-	0	526	207
Stage 1	-	-	-	-	405	-
Stage 2	-	-	-	-	121	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1142	-	-	-	482	799
Stage 1	-	-	-	-	642	-
Stage 2	-	-	-	-	891	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1142	-	-	-	472	799
Mov Cap-2 Maneuver	-	-	-	-	472	-
Stage 1	-	-	-	-	642	-
Stage 2	-	-	-	-	872	-
Approach	EB	WB		SB		
HCM Control Delay, s	1.1	0		12.9		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1142	-	-	-	486	
HCM Lane V/C Ratio	0.019	-	-	-	0.063	
HCM Control Delay (s)	8.2	0.1	-	-	12.9	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2	

Intersection

Int Delay, s/veh 0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↗↗	↗↗	
Traffic Vol, veh/h	0	2	0	343	944	148
Future Vol, veh/h	0	2	0	343	944	148
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	Free
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	2	0	373	1026	161

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	- 513	- 0	- 0
Stage 1	- -	- -	- -
Stage 2	- -	- -	- -
Critical Hdwy	- 6.94	- -	- -
Critical Hdwy Stg 1	- -	- -	- -
Critical Hdwy Stg 2	- -	- -	- -
Follow-up Hdwy	- 3.32	- -	- -
Pot Cap-1 Maneuver	0 506	0 -	- 0
Stage 1	0 -	0 -	- 0
Stage 2	0 -	0 -	- 0
Platoon blocked, %		- -	
Mov Cap-1 Maneuver	- 506	- -	- -
Mov Cap-2 Maneuver	- -	- -	- -
Stage 1	- -	- -	- -
Stage 2	- -	- -	- -

Approach	EB	NB	SB
HCM Control Delay, s	12.1	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT EBLn1	SBT
Capacity (veh/h)	- 506	-
HCM Lane V/C Ratio	- 0.004	-
HCM Control Delay (s)	- 12.1	-
HCM Lane LOS	- B	-
HCM 95th %tile Q(veh)	- 0	-

Intersection

Int Delay, s/veh 0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑↑↑	↑↑	
Traffic Vol, veh/h	0	2	0	343	1090	49
Future Vol, veh/h	0	2	0	343	1090	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	Free
Storage Length	-	0	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	2	0	373	1185	53

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	592	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	-
Pot Cap-1 Maneuver	0	449	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %			-
Mov Cap-1 Maneuver	-	449	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.1	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT EBLn1	SBT
Capacity (veh/h)	- 449	-
HCM Lane V/C Ratio	- 0.005	-
HCM Control Delay (s)	- 13.1	-
HCM Lane LOS	- B	-
HCM 95th %tile Q(veh)	- 0	-

Intersection

Int Delay, s/veh 0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑		↑↑↑		↑
Traffic Vol, veh/h	1643	125	0	1070	0	7
Future Vol, veh/h	1643	125	0	1070	0	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Free	-	None	-	Yield
Storage Length	-	100	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1786	136	0	1163	0	8

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	-	- 893
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	- 7.14
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	- 3.92
Pot Cap-1 Maneuver	-	0	0 - 244
Stage 1	-	0	0 -
Stage 2	-	0	0 -
Platoon blocked, %	-		-
Mov Cap-1 Maneuver	-	-	- 244
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	20.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	244	-	-
HCM Lane V/C Ratio	0.031	-	-
HCM Control Delay (s)	20.2	-	-
HCM Lane LOS	C	-	-
HCM 95th %tile Q(veh)	0.1	-	-

Timings

1: GA 400 SB & McGinnis Ferry Rd

2020 Build PM Peak - Improved

09/24/2018

	→	↘	↙	←	↘	↙
Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Configurations	↑↑↑	↑	↘↙	↑↑	↘↙	↑
Traffic Volume (vph)	985	300	693	1228	558	90
Future Volume (vph)	985	300	693	1228	558	90
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	4.0	15.0	6.0	6.0
Minimum Split (s)	23.5	23.5	15.0	23.5	23.5	23.5
Total Split (s)	55.0	55.0	45.0	100.0	40.0	40.0
Total Split (%)	39.3%	39.3%	32.1%	71.4%	28.6%	28.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Recall Mode	C-Min	C-Min	None	C-Min	None	None

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 91 (65%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Splits and Phases: 1: GA 400 SB & McGinnis Ferry Rd



HCM Signalized Intersection Capacity Analysis

1: GA 400 SB & McGinnis Ferry Rd

2020 Build PM Peak - Improved

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑↑		↑
Traffic Volume (vph)	0	985	300	693	1228	0	0	0	0	558	0	90
Future Volume (vph)	0	985	300	693	1228	0	0	0	0	558	0	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5	5.5	5.5					5.5		5.5
Lane Util. Factor		0.91	1.00	0.97	0.95					0.97		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)		5085	1583	3433	3539					3433		1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		5085	1583	3433	3539					3433		1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1071	326	753	1335	0	0	0	0	607	0	98
RTOR Reduction (vph)	0	0	139	0	0	0	0	0	0	0	0	60
Lane Group Flow (vph)	0	1071	187	753	1335	0	0	0	0	607	0	38
Turn Type		NA	Perm	Prot	NA					Prot		Perm
Protected Phases		2		1	6					8		
Permitted Phases			2									8
Actuated Green, G (s)		56.2	56.2	35.4	97.1					31.9		31.9
Effective Green, g (s)		56.2	56.2	35.4	97.1					31.9		31.9
Actuated g/C Ratio		0.40	0.40	0.25	0.69					0.23		0.23
Clearance Time (s)		5.5	5.5	5.5	5.5					5.5		5.5
Vehicle Extension (s)		5.0	5.0	3.0	3.0					5.0		5.0
Lane Grp Cap (vph)		2041	635	868	2454					782		360
v/s Ratio Prot		0.21		c0.22	c0.38					c0.18		
v/s Ratio Perm			0.12									0.02
v/c Ratio		0.52	0.29	0.87	0.54					0.78		0.10
Uniform Delay, d1		31.8	28.4	50.1	10.6					50.7		42.8
Progression Factor		1.00	1.00	0.77	0.69					1.00		1.00
Incremental Delay, d2		1.0	1.2	8.1	0.8					5.7		0.3
Delay (s)		32.7	29.6	46.9	8.1					56.4		43.0
Level of Service		C	C	D	A					E		D
Approach Delay (s)		32.0			22.1			0.0			54.5	
Approach LOS		C			C			A			D	
Intersection Summary												
HCM 2000 Control Delay			30.8			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)				16.5		
Intersection Capacity Utilization			68.5%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

Timings
2: GA 400 NB & McGinnis Ferry Rd

2020 Build PM Peak - Improved

09/24/2018

						
Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	215	1027	1651	473	270	151
Future Volume (vph)	215	1027	1651	473	270	151
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	4.0	15.0	15.0	15.0	6.0	6.0
Minimum Split (s)	15.0	23.5	23.5	23.5	23.5	23.5
Total Split (s)	25.0	90.0	65.0	65.0	50.0	50.0
Total Split (%)	17.9%	64.3%	46.4%	46.4%	35.7%	35.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Recall Mode	None	C-Min	C-Min	C-Min	None	None

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 64 (46%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated

Splits and Phases: 2: GA 400 NB & McGinnis Ferry Rd



HCM Signalized Intersection Capacity Analysis

2: GA 400 NB & McGinnis Ferry Rd

2020 Build PM Peak - Improved

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	215	1027	0	0	1651	473	270	0	151	0	0	0
Future Volume (vph)	215	1027	0	0	1651	473	270	0	151	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5			5.5	5.5	5.5		5.5			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.97		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)	3433	3539			5085	1583	3433		1583			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3433	3539			5085	1583	3433		1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	234	1116	0	0	1795	514	293	0	164	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	134	0	0	82	0	0	0
Lane Group Flow (vph)	234	1116	0	0	1795	380	293	0	82	0	0	0
Turn Type	Prot	NA			NA	Perm	Prot		Perm			
Protected Phases	5	2			6		4					
Permitted Phases						6			4			
Actuated Green, G (s)	14.8	111.3			91.0	91.0	17.7		17.7			
Effective Green, g (s)	14.8	111.3			91.0	91.0	17.7		17.7			
Actuated g/C Ratio	0.11	0.79			0.65	0.65	0.13		0.13			
Clearance Time (s)	5.5	5.5			5.5	5.5	5.5		5.5			
Vehicle Extension (s)	3.0	5.0			5.0	5.0	3.0		3.0			
Lane Grp Cap (vph)	362	2813			3305	1028	434		200			
v/s Ratio Prot	c0.07	0.32			c0.35		c0.09					
v/s Ratio Perm						0.24			0.05			
v/c Ratio	0.65	0.40			0.54	0.37	0.68		0.41			
Uniform Delay, d1	60.1	4.3			13.3	11.3	58.4		56.3			
Progression Factor	0.85	0.94			1.29	2.53	1.00		1.00			
Incremental Delay, d2	3.2	0.3			0.4	0.6	4.1		1.4			
Delay (s)	54.1	4.4			17.4	29.2	62.5		57.7			
Level of Service	D	A			B	C	E		E			
Approach Delay (s)		13.0			20.0		60.8				0.0	
Approach LOS		B			C		E				A	
Intersection Summary												
HCM 2000 Control Delay		22.3			HCM 2000 Level of Service		C					
HCM 2000 Volume to Capacity ratio		0.57										
Actuated Cycle Length (s)		140.0			Sum of lost time (s)		16.5					
Intersection Capacity Utilization		68.5%			ICU Level of Service		C					
Analysis Period (min)		15										
c Critical Lane Group												

Timings
3: Windward Concourse & McGinnis Ferry Rd

2020 Build PM Peak - Improved

09/24/2018

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	5	1660	231	177	1445	5	810	35	743	45	30
Future Volume (vph)	5	1660	231	177	1445	5	810	35	743	45	30
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	pm+ov	NA	Perm
Protected Phases	5	2		1	6		4	4	1	3	
Permitted Phases			2			6			4		3
Detector Phase	5	2	2	1	6	6	4	4	1	3	3
Switch Phase	2			6							
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	15.0	15.0	5.0	5.0	5.0
Minimum Split (s)	15.0	52.5	52.5	15.0	26.3	26.3	23.6	23.6	15.0	23.6	23.6
Total Split (s)	15.0	60.0	60.0	15.0	60.0	60.0	35.0	35.0	15.0	30.0	30.0
Total Split (%)	10.7%	42.9%	42.9%	10.7%	42.9%	42.9%	25.0%	25.0%	10.7%	21.4%	21.4%
Yellow Time (s)	3.2	4.3	4.3	3.2	4.3	4.3	3.6	3.6	3.2	3.6	3.6
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	6.3	6.3	5.2	6.3	6.3	5.6	5.6	5.2	5.6	5.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?											
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

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

Natural Cycle: 135

Control Type: Actuated-Coordinated

Splits and Phases: 3: Windward Concourse & McGinnis Ferry Rd

			
Ø1	Ø2 (R)	Ø3	Ø4
15 s	60 s	30 s	35 s
			
Ø5	Ø6 (R)		
15 s	60 s		

HCM Signalized Intersection Capacity Analysis

3: Windward Concourse & McGinnis Ferry Rd

2020 Build PM Peak - Improved

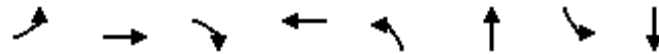
09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1660	231	177	1445	5	810	35	743	13	45	30
Future Volume (vph)	5	1660	231	177	1445	5	810	35	743	13	45	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.3	6.3	5.2	6.3	6.3	5.6	5.6	5.2		5.6	5.6
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.95	0.95	0.88		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	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.99	1.00
Satd. Flow (prot)	3433	5036	1583	3433	5036	1583	1681	1692	2787		1842	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.99	1.00
Satd. Flow (perm)	3433	5036	1583	3433	5036	1583	1681	1692	2787		1842	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	1804	251	192	1571	5	880	38	808	14	49	33
RTOR Reduction (vph)	0	0	87	0	0	2	0	0	392	0	0	31
Lane Group Flow (vph)	5	1804	164	192	1571	3	458	460	416	0	63	2
Heavy Vehicles (%)	2%	3%	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	pm+ov	Split	NA	Perm
Protected Phases	5	2		1	6		4	4	1	3	3	
Permitted Phases			2			6			4			3
Actuated Green, G (s)	1.1	69.9	69.9	9.7	78.5	78.5	29.4	29.4	39.1		8.3	8.3
Effective Green, g (s)	1.1	69.9	69.9	9.7	78.5	78.5	29.4	29.4	39.1		8.3	8.3
Actuated g/C Ratio	0.01	0.50	0.50	0.07	0.56	0.56	0.21	0.21	0.28		0.06	0.06
Clearance Time (s)	5.2	6.3	6.3	5.2	6.3	6.3	5.6	5.6	5.2		5.6	5.6
Vehicle Extension (s)	2.1	5.1	5.1	2.1	5.1	5.1	2.1	2.1	2.1		2.1	2.1
Lane Grp Cap (vph)	26	2514	790	237	2823	887	353	355	778		109	93
v/s Ratio Prot	0.00	c0.36		c0.06	0.31		c0.27	0.27	0.04		c0.03	
v/s Ratio Perm			0.10			0.00			0.11			0.00
v/c Ratio	0.19	0.72	0.21	0.81	0.56	0.00	1.30	1.30	0.53		0.58	0.02
Uniform Delay, d1	69.0	27.3	19.6	64.2	19.6	13.5	55.3	55.3	42.7		64.1	62.0
Progression Factor	1.16	0.65	0.39	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.6	1.8	0.6	17.8	0.8	0.0	153.3	152.5	0.4		4.8	0.0
Delay (s)	81.7	19.6	8.3	82.0	20.4	13.5	208.6	207.8	43.1		69.0	62.1
Level of Service	F	B	A	F	C	B	F	F	D		E	E
Approach Delay (s)		18.3			27.1			130.9			66.6	
Approach LOS		B			C			F			E	
Intersection Summary												
HCM 2000 Control Delay			56.3			HCM 2000 Level of Service			E			
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)			22.7			
Intersection Capacity Utilization			81.4%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Timings
4: Windward Concourse & Alderman Dr/Private Drwy

2020 Build PM Peak - Improved

09/24/2018



Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	793	10	33	45	15	465	9	291
Future Volume (vph)	793	10	33	45	15	465	9	291
Turn Type	Split	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	4	4		3		2		6
Permitted Phases			4		2		6	
Detector Phase	4	4	4	3	2	2	6	6
Switch Phase								
Minimum Initial (s)	6.0	6.0	6.0	6.0	15.0	15.0	15.0	15.0
Minimum Split (s)	23.5	23.5	23.5	15.0	23.5	23.5	23.5	23.5
Total Split (s)	45.0	45.0	45.0	30.0	45.0	45.0	45.0	45.0
Total Split (%)	37.5%	37.5%	37.5%	25.0%	37.5%	37.5%	37.5%	37.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5		5.5		5.5
Lead/Lag	Lag	Lag	Lag	Lead				
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min	C-Min

Intersection Summary

Cycle Length: 120

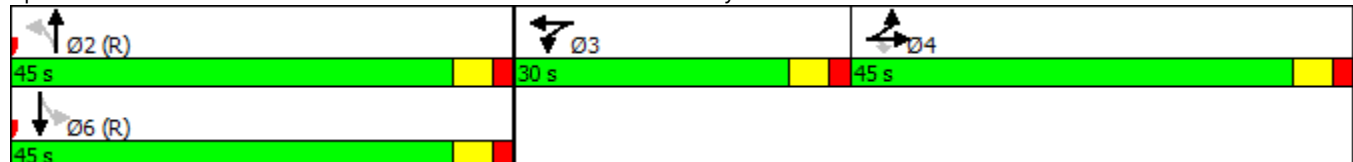
Actuated Cycle Length: 120

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

Natural Cycle: 70

Control Type: Actuated-Coordinated

Splits and Phases: 4: Windward Concourse & Alderman Dr/Private Drwy



HCM Signalized Intersection Capacity Analysis

4: Windward Concourse & Alderman Dr/Private Drwy

2020 Build PM Peak - Improved

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	793	10	33	136	45	26	15	465	11	9	291	39
Future Volume (vph)	793	10	33	136	45	26	15	465	11	9	291	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5		5.5			5.5			5.5	
Lane Util. Factor	0.95	0.95	1.00		1.00			0.95			0.95	
Frt	1.00	1.00	0.85		0.98			1.00			0.98	
Flt Protected	0.95	0.95	1.00		0.97			1.00			1.00	
Satd. Flow (prot)	1681	1687	1583		1773			3521			3474	
Flt Permitted	0.95	0.95	1.00		0.97			0.94			0.94	
Satd. Flow (perm)	1681	1687	1583		1773			3299			3260	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	901	11	38	155	51	30	17	528	12	10	331	44
RTOR Reduction (vph)	0	0	26	0	4	0	0	1	0	0	7	0
Lane Group Flow (vph)	460	452	12	0	232	0	0	557	0	0	378	0
Turn Type	Split	NA	Perm	Split	NA		Perm	NA		Perm	NA	
Protected Phases	4	4		3	3			2			6	
Permitted Phases			4				2			6		
Actuated Green, G (s)	36.5	36.5	36.5		20.1			46.9			46.9	
Effective Green, g (s)	36.5	36.5	36.5		20.1			46.9			46.9	
Actuated g/C Ratio	0.30	0.30	0.30		0.17			0.39			0.39	
Clearance Time (s)	5.5	5.5	5.5		5.5			5.5			5.5	
Vehicle Extension (s)	3.0	3.0	3.0		3.0			3.0			3.0	
Lane Grp Cap (vph)	511	513	481		296			1289			1274	
v/s Ratio Prot	c0.27	0.27			c0.13							
v/s Ratio Perm			0.01					c0.17			0.12	
v/c Ratio	0.90	0.88	0.02		0.78			0.43			0.30	
Uniform Delay, d1	40.0	39.7	29.3		47.9			26.8			25.2	
Progression Factor	1.00	1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2	18.8	16.1	0.0		12.7			1.1			0.6	
Delay (s)	58.8	55.8	29.3		60.5			27.8			25.8	
Level of Service	E	E	C		E			C			C	
Approach Delay (s)		56.2			60.5			27.8			25.8	
Approach LOS		E			E			C			C	
Intersection Summary												
HCM 2000 Control Delay			43.8									
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			120.0									
Intersection Capacity Utilization			62.2%									
Analysis Period (min)			15									
c Critical Lane Group												

Timings

2020 Build PM Peak - Improved

5: Windward Plaza/Windward Concourse & Windward Pkwy

09/24/2018



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	174	1525	65	402	102	91	279	57	379
Future Volume (vph)	174	1525	65	402	102	91	279	57	379
Turn Type	Prot	NA	pm+pt	NA	Split	NA	Perm	NA	Perm
Protected Phases	5	2	1	6	3	3		4	
Permitted Phases			6				3		4
Detector Phase	5	2	1	6	3	3	3	4	4
Switch Phase									
Minimum Initial (s)	4.0	15.0	4.0	15.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	15.0	46.2	15.0	50.2	41.0	41.0	41.0	22.5	22.5
Total Split (s)	30.0	90.0	13.0	73.0	23.0	23.0	23.0	34.0	34.0
Total Split (%)	18.8%	56.3%	8.1%	45.6%	14.4%	14.4%	14.4%	21.3%	21.3%
Yellow Time (s)	3.0	4.2	3.4	4.2	3.1	3.1	3.1	3.6	3.6
All-Red Time (s)	2.5	2.0	2.8	2.0	2.9	2.9	2.9	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	6.2	6.2	6.2	6.0	6.0	6.0	6.2	6.2
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?									
Recall Mode	Min	C-Min	None	C-Min	None	None	None	None	None

Intersection Summary

Cycle Length: 160

Actuated Cycle Length: 160

Offset: 146 (91%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Splits and Phases: 5: Windward Plaza/Windward Concourse & Windward Pkwy



HCM Signalized Intersection Capacity Analysis

5: Windward Plaza/Windward Concourse & Windward Pkwy

2020 Build PM Peak - Improved

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	174	1525	29	65	402	33	102	91	279	246	57	379
Future Volume (vph)	174	1525	29	65	402	33	102	91	279	246	57	379
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	6.2		6.2	6.2		6.0	6.0	6.0		6.2	6.2
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00		1.00	0.99		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00		0.96	1.00
Satd. Flow (prot)	1770	3529		1770	3499		1770	1863	1583		1790	1583
Flt Permitted	0.95	1.00		0.06	1.00		0.95	1.00	1.00		0.96	1.00
Satd. Flow (perm)	1770	3529		105	3499		1770	1863	1583		1790	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	183	1605	31	68	423	35	107	96	294	259	60	399
RTOR Reduction (vph)	0	1	0	0	4	0	0	0	129	0	0	310
Lane Group Flow (vph)	183	1635	0	68	454	0	107	96	165	0	319	89
Turn Type	Prot	NA		pm+pt	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases				6					3			4
Actuated Green, G (s)	20.2	84.2		77.5	71.1		17.0	17.0	17.0		27.8	27.8
Effective Green, g (s)	20.2	84.2		77.5	71.1		17.0	17.0	17.0		27.8	27.8
Actuated g/C Ratio	0.13	0.53		0.48	0.44		0.11	0.11	0.11		0.17	0.17
Clearance Time (s)	5.5	6.2		6.2	6.2		6.0	6.0	6.0		6.2	6.2
Vehicle Extension (s)	2.1	5.1		2.1	5.1		2.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)	223	1857		117	1554		188	197	168		311	275
v/s Ratio Prot	c0.10	c0.46		0.02	0.13		0.06	0.05			c0.18	
v/s Ratio Perm				0.26					c0.10			0.06
v/c Ratio	0.82	0.88		0.58	0.29		0.57	0.49	0.98		1.03	0.32
Uniform Delay, d1	68.1	33.5		31.9	28.4		68.0	67.4	71.4		66.1	57.9
Progression Factor	1.10	0.75		1.00	1.00		0.94	0.93	0.86		1.00	1.00
Incremental Delay, d2	12.4	3.8		4.9	0.5		2.3	0.7	63.6		57.8	0.3
Delay (s)	87.3	28.8		36.8	28.9		65.9	63.6	125.1		123.9	58.1
Level of Service	F	C		D	C		E	E	F		F	E
Approach Delay (s)		34.7			29.9			100.5			87.3	
Approach LOS		C			C			F			F	
Intersection Summary												
HCM 2000 Control Delay			53.8			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.94									
Actuated Cycle Length (s)			160.0			Sum of lost time (s)			24.6			
Intersection Capacity Utilization			92.3%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

Timings
6: Windward Plaza/Alderman Dr & Windward Pkwy

2020 Build PM Peak - Improved

09/24/2018



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	325	1507	39	774	37	326	22	14	447
Future Volume (vph)	325	1507	39	774	37	326	22	14	447
Turn Type	Prot	NA	Perm	NA	Perm	Split	NA	NA	pm+ov
Protected Phases	5	2		6		4	4	3	5
Permitted Phases			6		6				3
Detector Phase	5	2	6	6	6	4	4	3	5
Switch Phase	2								
Minimum Initial (s)	4.0	20.0	20.0	20.0	20.0	6.0	6.0	6.0	4.0
Minimum Split (s)	15.0	48.8	51.8	51.8	51.8	45.2	45.2	22.5	15.0
Total Split (s)	30.0	113.0	83.0	83.0	83.0	25.0	25.0	22.0	30.0
Total Split (%)	18.8%	70.6%	51.9%	51.9%	51.9%	15.6%	15.6%	13.8%	18.8%
Yellow Time (s)	3.0	4.3	4.3	4.3	4.3	3.3	3.3	3.3	3.0
All-Red Time (s)	2.9	2.5	2.5	2.5	2.5	2.9	2.9	3.0	2.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	6.8	6.8	6.8	6.8	6.2	6.2	6.3	5.9
Lead/Lag	Lead		Lag	Lag	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?									
Recall Mode	None	C-Min	C-Min	C-Min	C-Min	None	None	None	None

Intersection Summary

Cycle Length: 160

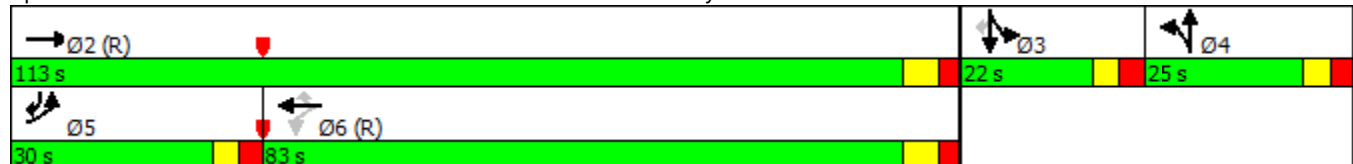
Actuated Cycle Length: 160

Offset: 117 (73%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 145

Control Type: Actuated-Coordinated

Splits and Phases: 6: Windward Plaza/Alderman Dr & Windward Pkwy



HCM Signalized Intersection Capacity Analysis

6: Windward Plaza/Alderman Dr & Windward Pkwy

2020 Build PM Peak - Improved

09/24/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	325	1507	86	39	774	37	326	22	36	196	14	447
Future Volume (vph)	325	1507	86	39	774	37	326	22	36	196	14	447
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	6.8		6.8	6.8	6.8	6.2	6.2			6.3	5.9
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	0.97	1.00			1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.91			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.96	1.00
Satd. Flow (prot)	3433	3510		1770	3539	1583	3433	1688			1780	1583
Flt Permitted	0.95	1.00		0.10	1.00	1.00	0.95	1.00			0.96	1.00
Satd. Flow (perm)	3433	3510		188	3539	1583	3433	1688			1780	1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	357	1656	95	43	851	41	358	24	40	215	15	491
RTOR Reduction (vph)	0	3	0	0	0	21	0	35	0	0	0	64
Lane Group Flow (vph)	357	1748	0	43	851	20	358	29	0	0	230	427
Turn Type	Prot	NA		Perm	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2			6		4	4		3	3	5
Permitted Phases				6		6						3
Actuated Green, G (s)	24.5	106.6		76.2	76.2	76.2	18.4	18.4			15.7	40.2
Effective Green, g (s)	24.5	106.6		76.2	76.2	76.2	18.4	18.4			15.7	40.2
Actuated g/C Ratio	0.15	0.67		0.48	0.48	0.48	0.11	0.11			0.10	0.25
Clearance Time (s)	5.9	6.8		6.8	6.8	6.8	6.2	6.2			6.3	5.9
Vehicle Extension (s)	2.0	5.0		5.0	5.0	5.0	2.0	2.0			2.0	2.0
Lane Grp Cap (vph)	525	2338		89	1685	753	394	194			174	397
v/s Ratio Prot	0.10	c0.50			0.24		c0.10	0.02			c0.13	c0.16
v/s Ratio Perm				0.23		0.01						0.11
v/c Ratio	0.68	0.75		0.48	0.51	0.03	0.91	0.15			1.32	1.08
Uniform Delay, d1	64.0	17.8		28.5	28.9	22.2	70.0	63.7			72.2	59.9
Progression Factor	1.00	1.00		0.90	0.85	1.00	0.98	0.99			1.00	1.00
Incremental Delay, d2	2.9	2.2		15.7	1.0	0.1	23.1	0.1			179.2	67.1
Delay (s)	66.9	20.0		41.2	25.6	22.3	91.6	63.3			251.3	127.0
Level of Service	E	B		D	C	C	F	E			F	F
Approach Delay (s)		27.9			26.2			87.3			166.7	
Approach LOS		C			C			F			F	
Intersection Summary												
HCM 2000 Control Delay			57.4				HCM 2000 Level of Service			E		
HCM 2000 Volume to Capacity ratio			0.91									
Actuated Cycle Length (s)			160.0				Sum of lost time (s)			25.2		
Intersection Capacity Utilization			95.9%				ICU Level of Service			F		
Analysis Period (min)			15									
c Critical Lane Group												

Intersection						
Int Delay, s/veh	2.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	442	100	19	122	21
Future Vol, veh/h	3	442	100	19	122	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	88	88	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	502	114	21	133	23
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	134	0	-	0	382	67
Stage 1	-	-	-	-	124	-
Stage 2	-	-	-	-	258	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1448	-	-	-	593	983
Stage 1	-	-	-	-	888	-
Stage 2	-	-	-	-	761	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1448	-	-	-	591	983
Mov Cap-2 Maneuver	-	-	-	-	591	-
Stage 1	-	-	-	-	888	-
Stage 2	-	-	-	-	759	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		12.6		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1448	-	-	-	628	
HCM Lane V/C Ratio	0.002	-	-	-	0.248	
HCM Control Delay (s)	7.5	0	-	-	12.6	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	1	

Intersection						
Int Delay, s/veh	2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	561	109	3	111	10
Future Vol, veh/h	3	561	109	3	111	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	88	88	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	638	124	3	121	11
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	127	0	-	0	450	64
Stage 1	-	-	-	-	125	-
Stage 2	-	-	-	-	325	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1457	-	-	-	538	987
Stage 1	-	-	-	-	887	-
Stage 2	-	-	-	-	705	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1457	-	-	-	536	987
Mov Cap-2 Maneuver	-	-	-	-	536	-
Stage 1	-	-	-	-	887	-
Stage 2	-	-	-	-	703	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		13.5		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1457	-	-	-	557	
HCM Lane V/C Ratio	0.002	-	-	-	0.236	
HCM Control Delay (s)	7.5	0	-	-	13.5	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.9	

Intersection						
Int Delay, s/veh	3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	4	668	96	3	166	15
Future Vol, veh/h	4	668	96	3	166	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	88	88	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	759	109	3	180	16
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	112	0	-	0	499	56
Stage 1	-	-	-	-	111	-
Stage 2	-	-	-	-	388	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1475	-	-	-	501	999
Stage 1	-	-	-	-	901	-
Stage 2	-	-	-	-	655	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1475	-	-	-	498	999
Mov Cap-2 Maneuver	-	-	-	-	498	-
Stage 1	-	-	-	-	901	-
Stage 2	-	-	-	-	652	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		16.1		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1475	-	-	-	520	
HCM Lane V/C Ratio	0.003	-	-	-	0.378	
HCM Control Delay (s)	7.4	0	-	-	16.1	
HCM Lane LOS	A	A	-	-	C	
HCM 95th %tile Q(veh)	0	-	-	-	1.8	

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑↑	↑↑	
Traffic Vol, veh/h	0	13	0	1283	326	29
Future Vol, veh/h	0	13	0	1283	326	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	Free
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	14	0	1395	354	32
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	-	177	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	835	0	-	-	0
Stage 1	0	-	0	-	-	0
Stage 2	0	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	-	835	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	9.4	0	0			
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	EBLn1	SBT			
Capacity (veh/h)	-	835	-			
HCM Lane V/C Ratio	-	0.017	-			
HCM Control Delay (s)	-	9.4	-			
HCM Lane LOS	-	A	-			
HCM 95th %tile Q(veh)	-	0.1	-			

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑↑↑	↑↑	
Traffic Vol, veh/h	0	10	0	1283	345	10
Future Vol, veh/h	0	10	0	1283	345	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	Free
Storage Length	-	0	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	11	0	1395	375	11
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	-	188	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	822	0	-	-	0
Stage 1	0	-	0	-	-	0
Stage 2	0	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	-	822	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	9.4	0	0			
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	EBLn1	SBT			
Capacity (veh/h)	-	822	-			
HCM Lane V/C Ratio	-	0.013	-			
HCM Control Delay (s)	-	9.4	-			
HCM Lane LOS	-	A	-			
HCM 95th %tile Q(veh)	-	0	-			

Intersection

Int Delay, s/veh 0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑		↑↑↑		↑
Traffic Vol, veh/h	1851	25	0	2285	0	45
Future Vol, veh/h	1851	25	0	2285	0	45
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Free	-	None	-	Yield
Storage Length	-	100	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2012	27	0	2484	0	49

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	-	- 1006
Stage 1	-	-	- -
Stage 2	-	-	- -
Critical Hdwy	-	-	- 7.14
Critical Hdwy Stg 1	-	-	- -
Critical Hdwy Stg 2	-	-	- -
Follow-up Hdwy	-	-	- 3.92
Pot Cap-1 Maneuver	-	0	0 - 0 206
Stage 1	-	0	0 - 0 -
Stage 2	-	0	0 - 0 -
Platoon blocked, %	-		-
Mov Cap-1 Maneuver	-	-	- - 206
Mov Cap-2 Maneuver	-	-	- -
Stage 1	-	-	- -
Stage 2	-	-	- -

Approach	EB	WB	NB
HCM Control Delay, s	0	0	27.8
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	206	-	-
HCM Lane V/C Ratio	0.237	-	-
HCM Control Delay (s)	27.8	-	-
HCM Lane LOS	D	-	-
HCM 95th %tile Q(veh)	0.9	-	-

TRAFFIC VOLUME WORKSHEETS

18-060 Equinox Corporate Campus-1275 McGinnis Ferry Rd-Alpharetta GA
Traffic Volumes

A&R Engineering
September 2018

1. McGinnis @ GA 400 SB Ramp

A.M. Peak Hour

Condition	-			GA 400 Southbound Off-Ramp			McGinnis Ferry Road			McGinnis Ferry Road		
	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing 2018 Volumes:	0	0	0	0	0	0	0	0	0	959	0	959
Growth Factor (%):	3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	3.5	
GDOT 2020 Volumes:	0	0	0	0	200	0	250	450	0	1190	170	1360
No-Build 2020 Volumes:	0	0	0	0	200	0	250	450	0	1190	170	1360
Total New Trips:	0	0	0	0	115	0	0	115	0	100	0	100
Future 2020 Traffic Volumes:	0	0	0	0	315	0	250	565	0	1290	170	1460

P.M. Peak Hour

Condition	-			GA 400 Southbound Off-Ramp			McGinnis Ferry Road			McGinnis Ferry Road		
	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing 2018 Volumes:	0	0	0	0	0	0	0	0	0	562	0	562
Growth Factor (%):	3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	3.5	
GDOT 2020 Volumes:	0	0	0	0	535	0	90	625	0	965	300	1265
No-Build 2020 Volumes:	0	0	0	0	535	0	90	625	0	965	300	1265
Total New Trips:	0	0	0	0	23	0	0	23	0	20	0	20
Future 2020 Traffic Volumes:	0	0	0	0	558	0	90	648	0	985	300	1285

18-060 Equinox Corporate Campus-1275 McGinnis Ferry Rd-Alpharetta GA
Traffic Volumes

A&R Engineering
September 2018

2. McGinnis @ GA 400 NB Ramp

A.M. Peak Hour

Condition	GA 400 Northbound Off-Ramp				- Southbound				McGinnis Ferry Road Eastbound				McGinnis Ferry Road Westbound			
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing 2018 Volumes:	0	0	0	0	0	0	0	0	0	959	0	959	0	396	0	396
Growth Factor (%):	3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	3.5	
GDOT 2020 Volumes:	230	0	300	530	0	0	0	0	165	1055	0	1220	0	740	275	1015
No-Build 2020 Volumes:	230	0	300	530	0	0	0	0	165	1055	0	1220	0	740	275	1015
Total New Trips:	0	0	100	100	0	0	0	0	0	214	0	214	0	32	18	50
Future 2020 Traffic Volumes:	230	0	400	630	0	0	0	0	165	1269	0	1434	0	772	293	1065

P.M. Peak Hour

Condition	GA 400 Northbound Off-Ramp				- Southbound				McGinnis Ferry Road Eastbound				McGinnis Ferry Road Westbound			
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing 2018 Volumes:	0	0	0	0	0	0	0	0	0	562	0	562	0	854	0	854
Growth Factor (%):	3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	3.5	
GDOT 2020 Volumes:	270	0	735	1005	0	0	0	0	215	985	0	1200	0	1445	355	1800
No-Build 2020 Volumes:	270	0	735	1005	0	0	0	0	215	985	0	1200	0	1445	355	1800
Total New Trips:	0	0	20	20	0	0	0	0	0	42	0	42	0	206	118	324
Future 2020 Traffic Volumes:	270	0	755	1025	0	0	0	0	215	1027	0	1242	0	1651	473	2124

18-060 Equinox Corporate Campus-1275 McGinnis Ferry Rd-Alpharetta GA
Traffic Volumes

A&R Engineering
September 2018

3. McGinnis @ Windward Con.

A.M. Peak Hour

Condition	Windward Concourse				Windward Concourse				McGinnis Ferry Road				McGinnis Ferry Road			
	Northbound		Southbound		Northbound		Southbound		Eastbound		Westbound		Eastbound		Westbound	
Existing 2018 Volumes:	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Growth Factor (%):	83	45	97	225	3	78	9	90	25	488	446	959	397	304	68	769
GDOT 2020 Volumes:	3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	3.5	
No-Build 2020 Volumes:	90	30	110	230	5	5	5	15	25	950	380	1355	565	920	40	1525
Total New Trips:	90	48	110	248	5	84	10	99	27	950	478	1455	565	920	73	1558
Future 2020 Traffic Volumes:	50	0	11	61	0	0	0	0	0	7	188	195	110	0	0	110
	140	48	121	309	5	84	10	99	27	957	666	1650	675	920	73	1668

P.M. Peak Hour

Condition	Windward Concourse				Windward Concourse				McGinnis Ferry Road				McGinnis Ferry Road			
	Northbound		Southbound		Northbound		Southbound		Eastbound		Westbound		Eastbound		Westbound	
Existing 2018 Volumes:	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Growth Factor (%):	454	33	381	868	12	31	11	54	3	378	181	562	112	389	4	505
GDOT 2020 Volumes:	3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	3.5	
No-Build 2020 Volumes:	325	15	675	1015	10	45	30	85	5	1615	100	1720	155	1445	5	1605
Total New Trips:	486	35	675	1196	13	45	30	88	5	1615	194	1814	155	1445	5	1605
Future 2020 Traffic Volumes:	324	0	68	392	0	0	0	0	0	45	37	82	22	0	0	22
	810	35	743	1588	13	45	30	88	5	1660	231	1896	177	1445	5	1627

18-060 Equinox Corporate Campus-1275 McGinnis Ferry Rd-Alpharetta GA
Traffic Volumes

A&R Engineering
 September 2018

4. Windward Con. @ Alderman

A.M. Peak Hour

Condition	Windward Concourse				Windward Concourse				Alderman Drive				Private Driveway			
	Northbound				Southbound				Eastbound				Westbound			
Existing 2018 Volumes:	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Growth Factor (%):	10	226	94	330	33	530	222	785	30	61	8	99	10	5	7	22
GDOT 2020 Volumes:	3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	3.5	
No-Build 2020 Volumes:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total New Trips:	11	242	101	354	35	568	238	841	32	65	9	106	11	5	7	23
Future 2020 Traffic Volumes:	25	0	0	25	0	4	101	105	61	0	1	62	0	0	0	0
	36	242	101	379	35	572	339	946	93	65	10	168	11	5	7	23

P.M. Peak Hour

Condition	Windward Concourse				Windward Concourse				Alderman Drive				Private Driveway			
	Northbound				Southbound				Eastbound				Westbound			
Existing 2018 Volumes:	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Growth Factor (%):	9	434	10	453	8	250	18	276	374	9	23	406	127	42	24	193
GDOT 2020 Volumes:	3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	3.5	
No-Build 2020 Volumes:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total New Trips:	10	465	11	486	9	268	19	296	401	10	25	436	136	45	26	207
Future 2020 Traffic Volumes:	5	0	0	5	0	23	20	43	392	0	8	400	0	0	0	0
	15	465	11	491	9	291	39	339	793	10	33	836	136	45	26	207

18-060 Equinox Corporate Campus-1275 McGinnis Ferry Rd-Alpharetta GA
Traffic Volumes

A&R Engineering
 September 2018

5. Windward Pky @ Windward Con.

A.M. Peak Hour

Condition	Windward Plaza				Windward Concourse				Windward Parkway				Windward Parkway			
	Northbound				Southbound				Eastbound				Westbound			
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing 2018 Volumes:	50	67	22	139	52	153	283	488	261	908	42	1211	283	1249	150	1682
Growth Factor (%):	3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	3.5	
GDOT 2020 Volumes:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No-Build 2020 Volumes:	54	72	24	150	56	164	303	523	280	973	45	1298	303	1338	161	1802
Total New Trips:	0	0	0	0	3	0	2	5	0	1	0	1	0	0	25	25
Future 2020 Traffic Volumes:	54	72	24	150	59	164	305	528	280	974	45	1299	303	1338	186	1827

P.M. Peak Hour

Condition	Windward Plaza				Windward Concourse				Windward Parkway				Windward Parkway			
	Northbound				Southbound				Eastbound				Westbound			
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing 2018 Volumes:	95	85	260	440	210	53	344	607	162	1419	27	1608	61	375	26	462
Growth Factor (%):	3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	3.5	
GDOT 2020 Volumes:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No-Build 2020 Volumes:	102	91	279	472	225	57	369	651	174	1520	29	1723	65	402	28	495
Total New Trips:	0	0	0	0	21	0	10	31	0	5	0	5	0	0	5	5
Future 2020 Traffic Volumes:	102	91	279	472	246	57	379	682	174	1525	29	1728	65	402	33	500

18-060 Equinox Corporate Campus-1275 McGinnis Ferry Rd-Alpharetta GA
Traffic Volumes

A&R Engineering
 September 2018

6. Windward Pky @ Alderman

A.M. Peak Hour

Condition	Windward Plaza				Alderman Drive				Windward Parkway				Windward Parkway			
	Northbound				Southbound				Eastbound				Westbound			
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing 2018 Volumes:	85	34	39	158	16	11	194	221	474	1156	375	2005	27	1547	185	1759
Growth Factor (%):	3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	3.5	
GDOT 2020 Volumes:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No-Build 2020 Volumes:	91	36	42	169	17	12	208	237	508	1238	402	2148	29	1657	198	1884
Total New Trips:	0	0	0	0	1	0	6	7	50	0	0	50	0	2	0	2
Future 2020 Traffic Volumes:	91	36	42	169	18	12	214	244	558	1238	402	2198	29	1659	198	1886

P.M. Peak Hour

Condition	Windward Plaza				Alderman Drive				Windward Parkway				Windward Parkway			
	Northbound				Southbound				Eastbound				Westbound			
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing 2018 Volumes:	304	21	34	359	178	13	379	570	294	1407	80	1781	36	713	35	784
Growth Factor (%):	3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	3.5	
GDOT 2020 Volumes:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No-Build 2020 Volumes:	326	22	36	384	191	14	406	611	315	1507	86	1908	39	764	37	840
Total New Trips:	0	0	0	0	5	0	41	46	10	0	0	10	0	10	0	10
Future 2020 Traffic Volumes:	326	22	36	384	196	14	447	657	325	1507	86	1918	39	774	37	850

18-060 Equinox Corporate Campus-1275 McGinnis Ferry Rd-Alpharetta GA
Traffic Volumes

A&R Engineering
 September 2018

7. Alderman @ Drwy 1

A.M. Peak Hour

Condition	-			Northbound			Site Driveway 1 (West)			Alderman Drive Eastbound			Alderman Drive Westbound		
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	Tot
Existing 2018 Volumes:	0	0	0	0	0	0	0	0	0	99	0	99	0	237	0
Growth Factor (%):	3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	
GDOT 2020 Volumes:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No-Build 2020 Volumes:	0	0	0	0	0	0	0	0	0	106	0	106	0	254	0
Total New Trips:	0	0	0	0	19	0	3	22	15	35	0	50	0	4	98
Future 2020 Traffic Volumes:	0	0	0	0	19	0	3	22	15	141	0	156	0	258	98

P.M. Peak Hour

Condition	-			Northbound			Site Driveway 1 (West)			Alderman Drive Eastbound			Alderman Drive Westbound		
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	Tot
Existing 2018 Volumes:	0	0	0	0	0	0	0	0	0	406	0	406	0	69	0
Growth Factor (%):	3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	
GDOT 2020 Volumes:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No-Build 2020 Volumes:	0	0	0	0	0	0	0	0	0	435	0	435	0	74	0
Total New Trips:	0	0	0	0	122	0	21	143	3	7	0	10	0	26	19
Future 2020 Traffic Volumes:	0	0	0	0	122	0	21	143	3	442	0	445	0	100	119

18-060 Equinox Corporate Campus-1275 McGinnis Ferry Rd-Alpharetta GA
Traffic Volumes

A&R Engineering
 September 2018

8. Alderman @ Drwy 2

A.M. Peak Hour

Condition	Northbound			Site Driveway 2 (Middle)			Alderman Drive Eastbound			Alderman Drive Westbound		
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing 2018 Volumes:	0	0	0	0	0	0	0	0	0	99	0	99
Growth Factor (%):	3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	3.5	
GDOT 2020 Volumes:	0	0	0	0	0	0	0	0	0	0	0	0
No-Build 2020 Volumes:	0	0	0	0	0	0	0	0	0	106	0	106
Total New Trips:	0	0	0	0	17	0	2	19	15	39	0	54
Future 2020 Traffic Volumes:	0	0	0	0	17	0	2	19	15	145	0	160

P.M. Peak Hour

Condition	Northbound			Site Driveway 2 (Middle)			Alderman Drive Eastbound			Alderman Drive Westbound		
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing 2018 Volumes:	0	0	0	0	0	0	0	0	0	406	0	406
Growth Factor (%):	3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	3.5	
GDOT 2020 Volumes:	0	0	0	0	0	0	0	0	0	0	0	0
No-Build 2020 Volumes:	0	0	0	0	0	0	0	0	0	435	0	435
Total New Trips:	0	0	0	0	111	0	10	121	3	126	0	129
Future 2020 Traffic Volumes:	0	0	0	0	111	0	10	121	3	561	0	564

18-060 Equinox Corporate Campus-1275 McGinnis Ferry Rd-Alpharetta GA
Traffic Volumes

A&R Engineering
 September 2018

9. Alderman @ Drwy 3

A.M. Peak Hour

Condition	Northbound			Site Driveway 3 (East)			Alderman Drive Eastbound			Alderman Drive Westbound		
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing 2018 Volumes:	0	0	0	0	0	0	0	0	0	99	0	99
Growth Factor (%):	3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	3.5	
GDOT 2020 Volumes:	0	0	0	0	0	0	0	0	0	0	0	0
No-Build 2020 Volumes:	0	0	0	0	0	0	0	0	0	106	0	106
Total New Trips:	0	0	0	0	26	0	2	28	20	36	0	56
Future 2020 Traffic Volumes:	0	0	0	0	26	0	2	28	20	142	0	162

P.M. Peak Hour

Condition	Northbound			Site Driveway 3 (East)			Alderman Drive Eastbound			Alderman Drive Westbound		
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing 2018 Volumes:	0	0	0	0	0	0	0	0	0	406	0	406
Growth Factor (%):	3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	3.5	
GDOT 2020 Volumes:	0	0	0	0	0	0	0	0	0	0	0	0
No-Build 2020 Volumes:	0	0	0	0	0	0	0	0	0	435	0	435
Total New Trips:	0	0	0	0	166	0	15	181	4	233	0	237
Future 2020 Traffic Volumes:	0	0	0	0	166	0	15	181	4	668	0	672

18-060 Equinox Corporate Campus-1275 McGinnis Ferry Rd-Alpharetta GA
Traffic Volumes

A&R Engineering
 September 2018

10. Windward Con. @ Drwy 4

A.M. Peak Hour

Condition	Windward Concourse				Windward Concourse				Site Driveway 4 (South RIRO)				-			
	Northbound				Southbound				Eastbound				Westbound			
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing 2018 Volumes:	0	263	0	263	0	785	0	785	0	0	0	0	0	0	0	0
Growth Factor (%):	3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	3.5	
GDOT 2020 Volumes:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No-Build 2020 Volumes:	0	282	0	282	0	841	0	841	0	0	0	0	0	0	0	0
Total New Trips:	0	61	0	61	0	103	148	251	0	0	2	2	0	0	0	0
Future 2020 Traffic Volumes:	0	343	0	343	0	944	148	1092	0	0	2	2	0	0	0	0

P.M. Peak Hour

Condition	Windward Concourse				Windward Concourse				Site Driveway 4 (South RIRO)				-			
	Northbound				Southbound				Eastbound				Westbound			
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing 2018 Volumes:	0	832	0	832	0	276	0	276	0	0	0	0	0	0	0	0
Growth Factor (%):	3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	3.5	
GDOT 2020 Volumes:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No-Build 2020 Volumes:	0	891	0	891	0	296	0	296	0	0	0	0	0	0	0	0
Total New Trips:	0	392	0	392	0	30	29	59	0	0	13	13	0	0	0	0
Future 2020 Traffic Volumes:	0	1283	0	1283	0	326	29	355	0	0	13	13	0	0	0	0

18-060 Equinox Corporate Campus-1275 McGinnis Ferry Rd-Alpharetta GA
Traffic Volumes

A&R Engineering
 September 2018

11. Windward Con. @ Drwy 5

A.M. Peak Hour

Condition	Windward Concourse				Windward Concourse				Site Driveway 5 (North RIRO)				-			
	Northbound				Southbound				Eastbound				Westbound			
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing 2018 Volumes:	0	263	0	263	0	785	0	785	0	0	0	0	0	0	0	0
Growth Factor (%):	3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	3.5	
GDOT 2020 Volumes:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No-Build 2020 Volumes:	0	282	0	282	0	841	0	841	0	0	0	0	0	0	0	0
Total New Trips:	0	61	0	61	0	249	49	298	0	0	2	2	0	0	0	0
Future 2020 Traffic Volumes:	0	343	0	343	0	1090	49	1139	0	0	2	2	0	0	0	0

P.M. Peak Hour

Condition	Windward Concourse				Windward Concourse				Site Driveway 5 (North RIRO)				-			
	Northbound				Southbound				Eastbound				Westbound			
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing 2018 Volumes:	0	832	0	832	0	276	0	276	0	0	0	0	0	0	0	0
Growth Factor (%):	3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	3.5	
GDOT 2020 Volumes:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No-Build 2020 Volumes:	0	891	0	891	0	296	0	296	0	0	0	0	0	0	0	0
Total New Trips:	0	392	0	392	0	49	10	59	0	0	10	10	0	0	0	0
Future 2020 Traffic Volumes:	0	1283	0	1283	0	345	10	355	0	0	10	10	0	0	0	0

18-060 Equinox Corporate Campus-1275 McGinnis Ferry Rd-Alpharetta GA
Traffic Volumes

A&R Engineering
September 2018

12. McGinnis @ Drwy 6

A.M. Peak Hour

Condition	Site Driveway 6 (RIRO)				-				McGinnis Ferry Road				McGinnis Ferry Road			
	Northbound		Southbound		L		T		Eastbound		Westbound		L		T	
Existing 2018 Volumes:	0	0	0	0	0	0	0	0	0	959	0	959	0	396	0	396
Growth Factor (%):	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
GDOT 2020 Volumes:	0	0	0	0	0	0	0	0	0	1355	0	1355	0	1015	0	1015
No-Build 2020 Volumes:	0	0	0	0	0	0	0	0	0	1455	0	1455	0	1020	0	1020
Total New Trips:	0	0	7	7	0	0	0	0	0	188	125	313	0	50	0	50
Future 2020 Traffic Volumes:	0	0	7	7	0	0	0	0	0	1643	125	1768	0	1070	0	1070

P.M. Peak Hour

Condition	Site Driveway 6 (RIRO)				-				McGinnis Ferry Road				McGinnis Ferry Road			
	Northbound		Southbound		L		T		Eastbound		Westbound		L		T	
Existing 2018 Volumes:	0	0	0	0	0	0	0	0	0	562	0	562	0	854	0	854
Growth Factor (%):	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
GDOT 2020 Volumes:	0	0	0	0	0	0	0	0	0	1720	0	1720	0	1800	0	1800
No-Build 2020 Volumes:	0	0	0	0	0	0	0	0	0	1814	0	1814	0	1961	0	1961
Total New Trips:	0	0	45	45	0	0	0	0	0	37	25	62	0	324	0	324
Future 2020 Traffic Volumes:	0	0	45	45	0	0	0	0	0	1851	25	1876	0	2285	0	2285