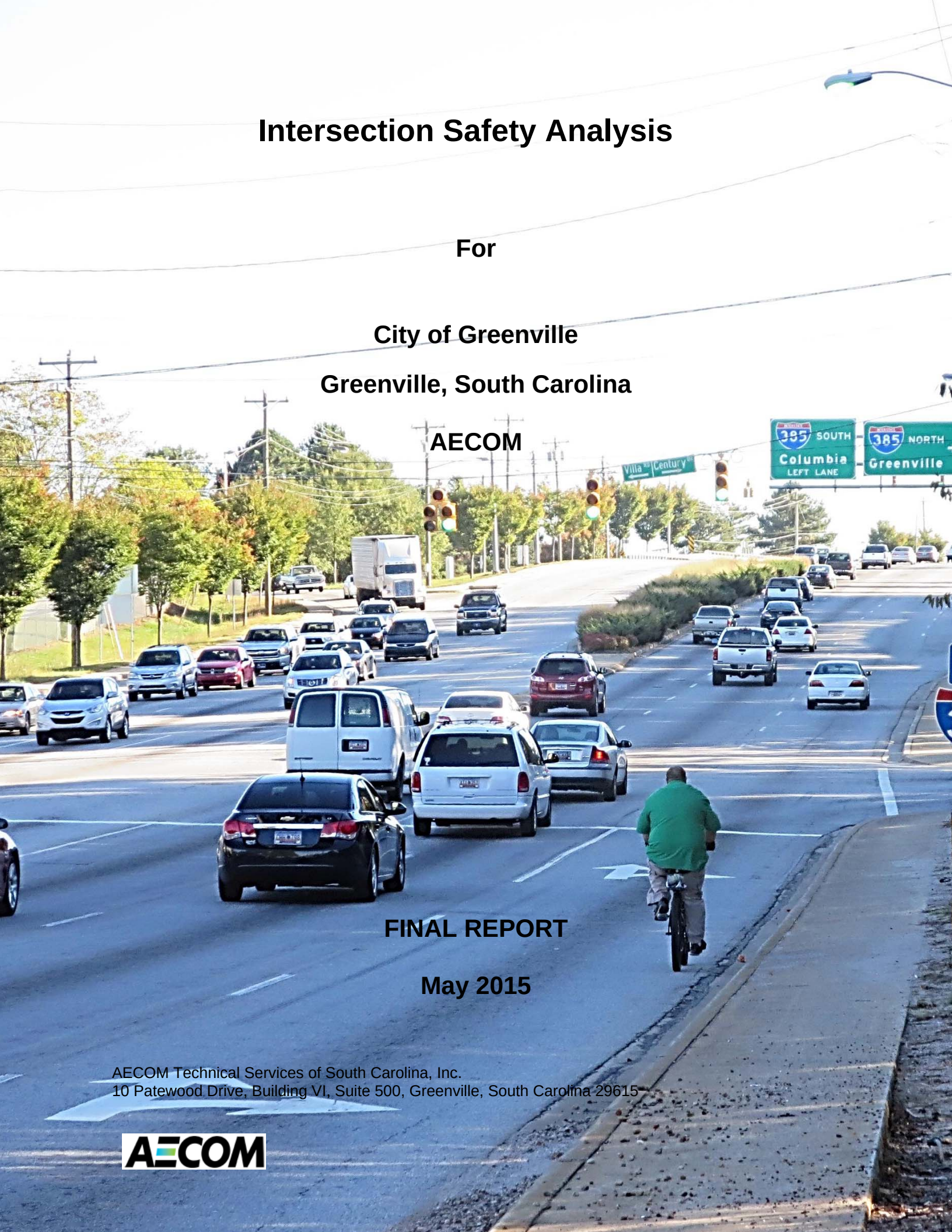
Intersection Safety Analysis

For

City of Greenville

Greenville, South Carolina

AECOM



FINAL REPORT

May 2015

AECOM Technical Services of South Carolina, Inc.
10 Patewood Drive, Building VI, Suite 500, Greenville, South Carolina 29615

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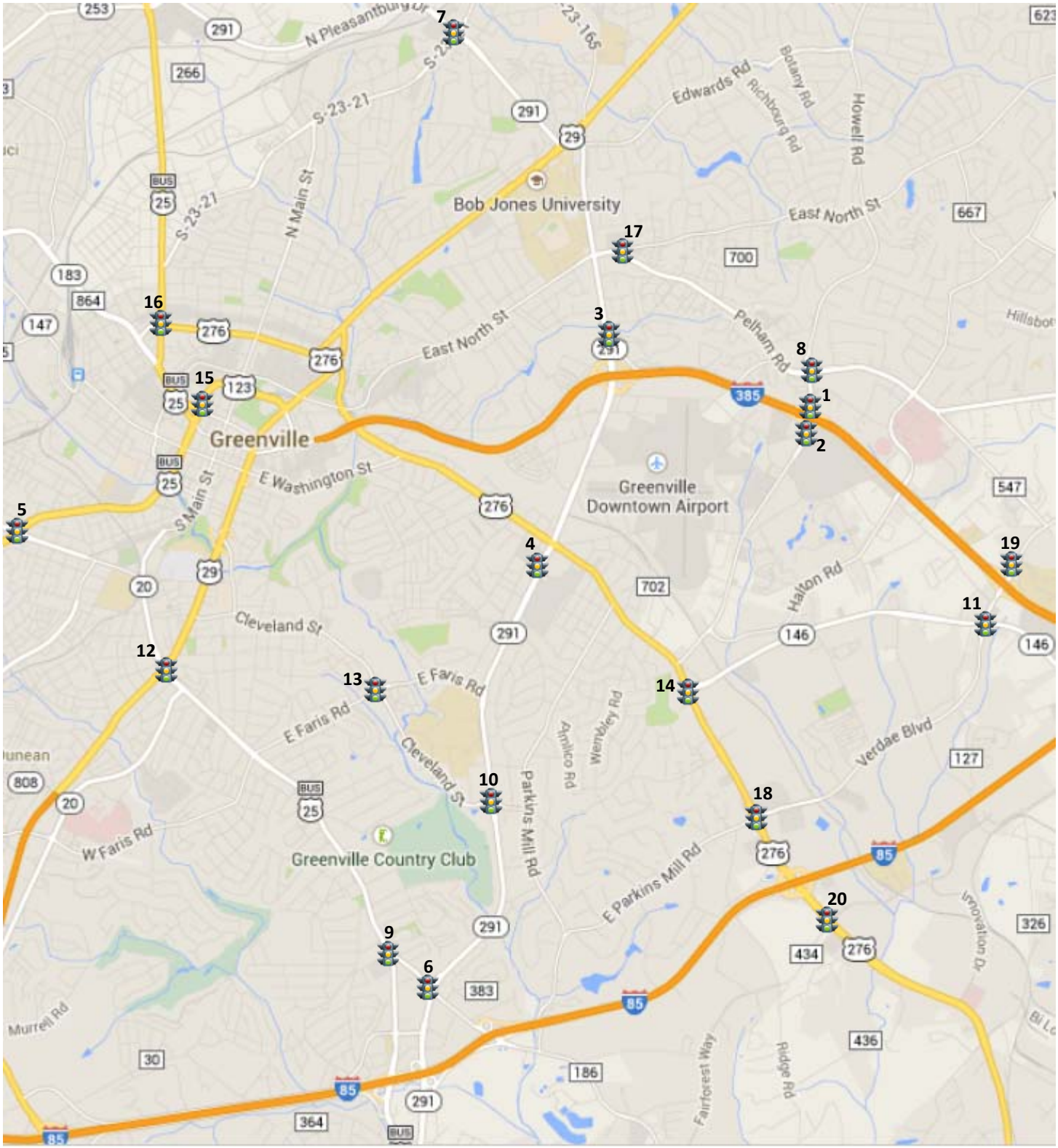
1 Introduction

At the request of the City of Greenville, AECOM performed a traffic safety review for twenty (20) signalized intersections within the City limits. A kick-off meeting was held for this project and the meeting minutes are included as part of **Appendix A**. Using detailed crash information provided by the City of Greenville's police department, collision diagrams were developed summarizing the crash patterns for seventeen (17) intersections. The South Carolina Department of Transportation (SCDOT) provided collision diagrams for the remaining three intersections. Focusing on these crash patterns, AECOM identified both short-term and long-term considerations after performing field visits during the peak hours. The following intersections were analyzed as part of this project as shown in **Figure 1**:

1. Haywood Road (S-273) at I-385 Northbound Ramps
2. Haywood Road (S-273) at I-385 Southbound Ramps
3. N. Pleasantburg Drive (SC 291) at Villa Road (S-740) / Century Drive (S-740)
4. S. Pleasantburg Drive (SC 291) at E. Antrim Drive (Local) / W. Antrim Drive (Local)
5. Pendleton Street (SC 124) at Easley Bridge Road (US 123) / S. Academy Street (US 123)
6. S. Pleasantburg Drive (SC 291) at Mauldin Road (S-107)
7. Pleasantburg Drive (SC 291) at Rutherford Road (S-21)
8. Haywood Road (S-273) at Pelham Road (S-492)
9. Augusta Road (S-201) at Mauldin Road (S-107) / Potomac Avenue (S-30)
10. S. Pleasantburg Drive (SC 291) at Cleveland Street (S-189) / Cleveland Street Extension (S-189)
11. Woodruff Road (SC 146) at Verdae Boulevard (Local) / Roper Mountain Road (S-183)
12. S. Church Street (US 29) / Mills Avenue (US 29) at Augusta Street (SC 20)
13. E. Faris Road (S-149) at Cleveland Street (S-189)
14. Laurens Road (US 276) at Woodruff Road (SC 146)
15. Academy Street (US 123) at College Street (SC 183)
16. Stone Avenue (US 276 & Local) at Rutherford Street (US 276 & S-200)
17. Pelham Road (S-492) at E. North Street (S-94)
18. Laurens Road (US 276) at Verdae Boulevard (Local) / E. Parkins Mill Road (S-1016)
19. Roper Mountain Road (S-183) at Frontage Road (S-1103) / Independence Boulevard (S-1102)
20. Laurens Road (US 276) at Millennium Boulevard (Local) / Fairforest Way (Local)



2014 Google Maps

NORTH

1 mi
1 km

AECOM

Vicinity Map

Intersection Safety Analysis
Greenville, South Carolina

Project No. 60332799

Date: 3-11-15

Figure 1

2 Data Collection and Analysis

2.1 Collision Diagrams

The South Carolina Department of Transportation (SCDOT) provided the collision diagrams for the following locations:

- S. Pleasantburg Drive at Mauldin Road
- Pleasantburg Drive at Rutherford Road
- Haywood Road at Pelham Road

Detailed crash data was obtained by the City of Greenville Police Department to develop the collision diagrams for the remaining study intersections. Bihl Engineering, LLC, a subconsultant to AECOM, developed collision diagrams at the following locations:

- S. Pleasantburg Drive at E. Antrim Drive / W. Antrim Drive
- Pendleton Street at Easley Bridge Road / S. Academy Street
- S. Pleasantburg Drive at Cleveland Street / Cleveland Street Extension

The remaining fourteen (14) collision diagrams were developed by AECOM using SCDOT's collision diagram format. A summary of the number of crashes over a 2.5-year period along with intersection annual average daily traffic (AADT), crash rate, and severity index is shown in **Table 1**. Collision diagrams summarizing each crash for every study intersection are shown in **Appendix B**.

Table 1 – Crash Summary

#	Intersection	# of Crashes	AADT	Crash Rate	Severity Index
1	Haywood Rd at I-385 NB Ramps	77	35,900	2.428	2.933
2	Haywood Rd at I-385 SB Ramps	99	34.600	3.239	4.483
3	N. Pleasantburg Dr at Villa Rd / Century Dr	75	36,700	2.403	3.364
4	S. Pleasantburg Dr at E. Antrim Dr / W. Antrim Dr	75	31,050	2.840	4.204
5	Pendleton St at Easley Bridge Rd / S. Academy St	57	28,050	2.566	5.086
6	S. Pleasantburg Dr at Mauldin Rd	61	44,400	1.615	2.357
7	Pleasantburg Dr at Rutherford Rd	96	40,250	2.805	3.681
8	Haywood Rd at Pelham Rd	94	46,100	2.398	3.163
9	Augusta Rd at Mauldin Rd / Potomac Ave	36	23,600	1.727	2.590
10	S. Pleasantburg Dr at Cleveland St / Cleveland St Ext	32	27,950	1.346	2.103
11	Woodruff Rd at Verdae Blvd / Roper Mountain Rd	163	38,250	4.824	6.452
12	S. Church St / Mills Ave at Augusta St	67	40,550	1.811	2.567
13	E. Faris Rd at Cleveland St	37	28,050	1.446	2.227
14	Laurens Rd at Woodruff Rd	64	36,650	1.914	2.751
15	Academy St at College St	55	30,500	1.976	2.695
16	Stone Avenue at Rutherford St	32	32,750	1.106	2.143
17	Pelham Rd at E. North St	40	40,100	1.092	1.474
18	Laurens Rd at Verdae Blvd / E. Parkins Mill Rd	84	40,850	2.253	2.897
19	Roper Mountain Rd at Frontage Rd / Independence Blvd	18	25,250	0.977	1.411
20	Laurens Rd at Millennium Blvd / Fairforest Way	26	31,900	0.992	1.211

2.2 Field Safety Review

After the development of collision diagrams, AECOM performed a site visit at each intersection during the AM and PM peak hours. Using the collision diagram, AECOM noted any potential correlations to crash pattern as it related to the existing geometry, signal phasing, and speed limits. AECOM utilized the National Highway Institute (NHI)-Road Safety Audit's G.O.R.E (Geometry, Operations, Road users, and Environmental) methodology while performing the field study and recommending safety considerations. Using the list of intersections confirmed by the City and the review of collision diagrams, AECOM collected information and performed the following tasks at each intersection within 200 feet of all approaches at a minimum:

- Drove each approach to the intersection taking pictures from the driver's perspective.
- Identified both horizontal and vertical curvatures, gradient, cross section, clearance, sight distance, and clear zone.
- Noted any congestion, signal operations, queuing, speed management, and turning movements.
- Included human factor perspectives among all potential road users: motorist, bicyclist, pedestrians, and others (transit, emergency, buses, farm equipment, and RV's).
- Determined any factors due to the surrounding environment that may have an impact such as weather, lighting, and pavement conditions.
- Compared signal plan (provided by the City) with existing geometry, signal timing, and pedestrian accommodations.
- Noted existing signage

AECOM completed fieldwork during the months of November 2014 – February 2015. Please note some intersections might be scheduled for upgrades with some of our recommendations as part of another project.

2.3 Traffic Capacity Analysis

AECOM used available signal plans and timings for each project location to perform analysis using *Synchro 8.0, Version 8* (Build 806, Rev 61) software. The analyses were conducted in accordance with the latest SCDOT standards and Guidelines.

All traffic counts were provided by the City of Greenville. The traffic counts were conducted between 2006 - 2014. Due to the safety focus of this project, new traffic counts were not conducted at this time. Average Daily Traffic (ADT) trends were reviewed during the count years using SCDOT count database and traffic volumes have decreased during this time. Based on this trend, no modifications were made to the older counts as they are likely to be more conservative (higher) than existing 2015 traffic volumes. Before final implementation of any safety consideration that significantly affects capacity at an intersection, it is recommended a new traffic count be performed at that intersection. All traffic counts are provided in **Appendix C** (as Synchro files or traffic count sheets) and summarized below in **Table 2**.

Table 2 - Traffic Count Summary

#	Intersection	Date of AM / PM Peak Hour Traffic Counts
1	Haywood Rd at I-385 NB Ramps	City Synchro File
2	Haywood Rd at I-385 SB Ramps	City Synchro File
3	N. Pleasantburg Dr at Villa Rd / Century Dr	11/20/2013
4	S. Pleasantburg Dr at E. Antrim Dr / W. Antrim Dr	3/20/2013
5	Pendleton St at Easley Bridge Rd / S. Academy St	4/1/2009
6	S. Pleasantburg Dr at Mauldin Rd	9/15/2010
7	Pleasantburg Dr at Rutherford Rd	4/22/2008
8	Haywood Rd at Pelham Rd	1/27/2009
9	Augusta Rd at Mauldin Rd / Potomac Ave	2/28/2008
10	S. Pleasantburg Dr at Cleveland St / Cleveland St Ext	City Synchro File
11	Woodruff Rd at Verdae Blvd / Roper Mountain Rd	4/22/2014
12	S. Church St / Mills Ave at Augusta St	10/23/2012
13	E. Faris Rd at Cleveland St	2/6/2013
14	Laurens Rd at Woodruff Rd	5/8/2008
15	N. Academy St at College St	3/25/2009
16	Stone Ave at Rutherford St	8/30/2007
17	Pelham Rd at E. North St	12/10/2008
18	Laurens Rd at Verdae Blvd / E. Parkins Mill Rd	5/8/2008
19	Roper Mountain Rd at Frontage Rd / Independence Blvd	5/15/2014
20	Laurens Rd at Millennium Blvd / Fairforest Way	12/20/2006

Existing timings (minimum initial, yellow change, and red clearance) and signal plans were provided by the City of Greenville. Existing phasing was verified at each intersection. Cycle lengths and splits were optimized in Synchro at each study intersection with the exception of Haywood Road intersections (1, 2, and 8). The City of Greenville provided the Synchro files used to develop the signal coordination of this corridor, which was conducted within the past five years.

All signal plans and signal timing are provided in **Appendix D** and **Appendix E**.

The traffic carrying ability of a roadway is described by levels of service (LOS) that range from LOS A to LOS F. LOS A represents unrestricted maneuverability and operating speeds. LOS B represents reduced maneuverability and operating speeds. LOS C represents restricted maneuverability and operating speeds closer to the speed limit. LOS D represents severely restricted maneuverability and unstable, low operating speeds. LOS E represents operating conditions at or near the capacity level. LOS F represents breakdown conditions characterized by stop and go travel. **Table 3** defines the traffic flow conditions and approximate driver comfort level at each level of service

Table 3 - Level of Service (LOS) Index

LOS	Traffic Flow Conditions	Delay (seconds) Signalized Intersections
A	Progression is extremely favorable and most vehicles do not stop at all.	0-10
B	Good progression, some delay.	>10-20
C	Fair progression, higher delay.	>20-35
D	Unfavorable progression, congestion becomes apparent.	>35-55
E	Poor progression, significant delay.	>55-80
F	Poor progression, extreme delay.	>80

Queue lengths were also reviewed using the 95th percentile. All Synchro Traffic Reports including HCM 2010 Reports are shown in **Appendix F.**

2.4 Yellow Change and Red Clearance Interval Analysis

The duration of the yellow change and red clearance intervals has an impact on driver behavior and intersection safety. A properly timed yellow interval is essential to reduce signal violations. An improperly timed yellow interval may cause vehicles to violate the signal. In order to reduce signal violations, the engineer should ensure that the yellow interval is adequate for the conditions at the intersection and the expectations of the motorists. An all-red interval is that portion of a traffic signal cycle where all approaches have a red-signal display. The all-red interval follows the yellow-change interval and precedes the next conflicting green interval. Studies have shown that providing a red interval does have a positive effect on the safety of the intersection.

AECOM analyzed the existing yellow change and red clearance intervals. Using SCDOT's latest guidelines, calculations were conducted and safety considerations were made at each intersection. All yellow change and red clearance intervals and calculations should be reviewed by the City prior to implementation, if found acceptable according to City's and SCDOT's guidelines and procedures for signalized intersections. Detailed calculations are shown in **Appendix G**.

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3 Intersection Safety Analysis

In this section, the main crash pattern for each intersection is highlighted to help the City prioritize the order of improvements. AECOM used the August 2004 publication *FHWA-HRT-04-091 Signalized Intersection: Informational Guide* when determining if additional signal phases may be needed based on crash history. The reference was also used as a toolbox for both short and long-term considerations. An economic analysis was not part of the scope for this project. It can be conducted, if desired as an additional service for the City.
Several considerations are made for each intersection categorized into two areas:

- Short-term: Less than $5,000 to construct and 6 months to implement
- Long-term: Greater than $5,000 to construct and 6 months to implement

As described in the Section 2.4, analysis of the existing and calculated yellow change and red clearance intervals are also summarized in this section for the City's review. Changes to the yellow change and red clearance intervals are classified as short-term consideration.

Next, AECOM conducted a traffic capacity analysis for each intersection (if counts were available) to indicate the existing LOS and delay. Capacity conditions at the intersection or adjacent intersections may be linked to crash patterns. Some safety considerations such as phase changes, new signal timings, or turn restrictions may have an effect on capacity; therefore, a proposed capacity analysis was conducted for these scenarios. For the purposes of this study, the capacity analysis results should be used for planning purpose only and not recommended for signal timing implementation. Details such as cycle lengths, splits, and offsets were not provided; therefore, the results indicate an optimized condition and do not reflect true operational conditions especially if the study intersection is within a coordinated signal system. If data was available, AECOM included adjacent intersections for the capacity analysis. Please note the proposed capacity analysis for each intersection may not correlate with the most beneficial consideration listed in this section. The purpose of the capacity analysis is to show effect adding more phases, restricting or adding turning movement or anything else that significantly changes the existing conditions.

Lastly, for each intersection, AECOM summarizes the existing conditions of each intersection and identifies crash patterns based on the collision diagrams and observations in the field. An aerial of each intersection with pictures of each approach along with daily traffic volumes (2013), existing signal phasing, and speed limits are provided. The collision diagram is also summarized with the number crashes categorized into the type (right angle, rear end, side swipe, head on, out of control, hit animal, and other) and crash condition (night, day, wet, and dry). This stand-alone one page (double sided) summary can also be found in **Appendix H**.

3.1 Haywood Road (S-273) at I-385 Northbound Ramps

Haywood Road (S-273) is a north / south four lane divided minor arterial carrying 25,950 vehicles per day (vpd) with a speed limit of 40 miles per hour (mph). Haywood Road crosses I-385 with an eight-lane bridge that includes dual left-turn lanes onto I-385 from both directions. The I-385 Northbound Off Ramp intersects Haywood Road with two left-turn lanes and two right-turn lanes carrying approximately 14,300 vpd. **The collision diagram indicates that the majority of the crashes are rear-end directly related to capacity and a steep southbound grade and angle collisions associated with turning movements from the Off Ramp**. The most beneficial short-term and long-term consideration includes:

- **Short-Term**: Install reflective backplates for each signal head and restripe entire intersection. Provide a R10-11a "No Turn on Red" overhead sign (required sight distance is 445 feet, actual sight distance is 140 feet) for the dual right-turn lane Off Ramp and restripe the center left-turn lane to a shared left / thru / right providing triple right-turn lanes. The overhead lane usage sign should be updated warning heavy trucks not to use inner right-turn lane as well as provide destination signs so vehicles can position in the correct lane. Turning radii should modified and new skips lines should be marked for triple right-turn lane Off Ramp.

- **Long-Term:** Convert interchange to a Diverging Diamond Interchange with improved lighting.

Existing and Calculated Yellow Change and Red Clearance Intervals

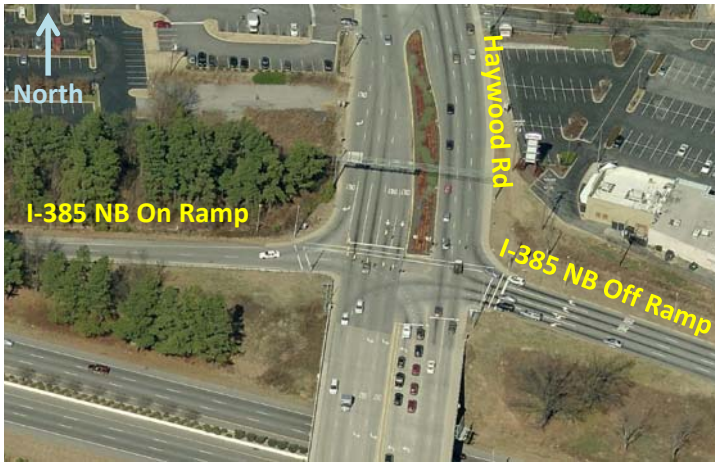
Road	**-**			**I-385 Off Ramp**			**Haywood**			**Haywood**		
Movement	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
Existing Yellow	-	-	-	4.0	4.0	4.0	4.0	4.5	4.5	-	4.5	4.5
Calculated Yellow	**-**	**-**	**-**	**3.5**	**3.5**	**3.5**	**3.0**	**3.9**	**3.9**	**-**	**4.1**	**4.1**
Existing Red	-	-	-	2.5	2.5	2.5	2.5	2.0	2.0	-	2.0	2.0
Calculated Red	**-**	**-**	**-**	**3.0**	**3.0**	**3.0**	**3.0**	**3.0**	**3.0**	**-**	**1.5**	**1.5**

The following table below shows the existing LOS and delay and the capacity effect of proposed R1-11a "No Turn on Red" overhead sign along with the triple right-turns for the Off Ramp. The Synchro files provided by the City are dated 10/11/06; however, signal timings along corridor have been updated within the past five years. AECOM maintained the splits, offsets, and cycle lengths in Synchro files provided by the City. A diverging diamond interchange was also analyzed including adjacent upstream and downstream signals to identify the capacity and safety effects.

Capacity Analysis

Scenario	**AM Peak**		**PM Peak**	
	LOS	**Delay (sec)**	**LOS**	**Delay (sec)**
Existing	C	20.9	F	112.4
Proposed	C	23.4	E	68.0
Proposed (Diverging Diamond Interchange)	B	19.3	B	14.2

Haywood Road (S-273) at I-385 NB Ramps



77 Crashes (7/1/12 to 11/30/14)
16 – Right Angle
34 – Rear End
23 – Side Swipe
1 – Head On
2 – Out of Control
0 – Hit Animal
1 – Other

Crash Conditions	
25 - Night	52 - Day
14 - Wet	63 - Dry

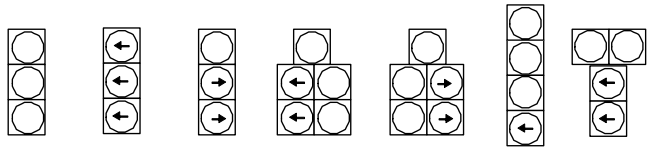
Speed limits (mph):

Haywood Rd – 40
I-385 NB Ramps – NP

Signal Phasing:

	Signal Head	Phasing				Overlap		X -Walk		Ped Sig	
NB	BBAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
EB	-	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
SB	AAAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
WB	BBAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N

* Circle if Advanced Head



Observations:

- SB queuing from I-385 SB Ramps and NB queuing from Pelham Road blocks intersection
- I-385 NB Off Ramp right-turn phase may need coordinated with Orchard Park Dr and Pelham Rd
- I-385 NB Off Ramp vehicles pull up beyond stop bar and on crosswalk to turn right on red and impedes third receiving lane on Haywood Rd. Signage and bridge restricts sight distance to make a right-turn on red.
- SB right-turns under yield control cannot see pedestrians and has conflicts with I-385 NB Off ramp through traffic (low volume) and NB dual left turning traffic (high volume) from Haywood Rd
- Poor lighting and pavement markings / skip lines for dual turning movements are faded at intersection

Short-Term Considerations:

- R10-11a "No Turn on Red" sign for NB Off Ramp and restripe to provide triple right-turns, update turning radii and overhead lane use signs
- Retroreflective backplates and restripe
- R10-15 "yield to pedestrians" sign, remove foliage and yield sign and replace with stop bar on southbound approach
- A SB blank out sign with "No Turn on Red" image coinciding with NB left-turn phase

Long-Term Considerations:

- Diverging Diamond Interchange
- Retime entire corridor to improve blocking
- Third receiving lane on I-385 On Ramp to allow a SB free flow right-turn lane
- Improve street lighting
- A rail buffer for sidewalk over bridge
- Eliminate third NB receiving lane using concrete creating a finite right-turn lane onto Orchard Park Dr and move up stop bar on Off Ramp

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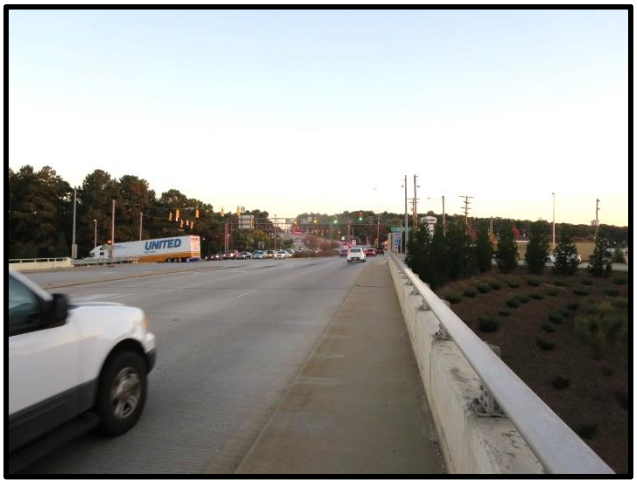
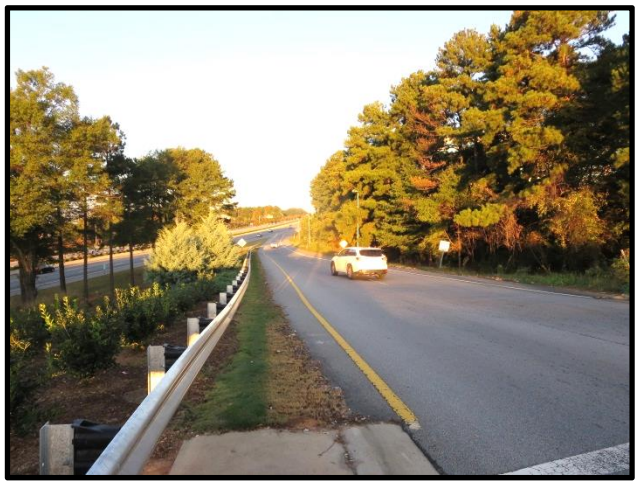
Haywood Road (S-273) at I-385 NB Ramps



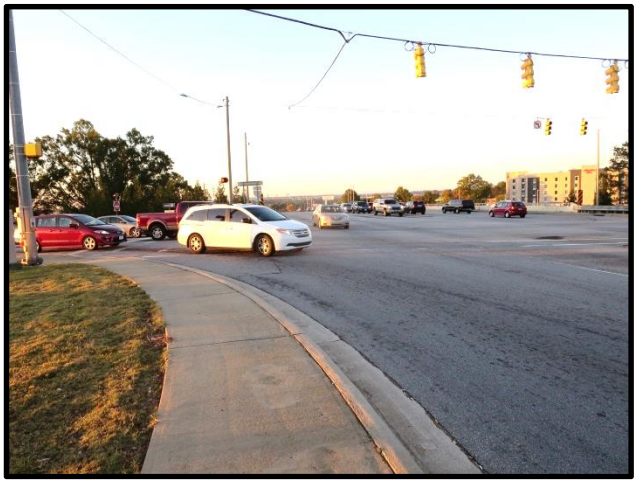
Northbound Approach



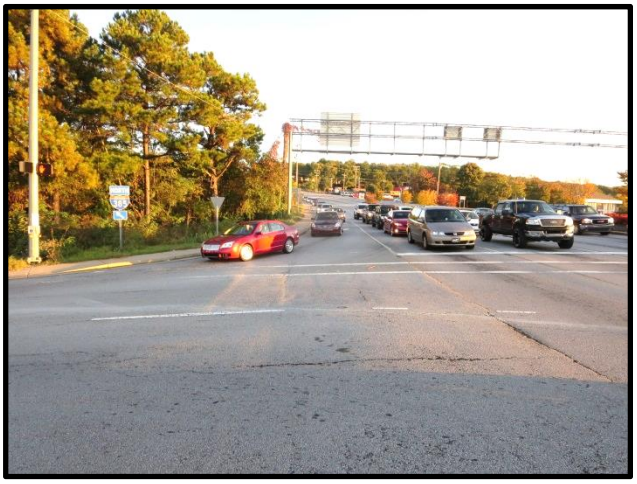
I-385 NB On Ramp

Southbound Approach

Westbound Approach



I-385 NB Off Ramp dual right-turns have limited sight distance from stop bar and pull out into third receiving lane and impede crosswalk for right-turn turn on red movement



SB Right-turns under yield control cannot see pedestrians and conflict with I-385 Off ramp through traffic and NB dual left turning traffic from Haywood Rd

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3.2 Haywood Road (S-273) at I-385 Southbound Ramps

Haywood Road (S-273) is a north / south four lane divided minor arterial carrying 25,950 vehicles per day (vpd) with a speed limit of 40 miles per hour (mph). Haywood Road crosses I-385 with an eight-lane bridge that includes dual left-turn lanes onto I-385 from both directions. The I-385 Southbound Off Ramp intersects Haywood Road with four turn lanes carrying approximately 8,790 vpd. **The collision diagram indicates that the majority of the crashes are rear-end and with turning movements from the Off Ramp**. The most beneficial short-term and long-term consideration includes:

- **Short-Term**: Provide a R10-11a "No Turn of Red" overhead sign (required sight distance is 445 feet, actual sight distance is 130 feet) for the dual-right turn lane off-ramp and restripe the entire intersection providing skips lines directing vehicles from the dual right-turn Off Ramp onto Haywood Road. On the I-385 Off Ramp, advanced W3-3-48 dual "signal ahead" warning signing, and the overhead lane use signs should be moved respectively over each lane.

- **Long-Term:** Convert interchange to a Diverging Diamond Interchange with improved lighting.

Existing and Calculated Yellow Change and Red Clearance Intervals

Road	**I-385 Off Ramp**			**-**			**Haywood**			**Haywood**		
Movement	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
Existing Yellow	4.0	4.0	4.0	-	-	-	4.5	4.5	4.5	4.0	4.5	4.5
Calculated Yellow	**3.6**	**3.6**	**3.6**	**-**	**-**	**-**	**3.4**	**3.4**	**3.4**	**3.0**	**4.8**	**4.8**
Existing Red	2.5	2.5	2.5	-	-	-	2.0	2.0	2.0	2.5	2.0	2.0
Calculated Red	**3.0**	**3.0**	**3.0**	**-**	**-**	**-**	**1.8**	**1.8**	**1.8**	**3.0**	**2.9**	**2.9**

The following table below shows the existing LOS and delay and the capacity effect of a proposed R10-11a "No Turn on Red" overhead sign for the Off Ramp. Queuing is expected to increase for the Off-Ramp; therefore, green time for this phase should be adjusted accordingly. AECOM maintained the splits, offsets, and cycle lengths in Synchro files provided by the City. A diverging diamond interchange was also analyzed including adjacent upstream and downstream signals to identify the capacity and safety effects.

Capacity Analysis

Scenario	**AM Peak**		**PM Peak**	
	LOS	**Delay (sec)**	**LOS**	**Delay (sec)**
Existing	C	23.8	C	25.3
Proposed	C	25.6	C	27.7
Proposed (Diverging Diamond Interchange)	B	10.4	B	14.8

Haywood Road (S-273) at I-385 SB Ramps

99 Crashes (7/1/12 to 11/30/14)
16 – Right Angle
58 – Rear End
19 – Side Swipe
0 – Head On
4 – Out of Control
0 – Hit Animal
2 – Other

Crash Conditions	
14 - Night	85 - Day
15 - Wet	84 - Dry

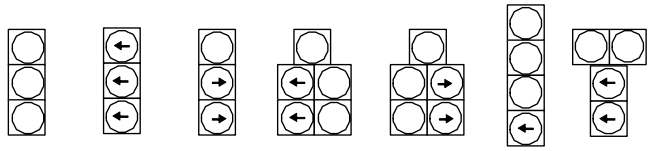
Speed limits (mph):

Haywood Rd – 40
I-385 SB Ramps – NP

Signal Phasing:

	Signal Head	Phasing				Overlap		X -Walk		Ped Sig	
NB	AAAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
EB	BBA (A)	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
SB	BBAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
WB	-	Prot	PP	Perm	Split	Y	N	Y	N	Y	N

* Circle if Advanced Head



Observations:

- Moderate queuing on I-385 Off Ramp due to poor lane utilization for dual left-turn lane as vehicles use center left-turn lane in preparation of turning right at Orchard Park Dr or Pelham Rd
- Poor sight distance from I-385 Off Ramp for right-turn on red movements
- Poor lighting and faded pavement markings at interchange
- The Off Ramp is part of an auxiliary lane that connects to the upstream Plesantburg Dr at I-385 SB On Ramp
- Pedestrian visibility may be a concern for the heavy NB right-turn movement
- Haywood Mall signalized intersections to the south

Short-Term Considerations:

- R10-11a “No Turn on Red” sign for SB Off Ramp
- Retroreflective backplates and restripe
- Adjust I-385 Off Ramp overhead lane use signs
- R3-1 SB “No Right-turn” overhead sign
- Overhead signs for adjacent Mall Exit signal dual right-turns lanes indicating which lane to be in to access I-385 NB or SB
- Dual W3-3-48 “signal ahead” signs on Ramp
- Review yellow change and red clearance intervals

Long-Term Considerations:

- Diverging Diamond and remove phases at the signals adjacent to the interchange
- Retime entire corridor to improve blocking
- Improve street lighting
- Rail buffer for sidewalk over bridge
- An additional NB right-turn lane onto I-385 to provide dual right-turn lanes
- Transverse rumble strips on the narrow section of the I-385 SB Off Ramp

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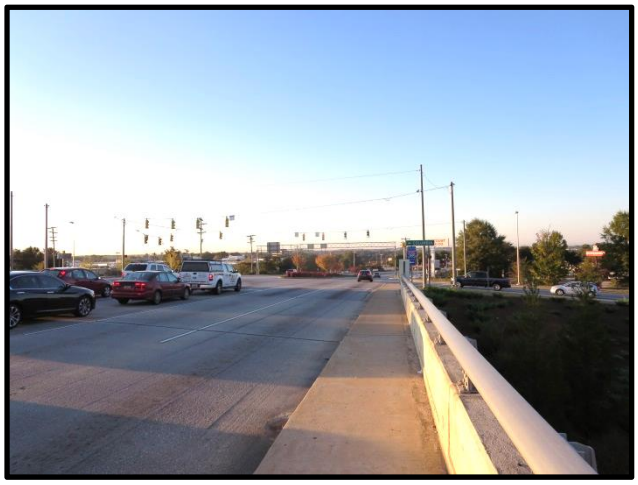
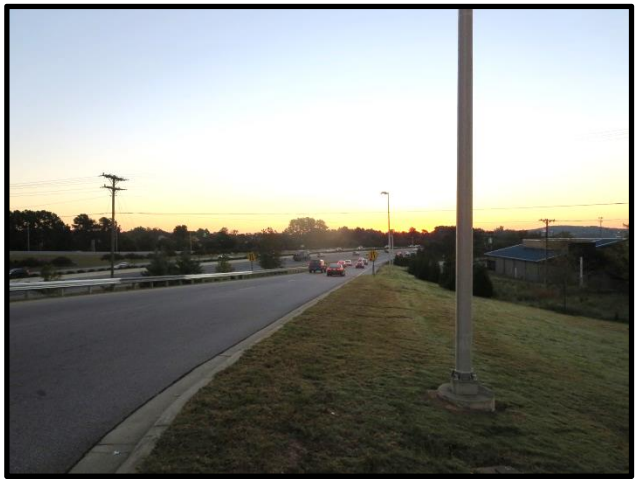
Haywood Road (S-273) at I-385 SB Ramps

Northbound Approach

Eastbound Approach



Southbound Approach



I-385 Eastbound On Ramp

I-385 SB Off Ramp Dual right-turns have limited sight distance from stop bar and vehicles pull up covering crosswalk for right-turn turn on red movement

Dual left-turn lanes from Off Ramp have poor lane utilization because vehicles tend to use center left-turn lane in preparation for right-turn onto Orchard Park Dr leading intersection

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3.3 N. Pleasantburg Drive (SC 291) at Villa Road / Century Drive (S-740)

N. Pleasantburg Drive (SC 291) is a north / south seven lane undivided principal arterial carrying 36,900 vehicles per day (vpd) with a speed limit of 40 miles per hour (mph). Both Villa Road (S-740) carrying 4,950 vpd and Century Drive (S-740) carrying 3,480 vpd are two lane state maintained roads with a speed limit of 35 mph. Both vpd estimates on Villa Road and Century Drive were determined using peak hour counts. The I-385 NB Exit Ramp (under yield control) is located approximately 500 feet south on this intersection. **The collision diagram indicates that the majority of the crashes are associated with vehicles driving too fast along N. Pleasantburg Drive resulting in rear end collisions prior to the intersection**. The most beneficial short-term and long-term consideration based on the 40 (forty) rear-end collisions along N. Pleasantburg Drive include:

- **Short-Term**: Add backplates to existing signal heads, add additional signal heads over lanes, and review yellow change and red clearance intervals along N. Pleasantburg Drive.

- **Long-Term:** Install an Advance-Warning Flasher in southbound direction along N. Pleasantburg Drive and signalize the I-385 NB Off Ramp

Existing and Calculated Yellow Change and Red Clearance Intervals

Road	Century			Villa			N. Pleasantburg			N. Pleasantburg		
Movement	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
Existing Yellow	4.0	4.0	4.0	4.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Calculated Yellow	**4.2**	**4.2**	**4.2**	**3.9**	**3.9**	**3.9**	**3.0**	**4.4**	**4.4**	**3.0**	**3.9**	**3.9**
Existing Red	2.0	2.0	2.0	2.0	2.0	2.0	0.5	2.0	2.0	0.5	2.0	2.0
Calculated Red	**2.4**	**2.4**	**2.4**	**2.6**	**2.6**	**2.6**	**3.0**	**2.2**	**2.2**	**3.0**	**2.7**	**2.7**

The following table below shows the existing LOS and delay and the capacity effect of converting the existing yield control I-385 NB Off Ramp to signal control with dual right-turn lanes. With adding an additional phase to the I-385 NB Off Ramp signal, the corridor will need to be retimed with adequate green time to prevent queuing onto I-385.

Capacity Analysis

Scenario	AM Peak		PM Peak	
	LOS	**Delay (sec)**	**LOS**	**Delay (sec)**
Existing (Villa Road / Century Drive)	B	16.6	B	16.9
Proposed (Villa Road / Century Drive)	B	15.8	B	15.1
Existing (I-385 NB Off Ramp Yield)	A	0.5	A	1.2
Proposed (I-385 NB Off Ramp Signal)	B	15.1	C	20.7

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N. Pleasantburg Drive (SC 291) at Villa Road / Century Drive (S-740)

75 Crashes between (08/01/12 to 11/30/14)
18 – Right Angle
43 – Rear End
8 – Side Swipe
3 – Head On
0 – Out of Control
0 – Hit Animal
3 – Other

Crash Conditions	
14 - Night	61 - Day
14 - Wet	61 - Dry

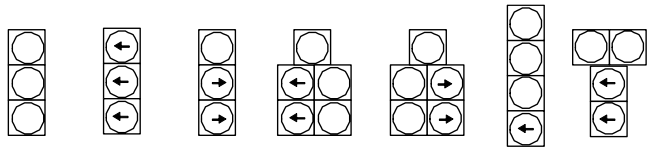
Speed limits (mph):

N. Pleasantburg Dr – 40
Century Dr – 35
Villa Rd – 35

Signal Phasing:

	Signal Head	Phasing				Overlap		X -Walk		Ped Sig	
NB	DAAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
EB	AA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
SB	DAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
WB	AA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N

* Circle if Advanced Head



Observations:

- Queuing on Villa Rd extends a few hundred feet prior to intersection and red light running
- No consistency in regards to pedestrian accommodation such as pedestrian signals, push buttons, and ramps
- Vehicles weave up to three lane changes on the NB approach from I-385 Off Ramp
- Vehicles come to a complete stop from I-385 Off Ramp as NB queuing from intersection prohibits merging
- Intersection is in a sag curve with vehicles exceeding speed limit on N. Pleasantburg Dr
- Light pedestrian and bike use
- Horizontal and vertical curvature on side streets may create sight distance issues with existing signal heads

Short-Term Considerations:

- Review yellow change and red clearance intervals
- Retroreflective backplates
- R10-12 “left-turn YIELD on Green” sign or flashing yellow arrows on N. Pleasantburg Dr
- Protected permissive phasing for Villa Rd
- Create gaps for I-385 Off Ramp by temporarily stopping NB N. Pleasantburg Dr with a red light
- Add signals heads on N. Pleasantburg Dr
- Pedestrian heads, push buttons, and crosswalks

Long-Term Considerations:

- Advanced Warning Flasher on SB approach
- Realign I-385 Off Ramp with On Ramp under signal control with dual right-turns to mitigate existing weave under yield control
- Raised median on SB approach
- Improve lighting on Century Dr and repave with high friction asphalt
- A short EB right-turn lane with an overlap
- A SB right-turn lane on N. Pleasantburg Dr

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N. Pleasantburg Drive (SC 291) at Villa Road / Century Drive (S-740)

Northbound Approach

Eastbound Approach

Southbound Approach

Westbound Approach

Excessive queuing on Villa Rd as left-turn movement yields to opposing traffic under permissive phasing

Weaving between I-385 Off Ramp and Villa Rd / Century Dr and NB queue extending beyond Off Ramp merge

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3.4 S. Pleasantburg Drive (SC 291) at E. Antrim Drive / W. Antrim Drive

S. Pleasantburg Drive (SC 291) is a north / south six lane divided principal arterial carrying 28,000 vehicles per day (vpd) with a speed limit of 40 miles per hour (mph). Antrim Drive carrying 7,500 vpd (estimated from peak hour counts) is a two-lane city maintained road with a speed limit not posted. **The collision diagram indicates that the majority of the crashes are associated with rear-end crashes along S. Pleasantburg Drive prior to the intersection. Angle collisions in particularly the southbound left-turn from S. Pleasantburg to E. Antrim Drive**. The most beneficial short-term and long-term consideration includes:

- **Short-Term**: Restripe to provide a northbound right-turn lane with an overlap signal head, install a southbound protected only left-turn phase, install a southbound W3-3-48 "signal ahead" warning sign, replace overhead usage signs, and review yellow change and red clearance intervals along S. Pleasantburg Drive in particular the red clearance interval.

- **Long-Term:** Install an Advance Warning Flasher on both approaches of S. Pleasantburg Drive.

Existing and Calculated Yellow Change and Red Clearance Intervals

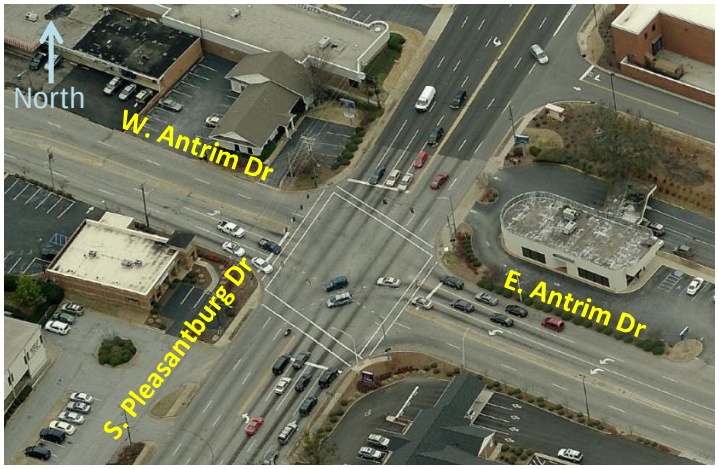
Road	W. Antrim			E. Antrim			S. Pleasantburg			S. Pleasantburg		
Movement	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
Existing Yellow	3.5	4.0	4.0	3.5	4.0	4.0	3.5	4.0	4.0	3.5	4.0	4.0
Calculated Yellow	**3.0**	**3.8**	**3.8**	**3.0**	**3.6**	**3.6**	**3.0**	**3.9**	**3.9**	**3.0**	**3.9**	**3.9**
Existing Red	0.5	2.0	2.0	0.5	2.0	2.0	0.5	2.0	2.0	0.5	2.0	2.0
Calculated Red	**3.0**	**2.4**	**2.4**	**3.0**	**3.0**	**3.0**	**3.0**	**3.0**	**3.0**	**3.0**	**3.0**	**3.0**

The following table below shows the existing LOS and delay and the capacity effect of restriping the existing northbound through / right-turn lane to an exclusive right-turn lane with an overlap and a protected only phase for the southbound left-turn movement. Queuing is expected to increase for the northbound direction as one of the through lanes is removed; however, based on observations, many use the shared through / right-turn lane today as primarily a right-turn only lane. Providing protected-only phasing for the southbound left is expected in increase queuing, but the existing storage is sufficient.

Capacity Analysis

Scenario	AM Peak		PM Peak	
	LOS	**Delay (sec)**	**LOS**	**Delay (sec)**
Existing	C	27.0	C	33.6
Proposed	C	25.5	D	36.5

S. Pleasantburg Drive (SC 291) at E. Antrim Drive / W. Antrim Drive



75 Crashes between (08/28/12 to 12/03/14)
27 – Right Angle
36 – Rear End
11 – Side Swipe
1 – Head On
0 – Out of Control
0 – Hit Animal
0 – Other

Crash Conditions	
10 - Night	65 - Day
11 - Wet	64 - Dry

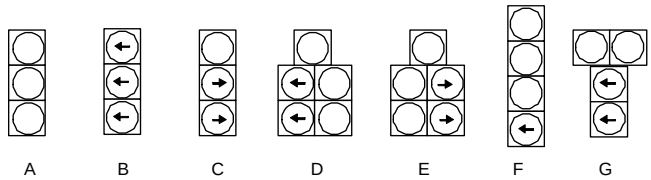
Speed limits (mph):

N Pleasantburg Dr – 40
W Antrim Dr – NP
E Antrim Dr – NP

Signal Phasing:

	Signal Head	Phasing				Overlap		X -Walk		Ped Sig	
NB	DA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
EB	DA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
SB	DA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
WB	BBAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N

* Circle if Advanced Head



Observations:

- Queuing and red light running on SB S. Pleasantburg Dr with a green time split under 30 seconds
- Nose of existing NB median creates a tight turning radius for inner WB left-turn lane
- NB overhead lane usage signs before intersection are not retroreflective and right-turn sign is blocked by tree
- There is a bus stop before intersection in SB direction
- Driveways to Wells Fargo and Suntrust banks are full access onto S. Pleasantburg Dr
- Permissive left-turns from S. Pleasantburg are usually made on a red light
- Lanes width are wide on W. Antrim Dr and signs on E. Antrim Dr are blocked by small trees

Short-Term Considerations:

- Restripe and sign a NB exclusive right-turn lane
- Additional signal heads on NB /SB S. Pleasantburg
- R10-12 “Left-turn YIELD on Green” for NB, SB, EB
- Replace NB overhead lane usage signs
- Review yellow change and red clearance intervals
- Convert University Center Driveway closest to signal to a right-out only and close median
- A SB protected only left-turn phase
- A SB W3-3-48 “signal ahead” warning sign

Long-Term Considerations:

- Consider increasing cycle length to provide longer green splits on S. Pleasantburg Dr and for left-turns from Antrim Dr approaches
- Permanently close NB Off Ramp to Laurens Road
- Large overhead destination signs for the NB S. Pleasantburg Dr approach
- Move bus stop after intersection in SB direction
- Permanently close Wells Fargo driveways on S. Pleasantburg Dr

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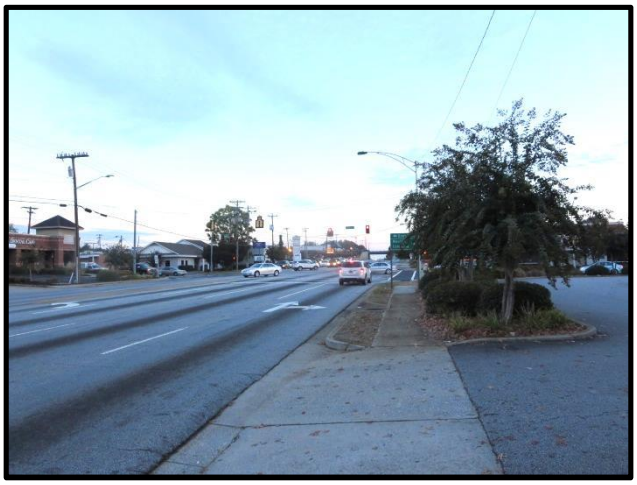
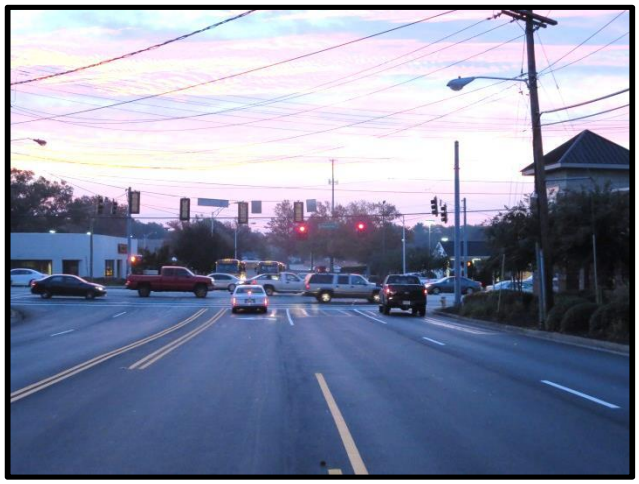
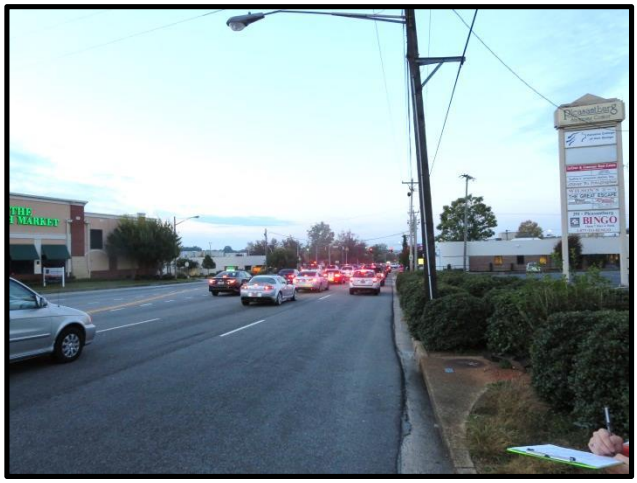
S. Pleasantburg Drive (SC 291) at E. Antrim Drive / W. Antrim Drive



Northbound Approach



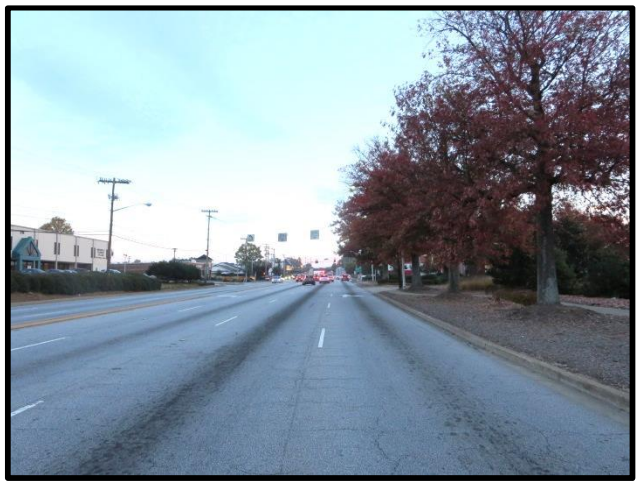
Eastbound Approach



Southbound Approach

Westbound Approach

Inner WB left-turn lane has tight turning radius with existing median nose placement



NB overhead lane usage signs blocked by trees and are not retroreflective

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3.5 Pendleton Street (SC 124) at Easley Bridge Road / S. Academy Street (US 123)

Easley Bridge Road / S. Academy Street (US 123) is an east / west four lane principal arterial carrying 17,400 vehicles per day (vpd) with a speed limit of 40 miles per hour (mph) eastbound and 35 mph westbound. Pendleton Street (SC 124) is a minor arterial two-lane roadway carrying approximately 8,500 vpd. **The collision diagram indicates that the majority of the crashes (approximately 50) are rear-end or right angle in the center of intersection including two fatalities. Approximately 30 percent of the crashes occur at night. The most common angle crash is associated with the eastbound left-turn movement from Easley Bridge Road**. It is to be noted that the intersection geometry and phasing has been updated in the past year, so some of the changes may have improved overall safety.

The most beneficial short-term and long-term consideration includes:

- **Short-Term**: Review yellow change and red clearance intervals and provide an eastbound protected only left-turn phase from Easley Bridge Road, and a northbound and southbound protected only left-turn phase from Pendleton Street.

- **Long-Term:** Improve lighting of entire intersection along with a roundabout.

Existing and Calculated Yellow Change and Red Clearance Intervals

Road	Easley Bridge			S. Academy			Pendleton			Pendleton		
Movement	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
Existing Yellow	4.0	4.0	4.0	4.0*	4.0*	4.0*	3.5	4.0	4.0	3.5	4.0	4.0
Calculated Yellow	**3.8**	**3.8**	**3.8**	**3.8**	**3.8**	**3.8**	**3.0**	**3.4**	**3.4**	**3.0**	**3.1**	**3.1**
Existing Red	2.0	2.0	2.0	2.0*	2.0*	2.0*	0.5	2.0	2.0	0.5	2.0	2.0
Calculated Red	**2.5**	**2.5**	**2.5**	**2.5**	**2.5**	**2.5**	**3.0**	**3.0**	**3.0**	**3.0**	**3.0**	**3.0**

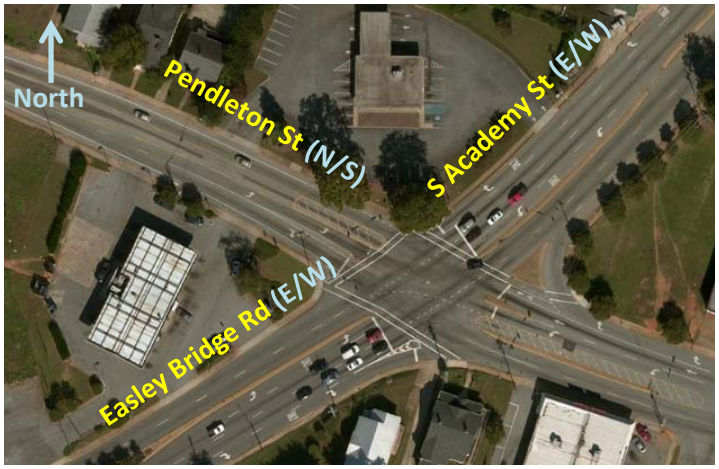
*This makes the assumption that phase 6 is not being used and phase 2 runs both Easley Bridge Rd and S. Academy St according to signal timing sheets provided by the City.

The following table below shows the existing LOS and delay and the capacity effect of adding a protected only left-turn phase for the eastbound, northbound, and south approaches as well as right-turn overlap phases Easley Bridge Road / S. Academy Street. Queuing is primarily unchanged with these new protected-only phases and overlaps, except the southbound left-turn lane on Pendleton Street, which increase moderately in the PM peak hour.

Capacity Analysis

Scenario	AM Peak		PM Peak	
	LOS	**Delay (sec)**	**LOS**	**Delay (sec)**
Existing	C	22.3	B	19.9
Proposed	C	29.2	C	28.6

Pendleton Street (SC 124) at Easley Bridge Road / S. Academy Street (US 123)



57 Crashes between (11/19/12 to 12/3/14)
27 – Right Angle
22 – Rear End
3 – Side Swipe
1 – Head On
2 – Out of Control
0 – Hit Animal
2 – Other

Crash Conditions	
16 - Night	41 - Day
12 - Wet	45 - Dry

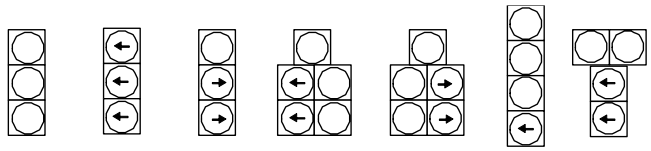
Speed limits (mph):

Pendleton St – 30
Easley Bridge Rd – 35
S Academy St – 35

Signal Phasing:

	Signal Head	Phasing				Overlap		X -Walk		Ped Sig	
NB	DAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
EB	AA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
SB	DAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
WB	AA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N

* Circle if Advanced Head



Observations:

- SB on Pendleton St looks straight into sun during the AM Peak hour
- Overall pavement condition is poor
- Intersection has been modified recently to accommodate bike lanes on Pendleton St
- Pavement markings need updated and signs need removed as a result of latest intersection modification
- No pedestrian signal equipment is present with existing crosswalks
- Moderate queuing on SB through / right-turn lane on Pendleton St
- Many signs were obstructed by foliage on S Academy St

Short-Term Considerations:

- A protected only EB, NB, SB left-turn phase
- Add pedestrian heads and push buttons at x-walks
- Review yellow change and red clearances intervals
- W3-3-48 signal ahead warning signs on S Academy
- Skip lines for all turn lanes
- Right-turn overlap on EB Academy St
- R1-1A "keep moving" sign for NB right-turn approach on Pendleton St
- Close near driveways on Pendleton St at Spinx

Long-Term Considerations:

- Restripe and repave entire intersection
- Improve lighting on all approaches
- Roundabout
- Overhead Advanced Warning Flasher on EB Easley Bridge Rd approach
- Remove trees in median on EB approach
- Tighten intersection by removing exclusive right-turn lane as indicated in the 2010 Downtown Streetscape Master Plan

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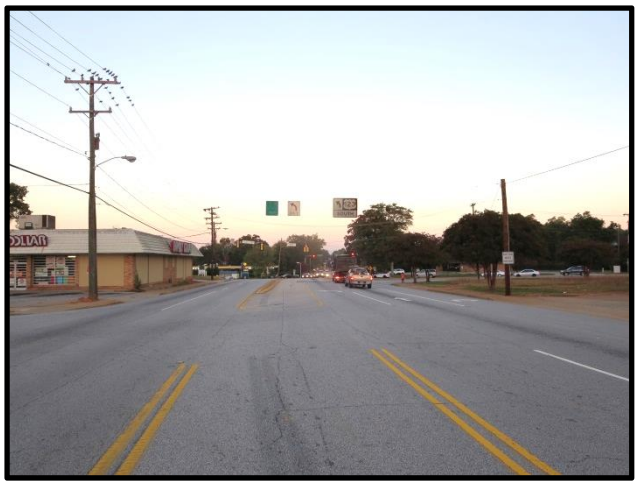
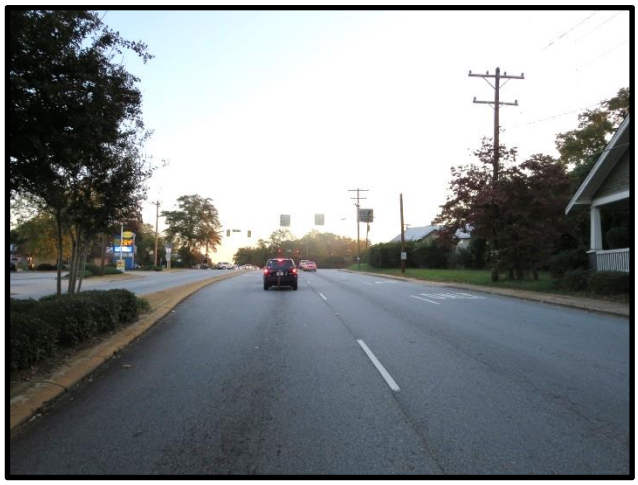
Pendleton Street (SC 124) at Easley Bridge Road / S. Academy Street (US 123)



Northbound Approach

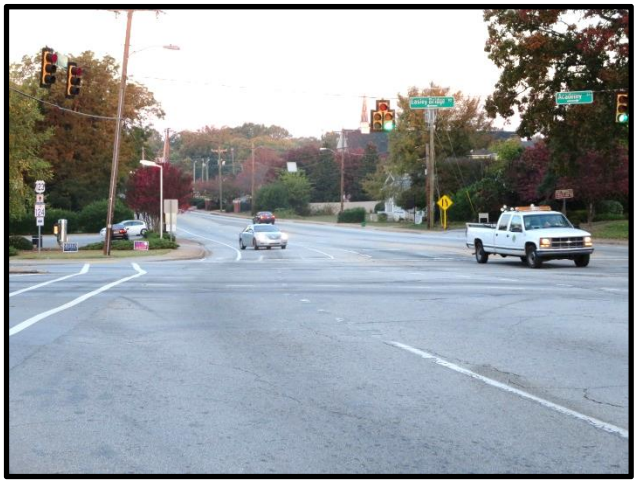


Eastbound Approach

Southbound Approach

Westbound Approach

Crosswalks with no pedestrian signals



Poorly milled out skip line creates ambiguous lane paths with single SB through lane and two receiving lanes combined with poor pavement conditions

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3.6 S. Pleasantburg Drive (SC 291) at Mauldin Road (S-107)

S. Pleasantburg Drive (SC 291) is a north / south seven lane principal arterial carrying 21,400 vehicles per day (vpd) with a speed limit of 45 miles per hour (mph). Mauldin Road (S-107) is a five lane minor arterial with a speed limit of 35 mph and carrying approximately 23,000 vpd. **The collision diagram indicates that the majority of the crashes are associated with the northbound left-turn from S. Pleasantburg onto Mauldin Road and access management issues on the south leg**. The most beneficial short-term and long-term consideration includes:

- **Short-Term**: Install a protective only signal head for the northbound left-turn phase from S. Pleasantburg Drive to Mauldin Road combined. Six total crashes (four occurring in the same year) are associated with associated with this left-turn movement.

- **Long-Term:** Install a concrete median on south leg extending beyond Citgo Driveways. Approximately 10 crashes are associated with the unrestricted access on this south leg.

Existing and Calculated Yellow Change and Red Clearance Intervals

Road	Mauldin			Mauldin			S. Pleasantburg			S. Pleasantburg		
Movement	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
Existing Yellow	3.8	4.0	3.8	3.8	4.0	4.0	3.8	4.0	4.0	3.8	4.0	3.8
Calculated Yellow	**3.0**	**3.9**	**3.9**	**3.0**	**3.5**	**3.5**	**4.5**	**4.5**	**3.0**	**3.0**	**4.4**	**3.0**
Existing Red	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Calculated Red	**3.0**	**3.0**	**3.0**	**3.0**	**3.0**	**3.0**	**2.6**	**2.6**	**3.0**	**3.0**	**3.0**	**3.0**

The following table below shows the existing LOS and delay and the proposed capacity effect of adding a northbound protective only left-turn phase on S. Pleasantburg Drive and removing one eastbound left-turn lane on Mauldin Road with protective-permissive phasing. Queuing is expected to increase for the eastbound left-turn and northbound left-turn; however, the existing storage bays are sufficient.

Capacity Analysis

Scenario	AM Peak		PM Peak	
	LOS	**Delay (sec)**	**LOS**	**Delay (sec)**
Existing	C	30.5	C	30.8
Proposed	C	31.7	C	31.7

S. Pleasantburg Drive (SC 291) at Mauldin Road (S-107)

61 Crashes between (01/01/12 to 04/30/14)
25 – Right Angle
27 – Rear End
8 – Side Swipe
0 – Head On
0 – Out of Control
0 – Hit Animal
1 – Other

Crash Conditions	
16 - Night	45 - Day
9 - Wet	52 - Dry

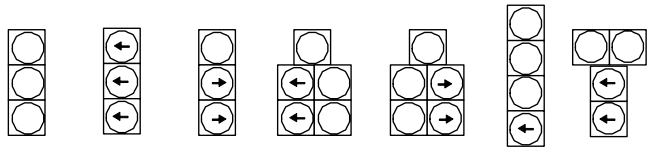
Speed limits (mph):

S. Pleasantburg Dr – 45
Mauldin Rd – 35

Signal Phasing:

	Signal Head	Phasing				Overlap		X -Walk		Ped Sig	
NB	DAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
EB	BBAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
SB	BBAAE	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
WB	DE	Prot	PP	Perm	Split	Y	N	Y	N	Y	N

* Circle if Advanced Head



Observations:

- Overhead lane usage signs on span wire are unreadable at dusk and missing over some turn lanes
- SB and WB approaches have crosswalk but no pedestrian signal heads. No truncated domes are present
- WB right-turn lane blocked by through traffic extending to interstate during the AM peak hour
- EB visibility is hindered by the sun in the AM peak hour
- Overall pavement markings and signage are in fair condition
- Existing way finding signs are excessive
- NB approach is uphill and at a slight curve

Short-Term Considerations:

- A protected only NB left-turn phase
- Review yellow change and red clearance intervals
- Bollards to construct a divided median on south leg extending beyond Citgo Driveway
- Pedestrian heads on SB and WB approaches
- Replace all overhead lane usage signs and have one for each turn lane
- Replace older signs with new retroreflective ones
- R4-7 signs on S. Pleasantburg Dr medians

Long-Term Considerations:

- Raised median on south leg extending beyond Citgo Driveway
- Channelization and a NB right-turn lane for pedestrian refuge on S. Pleasantburg Dr
- Restripe EB approach with one left-turn lane and install flashing yellow arrows on left-turns for both approaches along Mauldin Rd
- An exclusive EB right-turn lane with an overlap on Mauldin Rd

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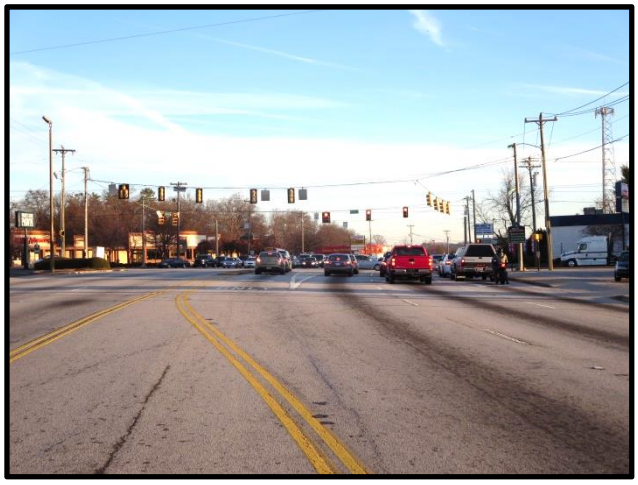
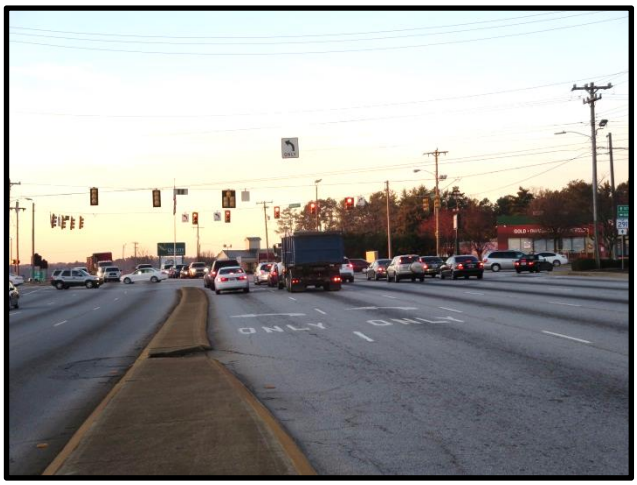
S. Pleasantburg Drive (SC 291) at Mauldin Road (S-107)

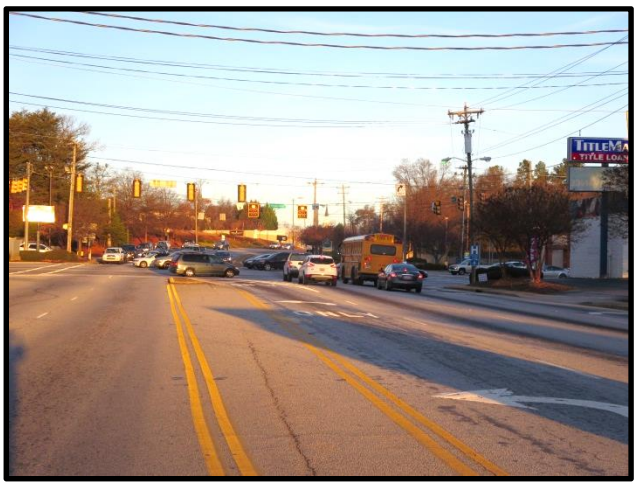


Northbound Approach

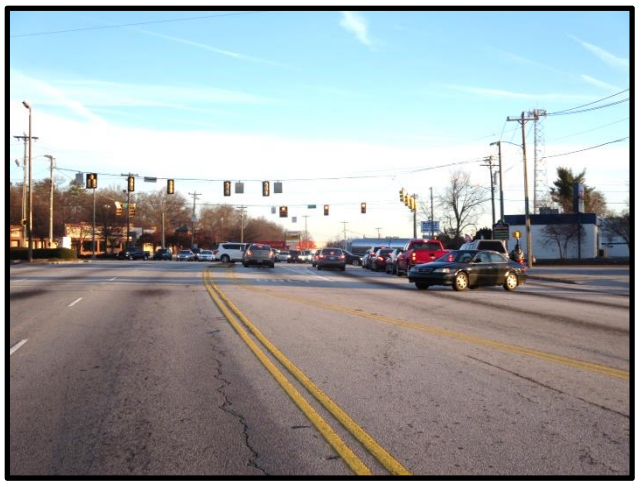
Eastbound Approach



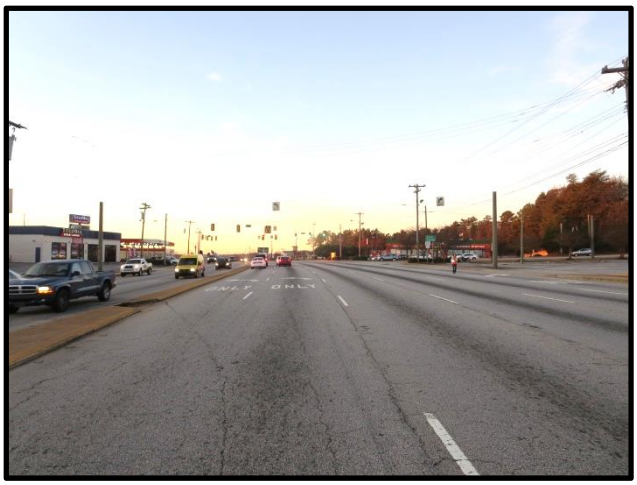
Southbound Approach



Westbound Approach



A vehicle freely exits the Citgo Gas Station onto the south leg of S. Pleasantburg Dr (7-lane section). Queuing extends beyond driveways during peak hours.



Dual SB left-turn lanes with one overhead left-turn sign in the middle of lanes on S. Pleasantburg Dr may cause lane confusion

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3.7 Pleasantburg Drive (SC 291) at Rutherford Road (S-21)

Pleasantburg Drive (SC 291) is an east / west seven lane principal arterial carrying 26,400 vehicles per day (vpd) with a speed limit of 45 miles per hour (mph). Rutherford Road (S-21) is a north / south four lane minor arterial carrying 14,300 vpd with a speed limit of 40 mph northbound and 35 mph southbound. **The collision diagram indicates that the majority of the crashes are associated with the northbound left-turn movement from Rutherford Road to Pleasantburg Drive and rear-end collisions along Pleasantburg Drive**. This intersection has recently been upgraded with reflective back plates and signal ahead warning signs; therefore, a drop in rear end crashes along Pleasantburg Drive is expected as indicated with crashes in 2014. The most beneficial short-term and long-term consideration includes:

- **Short-Term**: Install a protective only signal head for the northbound left-turn phase from Rutherford Road to Pleasantburg Drive along with a southbound "No Turn on Red" blank out sign to correspond with this phase. Over a dozen crashes within the past 2.5 year are associated with this movement.

- **Long-Term:** Construct overhead lane use signs on Pleasantburg Drive. Over 22 crashes in the past 2.5 years are sideswipes.

Existing and Calculated Yellow Change and Red Clearance Intervals

Road	**Pleasantburg**			**Pleasantburg**			**Rutherford**			**Rutherford**		
Movement	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
Existing Yellow	3.7	4.3	4.3	3.7	4.3	4.3	4.4	4.0	4.0	4.4	4.0	4.0
Calculated Yellow	**3.0**	**4.5**	**4.5**	**3.0**	**4.4**	**4.4**	**3.0**	**3.8**	**3.8**	**3.0**	**3.9**	**3.9**
Existing Red	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Calculated Red	**3.0**	**2.4**	**2.4**	**3.0**	**2.2**	**2.2**	**3.0**	**2.6**	**2.6**	**3.0**	**2.5**	**2.5**

The following table below shows the existing LOS and delay and the proposed capacity effect of adding a northbound protective only left-turn phase. Queuing is expected to increase for the northbound left-turn; however, the existing storage bay is sufficient.

Capacity Analysis

Scenario	**AM Peak**		**PM Peak**	
	LOS	**Delay (sec)**	**LOS**	**Delay (sec)**
Existing	D	49.6	D	47.7
Proposed	D	51.2	E	58.3

Pleasantburg Drive (SC 291) at Rutherford Road (S-21)

96 Crashes between (01/01/12 to 04/30/14)
22 – Right Angle
52 – Rear End
18 – Side Swipe
1 – Head On
1 – Out of Control
0 – Hit Animal
2 – Other

Crash Conditions	
17 - Night	79 - Day
13 - Wet	83 - Dry

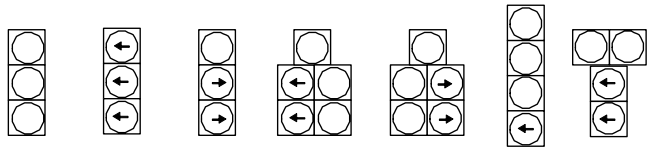
Speed limits (mph):

Pleasantburg Dr – 45
Rutherford Rd – 40 (NB)
Rutherford Rd – 35 (SB)

Signal Phasing:

	Signal Head	Phasing				Overlap		X -Walk		Ped Sig	
NB	DE	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
EB	GAAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
SB	DE	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
WB	GAAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N

* Circle if Advanced Head



Observations:

- Sight distance is limited for right-turn on red for EB Pleasantburg Dr and sun in face during the AM peak
- Pedestrian visibility crossing Pleasantburg Dr SB is limited for SB right-turns due to brick wall and curve / grade
- Raised medians need painted yellow and WB R4-7 “median keep right” sign was knocked down
- Vehicles using EB left-turn lane spill out of provided storage and block though lane in PM peak hour
- Lack of SB left-turn lane into Travelers Rest Bank force vehicles to stop in through lane along Rutherford Rd
- Bus stop is located on Rutherford Rd south leg in the SB direction just beyond Bi-Lo driveway
- Long queues on each approach block driveway access

Short-Term Considerations:

- A protected only NB left-turn phase with “No Turn on Red” blankout sign for SB right-turn
- Review yellow change and red clearance intervals
- Provide more green time for EB left-turn phase to prevent spillback into through lanes
- Crosswalks and pedestrian heads on all four legs
- Repaint medians on Pleasantburg Dr and fix R4-7 signs on medians
- R10-15 “yield to pedestrian” sign for SB & EB

Long-Term Considerations:

- Overhead lane use signs for Pleasantburg
- Retime signals along Pleasantburg Dr corridor to minimize queuing and optimize coordination
- An exclusive EB right-turn lane into Bi-Lo Shopping Center Driveway
- Extend raised median on South leg past the Bi-lo and Bank of Travelers Rest driveways
- Close Citgo driveways nearest to traffic signal on both Pleasantburg Dr and Rutherford Rd

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Pleasantburg Drive (SC 291) at Rutherford Road (S-21)

Northbound Approach

Eastbound Approach

Southbound Approach

Westbound Approach

Bank of Travelers Rest driveway onto Rutherford Rd blocked by queuing from traffic signal

EB Pleasantburg Dr queues to upstream Piney Mountain Rd signal blocking access to / from Shopping Center Driveways

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3.8 Haywood Road (S-273) at Pelham Road (S-492)

Haywood Road (S-273) is a north / south five lane minor arterial carrying 25,500 vehicles per day (vpd) with a speed limit of 40 miles per hour (mph). Pelham Road (S-492) is an east / west for lane minor arterial carrying approximately 22,500 vpd on the east leg and 18,700 vpd on the west leg. This intersection is the northern termini point and the highest in elevation of the Haywood Road signal system. The I-385 interchange, south of this intersection, is very congested and queues uphill into this study intersection. **The collision diagram indicates that the majority of the crashes are rear-end collisions along Haywood Road, which is a direct correlation to capacity, driveways near intersection, and headways between vehicles**. The most beneficial short-term and long-term consideration includes:

- **Short-Term**: Install a southbound "Watch for Stopped Traffic" sign and close Spinx driveway nearest to intersection on Haywood Road and install an eastbound right-turn overlap signal head.

- **Long-Term:** Improve capacity at intersection by providing dual southbound left-turn lanes (lead or lag based on opposing left-turn phase), an exclusive westbound right-turn lane and retime corridor. Capacity improvement to the I-385 interchange and Orchard Park Drive signalized intersection would help with the queuing.

Existing and Calculated Yellow Change and Red Clearance Intervals

Road	Pelham			Pelham			Haywood			Haywood		
Movement	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
Existing Yellow	3.5	4.0	4.0	3.5	4.0	4.0	3.5	4.0	3.5	3.5	4.0	4.0
Calculated Yellow	**3.0**	**4.4**	**4.4**	**3.0**	**4.4**	**4.4**	**3.0**	**3.4**	**3.0**	**3.0**	**4.6**	**4.6**
Existing Red	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	1.0	1.0	2.0	2.0
Calculated Red	**3.0**	**2.2**	**2.2**	**3.0**	**2.5**	**2.5**	**3.0**	**3.0**	**3.0**	**3.0**	**2.1**	**2.1**

The following table below shows the existing LOS and delay and the capacity effect of adding dual southbound left-turn lanes, R10-11a "No Turn on Red" signs on the southbound (required sight distance is 500 feet, actual sight distance is 180 feet) and westbound (required sight distance is 500 feet, actual sight distance is 225 feet) approaches, and an eastbound right-turn overlap. AECOM maintained the splits, offsets, and cycle lengths in Synchro files provided by the City for existing conditions. Queuing is expected to decrease by providing an eastbound right-turn overlap phase. The "No Turn on Red" signs have a minor impact overall queuing.

Capacity Analysis

Scenario	AM Peak		PM Peak	
	LOS	**Delay (sec)**	**LOS**	**Delay (sec)**
Existing	F	172.4	F	103.2
Proposed	E	79.2	D	53.2

Haywood Road (S-273) at Pelham Road (S-492)

94 Crashes between (01/01/12 to 04/30/14)
19 – Right Angle
52 – Rear End
21 – Side Swipe
0 – Head On
0 – Out of Control
0 – Hit Animal

Crash Conditions	
19 - Night	75 - Day
14 - Wet	80 - Dry

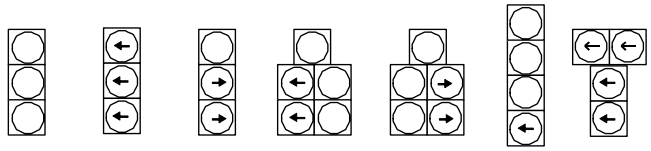
Speed limits (mph):

Haywood Rd – 45
Pelham Rd – 45

Signal Phasing:

	Signal Head	Phasing				Overlap		X -Walk		Ped Sig	
NB	BBAAE	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
EB	DAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
SB	GAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
WB	BBAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N

* Circle if Advanced Head



Observations:

- SB queuing from Orchard Park (Split Phased) signal extends beyond Pelham Rd and blocks intersection
- SB queuing extends from Pelham (over ¼ of a mile) and SB left-turns use TWLTL to pass by this queue
- Spinx Gas Station Driveways closest to intersection are full access
- Vehicular speed SB and downhill grade with no right-turn lane into Spinx Gas Station cause abrupt stops
- EB right-turn lane has a R10-11a "No Turn on Red" sign with no overlap leading to long queues and violations
- Sight distance is poor for SB and WB right-turns when turning on red
- Long queues were observed in the WB direction and red light running was observed for left-turning vehicles

Short-Term Considerations:

- Close both Spinx driveways nearest to intersection (on both Haywood and Pelham)
- R10-11a "No Turn on Red" signs for SB and WB approaches
- "Watch for stopped traffic" sign on SB approach
- R10-7 "Do Not Block Intersection" sign on EB and SB approaches
- Repaint medians
- Add an EB right-turn overlap

Long-Term Considerations:

- NB overhead lane usage signs
- An exclusive WB right-turn lane
- Analyze signal timing of corridor and include possible EB right-turn overlap and dual southbound left-turns (Lead / Lag)
- Provide access to Spinx Gas Station from Orchard Park Dr and remove driveways on Haywood Rd
- Improve capacity at the I-385 interchange to prevent spill back into study intersection

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Haywood Road (S-273) at Pelham Road (S-492)

Northbound Approach

Eastbound Approach

Southbound Approach

Westbound Approach

Queuing & Blocked Intersection - SB Receiving Lanes (Orchard Drive is Split Phased and I-385 Interchange over capacity)

Long queues on EB right-turn lane (Right-turn overlap recommended) as vehicles are violating No Turn on Red overhead sign

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3.9 Augusta Road (S-201) at Mauldin Road (S-107) / Potomac Avenue (S-30)

Augusta Road (S-201) is a north / south four to five lane minor arterial carrying between 14,510 and 19,800 vehicles per day (vpd) with a speed limit of 35 miles per hour (mph). Mauldin Road (S-107) is a five lane east / west minor arterial carrying 7,940 vpd while Potomac Avenue (S-30) is a two lane collector roadway carrying 5,000 vpd (calculated from peak hour). Both Mauldin Rod and Potomac Avenue have a speed limit of 35 mph. **The collision diagram indicates that the majority of the crashes are rear-end associated with the dual right-turning movement from Mauldin Road to Augusta Road. These crashes make approximately a third of the total crashes at this intersection.** This heavy right-turn movement has limited green time because the green time phase corresponds only with the southbound left-turn phase. As a result, many of these vehicles make a right-turn on red yielding to northbound through traffic and eastbound left-turn traffic. Based on the horizontal curvature to the westbound approach, drivers may see the green signal head for the through movement, before they can see the red signal head for the right-turn movement creating a sudden stop. The most beneficial short-term and long-term consideration includes:

- **Short-Term**: Provide a protected only eastbound left-turn phase from Potomac Avenue, although volumes for this left-turn movement do not justify the protection.

- **Long-Term:** Realign westbound approach to ninety degrees by removing left-turn lane into Waters Ave and add near side heads for approach.

Existing and Calculated Yellow Change and Red Clearance Intervals

Road	Potomac			Mauldin			Augusta			Augusta		
Movement	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
Existing Yellow	4.0	4.0	4.0	4.0	4.0	4.0	3.5	4.0	4.0	3.5	4.0	4.0
Calculated Yellow	**3.5**	**3.5**	**3.5**	**3.0**	**3.7**	**3.7**	**3.0**	**3.3**	**3.3**	**3.0**	**3.8**	**3.8**
Existing Red	2.5	2.5	2.5	2.5	2.5	2.5	1.0	2.0	2.0	0.0	2.0	2.0
Calculated Red	**2.8**	**2.8**	**2.8**	**3.0**	**2.9**	**2.9**	**3.0**	**3.0**	**3.0**	**3.0**	**3.0**	**3.0**

The following table below shows the existing LOS and delay and the capacity effect of adding a protected only eastbound left-turn lane, allowing a westbound right to run with westbound through movement, and prohibiting westbound right-turn to turn on red. R10-11a “No Turn on Red” sign on the westbound approach was considered due to skew of intersection and not based on sight distance. No significant changes are expected in overall queuing with these considerations.

Capacity Analysis

Scenario	AM Peak		PM Peak	
	LOS	**Delay (sec)**	**LOS**	**Delay (sec)**
Existing	B	13.0	B	14.9
Proposed	C	20.8	B	16.8

Augusta Road (S-201) at Mauldin Road (S-107) / Potomac Avenue (S-30)

36 Crashes between (07/01/12 to 11/30/14)
5 – Right Angle
19 – Rear End
8 – Side Swipe
2 – Head On
0 – Out of Control
0 – Hit Animal
2 – Other

Crash Conditions	
6 - Night	30 - Day
5 - Wet	31 - Dry

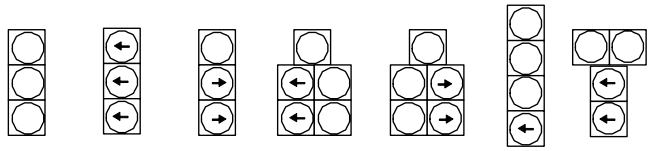
Speed limits (mph):

Augusta Rd – 35
Mauldin Rd – 35
Potomac Ave – 35

Signal Phasing:

	Signal Head	Phasing	Overlap	X -Walk	Ped Sig
NB	AA	Prot PP (Perm) Split	Y (N)	(Y) N	(Y) N
EB	AAA	Prot PP (Perm) Split	Y (N)	(Y) N	(Y) N
SB	BBAA	(Prot) PP Perm Split	Y (N)	(Y) N	(Y) N
WB	AA AA	Prot PP (Perm) Split	(Y) N	(Y) N	(Y) N

* Circle if Advanced Head



Observations:

- WB through movement is green while right-turn movement is red may create driver expectation confusion
- Many vehicles do not come to a complete stop for WB right-turn on red movement and treat as a yield control
- Mild queuing is present for WB right-turn during NB through movement phase
- Wide receiving lanes for dual EB through movement lead to vehicle confusion through intersection
- Landscaped islands with trees may restrict visibility in the Spring and Summer months
- No signal ahead warning signs are present on SB, NB, and WB approaches
- No Yield lines were painted

Short-Term Considerations:

- A protected only EB left-turn phase allowing (WB through and right-turn) green phase together
- R10-11a "No Turn on Red" sign for WB right
- W3-3-48 "signal ahead" signs (NB, SB, & WB)
- Stripe yield lines for SB and NB right-turns
- Restripe EB approach to one through lane and one right-turn lane and repaint receiving lanes
- Retroreflective backplates
- Review yellow change and red clearance intervals

Long-Term Considerations:

- Option 1: Realign WB approach to 90 degrees by removing left-turn lane onto Waters Ave and add near side heads for approach
- Option 2: Provide one WB free flow right-turn lane by restriping NB approach to one left, one through, and one right-turn lane. Stripe out one of the existing dual WB right-turn lanes
- Improve lighting
- Decorative pavers for crosswalks

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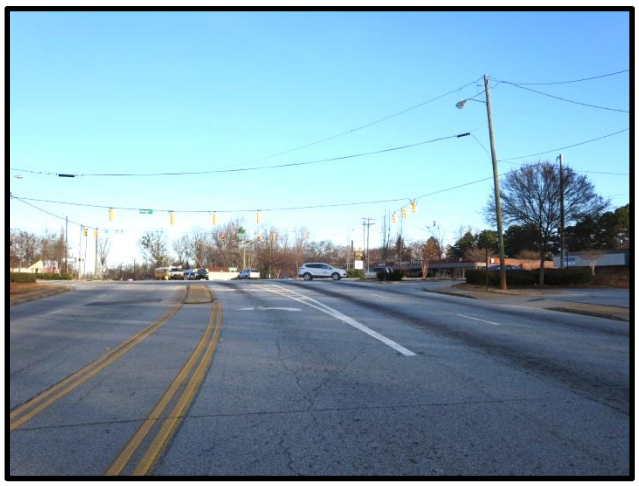
Augusta Road (S-201) at Mauldin Road (S-107) / Potomac Avenue (S-30)



Northbound Approach

Eastbound Approach

Southbound Approach

Westbound Approach

WB approach through volume has green signal while right-turns are red. Dual right-turn on red movement must yield to NB through, EB left, and pedestrians

Receiving lane striping for dual westbound right-turns overlap with northbound through movement

AECOM

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3.10 S. Pleasantburg Drive (SC 291) at Cleveland Street / Cleveland Street Extension (S-189)

S. Pleasantburg Drive (SC 291) is a north / south seven lane principal arterial carrying 21,400 vehicles per day (vpd) with a speed limit of 40 miles per hour (mph) southbound and 45 mph northbound. Cleveland Street / Cleveland Street Extension (S-189) is a two lane minor arterial with a speed limit of 35 mph. **The collision diagram indicates that the majority of the crashes are associated with rear-end collisions on S. Pleasantburg Drive prior to the intersection**. This intersection has been recently been updated with signal equipment and signs. AECOM also conducted a sight distance study to determine if a near side head was needed in the westbound direction. It was determine that the required sight distance to see approaching signal heads was 250 feet; however, actual sight distance was only 140 feet.

The most beneficial short-term and long-term consideration includes:

- **Short-Term**: Review yellow change and red clearance intervals.
- **Long-Term:** Install an additional NB left-turn lane. Cleveland Street would need to be widened to receive the additional left-turn lane but could terminate at Winterberry Court.

Existing and Calculated Yellow Change and Red Clearance Intervals

Road	Cleveland			Cleveland Ext			S. Pleasantburg			S. Pleasantburg		
Movement	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
Existing Yellow	3.5	4.0	4.0	3.5	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Calculated Yellow	**3.0**	**3.6**	**3.6**	**3.0**	**3.6**	**3.6**	**3.0**	**3.7**	**3.7**	**3.0**	**4.2**	**4.2**
Existing Red	0.5	2.0	2.0	0.5	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Calculated Red	**3.0**	**3.0**	**3.0**	**3.0**	**2.7**	**2.7**	**3.0**	**2.9**	**2.9**	**3.0**	**2.1**	**2.1**

The following table below shows the existing LOS and delay and the capacity effect of adding an additional northbound left-turn lane. A significant queuing reduction is expected by providing an additional northbound left-turn lane especially during the morning peak.

Capacity Analysis

Scenario	AM Peak		PM Peak	
	LOS	**Delay (sec)**	**LOS**	**Delay (sec)**
Existing	D	39.3	C	30.7
Proposed	C	33.0	C	29.8

S. Pleasantburg Drive (SC 291) at Cleveland Street / Cleveland Street Ext. (S-189)

32 Crashes (8/1/12 to 12/3/14)
9 – Right Angle
14 – Rear End
4 – Side Swipe
0 – Head On
5 – Out of Control
0 – Hit Animal
0 – Other

Crash Conditions	
8 - Night	24 - Day
2 - Wet	30 - Dry

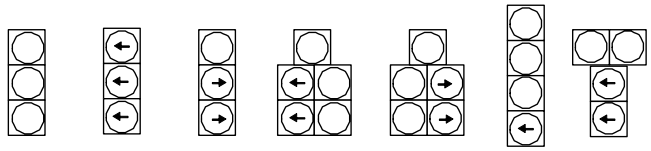
Speed limits (mph):

S Pleasantburg Dr – 45(NB)
S Pleasantburg Dr – 40(SB)
Cleveland St – 35
Cleveland St Ext – 35

Signal Phasing:

	Signal Head	Phasing			Overlap		X -Walk		Ped Sig	
NB	DAAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
EB	DE	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
SB	DAAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
WB	DE	Prot	PP	Perm	Split	Y	N	Y	N	Y	N

* Circle if Advanced Head



Observations:

- Intersection appears to have been upgraded recently
- Significant queuing on WB Cleveland St Ext during the AM peak hour
- Due to horizontal curvature, WB Cleveland St Ext existing sight distance for signal heads is limited
- Significant queuing was observed for the NB left-turn from S. Pleasantburg Dr during the AM peak hour
- Pedestrian signal heads without crosswalks are present for EB direction across S. Pleasantburg Dr
- The Swamp Rabbit Trail begins at this intersection along Cleveland St
- EB right-turn on Cleveland St has limited sight distance to complete the movement for right-turn on red

Short-Term Considerations:

- Review yellow change and red clearance intervals
- R10-12 "Left Turn YIELD on Green" all approaches
- A nearside head on WB approach
- A "Watch for Stopped Traffic" sign on WB approach at least 500 feet from stop bar
- R10-15 overhead "yield to pedestrians" sign on all approaches
- Install flashing yellow arrow signal heads on S. Pleasantburg Drive

Long-Term Considerations:

- Install Advanced Warning Flasher on SB approach
- Remove trees on WB approach to improve signal visibility
- Realign WB approach to 90 degrees
- A dual NB left-turn lane
- A NB right-turn lane
- Improve lighting at intersection
- Close nearest driveway to Morgan Manor Shopping Center

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S. Pleasantburg Drive (SC 291) at Cleveland Street / Cleveland Street Ext. (S-189)

Northbound Approach

Eastbound Approach

Southbound Approach

Westbound Approach

Pedestrian signal head but missing crosswalk across S. Pleasantburg Dr heading EB

WB Cleveland St Ext has horizontal and vertical challenges with limited sight distance for stopping (significant queuing and signal head placement potential issues)

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3.11 Woodruff Road (SC 146) at Verdae Boulevard / Roper Mountain Road (S-183)

Woodruff Road (SC 146) is an east / west five lane minor arterial carrying 11,900 to 34,600 vehicles per day (vpd) with a speed limit of 45 miles per hour (mph) eastbound and 35 mph westbound. Verdae Boulevard is five lane local road carrying 11,700 vpd with a speed limit of 45 mph. Roper Mountain (S-183) is a five-lane collector road carrying 18,300 vpd with a speed limit of 40 mph. **The collision diagram indicates that the majority of the crashes are rear-ends (123 of 163 crashes) associated with the channelized right-turns under yield control.** The most beneficial short-term and long-term consideration includes:

- **Short-Term**: Install two R-1-48 "yield" signs for each channelized right-turn. Improve sight distance for westbound right-turn by removing shrubs and tighten turning radii to decrease speeds.

- **Long-Term:** Reconfigure intersection by removing all channelization from right-turns and bring right-turns to the intersection under signal control. Dual westbound right-turns lane should also be considered based on the traffic volumes.

Existing and Calculated Yellow Change and Red Clearance Intervals

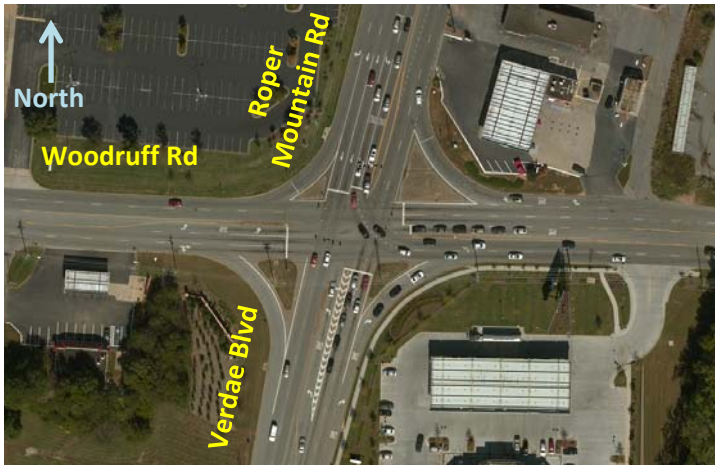
Road	Woodruff			Woodruff			Verdae			Roper Mountain		
Movement	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
Existing Yellow	3.0	4.0	-	3.0	4.0	-	4.0	4.0	-	4.0	4.0	-
Calculated Yellow	**3.0**	**4.4**	**-**	**3.0**	**3.4**	**-**	**4.1**	**4.1**	**-**	**3.0**	**4.3**	**-**
Existing Red	1.0	2.0	-	1.0	2.0	-	2.0	2.0	-	1.0	2.0	-
Calculated Red	**3.0**	**2.2**	**-**	**3.0**	**3.0**	**-**	**2.2**	**2.2**	**-**	**3.0**	**2.2**	**-**

The following table below shows the existing LOS and delay and the capacity effect of adding a protective only northbound left-turn (4 collisions in one year), providing dual westbound right-turns, and signalizing all the right-turns. No significant increase in queuing is expected with these by implementing these considerations.

Capacity Analysis

Scenario	AM Peak		PM Peak	
	LOS	**Delay (sec)**	**LOS**	**Delay (sec)**
Existing	C	24.3	C	30.9
Proposed	C	26.8	C	32.9

Woodruff Road (SC 146) at Verdae Boulevard / Roper Mountain Road (S-183)



163 Crashes between (07/01/12 to 11/30/14)
28 – Right Angle
123 – Rear End
9 – Side Swipe
0 – Head On
1 – Out of Control
0 – Hit Animal
2 – Other

Crash Conditions	
29 - Night	134 - Day
12 - Wet	151 - Dry

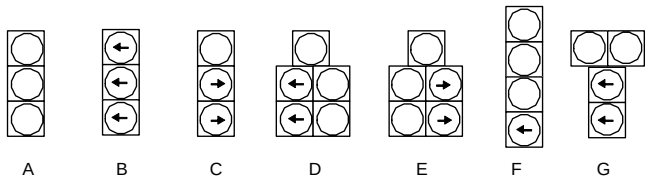
Speed limits (mph):

Woodruff Rd – 45 (EB)
Woodruff Rd – 35 (WB)
Verdae Blvd – 45
Roper Mountain – 40

Signal Phasing:

	Signal Head	Phasing				Overlap	X -Walk	Ped Sig
NB	AA	Prot	PP	Perm	Split	Y N	Y N	Y N
EB	DA	Prot	PP	Perm	Split	Y N	Y N	Y N
SB	BBAA	Prot	PP	Perm	Split	Y N	Y N	Y N
WB	DA	Prot	PP	Perm	Split	Y N	Y N	Y N

* Circle if Advanced Head



Observations:

- All right-turns are channelized under yield control
- A bus stop is located on the south leg in the SB direction and pedestrians were observed crossing Verdae Blvd
- Sight distance is limited for the NB channelized right-turn under yield control
- Extremely congested intersection with queuing in the SB, NB, and WB directions
- Queuing from the Congaree Rd (700 ft) and Costco Entrance (900 ft) signals spill back into intersection
- QT Gas Station driveway access on Verdae Blvd is blocked by queuing from signal during peak hours
- Dual SB left-turn lanes and WB right-turn lane storage spills back into through lanes

Short-Term Considerations:

- A protected only NB left-turn phase
- Review yellow change and red clearance intervals
- Remove shrubbery in northeast quadrant and reduce radius of WB right-turn
- Additional signal heads on Woodruff Rd
- Dual R1-2-48 “yield” signs for all right-turns
- Convert Kangaroo Driveway on Roper Mountain to right-in / right out and Convert QT Driveway on Woodruff Rd to a left-in / right-out only

Long-Term Considerations:

- Remove all channelization and bring right-turns to intersection under signal control
- Dual WB right-turn lanes
- Raised median on south leg extending from signal beyond QT driveway
- Develop a quadrant left intersection in southeast or southwest quadrant by removing left-turns from Verdae Blvd to reduce queuing along Roper Mountain

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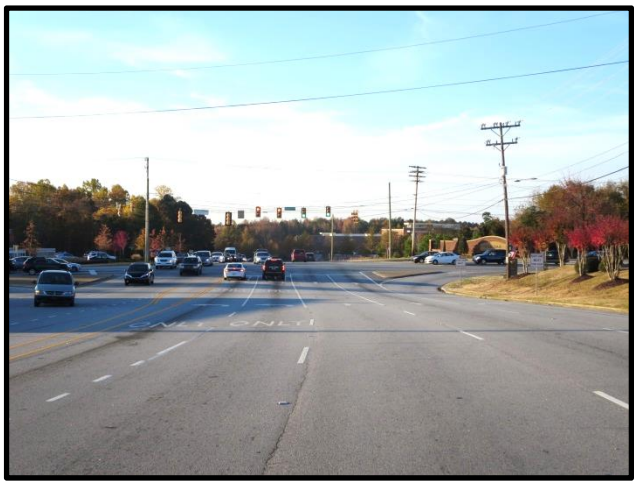
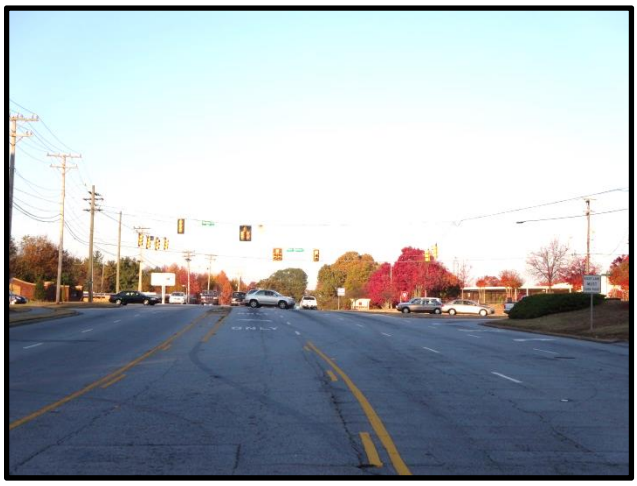
Woodruff Road (SC 146) at Verdae Boulevard / Roper Mountain Road (S-183)

Northbound Approach

Eastbound Approach



Southbound Approach



Westbound Approach

NB approach on Verdae Blvd queue beyond QT driveway combined with a bus stop with frequent pedestrian crossings not at intersection

SB channelized right-turn on Roper Mountain Rd with high traffic volumes yield to mainline traffic on Woodruff Rd

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3.12 S. Church Street (US 29) / Mills Avenue (US 29) at Augusta Street (SC 20)

S. Church Street / Mills Avenue (US 29) is a north / south four lane divided principal arterial carrying between 19,700 and 25,600 vehicles per day (vpd) with a speed limit of 35 miles per hour (mph). Augusta Street (SC 20) is an east / west four lane undivided minor arterial carrying between 16,100 and 19,700 vpd with a speed limit of 30 mph. **The collision diagram indicates that the majority of the crashes are rear-end on southbound S. Church Street and westbound Augusta Street**. The most beneficial short-term and long-term consideration includes:

- **Short-Term**: Install W3-3-48 "signal ahead" warning signs on each approach, add reflectivity on existing signal head backplates, add a nearside head on westbound Augusta Street, and review yellow change and red clearance intervals. It is to be noted that a westbound nearside head may not be needed based on the 30 mph speed limit (required sight distance is 200 feet, actual sight distance is 275 feet); however, queuing from the stop bar and the blind corner contribute to much shorter stopping distance than what is required.

- **Long-Term:** Provide overhead Advance Warning Flasher for southbound Church Street and an exclusive westbound right-turn lane with overlap on Augusta Street.

Existing and Calculated Yellow Change and Red Clearance Intervals

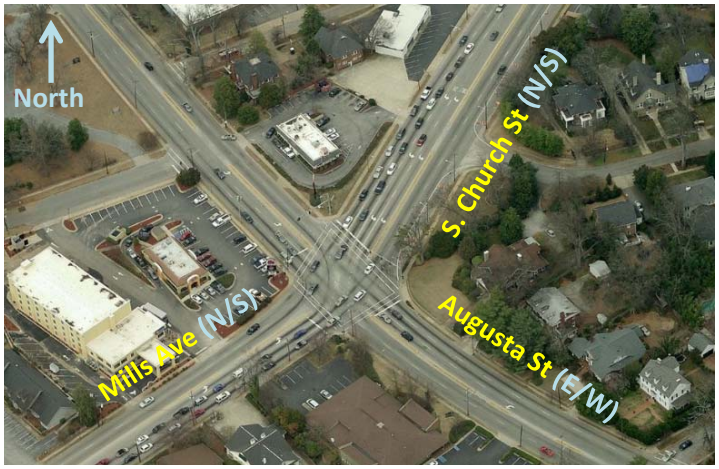
Road	Augusta			Augusta			Mills			Church		
Movement	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
Existing Yellow	3.5	4.0	4.0	3.5	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
Calculated Yellow	**3.0**	**3.3**	**3.3**	**3.0**	**3.2**	**3.2**	**3.0**	**3.5**	**3.5**	**3.0**	**3.7**	**3.7**
Existing Red	1.5	2.0	2.0	1.5	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Calculated Red	**3.3**	**3.1**	**3.1**	**3.2**	**3.2**	**3.2**	**3.8**	**3.3**	**3.3**	**4.2**	**3.5**	**3.5**

The following table below shows the existing LOS and delay and the capacity effect of a proposed westbound right-turn lane along Augusta Street to help with rear-end collisions and capacity. A quadrant left alternative was also analyzed which includes restriping the westbound approach along Augusta Street to a through, through, right-turn lane with an overlap. Westbound left-turns from Augusta Street travel pattern would change by traveling through intersection and turning right onto Tindall Avenue, and then right again on S. Church Street. Radii improvements to Tindall Avenue and signing and striping would be required.

Capacity Analysis

Scenario	AM Peak		PM Peak	
	LOS	**Delay (sec)**	**LOS**	**Delay (sec)**
Existing	D	43.1	D	41.8
Proposed (WB Right-turn lane)	C	33.6	D	40.1
Proposed (Quadrant Left)	C	34.3	C	34.4

S. Church Street (US 29) / Mills Avenue (US 29) at Augusta Street (SC 20)



67 Crashes between (07/01/12 to 12/31/14)
15 – Right Angle
36 – Rear End
15 – Side Swipe
0 – Head On
0 – Out of Control
0 – Hit Animal
0 – Other

Crash Conditions	
12 - Night	55 - Day
7 - Wet	60 - Dry

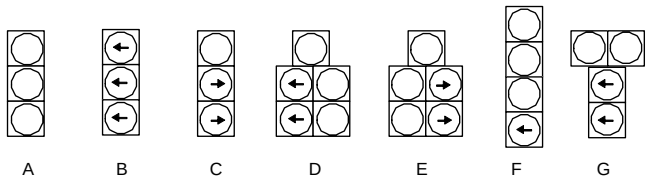
Speed limits (mph):

Augusta St – 30
Mills Ave – 35
Church St – 35

Signal Phasing:

	Signal Head	Phasing				Overlap		X -Walk		Ped Sig	
NB	BAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
EB	DA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
SB	BBAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
WB	DA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N

* Circle if Advanced Head



Observations:

- Bike lanes exists on the SB approach on S. Church Street
- SB left-turn lane utilization along S. Church St was uneven with the majority using outermost left-turn lane in preparation for right-turn on Grove Rd approximately 800 feet southeast of intersection along Augusta St
- WB approach has narrow lanes (less than 12 feet)
- R10-11a "No Turn on Red" overhead sign is located on NB approach
- Many vehicles turn left from Grove Road and then turn right onto S. Church St (US 29) towards downtown
- Existing WB queuing extends past Grove Road Signalized intersection and NB queuing extends a few hundred feet

Short-Term Considerations:

- Near side signal head for WB approach
- Review yellow change and red clearance intervals
- Retroeflectivity to existing signal head backplates
- W3-3-48 "signal ahead" warning signs on all approaches
- Move I-385 guide signs back on WB approach
- Close NB median break into Taco Bell driveway
- Skip lines to guide NB traffic through intersection to help with existing skew

Long-Term Considerations:

- Retime signals along Augusta St
- A WB right-turn lane with an overlap
- Overhead Advance Warning Flasher for SB Church St to warn vehicles of signal
- A concrete raised median on south leg extending to Elm St
- Overhead lane usage signs on Augusta St
- Restripe WB approach to a through, though, right and improve Tindal Ave for quadrant intersection

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S. Church Street (US 29) / Mills Avenue (US 29) at Augusta Street (SC 20)

Northbound Approach

Eastbound Approach

Southbound Approach

Westbound Approach

WB approach on Augusta St has limited signal head visibility of due to horizontal curvature and trees

Significant NB queuing along Mills Ave restricts access to / from business driveways during the PM Peak hour

AECOM

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3.13 E. Faris Road (S-149) at Cleveland Street (S-189)

E. Faris Road (S-149) is an east / west minor arterial carrying 16,200 vehicles per day (vpd) with a speed limit of 35 miles per hour (mph) eastbound and 40 mph westbound. E. Fairs Road is a four lane undivided roadway approaching Cleveland Street and transitions to a two lane undivided road west of Cleveland. Cleveland Street (S-189) is a north / south minor arterial carrying between 8,700 vpd and 15,300 vpd with a speed limit of 35 mph. Cleveland Street is a three lane undivided roadway southbound approaching E. Faris Road and transitions to a two lane undivided road south of E. Faris Road. **The collision diagram indicates that the majority of the crashes are rear-end with most of them occurring on E Faris Road**. The most beneficial short-term and long-term consideration includes:

- **Short-Term**: Install W3-3-48 "signal ahead" warning signs on each approach, add reflectivity on existing signal head backplates, and review yellow change and red clearance intervals.

- **Long-Term:** Widen E. Faris Road to a five lane section east of Cleveland Street and improve intersection lighting

Existing and Calculated Yellow Change and Red Clearance Intervals

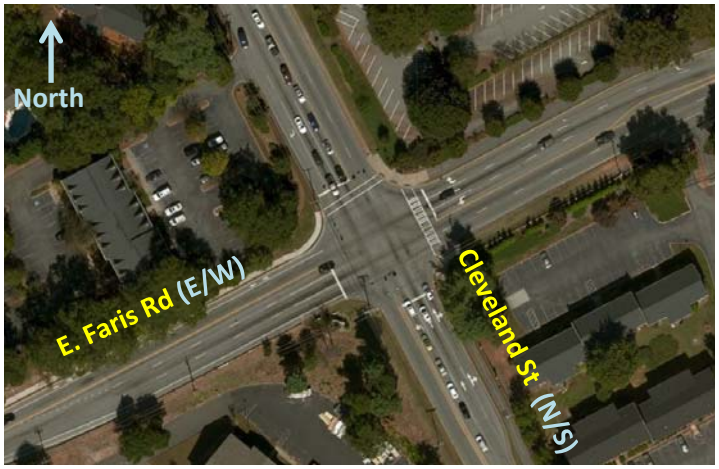
Road	Faris			Faris			Cleveland			Cleveland		
Movement	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
Existing Yellow	4.0	4.0	4.0	3.5	4.0	4.0	3.5	4.0	4.0	3.5	4.0	4.0
Calculated Yellow	**3.3**	**3.3**	**3.3**	**3.0**	**3.9**	**3.9**	**3.0**	**3.4**	**3.4**	**3.0**	**4.0**	**4.0**
Existing Red	2.0	2.0	2.0	0.5	2.0	2.0	0.5	2.0	2.0	0.5	2.0	2.0
Calculated Red	**2.9**	**2.9**	**2.9**	**3.3**	**2.4**	**2.4**	**3.3**	**2.9**	**2.9**	**3.4**	**2.4**	**2.4**

The following table below shows the existing LOS and delay and the capacity effect of a proposed R10-11a "No Turn on Red" overhead sign for the northbound approach (required sight distance is 390 feet, actual sight distance is 100 feet), and westbound approach (required sight distance is 390 feet, actual sight distance is 190 feet). There will be minor increases in overall delay and queuing as of result of restricting vehicles from turning right on red; however, vehicular and pedestrian safety are expected to improve.

Capacity Analysis

Scenario	AM Peak		PM Peak	
	LOS	**Delay (sec)**	**LOS**	**Delay (sec)**
Existing	B	18.9	C	31.6
Proposed	C	20.1	C	33.7

E. Faris Road (S-149) at Cleveland Street (S-189)



37 Crashes between (07/01/12 to 12/31/14)
8 – Right Angle
19 – Rear End
5 – Side Swipe
0 – Head On
1 – Out of Control
0 – Hit Animal
4 – Other

Crash Conditions	
9 - Night	28 - Day
9 - Wet	28 - Dry

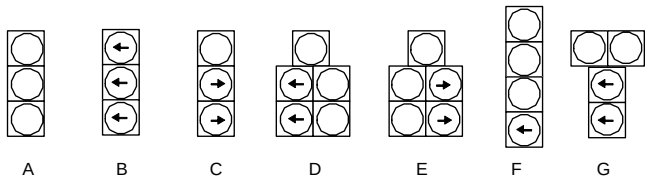
Speed limits (mph):

E. Faris Rd – 35 (EB)
E. Faris Rd – 40 (WB)
Cleveland St – 35

Signal Phasing:

	Signal Head	Phasing			Overlap		X -Walk		Ped Sig	
NB	BA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
EB	AA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
SB	BA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
WB	BA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N

* Circle if Advanced Head



Observations:

- Swamp Rabbit Trail crosses E. Faris Rd on the NB approach equating to many bicyclist and pedestrians
- SB queue is over a half a mile long in the PM peak hour
- EB approach has a steep uphill grade after steep downhill grade translating to high vehicular speeds
- No signal ahead warning signs were present
- Greenville Tech community college is located just south of this intersection
- First Baptist Greenville Church and Riverbend Apartments have no turn lanes off of E. Faris Rd
- E. Faris Rd is 4 lanes east of Cleveland St and 2 lanes west of Cleveland St

Short-Term Considerations:

- W3-3-48 “signal ahead” signs all approaches
- Retroreflectivity to existing signal head backplates
- R10-11a “No Turn on Red” sign on NB and WB approaches
- Review yellow change and red clearance intervals
- R10-12 “left-turn YIELD on Green” sign for NB, SB, and WB protected permissive signal heads
- Convert Riverbend apartment driveway on E. Faris Rd to a right-in / right-out

Long-Term Considerations:

- Widen Cleveland St to four lanes between E. Faris Rd and S. Pleasantburg Dr and restripe SB right-turn lane to a thru /right-turn lane
- Widen E. Faris Rd to a five lane section east of Cleveland St
- Repave and restripe entire intersection
- Offset left-turn lanes on Cleveland St
- Replace all five section signal heads with four section flashing yellow arrow signal heads

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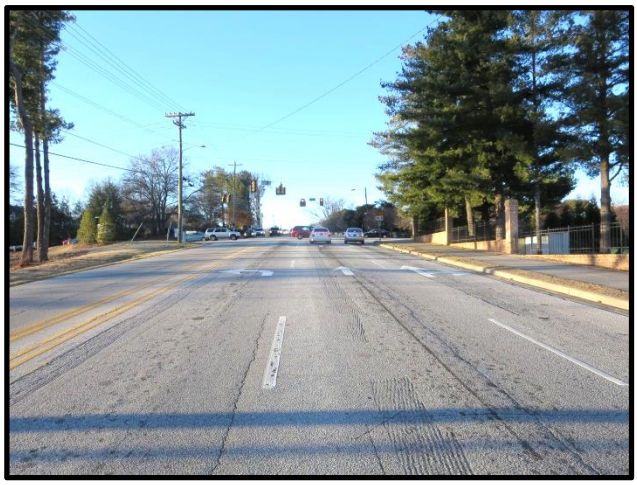
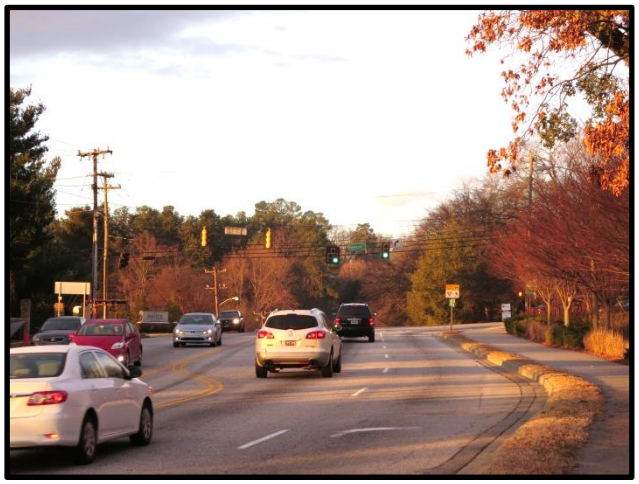
E. Faris Road (S-149) at Cleveland Street (S-189)



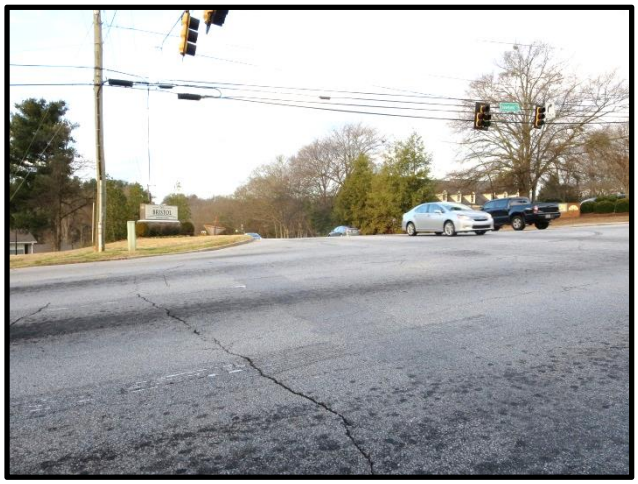
Northbound Approach

Eastbound Approach

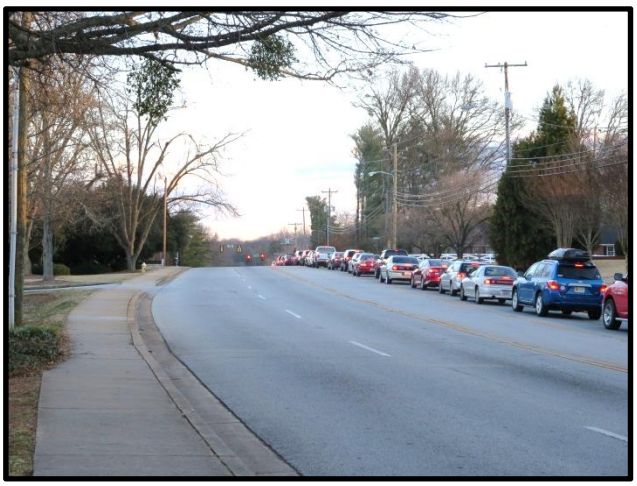
Southbound Approach



Westbound Approach



NB approach on Cleveland St has limited visibility to make a right-turn on red



Significant SB queuing along Cleveland St during the PM Peak hour. Queue extends a half a mile to Southland Avenue signal

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3.14 Laurens Road (US 276) at Woodruff Road (SC 146)

Laurens Road (US 276) is a north / south seven lane undivided principal arterial carrying between 19,800 and 29,700 vehicles per day (vpd) with a speed limit of 35 miles per hour (mph). Woodruff Road (SC 146) is an east/west four lane divided and undivided minor arterial carrying 11,900 vpd with a speed limit of 45 mph. **The collision diagram indicates that the majority of the crashes are rear-end collisions on Laurens Road and from the westbound channelized right-turn movement from Woodruff Road**. The most beneficial short-term and long-term consideration includes:

- **Short-Term**: Restripe northbound approach to provide a left-turn lane, install dual R1-2-48 "yield" signs westbound channelized right-turns, and review yellow change and red clearance intervals.

- **Long-Term:** Remove westbound right-turn channelization and replace with dual right-turns with an overlap and retime signal along Laurens Road.

Existing and Calculated Yellow Change and Red Clearance Intervals

Road	Woodruff			Woodruff			Laurens			Laurens		
Movement	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
Existing Yellow	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Calculated Yellow	**3.5**	**3.5**	**3.5**	**3.4**	**3.4**	**3.4**	**3.9**	**3.9**	**3.9**	**3.0**	**3.5**	**3.5**
Existing Red	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	2.0
Calculated Red	**3.3**	**3.3**	**3.3**	**3.0**	**3.0**	**3.0**	**3.0**	**3.0**	**3.0**	**3.9**	**3.4**	**3.4**

The following table below shows the existing LOS and delay and the capacity effect of converting the existing dual southbound left-turn lanes into a single left and a single U-turn lane to provide northbound free flow right-turn lane onto Woodruff Road. No significant changes in queues or delay are expected. By providing this U-turn, access management strategies could be applied improving the overall safety along Laurens Road.

Capacity Analysis

Scenario	AM Peak		PM Peak	
	LOS	**Delay (sec)**	**LOS**	**Delay (sec)**
Existing	B	14.3	C	21.8
Proposed	B	16.0	C	21.8

Laurens Road (US 276) at Woodruff Road (SC 146)

64 Crashes between (07/01/12 to 12/31/14)
7 – Right Angle
48 – Rear End
8 – Side Swipe
0 – Head On
0 – Out of Control
0 – Hit Animal
1 – Other

Crash Conditions	
8 - Night	56 - Day
9 - Wet	55 - Dry

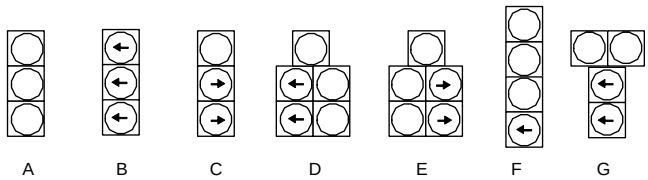
Speed limits (mph):

Laurens Rd – 35
Woodruff Rd – 45

Signal Phasing:

	Signal Head	Phasing				Overlap		X -Walk		Ped Sig	
NB	AAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
EB	FA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
SB	BBAAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
WB	FA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N

* Circle if Advanced Head



Observations:

- Speed limit on the seven lane Laurens Rd is 35 mph; however, vehicles appear to be driving faster
- No left-turn lane is striped for NB Laurens Rd, but extra pavement is available
- There is a heavy NB right-turn movement from Laurens Rd to Woodruff Rd during the AM peak
- NB queuing along Laurens Rd from the Haywood Rd intersection extends beyond Woodruff Rd causing blocking
- Heavy existing WB right-turn from Woodruff Rd must make two lane changes as one lane drops at Haywood Rd
- Laurens Rd is 7 lanes with unlimited access to business driveways
- Additional pedestrian signal heads were being install during field visit

Short-Term Considerations:

- R1-2-48 “yield signs” for WB and NB right-turns
- Paint skip lines for all turn lanes with storage especially SB approach on Laurens Rd
- Restripe NB approach to provide a left-turn lane
- Review yellow change and red clearance intervals
- Restripe one of the SB left-turn lanes to a U-turn only lane and make NB right-turn lane free flow with a R1-1A sign “keep moving” and R10-15 “ yield to pedestrians”

Long-Term Considerations:

- Remove WB right-turn channelization and replace with dual right-turns with an overlap and a R10-11a “No turn on Red” sign
- Concrete median between Haywood Rd and Woodruff Rd except left-turn access only onto Laurel Creek Ln from Laurens Rd
- A concrete median between Woodruff Rd and McDonalds / Taco Bell signal
- Retime signals along Laurens Rd

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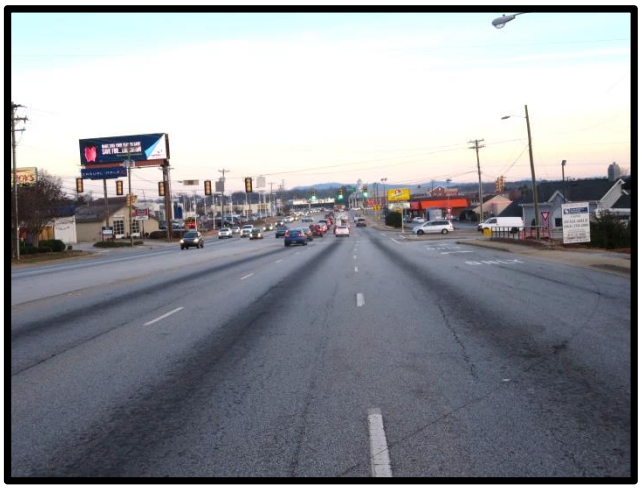
Laurens Road (US 276) at Woodruff Road (SC 146)



Northbound Approach

Eastbound Approach

Southbound Approach

Westbound Approach

WB right-turn channelized yield movement carries heavy volumes with few gaps on Laurens Rd and weaving causing rear-end collisions

Adjacent signal is less than 1000 feet away (Haywood Rd) shows grid lock between both signals making it difficult to access driveways

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3.15 Academy Street (US 123) at College Street (SC 183)

Academy Street (US 123) is a north / south six lane divided minor arterial carrying 15,600 vehicles per day (vpd) on the north leg and a principal arterial carrying 23,000 vpd on the south leg with a speed limit of 40 miles per hour (mph). College Street (SC 183) is a one way westbound four lane principal arterial carrying 11,200 vpd with a speed limit of 35 mph. **The collision diagram indicates that the majority of the crashes are right angle due to disregarding the signal in the southbound and westbound approaches**. **Approximately 40 percent of the crashes at this intersection occur at night.** The most beneficial short-term and long-term consideration includes:

- **Short-Term**: Install louvers on the westbound and southbound downstream signals and review yellow change and red clearance intervals.

- **Long-Term:** Remove downstream pedestrian signal crossing and replace with pedestrian bridge and improve overall lighting at intersection

Existing and Calculated Yellow Change and Red Clearance Intervals

Road	College			College			Academy			Academy		
Movement	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
Existing Yellow	-	-	-	4.0	4.0	4.0	3.5	4.0	4.0	4.0	4.0	4.0
Calculated Yellow	**-**	**-**	**-**	**3.5**	**3.5**	**3.5**	**3.0**	**3.9**	**3.9**	**4.1**	**4.1**	**4.1**
Existing Red	-	-	-	2.0	2.0	2.0	0.5	2.0	2.0	2.0	2.0	2.0
Calculated Red	**-**	**-**	**-**	**3.2**	**3.2**	**3.2**	**3.7**	**2.8**	**2.8**	**1.8**	**1.8**	**1.8**

The following table below shows the existing LOS and delay and the capacity effect of restriping westbound College Street to provide one left-turn lane to help with existing sideswipes crashes. The northbound left-turn lane on Academy Street is also changed from protected-permissive to protected-only phasing. By protecting the northbound left-turn phase, minor queuing is expected and may exceed storage length; therefore, this split may need adjusted. No significant queuing in the westbound direction is expected as result of removing one of the left-turn lanes.

Capacity Analysis

Scenario	AM Peak		PM Peak	
	LOS	**Delay (sec)**	**LOS**	**Delay (sec)**
Existing	C	20.2	C	21.5
Proposed	C	27.8	C	24.5

Academy Street (US 123) at College Street (SC 183)

55 Crashes between (07/01/12 to 12/31/14)
27 – Right Angle
14 – Rear End
14 – Side Swipe
0 – Head On
0 – Out of Control
0 – Hit Animal
0 – Other

Crash Conditions	
24 - Night	31 - Day
13 - Wet	42 - Dry

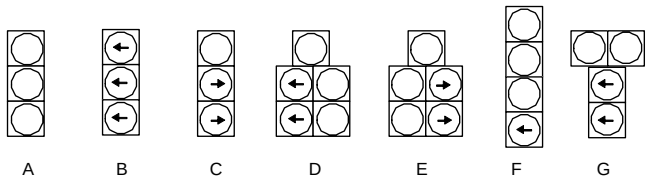
Speed limits (mph):

N. Academy St – 40
College St – 35

Signal Phasing:

	Signal Head	Phasing	Overlap	X -Walk	Ped Sig
NB	DA	Prot PP Perm Split	Y N	Y N	Y N
EB		Prot PP Perm Split	Y N	Y N	Y N
SB	AA	Prot PP Perm Split	Y N	Y N	Y N
WB	AAA	Prot PP Perm Split	Y N	Y N	Y N

* Circle if Advanced Head



Observations:

- Academy St does not appear to be coordinated
- There is a downstream pedestrian crossing that is triggered even by pedestrians crossing Buncombe St
- Vehicles do not stay in their own lanes when passing though the dual left-turn lanes from College St
- The spacing of the adjacent signals may contribute to the disregard to traffic control if looking at downstream signal
- Trees in the median with foliage may restrict sight distance for the NB protected permissive left-turn
- SB and NB queuing on Academy St at Buncombe St extends beyond study intersection creating gridlock
- Pavement was in poor condition

Short-Term Considerations:

- Retroreflective backplates
- Louvers on WB and SB downstream signals
- NB R10-12 “left-turn YIELD on Green” sign
- Restripe WB approach to have one left-turn lane
- Review yellow change and red clearance intervals
- Protected only phasing for NB left-turn
- WB R3-5L overhead “left-turn” sign on mast arm
- An additional signal head on WB approach
- R10-15 “yield to pedestrian” signs all approaches

Long-Term Considerations:

- Overhead lane usage signs
- Improve overall lighting at intersection
- Improve coordination along Academy St
- Remove downstream pedestrian signal crossing and replace with pedestrian bridge
- Remove NB left-turn phasing / lane and reroute to W Elford to Main St and provide three SB receiving lanes
- Repave and restripe entire intersection

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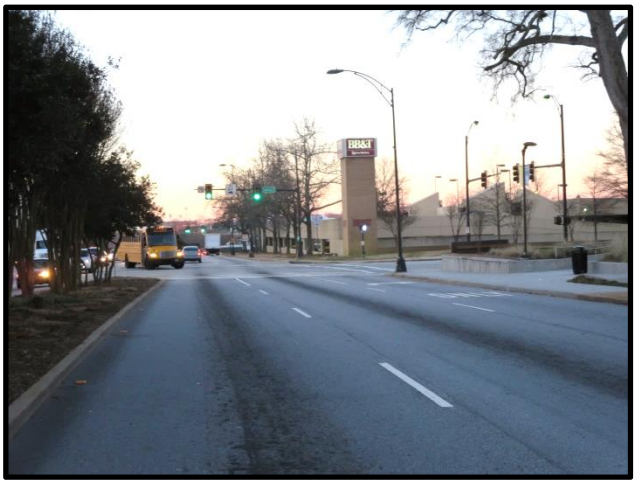
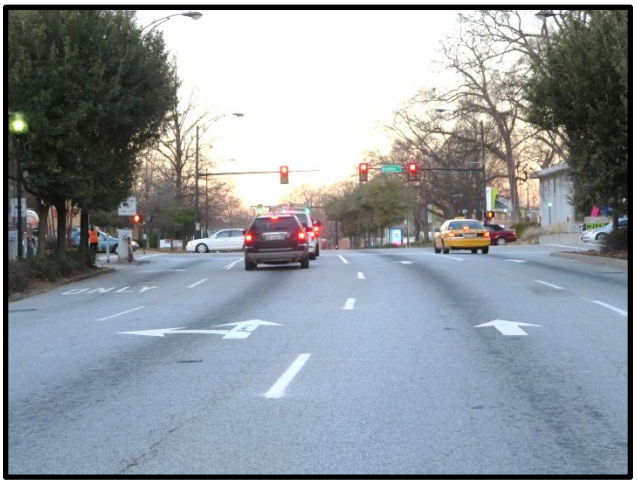
Academy Street (US 123) at College Street (SC 183)

Northbound Approach

Eastbound Approach

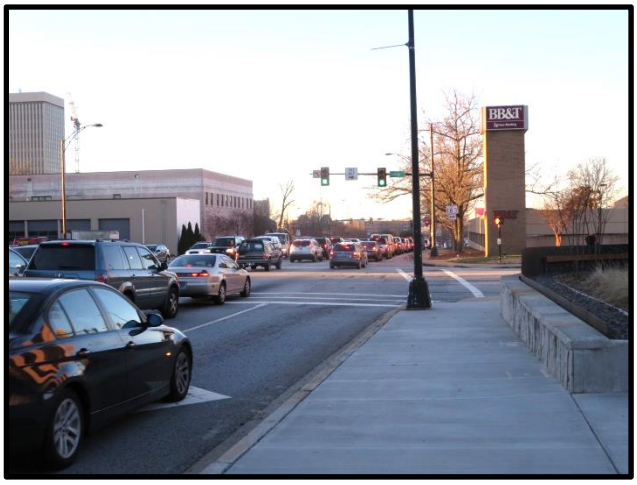


Southbound Approach



Westbound Approach

WB College St has many collisions involving disregard to traffic control possibly linked to the downstream pedestrian signal crossing that is in the cone of vision



SB Academy St congestion queues beyond signal creating gridlock and vehicles block intersection prohibiting passage

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3.16 Stone Avenue (US 276) at Rutherford Street (S-200 / US 276)

Stone Avenue (US 276) is an east / west four lane undivided minor arterial carrying 18,700 vehicles per day (vpd) on the east leg and a local road with a 6,700 vpd on the west leg with a speed limit of 35 miles per hour (mph). Rutherford Street (US 276 & S-200) is a north / south five lane divided and undivided principal arterial carrying between 15,000 and 25,100 vpd with a speed limit of 35 mph. **The collision diagram indicates an evenly divided type of crashes between angle and rear-end**. **It is to be noted that four (4) pedestrian have been injured at this intersection over the past 2.5 years.** The most beneficial short-term and long-term consideration includes:

- **Short-Term**: Install retroreflective backplates for signal heads, a W3-3-48 "signal ahead" warning signs for each approach, a R10-12 "left turn Yield on Green Ball" signs for each protective-permissive signal head, a northbound R10-11a "No Turn on Red" sign, an EB nearside head (required sight distance is 250 feet, actual sight distance is 200 feet), truncated domes and trim corner bushes, repaint medians, repaint NB stop bar and ladder crosswalks, and R10-15 "yield to pedestrians" signs for all approaches.

- **Long-Term:** Install decorative pavers for cross walks with flashing lights embedded in pavement and improve overall lighting at intersection

Existing and Calculated Yellow Change and Red Clearance Intervals

Road	Stone			Stone			Rutherford			Rutherford		
Movement	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
Existing Yellow	3.5	4.0	4.0	3.5	4.0	4.0	4.0	4.0	4.0	3.6	4.0	4.0
Calculated Yellow	**3.0**	**3.4**	**3.4**	**3.0**	**3.4**	**3.4**	**3.6**	**3.6**	**3.6**	**3.0**	**3.7**	**3.7**
Existing Red	1.0	2.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0	1.5	2.0	2.0
Calculated Red	**3.3**	**2.9**	**2.9**	**3.3**	**2.6**	**2.6**	**2.7**	**2.7**	**2.7**	**3.3**	**2.6**	**2.6**

The following table below shows the existing LOS and delay and the capacity effect of adding a R10-11a "No Turn on Red" (required sight distance is 390 feet, actual sight distance is 130 feet) for the northbound approach along Rutherford Street. Overall delay and queuing is not expected to increase. This "No Turn on Red" consideration is expected to improve vehicular and pedestrian safety at this intersection.

Capacity Analysis

Scenario	AM Peak		PM Peak	
	LOS	**Delay (sec)**	**LOS**	**Delay (sec)**
Existing	C	20.6	D	36.8
Proposed	C	20.8	D	36.5

Stone Avenue (US 276) at Rutherford Street (S-200 / US 276)

32 Crashes between (08/01/12 to 12/31/14)
12 – Right Angle
12 – Rear End
4 – Side Swipe
0 – Head On
0 – Out of Control
0 – Hit Animal
4 – Other

Crash Conditions	
6 - Night	26 - Day
7 - Wet	25 - Dry

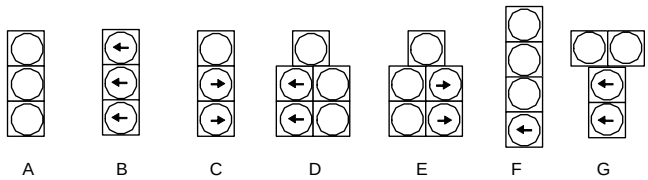
Speed limits (mph):

Stone Ave – 35
Rutherford St – 35

Signal Phasing:

	Signal Head	Phasing				Overlap		X -Walk		Ped Sig	
NB	AA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
EB	DA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
SB	DA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
WB	DE	Prot	PP	Perm	Split	Y	N	Y	N	Y	N

* Circle if Advanced Head



Observations:

- NB right-turn on red has limited sight distance due to building set back and EB approach horizontal curve
- EB approach intersects with a sharp curve with limited sight distance of signal heads
- There was a high number of pedestrians using this intersection
- SB left-turn queuing was significant and extended beyond the pedestrian crossing under signal control
- WB receiving leg on Stone Ave has bollards in one of the two receiving lanes to create a single receiving lane
- Red light running and pedestrians not using pedestrian push buttons was a regular occurrence
- R10-11a “No Turn on Red” overhead sign is located on SB approach

Short-Term Considerations:

- Retroreflective back plates
- W3-3-48 “signal ahead” on all approaches
- SB/EB/WB R10-12 “left-turn YIELD on Green” signs
- R10-11a NB “No Turn on Red” overhead sign
- Review yellow change and red clearance intervals
- EB near side signal head
- Truncated domes and trim corner bushes
- Repaint medians, NB stop bar, ladder x-walks
- R10-15 "yield to pedestrians” signs all approaches

Long-Term Considerations:

- Crosswalks with flashing lights embedded in pavement
- Decorative paver for cross walks
- Improve overall lighting at intersection
- Fencing at intersection corners to limit ped access
- An additional SB left-turn lane
- Purchase property in SW corner to provide quadrant left intersection eliminating existing SB left-turn movement

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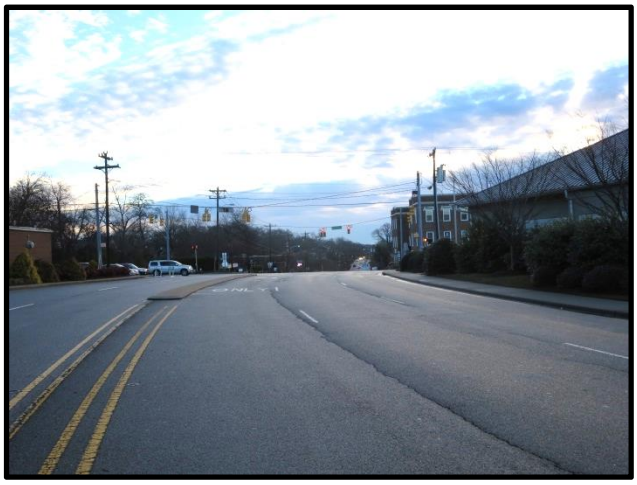
Stone Avenue (US 276) at Rutherford Street (S-200 / US 276)

Northbound Approach



Eastbound Approach

Southbound Approach

Westbound Approach

EB Stone Ave limited sight distance of signal heads due to horizontal curvature

Long SB left-turn lane queues extending beyond pedestrian signal crossing combined with many pedestrians traversing this intersection

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3.17 E. North Street (S-94) at Pelham Road (S-492)

Pelham Road (S-492) is a north / south five lane undivided minor arterial carrying 18,700 vehicles per day (vpd) with a speed limit of 45 miles per hour (mph). E. North Street (S-94) is an east / west four lane undivided minor arterial carrying between 14,900 and 28,000 vpd with a speed limit of 35 mph. **The collision diagram indicates that the majority of the crashes are rear-end along E. North St directly related to capacity and congestion between the N. Pleasantburg Dr and Pelham Rd signals**. The most beneficial short-term and long-term consideration includes:

- **Short-Term**: Install retroreflective backplates on signal heads, install "watch of stopped traffic" warning sign on westbound approach prior to crest of hill, and review yellow change and red clearance intervals.

- **Long-Term:** Install a raised concrete median between N. Pleasantburg Drive and Pelham Rd, review signal timing plans on E. North St, and install an additional westbound right-turn lane at N. Pleasantburg Drive intersection.

Existing and Calculated Yellow Change and Red Clearance Intervals

Road	E. North			E. North			Pelham			Shopping		
Movement	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
Existing Yellow	3.5	4.0	4.0	3.5	3.5	3.5	4.0	4.0	4.0	3.5	3.5	3.5
Calculated Yellow	**3.0**	**3.6**	**3.6**	**3.0**	**3.6**	**3.6**	**3.3**	**3.3**	**3.3**	**3.0**	**3.0**	**3.0**
Existing Red	1.0	2.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Calculated Red	**3.9**	**3.3**	**3.3**	**2.9**	**2.3**	**2.3**	**3.1**	**3.1**	**3.1**	**3.3**	**3.3**	**3.3**

The following table below shows the existing LOS and delay and the proposed capacity effect of restriping the existing westbound left-turn lane to a through lane eliminating this left-turn movement. This analysis also include an additional westbound right-turn lane at the intersection of N. Plesantburg Drive. Queuing and delay in the westbound directions is expected to decrease with these considerations.

Capacity Analysis

Scenario	AM Peak		PM Peak	
	LOS	**Delay (sec)**	**LOS**	**Delay (sec)**
Existing (Pelham Rd)	C	25.0	C	30.0
Proposed (Pelham Rd)	C	23.0	C	22.7
Existing (N. Pleasantburg Dr)	D	49.6	E	76.1
Proposed (N. Pleasantburg Dr)	D	49.8	E	57.9

E. North Street (S-94) at Pelham Road (S-492)

40 Crashes between (07/01/12 to 12/31/14)
11 – Right Angle
21 – Rear End
4 – Side Swipe
0 – Head On
0 – Out of Control
0 – Hit Animal
4 – Other

Crash Conditions	
7 - Night	33 - Day
11 - Wet	29 - Dry

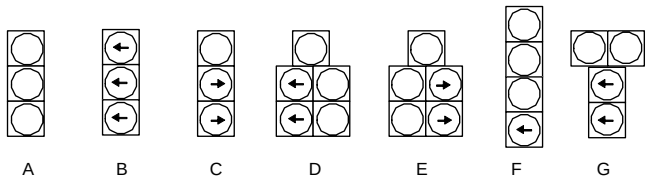
Speed limits (mph):

E. North St – 35
Pelham Rd – 45

Signal Phasing:

	Signal Head	Phasing				Overlap	X -Walk	Ped Sig
NB	FFA	Prot	PP	Perm	**Split**	Y **N**	Y **N**	Y **N**
EB	DA	Prot	**PP**	Perm	Split	Y **N**	Y **N**	Y **N**
SB	FA	Prot	PP	Perm	**Split**	Y **N**	Y **N**	Y **N**
WB	DA	Prot	**PP**	Perm	Split	Y **N**	**Y** N	Y **N**

* Circle if Advanced Head



Observations:

- WB queues along E. North St extend beyond Trenholm Rd with limited sight distance due to vertical curvature
- No access management restrictions or turn lanes along E. North St between N. Pleasantburg Dr and Pelham Rd as vehicles stop in through lanes to cross three or more lanes to access driveways.
- Center NB left-turn lane (dual lefts) predominantly used in anticipation of turning right onto N. Pleasantburg Dr
- R10-11a "No Turn on Red" overhead sign is located on SB approach
- Single WB right-turn lane at downstream N. Pleasantburg Dr is over capacity and queues block Pelham intersection
- EB right-turn movement is free flow though a posted yield sign causes vehicle to hesitate through turn

Short-Term Considerations:

- Retroreflective back plates
- A "watch for stopped traffic" sign on WB approach prior to crest of hill
- EB/WB R10-12 "left-turn YIELD on Green" signs
- Remove EB R1-2 "yield" sign and replace with a R1-1A "keep moving sign prior to intersection
- Review yellow change and red clearance intervals
- R10-7 "Do Not Block Intersection" sign for NB/WB
- Pedestrian heads and push buttons at x-walks

Long-Term Considerations:

- A raised concrete median between N. Pleasantburg Dr and Pelham Rd
- Review signal timing plans on E. North St
- An additional WB right-turn lane at N. Pleasantburg Dr intersection
- An advance warning flasher on NB approach
- Flashing Yellow Arrows on E. North St
- Restripe WB left-turn lane to a through lane
- Combine driveways South of E. North St

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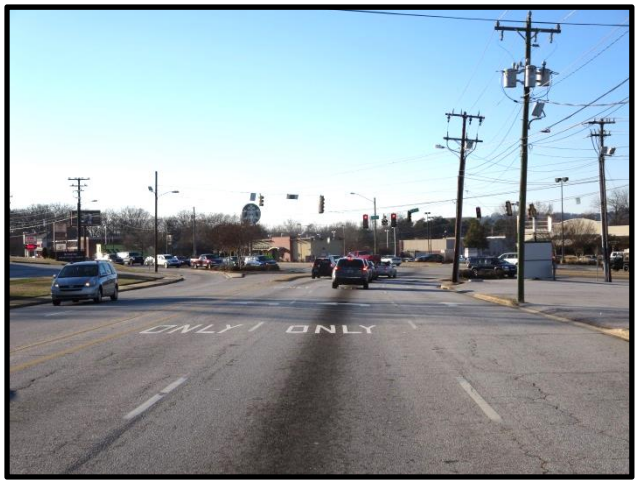
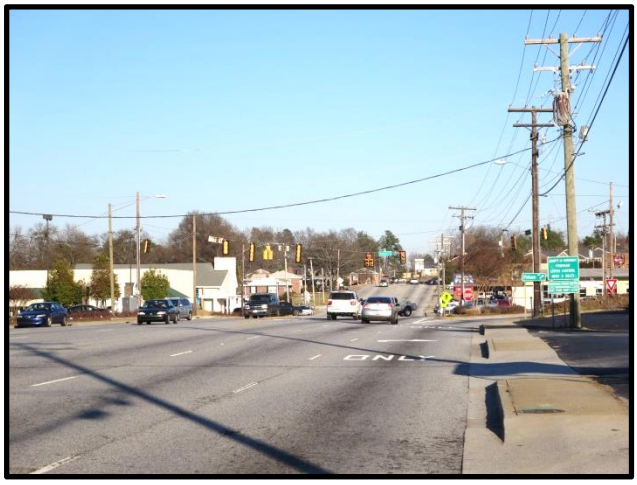
E. North Street (S-94) at Pelham Road (S-492)



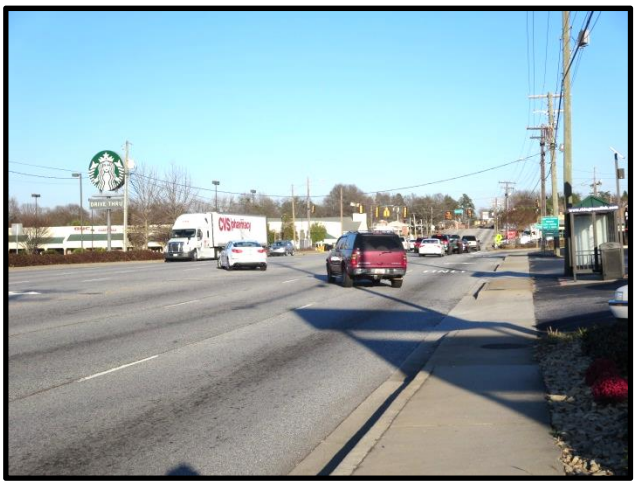
Northbound Approach



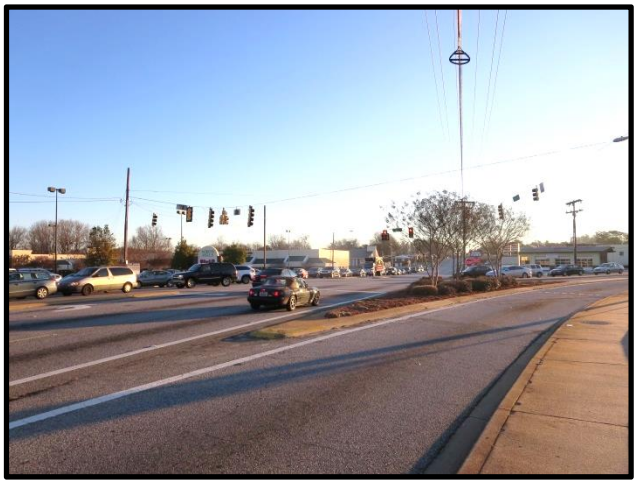
Eastbound Approach

Southbound Approach

Westbound Approach



Vehicles stop in EB through lane or use one of the opposing dual left-turn lanes to turn left into North Hills Development to access Starbucks



WB vehicular queues along E. North St from the N. Pleasantburg Dr. intersection extend beyond Pelham Rd blocking intersection

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3.18 Laurens Road (US 276) at E. Parkins Mill Road (S-1016) / Verdae Boulevard

Laurens Road (US 276) is a north / south seven lane undivided principal arterial carrying 29,700 vehicles per day (vpd) with a speed limit of 40 miles per hour (mph). The west leg of the intersection, E. Parkins Mill Road (S-1016), is an east / west two lane undivided collector road carrying 9,500 vpd with a speed limit of 35 mph. The east leg of the intersection, Verdae Boulevard (local), is an east / west four to five lane divided collector road carrying 12,800 vpd with a speed limit of 45 mph. **The collision diagram indicates that the majority of the crashes are rear-end on all approaches contributing to approximately 70 percent of all crashes**. The most beneficial short-term and long-term consideration includes:

- **Short-Term**: Add retroreflectivity to all existing backplates and extend green time splits for eastbound and westbound left-turns from Verdae Boulevard and E. Parkins Mill Road. Review yellow change and red clearance intervals

- **Long-Term:** Retime signals along Laurens Road corridor and install overhead Advance Warning Flashers on both Laurens Road approaches.

Existing and Calculated Yellow Change and Red Clearance Intervals

Road	**Parkins Mill**			**Verdae**			**Laurens**			**Laurens**		
Movement	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
Existing Yellow	3.5	4.0	4.0	4.0	4.0	4.0	3.5	5.0	5.0	3.5	5.0	5.0
Calculated Yellow	**3.0**	**3.5**	**3.5**	**3.0**	**4.6**	**4.6**	**3.0**	**4.7**	**4.7**	**3.0**	**4.2**	**4.2**
Existing Red	0.5	2.0	2.0	2.0	2.0	2.0	0.5	2.0	2.0	0.5	2.0	2.0
Calculated Red	**3.6**	**3.1**	**3.1**	**4.1**	**2.5**	**2.5**	**3.9**	**2.2**	**2.2**	**4.1**	**2.9**	**2.9**

The following table below shows the existing LOS and delay and the proposed capacity effect of adding an additional eastbound left-turn lane on E. Parkins Mill Road providing dual left-turn lanes, removing the channelization for the westbound right-turn on Verdae Boulevard, and adding a southbound right-turn overlap on Laurens Road. Queue lengths are expected to decrease, weaving issue on Laurens Road just north of intersection is removed, and overall delay is expected to improve or stay the same because of these considerations.

Capacity Analysis

Scenario	**AM Peak**		**PM Peak**	
	LOS	**Delay (sec)**	**LOS**	**Delay (sec)**
Existing	C	26.8	C	31.7
Proposed	C	26.5	C	31.8

Laurens Road (US 276) at E. Parkins Mill Road (S-1016) / Verdae Boulevard

84 Crashes between (07/01/12 to 12/31/14)
16 – Right Angle
59 – Rear End
6 – Side Swipe
2 – Head On
0 – Out of Control
0 – Hit Animal
1 – Other

Crash Conditions	
9 - Night	75 - Day
9 - Wet	75 - Dry

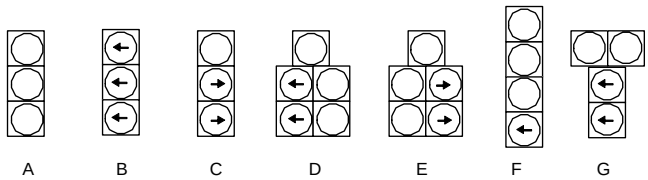
Speed limits (mph):

Laurens Rd – 40
E. Parkins Mill Rd – 35
Verdae Blvd – 45

Signal Phasing:

	Signal Head	Phasing				Overlap		X -Walk		Ped Sig	
NB	BAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
EB	DA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
SB	BBAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
WB	BBAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N

* Circle if Advanced Head



Observations:

- Significant queuing for dual-left-turn lanes on Verdae Blvd as a result of split allocated for this movement
- Pedestrian crossings may be challenging without pedestrian signals and with channelized right-turns
- Sun is an issue by limiting visibility in the PM peak hour along WB Verdae Blvd
- Very few pedestrians were observed during the peak hours
- Queuing extends beyond storage length for single EB left-turn lane
- Laurens Rd is 7 lanes with unlimited access to business driveways
- SB queue during PM peak hour on Laurens Rd extends past Jeep Dealership blocking access to / from driveways

Short-Term Considerations:

- A R1-1A "keep moving" sign for NB right-turn
- R10-12 "left-turn YIELD on Green" for EB approach
- Retroreflective backplates & add 1 NB signal head
- Extend green time splits for EB/WB left-turn phase
- Review yellow change and red clearance intervals
- Pedestrian signals and push buttons
- Repaint x-walks, skips, add "yield to peds" signs
- Restripe to provide dual EB left-turns
- Add a SB right-turn overlap

Long-Term Considerations:

- Remove WB right-turn channelization on Verdae Blvd and convert to signal control. Then restripe existing pavement on Laurens Rd to provide right-turn lane into Burger King Driveway
- Concrete median on Verdae Blvd that extends from beyond Olive Garden Driveway
- Advanced warning flashers on both directions on Laurens Rd
- Retime signals along Laurens Rd

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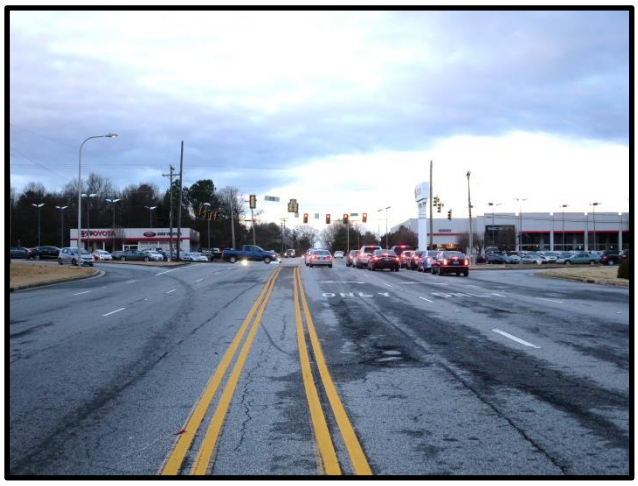
Laurens Road (US 276) at E. Parkins Mill Road (S-1016) / Verdae Boulevard

Northbound Approach

Eastbound Approach

Southbound Approach



Westbound Approach

WB right-turn channelized yield movement onto Laurens Rd creates a weaving movement with right-turn lane into shopping center driveway.

NB right-turn lane is free flow but vehicles stop as if it was a yield condition. Significant queuing is also present on Verdae Blvd.

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3.19 Roper Mountain Road (S-183) at Frontage Road (S-1103) / Independence Boulevard (S-1102)

Roper Mountain Road (S-183) is a five-lane collector road carrying 18,300 vehicles (vpd) with a speed limit of 40 miles per hour (mph). Frontage Road (S-1103l) / Independence Boulevard (S-1102) is an east / west state-maintained road with a speed limit of 35 mph carrying approximately 4,800 vpd on the west leg and 9,100 vpd on the east leg. **The collision diagram indicates that the majority of the crashes are rear-end associated with congested conditions including queuing and blocking at the intersection.** The most beneficial short-term and long-term consideration includes:

- **Short-Term**: Retroreflective backplates on signal heads, W3-3-48 "signal ahead" warning signs on each approach, and R10-7 "Do Not Block Intersection" signs on each approach, and a nearside signal on the Independence Boulevard approach (required sight distance is 250 feet, actual sight distance is 120 feet).

- **Long-Term:** Improve capacity at intersection by restriping Frontage Road to a shared left / through lane and a single right-turn lane with an overlap. Reconfigure I-385 Southbound On Ramp from Roper Mountain Road to dual southbound left-turn lanes and widen on ramp to two lanes to receive the extra left-turn lane. Reconfigure I-385 Northbound On Ramp from Roper Mountain Road to a single left-turn lane. These considerations are expected to require no additional bridge widening on Roper Mountain Road.

Road	Frontage			Independence			Roper Mountain			Roper Mountain		
Movement	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
Existing Yellow	4.0	4.0	4.0	4.0	4.0	4.0	3.5	4.0	4.0	4.0	4.0	4.0
Calculated Yellow	**3.4**	**3.4**	**3.4**	**3.5**	**3.5**	**3.5**	**3.0**	**3.9**	**3.9**	**4.2**	**4.2**	**4.2**
Existing Red	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Calculated Red	**3.6**	**3.6**	**3.6**	**3.3**	**3.3**	**3.3**	**3.7**	**2.8**	**2.8**	**2.6**	**2.6**	**2.6**

The following table below shows the existing LOS and delay and the capacity effect of restriping Frontage Road to a shared left / through lane and a single right-turn lane with an overlap. Reconfigure I-385 Southbound On Ramp on Roper Mountain Road to dual southbound left-turn lanes and widen on ramp to two lanes. Reconfigure I-385 Northbound On Ramp on Roper Mountain Road to a single left-turn lane. Queuing is expected to decrease by implementing these considerations as well as overall delay.

Capacity Analysis

Scenario	AM Peak		PM Peak	
	LOS	**Delay (sec)**	**LOS**	**Delay (sec)**
Existing (Frontage Rd / Independence Blvd)	C	25.6	C	34.8
Proposed (Frontage Rd / Independence Blvd)	C	21.7	C	26.4
Existing (I-385 NB Ramps)	B	18.5	C	28.7
Proposed (I-385 NB Ramps)	B	15.2	C	20.2
Existing (I-385 SB Ramps)	B	13.2	B	16.6
Proposed (I-385 SB Ramps)	B	13.0	B	14.8

Roper Mountain Road (S-183) at Frontage Rd (S-1103) / Independence Blvd (S-1102)

18 Crashes between (11/01/12 to 10/31/14)
1 – Right Angle
14 – Rear End
3 – Side Swipe
0 – Head On
0 – Out of Control
0 – Hit Animal
0 – Other

Crash Conditions	
1 - Night	17 - Day
4 - Wet	14 - Dry

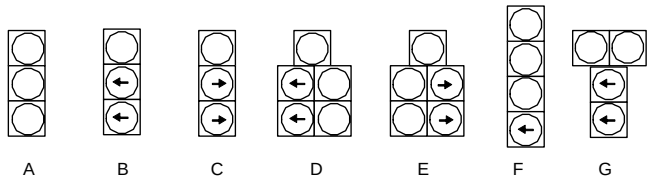
Speed limits (mph):

Roper Mountain Rd – 40
Frontage Rd – 35
Independence Blvd – 35

Signal Phasing:

	Signal Head	Phasing				Overlap		X -Walk		Ped Sig	
NB	DA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
EB	FA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
SB	AA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
WB	BFC	Prot	PP	Perm	Split	Y	N	Y	N	Y	N

* Circle if Advanced Head



Observations:

- The single SB left-turn lane onto I-385 EB is over capacity and queues extend beyond study intersection
- Vehicles block intersection creating long queues on Frontage Road and Independence Blvd
- EB phase on Frontage Rd skips when no left turn was present and right turn vehicles were not on loop
- Multiple vehicles traveling EB and SB cut through the adjacent parking lot to avoid sitting in queues
- Significant queuing exist in the SB direction extending to the Roper Mountain Extension signalized intersection
- NB left-turns onto Frontage Road are restricted when vehicles block intersection
- Horizontal and vertical curvature on side streets may create sight distance issues with existing signal heads

Short-Term Considerations:

- Retroreflective backplates and W3-3-48 “signal ahead” warning signs on each approach
- R10-7 “Do Not Block Intersection” all approaches
- Add EB queue loop or right turn loop
- Restripe EB approach to a shared left-through lane and a right turn lane with overlap
- Nearside signal head on Independence Blvd approach
- R10-12 “Left-turn YIELD on Green” NB approach

Long-Term Considerations:

- (1) Reconfigure NB leg to remove median and restripe an additional SB receiving lane signed as I-385 to provide additional storage for EB On-Ramp
- (2) provide dual I-385 EB left-turn lanes / widen on ramp and replace existing dual I-385 WB left-turn lanes with a single without widening bridge
- Analyze signal timing of corridor and include possible NB protected left turn
- Review Innovative Interchange

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Roper Mountain Road (S-183) at Frontage Rd (S-1103) / Independence Blvd (S-1102)

Northbound Approach

Eastbound Approach

Southbound Approach

Westbound Approach

Queuing & Blocked Intersection - SB Receiving

WB approach has limited sight distance of signal heads due horizontal and vertical curvature

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3.20 Laurens Road (US 276) at Millennium Boulevard / Fairforest Way

Laurens Road (US 276) is a north / south six lane divided southbound and four lane divided northbound principal arterial carrying between 21,500 and 29,700 vehicles per day (vpd) with a speed limit of 40 miles per hour (mph). The west leg of the intersection, Fairforest Way, is an east / west three lane undivided collector road carrying 6,300 vpd with a speed limit of 30 mph. The east leg of the intersection, Millennium Boulevard, is an east / west four lane divided local road carrying 6,300 vehicles per day (vpd) with a speed limit of 35 mph. **The collision diagram indicates that the majority of the crashes are rear-end primarily in the northbound direction along Lauren Road.** The most beneficial short-term and long-term consideration includes:

- **Short-Term**: Install retroreflective backplates, review yellow change and red clearance intervals, and provide W3-3-48 “signal ahead” warning signs on all approaches

- **Long-Term:** Construct a third northbound through lane on Laurens Road that extends to the I-85 Ramps and install an overhead Advanced Warning Flasher on both approaches along Laurens Road.

Existing and Calculated Yellow Change and Red Clearance Intervals

Road	Fairforest			Millennium			Laurens			Laurens		
Movement	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
Existing Yellow	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.5	4.5	3.5	4.5	4.5
Calculated Yellow	**3.0**	**3.8**	**3.8**	**3.0**	**3.7**	**3.7**	**3.0**	**4.1**	**4.1**	**3.0**	**4.2**	**4.2**
Existing Red	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Calculated Red	**4.6**	**3.8**	**3.8**	**4.2**	**3.5**	**3.5**	**3.8**	**3.0**	**3.0**	**3.6**	**2.4**	**2.4**

The following table below shows the existing LOS and delay and the capacity effect of restriping an eastbound right-turn lane with an overlap on Fairforest Way, and restriping and constructing a third northbound through lane extending to I-85 NB On Ramp. Northbound queueing along Laurens Road is expected to be reduced by 50 percent because of these considerations.

Capacity Analysis

Scenario	AM Peak		PM Peak	
	LOS	**Delay (sec)**	**LOS**	**Delay (sec)**
Existing	B	13.5	B	19.0
Proposed	B	11.6	B	18.2

Laurens Road (US 276) at Millennium Boulevard / Fairforest Way

26 Crashes between (09/01/12 to 12/31/14)
1 – Right Angle
20 – Rear End
4 – Side Swipe
0 – Head On
1 – Out of Control
0 – Hit Animal
0 – Other

Crash Conditions	
4 - Night	22 - Day
4 - Wet	22 - Dry

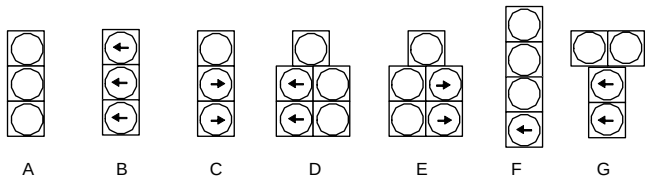
Speed limits (mph):

Laurens Rd – 40
Fairforest Way – 30
Millennium Blvd – 35

Signal Phasing:

	Signal Head	Phasing				Overlap		X -Walk		Ped Sig	
NB	DAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
EB	BBAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
SB	DAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
WB	DAAE	Prot	PP	Perm	Split	Y	N	Y	N	Y	N

* Circle if Advanced Head



Observations:

- R10-11a "No Turn on Red" overhead sign prohibits the dual WB right-turns from Millennium Blvd to Laurens Rd
- No left-turn lane skip lines are provided for the dual EB turns through the intersection
- Young driver population on Fairforest Way with JL Mann High School and Christ Church Episcopal School
- Significant queuing (NB Laurens Rd during AM peak, SB Laurens Rd during PM peak, EB Fairforest Way both peaks)
- Severe rutting through center of intersection / poor pavement conditions
- Vehicles are use median break on Millennium Blvd to make a U-turn maneuver
- SB channelized right-turn movement is heavy and conducted at high speeds with limited pedestrian visibility

Short-Term Considerations:

- Retroreflective backplates
- Close median on Millennium Blvd
- Restripe entire intersection especially skip lines
- Review yellow change and red clearance intervals
- R10-12 overhead signs beside 5-section heads
- Two R1-2 "Yield" signs for SB right-turn
- Provide W3-3-48 "signal ahead" on all approaches
- Restripe an EB right-turn lane with overlap
- NB right-turn overlap

Long-Term Considerations:

- Repave entire intersection
- Restripe and construct a third NB through lane to I-85 ramps
- Overhead advanced warning flasher on both directions on Laurens Rd
- Retime signals along Laurens Rd
- Decorative pavers for cross walks and R10-15 "yield to pedestrians"overhead signs
- Landscape medians along Laurens Rd

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Laurens Road (US 276) at Millennium Boulevard / Fairforest Way

Northbound Approach

Eastbound Approach

Southbound Approach

Westbound Approach

NB queuing on Laurens Rd extends over 1000 feet during AM pear hour. SB right shoulder south of intersection on Laurens Rd in poor condition.

Laurens Rd is severely rutted as shown with the crosswalk vertical curvature. Vehicles traveling to / from the Fairforest Way / Milliennium Blvd must slow down

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4 Action Plan

Based on AECOM's safety analysis at 20 (twenty) intersections within the City of Greenville limits, many short-term considerations can be implemented immediately such as modifying existing yellow change and red clearance intervals, signage, pavement markings and others. AECOM calculated yellow change and red clearance intervals for each of the study intersection using SCDOT latest methodologies. The City should review these calculations and modify the intervals accordingly. AECOM noted in the field and from timing worksheets that not all signals operate with the same controller. It is recommended that the City upgrade its equipment to assist with standardization of uploading and downloading timings or manual entry to help quality control and efficiency. Some of the considerations provided in this analysis such as upgrading to flashing yellow arrow signal heads or using an adaptive signal system may have implementation constraints based on the older signal controllers at some locations.

Many of the safety considerations detailed in this report may have positive impact on safety, but may have an adverse effect on capacity. AECOM has identified the following low cost considerations (signs, signals, striping, and foliage removal) that can be implemented without having adverse effect on capacity and have generally proven to reduce crashes in other locations around the State and the region.

Table 4 – Immediate Consideration List

#	Intersection	Considerations
1	Haywood Rd at I-385 NB Ramps	• Retroreflective backplates • R10-15 "yield to pedestrians" sign on SB approach • Remove foliage in northwest quadrant to improve vehicular view of pedestrian crossing
2	Haywood Rd at I-385 SB Ramps	• Retroreflective backplates • W3-3-48 "signal ahead" warning signs for Off Ramp
3	N. Pleasantburg Dr at Villa Rd / Century Dr	• Retroreflective backplates • R10-12 "Left-turn Yield on Green Ball" signs on N. Pleasantburg Dr • Increase number of signal heads on N. Pleasantburg Dr. • Pedestrian head, push buttons, and x-walks
4	S. Pleasantburg Dr at E. Antrim Dr / W. Antrim Dr	• Additional signal heads on S. Pleasantburg Dr • W3-3-48 "signal ahead" warning signs • New retroreflective overhead lane usage signs on S. Pleasantburg Dr.
5	Pendleton St at Easley Bridge Rd / S. Academy St	• Pedestrian heads and push buttons (NB, SB, WB) • W3-3-48 "signal ahead" warning signs on S. Academy St • EB right-turn overlap on Academy St.
6	S. Pleasantburg Dr at Mauldin Rd	• Pedestrian signals for SB and WB approaches • New overhead lane usage signs

Table 4 (Con't) – Immediate Consideration List

#	Intersection	Considerations
7	Pleasantburg Dr at Rutherford Rd	• Crosswalks and pedestrian heads for NB and WB approaches • R10-15 "yield to pedestrians" signs for SB and EB approaches
8	Haywood Rd at Pelham Rd	• SB "Watch for Stopped Traffic" sign • R10-7 "Do Not Block Intersection" sign on EB and SB approaches • EB right-turn overlap
9	Augusta Rd at Mauldin Rd / Potomac Ave	• W3-3-48 "signal ahead" warning signs on NB, SB, and WB approaches • Retroreflective backplates • Stripe yield lines for SB and NB right-turns
10	S. Pleasantburg Dr at Cleveland St / Cleveland St Ext	• R10-12 "Left-turn YIELD on Green Ball" signs on S. Pleasantburg Dr approaches • Nearside head for WB approach
11	Woodruff Rd at Verdae Blvd / Roper Mountain Rd	• Remove shrubbery in northeast quadrant for WB right-turns • Additional signal heads on Woodruff Rd • Dual R1-2-48 "yield" signs for all right-turn turns
12	S. Church St / Mills Ave at Augusta St	• Nearside signal head for WB approach • Add retroreflectivity to existing backplates • W3-3-48 "signal ahead" warning signs on all approaches • Skip lines to guide NB vehicles through intersection
13	E. Faris Rd at Cleveland St	• W3-3-48 "signal ahead" warning signs on all approaches • Add retroreflectivity to existing backplates • R10-12 "Left-turn YIELD on Green Ball" sign for NB, SB, and WB approaches
14	Laurens Rd at Woodruff Rd	• Dual R1-2-48 "yield" signs for WB and NB right-turns • Paint skip lines for all turn lanes
15	Academy St at College St	• Retroreflective backplates • Louvers on WB and SB downstream signal heads • R10-12 "Left-turn on YIELD on Green Ball" on NB approach • additional signal head on WB approach • R10-15 "yield to pedestrians" signs on all approaches

Table 4 (Con't.) – Immediate Consideration List

#	Intersection	Considerations
16	Stone Ave at Rutherford St	• Retroreflective backplates • W3-3-48 "signal head" warning signs on all approaches • R10-12 "Left-turn YIELD on Green Ball" signs for SB, EB, and WB approaches • Nearside head on EB approach • Truncated domes and trim corner bushes • Repaint medians, NB stop bar, and ladder crosswalks • R10-15 "yield to pedestrians" signs for all approaches
17	Pelham Rd at E. North St	• Retroreflective backplates • A "watch for stopped traffic" sign on WB approach prior to crest of hill • R10-12 "Left-turn YIELD on Green Ball" signs for EB and WB approaches • Remove EB right-turn R1-2 "Yield" sign and replace with R1-1A "keep moving' sign • R10-7 "Do Not Block Intersection" signs for NB and WB approaches • Pedestrian heads and push buttons at crosswalks
18	Laurens Rd at Verdae Blvd / E. Parkins Mill Rd	• R1-1A "keep moving" sign for northbound right-turn • R10-12 "Left-turn YIELD on Green Ball" sign for EB approach • Retroreflective backplates • Add signal head for NB approach • Pedestrian signal head and push buttons • Repaint crosswalks, skip lines • R10-15 "yield to pedestrians" signs for all approaches
19	Roper Mountain Rd at Frontage Rd / Independence Blvd	• Retroreflective backplates • W3-3-48 "signal head" warning signs on all approaches • R10-7 "Do Not Block Intersection" sign on all approaches • Add EB queue loop or modify right-turn loop on Frontage Rd • Nearside signal head on Independence Blvd approach • R10-12 "Left-turn YIELD on Green Ball" sign on NB approach

Table 4 (Con't.) – Immediate Consideration List

#	Intersection	Considerations
20	Laurens Rd at Millennium Blvd / Fairforest Way	• Retroreflective backplates • Restripe entire intersection especially skip lines • R10-12 "Left-turn YIELD on Green Ball" sign for NB,SB, and WB approaches • Dual R1-2 "yield" signs for SB right-turns • W3-3-48 "signal head" warning signs on all approaches

The next course of action is to implement the safety considerations that may have an adverse effect on capacity. The report provides existing and proposed LOS charts for each study intersection that quantitatively show the capacity effect with these considerations. These summaries should be used with caution since many of the intersections are part larger signal systems where operations are dictated by set plans, and the analyses of those systems are not part of this study. Any new phasing consideration in a coordinated system will most likely require retiming the entire corridor.

Lastly, the long-term considerations for each intersection should be reviewed and potentially incorporated into future CIP (Capital Improvement Projects) program by the City or SCDOT. AECOM conducted a capacity analysis using existing traffic volumes for many of these long-term considerations to make sure they were reasonable. A future year analysis would be the next step to determine the feasibility of these long-term considerations.

APPENDIX A – Kick off Meeting Minutes

AECOM

Meeting Minutes

Subject	Kick Off Meeting – City of Greenville Intersection Safety Review
Date	August 7, 2014
Time	11:00 AM
Location	Traffic Engineering Dept. - 26 Woods Lake Road, Greenville, SC 29607
Project Name	City of Greenville Intersection Traffic and Safety Study
Attendees	Valerie Holmes, Sunny Nandagiri, Ryan Eckenrode, Carrie Mussman

1. **Contract**
    a. **Summary-Logistics**
    AECOM hand delivered the Contract. Valerie forwarded it for execution.
    b. **Start and completion date**
    NTP is pending and will likely come from Valerie. The schedule was discussed and AECOM can have up to 6 months to complete the project if needed. 50K is hard ceiling City currently has for this project.
    c. **City's goals and objectives of project**
    The City would like to maximize the number of intersections studied, within budget constraints, with all council districts represented in the final report.
2. **Study Area**
    a. **Number of Intersections and Corridors**
    Valerie will prioritize the list and provide to AECOM. Once a cursory review is completed, AECOM will provide a detailed scope and fee determining how many intersections can be completed for the project budget.

    Most of intersections will be signalized but may be a few unsignalized. (The City has already identified an estimated 10-20 intersections and 2-3 corridors). Identified segments include Pleasantburg Rd (between I-385 NB and Villa Road), East North (between Pleasantburg Rd and Pelham), Augusta Road (between Oregon and McDaniel).

    Keep Gaye Sprague (City Council) and Keith Brockington (Greenville County) in the loop for this project.

3. **Background Information**
    The City has ARC GIS data files that will be made available.
    a. **Counts**
    Some counts will be available. Any obtained between 2010 and 2014 will be valid for this project-as this is not an analysis project. AECOM will review SCDOT's TEAMS (with SCDOT's permission) website to determine if any additional counts are available at the studied intersections.

    City can/will perform counts for small/medium intersections-requiring a one person count.

b. **Signal timings and Signal design plans (CADD)**
The City does have some signal timing and signal design plans. Signal design plans may or may not be current.

c. **Collision diagrams**
The City does not have collision diagrams however Valerie will check with SCDOT (Joey Riddle or others) to determine if diagrams can be obtained. It will be determined at a later date if this will be part of the deliverables provided by AECOM.

4. AECOM Examples of Previous Safety work for SCDOT

a. 346 Intersections Low Cost Safety Project (Sketch level with no report)
b. 15 High Crash Safety Intersection Project (Detailed with report)

AECOM summarized the documents above and left them with Valerie.

5. Analysis (Optional)

a. **Preferred Synchro version**
Synchro Version 9

b. **Roundabout Analysis? Software?**
Roundabout analysis will not be part of this project.

c. **RTOR and speed study?**
This will be required with recommendation.

d. **Sight distance study?**
This will be required with recommendation.

e. **B/C study with crash modification factors?**
A B/C study will not be needed.

6. Recommendations

a. **Preferred methodology for determining turn lanes, storage length, and signal timing**
95th percentile in Synchro. Use cross product for left-turns. Use SCDOT guidelines for the analysis.

b. **Define short and long term improvements**
Short Term – Less than 6 months and/or Less than $5,000
Long Term – More than 6 months and/or More than $5,000

c. **Will recommendations need to be supported by crash and b/c data?**
Recommendation needs to be supported by engineering analysis and crash data; however B/C data is not part of this project.

7. **Deliverables**

a. Sketch of improvements
b. Collision diagram
c. Photos
d. Memo per intersection with supporting analysis data

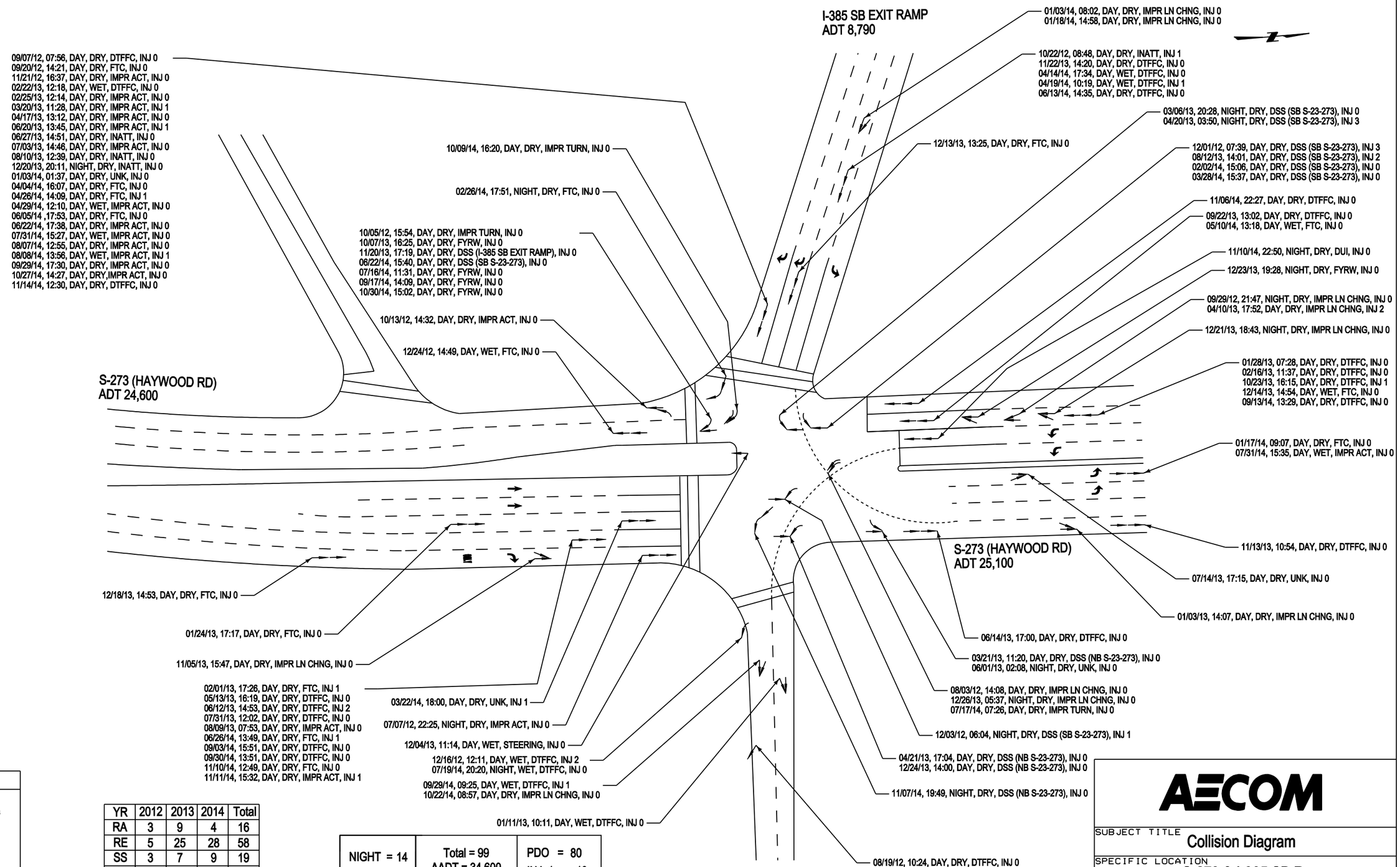
Deliverable options were discussed at length but a final decision is yet to be made. No specific verbiage is required when describing improvements from legal perspective.

8. Additional Comments or Questions

9. Action Items

a. The City will identify a list of intersections to be studied
b. The City will determine if any unsignalized intersections need to be included as part of the list.
c. The City will provide the necessary background information to AECOM on this list
d. The City will determine the contents for each deliverable
e. Once AECOM receives this information (a-c), AECOM will optimize the number intersections to be studied for the allowable 50K.

APPENDIX B – Collision Diagrams



LEGEND

DSS - Disregarded Sign or Signal
Inatt - Inattention
DTFFC - Driving Too Fast for Conditions
FYRW - Failure to Yield Right of Way
ROR - Ran off Road
FTC - Followed Too Closely
AOV - Aggressive Operation of Vehicle
SAO - Swerving to Avoid Object
DUI - Under the Influence
Imp LC - Improper Lane Change

RA = Right Angle
RE = Rear End
SS = Side Swipe
HO = Head On
OC = Out of Control
HA = Hit Animal
OTH = Other

YR	2012	2013	2014	Total
RA	3	9	4	16
RE	5	25	28	58
SS	3	7	9	19
HO	0	0	0	0
OC	2	1	1	4
HA	0	0	0	0
OTH	1	1	0	2
Total	14	43	42	99

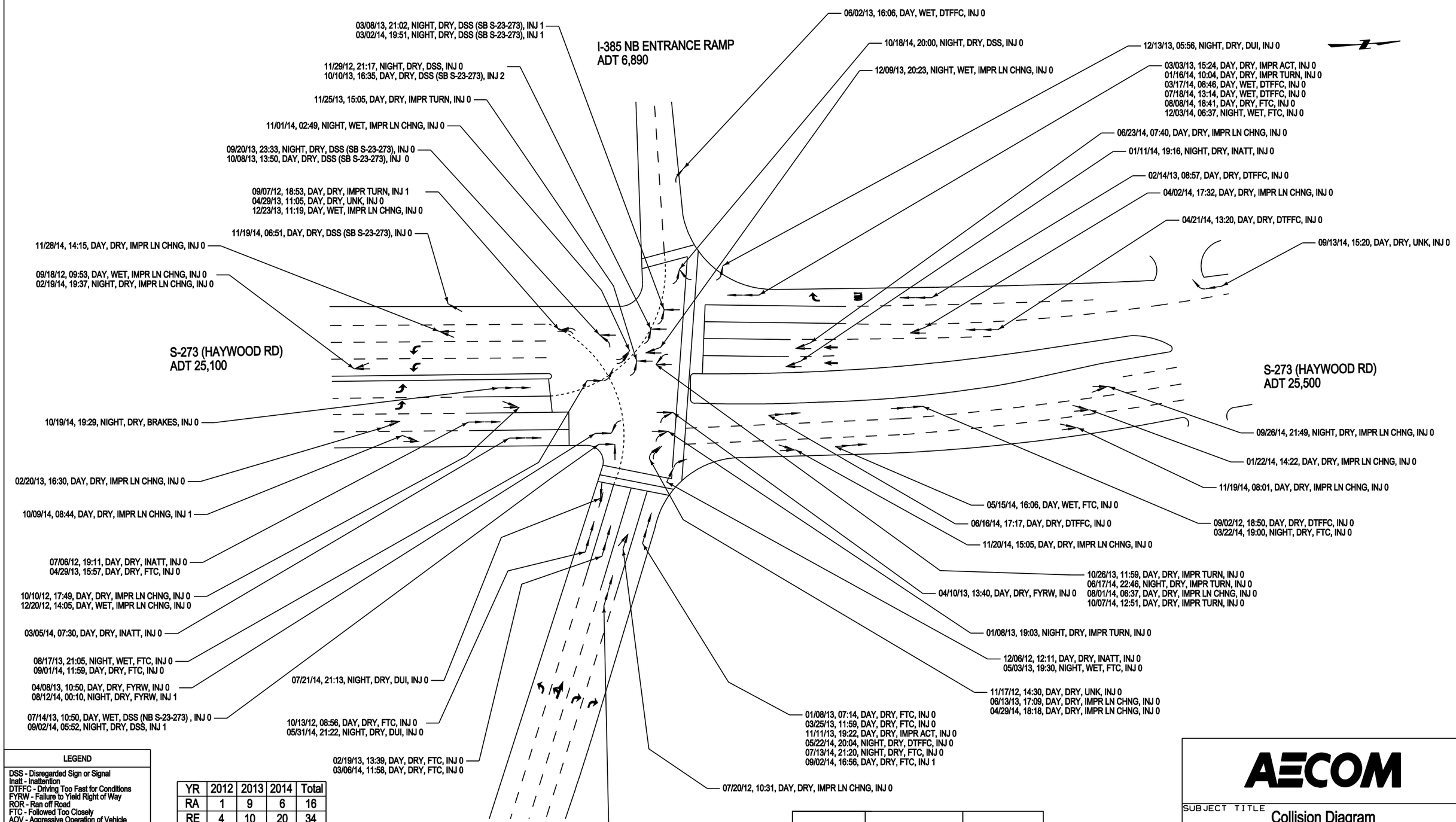
NIGHT = 14	Total = 99	PDO = 80
DAY = 85	AADT = 34,600	INJ. 1 = 13
	Years = 2.42	INJ. 2 = 4
WET = 15	07/01/12 to 11/30/14	INJ. 3 = 2
DRY = 84	CR = 3.239	FATAL = 0
	SI = 4.483	

AECOM

SUBJECT TITLE
Collision Diagram

SPECIFIC LOCATION
S-273 & I-385 SB Ramps

CITY	COUNTY		
Greenville	Greenville		
DRAWN BY	DATE	SCALE	PAGE
ATC	1/12/15	None	1 of 2



LEGEND
DSS - Disregarded Sign or Signal Inatt - Inattention DTFFC - Driving Too Fast for Conditions FYRW - Failure to Yield Right of Way ROR - Ran off Road FTC - Followed Too Closely AOV - Aggressive Operation of Vehicle SAO - Swerving to Avoid Object DUI - Under the Influence Imp LC - Improper Lane Change
RA = Right Angle RE = Rear End SS = Side Swipe HO = Head On OC = Out of Control HA = Hit Animal OTH = Other

YR	2012	2013	2014	Total
RA	1	9	6	16
RE	4	10	20	34
SS	6	5	12	23
HO	0	1	0	1
OC	1	1	0	2
HA	0	0	0	0
OTH	0	0	1	1
Total	12	26	39	77

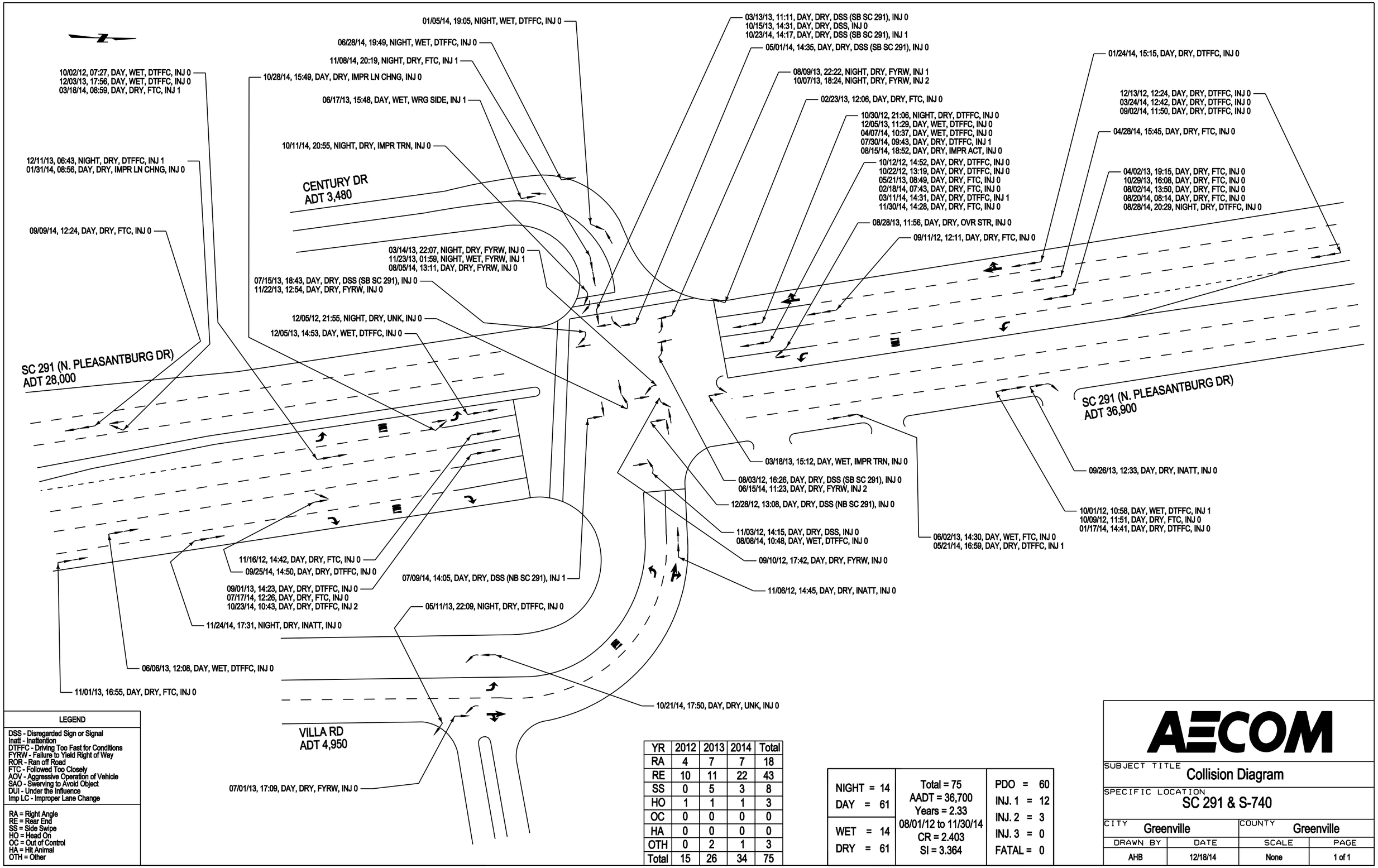
NIGHT = 25 DAY = 52	Total = 77 AADT = 35,900 Years = 2.42 07/01/12 to 11/30/14 CR = 2.428 SI = 2.933	PDO = 69 INJ. 1 = 7 INJ. 2 = 1 INJ. 3 = 0 FATAL = 0
WET = 14 DRY = 63		

AECOM

SUBJECT TITLE
Collision Diagram

SPECIFIC LOCATION
S-273 & I-385 NB Ramps

CITY	COUNTY		
Greenville	Greenville		
DRAWN BY	DATE	SCALE	PAGE
ATC	1/12/15	None	2 of 2



LEGEND

DSS - Disregarded Sign or Signal
Inatt - Inattention
DTFFC - Driving Too Fast for Conditions
FYRW - Failure to Yield Right of Way
ROR - Ran off Road
FTC - Followed Too Closely
AOV - Aggressive Operation of Vehicle
SAO - Swerving to Avoid Object
DUI - Under the Influence
Imp LC - Improper Lane Change

RA = Right Angle
RE = Rear End
SS = Side Swipe
HO = Head On
OC = Out of Control
HA = Hit Animal
OTH = Other

YR	2012	2013	2014	Total
RA	4	7	7	18
RE	10	11	22	43
SS	0	5	3	8
HO	1	1	1	3
OC	0	0	0	0
HA	0	0	0	0
OTH	0	2	1	3
Total	15	26	34	75

NIGHT = 14	Total = 75	PDO = 60
DAY = 61	AADT = 36,700	INJ. 1 = 12
	Years = 2.33	INJ. 2 = 3
WET = 14	08/01/12 to 11/30/14	INJ. 3 = 0
DRY = 61	CR = 2.403	FATAL = 0
	SI = 3.364	

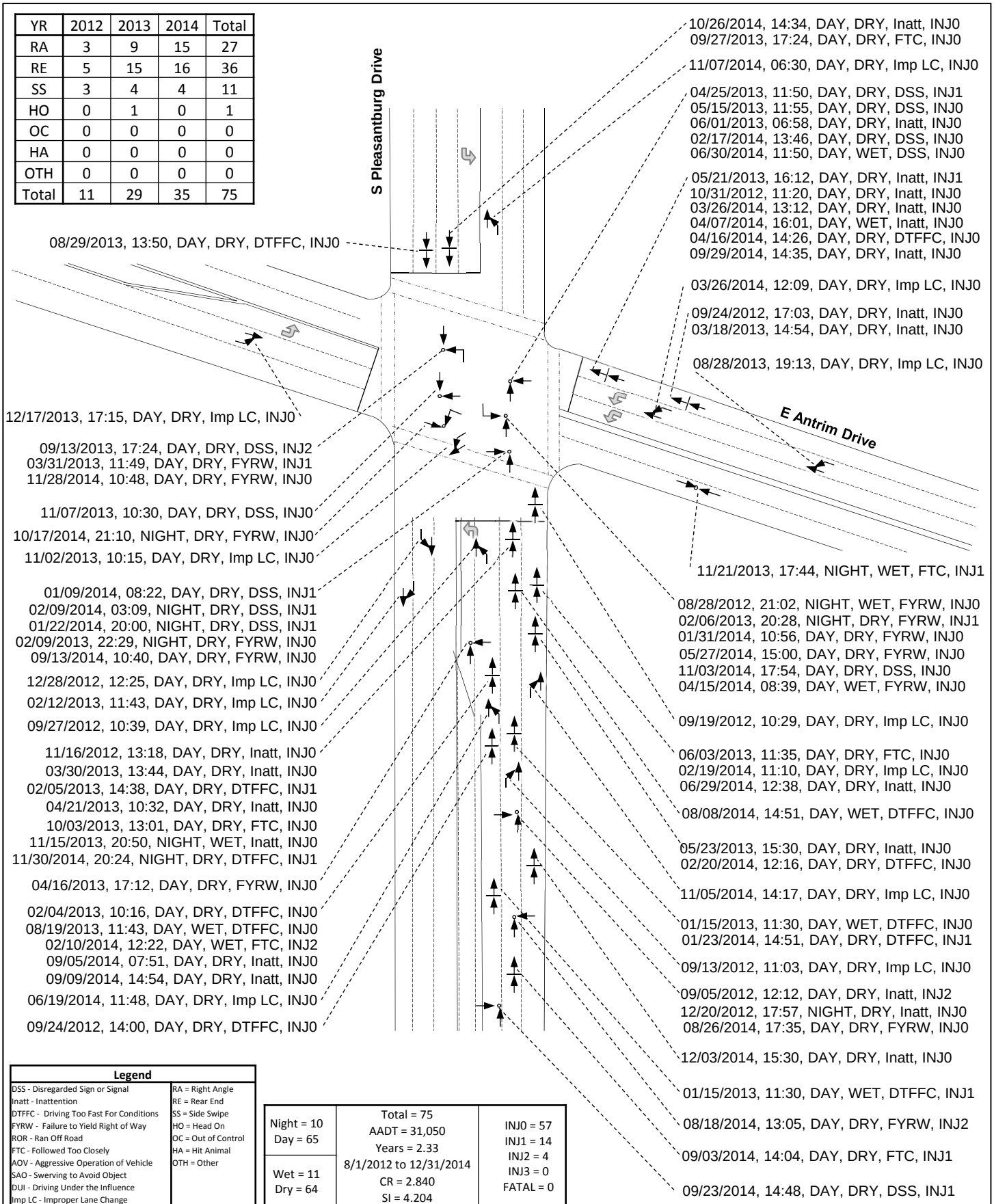
AECOM

SUBJECT TITLE
Collision Diagram

SPECIFIC LOCATION
SC 291 & S-740

CITY		COUNTY	
Greenville		Greenville	
DRAWN BY	DATE	SCALE	PAGE
AHB	12/18/14	None	1 of 1

YR	2012	2013	2014	Total
RA	3	9	15	27
RE	5	15	16	36
SS	3	4	4	11
HO	0	1	0	1
OC	0	0	0	0
HA	0	0	0	0
OTH	0	0	0	0
Total	11	29	35	75



Legend	
DSS - Disregarded Sign or Signal	RA = Right Angle
Inatt - Inattention	RE = Rear End
DTFFC - Driving Too Fast For Conditions	SS = Side Swipe
FYRW - Failure to Yield Right of Way	HO = Head On
ROR - Ran Off Road	OC = Out of Control
FTC - Followed Too Closely	HA = Hit Animal
AOV - Aggressive Operation of Vehicle	OTH = Other
SAO - Swerving to Avoid Object	
DUI - Driving Under the Influence	
Imp LC - Improper Lane Change	

Night = 10 Day = 65	Total = 75 AADT = 31,050 Years = 2.33 8/1/2012 to 12/31/2014 CR = 2.840 SI = 4.204	INJ0 = 57 INJ1 = 14 INJ2 = 4 INJ3 = 0 FATAL = 0
Wet = 11 Dry = 64		

BIHL ENGINEERING

E. Antrim Drive at S. Pleasantburg Drive

Collision Diagram

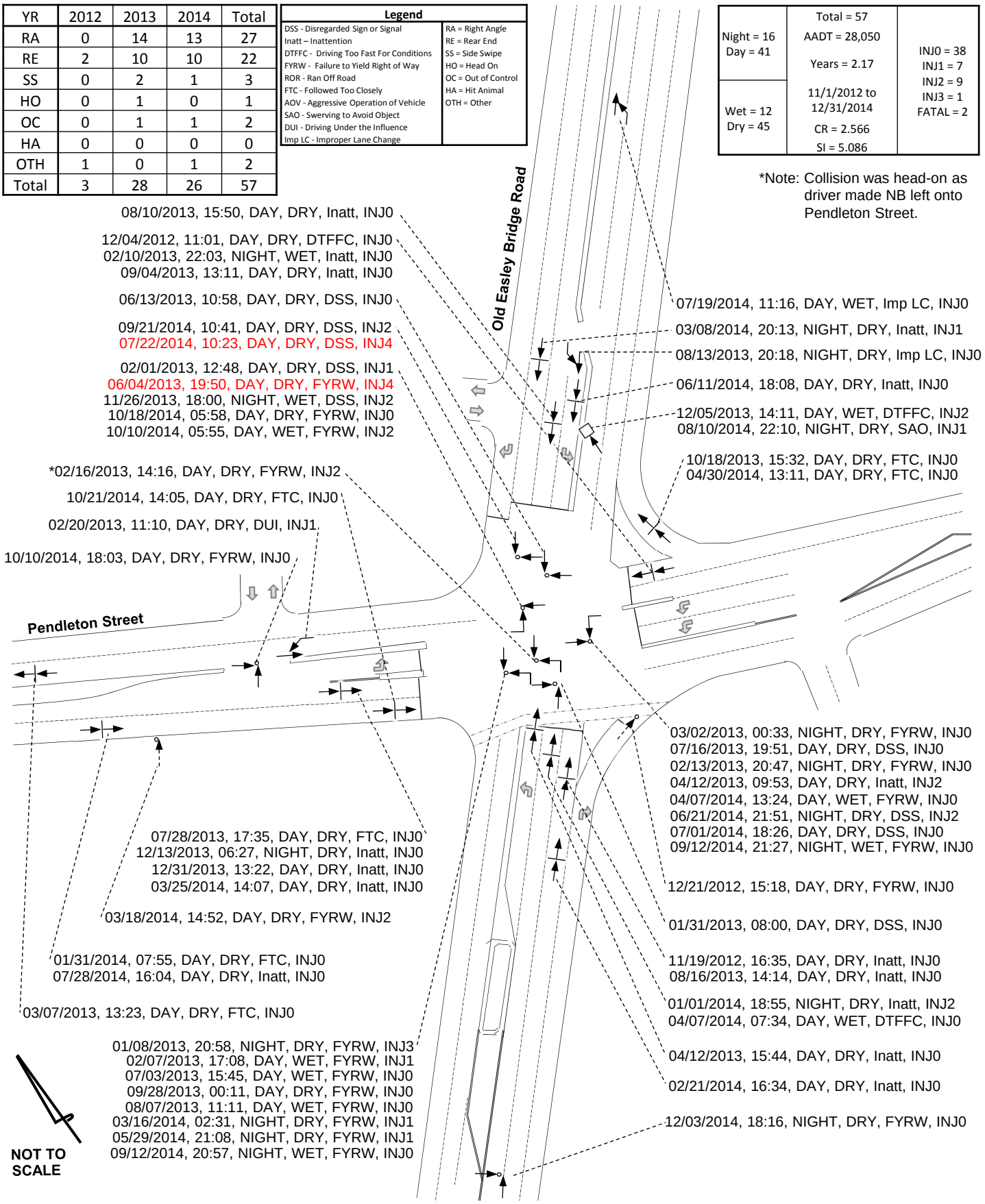
Figure 3

YR	2012	2013	2014	Total
RA	0	14	13	27
RE	2	10	10	22
SS	0	2	1	3
HO	0	1	0	1
OC	0	1	1	2
HA	0	0	0	0
OTH	1	0	1	2
Total	3	28	26	57

Legend	
DSS - Disregarded Sign or Signal	RA = Right Angle
Inatt – Inattention	RE = Rear End
DTFFC - Driving Too Fast For Conditions	SS = Side Swipe
FYRW - Failure to Yield Right of Way	HO = Head On
ROR - Ran Off Road	OC = Out of Control
FTC - Followed Too Closely	HA = Hit Animal
AOV - Aggressive Operation of Vehicle	OTH = Other
SAO - Swerving to Avoid Object	
DUI - Driving Under the Influence	
Imp LC - Improper Lane Change	

Night = 16 Day = 41	Total = 57 AADT = 28,050 Years = 2.17	INJ0 = 38 INJ1 = 7 INJ2 = 9 INJ3 = 1 FATAL = 2
Wet = 12 Dry = 45	11/1/2012 to 12/31/2014 CR = 2.566 SI = 5.086	

*Note: Collision was head-on as driver made NB left onto Pendleton Street.

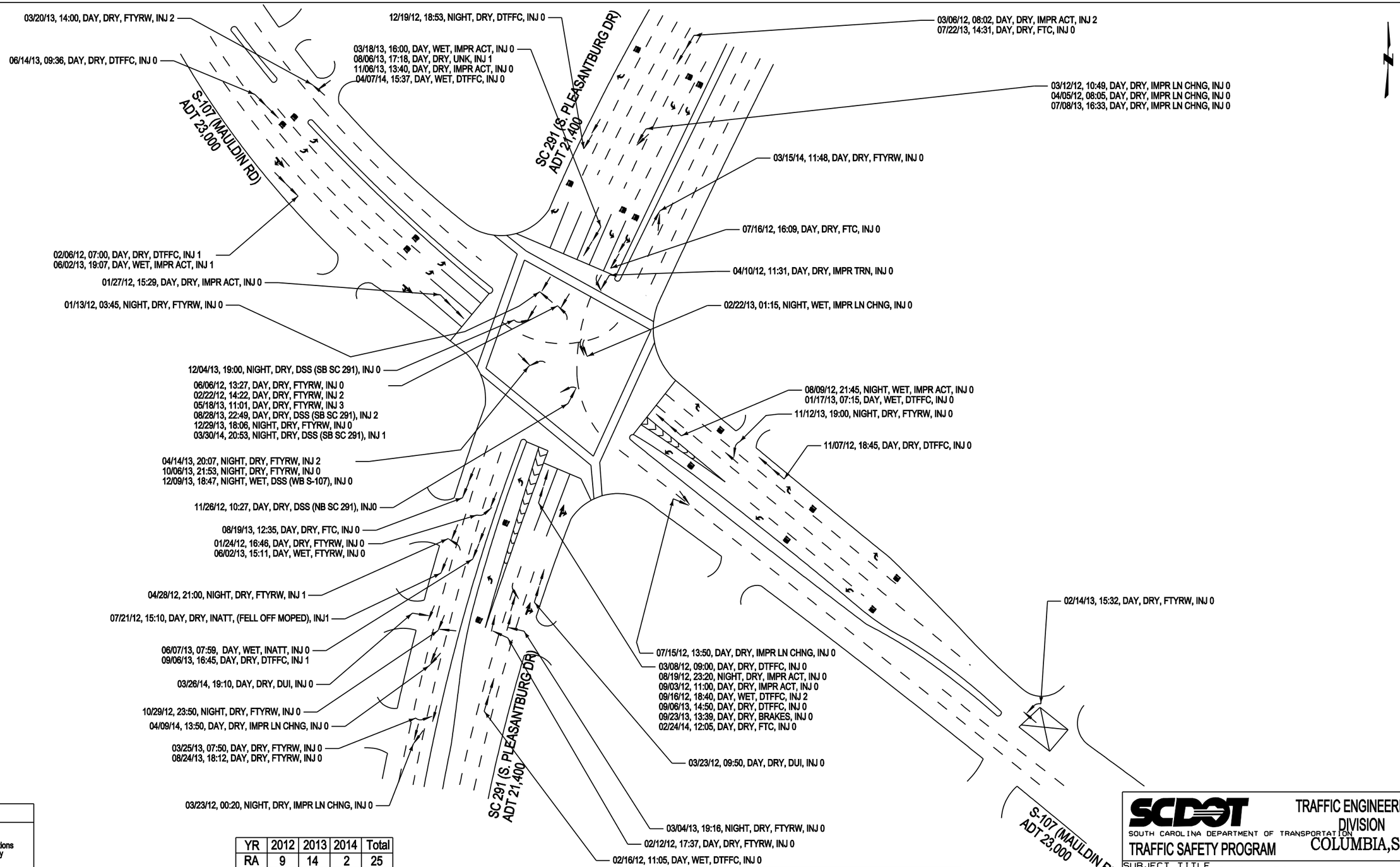


BIHL ENGINEERING

Pendleton Street at Old Easley Bridge Road

Collision Diagram

Figure 4



LEGEND

DSS - Disregarded Sign or Signal
Inatt - Inattention
DTFFC - Driving Too Fast for Conditions
FYRW - Failure to Yield Right of Way
ROR - Ran off Road
FTC - Followed Too Closely
AOV - Aggressive Operation of Vehicle
SAO - Swerving to Avoid Object
DUI - Under the Influence
Imp LC - Improper Lane Change

RA = Right Angle
RE = Rear End
SS = Side Swipe
HO = Head On
OC = Out of Control
HA = Hit Animal
OTH = Other

YR	2012	2013	2014	Total
RA	9	14	2	25
RE	13	12	2	27
SS	4	2	2	8
HO	0	0	0	0
OC	0	0	0	0
HA	0	0	0	0
OTH	1	0	0	1
Total	27	28	6	61

NIGHT = 16 DAY = 45	Total = 61 AADT = 44,400 Years = 2.33 01/01/12 to 04/30/14 CR = 1.615 SI = 2.357	PDO = 47 INJ. 1 = 7 INJ. 2 = 6 INJ. 3 = 1 FATAL = 0
WET = 9 DRY = 52		

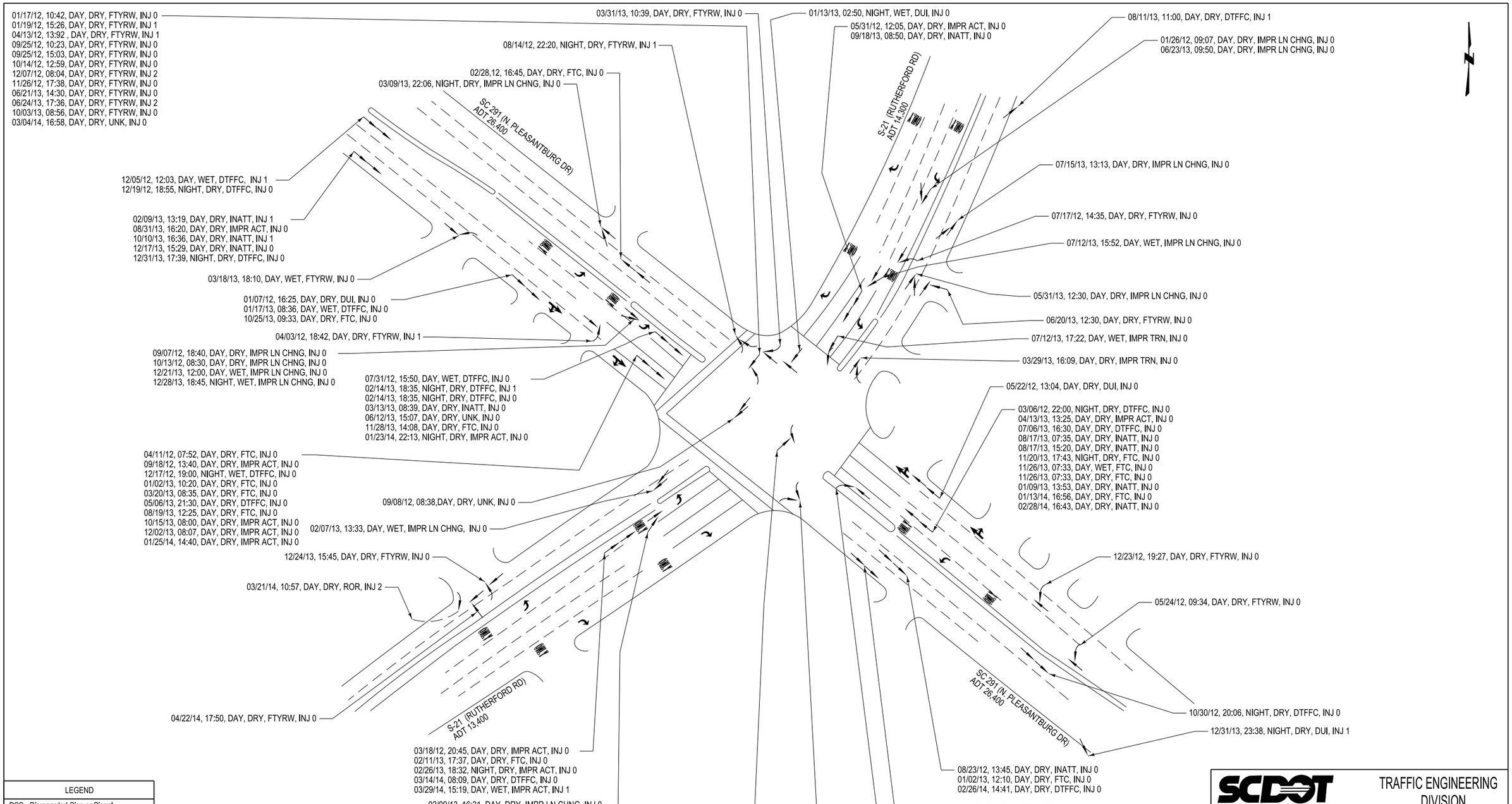
SCDOT
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
TRAFFIC SAFETY PROGRAM

TRAFFIC ENGINEERING DIVISION
COLUMBIA, S.C.

SUBJECT TITLE: Collision Diagram

SPECIFIC LOCATION: SC 291 & S-107

CITY	COUNTY		
Greenville	Greenville		
DRAWN BY	DATE	SCALE	PAGE
WWB	10/14/14	None	1 of 1



YR	2012	2013	2014	Total
RA	12	7	3	22
RE	14	31	7	52
SS	6	12	0	18
HO	0	1	0	1
OC	0	0	1	1
HA	0	0	0	0
OTH	0	2	0	2
Total	32	53	11	96

NIGHT = 17 DAY = 79	Total = 96 AADT = 40,250 Years = 2.33 01/01/12 to 04/30/14 CR = 2.805 SI = 3.681	PDO = 81 INJ. 1 = 11 INJ. 2 = 4 INJ. 3 = 0 FATAL = 0
WET = 13 DRY = 83		

LEGEND

DSS - Disregarded Sign or Signal
Inatt - Inattention
DTFFC - Driving Too Fast for Conditions
FYRW - Failure to Yield Right of Way
ROR - Ran off Road
FTC - Followed Too Closely
AOV - Aggressive Operation of Vehicle
SAO - Swerving to Avoid Object
DUI - Under the Influence
Imp LC - Improper Lane Change

RA = Right Angle
RE = Rear End
SS = Side Swipe
HO = Head On
OC = Out of Control
HA = Hit Animal
OTH = Other

SCDOT
South Carolina Department of Transportation
TRAFFIC SAFETY PROGRAM

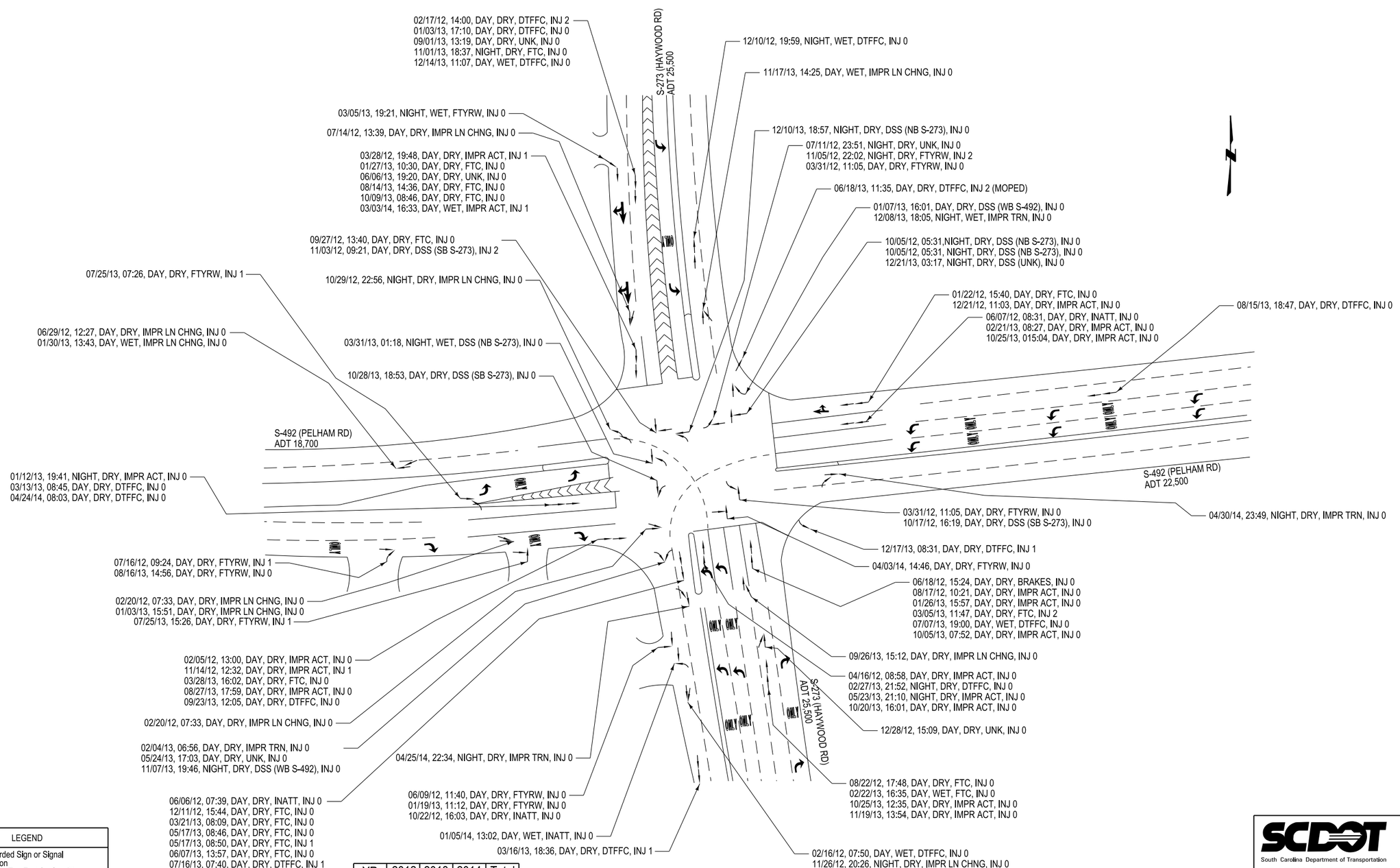
TRAFFIC ENGINEERING DIVISION
COLUMBIA,S.C.

SUBJECT TITLE: Collision Diagram

SPECIFIC LOCATION: SC 291 & S-21

CITY: Greenville
COUNTY: Greenville

DRAWN BY	DATE	SCALE	PAGE
WWB	10/15/14	None	1 of 1



LEGEND
DSS - Disregarded Sign or Signal Inatt - Inattention DTFFC - Driving Too Fast for Conditions FYRW - Failure to Yield Right of Way ROR - Ran off Road FTC - Followed Too Closely AOV - Aggressive Operation of Vehicle SAO - Swerving to Avoid Object DUI - Under the Influence Imp LC - Improper Lane Change
RA = Right Angle RE = Rear End SS = Side Swipe HO = Head On OC = Out of Control HA = Hit Animal OTH = Other

YR	2012	2013	2014	Total
RA	11	6	2	19
RE	15	35	2	52
SS	8	11	2	21
HO	0	0	0	0
OC	0	0	0	0
HA	0	0	0	0
OTH	0	2	0	2
Total	34	54	6	94

NIGHT = 19 DAY = 75	Total = 94 AADT = 46,100 Years = 2.33 01/01/12 to 04/30/14 CR = 2.398 SI = 3.163	PDO = 79 INJ. 1 = 10 INJ. 2 = 5 INJ. 3 = 0 FATAL = 0
WET = 14 DRY = 80		

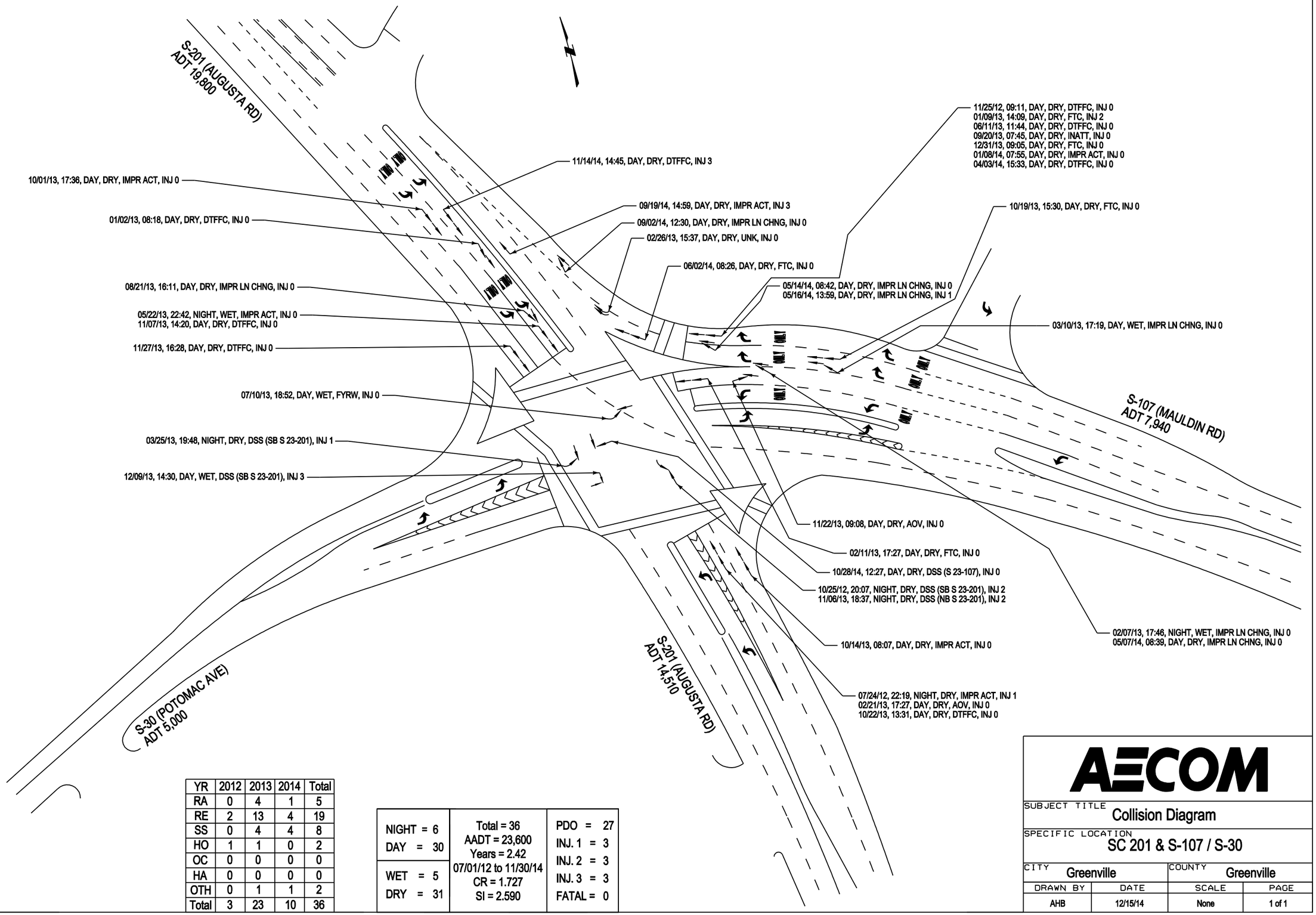
SCDOT
South Carolina Department of Transportation
TRAFFIC SAFETY PROGRAM

TRAFFIC ENGINEERING DIVISION
COLUMBIA,S.C.

SUBJECT TITLE: Collision Diagram

SPECIFIC LOCATION: S-273 & S-492

CITY	COUNTY		
Greenville	Greenville		
DRAWN BY	DATE	SCALE	PAGE
WWB	10/14/14	None	1 of 1



LEGEND

DSS - Disregarded Sign or Signal
Inatt - Inattention
DTFFC - Driving Too Fast for Conditions
FYRW - Failure to Yield Right of Way
ROR - Ran off Road
FTC - Followed Too Closely
AOV - Aggressive Operation of Vehicle
SAO - Swerving to Avoid Object
DUI - Under the Influence
Imp LC - Improper Lane Change

RA = Right Angle
RE = Rear End
SS = Side Swipe
HO = Head On
OC = Out of Control
HA = Hit Animal
OTH = Other

YR	2012	2013	2014	Total
RA	0	4	1	5
RE	2	13	4	19
SS	0	4	4	8
HO	1	1	0	2
OC	0	0	0	0
HA	0	0	0	0
OTH	0	1	1	2
Total	3	23	10	36

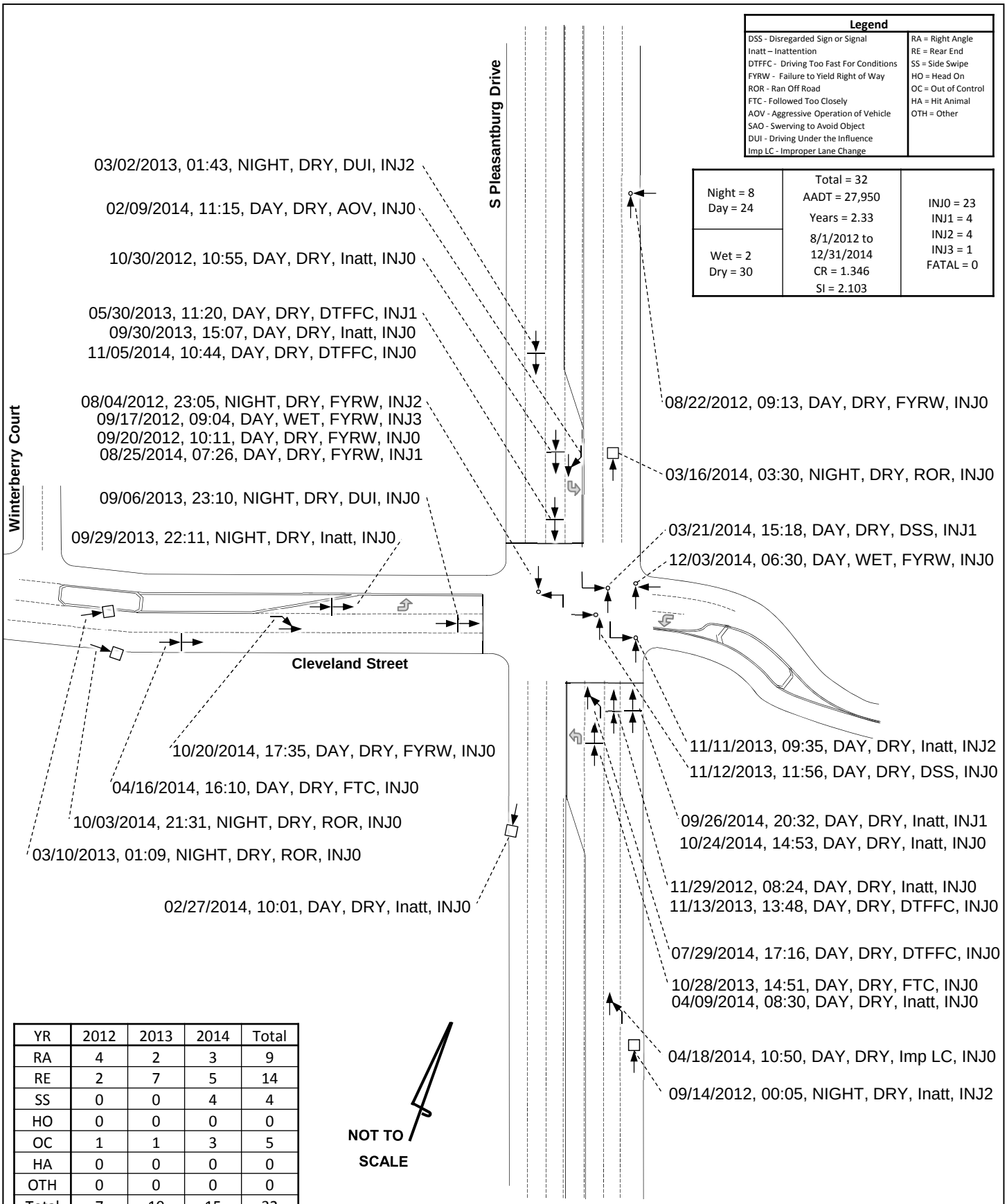
NIGHT = 6	Total = 36	PDO = 27
DAY = 30	AADT = 23,600	INJ. 1 = 3
	Years = 2.42	INJ. 2 = 3
WET = 5	07/01/12 to 11/30/14	INJ. 3 = 3
DRY = 31	CR = 1.727	FATAL = 0
	SI = 2.590	

AECOM

SUBJECT TITLE
Collision Diagram

SPECIFIC LOCATION
SC 201 & S-107 / S-30

CITY		COUNTY	
Greenville		Greenville	
DRAWN BY	DATE	SCALE	PAGE
AHB	12/15/14	None	1 of 1



Legend	
DSS - Disregarded Sign or Signal	RA = Right Angle
Inatt – Inattention	RE = Rear End
DTFFC - Driving Too Fast For Conditions	SS = Side Swipe
FYRW - Failure to Yield Right of Way	HO = Head On
ROR - Ran Off Road	OC = Out of Control
FTC - Followed Too Closely	HA = Hit Animal
AOV - Aggressive Operation of Vehicle	OTH = Other
SAO - Swerving to Avoid Object	
DUI - Driving Under the Influence	
Imp LC - Improper Lane Change	

Night = 8 Day = 24	Total = 32 AADT = 27,950 Years = 2.33	INJ0 = 23 INJ1 = 4 INJ2 = 4 INJ3 = 1 FATAL = 0
Wet = 2 Dry = 30	8/1/2012 to 12/31/2014 CR = 1.346 SI = 2.103	

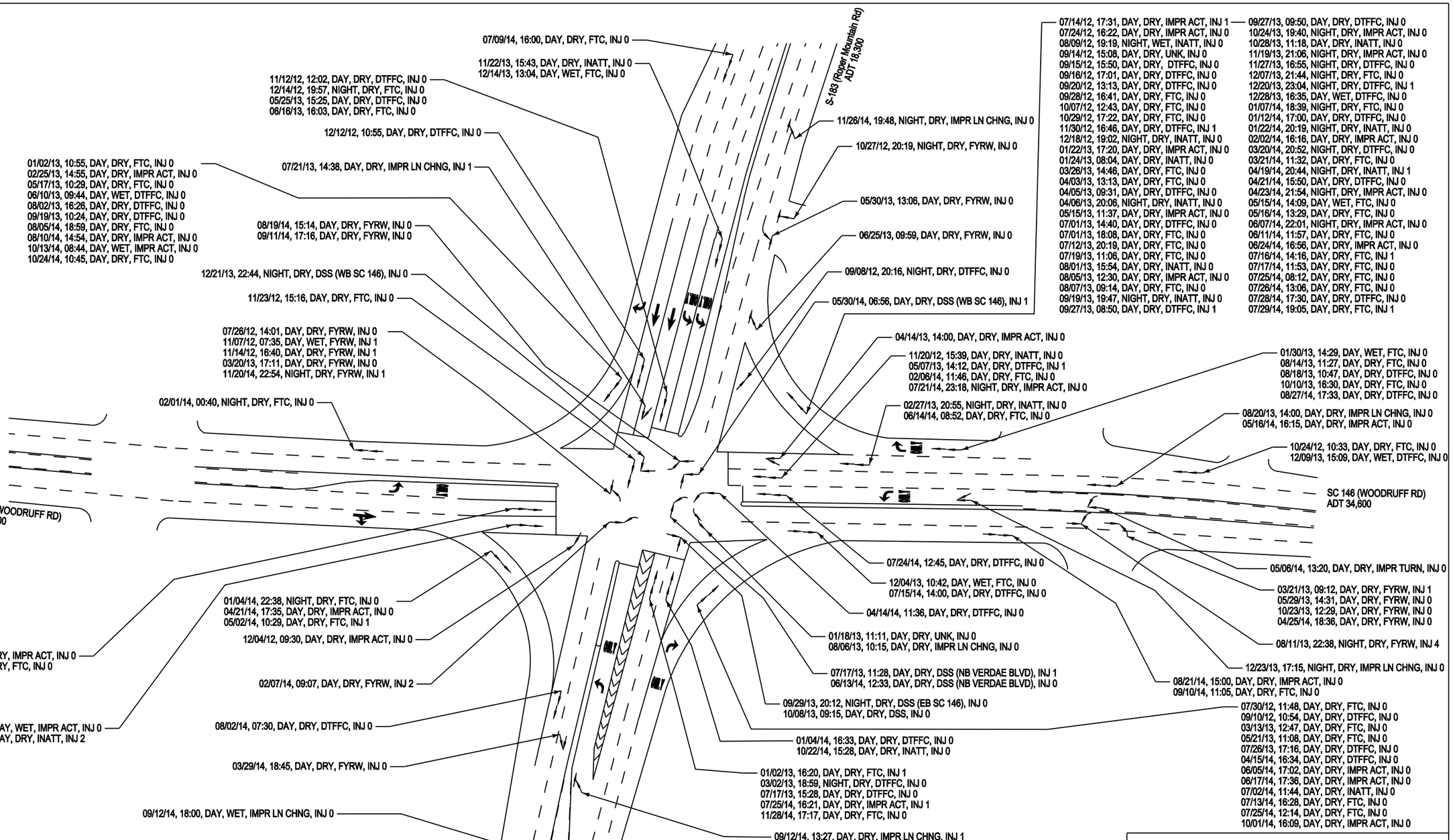
YR	2012	2013	2014	Total
RA	4	2	3	9
RE	2	7	5	14
SS	0	0	4	4
HO	0	0	0	0
OC	1	1	3	5
HA	0	0	0	0
OTH	0	0	0	0
Total	7	10	15	32

BIHL ENGINEERING

Cleveland Street at S. Pleasantburg Drive

Collision Diagram

Figure 9



LEGEND

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FYRW - Failure to Yield Right of Way
ROR - Ran off Road
FTC - Followed Too Closely
AOV - Aggressive Operation of Vehicle
SAO - Swerving to Avoid Object
DUI - Under the Influence
Imp LC - Improper Lane Change

RA = Right Angle
RE = Rear End
SS = Side Swipe
HO = Head On
OC = Out of Control
HA = Hit Animal
OTH = Other

YR	2012	2013	2014	Total
RA	4	12	12	28
RE	22	49	52	123
SS	0	6	3	9
HO	0	0	0	0
OC	1	0	0	1
HA	0	0	0	0
OTH	1	0	1	2
Total	28	67	67	163

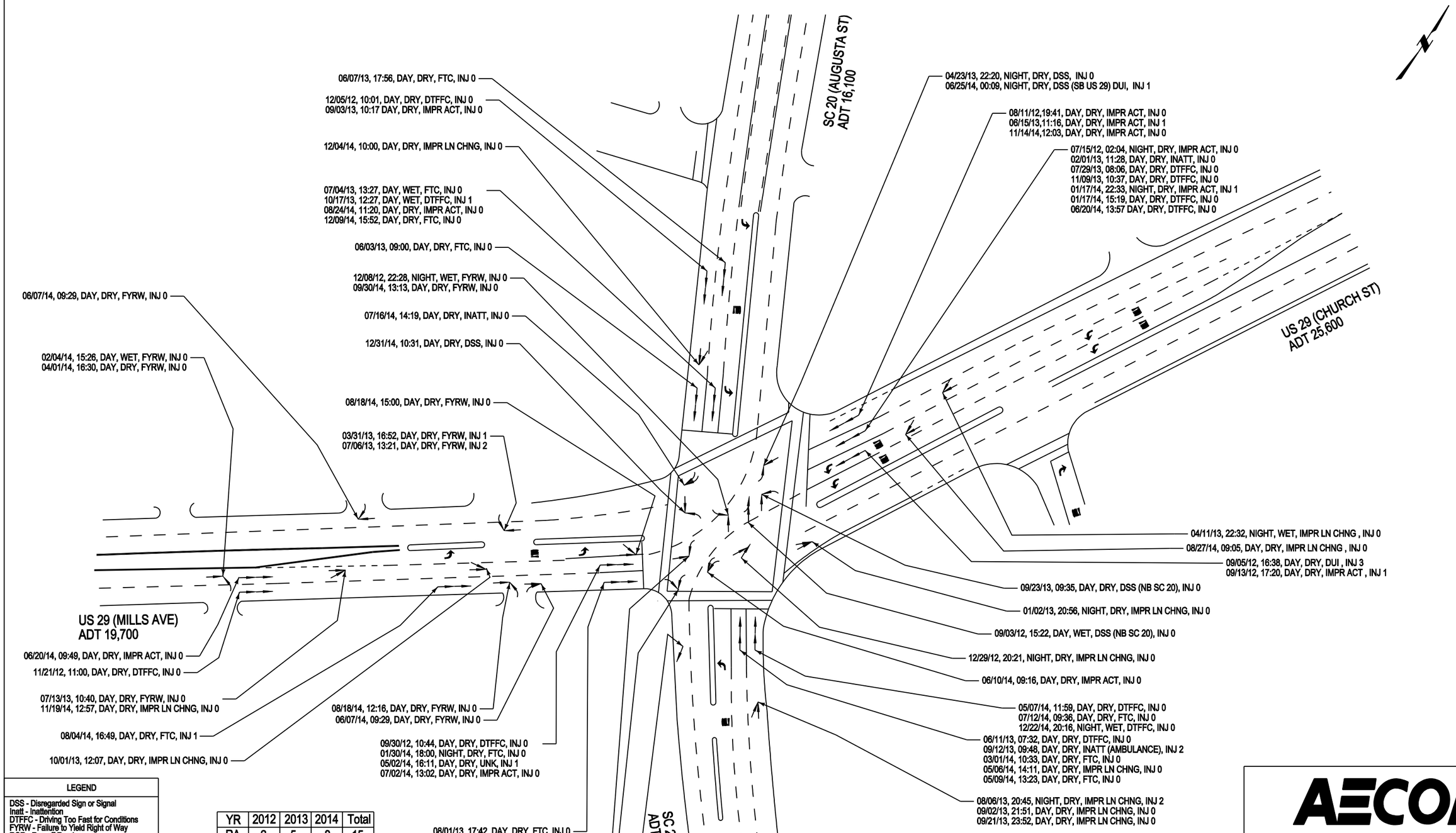
NIGHT = 29 DAY = 134	Total = 163 AADT = 38,250 Years = 2.42 07/01/12 to 11/30/14 CR = 4.824 SI = 6.452	PDO = 140 INJ. 1 = 19 INJ. 2 = 3 INJ. 3 = 0 FATAL = 1
WET = 12 DRY = 151		

AECOM

SUBJECT TITLE
Collision Diagram

SPECIFIC LOCATION
SC 146 & S-183/Verdae Blvd

CITY	COUNTY		
Greenville	Greenville		
DRAWN BY	DATE	SCALE	PAGE
ATC	12/11/14	None	1 of 1



LEGEND

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Inatt - Inattention
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AOV - Aggressive Operation of Vehicle
SAO - Swerving to Avoid Object
DUI - Under the Influence
Imp LC - Improper Lane Change

RA = Right Angle
RE = Rear End
SS = Side Swipe
HO = Head On
OC = Out of Control
HA = Hit Animal
OTH = Other

YR	2012	2013	2014	Total
RA	2	5	8	15
RE	7	12	17	36
SS	1	7	7	15
HO	0	0	0	0
OC	0	1	0	0
HA	0	0	0	0
OTH	0	0	0	0
Total	10	25	32	67

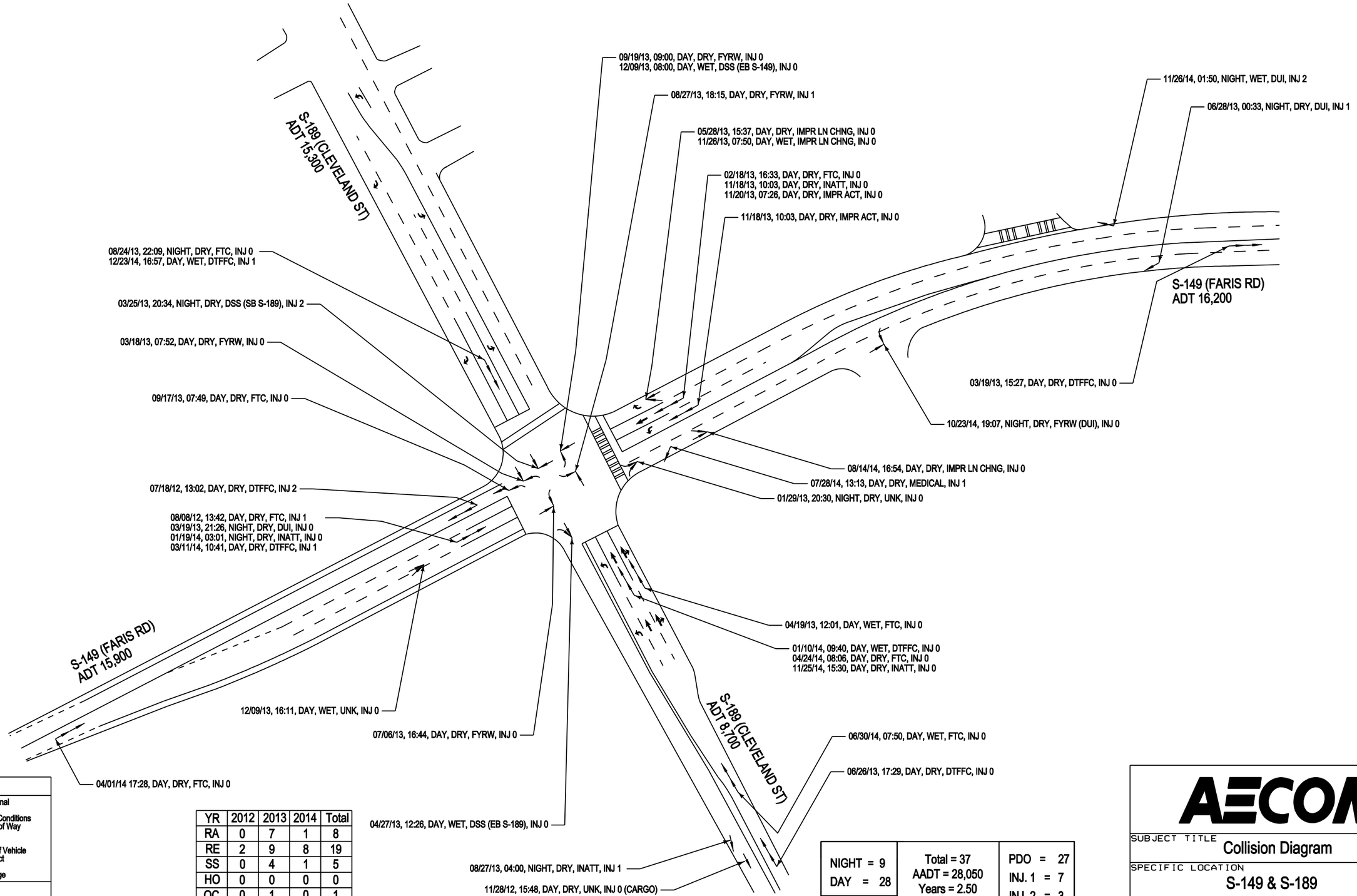
NIGHT = 12	Total = 67	PDO = 53
DAY = 55	AADT = 40,550	INJ. 1 = 9
	Years = 2.50	INJ. 2 = 4
WET = 7	07/01/12 to 12/31/14	INJ. 3 = 1
DRY = 60	CR = 1.811	FATAL = 0
	SI = 2.567	

AECOM

SUBJECT TITLE
Collision Diagram

SPECIFIC LOCATION
US 29 & SC 20

CITY	COUNTY		
Greenville	Greenville		
DRAWN BY	DATE	SCALE	PAGE
AHB	1/23/15	None	1 of 1



LEGEND

DSS - Disregarded Sign or Signal
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FYRW - Failure to Yield Right of Way
ROR - Ran off Road
FTC - Followed Too Closely
AOV - Aggressive Operation of Vehicle
SAO - Swerving to Avoid Object
DUI - Under the Influence
Imp LC - Improper Lane Change

RA = Right Angle
RE = Rear End
SS = Side Swipe
HO = Head On
OC = Out of Control
HA = Hit Animal
OTH = Other

YR	2012	2013	2014	Total
RA	0	7	1	8
RE	2	9	8	19
SS	0	4	1	5
HO	0	0	0	0
OC	0	1	0	1
HA	0	0	0	0
OTH	1	1	2	4
Total	3	22	12	37

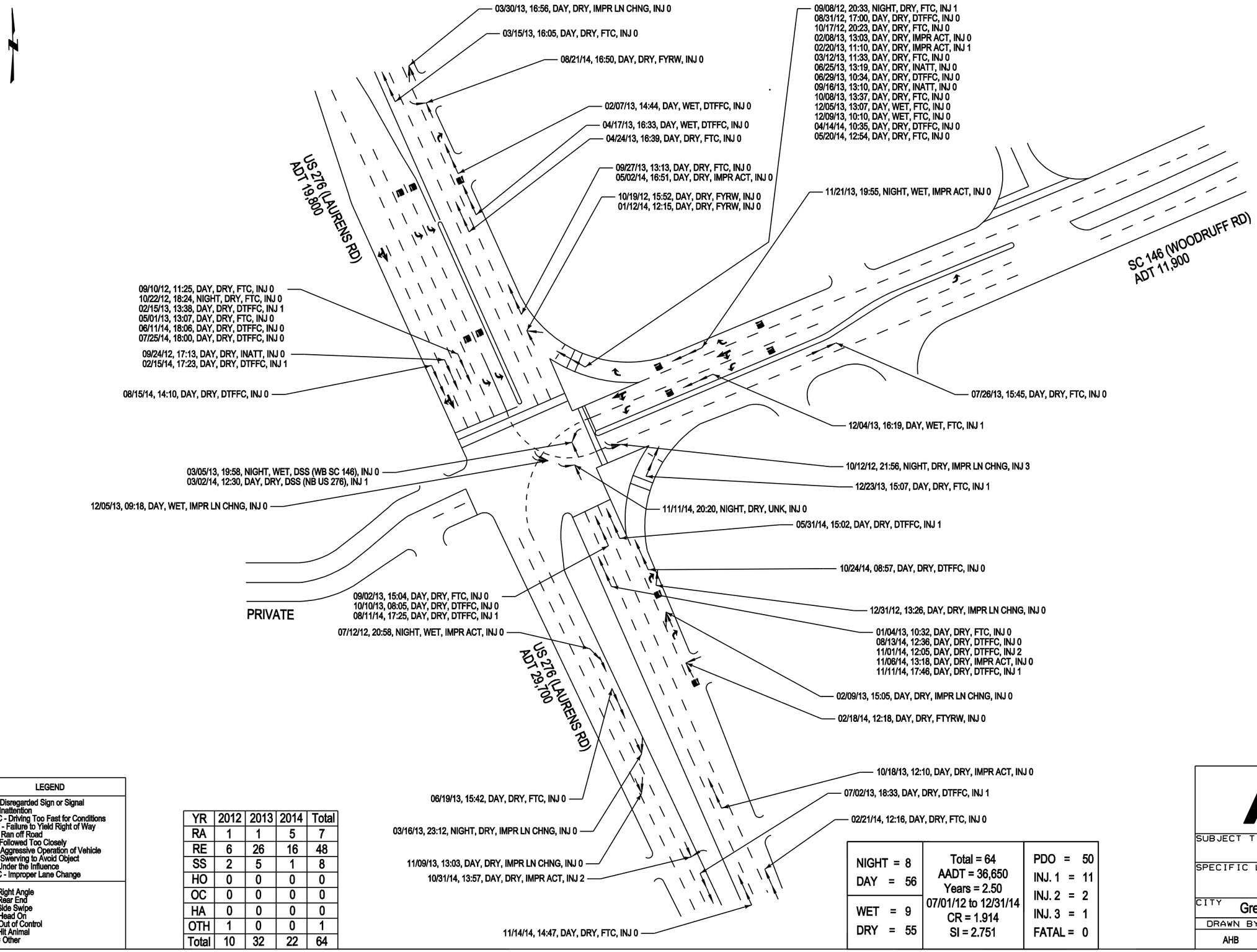
NIGHT = 9 DAY = 28	Total = 37 AADT = 28,050 Years = 2.50 07/01/12 to 12/31/14 CR = 1.446 SI = 2.227	PDO = 27 INJ. 1 = 7 INJ. 2 = 3 INJ. 3 = 0 FATAL = 0
WET = 9 DRY = 28		

AECOM

SUBJECT TITLE
Collision Diagram

SPECIFIC LOCATION
S-149 & S-189

CITY	COUNTY		
Greenville	Greenville		
DRAWN BY	DATE	SCALE	PAGE
AHB	01/22/15	None	1 of 1



LEGEND

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Inatt - Inattention
DTFFC - Driving Too Fast for Conditions
FYRW - Failure to Yield Right of Way
ROR - Ran off Road
FTC - Followed Too Closely
AOV - Aggressive Operation of Vehicle
SAO - Swerving to Avoid Object
DUI - Under the Influence
Imp LC - Improper Lane Change

RA = Right Angle
RE = Rear End
SS = Side Swipe
HO = Head On
OC = Out of Control
HA = Hit Animal
OTH = Other

YR	2012	2013	2014	Total
RA	1	1	5	7
RE	6	26	16	48
SS	2	5	1	8
HO	0	0	0	0
OC	0	0	0	0
HA	0	0	0	0
OTH	1	0	0	1
Total	10	32	22	64

NIGHT = 8 DAY = 56	Total = 64 AADT = 36,650 Years = 2.50 07/01/12 to 12/31/14 CR = 1.914 SI = 2.751	PDO = 50 INJ. 1 = 11 INJ. 2 = 2 INJ. 3 = 1 FATAL = 0
WET = 9 DRY = 55		

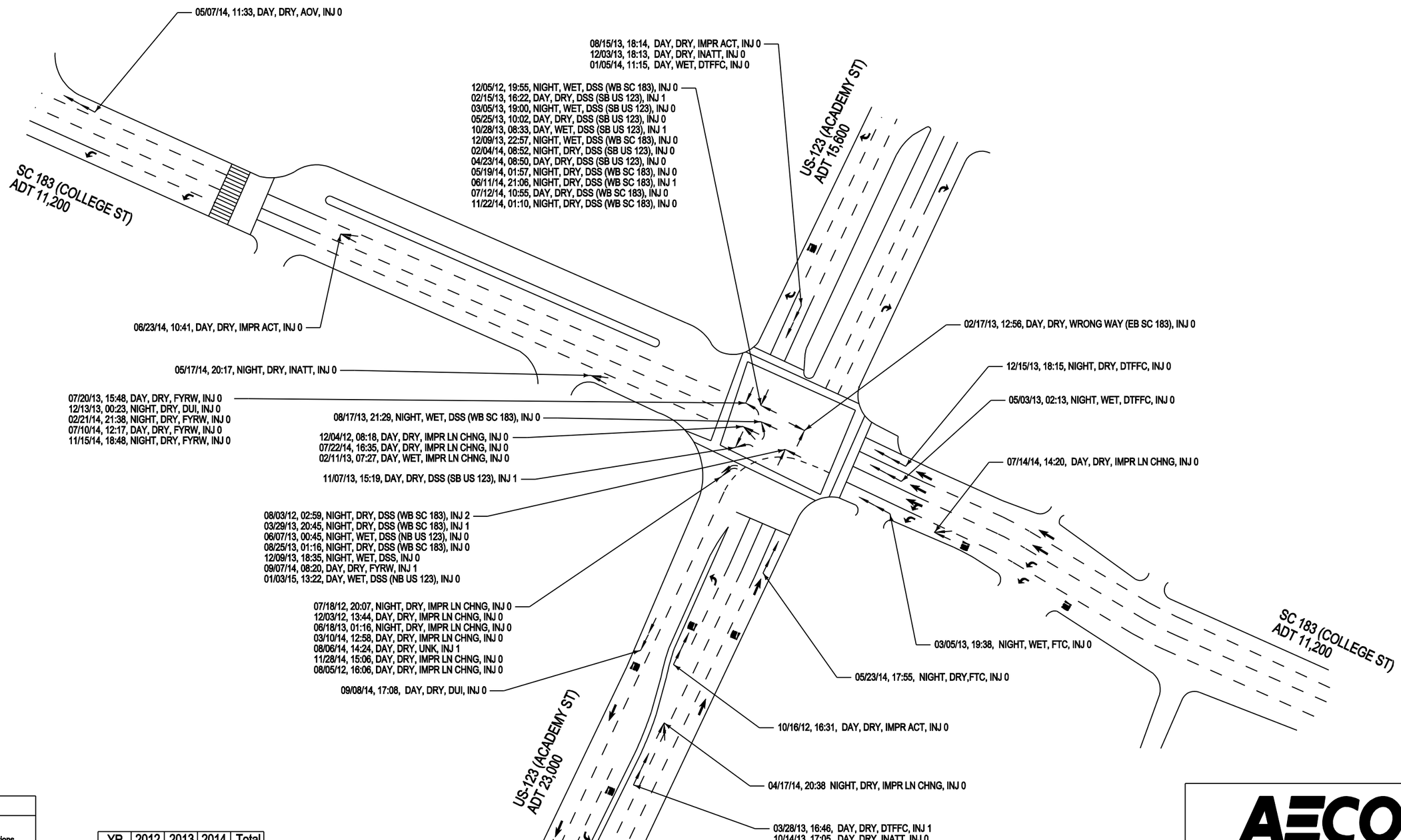
AECOM

SUBJECT TITLE: Collision Diagram

SPECIFIC LOCATION: US 276 & SC 146

CITY: Greenville | COUNTY: Greenville

DRAWN BY	DATE	SCALE	PAGE
AHB	1/31/15	None	1 of 1



LEGEND

DSS - Disregarded Sign or Signal
Inatt - Inattention
DTFFC - Driving Too Fast for Conditions
FYRW - Failure to Yield Right of Way
ROR - Ran off Road
FTC - Followed Too Closely
AOV - Aggressive Operation of Vehicle
SAO - Swerving to Avoid Object
DUI - Under the Influence
Imp LC - Improper Lane Change

RA = Right Angle
RE = Rear End
SS = Side Swipe
HO = Head On
OC = Out of Control
HA = Hit Animal
OTH = Other

YR	2012	2013	2014	Total
RA	2	14	11	27
RE	2	7	5	14
SS	4	2	8	14
HO	0	0	0	0
OC	0	0	0	0
HA	0	0	0	0
OTH	0	0	0	0
Total	8	23	24	55

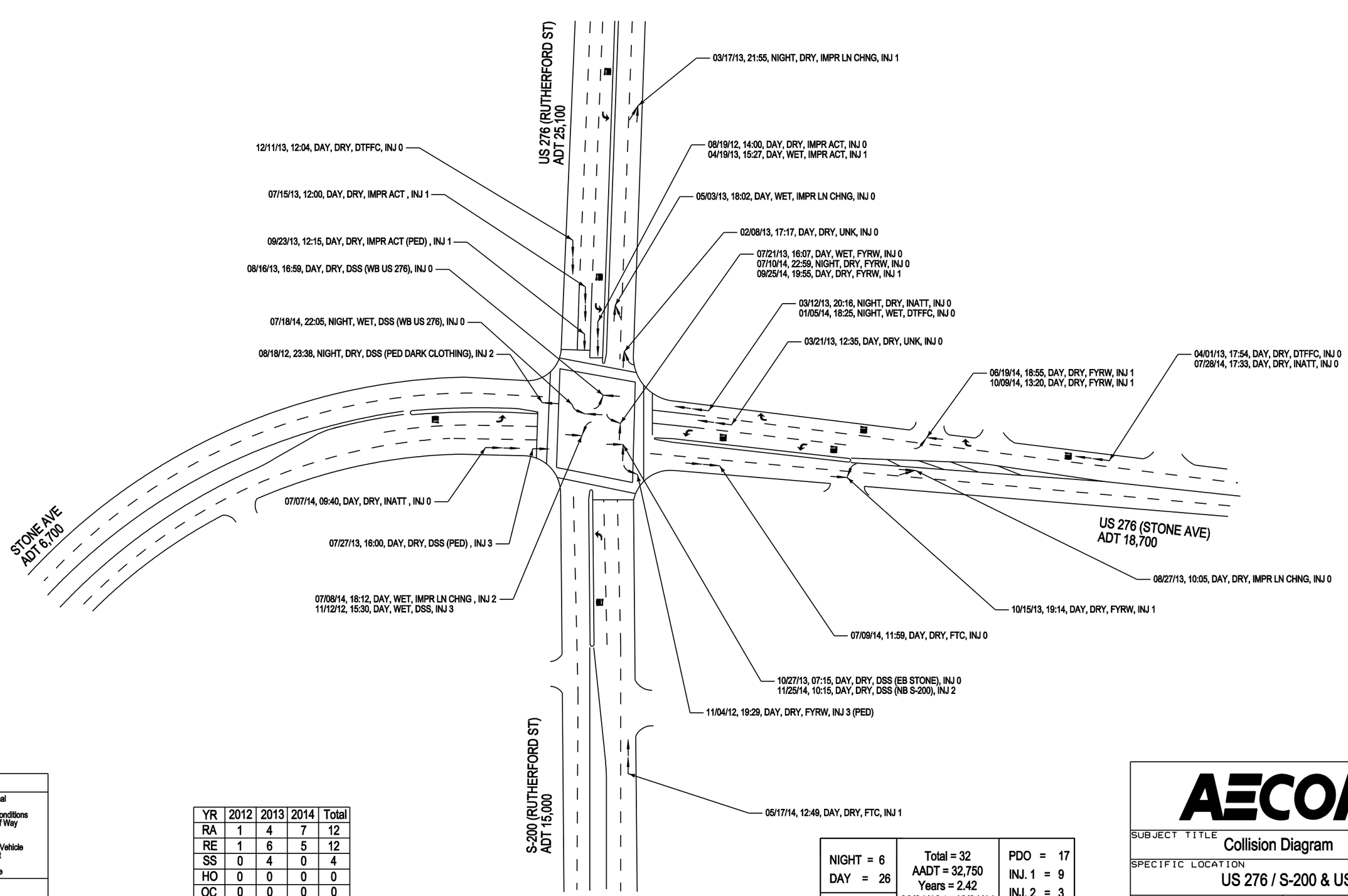
NIGHT = 24 DAY = 31	Total = 55 AADT = 30,500 Years = 2.50 07/01/12 to 12/31/14 CR = 1.976 SI = 2.695	PDO = 45 INJ. 1 = 9 INJ. 2 = 1 INJ. 3 = 0 FATAL = 0
WET = 13 DRY = 42		

AECOM

SUBJECT TITLE
Collision Diagram

SPECIFIC LOCATION
US 123 & SC 183

CITY	COUNTY		
Greenville	Greenville		
DRAWN BY	DATE	SCALE	PAGE
AHB	1/29/15	None	1 of 1



LEGEND

DSS - Disregarded Sign or Signal
Inatt - Inattention
DTFFC - Driving Too Fast for Conditions
FYRW - Failure to Yield Right of Way
ROR - Ran off Road
FTC - Followed Too Closely
AOV - Aggressive Operation of Vehicle
SAO - Swerving to Avoid Object
DUI - Under the Influence
Imp LC - Improper Lane Change

RA = Right Angle
RE = Rear End
SS = Side Swipe
HO = Head On
OC = Out of Control
HA = Hit Animal
OTH = Other

YR	2012	2013	2014	Total
RA	1	4	7	12
RE	1	6	5	12
SS	0	4	0	4
HO	0	0	0	0
OC	0	0	0	0
HA	0	0	0	0
OTH	2	2	0	4
Total	4	16	12	32

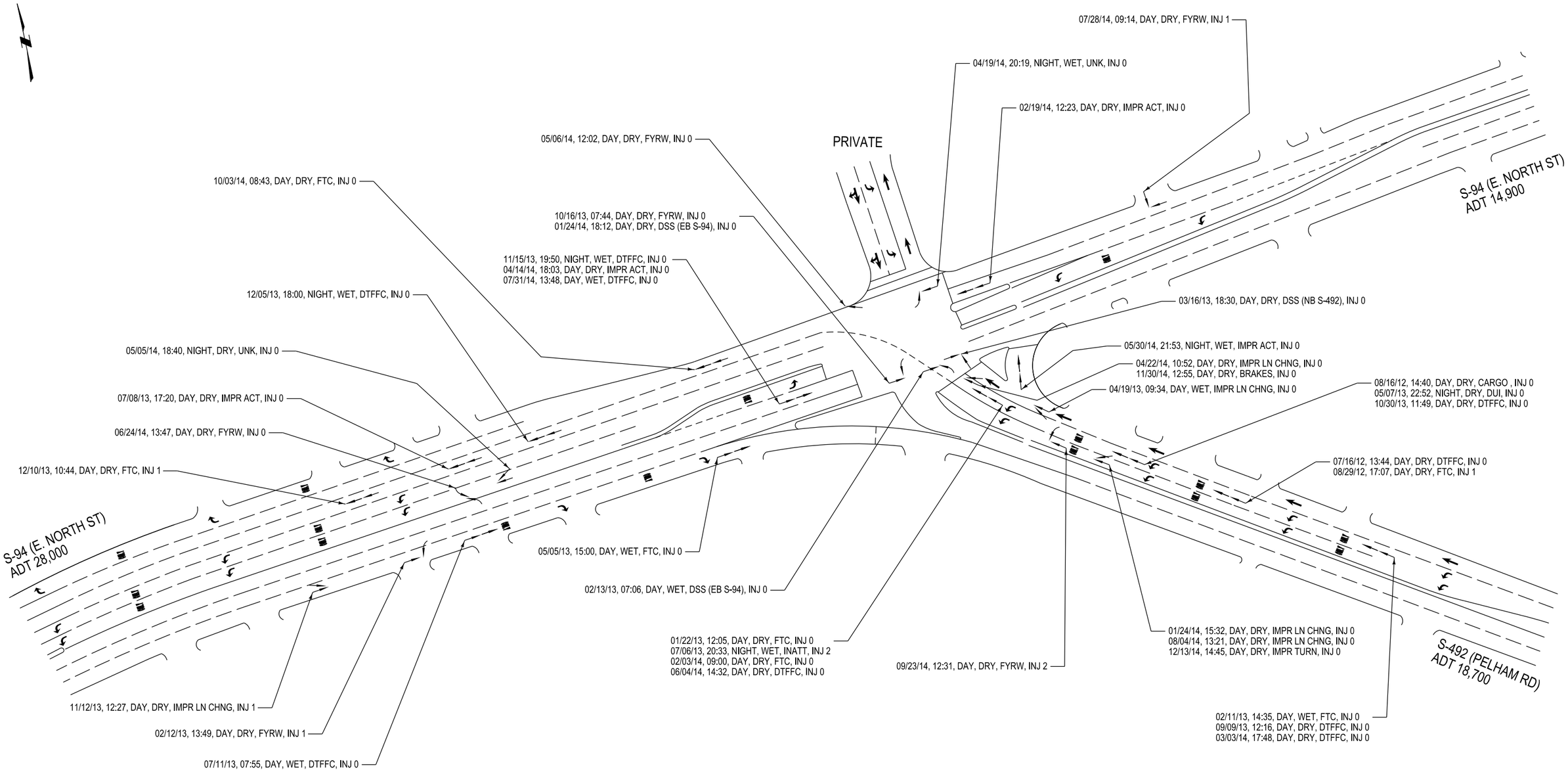
NIGHT = 6 DAY = 26	Total = 32 AADT = 32,750 Years = 2.42 08/01/12 to 12/31/14 CR = 1.106 SI = 2.143	PDO = 17 INJ. 1 = 9 INJ. 2 = 3 INJ. 3 = 3 FATAL = 0
WET = 7 DRY = 25		

AECOM

SUBJECT TITLE: Collision Diagram

SPECIFIC LOCATION: US 276 / S-200 & US 276

CITY	COUNTY		
Greenville	Greenville		
DRAWN BY	DATE	SCALE	PAGE
AHB	0129/15	None	1 of 1



LEGEND
DSS - Disregarded Sign or Signal Inatt - Inattention DTFFC - Driving Too Fast for Conditions FYRW - Failure to Yield Right of Way ROR - Ran off Road FTC - Followed Too Closely AOV - Aggressive Operation of Vehicle SAO - Swerving to Avoid Object DUI - Under the Influence Imp LC - Improper Lane Change
RA = Right Angle RE = Rear End SS = Side Swipe HO = Head On OC = Out of Control HA = Hit Animal OTH = Other

YR	2012	2013	2014	Total
RA	0	4	7	11
RE	2	12	7	21
SS	0	2	2	4
HO	0	0	0	0
OC	0	0	0	0
HA	0	0	0	0
OTH	1	0	3	4
Total	3	18	19	40

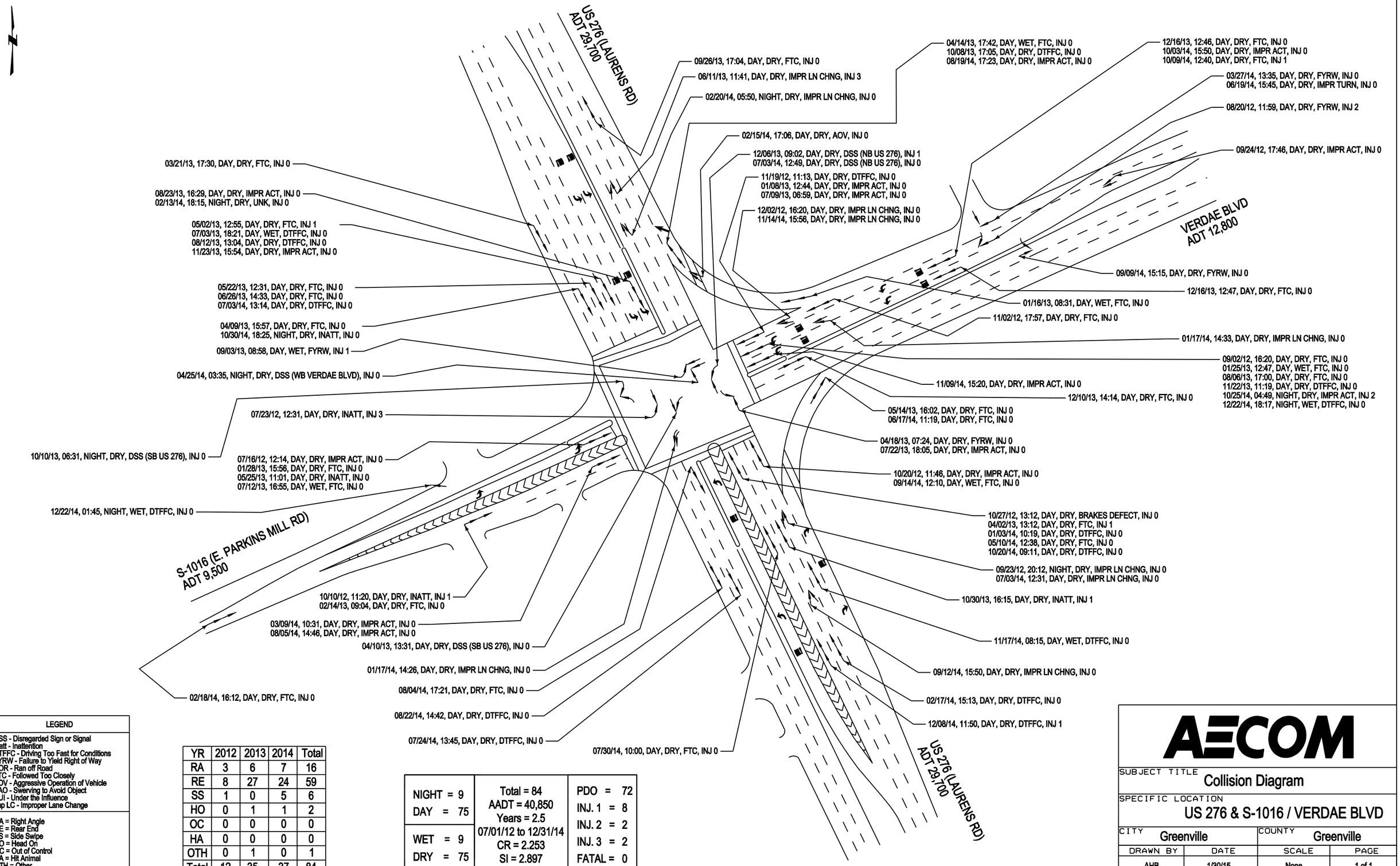
NIGHT = 7 DAY = 33	Total = 40 AADT = 40,100 Years = 2.5 07/01/12 to 12/31/14 CR = 1.092 SI = 1.474	PDO = 33 INJ. 1 = 5 INJ. 2 = 2 INJ. 3 = 0 FATAL = 0
WET = 11 DRY = 29		

AECOM

SUBJECT TITLE
Collision Diagram

SPECIFIC LOCATION
S-492 & S-94

CITY	COUNTY		
Greenville	Greenville		
DRAWN BY	DATE	SCALE	PAGE
AHB	1/29/15	None	1 of 1



LEGEND

DSS - Disregarded Sign or Signal
Inatt - Inattention
DTFFC - Driving Too Fast for Conditions
FYRW - Failure to Yield Right of Way
ROR - Ran off Road
FTC - Followed Too Closely
AOV - Aggressive Operation of Vehicle
SAO - Swerving to Avoid Object
DUI - Under the Influence
Imp LC - Improper Lane Change

RA = Right Angle
RE = Rear End
SS = Side Swipe
HO = Head On
OC = Out of Control
HA = Hit Animal
OTH = Other

YR	2012	2013	2014	Total
RA	3	6	7	16
RE	8	27	24	59
SS	1	0	5	6
HO	0	1	1	2
OC	0	0	0	0
HA	0	0	0	0
OTH	0	1	0	1
Total	12	35	37	84

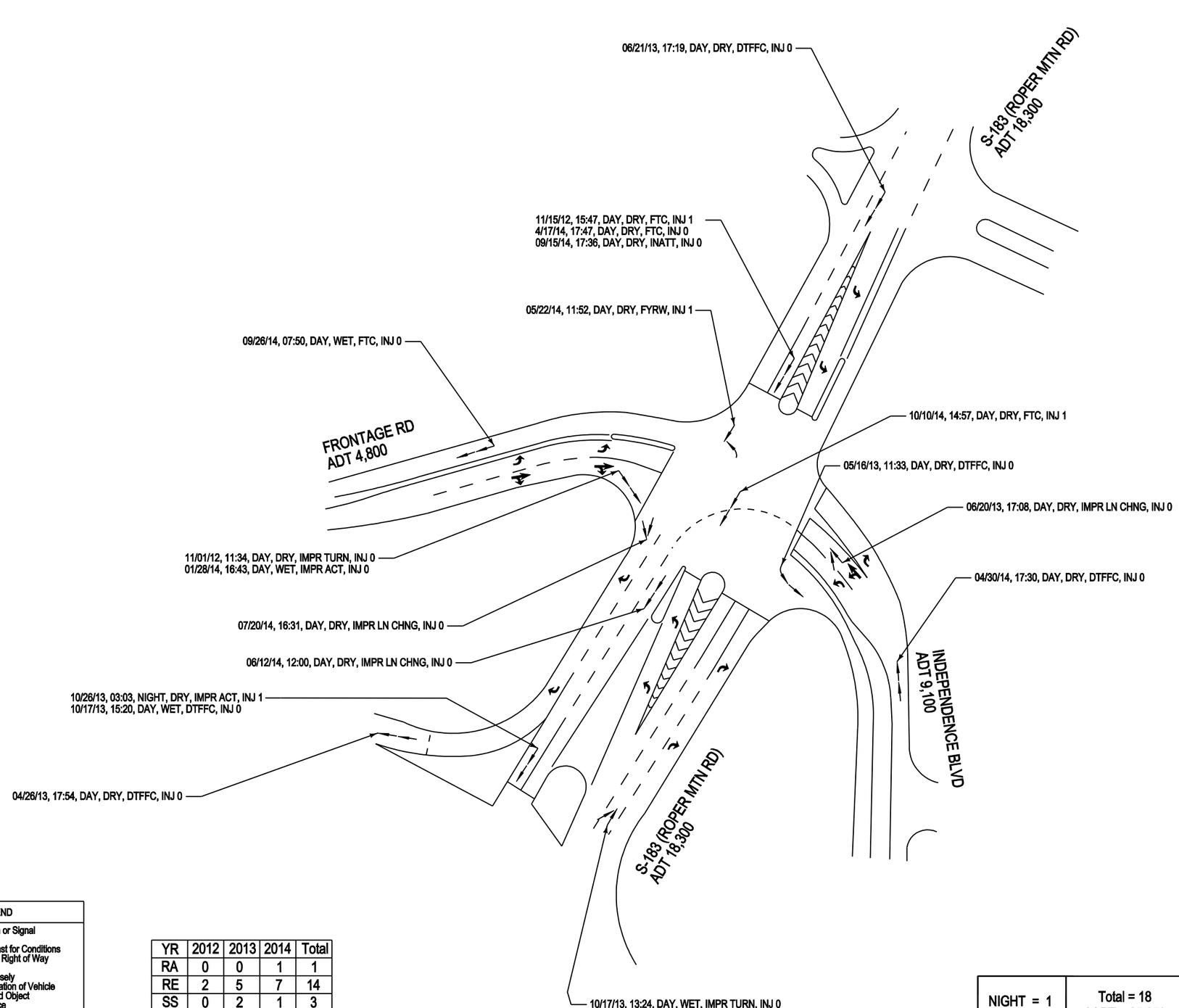
NIGHT = 9 DAY = 75	Total = 84 AADT = 40,850 Years = 2.5 07/01/12 to 12/31/14 CR = 2.253 SI = 2.897	PDO = 72 INJ. 1 = 8 INJ. 2 = 2 INJ. 3 = 2 FATAL = 0
WET = 9 DRY = 75		

AECOM

SUBJECT TITLE
Collision Diagram

SPECIFIC LOCATION
US 276 & S-1016 / VERDAE BLVD

CITY	COUNTY		
Greenville	Greenville		
DRAWN BY	DATE	SCALE	PAGE
AHB	1/30/15	None	1 of 1



LEGEND

DSS - Disregarded Sign or Signal
Inatt - Inattention
DTFFC - Driving Too Fast for Conditions
FYRW - Failure to Yield Right of Way
ROR - Ran off Road
FTC - Followed Too Closely
AOV - Aggressive Operation of Vehicle
SAO - Swerving to Avoid Object
DUI - Under the Influence
Imp LC - Improper Lane Change

RA = Right Angle
RE = Rear End
SS = Side Swipe
HO = Head On
OC = Out of Control
HA = Hit Animal
OTH = Other

YR	2012	2013	2014	Total
RA	0	0	1	1
RE	2	5	7	14
SS	0	2	1	3
HO	0	0	0	0
OC	0	0	0	0
HA	0	0	0	0
OTH	0	0	0	0
Total	2	7	9	18

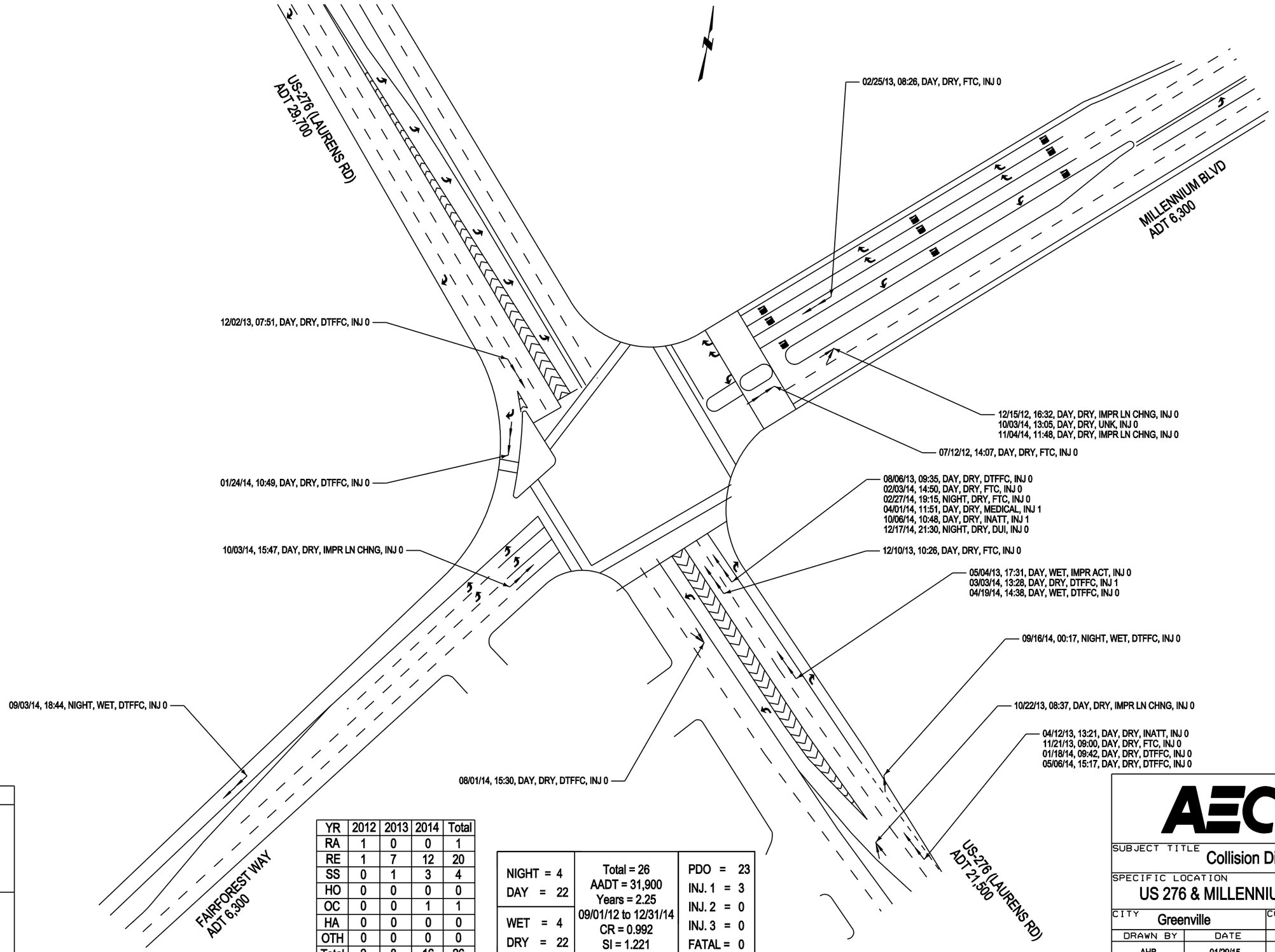
NIGHT = 1 DAY = 17	Total = 18 AADT = 25,250 Years = 2.0 11/01/12 to 10/31/14 CR = 0.977 SI = 1.411	PDO = 14 INJ. 1 = 4 INJ. 2 = 0 INJ. 3 = 0 FATAL = 0
WET = 4 DRY = 14		

AECOM

SUBJECT TITLE
Collision Diagram

SPECIFIC LOCATION
S-183 & FRONTAGE RD / INDEPENDENCE BLVD

CITY		COUNTY	
Greenville		Greenville	
DRAWN BY	DATE	SCALE	PAGE
AHB	2/11/15	None	1 of 1



LEGEND

DSS - Disregarded Sign or Signal
Inatt - Inattention
DTFFC - Driving Too Fast for Conditions
FYRW - Failure to Yield Right of Way
ROR - Ran off Road
FTC - Followed Too Closely
AOV - Aggressive Operation of Vehicle
SAO - Swerving to Avoid Object
DUI - Under the Influence
Imp LC - Improper Lane Change

RA = Right Angle
RE = Rear End
SS = Side Swipe
HO = Head On
OC = Out of Control
HA = Hit Animal
OTH = Other

YR	2012	2013	2014	Total
RA	1	0	0	1
RE	1	7	12	20
SS	0	1	3	4
HO	0	0	0	0
OC	0	0	1	1
HA	0	0	0	0
OTH	0	0	0	0
Total	2	8	16	26

NIGHT = 4 DAY = 22	Total = 26 AADT = 31,900 Years = 2.25 09/01/12 to 12/31/14 CR = 0.992 SI = 1.221	PDO = 23 INJ. 1 = 3 INJ. 2 = 0 INJ. 3 = 0 FATAL = 0
WET = 4 DRY = 22		

AECOM

SUBJECT TITLE
Collision Diagram

SPECIFIC LOCATION
US 276 & MILLENNIUM / FAIRFOREST

CITY	COUNTY		
Greenville	Greenville		
DRAWN BY	DATE	SCALE	PAGE
AHB	01/29/15	None	1 of 1

APPENDIX C – Traffic Counts

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	467	7	325	0	0	0	0	408	165	616	927	0
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)	49%											

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	0	0	0	228	0	589	103	927	0	0	1254	749
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	105%	105%	105%	105%	105%	105%	105%	105%	105%	105%	105%	105%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)				50%								

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	419	1	459	0	0	0	0	1163	474	594	1037	0
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)	50%											

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	0	0	0	441	0	921	222	1337	0	0	1261	434
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	105%	105%	105%	105%	105%	105%	105%	105%	105%	105%	105%	105%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)				50%								

Intersection Summary

Traffic Engineering Division

26 Woods Lake Road
Greenville, SC 29607

Location: Pleasantburg/Century/Villa
Weather: Clear
Counter: DB-400
Counted By: Jonathan

File Name : PleasantburgCenturyVilla13
Site Code : 56111111
Start Date : 11/20/2013
Page No : 1

Groups Printed- Unshifted - Bank 1

	N. Pleasantburg Dr. From North				Villa Rd. From East				N. Pleasantburg Dr. From South				Century Dr. From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	5	377	12	0	6	3	20	0	23	233	7	0	15	3	5	0	709
07:15 AM	7	439	15	0	10	10	35	0	29	243	7	0	11	6	13	0	825
07:30 AM	11	511	21	0	10	17	29	0	39	306	10	0	24	8	10	0	996
07:45 AM	13	577	18	0	14	29	41	0	52	365	17	0	33	10	12	0	1181
Total	36	1904	66	0	40	59	125	0	143	1147	41	0	83	27	40	0	3711
08:00 AM	19	548	22	0	11	9	40	0	58	338	16	0	17	11	14	0	1103
08:15 AM	21	503	25	0	7	8	30	0	67	283	16	0	16	2	8	0	986
08:30 AM	13	494	22	0	5	7	39	0	61	302	10	0	18	6	12	0	989
08:45 AM	9	427	17	0	16	2	36	0	42	269	8	0	10	6	8	0	850
Total	62	1972	86	0	39	26	145	0	228	1192	50	0	61	25	42	0	3928
*** BREAK ***																	
11:00 AM	5	327	13	0	7	1	26	0	20	306	6	0	10	2	10	0	733
11:15 AM	13	338	9	0	13	2	19	0	28	305	12	0	10	3	14	0	766
11:30 AM	10	311	10	0	8	3	23	0	22	294	10	0	9	3	15	0	718
11:45 AM	14	345	16	0	14	3	29	0	39	366	15	0	11	2	12	0	866
Total	42	1321	48	0	42	9	97	0	109	1271	43	0	40	10	51	0	3083
12:00 PM	16	367	15	0	23	7	32	0	32	401	12	0	6	3	14	0	928
12:15 PM	20	357	20	0	13	4	39	0	29	411	16	0	16	5	18	0	948
12:30 PM	20	342	19	0	14	4	31	0	44	404	14	0	10	6	17	0	925
12:45 PM	15	375	17	0	16	10	30	0	52	420	15	0	8	5	7	0	970
Total	71	1441	71	0	66	25	132	0	157	1636	57	0	40	19	56	0	3771
*** BREAK ***																	
04:00 PM	10	340	15	0	13	5	31	0	41	458	7	0	15	4	18	0	957
04:15 PM	9	420	19	0	13	6	44	0	23	420	11	0	9	6	10	0	990
04:30 PM	7	440	12	0	9	8	39	0	31	469	8	0	19	5	24	0	1071
04:45 PM	12	486	16	0	15	7	49	0	44	503	9	0	26	6	22	0	1195
Total	38	1686	62	0	50	26	163	0	139	1850	35	0	69	21	74	0	4213
05:00 PM	23	513	27	0	19	18	28	0	57	584	16	0	14	9	15	0	1323
05:15 PM	19	498	23	0	19	14	31	0	38	477	7	0	19	8	19	0	1172
05:30 PM	14	402	13	0	12	12	22	0	35	401	10	0	7	6	13	0	947
05:45 PM	16	339	15	0	13	9	20	0	29	354	10	0	10	11	17	0	843
Total	72	1752	78	0	63	53	101	0	159	1816	43	0	50	34	64	0	4285
Grand Total	321	10076	411	0	300	198	763	0	935	8912	269	0	343	136	327	0	22991
Apprch %	3	93.2	3.8	0	23.8	15.7	60.5	0	9.2	88.1	2.7	0	42.6	16.9	40.6	0	
Total %	1.4	43.8	1.8	0	1.3	0.9	3.3	0	4.1	38.8	1.2	0	1.5	0.6	1.4	0	
Unshifted	321	10076	411	0	300	198	763	0	935	8912	269	0	343	136	327	0	22991
% Unshifted	100	100	100	0	100	100	100	0	100	100	100	0	100	100	100	0	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Traffic Engineering Division

26 Woods Lake Road
Greenville, SC 29607

Location: Pleasantburg/Antrim
Weather: Clear
Counter: DB-400
Counted By: Jonathan

File Name : PleasantburgAntrim2
Site Code : 56114411
Start Date : 3/20/2013
Page No : 1

Groups Printed- Unshifted - Bank 1

	N. Pleasantburg Dr. From North				E. Antrim Dr. From East				S. Pleasantburg Dr. From South				W. Antrim Dr. From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	14	201	18	0	4	10	49	0	33	156	23	0	24	11	13	0	556
07:15 AM	19	255	22	0	6	21	65	0	49	195	20	0	29	14	19	0	714
07:30 AM	25	302	15	0	7	16	59	0	70	244	31	0	30	16	18	0	833
07:45 AM	30	354	26	0	10	26	72	0	88	294	39	0	38	26	29	0	1032
Total	88	1112	81	0	27	73	245	0	240	889	113	0	121	67	79	0	3135
08:00 AM	37	307	20	0	10	22	64	0	77	259	24	0	33	12	11	1	877
08:15 AM	32	288	32	0	4	19	58	0	75	240	29	0	39	10	21	0	847
08:30 AM	24	268	31	0	3	22	55	1	53	164	33	0	39	17	9	0	719
08:45 AM	23	302	21	0	7	7	55	0	40	193	36	0	33	10	16	0	743
Total	116	1165	104	0	24	70	232	1	245	856	122	0	144	49	57	1	3186
*** BREAK ***																	
11:00 AM	9	151	20	0	9	14	81	0	119	188	24	0	41	27	22	0	705
11:15 AM	8	175	19	0	20	13	81	1	74	188	32	0	29	17	14	0	671
11:30 AM	7	187	23	0	12	14	87	0	88	197	35	0	22	25	14	0	711
11:45 AM	13	194	22	0	19	16	95	0	93	213	26	0	28	20	30	0	769
Total	37	707	84	0	60	57	344	1	374	786	117	0	120	89	80	0	2856
12:00 PM	19	236	17	0	27	28	84	0	123	245	39	0	46	22	25	0	911
12:15 PM	9	201	26	0	12	20	103	0	109	189	28	0	38	29	16	0	780
12:30 PM	7	179	25	0	16	11	77	1	84	202	26	0	20	16	19	0	683
12:45 PM	10	213	25	0	22	17	63	0	73	171	31	0	26	19	26	0	696
Total	45	829	93	0	77	76	327	1	389	807	124	0	130	86	86	0	3070
*** BREAK ***																	
04:00 PM	10	233	26	0	20	13	115	0	70	320	25	0	36	16	24	1	909
04:15 PM	11	218	28	0	14	17	99	2	79	307	29	0	37	25	13	0	879
04:30 PM	9	243	27	0	21	24	99	0	108	318	46	0	43	22	27	0	987
04:45 PM	17	253	23	0	18	16	104	0	91	351	31	0	51	28	23	0	1006
Total	47	947	104	0	73	70	417	2	348	1296	131	0	167	91	87	1	3781
05:00 PM	8	252	26	0	18	20	112	0	104	374	44	0	57	30	80	0	1125
05:15 PM	12	241	31	0	9	19	102	0	88	311	33	0	50	19	61	0	976
05:30 PM	16	203	19	0	13	11	68	0	77	251	21	0	33	26	34	0	772
05:45 PM	9	181	22	0	10	12	73	0	63	269	26	0	28	22	23	0	738
Total	45	877	98	0	50	62	355	0	332	1205	124	0	168	97	198	0	3611
Grand Total	378	5637	564	0	311	408	1920	5	1928	5839	731	0	850	479	587	2	19639
Apprch %	5.7	85.7	8.6	0	11.8	15.4	72.6	0.2	22.7	68.7	8.6	0	44.3	25	30.6	0.1	
Total %	1.9	28.7	2.9	0	1.6	2.1	9.8	0	9.8	29.7	3.7	0	4.3	2.4	3	0	
Unshifted	378	5637	564	0	311	408	1920	5	1928	5839	731	0	850	479	587	2	19639
% Unshifted	100	100	100	0	100	100	100	100	100	100	100	0	100	100	100	100	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Traffic Engineering Division

26 Woods Lake Road
Greenville, SC 29607

Location: Academy/Pendleton
Weather: Rain
Counter: DB-400
Counted By: Jonathan

File Name : AcademyPendleton
Site Code : 65876576
Start Date : 4/1/2009
Page No : 1

Groups Printed- Unshifted - Bank 1

	Academy St. From North				Pendleton St. From East				Academy St. From South				Pendleton St. From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	16	102	3	0	6	30	8	0	14	157	2	0	4	52	25	0	419
07:15 AM	19	133	8	0	9	41	12	0	19	188	3	0	5	66	28	0	531
07:30 AM	22	149	5	0	8	56	16	0	25	240	5	0	5	89	38	0	658
07:45 AM	23	157	4	0	15	59	18	0	20	273	3	0	10	114	59	0	755
Total	80	541	20	0	38	186	54	0	78	858	13	0	24	321	150	0	2363
08:00 AM	30	163	8	0	13	66	26	0	42	287	7	0	1	116	73	0	832
08:15 AM	22	168	14	0	9	54	18	0	31	279	9	0	4	109	51	0	768
08:30 AM	30	136	17	0	11	41	11	0	24	206	5	0	13	78	33	0	605
08:45 AM	25	120	16	0	10	47	14	0	22	188	4	0	7	71	47	0	571
Total	107	587	55	0	43	208	69	0	119	960	25	0	25	374	204	0	2776
*** BREAK ***																	
11:00 AM	22	114	11	0	13	40	15	0	23	129	5	0	3	55	39	0	469
11:15 AM	31	135	15	0	9	49	27	0	33	146	7	0	6	75	22	0	555
11:30 AM	25	123	14	0	16	56	21	0	29	131	7	0	2	63	26	0	513
11:45 AM	33	129	11	0	15	52	26	0	22	127	11	0	6	71	34	0	537
Total	111	501	51	0	53	197	89	0	107	533	30	0	17	264	121	0	2074
12:00 PM	36	125	13	0	12	63	22	0	27	119	10	0	2	64	28	0	521
12:15 PM	38	127	10	0	12	83	32	0	20	131	8	0	7	59	27	0	554
12:30 PM	37	129	15	0	9	59	26	0	31	137	14	0	8	66	42	0	573
12:45 PM	25	133	22	0	20	69	25	0	20	136	11	0	12	86	30	0	589
Total	136	514	60	0	53	274	105	0	98	523	43	0	29	275	127	0	2237
*** BREAK ***																	
04:00 PM	15	121	5	0	7	43	16	0	17	169	6	0	6	59	29	0	493
04:15 PM	22	140	6	0	15	53	26	0	23	189	9	0	10	56	36	0	585
04:30 PM	23	142	11	0	15	42	20	0	39	226	10	0	9	69	39	0	645
04:45 PM	29	160	15	0	23	59	33	0	43	244	14	0	11	76	49	0	756
Total	89	563	37	0	60	197	95	0	122	828	39	0	36	260	153	0	2479
05:00 PM	36	189	19	0	22	79	29	0	53	268	13	0	15	93	63	0	879
05:15 PM	32	185	12	0	11	64	26	0	36	238	9	0	9	90	51	0	763
05:30 PM	28	148	8	0	16	53	23	0	29	213	6	0	5	76	39	0	644
05:45 PM	27	131	12	0	12	41	16	0	26	186	8	0	5	61	43	0	568
Total	123	653	51	0	61	237	94	0	144	905	36	0	34	320	196	0	2854
Grand Total	646	3359	274	0	308	1299	506	0	668	4607	186	0	165	1814	951	0	14783
Apprch %	15.1	78.5	6.4	0	14.6	61.5	23.9	0	12.2	84.4	3.4	0	5.6	61.9	32.5	0	
Total %	4.4	22.7	1.9	0	2.1	8.8	3.4	0	4.5	31.2	1.3	0	1.1	12.3	6.4	0	
Unshifted	646	3359	274	0	308	1299	506	0	668	4607	186	0	165	1814	951	0	14783
% Unshifted	100	100	100	0	100	100	100	0	100	100	100	0	100	100	100	0	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Traffic Engineering Division

26 Woods Lake Road
Greenville, SC 29607

Location: Pleasantburg/Mauldin
Weather: Clear
Counter: DB-400
Counted By: Jonathan

File Name : PleasantburgMauldin
Site Code : 58765678
Start Date : 9/15/2010
Page No : 1

Groups Printed- Unshifted - Bank 1

	S. Pleasantburg Dr. From North				Mauldin Rd. From East				S. Pleasantburg Dr. From South				Mauldin Rd. From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	16	87	29	0	43	90	13	0	9	134	11	0	4	57	17	0	510
07:15 AM	19	103	38	0	56	113	23	0	14	179	30	0	9	84	26	0	694
07:30 AM	35	147	56	0	59	123	19	0	20	209	27	0	8	73	31	0	807
07:45 AM	42	161	51	0	84	156	51	0	13	276	63	0	13	113	57	0	1080
Total	112	498	174	0	242	482	106	0	56	798	131	0	34	327	131	0	3091
08:00 AM	52	155	61	0	92	143	38	0	14	323	49	0	14	121	45	0	1107
08:15 AM	26	115	39	0	113	138	40	0	21	308	32	0	5	129	43	0	1009
08:30 AM	25	136	39	0	102	163	40	0	15	258	22	0	9	117	30	0	956
08:45 AM	35	99	39	0	100	124	18	0	18	261	19	0	8	101	42	0	864
Total	138	505	178	0	407	568	136	0	68	1150	122	0	36	468	160	0	3936
*** BREAK ***																	
11:00 AM	29	107	29	0	50	132	20	0	12	131	20	0	9	109	29	0	677
11:15 AM	46	126	36	0	47	120	19	0	18	149	16	0	13	89	35	0	714
11:30 AM	40	112	44	0	36	111	15	0	13	123	24	0	16	99	39	0	672
11:45 AM	43	137	46	0	53	129	36	0	17	155	19	0	11	126	41	0	813
Total	158	482	155	0	186	492	90	0	60	558	79	0	49	423	144	0	2876
12:00 PM	53	119	54	0	62	120	18	0	22	176	34	0	11	111	44	0	824
12:15 PM	38	142	59	0	49	103	23	0	14	156	23	0	6	121	33	0	767
12:30 PM	45	180	58	0	42	98	24	0	12	139	15	0	7	98	35	0	753
12:45 PM	28	123	52	0	31	116	24	0	18	110	32	0	10	109	38	0	691
Total	164	564	223	0	184	437	89	0	66	581	104	0	34	439	150	0	3035
*** BREAK ***																	
04:00 PM	34	139	39	0	53	96	28	0	26	141	14	0	24	74	31	0	699
04:15 PM	24	150	57	0	67	106	35	0	23	179	20	0	16	139	51	0	867
04:30 PM	43	189	62	0	86	129	26	0	35	136	19	0	12	123	33	0	893
04:45 PM	56	269	68	0	103	159	48	0	51	189	31	0	20	156	47	0	1197
Total	157	747	226	0	309	490	137	0	135	645	84	0	72	492	162	0	3656
05:00 PM	61	255	86	0	95	174	45	0	40	260	23	0	29	169	59	0	1296
05:15 PM	40	273	43	0	84	156	41	0	36	253	46	0	23	123	36	0	1154
05:30 PM	23	180	51	0	79	134	55	0	23	194	39	0	13	129	23	0	943
05:45 PM	26	153	35	0	63	90	53	0	20	159	28	0	10	103	26	0	766
Total	150	861	215	0	321	554	194	0	119	866	136	0	75	524	144	0	4159
Grand Total	879	3657	1171	0	1649	3023	752	0	504	4598	656	0	300	2673	891	0	20753
Apprch %	15.4	64.1	20.5	0	30.4	55.7	13.9	0	8.8	79.9	11.4	0	7.8	69.2	23.1	0	
Total %	4.2	17.6	5.6	0	7.9	14.6	3.6	0	2.4	22.2	3.2	0	1.4	12.9	4.3	0	
Unshifted	879	3657	1171	0	1649	3023	752	0	504	4598	656	0	300	2673	891	0	20753
% Unshifted	100	100	100	0	100	100	100	0	100	100	100	0	100	100	100	0	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Traffic Engineering Division

26 Woods Lake Road
Greenville, SC 29607

Location: Pleasantburg/Rutherford
Weather: Clear
Counter: DB-400
Counted By: Jonathan/Wil

File Name : PleasantburgRutherford
Site Code : 19191919
Start Date : 4/22/2008
Page No : 1

Groups Printed- Unshifted - Bank 1

	Pleasantburg Dr. From North				Rutherford Rd. From East				Pleasantburg Dr. From South				Rutherford Rd. From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	16	189	54	0	53	85	36	0	14	105	21	0	19	38	5	0	635
07:15 AM	29	305	65	0	91	129	70	0	20	120	40	0	36	46	10	0	961
07:30 AM	38	325	83	0	82	223	82	0	17	171	40	0	73	80	26	0	1240
07:45 AM	38	397	97	0	109	220	76	0	28	190	48	0	91	106	49	0	1449
Total	121	1216	299	0	335	657	264	0	79	586	149	0	219	270	90	0	4285
08:00 AM	33	374	79	0	93	199	69	0	22	228	39	0	86	69	29	0	1320
08:15 AM	37	330	64	0	91	167	61	0	33	212	43	0	46	59	25	0	1168
08:30 AM	42	311	94	0	82	107	45	0	22	201	38	0	44	51	25	0	1062
08:45 AM	26	237	81	0	74	91	44	0	33	173	28	0	32	56	19	0	894
Total	138	1252	318	0	340	564	219	0	110	814	148	0	208	235	98	0	4444
*** BREAK ***																	
11:00 AM	26	207	66	0	83	48	26	0	21	195	30	0	18	49	17	0	786
11:15 AM	24	181	55	0	59	35	25	0	13	172	25	0	25	39	23	0	676
11:30 AM	22	176	60	0	66	40	26	1	31	178	24	0	40	43	37	0	744
11:45 AM	25	230	73	0	84	56	30	1	25	232	28	0	32	57	33	0	906
Total	97	794	254	0	292	179	107	2	90	777	107	0	115	188	110	0	3112
12:00 PM	23	206	76	0	68	46	30	0	26	224	31	0	40	67	34	0	871
12:15 PM	30	181	77	0	75	46	25	0	22	191	36	0	31	61	30	0	805
12:30 PM	35	247	61	0	82	48	22	0	28	243	30	0	41	49	26	0	912
12:45 PM	28	247	68	0	69	61	41	0	28	231	43	0	32	43	34	0	925
Total	116	881	282	0	294	201	118	0	104	889	140	0	144	220	124	0	3513
*** BREAK ***																	
04:00 PM	28	242	89	0	90	71	25	0	29	266	50	0	41	92	36	0	1059
04:15 PM	22	230	90	0	87	66	25	0	35	282	41	0	42	106	27	0	1053
04:30 PM	18	228	86	1	100	81	47	0	21	279	33	0	47	119	38	0	1098
04:45 PM	21	273	114	0	67	63	36	1	33	333	45	0	26	93	37	0	1142
Total	89	973	379	1	344	281	133	1	118	1160	169	0	156	410	138	0	4352
05:00 PM	24	253	111	0	89	74	34	0	25	322	41	0	42	145	37	0	1197
05:15 PM	22	238	104	0	103	86	31	1	23	329	47	0	38	183	51	0	1256
05:30 PM	22	250	107	0	85	86	31	0	29	328	30	0	29	129	52	0	1178
05:45 PM	22	225	93	0	115	117	45	0	28	274	32	0	50	123	38	0	1162
Total	90	966	415	0	392	363	141	1	105	1253	150	0	159	580	178	0	4793
Grand Total	651	6082	1947	1	1997	2245	982	4	606	5479	863	0	1001	1903	738	0	24499
Apprch %	7.5	70.1	22.4	0	38.2	42.9	18.8	0.1	8.7	78.9	12.4	0	27.5	52.3	20.3	0	
Total %	2.7	24.8	7.9	0	8.2	9.2	4	0	2.5	22.4	3.5	0	4.1	7.8	3	0	
Unshifted	651	6082	1947	1	1997	2245	982	4	606	5479	863	0	1001	1903	738	0	24499
% Unshifted	100	100	100	100	100	100	100	100	100	100	100	0	100	100	100	0	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

TRAFFIC ENGINEERING

County: GREENVILLE City: GREENVILLE Date: 1/27/2009

Major Rt: HAYWOOD Minor Rt: PELHAM RD

Day of Week: TUESDAY Weather: MIXED Name: RIVERSEDGE TRAFFIC DATA

Type of Control: SIGNAL Speed Limit (major st) 40

Direction of Minor Street: N-S Intersection ADT - 51060 (Calc)

Number of Lanes (major st)* 2 Number of Lanes (minor st)* 2

* Each Direction

INTERSECTION VOLUME SUMMARY

	From N PELHAM RD				From S PELHAM RD				From E HAYWOOD				From W HAYWOOD				Total	Total
	LT	STR	RT	TOT	LT	STR	RT	TOT	LT	STR	RT	TOT	LT	STR	RT	TOT	Vol	Peds
7:00 - 7:15	0	65	38	103	39	34	16	89	27	162	4	193	13	66	12	91	476	0
7:15 - 7:30	9	73	46	128	40	63	20	123	41	189	4	234	25	79	18	122	607	0
7:30 - 7:45	8	111	66	185	91	121	26	238	84	262	5	351	47	89	20	156	930	0
7:45 - 8:00	9	118	68	195	136	155	53	344	99	339	12	450	48	136	32	216	1205	0
8:00 - 8:15	8	191	63	262	142	141	43	326	101	301	20	422	54	123	38	215	1225	1
8:15 - 8:30	9	164	71	244	147	133	38	318	84	273	16	373	65	113	36	214	1149	0
8:30 - 8:45	13	152	52	217	116	147	43	306	83	207	19	309	64	120	40	224	1056	0
8:45 - 9:00	15	115	79	209	85	105	55	245	68	177	12	257	74	118	25	217	928	0
11:00 - 11:15	12	91	64	167	67	109	49	225	51	141	10	202	64	117	44	225	819	0
11:15 - 11:30	12	79	77	168	64	89	36	189	59	142	12	213	88	95	42	225	795	1
11:30 - 11:45	16	92	85	193	54	105	48	207	56	142	9	207	69	128	41	238	845	0
11:45 - 12:00	9	115	98	222	66	122	58	246	49	167	13	229	81	132	36	249	946	0
12:00 - 12:15	17	107	89	213	76	129	55	260	49	167	17	233	106	131	51	288	994	0
12:15 - 12:30	25	102	74	201	47	132	53	232	43	151	10	204	94	125	65	284	921	1
12:30 - 12:45	18	106	102	226	53	89	59	201	59	167	12	238	91	121	42	254	919	0
12:45 - 13:00	10	141	109	260	56	96	48	200	63	176	15	254	81	166	49	296	1010	0
14:00 - 14:15	16	101	66	183	54	123	57	234	55	153	12	220	97	170	57	324	961	1
14:15 - 14:30	18	110	71	199	48	129	55	232	55	187	11	253	96	156	43	295	979	1
14:30 - 14:45	13	124	76	213	71	106	44	221	37	147	10	194	90	189	52	331	959	0
14:45 - 15:00	21	121	66	208	60	145	72	277	67	150	18	235	84	148	68	300	1020	0
15:00 - 15:15	15	132	85	232	61	146	67	274	52	139	17	208	101	152	48	301	1015	0
15:15 - 15:30	14	143	92	249	75	130	69	274	66	157	11	234	113	175	75	363	1120	0
15:30 - 15:45	22	127	90	239	58	122	62	242	45	181	18	244	76	217	50	343	1068	0
15:45 - 16:00	24	133	92	249	69	138	74	281	59	140	16	215	85	170	64	319	1064	0
16:00 - 16:15	12	130	78	220	59	136	67	262	54	150	15	219	110	215	58	383	1084	0
16:15 - 16:30	19	116	94	229	56	144	86	286	51	149	19	219	101	211	55	367	1101	0
16:30 - 16:45	18	99	76	193	52	112	65	229	56	170	12	238	105	231	43	379	1039	0
16:45 - 17:00	17	110	91	218	54	122	87	263	55	167	14	236	76	206	55	337	1054	1
17:00 - 17:15	26	134	93	253	66	123	65	254	59	195	7	261	99	217	59	375	1143	1
17:15 - 17:30	28	134	95	257	45	151	98	294	65	198	9	272	107	299	72	478	1301	0
17:30 - 17:45	15	137	81	233	62	164	86	312	67	166	11	244	137	285	90	512	1301	0
17:45 - 18:00	23	161	79	263	68	125	94	287	75	210	17	302	130	285	94	509	1361	0
TOTAL	491	3834	2506	6831	2237	3886	1848	7971	1934	5822	407	8163	2671	5185	1574	9430	32395	7
Trucks	0	12	6	18	1	5	4	10	1	9	0	10	3	10	2	15	53	0.2%
School Buses	2	22	3	27	5	11	9	25	5	5	2	12	12	9	4	25	89	0.3%

Traffic Engineering Division

26 Woods Lake Road
Greenville, SC 29607

Location: Augusta/Mauldin
Weather: Clear
Counter: DB-400
Counted By: Jonathan

File Name : AugustaMauldin
Site Code : 15151515
Start Date : 2/28/2008
Page No : 1

Groups Printed- Unshifted - Bank 1

	Augusta St. From North				Mauldin Rd. From East				Augusta St. From South				Potomac Dr. From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	3	48	61	0	88	13	4	0	8	51	3	0	6	16	8	0	309
07:15 AM	5	55	72	0	103	18	4	0	6	61	9	0	6	23	5	0	367
07:30 AM	5	73	88	0	110	26	6	0	13	80	6	2	16	39	12	0	476
07:45 AM	11	68	81	0	133	43	10	0	9	106	11	0	13	33	9	0	527
Total	24	244	302	0	434	100	24	0	36	298	29	2	41	111	34	0	1679
08:00 AM	14	80	101	0	159	32	6	0	8	99	11	0	7	46	11	0	574
08:15 AM	6	59	89	0	153	29	8	0	5	89	12	0	8	23	9	0	490
08:30 AM	7	63	76	0	156	27	7	0	5	78	10	0	9	37	9	0	484
08:45 AM	8	70	79	0	137	26	8	0	6	86	4	3	12	27	8	0	474
Total	35	272	345	0	605	114	29	0	24	352	37	3	36	133	37	0	2022
*** BREAK ***																	
11:00 AM	13	77	86	0	111	36	9	0	7	71	11	0	10	29	7	0	467
11:15 AM	15	72	82	0	120	34	7	0	8	66	13	0	5	24	5	0	451
11:30 AM	11	84	102	0	101	31	10	1	5	74	12	0	16	30	16	0	493
11:45 AM	11	82	105	0	121	30	5	0	10	81	9	0	15	38	14	0	521
Total	50	315	375	0	453	131	31	1	30	292	45	0	46	121	42	0	1932
12:00 PM	14	91	104	0	118	29	6	0	12	88	11	0	11	33	11	0	528
12:15 PM	12	82	117	0	116	36	10	0	15	83	14	0	13	42	15	0	555
12:30 PM	15	85	113	0	121	37	19	0	14	66	8	0	12	38	17	0	545
12:45 PM	10	87	121	0	112	37	6	0	13	78	10	0	25	32	8	0	539
Total	51	345	455	0	467	139	41	0	54	315	43	0	61	145	51	0	2167
*** BREAK ***																	
04:00 PM	7	71	84	0	116	22	7	0	6	67	6	0	10	23	6	0	425
04:15 PM	13	94	111	0	131	26	13	0	11	79	9	0	6	29	6	0	528
04:30 PM	10	82	99	0	123	39	9	0	9	91	14	0	15	17	13	0	521
04:45 PM	14	95	126	0	163	42	15	0	13	82	18	0	22	33	9	0	632
Total	44	342	420	0	533	129	44	0	39	319	47	0	53	102	34	0	2106
05:00 PM	23	113	137	0	149	34	14	0	17	94	9	0	19	52	15	0	676
05:15 PM	16	102	116	0	165	41	10	0	14	77	13	0	16	29	5	0	604
05:30 PM	8	89	93	0	134	26	16	0	10	64	5	0	7	21	7	0	480
05:45 PM	10	65	83	0	130	19	7	0	7	69	10	0	7	27	8	0	442
Total	57	369	429	0	578	120	47	0	48	304	37	0	49	129	35	0	2202
Grand Total	261	1887	2326	0	3070	733	216	1	231	1880	238	5	286	741	233	0	12108
Apprch %	5.8	42.2	52	0	76.4	18.2	5.4	0	9.8	79.9	10.1	0.2	22.7	58.8	18.5	0	
Total %	2.2	15.6	19.2	0	25.4	6.1	1.8	0	1.9	15.5	2	0	2.4	6.1	1.9	0	
Unshifted	261	1887	2326	0	3070	733	216	1	231	1880	238	5	286	741	233	0	12108
% Unshifted	100	100	100	0	100	100	100	100	100	100	100	100	100	100	100	0	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

120: S. Pleasantburg Dr. & Cleveland St./Cleveland St. Ext.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	44	166	282	44	335	53	499	1074	37	55	893	144
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.65	0.85	0.77	0.85	0.86	0.83	0.84	0.91	0.71	0.86	0.90	0.86
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												

Intersection Summary

120: S. Pleasantburg Dr. & Cleveland St./Cleveland St. Ext.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	139	269	338	32	239	82	280	1068	45	81	1154	109
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.76	0.76	0.79	0.62	0.76	0.79	0.81	0.95	0.80	0.78	0.90	0.63
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												

Intersection Summary

Your Company Name Here

This is your address
Your City, State ZipCode
Your Tagline Here

Location: Woodruff/RoperMtn/Verdae
Weather: Mixed
Counter: DB-400
Counted By: Jonathan/Valerie

File Name : WoodruffRoperMtnVerdae
Site Code : 55223377
Start Date : 4/22/2014
Page No : 1

Groups Printed- Unshifted - Bank 1

	Roper Mtn. Rd. From North				Woodruff Rd. From East				Verdae Blvd. From South				Woodruff Rd. From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	61	110	38	0	45	70	20	0	10	74	17	0	5	19	20	0	489
07:15 AM	76	123	54	0	38	89	26	0	10	121	31	0	6	27	31	0	632
07:30 AM	86	164	54	0	64	81	27	0	21	214	47	0	10	34	46	0	848
07:45 AM	81	148	86	0	72	69	24	0	36	217	56	0	9	47	60	0	905
Total	304	545	232	0	219	309	97	0	77	626	151	0	30	127	157	0	2874
08:00 AM	124	163	85	0	81	98	27	0	26	169	60	0	14	62	46	0	955
08:15 AM	88	164	89	0	69	90	22	0	23	172	29	0	19	79	67	0	911
08:30 AM	55	157	68	0	70	52	25	0	34	130	32	0	14	63	38	0	738
08:45 AM	53	107	99	0	58	53	31	0	25	142	18	0	8	40	26	0	660
Total	320	591	341	0	278	293	105	0	108	613	139	0	55	244	177	0	3264
*** BREAK ***																	
11:00 AM	48	90	225	0	124	76	43	0	43	93	12	0	9	87	40	0	890
11:15 AM	55	101	210	0	139	79	44	0	56	82	25	0	12	117	40	0	960
11:30 AM	42	118	217	0	151	92	33	0	67	97	27	0	16	114	43	0	1017
11:45 AM	54	144	237	0	162	95	64	0	54	112	26	0	17	141	35	0	1141
Total	199	453	889	0	576	342	184	0	220	384	90	0	54	459	158	0	4008
12:00 PM	50	108	212	0	177	113	47	0	66	104	26	0	16	127	49	0	1095
12:15 PM	31	105	228	0	197	123	60	0	50	103	25	0	13	115	39	0	1089
12:30 PM	62	106	216	0	197	145	63	0	77	112	36	0	16	113	48	0	1191
12:45 PM	45	116	208	0	209	119	70	0	62	127	28	0	17	95	43	0	1139
Total	188	435	864	0	780	500	240	0	255	446	115	0	62	450	179	0	4514
*** BREAK ***																	
04:00 PM	68	117	149	0	154	103	49	0	40	157	36	0	9	73	59	0	1014
04:15 PM	67	90	149	0	192	101	44	0	58	136	25	0	23	98	72	0	1055
04:30 PM	55	145	176	0	169	84	57	0	48	173	20	0	25	87	75	0	1114
04:45 PM	58	126	156	0	136	90	29	0	58	146	29	0	22	84	70	0	1004
Total	248	478	630	0	651	378	179	0	204	612	110	0	79	342	276	0	4187
05:00 PM	53	155	163	0	148	78	37	0	44	160	17	0	26	87	82	0	1050
05:15 PM	47	164	181	0	160	90	40	0	57	157	22	0	42	122	63	0	1145
05:30 PM	51	171	212	0	188	91	44	0	57	153	13	0	34	110	69	0	1193
05:45 PM	57	147	210	0	202	115	71	0	66	156	22	0	29	105	68	0	1248
Total	208	637	766	0	698	374	192	0	224	626	74	0	131	424	282	0	4636
Grand Total	1467	3139	3722	0	3202	2196	997	0	1088	3307	679	0	411	2046	1229	0	23483
Apprch %	17.6	37.7	44.7	0	50.1	34.3	15.6	0	21.4	65.2	13.4	0	11.2	55.5	33.3	0	
Total %	6.2	13.4	15.8	0	13.6	9.4	4.2	0	4.6	14.1	2.9	0	1.8	8.7	5.2	0	
Unshifted	1467	3139	3722	0	3202	2196	997	0	1088	3307	679	0	411	2046	1229	0	23483
% Unshifted	100	100	100	0	100	100	100	0	100	100	100	0	100	100	100	0	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

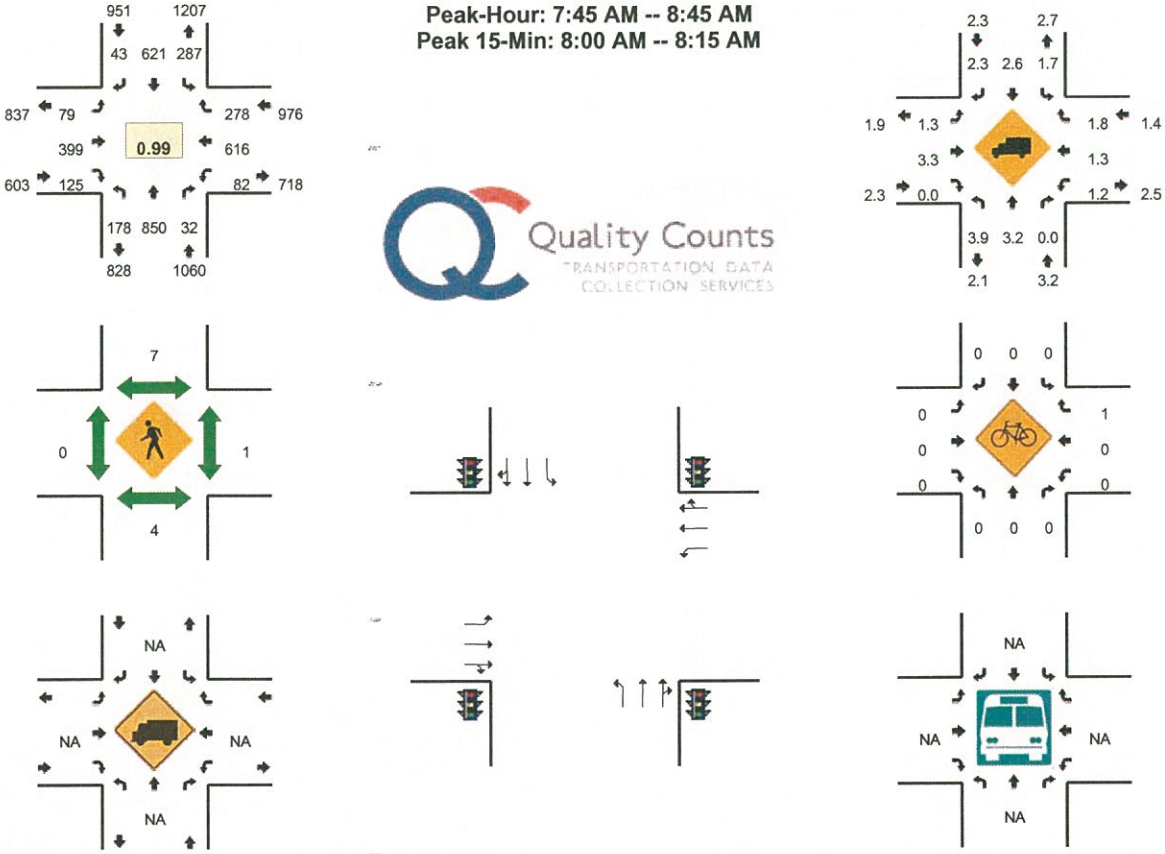
Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: Church St -- Augusta St
CITY/STATE: Greenville, SC

QC JOB #: 10835707
DATE: Tue, Oct 23 2012

Peak-Hour: 7:45 AM -- 8:45 AM
Peak 15-Min: 8:00 AM -- 8:15 AM



15-Min Count Period Beginning At	Church St (Northbound)				Church St (Southbound)				Augusta St (Eastbound)				Augusta St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	16	117	10	0	36	103	1	0	5	39	11	0	2	45	31	0	416	
7:15 AM	27	162	6	0	67	105	5	0	9	66	19	0	12	95	44	0	617	
7:30 AM	40	203	9	0	83	148	7	0	13	89	33	0	12	100	45	0	782	
7:45 AM	38	230	6	0	74	179	3	0	13	109	25	0	10	148	66	0	901	2716
8:00 AM	60	197	10	0	85	152	10	0	21	96	30	0	20	145	77	0	903	3203
8:15 AM	39	222	8	0	63	156	15	0	22	94	32	0	35	147	68	0	901	3487
8:30 AM	41	201	8	0	65	134	15	0	23	100	38	0	17	176	67	0	885	3590
8:45 AM	52	207	12	0	68	190	20	0	17	78	28	1	27	109	52	0	861	3550

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	240	788	40	0	340	608	40	0	84	384	120	0	80	580	308	0	3612
Heavy Trucks	4	24	0		4	8	0		0	8	0		0	0	0		48
Pedestrians		8				0				0				0			8
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad Stopped Buses																	

Comments:

Report generated on 11/1/2012 6:28 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

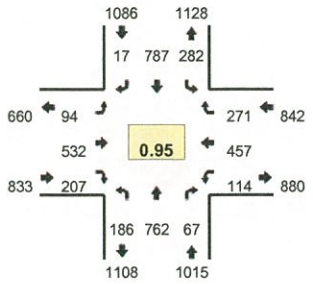
Type of peak hour being reported: Intersection Peak

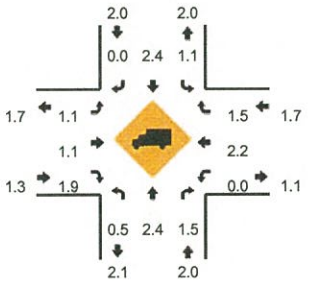
Method for determining peak hour: Total Entering Volume

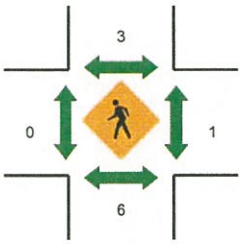
LOCATION: Church St -- Augusta St
CITY/STATE: Greenville, SC

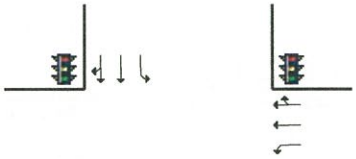
QC JOB #: 10835708
DATE: Tue, Oct 23 2012

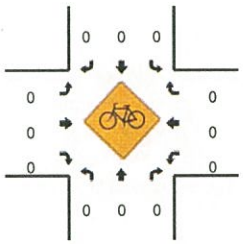
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

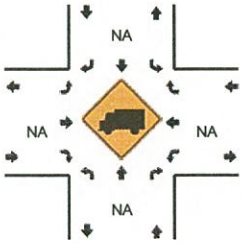


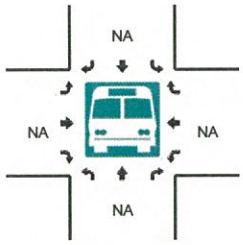












15-Min Count Period Beginning At	Church St (Northbound)				Church St (Southbound)				Augusta St (Eastbound)				Augusta St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	41	167	18	0	87	163	7	0	32	174	53	0	21	105	73	0	941	
4:15 PM	41	204	18	0	48	189	7	0	21	100	41	0	28	102	73	0	872	
4:30 PM	35	179	21	0	64	186	5	0	26	129	62	0	34	106	69	0	916	
4:45 PM	40	211	21	0	53	197	4	0	22	126	41	0	30	106	62	0	913	3642
5:00 PM	43	180	11	0	84	195	5	0	34	143	53	0	30	141	79	0	998	3699
5:15 PM	68	192	14	0	80	209	3	1	12	134	51	0	20	104	61	0	949	3776
5:30 PM	41	197	17	0	61	201	3	0	17	124	43	0	23	104	67	0	898	3758
5:45 PM	24	183	8	0	69	197	5	0	20	93	42	0	16	105	58	0	820	3665

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	172	720	44	0	336	780	20	0	136	572	212	0	120	564	316	0	3992
Heavy Trucks	0	28	0		4	24	0		0	0	4		0	8	0		68
Pedestrians		4				4				0				0			8
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/1/2012 6:28 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Traffic Engineering Division

26 Woods Lake Road
Greenville, SC 29607

Location: Cleveland/Faris
Weather: Cloudy
Counter: DB-400
Counted By: Jonathan

File Name : ClevelandFaris13
Site Code : 55778888
Start Date : 2/6/2013
Page No : 1

Groups Printed- Unshifted - Bank 1

	Cleveland St. From North				E. Faris Rd. From East				Cleveland St. From South				E. Faris Rd. From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	10	49	14	1	32	64	7	0	7	71	24	0	38	59	5	0	381
07:15 AM	8	70	20	0	29	79	10	1	9	77	39	0	44	79	8	0	473
07:30 AM	15	89	31	0	44	83	13	0	14	93	33	0	61	84	12	0	572
07:45 AM	9	131	44	2	65	99	13	0	15	117	51	0	68	96	13	0	723
Total	42	339	109	3	170	325	43	1	45	358	147	0	211	318	38	0	2149
08:00 AM	16	59	32	0	34	96	10	0	15	128	48	1	55	100	16	0	610
08:15 AM	13	57	36	1	58	93	10	0	9	128	46	0	54	105	18	1	629
08:30 AM	11	56	23	1	51	88	7	0	12	96	42	1	47	112	17	0	564
08:45 AM	20	47	39	0	47	100	13	0	11	74	45	0	56	143	22	0	617
Total	60	219	130	2	190	377	40	0	47	426	181	2	212	460	73	1	2420
*** BREAK ***																	
11:00 AM	12	48	27	0	33	88	12	1	9	56	54	0	30	107	17	0	494
11:15 AM	15	36	37	0	41	81	10	0	13	44	33	0	39	107	4	0	460
11:30 AM	13	36	38	0	32	86	19	0	23	37	36	0	36	115	15	0	486
11:45 AM	22	47	38	0	48	87	22	0	20	52	46	0	33	111	11	0	537
Total	62	167	140	0	154	342	63	1	65	189	169	0	138	440	47	0	1977
12:00 PM	26	59	51	0	51	98	14	0	14	59	64	0	40	138	6	0	620
12:15 PM	21	51	41	0	38	107	16	0	11	51	34	0	49	129	12	0	560
12:30 PM	14	42	49	0	43	94	11	0	16	47	45	0	31	125	9	0	526
12:45 PM	19	44	33	0	46	112	15	0	15	41	47	0	35	111	5	0	523
Total	80	196	174	0	178	411	56	0	56	198	190	0	155	503	32	0	2229
*** BREAK ***																	
04:00 PM	19	40	35	0	39	102	5	0	8	75	52	0	41	137	20	0	573
04:15 PM	20	72	43	1	36	100	10	1	16	75	37	2	39	126	18	0	596
04:30 PM	17	73	70	1	48	127	16	0	8	73	51	0	37	139	17	0	677
04:45 PM	24	89	51	0	64	136	12	0	14	99	61	1	42	146	15	0	754
Total	80	274	199	2	187	465	43	1	46	322	201	3	159	548	70	0	2600
05:00 PM	31	146	55	0	87	155	31	1	22	121	86	1	44	170	22	0	972
05:15 PM	29	141	59	1	88	121	22	0	13	94	59	0	33	156	13	0	829
05:30 PM	23	130	43	2	63	103	20	1	17	77	38	0	39	129	9	0	694
05:45 PM	19	101	46	0	46	116	19	0	11	73	40	0	30	113	10	0	624
Total	102	518	203	3	284	495	92	2	63	365	223	1	146	568	54	0	3119
Grand Total	426	1713	955	10	1163	2415	337	5	322	1858	1111	6	1021	2837	314	1	14494
Apprch %	13.7	55.2	30.8	0.3	29.7	61.6	8.6	0.1	9.8	56.4	33.7	0.2	24.5	68	7.5	0	
Total %	2.9	11.8	6.6	0.1	8	16.7	2.3	0	2.2	12.8	7.7	0	7	19.6	2.2	0	
Unshifted	426	1713	955	10	1163	2415	337	5	322	1858	1111	6	1021	2837	314	1	14494
% Unshifted	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Traffic Engineering Division

26 Woods Lake Road
Greenville, SC 29607

Location: Laurens/Woodruff
Weather: Clear
Counter: DB-100
Counted By: Jonathan

File Name : LaurensWoodruff
Site Code : 11111111
Start Date : 5/8/2008
Page No : 1

Groups Printed- Unshifted - Bank 1

	Woodruff Rd. From North				Laurens Rd. From East				Pep Boys From South				Laurens Rd. From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	24	0	22	0	39	186	1	0	0	0	1	0	2	156	22	0	453
07:15 AM	37	1	37	0	55	249	1	0	0	0	0	0	4	195	30	0	609
07:30 AM	32	0	44	0	86	323	2	0	2	1	0	0	3	233	48	0	774
07:45 AM	49	3	61	0	103	379	1	0	2	1	0	0	5	249	41	0	894
Total	142	4	164	0	283	1137	5	0	4	2	1	0	14	833	141	0	2730
08:00 AM	61	2	49	0	98	407	2	0	1	0	0	0	5	253	52	0	930
08:15 AM	53	2	44	0	93	393	1	0	2	1	3	0	4	271	34	0	901
08:30 AM	35	1	29	0	65	360	0	0	3	0	0	0	4	248	31	0	776
08:45 AM	42	1	29	0	64	321	1	0	1	2	2	0	3	248	27	0	741
Total	191	6	151	0	320	1481	4	0	7	3	5	0	16	1020	144	0	3348
*** BREAK ***																	
11:00 AM	63	1	49	0	51	299	3	0	3	2	2	0	6	251	41	0	771
11:15 AM	54	2	41	0	47	280	2	0	4	2	4	0	7	274	51	0	768
11:30 AM	72	2	50	0	61	297	2	0	2	1	6	0	9	280	52	0	834
11:45 AM	52	2	44	0	74	312	2	0	3	7	3	0	6	283	50	0	838
Total	241	7	184	0	233	1188	9	0	12	12	15	0	28	1088	194	0	3211
12:00 PM	55	3	61	0	71	350	3	0	5	4	5	0	7	269	66	0	899
12:15 PM	59	1	65	0	88	371	2	0	7	2	6	0	6	306	60	0	973
12:30 PM	79	3	69	0	69	334	3	0	5	2	6	0	9	319	58	0	956
12:45 PM	57	4	61	0	81	318	1	0	2	2	8	0	10	359	51	0	954
Total	250	11	256	0	309	1373	9	0	19	10	25	0	32	1253	235	0	3782
*** BREAK ***																	
04:00 PM	49	2	54	0	59	253	1	0	3	4	4	0	10	269	31	0	739
04:15 PM	56	0	44	0	45	302	0	0	5	2	3	0	5	292	51	0	805
04:30 PM	66	1	66	0	56	344	1	0	3	5	2	0	8	307	59	0	918
04:45 PM	68	1	73	0	42	368	0	0	1	3	3	0	5	331	62	0	957
Total	239	4	237	0	202	1267	2	0	12	14	12	0	28	1199	203	0	3419
05:00 PM	84	3	89	0	69	420	2	0	2	5	6	0	4	394	66	0	1144
05:15 PM	64	3	79	0	55	386	0	0	2	5	3	0	6	384	47	0	1034
05:30 PM	52	1	58	0	71	347	1	0	4	4	5	0	6	377	53	0	979
05:45 PM	56	1	66	0	56	308	1	0	2	2	5	0	4	313	42	0	856
Total	256	8	292	0	251	1461	4	0	10	16	19	0	20	1468	208	0	4013
Grand Total	1319	40	1284	0	1598	7907	33	0	64	57	77	0	138	6861	1125	0	20503
Apprch %	49.9	1.5	48.6	0	16.8	82.9	0.3	0	32.3	28.8	38.9	0	1.7	84.5	13.8	0	
Total %	6.4	0.2	6.3	0	7.8	38.6	0.2	0	0.3	0.3	0.4	0	0.7	33.5	5.5	0	
Unshifted	1319	40	1284	0	1598	7907	33	0	64	57	77	0	138	6861	1125	0	20503
% Unshifted	100	100	100	0	100	100	100	0	100	100	100	0	100	100	100	0	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Traffic Engineering Division

26 Woods Lake Road
Greenville, SC 29607

Location: Academy/College
Weather: Rain
unter: DB-400
Counted By: Jonathan

File Name : AcademyCollege
Site Code : 88887777
Start Date : 3/25/2009
Page No : 1

Groups Printed- Unshifted - Bank 1

	Academy St. From North				College St. From East				Academy St. From South				From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	17	153	0	0	2	71	34	0	0	144	23	0	0	0	0	0	444
07:15 AM	23	199	0	0	3	89	59	0	0	194	34	0	0	0	0	0	601
07:30 AM	34	234	0	0	1	99	84	0	0	213	44	0	0	0	0	0	709
07:45 AM	26	251	0	0	2	88	108	0	0	248	36	0	0	0	0	0	759
Total	100	837	0	0	8	347	285	0	0	799	137	0	0	0	0	0	2513
08:00 AM	37	287	0	0	1	87	64	0	0	231	36	0	0	0	0	0	743
08:15 AM	37	256	0	0	4	105	88	0	0	200	43	0	0	0	0	0	733
08:30 AM	39	219	0	0	2	102	61	0	0	172	26	0	0	0	0	0	621
08:45 AM	31	189	0	0	1	100	85	0	0	156	33	0	0	0	0	0	595
Total	144	951	0	0	8	394	298	0	0	759	138	0	0	0	0	0	2692
*** BREAK ***																	
11:00 AM	17	123	0	0	1	79	56	0	0	155	39	0	0	0	0	0	470
11:15 AM	31	89	0	0	3	86	32	0	0	179	56	0	0	0	0	0	476
11:30 AM	23	112	0	0	3	102	49	0	0	169	29	0	0	0	0	0	487
11:45 AM	25	110	0	0	2	130	39	0	0	153	44	0	0	0	0	0	503
Total	96	434	0	0	9	397	176	0	0	656	168	0	0	0	0	0	1936
12:00 PM	22	100	0	0	4	114	38	0	0	140	53	0	0	0	0	0	471
12:15 PM	23	94	0	0	2	127	43	0	0	172	38	0	0	0	0	0	499
12:30 PM	26	120	0	0	5	120	42	0	0	159	50	0	0	0	0	0	522
12:45 PM	29	110	0	0	3	97	43	0	0	149	46	0	0	0	0	0	477
Total	100	424	0	0	14	458	166	0	0	620	187	0	0	0	0	0	1969
*** BREAK ***																	
04:00 PM	20	129	0	0	5	157	48	0	0	163	25	0	0	0	0	0	547
04:15 PM	29	109	0	0	3	185	51	0	0	194	43	0	0	0	0	0	614
04:30 PM	51	157	0	0	3	213	71	0	0	186	31	0	0	0	0	0	712
04:45 PM	31	210	0	0	4	225	88	0	0	249	53	0	0	0	0	0	860
Total	131	605	0	0	15	780	258	0	0	792	152	0	0	0	0	0	2733
05:00 PM	48	233	0	0	7	257	98	0	0	279	39	0	0	0	0	0	961
05:15 PM	33	221	0	0	4	191	69	0	0	234	26	0	0	0	0	0	778
05:30 PM	35	186	0	0	6	155	71	0	0	203	43	0	0	0	0	0	699
05:45 PM	23	155	0	0	3	168	44	0	0	181	41	0	0	0	0	0	615
Total	139	795	0	0	20	771	282	0	0	897	149	0	0	0	0	0	3053
Grand Total	710	4046	0	0	74	3147	1465	0	0	4523	931	0	0	0	0	0	14896
Apprch %	14.9	85.1	0	0	1.6	67.2	31.3	0	0	82.9	17.1	0	0	0	0	0	
Total %	4.8	27.2	0	0	0.5	21.1	9.8	0	0	30.4	6.2	0	0	0	0	0	
Unshifted	710	4046	0	0	74	3147	1465	0	0	4523	931	0	0	0	0	0	14896
% Unshifted	100	100	0	0	100	100	100	0	0	100	100	0	0	0	0	0	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

File Name: F:\JEFFCOJ\Traffic Counts\TMC Counts\StoneRutherford.ppd
Start Date: 8/30/2007
Start Time: 7:00:00 AM
Site Code: 11111111
Comment 1: Location: Rutherford/Stone
Comment 2: Weather: Clear
Comment 3: Counter: DB-400
Comment 4: Counted By: Jonathan

	Rutherford St. From North				E. Stone Av. From East				Rutherford St. From South				W. Stone Av. From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	TOTAL
07:00 AM	7	159	84	3	47	19	16	1	11	89	1	1	2	51	15	2	508
07:15 AM	13	181	105	1	59	22	22	0	19	84	2	0	6	70	21	0	605
07:30 AM	16	199	119	5	51	31	19	0	16	93	1	1	5	65	20	1	642
07:45 AM	25	260	143	2	54	27	17	0	12	103	2	0	7	79	23	1	755
TOTAL	**61**	**799**	**451**	**11**	**211**	**99**	**74**	**1**	**58**	**369**	**6**	**2**	**20**	**265**	**79**	**4**	**2510**
08:00 AM	16	256	115	18	83	40	21	1	16	104	0	0	3	68	17	0	758
08:15 AM	12	226	120	1	79	28	15	0	25	95	4	1	6	64	14	0	690
08:30 AM	8	194	111	3	88	22	16	0	17	96	5	2	4	51	17	4	638
08:45 AM	4	183	93	3	77	26	15	0	18	81	2	1	3	48	13	0	567
TOTAL	**40**	**859**	**439**	**25**	**327**	**116**	**67**	**1**	**76**	**376**	**11**	**4**	**16**	**231**	**61**	**4**	**2653**
11:00 AM	8	141	79	3	70	34	22	1	16	139	2	1	2	41	11	0	570
11:15 AM	10	130	72	3	78	29	23	2	13	111	1	1	1	26	10	0	510
11:30 AM	7	129	88	4	84	33	17	1	20	122	1	3	2	34	17	0	562
11:45 AM	4	137	84	1	80	44	24	0	17	127	3	1	3	31	20	0	576
TOTAL	**29**	**537**	**323**	**11**	**312**	**140**	**86**	**4**	**66**	**499**	**7**	**6**	**8**	**132**	**58**	**0**	**2218**
12:00 PM	6	125	78	0	83	50	19	3	12	132	2	3	4	30	13	0	560
12:15 PM	13	149	69	2	77	34	31	0	18	141	1	3	3	25	16	0	582
12:30 PM	11	164	77	2	89	41	26	1	15	147	0	4	5	36	13	0	631
12:45 PM	16	151	80	1	87	39	23	0	32	113	3	2	2	31	11	0	591
TOTAL	**46**	**589**	**304**	**5**	**336**	**164**	**99**	**4**	**77**	**533**	**6**	**12**	**14**	**122**	**53**	**0**	**2364**
04:00 PM	11	132	61	0	81	44	19	0	15	133	2	1	3	26	16	0	544
04:15 PM	13	103	52	1	97	68	14	1	6	119	1	2	2	39	12	0	530
04:30 PM	27	172	84	1	129	57	30	0	12	174	3	2	2	47	14	0	754
04:45 PM	24	189	108	3	138	56	47	1	19	221	5	0	5	43	19	0	878
TOTAL	**75**	**596**	**305**	**5**	**445**	**225**	**110**	**2**	**52**	**647**	**11**	**5**	**12**	**155**	**61**	**0**	**2706**
05:00 PM	37	219	125	2	164	81	56	0	35	265	2	2	7	69	23	0	1087
05:15 PM	21	165	92	4	103	71	31	2	26	239	4	0	3	79	14	0	854
05:30 PM	18	141	81	2	84	59	22	1	18	188	2	1	6	42	18	0	683
05:45 PM	14	149	79	2	94	43	26	0	19	152	3	3	4	35	11	0	634
TOTAL	**90**	**674**	**377**	**10**	**445**	**254**	**135**	**3**	**98**	**844**	**11**	**6**	**20**	**225**	**66**	**0**	**3258**

File Name: F:\JEFFCOJ\Traffic Counts\TMC Counts\PleasantburgENorth.ppd
Start Date: 3/6/2008
Start Time: 7:00:00 AM
Site Code: 88888888
Comment 1: Location: Pleasantburg/E. North
Comment 2: Weather: Clear
Comment 3: Counter: DB-400
Comment 4: Counted By: Jonathan/Wil

	N. Pleasantburg Dr. From North				E. North St. From East				N. Pleasantburg Dr. From South				E. North St. From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	TOTAL
07:00 AM	6	238	74	0	62	61	73	0	21	151	10	0	8	39	5	0	748
07:15 AM	7	375	86	0	91	129	93	0	36	224	34	0	14	52	14	0	1155
07:30 AM	12	437	97	1	116	232	105	1	43	252	48	1	40	116	14	0	1515
07:45 AM	15	503	134	1	121	255	126	0	55	288	57	0	47	144	30	0	1776
TOTAL	**40**	**1553**	**391**	**2**	**390**	**677**	**397**	**1**	**155**	**915**	**149**	**1**	**109**	**351**	**63**	**0**	**5194**
08:00 AM	19	454	148	0	117	231	143	0	52	268	28	0	35	151	31	0	1677
08:15 AM	10	397	130	0	94	181	131	0	42	242	19	0	18	103	14	0	1381
08:30 AM	10	340	131	0	85	134	106	0	51	241	13	0	15	65	8	0	1199
08:45 AM	10	324	117	0	91	106	99	0	45	268	22	0	23	91	13	1	1210
TOTAL	**49**	**1515**	**526**	**0**	**387**	**652**	**479**	**0**	**190**	**1019**	**82**	**0**	**91**	**410**	**66**	**1**	**5467**
11:00 AM	9	206	105	1	111	71	59	0	76	259	30	0	17	77	16	0	1037
11:15 AM	12	275	103	0	105	65	68	0	59	276	26	0	17	70	19	0	1095
11:30 AM	13	249	100	1	121	114	69	5	85	273	28	0	13	95	26	0	1192
11:45 AM	12	269	117	1	148	99	71	0	82	250	42	0	32	127	28	0	1278
TOTAL	**46**	**999**	**425**	**3**	**485**	**349**	**267**	**5**	**302**	**1058**	**126**	**0**	**79**	**369**	**89**	**0**	**4602**
12:00 PM	15	251	124	0	125	94	82	0	101	286	40	0	29	117	31	0	1295
12:15 PM	17	304	112	0	140	100	80	0	113	299	45	0	40	82	34	0	1366
12:30 PM	16	284	113	0	126	95	72	0	106	320	31	0	19	81	34	1	1298
12:45 PM	11	292	124	0	164	110	97	0	95	271	39	1	30	105	26	0	1365
TOTAL	**59**	**1131**	**473**	**0**	**555**	**399**	**331**	**0**	**415**	**1176**	**155**	**1**	**118**	**385**	**125**	**1**	**5324**
04:00 PM	18	341	148	0	172	115	92	0	99	343	33	0	27	131	32	0	1551
04:15 PM	14	304	133	1	165	121	54	0	103	354	24	0	33	120	17	1	1444
04:30 PM	11	293	126	0	169	110	64	0	121	384	32	0	22	145	22	0	1499
04:45 PM	16	315	116	2	186	122	78	0	135	415	38	0	18	173	32	1	1647
TOTAL	**59**	**1253**	**523**	**3**	**692**	**468**	**288**	**0**	**458**	**1496**	**127**	**0**	**100**	**569**	**103**	**2**	**6141**
05:00 PM	10	382	133	0	171	129	92	3	130	397	31	1	37	189	20	1	1726
05:15 PM	9	336	129	0	203	158	85	0	141	428	22	1	35	234	35	0	1816
05:30 PM	17	354	143	0	187	141	96	0	143	439	34	0	26	219	21	0	1820
05:45 PM	10	302	143	0	198	152	100	0	164	415	34	0	22	164	33	0	1737
TOTAL	**46**	**1374**	**548**	**0**	**759**	**580**	**373**	**3**	**578**	**1679**	**121**	**2**	**120**	**806**	**109**	**1**	**7099**

Traffic Engineering Division

26 Woods Lake Road
Greenville, SC 29607

Location: Pelham Rd./E. North St.
Weather: Rain
Counter: DB-400
Counted By: Jonathan

File Name : PelhamENorth
Site Code : 88888888
Start Date : 12/10/2008
Page No : 1

Groups Printed- Unshifted - Bank 1

	Shopping Ctr. From North				E. North St. From East				Pelham Rd. From South				E. North St. From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	6	2	5	0	3	123	1	0	5	0	117	0	94	71	5	0	432
07:15 AM	4	7	13	0	3	156	3	0	4	2	131	0	113	91	7	0	534
07:30 AM	7	6	8	0	2	195	5	0	8	5	141	0	135	103	7	0	622
07:45 AM	5	12	12	0	7	229	6	0	12	9	171	0	141	141	13	0	758
Total	22	27	38	0	15	703	15	0	29	16	560	0	483	406	32	0	2346
08:00 AM	8	11	10	0	5	259	6	0	12	5	156	0	152	124	12	0	760
08:15 AM	10	13	16	0	6	244	9	0	6	6	133	0	143	98	11	0	695
08:30 AM	6	13	5	0	2	189	6	0	8	8	115	0	136	87	8	0	583
08:45 AM	7	10	7	0	4	148	4	0	9	6	132	0	118	78	9	0	532
Total	31	47	38	0	17	840	25	0	35	25	536	0	549	387	40	0	2570
*** BREAK ***																	
11:00 AM	12	11	4	0	4	119	10	0	11	17	126	0	111	113	11	0	549
11:15 AM	14	11	7	0	5	122	7	0	7	14	138	0	124	99	13	1	562
11:30 AM	16	16	10	0	3	106	5	0	5	12	129	0	144	106	16	0	568
11:45 AM	13	12	7	0	1	93	6	0	9	18	145	0	136	139	17	0	596
Total	55	50	28	0	13	440	28	0	32	61	538	0	515	457	57	1	2275
12:00 PM	18	8	13	0	7	99	10	0	13	11	147	0	138	126	27	0	617
12:15 PM	12	10	11	0	6	131	15	0	15	14	141	0	126	116	21	0	618
12:30 PM	16	13	14	0	9	113	19	0	12	9	127	0	136	90	16	0	574
12:45 PM	19	19	7	0	5	109	7	0	12	16	156	0	129	97	27	0	603
Total	65	50	45	0	27	452	51	0	52	50	571	0	529	429	91	0	2412
*** BREAK ***																	
04:00 PM	14	13	14	0	10	123	14	0	16	20	177	0	131	175	22	0	729
04:15 PM	19	14	19	0	6	135	10	0	8	16	157	0	127	192	25	0	728
04:30 PM	9	17	16	0	8	130	11	0	18	14	170	0	155	197	26	0	771
04:45 PM	20	16	11	0	4	124	7	0	18	28	181	0	148	192	30	0	779
Total	62	60	60	0	28	512	42	0	60	78	685	0	561	756	103	0	3007
05:00 PM	15	20	16	0	9	137	13	0	13	19	169	0	158	240	37	1	847
05:15 PM	19	14	17	0	10	123	11	0	19	14	179	0	171	237	29	0	843
05:30 PM	13	16	12	0	5	95	7	0	12	23	141	0	151	221	31	0	727
05:45 PM	15	11	14	0	5	119	10	0	13	15	156	0	138	184	22	0	702
Total	62	61	59	0	29	474	41	0	57	71	645	0	618	882	119	1	3119
Grand Total	297	295	268	0	129	3421	202	0	265	301	3535	0	3255	3317	442	2	15729
Apprch %	34.5	34.3	31.2	0	3.4	91.2	5.4	0	6.5	7.3	86.2	0	46.4	47.3	6.3	0	
Total %	1.9	1.9	1.7	0	0.8	21.7	1.3	0	1.7	1.9	22.5	0	20.7	21.1	2.8	0	
Unshifted	297	295	268	0	129	3421	202	0	265	301	3535	0	3255	3317	442	2	15729
% Unshifted	100	100	100	0	100	100	100	0	100	100	100	0	100	100	100	100	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Traffic Engineering Division

26 Woods Lake Road
Greenville, SC 29607

Location: Laurens/Verdae/E. Parkins Mill
Weather: Clear
Counter: DB-100
Counted By: Jonathan/Wil

File Name : LaurensVerdae
Site Code : 45645677
Start Date : 5/28/2008
Page No : 1

Groups Printed- Unshifted - Bank 1

	Verdae Blvd. From North				Laurens Rd. From East				E. Parkins Mill Rd. From South				Laurens Rd. From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	13	14	23	0	37	211	15	0	15	33	26	0	19	138	13	0	557
07:15 AM	12	47	31	0	86	306	22	0	12	27	36	0	25	147	13	0	764
07:30 AM	8	64	50	0	123	407	36	0	29	72	53	0	87	199	24	0	1152
07:45 AM	18	52	48	0	131	481	37	0	22	77	78	0	82	206	16	0	1248
Total	51	177	152	0	377	1405	110	0	78	209	193	0	213	690	66	0	3721
08:00 AM	16	59	54	0	121	488	48	0	15	44	61	0	86	190	19	0	1201
08:15 AM	20	45	48	0	104	415	37	0	28	33	55	0	63	209	26	0	1083
08:30 AM	30	39	29	0	66	295	25	0	11	31	47	0	36	149	29	0	787
08:45 AM	20	33	35	0	53	322	29	0	19	26	28	0	42	158	30	0	795
Total	86	176	166	0	344	1520	139	0	73	134	191	0	227	706	104	0	3866
*** BREAK ***																	
11:00 AM	29	38	38	0	57	236	21	0	12	37	43	0	42	194	35	0	782
11:15 AM	33	32	63	0	60	260	13	0	18	38	54	0	39	204	24	0	838
11:30 AM	29	38	49	0	64	265	14	0	22	35	47	0	50	252	41	1	907
11:45 AM	45	42	37	0	80	250	23	0	22	46	57	0	48	239	45	0	934
Total	136	150	187	0	261	1011	71	0	74	156	201	0	179	889	145	1	3461
12:00 PM	42	39	61	0	73	319	18	0	20	56	77	0	56	266	40	0	1067
12:15 PM	43	38	69	0	62	258	15	0	17	49	67	0	48	282	41	0	989
12:30 PM	44	42	71	0	59	270	17	0	20	68	78	0	61	236	42	0	1008
12:45 PM	45	50	80	0	65	262	17	0	17	37	46	0	53	242	41	0	955
Total	174	169	281	0	259	1109	67	0	74	210	268	0	218	1026	164	0	4019
*** BREAK ***																	
04:00 PM	45	48	59	0	52	252	21	0	18	44	39	0	45	318	32	0	973
04:15 PM	53	32	60	0	55	283	22	0	18	47	55	0	39	250	31	0	945
04:30 PM	56	36	92	0	71	241	17	0	27	43	59	0	39	320	29	0	1030
04:45 PM	35	29	75	0	71	286	24	0	23	49	48	0	43	302	26	0	1011
Total	189	145	286	0	249	1062	84	0	86	183	201	0	166	1190	118	0	3959
05:00 PM	40	55	95	0	63	320	20	0	32	56	61	0	51	399	29	0	1221
05:15 PM	43	51	108	0	40	294	31	6	33	66	48	0	46	445	34	0	1245
05:30 PM	34	66	119	0	58	273	21	0	34	48	67	0	46	455	39	1	1261
05:45 PM	46	52	105	0	54	272	27	0	36	63	40	0	40	391	44	0	1170
Total	163	224	427	0	215	1159	99	6	135	233	216	0	183	1690	146	1	4897
Grand Total	799	1041	1499	0	1705	7266	570	6	520	1125	1270	0	1186	6191	743	2	23923
Apprch %	23.9	31.2	44.9	0	17.9	76.1	6	0.1	17.8	38.6	43.6	0	14.6	76.2	9.1	0	
Total %	3.3	4.4	6.3	0	7.1	30.4	2.4	0	2.2	4.7	5.3	0	5	25.9	3.1	0	
Unshifted	799	1041	1499	0	1705	7266	570	6	520	1125	1270	0	1186	6191	743	2	23923
% Unshifted	100	100	100	0	100	100	100	100	100	100	100	0	100	100	100	100	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

City of Greenville

26 Woods Lake Road
Greenville, SC 29607

Location: Roper Mtn/Frontage/Ind.
Weather: Clear
Counter: DB-400
Counted By: Jonathan

File Name : RoperMtnIndependence
Site Code : 11111111
Start Date : 5/15/2014
Page No : 1

Groups Printed- Unshifted - Bank 1

	Roper Mtn. Rd. From North				Independece Blvd. From East				Roper Mtn. Rd. From South				Frontage Rd. From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	3	156	7	0	2	4	26	0	34	149	47	0	30	4	2	0	464
07:15 AM	2	174	13	0	4	3	36	0	77	166	63	0	14	3	0	0	555
07:30 AM	6	177	11	0	4	4	39	0	94	189	103	0	18	7	1	0	653
07:45 AM	4	186	15	0	6	9	44	0	146	156	122	0	26	6	3	0	723
Total	15	693	46	0	16	20	145	0	351	660	335	0	88	20	6	0	2395
08:00 AM	9	196	26	0	3	5	28	0	179	183	134	0	15	8	3	0	789
08:15 AM	6	201	20	0	6	6	73	0	134	183	124	0	28	13	0	0	794
08:30 AM	5	175	29	0	4	2	57	0	96	156	112	0	20	8	2	0	666
08:45 AM	6	249	23	0	16	4	45	0	104	150	111	0	28	5	5	0	746
Total	26	821	98	0	29	17	203	0	513	672	481	0	91	34	10	0	2995
*** BREAK ***																	
11:00 AM	2	177	5	0	4	10	63	0	40	138	29	0	64	3	6	0	541
11:15 AM	6	193	3	0	8	6	79	0	31	146	41	0	74	1	5	0	593
11:30 AM	4	181	4	0	13	11	96	0	23	156	33	0	82	2	7	0	612
11:45 AM	3	184	3	0	6	13	88	0	48	154	58	0	78	2	7	0	644
Total	15	735	15	0	31	40	326	0	142	594	161	0	298	8	25	0	2390
12:00 PM	3	202	4	0	5	7	77	0	51	169	48	0	59	3	4	0	632
12:15 PM	2	183	6	0	3	3	99	0	58	178	55	0	52	3	3	0	645
12:30 PM	4	233	10	0	6	14	80	0	77	198	65	0	54	5	1	0	747
12:45 PM	13	227	8	0	8	10	50	0	113	200	70	0	59	4	3	0	765
Total	22	845	28	0	22	34	306	0	299	745	238	0	224	15	11	0	2789
*** BREAK ***																	
04:00 PM	3	216	4	0	3	4	47	0	32	237	46	0	57	2	1	0	652
04:15 PM	3	241	3	0	4	7	84	0	39	249	28	0	77	4	3	0	742
04:30 PM	6	231	6	0	10	5	102	0	31	289	40	0	69	7	8	0	804
04:45 PM	2	226	2	0	8	5	136	0	53	333	33	0	84	4	4	0	890
Total	14	914	15	0	25	21	369	0	155	1108	147	0	287	17	16	0	3088
05:00 PM	1	238	3	0	11	5	174	0	41	303	30	0	67	6	6	0	885
05:15 PM	1	230	4	0	16	8	156	0	56	319	37	0	71	3	3	0	904
05:30 PM	3	254	7	0	21	9	140	0	39	336	34	0	53	3	9	0	908
05:45 PM	4	222	5	0	13	6	94	0	31	256	23	0	53	2	7	0	716
Total	9	944	19	0	61	28	564	0	167	1214	124	0	244	14	25	0	3413
Grand Total	101	4952	221	0	184	160	1913	0	1627	4993	1486	0	1232	108	93	0	17070
Apprch %	1.9	93.9	4.2	0	8.2	7.1	84.8	0	20.1	61.6	18.3	0	86	7.5	6.5	0	
Total %	0.6	29	1.3	0	1.1	0.9	11.2	0	9.5	29.3	8.7	0	7.2	0.6	0.5	0	
Unshifted	101	4952	221	0	184	160	1913	0	1627	4993	1486	0	1232	108	93	0	17070
% Unshifted	100	100	100	0	100	100	100	0	100	100	100	0	100	100	100	0	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

City of Greenville

26 Woods Lake Road
Greenville, SC 29607

Location: Roper Mtn/385 WB Ramp
Weather: Clear
Counter: DB-400
Counted By: Jonathan

File Name : RoperMtn385WBRamp
Site Code : 11111111
Start Date : 6/3/2014
Page No : 1

Groups Printed- Unshifted - Bank 1

	Roper Mtn. Rd. From North				I-385 WB Ramp From East				Roper Mtn. Rd. From South				From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	99	248	0	0	196	0	172	0	0	162	47	0	0	0	0	0	924
07:15 AM	139	270	0	0	242	0	131	0	0	280	58	0	0	0	0	0	1120
07:30 AM	114	262	0	0	230	0	157	0	0	212	52	0	0	0	0	0	1027
07:45 AM	101	303	0	0	264	0	148	0	0	413	43	0	0	0	0	0	1272
Total	453	1083	0	0	932	0	608	0	0	1067	200	0	0	0	0	0	4343
08:00 AM	97	263	0	0	210	0	143	0	0	257	67	0	0	0	0	0	1037
08:15 AM	127	250	0	0	231	0	163	0	0	231	70	0	0	0	0	0	1072
08:30 AM	91	231	0	0	179	0	130	0	0	239	74	0	0	0	0	0	944
08:45 AM	84	198	0	0	159	0	104	0	0	173	52	0	0	0	0	0	770
Total	399	942	0	0	779	0	540	0	0	900	263	0	0	0	0	0	3823
*** BREAK ***																	
11:00 AM	86	226	0	0	111	0	79	0	0	171	51	0	0	0	0	0	724
11:15 AM	81	248	0	0	105	0	89	0	0	196	63	0	0	0	0	0	782
11:30 AM	121	282	0	0	133	0	95	0	0	187	74	0	0	0	0	0	892
11:45 AM	106	338	0	0	119	0	87	0	0	230	96	0	0	0	0	0	976
Total	394	1094	0	0	468	0	350	0	0	784	284	0	0	0	0	0	3374
12:00 PM	94	302	0	0	101	0	119	0	0	255	66	0	0	0	0	0	937
12:15 PM	113	264	0	0	113	0	103	0	0	188	71	0	0	0	0	0	852
12:30 PM	100	288	0	0	151	0	94	0	0	203	53	0	0	0	0	0	889
12:45 PM	88	251	0	0	129	0	123	0	0	177	59	0	0	0	0	0	827
Total	395	1105	0	0	494	0	439	0	0	823	249	0	0	0	0	0	3505
*** BREAK ***																	
04:00 PM	123	267	0	0	119	0	88	0	0	179	69	0	0	0	0	0	845
04:15 PM	141	294	0	0	134	0	113	0	0	241	102	0	0	0	0	0	1025
04:30 PM	126	304	0	0	124	0	100	0	0	219	71	0	0	0	0	0	944
04:45 PM	116	339	0	0	107	0	148	0	0	278	91	0	0	0	0	0	1079
Total	506	1204	0	0	484	0	449	0	0	917	333	0	0	0	0	0	3893
05:00 PM	168	371	0	0	121	0	123	0	0	266	103	0	0	0	0	0	1152
05:15 PM	168	380	0	0	123	0	148	0	0	286	103	0	0	0	0	0	1208
05:30 PM	156	373	0	0	181	0	151	0	0	309	91	0	0	0	0	0	1261
05:45 PM	134	313	0	0	203	0	117	0	0	257	81	0	0	0	0	0	1105
Total	626	1437	0	0	628	0	539	0	0	1118	378	0	0	0	0	0	4726
Grand Total	2773	6865	0	0	3785	0	2925	0	0	5609	1707	0	0	0	0	0	23664
Apprch %	28.8	71.2	0	0	56.4	0	43.6	0	0	76.7	23.3	0	0	0	0	0	
Total %	11.7	29	0	0	16	0	12.4	0	0	23.7	7.2	0	0	0	0	0	
Unshifted	2773	6865	0	0	3785	0	2925	0	0	5609	1707	0	0	0	0	0	23664
% Unshifted	100	100	0	0	100	0	100	0	0	100	100	0	0	0	0	0	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

City of Greenville

26 Woods Lake Road
Greenville, SC 29607

Location: Roper Mtn/385 EB Ramp
Weather: Clear
Counter: DB-400
Counted By: Jonathan

File Name : RoperMtn385EBRamp
Site Code : 55887766
Start Date : 5/21/2014
Page No : 1

Groups Printed- Unshifted - Bank 1

	Roper Mtn. Rd. From North				From East				Roper Mtn. Rd. From South				I-385 EB Off Ramp From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	184	49	0	0	0	0	0	53	135	0	0	75	0	49	0	545
07:15 AM	0	252	70	0	0	0	0	0	75	194	0	0	91	0	70	0	752
07:30 AM	0	265	65	0	0	0	0	0	61	223	0	0	76	0	93	0	783
07:45 AM	0	286	91	0	0	0	0	0	85	264	0	0	107	0	101	0	934
Total	0	987	275	0	0	0	0	0	274	816	0	0	349	0	313	0	3014
08:00 AM	0	328	82	0	0	0	0	0	60	205	0	0	92	0	129	0	896
08:15 AM	0	327	76	0	0	0	0	0	78	213	0	0	102	0	109	0	905
08:30 AM	0	218	70	0	0	0	0	0	85	191	0	0	71	0	96	0	731
08:45 AM	0	244	79	0	0	0	0	0	66	141	0	0	84	0	62	0	676
Total	0	1117	307	0	0	0	0	0	289	750	0	0	349	0	396	0	3208
*** BREAK ***																	
11:00 AM	0	239	98	0	0	0	0	0	101	214	0	0	120	0	28	0	800
11:15 AM	0	211	71	0	0	0	0	0	89	227	0	0	79	0	34	0	711
11:30 AM	0	223	78	0	0	0	0	0	113	261	0	0	89	0	56	0	820
11:45 AM	0	249	64	0	0	0	0	0	134	247	0	0	121	0	51	0	866
Total	0	922	311	0	0	0	0	0	437	949	0	0	409	0	169	0	3197
12:00 PM	0	267	83	0	0	0	0	0	166	266	0	0	113	0	42	0	937
12:15 PM	0	234	70	0	0	0	0	0	160	331	0	0	94	0	71	0	960
12:30 PM	0	256	87	0	0	0	0	0	169	318	0	0	84	0	61	0	975
12:45 PM	0	251	69	0	0	0	0	0	177	284	0	0	107	0	64	0	952
Total	0	1008	309	0	0	0	0	0	672	1199	0	0	398	0	238	0	3824
*** BREAK ***																	
04:00 PM	0	242	153	0	0	0	0	0	156	261	0	0	119	0	64	0	995
04:15 PM	0	239	138	0	0	0	0	0	209	323	0	0	137	0	58	0	1104
04:30 PM	0	269	146	0	0	0	0	0	219	262	0	0	122	0	76	0	1094
04:45 PM	0	256	167	0	0	0	0	0	229	279	0	0	147	0	94	0	1172
Total	0	1006	604	0	0	0	0	0	813	1125	0	0	525	0	292	0	4365
05:00 PM	0	270	165	0	0	0	0	0	204	244	0	0	163	0	71	0	1117
05:15 PM	0	223	134	0	0	0	0	0	177	294	0	0	123	0	63	0	1014
05:30 PM	0	229	102	0	0	0	0	0	147	256	0	0	112	0	45	0	891
05:45 PM	0	207	93	0	0	0	0	0	158	263	0	0	103	0	55	0	879
Total	0	929	494	0	0	0	0	0	686	1057	0	0	501	0	234	0	3901
Grand Total	0	5969	2300	0	0	0	0	0	3171	5896	0	0	2531	0	1642	0	21509
Apprch %	0	72.2	27.8	0	0	0	0	0	35	65	0	0	60.7	0	39.3	0	
Total %	0	27.8	10.7	0	0	0	0	0	14.7	27.4	0	0	11.8	0	7.6	0	
Unshifted	0	5969	2300	0	0	0	0	0	3171	5896	0	0	2531	0	1642	0	21509
% Unshifted	0	100	100	0	0	0	0	0	100	100	0	0	100	0	100	0	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

File Name: F:\JEFFCOJ\Traffic Counts\TMC Counts\LaurensMillenium.ppd
Start Date: 12/20/2006
Start Time: 7:00:00 AM
Site Code: 58585858
Comment 1: Location: Laurens/Fairforest/Millennium
Comment 2: Weather: Cloudy
Comment 3: Counter: DB-400
Comment 4: Counted By: Jonathan

	Laurens Rd. From North				Millennium Blvd. From East				Laurens Rd. From South				Fairforest Rd. From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	TOTAL
07:00 AM	43	163	7	0	6	2	0	0	2	284	20	0	3	2	30	0	562
07:15 AM	55	192	10	0	5	3	1	0	3	321	28	0	9	5	38	0	670
07:30 AM	64	213	11	0	6	4	0	0	5	386	27	0	6	3	42	0	767
07:45 AM	53	256	10	0	8	7	2	0	6	387	51	0	15	9	55	0	859
TOTAL	**215**	**824**	**38**	**0**	**25**	**16**	**3**	**0**	**16**	**1378**	**126**	**0**	**33**	**19**	**165**	**0**	**2858**
08:00 AM	63	205	13	0	5	3	1	0	2	349	72	0	19	3	30	0	765
08:15 AM	55	200	11	0	5	1	1	0	2	284	45	0	16	2	49	0	671
08:30 AM	41	173	10	0	3	1	0	0	1	246	24	0	17	1	55	0	572
08:45 AM	37	181	8	0	4	2	1	0	2	259	30	0	11	1	34	0	570
TOTAL	**196**	**759**	**42**	**0**	**17**	**7**	**3**	**0**	**7**	**1138**	**171**	**0**	**63**	**7**	**168**	**0**	**2578**
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	28	229	15	0	14	3	2	0	5	184	20	0	17	5	31	0	553
12:15 PM	31	219	18	0	12	2	3	0	7	191	19	0	24	3	35	0	564
TOTAL	**59**	**448**	**33**	**0**	**26**	**5**	**5**	**0**	**12**	**375**	**39**	**0**	**41**	**8**	**66**	**0**	**1117**
12:30 PM	32	250	6	0	11	3	3	0	6	233	23	0	13	8	33	0	621
12:45 PM	44	277	21	0	9	4	3	0	2	267	20	0	16	7	34	0	704
01:00 PM	49	249	13	0	10	3	2	0	5	249	15	0	11	8	29	0	643
01:15 PM	39	269	11	0	10	4	2	0	3	231	17	0	19	4	36	0	645
TOTAL	**164**	**1045**	**51**	**0**	**40**	**14**	**10**	**0**	**16**	**980**	**75**	**0**	**59**	**27**	**132**	**0**	**2613**
04:00 PM	32	281	5	0	16	4	8	0	3	296	20	0	20	4	38	0	727
04:15 PM	40	330	5	0	17	1	3	0	0	268	22	0	19	3	23	0	731
04:30 PM	40	336	12	0	20	5	4	0	2	304	16	0	21	3	54	0	817
04:45 PM	46	374	15	0	12	3	6	0	1	314	24	0	26	3	48	0	872
TOTAL	**158**	**1321**	**37**	**0**	**65**	**13**	**21**	**0**	**6**	**1182**	**82**	**0**	**86**	**13**	**163**	**0**	**3147**
05:00 PM	56	391	19	0	16	5	6	0	3	346	34	0	20	7	61	0	964
05:15 PM	41	359	24	0	18	6	4	0	4	293	30	0	14	5	52	0	850
05:30 PM	45	325	17	0	17	4	2	0	2	274	22	0	16	2	34	0	760
05:45 PM	34	302	13	0	12	2	3	0	2	253	15	0	11	3	36	0	686
TOTAL	**176**	**1377**	**73**	**0**	**63**	**17**	**15**	**0**	**11**	**1166**	**101**	**0**	**61**	**17**	**183**	**0**	**3260**

APPENDIX D – Existing Signal Plans

FED. RD. DIV. NO.	STATE	COUNTY	FILE NO.	PROJECT NO.	ROUTE NO.	SHEET NO.	TOTAL SHEETS
3	S.C.	GREENVILLE	23.477A	SB-GRD(010)	I-385	TS-7	979

—SIGNAL EQUIPMENT—

* 8 PHASE FULLY ACTUATED STANDARD NEMA CONTROLLER WITH FLASHER, SIGNAL MONITOR UNIT, AND BASE-MOUNTED NEMA CABINET. EXT. PROP.

12 (2)-CHANNEL VEHICLE DETECTOR UNITS

PEDESTRIAN SIGNALS: EXT. P PROP. W/ACT. & SIGN

VEHICLE SIGNALS: EXT. PROP.

SIGNAL NUMBER	2	2A	3	3A	4	4A	6	6A	9	10	2P	3P	4P	6P
LENS	R Y G	R Y G	R Y G	R Y G	R Y G	R Y G	R Y G	R Y G	R Y G	R Y G	W	W	W	W
PHASE	2	2	8	8	4	4	6	6	OLA	OLB	2P	3P	4P	6P
SIZE	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"
QUANTITY	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

OLA= 4+6 OLC=_____
OLB= 2+3 OLD=_____

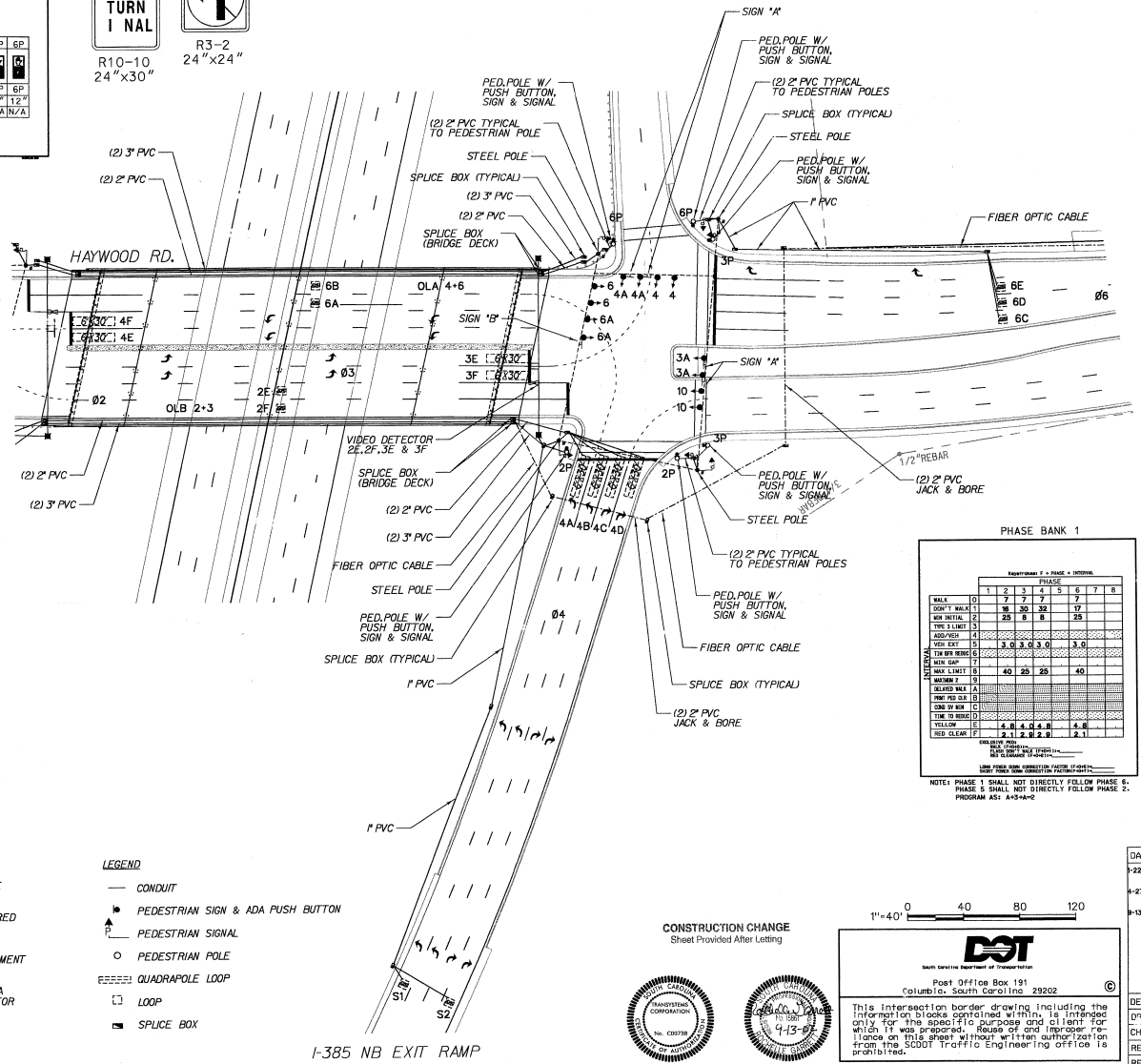
METAL POLES AS NECESSARY: EXT. ○ PROP. ●M
WOOD POLES AS NECESSARY: EXT. ⊖ PROP. ●W

* CONTROLLER OPERATES NB & SB EXIT RAMPS

SIGNS

Ⓐ LEFT TURN I NAL — R10-10 24"x30"

Ⓑ — R3-2 24"x24"



LOOP INSTALLATION AND ASSIGNMENT CHART

LOOP NUMBER	PHASE ASSIGNMENT	OPERATIONAL MODE	SPECIAL FUNCTION	MEMORY	SIZE	DISTANCE FROM STOP BAR
2A	2	PRESENCE	–	LOCK	6'X6'	200'
2B	2	PRESENCE	–	LOCK	6'X6'	200'
2C	2	PRESENCE	–	LOCK	6'X6'	200'
2D	2	PRESENCE	–	LOCK	6'X6'	200'
2E	2	VIDEO	NB RAMP	LOCK	6'X6'	200'
2F	2	VIDEO	NB RAMP	LOCK	6'X6'	200'
3A	3	PRESENCE	–	NON-LOCK	6'X30' QUAD	-2'
3B	3	PRESENCE	–	NON-LOCK	6'X30' QUAD	-2'
3C	3	PRESENCE	10 SEC. DELAY	NON-LOCK	6'X30' QUAD	-2'
3D	3	PRESENCE	10 SEC. DELAY	NON-LOCK	6'X30' QUAD	-2'
3E	5	VIDEO	NB	NON-LOCK	6'X30'	0
3F	5	VIDEO	NB	NON-LOCK	6'X30'	0
4A	4	PRESENCE	NB RAMP	NON-LOCK	6'X30' QUAD	-2'
4B	4	PRESENCE	NB RAMP	NON-LOCK	6'X30' QUAD	-2'
4C	4	PRESENCE	10 SEC DELAY	NON-LOCK	6'X30' QUAD	-2'
4D	4	PRESENCE	10 SEC DELAY	NON-LOCK	6'X30' QUAD	-2'
4E	1	VIDEO	–	NON-LOCK	6'X30'	0
4F	1	VIDEO	–	NON-LOCK	6'X30'	0
6A	6	VIDEO	–	LOCK	6'x6'	200'
6B	6	VIDEO	–	LOCK	6'x6'	200'
6C	6	PRESENCE	NB RAMP	LOCK	6'x6'	200'
6D	6	PRESENCE	NB RAMP	LOCK	6'x6'	200'
6E	6	PRESENCE	NB RAMP	LOCK	6'x6'	200'
S1	SYSTEM	PRESENCE	SYSTEM NB	N/A	6'x6'	400'
S2	SYSTEM	PRESENCE	SYSTEM NB	N/A	6'x6'	400'
SS1	SYSTEM	PRESENCE	SYSTEM SB	N/A	6'x6'	400'
SS2	SYSTEM	PRESENCE	SYSTEM SB	N/A	6'x6'	400'

INSTALLATION NOTES:

1. INSTALL SIGNAL HEADS, PEDESTRIAN SIGNAL HEADS, PUSH BUTTONS AND SIGNS, LOOPS, LOOP LEAD-INS, CABINET BASE, CABINET AND CONTROLLER, CONDUIT, SIGNAL SPAN AND CABLE AND WIRES AS SHOWN.
2. SEE GENERAL PROJECT NOTES SHEET TS-1 FOR REQUIRED CONDUIT.
3. PEDESTRIAN PUSH BUTTONS AND HEADS ARE TO BE ADA (AMERICANS WITH DISABILITIES ACT) APPROVED AND INSTALLED PER SCDOT SPECIFICATIONS.
4. EACH LOOP SHOWN ON THE PLANS SHALL BE HOOKED UP TO A SEPARATE LOOP DETECTOR CHANNEL IN THE CABINET. SEE THE LOOP INSTALLATION CHART FOR THE APPROPRIATE PHASE WIRING REQUIREMENTS.
5. A MINIMUM OF ONE DETECTOR INPUT JACK SHALL BE REQUIRED FOR EACH CABINET PHASE. ADDITIONAL JACKS ARE REQUIRED AS SHOWN FOR EACH LOOP.
6. PAVEMENT MARKINGS ARE FOR INFORMATION ONLY. SEE PAVEMENT MARKING PLAN SHEETS FOR DETAILS AND QUANTITIES.
7. EACH LOOP SHALL BE INSTALLED IN A SEPARATE SAW CUT. A MINIMUM OF ONE FOOT SEPARATION SHALL BE MAINTAINED FOR EACH LOOP AND LOOP LEAD TO PREVENT CROSS TALK.
8. SEE SHEET TS-13 FOR FIBER OPTIC CABLE DETAILS.

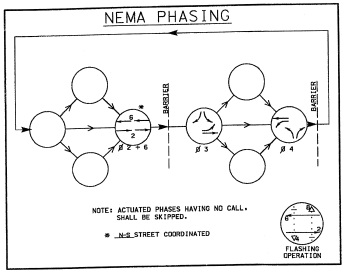
LEGEND

- CONDUIT
- PEDESTRIAN SIGN & ADA PUSH BUTTON
- PEDESTRIAN SIGNAL
- PEDESTRIAN POLE
- QUADRAPOLE LOOP
- LOOP
- SPLICE BOX

CONSTRUCTION CHANGE
Sheet Provided After Letting

1"=40' 0 40 80 120

NEMA PHASING



RECEIVED
SEP 16 2002
FLUOR DANIEL CRM

STREET NAME	HAYWOOD				I-385 NB EXIT			
APPROACH DIRECTION	NB	SB	EB	WB	NB	SB	EB	WB
SIGNAL DESIGN SPEED	40	40					35	
GRADE (%)	-1	-1					-6	

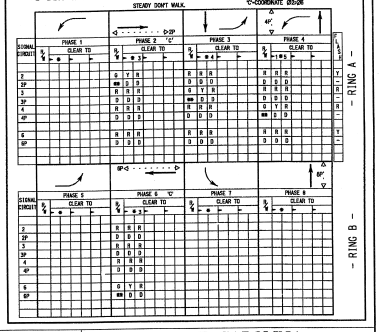
N. E. M. A. 8 PHASE CONTROLLER SEQUENCE DIAGRAM

NOTE A - ANY ACTUATED PHASE FOR WHICH THERE IS NO CALL SHALL BE SKIPPED.
NOTE B - WHEN ONE PHASE IS ON ALONE, ANY NON-CONFLICTING PHASE MAY START TIMING CONCURRENTLY WITHOUT A CLEARANCE INTERVAL (SEE CHART).
**CONFLICTING PHASES REQUIRE A CLEARANCE INTERVAL.

G-GREEN
Y-YELLOW
R-RED
G-G. ARROW
Y-Y. ARROW
W-WALK **
D-DON'T WALK

**WHEN CALLED, TIMES WALK, THEN FLASHING DON'T WALK, THEN GOES STEADY DON'T WALK.

PHASE CHART	NON-CONFLICTING PHASE (S)	CONFLICTING PHASE **
1	5,6,P	2,3,4,2P,3P,4P
2	5,6,P	3,4,1,3P,4P
3	1,4,6,P	2,5,6,2P,6P
4	1,5,6,P	2,3,5,6,2P,6P
5	1,2,P	3,4,6,3P,4P,6P
6	1,2,3,P	4,5,1,2,4P,5P
7	1,5,P	1,2,3,6,2P,3P,6P
8	1,4,P,6P	2,3,5,6,1,2P,6P



PHASE BANK 1

Equivalent F + PHASE + INTERVAL

		PHASE 1	2	3	4	5	6	7	8
WALK	0	7	7	7		7			
DON'T WALK	1	18	30	32		17			
MIN INITIAL	2	25	8	8		25			
TYPE 3 LIMIT	3								
ADD/VEH	4								
VEH EXT	5	3.0	3.0	3.0		3.0			
TIM BFR REDS	6								
MIN GAP	7								
MAX LIMIT	8	40	25	25		40			
MAXIMN 2	9								
DELAYED WALK	A								
PNNT PED DLB	B								
COND DV NON	C								
TIME TO REDUC	D								
YELLOW	E	4.0	4.0	4.0		4.0			
RED CLEAR	F	2.1	2.0	2.0		2.1			

INTERVAL

EXCLUSIVE PED:
WALK + FLASHING DON'T WALK (PEDITIME)_____
RED CLEARANCE (F+DOB)=_____

LOOP STACK TIME CORRECTION FACTOR (F+DB)=_____
LOOP TIMER TIME CORRECTION FACTOR(F+DB)=_____

NOTE: PHASE 1 SHALL NOT DIRECTLY FOLLOW PHASE 6.
PHASE 5 SHALL NOT DIRECTLY FOLLOW PHASE 2.
PROGRAM AS: A+3+A+2

DATE	REVISIONS
1-22-01	ADD DELAY TO LOOP 8C
4-27-01	SWITCH TO STEEL STRAIN POLES
9-13-02	NEW BRIDGE ALL NEW SIGNAL SHEET

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION
COLUMBIA S.C.

SUBJECT TITLE: SIGNAL PLAN

SPECIFIC LOCATION: HAYWOOD ROAD @ I-385 NB RAMP

CITY GREENVILLE — COUNTY GREENVILLE

APPROVED BY — COL OF TRAFFIC ENGINEERING
APPROVED BY — ENGINEER

DESIGNED RG
DRAWN RW
CHECKED
REVIEWED
RECOMMENDED

SCALE	DATE	SHEET NO.	INDEX NO.
1"=40'	9-13-02	OF	DRAWING #72

South Carolina Department of Transportation
Post Office Box 191
Columbia, South Carolina 29202 ©

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TRANSYSTEMS CORPORATION No. C00738 — STATE OF SOUTH CAROLINA

STATE OF SOUTH CAROLINA No. 19867 — 9-13-02

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—SIGNAL EQUIPMENT—

* ONE (1) 8 PHASE FULLY ACTUATED STANDARD NEMA CONTROLLER WITH FLASHER, SIGNAL MONITOR UNIT, AND BASE-MOUNTED NEMA CABINET. EXT. ▭ PROP. ▬

12 (2)-CHANNEL VEHICLE DETECTOR UNITS

PEDESTRIAN SIGNALS: EXT. P PROP. P W/ACT. & SIGN

VEHICLE SIGNALS: EXT. ○─▷ PROP. ●─▶

SIGNAL NUMBER	2	2A	3	3A	4	4A	6	6A	9	10	2P	3P	4P	6P
LENS	R Y G	R Y G	R Y G	R ←Y ←G	R Y G	R ←Y ←G	R Y G	R Y G	R Y G	R Y G				
PHASE	2	2	8	8	4	4	6	6	OLA	OLB	2P	3P	4P	6P
SIZE	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"
QUANTITY	2	2	2	4	2	4	2	2	2	2	4	2	2	4

OLA= 4+6 OLC=______
OLB= 2+3 OLD=______

METAL POLES AS NECESSARY: EXT. ○ PROP. ●M
WOOD POLES AS NECESSARY: EXT. ⊖ PROP. ●W

* CONTROLLER OPERATES NB & SB EXIT RAMPS

ESTIMATED QUANTITIES**
FURNISH AND INSTALL

BID ITEM NO.	DESCRIPTION	QUANTITY	UNIT
6060085	2.0" GALVANIZED RIGID CONDUIT (BORED & JACKED)		L.F.
606027C	3.0" SCHEDULE 80 PVC CONDUIT	1865	L.F.
606027V	3.0" SCHEDULE 80 PVC CONDUIT (BORED & JACKED)	125	L.F.
6060275	1.0" SCHEDULE 80 PVC CONDUIT	1215	L.F.
6060278	2.0" SCHEDULE 80 PVC CONDUIT	2180	L.F.
6060391	NO. 14CU WIRE 7 CONDU., IMSA-20-1	3110	L.F.
6060407	NO. 14CU., 4CON, AL SHIELD, IMSA-50-2	7695	L.F.
6060413	#14 COPPER WIRE, 1 COND., IMSA 51-1	3995	L.F.
6060495	SAW CUT FOR LOOP DETECTOR	1480	L.F.
6060499	ELECTRICAL SERVICE FOR TRAFFIC SIGNAL	1	EA.
6060508	12x12x12D ELEC. UNGRD. ENCL/HD (MOD. FOR BRIDGE DECK)	8	EA.
6060515	12x12x12D ELEC. UNGRD. ENCL/HD	25	EA.
6060105	FLAT SHEET, TYPE III, FIXED SZ. & MEC. SIGN	48	S.F.
6085058	13"x28' STEEL STRAIN POLE	8	EA.
6085090	1/4" GALVANIZED STEEL CABLE		L.F.
6085092	3/8" GALVANIZED STEEL CABLE	1100	L.F.
6085480	4' BRK. AWAY ALUM. PEDESTRIAL POLE	12	EA.
6085513	CONTROLLER, 9PH, T-5 BASE MTD. W/COORD.	1	EA.
6085660	DETECT. AMP/HARN. 1CH. W/DEL/EXT.		EA.
6085661	DETECT. AMP/HARN. 2 CH. W/DEL/EXT.	12	EA.
6085731	12" 1 WAY, 3 SECT. - R/ Y/ G/ TRAFFIC SIGNAL	20	EA.
6085733	12" 1 WAY, 3 SECT. - R. YA. GA. TRAFFIC SIGNAL	8	EA.
6085780	1 WAY - 1 SECT. HAND/MAN PED. SIGNAL	12	EA.
6085790	PED. PUSH BUTTON & SIGN (R-10-48)	12	EA.
6085830	VEH. TRAFFIC SIGNAL MTG./SPAN WIRE	24	EA.
6085841	PEDESTRIAN TRAFFIC SIGNAL MTG./SIDE	12	EA.
6085990	REM. SAL. & DISP. EXISTING TRAFFIC SIGNAL EQUIPMENT	1	L.S.
9100004	VIDEO DETECTION SYSTEM W/HARDWARE	2	EA.

**FOR NB & SB RAMPS

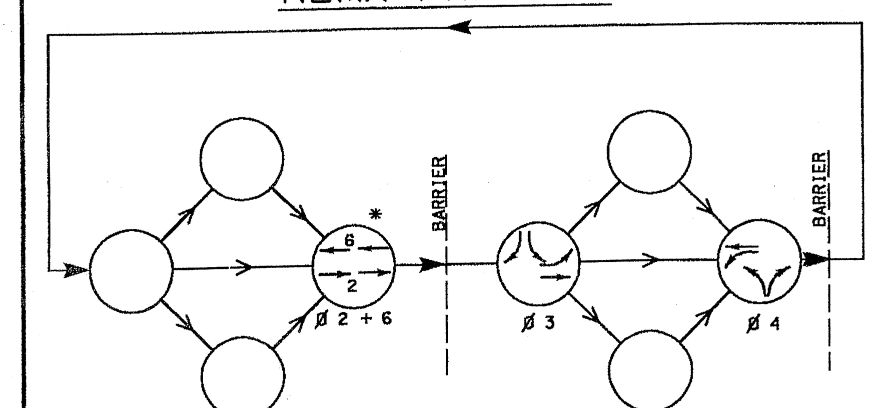
RECEIVED SEP 16 2002 FLUOR DANIEL CRM

FED. RD. DIV. NO.	STATE	COUNTY	FILE NO.	PROJECT NO.	ROUTE NO.	SHEET NO.	TOTAL SHEETS
3	S.C.	GREENVILLE	23.477A	SB-GRID(010)	I-385	TS-6	979

LOOP INSTALLATION AND ASSIGNMENT CHART

LOOP NUMBER	PHASE ASSIGNMENT	OPERATIONAL MODE	SPECIAL FUNCTION	MEMORY	SIZE	DISTANCE FROM STOP BAR
2A	2	PRESENCE	–	LOCK	6'X6'	200'
2B	2	PRESENCE	–	LOCK	6'X6'	200'
2C	2	PRESENCE	–	LOCK	6'X6'	200'
2D	2	PRESENCE	–	LOCK	6'X6'	200'
2E	2	VIDEO	NB RAMP	LOCK	6'X6'	200'
2F	2	VIDEO	NB RAMP	LOCK	6'X6'	200'
3A	3	PRESENCE	–	NON-LOCK	6'X30' QUAD	-2'
3B	3	PRESENCE	–	NON-LOCK	6'x30' QUAD	-2'
3C	3	PRESENCE	10 SEC. DELAY	NON-LOCK	6'x30' QUAD	-2'
3D	3	PRESENCE	10 SEC. DELAY	NON-LOCK	6'x30' QUAD	-2'
3E	5	VIDEO	NB RAMP	NON-LOCK	6'x30'	0
3F	5	VIDEO	NB RAMP	NON-LOCK	6'x30'	0
4A	4	PRESENCE	NB RAMP	NON-LOCK	6'x30' QUAD	-2'
4B	4	PRESENCE	NB RAMP	NON-LOCK	6'x30' QUAD	-2'
4C	4	PRESENCE	10 SEC DELAY	NON-LOCK	6'x30' QUAD	-2'
4D	4	PRESENCE	10 SEC DELAY	NON-LOCK	6'x30' QUAD	-2'
4E	1	VIDEO	–	NON-LOCK	6'x30'	0
4F	1	VIDEO	–	NON-LOCK	6'x30'	0
6A	6	VIDEO	–	LOCK	6'x6'	200'
6B	6	VIDEO	–	LOCK	6'x6'	200'
6C	6	PRESENCE	NB RAMP	LOCK	6'x6'	200'
6D	6	PRESENCE	NB RAMP	LOCK	6'x6'	200'
6E	6	PRESENCE	NB RAMP	LOCK	6'x6'	200'
S1	SYSTEM	PRESENCE	SYSTEM NB	N/A	6'x6'	400'
S2	SYSTEM	PRESENCE	SYSTEM NB	N/A	6'x6'	400'
SS1	SYSTEM	PRESENCE	SYSTEM SB	N/A	6'x6'	400'
SS2	SYSTEM	PRESENCE	SYSTEM SB	N/A	6'x6'	400'

NEMA PHASING



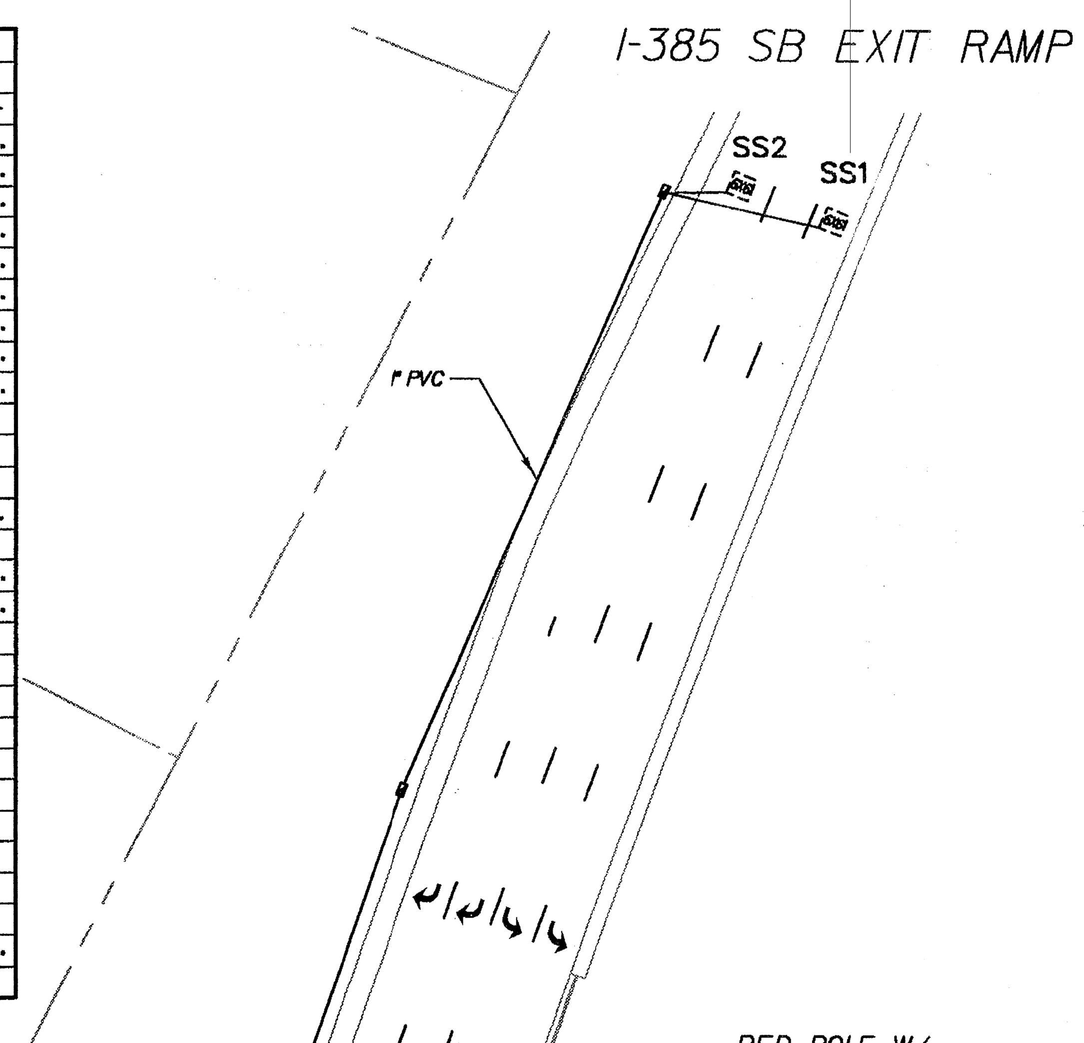
NOTE: ACTUATED PHASES HAVING NO CALL. SHALL BE SKIPPED.

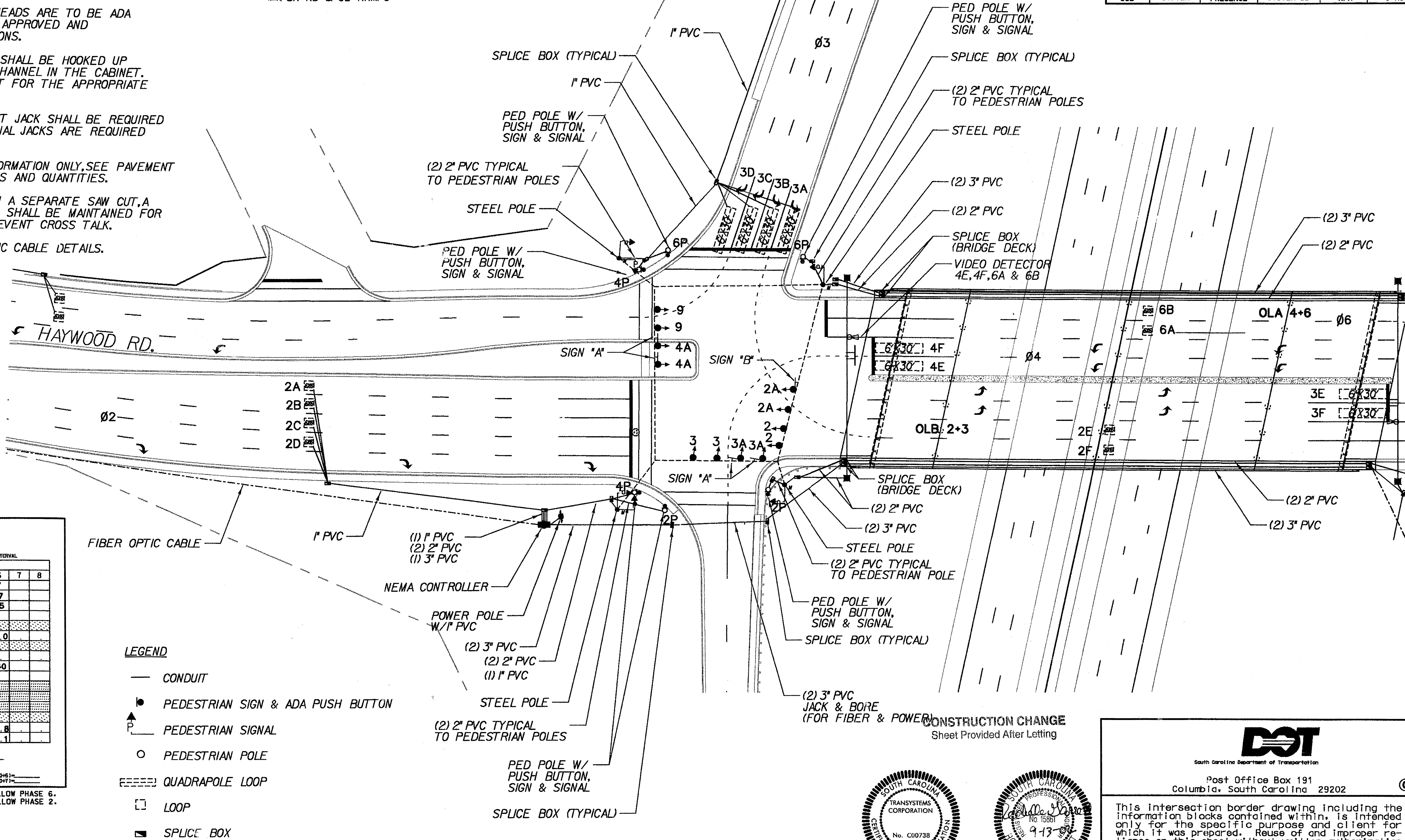
* N-S STREET COORDINATED

FLASHING OPERATION

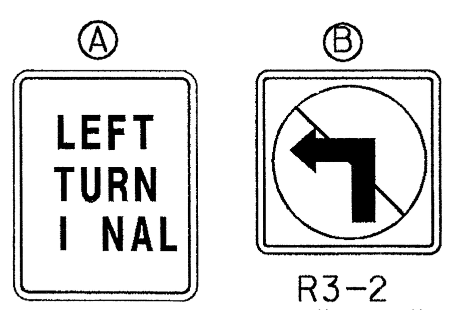
INSTALLATION NOTES:

1. INSTALL SIGNAL HEADS, PEDESTRIAN SIGNAL HEADS, PUSH BUTTONS AND SIGNS, LOOPS, LOOP LEAD-INS, CABINET BASE, CABINET AND CONTROLLER, CONDUIT, SIGNAL SPAN AND CABLE AND WIRES AS SHOWN.
2. SEE GENERAL PROJECT NOTES SHEET TS-1 FOR REQUIRED CONDUIT.
3. PEDESTRIAN PUSH BUTTONS AND HEADS ARE TO BE ADA (AMERICANS WITH DISABILITIES ACT) APPROVED AND INSTALLED PER SCDOT SPECIFICATIONS.
4. EACH LOOP SHOWN ON THE PLANS SHALL BE HOOKED UP TO A SEPARATE LOOP DETECTOR CHANNEL IN THE CABINET. SEE THE LOOP INSTALLATION CHART FOR THE APPROPRIATE PHASE WIRING REQUIREMENTS.
5. A MINIMUM OF ONE DETECTOR INPUT JACK SHALL BE REQUIRED FOR EACH CABINET PHASE, ADDITIONAL JACKS ARE REQUIRED AS SHOWN FOR EACH LOOP.
6. PAVEMENT MARKINGS ARE FOR INFORMATION ONLY, SEE PAVEMENT MARKING PLAN SHEETS FOR DETAILS AND QUANTITIES.
7. EACH LOOP SHALL BE INSTALLED IN A SEPARATE SAW CUT, A MINIMUM OF ONE FOOT SEPARATION SHALL BE MAINTAINED FOR EACH LOOP AND LOOP LEAD TO PREVENT CROSS TALK.
8. SEE SHEET TS-13 FOR FIBER OPTIC CABLE DETAILS.





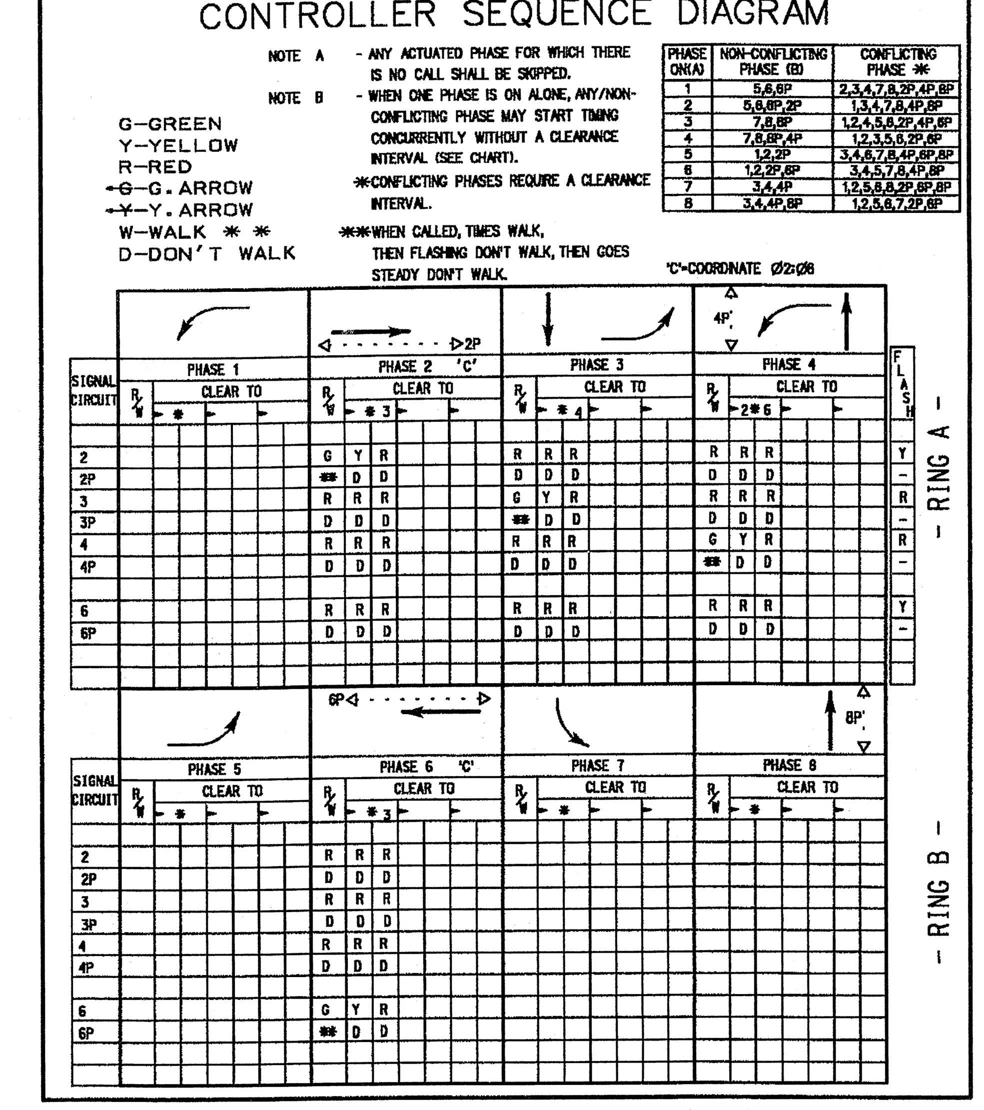
SIGNS



R10-10 24"x30" R3-2 24"x24"

STREET NAME	HAYWOOD				SB EXIT			
APPROACH DIRECTION	NB	SB	EB	WB	NB	SB	EB	WB
SIGNAL DESIGN SPEED	40	40					35	
GRADE (%)	+7	-7					+4	

N. E. M. A. 8 PHASE CONTROLLER SEQUENCE DIAGRAM



PHASE BANK 1

Keystrokes: F + PHASE + INTERVAL

INTERVAL		PHASE 1	2	3	4	5	6	7	8
WALK	0		7	7	7		7		
DON'T WALK	1		16	30	32		17		
MIN INITIAL	2		25	8	8		25		
TYPE 3 LIMIT	3								
ADD/VEH	4								
VEH EXT	5	.	3.0	3.0	3.0	.	3.0	.	.
TIM BFR REDUC	6								
MIN GAP	7	.	.	.	.	.	.	.	.
MAX LIMIT	8		40	25	25		40		
MAXIMUM 2	9								
DELAYED WALK	A								
PRMT PED CLR	B								
COND SV MIN	C								
TIME TO REDUC	D								
YELLOW	E	.	4.8	4.0	4.8	.	4.8	.	.
RED CLEAR	F	.	2.1	2.9	2.9	.	2.1	.	.

EXCLUSIVE PED:
WALK (F+0+0):=______
FLASH DON'T WALK (F+0+1):=______
RED CLEARANCE (F+0+2):=______

LONG POWER DOWN CORRECTION FACTOR (F+0+6)=______
SHORT POWER DOWN CORRECTION FACTOR(F+0+7)=______

NOTE: PHASE 1 SHALL NOT DIRECTLY FOLLOW PHASE 6.
PHASE 5 SHALL NOT DIRECTLY FOLLOW PHASE 2.
PROGRAM AS: A+3+A=2

LEGEND

- CONDUIT
- PEDESTRIAN SIGN & ADA PUSH BUTTON
- PEDESTRIAN SIGNAL
- PEDESTRIAN POLE
- QUADRAPOLE LOOP
- LOOP
- SPLICE BOX

CONSTRUCTION CHANGE
Sheet Provided After Letting

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SOUTH CAROLINA TRANSYSTEMS CORPORATION No. C00738 CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 15861 9-13-02

DATE	REVISIONS
1-22-01	ADD DELAY TO LOOP 8C
4-27-01	SWITCH TO STEEL STRAIN POLES
9-13-02	NEW BRIDGE ALL NEW SIGNAL SHEET

SOUTH CAROLINA
DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION
COLUMBIA S.C.

SUBJECT TITLE: SIGNAL PLAN

SPECIFIC LOCATION: HAYWOOD ROAD @ I-385 SB RAMP

DESIGNED RG	CITY GREENVILLE	COUNTY GREENVILLE	
DRAWN RW	APPROVED BY	APPROVED BY	
CHECKED	DIR. OF TRAFFIC ENGINEERING	ENGINEER	
REVIEWED	SCALE	DATE	SHEET NO.	INDEX NO.
RECOMMENDED	1"=40'	9-13-02	OF	DRAWING #220

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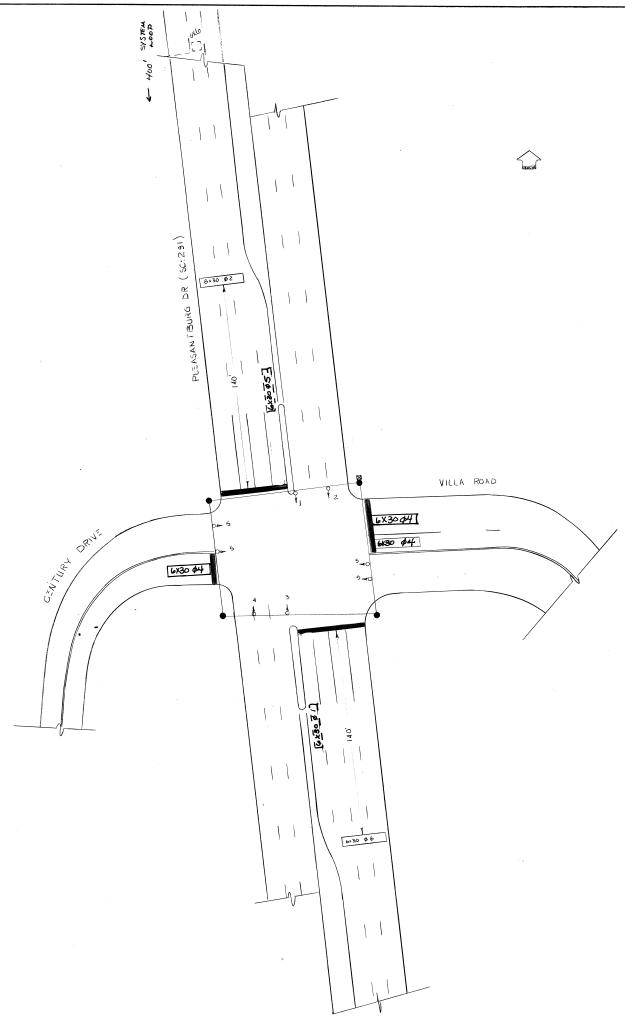


EXISTING EQUIPMENT TO REMAIN

FOUR WOOD POLES.
PAVEMENT LOOPS.
SIX 12" SIGNAL HEADS

NEW EQUIPMENT

☒ ONE (1) EIGHT PHASE FULLY ACTUATED NEMA CONTROLLER AND BASE MOUNTED CABINET.
FIVE (5) LOOP DETECTORS - LOCAL / 1 DETECTOR - SYSTEM

TWO (2) 12" 5 SECTION SIGNAL HEADS.
3 PAVEMENT LOOPS.
ONE (1) COORDINATION UNIT OR MODULE.

SIGNAL OPERATION

SIGNAL HEAD NUMBER	Ø 1 + 5 R/W	Ø 1 + 5 CLEAR TO 1+6	Ø 1 + 5 CLEAR TO 2+5	Ø 1 + 5 CLEAR TO ALL OTHER	Ø 1 + 6 R/W	Ø 1 + 6 CLEAR TO 2+6	Ø 1 + 6 CLEAR TO 1+5	Ø 1 + 6 CLEAR TO ALL OTHER	Ø 2 + 5 R/W	Ø 2 + 5 CLEAR TO 2+6	Ø 2 + 5 CLEAR TO 1+5	Ø 2 + 5 CLEAR TO ALL OTHER	Ø 2 + 6 R/W	Ø 2 + 6 CLEAR TO 1+6	Ø 2 + 6 CLEAR TO 2+5	Ø 2 + 6 CLEAR TO ALL OTHER	Ø 4 R/W	Ø 4 CLEAR TO ALL PHASES			FLASHING
1	~~6~~ R	~~6~~ R	~~4~~ R	~~4~~ R	~~6~~ G	~~4~~ G	~~6~~ Y	~~4~~ Y	R	R	R	R	G	G	Y	Y	R	R			Y
2	R	R	R	R	G	G	Y	Y	R	R	R	R	G	G	Y	Y	R	R			Y
3	~~6~~ R	~~4~~ R	~~6~~ R	~~4~~ R	R	R	R	R	~~6~~ G	~~4~~ G	~~6~~ Y	~~4~~ Y	G	Y	G	Y	R	R			Y
4	R	R	R	R	R	R	R	R	G	G	Y	Y	G	Y	G	Y	R	R			Y
5	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	Y			R
6																					
7																					
8																					

SIGNAL TIMING

SETTINGS	SECONDS Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8
INITIAL	3	10		4	3	10		
EXTENSION	2	3		3	2	3		
WALK	-	-		-	-	-		
PED CL.	-	-		-	-	-		
MAXIMUM I	17	37		22	17	37		
MAXIMUM II	-	-		-	-	-		
YELLOW	3.5	4.5		4.0	3.5	4.5		
ALL RED	0.5	1.0		0.5	0.5	1.0		
RECALL	-	MIN		-	-	MIN		
DETECTOR MODE	-	K		-	-	K		

N = NON-LOCK K = LOCK

SIGNAL HEAD LEGEND

SIGNAL LEGEND	QUANTITY	SIZE	SECTIONS	LENS
1	1	12"	5	~~6~~ ~~4~~ RYG
2	1	12"	3	RYG
3	1	12"	5	~~6~~ ~~4~~
4	1	12"	3	RYG
5	4	12"	3	RYG
6				
7				
8				

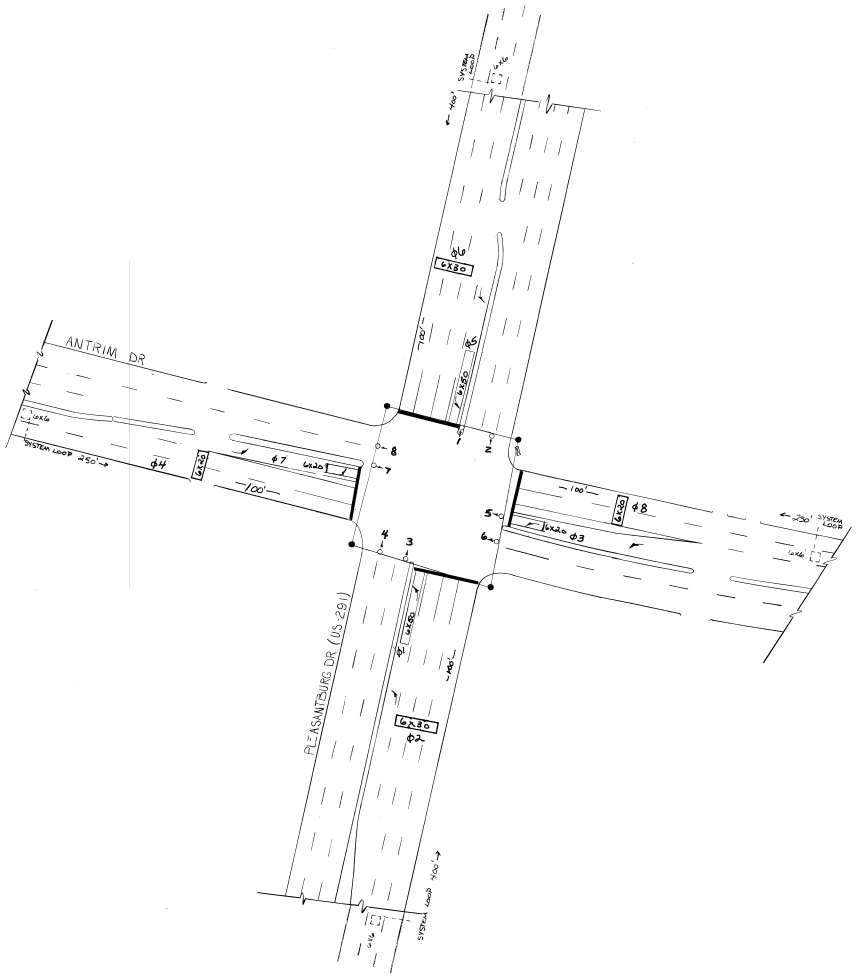
THE CITY OF GREENVILLE
POST OFFICE BOX 2207 GREENVILLE, SOUTH CAROLINA

PLEASANTBURD DR. (S.C.-291)

CENTURY DR. / VILLA RD.

SURVEYED BY ____ DATE ____ CHECKED BY ____ DATE ____
DRAWN BY MEG DATE 9-6-83 FIELD BOOK NO. ____
SCALE ____ FILE NO. ____
SHEET NUMBER 5.13 OF 5.13

DRAWING # 119



EXISTING EQUIPMENT TO REMAIN

☐ FOUR WOOD POLES.
PAVEMENT LOOPS.
8 12" SIGNAL HEADS

NEW EQUIPMENT

☒ ONE (1) EIGHT PHASE FULLY ACTUATED NEMA CONTROLLER AND BASE MOUNTED CABINET.
EIGHT LOOP DETECTORS-LOCAL / 4 DETECTORS - SYSTEM

ONE (1) COORDINATION UNIT OR MODULE.

☐ FOUR SYSTEM LOOPS

SIGNAL OPERATION

SIGNAL HEAD NUMBER	Ø 1+5 R/W	CLEAR TO 1+6	CLEAR TO 2+5	CLEAR TO ALL OTHER	Ø 1+6 R/W	CLEAR TO 2+6	CLEAR TO 1+5	CLEAR TO ALL OTHER	Ø 2+5 R/W	CLEAR TO 2+6	CLEAR TO 1+5	CLEAR TO ALL OTHER	Ø 2+6 R/W	CLEAR TO 1+6	CLEAR TO 2+5	CLEAR TO ALL OTHER	FLASHING
1	R/G	R/Y	R/Y	R/Y	R	R	R	R	R/G	R/Y	R/Y	R/Y	G	Y	G	Y	
2	R	R	R	R	R	R	R	R	G	G	Y	Y	G	Y	G	Y	
3	R/G	R/Y	R/Y	R/Y	R/G	R/Y	R/Y	R/Y	R	R	R	R	G	G	Y	Y	
4	R	R	R	R	G	G	Y	Y	R	R	R	R	G	G	Y	Y	
5	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	
6	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	
7	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	
8	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	

SIGNAL OPERATION

SIGNAL HEAD NUMBER	Ø 3+7 R/W	CLEAR TO 3+8	CLEAR TO 4+7	CLEAR TO ALL OTHER	Ø 3+8 R/W	CLEAR TO 4+8	CLEAR TO 3+7	CLEAR TO ALL OTHER	Ø 4+7 R/W	CLEAR TO 4+8	CLEAR TO 3+7	CLEAR TO ALL OTHER	Ø 4+8 R/W	CLEAR TO 3+8	CLEAR TO 4+7	CLEAR TO ALL OTHER	FLASHING
1	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	Y
2	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	Y
3	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	Y
4	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	Y
5	R/G	R/Y	R/Y	R/Y	R	R	R	R	R/G	R/Y	R/Y	R/Y	G	Y	G	Y	R
6	R	R	R	R	R	R	R	R	G	G	Y	Y	G	Y	G	Y	R
7	R/G	R/Y	R/Y	R/Y	R/G	R/Y	R/Y	R/Y	R	R	R	R	G	G	Y	Y	R
8	R	R	R	R	G	G	Y	Y	R	R	R	R	G	G	Y	Y	R

SIGNAL TIMING

SETTINGS	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8
	SECONDS							
INITIAL	3	10	3	3	3	10	3	3
EXTENSION	2	4	2	3	2	4	2	3
WALK	-	-	-	-	-	-	-	-
PED CL.	-	-	-	-	-	-	-	-
MAXIMUM I	15	22	18	18	15	22	18	18
MAXIMUM II	-	-	-	-	-	-	-	-
YELLOW	3.5	4.0	3.5	4.0	3.5	4.0	3.5	4.0
ALL RED	0.5	1.0	0.5	1.0	0.5	1.0	0.5	1.0
RECALL	-	MIN	-	-	-	MIN	-	-
DETECTOR MODE	N	K	N	K	N	K	N	K
N = NON-LOCK K = LOCK								

SIGNAL HEAD LEGEND

SIGNAL LEGEND	QUANTITY	SIZE	SECTIONS	LENS
1	1	12"	5	R/G Y RYG
2	1	12"	3	RYG
3	1	12"	5	R/G Y RYG
4	1	12"	3	RYG
5	1	12"	5	R/G Y RYG
6	1	12"	3	RYG
7	1	12"	5	R/G Y RYG
8	1	12"	3	RYG

THE CITY OF GREENVILLE
POST OFFICE BOX 2207 GREENVILLE, SOUTH CAROLINA

SIGNAL SYSTEM

PLEASANTBURG DR. (S.C.-291) ANTRIM DR.

SURVEYED BY ____ DATE ____	CHECKED BY ____ DATE ____	SHEET NUMBER 5.7
DRAWN BY MEG DATE 1-28-85	FIELD BOOK NO. ____	OF 5.13
SCALE 1" = 40'	FILE NO. ____	

DRAWING # 112

NEMA PHASING

ACTUATED PHASES HAVING NO CALL, SHALL BE SKIPPED.

LEFT TURN TRAP PROTECTION TO BE ACTIVATED.

* ***N–S*** STREET COORDINATED (Academy St.)

2+6 FLASHING OPERATION

SIGNAL EQUIPMENT

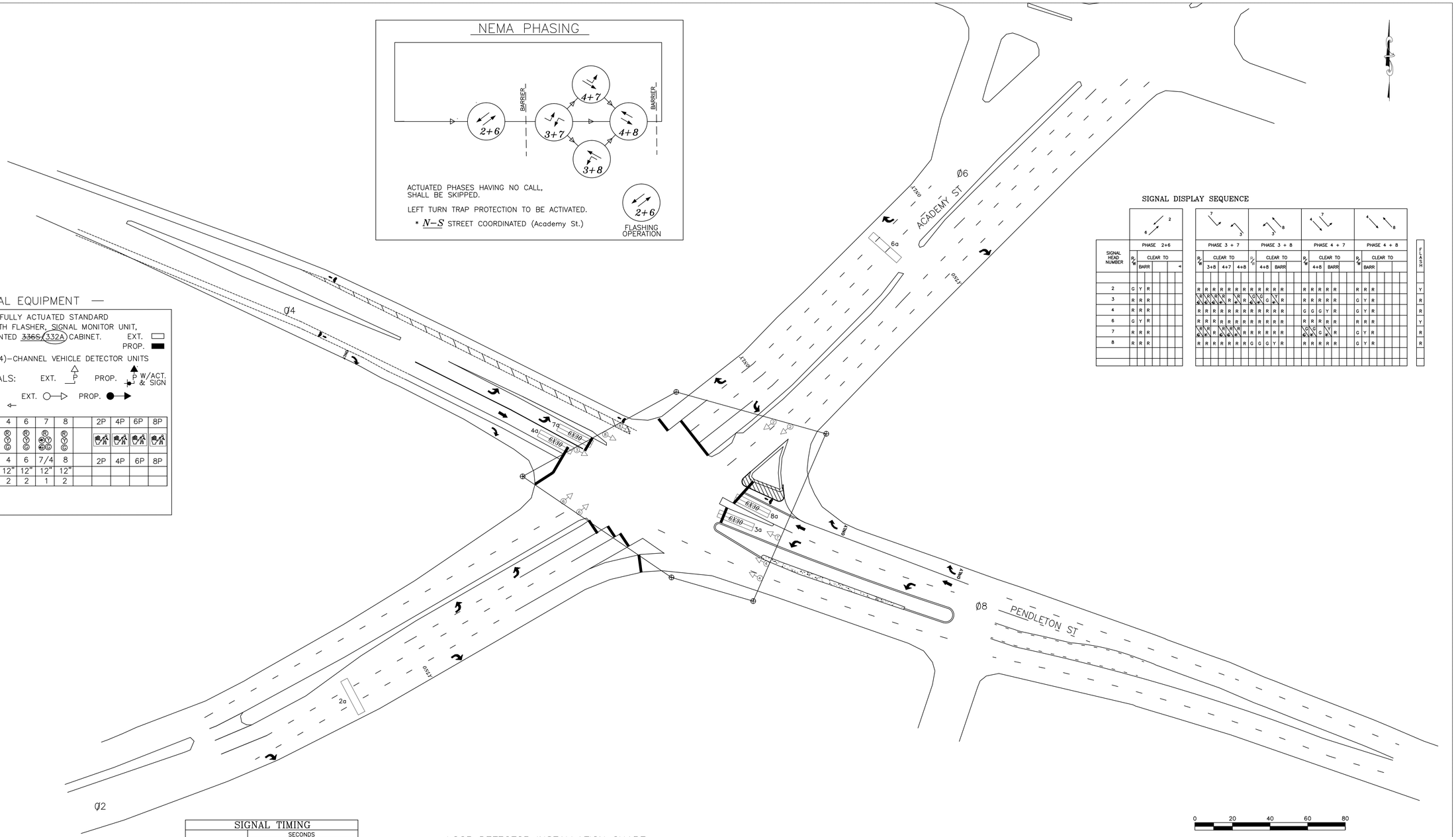
ONE (1) 8 PHASE FULLY ACTUATED STANDARD NEMA CONTROLLER WITH FLASHER, SIGNAL MONITOR UNIT, AND ~~POLE~~/BASE-MOUNTED ~~336S~~/332A CABINET. EXT. PROP.

2 MODEL 222, (4)–CHANNEL VEHICLE DETECTOR UNITS

PEDESTRIAN SIGNALS: EXT. P PROP. P W/ACT. & SIGN

VEHICLE SIGNALS: EXT. PROP.

SIGNAL NUMBER	2	3	4	6	7	8		2P	4P	6P	8P
LENS											
PHASE	2	3/8	4	6	7/4	8		2P	4P	6P	8P
SIZE	12"	12"	12"	12"	12"	12"					
QUANTITY	2	1	2	2	1	2					



SIGNAL DISPLAY SEQUENCE

SIGNAL HEAD NUMBER	PHASE 2+6 R/W	CLEAR TO BARR							PHASE 3 + 7 R/W	CLEAR TO 3+8			4+7		4+8		PHASE 3 + 8 R/W	CLEAR TO 4+8			BARR				PHASE 4 + 7 R/W	CLEAR TO 4+8			BARR				PHASE 4 + 8 R/W	CLEAR TO BARR							FLASH
2	G	Y	R						R	R	R	R	R	R	R	R	R	R	R	R	R				R	R	R	R	R				R	R	R							Y
3	R	R	R						R	R	R	R	R	R	R	R	R	G	G	G	Y	R			R	R	R	R	R				G	Y	R							R
4	R	R	R						R	R	R	R	R	R	R	R	R	R	R	R	R	R			G	G	G	Y	R				G	Y	R							Y
6	G	Y	R						R	R	R	R	R	R	R	R	R	R	R	R	R	R			R	R	R	R	R				R	R	R							R
7	R	R	R						R	R	R	R	R	R	R	R	R	R	R	R	R	R			G	G	G	Y	R				G	Y	R							R
8	R	R	R						R	R	R	R	R	R	R	G	G	G	G	Y	R				R	R	R	R	R				G	Y	R							R

SIGNAL TIMING

SETTINGS	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8
	SECONDS							
INITIAL		20	04	05		20	04	05
EXTENSION		5.0	3.0	3.0		5.0	3.0	3.0
WALK								
PED. CL.								
MAXIMUM 1		40	20	30		40	25	30
MAXIMUM 11								
YELLOW		4.0	3.5	4.0		4.0	3.5	4.0
ALL RED		2.0	0.5	2.0		2.0	1.0	2.0
RECALL								
DELAY								
DETECTOR MODE		K		N		K		N
DETECTOR MODE:	N = NON LOCK					K = LOCK		

— LOOP DETECTOR INSTALLATION CHART —

PHASE/ LOOP LTR#	EXISTING OR PROPOSED	DETECTOR AMP NO.	DETECTOR CHAN NO.	WIRED TO PHASE(S)	OPERATION X LOCK	OPERATION X NON-LOCK	OPERATION X PULSE	OPERATION X PRES	OPERATION DELAY SEC	OPERATION EXT SEC	SPECIAL FEATURES TIME OF DAY-TRED., SWITCHING, etc.	LOOP DESIGN SIZE X	LOOP DESIGN NO.OF TURNS	LOOP DESIGN DIST. FROM ℄
2a	EXISTING			2	X			X				6' X 25'	3	225'
3a	EXISTING			3		X		X			QUADRUPOLE	6' X 30'	2–4–2	+5'
4a	PROPOSED			4		X		X			QUADRUPOLE	6' X 30'	2–4–2	+5'
6a	EXISTING			6	X			X				6' X 25'	3	225'
7a	EXISTING			7		X		X			QUADRUPOLE	6' X 30'	2–4–2	+5'
8a	EXISTING			8		X		X			QUADRUPOLE	6' X 6'	2–4–2	+5'

0 20 40 60 80

REVISIONS			
MARK	DATE	BY	DESCRIPTION
△			
△			
△			
△			
△			

City of Greenville, SC
TRAFFIC ENGINEERING DIVISION
1000 GREENE ST. POST OFFICE BOX 2207 GREENVILLE, SC 29602

LOCATION: ACADEMY STREET (US 123) AND PENDLETON STREET (SC 124)

S.C. D.O.T. APPROVALS

DRAWN BY: W. RAVENHORST DATE: 03–28–11 EQUIP. REVIEW

DESIGNED BY: W. RAVENHORST DATE: 07–29–11 SCALE: 1" = 20'

APPROVED BY: DATE:

12

FED. RD. DIV.-NO.	STATE	COUNTY	FILE NO.	PROJECT NO.	ROUTE NO.	SHEET NO.	TOTAL SHEETS
3	S.C.	GREENVILLE	23.246A		I-85	TS21	

SIGNAL EQUIPMENT

ONE (1) 8 PHASE FULLY ACTUATED STANDARD NEMA CONTROLLER WITH FLASHER, SIGNAL MONITOR UNIT, AND BASE-MOUNTED CABINET TYPE 5.

15 VEHICLE DETECTOR UNITS

PEDESTRIAN SIGNALS: EXT. P PROP. W/ACT. & SIGN

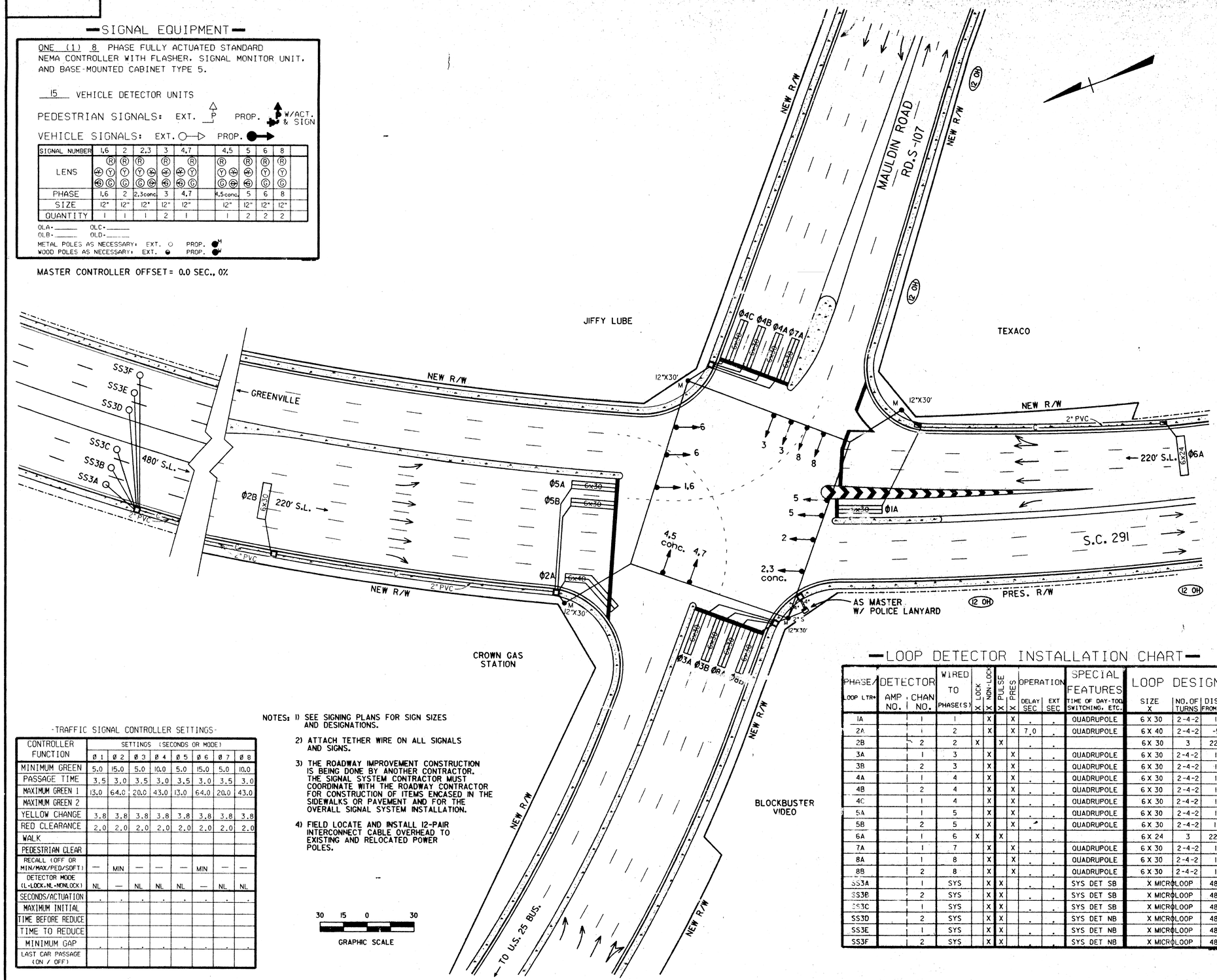
VEHICLE SIGNALS: EXT. PROP.

SIGNAL NUMBER	1,6	2	2,3	3	4,7		4,5	5	6	8	
LENS	R Y G	R Y G	R Y G	R Y G	R Y G		R Y G	R Y G	R Y G	R Y G	
PHASE	1,6	2	2,3 conc.	3	4,7		4,5 conc.	5	6	8	
SIZE	12"	12"	12"	12"	12"		12"	12"	12"	12"	
QUANTITY	1	1	1	2	1		1	2	2	2	

OLA-_____ OLC-_____
OLB-_____ OLD-_____

METAL POLES AS NECESSARY: EXT. PROP. M
WOOD POLES AS NECESSARY: EXT. PROP. W

MASTER CONTROLLER OFFSET = 0.0 SEC., 0%



N. E. M. A. 8 PHASE CONTROLLER SEQUENCE DIAGRAM

G-GREEN
Y-YELLOW
R-RED
-G-O.ARROW
-W-Y.ARROW
W-WALK
D-DON'T WALK

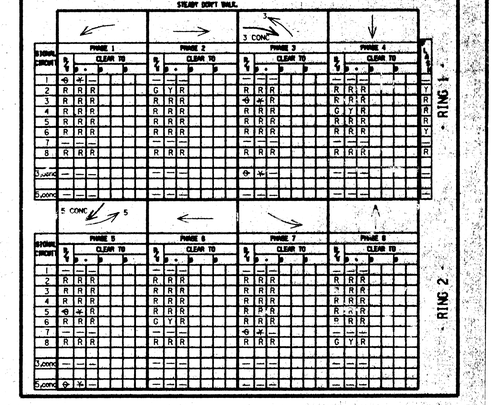
NOTE A - ANY ACTUATED PHASE FOR WHICH THERE IS NO CALL SHALL BE SKIPPED.

NOTE B - WHEN ONE PHASE IS ON ALONE, ANY NON-CONFLICTING PHASE MAY START TIMING CONCURRENTLY WITHOUT A CLEARANCE INTERVAL ONE CONFL.

* CONFLICTING PHASES REQUIRE A CLEARANCE INTERVAL.

** WHEN CALLED, TAKES WALK, THEN FLASHING DON'T WALK, THEN GOES STEADY DON'T WALK.

PHASE CHART	NON-CONFLICTING PHASE **	CONFLICTING PHASE *
1	2 3 4 5 6 7 8	
2	1 3 4 5 6 7 8	
3	1 2 4 5 6 7 8	
4	1 2 3 5 6 7 8	
5	1 2 3 4 6 7 8	
6	1 2 3 4 5 7 8	
7	1 2 3 4 5 6 8	
8	1 2 3 4 5 6 7	



-TRAFFIC SIGNAL CONTROLLER SETTINGS-

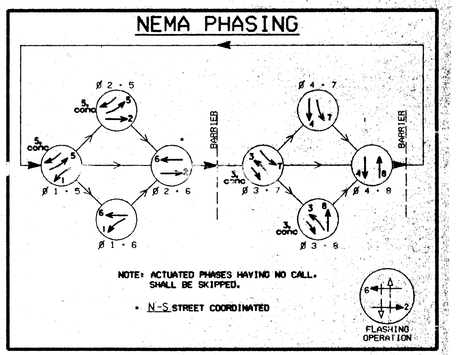
CONTROLLER FUNCTION	SETTINGS (SECONDS OR MODE) Ø 1	Ø 2	Ø 3	Ø 4	Ø 5	Ø 6	Ø 7	Ø 8
MINIMUM GREEN	5.0	15.0	5.0	10.0	5.0	15.0	5.0	10.0
PASSAGE TIME	3.5	3.0	3.5	3.0	3.5	3.0	3.5	3.0
MAXIMUM GREEN 1	13.0	64.0	20.0	43.0	13.0	64.0	20.0	43.0
MAXIMUM GREEN 2								
YELLOW CHANGE	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8
RED CLEARANCE	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
WALK								
PEDESTRIAN CLEAR								
RECALL (OFF OR MIN/MAX/PED/SOFT)	—	MIN	—	—	—	MIN	—	—
DETECTOR MODE (L-LOCK, NL-NONLOCK)	NL	—	NL	NL	NL	—	NL	NL
SECONDS/ACTUATION	.	.	.	.	.	.	.	.
MAXIMUM INITIAL								
TIME BEFORE REDUCE								
TIME TO REDUCE								
MINIMUM GAP	.	.	.	.	.	.	.	.
LAST CAR PASSAGE (ON / OFF)								

NOTES:
1) SEE SIGNING PLANS FOR SIGN SIZES AND DESIGNATIONS.
2) ATTACH TETHER WIRE ON ALL SIGNALS AND SIGNS.
3) THE ROADWAY IMPROVEMENT CONSTRUCTION IS BEING DONE BY ANOTHER CONTRACTOR. THE SIGNAL SYSTEM CONTRACTOR MUST COORDINATE WITH THE ROADWAY CONTRACTOR FOR CONSTRUCTION OF ITEMS ENCASED IN THE SIDEWALKS OR PAVEMENT AND FOR THE OVERALL SIGNAL SYSTEM INSTALLATION.
4) FIELD LOCATE AND INSTALL 12-PAIR INTERCONNECT CABLE OVERHEAD TO EXISTING AND RELOCATED POWER POLES.

-LOOP DETECTOR INSTALLATION CHART-

PHASE/LOOP LTR.	DETECTOR AMP NO.	DETECTOR CHAN NO.	WIRED TO PHASE(S)	LOCK	NON-LOCK	PULSE	PRES	OPERATION DELAY SEC	OPERATION EXT SEC	SPECIAL FEATURES TIME OF DAY-TOD SWITCHING, ETC.	LOOP DESIGN SIZE X	NO. OF TURNS	DIST. FROM S
1A		1	1		X		X	.	.	QUADRUPOLE	6 X 30	2-4-2	1
2A		1	2		X		X	7.0	.	QUADRUPOLE	6 X 40	2-4-2	-5
2B		2	2	X		X		.	.		6 X 30	3	220
3A		1	3		X		X	.	.	QUADRUPOLE	6 X 30	2-4-2	1
3B		2	3		X		X	.	.	QUADRUPOLE	6 X 30	2-4-2	1
4A		1	4		X		X	.	.	QUADRUPOLE	6 X 30	2-4-2	1
4B		2	4		X		X	.	.	QUADRUPOLE	6 X 30	2-4-2	1
4C		1	4		X		X	.	.	QUADRUPOLE	6 X 30	2-4-2	1
5A		1	5		X		X	.	.	QUADRUPOLE	6 X 30	2-4-2	1
5B		2	5		X		X	.	.	QUADRUPOLE	6 X 30	2-4-2	1
6A		1	6	X		X		.	.		6 X 24	3	220
7A		1	7		X		X	.	.	QUADRUPOLE	6 X 30	2-4-2	1
8A		1	8		X		X	.	.	QUADRUPOLE	6 X 30	2-4-2	1
8B		2	8		X		X	.	.	QUADRUPOLE	6 X 30	2-4-2	1
SS3A		1	SYS		X	X		.	.	SYS DET SB	X MICROLOOP		480
SS3B		2	SYS		X	X		.	.	SYS DET SB	X MICROLOOP		480
SS3C		1	SYS		X	X		.	.	SYS DET SB	X MICROLOOP		480
SS3D		2	SYS		X	X		.	.	SYS DET NB	X MICROLOOP		480
SS3E		1	SYS		X	X		.	.	SYS DET NB	X MICROLOOP		480
SS3F		2	SYS		X	X		.	.	SYS DET NB	X MICROLOOP		480

NEMA PHASING



NOTE: ACTUATED PHASES HAVING NO CALL, SHALL BE SKIPPED.

* N-S STREET COORDINATED

DATE	REVISIONS

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION
COLUMBIA S.C.

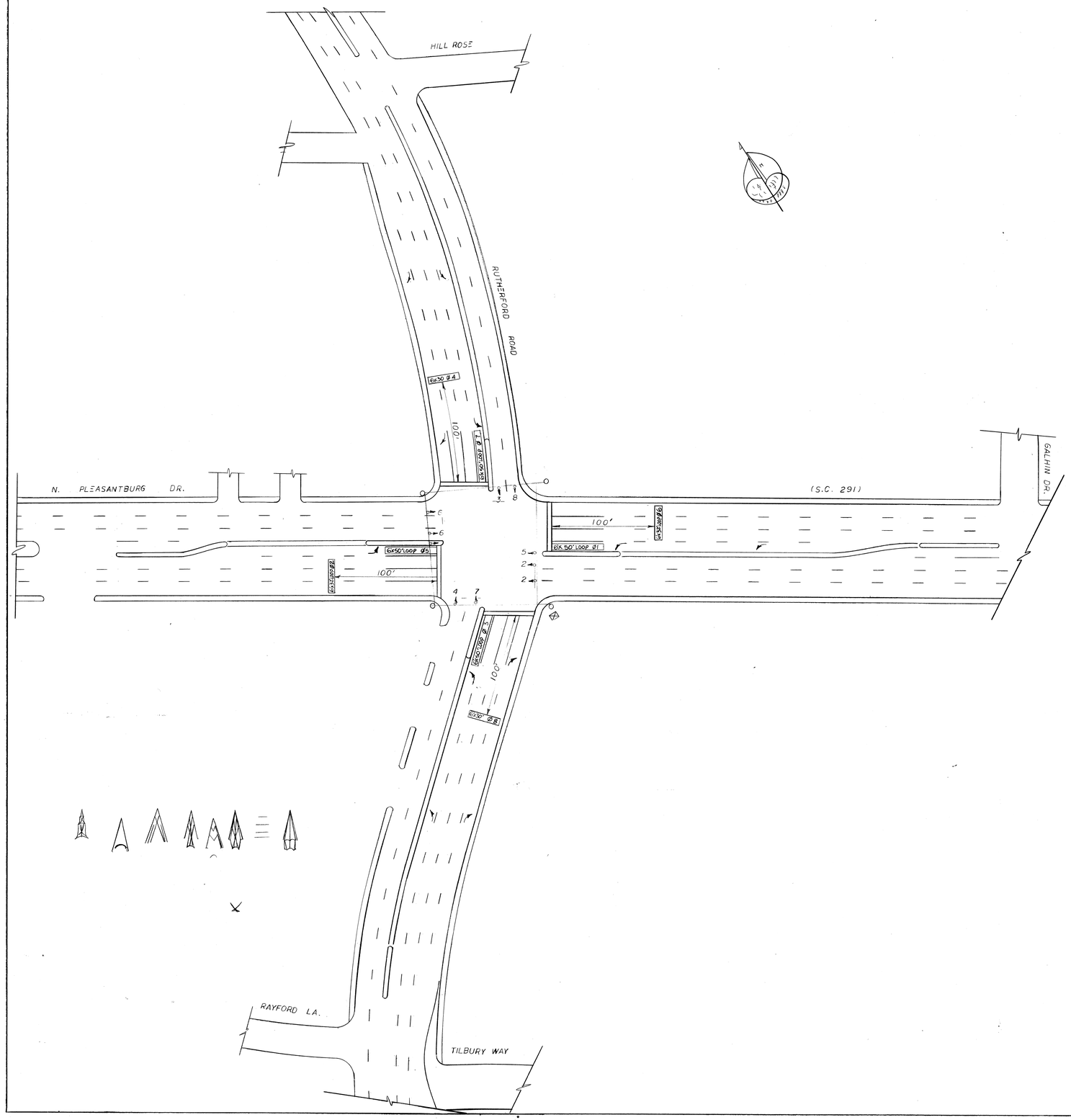
SUBJECT TITLE: S.C. 291 SIGNAL SYSTEM

SPECIFIC LOCATION: INTERSECTION OF S.C. 291 AND RD.S-107 (MAULDIN RD.)

CITY —— COUNTY GREENVILLE

DESIGNED	APPROVED BY	APPROVED BY
DRAWN		
CHECKED	SIGN OF TRAFFIC ENGINEER	DATE
REVIEWED	SCALE	DATE	SHEET	EX NO.
RECOMMENDED	1"=30'		OF	

DRAWING # 127 PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SIGNAL OPERATION

SIGNAL HEAD NUMBER	5 → 1 (Ø 1 + 5) R/W	CLEAR TO 1+6	CLEAR TO 2+5	CLEAR TO ALL OTHERS	6 → 1 (Ø 1 + 6) R/W	CLEAR TO 1+5	CLEAR TO 2+6	CLEAR TO ALL OTHERS	5, 2 (Ø 2 + 5) R/W	CLEAR TO 1+5	CLEAR TO 2+6	CLEAR TO ALL OTHERS	6, 2 (Ø 2 + 6) R/W	CLEAR TO 2+5	CLEAR TO 1+6	CLEAR TO ALL OTHERS	FLASHING
1	G	G	Y	Y	G	G	Y	Y	R	R	R	R	R	R	R	R	X
2	R	R	R	R	R	R	R	R	G	Y	G	Y	G	G	Y	Y	X
3	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	X
4	G R	Y R	G R	Y R	R	R	R	R	G R	G R	Y R	Y R	R	R	R	R	X
5	G	Y	G	Y	R	R	R	R	G	G	Y	Y	R	R	R	R	X
6	R	R	R	R	G	Y	G	Y	R	R	R	R	G	Y	G	Y	X
7	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	X
8	G R	G R	Y R	Y R	G R	G R	Y R	Y R	R	R	R	R	R	R	R	R	X

SIGNAL OPERATION

SIGNAL HEAD NUMBER	7, 3 (Ø 3 + 7) R/W	CLEAR TO 3+8	CLEAR TO 4+7	CLEAR TO ALL OTHERS	3, 8 (Ø 3 + 8) R/W	CLEAR TO 3+7	CLEAR TO 4+8	CLEAR TO ALL OTHERS	4, 7 (Ø 4 + 7) R/W	CLEAR TO 3+7	CLEAR TO 4-8	CLEAR TO ALL OTHERS	4, 8 (Ø 4 + 8) R/W	CLEAR TO 3+8	CLEAR TO 4+7	CLEAR TO ALL OTHERS	FLASHING
1	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	Y
2	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	Y
3	G R	G R	Y R	Y R	G	G Y	Y G	Y	R	R	R	R	G	G	Y	Y	R
4	R	R	R	R	R	R	R	R	G	Y	G	Y	G	Y	G	Y	R
5	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	Y
6	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	Y
7	G R	Y R	G R	Y R	R	R	R	R	G	G Y	Y G	Y	G	Y	G	Y	R
8	R	R	R	R	G	Y	G	Y	R	R	R	R	G	G	Y	Y	R

SIGNAL TIMING

SETTINGS	Ø 1	Ø 2	Ø 3	Ø 4	Ø 5	Ø 6	Ø 7	Ø 8
	SECONDS							
INITIAL	3	10	3	10	3	10	3	10
EXTENSION	2	3	2	2	2	3	2	2
WALK								
PED CL.								
MAXIMUM I	20	35	15	20	30	35	15	20
MAXIMUM II								
YELLOW	3.5	4.0	3.5	3.5	3.5	4.0	3.5	3.5
ALL RED	0.5	1.0	1.0	1.0	0.5	1.0	1.0	1.0
RECALL		MIN				MIN		
DETECTOR MODE	N	K	N	K	N	K	N	K

N = NON-LOCK K = LOCK

SIGNAL HEAD LEGEND

SIGNAL LEGEND	QUANTITY	SIZE	SECTIONS	LENS
1	1	12"	3	R Y G
2	2	12"	3	R Y G
3	1	12"	5	Y G R Y G
4	1	12"	5	Y G R Y G
5	1	12"	3	R Y G
6	2	12"	3	R Y G
7	1	12"	5	Y G R Y G
8	1	12"	5	Y G R Y G

THE CITY OF GREENVILLE

POST OFFICE BOX 2207 GREENVILLE, SOUTH CAROLINA

N. PLEASANTBURG DRIVE (S.C.-291)
RUTHERFORD ROAD

DESIGNED BY: [illegible]

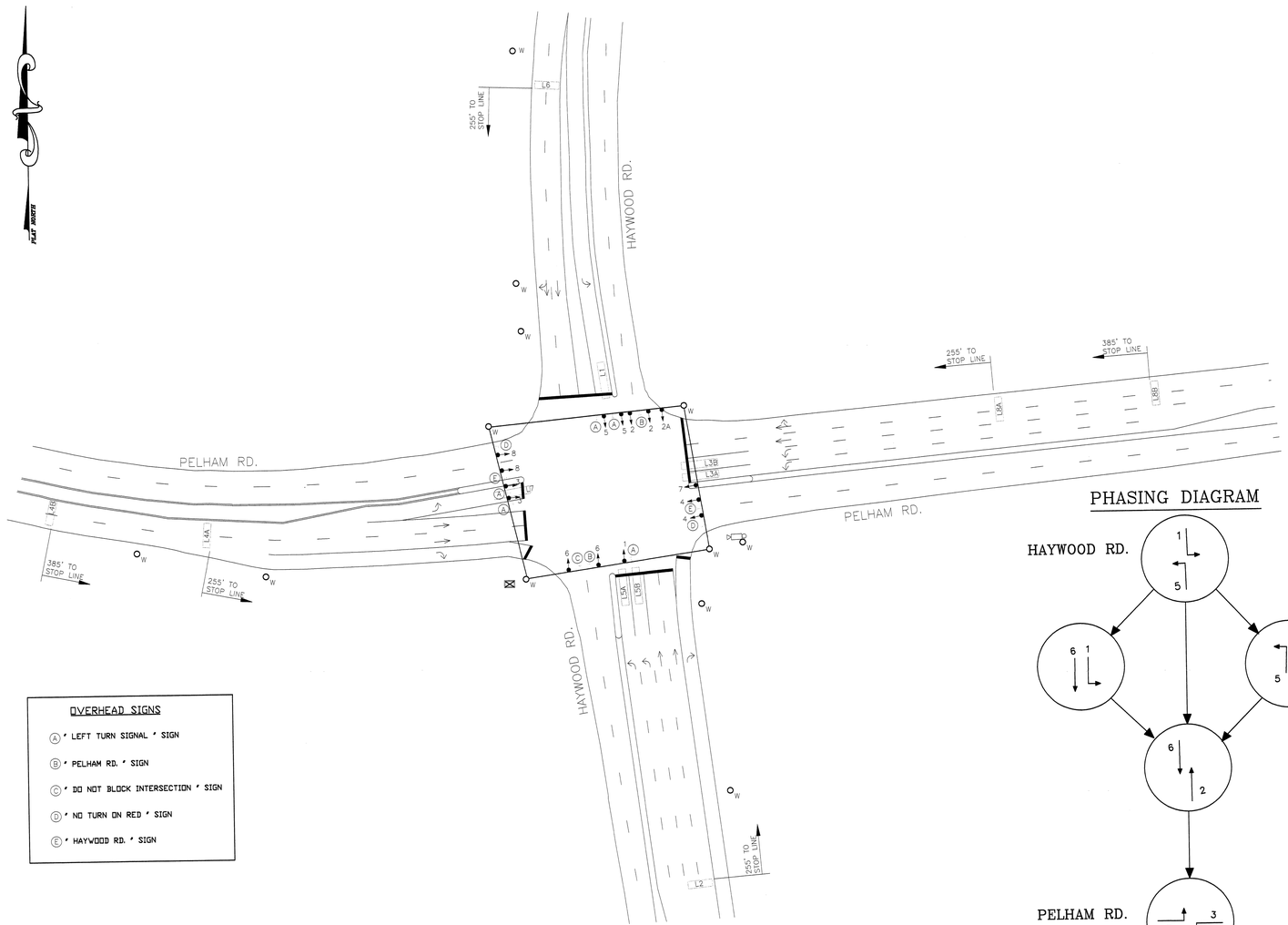
SURVEYED BY MJG DATE 07/1999 CHECKED BY ____ DATE ____

DRAWN BY [illegible] DATE 07/15/99 FIELD BOOK NO. ____

SCALE 1" = 50' FILE NO. ____

SHEET NUMBER ____ OF ____

DRAWING # 155



OVERHEAD SIGNS

- (A) " LEFT TURN SIGNAL " SIGN
- (B) " PELHAM RD. " SIGN
- (C) " DO NOT BLOCK INTERSECTION " SIGN
- (D) " NO TURN ON RED " SIGN
- (E) " HAYWOOD RD. " SIGN

80' 40' 0 40' 120'

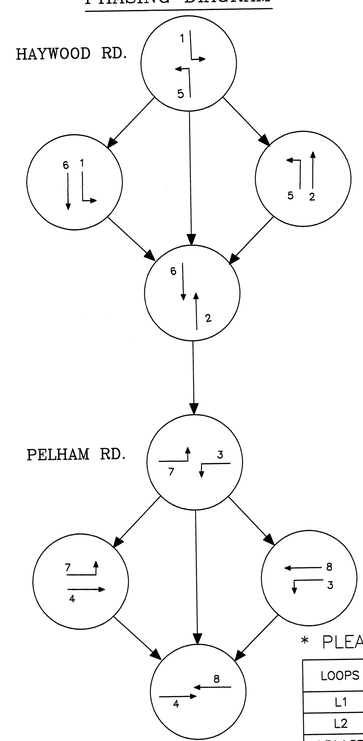
SCALE: 1" = 40'-0"

SIGNAL DISPLAY SEQUENCE

SIGNAL HEAD NUMBER	PHASE 1+5 (1, 5) R/W	CLEAR TO 1+6	CLEAR TO 2+5	CLEAR TO 2+6	PHASE 1+6 (6, 1) R/W	CLEAR TO 2+6	PHASE 2+5 (5, 2) R/W	CLEAR TO 2+6	PHASE 2+6 (6, 2) R/W	CLEAR TO BARR	FLASH
1	←G	←G	←Y	R	←Y	R	←G	←Y	R	R	R
2	R	R	R	R	R	R	R	R	R	G	Y
2A	R	R	R	R	R	R	R	R	R	G	Y
3	R	R	R	R	R	R	R	R	R	R	R
4	R	R	R	R	R	R	R	R	R	R	R
5	←G	←Y	R	←G	←G	←Y	R	R	R	R	R
6	R	R	R	R	R	R	G	G	G	G	Y
7	R	R	R	R	R	R	R	R	R	R	R
8	R	R	R	R	R	R	R	R	R	R	R

SIGNAL HEAD NUMBER	PHASE 3+7 (7, 3) R/W	CLEAR TO 3+8	CLEAR TO 4+7	CLEAR TO 4+8	PHASE 3+8 (8, 3) R/W	CLEAR TO 4+8	PHASE 4+7 (7, 4) R/W	CLEAR TO 4+8	PHASE 4+8 (8, 4) R/W	CLEAR TO BARR	FLASH
1	R	R	R	R	R	R	R	R	R	R	R
2	R	R	R	R	R	R	R	R	R	R	Y
2A	R/G	R/G	R/G	R/Y	R	R/Y	R/G	R/Y	R	R	Y
3	←G	←G	←G	←Y	R	←Y	R	←G	←Y	R	R
4	R	R	R	R	R	R	R	R	R	G	R
5	R	R	R	R	R	R	R	R	R	R	R
6	R	R	R	R	R	R	R	R	R	R	Y
7	R/←G	R/←Y	R	R/←G	R/←G	R/←Y	R	R	R	G/←G	R
8	R	R	R	R	R	R	G	G	G	G	R

PHASING DIAGRAM



LEGEND

DESCRIPTION	EXISTING	NEW
CABINET	SEE BELOW	0
WOOD POLE	4	0
LOOP	12	0
SIGNAL HEADS	14	0
CCTV CAMERA	1	0

EQUIPMENT

ONE (1) EIGHT PHASE NEMA CONTROLLER & BASE MOUNTED CABINET & COORDINATION UNIT

SIGNAL HEAD LEGEND

SIGNAL LEGEND	QUANTITY	SIZE	SECTIONS	LENS
1	1	12"	3	R←Y←G
2	2	12"	3	RYG
2A	1	12"	5	RYG\Y→G→
3	2	12"	3	R←Y←G
4	2	12"	3	RYG
5	2	12"	3	R←Y←G
6	2	12"	3	RYG
7	1	12"	5	←Y←G\RYG
8	2	12"	3	RYG

SIGNAL TIMING

SETTINGS	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8
	SECONDS							
INITIAL	3	10	3	10	3	10	3	10
EXTENSION	2.0	3.0	2.0	2.0	2.0	3.0	2.0	2.0
WALK								
PED. CL.								
MAXIMUM I	20	40	40	20	25	40	20	20
MAXIMUM II								
YELLOW	3.5	4.0	3.5	4.0	3.5	4.0	3.5	4.0
ALL RED	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
RECALL		MIN				MIN		
DETECTOR MODE	N	K	N	K	N	K	N	K

N = NON LOCK K = LOCK

APPROACH	STREET	SPEED	GRADE
NB	HAYWOOD RD.	40	+8.9%
SB	HAYWOOD RD.	40	-1.3%
EB	PELHAM RD.	45	+0.8%
WB	PELHAM RD.	45	0.0%

* PLEASE NOTE ALL LOOPS ARE EXISTING

LOOPS	DELAY	SIZE	PHASE
L1	0	6' x 30'	Ø1
L2	0	6' x 20'	Ø2
L3A,L3B	0	6' x 30'	Ø3
L4A,L4B	0	6' x 20'	Ø4
L5A,L5B	0	6' x 30'	Ø5
L6	0	6' x 20'	Ø6
L7	0	6' x 30'	Ø7
L8A,L8B	0	6' x 20'	Ø8

REVISIONS

MARK	DATE	BY	DESCRIPTION
△			
△			
△			
△			
△			

The City of Greenville
TRAFFIC ENGINEERING DIVISION
GREENVILLE, SOUTH CAROLINA
POST OFFICE BOX 2207

LOCATION: PELHAM RD. (S-492) AND HAYWOOD RD. (S-273)

S.C. D.O.T. APPROVALS

DRAWN BY: C. JORDAN DATE: 04-22-04 EQUIP. REVIEW

DESIGNED BY: K. STURGIS DATE: 04-22-04 SCALE: 1" = 40'-0"

APPROVED BY: W. RAVENHORST DATE: 04-22-04 DRAWING # 74

PELHAM/HAYWOOD 04-22-04 #74

STATE	DIST.	COUNTY	TOTAL SHEETS	SHEET NO.	SHEETS
3	S.C.	GREENVILLE	23.246A	I-85	TS13

—SIGNAL EQUIPMENT—

ONE (1) 8 PHASE FULLY ACTUATED STANDARD NEMA CONTROLLER WITH FLASHER, SIGNAL MONITOR UNIT, AND BASE-MOUNTED CABINET TYPE 5.

12 VEHICLE DETECTOR UNITS

PEDESTRIAN SIGNALS: EXT. PROP. W/ACT. & SIGN

VEHICLE SIGNALS: EXT. PROP.

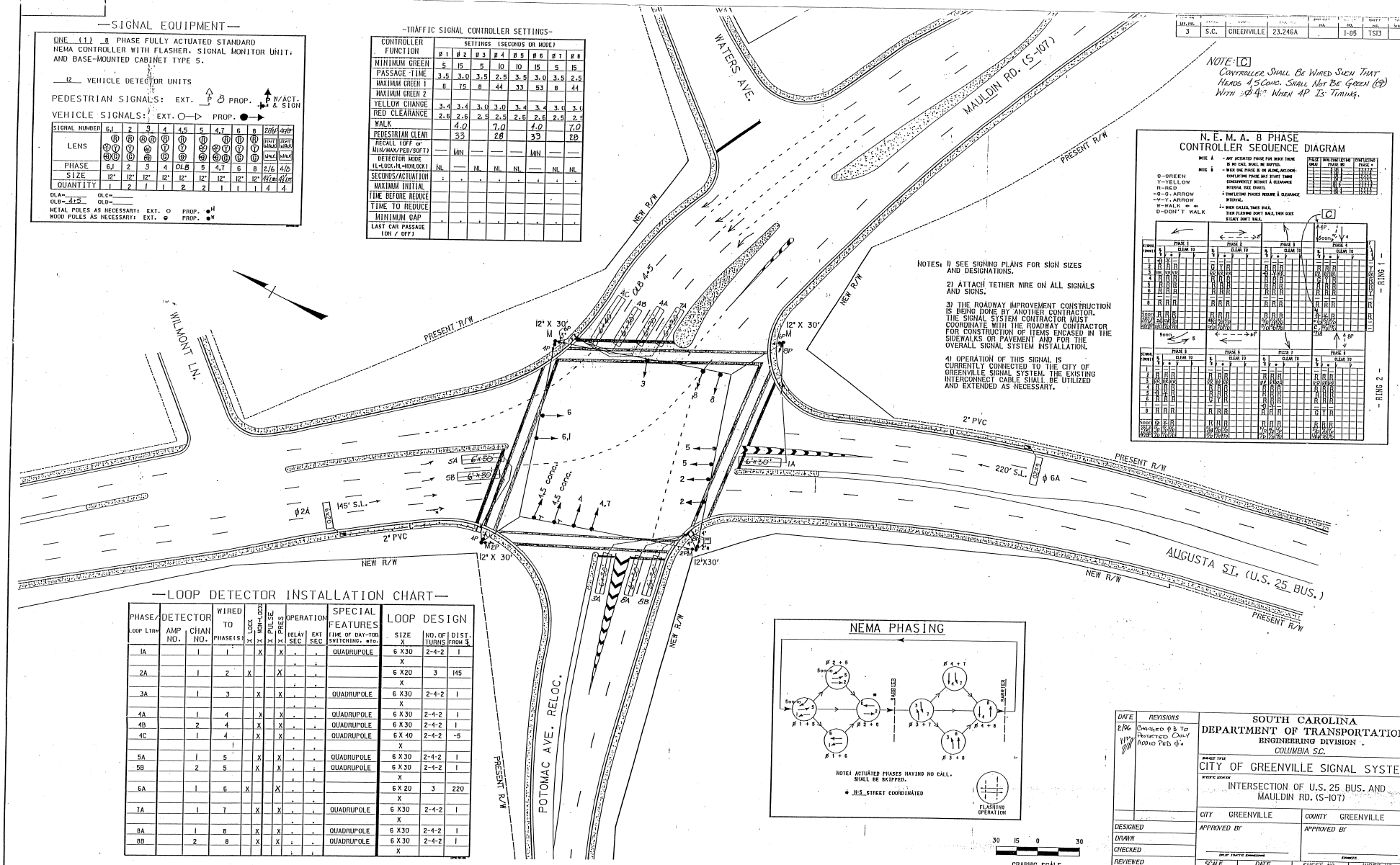
SIGNAL NUMBER	6,I	2	3	4	4,5	5	4,7	6	8	2/16	4/10
LENS	R Y G	R Y G	R Y G	R Y G	R Y G	R Y G	R Y G	R Y G	R Y G	RIGHT ARROW	RIGHT ARROW
PHASE	6,I	2	3	4	OLB	5	4,7	6	8	2/16	4/10
SIZE	12"	12"	12"	12"	12"	12"	12"	12"	12"	4½"x6"	4½"x6"
QUANTITY	1	2	1	1	2	2	1	1	1	4	4

OLA= OLC=
OLB= 4,5 OLD=

METAL POLES AS NECESSARY: EXT. O PROP. M
WOOD POLES AS NECESSARY: EXT. PROP. M

—TRAFFIC SIGNAL CONTROLLER SETTINGS—

CONTROLLER FUNCTION	SETTINGS (SECONDS OR MODE)							
	Ø 1	Ø 2	Ø 3	Ø 4	Ø 5	Ø 6	Ø 7	Ø 8
MINIMUM GREEN	5	15	5	10	10	15	5	15
PASSAGE TIME	3.5	3.0	3.5	2.5	3.5	3.0	3.5	2.5
MAXIMUM GREEN 1	8	75	8	44	33	53	8	44
MAXIMUM GREEN 2								
YELLOW CHANGE	3.4	3.4	3.0	3.0	3.4	3.4	3.0	3.0
RED CLEARANCE	2.6	2.6	2.5	2.5	2.6	2.6	2.5	2.5
WALK		4.0		7.0		4.0		7.0
PEDESTRIAN CLEAR		33		28		33		28
RECALL (OFF or MIN/MAX/PED/SOFT)	—	MIN	—	—	—	MIN	—	—
DETECTOR MODE (L=LOCK, N=NON-LOCK)	NL	—	NL	NL	NL	—	NL	NL
SECONDS/ACTUATION	.	.	.	.	.	.	.	.
MAXIMUM INITIAL								
TIME BEFORE REDUCE								
TIME TO REDUCE								
MINIMUM GAP	.	.	.	.	.	.	.	.
LAST CAR PASSAGE (ON / OFF)								



NOTE: [C] CONTROLLER SHALL BE WIRED SUCH THAT HEADS 4,5 CONC. SHALL NOT BE GREEN (Ø) WITH Ø 4 WHEN AP IS TIMING.

NOTES: 1) SEE SIGNING PLANS FOR SIGN SIZES AND DESIGNATIONS.

2) ATTACH TETHER WIRE ON ALL SIGNALS AND SIGNS.

3) THE ROADWAY IMPROVEMENT CONSTRUCTION IS BEING DONE BY ANOTHER CONTRACTOR. THE SIGNAL SYSTEM CONTRACTOR MUST COORDINATE WITH THE ROADWAY CONTRACTOR FOR CONSTRUCTION OF ITEMS ENCASED IN THE SIDEWALKS OR PAVEMENT AND FOR THE OVERALL SIGNAL SYSTEM INSTALLATION.

4) OPERATION OF THIS SIGNAL IS CURRENTLY CONNECTED TO THE CITY OF GREENVILLE SIGNAL SYSTEM. THE EXISTING INTERCONNECT CABLE SHALL BE UTILIZED AND EXTENDED AS NECESSARY.

N. E. M. A. 8 PHASE CONTROLLER SEQUENCE DIAGRAM

NOTE A - ANY ACTUATED PHASE FOR WHICH THERE IS NO CALL SHALL BE SKIPPED.

NOTE B - WHEN ONE PHASE IS ON ALONE, WITHOUT CONFLICTING PHASE MAY START TIMING CONCURRENTLY WITHOUT A CLEARANCE INTERVAL BEIG CHARGE.

+ CONFLICTING PHASES REQUIRE A CLEARANCE INTERVAL.

+* WHEN CALLED, TIMES WALK, THEN FLASHING DON'T WALK, THEN DOES RIGHT DON'T WALK.

G-GREEN
Y-YELLOW
R-RED
-G-G. ARROW
-Y-Y. ARROW
W-WALK
D-DON'T WALK

PHASE ONLY	NON-CONFLICTING PHASE NO.	CONFLICTING PHASE +
1	5 6	2 3 4 7 8
2	1 5 6	3 4 7 8
3	1 5 6	2 4 7 8
4	1 5 6	2 3 7 8
5	2 3 4 7 8	1 6
6	2 3 4 7 8	1 5
7	1 5 6	2 3 4 8
8	1 5 6	2 3 4 7

[C]

—LOOP DETECTOR INSTALLATION CHART—

PHASE/LOOP LTR.	DETECTOR AMP NO.	DETECTOR CHAN NO.	WIRED TO PHASE(S)	LOCK	NON-LOCK	PULSE	PRES	OPERATION DELAY SEC	OPERATION EXT SEC	SPECIAL FEATURES (TIME OF DAY-TOD SWITCHING, etc.)	LOOP DESIGN SIZE X	NO. OF TURNS	DIST. FROM ℄
1A		1	1		X		X	.	.	QUADRUPOLE	6 X30	2-4-2	1
								.	.		X		
2A		1	2	X		X		.	.		6 X20	3	145
								.	.		X		
3A		1	3		X		X	.	.	QUADRUPOLE	6 X30	2-4-2	1
								.	.		X		
4A		1	4		X		X	.	.	QUADRUPOLE	6 X30	2-4-2	1
4B		2	4		X		X	.	.	QUADRUPOLE	6 X30	2-4-2	1
4C		1	4		X		X	.	.	QUADRUPOLE	6 X40	2-4-2	-5
								.	.		X		
5A		1	5		X		X	.	.	QUADRUPOLE	6 X30	2-4-2	1
5B		2	5		X		X	.	.	QUADRUPOLE	6 X30	2-4-2	1
								.	.		X		
6A		1	6	X			X	.	.		6 X20	3	220
								.	.		X		
7A		1	7		X		X	.	.	QUADRUPOLE	6 X30	2-4-2	1
								.	.		X		
8A		1	8		X		X	.	.	QUADRUPOLE	6 X30	2-4-2	1
8B		2	8		X		X	.	.	QUADRUPOLE	6 X30	2-4-2	1
								.	.		X		

NEMA PHASING

NOTE: ACTUATED PHASES HAVING NO CALL, SHALL BE SKIPPED.

* N-S STREET COORDINATED

30 15 0 30
GRAPHIC SCALE

DATE	REVISIONS
2/96	CHANGED Ø 5 TO PROTECTED ONLY ADDED PED Ø's

SOUTH CAROLINA
DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION
COLUMBIA S.C.

PROJECT TITLE: CITY OF GREENVILLE SIGNAL SYSTEM

SHEET TITLE: INTERSECTION OF U.S. 25 BUS. AND MAULDIN RD. (S-107)

CITY: GREENVILLE COUNTY: GREENVILLE

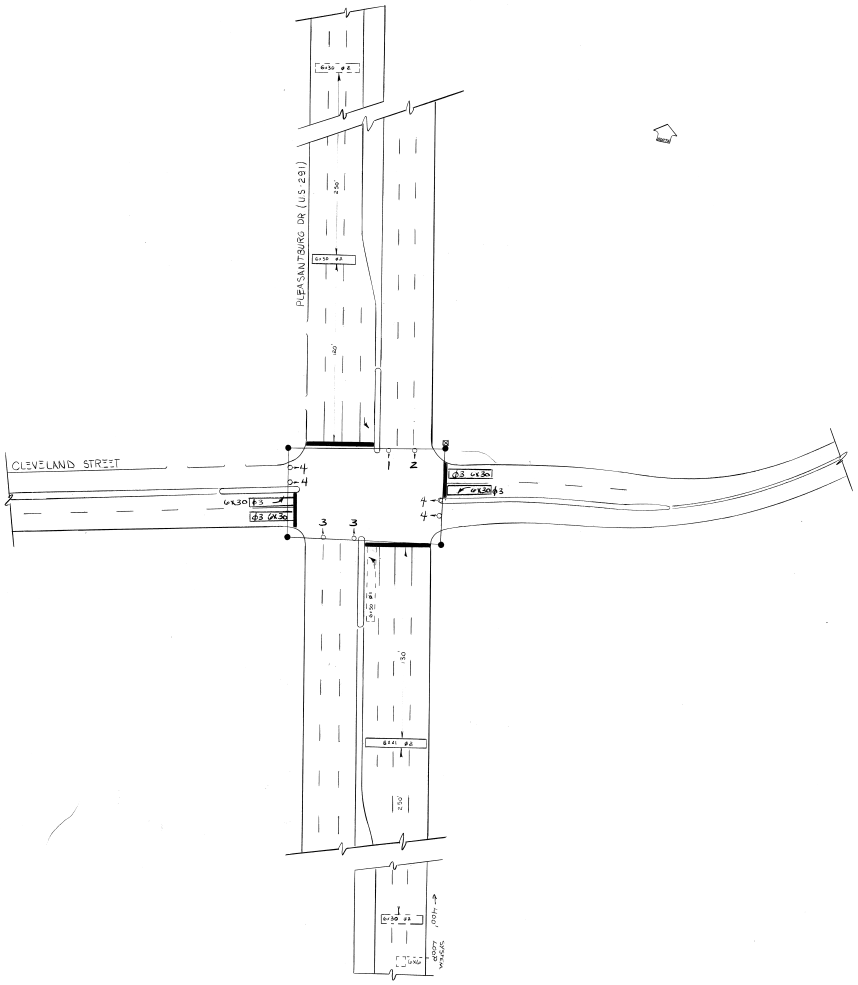
DESIGNED / DRAWN / CHECKED / REVIEWED / RECOMMENDED

APPROVED BY: PHILIP TRAFTON ENGINEERING

APPROVED BY: ENGINEER

SCALE: 1"=30' DATE: SHEET NO. OF INDEX NO. (23)96-2

DRAWING #26 (REV)
1998



EXISTING EQUIPMENT TO REMAIN

FOUR (4) WOOD POLES.
SEVEN (7) SIGNAL HEADS
PAVEMENT LOOPS

NEW EQUIPMENT

☒ ONE (1) FOUR PHASE FULLY ACTUATED NEMA CONTROLLER AND BASE MOUNTED CABINET.
FOUR (4) LOOP DETECTORS - LOCAL / 1 LOOP DETECTOR - SYSTEM

[ ] ONE (1) 12" 5 SECTION SIGNAL HEADS.
4 PAVEMENT LOOPS.
ONE (1) COORDINATION UNIT OR MODULE.

SIGNAL OPERATION

SIGNAL HEAD NUMBER	Ø 1 R/W	Ø 1 CLEAR TO 2	Ø 1 CLEAR TO 3	Ø 1 CLEAR TO ALL RED	Ø 2 R/W	Ø 2 CLEAR TO 3	Ø 2 CLEAR TO 1	Ø 2 CLEAR TO ALL RED	Ø 3 R/W	Ø 3 CLEAR TO 1	Ø 3 CLEAR TO 2	Ø 3 CLEAR TO ALL RED	Ø R/W	Ø CLEAR TO			FLASHING
1	G	G	Y	R	G	Y	G	R	R	R	R	R					Y
2	G	G	Y	R	G	Y	G	R	R	R	R	R					Y
3	R	R	R	R	G	Y	Y	R	R	R	R	R					Y
4	R	R	R	R	R	R	R	R	G	Y	Y	R					R
5																	
6																	
7																	
8																	

O/L A

1.) Ø1 TO Ø2 NO ALL RED.
Ø1 TO Ø3 AS SHOWN.
2.) Ø2 TO Ø3 AS SHOWN.
Ø2 TO Ø1 HEAD # 1 AND 2 NO ALL RED.

O/L A 1+2

SIGNAL TIMING

SETTINGS	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8
	SECONDS							
INITIAL	3	10	4					
EXTENSION	2	3	3					
WALK	-	-	-					
PED CL.	-	-	-					
MAXIMUM I	18	40	20					
MAXIMUM II	-	-	-					
YELLOW	3.5	4.0	3.5					
ALL RED	1.0	1.0	1.0					
RECALL	-	MIN	-					
DETECTOR MODE	N	K	N					

N = NON-LOCK K = LOCK

CABINET NOTE: Ø1 - WIRED FOR 1 DETECTOR
Ø2 - WIRED FOR 2 DETECTORS
Ø3 - WIRED FOR 1 DETECTOR

SIGNAL HEAD LEGEND

SIGNAL LEGEND	QUANTITY	SIZE	SECTIONS	LENS
1	1	12"	5	~~G~~ RYG
2	1	12"	3	RYG
3	2	12"	3	RYG
4	4	12"	3	RYG
5				
6				
7				
8				

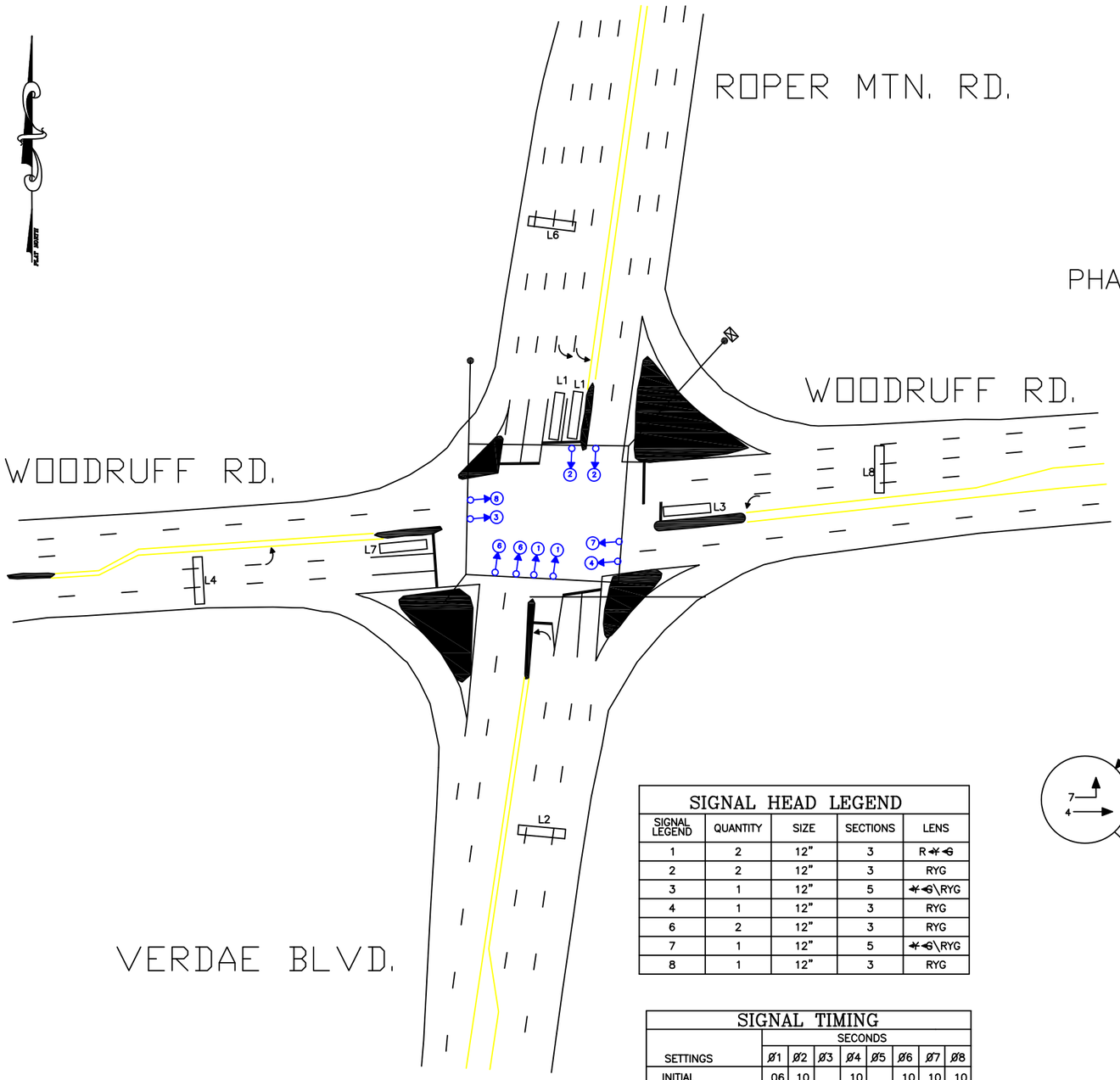
THE CITY OF GREENVILLE
POST OFFICE BOX 2207 GREENVILLE, SOUTH CAROLINA

PLEASANTBURG DR. (S.C.-291)

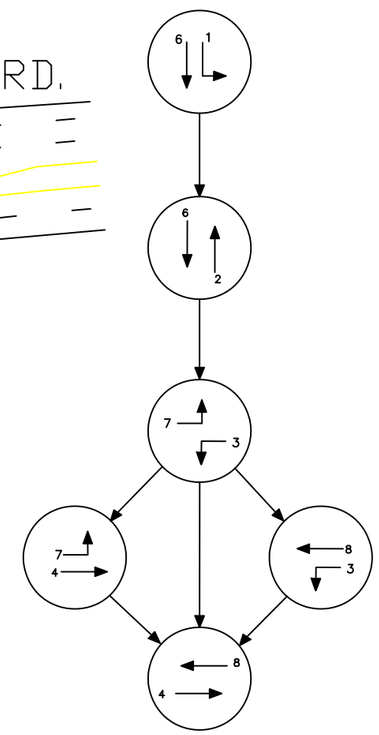
CLEVELAND ST. (S.-189)

SURVEYED BY ____ DATE ____	CHECKED BY ____ DATE ____		SHEET NUMBER 5 OF 5/13
DRAWN BY MRG DATE 1-27-84	FIELD BOOK NO. ____		
SCALE 1"=40'	FILE NO. ____		

DRAWING # 120



PHASING DIAGRAM



SIGNAL DISPLAY SEQUENCE

SIGNAL HEAD NUMBER	PHASE 1+6 (6, 1) R/W	CLEAR TO 2+6	CLEAR TO BARR				PHASE 2+6 (6, 2) R/W	CLEAR TO BARR					FLASH
1	G	Y	R	Y	R		R	R	R				R
2	R	R	R	R	R		G	Y	R				Y
3	R	R	R	R	R		R	R	R				R
4	R	R	R	R	R		R	R	R				R
6	G	G	G	Y	R		G	Y	R				Y
7	R	R	R	R	R		R	R	R				R
8	R	R	R	R	R		R	R	R				R

SIGNAL DISPLAY SEQUENCE

SIGNAL HEAD NUMBER	PHASE 3+7 (7, 3) R/W	CLEAR TO ø3+8	ø4+7	ø4+8			PHASE 3+8 (8, 3) R/W	CLEAR TO ø4+8	BARR				PHASE 4+7 (7, 4) R/W	CLEAR TO ø4+8	BARR				PHASE 4+8 (8, 4) R/W	CLEAR TO BARR	ø				FLASH
1																									R
2																									Y
3	R	R	R	R	R	R	R												G	Y	R				R
4																			G	Y	R				R
6																									Y
7	R	R	R																G	Y	R				R
8																			G	Y	R				R

SIGNAL HEAD LEGEND

SIGNAL LEGEND	QUANTITY	SIZE	SECTIONS	LENS
1	2	12"	3	R Y G
2	2	12"	3	RYG
3	1	12"	5	Y G \ RYG
4	1	12"	3	RYG
6	2	12"	3	RYG
7	1	12"	5	Y G \ RYG
8	1	12"	3	RYG

SIGNAL TIMING

SETTINGS	SECONDS ø1	ø2	ø3	ø4	ø5	ø6	ø7	ø8
INITIAL	06	10		10		10	10	10
EXTENSION	4	4		6		4	2	6
WALK								
PED. CL.								
MAXIMUM 1	25	30		25		30	15	25
MAXIMUM 11								
YELLOW	4.0	4.0		4.0		4.0	3.0	4.0
ALL RED	1.0	1.0	1.0	1.0		1.0	1.0	1.0
RECALL		MIN				MIN	MIN	MIN
DETECTOR MODE	K	K	N	K		K	N	K

N = NON LOCK K = LOCK

APPROACH	STREET	SPEED	GRADE
NB	VERDAE BL	45	+3%
SB	ROPER MTN	40	−3%
EB	WOODRUFF RD	45	0%
WB	WOODRUFF RD	35	+3%

* NOTE PHASE−1 SHALL NOT FOLLOW PHASE−2

LOOPS	DELAY	SIZE	PHASE
L1	0	6' x 30'	ø1
L2	0	6' x 32'	ø2
L3	0	6' x 30'	ø2
L4	0	6' x 32'	ø3
L6	0	6' x 32'	ø4
L7	0	6' x 30'	ø4
L8	0	6' x 32'	

LEGEND

DESCRIPTION	EXISTING	NEW
CABINET	1	0
WOOD POLE	4	0
STEEL POLE	0	0
LOOP	8	0
SIGNAL HEADS	10	4
PEDESTRIAN HEADS	0	0

EQUIPMENT

ONE (1) FOUR PHASE NEMA CONTROLLER
& BASE MOUNTED CABINET
& COORDINATION UNIT

80' 40' 0 40' 120'

SCALE: 1" = 40'−0"

The City of Greenville
TRAFFIC ENGINEERING DIVISION
GREENVILLE, SOUTH CAROLINA

REVISIONS

MARK	DATE	BY	DESCRIPTION
△			
△			
△			
△			
△			

LOCATION: WOODRUFF ROAD (SC 146) AND ROPER MTN (S-183) / VERDAE BLVD

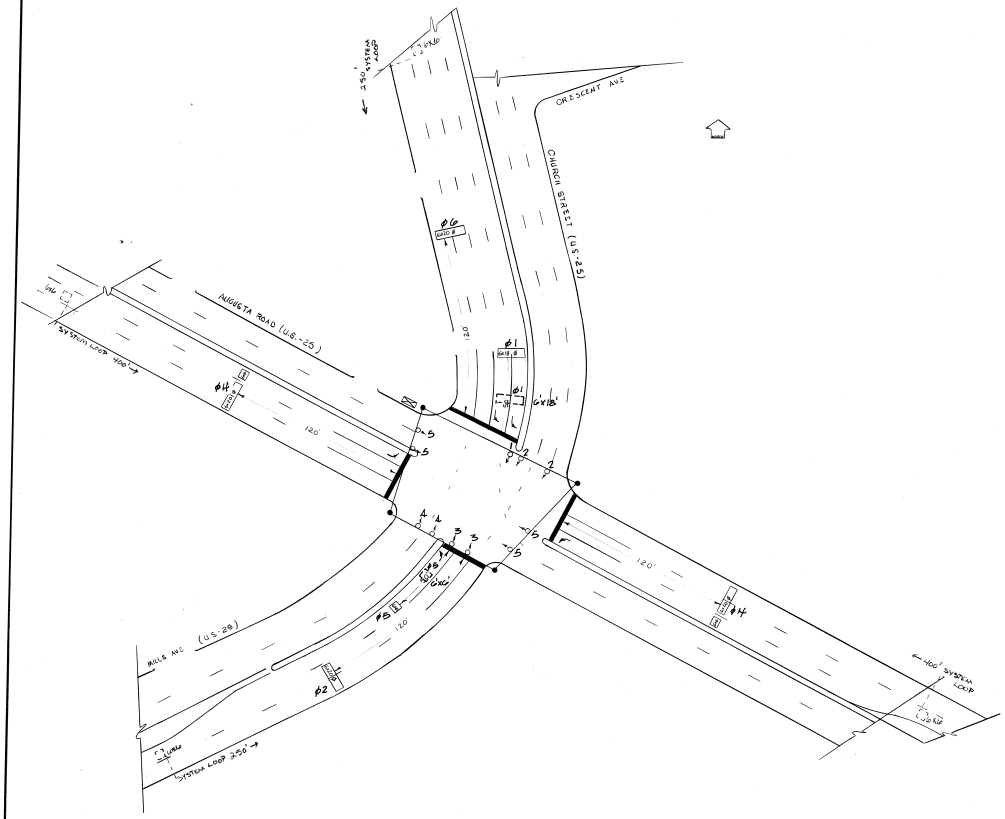
S.C. D.O.T. APPROVALS

DRAWN BY: C. JORDAN DATE: 09-25-03 EQUIP. REVIEW

DESIGNED BY: W. RAVENHORST DATE: 09-25-03 SCALE: 1" = 40'-0"

APPROVED BY: P. LINDSAY DATE: 09-25-03 DRAWING # 191

WOODRUFF/ROPER MTN.DWG# 91 09-25-03



EXISTING EQUIPMENT TO REMAIN

- 4 WOOD POLES
- 8 PAVEMENT LOOPS
- 11 12" SIGNAL HEADS

NEW EQUIPMENT

- 6 PAVEMENT LOOPS
- 1 EIGHT PHASE FULLY ACTUATED NEMA CONTROLLER AND BASE MOUNTED CABINET
- 6 INDUCTIVE LOOP DETECTORS - LOCAL/4 DETECTORS - SYSTEM
- 1 COORDINATION UNIT OR MODULE

SIGNAL OPERATION

SIGNAL HEAD NUMBER	Ø 1+5				Ø 1+6				Ø 2+5				Ø 2+6				Ø 4				FLASHING
	R/W	CLEAR TO 1+6	CLEAR TO 2+5	CLEAR TO ALL OTHER	R/W	CLEAR TO 2+6	CLEAR TO 1+5	CLEAR TO ALL OTHER	R/W	CLEAR TO 2+6	CLEAR TO 1+5	CLEAR TO ALL OTHER	R/W	CLEAR TO 1+6	CLEAR TO 2+5	CLEAR TO ALL OTHER	R/W	CLEAR TO ALL OTHER			
1	←G	Y	←G	←Y	R	R	R	R	←G	Y	←G	Y	R	R	R	R	R	R			Y
2	R	R	R	R	R	R	R	R	G	G	Y	Y	G	Y	G	Y	R	R			Y
3	←G	←G	←Y	←Y	←G	Y	←G	Y	R	R	R	R	R	R	R	R	R	R			Y
4	R	R	R	R	G	G	Y	Y	R	R	R	R	G	G	Y	Y	R	R			Y
5	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	Y			R
6																					
7																					
8																					

SIGNAL TIMING

SETTINGS	SECONDS Ø1	Ø2	Ø4	Ø3	Ø5	Ø6	Ø7	Ø8
INITIAL	4				4			
EXTENSION	3				3			
WALK	—	—	—		—	—		
PED CL.	—	—	—		—	—		
MAXIMUM I	12	17	16		12	17		
MAXIMUM II								
YELLOW	4.0	4.0	4.0		4.0	4.0		
ALL RED	1.0	1	1		1.0	1		
RECALL	—	—	MIN.		—	—		
DETECTOR MODE	N	K	K		N	K		

N = NON-LOCK K = LOCK

SIGNAL HEAD LEGEND

SIGNAL LEGEND	QUANTITY	SIZE	SECTIONS	LENS
1	1	12"	3	RY←G
2	2	12"	3	RYG
3	2	12"	3	RY←G
4	2	12"	3	RYG
5	4	12"	3	RYG
6				
7				
8				

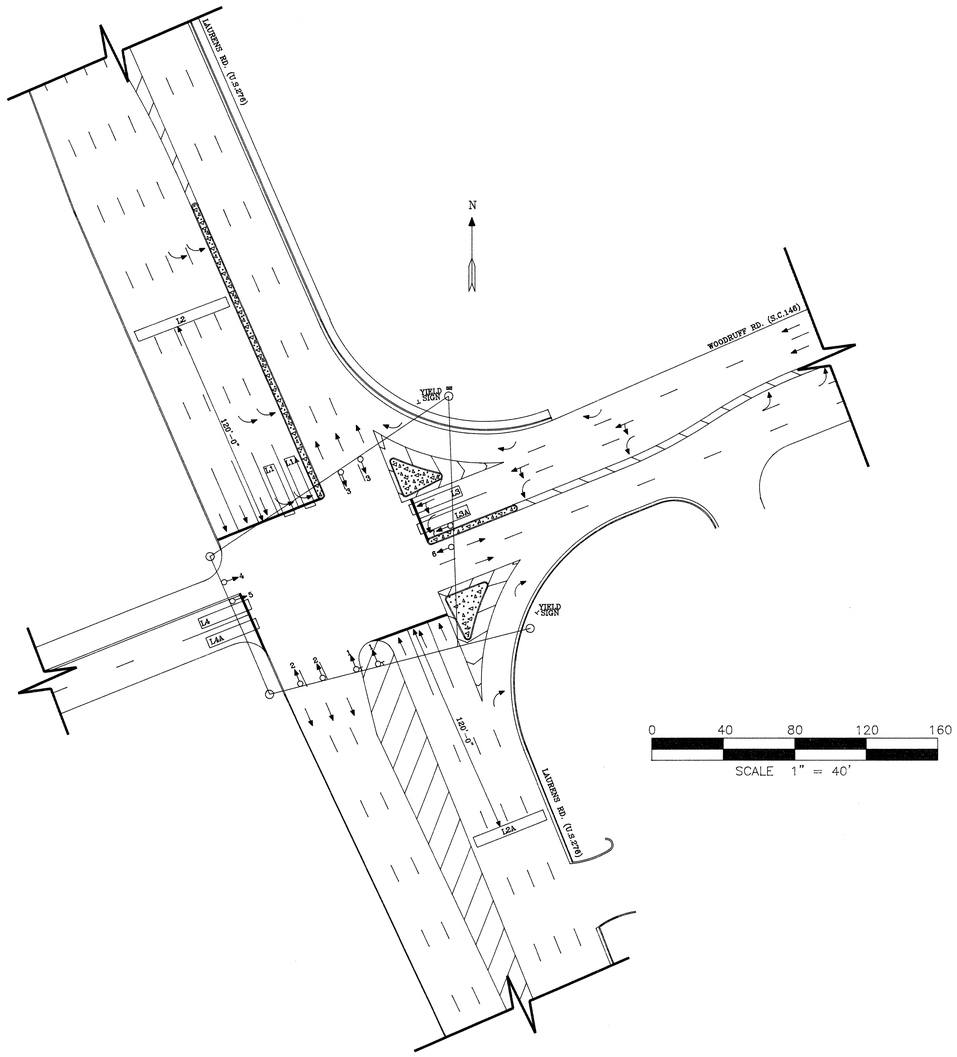
THE CITY OF GREENVILLE
POST OFFICE BOX 2207 GREENVILLE, SOUTH CAROLINA

AUGUSTA RD. (U.S.-25)

CHURCH ST. / MILLS AVE. (U.S.-29)

SURVEYED BY ____ DATE ____	CHECKED BY ____ DATE ____	SHEET NUMBER 3.15
DRAWN BY WRG DATE 5-10-83	FIELD BOOK NO. ____	
SCALE ____	FILE NO. ____	OF 5.13

DRAWING # 10



SIGNAL DISPLAY SEQUENCE

SIGNAL HEAD NUMBER	PHASE 1 (↓ ↳) R/W	CLEAR TO Ø2	CLEAR TO Ø3	CLEAR TO Ø4	PHASE 2 (↓ ↑) R/W	CLEAR TO Ø3	CLEAR TO Ø4		PHASE 3 (←) R/W	CLEAR TO Ø4	CLEAR TO Ø1	CLEAR TO Ø2	PHASE 4 (→) R/W	CLEAR TO Ø1	CLEAR TO Ø2	CLEAR TO Ø3	FLASH
1	~~G~~	~~Y~~	R	~~Y~~	R	R	R	R	R	R	R	R	R	R	R	R	R
2	G	G	Y	R	Y	R	G	Y	R	Y	R	R	R	R	R	R	Y
3	R	R	R	R	R	G	Y	R	Y	R	R	R	R	R	R	R	Y
4	R	R	R	R	R	R	R	R	R	R	G	Y	R	Y	R	R	R
5	R	R	R	R	R	R	R	R	R	R	G/Y	Y	R	Y	R	R	R
6	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R
7	R	R	R	R	R	R	R	R	R	R	R	R	G/Y	Y	R	Y	R

NOTE: PHASE 1 SHALL NOT FOLLOW PHASE 2

SIGNAL TIMING

SETTINGS	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8
	SECONDS							
INITIAL	7	15	4	4				
EXTENSION	3	3	3	3				
WALK								
PED. CL.								
MAXIMUM 1	25	50	25	12				
MAXIMUM 11								
YELLOW	4	4	3.5	3.5				
ALL RED	2	2	2.5	2.5				
RECALL		MIN.						
DETECTOR MODE								

N = NON LOCK K = LOCK

SIGNAL HEAD LEGEND

SIGNAL LEGEND	QUANTITY	SIZE	SECTIONS	LENS
1	2	12"	3	R-~~Y~~-G
2	2	12"	3	RGY
3	2	12"	3	RGY
4	1	12"	3	RGY
5	1	12"	4	RYG-~~G~~
6	1	12"	3	RGY
7	1	12"	4	RYG-~~G~~

LEGEND

DESCRIPTION	EXISTING	NEW
CABINET	RELOCATED	
WOOD POLE		4
STEEL POLE		–
LOOP		8
SIGNAL HEADS		10
PEDESTRIAN HEADS		–

OVERLAP	PHASES
A	1

APPROACH	STREET	SPEED	GRADE
NB	LAURENS	35	–2.85 %
SB	LAURENS	35	2.85 %
WB	WOODRUFF	35	+2.02 %
EB	PEPBOYS	–	0 %

LOOPS	DELAY	SIZE	PHASE
L1	–	6' x 30'	1
L1A	–	6' x 30'	1
L2	–	50' x 6'	2
L2A	–	40' x 6'	2
L3	–	6' x 30'	3
L3A	–	6' x 30'	3
L4	–	6' x 30'	4
L4A	5 SEC.	6' x 30'	4

REVISIONS			
MARK	DATE	BY	DESCRIPTION
△			
△			
△			
△			
△			

The City of Greenville
TRAFFIC ENGINEERING DIVISION
POST OFFICE BOX 2207 GREENVILLE, SOUTH CAROLINA

LOCATION: LAURENS RD.(U.S.276)@WOODRUFF RD.(S.C.146)

S.C. D.O.T. APPROVALS

DRAWN BY: B. STEADING DATE: 5–02–96 EQUIP. REVIEW

DESIGNED BY: DATE: SCALE: 1" = 40'

APPROVED BY: DATE: DRAWING # 96–3

DRAWING # 89

FED. ROAD DIV. NO.	STATE	COUNTY	FILE NO.	PROJECT NO.	ROUTE NO.	SHEET NO.	TOTAL SHEETS
3	S.C.	GREENVILLE	23.241A		276		

—SIGNAL EQUIPMENT —

ONE (1) 8 PHASE FULLY ACTUATED STANDARD ~~170~~ CONTROLLER WITH FLASHER, SIGNAL MONITOR UNIT, AND POLE/BASE MOUNTED ~~336S/332A~~ CABINET. EXT. ▭ PROP. ■

_____ MODEL 222, (2)-CHANNEL VEHICLE DETECTOR UNITS

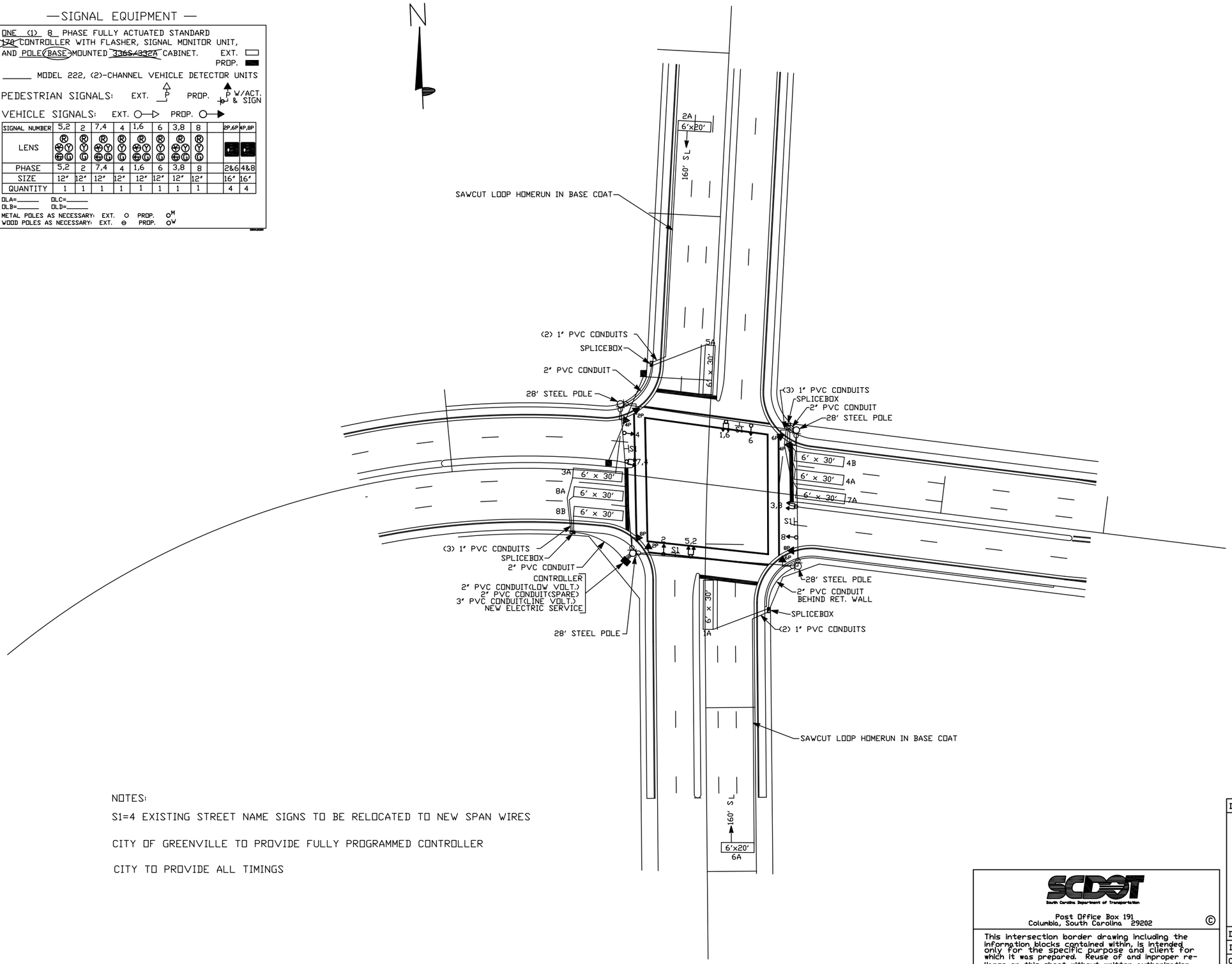
PEDESTRIAN SIGNALS: EXT. △P PROP. ▲P W/ACT. P1 & SIGN

VEHICLE SIGNALS: EXT. ○—▷ PROP. ○→

SIGNAL NUMBER	5,2	2	7,4	4	1,6	6	3,8	8		2P,6P	4P,8P
LENS	R Y G	R Y G	R Y G	R Y G	R Y G	R Y G	R Y G	R Y G			
PHASE	5,2	2	7,4	4	1,6	6	3,8	8		2&6	4&8
SIZE	12"	12"	12"	12"	12"	12"	12"	12"		16"	16"
QUANTITY	1	1	1	1	1	1	1	1		4	4

DLA=_____ DLC=_____
DLB=_____ DLD=_____

METAL POLES AS NECESSARY: EXT. ○ PROP. ○M
WOOD POLES AS NECESSARY: EXT. ⊖ PROP. ○W



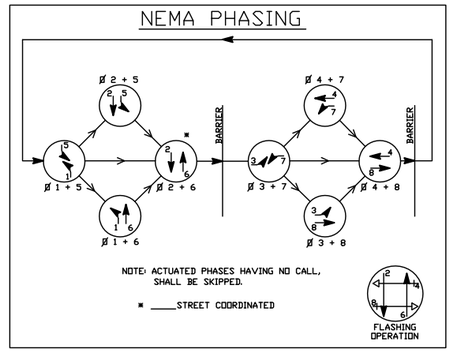
NOTES:

S1=4 EXISTING STREET NAME SIGNS TO BE RELOCATED TO NEW SPAN WIRES

CITY OF GREENVILLE TO PROVIDE FULLY PROGRAMMED CONTROLLER

CITY TO PROVIDE ALL TIMINGS

NEMA PHASING



170 AS N. E. M. A. 8 PHASE CONTROLLER SEQUENCE DIAGRAM

NOTE A - ANY ACTUATED PHASE FOR WHICH THERE IS NO CALL SHALL BE SKIPPED.

NOTE B - WHEN ONE PHASE IS IN ALONE, ANY CONFLICTING PHASE MAY START TIMING CONCURRENTLY WITHOUT A CLEARANCE INTERVAL (SEE CHART).

* CONFLICTING PHASES REQUIRE A CLEARANCE INTERVAL.

** WHEN CALLED, TIMES WALK, THEN FLASHING DON'T WALK, THEN GOES STEADY DON'T WALK.

G-GREEN
Y-YELLOW
R-RED
←G-GARROW
←Y-YARROW
W-WALK **
D-DON'T WALK

PHASE	NON-CONFLICTING PHASE (A)	CONFLICTING PHASE (B)
1	5,6,6P	2,3,4,7,8,2P,4P,8P
2	5,6,6P,2P	1,3,4,7,8,4P,8P
3	7,8,8P	1,2,4,5,6,2P,4P,6P
4	7,8,8P,4P	1,2,3,5,6,2P,6P
5	1,2,2P	3,4,6,7,8,4P,8P
6	1,2,2P,6P	3,4,5,7,8,4P,8P
7	3,4,4P	1,2,5,6,8,2P,6P,8P
8	3,4,4P,8P	1,2,5,6,7,2P,6P

'C'=COORDINATE Ø 2) 6

SIGNAL CIRCUIT	PHASE 1 R	J	*	J	CLEAR TO J	J	PHASE 2 'C' R	J	*	J	CLEAR TO J	J	PHASE 3 R	J	*	J	CLEAR TO J	J	PHASE 4 R	J	*	J	CLEAR TO J	J	FLASH
1	◀	◀	-				-	-	-				-	-	-				-	-	-				-
2	R	R	R				G	Y	R				R	R	R				R	R	R				Y
2P	D	D	D				**	D	D				D	D	D				D	D	D				
3	-	-	-				-	-	-				◀	◀	-				-	-	-				-
4	R	R	R				R	R	R				R	R	R				G	Y	R				R
4P	D	D	D				D	D	D				**						D	D	D				
5	-	-	-				-	-	-				-	-	-				-	-	-				-
6	R	R	R				R	R	R				R	R	R				R	R	R				Y
6P	D	D	D				D	D	D				D	D	D				D	D	D				
7	-	-	-				-	-	-				-	-	-				-	-	-				-
8	R	R	R				R	R	R				R	R	R				R	R	R				R
8P	D	D	D				D	D	D				D	D	D				D	D	D				

- RING A -

SIGNAL CIRCUIT	PHASE 5 R	J	*	J	CLEAR TO J	J	PHASE 6 'C' R	J	*	J	CLEAR TO J	J	PHASE 7 R	J	*	J	CLEAR TO J	J	PHASE 8 R	J	*	J	CLEAR TO J	J
1	-	-	-				-	-	-				-	-	-				-	-	-			
2	R	R	R				R	R	R				R	R	R				R	R	R			
2P	D	D	D				D	D	D				D	D	D				D	D	D			
3	-	-	-				-	-	-				-	-	-				-	-	-			
4	R	R	R				R	R	R				R	R	R				R	R	R			
4P	D	D	D				D	D	D				D	D	D				D	D	D			
5	◀	◀	-				-	-	-				-	-	-				-	-	-			
6	R	R	R				G	Y	R				R	R	R				R	R	R			
6P	D	D	D				**	D	D				D	D	D				D	D	D			
7	-	-	-				-	-	-				◀	◀	-				-	-	-			
8	R	R	R				R	R	R				R	R	R				G	Y	R			
8P	D	D	D				D	D	D				D	D	D				**	D	D			

- RING B -

SCDOT
South Carolina Department of Transportation
Post Office Box 191
Columbia, South Carolina 29202 ©

This intersection border drawing including the information blocks contained within, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this sheet without written authorization from the SCDOT Traffic Engineering Office is prohibited.

DATE	REVISIONS
3/02	ADDED PEDESTRIAN HEADS AND CROSSWALKS

SOUTH CAROLINA
DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION
COLUMBIA S.C.

SUBJECT TITLE: CITY OF GREENVILLE
TRAFFIC SIGNAL INSTALLATION

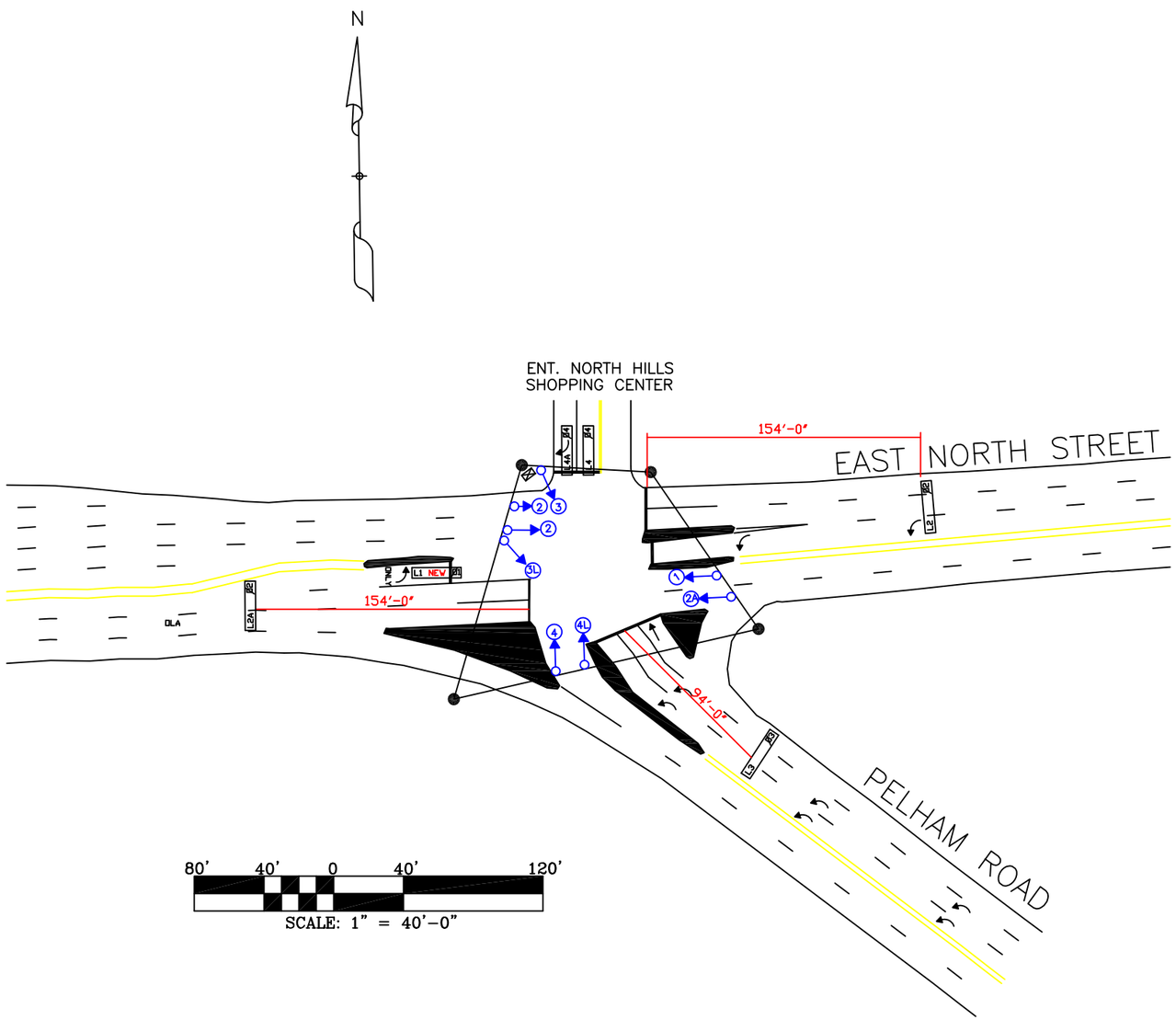
SPECIFIC LOCATION: US 276 STONE AVE. EXT.
&
RUTHERFORD STREET

CITY GREENVILLE | COUNTY GREENVILLE

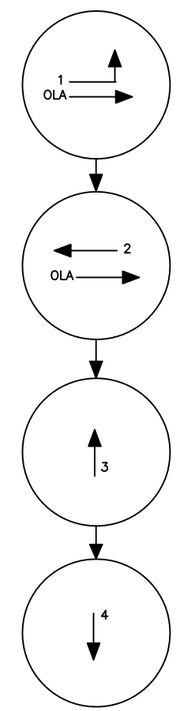
DESIGNED
DRAWN AKF
CHECKED
REVIEWED
RECOMMENDED

APPROVED BY _____ DIR. OF TRAFFIC ENGINEERING
APPROVED BY _____ ENGINEER

SCALE	DATE	SHEET NO.	INDEX NO.
1" = 30'	5/01	1 OF 1	



PHASING DIAGRAM



SIGNAL DISPLAY SEQUENCE

SIGNAL HEAD NUMBER	PHASE 1 (1 OLA) R/W	CLEAR TO Ø2	CLEAR TO Ø				PHASE 2 (2 OLA) R/W	CLEAR TO Ø3	CLEAR TO Ø4				PHASE 3 (3) R/W	CLEAR TO Ø4	CLEAR TO Ø1	CLEAR TO Ø2			PHASE 4 (4) R/W	CLEAR TO Ø1	CLEAR TO Ø2				FLASH
1	G/G	G/Y	G				G	Y	R	Y	R		R	R	R	R	R	R	R	R	R	R	R		Y
2	R	R	R				G	Y	R	Y	R		R	R	R	R	R	R	R	R	R	R	R		Y
2A	G	G	G				G	Y	R	Y	R		R	R	R	R	R	R	R	R	R	R	R		Y
3	R	R	R				R	R	R	R	R		G	Y	R	Y	R	Y	R	R	R	R	R		R
3L	R	R	R				R	R	R	R	R		G/G	Y	R	Y	R	Y	R	R	R	R	R		R
4	R	R	R				R	R	R	R	R		R	R	R	R	R	R	G	Y	R	Y	R		R
4L	R	R	R				R	R	R	R	R		R	R	R	R	R	R	G/G	Y	R	Y	R		R

SIGNAL HEAD LEGEND

SIGNAL LEGEND	QUANTITY	SIZE	SECTIONS	LENS
1	1	12"	5	Y G RYG
2	2	12"	3	RYG
2A	1	12"	3	RYG
3	1	12"	3	RYG
3L	1	12"	4	RYG G
4	1	12"	3	RYG
4L	1	12"	4	RYG G

SIGNAL TIMING

SETTINGS	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8
	SECONDS							
INITIAL	3	10	10	3				
EXTENSION	2	4	3	2				
WALK								
PED. CL.								
MAXIMUM 1	10	30	40	20				
MAXIMUM 11								
YELLOW	4.7	4.0	3.5	4.2				
ALL RED	2.0	1.3	2.0	2.0				
RECALL		MIN						
DETECTOR MODE	N	K	K	N				

N = NON LOCK K = LOCK

LEGEND

DESCRIPTION	EXISTING	NEW
CABINET	SEE BELOW	0
WOOD POLE	4	0
STEEL POLE	0	0
LOOP	5	1
SIGNAL HEADS	8	1
PEDESTRIAN HEADS	0	0

NEW EQUIPMENT

ONE (1) FOUR PHASE NEMA CONTROLLER
& BASE MOUNTED CABINET
& COORDINATION UNIT

* PLEASE NOTE ALL LOOPS EXCEPT FOR LOOP-1 ARE EXISTING LOOPS

* NOTE PHASE-1 SHALL NOT FOLLOW PHASE-2

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER NO. 09769 CARRISON, SPRAGUE

OVERLAPS	PHASES
A	1 + 2

APPROACH	STREET	SPEED	GRADE
NB	PELHAM RD	30	0 %
SB	NORTH HILLS	20	0 %
EB	E.NORTH ST	35	0 %
WB	E.NORTH ST	35	0 %

LOOPS	DELAY	SIZE	PHASE
L1	5 sec.	6' x 30'	Ø1
L2	0	6' x 30'	Ø2
L2A	0	6' x 30'	Ø2
L3	0	6' x 30'	Ø3
L4	0	6' x 30'	Ø4
L4A	10 sec.	6' x 30'	Ø4

REVISIONS

MARK	DATE	BY	DESCRIPTION
△			
△			
△			
△			
△			

The City of Greenville
TRAFFIC ENGINEERING DIVISION
POST OFFICE BOX 2207 GREENVILLE, SOUTH CAROLINA

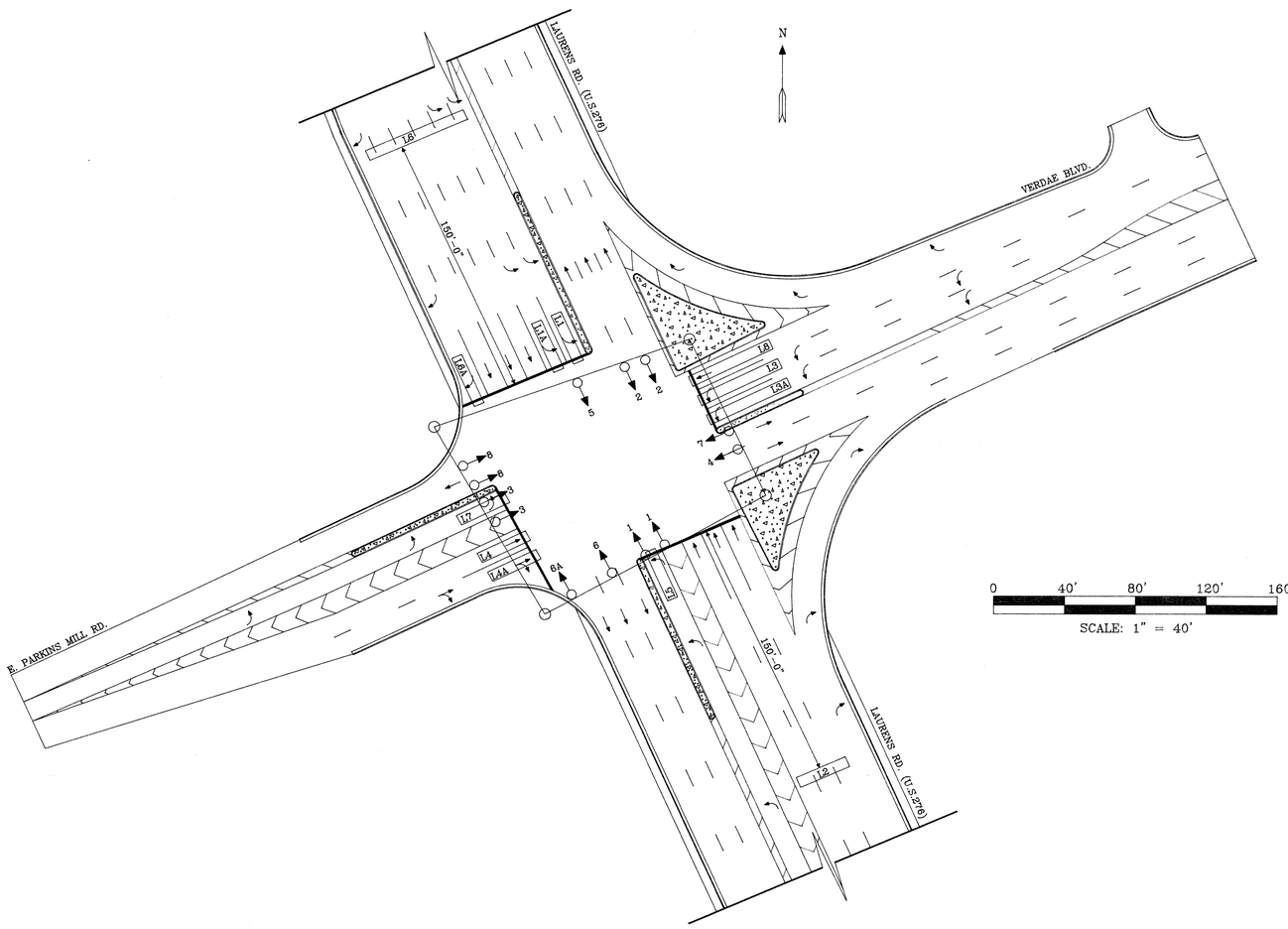
LOCATION: EAST NORTH ST.(S-94)@ PELHAM RD.(S-492)

S.C. D.O.T. APPROVALS

DRAWN BY: B. STEADING DATE: 8-07-00 EQUIP. REVIEW

DESIGNED BY: DATE: SCALE: 1" = 40'-0"

APPROVED BY: DATE: DRAWING # 61



SIGNAL DISPLAY SEQUENCE

SIGNAL HEAD NUMBER	PHASE 1 & 5							PHASE 1 & 6							PHASE 2 & 5							PHASE 2 & 6							FLASH
	R/W	CLEAR TO						R/W	CLEAR TO						R/W	CLEAR TO						R/W	CLEAR TO						
		1&6		2&5		2&6			2&6							2&6							ALL OTHERS						
1	◄G	◄G	◄G	Y	R	Y	R	◄G	Y	R					R	R	R					R	R	R					R
2	R	R	R	R	R	R	R	R	R	R					G	G	G					G	Y	R					Y
3	R	R	R	R	R	R	R	R	R	R					R	R	R					R	R	R					R
4	R	R	R	R	R	R	R	R	R	R					R	R	R					R	R	R					R
5	◄G	Y	R	◄G	◄G	Y	R	R	R	R					◄G	Y	R					R	R	R					R
6	R	R	R	R	R	R	R	G	G	G					R	R	R					G	Y	R					Y
6A	R	R	R	R	R	R	R	G	G	G					R	R	R					G	Y	R					Y
7	R	R	R	R	R	R	R	R	R	R					R	R	R					R	R	R					R
8	R	R	R	R	R	R	R	R	R	R					R	R	R					R	R	R					R

PHASE 2 & 6 MAY NOT CLEAR TO PHASE 1 & 6 AND 2 & 5

SIGNAL DISPLAY SEQUENCE

SIGNAL HEAD NUMBER	PHASE 3 & 7							PHASE 3 & 8							PHASE 4 & 7							PHASE 4 & 8							FLASH
	R/W	CLEAR TO						R/W	CLEAR TO						R/W	CLEAR TO						R/W	CLEAR TO						
		3&8		4&7		4&8			4&8							4&8							ALL OTHERS						
1	R	R	R	R	R	R	R	R	R	R					R	R	R					R	R	R					R
2	R	R	R	R	R	R	R	R	R	R					R	R	R					R	R	R					Y
3	◄G	◄G	◄G	Y	R	Y	R	◄G	Y	R					R	R	R					R	R	R					R
4	R	R	R	R	R	R	R	R	R	R					G	G	G					G	Y	R					R
5	R	R	R	R	R	R	R	R	R	R					R	R	R					R	R	R					R
6	R	R	R	R	R	R	R	R	R	R					R	R	R					R	R	R					Y
6A	R/G▶	R/Y▶	R	R/Y▶	R	R/Y▶	R	R	R	R					R	R	R					R	R	R					Y
7	◄G	Y	R	◄G	◄G	Y	R	R	R	R					◄G	Y	R					R	R	R					R
8	R	R	R	R	R	R	R	G	G	G					R	R	R					G	Y	R					R

PHASE 4 & 8 MAY NOT CLEAR TO PHASE 3 & 8 AND 4 & 7

SIGNAL HEAD LEGEND

SIGNAL LEGEND	QUANTITY	SIZE	SECTIONS	LENS
1	2	12"	3	RY◄G
2	2	12"	3	RYG
3	2	12"	3	RY◄G
4	1	12"	3	RYG
5	1	12"	3	RY◄G
6	1	12"	3	RYG
6A	1	12"	5	RYG/Y▶G▶
7	1	12"	5	RYG/◄Y◄G
8	2	12"	3	RYG

SIGNAL TIMING

SETTINGS	SECONDS Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8
INITIAL	4	20	4	4	4	20	4	4
EXTENSION	3	3	3	3	3	3	3	3
WALK								
PED. CL.								
MAXIMUM 1	16	45	15	25	16	45	15	25
MAXIMUM 11								
YELLOW	4.5	4.6	4.5	4.0	4.6	4.5	4.0	4.5
ALL RED	2.5	2.0	2.5	2.5	2.5	2.0	2.5	2.5
RECALL		MIN.				MIN.		
DETECTOR MODE								
N = NON LOCK					K = LOCK			

OVERLAP	PHASES
A	6
B	–
C	–
D	–

APPROACH	STREET	SPEED	GRADE
NB	LAURENS RD	45	–2.54 %
SB	LAURENS RD	45	1.5 %
EB	PARK. MILL	35	2.08 %
WB	VERDAE BLVD.	45	–2.0 %

LOOPS	DELAY	SIZE	PHASE
L1	–	6' x 30'	1
L1A	–	6' x 30'	1
L2	–	30' x 6'	2
L3	–	6' x 50'	3
L3A	–	6' x 50'	3
L4	–	6' x 30'	4
L4A	–	6' x 30'	4
L5	–	6' x 30'	5
L6	–	60' x 6'	6
L6A	5 SEC.	6' x 30'	6
L7	–	6' x 30'	7
L8	–	6' x 50'	8

LEGEND

DESCRIPTION	EXISTING	NEW
CABINET	SEE BELOW	–
WOOD POLE	–	4
STEEL POLE	–	–
LOOP	–	12
SIGNAL HEADS	–	4
PEDESTRIAN HEADS	–	–

NEW EQUIPMENT

ONE (1) FOUR PHASE NEMA CONTROLLER & BASE MOUNTED CABINET &COORDINATION UNIT (RELOCATED)

REVISIONS

MARK	DATE	BY	DESCRIPTION
△			
△			
△			
△			
△			

The City of Greenville
TRAFFIC ENGINEERING DIVISION
POST OFFICE BOX 2207 GREENVILLE, SOUTH CAROLINA

LOCATION: LAURENS RD.(U.S.276) @ VERDAE BLVD.

S.C. D.O.T. APPROVALS

DRAWN BY: B.STEADING DATE: 5-07-96 EQUIP. REVIEW

DESIGNED BY: DATE: SCALE: 1" = 40'

APPROVED BY: DATE: DRAWING # 96-6

82

FED. ROAD DIV. NO.	STATE	COUNTY	FILE NO.	PROJECT NO.	ROAD NO.	SHEET NO.	TOTAL SHEETS
3	SC	GREENVILLE	23.477A	SIB-GRID (010)	I-385	TS-9	·

ESTIMATED QUANTITIES
FURNISH AND INSTALL

BID ITEM NO.	DESCRIPTION	QUANTITIY	UNIT
6060275	1.0" SCHEDULE 80 PVC CONDUIT	140	LF.
6060278	2.0" SCHEDULE 80 PVC CONDUIT	960	LF.
6060391	NO. 14CU WIRE, 7 CONDU., IMSA-20-1	870	L.F.
6060407	NO. 14CU., 4CON, AL SHIELD, IMSA-50-2	2,100	L.F.
6060413	#14 COPPER WIRE, 1 COND., IMSA 51-1	2,500	L.F.
6060495	SAW CUT FOR LOOP DETECTOR	1,150	L.F.
6060499	ELECTRICAL SERVICE FOR TRAFFIC SIGNAL	1	EA
6060515	13x24x12D ELEC. UNGRD. ENCLOS/HD	6	EA
6080105	FLAT SHEET, TYPE III. FIXED SZ. & MSG. SIGN	16	S.F
6085513	CONTROLLER, 8PH, T-5 BASE MTD. w/COORD.	1	EA.
6085661	DETECT. AMP/HARN. 2 CH. w/DEL/EXT	5	EA
6085731	12" 1 WAY, 3 SECT. - R. Y. G. TRAFFIC SIGNAL	6	EA
6085733	12" 1 WAY, 3 SECT. - R. YA. GA. TRAFFIC SIGNAL	4	EA.
6085830	VEH. TRAFFIC SIGNAL MTG./SPAN WIRE	10	EA.
6085990	REM. SAL. & DISP. EXISTING TRAFFIC SIGNAL EQUIPMENT	1	L.S.

SIGNAL HEAD CHART

HEAD NUMBER	2	5	6	8L	8
DISPLAY	R Y G	R Y G	R Y G	R Y G	R Y G
PHASE	2	5	6	8	8
SIZE	12	12"	12"	12"	12"
QUANTITY	2	2	2	2	2

SIGNAL DISPLAY SEQUENCE

FLASH	SIGNAL HEAD NUMBER	PHASE 2+5 CLEAR TO R/W	2+6			PHASE 2 & 6 CLEAR TO R/W		BARR.		PHASE 8 CLEAR TO R/W		BARR.	
Y	2	G	G	G		G		Y	R	R		R	R
R	5	↓G	↓Y	R		R		R	R	R		R	R
Y	6	R	R	R		G		G	G	R		R	R
R	8L	R	R	R		R		R	R	↓G		↓Y	R
R	8	R	R	R		R		R	R	G		Y	R

BARRIER

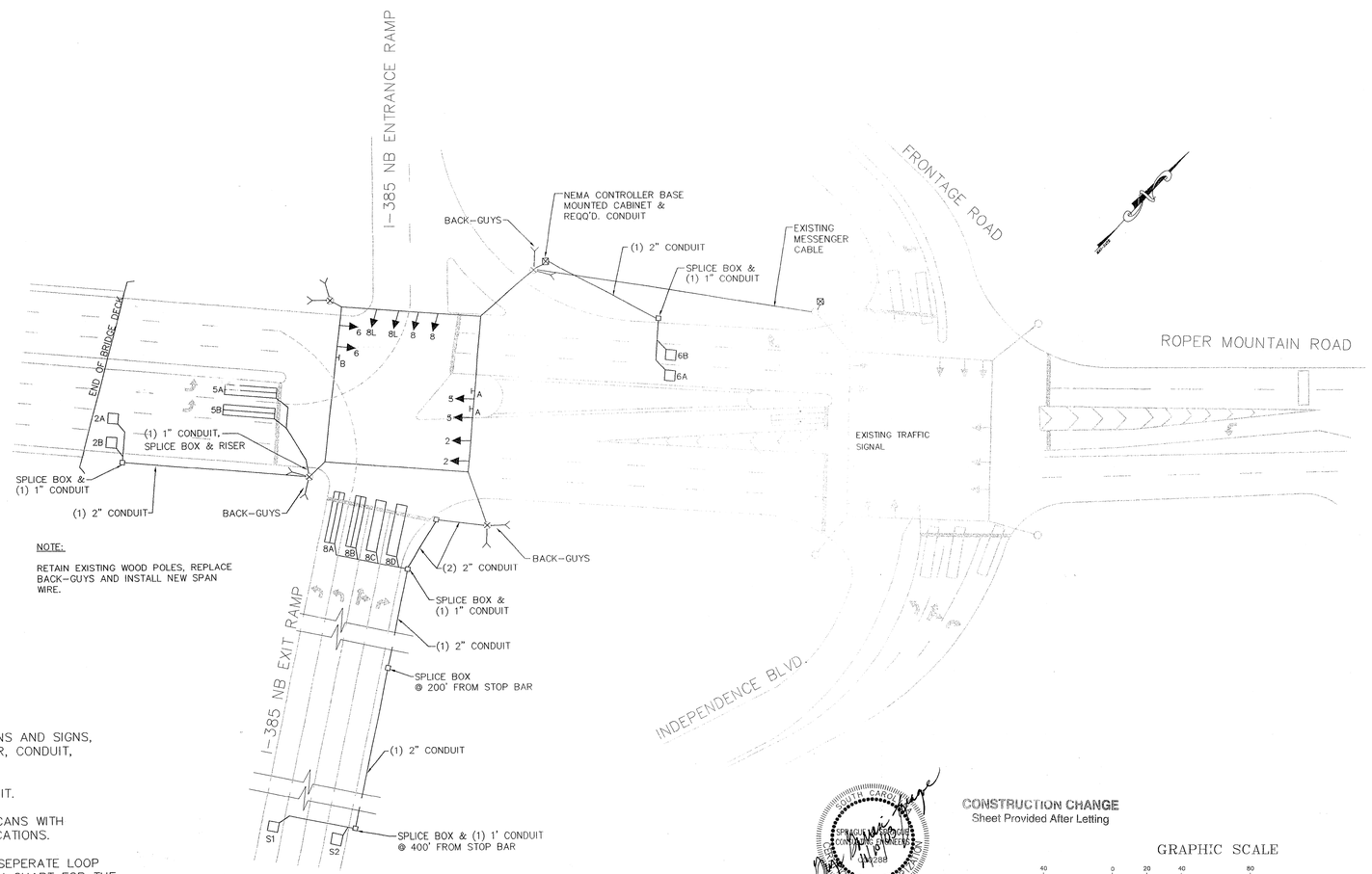
LOOP INSTALLATION AND ASSIGNMENT CHART

LOOP NUMBER	PHASE ASSIGNMENT	OPERATIONAL MODE	SPECIAL FUNCTION	MEMORY	SIZE	DISTANCE FROM STOP BAR
2A	2	PRESENCE	–	LOCK	6' x 6'	100'
2B	2	PRESENCE	–	LOCK	6' x 6'	100'
5A	5	PRESENCE	–	NON-LOCK	6' x 30' QUAD	+5'
5B	6	PRESENCE	–	NON-LOCK	6' x 6'	120'
6A	6	PRESENCE	–	NON-LOCK	6' x 6'	120'
6B	6	PRESENCE	–	LOCK	6' x 20'	150'
8A	8	PRESENCE	–	NON-LOCK	6' x 30' QUAD	+5'
8B	8	PRESENCE	–	NON-LOCK	6' x 30' QUAD	+5'
8C	8	PRESENCE	–	NON-LOCK	6' x 30'	+5'
8D	8	PRESENCE	10 SEC. DELAY	NON-LOCK	6' x 30'	+5'
S1	SYSTEM	–	–	N/A	6' x 6'	400'
S2	SYSTEM	–	–	N/A	6' x 6'	400'

TRAFFIC SIGNAL SETTINGS

FUNCTIONS	SECONDS ø1	ø2	ø3	ø4	ø5	ø6	ø7	ø8
MIN. GREEN		25			5	25		5
ADDED INIT. (SEC./ACT)		–			–	–		–
MAX. INITIAL		–			–	–		–
PASSAGE		3.0			3.0	3.0		3.0
TIME BEFORE REDUCE		–			–	–		–
TIME TO REDUCE		–			–	–		–
MIN. GAP		–			–	–		–
MAXIMUM I		35			20	35		25
MAXIMUM II		–			–	–		–
YELLOW CHANGE		4.0			3.5	4.0		4.0
RED CLEAR		2.0			2.0	2.0		2.0
RECALL		MIN.			–	MIN.		–
DET. MEMORY		L			N	L		N
L-LOCK, N-NON-LOCK								
DET. DELAY								10*
DET. MODE		PR			PR	PR		PR
P-PULSE, PR-PRESENCE								
WALK								
PEDESTRIAN CLEAR								

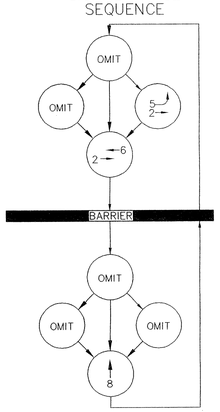
* LOOP 8D ONLY



NOTE:

RETAIN EXISTING WOOD POLES, REPLACE BACK-GUYS AND INSTALL NEW SPAN WIRE.

SIGNAL PHASE SEQUENCE



INSTALLATION NOTES:

1. INSTALL SIGNAL HEADS, PEDESTRIAN SIGNAL HEADS, PUSH BUTTONS AND SIGNS, LOOPS, LOOP LEAD-INS, CABINET BASE, CABINET AND CONTROLLER, CONDUIT, SIGNAL SPAN AND CABLE AND WIRES AS SHOWN.
2. SEE GENERAL PROJECT NOTES SHEET TS-1 FOR REQUIRED CONDUIT.
3. PEDESTRIAN PUSH BUTTONS AND HEADS ARE TO BE ADA (AMERICANS WITH DISABILITIES ACT) APPROVED AND INSTALLED PER SCDOT SPECIFICATIONS.
4. EACH LOOP SHOWN ON THE PLANS SHALL BE HOOKED UP TO A SEPERATE LOOP DETECTOR CHANNEL IN THE CABINET. SEE THE LOOP INSTALLATION CHART FOR THE APPROPRIATE PHASE WIRING REQUIREMENTS.
5. A MINIMUN OF ONE DETECTOR INPUT JACK SHALL BE REQUIRED FOR EACH CABINET PHASE. ADDITIONAL JACKS ARE REQUIRED AS SHOWN FOR EACH LOOP.
6. PAVEMENT MARKINGS ARE FOR INFORMATION ONLY. SEE PAVEMENT MARKING PLAN SHEETS FOR DETAILS AND QUANTITIES.
7. EACH LOOP SHALL BE INSTALLED IN A SEPERATE SAW CUT. A MINIMUM OF ONE FOOT SEPERATION SHALL BE MAINTAINED FOR EACH LOOP AND LOOP LEAD TO PREVENT CROSS TALK.
8. ⚠ NO BRIDGE DECK CONSTRUCTION OR WIDENING, UPGRADE SIGNALS ONLY. NO ADDITIONAL IMPROVEMENTS ARE INCLUDED. SEPERATE PEDESTRIAN INDICATIONS ARE NOT INCLUDED FOR THIS LIMITED IMPROVEMENT PROJECT AND ARE OUTSIDE SCOPE OF IMPROVEMENT PROJECT.

SIGNS

Ⓐ

R10-10
24"x30"

Ⓑ

R3-2
24"x24"

CAUTION

PALMETTO UTILITY LOCATION SERVICE

3 DAYS BEFORE DIGGING CALL TOLL FREE 1-800-922-0983

A ONE CALL SYSTEM FOR COMMUNITY AND JOB SAFETY.

THE UTILITIES SHOWN ARE SHOWN FOR THE CONTRACTOR'S CONVENIENCE ONLY. THERE MAY BE OTHER UTILITIES NOT SHOWN ON THESE PLANS. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THE LOCATIONS SHOWN AND IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE LOCATIONS OF ALL UTILITIES WITHIN THE LIMITS OF THE WORK. ALL DAMAGE MADE TO EXISTING UTILITIES BY THE CONTRACTOR SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

RECEIVED
NOV 1 1 2003
FLUOR DANIEL CRM

CONSTRUCTION CHANGE
Sheet Provided After Letting

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

LEGEND

- CONDUIT
- STEEL STRAIN POLE
- WOOD POLE
- TRAFFIC SIGNAL HEADS
- PEDESTRIAN SIGNAL HEAD W/SIGN & PUSH BUTTON
- PULL BOX
- CONTROLLER CABINET
- QUADRAPOLE PRESENCE LOOP (6' x 30')
- CALL LOOP (6' x 6')
- PRESENCE LOOP (6' x VARIABLE)
- BACK GUY

REV. NO.	BY	DATE	DESCRIPTION OF REVISION
4			
3			
2			
1	GAR	1/30/01	NOTE #8 (ISSUED 11-10-03)

TOPO. _____ DATE _____
DWG. _____ DATE _____
R/W _____ DATE _____

TRANSYSTEMS CORPORATION

Sprague & Sprague
CONSULTING ENGINEERS
BOX 9192
GREENVILLE, SC 29604-9192

TRAFFIC SIGNAL INSTALLATION #8

SOUTH CAROLINA
DEPARTMENT OF TRANSPORTATION
COLUMBIA, S.C.

ROPER MOUNTAIN ROAD
@ I-385 NB RAMPS
IN GREENVILLE

SCALE 1"=40' RTE. I-385 DWG. NO. TS-9

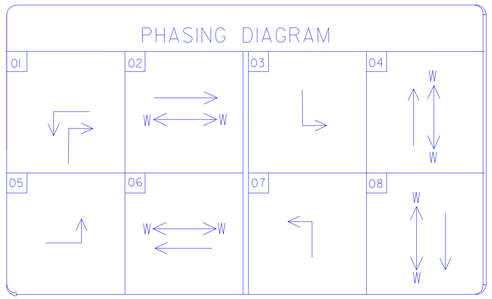
2/21/01 TS9.DWG

TS9.DWG DRAWING #212

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
S.C.	- - - - - - - - - - - - - - -	- - -	- - -

REVISION DATES

PHASING DIAGRAM



APPROACH	STREET	SPEED	GRADE
WB	LAURENS ROAD	40	-0.8%
EB	LAURENS ROAD	40	-1.4%
NB	FAIRFOREST WY	35	-1.9%
SB	ROAD "A"	35	-1%

SIGNAL SEQUENCE CHART

SIGNAL HEAD NUMBER	PHASE 1/5 (CLEAR TO 01/6, 02/5, 02/6)	PHASE 2/6 (CLEAR TO 03/7)	PHASE 3/7 (CLEAR TO 03/8, 07/4, 04/8)	PHASE 4/8 (CLEAR TO 01/5)	FLASH
1/6	R/W, R, G, R, R, R, G, G	G, Y, R	R, R, R, R, R, R, R	R, R, R	Y
2	R, R, R, G, G, G, G	G, Y, R	R, R, R, R, R, R, R	R, R, R	Y
3	R, R, R, R, R, R, R	R, R, R	R, R, R, R, R, R, R	R, R, R	R
4/1	R, R, R, R, R, R, R	R, R, R	R, R, R, R, R, R, R	G, Y, R	R
4	R, R, R, R, R, R, R	R, R, R	R, R, R, R, R, R, R	G, Y, R	R
5/2	R, R, R, R, G, G, G	G, Y, R	R, R, R, R, R, R, R	R, R, R	Y
6	R, R, R, R, R, R, R	G, Y, R	R, R, R, R, R, R, R	R, R, R	Y
7/4	R, R, R, R, R, R, R	R, R, R	R, R, R, R, R, R, R	G, Y, R	R
8	R, R, R, R, R, R, R	R, R, R	R, R, R, R, R, R, R	G, Y, R	R

ESTIMATED QUANTITIES

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY
6060275	1.0" SCHEDULE 80 PVC CONDUIT	LF	650
6060278	2.0" SCHEDULE 80 PVC CONDUIT	LF	250
		LF	
6060413	NO. 14 COPPER WIRE, 1-CONDUCTOR FOR LOOP WIRE	LF	6000
6060495	SAWCUT FOR LOOP DETECTOR	LF	1600
6060497	DISCONNECT SWITCH FOR STREET LIGHTING	EA	1
6060499	ELECTRICAL SERVICE FOR TRAFFIC SIGNAL	EA	1
6060518	13"X24"X18"D,ELEC.FLUSH UNDGRD.ENCLOSURE-(STR,POLY,CONC.)HD	EA	10
6060573	24"X48"X36"D,ELEC.FLUSH UNDGRD.ENCLOSURE-(STR,POLY,CONC.)HD	EA	1
6066110	HIGH PRESSURE SODIUM LUMINAIRE-150 WATT	EA	4
608505D	13" X 32' STEEL STRAIN POLE, WITH 10FT LUMINAIRE ARM	EA	4
6085092	3/8" GALVANIZED STEEL CABLE	LF	650
6085484	10' BREAK-AWAY ALUMINUM PEDESTAL POLE	EA	3
6085710	12" 1-WAY-5 SECTION(R,Y,YA,G,GA)VEHICLE TRAFFIC SIGNAL, LED	EA	4
6085731	12" 1-WAY-3 SECTION(R,Y,G,)VEHICLE TRAFFIC SIGNAL, LED	EA	8
6085733	12" 1-WAY-3 SECTION(R,YA,GA,)VEHICLE TRAFFIC SIGNAL, LED	EA	2
6085780	1-WAY-1SECT.HAND/MAN PEDESTRIAN SIGNAL HEAD, LED	EA	8
6085790	PEDESTRIAN PUSH BUTTON AND SIGN (R-10-3 B/C)	EA	8
6085830	VEHICLE TRAFFIC SIGNAL HEAD MOUNTING ASSEMBLY FOR SPAN WIRE	EA	14
6085840	PEDESTRIAN TRAF. SIGNAL HEAD MOUNTING ASSEMBLY FOR POST TOP	EA	3
6085841	PEDESTRIAN TRAF. SIGNAL HEAD MOUNTING ASSEMBLY FOR SIDE POLE	EA	3
6085990	REMOVAL,SALVAGE,&DISP.OF EXISTING TRAF. SIGNAL EQUIPMENT	LS	1
8999901	TRAFFIC SIGNAL CONSTRUCTION, COMPLETE	LS	1

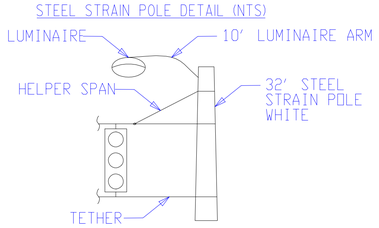
FURNISHED BY THE CITY OF GREENVILLE

332A CABINET ASSEMBLY - BASE MTD	EA	1
2070L CONTROLLER AND SOFTWARE	EA	1
2010 CONFLICT MONITOR	EA	1
2 CHANNEL DETECTOR	EA	8
DC ISOLATOR	EA	3
LOAD SWITCH	EA	12

LED TRAFFIC SIGNAL HEADS

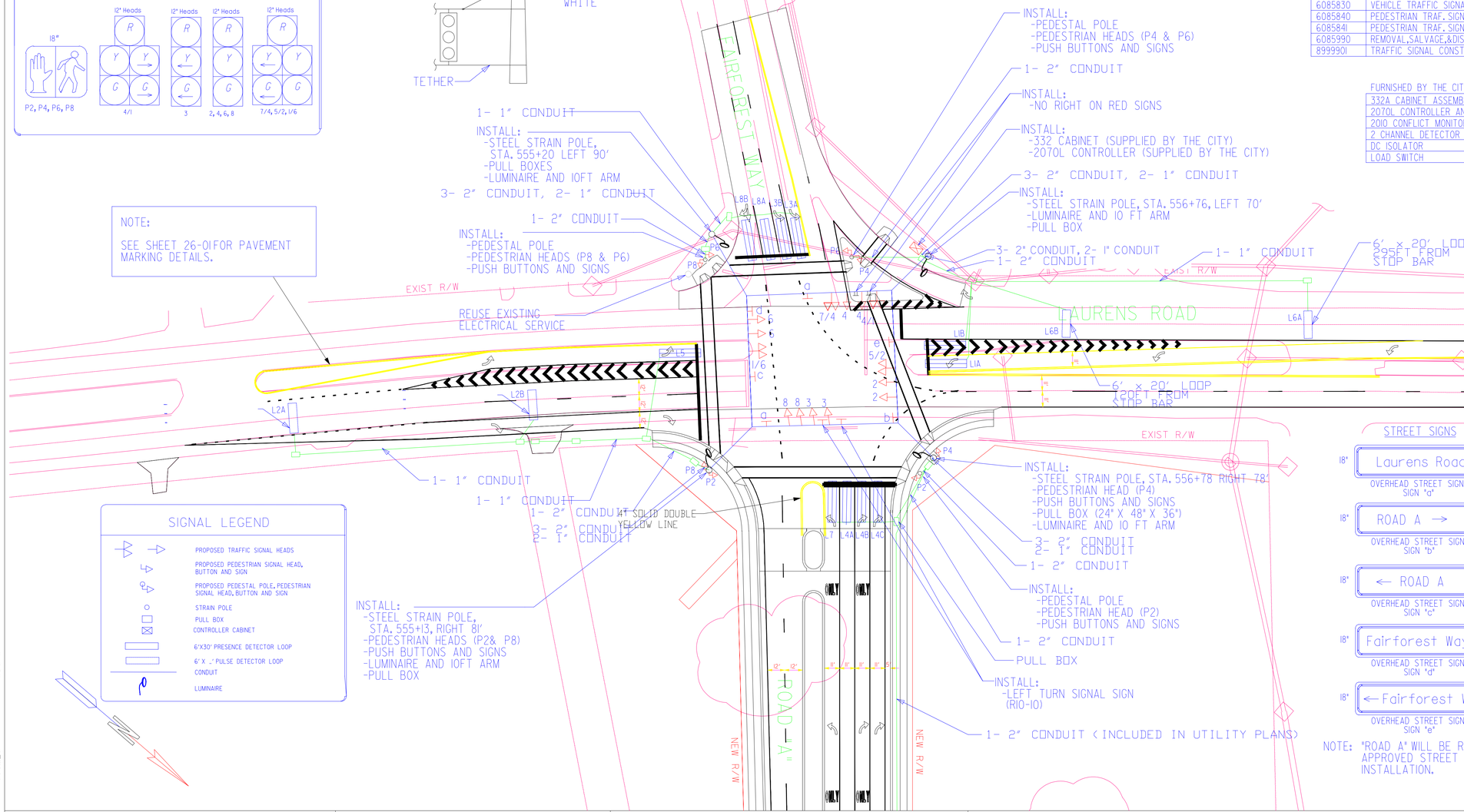
VEHICLE SIGNALS TO INCLUDE 5" LOUVERED BACKPLATES

STEEL STRAIN POLE DETAIL (NTS)



NOTE:

SEE SHEET 26-01 FOR PAVEMENT MARKING DETAILS.



Notes:

1) Steel strain poles are SCDOT standard, powder coated white, 13"x32", with 10 ft. luminaire arm and luminaire.
2) Contractor shall install luminaire arms and appropriate wiring from arm to electrical service connection point. The Contractor shall install one disconnect for street lighting per intersection.
3) The City of Greenville shall furnish a 332A cabinet assembly and controller fully equipped for operation. The Contractor shall install the furnished equipment on a Contractor installed base.
4) All materials and construction methods shall meet or exceed SCDOT and City of Greenville standards and specifications.
5) All conduit is PVC schedule 80.
6) The Contractor shall install street signs furnished by the city.
7) All labor and materials required to construct the traffic signal as intended by these plans, not accounted for in the estimated quantities, shall be included as incidental items to the listed quantities.

SIGNAL LEGEND

- PROPOSED TRAFFIC SIGNAL HEADS
- PROPOSED PEDESTRIAN SIGNAL HEAD, BUTTON AND SIGN
- PROPOSED PEDESTAL POLE, PEDESTRIAN SIGNAL HEAD, BUTTON AND SIGN
- STRAIN POLE
- PULL BOX
- CONTROLLER CABINET
- 6'X30' PRESENCE DETECTOR LOOP
- 6' X ..' PULSE DETECTOR LOOP
- CONDUIT
- LUMINAIRE

STREET SIGNS

18"	Laurens Road	OVERHEAD STREET SIGN SIGN 'a'
18"	ROAD A →	OVERHEAD STREET SIGN SIGN 'b'
18"	← ROAD A	OVERHEAD STREET SIGN SIGN 'c'
18"	Fairforest Way →	OVERHEAD STREET SIGN SIGN 'd'
18"	← Fairforest Way	OVERHEAD STREET SIGN SIGN 'e'

NOTE: "ROAD A" WILL BE REPLACED WITH THE APPROVED STREET NAME PRIOR TO INSTALLATION.

LOOPS	DELAY	SIZE	PHASE
L1A	0 sec.	6' x 30'	1
L1B	0 sec.	6' x 30'	1
L2A	0 sec.	6' x 20'	2
L2B	0 sec.	6' x 20'	2
L3A	0 sec.	6' x 30'	3
L3B	0 sec.	6' x 30'	3
L4A	0 sec.	6' x 30'	4
L4B	0 sec.	6' x 30'	4
L4C	0 sec.	6' x 30'	4
L5	0 sec.	6' x 30'	5
L6A	0 sec.	6' x 20'	6
L6B	0 sec.	6' x 20'	6
L7	0 sec.	6' x 30'	7
L8A	0 sec.	6' x 30'	8
L8B	0 sec.	6' x 30'	8

DGN
$TIME$
$DATE$

SCALE IN FEET: 0 40 80 160

the city of greenville

URS
2510-C WADE HAMPTON BOULEVARD
SUITE A
GREENVILLE, S.C. 29615
TEL: (864) 609-9111 FAX: (864) 609-9069

PROPOSED RESEARCH & DEVELOPMENT PARK — TRAFFIC SIGNAL PLANS

DRAWING No. 27-01

APPENDIX E – Existing Signal Timings

Phase Vehicle Basic Timing Data

Date
11/4/20

Time
9:52:35

Intersection Name: Haywood/I-385 NB. Ramps

Source: Database

Phase	1	2	3	4	5	6	7	8
Minimum Green	0	15	0	14	14	15	0	0
Passage	0.0	3.0	0.0	3.0	3.0	3.0	0.0	0.0
Maximum 1	0	40	0	30	30	40	0	0
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	3.0	4.5	3.0	4.0	4.0	4.5	3.0	3.0
Red Clearance	0.0	2.0	0.0	2.5	2.5	2.0	0.0	0.0

Phase	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0
Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum 1	0	0	0	0	0	0	0	0
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clearance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Phase Vehicle Basic Timing Data

Date
11/4/20

Time
9:58:24

Intersection Name: Haywood/I-385 SB. Ramps

Source: Database

Phase	1	2	3	4	5	6	7	8
Minimum Green	7	15	0	7	0	15	0	0
Passage	3.0	3.0	0.0	3.0	0.0	3.0	0.0	0.0
Maximum 1	30	40	0	30	0	40	0	0
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	4.0	4.5	3.0	4.0	3.0	4.5	3.0	3.0
Red Clearance	2.5	2.0	0.0	2.5	0.0	2.0	0.0	0.0

Phase	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0
Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum 1	0	0	0	0	0	0	0	0
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clearance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Phase Vehicle Basic Timing Data

Date
11/4/20

Time
9:59:03

Intersection Name: Pleasantburg/Century/Villa

Source: Database

Phase	1	2	3	4	5	6	7	8
Minimum Green	3	10	0	3	3	10	0	10
Passage	2.0	5.0	0.0	2.0	2.0	5.0	0.0	2.0
Maximum 1	20	60	0	30	20	60	0	30
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	3.0	5.0	3.0	4.0	3.0	5.0	3.0	4.0
Red Clearance	0.5	2.0	0.0	2.0	0.5	2.0	0.0	2.0

Phase	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0
Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum 1	0	0	0	0	0	0	0	0
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clearance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Phase Vehicle Basic Timing Data

Date
11/4/20

Time
10:04:58

Intersection Name Pleasantburg/Antrim

Source Database

Phase	1	2	3	4	5	6	7	8
Minimum Green	3	15	3	5	3	15	3	8
Passage	2.0	4.0	2.0	3.0	2.0	4.0	2.0	3.0
Maximum 1	20	40	25	25	20	40	20	25
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	3.5	4.0	3.5	4.0	3.5	4.0	3.5	4.0
Red Clearance	0.5	2.0	0.5	2.0	0.5	2.0	0.5	2.0

Phase	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0
Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum 1	0	0	0	0	0	0	0	0
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clearance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Phase Vehicle Basic Timing Data

Date
11/4/20

Time
10:05:26

Intersection Name: Academy/Pendleton

Source: Database

Phase	1	2	3	4	5	6	7	8
Minimum Green	0	18	3	8	0	0	5	8
Passage	0.0	4.5	2.0	3.0	0.0	0.0	3.0	3.0
Maximum 1	0	60	20	30	0	0	30	30
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	3.0	4.0	3.5	4.0	3.0	3.0	3.5	4.0
Red Clearance	0.0	2.0	0.5	2.0	0.0	0.0	0.5	2.0

Phase	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0
Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum 1	0	0	0	0	0	0	0	0
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clearance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Phase Vehicle Basic Timing Data

Date
11/4/20

Time
10:05:57

Intersection Name Pleasantburg/Mauldin Rd.

Source Database

Phase	1	2	3	4	5	6	7	8
Minimum Green	5	18	6	10	6	18	5	10
Passage	3.0	4.0	3.5	3.5	3.5	4.0	3.0	3.5
Maximum 1	15	60	18	40	18	60	15	40
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	3.8	4.0	3.8	4.0	3.8	4.0	3.8	4.0
Red Clearance	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

Phase	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0
Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum 1	0	0	0	0	0	0	0	0
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clearance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Phase Vehicle Basic Timing Data

Date
11/4/20

Time
10:07:22

Intersection Name: Pleaburg / Rutherford Rd 2070

Source: Database

Phase	1	2	3	4	5	6	7	8
Minimum Green	3	20	3	10	3	20	3	10
Passage	2.0	3.0	2.0	2.0	2.0	3.0	2.0	2.0
Maximum 1	20	35	15	30	30	35	15	30
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	3.7	4.3	4.4	4.0	3.7	4.3	4.4	4.0
Red Clearance	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

Phase	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0
Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum 1	0	0	0	0	0	0	0	0
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clearance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Phase Vehicle Basic Timing Data

Date
11/4/20

Time
10:07:59

Intersection Name Haywood/Pelham

Source Database

Phase	1	2	3	4	5	6	7	8
Minimum Green	3	10	3	10	3	10	3	10
Passage	2.0	3.0	2.0	2.0	2.0	3.0	2.0	2.0
Maximum 1	20	40	40	20	25	40	20	20
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	3.5	4.0	3.5	4.0	3.5	4.0	3.5	4.0
Red Clearance	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0

Phase	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0
Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum 1	0	0	0	0	0	0	0	0
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clearance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Phase Vehicle Basic Timing Data

Date
11/4/20

Time
10:08:33

Intersection Name Augusta/Mauldin/Potomac

Source Database

Phase	1	2	3	4	5	6	7	8
Minimum Green	0	20	0	8	10	20	0	8
Passage	0.0	3.5	0.0	3.0	3.5	3.5	0.0	3.0
Maximum 1	0	60	0	35	33	60	0	35
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	3.0	4.0	3.0	4.0	3.5	4.0	3.0	4.0
Red Clearance	0.0	2.0	0.0	2.5	1.0	2.0	0.0	2.5

Phase	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0
Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum 1	0	0	0	0	0	0	0	0
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clearance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Phase Vehicle Basic Timing Data

Date
11/4/20

Time
10:08:56

Intersection Name Pleasantburg/Cleveland

Source Database

Phase	1	2	3	4	5	6	7	8
Minimum Green	3	23	3	5	5	23	3	5
Passage	2.0	4.0	2.0	3.0	3.0	4.0	2.0	3.0
Maximum 1	12	50	12	30	30	50	12	30
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	3.0	5.0	3.5	4.0	3.0	5.0	3.5	4.0
Red Clearance	1.0	2.0	0.5	2.0	1.0	2.0	0.5	2.0

Phase	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0
Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum 1	0	0	0	0	0	0	0	0
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clearance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Phase Vehicle Basic Timing Data

Date
11/4/20

Time
10:10:11

Intersection Name: Roper Mtn./Woodruff Rd.

Source: Database

Phase	1	2	3	4	5	6	7	8
Minimum Green	6	10	10	10	0	10	10	10
Passage	4.0	4.0	2.0	6.0	0.0	4.0	2.0	6.0
Maximum 1	50	30	15	25	0	30	15	25
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	4.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
Red Clearance	1.0	2.0	1.0	2.0	0.0	2.0	1.0	2.0

Phase	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0
Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum 1	0	0	0	0	0	0	0	0
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clearance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Phase Vehicle Basic Timing Data

Date
1/22/20

Time
10:18:51

Intersection Name Augusta/Church/Mills 2070

Source Database

Phase	1	2	3	4	5	6	7	8
Minimum Green	3	10	5	10	3	10	5	10
Passage	2.0	4.0	3.0	3.0	2.0	4.0	3.0	3.0
Maximum 1	15	35	20	30	15	35	20	30
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	3.5	4.0	3.0	4.0	3.5	4.0	3.0	4.0
Red Clearance	1.5	2.0	1.0	2.0	1.5	2.0	1.0	2.0

Phase	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0
Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum 1	0	0	0	0	0	0	0	0
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clearance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Phase Vehicle Basic Timing Data

Date
1/22/20

Time
10:19:19

Intersection Name: Cleveland/ Faris 2070

Source: Database

Phase	1	2	3	4	5	6	7	8
Minimum Green	3	8	3	8	3	8	0	8
Passage	2.0	4.0	2.0	4.0	2.0	4.0	0.0	4.0
Maximum 1	13	27	12	35	13	27	0	35
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	3.5	4.0	3.5	4.0	3.5	4.0	3.0	4.0
Red Clearance	0.5	2.0	0.5	2.0	0.5	2.0	0.0	2.0

Phase	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0
Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum 1	0	0	0	0	0	0	0	0
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clearance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Phase Vehicle Basic Timing Data

Date
1/22/20

Time
10:19:51

Intersection Name Laurens/Woodruff 2070

Source Database

Phase	1	2	3	4	5	6	7	8
Minimum Green	3	10	4	3	0	10	0	0
Passage	2.0	5.0	3.0	2.0	0.0	5.0	0.0	0.0
Maximum 1	25	50	12	25	0	50	0	0
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	4.0	4.0	4.0	4.0	3.0	4.0	3.0	3.0
Red Clearance	1.0	2.0	2.0	2.0	0.0	2.0	0.0	0.0

Phase	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0
Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum 1	0	0	0	0	0	0	0	0
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clearance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Phase Vehicle Basic Timing Data

Date
1/22/20

Time
10:20:09

Intersection Name Academy/College

Source Database

Phase	1	2	3	4	5	6	7	8
Minimum Green	0	10	3	10	0	0	0	0
Passage	0.0	3.0	2.0	3.0	0.0	0.0	0.0	0.0
Maximum 1	0	25	12	20	0	0	0	0
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	3.0	4.0	3.5	4.0	3.0	3.0	3.0	3.0
Red Clearance	0.0	2.0	0.5	2.0	0.0	0.0	0.0	0.0

Phase	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0
Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum 1	0	0	0	0	0	0	0	0
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clearance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Phase Vehicle Basic Timing Data

Date
1/22/20

Time
10:20:35

Intersection Name Rutherford/Stone

Source Database

Phase	1	2	3	4	5	6	7	8
Minimum Green	0	14	5	8	6	14	5	8
Passage	0.0	4.0	2.5	3.0	2.5	4.0	2.5	3.0
Maximum 1	0	40	15	30	25	40	20	30
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	3.0	4.0	3.5	4.0	3.6	4.0	3.5	4.0
Red Clearance	0.0	2.0	1.0	2.0	1.5	2.0	1.0	2.0

Phase	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0
Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum 1	0	0	0	0	0	0	0	0
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clearance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Phase Vehicle Basic Timing Data

Date
1/22/20

Time
10:21:18

Intersection Name E. North/Pelham/North Hills

Source Database

Phase	1	2	3	4	5	6	7	8
Minimum Green	3	15	8	3	3	15	0	0
Passage	2.0	4.0	3.0	2.0	2.0	4.0	0.0	0.0
Maximum 1	12	40	35	12	10	40	0	0
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	3.5	4.0	4.0	3.5	3.5	4.0	3.0	3.0
Red Clearance	1.0	2.0	2.0	2.0	1.0	2.0	0.0	0.0

Phase	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0
Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum 1	0	0	0	0	0	0	0	0
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clearance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Phase Vehicle Basic Timing Data

Date
1/22/20

Time
10:23:46

Intersection Name: Laurens/E. Parkins Mill 2070

Source: Database

Phase	1	2	3	4	5	6	7	8
Minimum Green	3	25	3	5	3	25	3	5
Passage	2.0	4.5	2.0	3.0	2.0	4.5	2.0	3.0
Maximum 1	16	50	15	25	12	50	12	25
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	3.5	5.0	4.0	4.0	3.5	5.0	3.5	4.0
Red Clearance	0.5	2.0	2.0	2.0	0.5	2.0	0.5	2.0

Phase	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0
Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum 1	0	0	0	0	0	0	0	0
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clearance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Phase Vehicle Basic Timing Data

Date
1/22/20

Time
10:24:22

Intersection Name Roper Mtn./Frontage

Source Database

Phase	1	2	3	4	5	6	7	8
Minimum Green	0	25	0	5	5	25	0	6
Passage	0.0	3.0	0.0	3.0	3.0	3.0	0.0	3.0
Maximum 1	0	35	0	15	20	35	0	20
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	3.0	4.0	3.0	4.0	3.5	4.0	3.0	4.0
Red Clearance	0.0	2.0	0.0	2.0	2.0	2.0	0.0	2.0

Phase	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0
Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum 1	0	0	0	0	0	0	0	0
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clearance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Phase Vehicle Basic Timing Data

Date
1/22/20

Time
10:25:56

Intersection Name: Laurens/Fairforest 2070

Source: Database

Phase	1	2	3	4	5	6	7	8
Minimum Green	4	35	6	4	6	35	3	4
Passage	3.0	5.0	3.5	3.0	3.0	5.0	2.0	3.0
Maximum 1	20	60	30	25	25	60	12	25
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	3.5	4.5	4.0	4.0	3.0	4.5	4.0	4.0
Red Clearance	1.0	2.0	2.0	2.0	1.0	2.0	2.0	2.0

Phase	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0
Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum 1	0	0	0	0	0	0	0	0
Maximum 2	0	0	0	0	0	0	0	0
Yellow Change	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clearance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

APPENDIX F – Synchro File Outputs

#1 - #2 Haywood Road at I-385 Ramps

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	228	0	589	103	927	0	0	1254	749
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Storage Length (ft)	0		0	510		700	0		0	180		275
Storage Lanes	0		0	1		2	2		0	2		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	0	0	0	1504	1504	2493	3072	3167	0	0	5733	1417
Flt Permitted				0.950	0.950		0.950					
Satd. Flow (perm)	0	0	0	1504	1504	2493	3072	3167	0	0	5733	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						238						832
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		401			1308			530			608	
Travel Time (s)		7.8			25.5			9.0			10.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)				50%								
Lane Group Flow (vph)	0	0	0	126	127	654	114	1030	0	0	1393	832
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Right	R NA	Left	L NA	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			-18			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					4		5	2			6	
Permitted Phases				4		4						6
Minimum Split (s)				25.0	25.0	25.0	21.0	22.0			22.0	22.0
Total Split (s)				38.0	38.0	38.0	22.0	82.0			60.0	60.0
Total Split (%)				31.7%	31.7%	31.7%	18.3%	68.3%			50.0%	50.0%
Maximum Green (s)				31.5	31.5	31.5	15.5	75.5			53.5	53.5
Yellow Time (s)				4.0	4.0	4.0	4.0	4.5			4.5	4.5
All-Red Time (s)				2.5	2.5	2.5	2.5	2.0			2.0	2.0
Lost Time Adjust (s)				-2.5	-2.5	-2.5	-2.5	-2.5			-2.5	-2.5
Total Lost Time (s)				4.0	4.0	4.0	4.0	4.0			4.0	4.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Walk Time (s)				4.0	4.0	4.0		4.0			4.0	4.0
Flash Dont Walk (s)				14.0	14.0	14.0		9.0			9.0	9.0
Pedestrian Calls (#/hr)				30	30	30		30			30	30
Act Effct Green (s)				34.0	34.0	34.0	18.0	78.0			56.0	56.0
Actuated g/C Ratio				0.28	0.28	0.28	0.15	0.65			0.47	0.47
v/c Ratio				0.30	0.30	0.75	0.25	0.50			0.52	0.75
Control Delay				36.0	36.0	30.5	77.3	12.6			23.4	6.5
Queue Delay				0.0	0.0	0.0	0.0	0.7			0.0	0.0
Total Delay				36.0	36.0	30.5	77.3	13.2			23.4	6.5
LOS				D	D	C	E	B			C	A
Approach Delay					32.0			19.6			17.1	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS					C			B			B	
Queue Length 50th (ft)				80	81	170	36	216			215	0
Queue Length 95th (ft)				137	140	250	48	221			250	87
Internal Link Dist (ft)		321			1228			450			528	
Turn Bay Length (ft)				510		700						275
Base Capacity (vph)				426	426	876	460	2058			2675	1105
Starvation Cap Reductn				0	0	0	0	619			0	0
Spillback Cap Reductn				0	0	0	0	0			0	0
Storage Cap Reductn				0	0	0	0	0			0	0
Reduced v/c Ratio				0.30	0.30	0.75	0.25	0.72			0.52	0.75

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 106 (88%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 70
Control Type: Pretimed
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 20.9 Intersection LOS: C
Intersection Capacity Utilization 85.2% ICU Level of Service E
Analysis Period (min) 25

Splits and Phases: 1: Haywood Rd. & I-385 NB Ramp

HCM 2010 Computation does not support turning movement with Shared and Exclusive lanes.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	467	7	325	0	0	0	0	408	165	616	927	0
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Lane Width (ft)	12	12	12	12	12	12	12	12	13	12	12	12
Storage Length (ft)	0		400	0		0	230		0	0		0
Storage Lanes	1		2	0		0	2		1	2		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1504	1510	2493	0	0	0	0	5733	1464	3072	3167	0
Flt Permitted	0.950	0.954								0.950		
Satd. Flow (perm)	1504	1510	2493	0	0	0	0	5733	1464	3072	3167	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			198						183			
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		697			1078			647			530	
Travel Time (s)		13.6			21.0			11.0			9.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)	49%											
Lane Group Flow (vph)	265	262	361	0	0	0	0	453	183	684	1030	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Right	Right	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		-18			18			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.11	1.15	1.15	1.15
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Perm					NA	Perm	Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Minimum Split (s)	20.0	20.0	20.0					23.0	23.0	14.0	23.0	
Total Split (s)	44.0	44.0	44.0					42.0	42.0	34.0	76.0	
Total Split (%)	36.7%	36.7%	36.7%					35.0%	35.0%	28.3%	63.3%	
Maximum Green (s)	37.5	37.5	37.5					35.5	35.5	27.5	69.5	
Yellow Time (s)	4.0	4.0	4.0					4.5	4.5	4.0	4.5	
All-Red Time (s)	2.5	2.5	2.5					2.0	2.0	2.5	2.0	
Lost Time Adjust (s)	-2.5	-2.5	-2.5					-2.5	-2.5	-2.5	-2.5	
Total Lost Time (s)	4.0	4.0	4.0					4.0	4.0	4.0	4.0	
Lead/Lag								Lead	Lead	Lag		
Lead-Lag Optimize?								Yes	Yes	Yes		
Walk Time (s)	4.0	4.0	4.0					4.0	4.0		4.0	
Flash Dont Walk (s)	9.0	9.0	9.0					12.0	12.0		12.0	
Pedestrian Calls (#/hr)	30	30	30					30	30		30	
Act Effct Green (s)	40.0	40.0	40.0					38.0	38.0	30.0	72.0	
Actuated g/C Ratio	0.33	0.33	0.33					0.32	0.32	0.25	0.60	
v/c Ratio	0.53	0.52	0.37					0.25	0.31	0.89	0.54	
Control Delay	37.1	36.8	14.4					30.9	5.8	36.7	11.7	
Queue Delay	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay	37.1	36.8	14.4					30.9	5.8	36.7	11.8	
LOS	D	D	B					C	A	D	B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		27.8						23.6			21.7	
Approach LOS		C						C			C	
Queue Length 50th (ft)	173	171	51					75	0	249	118	
Queue Length 95th (ft)	266	262	96					99	52	301	132	
Internal Link Dist (ft)		617			998			567			450	
Turn Bay Length (ft)			400									
Base Capacity (vph)	501	503	963					1815	588	768	1900	
Starvation Cap Reductn	0	0	0					0	0	0	40	
Spillback Cap Reductn	0	0	0					0	0	0	0	
Storage Cap Reductn	0	0	0					0	0	0	0	
Reduced v/c Ratio	0.53	0.52	0.37					0.25	0.31	0.89	0.55	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 79 (66%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Pretimed	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 23.8	Intersection LOS: C
Intersection Capacity Utilization 85.2%	ICU Level of Service E
Analysis Period (min) 25	

Splits and Phases: 2: Haywood Rd. & I-385 SB Ramp

HCM 2010 Computation does not support turning movement with Shared and Exclusive lanes.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	441	0	921	222	1337	0	0	1261	434
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Storage Length (ft)	0		0	510		700	0		0	180		275
Storage Lanes	0		0	1		2	2		0	2		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	0	0	0	1504	1504	2493	3072	3167	0	0	5733	1417
Flt Permitted				0.950	0.950		0.950					
Satd. Flow (perm)	0	0	0	1504	1504	2493	3072	3167	0	0	5733	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						108						482
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		401			1308			530			608	
Travel Time (s)		7.8			25.5			9.0			10.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)				50%								
Lane Group Flow (vph)	0	0	0	245	245	1023	247	1486	0	0	1401	482
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Right	R NA	Left	L NA	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			-18			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					4		5	2			6	
Permitted Phases				4		4						6
Minimum Split (s)				25.0	25.0	25.0	21.0	22.0			22.0	22.0
Total Split (s)				35.0	35.0	35.0	25.0	91.0			66.0	66.0
Total Split (%)				27.8%	27.8%	27.8%	19.8%	72.2%			52.4%	52.4%
Maximum Green (s)				28.5	28.5	28.5	18.5	84.5			59.5	59.5
Yellow Time (s)				4.0	4.0	4.0	4.0	4.5			4.5	4.5
All-Red Time (s)				2.5	2.5	2.5	2.5	2.0			2.0	2.0
Lost Time Adjust (s)				-2.5	-2.5	-2.5	-2.5	-2.5			-2.5	-2.5
Total Lost Time (s)				4.0	4.0	4.0	4.0	4.0			4.0	4.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Walk Time (s)				4.0	4.0	4.0		4.0			4.0	4.0
Flash Dont Walk (s)				14.0	14.0	14.0		9.0			9.0	9.0
Pedestrian Calls (#/hr)				30	30	30		30			30	30
Act Effct Green (s)				31.0	31.0	31.0	21.0	87.0			62.0	62.0
Actuated g/C Ratio				0.25	0.25	0.25	0.17	0.69			0.49	0.49
v/c Ratio				0.66	0.66	1.47	0.48	0.68			0.50	0.51
Control Delay				52.9	52.9	395.0	59.4	18.7			22.3	3.6
Queue Delay				0.0	0.0	0.0	0.0	47.9			0.0	0.0
Total Delay				52.9	52.9	395.0	59.4	66.6			22.3	3.6
LOS				D	D	F	E	E			C	A
Approach Delay					284.2			65.6			17.5	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS					F			E			B	
Queue Length 50th (ft)				190	190	~615	63	670			217	0
Queue Length 95th (ft)				291	291	#763	100	758			250	56
Internal Link Dist (ft)		321			1228			450			528	
Turn Bay Length (ft)				510		700						275
Base Capacity (vph)				370	370	694	512	2186			2821	942
Starvation Cap Reductn				0	0	0	0	779			0	0
Spillback Cap Reductn				0	0	0	0	0			0	0
Storage Cap Reductn				0	0	0	0	0			0	0
Reduced v/c Ratio				0.66	0.66	1.47	0.48	1.06			0.50	0.51

Intersection Summary

Area Type: Other
Cycle Length: 126
Actuated Cycle Length: 126
Offset: 121.5 (96%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 90
Control Type: Pretimed
Maximum v/c Ratio: 1.47
Intersection Signal Delay: 112.4 Intersection LOS: F
Intersection Capacity Utilization 84.0% ICU Level of Service E
Analysis Period (min) 25

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Haywood Rd. & I-385 NB Ramp

HCM 2010 Computation does not support turning movement with Shared and Exclusive lanes.

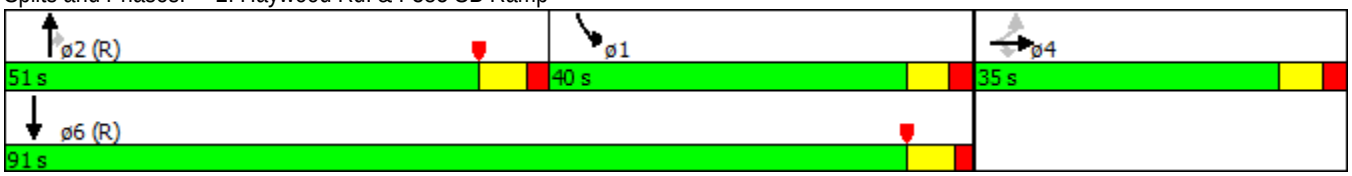
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	419	1	459	0	0	0	0	1163	474	594	1037	0
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Lane Width (ft)	12	12	12	12	12	12	12	12	13	12	12	12
Storage Length (ft)	0		400	0		0	230		0	0		0
Storage Lanes	1		2	0		0	2		1	2		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1504	1509	2493	0	0	0	0	5733	1464	3072	3167	0
Flt Permitted	0.950	0.953								0.950		
Satd. Flow (perm)	1504	1509	2493	0	0	0	0	5733	1464	3072	3167	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			212						525			
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		697			1078			647			530	
Travel Time (s)		13.6			21.0			11.0			9.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)	50%											
Lane Group Flow (vph)	233	234	510	0	0	0	0	1292	527	660	1152	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Right	Right	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		-18			18			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.11	1.15	1.15	1.15
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Perm					NA	Perm	Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Minimum Split (s)	20.0	20.0	20.0					23.0	23.0	14.0	23.0	
Total Split (s)	35.0	35.0	35.0					51.0	51.0	40.0	91.0	
Total Split (%)	27.8%	27.8%	27.8%					40.5%	40.5%	31.7%	72.2%	
Maximum Green (s)	28.5	28.5	28.5					44.5	44.5	33.5	84.5	
Yellow Time (s)	4.0	4.0	4.0					4.5	4.5	4.0	4.5	
All-Red Time (s)	2.5	2.5	2.5					2.0	2.0	2.5	2.0	
Lost Time Adjust (s)	-2.5	-2.5	-2.5					-2.5	-2.5	-2.5	-2.5	
Total Lost Time (s)	4.0	4.0	4.0					4.0	4.0	4.0	4.0	
Lead/Lag								Lead	Lead	Lag		
Lead-Lag Optimize?								Yes	Yes	Yes		
Walk Time (s)	4.0	4.0	4.0					4.0	4.0		4.0	
Flash Dont Walk (s)	9.0	9.0	9.0					12.0	12.0		12.0	
Pedestrian Calls (#/hr)	30	30	30					30	30		30	
Act Effct Green (s)	31.0	31.0	31.0					47.0	47.0	36.0	87.0	
Actuated g/C Ratio	0.25	0.25	0.25					0.37	0.37	0.29	0.69	
v/c Ratio	0.63	0.63	0.66					0.60	0.60	0.75	0.53	
Control Delay	51.3	51.3	29.0					33.4	5.6	25.0	12.7	
Queue Delay	0.0	0.0	0.0					0.5	0.0	0.0	0.1	
Total Delay	51.3	51.3	29.0					33.9	5.6	25.0	12.7	
LOS	D	D	C					C	A	C	B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		39.7						25.7			17.2	
Approach LOS		D						C			B	
Queue Length 50th (ft)	178	180	125					245	1	252	234	
Queue Length 95th (ft)	274	276	194					285	81	321	266	
Internal Link Dist (ft)		617			998			567			450	
Turn Bay Length (ft)			400									
Base Capacity (vph)	370	371	773					2138	875	877	2186	
Starvation Cap Reductn	0	0	0					0	0	0	119	
Spillback Cap Reductn	0	0	0					384	0	0	0	
Storage Cap Reductn	0	0	0					0	0	0	0	
Reduced v/c Ratio	0.63	0.63	0.66					0.74	0.60	0.75	0.56	

Intersection Summary

Area Type: Other
Cycle Length: 126
Actuated Cycle Length: 126
Offset: 81.5 (65%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 60
Control Type: Pretimed
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 25.3 Intersection LOS: C
Intersection Capacity Utilization 84.0% ICU Level of Service E
Analysis Period (min) 25

Splits and Phases: 2: Haywood Rd. & I-385 SB Ramp



HCM 2010 Computation does not support turning movement with Shared and Exclusive lanes.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	228	0	589	103	927	0	0	1254	749
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Storage Length (ft)	0		0	510		700	0		0	180		275
Storage Lanes	0		0	1		2	2		0	2		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	0	0	0	1504	1235	2578	3072	3167	0	0	5733	1417
Flt Permitted				0.950	0.995		0.950					
Satd. Flow (perm)	0	0	0	1504	1235	2578	3072	3167	0	0	5733	1417
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)												832
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		401			1308			530			608	
Travel Time (s)		7.8			25.5			9.0			10.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)				10%		31%						
Lane Group Flow (vph)	0	0	0	228	228	451	114	1030	0	0	1393	832
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Right	R NA	Left	L NA	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			-18			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					4		5	2			6	
Permitted Phases				4		4						6
Minimum Split (s)				25.0	25.0	25.0	21.0	22.0			22.0	22.0
Total Split (s)				38.0	38.0	38.0	22.0	82.0			60.0	60.0
Total Split (%)				31.7%	31.7%	31.7%	18.3%	68.3%			50.0%	50.0%
Maximum Green (s)				31.5	31.5	31.5	15.5	75.5			53.5	53.5
Yellow Time (s)				4.0	4.0	4.0	4.0	4.5			4.5	4.5
All-Red Time (s)				2.5	2.5	2.5	2.5	2.0			2.0	2.0
Lost Time Adjust (s)				-2.5	-2.5	-2.5	-2.5	-2.5			-2.5	-2.5
Total Lost Time (s)				4.0	4.0	4.0	4.0	4.0			4.0	4.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Walk Time (s)				4.0	4.0	4.0		4.0			4.0	4.0
Flash Dont Walk (s)				14.0	14.0	14.0		9.0			9.0	9.0
Pedestrian Calls (#/hr)				30	30	30		30			30	30
Act Effct Green (s)				34.0	34.0	34.0	18.0	78.0			56.0	56.0
Actuated g/C Ratio				0.28	0.28	0.28	0.15	0.65			0.47	0.47
v/c Ratio				0.54	0.65	0.62	0.25	0.50			0.52	0.75
Control Delay				41.9	48.2	41.8	77.3	12.6			23.4	6.5
Queue Delay				0.0	0.0	0.0	0.0	0.7			0.0	0.0
Total Delay				41.9	48.2	41.8	77.3	13.2			23.4	6.5
LOS				D	D	D	E	B			C	A
Approach Delay					43.4			19.6			17.1	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS					D			B			B	
Queue Length 50th (ft)				156	180	167	36	216			215	0
Queue Length 95th (ft)				245	288	227	48	221			250	87
Internal Link Dist (ft)		321			1228			450			528	
Turn Bay Length (ft)				510		700						275
Base Capacity (vph)				426	349	730	460	2058			2675	1105
Starvation Cap Reductn				0	0	0	0	619			0	0
Spillback Cap Reductn				0	0	0	0	0			0	0
Storage Cap Reductn				0	0	0	0	0			0	0
Reduced v/c Ratio				0.54	0.65	0.62	0.25	0.72			0.52	0.75

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 106 (88%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 70
Control Type: Pretimed
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 23.4 Intersection LOS: C
Intersection Capacity Utilization 85.2% ICU Level of Service E
Analysis Period (min) 25

Splits and Phases: 1: Haywood Rd. & I-385 NB Ramp

HCM 2010 Computation does not support turning movement with Shared and Exclusive lanes.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	467	7	325	0	0	0	0	408	165	616	927	0
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Lane Width (ft)	12	12	12	12	12	12	12	12	13	12	12	12
Storage Length (ft)	0		400	0		0	230		0	0		0
Storage Lanes	1		2	0		0	2		1	2		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1504	1510	2493	0	0	0	0	5733	1464	3072	3167	0
Flt Permitted	0.950	0.954								0.950		
Satd. Flow (perm)	1504	1510	2493	0	0	0	0	5733	1464	3072	3167	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)									183			
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		697			1078			647			530	
Travel Time (s)		13.6			21.0			11.0			9.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)	49%											
Lane Group Flow (vph)	265	262	361	0	0	0	0	453	183	684	1030	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Right	Right	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		-18			18			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.11	1.15	1.15	1.15
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Perm					NA	Perm	Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Minimum Split (s)	20.0	20.0	20.0					23.0	23.0	14.0	23.0	
Total Split (s)	44.0	44.0	44.0					42.0	42.0	34.0	76.0	
Total Split (%)	36.7%	36.7%	36.7%					35.0%	35.0%	28.3%	63.3%	
Maximum Green (s)	37.5	37.5	37.5					35.5	35.5	27.5	69.5	
Yellow Time (s)	4.0	4.0	4.0					4.5	4.5	4.0	4.5	
All-Red Time (s)	2.5	2.5	2.5					2.0	2.0	2.5	2.0	
Lost Time Adjust (s)	-2.5	-2.5	-2.5					-2.5	-2.5	-2.5	-2.5	
Total Lost Time (s)	4.0	4.0	4.0					4.0	4.0	4.0	4.0	
Lead/Lag								Lead	Lead	Lag		
Lead-Lag Optimize?								Yes	Yes	Yes		
Walk Time (s)	4.0	4.0	4.0					4.0	4.0		4.0	
Flash Dont Walk (s)	9.0	9.0	9.0					12.0	12.0		12.0	
Pedestrian Calls (#/hr)	30	30	30					30	30		30	
Act Effct Green (s)	40.0	40.0	40.0					38.0	38.0	30.0	72.0	
Actuated g/C Ratio	0.33	0.33	0.33					0.32	0.32	0.25	0.60	
v/c Ratio	0.53	0.52	0.43					0.25	0.31	0.89	0.54	
Control Delay	37.1	36.8	33.2					30.9	5.8	36.7	11.0	
Queue Delay	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay	37.1	36.8	33.2					30.9	5.8	36.7	11.0	
LOS	D	D	C					C	A	D	B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		35.4						23.6			21.2	
Approach LOS		D						C			C	
Queue Length 50th (ft)	173	171	123					75	0	249	118	
Queue Length 95th (ft)	266	262	173					99	52	301	132	
Internal Link Dist (ft)		617			998			567			450	
Turn Bay Length (ft)			400									
Base Capacity (vph)	501	503	831					1815	588	768	1900	
Starvation Cap Reductn	0	0	0					0	0	0	40	
Spillback Cap Reductn	0	0	0					0	0	0	0	
Storage Cap Reductn	0	0	0					0	0	0	0	
Reduced v/c Ratio	0.53	0.52	0.43					0.25	0.31	0.89	0.55	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 79 (66%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Pretimed	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 25.6	Intersection LOS: C
Intersection Capacity Utilization 85.2%	ICU Level of Service E
Analysis Period (min) 25	

Splits and Phases: 2: Haywood Rd. & I-385 SB Ramp

HCM 2010 Computation does not support turning movement with Shared and Exclusive lanes.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	441	0	921	222	1337	0	0	1261	434
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Storage Length (ft)	0		0	510		700	0		0	180		275
Storage Lanes	0		0	1		2	2		0	2		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	0	0	0	1504	1260	2578	3072	3167	0	0	5733	1417
Flt Permitted				0.950	0.987		0.950					
Satd. Flow (perm)	0	0	0	1504	1260	2578	3072	3167	0	0	5733	1417
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)												482
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		401			1308			530			608	
Travel Time (s)		7.8			25.5			9.0			10.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)				21%		27%						
Lane Group Flow (vph)	0	0	0	387	379	747	247	1486	0	0	1401	482
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Right	R NA	Left	L NA	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			-18			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					4		5	2			6	
Permitted Phases				4		4						6
Minimum Split (s)				25.0	25.0	25.0	21.0	22.0			22.0	22.0
Total Split (s)				40.0	40.0	40.0	25.0	86.0			61.0	61.0
Total Split (%)				31.7%	31.7%	31.7%	19.8%	68.3%			48.4%	48.4%
Maximum Green (s)				33.5	33.5	33.5	18.5	79.5			54.5	54.5
Yellow Time (s)				4.0	4.0	4.0	4.0	4.5			4.5	4.5
All-Red Time (s)				2.5	2.5	2.5	2.5	2.0			2.0	2.0
Lost Time Adjust (s)				-2.5	-2.5	-2.5	-2.5	-2.5			-2.5	-2.5
Total Lost Time (s)				4.0	4.0	4.0	4.0	4.0			4.0	4.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Walk Time (s)				4.0	4.0	4.0		4.0			4.0	4.0
Flash Dont Walk (s)				14.0	14.0	14.0		9.0			9.0	9.0
Pedestrian Calls (#/hr)				30	30	30		30			30	30
Act Effct Green (s)				36.0	36.0	36.0	21.0	82.0			57.0	57.0
Actuated g/C Ratio				0.29	0.29	0.29	0.17	0.65			0.45	0.45
v/c Ratio				0.90	1.05	1.01	0.48	0.72			0.54	0.53
Control Delay				72.0	129.3	93.7	43.0	24.1			26.0	4.2
Queue Delay				0.0	0.0	0.0	0.0	78.7			0.0	0.0
Total Delay				72.0	129.3	93.7	43.0	102.8			26.0	4.2
LOS				E	F	F	D	F			C	A
Approach Delay					97.1			94.3			20.4	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS					F			F			C	
Queue Length 50th (ft)				320	~391	~343	44	685			236	0
Queue Length 95th (ft)				#515	#620	#484	77	758			272	62
Internal Link Dist (ft)		321			1228			450			528	
Turn Bay Length (ft)				510		700						275
Base Capacity (vph)				429	360	736	512	2061			2593	904
Starvation Cap Reductn				0	0	0	0	780			0	0
Spillback Cap Reductn				0	0	0	0	0			0	0
Storage Cap Reductn				0	0	0	0	0			0	0
Reduced v/c Ratio				0.90	1.05	1.01	0.48	1.16			0.54	0.53

Intersection Summary

Area Type: Other
Cycle Length: 126
Actuated Cycle Length: 126
Offset: 121.5 (96%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 75
Control Type: Pretimed
Maximum v/c Ratio: 1.05
Intersection Signal Delay: 68.0 Intersection LOS: E
Intersection Capacity Utilization 76.8% ICU Level of Service D
Analysis Period (min) 25
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Haywood Rd. & I-385 NB Ramp

HCM 2010 Computation does not support turning movement with Shared and Exclusive lanes.

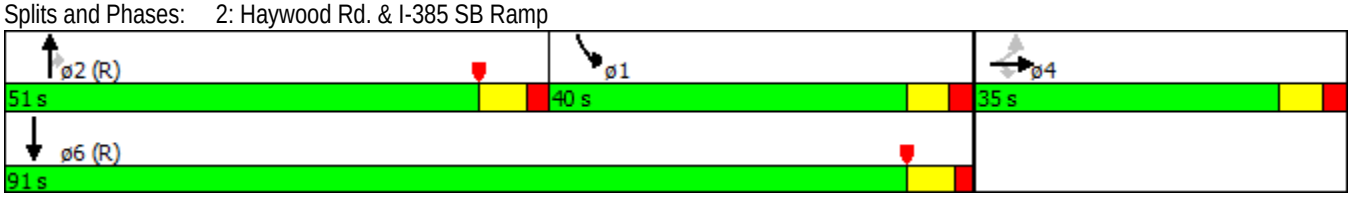
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	419	1	459	0	0	0	0	1163	474	594	1037	0
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Lane Width (ft)	12	12	12	12	12	12	12	12	13	12	12	12
Storage Length (ft)	0		400	0		0	230		0	0		0
Storage Lanes	1		2	0		0	2		1	2		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1504	1509	2493	0	0	0	0	5733	1464	3072	3167	0
Flt Permitted	0.950	0.953								0.950		
Satd. Flow (perm)	1504	1509	2493	0	0	0	0	5733	1464	3072	3167	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)									525			
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		697			1078			647			530	
Travel Time (s)		13.6			21.0			11.0			9.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)	50%											
Lane Group Flow (vph)	233	234	510	0	0	0	0	1292	527	660	1152	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Right	Right	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		-18			18			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.11	1.15	1.15	1.15
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Perm					NA	Perm	Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Minimum Split (s)	20.0	20.0	20.0					23.0	23.0	14.0	23.0	
Total Split (s)	35.0	35.0	35.0					51.0	51.0	40.0	91.0	
Total Split (%)	27.8%	27.8%	27.8%					40.5%	40.5%	31.7%	72.2%	
Maximum Green (s)	28.5	28.5	28.5					44.5	44.5	33.5	84.5	
Yellow Time (s)	4.0	4.0	4.0					4.5	4.5	4.0	4.5	
All-Red Time (s)	2.5	2.5	2.5					2.0	2.0	2.5	2.0	
Lost Time Adjust (s)	-2.5	-2.5	-2.5					-2.5	-2.5	-2.5	-2.5	
Total Lost Time (s)	4.0	4.0	4.0					4.0	4.0	4.0	4.0	
Lead/Lag								Lead	Lead	Lag		
Lead-Lag Optimize?								Yes	Yes	Yes		
Walk Time (s)	4.0	4.0	4.0					4.0	4.0		4.0	
Flash Dont Walk (s)	9.0	9.0	9.0					12.0	12.0		12.0	
Pedestrian Calls (#/hr)	30	30	30					30	30		30	
Act Effct Green (s)	31.0	31.0	31.0					47.0	47.0	36.0	87.0	
Actuated g/C Ratio	0.25	0.25	0.25					0.37	0.37	0.29	0.69	
v/c Ratio	0.63	0.63	0.83					0.60	0.60	0.75	0.53	
Control Delay	51.3	51.3	58.7					33.4	5.6	21.3	10.6	
Queue Delay	0.0	0.0	0.0					0.8	0.0	0.0	0.1	
Total Delay	51.3	51.3	58.7					34.3	5.6	21.3	10.7	
LOS	D	D	E					C	A	C	B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		55.2						25.9			14.6	
Approach LOS		E						C			B	
Queue Length 50th (ft)	178	180	225					245	1	252	234	
Queue Length 95th (ft)	274	276	#319					285	81	321	m261	
Internal Link Dist (ft)		617			998			567			450	
Turn Bay Length (ft)			400									
Base Capacity (vph)	370	371	613					2138	875	877	2186	
Starvation Cap Reductn	0	0	0					0	0	0	112	
Spillback Cap Reductn	0	0	0					497	0	0	0	
Storage Cap Reductn	0	0	0					0	0	0	0	
Reduced v/c Ratio	0.63	0.63	0.83					0.79	0.60	0.75	0.56	

Intersection Summary

Area Type: Other
Cycle Length: 126
Actuated Cycle Length: 126
Offset: 81.5 (65%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 60
Control Type: Pretimed
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 27.7 Intersection LOS: C
Intersection Capacity Utilization 76.8% ICU Level of Service D
Analysis Period (min) 25
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Haywood Rd. & I-385 SB Ramp



HCM 2010 Computation does not support turning movement with Shared and Exclusive lanes.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1254	0	0	0	0	0	927	0	0	0	0
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Satd. Flow (prot)	0	4550	0	0	0	0	0	4550	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	4550	0	0	0	0	0	4550	0	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		40			35			40			35	
Link Distance (ft)		146			171			172			157	
Travel Time (s)		2.5			3.3			2.9			3.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1393	0	0	0	0	0	1030	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA						NA				
Protected Phases		4						2				
Permitted Phases												
Detector Phase		4						2				
Switch Phase												
Minimum Initial (s)		14.0						14.0				
Minimum Split (s)		22.0						22.0				
Total Split (s)		67.0						53.0				
Total Split (%)		55.8%						44.2%				
Maximum Green (s)		61.0						47.0				
Yellow Time (s)		4.0						4.0				
All-Red Time (s)		2.0						2.0				
Lost Time Adjust (s)		-2.0						-2.0				
Total Lost Time (s)		4.0						4.0				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0						3.0				
Recall Mode		Max						C-Max				
Walk Time (s)		4.0						4.0				
Flash Dont Walk (s)		9.0						9.0				
Pedestrian Calls (#/hr)		30						30				
Act Effct Green (s)		63.0						49.0				
Actuated g/C Ratio		0.52						0.41				
v/c Ratio		0.58						0.55				
Control Delay		15.7						23.7				
Queue Delay		0.0						0.5				
Total Delay		15.7						24.1				

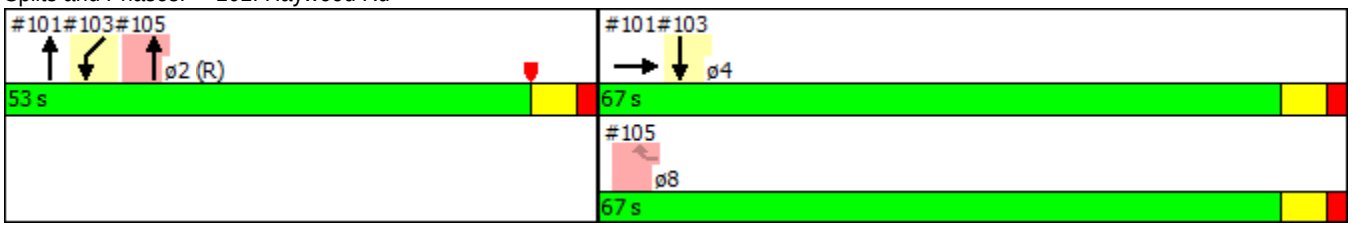
Lane Group	ø8
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	24.0
Total Split (s)	67.0
Total Split (%)	56%
Maximum Green (s)	61.0
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	4.0
Flash Dont Walk (s)	14.0
Pedestrian Calls (#/hr)	30
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		B						C				
Approach Delay		15.7						24.1				
Approach LOS		B						C				
Queue Length 50th (ft)		251						151				
Queue Length 95th (ft)		m279						220				
Internal Link Dist (ft)		66			91			92			77	
Turn Bay Length (ft)												
Base Capacity (vph)		2388						1857				
Starvation Cap Reductn		0						375				
Spillback Cap Reductn		0						0				
Storage Cap Reductn		0						0				
Reduced v/c Ratio		0.58						0.70				

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 11 (9%), Referenced to phase 2:NBT, Start of Yellow
Natural Cycle: 50
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.58
Intersection Signal Delay: 19.3 Intersection LOS: B
Intersection Capacity Utilization 53.8% ICU Level of Service A
Analysis Period (min) 25
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 101: Haywood Rd



Lane Group	ø8
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	408	0	0	0	0	0	0	0	0	927	0
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Satd. Flow (prot)	0	4550	0	0	0	0	0	0	0	0	3167	0
Flt Permitted												
Satd. Flow (perm)	0	4550	0	0	0	0	0	0	0	0	3167	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		40			35			35			40	
Link Distance (ft)		156			183			134			167	
Travel Time (s)		2.7			3.6			2.6			2.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	453	0	0	0	0	0	0	0	0	1030	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA									NA	
Protected Phases		2									4	
Permitted Phases												
Minimum Split (s)		22.0									22.0	
Total Split (s)		39.0									81.0	
Total Split (%)		32.5%									67.5%	
Maximum Green (s)		33.0									75.0	
Yellow Time (s)		4.0									4.0	
All-Red Time (s)		2.0									2.0	
Lost Time Adjust (s)		-2.0									-2.0	
Total Lost Time (s)		4.0									4.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)		4.0									4.0	
Flash Dont Walk (s)		12.0									12.0	
Pedestrian Calls (#/hr)		30									30	
Act Effct Green (s)		35.0									77.0	
Actuated g/C Ratio		0.29									0.64	
v/c Ratio		0.34									0.51	
Control Delay		28.7									2.3	
Queue Delay		0.0									0.0	
Total Delay		28.7									2.3	
LOS		C									A	
Approach Delay		28.7									2.3	
Approach LOS		C									A	
Queue Length 50th (ft)		87									27	
Queue Length 95th (ft)		113									32	

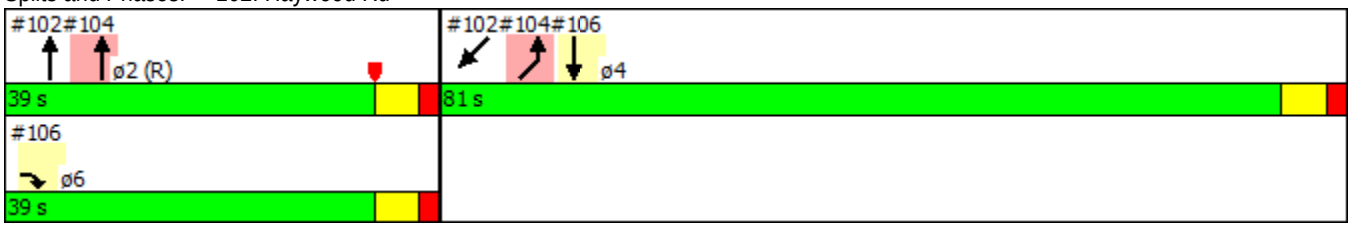
Lane Group	ø6
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	6
Permitted Phases	
Minimum Split (s)	22.0
Total Split (s)	39.0
Total Split (%)	33%
Maximum Green (s)	33.0
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Walk Time (s)	4.0
Flash Dont Walk (s)	12.0
Pedestrian Calls (#/hr)	30
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Internal Link Dist (ft)		76			103			54			87	
Turn Bay Length (ft)												
Base Capacity (vph)		1327									2032	
Starvation Cap Reductn		0									0	
Spillback Cap Reductn		0									0	
Storage Cap Reductn		0									0	
Reduced v/c Ratio		0.34									0.51	

Intersection Summary

Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 17 (14%), Referenced to phase 2:NBT, Start of Yellow	
Natural Cycle: 45	
Control Type: Pretimed	
Maximum v/c Ratio: 0.51	
Intersection Signal Delay: 10.4	Intersection LOS: B
Intersection Capacity Utilization 47.0%	ICU Level of Service A
Analysis Period (min) 25	

Splits and Phases: 102: Haywood Rd



Lane Group	ø6
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

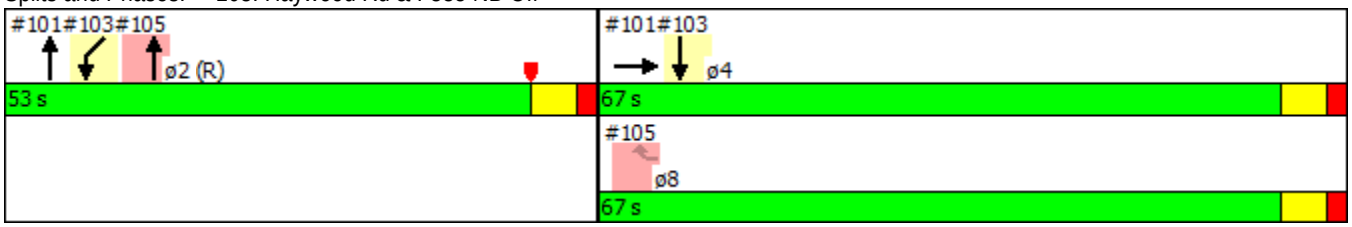
Intersection Summary

Lane Group	NBT	NBR	SBL	SBT	SWL	SWR	ø8
Lane Configurations							
Volume (vph)	0	0	0	1254	228	0	
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	
Satd. Flow (prot)	0	0	0	4550	3072	0	
Flt Permitted					0.950		
Satd. Flow (perm)	0	0	0	4550	3072	0	
Right Turn on Red		Yes			Yes	Yes	
Satd. Flow (RTOR)					58		
Link Speed (mph)	40			40	45		
Link Distance (ft)	181			171	226		
Travel Time (s)	3.1			2.9	3.4		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	0	1393	253	0	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	0			0	24		
Link Offset(ft)	0			0	0		
Crosswalk Width(ft)	16			16	16		
Two way Left Turn Lane							
Headway Factor	1.15	1.15	1.15	1.15	1.15	1.15	
Turning Speed (mph)		9	15		15	9	
Turn Type				NA	Prot		
Protected Phases				4	2		8
Permitted Phases							
Detector Phase				4	2		
Switch Phase							
Minimum Initial (s)				14.0	14.0		5.0
Minimum Split (s)				22.0	22.0		24.0
Total Split (s)				67.0	53.0		67.0
Total Split (%)				55.8%	44.2%		56%
Maximum Green (s)				61.0	47.0		61.0
Yellow Time (s)				4.0	4.0		4.0
All-Red Time (s)				2.0	2.0		2.0
Lost Time Adjust (s)				-2.0	-2.0		
Total Lost Time (s)				4.0	4.0		
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)				3.0	3.0		3.0
Recall Mode				Max	C-Max		None
Walk Time (s)				4.0	4.0		4.0
Flash Dont Walk (s)				9.0	9.0		14.0
Pedestrian Calls (#/hr)				30	30		30
Act Effct Green (s)				63.0	49.0		
Actuated g/C Ratio				0.52	0.41		
v/c Ratio				0.58	0.20		
Control Delay				1.0	17.8		
Queue Delay				0.0	0.0		
Total Delay				1.0	17.8		

Lane Group	NBT	NBR	SBL	SBT	SWL	SWR	ø8
LOS				A	B		
Approach Delay				1.0	17.8		
Approach LOS				A	B		
Queue Length 50th (ft)				0	48		
Queue Length 95th (ft)				2	76		
Internal Link Dist (ft)	101			91	146		
Turn Bay Length (ft)							
Base Capacity (vph)				2388	1288		
Starvation Cap Reductn				0	0		
Spillback Cap Reductn				0	0		
Storage Cap Reductn				0	0		
Reduced v/c Ratio				0.58	0.20		

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 11 (9%), Referenced to phase 2:NBT, Start of Yellow	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.58	
Intersection Signal Delay: 3.6	Intersection LOS: A
Intersection Capacity Utilization 51.9%	ICU Level of Service A
Analysis Period (min) 25	

Splits and Phases: 103: Haywood Rd & I-385 NB Off

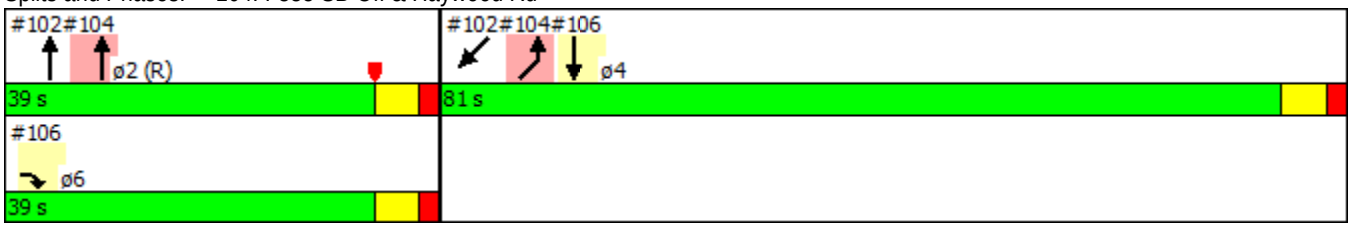


Lane Group	NBL	NBT	SBT	SBR	NEL	NER	ø6
Lane Configurations							
Volume (vph)	0	408	0	0	467	0	
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	
Satd. Flow (prot)	0	4550	0	0	3072	0	
Flt Permitted					0.950		
Satd. Flow (perm)	0	4550	0	0	3072	0	
Right Turn on Red				Yes	Yes	Yes	
Satd. Flow (RTOR)					274		
Link Speed (mph)		35	40		35		
Link Distance (ft)		183	174		202		
Travel Time (s)		3.6	3.0		3.9		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	453	0	0	519	0	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Left	Left	Right	Left	Right	
Median Width(ft)		0	0		24		
Link Offset(ft)		0	0		0		
Crosswalk Width(ft)		16	16		16		
Two way Left Turn Lane							
Headway Factor	1.15	1.15	1.15	1.15	1.15	1.15	
Turning Speed (mph)	15			9	15	9	
Turn Type		NA			Prot		
Protected Phases		2			4		6
Permitted Phases							
Minimum Split (s)		22.0			22.0		22.0
Total Split (s)		39.0			81.0		39.0
Total Split (%)		32.5%			67.5%		33%
Maximum Green (s)		33.0			75.0		33.0
Yellow Time (s)		4.0			4.0		4.0
All-Red Time (s)		2.0			2.0		2.0
Lost Time Adjust (s)		-2.0			-2.0		
Total Lost Time (s)		4.0			4.0		
Lead/Lag							
Lead-Lag Optimize?							
Walk Time (s)		4.0			4.0		4.0
Flash Dont Walk (s)		12.0			12.0		12.0
Pedestrian Calls (#/hr)		30			30		30
Act Effct Green (s)		35.0			77.0		
Actuated g/C Ratio		0.29			0.64		
v/c Ratio		0.34			0.25		
Control Delay		3.2			4.4		
Queue Delay		0.2			0.0		
Total Delay		3.4			4.4		
LOS		A			A		
Approach Delay		3.4			4.4		
Approach LOS		A			A		
Queue Length 50th (ft)		4			35		
Queue Length 95th (ft)		5			57		

Lane Group	NBL	NBT	SBT	SBR	NEL	NER	ø6
Internal Link Dist (ft)		103	94		122		
Turn Bay Length (ft)							
Base Capacity (vph)		1327			2069		
Starvation Cap Reductn		306			0		
Spillback Cap Reductn		0			0		
Storage Cap Reductn		0			0		
Reduced v/c Ratio		0.44			0.25		

Intersection Summary	
Area Type: Other	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 17 (14%), Referenced to phase 2:NBT, Start of Yellow	
Natural Cycle: 45	
Control Type: Pretimed	
Maximum v/c Ratio: 0.51	
Intersection Signal Delay: 3.9	Intersection LOS: A
Intersection Capacity Utilization 33.2%	ICU Level of Service A
Analysis Period (min) 25	

Splits and Phases: 104: I-385 SB Off & Haywood Rd

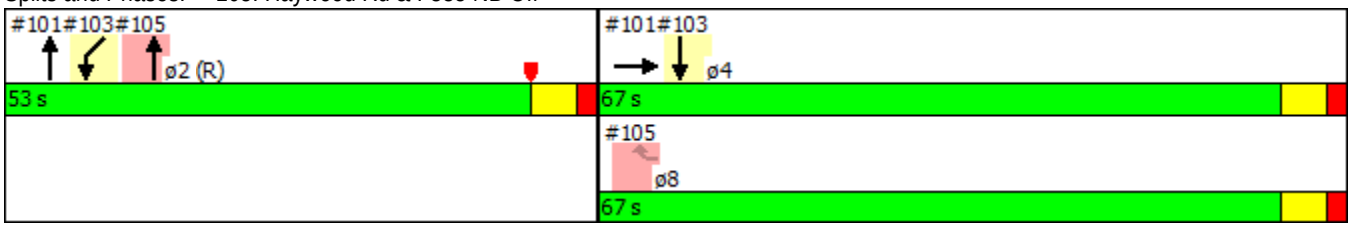


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø4
Lane Configurations							
Volume (vph)	0	589	927	0	0	0	
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	
Satd. Flow (prot)	0	3230	4550	0	0	0	
Flt Permitted							
Satd. Flow (perm)	0	3230	4550	0	0	0	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)		83					
Link Speed (mph)	45		40			40	
Link Distance (ft)	303		157			178	
Travel Time (s)	4.6		2.7			3.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	654	1030	0	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	
Median Width(ft)	0		0			0	
Link Offset(ft)	0		0			0	
Crosswalk Width(ft)	16		16			16	
Two way Left Turn Lane							
Headway Factor	1.15	1.15	1.15	1.15	1.15	1.15	
Turning Speed (mph)	15	9		9	15		
Turn Type		Perm	NA				
Protected Phases			2				4
Permitted Phases		8					
Detector Phase		8	2				
Switch Phase							
Minimum Initial (s)		5.0	14.0				14.0
Minimum Split (s)		24.0	22.0				22.0
Total Split (s)		67.0	53.0				67.0
Total Split (%)		55.8%	44.2%				56%
Maximum Green (s)		61.0	47.0				61.0
Yellow Time (s)		4.0	4.0				4.0
All-Red Time (s)		2.0	2.0				2.0
Lost Time Adjust (s)		-2.0	-2.0				
Total Lost Time (s)		4.0	4.0				
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)		3.0	3.0				3.0
Recall Mode		None	C-Max				Max
Walk Time (s)		4.0	4.0				4.0
Flash Dont Walk (s)		14.0	9.0				9.0
Pedestrian Calls (#/hr)		30	30				30
Act Effct Green (s)		63.0	49.0				
Actuated g/C Ratio		0.52	0.41				
v/c Ratio		0.38	0.55				
Control Delay		15.2	2.3				
Queue Delay		0.0	0.0				
Total Delay		15.2	2.3				

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø4
LOS		B	A				
Approach Delay			2.3				
Approach LOS			A				
Queue Length 50th (ft)		109	5				
Queue Length 95th (ft)		145	5				
Internal Link Dist (ft)	223		77			98	
Turn Bay Length (ft)							
Base Capacity (vph)		1735	1857				
Starvation Cap Reductn		0	0				
Spillback Cap Reductn		0	0				
Storage Cap Reductn		0	0				
Reduced v/c Ratio		0.38	0.55				

Intersection Summary	
Area Type: Other	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 11 (9%), Referenced to phase 2:NBT, Start of Yellow	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.58	
Intersection Signal Delay: 7.3	Intersection LOS: A
Intersection Capacity Utilization 53.8%	ICU Level of Service A
Analysis Period (min) 25	

Splits and Phases: 105: Haywood Rd & I-385 NB Off

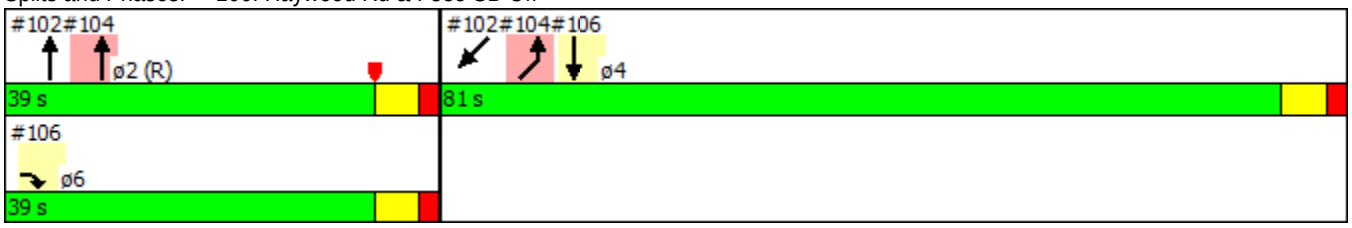


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø2
Lane Configurations							
Volume (vph)	0	325	0	0	927	0	
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	
Satd. Flow (prot)	0	2493	0	0	3167	0	
Flt Permitted							
Satd. Flow (perm)	0	2493	0	0	3167	0	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		231					
Link Speed (mph)	45			40	40		
Link Distance (ft)	296			255	134		
Travel Time (s)	4.5			4.3	2.3		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	361	0	0	1030	0	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	0			0	0		
Link Offset(ft)	0			0	0		
Crosswalk Width(ft)	16			16	16		
Two way Left Turn Lane							
Headway Factor	1.15	1.15	1.15	1.15	1.15	1.15	
Turning Speed (mph)	15	9	15			9	
Turn Type		Prot			NA		
Protected Phases		6			4		2
Permitted Phases							
Minimum Split (s)		22.0			22.0		22.0
Total Split (s)		39.0			81.0		39.0
Total Split (%)		32.5%			67.5%		33%
Maximum Green (s)		33.0			75.0		33.0
Yellow Time (s)		4.0			4.0		4.0
All-Red Time (s)		2.0			2.0		2.0
Lost Time Adjust (s)		-2.0			-2.0		
Total Lost Time (s)		4.0			4.0		
Lead/Lag							
Lead-Lag Optimize?							
Walk Time (s)		4.0			4.0		4.0
Flash Dont Walk (s)		12.0			12.0		12.0
Pedestrian Calls (#/hr)		30			30		30
Act Effct Green (s)		35.0			77.0		
Actuated g/C Ratio		0.29			0.64		
v/c Ratio		0.41			0.51		
Control Delay		13.3			1.0		
Queue Delay		0.0			0.0		
Total Delay		13.3			1.0		
LOS		B			A		
Approach Delay					1.0		
Approach LOS					A		
Queue Length 50th (ft)		42			1		
Queue Length 95th (ft)		89			2		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø2
Internal Link Dist (ft)	216			175	54		
Turn Bay Length (ft)							
Base Capacity (vph)		890			2032		
Starvation Cap Reductn		0			0		
Spillback Cap Reductn		0			0		
Storage Cap Reductn		0			0		
Reduced v/c Ratio		0.41			0.51		

Intersection Summary	
Area Type: Other	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 17 (14%), Referenced to phase 2:NBT, Start of Yellow	
Natural Cycle: 45	
Control Type: Pretimed	
Maximum v/c Ratio: 0.51	
Intersection Signal Delay: 4.2	Intersection LOS: A
Intersection Capacity Utilization 48.0%	ICU Level of Service A
Analysis Period (min) 25	

Splits and Phases: 106: Haywood Rd & I-385 SB Off



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1261	0	0	0	0	0	1337	0	0	0	0
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Satd. Flow (prot)	0	4550	0	0	0	0	0	4550	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	4550	0	0	0	0	0	4550	0	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		40			35			40			35	
Link Distance (ft)		146			171			172			157	
Travel Time (s)		2.5			3.3			2.9			3.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1401	0	0	0	0	0	1486	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA						NA				
Protected Phases		4						2				
Permitted Phases												
Detector Phase		4						2				
Switch Phase												
Minimum Initial (s)		14.0						14.0				
Minimum Split (s)		22.0						22.0				
Total Split (s)		34.0						36.0				
Total Split (%)		48.6%						51.4%				
Maximum Green (s)		28.0						30.0				
Yellow Time (s)		4.0						4.0				
All-Red Time (s)		2.0						2.0				
Lost Time Adjust (s)		-2.0						-2.0				
Total Lost Time (s)		4.0						4.0				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0						3.0				
Recall Mode		Max						C-Max				
Walk Time (s)		4.0						4.0				
Flash Dont Walk (s)		9.0						9.0				
Pedestrian Calls (#/hr)		30						30				
Act Effct Green (s)		30.0						32.0				
Actuated g/C Ratio		0.43						0.46				
v/c Ratio		0.72						0.71				
Control Delay		18.8						9.7				
Queue Delay		0.0						0.1				
Total Delay		18.8						9.8				

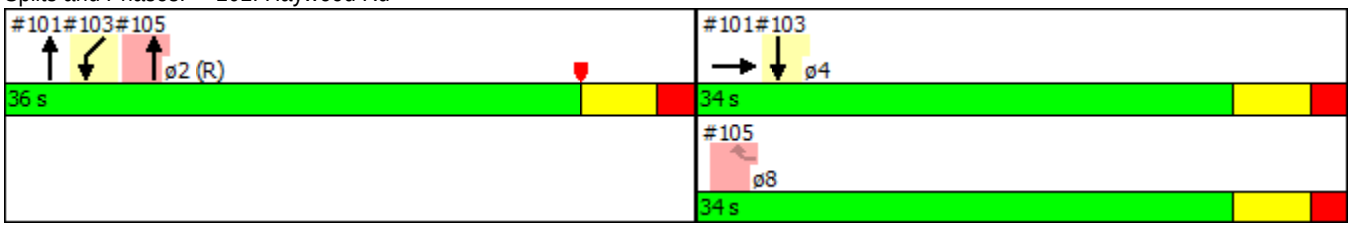
Lane Group	ø8
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	24.0
Total Split (s)	34.0
Total Split (%)	49%
Maximum Green (s)	28.0
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	4.0
Flash Dont Walk (s)	14.0
Pedestrian Calls (#/hr)	30
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		B						A				
Approach Delay		18.8						9.8				
Approach LOS		B						A				
Queue Length 50th (ft)		192						73				
Queue Length 95th (ft)		240						99				
Internal Link Dist (ft)		66			91			92			77	
Turn Bay Length (ft)												
Base Capacity (vph)		1950						2080				
Starvation Cap Reductn		0						83				
Spillback Cap Reductn		0						0				
Storage Cap Reductn		0						0				
Reduced v/c Ratio		0.72						0.74				

Intersection Summary

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 68 (97%), Referenced to phase 2:NBT, Start of Yellow
Natural Cycle: 50
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.73
Intersection Signal Delay: 14.2 Intersection LOS: B
Intersection Capacity Utilization 62.8% ICU Level of Service B
Analysis Period (min) 25

Splits and Phases: 101: Haywood Rd



Lane Group	ø8
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

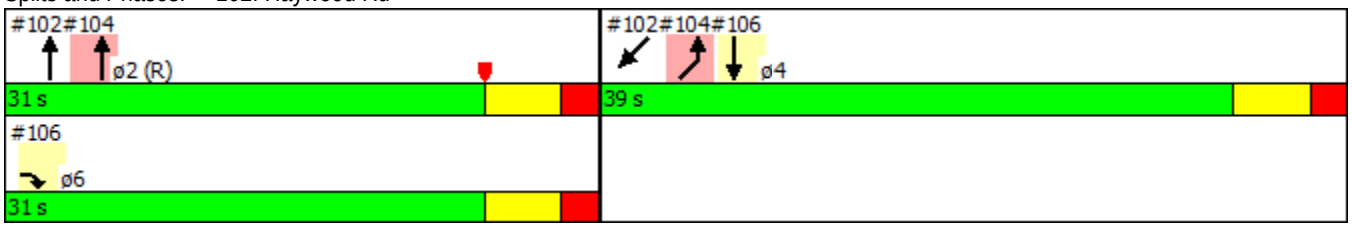
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	1163	0	0	0	0	0	0	0	0	1037	0
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Satd. Flow (prot)	0	4550	0	0	0	0	0	0	0	0	3167	0
Flt Permitted												
Satd. Flow (perm)	0	4550	0	0	0	0	0	0	0	0	3167	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		40			35			35			40	
Link Distance (ft)		156			183			134			167	
Travel Time (s)		2.7			3.6			2.6			2.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1292	0	0	0	0	0	0	0	0	1152	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA									NA	
Protected Phases		2									4	
Permitted Phases												
Detector Phase		2									4	
Switch Phase												
Minimum Initial (s)		14.0									14.0	
Minimum Split (s)		22.0									22.0	
Total Split (s)		31.0									39.0	
Total Split (%)		44.3%									55.7%	
Maximum Green (s)		25.0									33.0	
Yellow Time (s)		4.0									4.0	
All-Red Time (s)		2.0									2.0	
Lost Time Adjust (s)		-2.0									-2.0	
Total Lost Time (s)		4.0									4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0									3.0	
Recall Mode		C-Max									None	
Walk Time (s)		4.0									4.0	
Flash Dont Walk (s)		12.0									12.0	
Pedestrian Calls (#/hr)		30									30	
Act Effct Green (s)		27.0									35.0	
Actuated g/C Ratio		0.39									0.50	
v/c Ratio		0.74									0.73	
Control Delay		19.4									9.6	
Queue Delay		0.0									0.0	
Total Delay		19.4									9.6	

Lane Group	ø6
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	6
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	22.0
Total Split (s)	31.0
Total Split (%)	44%
Maximum Green (s)	25.0
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	4.0
Flash Dont Walk (s)	12.0
Pedestrian Calls (#/hr)	30
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
LOS		B									A	
Approach Delay		19.4									9.6	
Approach LOS		B									A	
Queue Length 50th (ft)		200									88	
Queue Length 95th (ft)		304									119	
Internal Link Dist (ft)		76			103			54			87	
Turn Bay Length (ft)												
Base Capacity (vph)		1755									1583	
Starvation Cap Reductn		0									0	
Spillback Cap Reductn		0									0	
Storage Cap Reductn		0									0	
Reduced v/c Ratio		0.74									0.73	

Intersection Summary	
Area Type:	Other
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 65 (93%), Referenced to phase 2:NBT, Start of Yellow	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 14.8	Intersection LOS: B
Intersection Capacity Utilization 63.8%	ICU Level of Service B
Analysis Period (min) 25	

Splits and Phases: 102: Haywood Rd



Lane Group	ø6
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

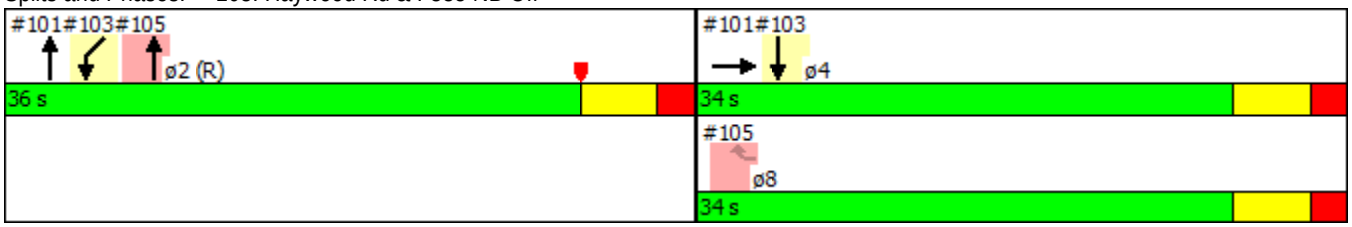
Intersection Summary

Lane Group	NBT	NBR	SBL	SBT	SWL	SWR	ø8
Lane Configurations							
Volume (vph)	0	0	0	1261	441	0	
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	
Satd. Flow (prot)	0	0	0	4550	3072	0	
Flt Permitted					0.950		
Satd. Flow (perm)	0	0	0	4550	3072	0	
Right Turn on Red		Yes			Yes	Yes	
Satd. Flow (RTOR)					24		
Link Speed (mph)	40			40	45		
Link Distance (ft)	181			171	226		
Travel Time (s)	3.1			2.9	3.4		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	0	1401	490	0	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	0			0	24		
Link Offset(ft)	0			0	0		
Crosswalk Width(ft)	16			16	16		
Two way Left Turn Lane							
Headway Factor	1.15	1.15	1.15	1.15	1.15	1.15	
Turning Speed (mph)		9	15		15	9	
Turn Type				NA	Prot		
Protected Phases				4	2		8
Permitted Phases							
Detector Phase				4	2		
Switch Phase							
Minimum Initial (s)				14.0	14.0		5.0
Minimum Split (s)				22.0	22.0		24.0
Total Split (s)				34.0	36.0		34.0
Total Split (%)				48.6%	51.4%		49%
Maximum Green (s)				28.0	30.0		28.0
Yellow Time (s)				4.0	4.0		4.0
All-Red Time (s)				2.0	2.0		2.0
Lost Time Adjust (s)				-2.0	-2.0		
Total Lost Time (s)				4.0	4.0		
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)				3.0	3.0		3.0
Recall Mode				Max	C-Max		None
Walk Time (s)				4.0	4.0		4.0
Flash Dont Walk (s)				9.0	9.0		14.0
Pedestrian Calls (#/hr)				30	30		30
Act Effct Green (s)				30.0	32.0		
Actuated g/C Ratio				0.43	0.46		
v/c Ratio				0.72	0.35		
Control Delay				3.1	12.5		
Queue Delay				0.0	0.0		
Total Delay				3.1	12.5		

Lane Group	NBT	NBR	SBL	SBT	SWL	SWR	ø8
LOS				A	B		
Approach Delay				3.1	12.5		
Approach LOS				A	B		
Queue Length 50th (ft)				14	62		
Queue Length 95th (ft)				16	94		
Internal Link Dist (ft)	101			91	146		
Turn Bay Length (ft)							
Base Capacity (vph)				1950	1417		
Starvation Cap Reductn				0	0		
Spillback Cap Reductn				0	0		
Storage Cap Reductn				0	0		
Reduced v/c Ratio				0.72	0.35		

Intersection Summary	
Area Type:	Other
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 68 (97%), Referenced to phase 2:NBT, Start of Yellow	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 5.6	Intersection LOS: A
Intersection Capacity Utilization 62.4%	ICU Level of Service B
Analysis Period (min) 25	

Splits and Phases: 103: Haywood Rd & I-385 NB Off

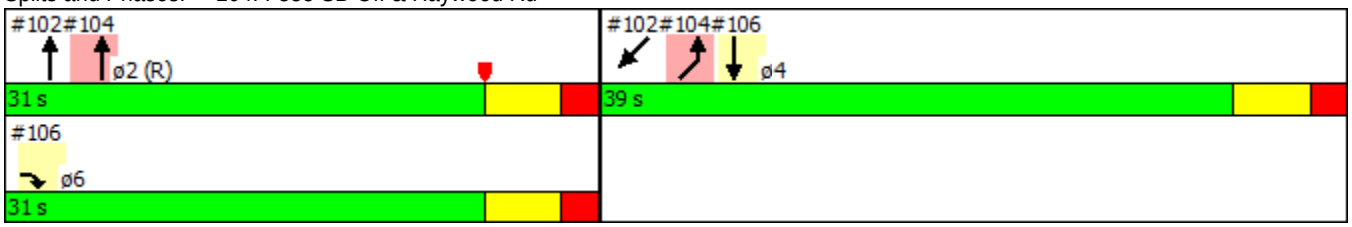


Lane Group	NBL	NBT	SBT	SBR	NEL	NER	ø6
Lane Configurations							
Volume (vph)	0	1163	0	0	419	0	
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	
Satd. Flow (prot)	0	4550	0	0	3072	0	
Flt Permitted					0.950		
Satd. Flow (perm)	0	4550	0	0	3072	0	
Right Turn on Red				Yes	Yes	Yes	
Satd. Flow (RTOR)					21		
Link Speed (mph)		35	40		35		
Link Distance (ft)		183	174		202		
Travel Time (s)		3.6	3.0		3.9		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	1292	0	0	466	0	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Left	Left	Right	Left	Right	
Median Width(ft)		0	0		24		
Link Offset(ft)		0	0		0		
Crosswalk Width(ft)		16	16		16		
Two way Left Turn Lane							
Headway Factor	1.15	1.15	1.15	1.15	1.15	1.15	
Turning Speed (mph)	15			9	15	9	
Turn Type		NA			Prot		
Protected Phases		2			4		6
Permitted Phases							
Detector Phase		2			4		
Switch Phase							
Minimum Initial (s)		14.0			14.0		5.0
Minimum Split (s)		22.0			22.0		22.0
Total Split (s)		31.0			39.0		31.0
Total Split (%)		44.3%			55.7%		44%
Maximum Green (s)		25.0			33.0		25.0
Yellow Time (s)		4.0			4.0		4.0
All-Red Time (s)		2.0			2.0		2.0
Lost Time Adjust (s)		-2.0			-2.0		
Total Lost Time (s)		4.0			4.0		
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)		3.0			3.0		3.0
Recall Mode		C-Max			None		None
Walk Time (s)		4.0			4.0		4.0
Flash Dont Walk (s)		12.0			12.0		12.0
Pedestrian Calls (#/hr)		30			30		30
Act Effct Green (s)		27.0			35.0		
Actuated g/C Ratio		0.39			0.50		
v/c Ratio		0.74			0.30		
Control Delay		4.6			10.5		
Queue Delay		0.0			0.0		
Total Delay		4.6			10.5		

Lane Group	NBL	NBT	SBT	SBR	NEL	NER	ø6
LOS		A			B		
Approach Delay		4.6			10.5		
Approach LOS		A			B		
Queue Length 50th (ft)		10			54		
Queue Length 95th (ft)		36			81		
Internal Link Dist (ft)		103	94		122		
Turn Bay Length (ft)							
Base Capacity (vph)		1755			1546		
Starvation Cap Reductn		0			0		
Spillback Cap Reductn		0			0		
Storage Cap Reductn		0			0		
Reduced v/c Ratio		0.74			0.30		

Intersection Summary	
Area Type: Other	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 65 (93%), Referenced to phase 2:NBT, Start of Yellow	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 6.1	Intersection LOS: A
Intersection Capacity Utilization 45.1%	ICU Level of Service A
Analysis Period (min) 25	

Splits and Phases: 104: I-385 SB Off & Haywood Rd

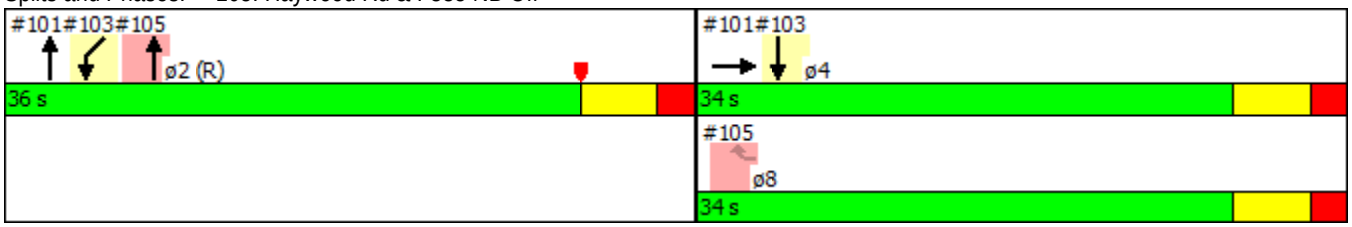


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø4
Lane Configurations							
Volume (vph)	0	921	1337	0	0	0	
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	
Satd. Flow (prot)	0	3230	4550	0	0	0	
Flt Permitted							
Satd. Flow (perm)	0	3230	4550	0	0	0	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)		29					
Link Speed (mph)	45		40			40	
Link Distance (ft)	303		157			178	
Travel Time (s)	4.6		2.7			3.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	1023	1486	0	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	
Median Width(ft)	0		0			0	
Link Offset(ft)	0		0			0	
Crosswalk Width(ft)	16		16			16	
Two way Left Turn Lane							
Headway Factor	1.15	1.15	1.15	1.15	1.15	1.15	
Turning Speed (mph)	15	9		9	15		
Turn Type		Perm	NA				
Protected Phases			2				4
Permitted Phases		8					
Detector Phase		8	2				
Switch Phase							
Minimum Initial (s)		5.0	14.0				14.0
Minimum Split (s)		24.0	22.0				22.0
Total Split (s)		34.0	36.0				34.0
Total Split (%)		48.6%	51.4%				49%
Maximum Green (s)		28.0	30.0				28.0
Yellow Time (s)		4.0	4.0				4.0
All-Red Time (s)		2.0	2.0				2.0
Lost Time Adjust (s)		-2.0	-2.0				
Total Lost Time (s)		4.0	4.0				
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)		3.0	3.0				3.0
Recall Mode		None	C-Max				Max
Walk Time (s)		4.0	4.0				4.0
Flash Dont Walk (s)		14.0	9.0				9.0
Pedestrian Calls (#/hr)		30	30				30
Act Effct Green (s)		30.0	32.0				
Actuated g/C Ratio		0.43	0.46				
v/c Ratio		0.73	0.71				
Control Delay		20.0	3.4				
Queue Delay		25.5	0.4				
Total Delay		45.5	3.8				

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø4
LOS		D	A				
Approach Delay			3.8				
Approach LOS			A				
Queue Length 50th (ft)		150	25				
Queue Length 95th (ft)		208	22				
Internal Link Dist (ft)	223		77			98	
Turn Bay Length (ft)							
Base Capacity (vph)		1400	2080				
Starvation Cap Reductn		0	0				
Spillback Cap Reductn		392	178				
Storage Cap Reductn		0	0				
Reduced v/c Ratio		1.01	0.78				

Intersection Summary	
Area Type: Other	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 68 (97%), Referenced to phase 2:NBT, Start of Yellow	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 20.8	Intersection LOS: C
Intersection Capacity Utilization 62.8%	ICU Level of Service B
Analysis Period (min) 25	

Splits and Phases: 105: Haywood Rd & I-385 NB Off

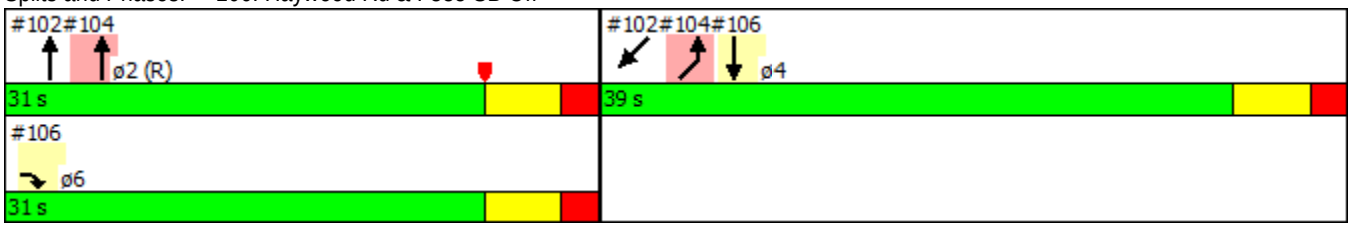


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø2
Lane Configurations							
Volume (vph)	0	459	0	0	1037	0	
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	
Satd. Flow (prot)	0	2493	0	0	3167	0	
Flt Permitted							
Satd. Flow (perm)	0	2493	0	0	3167	0	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		87					
Link Speed (mph)	45			40	40		
Link Distance (ft)	296			255	134		
Travel Time (s)	4.5			4.3	2.3		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	510	0	0	1152	0	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	0			0	0		
Link Offset(ft)	0			0	0		
Crosswalk Width(ft)	16			16	16		
Two way Left Turn Lane							
Headway Factor	1.15	1.15	1.15	1.15	1.15	1.15	
Turning Speed (mph)	15	9	15			9	
Turn Type		Prot			NA		
Protected Phases		6			4		2
Permitted Phases							
Detector Phase		6			4		
Switch Phase							
Minimum Initial (s)		5.0			14.0		14.0
Minimum Split (s)		22.0			22.0		22.0
Total Split (s)		31.0			39.0		31.0
Total Split (%)		44.3%			55.7%		44%
Maximum Green (s)		25.0			33.0		25.0
Yellow Time (s)		4.0			4.0		4.0
All-Red Time (s)		2.0			2.0		2.0
Lost Time Adjust (s)		-2.0			-2.0		
Total Lost Time (s)		4.0			4.0		
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)		3.0			3.0		3.0
Recall Mode		None			None		C-Max
Walk Time (s)		4.0			4.0		4.0
Flash Dont Walk (s)		12.0			12.0		12.0
Pedestrian Calls (#/hr)		30			30		30
Act Effct Green (s)		27.0			35.0		
Actuated g/C Ratio		0.39			0.50		
v/c Ratio		0.50			0.73		
Control Delay		15.5			3.3		
Queue Delay		0.0			0.0		
Total Delay		15.5			3.3		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø2
LOS		B			A		
Approach Delay					3.3		
Approach LOS					A		
Queue Length 50th (ft)		75			12		
Queue Length 95th (ft)		121			21		
Internal Link Dist (ft)	216			175	54		
Turn Bay Length (ft)							
Base Capacity (vph)		1015			1583		
Starvation Cap Reductn		0			0		
Spillback Cap Reductn		0			0		
Storage Cap Reductn		0			0		
Reduced v/c Ratio		0.50			0.73		

Intersection Summary	
Area Type: Other	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 65 (93%), Referenced to phase 2:NBT, Start of Yellow	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 7.0	Intersection LOS: A
Intersection Capacity Utilization 63.8%	ICU Level of Service B
Analysis Period (min) 25	

Splits and Phases: 106: Haywood Rd & I-385 SB Off



#3 N. Pleasantburg Drive at Villa Road / Century Drive

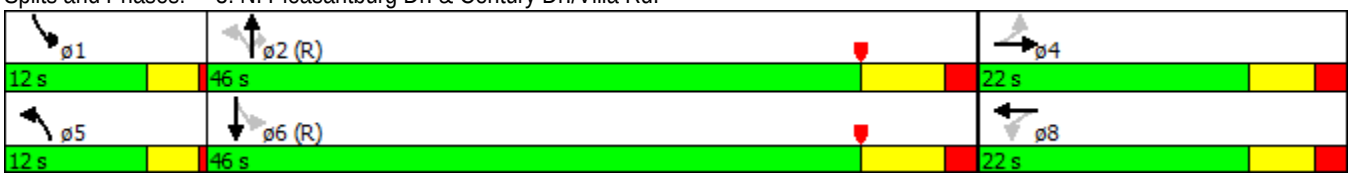
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	44	31	90	140	63	42	59	1292	216	86	2139	64
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		-6%			-3%			-3%			1%	
Storage Length (ft)	50		0	375		0	350		0	250		0
Storage Lanes	0		0	1		0	1		1	1		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	0	1661	0	1702	1684	0	1702	4890	1522	1668	4774	0
Flt Permitted		0.884		0.532			0.092			0.134		
Satd. Flow (perm)	0	1488	0	953	1684	0	165	4890	1522	235	4774	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		70			39				240		8	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		461			432			538			958	
Travel Time (s)		9.0			8.4			9.2			16.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	183	0	156	117	0	66	1436	240	96	2448	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane											Yes	
Headway Factor	1.03	1.03	1.03	1.05	1.05	1.05	1.05	1.05	1.05	1.08	1.08	1.08
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		8	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		10.0	10.0		3.0	10.0	10.0	3.0	10.0	
Minimum Split (s)	15.0	15.0		22.0	22.0		12.0	17.0	17.0	12.0	23.0	
Total Split (s)	22.0	22.0		22.0	22.0		12.0	46.0	46.0	12.0	46.0	
Total Split (%)	27.5%	27.5%		27.5%	27.5%		15.0%	57.5%	57.5%	15.0%	57.5%	
Maximum Green (s)	16.0	16.0		16.0	16.0		8.5	39.0	39.0	8.5	39.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	5.0	5.0	3.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		0.5	2.0	2.0	0.5	2.0	
Lost Time Adjust (s)		-2.0		-2.0	-2.0		0.5	-3.0	-3.0	0.5	-3.0	
Total Lost Time (s)		4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	5.0	5.0	2.0	5.0	
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	
Walk Time (s)				5.0	5.0						5.0	
Flash Dont Walk (s)				11.0	11.0						11.0	
Pedestrian Calls (#/hr)				0	0						0	
Act Effct Green (s)		16.4		16.4	16.4		51.9	47.6	47.6	52.9	48.1	
Actuated g/C Ratio		0.20		0.20	0.20		0.65	0.60	0.60	0.66	0.60	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.51		0.80	0.31		0.33	0.49	0.24	0.38	0.85	
Control Delay		22.0		59.9	20.2		9.1	10.9	2.0	8.9	18.5	
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		22.0		59.9	20.2		9.1	10.9	2.0	8.9	18.5	
LOS		C		E	C		A	B	A	A	B	
Approach Delay		22.0			42.9			9.6			18.1	
Approach LOS		C			D			A			B	
Queue Length 50th (ft)		48		73	32		10	152	0	14	369	
Queue Length 95th (ft)		108		#167	75		21	200	31	29	#536	
Internal Link Dist (ft)		381			352			458			878	
Turn Bay Length (ft)				375			350			250		
Base Capacity (vph)		389		214	409		264	2910	1003	303	2874	
Starvation Cap Reductn		0		0	0		0	0	0	0	0	
Spillback Cap Reductn		0		0	0		0	0	0	0	0	
Storage Cap Reductn		0		0	0		0	0	0	0	0	
Reduced v/c Ratio		0.47		0.73	0.29		0.25	0.49	0.24	0.32	0.85	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 16.6 Intersection LOS: B
Intersection Capacity Utilization 80.4% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: N. Pleasantburg Dr. & Century Dr./Villa Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	44	31	90	140	63	42	59	1292	216	86	2139	64
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1854	1818	1854	1791	1791	1827	1791	1791	1791	1756	1756	1791
Adj Flow Rate, veh/h	49	34	100	156	70	47	66	1436	240	96	2377	71
Adj No. of Lanes	0	1	0	1	1	0	1	3	1	1	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	118	76	165	305	207	139	161	2961	922	318	2953	88
Arrive On Green	0.22	0.21	0.19	0.21	0.21	0.19	0.05	1.00	1.00	0.04	0.62	0.59
Sat Flow, veh/h	294	370	800	1269	1001	672	1706	4890	1523	1672	4784	142
Grp Volume(v), veh/h	183	0	0	156	0	117	66	1436	240	96	1584	864
Grp Sat Flow(s),veh/h/ln	1465	0	0	1269	0	1673	1706	1630	1523	1672	1598	1731
Q Serve(g_s), s	4.5	0.0	0.0	3.0	0.0	4.8	1.3	0.0	0.0	2.0	30.1	30.6
Cycle Q Clear(g_c), s	9.3	0.0	0.0	12.3	0.0	4.8	1.3	0.0	0.0	2.0	30.1	30.6
Prop In Lane	0.27		0.55	1.00		0.40	1.00		1.00	1.00		0.08
Lane Grp Cap(c), veh/h	378	0	0	305	0	345	161	2961	922	318	1973	1068
V/C Ratio(X)	0.48	0.00	0.00	0.51	0.00	0.34	0.41	0.48	0.26	0.30	0.80	0.81
Avail Cap(c_a), veh/h	406	0	0	329	0	376	287	2961	922	422	1973	1068
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.9	0.0	0.0	30.5	0.0	27.3	16.1	0.0	0.0	6.8	11.6	11.8
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.5	0.0	0.2	0.6	0.6	0.7	0.2	3.6	6.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.0	0.0	3.3	0.0	2.2	0.8	0.2	0.2	0.9	14.0	16.4
LnGrp Delay(d),s/veh	29.3	0.0	0.0	31.0	0.0	27.5	16.7	0.6	0.7	7.0	15.2	18.4
LnGrp LOS	C			C		C	B	A	A	A	B	B
Approach Vol, veh/h		183			273			1742			2544	
Approach Delay, s/veh		29.3			29.5			1.2			16.0	
Approach LOS		C			C			A			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.0	52.5		20.5	6.1	53.4		20.5
Change Period (Y+Rc), s	3.5	7.0		6.0	3.5	7.0		6.0
Max Green Setting (Gmax), s	8.5	39.0		16.0	8.5	39.0		16.0
Max Q Clear Time (g_c+I1), s	4.0	2.0		11.3	3.3	32.6		14.3
Green Ext Time (p_c), s	0.1	36.6		0.6	0.0	6.4		0.2

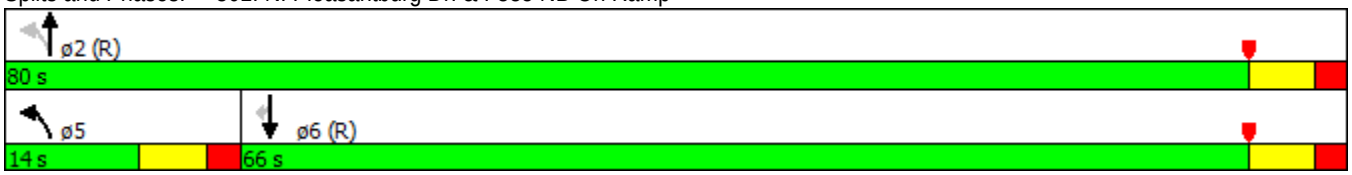
Intersection Summary	
HCM 2010 Ctrl Delay	11.8
HCM 2010 LOS	B

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	0	57	852	2183	186
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Grade (%)	0%			-3%	0%	
Storage Length (ft)	0	0	350			0
Storage Lanes	0	0	1			1
Taper Length (ft)	100		100			
Satd. Flow (prot)	0	0	1702	4890	4818	1500
Flt Permitted			0.058			
Satd. Flow (perm)	0	0	104	4890	4818	1500
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						207
Link Speed (mph)	40			40	40	
Link Distance (ft)	739			741	274	
Travel Time (s)	12.6			12.6	4.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	63	947	2426	207
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.07	1.07	1.05	1.05	1.07	1.07
Turning Speed (mph)	15	9	15			9
Turn Type			pm+pt	NA	NA	Perm
Protected Phases			5	2	6	
Permitted Phases			2			6
Detector Phase			5	2	6	6
Switch Phase						
Minimum Initial (s)			7.0	12.0	12.0	12.0
Minimum Split (s)			13.0	18.0	18.0	18.0
Total Split (s)			14.0	80.0	66.0	66.0
Total Split (%)			17.5%	100.0%	82.5%	82.5%
Maximum Green (s)			8.0	74.0	60.0	60.0
Yellow Time (s)			4.0	4.0	4.0	4.0
All-Red Time (s)			2.0	2.0	2.0	2.0
Lost Time Adjust (s)			-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)			4.0	4.0	4.0	4.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?						
Vehicle Extension (s)			3.0	3.0	3.0	3.0
Recall Mode			None	C-Max	C-Max	C-Max
Act Effct Green (s)			76.0	80.0	66.4	66.4
Actuated g/C Ratio			0.95	1.00	0.83	0.83
v/c Ratio			0.23	0.19	0.61	0.16
Control Delay			4.7	0.1	0.7	0.1
Queue Delay			0.0	0.0	0.0	0.0

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Delay			4.7	0.1	0.7	0.1
LOS			A	A	A	A
Approach Delay				0.4	0.6	
Approach LOS				A	A	
Queue Length 50th (ft)			0	0	3	0
Queue Length 95th (ft)			15	0	8	m0
Internal Link Dist (ft)	659			661	194	
Turn Bay Length (ft)			350			
Base Capacity (vph)			298	4890	3999	1280
Starvation Cap Reductn			0	0	0	0
Spillback Cap Reductn			0	0	0	0
Storage Cap Reductn			0	0	0	0
Reduced v/c Ratio			0.21	0.19	0.61	0.16

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 33 (41%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 0.5	Intersection LOS: A
Intersection Capacity Utilization 53.3%	ICU Level of Service A
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 301: N. Pleasantburg Dr. & I-385 NB On Ramp



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	0	57	852	2183	186
Number			5	2	6	16
Initial Q (Qb), veh			0	0	0	0
Ped-Bike Adj(A_pbT)			1.00			1.00
Parking Bus, Adj			1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln			1791	1791	1765	1765
Adj Flow Rate, veh/h			63	947	2426	207
Adj No. of Lanes			1	3	3	1
Peak Hour Factor			0.90	0.90	0.90	0.90
Percent Heavy Veh, %			2	2	2	2
Cap, veh/h			339	4645	3898	1214
Arrive On Green			0.09	0.95	1.00	1.00
Sat Flow, veh/h			1706	5051	4976	1500
Grp Volume(v), veh/h			63	947	2426	207
Grp Sat Flow(s),veh/h/ln			1706	1630	1606	1500
Q Serve(g_s), s			0.2	1.0	0.0	0.0
Cycle Q Clear(g_c), s			0.2	1.0	0.0	0.0
Prop In Lane			1.00			1.00
Lane Grp Cap(c), veh/h			339	4645	3898	1214
V/C Ratio(X)			0.19	0.20	0.62	0.17
Avail Cap(c_a), veh/h			397	4645	3898	1214
HCM Platoon Ratio			1.00	1.00	2.00	2.00
Upstream Filter(I)			1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh			0.3	0.1	0.0	0.0
Incr Delay (d2), s/veh			0.3	0.1	0.8	0.3
Initial Q Delay(d3),s/veh			0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln			0.1	0.4	0.3	0.1
LnGrp Delay(d),s/veh			0.5	0.2	0.8	0.3
LnGrp LOS			A	A	A	A
Approach Vol, veh/h				1010	2633	
Approach Delay, s/veh				0.2	0.7	
Approach LOS				A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		
Phs Duration (G+Y+Rc), s		80.0			11.3	68.7		
Change Period (Y+Rc), s		6.0			6.0	6.0		
Max Green Setting (Gmax), s		74.0			8.0	60.0		
Max Q Clear Time (g_c+I1), s		3.0			2.2	2.0		
Green Ext Time (p_c), s		59.4			0.0	50.0		

Intersection Summary	
HCM 2010 Ctrl Delay	0.6
HCM 2010 LOS	A

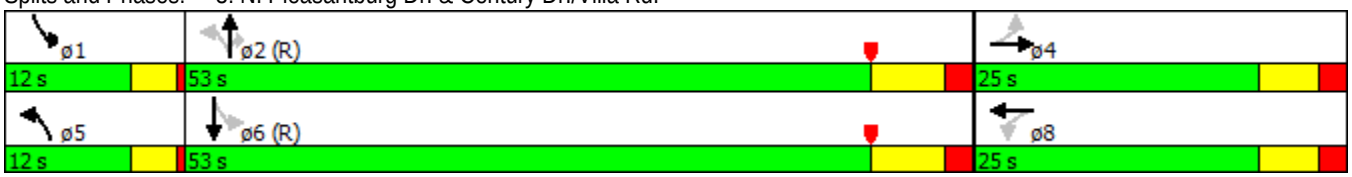
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	27	77	147	47	62	40	2033	170	78	1937	61
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		-6%			-3%			-3%			1%	
Storage Length (ft)	50		0	375		0	350		0	250		0
Storage Lanes	0		0	1		0	1		1	1		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	0	1678	0	1702	1637	0	1702	4890	1522	1668	4770	0
Flt Permitted		0.754		0.546			0.078			0.075		
Satd. Flow (perm)	0	1292	0	978	1637	0	140	4890	1522	132	4770	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		38			69				189		8	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		461			432			538			958	
Travel Time (s)		9.0			8.4			9.2			16.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	205	0	163	121	0	44	2259	189	87	2220	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane											Yes	
Headway Factor	1.03	1.03	1.03	1.05	1.05	1.05	1.05	1.05	1.05	1.08	1.08	1.08
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		8	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		7.0	7.0		3.0	10.0	10.0	3.0	10.0	
Minimum Split (s)	15.0	15.0		22.0	22.0		12.0	17.0	17.0	12.0	23.0	
Total Split (s)	25.0	25.0		25.0	25.0		12.0	53.0	53.0	12.0	53.0	
Total Split (%)	27.8%	27.8%		27.8%	27.8%		13.3%	58.9%	58.9%	13.3%	58.9%	
Maximum Green (s)	19.0	19.0		19.0	19.0		8.5	46.0	46.0	8.5	46.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	5.0	5.0	3.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		0.5	2.0	2.0	0.5	2.0	
Lost Time Adjust (s)		-2.0		-2.0	-2.0		0.5	-3.0	-3.0	0.5	-3.0	
Total Lost Time (s)		4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	5.0	5.0	2.0	5.0	
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	
Walk Time (s)				5.0	5.0						5.0	
Flash Dont Walk (s)				11.0	11.0						11.0	
Pedestrian Calls (#/hr)				0	0						0	
Act Effct Green (s)		18.6		18.6	18.6		59.2	55.3	55.3	61.8	57.9	
Actuated g/C Ratio		0.21		0.21	0.21		0.66	0.61	0.61	0.69	0.64	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.69		0.81	0.31		0.25	0.75	0.19	0.46	0.72	
Control Delay		38.9		62.8	16.0		8.6	16.0	2.0	15.9	14.0	
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		38.9		62.8	16.0		8.6	16.0	2.0	15.9	14.0	
LOS		D		E	B		A	B	A	B	B	
Approach Delay		38.9			42.8			14.8			14.0	
Approach LOS		D			D			B			B	
Queue Length 50th (ft)		85		86	24		7	347	0	15	333	
Queue Length 95th (ft)		161		#182	69		17	447	29	45	413	
Internal Link Dist (ft)		381			352			458			878	
Turn Bay Length (ft)				375			350			250		
Base Capacity (vph)		330		228	434		234	3002	1007	228	3069	
Starvation Cap Reductn		0		0	0		0	0	0	0	0	
Spillback Cap Reductn		0		0	0		0	0	0	0	0	
Storage Cap Reductn		0		0	0		0	0	0	0	0	
Reduced v/c Ratio		0.62		0.71	0.28		0.19	0.75	0.19	0.38	0.72	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 16.9 Intersection LOS: B
Intersection Capacity Utilization 73.8% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: N. Pleasantburg Dr. & Century Dr./Villa Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	80	27	77	147	47	62	40	2033	170	78	1937	61
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1854	1818	1854	1791	1791	1827	1791	1791	1791	1756	1756	1791
Adj Flow Rate, veh/h	89	30	86	163	52	69	44	2259	189	87	2152	68
Adj No. of Lanes	0	1	0	1	1	0	1	3	1	1	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	160	59	117	296	155	206	158	2989	930	215	2999	95
Arrive On Green	0.23	0.22	0.21	0.22	0.22	0.21	0.03	1.00	1.00	0.03	0.63	0.61
Sat Flow, veh/h	463	265	526	1290	699	928	1706	4890	1523	1672	4775	150
Grp Volume(v), veh/h	205	0	0	163	0	121	44	2259	189	87	1438	782
Grp Sat Flow(s),veh/h/ln	1254	0	0	1290	0	1627	1706	1630	1523	1672	1598	1729
Q Serve(g_s), s	9.1	0.0	0.0	1.0	0.0	5.7	1.0	0.0	0.0	1.9	27.4	27.7
Cycle Q Clear(g_c), s	14.8	0.0	0.0	15.8	0.0	5.7	1.0	0.0	0.0	1.9	27.4	27.7
Prop In Lane	0.43		0.42	1.00		0.57	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	349	0	0	296	0	361	158	2989	930	215	2007	1086
V/C Ratio(X)	0.59	0.00	0.00	0.55	0.00	0.34	0.28	0.76	0.20	0.40	0.72	0.72
Avail Cap(c_a), veh/h	366	0	0	311	0	380	281	2989	930	307	2007	1086
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.7	0.0	0.0	33.6	0.0	29.7	12.6	0.0	0.0	7.4	11.3	11.4
Incr Delay (d2), s/veh	1.4	0.0	0.0	0.9	0.0	0.2	0.4	1.8	0.5	0.5	2.2	4.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	0.0	0.0	3.9	0.0	2.6	0.5	0.5	0.1	0.9	12.6	14.3
LnGrp Delay(d),s/veh	35.1	0.0	0.0	34.5	0.0	29.9	13.0	1.8	0.5	7.8	13.5	15.5
LnGrp LOS	D			C		C	B	A	A	A	B	B
Approach Vol, veh/h		205			284			2492			2307	
Approach Delay, s/veh		35.1			32.6			1.9			14.0	
Approach LOS		D			C			A			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.0	59.0		24.0	5.5	60.5		24.0
Change Period (Y+Rc), s	3.5	7.0		6.0	3.5	7.0		6.0
Max Green Setting (Gmax), s	8.5	46.0		19.0	8.5	46.0		19.0
Max Q Clear Time (g_c+I1), s	3.9	2.0		16.8	3.0	29.7		17.8
Green Ext Time (p_c), s	0.0	43.8		0.3	0.0	16.3		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	10.1
HCM 2010 LOS	B

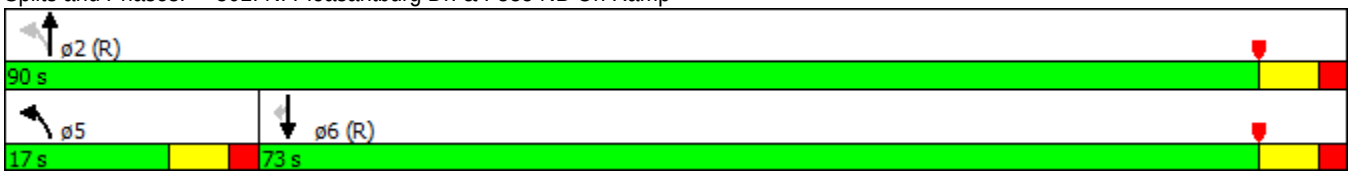
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	0	94	1551	2027	134
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Grade (%)	0%			-3%	0%	
Storage Length (ft)	0	0	350			0
Storage Lanes	0	0	1			1
Taper Length (ft)	100		100			
Satd. Flow (prot)	0	0	1702	4890	4818	1500
Flt Permitted			0.059			
Satd. Flow (perm)	0	0	106	4890	4818	1500
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						149
Link Speed (mph)	40			40	40	
Link Distance (ft)	739			741	274	
Travel Time (s)	12.6			12.6	4.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	104	1723	2252	149
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.07	1.07	1.05	1.05	1.07	1.07
Turning Speed (mph)	15	9	15			9
Turn Type			pm+pt	NA	NA	Perm
Protected Phases			5	2	6	
Permitted Phases			2			6
Detector Phase			5	2	6	6
Switch Phase						
Minimum Initial (s)			7.0	12.0	12.0	12.0
Minimum Split (s)			13.0	18.0	18.0	18.0
Total Split (s)			17.0	90.0	73.0	73.0
Total Split (%)			18.9%	100.0%	81.1%	81.1%
Maximum Green (s)			11.0	84.0	67.0	67.0
Yellow Time (s)			4.0	4.0	4.0	4.0
All-Red Time (s)			2.0	2.0	2.0	2.0
Lost Time Adjust (s)			-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)			4.0	4.0	4.0	4.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?						
Vehicle Extension (s)			3.0	3.0	3.0	3.0
Recall Mode			None	C-Max	C-Max	C-Max
Act Effct Green (s)			86.0	90.0	75.6	75.6
Actuated g/C Ratio			0.96	1.00	0.84	0.84
v/c Ratio			0.38	0.35	0.56	0.12
Control Delay			11.9	0.2	1.5	0.2
Queue Delay			0.0	0.0	0.0	0.0

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Delay			11.9	0.2	1.5	0.2
LOS			B	A	A	A
Approach Delay				0.9	1.4	
Approach LOS				A	A	
Queue Length 50th (ft)			0	0	4	0
Queue Length 95th (ft)			45	0	18	m0
Internal Link Dist (ft)	659			661	194	
Turn Bay Length (ft)			350			
Base Capacity (vph)			331	4890	4049	1284
Starvation Cap Reductn			0	0	0	0
Spillback Cap Reductn			0	0	0	0
Storage Cap Reductn			0	0	0	0
Reduced v/c Ratio			0.31	0.35	0.56	0.12

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 33 (37%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.56	
Intersection Signal Delay: 1.2	Intersection LOS: A
Intersection Capacity Utilization 53.8%	ICU Level of Service A
Analysis Period (min) 15	

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

Splits and Phases: 301: N. Pleasantburg Dr. & I-385 NB On Ramp



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	0	94	1551	2027	134
Number			5	2	6	16
Initial Q (Qb), veh			0	0	0	0
Ped-Bike Adj(A_pbT)			1.00			1.00
Parking Bus, Adj			1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln			1791	1791	1765	1765
Adj Flow Rate, veh/h			104	1723	2252	149
Adj No. of Lanes			1	3	3	1
Peak Hour Factor			0.90	0.90	0.90	0.90
Percent Heavy Veh, %			2	2	2	2
Cap, veh/h			360	4673	3935	1225
Arrive On Green			0.09	0.96	1.00	1.00
Sat Flow, veh/h			1706	5051	4976	1500
Grp Volume(v), veh/h			104	1723	2252	149
Grp Sat Flow(s),veh/h/ln			1706	1630	1606	1500
Q Serve(g_s), s			0.4	2.2	0.0	0.0
Cycle Q Clear(g_c), s			0.4	2.2	0.0	0.0
Prop In Lane			1.00			1.00
Lane Grp Cap(c), veh/h			360	4673	3935	1225
V/C Ratio(X)			0.29	0.37	0.57	0.12
Avail Cap(c_a), veh/h			446	4673	3935	1225
HCM Platoon Ratio			1.00	1.00	2.00	2.00
Upstream Filter(I)			1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh			0.3	0.1	0.0	0.0
Incr Delay (d2), s/veh			0.4	0.2	0.6	0.2
Initial Q Delay(d3),s/veh			0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln			0.2	0.9	0.2	0.1
LnGrp Delay(d),s/veh			0.7	0.4	0.6	0.2
LnGrp LOS			A	A	A	A
Approach Vol, veh/h				1827	2401	
Approach Delay, s/veh				0.4	0.6	
Approach LOS				A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		
Phs Duration (G+Y+Rc), s		90.0			12.5	77.5		
Change Period (Y+Rc), s		6.0			6.0	6.0		
Max Green Setting (Gmax), s		84.0			11.0	67.0		
Max Q Clear Time (g_c+I1), s		4.2			2.4	2.0		
Green Ext Time (p_c), s		72.0			0.1	59.7		

Intersection Summary	
HCM 2010 Ctrl Delay	0.5
HCM 2010 LOS	A

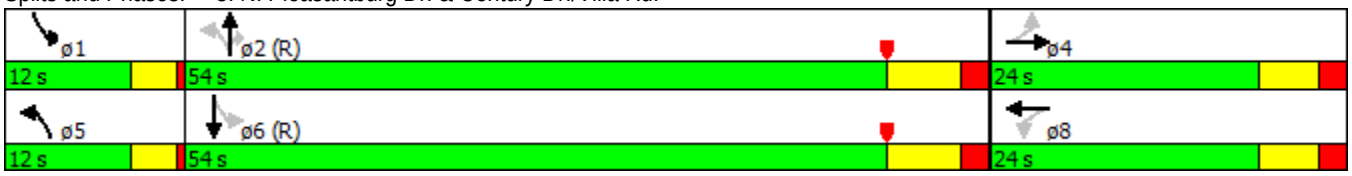
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	44	31	90	140	63	42	59	1292	216	86	2139	64
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		-6%			-3%			-3%			1%	
Storage Length (ft)	50		0	375		0	350		500	250		0
Storage Lanes	0		0	1		0	1		1	1		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	0	1661	0	1702	1684	0	1702	4890	1522	1668	4774	0
Flt Permitted		0.885		0.514			0.077			0.137		
Satd. Flow (perm)	0	1490	0	921	1684	0	138	4890	1522	241	4774	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		62			35				240		8	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		461			432			813			958	
Travel Time (s)		9.0			8.4			13.9			16.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	183	0	156	117	0	66	1436	240	96	2448	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane											Yes	
Headway Factor	1.03	1.03	1.03	1.05	1.05	1.05	1.05	1.05	1.05	1.08	1.08	1.08
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		8	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		10.0	10.0		3.0	10.0	10.0	3.0	10.0	
Minimum Split (s)	15.0	15.0		22.0	22.0		12.0	17.0	17.0	12.0	23.0	
Total Split (s)	24.0	24.0		24.0	24.0		12.0	54.0	54.0	12.0	54.0	
Total Split (%)	26.7%	26.7%		26.7%	26.7%		13.3%	60.0%	60.0%	13.3%	60.0%	
Maximum Green (s)	18.0	18.0		18.0	18.0		8.5	47.0	47.0	8.5	47.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	5.0	5.0	3.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		0.5	2.0	2.0	0.5	2.0	
Lost Time Adjust (s)		-2.0		-2.0	-2.0		0.5	-3.0	-3.0	0.5	-3.0	
Total Lost Time (s)		4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	5.0	5.0	2.0	5.0	
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	
Walk Time (s)				5.0	5.0						5.0	
Flash Dont Walk (s)				11.0	11.0						11.0	
Pedestrian Calls (#/hr)				0	0						0	
Act Effct Green (s)		18.1		18.1	18.1		60.1	55.8	55.8	61.2	56.3	
Actuated g/C Ratio		0.20		0.20	0.20		0.67	0.62	0.62	0.68	0.63	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.52		0.84	0.32		0.36	0.47	0.23	0.38	0.82	
Control Delay		26.2		70.8	23.3		13.6	8.3	0.7	9.0	17.3	
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		26.2		70.8	23.3		13.6	8.3	0.7	9.0	17.3	
LOS		C		E	C		B	A	A	A	B	
Approach Delay		26.2			50.5			7.5			17.0	
Approach LOS		C			D			A			B	
Queue Length 50th (ft)		59		84	38		8	142	1	16	396	
Queue Length 95th (ft)		124		#185	86		m12	m180	m4	30	495	
Internal Link Dist (ft)		381			352			733			878	
Turn Bay Length (ft)				375			350		500	250		
Base Capacity (vph)		379		204	401		234	3032	1035	294	2991	
Starvation Cap Reductn		0		0	0		0	0	0	0	0	
Spillback Cap Reductn		0		0	0		0	0	0	0	0	
Storage Cap Reductn		0		0	0		0	0	0	0	0	
Reduced v/c Ratio		0.48		0.76	0.29		0.28	0.47	0.23	0.33	0.82	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 15.8 Intersection LOS: B
Intersection Capacity Utilization 80.4% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: N. Pleasantburg Dr. & Century Dr./Villa Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	44	31	90	140	63	42	59	1292	216	86	2139	64
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1854	1818	1854	1791	1791	1827	1791	1791	1791	1756	1756	1791
Adj Flow Rate, veh/h	49	34	100	156	70	47	66	1436	240	96	2377	71
Adj No. of Lanes	0	1	0	1	1	0	1	3	1	1	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	112	76	165	288	208	139	156	3047	949	311	3032	90
Arrive On Green	0.22	0.21	0.20	0.21	0.21	0.20	0.05	1.00	1.00	0.04	0.63	0.61
Sat Flow, veh/h	294	368	798	1269	1001	672	1706	4890	1523	1672	4784	142
Grp Volume(v), veh/h	183	0	0	156	0	117	66	1436	240	96	1584	864
Grp Sat Flow(s),veh/h/ln	1459	0	0	1269	0	1673	1706	1630	1523	1672	1598	1731
Q Serve(g_s), s	5.2	0.0	0.0	3.9	0.0	5.4	1.4	0.0	0.0	2.1	32.4	32.9
Cycle Q Clear(g_c), s	10.6	0.0	0.0	14.4	0.0	5.4	1.4	0.0	0.0	2.1	32.4	32.9
Prop In Lane	0.27		0.55	1.00		0.40	1.00		1.00	1.00		0.08
Lane Grp Cap(c), veh/h	370	0	0	288	0	347	156	3047	949	311	2025	1097
V/C Ratio(X)	0.50	0.00	0.00	0.54	0.00	0.34	0.42	0.47	0.25	0.31	0.78	0.79
Avail Cap(c_a), veh/h	392	0	0	307	0	372	264	3047	949	400	2025	1097
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.77	0.77	0.77	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.5	0.0	0.0	34.7	0.0	30.6	16.9	0.0	0.0	6.9	12.0	12.1
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.7	0.0	0.2	0.5	0.4	0.5	0.2	3.1	5.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	0.0	0.0	3.7	0.0	2.5	1.0	0.1	0.1	1.0	15.0	17.1
LnGrp Delay(d),s/veh	32.9	0.0	0.0	35.4	0.0	30.8	17.4	0.4	0.5	7.1	15.1	17.9
LnGrp LOS	C			D		C	B	A	A	A	B	B
Approach Vol, veh/h		183			273			1742			2544	
Approach Delay, s/veh		32.9			33.4			1.1			15.7	
Approach LOS		C			C			A			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.3	60.1		22.7	6.3	61.0		22.7
Change Period (Y+Rc), s	3.5	7.0		6.0	3.5	7.0		6.0
Max Green Setting (Gmax), s	8.5	47.0		18.0	8.5	47.0		18.0
Max Q Clear Time (g_c+I1), s	4.1	2.0		12.6	3.4	34.9		16.4
Green Ext Time (p_c), s	0.1	44.4		0.6	0.0	12.0		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	12.0
HCM 2010 LOS	B

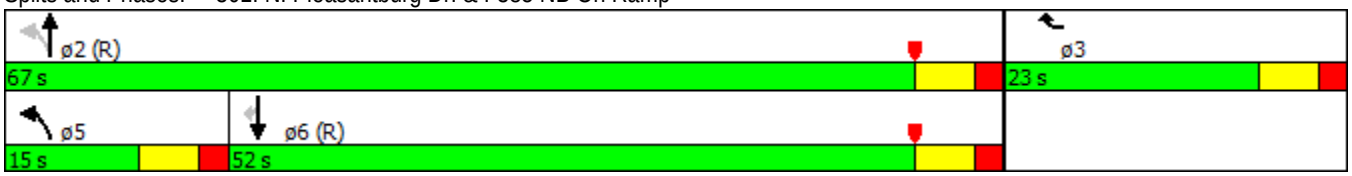
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	0	715	57	852	0	0	2183	186
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		0%			0%			-3%			0%	
Storage Length (ft)	0		0	0		0	350		0	0		400
Storage Lanes	0		0	0		2	1		0	0		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	0	0	0	0	0	2640	1702	4890	0	0	4818	1500
Flt Permitted							0.072					
Satd. Flow (perm)	0	0	0	0	0	2640	129	4890	0	0	4818	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						326						207
Link Speed (mph)		40			40			40			40	
Link Distance (ft)		739			678			741			813	
Travel Time (s)		12.6			11.6			12.6			13.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	794	63	947	0	0	2426	207
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.05	1.05	1.05	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type						Prot	pm+pt	NA			NA	Perm
Protected Phases						3	5	2			6	
Permitted Phases							2					6
Detector Phase						3	5	2			6	6
Switch Phase												
Minimum Initial (s)						7.0	7.0	12.0			12.0	12.0
Minimum Split (s)						15.0	15.0	22.0			22.0	22.0
Total Split (s)						23.0	15.0	67.0			52.0	52.0
Total Split (%)						25.6%	16.7%	74.4%			57.8%	57.8%
Maximum Green (s)						17.0	9.0	61.0			46.0	46.0
Yellow Time (s)						4.0	4.0	4.0			4.0	4.0
All-Red Time (s)						2.0	2.0	2.0			2.0	2.0
Lost Time Adjust (s)						-2.0	-2.0	-2.0			-2.0	-2.0
Total Lost Time (s)						4.0	4.0	4.0			4.0	4.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)						3.0	3.0	3.0			3.0	3.0
Recall Mode						None	None	C-Max			C-Max	C-Max
Act Effct Green (s)						19.0	63.0	63.0			52.5	52.5
Actuated g/C Ratio						0.21	0.70	0.70			0.58	0.58
v/c Ratio						0.98	0.25	0.28			0.86	0.22
Control Delay						48.3	6.7	5.3			9.6	0.3
Queue Delay						0.0	0.0	0.0			0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay						48.3	6.7	5.3			9.6	0.3
LOS						D	A	A			A	A
Approach Delay								5.4			8.8	
Approach LOS								A			A	
Queue Length 50th (ft)						160	10	62			117	0
Queue Length 95th (ft)						#298	22	79			#139	m0
Internal Link Dist (ft)		659			598			661			733	
Turn Bay Length (ft)							350					400
Base Capacity (vph)						814	282	3423			2809	961
Starvation Cap Reductn						0	0	0			0	0
Spillback Cap Reductn						0	0	0			0	0
Storage Cap Reductn						0	0	0			0	0
Reduced v/c Ratio						0.98	0.22	0.28			0.86	0.22

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 14 (16%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.98
Intersection Signal Delay: 15.1 Intersection LOS: B
Intersection Capacity Utilization 53.3% ICU Level of Service A
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 301: N. Pleasantburg Dr. & I-385 NB On Ramp



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	0	715	57	852	0	0	2183	186
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				0	0	1765	1791	1791	0	0	1765	1765
Adj Flow Rate, veh/h				0	0	794	63	947	0	0	2426	207
Adj No. of Lanes				0	0	2	1	3	0	0	3	1
Peak Hour Factor				0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %				0	0	2	2	2	0	0	2	2
Cap, veh/h				0	0	0	319	4673	0	0	3985	1241
Arrive On Green				0.00	0.00	0.02	0.08	0.96	0.00	0.00	1.00	1.00
Sat Flow, veh/h					0		1706	5051	0	0	4976	1500
Grp Volume(v), veh/h					0.0		63	947	0	0	2426	207
Grp Sat Flow(s),veh/h/ln							1706	1630	0	0	1606	1500
Q Serve(g_s), s							0.2	1.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s							0.2	1.0	0.0	0.0	0.0	0.0
Prop In Lane							1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h							319	4673	0	0	3985	1241
V/C Ratio(X)							0.20	0.20	0.00	0.00	0.61	0.17
Avail Cap(c_a), veh/h							385	4673	0	0	3985	1241
HCM Platoon Ratio							1.00	1.00	1.00	1.00	2.00	2.00
Upstream Filter(I)							1.00	1.00	0.00	0.00	0.47	0.47
Uniform Delay (d), s/veh							0.3	0.1	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh							0.3	0.1	0.0	0.0	0.3	0.1
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.1	0.4	0.0	0.0	0.1	0.0
LnGrp Delay(d),s/veh							0.6	0.2	0.0	0.0	0.3	0.1
LnGrp LOS							A	A			A	A
Approach Vol, veh/h								1010			2633	
Approach Delay, s/veh								0.2			0.3	
Approach LOS								A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		
Phs Duration (G+Y+Rc), s		90.0			11.6	78.4		
Change Period (Y+Rc), s		6.0			6.0	6.0		
Max Green Setting (Gmax), s		61.0			9.0	46.0		
Max Q Clear Time (g_c+I1), s		3.0			2.2	2.0		
Green Ext Time (p_c), s		50.0			0.1	39.2		

Intersection Summary	
HCM 2010 Ctrl Delay	0.3
HCM 2010 LOS	A

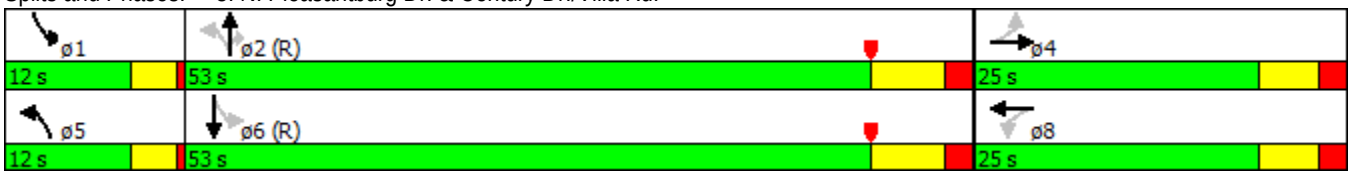
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	27	77	147	47	62	40	2033	170	78	1937	61
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		-6%			-3%			-3%			1%	
Storage Length (ft)	50		0	375		0	350		500	250		0
Storage Lanes	0		0	1		0	1		1	1		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	0	1678	0	1702	1637	0	1702	4890	1522	1668	4770	0
Flt Permitted		0.754		0.546			0.079			0.077		
Satd. Flow (perm)	0	1292	0	978	1637	0	142	4890	1522	135	4770	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		38			69				189		8	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		461			432			813			958	
Travel Time (s)		9.0			8.4			13.9			16.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	205	0	163	121	0	44	2259	189	87	2220	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane											Yes	
Headway Factor	1.03	1.03	1.03	1.05	1.05	1.05	1.05	1.05	1.05	1.08	1.08	1.08
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		8	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	12.0	12.0	7.0	12.0	
Minimum Split (s)	15.0	15.0		22.0	22.0		12.0	22.0	22.0	12.0	23.0	
Total Split (s)	25.0	25.0		25.0	25.0		12.0	53.0	53.0	12.0	53.0	
Total Split (%)	27.8%	27.8%		27.8%	27.8%		13.3%	58.9%	58.9%	13.3%	58.9%	
Maximum Green (s)	19.0	19.0		19.0	19.0		8.5	46.0	46.0	8.5	46.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	5.0	5.0	3.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		0.5	2.0	2.0	0.5	2.0	
Lost Time Adjust (s)		-2.0		-2.0	-2.0		0.5	-3.0	-3.0	0.5	-3.0	
Total Lost Time (s)		4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	5.0	5.0	2.0	5.0	
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	
Walk Time (s)				5.0	5.0						5.0	
Flash Dont Walk (s)				11.0	11.0						11.0	
Pedestrian Calls (#/hr)				0	0						0	
Act Effct Green (s)		18.6		18.6	18.6		59.9	54.7	54.7	61.3	57.1	
Actuated g/C Ratio		0.21		0.21	0.21		0.67	0.61	0.61	0.68	0.63	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.69		0.81	0.31		0.21	0.76	0.19	0.42	0.73	
Control Delay		38.9		62.8	16.0		6.0	11.3	0.6	14.2	14.8	
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		38.9		62.8	16.0		6.0	11.3	0.6	14.2	14.8	
LOS		D		E	B		A	B	A	B	B	
Approach Delay		38.9			42.8			10.4			14.8	
Approach LOS		D			D			B			B	
Queue Length 50th (ft)		85		86	24		5	258	1	15	352	
Queue Length 95th (ft)		161		#182	69		m8	m278	m2	45	423	
Internal Link Dist (ft)		381			352			733			878	
Turn Bay Length (ft)				375			350		500	250		
Base Capacity (vph)		330		228	434		234	2969	998	229	3027	
Starvation Cap Reductn		0		0	0		0	0	0	0	0	
Spillback Cap Reductn		0		0	0		0	0	0	0	0	
Storage Cap Reductn		0		0	0		0	0	0	0	0	
Reduced v/c Ratio		0.62		0.71	0.28		0.19	0.76	0.19	0.38	0.73	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 15.1 Intersection LOS: B
Intersection Capacity Utilization 75.1% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: N. Pleasantburg Dr. & Century Dr./Villa Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	80	27	77	147	47	62	40	2033	170	78	1937	61
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1854	1818	1854	1791	1791	1827	1791	1791	1791	1756	1756	1791
Adj Flow Rate, veh/h	89	30	86	163	52	69	44	2259	189	87	2152	68
Adj No. of Lanes	0	1	0	1	1	0	1	3	1	1	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	160	59	117	296	155	206	199	2844	885	260	2858	90
Arrive On Green	0.23	0.22	0.21	0.22	0.22	0.21	0.09	1.00	1.00	0.06	0.60	0.58
Sat Flow, veh/h	463	265	526	1290	699	928	1706	4890	1523	1672	4775	150
Grp Volume(v), veh/h	205	0	0	163	0	121	44	2259	189	87	1438	782
Grp Sat Flow(s),veh/h/ln	1254	0	0	1290	0	1627	1706	1630	1523	1672	1598	1729
Q Serve(g_s), s	9.1	0.0	0.0	1.0	0.0	5.7	1.0	0.0	0.0	1.9	29.6	29.9
Cycle Q Clear(g_c), s	14.8	0.0	0.0	15.8	0.0	5.7	1.0	0.0	0.0	1.9	29.6	29.9
Prop In Lane	0.43		0.42	1.00		0.57	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	349	0	0	296	0	361	199	2844	885	260	1913	1035
V/C Ratio(X)	0.59	0.00	0.00	0.55	0.00	0.34	0.22	0.79	0.21	0.33	0.75	0.76
Avail Cap(c_a), veh/h	366	0	0	311	0	380	272	2844	885	303	1913	1035
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.7	0.0	0.0	33.6	0.0	29.7	13.0	0.0	0.0	7.4	13.2	13.3
Incr Delay (d2), s/veh	1.4	0.0	0.0	0.9	0.0	0.2	0.1	1.6	0.4	0.3	2.8	5.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	0.0	0.0	3.9	0.0	2.6	0.4	0.4	0.1	0.9	13.7	15.6
LnGrp Delay(d),s/veh	35.1	0.0	0.0	34.5	0.0	29.9	13.1	1.6	0.4	7.6	16.0	18.4
LnGrp LOS	D			C		C	B	A	A	A	B	B
Approach Vol, veh/h		205			284			2492			2307	
Approach Delay, s/veh		35.1			32.6			1.7			16.5	
Approach LOS		D			C			A			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.7	56.3		24.0	8.2	57.9		24.0
Change Period (Y+Rc), s	3.5	7.0		6.0	3.5	7.0		6.0
Max Green Setting (Gmax), s	8.5	46.0		19.0	8.5	46.0		19.0
Max Q Clear Time (g_c+I1), s	3.9	2.0		16.8	3.0	31.9		17.8
Green Ext Time (p_c), s	0.0	43.8		0.3	0.0	14.1		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	11.1
HCM 2010 LOS	B

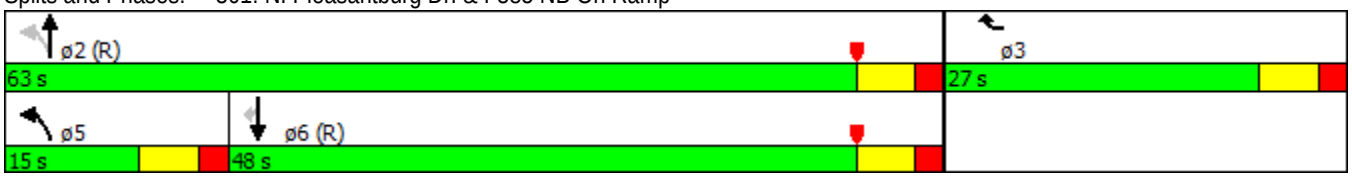
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	0	692	94	1551	0	0	2027	134
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		0%			0%			-3%			0%	
Storage Length (ft)	0		0	0		0	350		0	0		400
Storage Lanes	0		0	0		2	1		0	0		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	0	0	0	0	0	2640	1702	4890	0	0	4818	1500
Flt Permitted							0.079					
Satd. Flow (perm)	0	0	0	0	0	2640	142	4890	0	0	4818	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						109						149
Link Speed (mph)		40			40			40			40	
Link Distance (ft)		739			648			741			813	
Travel Time (s)		12.6			11.0			12.6			13.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	769	104	1723	0	0	2252	149
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.05	1.05	1.05	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type						Prot	pm+pt	NA			NA	Perm
Protected Phases						3	5	2			6	
Permitted Phases							2					6
Detector Phase						3	5	2			6	6
Switch Phase												
Minimum Initial (s)						7.0	7.0	12.0			12.0	12.0
Minimum Split (s)						15.0	15.0	22.0			22.0	22.0
Total Split (s)						27.0	15.0	63.0			48.0	48.0
Total Split (%)						30.0%	16.7%	70.0%			53.3%	53.3%
Maximum Green (s)						21.0	9.0	57.0			42.0	42.0
Yellow Time (s)						4.0	4.0	4.0			4.0	4.0
All-Red Time (s)						2.0	2.0	2.0			2.0	2.0
Lost Time Adjust (s)						-2.0	-2.0	-2.0			-2.0	-2.0
Total Lost Time (s)						4.0	4.0	4.0			4.0	4.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)						3.0	3.0	3.0			3.0	3.0
Recall Mode						None	None	C-Max			C-Max	C-Max
Act Effct Green (s)						23.0	59.0	59.0			47.9	47.9
Actuated g/C Ratio						0.26	0.66	0.66			0.53	0.53
v/c Ratio						1.02	0.40	0.54			0.88	0.17
Control Delay						67.6	13.0	9.0			15.3	0.7
Queue Delay						0.0	0.0	0.0			0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay						67.6	13.0	9.0			15.3	0.7
LOS						E	B	A			B	A
Approach Delay								9.2			14.4	
Approach LOS								A			B	
Queue Length 50th (ft)						~227	19	169			431	0
Queue Length 95th (ft)						#364	55	204			#568	m1
Internal Link Dist (ft)		659			568			661			733	
Turn Bay Length (ft)							350					400
Base Capacity (vph)						755	283	3205			2562	867
Starvation Cap Reductn						0	0	0			0	0
Spillback Cap Reductn						0	0	0			0	0
Storage Cap Reductn						0	0	0			0	0
Reduced v/c Ratio						1.02	0.37	0.54			0.88	0.17

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 15 (17%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.02	
Intersection Signal Delay: 20.7	Intersection LOS: C
Intersection Capacity Utilization 63.9%	ICU Level of Service B
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 301: N. Pleasantburg Dr. & I-385 NB On Ramp



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	0	692	94	1551	0	0	2027	134
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				0	0	1765	1791	1791	0	0	1765	1765
Adj Flow Rate, veh/h				0	0	769	104	1723	0	0	2252	149
Adj No. of Lanes				0	0	2	1	3	0	0	3	1
Peak Hour Factor				0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %				0	0	2	2	2	0	0	2	2
Cap, veh/h				0	0	0	360	4673	0	0	3935	1225
Arrive On Green				0.00	0.00	0.02	0.09	0.96	0.00	0.00	1.00	1.00
Sat Flow, veh/h					0		1706	5051	0	0	4976	1500
Grp Volume(v), veh/h					0.0		104	1723	0	0	2252	149
Grp Sat Flow(s),veh/h/ln							1706	1630	0	0	1606	1500
Q Serve(g_s), s							0.4	2.2	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s							0.4	2.2	0.0	0.0	0.0	0.0
Prop In Lane							1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h							360	4673	0	0	3935	1225
V/C Ratio(X)							0.29	0.37	0.00	0.00	0.57	0.12
Avail Cap(c_a), veh/h							408	4673	0	0	3935	1225
HCM Platoon Ratio							1.00	1.00	1.00	1.00	2.00	2.00
Upstream Filter(I)							1.00	1.00	0.00	0.00	0.60	0.60
Uniform Delay (d), s/veh							0.3	0.1	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh							0.4	0.2	0.0	0.0	0.4	0.1
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.2	0.9	0.0	0.0	0.1	0.0
LnGrp Delay(d),s/veh							0.7	0.4	0.0	0.0	0.4	0.1
LnGrp LOS							A	A			A	A
Approach Vol, veh/h								1827			2401	
Approach Delay, s/veh								0.4			0.3	
Approach LOS								A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		
Phs Duration (G+Y+Rc), s		90.0			12.5	77.5		
Change Period (Y+Rc), s		6.0			6.0	6.0		
Max Green Setting (Gmax), s		57.0			9.0	42.0		
Max Q Clear Time (g_c+I1), s		4.2			2.4	2.0		
Green Ext Time (p_c), s		49.3			0.1	37.9		

Intersection Summary	
HCM 2010 Ctrl Delay	0.4
HCM 2010 LOS	A

#4 S. Pleasantburg Drive at E. Antrim Drive / W. Antrim Drive

4: S. Pleasantburg Dr./N. Pleasantburg Dr. & W. Antrim Dr./E. Antrim Dr.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	79	64	140	253	83	31	123	1037	310	93	1251	124
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		-2%			1%			1%			1%	
Storage Length (ft)	125		0	275		0	350		0	250		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1693	3038	0	3236	1686	0	1668	4631	0	1668	4726	0
Flt Permitted	0.676			0.950			0.137			0.146		
Satd. Flow (perm)	1205	3038	0	3236	1686	0	241	4631	0	256	4726	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		156			22			93			20	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		763			919			795			553	
Travel Time (s)		14.9			17.9			13.6			9.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	88	227	0	281	126	0	137	1496	0	103	1528	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA		Prot	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4						2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	3.0	5.0		3.0	18.0		3.0	15.0		3.0	15.0	
Minimum Split (s)	15.0	22.0		15.0	24.0		15.0	22.0		15.0	22.0	
Total Split (s)	15.0	23.0		16.0	24.0		15.0	26.0		15.0	26.0	
Total Split (%)	18.8%	28.8%		20.0%	30.0%		18.8%	32.5%		18.8%	32.5%	
Maximum Green (s)	11.0	17.0		12.0	18.0		11.0	20.0		11.0	20.0	
Yellow Time (s)	3.5	4.0		3.5	4.0		3.5	4.0		3.5	4.0	
All-Red Time (s)	0.5	2.0		0.5	2.0		0.5	2.0		0.5	2.0	
Lost Time Adjust (s)	0.0	-2.0		0.0	-2.0		0.0	-2.0		0.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	4.0		2.0	4.0	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Walk Time (s)		5.0			5.0			5.0			5.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	22.7	15.2		10.6	20.0		40.0	32.8		37.3	30.1	
Actuated g/C Ratio	0.28	0.19		0.13	0.25		0.50	0.41		0.47	0.38	

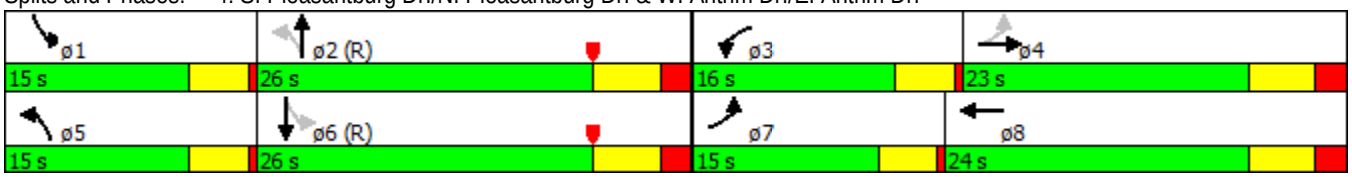
4: S. Pleasantburg Dr./N. Pleasantburg Dr. & W. Antrim Dr./E. Antrim Dr.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.23	0.32		0.66	0.29		0.52	0.77		0.42	0.85	
Control Delay	16.9	10.7		40.6	22.0		19.1	25.1		16.8	31.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	16.9	10.7		40.6	22.0		19.1	25.1		16.8	31.2	
LOS	B	B		D	C		B	C		B	C	
Approach Delay		12.4			34.9			24.6			30.3	
Approach LOS		B			C			C			C	
Queue Length 50th (ft)	27	15		69	42		35	232		26	257	
Queue Length 95th (ft)	53	43		106	87		74	#379		55	#426	
Internal Link Dist (ft)		683			839			715			473	
Turn Bay Length (ft)	125			275			350			250		
Base Capacity (vph)	461	840		485	438		323	1955		324	1791	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.19	0.27		0.58	0.29		0.42	0.77		0.32	0.85	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 27.0 Intersection LOS: C
Intersection Capacity Utilization 68.6% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: S. Pleasantburg Dr./N. Pleasantburg Dr. & W. Antrim Dr./E. Antrim Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	79	64	140	253	83	31	123	1037	310	93	1251	124
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1782	1782	1818	1756	1756	1791	1756	1756	1791	1756	1756	1791
Adj Flow Rate, veh/h	88	71	156	281	92	34	137	1152	344	103	1390	138
Adj No. of Lanes	1	2	0	2	1	0	1	3	0	1	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	397	332	297	364	306	113	252	1598	477	236	1868	185
Arrive On Green	0.06	0.20	0.18	0.11	0.25	0.24	0.07	0.44	0.42	0.06	0.42	0.41
Sat Flow, veh/h	1697	1693	1515	3244	1224	452	1672	3664	1094	1672	4434	440
Grp Volume(v), veh/h	88	71	156	281	0	126	137	1005	491	103	1002	526
Grp Sat Flow(s),veh/h/ln	1697	1693	1515	1622	0	1676	1672	1598	1563	1672	1598	1678
Q Serve(g_s), s	3.4	2.8	7.4	6.7	0.0	4.9	3.8	20.7	20.8	2.9	21.1	21.2
Cycle Q Clear(g_c), s	3.4	2.8	7.4	6.7	0.0	4.9	3.8	20.7	20.8	2.9	21.1	21.2
Prop In Lane	1.00		1.00	1.00		0.27	1.00		0.70	1.00		0.26
Lane Grp Cap(c), veh/h	397	332	297	364	0	419	252	1394	682	236	1347	707
V/C Ratio(X)	0.22	0.21	0.52	0.77	0.00	0.30	0.54	0.72	0.72	0.44	0.74	0.74
Avail Cap(c_a), veh/h	532	402	360	487	0	419	364	1394	682	372	1347	707
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.1	27.0	29.3	34.5	0.0	24.4	17.0	18.6	18.9	16.2	19.5	19.6
Incr Delay (d2), s/veh	0.1	0.3	1.4	3.6	0.0	0.4	0.7	3.3	6.5	0.5	3.8	7.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	1.4	3.2	3.2	0.0	2.3	1.8	9.7	10.1	1.3	9.9	11.2
LnGrp Delay(d),s/veh	25.2	27.3	30.7	38.2	0.0	24.8	17.6	21.8	25.4	16.7	23.3	26.6
LnGrp LOS	C	C	C	D		C	B	C	C	B	C	C
Approach Vol, veh/h		315			407			1633			1631	
Approach Delay, s/veh		28.4			34.0			22.5			23.9	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.5	38.9	13.0	19.7	9.6	37.7	8.7	24.0
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	11.0	20.0	12.0	17.0	11.0	20.0	11.0	18.0
Max Q Clear Time (g_c+I1), s	4.9	22.8	8.7	9.4	5.8	23.2	5.4	6.9
Green Ext Time (p_c), s	0.1	0.0	0.2	0.9	0.1	0.0	0.1	1.1

Intersection Summary	
HCM 2010 Ctrl Delay	24.7
HCM 2010 LOS	C

4: S. Pleasantburg Dr./N. Pleasantburg Dr. & W. Antrim Dr./E. Antrim Dr.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	191	99	201	417	79	66	154	1354	391	107	989	46
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		-2%			1%			1%			1%	
Storage Length (ft)	125		0	275		0	350		0	250		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1693	3048	0	3236	1636	0	1668	4631	0	1668	4760	0
Flt Permitted	0.503			0.950			0.158			0.106		
Satd. Flow (perm)	897	3048	0	3236	1636	0	277	4631	0	186	4760	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		223			41			91			9	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		763			875			795			478	
Travel Time (s)		14.9			17.0			13.6			8.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	212	333	0	463	161	0	171	1938	0	119	1150	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA		Prot	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4						2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	3.0	5.0		3.0	8.0		3.0	15.0		3.0	15.0	
Minimum Split (s)	15.0	22.0		15.0	22.0		15.0	22.0		15.0	22.0	
Total Split (s)	16.0	22.0		16.0	22.0		16.0	37.0		15.0	36.0	
Total Split (%)	17.8%	24.4%		17.8%	24.4%		17.8%	41.1%		16.7%	40.0%	
Maximum Green (s)	12.0	16.0		12.0	16.0		12.0	31.0		11.0	30.0	
Yellow Time (s)	3.5	4.0		3.5	4.0		3.5	4.0		3.5	4.0	
All-Red Time (s)	0.5	2.0		0.5	2.0		0.5	2.0		0.5	2.0	
Lost Time Adjust (s)	0.0	-2.0		0.0	-2.0		0.0	-2.0		0.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	4.0		2.0	4.0	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Walk Time (s)		5.0			5.0			5.0			5.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	24.5	13.4		12.0	14.2		49.9	41.0		47.4	39.7	
Actuated g/C Ratio	0.27	0.15		0.13	0.16		0.55	0.46		0.53	0.44	

4: S. Pleasantburg Dr./N. Pleasantburg Dr. & W. Antrim Dr./E. Antrim Dr.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.62	0.52		1.07	0.55		0.59	0.90		0.53	0.55	
Control Delay	31.2	14.4		103.5	32.7		19.1	30.2		21.2	20.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	31.2	14.4		103.5	32.7		19.1	30.2		21.2	20.7	
LOS	C	B		F	C		B	C		C	C	
Approach Delay		20.9			85.2			29.3			20.8	
Approach LOS		C			F			C			C	
Queue Length 50th (ft)	91	29		~152	63		42	348		29	171	
Queue Length 95th (ft)	141	65		#247	120		88	#549		74	248	
Internal Link Dist (ft)		683			795			715			398	
Turn Bay Length (ft)	125			275			350			250		
Base Capacity (vph)	359	788		431	360		345	2158		285	2105	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.59	0.42		1.07	0.45		0.50	0.90		0.42	0.55	

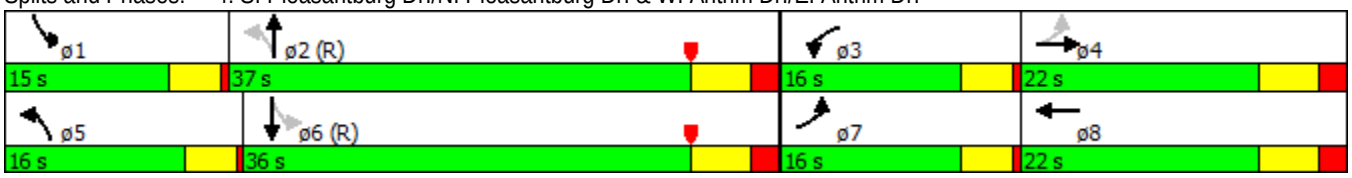
Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.07
Intersection Signal Delay: 33.6 Intersection LOS: C
Intersection Capacity Utilization 78.7% ICU Level of Service D
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: S. Pleasantburg Dr./N. Pleasantburg Dr. & W. Antrim Dr./E. Antrim Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	191	99	201	417	79	66	154	1354	391	107	989	46
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1782	1782	1818	1756	1756	1791	1756	1756	1791	1756	1756	1791
Adj Flow Rate, veh/h	212	110	223	463	88	73	171	1504	434	119	1099	51
Adj No. of Lanes	1	2	0	2	1	0	1	3	0	1	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	398	319	286	433	176	146	323	1626	465	189	1964	91
Arrive On Green	0.12	0.19	0.18	0.13	0.20	0.19	0.08	0.44	0.43	0.06	0.42	0.41
Sat Flow, veh/h	1697	1693	1515	3244	889	737	1672	3706	1059	1672	4695	218
Grp Volume(v), veh/h	212	110	223	463	0	161	171	1295	643	119	748	402
Grp Sat Flow(s),veh/h/ln	1697	1693	1515	1622	0	1626	1672	1598	1569	1672	1598	1717
Q Serve(g_s), s	9.1	5.1	12.6	12.0	0.0	8.0	5.4	34.4	35.1	3.7	16.0	16.0
Cycle Q Clear(g_c), s	9.1	5.1	12.6	12.0	0.0	8.0	5.4	34.4	35.1	3.7	16.0	16.0
Prop In Lane	1.00		1.00	1.00		0.45	1.00		0.67	1.00		0.13
Lane Grp Cap(c), veh/h	398	319	286	433	0	323	323	1403	689	189	1337	718
V/C Ratio(X)	0.53	0.34	0.78	1.07	0.00	0.50	0.53	0.92	0.93	0.63	0.56	0.56
Avail Cap(c_a), veh/h	415	339	303	433	0	325	409	1403	689	290	1337	718
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.3	31.7	35.2	39.0	0.0	32.3	15.9	23.8	24.3	21.3	19.9	19.9
Incr Delay (d2), s/veh	0.5	0.6	11.7	63.3	0.0	1.2	0.5	11.6	21.5	1.3	1.7	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	2.4	6.2	9.2	0.0	3.7	2.5	17.4	19.1	1.8	7.4	8.2
LnGrp Delay(d),s/veh	26.8	32.3	47.0	102.3	0.0	33.5	16.4	35.4	45.8	22.6	21.6	23.1
LnGrp LOS	C	C	D	F		C	B	D	D	C	C	C
Approach Vol, veh/h		545			624			2109			1269	
Approach Delay, s/veh		36.2			84.6			37.0			22.1	
Approach LOS		D			F			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.5	43.5	16.0	21.0	11.4	41.7	15.1	21.9
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	11.0	31.0	12.0	16.0	12.0	30.0	12.0	16.0
Max Q Clear Time (g_c+I1), s	5.7	37.1	14.0	14.6	7.4	18.0	11.1	10.0
Green Ext Time (p_c), s	0.1	0.0	0.0	0.3	0.1	11.2	0.0	1.1

Intersection Summary	
HCM 2010 Ctrl Delay	39.3
HCM 2010 LOS	D

4: S. Pleasantburg Dr./N. Pleasantburg Dr. & W. Antrim Dr./E. Antrim Dr.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	79	64	140	253	83	31	123	1037	310	93	1251	124
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		-2%			1%			1%			1%	
Storage Length (ft)	125		0	275		0	350		0	250		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1693	3038	0	3236	1686	0	1668	3336	1492	1668	4726	0
Flt Permitted	0.676			0.950			0.108			0.950		
Satd. Flow (perm)	1205	3038	0	3236	1686	0	190	3336	1492	1668	4726	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		156			19				344		20	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		763			919			795			553	
Travel Time (s)		14.9			17.9			13.6			9.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	88	227	0	281	126	0	137	1152	344	103	1528	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA		Prot	NA		pm+pt	NA	pm+ov	Prot	NA	
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases	4						2		2			
Detector Phase	7	4		3	8		5	2	3	1	6	
Switch Phase												
Minimum Initial (s)	3.0	5.0		3.0	18.0		3.0	15.0	3.0	3.0	15.0	
Minimum Split (s)	15.0	22.0		15.0	24.0		15.0	22.0	15.0	15.0	22.0	
Total Split (s)	15.0	23.0		16.0	24.0		15.0	36.0	16.0	15.0	36.0	
Total Split (%)	16.7%	25.6%		17.8%	26.7%		16.7%	40.0%	17.8%	16.7%	40.0%	
Maximum Green (s)	11.0	17.0		12.0	18.0		11.0	30.0	12.0	11.0	30.0	
Yellow Time (s)	3.5	4.0		3.5	4.0		3.5	4.0	3.5	3.5	4.0	
All-Red Time (s)	0.5	2.0		0.5	2.0		0.5	2.0	0.5	0.5	2.0	
Lost Time Adjust (s)	0.0	-2.0		0.0	-2.0		0.0	-2.0	0.0	0.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	4.0	2.0	2.0	4.0	
Recall Mode	None	None		None	None		None	C-Max	None	None	C-Max	
Walk Time (s)		5.0			5.0			5.0			5.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	23.2	15.2		11.0	20.0		47.5	40.5	55.5	9.3	39.7	
Actuated g/C Ratio	0.26	0.17		0.12	0.22		0.53	0.45	0.62	0.10	0.44	

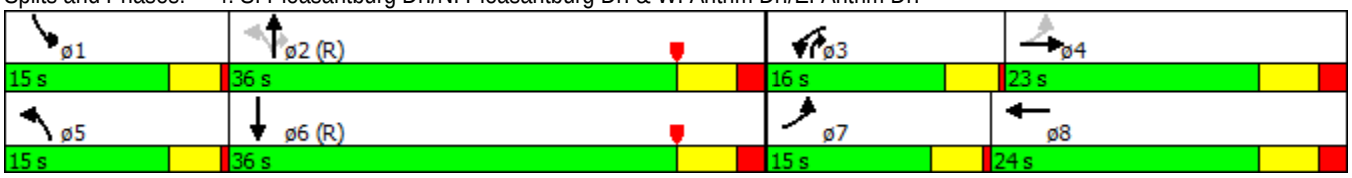
4: S. Pleasantburg Dr./N. Pleasantburg Dr. & W. Antrim Dr./E. Antrim Dr.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.25	0.35		0.71	0.32		0.59	0.77	0.33	0.60	0.73	
Control Delay	21.4	12.4		48.4	27.5		24.7	28.4	2.2	53.0	24.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	21.4	12.4		48.4	27.5		24.7	28.4	2.2	53.0	24.7	
LOS	C	B		D	C		C	C	A	D	C	
Approach Delay		14.9			41.9			22.5			26.5	
Approach LOS		B			D			C			C	
Queue Length 50th (ft)	34	17		79	51		35	308	0	56	260	
Queue Length 95th (ft)	63	48		121	101		88	#479	38	107	#389	
Internal Link Dist (ft)		683			839			715			473	
Turn Bay Length (ft)	125			275			350			250		
Base Capacity (vph)	410	764		431	389		284	1499	1064	206	2096	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.21	0.30		0.65	0.32		0.48	0.77	0.32	0.50	0.73	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 25.5 Intersection LOS: C
Intersection Capacity Utilization 68.6% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: S. Pleasantburg Dr./N. Pleasantburg Dr. & W. Antrim Dr./E. Antrim Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	79	64	140	253	83	31	123	1037	310	93	1251	124
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1782	1782	1818	1756	1756	1791	1756	1756	1756	1756	1756	1791
Adj Flow Rate, veh/h	88	71	156	281	92	34	137	1152	344	103	1390	138
Adj No. of Lanes	1	2	0	2	1	0	1	2	1	1	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	354	292	261	353	272	101	261	1549	822	129	2111	210
Arrive On Green	0.06	0.17	0.16	0.11	0.22	0.21	0.07	0.46	0.44	0.08	0.48	0.47
Sat Flow, veh/h	1697	1693	1515	3244	1224	452	1672	3336	1492	1672	4434	440
Grp Volume(v), veh/h	88	71	156	281	0	126	137	1152	344	103	1002	526
Grp Sat Flow(s),veh/h/ln	1697	1693	1515	1622	0	1676	1672	1668	1492	1672	1598	1678
Q Serve(g_s), s	3.9	3.3	8.6	7.6	0.0	5.7	4.0	25.4	12.1	5.5	21.5	21.6
Cycle Q Clear(g_c), s	3.9	3.3	8.6	7.6	0.0	5.7	4.0	25.4	12.1	5.5	21.5	21.6
Prop In Lane	1.00		1.00	1.00		0.27	1.00		1.00	1.00		0.26
Lane Grp Cap(c), veh/h	354	292	261	353	0	372	261	1549	822	129	1522	799
V/C Ratio(X)	0.25	0.24	0.60	0.80	0.00	0.34	0.52	0.74	0.42	0.80	0.66	0.66
Avail Cap(c_a), veh/h	461	357	320	433	0	372	357	1549	822	204	1522	799
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.7	32.2	34.9	39.1	0.0	29.6	15.8	19.7	11.8	40.9	18.0	18.1
Incr Delay (d2), s/veh	0.1	0.4	2.2	6.6	0.0	0.5	0.6	3.3	1.6	4.7	2.2	4.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	1.6	3.8	3.7	0.0	2.7	1.9	12.4	5.3	2.7	9.9	10.9
LnGrp Delay(d),s/veh	29.9	32.6	37.0	45.8	0.0	30.1	16.5	23.0	13.4	45.5	20.2	22.3
LnGrp LOS	C	C	D	D		C	B	C	B	D	C	C
Approach Vol, veh/h		315			407			1633			1631	
Approach Delay, s/veh		34.0			40.9			20.4			22.5	
Approach LOS		C			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.9	45.8	13.8	19.5	9.9	46.9	9.3	24.0
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	11.0	30.0	12.0	17.0	11.0	30.0	11.0	18.0
Max Q Clear Time (g_c+I1), s	7.5	27.4	9.6	10.6	6.0	23.6	5.9	7.7
Green Ext Time (p_c), s	0.0	2.5	0.2	0.8	0.1	6.1	0.1	1.0

Intersection Summary	
HCM 2010 Ctrl Delay	24.4
HCM 2010 LOS	C

4: S. Pleasantburg Dr./N. Pleasantburg Dr. & W. Antrim Dr./E. Antrim Dr.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	191	99	201	417	79	66	154	1354	391	107	989	46
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		-2%			1%			1%			1%	
Storage Length (ft)	125		0	275		0	350		0	250		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1693	3048	0	3236	1636	0	1668	3336	1492	1668	4760	0
Flt Permitted	0.516			0.950			0.178			0.950		
Satd. Flow (perm)	920	3048	0	3236	1636	0	313	3336	1492	1668	4760	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		212			37				403		8	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		763			875			795			478	
Travel Time (s)		14.9			17.0			13.6			8.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	212	333	0	463	161	0	171	1504	434	119	1150	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA		Prot	NA		pm+pt	NA	pm+ov	Prot	NA	
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases	4						2		2			
Detector Phase	7	4		3	8		5	2	3	1	6	
Switch Phase												
Minimum Initial (s)	3.0	5.0		3.0	8.0		3.0	15.0	3.0	3.0	15.0	
Minimum Split (s)	15.0	22.0		15.0	22.0		15.0	22.0	15.0	15.0	22.0	
Total Split (s)	17.0	22.0		18.0	23.0		16.0	45.0	18.0	15.0	44.0	
Total Split (%)	17.0%	22.0%		18.0%	23.0%		16.0%	45.0%	18.0%	15.0%	44.0%	
Maximum Green (s)	13.0	16.0		14.0	17.0		12.0	39.0	14.0	11.0	38.0	
Yellow Time (s)	3.5	4.0		3.5	4.0		3.5	4.0	3.5	3.5	4.0	
All-Red Time (s)	0.5	2.0		0.5	2.0		0.5	2.0	0.5	0.5	2.0	
Lost Time Adjust (s)	0.0	-2.0		0.0	-2.0		0.0	-2.0	0.0	0.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	4.0	2.0	2.0	4.0	
Recall Mode	None	None		None	None		None	C-Max	None	None	C-Max	
Walk Time (s)		5.0			5.0			5.0			5.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	25.4	13.4		14.0	15.3		55.3	46.3	64.3	10.4	47.6	
Actuated g/C Ratio	0.25	0.13		0.14	0.15		0.55	0.46	0.64	0.10	0.48	

4: S. Pleasantburg Dr./N. Pleasantburg Dr. & W. Antrim Dr./E. Antrim Dr.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.65	0.56		1.02	0.57		0.58	0.97	0.39	0.69	0.51	
Control Delay	36.4	18.0		91.5	38.0		18.0	46.0	2.5	63.9	20.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	36.4	18.0		91.5	38.0		18.0	46.0	2.5	63.9	20.0	
LOS	D	B		F	D		B	D	A	E	B	
Approach Delay		25.2			77.7			34.8			24.1	
Approach LOS		C			E			C			C	
Queue Length 50th (ft)	104	36		~158	74		45	~514	7	73	179	
Queue Length 95th (ft)	159	76		#262	134		85	#712	48	#150	253	
Internal Link Dist (ft)		683			795			715			398	
Turn Bay Length (ft)	125			275			350			250		
Base Capacity (vph)	342	722		453	340		344	1543	1102	191	2268	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.62	0.46		1.02	0.47		0.50	0.97	0.39	0.62	0.51	

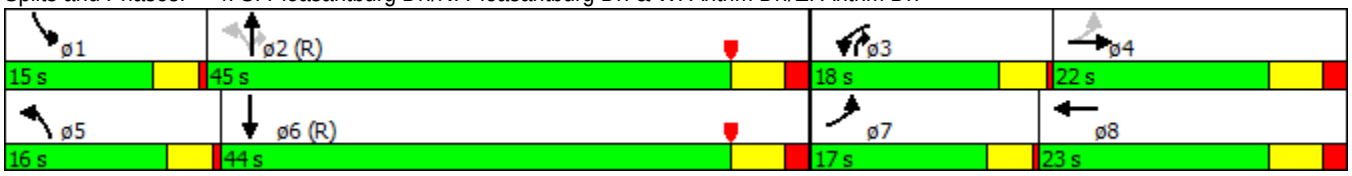
Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.02
Intersection Signal Delay: 36.5 Intersection LOS: D
Intersection Capacity Utilization 81.4% ICU Level of Service D
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: S. Pleasantburg Dr./N. Pleasantburg Dr. & W. Antrim Dr./E. Antrim Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	191	99	201	417	79	66	154	1354	391	107	989	46
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1782	1782	1818	1756	1756	1791	1756	1756	1756	1756	1756	1791
Adj Flow Rate, veh/h	212	110	223	463	88	73	171	1504	434	119	1099	51
Adj No. of Lanes	1	2	0	2	1	0	1	2	1	1	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	390	305	273	454	176	146	325	1445	825	145	2073	96
Arrive On Green	0.12	0.18	0.17	0.14	0.20	0.19	0.08	0.43	0.41	0.09	0.44	0.43
Sat Flow, veh/h	1697	1693	1515	3244	889	737	1672	3336	1492	1672	4695	218
Grp Volume(v), veh/h	212	110	223	463	0	161	171	1504	434	119	748	402
Grp Sat Flow(s),veh/h/ln	1697	1693	1515	1622	0	1626	1672	1668	1492	1672	1598	1717
Q Serve(g_s), s	10.2	5.7	14.2	14.0	0.0	8.8	5.8	43.3	18.3	7.0	17.1	17.1
Cycle Q Clear(g_c), s	10.2	5.7	14.2	14.0	0.0	8.8	5.8	43.3	18.3	7.0	17.1	17.1
Prop In Lane	1.00		1.00	1.00		0.45	1.00		1.00	1.00		0.13
Lane Grp Cap(c), veh/h	390	305	273	454	0	321	325	1445	825	145	1411	758
V/C Ratio(X)	0.54	0.36	0.82	1.02	0.00	0.50	0.53	1.04	0.53	0.82	0.53	0.53
Avail Cap(c_a), veh/h	402	305	273	454	0	321	394	1445	825	184	1411	758
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.7	36.0	39.9	43.0	0.0	35.9	16.4	28.3	14.1	44.9	20.4	20.4
Incr Delay (d2), s/veh	0.7	0.7	17.4	47.2	0.0	1.2	0.5	35.1	2.4	16.3	1.4	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	2.7	7.3	9.2	0.0	4.1	2.7	26.9	8.0	3.9	7.8	8.6
LnGrp Delay(d),s/veh	30.4	36.7	57.4	90.2	0.0	37.2	16.9	63.5	16.5	61.1	21.8	23.1
LnGrp LOS	C	D	E	F		D	B	F	B	E	C	C
Approach Vol, veh/h		545			624			2109			1269	
Approach Delay, s/veh		42.7			76.5			50.0			25.9	
Approach LOS		D			E			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.7	47.3	18.0	22.0	11.8	48.2	16.2	23.8
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	11.0	39.0	14.0	16.0	12.0	38.0	13.0	17.0
Max Q Clear Time (g_c+I1), s	9.0	45.3	16.0	16.2	7.8	19.1	12.2	10.8
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.1	17.1	0.0	1.1

Intersection Summary	
HCM 2010 Ctrl Delay	46.1
HCM 2010 LOS	D

#5 Pendleton Street at Easley Bridge Road / S Academy Street

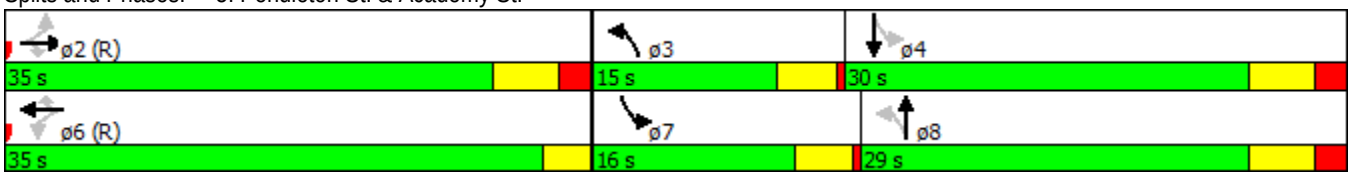
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	24	1079	118	31	637	97	78	235	45	221	428	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-2%			-1%			2%	
Storage Length (ft)	175		250	200		0	275		0	200		0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1743	3486	1560	1787	3575	1599	1778	1872	1591	1752	1831	0
Flt Permitted	0.295			0.116			0.236			0.357		
Satd. Flow (perm)	541	3486	1560	218	3575	1599	442	1872	1591	658	1831	0
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			131			108			177			
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		942			515			1182			672	
Travel Time (s)		18.4			10.0			26.9			15.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	27	1199	131	34	708	108	87	261	50	246	498	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		18			18			18			18	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.02	1.02	1.02	0.99	0.99	0.99	0.99	0.99	0.99	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Free	pm+pt	NA	
Protected Phases		2			6		3	8		7	4	
Permitted Phases	2		2	6		6	8		Free	4		
Detector Phase	2	2	2	6	6	6	3	8		7	4	
Switch Phase												
Minimum Initial (s)	18.0	18.0	18.0	18.0	18.0	18.0	3.0	8.0		5.0	8.0	
Minimum Split (s)	24.0	24.0	24.0	22.0	22.0	22.0	15.0	22.0		15.0	22.0	
Total Split (s)	35.0	35.0	35.0	35.0	35.0	35.0	15.0	29.0		16.0	30.0	
Total Split (%)	43.8%	43.8%	43.8%	43.8%	43.8%	43.8%	18.8%	36.3%		20.0%	37.5%	
Maximum Green (s)	29.0	29.0	29.0	32.0	32.0	32.0	11.0	23.0		12.0	24.0	
Yellow Time (s)	4.0	4.0	4.0	3.0	3.0	3.0	3.5	4.0		3.5	4.0	
All-Red Time (s)	2.0	2.0	2.0	0.0	0.0	0.0	0.5	2.0		0.5	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	1.0	1.0	1.0	0.0	-2.0		0.0	-2.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	4.5	4.5	4.5	0.2	0.2	0.2	2.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	C-Min	C-Min	C-Min	None	None		None	None	
Act Effct Green (s)	35.3	35.3	35.3	35.3	35.3	35.3	28.0	21.5	80.0	36.6	27.9	
Actuated g/C Ratio	0.44	0.44	0.44	0.44	0.44	0.44	0.35	0.27	1.00	0.46	0.35	
v/c Ratio	0.11	0.78	0.17	0.35	0.45	0.14	0.33	0.52	0.03	0.54	0.78	
Control Delay	17.3	25.2	3.8	30.9	17.9	4.1	14.7	28.0	0.0	17.4	33.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	17.3	25.2	3.8	30.9	17.9	4.1	14.7	28.0	0.0	17.4	33.2	
LOS	B	C	A	C	B	A	B	C	A	B	C	
Approach Delay		23.0			16.7			21.6			28.0	
Approach LOS		C			B			C			C	
Queue Length 50th (ft)	8	278	0	12	134	0	22	106	0	68	213	
Queue Length 95th (ft)	26	#415	32	#48	189	30	43	170	0	110	#363	
Internal Link Dist (ft)		862			435			1102			592	
Turn Bay Length (ft)	175		250	200			275			200		
Base Capacity (vph)	238	1537	761	96	1576	765	363	585	1591	465	639	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.11	0.78	0.17	0.35	0.45	0.14	0.24	0.45	0.03	0.53	0.78	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.78
Intersection Signal Delay: 22.3 Intersection LOS: C
Intersection Capacity Utilization 67.9% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Pendleton St. & Academy St.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	24	1079	118	31	637	97	78	235	45	221	428	20
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1835	1835	1835	1881	1881	1881	1872	1872	1872	1844	1844	1881
Adj Flow Rate, veh/h	27	1199	131	34	708	108	87	261	0	246	476	22
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	310	1652	739	156	1560	698	230	464	394	427	549	25
Arrive On Green	0.47	0.47	0.47	0.44	0.44	0.44	0.06	0.25	0.00	0.13	0.31	0.30
Sat Flow, veh/h	657	3486	1560	414	3575	1599	1783	1872	1591	1756	1749	81
Grp Volume(v), veh/h	27	1199	131	34	708	108	87	261	0	246	0	498
Grp Sat Flow(s),veh/h/ln	657	1743	1560	414	1787	1599	1783	1872	1591	1756	0	1830
Q Serve(g_s), s	2.3	22.1	3.9	6.0	11.1	3.3	2.9	9.7	0.0	8.1	0.0	20.5
Cycle Q Clear(g_c), s	13.4	22.1	3.9	28.1	11.1	3.3	2.9	9.7	0.0	8.1	0.0	20.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	310	1652	739	156	1560	698	230	464	394	427	0	574
V/C Ratio(X)	0.09	0.73	0.18	0.22	0.45	0.15	0.38	0.56	0.00	0.58	0.00	0.87
Avail Cap(c_a), veh/h	310	1652	739	156	1560	698	364	585	497	465	0	595
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.5	16.9	12.1	30.7	15.8	13.6	23.1	26.3	0.0	19.2	0.0	25.9
Incr Delay (d2), s/veh	0.6	2.8	0.5	3.2	1.0	0.5	0.4	1.1	0.0	1.5	0.0	12.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	11.1	1.7	0.8	5.6	1.5	1.5	5.1	0.0	4.1	0.0	12.4
LnGrp Delay(d),s/veh	19.0	19.7	12.6	33.9	16.8	14.1	23.5	27.4	0.0	20.7	0.0	38.5
LnGrp LOS	B	B	B	C	B	B	C	C		C		D
Approach Vol, veh/h		1357			850			348			744	
Approach Delay, s/veh		19.0			17.1			26.4			32.6	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		41.9	9.0	29.1		41.9	14.3	23.8
Change Period (Y+Rc), s		6.0	4.0	6.0		* 6	4.0	6.0
Max Green Setting (Gmax), s		29.0	11.0	24.0		* 32	12.0	23.0
Max Q Clear Time (g_c+I1), s		24.1	4.9	22.5		30.1	10.1	11.7
Green Ext Time (p_c), s		3.9	0.1	0.6		1.6	0.2	2.6

Intersection Summary	
HCM 2010 Ctrl Delay	22.4
HCM 2010 LOS	C

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

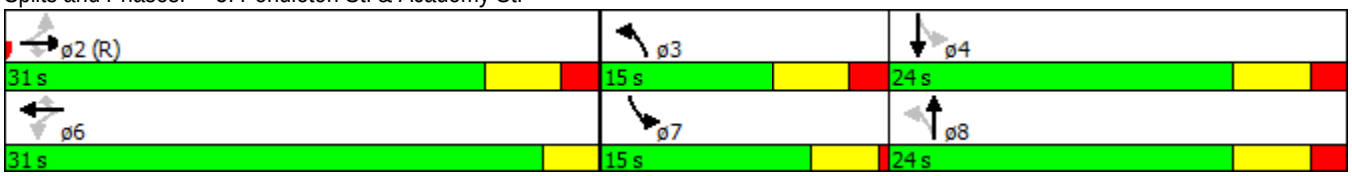
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	46	976	171	57	676	120	108	244	71	202	328	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-2%			-1%			2%	
Storage Length (ft)	175		250	200		0	275		0	200		0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1743	3486	1560	1787	3575	1599	1778	1872	1591	1752	1811	0
Flt Permitted	0.266			0.142			0.280			0.398		
Satd. Flow (perm)	488	3486	1560	267	3575	1599	524	1872	1591	734	1811	0
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			190			140			234			
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		942			515			1182			672	
Travel Time (s)		18.4			10.0			26.9			15.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	51	1084	190	63	751	133	120	271	79	224	413	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		18			18			18			18	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.02	1.02	1.02	0.99	0.99	0.99	0.99	0.99	0.99	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Free	pm+pt	NA	
Protected Phases		2			6		3	8		7	4	
Permitted Phases	2		2	6		6	8		Free	4		
Detector Phase	2	2	2	6	6	6	3	8		7	4	
Switch Phase												
Minimum Initial (s)	18.0	18.0	18.0	18.0	18.0	18.0	3.0	8.0		5.0	8.0	
Minimum Split (s)	24.0	24.0	24.0	22.0	22.0	22.0	15.0	22.0		15.0	22.0	
Total Split (s)	31.0	31.0	31.0	31.0	31.0	31.0	15.0	24.0		15.0	24.0	
Total Split (%)	44.3%	44.3%	44.3%	44.3%	44.3%	44.3%	21.4%	34.3%		21.4%	34.3%	
Maximum Green (s)	25.0	25.0	25.0	28.0	28.0	28.0	9.0	18.0		11.0	18.0	
Yellow Time (s)	4.0	4.0	4.0	3.0	3.0	3.0	4.0	4.0		3.5	4.0	
All-Red Time (s)	2.0	2.0	2.0	0.0	0.0	0.0	2.0	2.0		0.5	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	1.0	1.0	1.0	-2.0	-2.0		0.0	-2.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	4.5	4.5	4.5	0.2	0.2	0.2	3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	Min	Min	Min	None	None		None	None	
Act Effct Green (s)	29.4	29.4	29.4	29.4	29.4	29.4	28.3	18.5	70.0	29.5	21.2	
Actuated g/C Ratio	0.42	0.42	0.42	0.42	0.42	0.42	0.40	0.26	1.00	0.42	0.30	
v/c Ratio	0.25	0.74	0.25	0.57	0.50	0.18	0.31	0.55	0.05	0.49	0.76	
Control Delay	18.9	21.9	3.5	42.7	17.1	3.4	12.1	26.2	0.1	14.9	33.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	18.9	21.9	3.5	42.7	17.1	3.4	12.1	26.2	0.1	14.9	33.6	
LOS	B	C	A	D	B	A	B	C	A	B	C	
Approach Delay		19.2			16.9			18.2			27.0	
Approach LOS		B			B			B			C	
Queue Length 50th (ft)	15	213	0	21	128	0	26	96	0	52	160	
Queue Length 95th (ft)	42	289	36	#82	179	28	52	165	0	92	#302	
Internal Link Dist (ft)		862			435			1102			592	
Turn Bay Length (ft)	175		250	200			275			200		
Base Capacity (vph)	205	1466	766	111	1503	753	418	539	1591	474	547	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.25	0.74	0.25	0.57	0.50	0.18	0.29	0.50	0.05	0.47	0.76	

Intersection Summary

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 19.9 Intersection LOS: B
Intersection Capacity Utilization 81.2% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Pendleton St. & Academy St.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	46	976	171	57	676	120	108	244	71	202	328	44
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1835	1835	1835	1881	1881	1881	1872	1872	1872	1844	1844	1881
Adj Flow Rate, veh/h	51	1084	190	63	751	133	120	271	0	224	364	49
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	286	1581	707	175	1468	657	339	468	397	426	440	59
Arrive On Green	0.45	0.45	0.45	0.41	0.41	0.41	0.10	0.25	0.00	0.13	0.28	0.26
Sat Flow, veh/h	616	3486	1560	437	3575	1599	1783	1872	1591	1756	1592	214
Grp Volume(v), veh/h	51	1084	190	63	751	133	120	271	0	224	0	413
Grp Sat Flow(s),veh/h/ln	616	1743	1560	437	1787	1599	1783	1872	1591	1756	0	1806
Q Serve(g_s), s	4.4	17.3	5.3	9.9	11.0	3.7	3.3	8.9	0.0	6.7	0.0	15.0
Cycle Q Clear(g_c), s	15.4	17.3	5.3	27.1	11.0	3.7	3.3	8.9	0.0	6.7	0.0	15.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.12
Lane Grp Cap(c), veh/h	286	1581	707	175	1468	657	339	468	397	426	0	500
V/C Ratio(X)	0.18	0.69	0.27	0.36	0.51	0.20	0.35	0.58	0.00	0.53	0.00	0.83
Avail Cap(c_a), veh/h	286	1581	707	175	1468	657	444	535	455	482	0	516
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.9	15.2	11.9	28.6	15.4	13.3	17.4	23.0	0.0	17.8	0.0	23.8
Incr Delay (d2), s/veh	1.4	2.4	0.9	0.5	0.1	0.1	0.6	1.2	0.0	1.0	0.0	10.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	8.8	2.5	1.2	5.5	1.6	1.7	4.7	0.0	3.3	0.0	8.9
LnGrp Delay(d),s/veh	20.2	17.6	12.8	29.0	15.5	13.3	18.0	24.2	0.0	18.9	0.0	34.2
LnGrp LOS	C	B	B	C	B	B	B	C		B		C
Approach Vol, veh/h		1325			947			391			637	
Approach Delay, s/veh		17.0			16.1			22.3			28.8	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		35.8	10.9	23.4		35.8	12.8	21.5
Change Period (Y+Rc), s		6.0	6.0	6.0		* 6	4.0	6.0
Max Green Setting (Gmax), s		25.0	9.0	18.0		* 28	11.0	18.0
Max Q Clear Time (g_c+I1), s		19.3	5.3	17.0		29.1	8.7	10.9
Green Ext Time (p_c), s		4.5	0.1	0.3		0.0	0.2	1.8

Intersection Summary	
HCM 2010 Ctrl Delay	19.7
HCM 2010 LOS	B

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

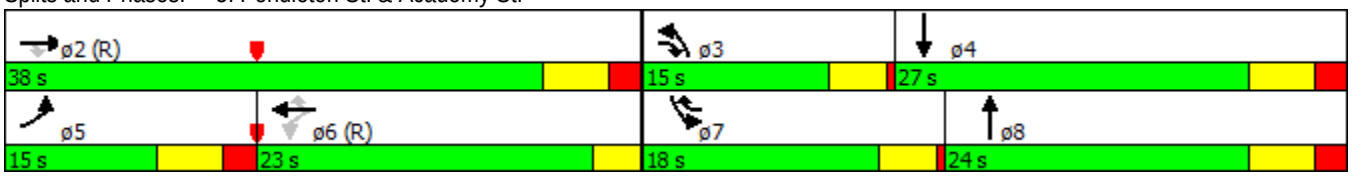
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	24	1079	118	31	637	97	78	235	45	221	428	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-2%			-1%			2%	
Storage Length (ft)	175		250	200		0	275		0	200		0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1743	3486	1560	1787	3575	1599	1778	1872	1591	1752	1831	0
Flt Permitted	0.950			0.156			0.950			0.950		
Satd. Flow (perm)	1743	3486	1560	293	3575	1599	1778	1872	1591	1752	1831	0
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			122			123			259			
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		942			515			1182			672	
Travel Time (s)		18.4			10.0			26.9			15.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	27	1199	131	34	708	108	87	261	50	246	498	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		18			18			18			18	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.02	1.02	1.02	0.99	0.99	0.99	0.99	0.99	0.99	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA	pm+ov	Perm	NA	pm+ov	Prot	NA	Free	Prot	NA	
Protected Phases	5	2	3		6	7	3	8		7	4	
Permitted Phases			2	6		6			Free			
Detector Phase	5	2	3	6	6	7	3	8		7	4	
Switch Phase												
Minimum Initial (s)	5.0	18.0	3.0	18.0	18.0	5.0	3.0	8.0		5.0	8.0	
Minimum Split (s)	15.0	24.0	15.0	22.0	22.0	15.0	15.0	22.0		15.0	22.0	
Total Split (s)	15.0	38.0	15.0	23.0	23.0	18.0	15.0	24.0		18.0	27.0	
Total Split (%)	18.8%	47.5%	18.8%	28.8%	28.8%	22.5%	18.8%	30.0%		22.5%	33.8%	
Maximum Green (s)	9.0	32.0	11.0	20.0	20.0	14.0	11.0	18.0		14.0	21.0	
Yellow Time (s)	4.0	4.0	3.5	3.0	3.0	3.5	3.5	4.0		3.5	4.0	
All-Red Time (s)	2.0	2.0	0.5	0.0	0.0	0.5	0.5	2.0		0.5	2.0	
Lost Time Adjust (s)	-2.0	-2.0	0.0	1.0	1.0	0.0	0.0	-2.0		0.0	-2.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead		Lead	Lag	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	4.5	2.0	0.2	0.2	3.0	2.0	3.0		3.0	3.0	
Recall Mode	None	C-Max	None	C-Min	C-Min	None	None	None		None	None	
Act Effct Green (s)	8.8	35.0	47.1	29.4	29.4	46.8	8.1	19.6	80.0	13.5	24.9	
Actuated g/C Ratio	0.11	0.44	0.59	0.37	0.37	0.58	0.10	0.24	1.00	0.17	0.31	
v/c Ratio	0.14	0.79	0.14	0.32	0.54	0.11	0.48	0.57	0.03	0.83	0.87	
Control Delay	33.3	24.3	1.9	35.1	24.4	2.3	42.3	32.0	0.0	57.3	45.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	33.3	24.3	1.9	35.1	24.4	2.3	42.3	32.0	0.0	57.3	45.2	
LOS	C	C	A	D	C	A	D	C	A	E	D	
Approach Delay		22.3			22.0			30.3			49.2	
Approach LOS		C			C			C			D	
Queue Length 50th (ft)	12	267	2	11	128	0	42	114	0	119	230	
Queue Length 95th (ft)	35	352	20	#55	#260	21	83	188	0	#236	#430	
Internal Link Dist (ft)		862			435			1102			592	
Turn Bay Length (ft)	175		250	200			275			200		
Base Capacity (vph)	239	1523	1019	107	1311	996	244	468	1591	306	570	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.11	0.79	0.13	0.32	0.54	0.11	0.36	0.56	0.03	0.80	0.87	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 29.2 Intersection LOS: C
Intersection Capacity Utilization 67.9% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Pendleton St. & Academy St.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	24	1079	118	31	637	97	78	235	45	221	428	20
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1835	1835	1835	1881	1881	1881	1872	1872	1872	1844	1844	1881
Adj Flow Rate, veh/h	27	1199	131	34	708	108	87	261	0	246	476	22
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	93	1703	837	166	1243	835	131	373	317	285	504	23
Arrive On Green	0.05	0.49	0.46	0.35	0.35	0.36	0.07	0.20	0.00	0.16	0.29	0.28
Sat Flow, veh/h	1747	3486	1560	414	3575	1599	1783	1872	1591	1756	1749	81
Grp Volume(v), veh/h	27	1199	131	34	708	108	87	261	0	246	0	498
Grp Sat Flow(s),veh/h/ln	1747	1743	1560	414	1787	1599	1783	1872	1591	1756	0	1830
Q Serve(g_s), s	1.2	21.5	3.4	5.8	12.9	2.8	3.8	10.4	0.0	10.9	0.0	21.3
Cycle Q Clear(g_c), s	1.2	21.5	3.4	19.0	12.9	2.8	3.8	10.4	0.0	10.9	0.0	21.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	93	1703	837	166	1243	835	131	373	317	285	0	528
V/C Ratio(X)	0.29	0.70	0.16	0.21	0.57	0.13	0.67	0.70	0.00	0.86	0.00	0.94
Avail Cap(c_a), veh/h	240	1703	837	166	1243	835	245	468	398	307	0	528
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	36.4	16.0	9.4	29.1	21.2	9.8	36.1	29.8	0.0	32.7	0.0	27.9
Incr Delay (d2), s/veh	1.7	2.5	0.4	2.8	1.9	0.3	2.2	3.3	0.0	20.6	0.0	25.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	10.7	1.6	0.8	6.6	1.3	1.9	5.7	0.0	6.9	0.0	14.4
LnGrp Delay(d),s/veh	38.1	18.4	9.8	31.9	23.1	10.1	38.3	33.1	0.0	53.3	0.0	53.7
LnGrp LOS	D	B	A	C	C	B	D	C		D		D
Approach Vol, veh/h		1357			850			348			744	
Approach Delay, s/veh		18.0			21.8			34.4			53.6	
Approach LOS		B			C			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s		43.1	9.9	27.1	8.3	34.8	17.0	20.0
Change Period (Y+Rc), s		6.0	4.0	6.0	6.0	* 6	4.0	6.0
Max Green Setting (Gmax), s		32.0	11.0	21.0	9.0	* 20	14.0	18.0
Max Q Clear Time (g_c+I1), s		23.5	5.8	23.3	3.2	21.0	12.9	12.4
Green Ext Time (p_c), s		6.2	0.1	0.0	0.0	0.0	0.1	1.6

Intersection Summary	
HCM 2010 Ctrl Delay	28.7
HCM 2010 LOS	C

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

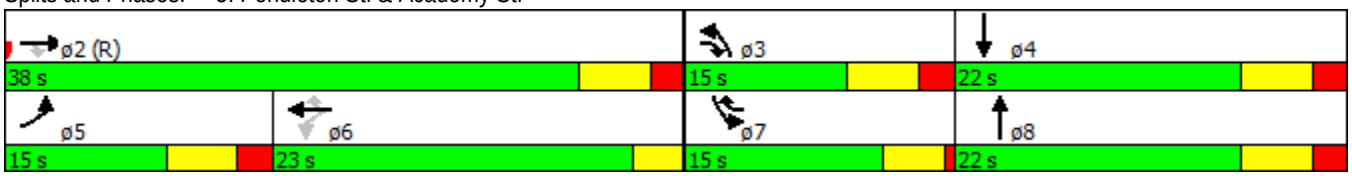
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	46	976	171	57	676	120	108	244	71	202	328	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-2%			-1%			2%	
Storage Length (ft)	175		250	200		0	275		0	200		0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1743	3486	1560	1787	3575	1599	1778	1872	1591	1752	1811	0
Flt Permitted	0.950			0.217			0.950			0.950		
Satd. Flow (perm)	1743	3486	1560	408	3575	1599	1778	1872	1591	1752	1811	0
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			148			133			305			
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		942			515			1182			672	
Travel Time (s)		18.4			10.0			26.9			15.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	51	1084	190	63	751	133	120	271	79	224	413	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		18			18			18			18	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.02	1.02	1.02	0.99	0.99	0.99	0.99	0.99	0.99	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA	pm+ov	Perm	NA	pm+ov	Prot	NA	Free	Prot	NA	
Protected Phases	5	2	3		6	7	3	8		7	4	
Permitted Phases			2	6		6			Free			
Detector Phase	5	2	3	6	6	7	3	8		7	4	
Switch Phase												
Minimum Initial (s)	5.0	18.0	3.0	18.0	18.0	5.0	3.0	8.0		5.0	8.0	
Minimum Split (s)	15.0	24.0	15.0	22.0	22.0	15.0	15.0	22.0		15.0	22.0	
Total Split (s)	15.0	38.0	15.0	23.0	23.0	15.0	15.0	22.0		15.0	22.0	
Total Split (%)	20.0%	50.7%	20.0%	30.7%	30.7%	20.0%	20.0%	29.3%		20.0%	29.3%	
Maximum Green (s)	9.0	32.0	9.0	20.0	20.0	11.0	9.0	16.0		11.0	16.0	
Yellow Time (s)	4.0	4.0	4.0	3.0	3.0	3.5	4.0	4.0		3.5	4.0	
All-Red Time (s)	2.0	2.0	2.0	0.0	0.0	0.5	2.0	2.0		0.5	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	1.0	1.0	0.0	-2.0	-2.0		0.0	-2.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead		Lead	Lag	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	4.5	3.0	0.2	0.2	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max	None	Min	Min	None	None	None		None	None	
Act Effct Green (s)	9.4	34.0	48.4	25.4	25.4	40.4	10.4	18.0	75.0	11.0	18.6	
Actuated g/C Ratio	0.13	0.45	0.65	0.34	0.34	0.54	0.14	0.24	1.00	0.15	0.25	
v/c Ratio	0.23	0.69	0.18	0.46	0.62	0.14	0.49	0.60	0.05	0.88	0.92	
Control Delay	31.7	19.1	1.9	38.7	25.9	2.9	36.8	31.9	0.1	65.9	57.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	31.7	19.1	1.9	38.7	25.9	2.9	36.8	31.9	0.1	65.9	57.5	
LOS	C	B	A	D	C	A	D	C	A	E	E	
Approach Delay		17.1			23.5			27.8			60.5	
Approach LOS		B			C			C			E	
Queue Length 50th (ft)	22	201	6	25	168	0	52	112	0	103	189	
Queue Length 95th (ft)	51	269	26	#85	#262	27	102	188	0	#225	#359	
Internal Link Dist (ft)		862			435			1102			592	
Turn Bay Length (ft)	175		250	200			275			200		
Base Capacity (vph)	255	1580	1070	137	1208	921	260	449	1591	256	448	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.20	0.69	0.18	0.46	0.62	0.14	0.46	0.60	0.05	0.88	0.92	

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 0 (0%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 28.6 Intersection LOS: C
Intersection Capacity Utilization 81.2% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Pendleton St. & Academy St.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	46	976	171	57	676	120	108	244	71	202	328	44
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1835	1835	1835	1881	1881	1881	1872	1872	1872	1844	1844	1881
Adj Flow Rate, veh/h	51	1084	190	63	751	133	120	271	0	224	364	49
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	123	1705	936	192	1163	776	198	382	325	258	382	51
Arrive On Green	0.07	0.49	0.49	0.33	0.33	0.34	0.11	0.20	0.00	0.15	0.24	0.23
Sat Flow, veh/h	1747	3486	1560	437	3575	1599	1783	1872	1591	1756	1592	214
Grp Volume(v), veh/h	51	1084	190	63	751	133	120	271	0	224	0	413
Grp Sat Flow(s),veh/h/ln	1747	1743	1560	437	1787	1599	1783	1872	1591	1756	0	1806
Q Serve(g_s), s	2.1	17.3	4.2	9.9	13.5	3.5	4.8	10.1	0.0	9.4	0.0	16.9
Cycle Q Clear(g_c), s	2.1	17.3	4.2	17.9	13.5	3.5	4.8	10.1	0.0	9.4	0.0	16.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.12
Lane Grp Cap(c), veh/h	123	1705	936	192	1163	776	198	382	325	258	0	434
V/C Ratio(X)	0.42	0.64	0.20	0.33	0.65	0.17	0.61	0.71	0.00	0.87	0.00	0.95
Avail Cap(c_a), veh/h	256	1705	936	192	1163	776	261	449	382	258	0	434
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.4	14.2	6.8	26.8	21.6	10.8	31.8	27.8	0.0	31.3	0.0	28.1
Incr Delay (d2), s/veh	2.2	1.8	0.5	0.4	1.0	0.0	3.0	4.2	0.0	25.8	0.0	31.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	8.7	1.9	1.2	6.7	1.5	2.5	5.6	0.0	6.4	0.0	12.1
LnGrp Delay(d),s/veh	35.6	16.0	7.3	27.1	22.6	10.9	34.8	32.0	0.0	57.1	0.0	59.5
LnGrp LOS	D	B	A	C	C	B	C	C		E		E
Approach Vol, veh/h		1325			947			391			637	
Approach Delay, s/veh		15.5			21.2			32.8			58.6	
Approach LOS		B			C			C			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s		40.7	12.3	22.0	9.3	31.4	15.0	19.3
Change Period (Y+Rc), s		6.0	6.0	6.0	6.0	* 6	4.0	6.0
Max Green Setting (Gmax), s		32.0	9.0	16.0	9.0	* 20	11.0	16.0
Max Q Clear Time (g_c+I1), s		19.3	6.8	18.9	4.1	19.9	11.4	12.1
Green Ext Time (p_c), s		8.1	0.1	0.0	0.0	0.1	0.0	1.2

Intersection Summary	
HCM 2010 Ctrl Delay	27.5
HCM 2010 LOS	C

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

#6 S. Pleasantburg Drive at Mauldin Road

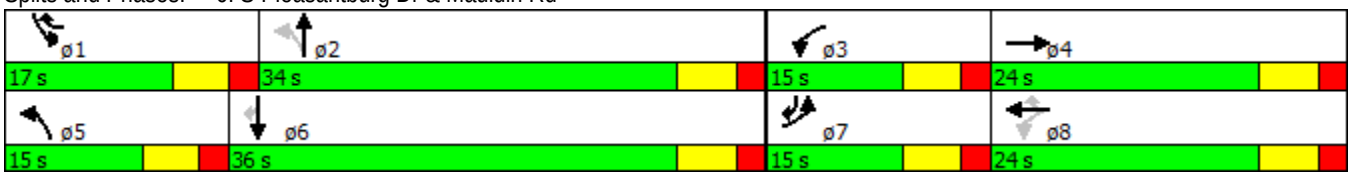
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	175	480	41	169	600	391	166	1165	63	190	567	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-3%			1%			-1%			1%	
Storage Length (ft)	300		0	275		250	150		0	375		300
Storage Lanes	2		0	1		1	1		0	2		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	3485	3549	0	1761	3522	1575	1778	5070	0	3416	5060	1575
Flt Permitted	0.950			0.206			0.360			0.950		
Satd. Flow (perm)	3485	3549	0	382	3522	1575	674	5070	0	3416	5060	1575
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9				107		10				154
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		931			727			912			718	
Travel Time (s)		18.1			14.2			13.8			10.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	194	579	0	188	667	434	184	1364	0	211	630	161
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			30			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes			Yes			Yes	
Headway Factor	0.98	0.98	0.98	1.01	1.01	1.01	0.99	0.99	0.99	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA		pm+pt	NA	pm+ov	pm+pt	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8	1	5	2		1	6	7
Permitted Phases				8		8	2					6
Detector Phase	7	4		3	8	1	5	2		1	6	7
Switch Phase												
Minimum Initial (s)	5.0	10.0		6.0	10.0	5.0	6.0	16.0		5.0	16.0	5.0
Minimum Split (s)	15.0	22.0		15.0	22.0	15.0	15.0	22.0		15.0	22.0	15.0
Total Split (s)	15.0	24.0		15.0	24.0	17.0	15.0	34.0		17.0	36.0	15.0
Total Split (%)	16.7%	26.7%		16.7%	26.7%	18.9%	16.7%	37.8%		18.9%	40.0%	16.7%
Maximum Green (s)	9.2	18.0		9.2	18.0	11.2	9.2	28.0		11.2	30.0	9.2
Yellow Time (s)	3.8	4.0		3.8	4.0	3.8	3.8	4.0		3.8	4.0	3.8
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-1.8	-2.0		-1.8	-2.0	-1.8	-1.8	-2.0		-1.8	-2.0	-1.8
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.5		3.5	3.5	3.0	3.5	4.0		3.0	4.0	3.0
Recall Mode	None	None		None	None	None	None	Max		None	Max	None
Walk Time (s)		5.0						5.0				
Flash Dont Walk (s)		11.0						11.0				
Pedestrian Calls (#/hr)		0						0				
Act Effct Green (s)	10.6	19.6		30.7	19.9	35.8	41.5	30.8		11.9	32.0	46.6
Actuated g/C Ratio	0.12	0.22		0.34	0.22	0.40	0.47	0.35		0.13	0.36	0.52

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.47	0.73		0.63	0.85	0.62	0.41	0.78		0.46	0.35	0.18
Control Delay	40.8	38.3		29.2	45.4	20.3	14.7	29.9		39.2	21.8	2.7
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	40.8	38.3		29.2	45.4	20.3	14.7	29.9		39.2	21.8	2.7
LOS	D	D		C	D	C	B	C		D	C	A
Approach Delay		38.9			34.6			28.1			22.4	
Approach LOS		D			C			C			C	
Queue Length 50th (ft)	53	158		72	192	143	53	252		57	95	2
Queue Length 95th (ft)	87	217		122	#283	242	90	311		91	126	30
Internal Link Dist (ft)		851			647			832			638	
Turn Bay Length (ft)	300			275		250	150			375		300
Base Capacity (vph)	429	802		302	790	713	451	1759		497	1815	903
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.45	0.72		0.62	0.84	0.61	0.41	0.78		0.42	0.35	0.18

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 89.2
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 30.5 Intersection LOS: C
Intersection Capacity Utilization 66.6% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: S Pleasantburg Dr & Mauldin Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	175	480	41	169	600	391	166	1165	63	190	567	145
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1891	1891	1928	1853	1853	1853	1872	1872	1910	1853	1853	1853
Adj Flow Rate, veh/h	194	533	46	188	667	434	184	1294	70	211	630	161
Adj No. of Lanes	2	2	0	1	2	1	1	3	0	2	3	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	343	717	62	352	840	538	463	1846	100	360	1883	737
Arrive On Green	0.10	0.21	0.19	0.12	0.24	0.24	0.10	0.37	0.35	0.11	0.37	0.37
Sat Flow, veh/h	3493	3348	288	1765	3522	1575	1783	4963	268	3424	5060	1575
Grp Volume(v), veh/h	194	285	294	188	667	434	184	888	476	211	630	161
Grp Sat Flow(s),veh/h/ln	1747	1796	1840	1765	1761	1575	1783	1704	1825	1712	1687	1575
Q Serve(g_s), s	4.6	12.8	12.8	6.8	15.3	20.3	5.2	19.0	19.1	5.1	7.7	5.2
Cycle Q Clear(g_c), s	4.6	12.8	12.8	6.8	15.3	20.3	5.2	19.0	19.1	5.1	7.7	5.2
Prop In Lane	1.00		0.16	1.00		1.00	1.00		0.15	1.00		1.00
Lane Grp Cap(c), veh/h	343	385	394	352	840	538	463	1267	679	360	1883	737
V/C Ratio(X)	0.57	0.74	0.75	0.53	0.79	0.81	0.40	0.70	0.70	0.59	0.33	0.22
Avail Cap(c_a), veh/h	447	418	428	361	840	538	504	1267	679	518	1883	737
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.0	31.6	31.7	22.5	30.8	25.7	13.7	22.9	23.1	36.7	19.4	13.5
Incr Delay (d2), s/veh	1.5	6.7	6.8	1.7	5.4	9.0	0.7	3.3	6.0	1.5	0.5	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	7.1	7.3	3.5	8.0	10.7	2.6	9.5	10.7	2.4	3.6	2.4
LnGrp Delay(d),s/veh	38.5	38.3	38.5	24.2	36.2	34.8	14.4	26.2	29.0	38.2	19.8	14.2
LnGrp LOS	D	D	D	C	D	C	B	C	C	D	B	B
Approach Vol, veh/h		773			1289			1548			1002	
Approach Delay, s/veh		38.4			34.0			25.7			22.8	
Approach LOS		D			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	36.0	14.5	22.4	13.0	36.0	12.4	24.5
Change Period (Y+Rc), s	* 5.8	6.0	* 5.8	6.0	* 5.8	6.0	* 5.8	6.0
Max Green Setting (Gmax), s	* 11	28.0	* 9.2	18.0	* 9.2	30.0	* 9.2	18.0
Max Q Clear Time (g_c+I1), s	7.1	21.1	8.8	14.8	7.2	9.7	6.6	22.3
Green Ext Time (p_c), s	0.2	6.2	0.0	1.6	0.1	16.2	0.2	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	29.5
HCM 2010 LOS	C

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

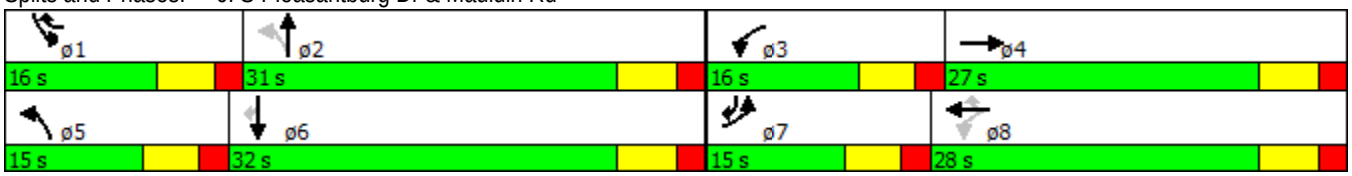
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	165	577	85	189	623	361	139	896	150	248	977	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-3%			1%			-1%			1%	
Storage Length (ft)	300		0	275		250	150		0	375		300
Storage Lanes	2		0	1		1	1		0	2		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	3485	3524	0	1761	3522	1575	1778	4998	0	3416	5060	1575
Flt Permitted	0.950			0.170			0.149			0.950		
Satd. Flow (perm)	3485	3524	0	315	3522	1575	279	4998	0	3416	5060	1575
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17				107		37				125
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		931			727			912			718	
Travel Time (s)		18.1			14.2			13.8			10.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	183	735	0	210	692	401	154	1163	0	276	1086	200
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			30			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes			Yes			Yes	
Headway Factor	0.98	0.98	0.98	1.01	1.01	1.01	0.99	0.99	0.99	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA		pm+pt	NA	pm+ov	pm+pt	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8	1	5	2		1	6	7
Permitted Phases				8		8	2					6
Detector Phase	7	4		3	8	1	5	2		1	6	7
Switch Phase												
Minimum Initial (s)	5.0	10.0		6.0	10.0	5.0	6.0	18.0		5.0	18.0	5.0
Minimum Split (s)	15.0	22.0		15.0	22.0	15.0	15.0	24.0		15.0	24.0	15.0
Total Split (s)	15.0	27.0		16.0	28.0	16.0	15.0	31.0		16.0	32.0	15.0
Total Split (%)	16.7%	30.0%		17.8%	31.1%	17.8%	16.7%	34.4%		17.8%	35.6%	16.7%
Maximum Green (s)	9.2	21.0		10.2	22.0	10.2	9.2	25.0		10.2	26.0	9.2
Yellow Time (s)	3.8	4.0		3.8	4.0	3.8	3.8	4.0		3.8	4.0	3.8
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-1.8	-2.0		-1.8	-2.0	-1.8	-1.8	-2.0		-1.8	-2.0	-1.8
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.5		3.5	3.5	3.0	3.5	4.0		3.0	4.0	3.0
Recall Mode	None	None		None	None	None	None	Max		None	Max	None
Walk Time (s)		5.0						5.0				
Flash Dont Walk (s)		11.0						11.0				
Pedestrian Calls (#/hr)		0						0				
Act Effct Green (s)	10.5	22.5		35.5	23.7	39.5	37.6	27.0		11.7	28.2	42.7
Actuated g/C Ratio	0.12	0.25		0.40	0.27	0.44	0.42	0.30		0.13	0.32	0.48

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.45	0.81		0.67	0.74	0.53	0.52	0.75		0.61	0.68	0.24
Control Delay	40.4	39.0		28.8	35.4	15.9	21.2	31.0		43.1	29.3	6.4
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	40.4	39.0		28.8	35.4	15.9	21.2	31.0		43.1	29.3	6.4
LOS	D	D		C	D	B	C	C		D	C	A
Approach Delay		39.3			28.4			29.8			28.8	
Approach LOS		D			C			C			C	
Queue Length 50th (ft)	50	201		75	188	115	48	212		77	197	22
Queue Length 95th (ft)	83	#271		#140	253	200	89	264		118	245	60
Internal Link Dist (ft)		851			647			832			638	
Turn Bay Length (ft)	300			275		250	150			375		300
Base Capacity (vph)	430	923		321	952	762	304	1542		460	1600	827
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.43	0.80		0.65	0.73	0.53	0.51	0.75		0.60	0.68	0.24

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 89
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 30.8 Intersection LOS: C
Intersection Capacity Utilization 70.2% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: S Pleasantburg Dr & Mauldin Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	165	577	85	189	623	361	139	896	150	248	977	180
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1891	1891	1928	1853	1853	1853	1872	1872	1910	1853	1853	1853
Adj Flow Rate, veh/h	183	641	94	210	692	401	154	996	167	276	1086	200
Adj No. of Lanes	2	2	0	1	2	1	1	3	0	2	3	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	331	794	116	349	1002	638	325	1379	231	420	1701	675
Arrive On Green	0.09	0.25	0.23	0.13	0.28	0.28	0.10	0.31	0.29	0.12	0.34	0.33
Sat Flow, veh/h	3493	3145	461	1765	3522	1575	1783	4411	738	3424	5060	1575
Grp Volume(v), veh/h	183	366	369	210	692	401	154	769	394	276	1086	200
Grp Sat Flow(s),veh/h/ln	1747	1796	1809	1765	1761	1575	1783	1704	1742	1712	1687	1575
Q Serve(g_s), s	4.3	16.5	16.6	7.2	15.1	17.5	4.8	17.3	17.4	6.6	15.7	7.2
Cycle Q Clear(g_c), s	4.3	16.5	16.6	7.2	15.1	17.5	4.8	17.3	17.4	6.6	15.7	7.2
Prop In Lane	1.00		0.25	1.00		1.00	1.00		0.42	1.00		1.00
Lane Grp Cap(c), veh/h	331	453	457	349	1002	638	325	1065	545	420	1701	675
V/C Ratio(X)	0.55	0.81	0.81	0.60	0.69	0.63	0.47	0.72	0.72	0.66	0.64	0.30
Avail Cap(c_a), veh/h	445	478	482	370	1002	638	376	1065	545	476	1701	675
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.3	30.3	30.6	20.9	27.5	20.5	18.2	26.3	26.8	36.2	24.2	16.1
Incr Delay (d2), s/veh	1.4	9.7	9.8	2.8	2.1	2.1	1.3	4.2	8.1	2.8	1.8	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	9.3	9.5	3.7	7.6	8.0	2.5	8.7	9.6	3.3	7.5	3.3
LnGrp Delay(d),s/veh	38.8	40.0	40.4	23.6	29.6	22.6	19.5	30.6	34.9	38.9	26.1	17.3
LnGrp LOS	D	D	D	C	C	C	B	C	C	D	C	B
Approach Vol, veh/h		918			1303			1317			1562	
Approach Delay, s/veh		39.9			26.5			30.6			27.2	
Approach LOS		D			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.6	31.0	15.0	25.8	12.6	33.0	12.2	28.6
Change Period (Y+Rc), s	* 5.8	6.0	* 5.8	6.0	* 5.8	6.0	* 5.8	6.0
Max Green Setting (Gmax), s	* 10	25.0	* 10	21.0	* 9.2	26.0	* 9.2	22.0
Max Q Clear Time (g_c+I1), s	8.6	19.4	9.2	18.6	6.8	17.7	6.3	19.5
Green Ext Time (p_c), s	0.2	5.2	0.1	1.2	0.1	7.7	0.1	2.1

Intersection Summary	
HCM 2010 Ctrl Delay	30.2
HCM 2010 LOS	C

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

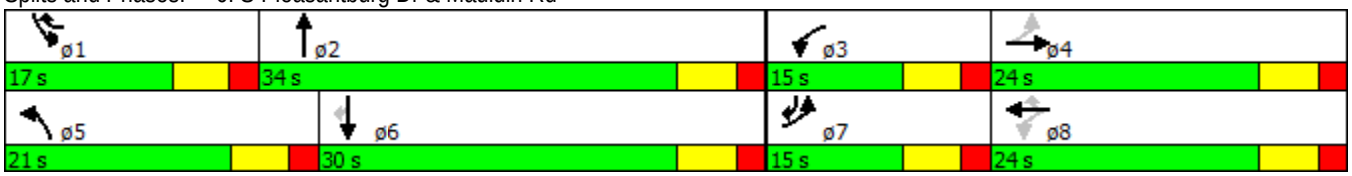
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	175	480	41	169	600	391	166	1165	63	190	567	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-3%			1%			-1%			1%	
Storage Length (ft)	300		0	275		250	150		0	375		300
Storage Lanes	1		0	1		1	1		0	2		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1796	3549	0	1761	3522	1575	1778	5070	0	3416	5060	1575
Flt Permitted	0.204			0.213			0.950			0.950		
Satd. Flow (perm)	386	3549	0	395	3522	1575	1778	5070	0	3416	5060	1575
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9				107		10				129
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		931			727			912			718	
Travel Time (s)		18.1			14.2			13.8			10.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	194	579	0	188	667	434	184	1364	0	211	630	161
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			30			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes			Yes			Yes	
Headway Factor	0.98	0.98	0.98	1.01	1.01	1.01	0.99	0.99	0.99	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8	1	5	2		1	6	7
Permitted Phases	4			8		8						6
Detector Phase	7	4		3	8	1	5	2		1	6	7
Switch Phase												
Minimum Initial (s)	5.0	10.0		6.0	10.0	5.0	6.0	16.0		5.0	16.0	5.0
Minimum Split (s)	15.0	22.0		15.0	22.0	15.0	15.0	22.0		15.0	22.0	15.0
Total Split (s)	15.0	24.0		15.0	24.0	17.0	21.0	34.0		17.0	30.0	15.0
Total Split (%)	16.7%	26.7%		16.7%	26.7%	18.9%	23.3%	37.8%		18.9%	33.3%	16.7%
Maximum Green (s)	9.2	18.0		9.2	18.0	11.2	15.2	28.0		11.2	24.0	9.2
Yellow Time (s)	3.8	4.0		3.8	4.0	3.8	3.8	4.0		3.8	4.0	3.8
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-1.8	-2.0		-1.8	-2.0	-1.8	-1.8	-2.0		-1.8	-2.0	-1.8
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.5		3.5	3.5	3.0	3.5	4.0		3.0	4.0	3.0
Recall Mode	None	None		None	None	None	None	Max		None	Max	None
Walk Time (s)		5.0						5.0				
Flash Dont Walk (s)		11.0						11.0				
Pedestrian Calls (#/hr)		0						0				
Act Effct Green (s)	30.6	19.8		30.6	19.8	35.7	15.2	30.0		11.9	26.7	41.5
Actuated g/C Ratio	0.35	0.22		0.35	0.22	0.40	0.17	0.34		0.13	0.30	0.47

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.64	0.72		0.62	0.85	0.62	0.60	0.79		0.46	0.41	0.20
Control Delay	29.2	37.5		28.5	44.7	20.0	42.7	30.5		39.0	26.1	4.9
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	29.2	37.5		28.5	44.7	20.0	42.7	30.5		39.0	26.1	4.9
LOS	C	D		C	D	C	D	C		D	C	A
Approach Delay		35.4			34.0			31.9			25.4	
Approach LOS		D			C			C			C	
Queue Length 50th (ft)	74	158		71	191	142	96	252		57	105	10
Queue Length 95th (ft)	125	217		122	#283	242	163	311		91	140	44
Internal Link Dist (ft)		851			647			832			638	
Turn Bay Length (ft)	300			275		250	150			375		300
Base Capacity (vph)	309	809		307	796	718	341	1727		502	1526	810
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.63	0.72		0.61	0.84	0.60	0.54	0.79		0.42	0.41	0.20

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 88.5
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 31.7 Intersection LOS: C
Intersection Capacity Utilization 68.9% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: S Pleasantburg Dr & Mauldin Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	175	480	41	169	600	391	166	1165	63	190	567	145
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1891	1891	1928	1853	1853	1853	1872	1872	1910	1853	1853	1853
Adj Flow Rate, veh/h	194	533	46	188	667	434	184	1294	70	211	630	161
Adj No. of Lanes	1	2	0	1	2	1	1	3	0	2	3	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	331	787	68	370	825	531	257	1743	94	361	1581	681
Arrive On Green	0.12	0.24	0.21	0.12	0.23	0.23	0.14	0.35	0.33	0.11	0.31	0.31
Sat Flow, veh/h	1801	3348	288	1765	3522	1575	1783	4963	268	3424	5060	1575
Grp Volume(v), veh/h	194	285	294	188	667	434	184	888	476	211	630	161
Grp Sat Flow(s),veh/h/ln	1801	1796	1840	1765	1761	1575	1783	1704	1825	1712	1687	1575
Q Serve(g_s), s	6.7	12.3	12.4	6.6	15.3	19.8	8.4	19.5	19.6	5.0	8.4	5.5
Cycle Q Clear(g_c), s	6.7	12.3	12.4	6.6	15.3	19.8	8.4	19.5	19.6	5.0	8.4	5.5
Prop In Lane	1.00		0.16	1.00		1.00	1.00		0.15	1.00		1.00
Lane Grp Cap(c), veh/h	331	422	432	370	825	531	257	1197	641	361	1581	681
V/C Ratio(X)	0.59	0.68	0.68	0.51	0.81	0.82	0.72	0.74	0.74	0.58	0.40	0.24
Avail Cap(c_a), veh/h	344	422	432	384	825	531	355	1197	641	521	1581	681
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.0	29.7	29.9	21.2	30.9	25.9	34.9	24.3	24.5	36.4	23.1	15.3
Incr Delay (d2), s/veh	2.4	4.5	4.5	1.3	6.2	9.8	4.9	4.2	7.6	1.5	0.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	6.6	6.8	3.3	8.1	10.8	4.5	9.8	11.1	2.4	4.0	2.5
LnGrp Delay(d),s/veh	24.4	34.2	34.4	22.5	37.1	35.7	39.8	28.5	32.1	37.9	23.8	16.2
LnGrp LOS	C	C	C	C	D	D	D	C	C	D	C	B
Approach Vol, veh/h		773			1289			1548			1002	
Approach Delay, s/veh		31.8			34.5			30.9			25.6	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	34.0	14.3	24.1	16.3	30.7	14.4	24.0
Change Period (Y+Rc), s	* 5.8	6.0	* 5.8	6.0	* 5.8	6.0	* 5.8	6.0
Max Green Setting (Gmax), s	* 11	28.0	* 9.2	18.0	* 15	24.0	* 9.2	18.0
Max Q Clear Time (g_c+I1), s	7.0	21.6	8.6	14.4	10.4	10.4	8.7	21.8
Green Ext Time (p_c), s	0.2	5.8	0.0	2.9	0.2	11.5	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	30.9
HCM 2010 LOS	C

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

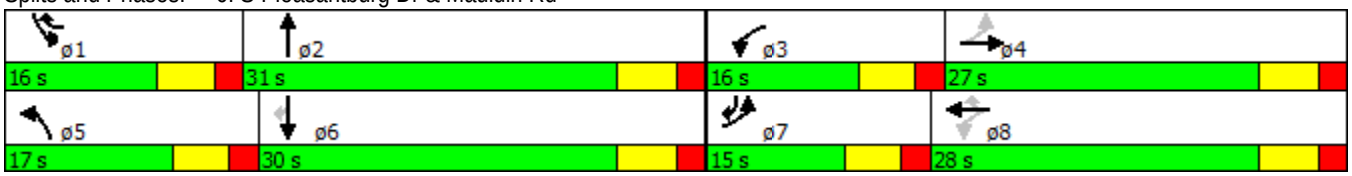
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	165	577	85	189	623	361	139	896	150	248	977	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-3%			1%			-1%			1%	
Storage Length (ft)	300		0	275		250	150		0	375		300
Storage Lanes	1		0	1		1	1		0	2		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1796	3524	0	1761	3522	1575	1778	4998	0	3416	5060	1575
Flt Permitted	0.187			0.171			0.950			0.950		
Satd. Flow (perm)	354	3524	0	317	3522	1575	1778	4998	0	3416	5060	1575
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17				107		37				111
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		931			727			912			718	
Travel Time (s)		18.1			14.2			13.8			10.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	183	735	0	210	692	401	154	1163	0	276	1086	200
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			30			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes			Yes			Yes	
Headway Factor	0.98	0.98	0.98	1.01	1.01	1.01	0.99	0.99	0.99	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8	1	5	2		1	6	7
Permitted Phases	4			8		8						6
Detector Phase	7	4		3	8	1	5	2		1	6	7
Switch Phase												
Minimum Initial (s)	5.0	10.0		6.0	10.0	5.0	6.0	18.0		5.0	18.0	5.0
Minimum Split (s)	15.0	22.0		15.0	22.0	15.0	15.0	24.0		15.0	24.0	15.0
Total Split (s)	15.0	27.0		16.0	28.0	16.0	17.0	31.0		16.0	30.0	15.0
Total Split (%)	16.7%	30.0%		17.8%	31.1%	17.8%	18.9%	34.4%		17.8%	33.3%	16.7%
Maximum Green (s)	9.2	21.0		10.2	22.0	10.2	11.2	25.0		10.2	24.0	9.2
Yellow Time (s)	3.8	4.0		3.8	4.0	3.8	3.8	4.0		3.8	4.0	3.8
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-1.8	-2.0		-1.8	-2.0	-1.8	-1.8	-2.0		-1.8	-2.0	-1.8
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.5		3.5	3.5	3.0	3.5	4.0		3.0	4.0	3.0
Recall Mode	None	None		None	None	None	None	Max		None	Max	None
Walk Time (s)		5.0						5.0				
Flash Dont Walk (s)		11.0						11.0				
Pedestrian Calls (#/hr)		0						0				
Act Effct Green (s)	33.2	22.5		35.3	23.6	39.3	12.4	27.0		11.7	26.3	41.0
Actuated g/C Ratio	0.37	0.25		0.40	0.27	0.44	0.14	0.30		0.13	0.30	0.46

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.60	0.81		0.66	0.74	0.53	0.62	0.75		0.61	0.73	0.26
Control Delay	25.5	39.0		28.7	35.7	15.9	48.0	31.0		43.1	31.8	7.8
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	25.5	39.0		28.7	35.7	15.9	48.0	31.0		43.1	31.8	7.8
LOS	C	D		C	D	B	D	C		D	C	A
Approach Delay		36.3			28.5			33.0			30.7	
Approach LOS		D			C			C			C	
Queue Length 50th (ft)	64	201		75	188	115	83	212		77	204	28
Queue Length 95th (ft)	109	#271		#139	253	200	147	264		118	254	69
Internal Link Dist (ft)		851			647			832			638	
Turn Bay Length (ft)	300			275		250	150			375		300
Base Capacity (vph)	311	923		321	950	760	259	1542		460	1496	790
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.59	0.80		0.65	0.73	0.53	0.59	0.75		0.60	0.73	0.25

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 89
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 31.7 Intersection LOS: C
Intersection Capacity Utilization 70.2% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: S Pleasantburg Dr & Mauldin Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	165	577	85	189	623	361	139	896	150	248	977	180
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1891	1891	1928	1853	1853	1853	1872	1872	1910	1853	1853	1853
Adj Flow Rate, veh/h	183	641	94	210	692	401	154	996	167	276	1086	200
Adj No. of Lanes	1	2	0	1	2	1	1	3	0	2	3	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	336	815	119	354	958	617	222	1363	228	418	1549	658
Arrive On Green	0.11	0.26	0.24	0.13	0.27	0.27	0.12	0.31	0.29	0.12	0.31	0.30
Sat Flow, veh/h	1801	3145	461	1765	3522	1575	1783	4411	738	3424	5060	1575
Grp Volume(v), veh/h	183	366	369	210	692	401	154	769	394	276	1086	200
Grp Sat Flow(s),veh/h/ln	1801	1796	1809	1765	1761	1575	1783	1704	1742	1712	1687	1575
Q Serve(g_s), s	6.2	16.6	16.6	7.3	15.6	18.2	7.2	17.6	17.8	6.7	16.6	7.4
Cycle Q Clear(g_c), s	6.2	16.6	16.6	7.3	15.6	18.2	7.2	17.6	17.8	6.7	16.6	7.4
Prop In Lane	1.00		0.25	1.00		1.00	1.00		0.42	1.00		1.00
Lane Grp Cap(c), veh/h	336	466	469	354	958	617	222	1052	538	418	1549	658
V/C Ratio(X)	0.55	0.79	0.79	0.59	0.72	0.65	0.69	0.73	0.73	0.66	0.70	0.30
Avail Cap(c_a), veh/h	357	473	476	372	967	621	265	1052	538	470	1549	658
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.1	30.1	30.4	21.1	28.8	21.7	36.7	27.0	27.4	36.6	26.8	17.0
Incr Delay (d2), s/veh	1.5	8.6	8.7	2.6	2.8	2.5	6.6	4.5	8.6	2.9	2.7	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	9.3	9.5	3.8	8.0	8.3	4.0	8.9	9.9	3.4	8.1	3.4
LnGrp Delay(d),s/veh	22.6	38.7	39.1	23.7	31.6	24.2	43.3	31.4	35.9	39.6	29.5	18.1
LnGrp LOS	C	D	D	C	C	C	D	C	D	D	C	B
Approach Vol, veh/h		918			1303			1317			1562	
Approach Delay, s/veh		35.7			28.1			34.2			29.8	
Approach LOS		D			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.7	31.0	15.1	26.7	14.9	30.8	14.0	27.8
Change Period (Y+Rc), s	* 5.8	6.0	* 5.8	6.0	* 5.8	6.0	* 5.8	6.0
Max Green Setting (Gmax), s	* 10	25.0	* 10	21.0	* 11	24.0	* 9.2	22.0
Max Q Clear Time (g_c+I1), s	8.7	19.8	9.3	18.6	9.2	18.6	8.2	20.2
Green Ext Time (p_c), s	0.1	4.9	0.1	2.0	0.1	5.1	0.0	1.6

Intersection Summary	
HCM 2010 Ctrl Delay	31.5
HCM 2010 LOS	C

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

#7 Pleasantburg Drive at Rutherford Road

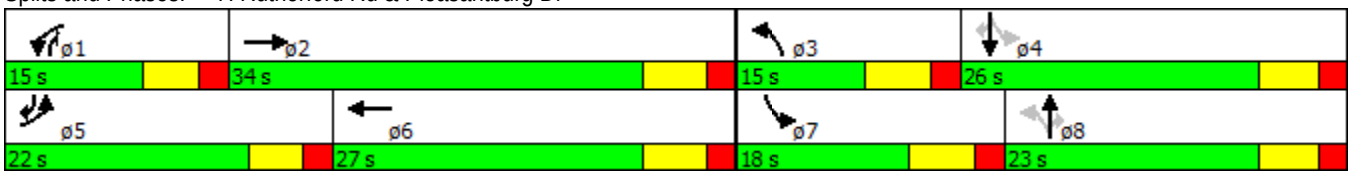
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	323	1426	146	170	801	100	129	314	296	288	809	375
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			0%			2%			2%	
Storage Length (ft)	200		0	200		0	325		325	550		250
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1778	5039	0	1770	4999	0	1752	3504	1567	1752	3504	1567
Flt Permitted	0.950			0.950			0.212			0.360		
Satd. Flow (perm)	1778	5039	0	1770	4999	0	391	3504	1567	664	3504	1567
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			23				187			118
Link Speed (mph)		45			45			40			35	
Link Distance (ft)		933			741			761			812	
Travel Time (s)		14.1			11.2			13.0			15.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	359	1746	0	189	1001	0	143	349	329	320	899	417
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	1.00	1.00	1.00	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA		Prot	NA		pm+pt	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	5	2		1	6		3	8	1	7	4	5
Permitted Phases							8		8	4		4
Detector Phase	5	2		1	6		3	8	1	7	4	5
Switch Phase												
Minimum Initial (s)	3.0	20.0		3.0	20.0		3.0	10.0	3.0	3.0	10.0	3.0
Minimum Split (s)	15.0	27.0		15.0	27.0		15.0	22.0	15.0	15.0	22.0	15.0
Total Split (s)	22.0	34.0		15.0	27.0		15.0	23.0	15.0	18.0	26.0	22.0
Total Split (%)	24.4%	37.8%		16.7%	30.0%		16.7%	25.6%	16.7%	20.0%	28.9%	24.4%
Maximum Green (s)	16.3	27.7		9.3	20.7		8.6	17.0	9.3	11.6	20.0	16.3
Yellow Time (s)	3.7	4.3		3.7	4.3		4.4	4.0	3.7	4.4	4.0	3.7
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.7	-2.3		-1.7	-2.3		-2.4	-2.0	1.7	-2.4	-2.0	-1.7
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	7.4	4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	2.0	2.0	2.0	2.0	2.0
Recall Mode	None	Max		None	Max		None	None	None	None	None	None
Walk Time (s)		5.0						5.0				
Flash Dont Walk (s)		11.0						11.0				
Pedestrian Calls (#/hr)		0						0				
Act Effct Green (s)	18.0	30.0		11.0	23.0		28.8	18.5	30.1	35.7	22.0	44.0
Actuated g/C Ratio	0.20	0.34		0.12	0.26		0.32	0.21	0.34	0.40	0.25	0.49

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	1.00	1.02		0.87	0.77		0.51	0.48	0.50	0.74	1.04	0.50
Control Delay	86.5	58.2		75.2	34.7		24.3	33.8	12.9	31.5	76.5	13.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.5	58.2		75.2	34.7		24.3	33.8	12.9	31.5	76.5	13.2
LOS	F	E		E	C		C	C	B	C	E	B
Approach Delay		63.0			41.1			23.8			51.6	
Approach LOS		E			D			C			D	
Queue Length 50th (ft)	~209	~391		107	189		51	92	58	128	~296	107
Queue Length 95th (ft)	#385	#488		#228	238		91	135	136	#216	#416	187
Internal Link Dist (ft)		853			661			681			732	
Turn Bay Length (ft)	200			200			325		325	550		250
Base Capacity (vph)	358	1706		218	1304		296	745	652	435	863	832
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	1.00	1.02		0.87	0.77		0.48	0.47	0.50	0.74	1.04	0.50

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 89.3
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.04
Intersection Signal Delay: 49.6 Intersection LOS: D
Intersection Capacity Utilization 83.1% ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Rutherford Rd & Pleasantburg Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	323	1426	146	170	801	100	129	314	296	288	809	375
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1872	1872	1910	1863	1863	1900	1844	1844	1844	1844	1844	1844
Adj Flow Rate, veh/h	359	1584	162	189	890	111	143	349	329	320	899	417
Adj No. of Lanes	1	3	0	1	3	0	1	2	1	1	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	357	1571	160	217	1171	146	274	740	399	450	903	712
Arrive On Green	0.20	0.33	0.31	0.12	0.26	0.23	0.11	0.21	0.17	0.16	0.26	0.25
Sat Flow, veh/h	1783	4713	481	1774	4583	569	1756	3504	1568	1756	3504	1568
Grp Volume(v), veh/h	359	1145	601	189	657	344	143	349	329	320	899	417
Grp Sat Flow(s),veh/h/ln	1783	1704	1787	1774	1695	1762	1756	1752	1568	1756	1752	1568
Q Serve(g_s), s	18.0	30.0	30.0	9.4	16.1	16.3	5.4	7.9	15.3	12.2	23.1	17.8
Cycle Q Clear(g_c), s	18.0	30.0	30.0	9.4	16.1	16.3	5.4	7.9	15.3	12.2	23.1	17.8
Prop In Lane	1.00		0.27	1.00		0.32	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	357	1136	596	217	866	450	274	740	399	450	903	712
V/C Ratio(X)	1.01	1.01	1.01	0.87	0.76	0.76	0.52	0.47	0.82	0.71	1.00	0.59
Avail Cap(c_a), veh/h	357	1136	596	217	866	450	297	740	399	450	903	712
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.0	30.0	30.3	38.8	30.9	31.3	24.4	31.1	31.7	21.2	33.4	18.3
Incr Delay (d2), s/veh	49.4	28.6	39.3	28.8	6.2	11.6	0.6	0.2	12.4	4.5	28.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.7	18.6	21.2	6.4	8.2	9.4	2.6	3.8	9.1	6.3	14.7	7.8
LnGrp Delay(d),s/veh	85.4	58.6	69.6	67.6	37.1	42.9	25.0	31.3	44.1	25.7	62.2	19.1
LnGrp LOS	F	F	F	E	D	D	C	C	D	C	E	B
Approach Vol, veh/h		2105			1190			821			1636	
Approach Delay, s/veh		66.3			43.6			35.3			44.1	
Approach LOS		E			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	34.0	13.8	27.2	22.0	27.0	18.0	23.0
Change Period (Y+Rc), s	* 5.7	6.3	6.4	6.0	* 5.7	6.3	6.4	6.0
Max Green Setting (Gmax), s	* 9.3	27.7	8.6	20.0	* 16	20.7	11.6	17.0
Max Q Clear Time (g_c+I1), s	11.4	32.0	7.4	25.1	20.0	18.3	14.2	17.3
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	2.3	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	50.9
HCM 2010 LOS	D

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	415	966	90	150	1253	105	178	580	159	141	363	392
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			0%			2%			2%	
Storage Length (ft)	200		0	200		0	325		325	550		250
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1778	5044	0	1770	5024	0	1752	3504	1567	1752	3504	1567
Flt Permitted	0.950			0.950			0.320			0.189		
Satd. Flow (perm)	1778	5044	0	1770	5024	0	590	3504	1567	349	3504	1567
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			13				153			96
Link Speed (mph)		45			45			40			35	
Link Distance (ft)		933			741			761			812	
Travel Time (s)		14.1			11.2			13.0			15.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	461	1173	0	167	1509	0	198	644	177	157	403	436
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	1.00	1.00	1.00	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA		Prot	NA		pm+pt	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	5	2		1	6		3	8	1	7	4	5
Permitted Phases							8		8	4		4
Detector Phase	5	2		1	6		3	8	1	7	4	5
Switch Phase												
Minimum Initial (s)	3.0	20.0		3.0	20.0		3.0	10.0	3.0	3.0	10.0	3.0
Minimum Split (s)	15.0	27.0		15.0	27.0		15.0	25.0	15.0	15.0	25.0	15.0
Total Split (s)	33.0	48.0		22.0	37.0		15.0	25.0	22.0	15.0	25.0	33.0
Total Split (%)	30.0%	43.6%		20.0%	33.6%		13.6%	22.7%	20.0%	13.6%	22.7%	30.0%
Maximum Green (s)	27.3	41.7		16.3	30.7		8.6	19.0	16.3	8.6	19.0	27.3
Yellow Time (s)	3.7	4.3		3.7	4.3		4.4	4.0	3.7	4.4	4.0	3.7
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.7	-2.3		-1.7	-2.3		-2.4	-2.0	-1.7	-2.4	-2.0	-1.7
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	2.0	2.0	2.0	2.0	2.0
Recall Mode	None	Max		None	Max		None	None	None	None	None	None
Walk Time (s)		5.0						5.0				
Flash Dont Walk (s)		11.0						11.0				
Pedestrian Calls (#/hr)		0						0				
Act Effct Green (s)	29.0	46.6		15.4	33.0		32.0	21.0	40.4	31.6	20.8	53.8
Actuated g/C Ratio	0.26	0.42		0.14	0.30		0.29	0.19	0.37	0.29	0.19	0.49

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.98	0.55		0.68	0.99		0.69	0.96	0.26	0.66	0.61	0.53
Control Delay	78.8	24.9		58.5	60.1		42.5	71.3	6.2	42.0	45.2	17.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.8	24.9		58.5	60.1		42.5	71.3	6.2	42.0	45.2	17.5
LOS	E	C		E	E		D	E	A	D	D	B
Approach Delay		40.1			59.9			54.4			32.6	
Approach LOS		D			E			D			C	
Queue Length 50th (ft)	324	223		112	386		105	239	11	81	137	158
Queue Length 95th (ft)	#534	276		182	#500		#177	#356	55	#142	190	253
Internal Link Dist (ft)		853			661			681			732	
Turn Bay Length (ft)	200			200			325		325	550		250
Base Capacity (vph)	469	2151		290	1518		288	669	706	241	669	817
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.98	0.55		0.58	0.99		0.69	0.96	0.25	0.65	0.60	0.53

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 109.8
Natural Cycle: 105
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 47.7 Intersection LOS: D
Intersection Capacity Utilization 86.7% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Rutherford Rd & Pleasantburg Dr

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	415	966	90	150	1253	105	178	580	159	141	363	392
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1872	1872	1910	1863	1863	1900	1844	1844	1844	1844	1844	1844
Adj Flow Rate, veh/h	461	1073	100	167	1392	117	198	644	177	157	403	436
Adj No. of Lanes	1	3	0	1	3	0	1	2	1	1	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	470	2086	194	222	1434	121	299	669	491	249	669	708
Arrive On Green	0.26	0.44	0.42	0.13	0.30	0.28	0.10	0.19	0.19	0.10	0.19	0.19
Sat Flow, veh/h	1783	4758	443	1774	4780	402	1756	3504	1568	1756	3504	1568
Grp Volume(v), veh/h	461	768	405	167	987	522	198	644	177	157	403	436
Grp Sat Flow(s),veh/h/ln	1783	1704	1794	1774	1695	1792	1756	1752	1568	1756	1752	1568
Q Serve(g_s), s	28.2	18.0	18.1	10.0	31.6	31.6	9.9	20.0	9.6	7.6	11.6	20.7
Cycle Q Clear(g_c), s	28.2	18.0	18.1	10.0	31.6	31.6	9.9	20.0	9.6	7.6	11.6	20.7
Prop In Lane	1.00		0.25	1.00		0.22	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	470	1494	786	222	1017	538	299	669	491	249	669	708
V/C Ratio(X)	0.98	0.51	0.52	0.75	0.97	0.97	0.66	0.96	0.36	0.63	0.60	0.62
Avail Cap(c_a), veh/h	470	1494	786	290	1017	538	299	669	491	249	669	708
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.2	22.4	22.6	46.5	38.0	38.3	31.7	44.1	29.2	32.1	40.7	22.9
Incr Delay (d2), s/veh	36.3	1.3	2.4	5.1	22.0	32.2	4.4	25.6	0.2	3.8	1.1	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.6	8.7	9.5	5.2	17.9	20.5	5.1	12.0	4.2	3.9	5.7	10.2
LnGrp Delay(d),s/veh	76.5	23.7	25.0	51.6	60.0	70.5	36.1	69.7	29.4	35.9	41.8	24.1
LnGrp LOS	E	C	C	D	E	E	D	E	C	D	D	C
Approach Vol, veh/h		1634			1676			1019			996	
Approach Delay, s/veh		38.9			62.4			56.2			33.1	
Approach LOS		D			E			E			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.8	52.2	15.0	25.0	33.0	37.0	15.0	25.0
Change Period (Y+Rc), s	* 5.7	6.3	6.4	6.0	* 5.7	6.3	6.4	6.0
Max Green Setting (Gmax), s	* 16	41.7	8.6	19.0	* 27	30.7	8.6	19.0
Max Q Clear Time (g_c+I1), s	12.0	20.1	11.9	22.7	30.2	33.6	9.6	22.0
Green Ext Time (p_c), s	0.1	16.9	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	48.5
HCM 2010 LOS	D

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

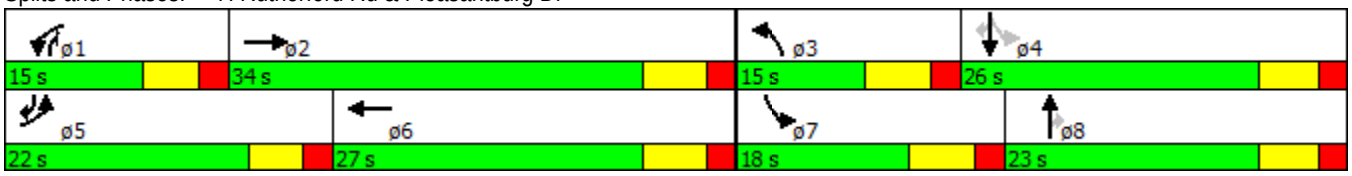
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	323	1426	146	170	801	100	129	314	296	288	809	375
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			0%			2%			2%	
Storage Length (ft)	200		0	200		0	325		325	550		250
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1778	5039	0	1770	4999	0	1752	3504	1567	1752	3504	1567
Flt Permitted	0.950			0.950			0.950			0.369		
Satd. Flow (perm)	1778	5039	0	1770	4999	0	1752	3504	1567	680	3504	1567
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			23				187			118
Link Speed (mph)		45			45			40			35	
Link Distance (ft)		933			741			761			812	
Travel Time (s)		14.1			11.2			13.0			15.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	359	1746	0	189	1001	0	143	349	329	320	899	417
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	1.00	1.00	1.00	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA		Prot	NA		Prot	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	5	2		1	6		3	8	1	7	4	5
Permitted Phases									8	4		4
Detector Phase	5	2		1	6		3	8	1	7	4	5
Switch Phase												
Minimum Initial (s)	3.0	20.0		3.0	20.0		3.0	10.0	3.0	3.0	10.0	3.0
Minimum Split (s)	15.0	27.0		15.0	27.0		15.0	22.0	15.0	15.0	22.0	15.0
Total Split (s)	22.0	34.0		15.0	27.0		15.0	23.0	15.0	18.0	26.0	22.0
Total Split (%)	24.4%	37.8%		16.7%	30.0%		16.7%	25.6%	16.7%	20.0%	28.9%	24.4%
Maximum Green (s)	16.3	27.7		9.3	20.7		8.6	17.0	9.3	11.6	20.0	16.3
Yellow Time (s)	3.7	4.3		3.7	4.3		4.4	4.0	3.7	4.4	4.0	3.7
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.7	-2.3		-1.7	-2.3		-2.4	-2.0	1.7	-2.4	-2.0	-1.7
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	7.4	4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	2.0	2.0	2.0	2.0	2.0
Recall Mode	None	Max		None	Max		None	None	None	None	None	None
Walk Time (s)		5.0						5.0				
Flash Dont Walk (s)		11.0						11.0				
Pedestrian Calls (#/hr)		0						0				
Act Effct Green (s)	18.0	30.0		11.0	23.0		10.7	18.9	30.5	35.8	22.0	44.0
Actuated g/C Ratio	0.20	0.33		0.12	0.26		0.12	0.21	0.34	0.40	0.25	0.49

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	1.01	1.03		0.87	0.77		0.68	0.47	0.50	0.73	1.05	0.50
Control Delay	87.7	59.6		76.1	35.0		55.8	33.6	12.8	31.0	78.1	13.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.7	59.6		76.1	35.0		55.8	33.6	12.8	31.0	78.1	13.3
LOS	F	E		E	C		E	C	B	C	E	B
Approach Delay		64.4			41.5			29.1			52.4	
Approach LOS		E			D			C			D	
Queue Length 50th (ft)	~209	~391		107	189		79	92	58	128	~296	107
Queue Length 95th (ft)	#385	#488		#228	238		#159	135	136	#213	#416	187
Internal Link Dist (ft)		853			661			681			732	
Turn Bay Length (ft)	200			200			325		325	550		250
Base Capacity (vph)	356	1699		217	1298		215	742	656	439	859	828
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	1.01	1.03		0.87	0.77		0.67	0.47	0.50	0.73	1.05	0.50

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 89.7
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.05
Intersection Signal Delay: 51.2 Intersection LOS: D
Intersection Capacity Utilization 83.1% ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Rutherford Rd & Pleasantburg Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	323	1426	146	170	801	100	129	314	296	288	809	375
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1872	1872	1910	1863	1863	1900	1844	1844	1844	1844	1844	1844
Adj Flow Rate, veh/h	359	1584	162	189	890	111	143	349	329	320	899	417
Adj No. of Lanes	1	3	0	1	3	0	1	2	1	1	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	357	1571	160	217	1171	146	215	740	399	450	856	691
Arrive On Green	0.20	0.33	0.31	0.12	0.26	0.23	0.12	0.21	0.17	0.16	0.24	0.24
Sat Flow, veh/h	1783	4713	481	1774	4583	569	1756	3504	1568	1756	3504	1568
Grp Volume(v), veh/h	359	1145	601	189	657	344	143	349	329	320	899	417
Grp Sat Flow(s),veh/h/ln	1783	1704	1787	1774	1695	1762	1756	1752	1568	1756	1752	1568
Q Serve(g_s), s	18.0	30.0	30.0	9.4	16.1	16.3	7.0	7.9	15.3	12.4	22.0	18.2
Cycle Q Clear(g_c), s	18.0	30.0	30.0	9.4	16.1	16.3	7.0	7.9	15.3	12.4	22.0	18.2
Prop In Lane	1.00		0.27	1.00		0.32	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	357	1136	596	217	866	450	215	740	399	450	856	691
V/C Ratio(X)	1.01	1.01	1.01	0.87	0.76	0.76	0.67	0.47	0.82	0.71	1.05	0.60
Avail Cap(c_a), veh/h	357	1136	596	217	866	450	215	740	399	450	856	691
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.0	30.0	30.3	38.8	30.9	31.3	37.7	31.1	31.7	21.8	34.0	19.2
Incr Delay (d2), s/veh	49.4	28.6	39.3	28.8	6.2	11.6	6.2	0.2	12.4	4.5	44.6	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.7	18.6	21.2	6.4	8.2	9.4	3.7	3.8	9.1	6.5	15.9	8.0
LnGrp Delay(d),s/veh	85.4	58.6	69.6	67.6	37.1	42.9	43.9	31.3	44.1	26.3	78.6	20.2
LnGrp LOS	F	F	F	E	D	D	D	C	D	C	F	C
Approach Vol, veh/h		2105			1190			821			1636	
Approach Delay, s/veh		66.3			43.6			38.6			53.5	
Approach LOS		E			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	34.0	15.0	26.0	22.0	27.0	18.0	23.0
Change Period (Y+Rc), s	* 5.7	6.3	6.4	6.0	* 5.7	6.3	6.4	6.0
Max Green Setting (Gmax), s	* 9.3	27.7	8.6	20.0	* 16	20.7	11.6	17.0
Max Q Clear Time (g_c+I1), s	11.4	32.0	9.0	24.0	20.0	18.3	14.4	17.3
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	2.3	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	54.0
HCM 2010 LOS	D

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	415	966	90	150	1253	105	178	580	159	141	363	392
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			0%			2%			2%	
Storage Length (ft)	200		0	200		0	325		325	550		250
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1778	5044	0	1770	5024	0	1752	3504	1567	1752	3504	1567
Flt Permitted	0.950			0.950			0.950			0.222		
Satd. Flow (perm)	1778	5044	0	1770	5024	0	1752	3504	1567	409	3504	1567
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18			15				118			118
Link Speed (mph)		45			45			40			35	
Link Distance (ft)		933			741			761			812	
Travel Time (s)		14.1			11.2			13.0			15.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	461	1173	0	167	1509	0	198	644	177	157	403	436
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	1.00	1.00	1.00	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA		Prot	NA		Prot	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	5	2		1	6		3	8	1	7	4	5
Permitted Phases									8	4		4
Detector Phase	5	2		1	6		3	8	1	7	4	5
Switch Phase												
Minimum Initial (s)	3.0	20.0		3.0	20.0		3.0	10.0	3.0	3.0	10.0	3.0
Minimum Split (s)	15.0	27.0		15.0	27.0		15.0	22.0	15.0	15.0	22.0	15.0
Total Split (s)	25.0	33.0		20.0	28.0		15.0	22.0	20.0	15.0	22.0	25.0
Total Split (%)	27.8%	36.7%		22.2%	31.1%		16.7%	24.4%	22.2%	16.7%	24.4%	27.8%
Maximum Green (s)	19.3	26.7		14.3	21.7		8.6	16.0	14.3	8.6	16.0	19.3
Yellow Time (s)	3.7	4.3		3.7	4.3		4.4	4.0	3.7	4.4	4.0	3.7
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.7	-2.3		-1.7	-2.3		-2.4	-2.0	-1.7	-2.4	-2.0	-1.7
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	2.0	2.0	2.0	2.0	2.0
Recall Mode	None	Max		None	Max		None	None	None	None	None	None
Walk Time (s)		5.0						5.0				
Flash Dont Walk (s)		11.0						11.0				
Pedestrian Calls (#/hr)		0						0				
Act Effct Green (s)	21.0	31.4		13.6	24.0		11.0	18.0	35.6	28.1	17.6	42.6
Actuated g/C Ratio	0.23	0.35		0.15	0.27		0.12	0.20	0.40	0.31	0.20	0.48

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	1.11	0.66		0.62	1.11		0.92	0.91	0.26	0.55	0.59	0.54
Control Delay	111.0	26.9		45.9	93.3		85.2	54.9	7.4	27.9	36.6	14.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	111.0	26.9		45.9	93.3		85.2	54.9	7.4	27.9	36.6	14.6
LOS	F	C		D	F		F	D	A	C	D	B
Approach Delay		50.6			88.6			52.5			25.6	
Approach LOS		D			F			D			C	
Queue Length 50th (ft)	~303	204		89	~364		113	190	20	61	110	119
Queue Length 95th (ft)	#488	260		151	#459		#243	#293	59	107	157	206
Internal Link Dist (ft)		853			661			681			732	
Turn Bay Length (ft)	200			200			325		325	550		250
Base Capacity (vph)	416	1781		316	1357		215	704	732	295	704	806
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	1.11	0.66		0.53	1.11		0.92	0.91	0.24	0.53	0.57	0.54

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 89.6
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.11
Intersection Signal Delay: 58.3 Intersection LOS: E
Intersection Capacity Utilization 86.7% ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Rutherford Rd & Pleasantburg Dr

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	415	966	90	150	1253	105	178	580	159	141	363	392
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1872	1872	1910	1863	1863	1900	1844	1844	1844	1844	1844	1844
Adj Flow Rate, veh/h	461	1073	100	167	1392	117	198	644	177	157	403	436
Adj No. of Lanes	1	3	0	1	3	0	1	2	1	1	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	416	1750	163	234	1275	107	215	723	526	304	701	674
Arrive On Green	0.23	0.37	0.34	0.13	0.27	0.24	0.12	0.21	0.20	0.12	0.20	0.20
Sat Flow, veh/h	1783	4758	443	1774	4780	402	1756	3504	1568	1756	3504	1568
Grp Volume(v), veh/h	461	768	405	167	987	522	198	644	177	157	403	436
Grp Sat Flow(s),veh/h/ln	1783	1704	1794	1774	1695	1792	1756	1752	1568	1756	1752	1568
Q Serve(g_s), s	21.0	16.6	16.7	8.1	24.0	24.0	10.0	16.1	7.6	6.0	9.4	17.7
Cycle Q Clear(g_c), s	21.0	16.6	16.7	8.1	24.0	24.0	10.0	16.1	7.6	6.0	9.4	17.7
Prop In Lane	1.00		0.25	1.00		0.22	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	416	1253	660	234	904	478	215	723	526	304	701	674
V/C Ratio(X)	1.11	0.61	0.61	0.71	1.09	1.09	0.92	0.89	0.34	0.52	0.58	0.65
Avail Cap(c_a), veh/h	416	1253	660	315	904	478	215	723	526	316	701	674
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.5	23.2	23.5	37.4	33.0	33.3	39.1	34.7	22.4	24.5	32.5	20.3
Incr Delay (d2), s/veh	76.8	2.2	4.2	2.5	58.2	68.5	39.9	12.8	0.1	0.5	0.8	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	19.2	8.2	9.0	4.2	18.5	20.9	7.2	9.1	3.3	2.9	4.6	8.8
LnGrp Delay(d),s/veh	111.3	25.5	27.7	39.9	91.2	101.7	79.0	47.5	22.6	25.0	33.3	22.0
LnGrp LOS	F	C	C	D	F	F	E	D	C	C	C	C
Approach Vol, veh/h		1634			1676			1019			996	
Approach Delay, s/veh		50.2			89.4			49.3			27.0	
Approach LOS		D			F			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.9	37.1	15.0	22.0	25.0	28.0	14.4	22.6
Change Period (Y+Rc), s	* 5.7	6.3	6.4	6.0	* 5.7	6.3	6.4	6.0
Max Green Setting (Gmax), s	* 14	26.7	8.6	16.0	* 19	21.7	8.6	16.0
Max Q Clear Time (g_c+I1), s	10.1	18.7	12.0	19.7	23.0	26.0	8.0	18.1
Green Ext Time (p_c), s	0.1	7.1	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	58.0
HCM 2010 LOS	E

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

#8 Haywood Road at Pelham Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	39	625	254	541	576	177	231	492	146	367	1120	67
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Grade (%)		1%			0%			9%			-1%	
Storage Length (ft)	125		200	425		0	250		0	500		0
Storage Lanes	1		1	2		0	2		1	1		0
Taper Length (ft)	80			100			85			100		
Satd. Flow (prot)	1575	3151	1410	3072	3056	0	2933	3024	1353	1591	3157	0
Flt Permitted	0.163			0.950			0.950			0.950		
Satd. Flow (perm)	270	3151	1410	3072	3056	0	2933	3024	1353	1591	3157	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)					32				109		7	
Link Speed (mph)		45			45			40			45	
Link Distance (ft)		911			863			556			1238	
Travel Time (s)		13.8			13.1			9.5			9.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	43	694	282	601	837	0	257	547	162	408	1318	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes						Yes	
Headway Factor	1.16	1.16	1.16	1.15	1.15	1.15	1.22	1.22	1.22	1.15	1.15	1.15
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA	Perm	Prot	NA		Prot	NA	pm+ov	Prot	NA	
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases	4		4						2			
Minimum Split (s)	8.0	16.0	16.0	8.0	16.0		8.0	16.0	8.0	8.0	16.0	
Total Split (s)	12.0	30.0	30.0	15.0	33.0		15.0	40.0	15.0	35.0	60.0	
Total Split (%)	10.0%	25.0%	25.0%	12.5%	27.5%		12.5%	33.3%	12.5%	29.2%	50.0%	
Maximum Green (s)	7.5	24.0	24.0	10.5	27.0		10.5	34.0	10.5	30.5	54.0	
Yellow Time (s)	3.5	4.0	4.0	3.5	4.0		3.5	4.0	3.5	3.5	4.0	
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0		1.0	2.0	1.0	1.0	2.0	
Lost Time Adjust (s)	-0.5	-2.0	-2.0	-0.5	-2.0		-0.5	-2.0	-0.5	-0.5	-2.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?	Yes				Yes		Yes	Yes		Yes	Yes	
Act Effct Green (s)	34.0	26.0	26.0	11.0	29.0		11.0	36.0	51.0	31.0	56.0	
Actuated g/C Ratio	0.28	0.22	0.22	0.09	0.24		0.09	0.30	0.42	0.26	0.47	
v/c Ratio	0.26	1.02	0.92	2.14	1.10		0.96	0.60	0.25	0.99	0.89	
Control Delay	31.3	98.6	88.5	892.8	135.5		110.3	39.3	9.0	99.3	38.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	31.3	98.6	88.5	892.8	135.5		110.3	39.3	9.0	99.3	38.7	
LOS	C	F	F	F	F		F	D	A	F	D	
Approach Delay		92.9			452.0			53.1			53.1	
Approach LOS		F			F			D			D	
Queue Length 50th (ft)	22	~292	216	~382	~376		103	190	24	316	477	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)	50	#421	#382	#497	#507		#188	251	70	#525	#592	
Internal Link Dist (ft)		831			783			476			1158	
Turn Bay Length (ft)	125		200	425			250			500		
Base Capacity (vph)	163	682	305	281	762		268	907	637	411	1477	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.26	1.02	0.92	2.14	1.10		0.96	0.60	0.25	0.99	0.89	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 97 (81%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 130
Control Type: Pretimed
Maximum v/c Ratio: 2.14
Intersection Signal Delay: 172.4 Intersection LOS: F
Intersection Capacity Utilization 94.2% ICU Level of Service F
Analysis Period (min) 25

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 8: Haywood Rd & Pelham Rd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	39	625	254	541	576	177	231	492	146	367	1120	67
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1658	1658	1658	1667	1667	1700	1592	1592	1592	1675	1675	1708
Adj Flow Rate, veh/h	43	694	282	601	640	197	257	547	162	408	1244	74
Adj No. of Lanes	1	2	1	2	2	0	2	2	1	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	165	683	305	282	577	177	270	907	513	412	1425	85
Arrive On Green	0.07	0.22	0.22	0.09	0.24	0.23	0.09	0.30	0.29	0.26	0.47	0.46
Sat Flow, veh/h	1579	3151	1410	3079	2387	734	2941	3024	1353	1595	3053	181
Grp Volume(v), veh/h	43	694	282	601	424	413	257	547	162	408	648	670
Grp Sat Flow(s),veh/h/ln	1579	1575	1410	1540	1583	1537	1470	1512	1353	1595	1591	1643
Q Serve(g_s), s	2.4	26.0	23.5	11.0	29.0	29.0	10.4	18.5	10.1	30.6	43.9	44.1
Cycle Q Clear(g_c), s	2.4	26.0	23.5	11.0	29.0	29.0	10.4	18.5	10.1	30.6	43.9	44.1
Prop In Lane	1.00		1.00	1.00		0.48	1.00		1.00	1.00		0.11
Lane Grp Cap(c), veh/h	165	683	305	282	383	371	270	907	513	412	743	767
V/C Ratio(X)	0.26	1.02	0.92	2.13	1.11	1.11	0.95	0.60	0.32	0.99	0.87	0.87
Avail Cap(c_a), veh/h	165	683	305	282	383	371	270	907	513	412	743	767
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.3	47.0	46.0	54.5	45.5	45.7	54.2	35.9	26.3	44.3	28.8	28.9
Incr Delay (d2), s/veh	3.8	51.5	41.3	858.7	115.6	117.4	53.8	3.0	1.6	53.3	14.4	14.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	16.2	12.7	38.3	24.9	24.4	6.3	8.1	4.0	19.6	22.2	23.0
LnGrp Delay(d),s/veh	39.1	98.5	87.3	913.2	161.1	163.2	108.0	38.9	27.9	97.7	43.2	43.1
LnGrp LOS	D	F	F	F	F	F	F	D	C	F	D	D
Approach Vol, veh/h		1019			1438			966			1726	
Approach Delay, s/veh		92.9			476.0			55.4			56.0	
Approach LOS		F			F			E			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	35.0	40.0	15.0	30.0	15.0	60.0	12.0	33.0
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0
Max Green Setting (Gmax), s	30.5	34.0	10.5	24.0	10.5	54.0	7.5	27.0
Max Q Clear Time (g_c+I1), s	32.6	20.5	13.0	28.0	12.4	46.1	4.4	31.0
Green Ext Time (p_c), s	0.0	7.7	0.0	0.0	0.0	5.2	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	180.5
HCM 2010 LOS	F

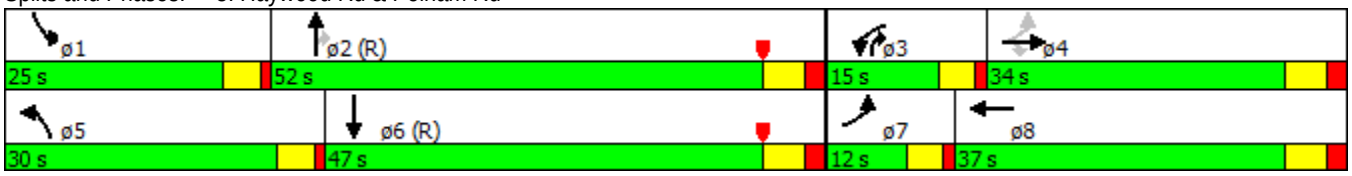
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	92	566	348	241	563	343	473	1086	315	266	769	44
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Grade (%)		1%			0%			9%			-1%	
Storage Length (ft)	125		200	425		0	250		0	500		0
Storage Lanes	1		1	2		0	2		1	1		0
Taper Length (ft)	80			100			85			100		
Satd. Flow (prot)	1575	3151	1410	3072	2986	0	2933	3024	1353	1591	3157	0
Flt Permitted	0.140			0.950			0.950			0.950		
Satd. Flow (perm)	232	3151	1410	3072	2986	0	2933	3024	1353	1591	3157	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)					99				65		5	
Link Speed (mph)		45			45			40			45	
Link Distance (ft)		911			863			556			1238	
Travel Time (s)		13.8			13.1			9.5			9.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	102	629	387	268	1007	0	526	1207	350	296	903	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes						Yes	
Headway Factor	1.16	1.16	1.16	1.15	1.15	1.15	1.22	1.22	1.22	1.15	1.15	1.15
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA	Perm	Prot	NA		Prot	NA	pm+ov	Prot	NA	
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases	4		4						2			
Minimum Split (s)	8.0	16.0	16.0	8.0	16.0		8.0	16.0	8.0	8.0	16.0	
Total Split (s)	12.0	34.0	34.0	15.0	37.0		30.0	52.0	15.0	25.0	47.0	
Total Split (%)	9.5%	27.0%	27.0%	11.9%	29.4%		23.8%	41.3%	11.9%	19.8%	37.3%	
Maximum Green (s)	7.5	28.0	28.0	10.5	31.0		25.5	46.0	10.5	20.5	41.0	
Yellow Time (s)	3.5	4.0	4.0	3.5	4.0		3.5	4.0	3.5	3.5	4.0	
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0		1.0	2.0	1.0	1.0	2.0	
Lost Time Adjust (s)	-0.5	-2.0	-2.0	-0.5	-2.0		-0.5	-2.0	-0.5	-0.5	-2.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?	Yes				Yes		Yes	Yes		Yes	Yes	
Act Effct Green (s)	38.0	30.0	30.0	11.0	33.0		26.0	48.0	63.0	21.0	43.0	
Actuated g/C Ratio	0.30	0.24	0.24	0.09	0.26		0.21	0.38	0.50	0.17	0.34	
v/c Ratio	0.66	0.84	1.16	1.00	1.18		0.87	1.05	0.49	1.12	0.84	
Control Delay	50.8	57.5	190.9	128.3	183.4		65.6	95.4	19.5	178.8	46.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	50.8	57.5	190.9	128.3	183.4		65.6	95.4	19.5	178.8	46.5	
LOS	D	E	F	F	F		E	F	B	F	D	
Approach Delay		103.0			171.8			75.1			79.2	
Approach LOS		F			F			E			E	
Queue Length 50th (ft)	57	258	~371	114	~485		215	~563	149	~277	353	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)	#112	#347	#570	#207	#621		#307	#700	235	#457	441	
Internal Link Dist (ft)		831			783			476			1158	
Turn Bay Length (ft)	125		200	425			250			500		
Base Capacity (vph)	155	750	335	268	855		605	1152	709	265	1080	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.66	0.84	1.16	1.00	1.18		0.87	1.05	0.49	1.12	0.84	

Intersection Summary

Area Type: Other
Cycle Length: 126
Actuated Cycle Length: 126
Offset: 104 (83%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 130
Control Type: Pretimed
Maximum v/c Ratio: 1.18
Intersection Signal Delay: 103.2 Intersection LOS: F
Intersection Capacity Utilization 98.7% ICU Level of Service F
Analysis Period (min) 25
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 8: Haywood Rd & Pelham Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	92	566	348	241	563	343	473	1086	315	266	769	44
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1658	1658	1658	1667	1667	1700	1592	1592	1592	1675	1675	1708
Adj Flow Rate, veh/h	102	629	387	268	626	381	526	1207	350	296	854	49
Adj No. of Lanes	1	2	1	2	2	0	2	2	1	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	157	750	336	269	496	302	607	1152	617	266	1044	60
Arrive On Green	0.06	0.24	0.24	0.09	0.26	0.25	0.21	0.38	0.37	0.17	0.34	0.33
Sat Flow, veh/h	1579	3151	1410	3079	1894	1153	2941	3024	1353	1595	3060	176
Grp Volume(v), veh/h	102	629	387	268	523	484	526	1207	350	296	444	459
Grp Sat Flow(s),veh/h/ln	1579	1575	1410	1540	1583	1463	1470	1512	1353	1595	1591	1644
Q Serve(g_s), s	6.2	23.9	30.0	11.0	33.0	33.0	21.8	48.0	23.9	21.0	32.1	32.1
Cycle Q Clear(g_c), s	6.2	23.9	30.0	11.0	33.0	33.0	21.8	48.0	23.9	21.0	32.1	32.1
Prop In Lane	1.00		1.00	1.00		0.79	1.00		1.00	1.00		0.11
Lane Grp Cap(c), veh/h	157	750	336	269	415	383	607	1152	617	266	543	561
V/C Ratio(X)	0.65	0.84	1.15	1.00	1.26	1.26	0.87	1.05	0.57	1.11	0.82	0.82
Avail Cap(c_a), veh/h	157	750	336	269	415	383	607	1152	617	266	543	561
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.2	45.7	48.0	57.5	46.5	46.9	48.3	39.0	25.1	52.5	37.9	38.0
Incr Delay (d2), s/veh	19.6	11.4	146.5	69.6	215.5	217.1	16.6	57.2	3.8	128.9	13.5	13.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	11.6	25.3	7.3	39.2	36.4	10.2	29.2	9.5	18.7	16.1	16.6
LnGrp Delay(d),s/veh	56.8	57.1	194.5	127.1	262.0	264.0	64.9	96.2	28.9	181.4	51.5	51.1
LnGrp LOS	E	E	F	F	F	F	E	F	C	F	D	D
Approach Vol, veh/h		1118			1275			2083			1199	
Approach Delay, s/veh		104.6			234.4			77.0			83.4	
Approach LOS		F			F			E			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	25.0	52.0	15.0	34.0	30.0	47.0	12.0	37.0
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0
Max Green Setting (Gmax), s	20.5	46.0	10.5	28.0	25.5	41.0	7.5	31.0
Max Q Clear Time (g_c+I1), s	23.0	50.0	13.0	32.0	23.8	34.1	8.2	35.0
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.3	5.4	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	119.2
HCM 2010 LOS	F

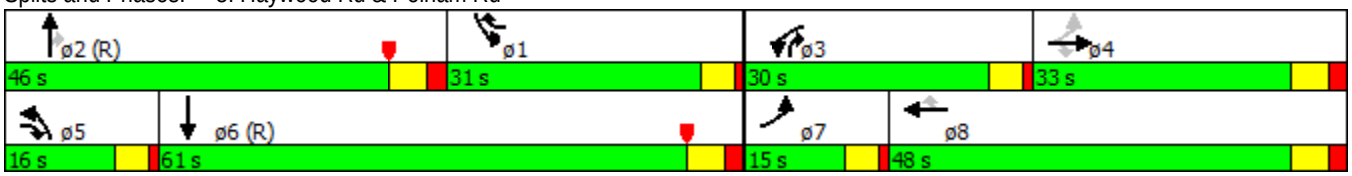
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	39	625	254	541	576	177	231	492	146	367	1120	67
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Grade (%)		1%			0%			9%			-1%	
Storage Length (ft)	125		200	425		0	250		0	500		0
Storage Lanes	1		1	2		1	2		1	2		0
Taper Length (ft)	80			100			85			100		
Satd. Flow (prot)	1575	3151	1410	3072	3167	1417	2933	3024	1353	3087	3157	0
Flt Permitted	0.409			0.950			0.950			0.950		
Satd. Flow (perm)	678	3151	1410	3072	3167	1417	2933	3024	1353	3087	3157	0
Right Turn on Red			No			No			Yes			No
Satd. Flow (RTOR)									70			
Link Speed (mph)		45			45			40			45	
Link Distance (ft)		911			863			556			1238	
Travel Time (s)		13.8			13.1			9.5			9.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	43	694	282	601	640	197	257	547	162	408	1318	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes						Yes	
Headway Factor	1.16	1.16	1.16	1.15	1.15	1.15	1.22	1.22	1.22	1.15	1.15	1.15
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	
Permitted Phases	4		4			8			2			
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	
Switch Phase												
Minimum Initial (s)	3.0	10.0	3.0	3.0	10.0	3.0	3.0	10.0	3.0	3.0	10.0	
Minimum Split (s)	15.0	22.0	15.0	15.0	22.0	15.0	15.0	22.0	15.0	15.0	22.0	
Total Split (s)	15.0	33.0	16.0	30.0	48.0	31.0	16.0	46.0	30.0	31.0	61.0	
Total Split (%)	10.7%	23.6%	11.4%	21.4%	34.3%	22.1%	11.4%	32.9%	21.4%	22.1%	43.6%	
Maximum Green (s)	10.5	27.0	11.5	25.5	42.0	26.5	11.5	40.0	25.5	26.5	55.0	
Yellow Time (s)	3.5	4.0	3.5	3.5	4.0	3.5	3.5	4.0	3.5	3.5	4.0	
All-Red Time (s)	1.0	2.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0	1.0	2.0	
Lost Time Adjust (s)	-0.5	-2.0	-0.5	-0.5	-2.0	-0.5	-0.5	-2.0	-0.5	-0.5	-2.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes		Yes		Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0	3.0	
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	
Act Effct Green (s)	36.3	29.0	45.0	26.0	49.5	77.3	12.0	42.0	68.0	27.0	57.0	
Actuated g/C Ratio	0.26	0.21	0.32	0.19	0.35	0.55	0.09	0.30	0.49	0.19	0.41	
v/c Ratio	0.19	1.06	0.62	1.05	0.57	0.25	1.02	0.60	0.23	0.69	1.03	
Control Delay	28.2	129.0	47.6	128.2	39.9	12.3	145.3	45.3	6.6	59.4	84.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	28.2	129.0	47.6	128.2	39.9	12.3	145.3	45.3	6.6	59.4	84.6	
LOS	C	F	D	F	D	B	F	D	A	E	F	
Approach Delay		102.2			73.0			65.4			78.6	
Approach LOS		F			E			E			E	
Queue Length 50th (ft)	23	~365	218	~307	252	70	~127	224	21	180	~671	
Queue Length 95th (ft)	49	#493	322	#428	327	108	#220	288	42	238	#812	
Internal Link Dist (ft)		831			783			476			1158	
Turn Bay Length (ft)	125		200	425			250			500		
Base Capacity (vph)	264	652	453	570	1120	782	251	907	693	595	1285	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.16	1.06	0.62	1.05	0.57	0.25	1.02	0.60	0.23	0.69	1.03	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.06
Intersection Signal Delay: 79.2 Intersection LOS: E
Intersection Capacity Utilization 94.2% ICU Level of Service F
Analysis Period (min) 25
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 8: Haywood Rd & Pelham Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	39	625	254	541	576	177	231	492	146	367	1120	67
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1658	1658	1658	1667	1667	1667	1592	1592	1592	1675	1675	1708
Adj Flow Rate, veh/h	43	694	282	601	640	197	257	547	162	408	1244	74
Adj No. of Lanes	1	2	1	2	2	1	2	2	1	2	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	225	653	398	572	1140	753	252	907	643	564	1243	74
Arrive On Green	0.03	0.21	0.20	0.19	0.36	0.35	0.09	0.30	0.29	0.18	0.41	0.40
Sat Flow, veh/h	1579	3151	1410	3079	3167	1417	2941	3024	1353	3095	3053	181
Grp Volume(v), veh/h	43	694	282	601	640	197	257	547	162	408	648	670
Grp Sat Flow(s),veh/h/ln	1579	1575	1410	1540	1583	1417	1470	1512	1353	1547	1591	1643
Q Serve(g_s), s	3.0	29.0	25.1	26.0	22.7	1.3	12.0	21.6	4.4	17.4	57.0	57.0
Cycle Q Clear(g_c), s	3.0	29.0	25.1	26.0	22.7	1.3	12.0	21.6	4.4	17.4	57.0	57.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.11
Lane Grp Cap(c), veh/h	225	653	398	572	1140	753	252	907	643	564	648	669
V/C Ratio(X)	0.19	1.06	0.71	1.05	0.56	0.26	1.02	0.60	0.25	0.72	1.00	1.00
Avail Cap(c_a), veh/h	297	653	398	572	1140	753	252	907	643	597	648	669
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.8	55.5	45.1	57.0	35.9	8.9	64.0	41.9	8.1	53.9	41.5	41.6
Incr Delay (d2), s/veh	0.2	76.3	5.0	72.4	0.4	0.1	81.6	3.0	0.9	3.4	45.5	45.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	19.5	10.3	16.8	10.0	2.9	7.7	9.4	1.8	7.7	33.2	34.3
LnGrp Delay(d),s/veh	42.9	131.8	50.1	129.4	36.3	8.9	145.6	44.9	9.0	57.4	87.0	87.3
LnGrp LOS	D	F	D	F	D	A	F	D	A	E	F	F
Approach Vol, veh/h		1019			1438			966			1726	
Approach Delay, s/veh		105.4			71.5			65.6			80.1	
Approach LOS		F			E			E			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	31.0	46.0	30.0	33.0	16.0	61.0	8.6	54.4
Change Period (Y+Rc), s	6.0	* 6	4.5	6.0	4.5	6.0	4.5	6.0
Max Green Setting (Gmax), s	26.5	* 40	25.5	27.0	11.5	55.0	10.5	42.0
Max Q Clear Time (g_c+I1), s	19.4	23.6	28.0	31.0	14.0	59.0	5.0	24.7
Green Ext Time (p_c), s	4.0	2.9	0.0	0.0	0.0	0.0	0.0	4.8

Intersection Summary	
HCM 2010 Ctrl Delay	80.0
HCM 2010 LOS	F

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

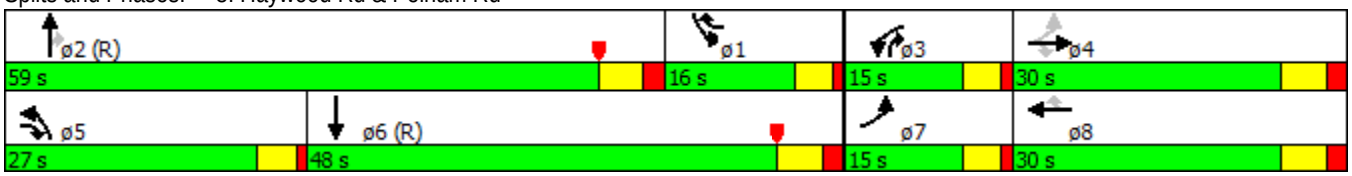
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	92	566	348	241	563	343	473	1086	315	266	769	44
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Grade (%)		1%			0%			9%			-1%	
Storage Length (ft)	125		200	425		0	250		0	500		0
Storage Lanes	1		1	2		1	2		1	2		0
Taper Length (ft)	80			100			85			100		
Satd. Flow (prot)	1575	3151	1410	3072	3167	1417	2933	3024	1353	3087	3157	0
Flt Permitted	0.164			0.950			0.950			0.950		
Satd. Flow (perm)	272	3151	1410	3072	3167	1417	2933	3024	1353	3087	3157	0
Right Turn on Red			No			No			Yes			No
Satd. Flow (RTOR)									82			
Link Speed (mph)		45			45			40			45	
Link Distance (ft)		911			863			556			1238	
Travel Time (s)		13.8			13.1			9.5			9.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	102	629	387	268	626	381	526	1207	350	296	903	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes						Yes	
Headway Factor	1.16	1.16	1.16	1.15	1.15	1.15	1.22	1.22	1.22	1.15	1.15	1.15
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	
Permitted Phases	4		4			8			2			
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	
Switch Phase												
Minimum Initial (s)	3.0	10.0	3.0	3.0	10.0	3.0	3.0	10.0	3.0	3.0	10.0	
Minimum Split (s)	15.0	22.0	15.0	15.0	22.0	15.0	15.0	22.0	15.0	15.0	22.0	
Total Split (s)	15.0	30.0	27.0	15.0	30.0	16.0	27.0	59.0	15.0	16.0	48.0	
Total Split (%)	12.5%	25.0%	22.5%	12.5%	25.0%	13.3%	22.5%	49.2%	12.5%	13.3%	40.0%	
Maximum Green (s)	10.5	24.0	22.5	10.5	24.0	11.5	22.5	53.0	10.5	11.5	42.0	
Yellow Time (s)	3.5	4.0	3.5	3.5	4.0	3.5	3.5	4.0	3.5	3.5	4.0	
All-Red Time (s)	1.0	2.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0	1.0	2.0	
Lost Time Adjust (s)	-0.5	-2.0	-0.5	-0.5	-2.0	-0.5	-0.5	-2.0	-0.5	-0.5	-2.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes		Yes		Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0	3.0	
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	
Act Effct Green (s)	35.4	25.8	52.7	11.0	27.3	39.3	22.8	55.2	66.2	12.0	44.3	
Actuated g/C Ratio	0.30	0.22	0.44	0.09	0.23	0.33	0.19	0.46	0.55	0.10	0.37	
v/c Ratio	0.55	0.93	0.63	0.95	0.87	0.82	0.94	0.87	0.45	0.96	0.77	
Control Delay	40.3	70.3	31.5	107.0	59.9	48.1	79.3	37.7	8.4	105.9	39.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	40.3	70.3	31.5	107.0	59.9	48.1	79.3	37.7	8.4	105.9	39.1	
LOS	D	E	C	F	E	D	E	D	A	F	D	
Approach Delay		54.1			66.2			43.3			55.6	
Approach LOS		D			E			D			E	
Queue Length 50th (ft)	55	252	226	108	249	206	208	433	66	119	323	
Queue Length 95th (ft)	99	#363	337	#193	#358	#368	#314	538	109	#209	406	
Internal Link Dist (ft)		831			783			476			1158	
Turn Bay Length (ft)	125		200	425			250			500		
Base Capacity (vph)	203	682	620	281	720	463	562	1390	783	308	1166	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.50	0.92	0.62	0.95	0.87	0.82	0.94	0.87	0.45	0.96	0.77	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 53.2 Intersection LOS: D
Intersection Capacity Utilization 80.5% ICU Level of Service D
Analysis Period (min) 25
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 8: Haywood Rd & Pelham Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	92	566	348	241	563	343	473	1086	315	266	769	44
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1658	1658	1658	1667	1667	1667	1592	1592	1592	1675	1675	1708
Adj Flow Rate, veh/h	102	629	387	268	626	381	526	1207	350	296	854	49
Adj No. of Lanes	1	2	1	2	2	1	2	2	1	2	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	191	683	558	282	758	844	564	1386	727	1141	1982	114
Arrive On Green	0.07	0.22	0.20	0.09	0.24	0.23	0.19	0.46	0.45	0.37	0.65	0.64
Sat Flow, veh/h	1579	3151	1410	3079	3167	1417	2941	3024	1353	3095	3060	176
Grp Volume(v), veh/h	102	629	387	268	626	381	526	1207	350	296	444	459
Grp Sat Flow(s),veh/h/ln	1579	1575	1410	1540	1583	1417	1470	1512	1353	1547	1591	1644
Q Serve(g_s), s	6.0	23.4	24.5	10.4	22.5	4.3	21.1	43.2	16.5	8.0	16.4	16.4
Cycle Q Clear(g_c), s	6.0	23.4	24.5	10.4	22.5	4.3	21.1	43.2	16.5	8.0	16.4	16.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.11
Lane Grp Cap(c), veh/h	191	683	558	282	758	844	564	1386	727	1141	1031	1065
V/C Ratio(X)	0.53	0.92	0.69	0.95	0.83	0.45	0.93	0.87	0.48	0.26	0.43	0.43
Avail Cap(c_a), veh/h	227	683	558	282	758	844	564	1386	727	1141	1031	1065
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.9	46.0	30.2	54.2	43.3	20.3	47.7	29.3	24.4	26.4	10.3	10.4
Incr Delay (d2), s/veh	0.9	19.8	3.1	48.0	7.3	0.1	25.8	8.1	2.3	0.0	1.3	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	12.1	11.2	6.3	10.6	8.3	10.6	19.5	6.6	3.4	7.5	7.8
LnGrp Delay(d),s/veh	36.7	65.8	33.3	102.2	50.5	20.4	73.6	37.4	26.7	26.5	11.6	11.6
LnGrp LOS	D	E	C	F	D	C	E	D	C	C	B	B
Approach Vol, veh/h		1118			1275			2083			1199	
Approach Delay, s/veh		51.9			52.4			44.7			15.3	
Approach LOS		D			D			D			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	49.9	59.0	15.0	30.0	27.0	81.9	12.3	32.7
Change Period (Y+Rc), s	6.0	* 6	4.5	6.0	4.5	6.0	4.5	6.0
Max Green Setting (Gmax), s	11.5	* 53	10.5	24.0	22.5	42.0	10.5	24.0
Max Q Clear Time (g_c+I1), s	10.0	45.2	12.4	26.5	23.1	18.4	8.0	24.5
Green Ext Time (p_c), s	0.2	4.6	0.0	0.0	0.0	4.5	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	41.6
HCM 2010 LOS	D

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

#9 Augusta Road at Mauldin Road / Potomac Avenue

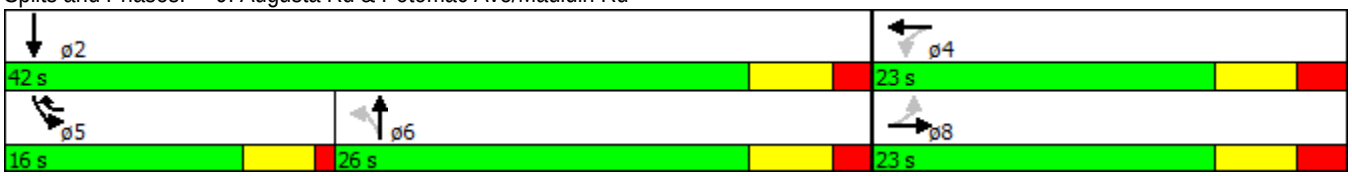
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	38	139	37	31	131	601	44	372	27	347	270	38
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		3%			-1%			1%			0%	
Storage Length (ft)	125		150	325		325	175		0	250		0
Storage Lanes	1		1	1		1	1		0	2		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1651	3197	0	1685	1774	2653	1668	3303	0	3252	3293	0
Flt Permitted	0.662			0.629			0.546			0.950		
Satd. Flow (perm)	1151	3197	0	1116	1774	2653	959	3303	0	3252	3293	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		41				668		12			41	
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		604			651			890			841	
Travel Time (s)		11.8			12.7			17.3			16.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	42	195	0	34	146	668	49	443	0	386	342	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes							
Headway Factor	1.09	1.09	1.09	1.07	1.07	1.07	1.08	1.08	1.08	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA	Over	Perm	NA		Prot	NA	
Protected Phases		8			4	5		6		5	2	
Permitted Phases	8			4			6					
Detector Phase	8	8		4	4	5	6	6		5	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	10.0	20.0	20.0		10.0	20.0	
Minimum Split (s)	23.0	23.0		23.0	23.0	15.0	26.0	26.0		15.0	26.0	
Total Split (s)	23.0	23.0		23.0	23.0	16.0	26.0	26.0		16.0	42.0	
Total Split (%)	35.4%	35.4%		35.4%	35.4%	24.6%	40.0%	40.0%		24.6%	64.6%	
Maximum Green (s)	16.5	16.5		16.5	16.5	11.5	20.0	20.0		11.5	36.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	3.5	4.0	4.0		3.5	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5	1.0	2.0	2.0		1.0	2.0	
Lost Time Adjust (s)	-2.5	-2.5		-2.5	-2.5	-0.5	-2.0	-2.0		-0.5	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag						Lead	Lag	Lag		Lead		
Lead-Lag Optimize?						Yes	Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	Min	Min		None	Min	
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	12.9	12.9		12.9	12.9	11.7	22.1	22.1		11.7	37.8	
Actuated g/C Ratio	0.22	0.22		0.22	0.22	0.20	0.38	0.38		0.20	0.64	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.17	0.27		0.14	0.37	0.63	0.14	0.35		0.60	0.16	
Control Delay	20.1	15.7		19.6	22.4	5.2	14.4	14.4		26.1	4.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	20.1	15.7		19.6	22.4	5.2	14.4	14.4		26.1	4.2	
LOS	C	B		B	C	A	B	B		C	A	
Approach Delay		16.4			8.8			14.4			15.8	
Approach LOS		B			A			B			B	
Queue Length 50th (ft)	12	23		10	44	0	11	55		63	17	
Queue Length 95th (ft)	34	46		29	87	43	34	97		110	37	
Internal Link Dist (ft)		524			571			810			761	
Turn Bay Length (ft)	125			325		325	175			250		
Base Capacity (vph)	373	1065		362	575	1074	360	1248		666	2151	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.11	0.18		0.09	0.25	0.62	0.14	0.35		0.58	0.16	

Intersection Summary

Area Type: Other
Cycle Length: 65
Actuated Cycle Length: 58.7
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.63
Intersection Signal Delay: 13.0 Intersection LOS: B
Intersection Capacity Utilization 60.6% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 9: Augusta Rd & Potomac Ave/Mauldin Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	38	139	37	31	131	601	44	372	27	347	270	38
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1738	1738	1773	1774	1774	1774	1756	1756	1791	1765	1765	1800
Adj Flow Rate, veh/h	42	154	41	34	146	668	49	413	0	386	300	0
Adj No. of Lanes	1	2	0	1	1	2	1	2	0	2	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	262	747	193	401	510	1123	492	1176	0	548	1960	0
Arrive On Green	0.29	0.29	0.26	0.29	0.29	0.26	0.35	0.35	0.00	0.17	0.58	0.00
Sat Flow, veh/h	658	2598	673	1189	1774	2653	1069	3424	0	3261	3441	0
Grp Volume(v), veh/h	42	96	99	34	146	668	49	413	0	386	300	0
Grp Sat Flow(s),veh/h/ln	658	1651	1620	1189	1774	1327	1069	1668	0	1630	1676	0
Q Serve(g_s), s	3.3	2.8	2.9	1.4	4.0	12.1	1.9	5.7	0.0	7.0	2.5	0.0
Cycle Q Clear(g_c), s	7.3	2.8	2.9	4.3	4.0	12.1	1.9	5.7	0.0	7.0	2.5	0.0
Prop In Lane	1.00		0.42	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	262	475	465	401	510	1123	492	1176	0	548	1960	0
V/C Ratio(X)	0.16	0.20	0.21	0.08	0.29	0.59	0.10	0.35	0.00	0.70	0.15	0.00
Avail Cap(c_a), veh/h	274	503	493	422	540	1168	492	1176	0	627	2041	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	20.1	16.8	17.1	18.5	17.3	13.9	13.7	14.9	0.0	24.5	5.9	0.0
Incr Delay (d2), s/veh	0.3	0.2	0.2	0.1	0.3	0.8	0.1	0.2	0.0	3.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	1.3	1.3	0.5	2.0	4.5	0.6	2.7	0.0	3.3	1.2	0.0
LnGrp Delay(d),s/veh	20.4	17.0	17.4	18.6	17.6	14.6	13.8	15.1	0.0	27.6	6.0	0.0
LnGrp LOS	C	B	B	B	B	B	B	B		C	A	
Approach Vol, veh/h		237			848			462			686	
Approach Delay, s/veh		17.8			15.3			15.0			18.1	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		40.5		21.9	14.5	26.0		21.9
Change Period (Y+Rc), s		6.0		6.5	4.5	6.0		6.5
Max Green Setting (Gmax), s		36.0		16.5	11.5	20.0		16.5
Max Q Clear Time (g_c+I1), s		4.5		14.1	9.0	7.7		9.3
Green Ext Time (p_c), s		3.7		1.3	0.5	2.9		3.2

Intersection Summary	
HCM 2010 Ctrl Delay	16.4
HCM 2010 LOS	B

Notes

User approved changes to right turn type.

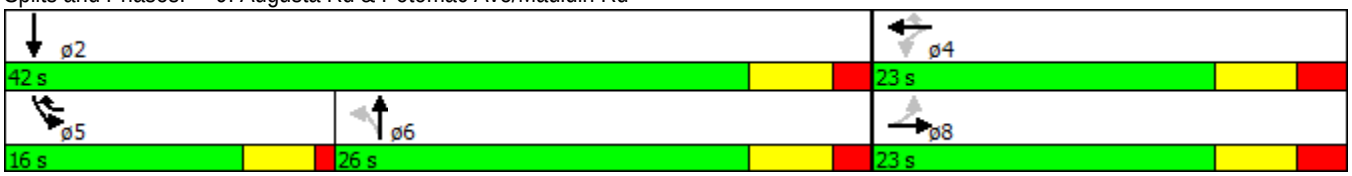
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	42	131	72	48	156	600	54	344	53	478	392	63
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		3%			-1%			1%			0%	
Storage Length (ft)	125		150	325		325	175		0	250		0
Storage Lanes	1		1	1		1	1		0	2		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1651	3128	0	1685	1774	2653	1668	3269	0	3252	3283	0
Flt Permitted	0.605			0.611			0.466			0.950		
Satd. Flow (perm)	1052	3128	0	1084	1774	2653	818	3269	0	3252	3283	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		80				441		29			48	
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		604			651			890			841	
Travel Time (s)		11.8			12.7			17.3			16.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	226	0	53	173	667	60	441	0	531	506	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes							
Headway Factor	1.09	1.09	1.09	1.07	1.07	1.07	1.08	1.08	1.08	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA		Prot	NA	
Protected Phases		8			4	5		6		5	2	
Permitted Phases	8			4		4	6					
Detector Phase	8	8		4	4	5	6	6		5	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	10.0	20.0	20.0		10.0	20.0	
Minimum Split (s)	23.0	23.0		23.0	23.0	15.0	26.0	26.0		15.0	26.0	
Total Split (s)	23.0	23.0		23.0	23.0	16.0	26.0	26.0		16.0	42.0	
Total Split (%)	35.4%	35.4%		35.4%	35.4%	24.6%	40.0%	40.0%		24.6%	64.6%	
Maximum Green (s)	16.5	16.5		16.5	16.5	11.5	20.0	20.0		11.5	36.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	3.5	4.0	4.0		3.5	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5	1.0	2.0	2.0		1.0	2.0	
Lost Time Adjust (s)	-2.5	-2.5		-2.5	-2.5	-0.5	-2.0	-2.0		-0.5	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag						Lead	Lag	Lag		Lead		
Lead-Lag Optimize?						Yes	Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	Min	Min		None	Min	
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	13.7	13.7		13.7	13.7	29.8	22.0	22.0		12.0	38.1	
Actuated g/C Ratio	0.23	0.23		0.23	0.23	0.50	0.37	0.37		0.20	0.64	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.20	0.29		0.21	0.43	0.43	0.20	0.36		0.81	0.24	
Control Delay	20.3	12.9		20.6	22.9	3.9	16.2	14.4		35.9	4.9	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	20.3	12.9		20.6	22.9	3.9	16.2	14.4		35.9	4.9	
LOS	C	B		C	C	A	B	B		D	A	
Approach Delay		14.2			8.6			14.6			20.8	
Approach LOS		B			A			B			C	
Queue Length 50th (ft)	14	22		15	53	23	14	54		94	30	
Queue Length 95th (ft)	37	46		41	101	50	43	97		#185	60	
Internal Link Dist (ft)		524			571			810			761	
Turn Bay Length (ft)	125			325		325	175			250		
Base Capacity (vph)	334	1049		344	564	1541	301	1222		653	2106	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.14	0.22		0.15	0.31	0.43	0.20	0.36		0.81	0.24	

Intersection Summary

Area Type: Other
Cycle Length: 65
Actuated Cycle Length: 59.8
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 14.9 Intersection LOS: B
Intersection Capacity Utilization 62.0% ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 9: Augusta Rd & Potomac Ave/Mauldin Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	42	131	72	48	156	600	54	344	53	478	392	63
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1738	1738	1773	1774	1774	1774	1756	1756	1791	1765	1765	1800
Adj Flow Rate, veh/h	47	146	80	53	173	667	60	382	0	531	436	0
Adj No. of Lanes	1	2	0	1	1	2	1	2	0	2	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	243	592	308	371	499	1161	437	1147	0	611	1991	0
Arrive On Green	0.28	0.28	0.26	0.28	0.28	0.25	0.34	0.34	0.00	0.19	0.59	0.00
Sat Flow, veh/h	642	2103	1093	1156	1774	2653	944	3424	0	3261	3441	0
Grp Volume(v), veh/h	47	113	113	53	173	667	60	382	0	531	436	0
Grp Sat Flow(s),veh/h/ln	642	1651	1545	1156	1774	1327	944	1668	0	1630	1676	0
Q Serve(g_s), s	4.0	3.4	3.7	2.4	5.0	12.1	2.9	5.4	0.0	10.1	3.9	0.0
Cycle Q Clear(g_c), s	9.0	3.4	3.7	6.1	5.0	12.1	2.9	5.4	0.0	10.1	3.9	0.0
Prop In Lane	1.00		0.71	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	243	465	435	371	499	1161	437	1147	0	611	1991	0
V/C Ratio(X)	0.19	0.24	0.26	0.14	0.35	0.57	0.14	0.33	0.00	0.87	0.22	0.00
Avail Cap(c_a), veh/h	253	490	459	389	526	1202	437	1147	0	611	1991	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	21.9	17.7	18.3	20.2	18.3	13.5	14.7	15.6	0.0	25.2	6.1	0.0
Incr Delay (d2), s/veh	0.4	0.3	0.3	0.2	0.4	0.6	0.1	0.2	0.0	12.7	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	1.6	1.6	0.8	2.5	4.5	0.8	2.5	0.0	5.7	1.8	0.0
LnGrp Delay(d),s/veh	22.3	18.0	18.6	20.4	18.7	14.2	14.9	15.7	0.0	38.0	6.1	0.0
LnGrp LOS	C	B	B	C	B	B	B	B		D	A	
Approach Vol, veh/h		273			893			442			967	
Approach Delay, s/veh		19.0			15.4			15.6			23.6	
Approach LOS		B			B			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		42.0		22.0	16.0	26.0		22.0
Change Period (Y+Rc), s		6.0		6.5	4.5	6.0		6.5
Max Green Setting (Gmax), s		36.0		16.5	11.5	20.0		16.5
Max Q Clear Time (g_c+I1), s		5.9		14.1	12.1	7.4		11.0
Green Ext Time (p_c), s		4.4		1.4	0.0	3.4		2.8

Intersection Summary	
HCM 2010 Ctrl Delay	18.9
HCM 2010 LOS	B

Notes

User approved changes to right turn type.

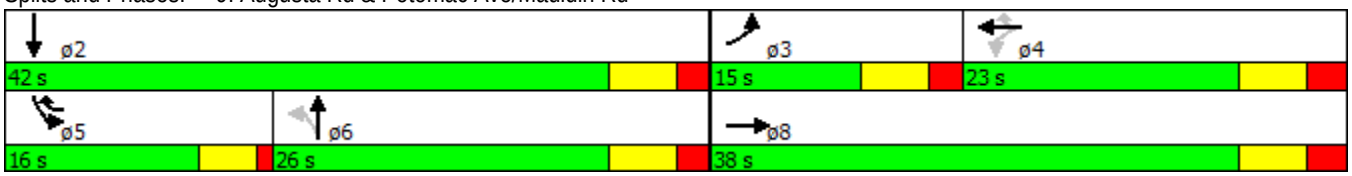
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	38	139	37	31	131	601	44	372	27	347	270	38
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		3%			-1%			1%			0%	
Storage Length (ft)	125		150	325		325	175		0	250		0
Storage Lanes	1		1	1		1	1		0	2		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1651	3197	0	1685	1774	2653	1668	3303	0	3252	3293	0
Flt Permitted	0.950			0.629			0.546			0.950		
Satd. Flow (perm)	1651	3197	0	1116	1774	2653	959	3303	0	3252	3293	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)		41						9			26	
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		604			651			890			841	
Travel Time (s)		11.8			12.7			17.3			16.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	42	195	0	34	146	668	49	443	0	386	342	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes							
Headway Factor	1.09	1.09	1.09	1.07	1.07	1.07	1.08	1.08	1.08	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA		Perm	NA	pm+ov	Perm	NA		Prot	NA	
Protected Phases	3	8			4	5		6		5	2	
Permitted Phases				4		4	6					
Detector Phase	3	8		4	4	5	6	6		5	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	10.0	20.0	20.0		10.0	20.0	
Minimum Split (s)	15.0	23.0		23.0	23.0	15.0	26.0	26.0		15.0	26.0	
Total Split (s)	15.0	38.0		23.0	23.0	16.0	26.0	26.0		16.0	42.0	
Total Split (%)	18.8%	47.5%		28.8%	28.8%	20.0%	32.5%	32.5%		20.0%	52.5%	
Maximum Green (s)	9.0	31.5		16.5	16.5	11.5	20.0	20.0		11.5	36.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	3.5	4.0	4.0		3.5	4.0	
All-Red Time (s)	2.0	2.5		2.5	2.5	1.0	2.0	2.0		1.0	2.0	
Lost Time Adjust (s)	-2.0	-2.5		-2.5	-2.5	-0.5	-2.0	-2.0		-0.5	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead			Lag	Lag	Lead	Lag	Lag		Lead		
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	Min	Min		None	Min	
Walk Time (s)		5.0		5.0	5.0		5.0	5.0			5.0	
Flash Dont Walk (s)		11.0		11.0	11.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)		0		0	0		0	0			0	
Act Effct Green (s)	10.5	21.6		13.9	13.9	30.0	22.5	22.5		12.0	38.6	
Actuated g/C Ratio	0.15	0.32		0.20	0.20	0.44	0.33	0.33		0.18	0.56	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.17	0.19		0.15	0.41	0.58	0.16	0.41		0.68	0.18	
Control Delay	30.9	12.4		26.2	29.0	17.9	22.0	21.0		35.9	8.9	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	30.9	12.4		26.2	29.0	17.9	22.0	21.0		35.9	8.9	
LOS	C	B		C	C	B	C	C		D	A	
Approach Delay		15.7			20.1			21.1			23.2	
Approach LOS		B			C			C			C	
Queue Length 50th (ft)	17	23		13	60	134	16	83		87	37	
Queue Length 95th (ft)	48	43		37	112	195	46	138		#161	71	
Internal Link Dist (ft)		524			571			810			761	
Turn Bay Length (ft)	125			325		325	175			250		
Base Capacity (vph)	271	1646		317	504	1173	315	1093		583	1883	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.15	0.12		0.11	0.29	0.57	0.16	0.41		0.66	0.18	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 68.4
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.68
Intersection Signal Delay: 20.8 Intersection LOS: C
Intersection Capacity Utilization 60.6% ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 9: Augusta Rd & Potomac Ave/Mauldin Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	38	139	37	31	131	601	44	372	27	347	270	38
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1738	1738	1773	1774	1774	1774	1756	1756	1791	1765	1765	1800
Adj Flow Rate, veh/h	42	154	41	34	146	668	49	413	0	386	300	0
Adj No. of Lanes	1	2	0	1	1	2	1	2	0	2	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	147	1029	266	398	450	1000	410	980	0	489	1667	0
Arrive On Green	0.09	0.40	0.38	0.25	0.25	0.23	0.29	0.29	0.00	0.15	0.50	0.00
Sat Flow, veh/h	1655	2598	673	1189	1774	2653	1069	3424	0	3261	3441	0
Grp Volume(v), veh/h	42	96	99	34	146	668	49	413	0	386	300	0
Grp Sat Flow(s),veh/h/ln	1655	1651	1620	1189	1774	1327	1069	1668	0	1630	1676	0
Q Serve(g_s), s	1.8	2.8	3.0	1.6	5.0	15.7	2.5	7.5	0.0	8.5	3.7	0.0
Cycle Q Clear(g_c), s	1.8	2.8	3.0	1.6	5.0	15.7	2.5	7.5	0.0	8.5	3.7	0.0
Prop In Lane	1.00		0.42	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	147	654	641	398	450	1000	410	980	0	489	1667	0
V/C Ratio(X)	0.29	0.15	0.15	0.09	0.32	0.67	0.12	0.42	0.00	0.79	0.18	0.00
Avail Cap(c_a), veh/h	243	750	735	398	450	1000	410	980	0	522	1701	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	31.9	14.5	14.8	21.5	22.7	19.4	19.6	21.3	0.0	30.7	10.4	0.0
Incr Delay (d2), s/veh	1.1	0.1	0.1	0.1	0.4	1.7	0.1	0.3	0.0	7.5	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	1.3	1.4	0.5	2.5	6.0	0.8	3.5	0.0	4.4	1.7	0.0
LnGrp Delay(d),s/veh	32.9	14.6	14.9	21.6	23.1	21.1	19.7	21.6	0.0	38.2	10.5	0.0
LnGrp LOS	C	B	B	C	C	C	B	C		D	B	
Approach Vol, veh/h		237			848			462			686	
Approach Delay, s/veh		18.0			21.5			21.4			26.1	
Approach LOS		B			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4	5	6		8
Phs Duration (G+Y+Rc), s		41.2	10.7	23.0	15.2	26.0		33.7
Change Period (Y+Rc), s		6.0	6.0	6.5	4.5	6.0		6.5
Max Green Setting (Gmax), s		36.0	9.0	16.5	11.5	20.0		31.5
Max Q Clear Time (g_c+I1), s		5.7	3.8	17.7	10.5	9.5		5.0
Green Ext Time (p_c), s		3.7	0.0	0.0	0.2	2.7		5.5

Intersection Summary	
HCM 2010 Ctrl Delay	22.5
HCM 2010 LOS	C

Notes

User approved changes to right turn type.

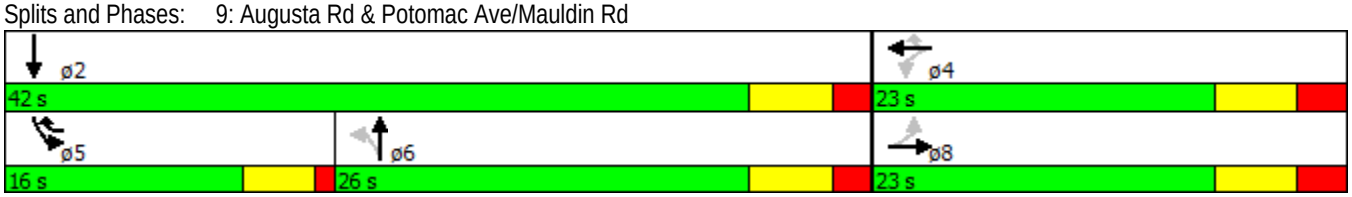
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	42	131	72	48	156	600	54	344	53	478	392	63
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		3%			-1%			1%			0%	
Storage Length (ft)	125		150	325		325	175		0	250		0
Storage Lanes	1		1	1		1	1		0	2		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1651	3128	0	1685	1774	2653	1668	3269	0	3252	3283	0
Flt Permitted	0.605			0.611			0.466			0.950		
Satd. Flow (perm)	1052	3128	0	1084	1774	2653	818	3269	0	3252	3283	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)		80						29			48	
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		604			651			890			841	
Travel Time (s)		11.8			12.7			17.3			16.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	226	0	53	173	667	60	441	0	531	506	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes							
Headway Factor	1.09	1.09	1.09	1.07	1.07	1.07	1.08	1.08	1.08	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA		Prot	NA	
Protected Phases		8			4	5		6		5	2	
Permitted Phases	8			4		4	6					
Detector Phase	8	8		4	4	5	6	6		5	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	10.0	20.0	20.0		10.0	20.0	
Minimum Split (s)	23.0	23.0		23.0	23.0	15.0	26.0	26.0		15.0	26.0	
Total Split (s)	23.0	23.0		23.0	23.0	16.0	26.0	26.0		16.0	42.0	
Total Split (%)	35.4%	35.4%		35.4%	35.4%	24.6%	40.0%	40.0%		24.6%	64.6%	
Maximum Green (s)	16.5	16.5		16.5	16.5	11.5	20.0	20.0		11.5	36.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	3.5	4.0	4.0		3.5	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5	1.0	2.0	2.0		1.0	2.0	
Lost Time Adjust (s)	-2.5	-2.5		-2.5	-2.5	-0.5	-2.0	-2.0		-0.5	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag						Lead	Lag	Lag		Lead		
Lead-Lag Optimize?						Yes	Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	Min	Min		None	Min	
Act Effct Green (s)	13.7	13.7		13.7	13.7	29.8	22.0	22.0		12.0	38.1	
Actuated g/C Ratio	0.23	0.23		0.23	0.23	0.50	0.37	0.37		0.20	0.64	
v/c Ratio	0.20	0.29		0.21	0.43	0.51	0.20	0.36		0.81	0.24	
Control Delay	20.3	12.9		20.6	22.9	11.6	16.2	14.4		35.9	4.9	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	20.3	12.9		20.6	22.9	11.6	16.2	14.4		35.9	4.9	
LOS	C	B		C	C	B	B	B		D	A	
Approach Delay		14.2			14.3			14.6			20.8	
Approach LOS		B			B			B			C	
Queue Length 50th (ft)	14	22		15	53	84	14	54		94	30	
Queue Length 95th (ft)	37	46		41	101	126	43	97		#185	60	
Internal Link Dist (ft)		524			571			810			761	
Turn Bay Length (ft)	125			325		325	175			250		
Base Capacity (vph)	334	1049		344	564	1320	301	1222		653	2106	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.14	0.22		0.15	0.31	0.51	0.20	0.36		0.81	0.24	

Intersection Summary	
Area Type: Other	
Cycle Length: 65	
Actuated Cycle Length: 59.8	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 16.8	Intersection LOS: B
Intersection Capacity Utilization 62.0%	ICU Level of Service B
Analysis Period (min) 15	

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 9: Augusta Rd & Potomac Ave/Mauldin Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	42	131	72	48	156	600	54	344	53	478	392	63
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1738	1738	1773	1774	1774	1774	1756	1756	1791	1765	1765	1800
Adj Flow Rate, veh/h	47	146	80	53	173	667	60	382	0	531	436	0
Adj No. of Lanes	1	2	0	1	1	2	1	2	0	2	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	243	592	308	371	499	1161	437	1147	0	611	1991	0
Arrive On Green	0.28	0.28	0.26	0.28	0.28	0.25	0.34	0.34	0.00	0.19	0.59	0.00
Sat Flow, veh/h	642	2103	1093	1156	1774	2653	944	3424	0	3261	3441	0
Grp Volume(v), veh/h	47	113	113	53	173	667	60	382	0	531	436	0
Grp Sat Flow(s),veh/h/ln	642	1651	1545	1156	1774	1327	944	1668	0	1630	1676	0
Q Serve(g_s), s	4.0	3.4	3.7	2.4	5.0	12.1	2.9	5.4	0.0	10.1	3.9	0.0
Cycle Q Clear(g_c), s	9.0	3.4	3.7	6.1	5.0	12.1	2.9	5.4	0.0	10.1	3.9	0.0
Prop In Lane	1.00		0.71	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	243	465	435	371	499	1161	437	1147	0	611	1991	0
V/C Ratio(X)	0.19	0.24	0.26	0.14	0.35	0.57	0.14	0.33	0.00	0.87	0.22	0.00
Avail Cap(c_a), veh/h	253	490	459	389	526	1202	437	1147	0	611	1991	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	21.9	17.7	18.3	20.2	18.3	13.5	14.7	15.6	0.0	25.2	6.1	0.0
Incr Delay (d2), s/veh	0.4	0.3	0.3	0.2	0.4	0.6	0.1	0.2	0.0	12.7	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	1.6	1.6	0.8	2.5	4.5	0.8	2.5	0.0	5.7	1.8	0.0
LnGrp Delay(d),s/veh	22.3	18.0	18.6	20.4	18.7	14.2	14.9	15.7	0.0	38.0	6.1	0.0
LnGrp LOS	C	B	B	C	B	B	B	B		D	A	
Approach Vol, veh/h		273			893			442			967	
Approach Delay, s/veh		19.0			15.4			15.6			23.6	
Approach LOS		B			B			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		42.0		22.0	16.0	26.0		22.0
Change Period (Y+Rc), s		6.0		6.5	4.5	6.0		6.5
Max Green Setting (Gmax), s		36.0		16.5	11.5	20.0		16.5
Max Q Clear Time (g_c+I1), s		5.9		14.1	12.1	7.4		11.0
Green Ext Time (p_c), s		4.4		1.4	0.0	3.4		2.8

Intersection Summary	
HCM 2010 Ctrl Delay	18.9
HCM 2010 LOS	B

Notes

User approved changes to right turn type.

#10 S. Pleasantburg Drive at Cleveland Street / Cleveland Street Extension

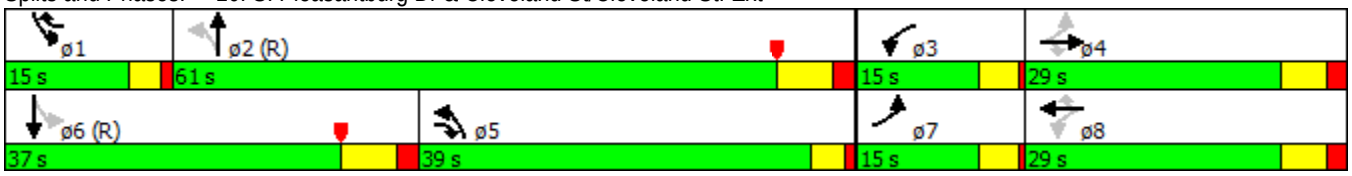
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	44	166	282	44	335	53	499	1074	37	55	893	144
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		4%			-4%			0%			0%	
Storage Length (ft)	250		300	75		150	450		0	200		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1643	1729	1470	1710	1800	1530	1676	4794	0	1676	4716	0
Flt Permitted	0.172			0.458			0.151			0.147		
Satd. Flow (perm)	297	1729	1470	824	1800	1530	266	4794	0	259	4716	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			240			136		6			25	
Link Speed (mph)		35			35			45			40	
Link Distance (ft)		622			738			1177			990	
Travel Time (s)		12.1			14.4			17.8			16.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	49	184	313	49	372	59	554	1234	0	61	1152	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.10	1.10	1.10	1.05	1.05	1.05	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	5	3	8	1	5	2		1	6	
Permitted Phases	4		4	8		8	2			6		
Detector Phase	7	4	5	3	8	1	5	2		1	6	
Switch Phase												
Minimum Initial (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	23.0		3.0	23.0	
Minimum Split (s)	15.0	25.0	15.0	15.0	25.0	15.0	15.0	30.0		15.0	30.0	
Total Split (s)	15.0	29.0	39.0	15.0	29.0	15.0	39.0	61.0		15.0	37.0	
Total Split (%)	12.5%	24.2%	32.5%	12.5%	24.2%	12.5%	32.5%	50.8%		12.5%	30.8%	
Maximum Green (s)	11.0	23.0	35.0	11.0	23.0	11.0	35.0	54.0		11.0	30.0	
Yellow Time (s)	3.5	4.0	3.0	3.5	4.0	3.0	3.0	5.0		3.0	5.0	
All-Red Time (s)	0.5	2.0	1.0	0.5	2.0	1.0	1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	-2.0	0.0	0.0	-2.0	0.0	0.0	-3.0		0.0	-3.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag		Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0	2.0	3.0	4.0		2.0	4.0	
Recall Mode	None	None	None	None	None	None	None	C-Max		None	C-Max	
Walk Time (s)		5.0			5.0			5.0			5.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	31.4	25.2	61.0	31.0	25.0	36.7	67.7	67.7		38.6	38.6	
Actuated g/C Ratio	0.26	0.21	0.51	0.26	0.21	0.31	0.56	0.56		0.32	0.32	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.31	0.51	0.36	0.19	0.99	0.10	0.99	0.46		0.35	0.75	
Control Delay	35.0	47.6	3.9	31.4	92.4	0.4	73.7	17.4		36.5	40.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	35.0	47.6	3.9	31.4	92.4	0.4	73.7	17.4		36.5	40.1	
LOS	C	D	A	C	F	A	E	B		D	D	
Approach Delay		21.4			74.8			34.8			39.9	
Approach LOS		C			E			C			D	
Queue Length 50th (ft)	27	127	21	27	290	0	~374	209		34	292	
Queue Length 95th (ft)	56	202	54	56	#489	0	#635	276		70	360	
Internal Link Dist (ft)		542			658			1097			910	
Turn Bay Length (ft)	250		300	75		150	450			200		
Base Capacity (vph)	206	363	865	312	375	600	561	2705		213	1533	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.24	0.51	0.36	0.16	0.99	0.10	0.99	0.46		0.29	0.75	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 39.3 Intersection LOS: D
Intersection Capacity Utilization 86.1% ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 10: S. Pleasantburg Dr & Cleveland St/Cleveland St. Ext



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	44	166	282	44	335	53	499	1074	37	55	893	144
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1729	1729	1729	1800	1800	1800	1765	1765	1800	1765	1765	1800
Adj Flow Rate, veh/h	49	184	313	49	372	59	554	1193	41	61	992	160
Adj No. of Lanes	1	1	1	1	1	1	1	3	0	1	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	114	362	762	205	375	354	611	2802	96	144	1151	185
Arrive On Green	0.03	0.21	0.19	0.03	0.21	0.19	0.33	0.59	0.57	0.04	0.28	0.26
Sat Flow, veh/h	1647	1729	1470	1714	1800	1530	1681	4783	164	1681	4184	673
Grp Volume(v), veh/h	49	184	313	49	372	59	554	801	433	61	761	391
Grp Sat Flow(s),veh/h/ln	1647	1729	1470	1714	1800	1530	1681	1606	1736	1681	1606	1646
Q Serve(g_s), s	2.9	11.3	2.1	2.7	24.7	3.7	33.0	16.5	16.6	3.5	27.0	27.2
Cycle Q Clear(g_c), s	2.9	11.3	2.1	2.7	24.7	3.7	33.0	16.5	16.6	3.5	27.0	27.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.09	1.00		0.41
Lane Grp Cap(c), veh/h	114	362	762	205	375	354	611	1882	1017	144	883	453
V/C Ratio(X)	0.43	0.51	0.41	0.24	0.99	0.17	0.91	0.43	0.43	0.42	0.86	0.86
Avail Cap(c_a), veh/h	211	362	762	307	375	354	611	1882	1017	231	883	453
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.4	42.0	7.6	37.8	47.4	36.9	36.5	13.7	13.8	38.3	41.3	41.8
Incr Delay (d2), s/veh	1.0	1.2	0.4	0.2	44.2	0.2	17.4	0.7	1.3	0.7	10.8	19.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	5.5	4.0	1.3	16.9	1.6	20.3	7.5	8.3	1.6	13.3	14.7
LnGrp Delay(d),s/veh	40.4	43.2	7.9	38.0	91.6	37.1	53.9	14.4	15.1	39.0	52.1	61.0
LnGrp LOS	D	D	A	D	F	D	D	B	B	D	D	E
Approach Vol, veh/h		546			480			1788			1213	
Approach Delay, s/veh		22.7			79.5			26.8			54.3	
Approach LOS		C			E			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.8	74.3	7.8	29.1	46.1	37.0	7.9	29.0
Change Period (Y+Rc), s	4.0	7.0	4.0	6.0	7.0	* 7	4.0	6.0
Max Green Setting (Gmax), s	11.0	54.0	11.0	23.0	35.0	* 30	11.0	23.0
Max Q Clear Time (g_c+I1), s	5.5	18.6	4.7	13.3	35.0	29.2	4.9	26.7
Green Ext Time (p_c), s	0.0	14.2	0.0	2.9	0.0	0.6	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	40.8
HCM 2010 LOS	D

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

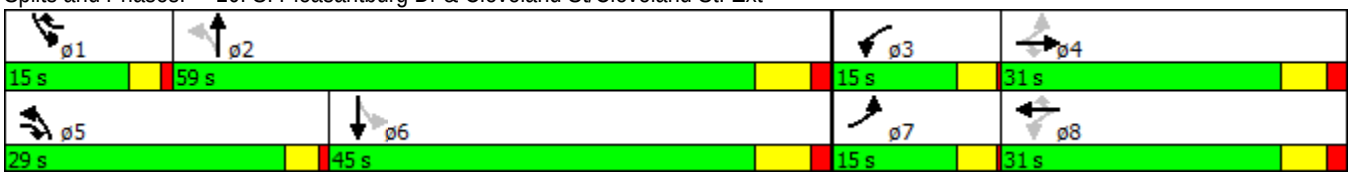
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	139	269	338	32	239	82	280	1068	45	81	1154	109
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		4%			-4%			0%			0%	
Storage Length (ft)	250		300	75		150	450		0	200		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1643	1729	1470	1710	1800	1530	1676	4789	0	1676	4755	0
Flt Permitted	0.252			0.430			0.099			0.207		
Satd. Flow (perm)	436	1729	1470	774	1800	1530	175	4789	0	365	4755	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			198			109		7			14	
Link Speed (mph)		35			35			45			40	
Link Distance (ft)		622			738			1177			990	
Travel Time (s)		12.1			14.4			17.8			16.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	154	299	376	36	266	91	311	1237	0	90	1403	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.10	1.10	1.10	1.05	1.05	1.05	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	5	3	8	1	5	2		1	6	
Permitted Phases	4		4	8		8	2			6		
Detector Phase	7	4	5	3	8	1	5	2		1	6	
Switch Phase												
Minimum Initial (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	23.0		3.0	23.0	
Minimum Split (s)	15.0	22.0	15.0	15.0	22.0	15.0	15.0	30.0		15.0	30.0	
Total Split (s)	15.0	31.0	29.0	15.0	31.0	15.0	29.0	59.0		15.0	45.0	
Total Split (%)	12.5%	25.8%	24.2%	12.5%	25.8%	12.5%	24.2%	49.2%		12.5%	37.5%	
Maximum Green (s)	11.0	25.0	25.0	11.0	25.0	11.0	25.0	52.0		11.0	38.0	
Yellow Time (s)	3.5	4.0	3.0	3.5	4.0	3.0	3.0	5.0		3.0	5.0	
All-Red Time (s)	0.5	2.0	1.0	0.5	2.0	1.0	1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	-2.0	0.0	0.0	-2.0	0.0	0.0	-3.0		0.0	-3.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0	2.0	3.0	4.0		2.0	4.0	
Recall Mode	None	None	None	None	None	None	None	None		None	None	
Walk Time (s)		5.0			5.0			5.0			5.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	36.5	30.6	56.0	28.5	22.3	33.5	65.0	53.8		46.7	39.6	
Actuated g/C Ratio	0.33	0.28	0.51	0.26	0.20	0.30	0.59	0.49		0.42	0.36	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.60	0.62	0.44	0.14	0.73	0.17	0.79	0.53		0.38	0.81	
Control Delay	38.3	43.7	10.1	27.7	54.3	4.3	41.4	20.7		17.6	37.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	38.3	43.7	10.1	27.7	54.3	4.3	41.4	20.7		17.6	37.3	
LOS	D	D	B	C	D	A	D	C		B	D	
Approach Delay		27.5			40.3			24.9			36.1	
Approach LOS		C			D			C			D	
Queue Length 50th (ft)	85	206	77	18	189	0	161	220		27	351	
Queue Length 95th (ft)	140	315	160	43	283	26	#293	287		53	429	
Internal Link Dist (ft)		542			658			1097			910	
Turn Bay Length (ft)	250		300	75		150	450			200		
Base Capacity (vph)	267	483	894	331	450	595	451	2507		302	1813	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.58	0.62	0.42	0.11	0.59	0.15	0.69	0.49		0.30	0.77	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 109.9
Natural Cycle: 85
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 30.7 Intersection LOS: C
Intersection Capacity Utilization 77.2% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 10: S. Pleasantburg Dr & Cleveland St/Cleveland St. Ext



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	139	269	338	32	239	82	280	1068	45	81	1154	109
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1729	1729	1729	1800	1800	1800	1765	1765	1800	1765	1765	1800
Adj Flow Rate, veh/h	154	299	376	36	266	91	311	1187	50	90	1282	121
Adj No. of Lanes	1	1	1	1	1	1	1	3	0	1	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	275	478	578	195	374	362	353	2316	98	284	1794	169
Arrive On Green	0.09	0.28	0.26	0.02	0.21	0.19	0.14	0.49	0.47	0.05	0.40	0.38
Sat Flow, veh/h	1647	1729	1470	1714	1800	1530	1681	4742	200	1681	4479	423
Grp Volume(v), veh/h	154	299	376	36	266	91	311	804	433	90	919	484
Grp Sat Flow(s),veh/h/ln	1647	1729	1470	1714	1800	1530	1681	1606	1729	1681	1606	1690
Q Serve(g_s), s	7.1	14.9	20.5	1.7	13.5	4.7	10.6	16.8	16.9	3.2	23.6	23.7
Cycle Q Clear(g_c), s	7.1	14.9	20.5	1.7	13.5	4.7	10.6	16.8	16.9	3.2	23.6	23.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.12	1.00		0.25
Lane Grp Cap(c), veh/h	275	478	578	195	374	362	353	1569	845	284	1287	677
V/C Ratio(X)	0.56	0.63	0.65	0.19	0.71	0.25	0.88	0.51	0.51	0.32	0.71	0.71
Avail Cap(c_a), veh/h	308	478	578	346	494	464	550	1797	967	390	1339	705
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.0	31.1	24.3	31.6	36.2	30.4	20.0	17.2	17.3	17.9	24.7	25.0
Incr Delay (d2), s/veh	0.7	2.6	2.6	0.2	3.2	0.4	10.2	0.4	0.7	0.2	2.0	3.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	7.4	8.7	0.8	7.1	2.0	5.8	7.5	8.1	1.5	10.8	11.7
LnGrp Delay(d),s/veh	28.7	33.7	26.9	31.8	39.4	30.8	30.1	17.5	17.9	18.2	26.7	28.6
LnGrp LOS	C	C	C	C	D	C	C	B	B	B	C	C
Approach Vol, veh/h		829			393			1548			1493	
Approach Delay, s/veh		29.7			36.7			20.2			26.8	
Approach LOS		C			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.8	52.0	6.3	31.2	17.5	43.4	13.0	24.4
Change Period (Y+Rc), s	4.0	7.0	4.0	6.0	4.0	7.0	4.0	6.0
Max Green Setting (Gmax), s	11.0	52.0	11.0	25.0	25.0	38.0	11.0	25.0
Max Q Clear Time (g_c+I1), s	5.2	18.9	3.7	22.5	12.6	25.7	9.1	15.5
Green Ext Time (p_c), s	0.1	24.3	0.0	1.2	0.9	10.7	0.1	2.9

Intersection Summary	
HCM 2010 Ctrl Delay	25.9
HCM 2010 LOS	C

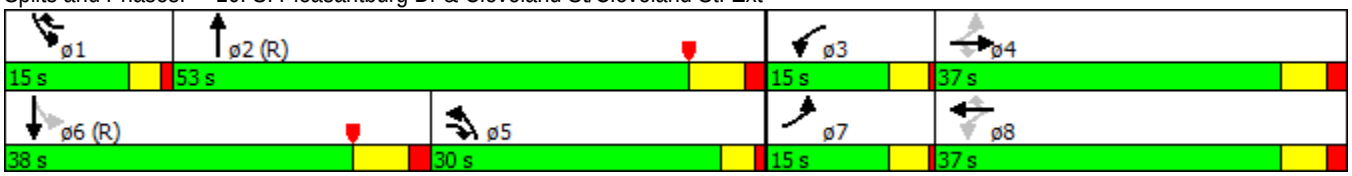
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	44	166	282	44	335	53	499	1074	37	55	893	144
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		4%			-4%			0%			0%	
Storage Length (ft)	250		300	75		150	450		0	200		0
Storage Lanes	1		1	1		1	2		0	1		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1643	1729	1470	1710	1800	1530	3252	4794	0	1676	4716	0
Flt Permitted	0.160			0.510			0.950			0.128		
Satd. Flow (perm)	277	1729	1470	918	1800	1530	3252	4794	0	226	4716	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			250			136		5			26	
Link Speed (mph)		35			35			45			40	
Link Distance (ft)		638			738			1177			990	
Travel Time (s)		12.4			14.4			17.8			16.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	49	184	313	49	372	59	554	1234	0	61	1152	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.10	1.10	1.10	1.05	1.05	1.05	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	Prot	NA		pm+pt	NA	
Protected Phases	7	4	5	3	8	1	5	2		1	6	
Permitted Phases	4		4	8		8				6		
Detector Phase	7	4	5	3	8	1	5	2		1	6	
Switch Phase												
Minimum Initial (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	23.0		3.0	23.0	
Minimum Split (s)	15.0	25.0	15.0	15.0	25.0	15.0	15.0	30.0		15.0	30.0	
Total Split (s)	15.0	37.0	30.0	15.0	37.0	15.0	30.0	53.0		15.0	38.0	
Total Split (%)	12.5%	30.8%	25.0%	12.5%	30.8%	12.5%	25.0%	44.2%		12.5%	31.7%	
Maximum Green (s)	11.0	31.0	26.0	11.0	31.0	11.0	26.0	46.0		11.0	31.0	
Yellow Time (s)	3.5	4.0	3.0	3.5	4.0	3.0	3.0	5.0		3.0	5.0	
All-Red Time (s)	0.5	2.0	1.0	0.5	2.0	1.0	1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	-2.0	0.0	0.0	-2.0	0.0	0.0	-3.0		0.0	-3.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag		Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0	2.0	3.0	4.0		2.0	4.0	
Recall Mode	None	None	None	None	None	None	None	C-Max		None	C-Max	
Walk Time (s)		5.0			5.0			5.0			5.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	36.6	30.4	57.2	35.8	29.9	41.5	26.0	62.7		42.6	42.6	
Actuated g/C Ratio	0.30	0.25	0.48	0.30	0.25	0.35	0.22	0.52		0.36	0.36	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.30	0.42	0.38	0.15	0.83	0.10	0.79	0.49		0.36	0.68	
Control Delay	29.3	39.9	3.8	25.8	58.6	0.3	53.5	21.5		35.4	36.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	29.3	39.9	3.8	25.8	58.6	0.3	53.5	21.5		35.4	36.1	
LOS	C	D	A	C	E	A	D	C		D	D	
Approach Delay		18.3			48.1			31.4			36.1	
Approach LOS		B			D			C			D	
Queue Length 50th (ft)	25	117	19	25	267	0	210	238		33	284	
Queue Length 95th (ft)	50	182	52	50	380	0	275	316		70	356	
Internal Link Dist (ft)		558			658			1097			910	
Turn Bay Length (ft)	250		300	75		150	450			200		
Base Capacity (vph)	215	479	831	367	495	657	704	2508		213	1691	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.23	0.38	0.38	0.13	0.75	0.09	0.79	0.49		0.29	0.68	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Yellow
Natural Cycle: 85
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 33.0 Intersection LOS: C
Intersection Capacity Utilization 71.9% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 10: S. Pleasantburg Dr & Cleveland St/Cleveland St. Ext



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	44	166	282	44	335	53	499	1074	37	55	893	144
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1729	1729	1729	1800	1800	1800	1765	1765	1800	1765	1765	1800
Adj Flow Rate, veh/h	49	184	313	49	372	59	554	1193	41	61	992	160
Adj No. of Lanes	1	1	1	1	1	1	2	3	0	1	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	144	428	751	242	444	412	913	2625	90	142	1186	191
Arrive On Green	0.03	0.25	0.23	0.03	0.25	0.23	0.28	0.55	0.53	0.04	0.28	0.27
Sat Flow, veh/h	1647	1729	1470	1714	1800	1530	3261	4783	164	1681	4184	673
Grp Volume(v), veh/h	49	184	313	49	372	59	554	801	433	61	761	391
Grp Sat Flow(s),veh/h/ln	1647	1729	1470	1714	1800	1530	1630	1606	1736	1681	1606	1646
Q Serve(g_s), s	2.7	10.8	2.1	2.6	23.6	3.5	17.7	18.0	18.0	3.4	26.7	26.9
Cycle Q Clear(g_c), s	2.7	10.8	2.1	2.6	23.6	3.5	17.7	18.0	18.0	3.4	26.7	26.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.09	1.00		0.41
Lane Grp Cap(c), veh/h	144	428	751	242	444	412	913	1763	953	142	910	466
V/C Ratio(X)	0.34	0.43	0.42	0.20	0.84	0.14	0.61	0.45	0.45	0.43	0.84	0.84
Avail Cap(c_a), veh/h	242	476	791	346	495	456	913	1763	953	230	910	466
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.1	38.0	8.0	34.2	42.9	33.3	37.5	16.3	16.3	37.7	40.4	40.8
Incr Delay (d2), s/veh	0.5	0.7	0.4	0.2	11.1	0.2	1.2	0.8	1.6	0.8	9.0	16.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	5.2	4.2	1.2	13.0	1.5	8.1	8.1	9.0	1.6	13.0	14.3
LnGrp Delay(d),s/veh	36.7	38.7	8.3	34.4	54.1	33.5	38.6	17.1	17.9	38.5	49.4	57.2
LnGrp LOS	D	D	A	C	D	C	D	B	B	D	D	E
Approach Vol, veh/h		546			480			1788			1213	
Approach Delay, s/veh		21.1			49.5			24.0			51.4	
Approach LOS		C			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.7	69.9	7.7	33.7	40.6	38.0	7.8	33.6
Change Period (Y+Rc), s	4.0	7.0	4.0	6.0	7.0	* 7	4.0	6.0
Max Green Setting (Gmax), s	11.0	46.0	11.0	31.0	26.0	* 31	11.0	31.0
Max Q Clear Time (g_c+I1), s	5.4	20.0	4.6	12.8	19.7	28.9	4.7	25.6
Green Ext Time (p_c), s	0.0	12.6	0.0	3.8	1.4	1.4	0.0	2.0

Intersection Summary	
HCM 2010 Ctrl Delay	34.9
HCM 2010 LOS	C

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	139	269	338	32	239	82	280	1068	45	81	1154	109
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		4%			-4%			0%			0%	
Storage Length (ft)	250		300	75		150	450		0	200		0
Storage Lanes	1		1	1		1	2		0	1		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1643	1729	1470	1710	1800	1530	3252	4789	0	1676	4755	0
Flt Permitted	0.276			0.477			0.950			0.170		
Satd. Flow (perm)	477	1729	1470	859	1800	1530	3252	4789	0	300	4755	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			197			109		6			14	
Link Speed (mph)		35			35			45			40	
Link Distance (ft)		622			738			1177			990	
Travel Time (s)		12.1			14.4			17.8			16.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	154	299	376	36	266	91	311	1237	0	90	1403	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.10	1.10	1.10	1.05	1.05	1.05	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	Prot	NA		pm+pt	NA	
Protected Phases	7	4	5	3	8	1	5	2		1	6	
Permitted Phases	4		4	8		8				6		
Detector Phase	7	4	5	3	8	1	5	2		1	6	
Switch Phase												
Minimum Initial (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	23.0		3.0	23.0	
Minimum Split (s)	15.0	22.0	15.0	15.0	22.0	15.0	15.0	30.0		15.0	30.0	
Total Split (s)	16.0	36.0	22.0	15.0	35.0	15.0	22.0	54.0		15.0	47.0	
Total Split (%)	13.3%	30.0%	18.3%	12.5%	29.2%	12.5%	18.3%	45.0%		12.5%	39.2%	
Maximum Green (s)	12.0	30.0	18.0	11.0	29.0	11.0	18.0	47.0		11.0	40.0	
Yellow Time (s)	3.5	4.0	3.0	3.5	4.0	3.0	3.0	5.0		3.0	5.0	
All-Red Time (s)	0.5	2.0	1.0	0.5	2.0	1.0	1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	-2.0	0.0	0.0	-2.0	0.0	0.0	-3.0		0.0	-3.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0	2.0	3.0	4.0		2.0	4.0	
Recall Mode	None	None	None	None	None	None	None	None		None	None	
Walk Time (s)		5.0			5.0			5.0			5.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	37.8	31.9	51.1	28.9	22.9	34.2	15.2	48.5		47.8	40.6	
Actuated g/C Ratio	0.36	0.30	0.48	0.27	0.22	0.32	0.14	0.46		0.45	0.38	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.53	0.57	0.46	0.13	0.69	0.16	0.67	0.56		0.39	0.77	
Control Delay	31.9	38.7	11.0	24.6	48.9	3.9	52.1	22.9		18.1	32.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	31.9	38.7	11.0	24.6	48.9	3.9	52.1	22.9		18.1	32.7	
LOS	C	D	B	C	D	A	D	C		B	C	
Approach Delay		24.9			36.2			28.8			31.8	
Approach LOS		C			D			C			C	
Queue Length 50th (ft)	78	190	81	17	177	0	109	222		28	312	
Queue Length 95th (ft)	130	295	166	40	270	25	167	315		59	417	
Internal Link Dist (ft)		542			658			1097			910	
Turn Bay Length (ft)	250		300	75		150	450			200		
Base Capacity (vph)	305	552	850	367	538	621	564	2363		292	1979	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.50	0.54	0.44	0.10	0.49	0.15	0.55	0.52		0.31	0.71	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 105.8
Natural Cycle: 85
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 29.8 Intersection LOS: C
Intersection Capacity Utilization 69.3% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 10: S. Pleasantburg Dr & Cleveland St/Cleveland St. Ext

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	139	269	338	32	239	82	280	1068	45	81	1154	109
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1729	1729	1729	1800	1800	1800	1765	1765	1800	1765	1765	1800
Adj Flow Rate, veh/h	154	299	376	36	266	91	311	1187	50	90	1282	121
Adj No. of Lanes	1	1	1	1	1	1	2	3	0	1	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	282	490	563	200	388	373	392	2293	97	280	1845	174
Arrive On Green	0.09	0.28	0.26	0.02	0.22	0.20	0.12	0.48	0.46	0.05	0.41	0.39
Sat Flow, veh/h	1647	1729	1470	1714	1800	1530	3261	4742	200	1681	4479	423
Grp Volume(v), veh/h	154	299	376	36	266	91	311	804	433	90	919	484
Grp Sat Flow(s),veh/h/ln	1647	1729	1470	1714	1800	1530	1630	1606	1729	1681	1606	1690
Q Serve(g_s), s	7.1	14.9	21.0	1.7	13.5	4.7	9.2	17.1	17.2	3.2	23.4	23.5
Cycle Q Clear(g_c), s	7.1	14.9	21.0	1.7	13.5	4.7	9.2	17.1	17.2	3.2	23.4	23.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.12	1.00		0.25
Lane Grp Cap(c), veh/h	282	490	563	200	388	373	392	1553	836	280	1323	696
V/C Ratio(X)	0.55	0.61	0.67	0.18	0.69	0.24	0.79	0.52	0.52	0.32	0.69	0.69
Avail Cap(c_a), veh/h	331	558	621	351	563	522	592	1619	872	385	1392	733
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.7	30.8	25.3	31.3	35.8	30.2	42.4	17.6	17.7	17.6	24.0	24.3
Incr Delay (d2), s/veh	0.6	1.6	2.4	0.2	2.2	0.3	4.3	0.4	0.7	0.2	1.6	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	7.3	8.9	0.8	7.0	2.0	4.4	7.7	8.4	1.5	10.6	11.5
LnGrp Delay(d),s/veh	28.4	32.4	27.8	31.4	38.0	30.5	46.8	18.0	18.4	17.9	25.7	27.3
LnGrp LOS	C	C	C	C	D	C	D	B	B	B	C	C
Approach Vol, veh/h		829			393			1548			1493	
Approach Delay, s/veh		29.5			35.7			23.9			25.7	
Approach LOS		C			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.8	52.0	6.3	32.1	15.9	44.9	13.0	25.4
Change Period (Y+Rc), s	4.0	7.0	4.0	6.0	4.0	7.0	4.0	6.0
Max Green Setting (Gmax), s	11.0	47.0	11.0	30.0	18.0	40.0	12.0	29.0
Max Q Clear Time (g_c+I1), s	5.2	19.2	3.7	23.0	11.2	25.5	9.1	15.5
Green Ext Time (p_c), s	0.1	21.3	0.0	2.7	0.7	12.4	0.1	3.9

Intersection Summary	
HCM 2010 Ctrl Delay	26.7
HCM 2010 LOS	C

#11 Woodruff Road at Verdae Boulevard / Roper Mountain Road

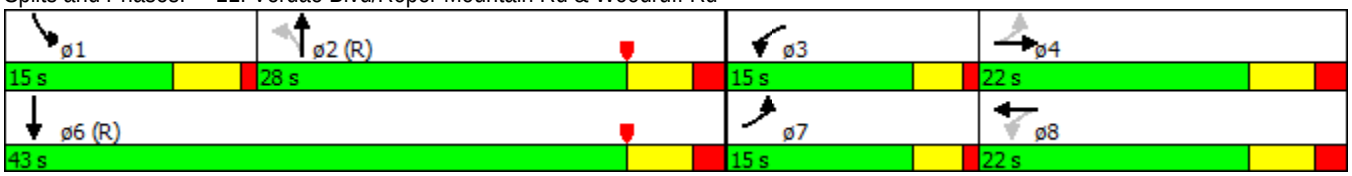
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	219	222	52	100	338	286	192	772	106	314	639	379
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%			3%			-3%	
Storage Length (ft)	125		0	200		200	150		225	350		200
Storage Lanes	1		0	1		1	1		1	2		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1770	3437	0	1743	3486	1560	1743	3486	1560	3485	3592	1607
Flt Permitted	0.351			0.566			0.382			0.950		
Satd. Flow (perm)	654	3437	0	1038	3486	1560	701	3486	1560	3485	3592	1607
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		33				318			245			421
Link Speed (mph)		45			35			45			40	
Link Distance (ft)		811			1125			986			669	
Travel Time (s)		12.3			21.9			14.9			11.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	243	305	0	111	376	318	213	858	118	349	710	421
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes			Yes				
Headway Factor	1.00	1.00	1.00	1.02	1.02	1.02	1.02	1.02	1.02	0.98	0.98	0.98
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA		pm+pt	NA	Free	Perm	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		Free	2		Free			Free
Detector Phase	7	4		3	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		9.0	9.0		6.0	10.0	
Minimum Split (s)	15.0	22.0		15.0	22.0		22.0	22.0		15.0	22.0	
Total Split (s)	15.0	22.0		15.0	22.0		28.0	28.0		15.0	43.0	
Total Split (%)	18.8%	27.5%		18.8%	27.5%		35.0%	35.0%		18.8%	53.8%	
Maximum Green (s)	11.0	16.0		11.0	16.0		22.0	22.0		10.0	37.0	
Yellow Time (s)	3.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	2.0		1.0	2.0		2.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	-2.0		0.0	-2.0		-2.0	-2.0		-1.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes		
Vehicle Extension (s)	2.0	6.0		2.0	6.0		4.0	4.0		4.0	4.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Act Effct Green (s)	29.3	20.6		27.3	17.2	80.0	24.7	24.7	80.0	11.4	40.1	80.0
Actuated g/C Ratio	0.37	0.26		0.34	0.22	1.00	0.31	0.31	1.00	0.14	0.50	1.00
v/c Ratio	0.63	0.34		0.25	0.50	0.20	0.99	0.80	0.08	0.70	0.39	0.26
Control Delay	24.7	23.6		16.8	30.1	0.3	90.3	32.5	0.1	41.5	13.5	0.4
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	24.7	23.6		16.8	30.1	0.3	90.3	32.5	0.1	41.5	13.5	0.4
LOS	C	C		B	C	A	F	C	A	D	B	A
Approach Delay		24.1			16.5			39.7			16.4	
Approach LOS		C			B			D			B	
Queue Length 50th (ft)	80	59		34	86	0	~108	207	0	87	113	0
Queue Length 95th (ft)	135	96		66	128	0	#245	#286	0	#141	154	0
Internal Link Dist (ft)		731			1045			906			589	
Turn Bay Length (ft)	125			200		200	150		225	350		200
Base Capacity (vph)	393	911		462	784	1560	216	1075	1560	498	1801	1607
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.33		0.24	0.48	0.20	0.99	0.80	0.08	0.70	0.39	0.26

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 24.3 Intersection LOS: C
Intersection Capacity Utilization 65.1% ICU Level of Service C
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 11: Verdae Blvd/Roper Mountain Rd & Woodruff Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	219	222	52	100	338	286	192	772	106	314	639	379
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1835	1835	1835	1835	1835	1835	1891	1891	1891
Adj Flow Rate, veh/h	243	247	0	111	376	0	213	858	0	349	710	0
Adj No. of Lanes	1	2	0	1	2	1	1	2	1	2	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	398	749	0	432	664	258	336	1184	491	469	1882	802
Arrive On Green	0.14	0.21	0.00	0.11	0.19	0.00	0.34	0.34	0.00	0.13	0.52	0.00
Sat Flow, veh/h	1774	3632	0	1747	3486	1560	725	3486	1560	3493	3592	1607
Grp Volume(v), veh/h	243	247	0	111	376	0	213	858	0	349	710	0
Grp Sat Flow(s),veh/h/ln	1774	1770	0	1747	1743	1560	725	1743	1560	1747	1796	1607
Q Serve(g_s), s	8.9	4.7	0.0	3.9	7.8	0.0	22.0	17.2	0.0	7.7	9.4	0.0
Cycle Q Clear(g_c), s	8.9	4.7	0.0	3.9	7.8	0.0	22.0	17.2	0.0	7.7	9.4	0.0
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	398	749	0	432	664	258	336	1184	491	469	1882	802
V/C Ratio(X)	0.61	0.33	0.00	0.26	0.57	0.00	0.63	0.72	0.00	0.74	0.38	0.00
Avail Cap(c_a), veh/h	402	796	0	472	784	312	336	1184	491	480	1882	802
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	23.2	26.7	0.0	22.2	29.4	0.0	24.7	23.1	0.0	33.3	11.3	0.0
Incr Delay (d2), s/veh	1.9	0.9	0.0	0.1	2.7	0.0	8.8	3.9	0.0	6.5	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	2.4	0.0	1.9	4.0	0.0	5.2	8.9	0.0	4.1	4.8	0.0
LnGrp Delay(d),s/veh	25.1	27.7	0.0	22.3	32.1	0.0	33.5	27.0	0.0	39.9	11.9	0.0
LnGrp LOS	C	C		C	C		C	C		D	B	
Approach Vol, veh/h		490			487			1071			1059	
Approach Delay, s/veh		26.4			29.9			28.3			21.1	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6	7	8
Phs Duration (G+Y+Rc), s	14.7	31.2	13.2	20.9		45.9	14.8	19.2
Change Period (Y+Rc), s	5.0	6.0	4.0	6.0		6.0	4.0	6.0
Max Green Setting (Gmax), s	10.0	22.0	11.0	16.0		37.0	11.0	16.0
Max Q Clear Time (g_c+I1), s	9.7	24.0	5.9	6.7		11.4	10.9	9.8
Green Ext Time (p_c), s	0.1	0.0	0.1	4.8		17.7	0.0	3.4

Intersection Summary	
HCM 2010 Ctrl Delay	25.8
HCM 2010 LOS	C

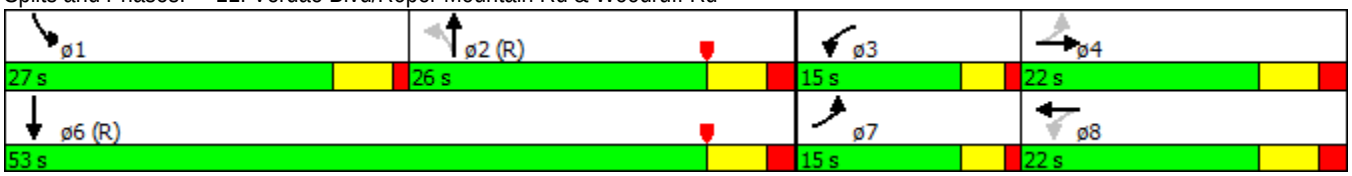
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	282	424	131	192	374	698	74	626	224	766	637	208
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%			3%			-3%	
Storage Length (ft)	125		0	200		200	150		225	350		200
Storage Lanes	1		0	1		1	1		1	2		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1770	3415	0	1743	3486	1560	1743	3486	1560	3485	3592	1607
Flt Permitted	0.315			0.250			0.382			0.950		
Satd. Flow (perm)	587	3415	0	459	3486	1560	701	3486	1560	3485	3592	1607
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		41				498			249			223
Link Speed (mph)		45			35			45			40	
Link Distance (ft)		811			1125			986			669	
Travel Time (s)		12.3			21.9			14.9			11.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	313	617	0	213	416	776	82	696	249	851	708	231
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes			Yes				
Headway Factor	1.00	1.00	1.00	1.02	1.02	1.02	1.02	1.02	1.02	0.98	0.98	0.98
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA		pm+pt	NA	Free	Perm	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		Free	2		Free			Free
Detector Phase	7	4		3	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		6.0	10.0	
Minimum Split (s)	15.0	22.0		15.0	22.0		22.0	22.0		15.0	22.0	
Total Split (s)	15.0	22.0		15.0	22.0		26.0	26.0		27.0	53.0	
Total Split (%)	16.7%	24.4%		16.7%	24.4%		28.9%	28.9%		30.0%	58.9%	
Maximum Green (s)	11.0	16.0		11.0	16.0		20.0	20.0		22.0	47.0	
Yellow Time (s)	3.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	2.0		1.0	2.0		2.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	-2.0		0.0	-2.0		-2.0	-2.0		-1.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes		
Vehicle Extension (s)	2.0	6.0		2.0	6.0		4.0	4.0		4.0	4.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Act Effct Green (s)	29.2	18.2		28.8	18.0	90.0	22.0	22.0	90.0	23.0	49.0	90.0
Actuated g/C Ratio	0.32	0.20		0.32	0.20	1.00	0.24	0.24	1.00	0.26	0.54	1.00
v/c Ratio	0.93	0.85		0.71	0.60	0.50	0.48	0.82	0.16	0.96	0.36	0.14
Control Delay	61.7	45.3		35.7	36.8	1.1	40.1	41.3	0.2	55.4	12.3	0.2
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	61.7	45.3		35.7	36.8	1.1	40.1	41.3	0.2	55.4	12.3	0.2
LOS	E	D		D	D	A	D	D	A	E	B	A
Approach Delay		50.8			16.9			31.2			31.2	
Approach LOS		D			B			C			C	
Queue Length 50th (ft)	135	168		86	114	0	40	196	0	245	112	0
Queue Length 95th (ft)	#261	#261		#154	162	0	88	#281	0	#366	151	0
Internal Link Dist (ft)		731			1045			906			589	
Turn Bay Length (ft)	125			200		200	150		225	350		200
Base Capacity (vph)	335	724		304	697	1560	171	852	1560	890	1955	1607
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.85		0.70	0.60	0.50	0.48	0.82	0.16	0.96	0.36	0.14

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 30.9 Intersection LOS: C
Intersection Capacity Utilization 79.0% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 11: Verdae Blvd/Roper Mountain Rd & Woodruff Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	282	424	131	192	374	698	74	626	224	766	637	208
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1835	1835	1835	1835	1835	1835	1891	1891	1891
Adj Flow Rate, veh/h	313	471	0	213	416	0	82	696	0	851	708	0
Adj No. of Lanes	1	2	0	1	2	1	1	2	1	2	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	353	681	0	332	664	262	264	885	361	893	1990	854
Arrive On Green	0.12	0.19	0.00	0.12	0.19	0.00	0.25	0.25	0.00	0.26	0.55	0.00
Sat Flow, veh/h	1774	3632	0	1747	3486	1560	727	3486	1560	3493	3592	1607
Grp Volume(v), veh/h	313	471	0	213	416	0	82	696	0	851	708	0
Grp Sat Flow(s),veh/h/ln	1774	1770	0	1747	1743	1560	727	1743	1560	1747	1796	1607
Q Serve(g_s), s	11.0	11.2	0.0	8.9	9.9	0.0	8.5	16.8	0.0	21.6	9.9	0.0
Cycle Q Clear(g_c), s	11.0	11.2	0.0	8.9	9.9	0.0	8.5	16.8	0.0	21.6	9.9	0.0
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	353	681	0	332	664	262	264	885	361	893	1990	854
V/C Ratio(X)	0.89	0.69	0.00	0.64	0.63	0.00	0.31	0.79	0.00	0.95	0.36	0.00
Avail Cap(c_a), veh/h	353	708	0	335	697	277	264	885	361	893	1990	854
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.2	33.9	0.0	26.8	33.5	0.0	28.2	31.3	0.0	33.0	11.2	0.0
Incr Delay (d2), s/veh	21.8	4.9	0.0	3.1	3.7	0.0	3.0	7.0	0.0	19.8	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	5.9	0.0	4.5	5.1	0.0	1.9	8.9	0.0	12.9	5.0	0.0
LnGrp Delay(d),s/veh	52.0	38.8	0.0	29.9	37.2	0.0	31.3	38.3	0.0	52.8	11.7	0.0
LnGrp LOS	D	D		C	D		C	D		D	B	
Approach Vol, veh/h		784			629			778			1559	
Approach Delay, s/veh		44.1			34.7			37.5			34.1	
Approach LOS		D			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6	7	8
Phs Duration (G+Y+Rc), s	27.0	26.9	14.8	21.3		53.9	15.0	21.1
Change Period (Y+Rc), s	5.0	6.0	4.0	6.0		6.0	4.0	6.0
Max Green Setting (Gmax), s	22.0	20.0	11.0	16.0		47.0	11.0	16.0
Max Q Clear Time (g_c+I1), s	23.6	18.8	10.9	13.2		11.9	13.0	11.9
Green Ext Time (p_c), s	0.0	1.1	0.0	2.2		17.6	0.0	3.1

Intersection Summary	
HCM 2010 Ctrl Delay	37.0
HCM 2010 LOS	D

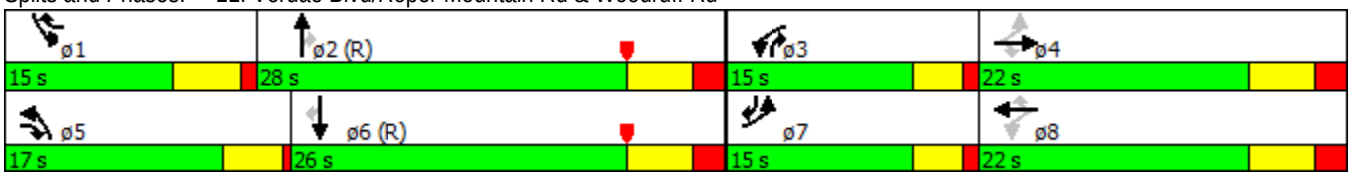
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	219	222	52	100	338	286	192	772	106	314	639	379
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%			3%			-3%	
Storage Length (ft)	125		125	200		200	150		225	350		200
Storage Lanes	1		1	1		2	1		1	2		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1770	3539	1583	1743	3486	2745	1743	3486	1560	3485	3592	1607
Flt Permitted	0.383			0.589			0.950			0.950		
Satd. Flow (perm)	713	3539	1583	1081	3486	2745	1743	3486	1560	3485	3592	1607
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95			195			118			149
Link Speed (mph)		45			35			45			40	
Link Distance (ft)		811			1125			986			669	
Travel Time (s)		12.3			21.9			14.9			11.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	243	247	58	111	376	318	213	858	118	349	710	421
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes			Yes				
Headway Factor	1.00	1.00	1.00	1.02	1.02	1.02	1.02	1.02	1.02	0.98	0.98	0.98
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases	4		4	8		8			2			6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	10.0	10.0	4.0	10.0	10.0	6.0	4.0	9.0	10.0	6.0	10.0	10.0
Minimum Split (s)	15.0	22.0	15.0	15.0	22.0	15.0	15.0	22.0	15.0	15.0	22.0	15.0
Total Split (s)	15.0	22.0	17.0	15.0	22.0	15.0	17.0	28.0	15.0	15.0	26.0	15.0
Total Split (%)	18.8%	27.5%	21.3%	18.8%	27.5%	18.8%	21.3%	35.0%	18.8%	18.8%	32.5%	18.8%
Maximum Green (s)	11.0	16.0	13.0	11.0	16.0	10.0	13.0	22.0	11.0	10.0	20.0	11.0
Yellow Time (s)	3.0	4.0	3.5	3.0	4.0	4.0	3.5	4.0	3.0	4.0	4.0	3.0
All-Red Time (s)	1.0	2.0	0.5	1.0	2.0	1.0	0.5	2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	0.0	-2.0	0.0	0.0	-2.0	-1.0	0.0	-2.0	0.0	-1.0	-2.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	6.0	3.0	2.0	6.0	4.0	3.0	4.0	2.0	4.0	4.0	2.0
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	28.5	17.8	34.2	27.3	17.2	32.6	12.4	24.7	38.8	11.4	23.7	38.4
Actuated g/C Ratio	0.36	0.22	0.43	0.34	0.22	0.41	0.16	0.31	0.48	0.14	0.30	0.48
v/c Ratio	0.62	0.31	0.08	0.25	0.50	0.26	0.79	0.80	0.14	0.70	0.67	0.50
Control Delay	24.2	26.9	1.4	16.7	30.1	6.6	54.4	32.5	2.9	41.6	29.0	11.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	24.2	26.9	1.4	16.7	30.1	6.6	54.4	32.5	2.9	41.6	29.0	11.6
LOS	C	C	A	B	C	A	D	C	A	D	C	B
Approach Delay		23.0			19.0			33.5			27.0	
Approach LOS		C			B			C			C	
Queue Length 50th (ft)	80	53	0	34	86	21	103	207	0	87	167	86
Queue Length 95th (ft)	135	85	9	66	128	48	#206	#286	25	#141	230	165
Internal Link Dist (ft)		731			1045			906			589	
Turn Bay Length (ft)	125		125	200		200	150		225	350		200
Base Capacity (vph)	401	817	742	471	784	1233	284	1075	832	497	1063	854
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.30	0.08	0.24	0.48	0.26	0.75	0.80	0.14	0.70	0.67	0.49

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 26.8 Intersection LOS: C
Intersection Capacity Utilization 65.1% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 11: Verdae Blvd/Roper Mountain Rd & Woodruff Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	219	222	52	100	338	286	192	772	106	314	639	379
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1835	1835	1835	1835	1835	1835	1891	1891	1891
Adj Flow Rate, veh/h	243	247	58	111	376	318	213	858	118	349	710	421
Adj No. of Lanes	1	2	1	1	2	2	1	2	1	2	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	389	790	541	437	711	894	251	1144	651	469	1145	687
Arrive On Green	0.13	0.22	0.20	0.11	0.20	0.19	0.14	0.33	0.30	0.13	0.32	0.29
Sat Flow, veh/h	1774	3539	1583	1747	3486	2745	1747	3486	1560	3493	3592	1607
Grp Volume(v), veh/h	243	247	58	111	376	318	213	858	118	349	710	421
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1747	1743	1372	1747	1743	1560	1747	1796	1607
Q Serve(g_s), s	8.7	4.7	2.0	3.8	7.7	7.1	9.5	17.5	3.8	7.7	13.4	16.3
Cycle Q Clear(g_c), s	8.7	4.7	2.0	3.8	7.7	7.1	9.5	17.5	3.8	7.7	13.4	16.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	389	790	541	437	711	894	251	1144	651	469	1145	687
V/C Ratio(X)	0.62	0.31	0.11	0.25	0.53	0.36	0.85	0.75	0.18	0.74	0.62	0.61
Avail Cap(c_a), veh/h	396	796	544	478	784	952	284	1144	651	480	1145	687
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.5	25.9	18.0	21.4	28.4	20.6	33.4	24.0	14.7	33.3	23.1	17.8
Incr Delay (d2), s/veh	2.2	0.8	0.3	0.1	2.2	0.9	19.1	4.5	0.6	6.5	2.5	4.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	2.4	0.9	1.8	3.9	2.8	5.9	9.2	1.7	4.1	7.0	7.9
LnGrp Delay(d),s/veh	24.7	26.8	18.3	21.5	30.6	21.4	52.5	28.5	15.3	39.9	25.7	21.8
LnGrp LOS	C	C	B	C	C	C	D	C	B	D	C	C
Approach Vol, veh/h		548			805			1189			1480	
Approach Delay, s/veh		24.9			25.7			31.5			27.9	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.7	30.2	13.2	21.9	15.5	29.5	14.7	20.3
Change Period (Y+Rc), s	5.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	10.0	22.0	11.0	16.0	13.0	20.0	11.0	16.0
Max Q Clear Time (g_c+I1), s	9.7	19.5	5.8	6.7	11.5	18.3	10.7	9.7
Green Ext Time (p_c), s	0.1	2.3	0.1	6.5	0.1	1.6	0.0	4.6

Intersection Summary	
HCM 2010 Ctrl Delay	28.1
HCM 2010 LOS	C

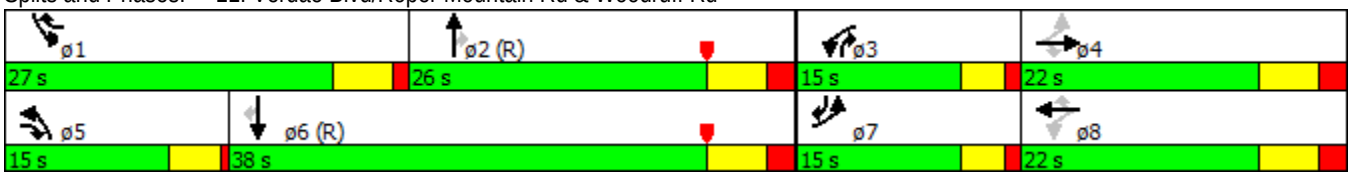
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	282	424	131	192	374	698	74	626	224	766	637	208
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%			3%			-3%	
Storage Length (ft)	125		125	200		200	150		225	350		200
Storage Lanes	1		1	1		2	1		1	2		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1770	3539	1583	1743	3486	2745	1743	3486	1560	3485	3592	1607
Flt Permitted	0.310			0.257			0.950			0.950		
Satd. Flow (perm)	577	3539	1583	472	3486	2745	1743	3486	1560	3485	3592	1607
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			145			100			145			228
Link Speed (mph)		45			35			45			40	
Link Distance (ft)		811			1125			986			669	
Travel Time (s)		12.3			21.9			14.9			11.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	313	471	146	213	416	776	82	696	249	851	708	231
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes			Yes				
Headway Factor	1.00	1.00	1.00	1.02	1.02	1.02	1.02	1.02	1.02	0.98	0.98	0.98
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases	4		4	8		8			2			6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	10.0	10.0	4.0	10.0	10.0	6.0	4.0	10.0	10.0	6.0	10.0	10.0
Minimum Split (s)	15.0	22.0	15.0	15.0	22.0	15.0	15.0	22.0	15.0	15.0	22.0	15.0
Total Split (s)	15.0	22.0	15.0	15.0	22.0	27.0	15.0	26.0	15.0	27.0	38.0	15.0
Total Split (%)	16.7%	24.4%	16.7%	16.7%	24.4%	30.0%	16.7%	28.9%	16.7%	30.0%	42.2%	16.7%
Maximum Green (s)	11.0	16.0	11.0	11.0	16.0	22.0	11.0	20.0	11.0	22.0	32.0	11.0
Yellow Time (s)	3.0	4.0	3.5	3.0	4.0	4.0	3.5	4.0	3.0	4.0	4.0	3.0
All-Red Time (s)	1.0	2.0	0.5	1.0	2.0	1.0	0.5	2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	0.0	-2.0	0.0	0.0	-2.0	-1.0	0.0	-2.0	0.0	-1.0	-2.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	6.0	3.0	2.0	6.0	4.0	3.0	4.0	2.0	4.0	4.0	2.0
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	28.9	17.9	31.0	28.5	17.7	45.0	9.1	22.0	36.8	23.3	36.2	51.2
Actuated g/C Ratio	0.32	0.20	0.34	0.32	0.20	0.50	0.10	0.24	0.41	0.26	0.40	0.57
v/c Ratio	0.95	0.67	0.23	0.71	0.61	0.55	0.47	0.82	0.34	0.94	0.49	0.23
Control Delay	64.3	38.6	4.5	35.5	37.2	15.0	46.5	41.3	9.1	53.1	21.9	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	64.3	38.6	4.5	35.5	37.2	15.0	46.5	41.3	9.1	53.1	21.9	2.1
LOS	E	D	A	D	D	B	D	D	A	D	C	A
Approach Delay		41.9			24.7			33.9			34.2	
Approach LOS		D			C			C			C	
Queue Length 50th (ft)	135	131	0	86	114	142	45	196	36	245	156	1
Queue Length 95th (ft)	#263	183	38	#151	162	199	88	#281	89	#366	215	32
Internal Link Dist (ft)		731			1045			906			589	
Turn Bay Length (ft)	125		125	200		200	150		225	350		200
Base Capacity (vph)	331	709	671	305	697	1422	213	852	726	902	1445	1012
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.66	0.22	0.70	0.60	0.55	0.38	0.82	0.34	0.94	0.49	0.23

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 32.9 Intersection LOS: C
Intersection Capacity Utilization 78.5% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 11: Verdae Blvd/Roper Mountain Rd & Woodruff Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	282	424	131	192	374	698	74	626	224	766	637	208
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1835	1835	1835	1835	1835	1835	1891	1891	1891
Adj Flow Rate, veh/h	313	471	146	213	416	776	82	696	249	851	708	231
Adj No. of Lanes	1	2	1	1	2	2	1	2	1	2	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	329	718	381	335	697	1220	105	852	533	893	1580	867
Arrive On Green	0.12	0.20	0.18	0.12	0.20	0.19	0.06	0.24	0.22	0.26	0.44	0.42
Sat Flow, veh/h	1774	3539	1583	1747	3486	2745	1747	3486	1560	3493	3592	1607
Grp Volume(v), veh/h	313	471	146	213	416	776	82	696	249	851	708	231
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1747	1743	1372	1747	1743	1560	1747	1796	1607
Q Serve(g_s), s	11.0	11.0	6.9	8.8	9.8	17.0	4.2	17.0	11.3	21.6	12.4	7.0
Cycle Q Clear(g_c), s	11.0	11.0	6.9	8.8	9.8	17.0	4.2	17.0	11.3	21.6	12.4	7.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	329	718	381	335	697	1220	105	852	533	893	1580	867
V/C Ratio(X)	0.95	0.66	0.38	0.64	0.60	0.64	0.78	0.82	0.47	0.95	0.45	0.27
Avail Cap(c_a), veh/h	329	718	381	340	697	1220	214	852	533	893	1580	867
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.8	33.0	28.6	26.2	32.7	19.4	41.7	32.1	23.2	33.0	17.6	11.1
Incr Delay (d2), s/veh	36.3	4.0	2.3	2.9	3.1	2.2	11.7	8.5	2.9	19.8	0.9	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.7	5.8	3.3	4.4	5.0	7.8	2.3	9.1	5.3	12.9	6.3	3.2
LnGrp Delay(d),s/veh	66.1	37.0	30.8	29.1	35.8	21.5	53.4	40.6	26.1	52.8	18.5	11.9
LnGrp LOS	E	D	C	C	D	C	D	D	C	D	B	B
Approach Vol, veh/h		930			1405			1027			1790	
Approach Delay, s/veh		45.8			26.9			38.1			33.9	
Approach LOS		D			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	27.0	26.0	14.7	22.3	9.4	43.6	15.0	22.0
Change Period (Y+Rc), s	5.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	22.0	20.0	11.0	16.0	11.0	32.0	11.0	16.0
Max Q Clear Time (g_c+I1), s	23.6	19.0	10.8	13.0	6.2	14.4	13.0	19.0
Green Ext Time (p_c), s	0.0	0.9	0.0	2.8	0.1	12.8	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	35.0
HCM 2010 LOS	C

#12 S. Church Street / Mills Avenue at Augusta Street

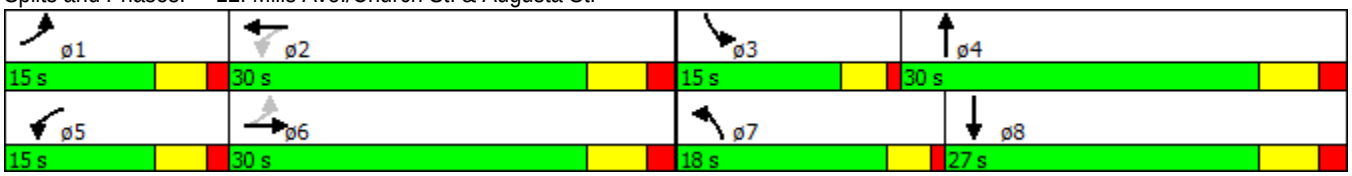
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	79	399	125	82	616	278	178	850	32	287	621	43
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		0%			1%			1%			-1%	
Storage Length (ft)	150		0	175		0	175		0	375		0
Storage Lanes	1		0	1		0	1		0	2		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1676	3232	0	1668	3179	0	1668	3316	0	3269	3336	0
Flt Permitted	0.159			0.290			0.950			0.950		
Satd. Flow (perm)	281	3232	0	509	3179	0	1668	3316	0	3269	3336	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		47			81						8	
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		916			823			731			929	
Travel Time (s)		20.8			18.7			14.2			18.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	88	582	0	91	993	0	198	980	0	319	738	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes			Yes				
Headway Factor	1.07	1.07	1.07	1.08	1.08	1.08	1.08	1.08	1.08	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA		pm+pt	NA		Prot	NA		Prot	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2								
Detector Phase	1	6		5	2		7	4		3	8	
Switch Phase												
Minimum Initial (s)	3.0	10.0		3.0	10.0		5.0	10.0		5.0	10.0	
Minimum Split (s)	15.0	22.0		15.0	22.0		15.0	22.0		15.0	22.0	
Total Split (s)	15.0	30.0		15.0	30.0		18.0	30.0		15.0	27.0	
Total Split (%)	16.7%	33.3%		16.7%	33.3%		20.0%	33.3%		16.7%	30.0%	
Maximum Green (s)	10.0	24.0		10.0	24.0		14.0	24.0		11.0	21.0	
Yellow Time (s)	3.5	4.0		3.5	4.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	1.5	2.0		1.5	2.0		1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	-1.0	-2.0		-1.0	-2.0		0.0	-2.0		0.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Walk Time (s)		5.0			5.0			5.0			5.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	33.0	26.1		33.1	26.2		13.0	26.1		10.8	23.9	
Actuated g/C Ratio	0.39	0.31		0.39	0.31		0.15	0.31		0.13	0.28	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.36	0.57		0.29	0.96		0.78	0.96		0.77	0.78	
Control Delay	19.0	26.1		17.2	48.7		57.3	51.8		51.0	36.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	19.0	26.1		17.2	48.7		57.3	51.8		51.0	36.4	
LOS	B	C		B	D		E	D		D	D	
Approach Delay		25.1			46.0			52.7			40.8	
Approach LOS		C			D			D			D	
Queue Length 50th (ft)	28	130		29	265		105	280		89	199	
Queue Length 95th (ft)	55	192		57	#423		#215	#436		#156	#306	
Internal Link Dist (ft)		836			743			651			849	
Turn Bay Length (ft)	150			175			175			375		
Base Capacity (vph)	295	1025		358	1034		275	1018		424	941	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.30	0.57		0.25	0.96		0.72	0.96		0.75	0.78	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 85.1
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 43.1 Intersection LOS: D
Intersection Capacity Utilization 79.8% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 12: Mills Ave./Church St. & Augusta St.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	79	399	125	82	616	278	178	850	32	287	621	43
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1765	1765	1800	1756	1756	1791	1756	1756	1791	1774	1774	1809
Adj Flow Rate, veh/h	88	443	139	91	684	309	198	944	36	319	690	48
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	2	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	194	781	243	319	697	315	234	1021	39	396	935	65
Arrive On Green	0.06	0.31	0.30	0.07	0.31	0.30	0.14	0.31	0.30	0.12	0.29	0.28
Sat Flow, veh/h	1681	2519	784	1672	2236	1010	1672	3277	125	3277	3197	222
Grp Volume(v), veh/h	88	294	288	91	510	483	198	481	499	319	363	375
Grp Sat Flow(s),veh/h/ln	1681	1676	1626	1672	1668	1578	1672	1668	1734	1638	1685	1734
Q Serve(g_s), s	2.9	12.2	12.5	3.1	25.3	25.3	9.6	23.2	23.2	7.9	16.2	16.3
Cycle Q Clear(g_c), s	2.9	12.2	12.5	3.1	25.3	25.3	9.6	23.2	23.2	7.9	16.2	16.3
Prop In Lane	1.00		0.48	1.00		0.64	1.00		0.07	1.00		0.13
Lane Grp Cap(c), veh/h	194	520	504	319	520	492	234	520	540	396	493	507
V/C Ratio(X)	0.45	0.56	0.57	0.29	0.98	0.98	0.85	0.92	0.92	0.81	0.74	0.74
Avail Cap(c_a), veh/h	308	523	507	429	520	492	281	520	540	432	493	507
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.6	24.1	24.4	18.9	28.5	28.8	35.0	27.8	27.8	35.7	26.6	26.7
Incr Delay (d2), s/veh	0.6	1.8	1.9	0.2	34.7	35.8	18.1	22.4	21.8	10.0	5.8	5.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	5.9	5.8	1.4	16.6	15.9	5.6	13.9	14.4	4.1	8.4	8.6
LnGrp Delay(d),s/veh	22.2	25.8	26.3	19.1	63.1	64.6	53.1	50.2	49.6	45.7	32.4	32.3
LnGrp LOS	C	C	C	B	E	E	D	D	D	D	C	C
Approach Vol, veh/h		670			1084			1178			1057	
Approach Delay, s/veh		25.5			60.1			50.4			36.4	
Approach LOS		C			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.3	30.0	14.1	30.0	9.5	29.9	15.7	28.4
Change Period (Y+Rc), s	5.0	6.0	4.0	6.0	5.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	10.0	24.0	11.0	24.0	10.0	24.0	14.0	21.0
Max Q Clear Time (g_c+I1), s	4.9	27.3	9.9	25.2	5.1	14.5	11.6	18.3
Green Ext Time (p_c), s	0.1	0.0	0.2	0.0	0.1	6.5	0.2	1.9

Intersection Summary	
HCM 2010 Ctrl Delay	45.2
HCM 2010 LOS	D

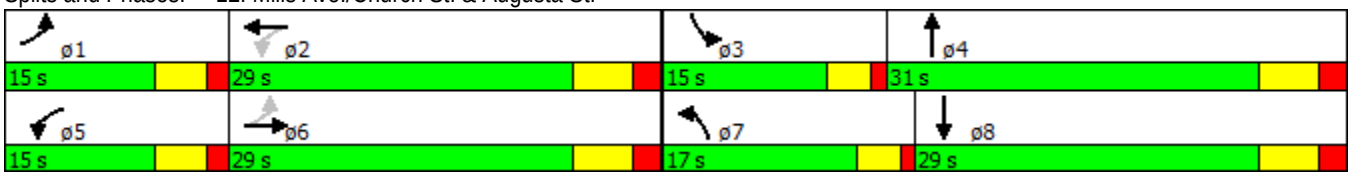
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	94	532	207	114	457	271	186	762	67	282	787	17
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		0%			1%			1%			-1%	
Storage Length (ft)	150		0	175		0	175		0	375		0
Storage Lanes	1		0	1		0	1		0	2		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1676	3212	0	1668	3149	0	1668	3296	0	3269	3360	0
Flt Permitted	0.161			0.151			0.950			0.950		
Satd. Flow (perm)	284	3212	0	265	3149	0	1668	3296	0	3269	3360	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		63			133						2	
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		916			828			724			934	
Travel Time (s)		20.8			18.8			14.1			18.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	104	821	0	127	809	0	207	921	0	313	893	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes			Yes				
Headway Factor	1.07	1.07	1.07	1.08	1.08	1.08	1.08	1.08	1.08	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA		pm+pt	NA		Prot	NA		Prot	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2								
Detector Phase	1	6		5	2		7	4		3	8	
Switch Phase												
Minimum Initial (s)	3.0	10.0		3.0	10.0		5.0	10.0		5.0	10.0	
Minimum Split (s)	15.0	22.0		15.0	22.0		15.0	22.0		15.0	22.0	
Total Split (s)	15.0	29.0		15.0	29.0		17.0	31.0		15.0	29.0	
Total Split (%)	16.7%	32.2%		16.7%	32.2%		18.9%	34.4%		16.7%	32.2%	
Maximum Green (s)	10.0	23.0		10.0	23.0		13.0	25.0		11.0	23.0	
Yellow Time (s)	3.5	4.0		3.5	4.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	1.5	2.0		1.5	2.0		1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	-1.0	-2.0		-1.0	-2.0		0.0	-2.0		0.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Walk Time (s)		5.0			5.0			5.0			5.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	33.4	24.7		35.4	27.5		12.7	27.0		10.8	25.1	
Actuated g/C Ratio	0.38	0.28		0.40	0.31		0.14	0.31		0.12	0.29	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.43	0.87		0.50	0.75		0.86	0.91		0.78	0.93	
Control Delay	20.8	39.2		22.5	28.9		69.9	44.1		52.5	48.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	20.8	39.2		22.5	28.9		69.9	44.1		52.5	48.3	
LOS	C	D		C	C		E	D		D	D	
Approach Delay		37.1			28.0			48.9			49.4	
Approach LOS		D			C			D			D	
Queue Length 50th (ft)	34	212		42	185		114	259		88	255	
Queue Length 95th (ft)	65	#324		77	#289		#240	#388		#152	#389	
Internal Link Dist (ft)		836			748			644			854	
Turn Bay Length (ft)	150			175			175			375		
Base Capacity (vph)	289	959		285	1077		246	1013		409	961	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.36	0.86		0.45	0.75		0.84	0.91		0.77	0.93	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 87.9
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 41.8 Intersection LOS: D
Intersection Capacity Utilization 76.9% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 12: Mills Ave./Church St. & Augusta St.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	94	532	207	114	457	271	186	762	67	282	787	17
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1765	1765	1800	1756	1756	1791	1756	1756	1791	1774	1774	1809
Adj Flow Rate, veh/h	104	591	230	127	508	301	207	847	74	313	874	19
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	2	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	243	683	265	252	607	359	241	992	87	388	992	22
Arrive On Green	0.07	0.29	0.28	0.08	0.30	0.29	0.14	0.32	0.31	0.12	0.29	0.28
Sat Flow, veh/h	1681	2362	918	1672	2020	1193	1672	3105	271	3277	3372	73
Grp Volume(v), veh/h	104	419	402	127	419	390	207	455	466	313	437	456
Grp Sat Flow(s),veh/h/ln	1681	1676	1603	1672	1668	1545	1672	1668	1708	1638	1685	1761
Q Serve(g_s), s	3.6	20.2	20.3	4.5	20.0	20.1	10.3	21.7	21.7	7.9	21.0	21.0
Cycle Q Clear(g_c), s	3.6	20.2	20.3	4.5	20.0	20.1	10.3	21.7	21.7	7.9	21.0	21.0
Prop In Lane	1.00		0.57	1.00		0.77	1.00		0.16	1.00		0.04
Lane Grp Cap(c), veh/h	243	484	463	252	501	465	241	533	546	388	495	518
V/C Ratio(X)	0.43	0.87	0.87	0.50	0.84	0.84	0.86	0.85	0.85	0.81	0.88	0.88
Avail Cap(c_a), veh/h	337	493	471	327	501	465	256	533	546	424	495	518
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.7	28.7	29.0	21.7	27.8	28.2	35.5	27.1	27.1	36.5	28.6	28.6
Incr Delay (d2), s/veh	0.4	15.1	15.9	0.6	12.2	13.3	23.4	12.7	12.5	10.2	16.7	16.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	11.4	11.0	2.1	10.9	10.3	6.3	11.9	12.1	4.1	12.0	12.5
LnGrp Delay(d),s/veh	22.1	43.8	44.9	22.2	39.9	41.4	59.0	39.8	39.6	46.7	45.3	44.8
LnGrp LOS	C	D	D	C	D	D	E	D	D	D	D	D
Approach Vol, veh/h		925			936			1128			1206	
Approach Delay, s/veh		41.8			38.2			43.2			45.5	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.2	29.6	14.1	31.2	11.2	28.6	16.2	29.0
Change Period (Y+Rc), s	5.0	6.0	4.0	6.0	5.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	10.0	23.0	11.0	25.0	10.0	23.0	13.0	23.0
Max Q Clear Time (g_c+I1), s	5.6	22.1	9.9	23.7	6.5	22.3	12.3	23.0
Green Ext Time (p_c), s	0.1	0.7	0.2	1.0	0.1	0.3	0.1	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	42.4
HCM 2010 LOS	D

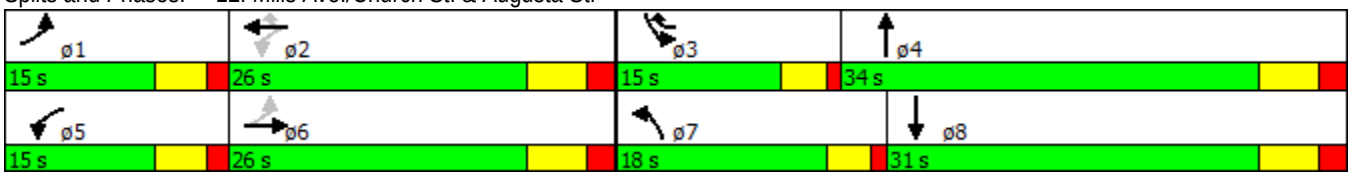
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	79	399	125	82	616	278	178	850	32	287	621	43
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		0%			1%			1%			-1%	
Storage Length (ft)	150		0	175		175	175		0	375		0
Storage Lanes	1		0	1		1	1		0	2		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1676	3232	0	1668	3336	1492	1668	3316	0	3269	3336	0
Flt Permitted	0.196			0.245			0.950			0.950		
Satd. Flow (perm)	346	3232	0	430	3336	1492	1668	3316	0	3269	3336	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		44				179					8	
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		916			823			731			929	
Travel Time (s)		20.8			18.7			14.2			18.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	88	582	0	91	684	309	198	980	0	319	738	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes			Yes				
Headway Factor	1.07	1.07	1.07	1.08	1.08	1.08	1.08	1.08	1.08	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	3	7	4		3	8	
Permitted Phases	6			2		2						
Detector Phase	1	6		5	2	3	7	4		3	8	
Switch Phase												
Minimum Initial (s)	3.0	10.0		3.0	10.0	5.0	5.0	10.0		5.0	10.0	
Minimum Split (s)	15.0	22.0		15.0	22.0	15.0	15.0	22.0		15.0	22.0	
Total Split (s)	15.0	26.0		15.0	26.0	15.0	18.0	34.0		15.0	31.0	
Total Split (%)	16.7%	28.9%		16.7%	28.9%	16.7%	20.0%	37.8%		16.7%	34.4%	
Maximum Green (s)	10.0	20.0		10.0	20.0	11.0	14.0	28.0		11.0	25.0	
Yellow Time (s)	3.5	4.0		3.5	4.0	3.0	3.0	4.0		3.0	4.0	
All-Red Time (s)	1.5	2.0		1.5	2.0	1.0	1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	-1.0	-2.0		-1.0	-2.0	0.0	0.0	-2.0		0.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min	None	None	None		None	None	
Walk Time (s)		5.0			5.0			5.0			5.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	28.2	21.4		28.3	21.4	36.3	13.0	28.8		10.8	26.5	
Actuated g/C Ratio	0.34	0.26		0.34	0.26	0.44	0.16	0.35		0.13	0.32	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.35	0.67		0.33	0.80	0.41	0.76	0.85		0.75	0.69	
Control Delay	21.1	31.3		20.5	38.2	9.4	55.1	35.1		49.0	29.7	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	21.1	31.3		20.5	38.2	9.4	55.1	35.1		49.0	29.7	
LOS	C	C		C	D	A	E	D		D	C	
Approach Delay		29.9			28.5			38.5			35.5	
Approach LOS		C			C			D			D	
Queue Length 50th (ft)	30	141		32	186	44	105	262		89	186	
Queue Length 95th (ft)	61	207		62	#284	112	#215	#391		#157	262	
Internal Link Dist (ft)		836			743			651			849	
Turn Bay Length (ft)	150			175		175	175			375		
Base Capacity (vph)	302	904		320	902	759	286	1220		440	1112	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.29	0.64		0.28	0.76	0.41	0.69	0.80		0.72	0.66	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 83.1
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 33.6 Intersection LOS: C
Intersection Capacity Utilization 70.4% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 12: Mills Ave./Church St. & Augusta St.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	79	399	125	82	616	278	178	850	32	287	621	43
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1765	1765	1800	1756	1756	1756	1756	1756	1791	1774	1774	1809
Adj Flow Rate, veh/h	88	443	139	91	684	309	198	944	36	319	690	48
Adj No. of Lanes	1	2	0	1	2	1	1	2	0	2	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	236	662	206	279	883	540	235	1146	44	399	1057	74
Arrive On Green	0.07	0.26	0.25	0.07	0.26	0.24	0.14	0.35	0.34	0.12	0.33	0.32
Sat Flow, veh/h	1681	2519	784	1672	3336	1492	1672	3277	125	3277	3197	222
Grp Volume(v), veh/h	88	294	288	91	684	309	198	481	499	319	363	375
Grp Sat Flow(s),veh/h/ln	1681	1676	1626	1672	1668	1492	1672	1668	1734	1638	1685	1734
Q Serve(g_s), s	3.1	12.7	12.9	3.2	15.4	13.5	9.4	21.3	21.4	7.7	14.9	15.0
Cycle Q Clear(g_c), s	3.1	12.7	12.9	3.2	15.4	13.5	9.4	21.3	21.4	7.7	14.9	15.0
Prop In Lane	1.00		0.48	1.00		1.00	1.00		0.07	1.00		0.13
Lane Grp Cap(c), veh/h	236	441	427	279	883	540	235	583	606	399	557	574
V/C Ratio(X)	0.37	0.67	0.67	0.33	0.77	0.57	0.84	0.82	0.82	0.80	0.65	0.65
Avail Cap(c_a), veh/h	352	455	441	391	905	550	289	617	641	444	561	577
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.6	26.7	27.0	21.0	27.6	20.8	34.0	24.1	24.1	34.7	23.2	23.2
Incr Delay (d2), s/veh	0.4	4.0	4.4	0.3	4.4	1.7	16.8	8.5	8.2	9.1	2.7	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	6.4	6.3	1.5	7.6	5.8	5.4	11.1	11.5	4.0	7.3	7.6
LnGrp Delay(d),s/veh	22.0	30.8	31.4	21.3	32.0	22.6	50.8	32.6	32.4	43.8	25.8	25.8
LnGrp LOS	C	C	C	C	C	C	D	C	C	D	C	C
Approach Vol, veh/h		670			1084			1178			1057	
Approach Delay, s/veh		29.9			28.4			35.6			31.2	
Approach LOS		C			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.4	25.5	13.9	32.4	9.6	25.3	15.4	30.8
Change Period (Y+Rc), s	5.0	6.0	4.0	6.0	5.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	10.0	20.0	11.0	28.0	10.0	20.0	14.0	25.0
Max Q Clear Time (g_c+I1), s	5.1	17.4	9.7	23.4	5.2	14.9	11.4	17.0
Green Ext Time (p_c), s	0.1	2.1	0.2	3.0	0.1	3.8	0.2	4.6

Intersection Summary	
HCM 2010 Ctrl Delay	31.5
HCM 2010 LOS	C

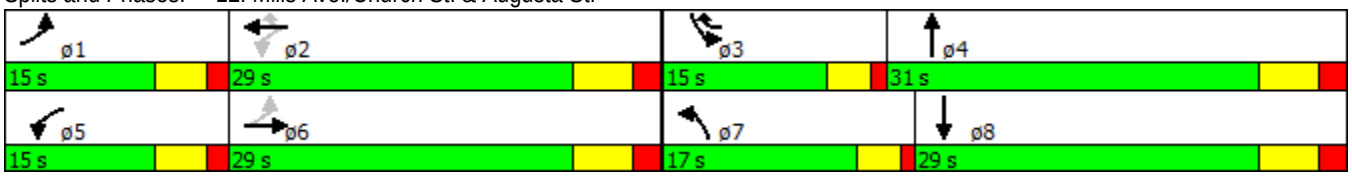
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	94	532	207	114	457	271	186	762	67	282	787	17
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		0%			1%			1%			-1%	
Storage Length (ft)	150		0	175		175	175		0	375		0
Storage Lanes	1		0	1		1	1		0	2		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1676	3212	0	1668	3336	1492	1668	3296	0	3269	3360	0
Flt Permitted	0.375			0.150			0.950			0.950		
Satd. Flow (perm)	662	3212	0	263	3336	1492	1668	3296	0	3269	3360	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		63				202					2	
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		916			828			724			934	
Travel Time (s)		20.8			18.8			14.1			18.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	104	821	0	127	508	301	207	921	0	313	893	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes			Yes				
Headway Factor	1.07	1.07	1.07	1.08	1.08	1.08	1.08	1.08	1.08	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	3	7	4		3	8	
Permitted Phases	6			2		2						
Detector Phase	1	6		5	2	3	7	4		3	8	
Switch Phase												
Minimum Initial (s)	3.0	10.0		3.0	10.0	5.0	5.0	10.0		5.0	10.0	
Minimum Split (s)	15.0	22.0		15.0	22.0	15.0	15.0	22.0		15.0	22.0	
Total Split (s)	15.0	29.0		15.0	29.0	15.0	17.0	31.0		15.0	29.0	
Total Split (%)	16.7%	32.2%		16.7%	32.2%	16.7%	18.9%	34.4%		16.7%	32.2%	
Maximum Green (s)	10.0	23.0		10.0	23.0	11.0	13.0	25.0		11.0	23.0	
Yellow Time (s)	3.5	4.0		3.5	4.0	3.0	3.0	4.0		3.0	4.0	
All-Red Time (s)	1.5	2.0		1.5	2.0	1.0	1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	-1.0	-2.0		-1.0	-2.0	0.0	0.0	-2.0		0.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min	None	None	None		None	None	
Walk Time (s)		5.0			5.0			5.0			5.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	33.3	24.7		35.7	27.7	42.5	12.7	27.0		10.8	25.1	
Actuated g/C Ratio	0.38	0.28		0.41	0.31	0.48	0.14	0.31		0.12	0.29	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.30	0.87		0.49	0.48	0.37	0.86	0.91		0.78	0.93	
Control Delay	17.5	39.4		22.3	27.5	6.8	70.4	44.4		52.6	48.6	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	17.5	39.4		22.3	27.5	6.8	70.4	44.4		52.6	48.6	
LOS	B	D		C	C	A	E	D		D	D	
Approach Delay		36.9			20.1			49.2			49.7	
Approach LOS		D			C			D			D	
Queue Length 50th (ft)	34	213		42	124	31	115	261		89	256	
Queue Length 95th (ft)	65	#324		77	180	88	#240	#388		#152	#389	
Internal Link Dist (ft)		836			748			644			854	
Turn Bay Length (ft)	150			175		175	175			375		
Base Capacity (vph)	395	957		284	1048	827	246	1011		408	959	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.26	0.86		0.45	0.48	0.36	0.84	0.91		0.77	0.93	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 88
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 40.1 Intersection LOS: D
Intersection Capacity Utilization 76.9% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 12: Mills Ave./Church St. & Augusta St.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	94	532	207	114	457	271	186	762	67	282	787	17
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1765	1765	1800	1756	1756	1756	1756	1756	1791	1774	1774	1809
Adj Flow Rate, veh/h	104	591	230	127	508	301	207	847	74	313	874	19
Adj No. of Lanes	1	2	0	1	2	1	1	2	0	2	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	317	683	265	252	1003	590	241	992	87	388	992	22
Arrive On Green	0.07	0.29	0.28	0.08	0.30	0.28	0.14	0.32	0.31	0.12	0.29	0.28
Sat Flow, veh/h	1681	2362	918	1672	3336	1492	1672	3105	271	3277	3372	73
Grp Volume(v), veh/h	104	419	402	127	508	301	207	455	466	313	437	456
Grp Sat Flow(s),veh/h/ln	1681	1676	1603	1672	1668	1492	1672	1668	1708	1638	1685	1761
Q Serve(g_s), s	3.6	20.2	20.3	4.5	10.7	13.0	10.3	21.7	21.7	7.9	21.0	21.0
Cycle Q Clear(g_c), s	3.6	20.2	20.3	4.5	10.7	13.0	10.3	21.7	21.7	7.9	21.0	21.0
Prop In Lane	1.00		0.57	1.00		1.00	1.00		0.16	1.00		0.04
Lane Grp Cap(c), veh/h	317	485	463	252	1003	590	241	533	546	388	495	518
V/C Ratio(X)	0.33	0.87	0.87	0.50	0.51	0.51	0.86	0.85	0.85	0.81	0.88	0.88
Avail Cap(c_a), veh/h	412	493	471	327	1003	590	256	533	546	424	495	518
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.8	28.7	29.0	21.7	24.5	19.5	35.6	27.1	27.1	36.5	28.6	28.6
Incr Delay (d2), s/veh	0.2	15.1	15.9	0.6	0.6	1.0	23.4	12.7	12.5	10.2	16.7	16.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	11.4	11.0	2.1	5.0	5.5	6.3	11.9	12.1	4.1	12.0	12.5
LnGrp Delay(d),s/veh	20.0	43.8	44.9	22.2	25.1	20.5	59.0	39.8	39.6	46.7	45.3	44.8
LnGrp LOS	B	D	D	C	C	C	E	D	D	D	D	D
Approach Vol, veh/h		925			936			1128			1206	
Approach Delay, s/veh		41.6			23.2			43.2			45.5	
Approach LOS		D			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.2	29.6	14.1	31.2	11.2	28.6	16.2	29.0
Change Period (Y+Rc), s	5.0	6.0	4.0	6.0	5.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	10.0	23.0	11.0	25.0	10.0	23.0	13.0	23.0
Max Q Clear Time (g_c+I1), s	5.6	15.0	9.9	23.7	6.5	22.3	12.3	23.0
Green Ext Time (p_c), s	0.1	5.8	0.2	1.0	0.1	0.3	0.1	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	39.1
HCM 2010 LOS	D

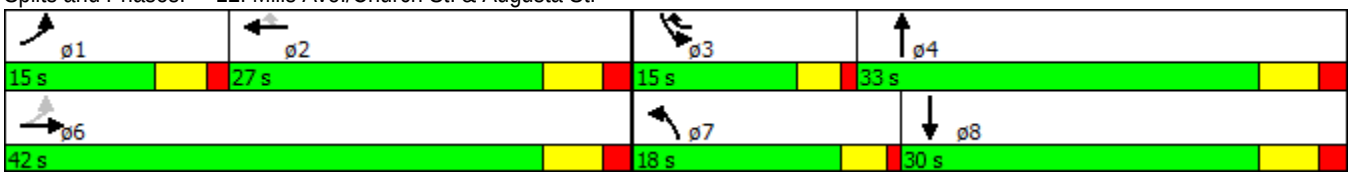
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	79	399	125	0	698	278	178	850	32	287	703	43
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		0%			1%			1%			-1%	
Storage Length (ft)	150		0	175		175	175		0	375		0
Storage Lanes	1		0	0		1	1		0	2		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1676	3232	0	0	3336	1492	1668	3316	0	3269	3339	0
Flt Permitted	0.154						0.950			0.950		
Satd. Flow (perm)	272	3232	0	0	3336	1492	1668	3316	0	3269	3339	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		58				180					7	
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		916			823			731			929	
Travel Time (s)		20.8			18.7			14.2			18.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	88	582	0	0	776	309	198	980	0	319	829	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes			Yes				
Headway Factor	1.07	1.07	1.07	1.08	1.08	1.08	1.08	1.08	1.08	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA			NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	1	6			2	3	7	4		3	8	
Permitted Phases	6					2						
Detector Phase	1	6			2	3	7	4		3	8	
Switch Phase												
Minimum Initial (s)	3.0	10.0			10.0	5.0	5.0	10.0		5.0	10.0	
Minimum Split (s)	15.0	22.0			22.0	15.0	15.0	22.0		15.0	22.0	
Total Split (s)	15.0	42.0			27.0	15.0	18.0	33.0		15.0	30.0	
Total Split (%)	16.7%	46.7%			30.0%	16.7%	20.0%	36.7%		16.7%	33.3%	
Maximum Green (s)	10.0	36.0			21.0	11.0	14.0	27.0		11.0	24.0	
Yellow Time (s)	3.5	4.0			4.0	3.0	3.0	4.0		3.0	4.0	
All-Red Time (s)	1.5	2.0			2.0	1.0	1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	-1.0	-2.0			-2.0	0.0	0.0	-2.0		0.0	-2.0	
Total Lost Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead				Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes				Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	4.0			4.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Min			Min	None	None	None		None	None	
Walk Time (s)		5.0			5.0			5.0			5.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	33.0	33.0			23.1	37.9	13.0	28.2		10.8	26.0	
Actuated g/C Ratio	0.39	0.39			0.27	0.45	0.15	0.34		0.13	0.31	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.36	0.45			0.85	0.40	0.77	0.88		0.76	0.80	
Control Delay	20.5	17.9			40.7	9.0	56.2	38.2		50.0	34.8	
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	20.5	17.9			40.7	9.0	56.2	38.2		50.0	34.8	
LOS	C	B			D	A	E	D		D	C	
Approach Delay		18.2			31.7			41.2			39.0	
Approach LOS		B			C			D			D	
Queue Length 50th (ft)	30	105			215	43	105	265		89	220	
Queue Length 95th (ft)	59	150			#335	109	#215	#403		#157	#333	
Internal Link Dist (ft)		836			743			651			849	
Turn Bay Length (ft)	150					175	175			375		
Base Capacity (vph)	292	1506			921	775	280	1154		431	1049	
Starvation Cap Reductn	0	0			0	0	0	0		0	0	
Spillback Cap Reductn	0	0			0	0	0	0		0	0	
Storage Cap Reductn	0	0			0	0	0	0		0	0	
Reduced v/c Ratio	0.30	0.39			0.84	0.40	0.71	0.85		0.74	0.79	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 84.1
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 34.3 Intersection LOS: C
Intersection Capacity Utilization 72.8% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 12: Mills Ave./Church St. & Augusta St.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	79	399	125	0	698	278	178	850	32	287	703	43
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1765	1765	1800	0	1756	1756	1756	1756	1791	1774	1774	1809
Adj Flow Rate, veh/h	88	443	139	0	776	309	198	944	36	319	781	48
Adj No. of Lanes	1	2	0	0	2	1	1	2	0	2	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	0	2	2	2	2	2	2	2	2
Cap, veh/h	221	988	307	0	930	561	235	1114	42	398	1035	64
Arrive On Green	0.06	0.39	0.38	0.00	0.28	0.25	0.14	0.34	0.33	0.12	0.32	0.31
Sat Flow, veh/h	1681	2519	784	0	3424	1492	1672	3277	125	3277	3225	198
Grp Volume(v), veh/h	88	294	288	0	776	309	198	481	499	319	408	421
Grp Sat Flow(s),veh/h/ln	1681	1676	1626	0	1668	1492	1672	1668	1734	1638	1685	1739
Q Serve(g_s), s	2.9	10.6	10.8	0.0	17.9	13.4	9.5	21.9	21.9	7.8	17.8	17.8
Cycle Q Clear(g_c), s	2.9	10.6	10.8	0.0	17.9	13.4	9.5	21.9	21.9	7.8	17.8	17.8
Prop In Lane	1.00		0.48	0.00		1.00	1.00		0.07	1.00		0.11
Lane Grp Cap(c), veh/h	221	658	638	0	930	561	235	567	589	398	541	558
V/C Ratio(X)	0.40	0.45	0.45	0.00	0.83	0.55	0.84	0.85	0.85	0.80	0.75	0.75
Avail Cap(c_a), veh/h	338	778	754	0	937	564	286	590	614	440	541	558
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.9	18.3	18.6	0.0	27.8	20.1	34.3	25.1	25.1	35.0	24.9	25.0
Incr Delay (d2), s/veh	0.4	0.7	0.7	0.0	6.8	1.5	17.2	10.8	10.4	9.4	6.0	5.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	5.0	5.0	0.0	9.1	5.7	5.5	11.7	12.1	4.0	9.2	9.4
LnGrp Delay(d),s/veh	21.3	19.0	19.3	0.0	34.6	21.6	51.6	35.9	35.5	44.5	30.9	30.8
LnGrp LOS	C	B	B		C	C	D	D	D	D	C	C
Approach Vol, veh/h		670			1085			1178			1148	
Approach Delay, s/veh		19.4			30.9			38.4			34.6	
Approach LOS		B			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6	7	8
Phs Duration (G+Y+Rc), s	9.3	26.8	13.9	31.9		36.1	15.5	30.3
Change Period (Y+Rc), s	5.0	6.0	4.0	6.0		6.0	4.0	6.0
Max Green Setting (Gmax), s	10.0	21.0	11.0	27.0		36.0	14.0	24.0
Max Q Clear Time (g_c+I1), s	4.9	19.9	9.8	23.9		12.8	11.5	19.8
Green Ext Time (p_c), s	0.1	0.9	0.2	2.0		12.7	0.2	2.9

Intersection Summary	
HCM 2010 Ctrl Delay	32.2
HCM 2010 LOS	C

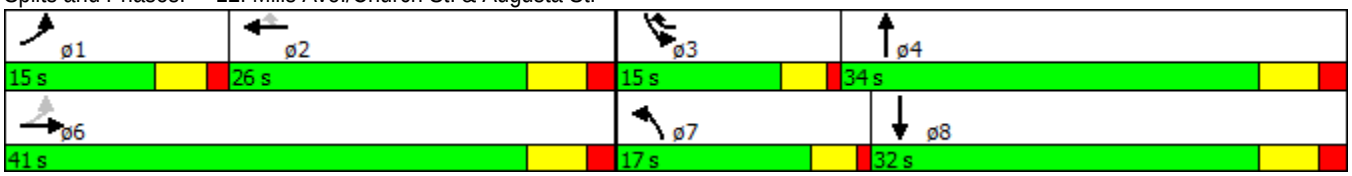
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	94	532	207	0	571	271	186	762	67	282	901	17
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		0%			1%			1%			-1%	
Storage Length (ft)	150		0	0		175	175		0	375		0
Storage Lanes	1		0	0		1	1		0	2		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1676	3212	0	0	3336	1492	1668	3296	0	3269	3360	0
Flt Permitted	0.169						0.950			0.950		
Satd. Flow (perm)	298	3212	0	0	3336	1492	1668	3296	0	3269	3360	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		77				165					2	
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		916			828			724			934	
Travel Time (s)		20.8			18.8			14.1			18.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	104	821	0	0	634	301	207	921	0	313	1020	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			0			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes				
Headway Factor	1.07	1.07	1.07	1.08	1.08	1.08	1.08	1.08	1.08	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA			NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	1	6			2	3	7	4		3	8	
Permitted Phases	6					2						
Detector Phase	1	6			2	3	7	4		3	8	
Switch Phase												
Minimum Initial (s)	3.0	10.0			10.0	5.0	5.0	10.0		5.0	10.0	
Minimum Split (s)	15.0	22.0			22.0	15.0	15.0	22.0		15.0	22.0	
Total Split (s)	15.0	41.0			26.0	15.0	17.0	34.0		15.0	32.0	
Total Split (%)	16.7%	45.6%			28.9%	16.7%	18.9%	37.8%		16.7%	35.6%	
Maximum Green (s)	10.0	35.0			20.0	11.0	13.0	28.0		11.0	26.0	
Yellow Time (s)	3.5	4.0			4.0	3.0	3.0	4.0		3.0	4.0	
All-Red Time (s)	1.5	2.0			2.0	1.0	1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	-1.0	-2.0			-2.0	0.0	0.0	-2.0		0.0	-2.0	
Total Lost Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead				Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes				Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	4.0			4.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Min			Min	None	None	None		None	None	
Walk Time (s)		5.0			5.0			5.0			5.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	32.2	32.2			21.8	36.5	12.6	30.1		10.7	28.2	
Actuated g/C Ratio	0.38	0.38			0.26	0.43	0.15	0.35		0.13	0.33	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.41	0.65			0.74	0.41	0.84	0.79		0.76	0.91	
Control Delay	22.1	22.0			36.2	10.0	66.2	31.9		50.4	42.5	
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	22.1	22.0			36.2	10.0	66.2	31.9		50.4	42.5	
LOS	C	C			D	A	E	C		D	D	
Approach Delay		22.1			27.8			38.2			44.4	
Approach LOS		C			C			D			D	
Queue Length 50th (ft)	36	169			171	47	113	243		88	288	
Queue Length 95th (ft)	70	230			241	114	#240	#338		#152	#438	
Internal Link Dist (ft)		836			748			644			854	
Turn Bay Length (ft)	150					175	175			375		
Base Capacity (vph)	291	1450			869	740	256	1170		425	1115	
Starvation Cap Reductn	0	0			0	0	0	0		0	0	
Spillback Cap Reductn	0	0			0	0	0	0		0	0	
Storage Cap Reductn	0	0			0	0	0	0		0	0	
Reduced v/c Ratio	0.36	0.57			0.73	0.41	0.81	0.79		0.74	0.91	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 85.1
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 34.4 Intersection LOS: C
Intersection Capacity Utilization 73.2% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 12: Mills Ave./Church St. & Augusta St.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	94	532	207	0	571	271	186	762	67	282	901	17
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1765	1765	1800	0	1756	1756	1756	1756	1791	1774	1774	1809
Adj Flow Rate, veh/h	104	591	230	0	634	301	207	847	74	313	1001	19
Adj No. of Lanes	1	2	0	0	2	1	1	2	0	2	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	0	2	2	2	2	2	2	2	2
Cap, veh/h	253	895	348	0	858	526	241	1114	97	390	1128	21
Arrive On Green	0.07	0.38	0.37	0.00	0.26	0.23	0.14	0.36	0.35	0.12	0.33	0.32
Sat Flow, veh/h	1681	2362	918	0	3424	1492	1672	3105	271	3277	3383	64
Grp Volume(v), veh/h	104	419	402	0	634	301	207	455	466	313	499	521
Grp Sat Flow(s),veh/h/ln	1681	1676	1603	0	1668	1492	1672	1668	1708	1638	1685	1762
Q Serve(g_s), s	3.6	17.3	17.5	0.0	14.6	13.7	10.1	20.1	20.1	7.8	23.4	23.4
Cycle Q Clear(g_c), s	3.6	17.3	17.5	0.0	14.6	13.7	10.1	20.1	20.1	7.8	23.4	23.4
Prop In Lane	1.00		0.57	0.00		1.00	1.00		0.16	1.00		0.04
Lane Grp Cap(c), veh/h	253	635	607	0	858	526	241	598	613	390	562	587
V/C Ratio(X)	0.41	0.66	0.66	0.00	0.74	0.57	0.86	0.76	0.76	0.80	0.89	0.89
Avail Cap(c_a), veh/h	349	741	709	0	877	534	260	598	613	431	564	590
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.2	21.5	21.8	0.0	28.5	22.0	34.9	23.7	23.7	35.9	26.4	26.4
Incr Delay (d2), s/veh	0.4	2.2	2.3	0.0	3.6	1.8	22.6	5.7	5.5	9.7	15.8	15.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	8.4	8.1	0.0	7.1	5.9	6.2	10.2	10.4	4.0	13.3	13.8
LnGrp Delay(d),s/veh	21.6	23.7	24.1	0.0	32.1	23.8	57.5	29.3	29.3	45.6	42.2	41.7
LnGrp LOS	C	C	C		C	C	E	C	C	D	D	D
Approach Vol, veh/h		925			935			1128			1333	
Approach Delay, s/veh		23.6			29.4			34.5			42.8	
Approach LOS		C			C			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6	7	8
Phs Duration (G+Y+Rc), s	10.2	25.5	14.0	34.0		35.7	16.1	31.9
Change Period (Y+Rc), s	5.0	6.0	4.0	6.0		6.0	4.0	6.0
Max Green Setting (Gmax), s	10.0	20.0	11.0	28.0		35.0	13.0	26.0
Max Q Clear Time (g_c+I1), s	5.6	16.6	9.8	22.1		19.5	12.1	25.4
Green Ext Time (p_c), s	0.1	2.8	0.2	4.0		10.2	0.1	0.4

Intersection Summary	
HCM 2010 Ctrl Delay	33.6
HCM 2010 LOS	C

#13 E. Faris Road at Cleveland Street

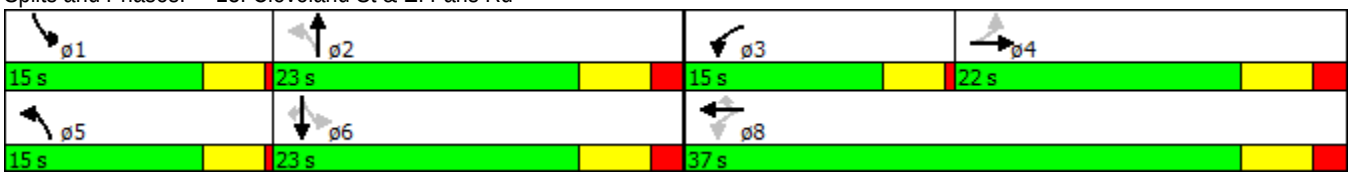
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	64	413	224	40	376	208	187	469	51	135	303	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			2%			4%			-3%	
Storage Length (ft)	225		225	150		0	150		150	225		275
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1734	3285	0	1752	1844	1567	1734	3416	0	1796	1891	1607
Flt Permitted	0.487			0.194			0.306			0.377		
Satd. Flow (perm)	889	3285	0	358	1844	1567	559	3416	0	713	1891	1607
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		127				231		15				160
Link Speed (mph)		35			40			35			35	
Link Distance (ft)		991			1096			893			928	
Travel Time (s)		19.3			18.7			17.4			18.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	71	708	0	44	418	231	208	578	0	150	337	54
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.03	1.03	1.03	1.01	1.01	1.01	1.03	1.03	1.03	0.98	0.98	0.98
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2			6		6
Detector Phase	4	4		3	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		3.0	8.0	8.0	3.0	8.0		3.0	8.0	8.0
Minimum Split (s)	22.0	22.0		15.0	22.0	22.0	15.0	22.0		15.0	22.0	22.0
Total Split (s)	22.0	22.0		15.0	37.0	37.0	15.0	23.0		15.0	23.0	23.0
Total Split (%)	29.3%	29.3%		20.0%	49.3%	49.3%	20.0%	30.7%		20.0%	30.7%	30.7%
Maximum Green (s)	16.0	16.0		11.0	31.0	31.0	11.0	17.0		11.0	17.0	17.0
Yellow Time (s)	4.0	4.0		3.5	4.0	4.0	3.5	4.0		3.5	4.0	4.0
All-Red Time (s)	2.0	2.0		0.5	2.0	2.0	0.5	2.0		0.5	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0		0.0	-2.0	-2.0	0.0	-2.0		0.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lag	Lag		Lead			Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	4.0	4.0		2.0	4.0	4.0	2.0	4.0		2.0	4.0	4.0
Recall Mode	None	None		None	None	None	None	Max		None	Max	Max
Walk Time (s)					5.0	5.0		5.0				
Flash Dont Walk (s)					11.0	11.0		11.0				
Pedestrian Calls (#/hr)					0	0		0				
Act Effct Green (s)	18.6	18.6		24.2	24.2	24.2	30.3	22.9		26.9	19.3	19.3
Actuated g/C Ratio	0.29	0.29		0.37	0.37	0.37	0.47	0.35		0.42	0.30	0.30

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.28	0.68		0.17	0.61	0.32	0.49	0.47		0.35	0.60	0.09
Control Delay	23.5	21.4		14.1	20.4	3.4	15.1	20.4		13.3	27.2	0.3
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	23.5	21.4		14.1	20.4	3.4	15.1	20.4		13.3	27.2	0.3
LOS	C	C		B	C	A	B	C		B	C	A
Approach Delay		21.6			14.3			19.0			20.7	
Approach LOS		C			B			B			C	
Queue Length 50th (ft)	24	115		11	130	0	48	101		34	123	0
Queue Length 95th (ft)	59	182		29	215	36	101	176		74	#238	0
Internal Link Dist (ft)		911			1016			813			848	
Turn Bay Length (ft)	225			150			150			225		275
Base Capacity (vph)	266	1072		374	956	924	472	1218		521	565	592
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.27	0.66		0.12	0.44	0.25	0.44	0.47		0.29	0.60	0.09

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 64.7
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.68
Intersection Signal Delay: 18.9 Intersection LOS: B
Intersection Capacity Utilization 66.1% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 13: Cleveland St & E. Faris Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	64	413	224	40	376	208	187	469	51	135	303	49
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1825	1825	1862	1844	1844	1844	1825	1825	1862	1891	1891	1891
Adj Flow Rate, veh/h	71	459	249	44	418	231	208	521	57	150	337	54
Adj No. of Lanes	1	2	0	1	1	1	1	2	0	1	1	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	278	657	354	219	723	614	429	1047	114	409	572	487
Arrive On Green	0.30	0.30	0.27	0.03	0.39	0.39	0.11	0.33	0.30	0.09	0.30	0.30
Sat Flow, veh/h	764	2179	1174	1756	1844	1568	1739	3155	344	1801	1891	1607
Grp Volume(v), veh/h	71	365	343	44	418	231	208	286	292	150	337	54
Grp Sat Flow(s),veh/h/ln	764	1734	1618	1756	1844	1568	1739	1734	1765	1801	1891	1607
Q Serve(g_s), s	5.1	11.7	11.9	1.1	11.2	6.6	5.2	8.3	8.4	3.7	9.5	1.5
Cycle Q Clear(g_c), s	10.6	11.7	11.9	1.1	11.2	6.6	5.2	8.3	8.4	3.7	9.5	1.5
Prop In Lane	1.00		0.73	1.00		1.00	1.00		0.19	1.00		1.00
Lane Grp Cap(c), veh/h	278	523	488	219	723	614	429	575	586	409	572	487
V/C Ratio(X)	0.26	0.70	0.70	0.20	0.58	0.38	0.48	0.50	0.50	0.37	0.59	0.11
Avail Cap(c_a), veh/h	278	523	488	481	970	824	536	575	586	571	572	487
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.4	19.4	20.1	16.2	15.0	13.6	14.4	16.8	17.0	14.6	18.6	15.8
Incr Delay (d2), s/veh	0.7	4.4	5.0	0.2	1.0	0.5	0.3	3.0	3.0	0.2	4.4	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	6.2	6.0	0.5	5.9	2.9	2.5	4.5	4.6	1.8	5.7	0.7
LnGrp Delay(d),s/veh	22.1	23.8	25.1	16.3	16.0	14.1	14.7	19.8	20.0	14.8	23.0	16.2
LnGrp LOS	C	C	C	B	B	B	B	B	B	B	C	B
Approach Vol, veh/h		779			693			786			541	
Approach Delay, s/veh		24.2			15.4			18.5			20.0	
Approach LOS		C			B			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6		8
Phs Duration (G+Y+Rc), s	9.3	24.8	5.7	22.9	11.2	23.0		28.6
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0		6.0
Max Green Setting (Gmax), s	11.0	17.0	11.0	16.0	11.0	17.0		31.0
Max Q Clear Time (g_c+I1), s	5.7	10.4	3.1	13.9	7.2	11.5		13.2
Green Ext Time (p_c), s	0.1	3.8	0.0	1.7	0.1	3.2		9.4

Intersection Summary	
HCM 2010 Ctrl Delay	19.6
HCM 2010 LOS	B

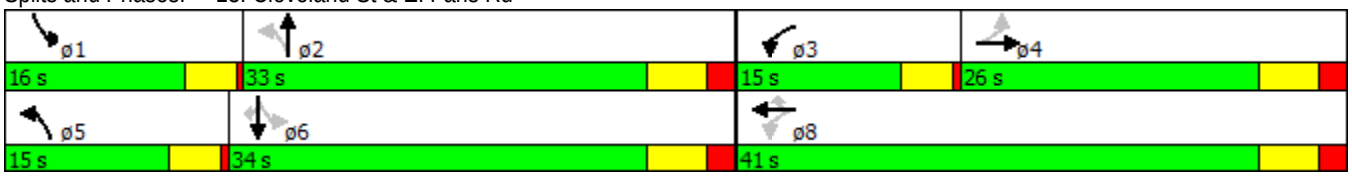
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	59	601	158	85	515	302	244	391	66	208	506	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			2%			4%			-3%	
Storage Length (ft)	225		225	150		0	150		150	225		275
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1734	3361	0	1752	1844	1567	1734	3392	0	1796	1891	1607
Flt Permitted	0.255			0.154			0.137			0.386		
Satd. Flow (perm)	466	3361	0	284	1844	1567	250	3392	0	730	1891	1607
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		35				336		22				133
Link Speed (mph)		35			40			35			35	
Link Distance (ft)		991			1096			893			975	
Travel Time (s)		19.3			18.7			17.4			19.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	66	844	0	94	572	336	271	507	0	231	562	119
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.03	1.03	1.03	1.01	1.01	1.01	1.03	1.03	1.03	0.98	0.98	0.98
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2			6		6
Detector Phase	4	4		3	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		3.0	8.0	8.0	3.0	8.0		3.0	8.0	8.0
Minimum Split (s)	22.0	22.0		15.0	22.0	22.0	15.0	22.0		15.0	22.0	22.0
Total Split (s)	26.0	26.0		15.0	41.0	41.0	15.0	33.0		16.0	34.0	34.0
Total Split (%)	28.9%	28.9%		16.7%	45.6%	45.6%	16.7%	36.7%		17.8%	37.8%	37.8%
Maximum Green (s)	20.0	20.0		11.0	35.0	35.0	11.0	27.0		12.0	28.0	28.0
Yellow Time (s)	4.0	4.0		3.5	4.0	4.0	3.5	4.0		3.5	4.0	4.0
All-Red Time (s)	2.0	2.0		0.5	2.0	2.0	0.5	2.0		0.5	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0		0.0	-2.0	-2.0	0.0	-2.0		0.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lag	Lag		Lead			Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	4.0	4.0		2.0	4.0	4.0	2.0	4.0		2.0	4.0	4.0
Recall Mode	None	None		None	None	None	None	Max		None	Max	Max
Walk Time (s)					5.0	5.0		5.0				
Flash Dont Walk (s)					11.0	11.0		11.0				
Pedestrian Calls (#/hr)					0	0		0				
Act Effct Green (s)	23.9	23.9		33.4	33.4	33.4	42.0	31.0		40.1	30.1	30.1
Actuated g/C Ratio	0.28	0.28		0.39	0.39	0.39	0.49	0.36		0.46	0.35	0.35

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.52	0.88		0.40	0.80	0.41	0.88	0.41		0.50	0.86	0.18
Control Delay	45.4	42.3		21.9	33.4	3.7	50.0	22.5		16.5	41.9	4.0
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	45.4	42.3		21.9	33.4	3.7	50.0	22.5		16.5	41.9	4.0
LOS	D	D		C	C	A	D	C		B	D	A
Approach Delay		42.6			22.4			32.0			30.6	
Approach LOS		D			C			C			C	
Queue Length 50th (ft)	31	230		33	271	0	101	112		72	300	0
Queue Length 95th (ft)	#92	#367		64	403	49	#253	160		118	#493	30
Internal Link Dist (ft)		911			1016			813			895	
Turn Bay Length (ft)	225			150			150			225		275
Base Capacity (vph)	128	954		297	791	864	310	1230		503	657	645
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.52	0.88		0.32	0.72	0.39	0.87	0.41		0.46	0.86	0.18

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 86.5
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 31.6 Intersection LOS: C
Intersection Capacity Utilization 87.3% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 13: Cleveland St & E. Faris Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	59	601	158	85	515	302	244	391	66	208	506	107
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1825	1825	1862	1844	1844	1844	1825	1825	1862	1891	1891	1891
Adj Flow Rate, veh/h	66	668	176	94	572	336	271	434	73	231	562	119
Adj No. of Lanes	1	2	0	1	1	1	1	2	0	1	1	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	149	771	203	197	710	604	339	1093	183	489	662	563
Arrive On Green	0.28	0.28	0.26	0.05	0.39	0.39	0.12	0.37	0.34	0.11	0.35	0.35
Sat Flow, veh/h	600	2718	716	1756	1844	1568	1739	2975	497	1801	1891	1607
Grp Volume(v), veh/h	66	426	418	94	572	336	271	252	255	231	562	119
Grp Sat Flow(s),veh/h/ln	600	1734	1699	1756	1844	1568	1739	1734	1738	1801	1891	1607
Q Serve(g_s), s	9.3	20.0	20.1	3.2	23.7	14.4	8.7	9.2	9.4	7.1	23.5	4.5
Cycle Q Clear(g_c), s	24.3	20.0	20.1	3.2	23.7	14.4	8.7	9.2	9.4	7.1	23.5	4.5
Prop In Lane	1.00		0.42	1.00		1.00	1.00		0.29	1.00		1.00
Lane Grp Cap(c), veh/h	149	492	482	197	710	604	339	637	639	489	662	563
V/C Ratio(X)	0.44	0.87	0.87	0.48	0.81	0.56	0.80	0.40	0.40	0.47	0.85	0.21
Avail Cap(c_a), veh/h	149	492	482	326	796	677	346	637	639	548	662	563
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.2	29.1	29.6	23.1	23.5	20.6	19.5	20.1	20.3	16.2	25.7	19.5
Incr Delay (d2), s/veh	2.9	15.3	15.7	0.7	6.0	1.1	11.3	1.8	1.9	0.3	12.8	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	11.7	11.5	1.6	13.1	6.4	5.1	4.7	4.8	3.5	14.5	2.1
LnGrp Delay(d),s/veh	41.2	44.5	45.3	23.7	29.5	21.8	30.8	21.9	22.2	16.5	38.6	20.4
LnGrp LOS	D	D	D	C	C	C	C	C	C	B	D	C
Approach Vol, veh/h		910			1002			778			912	
Approach Delay, s/veh		44.6			26.3			25.1			30.6	
Approach LOS		D			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6		8
Phs Duration (G+Y+Rc), s	13.2	35.5	8.7	28.3	14.7	34.0		37.0
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0		6.0
Max Green Setting (Gmax), s	12.0	27.0	11.0	20.0	11.0	28.0		35.0
Max Q Clear Time (g_c+I1), s	9.1	11.4	5.2	26.3	10.7	25.5		25.7
Green Ext Time (p_c), s	0.1	8.4	0.0	0.0	0.0	1.8		5.3

Intersection Summary	
HCM 2010 Ctrl Delay	31.8
HCM 2010 LOS	C

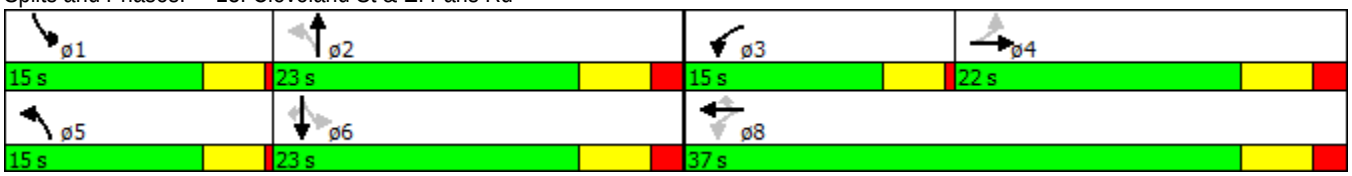
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	64	413	224	40	376	208	187	469	51	135	303	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			2%			4%			-3%	
Storage Length (ft)	225		225	150		0	150		150	225		275
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1734	3285	0	1752	1844	1567	1734	3416	0	1796	1891	1607
Flt Permitted	0.487			0.194			0.306			0.377		
Satd. Flow (perm)	889	3285	0	358	1844	1567	559	3416	0	713	1891	1607
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)		127										160
Link Speed (mph)		35			40			35			35	
Link Distance (ft)		991			1096			893			928	
Travel Time (s)		19.3			18.7			17.4			18.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	71	708	0	44	418	231	208	578	0	150	337	54
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.03	1.03	1.03	1.01	1.01	1.01	1.03	1.03	1.03	0.98	0.98	0.98
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2			6		6
Detector Phase	4	4		3	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		3.0	8.0	8.0	3.0	8.0		3.0	8.0	8.0
Minimum Split (s)	22.0	22.0		15.0	22.0	22.0	15.0	22.0		15.0	22.0	22.0
Total Split (s)	22.0	22.0		15.0	37.0	37.0	15.0	23.0		15.0	23.0	23.0
Total Split (%)	29.3%	29.3%		20.0%	49.3%	49.3%	20.0%	30.7%		20.0%	30.7%	30.7%
Maximum Green (s)	16.0	16.0		11.0	31.0	31.0	11.0	17.0		11.0	17.0	17.0
Yellow Time (s)	4.0	4.0		3.5	4.0	4.0	3.5	4.0		3.5	4.0	4.0
All-Red Time (s)	2.0	2.0		0.5	2.0	2.0	0.5	2.0		0.5	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0		0.0	-2.0	-2.0	0.0	-2.0		0.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lag	Lag		Lead			Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	4.0	4.0		2.0	4.0	4.0	2.0	4.0		2.0	4.0	4.0
Recall Mode	None	None		None	None	None	None	Max		None	Max	Max
Walk Time (s)					5.0	5.0		5.0				
Flash Dont Walk (s)					11.0	11.0		11.0				
Pedestrian Calls (#/hr)					0	0		0				
Act Effct Green (s)	18.6	18.6		24.2	24.2	24.2	30.3	22.9		26.9	19.3	19.3
Actuated g/C Ratio	0.29	0.29		0.37	0.37	0.37	0.47	0.35		0.42	0.30	0.30

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.28	0.68		0.17	0.61	0.39	0.49	0.48		0.35	0.60	0.09
Control Delay	23.5	21.4		14.1	20.4	16.8	15.1	21.0		13.3	27.2	0.3
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	23.5	21.4		14.1	20.4	16.8	15.1	21.0		13.3	27.2	0.3
LOS	C	C		B	C	B	B	C		B	C	A
Approach Delay		21.6			18.8			19.5			20.7	
Approach LOS		C			B			B			C	
Queue Length 50th (ft)	24	115		11	130	65	48	104		34	123	0
Queue Length 95th (ft)	59	182		29	215	119	101	181		74	#238	0
Internal Link Dist (ft)		911			1016			813			848	
Turn Bay Length (ft)	225			150			150			225		275
Base Capacity (vph)	266	1072		374	956	813	472	1208		521	565	592
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.27	0.66		0.12	0.44	0.28	0.44	0.48		0.29	0.60	0.09

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 64.7
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.68
Intersection Signal Delay: 20.1 Intersection LOS: C
Intersection Capacity Utilization 66.1% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 13: Cleveland St & E. Faris Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	64	413	224	40	376	208	187	469	51	135	303	49
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1825	1825	1862	1844	1844	1844	1825	1825	1862	1891	1891	1891
Adj Flow Rate, veh/h	71	459	249	44	418	231	208	521	57	150	337	54
Adj No. of Lanes	1	2	0	1	1	1	1	2	0	1	1	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	278	657	354	219	723	614	429	1047	114	409	572	487
Arrive On Green	0.30	0.30	0.27	0.03	0.39	0.39	0.11	0.33	0.30	0.09	0.30	0.30
Sat Flow, veh/h	764	2179	1174	1756	1844	1568	1739	3155	344	1801	1891	1607
Grp Volume(v), veh/h	71	365	343	44	418	231	208	286	292	150	337	54
Grp Sat Flow(s),veh/h/ln	764	1734	1618	1756	1844	1568	1739	1734	1765	1801	1891	1607
Q Serve(g_s), s	5.1	11.7	11.9	1.1	11.2	6.6	5.2	8.3	8.4	3.7	9.5	1.5
Cycle Q Clear(g_c), s	10.6	11.7	11.9	1.1	11.2	6.6	5.2	8.3	8.4	3.7	9.5	1.5
Prop In Lane	1.00		0.73	1.00		1.00	1.00		0.19	1.00		1.00
Lane Grp Cap(c), veh/h	278	523	488	219	723	614	429	575	586	409	572	487
V/C Ratio(X)	0.26	0.70	0.70	0.20	0.58	0.38	0.48	0.50	0.50	0.37	0.59	0.11
Avail Cap(c_a), veh/h	278	523	488	481	970	824	536	575	586	571	572	487
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.4	19.4	20.1	16.2	15.0	13.6	14.4	16.8	17.0	14.6	18.6	15.8
Incr Delay (d2), s/veh	0.7	4.4	5.0	0.2	1.0	0.5	0.3	3.0	3.0	0.2	4.4	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	6.2	6.0	0.5	5.9	2.9	2.5	4.5	4.6	1.8	5.7	0.7
LnGrp Delay(d),s/veh	22.1	23.8	25.1	16.3	16.0	14.1	14.7	19.8	20.0	14.8	23.0	16.2
LnGrp LOS	C	C	C	B	B	B	B	B	B	B	C	B
Approach Vol, veh/h		779			693			786			541	
Approach Delay, s/veh		24.2			15.4			18.5			20.0	
Approach LOS		C			B			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6		8
Phs Duration (G+Y+Rc), s	9.3	24.8	5.7	22.9	11.2	23.0		28.6
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0		6.0
Max Green Setting (Gmax), s	11.0	17.0	11.0	16.0	11.0	17.0		31.0
Max Q Clear Time (g_c+I1), s	5.7	10.4	3.1	13.9	7.2	11.5		13.2
Green Ext Time (p_c), s	0.1	3.8	0.0	1.7	0.1	3.2		9.4

Intersection Summary	
HCM 2010 Ctrl Delay	19.6
HCM 2010 LOS	B

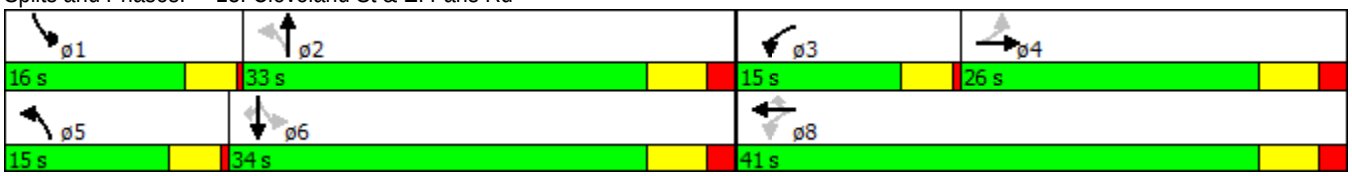
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	59	601	158	85	515	302	244	391	66	208	506	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			2%			4%			-3%	
Storage Length (ft)	225		225	150		0	150		150	225		275
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1734	3361	0	1752	1844	1567	1734	3392	0	1796	1891	1607
Flt Permitted	0.255			0.154			0.137			0.386		
Satd. Flow (perm)	466	3361	0	284	1844	1567	250	3392	0	730	1891	1607
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)		35										133
Link Speed (mph)		35			40			35			35	
Link Distance (ft)		991			1096			893			975	
Travel Time (s)		19.3			18.7			17.4			19.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	66	844	0	94	572	336	271	507	0	231	562	119
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.03	1.03	1.03	1.01	1.01	1.01	1.03	1.03	1.03	0.98	0.98	0.98
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2			6		6
Detector Phase	4	4		3	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		3.0	8.0	8.0	3.0	8.0		3.0	8.0	8.0
Minimum Split (s)	22.0	22.0		15.0	22.0	22.0	15.0	22.0		15.0	22.0	22.0
Total Split (s)	26.0	26.0		15.0	41.0	41.0	15.0	33.0		16.0	34.0	34.0
Total Split (%)	28.9%	28.9%		16.7%	45.6%	45.6%	16.7%	36.7%		17.8%	37.8%	37.8%
Maximum Green (s)	20.0	20.0		11.0	35.0	35.0	11.0	27.0		12.0	28.0	28.0
Yellow Time (s)	4.0	4.0		3.5	4.0	4.0	3.5	4.0		3.5	4.0	4.0
All-Red Time (s)	2.0	2.0		0.5	2.0	2.0	0.5	2.0		0.5	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0		0.0	-2.0	-2.0	0.0	-2.0		0.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lag	Lag		Lead			Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	4.0	4.0		2.0	4.0	4.0	2.0	4.0		2.0	4.0	4.0
Recall Mode	None	None		None	None	None	None	Max		None	Max	Max
Walk Time (s)					5.0	5.0		5.0				
Flash Dont Walk (s)					11.0	11.0		11.0				
Pedestrian Calls (#/hr)					0	0		0				
Act Effct Green (s)	23.9	23.9		33.4	33.4	33.4	42.0	31.0		40.1	30.1	30.1
Actuated g/C Ratio	0.28	0.28		0.39	0.39	0.39	0.49	0.36		0.46	0.35	0.35

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.52	0.88		0.40	0.80	0.56	0.88	0.42		0.50	0.86	0.18
Control Delay	45.4	42.3		21.9	33.4	24.6	50.0	23.6		16.5	41.9	4.0
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	45.4	42.3		21.9	33.4	24.6	50.0	23.6		16.5	41.9	4.0
LOS	D	D		C	C	C	D	C		B	D	A
Approach Delay		42.6			29.4			32.8			30.6	
Approach LOS		D			C			C			C	
Queue Length 50th (ft)	31	230		33	271	140	101	117		72	300	0
Queue Length 95th (ft)	#92	#367		64	403	222	#253	166		118	#493	30
Internal Link Dist (ft)		911			1016			813			895	
Turn Bay Length (ft)	225			150			150			225		275
Base Capacity (vph)	128	954		297	791	672	310	1216		503	657	645
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.52	0.88		0.32	0.72	0.50	0.87	0.42		0.46	0.86	0.18

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 86.5
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 33.7 Intersection LOS: C
Intersection Capacity Utilization 87.3% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 13: Cleveland St & E. Faris Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	59	601	158	85	515	302	244	391	66	208	506	107
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1825	1825	1862	1844	1844	1844	1825	1825	1862	1891	1891	1891
Adj Flow Rate, veh/h	66	668	176	94	572	336	271	434	73	231	562	119
Adj No. of Lanes	1	2	0	1	1	1	1	2	0	1	1	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	149	771	203	197	710	604	339	1093	183	489	662	563
Arrive On Green	0.28	0.28	0.26	0.05	0.39	0.39	0.12	0.37	0.34	0.11	0.35	0.35
Sat Flow, veh/h	600	2718	716	1756	1844	1568	1739	2975	497	1801	1891	1607
Grp Volume(v), veh/h	66	426	418	94	572	336	271	252	255	231	562	119
Grp Sat Flow(s),veh/h/ln	600	1734	1699	1756	1844	1568	1739	1734	1738	1801	1891	1607
Q Serve(g_s), s	9.3	20.0	20.1	3.2	23.7	14.4	8.7	9.2	9.4	7.1	23.5	4.5
Cycle Q Clear(g_c), s	24.3	20.0	20.1	3.2	23.7	14.4	8.7	9.2	9.4	7.1	23.5	4.5
Prop In Lane	1.00		0.42	1.00		1.00	1.00		0.29	1.00		1.00
Lane Grp Cap(c), veh/h	149	492	482	197	710	604	339	637	639	489	662	563
V/C Ratio(X)	0.44	0.87	0.87	0.48	0.81	0.56	0.80	0.40	0.40	0.47	0.85	0.21
Avail Cap(c_a), veh/h	149	492	482	326	796	677	346	637	639	548	662	563
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.2	29.1	29.6	23.1	23.5	20.6	19.5	20.1	20.3	16.2	25.7	19.5
Incr Delay (d2), s/veh	2.9	15.3	15.7	0.7	6.0	1.1	11.3	1.8	1.9	0.3	12.8	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	11.7	11.5	1.6	13.1	6.4	5.1	4.7	4.8	3.5	14.5	2.1
LnGrp Delay(d),s/veh	41.2	44.5	45.3	23.7	29.5	21.8	30.8	21.9	22.2	16.5	38.6	20.4
LnGrp LOS	D	D	D	C	C	C	C	C	C	B	D	C
Approach Vol, veh/h		910			1002			778			912	
Approach Delay, s/veh		44.6			26.3			25.1			30.6	
Approach LOS		D			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6		8
Phs Duration (G+Y+Rc), s	13.2	35.5	8.7	28.3	14.7	34.0		37.0
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0		6.0
Max Green Setting (Gmax), s	12.0	27.0	11.0	20.0	11.0	28.0		35.0
Max Q Clear Time (g_c+I1), s	9.1	11.4	5.2	26.3	10.7	25.5		25.7
Green Ext Time (p_c), s	0.1	8.4	0.0	0.0	0.0	1.8		5.3

Intersection Summary	
HCM 2010 Ctrl Delay	31.8
HCM 2010 LOS	C

#14 Laurens Road at Woodruff Road

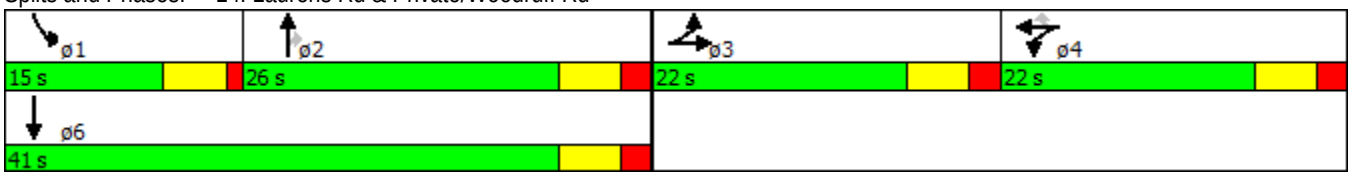
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	2	8	183	8	198	0	1539	359	158	1021	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			2%			-3%			3%	
Storage Length (ft)	75		50	200		0	0		175	250		250
Storage Lanes	1		0	1		1	0		1	2		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1770	1634	0	1664	1675	1567	0	5162	1607	3382	4994	0
Flt Permitted	0.950			0.950	0.956					0.950		
Satd. Flow (perm)	1770	1634	0	1664	1675	1567	0	5162	1607	3382	4994	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9				220			291		4	
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		276			1203			1157			960	
Travel Time (s)		4.2			18.2			22.5			18.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)				48%								
Lane Group Flow (vph)	3	11	0	106	106	220	0	1710	399	176	1154	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.01	1.01	1.01	0.98	0.98	0.98	1.02	1.02	1.02
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Split	NA		Split	NA	Perm		NA	Perm	Prot	NA	
Protected Phases	3	3		4	4			2		1	6	
Permitted Phases						4			2			
Detector Phase	3	3		4	4	4		2	2	1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		3.0	3.0	3.0		10.0	10.0	3.0	10.0	
Minimum Split (s)	22.0	22.0		22.0	22.0	22.0		22.0	22.0	15.0	22.0	
Total Split (s)	22.0	22.0		22.0	22.0	22.0		26.0	26.0	15.0	41.0	
Total Split (%)	25.9%	25.9%		25.9%	25.9%	25.9%		30.6%	30.6%	17.6%	48.2%	
Maximum Green (s)	16.0	16.0		16.0	16.0	16.0		20.0	20.0	10.0	35.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0		2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0		-2.0	-2.0	-1.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lead		Lag	Lag	Lag		Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes		Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		2.0	2.0	2.0		5.0	5.0	2.0	5.0	
Recall Mode	None	None		None	None	None		Max	Max	None	Max	
Walk Time (s)				5.0	5.0	5.0		5.0	5.0			
Flash Dont Walk (s)				11.0	11.0	11.0		11.0	11.0			
Pedestrian Calls (#/hr)				0	0	0		0	0			
Act Effct Green (s)	7.9	7.9		10.3	10.3	10.3		25.2	25.2	8.4	37.6	
Actuated g/C Ratio	0.14	0.14		0.18	0.18	0.18		0.43	0.43	0.14	0.65	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.01	0.05		0.36	0.36	0.48		0.76	0.46	0.36	0.36	
Control Delay	25.7	17.3		25.5	25.4	7.8		19.8	6.8	25.8	6.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	25.7	17.3		25.5	25.4	7.8		19.8	6.8	25.8	6.2	
LOS	C	B		C	C	A		B	A	C	A	
Approach Delay		19.1			16.5			17.3			8.8	
Approach LOS		B			B			B			A	
Queue Length 50th (ft)	1	1		32	32	0		156	19	26	45	
Queue Length 95th (ft)	9	15		87	87	52		#421	115	65	148	
Internal Link Dist (ft)		196			1123			1077			880	
Turn Bay Length (ft)	75			200					175	250		
Base Capacity (vph)	557	521		524	527	644		2238	861	651	3236	
Starvation Cap Reductn	0	0		0	0	0		0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	
Reduced v/c Ratio	0.01	0.02		0.20	0.20	0.34		0.76	0.46	0.27	0.36	

Intersection Summary

Area Type: Other
Cycle Length: 85
Actuated Cycle Length: 58
Natural Cycle: 85
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 14.3 Intersection LOS: B
Intersection Capacity Utilization 56.2% ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 14: Laurens Rd & Private/Woodruff Rd



HCM 2010 analysis expects strict NEMA phasing.

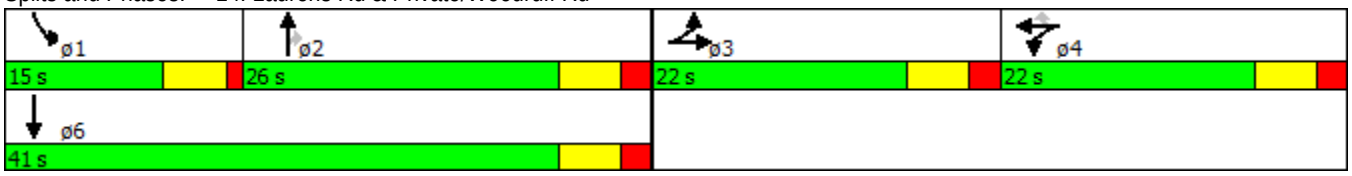
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	17	17	9	299	8	268	0	1521	237	228	1486	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			2%			-3%			3%	
Storage Length (ft)	75		50	200		0	0		175	250		250
Storage Lanes	1		0	1		1	0		1	2		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1770	1766	0	1664	1673	1567	0	5162	1607	3382	4999	0
Flt Permitted	0.950			0.950	0.955					0.950		
Satd. Flow (perm)	1770	1766	0	1664	1673	1567	0	5162	1607	3382	4999	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10				298			194		3	
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		276			1203			1157			960	
Travel Time (s)		4.2			18.2			22.5			18.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)				49%								
Lane Group Flow (vph)	19	29	0	169	172	298	0	1690	263	253	1674	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.01	1.01	1.01	0.98	0.98	0.98	1.02	1.02	1.02
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Split	NA		Split	NA	Perm		NA	Perm	Prot	NA	
Protected Phases	3	3		4	4			2		1	6	
Permitted Phases						4			2			
Detector Phase	3	3		4	4	4		2	2	1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		3.0	3.0	3.0		10.0	10.0	3.0	10.0	
Minimum Split (s)	22.0	22.0		22.0	22.0	22.0		22.0	22.0	15.0	22.0	
Total Split (s)	22.0	22.0		22.0	22.0	22.0		26.0	26.0	15.0	41.0	
Total Split (%)	25.9%	25.9%		25.9%	25.9%	25.9%		30.6%	30.6%	17.6%	48.2%	
Maximum Green (s)	16.0	16.0		16.0	16.0	16.0		20.0	20.0	10.0	35.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0		2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0		-2.0	-2.0	-1.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lead		Lag	Lag	Lag		Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes		Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		2.0	2.0	2.0		5.0	5.0	2.0	5.0	
Recall Mode	None	None		None	None	None		Max	Max	None	Max	
Walk Time (s)				5.0	5.0	5.0		5.0	5.0			
Flash Dont Walk (s)				11.0	11.0	11.0		11.0	11.0			
Pedestrian Calls (#/hr)				0	0	0		0	0			
Act Effct Green (s)	8.6	8.6		13.2	13.2	13.2		24.1	24.1	9.7	37.9	
Actuated g/C Ratio	0.13	0.13		0.20	0.20	0.20		0.36	0.36	0.15	0.57	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.08	0.12		0.51	0.52	0.54		0.90	0.37	0.51	0.59	
Control Delay	30.1	24.0		30.8	30.9	7.5		32.4	8.3	31.9	12.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	30.1	24.0		30.8	30.9	7.5		32.4	8.3	31.9	12.2	
LOS	C	C		C	C	A		C	A	C	B	
Approach Delay		26.4			19.9			29.1			14.8	
Approach LOS		C			B			C			B	
Queue Length 50th (ft)	8	8		70	71	0		~296	21	53	176	
Queue Length 95th (ft)	27	31		133	134	59		#447	84	94	271	
Internal Link Dist (ft)		196			1123			1077			880	
Turn Bay Length (ft)	75			200					175	250		
Base Capacity (vph)	491	498		462	464	650		1875	707	574	2857	
Starvation Cap Reductn	0	0		0	0	0		0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	
Reduced v/c Ratio	0.04	0.06		0.37	0.37	0.46		0.90	0.37	0.44	0.59	

Intersection Summary

Area Type: Other
Cycle Length: 85
Actuated Cycle Length: 66.3
Natural Cycle: 85
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 21.8 Intersection LOS: C
Intersection Capacity Utilization 61.1% ICU Level of Service B
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 14: Laurens Rd & Private/Woodruff Rd



HCM 2010 analysis expects strict NEMA phasing.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Volume (vph)	3	2	8	183	8	198	0	1539	359	4	158	1021
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			2%			-3%				3%
Storage Length (ft)	75		50	200		0	0		175		250	
Storage Lanes	1		0	1		1	0		1		2	
Taper Length (ft)	100			100			100				100	
Satd. Flow (prot)	1770	1634	0	1664	1675	1567	0	5162	1607	1743	1743	4994
Flt Permitted	0.950			0.950	0.956					0.950	0.950	
Satd. Flow (perm)	1770	1634	0	1664	1675	1567	0	5162	1607	1743	1743	4994
Right Turn on Red			Yes			Yes			Yes			
Satd. Flow (RTOR)		9				220			291			4
Link Speed (mph)		45			45			35				35
Link Distance (ft)		276			1203			1157				960
Travel Time (s)		4.2			18.2			22.5				18.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)				48%								
Lane Group Flow (vph)	3	11	0	106	106	220	0	1710	399	4	176	1154
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	R NA	Left	Left
Median Width(ft)		12			12			24				24
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane								Yes				Yes
Headway Factor	1.00	1.00	1.00	1.01	1.01	1.01	0.98	0.98	0.98	1.02	1.02	1.02
Turning Speed (mph)	15		9	15		9	15		9	9	15	
Turn Type	Split	NA		Split	NA	Perm		NA	Perm	Prot	Prot	NA
Protected Phases	3	3		4	4			2		1	1	6
Permitted Phases						4			2			
Detector Phase	3	3		4	4	4		2	2	1	1	6
Switch Phase												
Minimum Initial (s)	4.0	4.0		3.0	3.0	3.0		10.0	10.0	3.0	3.0	10.0
Minimum Split (s)	22.0	22.0		22.0	22.0	22.0		22.0	22.0	15.0	15.0	22.0
Total Split (s)	22.0	22.0		22.0	22.0	22.0		26.0	26.0	15.0	15.0	41.0
Total Split (%)	25.9%	25.9%		25.9%	25.9%	25.9%		30.6%	30.6%	17.6%	17.6%	48.2%
Maximum Green (s)	16.0	16.0		16.0	16.0	16.0		20.0	20.0	10.0	10.0	35.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0		2.0	2.0	1.0	1.0	2.0
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0		-2.0	-2.0	-1.0	-1.0	-2.0
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lead		Lag	Lag	Lag		Lag	Lag	Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes		Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0		2.0	2.0	2.0		5.0	5.0	2.0	2.0	5.0
Recall Mode	None	None		None	None	None		Max	Max	None	None	Max
Walk Time (s)				5.0	5.0	5.0		5.0	5.0			
Flash Dont Walk (s)				11.0	11.0	11.0		11.0	11.0			
Pedestrian Calls (#/hr)				0	0	0		0	0			
Act Effct Green (s)	7.9	7.9		10.3	10.3	10.3		23.1	23.1	10.4	10.4	37.6
Actuated g/C Ratio	0.14	0.14		0.18	0.18	0.18		0.40	0.40	0.18	0.18	0.65

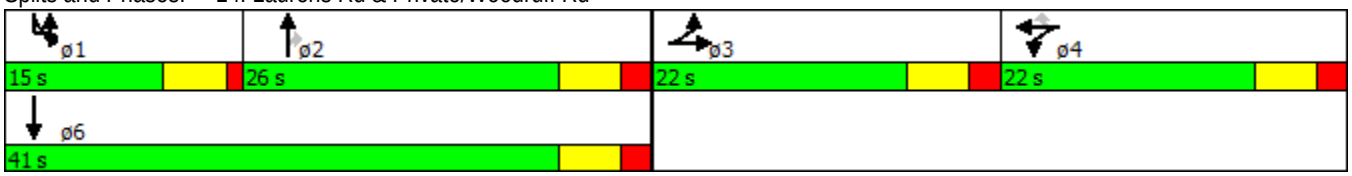
Lane Group	SBR
Lane Configurations	
Volume (vph)	18
Ideal Flow (vphpl)	1900
Grade (%)	
Storage Length (ft)	250
Storage Lanes	1
Taper Length (ft)	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	Yes
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.02
Turning Speed (mph)	9
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Walk Time (s)	
Flash Dont Walk (s)	
Pedestrian Calls (#/hr)	
Act Effct Green (s)	
Actuated g/C Ratio	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
v/c Ratio	0.01	0.05		0.36	0.36	0.48		0.83	0.49	0.01	0.56	0.36
Control Delay	25.7	17.3		25.5	25.4	7.8		22.8	7.3	23.2	32.1	6.2
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	25.7	17.3		25.5	25.4	7.8		22.8	7.3	23.2	32.1	6.2
LOS	C	B		C	C	A		C	A	C	C	A
Approach Delay		19.1			16.5			19.9				9.7
Approach LOS		B			B			B				A
Queue Length 50th (ft)	1	1		32	32	0		174	22	1	51	45
Queue Length 95th (ft)	9	15		87	87	52		#421	115	10	#160	148
Internal Link Dist (ft)		196			1123			1077				880
Turn Bay Length (ft)	75			200					175	250	250	
Base Capacity (vph)	557	521		524	527	644		2057	815	335	335	3236
Starvation Cap Reductn	0	0		0	0	0		0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	0
Reduced v/c Ratio	0.01	0.02		0.20	0.20	0.34		0.83	0.49	0.01	0.53	0.36

Intersection Summary

Area Type: Other
Cycle Length: 85
Actuated Cycle Length: 58
Natural Cycle: 85
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 16.0 Intersection LOS: B
Intersection Capacity Utilization 62.0% ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 14: Laurens Rd & Private/Woodruff Rd



Lane Group	SBR
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

HCM 2010 analysis expects strict NEMA phasing.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Volume (vph)	17	17	9	299	8	268	0	1521	237	4	228	1486
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			2%			-3%				3%
Storage Length (ft)	75		50	200		0	0		175		250	
Storage Lanes	1		0	1		1	0		1		2	
Taper Length (ft)	100			100			100				100	
Satd. Flow (prot)	1770	1766	0	1664	1673	1567	0	5162	1607	1743	1743	4999
Flt Permitted	0.950			0.950	0.955					0.950	0.950	
Satd. Flow (perm)	1770	1766	0	1664	1673	1567	0	5162	1607	1743	1743	4999
Right Turn on Red			Yes			Yes			Yes			
Satd. Flow (RTOR)		10				298			188			3
Link Speed (mph)		45			45			35				35
Link Distance (ft)		276			1203			1157				960
Travel Time (s)		4.2			18.2			22.5				18.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)				49%								
Lane Group Flow (vph)	19	29	0	169	172	298	0	1690	263	4	253	1674
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	R NA	Left	Left
Median Width(ft)		12			12			24				24
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane								Yes				Yes
Headway Factor	1.00	1.00	1.00	1.01	1.01	1.01	0.98	0.98	0.98	1.02	1.02	1.02
Turning Speed (mph)	15		9	15		9	15		9	9	15	
Turn Type	Split	NA		Split	NA	Perm		NA	Perm	Prot	Prot	NA
Protected Phases	3	3		4	4			2		1	1	6
Permitted Phases						4			2			
Detector Phase	3	3		4	4	4		2	2	1	1	6
Switch Phase												
Minimum Initial (s)	4.0	4.0		3.0	3.0	3.0		10.0	10.0	3.0	3.0	10.0
Minimum Split (s)	22.0	22.0		22.0	22.0	22.0		22.0	22.0	15.0	15.0	22.0
Total Split (s)	22.0	22.0		22.0	22.0	22.0		34.0	34.0	17.0	17.0	51.0
Total Split (%)	23.2%	23.2%		23.2%	23.2%	23.2%		35.8%	35.8%	17.9%	17.9%	53.7%
Maximum Green (s)	16.0	16.0		16.0	16.0	16.0		28.0	28.0	12.0	12.0	45.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0		2.0	2.0	1.0	1.0	2.0
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0		-2.0	-2.0	-1.0	-1.0	-2.0
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lead		Lag	Lag	Lag		Lag	Lag	Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes		Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0		2.0	2.0	2.0		5.0	5.0	2.0	2.0	5.0
Recall Mode	None	None		None	None	None		Max	Max	None	None	Max
Walk Time (s)				5.0	5.0	5.0		5.0	5.0			
Flash Dont Walk (s)				11.0	11.0	11.0		11.0	11.0			
Pedestrian Calls (#/hr)				0	0	0		0	0			
Act Effct Green (s)	8.6	8.6		14.0	14.0	14.0		30.5	30.5	13.2	13.2	47.8
Actuated g/C Ratio	0.11	0.11		0.18	0.18	0.18		0.40	0.40	0.17	0.17	0.62

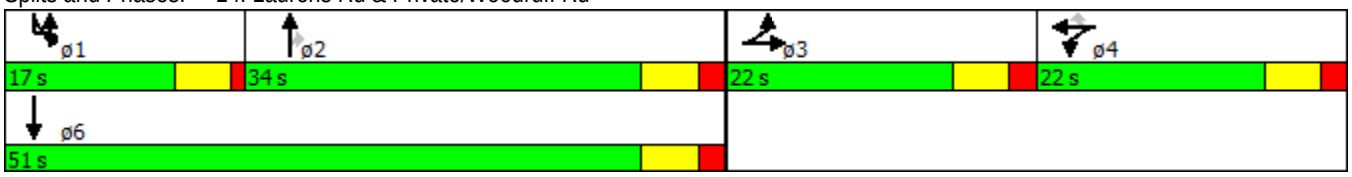
Lane Group	SBR
Lane Configurations	
Volume (vph)	21
Ideal Flow (vphpl)	1900
Grade (%)	
Storage Length (ft)	250
Storage Lanes	1
Taper Length (ft)	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	Yes
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.02
Turning Speed (mph)	9
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Walk Time (s)	
Flash Dont Walk (s)	
Pedestrian Calls (#/hr)	
Act Effct Green (s)	
Actuated g/C Ratio	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
v/c Ratio	0.10	0.14		0.56	0.57	0.56		0.83	0.35	0.01	0.85	0.54
Control Delay	35.5	27.9		37.6	37.8	8.5		27.6	8.0	31.5	61.0	11.0
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	35.5	27.9		37.6	37.8	8.5		27.6	8.0	31.5	61.0	11.0
LOS	D	C		D	D	A		C	A	C	E	B
Approach Delay		30.9			24.1			25.0				17.6
Approach LOS		C			C			C				B
Queue Length 50th (ft)	9	9		84	86	0		294	25	2	130	185
Queue Length 95th (ft)	30	34		152	154	65		#435	85	11	#289	267
Internal Link Dist (ft)		196			1123			1077				880
Turn Bay Length (ft)	75			200					175	250	250	
Base Capacity (vph)	419	426		394	396	598		2040	749	298	298	3097
Starvation Cap Reductn	0	0		0	0	0		0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	0
Reduced v/c Ratio	0.05	0.07		0.43	0.43	0.50		0.83	0.35	0.01	0.85	0.54

Intersection Summary

Area Type: Other
Cycle Length: 95
Actuated Cycle Length: 77.2
Natural Cycle: 95
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 21.8 Intersection LOS: C
Intersection Capacity Utilization 67.2% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 14: Laurens Rd & Private/Woodruff Rd



Lane Group	SBR
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

HCM 2010 analysis expects strict NEMA phasing.

#15 Academy Street at College Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	344	379	8	159	892	0	0	1028	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			2%			1%			-1%	
Storage Length (ft)	0		0	0		150	125		0	0		0
Storage Lanes	0		0	1		0	1		0	0		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	0	0	0	1507	4677	0	1761	5060	0	0	3557	1591
Flt Permitted				0.950	0.985		0.200					
Satd. Flow (perm)	0	0	0	1507	4677	0	371	5060	0	0	3557	1591
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					3							149
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		606			489			460			309	
Travel Time (s)		11.8			9.5			7.8			5.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)				48%								
Lane Group Flow (vph)	0	0	0	199	613	0	177	991	0	0	1142	149
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			18	
Link Offset(ft)		36			-24			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.01	1.01	1.01	1.01	1.01	1.01	0.99	0.99	0.99
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Perm	NA		pm+pt	NA			NA	Perm
Protected Phases					2		3	4			4	
Permitted Phases				2	2		4					4
Detector Phase				2	2		3	4			4	4
Switch Phase												
Minimum Initial (s)				10.0	10.0		3.0	10.0			10.0	10.0
Minimum Split (s)				22.0	22.0		22.0	22.0			22.0	22.0
Total Split (s)				22.0	22.0		22.0	26.0			26.0	26.0
Total Split (%)				31.4%	31.4%		31.4%	37.1%			37.1%	37.1%
Maximum Green (s)				16.0	16.0		18.0	20.0			20.0	20.0
Yellow Time (s)				4.0	4.0		3.5	4.0			4.0	4.0
All-Red Time (s)				2.0	2.0		0.5	2.0			2.0	2.0
Lost Time Adjust (s)				2.0	-2.0		0.0	-2.0			-2.0	-2.0
Total Lost Time (s)				8.0	4.0		4.0	4.0			4.0	4.0
Lead/Lag							Lead	Lag			Lag	Lag
Lead-Lag Optimize?								Yes			Yes	Yes
Vehicle Extension (s)				3.0	3.0		2.0	3.0			3.0	3.0
Recall Mode				Max	Max		None	Max			Max	Max
Walk Time (s)				5.0	5.0		5.0	5.0			5.0	5.0
Flash Dont Walk (s)				11.0	11.0		11.0	11.0			11.0	11.0
Pedestrian Calls (#/hr)				0	0		0	0			0	0
Act Effct Green (s)				14.0	18.0		29.5	22.0			22.0	22.0
Actuated g/C Ratio				0.24	0.30		0.50	0.37			0.37	0.37

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio				0.56	0.43		0.49	0.53			0.87	0.22
Control Delay				27.6	18.0		11.7	16.2			27.1	3.8
Queue Delay				0.0	0.0		0.0	0.0			0.0	0.0
Total Delay				27.6	18.0		11.7	16.2			27.1	3.8
LOS				C	B		B	B			C	A
Approach Delay					20.4			15.5			24.4	
Approach LOS					C			B			C	
Queue Length 50th (ft)				73	67		27	98			193	0
Queue Length 95th (ft)				147	102		52	143			#330	32
Internal Link Dist (ft)		526			409			380			229	
Turn Bay Length (ft)							125					
Base Capacity (vph)				354	1418		629	1872			1316	682
Starvation Cap Reductn				0	0		0	0			0	0
Spillback Cap Reductn				0	0		0	0			0	0
Storage Cap Reductn				0	0		0	0			0	0
Reduced v/c Ratio				0.56	0.43		0.28	0.53			0.87	0.22

Intersection Summary

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 59.5
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 20.2 Intersection LOS: C
Intersection Capacity Utilization 58.1% ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 15: Academy St & College St

HCM 2010 Research does not support Non-NEMA phasing.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	326	886	18	149	948	0	0	821	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			2%			1%			-1%	
Storage Length (ft)	0		0	0		150	125		0	0		0
Storage Lanes	0		0	1		0	1		0	0		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	0	0	0	1507	4734	0	1761	5060	0	0	3557	1591
Flt Permitted				0.950	0.998		0.211					
Satd. Flow (perm)	0	0	0	1507	4734	0	391	5060	0	0	3557	1591
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					4							181
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		606			489			460			309	
Travel Time (s)		11.8			9.5			7.8			5.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)				10%								
Lane Group Flow (vph)	0	0	0	326	1040	0	166	1053	0	0	912	181
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			18	
Link Offset(ft)		36			-24			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.01	1.01	1.01	1.01	1.01	1.01	0.99	0.99	0.99
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Perm	NA		pm+pt	NA			NA	Perm
Protected Phases					2		3	4			4	
Permitted Phases				2	2		4					4
Detector Phase				2	2		3	4			4	4
Switch Phase												
Minimum Initial (s)				10.0	10.0		3.0	10.0			10.0	10.0
Minimum Split (s)				22.0	22.0		22.0	22.0			22.0	22.0
Total Split (s)				28.0	28.0		22.0	25.0			25.0	25.0
Total Split (%)				37.3%	37.3%		29.3%	33.3%			33.3%	33.3%
Maximum Green (s)				22.0	22.0		18.0	19.0			19.0	19.0
Yellow Time (s)				4.0	4.0		3.5	4.0			4.0	4.0
All-Red Time (s)				2.0	2.0		0.5	2.0			2.0	2.0
Lost Time Adjust (s)				2.0	-2.0		0.0	-2.0			-2.0	-2.0
Total Lost Time (s)				8.0	4.0		4.0	4.0			4.0	4.0
Lead/Lag							Lead	Lag			Lag	Lag
Lead-Lag Optimize?								Yes			Yes	Yes
Vehicle Extension (s)				3.0	3.0		2.0	3.0			3.0	3.0
Recall Mode				Max	Max		None	Max			Max	Max
Walk Time (s)				5.0	5.0		5.0	5.0			5.0	5.0
Flash Dont Walk (s)				11.0	11.0		11.0	11.0			11.0	11.0
Pedestrian Calls (#/hr)				0	0		0	0			0	0
Act Effct Green (s)				20.0	24.0		28.9	21.0			21.0	21.0
Actuated g/C Ratio				0.31	0.37		0.45	0.32			0.32	0.32

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio				0.70	0.59		0.49	0.64			0.79	0.28
Control Delay				30.5	18.4		14.1	21.2			26.8	4.5
Queue Delay				0.0	0.0		0.0	0.0			0.0	0.0
Total Delay				30.5	18.4		14.1	21.2			26.8	4.5
LOS				C	B		B	C			C	A
Approach Delay					21.3			20.2			23.1	
Approach LOS					C			C			C	
Queue Length 50th (ft)				130	124		33	127			169	0
Queue Length 95th (ft)				#273	177		62	180			#276	39
Internal Link Dist (ft)		526			409			380			229	
Turn Bay Length (ft)							125					
Base Capacity (vph)				465	1754		578	1638			1152	637
Starvation Cap Reductn				0	0		0	0			0	0
Spillback Cap Reductn				0	0		0	0			0	0
Storage Cap Reductn				0	0		0	0			0	0
Reduced v/c Ratio				0.70	0.59		0.29	0.64			0.79	0.28

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 64.9
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 21.5 Intersection LOS: C
Intersection Capacity Utilization 59.1% ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 15: Academy St & College St

HCM 2010 Research does not support Non-NEMA phasing.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	344	379	8	159	892	0	0	1028	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			2%			1%			-1%	
Storage Length (ft)	0		0	0		150	125		0	0		0
Storage Lanes	0		0	1		0	1		0	0		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	0	0	0	1752	5019	0	1761	5060	0	0	3557	1591
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	0	0	1752	5019	0	1761	5060	0	0	3557	1591
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					4							149
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		606			489			460			309	
Travel Time (s)		11.8			9.5			7.8			5.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	382	430	0	177	991	0	0	1142	149
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			18	
Link Offset(ft)		36			-24			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.01	1.01	1.01	1.01	1.01	1.01	0.99	0.99	0.99
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Perm	NA		Prot	NA			NA	Perm
Protected Phases					2		3	4			4	
Permitted Phases				2	2							4
Detector Phase				2	2		3	4			4	4
Switch Phase												
Minimum Initial (s)				10.0	10.0		3.0	10.0			10.0	10.0
Minimum Split (s)				22.0	22.0		22.0	22.0			22.0	22.0
Total Split (s)				27.0	27.0		22.0	31.0			31.0	31.0
Total Split (%)				33.8%	33.8%		27.5%	38.8%			38.8%	38.8%
Maximum Green (s)				21.0	21.0		18.0	25.0			25.0	25.0
Yellow Time (s)				4.0	4.0		3.5	4.0			4.0	4.0
All-Red Time (s)				2.0	2.0		0.5	2.0			2.0	2.0
Lost Time Adjust (s)				2.0	-2.0		0.0	-2.0			-2.0	-2.0
Total Lost Time (s)				8.0	4.0		4.0	4.0			4.0	4.0
Lead/Lag							Lead	Lag			Lag	Lag
Lead-Lag Optimize?								Yes			Yes	Yes
Vehicle Extension (s)				3.0	3.0		2.0	3.0			3.0	3.0
Recall Mode				Max	Max		None	Max			Max	Max
Walk Time (s)				5.0	5.0		5.0	5.0			5.0	5.0
Flash Dont Walk (s)				11.0	11.0		11.0	11.0			11.0	11.0
Pedestrian Calls (#/hr)				0	0		0	0			0	0
Act Effct Green (s)				19.0	23.0		11.7	27.0			27.0	27.0
Actuated g/C Ratio				0.26	0.31		0.16	0.37			0.37	0.37

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio				0.85	0.27		0.63	0.53			0.88	0.22
Control Delay				46.6	20.1		39.6	20.2			32.1	4.4
Queue Delay				0.0	0.0		0.0	0.0			0.0	0.0
Total Delay				46.6	20.1		39.6	20.2			32.1	4.4
LOS				D	C		D	C			C	A
Approach Delay					32.6			23.2			28.9	
Approach LOS					C			C			C	
Queue Length 50th (ft)				165	53		77	127			250	0
Queue Length 95th (ft)				#344	85		137	186			#417	37
Internal Link Dist (ft)		526			409			380			229	
Turn Bay Length (ft)							125					
Base Capacity (vph)				451	1569		430	1854			1303	677
Starvation Cap Reductn				0	0		0	0			0	0
Spillback Cap Reductn				0	0		0	0			0	0
Storage Cap Reductn				0	0		0	0			0	0
Reduced v/c Ratio				0.85	0.27		0.41	0.53			0.88	0.22

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 73.8
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 27.8 Intersection LOS: C
Intersection Capacity Utilization 66.3% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 15: Academy St & College St

HCM 2010 Research does not support Non-NEMA phasing.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	326	886	18	149	948	0	0	821	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			2%			1%			-1%	
Storage Length (ft)	0		0	0		150	125		0	0		0
Storage Lanes	0		0	1		0	1		0	0		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	0	0	0	1752	5019	0	1761	5060	0	0	3557	1591
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	0	0	1752	5019	0	1761	5060	0	0	3557	1591
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					4							181
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		606			489			460			309	
Travel Time (s)		11.8			9.5			7.8			5.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	362	1004	0	166	1053	0	0	912	181
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			18	
Link Offset(ft)		36			-24			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.01	1.01	1.01	1.01	1.01	1.01	0.99	0.99	0.99
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Perm	NA		Prot	NA			NA	Perm
Protected Phases					2		3	4			4	
Permitted Phases				2	2							4
Detector Phase				2	2		3	4			4	4
Switch Phase												
Minimum Initial (s)				10.0	10.0		3.0	10.0			10.0	10.0
Minimum Split (s)				22.0	22.0		22.0	22.0			22.0	22.0
Total Split (s)				28.0	28.0		22.0	25.0			25.0	25.0
Total Split (%)				37.3%	37.3%		29.3%	33.3%			33.3%	33.3%
Maximum Green (s)				22.0	22.0		18.0	19.0			19.0	19.0
Yellow Time (s)				4.0	4.0		3.5	4.0			4.0	4.0
All-Red Time (s)				2.0	2.0		0.5	2.0			2.0	2.0
Lost Time Adjust (s)				2.0	-2.0		0.0	-2.0			-2.0	-2.0
Total Lost Time (s)				8.0	4.0		4.0	4.0			4.0	4.0
Lead/Lag							Lead	Lag			Lag	Lag
Lead-Lag Optimize?								Yes			Yes	Yes
Vehicle Extension (s)				3.0	3.0		2.0	3.0			3.0	3.0
Recall Mode				Max	Max		None	Max			Max	Max
Walk Time (s)				5.0	5.0		5.0	5.0			5.0	5.0
Flash Dont Walk (s)				11.0	11.0		11.0	11.0			11.0	11.0
Pedestrian Calls (#/hr)				0	0		0	0			0	0
Act Effct Green (s)				20.0	24.1		10.7	21.0			21.0	21.0
Actuated g/C Ratio				0.29	0.36		0.16	0.31			0.31	0.31

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio				0.70	0.56		0.60	0.67			0.83	0.29
Control Delay				31.1	19.5		35.8	23.4			30.5	4.9
Queue Delay				0.0	0.0		0.0	0.0			0.0	0.0
Total Delay				31.1	19.5		35.8	23.4			30.5	4.9
LOS				C	B		D	C			C	A
Approach Delay					22.6			25.1			26.3	
Approach LOS					C			C			C	
Queue Length 50th (ft)				132	119		65	137			182	0
Queue Length 95th (ft)				#270	176		120	200			#312	42
Internal Link Dist (ft)		526			409			380			229	
Turn Bay Length (ft)							125					
Base Capacity (vph)				517	1783		468	1570			1104	618
Starvation Cap Reductn				0	0		0	0			0	0
Spillback Cap Reductn				0	0		0	0			0	0
Storage Cap Reductn				0	0		0	0			0	0
Reduced v/c Ratio				0.70	0.56		0.35	0.67			0.83	0.29

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 67.8
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 24.5 Intersection LOS: C
Intersection Capacity Utilization 59.0% ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 15: Academy St & College St

HCM 2010 Research does not support Non-NEMA phasing.

#16 Stone Avenue at Rutherford Street

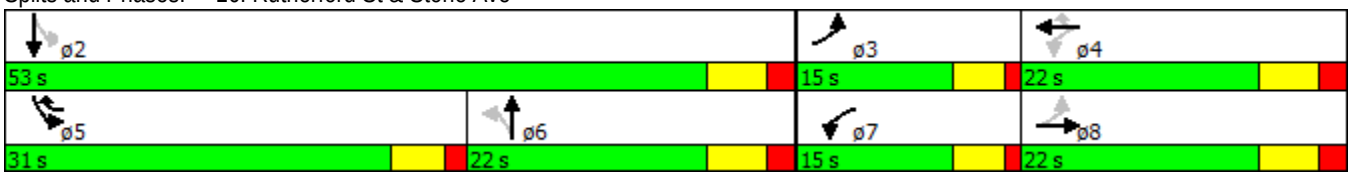
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	74	276	21	72	126	267	7	395	69	497	941	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%			1%			-1%	
Storage Length (ft)	175		0	175		0	150		0	0		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1770	3504	0	1743	1835	1560	1761	3444	0	1778	3521	0
Flt Permitted	0.578			0.413			0.254			0.263		
Satd. Flow (perm)	1077	3504	0	758	1835	1560	471	3444	0	492	3521	0
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)		8				297		20				
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		777			1378			731			394	
Travel Time (s)		15.1			26.8			14.2			7.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	82	330	0	80	140	297	8	516	0	552	1123	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.02	1.02	1.02	1.01	1.01	1.01	0.99	0.99	0.99
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	Perm	NA		pm+pt	NA	
Protected Phases	3	8		7	4	5		6		5	2	
Permitted Phases	8			4		4	6			2		
Detector Phase	3	8		7	4	5	6	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0	6.0	14.0	14.0		6.0	14.0	
Minimum Split (s)	15.0	22.0		15.0	22.0	15.0	22.0	22.0		15.0	22.0	
Total Split (s)	15.0	22.0		15.0	22.0	31.0	22.0	22.0		31.0	53.0	
Total Split (%)	16.7%	24.4%		16.7%	24.4%	34.4%	24.4%	24.4%		34.4%	58.9%	
Maximum Green (s)	10.5	16.0		10.5	16.0	25.9	16.0	16.0		25.9	47.0	
Yellow Time (s)	3.5	4.0		3.5	4.0	3.6	4.0	4.0		3.6	4.0	
All-Red Time (s)	1.0	2.0		1.0	2.0	1.5	2.0	2.0		1.5	2.0	
Lost Time Adjust (s)	-0.5	-2.0		-0.5	-2.0	-1.1	-2.0	-2.0		-1.1	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes		
Vehicle Extension (s)	2.5	3.0		2.5	3.0	2.5	4.0	4.0		2.5	4.0	
Recall Mode	None	None		None	None	None	Max	Max		None	Max	
Walk Time (s)		5.0			5.0		5.0	5.0			5.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)		0			0		0	0			0	
Act Effct Green (s)	21.4	14.6		21.5	14.6	42.1	22.1	22.1		49.5	49.5	
Actuated g/C Ratio	0.26	0.18		0.26	0.18	0.51	0.27	0.27		0.60	0.60	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.23	0.52		0.27	0.43	0.31	0.06	0.55		0.83	0.53	
Control Delay	21.7	33.7		22.3	35.4	2.2	30.4	30.5		26.6	11.9	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	21.7	33.7		22.3	35.4	2.2	30.4	30.5		26.6	11.9	
LOS	C	C		C	D	A	C	C		C	B	
Approach Delay		31.3			14.3			30.5			16.8	
Approach LOS		C			B			C			B	
Queue Length 50th (ft)	30	82		30	67	0	3	127		176	175	
Queue Length 95th (ft)	61	127		61	125	35	16	196		#392	271	
Internal Link Dist (ft)		697			1298			651			314	
Turn Bay Length (ft)	175			175			150					
Base Capacity (vph)	397	782		347	406	1004	126	940		723	2123	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.21	0.42		0.23	0.34	0.30	0.06	0.55		0.76	0.53	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 82.1
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 20.6 Intersection LOS: C
Intersection Capacity Utilization 66.5% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 16: Rutherford St & Stone Ave



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	74	276	21	72	126	267	7	395	69	497	941	69
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1835	1835	1835	1853	1853	1890	1872	1872	1910
Adj Flow Rate, veh/h	82	307	23	80	140	297	8	439	77	552	1046	77
Adj No. of Lanes	1	2	0	1	1	1	1	2	0	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	298	660	49	289	361	672	239	912	159	678	2010	148
Arrive On Green	0.06	0.20	0.17	0.06	0.20	0.19	0.30	0.30	0.28	0.25	0.60	0.57
Sat Flow, veh/h	1774	3340	249	1747	1835	1560	497	2999	523	1783	3360	247
Grp Volume(v), veh/h	82	162	168	80	140	297	8	257	259	552	554	569
Grp Sat Flow(s),veh/h/ln	1774	1770	1819	1747	1835	1560	497	1761	1761	1783	1778	1828
Q Serve(g_s), s	3.0	6.6	6.7	3.0	5.4	11.0	0.9	9.7	9.9	16.1	14.9	15.0
Cycle Q Clear(g_c), s	3.0	6.6	6.7	3.0	5.4	11.0	0.9	9.7	9.9	16.1	14.9	15.0
Prop In Lane	1.00		0.14	1.00		1.00	1.00		0.30	1.00		0.14
Lane Grp Cap(c), veh/h	298	350	359	289	361	672	239	535	536	678	1064	1094
V/C Ratio(X)	0.28	0.46	0.47	0.28	0.39	0.44	0.03	0.48	0.48	0.81	0.52	0.52
Avail Cap(c_a), veh/h	432	389	400	423	403	708	239	535	536	828	1064	1094
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.2	29.0	29.2	25.3	28.6	16.4	20.2	23.2	23.5	13.5	9.6	9.7
Incr Delay (d2), s/veh	0.4	1.0	0.9	0.4	0.7	0.5	0.3	3.1	3.1	4.9	1.8	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	3.3	3.5	1.5	2.8	4.8	0.1	5.2	5.2	8.6	7.8	8.0
LnGrp Delay(d),s/veh	25.6	30.0	30.1	25.7	29.3	16.8	20.4	26.3	26.6	18.4	11.4	11.5
LnGrp LOS	C	C	C	C	C	B	C	C	C	B	B	B
Approach Vol, veh/h		412			517			524			1675	
Approach Delay, s/veh		29.2			21.6			26.4			13.7	
Approach LOS		C			C			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s		53.0	8.8	20.1	24.1	28.9	8.7	20.2
Change Period (Y+Rc), s		6.0	4.5	6.0	5.1	6.0	4.5	6.0
Max Green Setting (Gmax), s		47.0	10.5	16.0	25.9	16.0	10.5	16.0
Max Q Clear Time (g_c+I1), s		17.0	5.0	13.0	18.1	11.9	5.0	8.7
Green Ext Time (p_c), s		18.1	0.0	1.2	0.9	3.5	0.0	2.3

Intersection Summary	
HCM 2010 Ctrl Delay	19.2
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	70	238	17	164	265	534	14	899	92	409	745	109
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%			1%			-1%	
Storage Length (ft)	175		0	175		0	150		0	0		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1770	3504	0	1743	1835	1560	1761	3472	0	1778	3489	0
Flt Permitted	0.337			0.390			0.301			0.132		
Satd. Flow (perm)	628	3504	0	716	1835	1560	558	3472	0	247	3489	0
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)		7				200		12				
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		777			1378			731			394	
Travel Time (s)		15.1			26.8			14.2			7.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	78	283	0	182	294	593	16	1101	0	454	949	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.02	1.02	1.02	1.01	1.01	1.01	0.99	0.99	0.99
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	Perm	NA		pm+pt	NA	
Protected Phases	3	8		7	4	5		6		5	2	
Permitted Phases	8			4		4	6			2		
Detector Phase	3	8		7	4	5	6	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0	6.0	14.0	14.0		6.0	14.0	
Minimum Split (s)	15.0	22.0		15.0	22.0	15.0	22.0	22.0		15.0	22.0	
Total Split (s)	15.0	22.0		15.0	22.0	22.0	31.0	31.0		22.0	53.0	
Total Split (%)	16.7%	24.4%		16.7%	24.4%	24.4%	34.4%	34.4%		24.4%	58.9%	
Maximum Green (s)	10.5	16.0		10.5	16.0	16.9	25.0	25.0		16.9	47.0	
Yellow Time (s)	3.5	4.0		3.5	4.0	3.6	4.0	4.0		3.6	4.0	
All-Red Time (s)	1.0	2.0		1.0	2.0	1.5	2.0	2.0		1.5	2.0	
Lost Time Adjust (s)	-0.5	-2.0		-0.5	-2.0	-1.1	-2.0	-2.0		-1.1	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes		
Vehicle Extension (s)	2.5	3.0		2.5	3.0	2.5	4.0	4.0		2.5	4.0	
Recall Mode	None	None		None	None	None	Max	Max		None	Max	
Walk Time (s)		5.0			5.0		5.0	5.0			5.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)		0			0		0	0			0	
Act Effct Green (s)	22.8	14.8		27.6	19.1	41.1	27.1	27.1		49.1	49.1	
Actuated g/C Ratio	0.26	0.17		0.32	0.22	0.48	0.31	0.31		0.57	0.57	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.29	0.47		0.52	0.72	0.70	0.09	1.00		0.98	0.48	
Control Delay	22.5	34.0		26.7	44.5	17.5	24.0	59.1		63.1	12.4	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	22.5	34.0		26.7	44.5	17.5	24.0	59.1		63.1	12.4	
LOS	C	C		C	D	B	C	E		E	B	
Approach Delay		31.5			26.5			58.6			28.8	
Approach LOS		C			C			E			C	
Queue Length 50th (ft)	29	72		72	153	168	6	~322		196	153	
Queue Length 95th (ft)	59	110		124	#288	318	23	#486		#412	215	
Internal Link Dist (ft)		697			1298			651			314	
Turn Bay Length (ft)	175			175			150					
Base Capacity (vph)	333	738		361	406	848	174	1098		461	1987	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.23	0.38		0.50	0.72	0.70	0.09	1.00		0.98	0.48	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 86.2
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.00
Intersection Signal Delay: 36.8 Intersection LOS: D
Intersection Capacity Utilization 81.9% ICU Level of Service D
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 16: Rutherford St & Stone Ave

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	70	238	17	164	265	534	14	899	92	409	745	109
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1835	1835	1835	1853	1853	1890	1872	1872	1910
Adj Flow Rate, veh/h	78	264	19	182	294	593	16	999	102	454	828	121
Adj No. of Lanes	1	2	0	1	1	1	1	2	0	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	217	536	38	358	395	654	274	1039	106	472	1820	266
Arrive On Green	0.06	0.16	0.14	0.11	0.22	0.20	0.32	0.32	0.30	0.21	0.58	0.56
Sat Flow, veh/h	1774	3350	240	1747	1835	1560	586	3227	329	1783	3115	455
Grp Volume(v), veh/h	78	139	144	182	294	593	16	545	556	454	473	476
Grp Sat Flow(s),veh/h/ln	1774	1770	1820	1747	1835	1560	586	1761	1795	1783	1778	1792
Q Serve(g_s), s	3.1	6.0	6.1	7.0	12.6	17.2	1.6	25.5	25.5	16.9	12.6	12.8
Cycle Q Clear(g_c), s	3.1	6.0	6.1	7.0	12.6	17.2	1.6	25.5	25.5	16.9	12.6	12.8
Prop In Lane	1.00		0.13	1.00		1.00	1.00		0.18	1.00		0.25
Lane Grp Cap(c), veh/h	217	283	291	358	395	654	274	567	578	472	1039	1047
V/C Ratio(X)	0.36	0.49	0.50	0.51	0.74	0.91	0.06	0.96	0.96	0.96	0.45	0.45
Avail Cap(c_a), veh/h	348	380	391	390	395	654	274	567	578	472	1039	1047
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.5	32.1	32.3	24.8	30.7	22.8	19.8	27.9	28.1	23.4	9.9	10.0
Incr Delay (d2), s/veh	0.7	1.3	1.3	0.8	7.4	16.4	0.4	29.4	29.2	31.6	1.4	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	3.0	3.2	3.4	7.2	15.8	0.3	16.9	17.2	14.5	6.6	6.7
LnGrp Delay(d),s/veh	29.3	33.4	33.6	25.7	38.2	39.2	20.2	57.3	57.3	55.0	11.3	11.5
LnGrp LOS	C	C	C	C	D	D	C	E	E	E	B	B
Approach Vol, veh/h		361			1069			1117			1403	
Approach Delay, s/veh		32.6			36.6			56.8			25.5	
Approach LOS		C			D			E			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s		53.0	8.8	22.1	22.0	31.0	13.5	17.4
Change Period (Y+Rc), s		6.0	4.5	6.0	5.1	6.0	4.5	6.0
Max Green Setting (Gmax), s		47.0	10.5	16.0	16.9	25.0	10.5	16.0
Max Q Clear Time (g_c+I1), s		14.8	5.1	19.2	18.9	27.5	9.0	8.1
Green Ext Time (p_c), s		23.6	0.0	0.0	0.0	0.0	0.1	3.3

Intersection Summary	
HCM 2010 Ctrl Delay	38.0
HCM 2010 LOS	D

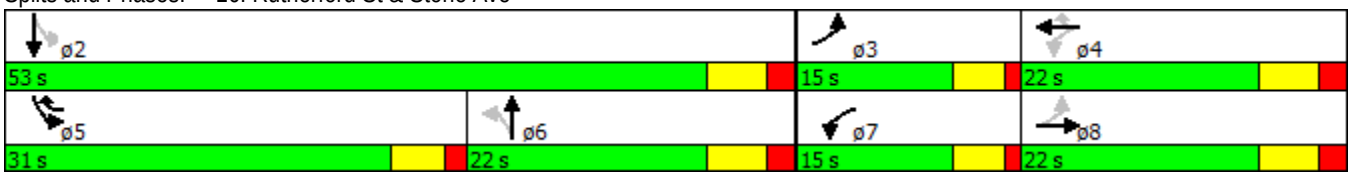
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	74	276	21	72	126	267	7	395	69	497	941	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%			1%			-1%	
Storage Length (ft)	175		0	175		0	150		0	0		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1770	3504	0	1743	1835	1560	1761	3444	0	1778	3521	0
Flt Permitted	0.578			0.413			0.254			0.263		
Satd. Flow (perm)	1077	3504	0	758	1835	1560	471	3444	0	492	3521	0
Right Turn on Red			Yes			Yes			No			No
Satd. Flow (RTOR)		8				297						
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		777			1378			731			394	
Travel Time (s)		15.1			26.8			14.2			7.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	82	330	0	80	140	297	8	516	0	552	1123	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.02	1.02	1.02	1.01	1.01	1.01	0.99	0.99	0.99
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	Perm	NA		pm+pt	NA	
Protected Phases	3	8		7	4	5		6		5	2	
Permitted Phases	8			4		4	6			2		
Detector Phase	3	8		7	4	5	6	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0	6.0	14.0	14.0		6.0	14.0	
Minimum Split (s)	15.0	22.0		15.0	22.0	15.0	22.0	22.0		15.0	22.0	
Total Split (s)	15.0	22.0		15.0	22.0	31.0	22.0	22.0		31.0	53.0	
Total Split (%)	16.7%	24.4%		16.7%	24.4%	34.4%	24.4%	24.4%		34.4%	58.9%	
Maximum Green (s)	10.5	16.0		10.5	16.0	25.9	16.0	16.0		25.9	47.0	
Yellow Time (s)	3.5	4.0		3.5	4.0	3.6	4.0	4.0		3.6	4.0	
All-Red Time (s)	1.0	2.0		1.0	2.0	1.5	2.0	2.0		1.5	2.0	
Lost Time Adjust (s)	-0.5	-2.0		-0.5	-2.0	-1.1	-2.0	-2.0		-1.1	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes		
Vehicle Extension (s)	2.5	3.0		2.5	3.0	2.5	4.0	4.0		2.5	4.0	
Recall Mode	None	None		None	None	None	Max	Max		None	Max	
Walk Time (s)		5.0			5.0		5.0	5.0			5.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)		0			0		0	0			0	
Act Effct Green (s)	21.4	14.6		21.5	14.6	42.1	22.1	22.1		49.5	49.5	
Actuated g/C Ratio	0.26	0.18		0.26	0.18	0.51	0.27	0.27		0.60	0.60	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.23	0.52		0.27	0.43	0.31	0.06	0.56		0.83	0.53	
Control Delay	21.7	33.7		22.3	35.4	2.2	30.4	31.9		26.6	11.9	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	21.7	33.7		22.3	35.4	2.2	30.4	31.9		26.6	11.9	
LOS	C	C		C	D	A	C	C		C	B	
Approach Delay		31.3			14.3			31.9			16.8	
Approach LOS		C			B			C			B	
Queue Length 50th (ft)	30	82		30	67	0	3	133		176	175	
Queue Length 95th (ft)	61	127		61	125	35	16	203		#392	271	
Internal Link Dist (ft)		697			1298			651			314	
Turn Bay Length (ft)	175			175			150					
Base Capacity (vph)	397	782		347	406	1004	126	925		723	2123	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.21	0.42		0.23	0.34	0.30	0.06	0.56		0.76	0.53	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 82.1
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 20.8 Intersection LOS: C
Intersection Capacity Utilization 66.5% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 16: Rutherford St & Stone Ave



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	74	276	21	72	126	267	7	395	69	497	941	69
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1835	1835	1835	1853	1853	1890	1872	1872	1910
Adj Flow Rate, veh/h	82	307	23	80	140	297	8	439	77	552	1046	77
Adj No. of Lanes	1	2	0	1	1	1	1	2	0	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	298	660	49	289	361	672	239	912	159	678	2010	148
Arrive On Green	0.06	0.20	0.17	0.06	0.20	0.19	0.30	0.30	0.28	0.25	0.60	0.57
Sat Flow, veh/h	1774	3340	249	1747	1835	1560	497	2999	523	1783	3360	247
Grp Volume(v), veh/h	82	162	168	80	140	297	8	257	259	552	554	569
Grp Sat Flow(s),veh/h/ln	1774	1770	1819	1747	1835	1560	497	1761	1761	1783	1778	1828
Q Serve(g_s), s	3.0	6.6	6.7	3.0	5.4	11.0	0.9	9.7	9.9	16.1	14.9	15.0
Cycle Q Clear(g_c), s	3.0	6.6	6.7	3.0	5.4	11.0	0.9	9.7	9.9	16.1	14.9	15.0
Prop In Lane	1.00		0.14	1.00		1.00	1.00		0.30	1.00		0.14
Lane Grp Cap(c), veh/h	298	350	359	289	361	672	239	535	536	678	1064	1094
V/C Ratio(X)	0.28	0.46	0.47	0.28	0.39	0.44	0.03	0.48	0.48	0.81	0.52	0.52
Avail Cap(c_a), veh/h	432	389	400	423	403	708	239	535	536	828	1064	1094
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.2	29.0	29.2	25.3	28.6	16.4	20.2	23.2	23.5	13.5	9.6	9.7
Incr Delay (d2), s/veh	0.4	1.0	0.9	0.4	0.7	0.5	0.3	3.1	3.1	4.9	1.8	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	3.3	3.5	1.5	2.8	4.8	0.1	5.2	5.2	8.6	7.8	8.0
LnGrp Delay(d),s/veh	25.6	30.0	30.1	25.7	29.3	16.8	20.4	26.3	26.6	18.4	11.4	11.5
LnGrp LOS	C	C	C	C	C	B	C	C	C	B	B	B
Approach Vol, veh/h		412			517			524			1675	
Approach Delay, s/veh		29.2			21.6			26.4			13.7	
Approach LOS		C			C			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s		53.0	8.8	20.1	24.1	28.9	8.7	20.2
Change Period (Y+Rc), s		6.0	4.5	6.0	5.1	6.0	4.5	6.0
Max Green Setting (Gmax), s		47.0	10.5	16.0	25.9	16.0	10.5	16.0
Max Q Clear Time (g_c+I1), s		17.0	5.0	13.0	18.1	11.9	5.0	8.7
Green Ext Time (p_c), s		18.1	0.0	1.2	0.9	3.5	0.0	2.3

Intersection Summary	
HCM 2010 Ctrl Delay	19.2
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	70	238	17	164	265	534	14	899	92	409	745	109
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%			1%			-1%	
Storage Length (ft)	175		0	175		0	150		0	0		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1770	3504	0	1743	1835	1560	1761	3472	0	1778	3489	0
Flt Permitted	0.337			0.390			0.301			0.128		
Satd. Flow (perm)	628	3504	0	716	1835	1560	558	3472	0	240	3489	0
Right Turn on Red			Yes			Yes			No			No
Satd. Flow (RTOR)		7				197						
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		777			1378			731			394	
Travel Time (s)		15.1			26.8			14.2			7.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	78	283	0	182	294	593	16	1101	0	454	949	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.02	1.02	1.02	1.01	1.01	1.01	0.99	0.99	0.99
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	Perm	NA		pm+pt	NA	
Protected Phases	3	8		7	4	5		6		5	2	
Permitted Phases	8			4		4	6			2		
Detector Phase	3	8		7	4	5	6	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0	6.0	14.0	14.0		6.0	14.0	
Minimum Split (s)	15.0	22.0		15.0	22.0	15.0	22.0	22.0		15.0	22.0	
Total Split (s)	15.0	22.0		15.0	22.0	21.0	32.0	32.0		21.0	53.0	
Total Split (%)	16.7%	24.4%		16.7%	24.4%	23.3%	35.6%	35.6%		23.3%	58.9%	
Maximum Green (s)	10.5	16.0		10.5	16.0	15.9	26.0	26.0		15.9	47.0	
Yellow Time (s)	3.5	4.0		3.5	4.0	3.6	4.0	4.0		3.6	4.0	
All-Red Time (s)	1.0	2.0		1.0	2.0	1.5	2.0	2.0		1.5	2.0	
Lost Time Adjust (s)	-0.5	-2.0		-0.5	-2.0	-1.1	-2.0	-2.0		-1.1	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes		
Vehicle Extension (s)	2.5	3.0		2.5	3.0	2.5	4.0	4.0		2.5	4.0	
Recall Mode	None	None		None	None	None	Max	Max		None	Max	
Walk Time (s)		5.0			5.0		5.0	5.0			5.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)		0			0		0	0			0	
Act Effct Green (s)	22.8	14.8		27.6	19.1	40.1	28.1	28.1		49.1	49.1	
Actuated g/C Ratio	0.26	0.17		0.32	0.22	0.47	0.33	0.33		0.57	0.57	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.29	0.47		0.52	0.72	0.71	0.09	0.97		1.03	0.48	
Control Delay	22.5	34.0		26.7	44.5	18.6	23.1	51.8		76.0	12.4	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	22.5	34.0		26.7	44.5	18.6	23.1	51.8		76.0	12.4	
LOS	C	C		C	D	B	C	D		E	B	
Approach Delay		31.5			27.1			51.4			33.0	
Approach LOS		C			C			D			C	
Queue Length 50th (ft)	29	72		72	153	174	6	312		~220	153	
Queue Length 95th (ft)	59	110		124	#288	327	22	#476		#424	215	
Internal Link Dist (ft)		697			1298			651			314	
Turn Bay Length (ft)	175			175			150					
Base Capacity (vph)	333	738		361	406	831	181	1130		440	1987	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.23	0.38		0.50	0.72	0.71	0.09	0.97		1.03	0.48	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 86.2
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.03
Intersection Signal Delay: 36.5 Intersection LOS: D
Intersection Capacity Utilization 81.9% ICU Level of Service D
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 16: Rutherford St & Stone Ave

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	70	238	17	164	265	534	14	899	92	409	745	109
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1835	1835	1835	1853	1853	1890	1872	1872	1910
Adj Flow Rate, veh/h	78	264	19	182	294	593	16	999	102	454	828	121
Adj No. of Lanes	1	2	0	1	1	1	1	2	0	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	217	536	38	358	395	635	281	1077	110	460	1820	266
Arrive On Green	0.06	0.16	0.14	0.11	0.22	0.20	0.33	0.33	0.31	0.20	0.58	0.56
Sat Flow, veh/h	1774	3350	240	1747	1835	1560	586	3227	329	1783	3115	455
Grp Volume(v), veh/h	78	139	144	182	294	593	16	545	556	454	473	476
Grp Sat Flow(s),veh/h/ln	1774	1770	1820	1747	1835	1560	586	1761	1795	1783	1778	1792
Q Serve(g_s), s	3.1	6.0	6.1	7.0	12.6	17.2	1.6	25.0	25.1	16.6	12.6	12.8
Cycle Q Clear(g_c), s	3.1	6.0	6.1	7.0	12.6	17.2	1.6	25.0	25.1	16.6	12.6	12.8
Prop In Lane	1.00		0.13	1.00		1.00	1.00		0.18	1.00		0.25
Lane Grp Cap(c), veh/h	217	283	291	358	395	635	281	588	599	460	1039	1047
V/C Ratio(X)	0.36	0.49	0.50	0.51	0.74	0.93	0.06	0.93	0.93	0.99	0.45	0.45
Avail Cap(c_a), veh/h	348	380	391	390	395	635	281	588	599	460	1039	1047
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.5	32.1	32.3	24.8	30.7	23.8	19.1	27.0	27.1	23.3	9.9	10.0
Incr Delay (d2), s/veh	0.7	1.3	1.3	0.8	7.4	20.9	0.4	22.9	22.7	38.7	1.4	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	3.0	3.2	3.4	7.2	16.7	0.3	15.9	16.1	15.3	6.6	6.7
LnGrp Delay(d),s/veh	29.3	33.4	33.6	25.7	38.2	44.7	19.5	49.9	49.8	62.0	11.3	11.5
LnGrp LOS	C	C	C	C	D	D	B	D	D	E	B	B
Approach Vol, veh/h		361			1069			1117			1403	
Approach Delay, s/veh		32.6			39.6			49.4			27.8	
Approach LOS		C			D			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s		53.0	8.8	22.1	21.0	32.0	13.5	17.4
Change Period (Y+Rc), s		6.0	4.5	6.0	5.1	6.0	4.5	6.0
Max Green Setting (Gmax), s		47.0	10.5	16.0	15.9	26.0	10.5	16.0
Max Q Clear Time (g_c+I1), s		14.8	5.1	19.2	18.6	27.1	9.0	8.1
Green Ext Time (p_c), s		23.6	0.0	0.0	0.0	0.0	0.1	3.3

Intersection Summary	
HCM 2010 Ctrl Delay	37.5
HCM 2010 LOS	D

#17 Pelham Road at E. North Street

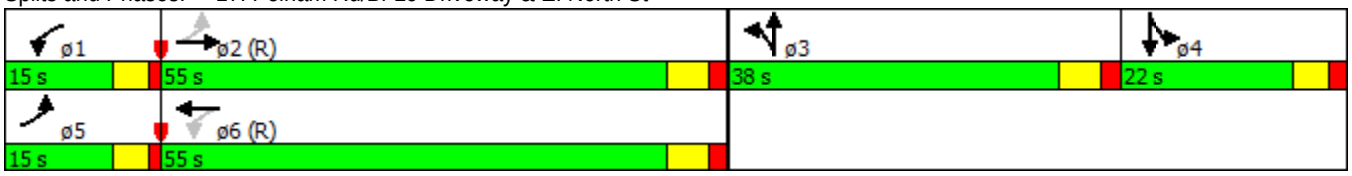
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	43	466	571	26	927	20	601	25	38	46	42	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	250		0	450		0	0		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1770	3539	1583	1770	3529	0	3433	1695	0	1770	1747	0
Flt Permitted	0.155			0.416			0.950			0.950		
Satd. Flow (perm)	289	3539	1583	775	3529	0	3433	1695	0	1770	1747	0
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			634		2			42				
Link Speed (mph)		35			35			45			20	
Link Distance (ft)		829			1058			970			245	
Travel Time (s)		16.1			20.6			14.7			8.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	48	518	634	29	1052	0	668	70	0	51	80	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			18			24			12	
Link Offset(ft)		0			0			-24			-18	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes			Yes				
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA	Free	pm+pt	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	2		Free	6								
Detector Phase	5	2		1	6		3	3		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		3.0	15.0		8.0	8.0		3.0	3.0	
Minimum Split (s)	15.0	22.0		15.0	22.0		15.0	15.0		22.0	22.0	
Total Split (s)	15.0	55.0		15.0	55.0		38.0	38.0		22.0	22.0	
Total Split (%)	11.5%	42.3%		11.5%	42.3%		29.2%	29.2%		16.9%	16.9%	
Maximum Green (s)	10.5	49.0		10.5	49.0		32.0	32.0		16.5	16.5	
Yellow Time (s)	3.5	4.0		3.5	4.0		4.0	4.0		3.5	3.5	
All-Red Time (s)	1.0	2.0		1.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-0.5	-2.0		-0.5	-2.0		-2.0	-2.0		-1.5	-1.5	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Act Effct Green (s)	71.8	66.8	130.0	69.9	64.1		31.5	31.5		12.8	12.8	
Actuated g/C Ratio	0.55	0.51	1.00	0.54	0.49		0.24	0.24		0.10	0.10	
v/c Ratio	0.20	0.29	0.40	0.06	0.60		0.80	0.16		0.29	0.47	
Control Delay	3.7	4.8	1.5	14.8	27.6		54.3	18.5		57.5	63.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	3.7	4.8	1.5	14.8	27.6		54.3	18.5		57.5	63.5	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	A	A	B	C		D	B		E	E	
Approach Delay		3.0			27.2			50.9			61.2	
Approach LOS		A			C			D			E	
Queue Length 50th (ft)	3	44	17	11	346		270	18		41	65	
Queue Length 95th (ft)	m4	m114	m28	28	468		338	57		80	114	
Internal Link Dist (ft)		749			978			890			165	
Turn Bay Length (ft)	100			250			450					
Base Capacity (vph)	288	1817	1583	518	1740		897	474		245	241	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.17	0.29	0.40	0.06	0.60		0.74	0.15		0.21	0.33	

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 30 (23%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 25.0 Intersection LOS: C
Intersection Capacity Utilization 63.4% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 17: Pelham Rd/Bi-Lo Driveway & E. North St



HCM 2010 analysis expects strict NEMA phasing.

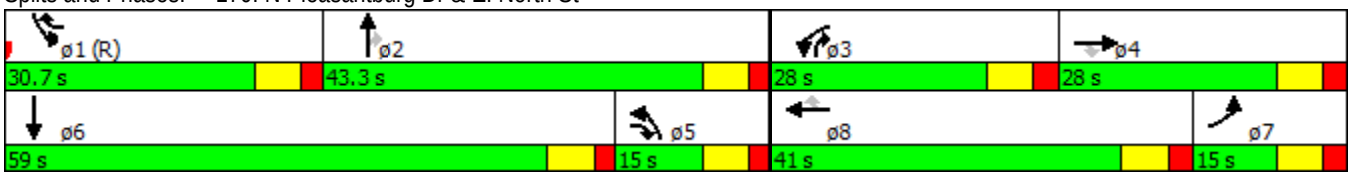
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	89	514	140	505	899	448	152	1050	192	509	1791	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		300	525		475	225		375	425		0
Storage Lanes	1		1	1		1	2		1	2		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	3433	5085	1583	3433	5060	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	3433	5085	1583	3433	5060	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)						143			147		4	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1214			829			833			749	
Travel Time (s)		23.6			16.1			14.2			12.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	99	571	156	561	999	498	169	1167	213	566	2052	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		18			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane											Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	
Permitted Phases			4			8			2			
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0	5.0	5.0	10.0	5.0	5.0	15.0	5.0	5.0	15.0	
Minimum Split (s)	15.0	23.0	15.0	15.0	23.0	15.0	15.0	22.5	15.0	15.0	22.5	
Total Split (s)	15.0	28.0	15.0	28.0	41.0	30.7	15.0	43.3	28.0	30.7	59.0	
Total Split (%)	11.5%	21.5%	11.5%	21.5%	31.5%	23.6%	11.5%	33.3%	21.5%	23.6%	45.4%	
Maximum Green (s)	8.0	21.0	8.5	21.0	34.0	24.2	8.5	36.8	21.0	24.2	52.5	
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
All-Red Time (s)	2.5	2.5	2.0	2.5	2.5	2.0	2.0	2.0	2.5	2.0	2.0	
Lost Time Adjust (s)	-3.0	-3.0	-2.5	-3.0	-3.0	-2.5	-2.5	-2.5	-3.0	-2.5	-2.5	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	
Recall Mode	None	None	None	None	None	C-Max	None	Max	None	C-Max	Max	
Walk Time (s)		5.0			5.0			5.0			5.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	11.0	24.0	35.0	24.0	37.0	63.7	11.0	39.3	67.3	26.7	55.0	
Actuated g/C Ratio	0.08	0.18	0.27	0.18	0.28	0.49	0.08	0.30	0.52	0.21	0.42	
v/c Ratio	0.66	0.87	0.37	0.89	0.99	0.59	0.58	0.76	0.24	0.80	0.96	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	79.2	66.9	24.2	56.5	63.4	15.4	66.0	44.9	6.2	58.9	48.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	79.2	66.9	24.2	56.5	63.4	15.4	66.0	44.9	6.2	58.9	48.2	
LOS	E	E	C	E	E	B	E	D	A	E	D	
Approach Delay		60.3			49.9			41.9			50.5	
Approach LOS		E			D			D			D	
Queue Length 50th (ft)	82	248	69	215	463	143	72	326	27	236	604	
Queue Length 95th (ft)	#161	#344	111	#331	#597	393	110	383	70	303	#723	
Internal Link Dist (ft)		1134			749			753			669	
Turn Bay Length (ft)	150		300	525		475	225		375	425		
Base Capacity (vph)	149	653	426	633	1007	848	290	1537	890	705	2143	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.66	0.87	0.37	0.89	0.99	0.59	0.58	0.76	0.24	0.80	0.96	

Intersection Summary	
Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 24 (18%), Referenced to phase 1:SBL, Start of Green	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 49.6	Intersection LOS: D
Intersection Capacity Utilization 83.3%	ICU Level of Service E
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 170: N Pleasantburg Dr & E. North St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	89	514	140	505	899	448	152	1050	192	509	1791	56
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	99	571	156	561	999	498	169	1167	213	566	1990	62
Adj No. of Lanes	1	2	1	2	2	1	2	3	1	2	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	150	653	420	635	1007	759	291	1571	787	684	2144	67
Arrive On Green	0.08	0.18	0.18	0.06	0.09	0.09	0.08	0.31	0.31	0.20	0.42	0.40
Sat Flow, veh/h	1774	3539	1583	3442	3539	1583	3442	5085	1583	3442	5068	158
Grp Volume(v), veh/h	99	571	156	561	999	498	169	1167	213	566	1330	722
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1721	1770	1583	1721	1695	1583	1721	1695	1835
Q Serve(g_s), s	7.0	20.4	2.8	21.0	36.7	18.4	6.1	26.8	10.2	20.5	48.4	48.6
Cycle Q Clear(g_c), s	7.0	20.4	2.8	21.0	36.7	18.4	6.1	26.8	10.2	20.5	48.4	48.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	150	653	420	635	1007	759	291	1571	787	684	1434	776
V/C Ratio(X)	0.66	0.87	0.37	0.88	0.99	0.66	0.58	0.74	0.27	0.83	0.93	0.93
Avail Cap(c_a), veh/h	150	653	420	635	1007	759	291	1571	787	707	1434	776
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.7	51.5	16.4	59.6	58.7	13.4	57.3	40.3	19.0	49.9	35.6	35.8
Incr Delay (d2), s/veh	10.8	12.7	0.7	10.0	21.3	1.5	3.2	3.2	0.8	8.1	11.8	19.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	11.1	2.8	10.9	21.0	8.4	3.1	13.0	4.6	10.5	24.9	28.8
LnGrp Delay(d),s/veh	68.5	64.2	17.1	69.7	80.0	14.9	60.5	43.5	19.8	58.0	47.4	54.9
LnGrp LOS	E	E	B	E	E	B	E	D	B	E	D	D
Approach Vol, veh/h		826			2058			1549			2618	
Approach Delay, s/veh		55.8			61.4			42.1			51.7	
Approach LOS		E			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	29.8	44.2	28.0	28.0	15.0	59.0	15.0	41.0
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0	6.5	6.5	7.0	7.0
Max Green Setting (Gmax), s	24.2	36.8	21.0	21.0	8.5	52.5	8.0	34.0
Max Q Clear Time (g_c+I1), s	22.5	28.8	23.0	22.4	8.1	50.6	9.0	38.7
Green Ext Time (p_c), s	0.5	5.7	0.0	0.0	0.0	1.7	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	52.9
HCM 2010 LOS	D

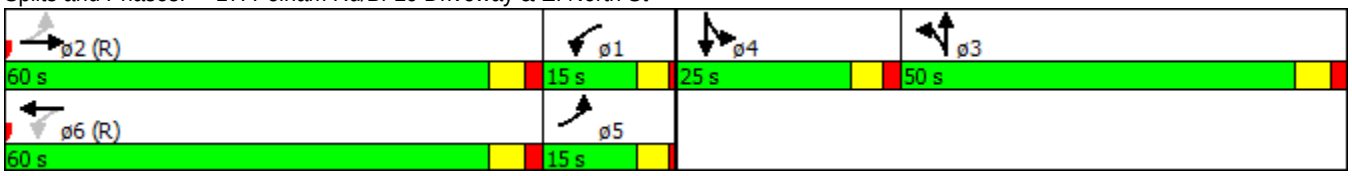
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	122	866	632	42	514	31	699	75	68	60	67	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	250		0	450		0	0		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1770	3539	1583	1770	3511	0	3433	1729	0	1770	1727	0
Flt Permitted	0.333			0.167			0.950			0.950		
Satd. Flow (perm)	620	3539	1583	311	3511	0	3433	1729	0	1770	1727	0
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			366		5			32				
Link Speed (mph)		35			35			45			20	
Link Distance (ft)		829			1058			970			245	
Travel Time (s)		16.1			20.6			14.7			8.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	136	962	702	47	605	0	777	159	0	67	144	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			18			24			12	
Link Offset(ft)		0			0			-24			-18	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes			Yes				
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA	Free	pm+pt	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	2		Free	6								
Detector Phase	5	2		1	6		3	3		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		3.0	15.0		8.0	8.0		3.0	3.0	
Minimum Split (s)	15.0	22.0		15.0	22.0		15.0	15.0		22.0	22.0	
Total Split (s)	15.0	60.0		15.0	60.0		50.0	50.0		25.0	25.0	
Total Split (%)	10.0%	40.0%		10.0%	40.0%		33.3%	33.3%		16.7%	16.7%	
Maximum Green (s)	10.5	54.0		10.5	54.0		44.0	44.0		19.5	19.5	
Yellow Time (s)	3.5	4.0		3.5	4.0		4.0	4.0		3.5	3.5	
All-Red Time (s)	1.0	2.0		1.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-0.5	-2.0		-0.5	-2.0		-2.0	-2.0		-1.5	-1.5	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lead		Lag	Lead		Lag	Lag		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Act Effct Green (s)	73.7	68.6	150.0	72.9	66.6		41.9	41.9		19.2	19.2	
Actuated g/C Ratio	0.49	0.46	1.00	0.49	0.44		0.28	0.28		0.13	0.13	
v/c Ratio	0.39	0.59	0.44	0.22	0.39		0.81	0.31		0.30	0.65	
Control Delay	19.6	21.2	0.4	29.1	30.2		57.4	34.6		61.2	75.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	19.6	21.2	0.4	29.1	30.2		57.4	34.6		61.2	75.6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	C	A	C	C		E	C		E	E	
Approach Delay		13.0			30.1			53.6			71.0	
Approach LOS		B			C			D			E	
Queue Length 50th (ft)	62	266	0	23	208		362	96		60	136	
Queue Length 95th (ft)	m73	m306	m0	52	291		429	159		106	204	
Internal Link Dist (ft)		749			978			890			165	
Turn Bay Length (ft)	100			250			450					
Base Capacity (vph)	408	1618	1583	267	1561		1053	552		260	253	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.33	0.59	0.44	0.18	0.39		0.74	0.29		0.26	0.57	

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 47 (31%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 30.0 Intersection LOS: C
Intersection Capacity Utilization 67.9% ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 17: Pelham Rd/Bi-Lo Driveway & E. North St



HCM 2010 analysis expects strict NEMA phasing.

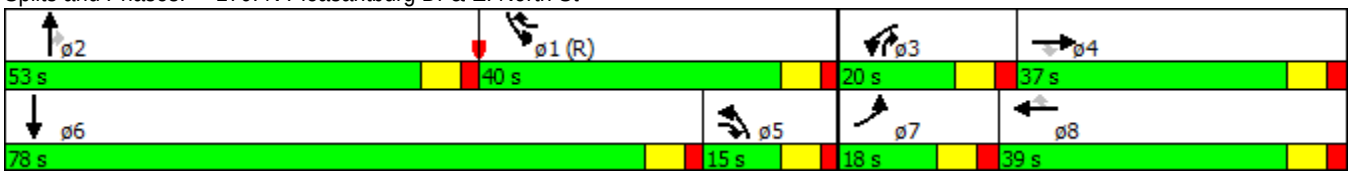
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	109	806	120	373	580	759	121	1679	578	548	1374	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		300	525		475	225		375	425		0
Storage Lanes	1		1	1		1	2		1	2		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	3433	5085	1583	3433	5060	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	3433	5085	1583	3433	5060	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)						76			124		5	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1214			829			833			749	
Travel Time (s)		23.6			16.1			14.2			12.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	121	896	133	414	644	843	134	1866	642	609	1578	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		18			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane											Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	
Permitted Phases			4			8			2			
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0	5.0	5.0	10.0	5.0	5.0	15.0	5.0	5.0	15.0	
Minimum Split (s)	15.0	23.0	15.0	15.0	23.0	15.0	15.0	22.5	15.0	15.0	22.5	
Total Split (s)	18.0	37.0	15.0	20.0	39.0	40.0	15.0	53.0	20.0	40.0	78.0	
Total Split (%)	12.0%	24.7%	10.0%	13.3%	26.0%	26.7%	10.0%	35.3%	13.3%	26.7%	52.0%	
Maximum Green (s)	11.0	30.0	8.5	13.0	32.0	33.5	8.5	46.5	13.0	33.5	71.5	
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
All-Red Time (s)	2.5	2.5	2.0	2.5	2.5	2.0	2.0	2.0	2.5	2.0	2.0	
Lost Time Adjust (s)	-3.0	-3.0	-2.5	-3.0	-3.0	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.5	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	
Recall Mode	None	None	None	None	None	C-Max	None	Max	None	C-Max	Max	
Walk Time (s)		5.0			5.0			5.0			5.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	14.0	33.0	44.0	16.0	35.0	71.0	11.0	49.0	64.0	36.0	74.0	
Actuated g/C Ratio	0.09	0.22	0.29	0.11	0.23	0.47	0.07	0.33	0.43	0.24	0.49	
v/c Ratio	0.74	1.15	0.29	1.13	0.78	1.07	0.53	1.12	0.86	0.74	0.63	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	91.5	133.5	28.9	137.7	48.0	68.7	75.3	109.9	34.5	59.0	29.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	91.5	133.5	28.9	137.7	48.0	68.7	75.3	109.9	34.5	59.0	29.3	
LOS	F	F	C	F	D	E	E	F	C	E	C	
Approach Delay		117.0			76.7			89.8			37.6	
Approach LOS		F			E			F			D	
Queue Length 50th (ft)	117	~541	77	~244	333	~461	66	~769	306	286	406	
Queue Length 95th (ft)	#216	#676	123	#348	357	#889	103	#863	#543	356	458	
Internal Link Dist (ft)		1134			749			753			669	
Turn Bay Length (ft)	150		300	525		475	225		375	425		
Base Capacity (vph)	165	778	464	366	826	789	251	1661	746	823	2498	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.73	1.15	0.29	1.13	0.78	1.07	0.53	1.12	0.86	0.74	0.63	

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 144 (96%), Referenced to phase 1:SBL, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.15
Intersection Signal Delay: 76.1 Intersection LOS: E
Intersection Capacity Utilization 95.5% ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 170: N Pleasantburg Dr & E. North St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	109	806	120	373	580	759	121	1679	578	548	1374	46
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	121	896	133	414	644	843	134	1866	642	609	1527	51
Adj No. of Lanes	1	2	1	2	2	1	2	3	1	2	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	166	779	459	367	826	738	252	1680	687	814	2493	83
Arrive On Green	0.09	0.22	0.22	0.18	0.39	0.38	0.07	0.33	0.33	0.24	0.49	0.48
Sat Flow, veh/h	1774	3539	1583	3442	3539	1583	3442	5085	1583	3442	5054	169
Grp Volume(v), veh/h	121	896	133	414	644	843	134	1866	642	609	1024	554
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1721	1770	1583	1721	1695	1583	1721	1695	1833
Q Serve(g_s), s	10.0	33.0	1.6	16.0	23.9	26.1	5.6	49.5	33.2	24.6	32.9	33.0
Cycle Q Clear(g_c), s	10.0	33.0	1.6	16.0	23.9	26.1	5.6	49.5	33.2	24.6	32.9	33.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	166	779	459	367	826	738	252	1680	687	814	1672	904
V/C Ratio(X)	0.73	1.15	0.29	1.13	0.78	1.14	0.53	1.11	0.94	0.75	0.61	0.61
Avail Cap(c_a), veh/h	166	779	459	367	826	738	252	1680	687	826	1672	904
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.74	0.74	0.74	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	66.2	58.5	21.9	61.6	42.4	12.8	67.0	50.2	19.8	53.1	27.6	27.7
Incr Delay (d2), s/veh	15.7	82.4	0.4	80.4	3.7	76.0	2.4	59.0	21.7	3.9	1.7	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	25.0	3.0	11.7	12.1	28.7	2.8	32.4	18.5	12.2	15.8	17.4
LnGrp Delay(d),s/veh	81.9	140.9	22.3	142.1	46.1	88.8	69.5	109.2	41.5	57.0	29.3	30.8
LnGrp LOS	F	F	C	F	D	F	E	F	D	E	C	C
Approach Vol, veh/h		1150			1901			2642			2187	
Approach Delay, s/veh		120.9			85.9			90.8			37.4	
Approach LOS		F			F			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	39.5	53.5	20.0	37.0	15.0	78.0	18.0	39.0
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0	6.5	6.5	7.0	7.0
Max Green Setting (Gmax), s	33.5	46.5	13.0	30.0	8.5	71.5	11.0	32.0
Max Q Clear Time (g_c+I1), s	26.6	51.5	18.0	35.0	7.6	35.0	12.0	28.1
Green Ext Time (p_c), s	2.0	0.0	0.0	0.0	0.4	17.0	0.0	3.6

Intersection Summary	
HCM 2010 Ctrl Delay	79.2
HCM 2010 LOS	E

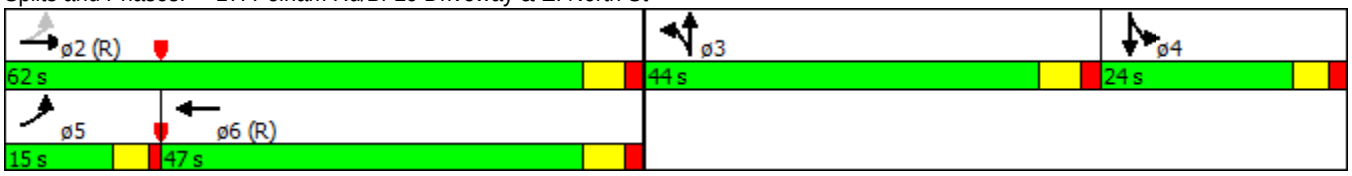
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	43	466	571	0	927	20	601	25	38	46	42	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	250		0	450		0	0		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1770	3539	1583	0	5070	0	3433	1695	0	1770	1747	0
Flt Permitted	0.183						0.950			0.950		
Satd. Flow (perm)	341	3539	1583	0	5070	0	3433	1695	0	1770	1747	0
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			634		3			42				
Link Speed (mph)		35			35			45			20	
Link Distance (ft)		829			1058			970			245	
Travel Time (s)		16.1			20.6			14.7			8.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	48	518	634	0	1052	0	668	70	0	51	80	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			18			24			12	
Link Offset(ft)		0			0			-24			-18	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes			Yes				
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA	Free		NA		Split	NA		Split	NA	
Protected Phases	5	2			6		3	3		4	4	
Permitted Phases	2		Free									
Detector Phase	5	2			6		3	3		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0			15.0		8.0	8.0		3.0	3.0	
Minimum Split (s)	15.0	22.0			22.0		15.0	15.0		22.0	22.0	
Total Split (s)	15.0	62.0			47.0		44.0	44.0		24.0	24.0	
Total Split (%)	11.5%	47.7%			36.2%		33.8%	33.8%		18.5%	18.5%	
Maximum Green (s)	10.5	56.0			41.0		38.0	38.0		18.5	18.5	
Yellow Time (s)	3.5	4.0			4.0		4.0	4.0		3.5	3.5	
All-Red Time (s)	1.0	2.0			2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-0.5	-2.0			-2.0		-2.0	-2.0		-1.5	-1.5	
Total Lost Time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead				Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes				Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max			C-Max		None	None		None	None	
Act Effct Green (s)	71.8	71.8	130.0		62.1		33.4	33.4		12.8	12.8	
Actuated g/C Ratio	0.55	0.55	1.00		0.48		0.26	0.26		0.10	0.10	
v/c Ratio	0.18	0.26	0.40		0.43		0.76	0.15		0.29	0.47	
Control Delay	3.6	2.7	1.5		25.1		50.2	17.1		57.5	63.4	
Queue Delay	0.0	0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay	3.6	2.7	1.5		25.1		50.2	17.1		57.5	63.4	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	A	A		C		D	B		E	E	
Approach Delay		2.1			25.1			47.0			61.1	
Approach LOS		A			C			D			E	
Queue Length 50th (ft)	3	15	17		215		269	18		41	65	
Queue Length 95th (ft)	m5	m39	m28		307		314	53		80	114	
Internal Link Dist (ft)		749			978			890			165	
Turn Bay Length (ft)	100						450					
Base Capacity (vph)	309	1955	1583		2422		1056	550		272	268	
Starvation Cap Reductn	0	0	0		0		0	0		0	0	
Spillback Cap Reductn	0	0	0		0		0	0		0	0	
Storage Cap Reductn	0	0	0		0		0	0		0	0	
Reduced v/c Ratio	0.16	0.26	0.40		0.43		0.63	0.13		0.19	0.30	

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 36 (28%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 23.0 Intersection LOS: C
Intersection Capacity Utilization 55.5% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 17: Pelham Rd/Bi-Lo Driveway & E. North St



HCM 2010 analysis expects strict NEMA phasing.

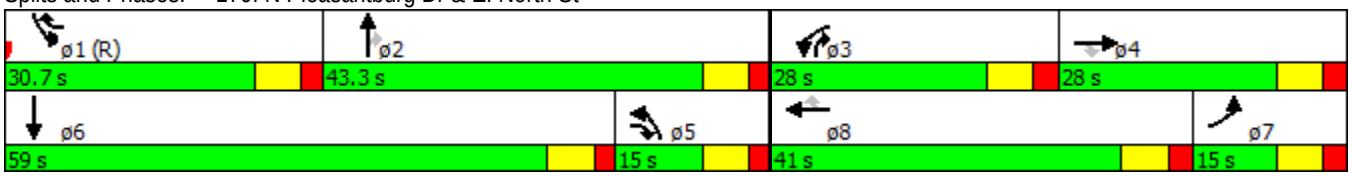
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	89	514	140	505	899	448	152	1050	192	509	1791	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		300	525		475	225		375	425		0
Storage Lanes	1		1	1		2	2		1	2		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1770	3539	1583	3433	3539	2787	3433	5085	1583	3433	5060	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3539	1583	3433	3539	2787	3433	5085	1583	3433	5060	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)						143			147		4	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1214			829			833			749	
Travel Time (s)		23.6			16.1			14.2			12.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	99	571	156	561	999	498	169	1167	213	566	2052	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		18			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane											Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	
Permitted Phases			4			8			2			
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0	5.0	5.0	10.0	5.0	5.0	15.0	5.0	5.0	15.0	
Minimum Split (s)	15.0	23.0	15.0	15.0	23.0	15.0	15.0	22.5	15.0	15.0	22.5	
Total Split (s)	15.0	28.0	15.0	28.0	41.0	30.7	15.0	43.3	28.0	30.7	59.0	
Total Split (%)	11.5%	21.5%	11.5%	21.5%	31.5%	23.6%	11.5%	33.3%	21.5%	23.6%	45.4%	
Maximum Green (s)	8.0	21.0	8.5	21.0	34.0	24.2	8.5	36.8	21.0	24.2	52.5	
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
All-Red Time (s)	2.5	2.5	2.0	2.5	2.5	2.0	2.0	2.0	2.5	2.0	2.0	
Lost Time Adjust (s)	-3.0	-3.0	-2.5	-3.0	-3.0	-2.5	-2.5	-2.5	-3.0	-2.5	-2.5	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	
Recall Mode	None	None	None	None	None	C-Max	None	Max	None	C-Max	Max	
Walk Time (s)		5.0			5.0			5.0			5.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	11.0	24.0	35.0	24.0	37.0	63.7	11.0	39.3	67.3	26.7	55.0	
Actuated g/C Ratio	0.08	0.18	0.27	0.18	0.28	0.49	0.08	0.30	0.52	0.21	0.42	
v/c Ratio	0.66	0.87	0.37	0.89	0.99	0.35	0.58	0.76	0.24	0.80	0.96	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	79.2	66.9	24.2	57.7	67.0	10.1	66.0	44.9	6.2	58.9	48.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	79.2	66.9	24.2	57.7	67.0	10.1	66.0	44.9	6.2	58.9	48.2	
LOS	E	E	C	E	E	B	E	D	A	E	D	
Approach Delay		60.3			50.7			41.9			50.5	
Approach LOS		E			D			D			D	
Queue Length 50th (ft)	82	248	69	215	465	39	72	326	27	236	604	
Queue Length 95th (ft)	#161	#344	111	#331	#602	156	110	383	70	303	#723	
Internal Link Dist (ft)		1134			749			753			669	
Turn Bay Length (ft)	150		300	525		475	225		375	425		
Base Capacity (vph)	149	653	426	633	1007	1438	290	1537	890	705	2143	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.66	0.87	0.37	0.89	0.99	0.35	0.58	0.76	0.24	0.80	0.96	

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 24 (18%), Referenced to phase 1:SBL, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 49.8 Intersection LOS: D
Intersection Capacity Utilization 83.3% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 170: N Pleasantburg Dr & E. North St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	89	514	140	505	899	448	152	1050	192	509	1791	56
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	99	571	156	561	999	498	169	1167	213	566	1990	62
Adj No. of Lanes	1	2	1	2	2	2	2	3	1	2	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	150	653	420	635	1007	1336	291	1571	787	684	2144	67
Arrive On Green	0.08	0.18	0.18	0.06	0.09	0.09	0.08	0.31	0.31	0.20	0.42	0.40
Sat Flow, veh/h	1774	3539	1583	3442	3539	2787	3442	5085	1583	3442	5068	158
Grp Volume(v), veh/h	99	571	156	561	999	498	169	1167	213	566	1330	722
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1721	1770	1393	1721	1695	1583	1721	1695	1835
Q Serve(g_s), s	7.0	20.4	2.8	21.0	36.7	10.0	6.1	26.8	10.2	20.5	48.4	48.6
Cycle Q Clear(g_c), s	7.0	20.4	2.8	21.0	36.7	10.0	6.1	26.8	10.2	20.5	48.4	48.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	150	653	420	635	1007	1336	291	1571	787	684	1434	776
V/C Ratio(X)	0.66	0.87	0.37	0.88	0.99	0.37	0.58	0.74	0.27	0.83	0.93	0.93
Avail Cap(c_a), veh/h	150	653	420	635	1007	1336	291	1571	787	707	1434	776
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.81	0.81	0.81	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.7	51.5	16.4	59.6	58.7	11.4	57.3	40.3	19.0	49.9	35.6	35.8
Incr Delay (d2), s/veh	10.8	12.7	0.7	11.7	23.4	0.2	3.2	3.2	0.8	8.1	11.8	19.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	11.1	2.8	11.1	21.3	3.9	3.1	13.0	4.6	10.5	24.9	28.8
LnGrp Delay(d),s/veh	68.5	64.2	17.1	71.3	82.2	11.6	60.5	43.5	19.8	58.0	47.4	54.9
LnGrp LOS	E	E	B	E	F	B	E	D	B	E	D	D
Approach Vol, veh/h		826			2058			1549			2618	
Approach Delay, s/veh		55.8			62.1			42.1			51.7	
Approach LOS		E			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	29.8	44.2	28.0	28.0	15.0	59.0	15.0	41.0
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0	6.5	6.5	7.0	7.0
Max Green Setting (Gmax), s	24.2	36.8	21.0	21.0	8.5	52.5	8.0	34.0
Max Q Clear Time (g_c+I1), s	22.5	28.8	23.0	22.4	8.1	50.6	9.0	38.7
Green Ext Time (p_c), s	0.5	5.7	0.0	0.0	0.0	1.7	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	53.1
HCM 2010 LOS	D

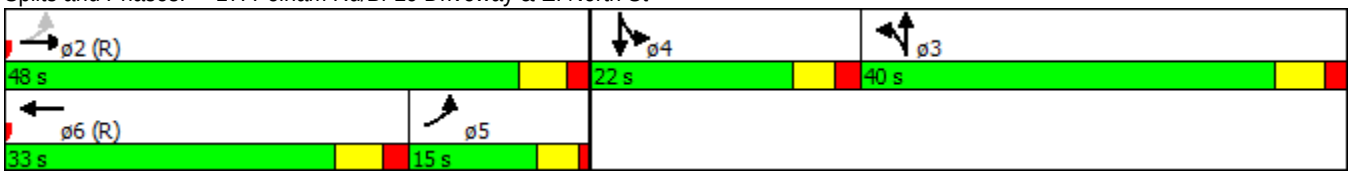
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	122	866	632	0	514	31	699	75	68	60	67	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	250		0	450		0	0		0
Storage Lanes	1		1	0		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1770	3539	1583	0	5045	0	3433	1729	0	1770	1727	0
Flt Permitted	0.343						0.950			0.950		
Satd. Flow (perm)	639	3539	1583	0	5045	0	3433	1729	0	1770	1727	0
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			499		8			45				
Link Speed (mph)		35			35			45			20	
Link Distance (ft)		829			1058			970			245	
Travel Time (s)		16.1			20.6			14.7			8.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	136	962	702	0	605	0	777	159	0	67	144	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			18			24			12	
Link Offset(ft)		0			0			-24			-18	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes			Yes				
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA	Free		NA		Split	NA		Split	NA	
Protected Phases	5	2			6		3	3		4	4	
Permitted Phases	2		Free									
Detector Phase	5	2			6		3	3		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0			15.0		8.0	8.0		3.0	3.0	
Minimum Split (s)	15.0	22.0			22.0		15.0	15.0		22.0	22.0	
Total Split (s)	15.0	48.0			33.0		40.0	40.0		22.0	22.0	
Total Split (%)	13.6%	43.6%			30.0%		36.4%	36.4%		20.0%	20.0%	
Maximum Green (s)	10.5	42.0			27.0		34.0	34.0		16.5	16.5	
Yellow Time (s)	3.5	4.0			4.0		4.0	4.0		3.5	3.5	
All-Red Time (s)	1.0	2.0			2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-0.5	-2.0			-2.0		-2.0	-2.0		-1.5	-1.5	
Total Lost Time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lag				Lead		Lag	Lag		Lead	Lead	
Lead-Lag Optimize?	Yes				Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max			C-Max		None	None		None	None	
Act Effct Green (s)	50.1	50.1	110.0		35.1		32.7	32.7		15.2	15.2	
Actuated g/C Ratio	0.46	0.46	1.00		0.32		0.30	0.30		0.14	0.14	
v/c Ratio	0.34	0.60	0.44		0.38		0.76	0.29		0.27	0.61	
Control Delay	15.8	14.7	0.4		30.7		40.2	21.7		44.4	55.1	
Queue Delay	0.0	0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay	15.8	14.7	0.4		30.7		40.2	21.7		44.4	55.1	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	B	A		C		D	C		D	E	
Approach Delay		9.2			30.7			37.0			51.7	
Approach LOS		A			C			D			D	
Queue Length 50th (ft)	37	188	0		122		251	59		43	96	
Queue Length 95th (ft)	m52	m257	m0		166		312	111		84	159	
Internal Link Dist (ft)		749			978			890			165	
Turn Bay Length (ft)	100						450					
Base Capacity (vph)	403	1610	1583		1613		1123	596		289	282	
Starvation Cap Reductn	0	0	0		0		0	0		0	0	
Spillback Cap Reductn	0	0	0		0		0	0		0	0	
Storage Cap Reductn	0	0	0		0		0	0		0	0	
Reduced v/c Ratio	0.34	0.60	0.44		0.38		0.69	0.27		0.23	0.51	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 32 (29%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 22.7 Intersection LOS: C
Intersection Capacity Utilization 61.3% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 17: Pelham Rd/Bi-Lo Driveway & E. North St



HCM 2010 analysis expects strict NEMA phasing.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	109	806	120	373	580	759	121	1679	578	548	1374	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		300	525		475	225		375	425		0
Storage Lanes	1		1	1		2	2		1	2		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1770	3539	1583	3433	3539	2787	3433	5085	1583	3433	5060	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3539	1583	3433	3539	2787	3433	5085	1583	3433	5060	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)						104			238		5	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1214			829			833			749	
Travel Time (s)		23.6			16.1			14.2			12.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	121	896	133	414	644	843	134	1866	642	609	1578	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		18			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane											Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	
Permitted Phases			4			8			2			
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0	5.0	5.0	10.0	5.0	5.0	15.0	5.0	5.0	15.0	
Minimum Split (s)	15.0	23.0	15.0	15.0	23.0	15.0	15.0	22.5	15.0	15.0	22.5	
Total Split (s)	15.0	29.0	15.0	17.0	31.0	23.0	15.0	41.0	17.0	23.0	49.0	
Total Split (%)	13.6%	26.4%	13.6%	15.5%	28.2%	20.9%	13.6%	37.3%	15.5%	20.9%	44.5%	
Maximum Green (s)	8.0	22.0	8.5	10.0	24.0	16.5	8.5	34.5	10.0	16.5	42.5	
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
All-Red Time (s)	2.5	2.5	2.0	2.5	2.5	2.0	2.0	2.0	2.5	2.0	2.0	
Lost Time Adjust (s)	-3.0	-3.0	-2.5	-3.0	-3.0	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.5	4.0	4.0	
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lag	Lag	Lead	Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	
Recall Mode	None	None	None	None	None	C-Max	None	Max	None	C-Max	Max	
Walk Time (s)		5.0			5.0			5.0			5.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	11.0	25.0	40.0	13.0	27.0	46.0	11.0	37.0	53.5	19.0	45.0	
Actuated g/C Ratio	0.10	0.23	0.36	0.12	0.25	0.42	0.10	0.34	0.49	0.17	0.41	
v/c Ratio	0.68	1.11	0.23	1.02	0.74	0.69	0.39	1.09	0.72	1.03	0.76	

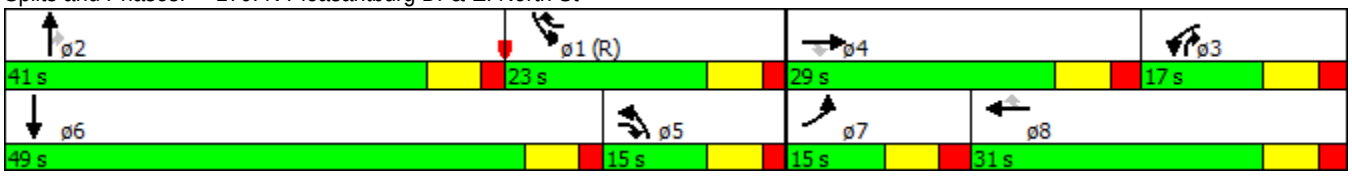
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	68.1	107.9	25.7	86.2	31.0	10.2	50.0	86.5	18.8	89.6	30.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	68.1	107.9	25.7	86.2	31.0	10.2	50.0	86.5	18.8	89.6	30.8	
LOS	E	F	C	F	C	B	D	F	B	F	C	
Approach Delay		94.2			33.8			68.2			47.2	
Approach LOS		F			C			E			D	
Queue Length 50th (ft)	84	~382	65	~163	180	91	46	~545	222	~237	342	
Queue Length 95th (ft)	#169	#510	112	#253	225	145	77	#642	369	#349	402	
Internal Link Dist (ft)		1134			749			753			669	
Turn Bay Length (ft)	150		300	525		475	225		375	425		
Base Capacity (vph)	177	804	575	405	868	1225	343	1710	892	592	2072	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.68	1.11	0.23	1.02	0.74	0.69	0.39	1.09	0.72	1.03	0.76	

Intersection Summary	
Area Type:	Other
Cycle Length: 110	
Actuated Cycle Length: 110	
Offset: 108 (98%), Referenced to phase 1:SBL, Start of Green	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.11	
Intersection Signal Delay: 57.9	Intersection LOS: E
Intersection Capacity Utilization 94.3%	ICU Level of Service F
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 170: N Pleasantburg Dr & E. North St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	109	806	120	373	580	759	121	1679	578	548	1374	46
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	121	896	133	414	644	843	134	1866	642	609	1527	51
Adj No. of Lanes	1	2	1	2	2	2	2	3	1	2	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	177	804	511	407	869	1153	344	1711	712	594	2068	69
Arrive On Green	0.10	0.23	0.22	0.20	0.41	0.40	0.10	0.34	0.34	0.17	0.41	0.39
Sat Flow, veh/h	1774	3539	1583	3442	3539	2787	3442	5085	1583	3442	5054	169
Grp Volume(v), veh/h	121	896	133	414	644	843	134	1866	642	609	1024	554
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1721	1770	1393	1721	1695	1583	1721	1695	1833
Q Serve(g_s), s	7.2	25.0	0.0	13.0	17.0	6.0	4.0	37.0	28.8	19.0	28.1	28.2
Cycle Q Clear(g_c), s	7.2	25.0	0.0	13.0	17.0	6.0	4.0	37.0	28.8	19.0	28.1	28.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	177	804	511	407	869	1153	344	1711	712	594	1387	750
V/C Ratio(X)	0.68	1.11	0.26	1.02	0.74	0.73	0.39	1.09	0.90	1.02	0.74	0.74
Avail Cap(c_a), veh/h	177	804	511	407	869	1153	344	1711	712	594	1387	750
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.78	0.78	0.78	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.8	42.5	27.5	44.1	29.5	7.8	46.4	36.5	28.0	45.5	27.5	27.6
Incr Delay (d2), s/veh	10.7	67.8	0.3	43.9	2.8	2.0	0.9	51.0	16.7	43.3	3.6	6.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	19.8	3.0	8.6	8.5	4.8	1.9	25.3	15.8	12.6	13.8	15.5
LnGrp Delay(d),s/veh	58.5	110.3	27.9	88.1	32.3	9.8	47.2	87.5	44.7	88.8	31.1	34.1
LnGrp LOS	E	F	C	F	C	A	D	F	D	F	C	C
Approach Vol, veh/h		1150			1901			2642			2187	
Approach Delay, s/veh		95.3			34.4			75.1			47.9	
Approach LOS		F			C			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	23.0	41.0	17.0	29.0	15.0	49.0	15.0	31.0
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0	6.5	6.5	7.0	7.0
Max Green Setting (Gmax), s	16.5	34.5	10.0	22.0	8.5	42.5	8.0	24.0
Max Q Clear Time (g_c+I1), s	21.0	39.0	15.0	27.0	6.0	30.2	9.2	19.0
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.9	8.5	0.0	4.0

Intersection Summary	
HCM 2010 Ctrl Delay	60.7
HCM 2010 LOS	E

#18 Laurens Road at Verdae Boulevard / E. Parkins Mill Road

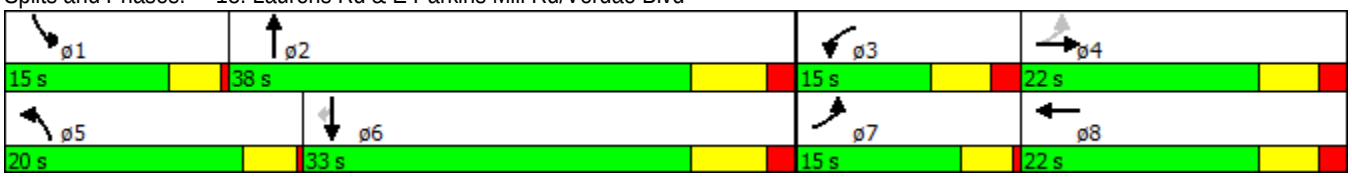
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	247	226	94	200	220	62	158	1791	479	85	804	318
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			2%			2%			-3%	
Storage Length (ft)	325		100	300		250	350		175	250		150
Storage Lanes	1		1	1		1	1		1	2		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1787	3417	0	3399	1844	1567	1752	5034	1567	3485	5162	1607
Flt Permitted	0.308			0.950			0.950			0.950		
Satd. Flow (perm)	579	3417	0	3399	1844	1567	1752	5034	1567	3485	5162	1607
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		63				291			291			353
Link Speed (mph)		35			45			40			40	
Link Distance (ft)		1549			720			907			403	
Travel Time (s)		30.2			10.9			15.5			6.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	274	355	0	222	244	69	176	1990	532	94	893	353
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes				
Headway Factor	0.99	0.99	0.99	1.01	1.01	1.01	1.01	1.01	1.01	0.98	0.98	0.98
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA		Prot	NA	Free	Prot	NA	Free	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4					Free			Free			6
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	3.0	5.0		3.0	5.0		3.0	15.0		4.0	15.0	15.0
Minimum Split (s)	15.0	22.0		15.0	22.0		15.0	22.0		15.0	22.0	22.0
Total Split (s)	15.0	22.0		15.0	22.0		20.0	38.0		15.0	33.0	33.0
Total Split (%)	16.7%	24.4%		16.7%	24.4%		22.2%	42.2%		16.7%	36.7%	36.7%
Maximum Green (s)	11.0	16.0		9.0	16.0		16.0	31.0		11.0	26.0	26.0
Yellow Time (s)	3.5	4.0		4.0	4.0		3.5	5.0		3.5	5.0	5.0
All-Red Time (s)	0.5	2.0		2.0	2.0		0.5	2.0		0.5	2.0	2.0
Lost Time Adjust (s)	0.0	-2.0		-2.0	-2.0		0.0	-3.0		0.0	-3.0	-3.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	4.5		2.0	4.5	4.5
Recall Mode	None	None		None	None		None	Max		None	Max	Max
Act Effct Green (s)	27.4	16.6		10.4	16.3	84.6	12.3	36.8	84.6	6.7	29.2	29.2
Actuated g/C Ratio	0.32	0.20		0.12	0.19	1.00	0.15	0.43	1.00	0.08	0.35	0.35
v/c Ratio	0.80	0.49		0.53	0.69	0.04	0.69	0.91	0.34	0.34	0.50	0.45
Control Delay	41.3	27.7		40.8	43.5	0.0	49.5	31.5	0.6	41.5	24.0	4.7
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	41.3	27.7		40.8	43.5	0.0	49.5	31.5	0.6	41.5	24.0	4.7
LOS	D	C		D	D	A	D	C	A	D	C	A
Approach Delay		33.7			36.8			26.6			20.1	
Approach LOS		C			D			C			C	
Queue Length 50th (ft)	108	73		59	123	0	92	382	0	25	142	0
Queue Length 95th (ft)	#207	120		98	209	0	160	#523	0	50	191	59
Internal Link Dist (ft)		1469			640			827			323	
Turn Bay Length (ft)	325			300		250	350		175	250		150
Base Capacity (vph)	347	779		444	394	1567	332	2189	1567	455	1781	785
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.46		0.50	0.62	0.04	0.53	0.91	0.34	0.21	0.50	0.45

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 84.6	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 26.8	Intersection LOS: C
Intersection Capacity Utilization 76.5%	ICU Level of Service D
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 18: Laurens Rd & E Parkins Mill Rd/Verdae Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	247	226	94	200	220	62	158	1791	479	85	804	318
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1919	1844	1844	1844	1844	1844	1844	1891	1891	1891
Adj Flow Rate, veh/h	274	251	104	222	244	0	176	1990	0	94	893	353
Adj No. of Lanes	1	2	0	2	1	1	1	3	1	2	3	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	377	529	213	380	348	295	213	2181	679	159	1844	574
Arrive On Green	0.14	0.21	0.19	0.11	0.19	0.00	0.12	0.43	0.00	0.05	0.36	0.36
Sat Flow, veh/h	1792	2489	1003	3407	1844	1568	1756	5034	1568	3493	5162	1607
Grp Volume(v), veh/h	274	178	177	222	244	0	176	1990	0	94	893	353
Grp Sat Flow(s),veh/h/ln	1792	1787	1704	1704	1844	1568	1756	1678	1568	1747	1721	1607
Q Serve(g_s), s	10.3	7.1	7.5	5.0	10.0	0.0	7.9	30.1	0.0	2.1	10.9	14.7
Cycle Q Clear(g_c), s	10.3	7.1	7.5	5.0	10.0	0.0	7.9	30.1	0.0	2.1	10.9	14.7
Prop In Lane	1.00		0.59	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	377	380	362	380	348	295	213	2181	679	159	1844	574
V/C Ratio(X)	0.73	0.47	0.49	0.58	0.70	0.00	0.82	0.91	0.00	0.59	0.48	0.61
Avail Cap(c_a), veh/h	377	396	378	462	409	348	346	2181	679	473	1844	574
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.3	28.0	28.6	34.3	30.8	0.0	34.8	21.6	0.0	38.0	20.3	21.5
Incr Delay (d2), s/veh	6.0	0.9	1.0	0.5	4.3	0.0	3.6	7.3	0.0	1.3	0.9	4.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.7	3.6	3.6	2.4	5.5	0.0	4.1	15.3	0.0	1.1	5.3	7.3
LnGrp Delay(d),s/veh	30.3	28.9	29.7	34.8	35.1	0.0	38.4	28.8	0.0	39.3	21.2	26.3
LnGrp LOS	C	C	C	C	D		D	C		D	C	C
Approach Vol, veh/h		629			466			2166			1340	
Approach Delay, s/veh		29.7			35.0			29.6			23.8	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.7	39.2	13.1	21.2	13.9	33.0	15.0	19.3
Change Period (Y+Rc), s	4.0	7.0	6.0	6.0	4.0	7.0	4.0	6.0
Max Green Setting (Gmax), s	11.0	31.0	9.0	16.0	16.0	26.0	11.0	16.0
Max Q Clear Time (g_c+I1), s	4.1	32.1	7.0	9.5	9.9	16.7	12.3	12.0
Green Ext Time (p_c), s	0.1	0.0	0.1	1.8	0.1	9.2	0.0	1.3

Intersection Summary	
HCM 2010 Ctrl Delay	28.5
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	216	233	135	427	224	163	99	1159	215	146	1690	183
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			2%			2%			-3%	
Storage Length (ft)	325		100	300		250	350		175	250		150
Storage Lanes	1		1	1		1	1		1	2		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1787	3378	0	3399	1844	1567	1752	5034	1567	3485	5162	1607
Flt Permitted	0.361			0.950			0.950			0.950		
Satd. Flow (perm)	679	3378	0	3399	1844	1567	1752	5034	1567	3485	5162	1607
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		115				218			218			133
Link Speed (mph)		35			45			40			40	
Link Distance (ft)		1549			720			907			403	
Travel Time (s)		30.2			10.9			15.5			6.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	240	409	0	474	249	181	110	1288	239	162	1878	203
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes				
Headway Factor	0.99	0.99	0.99	1.01	1.01	1.01	1.01	1.01	1.01	0.98	0.98	0.98
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA		Prot	NA	Free	Prot	NA	Free	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4					Free			Free			6
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	3.0	5.0		3.0	5.0		3.0	15.0		4.0	15.0	15.0
Minimum Split (s)	15.0	22.0		15.0	22.0		15.0	22.0		15.0	22.0	22.0
Total Split (s)	15.0	22.0		16.0	23.0		15.0	37.0		15.0	37.0	37.0
Total Split (%)	16.7%	24.4%		17.8%	25.6%		16.7%	41.1%		16.7%	41.1%	41.1%
Maximum Green (s)	11.0	16.0		10.0	17.0		11.0	30.0		11.0	30.0	30.0
Yellow Time (s)	3.5	4.0		4.0	4.0		3.5	5.0		3.5	5.0	5.0
All-Red Time (s)	0.5	2.0		2.0	2.0		0.5	2.0		0.5	2.0	2.0
Lost Time Adjust (s)	0.0	-2.0		-2.0	-2.0		0.0	-3.0		0.0	-3.0	-3.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	4.5		2.0	4.5	4.5
Recall Mode	None	None		None	None		None	Max		None	Max	Max
Act Effct Green (s)	26.2	15.8		12.0	17.4	86.0	9.0	33.8	86.0	8.3	35.3	35.3
Actuated g/C Ratio	0.30	0.18		0.14	0.20	1.00	0.10	0.39	1.00	0.10	0.41	0.41
v/c Ratio	0.71	0.57		1.00	0.67	0.12	0.60	0.65	0.15	0.48	0.89	0.28
Control Delay	33.1	26.2		80.4	41.7	0.1	51.6	23.8	0.2	42.2	32.1	8.6
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	33.1	26.2		80.4	41.7	0.1	51.6	23.8	0.2	42.2	32.1	8.6
LOS	C	C		F	D	A	D	C	A	D	C	A
Approach Delay		28.8			53.7			22.2			30.7	
Approach LOS		C			D			C			C	
Queue Length 50th (ft)	94	76		~148	128	0	60	213	0	45	374	25
Queue Length 95th (ft)	#162	124		#248	210	0	113	275	0	75	#503	74
Internal Link Dist (ft)		1469			640			827			323	
Turn Bay Length (ft)	325			300		250	350		175	250		150
Base Capacity (vph)	353	800		475	408	1567	224	1977	1567	447	2117	737
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.51		1.00	0.61	0.12	0.49	0.65	0.15	0.36	0.89	0.28

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 86	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.00	
Intersection Signal Delay: 31.7	Intersection LOS: C
Intersection Capacity Utilization 75.2%	ICU Level of Service D
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 18: Laurens Rd & E Parkins Mill Rd/Verdae Blvd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	216	233	135	427	224	163	99	1159	215	146	1690	183
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1919	1844	1844	1844	1844	1844	1844	1891	1891	1891
Adj Flow Rate, veh/h	240	259	150	474	249	0	110	1288	0	162	1878	203
Adj No. of Lanes	1	2	0	2	1	1	1	3	1	2	3	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	375	401	225	496	357	303	139	2064	643	242	2064	643
Arrive On Green	0.13	0.18	0.16	0.15	0.19	0.00	0.08	0.41	0.00	0.07	0.40	0.40
Sat Flow, veh/h	1792	2210	1240	3407	1844	1568	1756	5034	1568	3493	5162	1607
Grp Volume(v), veh/h	240	208	201	474	249	0	110	1288	0	162	1878	203
Grp Sat Flow(s),veh/h/ln	1792	1787	1663	1704	1844	1568	1756	1678	1568	1747	1721	1607
Q Serve(g_s), s	9.1	8.9	9.4	11.4	10.4	0.0	5.1	16.7	0.0	3.7	28.3	7.2
Cycle Q Clear(g_c), s	9.1	8.9	9.4	11.4	10.4	0.0	5.1	16.7	0.0	3.7	28.3	7.2
Prop In Lane	1.00		0.75	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	375	324	302	496	357	303	139	2064	643	242	2064	643
V/C Ratio(X)	0.64	0.64	0.67	0.96	0.70	0.00	0.79	0.62	0.00	0.67	0.91	0.32
Avail Cap(c_a), veh/h	375	390	363	496	425	361	234	2064	643	466	2064	643
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.7	31.3	32.2	35.0	31.0	0.0	37.3	19.3	0.0	37.5	23.4	17.0
Incr Delay (d2), s/veh	2.8	2.6	3.5	29.4	4.0	0.0	3.7	1.4	0.0	1.2	7.4	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	4.6	4.6	7.4	5.7	0.0	2.6	8.0	0.0	1.8	14.8	3.4
LnGrp Delay(d),s/veh	27.5	33.9	35.7	64.4	35.0	0.0	41.1	20.7	0.0	38.7	30.8	18.3
LnGrp LOS	C	C	D	E	C		D	C		D	C	B
Approach Vol, veh/h		649			723			1398			2243	
Approach Delay, s/veh		32.1			54.3			22.3			30.2	
Approach LOS		C			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.7	37.8	16.0	19.0	10.5	37.0	15.0	20.0
Change Period (Y+Rc), s	4.0	7.0	6.0	6.0	4.0	7.0	4.0	6.0
Max Green Setting (Gmax), s	11.0	30.0	10.0	16.0	11.0	30.0	11.0	17.0
Max Q Clear Time (g_c+I1), s	5.7	18.7	13.4	11.4	7.1	30.3	11.1	12.4
Green Ext Time (p_c), s	0.1	11.1	0.0	1.6	0.0	0.0	0.0	1.6

Intersection Summary	
HCM 2010 Ctrl Delay	31.7
HCM 2010 LOS	C

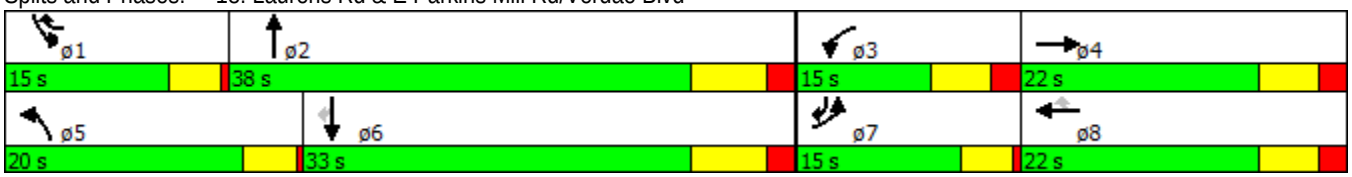
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	247	226	94	200	220	62	158	1791	479	85	804	318
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			2%			2%			-3%	
Storage Length (ft)	325		100	300		250	350		175	250		150
Storage Lanes	2		1	1		1	1		1	2		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	3467	3417	0	3399	1844	1567	1752	5034	1567	3485	5162	1607
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3467	3417	0	3399	1844	1567	1752	5034	1567	3485	5162	1607
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		63				170			291			255
Link Speed (mph)		35			45			40			40	
Link Distance (ft)		1549			720			907			403	
Travel Time (s)		30.2			10.9			15.5			6.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	274	355	0	222	244	69	176	1990	532	94	893	353
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes				
Headway Factor	0.99	0.99	0.99	1.01	1.01	1.01	1.01	1.01	1.01	0.98	0.98	0.98
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	Free	Prot	NA	pm+ov
Protected Phases	7	4		3	8	1	5	2		1	6	7
Permitted Phases						8			Free			6
Detector Phase	7	4		3	8	1	5	2		1	6	7
Switch Phase												
Minimum Initial (s)	3.0	5.0		3.0	5.0	4.0	3.0	15.0		4.0	15.0	3.0
Minimum Split (s)	15.0	22.0		15.0	22.0	15.0	15.0	22.0		15.0	22.0	15.0
Total Split (s)	15.0	22.0		15.0	22.0	15.0	20.0	38.0		15.0	33.0	15.0
Total Split (%)	16.7%	24.4%		16.7%	24.4%	16.7%	22.2%	42.2%		16.7%	36.7%	16.7%
Maximum Green (s)	11.0	16.0		9.0	16.0	11.0	16.0	31.0		11.0	26.0	11.0
Yellow Time (s)	3.5	4.0		4.0	4.0	3.5	3.5	5.0		3.5	5.0	3.5
All-Red Time (s)	0.5	2.0		2.0	2.0	0.5	0.5	2.0		0.5	2.0	0.5
Lost Time Adjust (s)	0.0	-2.0		-2.0	-2.0	0.0	0.0	-3.0		0.0	-3.0	-3.0
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	1.0
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	2.0	3.0		2.0	3.0	2.0	2.0	4.5		2.0	4.5	2.0
Recall Mode	None	None		None	None	None	None	Max		None	Max	None
Act Effct Green (s)	9.9	15.7		10.4	16.2	27.0	12.2	36.9	83.8	6.7	29.3	46.3
Actuated g/C Ratio	0.12	0.19		0.12	0.19	0.32	0.15	0.44	1.00	0.08	0.35	0.55
v/c Ratio	0.67	0.51		0.53	0.68	0.11	0.69	0.90	0.34	0.34	0.49	0.35
Control Delay	45.0	28.2		40.5	43.0	0.4	49.1	30.3	0.6	41.3	23.6	4.5
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	45.0	28.2		40.5	43.0	0.4	49.1	30.3	0.6	41.3	23.6	4.5
LOS	D	C		D	D	A	D	C	A	D	C	A
Approach Delay		35.5			36.4			25.7			19.8	
Approach LOS		D			D			C			B	
Queue Length 50th (ft)	74	73		59	123	0	92	382	0	25	142	25
Queue Length 95th (ft)	118	120		98	209	0	160	#523	0	50	191	73
Internal Link Dist (ft)		1469			640			827			323	
Turn Bay Length (ft)	325			300		250	350		175	250		150
Base Capacity (vph)	458	788		449	399	692	337	2216	1567	460	1805	1020
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.45		0.49	0.61	0.10	0.52	0.90	0.34	0.20	0.49	0.35

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 83.8	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 26.5	Intersection LOS: C
Intersection Capacity Utilization 69.9%	ICU Level of Service C
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 18: Laurens Rd & E Parkins Mill Rd/Verdae Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	247	226	94	200	220	62	158	1791	479	85	804	318
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1919	1844	1844	1844	1844	1844	1844	1891	1891	1891
Adj Flow Rate, veh/h	274	251	104	222	244	69	176	1990	0	94	893	353
Adj No. of Lanes	2	2	0	2	1	1	1	3	1	2	3	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	362	459	185	387	357	335	215	2265	705	161	1929	830
Arrive On Green	0.10	0.18	0.16	0.11	0.19	0.17	0.12	0.45	0.00	0.05	0.37	0.37
Sat Flow, veh/h	3476	2489	1003	3407	1844	1568	1756	5034	1568	3493	5162	1607
Grp Volume(v), veh/h	274	178	177	222	244	69	176	1990	0	94	893	353
Grp Sat Flow(s),veh/h/ln	1738	1787	1704	1704	1844	1568	1756	1678	1568	1747	1721	1607
Q Serve(g_s), s	5.9	7.0	7.4	4.8	9.5	2.8	7.6	27.9	0.0	2.0	10.2	10.6
Cycle Q Clear(g_c), s	5.9	7.0	7.4	4.8	9.5	2.8	7.6	27.9	0.0	2.0	10.2	10.6
Prop In Lane	1.00		0.59	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	362	329	314	387	357	335	215	2265	705	161	1929	830
V/C Ratio(X)	0.76	0.54	0.56	0.57	0.68	0.21	0.82	0.88	0.00	0.59	0.46	0.43
Avail Cap(c_a), veh/h	493	414	395	483	428	395	362	2265	705	495	1929	830
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.8	28.7	29.4	32.6	29.1	25.1	33.2	19.4	0.0	36.3	18.4	11.6
Incr Delay (d2), s/veh	2.8	1.4	1.6	0.5	3.5	0.3	3.0	5.2	0.0	1.3	0.8	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	3.6	3.6	2.3	5.2	1.2	3.8	13.8	0.0	1.0	4.9	5.0
LnGrp Delay(d),s/veh	36.6	30.1	31.0	33.1	32.5	25.4	36.2	24.7	0.0	37.6	19.2	13.2
LnGrp LOS	D	C	C	C	C	C	D	C		D	B	B
Approach Vol, veh/h		629			535			2166			1340	
Approach Delay, s/veh		33.1			31.9			25.6			18.9	
Approach LOS		C			C			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.6	38.9	12.8	18.3	13.5	33.0	12.1	19.0
Change Period (Y+Rc), s	4.0	7.0	6.0	6.0	4.0	7.0	4.0	6.0
Max Green Setting (Gmax), s	11.0	31.0	9.0	16.0	16.0	26.0	11.0	16.0
Max Q Clear Time (g_c+I1), s	4.0	29.9	6.8	9.4	9.6	12.6	7.9	11.5
Green Ext Time (p_c), s	0.1	1.1	0.1	2.0	0.1	13.2	0.2	1.5

Intersection Summary	
HCM 2010 Ctrl Delay	25.4
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	216	233	135	427	224	163	99	1159	215	146	1690	183
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			2%			2%			-3%	
Storage Length (ft)	325		100	300		250	350		175	250		150
Storage Lanes	2		1	1		1	1		1	2		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	3467	3378	0	3399	1844	1567	1752	5034	1567	3485	5162	1607
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3467	3378	0	3399	1844	1567	1752	5034	1567	3485	5162	1607
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		115				97			218			191
Link Speed (mph)		35			45			40			40	
Link Distance (ft)		1549			720			907			403	
Travel Time (s)		30.2			10.9			15.5			6.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	240	409	0	474	249	181	110	1288	239	162	1878	203
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes				
Headway Factor	0.99	0.99	0.99	1.01	1.01	1.01	1.01	1.01	1.01	0.98	0.98	0.98
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	Free	Prot	NA	pm+ov
Protected Phases	7	4		3	8	1	5	2		1	6	7
Permitted Phases						8			Free			6
Detector Phase	7	4		3	8	1	5	2		1	6	7
Switch Phase												
Minimum Initial (s)	3.0	5.0		3.0	5.0	4.0	3.0	15.0		4.0	15.0	3.0
Minimum Split (s)	15.0	22.0		15.0	22.0	15.0	15.0	22.0		15.0	22.0	15.0
Total Split (s)	15.0	22.0		16.0	23.0	15.0	15.0	37.0		15.0	37.0	15.0
Total Split (%)	16.7%	24.4%		17.8%	25.6%	16.7%	16.7%	41.1%		16.7%	41.1%	16.7%
Maximum Green (s)	11.0	16.0		10.0	17.0	11.0	11.0	30.0		11.0	30.0	11.0
Yellow Time (s)	3.5	4.0		4.0	4.0	3.5	3.5	5.0		3.5	5.0	3.5
All-Red Time (s)	0.5	2.0		2.0	2.0	0.5	0.5	2.0		0.5	2.0	0.5
Lost Time Adjust (s)	0.0	-2.0		-2.0	-2.0	-2.0	0.0	-3.0		0.0	-3.0	-3.0
Total Lost Time (s)	4.0	4.0		4.0	4.0	2.0	4.0	4.0		4.0	4.0	1.0
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	2.0	3.0		2.0	3.0	2.0	2.0	4.5		2.0	4.5	2.0
Recall Mode	None	None		None	None	None	None	Max		None	Max	None
Act Effct Green (s)	9.6	15.2		12.1	17.7	32.1	9.0	33.8	85.5	8.3	35.3	51.9
Actuated g/C Ratio	0.11	0.18		0.14	0.21	0.38	0.11	0.40	1.00	0.10	0.41	0.61
v/c Ratio	0.62	0.59		0.99	0.65	0.28	0.60	0.65	0.15	0.48	0.88	0.19
Control Delay	44.2	26.6		78.3	40.7	10.2	51.3	23.5	0.2	41.9	31.4	2.2
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	44.2	26.6		78.3	40.7	10.2	51.3	23.5	0.2	41.9	31.4	2.2
LOS	D	C		E	D	B	D	C	A	D	C	A
Approach Delay		33.1			54.3			22.0			29.5	
Approach LOS		C			D			C			C	
Queue Length 50th (ft)	66	76		~146	127	30	59	211	0	44	370	3
Queue Length 95th (ft)	105	124		#248	210	74	113	275	0	75	#503	31
Internal Link Dist (ft)		1469			640			827			323	
Turn Bay Length (ft)	325			300		250	350		175	250		150
Base Capacity (vph)	447	804		479	411	695	226	1991	1567	450	2130	1074
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.51		0.99	0.61	0.26	0.49	0.65	0.15	0.36	0.88	0.19

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 85.5
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 31.8 — Intersection LOS: C
Intersection Capacity Utilization 74.4% — ICU Level of Service D
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 18: Laurens Rd & E Parkins Mill Rd/Verdae Blvd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	216	233	135	427	224	163	99	1159	215	146	1690	183
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1919	1844	1844	1844	1844	1844	1844	1891	1891	1891
Adj Flow Rate, veh/h	240	259	150	474	249	181	110	1288	0	162	1878	203
Adj No. of Lanes	2	2	0	2	1	1	1	3	1	2	3	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	323	401	225	496	431	513	139	2065	643	242	2065	851
Arrive On Green	0.09	0.18	0.16	0.15	0.23	0.23	0.08	0.41	0.00	0.07	0.40	0.40
Sat Flow, veh/h	3476	2210	1240	3407	1844	1568	1756	5034	1568	3493	5162	1607
Grp Volume(v), veh/h	240	208	201	474	249	181	110	1288	0	162	1878	203
Grp Sat Flow(s),veh/h/ln	1738	1787	1663	1704	1844	1568	1756	1678	1568	1747	1721	1607
Q Serve(g_s), s	5.5	8.9	9.4	11.4	9.9	7.2	5.1	16.7	0.0	3.7	28.3	5.6
Cycle Q Clear(g_c), s	5.5	8.9	9.4	11.4	9.9	7.2	5.1	16.7	0.0	3.7	28.3	5.6
Prop In Lane	1.00		0.75	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	323	324	301	496	431	513	139	2065	643	242	2065	851
V/C Ratio(X)	0.74	0.64	0.67	0.96	0.58	0.35	0.79	0.62	0.00	0.67	0.91	0.24
Avail Cap(c_a), veh/h	464	390	363	496	431	513	234	2065	643	466	2065	851
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.4	31.3	32.2	35.0	28.0	21.1	37.3	19.3	0.0	37.5	23.3	10.5
Incr Delay (d2), s/veh	1.8	2.6	3.5	29.3	1.9	0.4	3.7	1.4	0.0	1.2	7.4	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	4.6	4.6	7.4	5.3	3.2	2.6	8.0	0.0	1.8	14.8	2.6
LnGrp Delay(d),s/veh	38.2	33.9	35.7	64.3	29.9	21.5	41.0	20.7	0.0	38.7	30.8	11.1
LnGrp LOS	D	C	D	E	C	C	D	C		D	C	B
Approach Vol, veh/h		649			904			1398			2243	
Approach Delay, s/veh		36.1			46.3			22.3			29.5	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.7	37.8	16.0	18.9	10.5	37.0	11.7	23.3
Change Period (Y+Rc), s	4.0	7.0	6.0	6.0	4.0	7.0	4.0	6.0
Max Green Setting (Gmax), s	11.0	30.0	10.0	16.0	11.0	30.0	11.0	17.0
Max Q Clear Time (g_c+I1), s	5.7	18.7	13.4	11.4	7.1	30.3	7.5	11.9
Green Ext Time (p_c), s	0.1	11.1	0.0	1.6	0.0	0.0	0.2	2.0

Intersection Summary	
HCM 2010 Ctrl Delay	31.3
HCM 2010 LOS	C

#19 Roper Mountain Road at Frontage Road / Independence Boulevard

19: Roper Mountain Rd & Frontage Rd/Independence Blvd

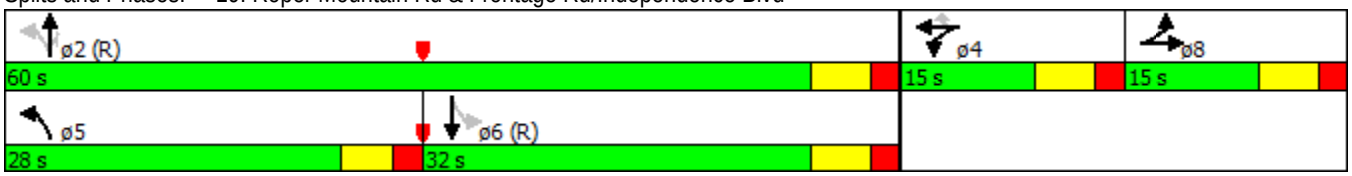
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	34	91	203	17	29	481	672	513	98	821	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			1%			1%			-1%	
Storage Length (ft)	200		50	75		75	150		0	150		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1743	1635	0	1673	1689	1575	1761	3522	1575	1778	3539	0
Flt Permitted	0.950			0.950	0.959		0.123			0.368		
Satd. Flow (perm)	1743	1635	0	1673	1689	1575	228	3522	1575	689	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		101				176			570		4	
Link Speed (mph)		30			30			40			40	
Link Distance (ft)		721			817			374			697	
Travel Time (s)		16.4			18.6			6.4			11.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)				46%								
Lane Group Flow (vph)	11	139	0	122	123	32	534	747	570	109	941	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			30			12	
Link Offset(ft)		0			-12			0			12	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane											Yes	
Headway Factor	1.02	1.02	1.02	1.01	1.01	1.01	1.01	1.01	1.01	0.99	0.99	0.99
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Split	NA		Split	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	8	8		4	4		5	2			6	
Permitted Phases						4	2		2	6		
Detector Phase	8	8		4	4	4	5	2	2	6	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		5.0	5.0	5.0	5.0	25.0	25.0	25.0	25.0	
Minimum Split (s)	15.0	15.0		15.0	15.0	15.0	15.0	31.0	31.0	31.0	31.0	
Total Split (s)	15.0	15.0		15.0	15.0	15.0	28.0	60.0	60.0	32.0	32.0	
Total Split (%)	16.7%	16.7%		16.7%	16.7%	16.7%	31.1%	66.7%	66.7%	35.6%	35.6%	
Maximum Green (s)	9.0	9.0		9.0	9.0	9.0	22.5	54.0	54.0	26.0	26.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	3.5	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0	-1.5	-2.0	-2.0	-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	C-Min	C-Min	
Act Effct Green (s)	9.5	9.5		10.6	10.6	10.6	57.8	57.8	57.8	28.9	28.9	
Actuated g/C Ratio	0.11	0.11		0.12	0.12	0.12	0.64	0.64	0.64	0.32	0.32	
v/c Ratio	0.06	0.53		0.62	0.62	0.09	0.94	0.33	0.47	0.49	0.83	
Control Delay	36.0	20.8		52.1	51.9	0.6	44.9	5.0	2.1	34.5	36.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0	4.1	0.2	0.2	0.0	0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	36.0	20.8		52.1	51.9	0.6	49.0	5.3	2.4	34.5	36.1	
LOS	D	C		D	D	A	D	A	A	C	D	
Approach Delay		21.9			46.1			17.0			35.9	
Approach LOS		C			D			B			D	
Queue Length 50th (ft)	6	20		70	70	0	229	75	27	50	261	
Queue Length 95th (ft)	21	75		#138	#138	0	m#432	86	m30	107	#365	
Internal Link Dist (ft)		641			737			294			617	
Turn Bay Length (ft)	200			75		75	150			150		
Base Capacity (vph)	213	288		204	206	346	571	2263	1215	221	1138	
Starvation Cap Reductn	0	0		0	0	0	18	771	168	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.05	0.48		0.60	0.60	0.09	0.97	0.50	0.54	0.49	0.83	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 25.6 Intersection LOS: C
Intersection Capacity Utilization 77.0% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 19: Roper Mountain Rd & Frontage Rd/Independence Blvd



HCM 2010 Computation does not support turning movement with Shared and Exclusive lanes.

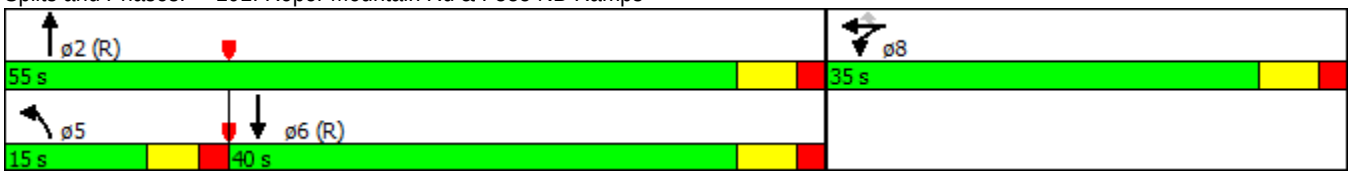
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	540	0	779	263	900	0	0	942	399
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	425		425	0		0	0		0
Storage Lanes	0		0	1		1	2		0	0		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	0	0	0	1681	1681	2787	3433	3539	0	0	3539	1583
Flt Permitted				0.950	0.950		0.950					
Satd. Flow (perm)	0	0	0	1681	1681	2787	3433	3539	0	0	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						185						354
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		603			1090			595			374	
Travel Time (s)		9.1			16.5			10.1			6.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)				50%								
Lane Group Flow (vph)	0	0	0	300	300	866	292	1000	0	0	1047	443
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Split	NA	Perm	Prot	NA			NA	Free
Protected Phases				8	8		5	2			6	
Permitted Phases						8						Free
Detector Phase				8	8	8	5	2			6	
Switch Phase												
Minimum Initial (s)				5.0	5.0	5.0	6.0	25.0			25.0	
Minimum Split (s)				22.0	22.0	22.0	15.0	31.0			31.0	
Total Split (s)				35.0	35.0	35.0	15.0	55.0			40.0	
Total Split (%)				38.9%	38.9%	38.9%	16.7%	61.1%			44.4%	
Maximum Green (s)				29.0	29.0	29.0	9.5	49.0			34.0	
Yellow Time (s)				4.0	4.0	4.0	3.5	4.0			4.0	
All-Red Time (s)				2.0	2.0	2.0	2.0	2.0			2.0	
Lost Time Adjust (s)				-2.0	-2.0	-2.0	-1.5	-2.0			-2.0	
Total Lost Time (s)				4.0	4.0	4.0	4.0	4.0			4.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	
Recall Mode				Min	Min	Min	None	C-Min			C-Min	
Act Effct Green (s)				29.6	29.6	29.6	11.4	52.4			37.0	90.0
Actuated g/C Ratio				0.33	0.33	0.33	0.13	0.58			0.41	1.00
v/c Ratio				0.54	0.54	0.83	0.67	0.49			0.72	0.28
Control Delay				28.5	28.5	29.6	28.4	9.9			15.7	0.3
Queue Delay				0.0	0.0	0.5	0.0	0.0			0.5	0.0
Total Delay				28.5	28.5	30.1	28.4	9.9			16.2	0.3

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS				C	C	C	C	A			B	A
Approach Delay					29.4			14.1			11.5	
Approach LOS					C			B			B	
Queue Length 50th (ft)				138	138	196	81	161			111	0
Queue Length 95th (ft)				225	225	285	101	197			135	m0
Internal Link Dist (ft)		523			1010			515			294	
Turn Bay Length (ft)				425		425						
Base Capacity (vph)				583	583	1087	434	2068			1468	1583
Starvation Cap Reductn				0	0	0	0	0			128	0
Spillback Cap Reductn				0	0	42	0	22			0	0
Storage Cap Reductn				0	0	0	0	0			0	0
Reduced v/c Ratio				0.51	0.51	0.83	0.67	0.49			0.78	0.28

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 88 (98%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 18.5 Intersection LOS: B
Intersection Capacity Utilization 58.8% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 191: Roper Mountain Rd & I-385 NB Ramps



HCM 2010 Computation does not support turning movement with Shared and Exclusive lanes.

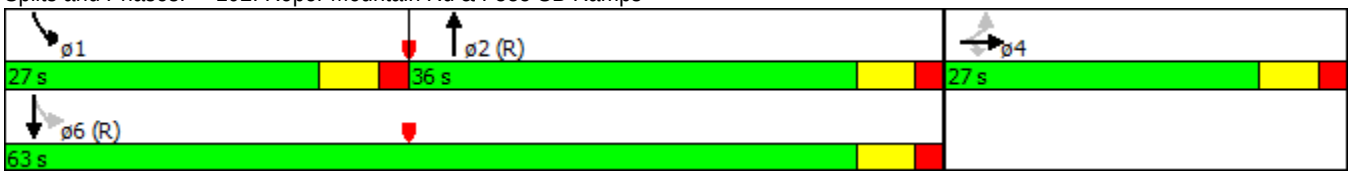
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	396	0	349	0	0	0	0	750	289	307	1117	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	550		550	0		0	0		125	0		0
Storage Lanes	1		2	0		0	0		1	1		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1681	1681	2787	0	0	0	0	5085	1583	1770	3539	0
Flt Permitted	0.950	0.950								0.259		
Satd. Flow (perm)	1681	1681	2787	0	0	0	0	5085	1583	482	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			155						253			
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		1120			1170			384			595	
Travel Time (s)		17.0			17.7			6.5			10.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)	50%											
Lane Group Flow (vph)	220	220	388	0	0	0	0	833	321	341	1241	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Right	Right	Left	Left	Right
Median Width(ft)		12			12			12			18	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes				
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Perm					NA	Free	pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						Free	6		
Detector Phase	4	4	4					2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0					25.0		5.0	25.0	
Minimum Split (s)	15.0	15.0	15.0					31.0		15.0	31.0	
Total Split (s)	27.0	27.0	27.0					36.0		27.0	63.0	
Total Split (%)	30.0%	30.0%	30.0%					40.0%		30.0%	70.0%	
Maximum Green (s)	21.0	21.0	21.0					30.0		21.0	57.0	
Yellow Time (s)	4.0	4.0	4.0					4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0					2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0					-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0	4.0					4.0		4.0	4.0	
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?								Yes		Yes		
Vehicle Extension (s)	3.0	3.0	3.0					3.0		3.0	3.0	
Recall Mode	None	None	None					C-Min		None	C-Min	
Act Effct Green (s)	20.0	20.0	20.0					42.7	90.0	62.0	62.0	
Actuated g/C Ratio	0.22	0.22	0.22					0.47	1.00	0.69	0.69	
v/c Ratio	0.59	0.59	0.52					0.35	0.20	0.62	0.51	
Control Delay	36.9	36.9	19.8					17.4	0.3	10.9	3.9	
Queue Delay	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay	36.9	36.9	19.8					17.4	0.3	10.9	3.9	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	D	D	B					B	A	B	A	
Approach Delay		28.9						12.6			5.4	
Approach LOS		C						B			A	
Queue Length 50th (ft)	118	118	64					101	0	63	64	
Queue Length 95th (ft)	174	174	100					184	0	m274	188	
Internal Link Dist (ft)		1040			1090			304			515	
Turn Bay Length (ft)	550		550						125			
Base Capacity (vph)	445	445	853					2465	1583	662	2471	
Starvation Cap Reductn	0	0	0					0	0	0	101	
Spillback Cap Reductn	0	0	0					0	0	0	0	
Storage Cap Reductn	0	0	0					0	0	0	0	
Reduced v/c Ratio	0.49	0.49	0.45					0.34	0.20	0.52	0.52	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 52 (58%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.62
Intersection Signal Delay: 13.2 Intersection LOS: B
Intersection Capacity Utilization 58.8% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 192: Roper Mountain Rd & I-385 SB Ramps



HCM 2010 Computation does not support turning movement with Shared and Exclusive lanes.

19: Roper Mountain Rd & Frontage Rd/Independence Blvd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	22	16	275	606	27	56	134	1291	189	16	948	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			1%			1%			-1%	
Storage Length (ft)	200		50	75		75	150		0	150		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1743	1574	0	1673	1683	1575	1761	3522	1575	1778	3553	0
Flt Permitted	0.950			0.950	0.956		0.112			0.125		
Satd. Flow (perm)	1743	1574	0	1673	1683	1575	208	3522	1575	234	3553	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		196				176			210		1	
Link Speed (mph)		30			30			40			40	
Link Distance (ft)		721			817			374			697	
Travel Time (s)		16.4			18.6			6.4			11.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)				48%								
Lane Group Flow (vph)	24	324	0	350	353	62	149	1434	210	18	1061	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			30			12	
Link Offset(ft)		0			-12			0			12	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane											Yes	
Headway Factor	1.02	1.02	1.02	1.01	1.01	1.01	1.01	1.01	1.01	0.99	0.99	0.99
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Split	NA		Split	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	8	8		4	4		5	2			6	
Permitted Phases						4	2		2	6		
Detector Phase	8	8		4	4	4	5	2	2	6	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		5.0	5.0	5.0	5.0	25.0	25.0	25.0	25.0	
Minimum Split (s)	15.0	15.0		15.0	15.0	15.0	15.0	31.0	31.0	31.0	31.0	
Total Split (s)	15.0	15.0		25.0	25.0	25.0	15.0	50.0	50.0	35.0	35.0	
Total Split (%)	16.7%	16.7%		27.8%	27.8%	27.8%	16.7%	55.6%	55.6%	38.9%	38.9%	
Maximum Green (s)	9.0	9.0		19.0	19.0	19.0	9.5	44.0	44.0	29.0	29.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	3.5	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0	-1.5	-2.0	-2.0	-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	C-Min	C-Min	
Act Effct Green (s)	10.8	10.8		20.9	20.9	20.9	46.3	46.3	46.3	32.1	32.1	
Actuated g/C Ratio	0.12	0.12		0.23	0.23	0.23	0.51	0.51	0.51	0.36	0.36	
v/c Ratio	0.11	0.90		0.90	0.91	0.12	0.53	0.79	0.23	0.22	0.84	
Control Delay	36.7	44.5		62.1	62.4	0.5	15.4	21.1	2.4	29.1	34.3	
Queue Delay	0.0	20.7		0.0	0.0	0.0	0.0	1.1	0.0	0.0	1.3	

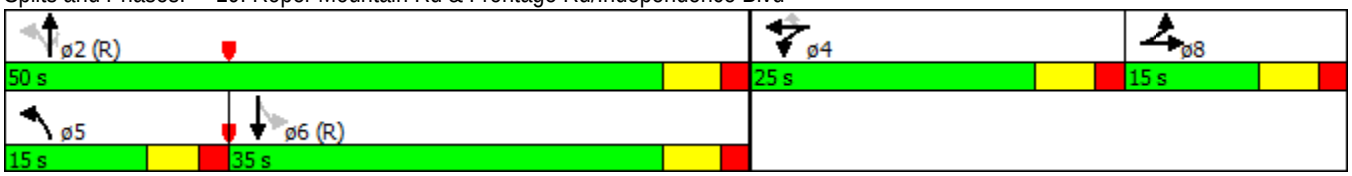
19: Roper Mountain Rd & Frontage Rd/Independence Blvd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	36.7	65.2		62.1	62.4	0.5	15.4	22.2	2.4	29.1	35.6	
LOS	D	E		E	E	A	B	C	A	C	D	
Approach Delay		63.3			57.2			19.4			35.5	
Approach LOS		E			E			B			D	
Queue Length 50th (ft)	12	71		204	206	0	36	452	6	7	292	
Queue Length 95th (ft)	36	#227		#372	#373	0	m59	531	m17	27	#407	
Internal Link Dist (ft)		641			737			294			617	
Turn Bay Length (ft)	200			75		75	150			150		
Base Capacity (vph)	213	364		390	392	502	297	1811	911	83	1267	
Starvation Cap Reductn	0	0		0	0	0	0	175	0	0	0	
Spillback Cap Reductn	0	44		0	0	0	0	0	0	0	75	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.11	1.01		0.90	0.90	0.12	0.50	0.88	0.23	0.22	0.89	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 12 (13%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 34.8 Intersection LOS: C
Intersection Capacity Utilization 105.2% ICU Level of Service G
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 19: Roper Mountain Rd & Frontage Rd/Independence Blvd



HCM 2010 Computation does not support turning movement with Shared and Exclusive lanes.

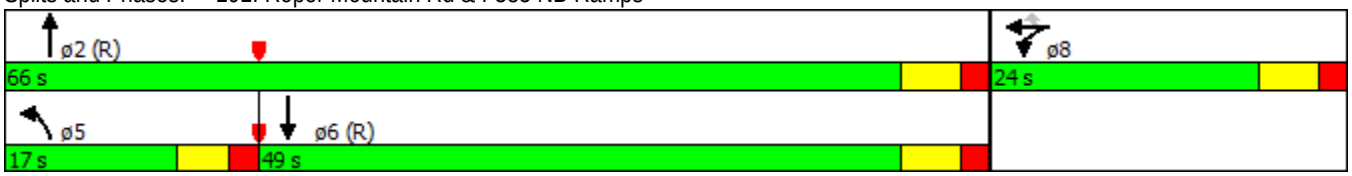
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	570	0	532	388	1139	0	0	1463	608
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	425		425	0		0	0		0
Storage Lanes	0		0	1		1	2		0	0		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	0	0	0	1681	1681	2787	3433	3539	0	0	3539	1583
Flt Permitted				0.950	0.950		0.950					
Satd. Flow (perm)	0	0	0	1681	1681	2787	3433	3539	0	0	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						168						347
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		576			1090			595			374	
Travel Time (s)		8.7			16.5			10.1			6.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)				50%								
Lane Group Flow (vph)	0	0	0	316	317	591	431	1266	0	0	1626	676
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Split	NA	Perm	Prot	NA			NA	Free
Protected Phases				8	8		5	2			6	
Permitted Phases						8						Free
Detector Phase				8	8	8	5	2			6	
Switch Phase												
Minimum Initial (s)				5.0	5.0	5.0	6.0	25.0			25.0	
Minimum Split (s)				22.0	22.0	22.0	15.0	31.0			31.0	
Total Split (s)				24.0	24.0	24.0	17.0	66.0			49.0	
Total Split (%)				26.7%	26.7%	26.7%	18.9%	73.3%			54.4%	
Maximum Green (s)				18.0	18.0	18.0	11.5	60.0			43.0	
Yellow Time (s)				4.0	4.0	4.0	3.5	4.0			4.0	
All-Red Time (s)				2.0	2.0	2.0	2.0	2.0			2.0	
Lost Time Adjust (s)				-2.0	-2.0	-2.0	-1.5	-2.0			-2.0	
Total Lost Time (s)				4.0	4.0	4.0	4.0	4.0			4.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	
Recall Mode				Min	Min	Min	None	C-Min			C-Min	
Act Effct Green (s)				19.8	19.8	19.8	13.3	62.2			44.9	90.0
Actuated g/C Ratio				0.22	0.22	0.22	0.15	0.69			0.50	1.00
v/c Ratio				0.86	0.86	0.80	0.85	0.52			0.92	0.43
Control Delay				57.0	57.3	32.6	32.5	7.1			25.6	0.5
Queue Delay				0.0	0.0	0.5	0.0	0.7			17.3	0.0
Total Delay				57.0	57.3	33.1	32.5	7.9			42.9	0.5

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS				E	E	C	C	A			D	A
Approach Delay					45.5			14.1			30.5	
Approach LOS					D			B			C	
Queue Length 50th (ft)				182	183	130	58	238			267	0
Queue Length 95th (ft)				#332	#333	#205	84	147			m#583	m0
Internal Link Dist (ft)		496			1010			515			294	
Turn Bay Length (ft)				425		425						
Base Capacity (vph)				373	373	750	507	2446			1769	1583
Starvation Cap Reductn				0	0	0	0	761			188	0
Spillback Cap Reductn				0	0	21	0	448			0	0
Storage Cap Reductn				0	0	0	0	0			0	0
Reduced v/c Ratio				0.85	0.85	0.81	0.85	0.75			1.03	0.43

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 28.7 Intersection LOS: C
Intersection Capacity Utilization 77.3% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 191: Roper Mountain Rd & I-385 NB Ramps



HCM 2010 Computation does not support turning movement with Shared and Exclusive lanes.

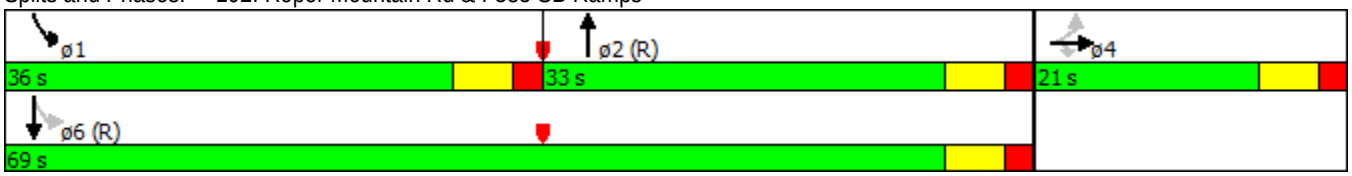
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	273	0	545	0	0	0	0	1073	757	568	978	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	550		550	0		0	0		125	0		0
Storage Lanes	1		2	0		0	0		1	1		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1681	1681	2787	0	0	0	0	5085	1583	1770	3539	0
Flt Permitted	0.950	0.950								0.114		
Satd. Flow (perm)	1681	1681	2787	0	0	0	0	5085	1583	212	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			265						462			
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		1120			1170			384			595	
Travel Time (s)		17.0			17.7			6.5			10.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)	50%											
Lane Group Flow (vph)	151	152	606	0	0	0	0	1192	841	631	1087	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Right	Right	Left	Left	Right
Median Width(ft)		12			12			12			18	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes				
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Perm					NA	Free	pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						Free	6		
Detector Phase	4	4	4					2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0					25.0		5.0	25.0	
Minimum Split (s)	15.0	15.0	15.0					31.0		15.0	31.0	
Total Split (s)	21.0	21.0	21.0					33.0		36.0	69.0	
Total Split (%)	23.3%	23.3%	23.3%					36.7%		40.0%	76.7%	
Maximum Green (s)	15.0	15.0	15.0					27.0		30.0	63.0	
Yellow Time (s)	4.0	4.0	4.0					4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0					2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0					-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0	4.0					4.0		4.0	4.0	
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?								Yes		Yes		
Vehicle Extension (s)	3.0	3.0	3.0					3.0		3.0	3.0	
Recall Mode	None	None	None					C-Min		None	C-Min	
Act Effct Green (s)	16.4	16.4	16.4					31.1	90.0	65.6	65.6	
Actuated g/C Ratio	0.18	0.18	0.18					0.35	1.00	0.73	0.73	
v/c Ratio	0.50	0.50	0.84					0.68	0.53	0.92	0.42	
Control Delay	39.0	39.1	31.4					28.2	1.3	16.5	1.1	
Queue Delay	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay	39.0	39.1	31.4					28.2	1.3	16.5	1.1	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	D	D	C					C	A	B	A	
Approach Delay		33.9						17.1			6.7	
Approach LOS		C						B			A	
Queue Length 50th (ft)	81	82	107					217	0	125	26	
Queue Length 95th (ft)	144	145	#199					269	0	m125	m28	
Internal Link Dist (ft)		1040			1090			304			515	
Turn Bay Length (ft)	550		550						125			
Base Capacity (vph)	320	320	746					1768	1583	708	2587	
Starvation Cap Reductn	0	0	0					0	0	0	0	
Spillback Cap Reductn	0	0	0					0	0	0	0	
Storage Cap Reductn	0	0	0					0	0	0	0	
Reduced v/c Ratio	0.47	0.47	0.81					0.67	0.53	0.89	0.42	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 55 (61%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 16.6 Intersection LOS: B
Intersection Capacity Utilization 77.3% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 192: Roper Mountain Rd & I-385 SB Ramps



HCM 2010 Computation does not support turning movement with Shared and Exclusive lanes.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	34	91	203	17	29	481	672	513	98	821	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			1%			1%			-1%	
Storage Length (ft)	200		50	75		75	150		0	150		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	0	1815	1560	1673	1689	1575	1761	3522	1575	1778	3539	0
Flt Permitted		0.989		0.950	0.959		0.142			0.368		
Satd. Flow (perm)	0	1815	1560	1673	1689	1575	263	3522	1575	689	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			123			198			570		4	
Link Speed (mph)		30			30			40			40	
Link Distance (ft)		721			817			374			697	
Travel Time (s)		16.4			18.6			6.4			11.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)				46%								
Lane Group Flow (vph)	0	49	101	122	123	32	534	747	570	109	941	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			18			12	
Link Offset(ft)		0			-12			0			12	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane											Yes	
Headway Factor	1.02	1.02	1.02	1.01	1.01	1.01	1.01	1.01	1.01	0.99	0.99	0.99
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Split	NA	pm+ov	Split	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	8	8	5	4	4		5	2			6	
Permitted Phases			8			4	2		2	6		
Detector Phase	8	8	5	4	4	4	5	2	2	6	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0	5.0	5.0	5.0	5.0	5.0	25.0	25.0	25.0	25.0	
Minimum Split (s)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	31.0	31.0	31.0	31.0	
Total Split (s)	15.0	15.0	19.0	15.0	15.0	15.0	19.0	50.0	50.0	31.0	31.0	
Total Split (%)	18.8%	18.8%	23.8%	18.8%	18.8%	18.8%	23.8%	62.5%	62.5%	38.8%	38.8%	
Maximum Green (s)	9.0	9.0	13.5	9.0	9.0	9.0	13.5	44.0	44.0	25.0	25.0	
Yellow Time (s)	4.0	4.0	3.5	4.0	4.0	4.0	3.5	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		-2.0	-1.5	-2.0	-2.0	-2.0	-1.5	-2.0	-2.0	-2.0	-2.0	
Total Lost Time (s)		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	C-Min	C-Min	
Act Effct Green (s)		9.5	30.5	10.5	10.5	10.5	52.8	52.8	52.8	27.0	27.0	
Actuated g/C Ratio		0.12	0.38	0.13	0.13	0.13	0.66	0.66	0.66	0.34	0.34	
v/c Ratio		0.23	0.15	0.55	0.55	0.08	0.92	0.32	0.46	0.47	0.79	
Control Delay		34.1	3.0	42.6	42.5	0.4	42.8	6.3	2.1	29.0	29.5	
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		34.1	3.0	42.6	42.5	0.4	42.8	6.5	2.4	29.0	29.5	
LOS		C	A	D	D	A	D	A	A	C	C	
Approach Delay		13.1			37.7			15.7			29.4	
Approach LOS		B			D			B			C	
Queue Length 50th (ft)		23	0	61	61	0	~262	72	18	42	219	
Queue Length 95th (ft)		53	22	116	116	0	m#441	m86	m23	93	292	
Internal Link Dist (ft)		641			737			294			617	
Turn Bay Length (ft)			50	75		75	150			150		
Base Capacity (vph)		249	669	230	232	387	582	2326	1233	232	1197	
Starvation Cap Reductn		0	0	0	0	0	0	699	184	0	0	
Spillback Cap Reductn		0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn		0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.20	0.15	0.53	0.53	0.08	0.92	0.46	0.54	0.47	0.79	

Intersection Summary	
Area Type: Other	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 16 (20%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 21.7	Intersection LOS: C
Intersection Capacity Utilization 72.9%	ICU Level of Service C
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

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

Splits and Phases: 19: Roper Mountain Rd & Frontage Rd/Independence Blvd

HCM 2010 Computation does not support turning movement with Shared and Exclusive lanes.

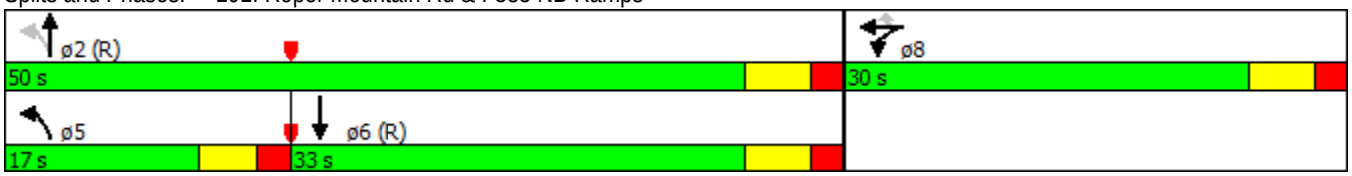
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	540	0	779	263	900	0	0	942	399
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	425		425	0		0	0		0
Storage Lanes	0		0	1		1	1		0	0		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	0	0	0	1681	1681	2787	1770	3539	0	0	5085	1583
Flt Permitted				0.950	0.950		0.152					
Satd. Flow (perm)	0	0	0	1681	1681	2787	283	3539	0	0	5085	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						192						443
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		603			1090			595			374	
Travel Time (s)		9.1			16.5			10.1			6.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)				50%								
Lane Group Flow (vph)	0	0	0	300	300	866	292	1000	0	0	1047	443
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Split	NA	Perm	pm+pt	NA			NA	Free
Protected Phases				8	8		5	2			6	
Permitted Phases						8	2					Free
Detector Phase				8	8	8	5	2			6	
Switch Phase												
Minimum Initial (s)				5.0	5.0	5.0	6.0	25.0			25.0	
Minimum Split (s)				22.0	22.0	22.0	15.0	31.0			31.0	
Total Split (s)				30.0	30.0	30.0	17.0	50.0			33.0	
Total Split (%)				37.5%	37.5%	37.5%	21.3%	62.5%			41.3%	
Maximum Green (s)				24.0	24.0	24.0	11.5	44.0			27.0	
Yellow Time (s)				4.0	4.0	4.0	3.5	4.0			4.0	
All-Red Time (s)				2.0	2.0	2.0	2.0	2.0			2.0	
Lost Time Adjust (s)				-2.0	-2.0	-2.0	-1.5	-2.0			-2.0	
Total Lost Time (s)				4.0	4.0	4.0	4.0	4.0			4.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	
Recall Mode				Min	Min	Min	None	C-Min			C-Min	
Act Effct Green (s)				26.2	26.2	26.2	45.8	45.8			29.4	80.0
Actuated g/C Ratio				0.33	0.33	0.33	0.57	0.57			0.37	1.00
v/c Ratio				0.54	0.54	0.83	0.74	0.49			0.56	0.28
Control Delay				26.2	26.2	27.4	24.2	6.9			10.6	0.4
Queue Delay				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay				26.2	26.2	27.4	24.2	6.9			10.6	0.4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS				C	C	C	C	A			B	A
Approach Delay					26.9			10.8			7.5	
Approach LOS					C			B			A	
Queue Length 50th (ft)				123	123	171	129	130			150	0
Queue Length 95th (ft)				210	210	#292	#213	168			153	m0
Internal Link Dist (ft)		523			1010			515			294	
Turn Bay Length (ft)				425		425						
Base Capacity (vph)				566	566	1066	403	2066			1926	1583
Starvation Cap Reductn				0	0	0	0	0			0	0
Spillback Cap Reductn				0	0	0	0	0			0	0
Storage Cap Reductn				0	0	0	0	0			0	0
Reduced v/c Ratio				0.53	0.53	0.81	0.72	0.48			0.54	0.28

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 35 (44%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 15.2 Intersection LOS: B
Intersection Capacity Utilization 60.4% ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 191: Roper Mountain Rd & I-385 NB Ramps



HCM 2010 Computation does not support turning movement with Shared and Exclusive lanes.

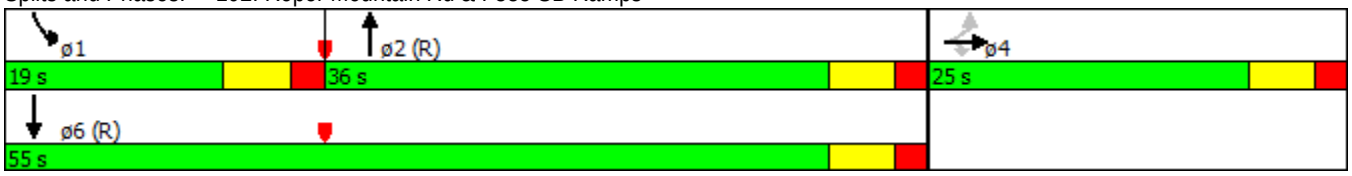
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	396	0	349	0	0	0	0	750	289	307	1117	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	550		550	0		0	0		125	0		0
Storage Lanes	1		2	0		0	0		1	2		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1681	1681	2787	0	0	0	0	5085	1583	3433	3539	0
Flt Permitted	0.950	0.950								0.950		
Satd. Flow (perm)	1681	1681	2787	0	0	0	0	5085	1583	3433	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			144						284			
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		1120			758			384			595	
Travel Time (s)		17.0			11.5			6.5			10.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)	50%											
Lane Group Flow (vph)	220	220	388	0	0	0	0	833	321	341	1241	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Right	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes				
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Perm					NA	Free	Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						Free			
Detector Phase	4	4	4					2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0					25.0		5.0	25.0	
Minimum Split (s)	15.0	15.0	15.0					31.0		15.0	31.0	
Total Split (s)	25.0	25.0	25.0					36.0		19.0	55.0	
Total Split (%)	31.3%	31.3%	31.3%					45.0%		23.8%	68.8%	
Maximum Green (s)	19.0	19.0	19.0					30.0		13.0	49.0	
Yellow Time (s)	4.0	4.0	4.0					4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0					2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0					-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0	4.0					4.0		4.0	4.0	
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?								Yes		Yes		
Vehicle Extension (s)	3.0	3.0	3.0					3.0		3.0	3.0	
Recall Mode	None	None	None					C-Min		None	C-Min	
Act Effct Green (s)	18.7	18.7	18.7					34.9	80.0	14.4	53.3	
Actuated g/C Ratio	0.23	0.23	0.23					0.44	1.00	0.18	0.67	
v/c Ratio	0.56	0.56	0.51					0.38	0.20	0.55	0.53	
Control Delay	31.6	31.6	17.9					17.2	0.3	12.5	5.6	
Queue Delay	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay	31.6	31.6	17.9					17.2	0.3	12.5	5.6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	C	C	B					B	A	B	A	
Approach Delay		25.2						12.5			7.1	
Approach LOS		C						B			A	
Queue Length 50th (ft)	103	103	58					100	0	32	160	
Queue Length 95th (ft)	153	153	90					155	0	116	225	
Internal Link Dist (ft)		1040			678			304			515	
Turn Bay Length (ft)	550		550						125			
Base Capacity (vph)	463	463	872					2306	1583	659	2403	
Starvation Cap Reductn	0	0	0					0	0	0	0	
Spillback Cap Reductn	0	0	0					0	0	0	0	
Storage Cap Reductn	0	0	0					0	0	0	0	
Reduced v/c Ratio	0.48	0.48	0.44					0.36	0.20	0.52	0.52	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.56
Intersection Signal Delay: 13.0 Intersection LOS: B
Intersection Capacity Utilization 60.4% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 192: Roper Mountain Rd & I-385 SB Ramps



HCM 2010 Computation does not support turning movement with Shared and Exclusive lanes.

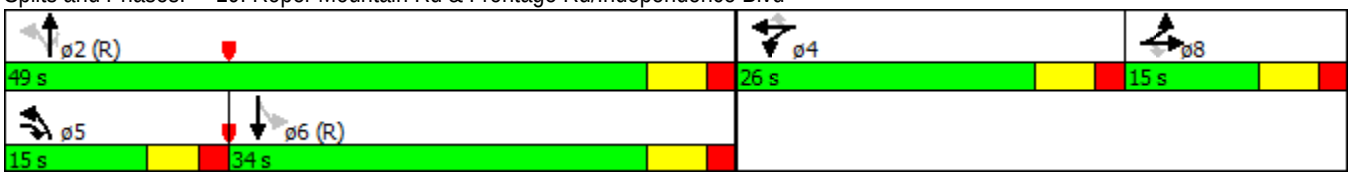
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	22	16	275	606	27	56	134	1291	189	16	948	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			1%			1%			-1%	
Storage Length (ft)	200		50	75		75	150		0	150		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	0	1783	1560	1673	1683	1575	1761	3522	1575	1778	3553	0
Flt Permitted		0.972		0.950	0.956		0.108			0.133		
Satd. Flow (perm)	0	1783	1560	1673	1683	1575	200	3522	1575	249	3553	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109			176			210		1	
Link Speed (mph)		30			30			40			40	
Link Distance (ft)		721			817			374			697	
Travel Time (s)		16.4			18.6			6.4			11.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)				48%								
Lane Group Flow (vph)	0	42	306	350	353	62	149	1434	210	18	1061	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			30			12	
Link Offset(ft)		0			-12			0			12	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane											Yes	
Headway Factor	1.02	1.02	1.02	1.01	1.01	1.01	1.01	1.01	1.01	0.99	0.99	0.99
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Split	NA	pm+ov	Split	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	8	8	5	4	4		5	2			6	
Permitted Phases			8			4	2		2	6		
Detector Phase	8	8	5	4	4	4	5	2	2	6	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0	5.0	5.0	5.0	5.0	5.0	25.0	25.0	25.0	25.0	
Minimum Split (s)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	31.0	31.0	31.0	31.0	
Total Split (s)	15.0	15.0	15.0	26.0	26.0	26.0	15.0	49.0	49.0	34.0	34.0	
Total Split (%)	16.7%	16.7%	16.7%	28.9%	28.9%	28.9%	16.7%	54.4%	54.4%	37.8%	37.8%	
Maximum Green (s)	9.0	9.0	9.5	20.0	20.0	20.0	9.5	43.0	43.0	28.0	28.0	
Yellow Time (s)	4.0	4.0	3.5	4.0	4.0	4.0	3.5	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		-2.0	-1.5	-2.0	-2.0	-2.0	-1.5	-2.0	-2.0	-2.0	-2.0	
Total Lost Time (s)		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	C-Min	C-Min	
Act Effct Green (s)		9.5	20.4	21.5	21.5	21.5	51.9	51.9	51.9	36.1	36.1	
Actuated g/C Ratio		0.11	0.23	0.24	0.24	0.24	0.58	0.58	0.58	0.40	0.40	
v/c Ratio		0.22	0.70	0.88	0.88	0.12	0.47	0.71	0.21	0.18	0.75	
Control Delay		39.4	28.1	57.1	57.1	0.5	22.2	11.6	1.3	27.2	29.0	
Queue Delay		0.0	0.1	3.6	3.6	0.0	0.0	0.4	0.0	0.0	0.2	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		39.4	28.2	60.7	60.7	0.5	22.2	12.0	1.3	27.2	29.2	
LOS		D	C	E	E	A	C	B	A	C	C	
Approach Delay		29.5			55.8			11.6			29.2	
Approach LOS		C			E			B			C	
Queue Length 50th (ft)		22	96	200	202	0	36	220	1	7	290	
Queue Length 95th (ft)		53	179	#360	#361	0	m82	268	m8	27	#420	
Internal Link Dist (ft)		641			737			294			617	
Turn Bay Length (ft)			50	75		75	150			150		
Base Capacity (vph)		217	440	408	411	517	322	2029	996	100	1424	
Starvation Cap Reductn		0	0	0	0	0	0	177	0	0	0	
Spillback Cap Reductn		0	3	22	22	0	0	0	0	0	40	
Storage Cap Reductn		0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.19	0.70	0.91	0.91	0.12	0.46	0.77	0.21	0.18	0.77	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 68 (76%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 26.4 Intersection LOS: C
Intersection Capacity Utilization 90.7% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 19: Roper Mountain Rd & Frontage Rd/Independence Blvd



HCM 2010 Computation does not support turning movement with Shared and Exclusive lanes.

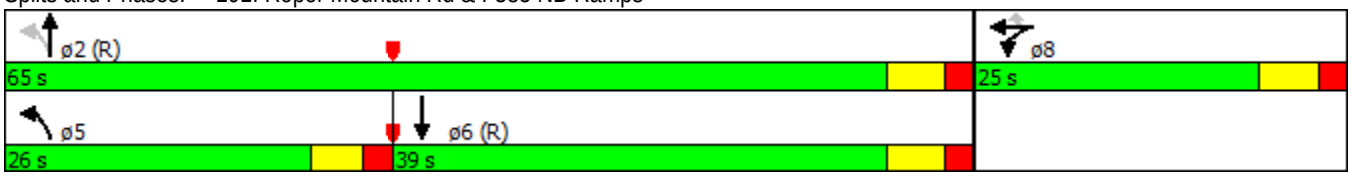
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	570	0	532	388	1139	0	0	1463	608
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	425		425	0		0	0		0
Storage Lanes	0		0	1		1	1		0	0		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	0	0	0	1681	1681	2787	1770	3539	0	0	5085	1583
Flt Permitted				0.950	0.950		0.099					
Satd. Flow (perm)	0	0	0	1681	1681	2787	184	3539	0	0	5085	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						161						499
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		576			1090			595			374	
Travel Time (s)		8.7			16.5			10.1			6.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)				50%								
Lane Group Flow (vph)	0	0	0	316	317	591	431	1266	0	0	1626	676
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Split	NA	Perm	pm+pt	NA			NA	Free
Protected Phases				8	8		5	2			6	
Permitted Phases						8	2					Free
Detector Phase				8	8	8	5	2			6	
Switch Phase												
Minimum Initial (s)				5.0	5.0	5.0	6.0	25.0			25.0	
Minimum Split (s)				22.0	22.0	22.0	15.0	31.0			31.0	
Total Split (s)				25.0	25.0	25.0	26.0	65.0			39.0	
Total Split (%)				27.8%	27.8%	27.8%	28.9%	72.2%			43.3%	
Maximum Green (s)				19.0	19.0	19.0	20.5	59.0			33.0	
Yellow Time (s)				4.0	4.0	4.0	3.5	4.0			4.0	
All-Red Time (s)				2.0	2.0	2.0	2.0	2.0			2.0	
Lost Time Adjust (s)				-2.0	-2.0	-2.0	-1.5	-2.0			-2.0	
Total Lost Time (s)				4.0	4.0	4.0	4.0	4.0			4.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	
Recall Mode				Min	Min	Min	None	C-Min			C-Min	
Act Effct Green (s)				20.5	20.5	20.5	61.5	61.5			37.1	90.0
Actuated g/C Ratio				0.23	0.23	0.23	0.68	0.68			0.41	1.00
v/c Ratio				0.83	0.83	0.78	0.89	0.52			0.78	0.43
Control Delay				52.6	52.8	31.6	24.1	4.6			19.7	0.6
Queue Delay				0.0	0.0	0.0	0.0	0.3			2.7	0.0
Total Delay				52.6	52.8	31.6	24.1	4.9			22.4	0.6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS				D	D	C	C	A			C	A
Approach Delay					42.5			9.7			16.0	
Approach LOS					D			A			B	
Queue Length 50th (ft)				178	180	130	10	12			261	0
Queue Length 95th (ft)				#321	#322	199	12	13			318	m0
Internal Link Dist (ft)		496			1010			515			294	
Turn Bay Length (ft)				425		425						
Base Capacity (vph)				392	392	773	513	2419			2093	1583
Starvation Cap Reductn				0	0	0	0	462			342	0
Spillback Cap Reductn				0	0	1	0	41			0	0
Storage Cap Reductn				0	0	0	0	0			0	0
Reduced v/c Ratio				0.81	0.81	0.77	0.84	0.65			0.93	0.43

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 20.2 Intersection LOS: C
Intersection Capacity Utilization 75.6% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 191: Roper Mountain Rd & I-385 NB Ramps



HCM 2010 Computation does not support turning movement with Shared and Exclusive lanes.

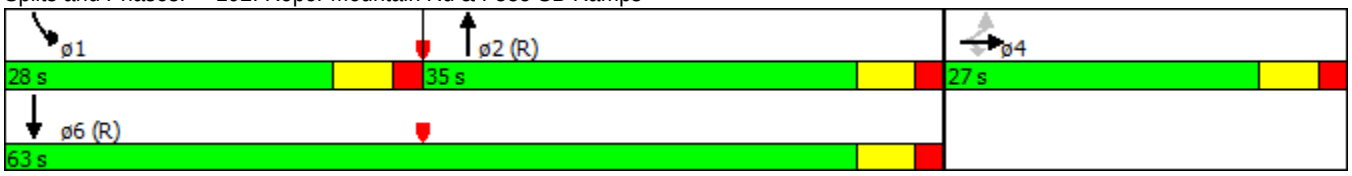
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	273	0	545	0	0	0	0	1073	757	568	978	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	550		550	0		0	0		125	0		0
Storage Lanes	1		2	0		0	0		1	2		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1681	1681	2787	0	0	0	0	5085	1583	3433	3539	0
Flt Permitted	0.950	0.950								0.950		
Satd. Flow (perm)	1681	1681	2787	0	0	0	0	5085	1583	3433	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			215						462			
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		1120			783			384			595	
Travel Time (s)		17.0			11.9			6.5			10.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)	50%											
Lane Group Flow (vph)	151	152	606	0	0	0	0	1192	841	631	1087	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Right	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes				
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Perm					NA	Free	Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						Free			
Detector Phase	4	4	4					2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0					25.0		5.0	25.0	
Minimum Split (s)	15.0	15.0	15.0					31.0		15.0	31.0	
Total Split (s)	27.0	27.0	27.0					35.0		28.0	63.0	
Total Split (%)	30.0%	30.0%	30.0%					38.9%		31.1%	70.0%	
Maximum Green (s)	21.0	21.0	21.0					29.0		22.0	57.0	
Yellow Time (s)	4.0	4.0	4.0					4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0					2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0					-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0	4.0					4.0		4.0	4.0	
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?								Yes		Yes		
Vehicle Extension (s)	3.0	3.0	3.0					3.0		3.0	3.0	
Recall Mode	None	None	None					C-Min		None	C-Min	
Act Effct Green (s)	20.3	20.3	20.3					35.5	90.0	22.3	61.7	
Actuated g/C Ratio	0.23	0.23	0.23					0.39	1.00	0.25	0.69	
v/c Ratio	0.40	0.40	0.76					0.59	0.53	0.74	0.45	
Control Delay	32.2	32.3	27.2					24.1	1.3	13.4	4.2	
Queue Delay	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay	32.2	32.3	27.2					24.1	1.3	13.4	4.2	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	C	C	C					C	A	B	A	
Approach Delay		28.9						14.7			7.6	
Approach LOS		C						B			A	
Queue Length 50th (ft)	74	75	115					205	0	96	108	
Queue Length 95th (ft)	131	132	180					259	0	150	142	
Internal Link Dist (ft)		1040			703			304			515	
Turn Bay Length (ft)	550		550						125			
Base Capacity (vph)	429	429	872					2004	1583	915	2427	
Starvation Cap Reductn	0	0	0					0	0	0	0	
Spillback Cap Reductn	0	0	0					0	0	0	0	
Storage Cap Reductn	0	0	0					0	0	0	0	
Reduced v/c Ratio	0.35	0.35	0.69					0.59	0.53	0.69	0.45	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 52 (58%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 14.8 Intersection LOS: B
Intersection Capacity Utilization 75.6% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 192: Roper Mountain Rd & I-385 SB Ramps



HCM 2010 Computation does not support turning movement with Shared and Exclusive lanes.

#20 Laurens Road at Millennium Boulevard / Fairforest Way

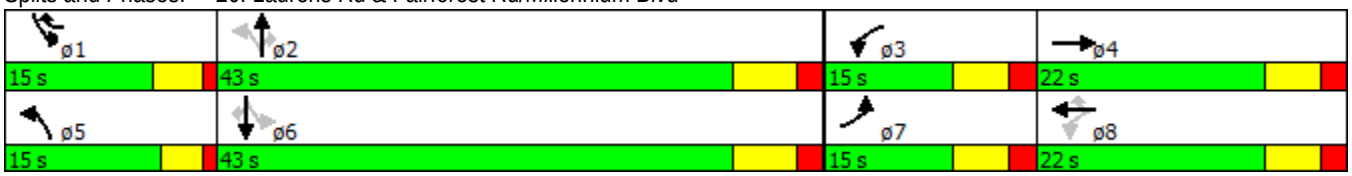
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	176	17	56	4	15	24	195	1406	15	45	874	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			-1%			-1%			-1%	
Storage Length (ft)	325		0	375		400	275		225	450		0
Storage Lanes	2		0	1		1	1		1	1		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	3467	3164	0	1778	1872	2801	1778	3557	1591	1778	3557	1591
Flt Permitted	0.950						0.190			0.102		
Satd. Flow (perm)	3467	3164	0	1872	1872	2801	356	3557	1591	191	3557	1591
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)		62							155			261
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		815			1424			1199			960	
Travel Time (s)		15.9			27.7			20.4			16.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	196	81	0	4	17	27	217	1562	17	50	971	261
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			36			36			36	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA		pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases				8		8	2		2	6		6
Detector Phase	7	4		3	8	1	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	3.0	4.0		6.0	4.0	4.0	6.0	35.0	35.0	4.0	35.0	35.0
Minimum Split (s)	15.0	22.0		15.0	22.0	15.0	15.0	42.0	42.0	15.0	42.0	42.0
Total Split (s)	15.0	22.0		15.0	22.0	15.0	15.0	43.0	43.0	15.0	43.0	43.0
Total Split (%)	15.8%	23.2%		15.8%	23.2%	15.8%	15.8%	45.3%	45.3%	15.8%	45.3%	45.3%
Maximum Green (s)	9.0	16.0		9.0	16.0	10.5	11.0	36.5	36.5	10.5	36.5	36.5
Yellow Time (s)	4.0	4.0		4.0	4.0	3.5	3.0	4.5	4.5	3.5	4.5	4.5
All-Red Time (s)	2.0	2.0		2.0	2.0	1.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-0.5	0.0	-2.5	-2.5	-0.5	-2.5	-2.5
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.0		3.5	3.0	3.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None		None	None	None	None	Max	Max	None	Max	Max
Walk Time (s)		5.0			5.0			5.0	5.0		5.0	5.0
Flash Dont Walk (s)		11.0			11.0			11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	10.0	10.2		9.9	8.3	9.1	51.9	46.2	46.2	46.1	39.4	39.4
Actuated g/C Ratio	0.14	0.14		0.14	0.11	0.12	0.71	0.63	0.63	0.63	0.54	0.54

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.41	0.16		0.02	0.08	0.08	0.50	0.69	0.02	0.19	0.51	0.27
Control Delay	32.8	13.1		25.0	32.4	27.8	8.4	13.9	0.0	6.3	13.0	2.5
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.8	13.1		25.0	32.4	27.8	8.4	13.9	0.0	6.3	13.0	2.5
LOS	C	B		C	C	C	A	B	A	A	B	A
Approach Delay		27.0			29.2			13.1			10.6	
Approach LOS		C			C			B			B	
Queue Length 50th (ft)	40	3		2	7	6	21	234	0	4	123	0
Queue Length 95th (ft)	85	24		9	28	17	77	#557	0	22	266	40
Internal Link Dist (ft)		735			1344			1119			880	
Turn Bay Length (ft)	325			375		400	275		225	450		
Base Capacity (vph)	527	833		312	465	514	472	2249	1063	373	1917	978
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.10		0.01	0.04	0.05	0.46	0.69	0.02	0.13	0.51	0.27

Intersection Summary

Area Type: Other
Cycle Length: 95
Actuated Cycle Length: 73
Natural Cycle: 95
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 13.5 Intersection LOS: B
Intersection Capacity Utilization 63.9% ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 20: Laurens Rd & Fairforest Rd/Millennium Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	176	17	56	4	15	24	195	1406	15	45	874	235
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1919	1872	1872	1872	1872	1872	1872	1872	1872	1872
Adj Flow Rate, veh/h	196	19	62	4	17	27	217	1562	17	50	971	0
Adj No. of Lanes	2	2	0	1	1	2	1	2	1	1	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	370	268	239	255	143	273	425	2004	896	232	1845	825
Arrive On Green	0.11	0.15	0.12	0.03	0.08	0.06	0.09	0.56	0.56	0.04	0.52	0.00
Sat Flow, veh/h	3476	1787	1599	1783	1872	2801	1783	3557	1591	1783	3557	1591
Grp Volume(v), veh/h	196	19	62	4	17	27	217	1562	17	50	971	0
Grp Sat Flow(s),veh/h/ln	1738	1787	1599	1783	1872	1400	1783	1778	1591	1783	1778	1591
Q Serve(g_s), s	4.0	0.7	2.6	0.2	0.6	0.7	4.3	25.7	0.4	1.0	13.6	0.0
Cycle Q Clear(g_c), s	4.0	0.7	2.6	0.2	0.6	0.7	4.3	25.7	0.4	1.0	13.6	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	370	268	239	255	143	273	425	2004	896	232	1845	825
V/C Ratio(X)	0.53	0.07	0.26	0.02	0.12	0.10	0.51	0.78	0.02	0.22	0.53	0.00
Avail Cap(c_a), veh/h	508	428	383	457	448	730	533	2004	896	420	1845	825
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	31.8	27.5	29.2	29.9	32.4	30.9	9.6	12.8	7.2	12.4	12.0	0.0
Incr Delay (d2), s/veh	0.4	0.1	0.6	0.0	0.4	0.2	0.9	3.1	0.0	0.5	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.3	1.2	0.1	0.3	0.3	2.2	13.2	0.2	0.5	6.9	0.0
LnGrp Delay(d),s/veh	32.2	27.6	29.8	29.9	32.7	31.1	10.5	15.9	7.3	12.8	13.1	0.0
LnGrp LOS	C	C	C	C	C	C	B	B	A	B	B	
Approach Vol, veh/h		277			48			1796			1021	
Approach Delay, s/veh		31.4			31.6			15.1			13.0	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.1	46.4	6.5	15.3	10.5	43.0	12.0	9.7
Change Period (Y+Rc), s	4.5	6.5	6.0	6.0	4.0	6.5	6.0	6.0
Max Green Setting (Gmax), s	10.5	36.5	9.0	16.0	11.0	36.5	9.0	16.0
Max Q Clear Time (g_c+I1), s	3.0	27.7	2.2	4.6	6.3	15.6	6.0	2.7
Green Ext Time (p_c), s	0.0	8.6	0.0	0.4	0.2	20.0	0.1	0.4

Intersection Summary	
HCM 2010 Ctrl Delay	16.1
HCM 2010 LOS	B

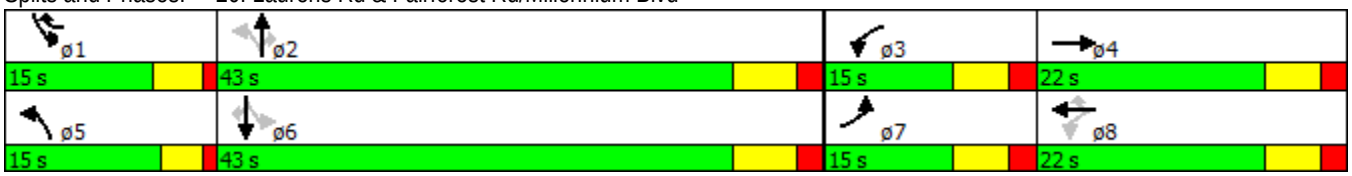
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	215	18	81	20	19	66	104	1257	10	70	1460	183
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			-1%			-1%			-1%	
Storage Length (ft)	325		0	375		400	275		225	450		0
Storage Lanes	2		0	1		1	1		1	1		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	3467	3135	0	1778	1872	2801	1778	3557	1591	1778	3557	1591
Flt Permitted	0.950			0.870			0.104			0.103		
Satd. Flow (perm)	3467	3135	0	1629	1872	2801	195	3557	1591	193	3557	1591
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)		90							155			168
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		815			1424			1199			960	
Travel Time (s)		15.9			27.7			20.4			16.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	239	110	0	22	21	73	116	1397	11	78	1622	203
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			36			36			36	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA		pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases				8		8	2		2	6		6
Detector Phase	7	4		3	8	1	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	3.0	4.0		6.0	4.0	4.0	6.0	35.0	35.0	4.0	35.0	35.0
Minimum Split (s)	15.0	22.0		15.0	22.0	15.0	15.0	42.0	42.0	15.0	42.0	42.0
Total Split (s)	15.0	22.0		15.0	22.0	15.0	15.0	43.0	43.0	15.0	43.0	43.0
Total Split (%)	15.8%	23.2%		15.8%	23.2%	15.8%	15.8%	45.3%	45.3%	15.8%	45.3%	45.3%
Maximum Green (s)	9.0	16.0		9.0	16.0	10.5	11.0	36.5	36.5	10.5	36.5	36.5
Yellow Time (s)	4.0	4.0		4.0	4.0	3.5	3.0	4.5	4.5	3.5	4.5	4.5
All-Red Time (s)	2.0	2.0		2.0	2.0	1.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-0.5	0.0	-2.5	-2.5	-0.5	-2.5	-2.5
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.0		3.5	3.0	3.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None		None	None	None	None	Max	Max	None	Max	Max
Walk Time (s)		5.0			5.0			5.0	5.0		5.0	5.0
Flash Dont Walk (s)		11.0			11.0			11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	10.4	10.4		12.2	8.5	12.2	46.9	40.8	40.8	46.9	40.8	40.8
Actuated g/C Ratio	0.14	0.14		0.17	0.12	0.17	0.64	0.56	0.56	0.64	0.56	0.56

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.48	0.21		0.08	0.10	0.16	0.40	0.70	0.01	0.27	0.82	0.21
Control Delay	34.7	12.2		23.8	33.9	26.3	11.1	17.0	0.0	8.2	21.4	4.1
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.7	12.2		23.8	33.9	26.3	11.1	17.0	0.0	8.2	21.4	4.1
LOS	C	B		C	C	C	B	B	A	A	C	A
Approach Delay		27.6			27.2			16.4			19.0	
Approach LOS		C			C			B			B	
Queue Length 50th (ft)	48	3		8	8	16	11	207	0	7	260	6
Queue Length 95th (ft)	101	28		26	32	35	52	431	0	32	#627	48
Internal Link Dist (ft)		735			1344			1119			880	
Turn Bay Length (ft)	325			375		400	275		225	450		
Base Capacity (vph)	531	853		345	469	607	373	1985	956	372	1983	961
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.13		0.06	0.04	0.12	0.31	0.70	0.01	0.21	0.82	0.21

Intersection Summary

Area Type: Other
Cycle Length: 95
Actuated Cycle Length: 73.2
Natural Cycle: 95
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 19.0 Intersection LOS: B
Intersection Capacity Utilization 68.9% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 20: Laurens Rd & Fairforest Rd/Millennium Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	215	18	81	20	19	66	104	1257	10	70	1460	183
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1919	1872	1872	1872	1872	1872	1872	1872	1872	1872
Adj Flow Rate, veh/h	239	20	90	22	21	73	116	1397	11	78	1622	0
Adj No. of Lanes	2	2	0	1	1	2	1	2	1	1	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	412	265	237	304	160	321	246	1908	854	263	1826	817
Arrive On Green	0.12	0.15	0.12	0.06	0.09	0.07	0.07	0.54	0.54	0.05	0.51	0.00
Sat Flow, veh/h	3476	1787	1599	1783	1872	2801	1783	3557	1591	1783	3557	1591
Grp Volume(v), veh/h	239	20	90	22	21	73	116	1397	11	78	1622	0
Grp Sat Flow(s),veh/h/ln	1738	1787	1599	1783	1872	1400	1783	1778	1591	1783	1778	1591
Q Serve(g_s), s	4.9	0.7	3.9	0.8	0.8	1.8	2.4	22.8	0.2	1.6	31.0	0.0
Cycle Q Clear(g_c), s	4.9	0.7	3.9	0.8	0.8	1.8	2.4	22.8	0.2	1.6	31.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	412	265	237	304	160	321	246	1908	854	263	1826	817
V/C Ratio(X)	0.58	0.08	0.38	0.07	0.13	0.23	0.47	0.73	0.01	0.30	0.89	0.00
Avail Cap(c_a), veh/h	503	424	379	463	444	746	376	1908	854	433	1826	817
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	31.7	27.9	30.1	28.4	32.1	30.6	16.4	13.4	8.2	12.2	16.5	0.0
Incr Delay (d2), s/veh	0.5	0.1	1.0	0.1	0.4	0.4	1.4	2.5	0.0	0.6	6.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.4	1.8	0.4	0.4	0.7	1.3	11.7	0.1	0.8	16.8	0.0
LnGrp Delay(d),s/veh	32.2	28.0	31.1	28.5	32.5	30.9	17.8	16.0	8.2	12.8	23.4	0.0
LnGrp LOS	C	C	C	C	C	C	B	B	A	B	C	
Approach Vol, veh/h		349			116			1524			1700	
Approach Delay, s/veh		31.7			30.7			16.0			22.9	
Approach LOS		C			C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.7	44.8	8.2	15.3	9.5	43.0	13.0	10.5
Change Period (Y+Rc), s	4.5	6.5	6.0	6.0	4.0	6.5	6.0	6.0
Max Green Setting (Gmax), s	10.5	36.5	9.0	16.0	11.0	36.5	9.0	16.0
Max Q Clear Time (g_c+I1), s	3.6	24.8	2.8	5.9	4.4	33.0	6.9	3.8
Green Ext Time (p_c), s	0.1	11.6	0.0	0.6	0.1	3.5	0.1	0.7

Intersection Summary	
HCM 2010 Ctrl Delay	21.2
HCM 2010 LOS	C

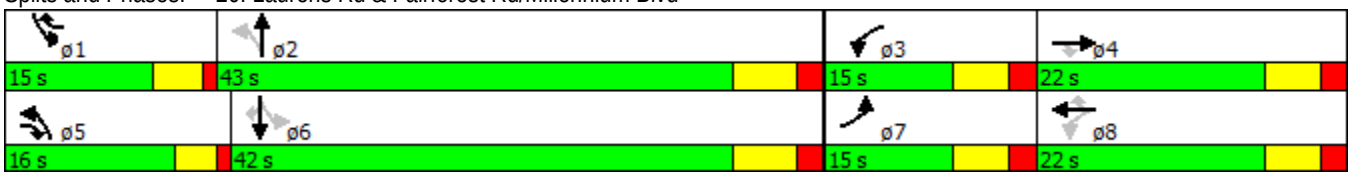
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	176	17	56	4	15	24	195	1406	15	45	874	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			-1%			-1%			-1%	
Storage Length (ft)	325		0	375		400	275		225	450		0
Storage Lanes	2		1	1		1	1		1	1		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	3467	1881	1599	1778	1872	2801	1778	5100	0	1778	3557	1591
Flt Permitted	0.950						0.187			0.122		
Satd. Flow (perm)	3467	1881	1599	1872	1872	2801	350	5100	0	228	3557	1591
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			109					2				261
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		815			1424			1199			960	
Travel Time (s)		15.9			27.7			20.4			16.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	196	19	62	4	17	27	217	1579	0	50	971	261
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			36			36			36	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4	5	3	8	1	5	2		1	6	
Permitted Phases			4	8		8	2			6		6
Detector Phase	7	4	5	3	8	1	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	3.0	4.0	6.0	6.0	4.0	4.0	6.0	35.0		4.0	35.0	35.0
Minimum Split (s)	15.0	22.0	15.0	15.0	22.0	15.0	15.0	42.0		15.0	42.0	42.0
Total Split (s)	15.0	22.0	16.0	15.0	22.0	15.0	16.0	43.0		15.0	42.0	42.0
Total Split (%)	15.8%	23.2%	16.8%	15.8%	23.2%	15.8%	16.8%	45.3%		15.8%	44.2%	44.2%
Maximum Green (s)	9.0	16.0	12.0	9.0	16.0	10.5	12.0	36.5		10.5	35.5	35.5
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	3.5	3.0	4.5		3.5	4.5	4.5
All-Red Time (s)	2.0	2.0	1.0	2.0	2.0	1.0	1.0	2.0		1.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-0.5	0.0	-2.5		-0.5	-2.5	-2.5
Total Lost Time (s)	4.0	4.0	2.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.0	3.0	3.5	3.0	3.0	3.0	5.0		3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	Max		None	Max	Max
Walk Time (s)		5.0			5.0			5.0			5.0	5.0
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	11.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	10.0	10.1	25.5	9.9	8.3	9.0	51.1	45.2		45.1	38.4	38.4
Actuated g/C Ratio	0.14	0.14	0.35	0.14	0.12	0.12	0.71	0.63		0.63	0.53	0.53

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.41	0.07	0.10	0.02	0.08	0.08	0.50	0.49		0.17	0.51	0.27
Control Delay	32.4	29.8	1.4	24.8	32.1	27.5	8.4	9.8		6.1	13.3	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	32.4	29.8	1.4	24.8	32.1	27.5	8.4	9.8		6.1	13.3	2.6
LOS	C	C	A	C	C	C	A	A		A	B	A
Approach Delay		25.2			28.9			9.7			10.8	
Approach LOS		C			C			A			B	
Queue Length 50th (ft)	39	7	0	2	7	6	21	133		4	122	0
Queue Length 95th (ft)	85	29	8	9	28	17	77	273		22	272	41
Internal Link Dist (ft)		735			1344			1119			880	
Turn Bay Length (ft)	325			375		400	275			450		
Base Capacity (vph)	534	474	694	316	472	520	491	3205		395	1894	969
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.37	0.04	0.09	0.01	0.04	0.05	0.44	0.49		0.13	0.51	0.27

Intersection Summary

Area Type: Other
Cycle Length: 95
Actuated Cycle Length: 72
Natural Cycle: 95
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.51
Intersection Signal Delay: 11.6 Intersection LOS: B
Intersection Capacity Utilization 61.7% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 20: Laurens Rd & Fairforest Rd/Millennium Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	176	17	56	4	15	24	195	1406	15	45	874	235
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1881	1872	1872	1872	1872	1872	1910	1872	1872	1872
Adj Flow Rate, veh/h	196	19	62	4	17	27	217	1562	17	50	971	0
Adj No. of Lanes	2	1	1	1	1	2	1	3	0	1	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	373	284	424	258	144	275	424	2911	32	282	1823	816
Arrive On Green	0.11	0.15	0.15	0.03	0.08	0.06	0.09	0.56	0.55	0.04	0.51	0.00
Sat Flow, veh/h	3476	1881	1599	1783	1872	2801	1783	5212	57	1783	3557	1591
Grp Volume(v), veh/h	196	19	62	4	17	27	217	1021	558	50	971	0
Grp Sat Flow(s),veh/h/ln	1738	1881	1599	1783	1872	1400	1783	1704	1862	1783	1778	1591
Q Serve(g_s), s	4.0	0.6	2.2	0.1	0.6	0.7	4.3	14.0	14.0	1.0	13.6	0.0
Cycle Q Clear(g_c), s	4.0	0.6	2.2	0.1	0.6	0.7	4.3	14.0	14.0	1.0	13.6	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.03	1.00		1.00
Lane Grp Cap(c), veh/h	373	284	424	258	144	275	424	1903	1040	282	1823	816
V/C Ratio(X)	0.53	0.07	0.15	0.02	0.12	0.10	0.51	0.54	0.54	0.18	0.53	0.00
Avail Cap(c_a), veh/h	516	457	571	463	454	739	557	1903	1040	473	1823	816
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	31.3	27.0	20.8	29.4	31.9	30.4	9.7	10.3	10.3	9.4	12.1	0.0
Incr Delay (d2), s/veh	0.4	0.1	0.2	0.0	0.4	0.2	1.0	1.1	2.0	0.3	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.3	1.0	0.1	0.3	0.3	2.1	6.8	7.7	0.5	6.9	0.0
LnGrp Delay(d),s/veh	31.7	27.1	21.0	29.4	32.2	30.6	10.6	11.4	12.3	9.7	13.2	0.0
LnGrp LOS	C	C	C	C	C	C	B	B	B	A	B	
Approach Vol, veh/h		277			48			1796			1021	
Approach Delay, s/veh		29.0			31.1			11.6			13.1	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.1	45.4	6.5	15.2	10.5	42.0	12.0	9.7
Change Period (Y+Rc), s	4.5	6.5	6.0	6.0	4.0	6.5	6.0	6.0
Max Green Setting (Gmax), s	10.5	36.5	9.0	16.0	12.0	35.5	9.0	16.0
Max Q Clear Time (g_c+I1), s	3.0	16.0	2.1	4.2	6.3	15.6	6.0	2.7
Green Ext Time (p_c), s	0.0	19.5	0.0	0.3	0.3	19.0	0.1	0.3

Intersection Summary	
HCM 2010 Ctrl Delay	13.9
HCM 2010 LOS	B

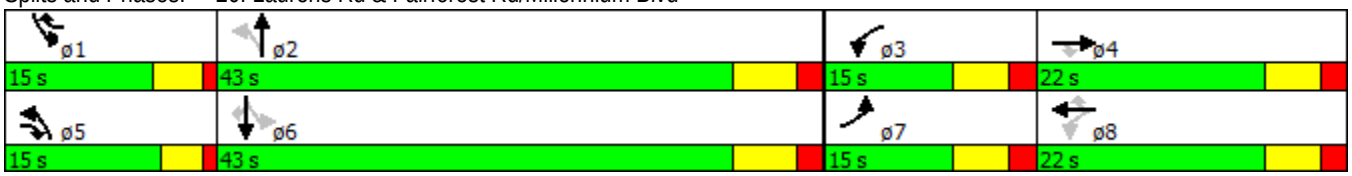
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	215	18	81	20	19	66	104	1257	10	70	1460	183
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			-1%			-1%			-1%	
Storage Length (ft)	325		0	375		400	275		225	450		0
Storage Lanes	2		1	1		1	1		1	1		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	3467	1881	1599	1778	1872	2801	1778	5106	0	1778	3557	1591
Flt Permitted	0.950			0.870			0.101			0.134		
Satd. Flow (perm)	3467	1881	1599	1629	1872	2801	189	5106	0	251	3557	1591
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			109					1				168
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		815			1424			1199			960	
Travel Time (s)		15.9			27.7			20.4			16.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	239	20	90	22	21	73	116	1408	0	78	1622	203
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			36			36			36	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4	5	3	8	1	5	2		1	6	
Permitted Phases			4	8		8	2			6		6
Detector Phase	7	4	5	3	8	1	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	3.0	4.0	6.0	6.0	4.0	4.0	6.0	35.0		4.0	35.0	35.0
Minimum Split (s)	15.0	22.0	15.0	15.0	22.0	15.0	15.0	42.0		15.0	42.0	42.0
Total Split (s)	15.0	22.0	15.0	15.0	22.0	15.0	15.0	43.0		15.0	43.0	43.0
Total Split (%)	15.8%	23.2%	15.8%	15.8%	23.2%	15.8%	15.8%	45.3%		15.8%	45.3%	45.3%
Maximum Green (s)	9.0	16.0	11.0	9.0	16.0	10.5	11.0	36.5		10.5	36.5	36.5
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	3.5	3.0	4.5		3.5	4.5	4.5
All-Red Time (s)	2.0	2.0	1.0	2.0	2.0	1.0	1.0	2.0		1.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	0.0	-2.0	-2.0	-0.5	0.0	-2.5		-0.5	-2.5	-2.5
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.0	3.0	3.5	3.0	3.0	3.0	5.0		3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	Max		None	Max	Max
Walk Time (s)		5.0			5.0			5.0			5.0	5.0
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	11.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	10.4	10.3	21.9	12.2	8.5	12.3	48.3	42.1		47.4	39.8	39.8
Actuated g/C Ratio	0.14	0.14	0.29	0.16	0.11	0.16	0.65	0.56		0.63	0.53	0.53

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.50	0.08	0.16	0.08	0.10	0.16	0.41	0.49		0.25	0.86	0.22
Control Delay	35.1	32.2	4.4	23.9	33.9	26.3	11.6	12.5		7.6	23.3	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	35.1	32.2	4.4	23.9	33.9	26.3	11.6	12.5		7.6	23.3	4.1
LOS	D	C	A	C	C	C	B	B		A	C	A
Approach Delay		27.1			27.2			12.5			20.6	
Approach LOS		C			C			B			C	
Queue Length 50th (ft)	48	7	0	8	8	16	11	121		7	260	6
Queue Length 95th (ft)	101	30	25	26	32	35	54	241		32	#627	48
Internal Link Dist (ft)		735			1344			1119			880	
Turn Bay Length (ft)	325			375		400	275			450		
Base Capacity (vph)	517	459	618	338	457	596	365	2881		397	1897	926
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.46	0.04	0.15	0.07	0.05	0.12	0.32	0.49		0.20	0.86	0.22

Intersection Summary

Area Type: Other
Cycle Length: 95
Actuated Cycle Length: 74.7
Natural Cycle: 95
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 18.2 Intersection LOS: B
Intersection Capacity Utilization 68.9% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 20: Laurens Rd & Fairforest Rd/Millennium Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	215	18	81	20	19	66	104	1257	10	70	1460	183
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1881	1872	1872	1872	1872	1872	1910	1872	1872	1872
Adj Flow Rate, veh/h	239	20	90	22	21	73	116	1397	11	78	1622	0
Adj No. of Lanes	2	1	1	1	1	2	1	3	0	1	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	412	275	307	301	156	316	247	2813	22	314	1831	819
Arrive On Green	0.12	0.15	0.12	0.06	0.08	0.06	0.07	0.54	0.54	0.05	0.51	0.00
Sat Flow, veh/h	3476	1881	1599	1783	1872	2801	1783	5231	41	1783	3557	1591
Grp Volume(v), veh/h	239	20	90	22	21	73	116	910	498	78	1622	0
Grp Sat Flow(s),veh/h/ln	1738	1881	1599	1783	1872	1400	1783	1704	1865	1783	1778	1591
Q Serve(g_s), s	4.9	0.7	3.7	0.8	0.8	1.8	2.4	12.8	12.8	1.6	30.8	0.0
Cycle Q Clear(g_c), s	4.9	0.7	3.7	0.8	0.8	1.8	2.4	12.8	12.8	1.6	30.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.02	1.00		1.00
Lane Grp Cap(c), veh/h	412	275	307	301	156	316	247	1832	1003	314	1831	819
V/C Ratio(X)	0.58	0.07	0.29	0.07	0.13	0.23	0.47	0.50	0.50	0.25	0.89	0.00
Avail Cap(c_a), veh/h	505	447	453	461	445	748	377	1832	1003	485	1831	819
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	31.6	27.9	26.2	28.4	32.2	30.6	16.3	11.0	11.0	9.5	16.4	0.0
Incr Delay (d2), s/veh	0.5	0.1	0.5	0.1	0.4	0.4	1.4	1.0	1.8	0.4	6.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.4	1.7	0.4	0.4	0.7	1.3	6.2	7.0	0.8	16.6	0.0
LnGrp Delay(d),s/veh	32.1	28.0	26.7	28.6	32.6	31.0	17.7	12.0	12.8	9.9	23.2	0.0
LnGrp LOS	C	C	C	C	C	C	B	B	B	A	C	
Approach Vol, veh/h		349			116			1524			1700	
Approach Delay, s/veh		30.5			30.8			12.7			22.6	
Approach LOS		C			C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.7	44.8	8.2	15.1	9.5	43.0	13.0	10.3
Change Period (Y+Rc), s	4.5	6.5	6.0	6.0	4.0	6.5	6.0	6.0
Max Green Setting (Gmax), s	10.5	36.5	9.0	16.0	11.0	36.5	9.0	16.0
Max Q Clear Time (g_c+I1), s	3.6	14.8	2.8	5.7	4.4	32.8	6.9	3.8
Green Ext Time (p_c), s	0.1	21.3	0.0	0.5	0.1	3.7	0.1	0.6

Intersection Summary	
HCM 2010 Ctrl Delay	19.5
HCM 2010 LOS	B

APPENDIX G – Calculated Signal Timing Worksheets

Major Changes to Signal Design Standards & Specifications

One of the major initiatives this year is the revision of the Traffic Signal Design Guidelines. Last updated in 2009, the Guidelines are undergoing a major overhaul.

We met with all 7 District Traffic Engineers in April to discuss several Traffic Signal "Hot Topics." The meeting was very productive and has resulted in revisions to several areas of traffic signal design in South Carolina.

The group reviewed standards from several other states, including our neighbors in Georgia and North Carolina.

Changes for immediate implementation include:

Flashing Yellow Arrow: Traffic Engineering Guideline 7 – Flashing Yellow Arrows (pages 5-6) sets the flashing yellow arrow signal head as the SCDOT standard for protected/permitted left turn phasing. A sample signal plan with FYA treatments is included on page 7.

Mainline Loop Placement: The standard loop placement for mainline detection was also revised (attached, page 8). Rather than two sets of mainline loops at 255' and 385' for all speeds, SCDOT will begin utilizing a single set of mainline loops with placement based on approach speed.

Clearance Calculations: Our procedure for calculating clearance intervals was reviewed. While our general equations and assumptions are unchanged, there are some additional considerations for calculating these intervals.

For calculating through phases (2, 4, 6 or 8) the clearance needs of permitted left turn movements will be considered.

Red times in excess of 3 seconds will be mitigated to avoid overly long clearance intervals.

We have developed some tools to assist in the calculation of clearance times. These tools will provide a standard approach for clearance calculations as well as documentation of the method of calculation for future use.

These design tools are included on pages 9-11.

Updated Pay Items and Specifications: We are in the process of updating our specifications and pay items. In an effort to reduce confusion as to which pay items should be used for a given situation, we have created a listing of the most common pay items. These should cover about 90% of signal designs. If you need an item not listed, please contact Lori or Patty for the correct item.

The listing of preferred pay items (pages 12-13) as well as our current specifications can be found at: http://www.scdot.org/doing/publications_Traffic.aspx.

Furnish & Install of Cabinets and Controllers: The standard practice for including cabinets and controllers on signal projects has changed. Previously, SCDOT furnished and programmed (integrated) signal controllers and cabinets and contractors "Installed Only." The new practice is for contractors to "Furnish & Install" cabinets and controllers with SCDOT Districts still performing the integration. We have revised our Special Provisions accordingly.

Further revisions and topics are under review and will be published as changes occur. Please refer to our website for further updates.

Topics to address in the future include:

- Side Street Volume Density
- Overhead Flashers at Two and Four-Way Stops
- Signal Ahead Flasher Design and Operation
- Emergency Vehicle Hybrid Beacons

Please let Lori know if you have other suggestions or topics for consideration.

New Employee Spotlight – Matt Kelly

Matt Kelly began working in the Signal Design Group on October 27th. Matt will be assisting with signal design, design reviews and project letting.

Matt graduated from University of South Carolina in 2010 and has worked for Stantec in Charleston for the last 4 years. While there, he worked on various traffic engineering projects, including traffic signal design.

When Matt is not working, he enjoys spending time with his wife of 2 years, Andrea and his dog, Molly. He also enjoys golfing, fishing and sometimes doing absolutely nothing.

Clearance Time Calculations

Rev 2014-10-07

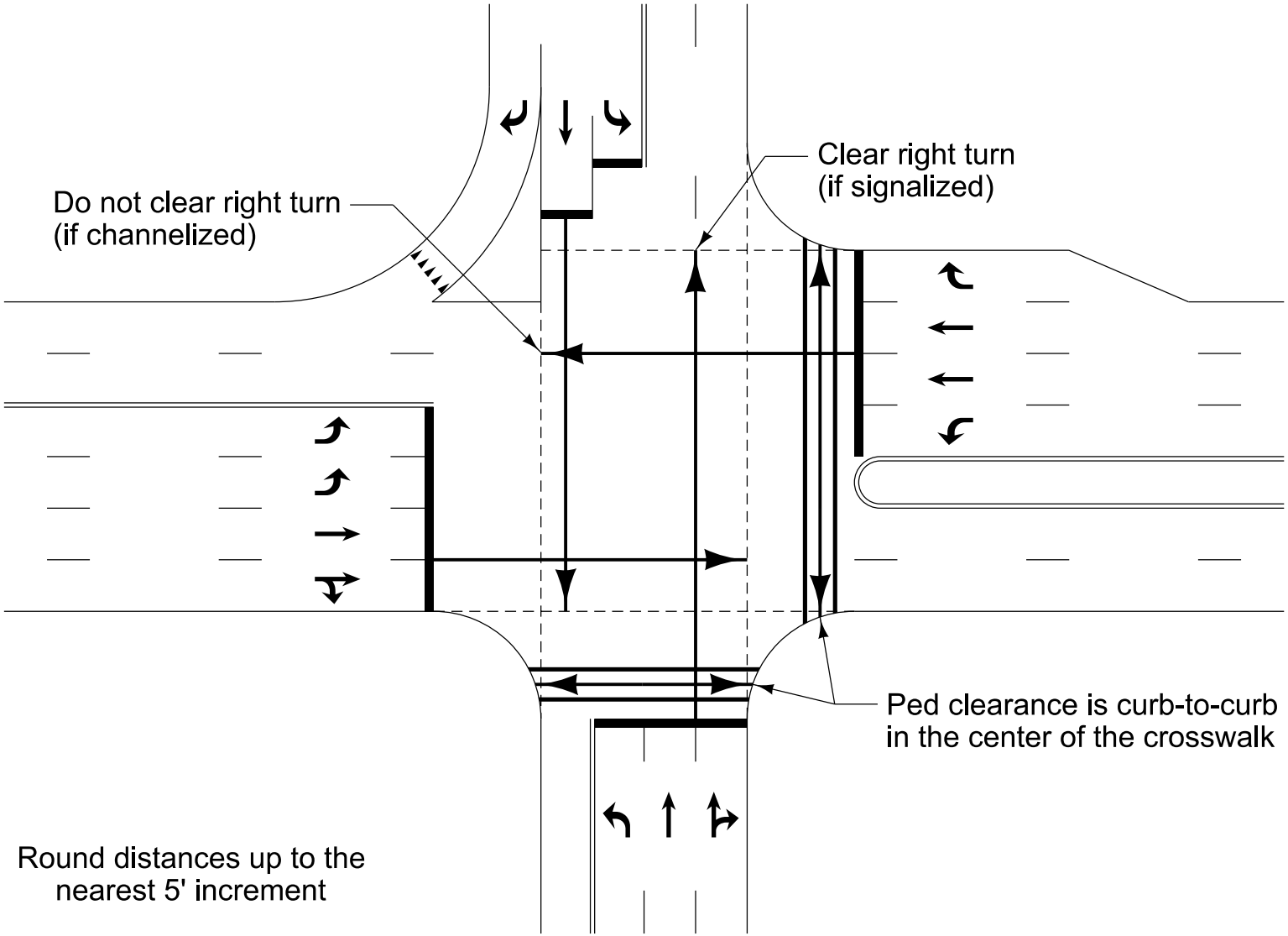
City:	Test	District:	
County:	Test	Sig. ID #	
NB Street:	Side St	Project #:	
SB Street:	Side St	Computed by:	
EB Street:	Main St	Checked by:	
WB Street:	Main St	Approved by:	

Movement	Street Name	Side St		Side St		Main St		Main St	
	Orientation	Northbound		Southbound		Eastbound		Westbound	
	Turn movement	Left	Thru	Left	Thru	Left	Thru	Left	Thru
NEMA Phase #	Protected	3	8		4		2	1	6
	Permissive	8		4		2		6	
FYA		N		N		N		Y	
Speed	mph	20	35	20	40	20	45	20	45
	ft/sec	29.33	66.00	29.33	66.00	29.33	66.00	29.33	66.00
Grade	%	0		0		0		0	
	Elevation at Stopbar, ft								
	Elevation at Setback, ft								
	Dist to Setback, ft								
	-OR- Enter Grade, %								
Clear Distance	feet	75	85	70	75	95	115	100	90
Ped Cross Dist	feet		85				95		
Parameters	Percept-React Time, sec	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Decel Rate, ft/sec^2	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
	Walk Speed, fps	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Recommended:	Phase #	3	8		4		2	1	6
Yellow	sec	3.0	4.4		4.4		4.4	3.0	4.4
All Red	sec	2.8	1.6		1.5		2.2	3.6	2.2
Flashing Don't Walk	sec		25.0				28.0		

NOTES:

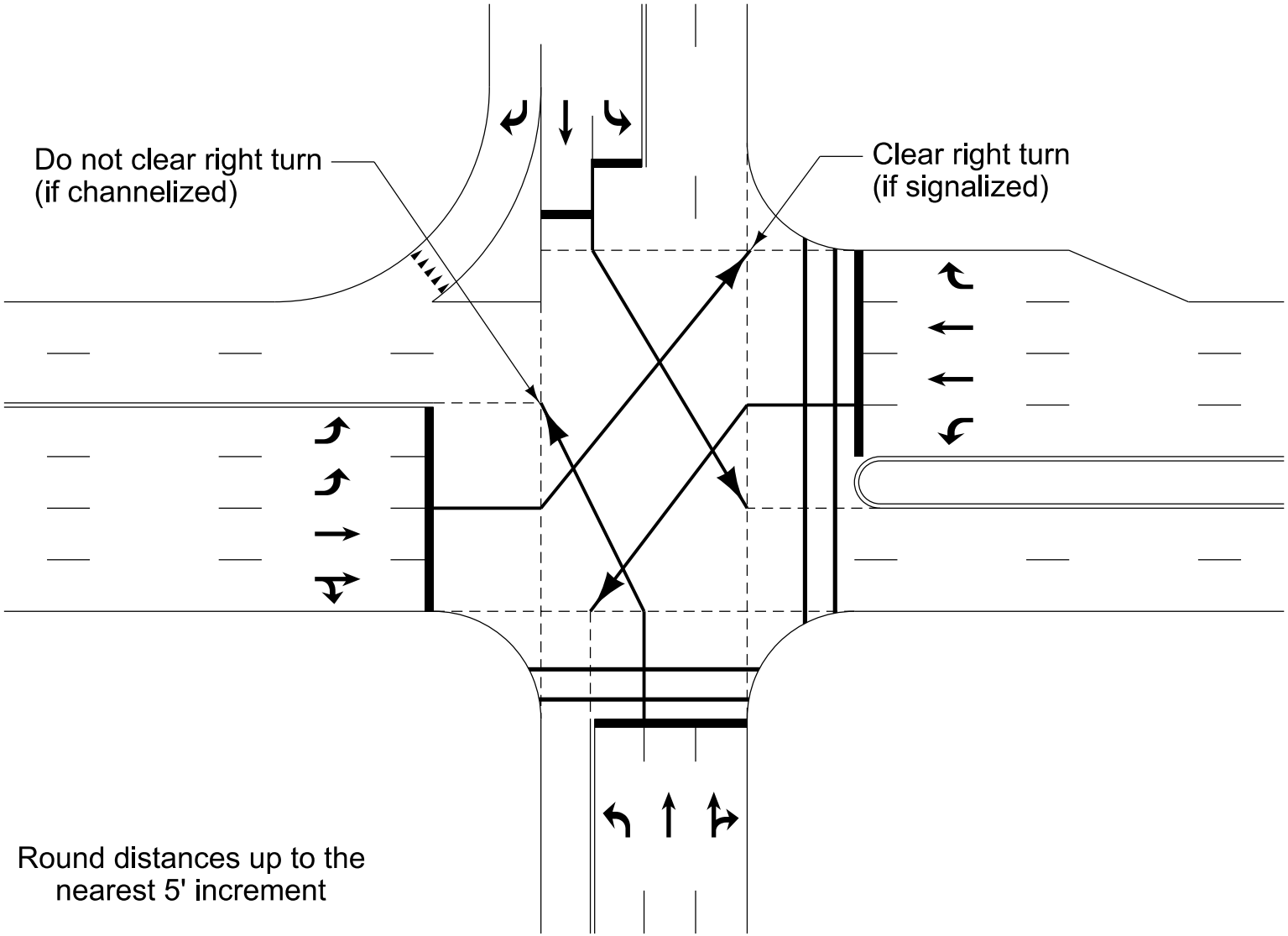
Compute times only as needed for plan.
Yellow change interval should be between 3 and 6 seconds.
Red clearance intervals less than 1.5 and more than 4.0 seconds require special circumstances.
Grades are rounded to the conservative whole percent.
Yellow and All Red times are rounded up to the next tenth of a second.
Ped clearance time is rounded up to the next whole second.

Through Movement Clearance Distances



Round distances up to the
nearest 5' increment

Left Turn Movement Clearance Distances



Round distances up to the nearest 5' increment

Clearance Time Calculations

Rev 2014-04-18

City:	Greenville	District:	
County:	Greenville	Sig. ID #	
NB Street:	Haywood Road	Project #:	
SB Street:	Haywood Road	Computed by:	
EB Street:	I-385 NB Ramp	Checked by:	
WB Street:	I-385 NB Ramp	Approved by:	

Movement	Street Name	Haywood Road		Haywood Road		I-385 NB Ramp		I-385 NB Ramp	
	Orientation	Northbound		Southbound		Eastbound		Westbound	
	Turn movement	Left	Thru	Left	Thru	Left	Thru	Left	Thru
NEMA Phase #	Protected	5	2		6				8
	Permissive	2		6				8	
Speed	mph	20	40	20	40	20	40	20	40
	ft/sec	29.33	58.67	29.33	58.67	29.33	58.67	29.33	58.67
Grade	%	1%		-1%				6%	
	Elevation at Stopbar, ft								
	Elevation at Setback, ft								
	Dist to Setback, ft								
	-OR- Enter Grade, %	1.0%		-1.0%				6.0%	
Clear Distance	feet	135	80		50			110	135
Ped Cross Dist	feet		55		40				170
Parameters	Percept-React Time, sec	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Decel Rate, ft/sec^2	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
	Walk Speed, fps	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Movement Calcs	Yellow, sec	2.5	3.9	2.6	4.1			2.3	3.5
	All Red, sec	5.3	1.8	0.7	1.2			4.5	2.7
	Mitigated Red, sec	4.2	-	-	-			3.8	-
	Flashing Don't Walk, sec		15.7		11.4				48.6
Movement Results	Yellow, sec	3.0	3.9	3.0	4.1			3.0	3.5
	All Red, sec	4.2	1.8	1.5	1.5			3.8	2.7
	Total Clear, sec	7.2	5.7	4.5	5.6			6.8	6.2
Shared Mvmt Calc	Yellow, sec	3.9		4.1				3.5	
	All Red, sec	3.3		1.5				3.3	
	Total Clear, sec	7.2		5.6				6.8	
	Flashing Don't Walk, sec	15.7		11.4				48.6	
Recommended:	Phase #	5	2		6				8
Yellow	sec	3.0	3.9		4.1				3.5
All Red	sec	4.2	3.3		1.5				3.3
Flashing Don't Walk	sec		16		12				49

Clearance Time Calculations

Rev 2014-04-18

City:	Greenville	District:	
County:	Greenville	Sig. ID #	
NB Street:	Haywood Road	Project #:	
SB Street:	Haywood Road	Computed by:	
EB Street:	I-385 SB Ramp	Checked by:	
WB Street:	I-385 SB Ramp	Approved by:	

Movement	Street Name	Haywood Road		Haywood Road		I-385 SB Ramp		I-385 SB Ramp	
	Orientation	Northbound		Southbound		Eastbound		Westbound	
	Turn movement	Left	Thru	Left	Thru	Left	Thru	Left	Thru
NEMA Phase #	Protected		2	1	6		4		
	Permissive	2		6		4			
Speed	mph	20	40	20	40	20	40	20	40
	ft/sec	29.33	58.67	29.33	58.67	29.33	58.67	29.33	58.67
Grade	%	7%		-7%		4%			
	Elevation at Stopbar, ft								
	Elevation at Setback, ft								
	Dist to Setback, ft								
	-OR- Enter Grade, %	7.0%		-7.0%		4.0%			
Clear Distance	feet		80	165	100	120	130		
Ped Cross Dist	feet		45		75		130		
Parameters	Percept-React Time, sec	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Decel Rate, ft/sec^2	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
	Walk Speed, fps	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Movement Calcs	Yellow, sec	2.2	3.4	2.9	4.8	2.3	3.6		
	All Red, sec	0.7	1.8	6.4	2.1	4.8	2.6		
	Mitigated Red, sec	-	-	4.7	-	3.9	-		
	Flashing Don't Walk, sec		12.9		21.4		37.1		
Movement Results	Yellow, sec	3.0	3.4	3.0	4.8	3.0	3.6		
	All Red, sec	1.5	1.8	4.7	2.1	3.9	2.6		
	Total Clear, sec	4.5	5.2	7.7	6.9	6.9	6.2		
Shared Mvmt Calc	Yellow, sec	3.4		4.8		3.6			
	All Red, sec	1.8		2.9		3.3			
	Total Clear, sec	5.2		7.7		6.9			
	Flashing Don't Walk, sec	12.9		21.4		37.1			
Recommended:	Phase #		2	1	6		4		
Yellow	sec		3.4	3.0	4.8		3.6		
All Red	sec		1.8	4.7	2.9		3.3		
Flashing Don't Walk	sec		13		22		38		

Clearance Time Calculations

Rev 2014-04-18

City:	Greenville	District:	
County:	Greenville	Sig. ID #	
NB Street:	Pleasantburg Drive	Project #:	
SB Street:	Pleasantburg Drive	Computed by:	
EB Street:	Century Drive	Checked by:	
WB Street:	Villa Road	Approved by:	

Movement	Street Name	Pleasantburg Drive		Pleasantburg Drive		Century Drive		Villa Road	
	Orientation	Northbound		Southbound		Eastbound		Westbound	
	Turn movement	Left	Thru	Left	Thru	Left	Thru	Left	Thru
NEMA Phase #	Protected	5	2	1	6		4		8
	Permissive	2		6		4		8	
Speed	mph	20	40	20	40	20	35	20	35
	ft/sec	29.33	58.67	29.33	58.67	29.33	51.33	29.33	51.33
Grade	%	-4%		1%		-6%		-3%	
	Elevation at Stopbar, ft								
	Elevation at Setback, ft								
	Dist to Setback, ft								
	-OR- Enter Grade, %	-3.2%		1.0%		-5.9%		-2.6%	
Clear Distance	feet	100	95	100	85	70	100	85	110
Ped Cross Dist	feet				60		105		
Parameters	Percept-React Time, sec	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Decel Rate, ft/sec^2	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
	Walk Speed, fps	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Movement Calcs	Yellow, sec	2.7	4.4	2.5	3.9	2.9	4.2	2.7	3.9
	All Red, sec	4.1	2.0	4.1	1.8	3.1	2.4	3.6	2.6
	Mitigated Red, sec	3.6	-	3.6	-	3.1	-	3.3	-
	Flashing Don't Walk, sec				17.1		30.0		
Movement Results	Yellow, sec	3.0	4.4	3.0	3.9	3.0	4.2	3.0	3.9
	All Red, sec	3.6	2.0	3.6	1.8	3.1	2.4	3.3	2.6
	Total Clear, sec	6.6	6.4	6.6	5.7	6.1	6.6	6.3	6.5
Shared Mvmt Calc	Yellow, sec	4.4		3.9		4.2		3.9	
	All Red, sec	2.2		2.7		2.4		2.6	
	Total Clear, sec	6.6		6.6		6.6		6.5	
	Flashing Don't Walk, sec	0.0		17.1		30.0		0.0	
Recommended:	Phase #	5	2	1	6		4		8
Yellow	sec	3.0	4.4	3.0	3.9		4.2		3.9
All Red	sec	3.6	2.2	3.6	2.7		2.4		2.6
Flashing Don't Walk	sec				18		30		

Clearance Time Calculations

Rev 2014-04-18

City:	Greenville	District:	
County:	Greenville	Sig. ID #	
NB Street:	Pleasantburg Drive	Project #:	
SB Street:	Pleasantburg Drive	Computed by:	
EB Street:	Antrim Drive	Checked by:	
WB Street:	Antrim Drive	Approved by:	

Movement	Street Name	Pleasantburg Drive		Pleasantburg Drive		Antrim Drive		Antrim Drive	
	Orientation	Northbound		Southbound		Eastbound		Westbound	
	Turn movement	Left	Thru	Left	Thru	Left	Thru	Left	Thru
NEMA Phase #	Protected	5	2	1	6	7	4	3	8
	Permissive	2		6		4		8	
Speed	mph	20	40	20	40	20	35	20	35
	ft/sec	29.33	58.67	29.33	58.67	29.33	51.33	29.33	51.33
Grade	%	1%		1%		-2%		0%	
	Elevation at Stopbar, ft								
	Elevation at Setback, ft								
	Dist to Setback, ft								
	-OR- Enter Grade, %	1.4%		1.1%		-1.5%		0.9%	
Clear Distance	feet	130	120	115	115	75	100	110	110
Ped Cross Dist	feet		100		100		95		100
Parameters	Percept-React Time, sec	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Decel Rate, ft/sec^2	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
	Walk Speed, fps	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Movement Calcs	Yellow, sec	2.5	3.9	2.5	3.9	2.6	3.8	2.5	3.6
	All Red, sec	5.2	2.4	4.7	2.4	3.3	2.4	4.5	2.6
	Mitigated Red, sec	4.1	-	3.9	-	3.2	-	3.8	-
	Flashing Don't Walk, sec		28.6		28.6		27.1		28.6
Movement Results	Yellow, sec	3.0	3.9	3.0	3.9	3.0	3.8	3.0	3.6
	All Red, sec	4.1	2.4	3.9	2.4	3.2	2.4	3.8	2.6
	Total Clear, sec	7.1	6.3	6.9	6.3	6.2	6.2	6.8	6.2
Shared Mvmt Calc	Yellow, sec	3.9		3.9		3.8		3.6	
	All Red, sec	3.2		3.0		2.4		3.2	
	Total Clear, sec	7.1		6.9		6.2		6.8	
	Flashing Don't Walk, sec	28.6		28.6		27.1		28.6	
Recommended:	Phase #	5	2	1	6	7	4	3	8
Yellow	sec	3.0	3.9	3.0	3.9	3.0	3.8	3.0	3.6
All Red	sec	4.1	3.2	3.9	3.0	3.2	2.4	3.8	3.2
Flashing Don't Walk	sec		29		29		28		29

Clearance Time Calculations

Rev 2014-04-18

City:	Greenville	District:	
County:	Greenville	Sig. ID #	
NB Street:	Academy Street	Project #:	
SB Street:	Academy Street	Computed by:	
EB Street:	Pendleton Street	Checked by:	
WB Street:	Pendleton Street	Approved by:	

Movement	Street Name	Academy Street		Academy Street		Pendleton Street		Pendleton Street	
	Orientation	Northbound		Southbound		Eastbound		Westbound	
	Turn movement	Left	Thru	Left	Thru	Left	Thru	Left	Thru
NEMA Phase #	Protected		2		6	7	4	3	8
	Permissive	2		6		4		8	
Speed	mph	20	40	20	35	20	30	20	30
	ft/sec	29.33	58.67	29.33	51.33	29.33	44.00	29.33	44.00
Grade	%	2%		-2%		2%		-2%	
	Elevation at Stopbar, ft								
	Elevation at Setback, ft								
	Dist to Setback, ft								
	-OR- Enter Grade, %	2.7%		-1.9%		2.0%		-1.1%	
Clear Distance	feet	80	115	80	105	115	110	110	105
Ped Cross Dist	feet				95		140		160
Parameters	Percept-React Time, sec	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Decel Rate, ft/sec^2	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
	Walk Speed, fps	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Movement Calcs	Yellow, sec	2.4	3.8	2.6	3.8	2.4	3.1	2.6	3.4
	All Red, sec	3.5	2.4	3.5	2.5	4.7	3.0	4.5	2.9
	Mitigated Red, sec	3.3	-	3.3	-	3.9	-	3.8	-
	Flashing Don't Walk, sec				27.1		40.0		45.7
Movement Results	Yellow, sec	3.0	3.8	3.0	3.8	3.0	3.1	3.0	3.4
	All Red, sec	3.3	2.4	3.3	2.5	3.9	3.0	3.8	2.9
	Total Clear, sec	6.3	6.2	6.3	6.3	6.9	6.1	6.8	6.3
Shared Mvmt Calc	Yellow, sec	3.8		3.8		3.1		3.4	
	All Red, sec	2.5		2.5		3.8		3.4	
	Total Clear, sec	6.3		6.3		6.9		6.8	
	Flashing Don't Walk, sec	0.0		27.1		40.0		45.7	
Recommended:	Phase #		2		6	7	4	3	8
Yellow	sec		3.8		3.8	3.0	3.1	3.0	3.4
All Red	sec		2.5		2.5	3.9	3.8	3.8	3.4
Flashing Don't Walk	sec				28		40		46

Clearance Time Calculations

Rev 2014-04-18

City:	Greenville	District:	
County:	Greenville	Sig. ID #	
NB Street:	Pleasantburg Drive	Project #:	
SB Street:	Pleasantburg Drive	Computed by:	
EB Street:	Mauldin Road	Checked by:	
WB Street:	Mauldin Road	Approved by:	

Movement	Street Name	Pleasantburg Drive		Pleasantburg Drive		Mauldin Road		Mauldin Road	
	Orientation	Northbound		Southbound		Eastbound		Westbound	
	Turn movement	Left	Thru	Left	Thru	Left	Thru	Left	Thru
NEMA Phase #	Protected		2	1	6	7	4	3	8
	Permissive	2		6		4		8	
Speed	mph	20	45	20	45	20	35	20	35
	ft/sec	29.33	66.00	29.33	66.00	29.33	51.33	29.33	51.33
Grade	%	-1%		0%		-3%		1%	
	Elevation at Stopbar, ft								
	Elevation at Setback, ft								
	Dist to Setback, ft								
	-OR- Enter Grade, %	-0.7%		0.7%		-2.8%		1.3%	
Clear Distance	feet	130	120	160	110	145	145	90	150
Ped Cross Dist	feet		140		125		140		145
Parameters	Percept-React Time, sec	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Decel Rate, ft/sec^2	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
	Walk Speed, fps	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Movement Calcs	Yellow, sec	2.6	4.5	2.5	4.4	2.7	3.9	2.5	3.5
	All Red, sec	5.2	2.2	6.2	2.0	5.7	3.3	3.8	3.4
	Mitigated Red, sec	4.1	-	4.6	-	4.4	3.2	3.4	3.2
	Flashing Don't Walk, sec		40.0		35.7		40.0		41.4
Movement Results	Yellow, sec	3.0	4.5	3.0	4.4	3.0	3.9	3.0	3.5
	All Red, sec	4.1	2.2	4.6	2.0	4.4	3.2	3.4	3.2
	Total Clear, sec	7.1	6.7	7.6	6.4	7.4	7.1	6.4	6.7
Shared Mvmt Calc	Yellow, sec	4.5		4.4		3.9		3.5	
	All Red, sec	2.6		3.2		3.5		3.2	
	Total Clear, sec	7.1		7.6		7.4		6.7	
	Flashing Don't Walk, sec	40.0		35.7		40.0		41.4	
Recommended:	Phase #		2	1	6	7	4	3	8
Yellow	sec		4.5	3.0	4.4	3.0	3.9	3.0	3.5
All Red	sec		2.6	4.6	3.2	4.4	3.5	3.4	3.2
Flashing Don't Walk	sec		40		36		40		42

Clearance Time Calculations

Rev 2014-04-18

City:	Greenville	District:	
County:	Greenville	Sig. ID #	
NB Street:	Rutherford Road	Project #:	
SB Street:	Rutherford Road	Computed by:	
EB Street:	Pleasantburg Drive	Checked by:	
WB Street:	Pleasantburg Drive	Approved by:	

Movement	Street Name	Rutherford Road		Rutherford Road		Pleasantburg Drive		Pleasantburg Drive	
	Orientation	Northbound		Southbound		Eastbound		Westbound	
	Turn movement	Left	Thru	Left	Thru	Left	Thru	Left	Thru
NEMA Phase #	Protected	3	8	7	4	5	2	1	6
	Permissive	8		4		2		6	
Speed	mph	20	40	20	40	20	45	20	45
	ft/sec	29.33	58.67	29.33	58.67	29.33	66.00	29.33	66.00
Grade	%	2%		1%		-1%		0%	
	Elevation at Stopbar, ft								
	Elevation at Setback, ft								
	Dist to Setback, ft								
	-OR- Enter Grade, %	2.2%		1.8%		-0.9%		0.1%	
Clear Distance	feet	90	110	90	115	115	125	100	95
Ped Cross Dist	feet				95		115		
Parameters	Percept-React Time, sec	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Decel Rate, ft/sec^2	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
	Walk Speed, fps	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Movement Calcs	Yellow, sec	2.4	3.8	2.5	3.9	2.6	4.5	2.5	4.4
	All Red, sec	3.8	2.3	3.8	2.4	4.7	2.2	4.1	1.8
	Mitigated Red, sec	3.4	-	3.4	-	3.9	-	3.6	-
	Flashing Don't Walk, sec				27.1		32.9		
Movement Results	Yellow, sec	3.0	3.8	3.0	3.9	3.0	4.5	3.0	4.4
	All Red, sec	3.4	2.3	3.4	2.4	3.9	2.2	3.6	1.8
	Total Clear, sec	6.4	6.1	6.4	6.3	6.9	6.7	6.6	6.2
Shared Mvmt Calc	Yellow, sec	3.8		3.9		4.5		4.4	
	All Red, sec	2.6		2.5		2.4		2.2	
	Total Clear, sec	6.4		6.4		6.9		6.6	
	Flashing Don't Walk, sec	0.0		27.1		32.9		0.0	
Recommended:	Phase #	3	8	7	4	5	2	1	6
Yellow	sec	3.0	3.8	3.0	3.9	3.0	4.5	3.0	4.4
All Red	sec	3.4	2.6	3.4	2.5	3.9	2.4	3.6	2.2
Flashing Don't Walk	sec				28		33		

Clearance Time Calculations

Rev 2014-04-18

City:	Greenville	District:	
County:	Greenville	Sig. ID #	
NB Street:	Haywood Road	Project #:	
SB Street:	Haywood Road	Computed by:	
EB Street:	Pelham Road	Checked by:	
WB Street:	Pelham Road	Approved by:	

Movement	Street Name	Haywood Road		Haywood Road		Pelham Road		Pelham Road	
	Orientation	Northbound		Southbound		Eastbound		Westbound	
	Turn movement	Left	Thru	Left	Thru	Left	Thru	Left	Thru
NEMA Phase #	Protected	5	2	1	6	7	4	3	8
	Permissive	2		6		4		8	
Speed	mph	20	40	20	45	20	45	20	45
	ft/sec	29.33	58.67	29.33	66.00	29.33	66.00	29.33	66.00
Grade	%	8%		-2%		0%		0%	
	Elevation at Stopbar, ft								
	Elevation at Setback, ft								
	Dist to Setback, ft								
	-OR- Enter Grade, %	8.9%		-1.3%		0.8%		0.0%	
Clear Distance	feet	90	95	105	115	95	120	120	105
Ped Cross Dist	feet								
Parameters	Percept-React Time, sec	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Decel Rate, ft/sec^2	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
	Walk Speed, fps	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Movement Calcs	Yellow, sec	2.2	3.4	2.6	4.6	2.5	4.4	2.5	4.4
	All Red, sec	3.8	2.0	4.3	2.1	4.0	2.2	4.8	1.9
	Mitigated Red, sec	3.4	-	3.7	-	3.5	-	3.9	-
	Flashing Don't Walk, sec								
Movement Results	Yellow, sec	3.0	3.4	3.0	4.6	3.0	4.4	3.0	4.4
	All Red, sec	3.4	2.0	3.7	2.1	3.5	2.2	3.9	1.9
	Total Clear, sec	6.4	5.4	6.7	6.7	6.5	6.6	6.9	6.3
Shared Mvmt Calc	Yellow, sec	3.4		4.6		4.4		4.4	
	All Red, sec	3.0		2.1		2.2		2.5	
	Total Clear, sec	6.4		6.7		6.6		6.9	
	Flashing Don't Walk, sec	0.0		0.0		0.0		0.0	
Recommended:	Phase #	5	2	1	6	7	4	3	8
Yellow	sec	3.0	3.4	3.0	4.6	3.0	4.4	3.0	4.4
All Red	sec	3.4	3.0	3.7	2.1	3.5	2.2	3.9	2.5
Flashing Don't Walk	sec								

Clearance Time Calculations

Rev 2014-04-18

City:	Greenville	District:	
County:	Greenville	Sig. ID #	
NB Street:	Augusta Road	Project #:	
SB Street:	Augusta Road	Computed by:	
EB Street:	Potomac Ave	Checked by:	
WB Street:	Mauldin Road	Approved by:	

Movement	Street Name	Augusta Road		Augusta Road		Potomac Ave		Mauldin Road	
	Orientation	Northbound		Southbound		Eastbound		Westbound	
	Turn movement	Left	Thru	Left	Thru	Left	Thru	Left	Thru
NEMA Phase #	Protected	5	2	1	6		4	7	8
	Permissive	2		6		4		8	
Speed	mph	20	35	20	35	20	35	20	35
	ft/sec	29.33	51.33	29.33	51.33	29.33	51.33	29.33	51.33
Grade	%	4%		-2%		2%		-1%	
	Elevation at Stopbar, ft								
	Elevation at Setback, ft								
	Dist to Setback, ft								
	-OR- Enter Grade, %	4.8%		-1.4%		2.2%		-0.8%	
Clear Distance	feet	120	115	135	110	80	100	100	100
Ped Cross Dist	feet		165		135		125		160
Parameters	Percept-React Time, sec	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Decel Rate, ft/sec^2	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
	Walk Speed, fps	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Movement Calcs	Yellow, sec	2.3	3.3	2.6	3.8	2.4	3.5	2.6	3.7
	All Red, sec	4.8	2.7	5.3	2.6	3.5	2.4	4.1	2.4
	Mitigated Red, sec	3.9	-	4.2	-	3.3	-	3.6	-
	Flashing Don't Walk, sec		47.1		38.6		35.7		45.7
Movement Results	Yellow, sec	3.0	3.3	3.0	3.8	3.0	3.5	3.0	3.7
	All Red, sec	3.9	2.7	4.2	2.6	3.3	2.4	3.6	2.4
	Total Clear, sec	6.9	6.0	7.2	6.4	6.3	5.9	6.6	6.1
Shared Mvmt Calc	Yellow, sec	3.3		3.8		3.5		3.7	
	All Red, sec	3.6		3.4		2.8		2.9	
	Total Clear, sec	6.9		7.2		6.3		6.6	
	Flashing Don't Walk, sec	47.1		38.6		35.7		45.7	
Recommended:	Phase #	5	2	1	6		4	7	8
Yellow	sec	3.0	3.3	3.0	3.8		3.5	3.0	3.7
All Red	sec	3.9	3.6	4.2	3.4		2.8	3.6	2.9
Flashing Don't Walk	sec		48		39		36		46

Clearance Time Calculations

Rev 2014-04-18

City:	Greenville	District:	
County:	Greenville	Sig. ID #	
NB Street:	Pleasantburg Drive	Project #:	
SB Street:	Pleasantburg Drive	Computed by:	
EB Street:	Cleveland Street	Checked by:	
WB Street:	Cleveland Street	Approved by:	

Movement	Street Name	Pleasantburg Drive		Pleasantburg Drive		Cleveland Street		Cleveland Street	
	Orientation	Northbound		Southbound		Eastbound		Westbound	
	Turn movement	Left	Thru	Left	Thru	Left	Thru	Left	Thru
NEMA Phase #	Protected	5	2	1	6	7	4	3	8
	Permissive	2		6		4		8	
Speed	mph	20	45	20	40	20	35	20	35
	ft/sec	29.33	66.00	29.33	58.67	29.33	51.33	29.33	51.33
Grade	%	8%		-2%		0%		0%	
	Elevation at Stopbar, ft								
	Elevation at Setback, ft								
	Dist to Setback, ft								
	-OR- Enter Grade, %	8.9%		-1.3%		0.8%		0.0%	
Clear Distance	feet	101	110	80	80	100	115	85	100
Ped Cross Dist	feet		95		60				90
Parameters	Percept-React Time, sec	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Decel Rate, ft/sec^2	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
	Walk Speed, fps	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Movement Calcs	Yellow, sec	2.2	3.7	2.6	4.2	2.5	3.6	2.5	3.6
	All Red, sec	4.2	2.0	3.5	1.8	4.1	2.7	3.6	2.4
	Mitigated Red, sec	3.6	-	3.3	-	3.6	-	3.3	-
	Flashing Don't Walk, sec		27.1		17.1				25.7
Movement Results	Yellow, sec	3.0	3.7	3.0	4.2	3.0	3.6	3.0	3.6
	All Red, sec	3.6	2.0	3.3	1.8	3.6	2.7	3.3	2.4
	Total Clear, sec	6.6	5.7	6.3	6.0	6.6	6.3	6.3	6.0
Shared Mvmt Calc	Yellow, sec	3.7		4.2		3.6		3.6	
	All Red, sec	2.9		2.1		3.0		2.7	
	Total Clear, sec	6.6		6.3		6.6		6.3	
	Flashing Don't Walk, sec	27.1		17.1		0.0		25.7	
Recommended:	Phase #	5	2	1	6	7	4	3	8
Yellow	sec	3.0	3.7	3.0	4.2	3.0	3.6	3.0	3.6
All Red	sec	3.6	2.9	3.3	2.1	3.6	3.0	3.3	2.7
Flashing Don't Walk	sec		28		18				26

Clearance Time Calculations

Rev 2014-04-18

City:	Greenville	District:	
County:	Greenville	Sig. ID #	
NB Street:	Verdae Boulevard	Project #:	
SB Street:	Roper Mountain Road	Computed by:	
EB Street:	Woodruff Road	Checked by:	
WB Street:	Woodruff Road	Approved by:	

Movement	Street Name	Verdae Boulevard		Roper Mountain Road		Woodruff Road		Woodruff Road	
	Orientation	Northbound		Southbound		Eastbound		Westbound	
	Turn movement	Left	Thru	Left	Thru	Left	Thru	Left	Thru
NEMA Phase #	Protected		2	1	6	7	4	3	8
	Permissive	2		6		4		8	
Speed	mph	20	45	20	40	20	45	20	35
	ft/sec	29.33	66.00	29.33	58.67	29.33	66.00	29.33	51.33
Grade	%	3%		-3%		0%		3%	
	Elevation at Stopbar, ft								
	Elevation at Setback, ft								
	Dist to Setback, ft								
	-OR- Enter Grade, %	3.0%		-3.0%		0.0%		3.0%	
Clear Distance	feet	85	85	95	85	100	105	100	95
Ped Cross Dist	feet								
Parameters	Percept-React Time, sec	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Decel Rate, ft/sec^2	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
	Walk Speed, fps	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Movement Calcs	Yellow, sec	2.4	4.1	2.7	4.3	2.5	4.4	2.4	3.4
	All Red, sec	3.6	1.6	4.0	1.8	4.1	1.9	4.1	2.3
	Mitigated Red, sec	3.3	-	3.5	-	3.6	-	3.6	-
	Flashing Don't Walk, sec								
Movement Results	Yellow, sec	3.0	4.1	3.0	4.3	3.0	4.4	3.0	3.4
	All Red, sec	3.3	1.6	3.5	1.8	3.6	1.9	3.6	2.3
	Total Clear, sec	6.3	5.7	6.5	6.1	6.6	6.3	6.6	5.7
Shared Mvmt Calc	Yellow, sec	4.1		4.3		4.4		3.4	
	All Red, sec	2.2		2.2		2.2		3.2	
	Total Clear, sec	6.3		6.5		6.6		6.6	
	Flashing Don't Walk, sec	0.0		0.0		0.0		0.0	
Recommended:	Phase #		2	1	6	7	4	3	8
Yellow	sec		4.1	3.0	4.3	3.0	4.4	3.0	3.4
All Red	sec		2.2	3.5	2.2	3.6	2.2	3.6	3.2
Flashing Don't Walk	sec								

Clearance Time Calculations

Rev 2014-04-18

City:	Greenville	District:	
County:	Greenville	Sig. ID #	
NB Street:	Mills Ave	Project #:	
SB Street:	Church Street	Computed by:	
EB Street:	Augusta Road	Checked by:	
WB Street:	Augusta Road	Approved by:	

Movement	Street Name	Mills Ave		Church Street		Augusta Road		Augusta Road	
	Orientation	Northbound		Southbound		Eastbound		Westbound	
	Turn movement	Left	Thru	Left	Thru	Left	Thru	Left	Thru
NEMA Phase #	Protected	7	4	3	8	1	6	5	2
	Permissive	4		8		6		2	
Speed	mph	20	35	20	35	20	30	20	30
	ft/sec	29.33	51.33	29.33	51.33	29.33	44.00	29.33	44.00
Grade	%	1%		-1%		0%		1%	
	Elevation at Stopbar, ft								
	Elevation at Setback, ft								
	Dist to Setback, ft								
	-OR- Enter Grade, %	1.0%		-0.6%		0.9%		1.2%	
Clear Distance	feet	110	100	135	100	80	115	75	125
Ped Cross Dist	feet		80		95		90		130
Parameters	Percept-React Time, sec	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Decel Rate, ft/sec^2	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
	Walk Speed, fps	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Movement Calcs	Yellow, sec	2.5	3.5	2.6	3.7	2.5	3.3	2.5	3.2
	All Red, sec	4.5	2.4	5.3	2.4	3.5	3.1	3.3	3.3
	Mitigated Red, sec	3.8	-	4.2	-	3.3	3.1	3.2	3.2
	Flashing Don't Walk, sec		22.9		27.1		25.7		37.1
Movement Results	Yellow, sec	3.0	3.5	3.0	3.7	3.0	3.3	3.0	3.2
	All Red, sec	3.8	2.4	4.2	2.4	3.3	3.1	3.2	3.2
	Total Clear, sec	6.8	5.9	7.2	6.1	6.3	6.4	6.2	6.4
Shared Mvmt Calc	Yellow, sec	3.5		3.7		3.3		3.2	
	All Red, sec	3.3		3.5		3.1		3.2	
	Total Clear, sec	6.8		7.2		6.4		6.4	
	Flashing Don't Walk, sec	22.9		27.1		25.7		37.1	
Recommended:	Phase #	7	4	3	8	1	6	5	2
Yellow	sec	3.0	3.5	3.0	3.7	3.0	3.3	3.0	3.2
All Red	sec	3.8	3.3	4.2	3.5	3.3	3.1	3.2	3.2
Flashing Don't Walk	sec		23		28		26		38

Clearance Time Calculations

Rev 2014-04-18

City:	Greenville	District:	
County:	Greenville	Sig. ID #	
NB Street:	Cleveland Street	Project #:	
SB Street:	Cleveland Street	Computed by:	
EB Street:	E. Faris Rd	Checked by:	
WB Street:	E. Faris Rd	Approved by:	

Movement	Street Name	Cleveland Street		Cleveland Street		E. Faris Rd		E. Faris Rd	
	Orientation	Northbound		Southbound		Eastbound		Westbound	
	Turn movement	Left	Thru	Left	Thru	Left	Thru	Left	Thru
NEMA Phase #	Protected	5	2	1	6		4	3	8
	Permissive	2		6		4		8	
Speed	mph	20	35	20	35	20	35	20	40
	ft/sec	29.33	51.33	29.33	51.33	29.33	51.33	29.33	58.67
Grade	%	3%		-4%		4%		1%	
	Elevation at Stopbar, ft								
	Elevation at Setback, ft								
	Dist to Setback, ft								
	-OR- Enter Grade, %	3.9%		-3.1%		4.2%		1.5%	
Clear Distance	feet	80	100	90	100	75	80	85	90
Ped Cross Dist	feet		70						65
Parameters	Percept-React Time, sec	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Decel Rate, ft/sec^2	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
	Walk Speed, fps	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Movement Calcs	Yellow, sec	2.4	3.4	2.7	4.0	2.3	3.3	2.5	3.9
	All Red, sec	3.5	2.4	3.8	2.4	3.3	2.0	3.6	1.9
	Mitigated Red, sec	3.3	-	3.4	-	3.2	-	3.3	-
	Flashing Don't Walk, sec		20.0						18.6
Movement Results	Yellow, sec	3.0	3.4	3.0	4.0	3.0	3.3	3.0	3.9
	All Red, sec	3.3	2.4	3.4	2.4	3.2	2.0	3.3	1.9
	Total Clear, sec	6.3	5.8	6.4	6.4	6.2	5.3	6.3	5.8
Shared Mvmt Calc	Yellow, sec	3.4		4.0		3.3		3.9	
	All Red, sec	2.9		2.4		2.9		2.4	
	Total Clear, sec	6.3		6.4		6.2		6.3	
	Flashing Don't Walk, sec	20.0		0.0		0.0		18.6	
Recommended:	Phase #	5	2	1	6		4	3	8
Yellow	sec	3.0	3.4	3.0	4.0		3.3	3.0	3.9
All Red	sec	3.3	2.9	3.4	2.4		2.9	3.3	2.4
Flashing Don't Walk	sec		20						19

Clearance Time Calculations

Rev 2014-04-18

City:	Greenville	District:	
County:	Greenville	Sig. ID #	
NB Street:	Laurens Road	Project #:	
SB Street:	Laurens Road	Computed by:	
EB Street:	Woodruff Road	Checked by:	
WB Street:	Woodruff Road	Approved by:	

Movement	Street Name	Laurens Road		Laurens Road		Woodruff Road		Woodruff Road	
	Orientation	Northbound		Southbound		Eastbound		Westbound	
	Turn movement	Left	Thru	Left	Thru	Left	Thru	Left	Thru
NEMA Phase #	Protected		2	1	6		4		3
	Permissive	2		6		4		3	
Speed	mph	20	35	20	35	20	35	20	35
	ft/sec	29.33	51.33	29.33	51.33	29.33	51.33	29.33	51.33
Grade	%	-3%		2%		2%		3%	
	Elevation at Stopbar, ft								
	Elevation at Setback, ft								
	Dist to Setback, ft								
	-OR- Enter Grade, %	-2.9%		2.9%		2.0%		3.0%	
Clear Distance	feet	115	85	120	70	110	110	90	110
Ped Cross Dist	feet		100						100
Parameters	Percept-React Time, sec	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Decel Rate, ft/sec^2	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
	Walk Speed, fps	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Movement Calcs	Yellow, sec	2.7	3.9	2.4	3.5	2.4	3.5	2.4	3.4
	All Red, sec	4.7	2.1	4.8	1.8	4.5	2.6	3.8	2.6
	Mitigated Red, sec	3.9	-	3.9	-	3.8	-	3.4	-
	Flashing Don't Walk, sec		28.6		#VALUE!				28.6
Movement Results	Yellow, sec	3.0	3.9	3.0	3.5	3.0	3.5	3.0	3.4
	All Red, sec	3.9	2.1	3.9	1.8	3.8	2.6	3.4	2.6
	Total Clear, sec	6.9	6.0	6.9	5.3	6.8	6.1	6.4	6.0
Shared Mvmt Calc	Yellow, sec	3.9		3.5		3.5		3.4	
	All Red, sec	3.0		3.4		3.3		3.0	
	Total Clear, sec	6.9		6.9		6.8		6.4	
	Flashing Don't Walk, sec	28.6		#VALUE!		0.0		28.6	
Recommended:	Phase #		2	1	6		4		3
Yellow	sec		3.9	3.0	3.5		3.5		3.4
All Red	sec		3.0	3.9	3.4		3.3		3.0
Flashing Don't Walk	sec		29		#VALUE!				29

Clearance Time Calculations

Rev 2014-04-18

City:	Greenville	District:	
County:	Greenville	Sig. ID #	
NB Street:	Academy Street	Project #:	
SB Street:	Academy Street	Computed by:	
EB Street:	College Street	Checked by:	
WB Street:	College Street	Approved by:	

Movement	Street Name	Academy Street		Academy Street		College Street		College Street	
	Orientation	Northbound		Southbound		Eastbound		Westbound	
	Turn movement	Left	Thru	Left	Thru	Left	Thru	Left	Thru
NEMA Phase #	Protected	3	4		4				2
	Permissive	4		4				2	
Speed	mph	20	40	20	40			20	35
	ft/sec	29.33	58.67	29.33	58.67			29.33	51.33
Grade	%	1%		-1%				1%	
	Elevation at Stopbar, ft								
	Elevation at Setback, ft								
	Dist to Setback, ft								
	-OR- Enter Grade, %	1.2%		-1.0%				1.6%	
Clear Distance	feet	105	110		80			105	110
Ped Cross Dist	feet		75		90		105		105
Parameters	Percept-React Time, sec	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Decel Rate, ft/sec^2	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
	Walk Speed, fps	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Movement Calcs	Yellow, sec	2.5	3.9	2.6	4.1			2.5	3.5
	All Red, sec	4.3	2.3	0.7	1.8			4.3	2.6
	Mitigated Red, sec	3.7	-	-	-			3.7	-
	Flashing Don't Walk, sec		21.4		25.7		30.0		30.0
Movement Results	Yellow, sec	3.0	3.9	3.0	4.1			3.0	3.5
	All Red, sec	3.7	2.3	1.5	1.8			3.7	2.6
	Total Clear, sec	6.7	6.2	4.5	5.9			6.7	6.1
Shared Mvmt Calc	Yellow, sec	3.9		4.1				3.5	
	All Red, sec	2.8		1.8				3.2	
	Total Clear, sec	6.7		5.9				6.7	
	Flashing Don't Walk, sec	21.4		25.7				30.0	
Recommended:	Phase #	3	4		4				2
Yellow	sec	3.0	3.9		4.1				3.5
All Red	sec	3.7	2.8		1.8				3.2
Flashing Don't Walk	sec		22		26				30

Clearance Time Calculations

Rev 2014-04-18

City:	Greenville	District:	
County:	Greenville	Sig. ID #	
NB Street:	Rutherford Street	Project #:	
SB Street:	Rutherford Street	Computed by:	
EB Street:	W. Stone Ave	Checked by:	
WB Street:	W. Stone Ave	Approved by:	

Movement	Street Name	Rutherford Street		Rutherford Street		W. Stone Ave		W. Stone Ave	
	Orientation	Northbound		Southbound		Eastbound		Westbound	
	Turn movement	Left	Thru	Left	Thru	Left	Thru	Left	Thru
NEMA Phase #	Protected		6	5	2	3	8	7	4
	Permissive	6		2		8		4	
Speed	mph	20	35	20	35	20	35	20	35
	ft/sec	29.33	51.33	29.33	51.33	29.33	51.33	29.33	51.33
Grade	%	0%		-1%		-1%		3%	
	Elevation at Stopbar, ft								
	Elevation at Setback, ft								
	Dist to Setback, ft								
	-OR- Enter Grade, %	0.8%		-0.6%		-0.1%		3.3%	
Clear Distance	feet	80	95	85	100	80	85	80	85
Ped Cross Dist	feet		90		85		75		75
Parameters	Percept-React Time, sec	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Decel Rate, ft/sec^2	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
	Walk Speed, fps	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Movement Calcs	Yellow, sec	2.5	3.6	2.6	3.7	2.6	3.7	2.4	3.4
	All Red, sec	3.5	2.3	3.6	2.4	3.5	2.1	3.5	2.1
	Mitigated Red, sec	3.3	-	3.3	-	3.3	-	3.3	-
	Flashing Don't Walk, sec		25.7		24.3		21.4		21.4
Movement Results	Yellow, sec	3.0	3.6	3.0	3.7	3.0	3.7	3.0	3.4
	All Red, sec	3.3	2.3	3.3	2.4	3.3	2.1	3.3	2.1
	Total Clear, sec	6.3	5.9	6.3	6.1	6.3	5.8	6.3	5.5
Shared Mvmt Calc	Yellow, sec	3.6		3.7		3.7		3.4	
	All Red, sec	2.7		2.6		2.6		2.9	
	Total Clear, sec	6.3		6.3		6.3		6.3	
	Flashing Don't Walk, sec	25.7		24.3		21.4		21.4	
Recommended:	Phase #		6	5	2	3	8	7	4
Yellow	sec		3.6	3.0	3.7	3.0	3.7	3.0	3.4
All Red	sec		2.7	3.3	2.6	3.3	2.6	3.3	2.9
Flashing Don't Walk	sec		26		25		22		22

Clearance Time Calculations

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City:	Greenville	District:	
County:	Greenville	Sig. ID #	
NB Street:	Pelham Road	Project #:	
SB Street:	North Hills Shop	Computed by:	
EB Street:	E. North Street	Checked by:	
WB Street:	E. North Street	Approved by:	

Movement	Street Name	Pelham Road		North Hills Shop		E. North Street		E. North Street	
	Orientation	Northbound		Southbound		Eastbound		Westbound	
	Turn movement	Left	Thru	Left	Thru	Left	Thru	Left	Thru
NEMA Phase #	Protected	3	3	4	4	1	6	5	2
	Permissive					6		2	
Speed	mph	20	30	20	20	20	35	20	35
	ft/sec	29.33	44.00	29.33	29.33	29.33	51.33	29.33	51.33
Grade	%	0%		0%		0%		0%	
	Elevation at Stopbar, ft								
	Elevation at Setback, ft								
	Dist to Setback, ft								
	-OR- Enter Grade, %	0.0%		0.0%		0.0%		0.0%	
Clear Distance	feet	90	85	75	85	115	95	65	65
Ped Cross Dist	feet								70
Parameters	Percept-React Time, sec	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Decel Rate, ft/sec^2	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
	Walk Speed, fps	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Movement Calcs	Yellow, sec	2.5	3.3	2.5	2.5	2.5	3.6	2.5	3.6
	All Red, sec	3.8	2.4	3.3	3.6	4.7	2.3	2.9	1.7
	Mitigated Red, sec	3.4	-	3.2	3.3	3.9	-	-	-
	Flashing Don't Walk, sec								20.0
Movement Results	Yellow, sec	3.0	3.3	3.0	3.0	3.0	3.6	3.0	3.6
	All Red, sec	3.4	2.4	3.2	3.3	3.9	2.3	2.9	1.7
	Total Clear, sec	6.4	5.7	6.2	6.3	6.9	5.9	5.9	5.3
Shared Mvmt Calc	Yellow, sec	3.3		3.0		3.6		3.6	
	All Red, sec	3.1		3.3		3.3		2.3	
	Total Clear, sec	6.4		6.3		6.9		5.9	
	Flashing Don't Walk, sec	0.0		0.0		0.0		20.0	
Recommended:	Phase #	3	3	4	4	1	6	5	2
Yellow	sec	3.3	3.3	3.0	3.0	3.0	3.6	3.0	3.6
All Red	sec	3.1	3.1	3.3	3.3	3.9	3.3	2.9	2.3
Flashing Don't Walk	sec								20

Clearance Time Calculations

Rev 2014-04-18

City:	Greenville	District:	
County:	Greenville	Sig. ID #	
NB Street:	Laurens Road	Project #:	
SB Street:	Laurens Road	Computed by:	
EB Street:	E. Parkins Mill Rd	Checked by:	
WB Street:	Verdae Blvd	Approved by:	

Movement	Street Name	Laurens Road		Laurens Road		E. Parkins Mill Rd		Verdae Blvd	
	Orientation	Northbound		Southbound		Eastbound		Westbound	
	Turn movement	Left	Thru	Left	Thru	Left	Thru	Left	Thru
NEMA Phase #	Protected	5	2	1	6	7	4	3	8
	Permissive	2		6		4		8	
Speed	mph	20	45	20	45	20	35	20	45
	ft/sec	29.33	66.00	29.33	66.00	29.33	51.33	29.33	66.00
Grade	%	-3%		1%		2%		-2%	
	Elevation at Stopbar, ft								
	Elevation at Setback, ft								
	Dist to Setback, ft								
	-OR- Enter Grade, %	-2.5%		1.5%		2.1%		-2.0%	
Clear Distance	feet	120	95	130	120	100	125	130	135
Ped Cross Dist	feet		255		115		215		200
Parameters	Percept-React Time, sec	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Decel Rate, ft/sec^2	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
	Walk Speed, fps	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Movement Calcs	Yellow, sec	2.7	4.7	2.5	4.2	2.4	3.5	2.6	4.6
	All Red, sec	4.8	1.8	5.2	2.2	4.1	2.9	5.2	2.4
	Mitigated Red, sec	3.9	-	4.1	-	3.6	-	4.1	-
	Flashing Don't Walk, sec		72.9		32.9		61.4		57.1
Movement Results	Yellow, sec	3.0	4.7	3.0	4.2	3.0	3.5	3.0	4.6
	All Red, sec	3.9	1.8	4.1	2.2	3.6	2.9	4.1	2.4
	Total Clear, sec	6.9	6.5	7.1	6.4	6.6	6.4	7.1	7.0
Shared Mvmt Calc	Yellow, sec	4.7		4.2		3.5		4.6	
	All Red, sec	2.2		2.9		3.1		2.5	
	Total Clear, sec	6.9		7.1		6.6		7.1	
	Flashing Don't Walk, sec	72.9		32.9		61.4		57.1	
Recommended:	Phase #	5	2	1	6	7	4	3	8
Yellow	sec	3.0	4.7	3.0	4.2	3.0	3.5	3.0	4.6
All Red	sec	3.9	2.2	4.1	2.9	3.6	3.1	4.1	2.5
Flashing Don't Walk	sec		73		33		62		58

Clearance Time Calculations

Rev 2014-04-18

City:	Greenville	District:	
County:	Greenville	Sig. ID #	
NB Street:	Roper Mountain Road	Project #:	
SB Street:	Roper Mountain Road	Computed by:	
EB Street:	Frontage Rd	Checked by:	
WB Street:	Independance	Approved by:	

Movement	Street Name	Roper Mountain Road		Roper Mountain Road		Frontage Rd		Independance	
	Orientation	Northbound		Southbound		Eastbound		Westbound	
	Turn movement	Left	Thru	Left	Thru	Left	Thru	Left	Thru
NEMA Phase #	Protected	5	2		6		8		4
	Permissive	2		6		8		4	
Speed	mph	20	40	20	40	20	35	20	35
	ft/sec	29.33	58.67	29.33	58.67	29.33	51.33	29.33	51.33
Grade	%	1%		-2%		3%		1%	
	Elevation at Stopbar, ft								
	Elevation at Setback, ft								
	Dist to Setback, ft								
	-OR- Enter Grade, %	1.2%		-1.1%		3.2%		1.0%	
Clear Distance	feet	105	115	110	120	125	130	110	100
Ped Cross Dist	feet								
Parameters	Percept-React Time, sec	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Decel Rate, ft/sec^2	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
	Walk Speed, fps	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Movement Calcs	Yellow, sec	2.5	3.9	2.6	4.2	2.4	3.4	2.5	3.5
	All Red, sec	4.3	2.4	4.5	2.4	5.0	3.0	4.5	2.4
	Mitigated Red, sec	3.7	-	3.8	-	4.0	-	3.8	-
	Flashing Don't Walk, sec								
Movement Results	Yellow, sec	3.0	3.9	3.0	4.2	3.0	3.4	3.0	3.5
	All Red, sec	3.7	2.4	3.8	2.4	4.0	3.0	3.8	2.4
	Total Clear, sec	6.7	6.3	6.8	6.6	7.0	6.4	6.8	5.9
Shared Mvmt Calc	Yellow, sec	3.9		4.2		3.4		3.5	
	All Red, sec	2.8		2.6		3.6		3.3	
	Total Clear, sec	6.7		6.8		7.0		6.8	
	Flashing Don't Walk, sec	0.0		0.0		0.0		0.0	
Recommended:	Phase #	5	2		6		8		4
Yellow	sec	3.0	3.9		4.2		3.4		3.5
All Red	sec	3.7	2.8		2.6		3.6		3.3
Flashing Don't Walk	sec								

Clearance Time Calculations

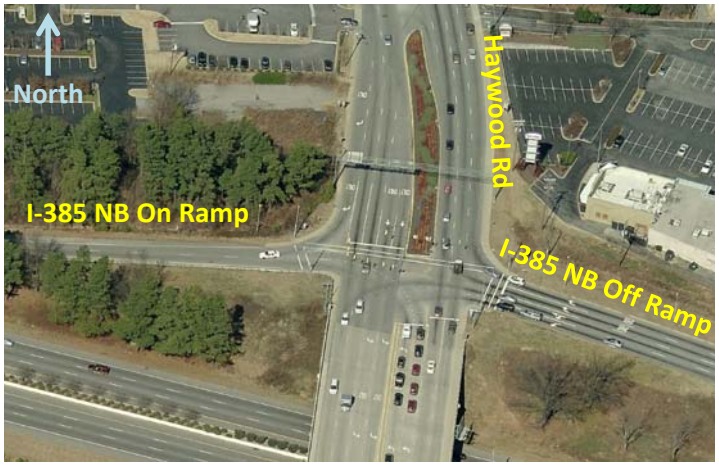
Rev 2014-04-18

City:	Greenville	District:	
County:	Greenville	Sig. ID #	
NB Street:	Laurens Road	Project #:	
SB Street:	Laurens Road	Computed by:	
EB Street:	Fairforest Way	Checked by:	
WB Street:	Millenium Blvd	Approved by:	

Movement	Street Name	Laurens Road		Laurens Road		Fairforest Way		Millenium Blvd	
	Orientation	Northbound		Southbound		Eastbound		Westbound	
	Turn movement	Left	Thru	Left	Thru	Left	Thru	Left	Thru
NEMA Phase #	Protected	5	2	1	6	3	8	7	4
	Permissive	2		6		8		4	
Speed	mph	20	40	20	40	20	30	20	35
	ft/sec	29.33	58.67	29.33	58.67	29.33	44.00	29.33	51.33
Grade	%	-1%		-2%		-2%		-1%	
	Elevation at Stopbar, ft								
	Elevation at Setback, ft								
	Dist to Setback, ft								
	-OR- Enter Grade, %	-0.8%		-1.4%		-1.9%		-1.0%	
Clear Distance	feet	110	155	100	120	160	140	135	140
Ped Cross Dist	feet		120		130		130		160
Parameters	Percept-React Time, sec	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Decel Rate, ft/sec^2	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
	Walk Speed, fps	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Movement Calcs	Yellow, sec	2.6	4.1	2.6	4.2	2.6	3.4	2.6	3.7
	All Red, sec	4.5	3.0	4.1	2.4	6.2	3.7	5.3	3.2
	Mitigated Red, sec	3.8	-	3.6	-	4.6	3.4	4.2	3.1
	Flashing Don't Walk, sec		34.3		37.1		37.1		45.7
Movement Results	Yellow, sec	3.0	4.1	3.0	4.2	3.0	3.4	3.0	3.7
	All Red, sec	3.8	3.0	3.6	2.4	4.6	3.4	4.2	3.1
	Total Clear, sec	6.8	7.1	6.6	6.6	7.6	6.8	7.2	6.8
Shared Mvmt Calc	Yellow, sec	4.1		4.2		3.4		3.7	
	All Red, sec	3.0		2.4		4.2		3.5	
	Total Clear, sec	7.1		6.6		7.6		7.2	
	Flashing Don't Walk, sec	34.3		37.1		37.1		45.7	
Recommended:	Phase #	5	2	1	6	3	8	7	4
Yellow	sec	3.0	4.1	3.0	4.2	3.0	3.4	3.0	3.7
All Red	sec	3.8	3.0	3.6	2.4	4.6	4.2	4.2	3.5
Flashing Don't Walk	sec		35		38		38		46

APPENDIX H – One Page (Two sided) Consideration Summaries

Haywood Road (S-273) at I-385 NB Ramps



77 Crashes (7/1/12 to 11/30/14)
16 – Right Angle
34 – Rear End
23 – Side Swipe
1 – Head On
2 – Out of Control
0 – Hit Animal
1 – Other

Crash Conditions	
25 - Night	52 - Day
14 - Wet	63 - Dry

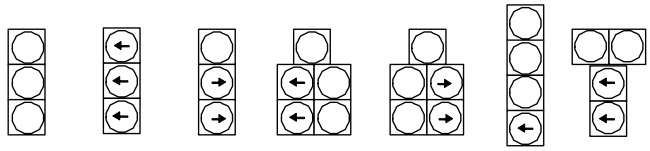
Speed limits (mph):

Haywood Rd – 40
I-385 NB Ramps – NP

Signal Phasing:

	Signal Head	Phasing				Overlap		X -Walk		Ped Sig	
NB	BBAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
EB	-	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
SB	AAAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
WB	BBAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N

* Circle if Advanced Head



Observations:

- SB queuing from I-385 SB Ramps and NB queuing from Pelham Road blocks intersection
- I-385 NB Off Ramp right-turn phase may need coordinated with Orchard Park Dr and Pelham Rd
- I-385 NB Off Ramp vehicles pull up beyond stop bar and on crosswalk to turn right on red and impedes third receiving lane on Haywood Rd. Signage and bridge restricts sight distance to make a right-turn on red.
- SB right-turns under yield control cannot see pedestrians and has conflicts with I-385 NB Off ramp through traffic (low volume) and NB dual left turning traffic (high volume) from Haywood Rd
- Poor lighting and pavement markings / skip lines for dual turning movements are faded at intersection

Short-Term Considerations:

- R10-11a "No Turn on Red" sign for NB Off Ramp and restripe to provide triple right-turns, update turning radii and overhead lane use signs
- Retroreflective backplates and restripe
- R10-15 "yield to pedestrians" sign, remove foliage and yield sign and replace with stop bar on southbound approach
- A SB blank out sign with "No Turn on Red" image coinciding with NB left-turn phase

Long-Term Considerations:

- Diverging Diamond Interchange
- Retime entire corridor to improve blocking
- Third receiving lane on I-385 On Ramp to allow a SB free flow right-turn lane
- Improve street lighting
- A rail buffer for sidewalk over bridge
- Eliminate third NB receiving lane using concrete creating a finite right-turn lane onto Orchard Park Dr and move up stop bar on Off Ramp

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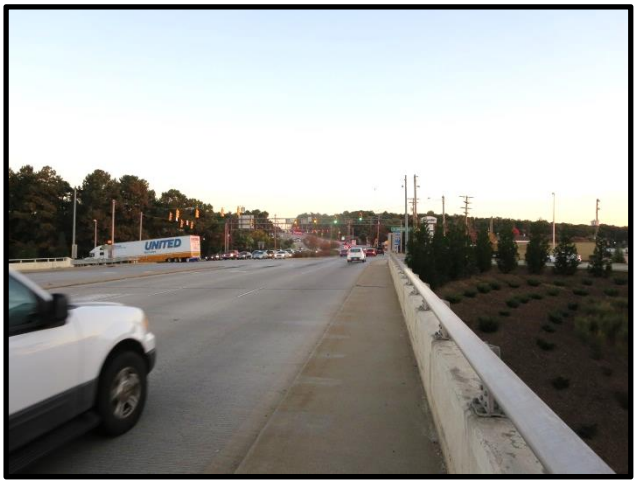
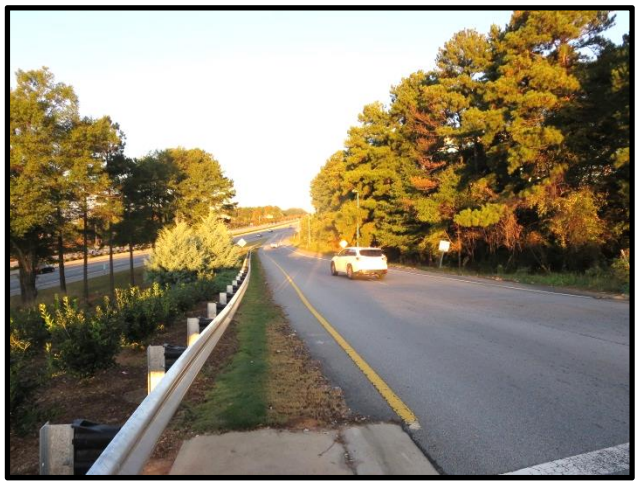
Haywood Road (S-273) at I-385 NB Ramps



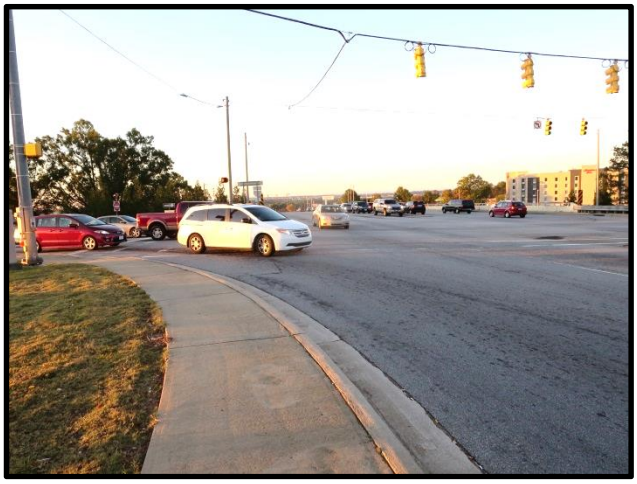
Northbound Approach



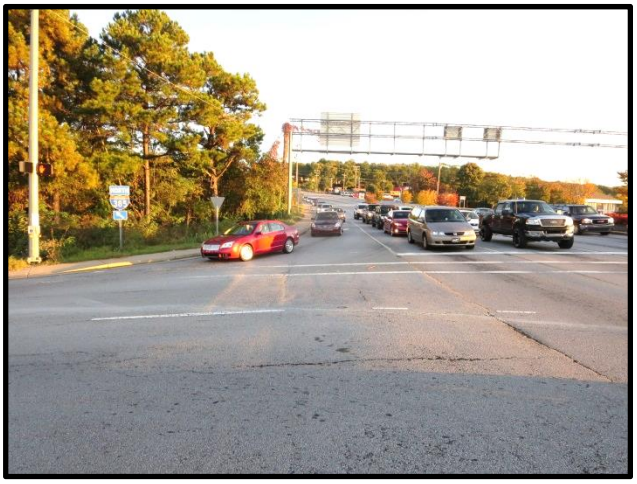
I-385 NB On Ramp

Southbound Approach

Westbound Approach



I-385 NB Off Ramp dual right-turns have limited sight distance from stop bar and pull out into third receiving lane and impede crosswalk for right-turn turn on red movement



SB Right-turns under yield control cannot see pedestrians and conflict with I-385 Off ramp through traffic and NB dual left turning traffic from Haywood Rd

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Haywood Road (S-273) at I-385 SB Ramps

99 Crashes (7/1/12 to 11/30/14)
16 – Right Angle
58 – Rear End
19 – Side Swipe
0 – Head On
4 – Out of Control
0 – Hit Animal
2 – Other

Crash Conditions	
14 - Night	85 - Day
15 - Wet	84 - Dry

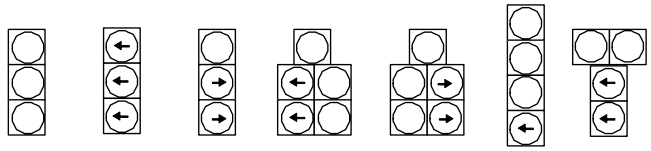
Speed limits (mph):

Haywood Rd – 40
I-385 SB Ramps – NP

Signal Phasing:

	Signal Head	Phasing				Overlap		X -Walk		Ped Sig	
NB	AAAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
EB	BBA (A)	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
SB	BBAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
WB	-	Prot	PP	Perm	Split	Y	N	Y	N	Y	N

* Circle if Advanced Head



Observations:

- Moderate queuing on I-385 Off Ramp due to poor lane utilization for dual left-turn lane as vehicles use center left-turn lane in preparation of turning right at Orchard Park Dr or Pelham Rd
- Poor sight distance from I-385 Off Ramp for right-turn on red movements
- Poor lighting and faded pavement markings at interchange
- The Off Ramp is part of an auxiliary lane that connects to the upstream Plesantburg Dr at I-385 SB On Ramp
- Pedestrian visibility may be a concern for the heavy NB right-turn movement
- Haywood Mall signalized intersections to the south

Short-Term Considerations:

- R10-11a “No Turn on Red” sign for SB Off Ramp
- Retroreflective backplates and restripe
- Adjust I-385 Off Ramp overhead lane use signs
- R3-1 SB “No Right-turn” overhead sign
- Overhead signs for adjacent Mall Exit signal dual right-turns lanes indicating which lane to be in to access I-385 NB or SB
- Dual W3-3-48 “signal ahead” signs on Ramp
- Review yellow change and red clearance intervals

Long-Term Considerations:

- Diverging Diamond and remove phases at the signals adjacent to the interchange
- Retime entire corridor to improve blocking
- Improve street lighting
- Rail buffer for sidewalk over bridge
- An additional NB right-turn lane onto I-385 to provide dual right-turn lanes
- Transverse rumble strips on the narrow section of the I-385 SB Off Ramp

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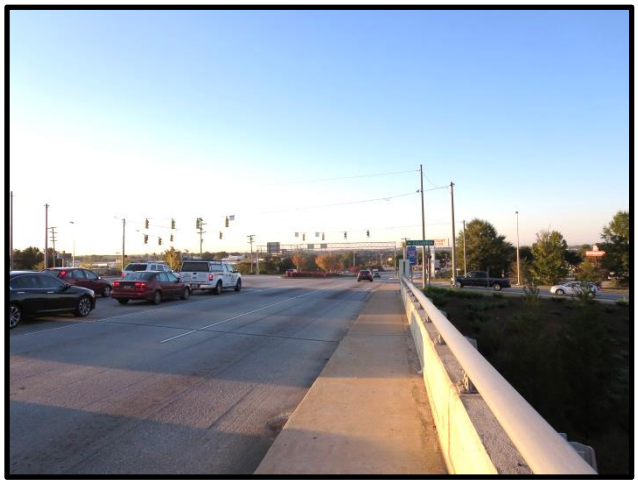
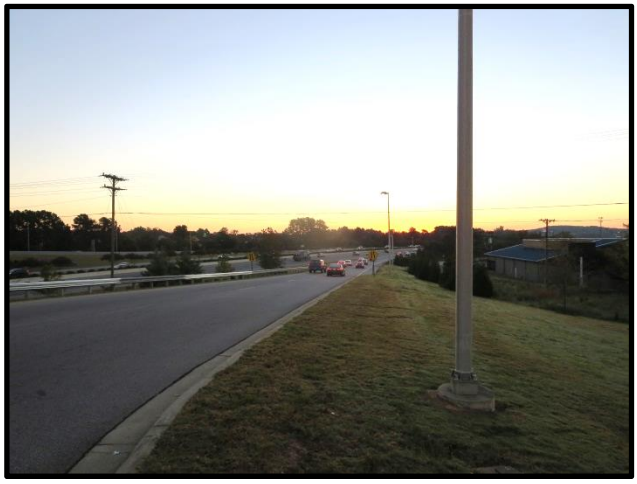
Haywood Road (S-273) at I-385 SB Ramps

Northbound Approach

Eastbound Approach



Southbound Approach



I-385 Eastbound On Ramp

I-385 SB Off Ramp Dual right-turns have limited sight distance from stop bar and vehicles pull up covering crosswalk for right-turn turn on red movement

Dual left-turn lanes from Off Ramp have poor lane utilization because vehicles tend to use center left-turn lane in preparation for right-turn onto Orchard Park Dr leading intersection

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N. Pleasantburg Drive (SC 291) at Villa Road / Century Drive (S-740)

75 Crashes between (08/01/12 to 11/30/14)
18 – Right Angle
43 – Rear End
8 – Side Swipe
3 – Head On
0 – Out of Control
0 – Hit Animal
3 – Other

Crash Conditions	
14 - Night	61 - Day
14 - Wet	61 - Dry

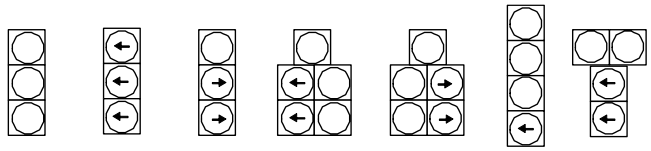
Speed limits (mph):

N. Pleasantburg Dr – 40
Century Dr – 35
Villa Rd – 35

Signal Phasing:

	Signal Head	Phasing				Overlap		X -Walk		Ped Sig	
NB	DAAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
EB	AA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
SB	DAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
WB	AA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N

* Circle if Advanced Head



Observations:

- Queuing on Villa Rd extends a few hundred feet prior to intersection and red light running
- No consistency in regards to pedestrian accommodation such as pedestrian signals, push buttons, and ramps
- Vehicles weave up to three lane changes on the NB approach from I-385 Off Ramp
- Vehicles come to a complete stop from I-385 Off Ramp as NB queuing from intersection prohibits merging
- Intersection is in a sag curve with vehicles exceeding speed limit on N. Pleasantburg Dr
- Light pedestrian and bike use
- Horizontal and vertical curvature on side streets may create sight distance issues with existing signal heads

Short-Term Considerations:

- Review yellow change and red clearance intervals
- Retroreflective backplates
- R10-12 “left-turn YIELD on Green” sign or flashing yellow arrows on N. Pleasantburg Dr
- Protected permissive phasing for Villa Rd
- Create gaps for I-385 Off Ramp by temporarily stopping NB N. Pleasantburg Dr with a red light
- Add signals heads on N. Pleasantburg Dr
- Pedestrian heads, push buttons, and crosswalks

Long-Term Considerations:

- Advanced Warning Flasher on SB approach
- Realign I-385 Off Ramp with On Ramp under signal control with dual right-turns to mitigate existing weave under yield control
- Raised median on SB approach
- Improve lighting on Century Dr and repave with high friction asphalt
- A short EB right-turn lane with an overlap
- A SB right-turn lane on N. Pleasantburg Dr

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N. Pleasantburg Drive (SC 291) at Villa Road / Century Drive (S-740)

Northbound Approach

Eastbound Approach

Southbound Approach

Westbound Approach

Excessive queuing on Villa Rd as left-turn movement yields to opposing traffic under permissive phasing

Weaving between I-385 Off Ramp and Villa Rd / Century Dr and NB queue extending beyond Off Ramp merge

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S. Pleasantburg Drive (SC 291) at E. Antrim Drive / W. Antrim Drive

75 Crashes between (08/28/12 to 12/03/14)
27 – Right Angle
36 – Rear End
11 – Side Swipe
1 – Head On
0 – Out of Control
0 – Hit Animal
0 – Other

Crash Conditions	
10 - Night	65 - Day
11 - Wet	64 - Dry

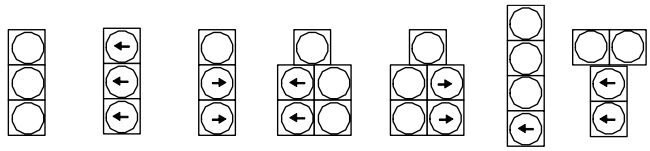
Speed limits (mph):

N Pleasantburg Dr – 40
W Antrim Dr – NP
E Antrim Dr – NP

Signal Phasing:

	Signal Head	Phasing				Overlap		X -Walk		Ped Sig	
NB	DA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
EB	DA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
SB	DA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
WB	BBAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N

* Circle if Advanced Head



Observations:

- Queuing and red light running on SB S. Pleasantburg Dr with a green time split under 30 seconds
- Nose of existing NB median creates a tight turning radius for inner WB left-turn lane
- NB overhead lane usage signs before intersection are not retroreflective and right-turn sign is blocked by tree
- There is a bus stop before intersection in SB direction
- Driveways to Wells Fargo and Suntrust banks are full access onto S. Pleasantburg Dr
- Permissive left-turns from S. Pleasantburg are usually made on a red light
- Lanes width are wide on W. Antrim Dr and signs on E. Antrim Dr are blocked by small trees

Short-Term Considerations:

- Restripe and sign a NB exclusive right-turn lane
- Additional signal heads on NB /SB S. Pleasantburg
- R10-12 “Left-turn YIELD on Green” for NB, SB, EB
- Replace NB overhead lane usage signs
- Review yellow change and red clearance intervals
- Convert University Center Driveway closest to signal to a right-out only and close median
- A SB protected only left-turn phase
- A SB W3-3-48 “signal ahead” warning sign

Long-Term Considerations:

- Consider increasing cycle length to provide longer green splits on S. Pleasantburg Dr and for left-turns from Antrim Dr approaches
- Permanently close NB Off Ramp to Laurens Road
- Large overhead destination signs for the NB S. Pleasantburg Dr approach
- Move bus stop after intersection in SB direction
- Permanently close Wells Fargo driveways on S. Pleasantburg Dr

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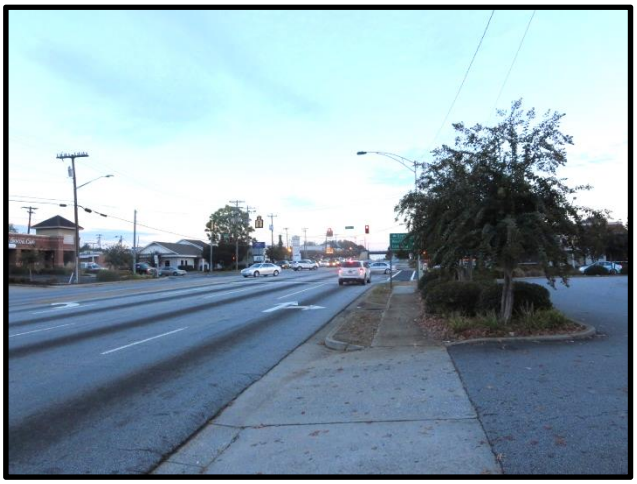
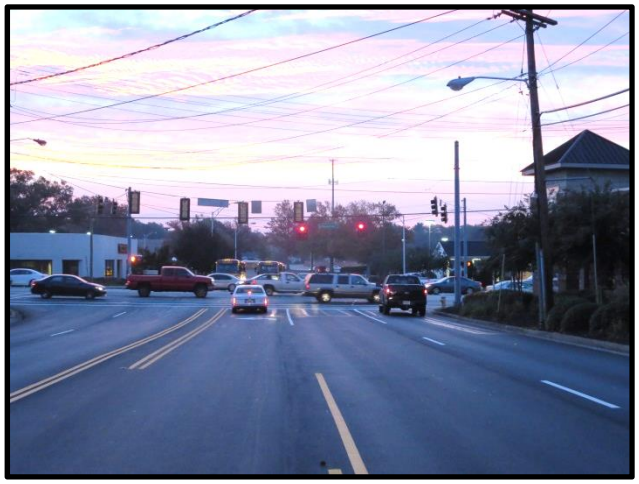
S. Pleasantburg Drive (SC 291) at E. Antrim Drive / W. Antrim Drive



Northbound Approach

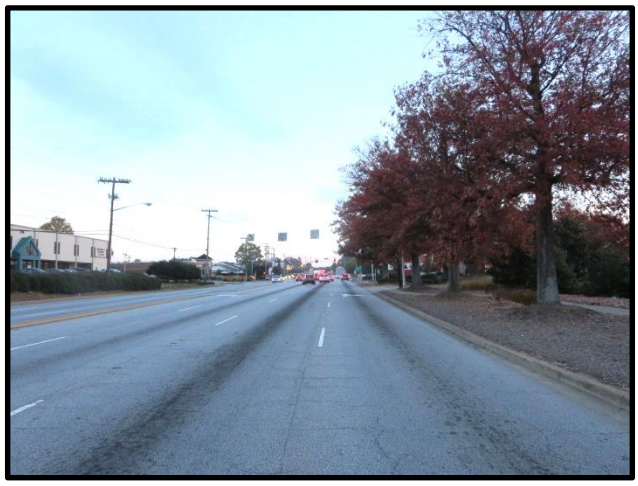


Eastbound Approach

Southbound Approach

Westbound Approach

Inner WB left-turn lane has tight turning radius with existing median nose placement



NB overhead lane usage signs blocked by trees and are not retroreflective

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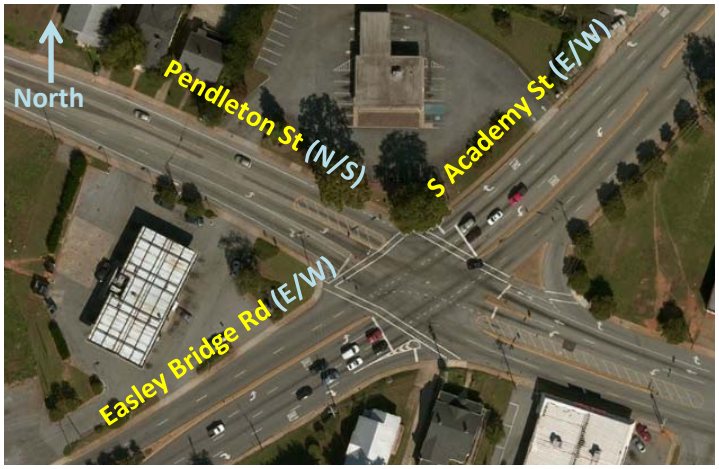
Pendleton Street (SC 124) at Easley Bridge Road / S. Academy Street (US 123)



57 Crashes between (11/19/12 to 12/3/14)
27 – Right Angle
22 – Rear End
3 – Side Swipe
1 – Head On
2 – Out of Control
0 – Hit Animal
2 – Other

Crash Conditions	
16 - Night	41 - Day
12 - Wet	45 - Dry

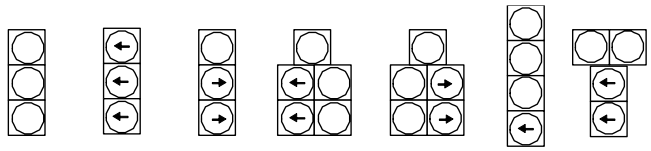
Speed limits (mph):

Pendleton St – 30
Easley Bridge Rd – 35
S Academy St – 35

Signal Phasing:

	Signal Head	Phasing				Overlap		X -Walk		Ped Sig	
NB	DAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
EB	AA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
SB	DAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
WB	AA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N

* Circle if Advanced Head



Observations:

- SB on Pendleton St looks straight into sun during the AM Peak hour
- Overall pavement condition is poor
- Intersection has been modified recently to accommodate bike lanes on Pendleton St
- Pavement markings need updated and signs need removed as a result of latest intersection modification
- No pedestrian signal equipment is present with existing crosswalks
- Moderate queuing on SB through / right-turn lane on Pendleton St
- Many signs were obstructed by foliage on S Academy St

Short-Term Considerations:

- A protected only EB, NB, SB left-turn phase
- Add pedestrian heads and push buttons at x-walks
- Review yellow change and red clearances intervals
- W3-3-48 signal ahead warning signs on S Academy
- Skip lines for all turn lanes
- Right-turn overlap on EB Academy St
- R1-1A "keep moving" sign for NB right-turn approach on Pendleton St
- Close near driveways on Pendleton St at Spinx

Long-Term Considerations:

- Restripe and repave entire intersection
- Improve lighting on all approaches
- Roundabout
- Overhead Advanced Warning Flasher on EB Easley Bridge Rd approach
- Remove trees in median on EB approach
- Tighten intersection by removing exclusive right-turn lane as indicated in the 2010 Downtown Streetscape Master Plan

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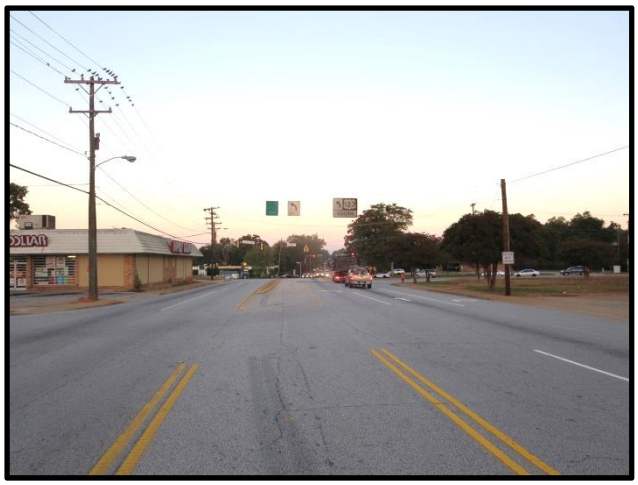
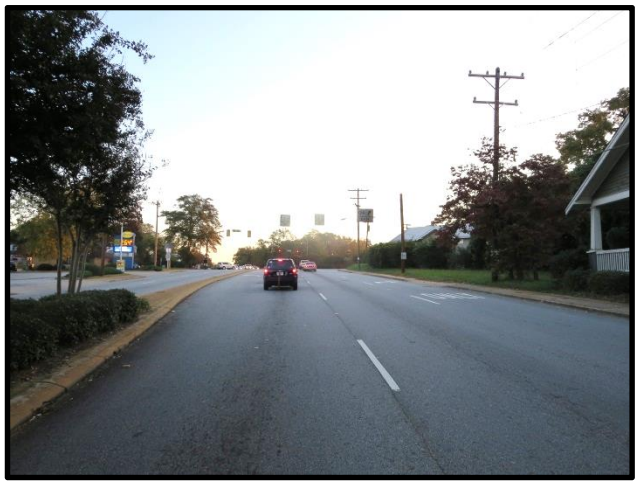
Pendleton Street (SC 124) at Easley Bridge Road / S. Academy Street (US 123)



Northbound Approach

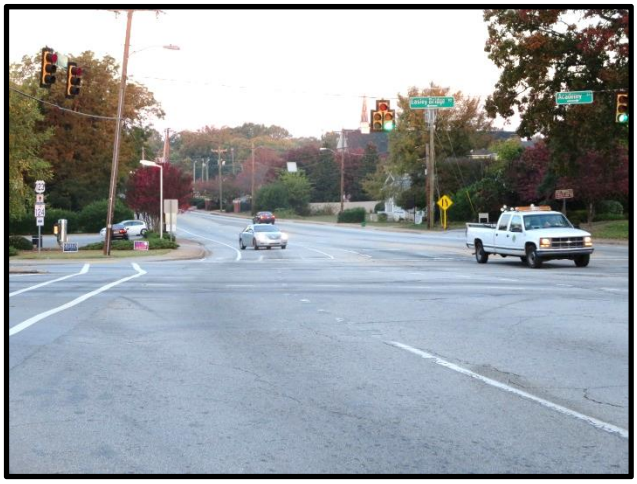


Eastbound Approach

Southbound Approach

Westbound Approach

Crosswalks with no pedestrian signals



Poorly milled out skip line creates ambiguous lane paths with single SB through lane and two receiving lanes combined with poor pavement conditions

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S. Pleasantburg Drive (SC 291) at Mauldin Road (S-107)

61 Crashes between (01/01/12 to 04/30/14)
25 – Right Angle
27 – Rear End
8 – Side Swipe
0 – Head On
0 – Out of Control
0 – Hit Animal
1 – Other

Crash Conditions	
16 - Night	45 - Day
9 - Wet	52 - Dry

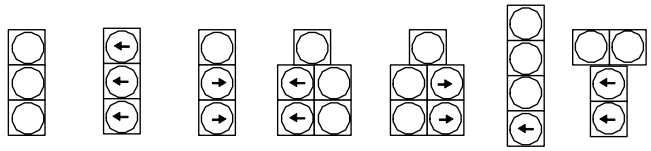
Speed limits (mph):

S. Pleasantburg Dr – 45
Mauldin Rd – 35

Signal Phasing:

	Signal Head	Phasing				Overlap		X -Walk		Ped Sig	
NB	DAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
EB	BBAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
SB	BBAAE	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
WB	DE	Prot	PP	Perm	Split	Y	N	Y	N	Y	N

* Circle if Advanced Head



Observations:

- Overhead lane usage signs on span wire are unreadable at dusk and missing over some turn lanes
- SB and WB approaches have crosswalk but no pedestrian signal heads. No truncated domes are present
- WB right-turn lane blocked by through traffic extending to interstate during the AM peak hour
- EB visibility is hindered by the sun in the AM peak hour
- Overall pavement markings and signage are in fair condition
- Existing way finding signs are excessive
- NB approach is uphill and at a slight curve

Short-Term Considerations:

- A protected only NB left-turn phase
- Review yellow change and red clearance intervals
- Bollards to construct a divided median on south leg extending beyond Citgo Driveway
- Pedestrian heads on SB and WB approaches
- Replace all overhead lane usage signs and have one for each turn lane
- Replace older signs with new retroreflective ones
- R4-7 signs on S. Pleasantburg Dr medians

Long-Term Considerations:

- Raised median on south leg extending beyond Citgo Driveway
- Channelization and a NB right-turn lane for pedestrian refuge on S. Pleasantburg Dr
- Restripe EB approach with one left-turn lane and install flashing yellow arrows on left-turns for both approaches along Mauldin Rd
- An exclusive EB right-turn lane with an overlap on Mauldin Rd

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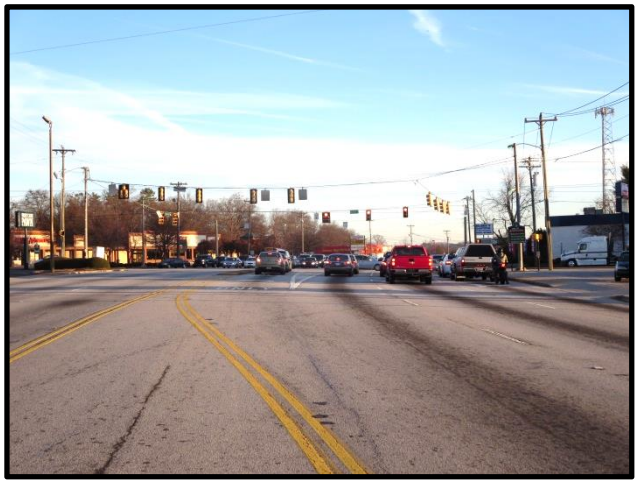
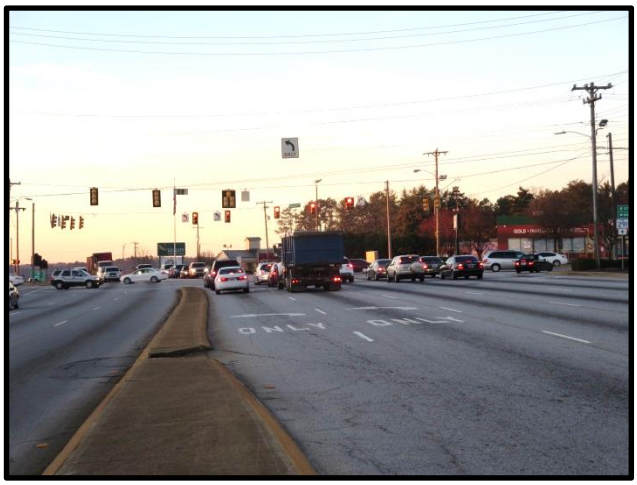
city of greenville

S. Pleasantburg Drive (SC 291) at Mauldin Road (S-107)

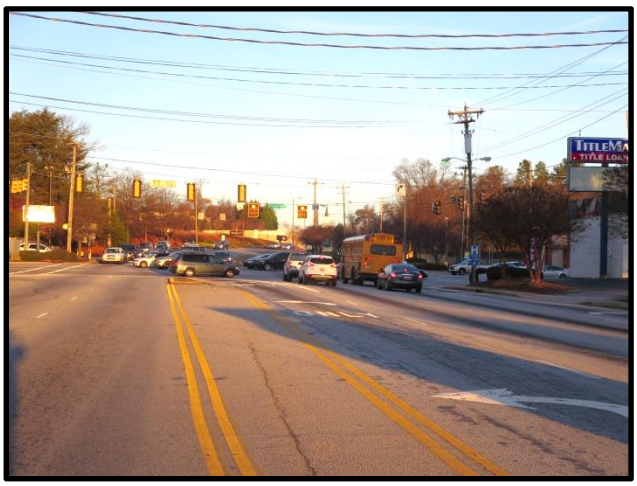


Northbound Approach

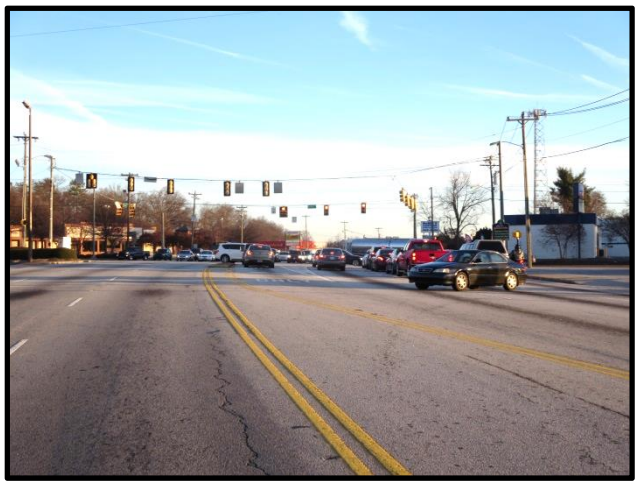
Eastbound Approach



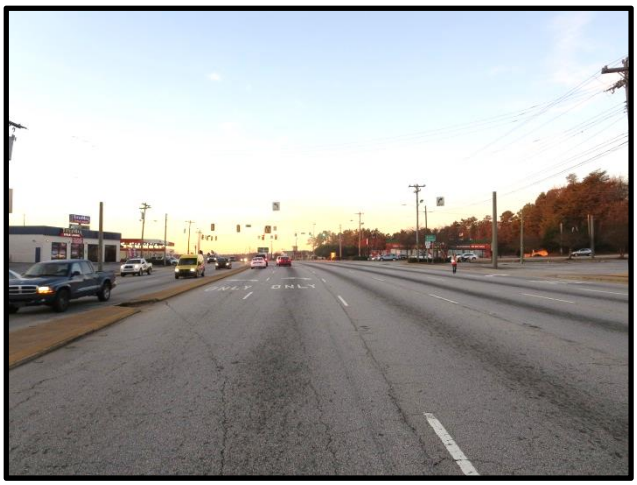
Southbound Approach



Westbound Approach



A vehicle freely exits the Citgo Gas Station onto the south leg of S. Pleasantburg Dr (7-lane section). Queuing extends beyond driveways during peak hours.



Dual SB left-turn lanes with one overhead left-turn sign in the middle of lanes on S. Pleasantburg Dr may cause lane confusion

AECOM

city of greenville

Pleasantburg Drive (SC 291) at Rutherford Road (S-21)

96 Crashes between (01/01/12 to 04/30/14)
22 – Right Angle
52 – Rear End
18 – Side Swipe
1 – Head On
1 – Out of Control
0 – Hit Animal
2 – Other

Crash Conditions	
17 - Night	79 - Day
13 - Wet	83 - Dry

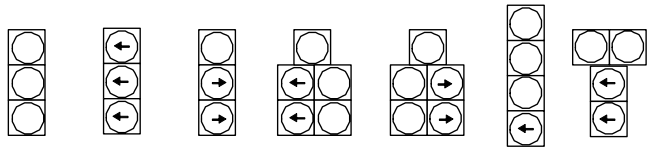
Speed limits (mph):

Pleasantburg Dr – 45
Rutherford Rd – 40 (NB)
Rutherford Rd – 35 (SB)

Signal Phasing:

	Signal Head	Phasing				Overlap		X -Walk		Ped Sig	
NB	DE	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
EB	GAAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
SB	DE	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
WB	GAAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N

* Circle if Advanced Head



Observations:

- Sight distance is limited for right-turn on red for EB Pleasantburg Dr and sun in face during the AM peak
- Pedestrian visibility crossing Pleasantburg Dr SB is limited for SB right-turns due to brick wall and curve / grade
- Raised medians need painted yellow and WB R4-7 “median keep right” sign was knocked down
- Vehicles using EB left-turn lane spill out of provided storage and block though lane in PM peak hour
- Lack of SB left-turn lane into Travelers Rest Bank force vehicles to stop in through lane along Rutherford Rd
- Bus stop is located on Rutherford Rd south leg in the SB direction just beyond Bi-Lo driveway
- Long queues on each approach block driveway access

Short-Term Considerations:

- A protected only NB left-turn phase with “No Turn on Red” blankout sign for SB right-turn
- Review yellow change and red clearance intervals
- Provide more green time for EB left-turn phase to prevent spillback into through lanes
- Crosswalks and pedestrian heads on all four legs
- Repaint medians on Pleasantburg Dr and fix R4-7 signs on medians
- R10-15 “yield to pedestrian” sign for SB & EB

Long-Term Considerations:

- Overhead lane use signs for Pleasantburg
- Retime signals along Pleasantburg Dr corridor to minimize queuing and optimize coordination
- An exclusive EB right-turn lane into Bi-Lo Shopping Center Driveway
- Extend raised median on South leg past the Bi-lo and Bank of Travelers Rest driveways
- Close Citgo driveways nearest to traffic signal on both Pleasantburg Dr and Rutherford Rd

AECOM

city of greenville

Pleasantburg Drive (SC 291) at Rutherford Road (S-21)

Northbound Approach

Eastbound Approach

Southbound Approach

Westbound Approach

Bank of Travelers Rest driveway onto Rutherford Rd blocked by queuing from traffic signal

EB Pleasantburg Dr queues to upstream Piney Mountain Rd signal blocking access to / from Shopping Center Driveways

AECOM

city of greenville

Haywood Road (S-273) at Pelham Road (S-492)

94 Crashes between (01/01/12 to 04/30/14)
19 – Right Angle
52 – Rear End
21 – Side Swipe
0 – Head On
0 – Out of Control
0 – Hit Animal

Crash Conditions	
19 - Night	75 - Day
14 - Wet	80 - Dry

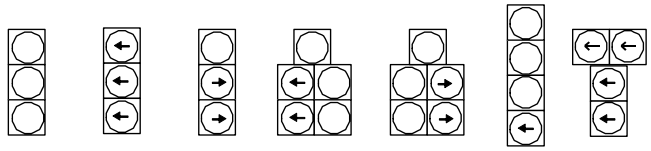
Speed limits (mph):

Haywood Rd – 45
Pelham Rd – 45

Signal Phasing:

	Signal Head	Phasing				Overlap		X -Walk		Ped Sig	
NB	BBAAE	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
EB	DAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
SB	GAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
WB	BBAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N

* Circle if Advanced Head



Observations:

- SB queuing from Orchard Park (Split Phased) signal extends beyond Pelham Rd and blocks intersection
- SB queuing extends from Pelham (over ¼ of a mile) and SB left-turns use TWLTL to pass by this queue
- Spinx Gas Station Driveways closest to intersection are full access
- Vehicular speed SB and downhill grade with no right-turn lane into Spinx Gas Station cause abrupt stops
- EB right-turn lane has a R10-11a "No Turn on Red" sign with no overlap leading to long queues and violations
- Sight distance is poor for SB and WB right-turns when turning on red
- Long queues were observed in the WB direction and red light running was observed for left-turning vehicles

Short-Term Considerations:

- Close both Spinx driveways nearest to intersection (on both Haywood and Pelham)
- R10-11a "No Turn on Red" signs for SB and WB approaches
- "Watch for stopped traffic" sign on SB approach
- R10-7 "Do Not Block Intersection" sign on EB and SB approaches
- Repaint medians
- Add an EB right-turn overlap

Long-Term Considerations:

- NB overhead lane usage signs
- An exclusive WB right-turn lane
- Analyze signal timing of corridor and include possible EB right-turn overlap and dual southbound left-turns (Lead / Lag)
- Provide access to Spinx Gas Station from Orchard Park Dr and remove driveways on Haywood Rd
- Improve capacity at the I-385 interchange to prevent spill back into study intersection

AECOM

city of greenville

Haywood Road (S-273) at Pelham Road (S-492)

Northbound Approach

Eastbound Approach

Southbound Approach

Westbound Approach

Queuing & Blocked Intersection - SB Receiving Lanes (Orchard Drive is Split Phased and I-385 Interchange over capacity)

Long queues on EB right-turn lane (Right-turn overlap recommended) as vehicles are violating No Turn on Red overhead sign

AECOM

city of greenville

Augusta Road (S-201) at Mauldin Road (S-107) / Potomac Avenue (S-30)

36 Crashes between (07/01/12 to 11/30/14)
5 – Right Angle
19 – Rear End
8 – Side Swipe
2 – Head On
0 – Out of Control
0 – Hit Animal
2 – Other

Crash Conditions	
6 - Night	30 - Day
5 - Wet	31 - Dry

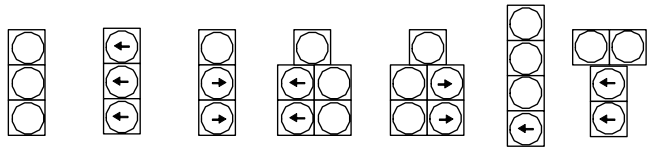
Speed limits (mph):

Augusta Rd – 35
Mauldin Rd – 35
Potomac Ave – 35

Signal Phasing:

	Signal Head	Phasing	Overlap	X -Walk	Ped Sig
NB	AA	Prot PP (Perm) Split	Y (N)	(Y) N	(Y) N
EB	AAA	Prot PP (Perm) Split	Y (N)	(Y) N	(Y) N
SB	BBAA	(Prot) PP Perm Split	Y (N)	(Y) N	(Y) N
WB	AA AA	Prot PP (Perm) Split	(Y) N	(Y) N	(Y) N

* Circle if Advanced Head



Observations:

- WB through movement is green while right-turn movement is red may create driver expectation confusion
- Many vehicles do not come to a complete stop for WB right-turn on red movement and treat as a yield control
- Mild queuing is present for WB right-turn during NB through movement phase
- Wide receiving lanes for dual EB through movement lead to vehicle confusion through intersection
- Landscaped islands with trees may restrict visibility in the Spring and Summer months
- No signal ahead warning signs are present on SB, NB, and WB approaches
- No Yield lines were painted

Short-Term Considerations:

- A protected only EB left-turn phase allowing (WB through and right-turn) green phase together
- R10-11a "No Turn on Red" sign for WB right
- W3-3-48 "signal ahead" signs (NB, SB, & WB)
- Stripe yield lines for SB and NB right-turns
- Restripe EB approach to one through lane and one right-turn lane and repaint receiving lanes
- Retroreflective backplates
- Review yellow change and red clearance intervals

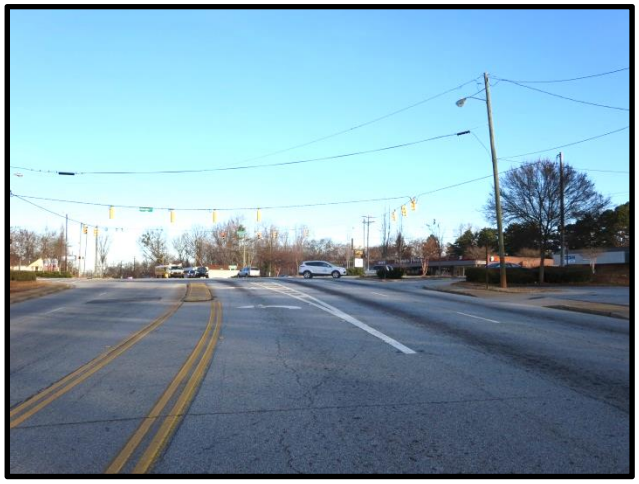
Long-Term Considerations:

- Option 1: Realign WB approach to 90 degrees by removing left-turn lane onto Waters Ave and add near side heads for approach
- Option 2: Provide one WB free flow right-turn lane by restriping NB approach to one left, one through, and one right-turn lane. Stripe out one of the existing dual WB right-turn lanes
- Improve lighting
- Decorative pavers for crosswalks

AECOM

city of greenville

Augusta Road (S-201) at Mauldin Road (S-107) / Potomac Avenue (S-30)



Northbound Approach

Eastbound Approach

Southbound Approach

Westbound Approach

WB approach through volume has green signal while right-turns are red. Dual right-turn on red movement must yield to NB through, EB left, and pedestrians

Receiving lane striping for dual westbound right-turns overlap with northbound through movement

AECOM

city of greenville

S. Pleasantburg Drive (SC 291) at Cleveland Street / Cleveland Street Ext. (S-189)

32 Crashes (8/1/12 to 12/3/14)
9 – Right Angle
14 – Rear End
4 – Side Swipe
0 – Head On
5 – Out of Control
0 – Hit Animal
0 – Other

Crash Conditions	
8 - Night	24 - Day
2 - Wet	30 - Dry

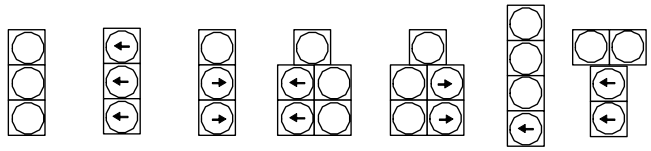
Speed limits (mph):

S Pleasantburg Dr – 45(NB)
S Pleasantburg Dr – 40(SB)
Cleveland St – 35
Cleveland St Ext – 35

Signal Phasing:

	Signal Head	Phasing			Overlap		X -Walk		Ped Sig	
NB	DAAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
EB	DE	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
SB	DAAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
WB	DE	Prot	PP	Perm	Split	Y	N	Y	N	Y	N

* Circle if Advanced Head



Observations:

- Intersection appears to have been upgraded recently
- Significant queuing on WB Cleveland St Ext during the AM peak hour
- Due to horizontal curvature, WB Cleveland St Ext existing sight distance for signal heads is limited
- Significant queuing was observed for the NB left-turn from S. Pleasantburg Dr during the AM peak hour
- Pedestrian signal heads without crosswalks are present for EB direction across S. Pleasantburg Dr
- The Swamp Rabbit Trail begins at this intersection along Cleveland St
- EB right-turn on Cleveland St has limited sight distance to complete the movement for right-turn on red

Short-Term Considerations:

- Review yellow change and red clearance intervals
- R10-12 "Left Turn YIELD on Green" all approaches
- A nearside head on WB approach
- A "Watch for Stopped Traffic" sign on WB approach at least 500 feet from stop bar
- R10-15 overhead "yield to pedestrians" sign on all approaches
- Install flashing yellow arrow signal heads on S. Pleasantburg Drive

Long-Term Considerations:

- Install Advanced Warning Flasher on SB approach
- Remove trees on WB approach to improve signal visibility
- Realign WB approach to 90 degrees
- A dual NB left-turn lane
- A NB right-turn lane
- Improve lighting at intersection
- Close nearest driveway to Morgan Manor Shopping Center

AECOM

city of greenville

S. Pleasantburg Drive (SC 291) at Cleveland Street / Cleveland Street Ext. (S-189)

Northbound Approach

Eastbound Approach

Southbound Approach

Westbound Approach

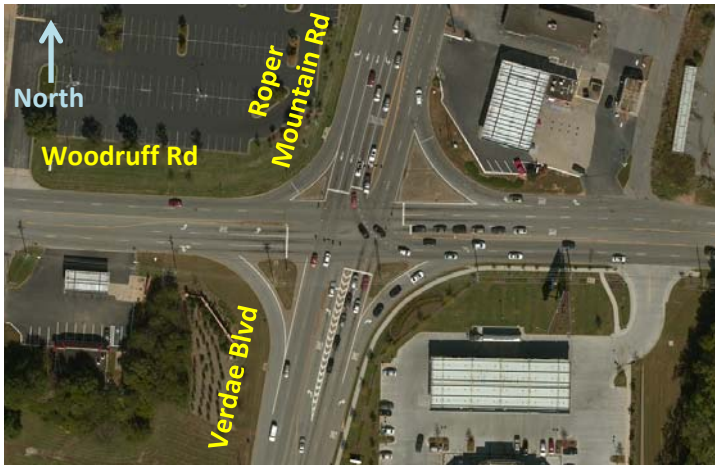
Pedestrian signal head but missing crosswalk across S. Pleasantburg Dr heading EB

WB Cleveland St Ext has horizontal and vertical challenges with limited sight distance for stopping (significant queuing and signal head placement potential issues)

AECOM

city of greenville

Woodruff Road (SC 146) at Verdae Boulevard / Roper Mountain Road (S-183)



163 Crashes between (07/01/12 to 11/30/14)
28 – Right Angle
123 – Rear End
9 – Side Swipe
0 – Head On
1 – Out of Control
0 – Hit Animal
2 – Other

Crash Conditions	
29 - Night	134 - Day
12 - Wet	151 - Dry

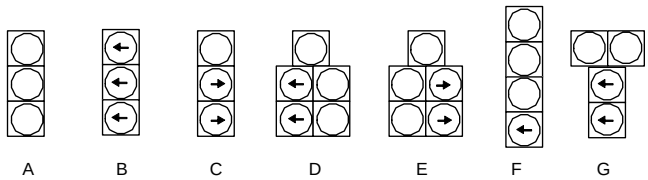
Speed limits (mph):

Woodruff Rd – 45 (EB)
Woodruff Rd – 35 (WB)
Verdae Blvd – 45
Roper Mountain – 40

Signal Phasing:

	Signal Head	Phasing				Overlap		X -Walk		Ped Sig	
NB	AA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
EB	DA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
SB	BBAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
WB	DA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N

* Circle if Advanced Head



Observations:

- All right-turns are channelized under yield control
- A bus stop is located on the south leg in the SB direction and pedestrians were observed crossing Verdae Blvd
- Sight distance is limited for the NB channelized right-turn under yield control
- Extremely congested intersection with queuing in the SB, NB, and WB directions
- Queuing from the Congaree Rd (700 ft) and Costco Entrance (900 ft) signals spill back into intersection
- QT Gas Station driveway access on Verdae Blvd is blocked by queuing from signal during peak hours
- Dual SB left-turn lanes and WB right-turn lane storage spills back into through lanes

Short-Term Considerations:

- A protected only NB left-turn phase
- Review yellow change and red clearance intervals
- Remove shrubbery in northeast quadrant and reduce radius of WB right-turn
- Additional signal heads on Woodruff Rd
- Dual R1-2-48 “yield” signs for all right-turns
- Convert Kangaroo Driveway on Roper Mountain to right-in / right out and Convert QT Driveway on Woodruff Rd to a left-in / right-out only

Long-Term Considerations:

- Remove all channelization and bring right-turns to intersection under signal control
- Dual WB right-turn lanes
- Raised median on south leg extending from signal beyond QT driveway
- Develop a quadrant left intersection in southeast or southwest quadrant by removing left-turns from Verdae Blvd to reduce queuing along Roper Mountain

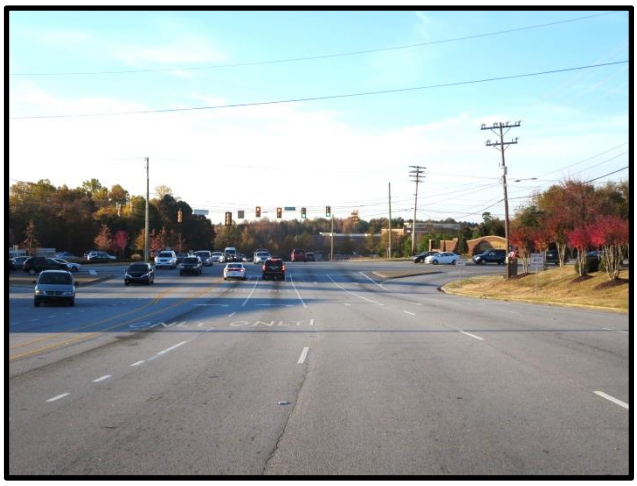
AECOM

city of greenville

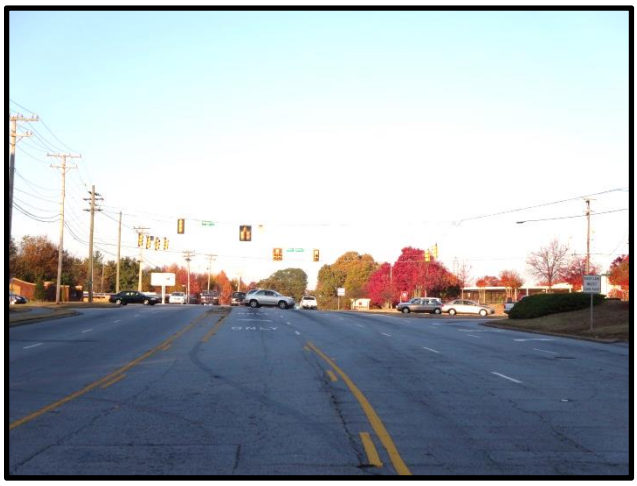
Woodruff Road (SC 146) at Verdae Boulevard / Roper Mountain Road (S-183)

Northbound Approach

Eastbound Approach



Southbound Approach



Westbound Approach

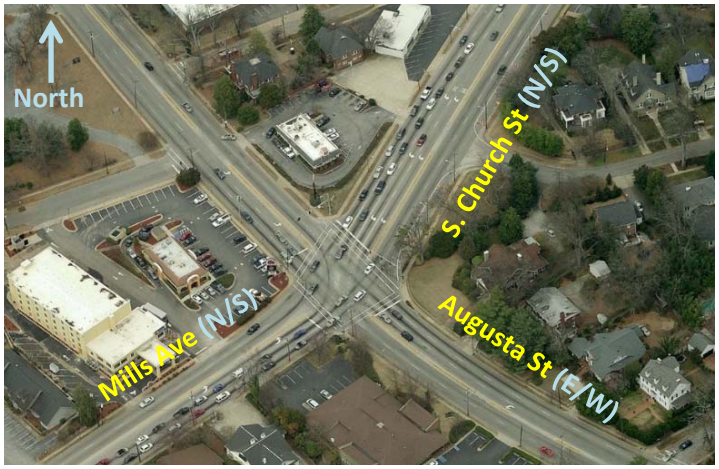
NB approach on Verdae Blvd queue beyond QT driveway combined with a bus stop with frequent pedestrian crossings not at intersection

SB channelized right-turn on Roper Mountain Rd with high traffic volumes yield to mainline traffic on Woodruff Rd

AECOM

city of greenville

S. Church Street (US 29) / Mills Avenue (US 29) at Augusta Street (SC 20)



67 Crashes between (07/01/12 to 12/31/14)
15 – Right Angle
36 – Rear End
15 – Side Swipe
0 – Head On
0 – Out of Control
0 – Hit Animal
0 – Other

Crash Conditions	
12 - Night	55 - Day
7 - Wet	60 - Dry

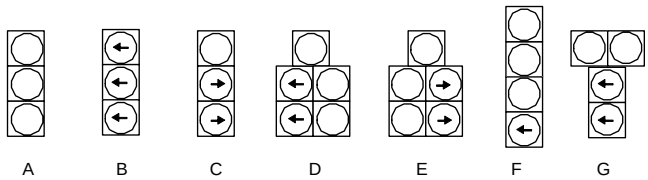
Speed limits (mph):

Augusta St – 30
Mills Ave – 35
Church St – 35

Signal Phasing:

	Signal Head	Phasing				Overlap		X -Walk		Ped Sig	
NB	BAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
EB	DA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
SB	BBAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
WB	DA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N

* Circle if Advanced Head



Observations:

- Bike lanes exists on the SB approach on S. Church Street
- SB left-turn lane utilization along S. Church St was uneven with the majority using outermost left-turn lane in preparation for right-turn on Grove Rd approximately 800 feet southeast of intersection along Augusta St
- WB approach has narrow lanes (less than 12 feet)
- R10-11a "No Turn on Red" overhead sign is located on NB approach
- Many vehicles turn left from Grove Road and then turn right onto S. Church St (US 29) towards downtown
- Existing WB queuing extends past Grove Road Signalized intersection and NB queuing extends a few hundred feet

Short-Term Considerations:

- Near side signal head for WB approach
- Review yellow change and red clearance intervals
- Retroeflectivity to existing signal head backplates
- W3-3-48 "signal ahead" warning signs on all approaches
- Move I-385 guide signs back on WB approach
- Close NB median break into Taco Bell driveway
- Skips lines to guide NB traffic through intersection to help with existing skew

Long-Term Considerations:

- Retime signals along Augusta St
- A WB right-turn lane with an overlap
- Overhead Advance Warning Flasher for SB Church St to warn vehicles of signal
- A concrete raised median on south leg extending to Elm St
- Overhead lane usage signs on Augusta St
- Restripe WB approach to a through, though, right and improve Tindal Ave for quadrant intersection

AECOM

city of greenville

S. Church Street (US 29) / Mills Avenue (US 29) at Augusta Street (SC 20)

Northbound Approach

Eastbound Approach

Southbound Approach

Westbound Approach

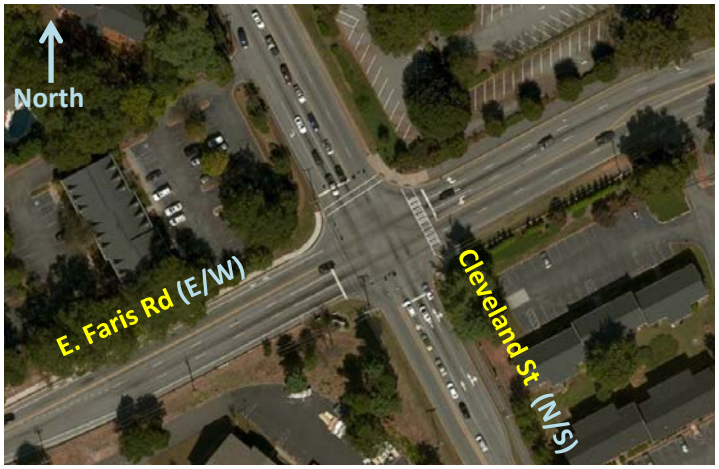
WB approach on Augusta St has limited signal head visibility of due to horizontal curvature and trees

Significant NB queuing along Mills Ave restricts access to / from business driveways during the PM Peak hour

AECOM

city of greenville

E. Faris Road (S-149) at Cleveland Street (S-189)



37 Crashes between (07/01/12 to 12/31/14)
8 – Right Angle
19 – Rear End
5 – Side Swipe
0 – Head On
1 – Out of Control
0 – Hit Animal
4 – Other

Crash Conditions	
9 - Night	28 - Day
9 - Wet	28 - Dry

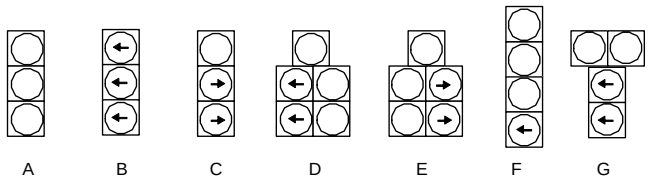
Speed limits (mph):

E. Faris Rd – 35 (EB)
E. Faris Rd – 40 (WB)
Cleveland St – 35

Signal Phasing:

	Signal Head	Phasing			Overlap		X -Walk		Ped Sig	
NB	BA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
EB	AA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
SB	BA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
WB	BA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N

* Circle if Advanced Head



Observations:

- Swamp Rabbit Trail crosses E. Faris Rd on the NB approach equating to many bicyclist and pedestrians
- SB queue is over a half a mile long in the PM peak hour
- EB approach has a steep uphill grade after steep downhill grade translating to high vehicular speeds
- No signal ahead warning signs were present
- Greenville Tech community college is located just south of this intersection
- First Baptist Greenville Church and Riverbend Apartments have no turn lanes off of E. Faris Rd
- E. Faris Rd is 4 lanes east of Cleveland St and 2 lanes west of Cleveland St

Short-Term Considerations:

- W3-3-48 “signal ahead” signs all approaches
- Retroreflectivity to existing signal head backplates
- R10-11a “No Turn on Red” sign on NB and WB approaches
- Review yellow change and red clearance intervals
- R10-12 “left-turn YIELD on Green” sign for NB, SB, and WB protected permissive signal heads
- Convert Riverbend apartment driveway on E. Faris Rd to a right-in / right-out

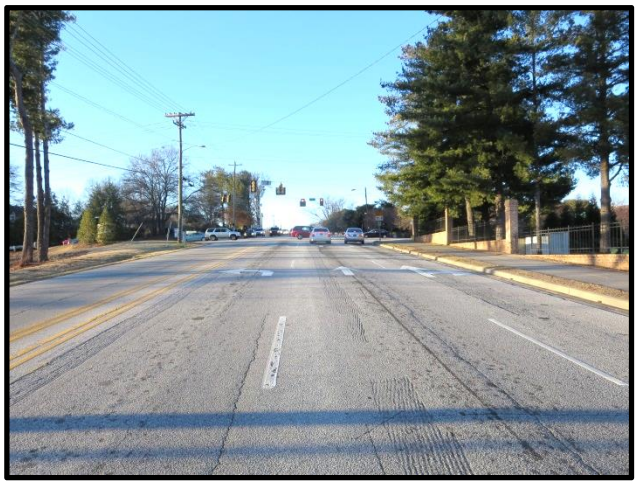
Long-Term Considerations:

- Widen Cleveland St to four lanes between E. Faris Rd and S. Pleasantburg Dr and restripe SB right-turn lane to a thru /right-turn lane
- Widen E. Faris Rd to a five lane section east of Cleveland St
- Repave and restripe entire intersection
- Offset left-turn lanes on Cleveland St
- Replace all five section signal heads with four section flashing yellow arrow signal heads

AECOM

city of greenville

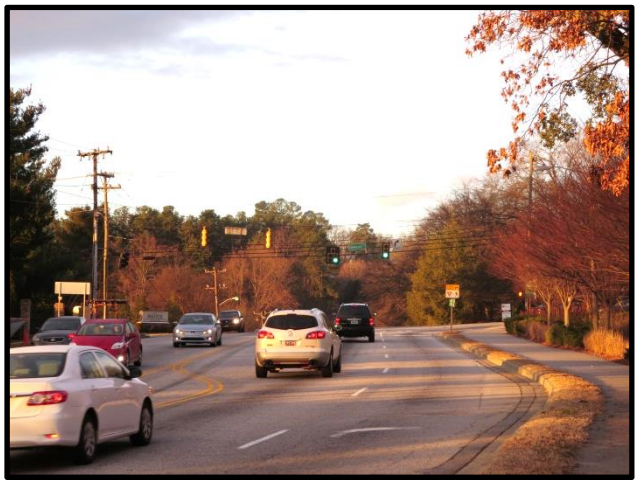
E. Faris Road (S-149) at Cleveland Street (S-189)



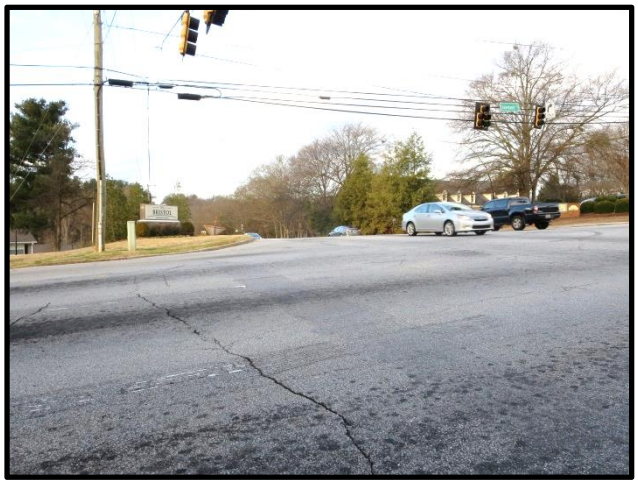
Northbound Approach

Eastbound Approach

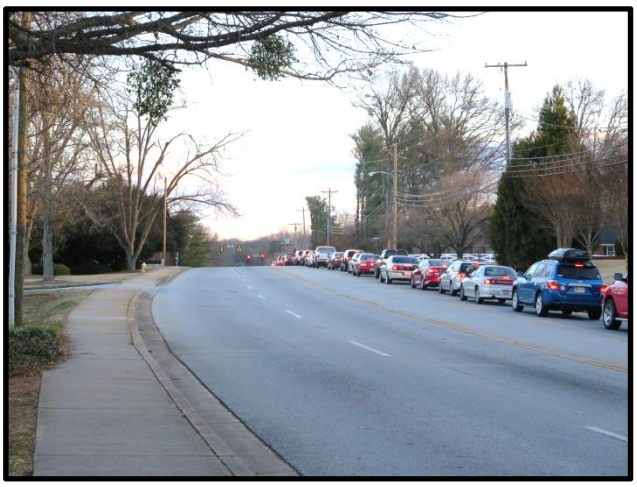
Southbound Approach



Westbound Approach



NB approach on Cleveland St has limited visibility to make a right-turn on red



Significant SB queuing along Cleveland St during the PM Peak hour. Queue extends a half a mile to Southland Avenue signal

AECOM

city of greenville

Laurens Road (US 276) at Woodruff Road (SC 146)

64 Crashes between (07/01/12 to 12/31/14)
7 – Right Angle
48 – Rear End
8 – Side Swipe
0 – Head On
0 – Out of Control
0 – Hit Animal
1 – Other

Crash Conditions	
8 - Night	56 - Day
9 - Wet	55 - Dry

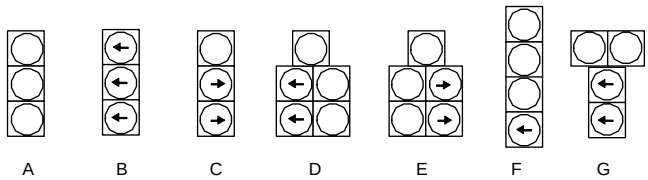
Speed limits (mph):

Laurens Rd – 35
Woodruff Rd – 45

Signal Phasing:

	Signal Head	Phasing				Overlap		X -Walk		Ped Sig	
NB	AAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
EB	FA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
SB	BBAAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
WB	FA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N

* Circle if Advanced Head



Observations:

- Speed limit on the seven lane Laurens Rd is 35 mph; however, vehicles appear to be driving faster
- No left-turn lane is striped for NB Laurens Rd, but extra pavement is available
- There is a heavy NB right-turn movement from Laurens Rd to Woodruff Rd during the AM peak
- NB queuing along Laurens Rd from the Haywood Rd intersection extends beyond Woodruff Rd causing blocking
- Heavy existing WB right-turn from Woodruff Rd must make two lane changes as one lane drops at Haywood Rd
- Laurens Rd is 7 lanes with unlimited access to business driveways
- Additional pedestrian signal heads were being install during field visit

Short-Term Considerations:

- R1-2-48 “yield signs” for WB and NB right-turns
- Paint skip lines for all turn lanes with storage especially SB approach on Laurens Rd
- Restripe NB approach to provide a left-turn lane
- Review yellow change and red clearance intervals
- Restripe one of the SB left-turn lanes to a U-turn only lane and make NB right-turn lane free flow with a R1-1A sign “keep moving” and R10-15 “ yield to pedestrians”

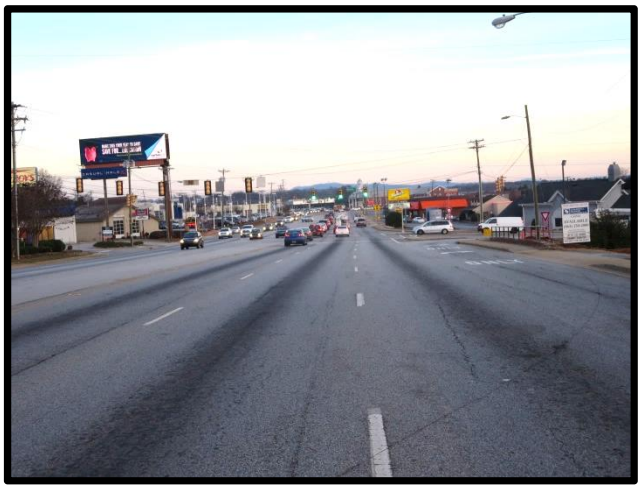
Long-Term Considerations:

- Remove WB right-turn channelization and replace with dual right-turns with an overlap and a R10-11a “No turn on Red” sign
- Concrete median between Haywood Rd and Woodruff Rd except left-turn access only onto Laurel Creek Ln from Laurens Rd
- A concrete median between Woodruff Rd and McDonalds / Taco Bell signal
- Retime signals along Laurens Rd

AECOM

city of greenville

Laurens Road (US 276) at Woodruff Road (SC 146)



Northbound Approach

Eastbound Approach

Southbound Approach

Westbound Approach

WB right-turn channelized yield movement carries heavy volumes with few gaps on Laurens Rd and weaving causing rear-end collisions

Adjacent signal is less than 1000 feet away (Haywood Rd) shows grid lock between both signals making it difficult to access driveways

AECOM

city of greenville

Academy Street (US 123) at College Street (SC 183)

55 Crashes between (07/01/12 to 12/31/14)
27 – Right Angle
14 – Rear End
14 – Side Swipe
0 – Head On
0 – Out of Control
0 – Hit Animal
0 – Other

Crash Conditions	
24 - Night	31 - Day
13 - Wet	42 - Dry

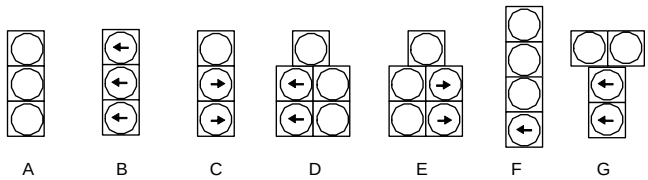
Speed limits (mph):

N. Academy St – 40
College St – 35

Signal Phasing:

	Signal Head	Phasing				Overlap		X -Walk		Ped Sig	
NB	DA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
EB		Prot	PP	Perm	Split	Y	N	Y	N	Y	N
SB	AA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
WB	AAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N

* Circle if Advanced Head



Observations:

- Academy St does not appear to be coordinated
- There is a downstream pedestrian crossing that is triggered even by pedestrians crossing Buncombe St
- Vehicles do not stay in their own lanes when passing though the dual left-turn lanes from College St
- The spacing of the adjacent signals may contribute to the disregard to traffic control if looking at downstream signal
- Trees in the median with foliage may restrict sight distance for the NB protected permissive left-turn
- SB and NB queuing on Academy St at Buncombe St extends beyond study intersection creating gridlock
- Pavement was in poor condition

Short-Term Considerations:

- Retroreflective backplates
- Louvers on WB and SB downstream signals
- NB R10-12 “left-turn YIELD on Green” sign
- Restripe WB approach to have one left-turn lane
- Review yellow change and red clearance intervals
- Protected only phasing for NB left-turn
- WB R3-5L overhead “left-turn” sign on mast arm
- An additional signal head on WB approach
- R10-15 “yield to pedestrian” signs all approaches

Long-Term Considerations:

- Overhead lane usage signs
- Improve overall lighting at intersection
- Improve coordination along Academy St
- Remove downstream pedestrian signal crossing and replace with pedestrian bridge
- Remove NB left-turn phasing / lane and reroute to W Elford to Main St and provide three SB receiving lanes
- Repave and restripe entire intersection

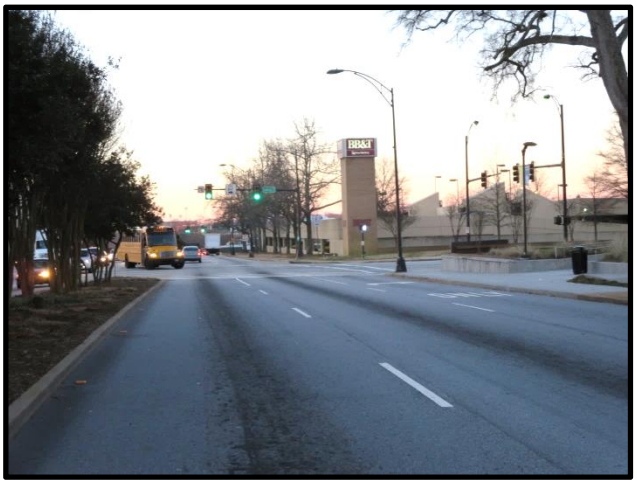
AECOM

city of greenville

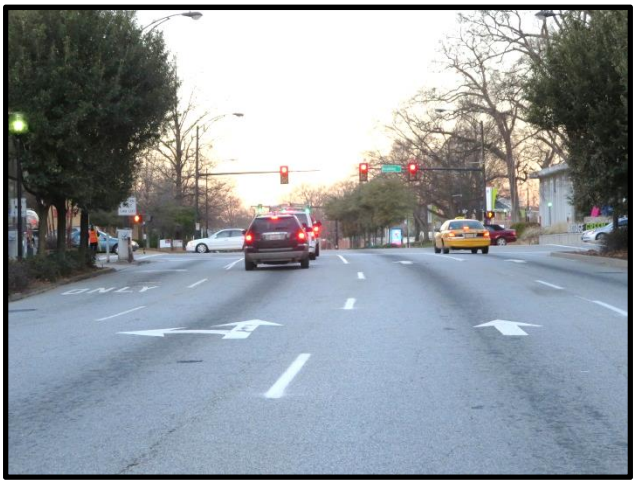
Academy Street (US 123) at College Street (SC 183)

Northbound Approach

Eastbound Approach

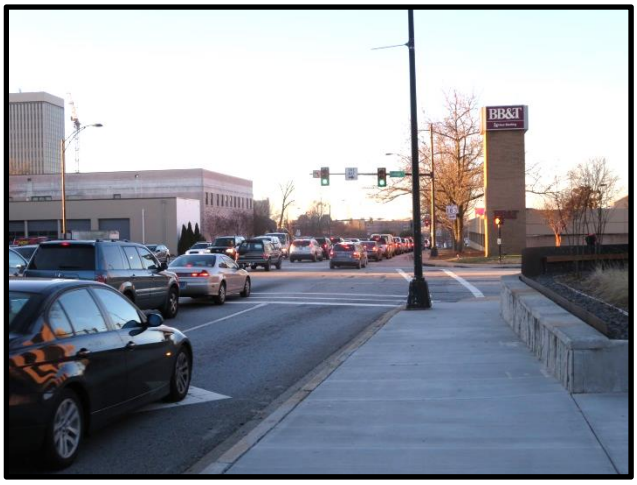


Southbound Approach



Westbound Approach

WB College St has many collisions involving disregard to traffic control possibly linked to the downstream pedestrian signal crossing that is in the cone of vision



SB Academy St congestion queues beyond signal creating gridlock and vehicles block intersection prohibiting passage

AECOM

city of greenville

Stone Avenue (US 276) at Rutherford Street (S-200 / US 276)

32 Crashes between (08/01/12 to 12/31/14)
12 – Right Angle
12 – Rear End
4 – Side Swipe
0 – Head On
0 – Out of Control
0 – Hit Animal
4 – Other

Crash Conditions	
6 - Night	26 - Day
7 - Wet	25 - Dry

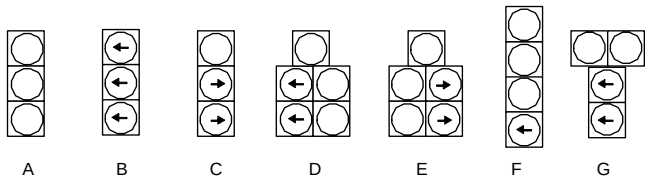
Speed limits (mph):

Stone Ave – 35
Rutherford St – 35

Signal Phasing:

	Signal Head	Phasing				Overlap		X -Walk		Ped Sig	
NB	AA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
EB	DA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
SB	DA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
WB	DE	Prot	PP	Perm	Split	Y	N	Y	N	Y	N

* Circle if Advanced Head



Observations:

- NB right-turn on red has limited sight distance due to building set back and EB approach horizontal curve
- EB approach intersects with a sharp curve with limited sight distance of signal heads
- There was a high number of pedestrians using this intersection
- SB left-turn queuing was significant and extended beyond the pedestrian crossing under signal control
- WB receiving leg on Stone Ave has bollards in one of the two receiving lanes to create a single receiving lane
- Red light running and pedestrians not using pedestrian push buttons was a regular occurrence
- R10-11a “No Turn on Red” overhead sign is located on SB approach

Short-Term Considerations:

- Retroreflective back plates
- W3-3-48 “signal ahead” on all approaches
- SB/EB/WB R10-12 “left-turn YIELD on Green” signs
- R10-11a NB “No Turn on Red” overhead sign
- Review yellow change and red clearance intervals
- EB near side signal head
- Truncated domes and trim corner bushes
- Repaint medians, NB stop bar, ladder x-walks
- R10-15 "yield to pedestrians” signs all approaches

Long-Term Considerations:

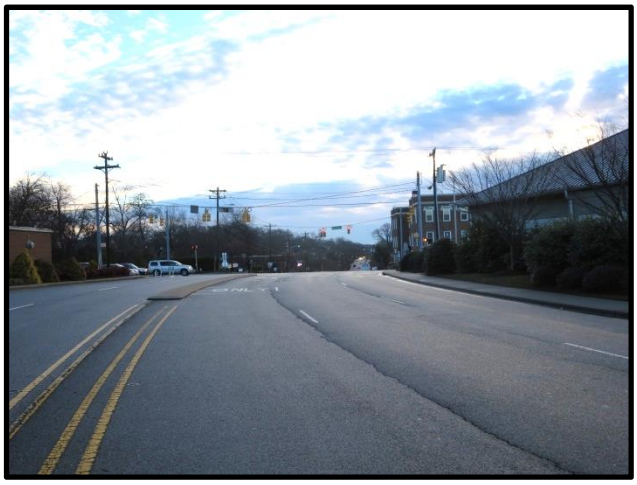
- Crosswalks with flashing lights embedded in pavement
- Decorative paver for cross walks
- Improve overall lighting at intersection
- Fencing at intersection corners to limit ped access
- An additional SB left-turn lane
- Purchase property in SW corner to provide quadrant left intersection eliminating existing SB left-turn movement

AECOM

city of greenville

Stone Avenue (US 276) at Rutherford Street (S-200 / US 276)

Northbound Approach



Eastbound Approach

Southbound Approach

Westbound Approach

EB Stone Ave limited sight distance of signal heads due to horizontal curvature

Long SB left-turn lane queues extending beyond pedestrian signal crossing combined with many pedestrians traversing this intersection

AECOM

city of greenville

E. North Street (S-94) at Pelham Road (S-492)

40 Crashes between (07/01/12 to 12/31/14)
11 – Right Angle
21 – Rear End
4 – Side Swipe
0 – Head On
0 – Out of Control
0 – Hit Animal
4 – Other

Crash Conditions	
7 - Night	33 - Day
11 - Wet	29 - Dry

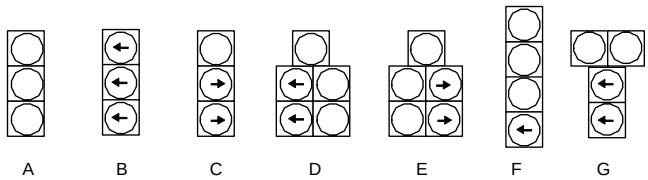
Speed limits (mph):

E. North St – 35
Pelham Rd – 45

Signal Phasing:

	Signal Head	Phasing				Overlap		X -Walk		Ped Sig	
NB	FFA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
EB	DA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
SB	FA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
WB	DA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N

* Circle if Advanced Head



Observations:

- WB queues along E. North St extend beyond Trenholm Rd with limited sight distance due to vertical curvature
- No access management restrictions or turn lanes along E. North St between N. Pleasantburg Dr and Pelham Rd as vehicles stop in through lanes to cross three or more lanes to access driveways.
- Center NB left-turn lane (dual lefts) predominantly used in anticipation of turning right onto N. Pleasantburg Dr
- R10-11a "No Turn on Red" overhead sign is located on SB approach
- Single WB right-turn lane at downstream N. Pleasantburg Dr is over capacity and queues block Pelham intersection
- EB right-turn movement is free flow though a posted yield sign causes vehicle to hesitate through turn

Short-Term Considerations:

- Retroreflective back plates
- A "watch for stopped traffic" sign on WB approach prior to crest of hill
- EB/WB R10-12 "left-turn YIELD on Green" signs
- Remove EB R1-2 "yield" sign and replace with a R1-1A "keep moving sign prior to intersection
- Review yellow change and red clearance intervals
- R10-7 "Do Not Block Intersection" sign for NB/WB
- Pedestrian heads and push buttons at x-walks

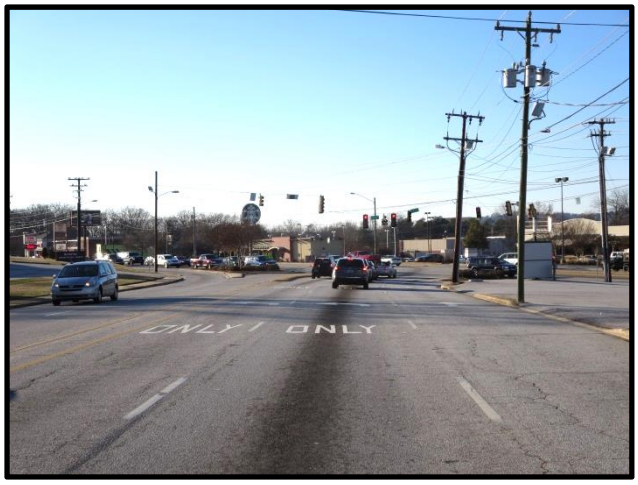
Long-Term Considerations:

- A raised concrete median between N. Pleasantburg Dr and Pelham Rd
- Review signal timing plans on E. North St
- An additional WB right-turn lane at N. Pleasantburg Dr intersection
- An advance warning flasher on NB approach
- Flashing Yellow Arrows on E. North St
- Restripe WB left-turn lane to a through lane
- Combine driveways South of E. North St

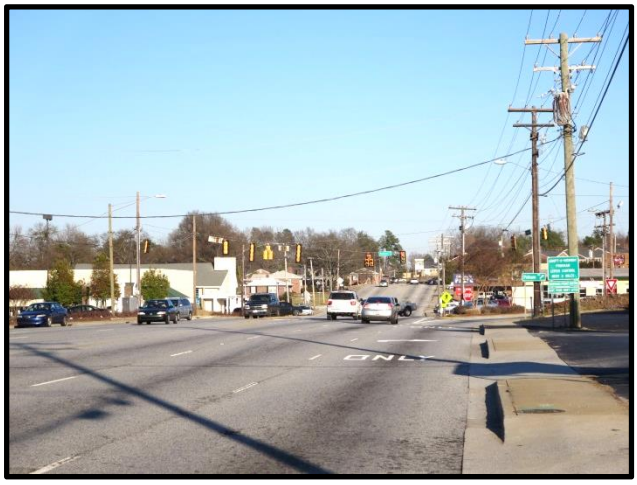
AECOM

city of greenville

E. North Street (S-94) at Pelham Road (S-492)



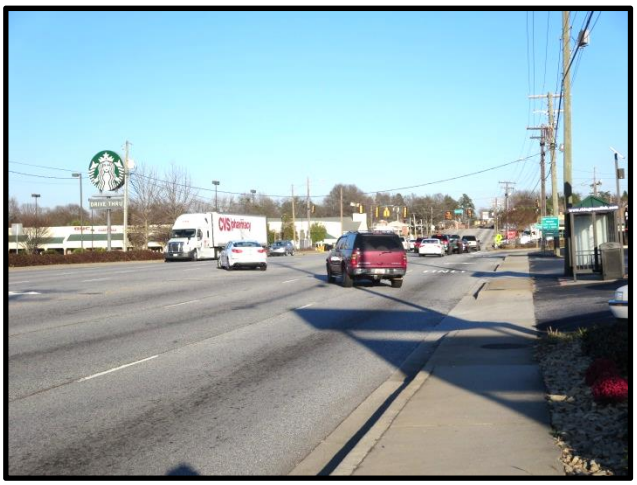
Northbound Approach



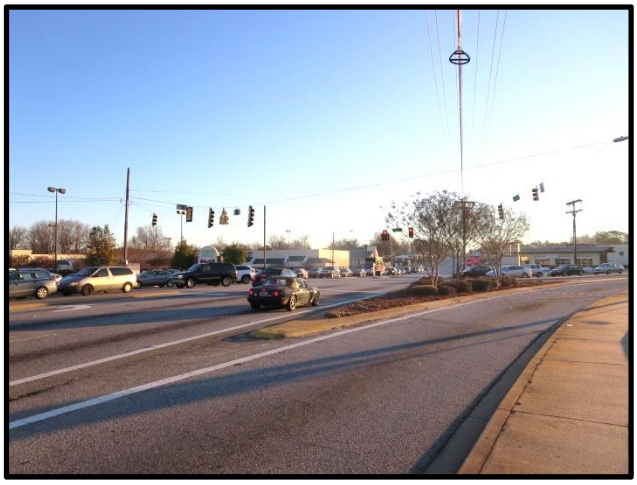
Eastbound Approach

Southbound Approach

Westbound Approach



Vehicles stop in EB through lane or use one of the opposing dual left-turn lanes to turn left into North Hills Development to access Starbucks



WB vehicular queues along E. North St from the N. Pleasantburg Dr. intersection extend beyond Pelham Rd blocking intersection

AECOM

city of greenville

Laurens Road (US 276) at E. Parkins Mill Road (S-1016) / Verdae Boulevard

84 Crashes between (07/01/12 to 12/31/14)
16 – Right Angle
59 – Rear End
6 – Side Swipe
2 – Head On
0 – Out of Control
0 – Hit Animal
1 – Other

Crash Conditions	
9 - Night	75 - Day
9 - Wet	75 - Dry

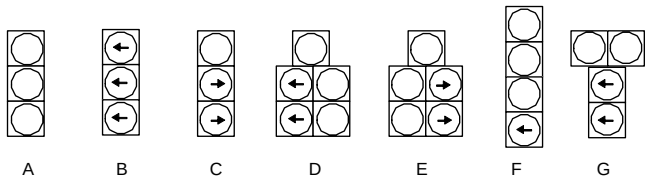
Speed limits (mph):

Laurens Rd – 40
E. Parkins Mill Rd – 35
Verdae Blvd – 45

Signal Phasing:

	Signal Head	Phasing				Overlap		X -Walk		Ped Sig	
NB	BAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
EB	DA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
SB	BBAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
WB	BBAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N

* Circle if Advanced Head



Observations:

- Significant queuing for dual-left-turn lanes on Verdae Blvd as a result of split allocated for this movement
- Pedestrian crossings may be challenging without pedestrian signals and with channelized right-turns
- Sun is an issue by limiting visibility in the PM peak hour along WB Verdae Blvd
- Very few pedestrians were observed during the peak hours
- Queuing extends beyond storage length for single EB left-turn lane
- Laurens Rd is 7 lanes with unlimited access to business driveways
- SB queue during PM peak hour on Laurens Rd extends past Jeep Dealership blocking access to / from driveways

Short-Term Considerations:

- A R1-1A "keep moving" sign for NB right-turn
- R10-12 "left-turn YIELD on Green" for EB approach
- Retroreflective backplates & add 1 NB signal head
- Extend green time splits for EB/WB left-turn phase
- Review yellow change and red clearance intervals
- Pedestrian signals and push buttons
- Repaint x-walks, skips, add "yield to peds" signs
- Restripe to provide dual EB left-turns
- Add a SB right-turn overlap

Long-Term Considerations:

- Remove WB right-turn channelization on Verdae Blvd and convert to signal control. Then restripe existing pavement on Laurens Rd to provide right-turn lane into Burger King Driveway
- Concrete median on Verdae Blvd that extends from beyond Olive Garden Driveway
- Advanced warning flashers on both directions on Laurens Rd
- Retime signals along Laurens Rd

AECOM

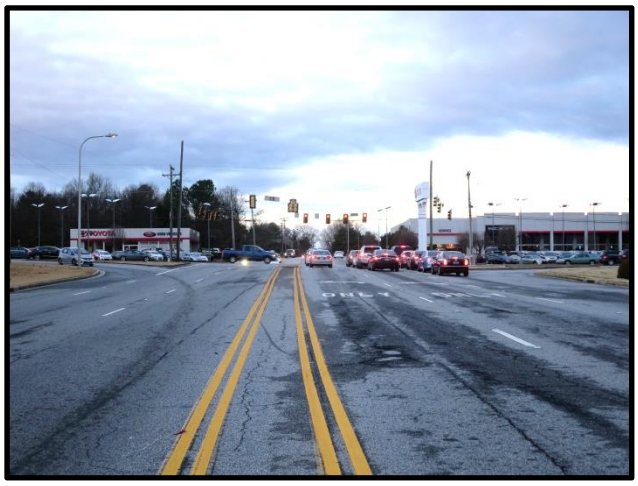
city of greenville

Laurens Road (US 276) at E. Parkins Mill Road (S-1016) / Verdae Boulevard

Northbound Approach

Eastbound Approach

Southbound Approach



Westbound Approach

WB right-turn channelized yield movement onto Laurens Rd creates a weaving movement with right-turn lane into shopping center driveway.

NB right-turn lane is free flow but vehicles stop as if it was a yield condition. Significant queuing is also present on Verdae Blvd.

AECOM

city of greenville

Roper Mountain Road (S-183) at Frontage Rd (S-1103) / Independence Blvd (S-1102)

18 Crashes between (11/01/12 to 10/31/14)
1 – Right Angle
14 – Rear End
3 – Side Swipe
0 – Head On
0 – Out of Control
0 – Hit Animal
0 – Other

Crash Conditions	
1 - Night	17 - Day
4 - Wet	14 - Dry

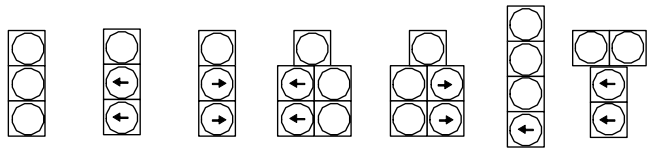
Speed limits (mph):

Roper Mountain Rd – 40
Frontage Rd – 35
Independence Blvd – 35

Signal Phasing:

	Signal Head	Phasing				Overlap		X -Walk		Ped Sig	
NB	DA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
EB	FA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
SB	AA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
WB	BFC	Prot	PP	Perm	Split	Y	N	Y	N	Y	N

* Circle if Advanced Head



Observations:

- The single SB left-turn lane onto I-385 EB is over capacity and queues extend beyond study intersection
- Vehicles block intersection creating long queues on Frontage Road and Independence Blvd
- EB phase on Frontage Rd skips when no left turn was present and right turn vehicles were not on loop
- Multiple vehicles traveling EB and SB cut through the adjacent parking lot to avoid sitting in queues
- Significant queuing exist in the SB direction extending to the Roper Mountain Extension signalized intersection
- NB left-turns onto Frontage Road are restricted when vehicles block intersection
- Horizontal and vertical curvature on side streets may create sight distance issues with existing signal heads

Short-Term Considerations:

- Retroreflective backplates and W3-3-48 “signal ahead” warning signs on each approach
- R10-7 “Do Not Block Intersection” all approaches
- Add EB queue loop or right turn loop
- Restripe EB approach to a shared left-through lane and a right turn lane with overlap
- Nearside signal head on Independence Blvd approach
- R10-8 “Left-turn YIELD on Green” NB approach

Long-Term Considerations:

- (1) Reconfigure NB leg to remove median and restripe an additional SB receiving lane signed as I-385 to provide additional storage for EB On-Ramp
- (2) provide dual I-385 EB left-turn lanes / widen on ramp and replace existing dual I-385 WB left-turn lanes with a single without widening bridge
- Analyze signal timing of corridor and include possible NB protected left turn
- Review Innovative Interchange

AECOM

city of greenville

Roper Mountain Road (S-183) at Frontage Rd (S-1103) / Independence Blvd (S-1102)

Northbound Approach

Eastbound Approach

Southbound Approach

Westbound Approach

Queuing & Blocked Intersection - SB Receiving

WB approach has limited sight distance of signal heads due horizontal and vertical curvature

AECOM

city of greenville

Laurens Road (US 276) at Millennium Boulevard / Fairforest Way

26 Crashes between (09/01/12 to 12/31/14)
1 – Right Angle
20 – Rear End
4 – Side Swipe
0 – Head On
1 – Out of Control
0 – Hit Animal
0 – Other

Crash Conditions	
4 - Night	22 - Day
4 - Wet	22 - Dry

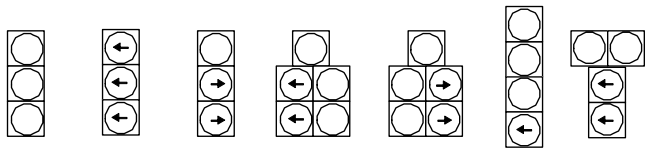
Speed limits (mph):

Laurens Rd – 40
Fairforest Way – 30
Millennium Blvd – 35

Signal Phasing:

	Signal Head	Phasing				Overlap		X -Walk		Ped Sig	
NB	DAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
EB	BBAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
SB	DAA	Prot	PP	Perm	Split	Y	N	Y	N	Y	N
WB	DAAE	Prot	PP	Perm	Split	Y	N	Y	N	Y	N

* Circle if Advanced Head



Observations:

- R10-11a "No Turn on Red" overhead sign prohibits the dual WB right-turns from Millennium Blvd to Laurens Rd
- No left-turn lane skip lines are provided for the dual EB turns through the intersection
- Young driver population on Fairforest Way with JL Mann High School and Christ Church Episcopal School
- Significant queuing (NB Laurens Rd during AM peak, SB Laurens Rd during PM peak, EB Fairforest Way both peaks)
- Severe rutting through center of intersection / poor pavement conditions
- Vehicles are use median break on Millennium Blvd to make a U-turn maneuver
- SB channelized right-turn movement is heavy and conducted at high speeds with limited pedestrian visibility

Short-Term Considerations:

- Retroreflective backplates
- Close median on Millennium Blvd
- Restripe entire intersection especially skip lines
- Review yellow change and red clearance intervals
- R10-12 overhead signs beside 5-section heads
- Two R1-2 "Yield" signs for SB right-turn
- Provide W3-3-48 "signal ahead" on all approaches
- Restripe an EB right-turn lane with overlap
- NB right-turn overlap

Long-Term Considerations:

- Repave entire intersection
- Restripe and construct a third NB through lane to I-85 ramps
- Overhead advanced warning flasher on both directions on Laurens Rd
- Retime signals along Laurens Rd
- Decorative pavers for cross walks and R10-15 "yield to pedestrians"overhead signs
- Landscape medians along Laurens Rd

AECOM

city of greenville

Laurens Road (US 276) at Millennium Boulevard / Fairforest Way

Northbound Approach

Eastbound Approach

Southbound Approach

Westbound Approach

NB queuing on Laurens Rd extends over 1000 feet during AM pear hour. SB right shoulder south of intersection on Laurens Rd in poor condition.

Laurens Rd is severely rutted as shown with the crosswalk vertical curvature. Vehicles traveling to / from the Fairforest Way / Milliennium Blvd must slow down

AECOM

city of greenville