ORIGINAL TO GENERAL FILES

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

OFFICE OF DESIGN POLICY & SUPPORT
INTERDEPARTMENTAL CORRESPONDENCE

FILE P.I. # 0009898
Bartow County
GDOT District 6 - Cartersville
I-75 @ CR 39/Old Allatoona Road –
SB & NB Ramps - No-Build

OFFICE Design Policy & Support

DATE October 9, 2013

FROM for Brent Story, State Design Policy Engineer

TO SEE DISTRIBUTION

SUBJECT **APPROVED CONCEPT REPORT**

Attached is the approved Limited Scope Concept Report for the above subject project.

Attachment

DISTRIBUTION:

Bobby Hilliard, Program Control Administrator
Genetha Rice-Singleton, State Program Delivery Engineer
Glenn Bowman, State Environmental Administrator
Cindy VanDyke, State Transportation Planning Administrator
Kathy Zahul, State Traffic Engineer
Angela Robinson, Financial Management Administrator
Lisa Myers, State Project Review Engineer
Charles "Chuck" Hasty, State Materials Engineer
Mike Bolden, State Utilities Engineer
Paul Tanner, Asst. State Transportation Data Administrator
Attn: Systems & Classification Branch
Jeff Fletcher, Statewide Location Bureau Chief
Andy Casey, State Roadway Design Engineer
Attn: Fletcher Miller, Design Group Manager
DeWayne Comer, District Engineer
Mike Haithcock, District Preconstruction Engineer
Kerry Bonner, District Utilities Engineer
Harry Maddox, District Traffic Engineer
Ryan Fernandez, Project Manager
BOARD MEMBER - 11th Congressional District

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA
LIMITED SCOPE PROJECT CONCEPT REPORT

Project Type:	Safety	P.I. Number:	0009898
GDOT District:	6	County:	Bartow
Federal Route Number:	I-75	State Route Number:	401

I-75 @ CR 397/ OLD ALLATOONA ROAD - SB & NB RAMPS

Submitted for approval:

C. Andy Carr — 8/22/13
State Roadway Design Engineer — DATE

Ryan Ferrell — 8-26-13
GDOT Project Manager — DATE

Genell Rice — 8/27/2013
State Program Delivery Engineer — DATE

Recommendation for approval:

* Kathy Zahn / KLP — 9-25-13
State Traffic Engineer *(required for roundabout projects)* — DATE

* Recommendation on file

The concept as presented herein and submitted for approval is consistent with that which is included in the Regional Transportation Plan (RTP) and/or the State Transportation Improvement Program (STIP).

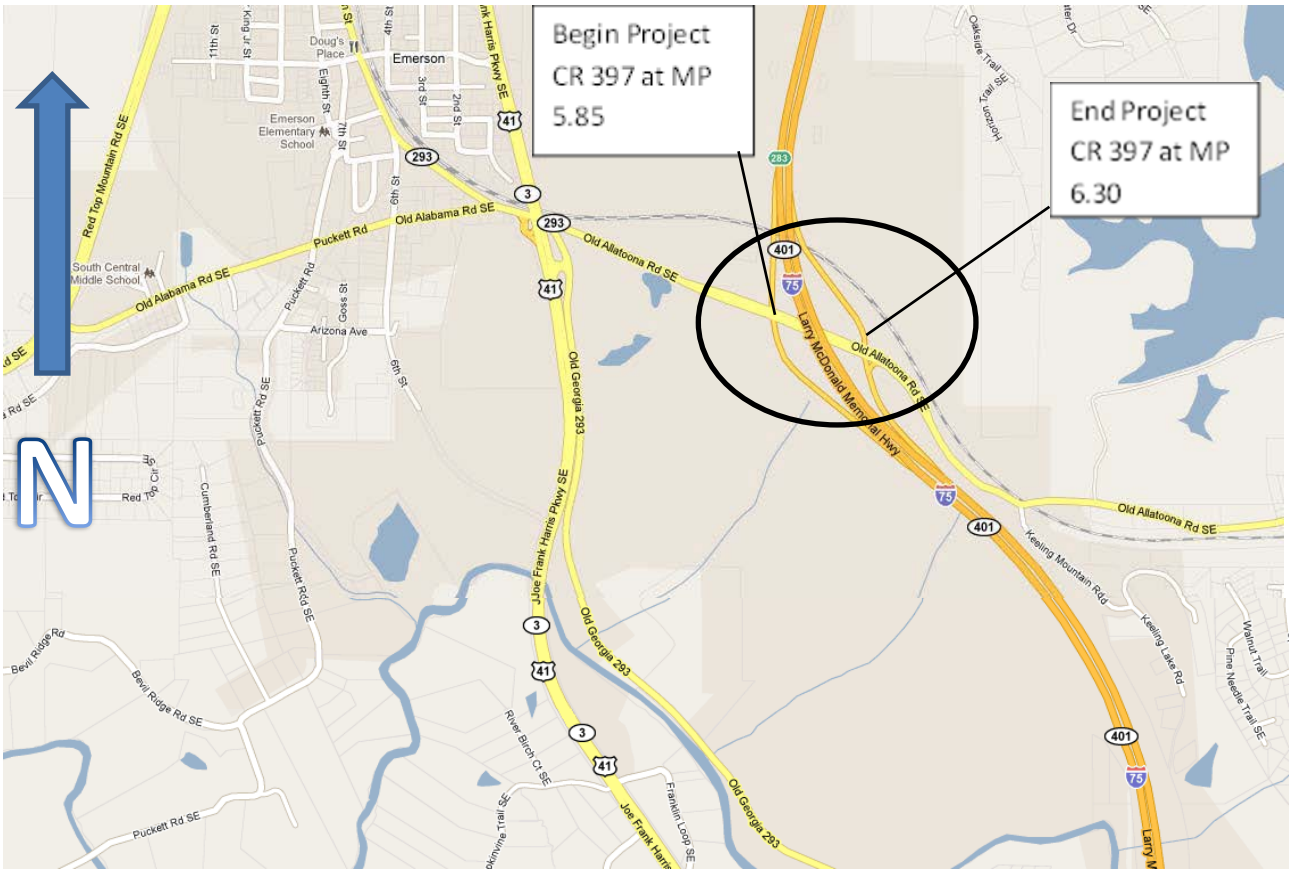
Cynthia L. Vaughn — 9-6-13
State Transportation Planning Administrator — DATE

Approval:

Concur: Joel Carpenter — 9/30/13
GDOT Director of Engineering — DATE

Approve: Paul R. Mill — 10/4/13
GDOT Chief Engineer — DATE

PROJECT LOCATION



PLANNING & BACKGROUND DATA

Project Justification Statement:

Studies have shown that the installation of a roundabout results in nearly an 80% reduction in fatal and serious injury crashes and nearly a 40% reduction in property damage crashes. Roundabouts have been identified as one of nine proven countermeasures by the Federal Highway Administration (FHWA). The installation of roundabouts in comparison to traditional safety countermeasures such as traffic signals have resulted in a greater reduction in crash frequency and in many instances better operational efficiency. Roundabouts are generally navigated at slower speeds which reduces the severity of crashes. A roundabout also presents fewer conflict points than a traditional intersection resulting in a lower crash potential.

The I-75/Old Allatoona Road interchange is located approximately five miles to the southeast of Cartersville, Georgia. The LakePoint Development is proposed as a mixed-use facility generating approximately 38,954 new weekday external trips on Old Allatoona Rd under Phase 1 and 112,696 new weekday external trips on Old Allatoona Rd under the ultimate build-out (See Attachment 3). In addition to the operational challenges created by the new development, the crash rates at the interchange are expected to increase in a no-build scenario. GEARS Collision Summaries from 2009-2013 indicated that 98 crashes occurred near or at these intersections resulting in 32 total injuries and one fatality (See Attachment 6, Crash Summary).

Description of the proposed project:
The project is located at the I-75/SR 401 interchange with Old Allatoona Road (CR 397) in Bartow County, GA within the City of Emerson. The project length is approximately 0.45 miles along Old Allatoona Road and includes two intersections with I-75 at the northbound and southbound exit and entrance ramps. It is proposed to retain the interchange in the current configuration; therefore a No-Build alternative is preferred.

Federal Oversight: ☒ Exempt ☐ State Funded ☐ Other

MPO: N/A MPO Project ID: N/A

Regional Commission: Northwest Georgia RC RC Project ID: N/A

Congressional District(s): 11

Projected Traffic: AADT
I-75/SR 401 interchange with Old Allatoona Road (CR 397)
Current Year (2011): 7525 Open Year (2017): 10,650 Design Year (2037): 25,600
Traffic Projections Performed by: GDOT Planning (January 2012)

Functional Classification (Mainline): Urban Minor Arterial Street

Is this a 3R (Resurfacing, Restoration, & Rehabilitation) Project? ☒ No ☐ Yes

Will Context Sensitive Solutions procedures be utilized? ☒ No ☐ Yes

DESIGN AND STRUCTURAL DATA

Feature	Existing	Standard*	Proposed
Typical Section			
- Number of Lanes	**4**	**4**	**No change**
- Lane Width(s)	**12'**	**11'-12'**	**No change**
- Median Width & Type	**12' raised**	**12' raised**	**No change**
- Outside Shoulder or Border Area Width	**12'(6.5' paved)**	**n/a**	**No change**
- Outside Shoulder Slope	**6%**	**n/a**	**No change**
- Inside Shoulder Width	**n/a**	**n/a**	**No change**
- Sidewalks	**n/a**	**n/a**	**No change**
- Auxiliary Lanes	**n/a**	**n/a**	**No change**
- Bike Lanes	**n/a**	**n/a**	**No change**
Posted Speed	**45 mph**		**No change**
Design Speed	**45 mph**	**n/a**	**No change**
Min Horizontal Curve Radius	**n/a**	**n/a**	**No change**
Superelevation Rate	**n/a**	**6%**	**No change**
Grade	**unavailable**	**7%**	**No change**
Access Control	**Limited Access**	**n/a**	**No change**
Right-of-Way Width	**n/a**	**n/a**	**No change**
Maximum Grade – Crossroad	**unavailable**	**5%**	**No change**
Design Vehicle	**WB-67**	**n/a**	**No change**

*According to current GDOT design policy if applicable

Major Structures:

Structure ID	Existing	Proposed
ID#015-0081-0	I-75 NB Length: 281' Typical section: three 12' travel lanes, 12' shoulders, Sufficiency rating: 91.36	Retain existing
ID#015-0082-0	I-75 SB Length: 276' Typical section: three 12' travel lanes, 12' shoulders, Sufficiency rating: 98	Retain existing

Major Interchanges/Intersections: Interstate 75 NB & SB Exit & Entrance Ramps

Utility Involvements: N/A

Public Interest Determination Policy and Procedure recommended (Utilities)? ☒ No ☐ Yes

SUE Required: ☒ No ☐ Yes

Railroad Involvement: N/A

Complete Streets - Bicycle, Pedestrian, and/or Transit Warrants:
Warrants met: ☒ None ☐ Bicycle ☐ Pedestrian ☐ Transit

Right-of-Way:
Required Right-of-Way anticipated: ☒ No ☐ Yes ☐ Undetermined
Easements anticipated: ☒ None ☐ Temporary ☐ Permanent ☐ Utility ☐ Other

Transportation Management Plan [TMP] Required: ☒ No ☐ Yes
If Yes: Project classified as: ☐ Non-Significant ☐ Significant
TMP Components Anticipated: ☐ TTC ☐ TO ☐ PI

Design Exceptions to FHWA/AASHTO controlling criteria anticipated: NONE

Design Variances to GDOT Standard Criteria anticipated: NONE

ENVIRONMENTAL DATA

Anticipated Environmental Document:
GEPA: ☐ **NEPA:** ☐ CE ☐ PCE

Project Air Quality:
Is the project located in a PM 2.5 Non-attainment area? ☐ No ☒ Yes
Is the project located in an Ozone Non-attainment area? ☐ No ☒ Yes
Is a Carbon Monoxide hotspot analysis required? ☐ No ☒ Yes

MS4 Compliance – Is the project located in an MS4 area? ☐ No ☒ Yes

Environmental Permits/Variances/Commitments/Coordination anticipated: NO

NEPA/GEPA Comments & Information: No environmental document is required for the preferred alternative.

PROJECT RESPONSIBILITIES

Project Activities:

Project Activity	Party Responsible for Performing Task(s)
Concept Development	Office of Roadway Design
Design	N/A
Right-of-Way Acquisition	N/A
Utility Relocation	N/A
Letting to Contract	N/A
Construction Supervision	N/A
Providing Material Pits	N/A
Providing Detours	N/A
Environmental Studies, Documents, and Permits	N/A
Environmental Mitigation	N/A
Construction Inspection & Materials Testing	N/A

Lighting required: ☒ No ☐ Yes

Other projects in the area:
P.I. No. 0007893 I-75 from CR 397/Glade Road to SR 20
P.I. No. 0009899 I-75 @ CR 633/Red Top Mountain Road– SB & NB Ramps (Roundabout) No Build Concept
P.I. No. 621410- SR 113/Old Alabama Rd relocation from SR 113/Pumpkinvine Creek to CR 699/Old Old Alabama Rd

Other coordination to date:
Meeting Minutes to Discuss Project Deletion, October 12, 2012
Kittleson & Associates, Inc. , Operational Analysis, November 28, 2012

Project Cost Estimate and Funding Responsibilities:

	Breakdown of PE	ROW	Reimbursable Utility	CST*	Environmental Mitigation	Total Cost
By Whom	GDOT	GDOT	N/A	GDOT	N/A	
$ Amount	$250,000	N/A	N/A	N/A	N/A	$250,000*
Date of Estimate	2/26/2010	N/A	N/A	N/A	N/A	

*Total cost should be revised to amount spent after No Build Concept is approved.

ALTERNATIVES

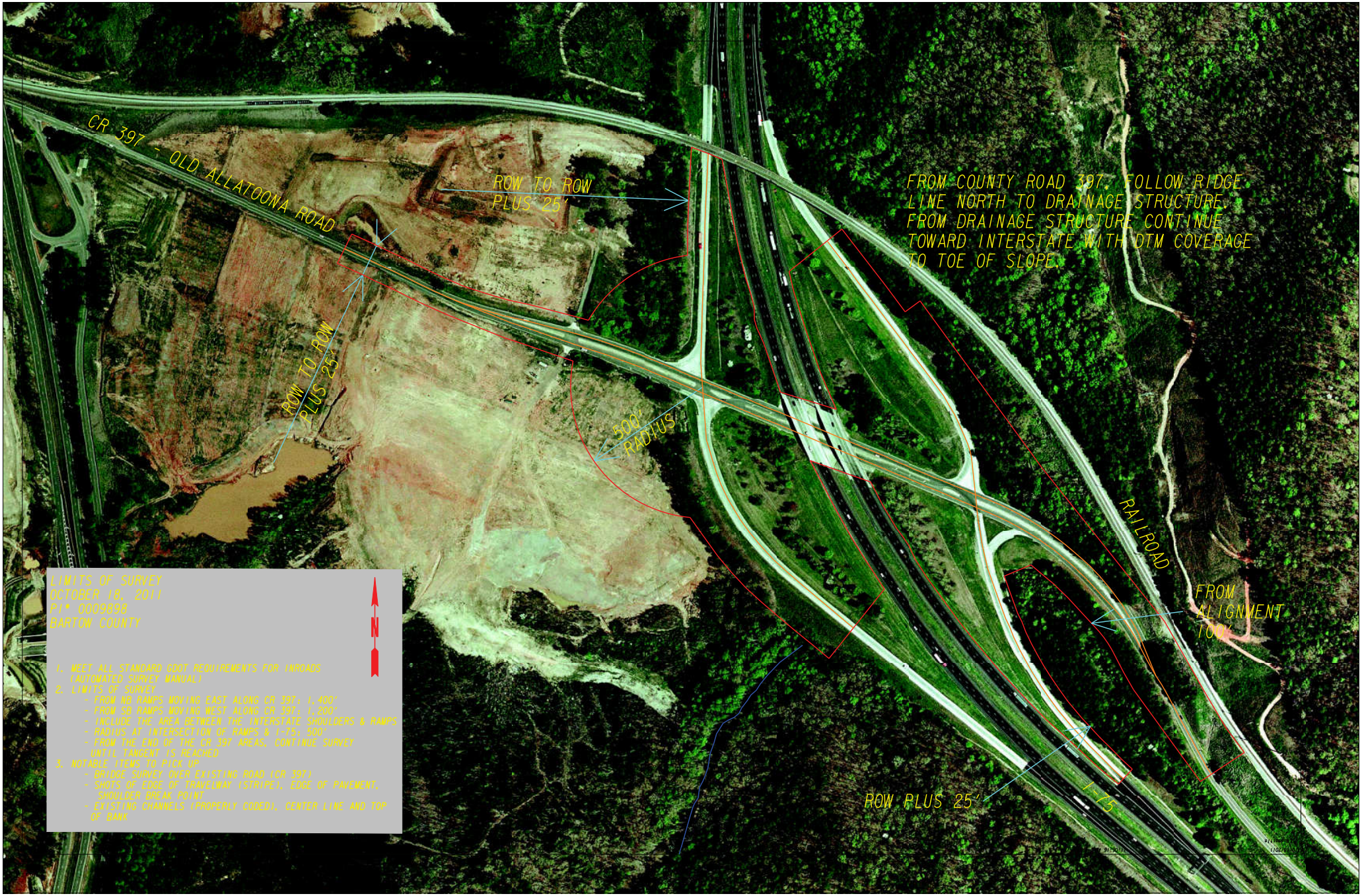
Preferred Alternative: No-Build Stop-controlled intersections at Old Allatoona Road /I-75 NB & SB Ramps			
Estimated Property Impacts:	**n/a**	**Estimated Total Cost:**	**n/a**
Estimated ROW Cost:	**n/a**	**Estimated CST Time:**	**n/a**
Rationale: This alternative was selected because it provides adequate capacity for existing traffic volumes. Neither of the two existing ramp intersections warrant a signal. The original proposed traffic volumes had been generated using GDOT standard traffic counting and projection measures in conjunction with a development of regional impact that included traffic projections proposed to be generated by the LakePoint Sporting Community Development. Upon review of the existing information, the GDOT Chief Engineer decided that, although he acknowledges that roundabouts are the preferred solutions at some locations, this project was not a feasible location for the proposed multi-lane roundabout design at this time. (See Attachment 9)			

Alternative 1: Signalized intersections at Old Allatoona Road /I-75 NB ramps and I-75 SB ramps			
Estimated Property Impacts:	**n/a**	**Estimated Total Cost:**	**$1.76 million**
Estimated ROW Cost:	**n/a**	**Estimated CST Time:**	**6 Months**
Rationale: This alternative was not selected because the current project's funding is not programmed for a signal improvement. This alternative would be preferred should traffic increase to the design year volumes due to the construction of the LakePoint Sporting Community Development.			

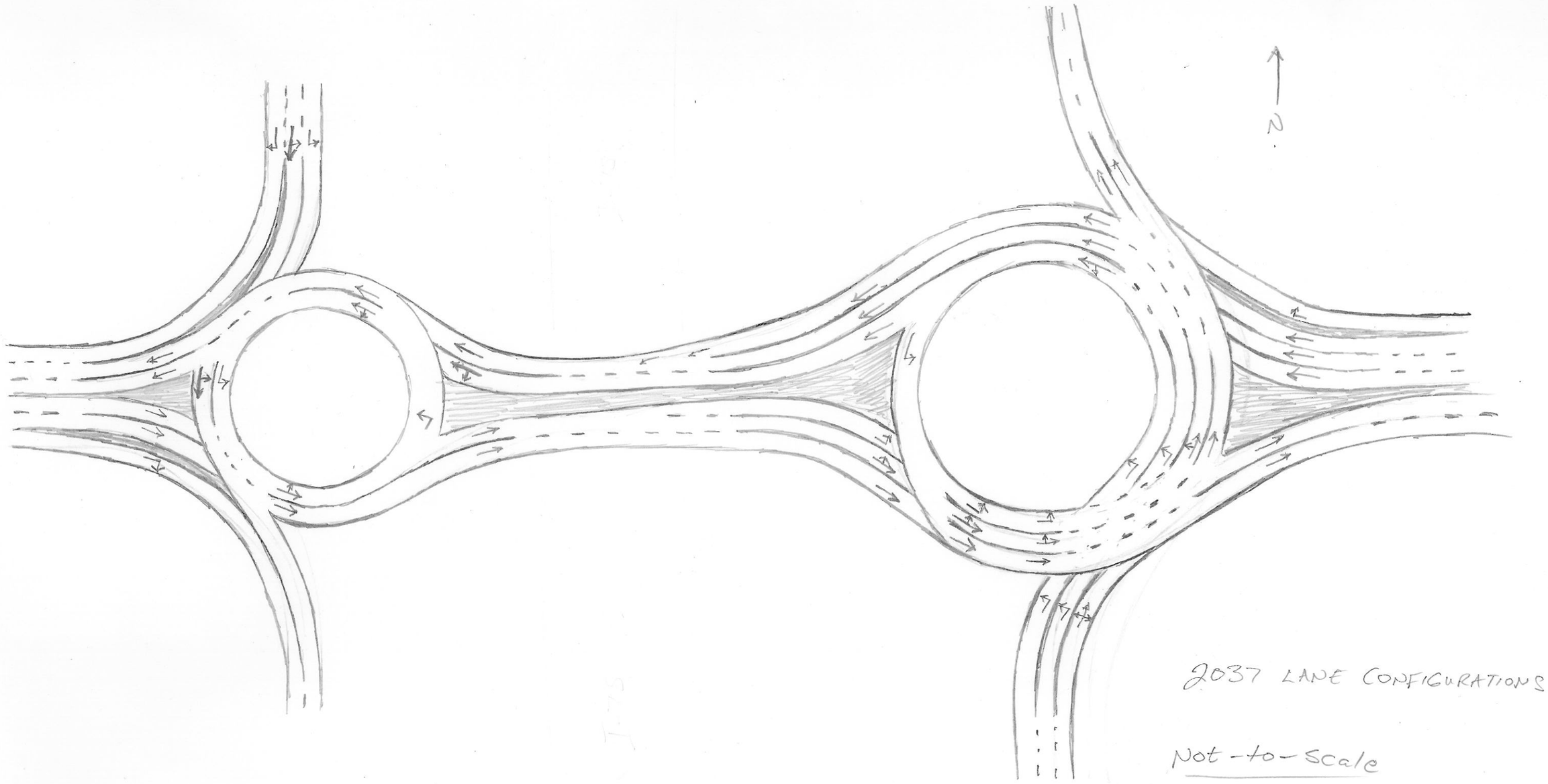
Alternative 2: Roundabouts at Old Allatoona Road /I-75 NB ramps and I-75 SB ramps			
Estimated Property Impacts:	**n/a**	**Estimated Total Cost:**	**$3.22 million**
Estimated ROW Cost:	**n/a**	**Estimated CST Time:**	**2 Years**
Rationale: This alternative was not selected because the design year traffic results in a multi-lane (more than 2 lanes) roundabout, which is undesirable, as the safety gain that roundabouts normally provide is decreased for this location. (See Attachment 2)			

Attachments:

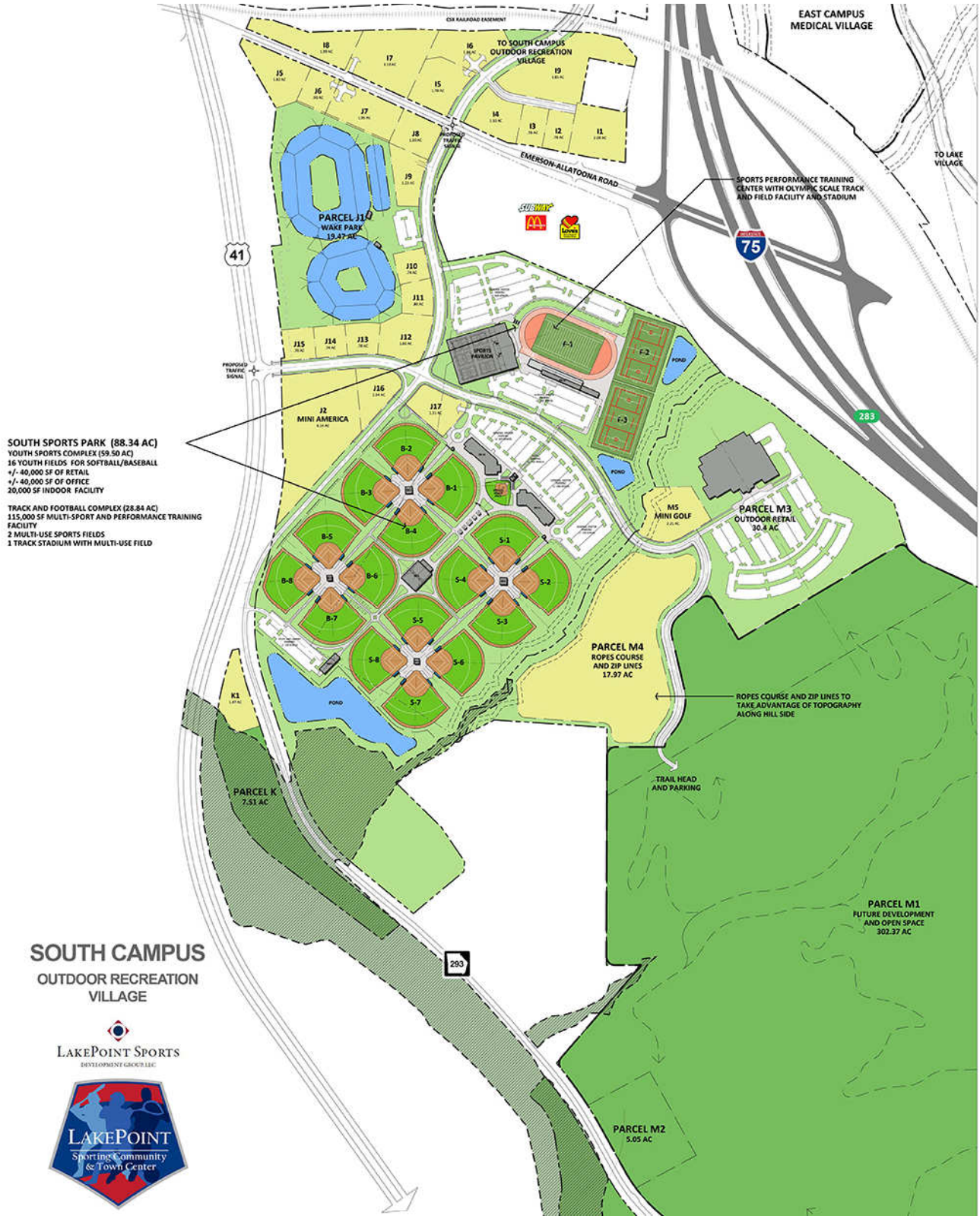
1. Aerial Location Map
2. Concept Layout (Roundabouts)
3. Proposed LakePoint Complex Layout
4. Detailed Cost Estimate: Construction (Roundabout)
5. Detailed Cost Estimate: Construction (Signal)
6. Crash Summary
7. Crash Data
8. Traffic Diagrams
9. Minutes of Project Deletion Meeting, October 12, 2012
10. Indication of Roundabout Support
11. Kittleson & Associates, Inc. Operational Analysis, November 28, 2012



Attachment #1 - Location Survey



Attachment #2 - Concept Layout 2037 Roundabout Configuration



Attachment 3 - PROPOSED LAKE POINT SPORTS COMPLEX

DATE: 03/21/2013

ESTIMATE

LOCATION: *I-75 @ CR 397/ OLD ALLATOONA ROAD - SB & NB RAMPS*

ROUNDABOUT ALTERNATIVE CONCEPTUAL ESTIMATE
(BASED ON CONCEPTUAL DRAWING, ALL QUANTITIES WILL CHANGE WITH FINAL DESIGN)

NEW ITEM #	NEW ITEM DESCRIPTION	Quantity	Unit	Price	Amount
Mainline					
206-0001	Unclassified Excavation (1)	16,500.00	CY	2.50	$41,250.00
	Removing Concrete	27,300.00	SY	10.00	$273,000.00
310-1101	GR Aggregate Base, 10-Inch Depth	16,500.00	TON	15.00	$247,500.00
430-0220	Concrete Pavement 11-Inch	21,650.00	SY	40.00	$866,000.00
	Concrete Median 4-Inch	4,100.00	SY	15.00	$61,500.00
	Concrete Curb and Gutter	8,750.00	LF	16.00	$140,000.00
	Storm Sewer/Culverts	1.00	LS	100,000.00	$100,000.00
153-1100	Field Engineers Office TP 1	1.00	EACH	60,000.00	$60,000.00
	Traffic Control	1.00	LS	75,000.00	$75,000.00
	Overhead Sign Bridges with green and white signs	6.00	EACH	25,000.00	$150,000.00
	Pavement Marking	1.00	LS	15,000.00	$15,000.00
	Lighting (cost per pole with wiring included)	24.00	EACH	10,000.00	$240,000.00
	Truck Apron - Colored Concrete 8-Inch	870.00	SY	65.00	$56,550.00
	Landscaping (Roundabout central island)	2.00	EACH	5,000.00	$10,000.00
	20% Contingencies				$467,160.00
				SUBTOTAL	**$2,802,960.00**
Assumed No Right-of-Way Required			0.00 S.F.	0.00	$0.00
Utilities			1.00 LS	0.00	$0.00
				15 % E & C	**$420,444.00**
				TOTAL	**$3,223,404.00**

ASSUMPTIONS FOR CONCEPTUAL ESTIMATE

(1) Unclassified Excavation was calculated assuming 20-inches of cut throughout roadway.

DATE: 03/21/2013

ESTIMATE

LOCATION: *I-75 @ CR 397/ OLD ALLATOONA ROAD - SB & NB RAMPS*

SIGNAL ALTERNATIVE CONCEPTUAL ESTIMATE
(BASED ON CONCEPTUAL DRAWING, ALL QUANTITIES WILL CHANGE WITH FINAL DESIGN)

NEW ITEM #	NEW ITEM DESCRIPTION	Quantity	Unit	Price	Amount
Mainline					
206-0001	Unclassified Excavation (1)	5,000.00	CY	2.50	$12,500.00
610-2700	Removing Concrete	9,750.00	SY	15.00	$146,250.00
310-1101	GR Aggregate Base, 10-Inch Depth	5,160.00	TON	15.00	$77,400.00
430-0220	Concrete Pavement 11-Inch	8,000.00	SY	40.00	$320,000.00
441-0104	Concrete Median 4-Inch	1,500.00	SY	27.00	$40,500.00
		3,000.00	LF	16.00	$48,000.00
	Storm Sewer/Culverts	1.00	LS	30,000.00	$30,000.00
153-1100	Field Engineers Office TP 1	1.00	EACH	60,000.00	$60,000.00
	Traffic Control	1.00	LS	30,000.00	$30,000.00
	Overhead Sign Bridges with black and white signs	6.00	EACH	10,000.00	$60,000.00
	Pavement Marking	1.00	LS	15,000.00	$15,000.00
	Lighting (Included in the signal cost)	0.00	EACH	10,000.00	$0.00
	Signal	2.00	SY	187,000.00	$374,000.00
	Landscaping (Roundabout central island)	0.00	EACH	5,000.00	$0.00
	Reducing Median on Bridge	500.00	SY	120.00	$60,000.00
	20% Contingencies				$254,730.00
				SUBTOTAL	**$1,528,380.00**
Assumed No Right-of-Way Required		0.00	SF	0.00	$0.00
Utilities		1.00	LS	0.00	$0.00
				15 % E & C	**$229,257.00**
				TOTAL	**$1,757,637.00**

ASSUMPTIONS FOR CONCEPTUAL ESTIMATE

(1) Unclassified Excavation was calculated assuming 20-inches of cut throughout roadway.

Attachment #5

Crash Summary for the most recent three years 2010-2012,
I-75@CR 397/Old Allatoona Rd Bartow County

*2010	Number of Incident	Injury	Fatality
Rear End	4	1	0
Angle	3	3	0
Not a Collision with Motor Vehicle	8	0	0
Sideswipe	2	3	0
Total	**17**	**7**	**0**

*2011	Number of Incident	Injury	Fatality
Rear End	8	1	0
Angle	4	2	0
Sideswipe	4	1	0
Not a Collision with Motor Vehicle	6	1	0
Total	**22**	**5**	**0**

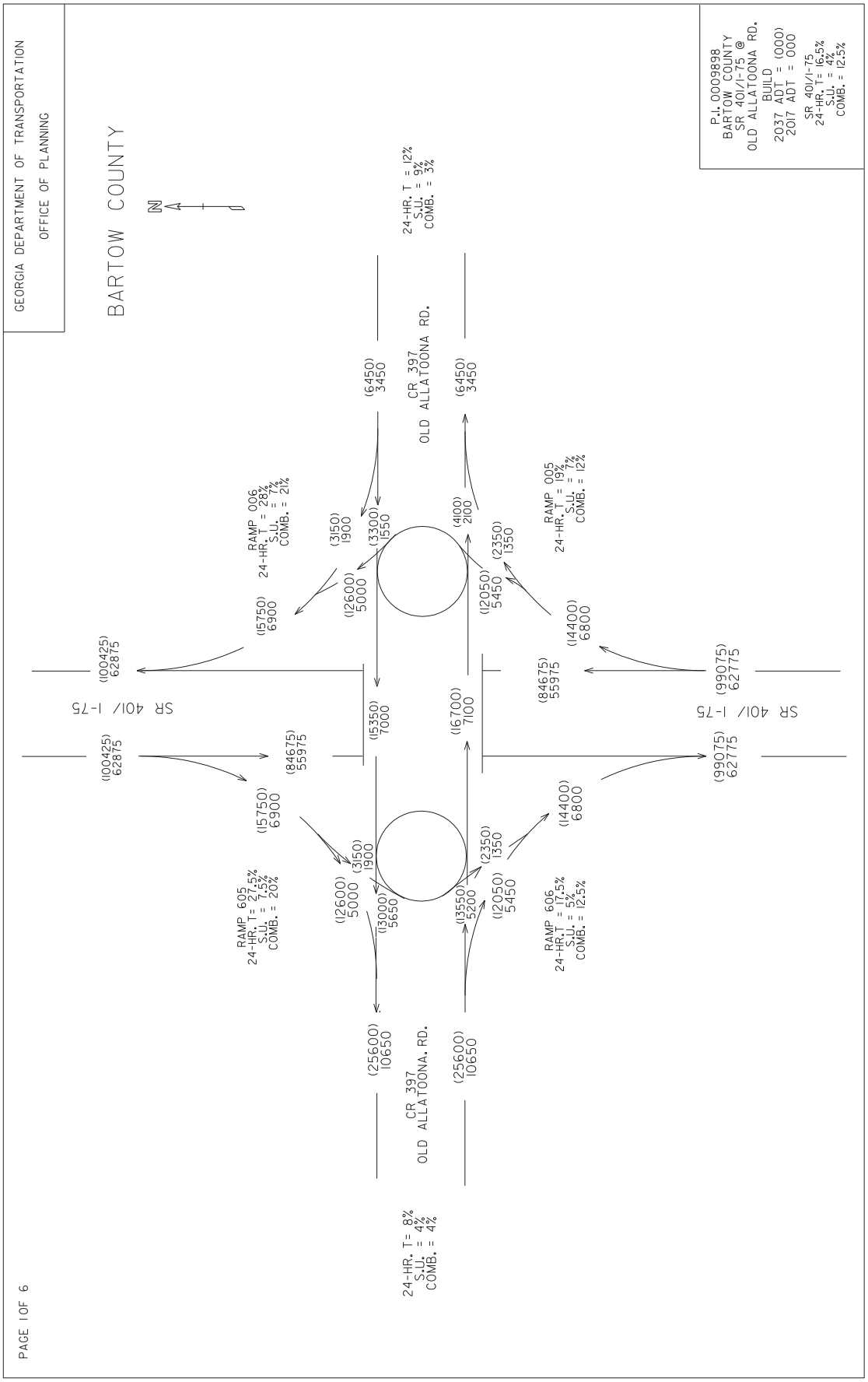
*2012	Number of Incident	Injury	Fatality
Rear End	12	3	0
Angle	13	11	0
Not a Collision with Motor Vehicle	20	5	1
Sideswipe	10	1	0
Head On	1	0	0
Undetermined	3	1	0
Total	59	20	1

*State-wide data compilation not yet available for these years

Attachment #6 - Crash Summary

Date	Route	IntersectingRoute	Injuries	Fatalities	MannerOfCollision	LocationOfImpact	FirstHarmfulEvent	MnvrVeh1	MnvrVeh2
3/31/2010	I 75	OLD ALLATOONA RD	0	0	Angle	On Roadway	Motor Vehicle In Motion	Stopped	Straight
7/24/2010	I 75	OLD ALLATOONA RD	0	0	Angle	On Roadway	Motor Vehicle In Motion	Straight	Straight
11/9/2010	I 75	OLD ALLATOONA RD	3	0	Angle	Off Roadway	Guard Rail Face	Straight	Straight
10/8/2011	OLD ALLATOONA RD	I 75	2	0	Angle	On Roadway	Motor Vehicle In Motion	Straight	Straight
11/26/2011	OLD ALLATOONA RD	I 75	0	0	Angle	On Roadway	Motor Vehicle In Motion	Turning Left	Straight
12/13/2011	OLD ALLATOONA RD	I 75	0	0	Angle	On Roadway	Motor Vehicle In Motion	Turning Right	Straight
12/13/2011	OLD ALLATOONA RD	I 75	0	0	Angle	On Roadway	Motor Vehicle In Motion	Turning Left	Straight
1/9/2012	I 75	OLD ALLATOONA RD	0	0	Angle	On Roadway	Motor Vehicle In Motion	Straight	Straight
1/18/2012	OLD ALLATOONA RD	I 75	2	0	Angle	On Roadway	Motor Vehicle In Motion	Entering/Leaving P	Straight
2/2/2012	I 75	OLD ALLATOONA RD	1	0	Angle	On Roadway	Motor Vehicle In Motion	Changing Lanes	Straight
3/5/2012	I 75	OLD ALLATOONA RD	0	0	Angle	On Roadway	Motor Vehicle In Motion	Changing Lanes	Straight
3/23/2012	OLD ALLATOONA RD	I 75	0	0	Angle	On Roadway	Motor Vehicle In Motion	Turning Left	Straight
5/7/2012	OLD ALLATOONA RD	N EXIT RP	1	0	Angle	On Roadway	Motor Vehicle In Motion	Turning Left	Straight
5/12/2012	I 75	OLD ALLATOONA RD	1	0	Angle	On Roadway	Motor Vehicle In Motion	Changing Lanes	Straight
5/14/2012	OLD ALLATOONA RD	I 75	1	0	Angle	On Roadway	Motor Vehicle In Motion	Turning Left	Straight
6/12/2012	OLD ALLATOONA RD	I 75	2	0	Angle	On Roadway	Motor Vehicle In Motion	Turning Left	Straight
7/18/2012	OLD ALLATOONA RD	I 75	1	0	Angle	On Roadway	Motor Vehicle In Motion	Turning Left	Straight
10/1/2012	I 75	OLD ALLATOONA RD	0	0	Angle	On Roadway	Motor Vehicle In Motion	Changing Lanes	Changing Lanes
10/11/2012	OLD ALLATOONA RD	I 75	2	0	Angle	On Roadway	Motor Vehicle In Motion	Straight	Straight
12/17/2012	I 75	OLD ALLATOONA RD	0	0	Angle	On Roadway	Motor Vehicle In Motion	Straight	Straight
5/31/2012	I 75	OLD ALLATOONA RD	0	0	Head On	On Roadway	Deer		Straight
2/19/2010	OLD ALLATOONA RD	I 75	0	0	Not A Collision with Motor Vehicle	On Roadway	Fire/Explosion	Straight	
5/7/2010	I 75	OLD ALLATOONA RD	0	0	Not A Collision with Motor Vehicle	On Roadway	Other Object (Not Fixed)	Stopped	
7/9/2010	I 75	OLD ALLATOONA RD	0	0	Not A Collision with Motor Vehicle	Median	Guard Rail Face	Straight	
7/24/2010	I 75	OLD ALLATOONA RD	0	0	Not A Collision with Motor Vehicle	On Shoulder	Bridge Rail	Straight	
8/14/2010	I 75	OLD ALLATOONA RD	0	0	Not A Collision with Motor Vehicle	On Shoulder	Median Barrier	Straight	
9/5/2010	OLD ALLATOONA RD	I 75	0	0	Not A Collision with Motor Vehicle	Off Roadway	Embankment	Straight	
9/21/2010	I 75	OLD ALLATOONA RD	0	0	Not A Collision with Motor Vehicle	On Roadway	Other Object (Not Fixed)	Straight	
10/1/2010	INTERSTATE 75 HWY	OLD ALLATOONA RD	0	0	Not A Collision with Motor Vehicle	On Roadway	Other Non-Collision	Straight	
7/30/2011	OLD ALLATOONA RD	I 75	0	0	Not A Collision with Motor Vehicle	Gore	Other Post/Pole Support	Turning Left	
10/4/2011	I 75	OLD ALLATOONA RD	0	0	Not A Collision with Motor Vehicle	On Roadway	Other Object (Not Fixed)	Straight	
10/11/2011	I 75	OLD ALLATOONA RD	0	0	Not A Collision with Motor Vehicle		Fire/Explosion	Straight	
10/23/2011	I 75	OLD ALLATOONA RD	1	0	Not A Collision with Motor Vehicle	Off Roadway	Other - Fixed Object	Straight	
11/18/2011	I 75	OLD ALLATOONA RD	0	0	Not A Collision with Motor Vehicle	Off Roadway	Over Turn	Changing Lanes	
11/22/2011	I 75	OLD ALLATOONA RD	0	0	Not A Collision with Motor Vehicle	On Roadway	Deer	Straight	
1/11/2012	OLD ALLATOONA RD	I 75	0	0	Not A Collision with Motor Vehicle	Median	Curb	Changing Lanes	Straight
1/28/2012	I 75	OLD ALLATOONA RD	0	0	Not A Collision with Motor Vehicle	Off Roadway	Embankment	Changing Lanes	
2/24/2012	I 75	OLD ALLATOONA RD	0	0	Not A Collision with Motor Vehicle	On Shoulder	Guard Rail Face	Straight	
3/4/2012	I 75	OLD ALLATOONA RD	1	0	Not A Collision with Motor Vehicle	Off Roadway	Median Barrier	Straight	
4/16/2012	I 75	OLD ALLATOONA RD	0	0	Not A Collision with Motor Vehicle	On Roadway	Other Object (Not Fixed)	Straight	Straight
4/18/2012	I 75	OLD ALLATOONA RD	0	0	Not A Collision with Motor Vehicle	Median	Guard Rail Face	Changing Lanes	
5/7/2012	I 75	OLD ALLATOONA RD	0	0	Not A Collision with Motor Vehicle	Median	Median Barrier	Straight	
5/9/2012	I 75	OLD ALLATOONA RD	1	0	Not A Collision with Motor Vehicle	Off Roadway	Over Turn	Straight	
6/5/2012	I 75	OLD ALLATOONA RD	0	0	Not A Collision with Motor Vehicle	On Shoulder	Guard Rail Face	Straight	
7/9/2012	I 75	OLD ALLATOONA RD	0	0	Not A Collision with Motor Vehicle	On Roadway	Other Non-Collision	Straight	
7/11/2012	I 75	OLD ALLATOONA RD	0	1	Not A Collision with Motor Vehicle	Off Roadway	Tree	Changing Lanes	
7/19/2012	OLD ALLATOONA RD	I 75	0	0	Not A Collision with Motor Vehicle	Off Roadway	Curb	Straight	Turning Left
7/26/2012	I 75	OLD ALLATOONA RD	0	0	Not A Collision with Motor Vehicle	Off Roadway	Over Turn	Straight	
8/25/2012	I 75	OLD ALLATOONA RD	0	0	Not A Collision with Motor Vehicle	On Roadway	Other Object (Not Fixed)	Straight	Straight
9/12/2012	I 75	OLD ALLATOONA RD	0	0	Not A Collision with Motor Vehicle	On Shoulder	Median Barrier	Straight	
9/17/2012	I 75	OLD ALLATOONA RD	0	0	Not A Collision with Motor Vehicle	On Roadway	Other Object (Not Fixed)	Straight	Straight
9/21/2012	I 75	OLD ALLATOONA RD	0	0	Not A Collision with Motor Vehicle	On Roadway	Other Object (Not Fixed)	Straight	
11/11/2012	I 75	OLD ALLATOONA RD	1	0	Not A Collision with Motor Vehicle	Off Roadway	Guard Rail Face	Straight	
11/14/2012	I 75	OLD ALLATOONA RD	0	0	Not A Collision with Motor Vehicle	Off Roadway	Guard Rail Face	Straight	
12/7/2012	I 75	OLD ALLATOONA RD	1	0	Not A Collision with Motor Vehicle	On Roadway	Deer	Straight	
3/31/2010	I 75	OLD ALLATOONA RD	1	0	Rear End	On Roadway	Parked Motor Vehicle	Straight	Parked
7/2/2010	I 75	OLD ALLATOONA RD	0	0	Rear End	On Roadway	Motor Vehicle In Motion	Straight	Stopped
7/12/2010	I 75	OLD ALLATOONA RD	0	0	Rear End	On Roadway	Motor Vehicle In Motion	Straight	Straight
12/10/2010	I 75	OLD ALLATOONA RD	0	0	Rear End	On Roadway	Motor Vehicle In Motion	Straight	Stopped
6/16/2011	OLD ALLATOONA RD	I 75	0	0	Rear End	On Roadway	Motor Vehicle In Motion	Straight	Turning Left
9/5/2011	I 75	OLD ALLATOONA RD	0	0	Rear End	On Roadway	Motor Vehicle In Motion	Straight	Straight
11/4/2011	I 75	OLD ALLATOONA RD	0	0	Rear End	On Roadway	Motor Vehicle In Motion	Straight	Stopped
11/25/2011	I 75	OLD ALLATOONA RD	0	0	Rear End	On Roadway	Motor Vehicle In Motion	Straight	Straight
12/22/2011	I 75	OLD ALLATOONA RD	0	0	Rear End	On Roadway	Motor Vehicle In Motion	Straight	
12/22/2011	I 75	OLD ALLATOONA RD	1	0	Rear End	On Roadway	Motor Vehicle In Motion	Straight	Straight
12/22/2011	I 75	OLD ALLATOONA RD	0	0	Rear End	On Roadway	Motor Vehicle In Motion	Straight	Straight
12/29/2011	I 75	OLD ALLATOONA RD	0	0	Rear End	On Roadway	Motor Vehicle In Motion	Straight	Stopped
2/16/2012	I 75	OLD ALLATOONA RD	0	0	Rear End	On Roadway	Motor Vehicle In Motion	Straight	Straight
4/5/2012	I 75	OLD ALLATOONA RD	0	0	Rear End	On Roadway	Motor Vehicle In Motion	Turning Right	Turning Left
4/23/2012	I 75	OLD ALLATOONA RD	0	0	Rear End	On Roadway	Motor Vehicle In Motion	Changing Lanes	Straight
6/3/2012	I 75	OLD ALLATOONA RD	0	0	Rear End	On Roadway	Motor Vehicle In Motion	Straight	Straight
6/3/2012	I 75	OLD ALLATOONA RD	2	0	Rear End	On Roadway	Motor Vehicle In Motion	Straight	Stopped
6/11/2012	I 75	OLD ALLATOONA RD	0	0	Rear End	On Roadway	Other Object (Not Fixed)	Stopped	Stopped
8/10/2012	I 75	OLD ALLATOONA RD	0	0	Rear End	On Roadway	Motor Vehicle In Motion	Straight	Stopped
8/15/2012	OLD ALLATOONA RD	I 75	0	0	Rear End	On Roadway	Motor Vehicle In Motion	Straight	Making U-turn
8/31/2012	I 75	OLD ALLATOONA RD	0	0	Rear End	On Roadway	Motor Vehicle In Motion	Straight	Straight
9/13/2012	I 75	OLD ALLATOONA RD	0	0	Rear End	On Roadway	Motor Vehicle In Motion	Backing	Straight
11/7/2012	I 75	OLD ALLATOONA RD	0	0	Rear End	On Roadway	Motor Vehicle In Motion	Straight	Stopped
11/12/2012	I 75	OLD ALLATOONA RD	1	0	Rear End	On Roadway	Motor Vehicle In Motion	Straight	Straight
3/5/2012	OLD ALLATOONA RD	I 75	1	0	Sideswipe-Opposite Direction	On Roadway	Motor Vehicle In Motion	Turning Left	Straight
1/27/2010	OLD ALLATOONA RD	75	0	0	Sideswipe-Same Direction	On Roadway	Motor Vehicle In Motion	Straight	Straight
4/25/2010	I 75	OLD ALLATOONA RD	3	0	Sideswipe-Same Direction	On Roadway	Motor Vehicle In Motion	Changing Lanes	Straight
8/7/2011	I 75	OLD ALLATOONA RD	0	0	Sideswipe-Same Direction	On Roadway	Motor Vehicle In Motion	Straight	Straight
8/25/2011	I 75	OLD ALLATOONA RD	0	0	Sideswipe-Same Direction	On Roadway	Motor Vehicle In Motion	Straight	Straight
9/22/2011	I 75	OLD ALLATOONA RD	0	0	Sideswipe-Same Direction	On Roadway	Motor Vehicle In Motion	Straight	Straight
10/25/2011	I 75	OLD ALLATOONA RD	1	0	Sideswipe-Same Direction	On Roadway	Motor Vehicle In Motion	Changing Lanes	Straight
1/18/2012	I 75	OLD ALLATOONA RD	0	0	Sideswipe-Same Direction	On Roadway	Motor Vehicle In Motion	Changing Lanes	Straight
1/25/2012	I 75	OLD ALLATOONA RD	0	0	Sideswipe-Same Direction	On Roadway	Motor Vehicle In Motion	Changing Lanes	Straight
4/28/2012	I 75	OLD ALLATOONA RD	0	0	Sideswipe-Same Direction	On Roadway	Motor Vehicle In Motion	Straight	Straight
5/21/2012	I 75	OLD ALLATOONA RD	0	0	Sideswipe-Same Direction	On Roadway	Motor Vehicle In Motion	Changing Lanes	Straight
7/3/2012	OLD ALLATOONA RD	I 75	0	0	Sideswipe-Same Direction	On Roadway	Motor Vehicle In Motion	Turning Left	Straight
8/8/2012	I 75	OLD ALLATOONA RD	0	0	Sideswipe-Same Direction	On Roadway	Motor Vehicle In Motion	Changing Lanes	Straight
8/20/2012	I 75	OLD ALLATOONA RD	0	0	Sideswipe-Same Direction	On Roadway	Motor Vehicle In Motion	Changing Lanes	Straight
9/5/2012	I 75	OLD ALLATOONA RD	0	0	Sideswipe-Same Direction	On Roadway	Motor Vehicle In Motion	Straight	Straight
9/30/2012	I 75	OLD ALLATOONA RD	0	0	Sideswipe-Same Direction	On Roadway	Motor Vehicle In Motion	Changing Lanes	Straight
5/1/2012	I 75	OLD ALLATOONA RD	0	0				Straight	
7/29/2012	I 75	OLD ALLATOONA RD	0	0				Straight	
8/13/2012	OLD ALLATOONA RD	I 75	1	0				Changing Lanes	Straight
			32	**1**					

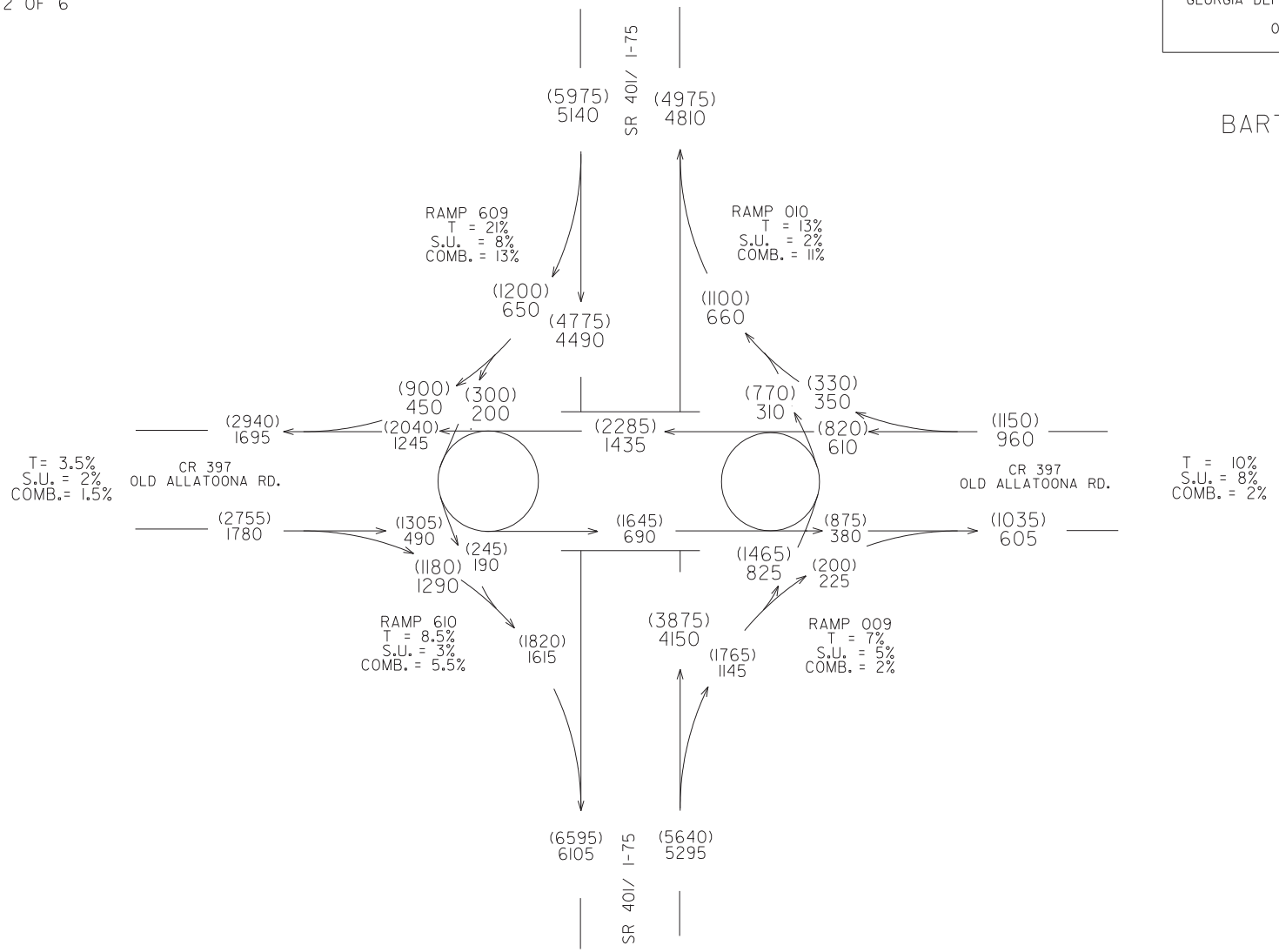
Attachment #7 - Crash Data



Attachment #8 - Traffic Diagrams

GEORGIA DEPARTMENT OF TRANSPORTATION
OFFICE OF PLANNING

BARTOW COUNTY



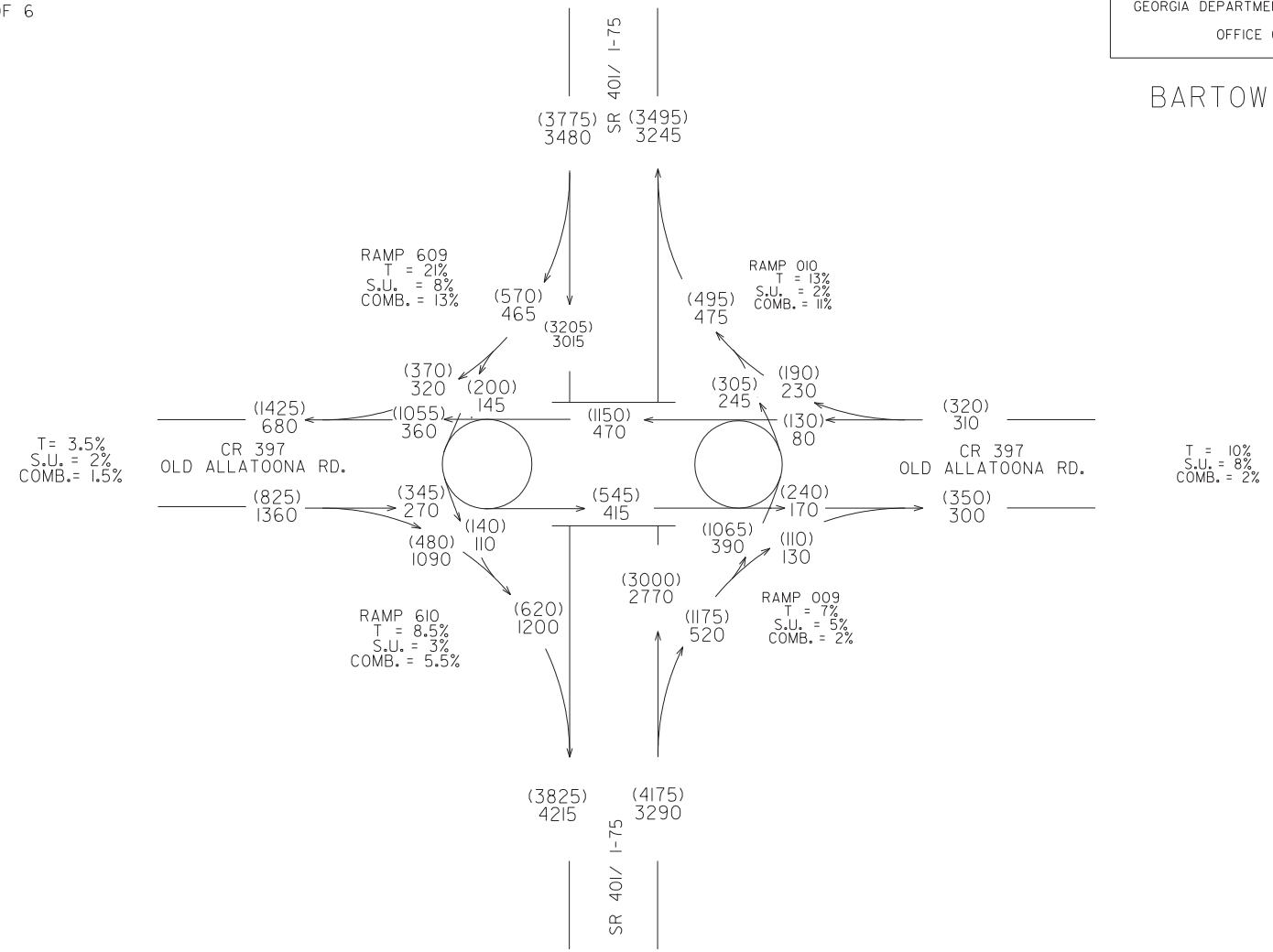
P.I. 0009898
BARTOW COUNTY
SR 401/I-75 @
OLD ALLATOONA RD.
BUILD
2037 PM DHV = (000)
2037 AM DHV = 000

SR 401/I-75
T = 10%
S.U. = 3%
COMB. = 7%

LRW
I-12

GEORGIA DEPARTMENT OF TRANSPORTATION
OFFICE OF PLANNING

BARTOW COUNTY



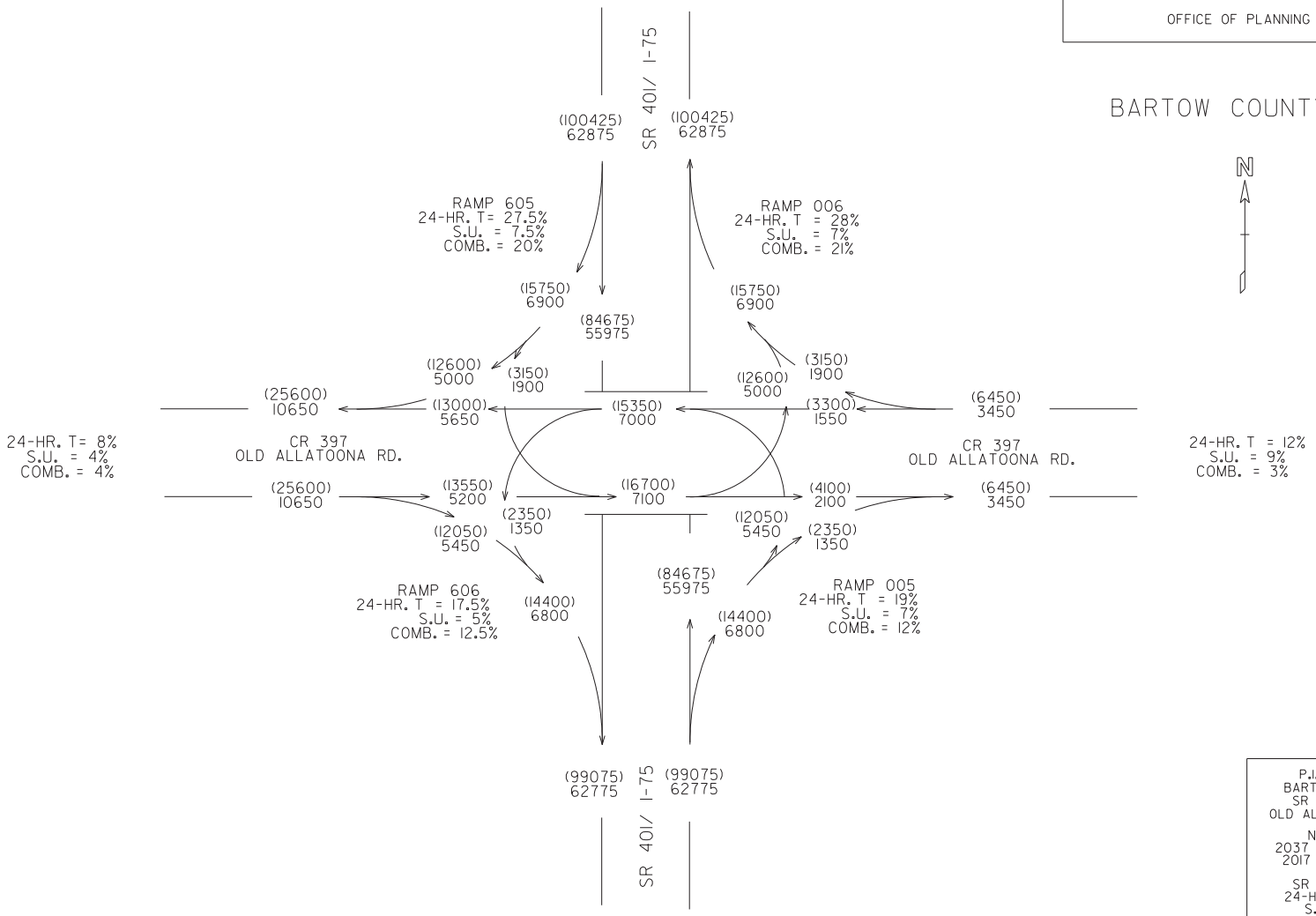
P.I. 0009898
BARTOW COUNTY
SR 401/I-75 @
OLD ALLATOONA RD.

BUILD
2017 PM DHV = (000)
2017 AM DHV = 000
SR 401/I-75
T = 10%
S.U. = 3%
COMB. = 7%

LRW
1-12

GEORGIA DEPARTMENT OF TRANSPORTATION
OFFICE OF PLANNING

BARTOW COUNTY



P.I. 0009898
BARTOW COUNTY
SR 401/I-75 @
OLD ALLATOONA RD.

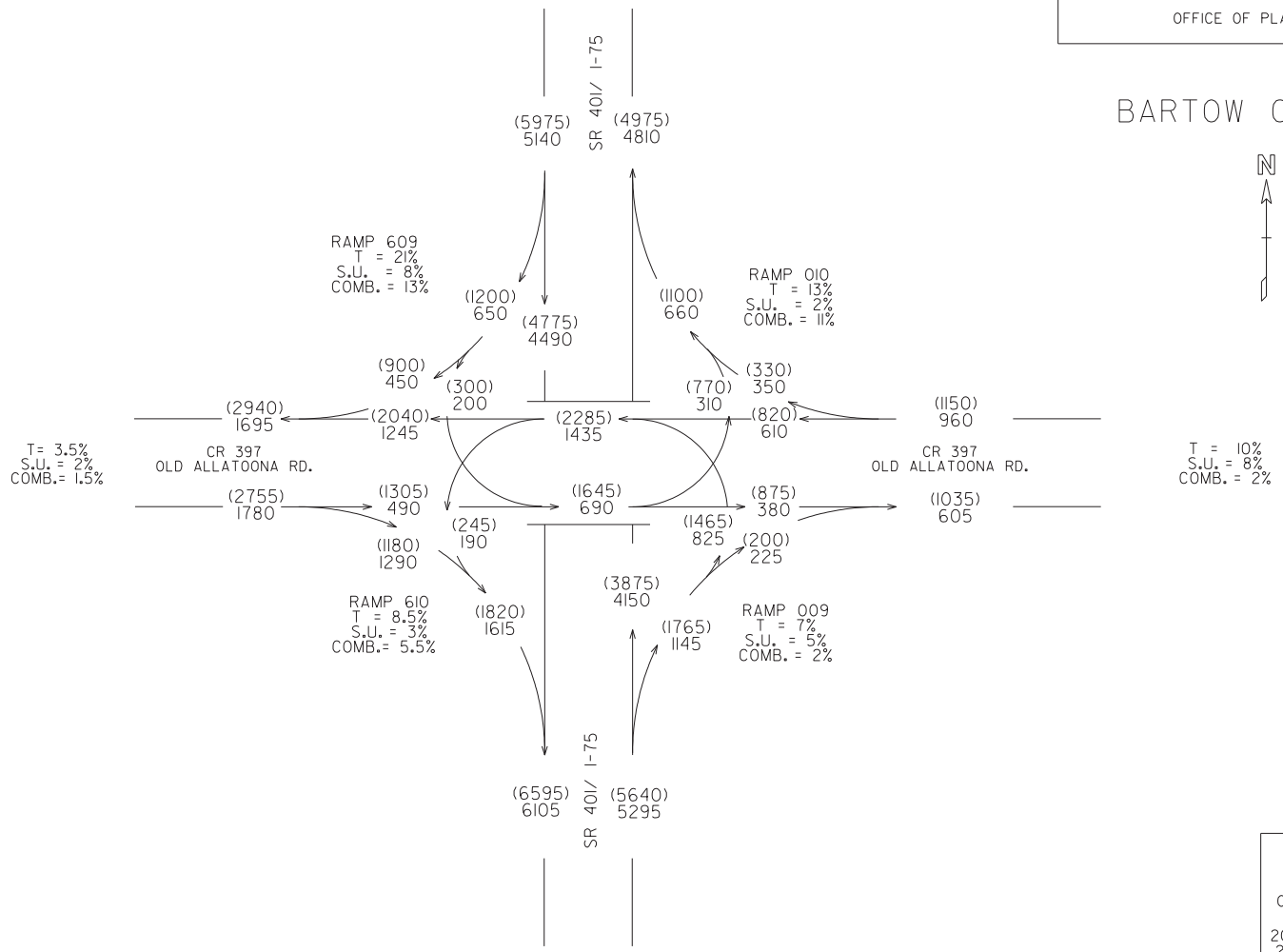
NO BUILD
2037 ADT = (000)
2017 ADT = 000

SR 401/I-75
24-HR. T= 16.5%
S.U. = 4%
COMB. = 12.5%

LRW
1-12

GEORGIA DEPARTMENT OF TRANSPORTATION
OFFICE OF PLANNING

BARTOW COUNTY

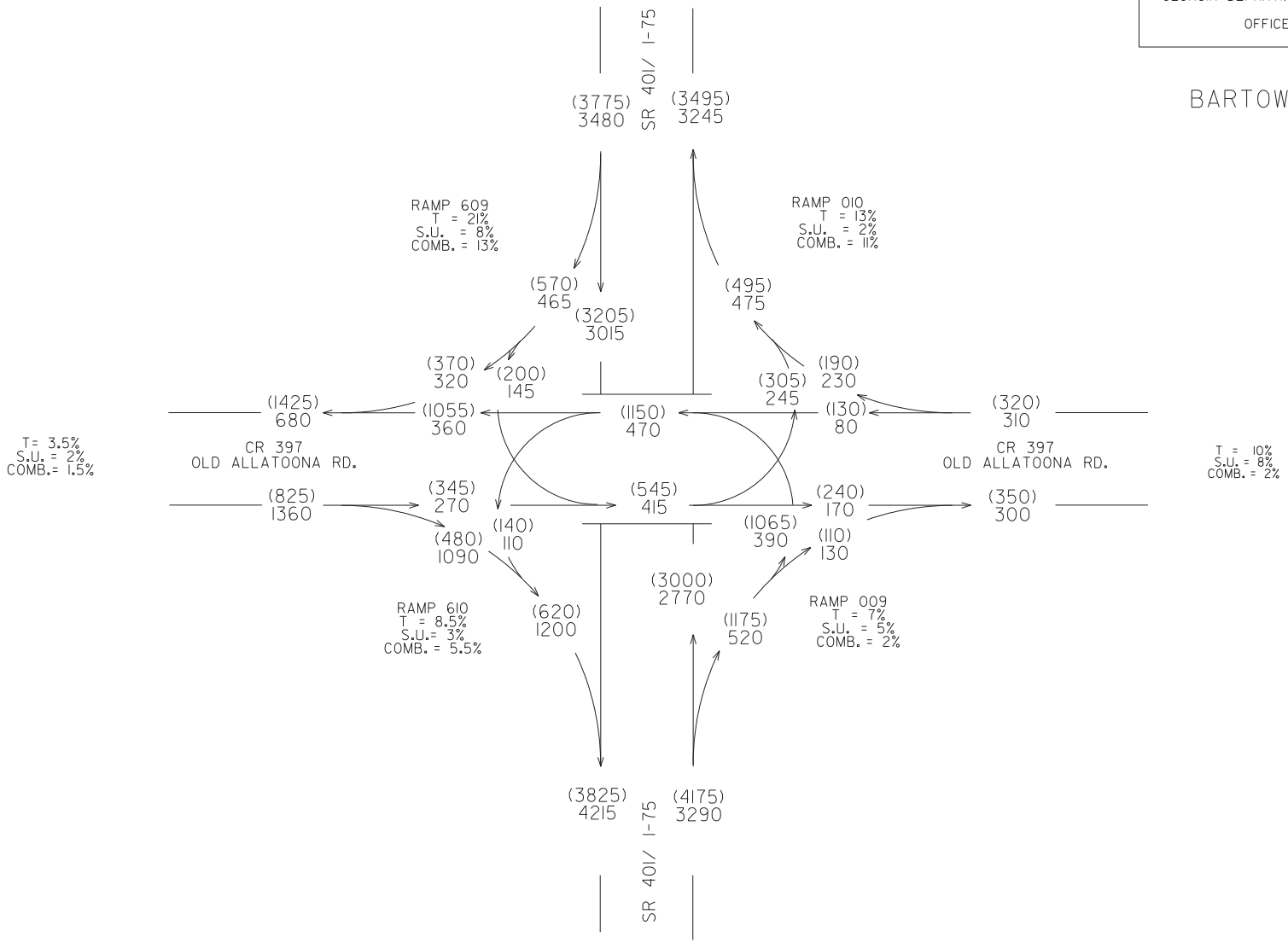


P.I. 0009898
BARTOW COUNTY
SR 401/I-75 @
OLD ALLATOONA RD.
NO BUILD
2037 PM DHV = (000)
2037 AM DHV = 000
SR 401/ I-75
T = 10%
S.U. = 3%
COMB. = 7%

LRW
I-12

GEORGIA DEPARTMENT OF TRANSPORTATION
OFFICE OF PLANNING

BARTOW COUNTY



P.I. 0009898
BARTOW COUNTY
SR 401/I-75 @
OLD ALLATOONA RD.

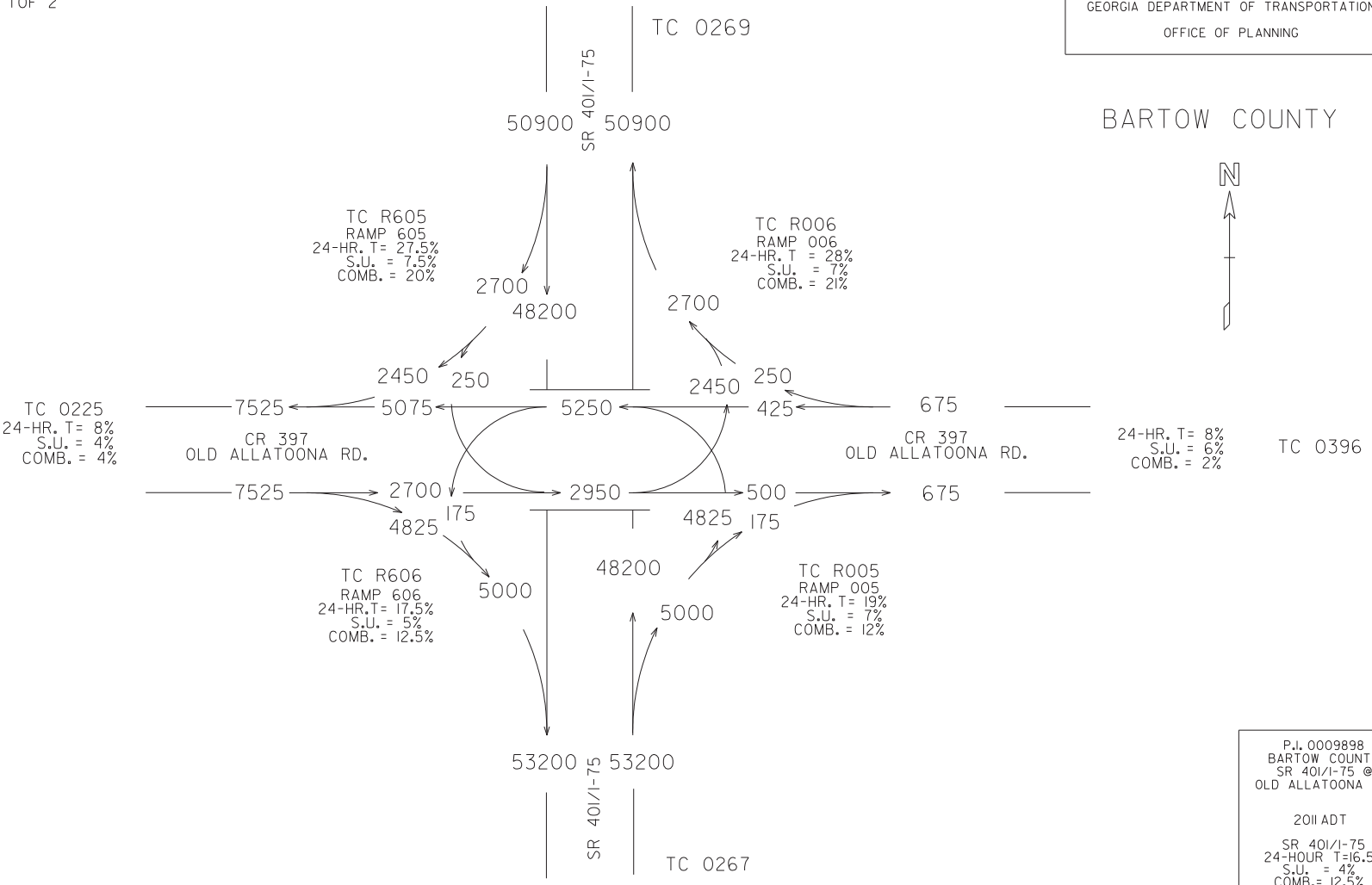
NO BUILD
2017 PM DHV = (000)
2017 AM DHV = 000

SR 401/I-75
T = 10%
S.U. = 3%
COMB. = 7%

LRW
1-12

GEORGIA DEPARTMENT OF TRANSPORTATION
OFFICE OF PLANNING

BARTOW COUNTY



P.I. 0009898
BARTOW COUNTY
SR 401/I-75 @
OLD ALLATOONA RD.

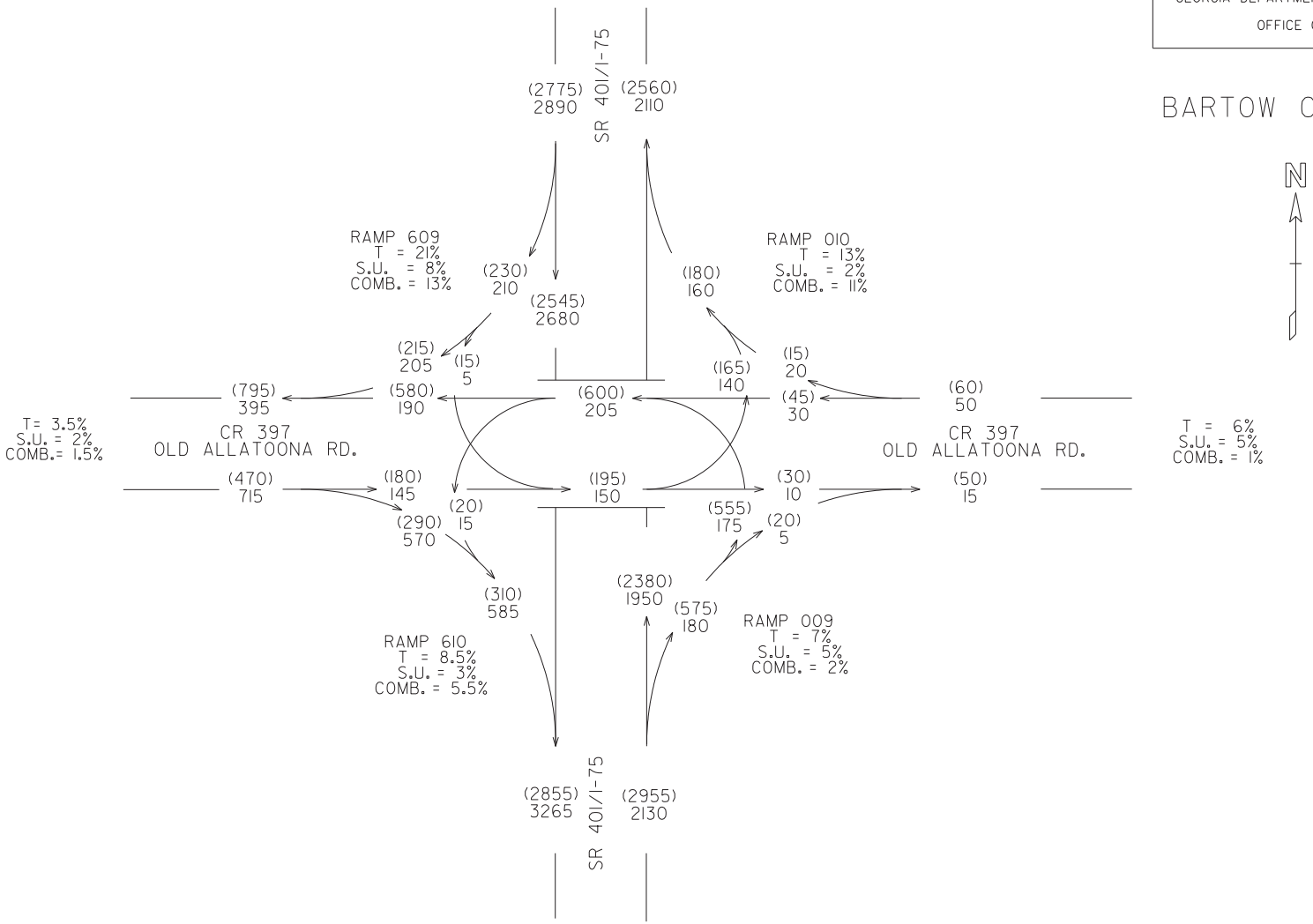
2011 ADT

SR 401/I-75
24-HOUR T=16.5%
S.U. = 4%
COMB.= 12.5%

LRW
1-12

GEORGIA DEPARTMENT OF TRANSPORTATION
OFFICE OF PLANNING

BARTOW COUNTY



P.I. 0009898
BARTOW COUNTY

SR 401/I-75 @
OLD ALABAMA RD.

2011 PM DHV = (000)
2011 AM DHV = 000

SR 401/I-75
T = 10%
S.U. = 3%
COMB.= 7%

LRW
1-12

D.O.T. 66

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

Meeting Minutes

SUBJECT: Project Status Meeting- Roundabout Feasibility at (P.I. No. 0009899) I-75 @ CR 633/RED TOP MOUNTAIN RD- SB & NB RAMPS-Bartow County & (P.I. No. 0009898) I-75 @ CR 397/OLD ALLATOONA ROAD-SB &NB RAMPS.

MEETING LOCATION: One Georgia Center, 22nd Floor Conference Room

MEETING DATE: October 12, 2012

ATTENDEES:

Gerald Ross	Darrell Richardson
Russell McMurry	Albert Shelby
Andy Casey	Charles A. Robinson
Genetha Rice-Singleton	Chad White Sr.
Kathy Zahul	

DISCUSSION:

Albert Shelby provided a general project background for P.I. Nos. 0009899 & 0009898. Albert stated that the GDOT approved traffic for both P.I. Nos. 0009899 and 0009898 in Bartow County had been generated using GDOT standard traffic counting and projection measures in conjunction with a development of regional impact (DRI) that included traffic projections proposed to be generated by the LakePoint Sporting Community Development. The traffic projections and roundabout feasibility study were indicating that a multilane roundabout would be required at the north and southbound interchanges for P.I No. 0009899. It was also mentioned that there was a low crash history at these interchanges and that the use of a crash predictive method was being utilized for this project's benefit-cost ratio. Both interchanges currently do not warrant a signal. There was also some uncertainty reading the timeline for the full build out of the LakePoint Sporting Community Development that would impact P.I. Nos. 0009899 & 0009898.

Kathy Zahul explained in more detail the crash predictive method that was being proposed to be utilized for P.I. No. 0009899.

Darrell Richardson stated that the signal alternative or diverging diamond interchange (DDI) interchange should be considered if traffic increases due to the construction of the LakePoint Development based on Roadway Design's review of the feasibility study.

Gerald Ross acknowledged that roundabouts are the preferred solutions at some locations, but decided that P.I. No.0009899 was not a feasible location for the proposed mutli lane roundabout design at this time after a review of the existing information. Gerald also stated the signal alternative should be further investigated for P.I. No. 0009898 and this location should be programmed as signal project if warranted.

Kathy Zahul concurred and stated that she would provide Charles A. Robinson a letter requesting that the P.I. No. 0009899 is deleted. Kathy stated that another project could be programmed in the future at this location if a signal was warranted. Kathy also stated that P.I.No.0009898 could be programmed as a signal project based on the results of further investigation of the crashes and signal warrants.

Transcribed by: Charles A. Robinson/Chad White
Reviewed by: Albert Shelby AYS

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INDICATION OF ROUNDABOUT SUPPORT

To the Georgia Department of Transportation:

Attn: State Traffic Engineer
935 E. Confederate Ave, Building 24
Atlanta, GA 30316

Location

The Commissioner of ~~Pickens~~ Bartow County supports the consideration of a roundabout at the location specified below.

Local Road Names: _____ at Old Alabama Road Allatoona

State/County Route Numbers: **State Route 401**

Associated Conditions

The undersigned agrees to participate in the following maintenance of the intersection in the event that the roundabout is selected as the preferred concept alternative:

- The full and entire cost of the electric energy used for any lighting installed and the maintenance thereof (if needed)
- ~~Any maintenance costs associated with the landscaping as approved by the local government and the Georgia Department of Transportation (after construction is complete)~~

We agree to participate in a formal Local Government Lighting Project Agreement during the preliminary design phase. This indication of support is submitted and all of the conditions are hereby agreed to. The undersigned are duly authorized to execute this agreement.

This is the 11th day of Oct, 2010

Attest:

_____
Clerk

By: Clarence Brown

Title: Commissioner

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING
225 E Robinson Street, Suite 450, Orlando, FL 32801 P 407.540.0555 F 407.540.0550

TECHNICAL MEMORANDUM

I-75 at CR 397/Old Allatoona Road Interchange

Roundabout Feasibility Study

Date:	November 28, 2012	Project #: 10956.13
To:	Georgia Department of Transportation	
From:	Justin Bansen, PE, Yuri Mereszczak, Ryan Whitney	
Subject:	*DRAFT* - Operational Analysis Results	

Kittelson & Associates, Inc. (KAI) has completed initial operational analyses for a Roundabout Feasibility Evaluation at the Interchange ramp terminals of Old Allatoona Road with Interstate 75 outside of Cartersville, Georgia. The interchange ramp terminal intersections were evaluated under two analysis scenarios – build year (2017) and planning year (2037). The following three intersection control alternatives were considered for both ramp terminal intersections: existing lane configurations and two-way stop control (build year only), signal control, and multilane roundabout control. Sensitivity analyses were performed for the signal control scenarios as well as for the roundabout scenarios to estimate the design life of various multilane roundabout configurations. Operational analyses for all alternatives are based upon volume projections provided by the Georgia Department of Transportation (GDOT) Office of Planning (see Attachment "A"). In addition, KAI reviewed the Lake Point Development TIS in order to better understand the context of the future development and to take into account any assumptions and/or conclusions presented in the TIS.

BACKGROUND

The I-75/Old Allatoona Road interchange is located approximately five miles to the southeast of Cartersville, Georgia. The location of the intersection is shown in Figure 1 and an aerial of the intersection is provided in Figure 2. The ramp terminal intersections currently exist as two-way stop-controlled intersections with the one-way ramps being the stop-controlled approaches. Both northbound and southbound off-ramps currently have a channelized right-turn lane. Left-turn lanes with approximately 150 feet of storage are provided on Old Allatoona Road for vehicles turning onto the I-75 on-ramps.

The Lake Point Development is proposed as a mixed-use facility generating approximately 38,954 new weekday external trips under Phase 1 and 112,696 new weekday external trips under ultimate build-out (Reference 1). The large number of trips generated by this proposed development is expected to have a substantial impact on the I-75/Old Allatoona Road interchange. The planning-level volumes provided by GDOT (shown in Attachment "A") incorporate the projected traffic from the Lake Point Development along with other existing and projected traffic. The high projected growth and resulting

volumes, especially under the planning year (2037) scenario, pose challenges to the feasibility of implementing roundabout intersection control alternative for these ramp terminals.

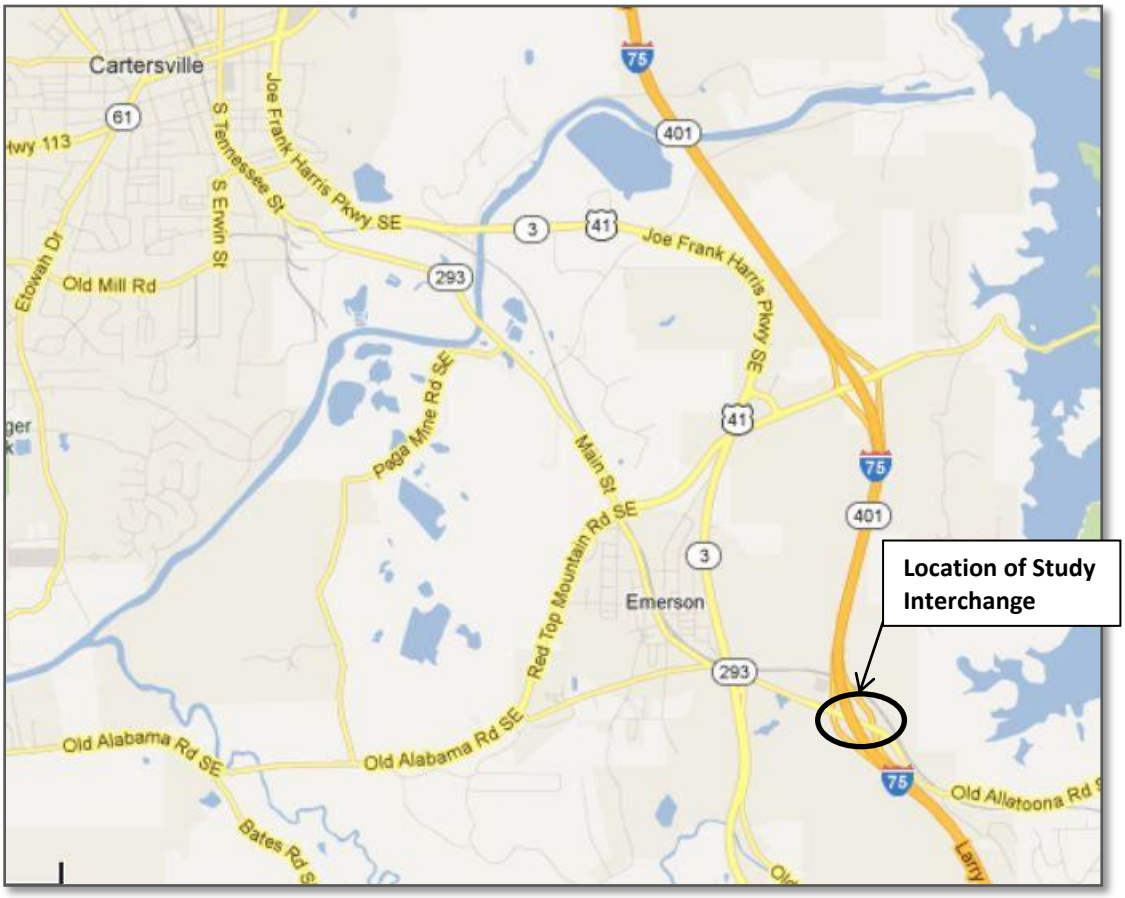


Figure 1 – I-75/Old Allatoona Road Interchange Location

Figure 2 – I-75/Old Allatoona Road Interchange Aerial

INTERSECTION TRAFFIC OPERATIONAL ANALYSIS

Intersection traffic operations were analyzed using 2010 Highway Capacity Manual (HCM) methodologies as applied by the Highway Capacity Software (HCS) (for two-way stop-controlled and signalized analyses). Roundabout traffic operations considered results from both the HCM 2010 methodologies as well as SIDRA Intersection software. The HCM 2010 procedures have limitations on the number of lanes that can be evaluated; therefore, the SIDRA Intersection software (version 5.1) was applied in order to evaluate some roundabout configurations with three or more lanes on an approach. SIDRA analyses, were conducted using the SIDRA Standard capacity model with an Environment Factor of 1.2. The GDOT Roundabout Analysis Tool was also applied for roundabout analyses where no approach required more than two entry lanes (plus a right-turn lane, if needed). Design hour volumes (DHV) for the weekday a.m. and p.m. peak periods as presented by the GDOT Planning Office (Attachment "A") were used for the build and design year analyses.

The analyses results presented below represent the critical information necessary for understanding both the near-term and long-term intersection configuration and control needs at each of the ramp terminals. Worksheets showing the results of additional analysis scenarios, including the no-build analysis and several lane configuration alternatives, are provided in Attachment "B," but are not described in detail within the body of this memorandum so as to focus on the critical analysis results necessary for decision-making.

Design Year Analysis (Year 2037)

The design year analysis is presented first in order to provide GDOT with an understanding of the ultimate lane configurations needed under each control alternative in order to accommodate the projected future year traffic volumes that were provided to KAI. Attachment "C" provides the design year analysis worksheets.

I-75 Northbound Ramps/Old Allatoona Road

Table 1 illustrates the operational analysis summary for the I-75 Northbound Ramps/Old Allatoona Road intersection in the 2037 Design Year. The results illustrate the lane configurations necessary to accommodate the projected 2037 volumes under each traffic control alternative.

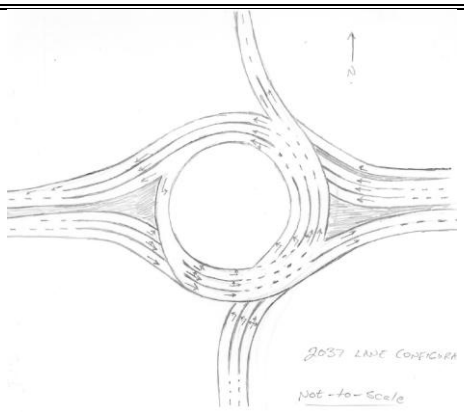
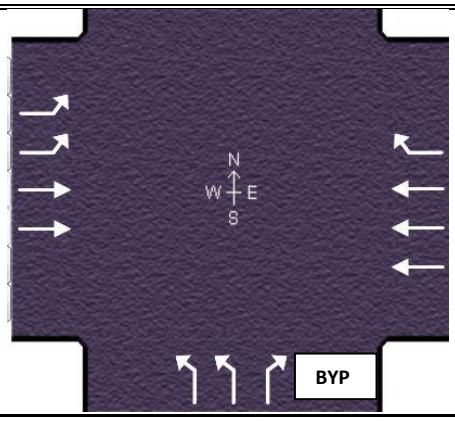
Multilane Roundabout Control

- A multilane roundabout assuming no more than two entry lanes plus a right-turn bypass lane (see Attachment "B" for analysis worksheets of this scenario) is not projected to provide adequate capacity to process the planning year p.m. peak hour forecast volumes for the northbound and westbound approaches.
- Three left-turn lanes are needed on the northbound entry in order to accommodate the maximum projected demand of nearly 1,500 vph for this movement.
    - Four lanes are needed within the circulatory roadway in front of the westbound approach in order to discourage lane change maneuvers within the circulatory roadway and guide drivers into the appropriate exit lanes.
- Due to the extremely high northbound left-turn volume coupled with the 770 vph projected volume for the eastbound left-turn, available gaps in traffic for westbound entry vehicles are limited. Therefore, three westbound through lanes plus a right-turn bypass lane are needed to accommodate the projected 820 vph through volume and the projected 330 vph right-turn volume.

Signal Control

- Dual left-turn lanes are needed for the northbound and eastbound approaches and three through lanes along with a separate right-turn lane are needed on the westbound approach for the signal control at the I-75 Northbound Ramps to be able to process the design year peak hour forecast volumes.
- The signal control alternative is shown to be at/near capacity during the p.m. peak hour with the above mentioned lane configurations.
- A bypass right-turn lane is shown for the right-turn movement on the northbound approach.

Table 1: I-75 Northbound Ramps/Old Allatoona Road – Year 2037 Ultimate Build

Lane Configuration							
Analysis Year/ Scenario		**2037 Design Year / Ultimate Build**			**2037 Design Year / Ultimate Build**		
Analysis Methodology		Sidra 5.1 (SIDRA Standard with EF=1.2)			HCM 2010		
Assumed PHF		0.95			0.95		
Assumed Heavy Vehicle Percentage	**Time Period**	NB	WB	EB	NB	WB	EB
	AM	7%	9%	4%	7%	9%	4%
	PM	7%	9%	4%	7%	9%	4%
Approach		**Volume to Capacity Ratio**	**Delay (sec)**	**LOS**	**Volume to Capacity Ratio**	**Delay (sec)**	**LOS**
AM Peak Hour							
I-75 NB Off-Ramp		0.34	11	B	0.86	27	D
Old Allatoona Road (WB)		0.29	5	A	0.36	18	B
Old Allatoona Road (EB)		0.15	8	A	0.74	20	C
PM Peak Hour							
I-75 NB Off-Ramp		0.67	17	C	1.00	73	E
Old Allatoona Road (WB)		0.86	28	D	0.90	82	F
Old Allatoona Road (EB)		0.35	7	A	0.94	58	E

Note: Volume-to-capacity ratios are reported for the critical movement. LOS & delays are aggregate values by approach.

I-75 Southbound Ramps/Old Allatoona Road

Table 2 illustrates the operational analysis summary for the ultimate build of the I-75 Southbound Ramps/Old Allatoona Road intersection in the 2037 Design Year, providing the necessary lane configurations for the roundabout and traffic signal control alternatives given the projected volumes from the GDOT Planning Office.

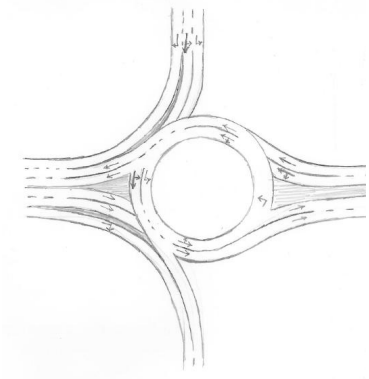
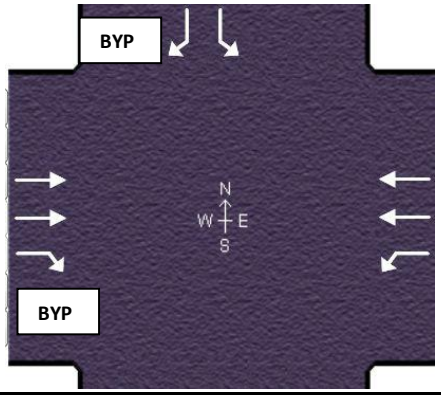
Multilane Roundabout Control

- A multilane roundabout assuming no more than two entry lanes plus a right-turn bypass lane (see Attachment "B" for analysis worksheets of this scenario) is projected to provide adequate capacity to process the planning year p.m. peak hour forecast volumes for all approaches.
- The west leg of the intersection requires six total lanes (3 inbound lanes, 3 outbound lanes) in order to provide adequate storage for the eastbound right-turn entry lane and adequate merging distance for vehicles using the southbound right-turn bypass lane.

Signal Control

- Right-turn bypass lanes with dedicated receiving lanes are needed for the southbound (900 vph) and eastbound right-turn (1,290 vph) movements for the signal control at the I-75 Southbound Ramps to be able to process the design year peak hour forecast volumes. These movements would operate independent of the signal control, and with a dedicated receiving lane and appropriate channelization, would be allowed to operate as uncontrolled movements.

Table 2: I-75 Southbound Ramps/Old Allatoona Road – Year 2037 Ultimate Build

Lane Configuration							
Analysis Year/ Scenario		**2037 Design Year / Ultimate Build**			**2037 Design Year / Ultimate Build**		
Analysis Methodology		Sidra 5.1 (Standard Right Method with Environmental Factor=1.2)			HCM 2010		
Assumed PHF		0.95			0.95		
Assumed Heavy Vehicle Percentage	**Time Period**	SB	WB	EB	SB	WB	EB
	AM	21%	8.1%	3.5%	21%	8%	4%
	PM	21%	8.1%	3.5%	21%	8%	4%
Approach		**Volume to Capacity Ratio**	**Delay (sec)**	**LOS**	**Volume to Capacity Ratio**	**Delay (sec)**	**LOS**
AM Peak Hour							
I-75 SB Off-Ramp		0.29	9	A	0.83	29	C
Old Allatoona Road (WB)		0.46	5	A	0.80	9	A
Old Allatoona Road (EB)		0.75	5	A	0.33	12	B
PM Peak Hour							
I-75 SB Off-Ramp		0.59	14	B	0.89	41	D
Old Allatoona Road (WB)		0.74	4	A	0.86	14	B
Old Allatoona Road (EB)		0.82	9	A	0.63	23	C

Note: Volume-to-capacity ratios are reported for the critical movement. LOS & delays are aggregate values by approach.

Opening Year Analysis (Year 2017) – Ultimate Build

The opening year analysis was conducted under the ultimate build configuration for both roundabout and signal control at each of the ramp terminal intersections. This provides GDOT with an understanding of the "spare capacity" available with each alternative and the operational performance of the intersections in the near-term if they were constructed to their ultimate configurations. Attachment "D" provides the opening year analysis worksheets.

I-75 Northbound Ramps/Old Allatoona Road

Table 3 illustrates the operational analysis summary for the ultimate build of the I-75 Northbound Ramps/Old Allatoona Road intersection in the 2017 Opening Year, with the analysis performed using the year 2017 projected volumes provided by the GDOT Planning Office.

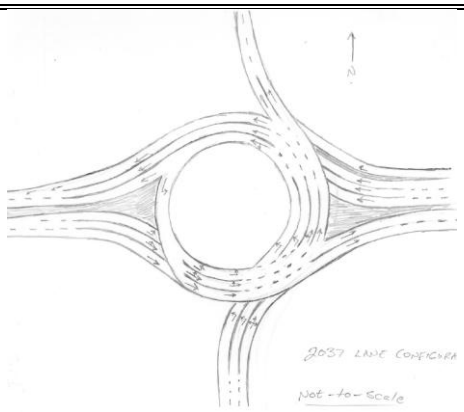
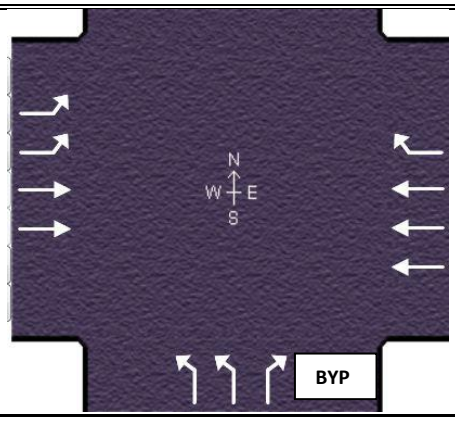
Multilane Roundabout Control

- The opening year analysis shows significant spare capacity available for the roundabout control alternative, with all movements operating at volume-to-capacity ratios of less than 0.40 and at level-of-service “A” or “B”.

Signal Control

- As compared to the roundabout alternative, the opening year analysis for the signal control shows much higher volume-to-capacity ratios for the northbound and eastbound movements and higher delays for all movements, with the approach level-of-service being “B” or “C”.

Table 3: I-75 Northbound Ramps/Old Allatoona Road – Year 2017 Ultimate Build

Lane Configuration							
Analysis Year/ Scenario		**2017 Opening Year / Ultimate Build**			**2017 Opening Year / Ultimate Build**		
Analysis Methodology		Sidra 5.1 (Standard Right Method with Environmental Factor=1.2)			HCM 2010		
Assumed PHF		0.92			0.92		
Assumed Heavy Vehicle Percentage	**Time Period**	NB	WB	EB	NB	WB	EB
	AM	7%	9%	4%	7%	9%	4%
	PM	7%	9%	4%	7%	9%	4%
Approach		**Volume to Capacity Ratio**	**Delay (sec)**	**LOS**	**Volume to Capacity Ratio**	**Delay (sec)**	**LOS**
AM Peak Hour							
I-75 NB Off-Ramp		0.16	10	B	0.76	27	C
Old Allatoona Road (WB)		0.19	5	A	0.09	10	B
Old Allatoona Road (EB)		0.09	8	A	0.53	17	B
PM Peak Hour							
I-75 NB Off-Ramp		0.38	12	B	0.90	28	C
Old Allatoona Road (WB)		0.16	5	A	0.09	22	C
Old Allatoona Road (EB)		0.12	7	A	0.78	28	C

Note: Volume-to-capacity ratios are reported for the critical movement. LOS & delays are aggregate values by approach.

I-75 Southbound Ramps/Old Allatoona Road

Table 4 illustrates the operational analysis summary for the ultimate build of the I-75 Southbound Ramps/Old Allatoona Road intersection in the 2017 Opening Year, with the analysis performed using the year 2017 projected volumes provided by the GDOT Planning Office.

Multilane Roundabout Control

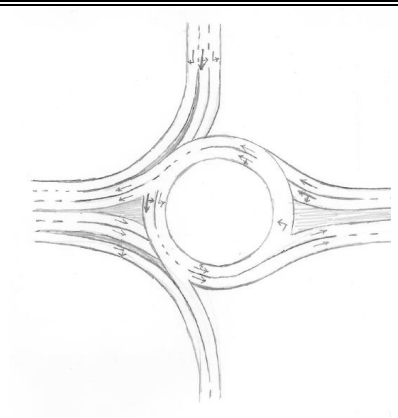
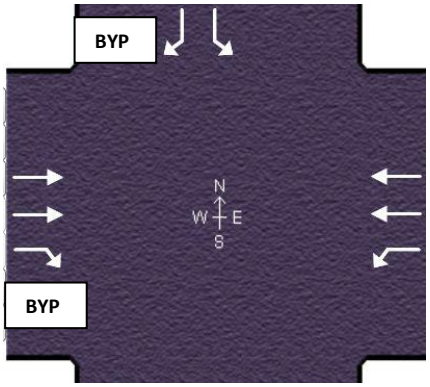
- The opening year analysis shows significant spare capacity available for the roundabout control alternative, with all movements operating at volume-to-capacity ratios of 0.40 or less and at level-of-service "A".

Signal Control

- As compared to the roundabout alternative, the opening year analysis for the signal control shows much higher volume-to-capacity ratios for the northbound and westbound movements, but much lower volume-to-capacity ratios for the eastbound movement.

Delays are higher for all movements under the signal alternative, with the approach level-of-service ranging from "A" to "C".

Table 4: I-75 Southbound Ramps/Old Allatoona Road – Year 2017 Ultimate Build

Lane Configuration							
Analysis Year/ Scenario		**2017 Opening Year / Ultimate Build**			**2017 Opening Year / Ultimate Build**		
Analysis Methodology		Sidra 5.1 (Standard Right Method with Environmental Factor=1.2)			HCM 2010		
Assumed PHF		0.92			0.92		
Assumed Heavy Vehicle Percentage	**Time Period**	SB	WB	EB	SB	WB	EB
	AM	21%	7.3%	3.5%	21%	8%	4%
	PM	21%	7.3%	3.5%	21%	8%	4%
Approach		**Volume to Capacity Ratio**	**Delay (sec)**	**LOS**	**Volume to Capacity Ratio**	**Delay (sec)**	**LOS**
AM Peak Hour							
I-75 SB Off-Ramp		0.22	8	A	0.81	29	C
Old Allatoona Road (WB)		0.16	5	A	0.51	8	A
Old Allatoona Road (EB)		0.65	5	A	0.17	9	A
PM Peak Hour							
I-75 SB Off-Ramp		0.25	9	A	0.83	29	C
Old Allatoona Road (WB)		0.40	4	A	0.64	7	A
Old Allatoona Road (EB)		0.29	5	A	0.17	11	B

Note: Volume-to-capacity ratios are reported for the critical movement. LOS & delays are aggregate values by approach.

Sensitivity Analysis

A sensitivity analysis was conducted for both the signal and roundabout control alternatives at each ramp terminal intersection. The purpose of this analysis was to explore opportunities for interim configurations that may be able to be implemented prior to construction of the ultimate build configurations. The sensitivity analysis was performed assuming a constant growth in volumes, by movement, between the 2017 opening year and the 2037 design year volumes provided by GDOT. The maximum design life of each interim alternative was determined as the year prior to any intersection approach exceeding a volume-to-capacity ratio of 1.0. Attachment "E" provides the sensitivity analysis worksheets.

I-75 Northbound Ramps/Old Allatoona Road

Table 5 illustrates the sensitivity analysis summary for the I-75 Northbound Ramps/Old Allatoona Road intersection.

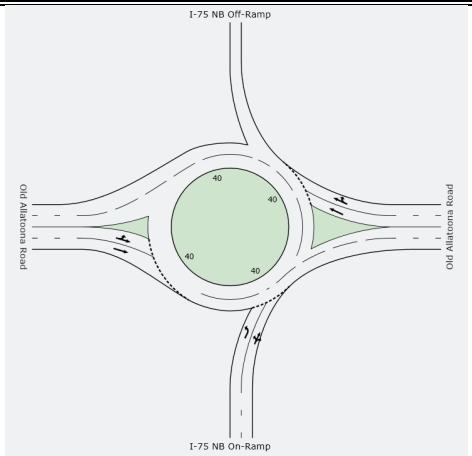
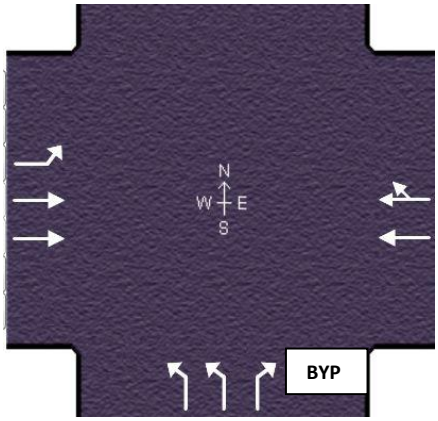
Multilane Roundabout Control

- The lane configurations were assumed as two entry lanes on each leg, two exit lanes on the west and east legs, and one exit lane on the north leg.
- Design Life = Year 2026
    - The westbound entry exceeds capacity in the year 2027 due to the increase in eastbound and northbound left-turn volumes conflicting with the westbound through volumes.

Signal Control

- The lane configurations were assumed to be the same as the existing conditions lane configurations with the exception of the addition a second northbound left-turn lane.
- Design Life = Year 2026
    - The northbound and eastbound entries exceed capacity in the year 2027 due to the increase in left-turn volume for these movements. A second left-turn lane could be added to the eastbound approach to help in improving capacity, but the northbound approach already has a second left-turn lane assumed and so additional intersection improvements would be necessary to assist with the capacity of the northbound approach.

Table 5: I-75 Northbound Ramps/Old Allatoona Road – Interim Build Design Life Evaluation

Lane Configuration							
Analysis Year/ Scenario		**Year 2026 / Interim Build (Design Life)**			**Year 2026 / Interim Build (Design Life)**		
Analysis Methodology		Sidra 5.1 (Standard Right Method with Environmental Factor=1.2)			HCM 2010		
Assumed PHF		0.95			0.95		
Assumed Heavy Vehicle Percentage	**Time Period**	NB	WB	EB	NB	WB	EB
	AM	7%	9%	4%	7%	9%	4%
	PM	7%	9%	4%	7%	9%	4%
Approach		**Volume to Capacity Ratio**	**Delay (sec)**	**LOS**	**Volume to Capacity Ratio**	**Delay (sec)**	**LOS**
AM Peak Hour							
I-75 NB Off-Ramp		0.39	12	B	0.82	29	C
Old Allatoona Road (WB)		0.40	9	A	0.31	16	B
Old Allatoona Road (EB)		0.16	8	A	**0.85**	19	B
PM Peak Hour							
I-75 NB Off-Ramp		**0.89**	25	C	**0.98**	63	E
Old Allatoona Road (WB)		**0.94**	55	F	0.65	55	E
Old Allatoona Road (EB)		0.28	8	A	**0.95**	38	D

Note: Volume-to-capacity ratios are reported for the critical movement. LOS & delays are aggregate values by approach.

I-75 Southbound Ramps/Old Allatoona Road

Table 6 illustrates the sensitivity analysis summary for the I-75 Northbound Ramps/Old Allatoona Road intersection.

Multilane Roundabout Control

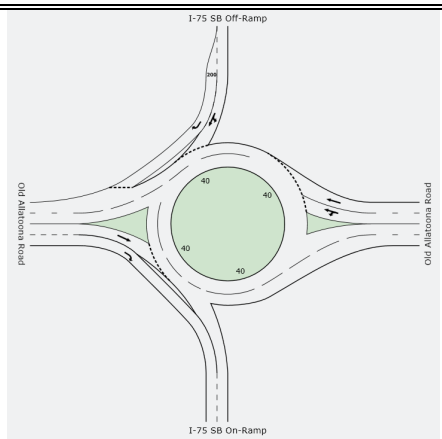
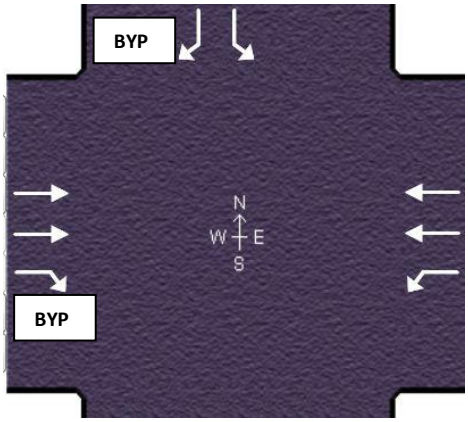
- The lane configurations were assumed as two entry lanes on each leg, with the north leg having a through-left lane and a yielding right-turn bypass lane and the west leg having a through lane and a merging right-turn bypass lane.
- Design Life = Year 2025
    - The southbound entry exceeds capacity in the year 2026 due to the high right-turn volume conflicting with the westbound through volume. Additional improvements to increase the capacity of the southbound right-turn involve construction of a

merging bypass lane, which requires a third lane be constructed on the west departure leg.

Signal Control

- No interim build scenario was evaluated under the signal control scenario, as the ultimate build configuration involves relatively minor geometric modifications to the existing intersection in addition to the installation of signal control. Therefore, if the signal control scenario is desired for this ramp intersection it is recommended that the ultimate build configuration be constructed initially.

Table 6: I-75 Southbound Ramps/Old Allatoona Road – Interim Build Design Life Evaluation

Lane Configuration							
Analysis Year/ Scenario		**Year 2025 / Interim Build (Design Life)**			**2037 Ultimate Build (No Interim Build)**		
Analysis Methodology		Sidra 5.1 (Standard Right Method with Environmental Factor=1.2)			HCM 2010		
Assumed PHF		0.95			0.95		
Assumed Heavy Vehicle Percentage	**Time Period**	SB	WB	EB	SB	WB	EB
	AM	21%	7.3%	3.5%	21%	8%	4%
	PM	21%	7.3%	3.5%	21%	8%	4%
Approach		**Volume to Capacity Ratio**	**Delay (sec)**	**LOS**	**Volume to Capacity Ratio**	**Delay (sec)**	**LOS**
AM Peak Hour							
I-75 SB Off-Ramp		0.50	12	B	0.83	29	C
Old Allatoona Road (WB)		0.23	5	A	0.80	9	A
Old Allatoona Road (EB)		0.68	5	A	0.33	12	B
PM Peak Hour							
I-75 SB Off-Ramp		0.97	36	E	0.89	41	D
Old Allatoona Road (WB)		0.52	4	A	0.86	14	B
Old Allatoona Road (EB)		0.82	9	A	0.63	23	C

Note: Volume-to-capacity ratios are reported for the critical movement. LOS & delays are aggregate values by approach.

SUMMARY OF FINDINGS

The primary purpose of this study is to determine the feasibility of implementing roundabouts at the ramp terminal intersections for the interchange of Old Allatoona Road with Interstate 75. Based upon design year volumes provided by GDOT, KAI evaluated the lane configurations necessary to serve the

projected volumes under roundabout and signal control alternatives. The operational analysis results provide the following key conclusions:

- A multilane roundabout with more than two entry lanes is expected to be needed to provide adequate capacity to process the planning year 2037 volumes at the I-75 Northbound Ramps/Old Allatoona Road intersection. At the I-75 Southbound Ramps/Old Allatoona Road intersection, a two-lane roundabout configuration is expected to provide adequate operations through the design year. Figure 3 illustrates the specific multilane roundabout configurations necessary to accommodate the year 2037 projected volumes on all approaches under Yield control.

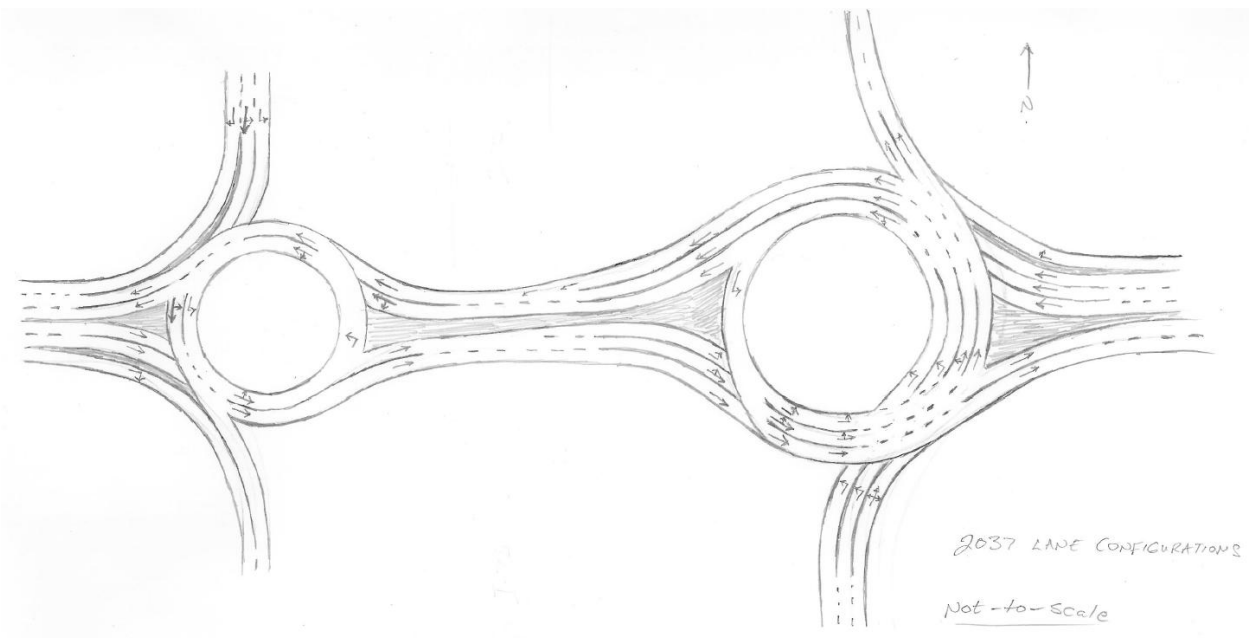


Figure 3 – I-75/Old Allatoona Road Interchange – 2037 Roundabout Ultimate Build Configurations

- Figure 4 illustrates the signal control configurations necessary to process the year 2037 projected volumes at each ramp terminal intersection.
    - The southbound ramp intersection ultimate build lane configuration is the same as the existing conditions lane configuration with relatively minor geometric modifications needed to accommodate the installation of the signal.
    - The northbound ramp intersection ultimate build lane configuration would require the following changes to the existing lane configurations:
        - Addition of a second eastbound left-turn lane.
        - Addition of a third westbound through lane and a dedicated right-turn lane.
        - Addition of a second northbound left-turn lane.

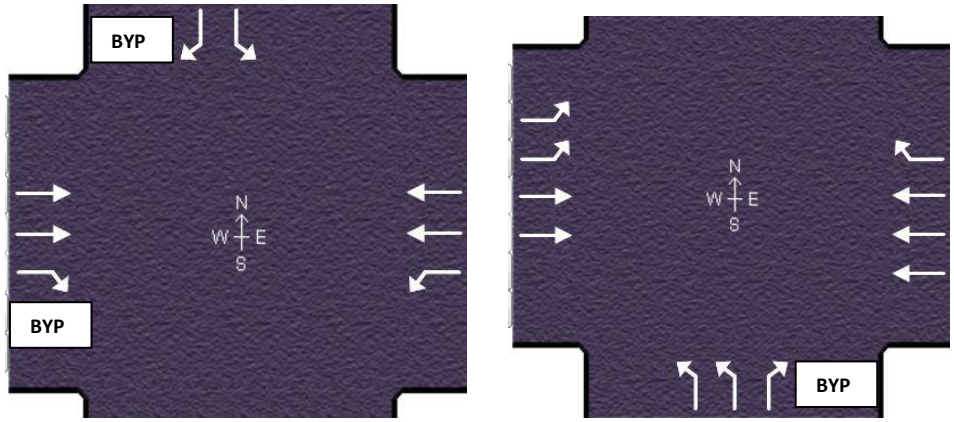


Figure 4 – I-75/Old Allatoona Road Interchange - Signal Ultimate Build Configurations

- Figure 5 illustrates the multilane roundabout lane configurations explored through a sensitivity analysis in order to estimate the design life of more "conventional" multilane roundabout designs. The northbound ramp terminal interim roundabout has an estimated design life up to year 2026, while the southbound ramp terminal interim roundabout has an estimated design life up to year 2025.

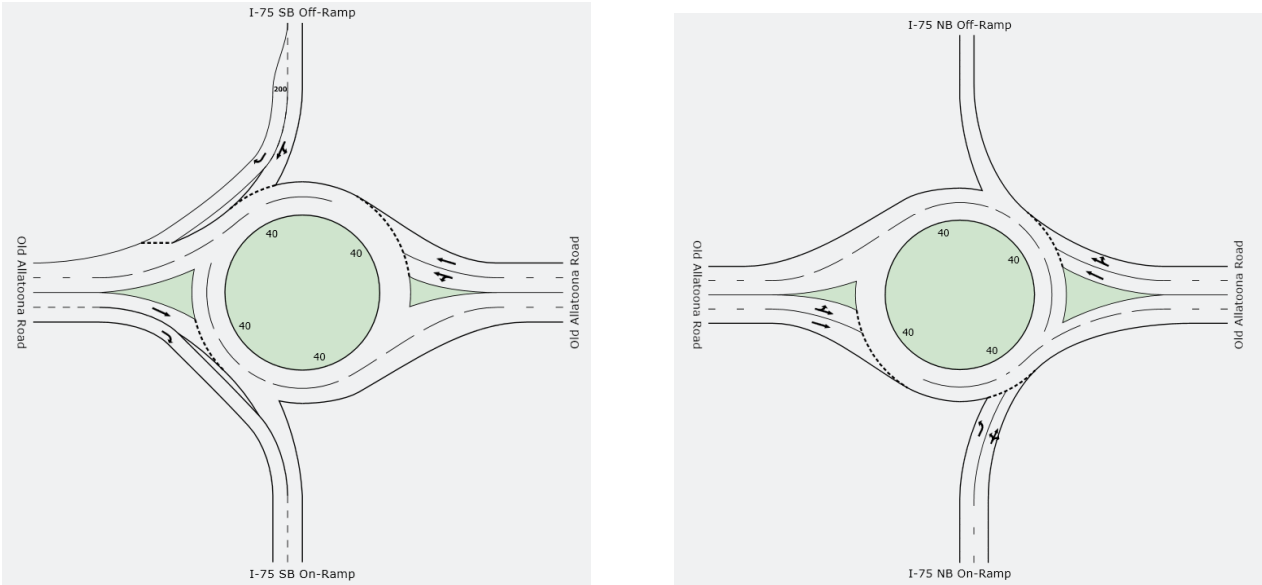


Figure 5 – I-75/Old Allatoona Road Interchange – Roundabout Interim Build Configurations

- Figure 6 illustrates signalized intersection configurations for the opening year that are similar to the existing conditions lane configurations so as to explore the design life of signalizing the ramp terminal intersections and constructing relatively minor initial lane configuration modifications. The northbound ramp terminal interim signal adds a second left-turn lane to the existing northbound approach and has an estimated design life up to year 2026, while the southbound ramp terminal signal can be constructed to the ultimate build configuration with

relatively minor geometric modifications to existing conditions and will provide a design life through the 2037 planning year.

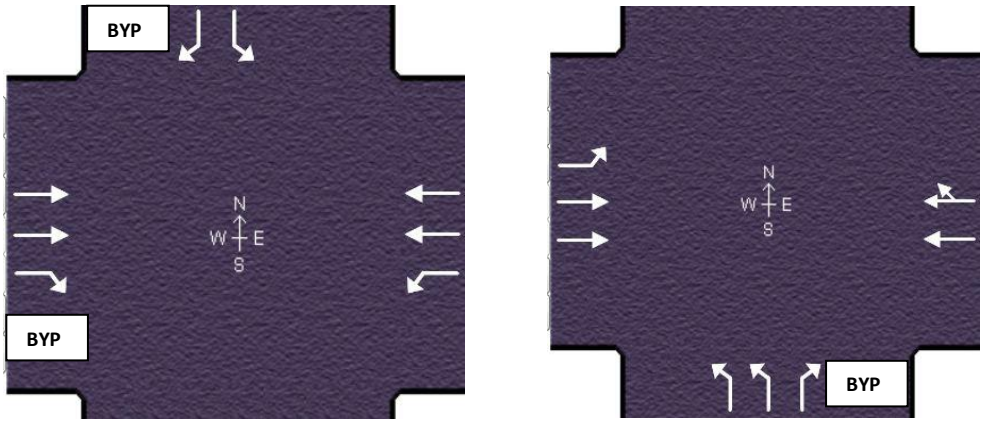


Figure 6 – I-75/Old Allatoona Road Interchange – Signal Interim Build Configurations

The ultimate build traffic signal alternatives necessary to accommodate the year 2037 projected volumes offer more flexibility for changes to the ramp terminal intersections in the future and also are less complex for drivers to travel through as compared to the ultimate build multilane roundabout alternatives. Roundabouts have shown significant safety benefits over traffic signals on the whole (Reference 2); however, it is difficult to predict whether significant safety benefits will be realized with roundabouts at these ramp terminal intersections given the complexity of the ultimate build roundabouts needed. It is important to note that the Lake Point Development is forecast to generate a large number of trips through this interchange, but this development has yet to be constructed and may take many years, perhaps even beyond the planning year threshold of this study, to fully realize the large number of trips forecast and that are incorporated into the design year volumes.

GDOT Planning Office staff should consider the operational analysis presented in this study in conjunction with previous studies conducted in the area and the context of the environment. KAI staff would like to discuss the results presented in this memo with GDOT staff prior to proceeding further with the roundabout feasibility study in order to determine whether or not it is appropriate to carry forward with additional evaluation of roundabout alternatives at the I-75 Interchange at Old Allatoona Road.

REFERENCES

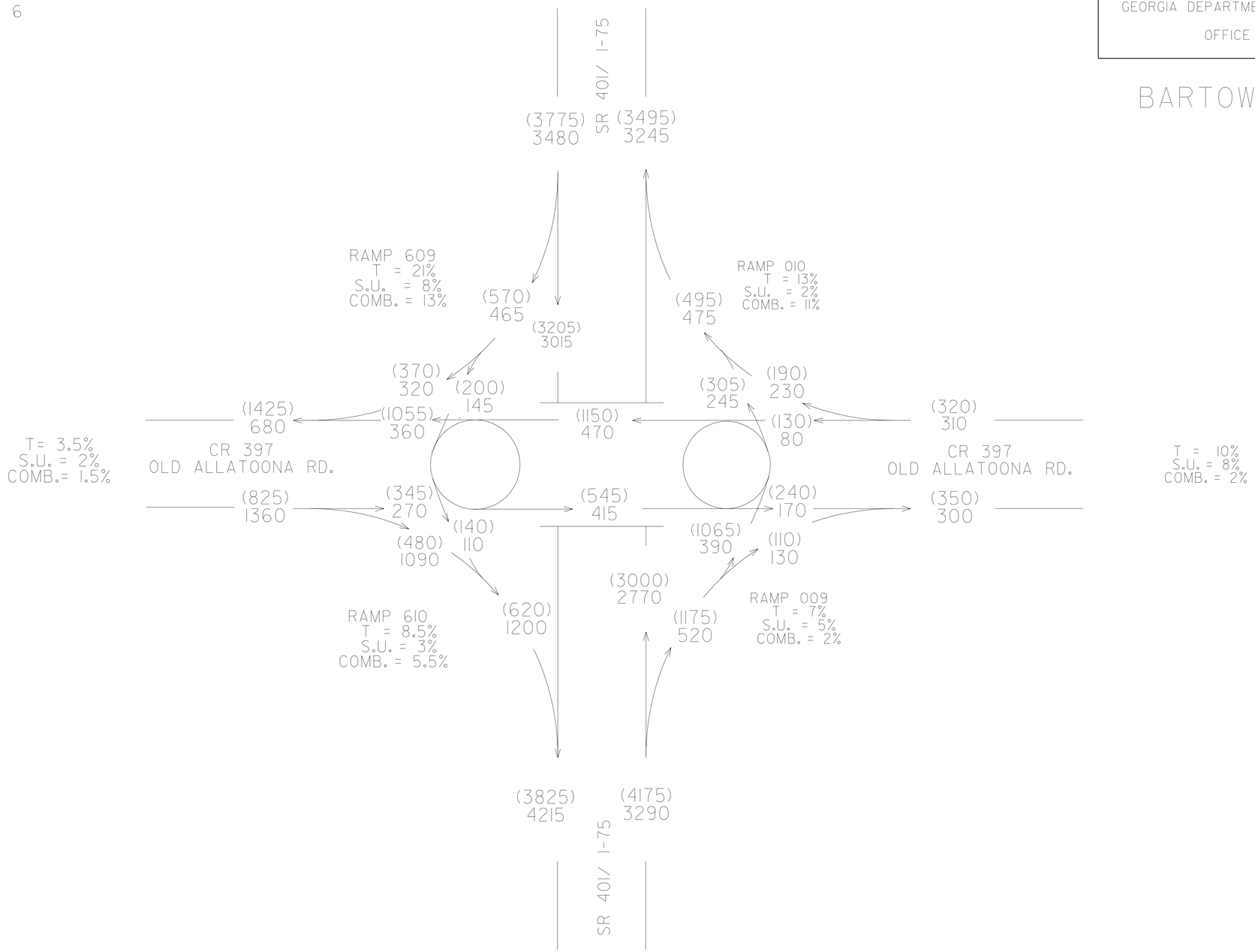
1. Stantec, Inc. “Traffic Impact Study for Lake Point Development.” February 2011.

2. Rodegerdts, L. A., et al. *NCHRP Report 672: Roundabouts: An Informational Guide, 2nd Edition.* National Cooperative Highway Research Program, Transportation Research Board of the National Academy of Sciences, Washington, D.C., November 2010.

Attachment A GDOT Office of Planning Design Hour Volume Projections

GEORGIA DEPARTMENT OF TRANSPORTATION
OFFICE OF PLANNING

BARTOW COUNTY



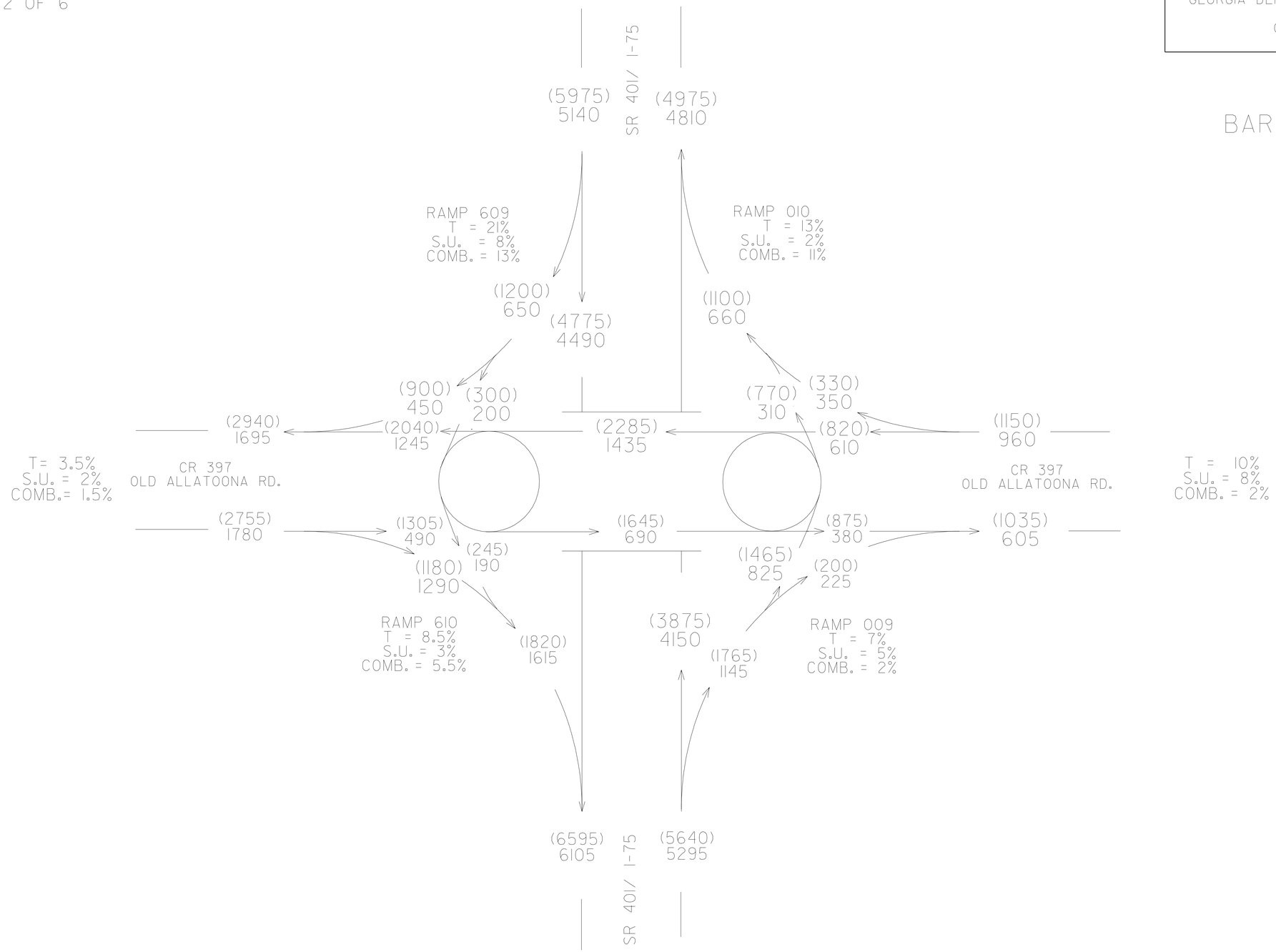
P.I. 0009898
BARTOW COUNTY
SR 401/I-75 @
OLD ALLATOONA RD.

BUILD
2017 PM DHV = (000)
2017 AM DHV = 000
SR 401/I-75
T = 10%
S.U. = 3%
COMB. = 7%

LRW
1-12

GEORGIA DEPARTMENT OF TRANSPORTATION
OFFICE OF PLANNING

BARTOW COUNTY



P.I. 0009898
BARTOW COUNTY
SR 401/I-75 @
OLD ALLATOONA RD.

BUILD
2037 PM DHV = (000)
2037 AM DHV = 000

SR 401/I-75
T = 10%
S.U. = 3%
COMB. = 7%

LRW
I-12

Attachment B Additional Analysis Scenarios

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*RAW*	Intersection	*I-75/Allatoona*
Agency/Co.	*Georgia DOT*	Jurisdiction	
Date Performed	*9/12/2012*	Analysis Year	*2017 No Build*
Analysis Time Period	*Weekday AM Peak Hr*		

Project Description *#10956.13*

East/West Street: *Alatoona* | North/South Street: *I-75 Northbound Ramp*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*245*	*170*			*80*	*230*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*245*	*170*	*0*	*0*	*80*	*230*
Percent Heavy Vehicles	*4*	--	--	*0*	--	--
Median Type	*Raised curb*					
RT Channelized			*0*			*0*
Lanes	*1*	*2*	*0*	*0*	*2*	*0*
Configuration	*L*	*T*			*T*	*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*390*		*130*			
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*390*	*0*	*130*	*0*	*0*	*0*
Percent Heavy Vehicles	*7*	*0*	*7*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*1*			*0*
Lanes	*1*	*0*	*1*	*0*	*0*	*0*
Configuration	*L*		*R*			

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*		*L*		*R*			
v (veh/h)	*245*		*390*		*130*			
C (m) (veh/h)	*1233*		*291*		*957*			
v/c	*0.20*		*1.34*		*0.14*			
95% queue length	*0.74*		*19.77*		*0.47*			
Control Delay (s/veh)	*8.6*		*209.3*		*9.4*			
LOS	*A*		*F*		*A*			
Approach Delay (s/veh)	--	--	*159.3*					
Approach LOS	--	--	*F*					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*RAW*	Intersection	*I-75/Allatoona*
Agency/Co.	*Georgia DOT*	Jurisdiction	
Date Performed	*9/12/2012*	Analysis Year	*2017 No Build*
Analysis Time Period	*Weekday PM Peak Hr*		

Project Description *#10956*

East/West Street: *Old Allatoona Road* North/South Street: *I-75 Northbound Ramp*

Intersection Orientation: *East-West* Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*305*	*240*			*130*	*190*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*305*	*240*	*0*	*0*	*130*	*190*
Percent Heavy Vehicles	*4*	--	--	*0*	--	--
Median Type	*Raised curb*					
RT Channelized			*0*			*0*
Lanes	*1*	*2*	*0*	*0*	*2*	*0*
Configuration	*L*	*T*			*T*	*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*1065*		*110*			
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*1065*	*0*	*110*	*0*	*0*	*0*
Percent Heavy Vehicles	*7*	*0*	*7*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*1*			*0*
Lanes	*1*	*0*	*1*	*0*	*0*	*0*
Configuration	*L*		*R*			

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*		*L*		*R*			
v (veh/h)	*305*		*1065*		*110*			
C (m) (veh/h)	*1222*		*197*		*914*			
v/c	*0.25*		*5.41*		*0.12*			
95% queue length	*0.99*		*112.06*		*0.41*			
Control Delay (s/veh)	*8.9*		*2028*		*9.5*			
LOS	*A*		*F*		*A*			
Approach Delay (s/veh)	--	--	*1839*					
Approach LOS	--	--	*F*					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*RAW*	Intersection	*I-75/Allatoona*
Agency/Co.	*Georgia DOT*	Jurisdiction	
Date Performed	*9/12/2012*	Analysis Year	*2017 No Build*
Analysis Time Period			

Project Description *#10956*

East/West Street: *Old Allatoona Road* | North/South Street: *I-75 Southbound Ramp*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*270*	*1090*	*110*	*360*	
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*270*	*1090*	*110*	*360*	*0*
Percent Heavy Vehicles	*4*	--	--	*10*	--	--
Median Type	*Raised curb*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*1*	*1*	*2*	*0*
Configuration		*T*	*R*	*L*	*T*	
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*145*		*370*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*145*	*0*	*370*
Percent Heavy Vehicles	*7*	*0*	*7*	*21*	*0*	*21*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*1*			*0*
Lanes	*0*	*0*	*0*	*1*	*0*	*1*
Configuration				*L*		*R*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*L*				*L*		*R*
v (veh/h)		*110*				*145*		*370*
C (m) (veh/h)		*462*				*249*		*803*
v/c		*0.24*				*0.58*		*0.46*
95% queue length		*0.92*				*3.33*		*2.45*
Control Delay (s/veh)		*15.2*				*37.8*		*13.3*
LOS		*C*				*E*		*B*
Approach Delay (s/veh)	--	--				*20.2*		
Approach LOS	--	--				*C*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*RAW*	Intersection	*I-75/Allatoona*
Agency/Co.	*Georgia DOT*	Jurisdiction	
Date Performed	*9/12/2012*	Analysis Year	*2017 No Build*
Analysis Time Period	*Weekday PM Peak Hr*		

Project Description *#10956*

East/West Street: *Old Allatoona Road* | North/South Street: *I-75 Southbound Ramp*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*345*	*480*	*140*	*1055*	
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*345*	*480*	*140*	*1055*	*0*
Percent Heavy Vehicles	*4*	--	--	*10*	--	--
Median Type	*Raised curb*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*1*	*1*	*2*	*0*
Configuration		*T*	*R*	*L*	*T*	
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*200*		*320*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*200*	*0*	*320*
Percent Heavy Vehicles	*7*	*0*	*7*	*21*	*0*	*21*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*1*			*0*
Lanes	*0*	*0*	*0*	*1*	*0*	*1*
Configuration				*L*		*R*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*L*				*L*		*R*
v (veh/h)		*140*				*200*		*320*
C (m) (veh/h)		*752*				*76*		*497*
v/c		*0.19*				*2.63*		*0.64*
95% queue length		*0.68*				*19.37*		*4.51*
Control Delay (s/veh)		*10.9*				*856.3*		*24.4*
LOS		*B*				*F*		*C*
Approach Delay (s/veh)	--	--				*344.4*		
Approach LOS	--	--				*F*		

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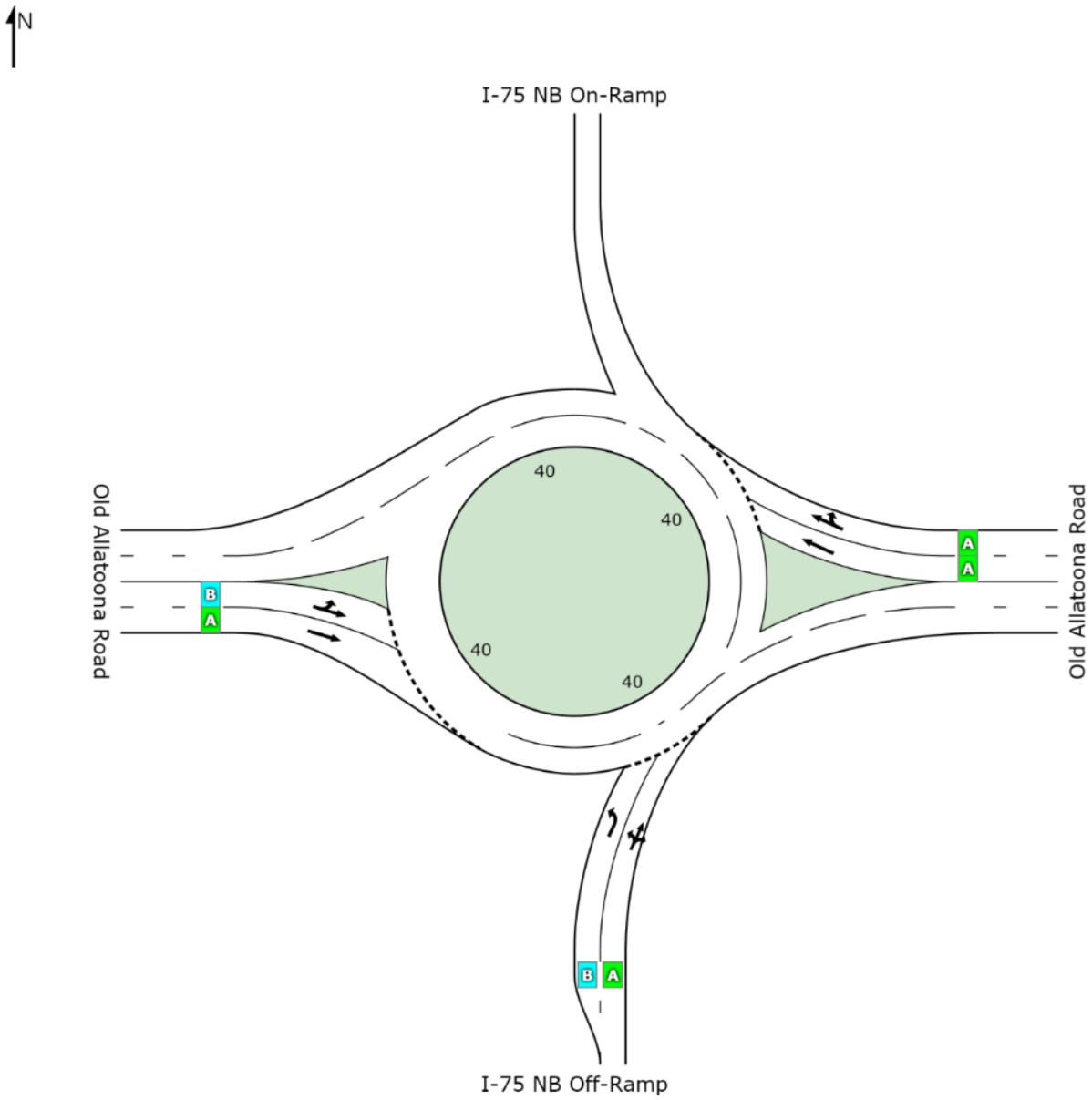
LEVEL OF SERVICE SUMMARY

Site: 2017 AM Peak - Base Config

I-75 Northbound Ramp & Old Allatoona Road 2017 AM Peak
Roundabout



	South	East	North	West	Intersection
LOS	B	A	NA	A	A

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.

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LANE SUMMARY

Site: 2017 AM Peak - Base Config

I-75 Northbound Ramp & Old Allatoona Road 2017 AM Peak
Roundabout

Lane Use and Performance

	Demand Flows L veh/h	T veh/h	R veh/h	Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Lane Length m	SL Type	Cap. Adj. %	Prob. Block. %
South: I-75 NB Off-Ramp																
Lane 1	279	0	0	279	7.0	979	0.285	100	13.2	LOS B	1.2	8.8	150	Turn Bay	0.0	0.0
Lane 2	145	1	141	287	7.0	1010	0.285	100	10.0	LOS A	1.2	8.8	500	–	0.0	0.0
Approach	424	1	141	566	7.0		0.285		11.6	LOS B	1.2	8.8				
East: Old Allatoona Road																
Lane 1	0	87	0	87	8.8	546	0.159	52[5]	7.9	LOS A	0.7	4.9	500	–	0.0	0.0
Lane 2	0	0	250	250	8.8	820	0.305	100	8.2	LOS A	1.5	11.2	500	–	0.0	0.0
Approach	0	87	250	337	8.8		0.305		8.1	LOS A	1.5	11.2				
West: Old Allatoona Road																
Lane 1	266	0	0	266	4.0	1811	0.147	100	11.3	LOS B	0.0	0.0	500	–	0.0	0.0
Lane 2	0	185	0	185	4.0	1524	0.121	82[5]	3.3	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	266	185	0	451	4.0		0.147		8.0	LOS A	0.0	0.0				
Intersection				1354	6.4		0.305		9.5	LOS A	1.5	11.2				

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

5 Lane underutilisation determined by program

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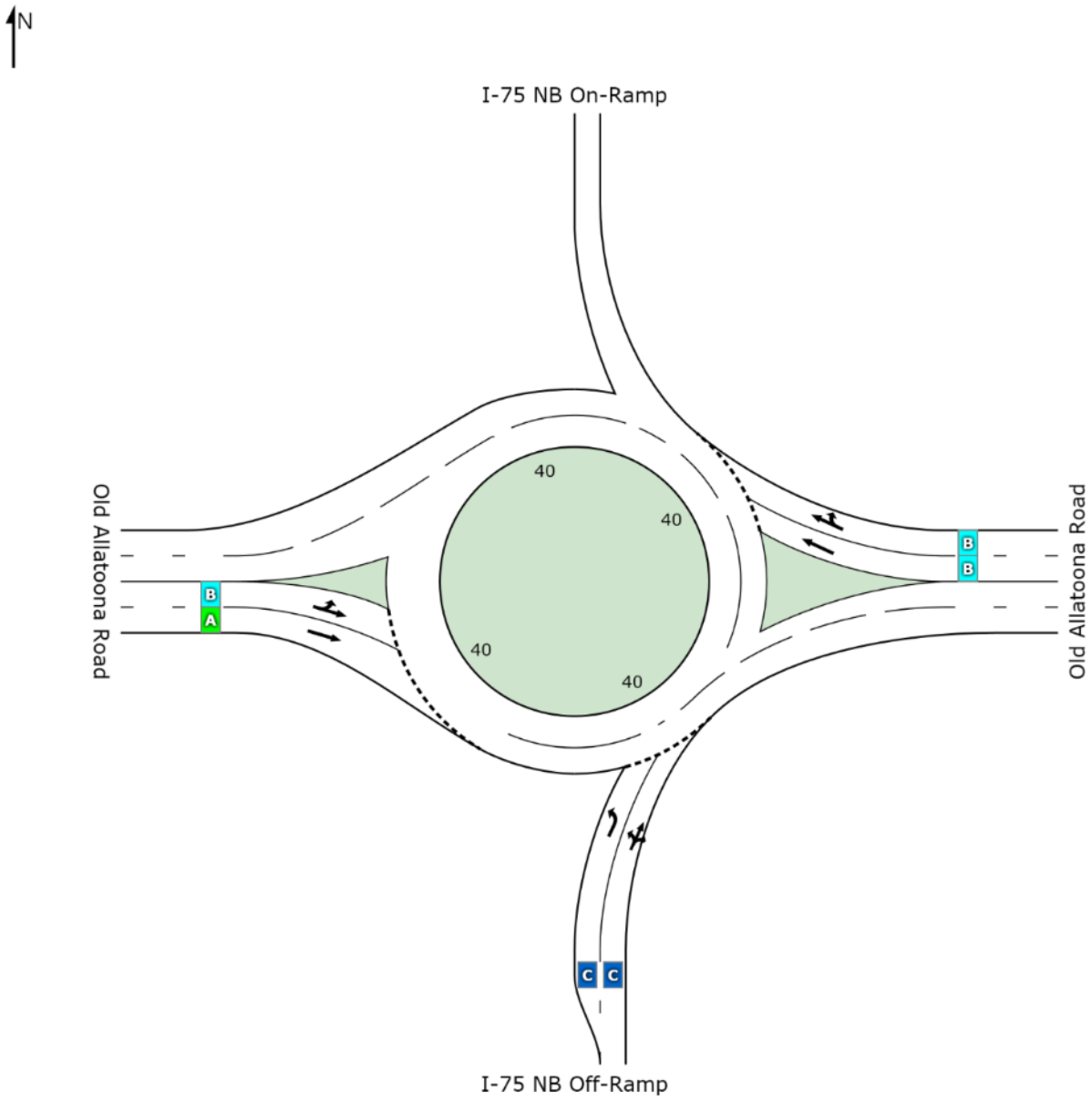
LEVEL OF SERVICE SUMMARY

Site: 2017 PM Peak - Base Config

I-75 Northbound Ramp & Old Allatoona Road 2017 PM Peak
Roundabout



	South	East	North	West	Intersection
LOS	C	B	NA	A	B

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.

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LANE SUMMARY

Site: 2017 PM Peak - Base Config

I-75 Northbound Ramp & Old Allatoona Road 2017 PM Peak
Roundabout

Lane Use and Performance

	Demand Flows L veh/h	T veh/h	R veh/h	Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Lane Length m	SL Type	Cap. Adj. %	Prob. Block. %
South: I-75 NB Off-Ramp																
Lane 1	623	0	0	623	7.0	908	0.686	100	16.8	LOS C	5.3	39.5	150	Turn Bay	0.0	0.0
Lane 2	535	1	120	655	7.0	955	0.686	100	15.3	LOS C	5.4	39.8	500	–	0.0	0.0
Approach	1158	1	120	1278	7.0		0.686		16.0	LOS C	5.4	39.8				
East: Old Allatoona Road																
Lane 1	0	141	0	141	9.0	377	0.375	87[5]	12.7	LOS B	1.9	14.5	500	–	0.0	0.0
Lane 2	0	0	207	207	9.0	477	0.433	100	13.3	LOS B	2.5	19.1	500	–	0.0	0.0
Approach	0	141	207	348	9.0		0.433		13.0	LOS B	2.5	19.1				
West: Old Allatoona Road																
Lane 1	332	0	0	332	4.0	1811	0.183	100	11.3	LOS B	0.0	0.0	500	–	0.0	0.0
Lane 2	0	261	0	261	4.0	1540	0.169	93[5]	3.3	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	332	261	0	592	4.0		0.183		7.8	LOS A	0.0	0.0				
Intersection				2218	6.5		0.686		13.4	LOS B	5.4	39.8				

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

5 Lane underutilisation determined by program

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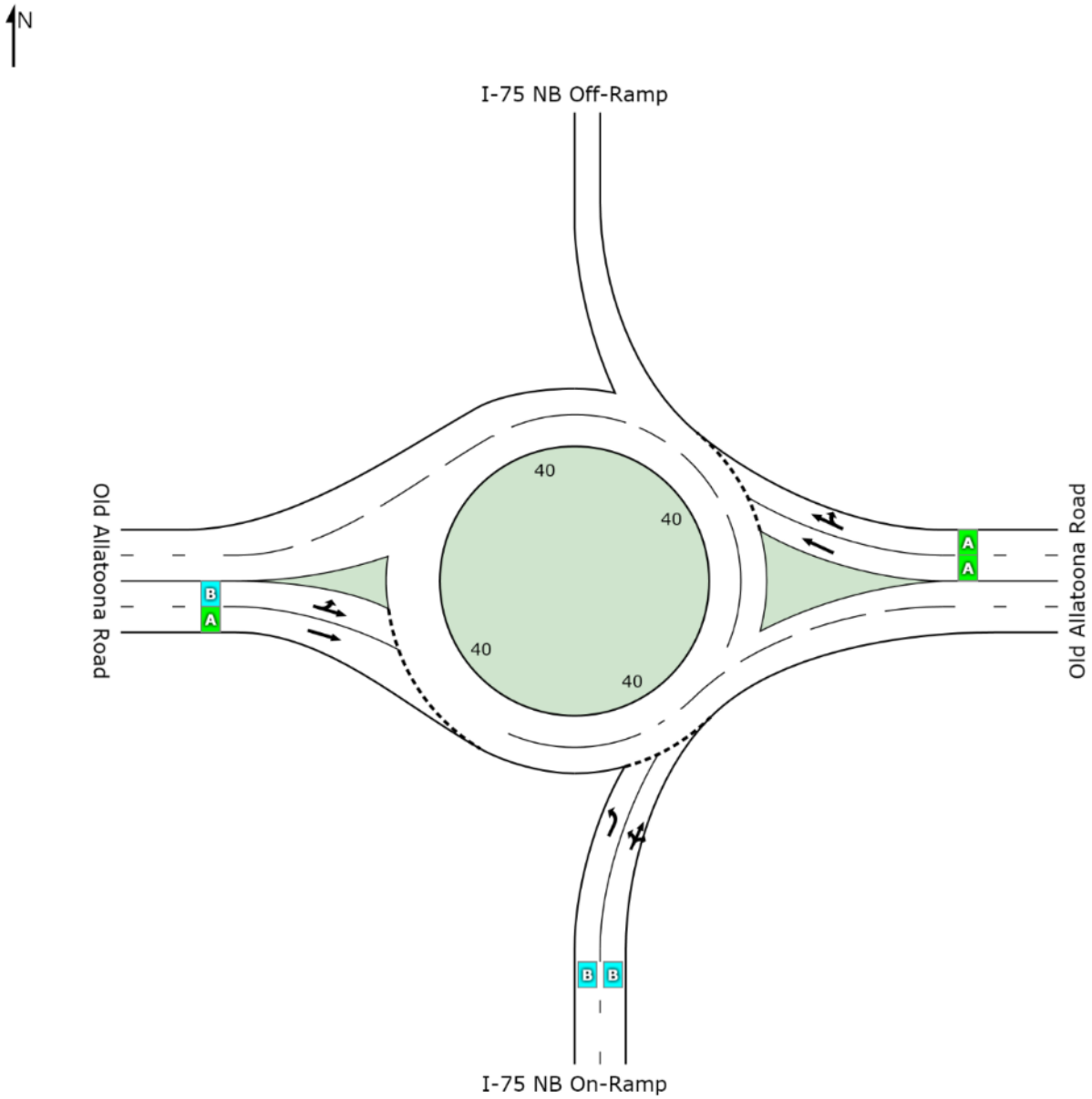
LEVEL OF SERVICE SUMMARY

Site: AM Peak - Sensitivity

I-75 Northbound Ramp & Old Allatoona Road Sensitivity AM Peak
Roundabout
Design Life Analysis (Capacity): Results for 9 years



	South	East	North	West	Intersection
LOS	B	A	NA	A	A

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.

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LANE SUMMARY

Site: 2017 AM Peak - Base Config

I-75 Southbound Ramp & Old Allatoona Road 2017 AM Peak
Roundabout

Lane Use and Performance

	Demand Flows L veh/h	T veh/h	R veh/h	Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Lane Length m	SL Type	Cap. Adj. %	Prob. Block. %
East: Old Allatoona Road																
Lane 1	120	116	0	236	7.3	1516	0.155	100	7.4	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	275	0	275	7.3	1771	0.155	100	3.4	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	120	391	0	511	7.3		0.155		5.3	LOS A	0.0	0.0				
North: I-75 SB Off-Ramp																
Lane 1	158	1	0	159	21.0	621	0.256	100	15.2	LOS C	1.0	8.1	500	–	0.0	0.0
Lane 2	0	0	348	348	21.0	873	0.398	100	7.2	LOS A	1.9	15.3	200	Turn Bay	0.0	0.0
Approach	158	1	348	507	21.0		0.398		9.7	LOS A	1.9	15.3				
West: Old Allatoona Road																
Lane 1	0	293	0	293	3.5	882	0.333	100	5.4	LOS A	1.7	12.5	500	–	0.0	0.0
Lane 2	0	0	1185	1185	3.5	1812	0.654	100	4.5	X	X	X	500	–	0.0	X
Approach	0	293	1185	1478	3.5		0.654		4.7	LOS A	1.7	12.5				
Intersection				2496	7.8		0.654		5.8	LOS A	1.9	15.3				

X: Not applicable for Continuous lane.

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

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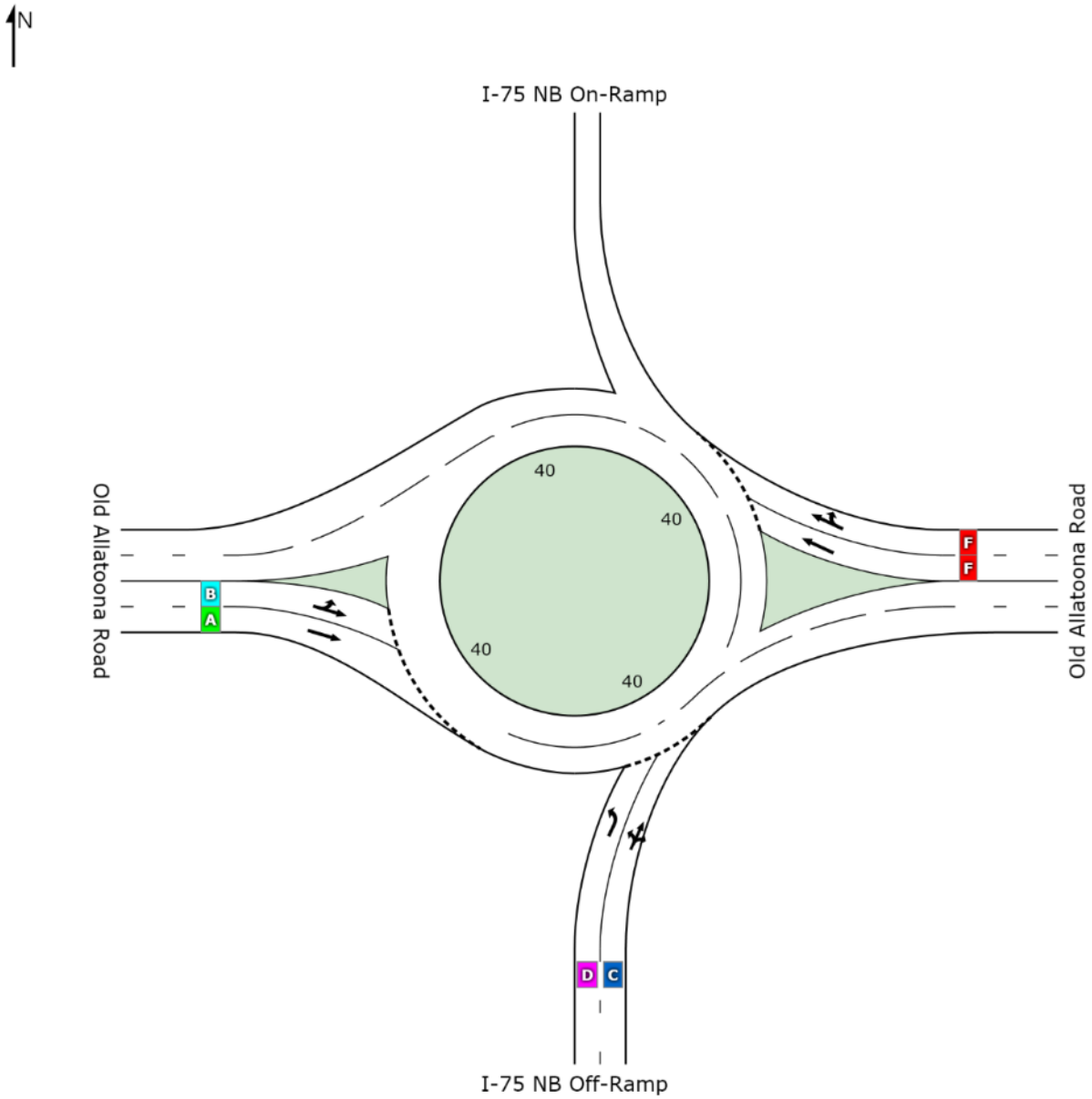
LEVEL OF SERVICE SUMMARY

Site: PM Peak - Sensitivity

I-75 Northbound Ramp & Old Allatoona Road Sensitivity PM Peak
Roundabout
Design Life Analysis (Capacity): Results for 9 years



	South	East	North	West	Intersection
LOS	C	F	NA	A	C

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.

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LANE SUMMARY

Site: 2017 PM Peak - Base Config

I-75 Southbound Ramp & Old Allatoona Road 2017 PM Peak
Roundabout

Lane Use and Performance

	Demand Flows L veh/h	T veh/h	R veh/h	Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Lane Length m	SL Type	Cap. Adj. %	Prob. Block. %
East: Old Allatoona Road																
Lane 1	152	447	0	599	7.3	1516	0.395	100	5.4	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	700	0	700	7.3	1771	0.395	100	3.4	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	152	1147	0	1299	7.3		0.395		4.3	LOS A	0.0	0.0				
North: I-75 SB Off-Ramp																
Lane 1	217	1	0	218	20.9	464	0.471	100	21.2	LOS C	2.2	17.9	500	–	0.0	0.0
Lane 2	0	0	402	402	21.0	641	0.627	100	13.8	LOS B	4.0	33.0	200	Turn Bay	0.0	0.0
Approach	217	1	402	621	21.0		0.627		16.4	LOS C	4.0	33.0				
West: Old Allatoona Road																
Lane 1	0	375	0	375	3.5	801	0.468	100	6.7	LOS A	2.9	21.2	500	–	0.0	0.0
Lane 2	0	0	522	522	3.5	1812	0.288	100	4.4	X	X	X	500	–	0.0	X
Approach	0	375	522	897	3.5		0.468		5.4	LOS A	2.9	21.2				
Intersection				2816	9.1		0.627		7.3	LOS A	4.0	33.0				

X: Not applicable for Continuous lane.

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

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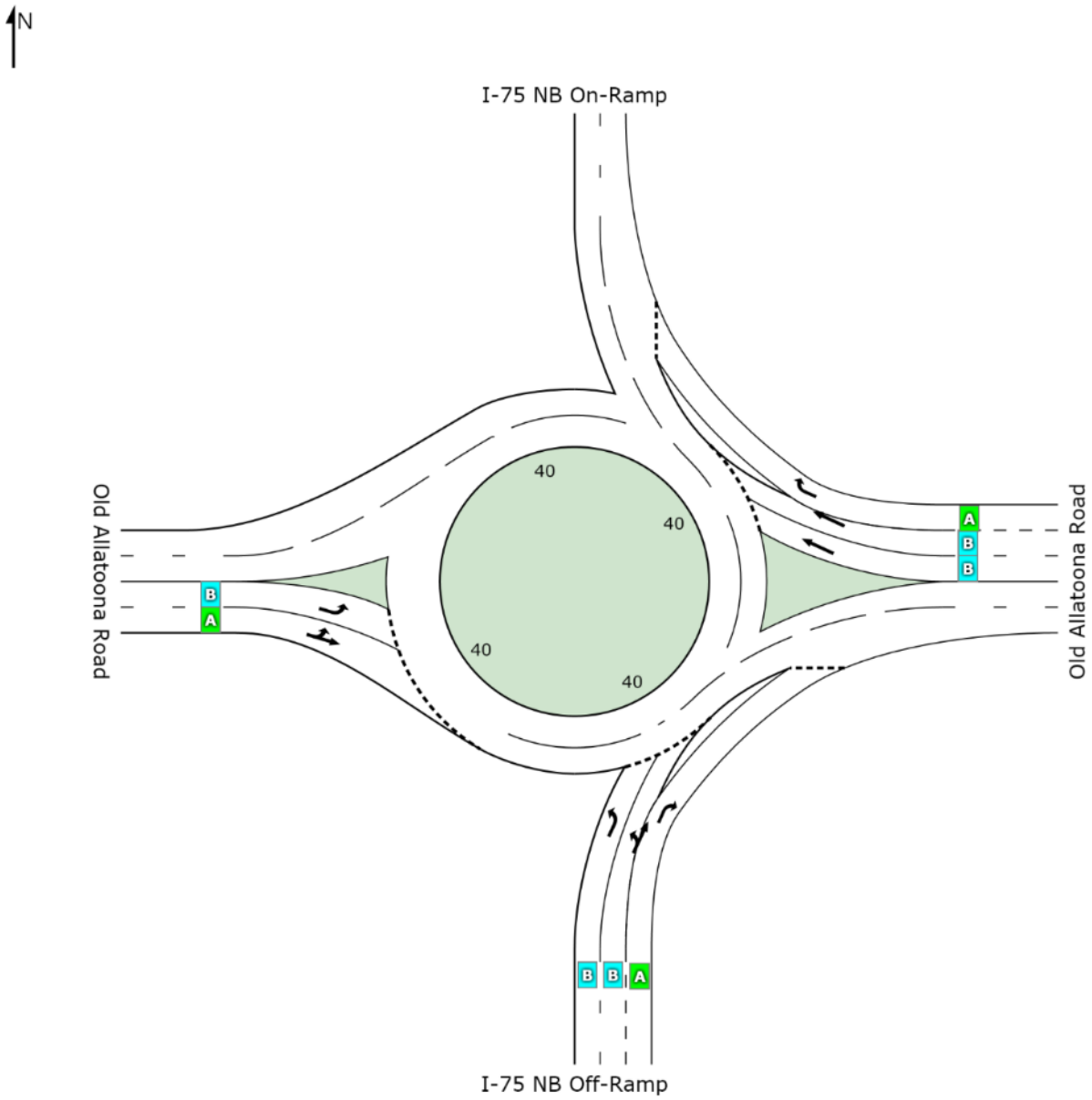
LEVEL OF SERVICE SUMMARY

Site: 2037 AM Peak - Test Config

I-75 Northbound Ramp & Old Allatoona Road 2037 AM Peak
Roundabout



	South	East	North	West	Intersection
LOS	B	A	NA	A	A

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.

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LANE SUMMARY

Site: 2037 AM Peak - Test Config

I-75 Northbound Ramp & Old Allatoona Road 2037 AM Peak
Roundabout

Lane Use and Performance

	Demand Flows L veh/h	T veh/h	R veh/h	Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Lane Length m	SL Type	Cap. Adj. %	Prob. Block. %
South: I-75 NB Off-Ramp																
Lane 1	387	0	0	387	7.0	962	0.403	100	14.2	LOS B	1.9	13.8	500	–	0.0	0.0
Lane 2	481	1	0	482	7.0	1197	0.403	100	13.4	LOS B	1.9	13.9	500	–	0.0	0.0
Lane 3	0	0	237	237	7.0	1268	0.187	100	6.1	LOS A	0.9	6.6	500	–	0.0	0.0
Approach	868	1	237	1106	7.0		0.403		12.1	LOS B	1.9	13.9				
East: Old Allatoona Road																
Lane 1	0	321	0	321	8.8	619	0.519	100	10.8	LOS B	3.3	25.0	500	–	0.0	0.0
Lane 2	0	321	0	321	8.8	619	0.519	100	10.8	LOS B	3.3	25.0	500	–	0.0	0.0
Lane 3	0	0	368	368	8.8	1288	0.286	100	6.0	LOS A	1.4	10.8	500	–	0.0	0.0
Approach	0	642	368	1011	8.8		0.519		9.0	LOS A	3.3	25.0				
West: Old Allatoona Road																
Lane 1	326	0	0	326	4.0	1545	0.211	96[5]	11.3	LOS B	0.0	0.0	500	–	0.0	0.0
Lane 2	0	400	0	400	4.0	1811	0.221	100	3.3	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	326	400	0	726	4.0		0.221		6.9	LOS A	0.0	0.0				
Intersection				2843	6.9		0.519		9.7	LOS A	3.3	25.0				

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

5 Lane underutilisation determined by program

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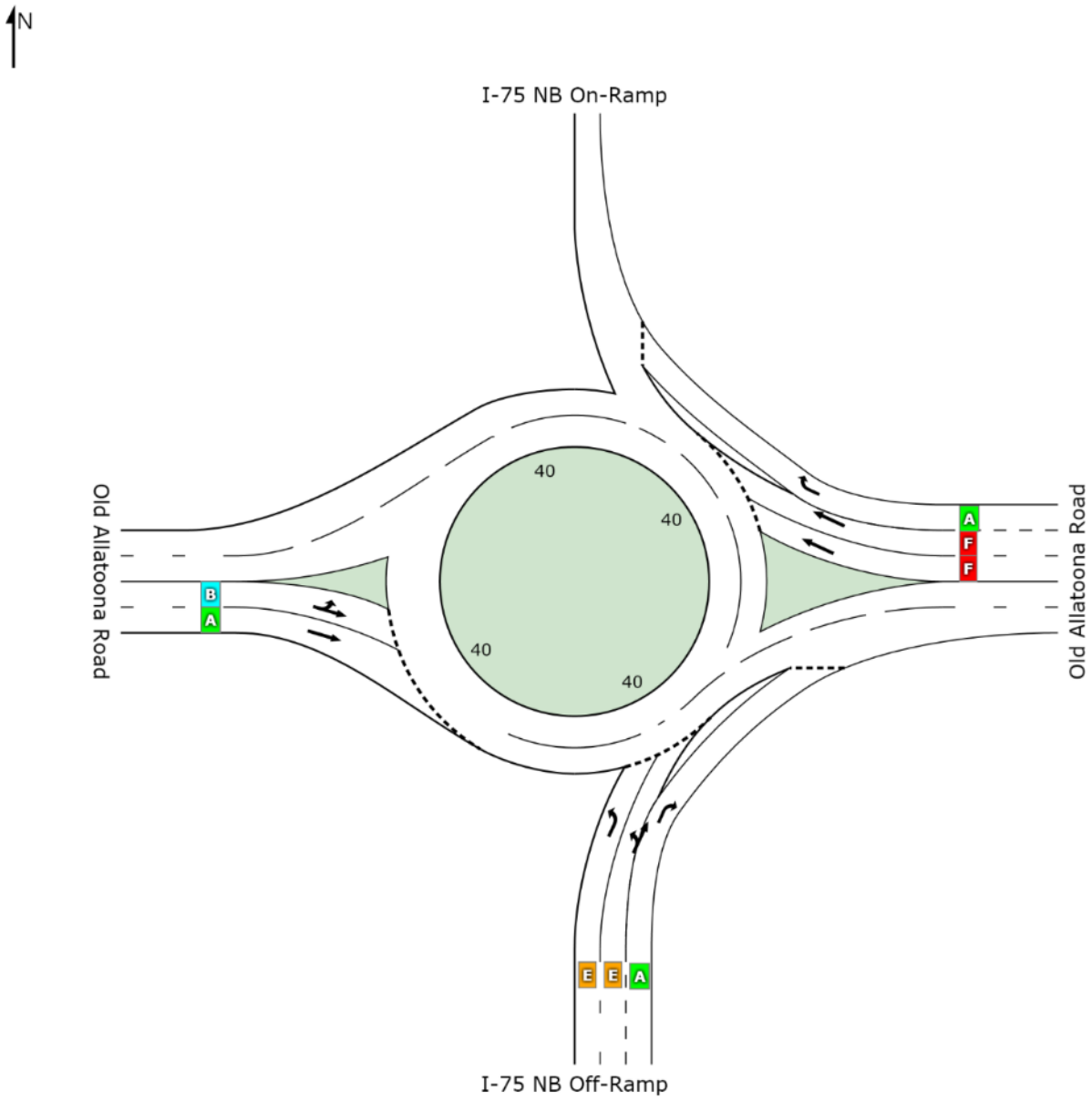
LEVEL OF SERVICE SUMMARY

Site: 2037 PM Peak - Test Config

I-75 Northbound Ramp & Old Allatoona Road 2037 PM Peak
Roundabout



	South	East	North	West	Intersection
LOS	D	F	NA	A	F

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.

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LANE SUMMARY

Site: 2037 PM Peak - Test Config

I-75 Northbound Ramp & Old Allatoona Road 2037 PM Peak
Roundabout

Lane Use and Performance

	Demand Flows L veh/h	T veh/h	R veh/h	Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Lane Length m	SL Type	Cap. Adj. %	Prob. Block. %
South: I-75 NB Off-Ramp																
Lane 1	623	0	0	623	7.0	653	0.953	100	41.8	LOS E	15.0	111.0	500	–	0.0	0.0
Lane 2	919	1	0	920	7.0	966	0.953	100	35.9	LOS E	18.9	140.3	500	–	0.0	0.0
Lane 3	0	0	211	211	7.0	921	0.229	100	9.8	LOS A	1.4	10.5	500	–	0.0	0.0
Approach	1542	1	211	1754	7.0		0.953		34.9	LOS D	18.9	140.3				
East: Old Allatoona Road																
Lane 1	0	432	0	432	9.0	150[2]	2.877	100	877.0	LOS F	95.2	717.6	500	–	0.0	16.9
Lane 2	0	432	0	432	9.0	150[2]	2.877	100	887.3	LOS F	96.7	729.1	500	–	0.0	17.5
Lane 3	0	0	347	347	9.0	975	0.356	100	9.2	LOS A	2.2	16.7	500	–	0.0	0.0
Approach	0	863	347	1211	9.0		2.877		631.7	LOS F	96.7	729.1				
West: Old Allatoona Road																
Lane 1	811	0	0	811	4.0	1554	0.522	100	11.3	LOS B	0.0	0.0	500	–	0.0	0.0
Lane 2	0	921	0	921	4.0	1811	0.508	97[5]	3.3	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	811	921	0	1732	4.0		0.522		7.1	LOS A	0.0	0.0				
Intersection				4696	6.4		2.877		178.5	LOS F	96.7	729.1				

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

2 Minimum Capacity
5 Lane underutilisation determined by program

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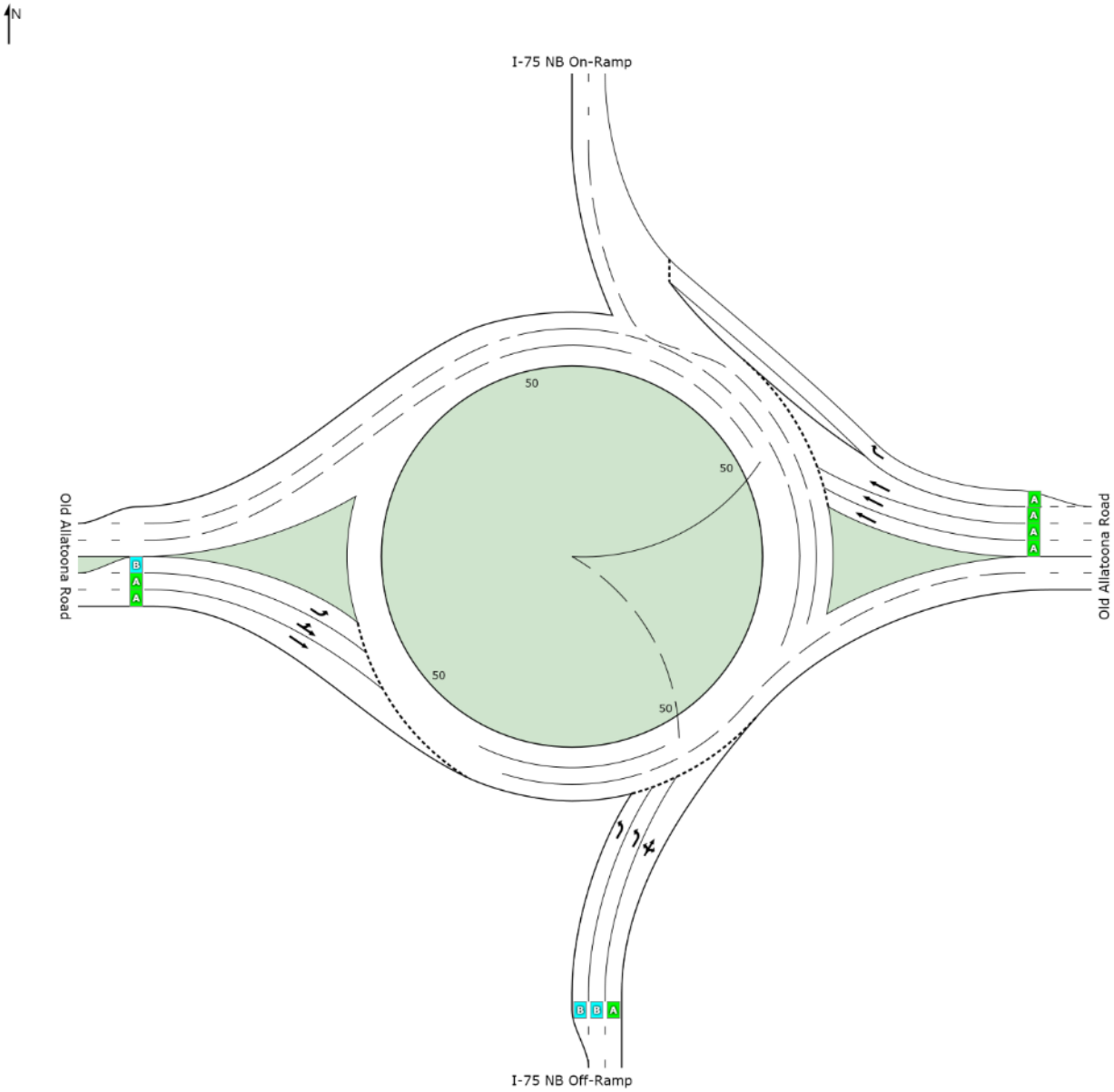
Attachment C Design Year Analysis (Year 2037) Worksheets

LEVEL OF SERVICE SUMMARY

Site: 2037 AM Peak - Ult Config

I-75 Northbound Ramp & Old Allatoona Road 2037 AM Peak
Roundabout



	South	East	North	West	Intersection
LOS	B	A	NA	A	A

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.

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LANE SUMMARY

Site: 2037 AM Peak - Ult Config

I-75 Northbound Ramp & Old Allatoona Road 2037 AM Peak
Roundabout

Lane Use and Performance

	Demand Flows L veh/h	T veh/h	R veh/h	Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Lane Length m	SL Type	Cap. Adj. %	Prob. Block. %
South: I-75 NB Off-Ramp																
Lane 1	349	0	0	349	7.0	1039	0.336	100	12.9	LOS B	1.1	8.0	150	Turn Bay	0.0	0.0
Lane 2	408	0	0	408	7.0	1214	0.336	100	12.6	LOS B	1.1	8.1	500	–	0.0	0.0
Lane 3	111	1	237	349	7.0	1039	0.336	100	8.1	LOS A	1.1	8.0	500	–	0.0	0.0
Approach	868	1	237	1106	7.0		0.336		11.3	LOS B	1.1	8.1				
East: Old Allatoona Road																
Lane 1	0	214	0	214	8.8	737	0.290	100	5.9	LOS A	1.1	8.2	500	–	0.0	0.0
Lane 2	0	214	0	214	8.8	737	0.290	100	5.9	LOS A	1.1	8.2	500	–	0.0	0.0
Lane 3	0	214	0	214	8.8	737	0.290	100	5.9	LOS A	1.1	8.2	500	–	0.0	0.0
Lane 4	0	0	368	368	8.8	1272	0.290	100	4.8	LOS A	1.0	7.7	150	Turn Bay	0.0	0.0
Approach	0	642	368	1011	8.8		0.290		5.5	LOS A	1.1	8.2				
West: Old Allatoona Road																
Lane 1	228	0	0	228	4.0	1566	0.146	100	11.2	LOS B	0.0	0.0	150	Turn Bay	0.0	0.0
Lane 2	98	172	0	270	4.0	1850	0.146	100	5.8	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 3	0	228	0	228	4.0	1566	0.146	100	2.7	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	326	400	0	726	4.0		0.146		6.5	LOS A	0.0	0.0				
Intersection				2843	6.9		0.336		8.0	LOS A	1.1	8.2				

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

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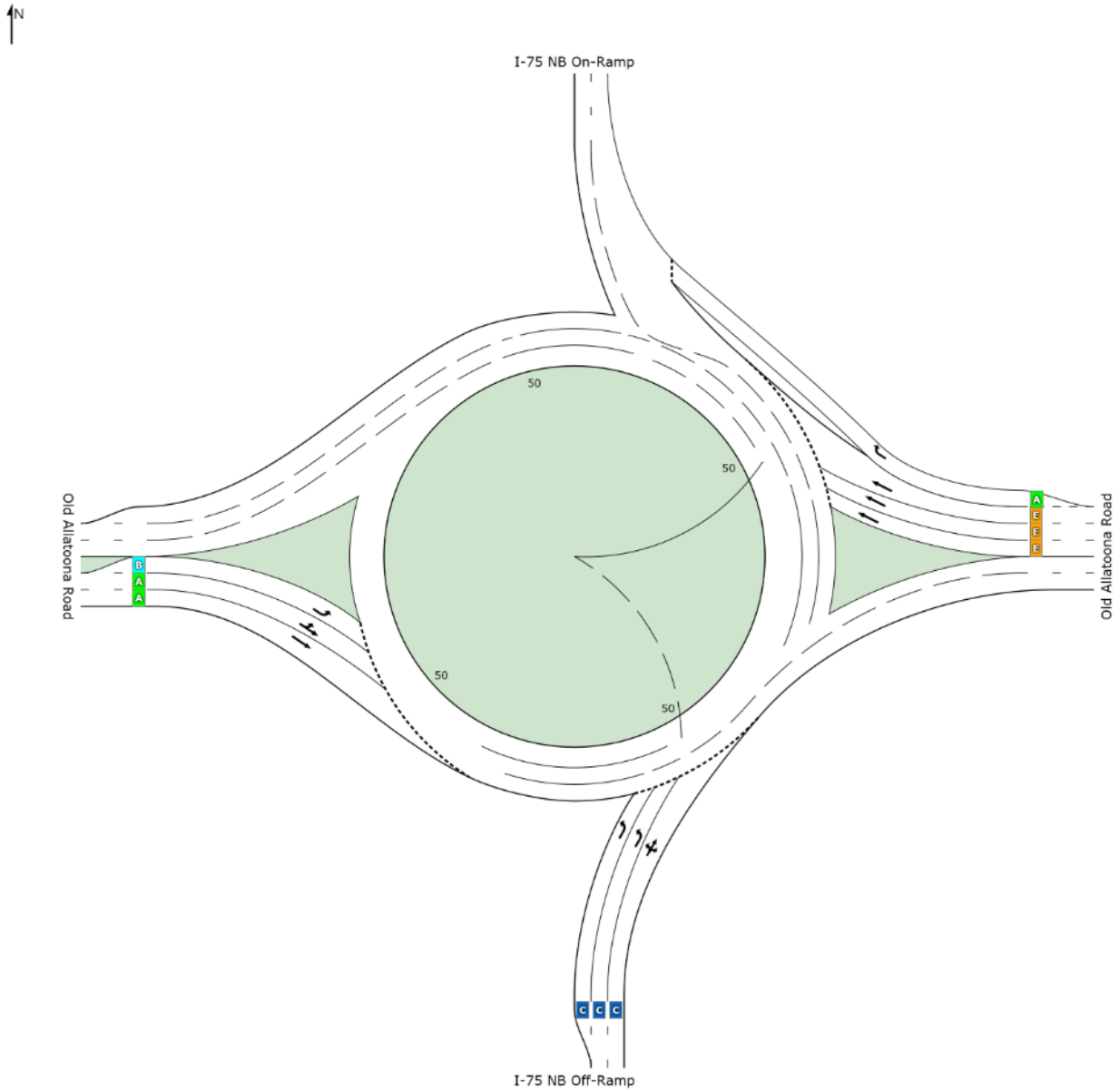
LEVEL OF SERVICE SUMMARY

Site: 2037 PM Peak - Ult Config

I-75 Northbound Ramp & Old Allatoona Road 2037 PM Peak
Roundabout



	South	East	North	West	Intersection
LOS	C	D	NA	A	C

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.

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LANE SUMMARY

Site: 2037 PM Peak - Ult Config

I-75 Northbound Ramp & Old Allatoona Road 2037 PM Peak
Roundabout

Lane Use and Performance

	Demand Flows L veh/h	T veh/h	R veh/h	Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Lane Length m	SL Type	Cap. Adj. %	Prob. Block. %
South: I-75 NB Off-Ramp																
Lane 1	520	0	0	520	7.0	776	0.671	100	18.1	LOS C	3.7	27.4	150	Turn Bay	0.0	0.0
Lane 2	713	0	0	713	7.0	1063	0.671	100	16.4	LOS C	4.1	30.3	500	–	0.0	0.0
Lane 3	309	1	211	520	7.0	776	0.671	100	15.3	LOS C	3.7	27.4	500	–	0.0	0.0
Approach	1542	1	211	1754	7.0		0.671		16.6	LOS C	4.1	30.3				
East: Old Allatoona Road																
Lane 1	0	288	0	288	9.0	335	0.860	100	36.3	LOS E	7.2	54.6	500	–	0.0	0.0
Lane 2	0	288	0	288	9.0	335	0.860	100	36.3	LOS E	7.2	54.6	500	–	0.0	0.0
Lane 3	0	288	0	288	9.0	335	0.860	100	36.3	LOS E	7.2	54.6	500	–	0.0	0.0
Lane 4	0	0	347	347	9.0	1125	0.309	100	5.8	LOS A	1.1	8.6	150	Turn Bay	0.0	0.0
Approach	0	863	347	1211	9.0		0.860		27.5	LOS D	7.2	54.6				
West: Old Allatoona Road																
Lane 1	544	0	0	544	4.0	1566	0.348	100	11.2	LOS B	0.0	0.0	150	Turn Bay	0.0	0.0
Lane 2	266	377	0	643	4.0	1850	0.348	100	6.2	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 3	0	544	0	544	4.0	1566	0.348	100	2.7	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	811	921	0	1732	4.0		0.348		6.7	LOS A	0.0	0.0				
Intersection				4696	6.4		0.860		15.7	LOS C	7.2	54.6				

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

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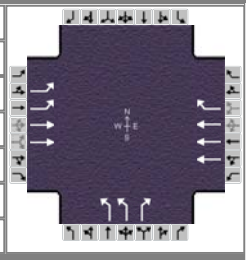
HCS 2010 Signalized Intersection Results Summary

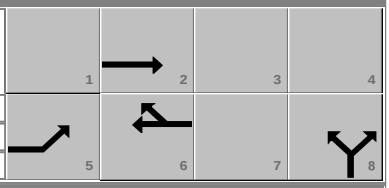
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	Sep 27, 2012	Area Type	Other
Jurisdiction		Time Period		PHF	0.95
Intersection	I-75NB Interchange	Analysis Year	2012	Analysis Period	1> 7:00
File Name	2037AM_Peak_Northbound.xus				
Project Description	2037 AM Peak Analysis				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	310	380			610	350	825		0			

Signal Information			
Cycle, s	79.5	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	10.2	30.0	24.3	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6		8		
Case Number	2.0	4.0		7.3		9.0		
Phase Duration, s	15.2	50.2		35.0		29.3		
Change Period, *(Y+Rc)*, s	5.0	5.0		5.0		5.0		
Max Allow Headway *(MAH)*, s	3.1	3.1		3.1		3.1		
Queue Clearance Time *(g_s)*, s	9.4	6.5		9.8		21.9		
Green Extension Time *(g_e)*, s	0.8	3.1		3.1		2.4		
Phase Call Probability	1.00	1.00		1.00		1.00		
Max Out Probability	0.00	0.00		0.00		0.00		

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16	3		18			
Adjusted Flow Rate *(v)*, veh/h	326	400			642	184	868		0			
Adjusted Saturation Flow Rate *(s)*, veh/h/ln	1689	1739			1568	1464	1642		1505			
Queue Service Time *(g_s)*, s	7.4	4.5			7.8	7.1	19.9		0.0			
Cycle Queue Clearance Time *(g_c)*, s	7.4	4.5			7.8	7.1	19.9		0.0			
Capacity *(c)*, veh/h	436	1977			1773	552	1005		460			
Volume-to-Capacity Ratio *(X)*	0.749	0.202			0.362	0.334	0.864		0.000			
Available Capacity *(c_a)*, veh/h	4243	4368			5909	1838	4124		1890			
Back of Queue *(Q)*, veh/ln (50th percentile)	3.0	1.5			2.7	2.3	7.4		0.0			
Overflow Queue *(Q_3)*, veh/ln	0.0	0.0			0.0	0.0	0.0		0.0			
Queue Storage Ratio *(RQ)* (50th percentile)	0.38	0.00			0.00	0.00	0.39		0.00			
Uniform Delay *(d_1)*, s/veh	33.4	8.4			17.9	17.7	26.1		0.0			
Incremental Delay *(d_2)*, s/veh	1.0	0.0			0.0	0.1	0.9		0.0			
Initial Queue Delay *(d_3)*, s/veh	0.0	0.0			0.0	0.0	0.0		0.0			
Control Delay *(d)*, s/veh	34.4	8.4			18.0	17.8	27.0		0.0			
Level of Service (LOS)	C	A			B	B	C					
Approach Delay, s/veh / LOS	20.1	C		17.9	B		27.0	C		0.0		
Intersection Delay, s/veh / LOS	21.8						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.9	A	2.4	B	3.2	C	3.3	C
Bicycle LOS Score / LOS	1.1	A	0.9	A		F		

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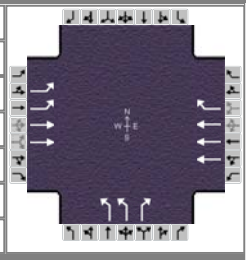
HCS 2010 Signalized Intersection Results Summary

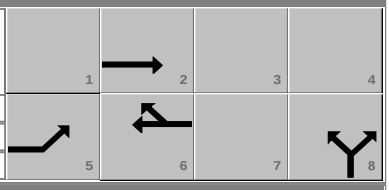
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	9/26/2012	Area Type	Other
Jurisdiction		Time Period		PHF	0.95
Intersection	I-75NB Interchange	Analysis Year	2012	Analysis Period	1> 7:00
File Name	2037PM_Peak_Northbound.xus				
Project Description	2037 PM Peak Analysis				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	770	875			820	330	1465		200			

Signal Information			
Cycle, s	212.4	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	54.1	43.3	100.0	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6		8		
Case Number	2.0	4.0		7.3		9.0		
Phase Duration, s	59.1	107.4		48.3		105.0		
Change Period, *(Y+Rc)*, s	5.0	5.0		5.0		5.0		
Max Allow Headway *(MAH)*, s	3.1	3.1		3.1		3.1		
Queue Clearance Time *(g_s)*, s	52.0	41.6		39.6		101.6		
Green Extension Time *(g_e)*, s	2.2	5.9		3.2		0.0		
Phase Call Probability	1.00	1.00		1.00		1.00		
Max Out Probability	0.00	0.00		0.00		1.00		

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16	3		18			
Adjusted Flow Rate *(v)*, veh/h	811	921			863	174	1542		211			
Adjusted Saturation Flow Rate *(s)*, veh/h/ln	1689	1739			1583	1477	1642		1505			
Queue Service Time *(g_s)*, s	50.0	39.6			37.6	22.5	99.6		18.3			
Cycle Queue Clearance Time *(g_c)*, s	50.0	39.6			37.6	22.5	99.6		18.3			
Capacity *(c)*, veh/h	861	1678			968	301	1546		708			
Volume-to-Capacity Ratio *(X)*	0.941	0.549			0.892	0.577	0.998		0.297			
Available Capacity *(c_a)*, veh/h	1590	1678			2235	695	1546		708			
Back of Queue *(Q)*, veh/ln (50th percentile)	22.1	17.3			15.5	8.7	45.7		6.9			
Overflow Queue *(Q_3)*, veh/ln	0.0	0.0			0.0	0.0	0.0		0.0			
Queue Storage Ratio *(RQ)* (50th percentile)	2.86	0.00			0.00	0.00	2.41		0.00			
Uniform Delay *(d_1)*, s/veh	77.6	38.7			82.3	76.3	56.1		34.6			
Incremental Delay *(d_2)*, s/veh	2.9	0.2			1.2	0.7	22.3		0.1			
Initial Queue Delay *(d_3)*, s/veh	0.0	0.0			0.0	0.0	0.0		0.0			
Control Delay *(d)*, s/veh	80.5	39.0			83.5	77.0	78.4		34.7			
Level of Service (LOS)	F	D			F	E	E		C			
Approach Delay, s/veh / LOS	58.4	E		82.4	F		73.2	E		0.0		
Intersection Delay, s/veh / LOS	69.6						E					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.9	A	2.5	B	3.2	C	3.3	C
Bicycle LOS Score / LOS	1.9	A	1.1	A		F		

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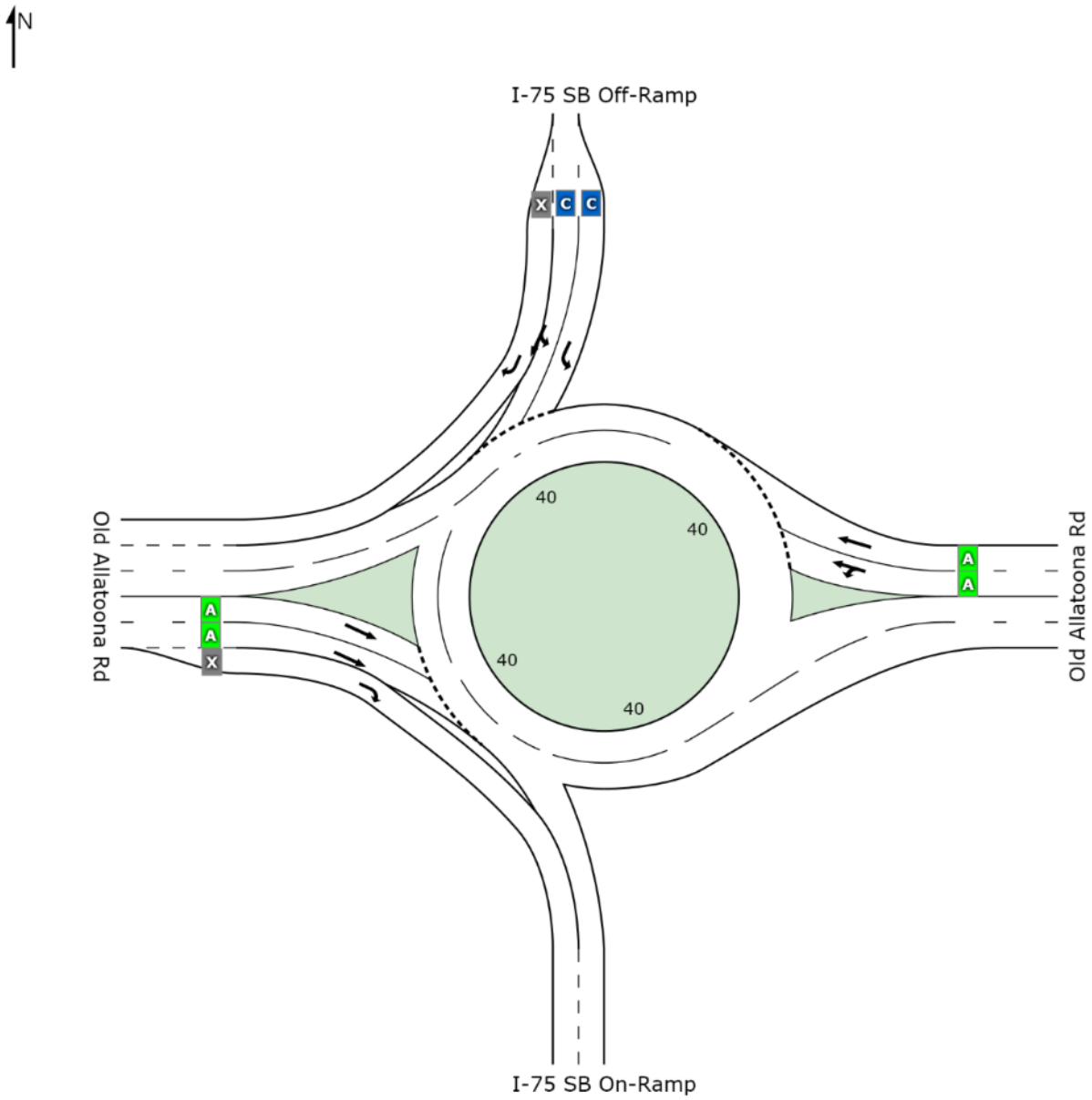
LEVEL OF SERVICE SUMMARY

Site: 2037 AM Peak - Ult Config

I-75 Southbound Ramp & Old Allatoona Road 2037 AM Peak
Roundabout



	South	East	North	West	Intersection
LOS	NA	A	A	A	A

X: Not applicable for Continuous lane.

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.

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LANE SUMMARY

Site: 2037 AM Peak - Ult Config

I-75 Southbound Ramp & Old Allatoona Road 2037 AM Peak
Roundabout

Lane Use and Performance

	Demand Flows L veh/h	T veh/h	R veh/h	Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Lane Length m	SL Type	Cap. Adj. %	Prob. Block. %
East: Old Allatoona Rd																
Lane 1	200	497	0	697	8.1	1504	0.463	100	5.7	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	814	0	814	8.1	1757	0.463	100	3.4	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	200	1311	0	1511	8.1		0.463		4.5	LOS A	0.0	0.0				
North: I-75 SB Off-Ramp																
Lane 1	94	0	0	94	21.0	460	0.204	100	19.1	LOS C	0.7	6.1	200	Turn Bay	0.0	0.0
Lane 2	117	1	0	118	21.0	578	0.204	100	17.5	LOS C	0.8	6.4	500	–	0.0	0.0
Lane 3	0	0	474	474	21.0	1615	0.293	100	5.1	X	X	X	200	Turn Bay	0.0	X
Approach	211	1	474	685	21.0		0.293		9.1	LOS A	0.8	6.4				
West: Old Allatoona Rd																
Lane 1	0	254	0	254	3.5	955	0.266	100	5.3	LOS A	1.3	9.2	500	–	0.0	0.0
Lane 2	0	262	0	262	3.5	984	0.266	100	5.2	LOS A	1.3	9.3	500	–	0.0	0.0
Lane 3	0	0	1358	1358	3.5	1812	0.749	100	4.8	X	X	X	200	Turn Bay	0.0	X
Approach	0	516	1358	1874	3.5		0.749		4.9	LOS A	1.3	9.3				
Intersection				4069	8.2		0.749		5.5	LOS A	1.3	9.3				

X: Not applicable for Continuous lane.

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

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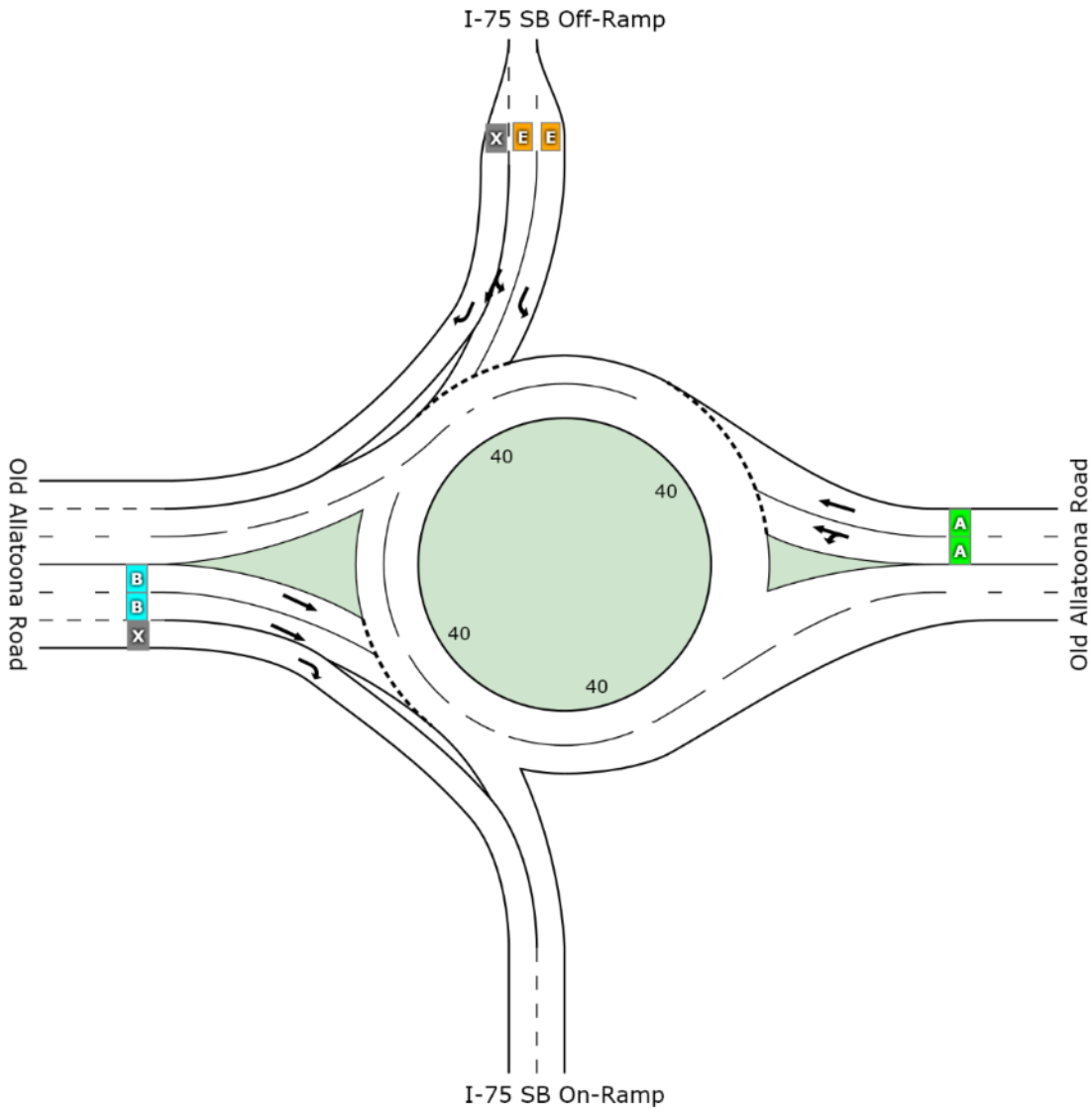
LEVEL OF SERVICE SUMMARY

Site: 2037 PM Peak - Ult Config

I-75 Southbound Ramp & Old Allatoona Road
Roundabout



	South	East	North	West	Intersection
LOS	NA	A	B	A	A

X: Not applicable for Continuous lane.

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.

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LANE SUMMARY

Site: 2037 PM Peak - Ult Config

I-75 Southbound Ramp & Old Allatoona Road
Roundabout

Lane Use and Performance

	Demand Flows L veh/h	T veh/h	R veh/h	Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Lane Length m	SL Type	Cap. Adj. %	Prob. Block. %
East: Old Allatoona Road																
Lane 1	258	851	0	1109	8.1	1504	0.737	100	5.3	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	1296	0	1296	8.1	1757	0.737	100	3.4	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	258	2147	0	2405	8.1		0.737		4.3	LOS A	0.0	0.0				
North: I-75 SB Off-Ramp																
Lane 1	127	0	0	127	21.0	232	0.547	100	43.9	LOS E	2.8	23.5	200	Turn Bay	0.0	0.0
Lane 2	189	1	0	190	21.0	347	0.547	100	35.7	LOS E	3.3	27.5	500	–	0.0	0.0
Lane 3	0	0	947	947	21.0	1615	0.587	100	5.1	X	X	X	200	Turn Bay	0.0	X
Approach	316	1	947	1264	21.0		0.587		13.6	LOS B	3.3	27.5				
West: Old Allatoona Road																
Lane 1	0	668	0	668	3.5	814	0.821	100	13.1	LOS B	9.9	71.2	500	–	0.0	0.0
Lane 2	0	706	0	706	3.5	860	0.821	100	12.6	LOS B	10.1	72.6	500	–	0.0	0.0
Lane 3	0	0	1242	1242	3.5	1812	0.686	100	4.8	X	X	X	500	–	0.0	X
Approach	0	1374	1242	2616	3.5		0.821		9.0	LOS A	10.1	72.6				
Intersection				6285	8.8		0.821		8.1	LOS A	10.1	72.6				

X: Not applicable for Continuous lane.

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

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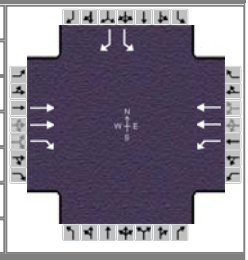
HCS 2010 Signalized Intersection Results Summary

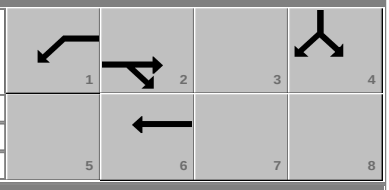
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	Sep 27, 2012	Area Type	Other
Jurisdiction		Time Period		PHF	0.95
Intersection	I-75SB Interchange	Analysis Year	2012	Analysis Period	1> 7:00
File Name	2037AM_Peak_Southbound.xus				
Project Description	2037 AM Peak				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h		490	0	190	1245					200		0

Signal Information			
Cycle, s	66.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	9.8	30.0	11.2	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2	1	6				4
Case Number		7.3	2.0	4.0				9.0
Phase Duration, s		35.0	14.8	49.8				16.2
Change Period, $(Y+R_c)$, s		5.0	5.0	5.0				5.0
Max Allow Headway *(MAH)*, s		3.0	3.1	3.0				3.1
Queue Clearance Time (g_s), s		8.3	9.6	15.7				11.0
Green Extension Time (g_e), s		5.6	0.4	5.6				0.4
Phase Call Probability		1.00	0.97	1.00				0.98
Max Out Probability		0.00	0.00	0.00				0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement		2	12	1	6					7		14
Adjusted Flow Rate *(v)*, veh/h		516	0	200	1311					211		0
Adjusted Saturation Flow Rate *(s)*, veh/h/ln		1739	1548	1675	1675					1495		1331
Queue Service Time (g_s), s		6.3	0.0	7.6	13.7					9.0		0.0
Cycle Queue Clearance Time (g_c), s		6.3	0.0	7.6	13.7					9.0		0.0
Capacity *(c)*, veh/h		1580	703	249	2273					254		226
Volume-to-Capacity Ratio *(X)*		0.326	0.000	0.802	0.577					0.828		0.000
Available Capacity (c_a), veh/h		5264	2343	2536	5069					2263		2014
Back of Queue *(Q)*, veh/ln (50th percentile)		2.1	0.0	3.0	3.0					3.2		0.0
Overflow Queue (Q_3), veh/ln		0.0	0.0	0.0	0.0					0.0		0.0
Queue Storage Ratio *(RQ)* (50th percentile)		0.00	0.00	0.53	0.00					0.00		0.00
Uniform Delay (d_1), s/veh		11.6	0.0	27.2	5.6					26.5		0.0
Incremental Delay (d_2), s/veh		0.0	0.0	2.3	0.1					2.6		0.0
Initial Queue Delay (d_3), s/veh		0.0	0.0	0.0	0.0					0.0		0.0
Control Delay *(d)*, s/veh		11.6	0.0	29.5	5.7					29.1		0.0
Level of Service (LOS)		B		C	A					C		
Approach Delay, s/veh / LOS	11.6	B		8.8	A		0.0			29.1	C	
Intersection Delay, s/veh / LOS	11.4						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.9	A	1.6	A	2.9	C	2.9	C
Bicycle LOS Score / LOS	0.9	A	1.7	A				F

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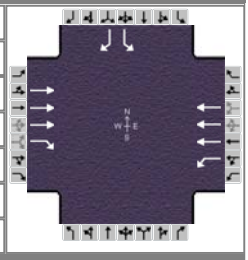
HCS 2010 Signalized Intersection Results Summary

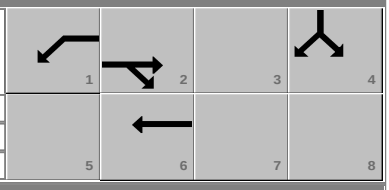
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	Sep 27, 2012	Area Type	Other
Jurisdiction		Time Period		PHF	0.95
Intersection	I-75SB Interchange	Analysis Year	2012	Analysis Period	1> 7:00
File Name	2037PM_Peak_Southbound.xus				
Project Description	2037 PM Peak				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h		1305	0	245	2040					300		0

Signal Information			
Cycle, s	101.7	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	18.1	44.6	24.0	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2	1	6				4
Case Number		7.3	2.0	4.0				9.0
Phase Duration, s		49.6	23.1	72.7				29.0
Change Period, *(Y+Rc)*, s		5.0	5.0	5.0				5.0
Max Allow Headway *(MAH)*, s		3.0	3.1	3.0				3.1
Queue Clearance Time *(g_s)*, s		24.0	17.4	29.9				23.0
Green Extension Time *(g_e)*, s		20.1	0.5	19.9				0.6
Phase Call Probability		1.00	1.00	1.00				1.00
Max Out Probability		0.03	0.00	0.05				0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement		2	12	1	6					7		14
Adjusted Flow Rate *(v)*, veh/h		1374	0	258	2147					316		0
Adjusted Saturation Flow Rate *(s)*, veh/h/ln		1659	1548	1675	1597					1495		1331
Queue Service Time *(g_s)*, s		22.0	0.0	15.4	27.9					21.0		0.0
Cycle Queue Clearance Time *(g_c)*, s		22.0	0.0	15.4	27.9					21.0		0.0
Capacity *(c)*, veh/h		2181	679	300	3191					354		315
Volume-to-Capacity Ratio *(X)*		0.630	0.000	0.860	0.673					0.892		0.000
Available Capacity *(c_a)*, veh/h		4840	1506	1629	4661					1454		1294
Back of Queue *(Q)*, veh/ln (50th percentile)		8.2	0.0	6.4	8.4					7.8		0.0
Overflow Queue *(Q_3)*, veh/ln		0.0	0.0	0.0	0.0					0.0		0.0
Queue Storage Ratio *(RQ)* (50th percentile)		0.00	0.00	0.00	0.00					0.00		0.00
Uniform Delay *(d_1)*, s/veh		22.4	0.0	41.0	10.4					38.0		0.0
Incremental Delay *(d_2)*, s/veh		0.1	0.0	2.8	0.1					3.2		0.0
Initial Queue Delay *(d_3)*, s/veh		0.0	0.0	0.0	0.0					0.0		0.0
Control Delay *(d)*, s/veh		22.5	0.0	43.8	10.5					41.1		0.0
Level of Service (LOS)		C		D	B					D		
Approach Delay, s/veh / LOS	22.5	C		14.1	B		0.0			41.1	D	
Intersection Delay, s/veh / LOS	19.0						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.9	A	1.6	A	3.3	C	3.3	C
Bicycle LOS Score / LOS	1.2	A	1.8	A				F

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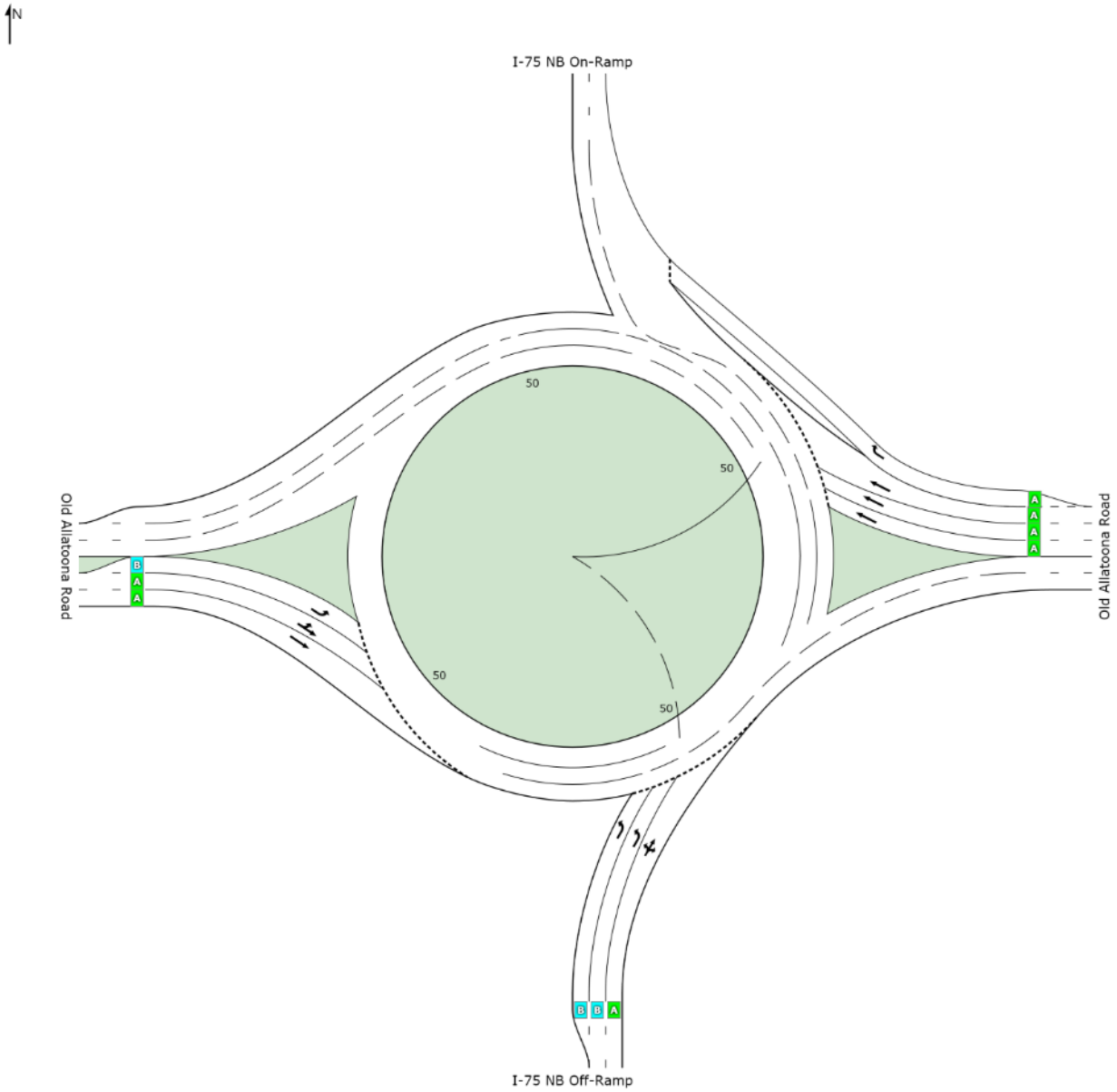
Attachment D Opening Year Analysis (Year 2017) Worksheets

LEVEL OF SERVICE SUMMARY

Site: 2017 AM Peak - Ult Config

I-75 Northbound Ramp & Old Allatoona Road 2017 AM Peak
Roundabout



	South	East	North	West	Intersection
LOS	B	A	NA	A	A

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.

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LANE SUMMARY

Site: 2017 AM Peak - Ult Config

I-75 Northbound Ramp & Old Allatoona Road 2017 AM Peak
Roundabout

Lane Use and Performance

	Demand Flows L veh/h	T veh/h	R veh/h	Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Lane Length m	SL Type	Cap. Adj. %	Prob. Block. %
South: I-75 NB Off-Ramp																
Lane 1	181	0	0	181	7.0	1133	0.160	100	12.2	LOS B	0.5	3.4	150	Turn Bay	0.0	0.0
Lane 2	203	0	0	203	7.0	1269	0.160	100	12.0	LOS B	0.5	3.4	500	–	0.0	0.0
Lane 3	39	1	141	182	7.0	1133	0.160	100	6.7	LOS A	0.5	3.4	500	–	0.0	0.0
Approach	424	1	141	566	7.0		0.160		10.4	LOS B	0.5	3.4				
East: Old Allatoona Road																
Lane 1	0	29	0	29	8.8	713	0.041	100	4.9	LOS A	0.1	0.9	500	–	0.0	0.0
Lane 2	0	29	0	29	8.8	713	0.041	100	4.9	LOS A	0.1	0.9	500	–	0.0	0.0
Lane 3	0	29	0	29	8.8	713	0.041	100	4.9	LOS A	0.1	0.9	500	–	0.0	0.0
Lane 4	0	0	250	250	8.8	1299	0.192	100	4.6	LOS A	0.6	4.5	150	Turn Bay	0.0	0.0
Approach	0	87	250	337	8.8		0.192		4.7	LOS A	0.6	4.5				
West: Old Allatoona Road																
Lane 1	142	0	0	142	4.0	1566	0.091	100	11.2	LOS B	0.0	0.0	150	Turn Bay	0.0	0.0
Lane 2	125	43	0	167	4.0	1850	0.091	100	9.0	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 3	0	142	0	142	4.0	1566	0.091	100	2.7	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	266	185	0	451	4.0		0.091		7.7	LOS A	0.0	0.0				
Intersection				1354	6.4		0.192		8.1	LOS A	0.6	4.5				

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

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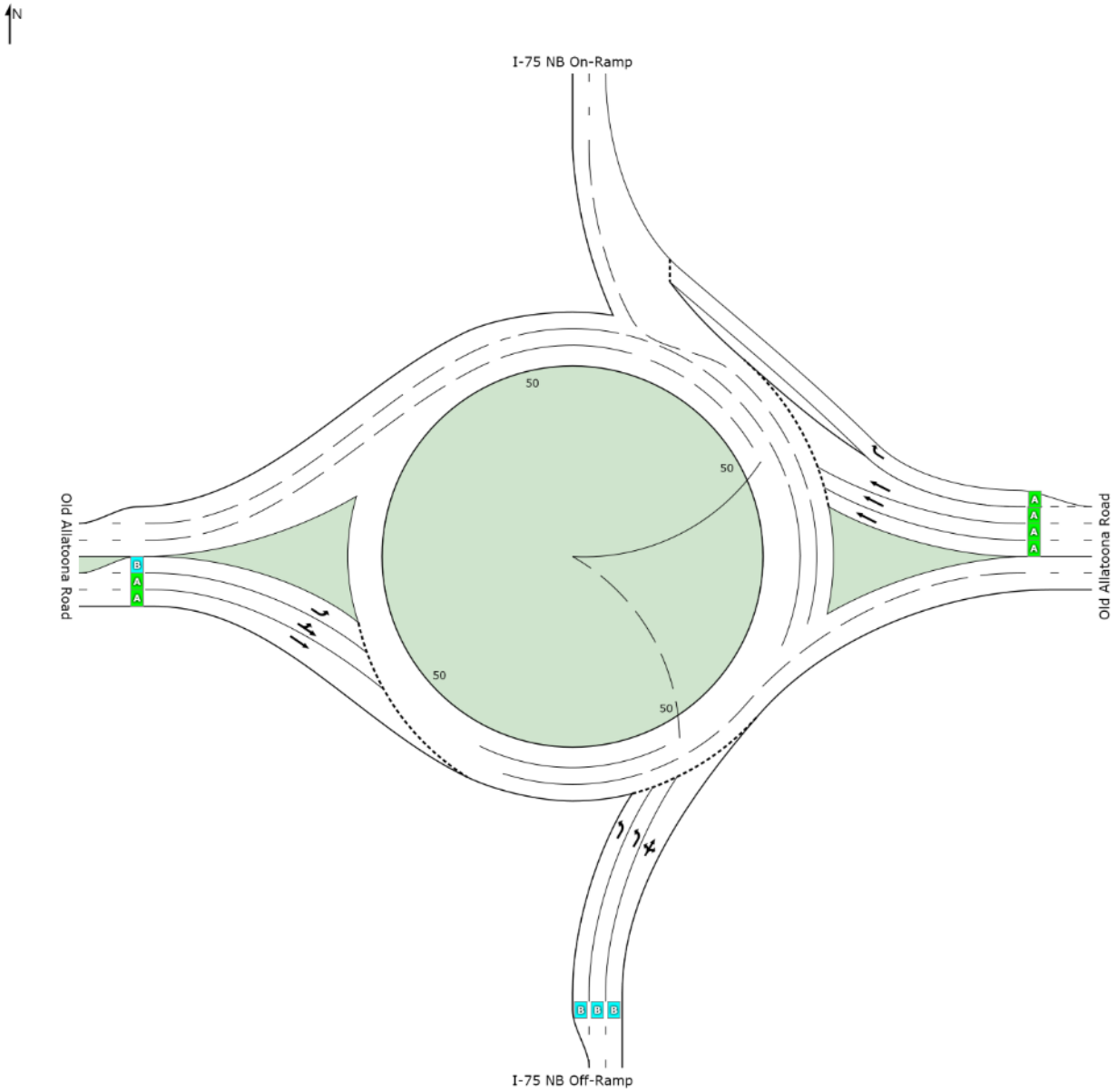
LEVEL OF SERVICE SUMMARY

Site: 2017 PM Peak - Ult Config

I-75 Northbound Ramp & Old Allatoona Road 2017 PM Peak
Roundabout



	South	East	North	West	Intersection
LOS	B	A	NA	A	A

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.

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LANE SUMMARY

Site: 2017 PM Peak - Ult Config

I-75 Northbound Ramp & Old Allatoona Road 2017 PM Peak
Roundabout

Lane Use and Performance

	Demand Flows L veh/h	T veh/h	R veh/h	Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Lane Length m	SL Type	Cap. Adj. %	Prob. Block. %
South: I-75 NB Off-Ramp																
Lane 1	406	0	0	406	7.0	1081	0.376	100	12.7	LOS B	1.3	9.5	150	Turn Bay	0.0	0.0
Lane 2	465	0	0	465	7.0	1237	0.376	100	12.5	LOS B	1.3	9.5	500	–	0.0	0.0
Lane 3	286	1	120	407	7.0	1081	0.376	100	10.7	LOS B	1.3	9.5	500	–	0.0	0.0
Approach	1158	1	120	1278	7.0		0.376		12.0	LOS B	1.3	9.5				
East: Old Allatoona Road																
Lane 1	0	47	0	47	9.0	598	0.079	100	6.3	LOS A	0.3	2.0	500	–	0.0	0.0
Lane 2	0	47	0	47	9.0	598	0.079	100	6.3	LOS A	0.3	2.0	500	–	0.0	0.0
Lane 3	0	47	0	47	9.0	598	0.079	100	6.3	LOS A	0.3	2.0	500	–	0.0	0.0
Lane 4	0	0	207	207	9.0	1272	0.162	100	4.7	LOS A	0.5	3.7	150	Turn Bay	0.0	0.0
Approach	0	141	207	348	9.0		0.162		5.3	LOS A	0.5	3.7				
West: Old Allatoona Road																
Lane 1	186	0	0	186	4.0	1566	0.119	100	11.2	LOS B	0.0	0.0	150	Turn Bay	0.0	0.0
Lane 2	145	75	0	220	4.0	1850	0.119	100	8.3	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 3	0	186	0	186	4.0	1566	0.119	100	2.7	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	332	261	0	592	4.0		0.119		7.4	LOS A	0.0	0.0				
Intersection				2218	6.5		0.376		9.7	LOS A	1.3	9.5				

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

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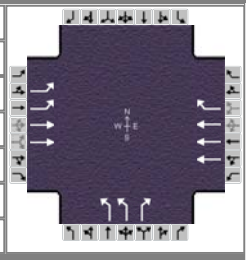
HCS 2010 Signalized Intersection Results Summary

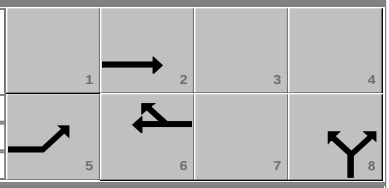
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	Sep 27, 2012	Area Type	Other
Jurisdiction		Time Period		PHF	0.92
Intersection	I-75NB Interchange	Analysis Year	2012	Analysis Period	1> 7:00
File Name	2017AM_Peak_Northbound_Ult Build.xus				
Project Description	2017 AM Peak Analysis_Ult Build				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	245	170			80	230	390		0			

Signal Information			
Cycle, s	66.1	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	9.9	30.0	11.2	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6		8		
Case Number	2.0	4.0		7.3		9.0		
Phase Duration, s	14.9	49.9		35.0		16.2		
Change Period, *(Y+R$_c$)*, s	5.0	5.0		5.0		5.0		
Max Allow Headway *(MAH)*, s	3.1	3.1		3.1		3.1		
Queue Clearance Time *(g$_s$)*, s	6.8	3.2		3.5		10.1		
Green Extension Time *(g$_e$)*, s	0.6	0.7		0.7		1.0		
Phase Call Probability	0.99	1.00		1.00		1.00		
Max Out Probability	0.00	0.00		0.00		0.00		

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16	3		18			
Adjusted Flow Rate *(v)*, veh/h	266	185			87	60	424		0			
Adjusted Saturation Flow Rate *(s)*, veh/h/ln	1689	1739			1568	1464	1642		1505			
Queue Service Time *(g$_s$)*, s	4.8	1.2			0.7	1.5	8.1		0.0			
Cycle Queue Clearance Time *(g$_c$)*, s	4.8	1.2			0.7	1.5	8.1		0.0			
Capacity *(c)*, veh/h	507	2363			2134	664	556		255			
Volume-to-Capacity Ratio *(X)*	0.525	0.078			0.041	0.090	0.762		0.000			
Available Capacity *(c$_a$)*, veh/h	5109	5259			7114	2213	4965		2275			
Back of Queue *(Q)*, veh/ln (50th percentile)	1.8	0.3			0.2	0.4	3.0		0.0			
Overflow Queue *(Q$_3$)*, veh/ln	0.0	0.0			0.0	0.0	0.0		0.0			
Queue Storage Ratio *(RQ)* (50th percentile)	0.24	0.00			0.00	0.00	0.16		0.00			
Uniform Delay *(d$_1$)*, s/veh	25.9	3.6			10.1	10.3	26.2		0.0			
Incremental Delay *(d$_2$)*, s/veh	0.3	0.0			0.0	0.0	0.8		0.0			
Initial Queue Delay *(d$_3$)*, s/veh	0.0	0.0			0.0	0.0	0.0		0.0			
Control Delay *(d)*, s/veh	26.2	3.6			10.1	10.3	27.0		0.0			
Level of Service (LOS)	C	A			B	B	C					
Approach Delay, s/veh / LOS	17.0	B		10.2	B		27.0	C		0.0		
Intersection Delay, s/veh / LOS	20.2						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.8	A	2.4	B	3.2	C	3.3	C
Bicycle LOS Score / LOS	0.9	A	0.6	A		F		

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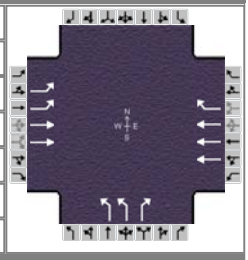
HCS 2010 Signalized Intersection Results Summary

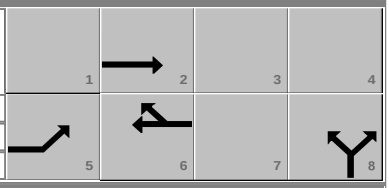
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	9/26/2012	Area Type	Other
Jurisdiction		Time Period		PHF	0.92
Intersection	I-75NB Interchange	Analysis Year	2012	Analysis Period	1> 7:00
File Name	2017PM_Peak_Northbound_Ult Build.xus				
Project Description	2017 PM Peak Analysis_Ult Build				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	305	240			130	190	1065		0			

Signal Information			
Cycle, s	93.2	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	11.7	30.0	36.4	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6		8		
Case Number	2.0	4.0		7.3		9.0		
Phase Duration, s	16.7	51.7		35.0		41.4		
Change Period, *(Y+R$_c$)*, s	5.0	5.0		5.0		5.0		
Max Allow Headway *(MAH)*, s	3.1	3.0		3.0		3.1		
Queue Clearance Time *(g$_s$)*, s	10.9	5.8		3.9		32.9		
Green Extension Time *(g$_e$)*, s	0.8	1.0		1.0		3.4		
Phase Call Probability	1.00	1.00		1.00		1.00		
Max Out Probability	0.00	0.00		0.00		0.00		

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16	3		18			
Adjusted Flow Rate *(v)*, veh/h	332	261			141	27	1158		0			
Adjusted Saturation Flow Rate *(s)*, veh/h/ln	1689	1739			1583	1477	1642		1505			
Queue Service Time *(g$_s$)*, s	8.9	3.8			1.9	1.2	30.9		0.0			
Cycle Queue Clearance Time *(g$_c$)*, s	8.9	3.8			1.9	1.2	30.9		0.0			
Capacity *(c)*, veh/h	426	1743			1526	475	1286		589			
Volume-to-Capacity Ratio *(X)*	0.778	0.150			0.093	0.057	0.900		0.000			
Available Capacity *(c$_a$)*, veh/h	3620	3727			5088	1583	3519		1612			
Back of Queue *(Q)*, veh/ln (50th percentile)	3.7	1.4			0.7	0.4	11.5		0.0			
Overflow Queue *(Q$_3$)*, veh/ln	0.0	0.0			0.0	0.0	0.0		0.0			
Queue Storage Ratio *(RQ)* (50th percentile)	0.47	0.00			0.00	0.00	0.61		0.00			
Uniform Delay *(d$_1$)*, s/veh	39.5	12.6			22.1	21.9	26.7		0.0			
Incremental Delay *(d$_2$)*, s/veh	1.2	0.0			0.0	0.0	1.0		0.0			
Initial Queue Delay *(d$_3$)*, s/veh	0.0	0.0			0.0	0.0	0.0		0.0			
Control Delay *(d)*, s/veh	40.7	12.6			22.2	21.9	27.7		0.0			
Level of Service (LOS)	D	B			C	C	C					
Approach Delay, s/veh / LOS	28.3		C	22.1		C	27.7		C	0.0		
Intersection Delay, s/veh / LOS	27.4						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.9	A	2.4	B	3.2	C	3.3	C
Bicycle LOS Score / LOS	1.0	A	0.6	A		F		

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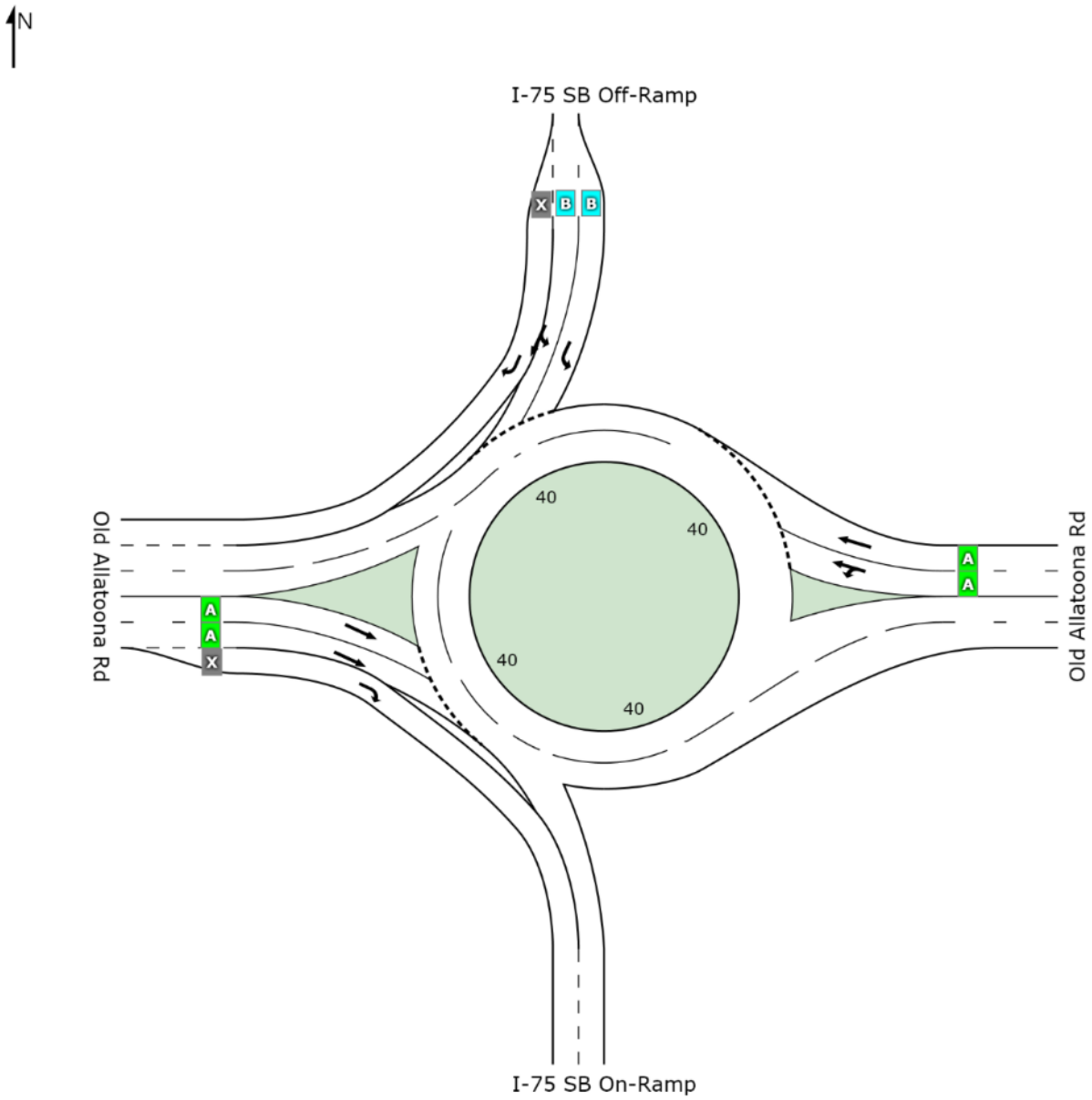
LEVEL OF SERVICE SUMMARY

Site: 2017 AM Peak - Ult Config

I-75 Southbound Ramp & Old Allatoona Road 2037 AM Peak
Roundabout



	South	East	North	West	Intersection
LOS	NA	A	A	A	A

X: Not applicable for Continuous lane.

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.

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LANE SUMMARY

Site: 2017 AM Peak - Ult Config

I-75 Southbound Ramp & Old Allatoona Road 2037 AM Peak
Roundabout

Lane Use and Performance

	Demand Flows L veh/h	T veh/h	R veh/h	Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Lane Length m	SL Type	Cap. Adj. %	Prob. Block. %
East: Old Allatoona Rd																
Lane 1	120	116	0	236	7.3	1516	0.155	100	7.4	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	275	0	275	7.3	1771	0.155	100	3.4	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	120	391	0	511	7.3		0.155		5.3	LOS A	0.0	0.0				
North: I-75 SB Off-Ramp																
Lane 1	78	0	0	78	21.0	790	0.098	100	13.9	LOS B	0.3	2.9	200	Turn Bay	0.0	0.0
Lane 2	80	1	0	81	21.0	824	0.098	100	13.7	LOS B	0.3	2.9	500	–	0.0	0.0
Lane 3	0	0	348	348	21.0	1615	0.215	100	5.1	X	X	X	200	Turn Bay	0.0	X
Approach	158	1	348	507	21.0		0.215		7.8	LOS A	0.3	2.9				
West: Old Allatoona Rd																
Lane 1	0	146	0	146	3.5	1069	0.136	100	4.5	LOS A	0.6	4.1	500	–	0.0	0.0
Lane 2	0	148	0	148	3.5	1082	0.136	100	4.5	LOS A	0.6	4.2	500	–	0.0	0.0
Lane 3	0	0	1185	1185	3.5	1812	0.654	100	4.7	X	X	X	200	Turn Bay	0.0	X
Approach	0	293	1185	1478	3.5		0.654		4.7	LOS A	0.6	4.2				
Intersection				2496	7.8		0.654		5.4	LOS A	0.6	4.2				

X: Not applicable for Continuous lane.

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

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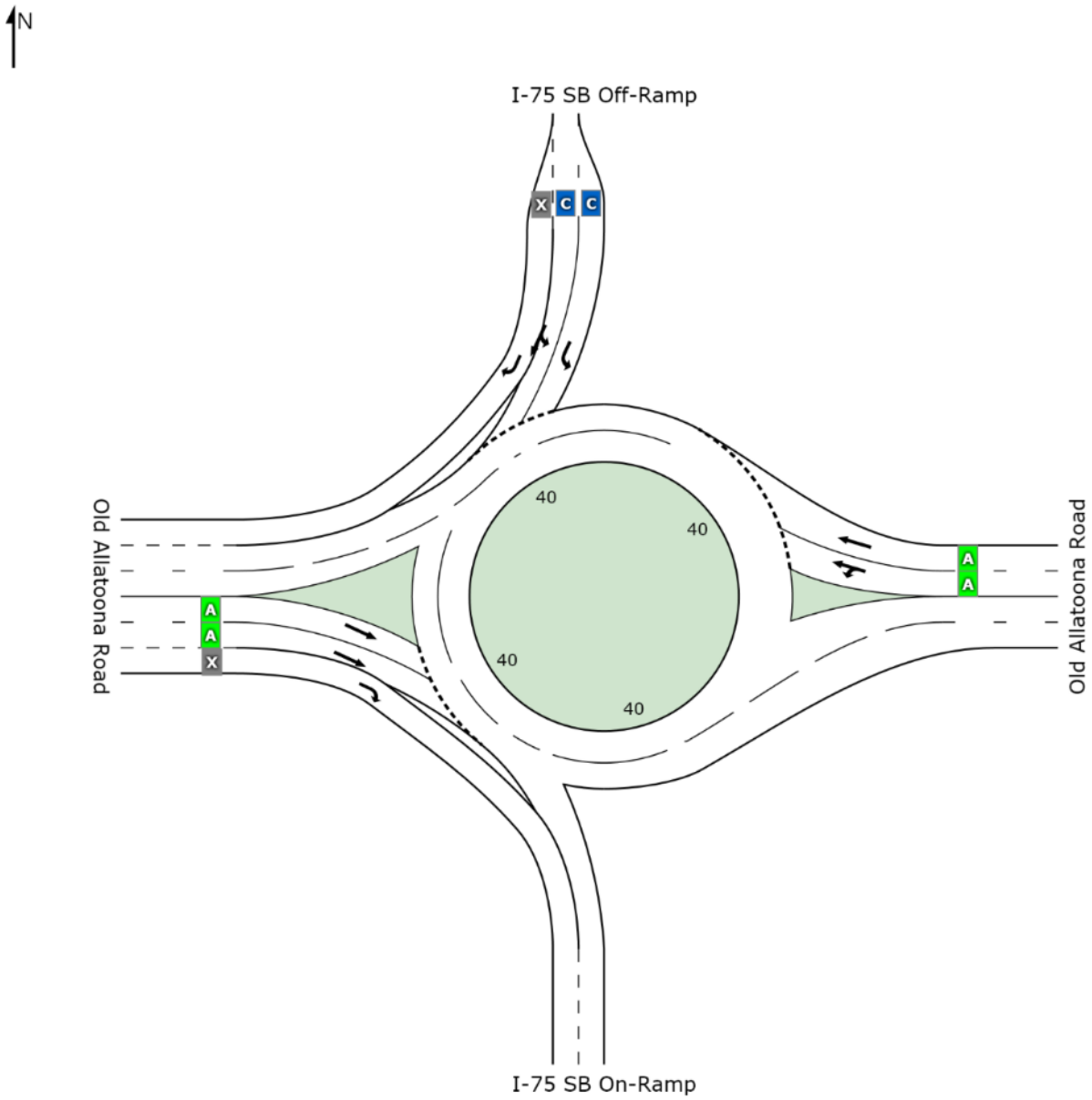
LEVEL OF SERVICE SUMMARY

Site: 2017 PM Peak - Ult Config

I-75 Southbound Ramp & Old Allatoona Road
Roundabout



	South	East	North	West	Intersection
LOS	NA	A	A	A	A

X: Not applicable for Continuous lane.

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.

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LANE SUMMARY

Site: 2017 PM Peak - Ult Config

I-75 Southbound Ramp & Old Allatoona Road
Roundabout

Lane Use and Performance

	Demand Flows L veh/h	T veh/h	R veh/h	Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Lane Length m	SL Type	Cap. Adj. %	Prob. Block. %
East: Old Allatoona Road																
Lane 1	152	447	0	599	7.3	1516	0.395	100	5.4	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	700	0	700	7.3	1771	0.395	100	3.4	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	152	1147	0	1299	7.3		0.395		4.3	LOS A	0.0	0.0				
North: I-75 SB Off-Ramp																
Lane 1	99	0	0	99	21.0	518	0.191	100	17.7	LOS C	0.7	5.7	200	Turn Bay	0.0	0.0
Lane 2	118	1	0	119	20.8	624	0.191	100	16.5	LOS C	0.7	5.9	500	–	0.0	0.0
Lane 3	0	0	402	402	21.0	1615	0.249	100	5.1	X	X	X	200	Turn Bay	0.0	X
Approach	217	1	402	621	21.0		0.249		9.3	LOS A	0.7	5.9				
West: Old Allatoona Road																
Lane 1	0	185	0	185	3.5	984	0.188	100	4.9	LOS A	0.8	6.1	500	–	0.0	0.0
Lane 2	0	190	0	190	3.5	1009	0.188	100	4.9	LOS A	0.9	6.1	500	–	0.0	0.0
Lane 3	0	0	522	522	3.5	1812	0.288	100	4.6	X	X	X	500	–	0.0	X
Approach	0	375	522	897	3.5		0.288		4.8	LOS A	0.9	6.1				
Intersection				2816	9.1		0.395		5.6	LOS A	0.9	6.1				

X: Not applicable for Continuous lane.

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

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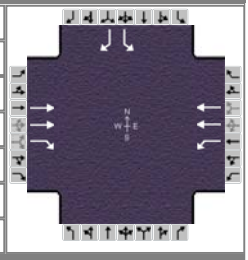
HCS 2010 Signalized Intersection Results Summary

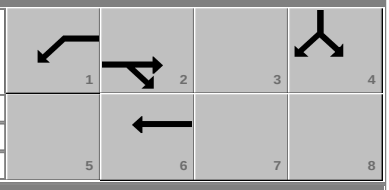
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	Sep 27, 2012	Area Type	Other
Jurisdiction		Time Period		PHF	0.92
Intersection	I-75SB Interchange	Analysis Year	2012	Analysis Period	1> 7:00
File Name	2017AM_Peak_Southbound_Ult Build.xus				
Project Description	2017 AM Peak				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h		270	0	110	360					145		0

Signal Information			
Cycle, s	61.8	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	8.7	30.0	8.1	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2	1	6				4
Case Number		7.3	2.0	4.0				9.0
Phase Duration, s		35.0	13.7	48.7				13.1
Change Period, $(Y+R_c)$, s		5.0	5.0	5.0				5.0
Max Allow Headway *(MAH)*, s		3.0	3.1	3.0				3.1
Queue Clearance Time (g_s), s		4.9	6.1	4.4				8.3
Green Extension Time (g_e), s		1.6	0.2	1.6				0.3
Phase Call Probability		1.00	0.87	1.00				0.93
Max Out Probability		0.00	0.00	0.00				0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement		2	12	1	6					7		14
Adjusted Flow Rate *(v)*, veh/h		293	0	120	391					158		0
Adjusted Saturation Flow Rate *(s)*, veh/h/ln		1739	1548	1675	1675					1495		1331
Queue Service Time (g_s), s		2.9	0.0	4.1	2.4					6.3		0.0
Cycle Queue Clearance Time (g_c), s		2.9	0.0	4.1	2.4					6.3		0.0
Capacity *(c)*, veh/h		1688	751	237	2370					195		174
Volume-to-Capacity Ratio *(X)*		0.174	0.000	0.505	0.165					0.806		0.000
Available Capacity (c_a), veh/h		5627	2504	2710	5418					2419		2153
Back of Queue *(Q)*, veh/ln (50th percentile)		0.9	0.0	1.5	0.4					2.2		0.0
Overflow Queue (Q_3), veh/ln		0.0	0.0	0.0	0.0					0.0		0.0
Queue Storage Ratio *(RQ)* (50th percentile)		0.00	0.00	0.27	0.00					0.00		0.00
Uniform Delay (d_1), s/veh		8.9	0.0	24.5	3.0					26.1		0.0
Incremental Delay (d_2), s/veh		0.0	0.0	0.6	0.0					3.0		0.0
Initial Queue Delay (d_3), s/veh		0.0	0.0	0.0	0.0					0.0		0.0
Control Delay *(d)*, s/veh		9.0	0.0	25.2	3.0					29.1		0.0
Level of Service (LOS)		A		C	A					C		
Approach Delay, s/veh / LOS	9.0	A		8.2	A		0.0			29.1	C	
Intersection Delay, s/veh / LOS	11.9						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.9	A	1.6	A	2.9	C	2.9	C
Bicycle LOS Score / LOS	0.7	A	0.9	A				F

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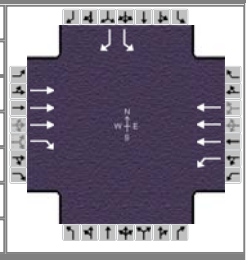
HCS 2010 Signalized Intersection Results Summary

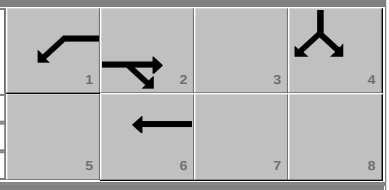
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	Sep 27, 2012	Area Type	Other
Jurisdiction		Time Period		PHF	0.92
Intersection	I-75SB Interchange	Analysis Year	2012	Analysis Period	1> 7:00
File Name	2017PM_Peak_Southbound_Ult Build.xus				
Project Description	2037 PM Peak_Southbound_Ult Build				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h		345	0	140	1055					200		0

Signal Information			
Cycle, s	65.9	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	9.4	30.0	11.5	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2	1	6				4
Case Number		7.3	2.0	4.0				9.0
Phase Duration, s		35.0	14.4	49.4				16.5
Change Period, $(Y+R_c)$, s		5.0	5.0	5.0				5.0
Max Allow Headway *(MAH)*, s		3.0	3.1	3.0				3.1
Queue Clearance Time (g_s), s		4.9	7.6	8.8				11.3
Green Extension Time (g_e), s		4.4	0.3	4.4				0.4
Phase Call Probability		1.00	0.94	1.00				0.98
Max Out Probability		0.00	0.00	0.00				0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement		2	12	1	6					7		14
Adjusted Flow Rate *(v)*, veh/h		375	0	152	1147					217		0
Adjusted Saturation Flow Rate *(s)*, veh/h/ln		1659	1548	1675	1597					1495		1331
Queue Service Time (g_s), s		2.9	0.0	5.6	6.8					9.3		0.0
Cycle Queue Clearance Time (g_c), s		2.9	0.0	5.6	6.8					9.3		0.0
Capacity *(c)*, veh/h		2266	705	239	3229					261		232
Volume-to-Capacity Ratio *(X)*		0.165	0.000	0.637	0.355					0.834		0.000
Available Capacity (c_a), veh/h		7552	2350	2543	7273					2270		2020
Back of Queue *(Q)*, veh/ln (50th percentile)		0.9	0.0	2.2	1.4					3.3		0.0
Overflow Queue (Q_3), veh/ln		0.0	0.0	0.0	0.0					0.0		0.0
Queue Storage Ratio *(RQ)* (50th percentile)		0.00	0.00	0.00	0.00					0.00		0.00
Uniform Delay (d_1), s/veh		10.6	0.0	26.6	4.6					26.3		0.0
Incremental Delay (d_2), s/veh		0.0	0.0	1.1	0.0					2.7		0.0
Initial Queue Delay (d_3), s/veh		0.0	0.0	0.0	0.0					0.0		0.0
Control Delay *(d)*, s/veh		10.6	0.0	27.7	4.6					29.0		0.0
Level of Service (LOS)		B		C	A					C		
Approach Delay, s/veh / LOS	10.6	B		7.3	A		0.0			29.0	C	
Intersection Delay, s/veh / LOS	10.5						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.9	A	1.6	A	3.3	C	3.3	C
Bicycle LOS Score / LOS	0.7	A	1.2	A				F

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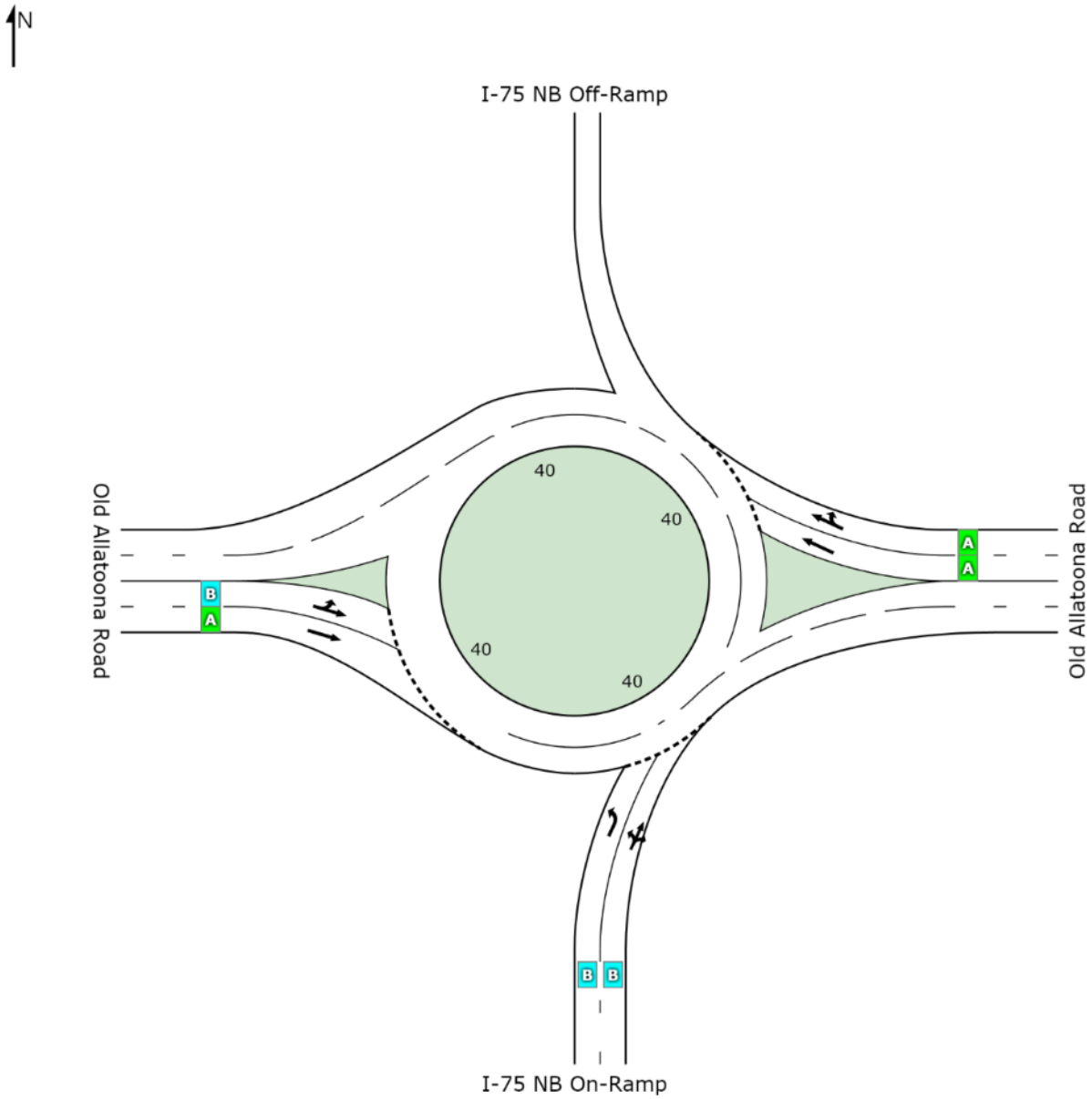
Attachment E Sensitivity Analysis Worksheets

LEVEL OF SERVICE SUMMARY

Site: AM Peak - Sensitivity

I-75 Northbound Ramp & Old Allatoona Road Sensitivity AM Peak
Roundabout
Design Life Analysis (Capacity): Results for 9 years



	South	East	North	West	Intersection
LOS	B	A	NA	A	A

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.

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LANE SUMMARY

Site: AM Peak - Sensitivity

I-75 Northbound Ramp & Old Allatoona Road Sensitivity AM Peak
Roundabout
Design Life Analysis (Capacity): Results for 9 years

Lane Use and Performance

	Demand Flows L veh/h	T veh/h	R veh/h	Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Lane Length m	SL Type	Cap. Adj. %	Prob. Block. %
South: I-75 NB On-Ramp																
Lane 1	368	0	0	368	7.0	932	0.394	100	13.8	LOS B	1.8	13.1	500	–	0.0	0.0
Lane 2	208	1	175	384	7.0	973	0.394	100	10.7	LOS B	1.8	13.1	500	–	0.0	0.0
Approach	575	1	175	751	7.0		0.394		12.2	LOS B	1.8	13.1				
East: Old Allatoona Road																
Lane 1	0	210	0	210	8.8	631	0.333	83[5]	8.0	LOS A	1.6	12.2	500	–	0.0	0.0
Lane 2	0	0	292	292	8.8	733	0.399	100	9.5	LOS A	2.2	16.6	500	–	0.0	0.0
Approach	0	210	292	502	8.8		0.399		8.9	LOS A	2.2	16.6				
West: Old Allatoona Road																
Lane 1	287	6	0	293	4.0	1811	0.162	100	11.1	LOS B	0.0	0.0	500	–	0.0	0.0
Lane 2	0	251	0	251	4.0	1550	0.162	100	3.3	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	287	257	0	544	4.0		0.162		7.5	LOS A	0.0	0.0				
Intersection				1797	6.6		0.399		9.9	LOS A	2.2	16.6				

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

5 Lane underutilisation determined by program

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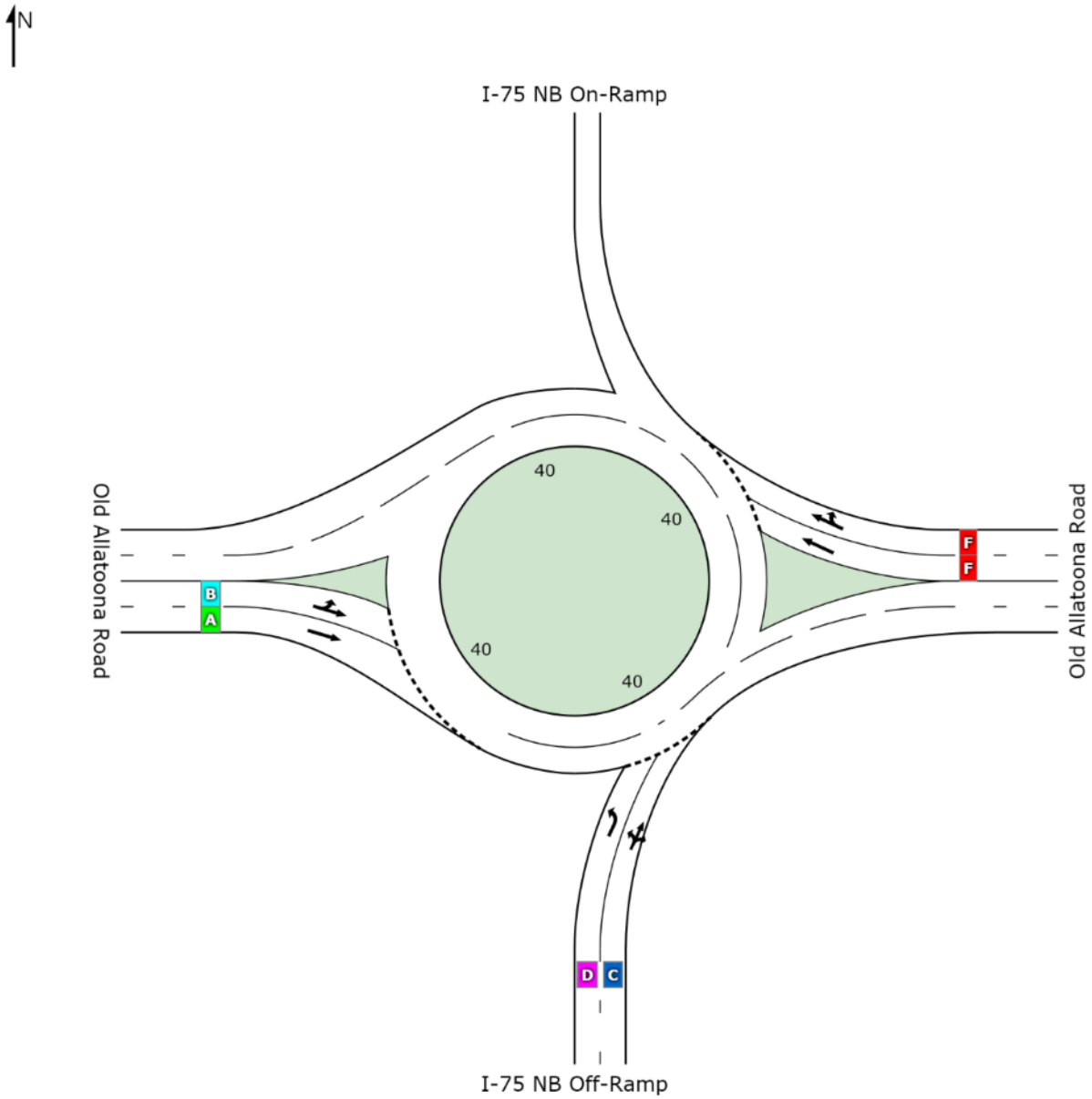
LEVEL OF SERVICE SUMMARY

Site: PM Peak - Sensitivity

I-75 Northbound Ramp & Old Allatoona Road Sensitivity PM Peak
Roundabout
Design Life Analysis (Capacity): Results for 9 years



	South	East	North	West	Intersection
LOS	C	F	NA	A	C

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.

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LANE SUMMARY

Site: PM Peak - Sensitivity

I-75 Northbound Ramp & Old Allatoona Road Sensitivity PM Peak
Roundabout
Design Life Analysis (Capacity): Results for 9 years

Lane Use and Performance

	Demand Flows L veh/h	T veh/h	R veh/h	Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Lane Length m	SL Type	Cap. Adj. %	Prob. Block. %
South: I-75 NB Off-Ramp																
Lane 1	685	0	0	685	7.0	768	0.892	100	26.1	LOS D	11.0	81.4	500	–	0.0	0.0
Lane 2	609	1	151	762	7.0	854	0.892	100	23.5	LOS C	11.4	84.5	500	–	0.0	0.0
Approach	1294	1	151	1447	7.0		0.892		24.7	LOS C	11.4	84.5				
East: Old Allatoona Road																
Lane 1	0	250	0	250	9.0	267	0.935	100	56.6	LOS F	9.9	74.9	500	–	0.0	0.0
Lane 2	0	64	256	320	9.0	343	0.935	100	52.7	LOS F	11.7	88.3	500	–	0.0	0.0
Approach	0	314	256	570	9.0		0.935		54.4	LOS F	11.7	88.3				
West: Old Allatoona Road																
Lane 1	487	19	0	506	4.0	1811	0.279	100	11.0	LOS B	0.0	0.0	500	–	0.0	0.0
Lane 2	0	433	0	433	4.0	1550	0.279	100	3.3	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	487	452	0	939	4.0		0.279		7.5	LOS A	0.0	0.0				
Intersection				2956	6.4		0.935		25.0	LOS C	11.7	88.3				

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

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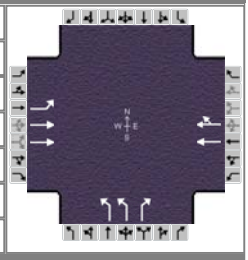
HCS 2010 Signalized Intersection Results Summary

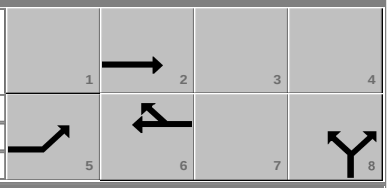
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	9/26/2012	Area Type	Other
Jurisdiction		Time Period		PHF	0.95
Intersection	I-75NB Interchange	Analysis Year	2012	Analysis Period	1> 7:00
File Name	AM_Peak_Northbound_Sensitivity.xus				
Project Description	2017 AM Peak Sensitivity (Year 2026)				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	272	244			200	278	546		0			

Signal Information			
Cycle, s	75.8	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	14.6	30.0	16.1	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6		8		
Case Number	2.0	4.0		8.3		9.0		
Phase Duration, s	19.6	54.6		35.0		21.1		
Change Period, *(Y+R$_c$)*, s	5.0	5.0		5.0		5.0		
Max Allow Headway *(MAH)*, s	3.1	3.1		3.1		3.1		
Queue Clearance Time *(g$_s$)*, s	14.1	4.1		22.0		14.7		
Green Extension Time *(g$_e$)*, s	0.5	1.2		1.2		1.5		
Phase Call Probability	1.00	1.00		1.00		1.00		
Max Out Probability	0.00	0.00		0.00		0.00		

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16	3		18			
Adjusted Flow Rate *(v)*, veh/h	286	257			211	137	575		0			
Adjusted Saturation Flow Rate *(s)*, veh/h/ln	1740	1739			1727	1464	1642		1505			
Queue Service Time *(g$_s$)*, s	12.1	2.1			20.0	4.7	12.7		0.0			
Cycle Queue Clearance Time *(g$_c$)*, s	12.1	2.1			20.0	4.7	12.7		0.0			
Capacity *(c)*, veh/h	336	2277			683	579	701		321			
Volume-to-Capacity Ratio *(X)*	0.852	0.113			0.308	0.236	0.820		0.000			
Available Capacity *(c$_a$)*, veh/h	2294	4586			2277	1930	2598		1190			
Back of Queue *(Q)*, veh/ln (50th percentile)	5.0	0.6			2.3	1.5	4.8		0.0			
Overflow Queue *(Q$_3$)*, veh/ln	0.0	0.0			0.0	0.0	0.0		0.0			
Queue Storage Ratio *(RQ)* (50th percentile)	0.64	0.00			0.00	0.00	0.25		0.00			
Uniform Delay *(d$_1$)*, s/veh	29.6	4.9			15.8	15.3	28.4		0.0			
Incremental Delay *(d$_2$)*, s/veh	2.4	0.0			0.1	0.1	0.9		0.0			
Initial Queue Delay *(d$_3$)*, s/veh	0.0	0.0			0.0	0.0	0.0		0.0			
Control Delay *(d)*, s/veh	31.9	4.9			15.9	15.4	29.4		0.0			
Level of Service (LOS)	C	A			B	B	C					
Approach Delay, s/veh / LOS	19.2	B		15.7	B		29.4	C		0.0		
Intersection Delay, s/veh / LOS	22.3						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.9	A	1.9	A	2.9	C	2.8	C
Bicycle LOS Score / LOS	0.9	A	0.8	A		F		

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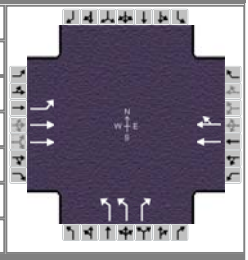
HCS 2010 Signalized Intersection Results Summary

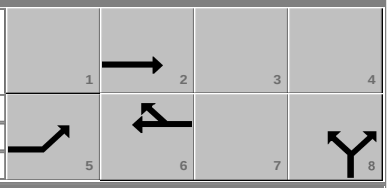
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	Sep 27, 2012	Area Type	Other
Jurisdiction		Time Period		PHF	0.95
Intersection	I-75NB Interchange	Analysis Year	2012	Analysis Period	1> 7:00
File Name	PM_Peak_Northbound_Sensitivity.xus				
Project Description	PM Peak Sensitivity (Year 2026)				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	463	430			298	244	1229		0			

Signal Information			
Cycle, s	148.8	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	43.8	30.0	59.9	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6		8		
Case Number	2.0	4.0		8.3		9.0		
Phase Duration, s	48.8	83.8		35.0		64.9		
Change Period, *(Y+Rc)*, s	5.0	5.0		5.0		5.0		
Max Allow Headway *(MAH)*, s	3.1	3.1		3.1		3.1		
Queue Clearance Time *(g_s)*, s	42.8	12.5		27.6		59.8		
Green Extension Time *(g_e)*, s	1.0	1.9		1.9		0.1		
Phase Call Probability	1.00	1.00		1.00		1.00		
Max Out Probability	0.00	0.00		0.00		1.00		

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16	3		18			
Adjusted Flow Rate *(v)*, veh/h	487	453			221	207	1294		0			
Adjusted Saturation Flow Rate *(s)*, veh/h/ln	1740	1739			1727	1571	1642		1505			
Queue Service Time *(g_s)*, s	40.8	10.5			25.6	18.0	57.8		0.0			
Cycle Queue Clearance Time *(g_c)*, s	40.8	10.5			25.6	18.0	57.8		0.0			
Capacity *(c)*, veh/h	513	1844			348	317	1323		606			
Volume-to-Capacity Ratio *(X)*	0.950	0.246			0.635	0.654	0.978		0.000			
Available Capacity *(c_a)*, veh/h	1169	2338			1161	1056	1324		607			
Back of Queue *(Q)*, veh/ln (50th percentile)	18.3	4.2			7.7	7.2	26.6		0.0			
Overflow Queue *(Q_3)*, veh/ln	0.0	0.0			0.0	0.0	0.0		0.0			
Queue Storage Ratio *(RQ)* (50th percentile)	2.36	0.00			0.00	0.00	1.40		0.00			
Uniform Delay *(d_1)*, s/veh	51.4	18.9			54.4	54.6	43.8		0.0			
Incremental Delay *(d_2)*, s/veh	4.5	0.0			0.7	0.9	19.5		0.0			
Initial Queue Delay *(d_3)*, s/veh	0.0	0.0			0.0	0.0	0.0		0.0			
Control Delay *(d)*, s/veh	55.9	18.9			55.1	55.5	63.3		0.0			
Level of Service (LOS)	E	B			E	E	E					
Approach Delay, s/veh / LOS	38.1	D		55.3	E		63.3	E		0.0		
Intersection Delay, s/veh / LOS	53.1						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.9	A	2.0	A	3.0	C	2.8	C
Bicycle LOS Score / LOS	1.3	A	0.8	A		F		

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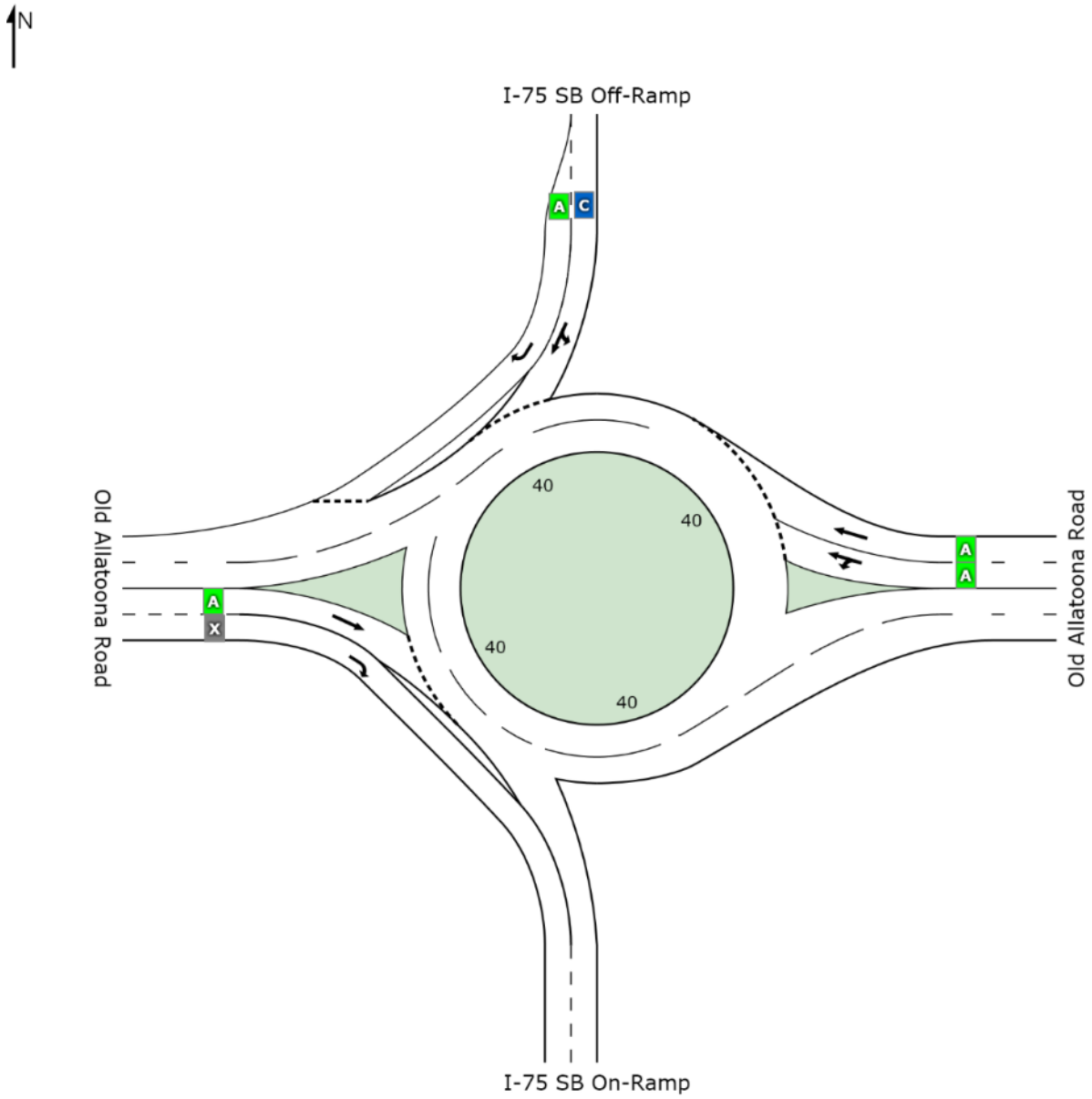
LEVEL OF SERVICE SUMMARY

Site: AM Peak - Sensitivity

I-75 Southbound Ramp & Old Allatoona Road AM Peak Sensitivity Analysis
Roundabout
Design Life Analysis (Capacity): Results for 8 years



	South	East	North	West	Intersection
LOS	NA	A	B	A	A

X: Not applicable for Continuous lane.

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.

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LANE SUMMARY

Site: AM Peak - Sensitivity

I-75 Southbound Ramp & Old Allatoona Road AM Peak Sensitivity Analysis
Roundabout
Design Life Analysis (Capacity): Results for 8 years

Lane Use and Performance

	Demand Flows L veh/h	T veh/h	R veh/h	Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Lane Length m	SL Type	Cap. Adj. %	Prob. Block. %
East: Old Allatoona Road																
Lane 1	144	209	0	354	7.3	1516	0.233	100	6.7	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	413	0	413	7.3	1771	0.233	100	3.4	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	144	622	0	767	7.3		0.233		4.9	LOS A	0.0	0.0				
North: I-75 SB Off-Ramp																
Lane 1	174	1	0	175	21.0	541	0.323	100	17.0	LOS C	1.3	10.4	500	–	0.0	0.0
Lane 2	0	0	386	386	21.0	780	0.495	100	9.2	LOS A	2.7	22.4	200	Turn Bay	0.0	0.0
Approach	174	1	386	561	21.0		0.495		11.6	LOS B	2.7	22.4				
West: Old Allatoona Road																
Lane 1	0	361	0	361	3.5	849	0.425	100	5.9	LOS A	2.4	17.4	500	–	0.0	0.0
Lane 2	0	0	1228	1228	3.5	1812	0.678	100	4.5	X	X	X	500	–	0.0	X
Approach	0	361	1228	1588	3.5		0.678		4.9	LOS A	2.4	17.4				
Intersection				2916	7.9		0.678		6.2	LOS A	2.7	22.4				

X: Not applicable for Continuous lane.

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

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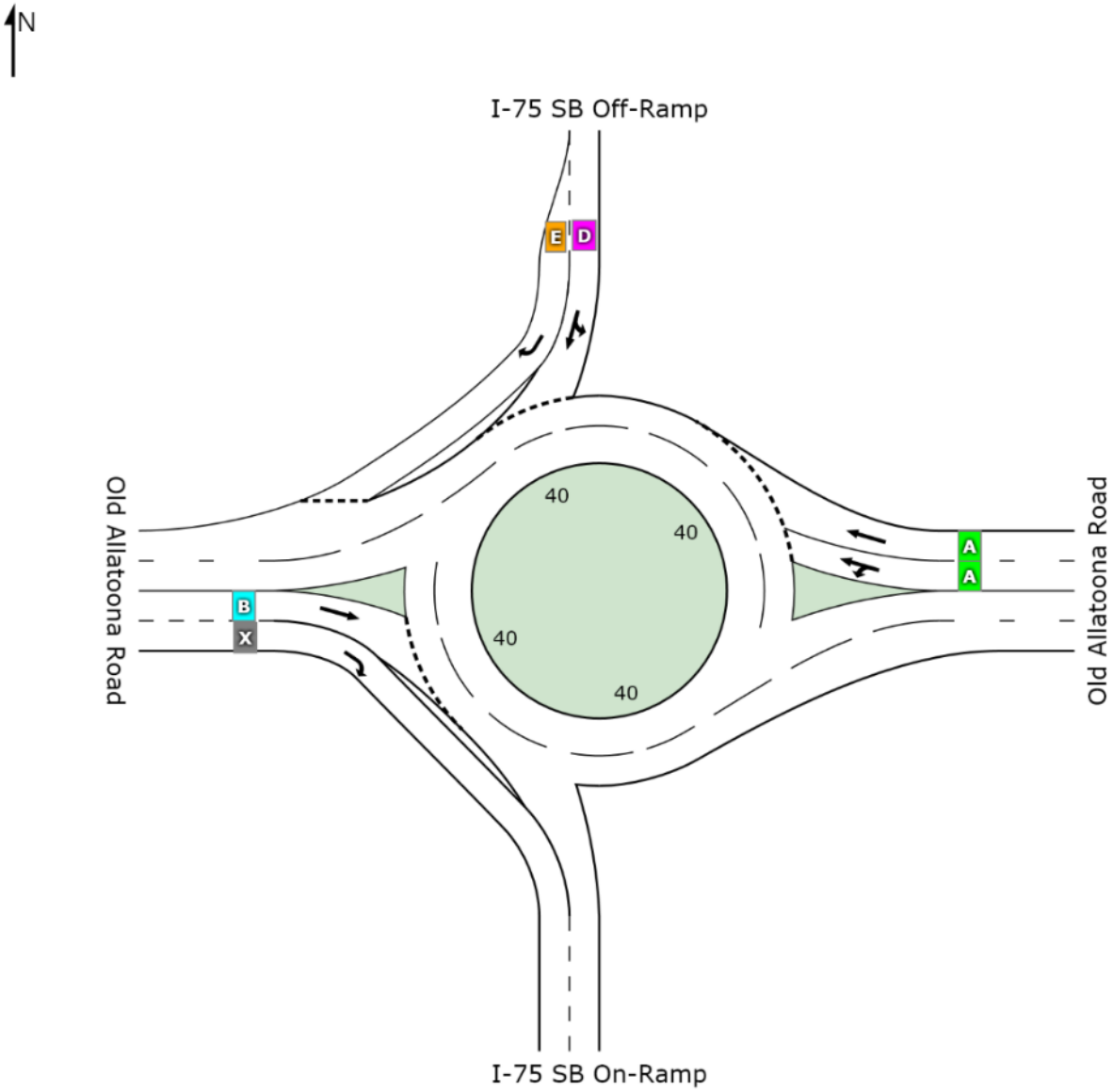
LEVEL OF SERVICE SUMMARY

Site: PM Peak - Sensitivity

I-75 Southbound Ramp & Old Allatoona Road PM Peak Sensitivity Analysis
Roundabout
Design Life Analysis (Capacity): Results for 8 years



	South	East	North	West	Intersection
LOS	NA	A	E	A	B

X: Not applicable for Continuous lane.

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.

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LANE SUMMARY

Site: PM Peak - Sensitivity

I-75 Southbound Ramp & Old Allatoona Road PM Peak Sensitivity Analysis
Roundabout
Design Life Analysis (Capacity): Results for 8 years

Lane Use and Performance

	Demand Flows L veh/h	T veh/h	R veh/h	Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Lane Length m	SL Type	Cap. Adj. %	Prob. Block. %
East: Old Allatoona Road																
Lane 1	184	579	0	764	7.3	1477	0.517	100	5.4	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	866	0	866	7.3	1676	0.517	100	3.5	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	184	1445	0	1630	7.3		0.517		4.4	LOS A	0.0	0.0				
North: I-75 SB Off-Ramp																
Lane 1	248	1	0	249	20.9	381	0.653	100	28.7	LOS D	3.6	29.9	500	–	0.0	0.0
Lane 2	0	0	556	556	21.0	574	0.968	100	39.6	LOS E	15.4	127.4	200	Turn Bay	0.0	0.0
Approach	248	1	556	804	21.0		0.968		36.2	LOS E	15.4	127.4				
West: Old Allatoona Road																
Lane 1	0	618	0	618	3.5	755	0.819	100	14.6	LOS B	11.0	79.0	500	–	0.0	0.0
Lane 2	0	0	724	724	3.5	1812	0.400	100	4.4	X	X	X	500	–	0.0	X
Approach	0	618	724	1342	3.5		0.819		9.1	LOS A	11.0	79.0				
Intersection				3777	8.9		0.968		12.8	LOS B	15.4	127.4				

X: Not applicable for Continuous lane.

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

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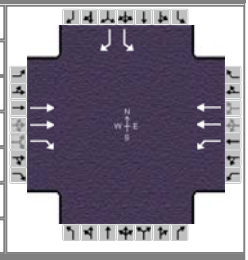
HCS 2010 Signalized Intersection Results Summary

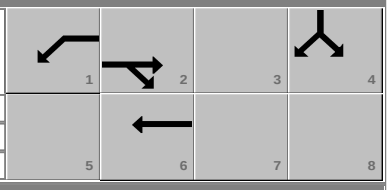
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	Sep 27, 2012	Area Type	Other
Jurisdiction		Time Period		PHF	0.95
Intersection	I-75SB Interchange	Analysis Year	2012	Analysis Period	1> 7:00
File Name	AM_Peak_Southbound_Sensitivity.xus				
Project Description	AM Peak Southbound Sensitivity				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h		490	0	190	1245					200		0

Signal Information			
Cycle, s	66.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	9.8	30.0	11.2	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2	1	6				4
Case Number		7.3	2.0	4.0				9.0
Phase Duration, s		35.0	14.8	49.8				16.2
Change Period, *(Y+R$_c$)*, s		5.0	5.0	5.0				5.0
Max Allow Headway *(MAH)*, s		3.0	3.1	3.0				3.1
Queue Clearance Time *(g$_s$)*, s		8.3	9.6	15.7				11.0
Green Extension Time *(g$_e$)*, s		5.6	0.4	5.6				0.4
Phase Call Probability		1.00	0.97	1.00				0.98
Max Out Probability		0.00	0.00	0.00				0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement		2	12	1	6					7		14
Adjusted Flow Rate *(v)*, veh/h		516	0	200	1311					211		0
Adjusted Saturation Flow Rate *(s)*, veh/h/ln		1739	1548	1675	1675					1495		1331
Queue Service Time *(g$_s$)*, s		6.3	0.0	7.6	13.7					9.0		0.0
Cycle Queue Clearance Time *(g$_c$)*, s		6.3	0.0	7.6	13.7					9.0		0.0
Capacity *(c)*, veh/h		1580	703	249	2273					254		226
Volume-to-Capacity Ratio *(X)*		0.326	0.000	0.802	0.577					0.828		0.000
Available Capacity *(c$_a$)*, veh/h		5264	2343	2536	5069					2263		2014
Back of Queue *(Q)*, veh/ln (50th percentile)		2.1	0.0	3.0	3.0					3.2		0.0
Overflow Queue *(Q$_3$)*, veh/ln		0.0	0.0	0.0	0.0					0.0		0.0
Queue Storage Ratio *(RQ)* (50th percentile)		0.00	0.00	0.53	0.00					0.00		0.00
Uniform Delay *(d$_1$)*, s/veh		11.6	0.0	27.2	5.6					26.5		0.0
Incremental Delay *(d$_2$)*, s/veh		0.0	0.0	2.3	0.1					2.6		0.0
Initial Queue Delay *(d$_3$)*, s/veh		0.0	0.0	0.0	0.0					0.0		0.0
Control Delay *(d)*, s/veh		11.6	0.0	29.5	5.7					29.1		0.0
Level of Service (LOS)		B		C	A					C		
Approach Delay, s/veh / LOS	11.6	B		8.8	A		0.0			29.1	C	
Intersection Delay, s/veh / LOS	11.4						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.9	A	1.6	A	2.9	C	2.9	C
Bicycle LOS Score / LOS	0.9	A	1.7	A				F

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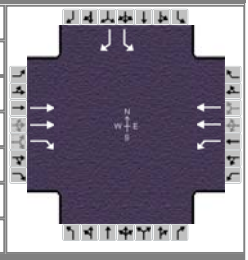
HCS 2010 Signalized Intersection Results Summary

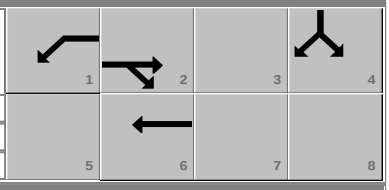
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	Sep 27, 2012	Area Type	Other
Jurisdiction		Time Period		PHF	0.95
Intersection	I-75SB Interchange	Analysis Year	2012	Analysis Period	1> 7:00
File Name	PM_Peak_Southbound_Sensitivity.xus				
Project Description	PM Peak Sensitivity				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h		1305	0	245	2040					300		0

Signal Information			
Cycle, s	140.5	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	24.4	69.1	32.0	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2	1	6				4
Case Number		7.3	2.0	4.0				9.0
Phase Duration, s		74.1	29.4	103.4				37.0
Change Period, $(Y+R_c)$, s		5.0	5.0	5.0				5.0
Max Allow Headway *(MAH)*, s		3.0	3.1	3.0				3.1
Queue Clearance Time (g_s), s		48.9	23.7	81.5				31.2
Green Extension Time (g_e), s		19.9	0.5	12.1				0.6
Phase Call Probability		1.00	1.00	1.00				1.00
Max Out Probability		0.14	0.00	0.54				0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement		2	12	1	6					7		14
Adjusted Flow Rate *(v)*, veh/h		1374	0	258	2147					316		0
Adjusted Saturation Flow Rate *(s)*, veh/h/ln		1739	1548	1645	1644					1495		1331
Queue Service Time (g_s), s		46.9	0.0	21.7	79.5					29.2		0.0
Cycle Queue Clearance Time (g_c), s		46.9	0.0	21.7	79.5					29.2		0.0
Capacity *(c)*, veh/h		1710	761	286	2305					341		304
Volume-to-Capacity Ratio *(X)*		0.803	0.000	0.902	0.932					0.925		0.000
Available Capacity (c_a), veh/h		2463	1096	1165	2328					1059		942
Back of Queue *(Q)*, veh/ln (50th percentile)		19.3	0.0	9.3	29.1					11.3		0.0
Overflow Queue (Q_3), veh/ln		0.0	0.0	0.0	0.0					0.0		0.0
Queue Storage Ratio *(RQ)* (50th percentile)		0.00	0.00	1.67	0.00					0.00		0.00
Uniform Delay (d_1), s/veh		30.2	0.0	57.2	18.2					53.3		0.0
Incremental Delay (d_2), s/veh		0.8	0.0	4.2	7.4					4.6		0.0
Initial Queue Delay (d_3), s/veh		0.0	0.0	0.0	0.0					0.0		0.0
Control Delay *(d)*, s/veh		31.0	0.0	61.4	25.6					57.9		0.0
Level of Service (LOS)		C		E	C					E		
Approach Delay, s/veh / LOS	31.0	C		29.4	C		0.0			57.9	E	
Intersection Delay, s/veh / LOS	32.1						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.9	A	1.6	A	2.9	C	2.9	C
Bicycle LOS Score / LOS	1.6	A	2.5	B				F

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