LAI ENGINEERING Building Relationships Through Performance

Developments of Regional Impact (DRI) The Avenue Ridgewalk Woodstock, GA DRI # 1594 March 07, 2008



Civil, Survey & Transportation

1800 Parkway Place, Suite 720 Marietta, GA 30067 770-423-0807

www.LAlengineering.com



The Avenue Ridgewalk Development of Regional Impacts (DRI) # 1594

Anticipated Traffic Impact Study Results

Prepared By:



Prepared For:

Cousins Properties Incorporated

March 07, 2008



Table of Contents

	Exec	utive Summary
0	Proje	ect Description
	1.1	Introduction
		1.1.1 Site Plan Review
		1.1.2 Site Access
	1.2	Bicycle and Pedestrian Facilities
	1.3	Transit Facilities
)	Traff	ic Analyses - Methodology and Assumptions
	2.1	Existing Facilities
	2.2	Growth Rate
		2.2.1 Traffic Data Collection
	2.3	Detailed Intersection Analysis
)	Study	y Network
	3.1	Existing Facilities
	3.2	Study Network Determination
	3.3	Gross Trip Generation
	3.4	Level of Service Standards
)	Trip	Generation
D	Trip	Distribution
C	Traff	ic Analysis
	6.1	Existing Traffic
	6.2	Scenario 1 (Without Rope Mill Rd / I-575 Interchange), 2010 No-Build Traffic
	6.3	Scenario 1 (Without Rope Mill Rd / I-575 Interchange), 2010 Build Traffic .



Table of Contents cont.

	6.4	Scenario 2 (With Rope Mill Rd / I-575 Interchange), 2010 No-Build Traffic .	43
	6.5	Scenario 2 (With Rope Mill Rd / I-575 Interchange), 2010 Build Traffic	48
	6.6	Corridor Segment Study	54
7.0	ldent	ification of Programmed Projects	55
8.0	Ingre	ss/Egress Analysis	56
9.0	Comp	pliance with Comprehensive Plan Analysis	57
10.0	Non-E	Expedited Criteria	57
	10.1	Quality, Character, Convenience, and Flexibility of Transportation Options	57
	10.2	Vehicle Miles Traveled	57
	10.3	Relationship between location of proposed DRI and Regional Mobility	57
	10.4	Relationship between Proposed DRI and Existing or Planned Transit Facilities	57
	10.5	Transportation Management Area Designation	60
	10.6	Offsite Trip Reduction and Trip Reduction Techniques	60
	10.7	Balance of Land Uses - Jobs/Housing Balance	60
	10.8	Relationship between Proposed DRI and Existing Development and Infrastructure	60
11.0	Area	of Influence	60
	11.1	Criteria	60
	11.2	Study Area Determination and Characteristics	61
	11.3	Affordable Housing Analysis	63
12.0	ARC's	s Air Quality Benchmark	68
13.0	Concl	lusion	69
14.0	Appe	ndix	74



List of Tables

Page

<u>Table 1:</u>	Proposed Land Uses	1
<u>Table 2:</u>	Existing Roadway Facilities with Functional Classification	7
<u>Table 3:</u>	Weekday Gross Site Trip Generation	18
Table 4:	Saturday Gross Site Trip Generation	19
<u>Table 5:</u>	Level of Service Criteria (Delay, sec)	20
<u>Table 6:</u>	Level of Service Criteria (V/C Ratio)	21
Table 7:	Existing 2007 Intersection Level of Service	29
Table 8:	Scenario 1 (Without Rope Mill Rd / I-575 Interchange), 2010 No-Build, Intersection Level of Service	34
Table 9:	Scenario 1 (Without Rope Mill Rd / I-575 Interchange), 2010 Build, Intersection Level of Service	37
Table 10:	Scenario 1 (Without Rope Mill Rd / I-575 Interchange), 2010 Build, Improved Intersection Level of Service	41
Table 11:	Scenario 2 (With Rope Mill Rd / I-575 Interchange), 2010 No-Build, Intersection Level of Service	44
Table 12:	Scenario 2 (With Rope Mill Rd / I-575 Interchange), 2010 No-Build, Improved Intersection Level of Service	47
Table 13:	Scenario 2 (With Rope Mill Rd / I-575 Interchange), 2010 Build, Intersection Level of Service	48
Table 14:	Scenario 2 (With Rope Mill Rd / I-575 Interchange), 2010 Build, Improved Intersection Level of Service	52



List of Tables cont.

<u>Table 15:</u>	Avenue Ridgewalk Corridor Levels of Service	54
<u>Table 16:</u>	Identification of Programmed Projects	55
<u>Table 17:</u>	Trip Generation Summary	57
<u>Table 18:</u>	2007 Demographic Profile	61
<u>Table 19:</u>	Employment by Occupation and Land Uses	63
<u>Table 20:</u>	Employment, Salary & Affordable Housing Payment by Occupation	64
<u>Table 21:</u>	Selected Monthly Housing Cost	66
<u>Table 22:</u>	Comparison of DRI Employee Affordable Monthly Housing Payment and AOI Monthly Housing Cost	67
<u>Table 23:</u>	ARC VMT Reductions	68



List of Figures

<u>Page</u>

Figure 1:	Aerial Site View	2
Figure 2:	Aerial Site Plan	3
Figure 3:	Site Plan	4
Figure 4:	Study Network Intersections	16
Figure 5:	Network AADT	23
Figure 6:	Scenario 1 (Without Rope Mill Rd / I-575 Interchange), Site Trip Distribution Percentages	24
<u>Figure 7:</u>	Scenario 2 (With Rope Mill Rd / I-575 Interchange), Site Trip Distribution Percentages	25
Figure 8:	Scenario 1 (Without Rope Mill Rd / I-575 Interchange), Site Generated Volumes	26
Figure 9:	Scenario 2 (With Rope Mill Rd / I-575 Interchange), Site Generated Volumes	27
Figure 10:	2007 Existing Lane Geometry	31
Figure 11:	2007 Existing Turning Movement Counts	32
Figure 12:	Scenario 1 (Without Rope Mill Rd / I-575 Interchange), 2010 No-Build, AM-PM-SAT Peak Conditions	36
Figure 13:	Scenario 1 (Without Rope Mill Rd / I-575 Interchange), 2010 Build, AM-PM-SAT Peak Conditions	39
Figure 14:	Scenario 1 (Without Rope Mill Rd / I-575 Interchange), 2010 Build, Improved AM- PM-SAT Peak Conditions with Lane Geometry	42



List of Figures cont.

Figure 15:	Scenario 2 (With Rope Mill Rd / I-575 Interchange), 2010 No-Build, AM-PM-SAT Peak Conditions	46
Figure 16:	Scenario 2 (With Rope Mill Rd / I-575 Interchange), 2010 Build, AM-PM-SAT Peak Conditions	50
Figure 17:	Scenario 2 (With Rope Mill Rd / I-575 Interchange), 2010 Build, Improved AM-PM-SAT Peak Conditions with Lane Geometry	53
<u>Figure 18:</u>	Cherokee County Zoning Map	58
Figure 19:	Cherokee County Future Development Map	59
Figure 20:	AOI Boundary Map	62



List of Photographs

<u>Page</u>

Photograph 1:	East Bound view from Towne Lake Parkway at I-575 North Bound Ramp	10
Photograph 2:	West Bound view from Towne Lake Parkway at I-575 North Bound Ramp	10
Photograph 3:	East Bound view from Sixes Road at I-575 South Bound Ramp	11
<u>Photograph 4</u> :	West Bound view from Sixes Road just before the I-575 North Bound Ramp	11
<u>Photograph 5</u> :	East Bound view from Towne Lake Parkway at Canton Highway	12
<u>Photograph 6</u> :	North Bound view from Canton Highway at Towne Lake Parkway	12
Photograph 7:	West Bound view from Rope Mill Road at Woodstock Parkway	13
<u>Photograph 8</u> :	North Bound view from Woodstock Parkway at Rope Mill Road	13
<u>Photograph 9</u> :	East Bound view from Ridgewalk Parkway at Woodstock Parkway	14
Photograph 10:	North Bound view from Woodstock Parkway at Ridgewalk Parkway	14



Executive Summary

This report presents a systematic approach, by LAI Engineering (LAI), to analyze the anticipated traffic impacts for a proposed 50 acre commercial development (The Avenue Ridgewalk). The Avenue Ridgewalk is proposed to be located within the City of Woodstock in Cherokee County, Georgia. See Figure 1 for an Aerial Site View of the development. The applicant (Cousins Properties Incorporated) is applying for approval under Georgia Regional Transportation Authorities (GRTA's) non-expedited review process. Because the project will exceed 300,000 square feet of commercial development, The Avenue Ridgewalk requires a Development of Regional Impact (DRI) study and is subject to GRTA and Atlanta Regional Commission (ARC) review.

Proposed Development Conditions

The Avenue Ridgewalk is expected to consist of commercial retail and office space with a total gross area of 353,000 square feet. The Avenue Ridgewalk development is comprised of two pods, but will be analyzed as one development. The development is scheduled to be completed by the year 2010.

As part of the DRI process, 2007 existing traffic conditions, for two different scenarios were analyzed using Synchro 7. Each scenario was analyzed using AM, PM and Saturday peak hour traffic data for the 2010 build-out year. The projected traffic was calculated using a 2% background traffic growth rate agreed upon by GRTA during the methodology review process.

- Scenario 1 includes the eighteen intersections within the study network and all five proposed access driveways.
- Scenario 2 includes the eighteen intersections within the study network and all five proposed access driveways plus the proposed I-575 full access interchange at Rope Mill Road (Georgia Department of Transportation (GDOT) project # 0006043) and the existing SR 92 and I-575 Interchange.

See Figure 3 for Site Plan and Figure 4 for the Study Network Intersections.



Existing Traffic Analysis

Based on intersection analysis under the 2007 existing conditions, there were **no** intersections below the standard level of service D.

No-Build Conditions

The No-Build conditions were analyzed using the factors described in the Analysis of Anticipated Traffic Impact paragraph below for the 2010 build-out year.

Build Conditions

The Build conditions were analyzed using the factors described in the Analysis of Anticipated Traffic Impact paragraph below, plus the site generated traffic associated with The Avenue Ridgewalk development for the 2010 build-out year.

Analysis of the Anticipated Traffic Impacts

The results of the detailed intersection analysis for the 2010 No-Build conditions include background traffic growth of 2% per year and include traffic for an approved Home Depot development (DRI# 928) north of Sixes Road. DRI # 1245 & DRI # 1271 listed in GRTA's Letter of Understanding have a build year of 2011 and will not affect The Avenue Ridgewalk traffic analysis.

The 2010 Build conditions include the 2010 No-Build conditions plus the site generated traffic associated with the Avenue Ridgewalk development.

Scenario 1 (Without Rope Mill Rd / I-575 Interchange), 2010 No-Build

Based on intersection analysis in a Scenario 1 (Without Rope Mill Rd / I-575 Interchange), 2010 No-Build condition, there were **no** intersections below the standard level of service D.



Scenario 1 (Without Rope Mill Rd / I-575 Interchange), 2010 Build

There were **seven** (7) intersections identified by LAI as operating below the standard level of service D for the Scenario 1 (Without Rope Mill Rd / I-575 Interchange), <u>2010 Build</u> condition. The Intersections that were below the standard level of service D are:

- Towne Lake Parkway at I-575 NB Ramp (PM)
- Canton Hwy at Towne Lake Parkway / Arnold Mill Road (PM & SAT)
- Ridgewalk Parkway at Woodstock Parkway (SAT)
- Canton Hwy at Ridgewalk Parkway (SAT)
- Canton at Sixes Road (SAT)
- Sixes Road at I-575 NB ramp (PM)
- Sixes Road at I-575 SB ramp (SAT)

The above mentioned intersections were improved in the analysis models to insure that the intersections continue to operate at or above an acceptable level of service. The recommended improvements for these intersections, which did not meet the standard level of service D, are listed below:

Recommended Improvements:

- Towne Lake Parkway @ 575 NB Ramp
 - Recommend adding a right turn storage lane (approx. 100 ft.) to Towne Lake
 Parkway at the WB approach to I-575 NB on ramp.
- Canton Hwy @ Towne Lake Parkway
 - The City of Woodstock recognizes that limited intersection improvements can be made to the intersections or roadway segments around the intersection of Canton Hwy and Towne Lake Parkway/Arnold Mill Road. Woodstock's historic downtown commercial district has many buildings and landmarks that are trademarks of the city and are registered as National Historical Places. These historic designations prevent the addition of or widening of lanes in and around the intersection of Canton Hwy and Towne Lake Parkway /Arnold Mill Road; therefore, all measured operational efficiencies below the standard LOS of D will have no recommended improvements.



- Ridgewalk Parkway @ Woodstock Parkway
 - Recommend adding additional WB left turn storage lane (approx. 200 ft.) on Ridgewalk Parkway.
- Canton Hwy @ Ridgewalk Parkway
 - Recommend adding a dual left on the EB approach of Ridgewalk Parkway (approx 235 ft). Utilize existing NB right turn on Canton Hwy as a receiving lane that would taper back into one lane (approx 350 ft.)
- Canton Rd @ Sixes Road
 - Recommend adding additional EB left turn storage (approx. 200 ft.) and convert existing EB left turn lane into an EB exclusive thru lane, also add additional EB right storage (approx. 200 ft.).
 - Recommend adding additional SB lane on Canton Hwy starting at Sixes road and turning into a right turn exclusive lane at River Park Blvd.
- Sixes Road @ I-575 NB Ramp
 - Recommend adding additional right turn storage (approx. 650 ft.) to NB exit ramp making a dual signalized right turn with a shared thru left.
- Sixes Road @ I-575 SB Ramp
 - Above recommendations for Canton Hwy @ Sixes Rd and Sixes Road @ I-575
 ramp adjust the SB ramp intersection level of service to and acceptable level of service.

Scenario 2 (With Rope Mill Rd / I-575 Interchange), 2010 No-Build

There was **one** (1) intersection identified by LAI as operating below the standard level of service D for the Scenario 2 (With Rope Mill Rd / I-575 Interchange), <u>2010 No-Build</u> condition. The Intersection that was below the standard level of service D is:

• I-575 NB ramp at Sixes Road (PM)

The above intersection was improved in the analysis models to insure that the intersection will continue to operate at an acceptable level of service. It is should not be the responsibility of the developer to make the recommended improvement for the above mentioned intersection because the failure to maintain an acceptable LOS was found in a No-Build condition. The recommended improvement to return this intersection to an acceptable level of service is listed below:



Recommended Improvements:

- Sixes Rd @ I 575 NB Ramp
 - Recommend adding additional right turn storage (approx. 650 ft.) to the NB I-575 off ramp.

Scenario 2 (With Rope Mill Rd / I-575 Interchange), 2010 Build

There were **two** (2) intersections identified by LAI as operating below the standard level of service D for the Scenario 2 (With Rope Mill Rd / I-575 Interchange), <u>2010 Build</u> condition. The Intersections that were below the standard level of service D are:

- Towne Lake Parkway at the I-575 NB Ramp (PM)
- Canton Hwy at Towne Lake Parkway / Arnold Mill Road (PM)

The above intersections were improved in the analysis models to insure that the intersections will continue to operate at an acceptable level of service. The recommended improvements for these intersections, which did not meet the standard level of service D, are listed below:

Recommended Improvements

Towne Lake Parkway @ I-575 NB Ramp

• Recommend adding WB right turn storage (approx. 100 ft.) to Towne Lake Parkway.

Canton Hwy at Towne Lake Parkway / Arnold Mill Road

The City of Woodstock recognizes that limited intersection improvements can be made to the intersections or roadway segments around the intersection of Canton Hwy and Towne Lake Parkway/Arnold Mill Road. Woodstock's historic downtown commercial district has many buildings and landmarks that are trademarks of the city and are registered as National Historical Places. These historic designations prevent the addition of or widening of lanes in and around the intersection of Canton Hwy and Towne Lake Parkway /Arnold Mill Road; therefore, all measured operational efficiencies below the standard LOS of D will have no recommended improvements.



Segment Analysis

As part of the DRI process, a detailed segment analysis for all major corridors in the study network had to be completed. Woodstock Parkway, Ridgewalk Parkway and Canton Highway were the three major segments analyzed. The analysis was completed for the build-out year (2010) for both No-Build and Build scenarios. The results of the detailed segment analysis reveal that Woodstock Parkway, Ridgewalk Parkway and Canton Highway will all operate at acceptable levels of service during all analyzed scenarios, per the outlined technical guidelines in GRTA's Letter of Understanding.



PROJECT SUMMARY

Name and Number of DRI	The Avenue Ridgewalk, DRI # 1594		
Jurisdiction	City of Woodstock		
Local Development Approval Sought	Land Development Permit		
Location	728 Woodstock Parkway, Woodstock, GA 30189		
Uses and Intensities of Use	348,760 square feet proposed retail		
	4,240 square feet proposed office		
Project Phasing and Build-Out	One Phase with 2010 Build-Out		
Site Trip Generation (Average Daily Traffic / AM / PM / SAT Peak Hour Traffic)	(21,789 / 1,071 / 1,979 / 2,735)		



The Avenue Ridgewalk Development of Regional Impacts (DRI) # 1594

Anticipated Traffic Impact Study Results March 07, 2008



1.0 <u>Project Description</u>

1.1 Introduction

This report presents a systematic approach to the analysis of the anticipated traffic impacts for The Avenue Ridgewalk, a proposed 50 acre commercial development. The Avenue Ridgewalk (DRI #1594), is located in the City of Woodstock, Cherokee County, Georgia. More specifically, the proposed development is located east of I-575, south of the intersection of Ridgewalk Parkway and Woodstock Parkway and bisected by Woodstock Parkway. See Figure 1 and Figure 2 for Aerial Site View and the Aerial Site Plan.

The proposed development will reside on a 50 acre site and consist of retail and office space with a total area of 353,000 square feet. The site is currently zoned for Light Industrial (LI), which allows commercial uses. The proposed zoning will remain LI (Light Industrial) and commercial. The project is scheduled to be completed in 2010. See Table 1 for proposed land use intensities..

Table 1 Proposed Land Uses					
Retail	288,260 SF				
Office	4,240 SF				
Restaurant	42,500 SF				
Pharmacy	13,500 SF				
Bank	4,500 SF				
Total	353,000 SF				

1.1.1 Site Plan Review

The proposed development utilizes a two pod design, where the elements contained within Pod A and Pod B of the project are accessible by internal connections such as vehicular access and pedestrian walkways. These internal connections will provide access for all retail and office elements of the proposed development. See Figure 3 for the Site Plan.





NOT ISSUED FOR CONSTRUCTION





1.1.2 Site Access

The proposed development will be accessible by five (5) driveways; one (1) driveway along Ridgewalk Parkway and four (4) driveways along Woodstock Parkway.

- Driveway 1 into Pod A is proposed as a right-in/right-out commercial driveway along Ridgewalk Parkway. Driveway 1 will be located approximately 317 feet east of the Ridgewalk Parkway and Woodstock Parkway intersection.
- 2. Driveway 2 into Pod A is proposed as a right-in, left in and right-out commercial driveway located on Woodstock Parkway. Driveway 2 will be located approximately 395 feet south of the Ridgewalk Parkway and Woodstock Parkway intersection.
- 3. Driveway 3 into Pod B is proposed as a right-in, left in and right out commercial driveway located on Woodstock Parkway. Driveway 3 will be located approximately 395 feet south of the Ridgewalk Parkway and Woodstock Parkway intersection. Driveway 3 aligns perpendicular to Driveway 2 along Woodstock Parkway.
- 4. Driveway 4 into Pod A is proposed as a full access commercial main entrance drive located along Woodstock Parkway. Driveway 4 will be located approximately 925 feet south of the Ridgewalk Parkway and Woodstock Parkway intersection.
- 5. Driveway 5 into Pod B is proposed as a full access commercial main entrance drive located along Woodstock Parkway. Driveway 5 will be located approximately 925 feet south of the Ridgewalk Parkway and Woodstock Parkway intersection. Driveway 5 aligns perpendicular to Driveway 4 along Woodstock Parkway.

The City of Woodstock is the permitting agency for all site accesses along Ridgewalk Parkway and Woodstock Parkway.



1.2 Bicycle and Pedestrian Facilities

The proposed development is designed to be a highly pedestrian friendly shopping center. This pedestrian friendly environment will be created through the use of wide sidewalks, allowing for walkers and bikers, and strategically placed aesthetic plantings. Additionally, the developer is proposing sidewalk improvements along both sides of Woodstock Parkway as well as along one side of Ridgewalk Parkway and one side of Rope Mill Road for the entire frontage of the site.

- Approximately 1500 linear feet of sidewalk is proposed along the east and west sides of Woodstock Parkway from its intersection with Ridgewalk Parkway on the north to Rope Mill Road to the south.
- Approximately 710 linear feet of sidewalk is proposed along the north side of Rope Mill Road east from its intersection with Woodstock Parkway.
- Sidewalk installation is also being planned along the south side of Ridgewalk Parkway from Woodstock Parkway to the adjoining property to the east.
- In addition to developer-installed sidewalks, the City of Woodstock is planning further sidewalk installations on three (3) of the area roadways surrounding the site (Ridgewalk Parkway, Woodstock Parkway and Rope Mill Road).

1.3 Transit Facilities

Currently there are no transit agencies that service the proposed development area. Information obtained from the City of Woodstock and Cherokee County indicated that there are no current plans for any future transit elements in this area.

GRTA has an Xpress commuter service route originating from the Woodstock Community. Route 490 provides four commuter coaches from Canton and Woodstock to Midtown and Downtown Atlanta, Monday-Friday. No reverse commute service is available. The route begins at Boling Park in Canton and stops at the Woodstock Community Church, approximately 1.5 miles southeast from the development, before proceeding to Midtown Atlanta at 14th Street with continuing service to Downtown Atlanta.





The 173-space Boling Park is located off GA Hwy 5, just south of Cherokee County High School, approximately 8 miles north of the development in Canton, GA 30114. The 100-space Woodstock Community Church is located at 8534 Main St., Woodstock, GA 30188. Source: www.XpressGA.com

2.0 Traffic Analyses - Methodology and Assumptions

2.1 Existing Facilities

The area roadways in the vicinity of the proposed development offer drivers a wide range of travel paths with functional classifications including Urban Local Streets, Urban Minor Streets, Urban Collector Streets and Urban Principal streets. There are three basic functional classifications of roadways: arterial, collector and local roads. All streets and highways are grouped into one of these classifications depending on the character of traffic (i.e., local or long distance) and the degree of property access they allow. See **Table 2** for a list of existing roadways in the study network and their existing functional classification as defined by the Georgia Department of Transportation (GDOT).

Table 2					
Existing Roadway Facilities	with Functional Classification				
Roadway Name	GDOT Classification				
Ridgewalk Pkwy	Urban Local Street				
Woodstock Pkwy	Urban Local Street				
Rope Mill Rd	Urban Local Street				
Toonigh Rd	Urban Local Street				
River Park Blvd	Urban Local Street				
Neese Rd	Urban Local Street				
Dupree Rd	Urban Local Street				
Canton Hwy	Urban Minor Arterial				
Towne Lake Pkwy	Urban Minor Arterial				
East Cherokee Dr	Urban Minor Arterial				
Arnold Mill Rd	Urban Minor Arterial				
Sixes Rd	Urban Collector Street				
Hwy 92	Urban Principal Arterial				



2.2 Growth Rate

Historical traffic volumes were analyzed utilizing volume data gathered from the Georgia Department of Transportation. Volume data from 6 previous years was assembled to help determine a background traffic growth rate on the roadways within the study network. Based on recent travel trends in traffic along the area roadways, as well as the population growth rates of Cherokee County from the 1990 to 2000 Census, a growth rate of 2.0% per year was used to calculate all future traffic. This 2% growth rate was approved by GRTA during the methodology review process and is documented in GRTA's Letter of Understanding dated November 26, 2007.

2.2.1 Traffic Data Collection

Vehicle turning movement counts were collected by Reliable Traffic Data Services, LLC and LAI Engineering for weekday AM (7:00 am - 9:00 am) and weekday PM (4:00 pm - 6:00 pm) peak periods. Peak hour counts were also collected for a typical Saturday Peak period (12:00 pm - 2:00 pm). Counts were performed from Tuesday October 16, 2007 through Tuesday December 4, 2007. The peak hours utilized for all traffic analysis were 7:00am - 8:00am and 4:30pm - 5:30pm for all weekday periods. The Saturday peak hour period was determined to be from 12:30 pm - 1:30 pm. See Appendix C for Peak Hour Traffic Counts.

2.3 Detailed Intersection Analysis

Level of service (LOS) is used to describe the operating characteristics of a road segment or intersection in relation to its capacity. LOS is defined as a quantitative measure that describes operational conditions and motorist perceptions within a traffic stream. The Highway Capacity Manual defines six levels of service, LOS A through LOS F, with A being the best and F being the worst. Level of service analyses were conducted at all intersections within the study network using Synchro Professional, Version 7.

Levels of service for signalized intersections are reported for individual movements as well as for the intersection as a whole. One or more movements at an intersection may experience a low level of service, while the intersection as a whole may operate acceptably.



Levels of service for un-signalized intersections, with stop control on the minor street only are reported for the minor (side) street left turn movements and for the side street approaches. Low levels of service for side street approaches are not uncommon, as vehicles may experience delay in turning onto major roadways.

If an intersection or roadway segment (corridor) was found to be below the acceptable level of service, as established by the city standards, it was improved to an acceptable level of service before the analysis could be considered complete. See section 6.4 for Corridor Segment Study.

3.0 <u>Study Network</u>

3.1 Existing Facilities

As stated earlier, there are three (3) functional classifications of roadways: arterial, collector and local roads. All streets and highways are grouped into one of these classifications, depending on the character of traffic (i.e., local or long distance) and the degree of land access they allow. See **Table 2** for a list of area roadways included in the study network and the functional classification of each. Functional classifications were determined using the GDOT website. See the following photographs of the major intersections in the study network.







Photograph 1 is looking East Bound from Towne Lake Parkway at I-575 North Bound Ramp.

Photograph 2 is looking West Bound from Towne Lake Parkway at I-575 North Bound Ramp.









Photograph 3 is looking East Bound from Sixes Road at I-575 South Bound Ramp.

Photograph 4 is looking West Bound from Sixes Road just before the I-575 North Bound Ramp.







Photograph 5 is looking East Bound from Towne Lake Parkway at Canton Highway.

Photograph 6 is looking North Bound from Canton Highway at Towne Lake Parkway/Arnold Mill Road.









Photograph 7 is looking West Bound from Rope Mill Road at Woodstock Parkway.

Photograph 8 is looking North Bound from Woodstock Parkway at Rope Mill Road.







Photograph 9 East Bound from Ridgewalk Parkway at Woodstock Parkway.

Photograph 10 is looking North Bound from Woodstock Parkway at Ridgewalk Parkway.





3.2 Study Network Determination

The study network was determined by evaluating the amount of traffic that the proposed development will add to each roadway segment in the area. According to GRTA's requirements, a roadway segment carries a "significant" amount of traffic if the project contributes 7% or more trips to the two-way daily service volumes of the roadway at the appropriate level of service standard. Upon agreement with GRTA, a standard LOS D was used for determining the study network area. See **Figure 4** for Study Network Intersections. See **Appendix A** for GRTA's 7% study network determination table.

The traffic generated by the proposed project was then assigned to the area roadways using a trip distribution process (historical travel trends, residential densities and engineering judgment) to determine the site-generated traffic volumes on each roadway segment. The boundaries of the study network extend to the most distant intersections where at least 7% of the service volumes on the segment are attributed to the project traffic. The following intersections were found to have site generated volumes in keeping with the 7% rule and have been included in the traffic study:

- SR 92 @ Canton Hwy Rope Mill Rd @ Woodstock Pkwy
- Canton Hwy @ Dupree Rd Ridgewalk Pkwy @ Woodstock Pkwy
- Towne Lake Pkwy @ I-575 SB Ramp Canton Hwy @ Ridgewalk Pkwy
- Towne Lake Pkwy @ I-575 NB Ramp Canton Hwy @ E. Cherokee Dr
- Towne Lake Pkwy @ Woodstock Pkwy Canton Hwy @ Toonigh Rd
- Towne Lake Pkwy @ Canton Hwy Canton Hwy @ River Park Blvd
- Arnold Mill Rd @ Dobbs Rd Canton Hwy @ Sixes Rd
- Arnold Mill Rd @ Neese Rd Sixes Rd @ I-575 SB Ramps
- Canton Hwy @ Rope Mill Rd Sixes Rd @ I-575 NB Ramps



NOT ISSUED FOR CONSTRUCTION





3.3 Gross Trip Distribution

Trip generation estimates were based on the rates and equations published in the 7th Edition of the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (2003). The ITE *Trip Generation Manual* contains traffic volume count data collected at similar facilities nationwide. The proposed development will consist of 348,760 square feet of retail space and 4,240 square feet of office space. See **Table 3** for Weekday gross site trips and **Table 4** for Saturday gross site trips.





Table 3 Weekday Gross Site Trip Generation									
Land Use Code/Size	24 Hour 2-Way Volume	Movement Direction	AM Peak Trips	PM Peak Trips	PM Internal Trips	PM External Trips	PM Pass-By Trips	AM Net New Trips	PM Net New Trips
			POD A - 2	2010 Buil	ld-Out				
Shopping Center	11 820	Enter	173	495	40	628	143	173	312
820/275,260 SF	11,020	Exit	110	537	43	604	156	110	338
High Turn Over	0.5(0	Enter	168	186	15	339	80	168	91
(Sit Down) Rest. 932/28,000 SF	3,560	Exit	155	119	10	264	51	155	58
General Office	47	Enter	6	1	-	7	-	6	1
720/4,240 SF	77	Exit	1	5	_	6	-	1	5
Total	15 427	Enter	347	682	55	627	223	347	404
	10,72,	Exit	266	661	53	608	207	266	401
	-		POD B - 2	2010 Buil	d-Out	1.	1.	1.	
Shopping Center	558	Enter	8	23	-	31	16	8	7
820/13,000 SF		Exit	5	25	-	30	18	5	7
Drive-in Bank	1109	Enter	31	103	-	134	48	31	55
912/4,500 SF		Exit	24	103	-	127	48	24	55
High Turn Over	1070	Enter	60	67	-	127	29	60	38
(Sit Down)Rest. 932/10,000 SF	1272	Exit	55	43	-	98	18	55	25
Fast-Food Rest.		Enter	122	81	-	203	101	62	40
w/ Drive-Thru 934/4,500 SF	2233	Exit	117	75	-	192	95	60	37
Pharmacy		Enter	21	57	-	21	0	21	57
w/ Drive-Thru 881/13,500 SF	1190	Exit	15	59	-	15	0	15	59
Total	6362	Enter	242	331	-	573	194	182	197
Total	0302	Exit	216	305	-	521	179	159	183
Total AM & PM Peak Net New Trips Generated by POD A & B - 2010 Build-Out									
Total	21,789	Enter	589	1013	55	1,547	417	529	601
Total	21,707	Exit	482	966	53	1,395	386	425	584



Table 4 Saturday Gross Site Trip Generation									
Land Use Code/Size	24 Hour 2-Way Volume	Movement Direction	Saturday Peak Total Trips	Internal Trips	External Trips	Pass-By Trips	Net New Saturday Trips		
POD A - 2010 Build-Out									
Shopping Center	11 820	Enter	710	-	710	227	483		
820/275,260 SF	11,020	Exit	658	-	658	210	448		
High Turn Over	2 5/0	Enter	353	-	353	-	353		
(SIT Down)Rest. 932/28,000 SF	3,300	Exit	207	-	207	-	207		
General Office 720/4,240	47	Enter	1	-	1	-	1		
SF	47	Exit	1	-	1	-	1		
Total	15 407	Enter	1,064	-	1,064	227	837		
TOTAL	15,427	Exit	866	-	866	210	656		
POD B - 2010 Build-Out									
Shopping Center	558	Enter	34	-	34	13	21		
820/13,000 SF		Exit	31	-	31	12	19		
Drive-in Bank	1109	Enter	85	-	85	-	85		
912/4,500 SF		Exit	82	-	82	-	82		
High Turn Over	1070	Enter	126	-	126	-	126		
(SIT Down)Rest. 932/15,200 SF	1272	Exit	74	-	74	-	74		
Fast-Food Rest.	0000	Enter	136	-	136	-	136		
w/ Drive-Thru 934/4,500 SF	2233	Exit	131	-	131	-	131		
Pharmacy	1100	Enter	53	-	53	-	53		
w/ Drive-Thru 881/13,500 SF	1190	Exit	53	-	53	-	53		
Tabal	(2/2	Enter	434	-	434	13	421		
lotai	6362	Exit	371	-	371	12	359		
Total Saturday Peak Net New Trips Generated by POD A & B - 2010 Build-Out									
Tatal	21 700	Enter	1,498	-	1,498	240	1,258		
וטנמו	21,/89	Exit	1,237	-	1,237	222	1,015		


3.4 Level of Service Standards

The City of Woodstock does not currently have a standard level of service. For the purpose of this DRI analysis and as per the previously mentioned GRTA technical guidelines, a standard LOS D was utilized for all analyses.

The LOS is assigned based on intersection average control delay and the "V/C" ratio is calculated by volume to capacity ratio and control delay. See Table 5 and Table 6 for LOS and V/C ratio criteria.

			Table 5
		Level of Se	ervice Criteria (Delay, sec)
Level of Service (LOS)	Average Vehicle for Signalized Control Delays (Seconds)	Average Vehicle for Un-Signalized Control Delays (Seconds)	Description
A	<u><</u> 10.0	<u><</u> 10.0	Free Flow/Insignificant Delays: No approach phase is fully utilized by traffic and no vehicle waits longer than one red indication.
В	10.1-20.0	10.1 - 15.0	Stable Operation/Minimal Delays: An occasional approach phase is fully utilized. Many drivers begin to feel somewhat restricted within platoons of vehicles.
С	20.1-35.0	15.1 - 25.0	Stable Operation/Acceptable Delays: Major approach phases fully utilized. Most drivers feel somewhat restricted.
D	35.1-55.0	25.1 - 35.0	Approaching Unstable/Tolerable Delays: Drivers may have to wait through more than one red signal indication. Queues may develop but dissipate rapidly, without excessive delays.
E	55.1-80.0	35.1 - 50.0	Unstable Operation/Significant Delays: Volumes at or near capacity. Vehicles may wait through several signal cycles. Long queues form upstream from intersection
F	<u>></u> 80.1	<u>></u> 50.1	Forced Flow/Excessive Delays: Represents jammed conditions. Intersection operates below capacity with low volumes. Queues may block upstream intersections.

Source: Transportation Research Board, *Highway Capacity Manual* (2000)

It is important to note that is not uncommon to have an un-signalized intersection to have an approach (usually a side street) to have an unacceptable LOS. This does not mean that the intersection as a whole is not operating at an acceptable level of service.



		Table 6
Level of	Volume/	
Service	Capacity	Description
(LOS)	Ratio	
А	0.00 - 0.60	Excellent: No vehicle waits longer than one red light and no approach phase are fully used.
В	0.61 - 0.70	Very Good: An occasional approach phase is fully utilized. Many drivers begin to feel somewhat restricted within groups of vehicles.
С	0.70 - 0.80	Good: Occasionally drivers may have to wait through more than one red light. Backups may develop behind turning vehicles.
D	0.81 - 0.90	Fair: Delays may be substantial during portions of the rush hours, but enough lower volume periods occur to permit clearing of developing lines, preventing excessive backups.
E	0.91 - 1.00	Poor: Represents the most vehicles intersection approaches can accommodate. May be long lines of waiting vehicles throughout several signal cycles.
F	>1.00	Failure: Backups from nearby locations or on cross streets may restrict or prevent the movement of vehicles out of the intersection approaches. Tremendous delays with continuously increasing queue lengths.

Source: Transportation Research Board, *Transportation Research Circular* No. 212, *Interim Materials on Highway Capacity* (1980).





4.0 Trip Generation

As stated earlier in section 3.3, trips associated with the proposed development were estimated using the *ITE Trip Generation Manual*, Seventh Edition (2003). Pass-by reductions were taken for the retail land uses based on ITE's Trip Generation Handbook, October 1998. The reductions were based on 29% pass-by reduction for a commercial shopping center land use, a 50% pass-by reduction for fast food restaurants and a 43% pass-by reduction for sit down restaurants. The pass-by reductions were limited to 10% of the adjacent street volumes per GRTA's standards. The site trips generated and the reductions taken were presented in Table 3 and Table 4.

5.0 <u>Trip Distribution</u>

The trip distribution is the percentage of the traffic generated by the site that uses each segment of the surrounding roadway network. A trip distribution is estimated for the land use for the site. The site generated traffic distributions were based on knowledge of the roadway system in conjunction with engineering judgment and historical travel trends within the defined study network. Historical travel trend data gathered from average daily traffic (ADT) was taken from the GDOT web-site and utilized 2006 annual traffic data to develop the distributions. The distributions were discussed and agreed upon in the methodology process with GRTA. See Figure 5 for the 2006 Network ADT numbers. Note that no historical data was available for Ridgewalk Parkway or Woodstock Parkway from GDOT, Cherokee County or the City of Woodstock.

See Figure 6, Figure 7, for Scenarios 1 (Without Rope Mill Rd / I-575 Interchange) and Scenario 2 (With Rope Mill Rd / I-575 Interchange), site trip distribution percentages. See Figure 8 and Figure 9 for Scenarios 1 (Without Rope Mill Rd / I-575 Interchange) and Scenario 2 (With Rope Mill Rd / I-575 Interchange), site trip distribution volumes.









NOT ISSUED FOR CONSTRUCTION







6.0 Traffic Analysis

6.1 Existing Traffic

Existing traffic was analyzed at recommended intersections which were identified by GRTA during the methodology process and then confirmed by GRTA's Letter of Understanding. Any intersection that was found to be below the standard LOS D had to be improved in the analysis models before any future traffic analysis could be completed. This would insure that the area intersections would operate, and will continue to operate at an acceptable level of service.

The recommended improvements for those intersections which did not meet the standard level of service (LOS) D were made and all future traffic analysis includes those recommended improvements. The existing analysis was performed using Synchro 7 and the results are shown in Table 7.

See Table 7 for Existing Intersection Levels of Service.

* NOTE: It is important to note that is not uncommon to have an un-signalized intersection to have an approach (usually a side street) to have an unacceptable LOS. This does not mean that the intersection as a whole is not operating at an acceptable level of service.



Evicting 20	Table 7									
Existing 20	Jor merse		AM Peak Hour		PM Peak Hour		Sat Peak Hour			
Intersection	Traffic Control	Approach	LOS (Delay)	v/c	LOS (Delay)	v/c	LOS (Delay)	v/c		
Canton Highway @ Hwy 92	Signalized		C (33.6)		C (32.0)		B (10.8)			
Canton Highway @ Dupree Rd	Signalized		B (14.8)		B (14.5)		A (7.7)			
Towne Lake Pkwy @ I-575 SB Ramp	Signalized		B (17.0)		C (23.0)		B (11.5)			
Towne Lake Pkwy @ I-575 NB Ramp	Signalized		C (20.5)		D (43.1)	1.01	A (9.1)			
Towne Lake Pkwy @ Woodstock Pkwy	Signalized		A (7.2)		B (13.4)		B (10.2)			
Towne Lake Pkwy @ Canton Highway	Signalized		C (32.5)		C (31.4)		C (27.3)			
		South								
Arnold Mill @ Dobbs Rd	Un- Signalized	East	A (0.0)		A (0.0)		A (0.0)			
		West	A (0.0)		A (0.0)		A (0.0)			
Arnold Mill Road @ Neese Rd	Signalized		A (0.0)		A (0.0)		A (6.3)			
		North	A (2.3)		A (2.8)		A (0.0)			
Capton Highway @ Popo Mill Pd	Un-	South	A (0.1)		A (0.4)		A (0.0)			
	Signalized	East	B (13.7)		C (17.1)		B (11.8)			
		West	B (13.6)		* E (45.5)					
		North	A (0.0)		A (0.0)		A (0.0)	1		
Woodstock Pkwy @ Rope Mill Rd	Un- Signalized	South	A (8.1)		A (8.5)		A (8.5)			
		West	C (23.4)		C (17.8)		C (19.7)			
Ridgewalk Pkwy @ Woodstock Pkwy	Signalized		A (8.4)		A (8.8)		A (9.5)	1		
Canton Highway @ Ridgewalk Pkwy	Signalized		B (11.2)		B (12.9)		A (8.8)			
Canton Highway @ East Cherokee Dr	Signalized		C (24.6)		B (16.4)		B (13.1)			
Canton Highway @ Toonigh Rd	Signalized		B (11.9)		B (15.2)		A (1.0)			

Color Legend

0				
LOS A	LOS B	LOS C	LOS D	LOS E or F



Table 7 cont. Existing 2007 Intersection Levels of Service (Delay, sec)										
<u>_</u>	Troffic	A		AM Peak	Hour	PM Peak	Hour	Sat Peak Hour		
Intersection	Control	Approach	LOS (Delay)	v/c	LOS (Delay)	v/c	LOS (Delay)	v/c		
Canton Highway @ River Park Blvd		North	B (11.0)		B (11.7)		A (0.0)			
	Un- Signalized	South	A (0.0)		A (0.0)		A (0.0)			
		East	* F (243.1)		* F					
		West	* F (97.4)		* F (842.3)					
Canton Highway @ Sixes Rd	Signalized		B (16.6)		B (15.7)		C (22.2)			
Sixes Road @ I-575 NB Ramp	Signalized		B (10.6)		C (25.8)		B (10.5)			
Sixes Road @ I-575 SB Ramp	Signalized		B (10.5)		B (13.3)		C (21.4)			

Color Legend				
LOS A	LOS B	LOS C	LOS D	LOS E or F

See Figure 10 for 2007 Existing Lane Geometry and Figure 11 for 2007 Existing Turning Movement Counts.

Based on intersection analysis under 2007 Existing conditions, there were **no** intersections below the standard LOS D.



NOT ISSUED FOR CONSTRUCTION





6.2 Scenario 1 (Without Rope Mill Rd / I-575 Interchange), 2010 No-Build Traffic

The Avenue Ridgewalk development is currently scheduled to be built out by the end of 2010. Scenario 1 is based only on the projected build-out year traffic conditions without the proposed Rope Mill Rd / I-575 interchange.

The projected build-out year traffic conditions consist of the following key elements:

- Potential increase in through traffic based on historical growth trends. (2%)
- Projected trip generation for other approved developments within the immediate site area which are likely to be built out by year 2010. (Home Depot DRI# 928)
- Any planned and programmed transportation system improvements which would impact the configuration and capacity of the study area roadway network by 2010.

This DRI transportation analysis applied a conservative two percent (2.0%) annual growth factor in through traffic for the study area network and took into consideration traffic generated by the approved background developments. The background developments considered in this study were based on the following:

- Economics Development Map of The City of Woodstock, office of Deputy Mayor for Planning and Economics Development; and
- Development activity information provided by the Office of Planning, GDOT.

* NOTE: It is important to note that is not uncommon to have an un-signalized intersection to have an approach (usually a side street) to have an unacceptable LOS. This does not mean that the intersection as a whole is not operating at an acceptable level of service.

See Table 8 for Scenario 1 (Without Rope Mill Rd / I-575 Interchange), 2010 No-Build Levels of Service.



Table 8										
Scenario 1 (Without Rope Mill Rd / I-575 Interchange),										
2010 No-Build Intersection Levels of Service (Delay, sec)										
Intersection	Traffic	Approach	LOS	HOUI		, HOUI	LOS	noui		
	Control		(Delay)	V/C	(Delay)	V/C	(Delay)	V/C		
Canton Highway @ Hwy 92	Signalized		C (29.0)		C (30.2)		C (30.8)			
Canton Highway @ Dupree Rd	Signalized		B (16.6)		B (16.8)		A (8.1)			
Towne Lake Pkwy @ I-575 SB Ramp	Signalized		B (19.9)		A (7.6)		B (12.7)			
Towne Lake Pkwy @ I-575 NB Ramp	Signalized		C (21.3)		D (53.1)	1.09	B (13.5)			
Towne Lake Pkwy @ Woodstock Pkwy	Signalized		A (8.3)		B (12.6)		B (15.3)			
Towne Lake Pkwy @ Canton Highway	Signalized		D (37.2)	1.03	D (36.5)	0.95	C (29.1)			
		South								
Arnold Mill @ Dobbs Rd	Un- Signalized	East	A (0.0)		A (0.0)		A (0.0)			
		West	A (0.0)		A (0.0)		A (0.0)			
Arnold Mill Road @ Neese Rd	Signalized		A (0.5)		A (0.6)		A (6.4)			
		North	A (2.4)		A (3.0)		A (0.0)			
Canton Highway @ Rone Mill Rd	Un-	South	A (0.1)		A (0.4)		A (0.0)			
cantor righway e Rope will Ru	Signalized	East	B (14.4)		C (18.8)		B (12.1)			
		West	B (14.4)		* F (57.7)					
		North	A (0.0)		A (0.0)		A (0.0)			
Woodstock Pkwy @ Rope Mill Rd	Un- Signalized	South	A (1.2)		A (0.9)		A (1.7)			
		West	D (26.0)		C (20.0)		C (23.0)			
Ridgewalk Pkwy @ Woodstock Pkwy	Signalized		A (8.1)		A (9.6)		B (10.2)			
Canton Highway @ Ridgewalk Pkwy	Signalized		B (11.0)		B (13.6)		B (10.5)			
Canton Highway @ East Cherokee Dr	Signalized		C (28.7)		C (25.2)		C (20.7)			
Canton Highway @ Toonigh Rd	Signalized		B (14.8)		C (29.2)		A (4.3)			

Colo	r Leo	pend
0010		10110
		,

LOS A	LOS B	LOS C	LOS D	LOS E or F



Table 8 cont. Scenario 1 (Without Rope Mill Rd / I-575 Interchange), 2010 No-Build Intersection Levels of Service (Delay, sec)											
	Traffic		AM Peak	Hour	PM Peak	Hour	Sat Peak	Hour			
Intersection	Control	Approach	LOS (Delay)	v/c	LOS (Delay)	v/c	LOS (Delay)	v/c			
		North	B (11.5)		B (13.1)		A (0.0)				
Canton Highway @ Divor Dark Blud	Un- Signalized	South	A (0.0)		A (0.0)		A (0.0)				
Canton Highway @ Kivel Fark bivu		East	* F (333.9)		* F						
		West	* F (120.0)		* F (795.9)						
Canton Highway @ Sixes Rd	Signalized		B (16.8)		B (18.7)		D (50.9)	1.20			
Sixes Road @ I-575 NB Ramp	Signalized		B (11.6)		D (54.6)	1.10	D (39.3)	1.15			
Sixes Road @ I-575 SB Ramp	Signalized		B (13.5)		B (15.5)		D (45.2)	1.04			

Color Legend				
LOS A	LOS B	LOS C	LOS D	LOS E or F

See Figure 12 for Scenario 1 (Without Rope Mill Rd / I-575 Interchange), 2010 No-Build AM-PM-SAT Peak Conditions.

Based on intersection analysis under Scenario 1 (Without Rope Mill Rd I-575 Interchange), 2010 No-Build condition, there were **no** intersections below the standard LOS D.





6.3 Scenario 1 (Without I-575 / Interchange), 2010 Build Traffic

Traffic generated by the development was combined with projected 2010 No-Build traffic volumes and analyzed with the recommended 2010 No-Build improvements to the network.

* NOTE: It is important to note that is not uncommon to have an un-signalized intersection to have an approach (usually a side street) to have an unacceptable LOS. This does not mean that the intersection as a whole is not operating at an acceptable level of service.

See Table 9 for Scenario 1 (Without Rope Mill Rd / I-575 Interchange), 2010 Build Levels of Service.

Table 9											
Scenario 1 (Without Rope Mill Rd / 1-575 Interchange), 2010 Build Intersection Levels of Service (Delay, sec)											
Traffic AM Peak Hour PM Peak Hour Sat Peak Hour											
Intersection	Control	Approach	LOS (Delay)	v/c	LOS (Delay)	v/c	LOS (Delay)	v/c			
Canton Highway @ Hwy 92	Signalized		C (31.0)		C (33.0)		D (42.5)	1.01			
Canton Highway @ Dupree Rd	Signalized		C (27.8)		C (25.8)		C (22.3)				
Towne Lake Pkwy @ 1-575 SB Ramp	Signalized		B (19.6)		C (26.4)		B (17.2)				
Towne Lake Pkwy @ I-575 NB Ramp	Signalized		B (18.6)		E (62.3)	1.09	B (19.0)				
Towne Lake Pkwy @ Woodstock Pkwy	Signalized		A (7.0)		C (20.2)		B (18.4)				
Towne Lake Pkwy @ Canton Highway	Signalized		D (52.0)	1.20	E (77.4)	1.26	F (101.0)	1.38			
		South	B (10.1)		B (12.2)		B (12.8)				
Arnold Mill @ Dobbs Rd	Un- Signalized	East	A (0.1)		A (0.2)		A (0.3)				
		West	A (0.0)		A (0.0)		A (0.0)				
Arnold Mill Road @ Neese Rd	Signalized		A (1.6)		A (1.4)		A (6.9)				
		North	A (1.8)		A (5.5)		A (0.0)				
Canton Highway @ Done Mill Dd	Un-	South	A (0.1)		A (0.9)		A (0.0)				
	Signalized	East	C (21.8)		* F (657.8)		D (31.8)				
		West	* E (37.1)		* F						
Drive 4 / 5	Signalized		B (10.1)		B (14.7)		C (33.7)				

Color Legend				
LOS A	LOS B	LOS C	LOS D	LOS E or F



Table 9 cont.								
Scenario 1	(Without R	Rope Mill Ro	d / I-575	Intercl	nange),			
2010 Bullo	intersecti	on Leveis (y, sec)	Hour	Sat Doak	Hour
Intersection	Traffic Control	Approach	LOS (Delay)	v/c	LOS (Delay)	v/c	LOS (Delay)	v/c
		North	A (0.0)		A (0.0)		A (0.0)	
Woodstock Pkwy @ Rope Mill Rd	Un- Signalized	South	A (8.4)		A (9.1)		A (9.6)	
		West	* E (42.2)		D (27.6)		* F (57.2)	
		North	A (9.4)		A (8.4)		A (8.8)	
Drive 2 / 3	Un-	South	A (8.2)		A (9.0)		A (9.6)	
	Signalized	East	B (11.6)		B (10.2)		B (10.3)	
		West	A (9.6)		B (10.6)		B (11.8)	
Ridgewalk Pkwy @ Woodstock Pkwy	Signalized		B (18.9)		B (15.6)		E (57.7)	1.17
	Un- Signalized	North	B (14.1)		C (22.1)		* F (69.8)	
Drive 1		East	A (0.0)		A (0.0)		A (0.0)	
		West	A (0.0)		A (0.0)		A (0.0)	
Canton Hwy @ Ridgewalk Pkwy	Signalized		B (19.7)		C (25.9)		E (68.1)	1.25
Canton Highway @ East Cherokee Dr	Signalized		C (31.8)		C (32.5)		C (26.5)	
Canton Highway @ Toonigh Rd	Signalized		B (16.5)		D (36.0)	1.01	A (9.6)	
		North	B (12.1)		B (14.2)		B (13.7)	
Canton Highway @ River Park Blvd	Un-	South	A (0.0)		A (0.0)		A (0.0)	
<u> </u>	Signalized	East	* F (449.4)		* F		D (31.2)	
		West	* F (163.8)		* F (1494)			
Canton Highway @ Sixes Rd	Signalized		C (20.2)		C (21.1)		F (89.2)	1.40
Sixes Road @ I-575 NB Ramp	Signalized		B (12.0)		E (60.3)	1.14	D (41.8)	1.16
Sixes Road @ I-575 SB Ramp	Signalized		B (14.1)		D (48.8)	1.22	E (58.7)	1.11

Color Legend				
LOS A	LOS B	LOS C	LOS D	LOS E or F

See Figure 13 for Scenario 1 (Without Rope Mill Rd / I-575 Interchange), 2010 Build AM-PM-SAT Peak Conditions.



NOT ISSUED FOR CONSTRUCTION



Based on intersection analysis under Scenario 1 (Without Rope Mill Rd / I-575 Interchange), 2010 Build condition, there were seven (7) intersections that did not meet the standard LOS D. To provide appropriate Levels of Service, improvements to the intersections are recommended. Listed below are the recommended improvements, by intersection:

- Towne Lake Parkway @ 575 NB Ramp
 - Recommend adding a right turn storage lane (approx. 100 ft.) to Towne Lake
 Parkway at the WB approach to I-575 NB on ramp.
- Canton Hwy @ Towne Lake Parkway
 - The City of Woodstock recognizes that limited intersection improvements can be made to the intersections or roadway segments around the intersection of Canton Hwy and Towne Lake Parkway/Arnold Mill Road. Woodstock's historic downtown commercial district has many buildings and landmarks that are trademarks of the city and are registered as National Historical Places. These historic designations prevent the addition of or widening of lanes in and around the intersection of Canton Hwy and Towne Lake Parkway /Arnold Mill Road; therefore, all measured operational efficiencies below the standard LOS of D will have no recommended improvements.
- Ridgewalk Parkway @ Woodstock Parkway
 - Recommend adding additional WB left turn storage lane (approx. 200 ft.) on Ridgewalk Parkway.
- Canton Hwy @ Ridgewalk Parkway
 - Recommend adding a dual left on the EB approach of Ridgewalk Parkway (approx 235 ft). Utilize existing NB right turn on Canton Hwy as a receiving lane that would taper back into one lane (approx 350 ft.)
- Canton Rd @ Sixes Road
 - Recommend adding additional EB left turn storage (approx. 200 ft.) and convert existing EB left turn lane into an EB exclusive thru lane, also add additional EB right storage (approx. 200 ft.).
 - Recommend adding additional SB Iane on Canton Hwy starting at Sixes road and turning into a right turn exclusive Iane at River Park Blvd.



- Sixes Road @ I-575 NB Ramp
 - Recommend adding additional right turn storage (approx. 650 ft.) to NB exit ramp making a dual signalized right turn with a shared thru left.
- Sixes Road @ I-575 SB Ramp
 - Above recommendations for Canton Hwy @ Sixes Rd and Sixes Road @ I-575 ramp adjust the SB ramp intersection level of service to and acceptable LOS D.

See Table 10 for Scenario 1 (Without Rope Mill Rd / I-575 Interchange), 2010 Build Improved Levels of Service.

Table 10 Scenario 1 (Without Rope Mill Rd / I-575 Interchange), 2010 Build Improved Intersection Levels of Service (Delay, sec)								
Intersection	Traffic		AM Peak	Hour	PM Peak	Hour	Sat Peak	Hour
	Control	Approach	LOS (Delay)	v/c	LOS (Delay)	v/c	LOS (Delay)	v/c
Towne Lake Pkwy @ I-575 NB Ramp	Signalized				D (46.4)	1.09		
Towne Lake Pkwy @ Canton Highway	Signalized				See Note		See Note	
Ridgewalk Pkwy @ Woodstock Pkwy	Signalized						B (15.1)	
Ridgewalk Pkwy @ Woodstock Pkwy	Signalized						D 44.3	1.17
Canton Highway @ Sixes Rd	Signalized						D (36.8)	1.12
Sixes Rd @ I-575 NB Ramp	Signalized				D (40.5)	1.12		
Sixes Road @ I-575 SB Ramp	Signalized						D (54.4)	1.11

Color Legend

COIDI LEGENU				
LOS A	LOS B	LOS C	LOS D	LOS E or F

See Figure 14 for Scenario 1 (Without I-575 Interchange), 2010 Build Improved AM-PM-SAT Peak Conditions with Lane Geometry



NOT ISSUED FOR CONSTRUCTION



6.4 Scenario 2 (With Rope Mill Rd / I-575 Interchange), 2010 No-Build Traffic

The Avenue Ridgewalk development is currently scheduled to be built out by the end of 2010. **Scenario 2** is based on the projected build-out year traffic conditions along with the proposed full access interchange at Rope Mill Road and Interstate I-575 (GDOT project # 0006043).

The projected design year traffic conditions consist of the following key elements:

- Potential increase in through traffic based on historical growth trends. (2%)
- Projected trip generation for other approved developments within the immediate site area which are likely to be built out by year 2010. (Home Depot DRI# 928)
- Any planned and programmed transportation system improvements which would impact the configuration and capacity of the study area roadway network by 2010. (I-575 interchange GDOT project # 0006043 and City of Woodstock Project Ridgewalk Parkway Improvement)

This DRI Transportation Analysis applied a conservative two percent (2.0%) annual growth factor in through traffic for the study area network and took into consideration traffic generated by the approved background developments. The background developments considered in this study were based on the following:

- Economics Development Map of The City of Woodstock, office of Deputy Mayor for Planning and Economics Development; and
- Development activity information provided by the Office of Planning, GDOT.

* NOTE: It is important to note that is not uncommon to have an un-signalized intersection to have an approach (usually a side street) to have an unacceptable LOS. This does not mean that the intersection as a whole is not operating at an acceptable level of service.

See Table 11 for Scenario 2 (With Rope Mill Rd / I-575 Interchange), 2010 No-Build Levels of Service



		Table 11	Table 11								
Scenario 2 (With Rope Mill Rd / I-575 Interchange),											
2010 No-Bu	Id Intersec	tion Levels	s of Servi	ce (De	ay, sec)	Hour	Sat Dook	Hour			
Intersection	Traffic Control	Approach	LOS	Hour	LOS	HOUL	LOS	HOUL			
			(Delay)	v/C	(Delay)	V/C	(Delay)	V/C			
Hwy 92 @ 1-575 SB Ramp	Signalized		A (6.2)		A (5.1)		A (4.1)				
Hwy 92 @ I-575 NB Ramp	Signalized		A (3.7)		A (5.2)		A (5.1)				
Canton Highway @ Hwy 92	Signalized		C (30.6)		C (30.2)		C (30.8)				
Canton Highway @ Dupree Rd	Signalized		B (17.8)		B (16.0)		A (7.8)				
Towne Lake Pkwy @ I-575 SB Ramp	Signalized		B (18.7)		C (30.0)		B (12.8)				
Towne Lake Pkwy @ I-575 NB Ramp	Signalized		B (19.1)		D (50.8)	1.09	B (13.4)				
Towne Lake Pkwy @ Woodstock Pkwy	Signalized		A (7.6)		B (16.5)		B (14.9)				
Towne Lake Pkwy @ Canton Highway	Signalized		C (33.4)		D (52.7)	1.12	C (29.1)				
	Un- Signalized	South									
Arnold Mill @ Dobbs Rd		East	A (0.0)		A (0.0)		A (0.0)				
		West	A (0.0)		A (0.0)		A (0.0)				
Arnold Mill Road @ Neese Rd	Signalized		A (0.5)		A (0.5)		A (6.4)				
		North	A (2.4)		A (3.0)		A (0.0)				
Canton Highway @ Rone Mill Rd	Un-	South	A (0.1)		A (0.4)		A (0.0)				
	Signalized	East	B (14.4)		C (18.9)		B (12.1)				
		West	B (14.4		* F (58.1)						
		North	A (0.0)		A (0.0)		A (0.0)				
Woodstock Pkwy @ Rope Mill Rd	Un- Signalized	South	A (0.8)		A (8.7)		A (8.7)				
		West	D (26.0)		C (20.0)		C (23.0)				
Ridgewalk Pkwy @ I-575 SB Ramp	Signalized		B (15.1)		B (13.4)		B (15.2)				
Ridgewalk Pkwy @ I-575 NB Ramp	Signalized		A (2.3)		A (6.6)		A (9.8)				

Color Legend				
LOS A	LOS B	LOS C	LOS D	LOS E or F



Table 11 cont. Scenario 2 (With Rope Mill Rd / I-575 Interchange),								
2010 No-Build Intersection Levels of Service (Delay, sec)								
Intersection	Traffic	Annroach	AM Peak	Hour	PM Peak	Hour	Sat Peak	Hour
intersection	Control	Арргоаст	(Delay)	v/c	(Delay)	v/c	(Delay)	v/c
Ridgewalk Pkwy @ Woodstock Pkwy	Signalized		A (6.6)		A (6.2)		A (9.1)	
Canton Highway @ Ridgewalk Pkwy	Signalized		B (11.5)		B (14.0)		B (11.7)	
Canton Highway @ East Cherokee Dr	Signalized		C (31.4)		C (23.0)		C (20.7)	
Canton Highway @ Toonigh Rd	Signalized		B (18.8)		C (28.4)		A (4.4)	
		North	B (11.5)		B (13.1)		A (0.0)	
Canton Highway @ River Park Blvd	Un-	South	A (0.0)		A (0.0)		A (0.0)	
Canton highway e kiver raik biva	Signalized	East	* F (350.7)		* F			
		West	* F (123.5)		* F (759.8)			
Canton Highway @ Sixes Rd	Signalized		C (20.2)		C (20.7)		D (50.8)	1.20
Sixes Road @ I-575 NB Ramp	Signalized		B (12.9)		E (58.9)	1.13	D (40.0)	1.08
Sixes Road @ I-575 SB Ramp	Signalized		B (12.1)		B (15.3)		D (45.3)	1.04

Color Legend				
LOS A	LOS B	LOS C	LOS D	LOS E or F

See Figure 15 for Scenario 2 (With Rope Mill Rd / I-575 Interchange), 2010 No-Build AM-PM-SAT Peak Conditions.





Based on intersection analysis under Scenario 2 (With Rope Mill Rd / I-575 Interchange), 2010 No-Build condition, there was **one** (1) intersection that did not meet the standard LOS D. To provide appropriate Levels of Service, improvements were made to the roadway network. Listed below are the recommended improvements, by intersection, made to the roadway system.

- I-575 NB Ramp @ Sixes Road
 - Recommend adding additional right turn storage (approx. 650 ft.) to the NB I-575 off ramp.

See Table 12 for Scenario 2 (With Rope Mill Rd / I-575 Interchange), 2010 Improved Levels of Service.

Table 12 Scenario 2 (With Rope Mill Rd / I-575 Interchange), 2010 No-Build Improved Intersection Levels of Service (Delay, sec)								
Intersection	Traffic Control	Approach	AM Peak LOS (Delay)	t Hour v/c	PM Peak LOS (Delay)	t Hour v/c	Sat Peak LOS (Delay)	Hour v/c
Sixes Road @ I-575 NB Ramp					D (45.9)	1.12		

Color Legend

COLOR LEGGENA				
LOS A	LOS B	LOS C	LOS D	LOS E or F



6.5 Scenario 2 (With Rope Mill Rd / I-575 Interchange), 2010 Build Traffic

Traffic generated by the development was combined with projected 2010 No-Build traffic volumes and analyzed with the recommended 2010 No-Build improvements to the network. See **Table 13** for Scenario 2 (With Rope Mill Rd/I-575 Interchange), 2010 Build Levels of Service.

Table 13									
Scenario	2 (With Ro	pe Mill Rd	/ I-575 lr	itercha	inge),				
2010 Bullo	Intersecti	on Levels of	OT Service		y, sec)		Sat Dool	Hour	
Intersection	Traffic	Approach						. HOUI	
	Control		(Delay)	v/c	(Delay)	v/c	(Delay)	v/c	
SR 92 @ I-575 SB Ramps	Signalized		B (17.1)		A (5.6)		A (6.0)		
SR 92 @ I-575 NB Ramps	Signalized		A (6.7)		A (6.0)		A (5.9)		
Canton Highway @ Hwy 92	Signalized		C (30.5)		C (30.2)		C (30.5)		
Canton Highway @ Dupree Rd	Signalized		C (23.4)		C (25.1)		B (14.5)		
Towne Lake Pkwy @ I-575 SB Ramp	Signalized		C (26.5)		C (33.1)		B (17.8)		
Towne Lake Pkwy @ I-575 NB Ramp	Signalized		C (23.1)		E (68.3)	1.13	B (17.4)		
Towne Lake Pkwy @ Woodstock Pkwy	Signalized		A (7.8)		B (15.3)		B (15.9)		
Towne Lake Pkwy @ Canton Highway	Signalized		D (47.4)	1.16	E (61.0)	1.11	D (47.9)	1.01	
	Un- Signalized	South	B (10.1)		B (12.4)		B (12.5)		
Arnold Mill @ Dobbs Rd		East	A (0.1)		A (0.2)		A (0.2)		
		West	A (0.0)		A (0.0)		A (0.0)		
Arnold Mill Road @ Neese Rd	Signalized		A (1.6)		A (1.6)		A (6.8)		
		North	A (1.8)		A (4.2)		A (0.0)		
Canton Highway @ Rone Mill Rd	Un-	South	A (0.1)		A (0.6)		A (0.0)		
	Signalized	East	C (18.4)		* F (84.5)		C (18.1)		
		West	C (24.0)		* F (697.3)				
		North	A (0.0)		A (0.0)		A (0.0)		
Woodstock Pkwy @ Rope Mill Rd	Un- Signalized	South	A (8.3)		A (8.9)		A (8.9)		
	orginalized	West	D (33.4)		C (23.1)		D (29.3)		

Color Legend				
LOS A	LOS B	LOS C	LOS D	LOS E or F



Table 13 cont. Securation 2 (With Dama Mill Dd. (1575 Interchange)								
2010 Build Intersection Levels of Service (Delay, sec)								
Traffic AM Peak Hour PM Peak Hour Sat Peak Ho								Hour
Intersection	Control	Approach	LOS (Delay)	v/c	LOS (Delay)	v/c	LOS (Delay)	v/c
Drive 4 / 5	Signalized		B (10.1)		B (14.8)		C (24.5)	
		North	B (11.3)		A (9.6)		B (10.5)	
Drive 2 / 3	Un-	South	A (8.9)		A (10.0)		B (10.8)	
	Signalized	East	B (14.4)		B (11.7)		B (12.4)	
		West	A (9.9)		B (10.2)		B (10.6)	
Ridgewalk Pkwy @ I-575 SB Ramp	Signalized		C (25.8)		B (15.4)		B (18.8)	
Ridgewalk Pkwy @ I-575 NB Ramp	Signalized		A (5.9)		B (10.3)		B (17.8)	
Ridgewalk Pkwy @ Woodstock Pkwy	Signalized		B (13.7)		B (11.4)		B (18.0)	
		North	B (10.5)		B (11.7)		B (12.0)	
Drive 1	Un- Signalized	East	A (0.0)		A (0.0)		A (0.0)	
		West	A (0.0)		A (0.0)		A (0.0)	
Canton Highway @ Ridgewalk Pkwy	Signalized		B (14.3)		B (17.9)		B (18.1)	
Canton Highway @ East Cherokee Dr	Signalized		C (31.7)		C (26.9)		C (21.6)	
Canton Highway @ Toonigh Rd	Signalized		B (16.3)		C (31.4)		B (10.4)	
		North	B (11.7)		B (13.5)		B (12.5)	
Canton Highway @ River Park Blvd	Un-	South	A (0.0)		A (0.0)		A (0.0)	
<u> </u>	Signalized	East	* F (407.2)		* F		D (25.3)	
		West	* F (143.6)		* F (1098)			
Canton Highway @ Sixes Rd	Signalized		B (16.9)		C (21.1)		D (54.7)	1.20
Sixes Road @ I-575 NB Ramp	Signalized		B (11.7)		D (41.2)	1.09	B (17.6)	
Sixes Road @ I-575 SB Ramp	Signalized		B (13.7)		B (15.9)		D (41.8)	1.01

Color Legend

LUS A	LOS B	LUS C	LUS D	LUS E OF F
¥				

See Figure 16 for Scenario 2 (With Rope Mill Rd / I-575 Interchange), Build AM-PM-SAT Peak Conditions.





Based on intersection analysis under Scenario 2 (With Rope Mill Rd / I-575 Interchange), 2010 Build condition, there were two (2) intersections that did not meet the standard LOS D. The detailed graphics below show the intersections that are below the standard LOS D for the 2010 PM Build Scenario (excluding Canton Hwy at Towne Lake Parkway Arnold Mill Road).



- Towne Lake Parkway @ Canton Hwy
 - The City of Woodstock recognizes that limited intersection improvements can be made to the intersections or roadway segments around the intersection of Canton Hwy and Towne Lake Parkway/Arnold Mill Road. Woodstock's historic downtown commercial district has many buildings and landmarks that are trademarks of the city and are registered as National Historical Places. These historic designations prevent the addition of or widening of lanes in and around the intersection of Canton Hwy and Towne Lake Parkway /Arnold Mill Road; therefore, all measured operational efficiencies below the standard LOS of D will have no recommended improvements.



To provide appropriate Levels of Service, improvements were made to the roadway network. Listed below are the recommended Build improvements, by intersection, to the roadway system.



See Table 14 for Scenario 2 (With Rope Mill Rd / I-575 Interchange), 2010 Build Improved Level of Service.

Table 14 Scenario 2 (With Rope Mill Rd / I-575 Interchange), 2010 Build Improved Intersection Levels of Service (Delay, sec)								
	Traffic Control	Approach	AM Peak Hour		PM Peak Hour		Sat Peak Hour	
Intersection			LOS (Delay)	v/c	LOS (Delay)	v/c	LOS (Delay)	v/c
Towne Lake Pkwy @ I-575 NB Ramp					D (41.8)			
Towne Lake Pkwy @ Canton Highway					See Note			

Color Legend				
LOS A	LOS B	LOS C	LOS D	LOS E or F

See Figure 17 for Scenario 2 (With Rope Mill Rd / I-575 Interchange), 2010 Build Improved AM-PM-SAT Peak Conditions with Lane Geometry.



NOT ISSUED FOR CONSTRUCTION



6.6 Corridor Segment Study

Corridor analyses were preformed along segments of Ridgewalk Parkway, Canton Highway and Woodstock Parkway. Synchro 7.0 was utilized to calculate the existing, no-build and build corridor levels of service. A detailed segment analysis was completed based on those links within the study network, as defined by GRTA's Technical Analysis Guidelines. Table 15 illustrates the results.

Table 15 Avenue Ridgewalk Corridor Levels of Service							
	AM Peak	AM Peak Hour (LOS) PM Peak Hour (LOS) SAT Pe					
Ridgewalk Parkway	-		-				
Scenario	EB	WB	EB	WB	EB	WB	
2007 Existing	В	А	В	А	В	А	
2010 No-Build	С	А	С	А	С	В	
2010 Build	С	А	С	А	С	А	
Canton Hwy.							
Scenario	NB	SB	NB	SB	NB	SB	
2007 Existing	В	В	В	В	В	В	
2010 No-Build	В	В	С	В	В	В	
2010 Build	В	В	С	В	С	В	
Woodstock Parkway							
Scenario	NB	SB	NB	SB	NB	SB	
2007 Existing	А	В	А	В	А	В	
2010 No-Build	А	В	А	В	A	В	
2010 Build	С	В	В	В	В	В	

The results of the detailed segment analysis reveal that Ridgewalk Parkway, Canton Hwy and Woodstock Parkway will operate at acceptable levels of service during all analyzed scenarios per the outlined technical guidelines in GRTA's Letter of Understanding.



7.0 Identification of Planned Projects

The ARC's Transportation Improvement Program, Regional Transportation Improvement Program, State Transportation Improvement Program and GDOT's Construction Work Program were researched to determine the sponsors, funding source and projected improvements to be made to all roadways and intersections within the study network. See Table 16 for Identification of Programmed Projects. See Appendix B for the detailed information for ARC and GDOT programmed projects.

Table 16 Identification of Programmed Projects					
Project Number (Sponsor)	General Description (Completion Date)				
0006721 (Cherokee County)	The project includes intersection improvements to Towne Lake Parkway at I-575, consisting of the addition of left turn lane storage capacity for the eastbound and westbound traffic on Towne Lake Parkway at the I-575 ramps. Also included in the project is the addition of an eastbound passing lane under the interstate bridge to ease traffic flow on eastbound Towne Lake Parkway and to reduce the number of rear-end accidents at the intersection. (2008)				
0006994 (City of Woodstock)	Provide sidewalks with curb & gutter drainage, lighting, benches, trash receptacles, thermoplastic striping at crosswalks, and bicycle parking. The project limits include Main Street from Towne Lake Parkway to Serenade Lane; Towne Lake Parkway/Arnold Mill Road from West Mill Street to Maroney Drive; and, Rope Mill Road from Rusk Street to Rope Mill Lane. (2009)				
0006043 (GDOT)	I-575 at Rope Mill Connector - New Interchange				
Per City of Woodstock	Ridgewalk Parkway Improvement - Widen Ridgewalk Parkway to 4 lanes with raised Median. (* Note: this project has not been approved but is projected to be built with interchange per the City of Woodstock Public Works Office).				
662620 (Cherokee County)	Reconstruct intersections along SR 5 from Holly Springs city limits to Woodstock city limits. (2020)				
CH-168 (Cherokee County)	Arnold Mill Road extension/connector from Main Street to Arnold Mill Road [See also CH-167] (2030)				
CH-167 (Cherokee County)	Arnold Mill Road extension/connector from Main Street to Arnold Mill Road [See also CH-168] (2020)				
NH-575-1(28)	I-575 HOV lanes from I-75 North in Cobb County to Sixes Road in Cherokee County.				
NH-575-1(29)	I-575 from I-75 North to SR 5 Business in Cherokee County.				


8.0 Ingress/Egress Analysis

The proposed development will be accessible by five (5) driveways; one (1) driveway along Ridgewalk Parkway and four (4) driveways along Woodstock Parkway.

- Driveway 1 into Pod A is proposed as a right-in/right-out commercial driveway along Ridgewalk Parkway. Driveway 1 will be located approximately 317 feet east of the Ridgewalk Parkway and Woodstock Parkway intersection.
- 2. Driveway 2 into Pod A is proposed as a right-in, left in and right-out commercial driveway located on Woodstock Parkway. Driveway 2 will be located approximately 395 feet south of the Ridgewalk Parkway and Woodstock Parkway intersection.
- 3. Driveway 3 into Pod B is proposed as a right-in, left in and right out commercial driveway located on Woodstock Parkway. Driveway 3 will be located approximately 395 feet south of the Ridgewalk Parkway and Woodstock Parkway intersection. Driveway 3 aligns perpendicular to Driveway 2 along Woodstock Parkway.
- 4. Driveway 4 into Pod A is proposed as a full access commercial main entrance drive located along Woodstock Parkway. Driveway 4 will be located approximately 925 feet south of the Ridgewalk Parkway and Woodstock Parkway intersection.
- 5. Driveway 5 into Pod B is proposed as a full access commercial main entrance drive located along Woodstock Parkway. Driveway 5 will be located approximately 925 feet south of the Ridgewalk Parkway and Woodstock Parkway intersection. Driveway 5 aligns perpendicular to Driveway 4 along Woodstock Parkway.

The layout of the proposed development creates good internal traffic flow through the use of multiple driving paths to circulate vehicular traffic efficiently. Sidewalks and pathways provide pedestrians full walking access to the overall development.





9.0 Compliance with Comprehensive Plan Analysis

The site is currently zoned as "LI" (Light Industrial) and will require no additional rezoning. The Cherokee County Future Land Use Map identifies the site as "RAC" (Regional Activity Center). See Figure 18 and Figure 19 for the Cherokee County Zoning and Future Development Maps.

10.0 Non-Expedited Criteria

10.1 Quality, Character, Convenience and Flexibility of Transportation Options Currently, there are no transit facilities that service the proposed development area.

10.2 Vehicle Miles Traveled

The proposed development will consist of a variety of unique business operators similar to other such developments found throughout the country. Mixed-use reductions were taken into consideration since this a mixed-use component (commercial retail / office). Table 17 shows a summary of the trip generation.

Table 17 Trip Generation Summary					
DAILY AM PM SAT					
Trip Generation:	21,789	1,071	1,979	2,735	
Mixed use reductions (Internal Capture)	-1,089	-0	-108	-109	
Pass-by trips	-2,179 *	-117	-686	-462	
Alternative modes	-0	-0	-0	-0	
Net Trips:	18,521	954	1,185	2,164	

* Pass-by reductions were taken based on GRTA's 10% rule.

10.3 Relationship between location of proposed DRI and Regional Mobility

The proposed development is not located within an urban core, town center or activity center and is not part of an infill initiative. There is no rail station, express bus park and ride lot, or commuter rail station within walking distance of the development.



NOT ISSUED FOR CONSTRUCTION







10.4 Relationship between Proposed DRI and Existing or Planned Transit Facilities

The proposed development is not located near any existing transit facilities.

10.5 Transportation Management Area Designation

The proposed development is not located within an established Transportation Management Area.

10.6 Offsite Trip Reduction and Trip Reduction Techniques

Internal trip reductions were taken to account for new vehicular trips made within the site. An 8% reduction was used for PM peak hour trips and 5% for daily trips.

10.7 Balance of Land Uses - Jobs/Housing Balance

Please refer to the Area of Influence study in Section 11.0 of this report.

10.8 Relationship between Proposed DRI and Existing Development and Infrastructure

The proposed development is located in an area that is largely comprised of residential dwellings. There are single family homes located to the west and south of the proposed development with a variety of additional residential developments planned north of The Avenue Ridgewalk. The Avenue Ridgewalk will provide a centralized shopping center for inhabitants in the immediate area as well as the surrounding region.

11.0 Area of Influence

11.1 Criteria

Because The Avenue Ridgewalk consists solely of commercial space and no housing units, it is classified as "exclusively employment." As such, an AOI analysis is required to determine the ability of DRI employees to afford housing within the AOI (defined as the area within a six road-mile radius from the DRI site).

According to the GRTA non-expedited review process, a DRI classified as "exclusively employment" must meet the following criterion:



Be located in an Area of Influence where the proposed DRI is reasonably anticipated to contribute to a balance of land uses within the Area of Influence such that twenty-five percent (25%) of the persons who are reasonably anticipated to be employed in the proposed DRI have the opportunity to live within the Area of Influence.

11.2 Study Area Determination and Characteristics

The AOI is defined as the area within a six road-mile radius of the proposed DRI. To determine the AOI, Marketek used ArcGIS to follow major roads six miles from the intersection closest to the proposed DRI (Woodstock Parkway and Ridgewalk Parkway). Resulting locations were connected to create the AOI boundary. The AOI boundary was then uploaded to ESRI's Business Information Solutions (a proprietary data service provider that provides demographic, housing and market data for user-defined geographies at the census block group level) website to obtain AOI demographic and housing estimates based on the 2000 Census. See Figure 20 for the AOI Boundary Map.

Table 18 provides a demographic profile of the AOI, which contained an estimated 107,402 persons in 36,993 households in 2007. There were an estimated 50,097 employed AOI residents in 2007, for an average of 1.35 employees per household.

Table 18 2007 Demographic Profile				
Population 107,402				
Households	36,993			
Average Household Size	2.89			
Employed AOI Residents	50,097			
Average Employees per Household	1.35			
Median Household Income	\$87,509			
Owner Occupied Housing	83.7%			
Renter Occupied Housing	16.3%			

Source: ESRI Business Information Solutions



FIGURE 20 - AOI BOUNDARY MAP







NOT ISSUED FOR CONSTRUCTION



11.3 Affordable Housing Analysis

According to The Avenue Ridgewalk site plan, the DRI will have 353,000 square feet of commercial space including retail, restaurants, office space, a pharmacy and a bank. To estimate the number of employees that will work in the DRI, standards for number of employees per square feet of space are used. These standards are provided in Data Table A of the *AOI Guidebook for Non-Expedited Reviews* developed by Jerry Weitz and Associates. Based on *AOI Guidebook* standards, the DRI will employ an estimated 720 workers.

Using the Bureau of Labor Statistics' Occupation by Industry Matrix, Marketek estimated the number of employees likely to be employed in the DRI by occupation. Most employees (496 workers) will be employed as sales clerks in retail stores, with another 83 workers employed as servers or cooks in restaurants. Table 19 provides a breakdown of DRI Employment by Occupation and Land Uses.

Table 19 Employment by Occupation and Land Uses							
Land Has Toma in	6	Space	DRI	Employees by Occupation			
DRI	Square Footage	per Employe e	Employee s	Occupations	%	#	
				Business Owner / Manager	1%	6	
Retail	288 260	500 SE	577	Supervisor / Mid-Manger	13%	75	
Retail	200,200	300 31	577	Sales Clerk	86%	496	
				Business Owner / Manager	3%	3	
Restaurant 42,500 450 SF 94	0/	Supervisor / Mid-Manger	8%	8			
	42,300	450 51	74	Cook	89%	83	
				Manager	14%	3	
Pharmacy	13 500	795 SE	17	Pharmacist	20%	3	
Flaillacy	13,500 785 SF 17		Sales Clerk	66%	11		
				Manager / Head	4%	1	
Bank	4 500	250 SE	19	Supervisor / Mid-Manger	13%	2	
Dalik	4,500	200 01	10	Customer Service	83%	15	
				Manager	8%	1	
Offico 4 240 300 SE 14	1/	Mid-Level Manager	63%	9			
0111CE 4,240 500 SF 14		Administrative Support	29%	4			
Total	353,000		720			720	

Source: AOI Guidebook; Bureau of Labor Statistics Occupation by Industry Matrix



Table 20 provides expected monthly salaries for DRI employees by industry and occupation based on the Bureau of Labor Statistics' 2006 Wage Estimates for Metro Atlanta. Anticipated monthly household income is calculated by multiplying expected monthly salary by the average number of workers in each household in the AOI (1.35). Assuming that each household with an employee in the DRI spends a maximum of 30% of their income on housing, affordable monthly housing payments are calculated from monthly household income. Note that these calculations assume that each DRI employee forms one household and that each employed member of those households earns a similar income.

This analysis indicates that affordable monthly housing payments for households with a DRI employee will range from \$601 to \$3,206. Eighty-four percent (84.0%) of households (605 households) will have affordable housing payments of less than \$800 per month.

Table 20					
Employment, Salary and Affordable Housing Payment by Occupation					
Land Use Type in DRI	Type of Occupation	Number of Employees in DRI	Monthly Employee Salary (1)	Monthly Employee Salary (2)	Affordable Monthly Housing Payment (3)
Retail	Business Owner / Manager	6	\$4,153	\$5,607	\$1,682
	Supervisor / Mid-Manger	75	\$3,012	\$4,066	\$1,220
	Sales Clerk	496	\$1,893	\$2,556	\$767
	Business Owner / Manager	3	\$4,153	\$5,607	\$1,682
Restaurant	Supervisor / Mid-Manger	8	\$2,471	\$3,336	\$1,001
	Cook	83	\$1,484	\$2,003	\$601
Pharmacy	Manager	3	\$3,012	\$4,066	\$1,220
	Pharmacist	3	\$7,917	\$10,688	\$3,206
	Sales Clerk	11	\$1,893	\$2,556	\$767



The Avenue Ridgewalk DRI#1594

Table 20 cont.						
Employment, Salary and Affordable Housing Payment by Occupation						
Land Use Type in DRI	Type of Occupation	Number of Employees in DRI	Monthly Employee Salary (1)	Monthly Employee Salary (2)	Affordable Monthly Housing Payment (3)	
	Manager / Head	1	\$4,153	\$5,607	\$1,682	
Bank	Supervisor / Mid-Manger	2	\$3,012	\$4,066	\$1,220	
	Customer Service	15	\$1,893	\$2,556	\$767	
	Manager	1	\$7,749	\$10,461	\$3,138	
Office	Mid-Level Manager	9	\$5,189	\$7,005	\$2,102	
	Administrative Support	4	\$2,590	\$3,497	\$1,049	

Source: Bureau of Labor Statistics; ESRI BIS

(1) Mean Monthly employee salary in 2006 from Bureau of Labor Statistics at

http://www.bls.gov/oes/currentoes_12060.htm.

(2) Monthly employee salary multiplied by average number of employees per household from Table 20.

(3) Defined as 30% of monthly household salary.



To determine whether households formed by DRI employees will be able to find affordable housing within the AOI, affordable monthly housing payments are compared to AOI housing costs. **Table 21** provides estimates of the number of owner and renter occupied housing units by cost within the AOI. To update monthly housing costs since the 2000 Census, the increases in average home values (45.2%) and in monthly rents (7.4%) were used to translate the range of housing costs in 2000 to the range of costs in 2006. Estimated increases in owner occupied home values in the AOI from 2000 to 2006 were provided by ESRI Business Information Solutions. Estimated increases in rental housing costs in metro Atlanta from 2000 to 2006 were provided by Databank Inc.'s 2006 Rental Market Survey. To update the number of housing units within the AOI, ESRI estimates were used.

Table 21 Selected Monthly Housing Cost					
Housing Cost Range in 2000	Housing Cost Range in 2006 (1)	Owner Occupied Housing Units (2)	Renter Occupied Housing Units (3)	Total Occupied Housing Units	
\$399 or less	\$566 or less	133	529	662	
\$400 to \$499	\$567 to \$708	220	526	746	
\$500 to \$599	\$709 to \$850	366	666	1,032	
\$600 to \$699	\$851 to \$992	604	1,043	1,647	
\$700 to \$799	\$993 to \$1,134	1,238	1,060	2,298	
\$800 to \$899	\$1,135 to \$1,276	2,178	797	2,975	
\$900 to \$999	\$1,277 to \$1,418	2,141	541	2,682	
\$1,000 to \$1,249	\$1,419 to \$1,772	7,189	419	7,608	
\$1,250 to \$1,499	\$1,773 to \$2,127	5,312	189	5,501	
\$1,500 to \$1,999	\$2,128 to \$2,837	5,825	34	5,859	
\$2,000 or more	\$2,838 or more	2,612	0	2,612	
No Mortgage / rent	No mortgage / rent	3,132	239	3,371	
Total		30,950	6,043	36,993	

Source: ESRI Business Information Solutions; 2000 U.S. Census; Databank 2006 Rental Market Survey

(1) Based on the increase in AOI home values and increase in metro Atlanta rents from 2000 to 2006.

(2) From the 2000 U.S. Census, updated using ESRI BIS.

(3) From the 2000 U.S. Census, updated using ESRI BIS.



Using the distribution of housing costs provided in Table 21 and the affordable monthly housing payments of households with a DRI employee (Table 20), a comparison was done to analyze the available housing by price range. Table 22 provides this comparison. As shown, all DRI workers are expected to be able to find affordable housing in the AOI. Thus, the DRI satisfies the Area of Influence criterion set forth by the GRTA.

Table 22 Comparison of DRI Employee Affordable Monthly Housing Payment and AOI Monthly Housing Cost					
Monthly Dollar Range (2006)	Occupied Housing Units in AOI (2007)	Households with a DRI Employee	Employees to Find Housing		
\$566 or less	662	0	-		
\$567 to \$708	746	83	83		
\$709 to \$850	1,032	522	522		
\$851 to \$992	1,647	0	-		
\$993 to \$1,134	2,298	12	12		
\$1,135 to \$1,27	2,975	80	80		
\$1,277 to \$1,418	2,682	0	-		
\$1,419 to \$1,772	7,608	10	10		
\$1,773 to \$2,127	5,501	9	9		
\$2,128 to \$2,837	5,859	0	-		
\$2,838 or more	2,612	4	4		
No mortgage / rent	3,371	0	-		
Total	36,993	720	720		

Source: ESRI Business Information Solutions; Marketek, Inc.



12.0 ARC's Air Quality Benchmark

The development is a retail/office development located on approximately 50 acres and will hold approximately 353,000 square feet of retail/office space. The development meets the relevant density target levels Floor Area Ratio (FAR) of 18% resulting in a Vehicle Miles of Travel (VMT) credit of 6 %. The development will include pedestrian connections between internal land uses as well as adjoining land uses, which meets the ARC bicycle and pedestrian criteria for a 4 % reduction. Additionally, there is a neighborhood center in close proximity to the proposed development resulting in a VMT credit of 15 %. Therefore the total reduction for the proposed development is 25%. This surpasses the ARC Goal of 15%. These reductions are shown below in Table 23.

Table 23 ARC VMT Reductions				
Where retail / office is dominant, FAR > .8	6 %			
Bike/ped networks connecting to land uses within and adjoining the site	4 %			
Has a neighborhood center or one in close proximity	15%			
Total Reductions	25 %			



13.0 Conclusion

Existing Traffic Analysis

Based on intersection analysis under the 2007 existing conditions, there were **no** intersections below the standard LOS D.

No-Build Conditions

The No-Build conditions were analyzed using the factors described in the Analysis of Anticipated Traffic Impact paragraph below for the 2010 build-out year.

Build Conditions

The Build conditions were analyzed using the factors described in the Analysis of Anticipated Traffic Impact paragraph below plus the site generated traffic associated with The Avenue Ridgewalk development for the 2010 build-out year.

Analysis of the Anticipated Traffic Impacts

The results of the detailed intersection analysis for the 2010 No-Build conditions include background traffic growth of 2% per year and include traffic for an approved Home Depot development (DRI# 928) north of Sixes Road. DRI # 1245 & DRI # 1271 listed in GRTA's Letter of Understanding have a build year of 2011 and will not affect The Avenue Ridgewalk traffic analysis.

The 2010 Build conditions include the 2010 No-Build conditions plus the site generated traffic associated with the Avenue Ridgewalk development.

Scenario 1 (Without Rope Mill Rd / I-575 Interchange), 2010 No-Build

Based on intersection analysis in a Scenario 1 (Without Rope Mill Rd / I-575 Interchange), 2010 No-Build condition, there were **no** intersections below the standard LOS D.



Scenario 1 (Without Rope Mill Rd / I-575 Interchange), 2010 Build

There were **seven** (7) intersections identified by LAI as operating below the standard LOS D for the Scenario 1 (Without Rope Mill Rd / I-575 Interchange), <u>2010 Build</u> condition. The Intersections that were below the standard LOS D are:

- Towne Lake Parkway at I-575 NB Ramp (PM)
- Canton Hwy at Towne Lake Parkway / Arnold Mill Road (PM & SAT)
- Ridgewalk Parkway at Woodstock Parkway (SAT)
- Canton Hwy at Ridgewalk Parkway (SAT)
- Canton at Sixes Road (SAT)
- Sixes Road at I-575 NB ramp (PM)
- Sixes Road at I-575 SB ramp (SAT)

The above mentioned intersections were improved in the analysis models to insure that the intersections continue to operate at or above a LOS D. The recommended improvements for these intersections, which did not meet the standard LOS D, are listed below:

Recommended Improvements:

- Towne Lake Parkway @ 575 NB Ramp
 - Recommend adding a right turn storage lane (approx. 100 ft.) to Towne Lake
 Parkway at the WB approach to I-575 NB on ramp.
- Canton Hwy @ Towne Lake Parkway
 - The City of Woodstock recognizes that limited intersection improvements can be made to the intersections or roadway segments around the intersection of Canton Hwy and Towne Lake Parkway/Arnold Mill Road. Woodstock's historic downtown commercial district has many buildings and landmarks that are trademarks of the city and are registered as National Historical Places. These historic designations prevent the addition of or widening of lanes in and around the intersection of Canton Hwy and Towne Lake Parkway /Arnold Mill Road; therefore, all measured operational efficiencies below the standard LOS of D will have no recommended improvements.



- Ridgewalk Parkway @ Woodstock Parkway
 - Recommend adding additional WB left turn storage lane (approx. 200 ft.) on Ridgewalk Parkway.
- Canton Hwy @ Ridgewalk Parkway
 - Recommend adding a dual left on the EB approach of Ridgewalk Parkway (approx 235 ft). Utilize existing NB right turn on Canton Hwy as a receiving lane that would taper back into one lane (approx 350 ft.)
- Canton Rd @ Sixes Road
 - Recommend adding additional EB left turn storage (approx. 200 ft.) and convert existing EB left turn lane into an EB exclusive thru lane, also add additional EB right storage (approx. 200 ft.).
 - Recommend adding additional SB lane on Canton Hwy starting at Sixes road and turning into a right turn exclusive lane at River Park Blvd.
- Sixes Road @ I-575 NB Ramp
 - Recommend adding additional right turn storage (approx. 650 ft.) to NB exit ramp making a dual signalized right turn with a shared thru left.
- Sixes Road @ I-575 SB Ramp
 - Above recommendations for Canton Hwy @ Sixes Rd and Sixes Road @ I-575 ramp adjust the SB ramp intersection level of service to and acceptable LOS D.

Scenario 2 (With Rope Mill Rd / I-575 Interchange), 2010 No-Build

There was **one** (1) intersection identified by LAI as operating below the standard LOS D for the Scenario 2 (With Rope Mill Rd / I-575 Interchange), <u>2010 No-Build</u> condition. The Intersection that was below the standard LOS D is:

• I-575 NB ramp at Sixes Road (PM)

The above intersection was improved in the analysis models to insure that the intersection will continue to operate at an acceptable level of service. It is should not be the responsibility of the developer to make the recommended improvement for the above mentioned intersection because the failure to maintain an acceptable LOS was found in a No-Build condition. The recommended improvement to return this intersection to an acceptable level of service is listed below:



Recommended Improvements:

- Sixes Rd @ I 575 NB Ramp
 - Recommend adding additional right turn storage (approx. 650 ft.) to the NB I-575 off ramp.

Scenario 2 (With Rope Mill Rd / I-575 Interchange), 2010 Build

There were **two** (2) intersections identified by LAI as operating below the standard LOS D for the Scenario 2 (With Rope Mill Rd / I-575 Interchange), <u>2010 Build</u> condition. The Intersections that were below the acceptable LOS D are:

- Towne Lake Parkway at the I-575 NB Ramp (PM)
- Canton Hwy at Towne Lake Parkway / Arnold Mill Road (PM)

The above intersections were improved in the analysis models to insure that the intersections will continue to operate at an acceptable level of service. The recommended improvements for these intersections, which did not meet the standard LOS D, are listed below:

Recommended Improvements

Towne Lake Parkway @ I-575 NB Ramp

• Recommend adding WB right turn storage (approx. 100 ft.) to Towne Lake Parkway.

Canton Hwy at Towne Lake Parkway / Arnold Mill Road

o The City of Woodstock recognizes that limited intersection improvements can be made to the intersections or roadway segments around the intersection of Canton Hwy and Towne Lake Parkway/Arnold Mill Road. Woodstock's historic downtown commercial district has many buildings and landmarks that are trademarks of the city and are registered as National Historical Places. These historic designations prevent the addition of or widening of lanes in and around the intersection of Canton Hwy and Towne Lake Parkway /Arnold Mill Road; therefore, all measured operational efficiencies below the standard LOS of D will have no recommended improvements.



Segment Analysis

As part of the DRI process, a detailed segment analysis for all major corridors in the study network had to be completed. Woodstock Parkway, Ridgewalk Parkway and Canton Highway were the three major segments analyzed. The analysis was completed for the build-out year (2010) for both No-Build and Build scenarios. The results of the detailed segment analysis reveal that Woodstock Parkway, Ridgewalk Parkway and Canton Highway will all operate at acceptable levels of service during all analyzed scenarios, per the outlined technical guidelines in GRTA's Letter of Understanding.