DEVELOPMENT OF REGIONAL IMPACT (DRI #2494) TRAFFIC STUDY FOR 6615 GLENRIDGE DRIVE & 6565 GLENRIDGE DRIVE

SANDY SPRINGS, GA

Prepared for:

Ashton Woods Residential LLC 1455 Old Alabama Road, Suite 100 Roswell, GA 30076 & Mercedes-Benz USA One Mercedes Drive Montvale, NJ 07645

Prepared By:



A&R Engineering Inc.

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



May 14, 2015 A & R Project # 14-097

EXECUTIVE SUMMARY

The mixed-use project exceeds the 600,000 square foot threshold established by ARC for a Regional Center zone. Therefore, the proposed development is considered a Development of Regional Impact (DRI) and is subject to Georgia Regional Transportation Authority (GRTA) and Atlanta Regional Commission (ARC) review. This document is being submitted under the criteria for non-expedited review.

PROPOSED DEVELOPMENT

Traffic impacts were evaluated for the added traffic from the proposed mixed-use development located on Abernathy Road, between Glenridge Drive and Barfield Road. As shown on the DRI site plan (Figure 4), this study is associated with two tracts of land, one on the north side of Abernathy Road and the other on the south side. The development consists of:

Phase 1 (Year 2020)

- Northern Tract
 - Townhomes and Stacked Flats: 545 units
 - Commercial Space: 13,852 sf
- Southern Tract
 - Townhomes and Stacked Flats: 114 units
 - Commercial Space: 22,549 sf
 - Apartment: 399 units
 - Corporate Headquarters: 235,000 sf

Phase 2 (Year 2025 / Future)

- Northern Tract
 - o Phase 1 Development
- Southern Tract (Phase 2 / Future)
 - Phase 1 Development
 - Corporate Headquarters: 225,000 sf expansion

STUDY METHODOLOGY

- 2015 Existing conditions
 - o Based on traffic volumes collected in 2015 or provided by the City of Sandy Springs
- 2020 "No-Build" conditions
 - Uses 2015 Existing volumes grown at 1.5% annually for five years
 - Uses GDOT 2019 volumes for the DDI on Abernathy Rd at GA 400 grown at 1.5% for one year and increased to reflect similar traffic volumes as the adjacent intersections
 - Includes roadway improvements from FN-AR-100A / GDOT 721850 (SR 400 Collector / Distributor Lanes)
- 2020 "Build" conditions
 - Based on 2020 "No-Build" conditions with the addition of site traffic for Phase 1 of the development

- Includes roadway improvements from FN-AR-100A / GDOT 721850 (SR 400 Collector / Distributor Lanes)
- 2025 "No-Build" conditions
 - Based on 2020 "No-Build" volumes grown at 1.5% annually for five years
 - Includes roadway improvements from FN-AR-100A / GDOT 721850 (SR 400 Collector / Distributor Lanes)
- 2025 "Build" conditions
 - Based on 2025 "No-Build" conditions with the addition of site added traffic for Phase 2 of the development
 - Includes roadway improvements from FN-AR-100A / GDOT 721850 (SR 400 Collector / Distributor Lanes)

ROADWAY IMPROVEMENTS AND RECOMMENDATIONS

The following improvements result in the following intersections operating at or above their LOS standard, except where otherwise noted. The improvements are summarized in Table 1 and Table 2 (page 3 of the Executive Summary). *Please note that survey and construction drawings may be needed to verify the feasibility and extent of additional right-of-way required for any recommended improvements.*

SYSTEM RECOMMENDATIONS AND IMPROVEMENTS

Improvements that are identified as system improvements address deficiencies that are found the study network for the "No-Build" conditions, without the addition of traffic from the proposed development.

SITE MITIGATION IMPROVEMENTS

Improvements that are identified as mitigation improvements address deficiencies that are caused by site traffic and can be identified as related to the increase in traffic from the proposed development.

TABLE 1: YEAR 2020 / PHASE 1									
INTERSECTION	System Recommendations and Improvements for <u>"No-Build"</u> Conditions	Site Mitigation Recommendations and Improvements for <u>"Build"</u> Conditions							
5. Glenridge Dr @ Abernathy Rd	 Construct an additional northbound left turn lane Provide protected-only left turn phasing for the northbound left turn movement. 	 Construct southbound right turn lane on Glenridge Drive 							
6. Roswell Rd @ Abernathy Rd	 Future capacity improvement project (see report for potential scenarios) 	 No additional improvement identified beyond those needed for "No-Build" 							
7. Glenridge Dr @ Mount Vernon Hwy	 Widen and restripe the northbound approach on Glenridge Drive to add a dedicated left turn lane Widen and restripe the southbound approach on Glenridge Drive to include a dedicated left turn lane and shared through / right lane. 	 No additional improvement identified beyond those needed for "No-Build" 							
8. Barfield Rd @ Mount Vernon Hwy	 Construct a northbound right turn lane on Barfield Road that will free-flow into the additional eastbound lane on Mt Vernon Hwy (added from GDOT project 721850). 	 No additional improvement identified beyond those needed for "No-Build" 							
9. Glenridge Dr @ Glenlake Pkwy	 Median separate outside eastbound lane through the intersection, leaving the inside eastbound receiving lane open to southbound left turn movements (unsignalized Florida-T). 	 No additional improvement identified beyond those needed for "No-Build" 							
10. Glenridge Dr @ Spalding Dr	 Construct yield-controlled northbound right turn lane on Glenridge Drive Convert the intersection to side-street stop by removing stop condition for the eastbound and westbound approaches 	 No additional improvement identified beyond those needed for "No-Build" 							
	TABLE 2: YEAR 2	2025 / Phase 2							
INTERSECTION	System Recommendations and Improvements for <u>"No-Build"</u> Conditions	Site Mitigation Recommendations and Improvements for <u>"Build"</u> Conditions							
5. Glenridge Dr @ Abernathy Rd	 Improvements identified for the "No-Build" 2020 Conditions Construct southbound right turn lane on Glenridge Drive 	 Construct eastbound right turn lane on Glenridge Drive 							
6. Roswell Rd @ Abernathy Rd	 Improvements identified for the "No-Build" 2020 Conditions 	 Construct southbound right turn lane on Glenridge Drive 							
7. Glenridge Dr @ Mount Vernon Hwy	 Improvements identified for the "No-Build" 2020 Conditions 	 No additional improvement identified beyond those needed for "No-Build" 							
8. Barfield Rd @ Mount Vernon Hwy	 Improvements identified for the "No-Build" 2020 Conditions 	 No additional improvement identified beyond those needed for "No-Build" 							
9. Glenridge Dr @ Glenlake Pkwy	 Improvements identified for the "No-Build" 2020 Conditions 	 No additional improvement identified beyond those needed for "No-Build" 							
10. Glenridge Dr @ Spalding Dr	 Improvements identified for the "No-Build" 2020 Conditions 	 No additional improvement identified beyond those needed for "No-Build" 							

With the recommended improvements for the "No-Build" and "Build" conditions, all study intersections will operate at their level-of-service standard or better than the existing conditions. The intersections, which will not operate at their level-of-service standard for one or more peak hours are further discussed below:

7. Glenridge Drive @ Mount Vernon Highway

The intersection is expected to operate at an LOS "F" for the PM Peak period. According to engineering judgment, the necessary improvements needed to bring the PM peak period within the LOS standard are not feasible/practical. The intersection will, however, be within the LOS standard in the AM peak and continue to operate better than the existing conditions throughout all scenarios with the recommended improvements.

9. Glenridge Drive @ Glenlake Parkway

With the recommended improvements, the southbound stop-controlled approach will remain operating at LOS "F" in the AM peak period. A preliminary examination of the peak hour traffic indicates that volumes may not meet MUTCD thresholds for construction of a traffic signal. The AM peak period will continue to operate better than the existing conditions throughout all scenarios with the recommended improvements, and adequate level-of-service is expected during the rest of the day; therefore, no other reasonable improvements were identified at this intersection.

10. Glenridge Drive @ Spalding Drive

With the following improvements, the overall intersection operations will improve; however, the northbound left approach will operating at LOS "F" in the AM peak period. This approach has relatively few left turns in the AM peak hour (<25 veh/hr.), and the queues are anticipated to be reasonable after the following modifications; therefore, no other reasonable improvements were identified at this intersection. It should be noted that traffic calming measures have been placed along Glenridge Drive between Glenlake Pkwy and Spalding Drive, including several speed humps and a roundabout intersection, which may compete with the desire to improve traffic flow through this intersection.

SITE ACCESS CONFIGURATION

With the following site access configuration and the improvements in the "Build" conditions, the site intersections are anticipated to operate at their level-of-service standard.

Abernathy Road @ Northern Site Driveway #1 / Southern Site Driveway #1

- Northern Site Driveway #1
 - \circ $\;$ This driveway will be restricted to right-in and right-out access
 - This driveway will have one entering and one exiting lane
 - The intersection will be unsignalized with a yield sign on the southbound approach to Abernathy Road
 - A deceleration lane will be constructed for entering traffic based on local standards
- <u>Southern Site Driveway #1</u>
 - This driveway will be restricted to right-in and right-out access

- This driveway will have one entering and one exiting lane
- The intersection will be unsignalized with a yield sign on the southbound approach to Abernathy Road
- A deceleration lane will be constructed for entering traffic based on local standards

Abernathy Road @ Northern Site Driveway #2 / Southern Site Driveway #2

- A signal warrant analysis indicates that the projected volumes will meet MUTCD thresholds for a traffic signal. The intersection will be signalized as part of the development's construction, include a protected/permissive phase for the westbound left turn into the southern tract, and be interconnected to the adjacent signal in either direction on Abernathy Road.
- Northern Site Driveway #2
 - This driveway will consist of one entering and two exiting lanes (dedicated left and shared through / right
 - A dedicated left turn bay will be constructed for entering traffic based on local standards
 - A deceleration lane will be constructed for entering traffic based on local standards
- <u>Southern Site Driveway #2</u>
 - This driveway will consist of one entering and two exiting lanes (dedicated left and shared through / right
 - $\circ~$ A dedicated left turn bay will be constructed for entering traffic based on local standards
 - A deceleration lane will be constructed for entering traffic based on local standards

Abernathy Road @ Southern Site Driveway #3

- This driveway will be restricted to right-in and right-out access
- This driveway will have one entering and one exiting lane
- The intersection will be unsignalized with a yield sign on the southbound approach to Abernathy Road
- A deceleration lane will be constructed for entering traffic based on local standards

Glenridge Drive @ Southern Site Driveway #4

- This driveway will consist of one entering and one exiting lane
- The intersection will be unsignalized with a stop sign on the westbound approach to Glenridge Drive
- A dedicated left turn bay will be constructed for entering traffic based on local standards
- A deceleration lane will be constructed for entering traffic based on local standards

Barfield Road @ Southern Site Driveway #5

- This driveway will consist of one entering and one exiting lane
- The intersection will be unsignalized with a stop sign on the eastbound approach to Barfield Rd
- A dedicated left turn bay will be constructed within the existing two-way left turn lane for entering traffic
- A deceleration lane will be constructed for entering traffic based on local standards

TABLE OF CONTENTS

1.0	Intro	oduction	. 1
2.0	Stud	y Network Determination	. 3
2.	.1	Existing Roadway Facilities	3
2.	.2	Existing Bicycle and Pedestrian Facilities	4
2.	2.1	Nearby local or regional trails	4
2.	2.2	Bicycle paths or sidewalks	5
2.	.3	Existing Transit Facilities	5
3.0	Stud	y Methodology	. 7
3.	.1	Unsignalized Intersections	7
3.	.2	Signalized Intersections	7
3.	.3	Additional Modeling Parameters	8
4.0	Exist	ing Traffic Analysis	. 9
5.0	Proje	ect Description	14
5.	.1	Site Plan	14
5.	1.1	Planned Bicycle and Pedestrian Facilities	14
5.	1.2	Planned Transit Facilities	15
5.	1.3	Project Phasing	15
5.	2	Trip Generation	15
5.	.3	Trip Distribution	16
6.0	Plan	ned and Programmed Improvements	29
70	Futu	ro Voor 2020 Traffic Analysis	21
7.0			31
7.	.1	Future 2020 "No-Build" Conditions	31
7.0 7. 7.	.1 .1.1	Future 2020 "No-Build" Conditions Volumes at Abernathy Diverging Diamond Interchange	31 31 31
7. 7. 7. 7.	.1 .1.1 .1.2	Future 2020 "No-Build" Conditions Volumes at Abernathy Diverging Diamond Interchange Annual Growth Rate (No-Build 2020)	31 31 31 31
7.0 7. 7. 7. 7.	.1 .1.1 .1.2 .1.3	Future 2020 "No-Build" Conditions Volumes at Abernathy Diverging Diamond Interchange Annual Growth Rate (No-Build 2020) System Improvement Recommendations (No-Build 2020)	31 31 31 31 31
7. 7. 7. 7. 7. 7.	.1 .1.1 .1.2 .1.3 .1.4	Future 2020 "No-Build" Conditions Volumes at Abernathy Diverging Diamond Interchange Annual Growth Rate (No-Build 2020) System Improvement Recommendations (No-Build 2020) Intersection Operations Analysis (No-Build 2020)	31 31 31 31 31 33
7. 7. 7. 7. 7. 7. 7.	.1 .1.1 .1.2 .1.3 .1.4 .2	Future 2020 "No-Build" Conditions Volumes at Abernathy Diverging Diamond Interchange Annual Growth Rate (No-Build 2020) System Improvement Recommendations (No-Build 2020) Intersection Operations Analysis (No-Build 2020) Future 2020 "Build" Conditions	31 31 31 31 31 33 33
7. 7. 7. 7. 7. 7. 7. 7.	1 1.1 1.2 1.3 1.4 2 2.1	Future 2020 "No-Build" Conditions Volumes at Abernathy Diverging Diamond Interchange Annual Growth Rate (No-Build 2020) System Improvement Recommendations (No-Build 2020) Intersection Operations Analysis (No-Build 2020) Future 2020 "Build" Conditions Site Mitigation Improvements (Build 2020)	31 31 31 31 31 33 37 37
7. 7. 7. 7. 7. 7. 7. 7. 7.	1 1.1 1.2 1.3 1.4 2 2.1 2.2	Future 2020 "No-Build" Conditions Volumes at Abernathy Diverging Diamond Interchange	31 31 31 31 31 33 37 37 38
7.0 7. 7. 7. 7. 7. 7. 7. 7. 8.0	1 1.1 1.2 1.3 1.4 2 2.1 2.2 Futu	Future 2020 "No-Build" Conditions	31 31 31 31 31 33 37 37 38 43
7. 7. 7. 7. 7. 7. 7. 7. 7. 8.0 8.0	1 1.1 1.2 1.3 1.4 2.1 2.2 Futu 1	Future 2020 "No-Build" Conditions	31 31 31 31 31 33 37 37 38 43 43
7. 7. 7. 7. 7. 7. 7. 7. 8.0 8. 8. 8.	1 1.1 1.2 1.3 1.4 2 2.1 2.2 Futu 1 1.1	Future 2020 "No-Build" Conditions	31 31 31 31 31 33 37 37 38 43 43 43
7. 7. 7. 7. 7. 7. 7. 7. 8.0 8. 8. 8. 8. 8.	1 1.1 1.2 1.3 1.4 2.1 2.2 Futu 1 1.1 1.2	Future 2020 "No-Build" Conditions	31 31 31 31 33 37 37 38 43 43 43 43
7. 7. 7. 7. 7. 7. 7. 7. 8.0 8. 8. 8. 8. 8. 8. 8. 8. 8. 8. 8. 8. 8.	1 1.1 1.2 1.3 1.4 2 2.1 2.2 Futu 1 1.1 1.2 1.3	Future 2020 "No-Build" Conditions	31 31 31 31 33 37 37 38 43 43 43 43 43 43
7. 7. 7. 7. 7. 7. 7. 7. 8.0 8. 8. 8. 8. 8. 8. 8. 8. 8. 8. 8. 8. 8.	1 1.1 1.2 1.3 1.4 2.1 2.1 Futu 1 1.1 1.2 1.3 2	Future 2020 "No-Build" Conditions	31 31 31 31 33 37 37 38 43 43 43 43 43 43 43
7. 7. 7. 7. 7. 7. 7. 7. 7. 8.0 8. 8. 8. 8. 8. 8. 8. 8. 8. 8. 8. 8. 8.	1 1.1 1.2 1.3 1.4 2 2.1 2.2 Futu 1 1.1 1.2 1.3 2 2.1	Future 2020 "No-Build" Conditions	31 31 31 31 33 37 37 37 37 37 38 43 43 43 43 43 43 43 43 43 43 43 43
7. 7. 7. 7. 7. 7. 7. 7. 8.0 8. 8. 8. 8. 8. 8. 8. 8. 8. 8. 8. 8. 8.	1 1.1 1.2 1.3 1.4 2.1 2.1 2.2 Futu 1 1.1 1.2 1.3 2 2.1 2.2	Future 2020 "No-Build" Conditions	31 31 31 31 33 37 38 43 43 43 43 43 44 47 47 48
7. 7. 7. 7. 7. 7. 7. 7. 7. 8.0 8. 8. 8. 8. 8. 8. 8. 8. 8. 8. 8. 9.0	1 1.1 1.2 1.3 1.4 2 2.1 2.2 Futu 1 1.1 1.2 1.3 2 2.1 2.2 Site	Future 2020 "No-Build" Conditions Volumes at Abernathy Diverging Diamond Interchange Annual Growth Rate (No-Build 2020) System Improvement Recommendations (No-Build 2020) Intersection Operations Analysis (No-Build 2020) Future 2020 "Build" Conditions Site Mitigation Improvements (Build 2020) Intersection Operations Analysis (Build 2020) Intersection Operations Analysis (Build 2020) Future 2025 Traffic Analysis Future 2025 "No-Build" Conditions Annual Growth Rate (No-Build 2025) System Improvement Recommendations (No-Build 2025) Intersection Operations Analysis (No-Build 2025) System Improvement Recommendations (No-Build 2025) Intersection Operations Analysis (No-Build 2025) Site Mitigation Improvements (Build 2025) Future 2025 "Build" Conditions Site Mitigation Improvements (Build 2025) Future 2025 "Build" Conditions Site Mitigation Improvements (Build 2025) Access Analysis	31 31 31 31 33 37 38 43 43 43 43 43 43 43 44 47 47 48 53
7. 7. 7. 7. 7. 7. 7. 7. 7. 8.0 8. 8. 8. 8. 8. 8. 8. 8. 8. 8. 8. 9.0 9.	1 1.1 1.2 1.3 1.4 2 2.1 2.2 Futu 1 1.1 1.2 1.3 2 2.1 2.2 Site 4 1	Future 2020 "No-Build" Conditions	31 31 31 33 37 37 37 37 37 37 37 37 37 43 43 43 43 43 43 43 43 43 45 35 53
7. 7. 7. 7. 7. 7. 7. 7. 7. 7. 7. 8.0 8. 8. 8. 8. 8. 8. 8. 8. 8. 8. 8. 9.0 9. 10.0	1 1.1 1.2 1.3 1.4 2.1 2.1 2.2 Futu 1 1.1 1.2 1.3 2 2.1 2.1 2.2 Site A 1 OCon	Future 2020 "No-Build" Conditions	31 31 31 31 33 37 38 43 43 43 43 43 43 43 43 43 43 43 53 53 53

LIST OF TABLES

Table 1 – Level-of-service Criteria for Unsignalized Intersections	7
Table 2 – Level-of-service Criteria for Signalized Intersections	8
Table 3 – Existing 2015 Intersection Operations	10
Table 5 – Trip Generation for Northern Tract (Phase 1 & 2)	16
Table 6 – Trip Generation for Southern Tract (Phase 1)	16
Table 7 – Trip Generation for Southern Tract (Phase 1 & 2)	16
Table 6 – Planned and Programmed Improvements	29
Table 8 – SR 9 (Roswell Rd) at Abernathy Rd Improvement Scenarios	32
Table 9 – No-Build 2020 Intersection Operations	34
Table 10 – Build 2020 Intersection Operations	38
Table 11 – No-Build 2025 Intersection Operations	44
Table 12 – Build 2025 Intersection Operations	48
Table 13 – Site Driveway Intersection Operations	55
Table 14 –Site Driveway 95 th Percentile Queues	55

LIST OF FIGURES

Figure 1 – Location Map and Study Intersections	6
Figure 2 – Existing Weekday Peak Hour Volumes	12
Figure 3 – Existing Traffic Control and Lane Geometry	13
Figure 4 – Site Plan	18
Figure 5A – Site Generated Peak Hour Volumes – Northern Tract (Phase 1 & 2)	19
Figure 5B – Site Generated Peak Hour Volumes – Northern Tract (Phase 1 & 2)	20
Figure 6A – Site Generated Peak Hour Volumes – Southern Tract Retail and Residential (Phase 1)	21
Figure 6B – Site Generated Peak Hour Volumes – Southern Tract Retail and Residential (Phase 1)	22
Figure 7A – Site Generated Peak Hour Volumes – Southern Tract Office (Phase 1)	23
Figure 7B – Site Generated Peak Hour Volumes – Southern Tract Office (Phase 1)	24
Figure 8A – Site Generated Peak Hour Volumes – Southern Tract Retail and Residential (Phase 2)	25
Figure 8B – Site Generated Peak Hour Volumes – Southern Tract Retail and Residential (Phase 2)	26
Figure 9A – Site Generated Peak Hour Volumes – Southern Tract Office (Phase 2)	27
Figure 9B – Site Generated Peak Hour Volumes – Southern Tract Office (Phase 2)	28
Figure 10 – Future 2020 (No-Build) Peak Hour Volumes	36
Figure 11A – Future 2020 (Build) Peak Hour Volumes	40
Figure 11B – Future 2020 (Build) Peak Hour Volumes	41
Figure 12 – Future 2020 Traffic Control and Lane Geometry	42
Figure 13 – Future 2025 (No-Build) Peak Hour Volumes	46
Figure 14A – Future 2025 (Build) Peak Hour Volumes	50
Figure 14B – Future 2025 (Build) Peak Hour Volumes	51
Figure 15 – Future 2025 Traffic Control and Lane Geometry	52

1.0 INTRODUCTION

The purpose of this study is to determine the traffic impact that will result from the development located on Abernathy Road, between Glenridge Drive and Barfield Road. The traffic analysis evaluates the current operations compared to the future conditions with the traffic generated by the development. The proposed development consists of:

Phase 1 (Year 2020)

- Northern Tract
 - Townhomes and Stacked Flats: 545 units
 - Commercial Space: 13,852 sf
- Southern Tract
 - Townhomes and Stacked Flats: 114 units
 - Commercial Space: 22,549 sf
 - Apartment: 399 units
 - Corporate Headquarters: 235,000 sf

Phase 2 (Year 2025 / Future)

- Northern Tract
 - o Phase 1 Development
- Southern Tract (Phase 2 / Future)
 - Phase 1 Development
 - Corporate Headquarters: 225,000 sf expansion



The development proposes access at the following locations:

- Northern Tract Access:
 - North Site Driveway 1: Right-in / Right-out on Abernathy Road, east of Glenridge Drive
 - o North Site Driveway 2: Full-Access (Signalized) Driveway on Abernathy Road
- Southern Tract Access:
 - South Site Driveway 1: Right-in / Right-out on Abernathy Road, east of Glenridge Drive
 - \circ $\;$ South Site Driveway 2: Full-Access (Signalized) Driveway on Abernathy Road $\;$
 - South Site Driveway 3: Right-in / Right-out on Abernathy Road, west of Barfield Road
 - o South Site Driveway 4: Full-Access Driveway on Glenridge Drive
 - \circ $\:$ South Site Driveway 5: Full-Access Driveway on Barfield Road $\:$

The AM and PM peak hours have been analyzed in this study. In addition to the site driveway intersections, the following intersections have also been evaluated:

- 1. Abernathy Road at GA 400 Northbound On-ramps
- 2. Abernathy Road at GA 400 Northbound Off-ramps
- 3. Abernathy Road at GA 400 Southbound Ramps
- 4. Abernathy Road at Glenlake Parkway / Barfield Road
- 5. Abernathy Road at Glenridge Drive
- 6. Abernathy Road at SR 9 (Roswell Road)
- 7. Mt Vernon Hwy at Glenridge Drive
- 8. Mt Vernon Hwy at Barfield Road
- 9. Glenridge Drive at Glenlake Parkway / Glenridge Drive
- 10. Spalding Drive at Glenridge Drive

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

2.0 STUDY NETWORK DETERMINATION

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

The traffic generated by the proposed project was then assigned to the area roadways using the trip distribution to determine the site-generated traffic on each roadway segment. The boundaries of the study network extend to the most distant intersections where at least 7% of the service volumes on the segment are attributed to project traffic. The following study intersections fell within the 7% rule:

- 1. Abernathy Road at GA 400 Northbound On-ramps
- 2. Abernathy Road at GA 400 Northbound Off-ramps
- 3. Abernathy Road at GA 400 Southbound Ramps
- 4. Abernathy Road at Glenlake Parkway / Barfield Road
- 5. Abernathy Road at Glenridge Drive
- 6. Abernathy Road at SR 9 (Roswell Road)

Based on discussions with GRTA, GDOT and the City of Sandy Springs, the following intersections have also been included in the traffic impact study as being suitable for evaluation:

- 7. Mt Vernon Hwy at Glenridge Drive
- 8. Mt Vernon Hwy at Barfield Road
- 9. Glenridge Drive at Glenlake Parkway / Glenridge Drive
- 10. Spalding Drive at Glenridge Drive

The location of the development and the surrounding study network is shown in Figure 1. Other intermediate intersections within this corridor, such as unsignalized side streets and/or private driveways have not been included in the study network.

2.1 Existing Roadway Facilities

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

Abernathy Road

Abernathy Road is an east-west, four-lane, divided roadway with a posted speed limit of 45 mph in the vicinity of the site. GDOT published traffic volumes (Station ID 1215668 and 1215670) indicate that the daily traffic volume on Abernathy Road is 31,780 vehicles per day east of SR 9 (Roswell Road) and 52,120 vehicles per day east of GA 400. Abernathy Road is classified as a Principal Arterial by the Atlanta Regional Commission.

Barfield Road

Barfield Road is a north-south, five-lane roadway (including center two-way left turn lane) with a posted

speed limit of 45 mph in the vicinity of the site. GDOT published traffic volumes (Station ID 1210221) indicate that the daily traffic volume on Barfield Road is 7,790 vehicles per day south of Abernathy Road. Barfield Road is classified as a Major Collector by the Atlanta Regional Commission.

Glenlake Parkway

Glenlake Parkway is a north-south, four-lane, undivided roadway with a posted speed limit of 35 mph in the vicinity of the site. Glenlake Parkway is classified as a Major Collector by the Atlanta Regional Commission.

Glenridge Drive

Glenridge Drive is a north-south, two-lane, undivided roadway with a posted speed limit of 35 mph in the vicinity of the site. Between Glenlake Parkway and Spalding Drive, Glenridge Drive is a 25 mph roadway with speed humps. Glenridge Drive is classified as a Major Collector by the Atlanta Regional Commission.

Mount Vernon Highway

Mount Vernon Highway is an east-west, two-lane, undivided roadway with a posted speed limit of 35 mph in the vicinity of the site. GDOT published traffic volumes (Station ID 1215658 and 1215659) indicate that the daily traffic volume on Mount Vernon Highway is 13,454 vehicles per day west of Glenridge Drive and 12,010 vehicles per day east of GA 400. Mount Vernon Highway is classified as a Major Collector by the Atlanta Regional Commission.

Spalding Drive

Spalding Drive is an east-west, two-lane, undivided roadway with a posted speed limit of 35 mph in the vicinity of the site. Spalding Drive is classified as a Major Collector by the Atlanta Regional Commission.

State Route 9 (Roswell Road)

Roswell Road is a north-south, five-lane roadway (including center two-way left turn lane) with a posted speed limit of 45 mph in the vicinity of the site. GDOT published traffic volumes (Station ID 1215122 and 1215120) indicate that the daily traffic volume on Roswell Road is 32,474 vehicles per day south of Abernathy Road and 34,520 vehicles per day north of Abernathy Road. SR 9 (Roswell Road) is classified as a Regional Thoroughfare by the Atlanta Regional Commission.

2.2 Existing Bicycle and Pedestrian Facilities

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

2.2.1 Nearby local or regional trails

There are no existing trails located within the study area.

2.2.2 Bicycle paths or sidewalks

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

- Barfield Road:
 - Both sides of the road, between Abernathy Rd and Mt Vernon Hwy
 - Mt Vernon Hwy:
 - South side of the road, between Glenridge Drive and Barfield Rd
- Glenridge Drive:
 - Both sides of the road, between Abernathy Rd and Glengate Ave
 - West side of the road, between Glengate Ave and Mt Vernon Hwy
- Abernathy Road: both sides of the road

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

• Abernathy Road: west of SR 9 (Roswell Road)

The City of Sandy Springs "Bicycle, Pedestrian and Trail Implementation Plan" makes the following recommendations in the vicinity of the site:

- Barfield Road, between Abernathy Road and Mount Vernon Hwy
 - B01 Road Diet; Buffered Bike Lanes
- SR 9 (Roswell Road), between Abernathy Road and Dalrymple Rd
 - o BO4 Sidepath
- Glenridge Drive, between Spalding Drive and Glenlake Pkwy
 - B16 Sharrows
- Glenlake Pkwy, between Glenridge Drive and Abernathy Road
 - B17 Road Diet; Bike Lanes/Buffered Bike Lanes
- Glenridge Drive, between Johnson Ferry Rd / Glenairy Dr and Glenlake Pkwy
 - B18 Sharrows
- Abernathy Road, between SR 9 and Barfield Road
 - B26 Sidepath (Connects to bicycle lanes west of Roswell Road)
- Mount Vernon Hwy, between Johnson Ferry Rd and Barfield Road
 - o B30 Sidepath
- Abernathy Road, between Barfield Road and Peachtree Dunwoody Rd
 - S09 Construct Sidewalk, Both Sides
- Glenridge Drive, between Abernathy Road and Glenlake Pkwy
 - S16 Construct Sidewalk, Both Sides

2.3 Existing Transit Facilities

The site is not directly served by transit. However, the Sandy Springs MARTA Station is located approximately 0.65 miles east of the Abernathy Road at Barfield Road intersection. The nearest bus corridor that is served by MARTA is Roswell Road, bus route 87, which is approximately 0.65 miles west of the Barfield Road at Abernathy Road intersection. No transit facilities are planned for the development.



LOCATION MAP



3.0 STUDY METHODOLOGY

In this study, the methodology used for evaluating traffic operations at each of the subject intersections is based on the criteria set forth in the Transportation Research Board's <u>Highway Capacity Manual</u>, 2010 edition (HCM 2010). Synchro software, which utilizes the HCM methodology, was used for the analysis. Note that alternate intersection and interchange types are not HCM 2010 Computational Engine 4.3 compliant. If a signal deviates from the standard two-ring NEMA eight-phase configuration and design, includes more than one intersection (group or cluster control), has overlap phases, has more than eight phases, and / or has a left turn that operates from both an exclusive and shared lane, then HCM 2010 results are not displayed. A future clarification and/or change to HCM 2010 is expected to address this and provide improved computational code and/or supporting text. At non-compliant intersections, HCM 2000 will be used for the analysis. The following is a description of the methodology employed for the analysis of unsignalized and signalized intersections.

3.1 Unsignalized Intersections

For unsignalized intersections at which the side street or minor street is controlled by a stop sign, the criteria for evaluating traffic operations are the level-of-service (LOS) for the turning movements at the intersection and the level-of-service for the overall intersection. Level-of-service is based on the average controlled delay incurred at the intersection. Controlled delay for unsignalized intersections includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. Several factors affect the controlled delay for unsignalized intersections, such as the availability and distribution of gaps in the conflicting traffic stream, critical gaps, and follow-up time for a vehicle in the queue.

Level-of-service is assigned a letter designation from "A" through "F". Level-of-service "A" indicates excellent operations with little delay to motorists, while level-of-service "F" exists when there are insufficient gaps of acceptable size to allow vehicles on the side street to cross safely, resulting in extremely long total delays and long queues. The level-of-service criteria for two-way stop-controlled and all-way stop-controlled (unsignalized) intersections are given in Table 1.

TABLE 1 — LEVEL-OF-SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTION						
Level-of-service	Average Delay (sec)					
А	≤ 10					
В	$>$ 10 and \leq 15					
С	$>$ 15 and \leq 25					
D	$>$ 25 and \leq 35					
E	$>$ 35 and \leq 50					
F	> 50					

Source: 2010 Highway Capacity Manual

3.2 Signalized Intersections

For signalized intersections, it is necessary to evaluate both capacity and level-of-service in order to evaluate the overall operation of the intersection. The capacity analysis of an intersection is performed

by comparing the volume of traffic using the various lane groups at the intersection to the capacity of those lane groups. This results in a volume/capacity (v/c) ratio for each lane group. A v/c ratio greater than 1.0 indicates that the volume of traffic has exceeded the capacity available, resulting in a temporary excess of demand. Although the capacity of the entire intersection is not defined, a composite v/c ratio for the sum of the critical lane groups within the intersection is computed. This composite v/c ratio is an indication of the overall intersection sufficiency.

Level-of-service for a signalized intersection is defined in terms of average controlled delay per vehicle, which is composed of initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The level-of-service criteria for signalized intersections, based on average controlled delay, are shown in Table 2. Level-of-service "A" indicates operations with very low controlled delay, while level-of-service "F" describes operations with extremely high average controlled delay. Level-of-service "E" is typically considered to be the limit of acceptable delay, and level-of-service "F" is considered unacceptable by most drivers.

TABLE 2 – LEVEL-OF-SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS								
Level-of-service	Average Control Delay (sec)							
А	≤ 10							
В	$>$ 10 and \leq 20							
С	$>$ 20 and \leq 35							
D	$>$ 35 and \leq 55							
E	$>$ 55 and \leq 80							
F	F > 80 (or v/c ratio > 1.0)							

Source: 2010 Highway Capacity Manual

3.3 Additional Modeling Parameters

For signalized intersections, signal timing data provided by the City of Sandy Springs was used to model the existing conditions. Additionally, per discussions with the City of Sandy Springs, the approximate approach grades for each of the intersection were included in the model and the default saturated flow rate was reduced from 1,900 veh/hr./ln to 1,800 veh/hr./ln. Heavy vehicle percentages were kept at 2% for the study network.

4.0 EXISTING TRAFFIC ANALYSIS

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

- 1. Abernathy Road at GA 400 Northbound On-ramps
- 2. Abernathy Road at GA 400 Northbound Off-ramps
- 3. Abernathy Road at GA 400 Southbound Ramps
- 4. Abernathy Road at Glenlake Parkway / Barfield Road
- 5. Abernathy Road at Glenridge Drive
- 6. Abernathy Road at SR 9 (Roswell Road)
- 7. Mt Vernon Hwy at Glenridge Drive
- 8. Mt Vernon Hwy at Barfield Road
- 9. Glenridge Drive at Glenlake Parkway / Glenridge Drive
- 10. Spalding Drive at Glenridge Drive

Turning movement counts were collected on January 20, 2015 and April 16, 2015. All turning movement counts were recorded during the AM and PM peak hours between 7:00am to 9:00am and 4:00pm to 6:00pm, respectively. The four consecutive 15-minute interval volumes that summed to produce the highest volume at the intersections were then determined. For the intersection of SR 9 (Roswell Road) at Abernathy Road, the city requested that their volumes be used to analyze the intersection. These peak hour volumes were used in place of the data collected in April 2015. These volumes make up the peak hour traffic volumes for the intersections counted and are shown in Figure 2.

Existing traffic operations were analyzed at the study intersections in accordance with the HCM methodology. The local level-of-service (LOS) standard is "D" or better. If the existing LOS for the segment or intersection is "E" or "F", then the future "No-Build" and future "Build" LOS standard will be LOS "E", consistent with the GRTA Letter of Understanding. The results of the existing conditions analyses are shown in Tables 3.

	TABLE 3 – EXISTING 2	015 INTERSECT	TION OPERAT	rions	
	Intersection	Traffic Control	AM Peak	PM Peak	LOS
	intersection		LOS (Delay)	LOS (Delay)	Std
	Abernathy Rd @ GA 400 NB On-Ramp		<u>A (6.3)</u>	<u>C (22.1)</u>	D/D
1	Eastbound	Signalized	A (6.8)	C (27.2)	-
	Westbound		A (5.0)	B (15.2)	-
	GA 400 NB Off-Ramp @ Abernathy Rd	Stop Controlled			
2	Northbound	on Northbound &	F (252.1)	C (20.5)	E/D
	Southbound	Southbound	E (49.6)	D (29.5)	E/D
	GA 400 Ramps @ Abernathy Rd		<u>E (63.1)</u>	<u>D (39.0)</u>	<u>E / D</u>
2	Eastbound	Signalized	D (44.2)	D (46.8)	-
3	Westbound	Signalized	E (68.4)	C (23.1)	-
	Southbound		E (73.5)	F (87.4)	-
	Barfield Rd/Glenlake Pkwy @ Abernathy Rd		<u>F (100.4)</u>	<u>F (84.9)</u>	<u>E/E</u>
	Eastbound		F (105.6)	D (38.8)	-
4	Westbound	Signalized	F (95.3)	C (29.5)	-
	Northbound		E (65.8)	F (194.4)	-
	Southbound		F (119.8)	F (152.3)	-
	Glenridge Dr @ Abernathy Rd		<u>F (95.8)</u>	<u>E (79.4)</u>	<u>E/E</u>
	Eastbound		F (124.6)	C (32.6)	-
5	Westbound	Signalized	B (17.0)	E (65.4)	-
	Northbound		E (74.3)	F (194.3)	-
	Southbound		F (83.2)	F (106.0)	-
	SR 9 (Roswell Rd) @ Abernathy Rd		<u>F (125.2)</u>	<u>F (143.7)</u>	<u>E / E</u>
	Eastbound		F (110.0)	F (83.2)	-
6	Westbound	Signalized	D (49.5)	F (160.5)	-
	Northbound		E (73.4)	F (152.5)	-
	Southbound		F (179.6)	F (148.4)	-
	Glenridge Dr @ Mount Vernon Hwy		<u>F (112.9)</u>	<u>F (283.1)</u>	<u>E / E</u>
	Eastbound		D (46.2)	C (28.9)	-
7	Westbound	Signalized	C (24.8)	E (65.3)	-
	Northbound		F (446.0)	F (900.4)	-
	Southbound		F (97.1)	F (178.0)	-
	Barfield Rd @ Mount Vernon Hwy		<u>C (31.7)</u>	<u>E (68.9)</u>	<u>D/E</u>
	Eastbound		C (20.1)	C (32.6)	-
8	Westbound	Signalized	B (19.3)	D (44.7)	-
	Northbound		E (70.5)	F (167.4)	-
	Southbound		E (55.3)	D (42.6)	-
	Glenridge Dr @ Glenlake Pkwy	Stop Controlled			
9	Eastbound Left	on Southbound	A (7.6)	B (11.7)	D/D
	Southbound		F (145.0)	C (18.7)	E/D
	Glenridge Dr @ Spalding Drive				- /-
	Northbound	All-Way Stop	B (14.8)	B (10.8)	D/D
10	Lastbound	Controlled	F (58.5)	B (12.2)	E/D
	Westbound		B (13.6)	E (39.2)	D/E
	Southbound		A (0.0)	A (0.0)	D/D

The results of existing traffic operations analysis indicates that some of the study intersections are operating at a level-of-service that does not meet the standard. These areas are addressed in the Future

Traffic Analysis sections. The existing traffic control and lane geometry for the intersections are shown in Figure 3.





5.0 PROJECT DESCRIPTION

The purpose of this study is to determine the traffic impact that will result from the development located on Abernathy Road, between Glenridge Drive and Barfield Road. The traffic analysis evaluates the current operations compared to the future conditions with the traffic generated by the development. The proposed development consists of:

- Northern Tract (Phase 1)
 - Townhomes and Stacked Flats: 545 units
 - o Commercial Space: 13,852 sf
- Southern Tract (Phase 1)
 - Townhomes and Stacked Flats: 114 units
 - Commercial Space: 22,549 sf
 - Apartment: 399 units
 - Corporate Headquarters: 235,000 sf
- Southern Tract (Phase 2 / Future)
 - Corporate Headquarters: 225,000 sf expansion

The development proposes access at the following locations:

- Northern Tract Access:
 - North Site Driveway 1: Right-in / Right-out on Abernathy Road, east of Glenridge Drive
 - North Site Driveway 2: Full-Access (Signalized) Driveway on Abernathy Road
- Southern Tract Access:
 - South Site Driveway 1: Right-in / Right-out on Abernathy Road, east of Glenridge Drive
 - South Site Driveway 2: Full-Access (Signalized) Driveway on Abernathy Road
 - South Site Driveway 3: Right-in / Right-out on Abernathy Road, west of Barfield Road
 - South Site Driveway 4: Full-Access Driveway on Glenridge Drive
 - South Site Driveway 5: Full-Access Driveway on Barfield Road

5.1 Site Plan

A site plan is shown in Figure 4. A larger size drawing and a digital copy of the site plan are also provided with this report.

5.1.1 Planned Bicycle and Pedestrian Facilities

The on and/or off-site provisions for non-motorized travel included in the planned construction of the proposed development are as follows:

- The proposed development will be comprised of residential, retail, and office uses. Pedestrian connections are proposed between the mixed-uses on the site.
- The development plan includes several design elements that enhance the character and quality the site by incorporating building orientation, parking locations, bicycle and pedestrian facilities, and a mix of land uses.
- A sidewalk or a multiuse trail shall be provided along public street frontages with pedestrian lights and street trees.

5.1.2 Planned Transit Facilities

The site is not directly served by transit. However, the Sandy Springs MARTA Station is located approximately 0.65 miles east of the Abernathy Road at Barfield Road intersection. The nearest bus corridor that is served by MARTA is Roswell Road, bus route 87, which is approximately 0.65 miles west of the Barfield Road at Abernathy Road intersection. No transit facilities are planned for the development.

5.1.3 Project Phasing

A phasing schedule is to be provided for any proposed DRIs involving multiple phases. The phasing schedule for this project is as follows. Access to the development is to be constructed entirely in phase 1.

Phase 1 (Year 2020)

- Northern Tract
 - Townhomes and Stacked Flats: 545 units
 - Commercial Space: 13,852 sf
- Southern Tract
 - Townhomes and Stacked Flats: 114 units
 - Commercial Space: 22,549 sf
 - Apartment: 399 units
 - Corporate Headquarters: 235,000 sf

Phase 2 (Year 2025 / Future)

- Northern Tract
 - o Phase 1 Development
- Southern Tract (Phase 2 / Future)
 - Phase 1 Development
 - Corporate Headquarters: 225,000 sf expansion

5.2 Trip Generation

Trip generation estimates for the project were based on the rates and equations published in the 9th edition of the Institute of Transportation Engineers (ITE) Trip Generation report. This reference contains traffic volume count data collected at similar facilities nationwide. The trip generation was based on the following ITE Land Uses:

- LAND USE 220 Apartment
- LAND USE 230 Residential Condominium/Townhouse
- LAND USE 714 Corporate Headquarters Building
- LAND USE 820 Shopping Center

Due to the nature of the development, alternative mode and mixed-use reductions have been applied per ITE standards. The trip generation for the proposed development is shown in Tables 5, 6, and 7.

TABLE 5 – TRIP GENERATION FOR NORTHERN TRACT (PHASE 1 & 2)									
Land Lisa	Size	AM Peak Hour			PM Peak Hour			24 Hour	
Land Ose		Enter	Exit	Total	Enter	Exit	Total	Two-way	
Commercial	13,852 sf	29	18	47	77	83	160	1,879	
Townhomes and Stacked Flats 545 ur		34	166	200	162	79	241	2,812	
Mixed-Use Reductions (per II	-5	-5	-10	-17	-17	-34	-376		
Alternative Mode Rec	-2	-8	-10	-8	-4	-12	-141		
Total External Vehicle Trips	56	171	227	214	141	355	4,174		

TABLE 6 – TRIP GENERATION FOR SOUTHERN TRACT (PHASE 1)									
Land Lico	Sizo	AM Peak Hour			PM Peak Hour			24 Hour	
	3120	Enter	Exit	Total	Enter	Exit	Total	Two-way	
Townhomes and Stacked Flats	104 units	9	44	53	42	20	62	666	
Apartment	399 units	40	160	200	154	84	238	2,548	
Corporate Headquarters Building	235,000 sf	320	24	344	33	292	325	1,855	
Commercial	22,549 sf	39	24	63	107	115	222	2,579	
Mixed-Use Reductions (per II	-9	-9	-18	-33	-33	-66	-736		
Alternative Mode Rec	-20	-12	-32	-16	-24	-40	-345		
Total External Vehicle Trips	379	231	610	287	454	741	6,567		

TABLE 7 – TRIP GENERATION FOR SOUTHERN TRACT (PHASE 1 & 2)									
Land Lico	Ci- a	AM	Peak H	our	PM	24 Hour			
	Size	Enter	Exit	Total	Enter	Exit	Total	Two-way	
Townhomes and Stacked Flats	104 units	9	44	53	42	20	62	666	
Apartment	399 units	40	160	200	154	84	238	2,548	
Corporate Headquarters Building	460,000 sf	610	46	656	59	528	587	3,559	
Commercial	22,549 sf	39	24	63	107	115	222	2,579	
Mixed-Use Reductions (per IT	-4	-4	-8	-40	-40	-80	-912		
Alternative Mode Reductions (5%)			-13	-48	-16	-35	-51	-422	
Total External Vehicle Trips	659	257	916	306	672	978	8,018		

5.3 Trip Distribution

The trip distribution describes how traffic arrives and departs from the site. A distribution for the site traffic was developed to estimate trips entering and exiting the development. Separate trip distributions were developed for the office and residential/retail components based on:

- Locations of major roadways and highways that will serve the development
- Existing traffic count data (Appendix A)
- ARC Travel Demand Model Data for TAZ 191 and 195 (Appendix C)
- GDOT ADT volumes (Appendix E)
- Discussions with GRTA, GDOT, and City of Sandy Springs

The site-generated peak hour traffic volumes were assigned to the study area intersections based on the agreed-upon outer-leg distribution. The outer-leg distributions and AM and PM peak hour new traffic generated by the site are shown for the following trip generators:

- TRIP GENERATION NORTHERN PARCEL P.M. Peak Hour 24-Hr A.M. Peak Hour Land Use Commercial Space (13,852 sf) Enter Exit Total Exit Enter Total 2-way Townhomes and Flats (545 units) Phase 1 56 171 227 214 141 355 4,174 Development
- Figure 5 Northern Tract (Phase 1 & 2)

- Figure 6 Southern Tract Retail and Residential (Phase 1)
- Figure 7 Southern Tract Office (Phase 1)

Trip Gene	RATION											
Land Usa	A.M. Peak Hour			P.M. Peak Hour			24-Hr					
Land Use	Enter	Exit	Total	Enter	Exit	Total	2-way	Apartment (399 units)				
Residential & Retail Trips	76	209	285	259	182	441	4,909	Corporate Headquarters (235,000 sf) Commercial Space (22,549 sf)				
Office Trips	303	22	325	28	272	300	1,658	Townhomes and Flats (104 units)				
Phase 1 Development	379	231	610	287	454	741	6,567					

- Figure 8 Southern Tract Retail and Residential (Phase 2)
- Figure 9 Southern Tract Office (Phase 2)

Trip Gene	RATION									
Land Lisa	A.M. Peak Hour			P.M. Peak Hour			24-Hr			
Land Use	Enter	Exit	Total	Enter	Exit	Total	2-way	Apartment (399 units)		
Residential & Retail Trips	80	213	293	254	177	431	4,775	Corporate Headquarters (460,000 sf) Commercial Space (22,549 sf)		
Office Trips	579	44	623	52	495	547	3,243	Townhomes and Flats (104 units)		
Phase 2 Development	659	257	916	306	672	978	8,018			























6.0 PLANNED AND PROGRAMMED IMPROVEMENTS

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

	TABLE 6 — PLANNE	ED AND PROGRAMM	ED IMPROVEMENTS	5
ARC Number /	Pouto	Type of	Estimated	Sourco
GDOT Number	Noute	Improvement	Completion Year	Source
FN-AR-100A / GDOT	SR 400	General Purpose	2020	Plan 2040
721850	51(400	Capacity/Interchange	2020	Fian 2040
ASP-AR-424	SR 400	Transit / Rail Capacity	TBD	Plan 2040
AR-ML-300 / GDOT	SR 400	Roadway/Managed	2040	Plan 2040
0008445	51(400	Lanes	2040	Fiall 2040
AR-ML-200 / GDOT	I-285	Roadway/Managed	2030	Plan 2040
0001758		Lanes		
AR-957 / GDOT	I-285 at SR 400	Roadway/Interchange	2020	Plan 2040
0000784	. 200 01 011 100	Capacity		
GDOT 0013338	SR 400	Operational	TBD	GDOT TransPi
	511 +00	Improvement	100	
GDOT M005310	SR 400	Pavement Markings	TBD	GDOT TransPi
FN-282 / GDOT 0012629	SR 9 (Roswell Road)	Roadway / Operations & Safety	2016	Plan 2040

Projects that will be completed by the 2020 analysis year include:

FN-AR-100A / GDOT 721850: SR 400 COLLECTOR/DISTRIBUTOR LANES

FN-AR 100A includes the addition of a 4-lane collector/distributor system on SR 400 from just south of Hammond/Abernathy Road to North of Spalding Drive. The construction of this facility will allow for less congested conditions throughout the North Fulton corridor. This project has been represented through the following changes to the study network:

- Replacement of all GA 400 Ramp intersections with those proposed by the Abernathy Road DDI
- Additional eastbound through lane at the intersection of Abernathy Road at Barfield Road / Glenlake Pkwy
- Additional westbound shared through/right lane at the intersection of Abernathy Road at Barfield Road / Glenlake Pkwy
- Widening of Mt Vernon Hwy to have two eastbound departure lanes at Barfield Road
- Widening of Mt Vernon Hwy to have two westbound approach lanes at Barfield Road
- Adjustments signal timing (cycle length, splits, and offsets) along Abernathy Road



AR-957 / GDOT 0000784: REVIVE 285 - I-285 INTERCHANGE RECONSTRUCTION AND HOV SYSTEM

This project is to reconstruct the I-285/SR 400 interchange. It improves existing ramp connections between I-285 east and west and SR 400 north and south, in addition to constructing collectordistributor lanes on I-285 east and west and SR 400 north. The project does not preclude the addition of managed lane connections between I-285 and SR 400 in the future. This project has been represented through the following changes to the study network:

• No changes made for this project within the study network

FN-282 / GDOT 0012629: SR 9 (ROSWELL ROAD) - ITS SYSTEM EXPANSION

This project begins on SR 9/Roswell Road at Chastain Drive within the City of Atlanta limits and continues north to the intersection of SR 9/Roswell Road and Vernon Woods Drive in Sandy Springs. Adjacent signals on Hammond Drive, Johnson Ferry Road, and Mt. Vernon Highway are also included. The goal of the project is to provide for optimized signal operations along SR 9/Roswell Road to minimize daily vehicular delay and congestion. The scope of work includes adding the adaptive signal management system Split Cycle Offset Optimization Technique (SCOOT), enhanced vehicle counting stations and additional system vehicle detection as required for 27 intersections. Intersection upgrades will be limited to components necessary to operate the SCOOT system. It is anticipated that all work will be constructed within the state or city Right of Way. This project has been represented through the following changes to the study network:

• No changes made for this project within the study network

7.0 FUTURE YEAR 2020 TRAFFIC ANALYSIS

The future traffic operations are analyzed for the "Build" and "No-Build" conditions in the year 2020, which is the estimated completion date for Phase 1 of the development. This analysis provides a basis of reference for determining both the contribution of the background growth to overall traffic conditions and the additional improvements needed to provide sufficient site access and capacity for passing traffic.

Improvements that are identified as "System Improvements" address deficiencies that are found within the road network for the "No-Build" conditions, without the addition of traffic from the proposed development. Improvements that are identified as "Site Mitigation Improvements" address site-added impacts that are in addition to those caused by the background traffic.

7.1 Future 2020 "No-Build" Conditions

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

7.1.1 Volumes at Abernathy Diverging Diamond Interchange

GDOT provided projected 2019 design hour turning movement volumes at the diverging diamond interchange. These volumes were increased using the annual growth rate and compared to the projected volumes that were derived from data collected in the field. The eastbound and westbound directions were checked for variation between intersections with a goal of GEH statistic < 5 for individual link flows. The eastbound through volumes provided at the DDI were increased by 200 vehicles to meet this goal along Abernathy Road. More information is provided on these adjustments in the Appendix L. No decreases were made to the traffic volumes.

7.1.2 Annual Growth Rate (No-Build 2020)

In order to evaluate future traffic operations in this area, a projection of normal traffic growth was applied to the existing volumes. The Georgia Department of Transportation recorded average daily traffic volumes at several locations in the vicinity of the site. Reviewing the growth over the last several years revealed a consistent positive growth of through traffic. Based on discussions with the City of Sandy Springs, GDOT, and GRTA a growth rate of 1.5% was used in the analysis, consistent with the GRTA Letter of Understanding. This growth factor was applied to the existing traffic volumes in order to estimate the future year traffic volumes prior to the addition of site-generated traffic. The resulting Future "No-Build" volumes on the roadway are shown in Figure 10.

7.1.3 System Improvement Recommendations (No-Build 2020)

Improvements that are identified as system improvements address deficiencies that are found the study network for the "No-Build" conditions, without the addition of traffic from the proposed development. Based on the 2020 "No-Build" conditions (includes background growth without site added traffic) the following improvements result in the following intersections operating at their level-of-service standard

or better (except where stated otherwise). *Please note that the following improvements are in addition planned improvement projects that are to be completed by 2020.* Survey and construction drawings may be needed to verify the feasibility and extent of additional right-of-way required for any recommended improvements.

5. Glenridge Drive @ Abernathy Road

- Construct an additional northbound left turn lane, creating dual left turns and a shared through/right lane, on the Glenridge Drive approach to Abernathy Road.
- Provide protected-only left turn phasing for the northbound left turn movement.

6. SR 9 (Roswell Rd) @ Abernathy Road

This intersection is shown to have LOS "F" in the existing conditions, with high levels of delay and queuing on many of the approaches during peak hours. As the intersection already has dual left turn lanes and dedicated right turn lanes for each approach, a more involved project would be needed to bring delays up to the required level-of-service standard.

• Future capacity improvement project (e.g. Partial Median U-turn intersection, Six-lane widening, Grade separation, etc.)

Three such improvements were analyzed in this report: 1) Six-Lane all four approaches, 2) Grade Separated via a single-point diamond interchange (SPDI), 3) Partial MUTs—where direct left turns from only the major approaches are eliminated. The results of the "No-Build" 2020 operations for each of these scenarios are shown in Table 8. A conceptual representation of each of these improvement scenarios is provided in Appendix M.

TABLE 8 – SR 9 (ROSWELL RD) AT ABERNATHY RD IMPROVEMENT SCENARIOS										
No-Build 2020	Unimproved		Median U-Turn		Grade Se	eparated	Six-Lane			
Time Period	AM	PM	AM	PM	AM	PM	AM	PM		
OVERALL	<u>F (152.6)</u>	<u>F (173.7)</u>	<u>D (44.9)</u>	D (50.0)	<u>D (52.6)</u>	<u>E (60.1)</u>	<u>E (63.9)</u>	<u>E (75.9)</u>		
Eastbound	F (147.2)	F (93.5)	B (15.0)	B (10.3)	E (78.1)	E (73.2)	E (58.0)	E (72.6)		
Westbound	D (50.8)	F (189.2)	A (9.7)	C (28.9)	F (109.4)	F (106.0)	D (53.9)	E (73.2)		
Northbound	F (81.3)	F (192.5)	E (62.0)	F (84.7)	C (34.6)	D (49.2)	E (64.4)	E (67.6)		
Southbound	F (211.8)	F (179.2)	F (90.5)	E (77.1)	D (41.4)	D (45.7)	E (72.0)	F (89.5)		
Vehicle-Hours	236.4	318.7	92.9	135.2	77.7	90.6	99	139.3		

As the Median U-Turn concept seemed to require the least right-of-way and showed considerable improvement, it was used in the improved operations analysis for this report.

7. Glenridge Drive @ Mount Vernon Highway

The intersection is expected to operate at an LOS "F" for the PM Peak period. According to engineering judgment, the necessary improvements needed to bring the PM peak period within the LOS standard were not feasible/practical. The intersection will, however, be within the LOS standard in the AM peak and continue to operate better than the existing conditions with the following 2020 "No-Build" improvements.

- Widen and restripe the northbound approach on Glenridge Drive to include a dedicated left turn lane and shared through / right lane.
- Widen and restripe the southbound approach on Glenridge Drive to include a dedicated left turn lane and shared through / right lane.

8. Barfield Road @ Mount Vernon Highway

• Construct a northbound right turn lane on Barfield Road that will free-flow into the additional eastbound lane on Mt Vernon Hwy (added from GDOT project 721850).

9. Glenridge Drive @ Glenlake Parkway

With the following improvements, the southbound stop-controlled approach will remain operating at LOS "F" in the AM peak period. A preliminary examination of the peak hour traffic indicates that volumes may not meet MUTCD thresholds for construction of a traffic signal. The AM peak period will operate better than the existing conditions, and adequate level-of-service is expected during the rest of the day; therefore, no other reasonable improvements were identified at this intersection.

• Median separate outside eastbound lane through the intersection, leaving the inside eastbound receiving lane open to southbound left turn movements (unsignalized Florida-T).

10. Glenridge Drive @ Spalding Drive

With the following improvements, the overall intersection operations will improve; however, the northbound left approach will operating at LOS "F" in the AM peak period. This approach has relatively few left turns in the AM peak hour (16 veh/hr.), and the queues are anticipated to be reasonable after the following modifications; therefore, no other reasonable improvements were identified at this intersection.

- Construct yield-controlled northbound right turn lane on Glenridge Drive
- Convert the intersection from all-way stop to side-street stop by removing stop condition for the eastbound and westbound approaches

It should be noted that traffic calming measures have been placed along Glenridge Drive between Glenlake Pkwy and Spalding Drive, including several speed humps and a roundabout intersection, which may compete with the desire to improve traffic flow through this intersection.

7.1.4 Intersection Operations Analysis (No-Build 2020)

The traffic operations were analyzed at the study intersections in accordance with the HCM methodology. The local level-of-service (LOS) standard is "D" or better. If the existing LOS for the segment or intersection is "E" or "F", then the future "No-Build" LOS standard will be LOS "E", consistent with the GRTA Letter of Understanding. The projected 2020 "No-Build" levels-of-service with and without improvements are shown in Table 9.

	TABLE 9 – NO-BUILD 2020 INTERSECTION OPERATIONS									
		No-Buil	d 2020:	1.00	Modification(s)	Improved No-Build				
	Intersection	LOS (I	Delay)	LUS	In addition to Planned	2020: LO	S (Delay)			
		AM Peak	PM Peak	510	Improvement Projects	AM Peak	PM Peak			
	Abernathy Rd @ DDI	<u>C (26.6)</u>	<u>C (31.1)</u>	D/D		<u>C (29.4)</u>	<u>C (28.1)</u>			
D4	Crossover (East)									
DI	Westbound	D (46.9)	D (52.0)	-	-	D (43.5)	D (46.9)			
	Eastbound	B (15.4)	A (5.4)	-		C (21.6)	A (5.4)			
	Abernathy Rd @ DDI	<u>C (21.5)</u>	<u>C (20.3)</u>	<u>D/D</u>		<u>B (18.7)</u>	<u>B (14.9)</u>			
53	Crossover (West)									
DZ	Eastbound	C (32.4)	C (31.1)	-	-	C (24.4)	C (24.4)			
	Westbound	B (12.3)	A (9.8)	-		B (13.9)	A (5.9)			
	Barfield Rd @ Abernathy	<u>E (56.3)</u>	<u>E (67.6)</u>	<u>E/E</u>		<u>D (38.4)</u>	<u>E (63.1)</u>			
	Eastbound	E (61.5)	E (61.0)	-		C (29.3)	C (31.9)			
4	Westbound	C (27.4)	D (40.5)	-	-	C (29.9)	D (36.6)			
	Northbound	E (72.6)	F (91.1)	-		F (90.2)	F (85.7)			
	Southbound	E (76.5)	F (103.9)	-		E (79.3)	F (120.5)			
	Glenridge Dr @ Abernathy	<u>F (131.8)</u>	<u>F (102.0)</u>	<u>E/E</u>		<u>E (67.8)</u>	<u>E (69.5)</u>			
	Eastbound	F (171.0)	C (33.9)	-	- Miden for duel NDI	E (74.4)	A (5.3)			
5	Westbound	D (47.6)	F (89.3)	-	• Widen for dual NBL	C (21.6)	F (90.0)			
	Northbound	E (77.6)	F (253.4)	-	turn lartes	F (96.9)	F (82.8)			
	Southbound	F (91.9)	F (120.0)	-		F (97.2)	F (119.9)			
	SR 9 (Roswell Rd) @	<u>F (152.6)</u>	<u>F (173.7)</u>	<u>E/E</u>		<u>D (44.9)</u>	<u>D (50.0)</u>			
	Abernathy Rd									
6	Eastbound	F (147.2)	F (93.5)	-	 Median U-turn 	B (15.0)	B (10.3)			
Ů	Westbound	D (50.8)	F (189.2)	-	intersection	A (9.7)	C (28.9)			
	Northbound	F (81.3)	F (192.5)	-		E (62.0)	F (84.7)			
	Southbound	F (211.8)	F (179.2)	-		F (90.5)	E (77.1)			
	Glenridge Dr @ Mount	<u>F (154.7)</u>	<u>F (350.0)</u>	<u>E/E</u>		<u>D (54.1)</u>	<u>F (109.8)</u>			
	Vernon Hwy				 Restripe/widen for 					
7	Eastbound	E (68.2)	C (33.0)	-	NBL and NBT/R lanes	D (48.1)	F (218.6)			
	Westbound	C (30.5)	F (106.8)	-	 Restripe/widen for 	C (26.5)	E (80.0)			
	Northbound	F (597.5)	F (1075.2)	-	SBL and SBT/R lanes	E (56.2)	E (68.3)			
	Southbound	F (136.7)	F (232.4)	-		F (91.2)	E (65.1)			
	Barfield Rd @ Mount	<u>C (33.6)</u>	<u>F (84.1)</u>	<u>D/E</u>		<u>C (31.7)</u>	<u>D (49.1)</u>			
	Vernon Hwy									
8	Eastbound	C (22.6)	D (44.5)	-	 Free-flow northbound 	C (26.2)	C (22.8)			
	Westbound	C (22.0)	E (58.1)	-	right turn lane	B (17.2)	C (33.8)			
	Northbound	E (72.5)	F (199.8)	-		E (58.7)	F (97.8)			
	Southbound	D (54.9)	D (43.2)	-		E (57.8)	F (87.5)			
_	Glenridge Dr @ Glenlake		D (4	- /-	 Median separate 					
9	Eastbound Left	A (7.6)	B (12.6)	D/D	outside EB through	A (7.4)	A (8.7)			
	Southbound	F (202.9)	C (21.9)	E/D	lane to keep free flow	F (50.9)	В (11.0)			
		Tabl	e continued o	on next	page					

Intersection		No-Build 2020: LOS (Delay)		LOS	Modification(s) In addition to Planned	Improved No-Build 2020: LOS (Delay)	
		AM Peak	PM Peak	510	Improvement Projects	AM Peak	PM Peak
	Glenridge Dr @ Spalding				 Construct Yield 		
	Northbound C (16.5) B (11)		D/D	Controlled NBR lane	F (67.6)	C (18.7)	
10	Eastbound	F (59.2)	B (12.6)	E/D	 Remove stop 	A (0.0)	A (0.0)
	Westbound	B (14.4)	F (53.4)	D/E	condition for EB and	B (10.4)	A (3.6)
	Southbound	A (0.0)	A (0.0)	D/D	WB	A (0.0)	A (0.0)

The "No-Build" weekday peak hour volumes associated with the study network are shown in Figure 10.



7.2 Future 2020 "Build" Conditions

The "Build" or development conditions include the estimated background traffic from the "No-Build" conditions plus the added traffic from the proposed development. In order to evaluate future traffic operations in this area, the additional traffic volumes from the site (Figures 5, 6, and 7) were added to No-Build traffic volumes (Figure 10) to calculate the future traffic volumes after the construction of the development. These total future traffic volumes (Figures 11A and 11B) were used to evaluate the "Build" condition, which includes the projected site traffic. The results of the "Build" operations analyses with the assumed site access configuration are shown in Table 10.

7.2.1 Site Mitigation Improvements (Build 2020)

Improvements that are identified as mitigation improvements address deficiencies that are caused by site traffic and can be identified as related to the proposed development. Based on the 2020 "Build" conditions (includes background growth plus site added traffic) the following improvements result in the following intersections operating at their level-of-service standard or better (except where stated otherwise). *Please note that the following improvements are in addition to improvements needed in the 2020 "No-Build" conditions.* Survey and construction drawings may be needed to verify the feasibility and extent of additional right-of-way required for any recommended improvements.

5. Glenridge Drive @ Abernathy Road

• Construct southbound right turn lane on Glenridge Drive

7. Glenridge Drive @ Mount Vernon Highway

The intersection is expected to operate at an LOS "F" for the PM Peak Hour. According to engineering judgment, the necessary improvements needed to bring the PM peak hour within the LOS standard were not feasible/practical. The intersection will, however, be within the LOS standard in the AM peak and continue to operate better than the existing conditions with the "No-Build" improvements.

9. Glenridge Drive @ Glenlake Parkway

With the "No-Build" improvements, the southbound stop-controlled approach will remain operating at LOS "F" in the AM peak period. A preliminary examination of the peak hour traffic indicates that volumes may not meet MUTCD thresholds for construction of a traffic signal. The AM peak period will operate better than the existing conditions, and adequate level-of-service is expected during the rest of the day; therefore, no other reasonable improvements were identified at this intersection.

10. Glenridge Drive @ Spalding Drive

With the "No-Build" improvements, the overall intersection operations will improve; however, the northbound left approach will operating at LOS "F" in the AM peak period. This approach has relatively few left turns in the AM peak hour (20 veh/hr.), and the queues are anticipated to be reasonable after the following modifications; therefore, no other reasonable improvements were identified at this intersection. It should be noted that traffic calming measures have been placed along Glenridge Drive

between Glenlake Pkwy and Spalding Drive, including several speed humps and a roundabout intersection, which may compete with the desire to improve traffic flow through this intersection.

7.2.2 Intersection Operations Analysis (Build 2020)

The traffic operations were analyzed at the study intersections in accordance with the HCM methodology. The local level-of-service (LOS) standard is "D" or better. If the existing LOS for the segment or intersection is "E" or "F", then the future "No-Build" LOS standard will be LOS "E", consistent with the GRTA Letter of Understanding. The projected 2020 "Build" levels-of-service with and without improvements are shown in Table 10.

	TABLE	10 – Bui	LD 2020 I	NTER	SECTION OPERATION	1S	
		Build	2020:	1.00	Modification(s)	Improved B	Build 2020:
	Intersection	LOS (I	Delay)		In addition to No-Build	LOS (Delay)	
		AM Peak	PM Peak	210	2020 improvements	AM Peak	PM Peak
	Abernathy Rd @ DDI	<u>C (26.7)</u>	<u>C (31.6)</u>	D/D		<u>C (29.1)</u>	<u>C (30.0)</u>
D1	Crossover (East)						
DI	Westbound	D (47.6)	D (53.5)	-	-	C (20.8)	D (50.8)
	Eastbound	B (15.0)	A (5.0)	-		D (44.1)	A (5.0)
	Abernathy Rd @ DDI	<u>C (23.3)</u>	<u>C (27.6)</u>	D/D		<u>B (19.4)</u>	<u>C (20.5)</u>
53	Crossover (West)						
UZ	Eastbound	D (35.9)	D (44.9)	-	-	C (25.6)	C (34.6)
	Westbound	B (12.8)	B (11.2)	-		B (14.1)	A (7.3)
	Barfield Rd @ Abernathy	<u>E (67.0)</u>	<u>E (61.9)</u>	<u>E/E</u>		<u>D (38.3)</u>	<u>E (55.2)</u>
	Eastbound	F (80.2)	D (40.7)	-		C (26.1)	A (9.5)
4	Westbound	C (32.2)	D (44.5)	-	-	D (38.9)	D (40.3)
	Northbound	E (76.9)	F (92.7)	-		F (90.1)	F (86.5)
	Southbound	E (76.9)	F (104.4)	-		F (83.0)	F (121.6)
	Glenridge Dr @ Abernathy	<u>F (160.7)</u>	<u>F (121.2)</u>	<u>E/E</u>		<u>E (66.7)</u>	<u>D (42.9)</u>
	Eastbound	F (219.5)	D (36.8)	-		E (78.6)	A (4.7)
5	Westbound	D (41.8)	F (116.4)	-	Construct Southbound	A (9.0)	D (37.5)
	Northbound	F (87.6)	F (290.5)	-	Right Turn Lane	F (82.8)	F (110.2)
	Southbound	F (104.1)	F (117.3)	-		F (100.8)	E (78.9)
	SR 9 (Roswell Rd) @	<u>F (162.3)</u>	<u>F (181.5)</u>	<u>E/E</u>		<u>D (44.6)</u>	<u>E (57.0)</u>
	Abernathy Rd						
c	Eastbound	F (170.3)	F (94.9)	-		B (17.0)	B (10.4)
0	Westbound	E (55.4)	F (201.4)	-	-	A (4.9)	D (45.7)
	Northbound	F (99.5)	F (206.3)	-		E (62.6)	F (84.0)
	Southbound	F (209.7)	F (178.3)	-		F (90.9)	F (85.0)
	Glenridge Dr @ Mount	<u>F (166.0)</u>	<u>F (368.5)</u>	<u>E/E</u>		<u>E (62.0)</u>	<u>F (110.5)</u>
	Vernon Hwy						
7	Eastbound	E (67.3)	C (32.3)	-		D (47.5)	F (212.4)
'	Westbound	C (30.6)	F (106.6)	-	_	C (26.4)	E (79.7)
	Northbound	F (639.4)	F (1132.4)	-		E (57.1)	E (79.3)
	Southbound	F (149.9)	F (245.7)	-		F (120.5)	E (64.1)
		Table	e continued o	n next p	page		

		Build	2020:	1.05	Modification(s)	Improved Build 2020:	
	Intersection	LOS (I	Delay)		In addition to No-Build	LOS (Delay)	
		AM Peak	PM Peak	210	2020 improvements	AM Peak	PM Peak
	Barfield Rd @ Mount	<u>D (35.3)</u>	<u>F (91.1)</u>	<u>D/E</u>		<u>C (33.2)</u>	<u>E (58.9)</u>
	Vernon Hwy						
0	Eastbound	C (24.1)	D (47.9)	-		C (26.8)	C (22.8)
0	Westbound	C (23.5)	E (61.1)	-	-	B (17.8)	C (33.8)
	Northbound	E (74.5)	F (219.7)	-		E (59.0)	F (116.8)
	Southbound	D (54.7)	D (44.3)	-		E (60.4)	F (103.0)
	Glenridge Dr @ Glenlake						
9	Eastbound Left	A (7.6)	B (13.1)	D/D	-	A (7.5)	A (8.8)
	Southbound	F (244.5)	C (23.7)	E/D		F (58.8)	B (11.1)
	Glenridge Dr @ Spalding						
	Northbound	C (17.4)	B (11.3)	D/D		F (102.8)	C (21.1)
10	Eastbound	F (59.9)	B (13.2)	E/D	-	A (0.0)	A (0.0)
	Westbound	C (15.6)	F (53.9)	D/E		B (10.7)	A (3.9)
	Southbound	-	-	D/D		-	-

The volumes for the "Build" conditions are shown in Figures 11A and 11B. The laneage for the 2020 "No-Build" and "Build" improvements are shown in Figure 12.





A&R Engineering Inc.



8.0 FUTURE YEAR 2025 TRAFFIC ANALYSIS

The future traffic operations are analyzed for the "Build" and "No-Build" conditions in the year 2025, which is the estimated completion date for Phase 2 of the development. This analysis provides a basis of reference for determining both the contribution of the background growth to overall traffic conditions and the additional improvements needed to provide sufficient site access and capacity for passing traffic.

Improvements that are identified as "System Improvements" address deficiencies that are found within the road network for the "No-Build" conditions, without the addition of traffic from the proposed development. Improvements that are identified as "Site Mitigation Improvements" address site added impacts that are in addition to those caused by the background traffic.

8.1 Future 2025 "No-Build" Conditions

The "No-Build" (or background conditions) provide an assessment of how traffic will operate in the horizon year without the study site being developed as proposed. The Future "No-Build" volumes consist of the "No-Build" 2020 traffic volumes (Figure 10) plus increases for annual growth of through traffic.

8.1.1 Annual Growth Rate (No-Build 2025)

In order to evaluate future traffic operations in this area, a projection of normal traffic growth was applied to the "No-Build" 2020 volumes. The Georgia Department of Transportation recorded average daily traffic volumes at several locations in the vicinity of the site. Reviewing the growth over the last several years revealed a consistent positive growth of through traffic. Based on discussions with the City of Sandy Springs, GDOT, and GRTA a growth rate of 1.5% was used in the analysis, consistent with the GRTA Letter of Understanding. The resulting Future "No-Build" 2025 volumes on the roadway are shown in Figure 13.

8.1.2 System Improvement Recommendations (No-Build 2025)

Improvements that are identified as system improvements address deficiencies that are found the study network for the "No-Build" conditions, without the addition of traffic from the proposed development. Based on the 2025 "No-Build" conditions (includes background growth without site added traffic) the following improvements result in the following intersections operating at their level-of-service standard or better (except where stated otherwise). *Please note that the following improvements are in addition planned improvement projects that are to be completed by 2020 and the improvements needed in the "No-Build" 2020 conditions.* Survey and construction drawings may be needed to verify the feasibility and extent of additional right-of-way required for any recommended improvements.

5. Glenridge Drive @ Abernathy Road

• Construct southbound right turn lane on Glenridge Drive

7. Glenridge Drive @ Mount Vernon Highway

The intersection is expected to operate at an LOS "F" for the PM Peak Hour. According to engineering judgment, the necessary improvements needed to bring the PM peak hour within the LOS standard were not feasible/practical. The intersection will, however, continue to operate better than the existing conditions.

9. Glenridge Drive @ Glenlake Parkway

With the 2020 "No-Build" improvements, the southbound stop-controlled approach will remain operating at LOS "F" in the AM peak period. A preliminary examination of the peak hour traffic indicates that volumes may not meet MUTCD thresholds for construction of a traffic signal. The AM peak period will operate better than the existing conditions, and adequate level-of-service is expected during the rest of the day; therefore, no other reasonable improvements were identified at this intersection.

10. Glenridge Drive @ Spalding Drive

With the 2020 "No-Build" improvements, the overall intersection operations will improve; however, the northbound left approach will operating at LOS "F" in the AM peak period. This approach has relatively few left turns in the AM peak hour (17 veh/hr.), and the queues are anticipated to be reasonable after the following modifications; therefore, no other reasonable improvements were identified at this intersection. It should be noted that traffic calming measures have been placed along Glenridge Drive between Glenlake Pkwy and Spalding Drive, including several speed humps and a roundabout intersection, which may compete with the desire to improve traffic flow through this intersection.

8.1.3 Intersection Operations Analysis (No-Build 2025)

The traffic operations were analyzed at the study intersections in accordance with the HCM methodology. The local level-of-service (LOS) standard is "D" or better. If the existing LOS for the segment or intersection is "E" or "F", then the future "No-Build" LOS standard will be LOS "E", consistent with the GRTA Letter of Understanding. The projected 2025 "No-Build" levels-of-service with and without improvements are shown in Table 11.

	TABLE 11 – NO-BUILD 2025 INTERSECTION OPERATIONS									
		No-Buil	d 2025:	LOS	Modification(s)	Improved No-Build				
	Intersection	LOS (I	Delay)		In addition to No-Build	2025: LOS	S (Delay)			
		AM Peak	PM Peak		2020 Improvements	AM Peak	PM Peak			
	Abernathy Rd @ DDI	<u>C (28.3)</u>	<u>C (32.5)</u>	<u>D/D</u>		<u>C (30.7)</u>	<u>C (31.0)</u>			
D1	Crossover (East)									
	Westbound	D (48.2)	D (54.5)	-	-	D (54.8)	D (52.0)			
	Eastbound	B (17.3)	A (5.6)	-		B (17.5)	A (5.5)			
	Abernathy Rd @ DDI	<u>C (22.4)</u>	<u>C (22.3)</u>	<u>D/D</u>		<u>B (19.6)</u>	<u>B (16.4)</u>			
נח	Crossover (West)									
02	Eastbound	C (34.0)	D (35.8)	-	-	C (25.9)	C (27.5)			
	Westbound	B (12.6) A (9.3)		-		A (9.0)	A (5.8)			
		Tabl	e continued c	on next p	page					

		No-Build 2025:		1.00	Modification(s) Improved No-Build		
	Intersection	LOS (I	Delay)	LOS	In addition to No-Build	2025: LOS (Delay)	
		AM Peak	PM Peak	סוצ	2020 Improvements	AM Peak	PM Peak
	Barfield Rd @ Abernathy	<u>E (69.7)</u>	<u>E (75.5)</u>	<u>E/E</u>		<u>D (41.4)</u>	<u>E (72.5)</u>
	Eastbound	F (82.2)	E (61.2)	-		C (33.1)	C (33.7)
4	Westbound	C (28.9)	D (43.2)	-	-	C (32.1)	D (38.6)
	Northbound	E (72.1)	F (92.2)	-		F (91.9)	F (87.3)
	Southbound	F (80.1)	F (128.4)	-		F (80.4)	F (150.0)
	Glenridge Dr @ Abernathy	<u>F (165.0)</u>	<u>F (125.2)</u>	<u>E/E</u>		<u>E (74.9)</u>	<u>E (63.2)</u>
	Eastbound	F (219.1)	D (35.5)	-		F (82.6)	A (4.9)
5	Westbound	D (49.8)	F (119.9)	-	Construct Southbound	B (19.4)	E (75.9)
	Northbound	F (86.3)	F (290.7)	-	Right Turn Lane	F (110.1)	F (110.0)
	Southbound	F (110.1)	F (137.9)	-		F (110.6)	F (81.6)
	SR 9 (Roswell Rd) @	<u>F (184.9)</u>	<u>F (209.5)</u>	<u>E/E</u>		<u>E (60.5)</u>	<u>E (69.3)</u>
	Abernathy Rd						
6	Eastbound	F (189.9)	F (105.4)	-	_	C (33.8)	B (10.5)
Ŭ	Westbound	D (52.4)	F (228.4)	-	_	B (10.1)	D (53.2)
	Northbound	F (100.0)	F (238.4)	-		E (62.2)	F (109.3)
	Southbound	F (247.3)	F (212.7)	-		F (116.3)	F (97.7)
	Glenridge Dr @ Mount	<u>F (196.8)</u>	<u>F (428.8)</u>	<u>E/E</u>		<u>E (72.3)</u>	<u>F (133.2)</u>
	Vernon Hwy						
7	Eastbound	F (94.8)	D (39.8)	-	_	E (68.4)	F (259.6)
· ·	Westbound	D (35.3)	F (167.5)	-		D (42.8)	F (98.5)
	Northbound	F (734.8)	F (1267.1)	-		E (61.9)	F (91.4)
	Southbound	F (180.9)	F (290.3)	-		F (115.7)	E (72.8)
	Barfield Rd @ Mount	<u>D (36.3)</u>	<u>F (104.9</u>	<u>D/E</u>		<u>C (33.5)</u>	<u>E (59.0)</u>
	Vernon Hwy						
8	Eastbound	C (26.1)	E (62.2)	-	_	C (27.9)	C (25.2)
Ŭ	Westbound	C (25.6)	F (81.4)	-		B (19.5)	D (41.5)
	Northbound	E (74.8)	F (236.0)	-		E (57.3)	F (121.5)
	Southbound	D (54.6)	D (44.1)	-		E (60.0)	F (102.5)
	Glenridge Dr @ Glenlake						
9	Eastbound Left	A (7.6)	B (13.9)	D/D	-	A (7.5)	A (8.9)
	Southbound	F (274.1)	D (27.6)	E/D		F (76.2)	B (11.3)
	Glenridge Dr @ Spalding						
	Northbound	C (18.7)	B (11.3)	D/D		F (109.6)	C (22.3)
10	Eastbound	F (60.1)	B (13.2)	E/D	-	A (0.0)	A (0.0)
	Westbound	C (15.5)	F (53.9)	D/E		B (11.4)	A (3.6)
	Southbound	A (0.0)	A (0.0)	D/D		A (0.0)	A (0.0)

The "No-Build" weekday peak hour volumes associated with the study network are shown in Figure 13.



8.2 Future 2025 "Build" Conditions

The "Build" or development conditions include the estimated background traffic from the "No-Build" conditions plus the added traffic from the proposed development. In order to evaluate future traffic operations in this area, the additional traffic volumes from the site (Figures 5, 8, and 9) were added to the "No-Build" 2025 traffic volumes (Figure 13) to calculate the future "Build" 2025 traffic volumes after the construction of Phase 2 of the development. These total future traffic volumes (Figure 15) were used to evaluate the "Build" 2025 conditions. The results of the "No-Build" and "Build" operations analyses with the assumed site access configuration are shown in Table 12.

8.2.1 Site Mitigation Improvements (Build 2025)

Improvements that are identified as mitigation improvements address deficiencies that are caused by site traffic and can be identified as related to the proposed development. Based on the 2025 "Build" conditions (includes background growth plus site added traffic) the following improvements result in the following intersections operating at their level-of-service standard or better (except where stated otherwise). *Please note that the following improvements are in addition to improvements needed in the 2025 "No-Build" conditions.* Survey and construction drawings may be needed to verify the feasibility and extent of additional right-of-way required for any recommended improvements.

5. Glenridge Drive @ Abernathy Road

• Construct eastbound right turn lane on Glenridge Drive

7. Glenridge Drive @ Mount Vernon Highway

Even with the improvements below, the intersection is expected to operate at an LOS "F" for the PM Peak Hour. According to engineering judgment, the necessary improvements needed to bring the PM peak hour within the LOS standard were not feasible/practical. The intersection will, however, continue to operate better than the existing conditions with the following additional improvements.

• Construct southbound right turn lane on Glenridge Drive

9. Glenridge Drive @ Glenlake Parkway

With the "No-Build" improvements, the southbound stop-controlled approach will remain operating at LOS "F" in the AM peak period. A preliminary examination of the peak hour traffic indicates that volumes may not meet MUTCD thresholds for construction of a traffic signal. The AM peak period will operate better than the existing conditions, and adequate level-of-service is expected during the rest of the day; therefore, no other reasonable improvements were identified at this intersection.

10. Glenridge Drive @ Spalding Drive

With the "No-Build" improvements, the overall intersection operations will improve; however, the northbound left approach will operating at LOS "F" in the AM peak period. This approach has relatively few left turns in the AM peak hour (21 veh/hr.), and the queues are anticipated to be reasonable after the following modifications; therefore, no other reasonable improvements were identified at this intersection. It should be noted that traffic calming measures have been placed along Glenridge Drive

between Glenlake Pkwy and Spalding Drive, including several speed humps and a roundabout intersection, which may compete with the desire to improve traffic flow through this intersection.

8.2.2 Intersection Operations Analysis (Build 2025)

The traffic operations were analyzed at the study intersections in accordance with the HCM methodology. The local level-of-service (LOS) standard is "D" or better. If the existing LOS for the segment or intersection is "E" or "F", then the future "No-Build" LOS standard will be LOS "E", consistent with the GRTA Letter of Understanding. The projected 2025 "Build" levels-of-service with and without improvements are shown in Table 12.

	TABLE	12 – Buli	_D 2025 I	NTERS	SECTION OPERATION	IS	
		Build	2025:	105	Modification(s)	Improved Build 2025	
	Intersection	LOS (I	Delay)		In addition to No-Build	LOS (Delay)	
		AM Peak	PM Peak	510	2025 improvements	AM Peak	PM Peak
	Abernathy Rd @ DDI	<u>C (28.9)</u>	<u>C (33.2)</u>	<u>D/D</u>		<u>C (31.5)</u>	<u>C (32.2)</u>
D1	Crossover (East)						
DI	Westbound	D (49.7)	E (56.4)	-	-	D (45.5)	D (54.4)
	Eastbound	B (17.1)	A (5.5)	-		C (24.0)	A (5.9)
	Abernathy Rd @ DDI	<u>C (23.9)</u>	<u>C (33.2)</u>	<u>D/D</u>		<u>B (18.5)</u>	<u>C (20.6)</u>
נח	Crossover (West)						
02	Eastbound	D (35.4)	D (54.7)	-	-	C (21.1)	C (33.3)
	Westbound	B (14.9)	B (12.0)	-		B (16.5)	A (8.2)
	Barfield Rd @ Abernathy	<u>E (74.2)</u>	<u>E (77.6)</u>	<u>E/E</u>		<u>D (54.5)</u>	<u>E (77.4)</u>
	Eastbound	F (90.9)	D (35.2)	-		D (48.0)	A (9.3)
4	Westbound	D (39.6)	D (43.3)	-	-	D (50.7)	D (41.8)
	Northbound	E (76.5)	F (96.0)	-		F (97.4)	F (91.8)
	Southbound	F (80.6)	F (180.3)	-		F (82.7)	F (214.9)
	Glenridge Dr @ Abernathy	<u>F (173.5)</u>	<u>F (135.9)</u>	<u>E/E</u>		<u>E (57.3)</u>	<u>E (69.5)</u>
	Eastbound	F (247.6)	D (43.7)	-		E (65.0)	A (3.3)
5	Westbound	A (8.5)	F (153.2)	-	Construct Eastbound Bight Turn Long	A (2.8)	E (69.4)
	Northbound	F (110.6)	F (227.2)	-	Right Fulli Lane	F (81.2)	F (178.6)
	Southbound	F (86.0)	F (151.9)	-		F (102.8)	F (80.5)
	SR 9 (Roswell Rd) @	<u>F (183.9)</u>	<u>F (211.2)</u>	<u>E/E</u>		<u>E (62.5)</u>	<u>E (78.7)</u>
	Abernathy Rd						
c	Eastbound	F (215.3)	F (132.8)	-		D (44.0)	A (8.3)
0	Westbound	F (109.4)	F (205.4)	-	-	A (5.0)	E (57.3)
	Northbound	F (124.1)	F (239.2)	-		F (111.1)	F (129.6)
	Southbound	F (198.5)	F (230.5)	-		F (94.9)	F (117.7)
		Table	e continued o	n next p	page		

		Build	2025:	1.00	Modification(s)	Improved B	Build 2025:
	Intersection	LOS (I	Delay)	LUS	In addition to No-Build	LOS (Delay)	
		AM Peak	PM Peak	סוצ	2025 improvements	AM Peak	PM Peak
	Glenridge Dr @ Mount	<u>F (213.1)</u>	<u>F (447.3)</u>	<u>E/E</u>		<u>E (55.7)</u>	<u>F (126.4)</u>
	Vernon Hwy						
7	Eastbound	F (92.9)	D (38.7)	-	 Southbound Right 	D (43.2)	F (141.8)
1	Westbound	D (35.4)	F (166.4)	-	Turn Lane	C (22.6)	F (96.2)
	Northbound	F (798.8)	F (1327.6)	-		F (83.4)	F (190.0)
	Southbound	F (196.2)	F (305.9)	-		F (88.8)	E (73.5)
	Barfield Rd @ Mount	<u>D (38.6)</u>	<u>F (110.6)</u>	<u>D/E</u>		<u>D (46.7)</u>	<u>E (72.6)</u>
	Vernon Hwy						
0	Eastbound	C (28.3)	E (62.4)	-		D (45.6)	C (25.2)
0	Westbound	C (27.9)	F (81.8)	-	-	C (21.2)	D (41.5)
	Northbound	E (77.4)	F (257.1)	-		F (81.4)	F (146.6)
	Southbound	D (54.4)	D (48.1)	-		E (76.3)	F (129.3)
	Glenridge Dr @ Glenlake						
9	Eastbound Left	A (7.7)	B (14.8)	D/D	-	A (7.5)	A (9.1)
	Southbound	F (332.2)	D (33.0)	E/D		F (91.4)	B (11.6)
	Glenridge Dr @ Spalding						
	Northbound	C (20.4)	B (11.5)	D/D		F (102.8)	C (21.1)
10	Eastbound	F (60.9)	B (13.8)	E/D	-	A (0.0)	A (0.0)
	Westbound	C (17.2)	F (54.4)	D/E		B (10.7)	A (3.9)
	Southbound	A (0.0)	A (0.0)	D/D		A (0.0)	A (0.0)

The volumes for the "Build" conditions are shown in Figures 14A and 14B. The laneage for the 2025 "No-Build" and "Build" improvements are shown in Figure 15.





A&R Engineering Inc.



9.0 SITE ACCESS ANALYSIS

The development proposes access at the following locations:

- Northern Tract Access:
 - North Site Driveway 1: Right-in / Right-out on Abernathy Road, east of Glenridge Drive
 - North Site Driveway 2: Full-Access (Signalized) Driveway on Abernathy Road
- Southern Tract Access:
 - South Site Driveway 1: Right-in / Right-out on Abernathy Road, east of Glenridge Drive
 - South Site Driveway 2: Full-Access (Signalized) Driveway on Abernathy Road
 - South Site Driveway 3: Right-in / Right-out on Abernathy Road, west of Barfield Road
 - South Site Driveway 4: Full-Access Driveway on Glenridge Drive
 - South Site Driveway 5: Full-Access Driveway on Barfield Road

9.1 Site Access Configuration

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

Abernathy Road @ Northern Site Driveway #1 / Southern Site Driveway #1

- Northern Site Driveway #1
 - This driveway will be restricted to right-in and right-out access
 - This driveway will have one entering and one exiting lane
 - The intersection will be unsignalized with a yield sign on the southbound approach to Abernathy Road
 - A deceleration lane will be constructed for entering traffic based on local standards
- Southern Site Driveway #1
 - This driveway will be restricted to right-in and right-out access
 - This driveway will have one entering and one exiting lane
 - The intersection will be unsignalized with a yield sign on the southbound approach to Abernathy Road
 - A deceleration lane will be constructed for entering traffic based on local standards

Abernathy Road @ Northern Site Driveway #2 / Southern Site Driveway #2

- A signal warrant analysis indicates that the projected volumes will meet MUTCD thresholds for a traffic signal. The intersection will be signalized as part of the development's construction, include a protected/permissive phase for the westbound left turn into the southern tract, and be interconnected to the adjacent signal in either direction on Abernathy Road.
- Northern Site Driveway #2
 - This driveway will consist of one entering and two exiting lanes (dedicated left and shared through / right
 - $\circ~$ A dedicated left turn bay will be constructed for entering traffic based on local standards
 - A deceleration lane will be constructed for entering traffic based on local standards

- <u>Southern Site Driveway #2</u>
 - This driveway will consist of one entering and two exiting lanes (dedicated left and shared through / right
 - A dedicated left turn bay will be constructed for entering traffic based on local standards
 - A deceleration lane will be constructed for entering traffic based on local standards

Abernathy Road @ Southern Site Driveway #3

- This driveway will be restricted to right-in and right-out access
- This driveway will have one entering and one exiting lane
- The intersection will be unsignalized with a yield sign on the southbound approach to Abernathy Road
- A deceleration lane will be constructed for entering traffic based on local standards

Glenridge Drive @ Southern Site Driveway #4

- This driveway will consist of one entering and one exiting lane
- The intersection will be unsignalized with a stop sign on the westbound approach to Glenridge Drive
- A dedicated left turn bay will be constructed for entering traffic based on local standards
- A deceleration lane will be constructed for entering traffic based on local standards

Barfield Road @ Southern Site Driveway #5

- This driveway will consist of one entering and one exiting lane
- The intersection will be unsignalized with a stop sign on the eastbound approach to Barfield Road
- A dedicated left turn bay will be constructed within the existing two-way left turn lane for entering traffic
- A deceleration lane will be constructed for entering traffic based on local standards

	TABLE 13 – SITE DRIVEWA	ay Interse	ECTION OPE	RATIONS	
	Interaction	Build 2020	: LOS (Delay)	Build 2025	5: LOS (Delay)
	intersection	AM Peak	PM Peak	AM Peak	PM Peak
	Abernathy @ North Drwy 1 / South Drwy 1				
11	Northbound Right	D (30.4)	B (13.2)	E (37.8)	B (13.8)
	Southbound Right	B (11.8)	C (22.7)	B (12.1)	D (26.1)
	Abernathy @ South Drwy 2 / North Drwy 2	<u>B (15.1)</u>	<u>B (15.1)</u>	<u>C (21.8)</u>	<u>C (29.6)</u>
	Eastbound Approach	A (3.5)	A (0.7)	B (10.1)	A (0.8)
12	Westbound Approach	A (0.7)	A (1.2)	B (11.9)	A (1.5)
	Northbound Approach	F (86.3)	F (257.9)	F (94.8)	F (532.0)
	Southbound Approach	F (328.9)	F (229.1)	F (328.9)	F (229.1)
12	Abernathy @ South Drwy 3				
13	Northbound Right	B (14.8)	A (9.3)	B (14.8)	A (9.2)
	Glenridge Dr @ South Drwy 4				
14	Northbound Approach	B (13.3)	C (17.3)	B (14.4)	C (19.9)
	Southbound Left	A (7.9)	A (8.9)	A (8.1)	A (9.2)
	Barfield Rd @ South Drwy 5				
15	Eastbound Approach	B (12.0)	B (14.6)	B (12.6)	C (16.9)
	Northbound Approach	A (0.4)	A (0.2)	A (0.6)	A (0.2)

	TABLE 14 – SITE DRIVEWAY	95 TH PERCEI	NTILE QI	JEUES		
	la ka wa a ki a w	Available	Build	2020	Build	2025
	Intersection	Storage (ft)	AM	PM	AM	PM
	Abernathy @ North Drwy 1 / South Drwy 1					
11	Northbound Right	-	18	5	23	5
	Southbound Right	-	3	5	3	8
	Abernathy @ South Drwy 2 / North Drwy 2					
	Eastbound Left	235	0	13	0	15
	Eastbound Through	-	63	8	178	8
	Eastbound Right	175	0	0	0	0
	Westbound Left	235	38	35	408	38
12	Westbound Through	-	5	23	5	30
	Westbound Right	175	0	3	0	3
	Northbound Left	-	23	285	48	583
	Northbound Through / Right	-	0	0	0	0
	Southbound Left	-	363	253	363	253
	Southbound Through / Right	-	0	0	0	0
12	Abernathy @ South Drwy 3					
13	Northbound Right	-	1	4	4	16
	Glenridge Dr @ South Drwy 4					
14	Westbound Approach	-	5	15	8	28
	Southbound Left	160	3	3	3	3
	Barfield Rd @ South Drwy 5					
15	Northbound Left	160	0	3	3	3
	Eastbound Approach	-	8	18	8	33

10.0 CONSISTENCY WITH ADOPTED COMPREHENSIVE PLAN

The Comprehensive Land Use Plan (CLUP) designates the north tract as Private Recreational, within the Conservation character area. The CLUP designated the south tract as Living Working Neighborhood within the Protected Neighborhood character area.

The Comprehensive Land Use Plan (CLUP) does not identify appropriate development for the Private Recreational or Conservation categories. The focus in these areas, per the CLUP, is preservation for park areas. The CLUP notes that these two categories include "parks, open space and recreational facilities owned by the City of Sandy Springs, Fulton County and other governments, such as the National Park Service. The north tract, however, is privately owned, making the existing designation inconsistent with the description of the scope. The proposed development on the north tract is sensitive to the existing environmental conditions on the site, including the existing stream areas. Approximately 31 acres of the site will be left in a natural condition or as open space.

For the Living Working Neighborhood category, the Comprehensive Land Use Plan (CLUP) recommends a maximum density of 5 units per acre and 10,000 square feet of commercial/office use, a 30,000 square foot maximum limit per tenant and a two story height limitation. The Protected Neighborhood character area generally recommends development of single family homes. Although the proposed development on the south tract is not consistent with the specific scope of categories in the CLUP, it is designed to provide a transition from the more intensive uses existing and proposed on GA 400 to the single family homes to the west of the project.