Rowen
DRI Traffic Study

Prepared for:

Rowen Foundation, Inc

ROWEN

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1.0 PURPOSE AND INTENTION

The purpose of this Transportation Impact Study (TIS) document is to present necessary information concerning the subject development for the Development of Regional Impact (DRI) transportation analysis per the requirements of the Georgia Regional Transportation Authority (GRTA) DRI Review Procedures adopted on March 10, 2021, and in accordance with the Letter of Understanding (LOU) for the Rowen DRI published on June 28, 2021. See Appendix B for the LOU.

2.0 INTRODUCTION

Rowen is a proposed innovation district in Gwinnett County, Georgia. It is a knowledge community which will include a combination of offices, research facilities, public spaces, and residences, driven by three programmatic focuses: medicine, agriculture, and the environment. The planning and visioning of this project is led by the Rowen Foundation Inc., an independent not-for-profit organization.

The proposed development will construct a publicly accessible community for research, education, working, and living. The site will be comprised of a central Town Center, Medium Density Office Parks, and Light Density Office Parks. The Town Center will include Offices, Single and Multi-Family Residential Space, Hotels, Retail, and Civic land use. The anticipated open year of the development is 2035, with additional build-out planned for the future. The future phases are not covered by this TIS.

3.0 PROPOSED DEVELOPMENT

3.1.1 Description

The proposed development will construct a publicly-accessible community for research, education, working, and living. The site will be comprised of a central Town Center, Medium Density Office Parks, and Light Density Office Spaces. The Town Center will include Office Space, Single and Multi-Family Residential Space, Hotels, Retail, and Civic land uses. A summary of land uses can be found in Table 1 below.

Table 1: Rowen Land Use

Location	Land Use	ITE Code	ITE Unit	2035 Totals
Non-Town Center, North of SR 316	Office	710	KSF	500
Non-Town Center, South of SR 316	Office	710	KSF	1,200
Town Center	Office	710	KSF	1,670
	Residential	221	DU	300
	Hotel	310	Rooms	311
	Retail	820	KSF	50
	Civic	760	KSF	25
TOTAL	**Office**	**710**	**KSF**	**3,370**
	Residential	**221**	**DU**	**300**
	Hotel	**310**	**Rooms**	**311**
	Retail	**820**	**KSF**	**50**
	Civic	**760**	**KSF**	**25**

3.1.2 Future Lane Use

The Gwinnett County 2040 Unified Plan classifies the Rowen project area as an "Innovation District." Rowen serves this land classification directly, as it falls within line with the vision and anticipated development of project area. Additional Innovation Districts are designated through Gwinnett County in the areas surrounding SR 316 east of Lawrenceville and surrounding Dacula. The 2040 Unified Plan Future Development Map for Gwinnett County is contained in Appendix C.

3.1.3 Zoning

The existing zoning for the parcels in question are M1 (Light Industry District), M2 (Heavy Industry District), R1400 (Single Family Residence District), and RA200 (Agriculture Residence District).

The area encompassing Rowen is currently designated as "Innovation District" on the long-range 2040 Unified Plan for Gwinnett County. The County is currently defining and writing the text for a specific Zoning Classification as an Overlay that will encompass all land fronting on State Route (SR) 316 from the intersection of SR 316 and SR 8 eastward to Barrow County. The Overlay will allow for all the land uses and densities anticipated within the boundaries of Rowen and is anticipated to be adopted in 2021.

3.1.4 Other Plans or Projects

The Georgia Department of Transportation (GDOT) GeoPi mapping application, ARC's Regional Transportation Program (RTP), and the Gwinnett County SPLOST program list multiple programmed and planned projects in the vicinity of Rowen, tabulated in Table 2 below. Of these projects, two are located on SR 316 and would directly interact with the proposed development. Both projects involve constructing an interchange and/or a collector-distributor system along SR 316, at Williams Farm Drive and Drowning Creek Road. Both of these interchanges would provide a central point of access for traffic travelling on and off the Rowen Development, increasing capacity and improving operations.

The remainder of the projects listed in the project table provide additional capacity and connectivity to the network surrounding Rowen and would not conflict with the proposed development. The relevant Transportation Plans and project-specific documents are contained in Appendix C.

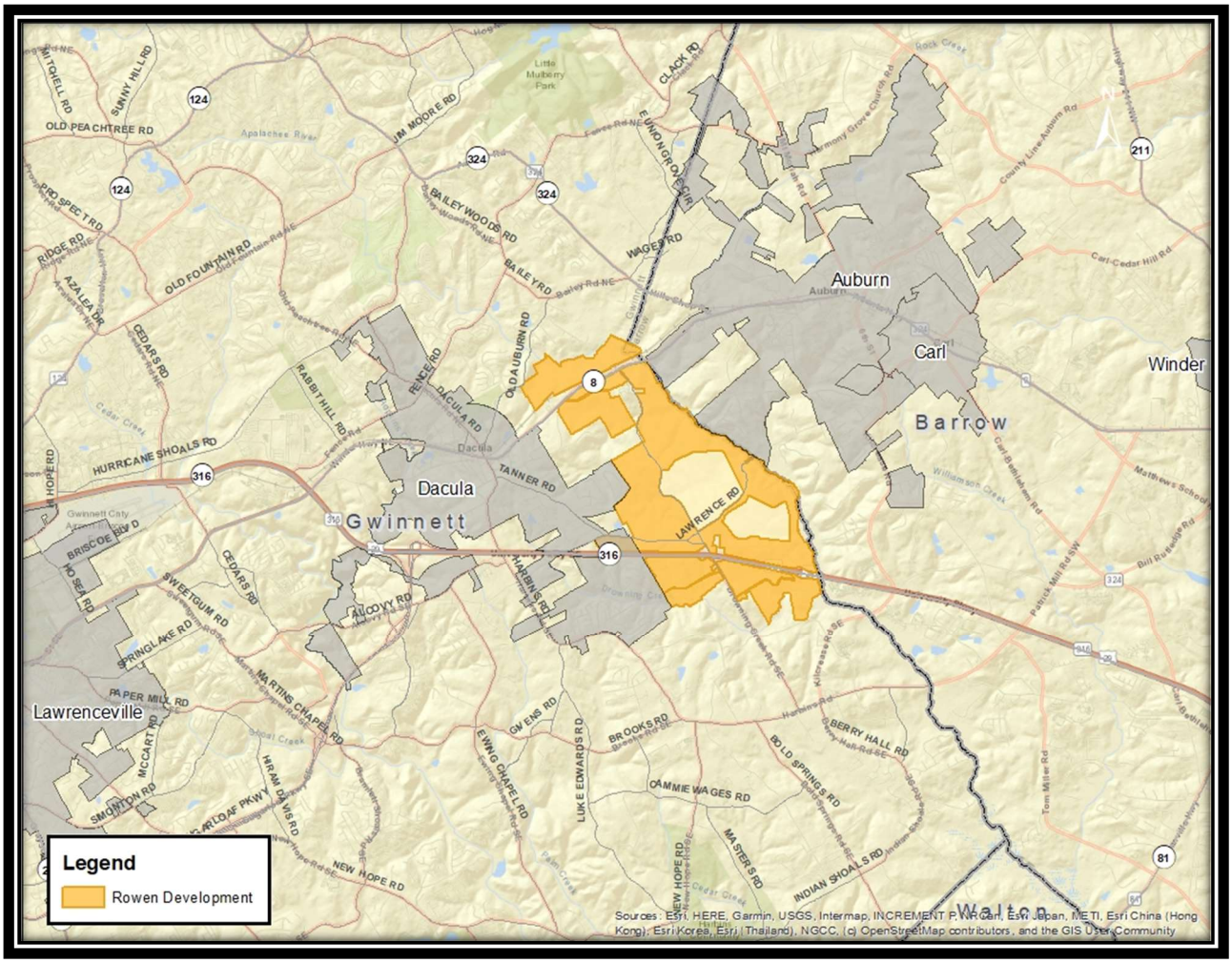
Table 2: Nearby Planned and Programmed Projects

Project Name	Project Limits	Sponsor	GDOT PI #	ARC ID # (RTP) or Gwinnett #	Design FY	ROW / UTL FY	CST FY	Source
Programmed Projects								
SR 8 at Dacula Road Intersection and Bridge Replacement	-	Gwinnett County	n/a	F-1248			2020	Gwinnett SPLOST
Tanner Road Safety and Alignment	Harbins Road to Drowning Creek Road	Gwinnett County	n/a	-			TBD	Gwinnett SPLOST
SR 316 at Williams Farm Drive	-	GDOT	0013900	-	2024	2026	2027	GeoPI
SR 316 at Drowning Creek Road	-	GDOT	0013901	GW-184B	2023	2025	2030	GeoPI
SR 316 at Kilcrease Road	-	GDOT	0013902	BA-184E	2022	2023	2030	GeoPI
SR 316 at Fence Rd	-	GDOT	0013896	-	2017	2022	2024	GeoPI
SR 316 at SR 8 / Winder Hwy	-	GDOT	0013897	-	2017	2022	2023	GeoPI
SR 316 at Harbins Road	-	GDOT	0013898	F-1253			2020	GeoPI/ Gwinnett SPLOST
Sugarload Parkway Extension	from I-85 to SR 316	Gwinnett County	0006924	GW-308B	2011	2020-2030	2030	GeoPI / ARC RTP
Gwinnett County ITS Enhancements	Gwinnett County	Gwinnett County	0016070	GW-415	N/A	N/A	2021	ARC TIP
Patrick Mill Road Bridge Replacement	Apalachee River	Barrow County	0015609	BA-038	2019	2018	2024	ARC RTP
Martins Chapel Road Bridge Replacement	Alcovy River	Gwinnett County	0016583	GW-348B	2020	2023	2025	ARC RTP
Harbins Road Park and Ride Lot	In the Vicinity of SR 316	Gwinnett County	n/a	GW-428	No Info	No Info	2023	ARC TIP
West Winder Bypass	-	Barrow County	001055	BA-005C	2013	2020	2022	ARC TIP
Harbins Road Widening	from SR 316 to SR 8	Gwinnett County	n/a	F-1361-01	-	-	-	Gwinnett County
Planned Projects/Long Range								
Mount Moriah Widening	from SR 8 to Barrow County Line	Barrow County	007831	BA-021	N/A	N/A	2050	ARC RTP
Fence Road Interchange	No Info	No Info	006924	No Info	No Info	No Info	No Info	GeoPI
SR 211 Widening	From SR 124 to West Winder Bypass	Barrow County	n/a	BA-013	No Info	No Info	2050	ARC RTP
West Winder Bypass Phase 4	From SR 211 to SR 53	Barrow County	001055	BA-005D	No Info	No Info	2030	ARC RTP
Local DRIs								
Inland Pass Mixed Use	At Harbins Road and SR 316 (SE Corner)	Gwinnett County	n/a	DRI 3207	n/a	n/a	2025	DRI Database

3.2 Map of the Development Area

A map of the study area is presented in Figure 1 and a proposed site plan in Figure 2 . The study area map represents the full Rowen Development area, the site plan in Figure 2 represents the area under study for the DRI.

Figure 1: Study Area Map



Source: Gwinnett County GIS; Rowen Foundation Inc.

3.3 DRI Plan of Development (Site Plan)

Figure 2 shows the planned layout of the development area contained within the DRI. The site area internal roadways shown in the figure are currently under development and the design of them are informed by the traffic study contained herein. The internal roadway network presented should not be assumed to be the final form.

For full discussion of the Trip Generation, see Section 4.1.

Note: Sheets 1 - 3 can be found in Appendix A

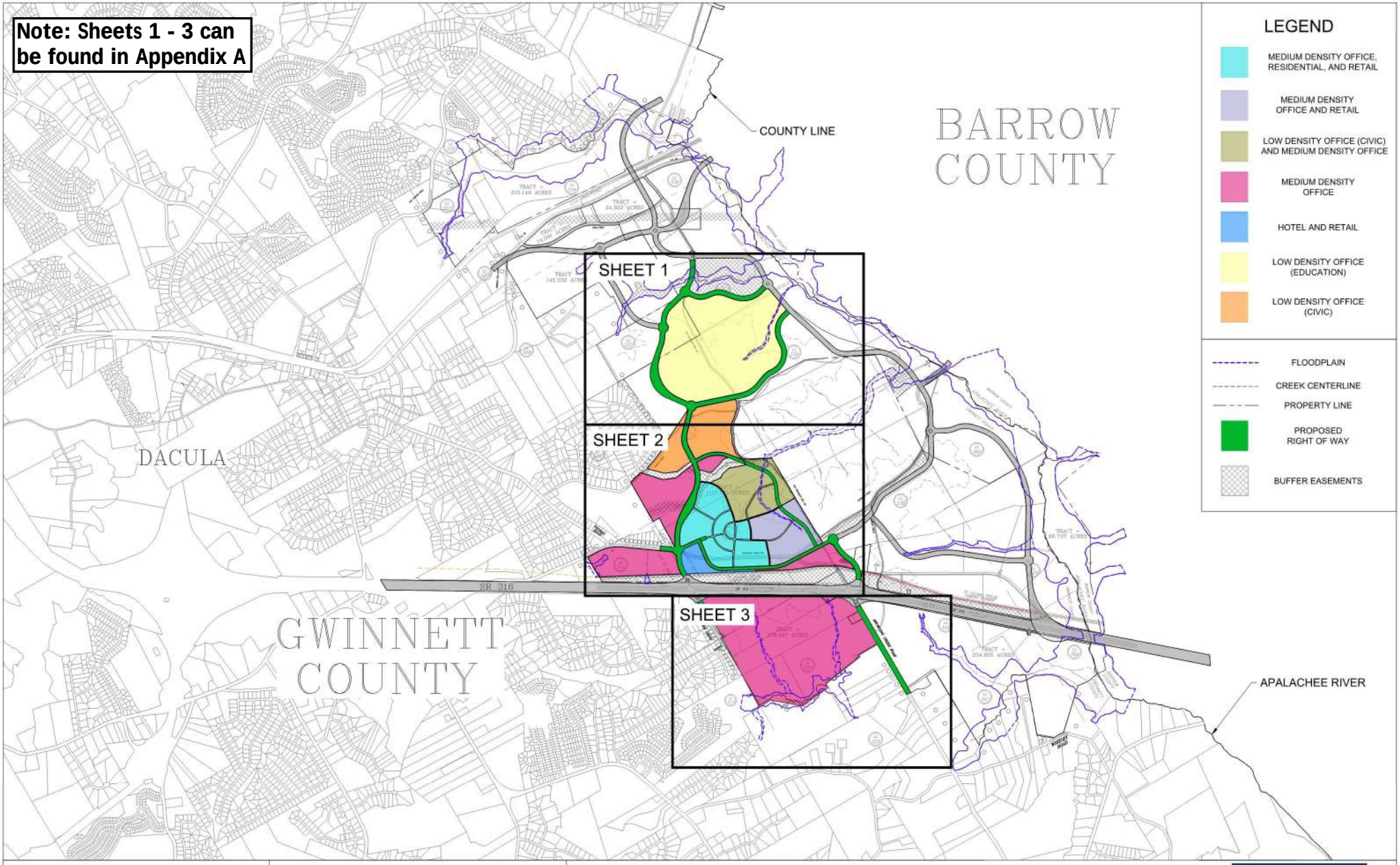


Figure 2

0' 500' 1000' 2000' 3000'
1" = 1000'

ROWEN DRI

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4.0 TRAFFIC ANALYSIS METHODS

The total trips projected for this development based on the projected trip generation and reductions described below is 35,617 trips per day. Note that this differs slightly from the GRTA Letter of Understanding (LOU) which cited the previous estimated volume of 34,693 trips per day. This alteration was due to slight adjustments to number of residential units from 167 DU to 300.

4.1 Trip Generation

The total additional daily trips generated by this development before reductions is 39,227 vehicles per day (vpd) as shown in Table 3. Projected trips were generated per the *Institute of Transportation Engineers (ITE) Trip Generation Handbook*, 3rd Edition and the *ITE Trip Generation Manual,* 10th Edition. The chosen land use types for the development are shown in Table 3. These land uses were used to generate daily and peak hour projections of new trips based average rates of generation.

4.1.1 Trip Reduction due to Internal Capture, Modal Choice, Pass By-Trips

Three methods are proposed for trip reductions of the daily traffic generation of the overall project development: Alternative Mode selection, internal capture within the development, and pass-by reductions based on the *ITE Trip Generation Manual.*

Alternative Mode Reduction – The Rowen development is using a 5% alternative mode reduction, as approved in the LOU. This is a conservative estimate with respect to the trip reduction being used. It acknowledges the vision and goals of the Rowen development; that it will provide for a number of opportunities that allow modal choices other than single-occupancy passenger vehicles. These elements will focus on transit accommodations in various types (traditional bus service, park-and-ride shuttling, ride-hailing, car-sharing, micromobility opportunities, internal circulators, and others). Multimodal improvements also incorporate the pedestrian and bicycle accommodations throughout the site.

Internal Capture Reduction – The internal capture reduction percentage is calculated using the NCHRP 684 spreadsheet tool. The LOU-approved reduction rate is 5% based on conglomerating the AM and PM internal capture calculation. The NCHRP 684 is found in the Appendix D.

Pass-By Trip Reduction - Per the requirements of the GRTA DRI Procedures, no pass-by reduction greater than 15% of the adjacent roadway volume is proposed. The only ITE Trip Generation Land Use Code that pass-by trips are applied to for this DRI are Shopping Center (LU 820). The average daily pass-by trip reduction proposed is 20%. This equates to 340 daily vehicles, well beneath the 15% adjacent road threshold.

4.1.2 Total Traffic Generated

The total trips projected for this development based on these assumptions is 35,617. The details of the Total, AM, and PM peak hour generation are shown in Table 3.

Table 3: Rowen Trip Generation

Land Use				Trip Generation	Internal Capture		Alternative Mode		Pass-By	
Land Use Type	ITE Code	ITE Unit	Land Use Totals	Generated Daily Trips	Adjustment Factor	Cumulative Adjusted Trips	Adjustment Factor	Cumulative Adjusted Trips	Adjustment Factor	Cumulative Adjusted Trips
Town Center										
Office	710	KSF	1,670	16,267	5%	15,454	5%	14,681	0%	14,681
Residential	221	DU	300	1,632	5%	1,550	5%	1,473	0%	1,473
Hotel	310	Rooms	311	2,600	5%	2,470	5%	2,347	0%	2,347
Retail	820	KSF	50	1,888	5%	1,794	5%	1,704	20%	1,363
Civic	760	KSF	25	282	5%	268	5%	255	0%	255
			Subtotal	***22,669***		***21,536***		***20,459***		***20,118***
Non-Town Center, North of SR 316										
Office	710	KSF	500	4,870	5%	4,627	5%	4,395	0%	4,395
			Subtotal	***4,870***		***4,627***		***4,395***		***4,395***
Non-Town Center, South of SR 316										
Office	710	KSF	1,200	11,688	0%	11,688	5%	11,104	0%	11,104
			Subtotal	***11,688***		***11,688***		***11,104***		***11,104***
			TOTAL TRIPS	**39,227**		**37,850**		**35,958**		**35,617**

Source: ITE Trip Generation Manual, 10th Edition

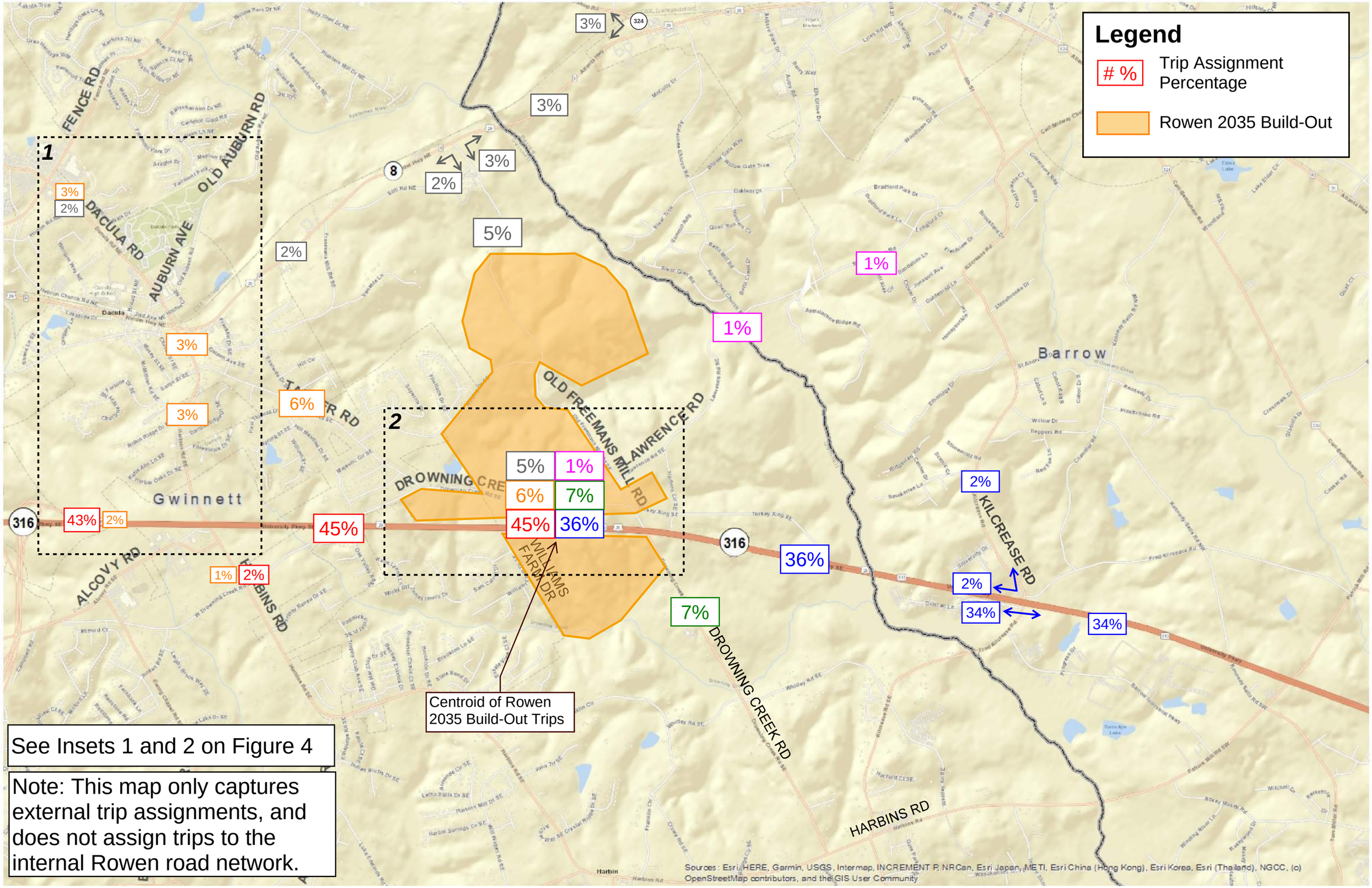
4.1.3 Trip Distribution

Trip distribution for this report uses assumed percentages based on the location of various land uses. These percentages are shown in Figure 3 and Figure 4.

4.1.1 Generated Traffic Volumes per Scenario

The traffic volumes for all scenarios envisioned by this study are shown in Figure 5 through Figure 12. These are for Existing (2035), No Build (2035), and Build (2035).

Note that trips from nearby Inland Pass DRI were included in all year 2035 scenarios.



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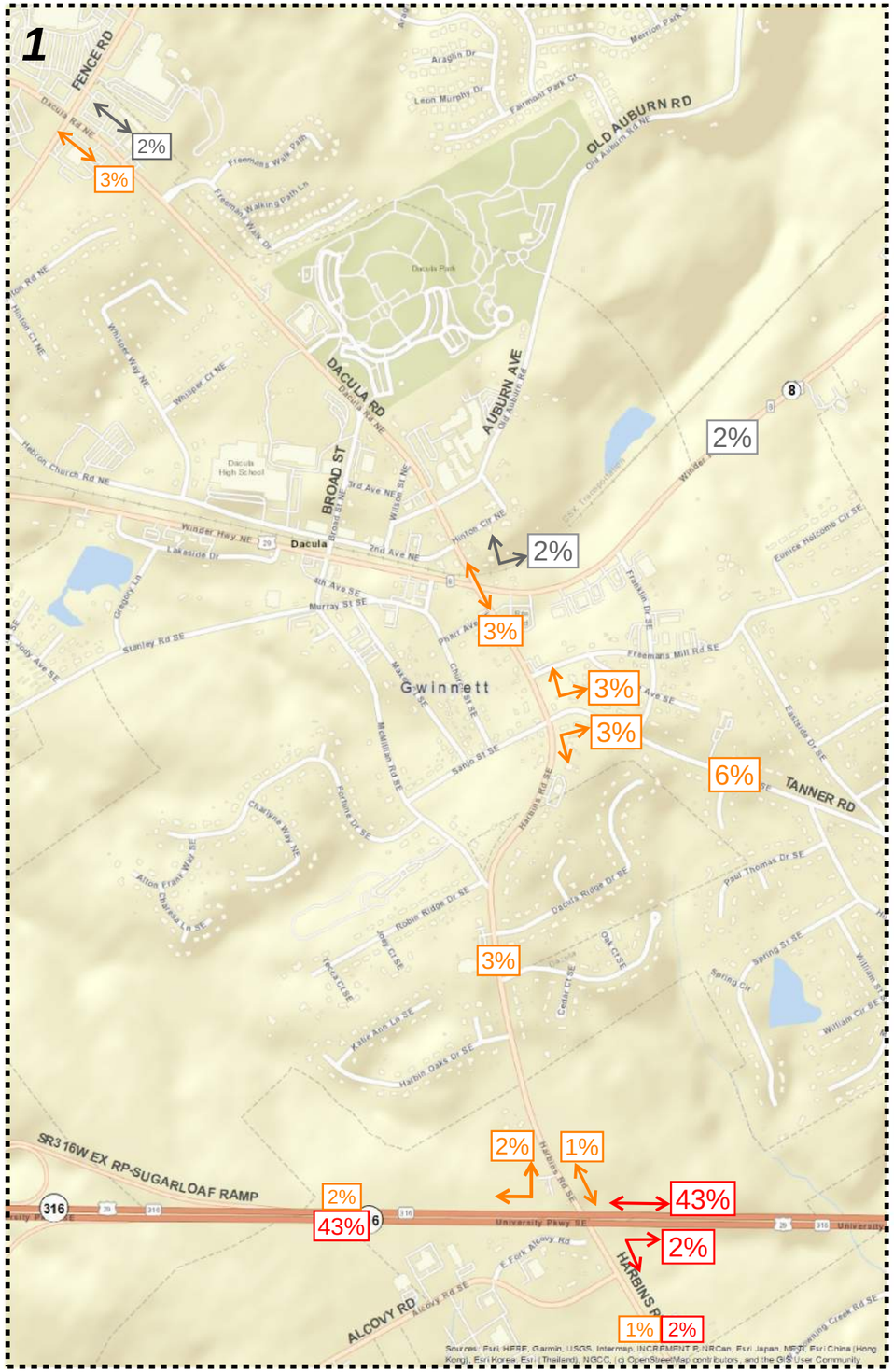
Trip Assignment

Figure 3

Legend

- # % — Trip Assignment Percentage
- Rowen 2035 Build-Out
- Potential Future Rowen Access



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Trip Assignment

Figure 4

MATCHLINE A - SEE FIGURE 6

MATCHLINE B - SEE FIGURE 6

Rowen Site

Harbins Road

Old Freemans Mill Rd

Drowning Creek Road

Williams Farm Road

Kilcrease Road

SR 316

Apalachee River

Gwinnett County

Barrow County

Rowen Site

Note: Configurations shown are based on unimproved scenarios.

Legend

- AM (PM) Peak Hour Traffic
- Signalized Intersection
- Stop Controlled Approach
- Unsignalized Intersection

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Rowen Development of Regional Impact

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Existing Volumes

Figure 5

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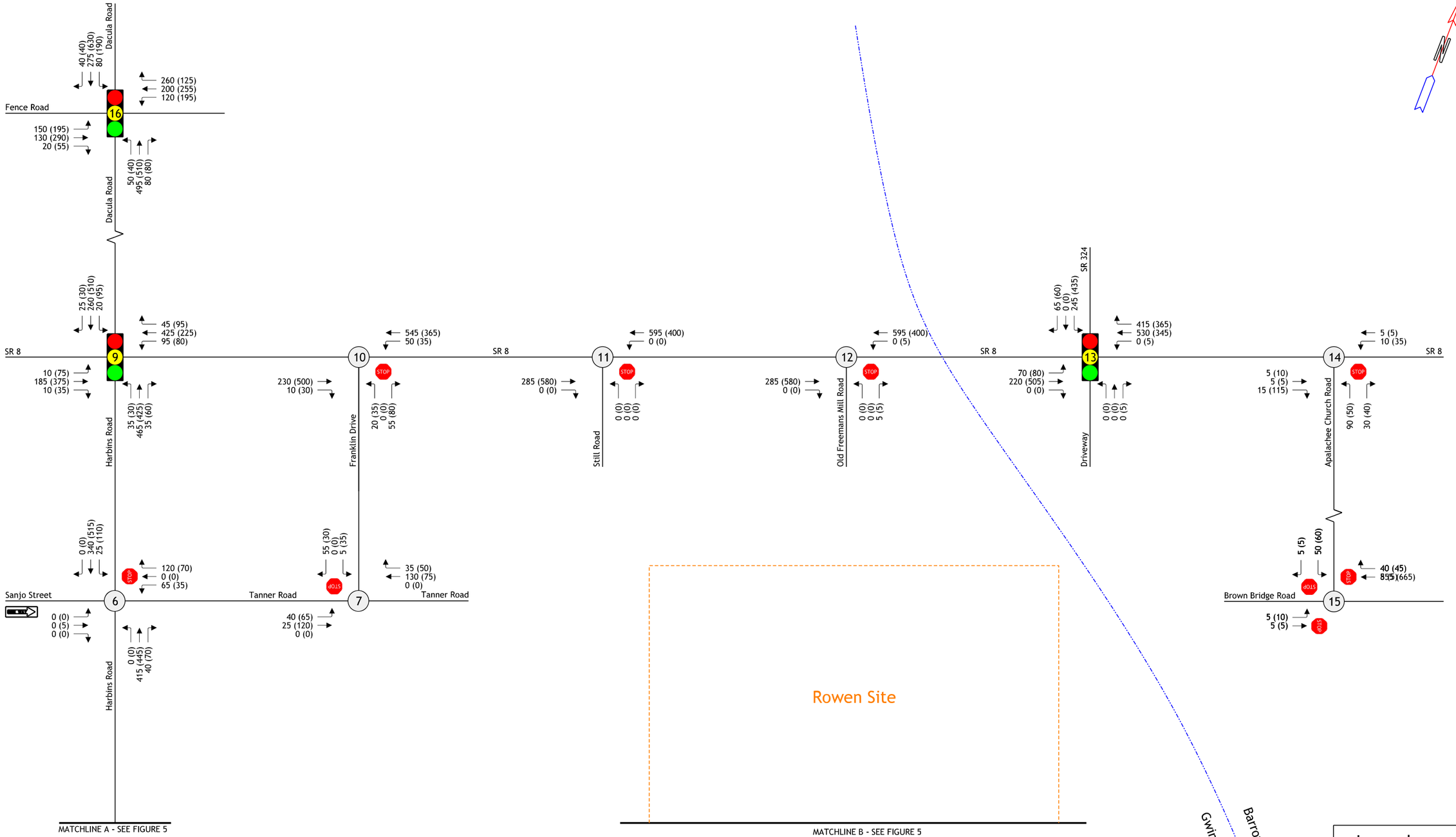
Existing Volumes

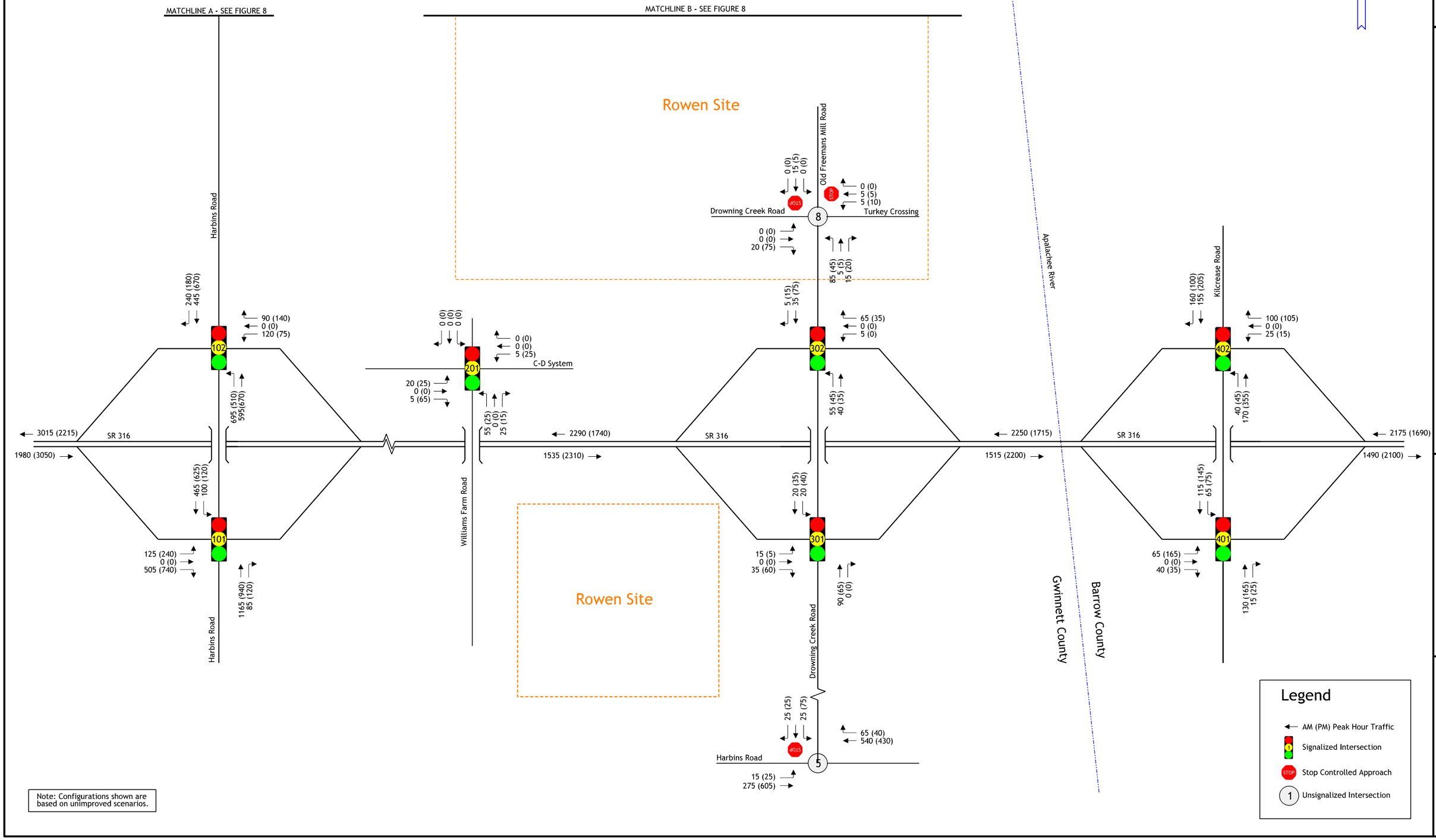
Figure 6



Note: Configurations shown are based on unimproved scenarios.

Legend

- AM (PM) Peak Hour Traffic
- Signalized Intersection
- Stop Controlled Approach
- Unsignalized Intersection



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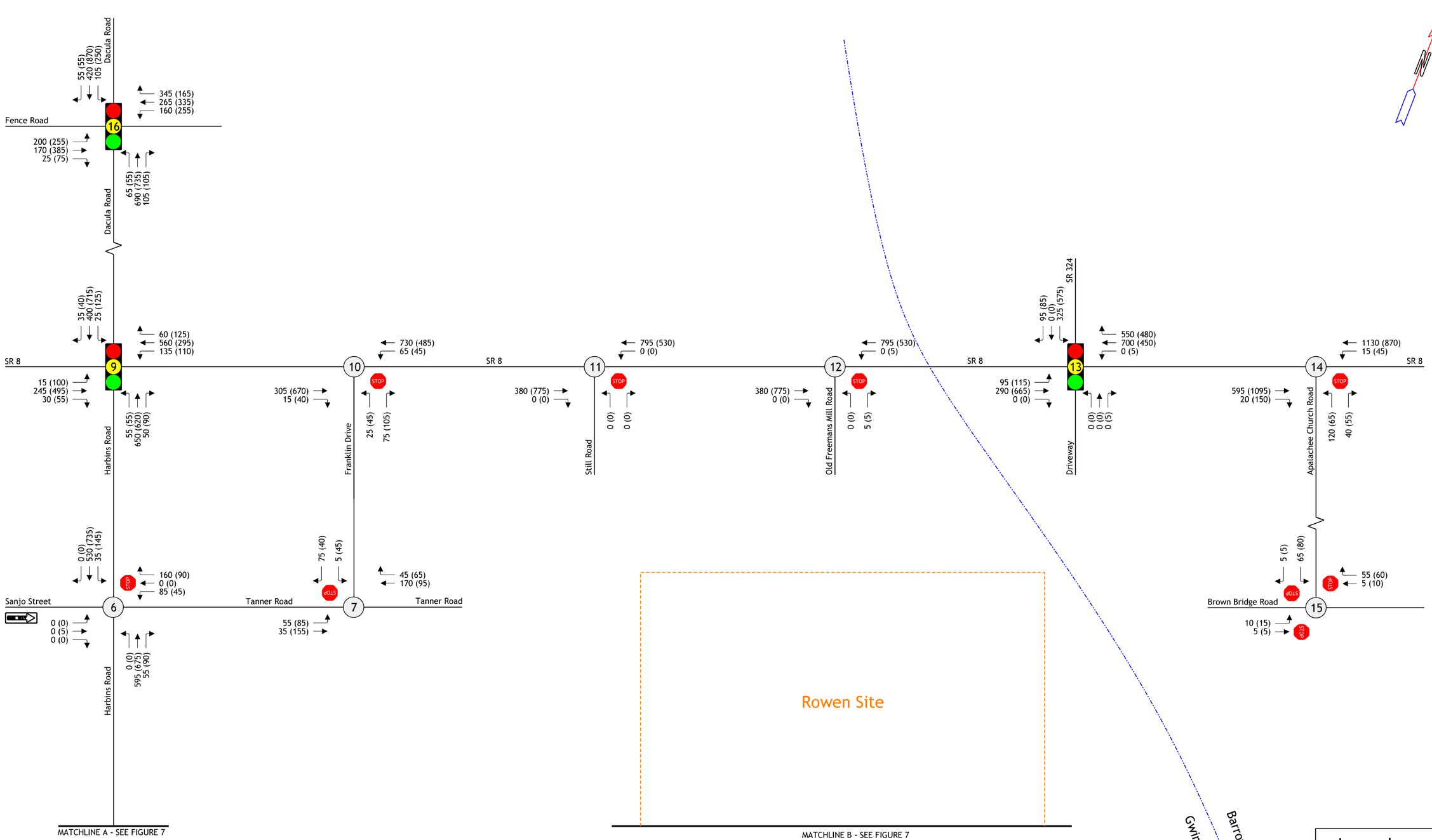
2035 No Build Volumes

Figure 7



Note: Configurations shown are based on unimproved scenarios.

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2035 No Build Volumes

Figure 8

MATCHLINE A - SEE FIGURE 10

MATCHLINE B - SEE FIGURE 10

Rowen Site

Harbins Road

Old Freemans Mill Road

Drowning Creek Road

Kilcrease Road

Williams Farm Road

Site Access

Site Access

Site Access

Rowen Site

Drowning Creek Road

Harbins Road

SR 316

SR 316

SR 316

Apalachee River

Gwinnett County

Barrow County

102

201

302

402

101

301

401

5

8

STOP

13 (69)
7 (35)
13 (69)
30 (114)
1560 (302)
454 (1707)
20 (104)
190 (451)
76 (20)
10 (38)
76 (20)

101 (520)
87 (451)
493 (131)
148 (763)
190 (50)
C-D System
569 (151)
835 (222)
304 (81)
54 (277)
34 (173)
831 (944)
946 (846)

101 (520)
134 (694)
759 (202)
569 (151)
493 (131)
190 (50)
47 (243)
835 (222)
237 (293)
87 (451)
569 (151)
266 (71)
314 (313)
34 (173)

76 (20)
40 (45)
170 (355)
1366 (363)
242 (1248)
1290 (363)
229 (1179)
13 (69)

134 (694)
5 (10)
Turkey Crossing

45 (129)
52 (214)
152 (40)
540 (430)
114 (30)

Note: Configurations shown are based on unimproved scenarios.

Legend

- AM (PM) Peak Hour Traffic
- Signalized Intersection
- Stop Controlled Approach
- Unsignalized Intersection

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Rowen Net Trips Added

Figure 9

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Rowen Development of Regional Impact

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Rowen Net Trips Added

Figure 10

Dacula Road

190 (50)

Fence Road

16

34 (173)

Dacula Road

114 (30)
76 (20)

13 (69)

SR 8

9

20 (104)

Harbins Road

76 (20)

10

13 (69)

Franklin Drive

SR 8

76 (20)

11

13 (69)

Still Road

Apalachee River

76 (20)

12

114 (30)

Old Freemans Mill Road

13 (69)

20 (104)

SR 8

114 (30)

SR 324

20 (104)

13

Driveway

SR 8

14

Apalachee Church Road

38 (10)

Brown Bridge Road

15

7 (35)

114 (30)

Sanjo Street

6

20 (104)

20 (104)

Harbins Road

114 (30)

Tanner Road

7

228 (61)

40 (208)

Tanner Road

MATCHLINE A - SEE FIGURE 9

Site Access

Rowen Site

Site Access

Site Access

MATCHLINE B - SEE FIGURE 9

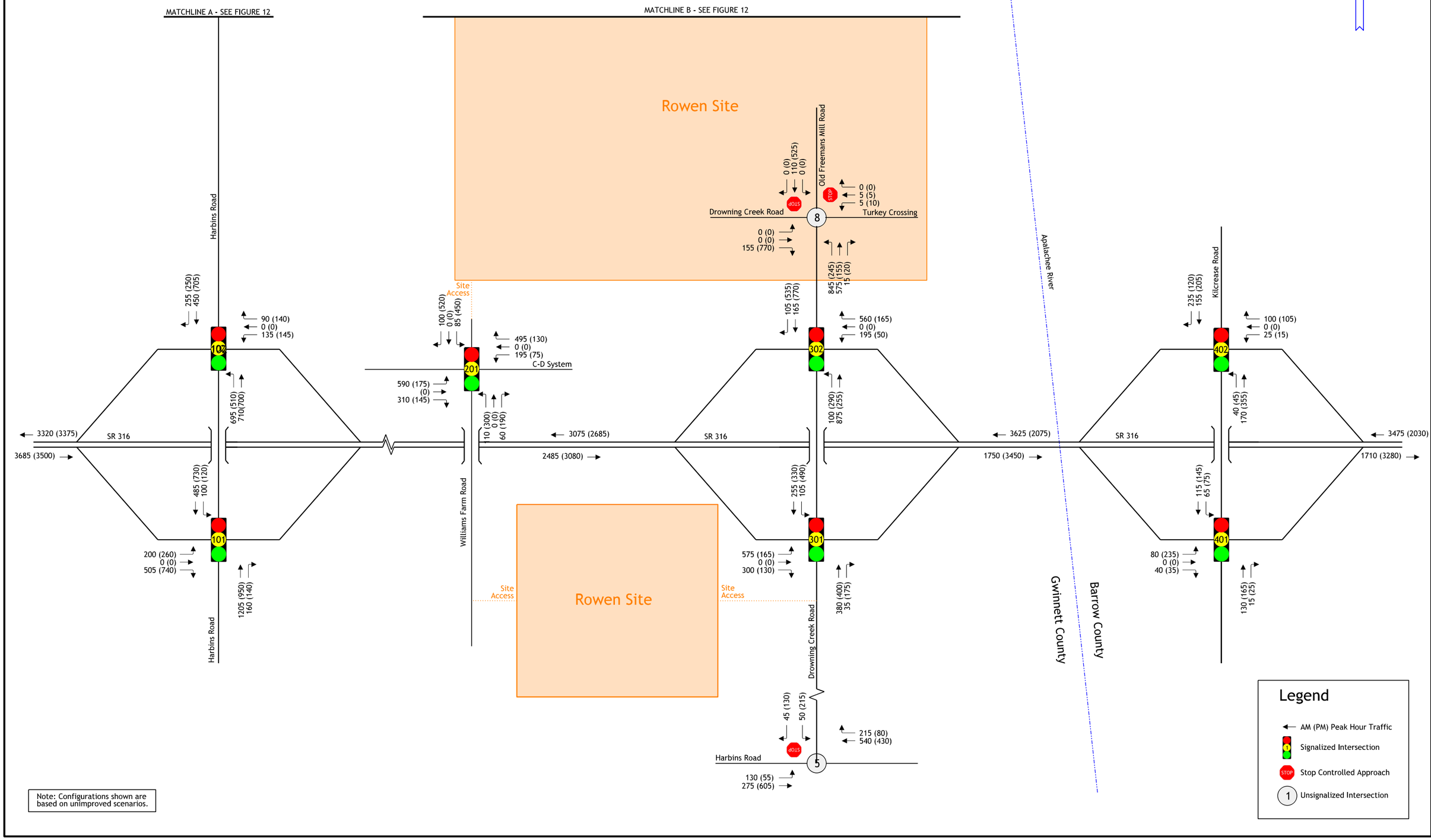
Barrow County

Gwinnett County

Note: Configurations shown are based on unimproved scenarios.

Legend

- AM (PM) Peak Hour Traffic
- Signalized Intersection
- STOP Stop Controlled Approach
- 1 Unsignalized Intersection



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Rowen Development of Regional Impact

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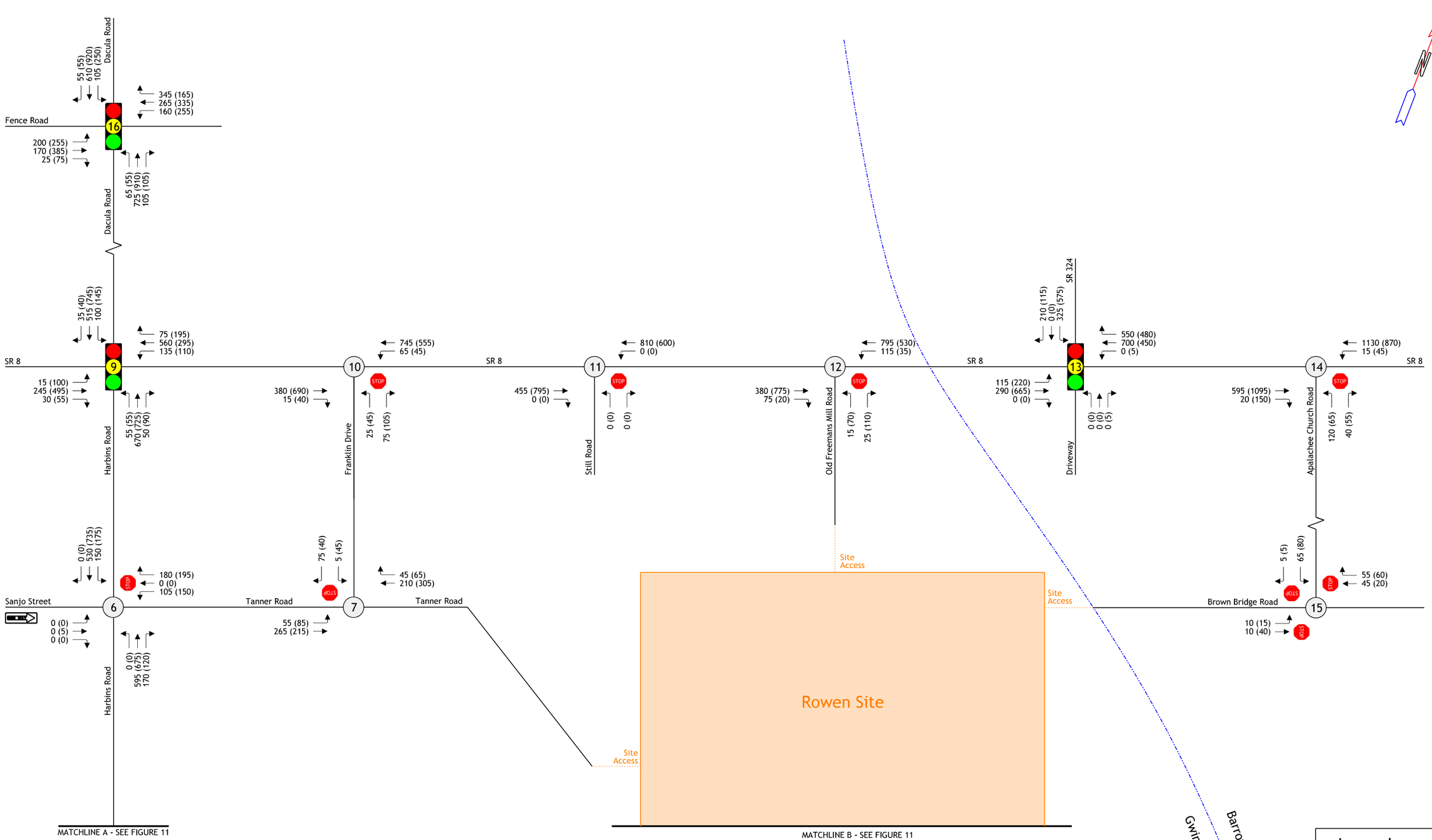
2035 Build Volumes

Figure 11



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2035 Build Volumes

Figure 12

4.2 Growth Rate

4.2.1 Background Growth

The background traffic growth was calculated with a combination of ARC travel demand model projections, US Census and ARC population projections, and local GDOT count station historical growth. Current background growth values for selected GDOT count stations is shown in Table 4. ARC travel demand model results are shown in Table 5 and Census/ARC population values are shown in Table 6.

Table 4: GDOT Count Station Historical Growth

Count Station	Roadway	Years	Growth Rate Using Actual Counts
135-0255	SR 316 West of Drowning Creek Road	2010 to 2019	6.05%
013-0363	SR 316 East of Kilcrease Road	2010 to 2019	3.13%
135-0040	SR 8 East of Village Broad Street	2010 to 2019	0.35%
135-0041	SR 8 West of Still Road	2010 to 2019	2.14%
0013-0001	SR 8 West of SR 324	2010 to 2019	3.14%
013-0003	SR 8 East of SR 324	2010 to 2019	3.64%
013-0154	SR 324 North of SR 8	2010 to 2019	5.90%
135-7369	Harbins Road West of Whitley Road	2010 to 2019	7.40%

Table 5: ARC Travel Demand Model Growth Factors

Facility	Annual Growth Rate (CAGR)	
	2015 to 2030	2030 to 2040
SR 316	3.4%	1.1%
SR 8	-0.7%	0.8%

Table 6: US Census Data and ARC Projected Growth

Year	Dacula	Annual Growth Rate	Gwinnett County	Annual Growth Rate	Barrow County	Annual Growth Rate
US Census Bureau Population Estimates						
2010	4,416	-	805,286	-	69,356	-
2016	5,053	2.3%	904,962	2%	77,000	1.8%
2019	5,919	5.4%	936,250	1%	83,240	2.6%
ARC Population Estimates						
2010	-	-	805,321		69,676	-
2015	-	-	859,800	1.3%	75,103	1.5%
2020	-	-	941,300	1.8%	-	
2050	-	-	1,448,676	1.4%	120,361	1.4%

Based on the historical traffic growth, ARC and Census population data, and the ARC travel demand model projects, a 2% background growth rate was used from 2021 to 2035.

This TIS is not proposing to use additional growth rates.

4.3 Analysis Tools

The traffic analysis software Synchro and its internal Highway Capacity Manual (HCM) module was used to perform operational analysis for the study area intersections. Using the methods described in the HCM, Synchro evaluates the performance of an intersection or group of intersections. It determines the average delay experienced by each vehicle due to traffic control devices, which then provides a Level of Service (LOS). Definitions of LOS for Stop Controlled/Roundabout Controlled and Signalized intersections are shown in Table 7 and will be used for this DRI analysis. Default saturation flow rates (1900 vphpl) were used.

Table 7: Level of Service Definitions

Level of Service	Control Delay Per Vehicle (sec)	
	Stop Controlled Intersection	Signalized Intersection
A	≤ 10	≤ 10
B	> 10 and ≤ 15	> 10 and ≤ 20
C	> 15 and ≤ 25	> 20 and ≤ 35
D	> 25 and ≤ 35	> 35 and ≤ 55
E	> 35 and ≤50	> 55 and ≤ 80
F	>50	> 80

5.0 TRAFFIC ANALYSIS RESULTS

The following intersections were designated as necessary to analyze for review of the DRI impacts. The intersections numbers were chosen so as to conform with the GRTA Letter of Understanding and have no particular significance. Figure 13 shows the geographic location of each intersection.

1. SR 316 at Harbins Road
2. SR 316 at Williams Farm Road
3. SR 316 at Drowning Creek Road
4. SR 316 at Kilcrease Road
5. Drowning Creek Road at Harbins Road
6. Harbins Road at Tanner Road
7. Tanner Road at Franklin Drive
8. Drowning Creek Road at Old Freeman Mill Road
9. SR 8 at Harbins Road / Dacula Road
10. SR 8 at Franklin Drive
11. SR 8 at Still Road
12. SR 8 at Old Freeman Mill Road
13. SR 8 at SR 324 / Hill's Shop Road
14. SR 8 at Apalachee Church Road
15. Brown Bridge Road at Apalachee Church Road
16. Dacula Road at Fence Road

The GRTA LOU also contained intersection number 17 – Fence Road at Sugarloaf Parkway interchange, however this intersection has not been examined as there is no specific design available to enable a No Build comparison. Forecast traffic information will be provided to Gwinnett County DOT.

Rowen Development of Regional Impact

Proposed Study Network

Figure 13

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Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user

5.1 Intersection Analysis

Each study intersection was examined under the Existing, No Build and Build conditions. Further examination was made to mitigate any intersections that did not meet the LOS D threshold requirement.

A note on terminology in this section:

- *Existing* refers to the roadway conditions in the year 2021 when this analysis was developed, and the Rowen Development is not built.
- *No Build* refers to the condition 2035 where the Rowen Development is not built.
- *Build* refers to year 2035 with the trip generation distributed to the roadway network.
- *Unmodified* refers to any year or condition where no changes to the traffic control or roadway geometry have been made from the Existing 2021 conditions.
- *With Improvements* or *Mitigated* refers to any year or condition where either signal timing, traffic control, or geometric improvements have been incorporated into a scenario to alleviate a failing LOS.

The existing geometry of all study intersections is shown in Figure 14 and Figure 15. The 2025 geometry is shown in Figure 16 and Figure 17. The build scenario geometry is shown in Figure 18 and Figure 19.

MATCHLINE A - SEE FIGURE 15

MATCHLINE B - SEE FIGURE 15

Rowen Site

Old Freemans Mill Rd

Drowning Creek Road

Turkey Crossing

8

Apalachee River

Harbins Road

SR 316

1

400'

200'

200'

400'

375'

700'

550'

250'

200'

200'

2

Williams Farm Road

CHANNELIZED

350'

300'

300'

350'

3

Drowning Creek Road

CHANNELIZED

350'

300'

300'

350'

4

Kilcrease Road

200'

425'

400'

200'

150'

5

Harbins Road

Rowen Site

Gwinnett County

Barrow County

Legend

- Existing Lane
- XX' Proposed Lane with Length
- XX' Proposed Lane from Former Phase
- Signalized Intersection
- Stop Controlled Approach
- 1 Unsignalized Intersection
- Improved Intersection

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Rowen Development of Regional Impact

Existing Geometry

Figure 14

Fence Road
Dacula Road
Dacula Road
SR 8
Harbins Road
CONTINUOUS
Franklin Drive
DROP LANE
Still Road
Old Freemans Mill Road
ADD LANE
ADD LANE
SR 324
Driveway
TWLTL
SR 8
Apalachee Church Road
Apalachee River
Sanjo Street
Tanner Road
Tanner Road
Harbins Road
Brown Bridge Road
MATCHLINE A - SEE FIGURE 14
MATCHLINE B - SEE FIGURE 14
Rowen Site
Barrow County
Gwinnett County

Legend

- Existing Lane
- XX' Proposed Lane with Length
- XX' Proposed Lane from Former Phase
- Signalized Intersection
- Stop Controlled Approach
- Unsignalized Intersection
- Improved Intersection

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Rowen Development of Regional Impact

ROWEN

Existing Geometry

Figure 15

MATCHLINE A - SEE FIGURE 17

MATCHLINE B - SEE FIGURE 17

Rowen Site

Old Freemans Mill Road

Drowning Creek Road

Turkey Crossing

Harbins Road

CONTINUOUS

102

180

CONTINUOUS

SR 316

250'

101

CONTINUOUS

380'

350'

Harbins Road

201

C-D System

Williams Farm Road

Rowen Site

300'

500'

302

300'

SR 316

300'

301

500'

300'

Drowning Creek Road

Harbins Road

5

Apalachee River

Gwinnett County

Barrow County

300'

Kilcrease Road

500'

402

300'

SR 316

300'

401

500'

300'

N

Legend

- Existing Lane
- XX' Proposed Lane with Length
- XX' Proposed Lane from Former Phase
- Signalized Intersection
- Stop Controlled Approach
- 1 Unsignalized Intersection
- Improved Intersection

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ROWEN

2035 No Build Geometry

Figure 16

Dacula Road
200'
125'
515'
Fence Road
16
125'
125'
200'
Dacula Road
300'
300'
200'
250'
SR 8
9
250'
150'
200'
CONTINUOUS
Harbins Road
950'
10
STOP
Franklin Drive
DROP LANE
11
STOP
Still Road
Apalachee River
12
STOP
Old Freemans Mill Road
ADD LANE
175'
ADD
LANE
275'
SR 324
13
300'
300'
Driveway
780'
14
STOP
TWLTL
SR 8
Apalachee Church Road
STOP
STOP
15
Brown Bridge Road
200'
Sanjo Street
6
100'
Tanner Road
STOP
7
Tanner Road
Harbins Road
MATCHLINE A - SEE FIGURE 16
Rowen Site
MATCHLINE B - SEE FIGURE 16
Barrow County
Gwinnett County

Legend

- Existing Lane
- XX' Proposed Lane with Length
- XX' Proposed Lane from Former Phase
- Signalized Intersection
- STOP Stop Controlled Approach
- 1 Unsignalized Intersection
- Improved Intersection

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Rowen Development of Regional Impact

ROWEN

2035 No Build Geometry

Figure 17

MATCHLINE A - SEE FIGURE 19

MATCHLINE B - SEE FIGURE 19

Rowen Site

Old Freemans Mill Road

Drowning Creek Road

Turkey Crossing

STOP

STOP

8

Harbins Road

CONTINUOUS

102

180

CONTINUOUS

SR 316

250'

101

CONTINUOUS

380'

350'

Harbins Road

Site Access

201

C-D System

Williams Farm Road

Site Access

Rowen Site

300'

500'

302

300'

SR 316

300'

301

500'

300'

Site Access

Drowning Creek Road

Harbins Road

STOP

5

Apalachee River

Gwinnett County

Barrow County

300'

Kilcrease Road

500'

402

300'

SR 316

300'

401

500'

300'

N

Legend

- Existing Lane
- XX' Proposed Lane with Length
- XX' Proposed Lane from Former Phase
- Signalized Intersection
- Stop Controlled Approach
- 1 Unsignalized Intersection
- Improved Intersection

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Rowen Development of Regional Impact

ROWEN

2035 Build Geometry

Figure 18

Fence Road
Dacula Road
Dacula Road
SR 8
Harbins Road
CONTINUOUS
Franklin Drive
DROP LANE
Still Road
Old Freemans Mill Road
ADD LANE
ADD LANE
SR 324
Driveway
TWLTL
SR 8
Apalachee Church Road
Apalachee River
Sanjo Street
Tanner Road
Tanner Road
Harbins Road
Site Access
Site Access
Site Access
Rowen Site
Brown Bridge Road
MATCHLINE A - SEE FIGURE 18
MATCHLINE B - SEE FIGURE 18
Barrow County
Gwinnett County

Legend

- Existing Lane
- XX' Proposed Lane with Length
- XX' Proposed Lane from Former Phase
- Signalized Intersection
- Stop Controlled Approach
- Unsignalized Intersection
- Improved Intersection

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Rowen Development of Regional Impact

ROWEN

2035 Build Geometry

Figure 19

5.1.1 Existing Condition (2021), No Build (2035)

The Existing and No Build conditions LOS results are shown in Table 8 and Table 9, and the Synchro reports can be found in Appendix E and F. These results show that the intersections of SR 316 at Harbins Road, SR 316 at Williams Farm Road, SR 8 at Harbins Road, and Dacula Road at Fence Road all have approaches which fail to meet the minimum LOS D threshold in the 2021 Existing Scenario.

The SR 316 intersections are converted to interchanges and a collector-distributor system in the 2035 No Build Scenarios, and all but SR 316 Eastbound Ramps at Harbins Road operate at an LOS D or better.

Additional intersections drop below the LOS D threshold in the year 2035, including Harbins Road at Tanners Road, which is signalized in the future year, and SR 8 at SR 324 and at Apalachee Church Road.

Table 8: Existing and No Build Analysis Results (1 of 3)

Intersection			2021 Existing LOS (Delay† in sec/veh)			2035 No Build LOS - (Delay† in sec/veh)			2035 No Build LOS - With Improvements (Delay† in sec/veh)		
#	Name	Approach	Control	AM Peak	PM Peak	Control	AM Peak	PM Peak	Control	AM Peak	PM Peak
1	SR 316 at Harbins Road	EB	Signal	D (37.7)	D (39.8)	See Intersections 101 - 401 At-Grade Intersections Replaced with Interchanges					
		WB	Signal	F (82.8)	D (42.2)						
		NB	Signal	F (107.9)	F (154.0)						
		SB	Signal	F (106.2)	F (117.9)						
		Total		**E (76.1)**	**E (66.0)**						
2	SR 316 at Williams Farm Road	EB	Free	A (0.3)	A (0.2)						
		WB	Free	A (0.1)	A (0.4)						
		NB	Stop	F (944.4)	A (0.0)						
		SB	Stop	A (0.0)	A (0.0)						
		Total		**D (47.9)**	**C (20.5)**						
3	SR 316 at Drowning Creek Road	EB	Free	A (0.2)	A (0.1)						
		WB	Free	A (0.1)	A (0.0)						
		NB	Stop	A (0.0)	A (0.0)						
		SB	Stop	A (0.0)	A (0.0)						
		Total		**A (0.1)**	**A (0.1)**						
4	SR 316 at Kilcrease Road	EB	Signal	B (15.1)	C (21.2)						
		WB	Signal	B (15.4)	C (25.6)						
		NB	Signal	E (66.8)	E (64.3)						
		SB	Signal	F (124.0)	F (141.7)						
		Total		**C (26.9)**	**C (34.5)**						
5	Drowning Creek Road at Harbins Road	EB	Free	A (0.4)	A (0.6)	Free	A (0.5)	A (0.6)	Free	A (0.5)	A (0.6)
		WB	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)
		SB	Stop	B (14.5)	C (20.6)	Stop	C (19.5)	E (47.8)	Stop	C (16.8)	D (33.4)
		Total		**A (0.9)**	**A (2.0)**		**A (1.2)**	**A (4.3)**		**A (1.0)**	**A (3.1)**
6	Harbins Road at Tanner Road	EB	Stop	A (0.0)	E (40.0)	Signal	A (0.0)	E (73.2)	Signal	A (0.0)	E (73.2)
		WB	Stop	C (17.6)	D (29.3)	Signal	C (21.2)	D (40.2)	Signal	C (21.2)	D (40.2)
		NB	Free	A (0.0)	A (0.0)	Signal	B (197)	B (10.0)	Signal	C (20.3)	A (7.7)
		SB	Free	A (0.7)	A (1.7)	Signal	A (2.0)	A (4.4)	Signal	A (1.9)	A (4.2)
		Total		**A (3.5)**	**A (3.5)**		**B (13.4)**	**B (10.2)**		**B (13.7)**	**A (9.0)**

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Table 9: Existing and No Build Analysis Results (2 of 3)

Intersection			2021 Existing LOS (Delay† in sec/veh)			2035 No Build LOS - (Delay† in sec/veh)			2035 No Build LOS - With Improvements (Delay† in sec/veh)		
#	Name	Approach	Control	AM Peak	PM Peak	Control	AM Peak	PM Peak	Control	AM Peak	PM Peak
7	Tanner Road at Franklin Drive	EB	Free	A (5.0)	A (2.7)	Free	A (5.1)	A (2.8)	Free	A (5.1)	A (2.8)
		WB	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)
		SB	Stop	A (10.0)	B (11.5)	Stop	B (10.8)	B (13.4)	Stop	B (10.8)	B (13.4)
		Total		**A (3.2)**	**A (3.3)**		**A (3.4)**	**A (3.7)**		**A (3.4)**	**A (3.7)**
8	Drowning Creek Road at Old Freeman Mill Road	EB	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)
		WB	Stop	A (9.1)	A (9.0)	Stop	A (9.4)	A (9.5)	Stop	A (9.4)	A (9.5)
		NB	Free	A (0.8)	A (1.0)	Free	A (0.6)	A (0.8)	Free	A (0.6)	A (0.8)
		SB	Stop	A (8.5)	A (8.7)	Stop	A (8.6)	A (8.9)	Stop	A (8.6)	A (8.9)
		Total		**A (2.4)**	**A (1.8)**		**A (2.2)**	**A (1.6)**		**A (2.2)**	**A (1.6)**
9	SR 8 at Harbins Road / Dacula Road	EB	Signal	C (30.5)	D (45.4)	Signal	C (34.9)	F (175.8)	Signal	C (34.5)	D (47.4)
		WB	Signal	B (19.6)	D (35.8)	Signal	C (31.1)	D (43.7)	Signal	C (27.5)	D (35.1)
		NB	Signal	D (47.4)	E (65.0)	Signal	C (32.4)	F (89.8)	Signal	C (32.5)	E (59.2)
		SB	Signal	C (25.7)	D (53.1)	Signal	C (28.1)	E (67.6)	Signal	B (19.8)	D (44.4)
		Total		**C (30.9)**	**D (50.3)**		**C (31.4)**	**F (98.9)**		**C (28.5)**	**D (47.2)**
10	SR 8 at Franklin Drive	EB	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)
		WB	Free	A (0.7)	A (0.9)	Free	A (0.7)	A (1.0)	Free	A (0.7)	A (1.0)
		NB	Stop	B (14.3)	C (18.7)	Stop	C (21.2)	E (40.5)	Stop	C (17.6)	C (24.1)
		Total		**A (1.6)**	**A (2.4)**		**A (2.2)**	**A (4.8)**		**A (1.9)**	**A (3.0)**
11	SR 8 at Still Road	EB	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)
		WB	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)
		NB	Stop	A (0.0)	A (0.0)	Stop	A (0.0)	A (0.0)	Stop	A (0.0)	A (0.0)
		Total		**A (0.0)**	**A (0.0)**		**A (0.0)**	**A (0.0)**		**A (0.0)**	**A (0.0)**
12	SR 8 at Old Freeman Mill Road	EB	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)
		WB	Free	A (0.0)	A (0.4)	Free	A (0.0)	A (0.3)	Free	A (0.0)	A (0.3)
		NB	Stop	B (10.4)	B (12.6)	Stop	B (11.3)	B (14.9)	Stop	B (11.3)	B (14.9)
		Total		**A (0.1)**	**A (0.2)**		**A (0.0)**	**A (0.2)**		**A (0.0)**	**A (0.2)**
13	SR 8 at SR 324 / Hill's Shop Road	EB	Signal	B (16.9)	C (24.3)	Signal	C (26.6)	D (44.8)	Signal	B (16.2)	C (22.0)
		WB	Signal	B (16.8)	B (18.1)	Signal	B (19.3)	C (25.3)	Signal	B (15.0)	B (16.0)
		NB	Signal	A (0.0)	A (0.4)	Signal	A (0.0)	A (0.6)	Signal	A (0.0)	A (0.6)
		SB	Signal	C (29.6)	C (33.3)	Signal	D (50.3)	D (48.0)	Signal	D (36.2)	C (32.1)
		Total		**B (19.7)**	**C (24.4)**		**C (27.6)**	**D (38.0)**		**C (19.9)**	**C (22.6)**
14	SR 8 at Apalachee Church Road	EB	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)	Signal	A (5.1)	A (5.9)
		WB	Free	A (0.3)	A (0.6)	Free	A (0.3)	A (0.6)	Signal	C (29.5)	B (12.3)
		NB	Stop	D (27.3)	D (29.7)	Stop	F (90.3)	F (100.8)	Signal	C (34.8)	C (21.2)
		Total		**A (2.4)**	**A (1.8)**		**A (7.7)**	**A (5.5)**		**C (22.2)**	**A (9.5)**
15	Brown Bridge Road at Apalachee Church Road	EB	Stop	A (7.5)	A (7.4)	Stop	A (7.7)	A (7.4)	Stop	A (7.7)	A (7.5)
		WB	Stop	A (6.9)	A (6.8)	Stop	A (7.0)	A (6.8)	Stop	A (7.0)	A (7.0)
		SB	Stop	A (7.7)	A (7.7)	Stop	A (8.0)	A (7.7)	Stop	A (8.0)	A (7.9)
		Total		**A (7.4)**	**A (7.3)**		**A (7.6)**	**A (7.3)**		**A (7.6)**	**A (7.5)**

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Table 10: Existing and No Build Analysis Results (3 of 3)

Intersection			2021 Existing LOS (Delay† in sec/veh)			2035 No Build LOS - (Delay† in sec/veh)			2035 No Build LOS - With Improvements (Delay† in sec/veh)		
#	Name	Approach	Control	AM Peak	PM Peak	Control	AM Peak	PM Peak	Control	AM Peak	PM Peak
16	Dacula Road at Fence Road	EB	Signal	D (53.8)	E (60.7)	Signal	E (55.2)	F (103.4)	Signal	D (38.9)	E (66.8)
		WB	Signal	C (29.2)	D (48.2)	Signal	C (33.9)	F (84.6)	Signal	C (30.0)	E (60.6)
		NB	Signal	B (15.1)	C (28.6)	Signal	D (37.2)	F (140.4)	Signal	B (10.4)	B (14.3)
		SB	Signal	C (24.1)	D (40.1)	Signal	D (41.1)	F (141.4)	Signal	B (19.9)	C (31.8)
		Total		**C (27.5)**	**D (43.8)**		**D (39.5)**	**F (120.5)**		**C (23.0)**	**D (41.3)**
101	SR 316 Eastbound Ramps at Harbins Road	EB	See Intersections 1-4 At-Grade Intersections Precede Interchanges			Signal	D (36.4)	D (50.6)	Signal	B (18.A)	D (43.6)
		NB				Signal	B (19.2)	D (43.0)	Signal	B (10.1)	C (22.1)
		SB				Signal	A (3.5)	C (29.2)	Signal	A (1.5)	A (7.0)
		Total					**B (20.0)**	**D (42.0)**		**B (10.2)**	**C (25.6)**
102	SR 316 Westbound Ramps at Harbins Road	WB				Signal	D (36.6)	C (30.3)	Signal	D (36.6)	C (30.3)
		NB				Signal	C (31.2)	B (16.1)	Signal	D (35.1)	C (21.2)
		SB				Signal	B (17.7)	C (127.7)	Signal	B (16.3)	C (21.5)
		Total					**C (27.5)**	**C (21.8)**		**C (29.3)**	**C (22.2)**
201	RELOCATED SR 316 at Williams Farm Road	EB				Signal	A (1.0)	A (1.2)	Signal	A (1.0)	A (1.2)
		WB				Signal	A (3.6)	A (2.3)	Signal	A (3.6)	A (2.3)
		NB				Signal	C (25.5)	B (14.1)	Signal	C (25.5)	B (14.1)
		SB				Signal	A (0.0)	A (0.0)	Signal	A (0.0)	A (0.0)
		Total					**B (19.0)**	**A (4.7)**		**B (19.0)**	**A (4.7)**
301	SR 316 Eastbound Ramps at Drowning Creek Road	EB				Signal	A (6.5)	B (15.6)	Signal	A (6.5)	B (15.6)
		NB				Signal	A (4.0)	A (4.9)	Signal	A (4.0)	A (4.9)
		SB				Signal	A (1.5)	A (2.0)	Signal	A (1.5)	A (2.0)
		Total					**A (4.0)**	**A (7.6)**		**A (4.0)**	**A (7.6)**
302	SR 316 Westbound Ramps at Drowning Creek Road	WB				Signal	A (10.0)	A (0.1)	Signal	A (10.0)	A (0.1)
		NB				Signal	A (2.0)	A (1.4)	Signal	A (2.0)	A (1.4)
		SB				Signal	A (4.9)	A (3.8)	Signal	A (4.9)	A (3.8)
		Total					**A (5.3)**	**A (2.2)**		**A (5.3)**	**A (2.2)**
401	SR 316 Eastbound Ramps at Kilcrease Road	EB				Signal	C (28.1)	D (37.5)	Signal	C (28.1)	D (37.5)
		NB				Signal	A (6.7)	A (7.7)	Signal	A (6.7)	A (7.7)
		SB				Signal	A (2.7)	A (3.5)	Signal	A (2.7)	A (3.5)
		Total					**B (10.2)**	**B (16.0)**		**A (5.3)**	**A (2.2)**
402	SR 316 Westbound Ramps at Kilcrease Road	WB				Signal	C (20.6)	B (18.6)	Signal	C (20.6)	B (18.6)
		NB				Signal	A (2.7)	A (4.2)	Signal	A (2.7)	A (4.2)
		SB				Signal	A (3.4)	A (3.5)	Signal	A (3.4)	A (3.5)
		Total					**A (6.6)**	**A (6.2)**		**A (6.6)**	**A (6.2)**

5.1.2 Build Conditions (2035)

The 2035 No Build, 2035 Build unmodified road network and 2035 Build with improvements conditions LOS results are shown in Table 11 and Table 12, and the corresponding Synchro reports can be found in Appendix G.

Results show that the only intersections requiring mitigation due to the additional volumes produced by the Rowen Development are Drowning Creek Road at Old Freeman Mill Road, Drowning Creek Road at Harbins Road, SR 8 at Franklin Drive, and SR 8 at Old Freeman Mill Drive. These intersections either are a direct connection from Rowen to the study network, or require the addition of turn lanes to support a connection. Any other intersection operating LOS E or lower did so in both the Build and No Build Scenarios. Table 11 and Table 12 also show the results of modifications to the intersections. These recommended modifications will be discussed in more detail in Section 6.0.

The eastbound approach of Harbins Road and Tanners Road operates at a Level of Service E in the mitigated scenario in the PM peak, due to the approach being a one-way driveway, with a maximum of 4 and 5 vehicles per hour during peak hour. The Fence Road approaches of Dacula Road at Fence intersection operate at an LOS E in the PM peak period, improved from LOS F in the 2035 No Build and Build unmitigated scenarios. The overall intersection operates at LOS D in the PM peak period, and it was determined that further mitigations to improve the side street would be excessive.

Table 11: Build Analysis Results (1 of 3)

Intersection			2035 Build LOS - (Delay† in sec/veh)			2035 Build LOS - With Improvements (Delay† in sec/veh)		
#	Name	Approach	Control	AM Peak	PM Peak	Control	AM Peak	PM Peak
Note: See Intersections 101 - 401; At-Grade Intersections Replaced with Interchanges								
5	Drowning Creek Road at Harbins Road	EB	Free	A (4.0)	A (1.4)	Signal	A (5.8)	B (19.1)
		WB	Free	A (0.0)	A (0.0)	Signal	A (5.4)	B (11.1)
		SB	Stop	F (89.5)	F (839.0)	Signal	B (11.9)	B (15.8)
		Total		**A (8.1)**	**F (191.7)**		**A (6.0)**	**B (15.7)**
6	Harbins Road at Tanner Road	EB	Signal	A (0.0)	E (73.2)	Signal	A (0.0)	E (71.0)
		WB	Signal	B (19.6)	D (41.6)	Signal	C (31.8)	D (41.6)
		NB	Signal	C (24.8)	B (11.5)	Signal	B (12.7)	B (11.0)
		SB	Signal	A (4.6)	A (5.3)	Signal	A (3.3)	A (5.0)
		Total		**B (16.2)**	**B (14.5)**		**B (12.5)**	**B (14.0)**
7	Tanner Road at Franklin Drive	EB	Free	A (1.5)	A (2.5)	Free	A (1.5)	A (2.5)
		WB	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)
		SB	Stop	B (11.8)	C (20.9)	Stop	B (11.8)	C (20.9)
		Total		**A (2.2)**	**A (3.3)**		**A (2.2)**	**A (3.3)**
8	Drowning Creek Road at Old Freeman Mill Road	EB	Free	A (0.0)	A (0.0)	Roundabout	A (0.0)	A (0.0)
		WB	Stop	A (0.0)	A (0.0)	Roundabout	B (11.3)	A (4.2)
		NB	Free	F (396.5)	C (31.9)	Roundabout	B (10.3)	A (4.2)
		SB	Stop	A (0.0)	A (0.0)	Roundabout	A (9.4)	B (10.8)
		Total		**F (353.8)**	**B (10.8)**		**B (10.2)**	**A (7.8)**
9	SR 8 at Harbins Road / Dacula Road	EB	Signal	D (39.4)	F (175.8)	Signal	D (39.1)	D (53.6)
		WB	Signal	D (35.9)	D (39.7)	Signal	C (33.0)	C (33.0)
		NB	Signal	E (56.7)	F (98.2)	Signal	D (40.4)	E (58.7)
		SB	Signal	C (31.5)	E (79.6)	Signal	C (20.9)	D (45.5)
		Total		**D (41.3)**	**F (101.8)**		**C (32.9)**	**D (48.7)**
10	SR 8 at Franklin Drive	EB	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)
		WB	Free	A (0.8)	A (0.9)	Free	A (0.8)	A (0.9)
		NB	Stop	D (25.1)	E (49.7)	Stop	C (20.0)	C (27.0)
		Total		**A (2.4)**	**A (5.4)**		**A (2.0)**	**A (3.1)**
11	SR 8 at Still Road	EB	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)
		WB	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)
		NB	Stop	A (0.0)	A (0.0)	Stop	A (0.0)	A (0.0)
		Total		**A (0.0)**	**A (0.0)**		**A (0.0)**	**A (0.0)**

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Table 12: Build Analysis Results (2 of 3)

Intersection			2035 Build LOS - (Delay† in sec/veh)			2035 Build LOS - With Improvements (Delay† in sec/veh)		
#	Name	Approach	Control	AM Peak	PM Peak	Control	AM Peak	PM Peak
12	SR 8 at Old Freeman Mill Road	EB	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)
		WB	Free	A (1.8)	A (0.9)	Free	A (1.8)	A (0.9)
		NB	Stop	C (19.4)	F (58.1)	Stop	B (18.5)	C (29.1)
		Total		**A (1.7)**	**A (7.1)**		**A (1.7)**	**A (3.7)**
13	SR 8 at SR 324 / Hill's Shop Road	EB	Signal	D (38.8)	F (155.0)	Signal	B (14.0)	B (19.2)
		WB	Signal	B (19.3)	C (25.3)	Signal	D (40.4)	C (27.2)
		NB	Signal	A (0.00	A (0.6)	Signal	A (0.00	A (0.4)
		SB	Signal	D (41.2)	D (46.0)	Signal	C (33.0)	D (48.9)
		Total		**D (28.7)**	**E (75.1)**		**C (33.5)**	**C (30.7)**
14	SR 8 at Apalachee Church Road	EB	Free	A (0.0)	A (0.0)	Signal	A (5.0)	A (5.9)
		WB	Free	A (0.3)	A (0.6)	Signal	C (27.1)	B (12.3)
		NB	Stop	F (90.3)	F (100.8)	Signal	D (36.4)	C (21.2)
		Total		**A (7.7)**	**A (5.5)**		**C (20.9)**	**A (9.5)**
15	Brown Bridge Road at Apalachee Church Road	EB	Stop	A (7.8)	A (7.7)	Stop	A (7.8)	A (7.7)
		WB	Stop	A (7.6)	A (7.2)	Stop	A (7.6)	A (7.2)
		SB	Stop	A (8.2)	A (8.0)	Stop	A (8.2)	A (8.0)
		Total		**A (7.8)**	**A (7.6)**		**A (7.8)**	**A (7.6)**
16	Dacula Road at Fence Road	EB	Signal	D (55.0)	F (103.4)	Signal	D (46.5)	E (66.3)
		WB	Signal	D (41.2)	F (84.9)	Signal	D (43.9)	E (67.2)
		NB	Signal	D (50.1)	F (255.7)	Signal	B (13.8)	B (17.8)
		SB	Signal	F (88.3)	F (162.7)	Signal	C (30.4)	C (32.0)
		Total		**F (58.6)**	**F (160.8)**		**C (31.8)**	**D (42.3)**
101	SR 316 Eastbound Ramps at Harbins Road	EB	Signal	D (38.2)	E (66.3)	Signal	C (21.2)	D (44.9)
		NB	Signal	C (19.3)	D (38.5)	Signal	B (13.1)	C (22.7)
		SB	Signal	A (3.8)	D (52.8)	Signal	A (2.2)	B (16.5)
		Total		**C (20.9)**	**D (52.1)**		**B (12.9)**	**C (28.5)**
102	SR 316 Westbound Ramps at Harbins Road	WB	Signal	D (38.4)	D (42.7)	Signal	D (38.4)	D (42.7)
		NB	Signal	C (24.3)	C (23.7)	Signal	C (27.3)	C (28.2)
		SB	Signal	B (14.7)	C (26.7)	Signal	B (15.8)	C (24.4)
		Total		**C (22.8)**	**C (27.1)**		**C (24.9)**	**C (28.4)**
201	RELOCATED SR 316 at Williams Farm Road	EB	Signal	F (435.2)	A (5.0)	Signal	A (9.3)	A (4.4)
		WB	Signal	D (44.6)	A (5.9)	Signal	A (4.1)	A (5.8)
		NB	Signal	C (34.1)	F (209.5)	Signal	B (17.6)	B (13.1)
		SB	Signal	C (24.4)	F (580.8)	Signal	B (11.9)	B (13.5)
		Total		**F (222.5)**	**F (380.3)**		**A (8.4)**	**B (12.0)**

Table 13: Build Analysis Results (3 of 3)

Intersection			2035 Build LOS - (Delay† in sec/veh)			2035 Build LOS - With Improvements (Delay† in sec/veh)		
#	Name	Approach	Control	AM Peak	PM Peak	Control	AM Peak	PM Peak
301	SR 316 Eastbound Ramps at Drowning Creek Road	EB	Signal	E (74.1)	C (29.0)	Signal	C (29.2)	C (30.4)
		NB	Signal	C (24.0)	C (20.8)	Signal	B (18.4)	B (18.5)
		SB	Signal	B (16.7)	C (20.9)	Signal	A (8.9)	B (16.7)
		Total		**D (48.7)**	**C (22.3)**		**C (22.0)**	**B (19.7)**
302	SR 316 Westbound Ramps at Drowning Creek Road	WB	Signal	E (69.3)	C (20.7)	Signal	D (59.3)	C (20.7)
		NB	Signal	C (32.7)	B (17.5)	Signal	D (39.5)	B (18.3)
		SB	Signal	B (13.1)	C (21.9)	Signal	B (10.1)	C (20.8)
		Total		**D (43.9)**	**C (20.6)**		**D (46.8)**	**C (20.1)**
401	SR 316 Eastbound Ramps at Kilcrease Road	EB	Signal	C (30.3)	D (38.4)	Signal	C (30.3)	D (38.4)
		NB	Signal	A (7.1)	A (9.8)	Signal	A (7.1)	A (9.8)
		SB	Signal	A (2.9)	A (4.5)	Signal	A (2.9)	A (4.5)
		Total		**B (11.6)**	**B (19.4)**		**B (11.6)**	**B (19.4)**
402	SR 316 Westbound Ramps at Kilcrease Road	WB	Signal	C (20.6)	B (18.6)	Signal	C (20.6)	B (18.6)
		NB	Signal	A (2.8)	A (4.7)	Signal	A (2.8)	A (4.7)
		SB	Signal	A (3.0)	A (3.3)	Signal	A (3.0)	A (3.3)
		Total		**A (6.0)**	**A (6.1)**		**A (6.0)**	**A (6.1)**

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6.0 IDENTIFIED NEEDS

The following improvements are recommended to address transportation needs due to the Rowen development. These projects will mitigate the intersections that were identified in section 5.0 as exceeding the LOS D threshold as required by GRTA. The proposed improvements are show in Figure 20, Figure 21, Figure 22 and Figure 23.

6.1 Proposed Improvements by 2035

Table 14: Proposed Improvements (1 of 3)

Intersection			2035 No Build Improvements		2035 Build Improvements	
#	Name	Approach	Proposed Improvement	Justification	Proposed Improvement	Justification
5	Drowning Creek Road at Harbins Road	EB	Add left turn lane	*Even though intersection's overall LOS is A, the LOS for southbound approach is E without these improvements.*	Same as No Build	*Southbound approach has LOS F and excessive delay without signalization.*
		WB	Add right turn lane		Same as No Build	
		SB	Add right turn lane		Same as No Build	
		Overall	-		Signalize Intersection	
6	Harbins Road at Tanner Road	EB	-	*Intersection has LOS E without the improvements. Adding a southbound left turn lane improves intersection LOS to B and the left turn volume meets criterial for left turn signal*	-	*Same as No Build*
		WB	-		-	
		NB	-		-	
		SB	Add left turn lane; change left-turn phasing to protected/permissive		Same as No Build	
		Overall	-		-	
8	Drowning Creek Road at Old Freeman Mill Road	EB	-	-	Add additional approach lane resulting in left-thru lane and a right turn slip lane	*The build condition adds significant traffic to intersection #8 as the main roadway providing access to SR 316. Intersection #8 will be too close to the proposed interchange for any improvement to result in satisfactory LOS.*
		WB	-		Add additional approach lane resulting in left-thru lane and an exclusive right turn lane	
		NB	-		Add additional approach lane resulting in an exclusive left turn lane and a thru-right lane	
		SB	-		Add additional approach lane resulting in left-thru lane and an exclusive right turn lane	
		Overall	-		Convert to roundabout	
9	SR 8 at Harbins Road / Dacula Road	EB	Add additional left turn lane; add auxiliary thru lane to terminate at Franklin Dr	*The intersection operates at LOS F. Current configurations will allow the dual lefts (eastbound/westbound) to have two receiving lanes. The southbound thru with a single lane has 715 vph during PM compared with 40 vph for right turn; the right turn conversion to thru/right shared allows it to operate as auxiliary thru lane. Ideally, Harbins Road/Dacula Road would be widened to 4 lanes since it connects to proposed interchange at SR 316 and a general shortage of N/S connectivity compared to the other two state routes (SR 316, SR 8) running E/W in this section.*	Same as No Build	*Same as No Build*
		WB	Add additional left turn lane		Same as No Build	
		NB	Add right turn lane		Same as No Build	
		SB	Convert right turn lane to shared thru/right lane.		Same as No Build	
		Overall	Ideally Harbins Road/Dacula Road would be widened to 4 lanes*		Same as No Build	

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Table 15: Proposed Improvements (2 of 3)

Intersection			2035 No Build Improvements		2035 Build Improvements	
#	Name	Approach	Proposed Improvement	Justification	Proposed Improvement	Justification
10	SR 8 at Franklin Drive	EB	-	*Intersection LOS is A; however, northbound approach LOS is E without the improvements. The northbound right turn lane improves LOS for the approach to D*	-	*Same as No Build*
		WB	-		-	
		NB	Add right turn lane		Same as No Build	
		Overall	-		-	
13	SR 8 at SR 324 / Hill's Shop Road	EB	-	*Intersection operates split phase with heavy SBL volume during PM peak (575 vph). This utilizes significant green time causing the eastbound left (which does not meet criterial for left turn signal) to operate at LOS F even though the eastbound approach overall operates at LOS D. The exclusive left turn lane allows for southbound allows two lanes for SBL which frees up more time on the mainline to create gaps for eastbound lefts*	-	*Projected traffic volume for PM peak under build scenario meets criteria for left turn signal and installing it will improve LOS*
		WB	-		-	
		NB	-		-	
		SB	Add exclusive left turn lane		Same as No Build; Also convert left-turn phasing to protected/permissive	
		Overall	-		-	
14	SR 8 at Apalachee Church Road	EB	-	*LOS for northbound approach is E with a shared left/right lane due to heavy traffic on mainline. Separating the right and left turn movements improves LOS to D for PM peak. However, AM peak has higher left turn volume and remains LOS F even with the turn lanes without signalization.*	-	*Same as No Build*
		WB	-		-	
		NB	Add right turn lane		Same as No Build	
		Overall	Signalize Intersection		Same as No Build	
16	Dacula Road at Fence Road	EB	Allow two thru lanes; add right turn lane; add additional left turn lane (dual lefts)	*Intersection has limited capacity already. Proposed improvement can address localized congestion and improve LOS at the intersection from F to D. However, the eastbound and westbound approaches will still be at LOS E due to the eastbound and westbound left turns having LOS F. If both roads are not widened to 4 lanes, the second thru lanes can end as right turn lanes at Kroger shopping for northbound on Dacula Road, at Dacula High School for southbound, at park and right lot for westbound and at Dacula Elementary School for eastbound.*	Same as No Build	*Same as No Build. Intersection has limited capacity already. Proposed improvement can address localized congestion and improve LOS at the intersection from F to D. However, the eastbound and westbound approaches will still be at LOS E due to the eastbound and westbound left turns having LOS F.*
		WB	Allow two thru lanes; add right turn lane; add additional left turn lane (dual lefts)		Same as No Build	
		NB	Allow two thru lanes; add right turn lane		Same as No Build	
		SB	Allow two thru lanes; add right turn lane; add additional left turn lane (dual lefts)		Same as No Build	
		Overall	Ideally, widen both roads to 4 lanes.*		Same as No Build	

**Not required*

Blue Text indicates additional improvement recommended for Build Scenario

Table 16: Proposed Improvements (3 of 3)

Intersection			2035 No Build Improvements		2035 Build Improvements	
#	Name	Approach	Proposed Improvement	Justification	Proposed Improvement	Justification
101	SR 316 Eastbound Ramps at Harbins Road	EB	Add additional right turn lane	*There are heavy right turns in both AM & PM peaks, particularly the PM with 740 vph. Even though the approach overall is at LOS D, the right turn movement without dual right is at LOS E.*	Same as No Build	*Same as No Build*
		NB	Add additional receiving lane for EBR, terminating at Alcovy Road		Same as No Build	
		SB	-		-	
		Overall	-		-	
201	RELOCATED SR 316 at Williams Farm Road	EB	-	-	Add right and left turn lanes	*This intersection is another major connection to SR 316 from the Rowen property and thus the build condition adds significant traffic. Adding exlusive turn lanes allows the intersection to operate at LOS A.*
		WB	-		Add right and left turn lanes	
		NB	-		Add right and left turn lanes	
		SB	-		Add right and left turn lanes	
		Overall	-		Add right and left turn lanes	
301	SR 316 Eastbound Ramps at Drowning Creek Road	EB	-	-	Add additional exclusive left turn lane	*The build condition adds significant traffic to this intersection as it is one of two major connection points to SR 316 from the Rowen property. An additonal right turn lane on the ramp improves the eastbound approach operations from LOS E to LOS C.*
		NB	-		-	
		SB	-		-	
		Overall	-		-	

**Not required*
Blue Text indicates additional improvement recommended for Build Scenario

6.2 Signal Warrant Analysis

Signal Warrant Analyses were conducted using the available turning movements counts for all intersections under consideration for signalization in the 2035 No Build and Build scenarios. Below is a list of intersections which warrant a signal, and the scenario in which they are warranted.

- #5 - Harbins Road at Drowning Creek Road (2035 Build)
- #8 - Harbins Road at Old Freeman Mill Road (2035 Build)
- #14 - SR 8 at Apalachee Church Road (2035 No Build)

Signal Warrant Analysis documentation can be found in Appendix H.

MATCHLINE A - SEE FIGURE 21

MATCHLINE B - SEE FIGURE 21

Rowen Site

Old Freemans Mill Road

Drowning Creek Road

Turkey Crossing

STOP

STOP

8

Harbins Road

CONTINUOUS

102

180

CONTINUOUS

SR 316

250'

101

CONTINUOUS

500'

380'

350'

Harbins Road

201

C-D System

Williams Farm Road

300'

500'

302

300'

SR 316

300'

301

500'

500'

300'

Drowning Creek Road

Rowen Site

200'

200'

STOP

5

Harbins Road

150'

Apalachee River

Gwinnett County

Barrow County

300'

Kilcrease Road

500'

402

300'

SR 316

300'

401

500'

300'

N

Legend

- Existing Lane
- XX' Proposed Lane with Length
- XX' Proposed Lane from Former Phase
- Signalized Intersection
- Stop Controlled Approach
- 1 Unsignalized Intersection
- Improved Intersection

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Rowen Development of Regional Impact

ROWEN

2035 No Build Geometry with Improvements

Figure 20

Dacula Road
Fence Road
16
Dacula Road
200'
200'
200'
125'
515'
515'
125'
200'
SR 8
9
Harbins Road
300'
300'
200'
250'
250'
250'
250'
150'
200'
200'
10
Franklin Drive
950'
STOP
300'
DROP LANE
11
Still Road
STOP
Old Freemans Mill Road
12
STOP
ADD LANE
Apalachee River
SR 324
13
Driveway
275'
300'
175'
ADD LANE
300'
300'
Apalachee Church Road
14
780'
TWLTL
200'
SR 8
Brown Bridge Road
15
STOP
STOP
STOP
Sanjo Street
6
Harbins Road
200'
100'
Tanner Road
7
STOP
Tanner Road
MATCHLINE A - SEE FIGURE 20
Rowen Site
MATCHLINE B - SEE FIGURE 20
Barrow County
Gwinnett County

Legend

- Existing Lane
- XX' Proposed Lane with Length
- XX' Proposed Lane from Former Phase
- Signalized Intersection
- STOP Stop Controlled Approach
- 1 Unsignalized Intersection
- Improved Intersection

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Rowen Development of Regional Impact

ROWEN

2035 No Build Geometry with Improvements

Figure 21

MATCHLINE A - SEE FIGURE 23

MATCHLINE B - SEE FIGURE 23

Intersection 8 converted to roundabout

Rowen Site

Old Freemans Mill Road

Drowning Creek Road

Turkey Crossing

8

CONTINUOUS

50'

Harbins Road

Site Access

C-D System

Williams Farm Road

Apalachee River

Kilcrease Road

SR 316

102

201

302

402

101

301

401

5

180'

250'

300'

500'

380'

350'

200'

150'

Rowen Site

Drowning Creek Road

Harbins Road

Gwinnett County

Barrow County

Legend

- Existing Lane
- XX' Proposed Lane with Length
- XX' Proposed Lane from Former Phase
- Signalized Intersection
- Stop Controlled Approach
- 1 Unsignalized Intersection
- Improved Intersection

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Rowen Development of Regional Impact

ROWEN

2035 Build Geometry with Improvements

Figure 22

Dacula Road
Fence Road
16
200'
200'
200'
125'
515'
515'
125'
200'
Dacula Road
SR 8
9
300'
300'
200'
250'
250'
250'
250'
150'
200'
200'
Harbins Road
10
950'
STOP
300'
Franklin Drive
DROP LANE
11
STOP
Still Road
12
STOP
Old Freemans Mill Road
ADD LANE
ADD LANE
Apalachee River
SR 324
13
275'
300'
175'
300'
300'
Driveway
14
TWLTL
SR 8
780'
200'
Apalachee Church Road
200'
100'
Sanjo Street
6
Harbins Road
Tanner Road
STOP
7
Tanner Road
Site Access
Rowen Site
Site Access
Site Access
STOP
STOP
Brown Bridge Road
15
MATCHLINE A - SEE FIGURE 22
MATCHLINE B - SEE FIGURE 22
Barrow County
Gwinnett County

Legend

- Existing Lane
- XX' Proposed Lane with Length
- XX' Proposed Lane from Former Phase
- Signalized Intersection
- STOP Stop Controlled Approach
- 1 Unsignalized Intersection
- Improved Intersection

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Rowen Development of Regional Impact

ROWEN

2035 Build Geometry with Improvements

Figure 23

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Table 17: All Analysis Results (1 of 3)

Intersection			2021 Existing LOS (Delay† in sec/veh)			2035 No Build LOS - (Delay† in sec/veh)			2035 No Build LOS - With Improvements (Delay† in sec/veh)			2035 Build LOS - (Delay† in sec/veh)			2035 Build LOS - With Improvements (Delay† in sec/veh)		
#	Name	Approach	Control	AM Peak	PM Peak	Control	AM Peak	PM Peak	Control	AM Peak	PM Peak	Control	AM Peak	PM Peak	Control	AM Peak	PM Peak
1	SR 316 at Harbins Road	EB	Signal	D (37.7)	D (39.8)	See Intersections 101 - 401 At-Grade Intersections Replaced with Interchanges											
		WB	Signal	F (82.8)	D (42.2)												
		NB	Signal	F (107.9)	F (154.0)												
		SB	Signal	F (106.2)	F (117.9)												
		Total		**E (76.1)**	**E (66.0)**												
2	SR 316 at Williams Farm Road	EB	Free	A (0.3)	A (0.2)												
		WB	Free	A (0.1)	A (0.4)												
		NB	Stop	F (944.4)	A (0.0)												
		SB	Stop	A (0.0)	A (0.0)												
		Total		**D (47.9)**	**C (20.5)**												
3	SR 316 at Drowning Creek Road	EB	Free	A (0.2)	A (0.1)												
		WB	Free	A (0.1)	A (0.0)												
		NB	Stop	A (0.0)	A (0.0)												
		SB	Stop	A (0.0)	A (0.0)												
		Total		**A (0.1)**	**A (0.1)**												
4	SR 316 at Kilcrease Road	EB	Signal	B (15.1)	C (21.2)												
		WB	Signal	B (15.4)	C (25.6)												
		NB	Signal	E (66.8)	E (64.3)												
		SB	Signal	F (124.0)	F (141.7)												
		Total		**C (26.9)**	**C (34.5)**												
5	Drowning Creek Road at Harbins Road	EB	Free	A (0.4)	A (0.6)	Free	A (0.5)	A (0.6)	Free	A (0.5)	A (0.6)	Free	A (4.0)	A (1.4)	Signal	A (5.8)	B (19.1)
		WB	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)	Signal	A (5.4)	B (11.1)
		SB	Stop	B (14.5)	C (20.6)	Stop	C (19.5)	E (47.8)	Stop	C (16.8)	D (33.4)	Stop	F (89.5)	F (839.0)	Signal	B (11.9)	B (15.8)
		Total		**A (0.9)**	**A (2.0)**		**A (1.2)**	**A (4.3)**		**A (1.0)**	**A (3.1)**		**A (8.1)**	**F (191.7)**		**A (6.0)**	**B (15.7)**
6	Harbins Road at Tanner Road	EB	Stop	A (0.0)	E (40.0)	Signal	A (0.0)	E (73.2)	Signal	A (0.0)	E (73.2)	Signal	A (0.0)	E (73.2)	Signal	A (0.0)	E (71.0)
		WB	Stop	C (17.6)	D (29.3)	Signal	C (21.2)	D (40.5)	Signal	C (21.2)	D (40.2)	Signal	C (22.6)	D (54.6)	Signal	C (31.8)	D (44.3)
		NB	Free	A (0.0)	A (0.0)	Signal	B (14.7)	B (13.9)	Signal	B (16.8)	B (18.7)	Signal	B (18.7)	B (18.4)	Signal	C (32.9)	C (32.1)
		SB	Free	A (0.7)	A (1.7)	Signal	A (5.2)	F (111.5)	Signal	A (7.3)	B (15.7)	Signal	F (289.4)	F (282.2)	Signal	B (16.3)	C (21.0)
		Total		**A (3.5)**	**A (3.5)**		**B (12.1)**	**D (64.4)**		**B (13.9)**	**B (19.3)**		**F (125.7)**	**F (140.5)**		**C (26.2)**	**C (29.5)**
7	Tanner Road at Franklin Drive	EB	Free	A (5.0)	A (2.7)	Free	A (5.1)	A (2.8)	Free	A (5.1)	A (2.8)	Free	A (1.5)	A (2.5)	Free	A (1.5)	A (2.5)
		WB	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)
		SB	Stop	A (10.0)	B (11.5)	Stop	B (10.8)	B (13.4)	Stop	B (10.8)	B (13.4)	Stop	B (11.8)	C (20.9)	Stop	B (11.8)	C (20.9)
		Total		**A (3.2)**	**A (3.3)**		**A (3.4)**	**A (3.7)**		**A (3.4)**	**A (3.7)**		**A (2.2)**	**A (3.3)**		**A (2.2)**	**A (3.3)**
8	Drowning Creek Road at Old Freeman Mill Road	EB	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)	Roundabout	A (0.0)	A (0.0)
		WB	Stop	A (9.1)	A (9.0)	Stop	A (9.4)	A (9.5)	Stop	A (9.4)	A (9.5)	Stop	A (0.0)	A (0.0)	Roundabout	B (11.3)	A (4.2)
		NB	Free	A (0.8)	A (1.0)	Free	A (0.6)	A (0.8)	Free	A (0.6)	A (0.8)	Free	F (396.5)	C (31.9)	Roundabout	B (10.3)	A (4.2)
		SB	Stop	A (8.5)	A (8.7)	Stop	A (8.6)	A (8.9)	Stop	A (8.6)	A (8.9)	Stop	A (0.0)	A (0.0)	Roundabout	A (9.4)	B (10.8)
		Total		**A (2.4)**	**A (1.8)**		**A (2.2)**	**A (1.6)**		**A (2.2)**	**A (1.6)**		**F (353.8)**	**B (10.8)**		**B (10.2)**	**A (7.8)**

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Table 18: All Analysis Results (2 of 3)

Intersection			2021 Existing LOS (Delay† in sec/veh)			2035 No Build LOS - (Delay† in sec/veh)			2035 No Build LOS - With Improvements (Delay† in sec/veh)			2035 Build LOS - (Delay† in sec/veh)			2035 Build LOS - With Improvements (Delay† in sec/veh)		
#	Name	Approach	Control	AM Peak	PM Peak	Control	AM Peak	PM Peak	Control	AM Peak	PM Peak	Control	AM Peak	PM Peak	Control	AM Peak	PM Peak
9	SR 8 at Harbins Road / Dacula Road	EB	Signal	C (30.5)	D (45.4)	Signal	C (34.9)	F (175.8)	Signal	C (34.5)	D (45.3)	Signal	D (39.4)	F (175.8)	Signal	D (39.1)	D (53.6)
		WB	Signal	B (19.6)	D (35.8)	Signal	C (31.1)	D (43.7)	Signal	C (27.5)	D (35.3)	Signal	D (35.9)	D (39.7)	Signal	C (33.0)	C (33.0)
		NB	Signal	D (47.4)	E (65.0)	Signal	D (44.5)	F (84.0)	Signal	D (46.5)	E (60.7)	Signal	D (47.2)	F (82.4)	Signal	D (39.5)	D (53.0)
		SB	Signal	C (25.7)	D (53.1)	Signal	C (28.1)	E (67.6)	Signal	B (19.8)	D (43.9)	Signal	C (31.5)	E (79.6)	Signal	C (20.9)	D (45.5)
		Total		**C (30.9)**	**D (50.3)**		**D (35.2)**	**F (97.5)**		**D (32.9)**	**D (46.9)**		**D (38.5)**	**F (97.7)**		**C (32.6)**	**D (47.2)**
10	SR 8 at Franklin Drive	EB	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)
		WB	Free	A (0.7)	A (0.9)	Free	A (0.7)	A (1.0)	Free	A (0.7)	A (1.0)	Free	A (0.8)	A (0.9)	Free	A (0.8)	A (0.9)
		NB	Stop	B (14.3)	C (18.7)	Stop	C (21.2)	E (40.5)	Stop	C (17.6)	C (24.1)	Stop	D (25.1)	E (49.7)	Stop	C (20.0)	C (27.0)
		Total		**A (1.6)**	**A (2.4)**		**A (2.2)**	**A (4.8)**		**A (1.9)**	**A (3.0)**		**A (2.4)**	**A (5.4)**		**A (2.0)**	**A (3.1)**
11	SR 8 at Still Road	EB	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)
		WB	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)
		NB	Stop	A (0.0)	A (0.0)	Stop	A (0.0)	A (0.0)	Stop	A (0.0)	A (0.0)	Stop	A (0.0)	A (0.0)	Stop	A (0.0)	A (0.0)
		Total		**A (0.0)**	**A (0.0)**		**A (0.0)**	**A (0.0)**		**A (0.0)**	**A (0.0)**		**A (0.0)**	**A (0.0)**		**A (0.0)**	**A (0.0)**
12	SR 8 at Old Freeman Mill Road	EB	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)
		WB	Free	A (0.0)	A (0.4)	Free	A (0.0)	A (0.3)	Free	A (0.0)	A (0.3)	Free	A (1.8)	A (0.9)	Free	A (1.8)	A (0.9)
		NB	Stop	B (10.4)	B (12.6)	Stop	B (11.3)	B (14.9)	Stop	B (11.3)	B (14.9)	Stop	C (19.4)	F (58.1)	Stop	B (18.5)	C (29.1)
		Total		**A (0.1)**	**A (0.2)**		**A (0.0)**	**A (0.2)**		**A (0.0)**	**A (0.2)**		**A (1.7)**	**A (7.1)**		**A (1.7)**	**A (3.7)**
13	SR 8 at SR 324 / Hill's Shop Road	EB	Signal	B (16.9)	C (24.3)	Signal	C (26.6)	D (44.8)	Signal	B (16.2)	C (22.0)	Signal	D (38.8)	F (155.0)	Signal	B (14.0)	B (19.2)
		WB	Signal	B (16.8)	B (18.1)	Signal	B (19.3)	C (25.3)	Signal	B (15.0)	B (16.0)	Signal	B (19.3)	C (25.3)	Signal	D (40.4)	C (27.2)
		NB	Signal	A (0.0)	A (0.4)	Signal	A (0.0)	A (0.6)	Signal	A (0.0)	A (0.6)	Signal	A (0.00	A (0.6)	Signal	A (0.00	A (0.4)
		SB	Signal	C (29.6)	C (33.3)	Signal	D (50.3)	D (48.0)	Signal	D (36.2)	C (32.1)	Signal	D (41.2)	D (46.0)	Signal	C (33.0)	D (48.9)
		Total		**B (19.7)**	**C (24.4)**		**C (27.6)**	**D (38.0)**		**C (19.9)**	**C (22.6)**		**D (28.7)**	**E (75.1)**		**C (33.5)**	**C (30.7)**
14	SR 8 at Apalachee Church Road	EB	Free	A (0.0)	A (0.0)	Free	A (0.0)	A (0.0)	Signal	A (5.1)	A (5.9)	Free	A (0.0)	A (0.0)	Signal	A (5.0)	A (5.9)
		WB	Free	A (0.3)	A (0.6)	Free	A (0.3)	A (0.6)	Signal	C (29.5)	B (12.3)	Free	A (0.3)	A (0.6)	Signal	C (27.1)	B (12.3)
		NB	Stop	D (27.3)	D (29.7)	Stop	F (90.3)	F (100.8)	Signal	C (34.8)	C (21.2)	Stop	F (90.3)	F (100.8)	Signal	D (36.4)	C (21.2)
		Total		**A (2.4)**	**A (1.8)**		**A (7.7)**	**A (5.5)**		**C (22.2)**	**A (9.5)**		**A (7.7)**	**A (5.5)**		**C (20.9)**	**A (9.5)**
15	Brown Bridge Road at Apalachee Church Road	EB	Stop	A (7.5)	A (7.4)	Stop	A (7.7)	A (7.4)	Stop	A (7.7)	A (7.5)	Stop	A (7.8)	A (7.7)	Stop	A (7.8)	A (7.7)
		WB	Stop	A (6.9)	A (6.8)	Stop	A (7.0)	A (6.8)	Stop	A (7.0)	A (7.0)	Stop	A (7.6)	A (7.2)	Stop	A (7.6)	A (7.2)
		SB	Stop	A (7.7)	A (7.7)	Stop	A (8.0)	A (7.7)	Stop	A (8.0)	A (7.9)	Stop	A (8.2)	A (8.0)	Stop	A (8.2)	A (8.0)
		Total		**A (7.4)**	**A (7.3)**		**A (7.6)**	**A (7.3)**		**A (7.6)**	**A (7.5)**		**A (7.8)**	**A (7.6)**		**A (7.8)**	**A (7.6)**
16	Dacula Road at Fence Road	EB	Signal	D (53.8)	E (60.7)	Signal	E (55.2)	F (103.4)	Signal	D (38.9)	E (66.8)	Signal	D (55.0)	F (103.4)	Signal	D (46.5)	E (66.3)
		WB	Signal	C (29.2)	D (48.2)	Signal	C (33.9)	F (84.6)	Signal	C (30.0)	E (60.6)	Signal	D (41.2)	F (84.9)	Signal	D (43.9)	E (67.2)
		NB	Signal	B (15.1)	C (28.6)	Signal	D (37.2)	F (140.4)	Signal	B (10.4)	B (14.3)	Signal	D (50.1)	F (255.7)	Signal	B (13.8)	B (17.8)
		SB	Signal	C (24.1)	D (40.1)	Signal	D (41.1)	F (141.4)	Signal	B (19.9)	C (31.8)	Signal	F (88.3)	F (162.7)	Signal	C (30.4)	C (32.0)
		Total		**C (27.5)**	**D (43.8)**		**D (39.5)**	**F (120.5)**		**C (23.0)**	**D (41.3)**		**F (58.6)**	**F (160.8)**		**C (31.8)**	**D (42.3)**

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Table 19: All Analysis Results (3 of 3)

Intersection			2021 Existing LOS (Delay† in sec/veh)			2035 No Build LOS - (Delay† in sec/veh)			2035 No Build LOS - With Improvements (Delay† in sec/veh)			2035 Build LOS - (Delay† in sec/veh)			2035 Build LOS - With Improvements (Delay† in sec/veh)		
#	Name	Approach	Control	AM Peak	PM Peak	Control	AM Peak	PM Peak	Control	AM Peak	PM Peak	Control	AM Peak	PM Peak	Control	AM Peak	PM Peak
101	SR 316 Eastbound Ramps at Harbins Road	EB	See Intersections 1-4 At-Grade Intersections Precede Interchanges			Signal	D (36.7)	E (58.3)	Signal	B (18.2)	D (43.6)	Signal	D (38.9)	E (56.6)	Signal	C (20.9)	D (44.9)
		NB				Signal	B (19.1)	D (45.5)	Signal	B (12.8)	C (24.7)	Signal	C (20.2)	D (52.5)	Signal	B (16.9)	C (27.6)
		SB				Signal	A (8.0)	C (27.4)	Signal	A (4.7)	A (6.5)	Signal	B (10.2)	E (58.6)	Signal	A (7.6)	B (10.9)
		Total					**C (21.0)**	**D (45.2)**		**B (12.3)**	**C (26.5)**		**C (22.9)**	**E (55.6)**		**B (15.9)**	**C (28.7)**
102	SR 316 Westbound Ramps at Harbins Road	WB				Signal	D (36.6)	C (30.3)	Signal	D (36.6)	C (30.3)	Signal	D (38.4)	D (42.4)	Signal	D (38.4)	D (42.4)
		NB				Signal	B (15.3)	B (13.5)	Signal	B (18.6)	B (18.7)	Signal	B (15.4)	B (13.4)	Signal	B (16.8)	B (18.1)
		SB				Signal	B (13.4)	B (16.6)	Signal	B (12.1)	B (14.9)	Signal	B (17.4)	C (20.7)	Signal	C (22.7)	C (20.3)
		Total					**B (16.8)**	**B (16.3)**		**B (18.3)**	**B (18.4)**		**C (18.2)**	**C (19.6)**		**C (20.7)**	**C (21.8)**
201	RELOCATED SR 316 at Williams Farm Road	EB				Signal	A (1.0)	A (1.2)	Signal	A (1.0)	A (1.2)	Signal	F (435.2)	A (5.0)	Signal	A (9.3)	A (4.4)
		WB				Signal	A (3.6)	A (2.3)	Signal	A (3.6)	A (2.3)	Signal	D (44.6)	A (5.9)	Signal	A (4.1)	A (5.8)
		NB				Signal	C (25.5)	B (14.1)	Signal	C (25.5)	B (14.1)	Signal	C (34.1)	F (209.5)	Signal	B (17.6)	B (13.1)
		SB				Signal	A (0.0)	A (0.0)	Signal	A (0.0)	A (0.0)	Signal	C (24.4)	F (580.8)	Signal	B (11.9)	B (13.5)
		Total					**B (19.0)**	**A (4.7)**		**B (19.0)**	**A (4.7)**		**F (222.5)**	**F (380.3)**		**A (8.4)**	**B (12.0)**
301	SR 316 Eastbound Ramps at Drowning Creek Road	EB				Signal	A (6.5)	B (15.6)	Signal	A (6.5)	B (15.6)	Signal	E (74.1)	C (29.0)	Signal	C (29.2)	C (30.4)
		NB				Signal	A (4.0)	A (4.9)	Signal	A (4.0)	A (4.9)	Signal	C (24.0)	C (20.8)	Signal	B (18.4)	B (18.5)
		SB				Signal	A (1.5)	A (2.0)	Signal	A (1.5)	A (2.0)	Signal	B (16.7)	C (20.9)	Signal	A (8.9)	B (16.7)
		Total					**A (4.0)**	**A (7.6)**		**A (4.0)**	**A (7.6)**		**D (48.7)**	**C (22.3)**		**C (22.0)**	**B (19.7)**
302	SR 316 Westbound Ramps at Drowning Creek Road	WB				Signal	A (10.0)	A (0.1)	Signal	A (10.0)	A (0.1)	Signal	E (69.3)	C (20.7)	Signal	D (59.3)	C (20.7)
		NB				Signal	A (2.0)	A (1.4)	Signal	A (2.0)	A (1.4)	Signal	C (32.7)	B (17.5)	Signal	D (39.5)	B (18.3)
		SB				Signal	A (4.9)	A (3.8)	Signal	A (4.9)	A (3.8)	Signal	B (13.1)	C (21.9)	Signal	B (10.1)	C (20.8)
		Total					**A (5.3)**	**A (2.2)**		**A (5.3)**	**A (2.2)**		**D (43.9)**	**C (20.6)**		**D (46.8)**	**C (20.1)**
401	SR 316 Eastbound Ramps at Kilcrease Road	EB				Signal	C (28.1)	D (37.5)	Signal	C (28.1)	D (37.5)	Signal	C (30.3)	D (38.4)	Signal	C (30.3)	D (38.4)
		NB				Signal	A (6.7)	A (7.7)	Signal	A (6.7)	A (7.7)	Signal	A (7.1)	A (9.8)	Signal	A (7.1)	A (9.8)
		SB				Signal	A (2.7)	A (3.5)	Signal	A (2.7)	A (3.5)	Signal	A (2.9)	A (4.5)	Signal	A (2.9)	A (4.5)
		Total					**B (10.2)**	**B (16.0)**		**A (5.3)**	**A (2.2)**		**B (11.6)**	**C (19.4)**		**C (22.0)**	**B (19.7)**
402	SR 316 Westbound Ramps at Kilcrease Road	WB				Signal	C (20.6)	B (18.6)	Signal	C (20.6)	B (18.6)	Signal	C (20.6)	B (18.6)	Signal	C (20.6)	B (18.6)
		NB				Signal	A (2.7)	A (4.2)	Signal	A (2.7)	A (4.2)	Signal	A (2.8)	A (4.7)	Signal	A (2.8)	A (4.7)
		SB				Signal	A (3.4)	A (3.5)	Signal	A (3.4)	A (3.5)	Signal	A (3.0)	A (3.3)	Signal	A (3.0)	A (3.3)
		Total					**A (6.6)**	**A (6.2)**		**A (6.6)**	**A (6.2)**		**A (6.0)**	**A (6.1)**		**A (6.0)**	**A (6.1)**

7.0 CRITERIA FOR GRTA REVIEW

The Rowen Development is evaluated and summarized here per the review criteria contained in Section 4. 3 of the DRI Review Procedures. It is our contention that the Rowen Development meets all goals and objectives of GRTA and ARC.

7.1 Accessibility

> "The Project is designed to provide safe, quality, and convenient access and provides the flexibility of non-vehicular transportation options from the proposed development to existing or planned pedestrian, bicycle, or transit facilities such that there is a likelihood of significant use by residents, employees and visitors to the Project."

The Rowen Development incorporates a complete streets philosophy throughout the development, as evidenced by Rowen Design Guidelines, summarized in Figure 24 and reviewable in Appendix A:

Figure 24: Excerpt from Rowen Design Guidelines

C. Transportation Network, Complete Streets and Walkability

i. The transportation network should support connectivity within Rowen and to the surrounding district.

ii. The transportation network should value and seek to advance alternative forms of transportation.

iii. The transportation network considers walking a vital form of transportation.

iv. All streets will be complete streets including facilities for bike, pedestrian, and transit.

v. The maximum design speed for streets shall be 30 MPH and shall be designed to promote traffic calming.

vi. Walkability will address reasons to walk, pedestrian safety, pedestrian comfort, and pedestrian interest along all walkways.

vii. Typical street sections shall provide for multiple modes of transportation, afford areas for landscape enhancements including opportunities for areas of formal street tree plantings and environmental restoration.

viii. The transportation network should be considered as a laboratory for appropriately testing, measuring, and validating innovative concepts in all forms of transportation and last mile connectivity.

D. Distribution of Land Uses

i. The Master Plan should seek to distribute land uses in a manner which supports accessibility to a wide range of companies and institutions.

ii. Uses should be distributed in a manner that affords all users services and access to open space.

7.2 Connectivity

> "The Project is likely to promote improved regional mobility in terms of new vehicular connections, on-site vehicular movements, and alternate routes that are likely to operate in a safe and efficient manner and avoid delays during peak periods. The Project is designed to maximize bicycle and pedestrian connections within the site as well as promote efficient and direct connections to external bicycle and pedestrian infrastructure. The Project is designed to incorporate existing and planned transit accessing the site. Street and sidewalk networks are designed, to the extent

possible, in a manner that provides multiple travel paths for vehicles and pedestrians thus minimizing traffic bottlenecks and providing more direct pedestrian routes."

The Rowen Development incorporates new and revised connections for all vehicular, pedestrian, and bicycle modes of travel. These connections are planned in cooperation with the surrounding jurisdictions of Gwinnett County, Barrow County, City of Dacula, City of Auburn, and the State of Georgia, and the known or planned improvements ongoing covered under various master plans or programmed projects. The intra-site connectivity is under design, but the roadway/sidewalk/path network is being designed to provide adequate connections to the proposed roadway intersections with SR 8, Harbins Road, Tanners Road, SR 316, Browns Bridge Road, and others. These connections will incorporate planned pathways linking the Apalachee River trail, the planned Piedmont Trail following the SR 316 corridor, and other pedestrian trails linking to the City of Dacula and to elsewhere in Gwinnett County.

The Rowen Development will incorporate improved connections to SR 316, providing alternate routes for vehicles to access eastern Gwinnett County with improved roadway infrastructures. These connections will have multiple routes through the site, to avoid unnecessary congestion during peak congestion periods.

While there are no specific Transit stops incorporated into the plan, there are discussions with Gwinnett County Transit and the Rowen Site Plan will incorporate stops and needed or desired to provide access to a growing transit system.

7.3 Access Management

"The Project is designed so that vehicular ingress and egress to any on-site parking facilities and all access points to adjacent public roads are likely to operate in a safe and efficient manner and are not reasonably anticipated to result in peak hour ingress and egress congestion on adjacent roads and at nearby intersections. The Project is designed so that pedestrian and bicycle trips accessing the site are designed in a direct and safe manner that encourages walking and bicycling trips. Additionally, vehicle access management and driveways are designed in a way that does not inhibit bicycle and pedestrian mobility or safety."

The access management philosophy of the Rowen Development follows their design guidelines, shown in Appendix A, and emphasizes the complete street nature of the development and incorporates at the beginning traffic calming principles. These guidelines and principles will enable safe movement of all modes of travel throughout Rowen. The development guidelines also incorporate the plan for SR 316 to be fully access controlled through Gwinnett County and toward the City of Athens. All designs of driveways and parking facilities will follow the Gwinnett County Universal Development Ordinance, and the Rowen Design Guidelines.

7.4 Regional Policies and Adopted Plans

"The Project is likely to promote improved regional mobility because it is located in a center or corridor where the Regional Commission, Local Government, or other government entity has an approved land use plan whereby the Project aligns with the plan's vision; or the Project has included in the proposed Site Plan components which will assist in the implementation of a transportation

project currently in the Regional Transportation Plan (RTP), Transportation Improvement Program (TIP), a local TSPLOST or other adopted local or regional plan. The Project is designed to not preclude the proposed alignment or timeline of programmed transportation projects that were programmed before the Project was filed with the permitting Local Government."

The Rowen Development is in line with the Gwinnett Future Land Use plan, incorporating the "Innovation District" on the long-range 2040 Unified Plan for Gwinnett County. Rowen is actively coordinating with GDOT on programmed improvements along SR 316 (PIs 0013898 through 0013902) to ensure the under-work projects take Rowen into account. The Rowen Development actively supports these GDOT projects to allow for a fully-limited access facility along SR 316.

All the identified Programmed or Planned improvements shown in Table 2 and the trails and paths adjacent to or within the Rowen footprints are being accommodated by the Rowen Development to ensure ease of design and eventual construction.

7.5 Local Standards Supporting Regional Policies

"The Project is located within a local jurisdiction, or other jurisdictional agencies, with adopted codes that support regionally adopted policies, or the development codes and standards do not prohibit or impede the Project from meeting the GRTA DRI review criteria."

The Rowen Development is located within, and is actively sponsored by, Gwinnett County. Gwinnett County has codes and policies from the codified Unified Development Ordinance to Gwinnett County Department of Transportation policies of engagement that assist in meeting the goals and objectives of GRTA.

7.6 Transportation and Traffic Analysis

"The Project is reasonably anticipated to comply with planned or programmed improvements, maintain performance measures for preserving regional mobility and air quality, provide safe and efficient operations, and minimizes congestion when the proposed development or phase of development is complete. The quality of the proposed and existing infrastructure in the transportation network operates in a safe manner and adequately serves new trips generated by the Project in the Build-Out Year. The Project identifies impacts on existing or programmed infrastructure, and proposes mitigation that is feasible and within the control of the Applicant or appropriate agencies to implement."

As demonstrated in Sections 5.0 and 6.0, all study intersections except one either meet or are mitigated to meet the LOS threshold requirements of GRTA in the build year. The sole exception is the eastbound approach of Harbins Road and Tanners Road (intersection #6) that operates at a Level of Service E. The number of vehicles being served by that movement is very small (maximum 5 in the peak hour) and the improvements necessary to achieve a LOS D are considered impractical.

7.7 Relationship to Existing Development and Infrastructure

"The Project is not located in any area where the existing level of development and availability of infrastructure is such that the Project is reasonably anticipated to result in unplanned and poorly

served development which would not otherwise occur until well-planned growth and development and adequate public facilities are available."

The Rowen Development is undergoing intensive design and review to ensure seamless connectivity with the surrounding land uses. The area is greenfield and all necessary infrastructure connections to supply the project are incorporated into the planning process. The project has strong local support and no issues with water, sewer, power, communications, or other utility connections are anticipated. The Rowen Foundation understands the need for a strong infrastructure in place to attract the development that is anticipated by this TIS and has already contracted a design firm as of June 2021 to begin the process of designing the roadway, water, and sewer infrastructure.