DEVELOPMENT OF REGIONAL IMPACT (DRI)

TRAFFIC IMPACT STUDY

FOR

Project Serenbe DRI

(DRI #4352)

City of Chattahoochee Hills, Fulton County, GA

Prepared For:
Serenbe CH Properties, LLC

Prepared By:

SOUTHEASTERN ENGINEERING, INC.

2470 Sandy Plains Road
Marietta, GA 30066

September 26, 2025

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EXECUTIVE SUMMARY

This traffic impact study has been conducted by Southeastern Engineering, Inc. (SEI) for Project Serenbe DRI, a mixed-use development in the City of Chattahoochee Hills, Fulton County, Georgia. Serenbe is currently zoned as a mixed-use hamlet and has already been built out and occupied in some of the areas. This DRI is reviewing the additional phases of development.

The development was analyzed in four phases.

- Phase 1 will be completed by 2027.
- Phase 2 will be completed by 2029.
- Phase 3 will be completed by 2032.
- Phase 4 will be completed by 2035.

Each intersection in the study network was reviewed based on capacity analysis. Any level of service (LOS) with a grade worse than a D is considered unacceptable. One of the existing intersections analyzed is operating at LOS E during the AM peak hour and PM peak hour. The intersection operating an unacceptable level of service is listed below.

- 21. SR 14/US 29/Roosevelt Hwy & Tommy Lee Cook Road

This could be mitigated by adding a channelized right turn lane in the eastbound direction. In the AM the LOS would improve to 19.8 (C) and 29. 2 (D) in the PM. However, with the growth in Phase 1, the channelized right turn will no longer be enough to have an acceptable level of service. It would need a roundabout to operate acceptably. Both options should be considered as a system improvement for the existing.

The Serenbe development will add additional trips beyond what will occur from background growth in the region. The following intersections will need improvements in the build condition that are not required in the no build condition. The recommended mitigation is listed for each intersection.

6: Atlanta Newnan Rd & Hutcheson Ferry Rd

- Convert to a roundabout in phase 4 (developer) if right of way permits

9: Hutcheson Ferry Rd & Cochran Mill Rd

- Convert to a roundabout in phase 4 (developer) if right of way permits or add a channelized southbound right turn lane in phase 4 (developer)

11: Church St & Toombs St

- Convert to an all-way stop in phase 3 (developer)

17: Jim Star Rd & Tommy Lee Cook Rd

- Convert to a roundabout in phase 3 (developer) or signalize the intersection if warrants are met

For Jim Star Rd at Tommy Lee Cook Rd, the background traffic will be enough to result in unacceptable level of service by 2035. The development traffic adds that by 2032. Depending on the timing of the development and expected background growth, this intersection should be reviewed to determine the improvement needed would be needed from the developer or the system.

19: Shell Rd & Tommy Lee Cook Rd

- Convert to a roundabout in phase 4 (developer)

The following intersections will need system improvements to have an acceptable LOS. These system improvements are adequate to the handle the build conditions.

12: SR 14/US 29 Roosevelt Hwy & Church St

- Convert to a roundabout in phase 1 (system)

17: Jim Star Rd & Tommy Lee Cook Rd

- Convert to a roundabout in phase 4 (system) or signalize the intersection if warrants are met

21: SR 14/US 29 Roosevelt Hwy & Tommy Lee Cook Rd

- Add a channelized right turn lane in the eastbound direction in the existing (system)
- Convert to a roundabout in phase 1 (system)

22: Cochran Mill Rd & S Fulton Pkwy

- Convert to a roundabout in phase 1 (system)

24: SR 14/Roosevelt Hwy & Meadow Chase Way/Weldon Rd

- Add southbound left turn lane; convert westbound right turn lane into a through right; convert westbound through lane to a left turn; add westbound left turn lane in phase 2 (system)
- Convert southbound right turn lane into a through-right in phase 4 (system)

PROJECT DESCRIPTION

Introduction

This traffic impact study has been conducted by Southeastern Engineering, Inc. (SEI) for Project Serenbe DRI, a mixed-use development in the City of Chattahoochee Hills, Fulton County, Georgia. The site is approximately 1,532 acres of partially developed land roughly bounded by SR 70/S Fulton Parkway, Hutcheson Ferry Road, Cochran Mill Road, and Atlanta Newnan Road/Shell Road in Fulton County and Coweta County. The project site is currently zoned for Mixed Use Hamlet (HM-MU) land use and the proposed zoning will be Mixed Use Hamlet (HM-MU) land use. The project exceeds the threshold of 400,000 SF of mixed-used development therefore, it qualifies to be analyzed as a Development of Regional Impact (DRI) by Georgia Regional Transportation Authority (GRTA) and Atlanta Regional Commission (ARC).

The development will be analyzed in four phases.

- Phase 1 will be completed by 2027.
- Phase 2 will be completed by 2029.
- Phase 3 will be completed by 2032.
- Phase 4 will be completed by 2035.

Development phases 1 through 4 will include approximately 1,097 residential units that will include single-family and multi-family residences as well as senior adult housing. The development will also include 203,000 SF of mixed-use developments. The land uses under each traffic study phase are shown in **Table 1**.

Table 1: Land Use By Phase												
Land Use (ITE Code)	Unit	Phase 1		Phase 2		Phase 3			Phase 4			
		2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Total
Residential Total Units												
Single Family Residential	Lot	170		118		80		108	19	66	85	646
Multi-family Residences	Unit		100		50		50		50		150	400
Senior Adult Housing (Detached)	Lot	24										24
Senior Adult Housing (Attached)	Lot	26										26
Non-Residential												
Hotel	Room			110		80						190
Public Park	Acres	4										4
Arena (Amphitheater / Public Park)	Acres			0.07								0.07
Community Recreational Center	SF	5,000						30,000				35,000
Private School	Student					220						220
Museum (Small Office Building)	SF							7,500				7,500
Small/General Office Building	SF			35,000		2,000					75,000	112,000
Spa (Small Office Building)	SF					4,000						4,000
Quality Restaurant	SF			35,000							10,000	45,000

The project site will create six new driveways in addition to six existing driveways. Two of the existing driveways are on Atlanta Newnan Road on the west side at Selborne Lane and Serenbe Lane. Rock Hill Drive (north and south) are two additional driveways along Atlanta Newnan Road on the east side, which currently are gravel driveways. One existing driveway is on Tommy Lee Cook Drive at Cedar Ridge, and one existing driveway is on Hutcheson Ferry Road at Selborne Lane. Proposed Driveway #1 will be located on Atlanta Newnan Road north of Selborne Lane. Proposed driveway #2 will be located on Atlanta Newnan Road south of Serenbe Lane. Proposed driveway #3 will be located on Atlanta Newnan Road west of Selborne Lane. The remaining new driveways on Sardis Road and Hutcheson Ferry Road. The Rock Hill Drive connections will exclusively serve the residential pods (Estate Bungalows and Brownstones Homes) which are not internally connected to the rest of the development. Proposed Driveways are expected to have full access. An overall location map showing the surrounding area near the site is shown in **Figure 1.**

This study will identify potential traffic impacts of each of the study phases on the surrounding roadway network. Improvements will be recommended for each study phase. The study includes the existing and future peak-hour traffic operations analysis at study intersections and development driveways. Operational improvements will be analyzed to mitigate the traffic impact resulting from the development, if needed. Recommendations made for the geometry and traffic control modifications for each study phase will consider the integration of succeeding development phases.

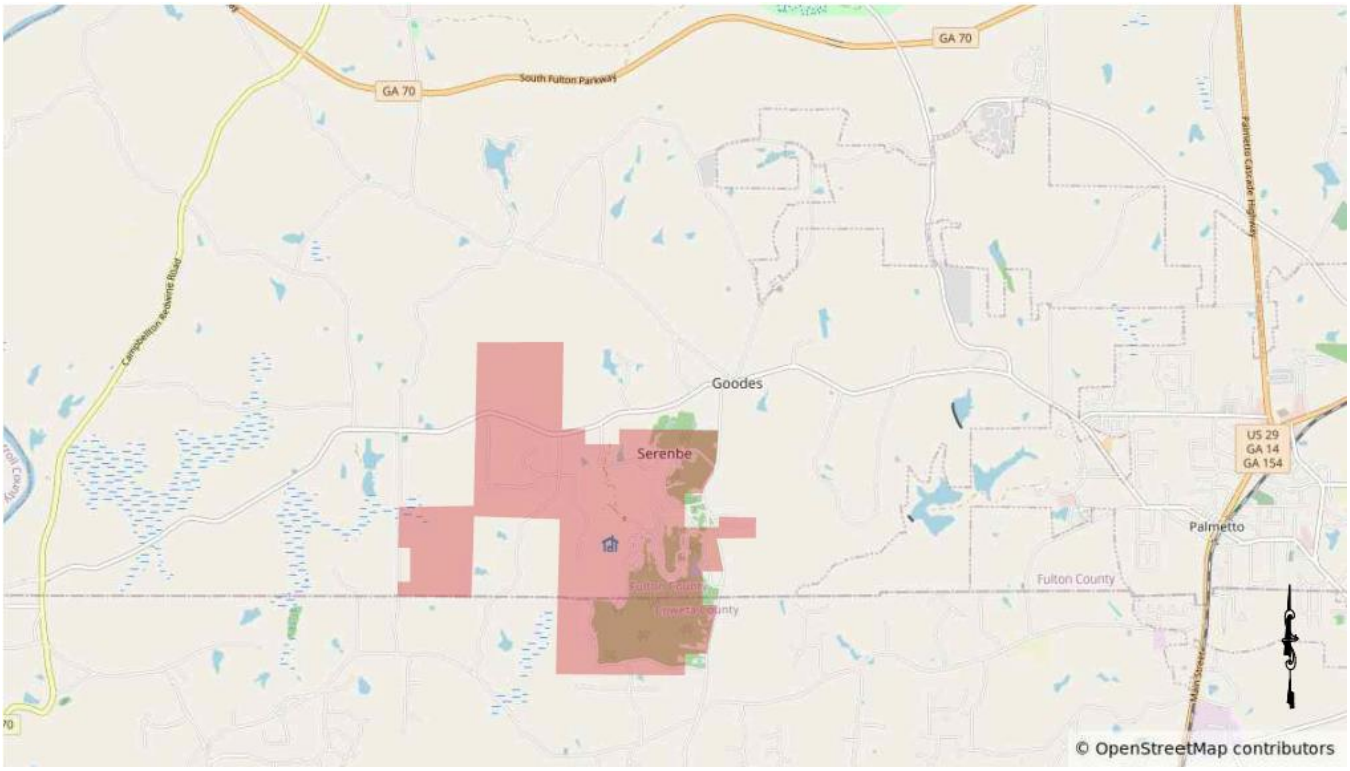


Figure 1. Overall Location

Study Network

The external roadway network adjacent the development was reviewed to determine the intersections most likely impacted by the development. Nearby historical Georgia Department of Transportation (GDOT) counts were utilized to determine the roadways to be most impacted and determine how the development traffic will be distributed throughout the network. The site-generated traffic was assigned to the roadway network according to the expected trip distribution and typical traffic patterns of the existing roadway network and expected origin and destinations for users of the development based on its land uses. The study network was set utilizing GRTA's 7% rule.

The following intersections were included in the study network:

1. Campbellton Redwine Rd & Hutcheson Ferry Rd
2. Hutcheson Ferry Rd & Farmette Driveway
3. Sardis Rd/Vernon Grove Rd & Hutcheson Ferry Rd
4. Serenbe Rd & Hutcheson Ferry Rd
5. Selborne Ln & Hutcheson Ferry Rd
6. Atlanta Newnan Rd & Hutcheson Ferry Rd
7. Hutcheson Ferry Rd & Rico Rd
8. Atlanta Newnan Rd & Hutcheson Ferry Rd
9. Hutcheson Ferry Rd & Cochran Mill Rd
10. Waterworks Rd/Toombs St & Hutcheson Ferry Rd
11. Church St & Toombs St
12. SR 14/Roosevelt Hwy & Church St
13. Atlanta Newnan Rd & Selborne Way
14. Atlanta Newnan Rd & Selborne Ln
15. Atlanta Newnan Rd & Serenbe Ln
16. Atlanta Newnan Rd & Serenbe Ln
17. Jim Star Rd & Tommy Lee Cook Rd
18. Tommy Lee Cook Rd & Sardis Rd
19. Shell Rd & Tommy Lee Cook Rd
20. Tommy Lee Cook Rd & Waterworks Rd
21. SR 14/Roosevelt Hwy & Tommy Lee Cook Rd
22. Cochran Mill Rd & S Fulton Pkwy
23. Sardis Rd & Serenbe Driveway
24. SR 14/Roosevelt Hwy & Meadow Chase Way/Weldon Rd
25. Tommy Lee Cook Rd & Cedar Ridge Rd
26. Atlanta Newnan Rd & Rock Hill Dr #1
27. Atlanta Newnan Rd & Rock Hill Dr #2

The roadway network adjacent to the proposed development in the study area was reviewed to evaluate the existing roadway characteristics. The existing roadway facilities in the vicinity of the development are summarized in **Table 2** and Figure 2 illustrates the study roadway network and the study intersections included in the analysis.

Table 2: Existing Roadway Inventory					
Roadway Name	**State Route #**	**GDOT Classification**	**Section**	**Typical Cross-Section**	**Speed Limits**
S Fulton Parkway	SR 70	Principal Arterial	At Cochran Mill Road	2 Lanes Undivided	55 mph
Sardis Road	-	Local Road	Hutcheson Ferry Road to Tommy Lee Cook Road	2 Lanes Undivided	45 mph
Atlanta Newnan Road	-	Local Road	Hutcheson Ferry Road to Tommy Lee Cook Road	2 Lanes Undivided	25 - 35 mph
Campbellton Redwine Road	SR 70	Major Collector	At Hutcheson Ferry Road	2 Lanes Undivided	55 mph
Tommy Lee Cook Road	-	Minor Collector	Jim Starr Road to US 29/Roosevelt Highway	2 Lanes Undivided	45 mph
Cochran Mill Road	-	Local Road	SR 70/South Fulton Parkway to Hutcheson Ferry Road	2 Lanes Undivided	45 mph
Jim Starr Road	-	Local Road	At Tommy Lee Cook Road	2 Lanes Undivided	45 mph
Hutcheson Ferry Road	-	Major Collector	SR 70Campbellton Redwine Road to Cochran Mill Road	2 Lanes Undivided	45 mph
Rico Road	-	Major Collector	Old Phillips Road to Hutcheson Ferry Road	2 Lanes Undivided	45 mph
Roosevelt Highway	SR 154	Principal Arterial	Church St to Weldon Road	2 Lanes Undivided	35 - 55 mph
Church Street	-	Local Road	At US 29/Roosevelt Highway	2 Lanes Undivided	30 mph

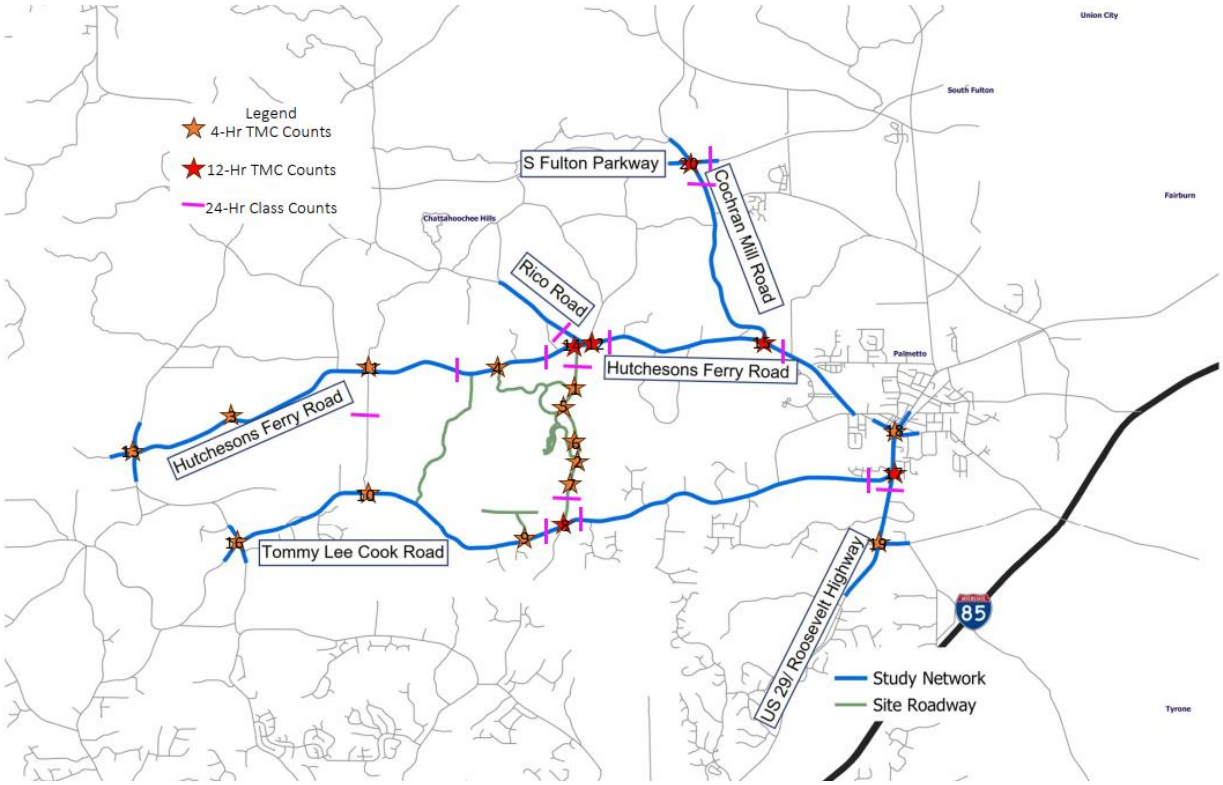


Figure 2. Study Network

Project Phasing Schedule

The development will be completed by 2035 and will be constructed in four phases. These four phases will be studied with detailed analysis. Build year for the four phases that will be studied in detail for this report are mentioned below:

- Phase 1 completed by 2027.
- Phase 2 completed by 2029.
- Phase 3 completed by 2032.
- Phase 4 completed by 2035.

Vehicle Site Access

The development will feature six new access driveways and six existing driveways to facilitate entry to development phases 1 through 4. Two of the existing driveways are on Atlanta Newnan Road on the west side at Selborne Lane and Serenbe Lane. Rock Hill Drive (north and south) are two additional driveways along Atlanta Newnan Road on the east side, which currently are gravel driveways. One existing driveway is on Tommy Lee Cook Drive at Cedar Ridge, and one existing driveway is on Hutcheson Ferry Road at Selborn Lane. and Proposed Driveway #1 will be located on Atlanta Newnan Road north of Selborn Lane. Proposed driveway #2 will be located on Atlanta Newnan Road south of Serenbe Lane. Proposed driveway #3 will be located on Atlanta Newnan Road west of Selborn Lane. Proposed driveway #2 and driveway #3 will exclusively serve the residential pods (Estate Bungalows and Brownstones Homes) which are not internally connected to the rest of the development. Proposed Driveways are expected to have full access.

Bicycle and Pedestrian Access

There is one Georgia State Bicycle Route running through the study network. Route 15 - Central Bicycle Route, which travels from the Florida state line in the south to the City of Acworth in the north. The homes and businesses in the Serenbe community are connected by sidewalks and trails giving pedestrians and cyclist access to the community. The state bicycle route is shown in **Figure 3**.

Transit Access and Facilities Description

No alternative transportation modes are present within a 2 miles vicinity of the development site. Therefore, there were no alternative mode reductions consider for the study.

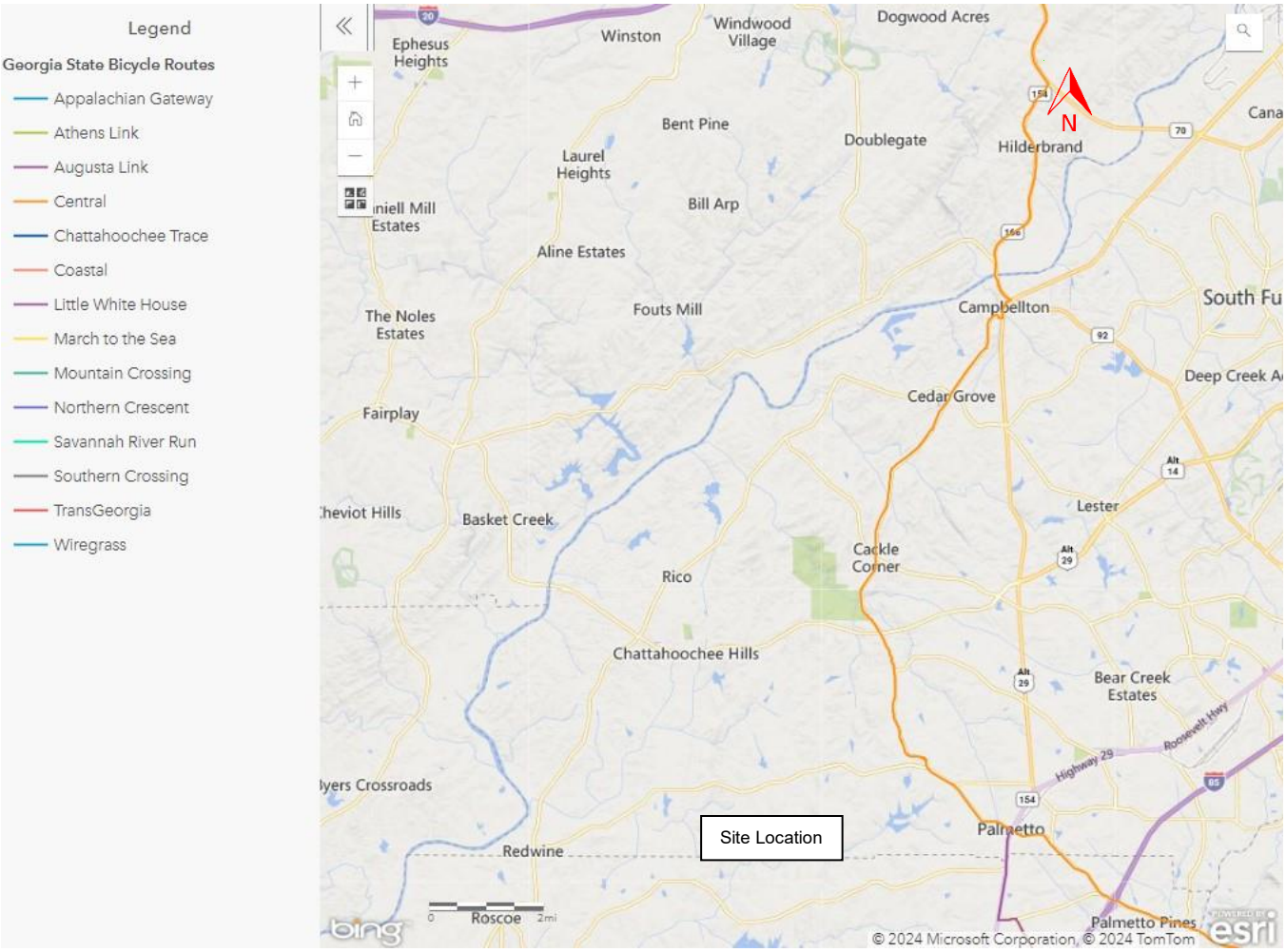


Figure 3. Georgia State Bicycle Routes Map

EXISTING TRAFFIC CONDITIONS

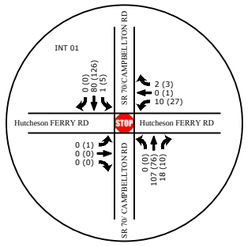
The traffic impact study analyzes the current traffic operations of the study network. Capacity analysis and level of service evaluations of the study intersections were conducted for the existing and future conditions with and without the proposed development to determine the impacts of the development traffic on the network.

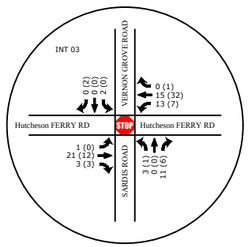
Traffic Data Collection

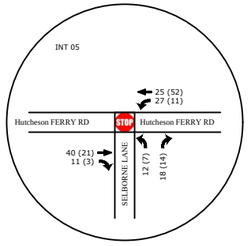
24-Hour bi-directional traffic volumes were collected on Wednesday, April 30, 2025, along the major roadways in the study area. 12-Hr and 4-Hr turning movement counts were collected on Wednesday, April 30, 2025, at the study intersections. The collected volumes are summarized in **Table 33**. The existing AM and PM peak-hour turning movement count (TMC) traffic volumes for the study intersections are shown in **Figure 4**. The existing count data are included in **Appendix C**.

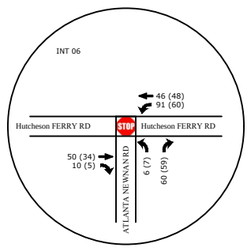
Table 3: Daily Volume			
Location	**NB / EB**	**SB / WB**	**Total Volume**
Tommy Lee Cook Road east of Shell Road	1,740	1,705	3,445
Tommy Lee Cook Road west of North Alexander Creek Road	1,425	1,390	2,815
Atlanta Newnan Road south of Serenbe Lane	598	608	1,202
Tommy Lee Cook Road west of SR 154/US 29	2,497	2,464	4,961
SR 154/US 29 south of Tommy Lee Cook Road	7,017	7,749	14,766
Hutcheson Ferry Road east of Cochran Mill Road	2,320	2,268	4,588
Cochran Mill Road south of GA 70/South Fulton Parkway	1,505	1,374	2,879
GA 70/South Fulton Parkway east of Cochran Mill Road	3,248	3,109	6,357
Rico Road north of Hutcheson Ferry Road	892	860	1,752
Atlanta Newnan Road south of Hutcheson Ferry Road	890	914	1,804
Hutcheson Ferry Road east of Rico Road	1,782	1,855	3,637
Hutcheson Ferry Road west of Rico Road	1,326	1,367	2,693
GA 70/Campbellton Redwine Road north of Hutcheson Ferry Road	1,078	1,068	2,146
Sardis Road south of Hutcheson Ferry Road	108	119	227

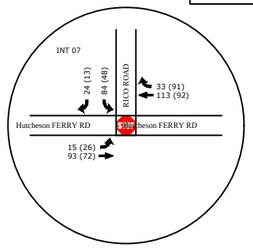
JURISDICTION	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
CHATTAHOOCHEE HILLS, GA	1402-24-179		

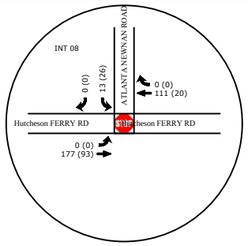


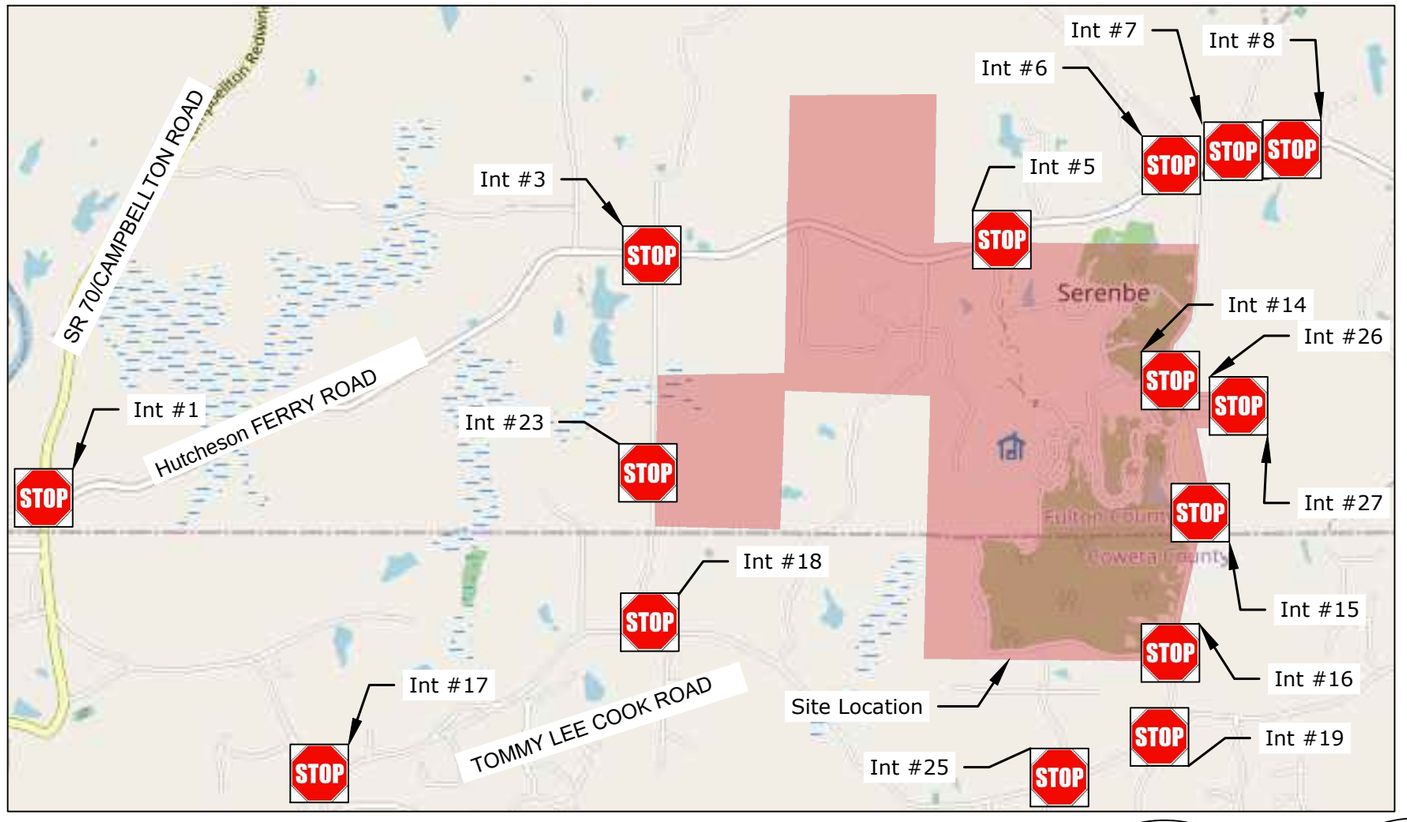












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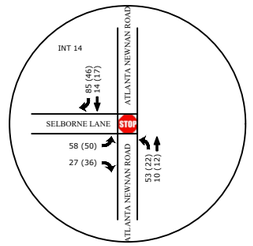

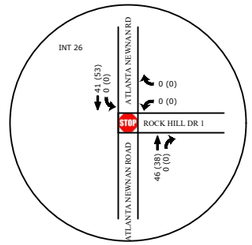

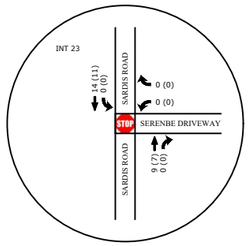

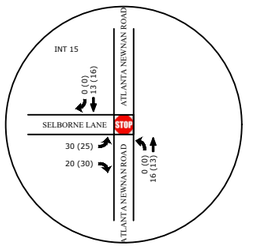

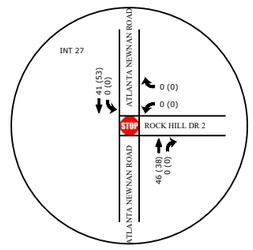

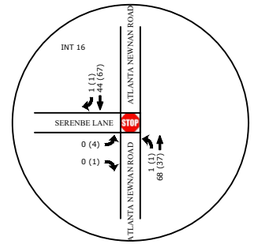

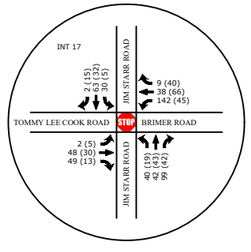

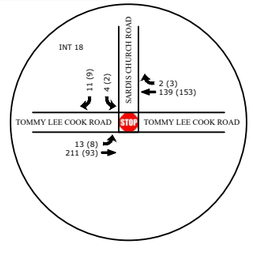

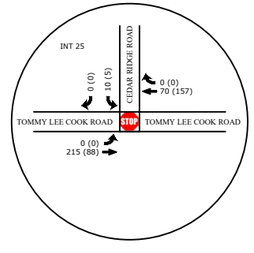

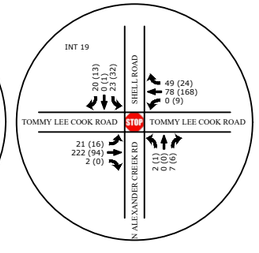

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FIGURE 4

SOUTHEASTERN ENGINEERING, INC.
2470 Sandy Plains Road
Marietta, Georgia 30066
tel: 770-321-3936
www.seengineering.com

EXISTING YEAR (2025)
PEAK HOUR VOLUMES
(WEST)

REVISION DATES		

DATE:

SERENBE DRI UPDATE

JURISDICTION	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
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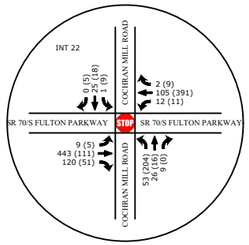

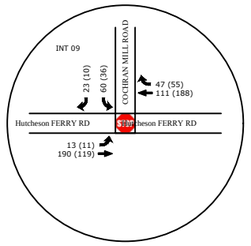

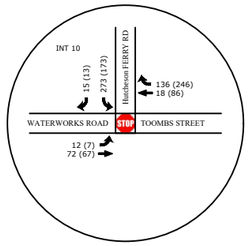

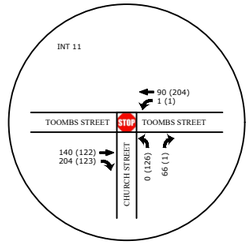

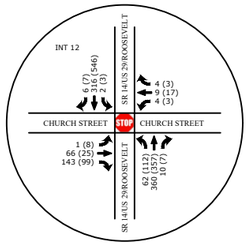

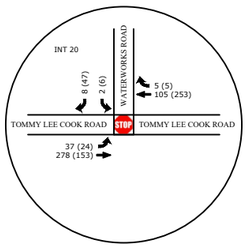

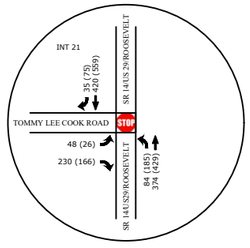

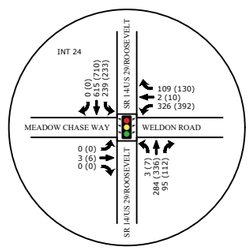

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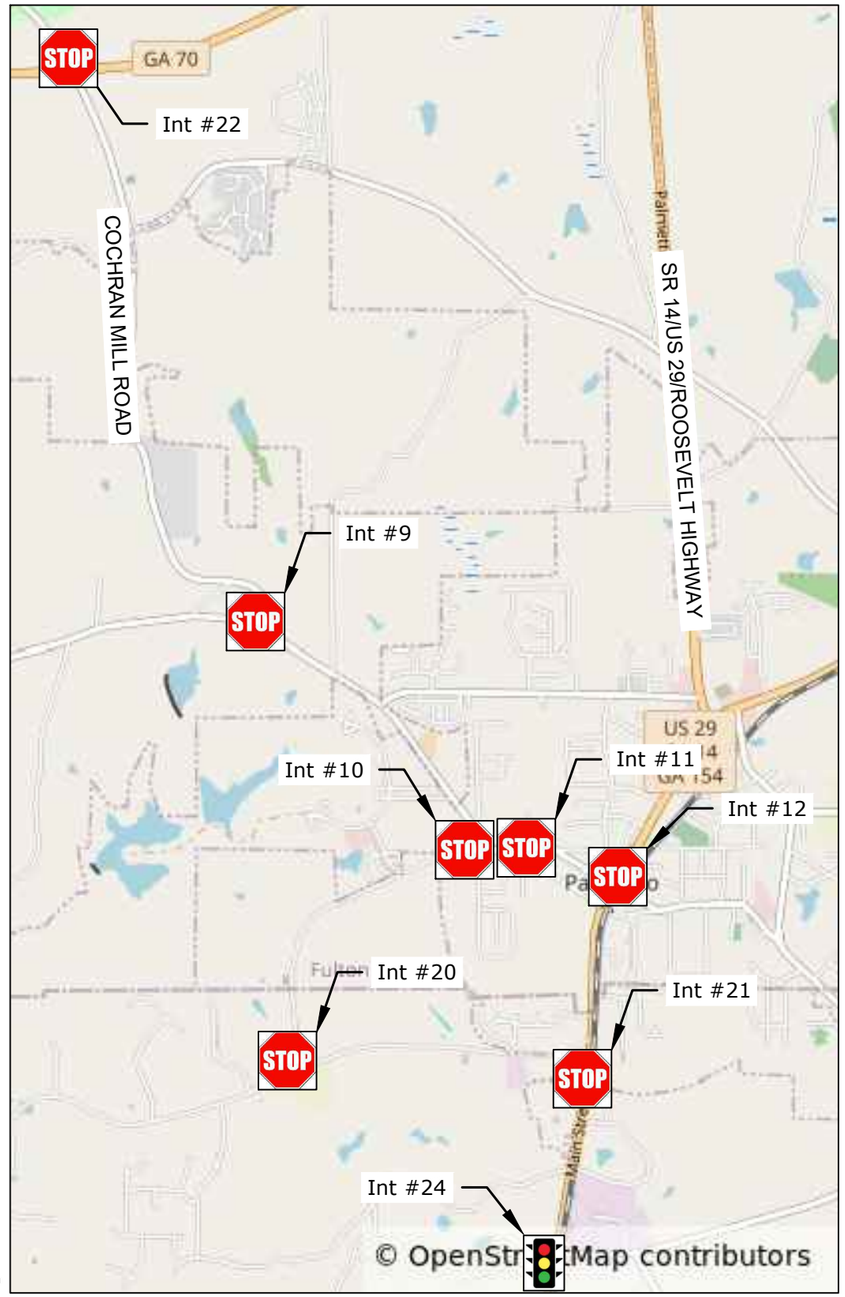

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PRINTED BY: HAEMO KU

FIGURE 5

SEI
SOUTHEASTERN ENGINEERING, INC.
2470 Sandy Plains Road
Marietta, Georgia 30066
tel: 770-321-3936
www.seengineering.com

EXISTING YEAR (2025) PEAK HOUR VOLUMES (EAST)

REVISION DATES		

DATE:

SERENBE DRI UPDATE

Growth Rate Determination

An average growth rate of 1.6% was calculated based on annual project growth rates in the project vicinity, which were calculated using annual volume statistics from GDOT's Traffic Analysis & Data Application (TADA), Georgia Statewide Travel Demand Model (GSTDM). Additionally, employment and population projections from the Regional Economic Models, Inc. (REMI) were utilized, and population projections for the county were obtained from the Governor's Office of Planning and Budget (OPB) and the US Census Bureau census data. ARC's Travel Demand Model (TDM) was given a higher weight because the data is specific to the study area; the census and model population data are countywide, and historical data is skewed due to limited data points. The development is proposed for full build-out of the development (2035).

Historic Traffic Count Growth Data:

Growth Rate using ARC's (Atlanta Regional Commission's) Travel Demand Model:

Table 4: ARC Travel Demand Model Growth Rate

Location	Growth Rate				
	2020-2030	2020-2033	2020-2040	2020-2050 (No- Build)	2020-2050
Sardis Road north of Tommy Lee Cook Road	4.1%	2.9%	3.9%	2.0%	1.7%
Tommy Lee Cook Road west of Sardis Road	2.6%	2.2%	1.4%	1.1%	0.7%
Tommy Lee Cook Road east of Sardis Road	1.4%	1.6%	-0.1%	0.8%	0.7%
Atlanta Newnan Road south of Hutcheson Ferry Road	2.7%	4.3%	2.6%	1.9%	2.7%
Hutcheson Ferry Road west of Atlanta Newnan Road	4.6%	3.7%	3.8%	2.7%	2.6%
Hutcheson Ferry Road east of Atlanta Newnan Road	4.5%	3.8%	3.7%	2.7%	2.6%
Hutcheson Ferry Road east of Campbellton Redwine Road	4.5%	3.4%	3.6%	3.7%	3.5%
Campbellton Redwine Road north of Hutcheson Ferry Road	2.3%	2.0%	1.9%	1.7%	1.6%
Campbellton Redwine Road south of Hutcheson Ferry Road	2.5%	2.1%	2.0%	1.8%	1.7%
S. Fulton Pkwy east of Campbellton Redwine Road	1.7%	1.6%	1.4%	1.3%	1.1%
Campbellton Redwine Road north of S. Fulton Pkwy	4.2%	3.9%	2.9%	2.5%	2.3%
S. Fulton Pkwy west of Campbellton Redwine Road	1.7%	1.6%	1.4%	1.3%	1.2%
Campbellton Redwine Road south of S. Fulton Pkwy	2.8%	2.4%	2.0%	1.8%	1.7%
Average	3.0%	2.7%	2.4%	1.9%	1.8%
Average Growth Rate Based on Different Models	**2.4%**				

Growth Rate using historical volume data from GDOT's TADA website:

Table 5: Growth Rate based on TADA Historical Counts			
Location	**5 - Year**	**10 - Year**	**15 - Year**
Rico Road South of Campbellton Redwine Road	-6.7%	-2.9%	-
Rico Road	3.6%	8.2%	-
Vernon Grove Road	0.0%	0.0%	-
SR 70 East of Campbellton Redwine Road	-0.2%	5.6%	1.6%
BEG Fulton 121	3.7%	7.1%	-
5 -, 10- and 15- Year Growth Rate	-0.8%	2.7%	1.6%
Average Growth Rate	1.2%		

Growth Rate using REMI's Projection data:

Table 6: Growth Rate Based on Regional Economic Models, Inc's Projections		
Projection Type	**2024-2040**	**2024-2051**
Employment Projection	0.6%	0.6%
Average	**0.6%**	
Population Projection	0.5%	0.4%
Average	**0.4%**	

Growth Rate using Georgia Governor's OPB Projection data:

Table 7: Georgia Governor's Office of Planning and Budget Annual Population Estimates		
Year	**County Population**	**Growth Rate**
2024	1,094,693	
2040	1,262,218	0.9%
2050	1,308,825	0.7%
Average		0.8%

Growth Rate using U.S. Census Bureau data:

Table 8: U.S. Census Bureau Annual Estimates of Resident Population			
Geographic Area	**2010 Census**	**2020 Census**	**2010 to 2020 Percent Change**
Fulton County	920,581	1,066,710	1.5%
Average			**1.5%**

The growth rate for the study area was determined by reviewing the results of the different growth rate sources and based on engineering judgment. Based on the project location and known land uses in the area, an average annual growth rate of 1.6% will be utilized to calculate future background traffic volumes. This is in alignment with DRI Letter of Understanding.

Level of Service Methodology

Intersection capacity analyses for the study intersections were performed using the methodology outlined in the Highway Capacity Manual, 6th Edition (HCM). This methodology is the industry standard for evaluating intersection capacity and delay. To facilitate the analysis, the computer software Synchro 11 was used. This software conforms to the HCM methodology.

An analysis of peak-hour traffic conditions was performed to determine the level of service (LOS) at the study intersections. LOS for an intersection is based on vehicular delay at the intersection and is a typical measure of effectiveness used to evaluate intersection operations. The HCM provides ranges of delay for each LOS definition, spanning from very minimal delays (LOS A) to high delays (LOS F). LOS F is considered unacceptable for most drivers.

For unsignalized intersections, where a stop sign controls side streets or minor streets, the criterion for evaluating traffic operations is the LOS for the controlled turning movements at the intersection. Methodology from the HCM to determine the delay and LOS for these turning movements is based on the following input data:

- Intersection geometry
- Lane configuration
- Turning movement volumes

For the signalized intersections, LOS is based on the following input data:

- Intersection geometry
- Lane configuration
- Turning movement volumes
- Existing traffic signal timing

Table 99 below indicates the relationship between delay and LOS for signalized and unsignalized intersections.

Table 9: Level of Service for Signalized and Unsignalized Intersections		
Level of Service	**Control Delay Per Vehicle (sec)**	
	Signalized Intersection	**Unsignalized Intersection**
A	≤10	≤10
B	>10 and ≤20	>10 and ≤15
C	>20 and ≤35	>15 and ≤25
D	>35 and ≤55	>25 and ≤35
E	>55 and ≤80	>35 and ≤50
F	>80	>50

Per the Letter of Understanding the standards acceptable LOS shall be LOS D unless specified otherwise in Section 3.2.2.1 of GRTA's DRI review procedures, which are listed below:

1. If an adopted Comprehensive Transportation Plan (or other applicable city or CID plan) notes the LOS standard for this area is E or F.
2. A Study Network intersection is located in a Region Core, Regional Employment Corridors, or a Regional Center zone as specified in the Atlanta Regional Commission's Unified Growth Policy Map. If ARC updates their designations to add or modify zone types, the old designations shall hold until GRTA updates these designations.
3. A Study Network intersection is within ½ mile of a fixed guideway transit station.
4. A LOS E is allowed if the existing LOS for the intersection is LOS F.
5. If an individual approach has a LOS of F, the LOS standard for that approach may be E even if the overall intersection LOS is E or better.
6. A LOS F is always considered a failing LOS.

Existing Conditions Level of Service

Synchro 11 and the HCM (Highway Capacity Manual) are the tools used to analyze the study intersections. SR 14 @ Weldon Rd is currently the only intersection that is signalized. It has a LOS of D in the AM and E in the PM. All other intersections are stop controlled intersections with LOS ranging from A-E with SR 14 @ Tommy Lee Cook Road being the only intersection failing with a LOS of E in both AM and PM.

Table 10. Existing Level of Service

Intersection	Intersection Control	Approach	AM-Peak Delay (LOS)	PM-Peak Delay (LOS)
1: Campbellton Redwine Rd & Hutcheson Ferry Rd	TWSC	Eastbound	0 (A)	10 (B)
		Westbound	9.7 (A)	10.1 (B)
3: Sardis Rd/Vernon Grove Rd & Hutcheson Ferry Rd	TWSC	Northbound	8.6 (A)	8.5 (A)
		Southbound	9.1 (A)	8.5 (A)
5: Selborne Ln & Hutcheson Ferry Rd	TWSC	Northbound	9 (A)	8.8 (A)
6: Atlanta Newnan Rd & Hutcheson Ferry Rd	TWSC	Northbound	7.5 (A)	9 (A)
7: Hutcheson Ferry Rd & Rico Rd	TWSC	Southbound	10.8 (B)	10.4 (B)
8: Atlanta Newnan Rd & Hutcheson Ferry Rd	TWSC	Southbound	10.4 (B)	9.3 (A)
9: Hutcheson Ferry Rd & Cochran Mill Rd	TWSC	Southbound	10.9 (B)	11.3 (B)
10: Waterworks Rd/Toombs St & Hutcheson Ferry Rd	AWSC	Southbound	11.1 (B)	10.4 (B)
		Eastbound	8.8 (A)	8.7 (A)
		Westbound	8.5 (A)	10.6 (B)
11: Church St & Toombs St	TWSC	Northbound	10.1 (B)	13.5 (B)
12: SR 14/Roosevelt Hwy & Church St	TWSC	Eastbound	23.5 (C)	24.8 (C)

		Westbound	23.5 (C)	32.1 (B)
14: Atlanta Newnan Rd & Selborne Ln	TWSC	Eastbound	9.7 (A)	9.3 (A)
15: Atlanta Newnan Rd & Serenbe Ln	TWSC	Eastbound	8.7 (A)	8.7 (A)
16: Atlanta Newnan Rd & Serenbe Ln	TWSC	Eastbound	0 (A)	9.1 (A)
17: Jim Star Rd & Tommy Lee Cook Rd	AWSC	Northbound	10.4 (B)	8.3 (A)
		Southbound	9.8 (A)	8 (A)
		Eastbound	9.2 (A)	7.9 (A)
		Westbound	11.4 (B)	8.8 (A)
18: Tommy Lee Cook Rd & Sardis Rd	TWSC	Southbound	10.1 (B)	9.4 (A)
19: Shell Rd & Tommy Lee Cook Rd	TWSC	Northbound	10.5 (B)	9.1 (A)
		Southbound	11.3 (B)	11 (B)
20: Tommy Lee Cook Rd & Waterworks Rd	TWSC	Southbound	9.5 (A)	10.3 (B)
21: SR 14/Roosevelt Hwy & Tommy Lee Cook Rd	TWSC	Eastbound	38.1 (E)	37.5 (E)
22: Cochran Mill Rd & S Fulton Pkwy	TWSC	Northbound	16.8 (C)	29.3 (D)
		Southbound	16.8 (C)	14.6 (B)
24: SR 14/Roosevelt Hwy & Meadow Chase Way/Weldon Rd	**Signalized**	Northbound	22.3 (C)	26.1 (C)
		Southbound	22.1 (C)	31.4 (C)
		Eastbound	18.2 (B)	23.8 (C)
		Westbound	27.3 (C)	44.6 (D)
		Overall	23.3 (C)	34.2 (C)
25: Tommy Lee Cook Rd & Cedar Ridge Rd	TWSC	Southbound	10.4 (B)	10 (B)

One of the existing intersections analyzed are operating at LOS E during the AM peak hour and PM peak hour. The intersection operating an unacceptable level of service is listed below.

- 21. SR 14/US 29/Roosevelt Hwy & Tommy Lee Cook Road

This could be mitigated by adding a channelized right turn lane in the eastbound direction. In the AM the LOS would improve to 19.8 (C) and 29. 2 (D) in the PM.

FUTURE CONDITIONS

The development will be analyzed under 4 phases for the transportation impact study:

The four phases will be studied with detailed analysis at the critical intersections. With the different build years, the traffic conditions will be analyzed for each build year.

Detailed study network intersection analysis:

- Phase 1 completed by 2027.
- Phase 2 completed by 2029.
- Phase 3 completed by 2032.
- Phase 4 completed by 2035.

Planning Context

Programmed Projects

There are multiple programmed projects planned in the study area. **Table 11** summarizes the projects, below are the project descriptions. Project reports of the projects are included in **Appendix F**.

Table 11. Summary of Programmed Projects

Project Name (Programmed)	From / To Points:	Sponsor	GDOT PI#	ARC ID# (TIP)	Design FY	ROW / UTL FY	CST FY
South Fulton Scenic Byway Multi-Use Trail	Cochran Mill Park	Chattahoochee Hills	0009643	FS-209	N/A	N/A	2035
Chattahoochee Hills Regional Greenway Trail - Carroll	Old Newnan Road to Capps Ferry Road	GDOT	0007640	N/A	N/A	N/A	2051
Project Name (Planned)	**From / To Points:**	**Sponsor**	**GDOT PI#**	**ARC ID# (TIP)**	**Design FY**	**ROW / UTL FY**	**CST FY**
Atlanta Newnan Road @ Cedar Creek 3 mi W of Palmetto	Bridge Replacement over Cedar Creek	GDOT	0018239	N/A	2023	2027	2028
SR 14, SR 16, & SR 246 @ 6 Locations Traffic Signal Upgrades	SR 14/SR 154/US 29 @ Meadow Chase Way/Weldon Road	GDOT	0019252	N/A	2025	2025	2026

Adjacent Projects

The DRIs in the proposed in the study area of the development were reviewed. The trips expected to be generated from these developments were included in the no-build and build analysis based on the DRI's completion year. The DRI projects and completion year as well the development phase that will be impacted is summarized in **Table 12**.

Table 12. DRI Projects		
DRI Name	**DRI #**	**DRI Build Year**
4027	Creative Land Co, LLC	2031
4282	Bouckaert Farm	2037 (earlier phases as well)

Proposed Development

The Serenbe development is a mixed-use project with residential, institutional, office, and retail on 1532-acre area on a site in the City of Chattahoochee Hills, Fulton County, Georgia. The development will have a total of 4 phases of which Phases 1-4 will be completed by 2035. The development will have 6 new driveways. The study will carry out detailed analysis of development phases 1-4. The land-use details for each phase are shown in **Table 13**.

Table 13. Land Use by Phase												
Land Use (ITE Code)	Unit	Phase 1		Phase 2			Phase 3		Phase 4			
		2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Total
Residential Total Units												
Single Family Residential	Lot	170		118		80		108	19	66	85	646
Multi-family Residences	Unit		100		50		50		50		150	400
Senior Adult Housing (Detached)	Lot	24										24
Senior Adult Housing (Attached)	Lot	26										26
Non-Residential												
Hotel	Room			110		80						190
Public Park	Acres	4										4
Arena (Amphitheater / Public Park)	Acres			0.07								0.07
Community Recreational Center	SF	5,000						30,000				35,000
Private School	Student					220						220
Museum (Small Office Building)	SF							7,500				7,500
Small/General Office Building	SF			35,000		2,000					75,000	112,000
Spa (Small Office Building)	SF					4,000						4,000
Quality Restaurant	SF			35,000							10,000	45,000

Trip Generation

The number of trips expected to be generated from the development was estimated based on the method defined in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition. Due to the development's mixed-use nature, internal capture/mixed-use reduction is expected. The full build-out of this development includes several land uses that will contribute to internal capture reductions. The NCHRP 8-51 Internal Trip Capture Estimation Tool was used to assess these reductions. An alternative mode reduction of 40% was applied for this development as it is planned to have a multi-use trail alongside the internal roadways for pedestrians, bicycles, and golf carts, which will help residential developments to access the non-residential land uses proposed in the development, thereby reducing the need for off-site trips. SEI conducted trip counts for the nearby Serenbe development in November 2021, indicating that Serenbe generates approximately 40% of the trip generation projections set by the Institute of Transportation Engineers (ITE). This 40% reduction may be attributed to the community residents' preference for walking, cycling, and using golf carts instead of relying on vehicles. The 40% reduction was used in areas with interconnectivity and multi-modal access. No pass-by trips are expected for this development. In addition, in the review of the trip generation, the site was divided into several subareas: Selborne Area, Selborne Traffic Circle, Mado, Spela, Overlook Area, Grange Area, Serenbe Farmette North, Serenbe Farmette South, and Serenbe Art Farm. The trip generation, 40% reduction, internal capture, and driveway assignment were analyzed per area to determine the expected trips at each driveway.

The trip generation for the development is summarized in **Table 14**. ITE trip generation report is attached in **Appendix G**.

Table 14: Proposed Site Trip Generation										
Land Use (ITE Code)	# Of Units	Daily Traffic			AM Peak Hour			PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
Residential										
Single Family Detached (210)	Dwelling Units	4,042	4,041	8,083	146	437	583	525	308	833
Single Family Attached (215)	Dwelling Units	3,023	3,023	6,046	106	316	422	286	198	484
Senior Adult Housing (251)	Dwelling Units	4,163	4,163	8,326	136	277	413	306	195	501
Non-Residential										
Shopping Center (820)	1000 SF	3,252	3,251	6,503	92	56	148	98	107	205
Supermarket (850)	1000 SF	1,729	1,729	3,458	59	41	100	165	165	330
Restaurant (932)	1000 SF	1,233	1,233	2,466	121	99	220	127	81	208
Office (712)	1000 SF	29	29	58	6	1	7	3	6	9
Services (assume bank) (912)	1000 SF	577	577	1,154	66	48	114	121	121	242
Government Office Building (730)	1000 SF	57	57	113	13	4	17	2	7	9
Gross Trips Generated		17,167	17,165	34,332	745	1,279	2,024	1,633	1,188	2,821
Internal Trip Capture		1,171	1,171	2,342	134	128	262	261	261	522
Alternative Mode		3,400	3,400	6,800	122	230	352	275	185	460
Net Trips Generated		27,065	13,534	13,534	489	922	1,411	1,097	742	1,839

Table 15 below details the traffic volumes in each scenario. The growth rate was only applied to the existing collected volumes at the intersection. The growth rate was not applied to the traffic volumes added by the developments.

Table 15: Traffic Volumes for Scenario Modeling		
Phase #	**Scenario Name**	**Traffic Volumes Added**
	Existing (2025)	2025 Collected Traffic Volumes
Phase 1	No-Build (2027)	2025 Collected Traffic Volumes + 2 Years Growth + Trips from Adjacent DRI's
	Build (2027)	No-Build (2027) + Phase 1 Site Trips
Phase 2	No-Build (2029)	2025 Collected Traffic Volumes + 4 Years Growth + Trips from Adjacent DRI's
	Build (2029)	No-Build (2029) + Phases 1 & 2 Site Trips
Phase 3	No-Build (2032)	2025 Collected Traffic Volumes + 7 Years Growth + Trips from Adjacent DRI's
	Build (2032)	No-Build (2032) + Phases 1, 2, & 3 Site Trips
Phase 4	No-Build (2035)	2025 Collected Traffic Volumes + 10 Years Growth + Trips from Adjacent DRI's
	Build (2035)	No-Build (2035) + Phases 1, 2, 3, & 4 Site Trips

Mode split

As no transit routes are present in the study area, trips generated from the proposed development will not be finished using transit service. Therefore, no transit reduction will be applied to the trips generated. But the development is planned to have a multi-use trail alongside the internal roadways for pedestrians, bicycles, and golf carts, which will help residential developments to access the non-residential land uses proposed in the development, thereby reducing the need for off-site trips. An alternative mode reduction of 40% will be applied in areas where these amenities and land uses are.

Trip Distribution and Assignment

The trips generated from the proposed development were distributed on the roadway network in the vicinity of the development. The distribution is based on historical counts and observed traffic patterns in the area.

FUTURE CONDITIONS – PHASE 1 (2027)

Future No Build Traffic Volumes (2027)

The future 2027 background traffic volumes were calculated by applying the annual exponential growth rate (1.6%) over five years to the existing background traffic volumes and adding the trips generated from the adjacent DRI's. The future 2027 no-build traffic volumes are shown in Figures 6 and 7.

Future No Build Level of Service (2027)

The same methodology discussed previously was used to determine the level of service for the study intersections using the future 2027 no-build traffic volumes. The intersection capacity analysis results for no-build Phase 1 (2027) are summarized in **Table 16** and detailed Synchro results are attached in **Appendix E**.

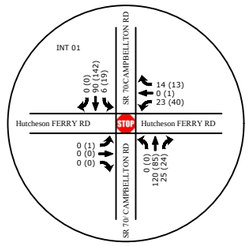
Table 16: No Build Level of Service for Phase 1 – 2027

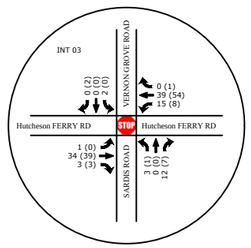
Intersection	Intersection Control	Approach	AM-Peak Delay (LOS)	PM-Peak Delay (LOS)
1: Campbellton Redwine Rd & Hutcheson Ferry Rd	TWSC	Eastbound	0 (A)	10.3 (B)
		Westbound	10 (B)	10.4 (B)
2: Hutcheson Ferry Rd & Farmette Driveway	TWSC	N/A	N/A	N/A
3: Sardis Rd/Vernon Grove Rd & Hutcheson Ferry Rd	TWSC	Northbound	8.7 (A)	8.5 (A)
		Southbound	9.3 (A)	8.6 (A)
4: Serenbe Rd & Hutcheson Ferry Rd	TWSC	N/A	N/A	N/A
5: Selborne Ln & Hutcheson Ferry Rd	TWSC	Northbound	9.2 (A)	8.9 (A)
6: Atlanta Newnan Rd & Hutcheson Ferry Rd	TWSC	Northbound	9.3 (A)	9.1 (A)
7: Hutcheson Ferry Rd & Rico Rd	TWSC	Southbound	11.1 (B)	10.7 (B)
8: Atlanta Newnan Rd & Hutcheson Ferry Rd	TWSC	Southbound	10.7 (B)	9.4 (A)
9: Hutcheson Ferry Rd & Cochran Mill Rd	TWSC	Southbound	12 (B)	11.8 (B)
10: Waterworks Rd/Toombs St & Hutcheson Ferry Rd	AWSC	Southbound	12.7 (B)	11.2 (B)
		Eastbound	9.2 (A)	9 (A)
		Westbound	9.1 (A)	11.8 (B)
11: Church St & Toombs St	TWSC	Northbound	10.6 (B)	14.8 (B)
12: SR 14/Roosevelt Hwy & Church St	TWSC	Eastbound	25.5 (D)	36.5 (E)
		Westbound	24.7 (C)	43.6 (E)
13: Atlanta Newnan Rd & Selborne Way	TWSC	N/A	N/A	N/A
14: Atlanta Newnan Rd & Selborne Ln	TWSC	Eastbound	10.1 (B)	9.4 (A)

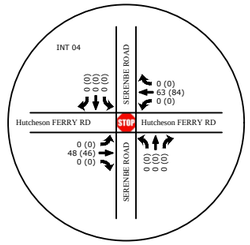
15: Atlanta Newnan Rd & Serenbe Ln	TWSC	Eastbound	8.8 (A)	8.8 (A)
16: Atlanta Newnan Rd & Serenbe Ln	TWSC	Eastbound	0 (A)	9.2 (A)
17: Jim Star Rd & Tommy Lee Cook Rd	AWSC	Northbound	11.1 (B)	8.6 (A)
		Southbound	10.2 (B)	8.2 (A)
		Eastbound	9.6 (A)	8.1 (A)
		Westbound	12.2 (B)	9.2 (A)
18: Tommy Lee Cook Rd & Sardis Rd	TWSC	Southbound	9.9 (A)	9.5 (A)
19: Shell Rd & Tommy Lee Cook Rd	TWSC	Northbound	10.2 (B)	9.2 (A)
		Southbound	11 (B)	11.4 (B)
20: Tommy Lee Cook Rd & Waterworks Rd	TWSC	Southbound	9.6 (A)	10.6 (B)
21: SR 14/Roosevelt Hwy & Tommy Lee Cook Rd	TWSC	Eastbound	43.9 (E)	88 (F)
22: Cochran Mill Rd & S Fulton Pkwy	TWSC	Northbound	21.3 (C)	48.7 (E)
		Southbound	19.9 (C)	15.9 (C)
23: Sardis Rd & Serenbe Driveway	N/A	N/A	N/A	N/A
24: SR 14/Roosevelt Hwy & Meadow Chase Way/Weldon Rd	Signalized	Northbound	26.1 (C)	30.4 (C)
		Southbound	30.7 (C)	52.6 (D)
		Eastbound	19.2 (B)	23.1 (C)
		Westbound	33.1 (C)	55.3 (D)
		Overall	30.3 (C)	48.6 (D)
25: Tommy Lee Cook Rd & Cedar Ridge Rd	TWSC	Southbound	10.7 (B)	10.3 (B)

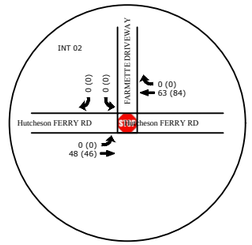
In the future 2027 no-build scenario all study intersections are expected to operate acceptably, LOS A-D except for the study intersections of SR 14/US 29/Roosevelt Highway at Meadow Chase Way/Weldon Road, SR 14/US 29/Roosevelt Highway at Tommy Lee Cook Road, are expected to operate unacceptably, LOS E- F, during the AM and PM peak hour. SR 14/US 29/Roosevelt Highway at Church Street and Cochran Mill Road at South Fulton Parkway, are expected to operate unacceptably, LOS E-F, during the PM peak hour. This can be mitigated with roundabouts in the no build condition for SR 14/Roosevelt Hwy & Church St, SR 14/Roosevelt Hwy & Tommy Lee Cook Rd, and Cochran Mill Rd & S Fulton Pkwy bringing the LOS to 8.8 (A), 8.1 (A), and 6.8 (A) respectively.

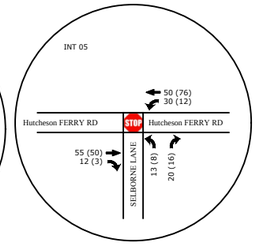
JURISDICTION	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
CHATTAHOOCHEE HILLS, GA	1402-24-179		

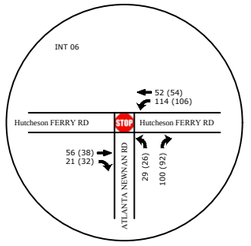


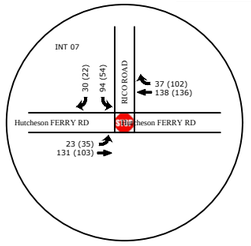


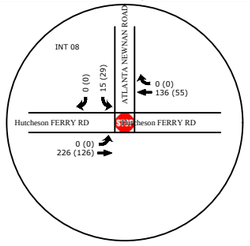


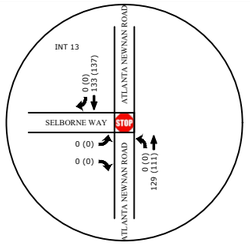


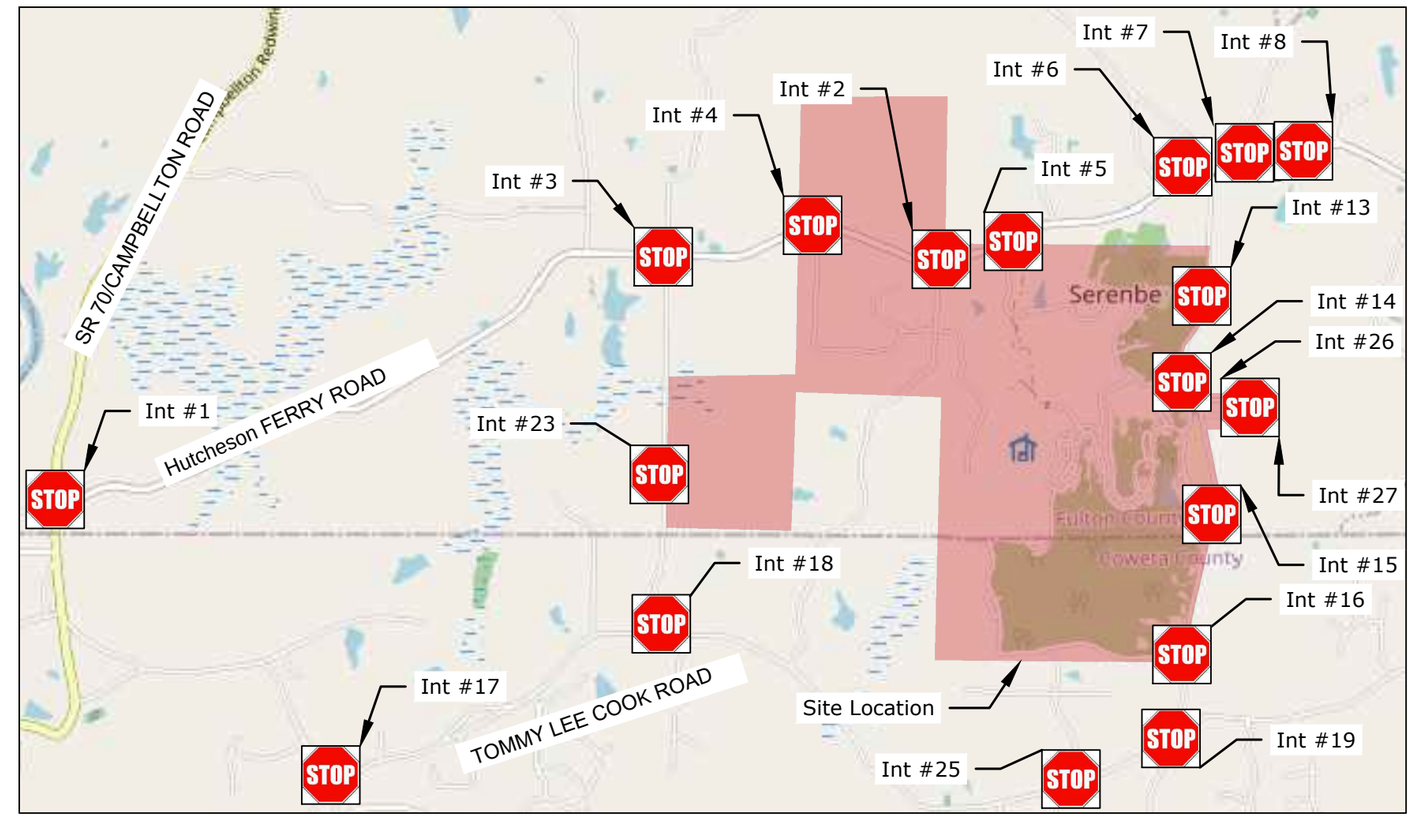




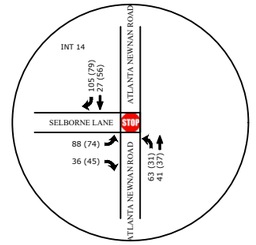


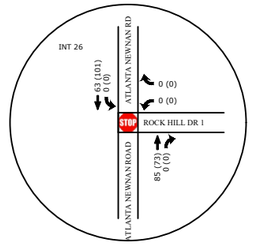


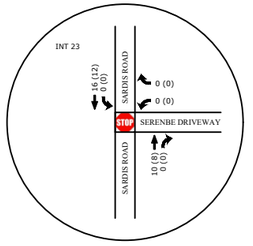


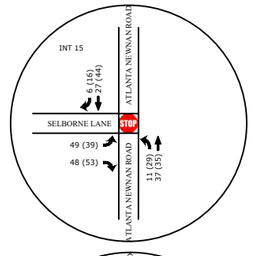


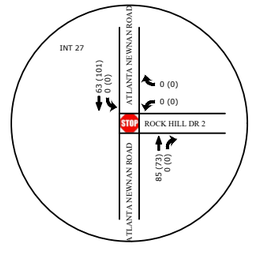
Legend: AM (PM)

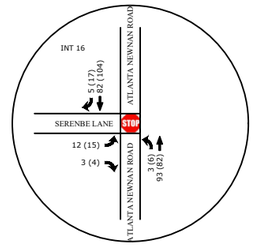


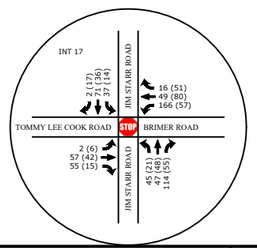


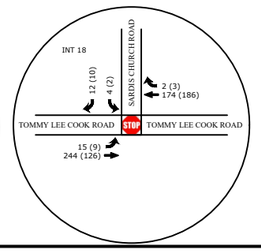


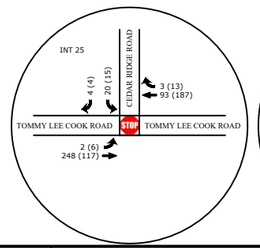












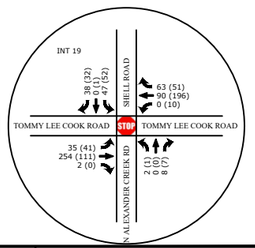


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FIGURE 8

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2470 Sandy Plains Road
Marietta, Georgia 30066
tel: 770-321-3936
www.seengineering.com

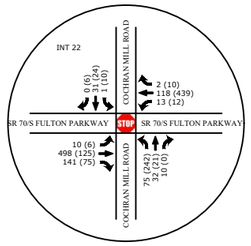
BUILD (2027) PHASE 1
PEAK HOUR VOLUMES
(WEST)

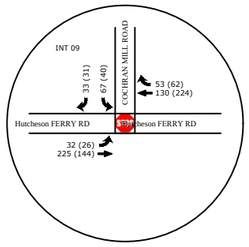
REVISION DATES		

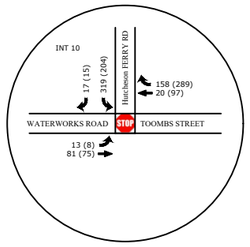
DATE:

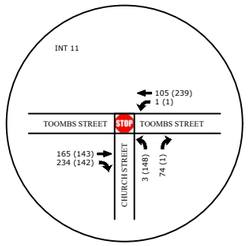
SERENBE DRI UPDATE

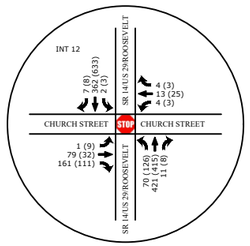
JURISDICTION	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
CHATTAHOOCHEE HILLS, GA	1402-24-179		

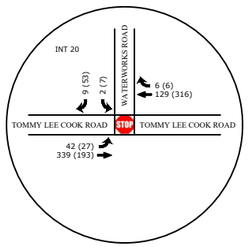


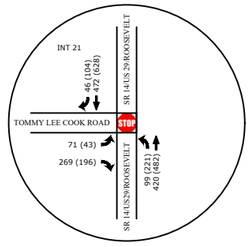


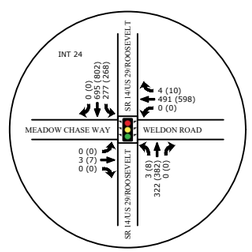












Legend: AM (PM)

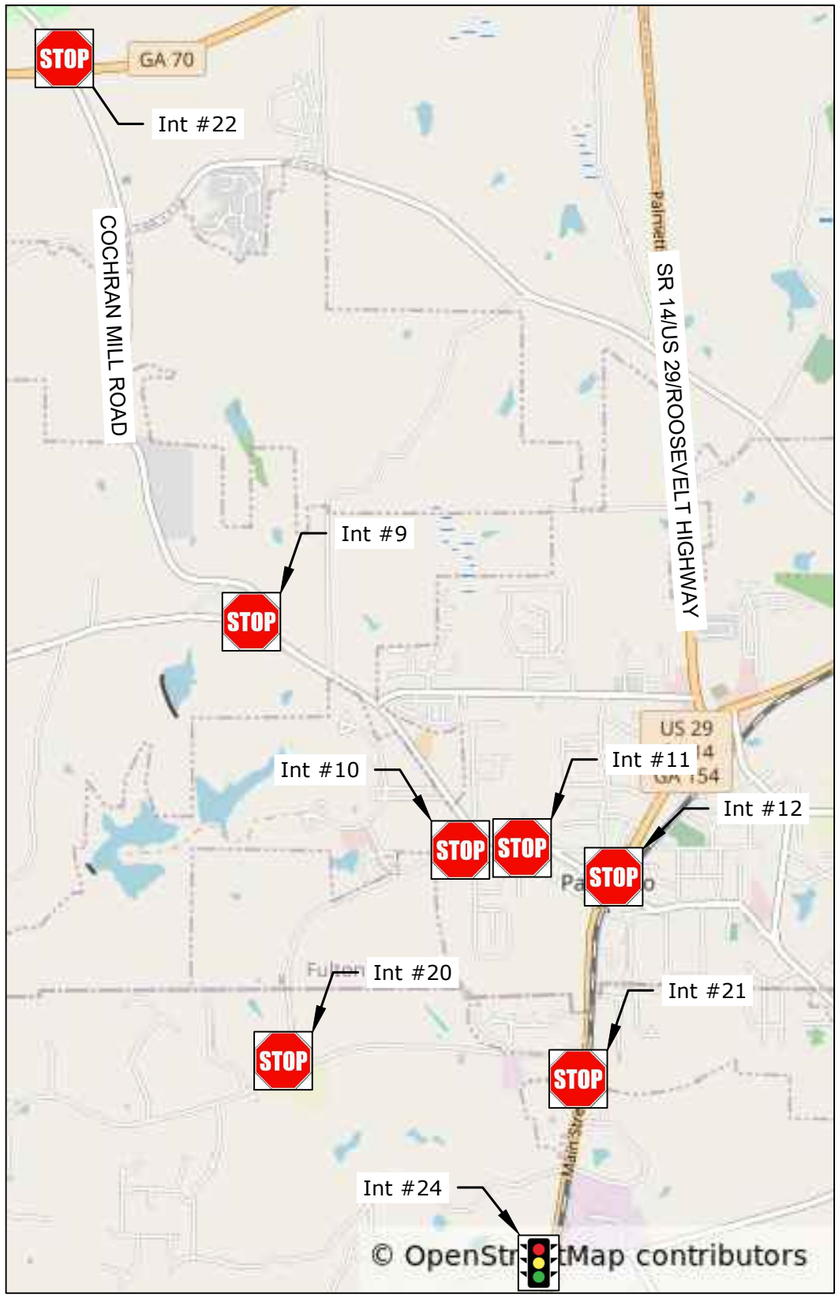


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FIGURE 9

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BUILD (2027) PHASE 1
PEAK HOUR VOLUMES
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Future Build Traffic Volumes (2027)

Future build traffic volumes for 2027 were calculated by summing the future 2027 no-build background traffic volumes and the site-generated peak hour volumes, assigned to the adjacent study network. Figures 8 and 9 show the future build (2027) traffic volumes.

Future Build Level of Service (2027)

The same methodology discussed previously was used to determine the level of service for the study intersections under phase 1 build conditions. The intersection capacity analysis results for Phase 1 (2027) build are summarized in **Table 17** and detailed Synchro results are attached in **Appendix E**.

Table 17. Build Level of Service for Phase 1 - 2027

Intersection	Intersection Control	Approach	AM-Peak Delay (LOS)	PM-Peak Delay (LOS)
1: Campbellton Redwine Rd & Hutcheson Ferry Rd	TWSC	Eastbound	0 (A)	10.7 (B)
		Westbound	9.9 (A)	10.5 (B)
2: Hutcheson Ferry Rd & Farmette Driveway	TWSC	N/A	N/A	N/A
3: Sardis Rd/Vernon Grove Rd & Hutcheson Ferry Rd	TWSC	Northbound	8.7 (A)	8.7 (A)
		Southbound	9.4 (A)	8.6 (A)
4: Serenbe Rd & Hutcheson Ferry Rd	TWSC	N/A	N/A	N/A
5: Selborne Ln & Hutcheson Ferry Rd	TWSC	Northbound	9.2 (A)	9 (A)
6: Atlanta Newnan Rd & Hutcheson Ferry Rd	TWSC	Northbound	10.2 (B)	9.9 (A)
7: Hutcheson Ferry Rd & Rico Rd	TWSC	Southbound	11.7 (B)	11.4 (B)
8: Atlanta Newnan Rd & Hutcheson Ferry Rd	TWSC	Southbound	11.1 (B)	9.7 (A)
9: Hutcheson Ferry Rd & Cochran Mill Rd	TWSC	Southbound	11.9 (B)	11.5 (B)
10: Waterworks Rd/Toombs St & Hutcheson Ferry Rd	AWSC	Southbound	12.7 (B)	11.2 (B)
		Eastbound	9.1 (A)	8.9 (A)
		Westbound	9.1 (A)	11.8 (B)
11: Church St & Toombs St	TWSC	Northbound	10.6 (B)	14.8 (B)
12: SR 14/Roosevelt Hwy & Church St	TWSC	Eastbound	31.9 (D)	84.5 (F)
		Westbound	40.7 (E)	76.3 (F)
13: Atlanta Newnan Rd & Selborne Way	TWSC	N/A	N/A	N/A
14: Atlanta Newnan Rd & Selborne Ln	TWSC	Eastbound	10.6 (B)	10.1 (B)
15: Atlanta Newnan Rd & Serenbe Ln	TWSC	Eastbound	9.2 (A)	9.4 (A)

16: Atlanta Newnan Rd & Serenbe Ln	TWSC	Eastbound	9.5 (A)	9.7 (A)
17: Jim Star Rd & Tommy Lee Cook Rd	AWSC	Northbound	11.9 (B)	9 (A)
		Southbound	10.7 (B)	8.6 (A)
		Eastbound	10.1 (B)	8.4 (A)
		Westbound	13.6 (B)	9.8 (A)
18: Tommy Lee Cook Rd & Sardis Rd	TWSC	Southbound	10.5 (B)	10 (B)
19: Shell Rd & Tommy Lee Cook Rd	TWSC	Northbound	11 (B)	9.7 (A)
		Southbound	13.3 (B)	14.1 (B)
20: Tommy Lee Cook Rd & Waterworks Rd	TWSC	Southbound	9.8 (A)	11.1 (B)
21: SR 14/Roosevelt Hwy & Tommy Lee Cook Rd	TWSC	Eastbound	142.8 (F)	>300 (F)
22: Cochran Mill Rd & S Fulton Pkwy	TWSC	Northbound	21.3 (C)	43.5 (E)
		Southbound	19.(C)	15.7 (C)
23: Sardis Rd & Serenbe Driveway	N/A	N/A	N/A	N/A
24: SR 14/Roosevelt Hwy & Meadow Chase Way/Weldon Rd	Signalized	Northbound	18.7 (B)	21.3 (C)
		Southbound	26.3 (C)	52.6 (D)
		Eastbound	19.1 (B)	23.1 (B)
		Westbound	32.5 (C)	55.3 (E)
		Overall	30.6 (C)	48.6 (D)
25: Tommy Lee Cook Rd & Cedar Ridge Rd	TWSC	Southbound	10.7 (B)	10.5 (B)

In the future 2027 build scenario all study intersections are expected to operate acceptably, LOS A-D except for the study intersections SR 14/US 29/Roosevelt Highway at Tommy Lee Cook Road, are expected to operate unacceptably, LOS E- F, during the AM and PM peak hour. SR 14/US 29/Roosevelt Highway at Church Street and Cochran Mill Road at South Fulton Parkway, are expected to operate unacceptably, LOS E-F, during the PM peak hour. These intersections also fail in the no build condition. With the recommended system improvements, the build LOS for SR 14/Roosevelt Hwy & Church St, SR 14/Roosevelt Hwy & Tommy Lee Cook Rd, and Cochran Mill Rd & S Fulton Pkwy would be 9.2 (A), 13.2 (B), and 6.9 (A) respectively.

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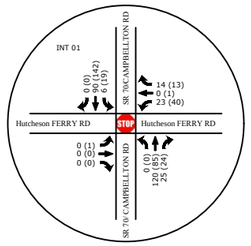
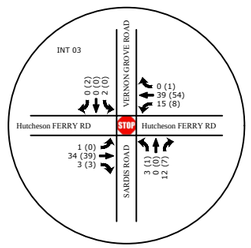
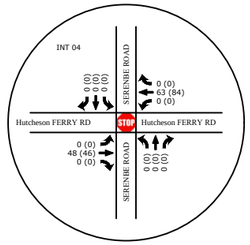
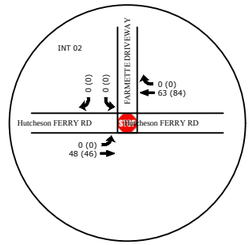
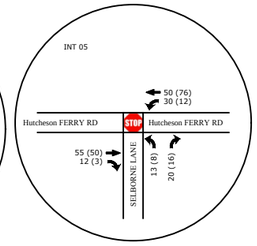
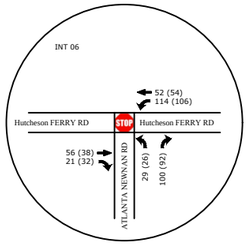


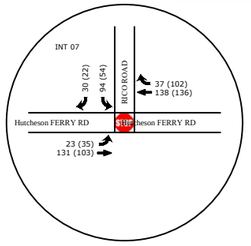


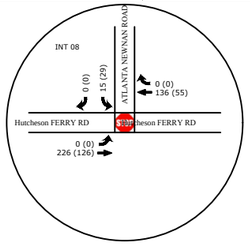


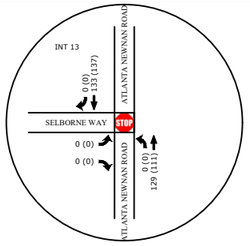


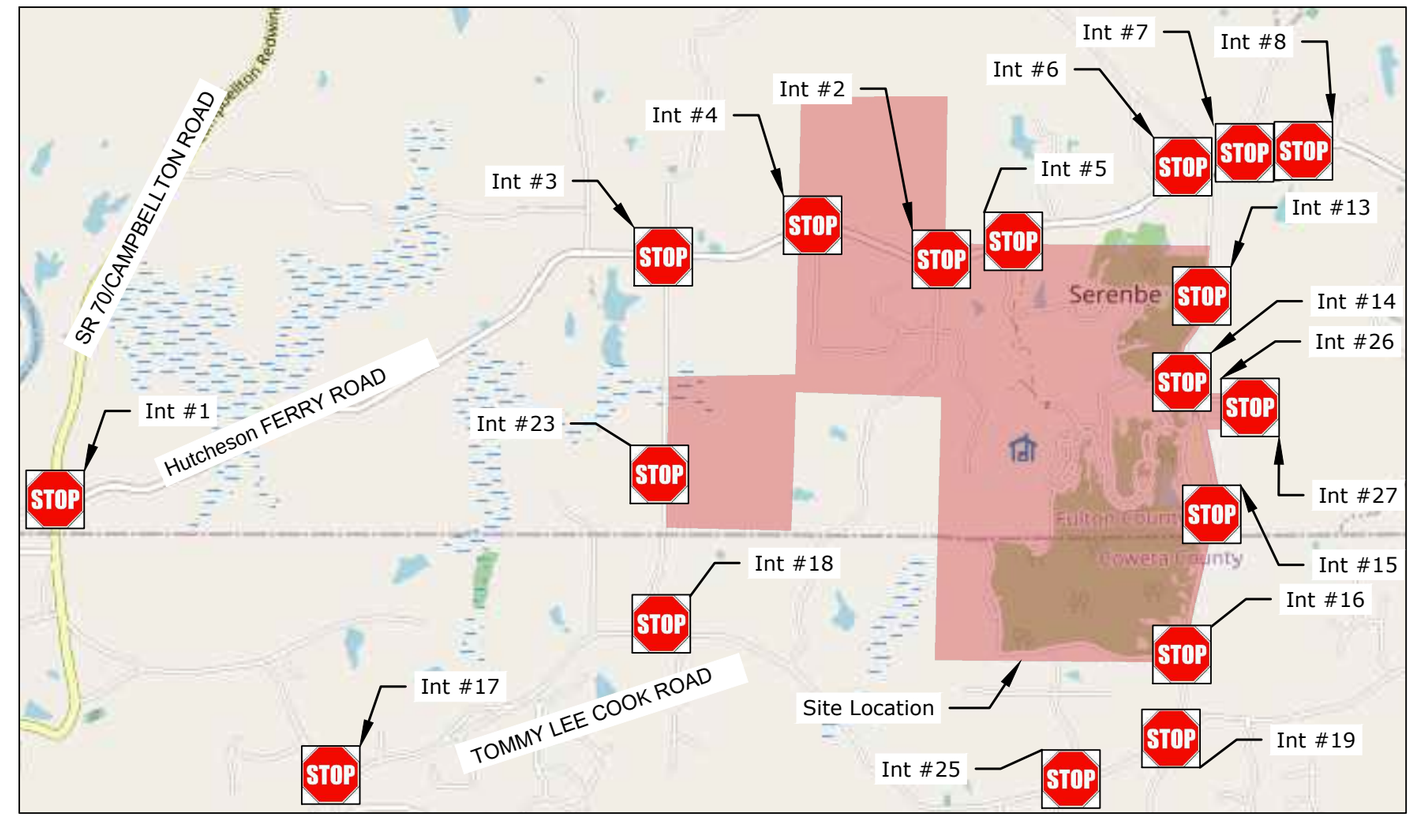




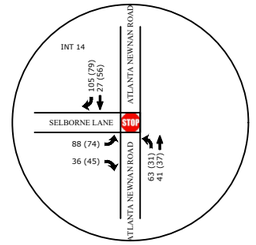


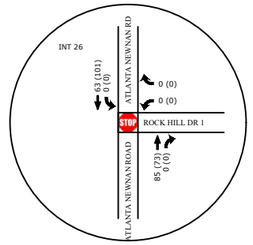


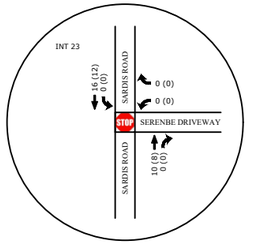


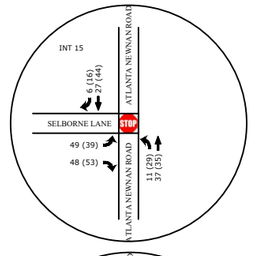


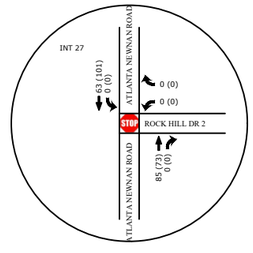
Legend: AM (PM)

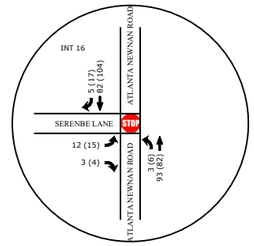


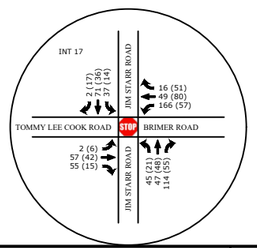


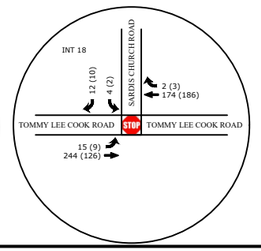


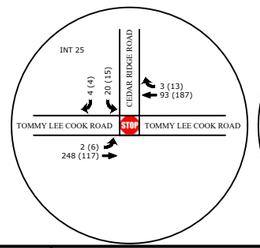


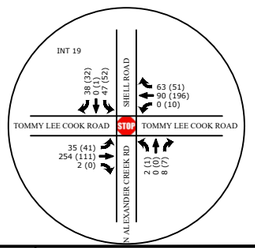












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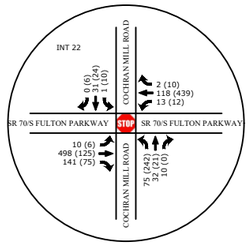
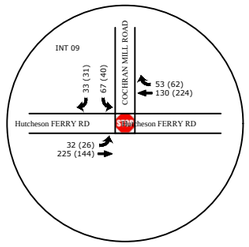
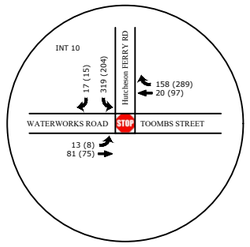
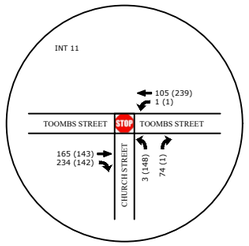
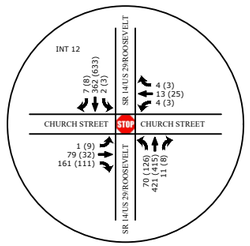
CHATTAHOOCHEE HILLS, GA	1402-24-179		

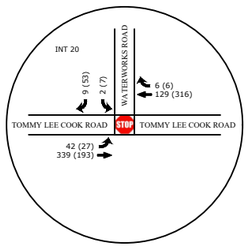


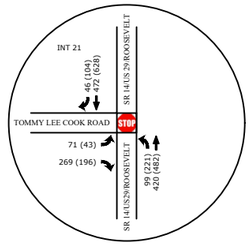


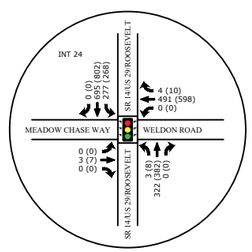












Legend: AM (PM)

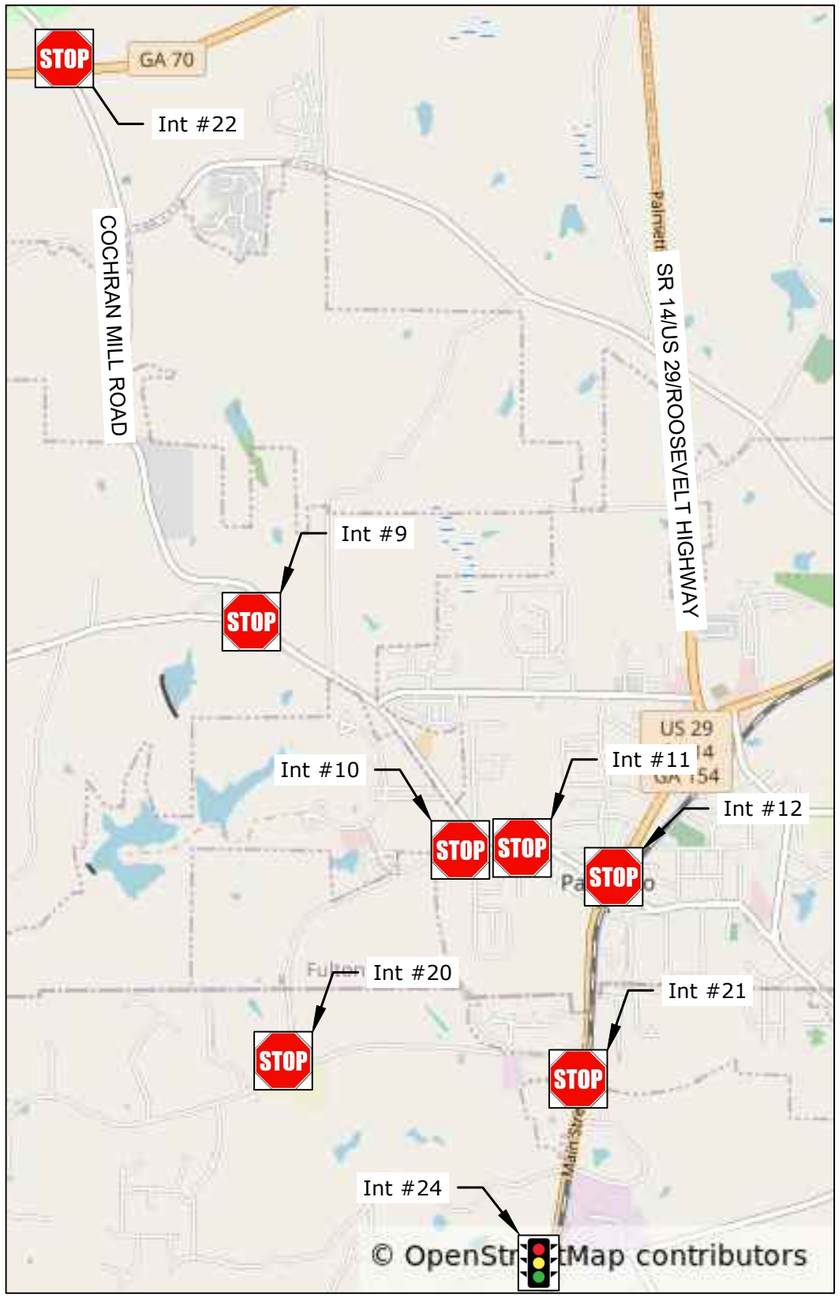


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FIGURE 9

SOUTHEASTERN ENGINEERING, INC.
2470 Sandy Plains Road
Marietta, Georgia 30066
tel: 770-321-3936
www.seengineering.com

BUILD (2027) PHASE 1
PEAK HOUR VOLUMES
(EAST)

REVISION DATES		

DATE:

SERENBE DRI UPDATE

FUTURE CONDITIONS – PHASE 2 (2029)

Future No Build Traffic Volumes (2029)

The future 2029 background traffic volumes were calculated by applying the annual exponential growth rate (1.6%) over four years to the existing background traffic volumes (2025) and adding the trips generated from the adjacent DRI's. It was assumed that the intersection improvements recommended under Phase 1 – 2027 will be implemented in 2029 and considered "existing" for the no-build analysis. The future 2029 no-build traffic volumes are shown in Figures 10 and 11.

Future No Build Level of Service (2029)

The same methodology discussed previously was used to determine the level of service for the study intersections using the future 2029 background traffic volumes. No-build 2029 analysis included Phase 1 improvements as base conditions. The intersection capacity analysis results for no-build Phase 2 (2029) are summarized in **Table 18** and detailed results are included in **Appendix E**.

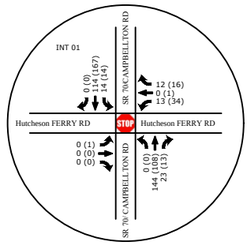
Table 18: No Build Level of Service for Phase 2 - 2029

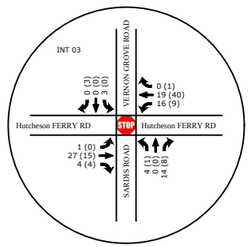
Intersection	Intersection Control	Approach	AM-Peak Delay (LOS)	PM-Peak Delay (LOS)
1: Campbellton Redwine Rd & Hutcheson Ferry Rd	TWSC	Eastbound	0 (A)	11 (B)
		Westbound	10.1 (B)	10.7 (B)
2: Hutcheson Ferry Rd & Farmette Driveway	N/A	N/A	N/A	N/A
3: Sardis Rd/Vernon Grove Rd & Hutcheson Ferry Rd	TWSC	Northbound	8.8 (A)	8.5 (A)
		Southbound	9.4 (A)	8.6 (A)
4: Serenbe Rd & Hutcheson Ferry Rd	N/A	N/A	N/A	N/A
5: Selborne Ln & Hutcheson Ferry Rd	TWSC	Northbound	9.4 (A)	8.9 (A)
6: Atlanta Newnan Rd & Hutcheson Ferry Rd	TWSC	Northbound	9.5 (A)	9.2 (A)
7: Hutcheson Ferry Rd & Rico Rd	TWSC	Southbound	11.7 (B)	11.2 (B)
8: Atlanta Newnan Rd & Hutcheson Ferry Rd	TWSC	Southbound	11.1 (B)	9.5 (A)
9: Hutcheson Ferry Rd & Cochran Mill Rd	TWSC	Southbound	13.2 (B)	12.8 (B)
10: Waterworks Rd/Toombs St & Hutcheson Ferry Rd	AWSC	Southbound	14.6 (B)	12.3 (B)
		Eastbound	9.6 (A)	9.4 (A)
		Westbound	9.7 (A)	13.8 (B)
11: Church St & Toombs St	TWSC	Northbound	11 (B)	16.8 (B)
12: SR 14/Roosevelt Hwy & Church St	TWSC	Eastbound	41.2 (E)	81.9 (F)
		Westbound	33.3 (D)	74.1 (F)
13: Atlanta Newnan Rd & Selborne Way	TWSC	N/A	N/A	N/A
14: Atlanta Newnan Rd & Selborne Ln	TWSC	Eastbound	10.4 (B)	9.5 (A)
15: Atlanta Newnan Rd & Serenbe Ln	TWSC	Eastbound	8.8 (A)	8.8 (A)

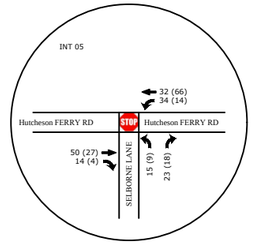
16: Atlanta Newnan Rd & Serenbe Ln	TWSC	Eastbound	0 (A)	9.3 (A)
17: Jim Star Rd & Tommy Lee Cook Rd	AWSC	Northbound	12.5 (B)	8.9 (A)
		Southbound	11 (B)	8.4 (A)
		Eastbound	10.4 (B)	8.3 (A)
		Westbound	13.9 (B)	9.7 (A)
18: Tommy Lee Cook Rd & Sardis Rd	TWSC	Southbound	10.2 (B)	9.8 (A)
19: Shell Rd & Tommy Lee Cook Rd	TWSC	Northbound	10.7 (B)	9.3 (A)
		Southbound	11.5 (B)	12 (B)
20: Tommy Lee Cook Rd & Waterworks Rd	TWSC	Southbound	10 (B)	11 (B)
21: SR 14/Roosevelt Hwy & Tommy Lee Cook Rd	TWSC	Eastbound	104.6 (F)	294.3 (F)
22: Cochran Mill Rd & S Fulton Pkwy	TWSC	Northbound	30.6 (D)	133.9 (F)
		Southbound	24.5 (C)	18.6 (C)
23: Sardis Rd & Serenbe Driveway	N/A	N/A	N/A	N/A
24: SR 14/Roosevelt Hwy & Meadow Chase Way/Weldon Rd	Signalized	Northbound	27.5 (C)	37.6 (D)
		Southbound	43.7 (D)	100 (F)
		Eastbound	20.4 (C)	22.1 (C)
		Westbound	47.4 (D)	72.7 (F)
		Overall	41.3 (D)	80.6 (F)
25: Tommy Lee Cook Rd & Cedar Ridge Rd	TWSC	Southbound	11 (B)	10.5 (B)

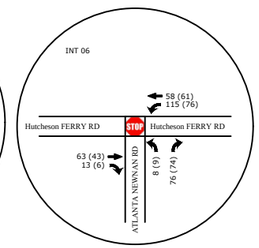
In the future 2029 no-build scenario all study intersections are anticipated to operate acceptably, LOS A-D, except for the study intersection of SR 14/US 29/Roosevelt Highway at Meadow Chase Way/Weldon Road, SR 14/US 29/Roosevelt Highway at Tommy Lee Cook Road and SR 14/US 29/Roosevelt Highway at Church St, are expected to operate unacceptably, LOS E- F, during the AM and PM peak hour. Cochran Mill Road at South Fulton Parkway is anticipated to operate at LOS F during the PM peak hour. This can be mitigated with roundabouts in the no build condition for SR 14/Roosevelt Hwy & Church St, SR 14/Roosevelt Hwy & Tommy Lee Cook Rd, and Cochran Mill Rd & S Fulton Pkwy bringing the LOS to 7.4 (A) in the AM and 10.7 (B) in the PM; 8.4 (A) in the AM and 13.5 (B) in the PM; and 7.9 (A) in the AM and 7.3 (A) in the PM respectively. For SR 14/US 29/Roosevelt Highway at Meadow Chase Way/Weldon Road this can mitigated by adding a southbound left turn lane, changing the right turn lane into a through right, and having two left turn lanes. This brings the overall LOS to 34.0 (C).

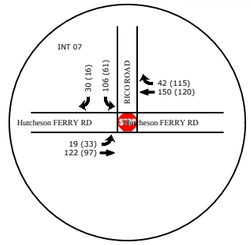
JURISDICTION	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
CHATTAHOOCHEE HILLS, GA	1402-24-179		

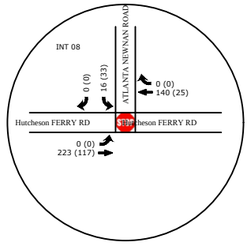


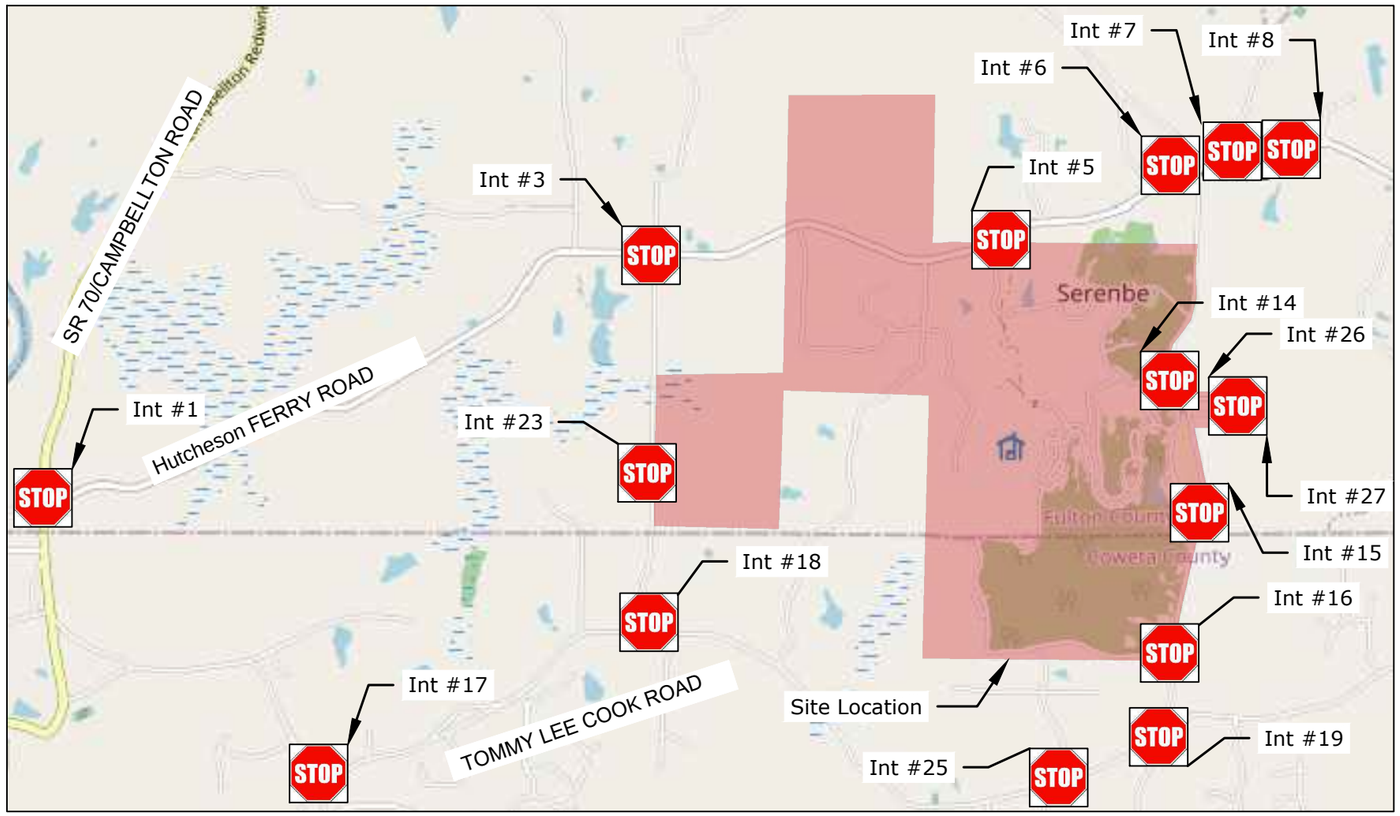




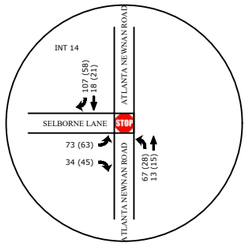


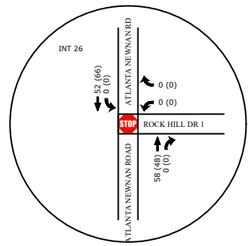


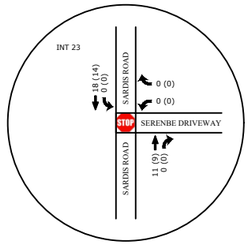


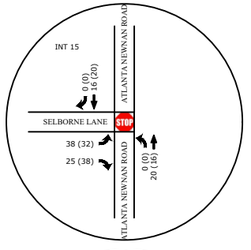


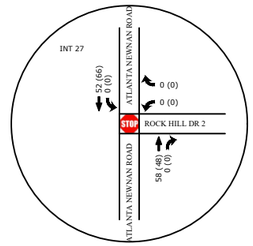
Legend: AM (PM)

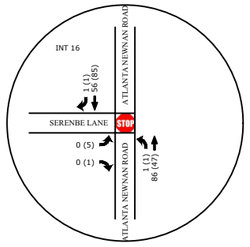


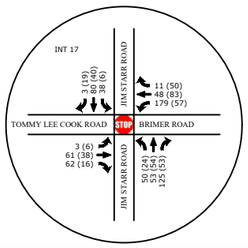


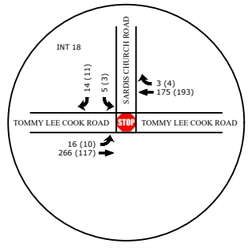


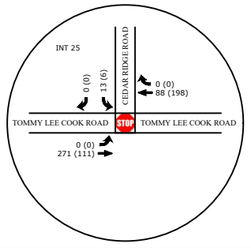












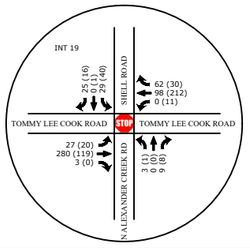


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FIGURE 10

SOUTHEASTERN ENGINEERING, INC.
2470 Sandy Plains Road
Marietta, Georgia 30066
tel: 770-321-3938
www.seengineering.com

PHASE 2 (2029)
NO-BUILD (WEST)

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SERENBE DRI UPDATE

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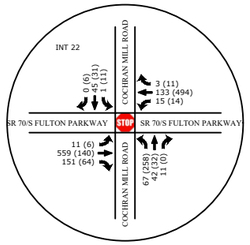
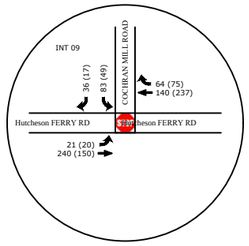
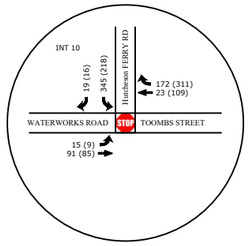
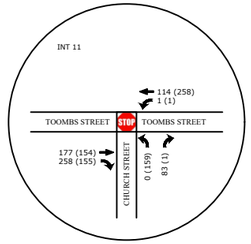
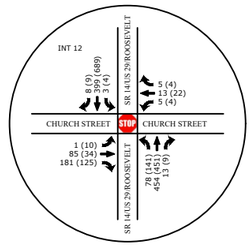
CHATTAHOOCHEE HILLS, GA	1402-24-179		

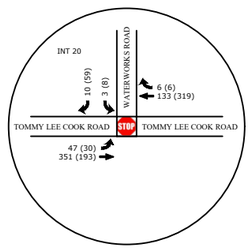


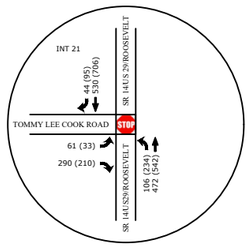


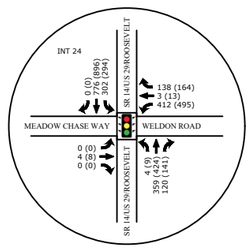












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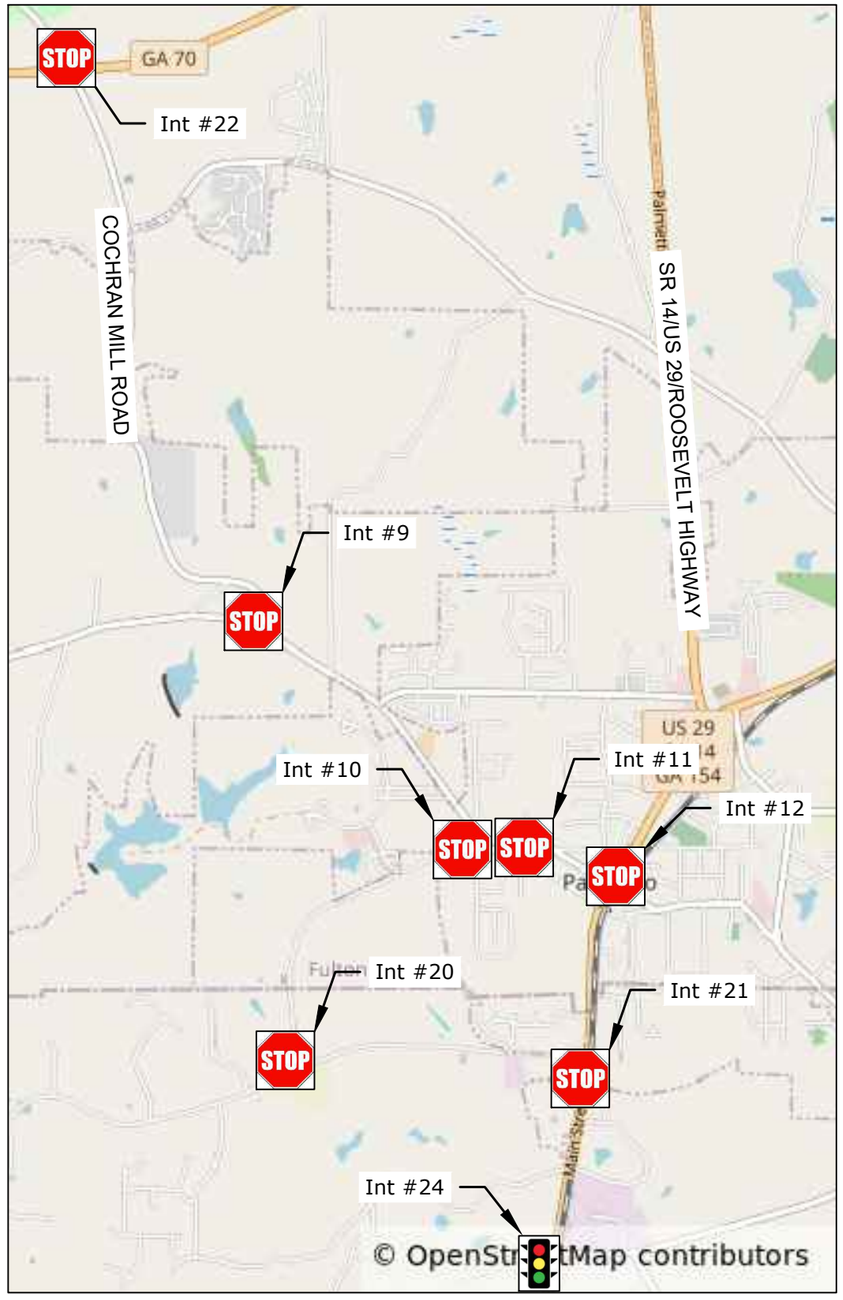

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FIGURE 11

SEI
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2470 Sandy Plains Road
Marietta, Georgia 30066
tel: 770-321-3936
www.seengineering.com

PHASE 2 (2029)
NO-BUILD (EAST)

REVISION DATES		

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SERENBE DRI UPDATE

Future Build Traffic Volumes (2029)

Future build traffic volumes for 2029 were calculated by adding the future 2029 no-build traffic volumes and Phase 2 site-generated peak hour volumes, assigned to the adjacent study network. Figures 12 and 13 show the future build (2029) traffic volumes.

Future Build Level of Service (2029)

The same methodology discussed previously was used to determine the level of service for the study intersections using the future build 2029 Phase 2 volumes. The intersection capacity analysis results for Phase 2 (2029) build are summarized in **Table 19** and detailed Synchro results are attached in **Appendix E**.

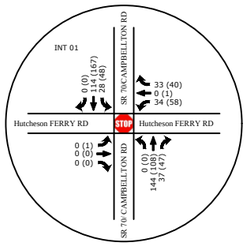
Table 19. Build Level of Service for Phase 2 - 2029

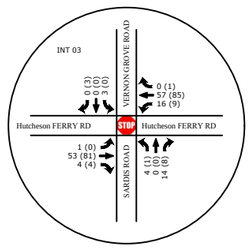
Intersection	Intersection Control	Approach	AM-Peak Delay (LOS)	PM-Peak Delay (LOS)
1: Campbellton Redwine Rd & Hutcheson Ferry Rd	TWSC	Eastbound	0 (A)	12.4 (B)
		Westbound	10.7 (B)	11.8 (B)
2: Hutcheson Ferry Rd & Farmette Driveway	N/A	N/A	N/A	N/A
3: Sardis Rd/Vernon Grove Rd & Hutcheson Ferry Rd	TWSC	Northbound	9 (A)	9.1 (A)
		Southbound	10 (B)	8.9 (A)
4: Serenbe Rd & Hutcheson Ferry Rd	N/A	N/A	N/A	N/A
5: Selborne Ln & Hutcheson Ferry Rd	TWSC	Northbound	9.8 (A)	9.9 (A)
6: Atlanta Newnan Rd & Hutcheson Ferry Rd	TWSC	Northbound	11.6 (B)	12 (B)
7: Hutcheson Ferry Rd & Rico Rd	TWSC	Southbound	13 (B)	12.8 (B)
8: Atlanta Newnan Rd & Hutcheson Ferry Rd	TWSC	Southbound	11.8 (B)	10.5 (B)
9: Hutcheson Ferry Rd & Cochran Mill Rd	TWSC	Southbound	14.9 (B)	14.2 (B)
10: Waterworks Rd/Toombs St & Hutcheson Ferry Rd	AWSC	Southbound	15.8 (C)	13.5 (B)
		Eastbound	9.8 (A)	9.7 (A)
		Westbound	10.1 (B)	15.8 (C)
11: Church St & Toombs St	TWSC	Northbound	11.5 (B)	18.9 (C)
12: SR 14/Roosevelt Hwy & Church St	TWSC	Eastbound	57.2 (F)	183.7 (F)
		Westbound	38.4 (E)	132.9 (F)
13: Atlanta Newnan Rd & Selborne Way	TWSC	N/A	N/A	N/A
14: Atlanta Newnan Rd & Selborne Ln	TWSC	Eastbound	12.2 (B)	12 (B)
15: Atlanta Newnan Rd & Serenbe Ln	TWSC	Eastbound	9.6 (A)	10.4 (B)
16: Atlanta Newnan Rd & Serenbe Ln	TWSC	Eastbound	10.4 (B)	11.4 (B)
17: Jim Star Rd & Tommy Lee Cook Rd	AWSC	Northbound	13.6 (B)	9.7 (A)
		Southbound	11.8 (B)	9.2 (A)
		Eastbound	11.1 (B)	8.9 (A)
		Westbound	16.2 (C)	11 (B)

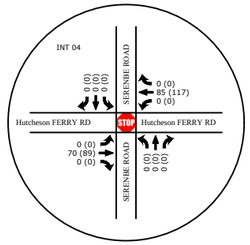
18: Tommy Lee Cook Rd & Sardis Rd	TWSC	Southbound	10.6 (B)	10.2 (B)
19: Shell Rd & Tommy Lee Cook Rd	TWSC	Northbound	11.2 (B)	9.7 (A)
		Southbound	13.6 (B)	16 (C)
20: Tommy Lee Cook Rd & Waterworks Rd	TWSC	Southbound	10.3 (B)	11.9 (B)
21: SR 14/Roosevelt Hwy & Tommy Lee Cook Rd	TWSC	Eastbound	234.2 (F)	>300 (F)
22: Cochran Mill Rd & S Fulton Pkwy	TWSC	Northbound	42.5 (E)	211.8 (F)
		Southbound	25.8 (D)	20.5 (C)
23: Sardis Rd & Serenbe Driveway	N/A	N/A	N/A	N/A
24: SR 14/Roosevelt Hwy & Meadow Chase Way/Weldon Rd	Signalized	Northbound	20.2 (B)	24 (C)
		Southbound	145.7 (F)	222.7 (F)
		Eastbound	12.3 (B)	12.3 (B)
		Westbound	47.8 (C)	115.9 (F)
		Overall	95.6 (F)	153.4 (F)
25: Tommy Lee Cook Rd & Cedar Ridge Rd	TWSC	Southbound	11.3 (B)	11.3 (B)
26. Atlanta Newnan Rd & Rock Hill Dr #1	TWSC	Westbound	9.4 (A)	9.7 (A)
27. Atlanta Newnan Rd & Rock Hill Dr #2	TWSC	Westbound	9.5 (A)	9.9 (A)

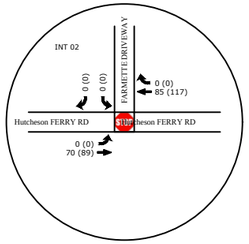
In the future 2029 build scenario all study intersections are anticipated to operate acceptably, LOS A-D, except for the study intersection of SR 14/US 29/Roosevelt Highway at Church St, SR 14/US 29/Roosevelt Highway at Tommy Lee Cook Road, Cochran Mill Road at South Fulton Parkway, and SR 14/US 29/Roosevelt Highway at Meadow Chase Way/Weldon Road, are expected to operate unacceptably, LOS E- F, during the AM and PM peak hour. With the recommended mitigations in the no build the LOS for these intersections is acceptable in the build condition.

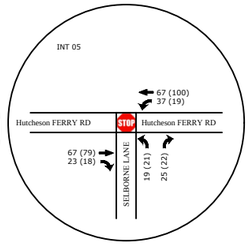
JURISDICTION	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
CHATTAHOOCHEE HILLS, GA	1402-24-179		

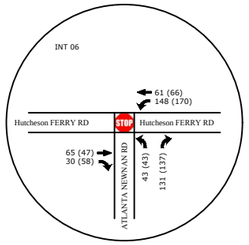


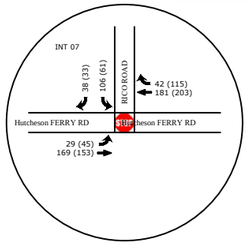


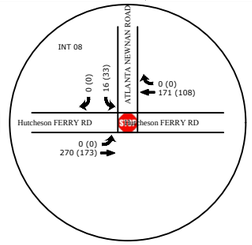


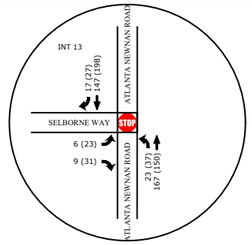


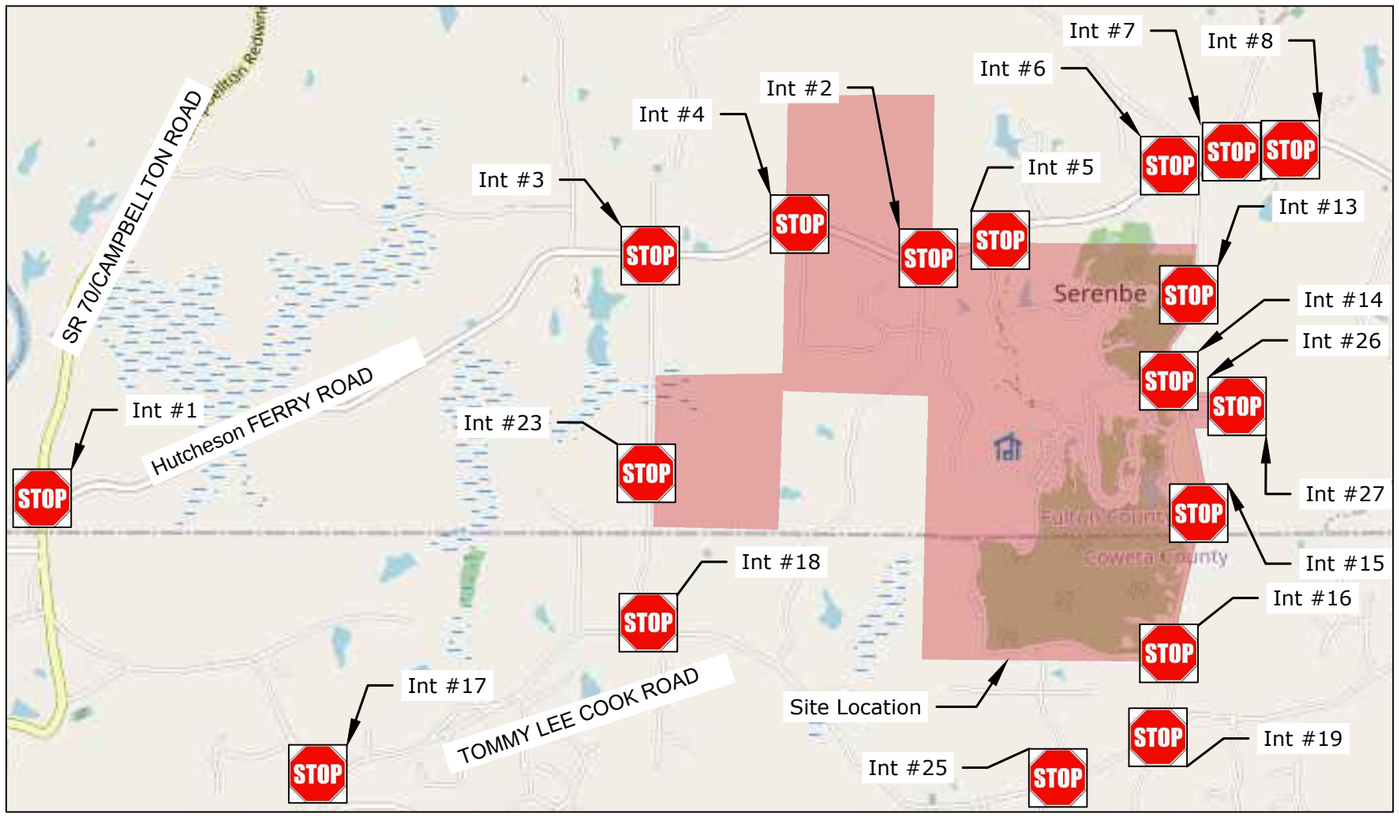




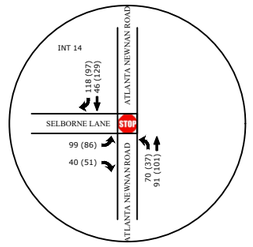


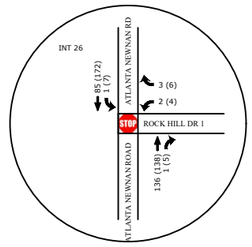


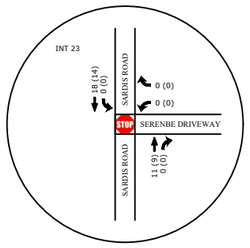


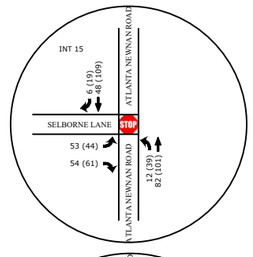


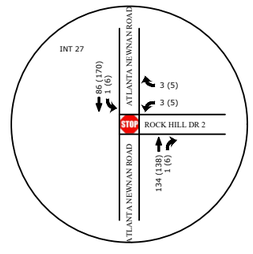
Legend: AM (PM)

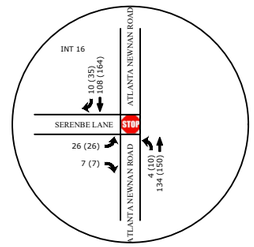


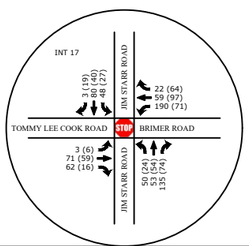


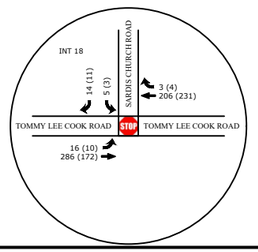


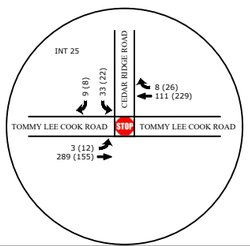












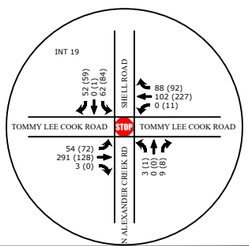


FIGURE 12

SOUTHEASTERN ENGINEERING, INC.
2470 Sandy Plains Road
Marietta, Georgia 30066
tel: 770-321-3936
www.seengineering.com

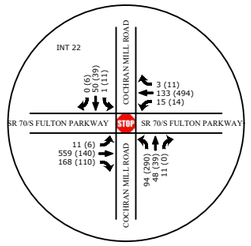
BUILD (2029) PHASE 2
PEAK HOUR VOLUMES
(WEST)

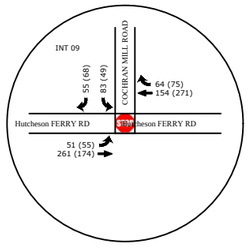
REVISION DATES		

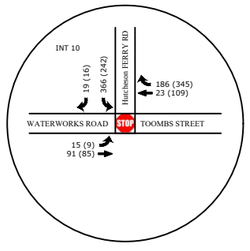
DATE:

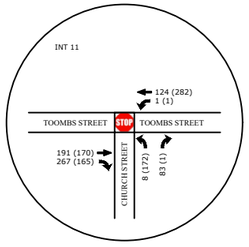
SERENBE DRI UPDATE

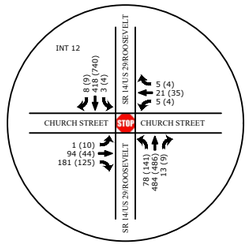
JURISDICTION	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
CHATTAHOOCHEE HILLS, GA	1402-24-179		

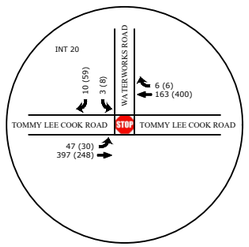


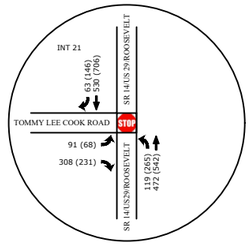


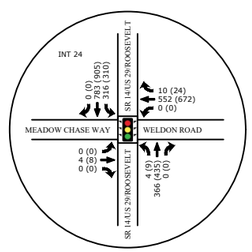


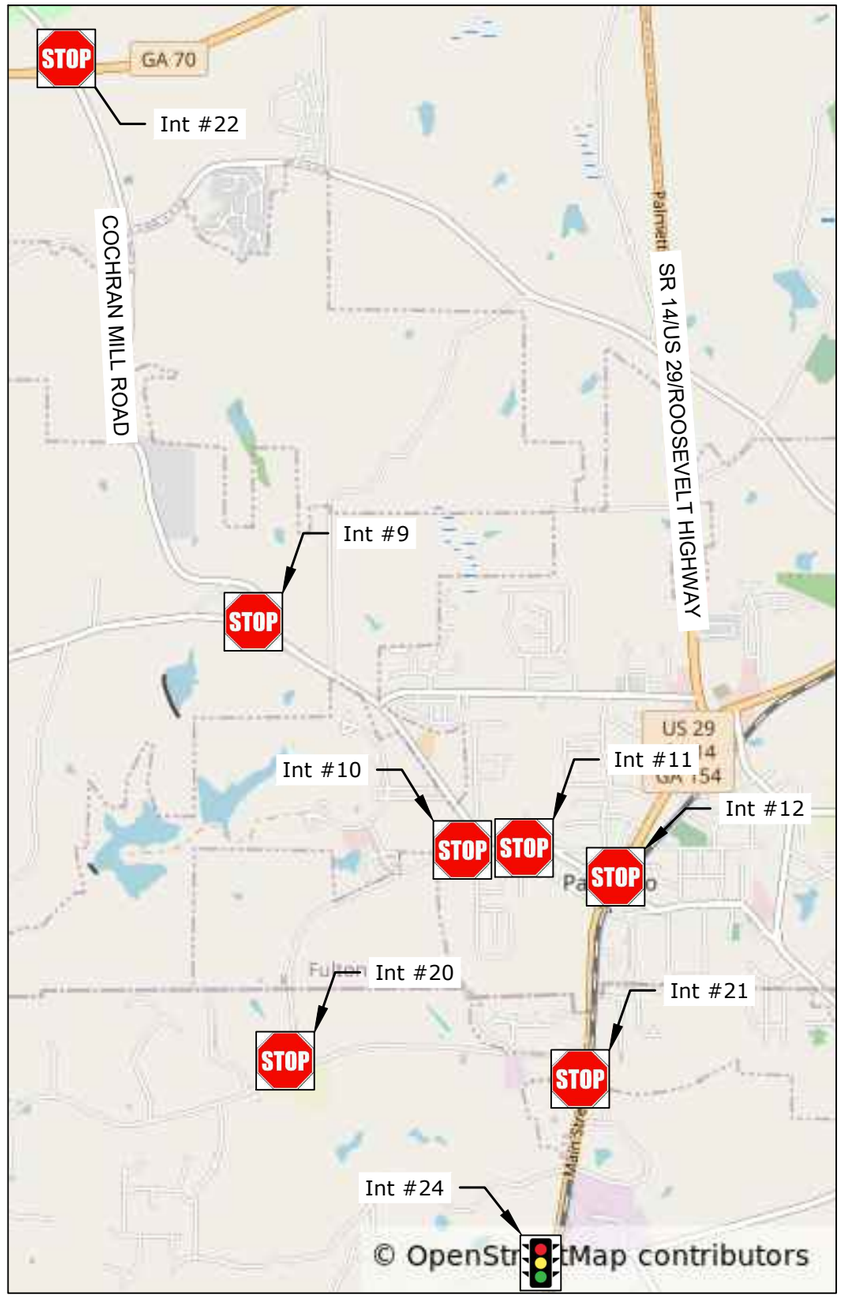












Legend: AM (PM)

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PLOT DATE - TIME: Aug. 11, 2025 - 8:26 AM
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FIGURE 13

SOUTHEASTERN ENGINEERING, INC.
2470 Sandy Plains Road
Marietta, Georgia 30066
tel: 770-321-3936
www.seengineering.com

BUILD (2029) PHASE 2
PEAK HOUR VOLUMES
(EAST)

REVISION DATES		

DATE:

SERENBE DRI UPDATE

FUTURE CONDITIONS – PHASE 3 (2032)

Future No Build Traffic Volumes (2032)

The future 2032 background traffic volumes were calculated by applying the annual exponential growth rate (1.6%) over eight years to the existing background traffic volumes (2025) and adding the trips generated from the adjacent DRI's. It was assumed that the intersection improvements recommended under Phase 2 – 2029 will be implemented in 2032 and considered "existing" for the no-build analysis. The future 2032 no-build traffic volumes are shown in Figures 14 and 15.

Future No Build Level of Service (2032)

The same methodology discussed previously was used to determine the level of service for the study intersections using the future 2032 background traffic volumes. No-build 2032 analysis included Phase 2 improvements as base conditions. The intersection capacity analysis results for no-build Phase 3 (2032) are summarized in **Table 20** and detailed results are included in **Appendix E**.

Table 20. No Build Level of Service for Phase 3 - 2032

Intersection	Intersection Control	Approach	AM-Peak Delay (LOS)	PM-Peak Delay (LOS)
1: Campbellton Redwine Rd & Hutcheson Ferry Rd	TWSC	Eastbound	0 (A)	13.6 (B)
		Westbound	10.9 (B)	11.9 (B)
2: Hutcheson Ferry Rd & Farmette Driveway	N/A	N/A	N/A	N/A
3: Sardis Rd/Vernon Grove Rd & Hutcheson Ferry Rd	TWSC	Northbound	8.8 (A)	8.7 (A)
		Southbound	9.6 (A)	8.6 (A)
4: Serenbe Rd & Hutcheson Ferry Rd	N/A	N/A	N/A	N/A
5: Selborne Ln & Hutcheson Ferry Rd	TWSC	Northbound	9.6 (A)	9.1 (A)
6: Atlanta Newnan Rd & Hutcheson Ferry Rd	TWSC	Northbound	9.8 (A)	9.5 (A)
7: Hutcheson Ferry Rd & Rico Rd	TWSC	Southbound	13.3 (B)	12.4 (B)
8: Atlanta Newnan Rd & Hutcheson Ferry Rd	TWSC	Southbound	11.8 (B)	9.7 (A)
9: Hutcheson Ferry Rd & Cochran Mill Rd	TWSC	Southbound	16.9 (C)	15.8 (C)
10: Waterworks Rd/Toombs St & Hutcheson Ferry Rd	AWSC	Southbound	20.9 (C)	15.2 (C)
		Eastbound	10.6 (B)	10.3 (B)
		Westbound	11.2 (B)	21.4 (C)
11: Church St & Toombs St	TWSC	Northbound	11.9 (B)	22.5 (C)
12: SR 14/Roosevelt Hwy & Church St	TWSC	Eastbound	158.3 (F)	>300 (F)
		Westbound	90.9 (F)	>300 (F)
13: Atlanta Newnan Rd & Selborne Way	TWSC	N/A	N/A	N/A
14: Atlanta Newnan Rd & Selborne Ln	TWSC	Eastbound	11 (B)	9.8 (A)
15: Atlanta Newnan Rd & Serenbe Ln	TWSC	Eastbound	8.9 (A)	8.9 (A)
16: Atlanta Newnan Rd & Serenbe Ln	TWSC	Eastbound	0 (A)	9.5 (A)
17: Jim Star Rd & Tommy Lee Cook Rd	AWSC	Northbound	16.9 (C)	9.7 (A)

		Southbound	13 (B)	8.9 (A)
		Eastbound	12.3 (B)	8.7 (A)
		Westbound	19.7 (C)	10.8 (B)
18: Tommy Lee Cook Rd & Sardis Rd	TWSC	Southbound	10.8 (B)	10.1 (B)
19: Shell Rd & Tommy Lee Cook Rd	TWSC	Northbound	11.2 (B)	9.8 (A)
		Southbound	12.7 (B)	13.3 (B)
20: Tommy Lee Cook Rd & Waterworks Rd	TWSC	Southbound	10.3 (B)	11.9 (B)
21: SR 14/Roosevelt Hwy & Tommy Lee Cook Rd	TWSC	Eastbound	>300 (F)	>300 (F)
22: Cochran Mill Rd & S Fulton Pkwy	TWSC	Northbound	137.7 (F)	>300 (F)
		Southbound	47.4 (E)	28.4 (D)
23: Sardis Rd & Serenbe Driveway	N/A	N/A	N/A	N/A
24: SR 14/Roosevelt Hwy & Meadow Chase Way/Weldon Rd	Signalized	Northbound	37.8 (D)	46.4 (D)
		Southbound	60 (E)	117.1 (F)
		Eastbound	22.8 (C)	25.1 (C)
		Westbound	143.1 (F)	189 (F)
25: Tommy Lee Cook Rd & Cedar Ridge Rd	TWSC	Southbound	11.7 (B)	11 (B)

In the future 2032 no-build scenario all study intersections are anticipated to operate acceptably, LOS A-D, except for the study intersection of SR 14/US 29/Roosevelt Highway at Meadow Chase Way/Weldon Road, SR 14/US 29/Roosevelt Highway at Tommy Lee Cook Road, SR 14/US 29/Roosevelt Highway at Church St, and Cochran Mill Road at South Fulton Parkway which is anticipated to operate at LOS E-F during the AM and PM peak hour. This can be mitigated with roundabouts in the no build condition for SR 14/Roosevelt Hwy & Church St, SR 14/Roosevelt Hwy & Tommy Lee Cook Rd, and Cochran Mill Rd & S Fulton Pkwy bringing the LOS to 9.4 (A) in the AM and 17.9 (B) in the PM; 11.3 (B) in the AM and 28.2 (C) in the PM; and 11.4 (B) in the AM and 10.3 (B) in the PM respectively.

JURISDICTION	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
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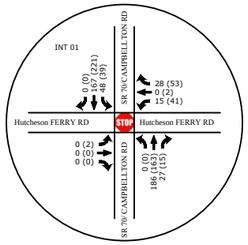
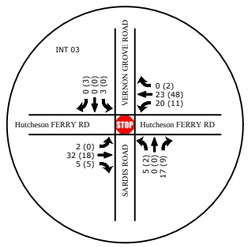
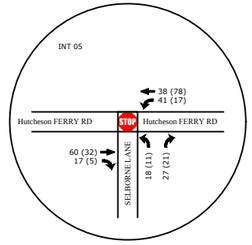
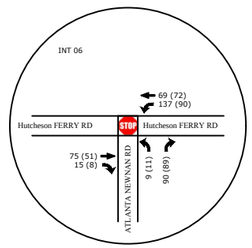
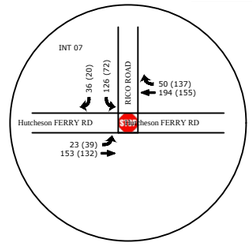
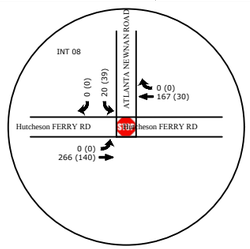


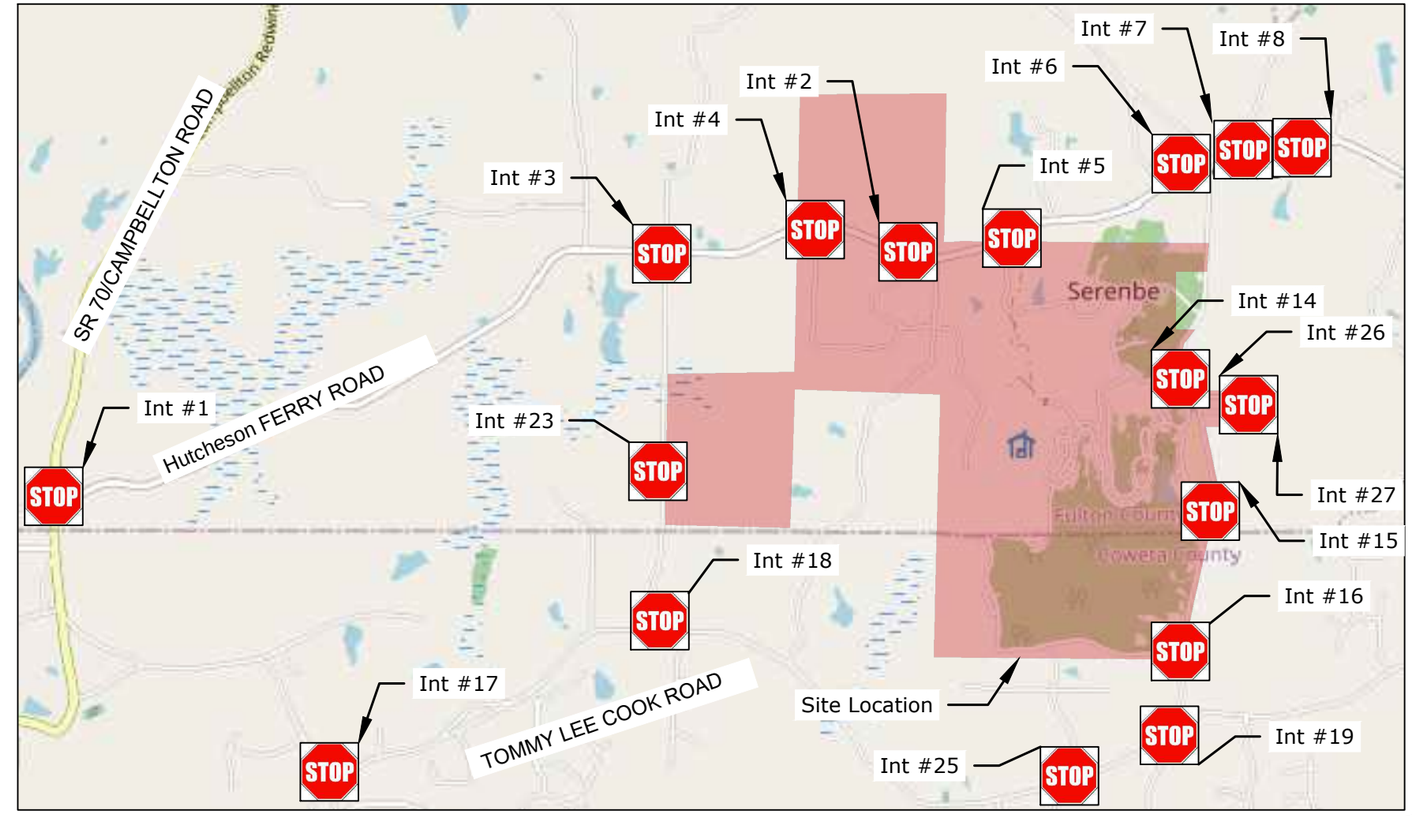




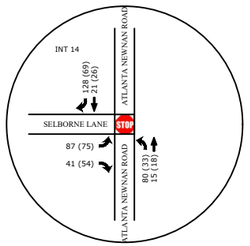


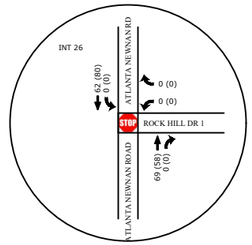


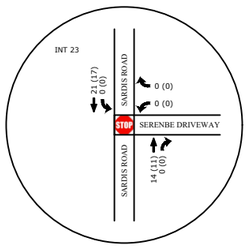


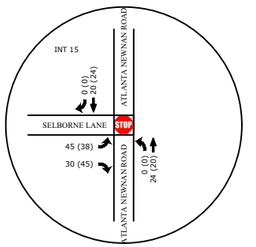


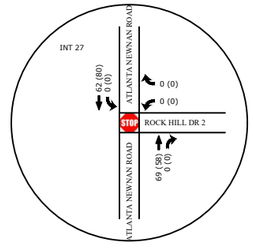
Legend: AM (PM)

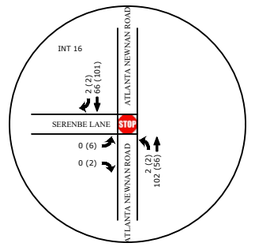


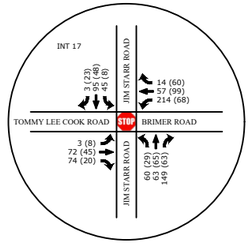


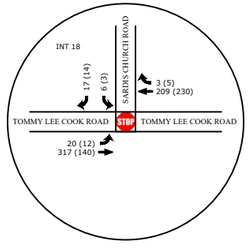


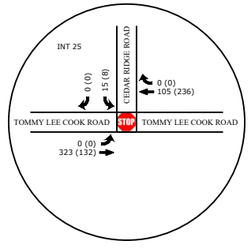












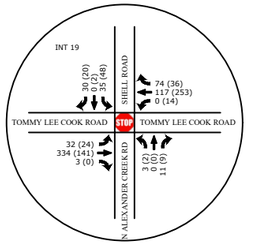


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FIGURE 14

SOUTHEASTERN ENGINEERING, INC.
2470 Sandy Plains Road
Marietta, Georgia 30066
tel: 770-321-3936
www.seengineering.com

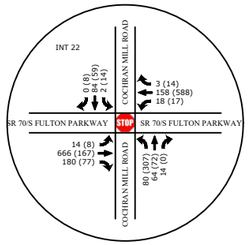
PHASE 3 (2032)
NO-BUILD (WEST)

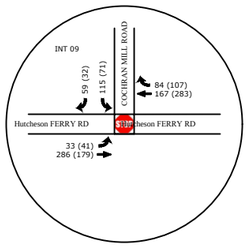
REVISION DATES		

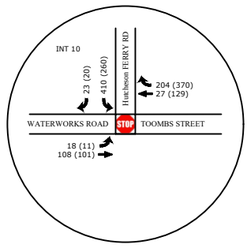
DATE:

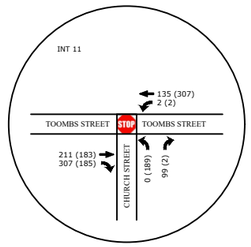
SERENBE DRI UPDATE

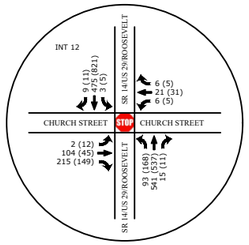
JURISDICTION	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
CHATTAHOOCHEE HILLS, GA	1402-24-179		

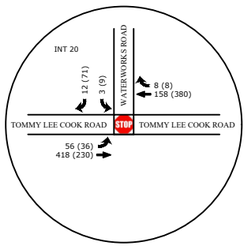


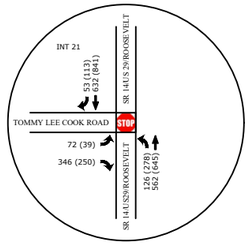


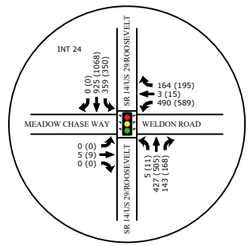












Legend: AM (PM)

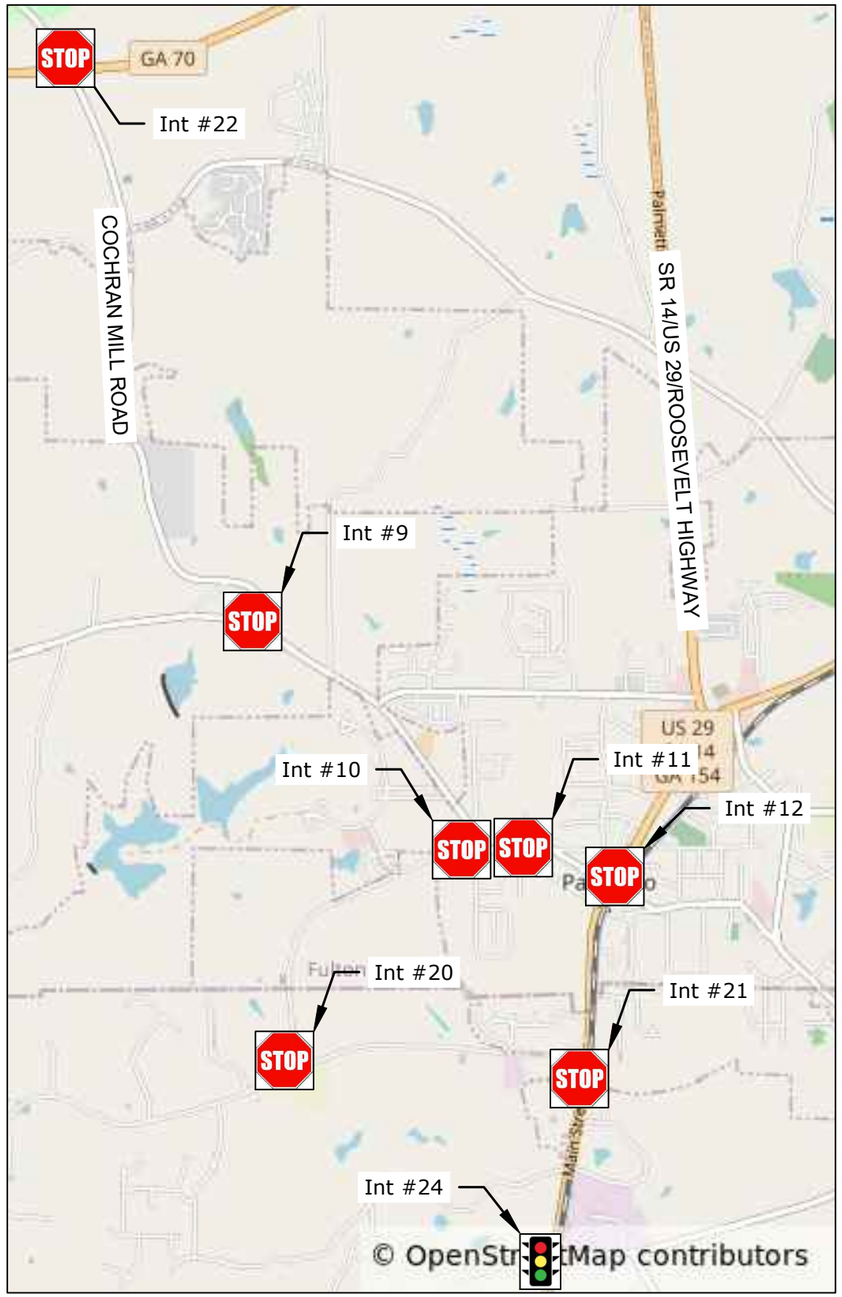


		FIGURE 15	SOUTHEASTERN ENGINEERING, INC. 2470 Sandy Plains Road Marietta, Georgia 30066 tel: 770-321-3936 www.seengineering.com	PHASE 3 (2032) NO-BUILD (EAST)	REVISION DATES	DATE: SERENBE DRI UPDATE

DRAWING NAME: I:\1402 Atwell\1402-24-179 Serenbe DRI Update\Traffic\DWG\Serenbe Figures.dwg
PLOT DATE - TIME: Aug. 08, 2025 - 4:06 PM
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Future Build Traffic Volumes (2032)

Future build traffic volumes for 2032 were calculated by adding the future 2032 no-build traffic volumes and Phase 3 site-generated peak hour volumes, assigned to the adjacent study network. Figures 16 and 17 show the future build (2032) traffic volumes.

Future Build Level of Service (2032)

The same methodology discussed previously was used to determine the level of service for the study intersections using the future build 2032 Phase 3 volumes. The intersection capacity analysis results for Phase 3 (2032) build are summarized in **Table 21** and detailed Synchro results are attached in **Appendix E**.

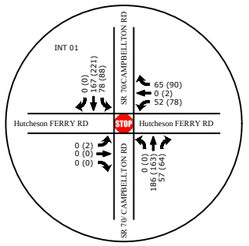
Table 21. Build Level of Service for Phase 3 - 2032

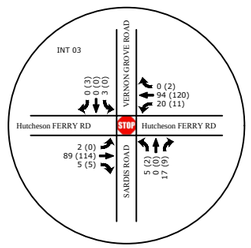
Intersection	Intersection Control	Approach	AM-Peak Delay (LOS)	PM-Peak Delay (LOS)
1: Campbellton Redwine Rd & Hutcheson Ferry Rd	TWSC	Eastbound	0 (A)	17 (C)
		Westbound	13.2 (B)	15.5 (C)
2: Hutcheson Ferry Rd & Farmette Driveway	N/A	N/A	N/A	N/A
3: Sardis Rd/Vernon Grove Rd & Hutcheson Ferry Rd	TWSC	Northbound	9.5 (A)	9.5 (A)
		Southbound	11.1 (B)	9.1 (A)
4: Serenbe Rd & Hutcheson Ferry Rd	N/A	N/A	N/A	N/A
5: Selborne Ln & Hutcheson Ferry Rd	TWSC	Northbound	10.6 (B)	10.6 (B)
6: Atlanta Newnan Rd & Hutcheson Ferry Rd	TWSC	Northbound	18.1 (C)	17.7 (C)
7: Hutcheson Ferry Rd & Rico Rd	TWSC	Southbound	17.3 (C)	16 (C)
8: Atlanta Newnan Rd & Hutcheson Ferry Rd	TWSC	Southbound	13.7 (B)	11.5 (B)
9: Hutcheson Ferry Rd & Cochran Mill Rd	TWSC	Southbound	25.6 (D)	22.5 (C)
10: Waterworks Rd/Toombs St & Hutcheson Ferry Rd	AWSC	Southbound	27 (D)	18.3 (C)
		Eastbound	11 (B)	10.8 (B)
		Westbound	12.3 (B)	30.6 (D)
11: Church St & Toombs St	TWSC	Northbound	13 (B)	35.4 (E)
12: SR 14/Roosevelt Hwy & Church St	TWSC	Eastbound	288.4 (F)	183.7 (F)
		Westbound	38.4 (E)	132.9 (F)
13: Atlanta Newnan Rd & Selborne Way	TWSC	N/A	N/A	N/A
14: Atlanta Newnan Rd & Selborne Ln	TWSC	Eastbound	17.8 (C)	15.7 (C)
15: Atlanta Newnan Rd & Serenbe Ln	TWSC	Eastbound	10.9 (B)	11.8 (B)
16: Atlanta Newnan Rd & Serenbe Ln	TWSC	Eastbound	12.5 (B)	14 (B)
17: Jim Star Rd & Tommy Lee Cook Rd	AWSC	Northbound	23.3 (C)	11.3 (B)
		Southbound	16 (C)	10.4 (B)

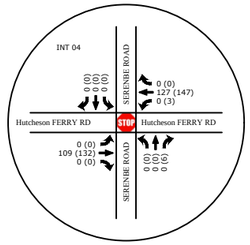
		Eastbound	15.1 (C)	10 (A)
		Westbound	36.2 (E)	14.1 (B)
18: Tommy Lee Cook Rd & Sardis Rd	TWSC	Southbound	11.5 (B)	10.7 (B)
19: Shell Rd & Tommy Lee Cook Rd	TWSC	Northbound	12.6 (B)	11.3 (B)
		Southbound	20.4 (C)	24.6 (C)
20: Tommy Lee Cook Rd & Waterworks Rd	TWSC	Southbound	11.2 (B)	13.5 (B)
21: SR 14/Roosevelt Hwy & Tommy Lee Cook Rd	TWSC	Eastbound	>300 (F)	>300 (F)
22: Cochran Mill Rd & S Fulton Pkwy	TWSC	Northbound	>300 (F)	>300 (F)
		Southbound	57.7 (F)	34.6 (D)
23: Sardis Rd & Serenbe Driveway	N/A	N/A	N/A	N/A
24: SR 14/Roosevelt Hwy & Meadow Chase Way/Weldon Rd	Signalized	Northbound	20.2 (B)	24 (C)
		Southbound	145.7 (F)	222.7 (F)
		Eastbound	12.3 (B)	12.3 (B)
		Westbound	47.8 (C)	115.9 (F)
		Overall	95.6 (F)	153.4 (F)
25: Tommy Lee Cook Rd & Cedar Ridge Rd	TWSC	Southbound	13.1 (B)	13.3 (B)
26. Atlanta Newnan Rd & Rock Hill Dr #1	TWSC	Westbound	10 (B)	10.5 (B)
27. Atlanta Newnan Rd & Rock Hill Dr #2	TWSC	Westbound	10.1 (B)	10.7 (B)

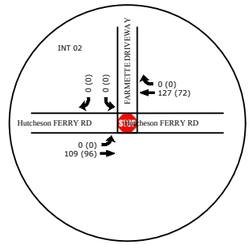
In the future 2029 build scenario all study intersections are anticipated to operate acceptably, LOS A-D, except for the study intersection of SR 14/US 29/Roosevelt Highway at Church St, SR 14/US 29/Roosevelt Highway at Tommy Lee Cook Road, Cochran Mill Road at South Fulton Parkway, and SR 14/US 29/Roosevelt Highway at Meadow Chase Way/Weldon Road, are expected to operate unacceptably, LOS E- F, during the AM and PM peak hour. Church Street at Toombs Street is expected to operate unacceptably, LOS E, during the PM peak hour and Jim Starr Road at Tommy Lee Cook Road is expected to operate unacceptably, LOS E, during the AM peak hour. Intersections 12, 21, 22, and 24 are failing in the no build condition. The system improvements recommended for the no build are adequate to handle the additional volume in the build condition. Church Street at Toombs Street and Jim Starr Road at Tommy Lee Cook Road fail in the build condition, but not in the no build condition. With the mitigation of a single lane roundabout at Jim Starr Road at Tommy Lee Cook Road, the LOS would improve to 5.6 (A) in the AM and 4.5 (A) in the PM.

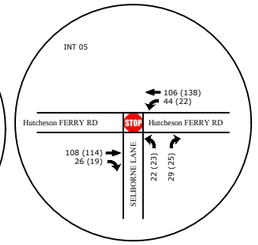
JURISDICTION	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
CHATTAHOOCHEE HILLS, GA	1402-24-179		

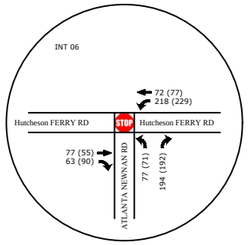


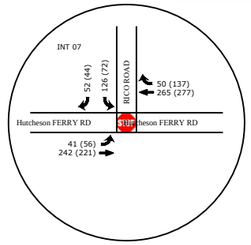


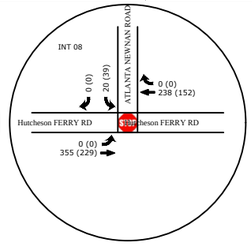


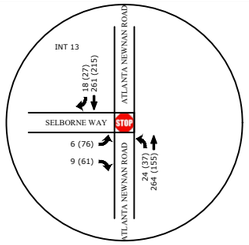


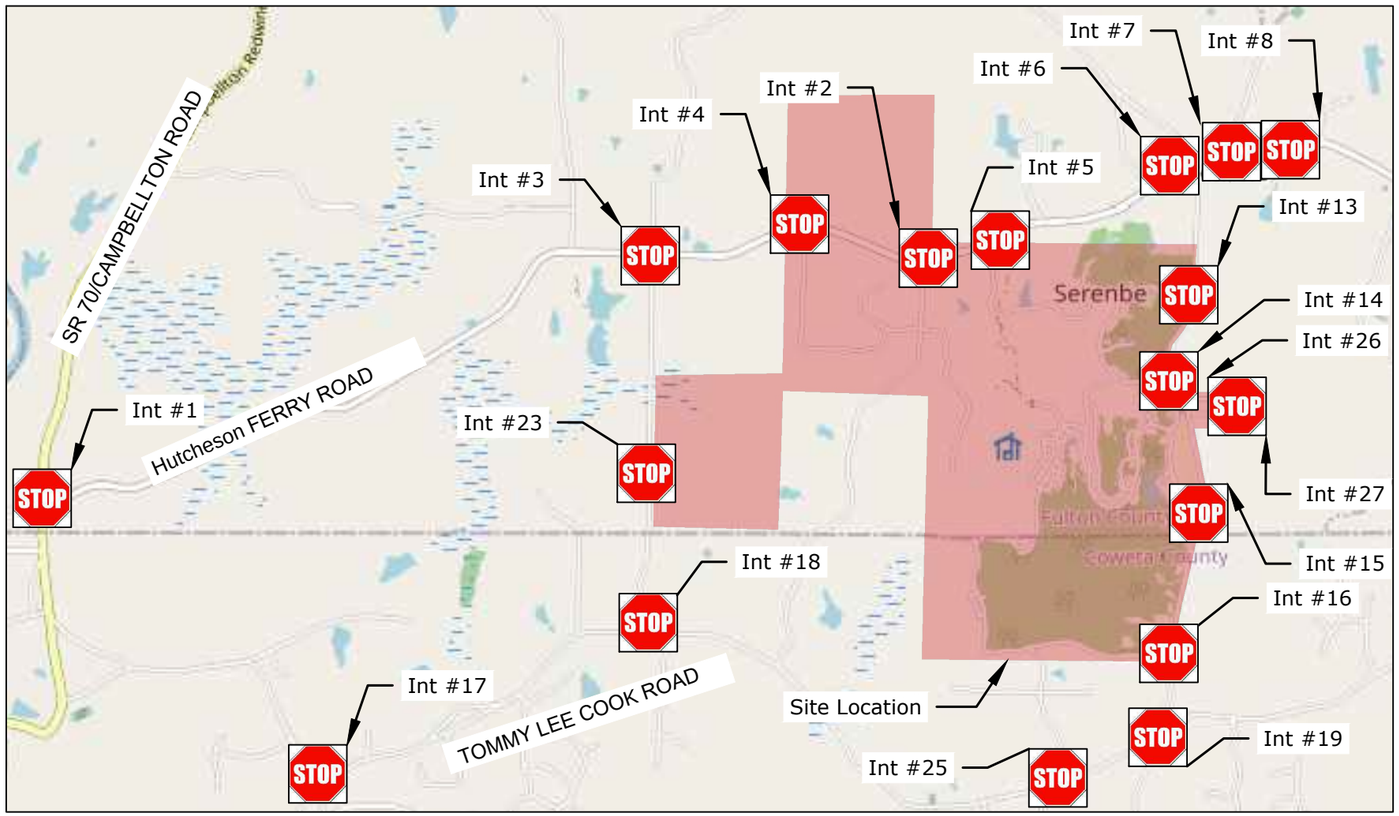




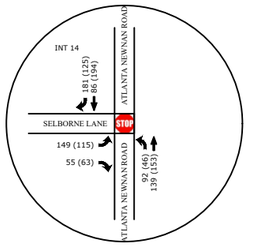


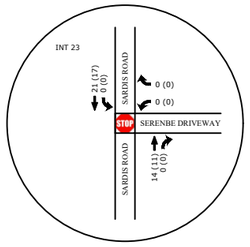


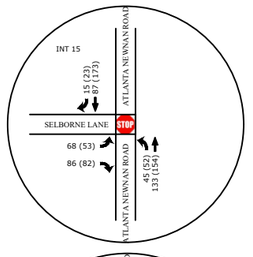


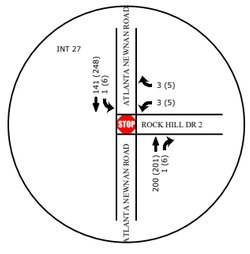


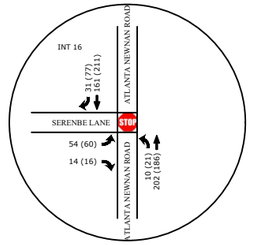
Legend: AM (PM)

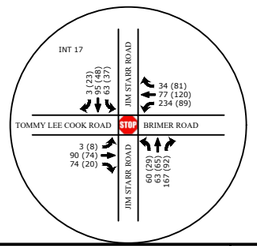


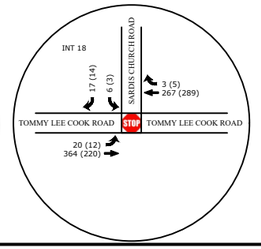


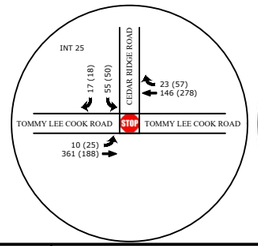












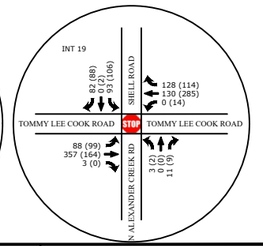


FIGURE 16

SOUTHEASTERN ENGINEERING, INC.
2470 Sandy Plains Road
Marietta, Georgia 30066
tel: 770-321-3936
www.seengineering.com

BUILD (2032) PHASE 3
PEAK HOUR VOLUMES
(WEST)

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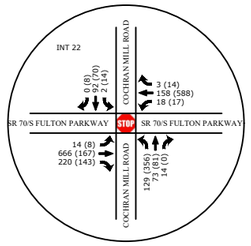
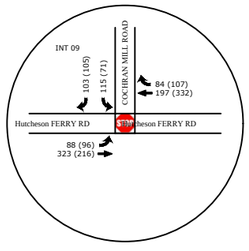
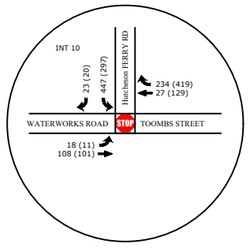
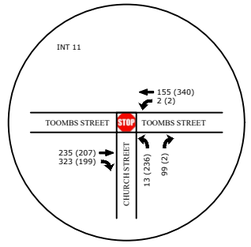
SERENBE DRI UPDATE

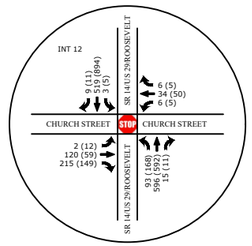
JURISDICTION	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
CHATTAHOOCHEE HILLS, GA	1402-24-179		

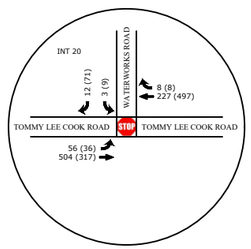


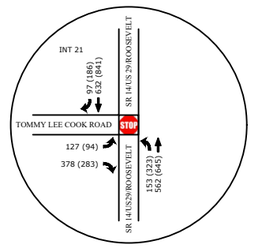


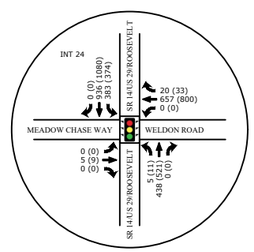












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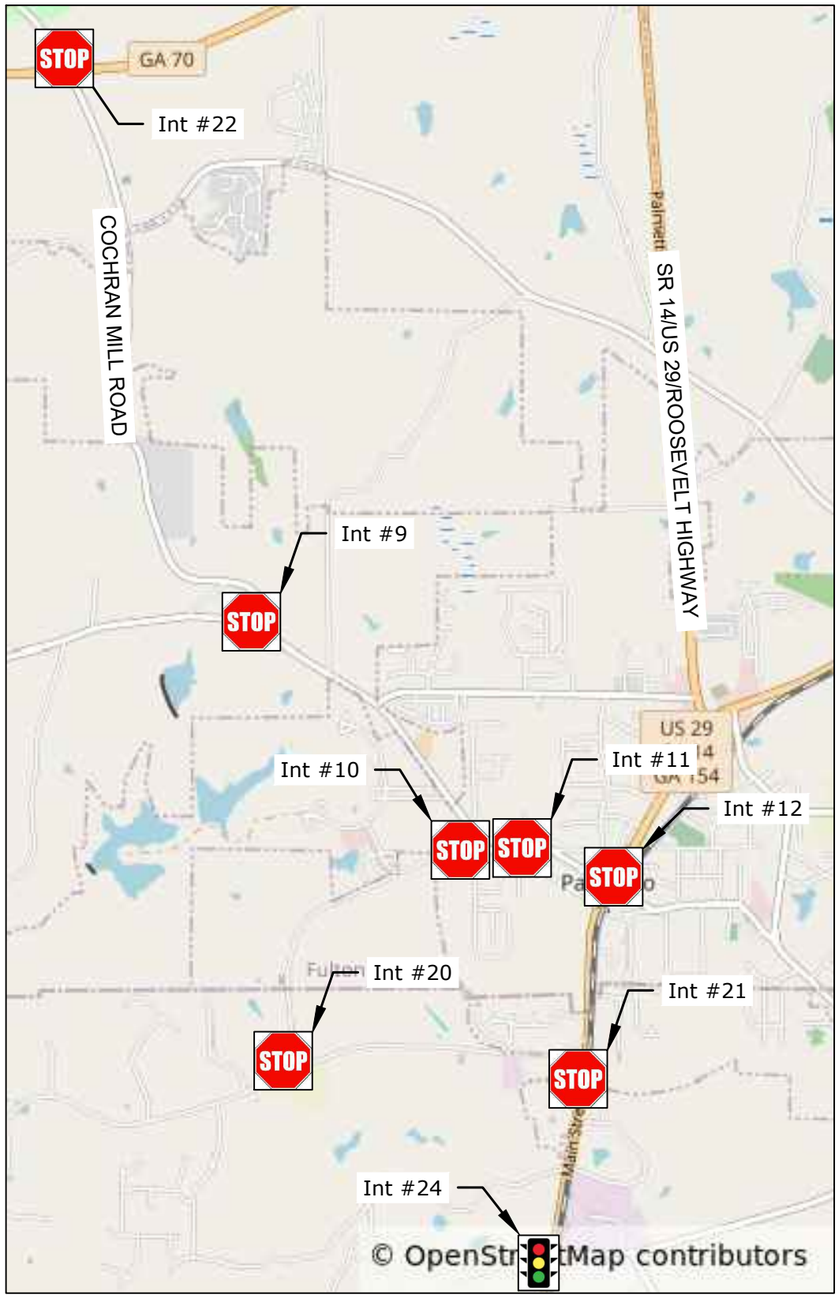

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PLOT DATE - TIME: Aug. 11, 2025 - 8:26 AM
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FIGURE 17

SOUTHEASTERN ENGINEERING, INC.
2470 Sandy Plains Road
Marietta, Georgia 30066
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www.seengineering.com

BUILD (2032) PHASE 3
PEAK HOUR VOLUMES
(EAST)

REVISION DATES		

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SERENBE DRI UPDATE

FUTURE CONDITIONS – PHASE 4 (2035)

Future No Build Traffic Volumes (2035)

The future 2035 background traffic volumes were calculated by applying the annual exponential growth rate (1.6%) over nine years to the existing background traffic volumes (2025) and adding the trips generated from the adjacent DRI's. It was assumed that the intersection improvements recommended under Phase 3 – 2032 will be implemented in 2035 and considered "existing" for the no-build analysis. The future 2035 no-build traffic volumes are shown in **Table 22**.

The same methodology discussed previously was used to determine the level of service for the study intersections using the future 2035 background traffic volumes. No-build 2035 analysis included Phase 3 improvements as base conditions. The intersection capacity analysis results for no-build Phase 4 (2035) are summarized in **Table 22** and detailed results are included in **Appendix E**.

Future No Build Level of Service (2035)

The same methodology discussed previously was used to determine the level of service for the study intersections using the future 2035 background traffic volumes. No-build 2035 analysis included Phase 3 improvements as base conditions. The intersection capacity analysis results for no-build Phase 4 (2035) are summarized in **Table 22** and detailed results are included in **Appendix E**.

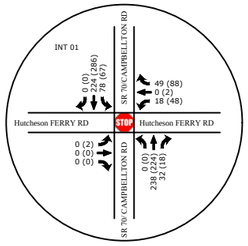
Table 22. No Build Level of Service for Phase 4 - 2035

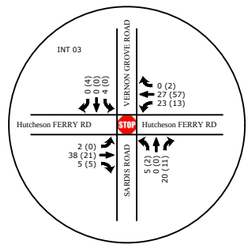
Intersection	Intersection Control	Approach	AM-Peak Delay (LOS)	PM-Peak Delay (LOS)
1: Campbellton Redwine Rd & Hutcheson Ferry Rd	TWSC	Eastbound	0 (A)	18.1 (C)
		Westbound	12.1 (B)	14.3 (B)
2: Hutcheson Ferry Rd & Farmette Driveway	N/A	N/A	N/A	N/A
3: Sardis Rd/Vernon Grove Rd & Hutcheson Ferry Rd	TWSC	Northbound	8.9 (A)	8.7 (A)
		Southbound	9.8 (A)	8.7 (A)
4: Serenbe Rd & Hutcheson Ferry Rd	N/A	N/A	N/A	N/A
5: Selborne Ln & Hutcheson Ferry Rd	TWSC	Northbound	9.9 (A)	9.2 (A)
6: Atlanta Newnan Rd & Hutcheson Ferry Rd	TWSC	Northbound	10.2 (B)	9.8 (A)
7: Hutcheson Ferry Rd & Rico Rd	TWSC	Southbound	16.5 (C)	14.7. (B)
8: Atlanta Newnan Rd & Hutcheson Ferry Rd	TWSC	Southbound	12.8 (B)	10 (B)
9: Hutcheson Ferry Rd & Cochran Mill Rd	TWSC	Southbound	29.3 (D)	24.7 (C)
10: Waterworks Rd/Toombs St & Hutcheson Ferry Rd	AWSC	Southbound	41.1 (E)	21.4 (C)
		Eastbound	12.1 (B)	11.7 (B)
		Westbound	13.8 (B)	48.9 (E)
11: Church St & Toombs St	TWSC	Northbound	13.2 (B)	39.5 (E)
12: SR 14/Roosevelt Hwy & Church St	TWSC	Eastbound	>300 (F)	>300 (F)
		Westbound	-	>300 (F)
13: Atlanta Newnan Rd & Selborne Way	TWSC	N/A	N/A	N/A
14: Atlanta Newnan Rd & Selborne Ln	TWSC	Eastbound	11.9 (B)	10.2 (B)
15: Atlanta Newnan Rd & Serenbe Ln	TWSC	Eastbound	9 (A)	9 (A)

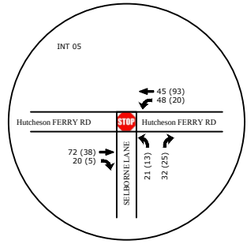
16: Atlanta Newnan Rd & Serenbe Ln	TWSC	Eastbound	0 (A)	9.7 (A)
17: Jim Star Rd & Tommy Lee Cook Rd	AWSC	Northbound	32.7 (D)	11 (B)
		Southbound	17.9 (C)	9.7 (A)
		Eastbound	17.1 (C)	9.4 (A)
		Westbound	42.3 (E)	12.9 (B)
18: Tommy Lee Cook Rd & Sardis Rd	TWSC	Southbound	11.5 (B)	10.6 (B)
19: Shell Rd & Tommy Lee Cook Rd	TWSC	Northbound	12.2 (B)	10.1 (A)
		Southbound	14.3 (B)	15.2 (C)
20: Tommy Lee Cook Rd & Waterworks Rd	TWSC	Southbound	11.1 (B)	13.2 (B)
21: SR 14/Roosevelt Hwy & Tommy Lee Cook Rd	TWSC	Eastbound	>300 (F)	294.9 (F)
22: Cochran Mill Rd & S Fulton Pkwy	TWSC	Northbound	137.7 (F)	>300 (F)
		Southbound	214.5 (F)	89.6 (F)
23: Sardis Rd & Serenbe Driveway	N/A	N/A	N/A	N/A
24: SR 14/Roosevelt Hwy & Meadow Chase Way/Weldon Rd	Signalized	Northbound	50.4 (D)	68.9 (E)
		Southbound	148.3 (F)	246.6 (F)
		Eastbound	22.2 (C)	25.2 (C)
		Westbound	213.9 (F)	283.4 (F)
25: Tommy Lee Cook Rd & Cedar Ridge Rd	TWSC	Southbound	12.6 (B)	11.7 (B)

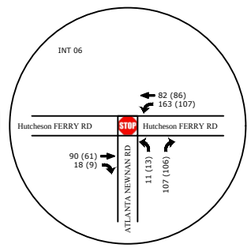
In the future 2035 no-build scenario all study intersections are anticipated to operate acceptably, LOS A-D, except for the study intersection of SR 14/US 29/Roosevelt Highway at Meadow Chase Way/Weldon Road, SR 14/US 29/Roosevelt Highway at Tommy Lee Cook Road, SR 14/US 29/Roosevelt Highway at Church St, Cochran Mill Road at South Fulton Parkway, and Waterworks Road/Toombs Street at Hutcheson Ferry Road which is anticipated to operate at LOS E-F during the AM and PM peak hour. Toombs Street at Church Street is anticipated to operate at LOS E during the PM peak hour.

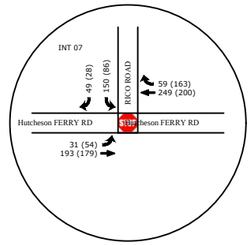
JURISDICTION	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
CHATTAHOOCHEE HILLS, GA	1402-24-179		

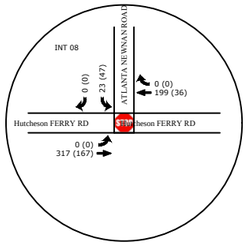


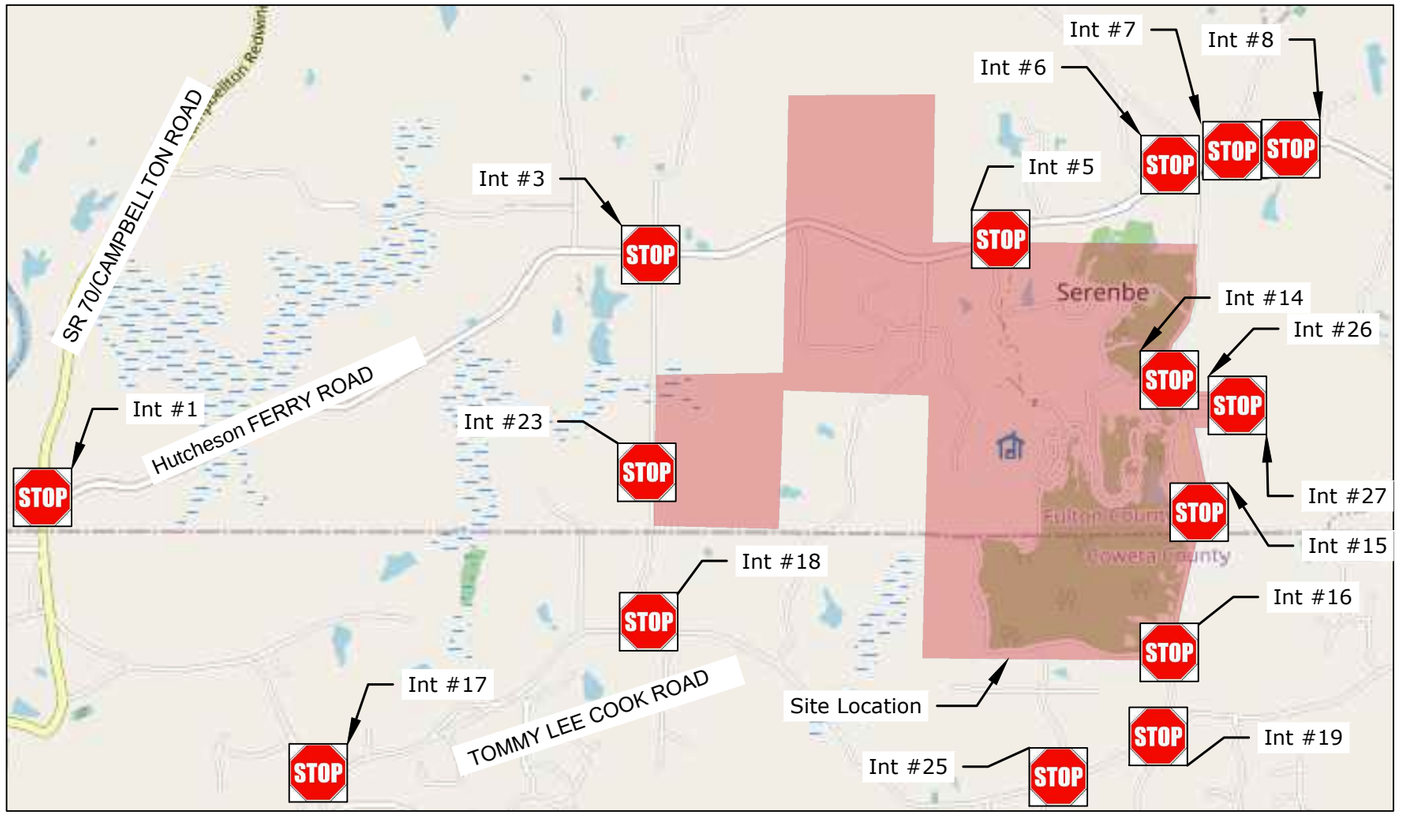












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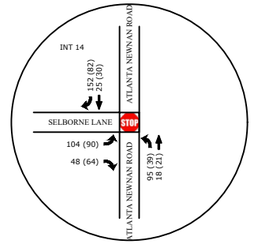

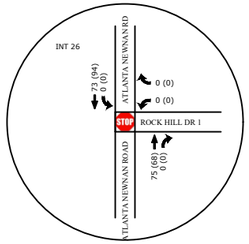

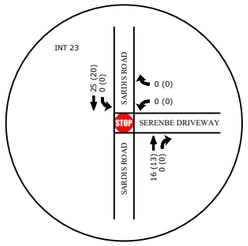

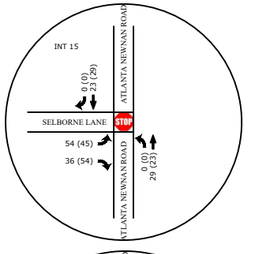

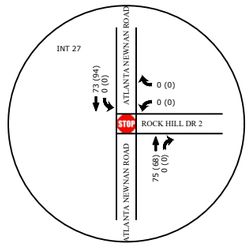

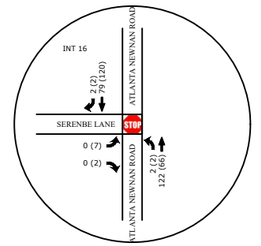

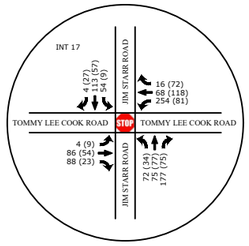

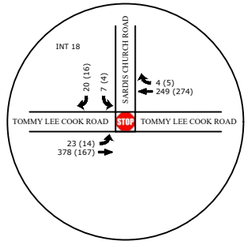

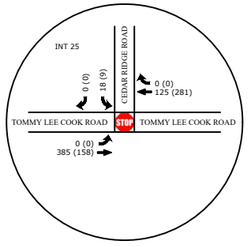

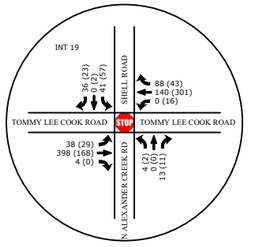

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FIGURE 18

SOUTHEASTERN ENGINEERING, INC.
2470 Sandy Plains Road
Marietta, Georgia 30066
tel: 770-321-3936
www.seengineering.com

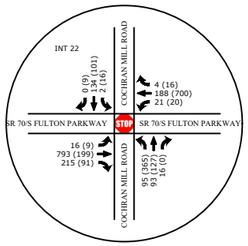
PHASE 4 (2035)
NO-BUILD (WEST)

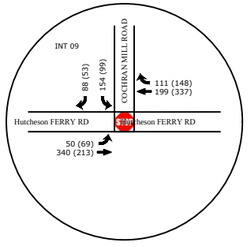
REVISION DATES		

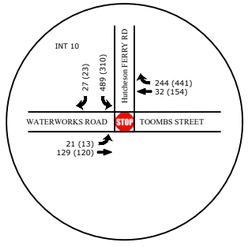
DATE:

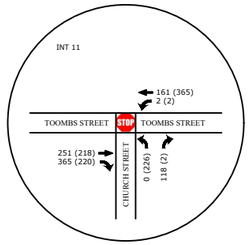
SERENBE DRI UPDATE

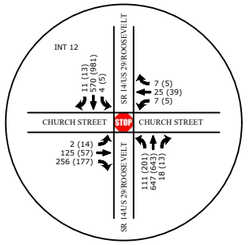
JURISDICTION	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
CHATTAHOOCHEE HILLS, GA	1402-24-179		

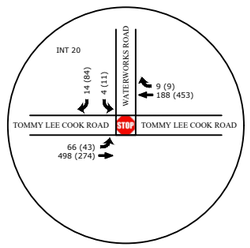


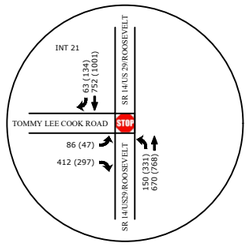


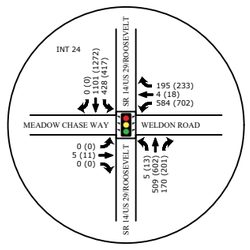




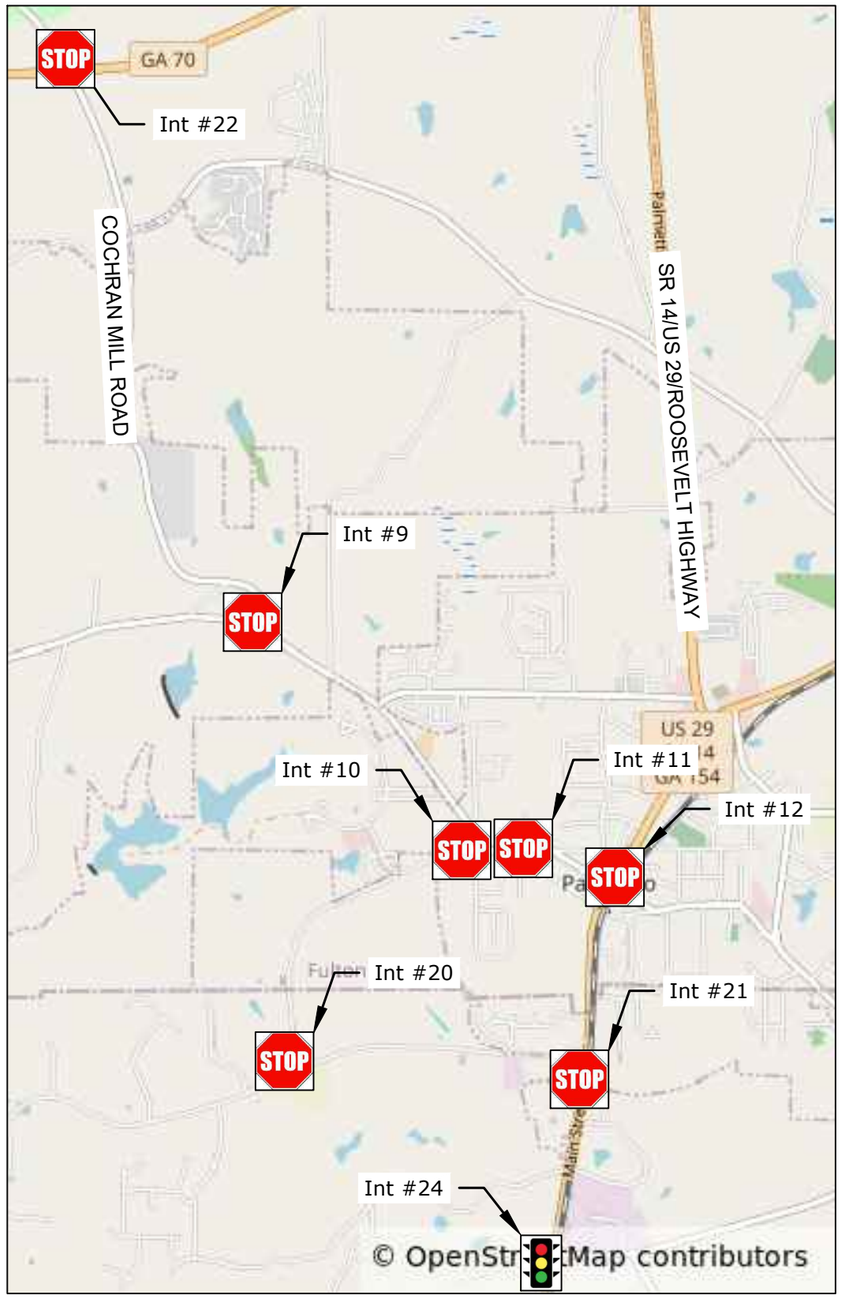








Legend: AM (PM)



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PLOT DATE - TIME: Aug. 08, 2025 - 4:07 PM
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FIGURE 19

SEI
SOUTHEASTERN ENGINEERING, INC.
2470 Sandy Plains Road
Marietta, Georgia 30066
Tel: 770-421-3936
www.seengineering.com

PHASE 4 (2035)
NO-BUILD (EAST)

REVISION DATES		

DATE:

SERENBE DRI UPDATE

Future Build Traffic Volumes (2035)

Future build traffic volumes for 2035 were calculated by adding the future 2035 no-build traffic volumes and Phase 4 site-generated peak hour volumes, assigned to the adjacent study network. Figures 20 and 21 show future build (2035) traffic volumes.

Future Build Level of Service (2035)

The same methodology discussed previously was used to determine the level of service for the study intersections using the future build 2035 Phase 4 volumes. The intersection capacity analysis results for Phase 4 (2035) build are summarized in Table 23 and detailed Synchro results are attached in **Appendix E**.

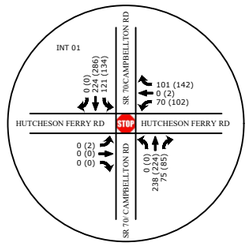
Table 23. Build Level of Service for Phase 4 - 2035

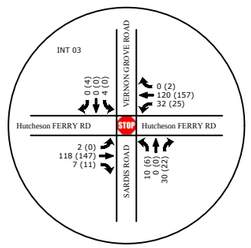
Intersection	Intersection Control	Approach	AM-Peak Delay (LOS)	PM-Peak Delay (LOS)
1: Campbellton Redwine Rd & Hutcheson Ferry Rd	TWSC	Eastbound	0 (A)	26.4 (D)
		Westbound	18.7 (C)	29.8 (D)
2: Hutcheson Ferry Rd & Farmette Driveway	TWSC	Southbound	10.1 (B)	10.6 (B)
3: Sardis Rd/Vernon Grove Rd & Hutcheson Ferry Rd	TWSC	Northbound	10.2 (B)	10.4 (B)
		Southbound	12.6 (B)	9.4 (A)
4: Serenbe Rd & Hutcheson Ferry Rd	TWSC	Northbound	9.9 (A)	10.3 (B)
		Southbound	10.4 (B)	11 (B)
5: Selborne Ln & Hutcheson Ferry Rd	TWSC	Northbound	11.8 (B)	11.7 (B)
6: Atlanta Newnan Rd & Hutcheson Ferry Rd	TWSC	Northbound	45.6 (E)	56.4 (F)
7: Hutcheson Ferry Rd & Rico Rd	TWSC	Southbound	29.5 (D)	24.6 (C)
8: Atlanta Newnan Rd & Hutcheson Ferry Rd	TWSC	Southbound	16 (C)	13 (B)
9: Hutcheson Ferry Rd & Cochran Mill Rd	TWSC	Southbound	131.2 (F)	105.8 (F)
10: Waterworks Rd/Toombs St & Hutcheson Ferry Rd	AWSC	Southbound	71.5 (F)	29.2 (D)
		Eastbound	12.9 (B)	12.5 (B)
		Westbound	16.7 (C)	100.1 (F)
11: Church St & Toombs St	TWSC	Northbound	15.4(C)	77.4 (F)
12: SR 14/Roosevelt Hwy & Church St	TWSC	Eastbound	>300 (F)	183.7 (F)
		Westbound	38.4 (E)	132.9 (F)
13: Atlanta Newnan Rd & Selborne Way	TWSC	N/A	N/A	N/A
14: Atlanta Newnan Rd & Selborne Ln	TWSC	Eastbound	29.8 (D)	22.5 (C)
15: Atlanta Newnan Rd & Serenbe Ln	TWSC	Eastbound	12.1 (B)	13.6 (B)
16: Atlanta Newnan Rd & Serenbe Ln	TWSC	Eastbound	14.5 (B)	17.4 (C)
17: Jim Star Rd & Tommy Lee Cook Rd	AWSC	Northbound	61.9 (F)	14.7 (B)

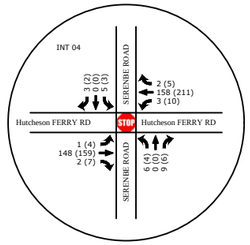
		Southbound	26 (D)	12.5 (B)
		Eastbound	24.8 (C)	11.8 (B)
		Westbound	144.1 (F)	24.4 (C)
18: Tommy Lee Cook Rd & Sardis Rd	TWSC	Southbound	13.4 (B)	12.2 (B)
19: Shell Rd & Tommy Lee Cook Rd	TWSC	Northbound	14.9 (B)	12.4 (B)
		Southbound	43.8 (E)	76.6 (F)
20: Tommy Lee Cook Rd & Waterworks Rd	TWSC	Southbound	12.7 (B)	16.3 (C)
21: SR 14/Roosevelt Hwy & Tommy Lee Cook Rd	TWSC	Eastbound	>300 (F)	>300 (F)
22: Cochran Mill Rd & S Fulton Pkwy	TWSC	Northbound	>300 (F)	>300 (F)
		Southbound	>300 (F)	169.5 (F)
23: Sardis Rd & Serenbe Driveway	TWSC	Westbound	8.7 (A)	8.7 (A)
24: SR 14/Roosevelt Hwy & Meadow Chase Way/Weldon Rd	Signalized	Northbound	20.2 (B)	24 (C)
		Southbound	145.7 (F)	222.7 (F)
		Eastbound	12.3 (B)	12.3 (B)
		Westbound	47.8 (C)	115.9 (F)
		Overall	95.6 (F)	153.4 (F)
25: Tommy Lee Cook Rd & Cedar Ridge Rd	TWSC	Southbound	15.1 (C)	15.3 (C)
26. Atlanta Newnan Rd & Rock Hill Dr #1	TWSC	Westbound	10.6 (B)	11.3 (B)
27. Atlanta Newnan Rd & Rock Hill Dr #2	TWSC	Westbound	10.7 (B)	11.6 (B)

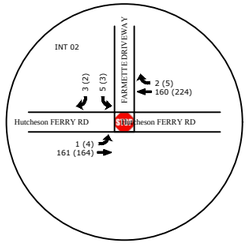
In the future 2029 build scenario all study intersections are anticipated to operate acceptably, LOS A-D, except for the study intersection of Atlanta Newnan Road at Hutcheson Ferry Road, Hutcheson Ferry Road at Cochran Mill Road, SR 14/US 29/Roosevelt Highway at Church St, Shell Road at Tommy Lee Cook Road, SR 14/US 29/Roosevelt Highway at Tommy Lee Cook Road, Cochran Mill Road at South Fulton Parkway, and SR 14/US 29/Roosevelt Highway at Meadow Chase Way/Weldon Road, are expected to operate unacceptably, LOS E- F, during the AM and PM peak hour. Church Street at Toombs Street is expected to operate unacceptably, LOS E, during the PM peak hour and Jim Starr Road at Tommy Lee Cook Road is expected to operate unacceptably, LOS E, during the AM peak hour.

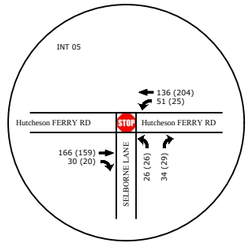
JURISDICTION	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
CHATTAHOOCHEE HILLS, GA	1402-24-179		

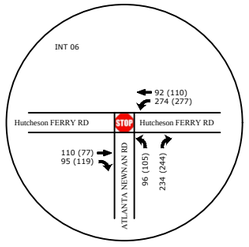


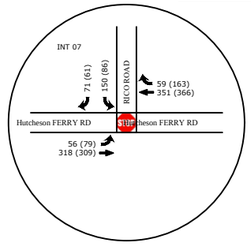


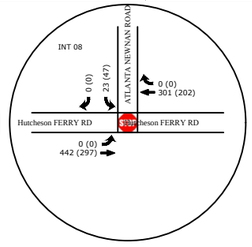


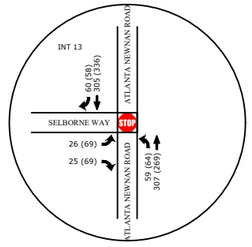


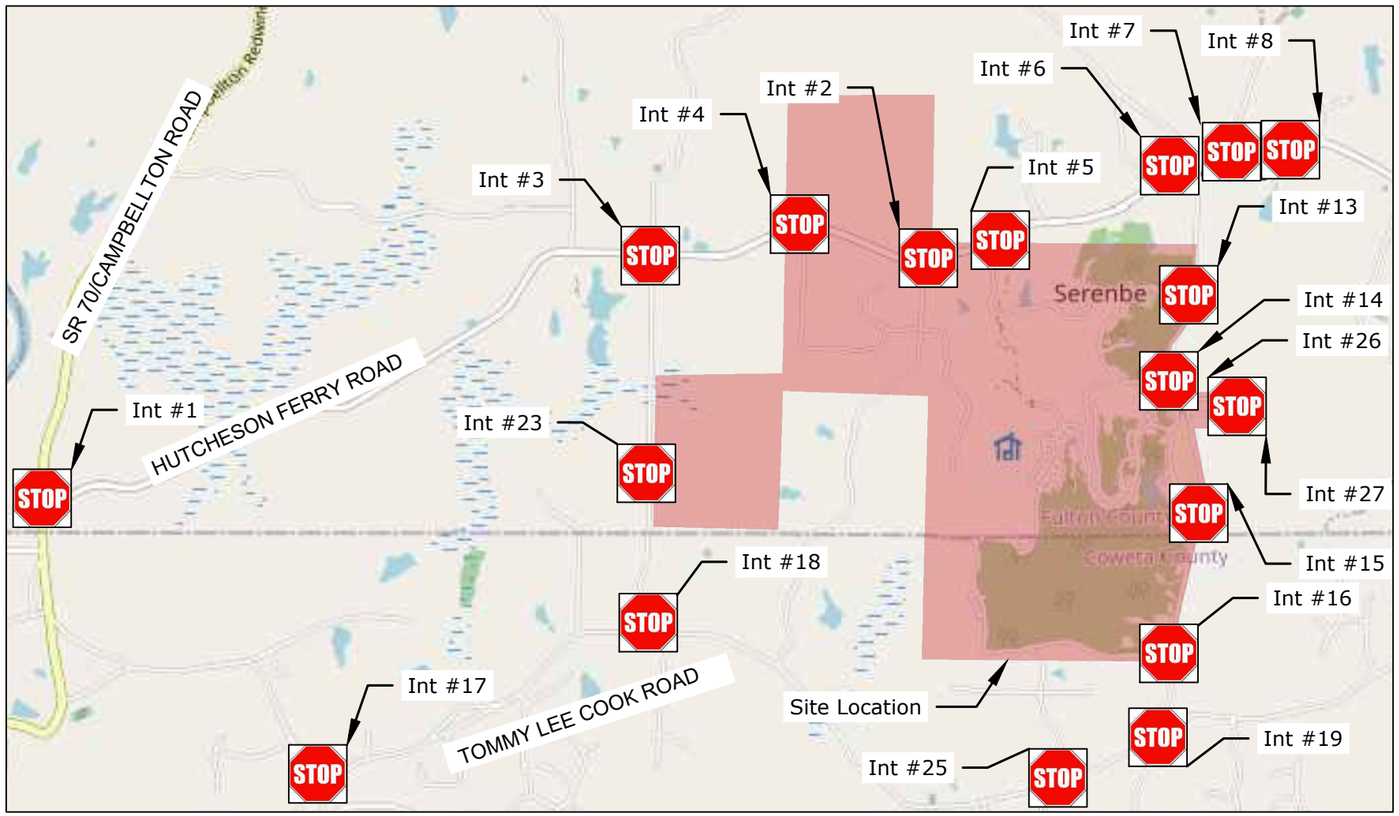




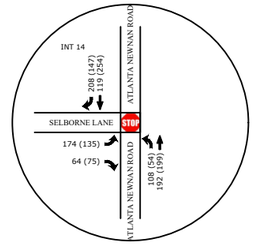


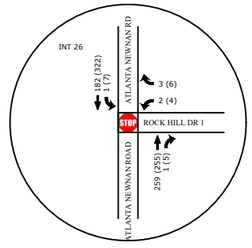


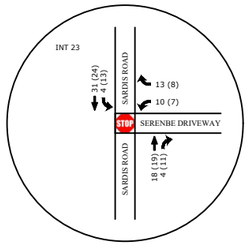


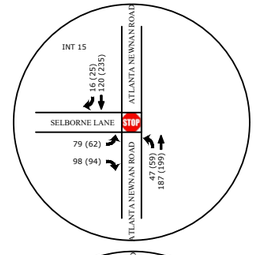


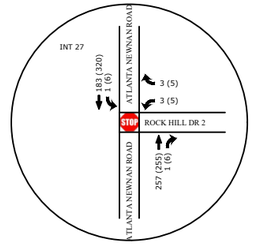
Legend: AM (PM)

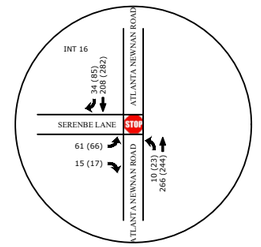


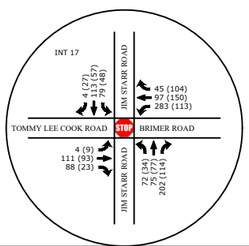


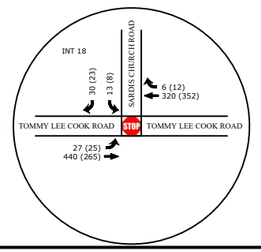


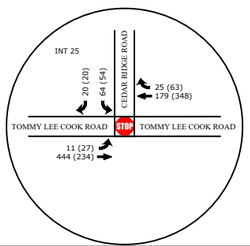












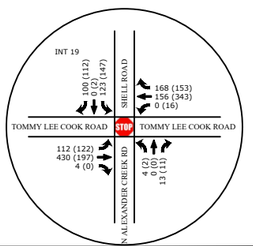


FIGURE 20

SOUTHEASTERN ENGINEERING, INC.
2470 Sandy Plains Road
Marietta, Georgia 30066
tel: 770-321-3936
www.seengineering.com

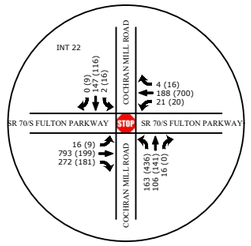
BUILD (2035) PHASE 4
PEAK HOUR VOLUMES
(WEST)

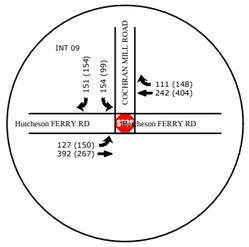
REVISION DATES		

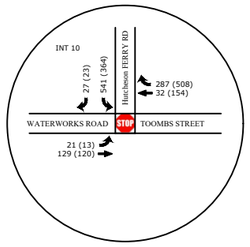
DATE:

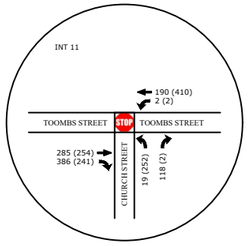
SERENBE DRI UPDATE

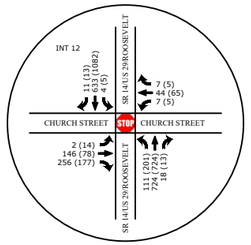
JURISDICTION	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
CHATTAHOOCHEE HILLS, GA	1402-24-179		

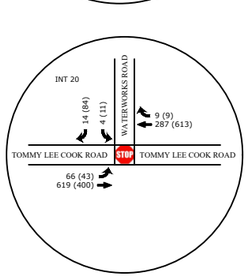


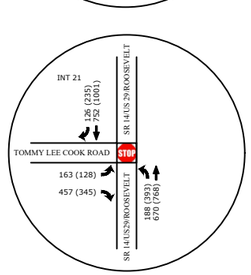


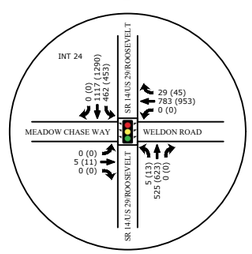


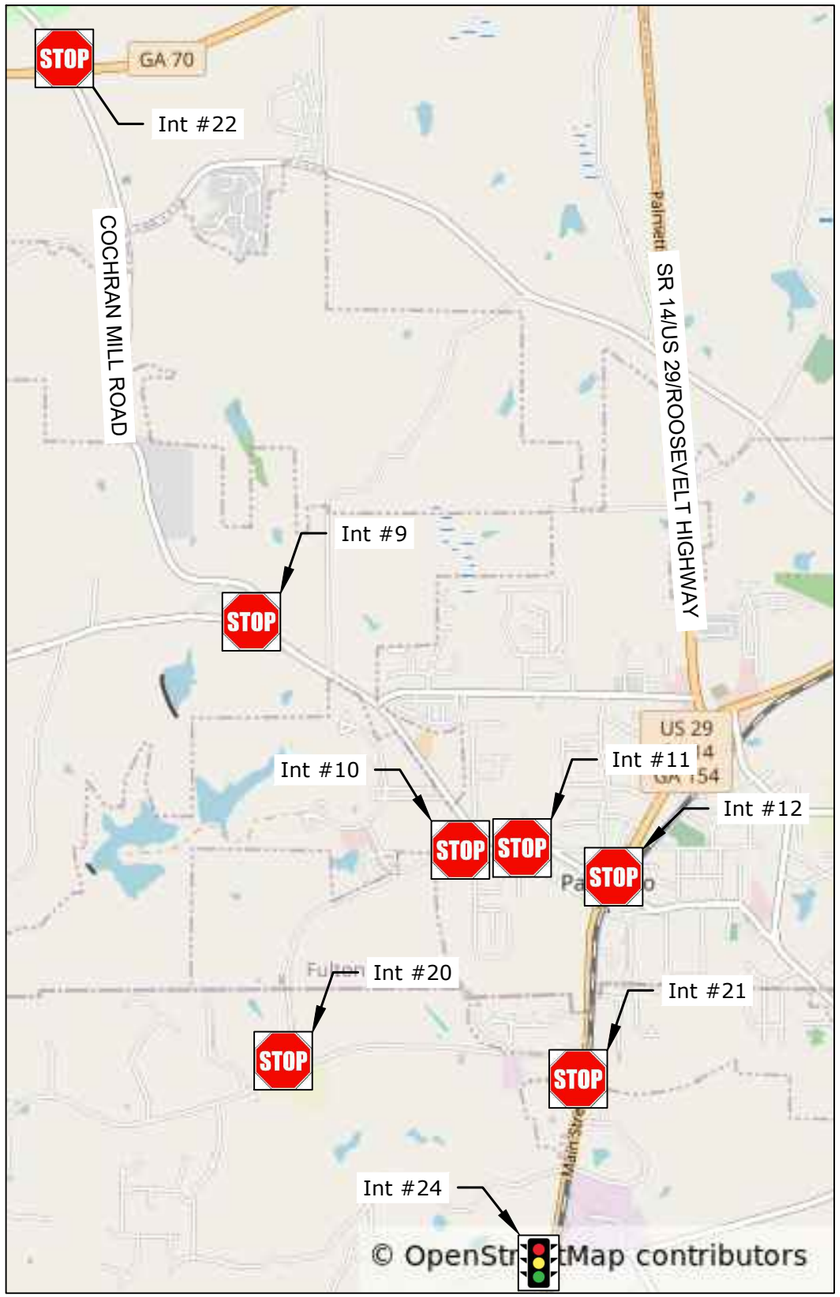












Legend: AM (PM)

		FIGURE 21	SOUTHEASTERN ENGINEERING, INC. 2470 Sandy Plains Road Marietta, Georgia 30066 tel: 770-321-3936 www.seengineering.com	BUILD (2035) PHASE 4 PEAK HOUR VOLUMES (EAST)	REVISION DATES	DATE: SERENBE DRI UPDATE

DRAWING NAME: I:\1402 Atwell\1402-24-179 Serenbe DRI Update\Traffic\DWG\Serenbe Figures.dwg
PLOT DATE - TIME:Aug. 11, 2025 - 8:27 AM
PRINTED BY: HAEMO KU

CONCLUSION AND RECOMMENDATION

The development was analyzed in four phases.

- Phase 1 will be completed by 2027.
- Phase 2 will be completed by 2029.
- Phase 3 will be completed by 2032.
- Phase 4 will be completed by 2035.

One of the existing intersections analyzed is operating at LOS E during the AM peak hour and PM peak hour. The intersection operating an unacceptable level of service is listed below.

- 21. SR 14/US 29/Roosevelt Hwy & Tommy Lee Cook Road

This could be mitigated by adding a channelized right turn lane in the eastbound direction. In the AM the LOS would improve to 19.8 (C) and 29. 2 (D) in the PM.

The following intersections will need improvements in the build condition that are not required in the no build condition.

6: Atlanta Newnan Rd & Hutcheson Ferry Rd

- Convert to a roundabout in phase 4 (developer)

9: Hutcheson Ferry Rd & Cochran Mill Rd

- Convert to a roundabout in phase 4 (developer) or add a channelized southbound right turn lane in phase 4 (developer)

11: Church St & Toombs St

- Convert to an all-way stop in phase 3 (developer)

17: Jim Star Rd & Tommy Lee Cook Rd

- Convert to a roundabout in phase 3 (developer) or signalize the intersection if warrants are met

Note: The LOS is below an acceptable level in the phase 4 no build and would require a system improvement at that time. Depending on the timing of the growth and build-out the improvements would need to be reviewed.

19: Shell Rd & Tommy Lee Cook Rd

- Convert to a roundabout in phase 4 (developer)

The following intersections will need system improvements to have an acceptable LOS. These system improvements are adequate to the handle the build conditions.

12: SR 14/Roosevelt Hwy & Church St

- Convert to a roundabout in phase 1 (system)

17: Jim Star Rd & Tommy Lee Cook Rd

- Convert to a roundabout in phase 4 (system) or signalize the intersection if warrants are met

21: SR 14/Roosevelt Hwy & Tommy Lee Cook Rd

- Add a channelized right turn lane in the eastbound direction in the existing (system)
- Convert to a roundabout in phase 1 (system)

22: Cochran Mill Rd & S Fulton Pkwy

- Convert to a roundabout in phase 1 (system)

24: SR 14/Roosevelt Hwy & Meadow Chase Way/Weldon Rd

- Add southbound left turn lane; convert westbound right turn lane into a through right; convert westbound through lane to a left turn; add westbound left turn lane in phase 2 (system)

Convert southbound right turn lane into a through-right in phase 4 (system)

APPENDICES

Appendix A : Site Plan

Appendix B : DRI Letter of Understanding

Appendix C : Traffic Counts Summary Sheets

Appendix D : Synchro Reports