TRAFFIC IMPACT STUDY FOR

DRI #3558
IDI/GRAVEL SPRINGS ROAD DISTRIBUTION CENTER

DATE:
March 1, 2022

LOCATION:
Buford, Gwinnett County, Georgia

PREPARED FOR:
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Executive Summary

A new 1,026,813 square foot (sf) industrial development is proposed for construction northwest of the I-85 interchange on SR 324/Gravel Springs Road (Gravel Springs Road), in Buford, Gwinnett County, Georgia. The development will contain three (3) new driveways along Gravel Springs Road: two (2) full-access driveways and one (1) Right-In/Right-Out (RIRO) driveway. The proposed full-access driveways will connect to Gravel Springs Road and align with the existing Camp Branch Road and Ivy Creek Road intersections. The proposed RIRO driveway will connect and align to Gravel Springs Road between Ivy Creek Road and Brown Road.

The development is expected to be built-out by 2024 and will generate a total of 1,660 new daily trips. Of these daily volumes, 147 new trips (113 entering and 34 exiting) are expected to occur during the AM peak hour and 150 new trips (42 entering and 108 exiting) are expected to occur during the PM peak hour.

Existing intersections adjacent to the planned development were evaluated to determine if new roadway geometries or traffic controls will be needed once the new development is built. The following intersections evaluated in this study are:

1. SR 324/Gravel Springs Road at I-85 Northbound ramps
2. SR 324/Gravel Springs Road at I-85 Southbound ramps
3. SR 324/Gravel Springs Road at Camp Branch Road/Site Driveway 1
4. SR 324/Gravel Springs Road at Ivy Creek Road/Site Driveway 2
5. SR 324/Gravel Springs Road at Site Driveway 3
6. SR 324/Gravel Springs Road at Brown Road
7. SR 324/Gravel Springs Road at Mall of Georgia Boulevard

By build-out, the I-85 overpass at Gravel Springs Road GDOT PI # 0012698 is programmed to be complete and replace the existing overpass between the I-85 northbound and southbound interchange ramps. Seven (7) additional roadway improvement projects are programmed and planned for future years by or after the 2024 build-out year by City of Buford, Gwinnett County, and GDOT authorities. However, only the I-85 overpass project was evaluated in future conditions since it is the only programmed project that will be installed by the build-out year.

Existing and No-Build Conditions evaluated peak hour traffic volumes with existing traffic controls and lane geometries. Build Conditions evaluated peak hour traffic volumes with existing traffic controls and lane geometries, with optimized timing splits from the Existing and No-Build cycle lengths.

Additionally, there are multiple adjacent developments being built or planned to be built along Gravel Springs Road in future conditions. The following developments and their associated site traffic on the study network were evaluated in future No-Build Conditions:

- New Gas Station – SR 324/Gravel Springs Rd and Brown Road/Ivy Creek Road
  (4,000 sf convenience store; 1,250 sf retail space; opens 2023)
- Oakmont Gravel Springs Road – 3020 Gravel Springs Road (333,325 sf warehouse)
- DRI # 3274 – Brown Road Project
- DRI # 3213 – Kilburn/Gravel Springs Road
- DRI # 1071 – The Villages at Ivy Creek

The trip assignments of these adjacent developments were obtained by NV5 and combined to account for future development site traffic expected to occur along Gravel Springs Road, in addition to pass-by trips associated with the new gas station.

From the conducted analysis, the following additional mitigations will be needed at the following study intersections beyond the programmed project mentioned above:

SR 324/Gravel Springs Road at Camp Branch Road/Site Driveway 1

- Dedicated left turn and shared through/right turn lanes on Camp Branch Road/Site Driveway 1
- Permissive phasing on Camp Branch Road/Site Driveway 1

SR 324/Gravel Springs Road at Ivy Creek Road/Site Driveway 2

- Dedicated left turn and shared through/right turn lanes on Site Driveway 2
- Dedicated right turn and shared left/through turn lanes on Ivy Creek Road

SR 324/Gravel Springs Road at Brown Road

- Signalized traffic control

SR 324/Gravel Springs Road at Mall of Georgia Boulevard

- Install dual northbound right turn lanes with protected overlap phasing with westbound dual left phasing.
- Optimized signal timing cycle length improvements in both peak hours to accommodate future traffic volumes.

These additional mitigations in the study network are based on the capacity analysis results identified for movements with failing Levels of Service (LOS) E or F by No-Build and Build Conditions. Future traffic volumes at the SR 324/Gravel Springs Road at Brown Road intersection warrant a traffic signal. Optimized signal timing plans should be considered at all signalized intersections in future years to accommodate future traffic volumes.

Future traffic volumes do not warrant signalized controls at the SR 324/Gravel Springs Road at Ivy Creek Road/Site Driveway 2 intersection. However, consideration should be made by the local jurisdiction to install a traffic signal at this intersection to minimize side street LOS F observed in future years.

A summary of the changes observed in intersections with failing LOS approaches between Existing and No-Build, and between No-Build and Build Conditions during AM and PM peak hours. These analysis comparisons are identified on the following pages in Tables A and B, respectfully.

Table C notes failing LOS approaches in the Build Condition only, with a relationship showing the percent of site traffic associated with all other future movements and approaches with LOS E or F.

Finally, Table D summarizes where the left turn or right turn storage lengths and taper lengths at intersections with LOS E or F are exceeded by either existing or future traffic volumes.

The general conditions and roadway improvement conditions that are recommended for this DRI are on the pages following the Table D results.

Table A: Capacity Analysis Result Summary – Existing and No-Build Conditions

ID	Intersection	Control	Movement	AM				PM			
				Existing		No-Build		Existing		No-Build	
				LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
1	SR 324/Gravel Springs Road & I-85 Northbound Ramps	Signal	**Overall**	**B**	**19.5**	**C**	**23.4**	**C**	**27.6**	**D**	**41.6**
			EB	C	33.4	D	44.7	E	62.8	F	91.0
			NB	C	26.6	C	29.4	C	34.7	D	46.6
			SB	A	2.2	A	7.0	A	8.5	B	19.5
2	SR 324/Gravel Springs Road & I-85 Southbound Ramps	Signal	**Overall**	**B**	**19.7**	**C**	**26.0**	**C**	**25.1**	**C**	**29.9**
			WB	D	45.7	D	54.4	D	53.4	F	83.1
			NB	B	12.0	B	16.3	B	12.7	B	15.9
			SB	C	24.7	C	32.2	C	30.4	C	30.7
3	SR 324/Gravel Springs Road & Camp Branch Road/Site Driveway 1	Signal	**Overall**	**B**	**11.8**	**C**	**23.0**	**C**	**24.5**	**C**	**27.8**
			EB	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			WB	C	28.2	D	45.2	D	46.3	D	47.9
			NB	A	8.3	C	22.6	C	31.5	D	35.4
			SB	A	7.7	B	10.1	B	11.0	B	15.2
4	SR 324/Gravel Springs Road & Ivy Creek Road/Site Driveway 2	Stop-Control	**Overall**	**A**	**4.7**	**C**	**23.3**	**B**	**10.4**	**D**	**33.8**
			EB	B	11.6	B	14.3	B	11.6	B	13.9
			WB	A	0.0	A	0.0	A	0.0	A	0.0
			NB	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			SB	F	111.4	F	664.4	F	451.4	F	1631.9
5	SR 324/Gravel Springs Road & Site Driveway 3	No Intersection	**Overall**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			EB	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			WB	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			NB	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6	SR 324/Gravel Springs Road & Brown Road	Stop-Control	**Overall**	**A**	**0.3**	**F**	**267.6**	**A**	**0.5**	**F**	**1096.4**
			EB	B	12.1	B	13.0	A	0.0	B	11.6
			WB	A	9.0	B	11.6	B	13.7	C	23.1
			NB	D	30.9	F	2305.5	E	47.3	F	9815.6
			SB	E	40.7	F	1602.6	F	194.5	F	8274.7
7	SR 324/Gravel Springs Road & Mall of Georgia Boulevard	Signal	**Overall**	**B**	**12.7**	**B**	**14.7**	**E**	**57.3**	**F**	**88.3**
			EB	B	11.0	B	17.7	C	24.5	C	34.6
			WB	B	11.8	B	11.5	B	18.6	C	26.6
			NB	B	18.2	C	20.6	F	161.3	F	255.8
			SB	C	20.3	C	22.3	B	18.4	B	19.9

Table B: Capacity Analysis Result Summary – No-Build and Build Conditions

ID	Intersection	Control	Movement	AM				PM			
				No-Build		Build		No-Build		Build	
				LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
1	SR 324/Gravel Springs Road & I-85 Northbound Ramps	Signal	**Overall**	**C**	**23.4**	**C**	**24.9**	**D**	**41.6**	**D**	**44.5**
			EB	D	44.7	D	44.0	F	91.0	F	90.2
			NB	C	29.4	C	31.4	D	46.6	D	47.8
			SB	A	7.0	A	7.6	B	19.5	C	25.3
2	SR 324/Gravel Springs Road & I-85 Southbound Ramps	Signal	**Overall**	**C**	**26.0**	**C**	**26.5**	**C**	**29.9**	**C**	**33.2**
			WB	D	54.4	D	50.8	F	83.1	D	54.0
			NB	B	16.3	B	17.5	B	15.9	B	15.6
			SB	C	32.2	C	32.9	C	30.7	D	43.3
3	SR 324/Gravel Springs Road & Camp Branch Road/Site Driveway 1	Signal	**Overall**	**C**	**23.0**	**C**	**28.1**	**C**	**27.8**	**C**	**23.6**
			EB	N/A	N/A	C	21.8	N/A	N/A	C	25.9
			WB	D	45.2	D	43.5	D	47.9	D	44.5
			NB	C	22.6	C	28.7	D	35.4	B	18.2
			SB	B	10.1	B	17.7	B	15.2	C	22.7
4	SR 324/Gravel Springs Road & Ivy Creek Road/Site Driveway 2	Stop-Control	**Overall**	**C**	**23.3**	**F**	**50.6**	**D**	**33.8**	**F**	**80.7**
			EB	B	14.3	C	16.9	B	13.9	C	18.3
			WB	A	0.0	A	9.5	A	0.0	C	16.2
			NB	N/A	N/A	F	161.6	N/A	N/A	F	1552.5
			SB	F	664.4	F	1508.6	F	1631.9	F	3880.6
5	SR 324/Gravel Springs Road & Site Driveway 3	No Intersection to Stop-Control	**Overall**	N/A	N/A	**A**	**0.0**	N/A	N/A	**A**	**0.0**
			EB	N/A	N/A	A	0.0	N/A	N/A	A	0.0
			WB	N/A	N/A	A	0.0	N/A	N/A	A	0.0
			NB	N/A	N/A	B	11.5	N/A	N/A	C	24.2
6	SR 324/Gravel Springs Road & Brown Road	Stop-Control	**Overall**	**F**	**267.6**	**F**	**275.5**	**F**	**1096.4**	**F**	**1085.5**
			EB	B	13.0	B	13.1	B	11.6	B	11.8
			WB	B	11.6	B	11.9	C	23.1	C	23.4
			NB	F	2305.5	F	2419.4	F	9815.6	F	9815.6
			SB	F	1602.6	F	1602.6	F	8274.7	F	8274.7
7	SR 324/Gravel Springs Road & Mall of Georgia Boulevard	Signal	**Overall**	**B**	**14.7**	**B**	**14.7**	**F**	**88.3**	**F**	**88.7**
			EB	B	17.7	B	17.6	C	34.6	D	35.9
			WB	B	11.5	B	11.6	C	26.6	C	26.5
			NB	C	20.6	C	20.8	F	255.8	F	257.7
			SB	C	22.3	C	22.5	B	19.9	B	20.0

Table C: Build Condition Comparison Summary – Failing Approach and Site Traffic Relationships

ID	Intersection	Control	Movement	AM Volume Relations					PM Volume Relations				
				LOS	Delay	Site Traffic	Total Traffic	% of Total Traffic	LOS	Delay	Site Traffic	Total Traffic	% of Total Traffic
1	SR 324/Gravel Springs Road & I-85 Northbound Ramps	Signal	**Overall**	**C**	**24.9**	68	3482	2%	**D**	**44.5**	69	4393	2%
			EB	D	44.0	28	314	9%	F	90.2	11	756	1%
			NB	C	31.4	24	2046	1%	D	47.8	8	1564	1%
			SB	A	7.6	16	1122	1%	C	25.3	50	2073	2%
4	SR 324/Gravel Springs Road & Ivy Creek Road/Site Driveway 2	Stop-Control	**Overall**	**F**	**50.6**	62	2609	2%	**F**	**80.7**	84	3551	2%
			EB	C	16.9	16	870	2%	C	18.3	40	1964	2%
			WB	A	9.5	34	1502	2%	C	16.2	23	1359	2%
			NB	F	161.6	11	11	100%	F	1552.5	21	21	100%
			SB	F	1508.6	1	226	0%	F	3880.6	0	207	0%
6	SR 324/Gravel Springs Road & Brown Road	Stop-Control	**Overall**	**F**	**275.5**	35	2768	1%	**F**	**1085.5**	36	3615	1%
			EB	B	13.1	27	810	3%	B	11.8	10	1819	1%
			WB	B	11.9	8	1622	0%	C	23.4	26	1390	2%
			NB	F	2419.4	0	271	0%	F	9815.6	0	364	0%
			SB	F	1602.6	0	65	0%	F	8274.7	0	42	0%
7	SR 324/Gravel Springs Road & Mall of Georgia Boulevard	Signal	**Overall**	**B**	**14.7**	35	2554	1%	F	**88.7**	36	3514	1%
			EB	B	17.6	22	682	3%	D	35.9	9	1244	1%
			WB	B	11.6	8	1335	1%	C	26.5	26	1335	2%
			NB	C	20.8	5	135	4%	F	257.7	1	895	0%
			SB	C	22.5	0	246	0%	B	20.0	0	40	0%

Table D: Left Turn/Right Turn Storage Length Queue Summary

ID	Intersection	Turn Lane / Movement Approach	50th (90th) Percentile Queues, in feet							
			Lengths, in feet		Existing		No-Build		Build	
			Storage	Taper	AM	PM	AM	PM	AM	PM
1	SR 324/Gravel Springs Road & I-85 Northbound Ramps	EBL[1]	225	150	62 (150)	161 (270)	110 (243)	211 (379)	88 (164)	129 (175)
		EBR	225	N/A	28 (88)	180 (298)	22 (65)	158 (217)	11 (47)	196 (265)
		NBR	550	50	0 (0)	0 (0)	0 (0)	120 (516)	0 (0)	0 (0)
		SBL	325	65	53 (84)	201 (297)	85 (101)	148 (199)	96 (140)	294 (383)
4	SR 324/Gravel Springs Road & Ivy Creek Road/Site Driveway 2	EBL/U	140	200	16 (50)	31 (79)	31 (70)	57 (93)	42 (58)	44 (60)
		EBR	175*	100*	N/A	N/A	N/A	N/A	0 (0)	0 (0)
		WBL/U	100	100	0 (0)	0 (0)	0 (0)	0 (0)	12 (29)	7 (21)
		WBL/U	235*	100*	N/A	N/A	N/A	N/A	N/A	N/A
		WBR	150	125	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
		NBL	150*	100*	N/A	N/A	N/A	N/A	0 (0)	0 (0)
		SBL	N/A	N/A	102 (213)	35 (50)	116 (240)	47 (97)	56 (98)	87 (137)
		SBR	65	25	29 (91)	35 (50)	36 (108)	16 (67)	18 (77)	54 (127)
6	SR 324/Gravel Springs Road & Brown Road	EBR	175	100	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
		EBL/U	225	150	0 (0)	0 (0)	3 (13)	3 (12)	0 (0)	5 (15)
		WBR	220	200	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
		WBL/U	200	175	0 (0)	0 (0)	42 (74)	32 (61)	49 (106)	34 (63)
		NB	N/A	N/A	19 (44)	6 (24)	371 (385)	366 (375)	359 (403)	362 (376)
		SB	N/A	N/A	6 (24)	0 (0)	60 (75)	51 (94)	91 (157)	59 (90)
7	SR 324/Gravel Springs Road & Mall of Georgia Boulevard	EBL	200	100	19 (43)	5 (21)	12 (29)	9 (28)	9 (27)	69 (260)
		EBR	350	200	0 (0)	11 (48)	76 (132)	0 (0)	0 (0)	227 (307)
		WBL/U[1]	500	200	133 (218)	191 (246)	168 (259)	166 (259)	89 (124)	224 (344)
		WBR	175	125	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
		NBL	200	N/A	14 (46)	63 (81)	10 (44)	42 (58)	0 (0)	190 (676)
		NBR	150	N/A	0 (0)	376 (455)	10 (44)	351 (471)	11 (46)	768 (855)
		SBL	135	N/A	56 (98)	0 (0)	49 (73)	6 (24)	29 (56)	9 (29)
		SBR	150	N/A	52 (76)	29 (56)	48 (63)	6 (26)	22 (67)	6 (27)

** = proposed turn lane storage lengths and taper lengths in future conditions*

[1] = Dual turn lane geometry

To receive the Notice of Decision Request for Expedited DRI #3558 – IDI/Gravel Springs Road Distribution Center, the following general conditions and roadway improvement conditions are recommended.

General Conditions:

Pedestrian, Bicycle, and Transit Facilities

- Provide internal pedestrian sidewalk and crosswalk connectivity from site to SR 324/Gravel Springs Road, between Camp Branch Road/Site Driveway 1 and the I-85 South On-Ramp.
- Provide internal pedestrian sidewalk and crosswalk connectivity from site to SR 324/Gravel Springs Road at the proposed SR 324/Gravel Springs Road and Site Driveway 3 intersection.

Roadway Improvement Conditions:

SR 324/Gravel Springs Road at I-85 Northbound Ramps

- Lane geometry improvements are not required based on capacity analysis results

SR 324/Gravel Springs Road at I-85 Southbound Ramps

- Lane geometry improvements are not required based on capacity analysis results

SR 324/Gravel Springs Road at Camp Branch Road/Site Driveway 1

- Dedicated left turn and shared through/right turn lanes on Camp Branch Road/Site Driveway 1

SR 324/Gravel Springs Road at Ivy Creek Road/Site Driveway 2

- Dedicated left turn and shared through/right turn lanes on Site Driveway 2
- Dedicated right turn and shared left/through turn lanes on Ivy Creek Road

SR 324/Gravel Springs Road at Site Driveway 3

- Right-In/Right-Out (RIRO) Driveway configuration
- Dedicated right turn deceleration lane turn lane on SR 324/Gravel Springs Road

SR 324/Gravel Springs Road at Brown Road

- Signalized traffic control

SR 324/Gravel Springs Road at Mall of Georgia Boulevard

- Install dual northbound right turn lanes with protected overlap phasing with westbound dual left phasing

These conditions are based on the approved Methodology Meeting inputs and parameters to be identified in the Georgia Regional Transportation Authority (GRTA) Letter of Understanding (LOU), once received.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

A. Introduction

A new 1,026,813 square foot (sf) industrial development is proposed for construction northwest of the I-85 interchange on SR 324/Gravel Springs Road (Gravel Springs Road), in Buford, Gwinnett County, Georgia. The development will contain three (3) new driveways along Gravel Springs Road: two (2) full-access driveways and one (1) Right-In/Right-Out (RIRO) driveway. The proposed full-access driveways will connect to Gravel Springs Road and align with the existing Camp Branch Road and Ivy Creek Road intersections. The proposed RIRO driveway will connect and align to Gravel Springs Road between Ivy Creek Road and Brown Road.

The purpose of this assessment is to identify the traffic expected to be generated by new vehicular trips when the development is complete in the year 2024. The full traffic study includes existing traffic volumes (2022), future traffic volumes (2024), trip generation, directional distribution, and anticipated traffic impacts at the following intersections:

1. SR 324/Gravel Springs Road at I-85 Northbound ramps
2. SR 324/Gravel Springs Road at I-85 Southbound ramps
3. SR 324/Gravel Springs Road at Camp Branch Road/Site Driveway 1
4. SR 324/Gravel Springs Road at Ivy Creek Road/Site Driveway 2
5. SR 324/Gravel Springs Road at Site Driveway 3
6. SR 324/Gravel Springs Road at Brown Road
7. SR 324/Gravel Springs Road at Mall of Georgia Boulevard

Figure 1 shows the site location. Figure 2 shows an aerial of the area and the study intersections in relation to the site. The site plan is provided in Appendix A.

Figure 1. Vicinity Map

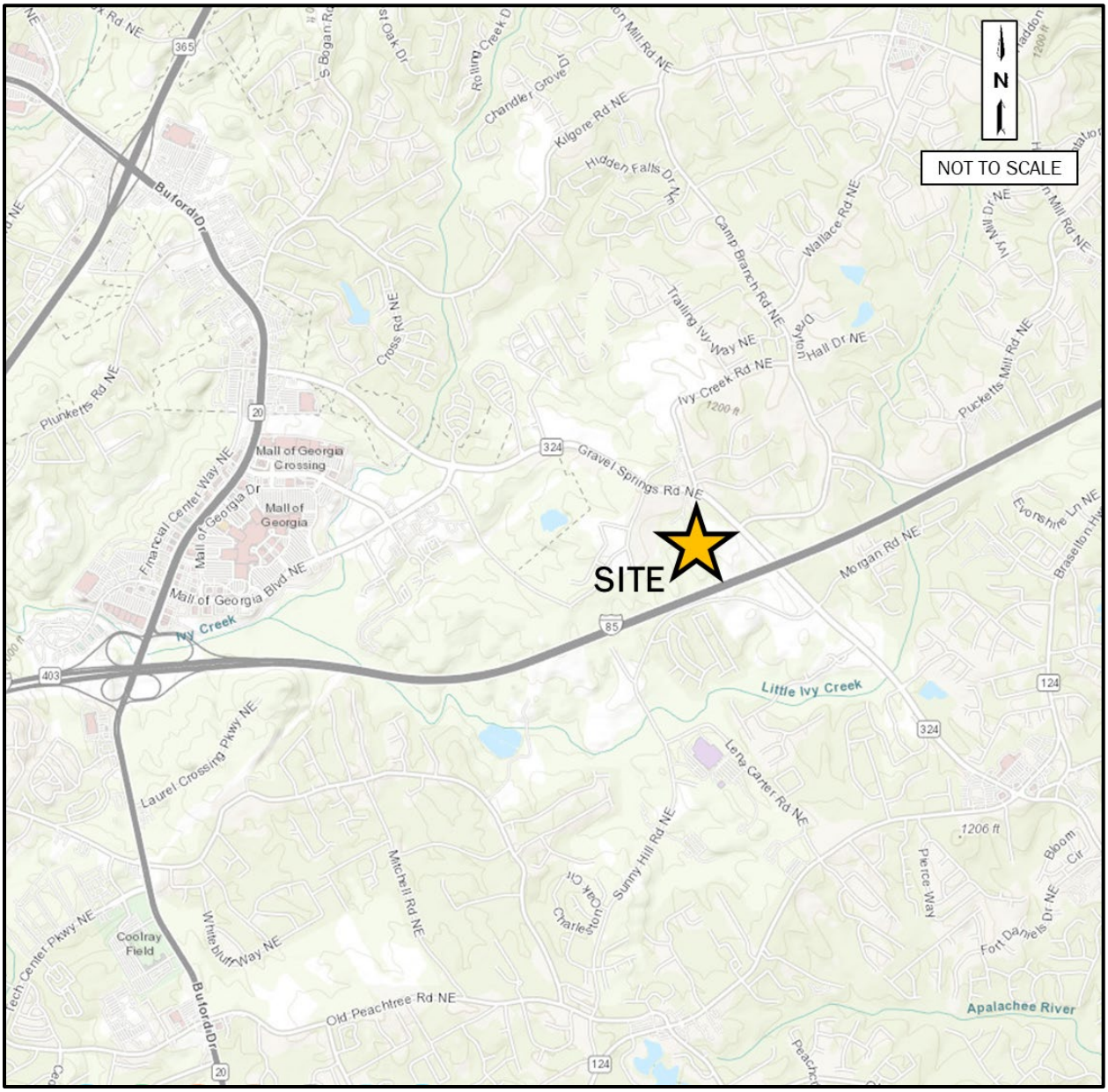
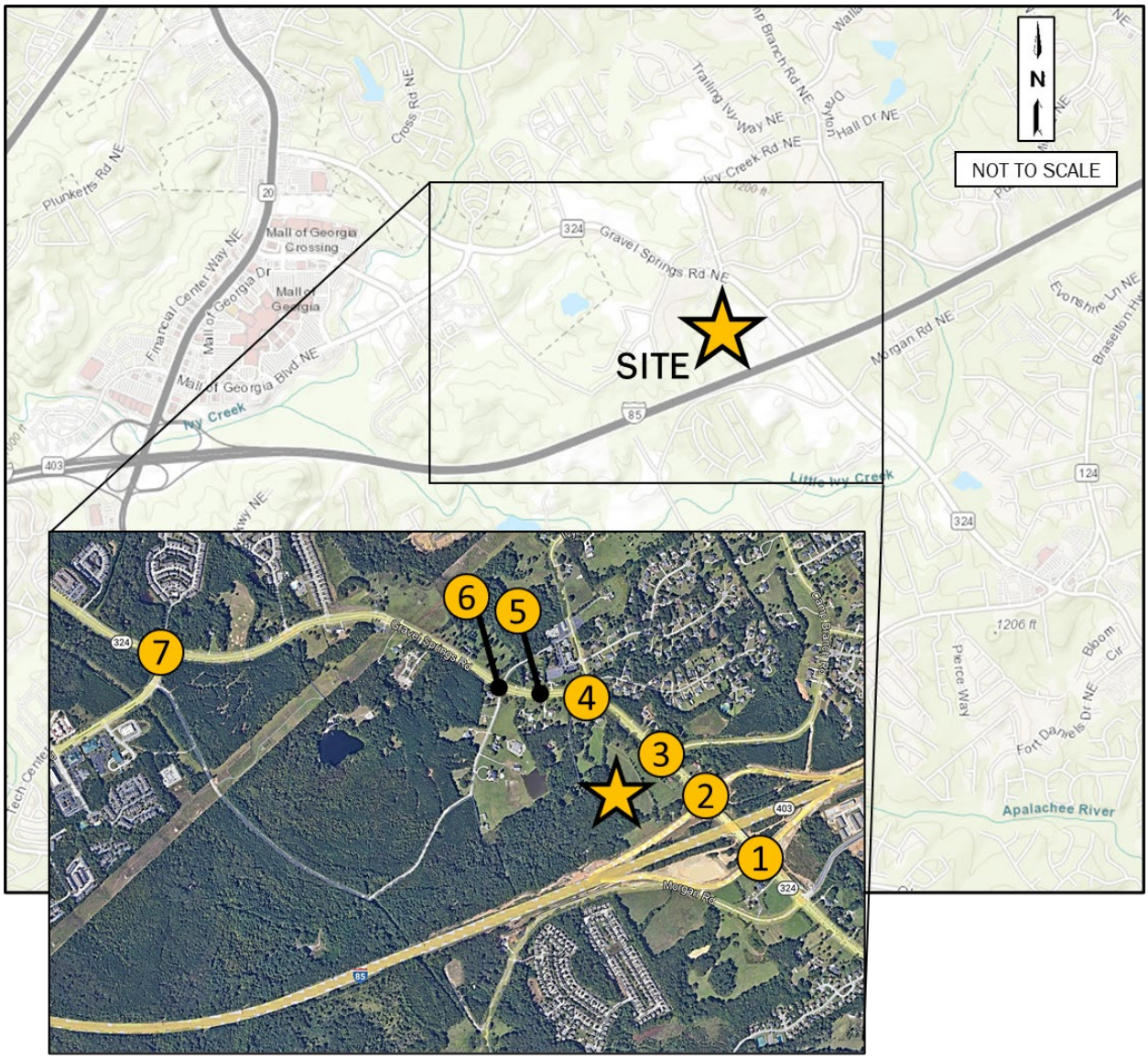


Figure 2. Site Location Aerial



LEGEND	
1.	SR 324/Gravel Springs Road at I-85 Northbound ramps
2.	SR 324/Gravel Springs Road at I-85 Southbound ramps
3.	SR 324/Gravel Springs Road at Camp Branch Road/Site Driveway 1
4.	SR 324/Gravel Springs Road at Ivy Creek Road/Site Driveway 2
5.	SR 324/Gravel Springs Road at Site Driveway 3
6.	SR 324/Gravel Springs Road at Brown Road
7.	SR 324/Gravel Springs Road at Mall of Georgia Boulevard

A.1. Programmed & Planned Regional Transportation Improvements

Regional transportation improvements were investigated using the Atlanta Regional Commission's (ARC's) Transportation Improvement Program (TIP), the GDOT GeoPI database, and the Gwinnett County project databases to verify if any large-scale infrastructure projects are programmed in the immediate area.

Table 1 identifies major transportation improvements programmed near the proposed development. Table 2 identifies major transportation improvements planned near the proposed development. Programmed and planned project report scope details are provided in Appendix B.

Table 1: Programmed Projects Near Site

ID	Project Name	From / To Points:	Sponsor	GDOT PI #	ARC ID # (TIP)	Design FY	ROW / UTL FY	CST FY
A	I-85 Overpass at SR 324	I-85 Southbound Ramp / I-85 Northbound Ramp	GDOT	0012698	N/A	2022	2017 / 2019	2019
B	SR 20 Widening	I-85 / Rock Springs Road	GDOT	0007850	GW-020D	2030	2026-2030	2030

By build-out, the I-85 overpass at Gravel Springs Road GDOT PI # 0012698 is programmed to be complete and replace the existing overpass between the I-85 northbound and southbound interchange ramps. Only the I-85 overpass project will be evaluated in future conditions since it is the only programmed project to be installed by the build-out year. The programmed SR 20 widening project is outside the bounds of the study area; thus, it will not be included in the DRI analysis. Six (6) additional roadway improvement projects are programmed and planned for future years by or after the 2024 build-out year by City of Buford, Gwinnett County, and GDOT authorities.

A.2. Other Planned Infrastructure Projects

Planned infrastructure projects were also recorded from the ARC TIP, Gwinnett County, and GDOT GeoPI databases for the Georgia Regional Transportation Authority (GRTA) and their record-keeping processes.

Table 2 identifies planned transportation improvement projects near the proposed development. Most of these planned projects either do not have an estimated design year confirmed or an established implementation year beyond the development construction year.

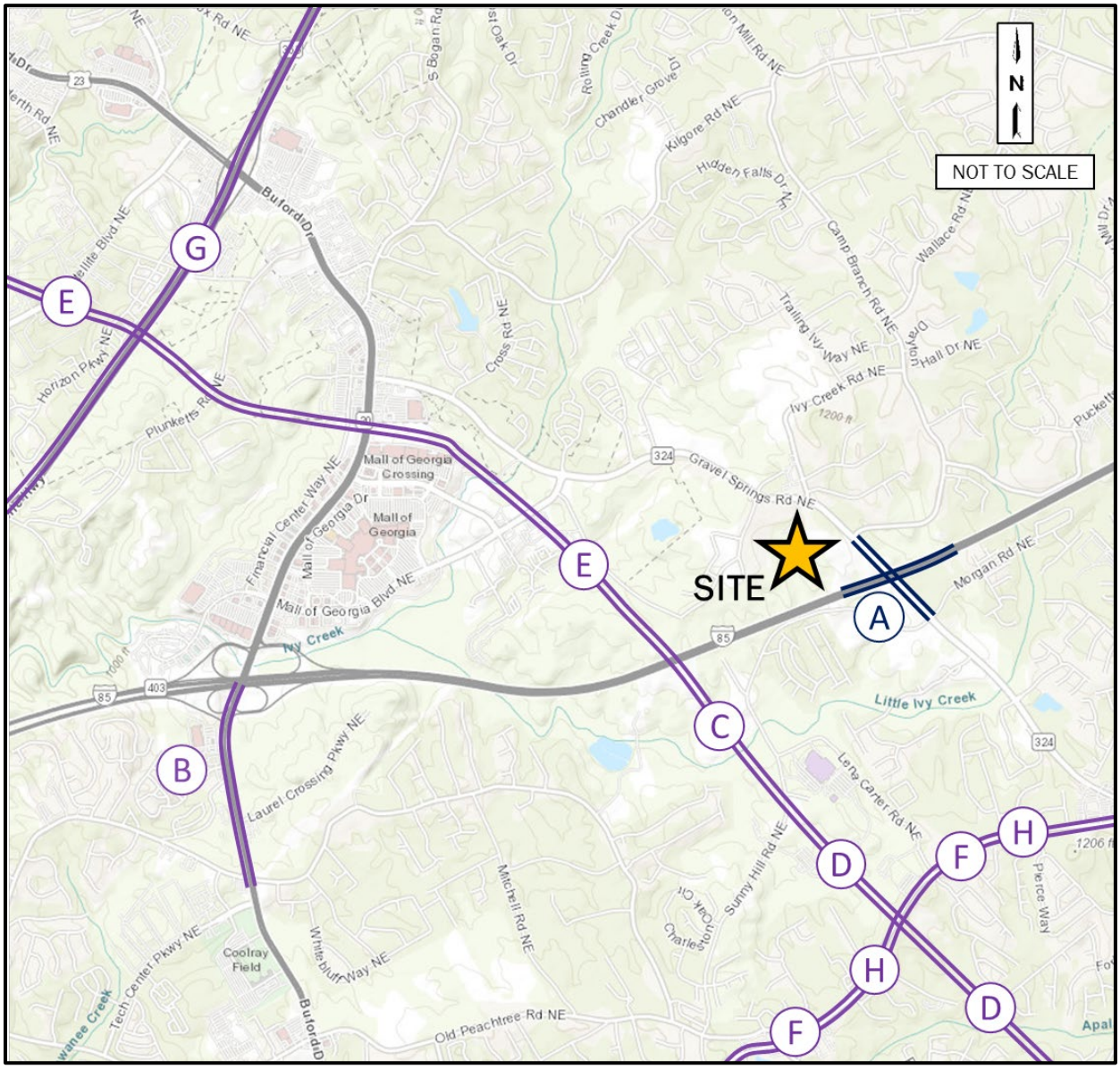
Table 2: Planned Projects Near Site

ID	Project Name	From / To Points:	Potential Sponsor	Project ID #	Project Timeline	Planning Document
C	Sugarloaf Parkway Extension	I-85 / SR 316	N/A	PI# 0006924	2051	GDOT GeoPI
D	Sugarloaf Parkway Extension, Phase 2	I-85 / SR 316	Gwinnett County	PI# 0006924 GW-308B	2030	ARC TIP
E	Sugarloaf Parkway Extension, Phase 3	I-85 / Peachtree Industrial Blvd	Gwinnett County	GW-308C	2040	ARC TIP
F	SR 124 Widening	Old Peachtree Rd / Hamilton Mill Pkwy	GDOT	PI# 0014926 GW-361B	2040	ARC TIP
G	I-985 Widening	Gwinnett County / Hall County	GDOT	PI# 0014130 GW-409	2030	ARC TIP
H	SR 124 ITS Expansion	SR 20 / Barrow County Line	Gwinnett County	PI# 0017998 GW-426	TBD	ARC TIP

The DRI should not conflict with other planned transportation projects. The six (6) additional roadway improvement projects are programmed and planned for future years at or after the 2024 build-out year by City of Buford, Gwinnett County, and GDOT authorities. These programmed and planned projects will not be evaluated in future conditions since they are projects that will be constructed after the 2024 build-out year.

Figure 3 shows the programmed and planned project locations in relation to the site.

Figure 3. Programmed and Planned Projects Near Site



TIP PROJECT ID LEGEND			
A.	PI # 0012698 (Programmed)	E.	GW-308C (Planned)
B.	PI # 0007850 (Programmed)	F.	GW-361B (Planned)
C.	PI # 0006924 (Planned)	G.	GW-409 (Planned)
D.	GW-308B (Planned)	H.	GW-426 (Planned)

B. Existing Conditions

B.1. Project Phasing

The development is planned to be completed in a single phase by 2024.

B.2. Transportation Facilities and LOS Standards

SR 324/Gravel Springs Road (Gravel Springs Road) is a four-lane median-divided minor arterial with a posted speed limit of 45 miles per hour (MPH). The land uses along SR 324 are residential, commercial, institutional, and medical/office. Gravel Springs Road serves as a connection from SR 8/US 29 Business/Atlanta Highway in the east to SR 20/Buford Drive in the west and has full access to I-85 just to the southeast of the site. In total, SR 324 traverses 9.6 miles. SR 324 will provide access to and from the proposed development and its two (2) full-access site driveways and its one (1) Right-in/Right-Out (RIRO) driveway.

Ivy Creek Road is a two-lane undivided local roadway with a posted speed limit of 30 MPH on which through trucks are not allowed. Ivy Creek Road serves only residential and institutional land uses. Ivy Creek Road connects with Gravel Springs Road to the south and with Camp Branch Road to the northeast. In total, Ivy Creek Road traverses 0.9 miles. Ivy Creek Road will provide access to and from the proposed development and is proposed to align with Site Driveway 2.

Camp Branch Road is a two-lane undivided local roadway with a posted speed limit of 35 MPH on which through trucks are not allowed. The land uses along Camp Branch Road are exclusively residential. Camp Branch Road connects with Gravel Springs Road to the west and with Hamilton Mill Road to the south. In total, Camp Branch Road traverses 2.4 miles. Camp Branch Road will provide access to and from the proposed development and is proposed to align with Site Driveway 1.

Mall of Georgia Boulevard is a four-lane median-divided local roadway with a posted speed limit of 45 MPH. The land uses along Mall of Georgia Boulevard are primarily commercial in and around the developmental periphery of the Mall of Georgia, with some municipal, industrial, and residential near Gravel Springs Road. Mall of Georgia Boulevard originates in and connects a multifamily residential development just west of Gravel Springs Road to the west with Gravel Springs Road to the east. In total, Mall of Georgia Boulevard traverses 2.0 miles.

LOS D is considered the minimum standard unless existing conditions are lower.

B.3. Transit

Transit accommodations are not present in the immediate area.

B.4. Pedestrian and Bicycle Facilities

Pedestrian infrastructure exists along the SR 324/Gravel Springs Road corridor and its side streets, from Morgan Road to SR 20. Additionally, pedestrian infrastructure is present along the Mall of Georgia Boulevard corridor. One (1) off-road bicycle trail route, called the Ivy Creek Greenway, runs along the southern and eastern perimeters of the existing Mall of Georgia, between One Water Way and Gravel Springs Road.

B.5. Traffic Counts

Weekday AM and PM peak period turning movement counts (TMCs) were collected at the following locations on Tuesday, February 8, 2022:

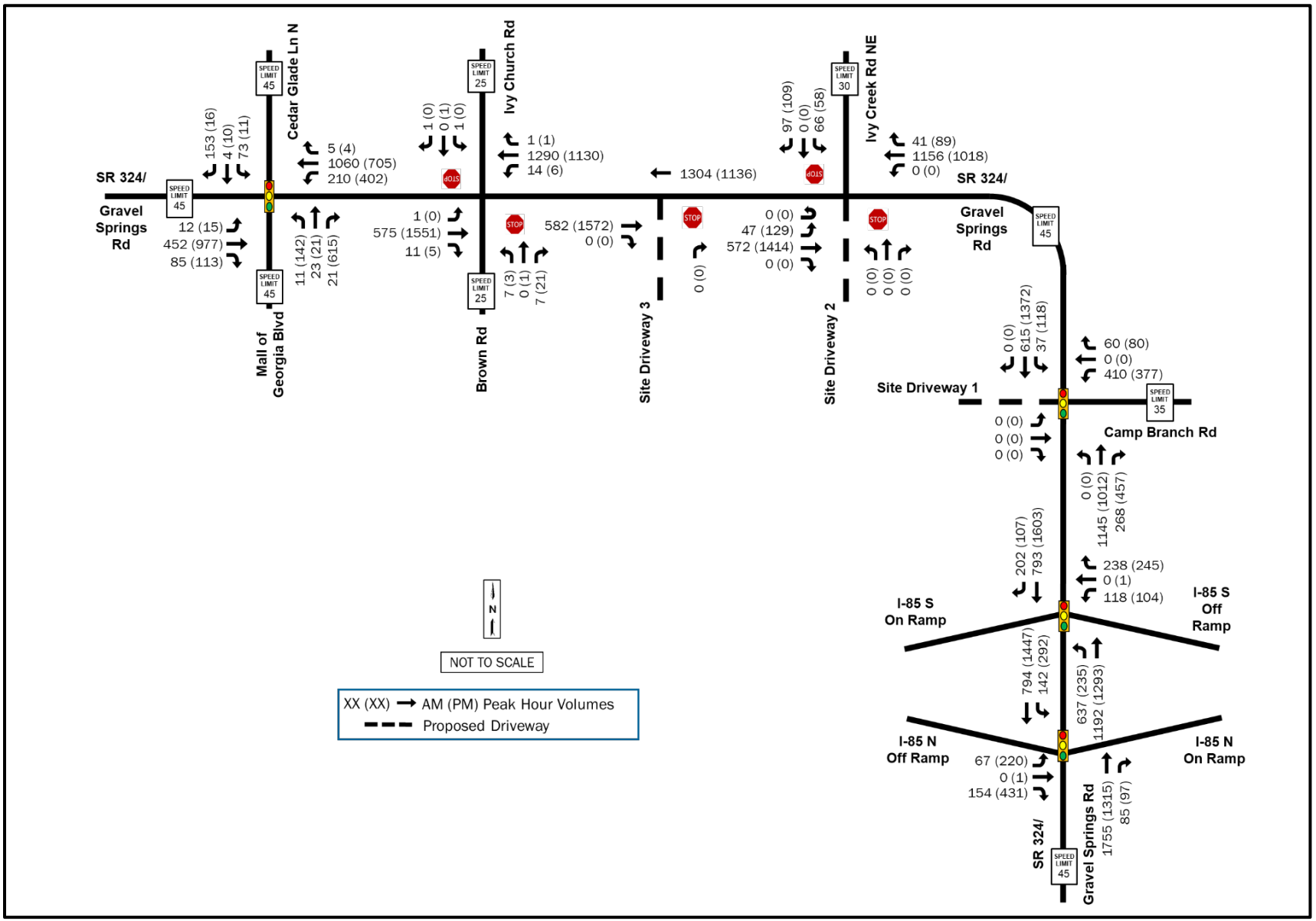
- SR 324/Gravel Springs Road at I-85 Northbound ramps
- SR 324/Gravel Springs Road at I-85 Southbound ramps
- SR 324/Gravel Springs Road at Camp Branch Road/Site Driveway 1
- SR 324/Gravel Springs Road at Ivy Creek Road/Site Driveway 2
- SR 324/Gravel Springs Road at Brown Road
- SR 324/Gravel Springs Road at Mall of Georgia Boulevard

Additionally, 24-hour bi-directional counts were collected on Gravel Springs Road, east of Ivy Creek Road, on Tuesday, February 8, 2022.

Figure 4 depicts the existing AM peak hour and PM peak hour traffic volumes at these intersections.

The No-Build and Build scenarios in the study utilize these volumes as baseline conditions. Traffic Count Data is provided in Appendix C.

Figure 4. 2022 Existing Traffic Volumes



C. Future Conditions

C.1. Adjacent Development Site Traffic

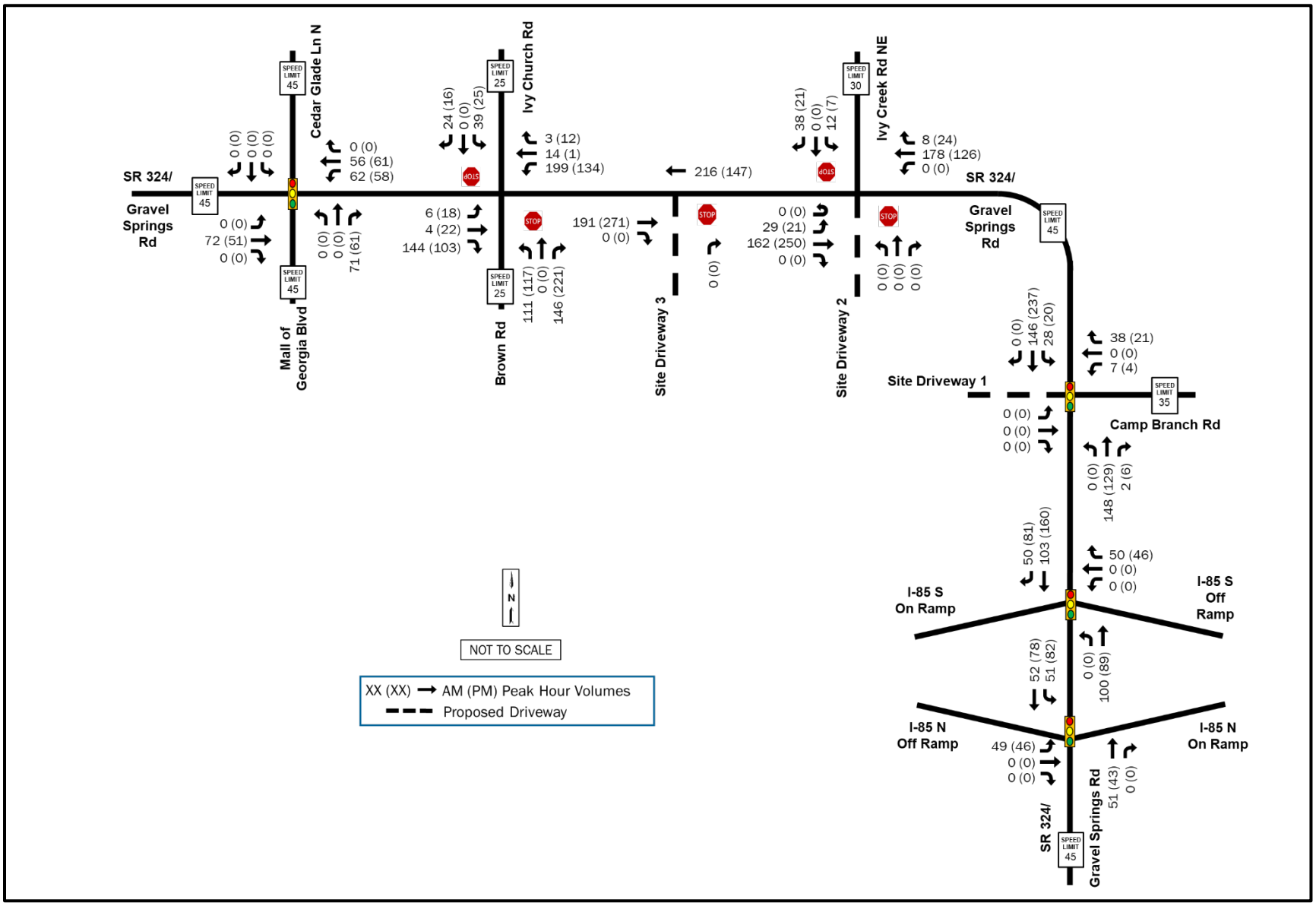
There are multiple adjacent developments being built or planned to be built along Gravel Springs Road that will be operating in future years. The following developments have been identified to account for additional site traffic expected to utilize Gravel Springs Road in future years:

- New Gas Station – SR 324/Gravel Springs Rd and Brown Road/Ivy Creek Road
  (4,000 sf convenience store; 1,250 sf retail space; opens 2023)
- Oakmont Gravel Springs Road – 3020 Gravel Springs Road (333,325 sf warehouse)
- DRI # 3274 – Brown Road Project
- DRI # 3213 – Kilburn/Gravel Springs Road
- DRI # 1071 – The Villages at Ivy Creek

The trip assignments of these adjacent developments were obtained by NV5 and combined to account for future adjacent development site traffic expected to occur along Gravel Springs Road, in addition to pass-by trips associated with the new gas station. Trip Assignment volume diagrams from the developments mentioned above are provided in Appendix D.

Figure 5 depicts the 2024 Combined Adjacent Development AM and PM peak hour traffic volumes.

Figure 5. 2024 Combined Adjacent Development Volumes



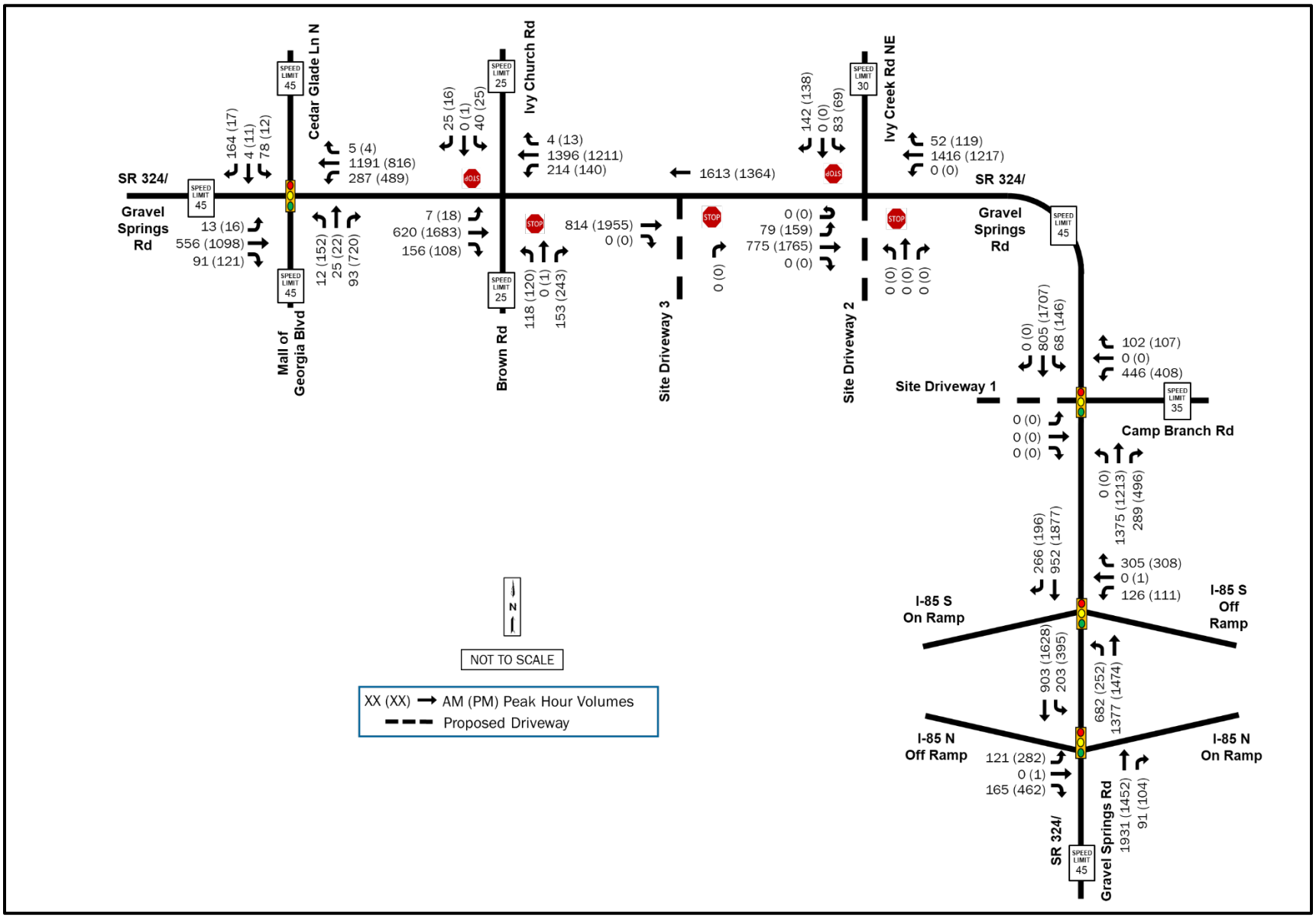
C.2. Background Growth

The growth rate in the study area is based on an analysis of historic traffic count data collected by the Georgia Department of Transportation (GDOT) and a collaboration with the Georgia Regional Transportation Authority (GRTA) during the DRI MMP Meetings held for this development.

The project is expected to be built out by the end of 2024. To account for future traffic growth, the 2022 base year traffic volumes were grown by 3.5% for two (2) years to develop the 2024 No-Build Traffic Volumes. Historic Traffic Count Data used to calculate the background growth is provided in Appendix E.

Figure 6 depicts the 2024 No-Build AM and PM peak hour traffic volumes.

Figure 6. 2024 No-Build Traffic Volumes



C.3. Project Trip Generation

Table 3 summarizes the fitted curve AM and PM peak hour project trip generation calculated using the Institute of Transportation Engineers' (ITE) Trip Generation Manual, 11th Edition, 2021.

Table 3: Project Trip Generation

Land Use	Code	Size (Square Feet)	Period	Total	Inbound	Outbound
Warehousing	150	1,026,813	Daily	1,660	830	830
			AM	147	113	34
			PM	150	42	108

The development will generate a total of 147 new trips (113 entering and 34 exiting) in the AM peak hour and 150 new trips (42 entering and 108 exiting) in the PM peak hour.

The site will generate trips by two (2) different vehicle types: personal auto vehicles and trucks (i.e., tractor trailers and /or box trucks). Table 4 summarizes the auto and truck trips that are associated with the total trips identified in the above Table 3 Project Trip Generation.

Table 4: Project Trip Generation – Auto and Truck Trips

Detailed Trip Generation by Vehicle Type	Period	Total	Inbound	Outbound
Autos	Daily	1,098	549	549
	AM	126	102	24
	PM	119	26	93
Trucks	Daily	562	281	281
	AM	21	11	10
	PM	31	16	15

The development will generate a total of 126 auto trips (102 entering and 24 exiting) and 21 truck trips (11 entering and 10 exiting) during the AM peak hour. During the PM peak hour, the development will generate a total of 119 auto trips (26 entering and 93 exiting) and 31 truck trips (16 entering and 15 exiting).

C.4. Trip Distribution and Assignment

The assignment and directional distribution of new project trips is based on existing traffic patterns observed in the overall study area and based on a collaboration with the Georgia Regional Transportation Authority (GRTA) during the DRI MMP Meetings held for this development.

From the trips generated, the vehicles will be distributed throughout the network via two (2) trip distributions as outlined below:

Personal Auto Vehicle Trip Distribution

- **Site Driveway 1: 55% entering trips, 55% exiting trips**
    - 46% of trips will travel to/from the south via Gravel Springs Road
        - 23% of these trips will travel to/from the I-85 N on/off ramps
        - 23% of these trips will travel to/from the I-85 S on/off ramps
    - 5% of the tips will travel to/from the east via Camp Branch Road
    - 4% of the trips will travel to/from the north via Gravel Springs Road and pass-through Site Driveways 2 and 3 via Mall of Georgia Boulevard
- **Site Driveway 2: 25% entering trips, 6% exiting trips**
    - 23% of trips will travel to/from the south via Gravel Springs Road and pass-through Site Driveway 1, continuing along Gravel Springs Road past the I-85 interchange
        - 18% of these trips will exit Site Driveway 3 and pass-through Site Driveway 2
        - 5% of these trips will exit Site Driveway 2 and pass-through Site Driveway 1
    - 1% of the tips will travel to/from the north via Ivy Creek Road
    - 1% of the trips will travel to/from the west via Gravel Springs Road and Mall of Georgia Boulevard
- **Site Driveway 3: 20% entering trips, 39% exiting trips**
    - 20% of trips will travel to/from the west via Gravel Springs Road, with all exiting trips making an eastbound U-Turn at Site Driveway 2
    - 5% of the tips will travel from the west via Gravel Springs Road, passing through Site Driveway 3 and continuing toward Site Driveways 1 and 2
        - 4% of these trips will enter/exit Site Driveway 1 via Gravel Springs Road
        - 1% of these trips will enter/exit Site Driveway 2 via Gravel Springs Road

Truck Vehicle Trip Distribution

- **Site Driveway 2: 100% entering and exiting trips**
    - 80% of the trips will travel to/from the south/southeast via Gravel Springs Road
        - 35% of these trips will travel to/from the I-85 North on/off ramps
        - 35% of these trips will travel to/from the I-85 South on/off ramps
        - 10% of these trips will travel to/from the south via Gravel Springs Road
    - 20% of the trips will travel to/from the west via Gravel Springs Road and continue traveling west through the Mall of Georgia Boulevard intersection

All traffic, both personal auto vehicles and trucks, will enter and exit the site via Gravel Springs Road.

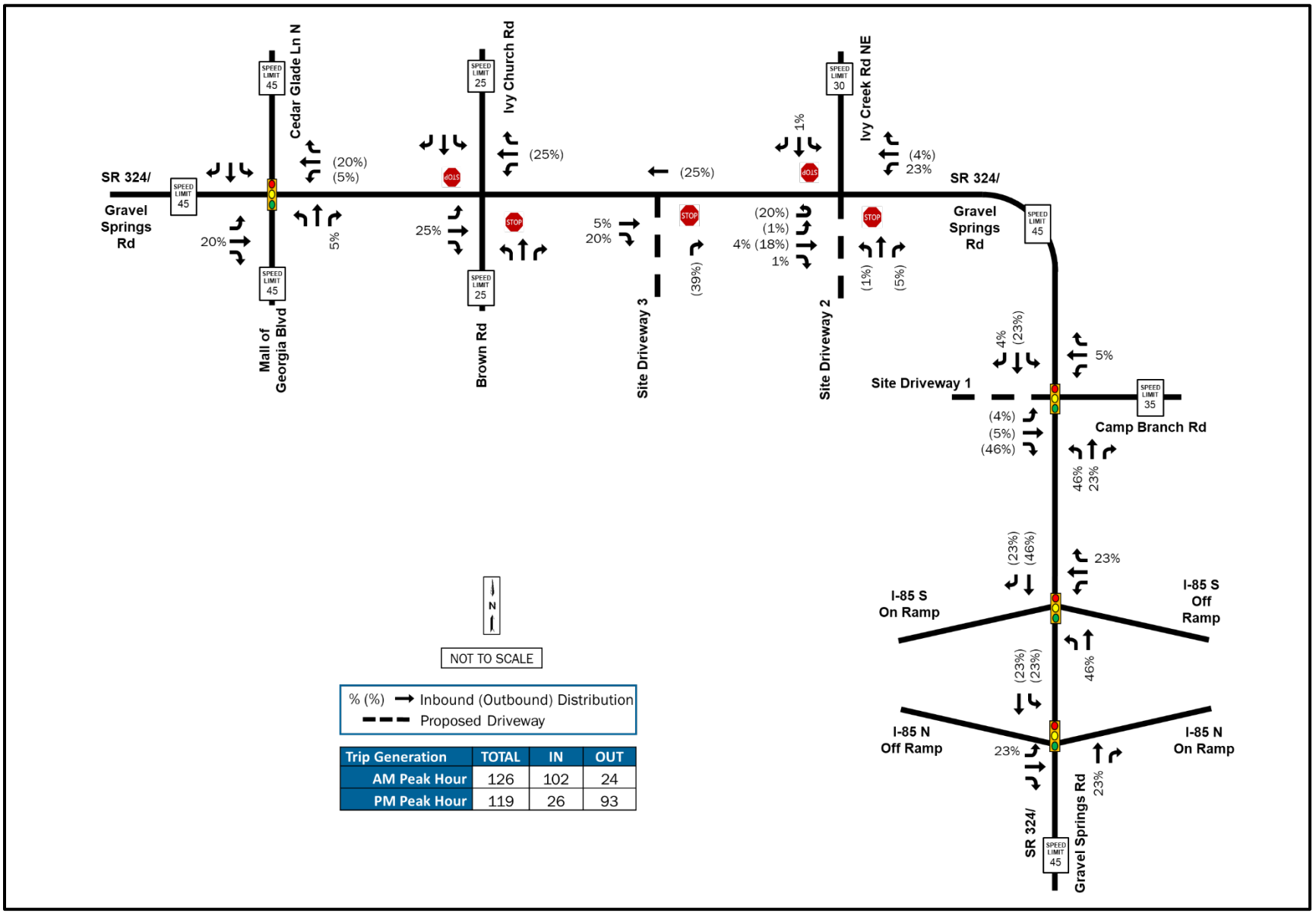
Figures 7 and 8 depict the trip distribution of new auto and truck trips, respectfully, to and from the proposed development.

Figures 9 and 10 depict the trip assignment of these new trips based on the distribution of traffic during the AM and PM peak hours.

Figure 11 depicts the combined auto and truck trip assignments based on the distribution of traffic during the AM and PM peak hours.

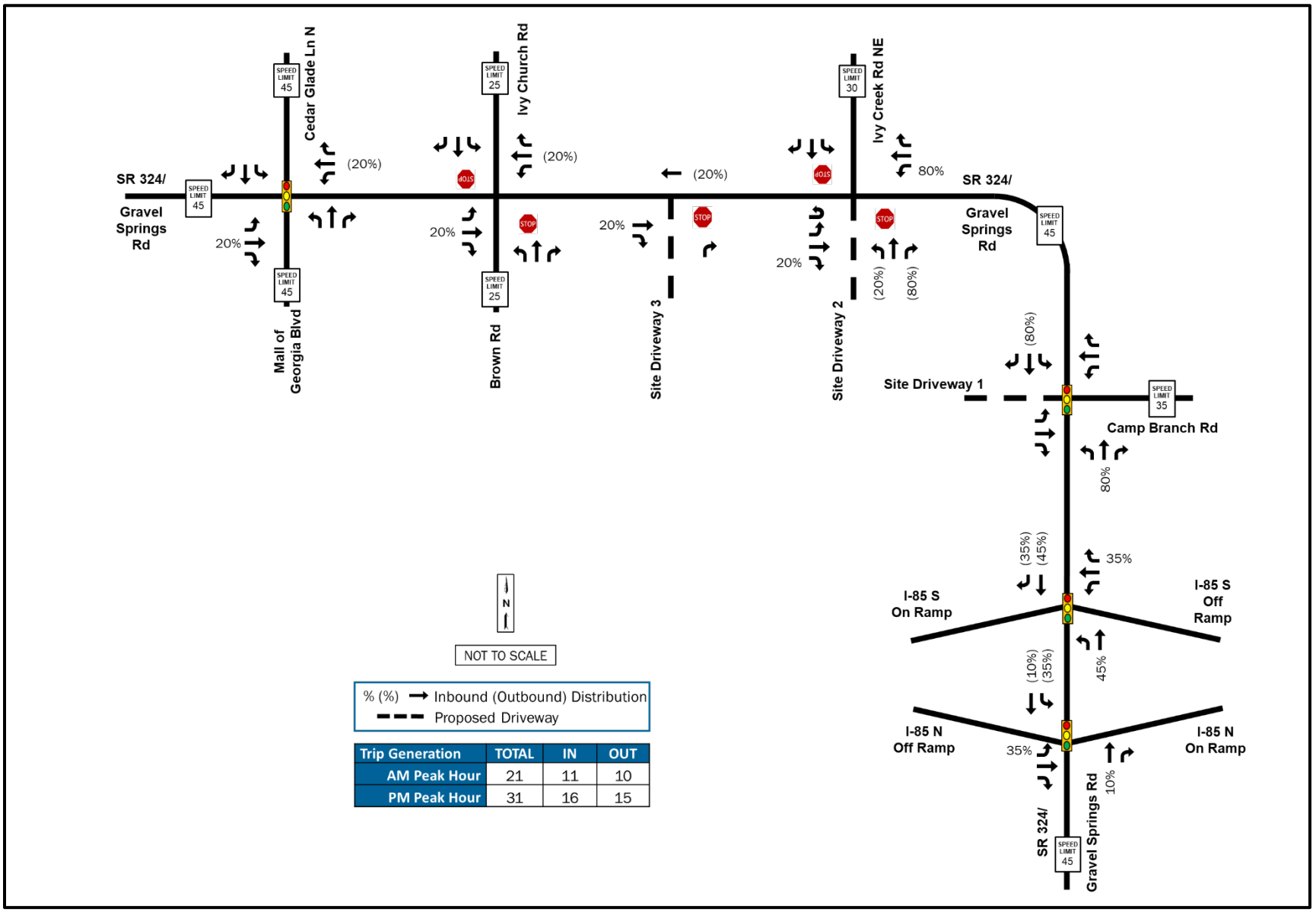
Figure 12 depicts the 2024 Build traffic volumes, which superimposes the combined adjacent development traffic volumes from Figure 5 with the 2024 No-Build traffic volumes in Figure 6 and the combined site traffic volumes in Figure 11.

Figure 7. Trip Distribution, Autos



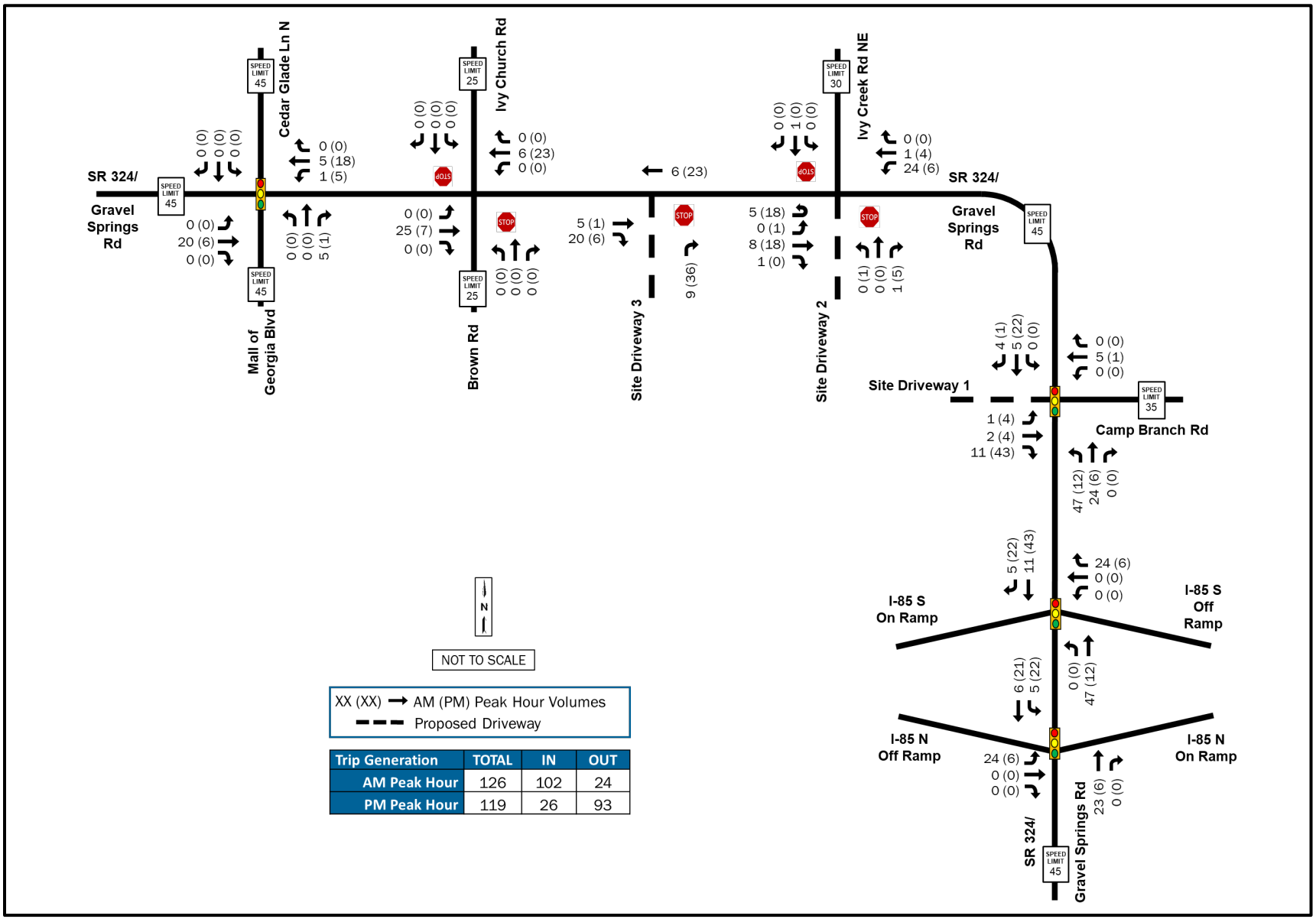
Trip Generation	TOTAL	IN	OUT
AM Peak Hour	126	102	24
PM Peak Hour	119	26	93

Figure 8. Trip Distribution, Trucks



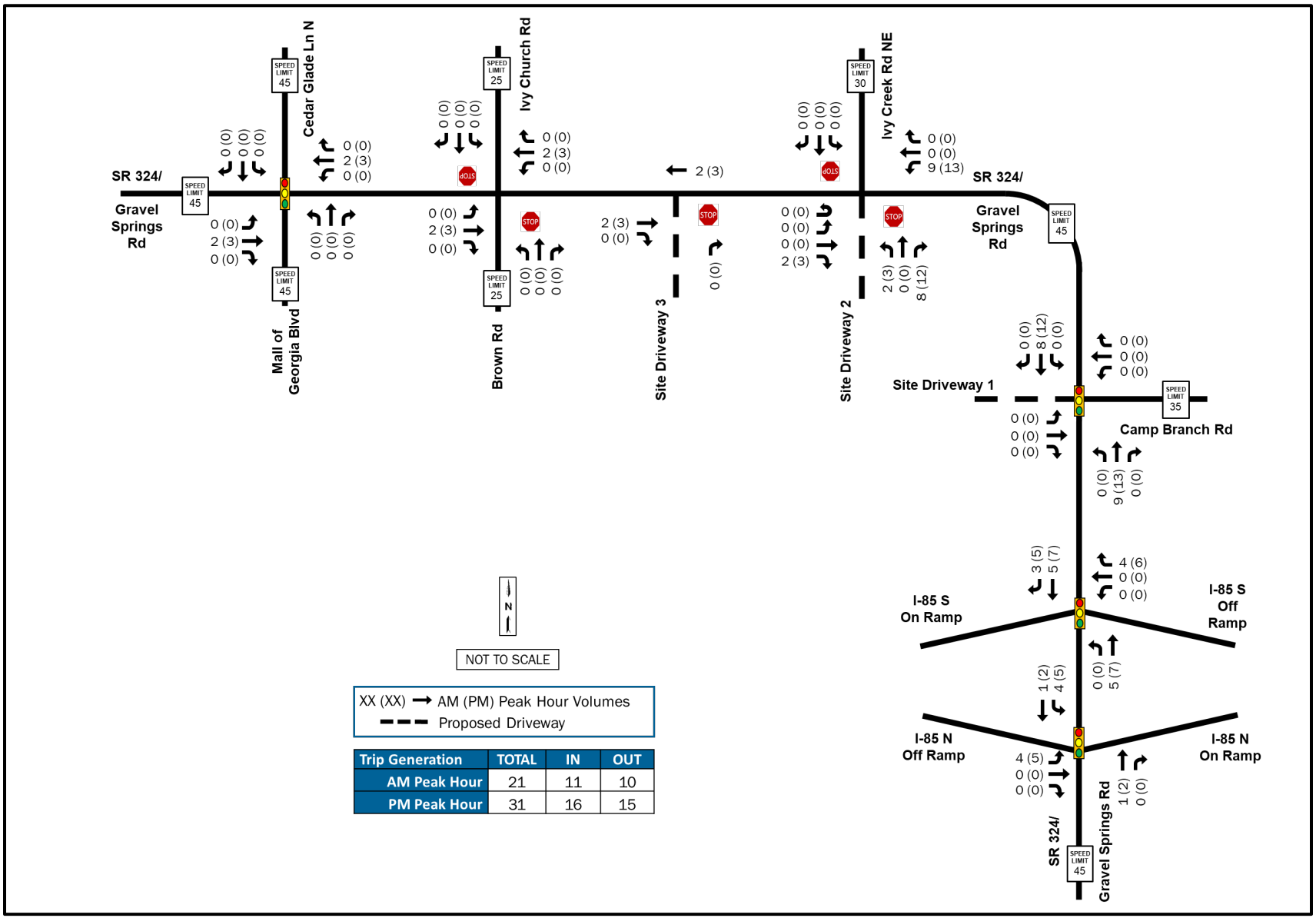
Trip Generation	TOTAL	IN	OUT
AM Peak Hour	21	11	10
PM Peak Hour	31	16	15

Figure 9. Trip Assignment, Autos



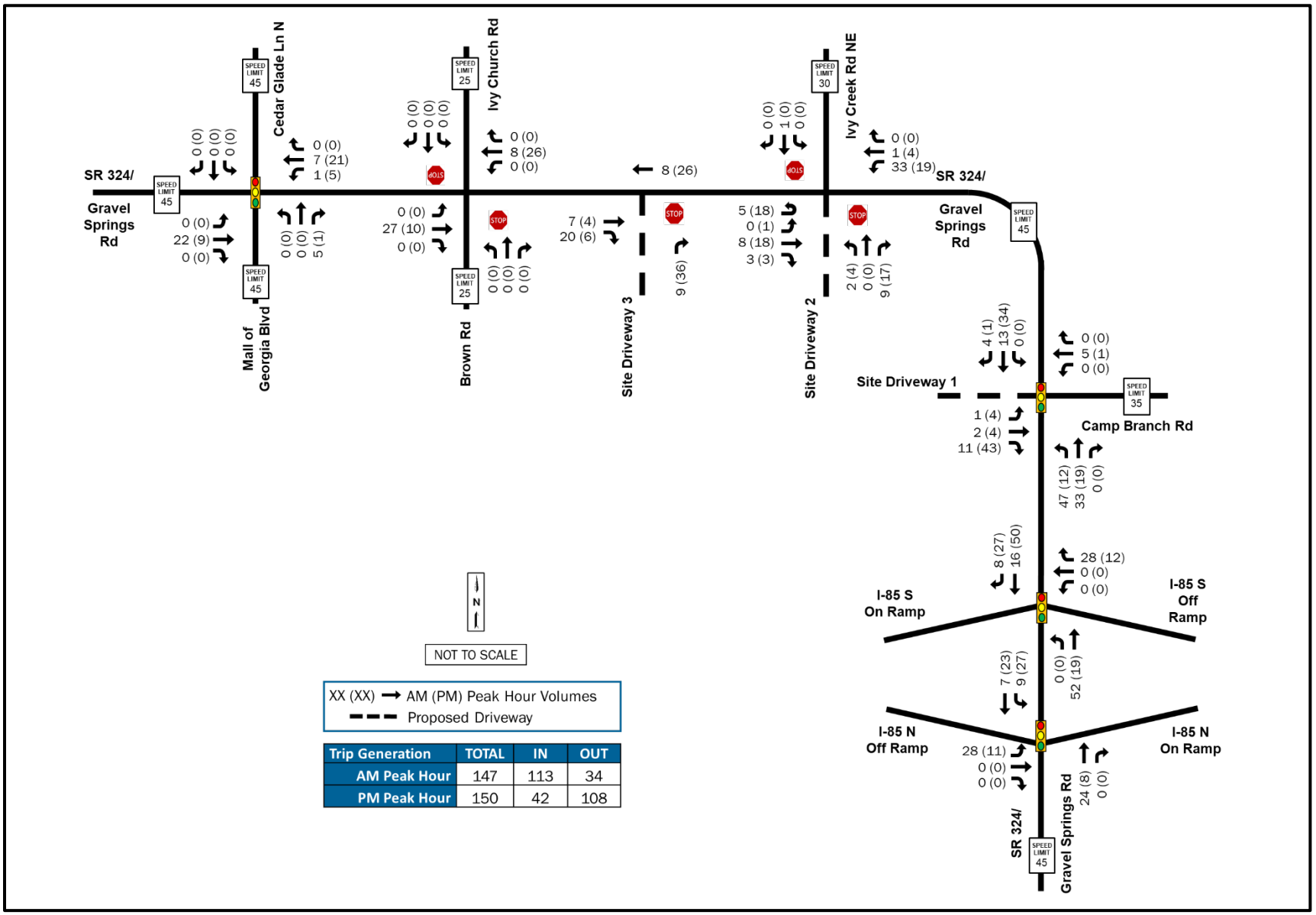
Trip Generation	TOTAL	IN	OUT
AM Peak Hour	126	102	24
PM Peak Hour	119	26	93

Figure 10. Trip Assignment, Trucks



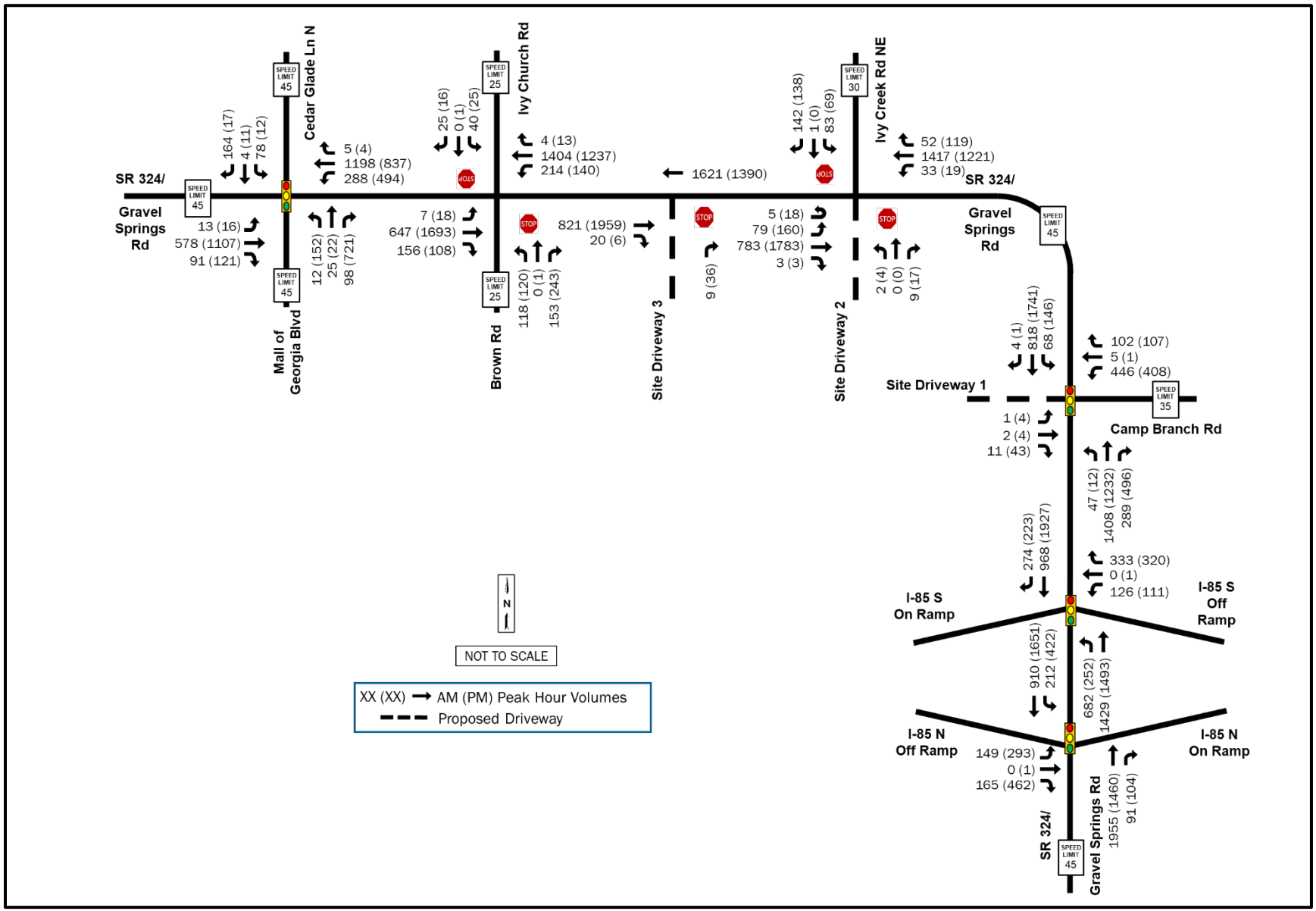
Trip Generation	TOTAL	IN	OUT
AM Peak Hour	21	11	10
PM Peak Hour	31	16	15

Figure 11. Trip Assignment, Combined Site Traffic (Autos and Trucks)



Trip Generation	TOTAL	IN	OUT
AM Peak Hour	147	113	34
PM Peak Hour	150	42	108

Figure 12. 2024 Build Traffic Volumes



D. Traffic Impact Analysis

The analysis in each of the scenarios for the study was performed using the traffic analysis software Synchro® 11. Average vehicular delays are calculated and reported as Levels of Service (LOS) as defined by the Highway Capacity Manual, 6th Edition (HCM 6).

Performance Criteria pertaining to the HCM methodology is shown in Table 5. The study considers an LOS D as a benchmark for acceptable intersection operation. Synchro® output reports for the study intersections are included in Appendix F.

Table 5: HCM Level-of-Service Performance Criteria

Average Delay (seconds/vehicle)		Level of Service (LOS)
Signalized Intersections	Unsignalized Intersections	
≤ 10.0	≤ 10.0	A
> 10 - 20	> 10 - 15	B
> 20 - 35	> 15 - 25	C
> 35 - 55	> 25 - 35	D
> 55 - 80	> 35 - 50	E
> 80.0	> 50.0	F

By build-out, the I-85 overpass at Gravel Springs Road GDOT PI # 0012698 is programmed to be complete and replace the existing overpass between the I-85 northbound and southbound interchange ramps. Seven (7) additional roadway improvement projects are programmed and planned for future years by or after the 2024 build-out year by City of Buford, Gwinnett County, and GDOT authorities. However, only the I-85 overpass project was evaluated in future conditions since it is the only programmed project that will be installed by the build-out year.

D.1. Existing Capacity Analysis

The results of the Existing Condition's capacity analysis are shown in Table 6 and include analysis of the volumes presented in Figure 4.

Table 6: Capacity Analysis Results –Existing Conditions

ID	Intersection	Control	Movement	AM		PM	
				LOS	Delay	LOS	Delay
1	SR 324/Gravel Springs Road & I-85 Northbound Ramps	Signal	**Overall**	**B**	**19.5**	**C**	**27.6**
			EB	C	33.4	E	62.8
			NB	C	26.6	C	34.7
			SB	A	2.2	A	8.5
2	SR 324/Gravel Springs Road & I-85 Southbound Ramps	Signal	**Overall**	**B**	**19.7**	**C**	**25.1**
			WB	D	45.7	D	53.4
			NB	B	12.0	B	12.7
			SB	C	24.7	C	30.4
3	SR 324/Gravel Springs Road & Camp Branch Road/Site Driveway 1	Signal	**Overall**	**B**	**11.8**	**C**	**24.5**
			EB	N/A	N/A	N/A	N/A
			WB	C	28.2	D	46.3
			NB	A	8.3	C	31.5
			SB	A	7.7	B	11.0
4	SR 324/Gravel Springs Road & Ivy Creek Road/Site Driveway 2	Stop-Control	**Overall**	**A**	**4.7**	**B**	**10.4**
			EB	B	11.6	B	11.6
			WB	A	0.0	A	0.0
			NB	N/A	N/A	N/A	N/A
			SB	F	111.4	F	451.4
6	SR 324/Gravel Springs Road & Brown Road	Stop-Control	**Overall**	**A**	**0.3**	**A**	**0.5**
			EB	B	12.1	A	0.0
			WB	A	9.0	B	13.7
			NB	D	30.9	E	47.3
			SB	E	40.7	F	194.5
7	SR 324/Gravel Springs Road & Mall of Georgia Boulevard	Signal	**Overall**	**B**	**12.7**	**E**	**57.3**
			EB	B	11.0	C	24.5
			WB	B	11.8	B	18.6
			NB	B	18.2	F	161.3
			SB	C	20.3	B	18.4

As shown in Table 6, the following existing conditions are identified for each associated study intersection:

SR 324/Gravel Springs Road at I-85 Northbound Ramps
The eastbound (off-ramp) approach operates at Levels of Service (LOS) E during the PM peak hour.

SR 324/Gravel Springs Road at I-85 Southbound Ramps
The signalized intersection currently operates at LOS D or better on all approaches during both the AM and PM peak hours.

SR 324/Gravel Springs Road at Camp Branch Road/Site Driveway 1
The signalized intersection currently operates at LOS D or better on all approaches during both the AM and PM peak hours.

SR 324/Gravel Springs Road at Ivy Creek Road/Site Driveway 2
The southbound approach left turning movement operates at LOS F during the AM and PM peak hour. There are 66 left-turn trips currently on the southbound approach of this intersection during the AM peak hour and 58 left-turn trips during the PM peak hour.

SR 324/Gravel Springs Road at Brown Road
The southbound approach of this intersection currently operates at LOS E during the AM peak hour and LOS F during the PM peak hour. However, only two (2) trips are on the southbound approach of this intersection during the AM peak hour and only one (1) trip during the PM peak hour. Additionally, the northbound approach of this intersection operates at LOS E during the PM peak hour. However, only 24 trips are on the northbound approach of this intersection during the PM peak hour.

SR 324/Gravel Springs Road at Mall of Georgia Boulevard
The signalized intersection currently operates at LOS D or better on all approaches during the AM peak hour. However, the northbound approach operates at LOS F during PM peak hour, and the overall intersection operations are LOS E during PM peak hour.

D.2. 2024 No-Build Capacity Analysis

The results of the 2024 No-Build Condition's capacity analysis are shown in Table 7 and include analysis of the volumes presented in Figure 6, as well as the programmed I-85 overpass project.

Table 7: Capacity Analysis Results – 2024 No-Build Conditions

ID	Intersection	Control	Movement	AM		PM	
				LOS	Delay	LOS	Delay
1	SR 324/Gravel Springs Road & I-85 Northbound Ramps	Signal	**Overall**	**C**	**23.4**	**D**	**41.6**
			EB	D	44.7	F	91.0
			NB	C	29.4	D	46.6
			SB	A	7.0	B	19.5
2	SR 324/Gravel Springs Road & I-85 Southbound Ramps	Signal	**Overall**	**C**	**26.0**	**C**	**29.9**
			WB	D	54.4	F	83.1
			NB	B	16.3	B	15.9
			SB	C	32.2	C	30.7
3	SR 324/Gravel Springs Road & Camp Branch Road/Site Driveway 1	Signal	**Overall**	**C**	**23.0**	**C**	**27.8**
			EB	N/A	N/A	N/A	N/A
			WB	D	45.2	D	47.9
			NB	C	22.6	D	35.4
			SB	B	10.1	B	15.2
4	SR 324/Gravel Springs Road & Ivy Creek Road/Site Driveway 2	Stop-Control	**Overall**	**C**	**23.3**	**D**	**33.8**
			EB	B	14.3	B	13.9
			WB	A	0.0	A	0.0
			NB	N/A	N/A	N/A	N/A
			SB	F	664.4	F	1631.9
6	SR 324/Gravel Springs Road & Brown Road	Stop-Control	**Overall**	**F**	**267.6**	**F**	**1096.4**
			EB	B	13.0	B	11.6
			WB	B	11.6	C	23.1
			NB	F	2305.5	F	9815.6
			SB	F	1602.6	F	8274.7
7	SR 324/Gravel Springs Road & Mall of Georgia Boulevard	Signal	**Overall**	**B**	**14.7**	**F**	**88.3**
			EB	B	17.7	C	34.6
			WB	B	11.5	C	26.6
			NB	C	20.6	F	255.8
			SB	C	22.3	B	19.9

As shown in Table 7, the following conditional changes are identified for each associated study intersection:

SR 324/Gravel Springs Road at I-85 Northbound Ramps

Analysis indicates that with the adjacent developments in place, the eastbound (off-ramp) approach changes to Levels of Service (LOS) F during the PM peak hour.

SR 324/Gravel Springs Road at I-85 Southbound Ramps

Analysis indicates that with the adjacent developments in place, the westbound (off-ramp) approach changes to LOS F during the PM peak hour.

SR 324/Gravel Springs Road at Camp Branch Road/Site Driveway 1

The signalized intersection will operate at LOS D or better on all approaches during both the AM and PM peak hours.

SR 324/Gravel Springs Road at Ivy Creek Road/Site Driveway 2

Analysis indicates that even with the adjacent developments in place, the southbound approach left turning movement is expected to operate at LOS F during the AM and PM peak hours. With the added traffic on this approach due to adjacent developments, 83 left-turn trips are on the southbound approach of this intersection in the AM peak hour and 69 left-turn trips are in the PM peak hour.

SR 324/Gravel Springs Road at Brown Road

Analysis indicates that with the adjacent developments in place, the southbound approach of this intersection changes to LOS F during the AM peak hour and is expected to operate at LOS F during the PM peak hour. With the added traffic on this approach due to adjacent developments, 65 shared-movement trips are on the southbound approach of this intersection in the AM peak hour and 41 shared-movement trips are in the PM peak hour. Additionally, the northbound approach of this intersection changes to LOS F in both AM and PM peak hours. With the added traffic on this approach due to adjacent developments, 271 shared-movement trips are on the northbound approach of this intersection during the AM peak hour and 364 shared-movement trips are during the PM peak hour.

SR 324/Gravel Springs Road at Mall of Georgia Boulevard

Analysis indicates that with the adjacent developments in place, the signalized intersection continues to operate at LOS D or better on all approaches during the AM peak hour. However, the northbound approach continues to operate at LOS F during PM peak hour conditions, and the overall intersection operation changes to LOS F during PM peak hour conditions.

D.3. Minimum Modeling Improvements Needed

Minimum improvements needed in the study network are signal split improvements to existing cycle lengths and turn lane improvements where site driveways are proposed at the following intersections to accommodate future traffic volumes:

- SR 324/Gravel Springs Road at I-85 Northbound Ramps
- SR 324/Gravel Springs Road at I-85 Southbound Ramps
- SR 324/Gravel Springs Road at Camp Branch Road/Site Driveway 1
  - Maintaining existing cycle lengths while adding an additional phase for the added Site Driveway 1 leg to the intersection
  - Installing a dedicated eastbound left turn lane for Site Driveway 1 with a 150-foot storage length and 100-foot taper
  - Installing a channelized thru/right turn lane for Site Driveway 1
  - Converting the existing westbound right turn lane on Camp Branch Road to a shared thru/right lane
  - Maintaining existing northbound, southbound, and westbound phases and splits
- SR 324/Gravel Springs Road at Ivy Creek Road/Site Driveway 2
  - Installing a dedicated northbound left turn lane for Site Driveway 2 with a 150-foot storage length and 100-foot taper
  - Installing a channelized thru/right turn lane for Site Driveway 2
  - Converting the existing southbound left turn lane on Ivy Creek Road to a shared left/thru lane
- SR 324/Gravel Springs Road at Mall of Georgia Boulevard

Additional right turn deceleration lanes on SR 324/Gravel Springs Road were also evaluated at the three (3) site driveway intersections to account for site traffic entering the development. Each site driveway was evaluated with channelized right turn deceleration lanes that have the minimum 175-foot storage length and 100-foot tapers needed.

Signalized timing improvements to existing cycle length splits and minimum turn lane improvements mentioned above are the only feasible options at these intersections before additional mitigations are evaluated.

D.4. 2024 Build Capacity Analysis

The results of the 2024 Build Condition's capacity analysis are shown in Table 8 and includes analysis of the volumes presented in Figure 12 with optimized signal timing conditions.

Table 8: Capacity Analysis Results – 2024 Build Conditions

ID	Intersection	Control	Movement	AM		PM	
				LOS	Delay	LOS	Delay
1	SR 324/Gravel Springs Road & I-85 Northbound Ramps	Signal	**Overall**	**C**	**24.9**	**D**	**44.5**
			EB	D	44.0	F	90.2
			NB	C	31.4	D	47.8
			SB	A	7.6	C	25.3
2	SR 324/Gravel Springs Road & I-85 Southbound Ramps	Signal	**Overall**	**C**	**26.5**	**C**	**33.2**
			WB	D	50.8	D	54.0
			NB	B	17.5	B	15.6
			SB	C	32.9	D	43.3
3	SR 324/Gravel Springs Road & Camp Branch Road/Site Driveway 1	Signal	**Overall**	**C**	**28.1**	**C**	**23.6**
			EB	C	21.8	C	25.9
			WB	D	43.5	D	44.5
			NB	C	28.7	B	18.2
			SB	B	17.7	C	22.7
4	SR 324/Gravel Springs Road & Ivy Creek Road/Site Driveway 2	Stop-Control	**Overall**	**F**	**50.6**	**F**	**80.7**
			EB	C	16.9	C	18.3
			WB	A	9.5	C	16.2
			NB	F	161.6	F	1552.5
			SB	F	1508.6	F	3880.6
5	SR 324/Gravel Springs Road & Site Driveway 3	Stop-Control	**Overall**	**A**	**0.0**	**A**	**0.0**
			EB	A	0.0	A	0.0
			WB	A	0.0	A	0.0
			NB	B	11.5	C	24.2
6	SR 324/Gravel Springs Road & Brown Road	Stop-Control	**Overall**	**F**	**275.5**	**F**	**1085.5**
			EB	B	13.1	B	11.8
			WB	B	11.9	C	23.4
			NB	F	2419.4	F	9815.6
			SB	F	1602.6	F	8274.7
7	SR 324/Gravel Springs Road & Mall of Georgia Boulevard	Signal	**Overall**	**B**	**14.7**	**F**	**88.7**
			EB	B	17.6	D	35.9
			WB	B	11.6	C	26.5
			NB	C	20.8	F	257.7
			SB	C	22.5	B	20.0

As shown in Table 8, the following conditional changes are identified for each associated study intersection:

SR 324/Gravel Springs Road at I-85 Northbound Ramps

The signalized intersection is expected to operate at Levels of Service (LOS) D or better on all approaches during the AM peak hour. However, the eastbound (off-ramp) approach continues to operate at LOS F during the PM peak hour.

SR 324/Gravel Springs Road at I-85 Southbound Ramps

With optimized cycle length splits, the signalized intersection is expected to operate at LOS D or better on all approaches during the AM and PM peak hours.

SR 324/Gravel Springs Road at Camp Branch Road/Site Driveway 1

Analysis indicates that with Site Driveway 1 in place, the signalized intersection and its approaches continue to operate at LOS D or better during the AM and PM peak hours.

SR 324/Gravel Springs Road at Ivy Creek Road/Site Driveway 2

Analysis indicates that with Site Driveway 2 in place, the southbound approach left turning movement continues to operate at LOS F during the AM and PM peak hours. However, only one (1) new trip is added to the southbound approach of this intersection in the AM peak hour. Additionally, the northbound approach is expected to operate at LOS F during the AM and PM peak hours. However, only 11 new trips are added to the northbound approach of this intersection during the AM peak hour and only 21 new trips are added during PM peak hour.

SR 324/Gravel Springs Road at Site Driveway 3

Analysis indicates that with Site Driveway 3 in place, the unsignalized intersection and its approaches are expected to operate at LOS D or better during the AM and PM peak hours.

SR 324/Gravel Springs Road at Brown Road

Analysis indicates that the unsignalized intersection and its northbound and southbound approaches are expected to continue to operate at LOS F during the AM and PM peak hours.

SR 324/Gravel Springs Road at Mall of Georgia Boulevard

Analysis indicates that the signalized intersection and its northbound approach continue to operate at LOS F during the PM peak hour.

D.5. Heavy Vehicle Enhanced Focus Area

The planned development is an industrial land use that is expected to generate heavy vehicles. Routes that heavy vehicles are expected to take at and around the study network are identified in Figure 8 and Figure 10. An inventory of existing and proposed pavement conditions, roadway widths, corner radii heavy vehicle staging, and pedestrian safety are included in Appendix F.

D.6. Queue Length Analysis

Queue length analysis was conducted for all intersection approaches with a failing Levels of Service (LOS) E or F where the project is adding additional trips to that approach. Queue length analysis results are modeled according to Highway Capacity Manual procedures, using the traffic analysis software Synchro® 11. Queue lengths reported on include 50th percentile (average) queues, 95th percentile queues, existing storage lengths, and existing taper lengths to intersection approaches.

Table 8 shows intersection queue results comparing Existing, No-Build, and Build Conditions. Study intersections included in Table 8 have failing LOS, and/or queues exceeding storage lengths under future traffic conditions. An inventory of queue length output reports is included in Appendix H.

Queueing analysis suggests that the existing roadway facilities in the study may become overloaded under future traffic conditions. The traffic expected to be generated by the adjacent developments in the No-Build Conditions are expected to contribute to the delays and queues at each intersection. The additional traffic expected to be generated by proposed development in the Build Conditions is also expected to contribute to the delays and queues at each intersection.

Table 9: Queue Analysis Comparisons

ID	Intersection	Turn Lane / Movement Approach	50th (90th) Percentile Queues, in feet							
			Lengths, in feet		Existing		No-Build		Build	
			Storage	Taper	AM	PM	AM	PM	AM	PM
1	SR 324/Gravel Springs Road & I-85 Northbound Ramps	EBL[1]	225	150	62 (150)	161 (270)	110 (243)	211 (379)	88 (164)	129 (175)
		EBR	225	N/A	28 (88)	180 (298)	22 (65)	158 (217)	11 (47)	196 (265)
		NBR	550	50	0 (0)	0 (0)	0 (0)	120 (516)	0 (0)	0 (0)
		SBL	325	65	53 (84)	201 (297)	85 (101)	148 (199)	96 (140)	294 (383)
4	SR 324/Gravel Springs Road & Ivy Creek Road/Site Driveway 2	EBL/U	140	200	16 (50)	31 (79)	31 (70)	57 (93)	42 (58)	44 (60)
		EBR	175*	100*	N/A	N/A	N/A	N/A	0 (0)	0 (0)
		WBL/U	100	100	0 (0)	0 (0)	0 (0)	0 (0)	12 (29)	7 (21)
		WBL/U	235*	100*	N/A	N/A	N/A	N/A	N/A	N/A
		WBR	150	125	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
		NBL	150*	100*	N/A	N/A	N/A	N/A	0 (0)	0 (0)
		SBR	65	25	102 (213)	35 (50)	116 (240)	47 (97)	56 (98)	87 (137)
6	SR 324/Gravel Springs Road & Brown Road	EBR	175	100	29 (91)	35 (50)	36 (108)	16 (67)	18 (77)	54 (127)
		EBL/U	225	150	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
		WBR	220	200	0 (0)	0 (0)	3 (13)	3 (12)	0 (0)	5 (15)
		WBL/U	200	175	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
		NB	N/A	N/A	0 (0)	0 (0)	42 (74)	32 (61)	49 (106)	34 (63)
		SB	N/A	N/A	19 (44)	6 (24)	371 (385)	366 (375)	359 (403)	362 (376)
7	SR 324/Gravel Springs Road & Mall of Georgia Boulevard	EBL	200	100	6 (24)	0 (0)	60 (75)	51 (94)	91 (157)	59 (90)
		EBR	350	200	19 (43)	5 (21)	12 (29)	9 (28)	9 (27)	69 (260)
		WBL/U[1]	500	200	0 (0)	11 (48)	76 (132)	0 (0)	0 (0)	227 (307)
		WBR	175	125	133 (218)	191 (246)	168 (259)	166 (259)	89 (124)	224 (344)
		NBL	200	N/A	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
		NBR	150	N/A	14 (46)	63 (81)	10 (44)	42 (58)	0 (0)	190 (676)
		SBL	135	N/A	0 (0)	376 (455)	10 (44)	351 (471)	11 (46)	768 (855)
		SBR	150	N/A	56 (98)	0 (0)	49 (73)	6 (24)	29 (56)	9 (29)

** = proposed turn lane storage lengths and taper lengths in future conditions*

[1] = Dual turn lane geometry

D.7. Additional Modeling Improvements Needed

The following study intersections need additional intersection lane geometry and traffic control improvements implemented to operate at LOS D or better in future years:

SR 324/Gravel Springs Road at I-85 Northbound Ramps

- Optimized signal timing cycle length improvements in the PM peak hour to accommodate future traffic volumes.

SR 324/Gravel Springs Road at Ivy Creek Road/Site Driveway 2

- Dedicated left turn and shared through/right turn lanes on Site Driveway 2
- Dedicated right turn and shared left/through turn lanes on Ivy Creek Road

SR 324/Gravel Springs Road at Brown Road

- Signalized traffic control

SR 324/Gravel Springs Road at Mall of Georgia Boulevard

- Install dual northbound right turn lanes with protected overlap phasing with westbound dual left phasing.
- Optimized signal timing cycle length improvements in both peak hours to accommodate future traffic volumes.

Future traffic volumes do not warrant signalized control at the SR 324/Gravel Springs Road at Ivy Creek Road/Site Driveway 2 intersection. However, a signal warrant analysis was conducted in a Traffic Engineering (TE) Report prepared by NV5 at the SR 324/Gravel Springs Road at Brown Road intersection. This TE Report identifies that future traffic volumes at this intersection warrant a traffic signal. This signal warrant analysis from the TE Report is included in Appendix I.

These additional mitigations in the study network are based on the capacity analysis results identified for movements failing with LOS E or F between existing and future years with the following future conditions already incorporated in the future scenarios evaluated:

- The programmed I-85 overpass at Gravel Springs Road project
- The No-Build Condition evaluation of the study network with adjacent development site traffic expected along SR 324/Gravel Springs Road
- The Build Condition signal optimization modifications incorporated in the study network
- The queue analysis conducted for the study intersections

D.8. 2024 Build Mitigation Capacity Analysis

The results of the 2024 Build Mitigation Condition's capacity analysis are shown in Table 10. These results include analysis of the volumes presented in Figure 12 with optimized signal timing conditions and the additional modeling improvements identified in Section D.7. Build Mitigation capacity analysis reports are provided in Appendix J.

Table 10: Capacity Analysis Results – 2024 Build Mitigation Conditions

ID	Intersection	Mitigation Measure	Movement	AM		PM	
				LOS	Delay	LOS	Delay
1	SR 324/Gravel Springs Road & I-85 Northbound Ramps	Signal Improvements	**Overall**	**C**	**24.9**	**D**	**53.3**
			EB	D	44.0	D	52.8
			NB	C	31.4	D	51.8
			SB	A	7.6	D	54.6
4	SR 324/Gravel Springs Road & Ivy Creek Road/Site Driveway 2	Turn Lane Improvements	**Overall**	**F**	**50.6**	**F**	**80.7**
			EB	C	16.9	C	18.3
			WB	A	9.5	C	16.2
			NB	F	161.6	F	1552.5
			SB	F	1508.6	F	3880.6
6	SR 324/Gravel Springs Road & Brown Road	Signal	**Overall**	**B**	**10.2**	**C**	**21.2**
			EB	A	6.3	B	14.4
			WB	B	10.4	C	21.5
			NB	B	19.5	D	52.8
			SB	B	15.8	C	33.3
7	SR 324/Gravel Springs Road & Mall of Georgia Boulevard	Signal & Turn Lane Improvements	**Overall**	**B**	**14.2**	**C**	**24.0**
			EB	B	17.6	C	27.0
			WB	B	11.6	C	25.4
			NB	B	12.1	B	17.8
			SB	C	22.5	C	21.2

Analysis indicates that the study intersections with associated mitigations are expected to operate at (Levels of Service) LOS D or better, except for the SR 324/Gravel Springs Road at Ivy Creek Road/Site Driveway 2 intersection. This intersection continues to operate at LOS F in the northbound and southbound approaches, with turn lane mitigations added to the side streets. Future traffic volumes at this intersection do not warrant a traffic signal.

E. Conclusion

A new 1,026,813 square foot (sf) industrial development is proposed for construction northwest of the I-85 interchange on SR 324/Gravel Springs Road (Gravel Springs Road), in Buford, Gwinnett County, Georgia. The development will contain three (3) new driveways along Gravel Springs Road: two (2) full-access driveways and one (1) Right-In/Right-Out (RIRO) driveway. The proposed full-access driveways will connect to Gravel Springs Road and align with the existing Camp Branch Road and Ivy Creek Road intersections. The proposed RIRO driveway will connect and align to Gravel Springs Road between Ivy Creek Road and Brown Road.

The development is expected to be built-out by 2024 and will generate a total of 1,660 new daily trips. Of these daily volumes, 147 new trips (113 entering and 34 exiting) are expected to occur during the AM peak hour and 150 new trips (42 entering and 108 exiting) are expected to occur during the PM peak hour.

Under Existing Conditions, all study intersections operate at Levels of Service (LOS) D or better except for the following intersections and approaches:

SR 324/Gravel Springs Road at I-85 Northbound Ramps
The eastbound (off-ramp) approach operates at Levels of Service (LOS) E during the PM peak hour.

SR 324/Gravel Springs Road at Camp Branch Road/Site Driveway 1
The signalized intersection currently operates at LOS D or better on all approaches during both the AM and PM peak hours.

SR 324/Gravel Springs Road at Ivy Creek Road/Site Driveway 2
The southbound approach left turning movement operates at LOS F during the AM and PM peak hours. There are 66 left-turn trips currently on the southbound approach of this intersection in the AM peak hour and 58 left-turn trips in the PM peak hour.

SR 324/Gravel Springs Road at Brown Road
The southbound approach of this intersection currently operates at LOS E during the AM peak hour and LOS F during the PM peak hour. However, only two (2) trips are on the southbound approach of this intersection during the AM peak hour and only one (1) trip during the PM peak hour. Additionally, the northbound approach of this intersection operates at LOS E during the PM peak hour. However, only 24 trips are on the northbound approach of this intersection during the PM peak hour.

SR 324/Gravel Springs Road at Mall of Georgia Boulevard
The signalized intersection currently operates at LOS D or better on all approaches during the AM peak hour. However, the northbound approach operates at LOS F during PM peak hour, and the overall intersection operations are LOS E during PM peak hour.

In future conditions, the I-85 overpass at Gravel Springs Road GDOT PI # 0012698 is programmed to be complete and replace the existing overpass between the I-85 northbound and southbound interchange ramps. The programmed I-85 overpass improvement on Gravel Springs Road is included in the No-Build and Build Conditions Analysis for this DRI.

Additionally, there are multiple adjacent developments being built or planned to be built along Gravel Springs Road in future conditions. The following developments and their associated site traffic on the study network were evaluated in future No-Build Conditions:

- New Gas Station – SR 324/Gravel Springs Rd and Brown Road/Ivy Creek Road (4,000 sf convenience store; 1,250 sf retail space; opens 2023)
- Oakmont Gravel Springs Road – 3020 Gravel Springs Road (333,325 sf warehouse)
- DRI # 3274 – Brown Road Project
- DRI # 3213 – Kilburn/Gravel Springs Road
- DRI # 1071 – The Villages at Ivy Creek

The trip assignments of these adjacent developments were obtained by NV5 and combined to account for future development site traffic expected to occur along Gravel Springs Road, in addition to pass-by trips associated with the new gas station.

In No-Build Conditions, the increase in traffic from the applied growth rate and adjacent development site traffic causes the following conditional changes at each associated study intersection:

SR 324/Gravel Springs Road at I-85 Northbound Ramps
The eastbound (off-ramp) approach changes to LOS F during the PM peak hour.

SR 324/Gravel Springs Road at I-85 Southbound Ramps
The westbound (off-ramp) approach changes to LOS F during the PM peak hour.

SR 324/Gravel Springs Road at Ivy Creek Road/Site Driveway 2
The southbound approach left turning movement continues to operate at LOS F during the AM and PM peak hours. With the added traffic on this approach due to adjacent developments, 83 left-turn trips are on the southbound approach of this intersection during the AM peak hour and 69 left-turn trips are during the PM peak hour.

SR 324/Gravel Springs Road at Brown Road
The southbound approach of this intersection changes to LOS F during the AM peak hour and continues to operate at LOS F during the PM peak hour. Additionally, the northbound approach of this intersection changes to LOS F during the AM and PM peak hours. With the added traffic on this approach due to adjacent developments, 65 shared-movement trips are on the southbound approach during the AM peak hour and 41 shared-movement trips during the PM peak hour. Additionally, the northbound approach of this intersection changes to LOS F during the AM and PM peak hours. With

the added traffic on this approach due to adjacent developments, 271 shared-movement trips on the northbound approach of this intersection during the AM peak hour and 364 shared-movement trips during the PM peak hour.

SR 324/Gravel Springs Road at Mall of Georgia Boulevard

The northbound approach continues to operate at LOS F during the in PM peak hour, and the overall intersection operation changes to LOS F during PM peak hour.

For Build Conditions, the addition of project traffic to the study intersections mentioned above causes an increase in overall intersection and approach delay when compared to No-Build Conditions.

Queueing analysis suggests that the existing roadway facilities in the study may become overloaded under future traffic conditions. The traffic expected to be generated by the adjacent developments in the No-Build Conditions are expected to contribute to the delays and queues at each intersection. The additional traffic expected to be generated by proposed development in the Build Conditions is also expected to contribute to the delays and queues at each intersection.

From the conducted analysis, the following additional mitigations will be needed at the following study intersections:

SR 324/Gravel Springs Road at I-85 Northbound Ramps

- Optimized signal timing cycle length improvements in the PM peak hour to accommodate future traffic volumes.

SR 324/Gravel Springs Road at Camp Branch Road/Site Driveway 1

- Dedicated left turn and shared through/right turn lanes on Camp Branch Road/Site Driveway 1
- Permissive phasing on Camp Branch Road/Site Driveway 1

SR 324/Gravel Springs Road at Ivy Creek Road/Site Driveway 2

- Dedicated left turn and shared through/right turn lanes on Site Driveway 2
- Dedicated right turn and shared left/through turn lanes on Ivy Creek Road

SR 324/Gravel Springs Road at Brown Road

- Signalized traffic control

SR 324/Gravel Springs Road at Mall of Georgia Boulevard

- Install dual northbound right turn lanes with protected overlap phasing with westbound dual left phasing.
- Optimized signal timing cycle length improvements in both peak hours to accommodate future traffic volumes.

These additional mitigations in the study network are based on the capacity analysis results identified for movements failing with LOS E or F between existing and future years with the following future conditions already incorporated in the future scenarios evaluated:

- The programmed I-85 overpass at Gravel Springs Road project
- The Build Condition signal optimization modifications incorporated in the study network

Consideration should also be made by the local jurisdiction to install future traffic signal controls at the SR 324/Gravel Springs Road at Ivy Creek Road/Site Driveway 2 intersection to minimize side street Levels of Service (LOS) F observed in future years that do not warrant a traffic signal.

APPENDIX

APPENDIX A

SITE PLAN

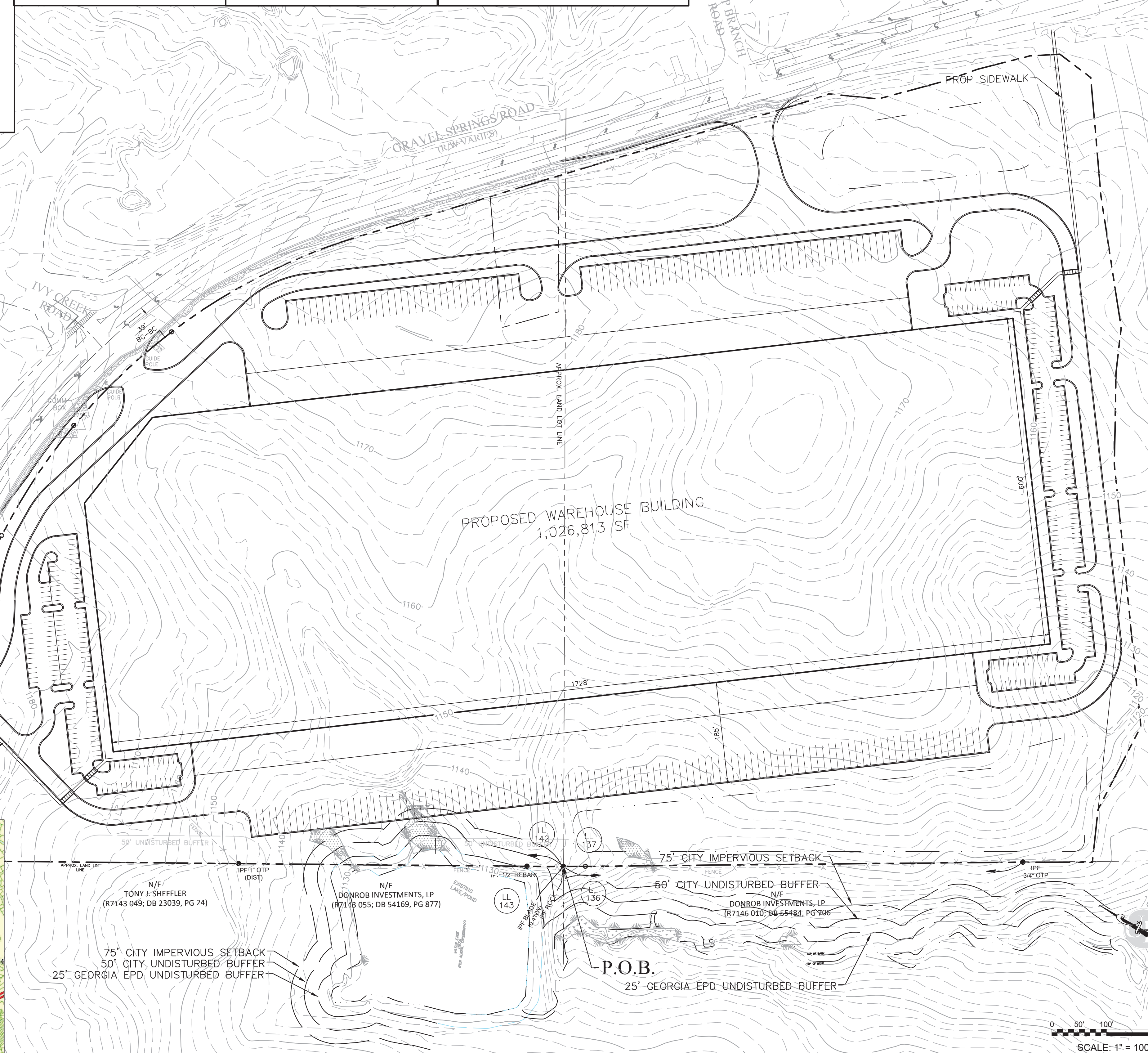
PROJECT DATA:

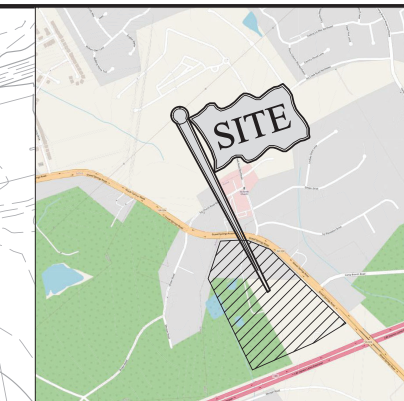
1. DRI NUMBER:
2. SITE AREA = 58.21 ACRES +/-
   DISTURBED AREA = 55.0 ACRES
3. FLOOR AREA RATIO = .40
4. PARKING:
   REQUIRED PER ZONING: 1,026,813 sf @ 1/1,500 SF = 684
   PROPOSED:
   - STANDARD: 330
   - HANDICAPPED: 7
   - TOTAL: 337
   - TOTAL TRAILER DROPS: 197
5. ROADWAY INFO:
   GRAVEL SPRINGS ROAD: 4 LANE GRAVEL
6. NO DEDICATED OPEN SPACE
7. BIKE PARKING PROPOSED: TBD
8. ELECTRIC CHARGING STATIONS: TBD
9. BUILDING USAGE BREAKDOWN:
   - OFFICE: 30,804 SF
   - WAREHOUSE: 996,009 SF
   - TOTAL: 1,026,813 SF
10. DOMESTIC WATER PROVIDED BY GWINNETT COUNTY
11. GRAVITY FEED SANITARY SEWER PROVIDED BY GWINNETT COUNTY

OWNER / DEVELOPER:
IDI LOGISTICS
1197 PEACHTREE STREET NE
SUITE 600
ATLANTA, GA 30361
PHONE: (770) 866-1117
CONTACT: GARY MINOR

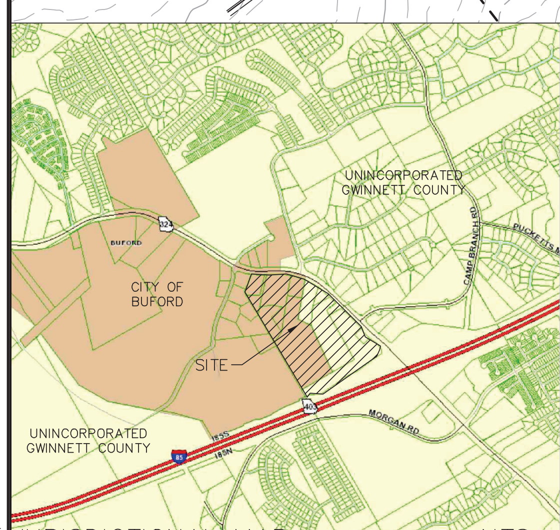
TRAFFIC ENGINEER:
NV5
1255 CANTON STREET
SUITE G
ROSWELL, GA 30075
PHONE: (678) 795-3649
CONTACT: NAVEED JAFFAR

CIVIL ENGINEER:
URBAN ENGINEERS
1904 MONROE DRIVE
SUITE 150
ATLANTA, GA 30324
PHONE: (404) 873-5874
CONTACT: DANIEL WINTERMEYER, P.E.





LOCATION MAP



JURISDICTIONAL MAP NTS

2/21/2022

Urban Engineers, Inc.
1904 MONROE DRIVE, N.E., SUITE 150
ATLANTA, GEORGIA 30324
PHONE:(404) 873-5874
www.urbanengineers.net

REVISIONS

DATE	△	DESCRIPTION
02/10/2022	1	REVISED LAYOUT AFTER DRI MEETING REVIEW
02/21/2022	2	ADDED SIDEWALKS

DRI SITE PLAN

IDI
GRAVEL SPRINGS ROAD
BUFORD, GA

PROJECT No.	22105-6
LAND LOT(S):	137 & 142
DISTRICT:	5TH
COUNTY:	GWINNETT
SCALE:	1"=100'
DATE:	01/27/2022

DRAWING NO.:
C-3.0

U:\IDI\u22105\6 - Gravel Springs Rd\u22105j6 - DRI.dwg
2/21/2022 4:43 PM

APPENDIX B

PROGRAMMED & PLANNED PROJECT REPORTS

I-85 @ SR 324

Project ID:	**0012698**	Notice to Proceed Date:	11/8/2019
Project Manager:	Jonathan Digioia	Construction Percent Complete:	61.18%
Office:	Program Delivery	Current Completion Date:	10/4/2022
County:	Gwinnett	Work Completion Date:	
Congressional District:	007	Construction Contract Amount:	
State Senate District.:	045	Construction Contractor:	GWINNETT COUNTY
State House District:	098, 103	**Preconstruction Status Report**	
Project Type:	New Construction	**Construction Status Report**	
Project Status:			
Right of Way Authorization:		Contact Us	

Project Description:

This project proposes four new ramps to create a new location, full access diamond interchange with the existing overpass of SR 324/ Gravel Springs Road over I-85/SR 403. The interchange will be situated between the existing SR 20/Buford Drive and Hamilton Mill Road interchanges within Gwinnett County. No new bridge or bridge widening is proposed by this project.

Activity	Program Year	Cost Estimate	Date of Last Estimate
PE (Preliminary Engineering)	2014	$650,000.00	7/14/2014
PE (Preliminary Engineering)	2015	$50,000.00	7/14/2014
ROW (Right of Way)	2017	$7,480,000.00	
UTL (Utilities)	2019	$82,000.00	
CST (Construction)	2019	$21,711,248.62	

Project Documents
Approved Concept Reports
0012698_L&D_ADs_MAY2017.pdf
0012698_L&D_MAY2017.pdf
0012698_CR_APR2015.pdf
Project Outreach Archive
0012698 PHOH Handout for SR 324 Interchange_2016.12.15.pdf
PI 0012698 - PHOH Display.pdf

Georgia Department of Transportation
One Georgia Center
600 West Peachtree NW
Atlanta, GA 30308
(404) 631-1990 Main Office
Contact Us

GW-020D

Atlanta Region's Plan RTP (2020) PROJECT FACT SHEET

Short Title	SR 20 (BUFORD DRIVE) WIDENING FROM I-85 NORTH TO ROCK SPRINGS ROAD
GDOT Project No.	0007850
Federal ID No.	N/A
Status	Programmed
Service Type	Roadway / General Purpose Capacity
Sponsor	GDOT
Jurisdiction	Regional - Northeast
Analysis Level	In the Region's Air Quality Conformity Analysis

Existing Thru Lane	4	**LCI**		**Network Year**	2030
Planned Thru Lane	8	**Flex**		**Corridor Length**	0.8 miles

Detailed Description and Justification

This project involves adding 2 lanes in each direction along SR 20 (Buford Drive) between I-85 North and Rock Springs Road.

Phase Status & Funding Information		Status	FISCAL YEAR	TOTAL PHASE COST	BREAKDOWN OF TOTAL PHASE COST BY FUNDING SOURCE			
					FEDERAL	STATE	BONDS	LOCAL/PRIVATE
PE	Transportation Funding Act (HB 170)		2023	**$699,953**	$0,000	$699,953	$0,000	$0,000
ROW	Transportation Funding Act (HB 170)		LR 2026-2030	**$3,148,187**	$0,000	$3,148,187	$0,000	$0,000
CST	General Federal Aid - 2026-2050		LR 2026-2030	**$15,198,980**	$12,159,184	$3,039,796	$0,000	$0,000
				$19,047,120	**$12,159,184**	**$6,887,936**	**$0,000**	**$0,000**

SCP: Scoping PE: Preliminary engineering / engineering / design / planning PE-OV: GDOT oversight services for engineering ROW: Right-of-way Acquistion
UTL: Utility relocation CST: Construction / Implementation ALL: Total estimated cost, inclusive of all phases

? For additional information about this project, please call (404) 463-3100 or email transportation@atlantaregional.com.

Report Generated: 8/25/2021

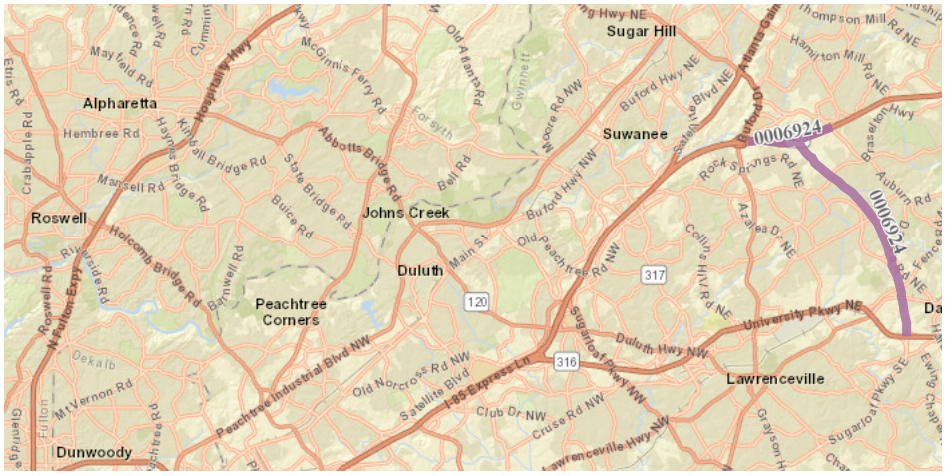
SUGARLOAF PKWY EXTENSION FM I-85 TO SR 316; INC CD - PH II

Project ID:	**0006924**	Notice to Proceed Date:	
Project Manager:	Matthew Fowler	Construction Percent Complete:	%
Office:	Innovative Prog. Delivery	Current Completion Date:	
County:	Gwinnett	Work Completion Date:	
Congressional District:	007, 010	Construction Contract Amount:	
State Senate District.:	009, 045	Construction Contractor:	
State House District:	098, 103, 104	**Preconstruction Status Report**	
Project Type:	New Construction	**Construction Status Report**	
Project Status:	Long Range Program		
Right of Way Authorization:	3/17/2020	Contact Us	

Project Description:

This project includes the construction of Sugarloaf Parkway Extension II from SR 20 (Buford Drive) to SR 316 (University Parkway). This section of new limited access freeway has interchanges at Mall of Georgia Boulevard, I-85, SR 124 (Braselton Highway), Fence Road and SR 316 (University Parkway). The project length is 8.3 miles.

Activity	Program Year	Cost Estimate	Date of Last Estimate
PE (Preliminary Engineering)	2011	$11,298,749.74	2/11/2010
ROW (Right of Way)	2014	$39,597,000.00	4/19/2017
UTL (Utilities)	2052	$6,500,900.00	5/17/2018
CST (Construction)	2052	$195,294,246.00	5/17/2018



Project Documents
Approved Concept Reports
0006924_0006925_CR_MAY2013.pdf
0006924_REVCR_MAY2018.pdf

Contractors
Design Guides
Crash Reporting
Disadvantaged Business Enterprise (DBE)

Georgia Department of Transportation
One Georgia Center
600 West Peachtree NW
Atlanta, GA 30308
(404) 631-1990 Main Office
Contact Us

GW-308B

Atlanta Region's Plan RTP (2020) PROJECT FACT SHEET

Short Title	SUGARLOAF PARKWAY EXTENSION: PHASE 2 - NEW ALIGNMENT FROM SR 316 EAST OF LAWRENCEVILLE TO I-85
GDOT Project No.	0006924
Federal ID No.	CSSTP-0006-00(924)
Status	Long Range
Service Type	Roadway / General Purpose Capacity
Sponsor	Gwinnett County
Jurisdiction	Regional - Northeast
Analysis Level	In the Region's Air Quality Conformity Analysis

Existing Thru Lane	0	**LCI**		**Network Year**	2030
Planned Thru Lane	4	**Flex**		**Corridor Length**	6.8 miles

Detailed Description and Justification

This Buford/Dacula/East-Cross County Connector project consists of constructing a new 6.8 miles roadway from SR 316 east of Lawrenceville to I 85. The road will include a 4 lane divided highway with a raised median, bicycle and pedestrian facilities, turn lanes as well as grade separation at I-85, SR 124, Old Fountain Rd., Old Peachtree Rd, Fence Rd, SR 8, and SR 316. The project will add need roadway capacity and address peak period congestion in the northern part of the county experiencing rapid population and employment growth.

Phase Status & Funding Information		Status	FISCAL YEAR	TOTAL PHASE COST	BREAKDOWN OF TOTAL PHASE COST BY FUNDING SOURCE			
					FEDERAL	STATE	BONDS	LOCAL/PRIVATE
PE	Local Jurisdiction/Municipality Funds	AUTH	2006	**$10,000,000**	~~$0,000~~	~~$0,000~~	~~$0,000~~	~~$10,000,000~~
PE	Federal Earmark Funding	AUTH	2018	**$9,450,000**	~~$4,499,500~~	~~$0,000~~	~~$0,000~~	~~$4,950,500~~
PE-OV	STP - Statewide Flexible (GDOT)	AUTH	2011	**$50,000**	~~$40,000~~	~~$10,000~~	~~$0,000~~	~~$0,000~~
ROW	Local Jurisdiction/Municipality Funds	AUTH	2020	**$60,000,000**	~~$0,000~~	~~$0,000~~	~~$0,000~~	~~$60,000,000~~
UTL	Local Jurisdiction/Municipality Funds		LR 2026-2030	**$6,414,500**	$0,000	$0,000	$0,000	$6,414,500
CST	General Federal Aid - 2026-2050		LR 2026-2030	**$300,000,000**	$165,427,567	$41,356,892	$0,000	$93,215,541
				$385,914,500	**$169,967,067**	**$41,366,892**	**$0,000**	**$174,580,541**

SCP: Scoping PE: Preliminary engineering / engineering / design / planning PE-OV: GDOT oversight services for engineering ROW: Right-of-way Acquistion
UTL: Utility relocation CST: Construction / Implementation ALL: Total estimated cost, inclusive of all phases

? For additional information about this project, please call (404) 463-3100 or email transportation@atlantaregional.com.

Report Generated: 8/25/2021

GW-308C

Atlanta Region's Plan RTP (2020) PROJECT FACT SHEET

Short Title	SUGARLOAF PARKWAY EXTENSION: PHASE 3 - NEW ALIGNMENT FROM I-85 TO PEACHTREE INDUSTRIAL BOULEVARD
GDOT Project No.	N/A
Federal ID No.	CSSTP-0006-00(925)
Status	Long Range
Service Type	Roadway / General Purpose Capacity
Sponsor	Gwinnett County
Jurisdiction	Gwinnett County
Analysis Level	In the Region's Air Quality Conformity Analysis

Existing Thru Lane	0	**LCI**		**Network Year**	2040
Planned Thru Lane	4	**Flex**		**Corridor Length**	5.8 miles

Detailed Description and Justification

This East-Cross County Connector project consists of constructing a new roadway from I-85 to Peachtree Industrial Blvd. The road will include a 4 lane divided highway with a raised median, bicycle and pedestrian facilities, turn lanes as well as grade separation at Norfolk Southern Railroad, Buford Hwy, Satellite Blvd. and I-985. The project will add roadway capacity and address peak period congestion in the northern part of the county experiencing rapid population and employment growth.

Phase Status & Funding Information		Status	FISCAL YEAR	TOTAL PHASE COST	BREAKDOWN OF TOTAL PHASE COST BY FUNDING SOURCE			
					FEDERAL	STATE	BONDS	LOCAL/PRIVATE
PE	Local Jurisdiction/Municipality Funds	AUTH	2006	**$8,000,000**	~~$0,000~~	~~$0,000~~	~~$0,000~~	~~$8,000,000~~
ROW	Local Jurisdiction/Municipality Funds	AUTH	2010	**$8,000,000**	~~$0,000~~	~~$0,000~~	~~$0,000~~	~~$8,000,000~~
UTL	Local Jurisdiction/Municipality Funds		LR 2031-2040	**$6,106,500**	$0,000	$0,000	$0,000	$6,106,500
CST	Local Jurisdiction/Municipality Funds		LR 2031-2040	**$109,415,586**	$0,000	$0,000	$0,000	$109,415,586
				$131,522,086	**$0,000**	**$0,000**	**$0,000**	**$131,522,086**

SCP: Scoping PE: Preliminary engineering / engineering / design / planning PE-OV: GDOT oversight services for engineering ROW: Right-of-way Acquistion
UTL: Utility relocation CST: Construction / Implementation ALL: Total estimated cost, inclusive of all phases

? For additional information about this project, please call (404) 463-3100 or email transportation@atlantaregional.com.

Report Generated: 8/25/2021

GW-361B

Atlanta Region's Plan RTP (2020) PROJECT FACT SHEET

Short Title	SR 124 (BRASELTON HIGHWAY) WIDENING FROM OLD PEACHTREE ROAD TO HAMILTON MILL PARKWAY
GDOT Project No.	0014926
Federal ID No.	N/A
Status	Long Range
Service Type	Roadway / General Purpose Capacity
Sponsor	GDOT
Jurisdiction	Gwinnett County
Analysis Level	In the Region's Air Quality Conformity Analysis

Existing Thru Lane	2	**LCI**		**Network Year**	2040
Planned Thru Lane	4	**Flex**		**Corridor Length**	3.6 miles

Detailed Description and Justification

This project will widen SR 124 to 4 lanes from Old Peachtree Road to Hamilton Mill Parkway.

Phase Status & Funding Information		Status	FISCAL YEAR	TOTAL PHASE COST	BREAKDOWN OF TOTAL PHASE COST BY FUNDING SOURCE			
					FEDERAL	STATE	BONDS	LOCAL/PRIVATE
PE	Transportation Funding Act (HB 170)		LR 2026-2030	**$2,735,000**	$0,000	$2,735,000	$0,000	$0,000
ALL	Transportation Funding Act (HB 170)		LR 2031-2040	**$54,429,000**	$0,000	$54,429,000	$0,000	$0,000
				$57,164,000	**$0,000**	**$57,164,000**	**$0,000**	**$0,000**

SCP: Scoping PE: Preliminary engineering / engineering / design / planning PE-OV: GDOT oversight services for engineering ROW: Right-of-way Acquistion
UTL: Utility relocation CST: Construction / Implementation ALL: Total estimated cost, inclusive of all phases

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Report Generated: 8/25/2021

GW-409

Atlanta Region's Plan RTP (2020) PROJECT FACT SHEET

Short Title	I-985 WIDENING FROM I-85 IN GWINNETT COUNTY TO SR 53 IN HALL COUNTY
GDOT Project No.	0014130
Federal ID No.	
Status	Programmed
Service Type	Roadway / General Purpose Capacity
Sponsor	GDOT
Jurisdiction	Gwinnett County
Analysis Level	In the Region's Air Quality Conformity Analysis

Existing Thru Lane	4	**LCI**		**Network Year**	2030
Planned Thru Lane	6	**Flex**		**Corridor Length**	16 miles

Detailed Description and Justification

This project proposes one new lane in each direction, constructed on the inside using existing right-of-way between I-85 in Gwinnett to SR 53 in Hall County. No new interchanges or ramps are anticipated. Existing bridges will be maintained where possible.

Phase Status & Funding Information		Status	FISCAL YEAR	TOTAL PHASE COST	BREAKDOWN OF TOTAL PHASE COST BY FUNDING SOURCE			
					FEDERAL	STATE	BONDS	LOCAL/PRIVATE
SCP	Transportation Funding Act (HB 170)	AUTH	2016	**$282,000**	~~$0,000~~	~~$282,000~~	~~$0,000~~	~~$0,000~~
PE	Transportation Funding Act (HB 170)	AUTH	2018	**$1,128,000**	~~$0,000~~	~~$1,128,000~~	~~$0,000~~	~~$0,000~~
PE	Transportation Funding Act (HB 170)	AUTH	2019	**$1,410,000**	~~$0,000~~	~~$1,410,000~~	~~$0,000~~	~~$0,000~~
CST	Transportation Funding Act (HB 170)		2023	**$37,957,200**	$0,000	$37,957,200	$0,000	$0,000
				$40,777,200	**$0,000**	**$40,777,200**	**$0,000**	**$0,000**

SCP: Scoping PE: Preliminary engineering / engineering / design / planning PE-OV: GDOT oversight services for engineering ROW: Right-of-way Acquistion
UTL: Utility relocation CST: Construction / Implementation ALL: Total estimated cost, inclusive of all phases

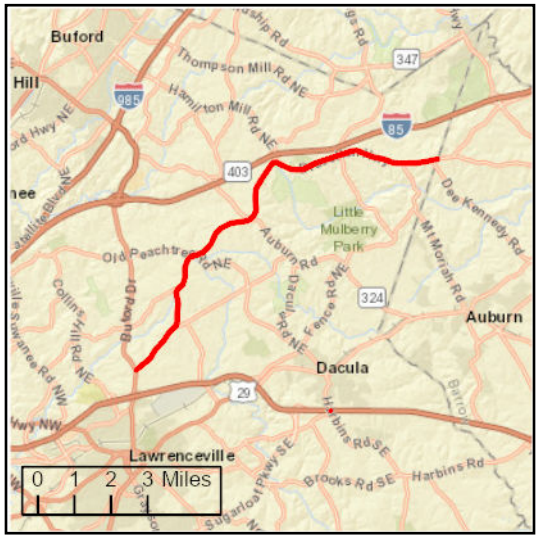
? For additional information about this project, please call (404) 463-3100 or email transportation@atlantaregional.com.

Report Generated: 8/25/2021

GW-426

Atlanta Region's Plan RTP (2020) PROJECT FACT SHEET

Short Title	ITS EXPANSION SR 124 (BRASELTON HIGHWAY) ☐ PHASE 1 FROM SR 20 TO BARROW COUNTY LINE
GDOT Project No.	0017998
Federal ID No.	N/A
Status	Programmed
Service Type	Roadway Operational Upgrades
Sponsor	Gwinnett County
Jurisdiction	Gwinnett County
Analysis Level	Exempt from Air Quality Analysis (40 CFR 93)



Existing Thru Lane	N/A	**LCI**		**Network Year**	TBD
Planned Thru Lane	N/A	**Flex**		**Corridor Length**	N/A miles

Detailed Description and Justification

This project will provide communications on SR 124/Braselton Highway from SR 20 to Barrow County. As part of the Countywide ITS expansion this segment will provide a fiber communications system providing greater network reliability and availability, improved signal coordination, reduces vehicle delay and facilitate traffic flow, improve overall safety along the corridor and facilitate incident management along this corridor.

Phase Status & Funding Information		Status	FISCAL YEAR	TOTAL PHASE COST	BREAKDOWN OF TOTAL PHASE COST BY FUNDING SOURCE			
					FEDERAL	STATE	BONDS	LOCAL/PRIVATE
CST	Congestion Mitigation & Air Quality Improvement (CMAQ)		2022	**$2,900,000**	$2,320,000	$0,000	$0,000	$580,000
				$2,900,000	**$2,320,000**	**$0,000**	**$0,000**	**$580,000**

SCP: Scoping PE: Preliminary engineering / engineering / design / planning PE-OV: GDOT oversight services for engineering ROW: Right-of-way Acquistion
UTL: Utility relocation CST: Construction / Implementation ALL: Total estimated cost, inclusive of all phases

? For additional information about this project, please call (404) 463-3100 or email transportation@atlantaregional.com.

Report Generated: 8/25/2021

APPENDIX C

TRAFFIC COUNT DATA

Reliable Traffic Data Services

Tel: (770) 578-8158 I Fax: (770) 578-8159
Info@reliabletraffic.org I www.reliabletraffic.org

TMC Data
Gravel Springs Rd (SR324) @
Mall of Georgia Blvd, Buford, GA
7-9 am I 4-6 pm

File Name : 46000001
Site Code : 46000001
Start Date : 2/8/2022
Page No : 1

Groups Printed- Cars, Buses & Light Trucks - Heavy Trucks

	Mall of Georgia Blvd Northbound					Cedar Glade Lane Southbound					Gravel Springs Rd (SR324) Eastbound					Gravel Springs Rd (SR324) Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	14	0	31	0	45	3	8	2	0	13	0	109	8	0	117	33	253	0	1	287	462
07:15 AM	17	0	35	0	52	6	1	2	0	9	0	114	10	0	124	30	248	3	0	281	466
07:30 AM	21	0	37	0	58	3	8	6	0	17	3	120	11	0	134	52	299	1	0	352	561
07:45 AM	23	2	44	0	69	5	4	5	0	14	0	108	26	0	134	61	264	0	0	325	542
Total	75	2	147	0	224	17	21	15	0	53	3	451	55	0	509	176	1064	4	1	1245	2031
08:00 AM	17	1	39	0	57	2	6	4	0	12	4	118	26	0	148	50	251	1	0	302	519
08:15 AM	12	1	33	0	46	1	5	6	0	12	5	106	22	0	133	47	246	3	0	296	487
08:30 AM	17	1	26	0	44	2	4	9	0	15	4	127	17	0	148	61	268	0	0	329	536
08:45 AM	12	2	26	0	40	1	3	5	0	9	1	130	14	0	145	87	253	0	0	340	534
Total	58	5	124	0	187	6	18	24	0	48	14	481	79	0	574	245	1018	4	0	1267	2076
*** BREAK ***																					
04:00 PM	36	3	149	0	188	2	0	1	0	3	3	222	20	0	245	89	147	0	0	236	672
04:15 PM	25	1	140	0	166	0	3	2	0	5	2	252	27	0	281	102	166	2	0	270	722
04:30 PM	24	4	123	0	151	3	3	2	0	8	5	230	25	0	260	100	199	1	0	300	719
04:45 PM	44	4	154	0	202	4	2	6	0	12	1	255	27	0	283	105	164	0	0	269	766
Total	129	12	566	0	707	9	8	11	0	28	11	959	99	0	1069	396	676	3	0	1075	2879
05:00 PM	35	5	157	0	197	2	2	4	0	8	4	246	23	0	273	102	189	0	0	291	769
05:15 PM	33	7	150	0	190	1	3	4	0	8	6	235	34	0	275	96	177	1	0	274	747
05:30 PM	30	5	154	0	189	4	3	2	0	9	4	241	29	0	274	99	175	3	0	277	749
05:45 PM	38	5	160	0	203	0	3	5	0	8	6	245	26	0	277	92	172	3	0	267	755
Total	136	22	621	0	779	7	11	15	0	33	20	967	112	0	1099	389	713	7	0	1109	3020
Grand Total	398	41	1458	0	1897	39	58	65	0	162	48	2858	345	0	3251	1206	3471	18	1	4696	10006
Apprch %	21	2.2	76.9	0		24.1	35.8	40.1	0		1.5	87.9	10.6	0		25.7	73.9	0.4	0		
Total %	4	0.4	14.6	0	19	0.4	0.6	0.6	0	1.6	0.5	28.6	3.4	0	32.5	12.1	34.7	0.2	0	46.9	
Cars, Buses & Light Trucks	395	41	1456	0	1892	39	58	65	0	162	48	2813	345	0	3206	1204	3424	18	1	4647	9907
% Cars, Buses & Light Trucks	99.2	100	99.9	0	99.7	100	100	100	0	100	100	98.4	100	0	98.6	99.8	98.6	100	100	99	99
Heavy Trucks	3	0	2	0	5	0	0	0	0	0	0	45	0	0	45	2	47	0	0	49	99
% Heavy Trucks	0.8	0	0.1	0	0.3	0	0	0	0	0	0	1.6	0	0	1.4	0.2	1.4	0	0	1	1

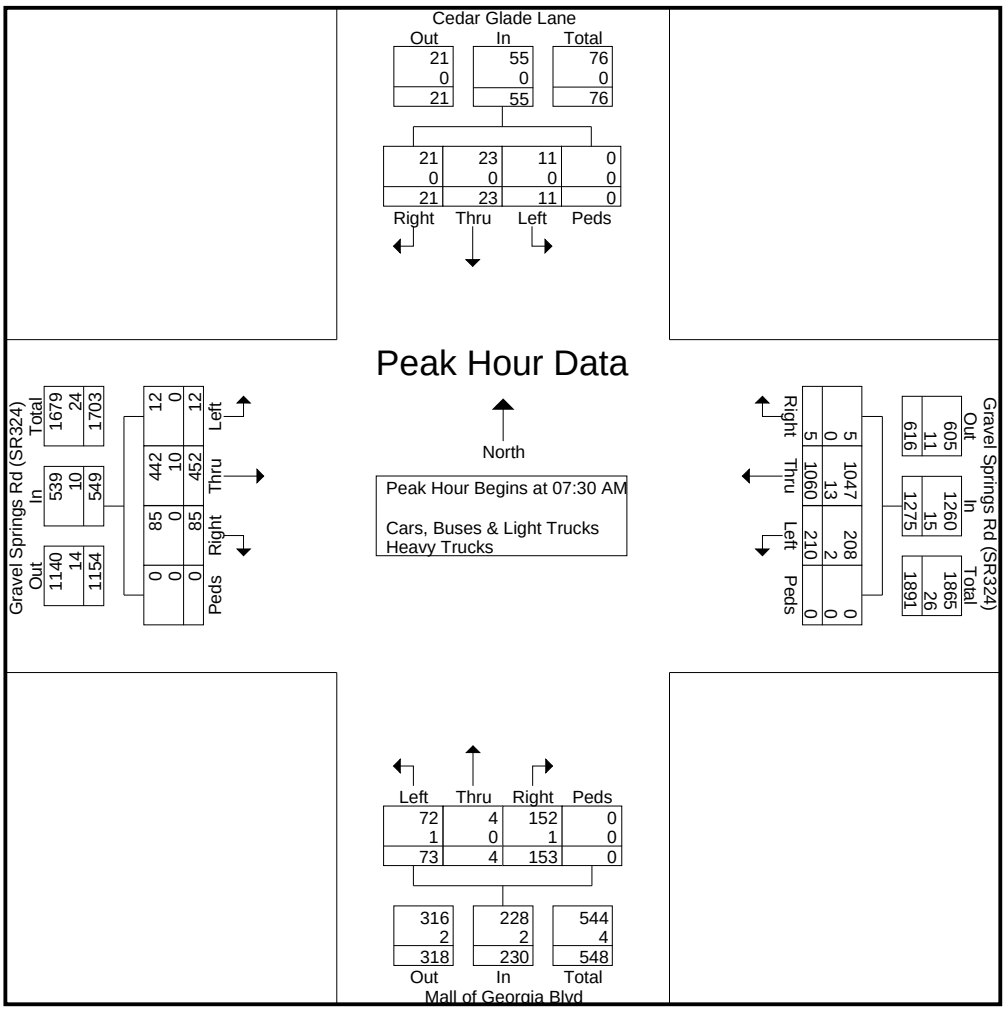
Reliable Traffic Data Services

Tel: (770) 578-8158 I Fax: (770) 578-8159
Info@reliabletraffic.org I www.reliabletraffic.org

TMC Data
Gravel Springs Rd (SR324) @
Mall of Georgia Blvd, Buford, GA
7-9 am I 4-6 pm

File Name : 46000001
Site Code : 46000001
Start Date : 2/8/2022
Page No : 2

	Mall of Georgia Blvd Northbound					Cedar Glade Lane Southbound					Gravel Springs Rd (SR324) Eastbound					Gravel Springs Rd (SR324) Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	21	0	37	0	58	3	**8**	**6**	0	**17**	3	**120**	11	0	134	52	**299**	1	0	**352**	**561**
07:45 AM	**23**	**2**	**44**	0	**69**	**5**	4	5	0	14	0	108	**26**	0	134	**61**	264	0	0	325	542
08:00 AM	17	1	39	0	57	2	6	4	0	12	4	118	26	0	**148**	50	251	1	0	302	519
08:15 AM	12	1	33	0	46	1	5	6	0	12	**5**	106	22	0	133	47	246	**3**	0	296	487
Total Volume	73	4	153	0	230	11	23	21	0	55	12	452	85	0	549	210	1060	5	0	1275	2109
% App. Total	31.7	1.7	66.5	0		20	41.8	38.2	0		2.2	82.3	15.5	0		16.5	83.1	0.4	0		
PHF	.793	.500	.869	.000	.833	.550	.719	.875	.000	.809	.600	.942	.817	.000	.927	.861	.886	.417	.000	.906	.940
Cars, Buses & Light Trucks	72	4	152	0	228	11	23	21	0	55	12	442	85	0	539	208	1047	5	0	1260	2082
% Cars, Buses & Light Trucks	98.6	100	99.3	0	99.1	100	100	100	0	100	100	97.8	100	0	98.2	99.0	98.8	100	0	98.8	98.7
Heavy Trucks	1	0	1	0	2	0	0	0	0	0	0	10	0	0	10	2	13	0	0	15	27
% Heavy Trucks	1.4	0	0.7	0	0.9	0	0	0	0	0	0	2.2	0	0	1.8	1.0	1.2	0	0	1.2	1.3



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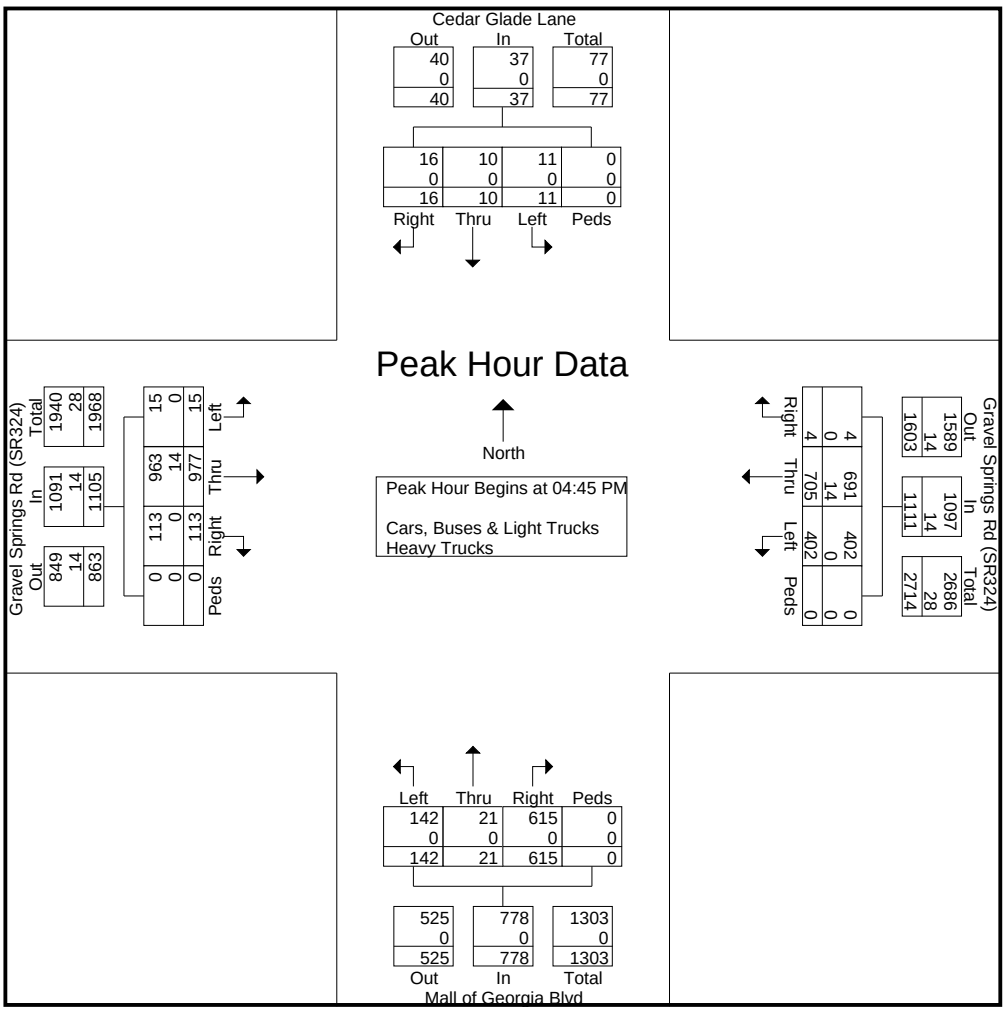
Info@reliabletraffic.org I www.reliabletraffic.org

TMC Data
Gravel Springs Rd (SR324) @
Mall of Georgia Blvd, Buford, GA
7-9 am I 4-6 pm

File Name : 46000001
Site Code : 46000001
Start Date : 2/8/2022
Page No : 3

	Mall of Georgia Blvd Northbound					Cedar Glade Lane Southbound					Gravel Springs Rd (SR324) Eastbound					Gravel Springs Rd (SR324) Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	**44**	4	154	0	**202**	**4**	2	**6**	0	**12**	1	**255**	27	0	**283**	**105**	164	0	0	269	766
05:00 PM	35	5	**157**	0	197	2	2	4	0	8	4	246	23	0	273	102	**189**	0	0	**291**	**769**
05:15 PM	33	**7**	150	0	190	1	**3**	4	0	8	**6**	235	**34**	0	275	96	177	1	0	274	747
05:30 PM	30	5	154	0	189	4	3	2	0	9	4	241	29	0	274	99	175	**3**	0	277	749
Total Volume	142	21	615	0	778	11	10	16	0	37	15	977	113	0	1105	402	705	4	0	1111	3031
% App. Total	18.3					29.7		43.2				88.4	10.2			36.2	63.5				
PHF	.807	.750	.979	.000	.963	.688	.833	.667	.000	.771	.625	.958	.831	.000	.976	.957	.933	.333	.000	.954	.985
Cars, Buses & Light Trucks	142	21	615	0	778	11	10	16	0	37	15	963	113	0	1091	402	691	4	0	1097	3003
% Cars, Buses & Light Trucks	100	100	100	0	100	100	100	100	0	100	100	98.6	100	0	98.7	100	98.0	100	0	98.7	99.1
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	14	0	0	14	0	14	0	0	14	28
% Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	1.4	0	0	1.3	0	2.0	0	0	1.3	0.9



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Info@reliabletraffic.org I www.reliabletraffic.org

TMC Data
Gravel Springs Rd (SR324) @
Brown Rd, Buford, GA
7-9 am I 4-6 pm

File Name : 46000002
Site Code : 46000002
Start Date : 2/8/2022
Page No : 1

Groups Printed- Cars, Buses & Light Trucks - Heavy Trucks

	Brown Rd Northbound					Ivy Church Rd Southbound					Gravel Springs Rd (SR324) Eastbound					Gravel Springs Rd (SR324) Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	0	0	1	0	1	0	0	0	0	0	0	140	3	0	143	5	273	0	0	278	422
07:15 AM	0	0	1	0	1	0	0	0	0	0	0	142	3	0	145	2	278	0	0	280	426
07:30 AM	1	0	0	0	1	0	0	0	0	0	0	152	3	0	155	4	349	0	0	353	509
07:45 AM	1	0	6	0	7	0	0	0	0	0	0	152	4	0	156	6	327	0	0	333	496
Total	2	0	8	0	10	0	0	0	0	0	0	586	13	0	599	17	1227	0	0	1244	1853
08:00 AM	3	0	0	0	3	0	0	0	0	0	0	140	1	0	141	2	303	0	0	305	449
08:15 AM	2	0	1	0	3	0	0	0	0	0	0	131	3	0	134	2	311	0	0	313	450
08:30 AM	1	0	1	0	2	0	0	0	0	0	1	151	3	0	155	1	333	0	0	334	491
08:45 AM	1	0	2	0	3	0	0	0	0	0	0	158	1	0	159	5	337	0	0	342	504
Total	7	0	4	0	11	0	0	0	0	0	1	580	8	0	589	10	1284	0	0	1294	1894
*** BREAK ***																					
04:00 PM	1	0	5	0	6	0	0	0	0	0	1	359	0	0	360	1	256	0	0	257	623
04:15 PM	1	0	4	0	5	0	0	0	0	0	0	366	0	0	366	3	268	0	0	271	642
04:30 PM	0	0	3	0	3	0	0	0	0	0	0	349	2	0	351	1	288	0	0	289	643
04:45 PM	2	0	3	0	5	0	0	0	0	0	0	397	0	0	397	2	276	0	0	278	680
Total	4	0	15	0	19	0	0	0	0	0	1	1471	2	0	1474	7	1088	0	0	1095	2588
05:00 PM	0	0	7	0	7	0	0	0	0	0	0	388	3	0	391	2	291	0	0	293	691
05:15 PM	1	0	3	0	4	0	0	0	0	0	0	380	0	0	380	1	286	0	0	287	671
05:30 PM	0	0	8	0	8	0	0	0	0	0	0	386	2	0	388	1	277	0	0	278	674
05:45 PM	1	0	5	0	6	0	0	0	0	0	0	395	0	0	395	0	270	0	0	270	671
Total	2	0	23	0	25	0	0	0	0	0	0	1549	5	0	1554	4	1124	0	0	1128	2707
Grand Total	15	0	50	0	65	0	0	0	0	0	2	4186	28	0	4216	38	4723	0	0	4761	9042
Apprch %	23.1	0	76.9	0		0	0	0	0		0	99.3	0.7	0		0.8	99.2	0	0		
Total %	0.2	0	0.6	0	0.7	0	0	0	0	0	0	46.3	0.3	0	46.6	0.4	52.2	0	0	52.7	
Cars, Buses & Light Trucks	13	0	49	0	62	0	0	0	0	0	2	4142	28	0	4172	36	4677	0	0	4713	8947
% Cars, Buses & Light Trucks	86.7	0	98	0	95.4	0	0	0	0	0	100	98.9	100	0	99	94.7	99	0	0	99	98.9
Heavy Trucks	2	0	1	0	3	0	0	0	0	0	0	44	0	0	44	2	46	0	0	48	95
% Heavy Trucks	13.3	0	2	0	4.6	0	0	0	0	0	0	1.1	0	0	1	5.3	1	0	0	1	1.1

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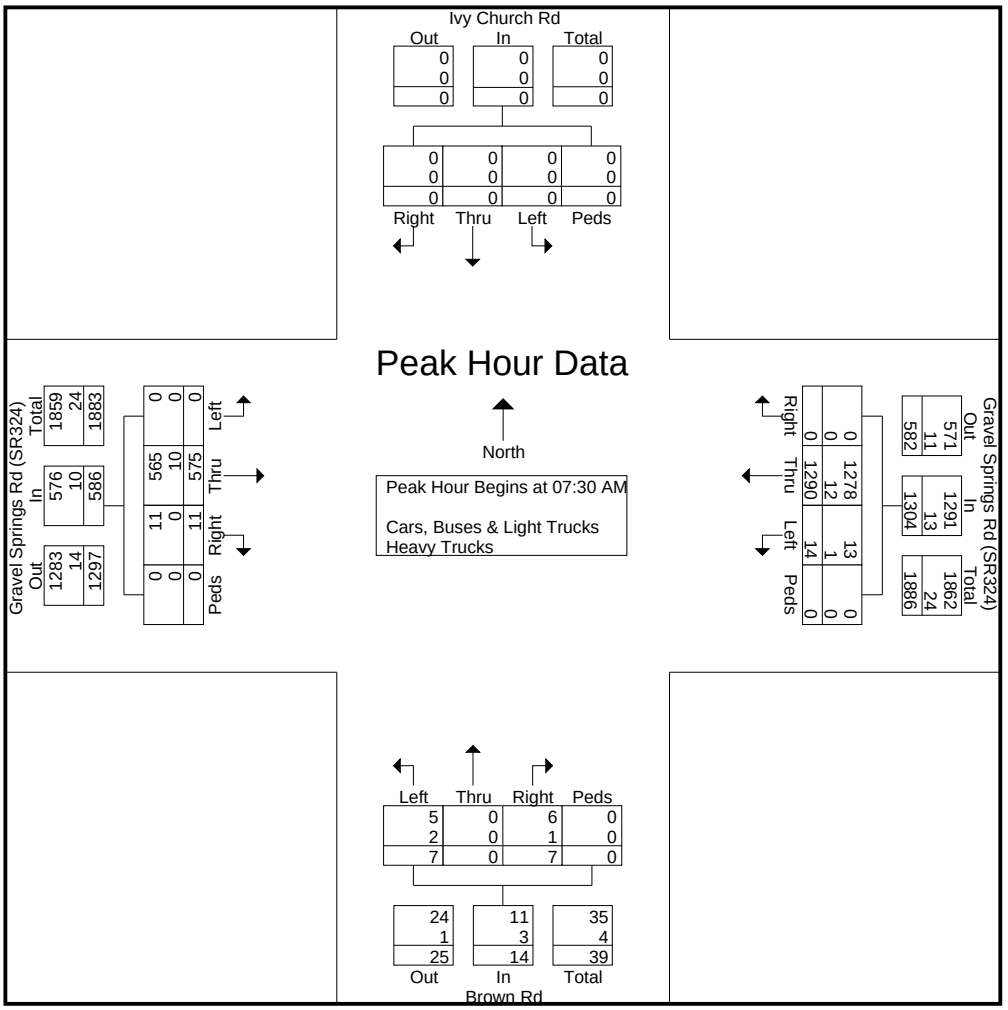
TMC Data
Gravel Springs Rd (SR324) @
Brown Rd, Buford, GA
7-9 am I 4-6 pm

File Name : 46000002
Site Code : 46000002
Start Date : 2/8/2022
Page No : 2

	Brown Rd Northbound					Ivy Church Rd Southbound					Gravel Springs Rd (SR324) Eastbound					Gravel Springs Rd (SR324) Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	1	0	0	0	1	0	0	0	0	0	0	**152**	3	0	155	4	**349**	0	0	**353**	**509**
07:45 AM	1	0	**6**	0	**7**	0	0	0	0	0	0	152	**4**	0	**156**	**6**	327	0	0	333	496
08:00 AM	**3**	0	0	0	3	0	0	0	0	0	0	140	1	0	141	2	303	0	0	305	449
08:15 AM	2	0	1	0	3	0	0	0	0	0	0	131	3	0	134	2	311	0	0	313	450
Total Volume	7	0	7	0	14	0	0	0	0	0	0	575	11	0	586	14	1290	0	0	1304	1904
% App. Total	50	0	50	0		0	0	0	0		0	98.1	1.9	0		1.1	98.9	0	0		
PHF	.583	.000	.292	.000	.500	.000	.000	.000	.000	.000	.000	.946	.688	.000	.939	.583	.924	.000	.000	.924	.935
Cars, Buses & Light Trucks	5	0	6	0	11	0	0	0	0	0	0	565	11	0	576	13	1278	0	0	1291	1878
% Cars, Buses & Light Trucks	71.4	0	85.7	0	78.6	0	0	0	0	0	0	98.3	100	0	98.3	92.9	99.1	0	0	99.0	98.6
Heavy Trucks	2	0	1	0	3	0	0	0	0	0	0	10	0	0	10	1	12	0	0	13	26
% Heavy Trucks	28.6	0	14.3	0	21.4	0	0	0	0	0	0	1.7	0	0	1.7	7.1	0.9	0	0	1.0	1.4



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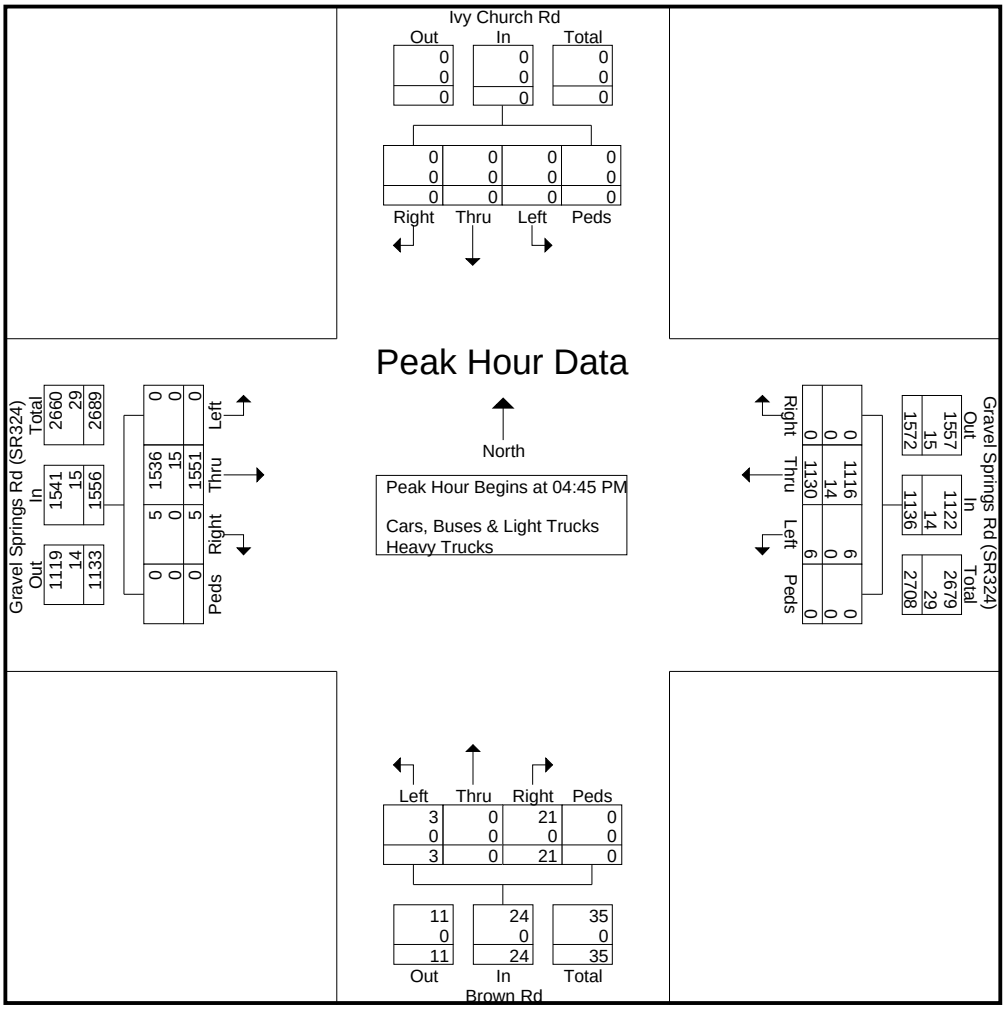
TMC Data
Gravel Springs Rd (SR324) @
Brown Rd, Buford, GA
7-9 am I 4-6 pm

File Name : 46000002
Site Code : 46000002
Start Date : 2/8/2022
Page No : 3

	Brown Rd Northbound					Ivy Church Rd Southbound					Gravel Springs Rd (SR324) Eastbound					Gravel Springs Rd (SR324) Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	**2**	0	3	0	5	0	0	0	0	0	0	**397**	0	0	**397**	**2**	276	0	0	278	680
05:00 PM	0	0	7	0	7	0	0	0	0	0	0	388	**3**	0	391	2	**291**	0	0	**293**	**691**
05:15 PM	1	0	3	0	4	0	0	0	0	0	0	380	0	0	380	1	286	0	0	287	671
05:30 PM	0	0	**8**	0	**8**	0	0	0	0	0	0	386	2	0	388	1	277	0	0	278	674
Total Volume	3	0	21	0	24	0	0	0	0	0	0	1551	5	0	1556	6	1130	0	0	1136	2716
% App. Total	12.5	0	87.5	0		0	0	0	0		0	99.7	0.3	0		0.5	99.5	0	0		
PHF	.375	.000	.656	.000	.750	.000	.000	.000	.000	.000	.000	.977	.417	.000	.980	.750	.971	.000	.000	.969	.983
Cars, Buses & Light Trucks	3	0	21	0	24	0	0	0	0	0	0	1536	5	0	1541	6	1116	0	0	1122	2687
% Cars, Buses & Light Trucks	100	0	100	0	100	0	0	0	0	0	0	99.0	100	0	99.0	100	98.8	0	0	98.8	98.9
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	15	0	0	15	0	14	0	0	14	29
% Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	1.0	0	0	1.0	0	1.2	0	0	1.2	1.1



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TMC Data
Gravel Springs Rd (SR324) @
Ivy Creek Rd, Buford, GA
6 am - 6 pm

File Name : 46000003
Site Code : 46000003
Start Date : 2/8/2022
Page No : 1

Groups Printed- Cars, Buses & Light Trucks - Heavy Trucks

	Northbound					Ivy Creek Rd Southbound					Gravel Springs Rd (SR324) Eastbound					Gravel Springs Rd (SR324) Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	0	0	0	0	0	11	0	11	0	22	3	64	0	0	67	0	125	4	0	129	218
06:15 AM	0	0	0	0	0	12	0	7	0	19	4	82	0	0	86	0	198	1	0	199	304
06:30 AM	0	0	0	0	0	15	0	13	0	28	5	95	0	0	100	0	212	5	0	217	345
06:45 AM	0	0	0	0	0	15	0	14	0	29	6	129	0	0	135	0	238	4	0	242	406
Total	0	0	0	0	0	53	0	45	0	98	18	370	0	0	388	0	773	14	0	787	1273
07:00 AM	0	0	0	0	0	19	0	14	0	33	6	130	0	0	136	0	264	9	0	273	442
07:15 AM	0	0	0	0	0	22	0	14	0	36	9	146	0	0	155	0	286	13	0	299	490
07:30 AM	0	0	0	0	0	16	0	22	0	38	12	153	0	0	165	0	293	7	0	300	503
07:45 AM	0	0	0	0	0	17	0	27	0	44	17	137	0	0	154	0	301	9	0	310	508
Total	0	0	0	0	0	74	0	77	0	151	44	566	0	0	610	0	1144	38	0	1182	1943
08:00 AM	0	0	0	0	0	11	0	34	0	45	9	136	0	0	145	0	276	12	0	288	478
08:15 AM	0	0	0	0	0	14	0	27	0	41	13	130	0	0	143	0	287	8	0	295	479
08:30 AM	0	0	0	0	0	16	0	25	0	41	19	142	0	0	161	0	290	10	0	300	502
08:45 AM	0	0	0	0	0	17	0	24	0	41	15	137	0	0	152	0	308	12	0	320	513
Total	0	0	0	0	0	58	0	110	0	168	56	545	0	0	601	0	1161	42	0	1203	1972
09:00 AM	0	0	0	0	0	16	0	12	0	28	8	166	0	0	174	0	239	8	0	247	449
09:15 AM	0	0	0	0	0	15	0	27	0	42	19	131	0	0	150	0	270	10	0	280	472
09:30 AM	0	0	0	0	0	14	0	35	0	49	10	129	0	0	139	0	246	19	0	265	453
09:45 AM	0	0	0	0	0	9	0	36	0	45	15	128	0	0	143	0	255	11	0	266	454
Total	0	0	0	0	0	54	0	110	0	164	52	554	0	0	606	0	1010	48	0	1058	1828
10:00 AM	0	0	0	0	0	14	0	31	0	45	14	137	0	0	151	0	249	6	0	255	451
10:15 AM	0	0	0	0	0	11	0	31	0	42	18	160	0	0	178	0	242	9	0	251	471
10:30 AM	0	0	0	0	0	19	0	36	0	55	18	160	0	0	178	0	239	8	0	247	480
10:45 AM	0	0	0	0	0	6	0	31	0	37	19	178	0	0	197	0	260	8	0	268	502
Total	0	0	0	0	0	50	0	129	0	179	69	635	0	0	704	0	990	31	0	1021	1904
11:00 AM	0	0	0	0	0	14	0	34	0	48	21	171	0	0	192	0	198	10	0	208	448
11:15 AM	0	0	0	0	0	10	0	35	0	45	24	175	0	0	199	0	225	6	0	231	475
11:30 AM	0	0	0	0	0	11	0	29	0	40	29	185	0	0	214	0	232	11	0	243	497
11:45 AM	0	0	0	0	0	12	0	33	0	45	21	205	0	0	226	0	247	7	0	254	525
Total	0	0	0	0	0	47	0	131	0	178	95	736	0	0	831	0	902	34	0	936	1945
12:00 PM	0	0	0	0	0	12	0	19	0	31	20	199	0	0	219	0	226	3	0	229	479
12:15 PM	0	0	0	0	0	12	0	21	0	33	26	221	0	0	247	0	239	11	0	250	530
12:30 PM	0	0	0	0	0	9	0	27	0	36	28	251	0	0	279	0	214	11	0	225	540
12:45 PM	0	0	0	0	0	15	0	30	0	45	29	228	0	0	257	0	233	4	0	237	539
Total	0	0	0	0	0	48	0	97	0	145	103	899	0	0	1002	0	912	29	0	941	2088
01:00 PM	0	0	0	0	0	8	0	23	0	31	34	213	0	0	247	0	203	13	0	216	494
01:15 PM	0	0	0	0	0	8	0	27	0	35	18	268	0	0	286	0	221	11	0	232	553
01:30 PM	0	0	0	0	0	8	0	21	0	29	30	224	0	0	254	0	219	10	0	229	512
01:45 PM	0	0	0	0	0	12	0	28	0	40	32	282	0	0	314	0	215	9	0	224	578
Total	0	0	0	0	0	36	0	99	0	135	114	987	0	0	1101	0	858	43	0	901	2137
02:00 PM	0	0	0	0	0	13	0	28	0	41	42	271	0	0	313	0	181	9	0	190	544
02:15 PM	0	0	0	0	0	14	0	24	0	38	36	285	0	0	321	0	210	18	0	228	587
02:30 PM	0	0	0	0	0	7	0	44	0	51	23	277	0	0	300	0	218	14	0	232	583
02:45 PM	0	0	0	0	0	8	0	31	0	39	34	294	0	0	328	0	251	11	0	262	629
Total	0	0	0	0	0	42	0	127	0	169	135	1127	0	0	1262	0	860	52	0	912	2343

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TMC Data
Gravel Springs Rd (SR324) @
Ivy Creek Rd, Buford, GA
6 am - 6 pm

File Name : 46000003
Site Code : 46000003
Start Date : 2/8/2022
Page No : 2

Groups Printed- Cars, Buses & Light Trucks - Heavy Trucks

	Northbound					Ivy Creek Rd Southbound					Gravel Springs Rd (SR324) Eastbound					Gravel Springs Rd (SR324) Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
03:00 PM	0	0	0	0	0	8	0	30	0	38	34	294	0	0	328	0	208	11	0	219	585
03:15 PM	0	0	0	0	0	6	0	21	0	27	36	310	0	0	346	0	218	15	0	233	606
03:30 PM	0	0	0	0	0	8	0	24	0	32	34	312	0	0	346	0	229	14	0	243	621
03:45 PM	0	0	0	0	0	9	0	35	0	44	30	320	0	0	350	0	261	12	0	273	667
Total	0	0	0	0	0	31	0	110	0	141	134	1236	0	0	1370	0	916	52	0	968	2479
04:00 PM	0	0	0	0	0	7	0	22	0	29	29	326	0	0	355	0	229	19	0	248	632
04:15 PM	0	0	0	0	0	15	0	22	0	37	20	335	0	0	355	0	250	12	0	262	654
04:30 PM	0	0	0	0	0	14	0	38	0	52	24	353	0	0	377	0	267	13	0	280	709
04:45 PM	0	0	0	0	0	13	0	25	0	38	28	345	0	0	373	0	260	28	0	288	699
Total	0	0	0	0	0	49	0	107	0	156	101	1359	0	0	1460	0	1006	72	0	1078	2694
05:00 PM	0	0	0	0	0	15	0	25	0	40	35	344	0	0	379	0	253	28	0	281	700
05:15 PM	0	0	0	0	0	20	0	33	0	53	27	346	0	0	373	0	260	15	0	275	701
05:30 PM	0	0	0	0	0	10	0	26	0	36	39	379	0	0	418	0	245	18	0	263	717
05:45 PM	0	0	0	0	0	10	0	34	0	44	31	347	0	0	378	0	239	13	0	252	674
Total	0	0	0	0	0	55	0	118	0	173	132	1416	0	0	1548	0	997	74	0	1071	2792
Grand Total	0	0	0	0	0	597	0	1260	0	1857	1053	10430	0	0	11483	0	11529	529	0	12058	25398
Apprch %	0	0	0	0		32.1	0	67.9	0		9.2	90.8	0	0		0	95.6	4.4	0		
Total %	0	0	0	0	0	2.4	0	5	0	7.3	4.1	41.1	0	0	45.2	0	45.4	2.1	0	47.5	
Cars, Buses & Light Trucks	0	0	0	0	0	596	0	1260	0	1856	1053	10318	0	0	11371	0	11418	528	0	11946	25173
% Cars, Buses & Light Trucks	0	0	0	0	0	99.8	0	100	0	99.9	100	98.9	0	0	99	0	99	99.8	0	99.1	99.1
Heavy Trucks	0	0	0	0	0	1	0	0	0	1	0	112	0	0	112	0	111	1	0	112	225
% Heavy Trucks	0	0	0	0	0	0.2	0	0	0	0.1	0	1.1	0	0	1	0	1	0.2	0	0.9	0.9

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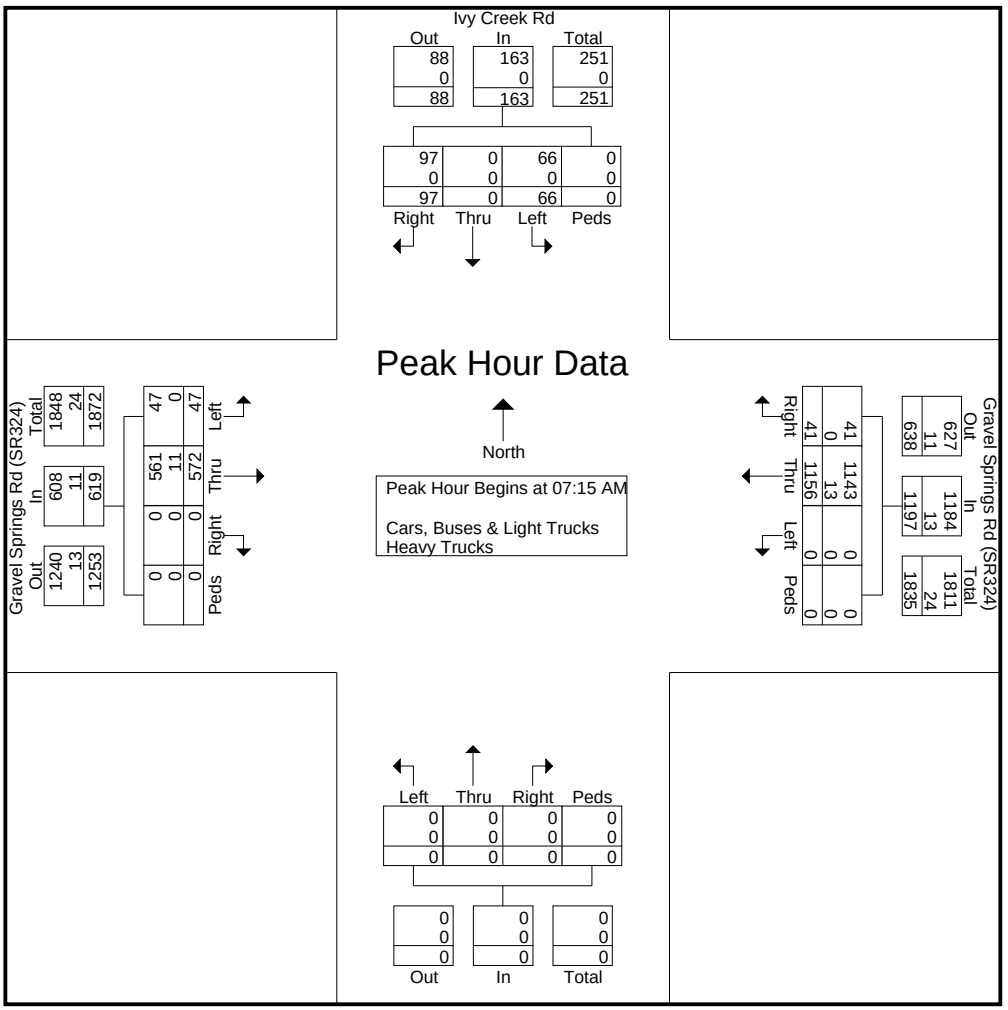
TMC Data
Gravel Springs Rd (SR324) @
Ivy Creek Rd, Buford, GA
6 am - 6 pm

File Name : 46000003
Site Code : 46000003
Start Date : 2/8/2022
Page No : 3

	Northbound					Ivy Creek Rd Southbound					Gravel Springs Rd (SR324) Eastbound					Gravel Springs Rd (SR324) Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	0	0	0	0	**22**	0	14	0	36	9	146	0	0	155	0	286	**13**	0	299	490
07:30 AM	0	0	0	0	0	16	0	22	0	38	12	**153**	0	0	**165**	0	293	7	0	300	503
07:45 AM	0	0	0	0	0	17	0	27	0	44	**17**	137	0	0	154	0	**301**	9	0	**310**	**508**
08:00 AM	0	0	0	0	0	11	0	**34**	0	**45**	9	136	0	0	145	0	276	12	0	288	478
Total Volume	0	0	0	0	0	66	0	97	0	163	47	572	0	0	619	0	1156	41	0	1197	1979
% App. Total	0	0	0	0		40.5	0	59.5	0		7.6	92.4	0	0		0	96.6	3.4	0		
PHF	.000	.000	.000	.000	.000	.750	.000	.713	.000	.906	.691	.935	.000	.000	.938	.000	.960	.788	.000	.965	.974
Cars, Buses & Light Trucks	0	0	0	0	0	66	0	97	0	163	47	561	0	0	608	0	1143	41	0	1184	1955
% Cars, Buses & Light Trucks	0	0	0	0	0	100	0	100	0	100	100	98.1	0	0	98.2	0	98.9	100	0	98.9	98.8
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	11	0	0	11	0	13	0	0	13	24
% Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	1.9	0	0	1.8	0	1.1	0	0	1.1	1.2



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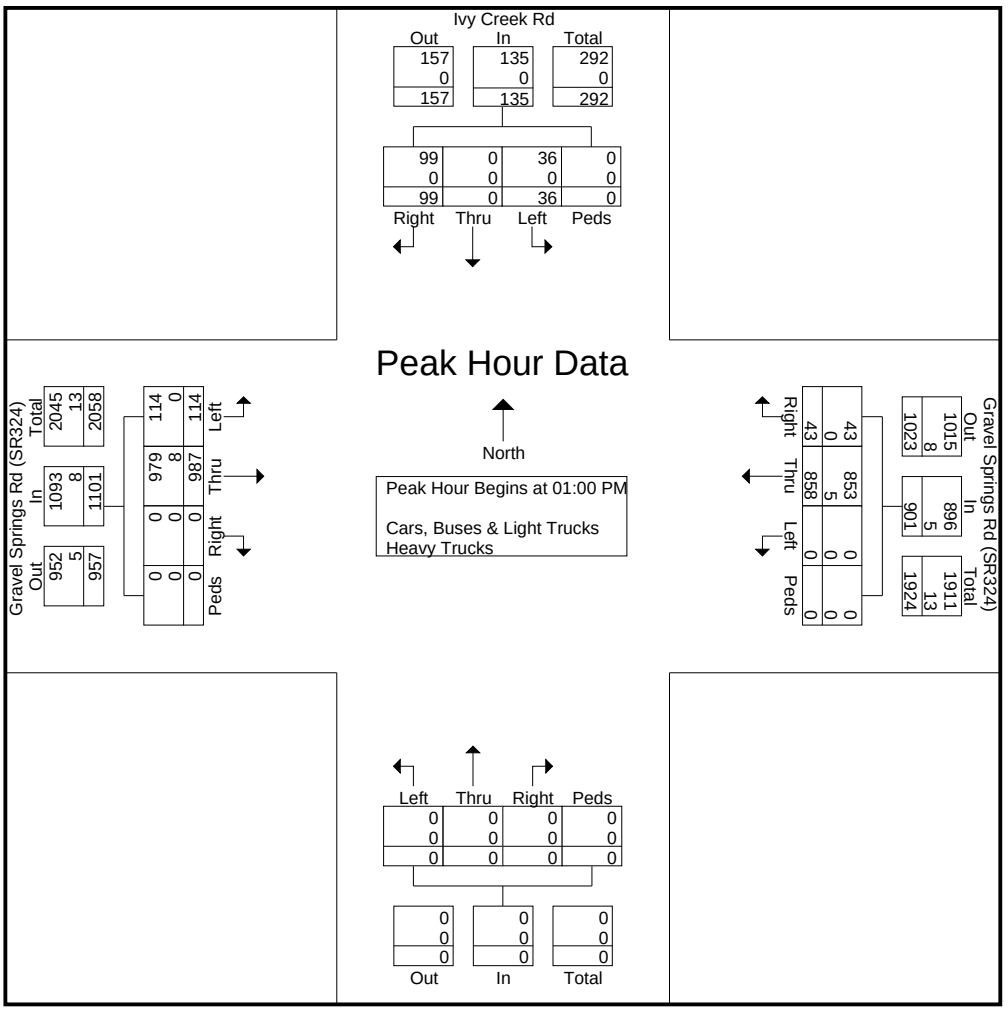
TMC Data
Gravel Springs Rd (SR324) @
Ivy Creek Rd, Buford, GA
6 am - 6 pm

File Name : 46000003
Site Code : 46000003
Start Date : 2/8/2022
Page No : 4

	Northbound					Ivy Creek Rd Southbound					Gravel Springs Rd (SR324) Eastbound					Gravel Springs Rd (SR324) Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 01:00 PM																					
01:00 PM	0	0	0	0	0	8	0	23	0	31	**34**	213	0	0	247	0	203	**13**	0	216	494
01:15 PM	0	0	0	0	0	8	0	27	0	35	18	268	0	0	286	0	**221**	11	0	**232**	553
01:30 PM	0	0	0	0	0	8	0	21	0	29	30	224	0	0	254	0	219	10	0	229	512
01:45 PM	0	0	0	0	0	**12**	0	**28**	0	**40**	32	**282**	0	0	**314**	0	215	9	0	224	**578**
Total Volume	0	0	0	0	0	36	0	99	0	135	114	987	0	0	1101	0	858	43	0	901	2137
% App. Total						26.7		73.3			10.4	89.6					95.2				
PHF	.000	.000	.000	.000	.000	.750	.000	.884	.000	.844	.838	.875	.000	.000	.877	.000	.971	.827	.000	.971	.924
Cars, Buses & Light Trucks	0	0	0	0	0	36	0	99	0	135	114	979	0	0	1093	0	853	43	0	896	2124
% Cars, Buses & Light Trucks	0	0	0	0	0	100	0	100	0	100	100	99.2	0	0	99.3	0	99.4	100	0	99.4	99.4
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	8	0	0	8	0	5	0	0	5	13
% Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0.8	0	0	0.7	0	0.6	0	0	0.6	0.6



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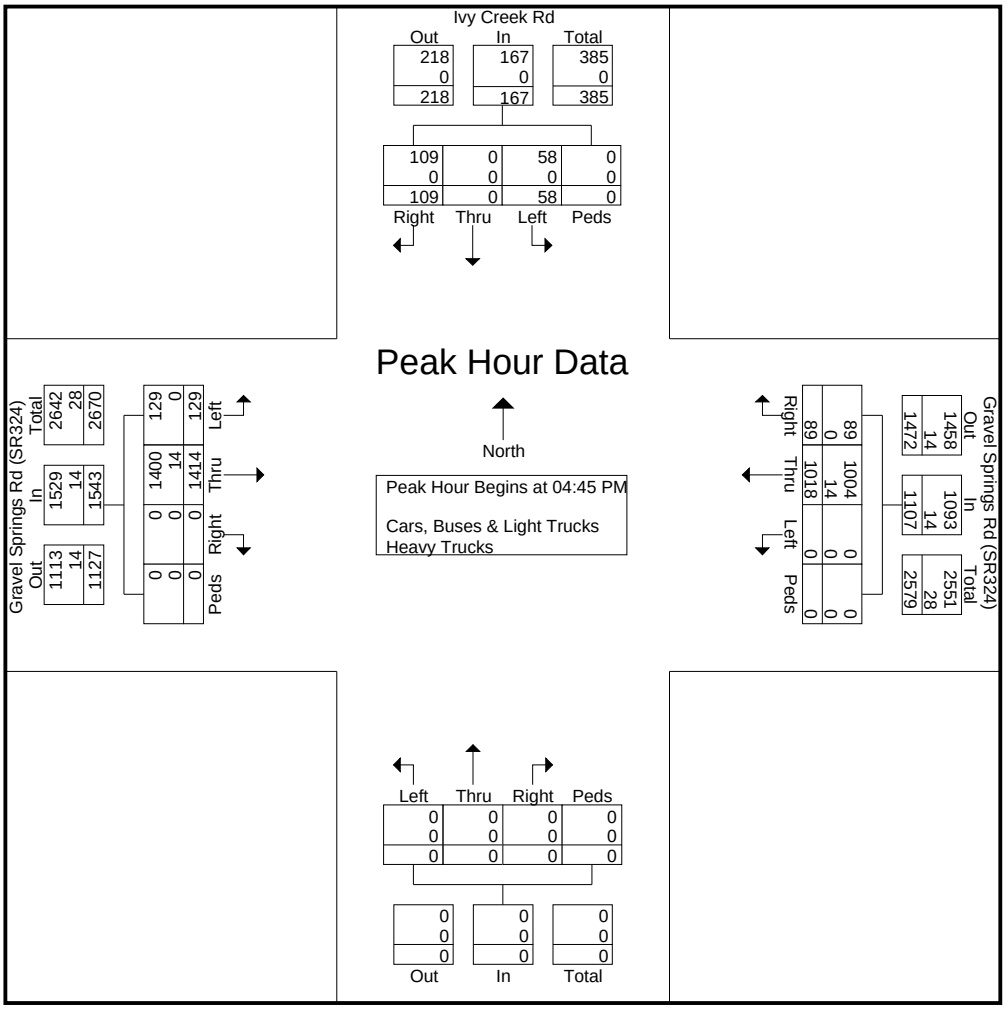
TMC Data
Gravel Springs Rd (SR324) @
Ivy Creek Rd, Buford, GA
6 am - 6 pm

File Name : 46000003
Site Code : 46000003
Start Date : 2/8/2022
Page No : 5

	Northbound					Ivy Creek Rd Southbound					Gravel Springs Rd (SR324) Eastbound					Gravel Springs Rd (SR324) Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	0	0	0	0	13	0	25	0	38	28	345	0	0	373	0	**260**	**28**	0	**288**	699
05:00 PM	0	0	0	0	0	15	0	25	0	40	35	344	0	0	379	0	253	28	0	281	700
05:15 PM	0	0	0	0	0	**20**	0	**33**	0	**53**	27	346	0	0	373	0	260	15	0	275	701
05:30 PM	0	0	0	0	0	10	0	26	0	36	**39**	**379**	0	0	**418**	0	245	18	0	263	**717**
Total Volume	0	0	0	0	0	58	0	109	0	167	129	1414	0	0	1543	0	1018	89	0	1107	2817
% App. Total	0	0	0	0		34.7	0	65.3	0		8.4	91.6	0	0		0	92	8	0		
PHF	.000	.000	.000	.000	.000	.725	.000	.826	.000	.788	.827	.933	.000	.000	.923	.000	.979	.795	.000	.961	.982
Cars, Buses & Light Trucks	0	0	0	0	0	58	0	109	0	167	129	1400	0	0	1529	0	1004	89	0	1093	2789
% Cars, Buses & Light Trucks	0	0	0	0	0	100	0	100	0	100	100	99.0	0	0	99.1	0	98.6	100	0	98.7	99.0
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	14	0	0	14	0	14	0	0	14	28
% Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	1.0	0	0	0.9	0	1.4	0	0	1.3	1.0



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TMC Data
Gravel Springs Rd (SR324) @
Camp Branch Rd, Buford, GA
7-9 am I 4-6 pm

File Name : 46000004
Site Code : 46000004
Start Date : 2/8/2022
Page No : 1

Groups Printed- Cars, Buses & Light Trucks - Heavy Trucks

	Northbound					Camp Branch Rd Southbound					Gravel Springs Rd (SR324) Eastbound					Gravel Springs Rd (SR324) Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	83	0	6	0	89	6	149	0	0	155	0	253	64	0	317	561
07:15 AM	0	0	0	0	0	110	0	10	0	120	7	162	0	0	169	0	286	74	0	360	649
07:30 AM	0	0	0	0	0	103	0	12	0	115	10	159	0	0	169	0	292	67	0	359	643
07:45 AM	0	0	0	0	0	107	0	22	0	129	9	152	0	0	161	0	287	71	0	358	648
Total	0	0	0	0	0	403	0	50	0	453	32	622	0	0	654	0	1118	276	0	1394	2501
08:00 AM	0	0	0	0	0	90	0	16	0	106	11	142	0	0	153	0	280	56	0	336	595
08:15 AM	0	0	0	0	0	85	0	17	0	102	5	140	0	0	145	0	272	58	0	330	577
08:30 AM	0	0	0	0	0	62	0	11	0	73	8	152	0	0	160	0	284	61	0	345	578
08:45 AM	0	0	0	0	0	103	0	12	0	115	8	149	0	0	157	0	276	44	0	320	592
Total	0	0	0	0	0	340	0	56	0	396	32	583	0	0	615	0	1112	219	0	1331	2342
*** BREAK ***																					
04:00 PM	0	0	0	0	0	93	0	14	0	107	31	321	0	0	352	0	200	82	0	282	741
04:15 PM	0	0	0	0	0	77	0	18	0	95	22	337	0	0	359	0	257	96	0	353	807
04:30 PM	0	0	0	0	0	90	0	21	0	111	27	305	0	0	332	0	261	95	0	356	799
04:45 PM	0	0	0	0	0	104	0	14	0	118	30	309	0	0	339	0	274	116	0	390	847
Total	0	0	0	0	0	364	0	67	0	431	110	1272	0	0	1382	0	992	389	0	1381	3194
05:00 PM	0	0	0	0	0	83	0	22	0	105	34	332	0	0	366	0	268	115	0	383	854
05:15 PM	0	0	0	0	0	104	0	22	0	126	22	340	0	0	362	0	256	114	0	370	858
05:30 PM	0	0	0	0	0	94	0	14	0	108	32	352	0	0	384	0	251	112	0	363	855
05:45 PM	0	0	0	0	0	96	0	22	0	118	30	348	0	0	378	0	237	116	0	353	849
Total	0	0	0	0	0	377	0	80	0	457	118	1372	0	0	1490	0	1012	457	0	1469	3416
Grand Total	0	0	0	0	0	1484	0	253	0	1737	292	3849	0	0	4141	0	4234	1341	0	5575	11453
Apprch %	0	0	0	0		85.4	0	14.6	0		7.1	92.9	0	0		0	75.9	24.1	0		
Total %	0	0	0	0	0	13	0	2.2	0	15.2	2.5	33.6	0	0	36.2	0	37	11.7	0	48.7	
Cars, Buses & Light Trucks	0	0	0	0	0	1481	0	253	0	1734	292	3804	0	0	4096	0	4193	1336	0	5529	11359
% Cars, Buses & Light Trucks	0	0	0	0	0	99.8	0	100	0	99.8	100	98.8	0	0	98.9	0	99	99.6	0	99.2	99.2
Heavy Trucks	0	0	0	0	0	3	0	0	0	3	0	45	0	0	45	0	41	5	0	46	94
% Heavy Trucks	0	0	0	0	0	0.2	0	0	0	0.2	0	1.2	0	0	1.1	0	1	0.4	0	0.8	0.8

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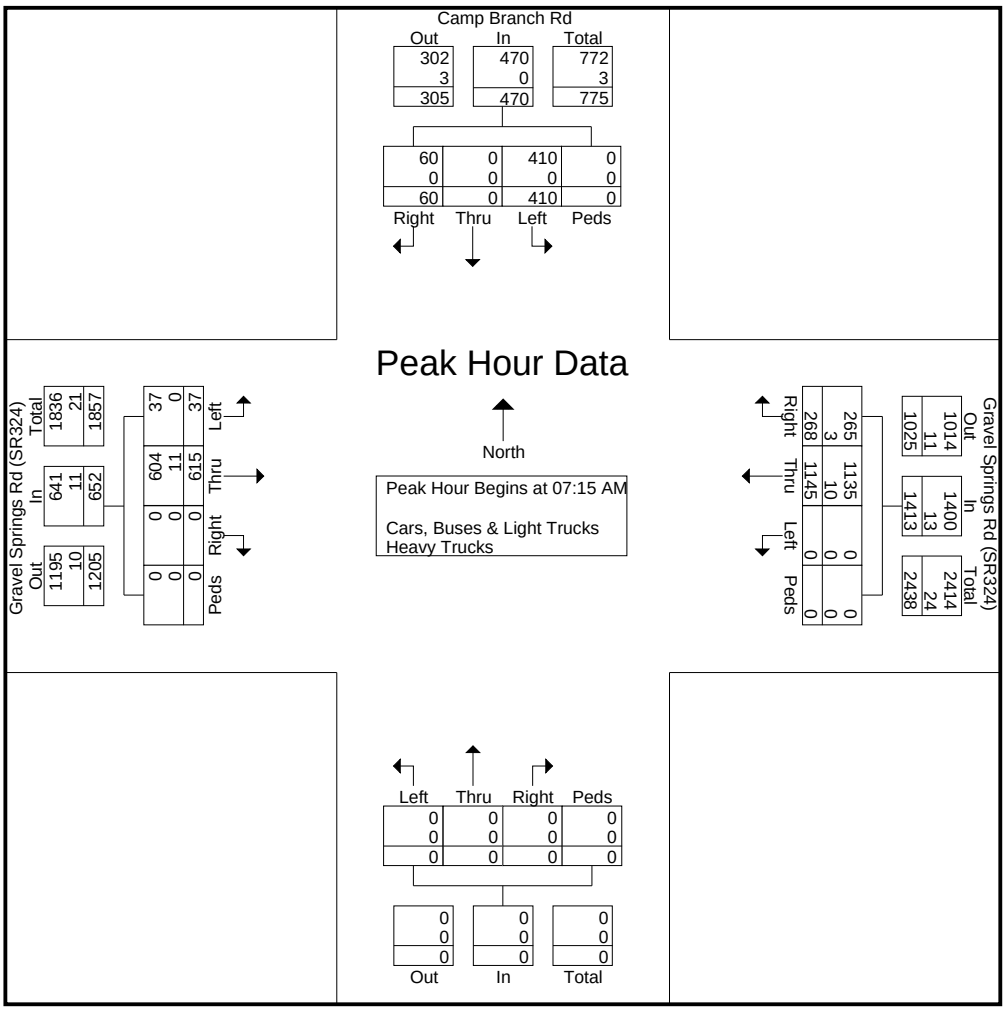
TMC Data
Gravel Springs Rd (SR324) @
Camp Branch Rd, Buford, GA
7-9 am I 4-6 pm

File Name : 46000004
Site Code : 46000004
Start Date : 2/8/2022
Page No : 2

	Northbound					Camp Branch Rd Southbound					Gravel Springs Rd (SR324) Eastbound					Gravel Springs Rd (SR324) Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	0	0	0	0	**110**	0	10	0	120	7	**162**	0	0	**169**	0	286	**74**	0	**360**	**649**
07:30 AM	0	0	0	0	0	103	0	12	0	115	10	159	0	0	169	0	**292**	67	0	359	643
07:45 AM	0	0	0	0	0	107	0	**22**	0	**129**	9	152	0	0	161	0	287	71	0	358	648
08:00 AM	0	0	0	0	0	90	0	16	0	106	**11**	142	0	0	153	0	280	56	0	336	595
Total Volume	0	0	0	0	0	410	0	60	0	470	37	615	0	0	652	0	1145	268	0	1413	2535
% App. Total	0	0	0	0		87.2	0	12.8	0		5.7	94.3	0	0		0	81	19	0		
PHF	.000	.000	.000	.000	.000	.932	.000	.682	.000	.911	.841	.949	.000	.000	.964	.000	.980	.905	.000	.981	.977
Cars, Buses & Light Trucks	0	0	0	0	0	410	0	60	0	470	37	604	0	0	641	0	1135	265	0	1400	2511
% Cars, Buses & Light Trucks	0	0	0	0	0	100	0	100	0	100	100	98.2	0	0	98.3	0	99.1	98.9	0	99.1	99.1
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	11	0	0	11	0	10	3	0	13	24
% Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	1.8	0	0	1.7	0	0.9	1.1	0	0.9	0.9



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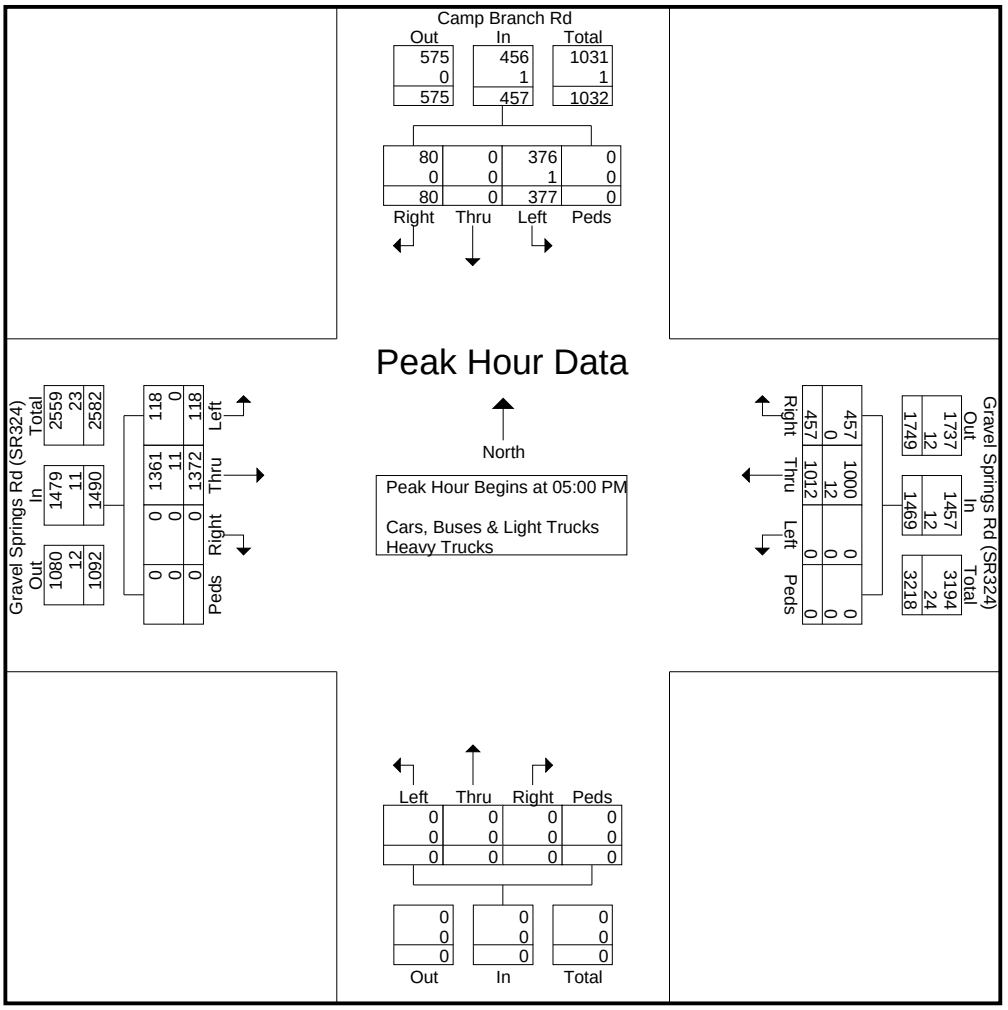
TMC Data
Gravel Springs Rd (SR324) @
Camp Branch Rd, Buford, GA
7-9 am I 4-6 pm

File Name : 46000004
Site Code : 46000004
Start Date : 2/8/2022
Page No : 3

	Northbound					Camp Branch Rd Southbound					Gravel Springs Rd (SR324) Eastbound					Gravel Springs Rd (SR324) Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	0	0	0	0	83	0	**22**	0	105	**34**	332	0	0	366	0	**268**	115	0	**383**	854
05:15 PM	0	0	0	0	0	**104**	0	22	0	**126**	22	340	0	0	362	0	256	114	0	370	**858**
05:30 PM	0	0	0	0	0	94	0	14	0	108	32	**352**	0	0	**384**	0	251	112	0	363	855
05:45 PM	0	0	0	0	0	96	0	22	0	118	30	348	0	0	378	0	237	**116**	0	353	849
Total Volume	0	0	0	0	0	377	0	80	0	457	118	1372	0	0	1490	0	1012	457	0	1469	3416
% App. Total	0	0	0	0		82.5	0	17.5	0		7.9	92.1	0	0		0	68.9	31.1	0		
PHF	.000	.000	.000	.000	.000	.906	.000	.909	.000	.907	.868	.974	.000	.000	.970	.000	.944	.985	.000	.959	.995
Cars, Buses & Light Trucks	0	0	0	0	0	376	0	80	0	456	118	1361	0	0	1479	0	1000	457	0	1457	3392
% Cars, Buses & Light Trucks	0	0	0	0	0	99.7	0	100	0	99.8	100	99.2	0	0	99.3	0	98.8	100	0	99.2	99.3
Heavy Trucks	0	0	0	0	0	1	0	0	0	1	0	11	0	0	11	0	12	0	0	12	24
% Heavy Trucks	0	0	0	0	0	0.3	0	0	0	0.2	0	0.8	0	0	0.7	0	1.2	0	0	0.8	0.7



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TMC Data
Gravel Springs Rd (SR324) @
I-85 SB Off-Ramp, Buford, GA
7-9 am I 4-6 pm

File Name : 46000005
Site Code : 46000005
Start Date : 2/8/2022
Page No : 1

Groups Printed- Cars, Buses & Light Trucks - Heavy Trucks

	Northbound					I-85 SB Off-Ramp Southbound					Gravel Springs Rd (SR324) Eastbound					Gravel Springs Rd (SR324) Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	12	0	65	0	77	0	179	49	0	228	133	257	0	0	390	695
07:15 AM	0	0	0	0	0	25	0	51	0	76	0	225	46	0	271	176	300	0	0	476	823
07:30 AM	0	0	0	0	0	41	0	63	0	104	0	200	58	0	258	149	306	0	0	455	817
07:45 AM	0	0	0	0	0	27	0	78	0	105	0	198	56	0	254	152	297	0	0	449	808
Total	0	0	0	0	0	105	0	257	0	362	0	802	209	0	1011	610	1160	0	0	1770	3143
08:00 AM	0	0	0	0	0	25	0	46	0	71	0	170	42	0	212	160	289	0	0	449	732
08:15 AM	0	0	0	0	0	20	0	70	0	90	0	166	53	0	219	129	258	0	0	387	696
08:30 AM	0	0	0	0	0	16	0	77	0	93	0	174	37	0	211	128	270	0	0	398	702
08:45 AM	0	0	0	0	0	15	0	72	0	87	0	209	42	0	251	103	279	0	0	382	720
Total	0	0	0	0	0	76	0	265	0	341	0	719	174	0	893	520	1096	0	0	1616	2850
*** BREAK ***																					
04:00 PM	0	0	0	0	0	18	0	54	0	72	0	387	22	0	409	58	243	0	0	301	782
04:15 PM	0	0	0	0	0	13	0	67	0	80	0	402	23	0	425	50	280	0	0	330	835
04:30 PM	0	0	0	0	0	16	0	59	0	75	0	395	26	0	421	53	321	0	0	374	870
04:45 PM	0	0	0	0	0	30	1	64	0	95	0	383	30	0	413	56	331	0	0	387	895
Total	0	0	0	0	0	77	1	244	0	322	0	1567	101	0	1668	217	1175	0	0	1392	3382
05:00 PM	0	0	0	0	0	25	0	62	0	87	0	377	28	0	405	64	324	0	0	388	880
05:15 PM	0	0	0	0	0	25	0	56	0	81	0	420	25	0	445	57	320	0	0	377	903
05:30 PM	0	0	0	0	0	24	0	63	0	87	0	423	24	0	447	58	318	0	0	376	910
05:45 PM	0	0	0	0	0	22	0	56	0	78	0	386	39	0	425	57	305	0	0	362	865
Total	0	0	0	0	0	96	0	237	0	333	0	1606	116	0	1722	236	1267	0	0	1503	3558
Grand Total	0	0	0	0	0	354	1	1003	0	1358	0	4694	600	0	5294	1583	4698	0	0	6281	12933
Apprch %	0	0	0	0		26.1	0.1	73.9	0		0	88.7	11.3	0		25.2	74.8	0	0		
Total %	0	0	0	0	0	2.7	0	7.8	0	10.5	0	36.3	4.6	0	40.9	12.2	36.3	0	0	48.6	
Cars, Buses & Light Trucks	0	0	0	0	0	343	1	985	0	1329	0	4650	595	0	5245	1571	4669	0	0	6240	12814
% Cars, Buses & Light Trucks	0	0	0	0	0	96.9	100	98.2	0	97.9	0	99.1	99.2	0	99.1	99.2	99.4	0	0	99.3	99.1
Heavy Trucks	0	0	0	0	0	11	0	18	0	29	0	44	5	0	49	12	29	0	0	41	119
% Heavy Trucks	0	0	0	0	0	3.1	0	1.8	0	2.1	0	0.9	0.8	0	0.9	0.8	0.6	0	0	0.7	0.9

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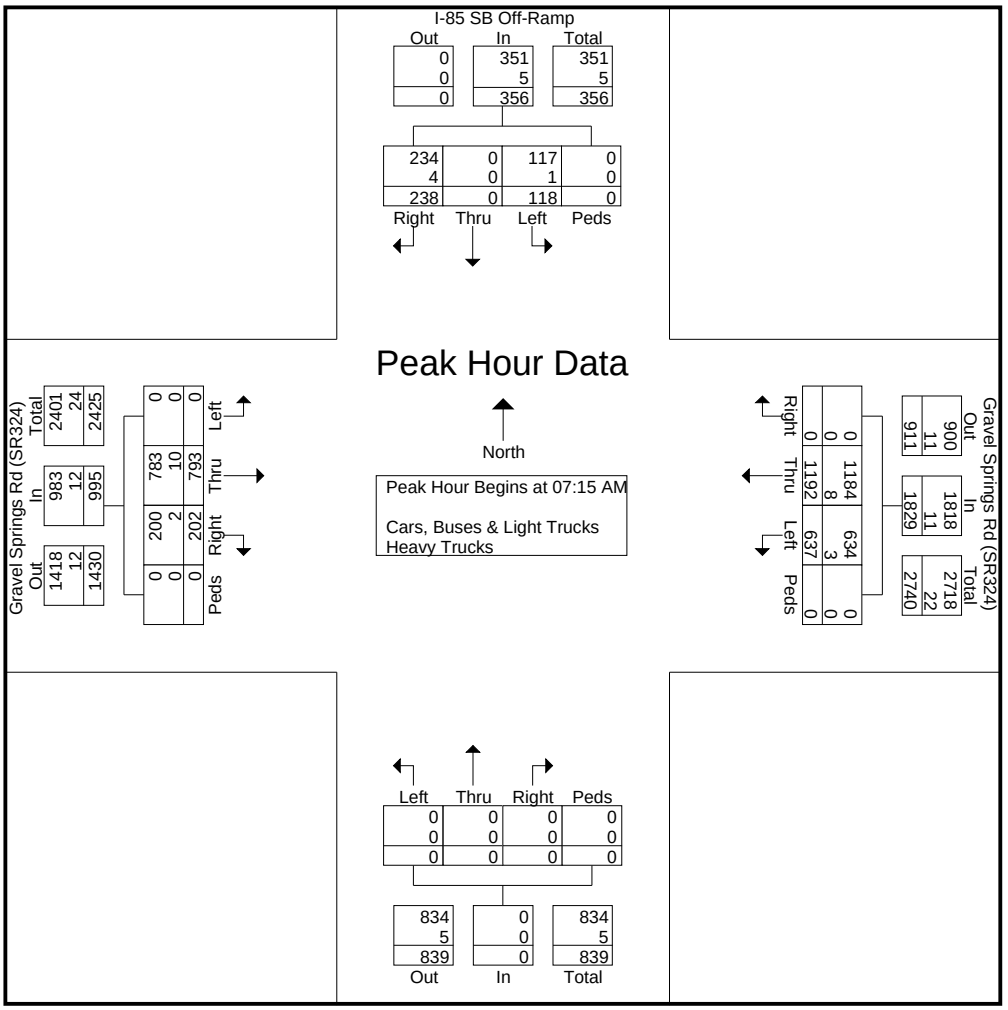
TMC Data
Gravel Springs Rd (SR324) @
I-85 SB Off-Ramp, Buford, GA
7-9 am I 4-6 pm

File Name : 46000005
Site Code : 46000005
Start Date : 2/8/2022
Page No : 2

	Northbound					I-85 SB Off-Ramp Southbound					Gravel Springs Rd (SR324) Eastbound					Gravel Springs Rd (SR324) Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	0	0	0	0	25	0	51	0	76	0	**225**	46	0	**271**	**176**	300	0	0	**476**	**823**
07:30 AM	0	0	0	0	0	**41**	0	63	0	104	0	200	**58**	0	258	149	**306**	0	0	455	817
07:45 AM	0	0	0	0	0	27	0	**78**	0	**105**	0	198	56	0	254	152	297	0	0	449	808
08:00 AM	0	0	0	0	0	25	0	46	0	71	0	170	42	0	212	160	289	0	0	449	732
Total Volume	0	0	0	0	0	118	0	238	0	356	0	793	202	0	995	637	1192	0	0	1829	3180
% App. Total	0	0	0	0		33.1	0	66.9	0		0	79.7	20.3	0		34.8	65.2	0	0		
PHF	.000	.000	.000	.000	.000	.720	.000	.763	.000	.848	.000	.881	.871	.000	.918	.905	.974	.000	.000	.961	.966
Cars, Buses & Light Trucks	0	0	0	0	0	117	0	234	0	351	0	783	200	0	983	634	1184	0	0	1818	3152
% Cars, Buses & Light Trucks	0	0	0	0	0	99.2	0	98.3	0	98.6	0	98.7	99.0	0	98.8	99.5	99.3	0	0	99.4	99.1
Heavy Trucks	0	0	0	0	0	1	0	4	0	5	0	10	2	0	12	3	8	0	0	11	28
% Heavy Trucks	0	0	0	0	0	0.8	0	1.7	0	1.4	0	1.3	1.0	0	1.2	0.5	0.7	0	0	0.6	0.9



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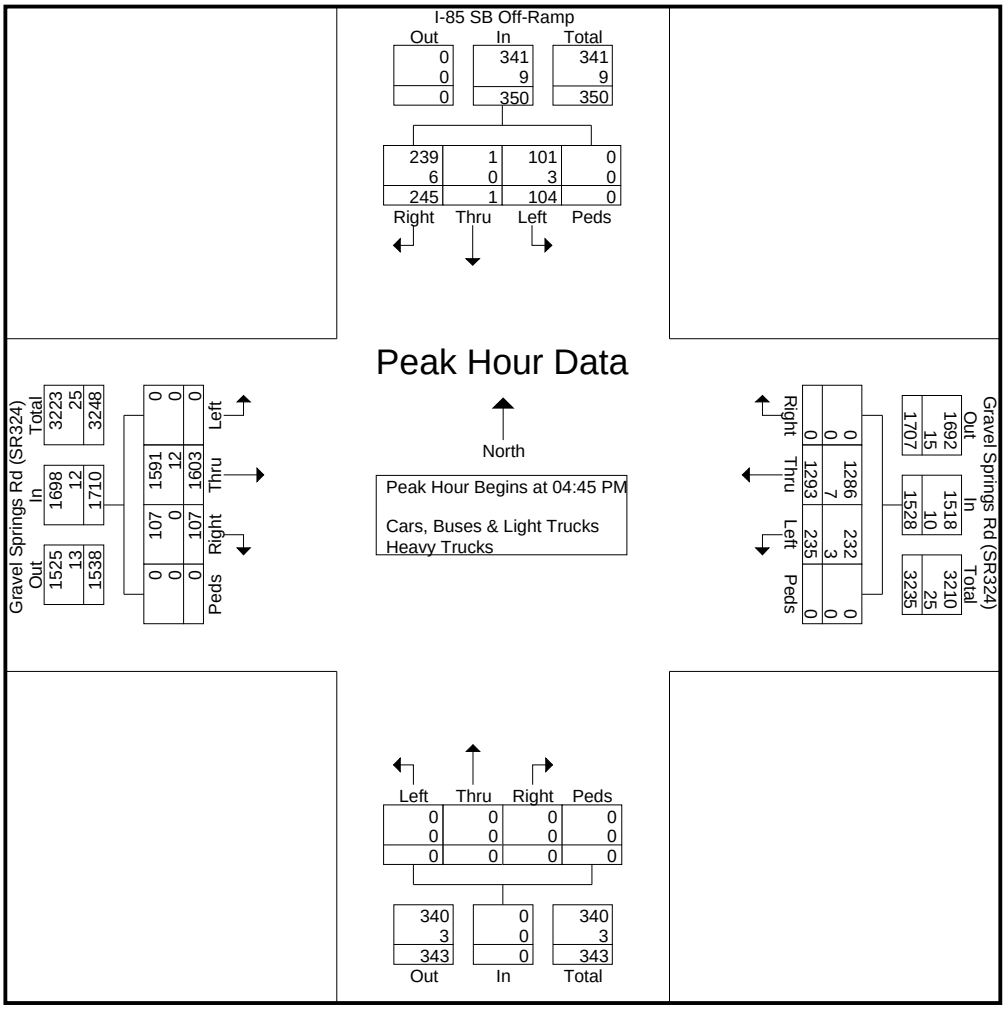
TMC Data
Gravel Springs Rd (SR324) @
I-85 SB Off-Ramp, Buford, GA
7-9 am I 4-6 pm

File Name : 46000005
Site Code : 46000005
Start Date : 2/8/2022
Page No : 3

	Northbound					I-85 SB Off-Ramp Southbound					Gravel Springs Rd (SR324) Eastbound					Gravel Springs Rd (SR324) Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	0	0	0	0	**30**	**1**	**64**	0	**95**	0	383	**30**	0	413	56	**331**	0	0	387	895
05:00 PM	0	0	0	0	0	25	0	62	0	87	0	377	28	0	405	**64**	324	0	0	**388**	880
05:15 PM	0	0	0	0	0	25	0	56	0	81	0	420	25	0	445	57	320	0	0	377	903
05:30 PM	0	0	0	0	0	24	0	63	0	87	0	**423**	24	0	**447**	58	318	0	0	376	**910**
Total Volume	0	0	0	0	0	104	1	245	0	350	0	1603	107	0	1710	235	1293	0	0	1528	3588
% App. Total	0	0	0	0		29.7	0.3	70	0		0	93.7	6.3	0		15.4	84.6	0	0		
PHF	.000	.000	.000	.000	.000	.867	.250	.957	.000	.921	.000	.947	.892	.000	.956	.918	.977	.000	.000	.985	.986
Cars, Buses & Light Trucks	0	0	0	0	0	101	1	239	0	341	0	1591	107	0	1698	232	1286	0	0	1518	3557
% Cars, Buses & Light Trucks	0	0	0	0	0	97.1	100	97.6	0	97.4	0	99.3	100	0	99.3	98.7	99.5	0	0	99.3	99.1
Heavy Trucks	0	0	0	0	0	3	0	6	0	9	0	12	0	0	12	3	7	0	0	10	31
% Heavy Trucks	0	0	0	0	0	2.9	0	2.4	0	2.6	0	0.7	0	0	0.7	1.3	0.5	0	0	0.7	0.9



Reliable Traffic Data Services

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TMC Data
Gravel Springs Rd (SR324) @
I-85 NB Off-Ramp, GA
7-9 am I 4-6 pm

File Name : 46000006
Site Code : 46000006
Start Date : 2/8/2022
Page No : 1

Groups Printed- Cars, Buses & Light Trucks - Heavy Trucks

	I-85 NB Off-Ramp Northbound					Southbound					Gravel Springs Rd (SR324) Eastbound					Gravel Springs Rd (SR324) Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	24	0	44	0	68	0	0	0	0	0	36	170	0	0	206	0	418	22	0	440	714
07:15 AM	10	0	43	0	53	0	0	0	0	0	34	185	0	0	219	0	429	23	0	452	724
07:30 AM	19	0	37	0	56	0	0	0	0	0	38	212	0	0	250	0	438	22	0	460	766
07:45 AM	17	0	37	0	54	0	0	0	0	0	39	216	0	0	255	0	444	17	0	461	770
Total	70	0	161	0	231	0	0	0	0	0	147	783	0	0	930	0	1729	84	0	1813	2974
08:00 AM	21	0	37	0	58	0	0	0	0	0	31	181	0	0	212	0	444	23	0	467	737
08:15 AM	14	0	45	0	59	0	0	0	0	0	29	159	0	0	188	0	431	16	0	447	694
08:30 AM	12	0	27	0	39	0	0	0	0	0	33	175	0	0	208	0	384	22	0	406	653
08:45 AM	16	0	37	0	53	0	0	0	0	0	22	192	0	0	214	0	330	18	0	348	615
Total	63	0	146	0	209	0	0	0	0	0	115	707	0	0	822	0	1589	79	0	1668	2699
*** BREAK ***																					
04:00 PM	31	0	101	0	132	0	0	0	0	0	76	331	0	0	407	0	279	26	0	305	844
04:15 PM	49	1	113	0	163	0	0	0	0	0	70	340	0	0	410	0	309	39	1	349	922
04:30 PM	59	0	106	0	165	0	0	0	0	0	65	356	0	0	421	0	329	34	0	363	949
04:45 PM	30	0	107	0	137	0	0	0	0	0	71	370	0	0	441	0	340	49	0	389	967
Total	169	1	427	0	597	0	0	0	0	0	282	1397	0	0	1679	0	1257	148	1	1406	3682
05:00 PM	61	0	95	0	156	0	0	0	0	0	68	359	0	0	427	0	309	27	0	336	919
05:15 PM	47	1	88	0	136	0	0	0	0	0	79	344	0	0	423	0	349	24	0	373	932
05:30 PM	46	0	122	0	168	0	0	0	0	0	66	368	0	0	434	0	337	27	0	364	966
05:45 PM	66	0	126	0	192	0	0	0	0	0	79	376	0	0	455	0	325	20	0	345	992
Total	220	1	431	0	652	0	0	0	0	0	292	1447	0	0	1739	0	1320	98	0	1418	3809
Grand Total	522	2	1165	0	1689	0	0	0	0	0	836	4334	0	0	5170	0	5895	409	1	6305	13164
Apprch %	30.9	0.1	69	0		0	0	0	0		16.2	83.8	0	0		0	93.5	6.5	0		
Total %	4	0	8.8	0	12.8	0	0	0	0	0	6.4	32.9	0	0	39.3	0	44.8	3.1	0	47.9	
Cars, Buses & Light Trucks	513	2	1155	0	1670	0	0	0	0	0	820	4297	0	0	5117	0	5866	399	0	6265	13052
% Cars, Buses & Light Trucks	98.3	100	99.1	0	98.9	0	0	0	0	0	98.1	99.1	0	0	99	0	99.5	97.6	0	99.4	99.1
Heavy Trucks	9	0	10	0	19	0	0	0	0	0	16	37	0	0	53	0	29	10	1	40	112
% Heavy Trucks	1.7	0	0.9	0	1.1	0	0	0	0	0	1.9	0.9	0	0	1	0	0.5	2.4	100	0.6	0.9

Reliable Traffic Data Services

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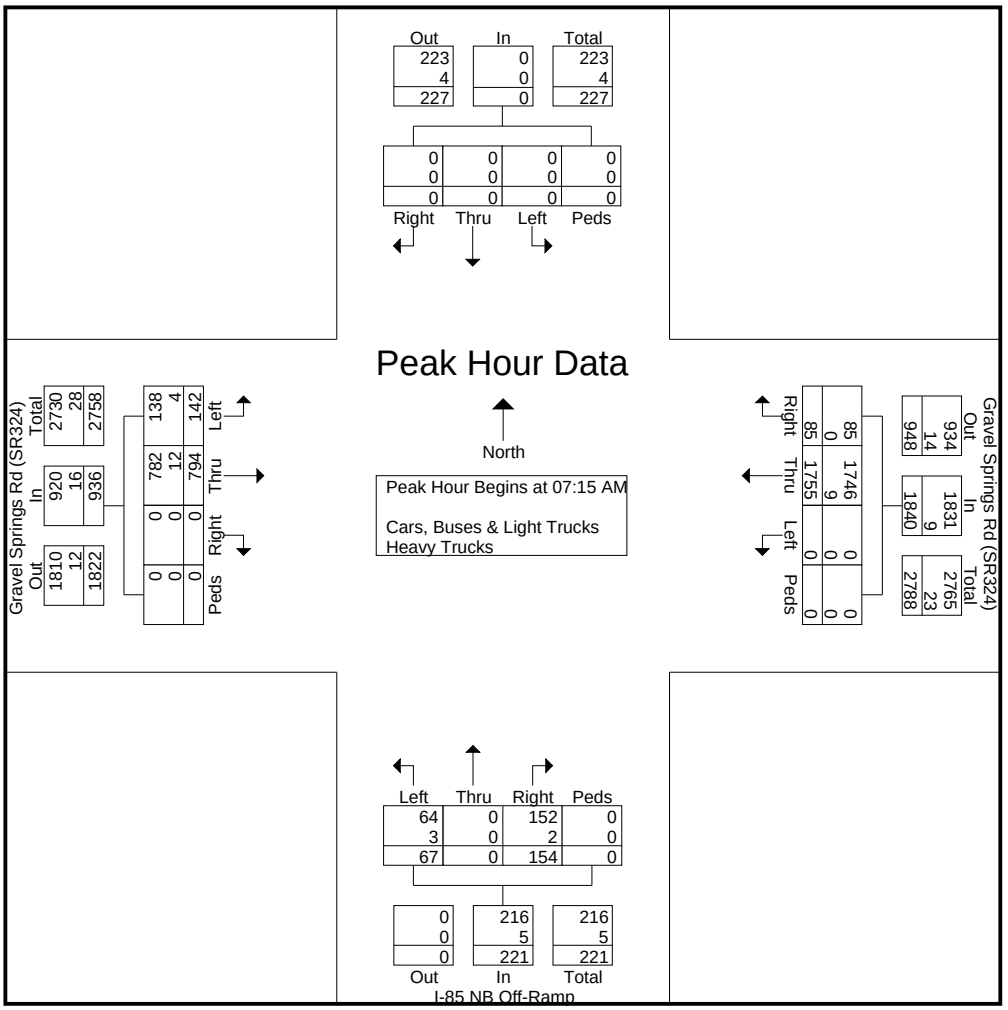
TMC Data
Gravel Springs Rd (SR324) @
I-85 NB Off-Ramp, GA
7-9 am I 4-6 pm

File Name : 46000006
Site Code : 46000006
Start Date : 2/8/2022
Page No : 2

	I-85 NB Off-Ramp Northbound					Southbound					Gravel Springs Rd (SR324) Eastbound					Gravel Springs Rd (SR324) Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	10	0	**43**	0	53	0	0	0	0	0	34	185	0	0	219	0	429	**23**	0	452	724
07:30 AM	19	0	37	0	56	0	0	0	0	0	38	212	0	0	250	0	438	22	0	460	766
07:45 AM	17	0	37	0	54	0	0	0	0	0	**39**	**216**	0	0	**255**	0	**444**	17	0	461	**770**
08:00 AM	**21**	0	37	0	**58**	0	0	0	0	0	31	181	0	0	212	0	444	23	0	**467**	737
Total Volume	67	0	154	0	221	0	0	0	0	0	142	794	0	0	936	0	1755	85	0	1840	2997
% App. Total	30.3	0	69.7	0		0	0	0	0		15.2	84.8	0	0		0	95.4	4.6	0		
PHF	.798	.000	.895	.000	.953	.000	.000	.000	.000	.000	.910	.919	.000	.000	.918	.000	.988	.924	.000	.985	.973
Cars, Buses & Light Trucks	64	0	152	0	216	0	0	0	0	0	138	782	0	0	920	0	1746	85	0	1831	2967
% Cars, Buses & Light Trucks	95.5	0	98.7	0	97.7	0	0	0	0	0	97.2	98.5	0	0	98.3	0	99.5	100	0	99.5	99.0
Heavy Trucks	3	0	2	0	5	0	0	0	0	0	4	12	0	0	16	0	9	0	0	9	30
% Heavy Trucks	4.5	0	1.3	0	2.3	0	0	0	0	0	2.8	1.5	0	0	1.7	0	0.5	0	0	0.5	1.0



Reliable Traffic Data Services

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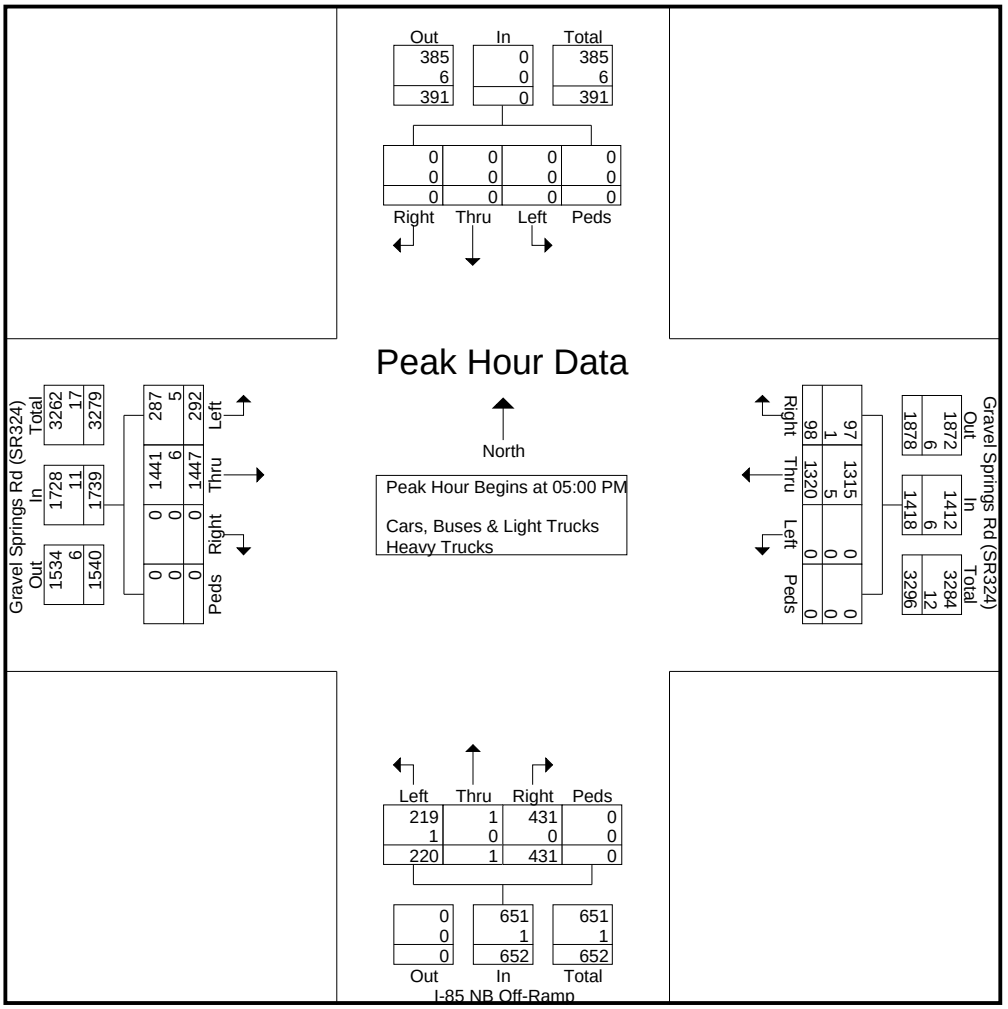
TMC Data
Gravel Springs Rd (SR324) @
I-85 NB Off-Ramp, GA
7-9 am I 4-6 pm

File Name : 46000006
Site Code : 46000006
Start Date : 2/8/2022
Page No : 3

	I-85 NB Off-Ramp Northbound					Southbound					Gravel Springs Rd (SR324) Eastbound					Gravel Springs Rd (SR324) Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	61	0	95	0	156	0	0	0	0	0	68	359	0	0	427	0	309	**27**	0	336	919
05:15 PM	47	**1**	88	0	136	0	0	0	0	0	**79**	344	0	0	423	0	**349**	24	0	**373**	932
05:30 PM	46	0	122	0	168	0	0	0	0	0	66	368	0	0	434	0	337	27	0	364	966
05:45 PM	**66**	0	**126**	0	**192**	0	0	0	0	0	79	**376**	0	0	**455**	0	325	20	0	345	**992**
Total Volume	220	1	431	0	652	0	0	0	0	0	292	1447	0	0	1739	0	1320	98	0	1418	3809
% App. Total	33.7	0.2	66.1	0		0	0	0	0		16.8	83.2	0	0		0	93.1	6.9	0		
PHF	.833	.250	.855	.000	.849	.000	.000	.000	.000	.000	.924	.962	.000	.000	.955	.000	.946	.907	.000	.950	.960
Cars, Buses & Light Trucks	219	1	431	0	651	0	0	0	0	0	287	1441	0	0	1728	0	1315	97	0	1412	3791
% Cars, Buses & Light Trucks	99.5	100	100	0	99.8	0	0	0	0	0	98.3	99.6	0	0	99.4	0	99.6	99.0	0	99.6	99.5
Heavy Trucks	1	0	0	0	1	0	0	0	0	0	5	6	0	0	11	0	5	1	0	6	18
% Heavy Trucks	0.5	0	0	0	0.2	0	0	0	0	0	1.7	0.4	0	0	0.6	0	0.4	1.0	0	0.4	0.5



Reliable Traffic Data Services

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Classification Data

Site Code: 46000101
Gravel Springs Rd East of Ivy Creek Rd
Buford, GA

Eastbound

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Class 14	Total
02/08/2															
2	0	18	0	0	1	0	0	0	0	0	0	0	0	0	19
00:15	0	12	1	0	0	0	0	0	0	0	0	0	0	0	13
00:30	0	22	2	0	0	0	0	1	0	0	0	0	0	0	25
00:45	0	6	1	0	0	0	0	1	0	0	0	0	0	0	8
	0	58	4	0	1	0	0	2	0	0	0	0	0	0	65
01:00	0	10	2	0	1	0	0	1	0	0	0	0	0	0	14
01:15	0	10	1	0	0	0	0	0	0	0	0	0	0	0	11
01:30	0	14	2	0	0	1	0	1	0	0	0	0	0	0	18
01:45	0	4	1	0	0	0	0	0	0	0	0	0	0	0	5
	0	38	6	0	1	1	0	2	0	0	0	0	0	0	48
02:00	0	8	5	0	0	0	0	0	0	0	0	0	0	0	13
02:15	0	12	2	0	0	0	0	1	0	0	0	0	0	0	15
02:30	0	8	0	0	1	0	0	1	0	0	0	0	0	0	10
02:45	0	9	1	0	1	0	0	0	0	0	0	0	0	0	11
	0	37	8	0	2	0	0	2	0	0	0	0	0	0	49
03:00	0	2	2	0	0	0	0	0	0	0	0	0	0	0	4
03:15	0	6	0	1	0	0	0	0	0	0	0	0	0	0	7
03:30	0	8	1	0	0	1	0	0	0	0	0	0	0	0	10
03:45	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
	0	20	3	1	0	1	0	0	0	0	0	0	0	0	25
04:00	0	7	3	0	1	0	0	0	0	0	0	0	0	0	11
04:15	0	10	3	1	0	0	0	0	0	0	0	0	0	0	14
04:30	0	13	1	0	0	0	0	0	0	0	0	0	0	0	14
04:45	0	16	4	1	0	0	0	1	0	0	0	0	0	0	22
	0	46	11	2	1	0	0	1	0	0	0	0	0	0	61
05:00	0	21	3	0	2	1	0	0	0	0	0	0	0	0	27
05:15	0	29	4	0	3	0	0	1	0	0	0	0	0	0	37
05:30	0	41	5	0	1	0	0	1	0	0	0	0	0	0	48
05:45	0	32	5	0	0	0	0	0	1	0	0	0	0	0	38
	0	123	17	0	6	1	0	2	1	0	0	0	0	0	150
06:00	0	61	9	0	6	0	0	0	0	0	0	0	0	0	76
06:15	0	62	19	1	11	0	0	1	0	0	0	0	0	0	94
06:30	0	82	17	4	6	0	0	2	0	0	0	0	0	0	111
06:45	0	116	12	1	10	3	0	2	0	0	0	0	0	0	144
	0	321	57	6	33	3	0	5	0	0	0	0	0	0	425
07:00	1	121	18	2	8	0	0	0	0	0	0	0	0	0	150
07:15	0	122	28	1	14	1	0	1	1	0	0	0	0	0	168
07:30	0	121	28	4	13	0	0	2	1	0	0	0	0	0	169
07:45	0	115	25	2	11	0	0	2	0	0	0	0	0	0	155
	1	479	99	9	46	1	0	5	2	0	0	0	0	0	642
08:00	0	109	21	0	9	0	0	2	0	0	0	0	0	0	141
08:15	1	111	20	1	13	0	0	1	0	0	0	0	0	0	147
08:30	0	116	28	3	10	1	0	0	0	0	0	0	0	0	158
08:45	0	116	17	4	13	2	0	1	1	0	1	0	0	0	155
	1	452	86	8	45	3	0	4	1	0	1	0	0	0	601
09:00	0	129	27	3	18	0	0	3	1	0	0	0	0	0	181
09:15	0	104	22	2	11	0	0	2	2	0	0	1	0	0	144
09:30	0	105	29	3	8	0	0	0	0	0	1	0	0	0	146
09:45	1	92	21	1	14	1	0	2	2	0	0	0	0	0	134
	1	430	99	9	51	1	0	7	5	0	1	1	0	0	605
10:00	1	107	25	1	12	1	0	2	1	0	0	0	0	0	150
10:15	0	133	27	1	9	2	0	0	1	0	1	0	0	0	174
10:30	0	152	17	1	10	2	0	0	0	0	0	0	0	0	182
10:45	0	141	22	2	15	1	0	2	1	0	0	0	0	0	184
	1	533	91	5	46	6	0	4	3	0	1	0	0	0	690
11:00	0	145	23	1	10	1	1	2	1	0	0	1	0	0	185
11:15	1	133	31	1	18	0	0	1	1	0	1	0	0	0	187
11:30	0	148	33	2	13	0	0	2	0	0	0	0	0	0	198
11:45	0	177	28	1	15	0	0	0	0	0	0	0	0	0	221
	1	603	115	5	56	1	1	5	2	0	1	1	0	0	791
Total	5	3140	596	45	288	18	1	39	14	0	4	2	0	0	4152
Percent	0.1%	75.6%	14.4%	1.1%	6.9%	0.4%	0.0%	0.9%	0.3%	0.0%	0.1%	0.0%	0.0%	0.0%	

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Classification Data

Site Code: 46000101
Gravel Springs Rd East of Ivy Creek Rd
Buford, GA

Eastbound

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Class 14	Total
12 PM	0	163	30	2	12	1	0	2	0	0	0	1	0	0	211
12:15	0	177	35	2	14	1	0	1	2	0	2	0	0	0	234
12:30	1	207	33	0	15	0	0	3	1	0	0	0	0	0	260
12:45	0	181	42	2	16	1	0	1	0	1	1	0	2	0	247
	1	728	140	6	57	3	0	7	3	1	3	1	2	0	952
13:00	0	164	40	1	13	0	0	1	2	0	1	0	0	0	222
13:15	0	218	40	1	18	1	0	0	1	0	0	0	1	0	280
13:30	0	195	30	2	10	0	0	0	0	0	0	0	0	0	237
13:45	0	229	39	3	17	2	0	2	2	0	0	0	0	0	294
	0	806	149	7	58	3	0	3	5	0	1	0	1	0	1033
14:00	0	214	51	1	12	3	0	2	1	0	0	1	0	0	285
14:15	1	239	53	1	10	0	1	0	0	0	0	0	0	0	305
14:30	0	228	36	2	18	1	1	1	0	0	0	1	0	0	288
14:45	0	237	47	0	13	0	0	2	2	0	1	1	0	0	303
	1	918	187	4	53	4	2	5	3	0	1	3	0	0	1181
15:00	0	237	46	1	14	1	0	3	0	0	0	2	0	0	304
15:15	1	247	51	1	11	5	1	1	1	0	0	1	0	0	320
15:30	1	251	45	1	14	3	1	2	1	0	0	1	2	0	322
15:45	2	250	57	1	14	2	1	3	0	0	0	1	0	0	331
	4	985	199	4	53	11	3	9	2	0	0	5	2	0	1277
16:00	4	265	53	0	14	3	0	2	1	0	0	0	0	0	342
16:15	0	287	46	0	13	0	3	0	2	0	1	0	0	0	352
16:30	0	274	43	2	23	1	0	0	1	0	0	0	1	0	345
16:45	0	265	51	1	18	3	0	0	0	0	0	2	2	0	342
	4	1091	193	3	68	7	3	2	4	0	1	2	3	0	1381
17:00	2	283	49	0	14	1	1	3	1	0	2	1	0	0	357
17:15	3	298	47	2	11	5	0	0	1	0	0	0	1	0	368
17:30	2	313	49	2	17	2	0	1	1	0	0	0	2	0	389
17:45	2	295	51	0	9	3	1	0	0	0	3	0	0	0	364
	9	1189	196	4	51	11	2	4	3	0	5	1	3	0	1478
18:00	1	295	47	3	22	3	1	2	1	0	0	1	0	0	376
18:15	0	276	53	0	12	5	1	2	0	0	0	0	0	0	349
18:30	2	282	64	1	16	2	0	1	1	0	0	0	0	0	369
18:45	0	278	40	0	12	1	0	1	0	0	0	0	0	0	332
	3	1131	204	4	62	11	2	6	2	0	0	1	0	0	1426
19:00	1	240	39	0	13	2	0	1	2	0	0	0	0	0	298
19:15	0	265	44	1	8	2	0	1	1	0	1	0	0	0	323
19:30	2	190	22	1	6	1	0	0	2	0	0	0	0	0	224
19:45	1	223	32	1	7	1	0	1	1	0	0	0	0	0	267
	4	918	137	3	34	6	0	3	6	0	1	0	0	0	1112
20:00	0	190	20	1	5	1	0	0	0	0	0	1	1	0	219
20:15	0	201	20	1	6	1	0	0	0	0	0	0	0	0	229
20:30	0	156	13	0	4	0	0	0	0	0	0	0	0	0	173
20:45	0	148	13	0	6	0	0	0	0	0	0	1	0	0	168
	0	695	66	2	21	2	0	0	0	0	0	2	1	0	789
21:00	0	126	17	0	7	0	0	2	0	0	0	0	0	0	152
21:15	0	118	7	0	2	0	0	1	1	0	0	0	0	0	129
21:30	0	101	8	0	4	0	0	0	0	0	0	0	0	0	113
21:45	0	99	3	0	2	0	0	0	0	0	0	0	0	0	104
	0	444	35	0	15	0	0	3	1	0	0	0	0	0	498
22:00	0	78	12	0	1	0	0	0	0	0	0	0	0	0	91
22:15	0	58	8	0	1	0	0	0	1	0	0	0	0	0	68
22:30	0	49	4	0	2	0	0	1	0	0	0	0	0	0	56
22:45	0	41	8	0	1	0	0	0	0	0	0	0	0	0	50
	0	226	32	0	5	0	0	1	1	0	0	0	0	0	265
23:00	0	35	7	0	0	0	0	0	0	0	0	0	0	0	42
23:15	0	37	2	0	1	0	0	2	1	0	0	0	0	0	43
23:30	0	29	2	0	1	0	0	1	0	0	0	0	0	0	33
23:45	0	23	1	0	0	0	0	0	1	0	0	0	0	0	25
	0	124	12	0	2	0	0	3	2	0	0	0	0	0	143
Total	26	9255	1550	37	479	58	12	46	32	1	12	15	12	0	11535
Percent	0.2%	80.2%	13.4%	0.3%	4.2%	0.5%	0.1%	0.4%	0.3%	0.0%	0.1%	0.1%	0.1%	0.0%	
Grand Total	31	12395	2146	82	767	76	13	85	46	1	16	17	12	0	15687
Percent	0.2%	79.0%	13.7%	0.5%	4.9%	0.5%	0.1%	0.5%	0.3%	0.0%	0.1%	0.1%	0.1%	0.0%	

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Classification Data

Site Code: 46000101
Gravel Springs Rd East of Ivy Creek Rd
Buford, GA

Westbound

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Class 14	Total
02/08/2															
2	0	16	1	0	1	0	0	2	0	0	0	0	0	0	20
00:15	0	5	2	0	0	0	0	2	0	0	0	0	0	0	9
00:30	0	8	2	0	0	0	0	0	0	0	0	0	0	0	10
00:45	0	8	1	0	2	0	0	0	0	0	0	0	0	0	11
	0	37	6	0	3	0	0	4	0	0	0	0	0	0	50
01:00	0	6	0	0	0	0	0	1	0	0	0	0	0	0	7
01:15	0	9	1	0	0	0	0	0	0	0	0	0	0	0	10
01:30	0	2	1	0	0	0	0	1	0	0	0	0	0	0	4
01:45	0	4	2	0	1	0	0	1	0	0	0	0	0	0	8
	0	21	4	0	1	0	0	3	0	0	0	0	0	0	29
02:00	0	1	2	0	0	0	0	0	0	0	0	0	0	0	3
02:15	0	5	1	0	1	0	0	1	0	0	0	0	0	0	8
02:30	0	10	1	0	0	0	0	1	0	0	0	0	0	0	12
02:45	0	6	0	0	1	0	0	0	0	0	0	0	0	0	7
	0	22	4	0	2	0	0	2	0	0	0	0	0	0	30
03:00	0	5	2	0	1	0	0	0	0	0	0	0	0	0	8
03:15	0	4	3	0	0	0	0	2	0	0	0	0	0	0	9
03:30	0	7	6	0	1	0	0	1	0	0	0	0	0	0	15
03:45	0	16	2	0	1	0	0	0	0	0	0	0	0	0	19
	0	32	13	0	3	0	0	3	0	0	0	0	0	0	51
04:00	0	10	4	0	1	0	0	1	0	0	0	0	0	0	16
04:15	0	19	4	0	2	0	1	0	0	0	0	0	0	0	26
04:30	0	23	7	0	3	0	0	0	0	0	0	0	0	0	33
04:45	0	36	13	1	0	0	0	1	0	0	0	0	0	0	51
	0	88	28	1	6	0	1	2	0	0	0	0	0	0	126
05:00	0	35	15	0	2	0	0	0	0	0	0	0	0	0	52
05:15	0	60	12	0	4	1	0	0	1	0	0	1	0	0	79
05:30	0	66	25	2	11	0	0	1	0	0	0	0	0	0	105
05:45	0	97	25	2	6	1	1	2	1	0	1	0	0	0	136
	0	258	77	4	23	2	1	3	2	0	1	1	0	0	372
06:00	0	99	21	2	7	0	0	1	0	0	0	0	0	0	130
06:15	1	142	42	2	13	2	0	0	0	0	0	1	0	0	203
06:30	0	150	54	0	15	0	0	0	0	0	1	1	0	0	221
06:45	0	162	60	1	16	1	1	2	1	0	0	0	0	0	244
	1	553	177	5	51	3	1	3	1	0	1	2	0	0	798
07:00	0	187	50	3	19	2	0	2	0	0	0	0	0	0	263
07:15	0	221	51	1	11	3	0	1	0	0	0	0	0	0	288
07:30	1	228	56	1	13	2	1	1	1	0	1	1	1	0	307
07:45	2	224	58	1	18	2	0	1	1	0	0	0	1	0	308
	3	860	215	6	61	9	1	5	2	0	1	1	2	0	1166
08:00	0	211	49	2	22	4	1	1	1	0	0	0	1	0	292
08:15	0	219	44	2	13	1	0	1	0	0	0	0	0	0	280
08:30	0	223	48	5	15	2	0	0	1	0	1	0	1	0	296
08:45	1	247	41	1	16	2	0	1	1	0	0	1	1	0	312
	1	900	182	10	66	9	1	3	3	0	1	1	3	0	1180
09:00	1	193	33	1	17	3	0	1	1	0	0	0	0	0	250
09:15	0	207	46	5	13	2	2	2	2	0	1	1	0	0	281
09:30	2	197	48	1	12	3	2	1	1	0	0	0	0	0	267
09:45	0	204	40	3	14	2	1	1	1	0	2	0	0	0	268
	3	801	167	10	56	10	5	5	5	0	3	1	0	0	1066
10:00	2	194	39	1	15	0	1	1	2	1	0	0	0	0	256
10:15	1	197	41	2	11	1	0	1	0	0	1	0	0	0	255
10:30	0	203	35	1	7	1	0	1	1	0	0	0	0	0	249
10:45	0	197	45	1	21	2	0	3	0	0	0	0	0	0	269
	3	791	160	5	54	4	1	6	3	1	1	0	0	0	1029
11:00	1	165	28	0	13	1	0	0	1	1	0	0	1	0	211
11:15	1	180	37	0	11	2	1	2	0	0	0	0	0	0	234
11:30	1	189	37	1	11	2	0	0	3	0	0	0	0	0	244
11:45	1	202	36	1	11	3	0	2	1	0	0	0	0	0	257
	4	736	138	2	46	8	1	4	5	1	0	0	1	0	946
Total	15	5099	1171	43	372	45	12	43	21	2	8	6	6	0	6843
Percent	0.2%	74.5%	17.1%	0.6%	5.4%	0.7%	0.2%	0.6%	0.3%	0.0%	0.1%	0.1%	0.1%	0.0%	

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Classification Data

Site Code: 46000101
Gravel Springs Rd East of Ivy Creek Rd
Buford, GA

Westbound

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Class 14	Total
12 PM	2	173	40	2	12	0	0	0	1	0	0	0	1	0	231
12:15	0	198	41	1	7	1	0	1	1	0	0	2	1	0	253
12:30	1	178	25	0	15	3	1	1	1	0	1	0	0	0	226
12:45	0	180	38	1	18	2	0	0	0	1	2	0	0	0	242
	3	729	144	4	52	6	1	2	3	1	3	2	2	0	952
13:00	0	166	36	1	9	1	2	2	0	0	1	0	0	0	218
13:15	0	173	45	2	10	1	0	1	1	0	0	1	0	0	234
13:30	1	191	28	0	13	1	0	0	0	0	0	0	0	0	234
13:45	6	175	30	2	12	1	1	0	0	0	0	0	0	0	227
	7	705	139	5	44	4	3	3	1	0	1	1	0	0	913
14:00	0	160	24	1	4	0	0	2	0	0	0	0	0	0	191
14:15	0	182	29	8	8	1	0	0	2	0	1	0	0	0	231
14:30	1	176	38	2	7	3	0	2	2	0	0	0	0	0	231
14:45	1	220	29	0	5	2	0	5	0	0	0	0	0	0	262
	2	738	120	11	24	6	0	9	4	0	1	0	0	0	915
15:00	0	183	25	1	6	1	1	1	1	0	0	0	1	0	220
15:15	0	205	18	1	6	1	0	1	0	0	2	0	0	0	234
15:30	2	191	38	2	10	0	1	2	0	0	0	0	0	0	246
15:45	0	218	38	0	12	4	0	1	2	0	0	1	0	0	276
	2	797	119	4	34	6	2	5	3	0	2	1	1	0	976
16:00	0	181	21	0	9	3	1	1	0	0	1	0	0	0	217
16:15	0	216	37	5	11	4	0	2	1	0	0	0	0	0	276
16:30	0	232	36	2	13	4	0	0	0	0	0	0	0	0	287
16:45	0	239	35	0	8	2	0	3	0	0	2	0	0	0	289
	0	868	129	7	41	13	1	6	1	0	3	0	0	0	1069
17:00	0	218	40	1	11	2	0	2	2	0	1	0	0	0	277
17:15	0	224	38	0	10	1	0	1	1	0	1	0	0	0	276
17:30	0	221	31	0	6	1	0	2	0	0	0	0	1	0	262
17:45	0	189	35	0	13	3	0	2	0	0	0	0	0	0	242
	0	852	144	1	40	7	0	7	3	0	2	0	1	0	1057
18:00	1	204	38	0	11	1	1	2	0	0	0	0	1	0	259
18:15	3	222	29	0	5	0	0	0	2	0	1	0	0	0	262
18:30	0	196	28	1	10	3	0	2	1	0	0	0	0	0	241
18:45	0	191	30	0	7	1	0	1	0	0	0	1	0	0	231
	4	813	125	1	33	5	1	5	3	0	1	1	1	0	993
19:00	0	156	16	0	11	1	0	1	1	0	0	0	0	0	186
19:15	1	166	18	0	6	2	0	0	0	0	0	0	0	0	193
19:30	0	138	16	1	6	1	0	1	0	0	0	0	0	0	163
19:45	0	114	23	0	2	3	0	0	0	0	0	0	0	0	142
	1	574	73	1	25	7	0	2	1	0	0	0	0	0	684
20:00	0	103	18	0	2	0	1	0	0	0	0	0	0	0	124
20:15	0	98	5	1	1	0	0	0	0	0	0	0	0	0	105
20:30	0	89	8	0	3	0	0	0	1	0	0	0	0	0	101
20:45	0	61	14	0	5	0	0	0	0	0	0	0	0	0	80
	0	351	45	1	11	0	1	0	1	0	0	0	0	0	410
21:00	0	56	5	0	0	0	0	0	0	0	0	0	0	0	61
21:15	0	53	9	0	3	0	0	2	0	0	0	0	0	0	67
21:30	0	45	4	0	3	0	0	0	0	0	0	0	0	0	52
21:45	0	43	5	0	0	0	0	2	0	0	0	0	0	0	50
	0	197	23	0	6	0	0	4	0	0	0	0	0	0	230
22:00	0	40	2	0	0	0	0	0	0	0	0	0	0	0	42
22:15	0	47	5	0	1	0	0	1	0	0	0	0	0	0	54
22:30	0	33	2	1	2	0	0	1	1	0	0	0	0	0	40
22:45	0	27	5	1	0	0	0	1	0	0	0	0	0	0	34
	0	147	14	2	3	0	0	3	1	0	0	0	0	0	170
23:00	0	28	4	0	1	0	0	0	0	0	0	0	0	0	33
23:15	0	21	2	0	2	0	0	1	0	0	0	0	0	0	26
23:30	0	19	1	0	0	0	0	0	0	0	0	0	0	0	20
23:45	0	10	2	0	0	0	0	1	0	0	0	0	0	0	13
	0	78	9	0	3	0	0	2	0	0	0	0	0	0	92
Total	19	6849	1084	37	316	54	9	48	21	1	13	5	5	0	8461
Percent	0.2%	80.9%	12.8%	0.4%	3.7%	0.6%	0.1%	0.6%	0.2%	0.0%	0.2%	0.1%	0.1%	0.0%	
Grand Total	34	11948	2255	80	688	99	21	91	42	3	21	11	11	0	15304
Percent	0.2%	78.1%	14.7%	0.5%	4.5%	0.6%	0.1%	0.6%	0.3%	0.0%	0.1%	0.1%	0.1%	0.0%	

APPENDIX D

ADJACENT DEVELOPMENT TRIP ASSIGNMENT FIGURES

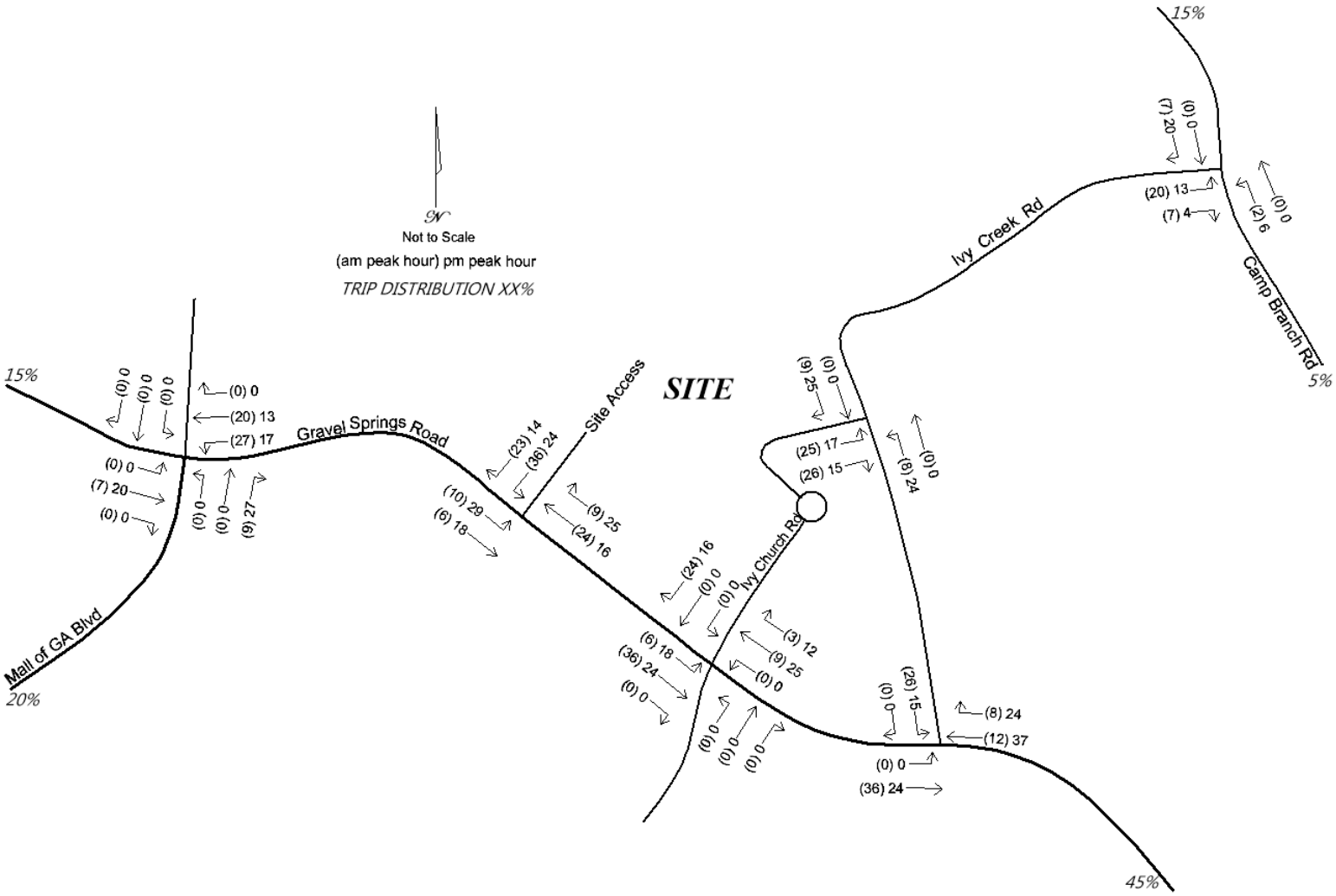


Figure 4 – Weekday AM and PM Peak Hour Site Trips and Distribution Percentages – no signal at Ivy Church/Brown

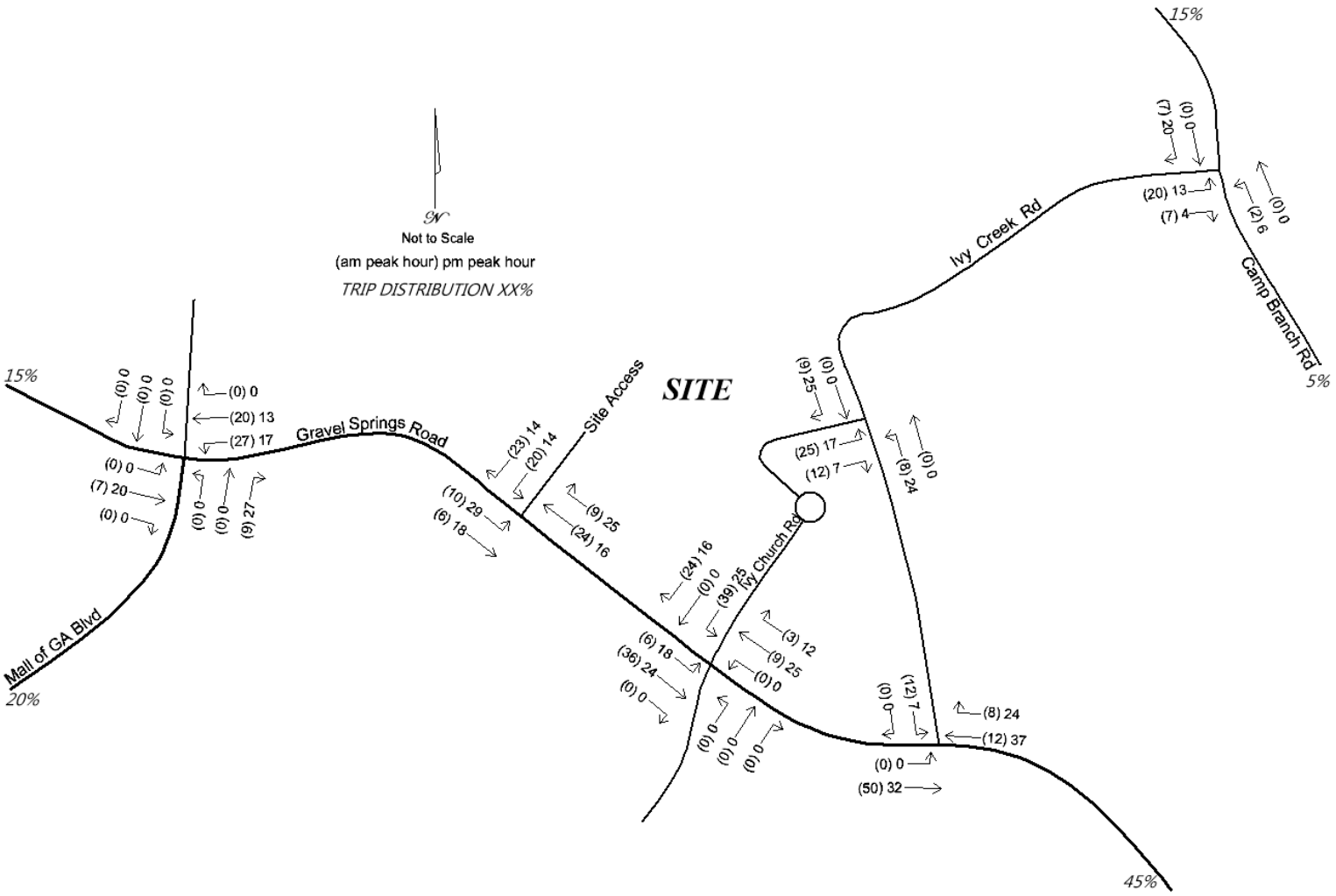


Figure 5 – Weekday AM and PM Peak Hour Site Trips and Distribution Percentages – with signal at Ivy Church/Brown

Figure 5: Project Trips Volumes

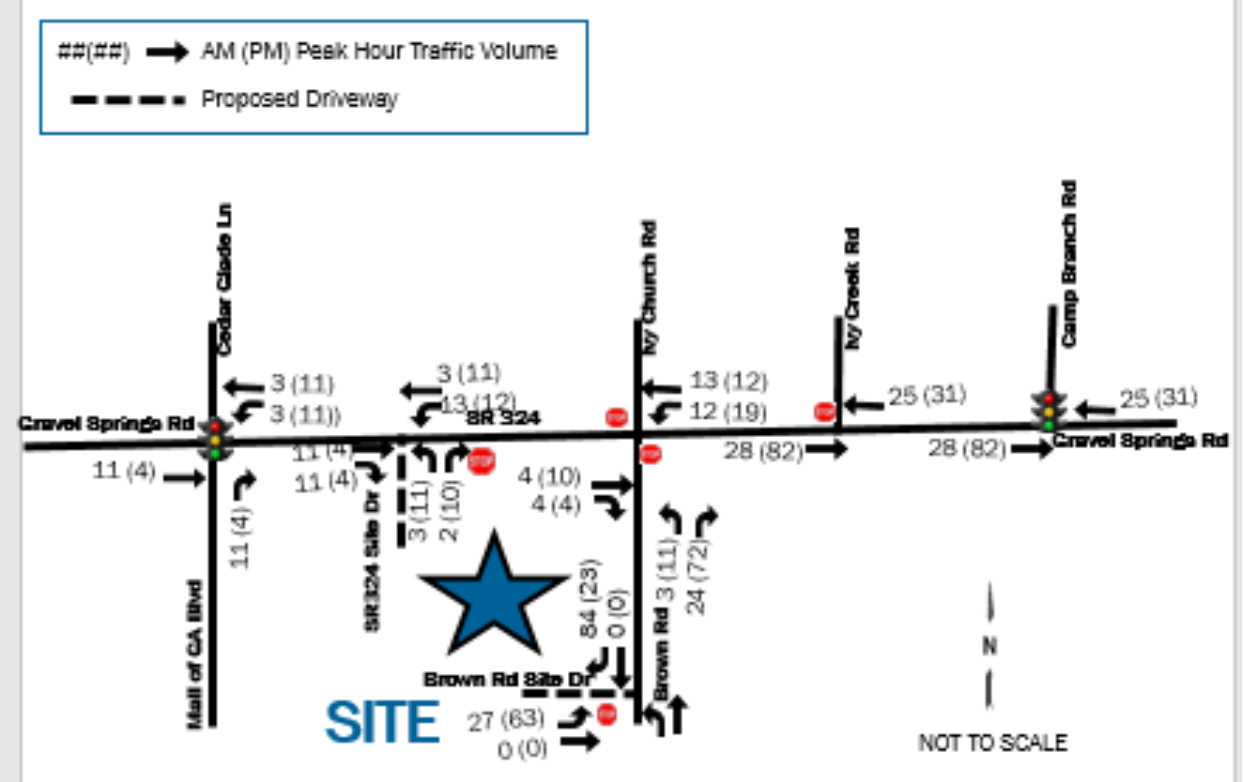
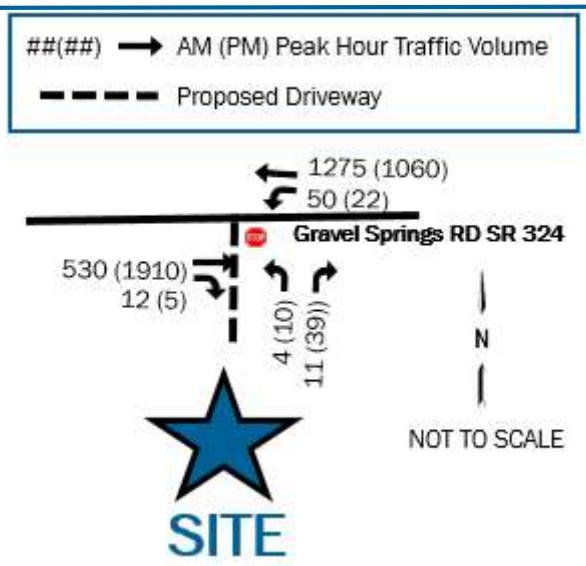


Figure 5: Project Trips Volumes

Figure 3: 2022 Build (with project trips) Traffic Volumes



Location:

SR 324/Gravel Springs Road (SR 324) at Brown Road/Ivy Church Road (study intersection) in the City of Buford, Gwinnett County, Georgia is located west of I-85 and east of SR 20. Brown Road will provide vehicular access to two new warehouse developments' (DRI #3213-958,896 square feet and DRI #3274-625,616 square feet), and a new gas station with a 4,000 square feet convenience store and a 1,250 square feet retail space to be open by 2023.

DRI #3213 will have a secondary vehicular access on SR 324 at an existing median crossover approximately 675 feet west of Brown Road to primarily service the new truck trips and 20% of the new personal vehicle trips. Ivy Church Road which aligns with Brown Road at SR 324 will provide vehicular access for a new 293-townhome residential development. A second vehicular access on SR 324 near the southwestern corner of the site is also planned but is not expected to attract significant left turns onto SR 324.

There is an existing median crossover approximately 1,025 feet east of the intersection of SR 324 at Brown Road/Ivy Creek Road. The SR 324 at Brown Road/Ivy Church Road intersection is approximately 3,000 feet west of the new I-85 interchange along SR 324.

Reason for Investigation:

To determine the appropriate traffic control of the intersection of Brown Road and Ivy Church Road at SR 324 due to the new traffic expected to be generated by the proposed developments.

Description of the Intersection:

SR 324 at Brown Road/Ivy Church Road:
At the existing intersection, SR 324 is a four-lane median divided roadway classified as an urban minor arterial with a general east-west orientation with a 45 mph speed limit. At the intersection, SR 324 has a 300 feet left-turn lane westbound, a 250 feet left turn lane eastbound, a 220 feet westbound right-turn lane, and a 285-feet eastbound right turn lane.

Brown Road at SR 324:
Brown Road is a two-lane local roadway south of SR 324 planned to be upgraded to City of Buford standards and include a dedicated left-turn lane approaching the intersection. The roadway will be terminated to the south.

Ivy Church Road at SR 324:

Ivy Church Road is a two-lane local roadway that cul-de-sacs north of SR 324.

Future + Project Trips - TOTAL

Time	SR 324 Eastbound			SR 324 Westbound			Brown Rd Northbound			Ivy Church Rd Southbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
6:00 AM	4	225	7	38	820	5	78	0	113	41	0	15
7:00 AM	10	399	9	53	1,157	12	103	0	145	91	0	32
8:00 AM	15	496	9	50	1,159	19	95	0	133	64	0	23
9:00 AM	15	555	8	46	1,111	18	90	0	124	51	0	18
10:00 AM	15	768	8	47	1,166	18	97	0	131	33	0	12
11:00 AM	19	878	8	45	1,260	23	94	0	124	39	0	14
12:00 PM	21	1,042	9	49	1,370	26	100	0	133	38	0	14
1:00 PM	18	1,251	9	49	1,178	22	96	0	133	35	0	12
2:00 PM	22	1,306	10	54	1,120	28	107	0	150	42	0	15
3:00 PM	32	1,458	11	60	1,085	39	131	0	167	37	0	13
4:00 PM	38	1,601	11	63	1,005	47	133	0	178	36	0	13
5:00 PM	43	1,761	10	59	1,101	53	121	0	162	47	0	17
6:00 PM	36	1,505	9	51	964	44	103	0	148	45	0	16

Project Trips

Time	SR 324 Eastbound			SR 324 Westbound			Brown Rd Northbound			Ivy Church Rd Southbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
6:00 AM	4	7	7	38	8	5	78	0	113	41	0	15
7:00 AM	10	13	9	53	16	12	103	0	145	91	0	32
8:00 AM	15	13	9	50	18	19	95	0	133	64	0	23
9:00 AM	15	14	8	46	19	18	90	0	124	51	0	18
10:00 AM	15	16	8	47	21	18	97	0	131	33	0	12
11:00 AM	19	20	8	45	26	23	94	0	124	39	0	14
12:00 PM	21	20	9	49	27	26	100	0	133	38	0	14
1:00 PM	18	15	9	49	21	22	96	0	133	35	0	12
2:00 PM	22	14	10	54	21	28	107	0	150	42	0	15
3:00 PM	32	32	11	60	42	39	131	0	167	37	0	13
4:00 PM	38	25	11	63	38	47	133	0	178	36	0	13
5:00 PM	43	22	10	59	36	53	121	0	162	47	0	17
6:00 PM	36	10	9	51	22	44	103	0	148	45	0	16

SR 324 Raw Counts

Time	SR 324 Eastbound			SR 324 Westbound		
	Left	Thru	Right	Left	Thru	Right
6:00 AM		218			812	
7:00 AM		386			1,141	
8:00 AM		483			1,141	
9:00 AM		541			1,092	
10:00 AM		752			1,145	
11:00 AM		858			1,234	
12:00 PM		1,022			1,343	
1:00 PM		1,236			1,157	
2:00 PM		1,292			1,099	
3:00 PM		1,426			1,043	
4:00 PM		1,576			967	
5:00 PM		1,739			1,065	
6:00 PM		1,495			942	
		13,024			14,181	

Project Trips - SANA Gas Station

50% in 50% out

Time	SR 324 Eastbound			SR 324 Westbound			Brown Rd Northbound			Ivy Church Rd Southbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
6:00 AM			73	70			73		70			
7:00 AM			94	97			94		97			
8:00 AM			86	91			86		91			
9:00 AM			80	85			80		85			
10:00 AM			85	86			85		86			
11:00 AM			80	83			80		83			
12:00 PM			86	89			86		89			
1:00 PM			86	89			86		89			
2:00 PM			97	99			97		99			
3:00 PM			108	111			108		111			
4:00 PM			115	115			115		115			
5:00 PM			105	108			105		108			
6:00 PM			96	94			96		94			

Time of Day - SANA Gas Station

Time	SR 324 Eastbound			SR 324 Westbound			Brown Rd Northbound			Ivy Church Rd Southbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
6:00 AM			4.8%	4.6%			4.8%		4.6%			
7:00 AM			6.2%	6.4%			6.2%		6.4%			
8:00 AM			5.7%	6.0%			5.7%		6.0%			
9:00 AM			5.3%	5.6%			5.3%		5.6%			
10:00 AM			5.6%	5.7%			5.6%		5.7%			
11:00 AM			5.3%	5.5%			5.3%		5.5%			
12:00 PM			5.7%	5.9%			5.7%		5.9%			
1:00 PM			5.7%	5.9%			5.7%		5.9%			
2:00 PM			6.4%	6.5%			6.4%		6.5%			
3:00 PM			7.1%	7.3%			7.1%		7.3%			
4:00 PM			7.6%	7.6%			7.6%		7.6%			
5:00 PM			6.9%	7.1%			6.9%		7.1%			
6:00 PM			6.3%	6.2%			6.3%		6.2%			

Project Trips - Residential Development (DRI 2889)

35% in in 43% out 65% 23% out

Time	SR 324 Eastbound			SR 324 Westbound			Brown Rd Northbound			Ivy Church Rd Southbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
6:00 AM	4					5				41		15
7:00 AM	10					12				91		32
8:00 AM	15					19				64		23
9:00 AM	15					18				51		18
10:00 AM	15					18				33		12
11:00 AM	19					23				39		14
12:00 PM	21					26				38		14
1:00 PM	18					22				35		12
2:00 PM	22					28				42		15
3:00 PM	32					39				37		13
4:00 PM	38					47				36		13
5:00 PM	43					53				47		17
6:00 PM	36					44				45		16

Time of Day - Residential Development (DRI 2889)

Time	SR 324 Eastbound			SR 324 Westbound			Brown Rd Northbound			Ivy Church Rd Southbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
6:00 AM	1.1%					1.1%				5.8%		5.8%
7:00 AM	2.6%					2.6%				12.9%		12.9%
8:00 AM	4.0%					4.0%				9.1%		9.1%
9:00 AM	3.9%					3.9%				7.2%		7.2%
10:00 AM	3.9%					3.9%				4.7%		4.7%
11:00 AM	4.9%					4.9%				5.5%		5.5%
12:00 PM	5.6%					5.6%				5.4%		5.4%
1:00 PM	4.8%					4.8%				4.9%		4.9%
2:00 PM	5.9%					5.9%				6.0%		6.0%
3:00 PM	8.3%					8.3%				5.2%		5.2%
4:00 PM	10.0%					10.0%				5.1%		5.1%
5:00 PM	11.4%					11.4%				6.7%		6.7%
6:00 PM	9.5%					9.5%				6.3%		6.3%

Project Trips - Brown Rd at Gravel Springs Rd (DRI 3274 & DRI 3213)

20% auto 80% auto 20% auto 80% auto
10% truck 90% truck 10% truck 90% truck

Time	SR 324 Eastbound			SR 324 Westbound			Brown Rd Northbound			Ivy Church Rd Southbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
6:00 AM			7	38			5		40			
7:00 AM			9	53			9		51			
8:00 AM			9	50			9		47			
9:00 AM			8	46			10		44			
10:00 AM			8	47			12		46			
11:00 AM			8	45			14		44			
12:00 PM			9	49			14		47			
1:00 PM			9	49			10		47			
2:00 PM			10	54			10		53			
3:00 PM			11	60			23		59			
4:00 PM			11	63			18		63			
5:00 PM			10	59			16		57			
6:00 PM			9	51			7		52			

Time of Day - Brown Rd at Gravel Springs Rd (DRI 3274 & DRI 3213)

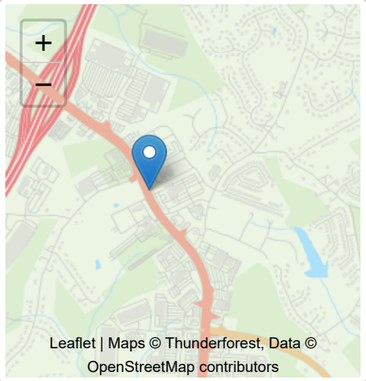
Time	SR 324 Eastbound			SR 324 Westbound			Brown Rd Northbound			Ivy Church Rd Southbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
6:00 AM			10.0%	10.0%			2.8%		2.8%			
7:00 AM			9.6%	9.6%			5.1%		5.1%			
8:00 AM			6.8%	6.8%			5.3%		5.3%			
9:00 AM			7.2%	7.2%			5.8%		5.8%			
10:00 AM			6.4%	6.4%			6.6%		6.6%			
11:00 AM			7.1%	7.1%			8.2%		8.2%			
12:00 PM			9.1%	9.1%			8.1%		8.1%			
1:00 PM			7.4%	7.4%			5.9%		5.9%			
2:00 PM			8.3%	8.3%			5.8%		5.8%			
3:00 PM			7.0%	7.0%			12.9%		12.9%			
4:00 PM			5.4%	5.4%			10.1%		10.1%			
5:00 PM			4.0%	4.0%			9.0%		9.0%			
6:00 PM			1.4%	1.4%			3.9%		3.9%			

APPENDIX E

HISTORIC TRAFFIC COUNT DATA

0000135_0118 - 135-0118
Description: RPX 419002L419001R
County: Gwinnett
Route number: 00002000
LRS section: 1351002000
Functional class: 3U - Principal Arterial - Other (Urban)
Coordinates: 34.0820380657936, -83.9874870191057

Site Data

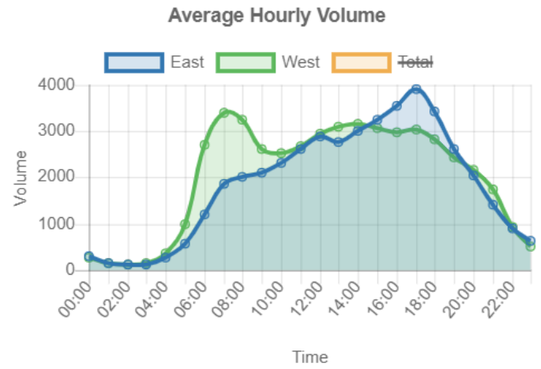


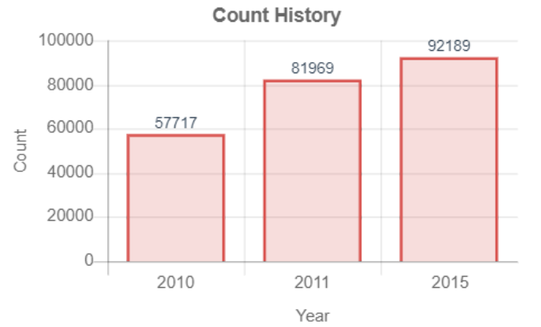
Count History

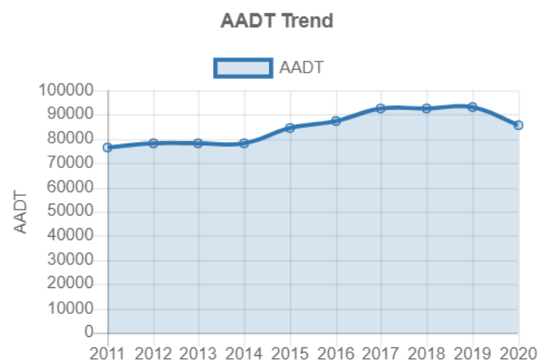
Year	Month	Count type	Duration	Count
2015	April	Class	48 hours	92189
2011	September	Class	48 hours	81969
2010	June	Volume	48 hours	57717

Annual Statistics

Data Item	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Statistics type	-	-	-	-	Actual	Estimated	Estimated	Estimated	Estimated	**Estimated**
AADT	76700	78000	78300	78300	84500	87300	92400	92300	92900	**85600**
K-Factor	-	-	-	-	0.083	0.083	-	-	-	**-**
D-Factor	-	-	-	-	0.600	0.600	-	-	-	**-**
Future AADT	-	-	-	-	-	163000	234000	205000	169000	**169000**





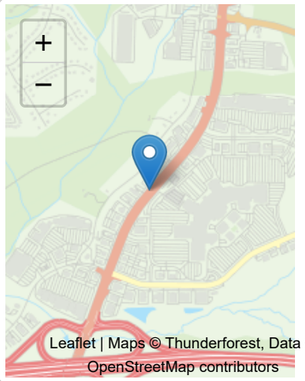


FHWA Vehicle Classification

1. Motorcycles 2 axles, 2 or 3 wheels.	**0.59%**
2. Passenger cars 2 axles. Can have 1- or 2-axle trailers.	**79.83%**
3. Pickups, panels, vans 2-axle, 4-tire single units. Can have 1- or 2-axle trailers.	**13.02%**
4. Buses 2- or 3-axle, full length.	**0.27%**
5. Single-unit trucks 2-axle, 6-tire, (dual rear tires), single-unit trucks.	**1.50%**
6. Single-unit trucks 3-axle, single-unit trucks.	**0.78%**
7. Single-unit trucks 4 or more axle, single-unit trucks.	**0.83%**
8. Single-trailer trucks 3- or 4-axle, single-trailer trucks.	**0.77%**
9. Single-trailer trucks 5-axle, single-trailer trucks.	**0.74%**
10. Single-trailer trucks 6 or more axle, single-trailer trucks.	**0.30%**
11. Multi-trailer trucks 5 or less axle, multi-trailer trucks.	**0.04%**
12. Multi-trailer trucks 6-axle, multi-trailer trucks.	**0.02%**
13. Multi-trailer trucks 7 or more axle, multi-trailer trucks.	**1.31%**

0000135_0121 - 135-0121
Description: BUFORD DR
County: Gwinnett
Route number: 00002000
LRS section: 1351002000
Functional class: 3U - Principal Arterial - Other (Urban)
Coordinates: 34.06600666, -83.9885123

Site Data



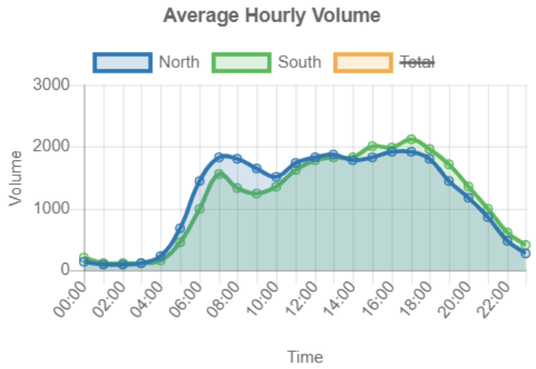
Count History

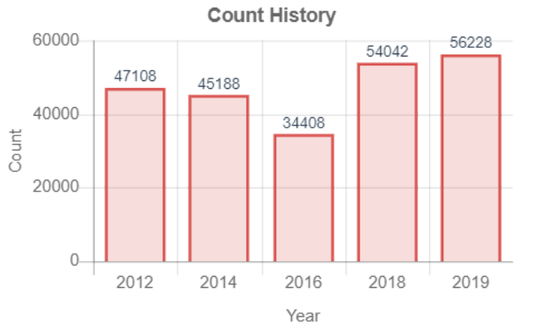
Year	Month	Count type	Duration	Count
2019	October	Class	48 hours	56228
2018	October	Class	48 hours	54042
2016	March	Class	48 hours	34408
2014	March	Volume	48 hours	45188
2012	August	Class	48 hours	47108

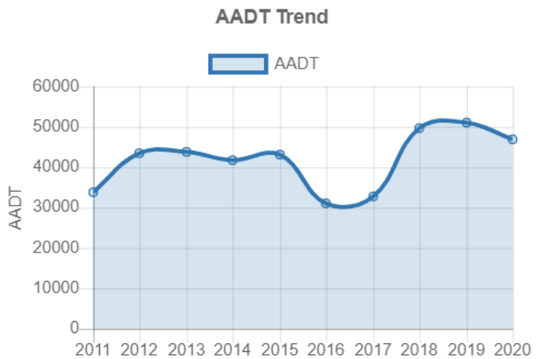
Annual Statistics

Data

Data Item	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Statistics type	-	-	-	-	Estimated	Actual	Estimated	Actual	Actual	**Estimated**
AADT	33900	43600	43700	41600	43000	31000	32800	49700	50900	**47000**
K-Factor	-	-	-	0.082	0.082	0.083	-	0.086	0.080	**0.080**
D-Factor	-	-	-	0.500	0.500	0.500	-	0.540	0.520	**0.520**
Future AADT	-	-	-	-	-	46400	42100	62600	66600	**66600**







FHWA Vehicle Classification

1. Motorcycles 2 axles, 2 or 3 wheels.	**0.43%**
2. Passenger cars 2 axles. Can have 1- or 2-axle trailers.	**80.98%**
3. Pickups, panels, vans 2-axle, 4-tire single units. Can have 1- or 2-axle trailers.	**14.05%**
4. Buses 2- or 3-axle, full length.	**0.49%**
5. Single-unit trucks 2-axle, 6-tire, (dual rear tires), single-unit trucks.	**2.00%**
6. Single-unit trucks 3-axle, single-unit trucks.	**0.54%**
7. Single-unit trucks 4 or more axle, single-unit trucks.	**0.06%**
8. Single-trailer trucks 3- or 4-axle, single-trailer trucks.	**0.43%**
9. Single-trailer trucks 5-axle, single-trailer trucks.	**0.85%**
10. Single-trailer trucks 6 or more axle, single-trailer trucks.	**0.07%**
11. Multi-trailer trucks 5 or less axle, multi-trailer trucks.	**0.01%**
12. Multi-trailer trucks 6-axle, multi-trailer trucks.	**0.00%**
13. Multi-trailer trucks 7 or more axle, multi-trailer trucks.	**0.08%**

0000135_0207 - 135-0207

Description:

County: Gwinnett

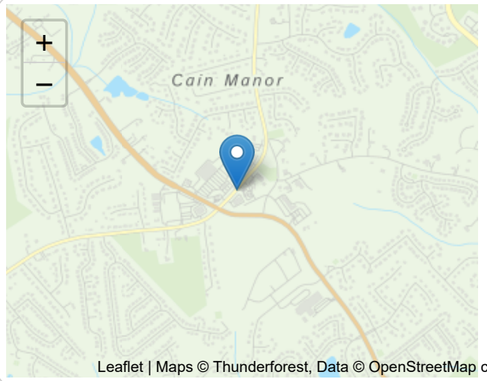
Route number: 00012400

LRS section: 1351012400

Functional class: 4U - Minor Arterial (Urban)

Coordinates: 34.0505369899393, -83.9285014793989

Site Data

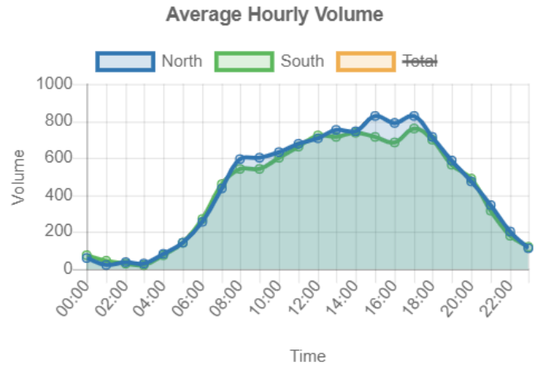


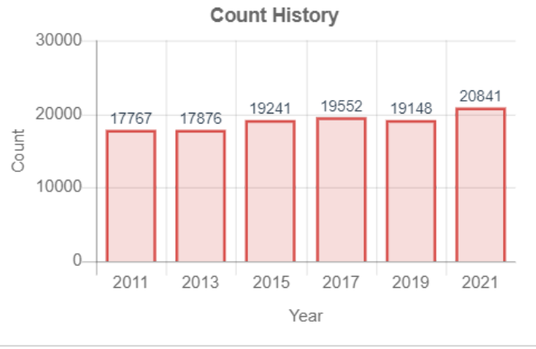
Count History

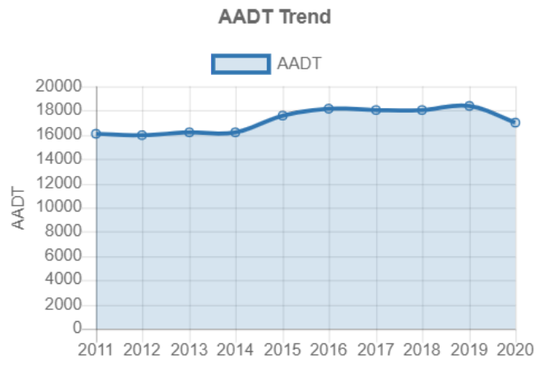
Year	Month	Count type	Duration	Count
2021	April	Volume	48 hours	20841
2019	January	Volume	48 hours	19148
2017	February	Volume	48 hours	19552
2015	March	Volume	48 hours	19241
2013	February	Volume	48 hours	17876
2011	April	Class	48 hours	17767

Annual Statistics

Data Item	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Statistics type	-	-	-	-	Actual	Estimated	Actual	Estimated	Actual	**Estimated**
AADT	16100	16000	16200	16200	17600	18200	18100	18100	18400	**17000**
K-Factor	-	-	0.080	0.080	0.086	0.086	0.083	0.083	0.080	**0.080**
D-Factor	-	-	-	-	0.500	0.500	0.500	0.500	0.550	**0.550**
Future AADT	-	-	-	-	-	24400	25800	27600	27000	**27000**







0000135_0258 - 135-0258

Description: SR 002000 BEG AT
County: Gwinnett
Route number: 00032400
LRS section: 1351032400
Functional class: 4U - Minor Arterial (Urban)
Coordinates: 34.068946959172, -83.9684563310238

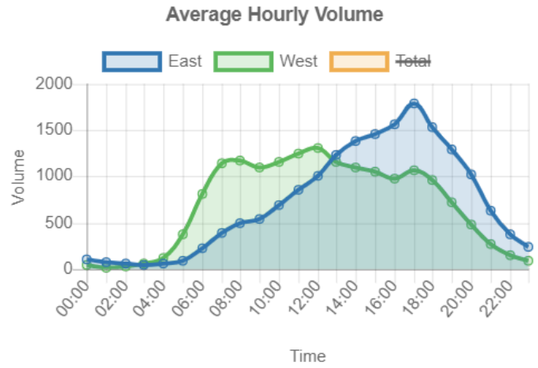
Site Data

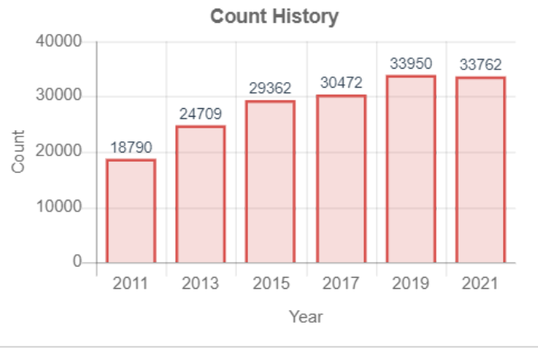
Count History

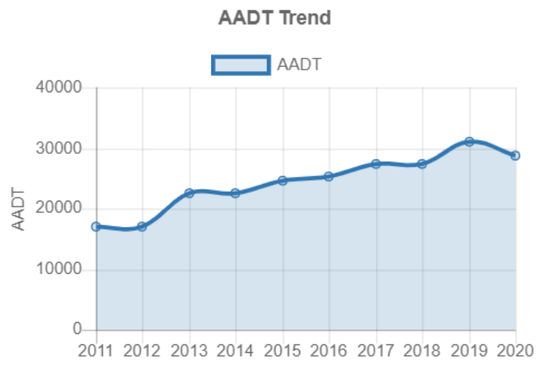
Year	Month	Count type	Duration	Count
2021	April	Volume	48 hours	33762
2019	October	Class	48 hours	33950
2017	February	Volume	48 hours	30472
2015	May	Volume	48 hours	29362
2013	February	Volume	48 hours	24709
2011	September	Class	48 hours	18790

Annual Statistics

Data Item	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Statistics type	-	-	-	-	Actual	Estimated	Actual	Estimated	Actual	**Estimated**
AADT	17100	17000	22600	22600	24600	25400	27300	27300	31100	**28700**
K-Factor	-	-	0.090	0.090	0.108	0.108	0.098	0.098	0.092	**0.092**
D-Factor	-	-	0.700	0.700	0.600	0.600	0.650	0.650	0.640	**0.640**
Future AADT	-	-	-	-	-	31400	42300	50600	58800	**58800**

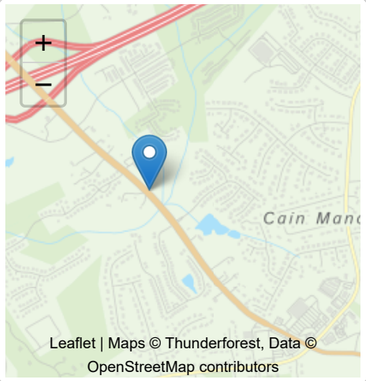






0000135_0261 - 135-0261
Description: CRY 016000 L
County: Gwinnett
Route number: 00032400
LRS section: 1351032400
Functional class: 4U - Minor Arterial (Urban)
Coordinates: 34.05756511, -83.93962382

Site Data

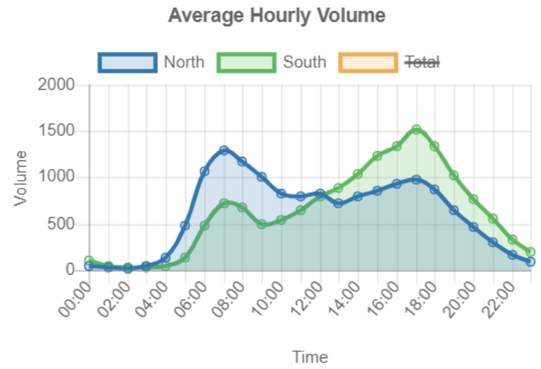


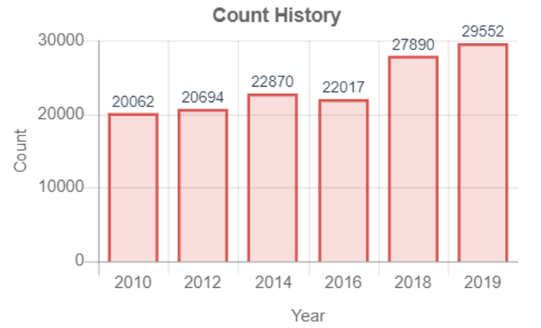
Count History

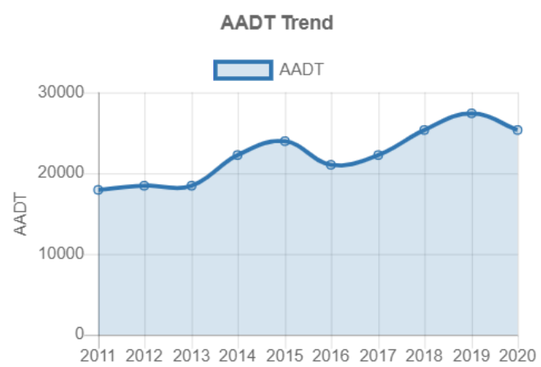
Year	Month	Count type	Duration	Count
2019	September	Class	48 hours	29552
2018	October	Volume	48 hours	27890
2016	February	Class	48 hours	22017
2014	February	Volume	48 hours	22870
2012	March	Volume	48 hours	20694
2010	March	Class	48 hours	20062

Annual Statistics

Data Item	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Statistics type	-	-	-	-	Estimated	Actual	Estimated	Actual	Actual	**Estimated**
AADT	17900	18400	18500	22300	24000	21000	22200	25400	27500	**25400**
K-Factor	-	-	-	0.090	0.090	0.098	-	0.096	0.092	**0.092**
D-Factor	-	-	-	0.700	0.700	0.600	-	0.650	0.600	**0.600**
Future AADT	-	-	-	-	-	36100	36400	39400	46400	**46400**







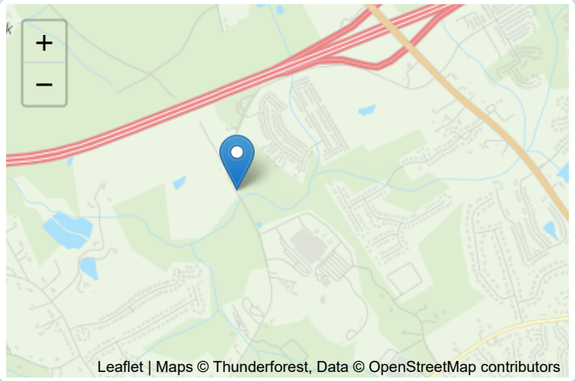
FHWA Vehicle Classification

1. Motorcycles 2 axles, 2 or 3 wheels.	**0.24%**
2. Passenger cars 2 axles. Can have 1- or 2-axle trailers.	**79.88%**
3. Pickups, panels, vans 2-axle, 4-tire single units. Can have 1- or 2-axle trailers.	**16.13%**
4. Buses 2- or 3-axle, full length.	**0.75%**
5. Single-unit trucks 2-axle, 6-tire, (dual rear tires), single-unit trucks.	**1.95%**
6. Single-unit trucks 3-axle, single-unit trucks.	**0.28%**
7. Single-unit trucks 4 or more axle, single-unit trucks.	**0.02%**
8. Single-trailer trucks 3- or 4-axle, single-trailer trucks.	**0.38%**
9. Single-trailer trucks 5-axle, single-trailer trucks.	**0.33%**
10. Single-trailer trucks 6 or more axle, single-trailer trucks.	**0.02%**
11. Multi-trailer trucks 5 or less axle, multi-trailer trucks.	**0.00%**
12. Multi-trailer trucks 6-axle, multi-trailer trucks.	**0.00%**
13. Multi-trailer trucks 7 or more axle, multi-trailer trucks.	**0.01%**

0000135_8524 - 135-8524

Description: BEG DE
County: Gwinnett
Route number: 00015500
LRS section: 1352015500
Functional class: 7U - Local (Urban)
Coordinates: 34.0548722586642, -83.9564671295183

Site Data

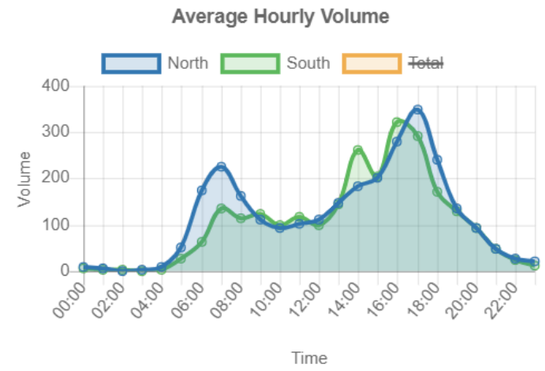


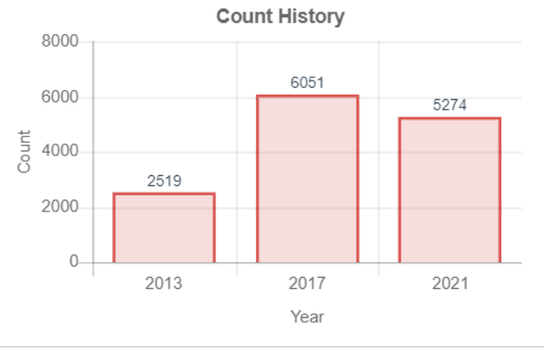
Count History

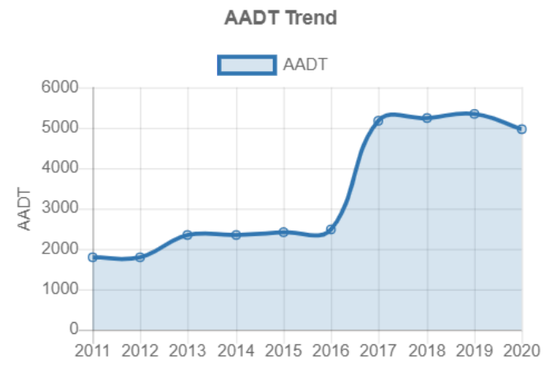
Year	Month	Count type	Duration	Count
2021	March	Volume	48 hours	5274
2017	February	Volume	48 hours	6051
2013	February	Volume	48 hours	2519

Annual Statistics

Data Item	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Statistics type	-	-	-	-	Estimated	Estimated	Actual	Estimated	Estimated	**Estimated**
AADT	1810	1810	2330	2330	2420	2480	5170	5250	5360	**4970**
K-Factor	-	-	0.110	0.110	0.110	0.110	0.133	0.133	0.133	**0.133**
D-Factor	-	-	-	-	-	-	0.500	0.500	0.500	**0.500**
Future AADT	-	-	-	-	-	4620	9250	14500	15300	**14900**





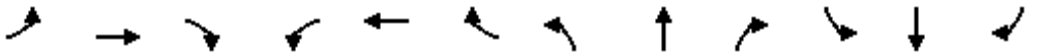


HISTORICAL TRAFFIC COUNTS
DRI# 3558 - Buford Distribution Center TIS
Gwinnett County, Georgia

Location	Counter ID (Gwinnett Co.)	Georgia DOT ADT													Forecast		Compounded Growth Rate	
		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2024	2022-2024	Percent
SR 20 b/t Sudderth Rd & Plunkett Rd	135-0118		57,717	81,969				92,189							133,837	145,147	4.14%	47.46%
SR 20 b/t Mall of GA Blvd & Woodward Crossing Blvd	135-0121				47,108		45,188		34,408		54,042	56,228			55,968	58,734	2.44%	19.21%
SR 124 N of SR 324	135-0207			17,767		17,876		19,241		19,552		19,148		20,841	20,742	21,299	1.33%	6.96%
SR 324 E of Mall of GA Blvd	135-0258			18,790		24,709		29,362		30,472		33,950		33,762	37,395	40,358	3.89%	13.20%
SR 324 E of Kirkstone Dr	135-0261		20,062		20,694		22,870		22,017		27,890	29,552			31,208	33,262	3.24%	10.88%
Morgan Rd S of Sunny Hill Rd	135-8524					2,519				6,051				5,274	6,337	7,025	5.29%	2.30%
															285,487	**305,825**	**3.5%**	**100.00%**

APPENDIX F

CAPACITY ANALYSIS REPORTS



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	0	154	0	0	0	0	1755	85	142	794	0
Future Volume (veh/h)	67	0	154	0	0	0	0	1755	85	142	794	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1841	1900	1885				0	1885	1900	1856	1870	0
Adj Flow Rate, veh/h	69	0	159				0	1809	88	146	819	0
Peak Hour Factor	0.97	0.97	0.97				0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	4	0	1				0	1	0	3	2	0
Cap, veh/h	453	0	215				0	1877	844	293	2488	0
Arrive On Green	0.13	0.00	0.13				0.00	0.52	0.52	0.19	1.00	0.00
Sat Flow, veh/h	3401	0	1610				0	3676	1610	1767	3647	0
Grp Volume(v), veh/h	69	0	159				0	1809	88	146	819	0
Grp Sat Flow(s),veh/h/ln	1700	0	1610				0	1791	1610	1767	1777	0
Q Serve(g_s), s	1.1	0.0	5.7				0.0	29.1	1.7	1.9	0.0	0.0
Cycle Q Clear(g_c), s	1.1	0.0	5.7				0.0	29.1	1.7	1.9	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	453	0	215				0	1877	844	293	2488	0
V/C Ratio(X)	0.15	0.00	0.74				0.00	0.96	0.10	0.50	0.33	0.00
Avail Cap(c_a), veh/h	453	0	215				0	1877	844	306	2488	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.78	0.78	0.00
Uniform Delay (d), s/veh	23.0	0.0	25.0				0.0	13.7	7.2	11.9	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	12.8				0.0	13.8	0.2	1.0	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	2.6				0.0	11.6	2.2	0.8	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.2	0.0	37.8				0.0	27.6	7.4	12.9	0.3	0.0
LnGrp LOS	C	A	D				A	C	A	B	A	A
Approach Vol, veh/h		228						1897			965	
Approach Delay, s/veh		33.4						26.6			2.2	
Approach LOS		C						C			A	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		47.0		13.0	10.6	36.4						
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0						
Max Green Setting (Gmax), s		41.0		7.0	5.0	30.0						
Max Q Clear Time (g_c+I1), s		2.0		7.7	3.9	31.1						
Green Ext Time (p_c), s		6.0		0.0	0.0	0.0						

Intersection Summary												
HCM 6th Ctrl Delay			19.5									
HCM 6th LOS			B									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	118	0	238	637	1192	0	0	793	202
Future Volume (veh/h)	0	0	0	118	0	238	637	1192	0	0	793	202
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1885	1900	1870	1900	1885	0	0	1885	1885
Adj Flow Rate, veh/h				122	0	245	657	1229	0	0	818	208
Peak Hour Factor				0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %				1	0	2	0	1	0	0	1	1
Cap, veh/h				581	0	268	820	2388	0	0	1253	559
Arrive On Green				0.17	0.00	0.17	0.23	0.67	0.00	0.00	0.12	0.12
Sat Flow, veh/h				3483	0	1610	3510	3676	0	0	3676	1598
Grp Volume(v), veh/h				122	0	245	657	1229	0	0	818	208
Grp Sat Flow(s),veh/h/ln				1742	0	1610	1755	1791	0	0	1791	1598
Q Serve(g_s), s				1.8	0.0	9.0	10.6	10.4	0.0	0.0	13.1	7.2
Cycle Q Clear(g_c), s				1.8	0.0	9.0	10.6	10.4	0.0	0.0	13.1	7.2
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				581	0	268	820	2388	0	0	1253	559
V/C Ratio(X)				0.21	0.00	0.91	0.80	0.51	0.00	0.00	0.65	0.37
Avail Cap(c_a), veh/h				581	0	268	878	2388	0	0	1253	559
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33
Upstream Filter(I)				1.00	0.00	1.00	0.50	0.50	0.00	0.00	0.85	0.85
Uniform Delay (d), s/veh				21.6	0.0	24.6	21.7	5.1	0.0	0.0	23.1	20.4
Incr Delay (d2), s/veh				0.2	0.0	33.0	2.6	0.4	0.0	0.0	2.3	1.6
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				0.6	0.0	5.3	4.0	2.0	0.0	0.0	6.3	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				21.8	0.0	57.6	24.3	5.5	0.0	0.0	25.3	22.1
LnGrp LOS				C	A	E	C	A	A	A	C	C
Approach Vol, veh/h					367			1886			1026	
Approach Delay, s/veh					45.7			12.0			24.7	
Approach LOS					D			B			C	

Timer - Assigned Phs	1	2			6		8					
Phs Duration (G+Y+Rc), s	9.0	26.0			45.0		15.0					
Change Period (Y+Rc), s	6.0	6.0			6.0		6.0					
Max Green Setting (Gmax), s	4.0	19.0			39.0		9.0					
Max Q Clear Time (g_c+I1), s	2.8	15.1			12.4		11.0					
Green Ext Time (p_c), s	0.4	2.1			9.5		0.0					

Intersection Summary		
HCM 6th Ctrl Delay		19.7
HCM 6th LOS		B

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	410	60	1145	268	37	615
Future Volume (veh/h)	410	60	1145	268	37	615
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1752	1856	1900	1870
Adj Flow Rate, veh/h	418	61	1168	273	38	628
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	10	3	0	2
Cap, veh/h	499	444	1392	658	306	1981
Arrive On Green	0.28	0.28	0.84	0.84	0.06	0.56
Sat Flow, veh/h	1810	1610	3416	1572	1810	3647
Grp Volume(v), veh/h	418	61	1168	273	38	628
Grp Sat Flow(s),veh/h/ln	1810	1610	1664	1572	1810	1777
Q Serve(g_s), s	13.1	1.7	11.5	2.6	0.6	5.7
Cycle Q Clear(g_c), s	13.1	1.7	11.5	2.6	0.6	5.7
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	499	444	1392	658	306	1981
V/C Ratio(X)	0.84	0.14	0.84	0.41	0.12	0.32
Avail Cap(c_a), veh/h	573	510	1392	658	386	1981
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.86	0.86	1.00	1.00
Uniform Delay (d), s/veh	20.5	16.3	3.8	3.1	9.1	7.1
Incr Delay (d2), s/veh	9.5	0.1	5.4	1.7	0.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.2	0.6	2.2	0.8	0.2	1.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	29.9	16.5	9.2	4.7	9.3	7.6
LnGrp LOS	C	B	A	A	A	A
Approach Vol, veh/h	479		1441			666
Approach Delay, s/veh	28.2		8.3			7.7
Approach LOS	C		A			A

Timer - Assigned Phs	2		5	6	8
Phs Duration (G+Y+Rc), s	38.4		8.3	30.1	21.6
Change Period (Y+Rc), s	6.0		6.0	6.0	6.0
Max Green Setting (Gmax), s	30.0		5.0	19.0	18.0
Max Q Clear Time (g_c+I1), s	7.7		2.6	13.5	15.1
Green Ext Time (p_c), s	3.9		0.0	3.6	0.5

Intersection Summary	
HCM 6th Ctrl Delay	11.8
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Vol, veh/h	47	572	0	1156	41	66	97
Future Vol, veh/h	47	572	0	1156	41	66	97
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	Yield	-	Yield
Storage Length	140	-	100	-	150	0	65
Veh in Median Storage, #	-	0	-	0	-	0	-
Grade, %	-	0	-	0	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97
Heavy Vehicles, %	0	2	0	1	0	0	0
Mvmt Flow	48	590	0	1192	42	68	100

Major/Minor	Major1		Major2			Minor2	
Conflicting Flow All	1192	0	590	-	0	1583	596
Stage 1	-	-	-	-	-	1192	-
Stage 2	-	-	-	-	-	391	-
Critical Hdwy	4.1	-	6.4	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	-	5.8	-
Follow-up Hdwy	2.2	-	2.5	-	-	3.5	3.3
Pot Cap-1 Maneuver	593	-	615	-	-	101	452
Stage 1	-	-	-	-	-	255	-
Stage 2	-	-	-	-	-	659	-
Platoon blocked, %		-		-	-		
Mov Cap-1 Maneuver	593	-	615	-	-	93	452
Mov Cap-2 Maneuver	-	-	-	-	-	93	-
Stage 1	-	-	-	-	-	234	-
Stage 2	-	-	-	-	-	659	-

Approach	EB	WB	SB
HCM Control Delay, s	0.9	0	54.2
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBU	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	593	-	615	-	-	93	452
HCM Lane V/C Ratio	0.082	-	-	-	-	0.732	0.221
HCM Control Delay (s)	11.6	-	0	-	-	111.4	15.2
HCM Lane LOS	B	-	A	-	-	F	C
HCM 95th %tile Q(veh)	0.3	-	0	-	-	3.7	0.8

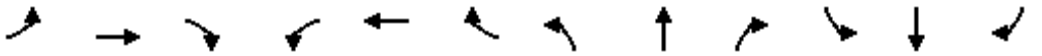
Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	575	11	14	1290	1	7	0	7	1	0	1
Future Vol, veh/h	1	575	11	14	1290	1	7	0	7	1	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	225	-	175	200	-	220	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	2	0	7	1	0	29	0	14	0	0	0
Mvmt Flow	1	612	12	15	1372	1	7	0	7	1	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1373	0	0	624	0	0	1330	2017	306	1710	2028	686
Stage 1	-	-	-	-	-	-	614	614	-	1402	1402	-
Stage 2	-	-	-	-	-	-	716	1403	-	308	626	-
Critical Hdwy	4.1	-	-	4.24	-	-	8.08	6.5	7.18	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	7.08	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	7.08	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.27	-	-	3.79	4	3.44	3.5	4	3.3
Pot Cap-1 Maneuver	506	-	-	920	-	-	89	59	656	60	58	395
Stage 1	-	-	-	-	-	-	386	486	-	150	209	-
Stage 2	-	-	-	-	-	-	331	208	-	683	480	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	506	-	-	920	-	-	87	58	656	59	57	395
Mov Cap-2 Maneuver	-	-	-	-	-	-	87	58	-	59	57	-
Stage 1	-	-	-	-	-	-	385	485	-	150	206	-
Stage 2	-	-	-	-	-	-	325	205	-	674	479	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	30.9	40.7
HCM LOS			D	E

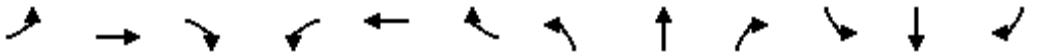
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	154	506	-	-	920	-	-	103
HCM Lane V/C Ratio	0.097	0.002	-	-	0.016	-	-	0.021
HCM Control Delay (s)	30.9	12.1	-	-	9	-	-	40.7
HCM Lane LOS	D	B	-	-	A	-	-	E
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0.1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	452	85	210	1060	5	11	23	21	73	4	153
Future Volume (veh/h)	12	452	85	210	1060	5	11	23	21	73	4	153
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1870	1900	1885	1885	1900	1767	1900	1826	1900	1900	1900
Adj Flow Rate, veh/h	13	481	90	223	1128	5	12	24	22	78	4	163
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	2	0	1	1	0	9	0	5	0	0	0
Cap, veh/h	66	1398	633	460	1752	787	236	334	272	372	7	277
Arrive On Green	0.04	0.39	0.39	0.13	0.49	0.49	0.18	0.18	0.18	0.18	0.18	0.18
Sat Flow, veh/h	1810	3554	1610	3483	3582	1610	1151	1900	1547	1381	39	1577
Grp Volume(v), veh/h	13	481	90	223	1128	5	12	24	22	78	0	167
Grp Sat Flow(s),veh/h/ln	1810	1777	1610	1742	1791	1610	1151	1900	1547	1381	0	1616
Q Serve(g_s), s	0.4	4.8	1.8	3.0	11.8	0.1	0.5	0.5	0.6	2.5	0.0	4.8
Cycle Q Clear(g_c), s	0.4	4.8	1.8	3.0	11.8	0.1	5.3	0.5	0.6	3.0	0.0	4.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Lane Grp Cap(c), veh/h	66	1398	633	460	1752	787	236	334	272	372	0	284
V/C Ratio(X)	0.20	0.34	0.14	0.48	0.64	0.01	0.05	0.07	0.08	0.21	0.00	0.59
Avail Cap(c_a), veh/h	288	3822	1732	1734	5065	2277	630	984	801	844	0	837
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.5	10.7	9.8	20.2	9.6	6.6	21.4	17.3	17.3	18.5	0.0	19.0
Incr Delay (d2), s/veh	1.4	0.1	0.1	0.8	0.4	0.0	0.1	0.1	0.1	0.3	0.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	1.4	0.5	1.1	3.0	0.0	0.1	0.2	0.2	0.8	0.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.9	10.8	9.9	21.0	10.0	6.6	21.5	17.4	17.4	18.8	0.0	21.0
LnGrp LOS	C	B	A	C	A	A	C	B	B	B	A	C
Approach Vol, veh/h		584			1356			58			245	
Approach Delay, s/veh		11.0			11.8			18.2			20.3	
Approach LOS		B			B			B			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.8	29.6		13.8	11.6	24.8		13.8				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	7.0	70.0		25.0	24.0	53.0		25.0				
Max Q Clear Time (g_c+I1), s	2.4	13.8		6.8	5.0	6.8		7.3				
Green Ext Time (p_c), s	0.0	9.8		1.2	0.7	3.5		0.1				

Intersection Summary												
HCM 6th Ctrl Delay			12.7									
HCM 6th LOS			B									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	220	1	431	0	0	0	0	1315	97	292	1447	0
Future Volume (veh/h)	220	1	431	0	0	0	0	1315	97	292	1447	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900				0	1900	1885	1870	1900	0
Adj Flow Rate, veh/h	229	1	449				0	1370	101	304	1507	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0				0	0	1	2	0	0
Cap, veh/h	989	1	453				0	1542	683	359	2264	0
Arrive On Green	0.28	0.28	0.28				0.00	0.43	0.43	0.31	1.00	0.00
Sat Flow, veh/h	3510	4	1607				0	3705	1598	1781	3705	0
Grp Volume(v), veh/h	229	0	450				0	1370	101	304	1507	0
Grp Sat Flow(s),veh/h/ln	1755	0	1611				0	1805	1598	1781	1805	0
Q Serve(g_s), s	5.5	0.0	30.6				0.0	38.5	1.3	11.9	0.0	0.0
Cycle Q Clear(g_c), s	5.5	0.0	30.6				0.0	38.5	1.3	11.9	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	989	0	454				0	1542	683	359	2264	0
V/C Ratio(X)	0.23	0.00	0.99				0.00	0.89	0.15	0.85	0.67	0.00
Avail Cap(c_a), veh/h	989	0	454				0	1542	683	359	2264	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.63	0.63	0.00
Uniform Delay (d), s/veh	30.3	0.0	39.4				0.0	29.1	2.1	34.4	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	39.9				0.0	8.0	0.5	11.5	1.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.0	16.2				0.0	17.1	3.7	6.8	0.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.5	0.0	79.2				0.0	37.1	2.6	45.9	1.0	0.0
LnGrp LOS	C	A	E				A	D	A	D	A	A
Approach Vol, veh/h		679						1471			1811	
Approach Delay, s/veh		62.8						34.7			8.5	
Approach LOS		E						C			A	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		74.0		36.0	22.0	52.0						
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0						
Max Green Setting (Gmax), s		68.0		30.0	16.0	46.0						
Max Q Clear Time (g_c+I1), s		2.0		32.6	13.9	40.5						
Green Ext Time (p_c), s		16.4		0.0	0.2	3.9						

Intersection Summary												
HCM 6th Ctrl Delay			27.6									
HCM 6th LOS			C									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	104	1	245	235	1293	0	0	1603	107
Future Volume (veh/h)	0	0	0	104	1	245	235	1293	0	0	1603	107
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1856	1900	1870	1885	1885	0	0	1885	1900
Adj Flow Rate, veh/h				105	1	247	237	1306	0	0	1619	108
Peak Hour Factor				0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %				3	0	2	1	1	0	0	1	0
Cap, veh/h				622	1	291	445	2606	0	0	1986	893
Arrive On Green				0.18	0.18	0.18	0.13	0.73	0.00	0.00	0.37	0.37
Sat Flow, veh/h				3428	6	1605	3483	3676	0	0	3676	1610
Grp Volume(v), veh/h				105	0	248	237	1306	0	0	1619	108
Grp Sat Flow(s),veh/h/ln				1714	0	1611	1742	1791	0	0	1791	1610
Q Serve(g_s), s				2.8	0.0	16.4	7.0	17.2	0.0	0.0	44.8	1.7
Cycle Q Clear(g_c), s				2.8	0.0	16.4	7.0	17.2	0.0	0.0	44.8	1.7
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				622	0	292	445	2606	0	0	1986	893
V/C Ratio(X)				0.17	0.00	0.85	0.53	0.50	0.00	0.00	0.82	0.12
Avail Cap(c_a), veh/h				717	0	337	445	2606	0	0	1986	893
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67
Upstream Filter(I)				1.00	0.00	1.00	0.53	0.53	0.00	0.00	0.73	0.73
Uniform Delay (d), s/veh				38.0	0.0	43.6	44.9	6.4	0.0	0.0	29.5	2.3
Incr Delay (d2), s/veh				0.1	0.0	16.3	0.7	0.4	0.0	0.0	2.8	0.2
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.1	0.0	7.5	3.0	5.0	0.0	0.0	20.3	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				38.1	0.0	59.9	45.6	6.8	0.0	0.0	32.3	2.5
LnGrp LOS				D	A	E	D	A	A	A	C	A
Approach Vol, veh/h					353			1543			1727	
Approach Delay, s/veh					53.4			12.7			30.4	
Approach LOS					D			B			C	

Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	19.0	66.0				85.0		25.0				
Change Period (Y+Rc), s	6.0	6.0				6.0		6.0				
Max Green Setting (Gmax), s	10.0	60.0				76.0		22.0				
Max Q Clear Time (g_c+I1), s	19.0	46.8				19.2		18.4				
Green Ext Time (p_c), s	0.1	8.9				12.4		0.6				

Intersection Summary		
HCM 6th Ctrl Delay	25.1	
HCM 6th LOS	C	

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	377	80	1012	457	118	1372
Future Volume (veh/h)	377	80	1012	457	118	1372
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1885	1900	1900	1885
Adj Flow Rate, veh/h	377	80	1012	457	118	1372
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	0	1	0	0	1
Cap, veh/h	432	384	2047	920	279	2401
Arrive On Green	0.24	0.24	0.19	0.19	0.05	0.67
Sat Flow, veh/h	1810	1610	3676	1610	1810	3676
Grp Volume(v), veh/h	377	80	1012	457	118	1372
Grp Sat Flow(s),veh/h/ln	1810	1610	1791	1610	1810	1791
Q Serve(g_s), s	22.0	4.4	27.8	27.9	2.7	22.5
Cycle Q Clear(g_c), s	22.0	4.4	27.8	27.9	2.7	22.5
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	432	384	2047	920	279	2401
V/C Ratio(X)	0.87	0.21	0.49	0.50	0.42	0.57
Avail Cap(c_a), veh/h	642	571	2047	920	330	2401
HCM Platoon Ratio	1.00	1.00	0.33	0.33	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.87	0.87	1.00	1.00
Uniform Delay (d), s/veh	40.3	33.5	30.4	30.5	13.5	9.7
Incr Delay (d2), s/veh	8.7	0.3	0.7	1.7	1.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.7	1.7	13.4	12.3	1.0	7.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	49.0	33.8	31.1	32.1	14.5	10.7
LnGrp LOS	D	C	C	C	B	B
Approach Vol, veh/h	457		1469			1490
Approach Delay, s/veh	46.3		31.5			11.0
Approach LOS	D		C			B

Timer - Assigned Phs	2		5	6	8
Phs Duration (G+Y+Rc), s	78.7		10.9	67.9	31.3
Change Period (Y+Rc), s	6.0		6.0	6.0	6.0
Max Green Setting (Gmax), s	60.0		8.0	46.0	38.0
Max Q Clear Time (g_c+I1), s	24.5		4.7	29.9	24.0
Green Ext Time (p_c), s	12.2		0.1	7.6	1.2

Intersection Summary	
HCM 6th Ctrl Delay	24.5
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	10.4

Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Vol, veh/h	129	1414	0	1018	89	58	109
Future Vol, veh/h	129	1414	0	1018	89	58	109
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	Yield	-	Yield
Storage Length	140	-	100	-	150	0	65
Veh in Median Storage, #	-	0	-	0	-	0	-
Grade, %	-	0	-	0	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98
Heavy Vehicles, %	0	1	0	1	0	0	0
Mvmt Flow	132	1443	0	1039	91	59	111

Major/Minor	Major1		Major2			Minor2	
Conflicting Flow All	1039	0	1443	-	0	2025	520
Stage 1	-	-	-	-	-	1039	-
Stage 2	-	-	-	-	-	986	-
Critical Hdwy	4.1	-	6.4	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	-	5.8	-
Follow-up Hdwy	2.2	-	2.5	-	-	3.5	3.3
Pot Cap-1 Maneuver	677	-	175	-	-	~ 51	506
Stage 1	-	-	-	-	-	306	-
Stage 2	-	-	-	-	-	327	-
Platoon blocked, %		-		-	-		
Mov Cap-1 Maneuver	677	-	175	-	-	~ 41	506
Mov Cap-2 Maneuver	-	-	-	-	-	~ 41	-
Stage 1	-	-	-	-	-	246	-
Stage 2	-	-	-	-	-	327	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	166
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBU	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	677	-	175	-	-	41	506
HCM Lane V/C Ratio	0.194	-	-	-	-	1.444	0.22
HCM Control Delay (s)	11.6	-	0	-	-	$ 451.4	14.1
HCM Lane LOS	B	-	A	-	-	F	B
HCM 95th %tile Q(veh)	0.7	-	0	-	-	6	0.8

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

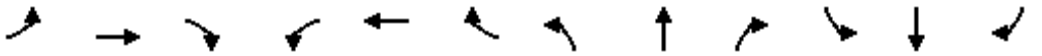
Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1551	5	6	1130	1	3	1	21	0	1	0
Future Vol, veh/h	0	1551	5	6	1130	1	3	1	21	0	1	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	225	-	175	200	-	220	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	0	1583	5	6	1153	1	3	1	21	0	1	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1154	0	0	1588	0	0	2172	2749	792	1957	2753	577
Stage 1	-	-	-	-	-	-	1583	1583	-	1165	1165	-
Stage 2	-	-	-	-	-	-	589	1166	-	792	1588	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	613	-	-	419	-	-	27	20	336	39	20	465
Stage 1	-	-	-	-	-	-	116	170	-	210	271	-
Stage 2	-	-	-	-	-	-	466	270	-	353	169	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	613	-	-	419	-	-	26	20	336	35	20	465
Mov Cap-2 Maneuver	-	-	-	-	-	-	26	20	-	35	20	-
Stage 1	-	-	-	-	-	-	116	170	-	210	267	-
Stage 2	-	-	-	-	-	-	458	266	-	329	169	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	47.3	194.5
HCM LOS			E	F

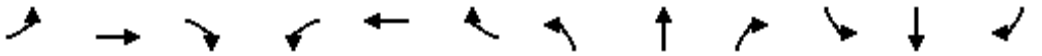
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	110	613	-	-	419	-	-	20
HCM Lane V/C Ratio	0.232	-	-	-	0.015	-	-	0.051
HCM Control Delay (s)	47.3	0	-	-	13.7	-	-	194.5
HCM Lane LOS	E	A	-	-	B	-	-	F
HCM 95th %tile Q(veh)	0.8	0	-	-	0	-	-	0.2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	977	113	402	705	4	142	21	615	11	10	16
Future Volume (veh/h)	15	977	113	402	705	4	142	21	615	11	10	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1885	1900	1900	1870	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	15	987	114	406	712	4	143	21	621	11	10	16
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	0	1	0	0	2	0	0	0	0	0	0	0
Cap, veh/h	58	1206	542	580	1668	756	487	541	458	324	187	300
Arrive On Green	0.03	0.34	0.34	0.17	0.47	0.47	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	1810	3582	1610	3510	3554	1610	1407	1900	1610	800	658	1053
Grp Volume(v), veh/h	15	987	114	406	712	4	143	21	621	11	0	26
Grp Sat Flow(s),veh/h/ln	1810	1791	1610	1755	1777	1610	1407	1900	1610	800	0	1711
Q Serve(g_s), s	0.6	17.7	3.6	7.7	9.3	0.1	5.8	0.6	20.0	0.7	0.0	0.8
Cycle Q Clear(g_c), s	0.6	17.7	3.6	7.7	9.3	0.1	6.5	0.6	20.0	1.3	0.0	0.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.62
Lane Grp Cap(c), veh/h	58	1206	542	580	1668	756	487	541	458	324	0	487
V/C Ratio(X)	0.26	0.82	0.21	0.70	0.43	0.01	0.29	0.04	1.35	0.03	0.00	0.05
Avail Cap(c_a), veh/h	155	1326	596	950	1973	894	487	541	458	324	0	487
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.2	21.3	16.6	27.7	12.4	9.9	20.6	18.2	25.1	18.6	0.0	18.2
Incr Delay (d2), s/veh	2.3	3.9	0.2	1.6	0.2	0.0	0.3	0.0	173.4	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	7.0	1.2	3.0	3.1	0.0	1.7	0.2	28.7	0.1	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.4	25.2	16.8	29.2	12.5	9.9	21.0	18.2	198.5	18.7	0.0	18.3
LnGrp LOS	D	C	B	C	B	A	C	B	F	B	A	B
Approach Vol, veh/h		1116			1122			785			37	
Approach Delay, s/veh		24.5			18.6			161.3			18.4	
Approach LOS		C			B			F			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.3	38.0		25.0	16.6	28.6		25.0				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	38.0		19.0	18.0	25.0		19.0				
Max Q Clear Time (g_c+I1), s	2.6	11.3		3.3	9.7	19.7		22.0				
Green Ext Time (p_c), s	0.0	4.7		0.1	0.9	2.9		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		57.3	
HCM 6th LOS		E	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	121	0	165	0	0	0	0	1931	91	203	903	0
Future Volume (veh/h)	121	0	165	0	0	0	0	1931	91	203	903	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1841	1900	1885				0	1885	1900	1856	1870	0
Adj Flow Rate, veh/h	125	0	170				0	1991	94	209	931	0
Peak Hour Factor	0.97	0.97	0.97				0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	4	0	1				0	1	0	3	2	0
Cap, veh/h	464	0	220				0	2070	930	294	2674	0
Arrive On Green	0.14	0.00	0.14				0.00	0.58	0.58	0.24	1.00	0.00
Sat Flow, veh/h	3401	0	1610				0	3676	1610	1767	3647	0
Grp Volume(v), veh/h	125	0	170				0	1991	94	209	931	0
Grp Sat Flow(s),veh/h/ln	1700	0	1610				0	1791	1610	1767	1777	0
Q Serve(g_s), s	3.0	0.0	9.2				0.0	47.6	0.9	5.1	0.0	0.0
Cycle Q Clear(g_c), s	3.0	0.0	9.2				0.0	47.6	0.9	5.1	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	464	0	220				0	2070	930	294	2674	0
V/C Ratio(X)	0.27	0.00	0.77				0.00	0.96	0.10	0.71	0.35	0.00
Avail Cap(c_a), veh/h	491	0	233				0	2070	930	294	2674	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.72	0.72	0.00
Uniform Delay (d), s/veh	34.8	0.0	37.5				0.0	18.1	1.3	31.1	0.0	0.0
Incr Delay (d2), s/veh	0.3	0.0	14.2				0.0	12.7	0.2	5.7	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	4.2				0.0	19.3	2.8	3.9	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.1	0.0	51.7				0.0	30.7	1.5	36.8	0.3	0.0
LnGrp LOS	D	A	D				A	C	A	D	A	A
Approach Vol, veh/h		295						2085			1140	
Approach Delay, s/veh		44.7						29.4			7.0	
Approach LOS		D						C			A	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		72.7		17.3	15.7	57.0						
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0						
Max Green Setting (Gmax), s		66.0		12.0	9.0	51.0						
Max Q Clear Time (g_c+I1), s		2.0		11.2	7.1	49.6						
Green Ext Time (p_c), s		7.3		0.1	0.1	1.3						

Intersection Summary												
HCM 6th Ctrl Delay			23.4									
HCM 6th LOS			C									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	126	0	305	682	1377	0	0	952	266
Future Volume (veh/h)	0	0	0	126	0	305	682	1377	0	0	952	266
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1885	1900	1870	1900	1885	0	0	1885	1885
Adj Flow Rate, veh/h				130	0	314	703	1420	0	0	981	274
Peak Hour Factor				0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %				1	0	2	0	1	0	0	1	1
Cap, veh/h				735	0	340	897	2428	0	0	1313	586
Arrive On Green				0.21	0.00	0.21	0.26	0.68	0.00	0.00	0.12	0.12
Sat Flow, veh/h				3483	0	1610	3510	3676	0	0	3676	1598
Grp Volume(v), veh/h				130	0	314	703	1420	0	0	981	274
Grp Sat Flow(s),veh/h/ln				1742	0	1610	1755	1791	0	0	1791	1598
Q Serve(g_s), s				2.8	0.0	17.2	16.8	19.0	0.0	0.0	23.8	6.6
Cycle Q Clear(g_c), s				2.8	0.0	17.2	16.8	19.0	0.0	0.0	23.8	6.6
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				735	0	340	897	2428	0	0	1313	586
V/C Ratio(X)				0.18	0.00	0.92	0.78	0.58	0.00	0.00	0.75	0.47
Avail Cap(c_a), veh/h				735	0	340	897	2428	0	0	1313	586
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33
Upstream Filter(I)				1.00	0.00	1.00	0.37	0.37	0.00	0.00	0.80	0.80
Uniform Delay (d), s/veh				29.1	0.0	34.8	31.2	7.7	0.0	0.0	35.5	6.9
Incr Delay (d2), s/veh				0.1	0.0	30.1	1.7	0.4	0.0	0.0	3.1	2.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.1	0.0	9.0	6.8	5.4	0.0	0.0	11.8	5.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				29.2	0.0	64.9	32.9	8.1	0.0	0.0	38.7	9.1
LnGrp LOS				C	A	E	C	A	A	A	D	A
Approach Vol, veh/h					444			2123			1255	
Approach Delay, s/veh					54.4			16.3			32.2	
Approach LOS					D			B			C	

Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	38.0	38.0				66.0		24.0				
Change Period (Y+Rc), s	6.0	6.0				6.0		6.0				
Max Green Setting (Gmax), s	32.0	32.0				60.0		18.0				
Max Q Clear Time (g_c+I1), s	19.8	25.8				21.0		19.2				
Green Ext Time (p_c), s	0.9	3.5				13.2		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	26.0
HCM 6th LOS	C

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	446	102	1375	289	68	805
Future Volume (veh/h)	446	102	1375	289	68	805
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1752	1856	1900	1870
Adj Flow Rate, veh/h	455	104	1403	295	69	821
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	10	3	0	2
Cap, veh/h	504	449	1657	783	221	2168
Arrive On Green	0.28	0.28	0.50	0.50	0.06	0.61
Sat Flow, veh/h	1810	1610	3416	1572	1810	3647
Grp Volume(v), veh/h	455	104	1403	295	69	821
Grp Sat Flow(s),veh/h/ln	1810	1610	1664	1572	1810	1777
Q Serve(g_s), s	21.8	4.5	32.9	10.4	1.5	10.5
Cycle Q Clear(g_c), s	21.8	4.5	32.9	10.4	1.5	10.5
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	504	449	1657	783	221	2168
V/C Ratio(X)	0.90	0.23	0.85	0.38	0.31	0.38
Avail Cap(c_a), veh/h	523	465	1657	783	239	2168
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.80	0.80	1.00	1.00
Uniform Delay (d), s/veh	31.3	25.0	19.6	14.0	17.2	8.9
Incr Delay (d2), s/veh	18.5	0.3	4.5	1.1	0.8	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.7	1.7	11.9	3.5	0.6	3.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	49.7	25.3	24.1	15.1	18.0	9.4
LnGrp LOS	D	C	C	B	B	A
Approach Vol, veh/h	559		1698			890
Approach Delay, s/veh	45.2		22.6			10.1
Approach LOS	D		C			B

Timer - Assigned Phs	2			5	6	8
Phs Duration (G+Y+Rc), s	59.9			10.1	49.8	30.1
Change Period (Y+Rc), s	6.0			6.0	6.0	6.0
Max Green Setting (Gmax), s	53.0			5.0	42.0	25.0
Max Q Clear Time (g_c+I1), s	12.5			3.5	34.9	23.8
Green Ext Time (p_c), s	6.0			0.0	5.1	0.3

Intersection Summary	
HCM 6th Ctrl Delay	23.0
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	23.3

Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Vol, veh/h	79	775	0	1416	52	83	142
Future Vol, veh/h	79	775	0	1416	52	83	142
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	Yield	-	Yield
Storage Length	140	-	100	-	150	0	65
Veh in Median Storage, #	-	0	-	0	-	0	-
Grade, %	-	0	-	0	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97
Heavy Vehicles, %	0	2	0	1	0	0	0
Mvmt Flow	81	799	0	1460	54	86	146

Major/Minor	Major1		Major2			Minor2	
Conflicting Flow All	1460	0	799	-	0	2022	730
Stage 1	-	-	-	-	-	1460	-
Stage 2	-	-	-	-	-	562	-
Critical Hdwy	4.1	-	6.4	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	-	5.8	-
Follow-up Hdwy	2.2	-	2.5	-	-	3.5	3.3
Pot Cap-1 Maneuver	469	-	453	-	-	~ 52	369
Stage 1	-	-	-	-	-	183	-
Stage 2	-	-	-	-	-	540	-
Platoon blocked, %		-		-	-		
Mov Cap-1 Maneuver	469	-	453	-	-	~ 43	369
Mov Cap-2 Maneuver	-	-	-	-	-	~ 43	-
Stage 1	-	-	-	-	-	151	-
Stage 2	-	-	-	-	-	540	-

Approach	EB	WB	SB
HCM Control Delay, s	1.3	0	258.3
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBU	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	469	-	453	-	-	43	369
HCM Lane V/C Ratio	0.174	-	-	-	-	1.99	0.397
HCM Control Delay (s)	14.3	-	0	-	-	$ 664.4	21
HCM Lane LOS	B	-	A	-	-	F	C
HCM 95th %tile Q(veh)	0.6	-	0	-	-	8.9	1.9

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	267.6

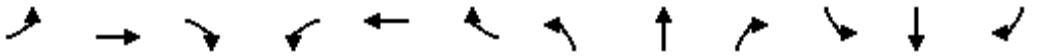
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	620	156	214	1396	4	118	0	153	40	0	25
Future Vol, veh/h	7	620	156	214	1396	4	118	0	153	40	0	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	225	-	175	200	-	220	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	2	0	7	1	0	29	0	14	0	0	0
Mvmt Flow	7	660	166	228	1485	4	126	0	163	43	0	27

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1489	0	0	826	0	0	1873	2619	330	2285	2781	743
Stage 1	-	-	-	-	-	-	674	674	-	1941	1941	-
Stage 2	-	-	-	-	-	-	1199	1945	-	344	840	-
Critical Hdwy	4.1	-	-	4.24	-	-	8.08	6.5	7.18	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	7.08	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	7.08	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.27	-	-	3.79	4	3.44	3.5	4	3.3
Pot Cap-1 Maneuver	457	-	-	769	-	-	~ 33	24	632	~ 22	19	362
Stage 1	-	-	-	-	-	-	352	457	-	69	113	-
Stage 2	-	-	-	-	-	-	158	113	-	650	384	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	457	-	-	769	-	-	~ 23	17	632	~ 12	13	362
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 23	17	-	~ 12	13	-
Stage 1	-	-	-	-	-	-	347	450	-	68	80	-
Stage 2	-	-	-	-	-	-	~ 103	80	-	475	378	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1.5	$ 2305.5	$ 1602.6
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	50	457	-	-	769	-	-	19
HCM Lane V/C Ratio	5.766	0.016	-	-	0.296	-	-	3.639
HCM Control Delay (s)	$ 2305.5	13	-	-	11.6	-	-	$ 1602.6
HCM Lane LOS	F	B	-	-	B	-	-	F
HCM 95th %tile Q(veh)	33.1	0.1	-	-	1.2	-	-	9.1

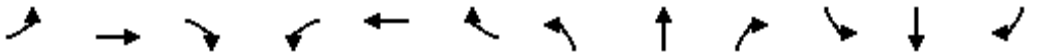
Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	556	91	287	1191	5	12	25	93	78	4	164
Future Volume (veh/h)	13	556	91	287	1191	5	12	25	93	78	4	164
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1870	1900	1885	1885	1900	1767	1900	1826	1900	1900	1900
Adj Flow Rate, veh/h	14	591	97	305	1267	5	13	27	99	83	4	174
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	2	0	1	1	0	9	0	5	0	0	0
Cap, veh/h	65	972	441	960	1839	827	216	334	272	342	6	277
Arrive On Green	0.04	0.27	0.27	0.28	0.51	0.51	0.18	0.18	0.18	0.18	0.18	0.18
Sat Flow, veh/h	1810	3554	1610	3483	3582	1610	1139	1900	1547	1285	36	1579
Grp Volume(v), veh/h	14	591	97	305	1267	5	13	27	99	83	0	178
Grp Sat Flow(s),veh/h/ln	1810	1777	1610	1742	1791	1610	1139	1900	1547	1285	0	1616
Q Serve(g_s), s	0.4	7.9	2.5	3.8	14.5	0.1	0.6	0.6	3.1	3.1	0.0	5.6
Cycle Q Clear(g_c), s	0.4	7.9	2.5	3.8	14.5	0.1	6.1	0.6	3.1	3.8	0.0	5.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Lane Grp Cap(c), veh/h	65	972	441	960	1839	827	216	334	272	342	0	284
V/C Ratio(X)	0.22	0.61	0.22	0.32	0.69	0.01	0.06	0.08	0.36	0.24	0.00	0.63
Avail Cap(c_a), veh/h	199	2281	1033	1277	3218	1447	434	697	567	588	0	593
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.5	17.3	15.3	15.7	10.0	6.5	23.7	18.8	19.8	20.4	0.0	20.8
Incr Delay (d2), s/veh	1.6	0.6	0.2	0.2	0.5	0.0	0.1	0.1	0.8	0.4	0.0	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	2.7	0.8	1.3	3.8	0.0	0.1	0.3	1.0	0.9	0.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.2	17.9	15.6	15.9	10.5	6.5	23.8	18.9	20.6	20.7	0.0	23.1
LnGrp LOS	C	B	B	B	B	A	C	B	C	C	A	C
Approach Vol, veh/h		702			1577			139			261	
Approach Delay, s/veh		17.7			11.5			20.6			22.3	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.0	33.0		14.6	20.0	19.9		14.6				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	48.0		19.0	19.0	34.0		19.0				
Max Q Clear Time (g_c+I1), s	2.4	16.5		7.6	5.8	9.9		8.1				
Green Ext Time (p_c), s	0.0	10.5		1.0	0.8	4.0		0.3				

Intersection Summary			
HCM 6th Ctrl Delay		14.7	
HCM 6th LOS		B	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	282	1	462	0	0	0	0	1452	104	395	1628	0
Future Volume (veh/h)	282	1	462	0	0	0	0	1452	104	395	1628	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900				0	1900	1885	1870	1900	0
Adj Flow Rate, veh/h	294	1	481				0	1512	108	411	1696	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0				0	0	1	2	0	0
Cap, veh/h	925	1	424				0	1542	683	373	2330	0
Arrive On Green	0.26	0.26	0.26				0.00	0.43	0.43	0.35	1.00	0.00
Sat Flow, veh/h	3510	3	1607				0	3705	1598	1781	3705	0
Grp Volume(v), veh/h	294	0	482				0	1512	108	411	1696	0
Grp Sat Flow(s),veh/h/ln	1755	0	1611				0	1805	1598	1781	1805	0
Q Serve(g_s), s	7.4	0.0	29.0				0.0	45.4	1.6	19.0	0.0	0.0
Cycle Q Clear(g_c), s	7.4	0.0	29.0				0.0	45.4	1.6	19.0	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	925	0	425				0	1542	683	373	2330	0
V/C Ratio(X)	0.32	0.00	1.14				0.00	0.98	0.16	1.10	0.73	0.00
Avail Cap(c_a), veh/h	925	0	425				0	1542	683	373	2330	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.42	0.42	0.00
Uniform Delay (d), s/veh	32.5	0.0	40.5				0.0	31.0	2.6	34.3	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	86.0				0.0	18.7	0.5	61.9	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	0.0	20.8				0.0	22.1	4.1	13.3	0.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.7	0.0	126.5				0.0	49.7	3.1	96.2	0.9	0.0
LnGrp LOS	C	A	F				A	D	A	F	A	A
Approach Vol, veh/h		776						1620			2107	
Approach Delay, s/veh		91.0						46.6			19.5	
Approach LOS		F						D			B	

Timer - Assigned Phs	2	4	5	6
Phs Duration (G+Y+Rc), s	76.0	34.0	24.0	52.0
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	70.0	28.0	18.0	46.0
Max Q Clear Time (g_c+I1), s	2.0	31.0	21.0	47.4
Green Ext Time (p_c), s	20.9	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	41.6
HCM 6th LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	111	1	308	252	1474	0	0	1877	196
Future Volume (veh/h)	0	0	0	111	1	308	252	1474	0	0	1877	196
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1856	1900	1870	1885	1885	0	0	1885	1900
Adj Flow Rate, veh/h				112	1	311	255	1489	0	0	1896	198
Peak Hour Factor				0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %				3	0	2	1	1	0	0	1	0
Cap, veh/h				654	1	307	285	2572	0	0	2117	951
Arrive On Green				0.19	0.19	0.19	0.08	0.72	0.00	0.00	0.40	0.40
Sat Flow, veh/h				3428	5	1606	3483	3676	0	0	3676	1610
Grp Volume(v), veh/h				112	0	312	255	1489	0	0	1896	198
Grp Sat Flow(s),veh/h/ln				1714	0	1611	1742	1791	0	0	1791	1610
Q Serve(g_s), s				3.0	0.0	21.0	8.0	22.1	0.0	0.0	54.5	2.4
Cycle Q Clear(g_c), s				3.0	0.0	21.0	8.0	22.1	0.0	0.0	54.5	2.4
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				654	0	308	285	2572	0	0	2117	951
V/C Ratio(X)				0.17	0.00	1.01	0.89	0.58	0.00	0.00	0.90	0.21
Avail Cap(c_a), veh/h				654	0	308	285	2572	0	0	2117	951
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67
Upstream Filter(I)				1.00	0.00	1.00	0.37	0.37	0.00	0.00	0.55	0.55
Uniform Delay (d), s/veh				37.2	0.0	44.5	50.0	7.5	0.0	0.0	30.1	1.3
Incr Delay (d2), s/veh				0.1	0.0	55.1	13.0	0.4	0.0	0.0	3.7	0.3
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.2	0.0	12.6	3.9	6.6	0.0	0.0	24.7	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				37.3	0.0	99.6	63.0	7.8	0.0	0.0	33.8	1.6
LnGrp LOS				D	A	F	E	A	A	A	C	A
Approach Vol, veh/h					424			1744			2094	
Approach Delay, s/veh					83.1			15.9			30.7	
Approach LOS					F			B			C	

Timer - Assigned Phs	1	2			6		8					
Phs Duration (G+Y+Rc), s	14.0	70.0			84.0		26.0					
Change Period (Y+Rc), s	6.0	6.0			6.0		6.0					
Max Green Setting (Gmax), s	8.0	64.0			78.0		20.0					
Max Q Clear Time (g_c+I1), s	10.0	56.5			24.1		23.0					
Green Ext Time (p_c), s	0.0	6.3			15.5		0.0					

Intersection Summary		
HCM 6th Ctrl Delay		29.9
HCM 6th LOS		C

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	408	107	1213	496	146	1707
Future Volume (veh/h)	408	107	1213	496	146	1707
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1885	1900	1900	1885
Adj Flow Rate, veh/h	408	107	1213	496	146	1707
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	0	1	0	0	1
Cap, veh/h	461	411	1963	882	244	2343
Arrive On Green	0.25	0.25	0.18	0.18	0.06	0.65
Sat Flow, veh/h	1810	1610	3676	1610	1810	3676
Grp Volume(v), veh/h	408	107	1213	496	146	1707
Grp Sat Flow(s),veh/h/ln	1810	1610	1791	1610	1810	1791
Q Serve(g_s), s	23.9	5.8	34.4	30.9	3.6	34.6
Cycle Q Clear(g_c), s	23.9	5.8	34.4	30.9	3.6	34.6
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	461	411	1963	882	244	2343
V/C Ratio(X)	0.88	0.26	0.62	0.56	0.60	0.73
Avail Cap(c_a), veh/h	592	527	1963	882	315	2343
HCM Platoon Ratio	1.00	1.00	0.33	0.33	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.79	0.79	1.00	1.00
Uniform Delay (d), s/veh	39.4	32.7	34.4	33.0	19.9	12.6
Incr Delay (d2), s/veh	12.3	0.3	1.2	2.0	2.4	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.9	2.3	16.6	13.7	2.1	12.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	51.8	33.0	35.6	35.1	22.2	14.6
LnGrp LOS	D	C	D	D	C	B
Approach Vol, veh/h	515		1709			1853
Approach Delay, s/veh	47.9		35.4			15.2
Approach LOS	D		D			B

Timer - Assigned Phs	2		5	6	8
Phs Duration (G+Y+Rc), s	77.0		11.7	65.3	33.0
Change Period (Y+Rc), s	6.0		6.0	6.0	6.0
Max Green Setting (Gmax), s	63.0		10.0	47.0	35.0
Max Q Clear Time (g_c+I1), s	36.6		5.6	36.4	25.9
Green Ext Time (p_c), s	14.6		0.1	6.8	1.2

Intersection Summary	
HCM 6th Ctrl Delay	27.8
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	33.8

Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Vol, veh/h	159	1765	0	1217	119	69	138
Future Vol, veh/h	159	1765	0	1217	119	69	138
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	Yield	-	Yield
Storage Length	140	-	100	-	150	0	65
Veh in Median Storage, #	-	0	-	0	-	0	-
Grade, %	-	0	-	0	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98
Heavy Vehicles, %	0	1	0	1	0	0	0
Mvmt Flow	162	1801	0	1242	121	70	141

Major/Minor	Major1		Major2			Minor2	
Conflicting Flow All	1242	0	1801	-	0	2467	621
Stage 1	-	-	-	-	-	1242	-
Stage 2	-	-	-	-	-	1225	-
Critical Hdwy	4.1	-	6.4	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	-	5.8	-
Follow-up Hdwy	2.2	-	2.5	-	-	3.5	3.3
Pot Cap-1 Maneuver	568	-	103	-	-	~ 26	435
Stage 1	-	-	-	-	-	240	-
Stage 2	-	-	-	-	-	245	-
Platoon blocked, %		-		-	-		
Mov Cap-1 Maneuver	568	-	103	-	-	~ 19	435
Mov Cap-2 Maneuver	-	-	-	-	-	~ 19	-
Stage 1	-	-	-	-	-	172	-
Stage 2	-	-	-	-	-	245	-

Approach	EB	WB	SB
HCM Control Delay, s	1.1	0	$ 555.4
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBU	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	568	-	103	-	-	19	435
HCM Lane V/C Ratio	0.286	-	-	-	-	3.706	0.324
HCM Control Delay (s)	13.9	-	0	-	-	$ 1631.9	17.2
HCM Lane LOS	B	-	A	-	-	F	C
HCM 95th %tile Q(veh)	1.2	-	0	-	-	9.3	1.4

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	1096.4

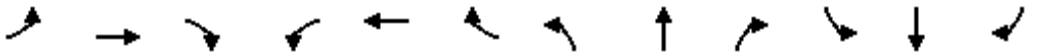
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	18	1683	108	140	1211	13	120	1	243	25	1	16
Future Vol, veh/h	18	1683	108	140	1211	13	120	1	243	25	1	16
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	225	-	175	200	-	220	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	18	1717	110	143	1236	13	122	1	248	26	1	16

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1249	0	0	1827	0	0	2658	3288	859	2417	3385	618
Stage 1	-	-	-	-	-	-	1753	1753	-	1522	1522	-
Stage 2	-	-	-	-	-	-	905	1535	-	895	1863	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	564	-	-	339	-	-	~ 11	9	304	~ 17	8	437
Stage 1	-	-	-	-	-	-	~ 90	140	-	126	182	-
Stage 2	-	-	-	-	-	-	302	180	-	306	124	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	564	-	-	339	-	-	~ 6	5	304	~ 2	4	437
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 6	5	-	~ 2	4	-
Stage 1	-	-	-	-	-	-	~ 87	136	-	122	105	-
Stage 2	-	-	-	-	-	-	166	104	-	54	120	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	2.4	$ 9815.6	$ 8274.7
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	17	564	-	-	339	-	-	3
HCM Lane V/C Ratio	21.849	0.033	-	-	0.421	-	-	14.286
HCM Control Delay (s)	$ 9815.6	11.6	-	-	23.1	-	-	$ 8274.7
HCM Lane LOS	F	B	-	-	C	-	-	F
HCM 95th %tile Q(veh)	47.3	0.1	-	-	2	-	-	7.2

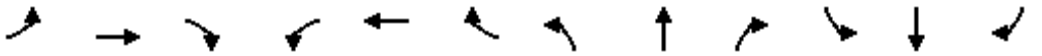
Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	1098	121	489	816	4	152	22	720	12	11	17
Future Volume (veh/h)	16	1098	121	489	816	4	152	22	720	12	11	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1885	1900	1900	1870	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	16	1109	122	494	824	4	154	22	727	12	11	17
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	0	1	0	0	2	0	0	0	0	0	0	0
Cap, veh/h	370	1195	537	654	1120	508	473	532	451	293	189	291
Arrive On Green	0.20	0.33	0.33	0.19	0.32	0.32	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	1810	3582	1610	3510	3554	1610	1404	1900	1610	724	673	1040
Grp Volume(v), veh/h	16	1109	122	494	824	4	154	22	727	12	0	28
Grp Sat Flow(s),veh/h/ln	1810	1791	1610	1755	1777	1610	1404	1900	1610	724	0	1713
Q Serve(g_s), s	0.5	22.4	4.1	10.0	15.5	0.1	6.8	0.6	21.0	0.9	0.0	0.9
Cycle Q Clear(g_c), s	0.5	22.4	4.1	10.0	15.5	0.1	7.7	0.6	21.0	1.6	0.0	0.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.61
Lane Grp Cap(c), veh/h	370	1195	537	654	1120	508	473	532	451	293	0	480
V/C Ratio(X)	0.04	0.93	0.23	0.76	0.74	0.01	0.33	0.04	1.61	0.04	0.00	0.06
Avail Cap(c_a), veh/h	370	1195	537	890	1802	816	473	532	451	293	0	480
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.9	24.1	18.0	28.9	22.9	17.6	22.5	19.6	27.0	20.2	0.0	19.7
Incr Delay (d2), s/veh	0.0	12.5	0.2	2.5	1.0	0.0	0.4	0.0	285.3	0.1	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	10.3	1.4	4.1	5.9	0.0	2.1	0.3	42.9	0.2	0.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.0	36.6	18.2	31.4	23.8	17.6	22.9	19.7	312.3	20.3	0.0	19.8
LnGrp LOS	C	D	B	C	C	B	C	B	F	C	A	B
Approach Vol, veh/h		1247			1322			903			40	
Approach Delay, s/veh		34.6			26.6			255.8			19.9	
Approach LOS		C			C			F			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	20.3	28.6		26.0	19.0	30.0		26.0				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	37.0		20.0	18.0	24.0		20.0				
Max Q Clear Time (g_c+I1), s	2.5	17.5		3.6	12.0	24.4		23.0				
Green Ext Time (p_c), s	0.0	5.1		0.1	1.0	0.0		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		88.3	
HCM 6th LOS		F	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	149	0	165	0	0	0	0	1955	91	212	910	0
Future Volume (veh/h)	149	0	165	0	0	0	0	1955	91	212	910	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1841	1900	1885				0	1885	1900	1856	1870	0
Adj Flow Rate, veh/h	154	0	170				0	2015	94	219	938	0
Peak Hour Factor	0.97	0.97	0.97				0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	4	0	1				0	1	0	3	2	0
Cap, veh/h	465	0	220				0	2070	930	290	2673	0
Arrive On Green	0.14	0.00	0.14				0.00	0.58	0.58	0.24	1.00	0.00
Sat Flow, veh/h	3401	0	1610				0	3676	1610	1767	3647	0
Grp Volume(v), veh/h	154	0	170				0	2015	94	219	938	0
Grp Sat Flow(s),veh/h/ln	1700	0	1610				0	1791	1610	1767	1777	0
Q Serve(g_s), s	3.7	0.0	9.2				0.0	48.9	0.8	5.9	0.0	0.0
Cycle Q Clear(g_c), s	3.7	0.0	9.2				0.0	48.9	0.8	5.9	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	465	0	220				0	2070	930	290	2673	0
V/C Ratio(X)	0.33	0.00	0.77				0.00	0.97	0.10	0.75	0.35	0.00
Avail Cap(c_a), veh/h	491	0	233				0	2070	930	290	2673	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.69	0.69	0.00
Uniform Delay (d), s/veh	35.1	0.0	37.5				0.0	18.3	1.3	31.4	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.0	14.1				0.0	14.5	0.2	7.5	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	4.2				0.0	20.3	2.8	4.3	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.6	0.0	51.6				0.0	32.8	1.5	38.9	0.3	0.0
LnGrp LOS	D	A	D				A	C	A	D	A	A
Approach Vol, veh/h		324						2109			1157	
Approach Delay, s/veh		44.0						31.4			7.6	
Approach LOS		D						C			A	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		72.7		17.3	15.7	57.0						
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0						
Max Green Setting (Gmax), s		66.0		12.0	9.0	51.0						
Max Q Clear Time (g_c+I1), s		2.0		11.2	7.9	50.9						
Green Ext Time (p_c), s		7.4		0.1	0.1	0.1						

Intersection Summary												
HCM 6th Ctrl Delay			24.9									
HCM 6th LOS			C									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	126	0	333	682	1429	0	0	968	274
Future Volume (veh/h)	0	0	0	126	0	333	682	1429	0	0	968	274
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1885	1900	1870	1900	1885	0	0	1885	1885
Adj Flow Rate, veh/h				130	0	343	703	1473	0	0	998	282
Peak Hour Factor				0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %				1	0	2	0	1	0	0	1	1
Cap, veh/h				813	0	376	858	2348	0	0	1274	568
Arrive On Green				0.23	0.00	0.23	0.24	0.66	0.00	0.00	0.12	0.12
Sat Flow, veh/h				3483	0	1610	3510	3676	0	0	3676	1598
Grp Volume(v), veh/h				130	0	343	703	1473	0	0	998	282
Grp Sat Flow(s),veh/h/ln				1742	0	1610	1755	1791	0	0	1791	1598
Q Serve(g_s), s				2.7	0.0	18.7	17.0	21.7	0.0	0.0	24.4	6.4
Cycle Q Clear(g_c), s				2.7	0.0	18.7	17.0	21.7	0.0	0.0	24.4	6.4
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				813	0	376	858	2348	0	0	1274	568
V/C Ratio(X)				0.16	0.00	0.91	0.82	0.63	0.00	0.00	0.78	0.50
Avail Cap(c_a), veh/h				813	0	376	858	2348	0	0	1274	568
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33
Upstream Filter(I)				1.00	0.00	1.00	0.33	0.33	0.00	0.00	0.69	0.69
Uniform Delay (d), s/veh				27.5	0.0	33.6	32.1	9.1	0.0	0.0	36.4	6.4
Incr Delay (d2), s/veh				0.1	0.0	26.1	2.2	0.4	0.0	0.0	3.4	2.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.0	0.0	9.3	7.0	6.4	0.0	0.0	12.1	5.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				27.6	0.0	59.7	34.3	9.5	0.0	0.0	39.8	8.5
LnGrp LOS				C	A	E	C	A	A	A	D	A
Approach Vol, veh/h					473			2176			1280	
Approach Delay, s/veh					50.8			17.5			32.9	
Approach LOS					D			B			C	

Timer - Assigned Phs	1	2			6		8					
Phs Duration (G+Y+Rc), s	7.0	37.0			64.0		26.0					
Change Period (Y+Rc), s	6.0	6.0			6.0		6.0					
Max Green Setting (Gmax), s	1.0	31.0			58.0		20.0					
Max Q Clear Time (g_c+I1), s	9.0	26.4			23.7		20.7					
Green Ext Time (p_c), s	0.6	2.8			13.4		0.0					

Intersection Summary		
HCM 6th Ctrl Delay	26.5	
HCM 6th LOS	C	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	2	11	446	5	102	47	1408	289	68	818	4
Future Volume (veh/h)	1	2	11	446	5	102	47	1408	289	68	818	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1752	1856	1900	1870	1900
Adj Flow Rate, veh/h	1	2	11	455	5	104	48	1437	295	69	835	4
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	10	3	0	2	0
Cap, veh/h	421	79	434	515	23	481	377	1549	732	200	1678	760
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.31	0.05	0.47	0.47	0.06	0.47	0.47
Sat Flow, veh/h	1305	254	1395	1423	74	1547	1810	3328	1572	1810	3554	1610
Grp Volume(v), veh/h	1	0	13	455	0	109	48	1437	295	69	835	4
Grp Sat Flow(s),veh/h/ln	1305	0	1649	1423	0	1622	1810	1664	1572	1810	1777	1610
Q Serve(g_s), s	0.1	0.0	0.5	27.5	0.0	4.5	1.2	36.6	11.1	1.7	14.6	0.1
Cycle Q Clear(g_c), s	4.5	0.0	0.5	28.0	0.0	4.5	1.2	36.6	11.1	1.7	14.6	0.1
Prop In Lane	1.00		0.85	1.00		0.95	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	421	0	513	515	0	504	377	1549	732	200	1678	760
V/C Ratio(X)	0.00	0.00	0.03	0.88	0.00	0.22	0.13	0.93	0.40	0.35	0.50	0.01
Avail Cap(c_a), veh/h	421	0	513	515	0	504	407	1549	732	217	1678	760
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.77	0.77	0.77	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.6	0.0	21.5	31.9	0.0	22.9	12.0	22.6	15.8	19.8	16.4	12.6
Incr Delay (d2), s/veh	0.0	0.0	0.0	16.5	0.0	0.2	0.1	9.0	1.3	1.0	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.2	11.9	0.0	1.7	0.4	14.3	3.8	0.7	5.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.6	0.0	21.5	48.3	0.0	23.1	12.1	31.6	17.1	20.8	17.4	12.6
LnGrp LOS	C	A	C	D	A	C	B	C	B	C	B	B
Approach Vol, veh/h		14			564			1780			908	
Approach Delay, s/veh		21.8			43.5			28.7			17.7	
Approach LOS		C			D			C			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.5	47.5		33.0	10.1	46.9		33.0
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s	5.0	40.0		27.0	5.0	40.0		27.0
Max Q Clear Time (g_c+I1), s	3.2	16.6		6.5	3.7	38.6		30.0
Green Ext Time (p_c), s	0.0	5.6		0.0	0.0	1.2		0.0

Intersection Summary		
HCM 6th Ctrl Delay	28.1	
HCM 6th LOS	C	

Intersection	
Int Delay, s/veh	50.6

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	5	79	783	3	33	1417	52	2	0	9	83	1	142
Future Vol, veh/h	5	79	783	3	33	1417	52	2	0	9	83	1	142
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	Yield	-	-	Yield	-	-	Yield	-	-	Yield
Storage Length	-	140	-	175	100	-	150	150	-	-	-	-	65
Veh in Median Storage, #	-	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	0	2	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	5	81	807	3	34	1461	54	2	0	9	86	1	146

Major/Minor	Major1				Major2			Minor1			Minor2		
Conflicting Flow All	1461	1461	0	0	807	0	0	1778	2508	404	2105	2508	731
Stage 1	-	-	-	-	-	-	-	979	979	-	1529	1529	-
Stage 2	-	-	-	-	-	-	-	799	1529	-	576	979	-
Critical Hdwy	6.4	4.1	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.5	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	171	469	-	-	827	-	-	53	29	602	~ 30	29	369
Stage 1	-	-	-	-	-	-	-	272	331	-	125	181	-
Stage 2	-	-	-	-	-	-	-	350	181	-	475	331	-
Platoon blocked, %			-	-		-	-						
Mov Cap-1 Maneuver	389	389	-	-	827	-	-	25	22	602	~ 24	22	369
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	25	22	-	~ 24	22	-
Stage 1	-	-	-	-	-	-	-	211	257	-	97	174	-
Stage 2	-	-	-	-	-	-	-	201	174	-	363	257	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.6	0.2	56.4	$ 573.9
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	25	138	389	-	-	827	-	-	24	369
HCM Lane V/C Ratio	0.082	0.067	0.223	-	-	0.041	-	-	3.608	0.397
HCM Control Delay (s)	161.6	33	16.9	-	-	9.5	-	-	$ 1508.6	21
HCM Lane LOS	F	D	C	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	0.2	0.2	0.8	-	-	0.1	-	-	10.8	1.9

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	821	20	0	1621	0	9
Future Vol, veh/h	821	20	0	1621	0	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Free	-	None	-	Yield
Storage Length	-	175	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	864	21	0	1706	0	9

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	-	-	-	-	432
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.35
Pot Cap-1 Maneuver	-	0	0	-	0	563
Stage 1	-	0	0	-	0	-
Stage 2	-	0	0	-	0	-
Platoon blocked, %	-			-		
Mov Cap-1 Maneuver	-	-	-	-	-	563
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	11.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	563	-	-
HCM Lane V/C Ratio	0.017	-	-
HCM Control Delay (s)	11.5	-	-
HCM Lane LOS	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-

Intersection	
Int Delay, s/veh	275.5

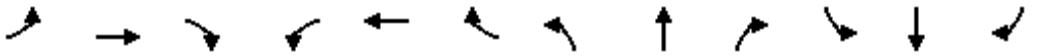
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	647	156	214	1404	4	118	0	153	40	0	25
Future Vol, veh/h	7	647	156	214	1404	4	118	0	153	40	0	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	225	-	175	200	-	220	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	2	0	7	1	0	29	0	14	0	0	0
Mvmt Flow	7	688	166	228	1494	4	126	0	163	43	0	27

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1498	0	0	854	0	0	1905	2656	344	2308	2818	747
Stage 1	-	-	-	-	-	-	702	702	-	1950	1950	-
Stage 2	-	-	-	-	-	-	1203	1954	-	358	868	-
Critical Hdwy	4.1	-	-	4.24	-	-	8.08	6.5	7.18	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	7.08	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	7.08	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.27	-	-	3.79	4	3.44	3.5	4	3.3
Pot Cap-1 Maneuver	454	-	-	750	-	-	~ 31	23	618	~ 21	18	360
Stage 1	-	-	-	-	-	-	338	443	-	68	112	-
Stage 2	-	-	-	-	-	-	157	111	-	638	372	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	454	-	-	750	-	-	~ 22	16	618	~ 12	12	360
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 22	16	-	~ 12	12	-
Stage 1	-	-	-	-	-	-	333	436	-	67	78	-
Stage 2	-	-	-	-	-	-	~ 101	77	-	463	366	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1.6	$ 2419.4	$ 1602.6
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	48	454	-	-	750	-	-	19
HCM Lane V/C Ratio	6.006	0.016	-	-	0.304	-	-	3.639
HCM Control Delay (s)	$ 2419.4	13.1	-	-	11.9	-	-	$ 1602.6
HCM Lane LOS	F	B	-	-	B	-	-	F
HCM 95th %tile Q(veh)	33.3	0.1	-	-	1.3	-	-	9.1

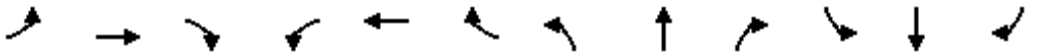
Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	578	91	288	1198	5	12	25	98	78	4	164
Future Volume (veh/h)	13	578	91	288	1198	5	12	25	98	78	4	164
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1870	1900	1885	1885	1900	1767	1900	1826	1900	1900	1900
Adj Flow Rate, veh/h	14	615	97	306	1274	5	13	27	104	83	4	174
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	2	0	1	1	0	9	0	5	0	0	0
Cap, veh/h	65	1000	453	938	1845	829	215	333	271	341	6	277
Arrive On Green	0.04	0.28	0.28	0.27	0.51	0.51	0.18	0.18	0.18	0.18	0.18	0.18
Sat Flow, veh/h	1810	3554	1610	3483	3582	1610	1139	1900	1547	1279	36	1579
Grp Volume(v), veh/h	14	615	97	306	1274	5	13	27	104	83	0	178
Grp Sat Flow(s),veh/h/ln	1810	1777	1610	1742	1791	1610	1139	1900	1547	1279	0	1616
Q Serve(g_s), s	0.4	8.2	2.5	3.9	14.7	0.1	0.6	0.7	3.3	3.2	0.0	5.6
Cycle Q Clear(g_c), s	0.4	8.2	2.5	3.9	14.7	0.1	6.2	0.7	3.3	3.8	0.0	5.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Lane Grp Cap(c), veh/h	65	1000	453	938	1845	829	215	333	271	341	0	283
V/C Ratio(X)	0.22	0.61	0.21	0.33	0.69	0.01	0.06	0.08	0.38	0.24	0.00	0.63
Avail Cap(c_a), veh/h	198	2271	1029	1272	3204	1440	431	694	565	583	0	590
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.7	17.1	15.0	16.0	10.0	6.5	23.8	18.9	20.0	20.5	0.0	20.9
Incr Delay (d2), s/veh	1.7	0.6	0.2	0.2	0.5	0.0	0.1	0.1	0.9	0.4	0.0	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	2.8	0.8	1.3	3.9	0.0	0.1	0.3	1.1	0.9	0.0	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.3	17.7	15.3	16.2	10.5	6.5	23.9	19.0	20.9	20.9	0.0	23.2
LnGrp LOS	C	B	B	B	B	A	C	B	C	C	A	C
Approach Vol, veh/h		726			1585			144			261	
Approach Delay, s/veh		17.6			11.6			20.8			22.5	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.0	33.2		14.6	19.7	20.4		14.6				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	48.0		19.0	19.0	34.0		19.0				
Max Q Clear Time (g_c+I1), s	2.4	16.7		7.6	5.9	10.2		8.2				
Green Ext Time (p_c), s	0.0	10.5		1.0	0.8	4.2		0.3				

Intersection Summary			
HCM 6th Ctrl Delay		14.7	
HCM 6th LOS		B	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	293	1	462	0	0	0	0	1460	104	422	1651	0
Future Volume (veh/h)	293	1	462	0	0	0	0	1460	104	422	1651	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900				0	1900	1885	1870	1900	0
Adj Flow Rate, veh/h	305	1	481				0	1521	108	440	1720	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0				0	0	1	2	0	0
Cap, veh/h	925	1	424				0	1542	683	373	2330	0
Arrive On Green	0.26	0.26	0.26				0.00	0.43	0.43	0.35	1.00	0.00
Sat Flow, veh/h	3510	3	1607				0	3705	1598	1781	3705	0
Grp Volume(v), veh/h	305	0	482				0	1521	108	440	1720	0
Grp Sat Flow(s),veh/h/ln	1755	0	1611				0	1805	1598	1781	1805	0
Q Serve(g_s), s	7.7	0.0	29.0				0.0	45.9	1.6	19.0	0.0	0.0
Cycle Q Clear(g_c), s	7.7	0.0	29.0				0.0	45.9	1.6	19.0	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	925	0	425				0	1542	683	373	2330	0
V/C Ratio(X)	0.33	0.00	1.14				0.00	0.99	0.16	1.18	0.74	0.00
Avail Cap(c_a), veh/h	925	0	425				0	1542	683	373	2330	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.24	0.24	0.00
Uniform Delay (d), s/veh	32.7	0.0	40.5				0.0	31.2	2.6	34.3	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	86.0				0.0	19.8	0.5	87.7	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.0	20.8				0.0	22.6	4.1	16.0	0.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.9	0.0	126.5				0.0	51.0	3.1	122.0	0.5	0.0
LnGrp LOS	C	A	F				A	D	A	F	A	A
Approach Vol, veh/h		787						1629			2160	
Approach Delay, s/veh		90.2						47.8			25.3	
Approach LOS		F						D			C	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		76.0		34.0	24.0	52.0						
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0						
Max Green Setting (Gmax), s		70.0		28.0	18.0	46.0						
Max Q Clear Time (g_c+I1), s		2.0		31.0	21.0	47.9						
Green Ext Time (p_c), s		21.5		0.0	0.0	0.0						

Intersection Summary												
HCM 6th Ctrl Delay			44.5									
HCM 6th LOS			D									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	111	1	320	252	1493	0	0	1927	223
Future Volume (veh/h)	0	0	0	111	1	320	252	1493	0	0	1927	223
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1856	1900	1870	1885	1885	0	0	1885	1900
Adj Flow Rate, veh/h				112	1	323	255	1508	0	0	1946	225
Peak Hour Factor				0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %				3	0	2	1	1	0	0	1	0
Cap, veh/h				779	1	365	381	2443	0	0	1889	849
Arrive On Green				0.23	0.23	0.23	0.11	0.68	0.00	0.00	0.53	0.53
Sat Flow, veh/h				3428	5	1606	3483	3676	0	0	3676	1610
Grp Volume(v), veh/h				112	0	324	255	1508	0	0	1946	225
Grp Sat Flow(s),veh/h/ln				1714	0	1611	1742	1791	0	0	1791	1610
Q Serve(g_s), s				2.9	0.0	21.4	7.7	25.4	0.0	0.0	58.0	2.4
Cycle Q Clear(g_c), s				2.9	0.0	21.4	7.7	25.4	0.0	0.0	58.0	2.4
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				779	0	366	381	2443	0	0	1889	849
V/C Ratio(X)				0.14	0.00	0.89	0.67	0.62	0.00	0.00	1.03	0.27
Avail Cap(c_a), veh/h				841	0	395	381	2443	0	0	1889	849
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.36	0.36	0.00	0.00	0.42	0.42
Uniform Delay (d), s/veh				34.0	0.0	41.1	47.1	9.6	0.0	0.0	26.0	1.3
Incr Delay (d2), s/veh				0.1	0.0	19.7	1.7	0.4	0.0	0.0	22.1	0.3
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.1	0.0	10.0	3.3	8.2	0.0	0.0	27.5	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				34.0	0.0	60.9	48.7	10.0	0.0	0.0	48.1	1.7
LnGrp LOS				C	A	E	D	B	A	A	F	A
Approach Vol, veh/h					436			1763			2171	
Approach Delay, s/veh					54.0			15.6			43.3	
Approach LOS					D			B			D	

Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	17.0	63.0				80.0		30.0				
Change Period (Y+Rc), s	6.0	6.0				6.0		6.0				
Max Green Setting (Gmax), s	9.0	57.0				72.0		26.0				
Max Q Clear Time (g_c+I1), s	9.7	60.0				27.4		23.4				
Green Ext Time (p_c), s	0.0	0.0				15.2		0.6				

Intersection Summary		
HCM 6th Ctrl Delay		33.2
HCM 6th LOS		C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	4	43	408	1	107	12	1232	496	146	1741	1
Future Volume (veh/h)	4	4	43	408	1	107	12	1232	496	146	1741	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1885	1900	1900	1885	1900
Adj Flow Rate, veh/h	4	4	43	408	1	107	12	1232	496	146	1741	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	0	0	0	0	0	0	1	0	0	1	0
Cap, veh/h	430	45	488	490	5	523	118	1682	756	252	2084	937
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.33	0.62	0.62	0.62	0.07	0.58	0.58
Sat Flow, veh/h	1306	139	1493	1380	15	1598	281	3582	1610	1810	3582	1610
Grp Volume(v), veh/h	4	0	47	408	0	108	12	1232	496	146	1741	1
Grp Sat Flow(s),veh/h/ln	1306	0	1631	1380	0	1612	281	1791	1610	1810	1791	1610
Q Serve(g_s), s	0.2	0.0	2.2	32.0	0.0	5.3	3.7	26.2	21.5	4.3	43.5	0.0
Cycle Q Clear(g_c), s	5.6	0.0	2.2	34.2	0.0	5.3	34.9	26.2	21.5	4.3	43.5	0.0
Prop In Lane	1.00		0.91	1.00		0.99	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	430	0	534	490	0	528	118	1682	756	252	2084	937
V/C Ratio(X)	0.01	0.00	0.09	0.83	0.00	0.20	0.10	0.73	0.66	0.58	0.84	0.00
Avail Cap(c_a), veh/h	430	0	534	490	0	528	118	1682	756	312	2084	937
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.76	0.76	0.76	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.7	0.0	25.6	37.5	0.0	26.7	29.9	15.9	15.0	19.2	18.7	9.6
Incr Delay (d2), s/veh	0.0	0.0	0.1	11.7	0.0	0.2	1.3	2.2	3.4	2.1	4.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.9	12.0	0.0	2.0	0.3	8.2	6.4	1.7	16.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.7	0.0	25.7	49.2	0.0	26.9	31.2	18.0	18.4	21.3	22.9	9.6
LnGrp LOS	C	A	C	D	A	C	C	B	B	C	C	A
Approach Vol, veh/h		51			516			1740			1888	
Approach Delay, s/veh		25.9			44.5			18.2			22.7	
Approach LOS		C			D			B			C	

Timer - Assigned Phs	2		4	5	6		8
Phs Duration (G+Y+Rc), s	69.0		41.0	12.3	56.7		41.0
Change Period (Y+Rc), s	6.0		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s	63.0		35.0	10.0	47.0		35.0
Max Q Clear Time (g_c+I1), s	45.5		7.6	6.3	36.9		36.2
Green Ext Time (p_c), s	11.5		0.2	0.1	6.7		0.0

Intersection Summary		
HCM 6th Ctrl Delay		23.6
HCM 6th LOS		C

Intersection	
Int Delay, s/veh	80.7

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	18	160	1783	3	19	1221	119	4	0	17	69	0	138
Future Vol, veh/h	18	160	1783	3	19	1221	119	4	0	17	69	0	138
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	Yield	-	-	Yield	-	-	Yield	-	-	Yield
Storage Length	-	140	-	175	100	-	150	150	-	-	-	-	65
Veh in Median Storage, #	-	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	0	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	18	163	1819	3	19	1246	121	4	0	17	70	0	141

Major/Minor	Major1				Major2			Minor1			Minor2		
Conflicting Flow All	1246	1246	0	0	1819	0	0	2842	3465	910	2556	3465	623
Stage 1	-	-	-	-	-	-	-	2181	2181	-	1284	1284	-
Stage 2	-	-	-	-	-	-	-	661	1284	-	1272	2181	-
Critical Hdwy	6.4	4.1	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.5	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	235	566	-	-	342	-	-	8	7	281	~ 14	7	434
Stage 1	-	-	-	-	-	-	-	48	85	-	177	238	-
Stage 2	-	-	-	-	-	-	-	423	238	-	180	85	-
Platoon blocked, %			-	-		-	-						
Mov Cap-1 Maneuver	450	450	-	-	342	-	-	~ 4	4	281	~ 9	4	434
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	~ 4	4	-	~ 9	4	-
Stage 1	-	-	-	-	-	-	-	29	51	-	105	225	-
Stage 2	-	-	-	-	-	-	-	270	225	-	101	51	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.7	0.2	$ 613.6	$ 1305
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	4	21	450	-	-	342	-	-	9	434
HCM Lane V/C Ratio	1.02	0.826	0.404	-	-	0.057	-	-	7.823	0.324
HCM Control Delay (s)	$ 1552.5	$ 392.7	18.3	-	-	16.2	-	-	$ 3880.6	17.2
HCM Lane LOS	F	F	C	-	-	C	-	-	F	C
HCM 95th %tile Q(veh)	1.2	2.3	1.9	-	-	0.2	-	-	10.3	1.4

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1959	6	0	1390	0	36
Future Vol, veh/h	1959	6	0	1390	0	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Free	-	None	-	Yield
Storage Length	-	175	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	2062	6	0	1463	0	38

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	-	-	-	-	1031
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.35
Pot Cap-1 Maneuver	-	0	0	-	0	225
Stage 1	-	0	0	-	0	-
Stage 2	-	0	0	-	0	-
Platoon blocked, %	-			-		
Mov Cap-1 Maneuver	-	-	-	-	-	225
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	24.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	225	-	-
HCM Lane V/C Ratio	0.168	-	-
HCM Control Delay (s)	24.2	-	-
HCM Lane LOS	C	-	-
HCM 95th %tile Q(veh)	0.6	-	-

Intersection	
Int Delay, s/veh	1085.5

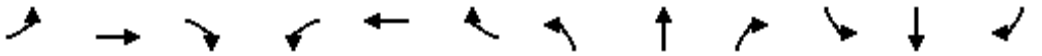
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	18	1693	108	140	1237	13	120	1	243	25	1	16
Future Vol, veh/h	18	1693	108	140	1237	13	120	1	243	25	1	16
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	225	-	175	200	-	220	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	18	1728	110	143	1262	13	122	1	248	26	1	16

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1275	0	0	1838	0	0	2682	3325	864	2449	3422	631
Stage 1	-	-	-	-	-	-	1764	1764	-	1548	1548	-
Stage 2	-	-	-	-	-	-	918	1561	-	901	1874	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	551	-	-	336	-	-	~ 11	8	301	~ 16	7	429
Stage 1	-	-	-	-	-	-	~ 89	139	-	122	177	-
Stage 2	-	-	-	-	-	-	296	175	-	303	122	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	551	-	-	336	-	-	~ 6	4	301	~ 2	4	429
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 6	4	-	~ 2	4	-
Stage 1	-	-	-	-	-	-	~ 86	134	-	118	102	-
Stage 2	-	-	-	-	-	-	162	100	-	51	118	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	2.4	$ 9815.6	$ 8274.7
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	17	551	-	-	336	-	-	3
HCM Lane V/C Ratio	21.849	0.033	-	-	0.425	-	-	14.286
HCM Control Delay (s)	$ 9815.6	11.8	-	-	23.4	-	-	$ 8274.7
HCM Lane LOS	F	B	-	-	C	-	-	F
HCM 95th %tile Q(veh)	47.3	0.1	-	-	2	-	-	7.2

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	1107	121	494	837	4	152	22	721	12	11	17
Future Volume (veh/h)	16	1107	121	494	837	4	152	22	721	12	11	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1885	1900	1900	1870	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	16	1118	122	499	845	4	154	22	728	12	11	17
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	0	1	0	0	2	0	0	0	0	0	0	0
Cap, veh/h	360	1193	536	658	1143	518	472	531	450	292	188	291
Arrive On Green	0.20	0.33	0.33	0.19	0.32	0.32	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	1810	3582	1610	3510	3554	1610	1404	1900	1610	723	673	1040
Grp Volume(v), veh/h	16	1118	122	499	845	4	154	22	728	12	0	28
Grp Sat Flow(s),veh/h/ln	1810	1791	1610	1755	1777	1610	1404	1900	1610	723	0	1713
Q Serve(g_s), s	0.5	22.7	4.1	10.1	15.9	0.1	6.8	0.6	21.0	0.9	0.0	0.9
Cycle Q Clear(g_c), s	0.5	22.7	4.1	10.1	15.9	0.1	7.7	0.6	21.0	1.6	0.0	0.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.61
Lane Grp Cap(c), veh/h	360	1193	536	658	1143	518	472	531	450	292	0	479
V/C Ratio(X)	0.04	0.94	0.23	0.76	0.74	0.01	0.33	0.04	1.62	0.04	0.00	0.06
Avail Cap(c_a), veh/h	360	1193	536	888	1799	815	472	531	450	292	0	479
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.3	24.3	18.1	28.9	22.7	17.3	22.6	19.7	27.0	20.3	0.0	19.8
Incr Delay (d2), s/veh	0.1	13.7	0.2	2.6	1.0	0.0	0.4	0.0	287.4	0.1	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	10.7	1.4	4.1	6.0	0.0	2.1	0.3	43.1	0.2	0.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.4	38.0	18.3	31.5	23.6	17.3	23.0	19.7	314.5	20.3	0.0	19.8
LnGrp LOS	C	D	B	C	C	B	C	B	F	C	A	B
Approach Vol, veh/h		1256			1348			904			40	
Approach Delay, s/veh		35.9			26.5			257.7			20.0	
Approach LOS		D			C			F			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	19.9	29.1		26.0	19.1	30.0		26.0				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	37.0		20.0	18.0	24.0		20.0				
Max Q Clear Time (g_c+I1), s	2.5	17.9		3.6	12.1	24.7		23.0				
Green Ext Time (p_c), s	0.0	5.3		0.1	1.0	0.0		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			88.7									
HCM 6th LOS			F									

APPENDIX G

HEAVY VEHICLE ENHANCED FOCUS AREA ANALYSIS

G. Heavy Vehicle Enhanced Focus Area

The TIS shall include a Heavy Vehicle Enhanced Focus Area component if the Project includes industrial or commercial components, or other components expected to generate Heavy Vehicles. The requirements in this section shall apply to not only commercial Heavy Vehicles but also to transit buses, school buses, and fire engines.

G.1. Heavy Vehicle Routing

All heavy trucks expected to be generated by the development will access the site via Gravel Springs Road (SR 324) fronting the site.

- 80% of the trips will travel to/from the south/southeast via Gravel Springs Road
  - 35% of these trips will travel to/from the I-85 North on/off ramps
  - 35% of these trips will travel to/from the I-85 South on/off ramps
  - 10% of these trips will travel to/from the south via Gravel Springs Road
- 20% of the trips will travel to/from the west via Gravel Springs Road and continue traveling west through the Mall of Georgia Boulevard intersection

G.2. Pavement Conditions

The TIS shall note the pavement condition of the Project's Heavy Vehicle route(s). The Heavy Vehicle route pavement condition analysis shall be limited to the roadway segments between all proposed Heavy Vehicle driveways and the nearest Study Network intersections in both directions. The Heavy Vehicle route pavement condition analysis shall specifically indicate roadway sections where the pavement condition is distressed. Each of the following images was taken from field inspection from February of 2022.

Gravel Springs Road at I-85 on ramp
Pavement newly installed and shows no signs of issue

Gravel Springs Road at I-85 on ramp
Pavement newly installed and shows no signs of issue

Gravel Springs Road at Ivy Creek Road
Pavement in good condition

Gravel Springs Road at Proposed West Driveway
Pavement in good condition

G.3. Roadway Width Inventory

Roadway Width: The TIS shall note the lane width for the Project's Heavy Vehicle driveways and the roadway segments between the driveways and the nearest Study Network intersection(s) in each direction Heavy Vehicles are expected to travel. The analysis shall include the roadway width of each lane, in tabular format, for distinct roadway segments. The Table below summarizes the pavement lane characteristics along the designated Heavy Truck Route proposed for this development.

Roadway	Type of Lane	# of Lanes	Direction	Actual Width	Regulation Width	Description
Gravel Springs Road	Travel	2	EB	12.5	12	From Brown Road to I-85
	Travel	2	WB	12.5	12	From I-85 to Brown Road
	Left-Turn	1	WB to SB	12	12	Turn into Driveway 1
	Left-Turn	1	WB to SB	12	12	Turn into Driveway 2

G.4. Corner Radii Analysis

The TIS shall note the corner radii for curbs/driveways and the anticipated wheel-path for the Project intersections. This information shall be included in as a diagram along with Heavy Vehicle radii standards for the typical Heavy Vehicles proposed to access the site.

An Auto-Turn Analysis was performed at the following intersections with a WB-67 design vehicle turn template:

- Gravel Springs & Driveway 1
- Gravel Springs & Driveway 2
- Gravel Springs and Driveway 3
- Gravel Springs & I-85 Southbound Ramp
- Gravel Springs and I-85 Northbound Ramp
- Gravel Springs and Mall Blvd.

The graphical results of the turning analysis can be found in Appendix E. Analysis indicates that the existing and proposed infrastructure is adequate to accommodate the design vehicle.

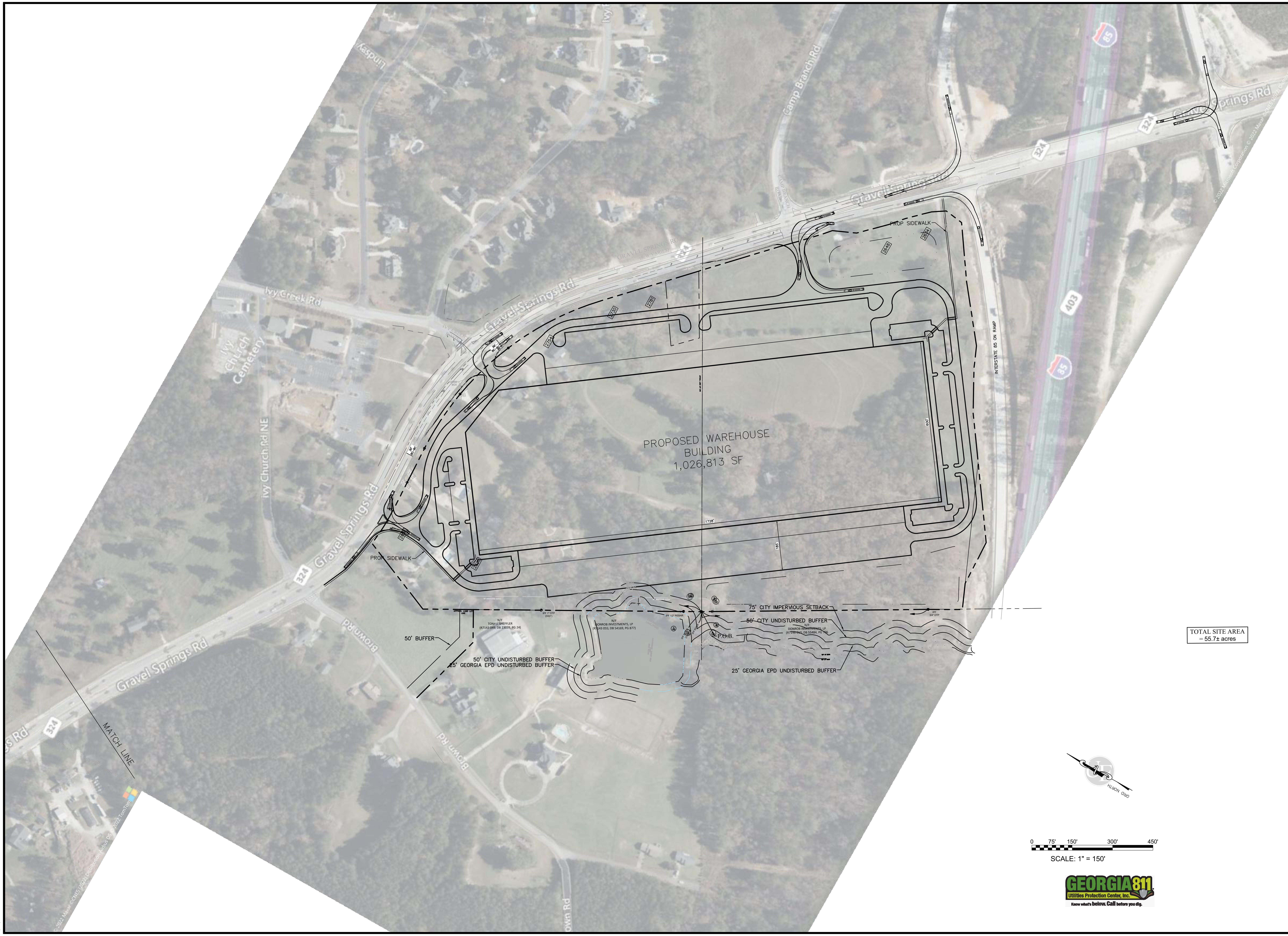
G.5. Heavy Vehicle Staging

Truck docks (loading/unloading areas) will be provided on the building proposed for this project. The truck courts will provide ample space for tractor-trailer turning movements and allow for staging while other vehicles are parking or maneuvering. All traffic, including trucks, will enter the site from Gravel Springs Road. The first allowed turning movement for tractor-trailers into the sites yields a storage area of 1100 feet from the curb cut on Gravel Springs Road. That would provide storage for up to 16 tractor-trailers which equates to the peak hour truck inbound trips. No vehicular access control is proposed, at this time, for this building which will minimize any potential queuing. The building is designed with areas for trailer drops.

Based on this development being a speculative development, the exact delivery hours and number of deliveries are unknown. Typically, the highest volume of deliveries is during the day and off-peak hours.

G.6. Pedestrian Safety

The proposed Gravel Springs Road will provide a sidewalk into the site on both the east and west side of the project from the public road to the office elements. Americans with Disabilities Act compliant ramps will also be provided as well as cross walks. Internal to the site, pedestrian sidewalks will be provided from automobile parking areas to the buildings.


PROPOSED WAREHOUSE
BUILDING
1,026,813 SF
Gravel Springs Rd
Ivy Creek Rd
Ivy Church Rd NE
Ivy Church Cemetery
Camp Branch Rd
Brown Rd
Lindsey
INTERSTATE 85 ON RAMP
PROP SIDEWALK
PROP SIDEWALK
75' CITY IMPERVIOUS SETBACK
50' CITY UNDISTURBED BUFFER
50' BUFFER
50' CITY UNDISTURBED BUFFER
25' GEORGIA EPD UNDISTURBED BUFFER
25' GEORGIA EPD UNDISTURBED BUFFER
P.O.B.
MATCH LINE
324
85
403
TOTAL SITE AREA
= 55.7± acres
0 75' 150' 300' 450'
SCALE: 1" = 150'

GEORGIA 811 Utilities Protection Center, Inc. Know what's below. Call before you dig.

GEORGIA REGISTERED PROFESSIONAL ENGINEER No. PE024610 DAVID R. WINTERMEYER 2/28/2022

Urban Engineers, Inc.

1904 MONROE DRIVE, N.E., SUITE 150
ATLANTA, GEORGIA 30324
PHONE:(404) 873-5874
www.urbanengineers.net

REVISIONS

DATE	DESCRIPTION

HEAVY VEHICLE TURNING PLAN

IDI
GRAVEL SPRINGS ROAD
BUFORD, GA

PROJECT No. 22105-6
LAND LOT(S): 137 & 142
DISTRICT: 5TH
COUNTY: GWINNETT
SCALE: 1"=150'
DATE: 01/27/2022

DRAWING NO.: C-1.0

U:\ID\\u22105j6 - Gravel Springs Rd\u22105j6 - DRI.dwg
2/28/2022 4:38 PM

U:\DI\u22105j6 - Gravel Springs Rd\u22105j6 - DRI.dwg
2/28/2022 4:38 PM

SCALE: 1" = 150'
0 75' 150' 300' 450'

GRID NORTH

GEORGIA811 Utilities Protection Center, Inc.

PROJECT No.	22105-6
LAND LOT(S):	137 & 142
DISTRICT:	5TH
COUNTY:	GWINNETT
SCALE:	1"=150'
DATE:	01/27/2022

DRAWING NO. C-1.1

HEAVY VEHICLE TURNING PLAN

IDI
GRAVEL SPRINGS ROAD
BUFORD, GA

REVISIONS

DATE	△	DESCRIPTION

Urban Engineers, Inc.
1904 MONROE DRIVE, N.E., SUITE 150
ATLANTA, GEORGIA 30324
PHONE:(404) 873-5874
www.urbanengineers.net

GEORGIA REGISTERED PROFESSIONAL ENGINEER
2/28/2022

APPENDIX H

QUEUE LENGTH ANALYSIS REPORTS

Intersection: 1: SR 324/Gravel Springs Rd & I-85 N on/off Ramp

Movement	EB	EB	EB	NB	NB	SB	SB	SB
Directions Served	L	L	TR	T	T	L	T	T
Maximum Queue (ft)	90	49	89	198	189	69	28	27
Average Queue (ft)	33	29	28	148	91	53	6	10
95th Queue (ft)	100	50	88	222	181	84	24	31
Link Distance (ft)		440	440	841	841		905	905
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	225					325		
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 2: SR 324/Gravel Springs Rd & I-85 S on/off Ramp

Movement	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	TR	L	L	T	T	T	T
Maximum Queue (ft)	51	130	148	161	73	71	216	228
Average Queue (ft)	45	71	122	122	39	24	113	114
95th Queue (ft)	62	147	156	183	71	67	201	219
Link Distance (ft)	714				905	905	603	603
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		350	375	375				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 3: SR 324/Gravel Springs Rd & Camp Branch Rd

Movement	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	R	T	T	L	T	T
Maximum Queue (ft)	235	51	204	163	28	153	138
Average Queue (ft)	171	19	123	124	21	80	86
95th Queue (ft)	249	51	223	188	38	146	129
Link Distance (ft)	456		603	603		1192	1192
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		100			425		
Storage Blk Time (%)	24						
Queuing Penalty (veh)	15						

Intersection: 4: SR 324/Gravel Springs Rd & Ivy Creek Rd

Movement	EB	SB	SB
Directions Served	UL	L	R
Maximum Queue (ft)	51	183	90
Average Queue (ft)	16	102	29
95th Queue (ft)	50	213	91
Link Distance (ft)		379	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	140		65
Storage Blk Time (%)		12	0
Queuing Penalty (veh)		12	0

Intersection: 6: Brown Rd & SR 324/Gravel Springs Rd

Movement	NB	SB
Directions Served	LTR	LTR
Maximum Queue (ft)	31	28
Average Queue (ft)	19	6
95th Queue (ft)	44	24
Link Distance (ft)	353	276
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Mall of GA Blvd & SR 324/Gravel Springs Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	UL	L	T	T	L	T	L	TR
Maximum Queue (ft)	44	156	139	111	115	193	194	48	49	94	76
Average Queue (ft)	19	94	39	63	70	93	94	14	24	56	52
95th Queue (ft)	43	164	124	107	111	185	180	46	50	98	76
Link Distance (ft)		828	828			4422	4422	779	779	287	287
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	200			500	500						
Storage Blk Time (%)							2				
Queuing Penalty (veh)							0				

Network Summary

Network wide Queuing Penalty: 27

Intersection: 1: SR 324/Gravel Springs Rd & I-85 N on/off Ramp

Movement	EB	EB	EB	NB	NB	SB	SB	SB
Directions Served	L	L	TR	T	T	L	T	T
Maximum Queue (ft)	122	156	294	343	300	276	138	118
Average Queue (ft)	38	123	180	274	248	201	87	63
95th Queue (ft)	109	161	298	355	311	297	175	134
Link Distance (ft)		440	440	841	841		905	905
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	225					325		
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 2: SR 324/Gravel Springs Rd & I-85 S on/off Ramp

Movement	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	L	TR	L	L	T	T	T	T
Maximum Queue (ft)	52	94	175	98	109	50	50	176	174
Average Queue (ft)	30	69	103	58	80	10	10	127	125
95th Queue (ft)	49	97	172	106	117	43	43	184	187
Link Distance (ft)		714				905	905	603	603
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	350		350	375	375				
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 3: SR 324/Gravel Springs Rd & Camp Branch Rd

Movement	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	R	T	T	L	T	T
Maximum Queue (ft)	422	250	155	182	72	207	179
Average Queue (ft)	271	74	128	128	55	145	134
95th Queue (ft)	443	220	180	186	69	246	182
Link Distance (ft)	456		603	603		1192	1192
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		100			425		
Storage Blk Time (%)	40						
Queuing Penalty (veh)	32						

Intersection: 4: SR 324/Gravel Springs Rd & Ivy Creek Rd

Movement	EB	SB
Directions Served	UL	L
Maximum Queue (ft)	74	54
Average Queue (ft)	31	35
95th Queue (ft)	79	50
Link Distance (ft)		379
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	140	
Storage Blk Time (%)		0
Queuing Penalty (veh)		0

Intersection: 6: Brown Rd & SR 324/Gravel Springs Rd

Movement	NB
Directions Served	LTR
Maximum Queue (ft)	28
Average Queue (ft)	6
95th Queue (ft)	24
Link Distance (ft)	353
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 7: Mall of GA Blvd & SR 324/Gravel Springs Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	UL	L	T	T	L	T	R	TR
Maximum Queue (ft)	24	342	313	56	112	133	140	162	74	28	434	53
Average Queue (ft)	5	260	225	11	85	106	61	84	63	11	376	29
95th Queue (ft)	21	371	353	48	110	136	151	165	81	33	455	56
Link Distance (ft)		828	828				4422	4422	779	779	779	287
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200			350	500	500						
Storage Blk Time (%)		19						0				
Queuing Penalty (veh)		3						0				

Network Summary

Network wide Queuing Penalty: 35

Intersection: 1: SR 324/Gravel Springs Rd & I-85 N on/off Ramp

Movement	EB	EB	EB	NB	NB	SB	SB	SB
Directions Served	L	L	TR	T	T	L	T	T
Maximum Queue (ft)	124	124	56	568	461	92	76	76
Average Queue (ft)	63	47	22	433	344	85	58	55
95th Queue (ft)	129	114	65	602	500	101	92	85
Link Distance (ft)		440	440	841	841		905	905
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	225					325		
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 2: SR 324/Gravel Springs Rd & I-85 S on/off Ramp

Movement	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	TR	L	L	T	T	T	T	R
Maximum Queue (ft)	74	72	159	173	212	93	95	134	164	101
Average Queue (ft)	20	59	101	121	148	29	51	113	133	31
95th Queue (ft)	67	84	158	187	215	85	92	138	187	98
Link Distance (ft)		714				905	905	603	603	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	350		350	375	375					275
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 3: SR 324/Gravel Springs Rd & Camp Branch Rd

Movement	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	R	T	T	L	T	T
Maximum Queue (ft)	404	250	256	217	72	119	136
Average Queue (ft)	310	164	219	173	37	83	90
95th Queue (ft)	404	332	269	256	66	132	151
Link Distance (ft)	456		603	603		1192	1192
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		100			425		
Storage Blk Time (%)	55						
Queuing Penalty (veh)	56						

Intersection: 4: SR 324/Gravel Springs Rd & Ivy Creek Rd

Movement	EB	SB	SB
Directions Served	UL	L	R
Maximum Queue (ft)	72	243	90
Average Queue (ft)	31	116	36
95th Queue (ft)	70	240	108
Link Distance (ft)		379	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	140		65
Storage Blk Time (%)		28	0
Queuing Penalty (veh)		40	0

Intersection: 6: Brown Rd & SR 324/Gravel Springs Rd

Movement	EB	WB	NB	SB
Directions Served	UL	UL	LTR	LTR
Maximum Queue (ft)	15	77	388	72
Average Queue (ft)	3	42	371	60
95th Queue (ft)	13	74	385	75
Link Distance (ft)			353	276
Upstream Blk Time (%)			69	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)	225	200		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: Mall of GA Blvd & SR 324/Gravel Springs Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	UL	L	T	T	L	T	R	L	TR
Maximum Queue (ft)	24	134	134	72	112	136	133	51	28	51	73	56
Average Queue (ft)	12	116	76	40	78	90	96	10	11	10	49	48
95th Queue (ft)	29	146	132	81	106	153	148	44	33	44	73	63
Link Distance (ft)		828	828			4422	4422	779	779	779	287	287
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200			500	500							
Storage Blk Time (%)												
Queuing Penalty (veh)												

Network Summary

Network wide Queuing Penalty: 96

Intersection: 1: SR 324/Gravel Springs Rd & I-85 N on/off Ramp

Movement	EB	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	TR	T	T	R	L	T	T
Maximum Queue (ft)	157	197	198	705	736	600	180	182	136
Average Queue (ft)	88	123	158	500	495	120	148	107	70
95th Queue (ft)	175	204	217	802	841	516	199	174	162
Link Distance (ft)		440	440	841	841			905	905
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	225					550	325		
Storage Blk Time (%)					15				
Queuing Penalty (veh)					15				

Intersection: 2: SR 324/Gravel Springs Rd & I-85 S on/off Ramp

Movement	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	L	TR	L	L	T	T	T	T
Maximum Queue (ft)	75	95	319	113	130	56	55	178	172
Average Queue (ft)	31	74	181	88	92	20	15	131	118
95th Queue (ft)	78	103	371	127	133	54	51	208	190
Link Distance (ft)		714				905	905	603	603
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	350		350	375	375				
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 3: SR 324/Gravel Springs Rd & Camp Branch Rd

Movement	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	R	T	T	L	T	T
Maximum Queue (ft)	370	51	227	204	118	236	207
Average Queue (ft)	240	37	163	148	74	156	149
95th Queue (ft)	360	54	244	216	113	242	237
Link Distance (ft)	456		603	603		1192	1192
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		100			425		
Storage Blk Time (%)	44						
Queuing Penalty (veh)	47						

Intersection: 4: SR 324/Gravel Springs Rd & Ivy Creek Rd

Movement	EB	SB	SB
Directions Served	UL	L	R
Maximum Queue (ft)	94	94	78
Average Queue (ft)	57	47	16
95th Queue (ft)	93	97	67
Link Distance (ft)		379	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	140		65
Storage Blk Time (%)		17	1
Queuing Penalty (veh)		24	1

Intersection: 6: Brown Rd & SR 324/Gravel Springs Rd

Movement	EB	WB	NB	SB
Directions Served	UL	UL	LTR	LTR
Maximum Queue (ft)	14	61	368	72
Average Queue (ft)	3	32	366	51
95th Queue (ft)	12	61	375	94
Link Distance (ft)			353	276
Upstream Blk Time (%)			81	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)	225	200		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: Mall of GA Blvd & SR 324/Gravel Springs Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	UL	L	T	T	L	T	R	L	TR
Maximum Queue (ft)	24	324	281	116	112	138	167	50	28	466	28	31
Average Queue (ft)	9	287	208	76	90	84	111	42	22	351	6	6
95th Queue (ft)	28	328	300	129	130	144	158	58	40	471	24	26
Link Distance (ft)		828	828			4422	4422	779	779	779	287	287
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200			500	500							
Storage Blk Time (%)		32					0					
Queuing Penalty (veh)		5					0					

Network Summary

Network wide Queuing Penalty: 92

Intersection: 1: SR 324/Gravel Springs Rd & I-85 N on/off Ramp

Movement	EB	EB	EB	NB	NB	SB	SB	SB
Directions Served	L	L	TR	T	T	L	T	T
Maximum Queue (ft)	74	70	55	653	576	135	185	101
Average Queue (ft)	51	37	11	387	312	96	57	25
95th Queue (ft)	95	69	47	692	623	140	172	90
Link Distance (ft)		440	440	841	841		905	905
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	225					325		
Storage Blk Time (%)					0			
Queuing Penalty (veh)					0			

Intersection: 2: SR 324/Gravel Springs Rd & I-85 S on/off Ramp

Movement	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	TR	L	L	T	T	T	T	R
Maximum Queue (ft)	123	136	206	178	189	26	93	180	181	119
Average Queue (ft)	60	66	114	144	141	15	36	127	127	41
95th Queue (ft)	130	130	226	189	199	36	87	194	198	127
Link Distance (ft)		714				905	905	603	603	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	350		350	375	375					275
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 3: SR 324/Gravel Springs Rd & Site Driveway 1/Camp Branch Rd

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	T	L	T	T
Maximum Queue (ft)	249	271	48	188	190	46	158	153
Average Queue (ft)	223	147	25	138	117	23	93	106
95th Queue (ft)	254	305	50	205	185	47	184	166
Link Distance (ft)		456		603	603		1172	1172
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	100		400			425		
Storage Blk Time (%)	43	5						
Queuing Penalty (veh)	46	23						

Intersection: 4: Site Driveway 2/Ivy Creek Rd & SR 324/Gravel Springs Rd

Movement	EB	WB	SB	SB
Directions Served	UL	UL	LT	R
Maximum Queue (ft)	51	22	96	90
Average Queue (ft)	42	12	56	18
95th Queue (ft)	58	29	98	77
Link Distance (ft)			379	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	140	100		65
Storage Blk Time (%)			13	
Queuing Penalty (veh)			18	

Intersection: 5: Site Driveway 3 & SR 324/Gravel Springs Rd

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 6: Brown Rd & SR 324/Gravel Springs Rd

Movement	WB	NB	SB
Directions Served	UL	LTR	LTR
Maximum Queue (ft)	87	388	160
Average Queue (ft)	49	359	91
95th Queue (ft)	106	403	157
Link Distance (ft)		353	276
Upstream Blk Time (%)		63	
Queuing Penalty (veh)		0	
Storage Bay Dist (ft)	200		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 7: Mall of GA Blvd & SR 324/Gravel Springs Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	T	UL	L	T	T	R	L	TR
Maximum Queue (ft)	24	112	51	51	71	196	162	54	52	56
Average Queue (ft)	9	77	46	32	57	129	112	11	29	22
95th Queue (ft)	27	126	60	48	76	204	166	46	56	67
Link Distance (ft)		828	828			4422	4422	779	287	287
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	200			500	500					
Storage Blk Time (%)							0			
Queuing Penalty (veh)							0			

Network Summary

Network wide Queuing Penalty: 88

Intersection: 1: SR 324/Gravel Springs Rd & I-85 N on/off Ramp

Movement	EB	EB	EB	NB	NB	SB	SB	SB
Directions Served	L	L	TR	T	T	L	T	T
Maximum Queue (ft)	52	112	243	460	426	379	72	74
Average Queue (ft)	33	96	196	398	360	294	54	32
95th Queue (ft)	65	110	265	489	456	383	81	71
Link Distance (ft)		440	440	841	841		905	905
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	225					325		
Storage Blk Time (%)						2		
Queuing Penalty (veh)						14		

Intersection: 2: SR 324/Gravel Springs Rd & I-85 S on/off Ramp

Movement	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	L	TR	L	L	T	T	T	T
Maximum Queue (ft)	74	70	234	113	113	140	116	158	150
Average Queue (ft)	44	37	122	90	99	42	53	110	109
95th Queue (ft)	76	71	226	123	127	135	118	188	160
Link Distance (ft)		714				905	905	603	603
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	350		350	375	375				
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 3: SR 324/Gravel Springs Rd & Site Driveway 1/Camp Branch Rd

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	TR	L	T	T	R	L	T	T
Maximum Queue (ft)	30	242	170	51	296	319	100	68	219	198
Average Queue (ft)	9	230	86	15	185	186	20	37	153	161
95th Queue (ft)	29	244	177	48	286	307	86	68	234	213
Link Distance (ft)			456		603	603			1172	1172
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	150	100		400			415	425		
Storage Blk Time (%)		52	0							4
Queuing Penalty (veh)		56	0							0

Intersection: 4: Site Driveway 2/Ivy Creek Rd & SR 324/Gravel Springs Rd

Movement	EB	WB	SB	SB
Directions Served	UL	UL	LT	R
Maximum Queue (ft)	55	18	118	90
Average Queue (ft)	44	7	87	54
95th Queue (ft)	60	21	137	127
Link Distance (ft)			379	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	140	100		65
Storage Blk Time (%)			44	
Queuing Penalty (veh)			61	

Intersection: 5: Site Driveway 3 & SR 324/Gravel Springs Rd

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 6: Brown Rd & SR 324/Gravel Springs Rd

Movement	EB	WB	NB	SB
Directions Served	UL	UL	LTR	LTR
Maximum Queue (ft)	15	61	368	94
Average Queue (ft)	5	34	362	59
95th Queue (ft)	15	63	376	90
Link Distance (ft)			353	276
Upstream Blk Time (%)			98	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)	225	200		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: Mall of GA Blvd & SR 324/Gravel Springs Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	UL	L	T	T	L	T	R	L	TR
Maximum Queue (ft)	299	341	276	154	159	114	155	778	794	794	30	31
Average Queue (ft)	69	298	227	116	128	68	86	190	629	768	9	6
95th Queue (ft)	260	372	307	164	180	134	161	676	1148	855	29	27
Link Distance (ft)		828	828			4422	4422	779	779	779	287	287
Upstream Blk Time (%)								0	48	58		
Queuing Penalty (veh)								0	0	0		
Storage Bay Dist (ft)	200			500	500							
Storage Blk Time (%)		36										
Queuing Penalty (veh)		6										

Network Summary

Network wide Queuing Penalty: 137

APPENDIX I

SIGNAL WARRANT ANALYSIS REPORT

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

TRAFFIC ENGINEERING REPORT

For the intersection of:
GA 324 (Gravel Springs Road) at Brown Road/Ivy Church Road
2838 Gravel Springs Road (Mile Post 1.7); Gwinnett County, Georgia

Report Prepared by:

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January 20, 2022

Location:

SR 324/Gravel Springs Road (SR 324) at Brown Road/Ivy Church Road (study intersection) in the City of Buford, Gwinnett County, Georgia is located west of I-85 and east of SR 20. Brown Road will provide vehicular access to two new warehouse developments' (DRI #3213-958,896 square feet and DRI #3274-625,616 square feet), and a new gas station with a 4,000 square feet convenience store and a 1,250 square feet retail space to be open by 2023.

DRI #3213 will have a secondary vehicular access on SR 324 at an existing median crossover approximately 675 feet west of Brown Road to primarily service the new truck trips and 20% of the new personal vehicle trips. Ivy Church Road which aligns with Brown Road at SR 324 will provide vehicular access for a new 293-townhome residential development. A second vehicular access on SR 324 near the southwestern corner of the site is also planned but is not expected to attract significant left turns onto SR 324.

There is an existing median crossover approximately 1,025 feet east of the intersection of SR 324 at Brown Road/Ivy Creek Road. The SR 324 at Brown Road/Ivy Church Road intersection is approximately 3,000 feet west of the new I-85 interchange along SR 324.

Reason for Investigation:

To determine the appropriate traffic control of the intersection of Brown Road and Ivy Church Road at SR 324 due to the new traffic expected to be generated by the proposed developments.

Description of the Intersection:

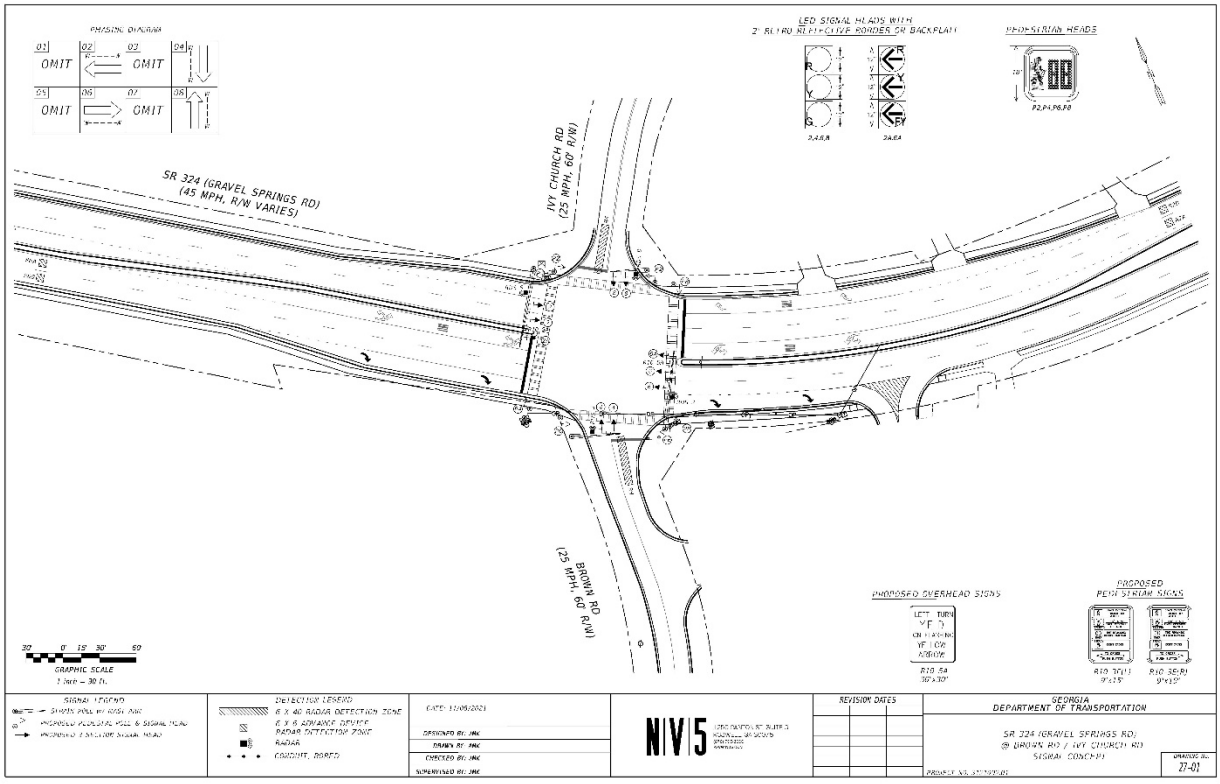
SR 324 at Brown Road/Ivy Church Road:
At the existing intersection, SR 324 is a four-lane median divided roadway classified as an urban minor arterial with a general east-west orientation with a 45 mph speed limit. At the intersection, SR 324 has a 300 feet left-turn lane westbound, a 250 feet left turn lane eastbound, a 220 feet westbound right-turn lane, and a 285-feet eastbound right turn lane.

Brown Road at SR 324:
Brown Road is a two-lane local roadway south of SR 324 planned to be upgraded to City of Buford standards and include a dedicated left-turn lane approaching the intersection. The roadway will be terminated to the south.

Ivy Church Road at SR 324:

Ivy Church Road is a two-lane local roadway that cul-de-sacs north of SR 324.

The proposed intersection configuration is shown in the sketch below and is included in Attachment "G".



Proposed Brown Road at SR 324 (Gravel Springs Road) intersection

Traffic Volumes in vehicles per day (vpd):

Latest year peak hour percent trucks: 2.4%
Latest year 24-hour percent trucks: 2.7%

A summary of the GDOT reported historical AADT data is provided in Table 1 below and Attachment "A" contains the existing (2020) 24-hour tube counts along Gravel Springs Road.

Table 1 - 135-0258 (Gwinnett County) – SR 324

Year	SR 324 (between Mall of GA Blvd and Brown Rd) (vpd)
2016	25,400
2017	27,300
2018	27,300
2019	31,100
2020	28,700

Existing Traffic Control:

SR 324 at Brown Road/Ivy Church Road

Both the Brown Road and Ivy Church Road approaches to SR 324 are stop sign controlled. SR 324 traffic is free-flowing.

Vehicular Speeds:

The speed limit on SR 324 is 45 mph and 25 mph on Brown Road and Ivy Church Road, respectively.

Pedestrian Movements:

There is sidewalk along the north and south sides of SR 324 and a sidewalk will be installed on Brown Road. Both adjacent signalized intersections have crosswalks on all four approaches with push-button stations and ADA Ramps.

Other Modes of Transportation Present:

There is no transit service along SR 324 near the intersection Brown Road.

Parking:

The planned new developments' sites will accommodate all vehicular parking on the sites. No parking on SR 324 or along Brown Road and Ivy Church Road will be permitted.

Accident History:

Historic crash data for the location of the proposed intersection along SR 324 was analyzed for years 2016 -2020. Table 2 shows the summary of the crash history and Attachment "B" contains the crash data:

Table 2 - SR 324 Crash Data

Year	Crashes							
	Rear-End	Side-Swipe	Angle	Head-on	Not a Collision With a Motor Vehicle	Total	Injury Crash	Fatal Crash
2016	0	0	0	0	0	0	0	0
2017	0	1	0	0	1	2	2	0
2018	0	1	1	0	2	4	1	0
2019	0	2	0	0	0	2	0	0
2020	0	0	0	0	0	0	0	0
TOTAL	**0**	**4**	**1**	**0**	**3**	**8**	**3**	**0**

As shown in Table 2, over the five-year period eight (8) crashes occurred at the study intersection, and only three (3) of these resulted in injury.

Adjacent Signalized Intersections:

The intersection is approximately 4,530 feet east of the intersection of SR 324 at Mall of Georgia Boulevard signalized intersection, and approximately 2,370 feet west of the signalized intersection of SR 324 at Camp Branch Road.

Signal Warrant Analysis:

Signal warrant analysis was conducted to determine appropriate traffic control at the study intersection of SR 324 at Brown Road/Ivy Church Road using the methodologies outlined in the Manual on Uniform Traffic Control Devices (MUTCD, 2009). The analyses are for Build conditions with the new project traffic from the approved DRI #3213 and DRI #3274 warehouse developments, the 2889 Gravel Springs Road residential development (a portion of DRI #1071), and the proposed SANA Plaza located southeast of the intersection.

For this analysis, Warrants 1A, 1B, 2, and 3 were considered. To prepare a conservative analysis, only left turns and through traffic volumes were used and the speeds were assumed to be below 40 miles per hour, although SR 324 is 45 mph. Also, the SR 324 hourly through volumes used in the analysis were collected on Tuesday, April 6, 2021, without adjustment for future background growth outside the area or adjustments for pandemic conditions.

The analyses include new project traffic generated by the new 958,896 square feet (sf) and 626,610 sf warehouses on Brown Road south of SR 324, the new 293-townhome development on Ivy Church Road north of SR 324, and the proposed new 4,000 sf gas station with convenience store and 1,250 sf retail located southeast of the intersection. For each of these land uses, ITE Trip Generation Manual 10th Edition methodology and data was used to calculate the daily trip generation and time of day entering and exiting volumes.

When complete, the warehouse developments are expected to generate 1,298 entering and 1,298 exiting trips daily, with 2,000 of these (1,000 entering and 1,000 exiting) on Brown Road. SANA Plaza is expected to generate 3,033 entering and 3,033 exiting trips daily, all on Brown Road. The residential development is expected to generate 1,087 entering and 1,087 exiting trips daily, with 2,000 of these (1,000 entering and 1,000 exiting) on Ivy Church Road.

The new warehouse trips were assigned based on the DRI approved directional distributions of 90% trucks and 80% personal vehicles to/from the east and the remainder to/from the west on SR 324 from the NV5 Traffic Impact Studies (TIS). The new residential trips were assigned based on the directional distribution provided by the Marc R. Acampora TIS of 65% to/from the east and 35% to/from the west on SR 324. The new gas station and retail trips assignments were directionally distributed equally to/from the east and west on SR 324 as agreed upon with GDOT District 1.

In addition, some of the new trips were assigned to the planned driveways on SR 324 at the existing median crossover west of Brown Road and Ivy Church Road as indicated in the DRI #3213 TIS and the latest townhomes site plan, reducing the number of new left-turning trips at

the study intersection. All the new SANA Plaza trips were assumed to use Brown Road; however, if a right-in/right-out (RIRO) driveway on SR 324 is permitted, the eastbound SR 324 right turn volumes into Brown Road and the right turn volumes from Brown Road to eastbound SR 324 may be diminished. Since right turn volumes are not included in this signal warrant analyses, the effect of this on the results would be minimal.

SR 324 hourly bi-directional vehicular volumes were collected on Tuesday, April 6, 2021, west of the intersection. Table 3 shows the hourly traffic volumes using the 24-hour counts. The raw counts are attached.

Table 3 - Existing Hourly Volumes (2021)

Time	SR 324			SR 324		
	Eastbound			Westbound		
	Left	Thru	Right	Left	Thru	Right
6:00 AM		218			812	
7:00 AM		386			1,141	
8:00 AM		483			1,141	
9:00 AM		541			1,092	
10:00 AM		752			1,145	
11:00 AM		858			1,234	
12:00 PM		1,022			1,343	
1:00 PM		1,236			1,157	
2:00 PM		1,292			1,099	
3:00 PM		1,426			1,043	
4:00 PM		1,576			967	
5:00 PM		1,739			1,065	
6:00 PM		1,495			942	

The assignment of site generated trips from the planned developments are shown in Table 4 and provided in Attachment "C".

Tables 4 - New Developments Hourly Turning Movement Volumes

Time	SR 324			SR 324			Brown Rd			Ivy Church Rd		
	Eastbound			Westbound			Northbound			Southbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
6:00 AM	4	7	7	38	8	5	78	0	113	41	0	15
7:00 AM	10	13	9	53	16	12	103	0	145	91	0	32
8:00 AM	15	13	9	50	18	19	95	0	133	64	0	23
9:00 AM	15	14	8	46	19	18	90	0	124	51	0	18
10:00 AM	15	16	8	47	21	18	97	0	131	33	0	12
11:00 AM	19	20	8	45	26	23	94	0	124	39	0	14
12:00 PM	21	20	9	49	27	26	100	0	133	38	0	14
1:00 PM	18	15	9	49	21	22	96	0	133	35	0	12
2:00 PM	22	14	10	54	21	28	107	0	150	42	0	15
3:00 PM	32	32	11	60	42	39	131	0	167	37	0	13
4:00 PM	38	25	11	63	38	47	133	0	178	36	0	13
5:00 PM	43	22	10	59	36	53	121	0	162	47	0	17
6:00 PM	36	10	9	51	22	44	103	0	148	45	0	16

The signal warrant volumes to be used in the signal warrant analysis were developed by adding the hourly volumes shown in Table 3 with the project trips shown in Table 4. The signal warrant volumes at the intersection of SR 324 at Brown Hood/Ivy Church Road are summarized in Table 5. Attachment "D" contains the warrant analysis documentation.

Table 5 - 2023 Signal Warrant Volumes

Time	SR 324			SR 324			Brown Rd			Ivy Church Rd		
	Eastbound			Westbound			Northbound			Southbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
6:00 AM	4	225	7	38	820	5	78	0	113	41	0	15
7:00 AM	10	399	9	53	1,157	12	103	0	145	91	0	32
8:00 AM	15	496	9	50	1,159	19	95	0	133	64	0	23
9:00 AM	15	555	8	46	1,111	18	90	0	124	51	0	18
10:00 AM	15	768	8	47	1,166	18	97	0	131	33	0	12
11:00 AM	19	878	8	45	1,260	23	94	0	124	39	0	14
12:00 PM	21	1,042	9	49	1,370	26	100	0	133	38	0	14
1:00 PM	18	1,251	9	49	1,178	22	96	0	133	35	0	12
2:00 PM	22	1,306	10	54	1,120	28	107	0	150	42	0	15
3:00 PM	32	1,458	11	60	1,085	39	131	0	167	37	0	13
4:00 PM	38	1,601	11	63	1,005	47	133	0	178	36	0	13
5:00 PM	43	1,761	10	59	1,101	53	121	0	162	47	0	17
6:00 PM	36	1,505	9	51	964	44	103	0	148	45	0	16

Table 6 - 2023 Warrant Results – SR 324 at Brown Road/Ivy Church Road

Hour Beginning	SR 324	Brown Rd/ Ivy Church Rd	WARRANT 1A Condition Met? Major>600 Minor>150	WARRANT 1B Condition Met? Major>900 Minor>75	WARRANT 2 Conditions Met?	WARRANT 3A Conditions Met?	WARRANT 3B Conditions Met?
	Combined Volume	Approach Volume w/o Right Turns					
6:00 AM	1,087	78	NO	YES	NO	NO	NO
7:00 AM	1,619	103	NO	YES	YES	YES	NO
8:00 AM	1,720	95	NO	YES	YES	NO	NO
9:00 AM	1,727	90	NO	YES	NO	NO	NO
10:00 AM	1,996	97	NO	YES	YES	NO	NO
11:00 AM	2,202	94	NO	YES	YES	NO	NO
12:00 PM	2,482	100	NO	YES	YES	YES	YES
1:00 PM	2,496	96	NO	YES	YES	NO	NO
2:00 PM	2,502	107	NO	YES	YES	YES	YES
3:00 PM	2,635	131	NO	YES	YES	YES	YES
4:00 PM	2,707	133	NO	YES	YES	YES	YES
5:00 PM	2,964	121	NO	YES	YES	YES	YES
6:00 PM	2,556	103	NO	YES	YES	YES	YES
Number of Hours Needed			**8**	**8**	**4**	**1**	**1**
Number of Hours Met			**0**	**13**	**12**	**7**	**6**
Warrant Satisfied?			**NO**	**YES**	**YES**	**YES**	**YES**

As seen Table 6, with the expected project trips from the planned developments, the traffic volumes at the SR 324 at Brown Road intersection are expected to meet the MUTCD minimum hourly 100% requirements for Warrant 1B and for Warrant 2 and only considering left-turn and through volumes.

Intersection Control Evaluations:

Intersection Control Evaluation (ICE) was performed at the study intersection to ensure that a traffic signal is the most effective mitigation measure at the intersection. In performance of the evaluation, a traffic signal ranked first out of three control measures including the existing, two-way stop control as well as the addition of left turn lanes on the minor street approaches. Attachment "E" contains ICE documentation.

Roundabout:

A roundabout would not be a feasible for the proposed subject intersection since the side street traffic volumes are expected to be less than 10% of the SR 324 through volume. A multi-lane roundabout is out of the scope of the project and would adversely affect operations at this intersection and along the SR 324 corridor between I-85 and SR 20. Therefore, roundabout analysis was not performed.

Conclusions and Recommendations:

Based on the findings of this study, a traffic signal is warranted at the intersection of SR 324 (Gravel Springs Road) at Brown Road/Ivy Church Road. At full build-out of the proposed developments, the intersection is expected to meet the vehicular volume-based requirements of Warrants 1B and 2 using 100% of the volumes and only considering left-turn and through volumes. Attachment "F" contains the Conceptual Traffic Signal Design.

It is recommended that a traffic signal be installed at the subject intersection. Also, it is recommended to install two-lane approaches on both Brown Road and Ivy Church Road.

RECOMMENDED BY:_____ DATE:_____
District Traffic Engineer

RECOMMENDED BY:_____ DATE:_____
State Traffic Engineer

APPROVED BY:_____ DATE:_____
Director of Operations

Traffic Engineering Report Appendix:

- Attachment "A" – AADT and Existing 24-Hour Tube Counts
- Attachment "B" – Crash Data
- Attachment "C" – Build Turning Movement Volumes
- Attachment "D" – Signal Warrant Analysis
- Attachment "E" – Intersection Control Evaluation (ICE) Documentation
- Attachment "F" – Conceptual Traffic Signal Design

Attachment "A" – AADT and Existing 24-Hour Tube Counts

0000135_0258 - 135-0258

Description: SR 002000 BEG AT
County: Gwinnett
Route number: 00032400
LRS section: 1351032400
Functional class: 4U - Minor Arterial (Urban)
Coordinates: 34.068946959172, -83.9684563310238

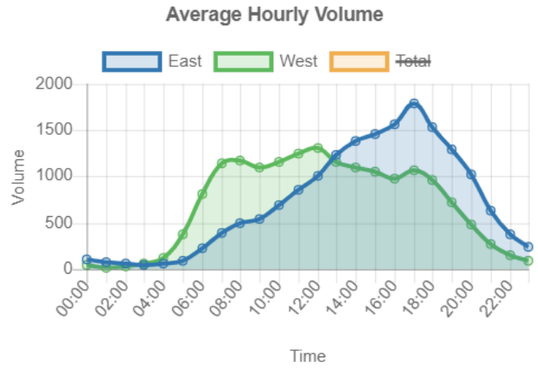
Site Data

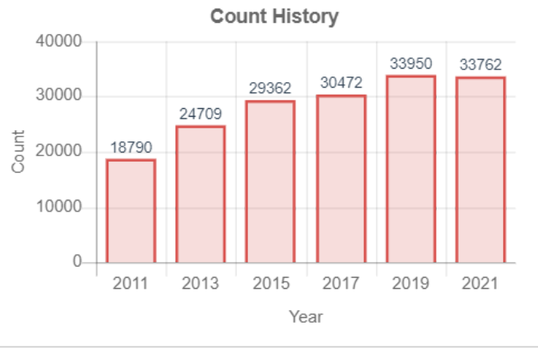
Count History

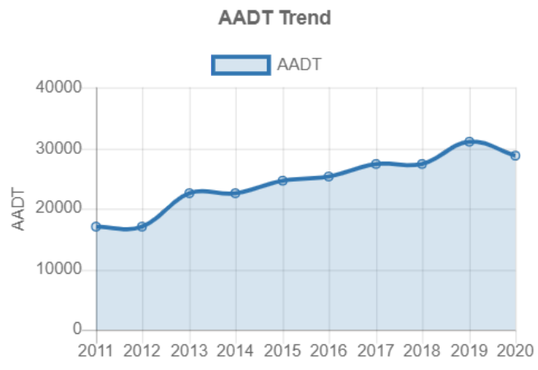
Year	Month	Count type	Duration	Count
2021	April	Volume	48 hours	33762
2019	October	Class	48 hours	33950
2017	February	Volume	48 hours	30472
2015	May	Volume	48 hours	29362
2013	February	Volume	48 hours	24709
2011	September	Class	48 hours	18790

Annual Statistics

Data Item	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Statistics type	-	-	-	-	Actual	Estimated	Actual	Estimated	Actual	**Estimated**
AADT	17100	17000	22600	22600	24600	25400	27300	27300	31100	**28700**
K-Factor	-	-	0.090	0.090	0.108	0.108	0.098	0.098	0.092	**0.092**
D-Factor	-	-	0.700	0.700	0.600	0.600	0.650	0.650	0.640	**0.640**
Future AADT	-	-	-	-	-	31400	42300	50600	58800	**58800**







Attachment "B" – Crash Data

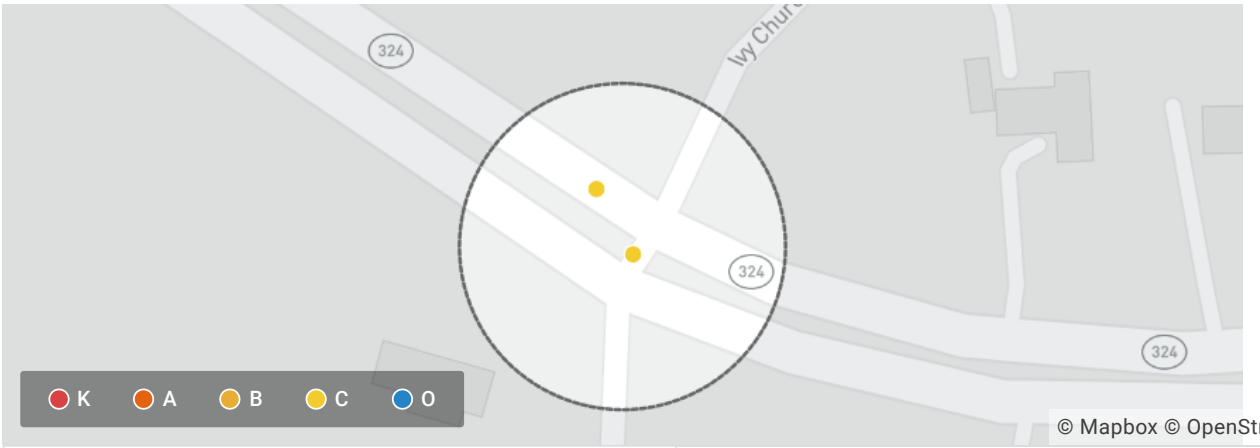
CRASH SUMMARY REPORT

SR 324 at Brown Rd/Ivy Church Rd

Created on January 12, 2022
Created by NV5 Traffic
Requested by GDOT D1
Data extents: June 10, 2017 to November 15, 2017

Applied Filters

Shape: Circle | 125 ft | Date and Time (Year) | ≤≥ | 2017 - 2017



Total Crashes	2	Fatal Crashes	0

KABCO Severity	Collisions Dataset	
(C) Possible Injury / Complaint	2	100.00%
+ 5 more	0	0%

Date and Time (Year)	Collisions Dataset	
2017	2	100.00%
+ 7 more	0	0%

Manner of Collision (Crash Level)	Collisions Dataset	
Not a Collision with Motor Vehicle	1	50.00%
Sideswipe-Same Direction	1	50.00%
+ 7 more	0	0%

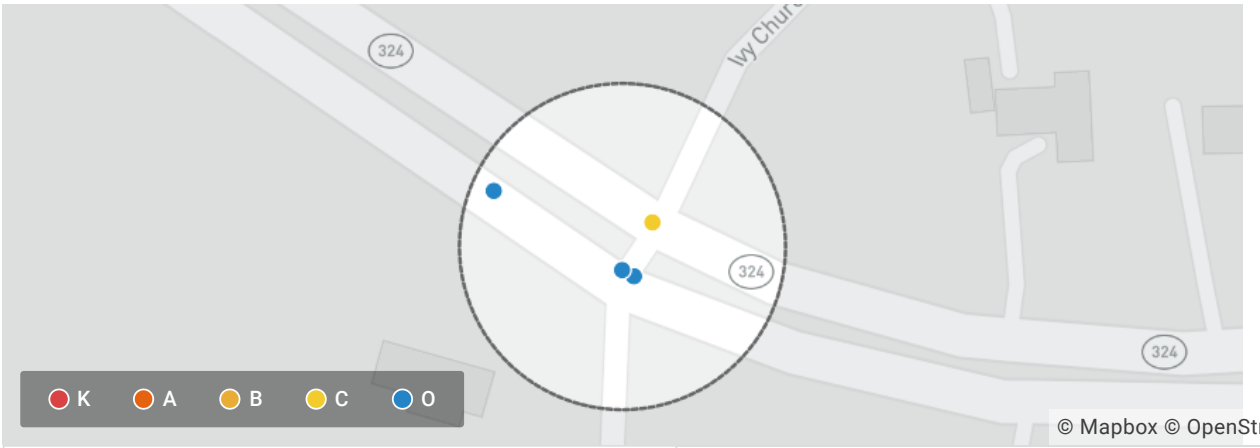
CRASH SUMMARY REPORT

SR 324 at Brown Rd/Ivy Church Rd

Created on January 12, 2022
Created by NV5 Traffic
Requested by GDOT D1
Data extents: February 1, 2018 to November 13, 2018

Applied Filters

Shape: Circle | 125 ft | Date and Time (Year) | ≤≥ | 2018 - 2018



Total Crashes	4	Fatal Crashes	0

KABCO Severity	Collisions	Dataset
(O) No Injury	3	75.00%
(C) Possible Injury / Complaint	1	25.00%
+ 4 more	0	0%

Date and Time (Year)	Collisions	Dataset
2018	4	100.00%
+ 7 more	0	0%

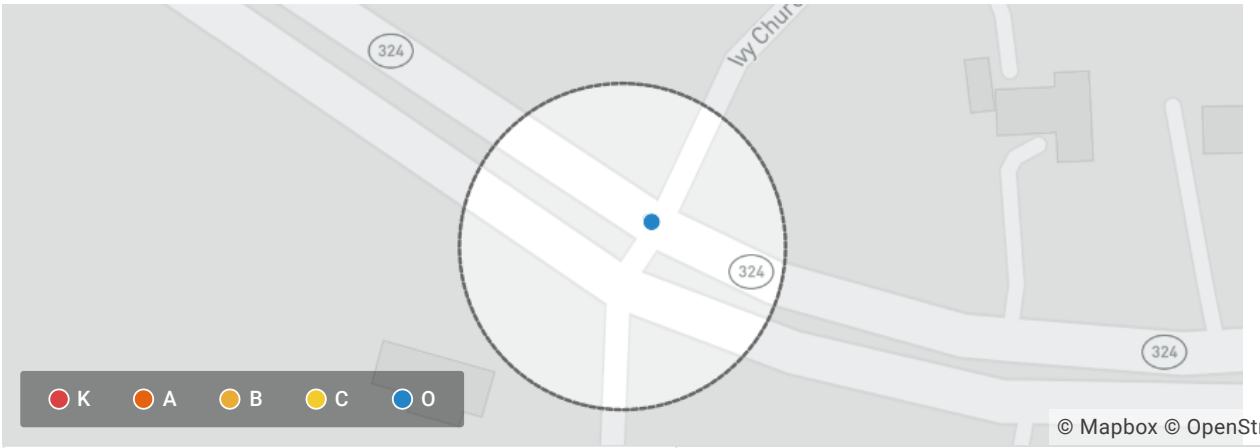
Manner of Collision (Crash Level)	Collisions	Dataset
Not a Collision with Motor Vehicle	2	50.00%
Angle (Other)	1	25.00%
Sideswipe-Same Direction	1	25.00%
+ 6 more	0	0%

SR 324 at Brown Rd/Ivy Church Rd

Created on January 12, 2022
Created by NV5 Traffic
Requested by GDOT D1
Data extents: January 21, 2019 to June 8, 2019

Applied Filters

Shape: Circle | 125 ft | Date and Time (Year) | ≤≥ | 2019 - 2019



Total Crashes	2	Fatal Crashes	0

KABCO Severity	Collisions Dataset	
(O) No Injury	2	100.00%
+ 5 more	0	0%

Date and Time (Year)	Collisions Dataset	
2019	2	100.00%
+ 7 more	0	0%

Manner of Collision (Crash Level)	Collisions Dataset	
Sideswipe-Same Direction	2	100.00%
+ 8 more	0	0%

Attachment "C" – Build Turning Movement Volumes

Future + Project Trips - TOTAL

Time	SR 324 Eastbound			SR 324 Westbound			Brown Rd Northbound			Ivy Church Rd Southbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
6:00 AM	4	225	7	38	820	5	78	0	113	41	0	15
7:00 AM	10	399	9	53	1,157	12	103	0	145	91	0	32
8:00 AM	15	496	9	50	1,159	19	95	0	133	64	0	23
9:00 AM	15	555	8	46	1,111	18	90	0	124	51	0	18
10:00 AM	15	768	8	47	1,166	18	97	0	131	33	0	12
11:00 AM	19	878	8	45	1,260	23	94	0	124	39	0	14
12:00 PM	21	1,042	9	49	1,370	26	100	0	133	38	0	14
1:00 PM	18	1,251	9	49	1,178	22	96	0	133	35	0	12
2:00 PM	22	1,306	10	54	1,120	28	107	0	150	42	0	15
3:00 PM	32	1,458	11	60	1,085	39	131	0	167	37	0	13
4:00 PM	38	1,601	11	63	1,005	47	133	0	178	36	0	13
5:00 PM	43	1,761	10	59	1,101	53	121	0	162	47	0	17
6:00 PM	36	1,505	9	51	964	44	103	0	148	45	0	16

Project Trips

Time	SR 324 Eastbound			SR 324 Westbound			Brown Rd Northbound			Ivy Church Rd Southbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
6:00 AM	4	7	7	38	8	5	78	0	113	41	0	15
7:00 AM	10	13	9	53	16	12	103	0	145	91	0	32
8:00 AM	15	13	9	50	18	19	95	0	133	64	0	23
9:00 AM	15	14	8	46	19	18	90	0	124	51	0	18
10:00 AM	15	16	8	47	21	18	97	0	131	33	0	12
11:00 AM	19	20	8	45	26	23	94	0	124	39	0	14
12:00 PM	21	20	9	49	27	26	100	0	133	38	0	14
1:00 PM	18	15	9	49	21	22	96	0	133	35	0	12
2:00 PM	22	14	10	54	21	28	107	0	150	42	0	15
3:00 PM	32	32	11	60	42	39	131	0	167	37	0	13
4:00 PM	38	25	11	63	38	47	133	0	178	36	0	13
5:00 PM	43	22	10	59	36	53	121	0	162	47	0	17
6:00 PM	36	10	9	51	22	44	103	0	148	45	0	16

SR 324 Raw Counts

Time	SR 324 Eastbound			SR 324 Westbound		
	Left	Thru	Right	Left	Thru	Right
6:00 AM		218			812	
7:00 AM		386			1,141	
8:00 AM		483			1,141	
9:00 AM		541			1,092	
10:00 AM		752			1,145	
11:00 AM		858			1,234	
12:00 PM		1,022			1,343	
1:00 PM		1,236			1,157	
2:00 PM		1,292			1,099	
3:00 PM		1,426			1,043	
4:00 PM		1,576			967	
5:00 PM		1,739			1,065	
6:00 PM		1,495			942	
		13,024			14,181	

Project Trips - SANA Gas Station

50% in 50% out

Time	SR 324 Eastbound			SR 324 Westbound			Brown Rd Northbound			Ivy Church Rd Southbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
6:00 AM			73	70			73		70			
7:00 AM			94	97			94		97			
8:00 AM			86	91			86		91			
9:00 AM			80	85			80		85			
10:00 AM			85	86			85		86			
11:00 AM			80	83			80		83			
12:00 PM			86	89			86		89			
1:00 PM			86	89			86		89			
2:00 PM			97	99			97		99			
3:00 PM			108	111			108		111			
4:00 PM			115	115			115		115			
5:00 PM			105	108			105		108			
6:00 PM			96	94			96		94			

Time of Day - SANA Gas Station

Time	SR 324 Eastbound			SR 324 Westbound			Brown Rd Northbound			Ivy Church Rd Southbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
6:00 AM			4.8%	4.6%			4.8%		4.6%			
7:00 AM			6.2%	6.4%			6.2%		6.4%			
8:00 AM			5.7%	6.0%			5.7%		6.0%			
9:00 AM			5.3%	5.6%			5.3%		5.6%			
10:00 AM			5.6%	5.7%			5.6%		5.7%			
11:00 AM			5.3%	5.5%			5.3%		5.5%			
12:00 PM			5.7%	5.9%			5.7%		5.9%			
1:00 PM			5.7%	5.9%			5.7%		5.9%			
2:00 PM			6.4%	6.5%			6.4%		6.5%			
3:00 PM			7.1%	7.3%			7.1%		7.3%			
4:00 PM			7.6%	7.6%			7.6%		7.6%			
5:00 PM			6.9%	7.1%			6.9%		7.1%			
6:00 PM			6.3%	6.2%			6.3%		6.2%			

Project Trips - Residential Development (DRI 2889)

35% in in 43% out 65% 23% out

Time	SR 324 Eastbound			SR 324 Westbound			Brown Rd Northbound			Ivy Church Rd Southbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
6:00 AM	4					5				41		15
7:00 AM	10					12				91		32
8:00 AM	15					19				64		23
9:00 AM	15					18				51		18
10:00 AM	15					18				33		12
11:00 AM	19					23				39		14
12:00 PM	21					26				38		14
1:00 PM	18					22				35		12
2:00 PM	22					28				42		15
3:00 PM	32					39				37		13
4:00 PM	38					47				36		13
5:00 PM	43					53				47		17
6:00 PM	36					44				45		16

Time of Day - Residential Development (DRI 2889)

Time	SR 324 Eastbound			SR 324 Westbound			Brown Rd Northbound			Ivy Church Rd Southbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
6:00 AM	1.1%					1.1%				5.8%		5.8%
7:00 AM	2.6%					2.6%				12.9%		12.9%
8:00 AM	4.0%					4.0%				9.1%		9.1%
9:00 AM	3.9%					3.9%				7.2%		7.2%
10:00 AM	3.9%					3.9%				4.7%		4.7%
11:00 AM	4.9%					4.9%				5.5%		5.5%
12:00 PM	5.6%					5.6%				5.4%		5.4%
1:00 PM	4.8%					4.8%				4.9%		4.9%
2:00 PM	5.9%					5.9%				6.0%		6.0%
3:00 PM	8.3%					8.3%				5.2%		5.2%
4:00 PM	10.0%					10.0%				5.1%		5.1%
5:00 PM	11.4%					11.4%				6.7%		6.7%
6:00 PM	9.5%					9.5%				6.3%		6.3%

Project Trips - Brown Rd at Gravel Springs Rd (DRI 3274 & DRI 3213)

20% auto 80% auto 20% auto 80% auto
10% truck 90% truck 10% truck 90% truck

Time	SR 324 Eastbound			SR 324 Westbound			Brown Rd Northbound			Ivy Church Rd Southbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
6:00 AM			7	38			5		40			
7:00 AM			9	53			9		51			
8:00 AM			9	50			9		47			
9:00 AM			8	46			10		44			
10:00 AM			8	47			12		46			
11:00 AM			8	45			14		44			
12:00 PM			9	49			14		47			
1:00 PM			9	49			10		47			
2:00 PM			10	54			10		53			
3:00 PM			11	60			23		59			
4:00 PM			11	63			18		63			
5:00 PM			10	59			16		57			
6:00 PM			9	51			7		52			

Time of Day - Brown Rd at Gravel Springs Rd (DRI 3274 & DRI 3213)

Time	SR 324 Eastbound			SR 324 Westbound			Brown Rd Northbound			Ivy Church Rd Southbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
6:00 AM			10.0%	10.0%			2.8%		2.8%			
7:00 AM			9.6%	9.6%			5.1%		5.1%			
8:00 AM			6.8%	6.8%			5.3%		5.3%			
9:00 AM			7.2%	7.2%			5.8%		5.8%			
10:00 AM			6.4%	6.4%			6.6%		6.6%			
11:00 AM			7.1%	7.1%			8.2%		8.2%			
12:00 PM			9.1%	9.1%			8.1%		8.1%			
1:00 PM			7.4%	7.4%			5.9%		5.9%			
2:00 PM			8.3%	8.3%			5.8%		5.8%			
3:00 PM			7.0%	7.0%			12.9%		12.9%			
4:00 PM			5.4%	5.4%			10.1%		10.1%			
5:00 PM			4.0%	4.0%			9.0%		9.0%			
6:00 PM			1.4%	1.4%			3.9%		3.9%			

Hourly Distribution of Entering and Exiting Vehicle Trips by Land Use

Source: ITE *Trip Generation Manual* , 10th Edition

Land Use Code	150	
Land Use	Warehousing	
Setting	General Urban/Suburban	
Time Period	Weekday	
Trip Type	Vehicle	
# Data Sites	13	
	% of 24-Hour Traffic	
Time	Entering	Exiting
12-1 AM	0.2	0.4
1-2 AM	0.1	1.0
2-3 AM	0.3	0.5
3-4 AM	0.7	0.6
4-5 AM	1.3	1.5
5-6 AM	3.9	2.4
6-7 AM	10.0	2.8
7-8 AM	9.6	5.1
8-9 AM	6.8	5.3
9-10 AM	7.2	5.8
10-11 AM	6.4	6.6
11-12 PM	7.1	8.2
12-1 PM	9.1	8.1
1-2 PM	7.4	5.9
2-3 PM	8.3	5.8
3-4 PM	7.0	12.9
4-5 PM	5.4	10.1
5-6 PM	4.0	9.0
6-7 PM	1.4	3.9
7-8 PM	0.9	0.9
8-9 PM	0.7	0.5
9-10 PM	0.4	1.0
10-11 PM	1.2	0.4
11-12 AM	0.7	1.3

Hourly Distribution of Entering and Exiting Vehicle Trips by Land Use

Source: ITE *Trip Generation Manual* , 10th Edition

Land Use Code	220			
Land Use	Multifamily Housing (Low-Rise)			
Setting	General Urban/Suburban		Dense Multi-Use Urban	
Time Period	Weekday		Weekday	
Trip Type	Vehicle		Vehicle	
# Data Sites	9		1	
	% of 24-Hour Traffic		% of 24-Hour Traffic	
Time	Entering	Exiting	Entering	Exiting
12-1 AM	0.7	0.3	1.6	0
1-2 AM	0.4	0.1	0.4	0
2-3 AM	0.3	0.3	0.0	0
3-4 AM	0.3	0.4	0.0	0.4
4-5 AM	0.4	1.0	0.4	1.6
5-6 AM	0.1	2.6	0.4	2.7
6-7 AM	1.1	5.8	1.6	8.6
7-8 AM	2.6	12.9	6.2	14.5
8-9 AM	4.0	9.1	3.5	7.5
9-10 AM	3.9	7.2	3.9	3.9
10-11 AM	3.9	4.7	3.5	3.9
11-12 PM	4.9	5.5	2.3	2.7
12-1 PM	5.6	5.4	4.7	3.5
1-2 PM	4.8	4.9	3.1	5.9
2-3 PM	5.9	6.0	6.2	5.9
3-4 PM	8.3	5.2	7.0	5.1
4-5 PM	10.0	5.1	7.4	5.5
5-6 PM	11.4	6.7	7.0	7.1
6-7 PM	9.5	6.3	10.9	5.5
7-8 PM	7.1	4.3	6.2	4.7
8-9 PM	5.7	3.5	7.8	2.4
9-10 PM	4.7	1.4	7.8	5.1
10-11 PM	2.9	1.0	4.7	2.7
11-12 AM	1.5	0.4	3.5	0.8

Land Use	944 Gasoline/Service Station								945 Gasoline/Service Station with Convenience Market	
Setting	General Urban/Suburban						Center City Core		General Urban/ Suburban	
Time Period	Weekday		Saturday		Sunday		Weekday		Weekday	
Trip Type	Vehicle		Vehicle		Vehicle		Vehicle		Vehicle	
# Data Sites	16		1		1		1		14	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
12:00	0.8	6.6	2.2	6.0	1.7	7.1	0.4	5.9	1.1	5.9
12:15	0.6	6.4	2.1	6.0	1.1	7.2	0.4	6.5	0.9	5.9
12:30	0.4	6.2	1.6	5.7	1.1	6.7	0.2	7.0	0.8	5.8
12:45	0.4	6.2	1.8	5.9	1.3	6.0	0.2	6.7	0.7	5.7
1:00	0.3	6.0	1.6	5.7	1.1	6.4	0.2	6.8	0.6	5.6
1:15	0.3	6.1	1.6	5.8	0.9	5.4	0.2	6.8	0.6	5.8
1:30	0.2	6.0	1.3	5.9	0.7	5.8	0.1	6.4	0.5	5.9
1:45	0.2	6.2	1.1	6.8	0.5	7.9	0.0	6.7	0.4	6.0
2:00	0.1	6.3	1.1	6.1	0.4	8.2	0.2	7.2	0.5	6.1
2:15	0.1	6.2	0.9	5.2	0.6	8.2	0.2	7.0	0.4	6.0
2:30	0.1	6.7	0.7	5.5	0.6	8.3	0.3	7.2	0.5	6.1
2:45	0.2	6.8	0.7	5.6	0.5	7.3	0.3	7.8	0.6	6.3
3:00	0.2	7.2	0.5	6.4	0.7	6.5	0.1	7.8	0.6	6.6
3:15	0.2	7.5	0.6	7.6	0.6	6.4	0.1	8.1	0.7	6.8
3:30	0.3	7.4	0.6	8.0	0.9	5.9	0.1	8.2	0.8	7.1
3:45	0.4	7.5	0.4	7.8	1.1	5.9	0.1	7.8	0.9	7.0
4:00	0.4	7.4	0.3	7.2	0.8	6.3	0.1	7.9	1.1	6.8
4:15	0.6	7.7	0.4	8.3	0.7	7.0	0.1	8.3	1.3	6.7
4:30	0.7	7.6	0.4	7.6	0.8	7.6	0.3	8.9	1.5	6.8
4:45	0.9	7.4	0.5	7.5	0.9	7.3	0.4	9.5	1.8	6.8
5:00	1.1	7.5	0.8	7.6	1.1	6.4	0.7	10.0	2.3	6.8
5:15	1.5	7.5	1.0	5.7	1.6	5.5	0.9	9.8	3.0	6.7
5:30	2.0	7.8	1.2	5.1	1.8	5.0	1.6	8.6	3.7	6.5
5:45	2.4	7.8	1.7	4.8	1.9	5.3	2.1	7.9	4.4	6.3
6:00	2.8	7.7	1.8	5.1	2.5	5.3	2.4	6.8	4.8	6.1
6:15	3.2	7.2	2.2	5.3	3.0	5.0	3.7	5.9	5.1	5.9
6:30	3.5	6.7	2.6	5.6	4.1	5.2	4.4	5.6	5.4	5.5
6:45	4.2	6.5	2.9	5.1	4.5	4.7	4.9	5.6	5.7	5.2
7:00	5.0	6.1	3.5	4.6	4.6	4.5	5.1	5.1	6.1	4.9
7:15	5.3	6.2	3.6	4.1	4.9	4.7	4.9	4.4	6.2	4.7
7:30	5.7	6.2	4.4	3.6	5.1	3.9	4.8	4.3	6.2	4.4
7:45	5.6	5.8	5.5	3.8	5.3	4.3	4.4	4.2	6.2	4.2
8:00	5.4	5.5	5.3	4.6	6.0	4.7	4.9	4.4	6.1	4.0
8:15	5.2	5.1	5.1	4.9	5.5	5.2	4.9	4.5	6.0	3.7
8:30	5.0	4.6	6.0	5.3	5.0	5.3	4.6	4.2	5.8	3.6
8:45	5.0	4.3	6.5	5.1	4.8	4.1	5.5	3.9	5.6	3.5
9:00	4.9	4.0	6.8	4.4	4.1	4.0	5.5	3.4	5.5	3.3
9:15	4.8	3.6	7.7	3.7	4.4	3.7	5.5	3.3	5.3	3.1
9:30	4.7	3.3	6.7	3.7	4.4	3.9	5.4	3.2	5.3	2.9
9:45	4.4	3.0	5.2	4.2	4.3	4.1	5.4	2.5	5.4	2.7
10:00	4.4	2.7	6.2	3.3	5.0	3.6	5.5	1.9	5.4	2.6
10:15	4.8	2.5	5.9	3.2	4.9	3.5	6.0	1.5	5.3	2.5
10:30	5.3	2.1	5.8	2.9	5.5	3.0	6.9	1.1	5.3	2.3
10:45	5.7	1.8	6.2	2.4	6.0	3.1	6.7	1.0	5.3	2.1
11:00	6.0	1.5	6.5	2.5	6.1	2.8	6.5	1.1	5.3	1.9
11:15	6.2	1.2	6.8	2.3	7.2	2.4	6.0	1.0	5.5	1.7
11:30	6.3	1.2	7.3	2.6	7.1	2.5	5.6	1.0	5.7	1.4
11:45	6.5	1.0	6.5	2.2	6.9	1.8	5.9	0.6	5.9	1.3

Percent of Daily Traffic During the 60-Minute Period Beginning at Displayed Time

Hourly Distribution of Entering and Exiting Vehicle Trips by Land Use

Source: ITE *Trip Generation Manual* , 10th Edition

Land Use Code	945	
Land Use	Gasoline/Service Station with Convenience Market	
Setting	General Urban/Suburban	
Time Period	Weekday	
Trip Type	Vehicle	
# Data Sites	5	
	% of 24-Hour Traffic	
Time	Entering	Exiting
12-1 AM	0.8	0.8
1-2 AM	0.4	0.5
2-3 AM	0.3	0.4
3-4 AM	0.4	0.7
4-5 AM	0.8	1.3
5-6 AM	2.3	2.2
6-7 AM	4.6	4.8
7-8 AM	6.4	6.2
8-9 AM	6.0	5.7
9-10 AM	5.6	5.3
10-11 AM	5.7	5.6
11-12 PM	5.5	5.3
12-1 PM	5.9	5.7
1-2 PM	5.9	5.7
2-3 PM	6.5	6.4
3-4 PM	7.3	7.1
4-5 PM	7.6	7.6
5-6 PM	7.1	6.9
6-7 PM	6.2	6.3
7-8 PM	4.2	4.3
8-9 PM	3.4	3.7
9-10 PM	2.9	2.9
10-11 PM	2.4	2.6
11-12 AM	1.8	1.9

Attachment "D" – Signal Warrant Analysis

Build			SR 324	Brown Rd					
					Combo 80%			WARRANT	
HOUR OF DAY	No RTs MAIN STREET VOLUME	No RTs MINOR STREET VOLUME	WARRANT 1A	WARRANT 1B	A	B	WARRANT 2	3A	3B
6:00	1087	78	MAIN	BOTH	MAIN	BOTH			
7:00	1619	103	MAIN	BOTH	MAIN	BOTH	YES	YES	
8:00	1720	95	MAIN	BOTH	MAIN	BOTH	YES		
9:00	1727	90	MAIN	BOTH	MAIN	BOTH	YES		
10:00	1996	97	MAIN	BOTH	MAIN	BOTH	YES		
11:00	2202	94	MAIN	BOTH	MAIN	BOTH	YES		
12:00	2482	100	MAIN	BOTH	MAIN	BOTH	YES	YES	YES
13:00	2496	96	MAIN	BOTH	MAIN	BOTH	YES		
14:00	2502	107	MAIN	BOTH	MAIN	BOTH	YES	YES	YES
15:00	2635	131	MAIN	BOTH	BOTH	BOTH	YES	YES	YES
16:00	2707	133	MAIN	BOTH	BOTH	BOTH	YES	YES	YES
17:00	2964	121	MAIN	BOTH	BOTH	BOTH	YES	YES	YES
18:00	2556	103	MAIN	BOTH	MAIN	BOTH	YES	YES	YES
REQUIRED VOLUMES:									
MAIN STREET			600	900	480	720			
SIDE STREET			150	75	120	60			
HOURS REQUIRED			8	8	8	8	4	1	1
HOURS MET			0	13	3	14	12	7	6

NO. OF LANES:

MAIN STREET (1 or 2)	2
SIDE STREET (1 or 2)	1

NO. OF APPROACHES (3 or 4)	4

DOES MAIN STREET SPEED EXCEED 40 MPH, Y or N ?	N

Traffic Signal Warrant for
SR 324 at Brown Road/Ivy Church Road

Attachment “E” – Intersection Control Evaluation (ICE) Documentation

GDOT INTERSECTION CONTROL EVALUATION (ICE) TOOL

ICE Version 2.15 | Revised 07/01/2019

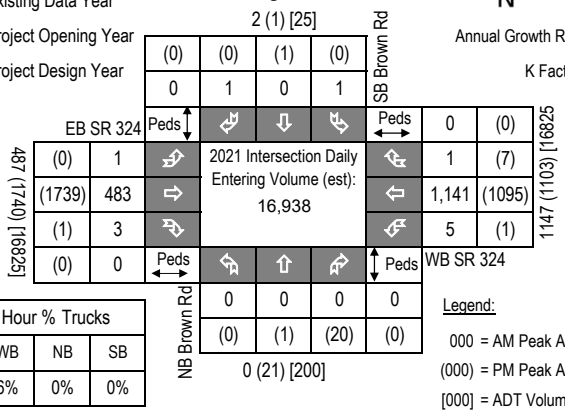
GDOT PI # (or N/A):	N/A	Request By:	Eberly & Associates, Inc.
County:	Gwinnett	GDOT District:	1 - Gainesville
Major (State) Road:	SR 324	Speed Limit:	45 mph
Minor (Crossing) ST:	Brown Rd	Speed Limit:	< 35 mph
Major ST Direction:	East/West	Area Type:	Suburb/Transition
Intersection Control:	Conventional (Minor Stop)		
Prepared By:	NV5	Analyst:	JP
Date:	1/14/2022	Project ID:	3121092.01
Project Purpose:	Provide improved access for new 958,896 & 626,616 SF warehouses developments (DRIs 3213 & 3274)		

2021	Existing Data Year
2023	Project Opening Year
2023	Project Design Year

Annual Growth Rate: 3.0%

K Factor*: 10%

2021 Existing Year Volumes



Peak Hour % Trucks			
EB	WB	NB	SB
6%	6%	0%	0%

Legend:

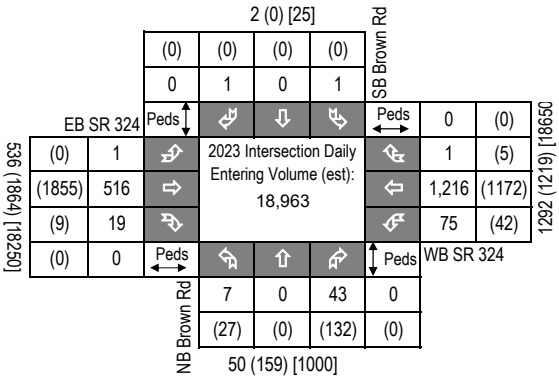
000 = AM Peak Approach Vol

(000) = PM Peak Approach Vol

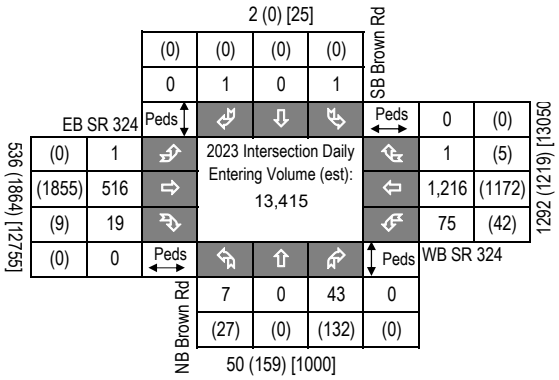
[000] = ADT Volume (Estimate)

Approach Splits: SR 324 - 0.99 / Brown Rd - 0.01

2023 Opening Year Volumes



2023 Design Year Volumes



Introduction: In 2005, SAFETEA-LU established the Highway Safety Improvement Program (HSIP) and mandated that each state prepare a Strategic Highway Safety Plan (SHSP) to prioritize safety funding investments. Intersections quickly became a common component of most states' SHSP emphasis areas and HSIP project lists, including Georgia's SHSP. Intersection Control Evaluation (ICE) policies and procedures represent a traceable and transparent procedure to streamline the evaluation of intersection control alternatives, and further leverage safety advancements for intersection improvements beyond just the safety program. Approximately one-third of all traffic fatalities and roughly seventy five percent of all traffic crashes in Georgia occur at or adjacent to intersections. Accordingly, the Georgia SHSP includes an emphasis on enhancing intersection safety to advance the *Toward Zero Deaths* vision embraced by the Georgia Governor's Office of Highway Safety (GOHS). This ICE tool was developed to support the ICE policy, developed and adopted to help ensure that intersection investments across the entire Georgia highway system are selected, prioritized and implemented with defensible benefits for safety towards those ends.

Tool Goal: The goal of this ICE tool is to provide a simplified and consistent way of importing traffic, safety, cost, environmental impact and stakeholder posture data to assess and quantify intersection control improvement benefits. The tool supports the ICE policy and procedures to provide traceability, transparency, consistency and accountability when identifying and selecting an intersection control solution that both meets project purpose and reflects overall best value in terms of specific performance-based criteria.

Requirements: An ICE is required for any intersection improvement (e.g. new or modified intersection, widening/reconstruction or corridor project, or work accomplished through a driveway or encroachment permit that affects an intersection) where: **1)** the intersection includes at least one roadway designated as a State Route (State Highway System) or as part of the National Highway System; or **2)** the intersection will be designed or constructed using State or Federal funding. In certain circumstances where an ICE would otherwise be required, the requirement may be waived based on appropriate evidence presented with a written request. (See the **"Waiver"** tab to review criteria that may make a project waiver eligible and for instructions to submit a waiver request to the Department). An ICE is not required when the proposed work does not include any changes to the intersection design, involves only routine traffic signal timing and equipment maintenance, or for driveway permits where the driveway is not a new leg to an already existing intersection on either 1) a divided, multi-lane highway with a closed median and only right-in/right-out access or 2) an undivided roadway where the development is not required to construct left and/or right turn lanes (as per the Driveway Manual and District Traffic Engineer).

Two-Stage Process: A complete ICE process consists of two (2) distinct stages, and it is expected that the respective level of effort for completing both stages of ICE will correspond to the magnitude and complexity of the intersection. Prior to starting an ICE, the District Traffic Engineer and/or State Traffic Engineer should be consulted for advice on an appropriate level of effort. The Stage 1 and Stage 2 ICE forms are designed minimize required data inputs using drop-down menu choices and limiting text entry. All fields shaded grey include drop down menu choices and all fields shaded blue require data entry. All other cells in the worksheet are locked.

Stage 1: Screening Decision Record Stage 1 should be conducted early in the project development process and is intended to inform which alternatives are worthy of further evaluation in Stage 2. Stage 1 serves as a screening effort meant to *eliminate* non-competitive options and identify which alternatives merit further considerations based on their practical feasibility. Users should use good engineering judgement in responding to the seven policy questions by selecting "Yes" or "No" in the drop-down boxes. Alternatives should not be summarily eliminated without due consideration, and reasons for eliminating or advancing an alternative should be documented in the "Screening Decision Justification" column.

Stage 2: Alternative Selection Decision Record Stage 2 involves a more detailed and familiar evaluation of the alternatives identified in Stage 1 in order to support the selection of a preferred alternative that may be advanced to detailed design. Stage 2 data entry may require the use of external analysis tools to determine costs, operations and/or safety data that, combined with environmental and stakeholder posture data, form the basis of the ICE evaluation. A separate "CostEst" worksheet tab helps users develop pre-planning-level cost estimates for each Stage 2 alternative evaluated, and a separate Users Guide has been prepared to give guidance on Stage 1 and Stage 2 data entry. Once all data is entered, each alternative is scored and ranked, with the results reported at the bottom of the Stage 2 worksheet to inform on the best of the intersection controls evaluated for project recommendation.

Documentation: A complete ICE document consists of the combination of the outputs from either a completed and signed waiver form or both Stage 1 and Stage 2 worksheets (along with supporting costing and/or environmental documentation), to be included in the approved project Concept Report (or equivalent) or as a stand-alone document.

GDOT ICE STAGE 1: SCREENING DECISION RECORD

ICE Version 2.15 | Revised 07/01/2019

GDOT PI #	N/A
Project Location:	SR 324 @ Brown Rd
Existing Control:	Conventional (Minor Stop)
Prepared by:	NV5
Date:	1/14/2022

Answer "Yes" or "No" to each policy question for each control type to identify which alternatives should be evaluated in the Stage 2 Decision Record; enter justification in the rightmost column

Note: Up to 5 alternatives may be selected and evaluated; Use this ICE Stage 1 to screen 5 or fewer alternatives to evaluate in Stage 2

	Intersection Alternative (see "Intersections" tab for detailed description of intersection/interchange type)	1. Does alternative address the project need in a balanced manner and in scale with the project?	2. Does alternative improve safety performance in terms of reducing severe crashes?	3. Does alternative incorporate safety, convenience and accessibility for pedestrians and/or bicyclists?	4. Does alternative improve (or preserve) traffic operations (congestion, delay, reliability, etc.)?	5. Does alternative appear feasible given the site characteristics, constrains & location context?	6. Does alternative appear feasible with respect to other project factors?	7. Overall feasible alternative (select alternative for further evaluation in Stage 2)?	Screening Decision Justification:
Unsignalized Intersections	Conventional (Minor Stop)	**Yes**	**No**	**No**	**No**	**Yes**	**Yes**	**Yes**	Existing Condition
	Conventional (All-Way Stop)	No	**Yes**	**Yes**	No	No	No	No	>33,000 daily through trips too high for all-way stop control
	Mini Roundabout	No	**Yes**	**Yes**	No	No	No	No	SR324is 4-lanes with median existing
	Single Lane Roundabout	No	**Yes**	**Yes**	No	No	No	No	side street volumes too low <10% thru
	Multilane Roundabout	No	No	**Yes**	No	No	No	No	side street volumes too low <10% thru
	RCUT (stop control)	No	**Yes**	No	No	No	No	No	>35 peak hours left turns from Brown Rd in both total (<1/2% thru volume)
	RIRO w/down stream U-Turn	No	**Yes**	**Yes**	No	No	No	No	thru traffic gaps allow sufficient left turn access from WB SR324 to Brown Rd
	High-T (unsignalized)	No	**Yes**	No	No	No	No	No	existing four approach intersection
	Offset-T Intersections	No	**Yes**	No	No	No	No	No	existing four approach intersection
	Diamond Interch (Stop Control)	No	**Yes**	No	No	No	No	No	not grade separated
	Diamond Interch (RAB Control)	No	**Yes**	No	No	No	No	No	not grade separated
	Add one LT Lane on Brown Rd No RT Lane Improvements	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No	existing LT & RT lanes on SR324,add Brown Rd NB LT lane
	Other unsignalized (provide description):	No	No	No	No	No	No	No	N/A
Signalized Intersections	Traffic Signal	**Yes**	**No**	**Yes**	**No**	**Yes**	**Yes**	**Yes**	Expected to meet MUTCD minimum Warrants hourly volumes in Build
	Median U-Turn (Indirect Left)	No	No	No	No	No	No	No	too turning voliumes do not warrant
	RCUT (signalized)	No	No	No	No	No	No	No	Does not meet MUTCD minimum Warrants hourly volumes
	Displaced Left Turn (CFI)	No	No	No	No	No	No	No	too turning voliumes do not warrant
	Continuous Green-T	No	No	No	No	No	No	No	too turning voliumes do not warrant
	Jughandle	No	No	No	No	No	No	No	too turning voliumes do not warrant
	Quadrant Roadway	No	No	No	No	No	No	No	too turning voliumes do not warrant
	Diamond Interch (Signal Control)	No	No	No	No	No	No	No	not grade separated
	Diverging Diamond	No	No	No	No	No	No	No	not grade separated
	Single Point Interchange	No	No	No	No	No	No	No	not grade separated
	No LT Lane Improvements No RT Lane Improvements	No	No	No	No	No	No	No	existing LT & RT lanes on SR324,add Brown Rd NB LT lane
	Other Signalized (provide description):	No	No	No	No	No	No	No	N/A

= Intersection type selected for more detailed analysis in Stage 2 Alternative Selection Decision Record

GDOT ICE STAGE 2: ALTERNATIVE SELECTION DECISION RECORD

ICE Version 2.15 | Revised 07/01/2019

GDOT PI # (or N/A): N/A
County: Gwinnett
Project Location: SR 324 @ Brown Rd
Existing Intersection Control: Conventional (Minor Stop)

GDOT District: 1 - Gainesville
Area Type: Suburb/Transition

Date: 1/14/2022
Agency/Firm: NV5
Analyst: JP

Type of Analysis: Conventional Non-Safety Funded Project

Opening / Design Year Traffic Operations

Intersection meets signal/AWS warrants?	Meets Signal Warrants	
Traffic Analysis Measure of Effectiveness	Intersection Delay	
Traffic Analysis Software Used	Synchro 10	
Analysis Time Period	AM Peak Hr	PM Peak Hr
2023 Opening Yr No-Build Peak Hr Intersection Delay	87.0 sec	500.0 sec
2023 Opening Yr No-Build Peak Hr Intersection V/C	0.07	1.82
2023 Design Yr No-Build Peak Hr Intersection Delay	87.0 sec	500.0 sec
2023 Design Yr No-Build Peak Hr Intersection V/C ratio	0.07	1.82

Complete Streets Warrants Met?

- ☐ PEDESTRIANS
- ☐ BICYCLES
- ☐ TRANSIT

Crash Type (Crash Data: Enter most recent 5 years of crash data)	Crash Severity: PDO	Injury Crash*	Fatal Crash*	
Angle	0	1	0	13%
Head-On	0	0	0	0%
Rear End	0	0	0	0%
Sideswipe - same	3	1	0	50%
Sideswipe - opposite	0	0	0	0%
Not Collision w/Motor Veh	2	1	0	38%
TOTALS:	5	3	0	8

* Number of crashes resulting in injuries / fatalities, not number of persons

Alternatives Analysis:	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Proposed Control Type/Improvement:	Conventional (Minor Stop)	Traffic Signal	N/A	N/A	N/A
Project Cost: (From CostEst Worksheet)	*Additional description here*	*Add LT bays (2) on Minor ST*			
Construction Cost	$0	$327,000			
ROW Cost	$0	$0			
Environmental Cost	$0	$0			
Reimbursable Utility Cost	$0	$6,000			
Design & Contingency Cost	$0	$114,000			
Cost Adjustment (justification req'd)	0%	0%			
Total Cost	$0	$447,000			
Traffic Operations:					
Traffic Analysis Software Used	Synchro 10	Synchro 10			
Analysis Period	AM Peak Hr / PM Peak Hr	AM Peak Hr / PM Peak Hr			
2023 Design Yr Build Intersection Delay	346.4 sec / 500.0 sec	13.8 sec / 16.6 sec			
2023 Design Yr Build Intersection V/C	1.38 / 5.00	0.80 / 0.88			
Safety Analysis:					
Predefined CRF: PDO	0%	39%			
Predefined CRF: Fatal/Inj	0%	40%			
Predefined CRF Source:	N/A	FHWA Clearinghouse #s 325 / 7984			
User Defined CRF: PDO					
User Defined CRF: Fatal/Inj					
User Defined CRF Source (write in if applicable):					
Environmental Impacts:[1]					
Historic District/Property	None	None			
Archaeology Resources	None	None			
Graveyard	None	None			
Stream	None	None			
Underground Tank/Hazmat	None	None			
Park Land	None	None			
EJ Community	None	None			
Wooded Area	None	None			
Wetland	None	None			
Stakeholder Posture:	*Note: If environmental impact is significant (**RED**), provide justification impact won't jeopardize project delivery using "Env" worksheet*				
Local Community Support	Neutral	Neutral			
GDOT Support	Neutral	Neutral			
Final ICE Stage 2 Score:	-3.7	5.8			
Rank of Control Type Alternatives:	2	1			

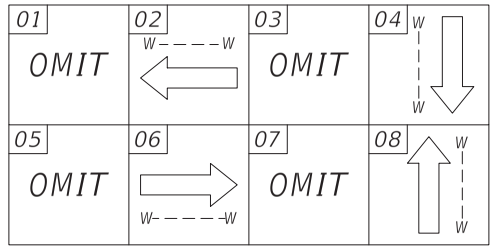
[1] *Environmental impacts are only preliminary estimates; detailed environmental impact documentation will be included with project concept report*

Note: Stage 2 score is not given (shown as "-") if signal or AWS is selected as control type but respective warrants are not met

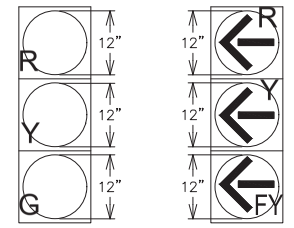
Provide additional comments and/or explain any unique analysis inputs, or results (as necessary):

Attachment "F" – Conceptual Traffic Signal Design

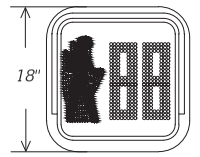
PHASING DIAGRAM

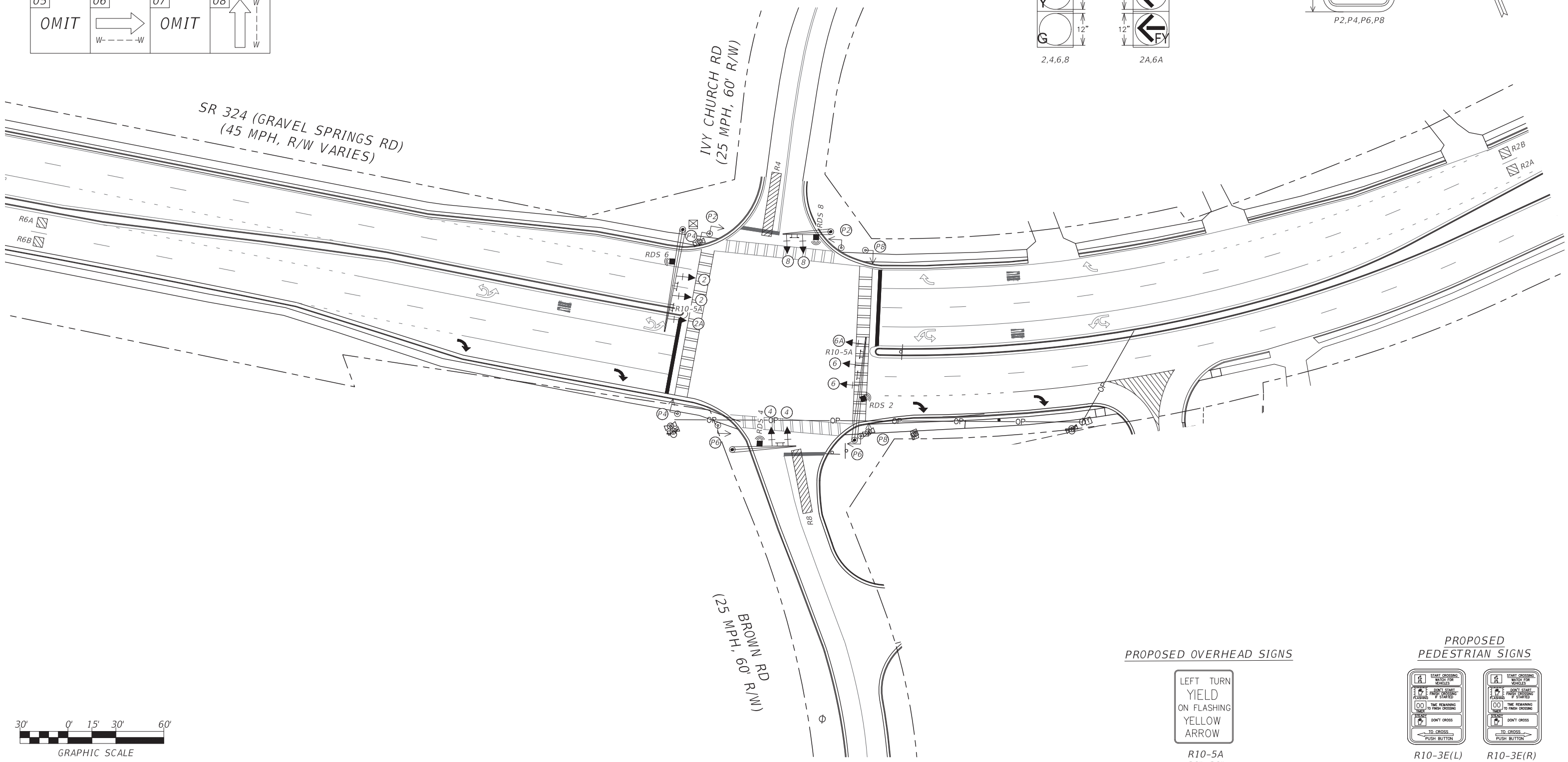


LED SIGNAL HEADS WITH 2" RETRO-REFLECTIVE BORDER ON BACKPLATE



PEDESTRIAN HEADS





PROPOSED OVERHEAD SIGNS

R10-5A
30"x30"

PROPOSED PEDESTRIAN SIGNS

R10-3E(L)
9"x15"

R10-3E(R)
9"x15"

SIGNAL LEGEND

- STRAIN POLE w/ MAST ARM
- PROPOSED PEDESTAL POLE & SIGNAL HEAD
- PROPOSED 3-SECTION SIGNAL HEAD

DETECTION LEGEND

- 6 X 40 RADAR DETECTION ZONE
- 6 X 6 ADVANCE DEVICE RADAR DETECTION ZONE
- RADAR
- CONDUIT, BORED

DATE: 11/08/2021

DESIGNED BY: JMK
DRAWN BY: AMK
CHECKED BY: JMK
SUPERVISED BY: JMK

N|V|5
1255 CANTON ST, SUITE G
ROSWELL, GA 30075
(678) 795-3600
WWW.NV5.COM

REVISION DATES

GEORGIA
DEPARTMENT OF TRANSPORTATION

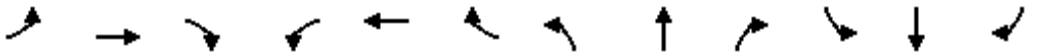
SR 324 (GRAVEL SPRINGS RD)
@ BROWN RD / IVY CHURCH RD
SIGNAL CONCEPT

PROJECT NO. 3121092.01

DRAWING No.
27-01

APPENDIX J

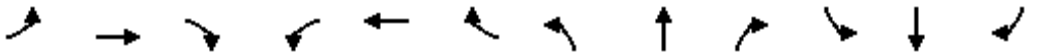
MITIGATION CAPACITY ANALYSIS REPORTS



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	149	0	165	0	0	0	0	1955	91	212	910	0
Future Volume (veh/h)	149	0	165	0	0	0	0	1955	91	212	910	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1841	1900	1885				0	1885	1900	1856	1870	0
Adj Flow Rate, veh/h	154	0	170				0	2015	94	219	938	0
Peak Hour Factor	0.97	0.97	0.97				0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	4	0	1				0	1	0	3	2	0
Cap, veh/h	465	0	220				0	2070	930	290	2673	0
Arrive On Green	0.14	0.00	0.14				0.00	0.58	0.58	0.24	1.00	0.00
Sat Flow, veh/h	3401	0	1610				0	3676	1610	1767	3647	0
Grp Volume(v), veh/h	154	0	170				0	2015	94	219	938	0
Grp Sat Flow(s),veh/h/ln	1700	0	1610				0	1791	1610	1767	1777	0
Q Serve(g_s), s	3.7	0.0	9.2				0.0	48.9	0.8	5.9	0.0	0.0
Cycle Q Clear(g_c), s	3.7	0.0	9.2				0.0	48.9	0.8	5.9	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	465	0	220				0	2070	930	290	2673	0
V/C Ratio(X)	0.33	0.00	0.77				0.00	0.97	0.10	0.75	0.35	0.00
Avail Cap(c_a), veh/h	491	0	233				0	2070	930	290	2673	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.69	0.69	0.00
Uniform Delay (d), s/veh	35.1	0.0	37.5				0.0	18.3	1.3	31.4	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.0	14.1				0.0	14.5	0.2	7.5	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	4.2				0.0	20.3	2.8	4.3	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.6	0.0	51.6				0.0	32.8	1.5	38.9	0.3	0.0
LnGrp LOS	D	A	D				A	C	A	D	A	A
Approach Vol, veh/h		324						2109			1157	
Approach Delay, s/veh		44.0						31.4			7.6	
Approach LOS		D						C			A	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		72.7		17.3	15.7	57.0						
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0						
Max Green Setting (Gmax), s		66.0		12.0	9.0	51.0						
Max Q Clear Time (g_c+I1), s		2.0		11.2	7.9	50.9						
Green Ext Time (p_c), s		7.4		0.1	0.1	0.1						

Intersection Summary												
HCM 6th Ctrl Delay			24.9									
HCM 6th LOS			C									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	293	1	462	0	0	0	0	1460	104	422	1651	0
Future Volume (veh/h)	293	1	462	0	0	0	0	1460	104	422	1651	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900				0	1900	1885	1870	1900	0
Adj Flow Rate, veh/h	305	1	481				0	1521	108	440	1720	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0				0	0	1	2	0	0
Cap, veh/h	1112	1	509				0	1534	679	298	2166	0
Arrive On Green	0.32	0.32	0.32				0.00	0.43	0.43	0.27	1.00	0.00
Sat Flow, veh/h	3510	3	1607				0	3705	1598	1781	3705	0
Grp Volume(v), veh/h	305	0	482				0	1521	108	440	1720	0
Grp Sat Flow(s),veh/h/ln	1755	0	1611				0	1805	1598	1781	1805	0
Q Serve(g_s), s	7.8	0.0	35.0				0.0	50.2	1.4	16.0	0.0	0.0
Cycle Q Clear(g_c), s	7.8	0.0	35.0				0.0	50.2	1.4	16.0	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	1112	0	510				0	1534	679	298	2166	0
V/C Ratio(X)	0.27	0.00	0.95				0.00	0.99	0.16	1.48	0.79	0.00
Avail Cap(c_a), veh/h	1112	0	510				0	1534	679	298	2166	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.33	0.33	0.00
Uniform Delay (d), s/veh	30.7	0.0	40.0				0.0	34.3	1.8	42.4	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	26.7				0.0	21.0	0.5	221.5	1.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	0.0	16.7				0.0	25.0	4.3	25.1	0.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.8	0.0	66.7				0.0	55.3	2.3	263.9	1.0	0.0
LnGrp LOS	C	A	E				A	E	A	F	A	A
Approach Vol, veh/h		787						1629			2160	
Approach Delay, s/veh		52.8						51.8			54.6	
Approach LOS		D						D			D	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		77.0		43.0	21.0	56.0						
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0						
Max Green Setting (Gmax), s		71.0		37.0	15.0	50.0						
Max Q Clear Time (g_c+I1), s		2.0		37.0	18.0	52.2						
Green Ext Time (p_c), s		21.6		0.0	0.0	0.0						

Intersection Summary												
HCM 6th Ctrl Delay			53.3									
HCM 6th LOS			D									

Intersection	
Int Delay, s/veh	50.6

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	5	79	783	3	33	1417	52	2	0	9	83	1	142
Future Vol, veh/h	5	79	783	3	33	1417	52	2	0	9	83	1	142
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	Yield	-	-	Yield	-	-	Yield	-	-	Yield
Storage Length	-	140	-	175	100	-	150	150	-	-	-	-	65
Veh in Median Storage, #	-	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	0	2	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	5	81	807	3	34	1461	54	2	0	9	86	1	146

Major/Minor	Major1				Major2			Minor1			Minor2		
Conflicting Flow All	1461	1461	0	0	807	0	0	1778	2508	404	2105	2508	731
Stage 1	-	-	-	-	-	-	-	979	979	-	1529	1529	-
Stage 2	-	-	-	-	-	-	-	799	1529	-	576	979	-
Critical Hdwy	6.4	4.1	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.5	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	171	469	-	-	827	-	-	53	29	602	~ 30	29	369
Stage 1	-	-	-	-	-	-	-	272	331	-	125	181	-
Stage 2	-	-	-	-	-	-	-	350	181	-	475	331	-
Platoon blocked, %			-	-		-	-						
Mov Cap-1 Maneuver	389	389	-	-	827	-	-	25	22	602	~ 24	22	369
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	25	22	-	~ 24	22	-
Stage 1	-	-	-	-	-	-	-	211	257	-	97	174	-
Stage 2	-	-	-	-	-	-	-	201	174	-	363	257	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.6	0.2	56.4	$ 573.9
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	25	138	389	-	-	827	-	-	24	369
HCM Lane V/C Ratio	0.082	0.067	0.223	-	-	0.041	-	-	3.608	0.397
HCM Control Delay (s)	161.6	33	16.9	-	-	9.5	-	-	$ 1508.6	21
HCM Lane LOS	F	D	C	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	0.2	0.2	0.8	-	-	0.1	-	-	10.8	1.9

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	80.7

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	18	160	1783	3	19	1221	119	4	0	17	69	0	138
Future Vol, veh/h	18	160	1783	3	19	1221	119	4	0	17	69	0	138
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	Yield	-	-	Yield	-	-	Yield	-	-	Yield
Storage Length	-	140	-	175	100	-	150	150	-	-	-	-	65
Veh in Median Storage, #	-	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	0	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	18	163	1819	3	19	1246	121	4	0	17	70	0	141

Major/Minor	Major1				Major2			Minor1			Minor2		
Conflicting Flow All	1246	1246	0	0	1819	0	0	2842	3465	910	2556	3465	623
Stage 1	-	-	-	-	-	-	-	2181	2181	-	1284	1284	-
Stage 2	-	-	-	-	-	-	-	661	1284	-	1272	2181	-
Critical Hdwy	6.4	4.1	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.5	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	235	566	-	-	342	-	-	8	7	281	~ 14	7	434
Stage 1	-	-	-	-	-	-	-	48	85	-	177	238	-
Stage 2	-	-	-	-	-	-	-	423	238	-	180	85	-
Platoon blocked, %			-	-		-	-						
Mov Cap-1 Maneuver	450	450	-	-	342	-	-	~ 4	4	281	~ 9	4	434
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	~ 4	4	-	~ 9	4	-
Stage 1	-	-	-	-	-	-	-	29	51	-	105	225	-
Stage 2	-	-	-	-	-	-	-	270	225	-	101	51	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.7	0.2	$ 613.6	$ 1305
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	4	21	450	-	-	342	-	-	9	434
HCM Lane V/C Ratio	1.02	0.826	0.404	-	-	0.057	-	-	7.823	0.324
HCM Control Delay (s)	$ 1552.5	$ 392.7	18.3	-	-	16.2	-	-	$ 3880.6	17.2
HCM Lane LOS	F	F	C	-	-	C	-	-	F	C
HCM 95th %tile Q(veh)	1.2	2.3	1.9	-	-	0.2	-	-	10.3	1.4

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	647	156	214	1404	4	118	0	153	40	0	25
Future Volume (veh/h)	7	647	156	214	1404	4	118	0	153	40	0	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1870	1900	1796	1885	1900	1470	1900	1693	1900	1900	1900
Adj Flow Rate, veh/h	7	688	166	228	1494	4	126	0	163	43	0	27
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	2	0	7	1	0	29	0	14	0	0	0
Cap, veh/h	226	2004	908	421	2020	908	244	20	215	297	26	134
Arrive On Green	0.56	0.56	0.56	0.56	0.56	0.56	0.25	0.00	0.25	0.25	0.00	0.25
Sat Flow, veh/h	356	3554	1610	621	3582	1610	594	80	872	759	105	542
Grp Volume(v), veh/h	7	688	166	228	1494	4	289	0	0	70	0	0
Grp Sat Flow(s),veh/h/ln	356	1777	1610	621	1791	1610	1546	0	0	1406	0	0
Q Serve(g_s), s	0.8	5.5	2.7	16.6	16.5	0.1	7.3	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	17.3	5.5	2.7	22.1	16.5	0.1	9.1	0.0	0.0	1.8	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.44		0.56	0.61		0.39
Lane Grp Cap(c), veh/h	226	2004	908	421	2020	908	479	0	0	457	0	0
V/C Ratio(X)	0.03	0.34	0.18	0.54	0.74	0.00	0.60	0.00	0.00	0.15	0.00	0.00
Avail Cap(c_a), veh/h	234	2083	944	435	2099	944	650	0	0	610	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	15.1	6.2	5.6	12.2	8.6	5.0	18.3	0.0	0.0	15.6	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.1	0.1	1.3	1.4	0.0	1.2	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	1.2	0.5	1.7	4.0	0.0	3.1	0.0	0.0	0.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.1	6.3	5.7	13.5	10.0	5.0	19.5	0.0	0.0	15.8	0.0	0.0
LnGrp LOS	B	A	A	B	A	A	B	A	A	B	A	A
Approach Vol, veh/h		861			1726			289			70	
Approach Delay, s/veh		6.3			10.4			19.5			15.8	
Approach LOS		A			B			B			B	

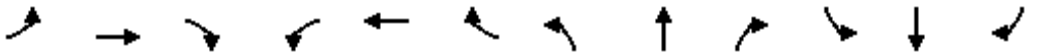
Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	34.8	18.1	34.8	18.1
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	30.0	18.0	30.0	18.0
Max Q Clear Time (g_c+I1), s	24.1	3.8	19.3	11.1
Green Ext Time (p_c), s	4.7	0.3	3.7	1.0

Intersection Summary	
HCM 6th Ctrl Delay	10.2
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	1693	108	140	1237	13	120	1	243	25	1	16
Future Volume (veh/h)	18	1693	108	140	1237	13	120	1	243	25	1	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1885	1900	1900	1885	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	18	1728	110	143	1262	13	122	1	248	26	1	16
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	1	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	267	2344	1053	146	2344	1053	166	10	273	192	18	95
Arrive On Green	0.65	0.65	0.65	0.65	0.65	0.65	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	441	3582	1610	256	3582	1610	481	37	1046	547	69	365
Grp Volume(v), veh/h	18	1728	110	143	1262	13	371	0	0	43	0	0
Grp Sat Flow(s),veh/h/ln	441	1791	1610	256	1791	1610	1564	0	0	980	0	0
Q Serve(g_s), s	2.7	37.9	3.0	39.1	22.1	0.3	23.9	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	24.8	37.9	3.0	77.0	22.1	0.3	27.0	0.0	0.0	3.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.33		0.67	0.60		0.37
Lane Grp Cap(c), veh/h	267	2344	1053	146	2344	1053	449	0	0	305	0	0
V/C Ratio(X)	0.07	0.74	0.10	0.98	0.54	0.01	0.83	0.00	0.00	0.14	0.00	0.00
Avail Cap(c_a), veh/h	267	2344	1053	146	2344	1053	479	0	0	330	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	17.5	13.6	7.5	47.2	10.9	7.1	41.9	0.0	0.0	33.1	0.0	0.0
Incr Delay (d2), s/veh	0.1	1.3	0.0	67.5	0.2	0.0	10.9	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	13.3	0.9	6.9	7.6	0.1	11.8	0.0	0.0	1.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.6	14.8	7.6	114.7	11.1	7.1	52.8	0.0	0.0	33.3	0.0	0.0
LnGrp LOS	B	B	A	F	B	A	D	A	A	C	A	A
Approach Vol, veh/h		1856			1418			371			43	
Approach Delay, s/veh		14.4			21.5			52.8			33.3	
Approach LOS		B			C			D			C	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	82.0	35.7	82.0	35.7
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	76.0	32.0	76.0	32.0
Max Q Clear Time (g_c+I1), s	79.0	5.0	39.9	29.0
Green Ext Time (p_c), s	0.0	0.2	18.6	0.7

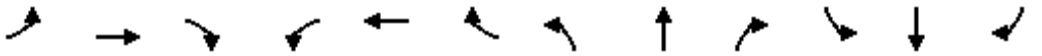
Intersection Summary	
HCM 6th Ctrl Delay	21.2
HCM 6th LOS	C



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	578	91	288	1198	5	12	25	98	78	4	164
Future Volume (veh/h)	13	578	91	288	1198	5	12	25	98	78	4	164
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1870	1900	1885	1885	1900	1767	1900	1826	1900	1900	1900
Adj Flow Rate, veh/h	14	615	97	306	1274	5	13	27	104	83	4	174
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	2	0	1	1	0	9	0	5	0	0	0
Cap, veh/h	65	1000	453	938	1845	829	215	333	1211	341	6	277
Arrive On Green	0.04	0.28	0.28	0.27	0.51	0.51	0.18	0.18	0.18	0.18	0.18	0.18
Sat Flow, veh/h	1810	3554	1610	3483	3582	1610	1139	1900	2723	1279	36	1579
Grp Volume(v), veh/h	14	615	97	306	1274	5	13	27	104	83	0	178
Grp Sat Flow(s),veh/h/ln	1810	1777	1610	1742	1791	1610	1139	1900	1362	1279	0	1616
Q Serve(g_s), s	0.4	8.2	2.5	3.9	14.7	0.1	0.6	0.7	0.0	3.2	0.0	5.6
Cycle Q Clear(g_c), s	0.4	8.2	2.5	3.9	14.7	0.1	6.2	0.7	0.0	3.8	0.0	5.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Lane Grp Cap(c), veh/h	65	1000	453	938	1845	829	215	333	1211	341	0	283
V/C Ratio(X)	0.22	0.61	0.21	0.33	0.69	0.01	0.06	0.08	0.09	0.24	0.00	0.63
Avail Cap(c_a), veh/h	198	2271	1029	1272	3204	1440	431	694	1728	583	0	590
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.7	17.1	15.0	16.0	10.0	6.5	23.8	18.9	8.8	20.5	0.0	20.9
Incr Delay (d2), s/veh	1.7	0.6	0.2	0.2	0.5	0.0	0.1	0.1	0.0	0.4	0.0	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	2.8	0.8	1.3	3.9	0.0	0.1	0.3	0.3	0.9	0.0	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.3	17.7	15.3	16.2	10.5	6.5	23.9	19.0	8.8	20.9	0.0	23.2
LnGrp LOS	C	B	B	B	B	A	C	B	A	C	A	C
Approach Vol, veh/h		726			1585			144			261	
Approach Delay, s/veh		17.6			11.6			12.1			22.5	
Approach LOS		B			B			B			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.0	33.2		14.6	19.7	20.4		14.6				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	48.0		19.0	19.0	34.0		19.0				
Max Q Clear Time (g_c+I1), s	2.4	16.7		7.6	5.9	10.2		8.2				
Green Ext Time (p_c), s	0.0	10.5		1.0	0.8	4.2		0.3				

Intersection Summary			
HCM 6th Ctrl Delay		14.2	
HCM 6th LOS		B	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	1107	121	494	837	4	152	22	721	12	11	17
Future Volume (veh/h)	16	1107	121	494	837	4	152	22	721	12	11	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1885	1900	1900	1870	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	16	1118	122	499	845	4	154	22	728	12	11	17
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	0	1	0	0	2	0	0	0	0	0	0	0
Cap, veh/h	399	1282	577	664	1161	526	428	469	1235	271	166	257
Arrive On Green	0.22	0.36	0.36	0.19	0.33	0.33	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	1810	3582	1610	3510	3554	1610	1404	1900	2834	723	673	1040
Grp Volume(v), veh/h	16	1118	122	499	845	4	154	22	728	12	0	28
Grp Sat Flow(s),veh/h/ln	1810	1791	1610	1755	1777	1610	1404	1900	1417	723	0	1713
Q Serve(g_s), s	0.5	21.2	3.8	9.8	15.3	0.1	6.9	0.6	14.2	0.9	0.0	0.9
Cycle Q Clear(g_c), s	0.5	21.2	3.8	9.8	15.3	0.1	7.8	0.6	14.2	1.6	0.0	0.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.61
Lane Grp Cap(c), veh/h	399	1282	577	664	1161	526	428	469	1235	271	0	423
V/C Ratio(X)	0.04	0.87	0.21	0.75	0.73	0.01	0.36	0.05	0.59	0.04	0.00	0.07
Avail Cap(c_a), veh/h	399	1328	597	916	1952	884	448	496	1276	281	0	447
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.3	21.8	16.2	27.9	21.7	16.5	24.0	20.9	15.6	21.5	0.0	21.0
Incr Delay (d2), s/veh	0.0	6.5	0.2	2.3	0.9	0.0	0.5	0.0	0.7	0.1	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	8.8	1.3	3.9	5.7	0.0	2.1	0.3	4.0	0.2	0.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.4	28.3	16.4	30.2	22.5	16.6	24.5	20.9	16.3	21.6	0.0	21.1
LnGrp LOS	C	C	B	C	C	B	C	C	B	C	A	C
Approach Vol, veh/h		1256			1348			904			40	
Approach Delay, s/veh		27.0			25.4			17.8			21.2	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	21.1	28.8		23.0	18.8	31.1		23.0				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	39.0		18.0	18.0	26.0		18.0				
Max Q Clear Time (g_c+I1), s	2.5	17.3		3.6	11.8	23.2		16.2				
Green Ext Time (p_c), s	0.0	5.5		0.1	1.0	1.9		0.8				

Intersection Summary												
HCM 6th Ctrl Delay			24.0									
HCM 6th LOS			C									