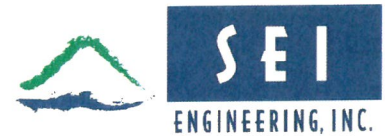


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Traffic Impact Study

Proposed Residential Townhome Development
Rosebud Road
City of Snellville, Georgia

November 29, 2024



in collaboration with

ACAMPORA TRAFFIC, LLC



Traffic Impact Study

Proposed Residential Townhome Development

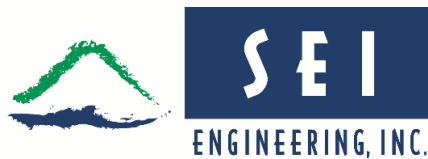
Rosebud Road

City of Snellville, Georgia

study prepared for:

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Summary

This study assesses the traffic impact of a proposed residential townhome development in the City of Snellville. The site is located along the west side of Rosebud Road, south of US 78, and the project will include 67 attached residential townhomes. Vehicular access will be provided at one location on Rosebud Road. An interparcel connection is anticipated to the mixed-use development adjacent to the north. The following are the findings and recommendations of this study:

1. The existing analysis reveals generally acceptable operating conditions at the study intersections. It is recommended that an exclusive right turn lane be added on the eastbound approach of US 78 at Rosebud Road. Protected/permissive signal phasing should be added for the eastbound left turn lane. These recommendations for the existing condition are system improvements which are needed whether or not the proposed development is built.
2. Traffic volume growth in this area has been positive and moderately-low and this is expected to continue into the future, with an annual growth rate of 2.0% used in developing future volume projections. In addition to the background growth, the specific trips from the planned adjacent mixed-use development to the north were added into the no-build and future volume projections.
3. The no-build analysis shows a moderate deterioration in operations due to anticipated growth in this area. The potential need for additional capacity at the US 78 / Rosebud Road intersection was identified for the no-build condition. High delays are also expected exiting the Kroger access and the planned mixed-development access but no mitigation for those delays was identified.
4. The proposed townhomes will generate 29 a.m. peak hour new trips, 36 p.m. peak hour new trips, and 460 weekday new trips.
5. The future analysis with the addition of the proposed townhomes' trips reveals slight deteriorations in operations at the study intersections. No off-site mitigation, other than the deceleration lane at the project access, is recommended as a consequence of the proposed development.
6. A southbound right turn lane is required on Rosebud Road at the project access. A northbound left turn lane is not necessary.
7. One entering and one exiting lane should be provided in the project access. The exiting approach should be controlled by stop sign and accompanying stop bar.
8. The project civil/site engineer should comply with all applicable design standards including sight distances, turn radii, turn lane storage and taper lengths, driveway widths, islands, angles with the adjacent roadways, and grades.

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Introduction

This study assesses the traffic impact of a proposed residential townhome development in the City of Snellville, Georgia. The site is located along the west side of Rosebud Road, south of US 78, as shown in Figure 1. The project will include 67 attached residential townhomes. Vehicular access will be provided at one location on Rosebud Road. An interparcel connection is anticipated to the mixed-use development adjacent to the north.

The purpose of this traffic impact study is to determine existing traffic operating conditions in the vicinity of the proposed development, project future traffic volumes, assess the impact of the subject development, then develop conclusions and recommendations to mitigate the project traffic impact and ensure safe and efficient existing and future traffic conditions in the vicinity of the project.



Figure 1 – Site Location Map

Existing Traffic Conditions

Existing traffic operating conditions in the vicinity of the proposed townhomes development were assessed. The following is a description of existing transportation facilities, traffic volumes, and intersection operations.

Description of Existing Roadways

Rosebud Road is a two lane minor arterial (Gwinnett County designation) that begins to the north at Grayson Highway, has a signalized intersection at US 78, passes the subject site, then continues to the south to SR 20 where it changes name to Miller Bottom Road and continues south. The terrain is level to very gently rolling near the site the posted speed limit is 45 mph. In 2023 the Georgia DOT recorded an Annual Average Daily Traffic (AADT) volume of 13,800 vehicles per day (vpd) with 4% trucks on Rosebud Road south of Brushy Fork Road.

US 78 an urban principal arterial (Georgia DOT designation) that provides east-west mobility. There are two through lanes in each direction and a center two way left turn lane (TWLTL). The terrain is gently rolling-to-rolling and the posted speed limit is 55 mph in this vicinity. There are exclusive left and right turn lanes at most major intersections including at Rosebud Road, with the exception of an eastbound exclusive right turn lane. In 2023 the Georgia DOT recorded an AADT volume of 38,400 vpd with 4% trucks on US 78 west of Brooks Drive.

Pedestrian, Bicycle, and Transit Accessibility

Rosebud Road has a rural cross section south of the site, with no shoulder, sidewalks, or curb-and-gutter. Beginning at the site frontage and to the north there is curb-and gutter on both sides of the road and a sidewalk on the east side of the road. The signalized intersection of US 78 at Rosebud Road has crosswalks and pedestrian signals on three approaches. There are no dedicated bicycle lanes in the vicinity of the site. There is no regularly scheduled mass transit service in the vicinity of the site.

Existing Traffic Volumes

Full turning movement peak hour traffic volume counts were collected at the following intersections in the vicinity of the site:

1. US 78 at Rosebud Road
2. Rosebud Road at Kroger Retail Center Access
3. Rosebud Road at Brushy Fork Road

The counts were collected on Wednesday, March 15, 2023, from 7:00 a.m. to 9:00 a.m. and from 4:00 p.m. to 6:00 p.m. Area schools were in session on the day on which the counts were recorded. The locations of the traffic counts are presented in Figure 2.



Figure 2 – Traffic Volume Count Locations

From the intersection turning movement count data, the highest four consecutive 15-minute interval volumes at each intersection, during each time period, were determined. These volumes make up the 2023 weekday a.m. and p.m. peak hour traffic volumes at each intersection. Historic traffic volume growth trends were reviewed in this area (presented later in this report in Table 2. Based on these trends, the 2023 counted volumes were increased by 2.0% to produce current, 2024 volumes at each study intersection. The 2024 volumes are shown in Figure 3. The raw count data is found in Appendix A.

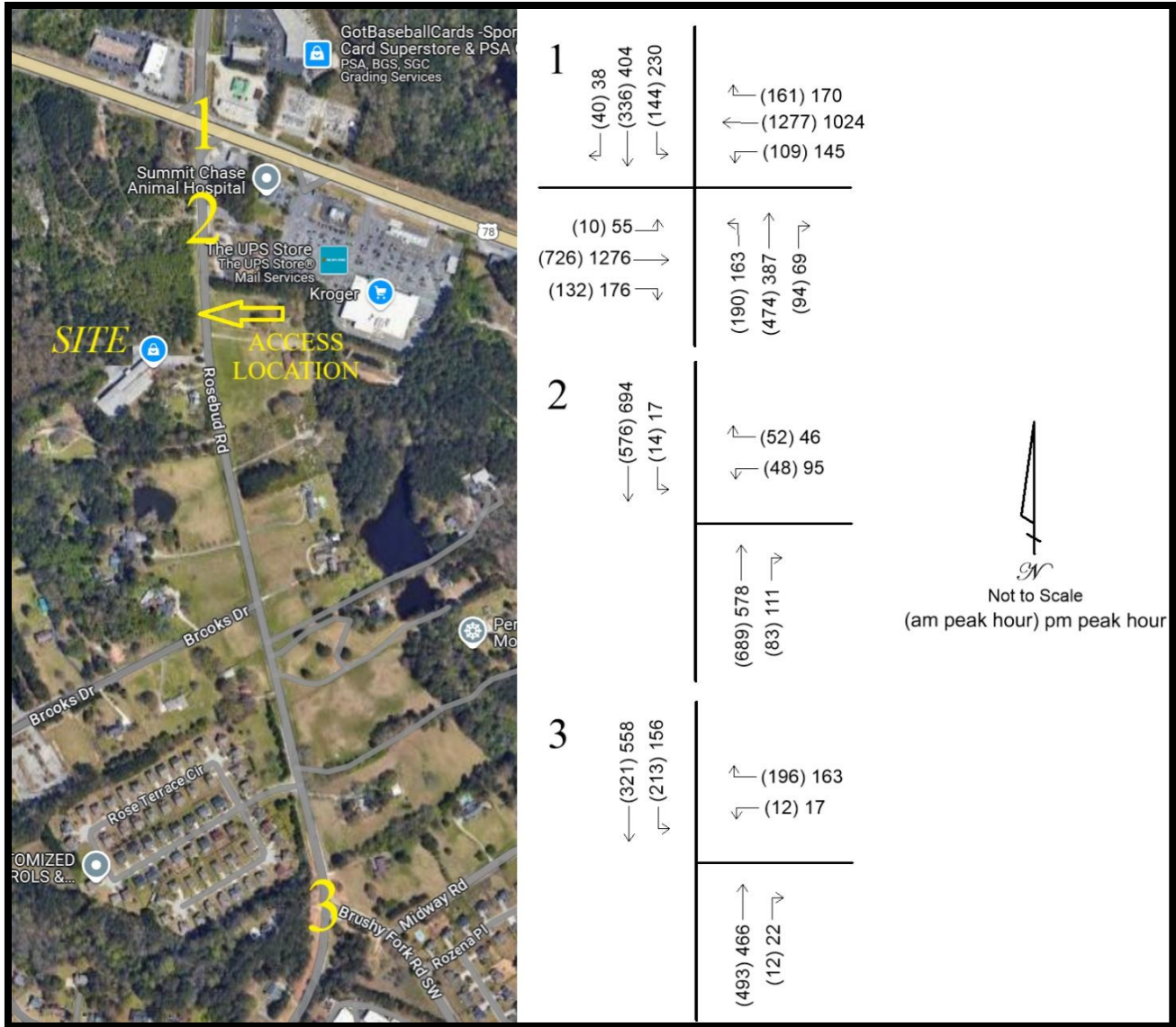


Figure 3 – 2024 Weekday A.M. and P.M. Peak Hour Traffic Volumes

Existing Intersection Operations

Existing traffic operations were analyzed at the counted intersections using Synchro software, version 12, in accordance with the methodology presented in the Transportation Research Board’s 2022 *Highway Capacity Manual (HCM 7)*. This methodology is presented in Appendix B. The results of the analysis are shown in Table 1. Computer printouts containing detailed results of the existing analysis are located in Appendix C. Levels of service and delays are provided for each overall intersection and for each controlled approach or movement. Locations that operate unacceptably (LOS E or LOS F) are presented in bold type.

Table 1 – Existing Intersection Operations

Intersection / Approach	A.M. Peak Hour		P.M. Peak Hour	
	LOS	Delay (s/veh)	LOS	Delay (s/veh)
1. US 78 at Rosebud Road (signal)	C	33.2	D	46.9
northbound approach	D	35.0	E	63.5
southbound approach	C	33.7	E	55.7
eastbound approach	C	34.0	E	58.0
westbound approach	C	32.0	C	22.5
2. Rosebud Road at Kroger Retail Center Access (side street stop)	A	2.9	A	8.9
southbound left turn	A	9.5	A	9.1
westbound approach	E	38.0	F	87.2
3. Rosebud Road at Brushy Fork Road (roundabout)	A	8.9	A	8.9
northbound approach	B	10.4	A	8.4
southbound approach	A	7.2	A	9.6
westbound approach	A	9.2	A	7.4

The analysis of the existing conditions reveals heavy major street volumes, but generally acceptable traffic operations. The following is a discussion of operations at each intersection:

The US 78 / Rosebud Road intersection operates acceptably overall in both a.m. and p.m. peaks. However, in the p.m., three of the four approaches operate at LOS E. An exclusive right turn lane should be added on the eastbound approach on US 78. There is a granite block retaining wall along that frontage which will likely need to be removed. However, the eastbound right turn volume is significant enough (132 vehicles in the a.m. and 176 vehicles in the p.m.), coupled with very heavy eastbound through volumes (726 vehicles in the a.m. and 1276 vehicles in the p.m.) to justify adding this lane. The eastbound left turn movement should receive protected/permissive signal phasing. Currently the other three approaches have protected/permissive phasing but the eastbound approach is signaled as permissive only.

The westbound approach exiting the Kroger retail center at Rosebud Road fails in both time periods. This is not unusual on side street stop sign controlled approaches at busy roads such as Rosebud Road. Mitigation would require a change in control to a signal or prohibition of exiting left turns. The volumes do not appear to satisfy any volume-based signal warrants and this intersection is located in close proximity to the signal at US 78. Therefore, signalization is improbable at this intersection. Prohibition of exiting left turns from the Kroger access merits some consideration since those left turns must cross the Rosebud Road through lanes plus the southern end of the northbound left turn lane on Rosebud Road at US 78. However, prohibiting those exiting left turns would simply shift that demand elsewhere which would most likely mean turning left from the Kroger center onto US 78, then turning left from westbound US 78 to southbound Rosebud Road, to pass the same location. Those additional turn

movements and vehicle miles of travel are less desirable than the moderately high delays incurred by the vehicles exiting at the Rosebud Road access. Therefore, no change is recommended.

The roundabout intersection of Rosebud Road at Brushy Fork Road operates acceptably. Therefore, no changes are recommended at that intersection in the existing condition.

Recommendations for the existing condition are system improvements, which are needed whether or not the proposed townhomes are built.

No-Build Traffic Conditions

A 2029 no-build condition was developed. This represents the traffic conditions that will exist in the future at the anticipated date of the build-out of the proposed townhomes, but not including the project's trips. The purpose of the analysis of this condition is to isolate the traffic impacts of the proposed development from background growth in volumes that are expected to occur in the area while the project is under construction.

In order to develop no-build volumes, background growth factors were developed using historic Georgia DOT 24-hour traffic counts that were collected in this area for the years 2019 through 2023, as shown in Table 2.

Table 2 – Historic Georgia DOT Traffic Volume Counts and Annual Growth Rates

Year	Rosebud S of Brushy Fork	Annual Growth	US 78 W of Brooks	Annual Growth	Rosebud N of Cooper	Annual Growth
Station ID	135-0516		135-0058		135-0518	
2019	12,500		38,800		15,700	
2020	11,500	-8.0%	35,500	-8.5%	14,400	-8.3%
2021	13,100	13.9%	38,400	8.2%	15,600	8.3%
2022	13,600	3.8%	39,900	3.9%	13,800	-11.5%
2023	13,800	1.5%	39,700	-0.5%	14,000	1.4%
<i>avg growth</i>		<i>2.0%</i>		<i>0.5%</i>		<i>-2.3%</i>

Growth in the area has been low-to-moderate. All three count locations experienced a decrease from 2019 to 2020, which is considered an anomaly due to the COVID-19 pandemic. The growth in the subsequent year primarily consisted of a return to pre-pandemic volumes. The latest year of data showed low growth of 1.4% to 1.5% at two count stations on Rosebud Road and a slight decrease of -0.5% on US 78. Based on the growth trends identified in Table 2 and taking the pandemic into consideration, a moderately-low 2.0% annual growth factor was applied to the existing volumes to project the future no-build volumes. The growth factor was applied for five years, for a total of 10.4% growth that will occur while the proposed townhomes are under construction. The existing (2024) traffic volumes were increased by that 10.4% growth factor.

In addition to the general background growth in volumes, the trips for a specific development were also added. The project is the multi-use development planned for the tract immediately adjacent to the north of the subject townhomes development. This adjacent development will consist of 57,000 square feet of retail village, 300 multi-family residential units, and 25 residential townhomes. The project will have two accesses on US 78, the eastern of which will align with the Midway Station retail access on the north side of US 78, and two accesses on Rosebud Road, the northern of which will align with the access to the Kroger retail center on the east side of Rosebud Road and the southern of which will be located just north of the proposed townhomes access. The trips that will be generated by this development were obtained from the traffic impact study that was prepared for that project in March 2023.

The existing (2024) volumes, increased by the background growth factor, plus the specific trips from the adjacent development, make up the 2029 no-build traffic volumes that will be on the roadway network in the future when the proposed townhomes project is completely developed, but excluding the townhomes' trips.

Programmed and Planned Transportation Infrastructure Improvements

The Georgia DOT projects website and the Gwinnett County Destination 2040 Comprehensive Transportation Plan were researched for planned (anticipated) or programmed (funded and scheduled) transportation improvement projects. The following project was identified:

Georgia DOT Project #0007853 – US 78 from Scenic Highway to Walton County Line – This project is listed as a long range reconstruction / rehabilitation project, with a construction year listed as 2051. No additional project information is provided.

No-Build Intersection Operations

The no-build condition includes the no-build traffic volumes and the existing lane configurations and control at all study intersections. These were entered into the Synchro 12 model and the 2029 no-build traffic operations were analyzed at the study intersections in accordance with the HCM 7 methodology. The results of the no-build analysis are shown in Table 3. Computer printouts containing detailed results of the no-build analysis are located in Appendix D. Levels of service and delays are provided for each overall intersection and for each controlled approach or movement. Locations that operate unacceptably (LOS E or LOS F) are presented in bold type.

Table 3 – No-Build Intersection Operations

Intersection / Approach	A.M. Peak Hour		P.M. Peak Hour	
	LOS	Delay (s/veh)	LOS	Delay (s/veh)
1. US 78 at Rosebud Road (signal)	D	44.6	<i>E</i>	71.0
northbound approach	D	54.9	<i>F</i>	95.1
southbound approach	D	42.3	<i>F</i>	93.4
eastbound approach	D	37.8	<i>F</i>	86.8
westbound approach	D	44.7	C	31.2
2. Rosebud Road at Kroger Retail Center Access / planned mixed-use development access (side street stop)	B	13.2	<i>F</i>	68.6
northbound left turn	A	9.1	A	9.8
southbound left turn	A	9.8	A	9.4
eastbound left turn/through	<i>F</i>	102.1	<i>F</i>	150.6
eastbound right turn	B	13.4	C	16.2
westbound approach	<i>F</i>	150.2	<i>F</i>	NA*
3. Rosebud Road at Brushy Fork Road (roundabout)	B	10.5	B	10.7
northbound approach	B	12.6	B	10.1
southbound approach	A	8.1	B	11.5
westbound approach	B	11.0	A	8.8

*NA – limits of methodology exceeded; results not reasonable

The no-build analysis reveals modest deteriorations in operations due to the expected background growth in volumes. The following is a discussion at each intersection:

The entire US 78 / Rosebud Road intersection will begin to fail by the no-build p.m. The eastbound exclusive right turn lane and left turn protected/permissive phasing recommended in the existing analysis will continue to be necessary and will allow for generally acceptable operations. However, additional capacity will eventually be needed at this intersection, which could entail adding through lanes on US 78 or Rosebud Road. Potential additional capacity is discussed more later in this report.

In the no-build condition, the Rosebud Road / Kroger access intersection will become the location of the northern access to the adjacent mixed-use development. The side street approaches (exiting the Kroger and exiting the mixed-use development) will both fail. This is not unexpected due to the heavy through volumes on Rosebud Road. A change in control to a signal or roundabout would be needed to mitigate the high side street delays, but both are considered improbable to receive County approval.

The roundabout intersection of Rosebud Road at Brushy Fork Road will continue to operate acceptably in the no build condition. Therefore, no changes are recommended at this intersections in the no-build condition.

Recommendations for the no-build condition are system improvements, which are needed whether or not the proposed townhomes are built.

Project Traffic Characteristics

This section describes the anticipated traffic characteristics of the proposed townhomes development, including a site description, how much traffic the project will generate, and where that traffic will travel.

Project Description

The project will include 67 attached residential townhomes. Vehicular access will be provided at one location on Rosebud Road. An interparcel connection is anticipated to the townhomes portion at the southern end of the mixed-use development adjacent to the north. The site plan is presented in Figure 4.

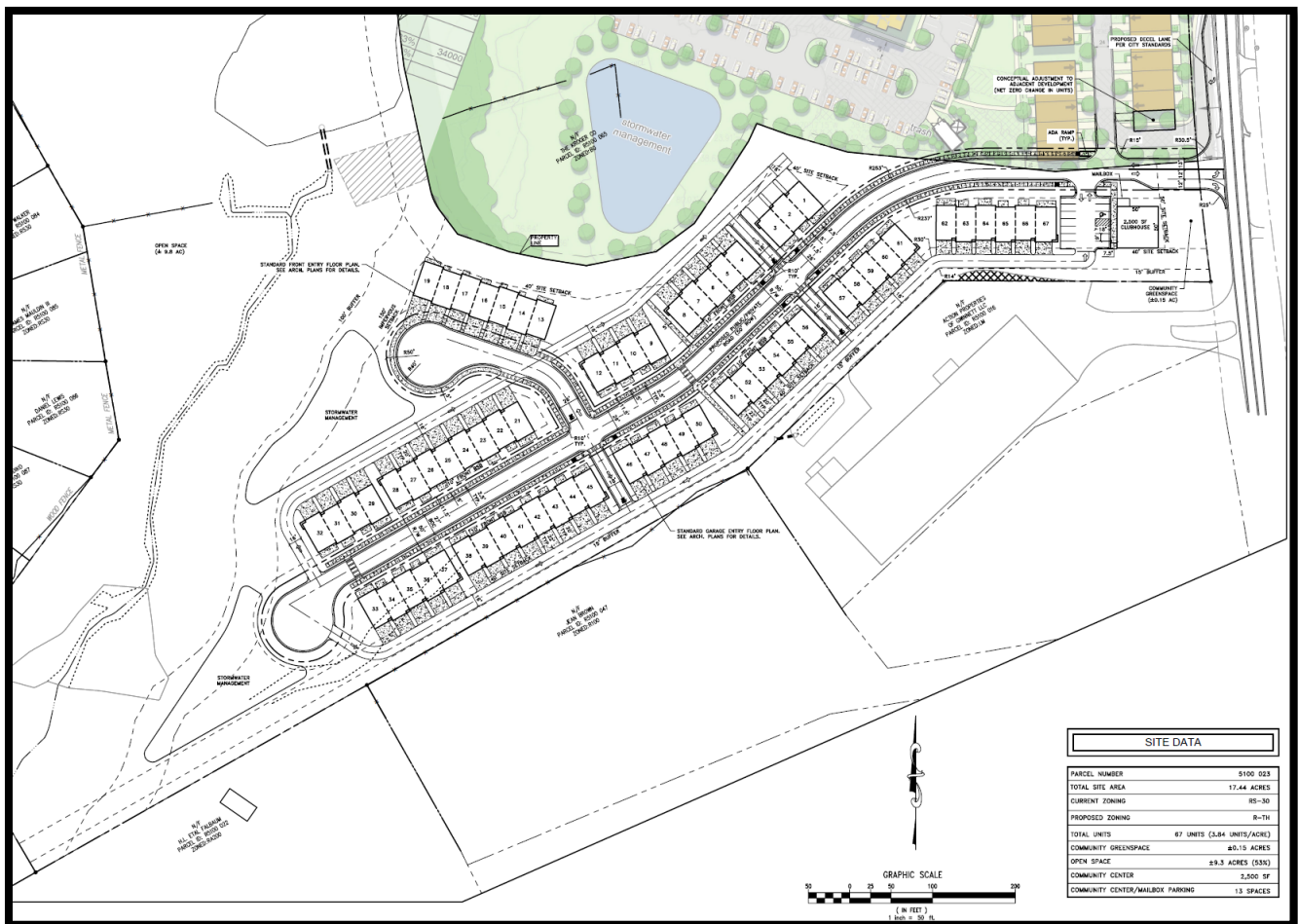


Figure 4 – Site Plan for Proposed Townhomes

Trip Generation

Trip generation is an estimate of the number of entering and exiting vehicular trips that will be generated by the proposed development. The volume of traffic that will be generated by the townhomes was calculated using the equations in the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 11th Edition (the current edition). ITE Land Use 215 – Single-Family Attached Housing was chosen as representative of the project. The trip generation for the project is presented in Table 4.

Table 4 – Rosebud Road Townhomes Trip Generation

Land Use	ITE Code	Size	A.M. Peak Hour			P.M. Peak Hour			24-Hour		
			In	Out	Total	In	Out	Total	In	Out	Total
Townhomes	215	67 homes	7	22	29	21	15	36	230	230	460

The proposed townhomes will generate 29 a.m. peak hour new trips, 36 p.m. peak hour new trips, and 460 weekday new trips.

Trip Distribution and Assignment

The trip distribution percentages indicate what proportion of the project’s trips will travel to and from various directions. The trip distribution percentages for the townhomes were developed based on the locations and proximity of likely trip origins and destinations including regional employment centers, retail and offices in the area, nearby schools, other regional trip attractors, and the major routes of travel in the area. A small number of trips from the adjacent townhomes can be expected to use the interparcel connection to access Rosebud Road. Conversely, a small percentage of the proposed townhomes’ trips can be expected to travel to and from the retail portion of the adjacent development using the interparcel connection. The net effect of this sharing of trips is anticipated to be minimal and, therefore, no specific trips were added or removed from the project access to account for the interparcel connection. The project trips, shown in Table 4, were assigned to the roadway network based on the distribution percentages. The trip distribution percentages and the a.m. and p.m. peak hour trips expected to be generated by the proposed townhomes are shown in Figure 5. Appendix A contains traffic volume worksheets that show the trips for each land use, at each intersection.

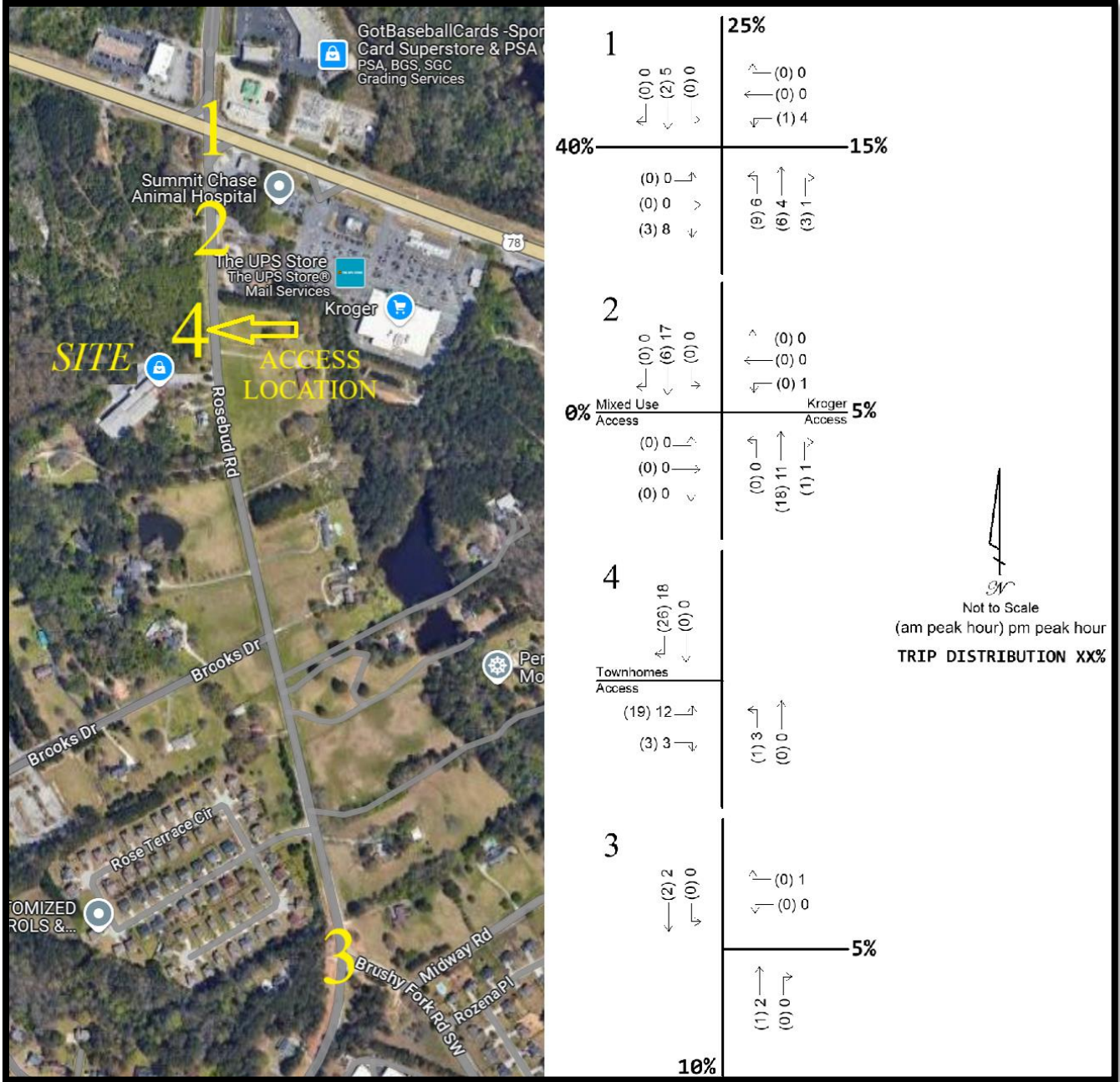


Figure 5 – Weekday A.M. and P.M. Peak Hour Project Trips and Distribution Percentages

Future Traffic Conditions

The future volumes consist of the no-build volumes plus the trips that will be generated by the proposed townhomes. The future volumes are shown in Figure 6.

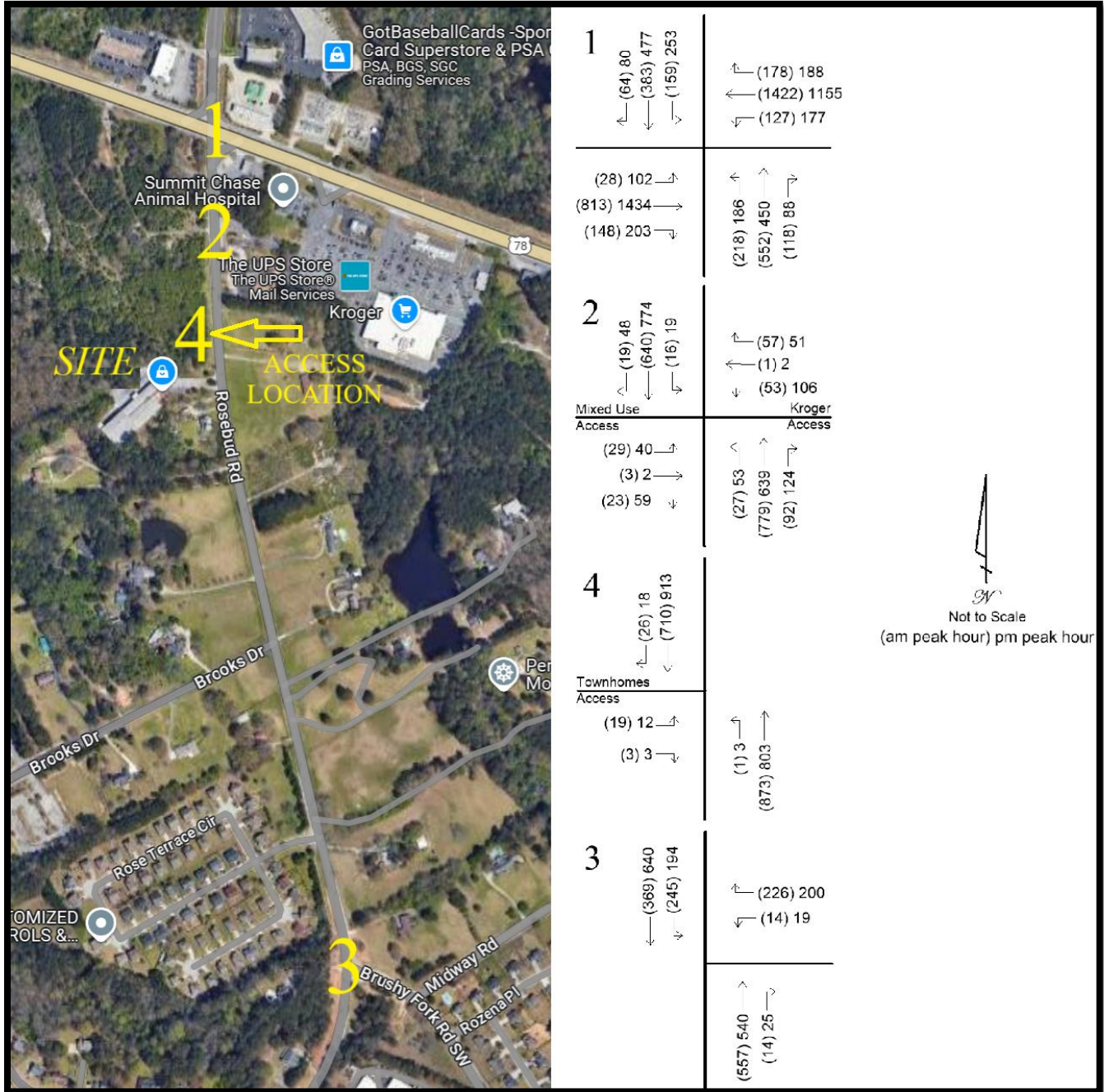


Figure 6 – Future Weekday A.M. and P.M. Peak Hour Volumes

Auxiliary Lane Requirements at Project Access

Rosebud Road falls under the jurisdiction of Gwinnett County. Therefore, in order to determine if a southbound right turn lane or a northbound left turn lane are required on Rosebud Road at the project access, the requirements set forth in the Gwinnett County Unified Development Ordinance, Section 900-30. Project Access Improvements, were evaluated. The Code states:

900-30.1 Project access improvements for single-family detached, single-family attached, and duplex residential subdivisions.

- A. When property that abuts upon an existing or proposed County road is to be developed or redeveloped as a single-family detached, attached, or duplex subdivision and the County street will provide access to the property, project access improvements to the County road (deceleration lanes, turn lanes, etc.) shall be provided by the developer as required herein.
- B. A deceleration lane shall be required to be provided at each project driveway or subdivision street entrance that is provided street access to a Minor Collector Street or Major Thoroughfare. In the event a street has an existing or proposed median, and the developer desires to construct a median break to serve the subdivision, a left turn lane leading to the median break shall be required to be provided by the developer if approved by the Department of Transportation and shall meet the standards contained herein. [details regarding median breaks removed, not applicable]. Meeting the spacing criteria is not, in itself, an indication that median openings will be allowed.
- C. Deceleration lanes shall have a length of 200 feet, with an additional 50 foot taper length, a pavement width of 12 feet (exclusive of curb and gutter) and shall be provided with curb and gutter. Additional right-of-way to accommodate the deceleration lane and an 11 foot shoulder measured from back of curb shall be dedicated by the developer to Gwinnett County at no cost. Associated stormwater infrastructure as deemed necessary by the construction of the deceleration lane shall also be required.
- D. A left turn lane shall be provided into each project driveway or subdivision street that accesses a Minor Collector or Major Thoroughfare in accordance with the Department of Transportation's "Criteria and Guidelines for Left Turn Lanes."
- E. Other project access improvements may be required by the Department upon the recommendation of the Department of Transportation in order to ensure adequate site access, pedestrian access, convenience and safety to the motoring public.
- F. The developer shall be responsible for the relocation of public or private utilities and stormwater infrastructure, as may be occasioned by the required Project Access Improvements.

Rosebud Road is minor arterial and, therefore, according to the Code, a southbound right turn lane is required on Rosebud Road at the project access and this study agrees with that requirement.

In order to determine the need for a northbound left turn lane, the standards for providing those lanes were reviewed in Gwinnett County DOT’s *Criteria and Guidelines for Left Turn Lanes*. Table 1 in that standard, which provides the criteria for left turn lanes for residential developments, is reproduced below as Table 5.

Table 5 – Gwinnett County’s Left Turn Lane Criteria for Residential Developments

Gwinnett County – Residential Developments *
Left Turn Lane Criteria

TABLE I

Posted Speed Limit (mph)	2 Lane Routes -----ADT-----		More Than 2 Lanes on Main Road -----ADT-----	
	<6000	>=6000	<10,000	>=10,000
30 to 35	120 Lots	75 Lots	160 Lots	120 Lots
40 to 50	100 Lots	65 Lots	130 Lots	100 Lots
>= 55	75 lots	55 Lots	100 Lots	75 Lots

* Zoning Districts R-XX(X)

For a two lane road with a posted speed limit of 45 mph and an ADT greater than 6,000 vpd (13,800 vpd on Rosebud Road in 2023), the number of lots above which a left turn lane is required is 100 lots. The proposed project consists of 67 homes. This is below the 100 lot threshold. Therefore, a northbound left turn lane is not required on Rosebud Road at the project access and this study agrees with this requirement. It is also noted that the majority of project trips will be oriented to and from the north on Rosebud Road, such that the northbound left turn volume entering the site from the south is projected at only one (1) vehicle in the a.m. peak hour and three (3) vehicles in the p.m. peak hour, reinforcing the conclusion that a left turn lane is unnecessary.

It is recommended that the project access include one entering lane and one exiting lane. The exiting approach should be controlled by side street stop sign and accompanying stop bar.

Future Intersection Operations

An operational analysis was performed for the anticipated future project build-out at the study intersections and the project access using Synchro 12 software in accordance with the HCM 7 methodology. Table 6 presents the results of the future analysis. Computer printouts containing detailed results of the future analysis are located in Appendix E. Levels of service and delays are provided for each overall intersection and for each controlled approach or movement. Locations that operate unacceptably (LOS E or LOS F) are presented in bold type.

Table 6 – Future Intersection Operations

Intersection / Approach	A.M. Peak Hour		P.M. Peak Hour	
	LOS	Delay (s/veh)	LOS	Delay (s/veh)
1. US 78 at Rosebud Road (signal)	D	45.3	<i>E</i>	73.5
northbound approach	<i>E</i>	57.0	<i>F</i>	92.8
southbound approach	D	44.4	<i>F</i>	97.4
eastbound approach	D	38.1	<i>F</i>	91.5
westbound approach	D	44.7	C	32.4
2. Rosebud Road at Kroger Retail Center Access / planned mixed-use development access (side street stop)	B	14.3	<i>F</i>	74.7
northbound left turn	A	9.1	A	9.9
southbound left turn	A	9.9	A	9.4
eastbound left turn/through	<i>F</i>	110.3	<i>F</i>	166.5
eastbound right turn	B	13.4	C	16.5
westbound approach	<i>F</i>	166.1	<i>F</i>	NA*
3. Rosebud Road at Brushy Fork Road (roundabout)	B	10.4	B	10.7
northbound approach	B	13.1	B	10.2
southbound approach	A	7.1	B	11.6
westbound approach	B	11.1	A	8.9
4. Rosebud Road at Townhomes Access (side street stop)	A	0.7	A	0.6
northbound left turn (entering townhomes)	A	9.3	A	10.0
eastbound approach (exiting townhomes)	<i>E</i>	43.4	<i>E</i>	47.1

*NA – limits of methodology exceeded; results not reasonable

The future analysis revealed slight increases in delays, with generally the same failing locations as the no-build condition. The following is a discussion at each intersection:

The US 78 / Rosebud Road intersection will continue to fail in the future. The eastbound exclusive right turn lane and left turn protected/permissive phasing recommended in the existing analysis will continue to be necessary. However, as noted in the no-build analysis, additional capacity will be needed for acceptable future operations. As one possibility, an additional through lane on US 78 in each direction was tested, and the results are reported in Table 7. A widening on US 78 is a major infrastructure project and it is beyond the scope of this traffic impact study for a small private development to recommend such a project. This study identifies that additional capacity is currently needed and that need will increase as volumes increase. The widening of US 78 is identified as one potential way to achieve that needed capacity.

The Rosebud Road / Kroger access intersection will continue to see high delays on the side street stop sign controlled approaches. As noted in the no-build analysis, signalization or a roundabout may merit consideration,

but the future volumes still appear to make a weak case for signalization and a roundabout is unlikely to be approved at this private access.

The roundabout at the Rosebud Road / Brushy Fork Road intersection will continue to operate well and no changes are recommended at this location for the future condition.

The townhomes access on Rosebud Road will experience LOS E on the exiting approach, but movements on Rosebud Road will operate acceptably. As with other side street stop sign controlled approaches at busy thoroughfares such as Rosebud Road, high side street delays are not uncommon. Mitigation would require a change in control to signalization or a roundabout. The side street volumes are insufficient to warrant signalization and a roundabout is unlikely to be approved for this low volume private access. Because the overall intersection will operate acceptably, the side street will operate at LOS E and not LOS F, and a change in control is improbable, no mitigation is identified for this access other than the addition of the required southbound right turn lane on Rosebud Road at this access.

Table 7 shows the future intersection operations without and with the mitigation identified in this report.

Table 7 – Future Intersection Operations Without and With Mitigation

Intersection / Approach	A.M. Peak Hour				P.M. Peak Hour			
	No Mitigation		With Mitigation		No Mitigation		With Mitigation	
	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)
1. US 78 at Rosebud Rd (signal)	D	45.3	D	35.0	<i>E</i>	73.5	D	35.3
northbound approach	<i>E</i>	57.0	D	37.1	<i>F</i>	92.8	D	36.4
southbound approach	D	44.4	C	32.1	<i>F</i>	97.4	D	35.2
eastbound approach	D	38.1	C	27.6	<i>F</i>	91.5	D	39.5
westbound approach	D	44.7	D	39.0	C	32.4	C	30.2

Discussion of Results and Recommendations

This study assesses the traffic impact of a proposed residential townhome development in the City of Snellville. The site is located along the west side of Rosebud Road, south of US 78, and the project will include 67 attached residential townhomes. Vehicular access will be provided at one location on Rosebud Road. An interparcel connection is anticipated to the mixed-use development adjacent to the north. The following are the findings and recommendations of this study:

1. The existing analysis reveals generally acceptable operating conditions at the study intersections. It is recommended that an exclusive right turn lane be added on the eastbound approach of US 78 at Rosebud Road. Protected/permissive signal phasing should be added for the eastbound left turn lane. These recommendations for the existing condition are system improvements which are needed whether or not the proposed development is built.
2. Traffic volume growth in this area has been positive and moderately-low and this is expected to continue into the future, with an annual growth rate of 2.0% used in developing future volume projections. In addition to the background growth, the specific trips from the planned adjacent mixed-use development to the north were added into the no-build and future volume projections.
3. The no-build analysis shows a moderate deterioration in operations due to anticipated growth in this area. The potential need for additional capacity at the US 78 / Rosebud Road intersection was identified for the no-build condition. High delays are also expected exiting the Kroger access and the planned mixed-development access but no mitigation for those delays was identified.
4. The proposed townhomes will generate 29 a.m. peak hour new trips, 36 p.m. peak hour new trips, and 460 weekday new trips.
5. The future analysis with the addition of the proposed townhomes' trips reveals slight deteriorations in operations at the study intersections. No off-site mitigation, other than the deceleration lane at the project access, is recommended as a consequence of the proposed development.
6. A southbound right turn lane is required on Rosebud Road at the project access. A northbound left turn lane is not necessary.
7. One entering and one exiting lane should be provided in the project access. The exiting approach should be controlled by stop sign and accompanying stop bar.
8. The project civil/site engineer should comply with all applicable design standards including sight distances, turn radii, turn lane storage and taper lengths, driveway widths, islands, angles with the adjacent roadways, and grades.

Appendix A

Traffic Count Data and Volume Worksheets

Rosebud Road Townhomes Traffic Impact Study

City of Snellville, Georgia

November 2024

Intersection: 1. US 78 at Rosebud Road

Weekday A.M. Peak Hour

	Northbound Rosebud Road				Southbound Rosebud Road				Eastbound US 78				Westbound US 78			
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Counted Volumes (Wednesday, March 15, 2023 7:30-8:30)	186	465	92	743	141	329	39	509	10	712	129	851	107	1252	158	1517
Adjustment to November 2024	2.0%	2.0%	2.0%		2.0%	2.0%	2.0%		2.0%	2.0%	2.0%		2.0%	2.0%	2.0%	
November 2024 Volumes	190	474	94	758	144	336	40	519	10	726	132	868	109	1277	161	1547
Total Annual Background Growth	10.4%	10.4%	10.4%		10.4%	10.4%	10.4%		10.4%	10.4%	10.4%		10.4%	10.4%	10.4%	
US 78 at Rosebud Mixed Use Trips	0	22	11	33	0	11	20	31	17	11	0	28	6	12	0	18
2029 No-Build Volumes	209	546	115	870	159	381	64	604	28	813	145	986	126	1422	178	1726
Proposed Rosebud Townhomes Trips	9	6	3	18	0	2	0	2	0	0	3	3	1	0	0	1
Build Volumes	218	552	118	888	159	383	64	606	28	813	148	989	127	1422	178	1727

Weekday P.M. Peak Hour

	Northbound Rosebud Road				Southbound Rosebud Road				Eastbound US 78				Westbound US 78			
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Counted Volumes (Wednesday, March 15, 2023 5:00-6:00)	160	379	68	607	225	396	37	658	54	1251	173	1478	142	1004	167	1313
Adjustment to November 2024	2.0%	2.0%	2.0%		2.0%	2.0%	2.0%		2.0%	2.0%	2.0%		2.0%	2.0%	2.0%	
November 2024 Volumes	163	387	69	619	230	404	38	671	55	1276	176	1508	145	1024	170	1339
Total Annual Background Growth	10.4%	10.4%	10.4%		10.4%	10.4%	10.4%		10.4%	10.4%	10.4%		10.4%	10.4%	10.4%	
US 78 at Rosebud Mixed Use Trips	0	19	10	29	0	26	38	64	41	25	0	66	13	24	0	37
2029 No-Build Volumes	180	446	87	713	253	472	80	805	102	1434	195	1730	173	1155	188	1516
Proposed Rosebud Townhomes Trips	6	4	1	11	0	5	0	5	0	0	8	8	4	0	0	4
Build Volumes	186	450	88	724	253	477	80	810	102	1434	203	1738	177	1155	188	1520

Rosebud Road Townhomes Traffic Impact Study

City of Snellville, Georgia

November 2024

Intersection: 2. Rosebud Road at Kroger Access / US 78 at Rosebud Mixed Use Access

Weekday A.M. Peak Hour	Northbound Rosebud Road				Southbound Rosebud Road				Eastbound Mixed Use Access				Westbound Kroger Access			
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Counted Volumes (Wednesday, March 15, 2023 7:45-8:45)		675	81	756	14	565		579					47		51	98
Adjustment to November 2024		2.0%	2.0%		2.0%	2.0%							2.0%		2.0%	
November 2024 Volumes		689	83	771	14	576		591					48		52	100
Total Annual Background Growth		10.4%	10.4%		10.4%	10.4%							10.4%		10.4%	
US 78 at Rosebud Mixed Use Trips	27	1	0	28	0	-2	19	17	29	3	23	55	0	1	0	1
2029 No-Build Volumes	27	761	91	879	16	634	19	669	29	3	23	55	53	1	57	111
Proposed Rosebud Townhomes Trips	0	18	1	19	0	6	0	6	0	0	0	0	0	0	0	0
Build Volumes	27	779	92	898	16	640	19	675	29	3	23	55	53	1	57	111

Weekday P.M. Peak Hour	Northbound Rosebud Road				Southbound Rosebud Road				Eastbound Mixed Use Access				Westbound Kroger Access			
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Counted Volumes (Wednesday, March 15, 2023 4:45-5:45)		567	109	676	17	680		697					93		45	138
Adjustment to November 2024		2.0%	2.0%		2.0%	2.0%							2.0%		2.0%	
November 2024 Volumes		578	111	690	17	694		711					95		46	141
Total Annual Background Growth		10.4%	10.4%		10.4%	10.4%							10.4%		10.4%	
US 78 at Rosebud Mixed Use Trips	53	-10	0	43	0	-9	48	39	40	2	59	101	0	2	0	2
2029 No-Build Volumes	53	628	123	804	19	757	48	824	40	2	59	101	105	2	51	157
Proposed Rosebud Townhomes Trips	0	11	1	12	0	17	0	17	0	0	0	0	1	0	0	1
Build Volumes	53	639	124	816	19	774	48	841	40	2	59	101	106	2	51	158

Rosebud Road Townhomes Traffic Impact Study
City of Snellville, Georgia

November 2024

Intersection: 3. Rosebud Road at Brushy Fork Road

Weekday A.M. Peak Hour	Northbound Rosebud Road			Southbound Rosebud Road			Westbound Brushy Fork Road		
	T	R	Tot	L	T	Tot	L	R	Tot
Counted Volumes (Wednesday, March 15, 2023 7:45-8:45)	483	12	495	209	315	524	12	192	204
Adjustment to November 2024	2.0%	2.0%		2.0%	2.0%		2.0%	2.0%	
November 2024 Volumes	493	12	505	213	321	534	12	196	208
Total Annual Background Growth	10.4%	10.4%		10.4%	10.4%		10.4%	10.4%	
US 78 at Rosebud Mixed Use Trips	12	0	12	9	12	21	0	10	10
2029 No-Build Volumes	556	14	569	244	367	611	14	226	240
Proposed Rosebud Townhomes Trips	1	0	1	1	2	3	0	0	0
Build Volumes	557	14	570	245	369	614	14	226	240

Weekday P.M. Peak Hour	Northbound Rosebud Road			Southbound Rosebud Road			Westbound Brushy Fork Road		
	T	R	Tot	L	T	Tot	L	R	Tot
Counted Volumes (Wednesday, March 15, 2023 5:00-6:00)	457	22	479	153	547	700	17	160	177
Adjustment to November 2024	2.0%	2.0%		2.0%	2.0%		2.0%	2.0%	
November 2024 Volumes	466	22	489	156	558	714	17	163	181
Total Annual Background Growth	10.4%	10.4%		10.4%	10.4%		10.4%	10.4%	
US 78 at Rosebud Mixed Use Trips	23	0	23	21	22	43	0	19	19
2029 No-Build Volumes	538	25	562	193	638	831	19	199	218
Proposed Rosebud Townhomes Trips	2	0	2	1	2	3	0	1	1
Build Volumes	540	25	564	194	640	834	19	200	219

Rosebud Road Townhomes Traffic Impact Study
City of Snellville, Georgia

November 2024

Intersection: 4. Rosebud Road at Townhomes Access

Weekday A.M. Peak Hour

	Northbound Rosebud Road			Southbound Rosebud Road			Eastbound Townhomes Access		
	L	T	Tot	T	R	Tot	L	R	Tot
Counted Volumes (Wednesday, March 15, 2023 7:45-8:45)		756	756	612		612			
Adjustment to November 2024		2.0%		2.0%					
November 2024 Volumes		771	771	624		624			
Total Annual Background Growth		10.4%		10.4%					
US 78 at Rosebud Mixed Use Trips		22	22	21	20	41			
2029 No-Build Volumes		873	873	710	20	730			
Proposed Rosebud Townhomes Trips	1	0	1	0	6	6	19	3	22
Build Volumes	1	873	874	710	26	736	19	3	22

Weekday P.M. Peak Hour

	Northbound Rosebud Road			Southbound Rosebud Road			Eastbound Townhomes Access		
	L	T	Tot	T	R	Tot	L	R	Tot
Counted Volumes (Wednesday, March 15, 2023 4:45-5:45)		676	676	773		773			
Adjustment to November 2024		2.0%		2.0%					
November 2024 Volumes		690	690	788		788			
Total Annual Background Growth		10.4%		10.4%					
US 78 at Rosebud Mixed Use Trips		42	42	43		43			
2029 No-Build Volumes		803	803	913		913			
Proposed Rosebud Townhomes Trips	3	0	3	0	18	18	12	3	15
Build Volumes	3	803	806	913	18	931	12	3	15

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TMC Data
 US 78 @ Rosebud Rd
 Snellville, GA
 7-9 AM | 4-6 PM

File Name : 47570003
 Site Code : 47570003
 Start Date : 3/15/2023
 Page No : 1

Groups Printed- Cars, Buses and Trucks

Start Time	Rosebud Rd Northbound					Rosebud Rd Southbound					US 78 Eastbound					US 78 Westbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
07:00 AM	25	85	20	0	130	26	56	13	0	95	9	170	15	0	194	29	286	32	0	347	766
07:15 AM	38	125	15	0	178	31	79	10	0	120	4	147	21	0	172	17	308	42	0	367	837
07:30 AM	47	107	29	0	183	27	59	13	0	99	5	183	37	0	225	20	391	35	0	446	953
07:45 AM	48	136	16	0	200	35	84	7	0	126	1	175	21	0	197	21	297	53	0	371	894
Total	158	453	80	0	691	119	278	43	0	440	19	675	94	0	788	87	1282	162	0	1531	3450
08:00 AM	48	113	26	0	187	39	88	9	0	136	1	197	36	0	234	36	291	39	0	366	923
08:15 AM	43	109	21	0	173	40	98	10	0	148	3	157	35	0	195	30	273	31	0	334	850
08:30 AM	55	112	25	0	192	30	70	9	0	109	4	182	39	0	225	36	267	34	0	337	863
08:45 AM	42	105	21	0	168	39	77	12	0	128	2	155	29	0	186	28	258	31	0	317	799
Total	188	439	93	0	720	148	333	40	0	521	10	691	139	0	840	130	1089	135	0	1354	3435
*** BREAK ***																					
04:00 PM	28	100	9	0	137	39	98	9	0	146	9	317	34	0	360	28	222	38	0	288	931
04:15 PM	32	113	9	0	154	47	95	12	0	154	14	331	33	0	378	34	235	45	0	314	1000
04:30 PM	47	105	11	0	163	62	90	9	0	161	12	318	31	0	361	27	218	37	0	282	967
04:45 PM	32	92	17	0	141	48	92	9	0	149	17	307	36	0	360	32	220	42	0	294	944
Total	139	410	46	0	595	196	375	39	0	610	52	1273	134	0	1459	121	895	162	0	1178	3842
05:00 PM	41	93	12	0	146	62	106	11	0	179	12	316	44	0	372	35	249	44	0	328	1025
05:15 PM	44	96	21	0	161	56	97	9	0	162	10	311	36	0	357	31	258	44	0	333	1013
05:30 PM	39	82	18	0	139	50	92	10	0	152	15	316	50	0	381	35	255	40	0	330	1002
05:45 PM	36	108	17	0	161	57	101	7	0	165	17	308	43	0	368	41	242	39	0	322	1016
Total	160	379	68	0	607	225	396	37	0	658	54	1251	173	0	1478	142	1004	167	0	1313	4056
Grand Total	645	1681	287	0	2613	688	1382	159	0	2229	135	3890	540	0	4565	480	4270	626	0	5376	14783
Apprch %	24.7	64.3	11	0		30.9	62	7.1	0		3	85.2	11.8	0		8.9	79.4	11.6	0		
Total %	4.4	11.4	1.9	0	17.7	4.7	9.3	1.1	0	15.1	0.9	26.3	3.7	0	30.9	3.2	28.9	4.2	0	36.4	

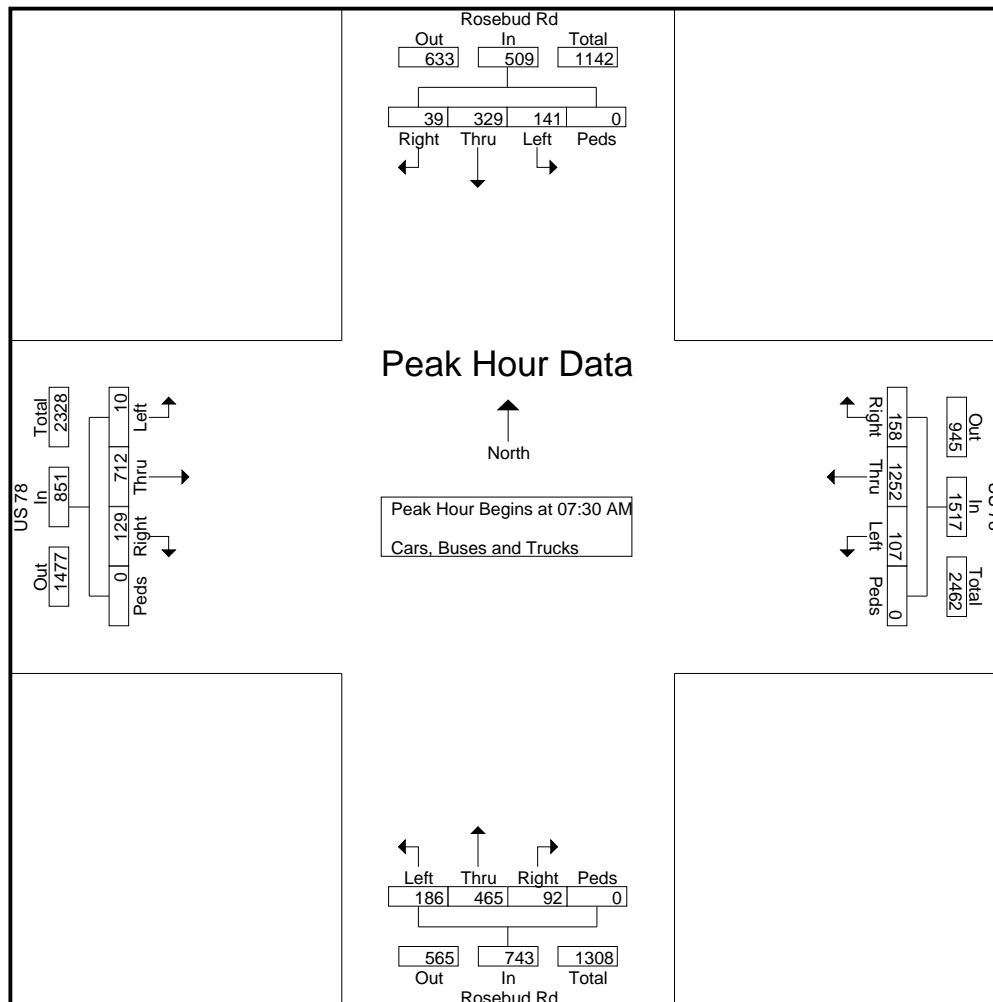
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TMC Data
 US 78 @ Rosebud Rd
 Snellville, GA
 7-9 AM | 4-6 PM

File Name : 47570003
 Site Code : 47570003
 Start Date : 3/15/2023
 Page No : 2

Start Time	Rosebud Rd Northbound					Rosebud Rd Southbound					US 78 Eastbound					US 78 Westbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. 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	47	107	29	0	183	27	59	13	0	99	5	183	37	0	225	20	391	35	0	446	953
07:45 AM	48	136	16	0	200	35	84	7	0	126	1	175	21	0	197	21	297	53	0	371	894
08:00 AM	48	113	26	0	187	39	88	9	0	136	1	197	36	0	234	36	291	39	0	366	923
08:15 AM	43	109	21	0	173	40	98	10	0	148	3	157	35	0	195	30	273	31	0	334	850
Total Volume	186	465	92	0	743	141	329	39	0	509	10	712	129	0	851	107	1252	158	0	1517	3620
% App. Total	25	62.6	12.4	0		27.7	64.6	7.7	0		1.2	83.7	15.2	0		7.1	82.5	10.4	0		
PHF	.969	.855	.793	.000	.929	.881	.839	.750	.000	.860	.500	.904	.872	.000	.909	.743	.801	.745	.000	.850	.950



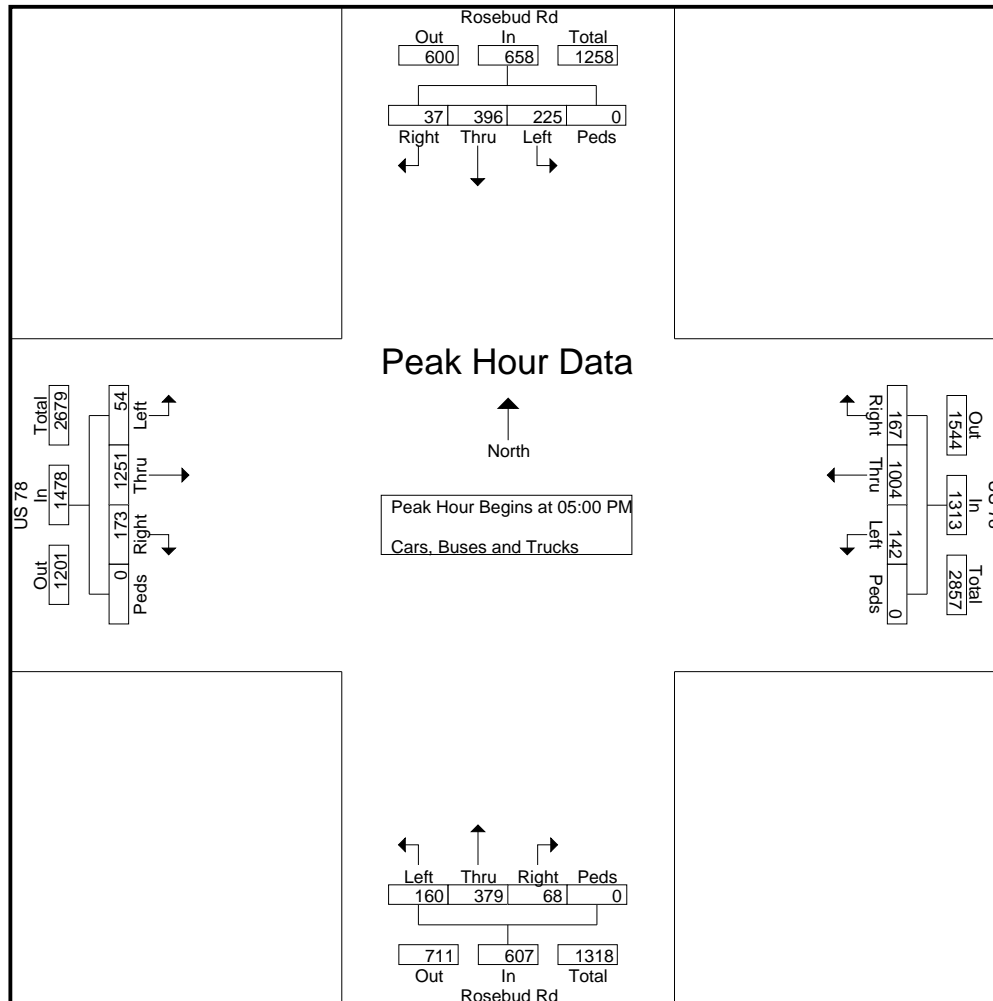
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TMC Data
 US 78 @ Rosebud Rd
 Snellville, GA
 7-9 AM | 4-6 PM

File Name : 47570003
 Site Code : 47570003
 Start Date : 3/15/2023
 Page No : 3

Start Time	Rosebud Rd Northbound					Rosebud Rd Southbound					US 78 Eastbound					US 78 Westbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. 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	41	93	12	0	146	62	106	11	0	179	12	316	44	0	372	35	249	44	0	328	1025
05:15 PM	44	96	21	0	161	56	97	9	0	162	10	311	36	0	357	31	258	44	0	333	1013
05:30 PM	39	82	18	0	139	50	92	10	0	152	15	316	50	0	381	35	255	40	0	330	1002
05:45 PM	36	108	17	0	161	57	101	7	0	165	17	308	43	0	368	41	242	39	0	322	1016
Total Volume	160	379	68	0	607	225	396	37	0	658	54	1251	173	0	1478	142	1004	167	0	1313	4056
% App. Total	26.4	62.4	11.2	0		34.2	60.2	5.6	0		3.7	84.6	11.7	0		10.8	76.5	12.7	0		
PHF	.909	.877	.810	.000	.943	.907	.934	.841	.000	.919	.794	.990	.865	.000	.970	.866	.973	.949	.000	.986	.989



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TMC Data
 Rosebud Rd @ Kroger Retail Drwy
 Snellville, GA
 7-9 AM | 4-6 PM

File Name : 47570004
 Site Code : 47570004
 Start Date : 3/15/2023
 Page No : 1

Groups Printed- Cars, Buses and Trucks

Start Time	Rosebud Rd Northbound					Rosebud Rd Southbound					Private Drwy Eastbound					Kroger Retail Drwy Westbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
07:00 AM	0	146	8	0	154	1	94	0	0	95	0	0	0	0	0	3	0	5	0	8	257
07:15 AM	0	150	9	0	159	0	97	0	0	97	0	0	0	0	0	8	0	8	0	16	272
07:30 AM	0	167	11	0	178	2	119	0	0	121	0	0	0	0	0	7	0	6	0	13	312
07:45 AM	0	180	19	0	199	3	128	0	0	131	0	0	0	0	0	8	0	14	0	22	352
Total	0	643	47	0	690	6	438	0	0	444	0	0	0	0	0	26	0	33	0	59	1193
08:00 AM	0	149	17	0	166	4	152	0	0	156	0	0	0	0	0	17	0	11	0	28	350
08:15 AM	0	175	24	0	199	4	147	0	0	151	0	0	0	0	0	12	0	12	0	24	374
08:30 AM	0	171	21	0	192	3	138	0	0	141	0	0	1	0	1	10	0	14	0	24	358
08:45 AM	0	163	14	0	177	3	132	0	0	135	0	0	0	0	0	11	0	7	0	18	330
Total	0	658	76	0	734	14	569	0	0	583	0	0	1	0	1	50	0	44	0	94	1412
*** BREAK ***																					
04:00 PM	0	134	16	0	150	3	160	0	0	163	0	0	0	0	0	17	0	11	0	28	341
04:15 PM	0	146	21	0	167	5	163	0	0	168	0	0	0	0	0	19	0	10	0	29	364
04:30 PM	0	148	19	0	167	4	156	0	0	160	0	0	0	0	0	15	0	12	0	27	354
04:45 PM	0	139	30	0	169	4	163	0	0	167	0	0	0	0	0	18	0	11	0	29	365
Total	0	567	86	0	653	16	642	0	0	658	0	0	0	0	0	69	0	44	0	113	1424
05:00 PM	0	142	24	0	166	5	178	0	0	183	0	0	0	0	0	28	0	12	0	40	389
05:15 PM	0	147	27	0	174	5	175	0	0	180	0	0	0	0	0	22	0	13	0	35	389
05:30 PM	0	139	28	0	167	3	164	0	0	167	0	0	0	0	0	25	0	9	0	34	368
05:45 PM	1	145	20	0	166	5	147	0	0	152	0	0	0	0	0	22	0	11	0	33	351
Total	1	573	99	0	673	18	664	0	0	682	0	0	0	0	0	97	0	45	0	142	1497
Grand Total	1	2441	308	0	2750	54	2313	0	0	2367	0	0	1	0	1	242	0	166	0	408	5526
Apprch %	0	88.8	11.2	0		2.3	97.7	0	0		0	0	100	0		59.3	0	40.7	0		
Total %	0	44.2	5.6	0	49.8	1	41.9	0	0	42.8	0	0	0	0	0	4.4	0	3	0	7.4	

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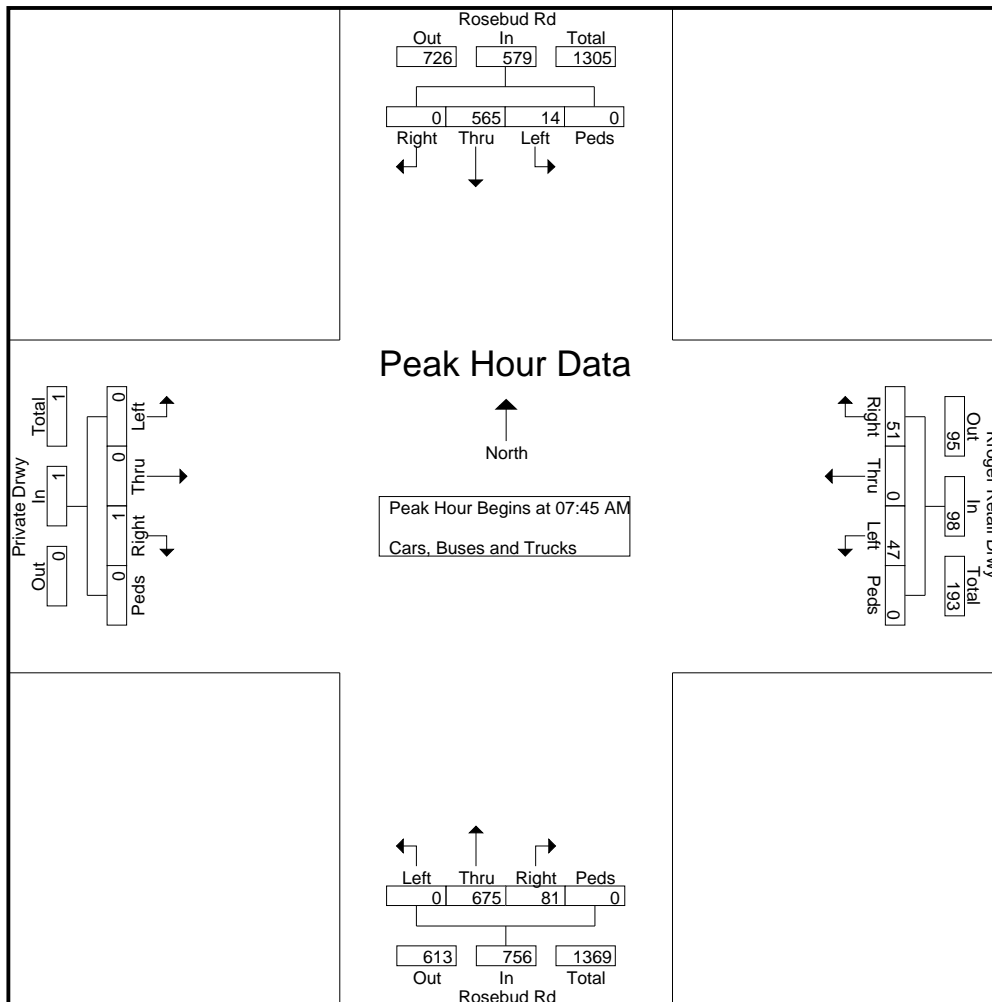
TMC Data
 Rosebud Rd @ Kroger Retail Drwy
 Snellville, GA
 7-9 AM | 4-6 PM

File Name : 47570004
 Site Code : 47570004
 Start Date : 3/15/2023
 Page No : 2

Start Time	Rosebud Rd Northbound					Rosebud Rd Southbound					Private Drwy Eastbound					Kroger Retail Drwy Westbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
07:45 AM	0	180	19	0	199	3	128	0	0	131	0	0	0	0	0	8	0	14	0	22	352
08:00 AM	0	149	17	0	166	4	152	0	0	156	0	0	0	0	0	17	0	11	0	28	350
08:15 AM	0	175	24	0	199	4	147	0	0	151	0	0	0	0	0	12	0	12	0	24	374
08:30 AM	0	171	21	0	192	3	138	0	0	141	0	0	1	0	1	10	0	14	0	24	358
Total Volume	0	675	81	0	756	14	565	0	0	579	0	0	1	0	1	47	0	51	0	98	1434
% App. Total		89.3	10.7				97.6						.250	.000	.250	.691	.000	.911	.000	.875	.959
PHF	.000	.938	.844	.000	.950	.875	.929	.000	.000	.928	.000	.000	.250	.000	.250	.691	.000	.911	.000	.875	.959

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:45 AM



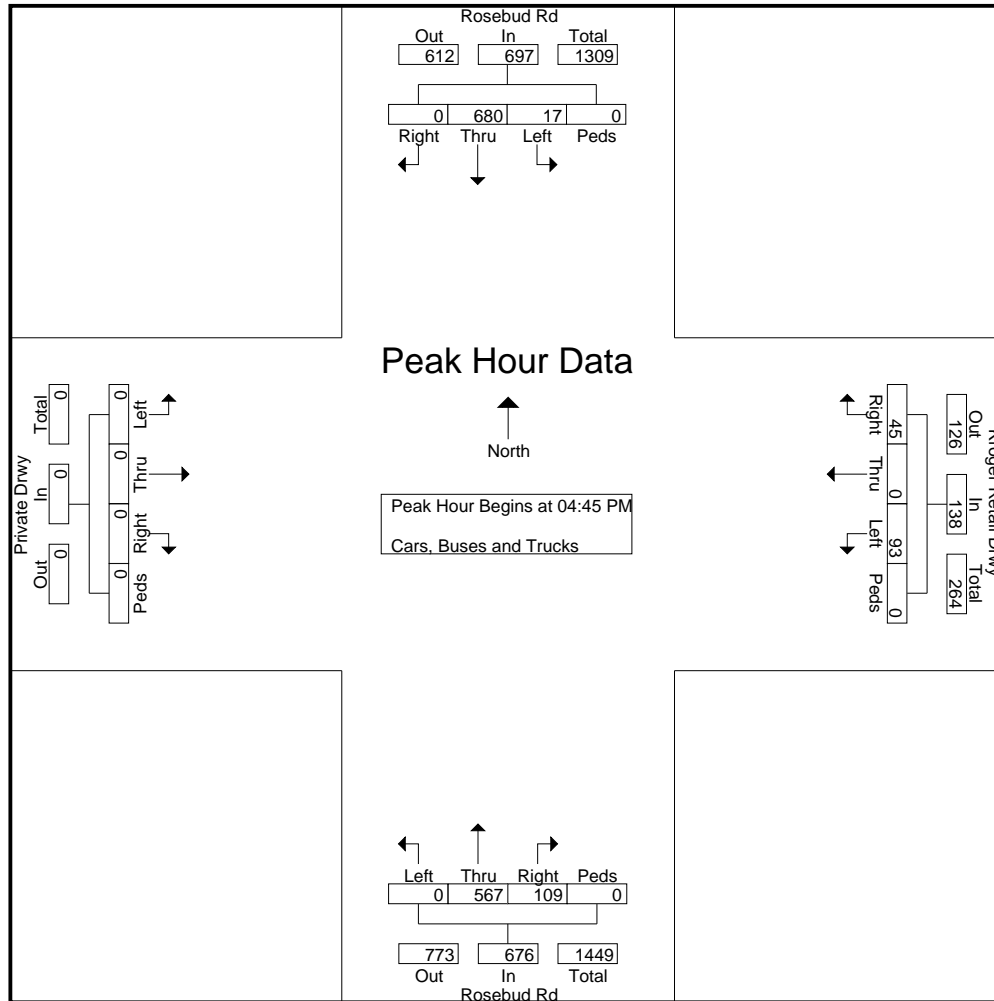
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TMC Data
 Rosebud Rd @ Kroger Retail Drwy
 Snellville, GA
 7-9 AM | 4-6 PM

File Name : 47570004
 Site Code : 47570004
 Start Date : 3/15/2023
 Page No : 3

Start Time	Rosebud Rd Northbound					Rosebud Rd Southbound					Private Drwy Eastbound					Kroger Retail Drwy Westbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. 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	139	30	0	169	4	163	0	0	167	0	0	0	0	0	18	0	11	0	29	365
05:00 PM	0	142	24	0	166	5	178	0	0	183	0	0	0	0	0	28	0	12	0	40	389
05:15 PM	0	147	27	0	174	5	175	0	0	180	0	0	0	0	0	22	0	13	0	35	389
05:30 PM	0	139	28	0	167	3	164	0	0	167	0	0	0	0	0	25	0	9	0	34	368
Total Volume	0	567	109	0	676	17	680	0	0	697	0	0	0	0	0	93	0	45	0	138	1511
% App. Total		83.9	16.1				97.6									67.4		32.6			
PHF	.000	.964	.908	.000	.971	.850	.955	.000	.000	.952	.000	.000	.000	.000	.000	.830	.000	.865	.000	.863	.971



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TMC Data
 Rosebud Rd @ Brushy Fork Rd (Roundabout)
 Snellville, GA
 7-9 AM | 4-6 PM

File Name : 47570005
 Site Code : 47570005
 Start Date : 3/15/2023
 Page No : 1

Groups Printed- Cars, Buses and Trucks

Start Time	Rosebud Rd Northbound					Rosebud Rd Southbound					Private Drwy Eastbound					Brushy Fork Rd Westbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
07:00 AM	0	109	0	0	109	13	80	0	0	93	0	0	0	0	0	2	0	19	0	21	223
07:15 AM	0	119	1	0	120	12	77	0	0	89	0	0	0	0	0	1	0	30	0	31	240
07:30 AM	0	106	4	0	110	31	82	0	0	113	0	0	0	0	0	4	0	41	0	45	268
07:45 AM	0	137	3	0	140	37	66	0	0	103	0	0	0	0	0	3	0	45	0	48	291
Total	0	471	8	0	479	93	305	0	0	398	0	0	0	0	0	10	0	135	0	145	1022
08:00 AM	0	108	0	0	108	48	98	0	0	146	0	0	0	0	0	1	0	35	0	36	290
08:15 AM	0	125	7	0	132	59	85	0	0	144	0	0	0	0	0	5	0	50	0	55	331
08:30 AM	0	113	2	0	115	65	66	0	0	131	0	0	0	0	0	3	0	62	0	65	311
08:45 AM	0	100	5	0	105	33	86	0	0	119	0	0	0	0	0	6	0	58	0	64	288
Total	0	446	14	0	460	205	335	0	0	540	0	0	0	0	0	15	0	205	0	220	1220
*** BREAK ***																					
04:00 PM	0	107	8	0	115	41	129	0	0	170	0	0	0	0	0	5	0	32	0	37	322
04:15 PM	0	115	9	0	124	44	133	0	0	177	0	0	0	0	0	7	0	36	0	43	344
04:30 PM	0	108	11	0	119	31	122	0	0	153	0	0	0	0	0	7	0	40	0	47	319
04:45 PM	0	96	6	0	102	35	131	0	0	166	0	0	0	0	0	6	0	37	0	43	311
Total	0	426	34	0	460	151	515	0	0	666	0	0	0	0	0	25	0	145	0	170	1296
05:00 PM	0	109	4	0	113	43	135	0	0	178	0	0	0	0	0	6	0	42	0	48	339
05:15 PM	0	122	7	0	129	38	139	0	0	177	0	0	0	0	0	4	0	36	0	40	346
05:30 PM	0	106	5	0	111	42	147	0	0	189	0	0	0	0	0	3	0	35	0	38	338
05:45 PM	0	120	6	0	126	30	126	0	0	156	0	0	0	0	0	4	0	47	0	51	333
Total	0	457	22	0	479	153	547	0	0	700	0	0	0	0	0	17	0	160	0	177	1356
Grand Total	0	1800	78	0	1878	602	1702	0	0	2304	0	0	0	0	0	67	0	645	0	712	4894
Apprch %	0	95.8	4.2	0		26.1	73.9	0	0		0	0	0	0		9.4	0	90.6	0		
Total %	0	36.8	1.6	0	38.4	12.3	34.8	0	0	47.1	0	0	0	0		1.4	0	13.2	0	14.5	

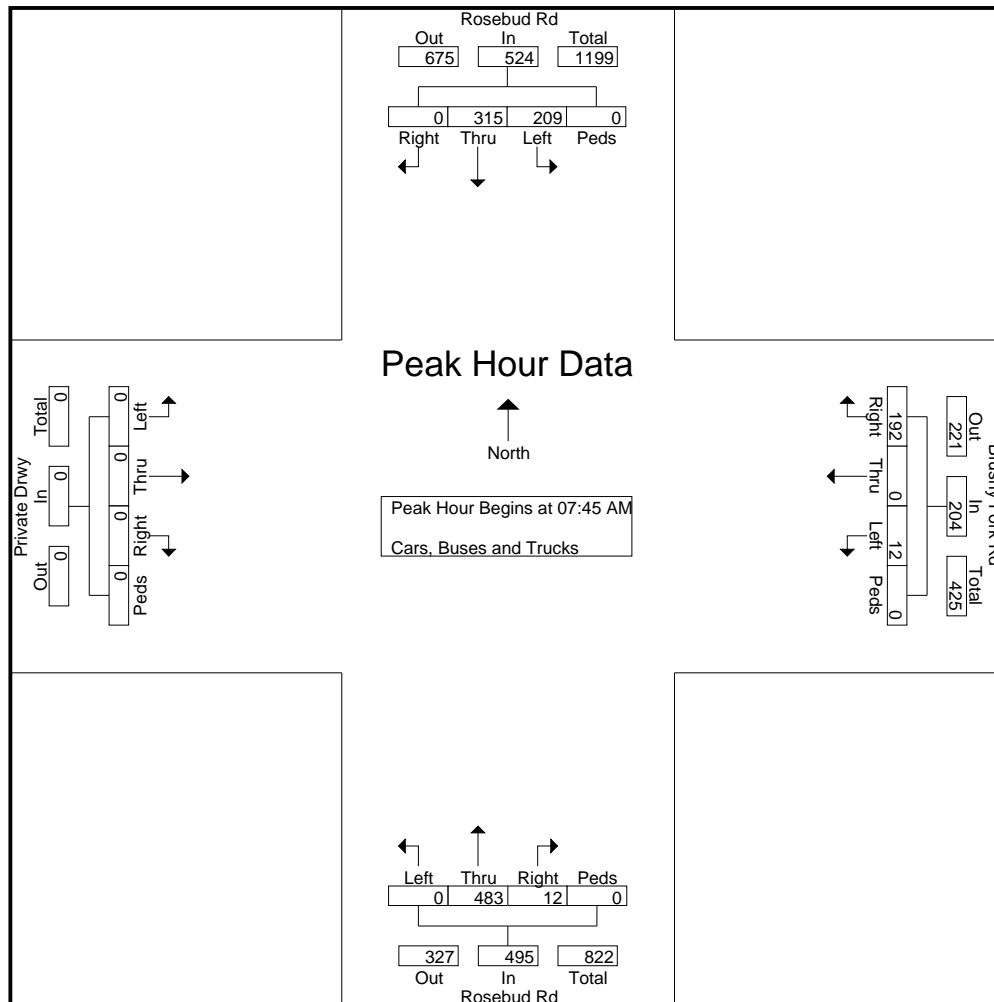
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TMC Data
 Rosebud Rd @ Brushy Fork Rd (Roundabout)
 Snellville, GA
 7-9 AM | 4-6 PM

File Name : 47570005
 Site Code : 47570005
 Start Date : 3/15/2023
 Page No : 2

Start Time	Rosebud Rd Northbound					Rosebud Rd Southbound					Private Drwy Eastbound					Brushy Fork Rd Westbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	0	137	3	0	140	37	66	0	0	103	0	0	0	0	0	3	0	45	0	48	291
08:00 AM	0	108	0	0	108	48	98	0	0	146	0	0	0	0	0	1	0	35	0	36	290
08:15 AM	0	125	7	0	132	59	85	0	0	144	0	0	0	0	0	5	0	50	0	55	331
08:30 AM	0	113	2	0	115	65	66	0	0	131	0	0	0	0	0	3	0	62	0	65	311
Total Volume	0	483	12	0	495	209	315	0	0	524	0	0	0	0	0	12	0	192	0	204	1223
% App. Total	97.6					39.9 60.1					94.1										
PHF	.000	.881	.429	.000	.884	.804	.804	.000	.000	.897	.000	.000	.000	.000	.000	.600	.000	.774	.000	.785	.924



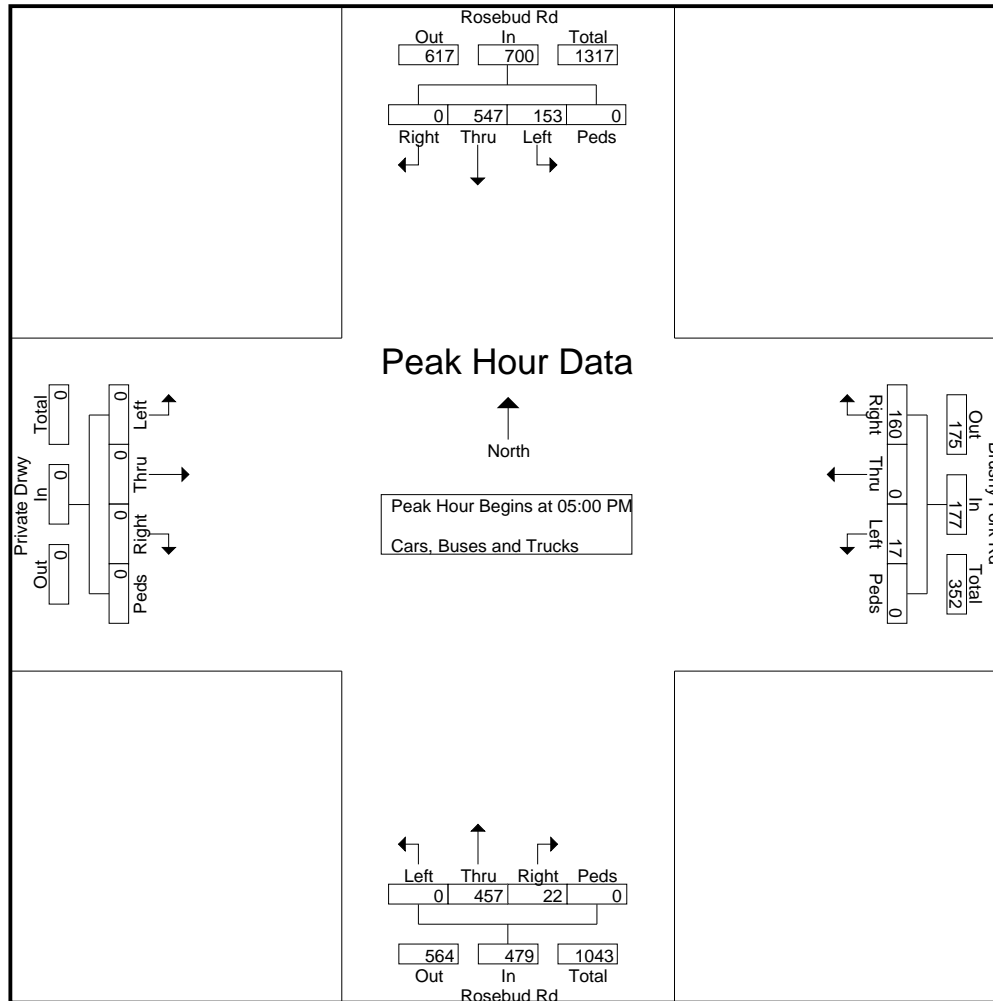
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TMC Data
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 Snellville, GA
 7-9 AM | 4-6 PM

File Name : 47570005
 Site Code : 47570005
 Start Date : 3/15/2023
 Page No : 3

Start Time	Rosebud Rd Northbound					Rosebud Rd Southbound					Private Drwy Eastbound					Brushy Fork Rd Westbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. 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	109	4	0	113	43	135	0	0	178	0	0	0	0	0	6	0	42	0	48	339
05:15 PM	0	122	7	0	129	38	139	0	0	177	0	0	0	0	0	4	0	36	0	40	346
05:30 PM	0	106	5	0	111	42	147	0	0	189	0	0	0	0	0	3	0	35	0	38	338
05:45 PM	0	120	6	0	126	30	126	0	0	156	0	0	0	0	0	4	0	47	0	51	333
Total Volume	0	457	22	0	479	153	547	0	0	700	0	0	0	0	0	17	0	160	0	177	1356
% App. Total	95.4					21.9 78.1					90.4										
PHF	.000	.936	.786	.000	.928	.890	.930	.000	.000	.926	.000	.000	.000	.000	.000	.708	.000	.851	.000	.868	.980



Appendix B
Intersection Analysis Methodology

Intersection Analysis Methodology

The methodology used for evaluating traffic operations at intersections is presented in the Transportation Research Board's 2022 *Highway Capacity Manual*, 7th Edition (HCM 7). Synchro 12 software, which emulates the HCM 7 methodology, was used for all analyses. The following is an overview of the methodology employed for the analysis of signalized intersections and roundabouts and stop-sign controlled (unsignalized) intersections. Levels of service (LOS) are assigned letters A through F. LOS A indicates operations with very low control delay while LOS F describes operations with high control delay. LOS F is considered to be unacceptable by most drivers, while LOS E is typically considered to be the limit of acceptable delay.

Signalized Intersections and Roundabouts – Level of service for a signalized intersection and a roundabout is defined in terms of control delay per vehicle. For signalized intersections and roundabouts, a composite intersection level of service is determined. The thresholds for each level of service are higher for signalized intersections and roundabouts than for unsignalized intersections. This is attributable to a variety of factors including expectation and acceptance of higher delays at signals/roundabouts, and the fact that drivers can relax when waiting at a signal as opposed to having to remain attentive as they proceed through the unsignalized intersection. The level of service criteria for signalized intersections and roundabouts are shown in Table A.

Table A – Level of Service Criteria for Signalized Intersections and Roundabouts

Control Delay (s/veh)	LOS
≤ 10	A
> 10 and ≤ 20	B
> 20 and ≤ 35	C
> 35 and ≤ 55	D
> 55 and ≤ 80	E
> 80	F

Source: Highway Capacity Manual 7

Unsignalized Intersections – Level of service for an unsignalized intersection is defined in terms of control delay per vehicle. Control delay is that portion of delay attributable to the control device and includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The delays at unsignalized intersections are based on gap acceptance theory, factoring in availability of gaps, usefulness of the gaps, and the priority of right-of-way given to each traffic stream. The level of service criteria for unsignalized intersections are presented in Table B.

Table B – Level of Service Criteria for Unsignalized Intersections

Control Delay (s/veh)	LOS
0 – 10	A
> 10 and ≤ 15	B
> 15 and ≤ 25	C
> 25 and ≤ 35	D
> 35 and ≤ 50	E
> 50	F

Source: Highway Capacity Manual 7

Appendix C

Existing Intersection Operational Analysis

Rosebud Road Townhomes, Snellville

1: Rosebud Road & US 78

existing a.m.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	726	132	109	1277	161	190	474	94	144	336	40
Future Volume (veh/h)	10	726	132	109	1277	161	190	474	94	144	336	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	1870	1841	1870	1870	1841	1870	1870	1841	1870	1870	1841	1870
Adj Flow Rate, veh/h	11	798	145	128	1502	189	204	510	0	167	391	0
Peak Hour Factor	0.91	0.91	0.91	0.85	0.85	0.85	0.93	0.93	0.93	0.86	0.86	0.86
Percent Heavy Veh, %	2	4	2	2	4	2	2	4	2	2	4	2
Cap, veh/h	93	1009	183	252	1592	722	359	614		258	553	
Arrive On Green	0.34	0.34	0.34	0.06	0.46	0.46	0.09	0.33	0.00	0.06	0.30	0.00
Sat Flow, veh/h	291	2956	537	1781	3497	1585	1781	1841	1585	1781	1841	1585
Grp Volume(v), veh/h	11	472	471	128	1502	189	204	510	0	167	391	0
Grp Sat Flow(s),veh/h/ln	291	1749	1744	1781	1749	1585	1781	1841	1585	1781	1841	1585
Q Serve(g_s), s	3.4	21.9	21.9	4.0	36.9	6.6	7.0	23.0	0.0	5.5	17.0	0.0
Cycle Q Clear(g_c), s	30.0	21.9	21.9	4.0	36.9	6.6	7.0	23.0	0.0	5.5	17.0	0.0
Prop In Lane	1.00		0.31	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	93	597	595	252	1592	722	359	614		258	553	
V/C Ratio(X)	0.12	0.79	0.79	0.51	0.94	0.26	0.57	0.83		0.65	0.71	
Avail Cap(c_a), veh/h	93	597	595	275	1613	731	359	614		258	553	
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	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	42.6	26.8	26.8	19.9	23.4	15.2	20.4	27.6	0.0	24.2	28.0	0.0
Incr Delay (d2), s/veh	0.6	7.1	7.2	1.6	11.5	0.2	2.1	12.4	0.0	5.5	7.5	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	9.2	9.2	1.5	15.2	2.1	2.8	11.3	0.0	2.7	8.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	43.2	33.9	33.9	21.5	34.9	15.3	22.5	40.0	0.0	29.7	35.4	0.0
LnGrp LOS	D	C	C	C	C	B	C	D		C	D	
Approach Vol, veh/h		954			1819			714			558	
Approach Delay, s/veh		34.0			32.0			35.0			33.7	
Approach LOS		C			C			D			C	
Timer - Assigned Phs	1	2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s	10.0	34.5	10.3	35.2	13.0	31.5		45.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.5	29.5	6.9	30.1	8.5	26.5		41.5				
Max Q Clear Time (g_c+I1), s	7.5	25.0	6.0	32.0	9.0	19.0		38.9				
Green Ext Time (p_c), s	0.0	1.2	0.0	0.0	0.0	1.2		2.1				

Intersection Summary

HCM 7th Control Delay, s/veh	33.2
HCM 7th LOS	C

Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Rosebud Road Townhomes, Snellville
 2: Rosebud Road & Kroger Access

existing a.m.

Intersection						
Int Delay, s/veh	2.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	48	52	689	83	14	576
Future Vol, veh/h	48	52	689	83	14	576
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	95	95	93	93
Heavy Vehicles, %	2	2	4	2	2	4
Mvmt Flow	55	59	725	87	15	619

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1418	769	0	0	813
Stage 1	769	-	-	-	-
Stage 2	649	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	151	401	-	-	814
Stage 1	457	-	-	-	-
Stage 2	520	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	146	401	-	-	814
Mov Cap-2 Maneuver	146	-	-	-	-
Stage 1	457	-	-	-	-
Stage 2	505	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v38.01		0	0.23
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	219	43
HCM Lane V/C Ratio	-	-	0.52	0.018
HCM Control Delay (s/veh)	-	-	38	9.5
HCM Lane LOS	-	-	E	A
HCM 95th %tile Q(veh)	-	-	2.7	0.1

Rosebud Road Townhomes, Snellville
 3: Rosebud Road & Bushy Fork Road

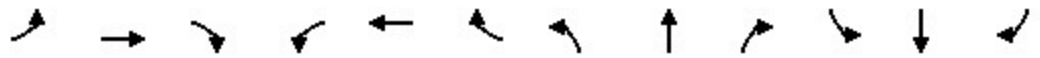
existing a.m.

Intersection			
Intersection Delay, s/veh	8.9		
Intersection LOS	A		
Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	263	574	594
Demand Flow Rate, veh/h	268	596	613
Vehicles Circulating, veh/h	582	242	15
Vehicles Exiting, veh/h	256	386	835
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	9.2	10.4	7.2
Approach LOS	A	B	A
Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
A (Intercept)	1380	1380	1380
B (Slope)	1.02e-3	1.02e-3	1.02e-3
Entry Flow, veh/h	268	596	613
Cap Entry Lane, veh/h	762	1078	1359
Entry HV Adj Factor	0.981	0.962	0.969
Flow Entry, veh/h	263	574	594
Cap Entry, veh/h	748	1038	1316
V/C Ratio	0.352	0.553	0.451
Control Delay, s/veh	9.2	10.4	7.2
LOS	A	B	A
95th %tile Queue, veh	2	3	2

Rosebud Road Townhomes, Snellville

1: Rosebud Road & US 78

existing p.m.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	1276	176	145	1024	170	163	387	69	230	404	38
Future Volume (veh/h)	55	1276	176	145	1024	170	163	387	69	230	404	38
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	1870	1841	1870	1870	1841	1870	1870	1841	1870	1870	1841	1870
Adj Flow Rate, veh/h	57	1315	181	146	1034	172	173	412	0	250	439	0
Peak Hour Factor	0.97	0.97	0.97	0.99	0.99	0.99	0.94	0.94	0.94	0.92	0.92	0.92
Percent Heavy Veh, %	2	4	2	2	4	2	2	4	2	2	4	2
Cap, veh/h	218	1352	185	173	1871	848	235	451		278	537	
Arrive On Green	0.44	0.44	0.44	0.06	0.54	0.54	0.06	0.24	0.00	0.11	0.29	0.00
Sat Flow, veh/h	464	3091	423	1781	3497	1585	1781	1841	1585	1781	1841	1585
Grp Volume(v), veh/h	57	740	756	146	1034	172	173	412	0	250	439	0
Grp Sat Flow(s),veh/h/ln	464	1749	1765	1781	1749	1585	1781	1841	1585	1781	1841	1585
Q Serve(g_s), s	11.1	49.5	50.6	5.3	23.4	6.8	7.3	26.1	0.0	12.4	26.6	0.0
Cycle Q Clear(g_c), s	22.8	49.5	50.6	5.3	23.4	6.8	7.3	26.1	0.0	12.4	26.6	0.0
Prop In Lane	1.00		0.24	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	218	765	772	173	1871	848	235	451		278	537	
V/C Ratio(X)	0.26	0.97	0.98	0.85	0.55	0.20	0.74	0.91		0.90	0.82	
Avail Cap(c_a), veh/h	218	765	772	174	1874	849	235	451		278	537	
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	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.8	32.9	33.2	28.1	18.4	14.6	37.7	44.1	0.0	31.7	39.5	0.0
Incr Delay (d2), s/veh	0.6	24.7	27.2	30.0	0.4	0.1	11.5	25.5	0.0	29.5	13.0	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	1.2	24.2	25.3	3.4	8.5	2.2	2.1	14.7	0.0	7.3	13.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	30.4	57.6	60.4	58.0	18.8	14.7	49.2	69.6	0.0	61.2	52.5	0.0
LnGrp LOS	C	E	E	E	B	B	D	E		E	D	
Approach Vol, veh/h		1553			1352			585			689	
Approach Delay, s/veh		58.0			22.5			63.5			55.7	
Approach LOS		E			C			E			E	
Timer - Assigned Phs	1	2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s	17.4	33.9	11.7	57.0	11.8	39.5		68.7				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	12.9	29.3	7.3	52.5	7.3	34.9		64.3				
Max Q Clear Time (g_c+I1), s	14.4	28.1	7.3	52.6	9.3	28.6		25.4				
Green Ext Time (p_c), s	0.0	0.3	0.0	0.0	0.0	1.3		8.4				

Intersection Summary

HCM 7th Control Delay, s/veh	46.9
HCM 7th LOS	D

Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Rosebud Road Townhomes, Snellville
 2: Rosebud Road & Kroger Access

existing p.m.

Intersection						
Int Delay, s/veh	8.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		B			A
Traffic Vol, veh/h	95	46	578	111	17	694
Future Vol, veh/h	95	46	578	111	17	694
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	86	86	97	97	95	95
Heavy Vehicles, %	2	2	4	2	2	4
Mvmt Flow	110	53	596	114	18	731

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1419	653	0	0	710
Stage 1	653	-	-	-	-
Stage 2	766	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	151	467	-	-	889
Stage 1	518	-	-	-	-
Stage 2	459	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	145	467	-	-	889
Mov Cap-2 Maneuver	145	-	-	-	-
Stage 1	518	-	-	-	-
Stage 2	443	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v87.25		0	0.22
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	188	43
HCM Lane V/C Ratio	-	-	0.874	0.02
HCM Control Delay (s/veh)	-	-	87.2	9.1
HCM Lane LOS	-	-	F	A
HCM 95th %tile Q(veh)	-	-	6.5	0.1

Rosebud Road Townhomes, Snellville
 3: Rosebud Road & Bushy Fork Road

existing p.m.

Intersection			
Intersection Delay, s/veh	8.9		
Intersection LOS	A		
Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	207	525	768
Demand Flow Rate, veh/h	211	545	795
Vehicles Circulating, veh/h	521	171	20
Vehicles Exiting, veh/h	195	644	712
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	7.4	8.4	9.6
Approach LOS	A	A	A
Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
A (Intercept)	1380	1380	1380
B (Slope)	1.02e-3	1.02e-3	1.02e-3
Entry Flow, veh/h	211	545	795
Cap Entry Lane, veh/h	811	1159	1352
Entry HV Adj Factor	0.981	0.963	0.966
Flow Entry, veh/h	207	525	768
Cap Entry, veh/h	796	1116	1306
V/C Ratio	0.260	0.470	0.588
Control Delay, s/veh	7.4	8.4	9.6
LOS	A	A	A
95th %tile Queue, veh	1	3	4

Appendix D

No-Build Intersection Operational Analysis

Rosebud Road Townhomes, Snellville

1: Rosebud Road & US 78

no-build a.m.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	813	145	126	1422	178	209	546	115	159	381	64
Future Volume (veh/h)	28	813	145	126	1422	178	209	546	115	159	381	64
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	1870	1841	1870	1870	1841	1870	1870	1841	1870	1870	1841	1870
Adj Flow Rate, veh/h	30	884	158	145	1634	205	222	581	0	183	438	0
Peak Hour Factor	0.92	0.92	0.92	0.87	0.87	0.87	0.94	0.94	0.94	0.87	0.87	0.87
Percent Heavy Veh, %	2	4	2	2	4	2	2	4	2	2	4	2
Cap, veh/h	80	1044	187	227	1613	731	307	591		207	583	
Arrive On Green	0.35	0.35	0.35	0.06	0.46	0.46	0.07	0.32	0.00	0.07	0.32	0.00
Sat Flow, veh/h	252	2964	530	1781	3497	1585	1781	1841	1585	1781	1841	1585
Grp Volume(v), veh/h	30	521	521	145	1634	205	222	581	0	183	438	0
Grp Sat Flow(s),veh/h/ln	252	1749	1745	1781	1749	1585	1781	1841	1585	1781	1841	1585
Q Serve(g_s), s	0.0	24.8	24.8	4.5	41.5	7.2	6.5	28.2	0.0	6.1	19.2	0.0
Cycle Q Clear(g_c), s	31.7	24.8	24.8	4.5	41.5	7.2	6.5	28.2	0.0	6.1	19.2	0.0
Prop In Lane	1.00		0.30	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	80	616	615	227	1613	731	307	591		207	583	
V/C Ratio(X)	0.37	0.85	0.85	0.64	1.01	0.28	0.72	0.98		0.88	0.75	
Avail Cap(c_a), veh/h	80	616	615	227	1613	731	307	591		207	583	
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	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	45.0	26.9	26.9	21.0	24.3	15.0	24.6	30.3	0.0	24.2	27.6	0.0
Incr Delay (d2), s/veh	2.9	10.6	10.7	5.9	25.7	0.2	8.2	33.1	0.0	32.8	8.7	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	0.7	10.9	10.9	2.0	19.9	2.3	3.7	16.8	0.0	4.3	9.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	47.9	37.5	37.6	27.0	50.0	15.2	32.7	63.4	0.0	57.0	36.2	0.0
LnGrp LOS	D	D	D	C	F	B	C	E		E	D	
Approach Vol, veh/h		1072			1984			803			621	
Approach Delay, s/veh		37.8			44.7			54.9			42.3	
Approach LOS		D			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s	10.6	33.4	9.8	36.2	11.0	33.0		46.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	6.1	28.9	5.3	31.7	6.5	28.5		41.5				
Max Q Clear Time (g_c+I1), s	8.1	30.2	6.5	33.7	8.5	21.2		43.5				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	1.4		0.0				

Intersection Summary

HCM 7th Control Delay, s/veh	44.6
HCM 7th LOS	D

Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Rosebud Road Townhomes, Snellville
 2: Rosebud Road & mixed-use access/Kroger Access

no-build a.m.

Intersection												
Int Delay, s/veh	13.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕		↖	↗			↕	↗
Traffic Vol, veh/h	29	3	23	53	1	57	27	761	91	16	634	19
Future Vol, veh/h	29	3	23	53	1	57	27	761	91	16	634	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	150	-	-	-	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	88	88	88	97	97	97	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	4	2	2	4	2
Mvmt Flow	36	4	29	60	1	65	28	785	94	17	667	20

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1542	1635	667	1590	1608	831	687	0	0	878	0	0
Stage 1	701	701	-	887	887	-	-	-	-	-	-	-
Stage 2	841	934	-	703	721	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	94	101	459	87	105	369	907	-	-	769	-	-
Stage 1	429	441	-	339	362	-	-	-	-	-	-	-
Stage 2	359	345	-	428	432	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	72	94	459	73	98	369	907	-	-	769	-	-
Mov Cap-2 Maneuver	72	94	-	73	98	-	-	-	-	-	-	-
Stage 1	414	425	-	328	351	-	-	-	-	-	-	-
Stage 2	286	334	-	384	416	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s/v64.99			150.17		0.28		0.23	
HCM LOS	F		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	907	-	-	73	459	125	44	-	-
HCM Lane V/C Ratio	0.031	-	-	0.546	0.063	1.009	0.022	-	-
HCM Control Delay (s/veh)	9.1	-	-	102.1	13.4	150.2	9.8	0	-
HCM Lane LOS	A	-	-	F	B	F	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	2.3	0.2	6.9	0.1	-	-

Rosebud Road Townhomes, Snellville
 3: Rosebud Road & Bushy Fork Road

no-build a.m.

Intersection			
Intersection Delay, s/veh	10.5		
Intersection LOS	B		
Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	300	634	671
Demand Flow Rate, veh/h	306	659	692
Vehicles Circulating, veh/h	643	273	18
Vehicles Exiting, veh/h	289	437	931
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	11.0	12.6	8.1
Approach LOS	B	B	A
Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
A (Intercept)	1380	1380	1380
B (Slope)	1.02e-3	1.02e-3	1.02e-3
Entry Flow, veh/h	306	659	692
Cap Entry Lane, veh/h	716	1045	1355
Entry HV Adj Factor	0.980	0.962	0.969
Flow Entry, veh/h	300	634	671
Cap Entry, veh/h	702	1005	1313
V/C Ratio	0.427	0.631	0.511
Control Delay, s/veh	11.0	12.6	8.1
LOS	B	B	A
95th %tile Queue, veh	2	5	3

Rosebud Road Townhomes, Snellville

1: Rosebud Road & US 78

no-build p.m.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	102	1434	195	173	1155	188	180	446	87	253	472	80
Future Volume (veh/h)	102	1434	195	173	1155	188	180	446	87	253	472	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	1870	1841	1870	1870	1841	1870	1870	1841	1870	1870	1841	1870
Adj Flow Rate, veh/h	103	1448	197	175	1167	190	189	469	0	272	508	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.95	0.95	0.95	0.93	0.93	0.93
Percent Heavy Veh, %	2	4	2	2	4	2	2	4	2	2	4	2
Cap, veh/h	178	1356	182	172	1881	852	198	457		251	521	
Arrive On Green	0.44	0.44	0.44	0.07	0.54	0.54	0.08	0.25	0.00	0.11	0.28	0.00
Sat Flow, veh/h	401	3098	417	1781	3497	1585	1781	1841	1585	1781	1841	1585
Grp Volume(v), veh/h	103	810	835	175	1167	190	189	469	0	272	508	0
Grp Sat Flow(s),veh/h/ln	401	1749	1766	1781	1749	1585	1781	1841	1585	1781	1841	1585
Q Serve(g_s), s	31.1	56.9	56.9	8.5	30.1	8.2	9.8	32.3	0.0	14.3	35.5	0.0
Cycle Q Clear(g_c), s	48.2	56.9	56.9	8.5	30.1	8.2	9.8	32.3	0.0	14.3	35.5	0.0
Prop In Lane	1.00		0.24	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	178	765	773	172	1881	852	198	457		251	521	
V/C Ratio(X)	0.58	1.06	1.08	1.02	0.62	0.22	0.95	1.03		1.08	0.97	
Avail Cap(c_a), veh/h	178	765	773	172	1881	852	198	457		251	521	
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	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	42.1	36.5	36.6	39.2	20.8	15.8	38.5	48.8	0.0	38.3	46.1	0.0
Incr Delay (d2), s/veh	4.6	49.2	56.1	73.5	0.6	0.1	50.3	48.7	0.0	80.4	33.7	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	3.1	32.6	34.4	6.0	11.3	2.8	7.2	20.5	0.0	11.6	20.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	46.7	85.8	92.7	112.7	21.5	15.9	88.8	97.6	0.0	118.7	79.8	0.0
LnGrp LOS	D	F	F	F	C	B	F	F		F	E	
Approach Vol, veh/h		1748			1532			658			780	
Approach Delay, s/veh		86.8			31.2			95.1			93.4	
Approach LOS		F			C			F			F	
Timer - Assigned Phs	1	2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s	18.8	36.8	13.0	61.4	14.3	41.3		74.4				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	14.3	32.3	8.5	56.9	9.8	36.8		69.9				
Max Q Clear Time (g_c+I1), s	16.3	34.3	10.5	58.9	11.8	37.5		32.1				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0		10.0				

Intersection Summary

HCM 7th Control Delay, s/veh	71.0
HCM 7th LOS	E

Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Rosebud Road Townhomes, Snellville
 2: Rosebud Road & mixed-use access/Kroger Access

no-build p.m.

Intersection												
Int Delay, s/veh	68.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕		↗	↖			↕	↗
Traffic Vol, veh/h	40	2	59	105	2	51	53	628	123	19	757	48
Future Vol, veh/h	40	2	59	105	2	51	53	628	123	19	757	48
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	150	-	-	-	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	87	87	87	98	98	98	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	4	2	2	4	2
Mvmt Flow	50	3	74	121	2	59	54	641	126	20	780	49

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1570	1694	780	1633	1681	704	830	0	0	766	0	0
Stage 1	820	820	-	812	812	-	-	-	-	-	-	-
Stage 2	750	874	-	821	869	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	90	93	395	~81	95	437	802	-	-	847	-	-
Stage 1	369	389	-	373	392	-	-	-	-	-	-	-
Stage 2	403	367	-	369	369	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	68	83	395	~57	84	437	802	-	-	847	-	-
Mov Cap-2 Maneuver	68	83	-	~57	84	-	-	-	-	-	-	-
Stage 1	353	372	-	348	366	-	-	-	-	-	-	-
Stage 2	324	342	-	285	353	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	72.1	\$ 692.55	0.65	0.22
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	802	-	-	68	395	80	44	-	-
HCM Lane V/C Ratio	0.067	-	-	0.769	0.187	2.269	0.023	-	-
HCM Control Delay (s/veh)	9.8	-	-	150.6	16.2	\$ 692.5	9.4	0	-
HCM Lane LOS	A	-	-	F	C	F	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	3.6	0.7	16.8	0.1	-	-

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

Rosebud Road Townhomes, Snellville
 3: Rosebud Road & Bushy Fork Road

no-build p.m.

Intersection			
Intersection Delay, s/veh	10.7		
Intersection LOS	B		
Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	245	592	875
Demand Flow Rate, veh/h	249	616	906
Vehicles Circulating, veh/h	589	207	21
Vehicles Exiting, veh/h	234	720	817
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	8.8	10.1	11.5
Approach LOS	A	B	B
Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
A (Intercept)	1380	1380	1380
B (Slope)	1.02e-3	1.02e-3	1.02e-3
Entry Flow, veh/h	249	616	906
Cap Entry Lane, veh/h	757	1117	1351
Entry HV Adj Factor	0.984	0.962	0.966
Flow Entry, veh/h	245	592	875
Cap Entry, veh/h	745	1074	1305
V/C Ratio	0.329	0.551	0.671
Control Delay, s/veh	8.8	10.1	11.5
LOS	A	B	B
95th %tile Queue, veh	1	3	6

Appendix E

Future Intersection Operational Analysis

Rosebud Road Townhomes, Snellville

1: Rosebud Road & US 78

future a.m.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	813	148	127	1422	178	218	552	118	159	383	64
Future Volume (veh/h)	28	813	148	127	1422	178	218	552	118	159	383	64
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	1870	1841	1870	1870	1841	1870	1870	1841	1870	1870	1841	1870
Adj Flow Rate, veh/h	30	884	161	146	1634	205	232	587	0	183	440	0
Peak Hour Factor	0.92	0.92	0.92	0.87	0.87	0.87	0.94	0.94	0.94	0.87	0.87	0.87
Percent Heavy Veh, %	2	4	2	2	4	2	2	4	2	2	4	2
Cap, veh/h	80	1041	189	226	1613	731	308	591		203	575	
Arrive On Green	0.35	0.35	0.35	0.06	0.46	0.46	0.08	0.32	0.00	0.07	0.31	0.00
Sat Flow, veh/h	252	2955	538	1781	3497	1585	1781	1841	1585	1781	1841	1585
Grp Volume(v), veh/h	30	523	522	146	1634	205	232	587	0	183	440	0
Grp Sat Flow(s),veh/h/ln	252	1749	1744	1781	1749	1585	1781	1841	1585	1781	1841	1585
Q Serve(g_s), s	0.0	24.9	24.9	4.6	41.5	7.2	6.9	28.6	0.0	6.1	19.4	0.0
Cycle Q Clear(g_c), s	31.7	24.9	24.9	4.6	41.5	7.2	6.9	28.6	0.0	6.1	19.4	0.0
Prop In Lane	1.00		0.31	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	80	616	614	226	1613	731	308	591		203	575	
V/C Ratio(X)	0.37	0.85	0.85	0.65	1.01	0.28	0.75	0.99		0.90	0.77	
Avail Cap(c_a), veh/h	80	616	614	226	1613	731	308	591		203	575	
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	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	45.0	26.9	26.9	21.1	24.3	15.0	24.7	30.5	0.0	24.4	28.0	0.0
Incr Delay (d2), s/veh	2.9	10.8	10.9	6.3	25.7	0.2	10.1	35.4	0.0	36.8	9.4	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	0.7	11.0	10.9	2.0	19.9	2.3	4.0	17.4	0.0	4.5	9.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	47.9	37.8	37.8	27.4	50.0	15.2	34.8	65.8	0.0	61.3	37.4	0.0
LnGrp LOS	D	D	D	C	F	B	C	E		E	D	
Approach Vol, veh/h		1075			1985			819			623	
Approach Delay, s/veh		38.1			44.7			57.0			44.4	
Approach LOS		D			D			E			D	
Timer - Assigned Phs	1	2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s	10.6	33.4	9.8	36.2	11.4	32.6		46.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	6.1	28.9	5.3	31.7	6.9	28.1		41.5				
Max Q Clear Time (g_c+I1), s	8.1	30.6	6.6	33.7	8.9	21.4		43.5				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	1.3		0.0				

Intersection Summary

HCM 7th Control Delay, s/veh	45.3
HCM 7th LOS	D

Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Rosebud Road Townhomes, Snellville

1: Rosebud Road & US 78

future a.m. with mitigation



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑↑	↗	↘	↑↑↑	↗	↘	↑	↗	↘	↑	↗
Traffic Volume (veh/h)	28	813	148	127	1422	178	218	552	118	159	383	64
Future Volume (veh/h)	28	813	148	127	1422	178	218	552	118	159	383	64
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	1870	1841	1870	1870	1841	1870	1870	1841	1870	1870	1841	1870
Adj Flow Rate, veh/h	30	884	161	146	1634	205	232	587	0	183	440	0
Peak Hour Factor	0.92	0.92	0.92	0.87	0.87	0.87	0.94	0.94	0.94	0.87	0.87	0.87
Percent Heavy Veh, %	2	4	2	2	4	2	2	4	2	2	4	2
Cap, veh/h	137	1468	463	292	1703	537	371	664		258	621	
Arrive On Green	0.03	0.29	0.29	0.08	0.34	0.34	0.09	0.36	0.00	0.07	0.34	0.00
Sat Flow, veh/h	1781	5025	1585	1781	5025	1585	1781	1841	1585	1781	1841	1585
Grp Volume(v), veh/h	30	884	161	146	1634	205	232	587	0	183	440	0
Grp Sat Flow(s),veh/h/ln	1781	1675	1585	1781	1675	1585	1781	1841	1585	1781	1841	1585
Q Serve(g_s), s	1.0	13.6	7.2	4.9	28.7	8.8	7.7	26.9	0.0	6.1	18.7	0.0
Cycle Q Clear(g_c), s	1.0	13.6	7.2	4.9	28.7	8.8	7.7	26.9	0.0	6.1	18.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	137	1468	463	292	1703	537	371	664		258	621	
V/C Ratio(X)	0.22	0.60	0.35	0.50	0.96	0.38	0.63	0.88		0.71	0.71	
Avail Cap(c_a), veh/h	184	1468	463	364	1703	537	371	664		258	621	
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	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	24.8	27.4	25.1	20.2	29.1	22.6	19.3	27.0	0.0	21.9	26.0	0.0
Incr Delay (d2), s/veh	0.8	0.7	0.4	1.3	13.5	0.4	3.3	15.9	0.0	8.8	6.7	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	0.4	5.0	2.5	1.9	12.2	3.0	3.2	13.6	0.0	2.9	8.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	25.5	28.1	25.5	21.5	42.6	23.0	22.6	42.9	0.0	30.7	32.7	0.0
LnGrp LOS	C	C	C	C	D	C	C	D		C	C	
Approach Vol, veh/h		1075			1985			819			623	
Approach Delay, s/veh		27.6			39.0			37.1			32.1	
Approach LOS		C			D			D			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.9	37.0	11.3	30.8	13.0	34.9	7.1	35.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	6.4	30.1	10.5	25.0	8.5	28.0	5.0	30.5				
Max Q Clear Time (g_c+I1), s	8.1	28.9	6.9	15.6	9.7	20.7	3.0	30.7				
Green Ext Time (p_c), s	0.0	0.4	0.1	4.0	0.0	1.4	0.0	0.0				

Intersection Summary

HCM 7th Control Delay, s/veh	35.0
HCM 7th LOS	D

Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Rosebud Road Townhomes, Snellville
 2: Rosebud Road & mixed-use access/Kroger Access

future a.m.

Intersection												
Int Delay, s/veh	14.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↕		↖	↗			↖	↗
Traffic Vol, veh/h	29	3	23	53	1	57	27	779	92	16	640	19
Future Vol, veh/h	29	3	23	53	1	57	27	779	92	16	640	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	150	-	-	-	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	88	88	88	97	97	97	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	4	2	2	4	2
Mvmt Flow	36	4	29	60	1	65	28	803	95	17	674	20

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1567	1661	674	1615	1634	851	694	0	0	898	0	0
Stage 1	707	707	-	906	906	-	-	-	-	-	-	-
Stage 2	859	954	-	709	727	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	90	97	455	83	101	360	902	-	-	756	-	-
Stage 1	426	438	-	330	355	-	-	-	-	-	-	-
Stage 2	351	337	-	425	429	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	68	91	455	70	94	360	902	-	-	756	-	-
Mov Cap-2 Maneuver	68	91	-	70	94	-	-	-	-	-	-	-
Stage 1	410	422	-	320	344	-	-	-	-	-	-	-
Stage 2	278	327	-	380	413	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s/v69.79			166.05		0.27		0.23	
HCM LOS	F		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	902	-	-	70	455	120	44	-	-
HCM Lane V/C Ratio	0.031	-	-	0.572	0.063	1.051	0.022	-	-
HCM Control Delay (s/veh)	9.1	-	-	110.3	13.4	166.1	9.9	0	-
HCM Lane LOS	A	-	-	F	B	F	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	2.4	0.2	7.3	0.1	-	-

Rosebud Road Townhomes, Snellville
 3: Rosebud Road & Bushy Fork Road

future a.m.

Intersection			
Intersection Delay, s/veh	10.4		
Intersection LOS	B		
Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	300	635	577
Demand Flow Rate, veh/h	306	660	595
Vehicles Circulating, veh/h	644	287	18
Vehicles Exiting, veh/h	303	326	932
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	11.1	13.1	7.1
Approach LOS	B	B	A
Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
A (Intercept)	1380	1380	1380
B (Slope)	1.02e-3	1.02e-3	1.02e-3
Entry Flow, veh/h	306	660	595
Cap Entry Lane, veh/h	715	1030	1355
Entry HV Adj Factor	0.980	0.962	0.970
Flow Entry, veh/h	300	635	577
Cap Entry, veh/h	701	991	1314
V/C Ratio	0.428	0.641	0.439
Control Delay, s/veh	11.1	13.1	7.1
LOS	B	B	A
95th %tile Queue, veh	2	5	2

Rosebud Road Townhomes, Snellville
 4: Rosebud Road & townhomes access

future a.m.

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	W
Traffic Vol, veh/h	19	3	1	873	710	26
Future Vol, veh/h	19	3	1	873	710	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	200
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	80	80	97	97	95	95
Heavy Vehicles, %	2	2	2	4	4	2
Mvmt Flow	24	4	1	900	747	27

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1649	747	775	0	-	0
Stage 1	747	-	-	-	-	-
Stage 2	902	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	109	413	841	-	-	-
Stage 1	468	-	-	-	-	-
Stage 2	396	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	109	413	841	-	-	-
Mov Cap-2 Maneuver	109	-	-	-	-	-
Stage 1	467	-	-	-	-	-
Stage 2	396	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	43.44	0.01	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	2	-	121	-	-
HCM Lane V/C Ratio	0.001	-	0.228	-	-
HCM Control Delay (s/veh)	9.3	0	43.4	-	-
HCM Lane LOS	A	A	E	-	-
HCM 95th %tile Q(veh)	0	-	0.8	-	-

Rosebud Road Townhomes, Snellville

1: Rosebud Road & US 78

future p.m.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	102	1434	203	177	1155	188	186	450	88	253	477	80
Future Volume (veh/h)	102	1434	203	177	1155	188	186	450	88	253	477	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	1870	1841	1870	1870	1841	1870	1870	1841	1870	1870	1841	1870
Adj Flow Rate, veh/h	103	1448	205	179	1167	190	196	474	0	272	513	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.95	0.95	0.95	0.93	0.93	0.93
Percent Heavy Veh, %	2	4	2	2	4	2	2	4	2	2	4	2
Cap, veh/h	176	1339	187	172	1870	847	198	474		241	531	
Arrive On Green	0.43	0.43	0.43	0.07	0.53	0.53	0.07	0.26	0.00	0.10	0.29	0.00
Sat Flow, veh/h	401	3081	431	1781	3497	1585	1781	1841	1585	1781	1841	1585
Grp Volume(v), veh/h	103	815	838	179	1167	190	196	474	0	272	513	0
Grp Sat Flow(s),veh/h/ln	401	1749	1763	1781	1749	1585	1781	1841	1585	1781	1841	1585
Q Serve(g_s), s	31.3	56.5	56.5	8.5	30.3	8.2	9.5	33.5	0.0	13.5	35.7	0.0
Cycle Q Clear(g_c), s	48.6	56.5	56.5	8.5	30.3	8.2	9.5	33.5	0.0	13.5	35.7	0.0
Prop In Lane	1.00		0.24	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	176	760	766	172	1870	847	198	474		241	531	
V/C Ratio(X)	0.58	1.07	1.09	1.04	0.62	0.22	0.99	1.00		1.13	0.97	
Avail Cap(c_a), veh/h	176	760	766	172	1870	847	198	474		241	531	
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	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	42.7	36.8	36.8	39.1	21.1	16.0	39.5	48.2	0.0	37.9	45.6	0.0
Incr Delay (d2), s/veh	4.8	53.6	61.3	80.0	0.7	0.1	61.6	41.1	0.0	97.7	31.5	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	33.4	35.3	6.4	11.4	2.8	7.9	20.2	0.0	11.8	20.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	47.5	90.3	98.0	119.1	21.8	16.1	101.2	89.4	0.0	135.6	77.1	0.0
LnGrp LOS	D	F	F	F	C	B	F	F		F	E	
Approach Vol, veh/h		1756			1536			670			785	
Approach Delay, s/veh		91.5			32.4			92.8			97.4	
Approach LOS		F			C			F			F	
Timer - Assigned Phs	1	2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s	18.0	38.0	13.0	61.0	14.0	42.0		74.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	13.5	33.5	8.5	56.5	9.5	37.5		69.5				
Max Q Clear Time (g_c+1), s	15.5	35.5	10.5	58.5	11.5	37.7		32.3				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0		9.9				

Intersection Summary

HCM 7th Control Delay, s/veh	73.5
HCM 7th LOS	E

Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Rosebud Road Townhomes, Snellville

1: Rosebud Road & US 78

future p.m. with mitigation

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	102	1434	203	177	1155	188	186	450	88	253	477	80
Future Volume (veh/h)	102	1434	203	177	1155	188	186	450	88	253	477	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	1870	1841	1870	1870	1841	1870	1870	1841	1870	1870	1841	1870
Adj Flow Rate, veh/h	103	1448	205	179	1167	190	196	474	0	272	513	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.95	0.95	0.95	0.93	0.93	0.93
Percent Heavy Veh, %	2	4	2	2	4	2	2	4	2	2	4	2
Cap, veh/h	227	1534	484	216	1612	508	297	584		342	645	
Arrive On Green	0.06	0.31	0.31	0.07	0.32	0.32	0.07	0.32	0.00	0.11	0.35	0.00
Sat Flow, veh/h	1781	5025	1585	1781	5025	1585	1781	1841	1585	1781	1841	1585
Grp Volume(v), veh/h	103	1448	205	179	1167	190	196	474	0	272	513	0
Grp Sat Flow(s),veh/h/ln	1781	1675	1585	1781	1675	1585	1781	1841	1585	1781	1841	1585
Q Serve(g_s), s	3.5	25.3	9.3	6.3	18.5	8.3	6.5	21.3	0.0	9.3	22.6	0.0
Cycle Q Clear(g_c), s	3.5	25.3	9.3	6.3	18.5	8.3	6.5	21.3	0.0	9.3	22.6	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	227	1534	484	216	1612	508	297	584		342	645	
V/C Ratio(X)	0.45	0.94	0.42	0.83	0.72	0.37	0.66	0.81		0.80	0.80	
Avail Cap(c_a), veh/h	227	1535	484	216	1614	509	297	584		342	645	
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	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	21.6	30.5	25.0	23.5	27.0	23.6	22.3	28.3	0.0	21.1	26.3	0.0
Incr Delay (d2), s/veh	1.4	12.2	0.6	22.8	1.6	0.5	5.3	11.7	0.0	12.3	9.8	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	1.4	10.8	3.2	3.7	6.8	2.9	3.0	10.5	0.0	4.6	10.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	23.0	42.7	25.5	46.4	28.7	24.0	27.6	40.0	0.0	33.4	36.1	0.0
LnGrp LOS	C	D	C	D	C	C	C	D		C	D	
Approach Vol, veh/h		1756			1536			670			785	
Approach Delay, s/veh		39.5			30.2			36.4			35.2	
Approach LOS		D			C			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.0	33.0	11.0	32.0	11.0	36.0	9.6	33.4				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	9.5	28.5	6.5	27.5	6.5	31.5	5.1	28.9				
Max Q Clear Time (g_c+I1), s	11.3	23.3	8.3	27.3	8.5	24.6	5.5	20.5				
Green Ext Time (p_c), s	0.0	1.2	0.0	0.2	0.0	1.7	0.0	4.7				
Intersection Summary												
HCM 7th Control Delay, s/veh			35.3									
HCM 7th LOS			D									
Notes												
Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Rosebud Road Townhomes, Snellville
 2: Rosebud Road & mixed-use access/Kroger Access

future p.m.

Intersection												
Int Delay, s/veh	74.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕		↕	↗			↕	↗
Traffic Vol, veh/h	40	2	59	106	2	51	53	639	124	19	774	48
Future Vol, veh/h	40	2	59	106	2	51	53	639	124	19	774	48
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	150	-	-	-	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	87	87	87	98	98	98	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	4	2	2	4	2
Mvmt Flow	50	3	74	122	2	59	54	652	127	20	798	49

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1598	1724	798	1662	1710	715	847	0	0	779	0	0
Stage 1	837	837	-	823	823	-	-	-	-	-	-	-
Stage 2	761	887	-	838	887	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	86	89	386	~ 77	91	431	790	-	-	838	-	-
Stage 1	361	382	-	367	388	-	-	-	-	-	-	-
Stage 2	398	362	-	360	362	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	64	79	386	~ 54	81	431	790	-	-	838	-	-
Mov Cap-2 Maneuver	64	79	-	~ 54	81	-	-	-	-	-	-	-
Stage 1	345	365	-	342	361	-	-	-	-	-	-	-
Stage 2	318	338	-	277	346	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	78.89	\$ 762.51	0.64	0.21
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	790	-	-	65	386	76	43	-	-
HCM Lane V/C Ratio	0.068	-	-	0.81	0.191	2.416	0.023	-	-
HCM Control Delay (s/veh)	9.9	-	-	166.5	16.5	\$ 762.5	9.4	0	-
HCM Lane LOS	A	-	-	F	C	F	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	3.7	0.7	17.3	0.1	-	-

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

Rosebud Road Townhomes, Snellville
 3: Rosebud Road & Bushy Fork Road

future p.m.

Intersection			
Intersection Delay, s/veh	10.7		
Intersection LOS	B		
Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	246	594	878
Demand Flow Rate, veh/h	251	618	909
Vehicles Circulating, veh/h	591	208	21
Vehicles Exiting, veh/h	235	722	821
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	8.9	10.2	11.6
Approach LOS	A	B	B
Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
A (Intercept)	1380	1380	1380
B (Slope)	1.02e-3	1.02e-3	1.02e-3
Entry Flow, veh/h	251	618	909
Cap Entry Lane, veh/h	755	1116	1351
Entry HV Adj Factor	0.980	0.962	0.966
Flow Entry, veh/h	246	594	878
Cap Entry, veh/h	740	1073	1305
V/C Ratio	0.332	0.554	0.673
Control Delay, s/veh	8.9	10.2	11.6
LOS	A	B	B
95th %tile Queue, veh	1	4	6

Rosebud Road Townhomes, Snellville
 4: Rosebud Road & townhomes access

future p.m.

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘			↖	↖	↗
Traffic Vol, veh/h	12	3	3	803	913	18
Future Vol, veh/h	12	3	3	803	913	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	200
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	70	70	98	98	97	97
Heavy Vehicles, %	2	2	2	4	4	2
Mvmt Flow	17	4	3	819	941	19

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1767	941	960	0	-	0
Stage 1	941	-	-	-	-	-
Stage 2	826	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	92	319	717	-	-	-
Stage 1	379	-	-	-	-	-
Stage 2	430	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	91	319	717	-	-	-
Mov Cap-2 Maneuver	91	-	-	-	-	-
Stage 1	376	-	-	-	-	-
Stage 2	430	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	47.12	0.04	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	7	-	107	-	-
HCM Lane V/C Ratio	0.004	-	0.201	-	-
HCM Control Delay (s/veh)	10	0	47.1	-	-
HCM Lane LOS	B	A	E	-	-
HCM 95th %tile Q(veh)	0	-	0.7	-	-