

Final Report

Lawrenceville Highway Corridor

Report Prepared:

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Introduction

Background and Purpose

The City of Tucker has requested a Safety Improvement Corridor Study for US 29/SR 8/Lawrenceville Highway between the intersection of Hugh Howell Road and Cofer Crossing (East). In addition to being a major thoroughfare for commuters, the study area consists of several commercial and institutional developments including multiple stores, restaurants, and a public library which generate high levels of vehicular and pedestrian traffic along the corridor. Tucker High School is also located just west of the study corridor along Lavista Road. The study corridor is also a major transit route with ten MARTA bus stops along the 0.7-mile corridor. The corridor is also experiencing a high crash rate.

The purpose of the study is to examine potential short-term and long-term improvements to address the operational and safety issues in the study area. This report will forecast future traffic in 2025 and 2045 and analyze future no-build conditions to determine operational deficiencies then develop several potential alternatives to address identified deficiencies. These alternatives will include a mix of short-term and long-term intersection modifications based on the analysis of operational deficiencies, crash history and trends, pedestrian movements, and public input presented in this report. Finally, the alternatives will be prioritized for implementation based on feedback from the City of Tucker and several projects will be identified for immediate consideration for GDOT Quick Response Project Program as well as potential funding from the ARC safety program.

Study Area

The study consists of 5 intersections along US 29/SR 8/Lawrenceville Highway. From east to west the streets that form the 5 intersections with Lawrenceville Highway are as follows: Cofer Crossing (east), Old Norcross Road, Lavista Road, Lynburn Drive and Hugh Howell Road. The study area is shown in **Figure 1**, outlined in red. The study area spans approximately 0.7 miles of Lawrenceville Highway.

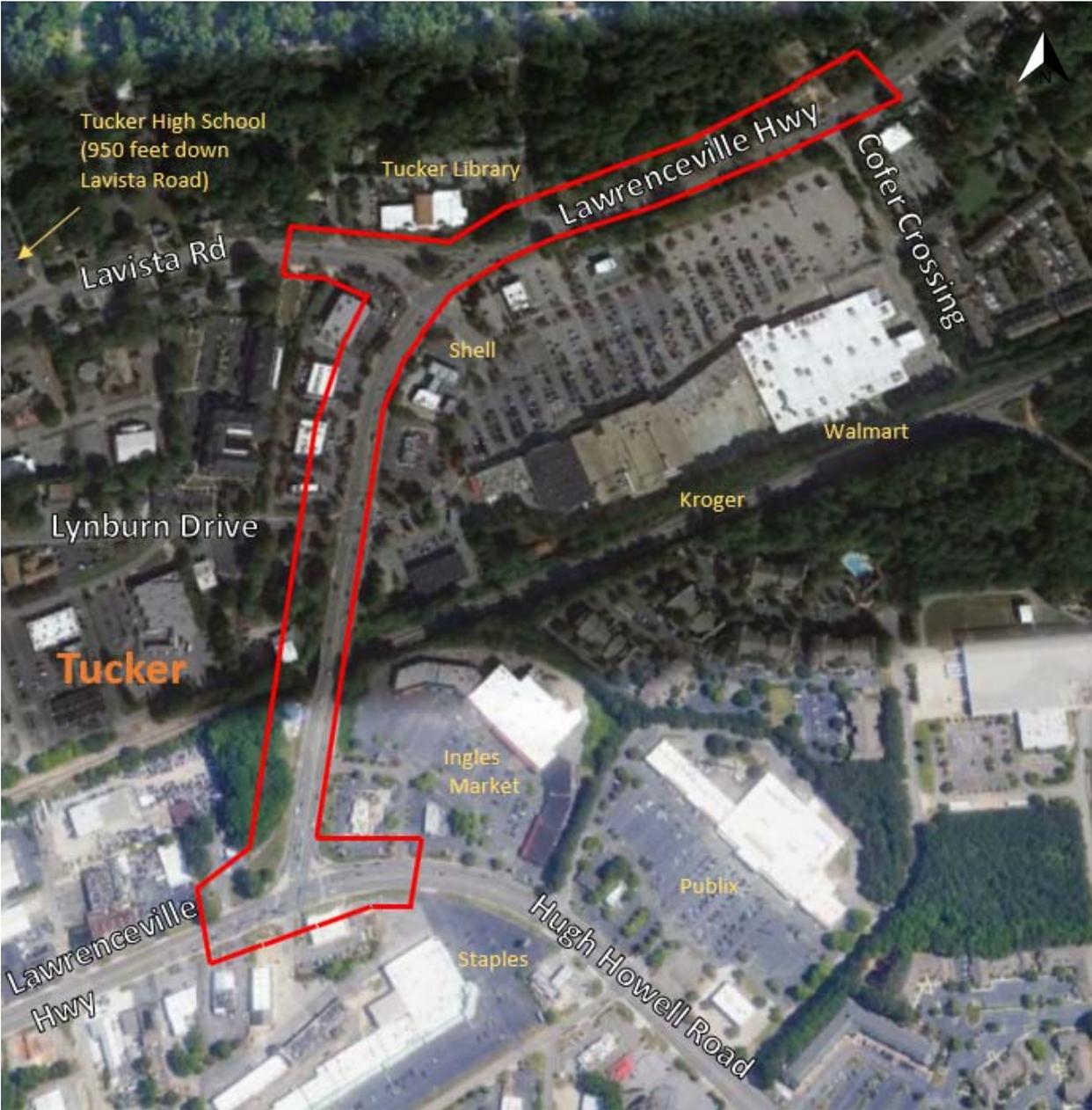


FIGURE 1: STUDY AREA MAP

Forecasting

Growth Rate Development

Historical traffic volumes are available at GDOT's TADA website¹. Historical data from count stations in the vicinity of the project area were analyzed to calculate an average 10 and 5-year growth. Growth rates were only calculated if at least two years of "actual" counts were collected during the timeframe. The results of these calculations are shown in **Table 1**. The 10-year growth rate was 0.8% while the 5-year growth rate was 1.8%. The growth rate calculations and data from each count location included in the analysis are presented in **Appendix A**.

TABLE 1: GROWTH RATES BASED ON HISTORICAL TRAFFIC DATA

GDOT Count Location	Location Description	Growth Rate (10-Year)	Growth Rate (5-Year)
089-3025	Lawrenceville Hwy W/O Hugh Howell Rd	0.9%	1.0%
089-3027	Lawrenceville Hwy Btw Hugh Howell Rd and LaVista Rd	1.1%	4.0%
089-3029	Lawrenceville Hwy E/O LaVista Rd	1.2%	0.7%
089-3272	LaVista Rd W/O Lawrenceville Hwy	1.6%	2.6%
089-3274	Hugh Howell Rd E/O Lawrenceville Hwy	-0.7%	0.5%
Average Growth Rate		0.8%	1.8%

A growth rate was also calculated based on projected future traffic volumes. ARC's regional travel demand model was used to collect existing conditions (2015) and future (2040) volumes on all links within the study area. The link volumes and resulting average growth rate is presented in **Table 2**. Based on the model data, traffic around the proposed development is project to grow at an average rate of 1.5%.

TABLE 2: GROWTH RATES BASED ON PROJECTED TRAFFIC VOLUMES

Model Link	2015	2040	Growth
Lawrenceville Hwy W/O Hugh Howell Rd	28,889	40,490	1.4%
Lawrenceville Hwy Betw Hugh Howell Rd and LaVista Rd	13,928	21,428	1.7%
Lawrenceville Hwy Betw LaVista Rd and Old Norcross Rd	27,943	39,967	1.4%
Lawrenceville Hwy E/O Old Norcross Rd	20,266	30,215	1.6%
LaVista Rd W/O Lawrenceville Hwy	14,016	22,334	1.9%
Hugh Howell Rd W/O Lawrenceville Hwy	24,304	33,324	1.3%
Average Growth Rate			1.5%

¹ <https://gdottrafficdata.drakewell.com/publicmultinodemap.asp>

The Governor’s Office of Planning and Budget’s (OPB) population projections for DeKalb County, and ARC’s population projections for Dekalb and the subarea of Northeast DeKalb are presented in **Table 3**. The 5, 15, 25 and 35-year growth rates calculated from this data are shown in **Table 4**. Based on these projections, the population in DeKalb County is expected to grow at an average rate of 1.0%.

TABLE 3: DEKALB COUNTY POPULATION PROJECTIONS

Place	2015	2020	2030	2040	2050
DeKalb County (OPB)	726,171	756,138	800,302	824,638	835,063
DeKalb County (ARC)	734,873	809,802	889,371	941,158	1,012,022
NE DeKalb (ARC)	137,491	150,902	163,416	172,169	182,816

TABLE 4: GROWTH RATE BASED ON POPULATION PROJECTIONS

Place	Growth 2020	Growth 2030	Growth 2040	Growth 2050	Average
DeKalb County (OPB)	0.8%	0.7%	0.5%	0.4%	0.6%
DeKalb County (ARC)	2.0%	1.3%	1.0%	0.9%	1.3%
NE DeKalb (ARC)	1.9%	1.2%	0.9%	0.8%	1.2%
Average	1.6%	1.0%	0.8%	0.7%	1.0%

ARC’s employment projections for DeKalb and the subarea of Northeast DeKalb are presented in **Table 5**. The 5, 15, 25 and 35-year growth rates calculated from this data are shown in **Table 6**. Based on these projections, the employment rate in DeKalb County is expected to grow at an average rate of 0.9%.

TABLE 5: DEKALB COUNTY EMPLOYMENT PROJECTIONS

Place	2015	2020	2030	2040	2050
DeKalb	366,020	391,015	407,179	436,969	474,144
NE DeKalb	75,275	80,615	84,211	90,290	98,009

TABLE 6: GROWTH RATE BASED ON EMPLOYMENT PROJECTIONS

Place	Growth 2020	Growth 2030	Growth 2040	Growth 2050	Average
DeKalb	1.3%	0.7%	0.7%	0.7%	0.9%
NE DeKalb	1.4%	0.8%	0.7%	0.8%	0.9%
Average	1.4%	0.7%	0.7%	0.7%	0.9%

Georgia Department of Labor’s Long-Range Employment Projections for the Atlanta Region and the resulting 10-year growth rate are presented in **Table 7**. Based on these projections, the employment rate in the Atlanta Region is 1.5%.

TABLE 7: ATLANTA REGION EMPLOYMENT PROJECTIONS

Place	2014	2024	Growth 2024
Atlanta Region	697,840	810,590	1.5%

Based on the results of this analysis, **a growth rate of 1.5% is recommended for all roadways** in this analysis.

Volume Development

Initially traffic data, including vehicular and pedestrian counts, were to be collected during a field visit. However, traffic patterns have been drastically altered in response to COVID-19. Therefore, any data collected under the current conditions would not be representative of normal traffic patterns. Instead, traffic data from previous studies was used to continue with the analysis, as the date traffic patterns will return to normal is undetermined. The City of Tucker provided data, made available through the GDOT RTOP, recorded in 2017 and 2018, which was used in this project. This data included raw turning movement counts for peak periods and one set of 48-hour classification counts. The raw data utilized for this report are included in **Appendix B**.

Peak Hour Volume Development

Raw peak hour turning movement volumes were converted to 2020 traffic volumes using the 1.5% annual growth rate applied directly to the AM and PM peak intersection volumes. These volumes were then balanced between intersections to develop existing conditions (2020) traffic volumes to be used for this analysis.

Pedestrian crossing counts were provided for Hugh Howell Road, Lynburn Drive, Lavista Road and Old Norcross Road Intersections. No pedestrian counts were provided for the Cofer Crossing (east) intersection. The sets of crossing counts, provided by the City of Tucker, were recorded in 2018, 2017 and 2015. The most current counts were used for each intersection and converted to 2020 pedestrian volumes using the 1.5% annual growth rate. This was done for the AM and PM peak for all the intersections with pedestrian data.

The 1.5% growth rate was then applied to the balanced 2020 vehicle and pedestrian volumes to forecast volumes for the future analysis years, 2025 and 2045. Traffic and pedestrian volume diagrams for the existing conditions, 2025 and 2045 peak hours can be found in **Appendix C**.

Daily (AADT) Volume Development

AADT volumes were developed by applying a K-factor calculated from the 48-hour classification counts to the balanced peak hour volumes. These volumes were also balanced between intersections. The AADT diagrams for each year, 2020, 2025, and 2045, are also included in **Appendix C**. The AADT diagrams do not include daily pedestrian volumes due to lack data.

Existing Conditions

Corridor Geometry

In the study area, Lawrenceville Highway has two through lanes in each direction, with a striped median between intersections from Hugh Howell Road to Old Norcross Road. There is a two-way left-turn lane provided between Old Norcross Road and Cofer Crossing (East). The corridor is mostly flat and has a large horizontal curve adjacent to the Lavista Road intersection that does not significantly obstruct sight lines. Lawrenceville Highway is classified as a principal arterial roadway.

Intersection Geometry

Hugh Howell Road Intersection

The eastbound approach of Lawrenceville Highway has two eastbound through lanes and two 240-foot eastbound left-turn bays. The southbound approach of Lawrenceville Highway has one channelized yield-controlled right turn lane, one lane allowing for both through and left turns, and one 320-foot left-turn bay. Lawrenceville Highway is relatively flat and straight through the vicinity of the study area.

The westbound approach of Hugh Howell Road has two through lanes, a channelized yield-controlled right turn lane and a 185-foot left turn bay. The road is relatively flat in the vicinity of the intersection. Hugh Howell Road has a horizontal curve approximately 175-feet east of the intersection, but it has no significant impact on sight distance at the intersection. Hugh Howell Road is classified as a minor arterial roadway.

The northbound approach of the shopping center driveway has one lane to accommodate the through, right turn and left turn movements. The shopping center driveway is relatively flat and straight in the vicinity of the intersection. There is a streetlight located on the east side of the shopping center driveway, located approximately 25-feet from the intersection. The shopping center this driveway serves consists of two stand-alone restaurants and one strip mall with 10 retail locations.

The intersection is signal controlled. Each leg of the intersection has a crosswalk and a pedestrian pushbutton. There is sidewalk bordering the intersection with the exception of the northeast quadrant of the intersection. There is one streetlight on the eastbound approach and one streetlight on the southbound approaches of Lawrenceville Highway. Both streetlights are located on the northwest quadrant of the intersection. There are streetlights on the south side of Hugh Howell Road in the vicinity of the intersection.

Lynburn Drive Intersection

The northbound approach of Lawrenceville Highway was two eastbound through lanes, a 200-foot right turn bay and a 180-foot left turn bay. The southbound approach of Lawrenceville Highway has two through lanes and one 135-foot left turn bay. Lawrenceville Highway is relatively flat and straight through the vicinity of the study area

The eastbound approach of Lynburn Drive has one lane which allows through, left, and right turn movements. The road is relatively flat in the vicinity of the intersection. Lynburn Drive is classified as a local roadway.

The westbound approach of the shopping center driveway has one through lane which allows for right turns and a 90-foot left turn bay. The shopping center driveway is relatively flat and straight in the vicinity of the intersection. There is one streetlight on the westbound approach, in the northeast quadrant of the intersection. The driveway leads into the Cofer Crossing shopping center.

The intersection is signal controlled. Each leg of the intersection has a crosswalk and a pedestrian pushbutton. There is sidewalk bordering each approach of the intersection. There is one streetlight on the northbound approach of Lawrenceville Highway, in the northwest quadrant of the intersection. There is one streetlight on the eastbound approach of the intersection, in the southwest quadrant of the intersection.

Lavista Road Intersection

The eastbound approach of Lawrenceville highway has two through lanes, one 400-foot left turn bay and one 230-foot channelized right turn bay. The westbound approach of Lawrenceville Highway has two through lanes and a high-speed free-flow channelized right turn. Left turns are not permitted from the westbound approach. Lawrenceville Highway is relatively flat at the intersection, with a horizontal curve that does not obscure sight lines.

The southbound approach of Lavista Road has one through lane, one left turn lane, one 300-foot left turn bay, and a 210-foot right turn bay. Lavista Road is relatively flat and through the vicinity of the study area with a slight horizontal curve approaching the intersection.

The northbound approach of the shopping center driveway only allows for right turn movements from a yield-controlled channelized right turn lane. Through and left turn movements are not permitted from the northbound approach. The shopping center driveway is relatively flat and straight in the vicinity of the intersection. The driveway serves the Cofer Crossing shopping center.

The intersection is signal controlled except for the westbound right turn, which is exclusively yield controlled. There are crosswalks with pedestrian pushbuttons on all legs of the intersection with the exception of the westbound leg of Lawrenceville Highway; this includes the channelized right-turn from Lawrenceville Highway to Lavista Road. There is sidewalk on every approach of the intersection. There are no streetlights on Lawrenceville Highway in the vicinity of the intersection. There is one streetlight on Lavista Road in the northwest quadrant of the intersection.

Old Norcross Road Intersection

The eastbound approach of Lawrenceville Highway has two through lanes and one 120-foot left turn bay. The westbound approach of Lawrenceville Highway has two through lanes, allowing for right turns. Lawrenceville Highway is relatively flat at this intersection, with a horizontal curve that does not obscure sight lines.

The southbound approach of Old Norcross Road has a left turn lane and a 165-foot right turn lane. Old Norcross Road is on a steep incline at this intersection and straight at this intersection.

The intersection is signal controlled. There are crosswalks with pedestrian pushbuttons on every leg of the intersection. There is sidewalk bordering all approaches of the intersection. There is a streetlight on the eastbound approach on the southern side of the intersection. There is one streetlight on the southbound approach on the southwest corner of the intersection.

Cofer Crossing (East) Intersection

The eastbound approach of Lawrenceville Highway has two through lanes and one 205-foot left turn bay. The westbound approach of Lawrenceville Highway has two through lanes and one 195-foot left turn lane. Lawrenceville Highway is relatively flat and straight at this intersection.

The northbound approach has a right turn lane and a left turn lane. Cofer Crossing is relatively flat and straight at this intersection. The southbound approach of the intersection is a residential driveway. The southbound approach currently does not have any signal heads controlling the entry or exit to the property.

The intersection is signal controlled, however the residential drive on the southbound approach does not have a signal head to control movements. There are crosswalks and pedestrian push buttons on all legs of the intersection. There is sidewalk on both sides of Lawrenceville Highway. There is not sidewalk on either side of Cofer Crossing. There are two streetlights on Lawrenceville Highway in the vicinity of the intersection, in the southeast and southwest quadrants of the intersection. There is one streetlight on the northbound approach of the intersection, in the southwest quadrant of the intersection.

Crash History

An analysis of historical crash data was conducted using crash data obtained from GDOT's GEARS platform for the years 2014 through 2019. **Figure 2** shows a heatmap of all crashes analyzed along the corridor and at intersections. Crashes in the study area are concentrated at major intersections including Hugh Howell Road, Lynbrn Drive, Lavista Road, and Old Norcross Road. There are more minor concentrations of crashes at Cofer Crossing (East), the commercial driveway north of Chick-fil-A, and the area between Lynbrun Drive and Lavista Road which has several access points to commercial developments along the corridor.

The analysis presented in the following sections focuses on corridor-wide crashes as well as specific intersection. Where applicable crash rates were calculated and compared to statewide averages provided by GDOT. Raw crash data used for this analysis is included in **Appendix D**.



FIGURE 2: CRASH HEAT MAP - LAWRENCEVILLE HIGHWAY STUDY AREA

Corridor-Wide

Table 8 shows the crash history for the whole corridor. **Figure 3** shows a breakdown of the crashes by type over the whole corridor.

TABLE 8: CORRIDOR-WIDE CRASH HISTORY

Item		Year					
		2014	2015	2016	2017	2018	2019
Crash Type	Angle	24	16	28	28	16	36
	Rear End	27	27	24	31	29	35
	Sideswipe-Same Direction	4	8	14	8	8	14
	Sideswipe-Opposite Direction	1	0	0	0	2	1
	Not a Collision with a Motor Vehicle	1	2	3	1	6	4
	Head On	1	0	1	2	0	3
	Unclassified	0	0	2	1	0	0
Total Crashes		58	53	72	71	61	93
Total Non-Fatal Injury Crashes		12	18	6	15	17	15
Total Fatality Crashes		0	0	0	0	0	0
Total Bike/Ped-Related Crashes		0	0	0	2	2	0
AADT		20800	21000	21700	24800	24800	24800
Distance (miles)		0.70	0.70	0.70	0.70	0.70	0.70
Crash Rate (per 100 MVMT)		1090	987	1297	1119	962	1466
Statewide Crash Rate (per 100 MVMT)		589	583	628	615	-	-
Non-Fatality Injury Crash Rate (per 100MVMT)		226	335	108	236	268	236
Statewide Non-Fatality Injury Crash Rate (per 100 MVMT)		134	138	145	149	-	-
Fatality Crash Rate (per 100 MVMT)		0	0	0	0	0	0
Statewide Fatality Crash Rate (per 100 MVMT)		1.15	1.24	1.47	1.24	-	-

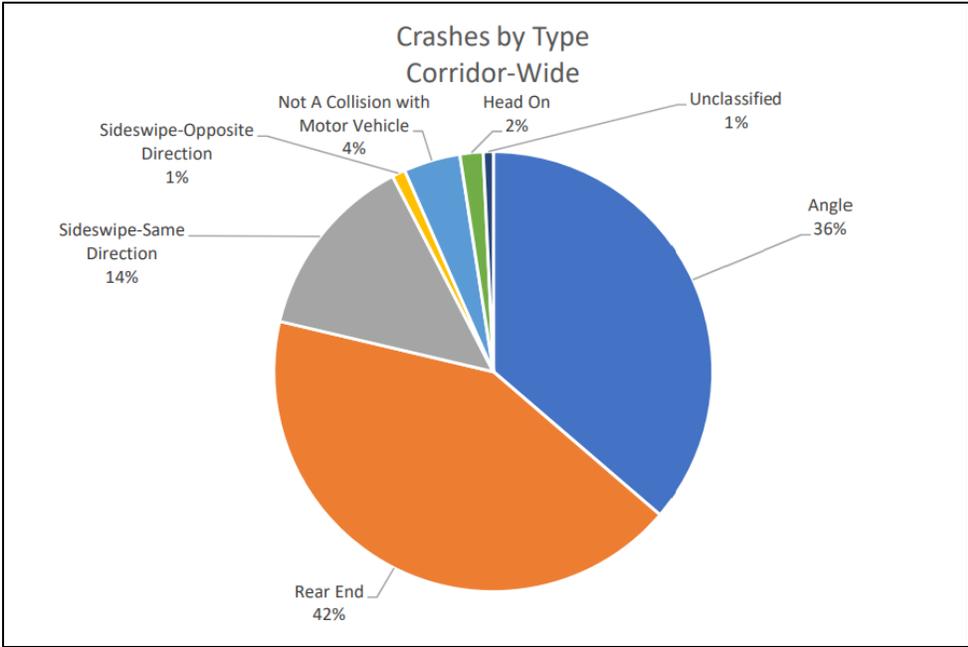


FIGURE 3: CRASHES BY TYPE - CORRIDOR-WIDE

Crashes included in this analysis occurred directly on Lawrenceville Highway north of the Hugh Howell Road and west of Cofer Crossing (East), exclusive of those intersections; crashes on side streets were not included in this analysis but are included in the individual intersection analyses. 408 crashes occurred on the corridor between 2014-2019. The crash rate for the corridor is higher than the statewide average crash rate. The three most common crash types are rear end, angle and sideswipe-same direction. No fatalities were reported on the corridor during the study years. Four crashes on the corridor involved pedestrians. These crashes all occurred at intersections and will be discussed in their respective sections.

Hugh Howell Road Intersection

Table 9 shows the crash history for the Hugh Howell Road intersection. **Figure 4** shows a breakdown of the crashes by type for the intersection.

TABLE 9: HUGH HOWELL ROAD CRASH HISTORY

Item		Year					
		2014	2015	2016	2017	2018	2019
Crash Type	Angle	5	11	8	6	12	10
	Rear End	54	33	46	39	43	56
	Sideswipe-Same Direction	7	4	11	9	9	11
	Sideswipe-Opposite Direction	2	0	1	0	1	3
	Not a Collision with a Motor Vehicle	0	0	1	0	2	1
	Head On	0	0	4	3	0	1
	Unclassified	0	0	0	0	0	1
Total Crashes		68	48	71	59	67	83
Total Non-Fatal Injury Crashes		20	8	20	18	15	15
Total Fatality Crashes		0	0	0	0	0	0
Total Bike/Ped-Related Crashes		0	0	0	0	0	1

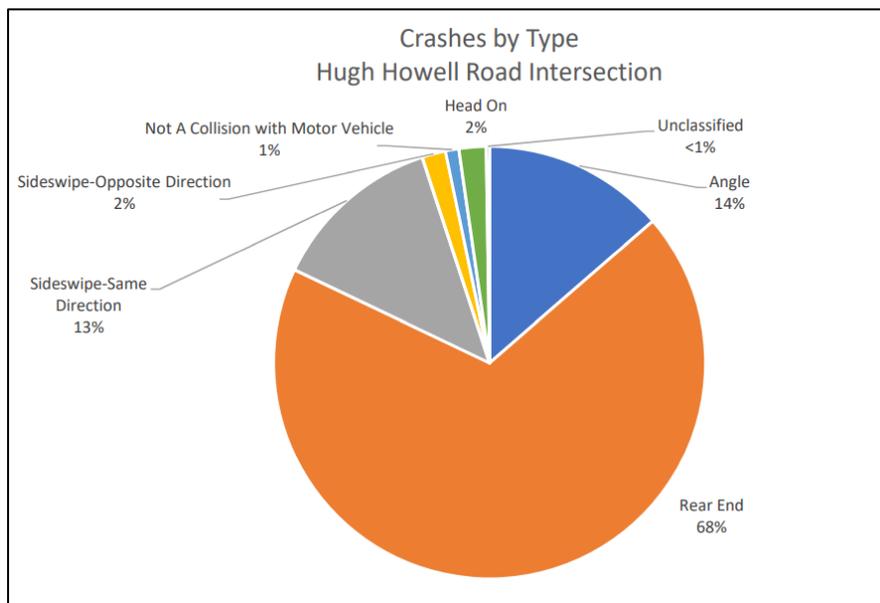


FIGURE 4: CRASHES BY TYPE - HUGH HOWELL ROAD INTERSECTION

396 crashed occurred at the Hugh Howell Road intersection between 2014-2019. The three most frequent crash types are rear end, angle and sideswipe-same direction crashes. One crash at this intersection involved a pedestrian. A vehicle on the westbound approach of Hugh Howell Road

was continuing straight onto Lawrenceville Highway and struck a pedestrian in the crosswalk. The crash report indicated the vehicle had a green signal and the pedestrian was crossing when prohibited to do so.

Lynburn Drive Intersection

Table 10 shows the crash history for the Lynburn Drive intersection. **Figure 5** shows a breakdown of the crashes by type for the intersection.

TABLE 10: LYNBURN DRIVE INTERSECTION CRASH HISTORY

Item		Year					
		2014	2015	2016	2017	2018	2019
Crash Type	Angle	5	7	3	9	6	13
	Rear End	5	6	3	8	10	4
	Sideswipe-Same Direction	1	1	3	2	2	5
	Sideswipe-Opposite Direction	0	0	0	0	2	0
	Not a Collision with a Motor Vehicle	1	2	0	0	2	0
	Head On	0	0	1	1	0	1
	Unclassified	0	0	1	0	0	0
Total Crashes		12	16	11	20	22	23
Total Non-Fatal Injury Crashes		2	7	0	4	7	3
Total Fatality Crashes		0	0	0	0	0	0
Total Bike/Ped-Related Crashes		0	0	0	0	1	0

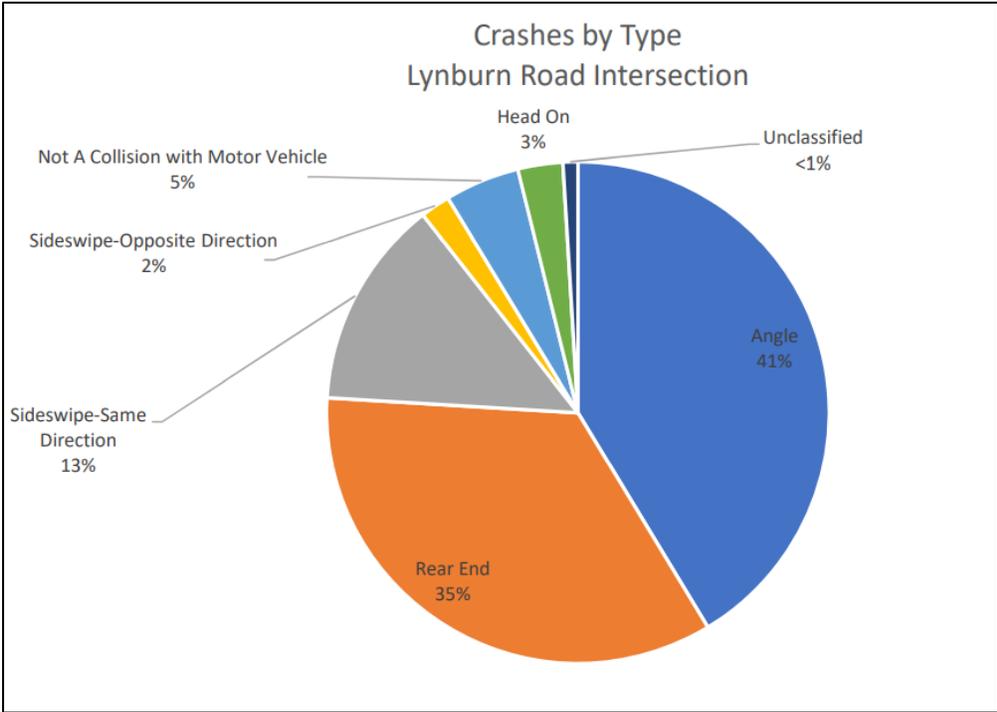


FIGURE 5: CRASHES BY TYPE - LYNBURN ROAD INTERSECTION

104 crashed occurred at the Lynburn Road intersection between 2014-2019. The three most frequent crash types are angle, rear end and sideswipe-same direction crashes. One crash at this intersection involved pedestrians. A vehicle stopped at the signal on the westbound approach of Lynburn Drive waiting to turn right onto Lawrenceville Highway. When the signal changed to green the driver proceeded to turn right, striking two pedestrians. The pedestrians were given the right of way to cross Lawrenceville Highway, and the driver was cited with failure to yield at a crosswalk.

Lavista Road Intersection

Table 11 shows the crash history for Lavista Road intersection. **Figure 6** shows a breakdown of the crashes by type for the intersection.

TABLE 11: LAVISTA ROAD INTERSECTION CRASH HISTORY

Item		Year					
		2014	2015	2016	2017	2018	2019
Crash Type	Angle	7	7	8	6	8	16
	Rear End	14	9	9	11	11	19
	Sideswipe-Same Direction	2	4	11	3	3	3
	Sideswipe-Opposite Direction	0	0	0	0	0	1
	Not a Collision with a Motor Vehicle	0	0	2	1	3	2
	Head On	0	0	0	0	0	1
	Unclassified	0	0	1	1	0	0
Total Crashes		23	20	31	22	25	42
Total Non-Fatal Injury Crashes		6	6	1	4	7	9
Total Fatality Crashes		0	0	0	0	0	0
Total Bike/Ped-Related Crashes		0	0	0	1	1	0

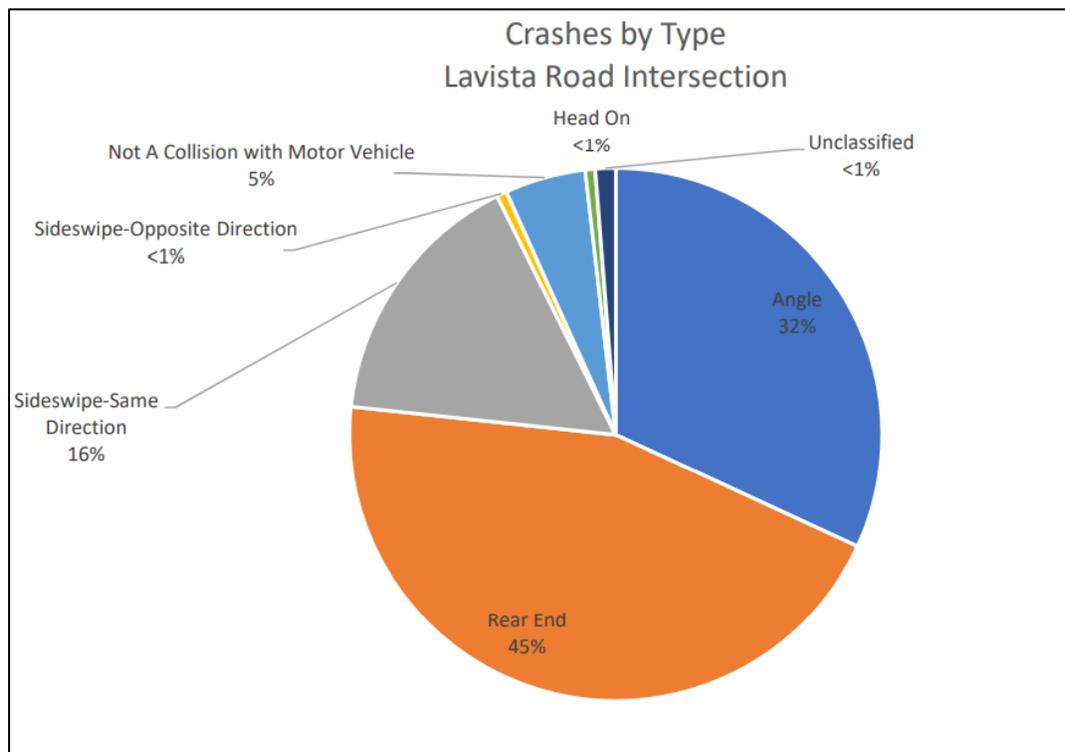


FIGURE 6: CRASHES BY TYPE - LAVISTA ROAD INTERSECTION

163 crashed occurred at the Lavista Road intersection between 2014-2019. The three most frequent crash types are rear end, angle and sideswipe same direction crashes. Two crashes at this intersection involved a pedestrians. Both the pedestrian crashes involved a vehicle turning right from the southbound approach of Lavista Road on to Lawrenceville Highway. In both cases the drivers did not see the pedestrian in the crosswalk.

Old Norcross Road Intersection

Table 12 shows the crash history for Old Norcross Road intersection. **Figure 7** shows a breakdown of the crashes by type for the intersection.

TABLE 12: OLD NORCROSS ROAD CRASH HISTORY

Item		Year					
		2014	2015	2016	2017	2018	2019
Crash Type	Angle	7	3	5	7	0	4
	Rear End	10	11	7	7	5	5
	Sideswipe-Same Direction	1	3	2	2	0	1
	Sideswipe-Opposite Direction	1	0	0	0	0	0
	Not a Collision with a Motor Vehicle	0	0	0	0	0	0
	Head On	1	0	1	0	0	0
	Unclassified	0	0	0	0	0	0
Total Crashes		20	17	15	16	5	10
Total Non-Fatal Injury Crashes		5	4	1	4	1	0
Total Fatality Crashes		0	0	0	0	0	0
Total Bike/Ped-Related Crashes		0	0	0	0	0	0

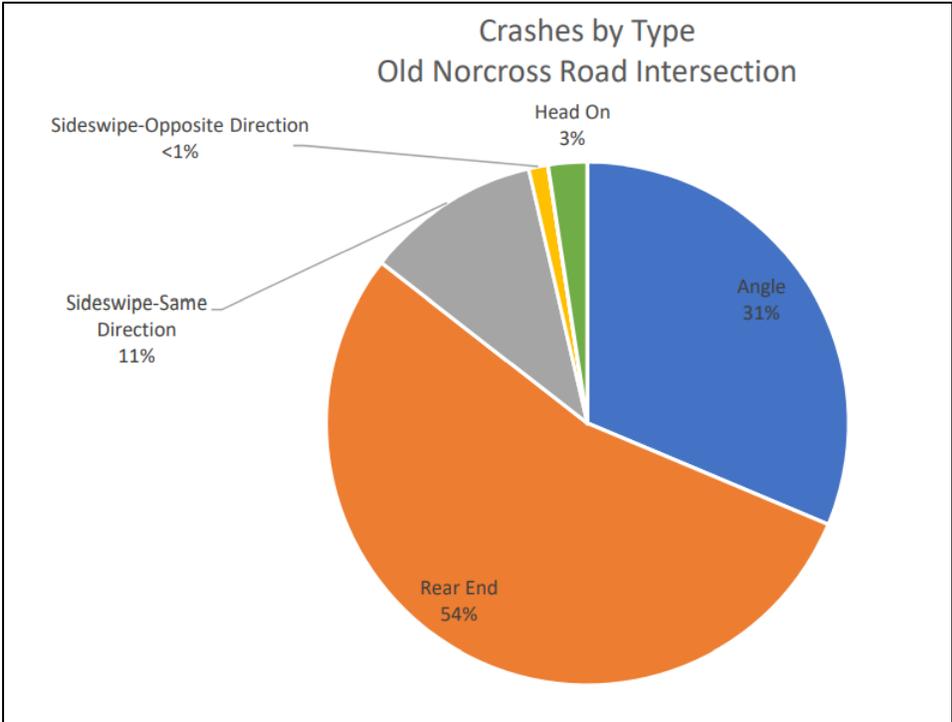


FIGURE 7: CRASHED BY TYPE - OLD NORCROSS ROAD INTERSECTION

83 crashed occurred at the Old Norcross Road intersection between 2014-2019. The three most frequent crash types are rear end, angle and sideswipe-same direction crashes.

Cofer Crossing (East) Intersection

Table 13 shows the crash history for Cofer Crossing (East) intersection. **Figure 8** shows a breakdown of the crashes by type for the intersection.

TABLE 13: COFER CROSSING (EAST) CRASH HISTORY

Item		Year					
		2014	2015	2016	2017	2018	2019
Crash Type	Angle	1	0	2	2	2	0
	Rear End	0	2	1	2	3	2
	Sideswipe-Same Direction	0	0	0	0	0	0
	Sideswipe-Opposite Direction	0	0	0	0	0	0
	Not a Collision with a Motor Vehicle	0	0	0	0	0	1
	Head On	0	0	0	0	0	0
	Unclassified	0	0	0	0	0	0
Total Crashes		1	2	3	4	5	3
Total Non-Fatal Injury Crashes		0	2	0	0	0	0
Total Fatality Crashes		0	0	0	0	0	0
Total Bike/Ped-Related Crashes		0	0	0	0	0	0

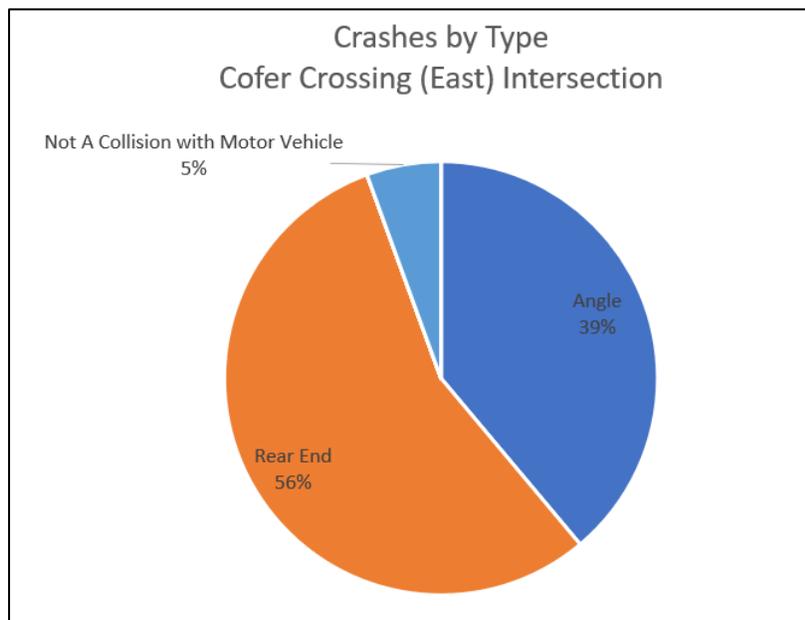


FIGURE 8: CRASHED BY TYPE - COFER CROSSING (EAST) INTERSECTION

18 crashed occurred at the Cofer Crossing (East) intersection between 2014-2019. The only three crashes experienced at the intersection are rear end, angle and not motor vehicle collisions.

Existing Conditions Synchro Analysis

The existing conditions Synchro files used for this analysis were obtained from GDOT's RTOP program. The level of service (LOS) analysis was conducted for the AM and PM peak hours for the existing conditions using the 2020 peak hour volumes found in **Appendix C**.

Intersection LOS and queue lengths were analyzed for each intersection on the corridor using Synchro version 10. The results of this analysis are presented in **Table 14 - Table 18**. The results shown in these tables come from existing conditions scenarios with optimized network cycle lengths, offsets and splits. Delay figures were obtained from the HCM 2000 reports while queue lengths were obtained from Synchro's default reports. Synchro generated reports for the intersections are included in **Appendix E**.

TABLE 14: EXISTING CONDITIONS LEVEL OF SERVICE AND INTERSECTION DELAY – HUGH HOWELL ROAD

Approach	AM Peak Hour			PM Peak Hour		
	Delay (s)	LOS	Left Turn Queue (ft)	Delay (s)	LOS	Left Turn Queue (ft)
Eastbound	43.5	D	275*	39.0	D	400*
Westbound	29.9	C	25	45.8	D	25
Northbound	73.5	E	-	54.8	D	-
Southbound	9.3	A	150	32.8	C	450*
Overall Intersection	26.4	C	-	38.7	D	-

* denotes queue exceeds turn bay length

TABLE 15: EXISTING CONDITIONS LEVEL OF SERVICE AND INTERSECTION DELAY – LYNBURN DRIVE

Approach	AM Peak Hour			PM Peak Hour		
	Delay (s)	LOS	Left Turn Queue (ft)	Delay (s)	LOS	Left Turn Queue (ft)
Eastbound	66.7	E	-	29.7	C	-
Westbound	68.6	E	100	55.8	E	375*
Northbound	5.4	A	150	25.5	C	150
Southbound	2.5	A	25	11.5	B	25
Overall Intersection	9.1	A	-	25.1	C	-

* denotes queue exceeds turn bay length

TABLE 16: EXISTING CONDITIONS LEVEL OF SERVICE AND INTERSECTION DELAY - LAVISTA ROAD

Approach	AM Peak Hour			PM Peak Hour		
	Delay (s)	LOS	Left Turn Queue (ft)	Delay (s)	LOS	Left Turn Queue (ft)
Eastbound	24.2	C	400	13.8	B	250
Westbound	20.0	C	-	24.0	C	-
Northbound	0.0	A	-	0.1	A	-
Southbound	45.8	D	125	42.5	D	475*
Overall Intersection	23.8	C	-	27.7	C	-

* denotes queue exceeds turn bay length

TABLE 17: EXISTING CONDITIONS LEVEL OF SERVICE AND INTERSECTION DELAY - OLD NORCROSS ROAD

Approach	AM Peak Hour			PM Peak Hour		
	Delay (s)	LOS	Left Turn Queue (ft)	Delay (s)	LOS	Left Turn Queue (ft)
Eastbound	11.0	B	125*	7.5	A	175*
Westbound	8.8	A	-	12.0	B	-
Southbound	57.7	E	100	39.4	D	150
Overall Intersection	14.0	B	-	12.4	B	-

* denotes queue exceeds turn bay length

TABLE 18: EXISTING CONDITIONS LEVEL OF SERVICE AND INTERSECTION DELAY - COFER CROSSING (EAST)

Approach	AM Peak Hour			PM Peak Hour		
	Delay (s)	LOS	Left Turn Queue (ft)	Delay (s)	LOS	Left Turn Queue (ft)
Eastbound	6.6	A	-	A	9.0	-
Westbound	8.3	A	75	B	16.7	200*
Northbound	34.6	C	225	C	25.1	175
Overall Intersection	11.4	B	-	B	13.2	-

* denotes queue exceeds turn bay length

Needs Assessment

Review of Previous Studies

Tucker Strategic Transportation Master Plan

The Tucker Strategic Transportation Master Plan (2019) provides some insight into goals the city has for the transportation network. The overall transportation vision for the City of Tucker is stated as follows: “To enhance Tucker by connecting places and people with safe travel options, today, tomorrow, together.” Several of the transportation objectives and strategies apply to the study area. First, the plan stresses improving walking and biking conditions. Emphasis is put on enhancing walking infrastructure and making safety improvements throughout the city. This applies directly to the missing and poorly maintained sidewalks in the study area. A second point of emphasis is improving traffic capacity, especially in the downtown corridor where the study area is located.

The Tucker Strategic Transportation Master Plan recommended the following three projects in the study area.

- Intersection of Lawrenceville Highway and Hugh Howell Road – detailed traffic study to identify a design that improves traffic flow and safety
- Intersection of Lawrenceville Highway and Lynburn Drive – provide a left turn/through lane and a right turn/through lane to alleviate traffic congestion and improve pedestrian safety
- Intersection of Lawrenceville Highway and Hugh Howell Road – add sidewalk where missing at the northeast quadrant of the intersection

Tucker Comprehensive Plan

The Tucker Comprehensive Plan (2018) formalizes a development strategy for the city as a whole. The major theme of the plan is promoting connectivity within the city. One of the main goals of the plan is to improve transportation connections. Some of the strategies within the transportation goal are specific to the study area and Lawrenceville Highway. First, the plan emphasizes improving pedestrian and cyclist safety by bettering sidewalks and intersections. Second, the plan outlines a goal to transform the Lawrenceville Highway – Hugh Howell Corridor into a gateway to connect the adjacent neighborhoods and commercial centers. The plan envisions a tree-lined corridor, with native plants, attractive signage and sidewalks. The area identified for these specific improvements runs perpendicular to the study area; the intersection

of Hugh Howell Road and Lawrenceville Highway is shared between the two regions. Therefore, these goals should be kept in mind while designing solutions for the study area.

Tucker Downtown Master Plan

The Downtown Tucker Master Plan (2019), mentions a few specific goals for development along Lawrenceville Highway. The master plan named the Hugh Howell Road and Lawrenceville Highway Intersection as a new gateway to downtown. The Downtown Master plan shares the same vision for new gateways as the Tucker Comprehensive Plan, previously discussed.

DeKalb County Transit Master Plan

The DeKalb Transit Master Plan (2019) shares ideas for the future of MARTA in Tucker and along Lawrenceville Highway. First, the transit plan deems Lawrenceville Highway as a major east-west travel corridor, both at the inter- and intra- county level. Lawrenceville Highway carries some of the highest number of users between the county and external locations and users starting and ending their trips within the county. Also, Tucker to downtown Atlanta is one of the top ten origin/destination pairs in DeKalb County, determined by the number of trips between the two locations. These high demand patterns make Tucker a focal point for transit growth in DeKalb County. The Transit Master Plan shares two expansion scenarios, based on two potential sales tax levels – a half penny and full penny. Both funding scenarios identify Tucker as a location for a mobility center. A mobility center is designed specifically to facilitate bus-to-bus centers, and provide a range of amenities including covered shelter, breeze card kiosks, real-time bus information, restrooms and safe pedestrian and bicycle access. The half penny scenario adds two arterial rapid transit (ART) routes, down Lawrenceville Highway and Lavista Road, to service the mobility center. The full penny scenario adds three ART lines, down Lawrenceville Highway, Lavista Road and Hairston Road. The potential for an increase in transit presence in the study area should be taken into consideration when designing potential solutions.

Tucker Parks Master Plan

The Tucker Parks Master Plan (2019), provides insight for the study area as the Tucker Nature Preserve is located on Lawrenceville Highway between the Old Norcross Road and Cofer Crossing Intersections. The Tucker Nature Preserve is a 12-acre park that has walking trails, a picnic area, and open green space. The master plan identifies some short-term recommendations to the Nature Preserve that could influence the study area. First, it is recommended to improve and expand the existing parking lot. Other improvements include the

installation of a playground, pavilions, community gardens and an outdoor amphitheater. This could change the curb cuts on Lawrenceville Highway, in the proximity of the Cofer Crossing (East) intersection and attract more users to the park changing traffic patterns in the study area.

Tucker Trails Master Plan

The Tucker Trails Master Plan (2019) contains recommendations that impact the study area. The theme of the trails master plan is to connect downtown commercial areas to neighborhood, parks and schools. The proposed Downtown to Kelly Cofer Park multi-use path touches the northern part of the study area, at the intersection of Lavista Road and Lawrenceville Highway. A diagram of the proposed trail can be seen in **Figure 9**. This segment of trail is deemed a primary trail segment and classified as Tier 2 for implementation. The plan has three implementation tiers, ranked in order of priority. The proposed changes to the Lavista Road intersection include adding a rapid flashing beacon at the westbound right turn lane from Lawrenceville Highway to Lavista Road. This proposed path and infrastructure change should be taken into consideration when designing potential solutions at the Lavista Road intersection.

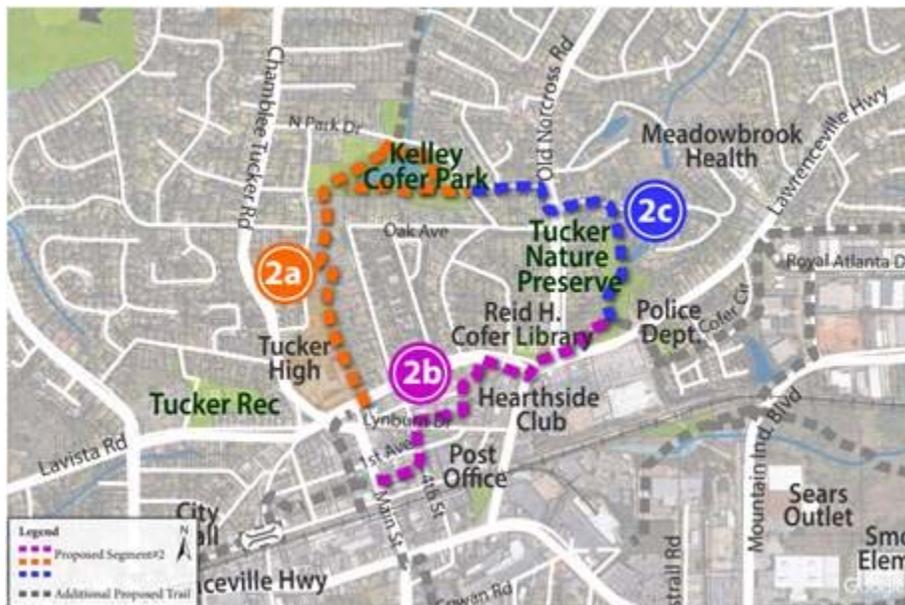


FIGURE 9: PROPOSED DOWNTOWN TO KELLEY COFER PARK MULTI USE PATH

Public Comments

Public input about the study corridor was collected through an online GIS survey, active from April 10th to May 20th. 304 responses were collected from the online survey. The survey allowed for the placement of specific concerns at the intersections and analyzed by location. Paper copies of the survey were handed out and collected directly from the senior living home near the corridor as well. 16 responses were received from the senior living home. **Figure 10** shows a map of the most frequent comments.

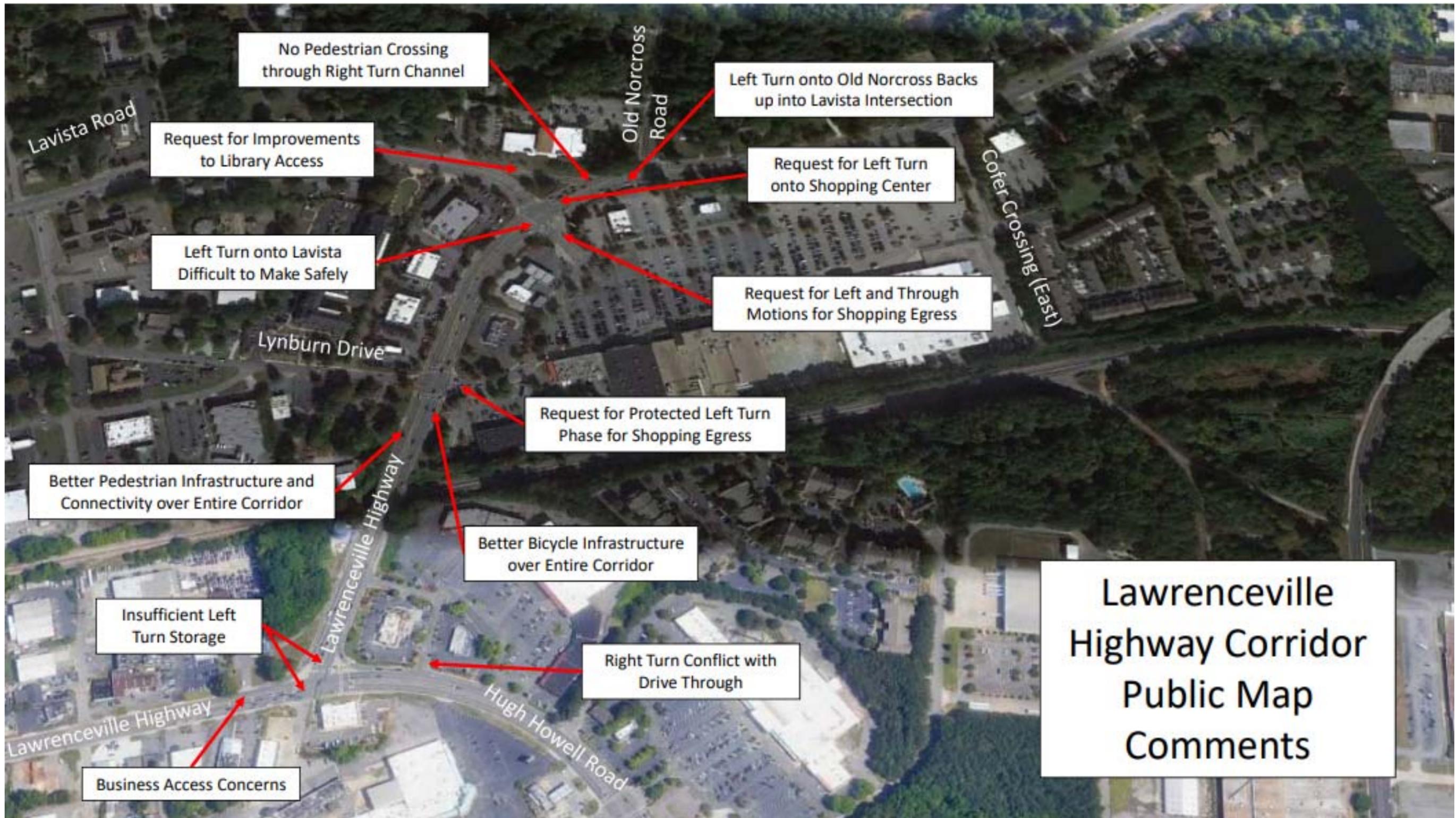


FIGURE 10: MAP OF PUBLIC COMMENTS

Hugh Howell Road Intersection

Figure 11 shows a detailed breakdown of the public comments for the intersection.

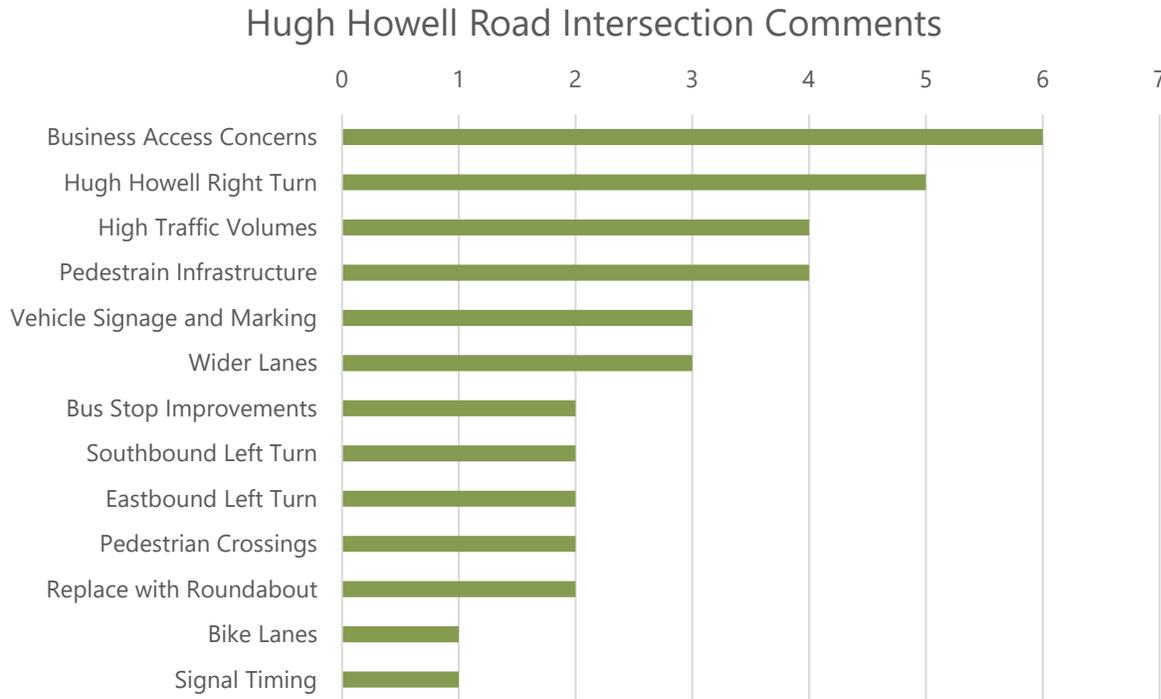


FIGURE 11: HUGH HOWELL ROAD PUBLIC COMMENTS

The most frequent comments at about the Hugh Howell Road intersection are summarized below.

- Business access concerns
- Westbound right turn from Hugh Howell Road to Lawrenceville Highway
- Eastbound and southbound left turn bays exceeding capacity

One concern identified through the public survey was about business access along the westbound and eastbound approach. There are many restaurants and businesses that have driveway entrances in the vicinity of the intersection. The driveways are unsignalized and the public commented that turning in and out of the businesses was difficult.

Another concern many citizens identified is the right turn from the Hugh Howell Road westbound approach to Lawrenceville Highway northbound. This is a channelized yield-controlled right turn lane that has a driveway entrance to a fast food restaurant. The public frequently commented that the drive through traffic is blocking the right turn lane.

The final major concern identified at the Lawrenceville Highway and Hugh Howell Road intersection concerned left turn bays. There are double left turn lanes for both the turn from eastbound Lawrenceville Highway onto northbound Lawrenceville Highway and the turn from southbound Lawrenceville Highway to eastbound Hugh Howell Road. The public noted that there is not enough vehicle storage in these left turn lanes and vehicles frequently back up into the through lanes.

Other, more minor concerns about the Hugh Howell Road intersection include the state of the pedestrian infrastructure, pedestrian crossing safety and requests for wider travel lanes.

Lynburn Drive Intersection

Figure 12 shows a detailed breakdown of the public comments for the intersection.

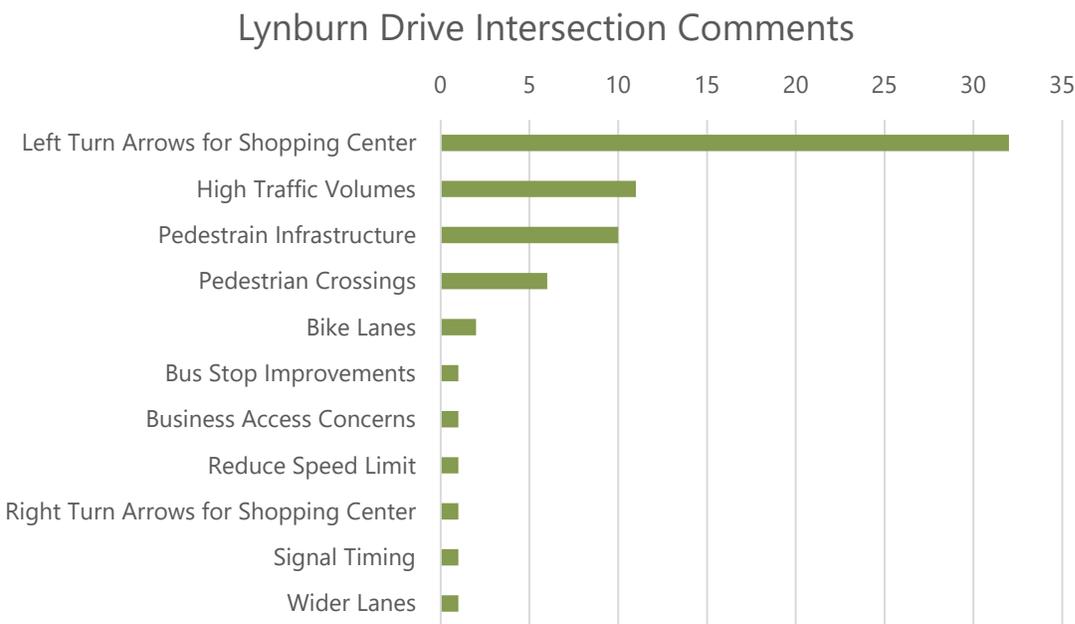


FIGURE 12: LYNBURN DRIVE PUBLIC COMMENTS

The most frequent comments at about the Lynburn Drive intersection are summarized below.

- Protected turning phases for the westbound approach exiting the shopping center
- Pedestrian infrastructure and crossing improvements

Overwhelmingly, the largest concern at the Lynburn Drive and Lawrenceville Highway Intersection is the request for a protected left turn phase for the westbound approach, exiting the shopping center. Drivers attempting to make the left turn out of the shopping center

complained about excessive delay. Drivers coming from the eastbound approach attempting to proceed straight into the shopping center raised safety concerns about the vehicles making the westbound left not yielding to through traffic and pulling out in front of them. A left turn phase was also specifically requested by residents of the senior center.

The next major concern was with pedestrian infrastructure and cross walks at the Lynburn Drive intersection. Comments were raised about the high pedestrian usage at the intersection, including elderly citizens and students at Tucker High School, which is located near the intersection. Requests were made for longer pedestrian phases to allow for safer crossings, especially for the elderly. Addressing the pedestrian infrastructure at the Lynburn Drive intersection was the most frequent comment on the surveys collected directly from the senior center.

Other minor concerns at the Lynburn Drive intersection include requests for bicycle infrastructure, improvements to the bus stops around the intersection, reducing the speed limit in the area and a protected right turn phase out of the shopping center. One resident of the senior center also requested adding a right turn lane from the eastbound approach of Lynburn Drive to Lawrenceville Highway.

Lavista Road Intersection

Figure 13 shows a detailed breakdown of the public comments for the intersection.

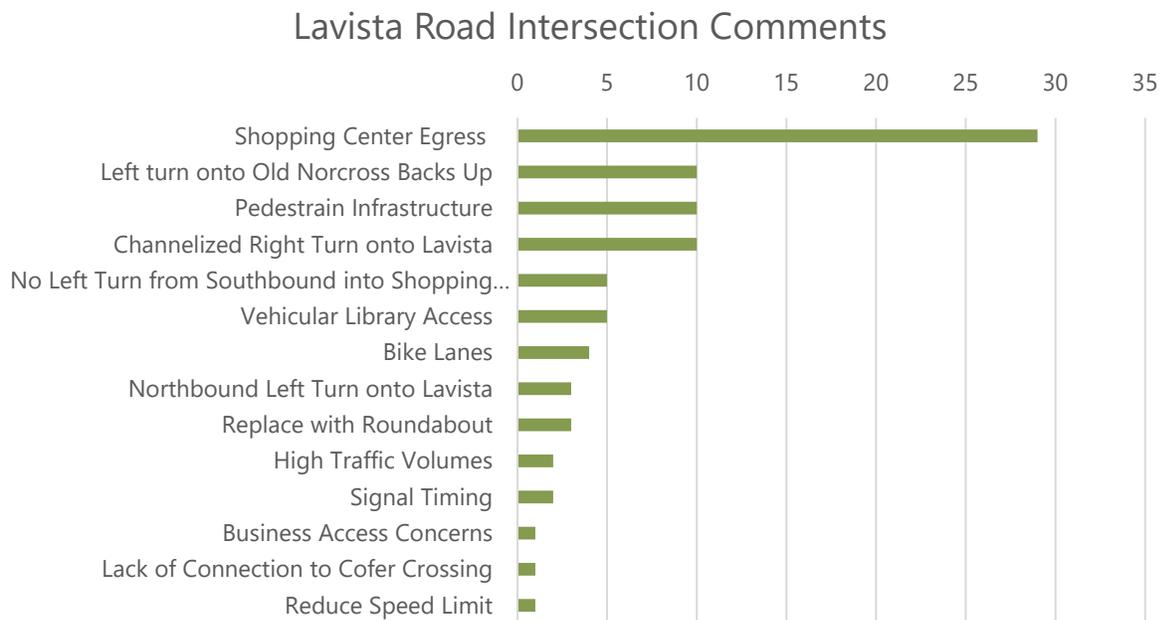


FIGURE 13: LAVISTA ROAD PUBLIC COMMENTS

The most frequent comments at about the Lavista Road intersection are summarized in the bullet points below.

- Straight and left turn movements for shopping center egress
- Left turn from Lawrenceville Highway onto Old Norcross Road backs up into the Lavista Road intersection
- Channelized right turn from Lawrenceville Highway onto Lavista Road is missing a crosswalk or pedestrian push buttons

The main concern about the Lavista Road intersection is about the shopping center egress. Currently, only a right turn onto Lawrenceville Highway is allowed when leaving the shopping center driveway. Users were requesting a through movement to Lavista Road and a left turn movement onto Lawrenceville Highway be allowed out of the intersection as well. Prohibiting these movement causes additional traffic circulation within the shopping center lot while traffic is redirected to other exits, including Lynburn Drive.

Another major concern is the vehicle back-up from the Old Norcross Road intersection. The left turn bay on Lawrenceville Highway to turn onto Old Norcross Road is extremely short, less than 50 feet. During peak hour, vehicles will exceed the storage provided and back up into the Lavista Road intersection causing additional congestion.

Finally, comments were made about the lack of pedestrian infrastructure at the channelized right turn lane from Lawrenceville Highway to Lavista Road. Residents of the senior living home identified this as a dangerous intersection to cross. The crosswalk does not extend through the channelized right-turn lane. Users say vehicles make this turn relatively quickly and do not yield to pedestrians. This is also one of the only ways pedestrians can reach the library from Lawrenceville Highway.

Other, more minor, issues include the desire to allow left turns from Lawrenceville Highway into the shopping center and vehicular library access. Currently, there is no left turn permitted from Lawrenceville Highway into the shopping center. Users said that often drivers will slow down to illegally make the left turn, causing congestion and creating major safety concerns. Another comment was about vehicle access to the library off Lavista Road southbound, which is a sudden stop and not well marked.

Old Norcross Road

Figure 14 shows a detailed breakdown of the public comments for the intersection.

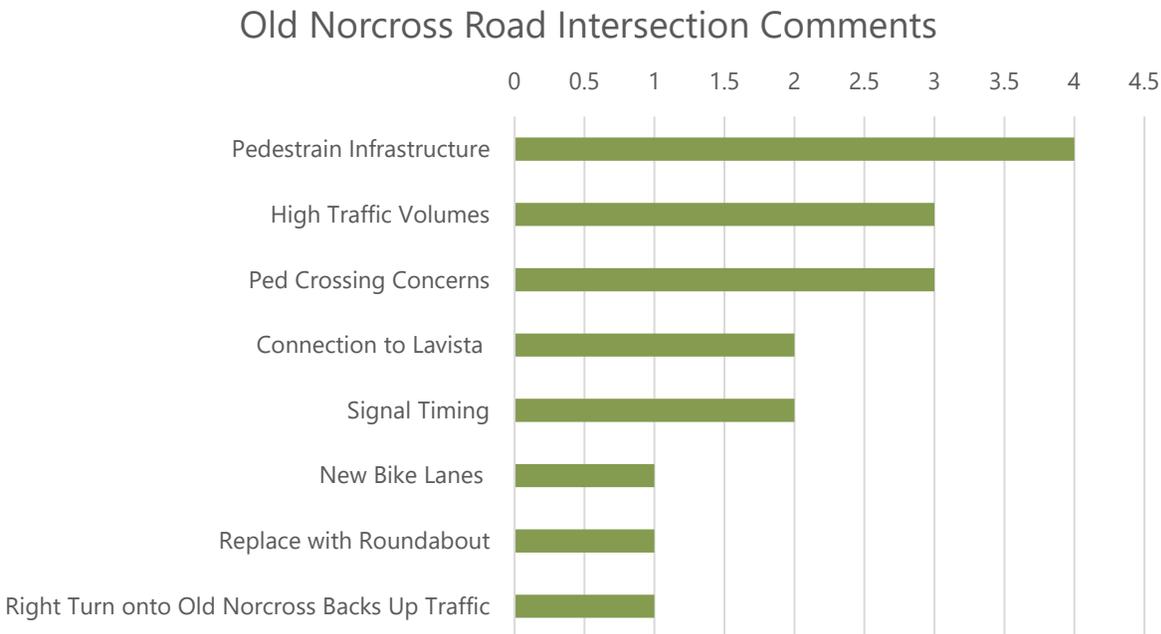


FIGURE 14: OLD NORCROSS ROAD INTERSECTION PUBLIC COMMENTS

The most frequent comments at about the Old Norcross Road intersection are summarized in the bullet points below.

- Pedestrian Infrastructure and Crossing Improvements
- Better Connection to Lavista Road

The main concern at the Old Norcross Road intersection was with pedestrian infrastructure and crossing safety. A comment said there is not enough green time for pedestrians to cross completely. Another said it was dangerous to cross the intersection. Several comments requested sidewalks to be added to Old Norcross Road approaching the intersection.

Another concern with the Old Norcross Road intersection is how it connects to Lavista Road. Several comments requested a direct way to access Lavista Road from Old Norcross Road without having to wait at the intersection or drive on Lawrenceville Highway. Users think this will help with congestion and delay time on Lawrenceville Highway.

Finally, another smaller concern included signal timing. Users noted the protected left turn phase from the northbound Lavista Road approach is not long enough to clear the queue of vehicles. This creates congestion that backs up to the Lavista Road intersection.

Corridor-Wide

Figure 15 shows a detailed breakdown of the public comments about the corridor as a whole.

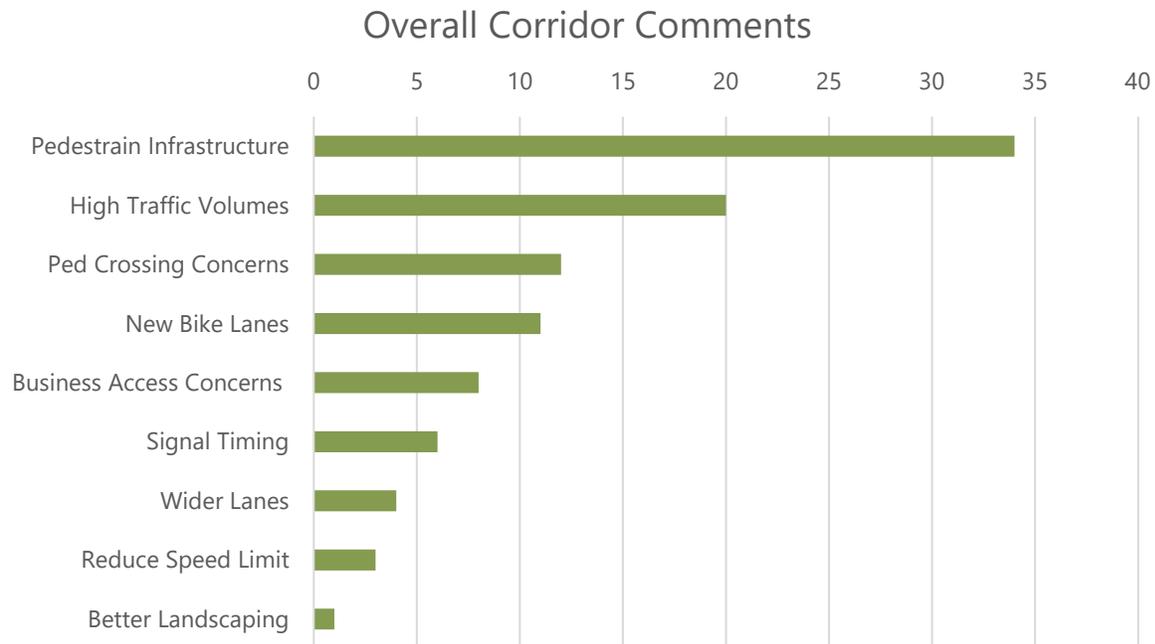


FIGURE 15: CORRIDOR WIDE PUBLIC COMMENTS

The most frequent comments about the entire corridor are summarized in the bullet points below.

- Pedestrian Infrastructure and Crossing Safety
- Bike Infrastructure
- Business Access Concerns

The biggest concern on the corridor was with pedestrian infrastructure and crossing safety. Many comments, including ones from the residents of the senior center, addressed adding sidewalk where it is missing and repairing where it is broken. Other comments addressed better landscaping on the corridor to ensure vegetation does not impede the sidewalk.

Next, was a request for bicycle infrastructure on the corridor. Users currently say due to the high traffic volumes and speed, the corridor is too dangerous to bike. Request for bike lanes were made to ensure cyclists can use the corridor safely.

Finally, concerns were raised about the business access on the corridor. Turns in and out of businesses are impeding the flow of traffic and are difficult to make. Specific instances of this were pointed out in the individual intersection sections, but the issue occurs through the entire corridor as well.

Other minor issues including signal timing, lane width and reducing the speed limit. Users want to see the signals optimized and better signal progression to alleviate congestion on the corridor. Concerns were raised that the lanes are too narrow on the corridor. Finally, several users wanted a reduced speed limit to increase pedestrian and bicyclists safety.

Field Visit

A site visit to the corridor was conducted on May 19, 2020 during the morning peak period. Because of the impact of COVID-19, normal traffic patterns could not be observed. However, notes were made about the infrastructure of the corridor.

Sidewalk connectivity was one of the largest issues on the corridor. Sidewalks are missing in the southern part of the corridor, bordering the Hugh Howell Road intersection. Sidewalk is missing from a majority of the northeast quadrant of the intersection, shown in red in **Figure 16**.

Figure 17 shows where the sidewalk ends on the east of Lawrenceville Highway, facing south.

Figure 18 shows the end of the crosswalks on the northeast corner of the Hugh Howell Road and Lawrenceville Highway Intersection.



FIGURE 16: MISSING SIDEWALK



FIGURE 17: END OF SIDEWALK SOUTHBOUND ON LAWRENCEVILLE HIGHWAY



FIGURE 18: MISSING SIDEWALK NORTHEAST OF HUGH HOWELL ROAD INTERSECTION

The stretch of roadway with no sidewalks connects several bus stops on Hugh Howell Road and Lawrenceville Highway. Currently, there is no safe way to navigate to and from these bus stops. Data presented in this report shows a steady flow of pedestrians along the corridor. During the site visit, three people were observed walking along the roadside adjacent to the Lawrenceville Highway northbound lanes where no sidewalk is provided to traverse between the Hugh Howell Road intersection and Lynburn Drive. Maintenance of the sidewalks was also noted on the corridor. Sidewalks were cracked, had large disjoints and overgrown vegetation sometimes impeded the path. **Figure 19** shows a stretch of sidewalk that is impeded by vegetation. **Figure 20** shows a portion of broken sidewalk on the corridor.



FIGURE 19: SIDEWALK WITH OVERGROWN VEGETATION ON LAWRENCEVILLE HIGHWAY FACING WESTBOUND TOWARD OLD NORCROSS ROAD



FIGURE 20: BROKEN SIDEWALK, LAWRENCEVILLE HIGHWAY FACING EASTBOUND AT HUGH HOWELL ROAD

Another common issue on the corridor was bus stop design. Several of the bus stops observed did not have a concrete pad connecting the sidewalk to the curb. Not having this sidewalk to curb connection causes issues for ADA access. **Figure 21** shows a bus stop on the corridor missing this connection.



FIGURE 21: BUS STOP THAT IS MISSING A SIDEWALK TO CURB EXTENSION ON LAWRENCEVILLE HIGHWAY FACING WESTBOUND TOWARD OLD NORCROSS ROAD

Finally, several concerns were observed at the intersection of Lavista Road and Lawrenceville Highway. First, there is no pedestrian crosswalk across the channelized right turn from Lawrenceville Highway to Lavista Road. There is no signage instructing vehicles to yield to pedestrians and it was observed that vehicles do not slow down for the right turn. Additionally, there is no curb cut on the east side of the intersection. All of these conditions create a dangerous situation for pedestrians crossing Lavista Road at this location, particularly for users requiring ADA accessibility. **Figure 22** shows a photo of this pedestrian crossing location.



FIGURE 22: MISSING PEDESTRIAN CROSSING ON CHANNELIZED RIGHT TURN FROM LAWRENCEVILLE HIGHWAY TO LAVISTA ROAD

No-Build Synchro Analysis

A no-build analysis was conducted in Synchro for the future years 2025 and 2045. The volumes used for 2025 and 2045 scenarios are shown in **Appendix C**. For the no-build scenarios, no changes in geometry were made from the existing condition scenarios. Cycle lengths, offsets and splits were optimized for each scenario. Synchro output for the analysis discussed below is included in **Appendix E**.

Hugh Howell Road Intersection

Table 19 shows the level of service for the Hugh Howell Road intersection approaches and the overall intersection delay for the Existing Conditions, 2025 No Build and 2045 No Build AM and PM peak hours. **Table 20** shows the queue lengths for the approaches with left turns bays.

TABLE 19: HUGH HOWELL ROAD LEVEL OF SERVICE AND INTERSECTION DELAY

Approach	Existing (2020)		No Build (2025)		No Build (2045)	
	AM LOS Optimized	PM LOS Optimized	AM LOS Optimized	PM LOS Optimized	AM LOS Optimized	PM LOS Optimized
EB (Lawrenceville Hwy)	D	D	D	D	D	F
WB (Hugh Howell Rd)	C	D	D	D	F	F
NB (shopping center driveway)	E	D	E	E	F	E
SB (Lawrenceville Hwy)	A	C	A	C	A	F
Intersection LOS	C	D	C	D	F	F
Overall Delay (sec/veh)	26.4	38.7	27.5	41.5	86.6	128.5
Overall Delay Change from Existing	-	-	4%	7%	228%	232%

TABLE 20: HUGH HOWELL ROAD QUEUE LENGTHS

Approach	Existing (2020)		No Build (2025)		No Build (2045)	
	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)
Eastbound Left Turn	275*	400*	275*	475*	575*	850*
Southbound Left Turn	150	450*	125	450*	175	650*

* denotes queue exceeds turn bay length

The intersection with Hugh Howell Road operates at an acceptable LOS in the existing and 2025 no-build conditions during both the AM and PM peak hours. By 2045 intersection operations are expected to degrade to LOS F during both the AM and PM peak hours.

Only the eastbound and southbound left turn movements have turn bays. The eastbound approach exceeds the left turn bay storage in every scenario modeled. The southbound approach exceeds the left turn bay storage for all of the PM scenarios.

Finally, four different movements have a volume to capacity (v/c) ratio higher than 1.0. The eastbound through, southbound through and southbound left turn movement all have a failing v/c for the 2045 PM condition. The westbound right turn has a failing v/c for the 2045 AM condition.

Lynburn Drive Intersection

Table 21 shows the level of service for the Lynburn Drive intersection approaches and the overall intersection delay for the Existing Conditions, 2025 No Build and 2045 No Build AM and PM peak hours. **Table 22** shows the queue lengths for the approached with left turns bays.

TABLE 21: LYNBURN DRIVE LEVEL OF SERVICE AND INTERSECTION DELAY

Approach	Existing (2020)		No Build (2025)		No Build (2045)	
	AM LOS Optimized	PM LOS Optimized	AM LOS Optimized	PM LOS Optimized	AM LOS Optimized	PM LOS Optimized
EB (Shopping Center Driveway)	E	C	E	D	F	D
WB (Lynburn Dr)	E	E	E	E	F	F
NB (Lawrenceville Hwy)	A	C	A	B	B	C
SB (Lawrenceville Hwy)	A	B	A	B	D	F
Intersection LOS	A	C	B	C	C	F
Overall Delay (sec/veh)	9.1	25.1	12.4	24.0	34.2	88.6
Overall Delay Change from Existing	-	-	36%	-4%	276%	253%

TABLE 22: LYNBURN DRIVE QUEUE LENGTH

Approach	Existing (2020)		No Build (2025)		No Build (2045)	
	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)
Northbound Left Turn	150	150	200*	100	600*	125
Southbound Left Turn	25	50	25	25	25	50

* denotes queue exceeds turn bay length

The intersection with Lynburn Drive operates at an acceptable LOS in the existing and 2025 no-build conditions during both the AM and PM peak hours and the 2045 AM peak hour. By the 2045 PM peak hour, the intersection operations are expected to degrade to LOS F.

Only the northbound and southbound left turns have turn bays. The only approach to exceed the turn bay capacity is the northbound left turn for the 2025 and 2045 AM scenarios.

Four movements have failing volume to capacity ratios that exceed 1. The northbound through, northbound left turn and westbound left turn all have a failing v/c for the 2045 PM scenario. The southbound through movement fails for both the AM and PM 2045 scenario.

Lavista Road Intersection

Table 23 shows the level of service for the Lavista Road intersection approaches and the overall intersection delay for the Existing Conditions, 2025 No Build and 2045 No Build AM and PM peak hours. **Table 24** shows the queue lengths for the approached with left turns bays.

TABLE 23: LAVISTA ROAD LEVEL OF SERVICE AND INTERSECTION DELAY

Approach	Existing (2020)		No Build (2025)		No Build (2045)	
	AM LOS Optimized	PM LOS Optimized	AM LOS Optimized	PM LOS Optimized	AM LOS Optimized	PM LOS Optimized
EB (Lawrenceville Hwy)	C	B	C	B	D	C
WB (Lawrenceville Hwy)	C	C	C	C	F	D
NB (shopping center driveway)	A	A	A	A	A	A
SB (Lavista Rd)	D	D	D	D	E	F
Intersection LOS	C	C	C	C	E	E
Overall Delay (sec/veh)	23.8	27.7	25.4	32.8	72.0	63.8
Overall Delay Change from Existing	-	-	7%	18%	203%	130%

TABLE 24: LAVISTA ROAD QUEUE LENGTH

Approach	Existing (2020)		No Build (2025)		No Build (2045)	
	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)
Eastbound Left Turn	400	250	475*	300	775*	425
Westbound Through	475	400	550	525	750	850
Southbound Left Turn	125	475*	125	625*	225	1050*

* denotes queue exceeds turn bay length

The intersection with Lavista Road operates at an acceptable LOS in the existing and 2025 no-build conditions during both the AM and PM peak hours. By 2045 intersection operations are expected to degrade to LOS E during both the AM and PM peak hours.

Two of the three left turn bays for this intersection will exceed their storage capacity. The eastbound left exceeds the capacity of the turn bays for the 2025 AM and the 2045 AM scenarios. The southbound left turn approach fails for all of the PM scenarios.

Four movements have a failing v/c. The southbound left turn movement fails for the 2045 PM scenario. The westbound right turn fails for the 2045 AM scenario. Both the eastbound left turn and the westbound through movement will fail for both 2045 scenarios.

Old Norcross Road Intersection

Table 25 shows the level of service for the Old Norcross Road intersection approaches and the overall intersection delay for the Existing Conditions, 2025 No Build and 2045 No Build AM and PM peak hours. **Table 26** shows the queue lengths for the approached with left turns bays.

TABLE 25: OLD NORCROSS ROAD LEVEL OF SERVICE AND INTERSECTION DELAY

Approach	Existing (2020)		No Build (2025)		No Build (2045)	
	AM LOS Optimized	PM LOS Optimized	AM LOS Optimized	PM LOS Optimized	AM LOS Optimized	PM LOS Optimized
EB (Lawrenceville Hwy)	B	A	B	A	D	C
WB (Lawrenceville Hwy)	A	B	A	B	D	C
SB (Old Norcross Rd)	E	D	D	E	F	E
Intersection LOS	B	B	B	B	D	D
Overall Delay (sec/veh)	14.0	12.4	14.6	15.1	52.9	34.1
Overall Delay Change from Existing	-	-	4%	22%	278%	175%

TABLE 26: OLD NORCROSS ROAD QUEUE LENGTH

Approach	Existing (2020)		No Build (2025)		No Build (2045)	
	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)
Eastbound Left Turn	125*	175*	175*	200*	425*	425*

* denotes queue exceeds turn bay length

The intersection with Old Norcross Road operates at an acceptable LOS during all the scenarios modeled.

The only left turn bay at this intersection exceeds capacity for every scenario modeled.

Three movements have a failing v/c. The eastbound left turn and the westbound through fail for the 2045 AM scenario. The eastbound through movement fails for the 2045 PM scenario.

Cofer Crossing (East)

Table 27 shows the level of service for the Old Norcross Road intersection approaches and the overall intersection delay for the Existing Conditions, 2025 No Build and 2045 No Build AM and PM peak hours. **Table 28** shows the queue lengths for the approached with left turns bays.

TABLE 27: COFER CROSSING (EAST) LEVEL OF SERVICE AND INTERSECTION DELAY

Approach	Existing (2020)		No Build (2025)		No Build (2045)	
	AM LOS Optimized	PM LOS Optimized	AM LOS Optimized	PM LOS Optimized	AM LOS Optimized	PM LOS Optimized
EB (Lawrenceville Hwy)	A	A	A	B	A	F
WB (Lawrenceville Hwy)	A	B	A	B	C	E
NB (Cofer Crossing (East))	C	C	C	C	D	D
Intersection LOS	B	B	B	B	C	E
Overall Delay (sec/veh)	11.4	13.2	11.5	17.9	23.1	72.9
Overall Delay Change from Existing	-	-	1%	36%	103%	452%

TABLE 28: COFER CROSSING (EAST) QUEUE LENGTHS

Approach	Existing (2020)		No Build (2025)		No Build (2045)	
	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)
Westbound Left Turn	75	200	75	250*	100	500*

* denotes queue exceeds turn bay length

The intersection with Cofer Crossing (East) operates at an acceptable LOS in the existing and 2025 no-build conditions during both the AM and PM peak hours and during the 2045 AM peak hour. By the 2045 PM peak hours, the intersection operations are expected to degrade to LOS E.

Only the westbound left turn has bay at this intersection. For the 2025 PM and the 2045 PM scenarios, the storage for the turn bay will be exceeded.

Finally, two approaches have a failing v/c. For the 2045 PM scenario, the eastbound through and westbound left turn have a failing v/c.

Alternatives Analysis

This section will examine potential improvements to address the operational and safety issues identified in the previous sections of this report. This section presents several feasible alternatives for the intersections on the corridor which are each assessed to determine the potential operational and safety benefits compared to the no-build conditions. The purpose of this comparison is to highlight the pros and cons of each alternative to aid decision makers in evaluating which alternatives to recommend for implementation.

Analysis Methodology

Some alternatives presented in the report are expected to impact the capacity and operations at the study intersection. Intersection LOS and queue lengths were analyzed for these alternatives using Synchro version 10. The results shown in this report assume 140 second cycle lengths and optimized offsets and splits. Delay figures and queue lengths were obtained from Synchro's default report. Synchro output reports for the alternatives are included in **Appendix F**.

Note that the future no-build output in this section may slightly differ from the output previously presented in the existing conditions and needs analysis. The alternatives analysis conducted for this section of the report analyzed isolated intersections, as opposed to the full optimized corridor in the previous sections, and used the default Synchro output to allow standardized comparison of all the alternatives.

Hugh Howell Road

Proposed Alternatives

The intersection of Lawrenceville Highway and Hugh Howell Road is a high-volume intersection of two state routes. The intersection is expected to operate at a failing level of service by the design year, 2045, with the eastbound approach failing as soon as 2025. The main concerns identified through public comments for the Hugh Howell Road and Lawrenceville Highway intersection were uncontrolled access to businesses along Hugh Howell Road, the conflict of the westbound right turns at the intersection and into the Chick-fil-a, and left turn bay capacity on the eastbound and southbound approaches.

Six alternatives were developed for the intersection of Hugh Howell Road and Lawrenceville Highway, which are listed below. More details about the design of the intersections and their potential operational and safety benefits can be found in the following sections.

- **Alternative A1** - Convert south leg to right-in right-out only
- **Alternative A2** - Fully remove the south leg of the intersection
- **Alternative A3** - Extend eastbound and southbound left turn storage and remove the south leg of the intersection
- **Alternative A4** – Realign Lawrenceville Highway to form the northbound and southbound intersection approaches
- **Alternative A5** – Separate the westbound right turns into the Chick-Fil-A and Lawrenceville Highway
- **Alternative A6** – Restrict left turns in and out of the business driveways near the intersection approaches with signage

Alternative A1

This alternative limits access to and from the south leg by making it a right-in right-out (RIRO) approach. The shopping center has ample alternative access points including two driveways along Hugh Howell Road and three driveways along Cowan Road. Half of all southbound through traffic is assumed to access the shopping center via Idlewood Road/Cowan Road, while the other half will access the shopping center via Hugh Howell Road along with all westbound left turning traffic. Restricting access to RIRO for the south leg will reduce conflict points at the intersection by eliminating vehicle-vehicle conflicts between westbound left turn and eastbound through movements and between southbound through and northbound left turn movements. Additionally, vehicle-pedestrian conflicts between westbound left turn and pedestrians crossing the south leg will also be eliminated. Eliminating the green time allocated to this south leg and

redistributing it to the other approaches will also give more signal green time for vehicles through the intersection. The results of the operational analysis are included in **Table 29** and **Table 30** below.

TABLE 29: ALTERNATIVE A1 LEVEL OF SERVICE AND DELAY

Approach	<i>No Build (2025)</i>		<i>Alternative A1 (2025)</i>		<i>No Build (2045)</i>		<i>Alternative A1 (2045)</i>	
	AM LOS	PM LOS	AM LOS	PM LOS	AM LOS	PM LOS	AM LOS	PM LOS
EB (Lawrenceville Hwy)	E	D	E	D	F	F	F	F
WB (Hugh Howell Rd)	D	D	C	D	F	F	F	E
NB (shopping center driveway)	D	D	A	A	D	E	A	A
SB (Lawrenceville Hwy)	C	D	C	C	F	F	F	F
Intersection LOS	D	D	D	D	F	F	F	F
Overall Delay (sec/veh)	42.0	44.6	37.2	35.1	129.6	113.9	122.8	83.0
Overall Delay Change from Existing No-Build	-	-	-11%	-21%	-	-	-13%	-27%

TABLE 30: ALTERNATIVE A1 QUEUE LENGTHS

Approach	<i>No Build (2025)</i>		<i>Alternative A1 (2025)</i>		<i>No Build (2045)</i>		<i>Alternative A1 (2045)</i>	
	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)
Eastbound Left Turn	350*	450*	350*	450*	550*	725*	550*	700*
Change from Existing	-	-	0%	0%	-	-	0%	-3%
Westbound Left Turn	25	25	-	-	25	25	-	-
Change from Existing	-	-	-	-	-	-	-	-
Southbound Left Turn	150	425*	100	275	200	650*	125	375*
Change from Existing	-	-	-33%	-35%	-	-	-38%	-42%

* denotes queue exceeds turn bay length

The operational analysis of this intersection indicates that the proposed changes would reduce the overall intersection delay from no-build conditions for all scenarios however the intersection level of service is not impacted and is still expected to operate at LOS F in the design year, 2045. Overall intersection delay is reduced due to the elimination of the northbound left and through movement phases which allows the intersection to operate more efficiently. This alternative is a

feasible short-term improvement that would reduce delay and improve the safety of the intersection. The estimated cost to convert the south leg to right-in right-out only is **\$80,000**.

Alternative A2

This alternative completely removes the south leg of the intersection. As previously mentioned, the shopping center has ample alternative access points including two driveways along Hugh Howell Road and three driveways along Cowan Road. The results of the operational analysis are included in **Table 31** and **Table 32** below.

TABLE 31: ALTERNATIVE A2 LEVEL OF SERVICE AND INTERSECTION DELAY

Approach	No Build (2025)		Alternative A2 (2025)		No Build (2045)		Alternative A2 (2045)	
	AM LOS	PM LOS	AM LOS	PM LOS	AM LOS	PM LOS	AM LOS	PM LOS
EB (Lawrenceville Hwy)	E	D	E	D	F	F	F	F
WB (Hugh Howell Rd)	D	D	C	D	F	F	F	E
NB (shopping center driveway)	D	D	n/a	n/a	D	E	n/a	n/a
SB (Lawrenceville Hwy)	C	D	C	C	F	F	F	F
Intersection LOS	D	D	D	D	F	F	F	F
Overall Delay (sec/veh)	42.0	44.6	37.3	35.4	129.6	113.9	113.2	83.9
Overall Delay Change from Existing No-Build	-	-	-11%	-21%	-	-	-13%	-26%

TABLE 32: ALTERNATIVE A2 QUEUE LENGTH

Approach	No Build (2025)		Alternative A2 (2025)		No Build (2045)		Alternative A2 (2045)	
	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)
Eastbound Left Turn	350*	450*	350*	450*	550*	725*	550*	700*
Change from Existing	-	-	0%	0%	-	-	0%	-3%
Westbound Left Turn	25	25	-	-	25	25	-	-
Change from Existing	-	-	-	-	-	-	-	-
Southbound Left Turn	150	425*	100	275	200	650*	125	375*
Change from Existing	-	-	-33%	-35%	-	-	-38%	-42%

* denotes queue exceeds turn bay length

The operational analysis of this alternative indicates that, similar to Alternative 1, overall intersection delay is decreased for all scenarios however the level of service is unchanged compared to no-build conditions. Half of all eastbound right turning traffic is assumed to access the shopping center via Idlewood Road/Cowan Road, while the remainder will travel through the intersection and access via Hugh Howell Road to the east. In practice, both Alternative 1 and Alternative 2 will result in similar intersection delays however, Alternative 2 offers additional safety benefits over Alternative 1. Alternative 2 further reduces conflicts at the intersection when compared to Alternative 1 by removing all vehicle-pedestrian conflicts along the south leg and vehicle-vehicle conflicts between eastbound right turn and northbound right turn movements with eastbound through vehicles. This alternative is a feasible short-term alternative that will decrease delay in improve safety at the intersection. The estimated cost to fully removed the south leg of the intersection is **\$60,000**.

Alternative A3

A sketch of this alternative is shown below in **Figure 23**.

This alternative is a copy of Alternative A2, which removes the south leg of the intersection, and also reduces the radius of the southbound to westbound right on Lawrenceville Highway and extends the eastbound and southbound left turn lanes to provide maximum storage for both left turn movements. The volumes match those used for Alternative A2. The results of the operational analysis are included in **Table 33** and **Table 34** below.



FIGURE 23: ALTERNATIVE A3

TABLE 33: ALTERNATIVE A3 LEVEL OF SERVICE AND INTERSECTION DELAY

Approach	No Build (2025)		Alternative A3 (2025)		No Build (2045)		Alternative A3 (2045)	
	AM LOS	PM LOS	AM LOS	PM LOS	AM LOS	PM LOS	AM LOS	PM LOS
EB (Lawrenceville Hwy)	E	D	E	D	F	F	F	F
WB (Hugh Howell Rd)	D	D	C	D	F	F	F	E
NB (shopping center driveway)	D	D	n/a	n/a	D	E	n/a	n/a
SB (Lawrenceville Hwy)	C	D	C	C	F	F	F	F
Intersection LOS	D	D	D	D	F	F	F	F
Overall Delay (sec/veh)	42.0	44.6	37.3	35.4	129.6	113.9	113.2	83.9
Overall Delay Change from Existing No-Build	-	-	-11%	-21%	-	-	-13%	-26%

TABLE 34: ALTERNATIVE A3 QUEUE LENGTHS

Approach	No Build (2025)		Alternative A3 (2025)		No Build (2045)		Alternative A3 (2045)	
	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)
Eastbound Left Turn	350*	450*	350*	450*	550*	725*	550*	700*
Change from Existing	-	-	0%	0%	-	-	0%	-3%
Westbound Left Turn	25	25	-	-	25	25	-	-
Change from Existing	-	-	-	-	-	-	-	-
Southbound Left Turn	150	425*	100	275	200	650*	125	375*
Change from Existing	-	-	-33%	-35%	-	-	-38%	-42%

* denotes queue exceeds turn bay length

Ultimately, the modeling software used for this analysis was not sensitive enough to measure any change to the intersection control delay when compared to Alternative 2. However, the increased left-turn bay capacity demonstrates that the existing southbound turn bay length is adequate for traffic through at least 2025 and that extending the eastbound left turn bay to 450 or more feet would adequately accommodate the 95th percentile queues in 2025.

The benefit of this alternative over alternative 2 is the additional safety benefits provided by increasing the left turn bay lengths and decreasing the radius of the channelized southbound right turn. Increasing the turn bays to accommodate the 95th percentile queues will reduce

conflicts between vehicles slowing or stopping to enter the left-turn bays. Decreasing the radius of the southbound right turn will require vehicles to slow down to make the turn which will improve pedestrian safety crossing the turn lane and will also give drivers making the right turn greater visibility of oncoming traffic. The cost of this project is expected to be **\$530,000**.

Alternative A4

A sketch of this alternative is shown below in **Figure 24**. In this alternative, the intersection is reconfigured so that Lawrenceville Highway is a continuous roadway and Hugh Howell Road intersects to form a T-intersection. The access to the shopping center on the south leg is removed due to the reconfiguration which will shift the intersection slightly north of its current position. As previously mentioned, the shopping center has ample alternative access points including two driveways along Hugh Howell Road and three driveways along Cowan Road. The volumes developed for Alternative A2 were used but were shifted to match the new intersection geometry. The results of the operational analysis are included in **Table 35** and **Table 36** below.



FIGURE 24: ALTERNATIVE A4

TABLE 35: ALTERNATIVE A4 LEVEL OF SERVICE AND INTERSECTION DELAY

Approach	No Build (2025)		Alternative A4 (2025)		No Build (2045)		Alternative A4 (2045)	
	AM LOS	PM LOS	AM LOS	PM LOS	AM LOS	PM LOS	AM LOS	PM LOS
EB (Lawrenceville Hwy)	E	D	C	C	F	F	E	D
WB (Hugh Howell Rd)	D	D	C	C	F	F	E	D
NB (shopping center driveway)	D	D	n/a	n/a	D	E	n/a	n/a
SB (Lawrenceville Hwy)	C	D	D	C	F	F	F	D
Intersection LOS	D	D	C	C	F	F	E	D
Overall Delay (sec/veh)	42.0	44.6	31.2	27.3	129.6	113.9	69.2	45.5
Overall Delay Change from Existing No-Build	-	-	-26%	-39%	-	-	-47%	-60%

TABLE 36: ALTERNATIVE A4 QUEUE LENGTH

Approach	No Build (2025)		Alternative A4 (2025)		No Build (2045)		Alternative A4 (2045)	
	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)
Eastbound Left Turn	350*	455*	-	-	550*	725*	-	-
Change from Existing	-	-	-	-	-	-	-	-
Westbound Left Turn	25	25	175	225	25	25	250	325
Change from Existing	-	-	600%	800%	-	-	900%	1200%
Southbound Left Turn	150	425*	150	275	200	650*	250	550*
Change from Existing	-	-	0%	-35%	-	-	25%	15%

* denotes queue exceeds turn bay length

The operational analysis of this alternative indicates that there are significant long-term benefits to reconfiguring the intersection with overall intersection delay being reduced by 47% and 60% in the 2045 AM and PM peak hours, respectively. This reconfiguration maintains or increases existing capacity for all movements. The most significant increase in capacity is allocated to the southbound to westbound Lawrenceville Highway movement which is currently a single right-turn lane and will be a two-lane through movement in the proposed build conditions. **Table 37** below shows the v/c ratio comparison for each movement assuming optimized splits.

TABLE 37: VOLUME TO CAPACITY RATIO COMPARISON, NO-BUILD VS. ALTERNATIVE A4 (2045)

Movement	2045 AM Peak			2045 PM Peak		
	No-Build	A4	% Diff.	No-Build	A4	% Diff.
EB Lawrenceville Hwy to EB Hugh Howell Rd	0.23	0.15	-53%	0.57	0.47	-21%
EB Lawrenceville Hwy to NB Lawrenceville Hwy	1.41	1.00	-41%	1.37	0.96	-43%
SB Lawrenceville Hwy to WB Lawrenceville Hwy	1.31	1.01	-30%	1.27	0.59	-115%
SB Lawrenceville Hwy to EB Hugh Howell Rd	0.34	1.01	66%	0.97	1.00	3%
WB Hugh Howell Rd to NB Lawrenceville Hwy	1.19	1.13	-5%	1.03	1.02	-1%
WB Hugh Howell Rd to WB Lawrenceville Hwy	1.02	0.42	-143%	1.14	0.68	-68%
Average	0.92	0.79	-17%	1.06	0.79	-35%

The comparison shows that the average intersection v/c ratio decreases by 17% and 35% in the 2045 AM and PM peak hours, respectively.

Care should be taken when designing the final geometry and signal timing plan for the reconfigured intersection to ensure safety of pedestrians crossing Hugh Howell Road and the south leg of Lawrenceville Highway as pedestrians will now have to cross a two-lane channelized right-turn from Lawrenceville Highway to Hugh Howell Road. The expected cost of this alternative is approximately **\$4,300,000**.

Alternative A5

In this alternative the westbound right turns at the intersection are separated from the turns into the Chick-Fil-A. A raised island will be placed in the turn lane to achieve this. In Synchro, it was modeled by shortening the westbound right turn lane to 150 feet. All volumes remained the same as the no-build conditions. The results of the operational analysis are included in

Table 38 and **Table 39** below.

TABLE 38: ALTERNATIVE A5 LEVEL OF SERVICE AND DELAY

Approach	No Build (2025)		Alternative A5 (2025)		No Build (2045)		Alternative A5 (2045)	
	AM LOS	PM LOS	AM LOS	PM LOS	AM LOS	PM LOS	AM LOS	PM LOS
EB (Lawrenceville Hwy)	E	D	E	D	F	F	F	F
WB (Hugh Howell Rd)	D	D	D	D	F	F	F	F
NB (shopping center driveway)	D	D	D	D	D	E	D	E
SB (Lawrenceville Hwy)	C	D	D	D	F	F	F	F
Intersection LOS	D	D	D	D	F	F	F	F
Overall Delay (sec/veh)	42.0	44.6	45.9	46.1	129.6	113.9	143.3	122.3
Overall Delay Change from Existing No-Build	-	-	9%	3%	-	-	11%	7%

TABLE 39: ALTERNATIVE A5 QUEUE LENGTH

Approach	No Build (2025)		Alternative A5 (2025)		No Build (2045)		Alternative A5 (2045)	
	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)
Eastbound Left Turn	350*	455*	350*	450*	550*	725*	550*	720*
Change from Existing	-	-	0%	0%	-	-	0%	-3%
Westbound Left Turn	25	25	25	25	25	25	25	25
Change from Existing	-	-	0%	0%	-	-	0%	0%
Southbound Left Turn	150	425*	150	425*	200	650*	200	675*
Change from Existing	-	-	0%	0%	-	-	0%	4%

* denotes queue exceeds turn bay length

The results of this operational analysis show that reducing the westbound right turn lane leads to an increase in overall intersection delay, however not so much that the overall intersection level of service will change. The intersection delay increases because right-turn vehicles cannot enter the right-turn lane until much closer to the intersection which causes more right-turning vehicles to wait for through vehicles to clear the intersection to reach the turn bay. While the model shows an increase in overall intersection delay it should be noted that these results likely mirror actual operations when traffic from the Chick-fil-A drive thru backs up into the right-turn lane. The estimated cost to separate the westbound right turns into the Chick-Fil-A and Lawrenceville Highway is **\$60,000**.

Alternative A6

Alternative A6 consists of adding signage to limit access to the business driveways on the intersection approaches, specifically to prohibit left-turn movements from the driveways. There are potential safety benefits associated with this alternative. Limiting driveway access reduces the number of vehicles turning on the intersection legs which reduces vehicle-vehicle conflict points. It is also a low-cost alternative as no geometric changes are necessary and can be implemented alongside any of the other Hugh Howell Road improvements. The estimated cost to restrict left turns in and out of the business driveways near the intersection approaches with signage is **\$30,000**.

Alternative Combinations

Table 40 below shows the alternatives for the Hugh Howell Road intersection that can be combined and implemented together.

TABLE 40: HUGH HOWELL ROAD ALTERNATIVE COMBINATIONS

	<i>Potential Alternative Combinations</i>					
	A1	A2	A3	A4	A5	A6
A1					✓	✓
A2					✓	✓
A3					✓	✓
A4					✓	✓
A5	✓	✓	✓	✓		✓
A6	✓	✓	✓	✓	✓	

Alternatives A1 through A4 cannot be implemented together because they all change the south leg of the intersection. A5 addresses the westbound leg and A6 addresses business access near the intersection. Therefore, both options can be combined with each other and A1, A2, A3 or A4.

Summary

The proposed short-term solutions (A1, A2, and A3), which all involve limiting access to/from the south leg of the intersection to some degree, result in slightly lower intersection delay however do not impact the expected level of service of the overall intersection. However, these alternatives do provide several safety benefits by reducing the number of vehicle-vehicle and vehicle-pedestrian conflicts.

Alternative A4 is a potential long-term solution and offers the most operational benefits by reconfiguring the intersection to increase capacity of high-volume movements. This alternative decreases conflict points by removing the shopping center access point at the intersection but

the two-lane right turn movement from eastbound Lawrenceville Highway to Hugh Howell Road will need to have signalization and signage to ensure pedestrian safety crossing the movement.

Alternatives A5 and A6 will not improve operations at the intersection however both alternatives address safety concerns brought up by respondents to the public outreach survey.

Table 41 below summarizes the operational and safety benefits of each alternative and also indicates which alternatives address the most common public comments received during the public feedback period. For the table an acceptable level of service is considered an overall intersection level of service of A, B, C or D.

TABLE 41: ALTERNATIVES MATRIX – HUGH HOWELL ROAD

Improvement Scenario	Provides Acceptable LOS				Addresses Safety			Responds to Public Comments		
	2025 AM	2025 PM	2045 AM	2045 PM	Reduced Vehicle-Vehicle Conflict Points	Reduced Vehicle-Pedestrian Conflict Points	Remove WB Right Turn Conflicts	Added EB Left Turn Storage	Added SB Left Turn Storage	Improved Pedestrian Crossing Infrastructure
A1	✓	✓			✓	✓				
A2	✓	✓			✓	✓				
A3	✓	✓			✓	✓		✓	✓	✓
A4	✓	✓		✓	✓					
A5	✓	✓					✓			
A6	✓	✓			✓					

Lynburn Drive

The intersection of Lynburn Drive and Lawrenceville Highway is one of three access points to the Cofer Crossing shopping center and provides connection to downtown Tucker. The intersection is expected to operate with a failing level of service by 2045. The main concerns identified through public comments for the Lynburn Drive and Lawrenceville Highway intersection were protected turning phases for vehicles exiting the shopping center and the need for pedestrian safety improvements.

Three alternatives were developed for the Lynburn Drive intersection, which are listed below. More details about the design of the intersections and their operational performance can be found in the following sections. Note that the no-build scenario at this intersection was updated to reflect the city's current plan to change the eastbound and westbound approaches to operate with a split phase plan which will eliminate opposing traffic during minor street movements.

- **Alternative B1** – add left turn bay on the eastbound approach
- **Alternative B2** – add a dedicated right turn lane to the westbound approach
- **Alternative B3** – channelize the right turn on the westbound approach and separate the westbound left and through movements
- **Alternative B4** – relocate MARTA stop in northbound right turn bay

Alternative B1

This alternative adds a 150-foot left turn bay on the eastbound approach of the intersection to accommodate eastbound left turn movements. This improvement allows the eastbound and westbound movements to operate concurrently with protected/permitted left turns instead of the current split phased plan. A sketch of this improvement can be seen in **Figure 25**, which includes improvements to the west leg as well as improvements recommended in the following alternative on the east leg. The results of the operational analysis are included in **Table 42** and **Table 43** below.

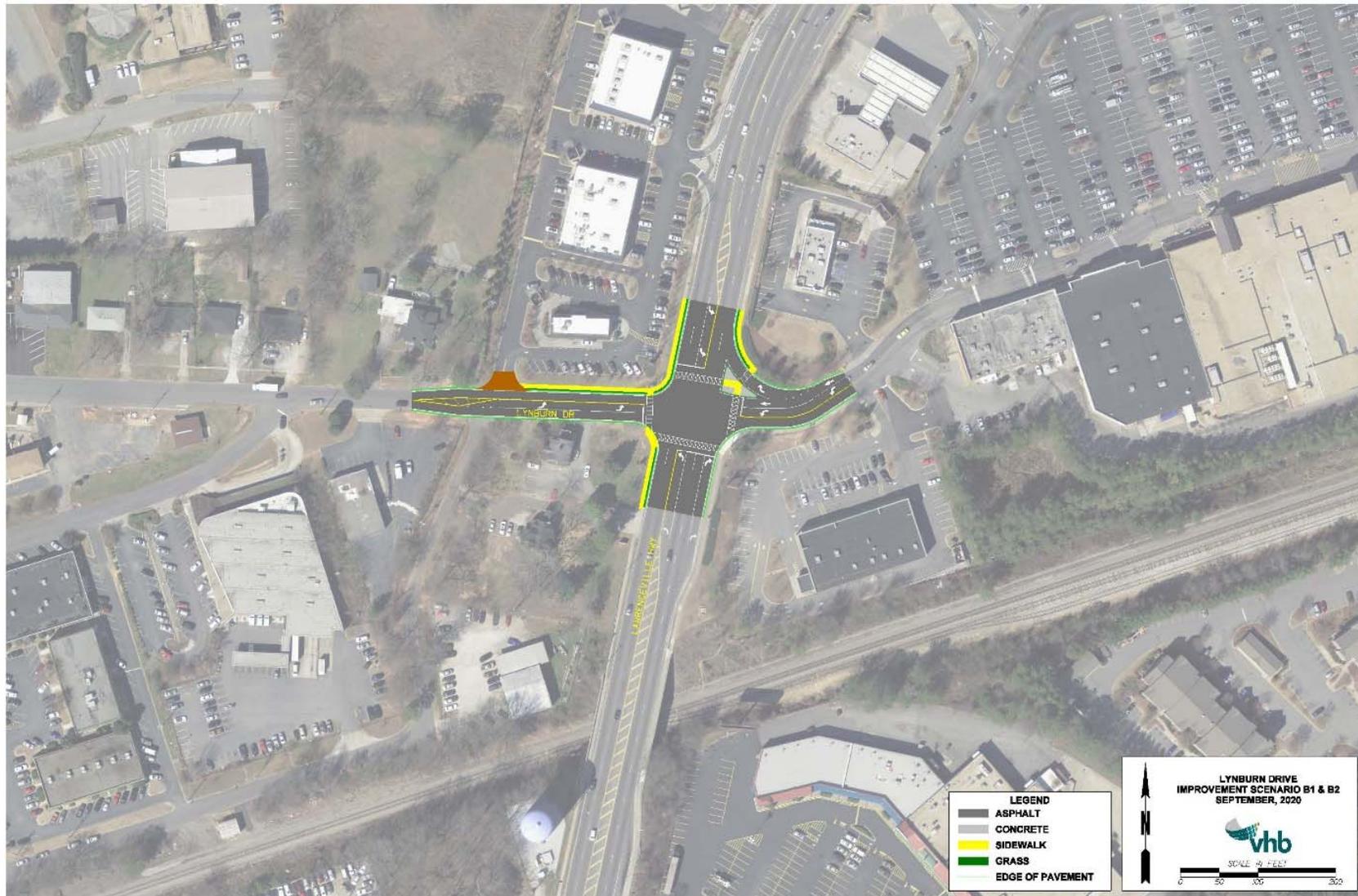


FIGURE 25: ALTERNATIVE B1 AND B2

TABLE 42: ALTERNATIVE B1 LEVEL OF SERVICE AND DELAY

Approach	Existing (2025)		Alternative B1 (2025)		Existing (2045)		Alternative B1 (2045)	
	AM LOS	PM LOS	AM LOS	PM LOS	AM LOS	PM LOS	AM LOS	PM LOS
EB (Shopping Center Driveway)	D	F	C	D	E	F	D	E
WB (Lynburn Dr)	E	E	D	E	E	F	D	F
NB (Lawrenceville Hwy)	B	C	B	C	D	E	D	D
SB (Lawrenceville Hwy)	D	D	C	C	F	F	E	F
Intersection LOS	C	D	C	C	E	F	D	E
Overall Delay (sec/veh)	28.5	47.2	22.8	32.4	74.1	107.3	52.5	68.1
Overall Delay Change from Existing No-Build	-	-	-20%	-31%	-	-	-29%	-37%

TABLE 43: ALTERNATIVE B1 QUEUE LENGTHS

Approach	No Build (2025)		Alternative B1 (2025)		No Build (2045)		Alternative B1 (2045)	
	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)
Eastbound Left Turn	-	-	50	75	-	-	50	100
Change from Existing	-	-	-	-	-	-	-	-
Westbound Left Turn	100*	450*	75	375*	125*	875*	100*	625*
Change from Existing	-	-	25%	-17%	-	-	-20%	-29%
Northbound Left Turn	425*	150	350*	100	850*	300*	775*	300*
Change from Existing	-	-	-18%	-33%	-	-	-9%	0%
Southbound Left Turn	25	50	25	50	25	125	25	75
Change from Existing	-	-	0%	0%	-	-	0%	-40%

* denotes queue exceeds turn bay length

The analysis of this alternative shows that the improved efficiency at the intersection from switching to protected/permitted phasing reduces overall intersection delay by up to 37% in 2045. While this alternative improves intersection operations by a full letter grade in three of the four scenarios tested the intersection is still projected to operate at LOS E during the PM peak hour in 2045. The estimated cost to add the left turn bay on the eastbound approach is **\$860,000**.

Alternative B2

This alternative changes the lane assignment on the westbound approach from shared through/right with a dedicated left turn lane in the no-build conditions to a dedicated right turn lane and a shared through/left lane. The proposed lane configuration is shown on the east leg of the intersection in **Figure 25**, above. This configuration allows the westbound right-turn movements to continue turning on to Lawrenceville Highway during the red phase. The intersection will continue to operate with a split phase plan for the eastbound and westbound movements. The results of the operational analysis are included in **Table 44** and **Table 45** below.

TABLE 44: ALTERNATIVE B2 LEVEL OF SERVICE AND DELAY

Approach	Existing (2025)		Alternative B2 (2025)		Existing (2045)		Alternative B2 (2045)	
	AM LOS	PM LOS	AM LOS	PM LOS	AM LOS	PM LOS	AM LOS	PM LOS
EB (Shopping Center Driveway)	D	F	E	F	E	F	E	F
WB (Lynburn Dr)	E	E	D	E	E	F	E	F
NB (Lawrenceville Hwy)	B	C	B	D	D	E	E	E
SB (Lawrenceville Hwy)	D	D	D	E	F	F	F	F
Intersection LOS	C	D	C	E	E	F	E	F
Overall Delay (sec/veh)	28.5	47.2	29.7	56.4	74.1	107.3	79.3	140.5
Overall Delay Change from Existing No-Build	-	-	4%	19%	-	-	7%	31%

TABLE 45: ALTERNATIVE B2 QUEUE LENGTH

Approach	No Build (2025)		Alternative B2 (2025)		No Build (2045)		Alternative B2 (2045)	
	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)
Eastbound Left Turn	-	-	-	-	-	-	-	-
Change from Existing	-	-	-	-	-	-	-	-
Westbound Left Turn	100*	450*	-	-	125*	875*	-	-
Change from Existing	-	-	-	-	-	-	-	-
Northbound Left Turn	425*	150	450*	200*	850*	300*	850*	300*
Change from Existing	-	-	6%	33%	-	-	0%	0%
Southbound Left Turn	25	50	25	50	25	125	25	125
Change from Existing	-	-	0%	0%	-	-	0%	0%

* denotes queue exceeds turn bay length

The analysis for this alternative indicates that adjusting the lane assignments on the westbound approach to give the right turn movement a dedicated lane will result in an increase to the overall intersection delay in all scenarios tested. This alternative shifts more vehicles into the already high-volume westbound left turn movements which requires more green time on the westbound approach and consequently reduces the amount of green time allocated to Lawrenceville Highway.

One benefit of this alternative is that, by adding a channelized right turn it allows for pedestrian refuge between the westbound right turn and all other traffic on Lawrenceville Highway which reduces the crossing distance and time that must be allotted to the pedestrian movement. The estimated cost to add a dedicated right turn lane to the westbound approach is **\$750,000**.

Alternative B3

This alternative changes the westbound approach to have three lanes to separate all westbound movements. The intersection will continue to operate on a split phase plan for the eastbound and westbound movements. The results of the operational analysis are included in **Table 46** and **Table 47** below.

TABLE 46: ALTERNATIVE B3 LEVEL OF SERVICE AND DELAY

Approach	Existing (2025)		Alternative B3 (2025)		Existing (2045)		Alternative B3 (2045)	
	AM LOS	PM LOS	AM LOS	PM LOS	AM LOS	PM LOS	AM LOS	PM LOS
EB (Shopping Center Driveway)	D	F	D	F	E	F	E	F
WB (Lynburn Dr)	E	E	D	E	E	F	D	F
NB (Lawrenceville Hwy)	B	C	B	C	D	E	D	E
SB (Lawrenceville Hwy)	D	D	D	D	F	F	F	F
Intersection LOS	C	D	C	D	E	F	E	F
Overall Delay (sec/veh)	28.5	47.2	28.0	46.4	74.1	107.3	67.9	105.7
Overall Delay Change from Existing No-Build	-	-	-2%	-2%	-	-	-8%	-1%

TABLE 47: ALTERNATIVE B3 QUEUE DELAY

Approach	No Build (2025)		Alternative B3 (2025)		No Build (2045)		Alternative B3 (2045)	
	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)
Eastbound Left Turn	-	-	-	-	-	-	-	-
Change from Existing	-	-	-	-	-	-	-	-
Westbound Left Turn	100*	450*	100*	450*	125*	875*	125*	675*
Change from Existing	-	-	0%	0%	-	-	0%	-23%
Northbound Left Turn	425*	150	425	150*	850*	300*	850	300
Change from Existing	-	-	0%	0%	-	-	0%	0%
Southbound Left Turn	25	50	25	50	25	125	25	125
Change from Existing	-	-	0%	0%	-	-	0%	0%

* denotes queue exceeds turn bay length

The analysis of this alternative shows that separating all westbound movements results in a slight, but relatively insignificant, decrease in overall intersection delay. A more significant decrease in delay was not realized because the timing of the westbound approach is still controlled by the high-volume left turn movement therefore clearing the through and right turn movements more quickly did not impact the overall allocation of green time at the intersection.

In addition to the slight improvement in intersection operations, this alternative also increases pedestrian safety by adding a channelized westbound right turn. This allows for pedestrian refuge between the westbound right turn and all other traffic on Lawrenceville Highway which reduces the crossing distance and time that must be allotted to the pedestrian movement. The estimated cost to channelize the right turn on the westbound approach and separate the westbound left and through movements is **\$790,000**.

Alternative B1 + B3

A sketch of this alternative is shown below in **Figure 26**. This alternative combines the changes made in B1 and B3, which includes a 50-foot channelized right-turn bay added to the westbound approach, and a 150-foot left turn bay added to the eastbound approach. This alternative allows the eastbound and westbound movements to operate concurrently with protected/permitted phasing for the left turn movements while also allowing the high volumes westbound right turn movement to turn right onto Lawrenceville Highway during the red phase. The results of the operational analysis are **Table 48** and **Table 49** below.



FIGURE 26: ALTERNATIVE B1 + B3

TABLE 48: ALTERNATIVE B1 + B3 LEVEL OF SERVICE AND DELAY

Approach	Existing (2025)		Alternative B1+B3 (2025)		Existing (2045)		Alternative B1+B3 (2045)	
	AM LOS	PM LOS	AM LOS	PM LOS	AM LOS	PM LOS	AM LOS	PM LOS
EB (Shopping Center Driveway)	D	F	D	D	E	F	D	E
WB (Lynburn Dr)	E	E	D	D	E	F	E	F
NB (Lawrenceville Hwy)	B	C	B	C	D	E	C	D
SB (Lawrenceville Hwy)	D	D	C	C	F	F	E	F
Intersection LOS	C	D	B	C	E	F	D	E
Overall Delay (sec/veh)	28.5	47.2	19.0	31.3	74.1	107.3	43.4	66.3
Overall Delay Change from Existing No-Build	-	-	-33%	-34%	-	-	-41%	-38%

TABLE 49: ALTERNATIVE B1 + B3 QUEUE LENGTHS

Approach	No Build (2025)		Alternative B1+B3 (2025)		No Build (2045)		Alternative B1+B3 (2045)	
	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)
Eastbound Left Turn	-	-	50	75	-	-	75	100
Change from Existing	-	-	-	-	-	-	-	-
Westbound Left Turn	100*	450*	75	375*	125*	875*	100*	625*
Change from Existing	-	-	-25%	-17%	-	-	-40%	-23%
Northbound Left Turn	425*	150	275*	100	850*	300*	725*	300*
Change from Existing	-	-	-35%	-33%	-	-	-12%	0%
Southbound Left Turn	25	50	25	50	25	125	25	75
Change from Existing	-	-	0%	0%	-	-	0%	-40%

* denotes queue exceeds turn bay length

The analysis for this alternative shows the separating the westbound right turns from other westbound movement in addition to implementing a protected/permitted phasing plan on the minor street will result in up to 41% reduction in intersection delay in 2045. This alternative realizes the operational improvements from B1 plus additional operational and pedestrian safety benefits from Alternative B3. When compared to implementing protected/permitted phasing

alone in Alternative B1, this alternative experiences an additional 17% reduction in overall intersection delay during the AM peak hour in 2045 and an additional 3% reduction in delay during the PM peak of the same year. The intersection is still projected to operate at LOS E during the PM peak hour in 2045.

Alternative B1 + C3

This alternative combines the geometric changes proposed in Alternative B1 and assumes reduced volumes on the westbound approach due to proposed changes at the Lavista Road intersection which will allow full egress from the Cofer Crossing shopping center. The analysis for this alternative assumes volumes on the westbound approach are reduced by approximately one third. The results of the operational analysis are included in **Table 50** and **Table 51** below.

TABLE 50: ALTERNATIVE B1+C3 LEVEL OF SERVICE AND DELAY

Approach	Existing (2025)		Alternative B1+C4 (2025)		Existing (2045)		Alternative B1+C4 (2045)	
	AM LOS	PM LOS	AM LOS	PM LOS	AM LOS	PM LOS	AM LOS	PM LOS
EB (Shopping Center Driveway)	D	F	D	D	E	F	D	E
WB (Lynburn Dr)	E	E	D	D	E	F	D	E
NB (Lawrenceville Hwy)	B	C	B	B	D	E	C	C
SB (Lawrenceville Hwy)	D	D	C	C	F	F	E	D
Intersection LOS	C	D	B	C	E	F	D	D
Overall Delay (sec/veh)	28.5	47.2	18.1	25.8	74.1	107.3	42.1	43.2
Overall Delay Change from Existing No-Build	-	-	-36%	-45%	-	-	-43%	-60%

TABLE 51: ALTERNATIVE B1+C3 QUEUE LENGTH

Approach	No Build (2025)		Alternative B1+C3 (2025)		No Build (2045)		Alternative B1+C3 (2045)	
	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)
Eastbound Left Turn	-	-	50	100	-	-	75	120
Change from Existing	-	-	-	-	-	-	-	-
Westbound Left Turn	100*	450*	50	225*	125*	875*	75	350*
Change from Existing	-	-	-50%	-50%	-	-	-40%	-60%
Northbound Left Turn	425*	150	275*	75	850*	300*	750*	250*
Change from Existing	-	-	-35%	-50%	-	-	-12%	-17%
Southbound Left Turn	25	50	25	50	25	125	25	50
Change from Existing	-	-	0%	0%	-	-	0%	-60%

* denotes queue exceeds turn bay length

The analysis of this alternative indicates that the reduction in volume on the westbound approach in addition to converting the minor street phasing to a protected/permitted plan results in a significant decrease in overall intersection delay. This alternative is the only proposed alternative that results in an acceptable level of service for both peak hours in 2025 and 2045. This alternative results in at least a further 20% reduction in overall intersection delay for all scenarios when compared to B1. It should be noted, however, that this improvement comes at the expense of degraded operations at the Lavista Road intersection, which will be presented later in this report.

Alternative B4

This alternative would relocate the MARTA bus stop in the northbound right turn lane. Currently, buses stopping in the northbound right turn lane block the view of drivers making a westbound right turn and obstructing their sight distance causes a safety issue at the intersection. The City will need to coordinate with MARTA to determine potential stop relocations that are compatible with their system plan.

Alternative Combinations

Table 52 below shows the alternatives for the Lynburn Drive intersection that can be combined and implemented together.

TABLE 52: LYNBURN DRIVE ALTERNATIVE COMBINATIONS

	<i>Potential Alternative Combinations</i>			
	B1	B2	B3	B4
B1		✓	✓	✓
B2	✓			✓
B3	✓			✓
B4	✓	✓	✓	

The only two alternatives that cannot be combined with each other are B2 and B3. Both of these options change the westbound approach differently, therefore cannot be implemented together. B1 alters the eastbound approach and B4 relocates the MARTA stop on the northbound approach therefore, both of these alternatives can be combined with each other and with B2 or B3.

Summary

All analyzed scenarios experience some improvement over no-build conditions, except alternative B2. Split phasing is not the ideal phasing pattern for this intersection and alternatives that allow the intersection to operate with protected/permitted left turns from the minor street will significantly improve operations.

It should be noted that while protected/permitted phasing is the most efficient intersection plan it does introduce vehicle-vehicle conflict points between eastbound and westbound left turning vehicles and the opposing through movements, both of which are eliminated by split phasing. Additionally, protected/permitted phasing also increases the number of vehicle-pedestrian conflicts compared to split phasing. Split phase plans eliminate vehicle-pedestrian conflicts between minor street left-turning vehicles and crossing pedestrians by only permitting pedestrian crossings along the leg adjacent to the through movement.

Additionally, split phasing is less efficient than protected/permitted phasing in that both minor street phases must provide adequate time for pedestrians to cross the major street. During this time three of the four approaches are prohibited from entering the intersection. On the other hand, protected/permitted phasing allows pedestrians to cross concurrently while still allowing all minor street movements. For both phasing plans, time allotted to pedestrians can be reduced by shortening the distance across the main roadway by channelizing right turn movements with raised concrete islands and adding pedestrian refuge in the median.

In conclusion, protected/permitted phasing on the minor street will result in the most efficient intersection operation but is not as safe for pedestrians as split phasing. Pedestrian safety is of particular concern at this intersection due to the proximity to the senior living facility on Lynburn Drive.

Table 53 below summarizes the operational and safety benefits of each alternative and also indicates which alternatives address the most common public comments received during the public feedback period. For the table an acceptable level of service is considered an overall intersection level of service of A, B, C or D.

TABLE 53: ALTERNATIVES MATRIX – LYNBURN DRIVE

Improvement Scenario	Provides Acceptable LOS				Addresses Safety			Responds to Public Comments	
	2025 AM	2025 PM	2045 AM	2045 PM	Reduced Vehicle-Vehicle Conflict Points	Increased Sight Distance	Reduced Vehicle-Pedestrian Conflict Points	Protected Left turn out of Shopping Center	Improved Pedestrian Crossing Infrastructure
B1	✓	✓	✓					✓	
B2	✓				✓	✓		✓	✓
B3	✓	✓			✓	✓	✓	✓	✓
B1 + B3	✓	✓	✓				✓	✓	✓
B1 + C3	✓	✓	✓	✓				✓	
B4	✓	✓			✓	✓	✓	✓	

Lavista Road

The intersection of Lavista Road and Lawrenceville Highway is a high-volume intersection of two state routes and is one of three access points to the Cofer Crossing shopping center. The intersection is expected to operate at a failing level of service by the design year, 2045. A majority of the public comments at this intersection expressed concern with the current limits on shopping center egress at this intersection. Other issues raised during the public comment phase include safety concerns related to the pedestrian crossing of the southbound right turn movement from Lawrenceville Highway to Lavista Road and traffic interaction between Old Norcross Road and Lavista Road.

Four alternatives were developed for the Lavista Road intersection. More details about the design of the intersections and their operational performance can be found in the following sections.

- **Alternative C1** – Reduce southbound right turn radius and increase turn bay storage
- **Alternative C2** – Add dual northbound left turn bay
- **Alternative C3** – Add full egress from the shopping center driveway
- **Alternative C4** – Add barrier to restrict southbound left turns into the shopping center

Alternative C1

A sketch of this alternative, along with proposed improvements in Alternative C2, is shown below in **Figure 27**. In this alternative, the radius of the southbound right turn from Lawrenceville Highway to Lavista Road was reduced to 50 feet and the turn bay storage was increased to 225-feet. The results of the operational analysis are included in **Table 54** and **Table 55** below.

TABLE 54: ALTERNATIVE C1 LEVEL OF SERVICE AND DELAY

Approach	No-Build (2025)		Alternative C1 (2025)		No-Build (2045)		Alternative C1 (2045)	
	AM LOS	PM LOS	AM LOS	PM LOS	AM LOS	PM LOS	AM LOS	PM LOS
EB (Lawrenceville Hwy)	C	D	C	D	C	D	C	D
WB (Lawrenceville Hwy)	C	C	C	C	D	E	D	E
NB (shopping center driveway)	-	A	-	A	-	A	-	A
SB (Lavista Rd)	D	C	D	C	D	E	D	E
Intersection LOS	C	C	C	C	D	E	D	E
Overall Delay (sec/veh)	25.4	32.1	25.0	31.7	42.7	59.4	42.7	59.5
Overall Delay Change from Existing No-Build	-	-	-2%	-1%	-	-	0%	0%

TABLE 55: ALTERNATIVE C1 QUEUE LENGTH

Approach	No Build (2025)		Alternative C1 (2025)		No Build (2045)		Alternative C1 (2045)	
	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)
Eastbound Left Turn	400	300	400	300	650*	475*	650*	475*
Change from Existing	-	-	0%	0%	-	-	0%	0%
Northbound Left Turn	-	-	-	-	-	-	-	-
Change from Existing	-	-	-	-	-	-	-	-
Southbound Left Turn	150	525*	150	525*	200	875*	200	875*
Change from Existing	-	-	0%	0%	-	-	0%	0%

* denotes queue exceeds turn bay length



FIGURE 27: ALTERNATIVE C1 AND C2

The analysis of this alternative shows that tightening the radius of the right turn has very little impact on the overall intersection operations. However, this alternative is especially beneficial when considering the safety improvements it will provide. Pedestrian safety will be improved because the tighter radius will reduce the speed of vehicles making the right-turn and the crosswalk striping will signal to drivers to watch for pedestrians in the turn lane. Adding a right-turn bay will also allow vehicles to pull out of the through traffic on Lawrenceville Highway before slowing down to make the turn or stop for pedestrians in the crosswalk which may reduce the risk of rear end crash types. The cost estimate to reduce the southbound right turn radius and increase turn bay storage is **\$1,650,000**.

Alternative C2

A sketch of this alternative is shown above in **Figure 27**. In this alternative, a second northbound left turn bay was added to the Lavista intersection. It is proposed to be a 445-foot turn bay to match the existing one. The results of the operational analysis are included in **Table 56** and **Table 57** below.

TABLE 56: ALTERNATIVE C2 LEVEL OF SERVICE AND DELAY

Approach	No-Build (2025)		Alternative C2 (2025)		No-Build (2045)		Alternative C2 (2045)	
	AM LOS	PM LOS	AM LOS	PM LOS	AM LOS	PM LOS	AM LOS	PM LOS
EB (Lawrenceville Hwy)	C	D	D	D	C	D	C	D
WB (Lawrenceville Hwy)	C	C	B	C	D	E	D	E
NB (shopping center driveway)	-	A	-	A	-	A	-	A
SB (Lavista Rd)	D	C	C	C	D	E	D	E
Intersection LOS	C	C	C	C	D	E	D	E
Overall Delay (sec/veh)	25.4	32.1	22.6	29.6	42.7	59.4	36.2	58.8
Overall Delay Change from Existing No-Build	-	-	-11%	-8%	-	-	-15%	-1%

TABLE 57: ALTERNATIVE C2 QUEUE LENGTH

Approach	No Build (2025)		Alternative C2 (2025)		No Build (2045)		Alternative C2 (2045)	
	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)
Eastbound Left Turn	400	300	200	150	650*	475*	275	225
Change from Existing	-	-	-50%	-50%	-	-	-58%	-53%
Northbound Left Turn	-	-	-	-	-	-	-	-
Change from Existing	-	-	-	-	-	-	-	-
Southbound Left Turn	150	525*	125	500*	200	875*	175	825*
Change from Existing	-	-	-17%	-5%	-	-	-13%	-6%

* denotes queue exceeds turn bay length

Analysis of this alternatives indicates that the addition of a second left turn lane on Lawrenceville Highway would improve operations by as much as 15% in 2045 during the AM peak hour. However less significant reductions were observed during the PM peak hour with only a 1% reduction in intersection delay and the intersection is still expected to operate at level of service E. The cost estimate to add dual northbound left turn bays is **\$2,010,000**.

Alternative C3

This alternative will allow all egress movements from the Cofer Crossing shopping center but does not change the current restrictions on left-turns from Lawrenceville Highway into the shopping center. A left turn lane is added to the shopping center driveway and the existing right turn lane is changed to a shared right turn/through lane and maintains the right turn channelization. The new egress traffic volumes were calculated was found by reassigning traffic from the other shopping center exits. The total egress traffic from the other two exits was summed together and a third of the total traffic was reassigned to the Lavista intersection driveway. The results of the operational analysis are included in **Table 58** and **Table 59** below.

TABLE 58: ALTERNATIVE C3 LEVELS OF SERVICE AND DELAY

Approach	No-Build (2025)		Alternative C3 (2025)		No-Build (2045)		Alternative C3 (2045)	
	AM LOS	PM LOS	AM LOS	PM LOS	AM LOS	PM LOS	AM LOS	PM LOS
EB (Lawrenceville Hwy)	C	D	D	D	C	D	D	E
WB (Lawrenceville Hwy)	C	C	C	D	D	E	D	F
NB (shopping center driveway)	-	A	E	E	-	A	F	F
SB (Lavista Rd)	D	C	E	E	D	E	F	F
Intersection LOS	C	C	C	D	D	E	E	F
Overall Delay (sec/veh)	25.4	32.1	32.0	52.5	42.7	59.4	58.6	120.4
Overall Delay Change from Existing No-Build	-	-	26%	64%	-	-	37%	103%

TABLE 59: ALTERNATIVE C3 QUEUE LENGTH

Approach	No Build (2025)		Alternative C2 (2025)		No Build (2045)		Alternative C2 (2045)	
	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)
Eastbound Left Turn	400	300	450*	375	650*	475*	725*	525*
Change from Existing	-	-	13%	25%	-	-	12%	11%
Northbound Left Turn	-	-	150	200	-	-	225	500
Change from Existing	-	-	-	-	-	-	-	-
Southbound Left Turn	150	525*	150	650*	200	875*	250	1025*
Change from Existing	-	-	0%	24%	-	-	25%	17%

* denotes queue exceeds turn bay length

Allowing full egress from the Cofer Crossing driveway significantly degrades operations at this intersection. The level of service during both peak hours in 2025 is acceptable however by 2045 the intersection operates at a failing level of service in the AM and PM peak hours. This alternative also introduces additional vehicle-vehicle conflict points with northbound through and left turning vehicles conflicting with southbound through movements. While operations at this intersection are degraded, it should be noted that the changes made at this intersection result in more efficient operations at Lynburn Drive by reducing the egress volumes from the shopping center. The estimated cost to add full egress from the shopping center driveway is **\$35,000**.

Alternative C4

This alternative adds a barrier on the southbound approach to prevent left turns into the shopping center driveway. Signage already prohibits left turns on that approach, however, vehicles still attempt to make the turns and slow down traffic. This improvement would increase safety by ensuring vehicles are not unexpectedly making a left turn across traffic and prevent the operational consequences of a vehicles stopping in the through lane and preventing other vehicles from clearing the intersection. The estimated cost to add a barrier to restrict southbound left turns into the shopping center is **\$25,000**.

Alternative Combinations

Table 60 below shows the alternatives for the Lavista Road intersection that can be combined and implemented together.

TABLE 60: LAVISTA ROAD ALTERNATIVE COMBINATIONS

	<i>Potential Alternative Combinations</i>			
	C1	C2	C3	C4
C1		✓	✓	✓
C2	✓		✓	✓
C3	✓	✓		✓
C4	✓	✓	✓	

All of the Lavista Road alternatives can be combined with each other because they all change different movements. C1 addresses the southbound right, C2 addresses the northbound left, C3 addresses the westbound approach and C4 addresses the southbound left.

Summary

The alternatives analyzed did not have a significant impact on the operations at Lavista Road except for alternative C3 (shopping center egress alt), which caused the Lavista Road intersection to operate at LOS E and F in the AM and PM peak hours in the design year versus LOS D and LOS E for all other analyzed alternatives. The recommendations for the Lavista Road intersection should primarily take the safety of all road users into consideration as none of the alternatives except C3 will degrade operations at the intersection.

Table 61 below summarizes the operational and safety benefits of each alternative and also indicates which alternatives address the most common public comments received during the public feedback period. For the table an acceptable level of service is considered an overall intersection level of service of A, B, C or D.

TABLE 61: ALTERNATIVES MATRIX – LAVISTA ROAD

Improvement Scenario	Provides Acceptable LOS				Addresses Safety		Responds to Public Comments	
	2025 AM	2025 PM	2045 AM	2045 PM	Reduced Vehicle-Vehicle Conflict Points	Reduced Vehicle-Pedestrian Conflict Points	Provides Full Shopping Center Egress	Improved Pedestrian Crossing Infrastructure
C1	✓	✓	✓		✓	✓		✓
C2	✓	✓	✓					
C3	✓	✓					✓	
C4	✓	✓	✓		✓			

Old Norcross Road

The intersection of Old Norcross Road and Lawrenceville Highway is a T-intersection located about 500-feet away from the Lavista Road intersection. The public comments focused on the traffic interaction with the Lavista Road intersection, and lack of existing pedestrian infrastructure along Old Norcross Road.

Three alternatives were developed for the Old Norcross Road intersection. More details about the design of the intersections and their operational performance can be found in the following sections.

- **Alternative D1** – Add westbound right turn bay and extend the eastbound left turn bay
- **Alternative D2** – Prohibit right turns on red for the southbound approach
- **Alternative D3** – Remove objects obstructing sight distance on southbound approach
- **Alternative D4** – Increase visibility of the supplemental signal

Alternative D1

A sketch of this alternative is shown below in **Figure 28**. A 200-foot right turn bay was added to the westbound approach and the eastbound turn bay was extended to 200-feet. Both proposed improvements will allow turning vehicles to exit the through lanes and increase the capacity of the intersection. Additionally, the westbound right turn lane will help increase sight distance for southbound right turning vehicles. The results of the operational analysis are included in **Table 62** and **Table 63** below.

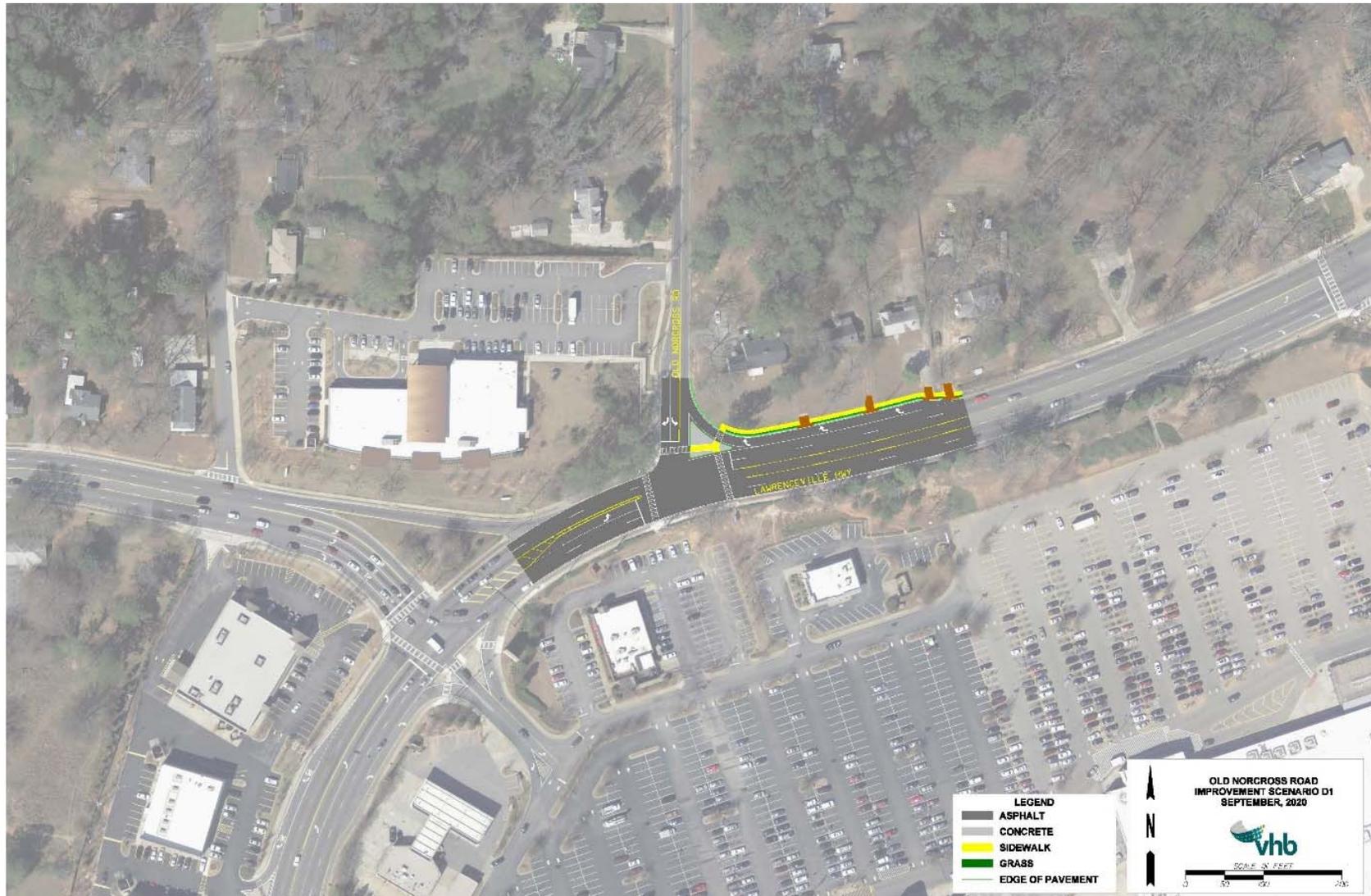


FIGURE 28: ALTERNATIVE D1

TABLE 62: ALTERNATIVE D1 LEVEL OF SERVICE AND DELAY

Approach	No-Build (2025)		Alternative D1 (2025)		No-Build (2045)		Alternative D1 (2045)	
	AM LOS	PM LOS	AM LOS	PM LOS	AM LOS	PM LOS	AM LOS	PM LOS
EB (Lawrenceville Hwy)	B	A	B	A	C	E	C	E
WB (Lawrenceville Hwy)	D	B	C	B	F	F	F	D
SB (Old Norcross Rd)	D	D	D	D	F	E	F	E
Intersection LOS	C	B	C	B	E	E	E	E
Overall Delay (sec/veh)	31.4	14.6	24.7	13.4	78.9	67.7	71.1	56.6
Overall Delay Change from Existing No-Build	-	-	-21%	-8%	-	-	-10%	-16%

TABLE 63: ALTERNATIVE D1 QUEUE LENGTH

Approach	No Build (2025)		Alternative D1 (2025)		No Build (2045)		Alternative D1 (2045)	
	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)
Eastbound Left Turn	150	100	150	100	325*	225*	325*	225*
Change from Existing	-	-	0%	0%	-	-	0%	0%
Southbound Right Turn	175*	175*	175*	175*	375*	275*	375*	275*
Change from Existing	-	-	0%	0%	-	-	0%	0%
Southbound Left Turn	75	175	75	175	175	300	175	300
Change from Existing	-	-	0%	0%	-	-	0%	0%

* denotes queue exceeds turn bay length

The analysis of this alternative indicates that overall the improvements will result in reduced delay at the intersection however the reduction does not impact the overall intersection level of service. With these improvements the intersection is still expected to operate at level of service E during both peak hours in 2045. This alternative may improve the overall safety of the intersection by allowing vehicles turning right onto Old Norcross Road to exit the through lanes on Lawrenceville highway sooner and decelerate in a dedicated lane. Similarly, the increased storage length for eastbound left turning vehicles will allow additional vehicles to queue in the turn lane and reduce blockage of the eastbound through lanes. Additionally, the westbound right turn lane will increase the sight distance for the southbound right turn movement. The estimated cost of this alternative is **\$1,360,000**.

Alternative D2

For this alternative, the original no-build geometry was assumed to be unchanged. The only change made was prohibiting right turns on red from the southbound approach due to safety concerns posed by sightline obstructions in the northeast quadrant of the intersection. The results of the operational analysis are included in **Table 64** and **Table 65** below.

TABLE 64: ALTERNATIVE D2 LEVEL OF SERVICE AND DELAY

Approach	No-Build (2025)		Alternative D2 (2025)		No-Build (2045)		Alternative D2 (2045)	
	AM LOS	PM LOS	AM LOS	PM LOS	AM LOS	PM LOS	AM LOS	PM LOS
EB (Lawrenceville Hwy)	B	A	B	A	C	E	B	D
WB (Lawrenceville Hwy)	D	B	C	C	F	F	F	E
SB (Old Norcross Rd)	D	D	E	E	F	E	F	F
Intersection LOS	C	B	C	B	E	E	F	E
Overall Delay (sec/veh)	31.4	14.6	31.2	17.9	78.9	67.7	95.1	63.9
Overall Delay Change from Existing No-Build	-	-	0%	23%	-	-	21%	-6%

TABLE 65: ALTERNATIVE D2 QUEUE LENGTH

Approach	No Build (2025)		Alternative D2 (2025)		No Build (2045)		Alternative D2 (2045)	
	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)	AM Queue (ft)	PM Queue (ft)
Eastbound Left Turn	150	100	150*	100	325*	225*	275*	225*
Change from Existing	-	-	0%	-25%	-	-	-15%	-11%
Southbound Right Turn	175*	175*	300*	300*	375*	275*	525*	450*
Change from Existing	-	-	71%	71%	-	-	40%	64%
Southbound Left Turn	75	175	100	175	175	300	175	300
Change from Existing	-	-	33%	0%	-	-	0%	0%

* denotes queue exceeds turn bay length

This analysis indicates that prohibiting southbound right turns on red will generally result in degraded operations at the intersection, however a slight improvement was observed during the PM peak hour in 2045, possibly due to updated offset and split optimization with Lavista Road for this scenario, but the intersection is still expected to operate at level of service E in that scenario. The benefit of this alternative is that it reduces the chances that a southbound right

turning vehicles will pull out in front of an oncoming westbound vehicle due to sight distance issues. Additionally, prohibiting right turns on red will eliminate one vehicle-pedestrian conflict point on the west leg of the intersection. A drawback of this alternative is that prohibiting right turns on red increases queues for the movements by as much as 71% in 2025 and 64% in 2045. The estimated cost to prohibit right turns on red for the southbound approach is **\$8,000**.

Alternative D3

A sketch of this alternative can be seen below in **Figure 29**. This alternative removes obstructions to the line of sight for the southbound approach. Currently there is vegetation and a utility pole blocking the view of vehicles wanting to turning right from Old Norcross Road to Lawrenceville Highway. Removing some of the obstructions will increase sight distance for the southbound right turn movement and will improve safety for that movement. The estimated cost to remove the objects obstructing sight distance on the southbound approach is **\$20,000**.



FIGURE 29: ALTERNATIVE D3

Alternative D4

This alternative recommends making improvements to the location and visibility of spanwire signage and supplemental signal heads in the vicinity of the intersection. Public comments indicate that currently tree branches obstruct visibility of the supplemental signal and signage on the spanwire is not in the correct place. Clearing the branches and moving the signage to the proper place will reduce driver confusion approaching the intersection and result in a safer intersection.

Alternative Combinations

Table 66 below shows the alternatives for the Old Norcross Road intersection that can be combined and implemented together.

TABLE 66: OLD NORCROSS ROAD ALTERNATIVE COMBINATIONS

	<i>Potential Alternative Combinations</i>			
	D1	D2	D3	D4
D1		✓	✓	✓
D2	✓		✓	✓
D3	✓	✓		✓
D4	✓	✓	✓	

All of the Old Norcross Road alternatives can be combined with each other because they alter different movements. D1 alters the east and west legs, D2 alters the north leg and D3 and D4 are related to clearing sight distance barriers.

Summary

Alternatives proposed at Old Norcross Road resulted in slight improvements to the overall intersection delay in the PM peak hour. However, restricting southbound right turn on red movements significantly degraded operations in the AM peak hour. Extending the eastbound left turn lane at Old Norcross Road (Alt D1) is the only alternative that provides benefits in both peak hours. While this alternative does not change the overall intersection level of service, it does reduce overall intersection delay by approximately 10 seconds in the AM and PM peak hours in the design year.

Table 67 below summarizes the operational and safety benefits of each alternative and also indicates which alternatives address the most common public comments received during the public feedback period. For the table an acceptable level of service is considered an overall intersection level of service of A, B, C or D.

TABLE 67: ALTERNATIVES MATRIX - OLD NORCROSS ROAD

Improvement Scenario	Provides Acceptable LOS				Addresses Safety			Responds to Public Comments		
	2025 AM	2025 PM	2045 AM	2045 PM	Reduced Vehicle-Vehicle Conflict Points	Reduced Vehicle-Pedestrian Conflict Points	Increases Sight Distance	Improved Pedestrian Crossing Infrastructure	Better Access and Connection to Lavista Road	Reduces EB LT Conflict with Lavista Intersection
D1	✓	✓			✓					✓
D2	✓	✓			✓	✓				
D3	✓	✓					✓			
D4	✓	✓								

Cofer Crossing (East)

The intersection of Cofer Crossing (East) and Lawrenceville Highway is one of three access points to the Cofer Crossing shopping center. A private driveway makes up the north leg, which does not currently have a signal head. Volumes on the minor street legs are very low compared to the high volumes observed on Lawrenceville Highway.

Three alternatives were developed for the Cofer Crossing (East) intersection. This intersection is expected to operate at an acceptable level of service through 2045 therefore no operational improvements are proposed for this intersection. The proposed alternatives provide safety benefits that are described in the following sections.

- **Alternative E1** – Add a signal head to the private driveway on the north leg
- **Alternative E2** – Encourage Cofer Crossing Property to provide better sidewalk access
- **Alternative E3** – Examine potential of direct driveway access from the police station to Lawrenceville Highway

Alternative E1

This alternative will add a signal head to the private driveway on the north leg of the intersection, where there currently is not one. This could have potential safety benefits by reducing conflict points because vehicles using the driveway will not have to look for a gap on the high-volume Lawrenceville Highway. The estimated cost to add a signal head to the private driveway on the north leg of the intersection is **\$10,000**.

Alternative E2

This alternative recommends coordinating with the property owners of Cofer Crossing to provide sidewalk access along this driveway. Currently, there is a stairway that provides access from the Walmart parking lot to Lawrenceville Highway however there is not a sidewalk along the Cofer Crossing (East) driveway which makes it difficult and unsafe for pedestrians requiring ADA accommodations to access the shopping center from Lawrenceville Highway.

Alternative E3

This alternative would examine the potential of connecting the DeKalb County Police Department, in the southeast quadrant of the intersection, directly to Lawrenceville Highway. Currently there is no direct access from the police station to Lawrenceville Highway. Vehicles must use Cofer Crossing (East) to access the police department. Providing direct access to Lawrenceville Highway would alleviate some traffic on the south leg of the intersection while allowing emergency vehicles to quickly access Lawrenceville Highway. Coordination between the City and DeKalb County would be required to determine feasibility of implementing this alternative.

Alternative Combinations

Table 68 below shows the alternatives for the Cofer Crossing (East) intersection that can be combined and implemented together.

TABLE 68: COFER CROSSING (EAST) ALTERNATIVE COMBINATION

	<i>Potential Alternative Combinations</i>		
	E1	E2	E3
E1		✓	✓
E2	✓		✓
E3	✓	✓	

All of the Cofer Crossing (East) alternatives can be combined with each other because they all change different aspects of the intersection. E1 adds a signal to the north leg of the intersection, E2 advocates for new sidewalks and E3 analyzes the police department driveway location.

General Improvements

The previous sections have provided alternatives to improve operations and safety at specific locations. There are several general corridor-wide improvements that can be implemented to further improve pedestrian safety and access to transit. Pedestrian infrastructure was one of the main concerns voiced by city officials and respondents of the public survey. Comments often focused on concerns related to crossing safety. The public comments also focused on improving bike infrastructure and business access along the corridor.

Four general improvements were developed for the corridor. More details about the design of the intersections and their operational performance can be found in the following sections.

- **Alternative F1** – Reduce the posted speed limit
- **Alternative F2** – Ensure sidewalk connectivity throughout the corridor
- **Alternative F3** – Improve transit shelters and accessibility
- **Alternative F4** – Coordinate with Cofer Crossing owner to improve access signage within property

Alternative F1

This alternative would reduce the posted speed limit over the entire corridor, which has a potential impact on safety. Reducing the speed also showed up in the public comments. A slower speed would potentially reduce the severity of any crashes that happen on the corridor, especially if they involve cyclists or pedestrians. Note that a review of vehicle speed data revealed that vehicles are already traveling slower than the posted speed limit of 45 miles per hour during the peak hours therefore these potential benefits are likely to be realized most on off-peak hours when there is less congestion on the roadway.

Alternative F2

This alternative would improve the sidewalk connectivity throughout the corridor. There are portions of the corridor where sidewalk is missing, for example the north leg of the Hugh Howell intersection. Other areas of sidewalk are not properly maintained and overgrown with vegetation which pose a safety hazard. Adding sidewalk where it is missing and fixing areas that need repair will increase pedestrian safety and improve ADA accessibility on the corridor.

Alternative F3

This alternative would improve the quality of transit shelters along the corridor and address accessibility needs. Several transit stops along the corridor do not have shelters or adequate seating for passengers. Also, several do not have a curb ramp which makes them inaccessible for

users with disabilities. Improving the shelters, amenities and accessibility of the transit stops would improve the safety and comfort of transit passengers on the corridor.

Alternative F4

Encourage the Cofer Crossing Shopping Center property owners to provide better signage and wayfinding within the parking lot to better distribute exiting vehicles. For example, more vehicles on the Walmart side of the parking lot could exit left at the Cofer Crossing (East) intersection instead of at the Lynburn Road intersection, thereby reducing the volumes at that intersection.

Recommendations

Prioritization

The proposed alternatives and results of the analyses were presented to the City for implementation prioritization. A four-tier system was developed to prioritize the alternatives as described below:

- **Tier 1** – Top priority
- **Tier 2** – Near-term priority
- **Tier 3** – Long-term desire
- **Tier 4** – Not recommended for implementation

The list of prioritized alternatives broken down by intersection is presented in **Table 69**.

TABLE 69: PROJECT PRIORITIZATION

Hugh Howell Road Intersection			
Improvement Scenario	Description	Cost Estimate	Priority Tier
A1	Convert south leg to right-in only	\$80,000	1
A2	Fully remove south leg of intersection	\$60,000	3
A3	Extend EB and SB left turn storage + reduce SB to WB right turn radius	\$470,000	2
A4	Realign Lawrenceville Hwy to form NB/SB thru movement, Hugh Howell Rd forms 'T' intersection	\$4,300,000	3
A5	Separate WB right turn to shopping center and Lawrenceville Hwy with raised island	\$60,000	3
A6	Restrict left turns in and out of business driveways near intersection with signage	\$30,000	1
Lynburn Drive Intersection			
Improvement Scenario	Description	Cost Estimate	Priority Tier
B1	Add left turn bay on EB approach	\$860,000	2
B2	Add dedicated right turn lane on WB approach	\$750,000	3
B3	Channelize right turn on WB approach, separate WB left and thru movements	\$790,000	1
B1 + B3	Improvements on EB and WB approaches	\$1,650,000	2
B1 + C3	Reduced traffic at intersection due to full egress at LaVista intersection	\$895,000	4
B4	Relocate MARTA stop in NB right turn bay	minimal	1

TABLE 69 CONT.

Lavista Road Intersection			
Improvement Scenario	Description	Cost Estimate	Priority Tier
C1	Reduce SB right turn radius to Lavista Rd and add turn bay storage	\$1,650,000	1
C2	Add second NB left turn bay	\$2,010,000	3
C3	Add full egress from the shopping center driveway	\$35,000	4
C4	Add barrier to restrict SB left turns into shopping center	\$25,000	1
Old Norcross Road Intersection			
Improvement Scenario	Description	Cost Estimate	Priority Tier
D1	Add WB right turn bay	\$1,360,000	2
D2	Prohibit RTOR on SB approach	\$8,000	4
D1 + D2	Combine D1 and D2	\$1,368,000	4
D3	Remove objects obstructing sight distance on NE corner of intersection	\$20,000	1
D4	Increase visibility of supplemental signal on NB approach	minimal	1
D5	Extend EB left turn bay	\$10,000	1
Cofer Crossing (East) Intersection			
Improvement Scenario	Description	Cost Estimate	Priority Tier
E1	Add signal head to private driveway on north leg	\$10,000	3
E2	Encourage Cofer Crossing property to provide better sidewalk access	minimal	2
E3	Examine potential of direct driveway access from police station to Lawrenceville Hwy	unknown	1

GDOT Quick Response Projects

The Quick Response Project Program are operational projects such as restriping, intersection improvements, turn lane additions and extensions that can be implemented in a short period of time and for under \$200,000. Projects to be submitted to the GDOT Quick Response Project Program were identified at Hugh Howell Road, Lynburn Drive, and Lavista Road/Old Norcross Road.

The project to be submitted for the intersection at Hugh Howell will combine alternative A1 with some components from alternative A3. This project will convert the south leg of the intersection to only allow right-turns into the driveway while restricting all other movements and will reduce

the radius of the southbound to westbound right-turn movement to enhance safety. A plot of the recommended improvements is included in **Appendix G**.

The project to be submitted for the intersection at Lynburn Drive involves some components of alternative B3. The project proposes to convert the existing shared through/right lane to a channelized right-turn only lane and shift through movements to a shared through/left lane. The channelizing island will allow the crosswalks on the north and east legs to be reduced and realigned with the new island. This configuration will allow the signal to operate as a split phase on the east-west legs, as is currently being implemented. A plot of the recommended improvements is included in **Appendix H**.

The project to be submitted for the intersections of Lavista Road and Old Norcross Road is a combination of alternatives C4, D3, D4 and D5. This project will involve adding a barrier to restrict left turns from Lawrenceville Highway into the shopping center driveway at Lavista Road while also increasing the length of the eastbound left-turn bay at Old Norcross Road. The project will also remove objects obstructing the sight distance on the northeast corner of Old Norcross Road and increase visibility of the supplemental signal head on the northbound approach to the intersection. A sketch of the left-turn barrier and extended left-turn lane at Old Norcross can be seen as part of the project sketch for the ARC Safety project in the following section.

ARC Safety Project

A project submitted to ARC for funding must be evaluated against other projects across the region. Improvements to the intersections of Lavista Road and Old Norcross Road will be submitted to the ARC as one project for consideration. This project combines recommendations from alternatives C1, C4, D1, and D5 and also recommends reducing the intersection skew of Old Norcross Road to further enhance safety. A sketch of the recommended project is included in **Appendix I**.

ARC projects are evaluated in three stages, referred to as key decision points or KDPs. The first KDP filters projects based on policy; this project will meet criteria for being recommended in a locally adopted plan and context sensitive design criteria. The second KDP prioritizes projects based on several performance metrics; this project will meet criteria for the mobility and congestion, network connectivity, and safety. The third KDP reviews projects to account for factors that cannot be easily quantified or that account for local politics and regional equity. The sponsor priority, cost-effectiveness, and deliverability of this project are all expected to work in favor of this project being selected for funding.

Appendix A

Historical Growth Rate Calculations

Historical Growth Rate

Station ID	089-3025	089-3027	089-3029	089-3272	089-3274
County	DeKalb	DeKalb	DeKalb	DeKalb	DeKalb
Description	Lawrenceville Hwy W/O Hugh Howell Rd	Lawrenceville Hwy Btwn Hugh Howell Rd and LaVista Rd	Lawrenceville Hwy E/O LaVista Rd	LaVista Rd W/O Lawrenceville Hwy	Hugh Howell Rd E/O Lawrenceville Hwy
Functional Class	Principal Arterial	Principal Arterial	Principal Arterial	Minor Arterial	Minor Arterial
2008					
2009	24600	23700	24100		31000
2010	24700	19700	24200	22700	22100
2011	24600	21900	24100	22700	23600
2012	24000	21800	24400	20400	23400
2013	24100	20800	24500	20500	25100
2014	25700	20800	25600	23300	25100
2015	26600	21000	26500	25100	21700
2016	25700	21700	26500	23200	22400
2017	27200	24800	28100	24600	25600
2018	25100	24800	24400	24300	25600
2008	24023	20712	23642	20797	25418
2018	26226	23186	26565	24460	23662
2013	25099	20073	25427	21936	23871
2018	26344	24658	26386	25068	24527
10-year avg.	0.9%	1.1%	1.2%	1.6%	-0.7%
5-year avg.	1.0%	4.0%	0.7%	2.6%	0.5%
10-year avg.	0.8%				
5-year avg.	1.8%				

Wt. Avg.
0.8%
1.8%

Actual Traffic Counts
XXXX
Calculated Values

Appendix B

Raw Volume Data

CLASSIFICATION

Lawrenceville Hwy Bet. Hugh Howell Rd & Old Norcross Rd

Day: Wednesday
Date: 5/16/2018

City: Tucker
Project #: GA18_9286_003n

North Bound

Time	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13	Total
00:00 AM	0	71	8	1	1	0	0	0	0	0	0	0	0	81
01:00	0	42	3	0	0	0	0	0	0	0	0	0	0	45
02:00	0	34	5	0	1	0	0	0	2	0	0	0	0	42
03:00	0	32	3	0	1	0	0	0	0	0	0	0	0	36
04:00	0	60	5	0	3	0	0	0	1	0	0	0	0	69
05:00	0	171	16	2	14	0	0	0	1	0	0	0	0	204
06:00	0	563	61	5	31	3	0	1	4	0	0	0	0	668
07:00	3	902	98	6	52	5	0	3	8	0	0	0	0	1077
08:00	2	958	93	7	61	5	0	5	6	0	0	0	0	1137
09:00	0	818	92	6	49	4	0	8	10	0	0	0	0	987
10:00	3	740	85	6	53	2	0	1	8	0	0	0	0	898
11:00	1	782	96	4	51	1	0	0	3	0	0	0	0	938
12:00 PM	1	900	108	4	54	0	0	2	7	0	0	0	0	1076
13:00	2	867	90	4	60	1	0	0	3	0	0	0	0	1027
14:00	4	881	93	3	56	3	2	2	5	0	0	0	0	1049
15:00	3	855	85	6	42	3	0	4	3	0	0	0	0	1001
16:00	3	971	108	7	56	2	0	4	2	0	0	0	0	1153
17:00	4	981	102	5	53	6	1	3	8	0	0	0	0	1163
18:00	2	902	97	5	46	0	1	1	4	0	0	0	0	1058
19:00	0	787	76	5	37	0	0	4	3	0	0	0	0	912
20:00	0	628	77	4	28	0	0	3	4	0	0	0	0	744
21:00	0	468	49	4	17	0	0	0	2	0	0	0	0	540
22:00	0	281	20	3	14	0	0	0	0	0	0	0	0	318
23:00	0	160	12	3	9	0	0	0	0	0	0	0	0	184
Totals	28	13854	1482	90	789	35	4	41	84	84	1%	0%	1%	16407
% of Totals	0%	84%	9%	1%	5%	0%	0%	0%	1%	0%	0%	0%	0%	100%

Directional Peak Periods	All Classes		AM 7-9		NOON 12-2		PM 4-6		Off Peak Volumes	
	Volume	%	Volume	%	Volume	%	Volume	%	Volume	%
AM Volumes	9	5173	37	317	20	18	43	0	0	6182
% AM	0%	32%	0%	2%	0%	0%	0%	0	0	38%
AM Peak Hour	07:00	08:00	08:00	08:00	07:00	09:00	09:00	09:00	08:00	08:00
Volume	3	958	7	61	5	8	10	0	0	1137
PM Volumes	19	8681	53	472	15	23	41	0	0	10225
% PM	0%	53%	0%	3%	0%	0%	0%	0	0	62%
PM Peak Hour	14:00	17:00	16:00	13:00	17:00	15:00	17:00	17:00	17:00	17:00
Volume	4	981	7	60	6	4	8	0	0	1163
Totals	2214	13%	2103	13%	2316	14%	9774	60%		

Classification Definitions	
1 Motorcycles	4 Buses
2 Passenger Cars	5 2-Axle, 6-Tire Single Units
3 2-Axle, 4-Tire Single Units	6 3-Axle Single Units
7 >=4-Axle Single Units	8 <=4-Axle Single Trailers
9 5-Axle Single Trailers	10 >=6-Axle Single Trailers
11 <=5-Axle Multi-Trailers	12 6-Axle Multi-Trailers
13 >=7-Axle Multi-Trailers	

CLASSIFICATION

Lawrenceville Hwy Bet. Hugh Howell Rd & Old Norcross Rd

Day: Wednesday
Date: 5/16/2018

City: Tucker
Project #: GA18_9286_003s

South Bound

Time	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13	Total
00:00 AM	0	87	8	1	1	0	0	0	0	1	0	0	0	98
01:00	0	46	4	0	0	0	0	0	0	0	0	0	0	50
02:00	0	26	4	0	0	0	0	0	0	0	0	0	0	30
03:00	0	35	3	0	0	0	0	0	0	0	0	0	0	38
04:00	0	53	6	0	1	0	0	0	0	0	0	0	0	60
05:00	0	119	15	1	5	0	0	0	0	0	0	0	0	140
06:00	0	419	71	6	19	1	0	0	1	0	0	0	0	517
07:00	3	627	117	6	28	2	0	1	1	0	0	0	0	785
08:00	2	721	112	2	37	3	0	2	4	0	0	0	0	883
09:00	3	706	113	6	28	2	0	1	4	0	0	0	0	863
10:00	2	624	96	3	28	1	0	0	1	0	0	0	0	755
11:00	2	722	106	2	32	2	0	1	1	0	0	0	0	868
12:00 PM	2	868	133	6	28	1	0	2	1	0	0	0	0	1041
13:00	0	920	132	2	36	1	0	4	2	0	0	0	0	1097
14:00	3	894	122	3	37	1	0	1	0	0	0	0	0	1061
15:00	3	1135	138	3	32	1	0	1	3	0	0	0	0	1316
16:00	3	1277	180	8	40	1	0	1	10	0	0	0	0	1520
17:00	4	1395	144	6	40	0	0	1	4	0	0	0	0	1594
18:00	3	1080	129	3	29	0	0	3	3	0	0	0	0	1250
19:00	2	849	95	3	10	0	0	0	1	0	0	0	0	960
20:00	0	651	68	2	10	0	0	0	0	0	0	0	0	731
21:00	0	510	58	2	14	0	0	0	0	0	0	0	0	584
22:00	0	310	25	2	4	0	0	0	0	0	0	0	0	341
23:00	0	196	15	2	1	0	0	0	0	0	0	0	0	214
Totals	32	14270	1894	69	460	16	18	37	0%	0%	18	37	0%	16796
% of Totals	0%	85%	11%	0%	3%	0%	0%	0%	0%	0%	13%	0%	0%	100%

Directional Peak Periods	All Classes	AM 7-9	NOON 12-2	PM 4-6	Off Peak Volumes
		Volume	Volume	Volume	Volume
AM Volumes	12	655	11	5	0
% AM	0%	4%	0%	0%	0%
AM Peak Hour	07:00	07:00	08:00	08:00	08:00
Volume	3	117	3	4	883
PM Volumes	20	1239	5	24	0
% PM	0%	7%	0%	0%	0%
PM Peak Hour	17:00	16:00	12:00	16:00	17:00
Volume	4	180	1	10	1594
Directional Peak Periods	All Classes	AM 7-9	NOON 12-2	PM 4-6	Off Peak Volumes
		Volume	Volume	Volume	Volume
		1668	2138	3114	9876
		%	%	%	%
		10%	13%	19%	59%

Classification Definitions	
1 Motorcycles	7 > =4-Axle Single Units
2 Passenger Cars	8 <=4-Axle Single Trailers
3 2-Axle, 4-Tire Single Units	9 5-Axle Single Trailers
4 Buses	10 >=6-Axle Single Trailers
5 2-Axle, 6-Tire Single Units	11 <=5-Axle Multi-Trailers
6 3-Axle Single Units	12 6-Axle Multi-Trailers
	13 >=7-Axle Multi-Trailers

CLASSIFICATION

Lawrenceville Hwy Bet. Hugh Howell Rd & Old Norcross Rd

Day: Thursday

Date: 5/17/2018

City: Tucker

Project #: GA18_9286_003n

North Bound

Time	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13	Total
00:00 AM	0	68	5	1	1	0	0	0	0	0	0	0	0	75
01:00	0	41	3	0	2	2	0	0	1	0	0	0	0	49
02:00	0	29	3	0	0	0	0	0	0	0	0	0	0	32
03:00	0	31	3	0	1	0	0	0	0	0	0	0	0	35
04:00	0	42	4	0	2	1	0	0	1	0	0	0	0	50
05:00	0	185	17	3	10	0	0	0	0	0	0	0	0	215
06:00	1	570	59	8	27	2	0	2	0	0	0	0	0	669
07:00	3	937	106	5	49	5	0	4	5	0	0	0	0	1114
08:00	0	817	88	7	37	6	0	1	2	0	0	0	0	958
09:00	1	623	71	6	40	0	0	2	4	0	0	0	0	747
10:00	4	665	70	4	37	3	0	4	3	0	0	0	0	790
11:00	1	731	75	4	39	1	0	2	0	0	0	0	0	853
12:00 PM	2	885	87	2	54	3	0	2	6	0	0	0	0	1041
13:00	1	902	92	4	47	3	0	2	3	0	0	0	0	1054
14:00	1	894	106	8	43	8	0	1	5	0	0	0	0	1066
15:00	2	887	89	4	46	5	0	1	3	0	0	0	0	1037
16:00	2	986	103	9	55	6	0	2	3	0	0	0	0	1166
17:00	2	1057	101	2	56	7	2	3	5	0	0	0	0	1235
18:00	2	962	103	4	46	7	0	3	5	0	0	0	0	1132
19:00	3	868	83	7	43	3	0	0	1	0	0	0	0	1008
20:00	0	693	67	4	35	0	0	1	0	0	0	0	0	800
21:00	1	456	40	4	15	0	0	0	2	0	0	0	0	518
22:00	0	302	23	4	12	0	0	0	0	0	0	0	0	341
23:00	0	163	11	4	5	0	0	0	0	0	0	0	0	183
Totals	26	13794	1409	94	702	62	2	30	49	0	0	0	0	16168
% of Totals	0%	85%	9%	1%	4%	0%	0%	0%	0%	0%	0%	0%	0%	100%

Directional Peak Periods	All Classes		AM 7-9		NOON 12-2		PM 4-6		Off Peak Volumes	
	Volume	%	Volume	%	Volume	%	Volume	%	Volume	%
AM Volumes	10	4739	504	38	245	20	15	16	0	0
% AM	0%	29%	3%	0%	2%	0%	0%	0%	0	0
AM Peak Hour	10:00	07:00	07:00	06:00	07:00	08:00	07:00	07:00	07:00	07:00
Volume	4	937	106	8	49	6	4	5	1114	1114
PM Volumes	16	9055	905	56	457	42	15	33	0	0
% PM	0%	56%	6%	0%	3%	0%	0%	0%	0	0
PM Peak Hour	19:00	17:00	14:00	16:00	17:00	14:00	17:00	12:00	17:00	17:00
Volume	3	1057	106	9	56	8	3	6	1235	1235
Directional Peak Periods	All Classes		AM 7-9		NOON 12-2		PM 4-6		Off Peak Volumes	
	Volume	%	Volume	%	Volume	%	Volume	%	Volume	%
	2072	13%	2095	13%	2401	15%	9600	59%		

Classification Definitions	
1 Motorcycles	7 > =4-Axle Single Units
2 Passenger Cars	8 <=4-Axle Single Trailers
3 2-Axle, 4-Tire Single Units	9 5-Axle Single Trailers
4 Buses	10 >=6-Axle Single Trailers
5 2-Axle, 6-Tire Single Units	11 <=5-Axle Multi-Trailers
6 3-Axle Single Units	12 6-Axle Multi-Trailers
	13 >=7-Axle Multi-Trailers

CLASSIFICATION

Lawrenceville Hwy Bet. Hugh Howell Rd & Old Norcross Rd

Day: Thursday

Date: 5/17/2018

City: Tucker

Project #: GA18_9286_003s

South Bound

Time	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13	Total
00:00 AM	0	86	6	1	1	0	0	0	0	0	0	0	0	94
01:00	0	42	4	0	0	0	0	0	0	0	0	0	0	46
02:00	0	32	4	0	0	0	0	0	0	0	0	0	0	36
03:00	0	31	4	0	2	0	0	0	0	0	0	0	0	37
04:00	0	49	9	0	1	0	0	0	0	0	0	0	0	59
05:00	0	115	27	1	3	0	0	0	0	0	0	0	0	146
06:00	0	457	74	3	21	0	0	1	1	0	0	0	0	557
07:00	0	644	102	4	39	0	0	2	1	0	0	0	0	792
08:00	5	741	123	4	37	2	0	1	3	0	0	0	0	916
09:00	2	631	104	4	35	0	0	4	0	0	0	0	0	780
10:00	3	598	100	3	29	1	0	0	3	0	0	0	0	737
11:00	1	742	111	3	37	0	0	1	1	0	0	0	0	896
12:00 PM	3	945	115	3	36	0	0	1	2	0	0	0	0	1105
13:00	2	898	127	4	42	0	0	4	1	0	0	0	0	1078
14:00	2	885	129	2	35	0	0	1	0	0	0	0	0	1054
15:00	2	1116	156	4	40	1	1	6	1	0	0	0	0	1327
16:00	1	1306	174	6	47	0	0	8	4	0	0	0	0	1546
17:00	3	1447	169	8	42	0	0	6	6	0	0	0	0	1681
18:00	3	1214	144	5	38	0	0	6	1	0	0	0	0	1411
19:00	0	945	112	2	27	0	0	1	2	0	0	0	0	1089
20:00	0	720	86	2	14	1	0	0	0	0	0	0	0	823
21:00	0	457	60	2	11	0	0	0	0	0	0	0	0	530
22:00	0	351	30	2	8	0	0	0	0	0	0	0	0	391
23:00	0	189	18	2	6	0	0	0	0	0	0	0	0	215
Totals	27	14641	1988	65	551	5	1	42	26	26	0	0	0	17346
% of Totals	0%	84%	11%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	100%

Directional Peak Periods	All Classes		AM 7-9		NOON 12-2		PM 4-6		Off Peak Volumes		
	Volume	%	Volume	%	Volume	%	Volume	%	Volume	%	
AM Volumes	11	4168	668	23	205	3	9	9	0	0	5096
% AM	0%	24%	4%	0%	1%	0%	0%	0%	0%	0%	29%
AM Peak Hour	08:00	11:00	08:00	07:00	07:00	08:00	09:00	08:00	08:00	08:00	08:00
Volume	5	742	123	4	39	2	4	3	916	916	916
PM Volumes	16	10473	1320	42	346	2	33	17	0	0	12250
% PM	0%	60%	8%	0%	2%	0%	0%	0%	0%	0%	71%
PM Peak Hour	12:00	17:00	16:00	17:00	16:00	15:00	16:00	17:00	17:00	17:00	17:00
Volume	3	1447	174	8	47	1	8	6	1681	1681	1681
Directional Peak Periods	All Classes		AM 7-9		NOON 12-2		PM 4-6		Off Peak Volumes		
	Volume	%	Volume	%	Volume	%	Volume	%	Volume	%	
	1708	10%	2183	13%	3227	19%	10228	59%			

Classification Definitions			
1	Motorcycles	7	> =4-Axle Single Units
2	Passenger Cars	8	< =4-Axle Single Trailers
3	2-Axle, 4-Tire Single Units	9	5-Axle Single Trailers
4	Buses	10	> =6-Axle Single Trailers
5	2-Axle, 6-Tire Single Units	11	< =5-Axle Multi-Trailers
6	3-Axle Single Units	12	6-Axle Multi-Trailers
		13	> =7-Axle Multi-Trailers

Project ID: 18-09285-007
 Location: Lawrenceville Hwy & Lynburn Dr
 City: Tucker

Day: Tuesday
 Date: 05/15/2018

Groups Printed - Cars, PU, Vans - Heavy Trucks

Start Time	Lawrenceville Hwy Northbound						Lawrenceville Hwy Southbound						Lynburn Dr Eastbound						Lynburn Dr Westbound						
	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	
7:00 AM	84	150	17	0	1	251	2	168	13	0	0	183	5	0	4	0	0	9	8	5	6	0	1	19	
7:15 AM	71	197	19	0	1	287	3	178	13	0	0	194	5	3	7	0	1	15	12	3	6	0	2	21	
7:30 AM	77	212	16	0	0	305	2	178	16	0	0	196	7	3	18	0	0	28	8	6	3	0	1	17	
7:45 AM	80	196	12	0	0	288	6	206	16	1	2	229	2	2	15	0	0	19	15	4	5	0	1	24	
Total	312	755	64	0	2	1131	13	730	58	1	2	802	19	8	44	0	1	71	43	18	20	0	5	81	
8:00 AM	74	206	19	0	0	299	3	249	14	0	0	266	3	2	11	0	0	16	14	2	3	0	0	19	
8:15 AM	73	202	22	0	4	297	6	196	15	0	0	217	5	3	15	0	0	23	21	8	3	0	0	32	
8:30 AM	76	206	21	0	0	303	3	198	15	0	1	216	10	5	13	0	0	28	16	7	2	0	3	25	
8:45 AM	58	175	24	0	1	257	4	183	11	1	0	199	9	5	11	0	1	25	23	8	2	0	1	33	
Total	281	789	86	0	5	1156	16	826	55	1	1	898	27	15	50	0	1	92	74	25	10	0	4	109	
9:00 AM	33	143	20	0	0	196	7	189	13	0	0	209	6	7	8	0	0	21	30	11	3	0	1	44	
9:15 AM	48	148	38	0	0	234	8	169	11	0	0	188	2	5	13	0	1	20	23	9	13	0	0	45	
9:30 AM	52	127	25	0	0	204	4	167	13	0	1	184	5	4	15	0	0	24	30	12	6	0	1	48	
9:45 AM	41	147	33	0	0	221	12	157	18	0	0	187	12	5	19	0	1	36	38	8	6	0	0	52	
Total	174	565	116	0	0	855	31	682	55	0	1	768	25	21	55	0	2	101	121	40	28	0	2	189	
BREAK																									
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3:30 PM	39	180	48	0	3	267	12	223	14	1	0	250	13	12	57	0	0	82	42	18	14	0	1	74	
3:45 PM	26	190	56	0	3	272	22	248	9	0	3	279	12	10	41	0	8	63	64	28	15	0	0	107	
Total	65	370	104	0	6	539	34	471	23	1	3	529	25	22	98	0	8	145	106	46	29	0	1	181	
4:00 PM	31	217	54	0	1	302	18	238	14	0	1	270	19	12	41	0	4	72	70	14	18	0	1	102	
4:15 PM	31	184	61	0	2	276	17	242	6	0	4	265	13	7	43	0	0	63	77	19	15	0	0	111	
4:30 PM	36	188	48	0	1	272	20	270	16	1	0	307	17	13	43	0	0	73	44	16	12	0	0	72	
4:45 PM	28	206	45	0	0	279	15	233	11	1	0	260	19	12	61	0	1	92	62	15	17	0	0	94	
Total	126	795	208	0	4	1129	70	983	47	2	5	1102	68	44	188	0	5	300	253	64	62	0	1	379	
5:00 PM	16	196	51	0	2	263	7	285	5	0	2	297	20	13	44	0	0	77	43	12	15	0	1	70	
5:15 PM	26	230	63	0	1	319	13	300	6	0	0	319	15	6	27	0	0	48	69	17	14	0	1	100	
5:30 PM	24	122	52	0	1	198	13	261	17	0	2	291	12	9	55	0	1	76	79	31	17	0	2	127	
5:45 PM	15	151	77	0	0	243	9	269	8	0	1	286	19	9	46	0	0	74	54	29	17	0	1	100	
Total	81	699	243	0	4	1023	42	1115	36	0	5	1193	66	37	172	0	1	275	245	89	63	0	5	397	
6:00 PM	39	210	66	0	1	315	24	248	18	1	1	291	12	9	54	0	0	75	52	21	19	0	0	92	
6:15 PM	27	172	70	0	1	269	18	268	13	0	0	299	10	11	30	0	0	51	69	22	17	0	1	108	
Total	66	382	136	0	2	584	42	516	31	1	1	590	22	20	84	0	0	126	121	43	36	0	1	200	
Grand Total	1105	4355	957	0	23	6417	248	5323	305	6	18	5882	252	167	691	0	18	1110	963	325	248	0	19	1536	
Approach %	17.2	67.9	14.9	0.0	0.4	4.2	90.5	5.2	0.1	0.3	22.7	15.0	62.3	0.0	1.6	62.7	21.2	16.1	0.0	1.2	62.7	21.2	16.1	0.0	1.2
Total %	7.4	29.1	6.4	0.0	0.2	1.7	35.6	2.0	0.0	0.1	39.4	1.7	1.1	4.6	0.0	0.1	7.4	6.4	2.2	1.7	0.0	0.1			
Cars, PU, Vans	1105	4311	956	0	23	6372	247	5272	303	18	5828	252	167	686	0	1105	962	324	244	0	19	1530			
% Cars, PU, Vans	100.0	99.0	99.9	0.0	100.0	99.3	99.6	99.0	99.3	0.0	100.0	100.0	99.3	0.0	0.0	99.9	99.7	98.4	0.0	100.0	99.6				
Heavy Trucks	0	44	1	0	0	45	1	51	2	0	54	0	0	5	0	5	1	1	4	0	0	6			
% Heavy Trucks	0.0	1.0	0.1	0.0	0.0	0.7	0.4	1.0	0.7	0.0	0.9	0.0	0.0	0.7	0.0	0.5	0.1	0.3	1.6	0.0	0.4	0.7			

Project ID: 18-09285-007
 Location: Lawrenceville Hwy & Lynburn Dr
 City: Tucker

PEAK HOURS

Day: Tuesday
 Date: 05/15/2018

AM

Start Time	Lawrenceville Hwy Northbound				Lawrenceville Hwy Southbound				Lynburn Dr Eastbound				Lynburn Dr Westbound								
	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Int. Total
Peak Hour Analysis from 07:00 AM to 10:00 AM																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
7:45 AM	80	196	12	0	288	6	206	16	1	229	2	2	15	0	19	15	4	5	0	24	560
8:00 AM	74	206	19	0	299	3	249	14	0	266	3	2	11	0	16	14	2	3	0	19	600
8:15 AM	73	202	22	0	297	6	196	15	0	217	5	3	15	0	23	21	8	3	0	32	569
8:30 AM	76	206	21	0	303	3	198	15	0	216	10	5	13	0	28	16	7	2	0	25	572
Total Volume	303	810	74	0	1187	18	849	60	1	928	20	12	54	0	86	66	21	13	0	100	2301
% App. Total	25.5	68.2	6.2	0.0	100	1.9	91.5	6.5	0.1	100	23.3	14.0	62.8	0.0	100	66.0	21.0	13.0	0.0	100	0.959
PHF	0.872																				
Cars, PU, Vans	303	800	74	0	1177	18	837	59	1	915	20	12	53	0	85	65	21	13	0	99	2276
% Cars, PU, Vans	100.0	98.8	100.0	0.0	99.2	100.0	98.6	98.3	100.0	98.6	100.0	100.0	98.1	0.0	98.8	98.5	100.0	100.0	0.0	99.0	98.9
Heavy Trucks	0	10	0	0	10	0	12	1	0	13	0	0	1	0	1	1	0	0	0	1	25
% Heavy Trucks	0.0	1.2	0.0	0.0	0.8	0.0	1.4	1.7	0.0	1.4	0.0	0.0	1.9	0.0	1.2	1.5	0.0	0.0	0.0	1.0	1.1

PM

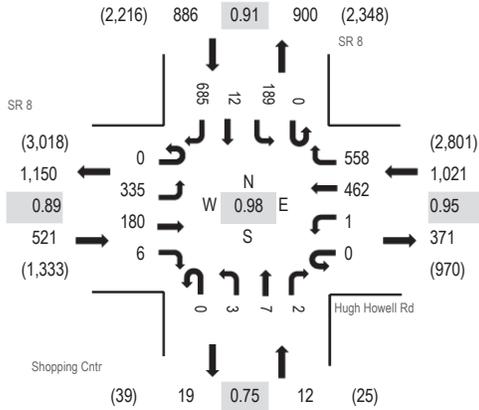
Start Time	Lawrenceville Hwy Northbound				Lawrenceville Hwy Southbound				Lynburn Dr Eastbound				Lynburn Dr Westbound								
	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Int. Total
Peak Hour Analysis from 03:30 PM to 06:30 PM																					
Peak Hour for Entire Intersection Begins at 05:15 PM																					
5:15 PM	26	230	63	0	319	13	300	6	0	319	15	6	27	0	48	69	17	14	0	100	786
5:30 PM	24	122	52	0	198	13	261	17	0	291	12	9	55	0	76	79	31	17	0	127	692
5:45 PM	15	151	77	0	243	9	269	8	0	286	19	9	46	0	74	54	29	17	0	100	703
6:00 PM	39	210	66	0	315	24	248	18	1	291	12	9	54	0	75	52	21	19	0	92	773
Total Volume	104	713	258	0	1075	59	1078	49	1	1187	58	33	182	0	273	254	98	67	0	419	2954
% App. Total	9.7	66.3	24.0	0.0	100	5.0	90.8	4.1	0.1	100	21.2	12.1	66.7	0.0	100	60.6	23.4	16.0	0.0	100	0.940
PHF	0.842																				
Cars, PU, Vans	104	706	258	0	1068	59	1074	48	1	1182	58	33	181	0	272	254	98	66	0	418	2940
% Cars, PU, Vans	100.0	99.0	100.0	0.0	99.3	100.0	99.6	98.0	100.0	99.6	100.0	100.0	99.5	0.0	99.6	100.0	100.0	98.5	0.0	99.8	99.5
Heavy Trucks	0	7	0	0	7	0	4	1	0	5	0	0	1	0	1	0	0	1	0	1	14
% Heavy Trucks	0.0	1.0	0.0	0.0	0.7	0.0	0.4	2.0	0.0	0.4	0.0	0.0	0.5	0.0	0.4	0.0	0.0	1.5	0.0	0.2	0.5



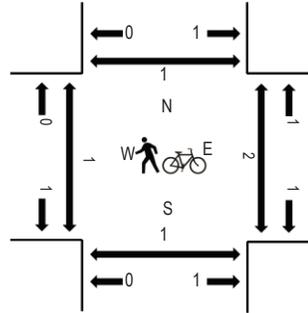
(303) 216-2439
www.alltrafficdata.net

Location: 3 Shopping Cntr & Hugh Howell Rd AM
Date and Start Time: Thursday, March 30, 2017
Peak Hour: 07:15 AM - 08:15 AM
Peak 15-Minutes: 07:30 AM - 07:45 AM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	SR 8 Eastbound				Hugh Howell Rd Westbound				Shopping Cntr Northbound				SR 8 Southbound				Total	Rolling Hour	Pedestrian Crossings				
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North	
6:00 AM	0	33	24	0	0	0	53	61	0	0	0	0	0	20	0	86	277	1,629	0	0	0	0	
6:15 AM	0	38	18	2	0	0	90	92	0	0	0	0	0	19	0	105	364	1,888	0	0	0	0	
6:30 AM	0	49	19	0	0	0	108	122	0	0	0	1	0	26	0	136	461	2,136	0	0	0	0	
6:45 AM	0	59	36	3	0	0	106	146	0	1	0	0	0	23	1	152	527	2,298	0	0	0	0	
7:00 AM	0	44	41	1	0	0	123	159	0	0	1	0	0	29	1	137	536	2,368	0	0	0	0	
7:15 AM	0	78	44	2	0	0	130	149	0	1	1	2	0	39	1	165	612	2,440	0	0	0	0	
7:30 AM	0	89	39	1	0	0	121	139	0	0	1	0	0	42	2	189	623	2,438	0	0	0	0	
7:45 AM	0	87	46	2	0	1	117	138	0	0	2	0	0	46	6	152	597	2,360	0	0	0	0	
8:00 AM	0	81	51	1	0	0	94	132	0	2	3	0	0	62	3	179	608	2,378	0	2	0	1	
8:15 AM	0	84	60	0	0	0	119	151	0	3	0	1	0	47	2	143	610		0	0	0	0	
8:30 AM	0	82	55	1	0	0	115	112	0	0	2	2	0	39	1	136	545		1	1	0	0	
8:45 AM	0	89	72	2	0	1	99	123	0	1	1	0	0	67	5	155	615		0	1	0	0	
9:00 AM																							
9:15 AM																							
9:30 AM																							

Peak Rolling Hour Flow Rates

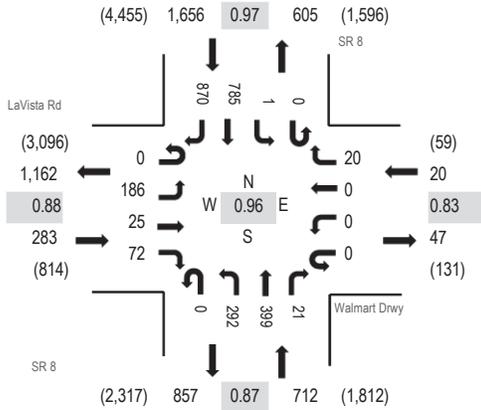
Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	2	3	1	0	0	1	2	0	0	0	0	0	1	0	8	18
Lights	0	322	170	5	0	1	447	536	0	3	7	2	0	178	12	653	2,336
Mediums	0	11	7	0	0	0	14	20	0	0	0	0	0	10	0	24	86
Total	0	335	180	6	0	1	462	558	0	3	7	2	0	189	12	685	2,440



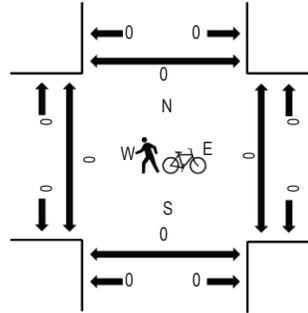
(303) 216-2439
www.alltrafficdata.net

Location: 4 SR 8 & Walmart Drwy AM
Date and Start Time: Thursday, March 30, 2017
Peak Hour: 07:00 AM - 08:00 AM
Peak 15-Minutes: 07:30 AM - 07:45 AM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	LaVista Rd Eastbound				Walmart Drwy Westbound				SR 8 Northbound				SR 8 Southbound				Total	Rolling Hour	Pedestrian Crossings				
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North	
6:00 AM	0	17	3	12	0	0	0	3	0	19	35	3	0	0	93	97	282	1,859	0	0	0	0	
6:15 AM	0	23	4	7	0	0	0	1	0	41	54	3	0	0	117	181	431	2,238	0	0	0	0	
6:30 AM	0	27	3	11	0	0	0	2	0	64	52	2	0	1	158	203	523	2,454	0	0	0	0	
6:45 AM	0	24	3	10	0	0	0	0	0	72	69	5	0	0	190	250	623	2,627	0	0	0	0	
7:00 AM	0	39	6	21	0	0	0	3	0	83	76	8	0	0	170	255	661	2,671	0	0	0	0	
7:15 AM	0	34	2	12	0	0	0	5	0	79	90	1	0	0	192	232	647	2,643	0	0	0	0	
7:30 AM	0	52	11	14	0	0	0	4	0	72	115	7	0	0	223	198	696	2,656	0	0	0	0	
7:45 AM	0	61	6	25	0	0	0	8	0	58	118	5	0	1	200	185	667	2,582	0	0	0	0	
8:00 AM	0	53	8	22	0	0	0	10	0	43	95	6	0	0	220	176	633	2,610	1	0	0	0	
8:15 AM	0	59	6	28	0	0	0	7	0	82	121	6	0	0	177	174	660		0	0	0	0	
8:30 AM	0	64	12	25	0	0	0	6	0	61	94	5	0	0	155	200	622		0	0	0	0	
8:45 AM	0	68	9	33	0	0	0	10	0	66	97	5	0	0	202	205	695		0	0	0	0	
9:00 AM																							
9:15 AM																							
9:30 AM																							

Peak Rolling Hour Flow Rates

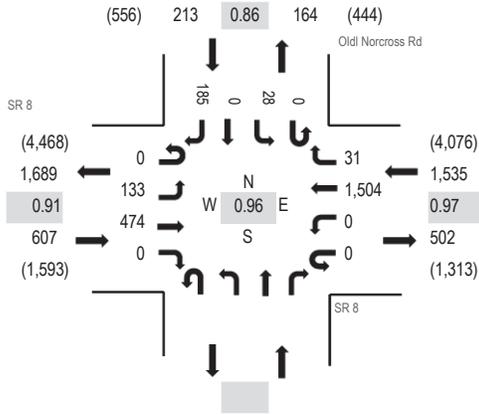
Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	1	1	1	0	0	0	0	0	2	2	0	0	0	8	2	17
Lights	0	179	24	68	0	0	0	19	0	279	387	21	0	1	753	849	2,580
Mediums	0	6	0	3	0	0	0	1	0	11	10	0	0	0	24	19	74
Total	0	186	25	72	0	0	0	20	0	292	399	21	0	1	785	870	2,671



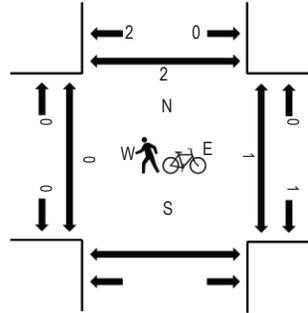
(303) 216-2439
www.alltrafficdata.net

Location: 5 Old Norcross Rd & SR 8 AM
Date and Start Time: Thursday, March 30, 2017
Peak Hour: 07:00 AM - 08:00 AM
Peak 15-Minutes: 07:30 AM - 07:45 AM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	SR 8 Eastbound				SR 8 Westbound				Northbound				Old Norcross Rd Southbound				Total	Rolling Hour	Pedestrian Crossings				
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North	
6:00 AM	0	10	45	0	0	0	0	165	1					0	1	0	21	243	1,627	0	0	0	
6:15 AM	0	15	64	0	0	0	0	269	5					0	1	0	27	381	1,953	0	0	0	
6:30 AM	0	17	69	0	0	0	0	347	7					0	1	0	29	470	2,131	0	0	0	
6:45 AM	0	19	68	0	0	0	0	394	9					0	7	0	36	533	2,275	0	0	0	
7:00 AM	0	23	91	0	0	0	0	392	6					0	8	0	49	569	2,355	0	0	0	
7:15 AM	0	40	97	0	0	0	0	356	11					0	5	0	50	559	2,328	0	0	0	
7:30 AM	0	33	132	0	0	0	0	398	7					0	8	0	36	614	2,331	0	1	0	
7:45 AM	0	37	154	0	0	0	0	358	7					0	7	0	50	613	2,263	0	0	2	
8:00 AM	0	42	109	0	0	0	0	321	11					0	6	0	53	542	2,243	0	0	1	
8:15 AM	0	41	149	0	0	0	0	317	12					0	6	0	37	562		0	0	0	
8:30 AM	0	35	132	0	0	0	0	302	12					0	7	0	58	546		1	0	1	
8:45 AM	0	33	138	0	0	0	0	358	11					0	8	0	45	593		1	0	2	
9:00 AM																							
9:15 AM																							
9:30 AM																							

Peak Rolling Hour Flow Rates

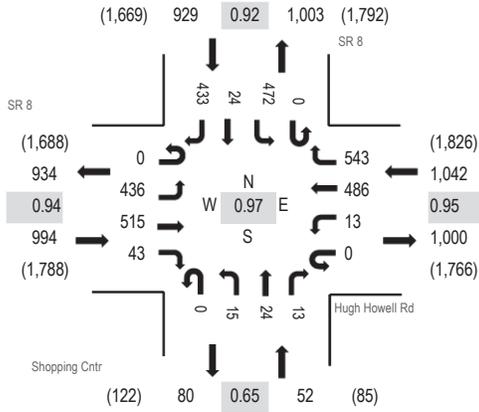
Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	3	0	0	0	13	0					0	0	0	0	16
Lights	0	132	457	0	0	0	1,450	31					0	28	0	182	2,280
Mediums	0	1	14	0	0	0	41	0					0	0	0	3	59
Total	0	133	474	0	0	0	1,504	31					0	28	0	185	2,355



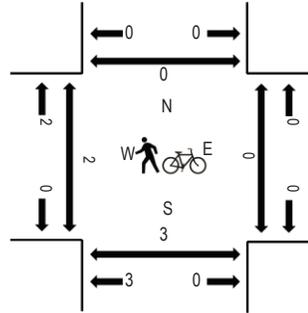
(303) 216-2439
www.alltrafficdata.net

Location: 3 Shopping Cntr & Hugh Howell Rd Noon
Date and Start Time: Thursday, March 30, 2017
Peak Hour: 12:00 PM - 01:00 PM
Peak 15-Minutes: 12:45 PM - 01:00 PM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	SR 8 Eastbound				Hugh Howell Rd Westbound				Shopping Cntr Northbound				SR 8 Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
11:00 AM	0	80	74	3	0	2	88	99	0	1	1	3	0	91	4	97	543	2,351	0	0	0	0
11:15 AM	0	100	105	5	0	2	76	103	0	2	3	1	0	75	2	93	567	2,562	0	1	0	0
11:30 AM	0	89	103	6	0	3	94	108	0	4	8	0	0	85	2	104	606	2,752	0	0	0	0
11:45 AM	0	96	129	4	0	4	108	97	0	4	5	1	0	99	5	83	635	2,873	3	2	0	1
12:00 PM	0	96	131	7	0	3	128	124	0	2	6	4	0	137	5	111	754	3,017	0	0	0	0
12:15 PM	0	125	126	8	0	6	121	124	0	2	1	3	0	116	6	119	757		0	0	0	0
12:30 PM	0	108	113	15	0	2	119	140	0	4	9	1	0	116	8	92	727		0	0	1	0
12:45 PM	0	107	145	13	0	2	118	155	0	7	8	5	0	103	5	111	779		2	0	2	0

Peak Rolling Hour Flow Rates

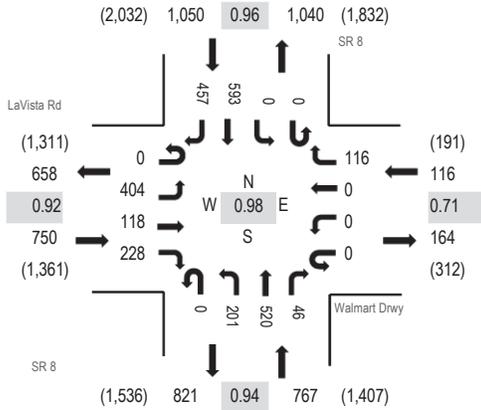
Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	4	7	0	0	0	3	6	0	0	0	0	0	0	0	5	25
Lights	0	424	499	42	0	13	468	529	0	15	24	13	0	467	24	414	2,932
Mediums	0	8	9	1	0	0	15	8	0	0	0	0	0	5	0	14	60
Total	0	436	515	43	0	13	486	543	0	15	24	13	0	472	24	433	3,017



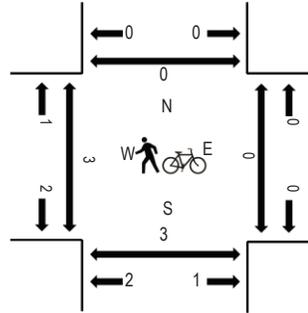
(303) 216-2439
www.alltrafficdata.net

Location: 4 SR 8 & Walmart Drwy Noon
Date and Start Time: Thursday, March 30, 2017
Peak Hour: 12:00 PM - 01:00 PM
Peak 15-Minutes: 12:00 PM - 12:15 PM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	LaVista Rd Eastbound				Walmart Drwy Westbound				SR 8 Northbound				SR 8 Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
11:00 AM	0	76	21	52	0	0	0	15	0	23	83	8	0	1	136	116	531	2,308	2	0	0	0
11:15 AM	0	70	24	46	0	0	0	12	0	51	119	14	0	1	117	106	560	2,459	0	0	0	0
11:30 AM	0	85	36	47	0	0	0	24	0	46	111	10	0	0	121	119	599	2,581	1	0	0	0
11:45 AM	0	70	24	60	0	0	0	24	0	63	103	9	0	0	136	129	618	2,649	0	1	0	0
12:00 PM	0	104	38	62	0	0	0	25	0	43	118	12	0	0	173	107	682	2,683	2	0	1	0
12:15 PM	0	97	24	58	0	0	0	33	0	55	130	11	0	0	156	118	682		0	0	0	0
12:30 PM	0	100	35	52	0	0	0	17	0	49	142	14	0	0	138	120	667		0	0	2	0
12:45 PM	0	103	21	56	0	0	0	41	0	54	130	9	0	0	126	112	652		1	0	0	0

Peak Rolling Hour Flow Rates

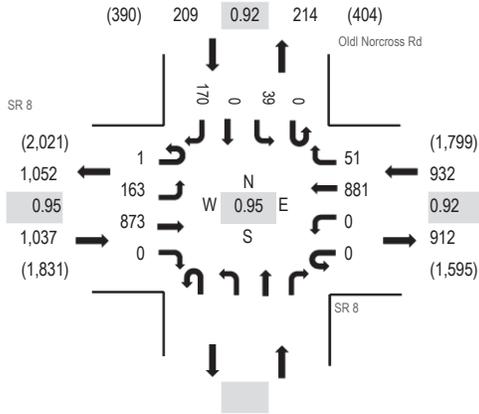
Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	2	0	1	0	0	0	0	0	2	8	0	0	0	6	5	24
Lights	0	382	116	222	0	0	0	116	0	196	500	46	0	0	572	439	2,589
Mediums	0	20	2	5	0	0	0	0	0	3	12	0	0	0	15	13	70
Total	0	404	118	228	0	0	0	116	0	201	520	46	0	0	593	457	2,683



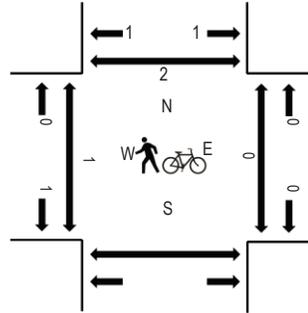
(303) 216-2439
www.alltrafficdata.net

Location: 5 Old Norcross Rd & SR 8 Noon
Date and Start Time: Thursday, March 30, 2017
Peak Hour: 12:00 PM - 01:00 PM
Peak 15-Minutes: 12:15 PM - 12:30 PM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	SR 8 Eastbound				SR 8 Westbound				Northbound				Old Norcross Rd Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
	11:00 AM	0	38	144	0	0	0	205	8					0	7	0			34	436	1,842	0
11:15 AM	0	36	159	0	0	0	195	12					0	11	0	31	444	1,936	0	0	0	
11:30 AM	2	34	183	0	0	0	212	11					0	9	0	36	487	2,066	0	0	0	
11:45 AM	0	44	154	0	0	0	217	7					0	16	0	37	475	2,115	1	0	0	
12:00 PM	1	44	198	0	0	0	231	10					0	5	0	41	530	2,178	0	0	0	
12:15 PM	0	38	222	0	0	0	239	18					0	13	0	44	574		1	0	0	
12:30 PM	0	34	227	0	0	0	212	12					0	7	0	44	536		0	0	1	
12:45 PM	0	47	226	0	0	0	199	11					0	14	0	41	538		0	0	1	

Peak Rolling Hour Flow Rates

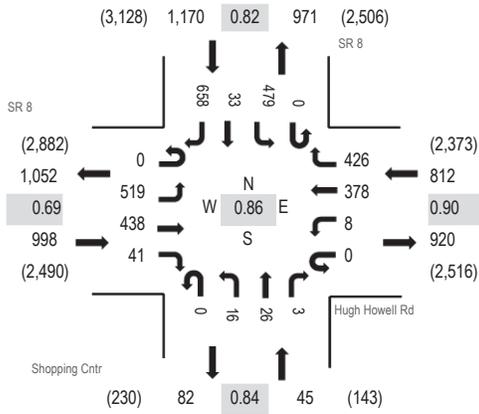
Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	1	9	0	0	0	12	0					0	0	0	0	22
Lights	1	159	834	0	0	0	838	49					0	38	0	166	2,085
Mediums	0	3	30	0	0	0	31	2					0	1	0	4	71
Total	1	163	873	0	0	0	881	51					0	39	0	170	2,178



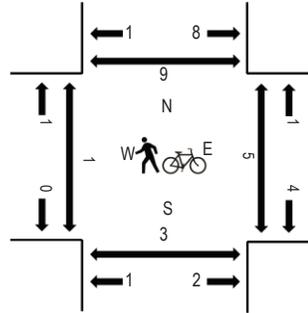
(303) 216-2439
www.alltrafficdata.net

Location: 3 Shopping Cntr & Hugh Howell Rd PM
Date and Start Time: Thursday, March 30, 2017
Peak Hour: 04:00 PM - 05:00 PM
Peak 15-Minutes: 04:00 PM - 04:15 PM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	SR 8 Eastbound				Hugh Howell Rd Westbound				Shopping Cntr Northbound				SR 8 Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	175	183	6	0	5	78	92	0	2	4	1	0	184	6	146	882	3,025	0	1	0	0
4:15 PM	0	105	54	14	0	1	120	109	0	4	7	1	0	148	12	195	770	2,691	0	1	1	2
4:30 PM	0	144	129	11	0	0	105	112	0	6	8	0	0	62	7	160	744	2,524	0	0	2	4
4:45 PM	0	95	72	10	0	2	75	113	0	4	7	1	0	85	8	157	629	2,330	0	3	0	3
5:00 PM	0	63	46	5	0	0	109	97	0	2	6	1	0	68	10	141	548	2,397	2	0	2	1
5:15 PM	0	74	99	8	0	2	108	124	0	0	7	1	0	48	10	122	603	2,493	2	0	3	0
5:30 PM	0	67	55	5	0	3	85	113	0	7	12	0	0	96	14	93	550	2,566	1	1	1	0
5:45 PM	0	76	111	10	0	2	95	99	0	3	8	3	0	120	10	159	696	2,712	0	1	1	2
6:00 PM	0	92	109	4	0	2	92	105	0	2	11	0	0	77	11	139	644	2,712	2	3	2	2
6:15 PM	0	82	78	1	0	1	83	85	0	5	13	0	0	150	16	162	676		0	2	2	1
6:30 PM	0	95	158	10	0	0	70	92	0	4	4	0	0	107	9	147	696		0	3	1	3
6:45 PM	0	101	132	11	0	2	89	103	0	2	6	1	0	136	2	111	696		0	1	2	0

Peak Rolling Hour Flow Rates

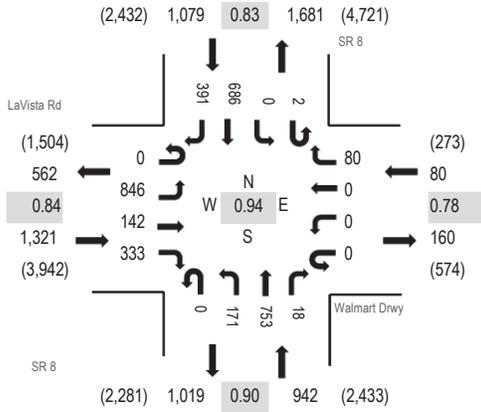
Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	1	7	0	0	0	4	4	0	0	0	0	0	1	0	4	21
Lights	0	505	426	40	0	8	358	409	0	16	26	3	0	470	32	642	2,935
Mediums	0	13	5	1	0	0	16	13	0	0	0	0	0	8	1	12	69
Total	0	519	438	41	0	8	378	426	0	16	26	3	0	479	33	658	3,025



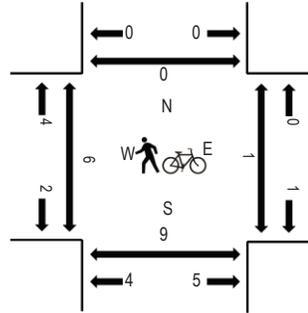
(303) 216-2439
www.alltrafficdata.net

Location: 4 SR 8 & Walmart Drwy PM
Date and Start Time: Thursday, March 30, 2017
Peak Hour: 04:00 PM - 05:00 PM
Peak 15-Minutes: 04:15 PM - 04:30 PM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	LaVista Rd Eastbound				Walmart Drwy Westbound				SR 8 Northbound				SR 8 Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	166	32	105	0	0	0	20	0	42	191	2	0	0	207	92	857	3,422	5	1	2	0
4:15 PM	0	206	38	90	0	0	0	24	0	45	172	6	0	0	202	124	907	3,383	0	0	1	0
4:30 PM	0	188	29	76	0	0	0	19	0	42	218	3	2	0	158	93	828	3,124	1	0	1	0
4:45 PM	0	286	43	62	0	0	0	17	0	42	172	7	0	0	119	82	830	2,889	0	0	5	0
5:00 PM	0	309	44	82	0	0	0	31	0	35	147	6	0	3	84	77	818	2,748	1	0	1	0
5:15 PM	0	187	39	53	0	0	0	24	0	42	153	7	0	2	78	63	648	2,611	3	0	0	2
5:30 PM	0	231	54	36	0	0	1	33	0	42	117	10	1	1	32	35	593	2,716	1	0	0	0
5:45 PM	0	154	36	82	0	0	0	12	0	45	138	5	0	0	115	102	689	2,874	1	2	1	0
6:00 PM	0	178	44	59	0	0	0	11	0	32	152	9	0	0	105	91	681	2,910	1	0	1	0
6:15 PM	0	224	47	91	0	0	0	25	0	34	124	7	0	0	102	99	753		0	0	0	0
6:30 PM	0	206	27	80	0	0	0	27	1	40	138	5	0	0	133	94	751		0	0	0	0
6:45 PM	0	236	57	65	0	0	0	29	0	40	152	10	1	1	64	70	725		1	0	0	0

Peak Rolling Hour Flow Rates

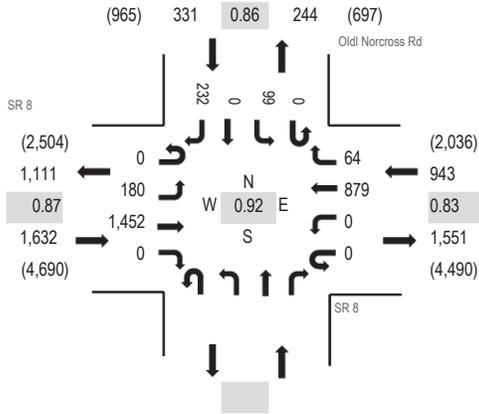
Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	4	0	0	0	0	0	0	0	1	6	0	0	0	5	2	18
Lights	0	827	141	327	0	0	0	79	0	165	736	18	2	0	664	383	3,342
Mediums	0	15	1	6	0	0	0	1	0	5	11	0	0	0	17	6	62
Total	0	846	142	333	0	0	0	80	0	171	753	18	2	0	686	391	3,422



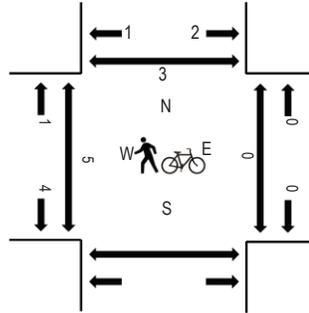
(303) 216-2439
www.alltrafficdata.net

Location: 5 Old Norcross Rd & SR 8 PM
Date and Start Time: Thursday, March 30, 2017
Peak Hour: 04:00 PM - 05:00 PM
Peak 15-Minutes: 04:15 PM - 04:30 PM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

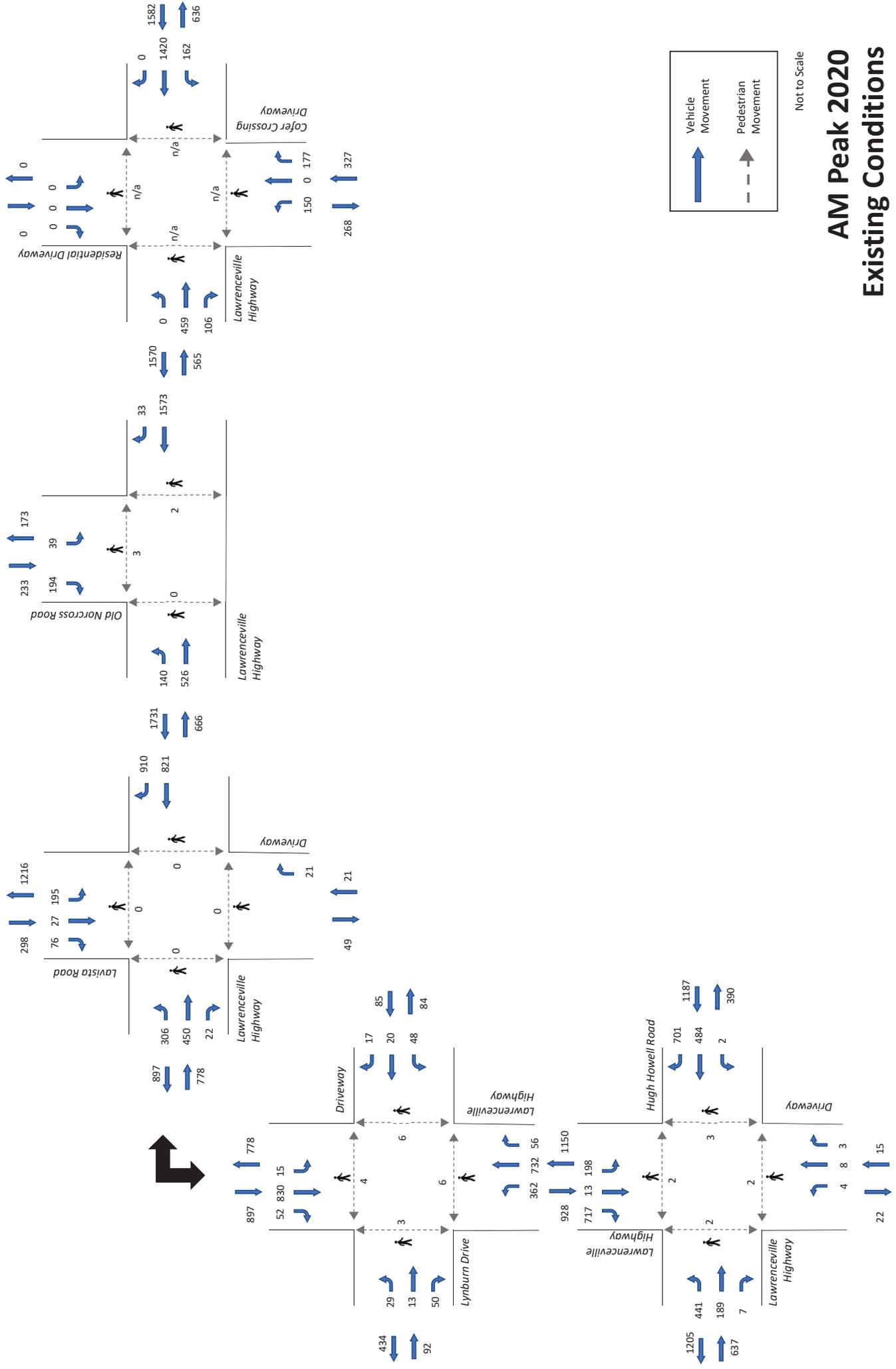
Interval Start Time	SR 8 Eastbound				SR 8 Westbound				Northbound			Old Norcross Rd Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru			Right	West	East	South
4:00 PM	0	49	321	0	0	0	262	22				0	16	0	51	721	2,906	0	0	0	0
4:15 PM	0	43	372	0	0	0	254	14				0	30	0	79	792	2,872	3	0	1	1
4:30 PM	0	46	349	0	0	0	195	14				0	26	0	51	681	2,613	0	0	2	2
4:45 PM	0	42	410	0	0	0	168	14				0	27	0	51	712	2,456	2	0	0	0
5:00 PM	0	45	462	0	0	0	96	11				0	16	0	57	687	2,308	0	0	2	2
5:15 PM	0	42	305	0	0	0	104	10				0	22	0	50	533	2,209	0	0	0	0
5:30 PM	0	56	351	0	0	0	53	3				0	35	0	26	524	2,329	0	0	1	1
5:45 PM	0	38	259	0	0	0	160	21				0	28	0	58	564	2,447	0	0	1	1
6:00 PM	0	40	290	0	0	0	155	18				0	40	0	45	588	2,477	0	0	0	0
6:15 PM	0	48	345	0	0	0	141	15				0	33	0	71	653		0	0	1	1
6:30 PM	0	36	331	0	0	0	177	14				0	35	0	49	642		0	0	1	1
6:45 PM	0	44	366	0	0	0	103	12				0	21	0	48	594		0	0	1	1

Peak Rolling Hour Flow Rates

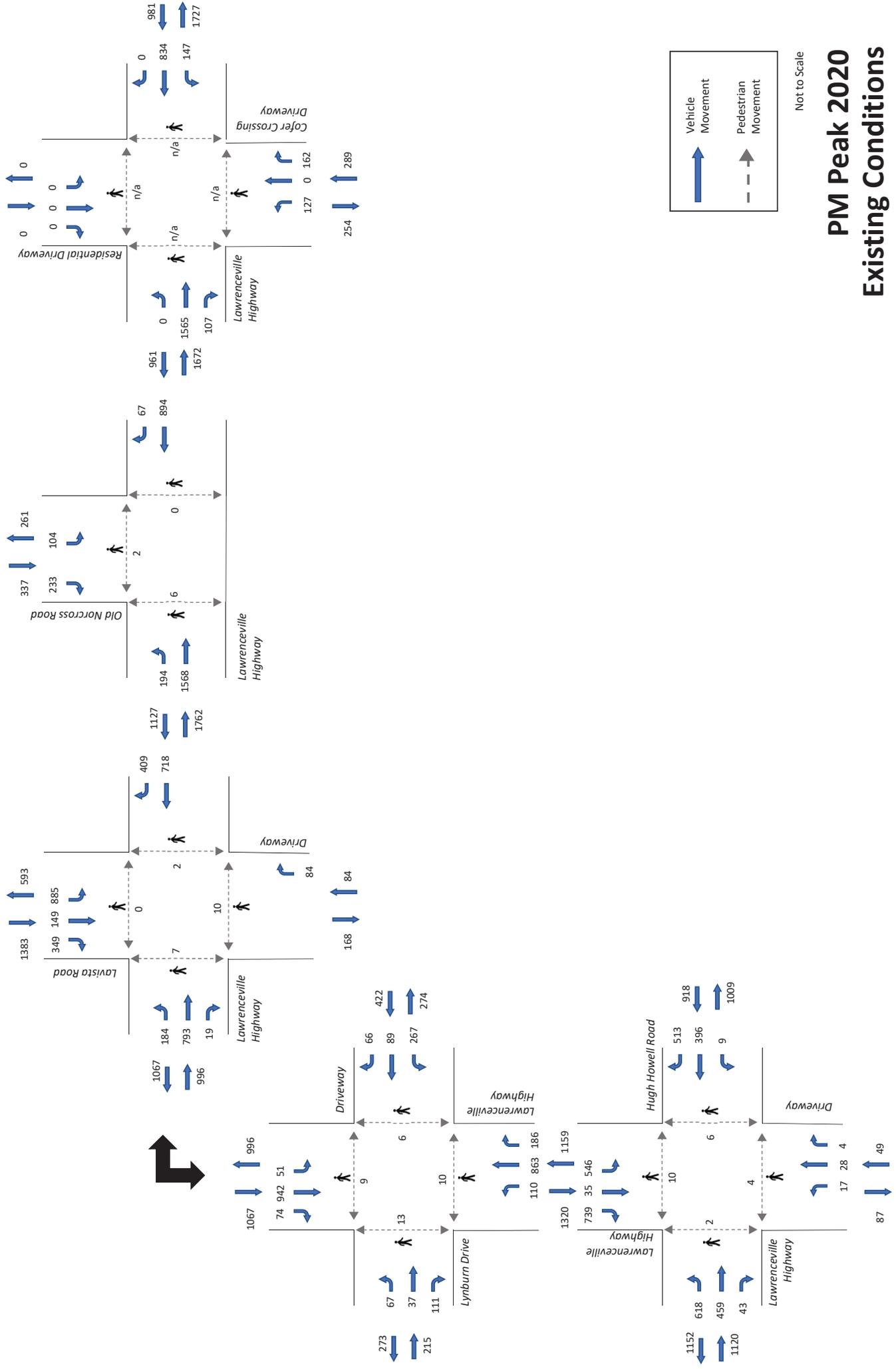
Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	10	0	0	0	7	0					0	0	0	0	17
Lights	0	179	1,410	0	0	0	849	63					0	97	0	230	2,828
Mediums	0	1	32	0	0	0	23	1					0	2	0	2	61
Total	0	180	1,452	0	0	0	879	64					0	99	0	232	2,906

Appendix C

Traffic Volume Diagrams

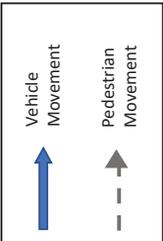
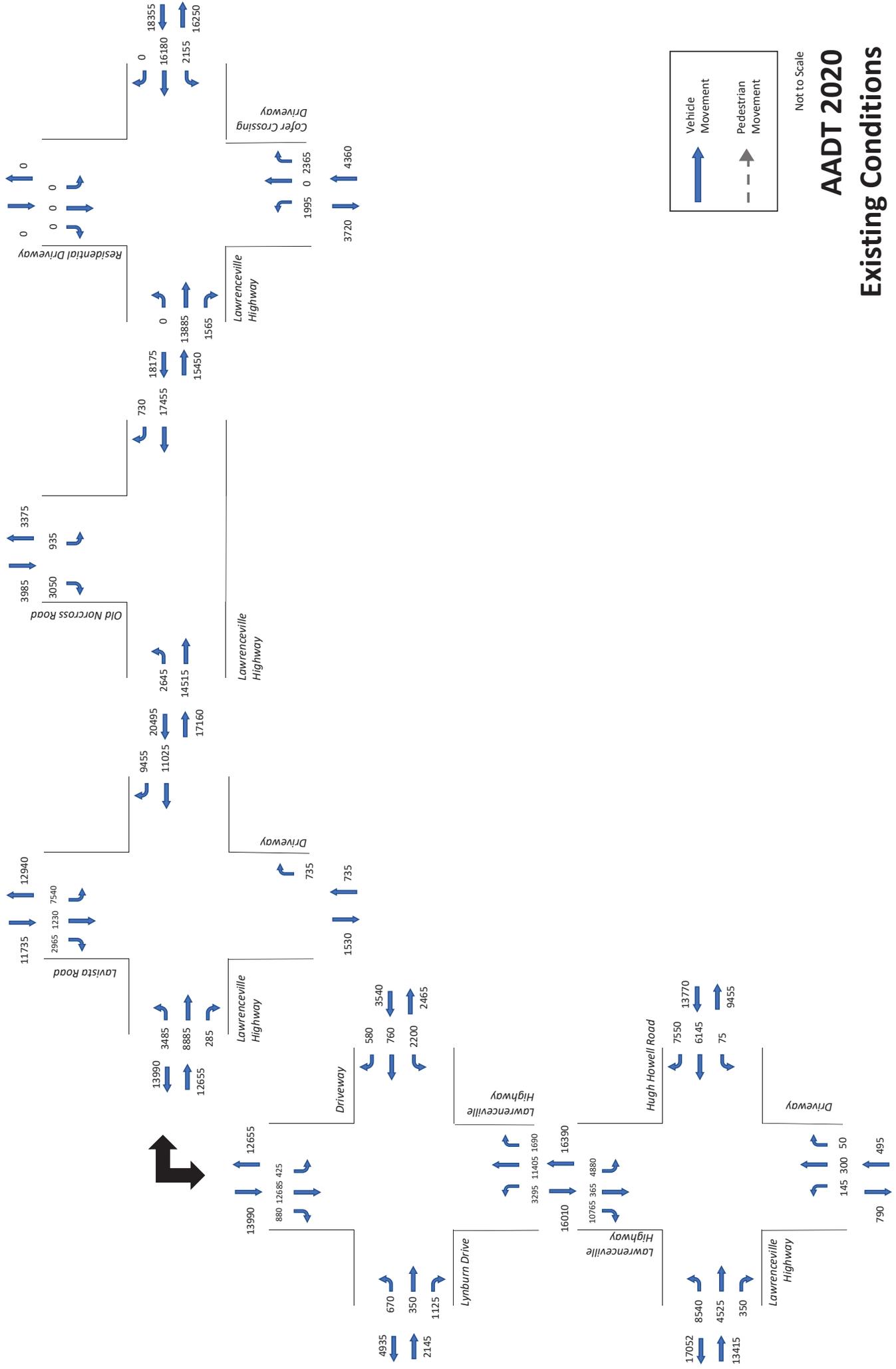


AM Peak 2020 Existing Conditions



Not to Scale

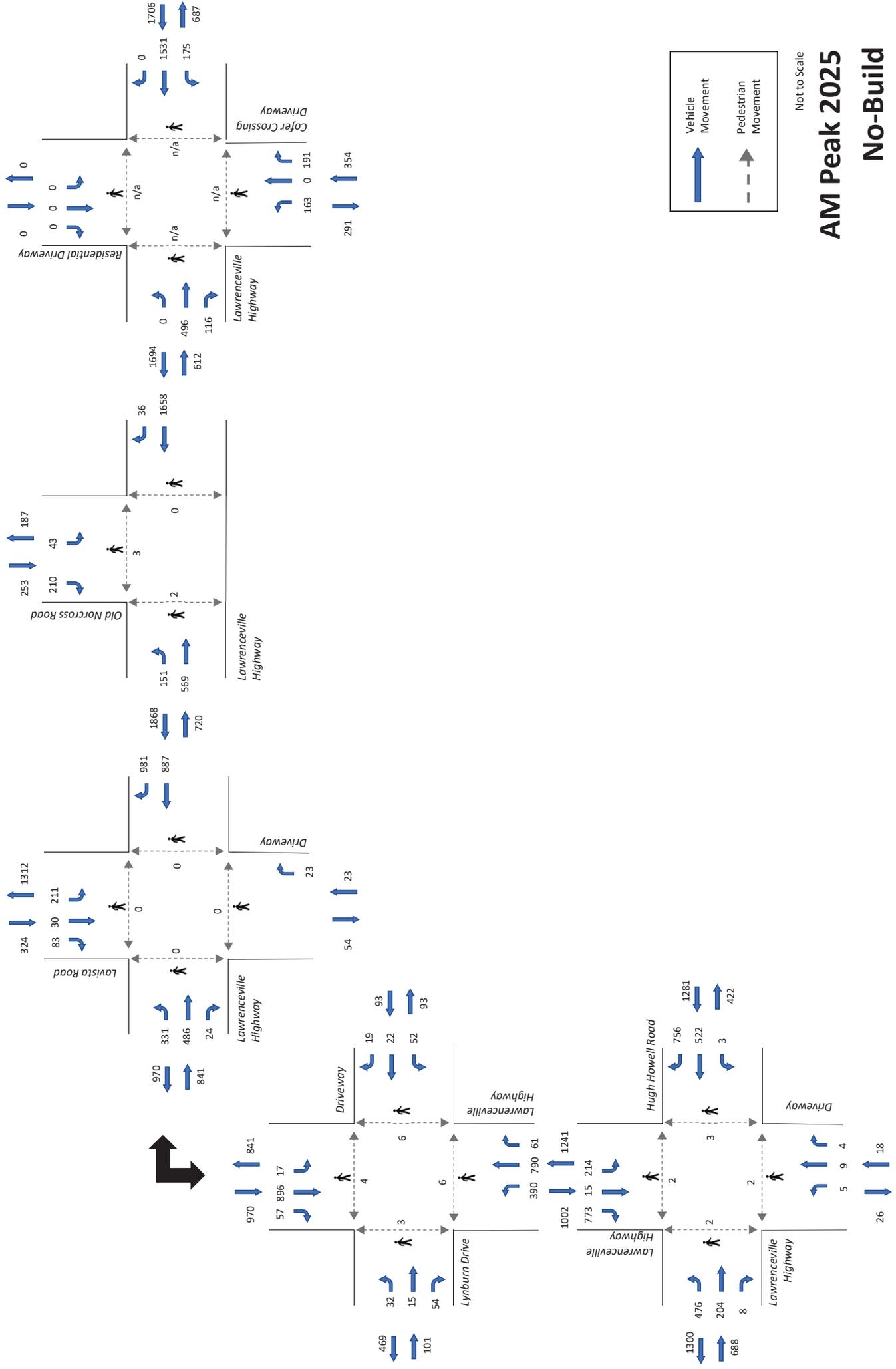
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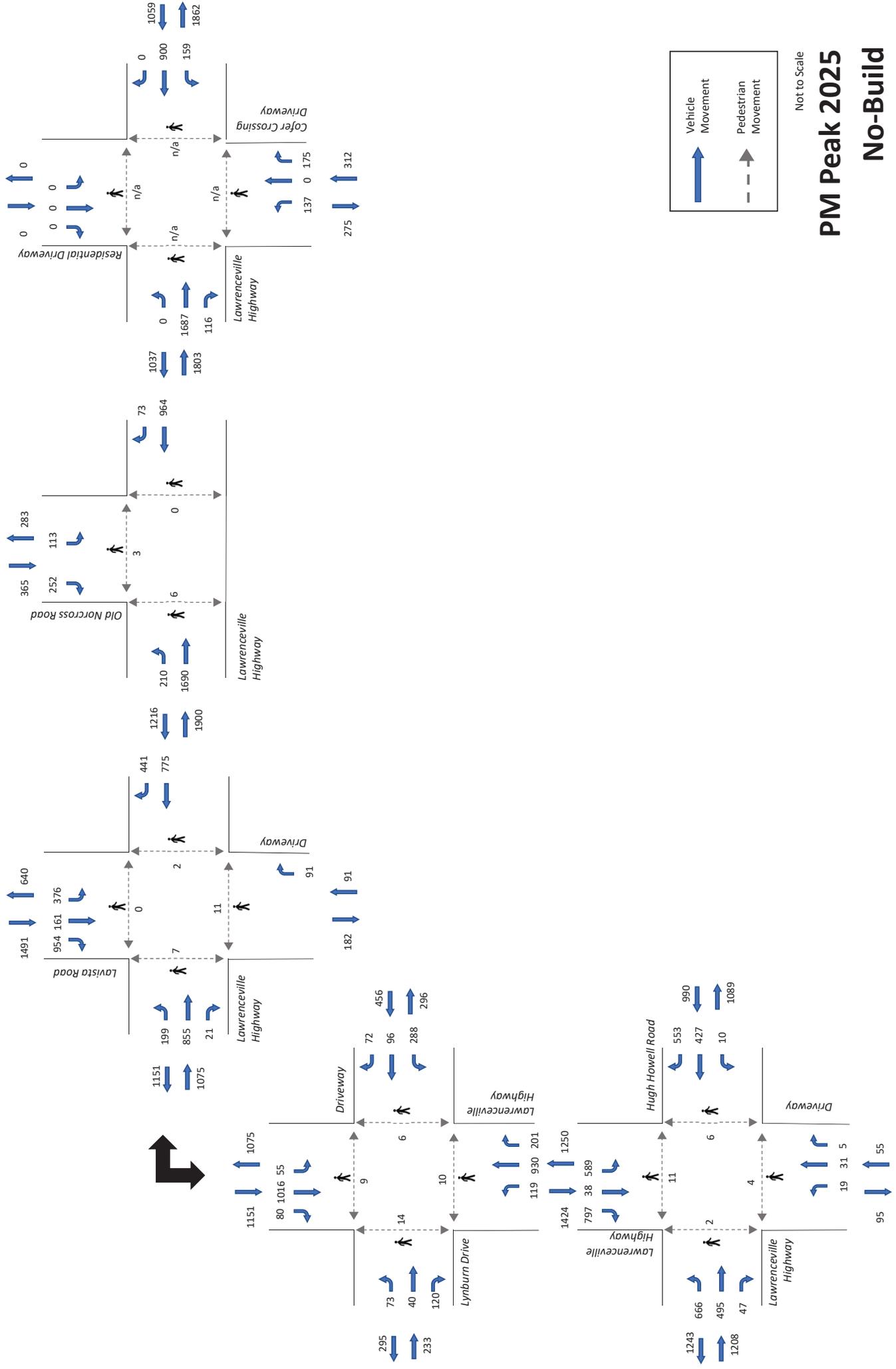


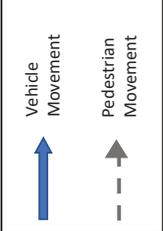
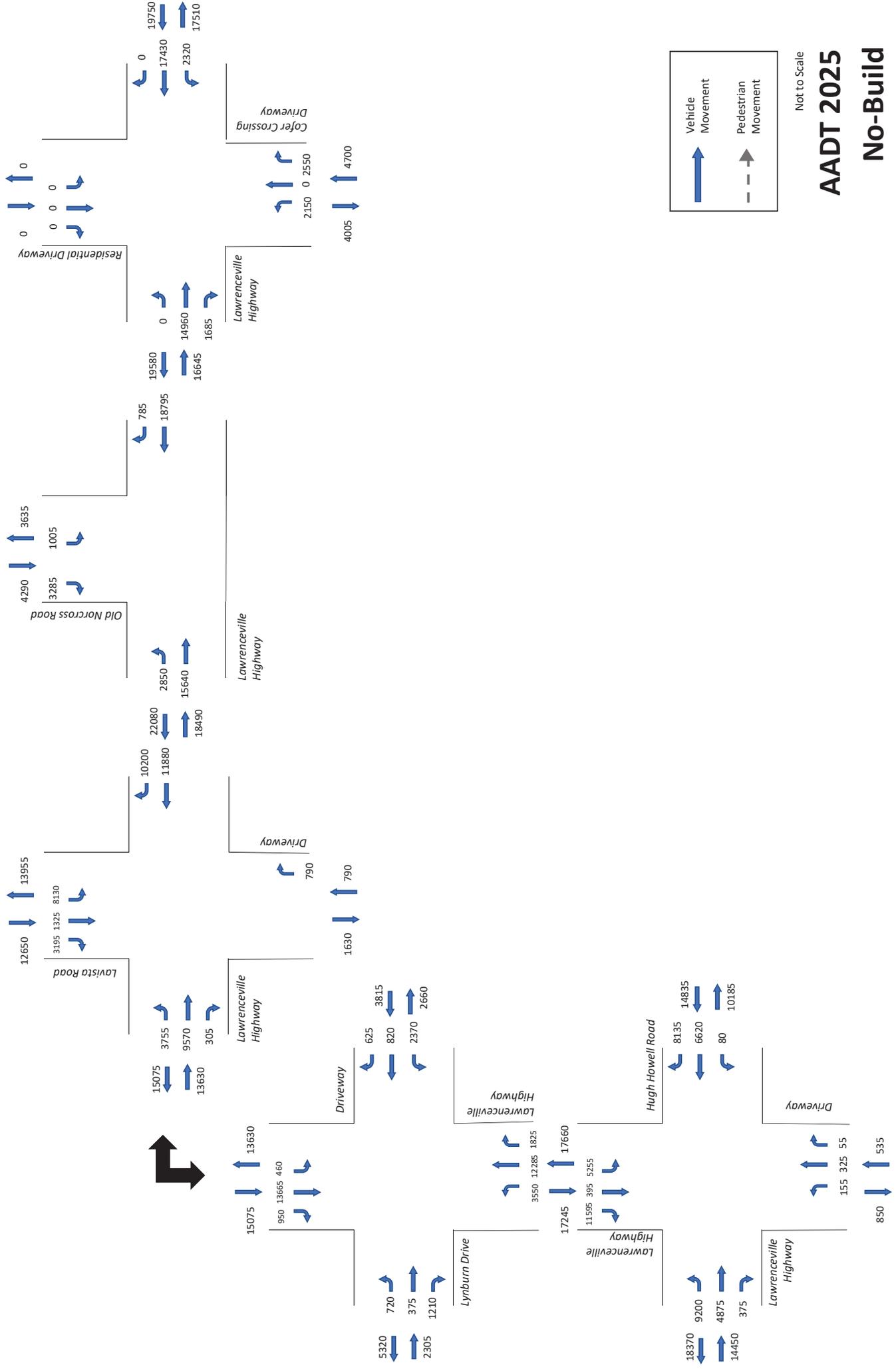
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AADT 2020

Existing Conditions



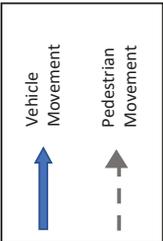
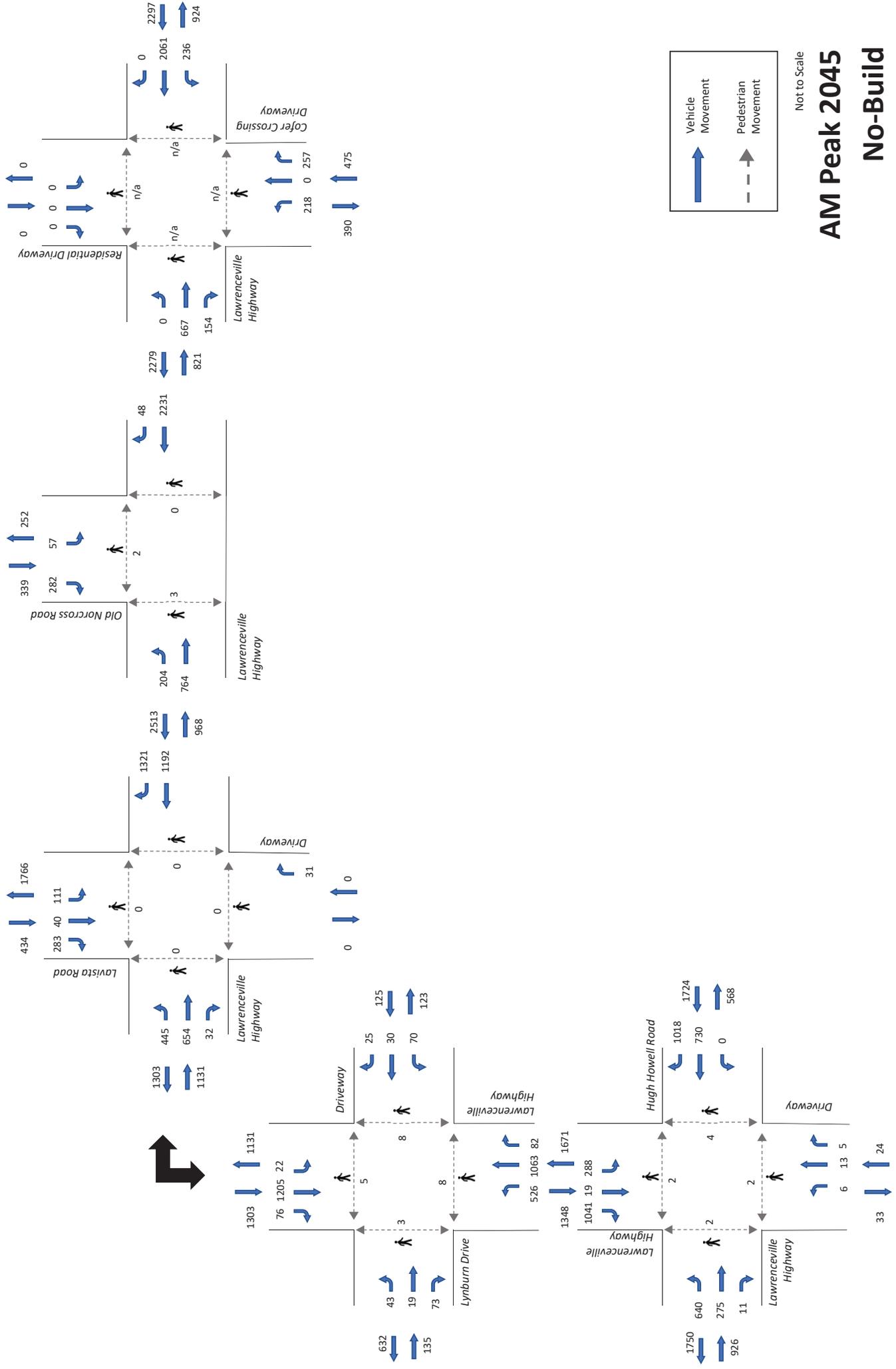




Not to Scale

AADT 2025

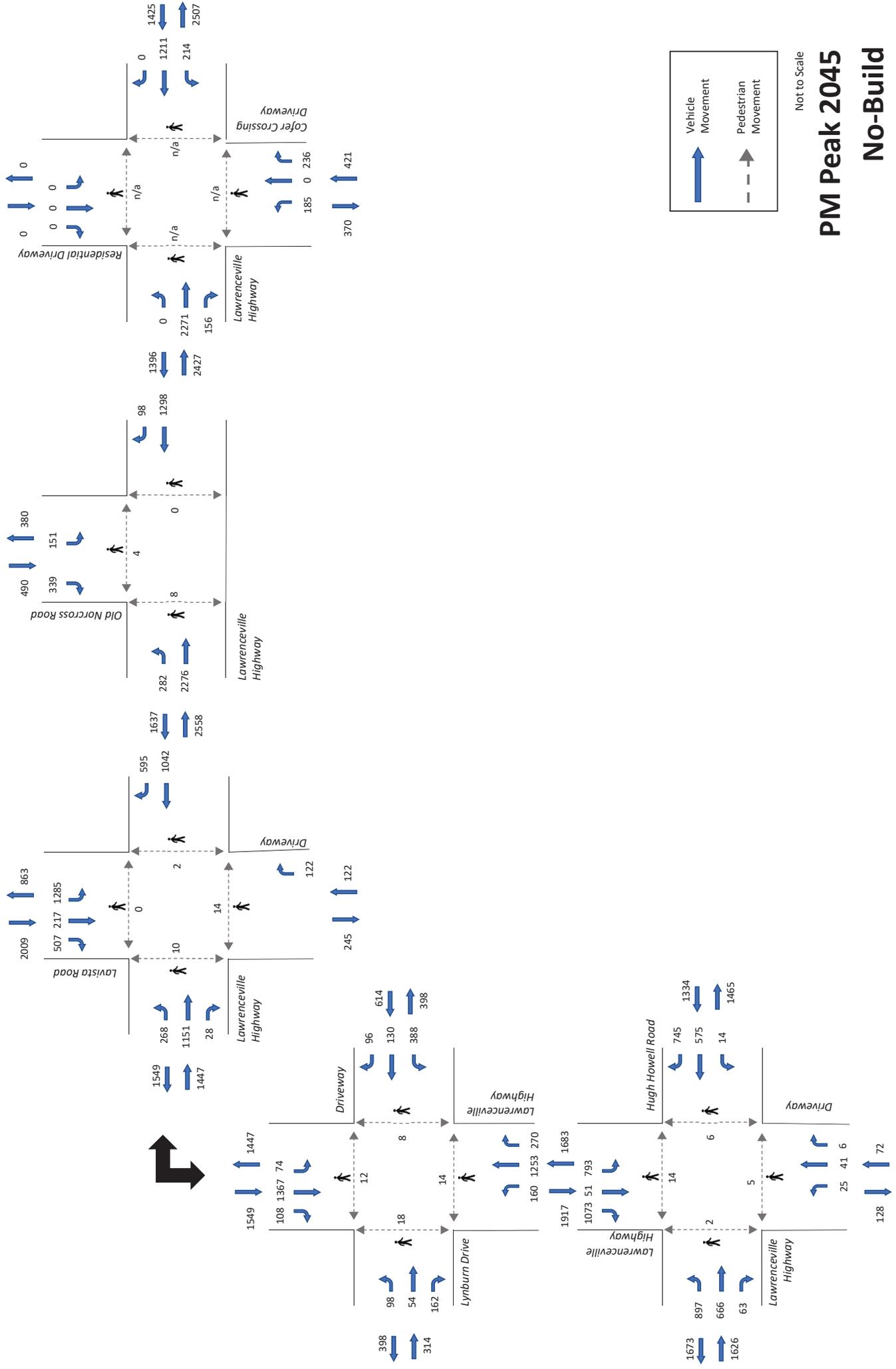
No-Build

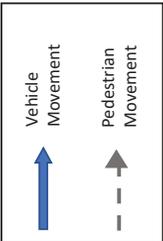
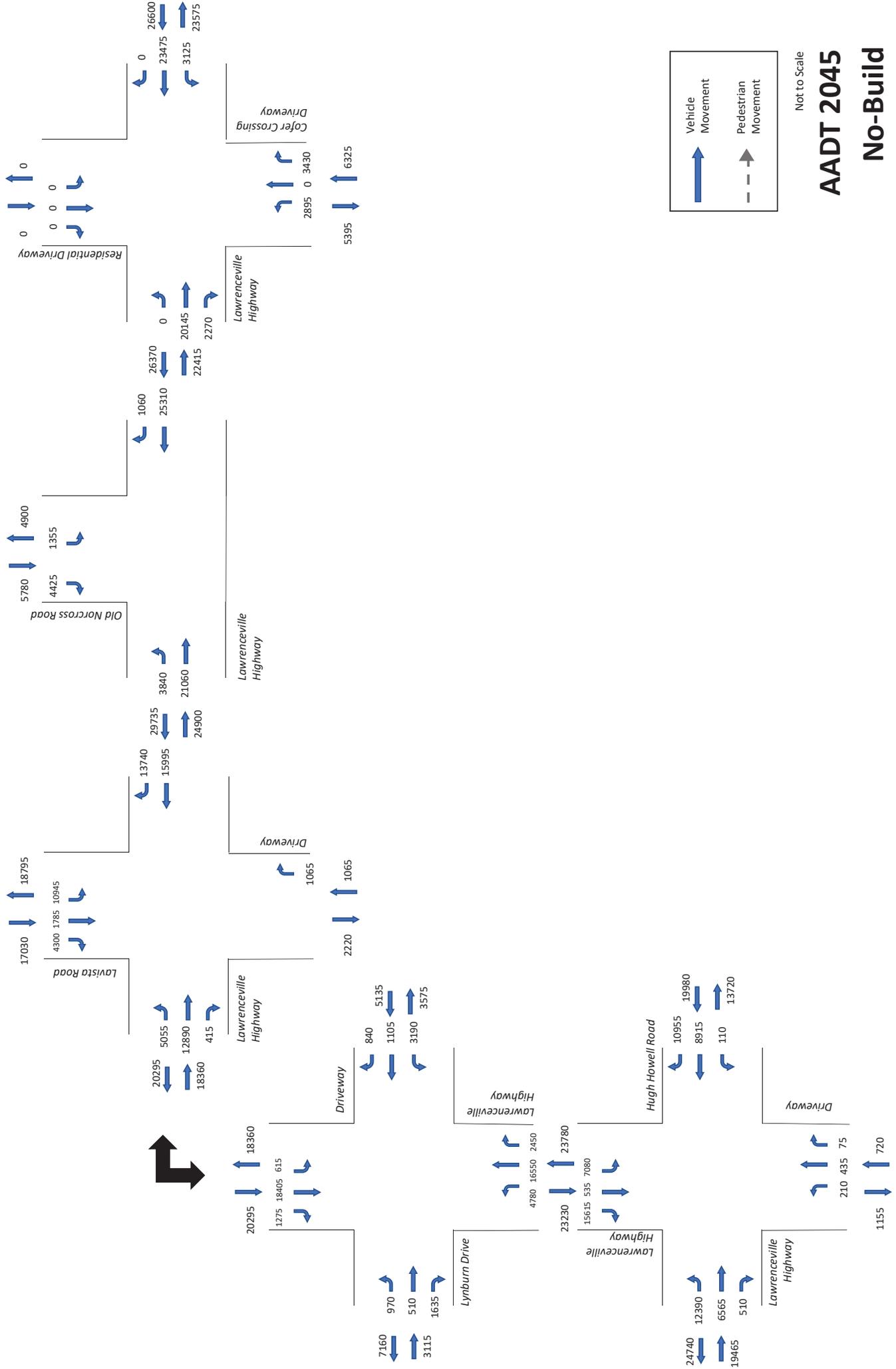


Not to Scale

AM Peak 2045

No-Build





Not to Scale

AADT 2045

No-Build

Appendix D

Historical Crash Data

Raw Crash Data

AccidentNo	Confidant Location	LRSRM	Agency Name	Date	Time	County	RouteType	Route	Intersect	RmpactCo	DistanceF	Direction	CrashSev	Injuries	Fatals	MinorOr	LocationOf	Light	Surface	DriverAge2
7342171	Coffer Crossing Int.	891003600	DeKalb Co Police Department	9/3/2019	7:00:00 AM	DEKALB	STATE ROUTE 451	LAWRENCEVILLE HWY	0	0	0	0	0	0	0	0	Private Property	Daylight	Dry	41
7348293	Lynburn Int.	891023600	DeKalb Co Police Department	9/4/2019	7:25:00 PM	DEKALB	STATE ROUTE 457	LAWRENCEVILLE HWY	0	0	0	0	0	0	0	0	On Roadway - Backward Intersection	Daylight	Dry	63
7368965	Lynburn Int.	891023600	DeKalb Co Police Department	9/5/2019	1:15:00 AM	DEKALB	STATE ROUTE 457	LAWRENCEVILLE HWY	0	0	0	0	0	0	0	0	Private Property	Dusk	Dry	41
7368882	Lavista Int.	891000800	DeKalb Co Police Department	9/20/2019	3:15:00 AM	DEKALB	STATE ROUTE 457	LAWRENCEVILLE HWY	0	0	0	0	0	0	0	0	On Roadway - Non-Intersection	Daylight	Dry	26
7374201	Lavista Int.	891023600	DeKalb Co Police Department	10/7/2019	11:20:00 AM	DEKALB	STATE ROUTE 457	LAWRENCEVILLE HWY	0	0	0	0	0	0	0	0	On Roadway - Backward Intersection	Daylight	Dry	58
7378853	Lavista Int.	891023600	DeKalb Co Police Department	10/9/2019	11:20:00 AM	DEKALB	STATE ROUTE 457	LAWRENCEVILLE HWY	0	0	0	0	0	0	0	0	On Roadway - Non-Intersection	Daylight	Dry	0
7381341	Lavista Int.	891023600	DeKalb Co Police Department	10/6/2019	7:00:00 PM	DEKALB	STATE ROUTE 457	LAWRENCEVILLE HWY	0	0	0	0	0	0	0	0	Private Property	Dark Lighted	Dry	41
7384893	Corridor	891023600	DeKalb Co Police Department	9/29/2019	1:35:00 PM	DEKALB	STATE ROUTE 450	LAWRENCEVILLE HWY	0	0	0	0	0	0	0	0	On Roadway - Non-Intersection	Daylight	Dry	1
7386933	Corridor	891023600	DeKalb Co Police Department	10/11/2019	6:45:00 PM	DEKALB	STATE ROUTE 457	LAWRENCEVILLE HWY	0	0	0	0	0	0	0	0	On Roadway - Non-Intersection	Daylight	Dry	20
7388542	Lynburn Int.	891023600	DeKalb Co Police Department	10/12/2019	7:55:00 PM	DEKALB	COUNTY ROAD 457	LAWRENCEVILLE HWY	0	0	0	0	0	0	0	0	On Roadway - Non-Intersection	Daylight	Dry	58
7388993	Corridor	891023600	DeKalb Co Police Department	10/12/2019	7:55:00 PM	DEKALB	COUNTY ROAD 457	LAWRENCEVILLE HWY	0	0	0	0	0	0	0	0	On Roadway - Backward Intersection	Daylight	Dry	0
7388994	Corridor	891023600	DeKalb Co Police Department	10/19/2019	3:00:00 PM	DEKALB	STATE ROUTE 457	LAWRENCEVILLE HWY	0	0	0	0	0	0	0	0	On Roadway - Non-Intersection	Daylight	Wet	19
7410714	Old Norcross Int.	891023600	DeKalb Co Police Department	11/1/2019	8:14:00 PM	DEKALB	COUNTY ROAD 457	OLD NORCROSS RD	0	0	0	0	0	0	0	0	On Roadway - Backward Intersection	Dark Lighted	Dry	72
7418237	Lavista Int.	891023600	DeKalb Co Police Department	11/3/2019	3:55:00 PM	DEKALB	STATE ROUTE 457	LAWRENCEVILLE HWY	0	0	0	0	0	0	0	0	On Roadway - Non-Intersection	Daylight	Dry	24
7420331	Corridor	891000800	DeKalb Co Police Department	11/11/2019	10:08:00 AM	DEKALB	STATE ROUTE 457	LAWRENCEVILLE HWY	0	0	0	0	0	0	0	0	On Roadway - Non-Intersection	Daylight	Dry	81
7429553	Corridor	891023600	DeKalb Co Police Department	11/11/2019	6:00:00 PM	DEKALB	STATE ROUTE 457	LAWRENCEVILLE HWY	0	0	0	0	0	0	0	0	On Roadway - Backward Intersection	Daylight	Dry	89
7429555	Old Norcross Int.	891023600	DeKalb Co Police Department	11/9/2019	12:24:00 PM	DEKALB	COUNTY ROAD 457	OLD NORCROSS RD	0	0	0	0	0	0	0	0	On Roadway - Backward Intersection	Daylight	Dry	59
7428165	Lavista Int.	891023600	DeKalb Co Police Department	11/10/2019	3:45:00 PM	DEKALB	STATE ROUTE 457	LAWRENCEVILLE HWY	0	0	0	0	0	0	0	0	On Roadway - Non-Intersection	Daylight	Dry	42
7447121	Lynburn Int.	891023600	DeKalb Co Police Department	11/11/2019	1:56:00 PM	DEKALB	STATE ROUTE 457	LAWRENCEVILLE HWY	0	0	0	0	0	0	0	0	On Roadway - Non-Intersection	Daylight	Dry	32
7447128	Lynburn Int.	891023600	DeKalb Co Police Department	11/19/2019	2:45:00 PM	DEKALB	COUNTY ROAD 457	LAWRENCEVILLE HWY	0	0	0	0	0	0	0	0	On Roadway - Non-Intersection	Daylight	Dry	21
7467108	Lavista Int.	891023600	DeKalb Co Police Department	12/8/2019	1:48:00 PM	DEKALB	STATE ROUTE 457	LAWRENCEVILLE HWY	0	0	0	0	0	0	0	0	On Roadway - Backward Intersection	Daylight	Dry	44
7478971	Lavista Int.	891023600	DeKalb Co Police Department	12/15/2019	2:18:00 PM	DEKALB	STATE ROUTE 457	LAWRENCEVILLE HWY	0	0	0	0	0	0	0	0	Private Property	Daylight	Dry	50
7485688	Corridor	891000800	DeKalb Co Police Department	12/17/2019	3:00:00 PM	DEKALB	STATE ROUTE 457	LAWRENCEVILLE HWY	0	0	0	0	0	0	0	0	On Roadway - Non-Intersection	Daylight	Dry	0
7485258	Lynburn Int.	891023600	DeKalb Co Police Department	12/17/2019	4:10:00 PM	DEKALB	STATE ROUTE 457	LAWRENCEVILLE HWY	0	0	0	0	0	0	0	0	On Roadway - Non-Intersection	Dark Lighted	Dry	44
7485752	Lynburn Int.	891023600	DeKalb Co Police Department	12/18/2019	1:00:00 PM	DEKALB	STATE ROUTE 457	LAWRENCEVILLE HWY	0	0	0	0	0	0	0	0	Private Property	Daylight	Dry	108
7485757	Light Tower Int.	891023600	DeKalb Co Police Department	12/18/2019	12:00:00 PM	DEKALB	STATE ROUTE 457	LAWRENCEVILLE HWY	0	0	0	0	0	0	0	0	On Roadway - Non-Intersection	Daylight	Dry	30
7485772	Light Tower Int.	891000800	DeKalb Co Police Department	12/23/2019	12:20:00 PM	DEKALB	STATE ROUTE 457	LAWRENCEVILLE HWY	0	0	0	0	0	0	0	0	On Roadway - Backward Intersection	Dark Lighted	Dry	58
7495157	Lynburn Int.	891023600	DeKalb Co Police Department	12/24/2019	5:33:00 PM	DEKALB	STATE ROUTE 457	LAWRENCEVILLE HWY	0	0	0	0	0	0	0	0	On Roadway - Backward Intersection	Dark Lighted	Dry	27

AccidentNo	DriverSide	Drivers_1	Driver2	DirWay1	DirWay2	UFIEnbr	UFIEnbr	NumberOnC	LDName1	LongDistm	PrivateProp	Sev Injury	WtbhInj	Complmt	UFIExtr
542688	Lap and Shoulder Belt Used	N/A	West	North	West	Motor Vehicle in Motion	Motor Vehicle in Motion	1	3357929	84-207711 N	0	0	0	0	2 Following too Close
543686	Lap and Shoulder Belt Used	N/A	West	North	West	Motor Vehicle in Motion	Motor Vehicle in Motion	1	3354677	84-209273 N	0	0	0	0	1 Failed to Yield
543836	Lap and Shoulder Belt Used	N/A	West	North	West	Motor Vehicle in Motion	Motor Vehicle in Motion	1	3385496	84-209172 N	0	0	0	0	0 Dringrad Stop Sign/Signal
544641	Lap and Shoulder Belt Used	N/A	East	West	East	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385614	84-20979 N	0	0	0	0	1 Following too Close
547277	Lap and Shoulder Belt Used	N/A	West	East	West	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385613	84-208796 N	0	0	0	0	0 Misjudged Clearance
548022	Lap and Shoulder Belt Used	N/A	North	North	North	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385643	84-209262 Y	0	0	0	0	0 Following too Close
548161	Lap and Shoulder Belt Used	N/A	West	North	West	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3387002	84-207711 N	0	0	0	0	0 Failed to Yield
549277	Lap and Shoulder Belt Used	N/A	South	South	South	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385466	84-209298 N	0	0	0	0	0 Following too Close
549414	Lap and Shoulder Belt Used	N/A	East	West	East	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385466	84-209298 N	0	0	0	0	0 Following too Close
549554	Lap and Shoulder Belt Used	N/A	South	South	South	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385466	84-209298 N	0	0	0	0	0 Following too Close
549555	Lap and Shoulder Belt Used	N/A	South	South	South	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385466	84-209298 N	0	0	0	0	0 Following too Close
551776	Unknown	N/A	None	None	None	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385453	84-209418 N	0	0	0	0	2 Dringrad Stop Sign/Signal
552029	Lap and Shoulder Belt Used	N/A	South	South	South	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385462	84-209261 N	0	0	0	0	1 Improper Turn
552048	Lap and Shoulder Belt Used	N/A	South	South	South	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385469	84-209297 Y	0	0	0	0	1 Following too Close
552988	Lap and Shoulder Belt Used	N/A	South	South	South	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385689	84-207691 N	0	0	0	0	0 Changed lanes Improperly
552999	Lap and Shoulder Belt Used	N/A	South	South	South	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385710	84-207903 N	0	0	0	0	0 Following too Close
560005	Unknown	N/A	None	None	None	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385679	84-207988 N	0	0	0	0	0 Changed lanes Improperly
560026	Lap and Shoulder Belt Used	N/A	South	South	South	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385692	84-208788 N	0	0	0	0	0 Improper Turn
560292	Lap and Shoulder Belt Used	N/A	West	North	West	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385643	84-209262 Y	0	0	0	0	0 Improper Turn
561045	Lap and Shoulder Belt Used	N/A	West	North	West	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385613	84-208748 N	0	0	0	0	0 Following too Close
564909	Lap and Shoulder Belt Used	N/A	South	South	South	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385688	84-208744 N	0	0	0	0	0 Following too Close
564966	Lap and Shoulder Belt Used	N/A	South	South	South	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385688	84-208744 N	0	0	0	0	0 No Contributing Factors
567166	Lap and Shoulder Belt Used	N/A	South	South	South	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385679	84-208744 N	0	0	0	0	0 No Contributing Factors
568818	Lap and Shoulder Belt Used	N/A	West	West	West	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385643	84-208744 N	0	0	0	0	0 No Contributing Factors
571979	Lap and Shoulder Belt Used	N/A	West	South	West	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385689	84-207691 N	0	0	0	0	0 Following too Close
573234	Lap and Shoulder Belt Used	N/A	East	East	East	Motor Vehicle in Motion	Motor Vehicle in Motion	3	3385716	84-209262 Y	0	0	0	0	0 Failed to Yield
574428	Lap and Shoulder Belt Used	N/A	South	South	South	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385721	84-210039 N	0	0	0	0	1 Following too Close
574657	Unknown	N/A	None	None	None	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385710	84-207903 N	0	0	0	0	0 No Contributing Factors
574743	Lap and Shoulder Belt Used	N/A	West	West	West	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385703	84-207797 N	0	0	0	0	0 No Contributing Factors
574768	Lap and Shoulder Belt Used	N/A	West	North	West	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385703	84-207797 N	0	0	0	0	0 Improper Turn
574978	Lap and Shoulder Belt Used	N/A	South	North	South	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385716	84-209262 Y	0	0	0	0	0 Other
579279	Unknown	N/A	None	None	None	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385688	84-208744 N	0	0	0	0	0 Improper Backing
579829	Lap and Shoulder Belt Used	N/A	South	South	South	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385736	84-210021 N	0	0	0	0	0 Improper Backing
581793	Lap and Shoulder Belt Used	N/A	West	North	West	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385743	84-205433 Y	0	0	0	0	0 Misjudged Clearance
584935	Lap and Shoulder Belt Used	N/A	West	West	West	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385674	84-208243 Y	0	0	0	0	0 Changed lanes Improperly
585292	Lap and Shoulder Belt Used	N/A	South	South	South	Motor Vehicle in Motion	Motor Vehicle in Motion	1	3385688	84-208243 Y	0	0	0	0	0 Changed lanes Improperly
586629	Lap and Shoulder Belt Used	N/A	West	South	West	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385724	84-210229 N	0	0	0	0	1 Following too Close
587290	Lap and Shoulder Belt Used	N/A	West	South	West	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385724	84-210229 N	0	0	0	0	0 To Fail for Conditions
588362	Lap and Shoulder Belt Used	N/A	West	North	West	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385734	84-208243 Y	0	0	0	0	0 Failed to Yield
590283	Lap and Shoulder Belt Used	N/A	West	None	West	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385734	84-208243 Y	0	0	0	0	0 No Contributing Factors
590979	Lap and Shoulder Belt Used	N/A	West	None	West	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385734	84-208243 Y	0	0	0	0	0 No Contributing Factors
592424	Lap and Shoulder Belt Used	N/A	North	North	North	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385734	84-208243 Y	0	0	0	0	0 Misjudged Clearance
592479	Unknown	N/A	None	None	None	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385652	84-208799 Y	0	0	0	0	0 Improper Backing
593481	Lap and Shoulder Belt Used	N/A	North	North	North	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385679	84-209457 Y	0	0	0	0	0 Following too Close
593629	Lap and Shoulder Belt Used	N/A	North	North	North	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385703	84-207797 N	0	0	0	0	0 Misjudged Clearance
594814	Lap and Shoulder Belt Used	N/A	North	North	North	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385726	84-207692 Y	0	0	0	0	0 Following too Close
594869	Lap and Shoulder Belt Used	N/A	South	East	South	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385739	84-208762 Y	0	0	0	0	0 Improper Backing
595258	Lap and Shoulder Belt Used	N/A	South	West	South	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385726	84-207692 Y	0	0	0	0	0 Following too Close
597642	Lap and Shoulder Belt Used	N/A	South	None	South	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385726	84-207692 Y	0	0	0	0	0 Following too Close
597405	Lap and Shoulder Belt Used	N/A	East	West	East	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385621	84-208294 Y	0	0	0	0	0 Improper Backing
597829	Lap and Shoulder Belt Used	N/A	South	South	South	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385621	84-208294 Y	0	0	0	0	0 No Contributing Factors
598296	Lap and Shoulder Belt Used	N/A	South	South	South	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385668	84-208811 N	0	0	0	0	0 Changed lanes Improperly
598434	Lap and Shoulder Belt Used	N/A	East	West	East	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385767	84-206245 Y	0	0	0	0	0 Improper Backing
598692	Lap and Shoulder Belt Used	N/A	South	North	South	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385684	84-208744 N	0	0	0	0	0 Failed to Yield
599035	Lap and Shoulder Belt Used	N/A	South	South	South	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385684	84-208792 N	0	0	0	0	0 Changed lanes Improperly
600075	Lap and Shoulder Belt Used	N/A	West	East	West	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385688	84-207692 Y	0	0	0	0	0 Changed lanes Improperly
600970	Lap and Shoulder Belt Used	N/A	South	None	South	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385504	84-209402 Y	0	0	0	0	0 Misjudged Clearance
601780	Lap and Shoulder Belt Used	N/A	South	N/A	South	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385719	84-204788 N	0	0	0	0	0 Failed to Yield
601794	Lap and Shoulder Belt Used	N/A	South	North	South	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385664	84-208243 Y	0	0	0	0	0 Improper Backing
602371	Lap and Shoulder Belt Used	N/A	North	North	North	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385659	84-210089 N	0	0	0	0	0 Following too Close
602875	Lap and Shoulder Belt Used	N/A	North	South	North	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385481	84-209499 N	0	0	0	0	0 Following too Close
602940	Unknown	N/A	North	North	North	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385706	84-207692 Y	0	0	0	0	0 Improper Turn
602986	Lap and Shoulder Belt Used	N/A	West	South	West	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385613	84-208744 N	0	0	0	0	0 Improper Backing
604960	N/A	N/A	East	East	East	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385098	84-209427 Y	0	0	0	0	0 No Contributing Factors
604980	Lap and Shoulder Belt Used	N/A	East	East	East	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385087	84-208622 N	0	0	0	0	0 Changed lanes Improperly
605301	Lap and Shoulder Belt Used	N/A	East	East	East	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385624	84-208706 N	0	0	0	0	0 Inattentive or Other Distract
607332	None Used	N/A	East	South	East	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385719	84-206159 Y	0	0	0	0	0 Improper Backing
608182	Lap and Shoulder Belt Used	N/A	West	N/A	West	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385739	84-205922 Y	0	0	0	0	0 Driver Lost Control
608326	Lap and Shoulder Belt Used	N/A	West	N/A	West	Motor Vehicle in Motion	Motor Vehicle in Motion	2	3385733	84-205915 Y	0	0	0	0	0 Improper Backing

Appendix E

Synchro Output – Existing Conditions

Lanes, Volumes, Timings
6: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd

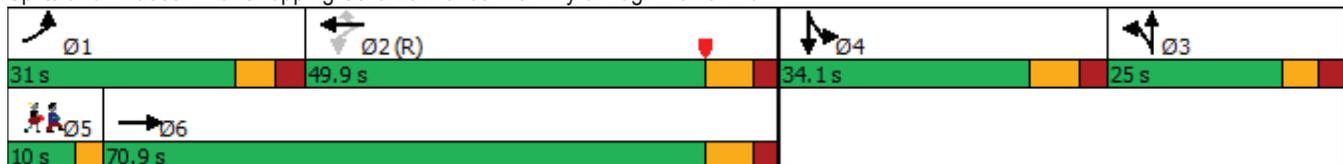
Lawrenceville Hwy Study
Existing Conditions - AM Peak - Optimized

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	441	189	7	2	484	701	4	8	3	198	13	717
Future Volume (vph)	441	189	7	2	484	701	4	8	3	198	13	717
Satd. Flow (prot)	3074	3150	0	1569	3138	1404	0	1534	0	1490	1503	1404
Flt Permitted	0.950			0.618				0.988		0.950	0.958	
Satd. Flow (perm)	3074	3150	0	1021	3138	1404	0	1534	0	1490	1503	1404
Satd. Flow (RTOR)		4				724		3				698
Lane Group Flow (vph)	479	213	0	2	526	762	0	16	0	114	115	779
Turn Type	Prot	NA		Perm	NA	Perm	Split	NA		Split	NA	Free
Protected Phases	1	6			2		3	3		4	4	
Permitted Phases				2		2						Free
Total Split (s)	31.0	70.9		49.9	49.9	49.9	25.0	25.0		34.1	34.1	
Total Lost Time (s)	7.2	8.0		8.0	8.0	8.0		6.7		8.1	8.1	
Act Effct Green (s)	27.8	101.9		66.9	66.9	66.9		7.0		16.0	16.0	140.0
Actuated g/C Ratio	0.20	0.73		0.48	0.48	0.48		0.05		0.11	0.11	1.00
v/c Ratio	0.78	0.09		0.00	0.35	0.73		0.20		0.67	0.67	0.55
Control Delay	62.7	7.1		28.5	26.9	8.1		60.5		44.0	44.0	12.5
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	0.0
Total Delay	62.7	7.1		28.5	26.9	8.1		60.5		44.0	44.0	12.5
LOS	E	A		C	C	A		E		D	D	B
Approach Delay		45.6			15.8			60.5			19.7	
Approach LOS		D			B			E			B	
Queue Length 50th (ft)	214	21		1	142	17		12		95	96	321
Queue Length 95th (ft)	268	57		8	260	201		37		135	136	856
Internal Link Dist (ft)		996			322			254			969	
Turn Bay Length (ft)	245			225						286		
Base Capacity (vph)	618	2293		487	1498	1048		203		276	279	1404
Starvation Cap Reductn	0	0		0	0	0		0		0	0	0
Spillback Cap Reductn	0	0		0	0	0		0		0	0	0
Storage Cap Reductn	0	0		0	0	0		0		0	0	0
Reduced v/c Ratio	0.78	0.09		0.00	0.35	0.73		0.08		0.41	0.41	0.55

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 89 (64%), Referenced to phase 2:WBTL, Start of Yellow
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 24.2
 Intersection LOS: C
 Intersection Capacity Utilization 85.5%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 6: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd



Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Total Split (s)	10.0
Total Lost Time (s)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
6: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd

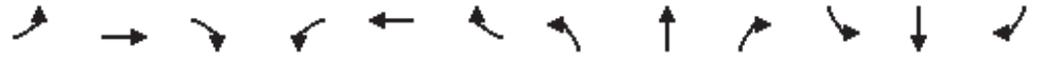
Lawrenceville Hwy Study
Existing Conditions - AM Peak - Optimized

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	441	189	7	2	484	701	4	8	3	198	13	717
Future Volume (vph)	441	189	7	2	484	701	4	8	3	198	13	717
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			3%			10%			3%	
Total Lost time (s)	7.2	8.0		8.0	8.0	8.0		6.7		8.1	8.1	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85		0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99		0.95	0.96	1.00
Satd. Flow (prot)	3074	3152		1569	3138	1404		1533		1490	1503	1404
Flt Permitted	0.95	1.00		0.62	1.00	1.00		0.99		0.95	0.96	1.00
Satd. Flow (perm)	3074	3152		1021	3138	1404		1533		1490	1503	1404
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	479	205	8	2	526	762	4	9	3	215	14	779
RTOR Reduction (vph)	0	1	0	0	0	399	0	3	0	0	0	0
Lane Group Flow (vph)	479	212	0	2	526	363	0	13	0	114	115	779
Turn Type	Prot	NA		Perm	NA	Perm	Split	NA		Split	NA	Free
Protected Phases	1	6			2		3	3		4	4	
Permitted Phases				2		2						Free
Actuated Green, G (s)	27.8	97.9		62.9	62.9	62.9		3.3		16.0	16.0	140.0
Effective Green, g (s)	27.8	97.9		62.9	62.9	62.9		3.3		16.0	16.0	140.0
Actuated g/C Ratio	0.20	0.70		0.45	0.45	0.45		0.02		0.11	0.11	1.00
Clearance Time (s)	7.2	8.0		8.0	8.0	8.0		6.7		8.1	8.1	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)	610	2204		458	1409	630		36		170	171	1404
v/s Ratio Prot	c0.16	0.07			0.17			0.01		0.08	0.08	
v/s Ratio Perm				0.00		0.26						c0.55
v/c Ratio	0.79	0.10		0.00	0.37	0.58		0.36		0.67	0.67	0.55
Uniform Delay, d1	53.3	6.8		21.3	25.5	28.7		67.3		59.5	59.5	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		0.47	0.47	1.00
Incremental Delay, d2	6.6	0.0		0.0	0.8	3.8		6.1		8.6	8.6	1.4
Delay (s)	59.9	6.8		21.3	26.3	32.5		73.5		36.5	36.5	1.4
Level of Service	E	A		C	C	C		E		D	D	A
Approach Delay (s)		43.5			29.9			73.5			9.3	
Approach LOS		D			C			E			A	
Intersection Summary												
HCM 2000 Control Delay			26.4									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			140.0							30.0		
Intersection Capacity Utilization			85.5%									ICU Level of Service E
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings

7: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
Existing Conditions - AM Peak - Optimized

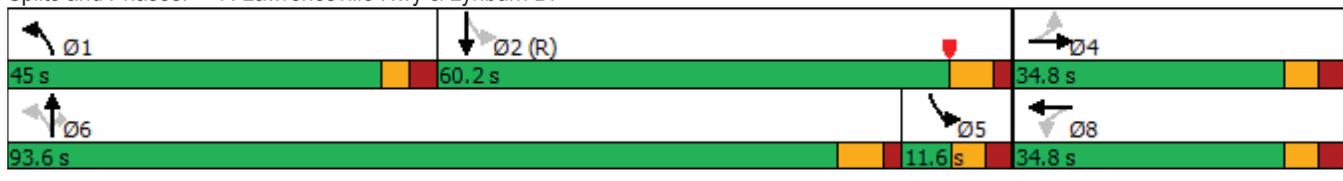


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↗	↘		↗	↑↑	↗	↗	↕	↕
Traffic Volume (vph)	29	13	50	48	20	17	362	732	56	15	830	52
Future Volume (vph)	29	13	50	48	20	17	362	732	56	15	830	52
Satd. Flow (prot)	0	1499	0	1545	1516	0	1617	3233	1446	1577	3125	0
Flt Permitted		0.878		0.579			0.203			0.351		
Satd. Flow (perm)	0	1337	0	942	1516	0	345	3233	1446	583	3125	0
Satd. Flow (RTOR)		38			18				79		5	
Lane Group Flow (vph)	0	100	0	52	40	0	393	796	61	16	959	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4			8			6		6	2		
Total Split (s)	34.8	34.8		34.8	34.8		45.0	93.6	93.6	11.6	60.2	
Total Lost Time (s)		6.5		6.5	6.5		6.1	6.7	6.7	6.4	6.7	
Act Effct Green (s)		12.4		12.4	12.4		110.4	109.8	109.8	77.4	77.1	
Actuated g/C Ratio		0.09		0.09	0.09		0.79	0.78	0.78	0.55	0.55	
v/c Ratio		0.65		0.63	0.27		0.71	0.31	0.05	0.04	0.56	
Control Delay		57.4		91.5	40.7		10.6	2.9	0.1	1.8	2.7	
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		57.4		91.5	40.7		10.6	2.9	0.1	1.8	2.7	
LOS		E		F	D		B	A	A	A	A	
Approach Delay		57.4			69.4			5.2			2.7	
Approach LOS		E			E			A			A	
Queue Length 50th (ft)		55		47	19		35	38	0	0	16	
Queue Length 95th (ft)		114		91	55		127	80	m0	m1	25	
Internal Link Dist (ft)		350			139			969			634	
Turn Bay Length (ft)				90			180		200	135		
Base Capacity (vph)		300		190	320		634	2534	1150	359	1723	
Starvation Cap Reductn		0		0	0		0	0	0	0	0	
Spillback Cap Reductn		0		0	0		0	0	0	0	0	
Storage Cap Reductn		0		0	0		0	0	0	0	0	
Reduced v/c Ratio		0.33		0.27	0.13		0.62	0.31	0.05	0.04	0.56	

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 109 (78%), Referenced to phase 2:SBTL, Start of Yellow
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.71
 Intersection Signal Delay: 8.8 Intersection LOS: A
 Intersection Capacity Utilization 78.3% ICU Level of Service D
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: Lawrenceville Hwy & Lynburn Dr



HCM Signalized Intersection Capacity Analysis

7: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
Existing Conditions - AM Peak - Optimized



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↕↕	↕	↕	↕↕	
Traffic Volume (vph)	29	13	50	48	20	17	362	732	56	15	830	52
Future Volume (vph)	29	13	50	48	20	17	362	732	56	15	830	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			6%			-3%				2%
Total Lost time (s)		6.5		6.5	6.5		6.1	6.7	6.7	6.4	6.7	
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt		0.93		1.00	0.93		1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.98		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1499		1545	1516		1617	3233	1446	1577	3125	
Flt Permitted		0.88		0.58	1.00		0.20	1.00	1.00	0.35	1.00	
Satd. Flow (perm)		1337		942	1516		345	3233	1446	582	3125	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	32	14	54	52	22	18	393	796	61	16	902	57
RTOR Reduction (vph)	0	35	0	0	16	0	0	0	15	0	2	0
Lane Group Flow (vph)	0	65	0	52	24	0	393	796	46	16	957	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4		8	8		1	6	6	5	2	
Permitted Phases	4			8			6		6	2		
Actuated Green, G (s)		12.4		12.4	12.4		105.9	105.9	105.9	77.4	77.1	
Effective Green, g (s)		12.4		12.4	12.4		105.9	105.9	105.9	77.4	77.1	
Actuated g/C Ratio		0.09		0.09	0.09		0.76	0.76	0.76	0.55	0.55	
Clearance Time (s)		6.5		6.5	6.5		6.1	6.7	6.7	6.4	6.7	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		118		83	134		544	2445	1093	336	1720	
v/s Ratio Prot					0.02		c0.16	0.25		0.00	c0.31	
v/s Ratio Perm		0.05		c0.06			c0.38		0.03	0.03		
v/c Ratio		0.55		0.63	0.18		0.72	0.33	0.04	0.05	0.56	
Uniform Delay, d1		61.1		61.6	59.1		16.5	5.5	4.3	14.4	20.4	
Progression Factor		1.00		1.00	1.00		0.47	0.50	0.02	0.08	0.08	
Incremental Delay, d2		5.5		13.8	0.6		3.1	0.2	0.0	0.0	0.9	
Delay (s)		66.7		75.4	59.7		11.0	3.0	0.2	1.2	2.5	
Level of Service		E		E	E		B	A	A	A	A	
Approach Delay (s)		66.7			68.6			5.4			2.5	
Approach LOS		E			E			A			A	

Intersection Summary

HCM 2000 Control Delay	9.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.6
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings 8: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
Existing Conditions - AM Peak - Optimized

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	306	450	22	0	821	910	0	0	21	195	27	76
Future Volume (vph)	306	450	22	0	821	910	0	0	21	195	27	76
Satd. Flow (prot)	1585	3169	1418	0	3185	1425	0	0	1450	3090	1676	1425
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1585	3169	1418	0	3185	1425	0	0	1450	3090	1676	1425
Satd. Flow (RTOR)			34			325			395			150
Lane Group Flow (vph)	333	489	24	0	892	989	0	0	23	212	29	83
Turn Type	Prot	NA	Perm		NA	Free			Free	Prot	NA	Perm
Protected Phases	1 9	6			2					7	4	
Permitted Phases		6	6			Free			Free			4
Total Split (s)		102.7	102.7		54.2					37.3	37.3	37.3
Total Lost Time (s)		8.0	8.0		8.0					7.3	7.3	7.3
Act Effct Green (s)	32.8	94.7	94.7		49.5	140.0			140.0	30.0	30.0	30.0
Actuated g/C Ratio	0.23	0.68	0.68		0.35	1.00			1.00	0.21	0.21	0.21
v/c Ratio	0.90	0.23	0.02		0.79	0.69			0.02	0.32	0.08	0.20
Control Delay	63.8	3.8	0.1		41.2	6.5			0.0	48.0	44.9	1.0
Queue Delay	0.0	0.0	0.0		21.4	0.0			0.0	0.0	0.0	0.0
Total Delay	63.8	3.8	0.1		62.6	6.5			0.0	48.0	44.9	1.0
LOS	E	A	A		E	A			A	D	D	A
Approach Delay		27.3			33.1							35.7
Approach LOS		C			C							D
Queue Length 50th (ft)	185	31	0		309	153			0	85	21	0
Queue Length 95th (ft)	#390	31	0		453	343			0	123	50	0
Internal Link Dist (ft)		634			283			65				481
Turn Bay Length (ft)	445		230			125				300		210
Base Capacity (vph)	408	2143	970		1126	1425			1450	662	359	423
Starvation Cap Reductn	0	0	0		255	0			0	0	0	0
Spillback Cap Reductn	0	0	0		0	0			0	0	0	0
Storage Cap Reductn	0	0	0		0	0			0	0	0	0
Reduced v/c Ratio	0.82	0.23	0.02		1.02	0.69			0.02	0.32	0.08	0.20

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 90 (64%), Referenced to phase 2:WBT, Start of Yellow

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 31.6

Intersection LOS: C

Intersection Capacity Utilization 70.3%

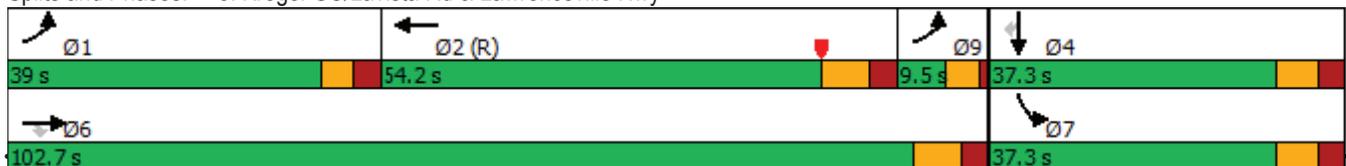
ICU Level of Service C

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 8: Kroger SC/Lavista Rd & Lawrenceville Hwy



Lane Group	Ø1	Ø9
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	9
Permitted Phases		
Total Split (s)	39.0	9.5
Total Lost Time (s)		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

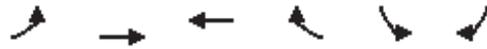
HCM Signalized Intersection Capacity Analysis
8: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
Existing Conditions - AM Peak - Optimized

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		 			 					 			
Traffic Volume (vph)	306	450	22	0	821	910	0	0	21	195	27	76	
Future Volume (vph)	306	450	22	0	821	910	0	0	21	195	27	76	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Grade (%)		1%			0%			0%			0%		
Total Lost time (s)	6.2	8.0	8.0		8.0	4.0			4.0	7.3	7.3	7.3	
Lane Util. Factor	1.00	0.95	1.00		0.95	1.00			1.00	0.97	1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85			0.86	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1585	3169	1418		3185	1425			1450	3090	1676	1425	
Flt Permitted	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1585	3169	1418		3185	1425			1450	3090	1676	1425	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	333	489	24	0	892	989	0	0	23	212	29	83	
RTOR Reduction (vph)	0	0	8	0	0	0	0	0	0	0	0	65	
Lane Group Flow (vph)	333	489	16	0	892	989	0	0	23	212	29	18	
Turn Type	Prot	NA	Perm		NA	Free			Free	Prot	NA	Perm	
Protected Phases	1 9	6			2					7	4		
Permitted Phases		6	6			Free			Free			4	
Actuated Green, G (s)	34.5	94.7	94.7		49.5	140.0			140.0	30.0	30.0	30.0	
Effective Green, g (s)	34.5	94.7	94.7		49.5	140.0			140.0	30.0	30.0	30.0	
Actuated g/C Ratio	0.25	0.68	0.68		0.35	1.00			1.00	0.21	0.21	0.21	
Clearance Time (s)		8.0	8.0		8.0					7.3	7.3	7.3	
Vehicle Extension (s)		3.0	3.0		3.0					3.0	3.0	3.0	
Lane Grp Cap (vph)	390	2143	959		1126	1425			1450	662	359	305	
v/s Ratio Prot	c0.21	0.15			0.28					0.07	0.02		
v/s Ratio Perm			0.01			c0.69			0.02			0.01	
v/c Ratio	0.85	0.23	0.02		0.79	0.69			0.02	0.32	0.08	0.06	
Uniform Delay, d1	50.3	8.7	7.4		40.6	0.0			0.0	46.4	44.0	43.8	
Progression Factor	0.79	0.41	0.03		0.89	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	15.9	0.2	0.0		3.9	1.9			0.0	0.3	0.4	0.4	
Delay (s)	55.9	3.8	0.3		40.2	1.9			0.0	46.7	44.4	44.1	
Level of Service	E	A	A		D	A			A	D	D	D	
Approach Delay (s)		24.2			20.0			0.0			45.8		
Approach LOS		C			C			A			D		
Intersection Summary													
HCM 2000 Control Delay			23.8									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.86										
Actuated Cycle Length (s)			140.0									Sum of lost time (s)	26.0
Intersection Capacity Utilization			70.3%									ICU Level of Service	C
Analysis Period (min)			15										
c Critical Lane Group													

Lanes, Volumes, Timings
 9: Lawrenceville Hwy & Old Norcross Rd

Lawrenceville Hwy Study
 Existing Conditions - AM Peak - Optimized

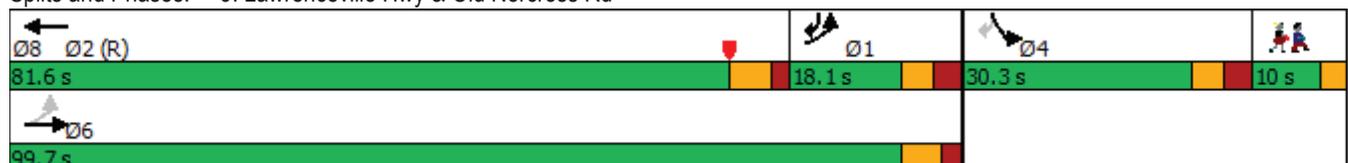


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø8
Lane Configurations							
Traffic Volume (vph)	140	526	1537	33	39	194	
Future Volume (vph)	140	526	1537	33	39	194	
Satd. Flow (prot)	1585	3169	3176	0	1545	1382	
Flt Permitted	0.097				0.950		
Satd. Flow (perm)	162	3169	3176	0	1545	1382	
Satd. Flow (RTOR)			2			107	
Lane Group Flow (vph)	152	572	1707	0	42	211	
Turn Type	pm+pt	NA	NA		Prot	pm+ov	
Protected Phases	1	6	2		4	1	8
Permitted Phases	6					4	
Total Split (s)	18.1	99.7	81.6		30.3	18.1	10.0
Total Lost Time (s)	6.4	6.4	6.4		6.2	6.4	
Act Effct Green (s)	119.9	121.2	101.8		10.7	25.4	
Actuated g/C Ratio	0.86	0.87	0.73		0.08	0.18	
v/c Ratio	0.59	0.21	0.74		0.36	0.62	
Control Delay	41.7	2.9	9.1		69.7	33.0	
Queue Delay	0.0	0.2	0.6		0.0	8.4	
Total Delay	41.7	3.1	9.7		69.7	41.3	
LOS	D	A	A		E	D	
Approach Delay		11.2	9.7		46.0		
Approach LOS		B	A		D		
Queue Length 50th (ft)	50	63	162		37	85	
Queue Length 95th (ft)	119	71	177		77	170	
Internal Link Dist (ft)		283	841		415		
Turn Bay Length (ft)	120					165	
Base Capacity (vph)	257	2743	2310		265	338	
Starvation Cap Reductn	0	1312	2		0	0	
Spillback Cap Reductn	0	0	258		0	91	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.59	0.40	0.83		0.16	0.85	

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 1 (1%), Referenced to phase 2:WBT, Start of Yellow
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.74
 Intersection Signal Delay: 13.5
 Intersection LOS: B
 Intersection Capacity Utilization 81.2%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 9: Lawrenceville Hwy & Old Norcross Rd



HCM Signalized Intersection Capacity Analysis
9: Lawrenceville Hwy & Old Norcross Rd

Lawrenceville Hwy Study
Existing Conditions - AM Peak - Optimized



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	140	526	1537	33	39	194
Future Volume (vph)	140	526	1537	33	39	194
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	0%		6%	
Total Lost time (s)	6.4	6.4	6.4		6.2	6.4
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1585	3169	3175		1545	1382
Flt Permitted	0.10	1.00	1.00		0.95	1.00
Satd. Flow (perm)	162	3169	3175		1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	572	1671	36	42	211
RTOR Reduction (vph)	0	0	1	0	0	91
Lane Group Flow (vph)	152	572	1706	0	42	120
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	1	6	2		4	1
Permitted Phases	6					4
Actuated Green, G (s)	118.7	118.7	100.6		8.7	20.4
Effective Green, g (s)	118.7	118.7	100.6		8.7	20.4
Actuated g/C Ratio	0.85	0.85	0.72		0.06	0.15
Clearance Time (s)	6.4	6.4	6.4		6.2	6.4
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	256	2686	2281		96	264
v/s Ratio Prot	c0.05	0.18	c0.54		0.03	c0.04
v/s Ratio Perm	0.45					0.05
v/c Ratio	0.59	0.21	0.75		0.44	0.45
Uniform Delay, d1	25.2	2.0	12.0		63.3	54.7
Progression Factor	1.54	1.29	0.58		1.00	1.00
Incremental Delay, d2	3.6	0.2	1.8		3.2	1.2
Delay (s)	42.3	2.7	8.8		66.5	55.9
Level of Service	D	A	A		E	E
Approach Delay (s)		11.0	8.8		57.7	
Approach LOS		B	A		E	

Intersection Summary

HCM 2000 Control Delay	14.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	81.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
 10: WalMart SC & Lawrenceville Hwy

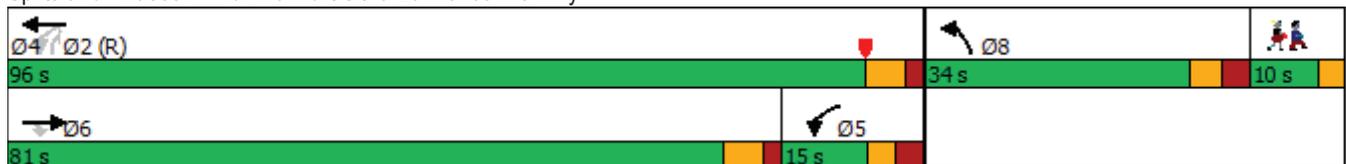


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø4
Lane Configurations	↑↑	↑	↓	↑↑	↓	↑	
Traffic Volume (vph)	459	106	162	1420	150	177	
Future Volume (vph)	459	106	162	1420	150	177	
Satd. Flow (prot)	3185	1425	1585	3169	1545	1382	
Flt Permitted			0.460		0.950		
Satd. Flow (perm)	3185	1425	767	3169	1545	1382	
Satd. Flow (RTOR)		115				192	
Lane Group Flow (vph)	499	115	176	1543	163	192	
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm	
Protected Phases	6		5	2	8		4
Permitted Phases		6	2			2	
Total Split (s)	81.0	81.0	15.0	96.0	34.0	96.0	10.0
Total Lost Time (s)	6.3	6.3	6.0	6.3	6.2	6.3	
Act Effct Green (s)	92.5	92.5	107.8	107.5	20.0	107.5	
Actuated g/C Ratio	0.66	0.66	0.77	0.77	0.14	0.77	
v/c Ratio	0.24	0.12	0.27	0.63	0.74	0.17	
Control Delay	6.7	1.8	6.8	9.5	76.6	1.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	6.7	1.8	6.8	9.5	76.6	1.1	
LOS	A	A	A	A	E	A	
Approach Delay	5.8			9.2	35.8		
Approach LOS	A			A	D		
Queue Length 50th (ft)	81	8	36	292	144	0	
Queue Length 95th (ft)	64	2	72	444	213	21	
Internal Link Dist (ft)	841			744	311		
Turn Bay Length (ft)		205	195				
Base Capacity (vph)	2104	980	643	2433	306	1105	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.24	0.12	0.27	0.63	0.53	0.17	

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 14 (10%), Referenced to phase 2:WBTL, Start of Yellow
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.74
 Intersection Signal Delay: 11.9
 Intersection LOS: B
 Intersection Capacity Utilization 63.3%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 10: WalMart SC & Lawrenceville Hwy



HCM Signalized Intersection Capacity Analysis
10: WalMart SC & Lawrenceville Hwy

Lawrenceville Hwy Study
Existing Conditions - AM Peak - Optimized



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	↑
Traffic Volume (vph)	459	106	162	1420	150	177
Future Volume (vph)	459	106	162	1420	150	177
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%			1%	6%	
Total Lost time (s)	6.3	6.3	6.0	6.3	6.2	6.3
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3185	1425	1585	3169	1545	1382
Flt Permitted	1.00	1.00	0.46	1.00	0.95	1.00
Satd. Flow (perm)	3185	1425	768	3169	1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	499	115	176	1543	163	192
RTOR Reduction (vph)	0	39	0	0	0	45
Lane Group Flow (vph)	499	76	176	1543	163	147
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	8	
Permitted Phases		6	2			2
Actuated Green, G (s)	92.5	92.5	107.8	107.5	20.0	107.5
Effective Green, g (s)	92.5	92.5	107.8	107.5	20.0	107.5
Actuated g/C Ratio	0.66	0.66	0.77	0.77	0.14	0.77
Clearance Time (s)	6.3	6.3	6.0	6.3	6.2	6.3
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2104	941	643	2433	220	1061
v/s Ratio Prot	0.16		0.02	c0.49	c0.11	
v/s Ratio Perm		0.05	0.19			0.11
v/c Ratio	0.24	0.08	0.27	0.63	0.74	0.14
Uniform Delay, d1	9.6	8.5	5.3	7.4	57.5	4.2
Progression Factor	0.63	0.87	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.2	0.2	1.3	12.6	0.3
Delay (s)	6.3	7.6	5.6	8.6	70.1	4.5
Level of Service	A	A	A	A	E	A
Approach Delay (s)	6.6			8.3	34.6	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	11.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.5
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
6: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd

Lawrenceville Hwy Study
Existing Conditions - PM Peak-Optimized

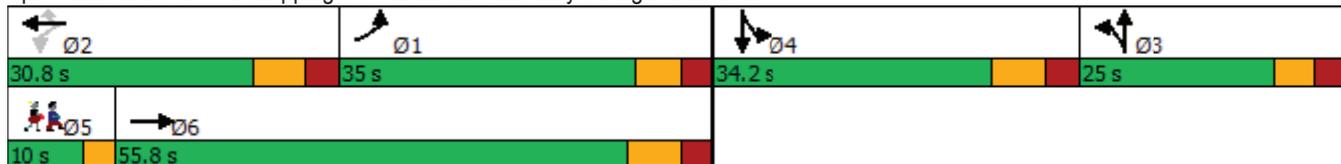


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	618	459	43	9	396	513	17	28	4	546	35	739
Future Volume (vph)	618	459	43	9	396	513	17	28	4	546	35	739
Satd. Flow (prot)	3074	3128	0	1569	3138	1404	0	1550	0	1490	1503	1404
Flt Permitted	0.950			0.394				0.983		0.950	0.958	
Satd. Flow (perm)	3074	3128	0	651	3138	1404	0	1550	0	1490	1503	1404
Satd. Flow (RTOR)		9				558		3				802
Lane Group Flow (vph)	672	546	0	10	430	558	0	52	0	314	317	803
Turn Type	Prot	NA		Perm	NA	Perm	Split	NA		Split	NA	Free
Protected Phases	1	6			2		3	3		4	4	
Permitted Phases				2		2						Free
Total Split (s)	35.0	55.8		30.8	30.8	30.8	25.0	25.0		34.2	34.2	
Total Lost Time (s)	7.2	8.0		8.0	8.0	8.0		6.7		8.1	8.1	
Act Effct Green (s)	27.6	57.7		22.9	22.9	22.9		9.1		26.2	26.2	113.0
Actuated g/C Ratio	0.24	0.51		0.20	0.20	0.20		0.08		0.23	0.23	1.00
v/c Ratio	0.90	0.34		0.08	0.68	0.77		0.41		0.91	0.91	0.57
Control Delay	58.2	17.7		41.1	48.8	11.5		58.0		74.4	74.4	1.7
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	0.0
Total Delay	58.2	17.7		41.1	48.8	11.5		58.0		74.4	74.4	1.7
LOS	E	B		D	D	B		E		E	E	A
Approach Delay		40.1			27.9			58.0			33.7	
Approach LOS		D			C			E			C	
Queue Length 50th (ft)	252	123		6	158	0		35		243	245	0
Queue Length 95th (ft)	#378	174		23	223	124		76		#447	#449	0
Internal Link Dist (ft)		996			322			254			969	
Turn Bay Length (ft)	245			225						286		
Base Capacity (vph)	759	1601		131	636	729		254		345	348	1404
Starvation Cap Reductn	0	0		0	0	0		0		0	0	0
Spillback Cap Reductn	0	0		0	0	0		0		0	0	0
Storage Cap Reductn	0	0		0	0	0		0		0	0	0
Reduced v/c Ratio	0.89	0.34		0.08	0.68	0.77		0.20		0.91	0.91	0.57

Intersection Summary

Cycle Length: 125
 Actuated Cycle Length: 113
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 34.6
 Intersection LOS: C
 Intersection Capacity Utilization 78.1%
 ICU Level of Service D
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 6: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd



Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Total Split (s)	10.0
Total Lost Time (s)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
6: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd

Lawrenceville Hwy Study
Existing Conditions - PM Peak-Optimized



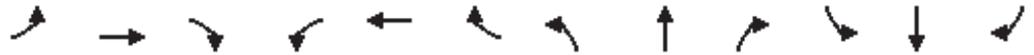
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	618	459	43	9	396	513	17	28	4	546	35	739
Future Volume (vph)	618	459	43	9	396	513	17	28	4	546	35	739
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			3%			10%			3%	
Total Lost time (s)	7.2	8.0		8.0	8.0	8.0		6.7		8.1	8.1	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85		0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98		0.95	0.96	1.00
Satd. Flow (prot)	3074	3128		1569	3138	1404		1549		1490	1503	1404
Flt Permitted	0.95	1.00		0.39	1.00	1.00		0.98		0.95	0.96	1.00
Satd. Flow (perm)	3074	3128		650	3138	1404		1549		1490	1503	1404
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	672	499	47	10	430	558	18	30	4	593	38	803
RTOR Reduction (vph)	0	4	0	0	0	446	0	3	0	0	0	0
Lane Group Flow (vph)	672	542	0	10	430	112	0	49	0	314	317	803
Turn Type	Prot	NA		Perm	NA	Perm	Split	NA		Split	NA	Free
Protected Phases	1	6			2		3	3		4	4	
Permitted Phases				2		2						Free
Actuated Green, G (s)	27.6	57.7		22.9	22.9	22.9		7.7		26.2	26.2	114.4
Effective Green, g (s)	27.6	57.7		22.9	22.9	22.9		7.7		26.2	26.2	114.4
Actuated g/C Ratio	0.24	0.50		0.20	0.20	0.20		0.07		0.23	0.23	1.00
Clearance Time (s)	7.2	8.0		8.0	8.0	8.0		6.7		8.1	8.1	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)	741	1577		130	628	281		104		341	344	1404
v/s Ratio Prot	c0.22	0.17			0.14			0.03		0.21	c0.21	
v/s Ratio Perm				0.02		0.08						c0.57
v/c Ratio	0.91	0.34		0.08	0.68	0.40		0.47		0.92	0.92	0.57
Uniform Delay, d1	42.2	17.0		37.2	42.4	39.8		51.4		43.1	43.1	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	14.7	0.1		1.2	6.0	4.2		3.4		29.4	29.3	1.7
Delay (s)	56.9	17.1		38.3	48.4	43.9		54.8		72.4	72.4	1.7
Level of Service	E	B		D	D	D		D		E	E	A
Approach Delay (s)		39.0			45.8			54.8			32.8	
Approach LOS		D			D			D			C	

Intersection Summary

HCM 2000 Control Delay	38.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	114.4	Sum of lost time (s)	30.0
Intersection Capacity Utilization	78.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
7: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
Existing Conditions - PM Peak-Optimized



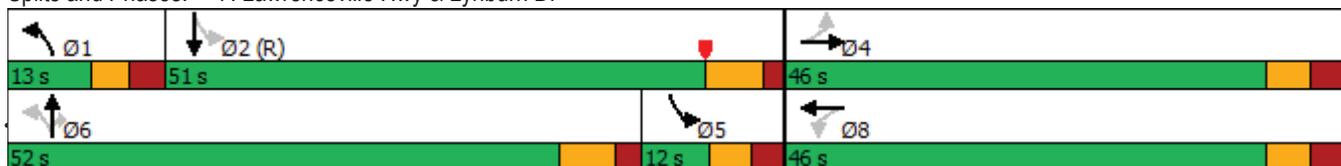
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖	↗		↖	↕	↗	↖	↕	↗
Traffic Volume (vph)	67	37	111	267	89	66	110	863	186	51	942	74
Future Volume (vph)	67	37	111	267	89	66	110	863	186	51	942	74
Satd. Flow (prot)	0	1505	0	1545	1522	0	1617	3233	1446	1577	3119	0
Flt Permitted		0.843		0.568			0.096			0.286		
Satd. Flow (perm)	0	1288	0	924	1522	0	163	3233	1446	475	3119	0
Satd. Flow (RTOR)		55			38				202		9	
Lane Group Flow (vph)	0	234	0	290	169	0	120	938	202	55	1104	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4			8			6		6	2		
Total Split (s)	46.0	46.0		46.0	46.0		13.0	52.0	52.0	12.0	51.0	
Total Lost Time (s)		6.5		6.5	6.5		6.1	6.7	6.7	6.4	6.7	
Act Effct Green (s)		36.6		36.6	36.6		51.2	50.6	50.6	46.9	46.6	
Actuated g/C Ratio		0.33		0.33	0.33		0.47	0.46	0.46	0.43	0.42	
v/c Ratio		0.50		0.94	0.32		0.69	0.63	0.26	0.21	0.83	
Control Delay		25.5		75.4	21.9		41.9	26.6	3.8	8.4	12.7	
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		25.5		75.4	21.9		41.9	26.6	3.8	8.4	12.7	
LOS		C		E	C		D	C	A	A	B	
Approach Delay		25.5			55.7			24.4			12.5	
Approach LOS		C			E			C			B	
Queue Length 50th (ft)		95		189	64		52	283	0	8	91	
Queue Length 95th (ft)		170		#352	119		#136	359	44	m13	m124	
Internal Link Dist (ft)		350			139			969			634	
Turn Bay Length (ft)				90			180		200	135		
Base Capacity (vph)		497		331	570		174	1487	774	258	1327	
Starvation Cap Reductn		0		0	0		0	0	0	0	0	
Spillback Cap Reductn		0		0	0		0	0	0	0	0	
Storage Cap Reductn		0		0	0		0	0	0	0	0	
Reduced v/c Ratio		0.47		0.88	0.30		0.69	0.63	0.26	0.21	0.83	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 14 (13%), Referenced to phase 2:SBTL, Start of Yellow
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.94
 Intersection Signal Delay: 24.7
 Intersection LOS: C
 Intersection Capacity Utilization 90.1%
 ICU Level of Service E
 Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: Lawrenceville Hwy & Lynburn Dr



HCM Signalized Intersection Capacity Analysis

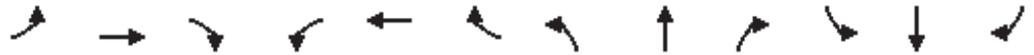
7: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
Existing Conditions - PM Peak-Optimized

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	37	111	267	89	66	110	863	186	51	942	74
Future Volume (vph)	67	37	111	267	89	66	110	863	186	51	942	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			6%			-3%				2%
Total Lost time (s)		6.5		6.5	6.5		6.1	6.7	6.7	6.4	6.7	
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt		0.93		1.00	0.94		1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.98		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1505		1545	1522		1617	3233	1446	1577	3119	
Flt Permitted		0.84		0.57	1.00		0.10	1.00	1.00	0.29	1.00	
Satd. Flow (perm)		1289		923	1522		163	3233	1446	474	3119	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	73	40	121	290	97	72	120	938	202	55	1024	80
RTOR Reduction (vph)	0	37	0	0	25	0	0	0	111	0	5	0
Lane Group Flow (vph)	0	197	0	290	144	0	120	938	91	55	1099	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4		8	8		1	6	6	5	2	
Permitted Phases	4			8			6		6	2		
Actuated Green, G (s)		36.6		36.6	36.6		49.3	49.3	49.3	46.9	46.6	
Effective Green, g (s)		36.6		36.6	36.6		49.3	49.3	49.3	46.9	46.6	
Actuated g/C Ratio		0.33		0.33	0.33		0.45	0.45	0.45	0.43	0.42	
Clearance Time (s)		6.5		6.5	6.5		6.1	6.7	6.7	6.4	6.7	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		428		307	506		172	1448	648	247	1321	
v/s Ratio Prot					0.09		0.05	c0.29		0.01	c0.35	
v/s Ratio Perm		0.15		c0.31			0.27		0.06	0.09		
v/c Ratio		0.46		0.94	0.28		0.70	0.65	0.14	0.22	0.83	
Uniform Delay, d1		28.9		35.7	27.0		23.2	23.6	17.9	22.0	28.2	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	0.31	0.28	
Incremental Delay, d2		0.8		36.6	0.3		11.7	2.3	0.5	0.3	3.9	
Delay (s)		29.7		72.3	27.4		34.8	25.9	18.3	7.1	11.7	
Level of Service		C		E	C		C	C	B	A	B	
Approach Delay (s)		29.7			55.8			25.5			11.5	
Approach LOS		C			E			C			B	
Intersection Summary												
HCM 2000 Control Delay			25.1				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.89									
Actuated Cycle Length (s)			110.0				Sum of lost time (s)			19.6		
Intersection Capacity Utilization			90.1%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
8: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
Existing Conditions - PM Peak-Optimized



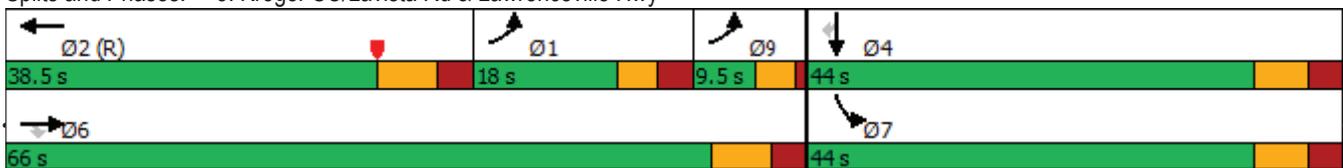
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	184	793	19	0	718	409	0	0	84	885	149	349
Future Volume (vph)	184	793	19	0	718	409	0	0	84	885	149	349
Satd. Flow (prot)	1585	3169	1418	0	3185	1425	0	0	1450	3090	1676	1425
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1585	3169	1418	0	3185	1425	0	0	1450	3090	1676	1425
Satd. Flow (RTOR)			43			263			263			348
Lane Group Flow (vph)	200	862	21	0	780	445	0	0	91	962	162	379
Turn Type	Prot	NA	Perm		NA	Free			Free	Prot	NA	Perm
Protected Phases	1 9	6			2					7	4	
Permitted Phases		6	6			Free			Free			4
Total Split (s)		66.0	66.0		38.5					44.0	44.0	44.0
Total Lost Time (s)		8.0	8.0		8.0					7.3	7.3	7.3
Act Effct Green (s)	21.3	58.0	58.0		30.5	110.0			110.0	36.7	36.7	36.7
Actuated g/C Ratio	0.19	0.53	0.53		0.28	1.00			1.00	0.33	0.33	0.33
v/c Ratio	0.65	0.52	0.03		0.88	0.31			0.06	0.93	0.29	0.54
Control Delay	45.4	8.8	0.1		38.4	0.5			0.1	52.1	28.8	7.2
Queue Delay	0.0	0.0	0.0		4.5	0.0			0.0	1.6	0.0	0.0
Total Delay	45.4	8.8	0.1		42.9	0.5			0.1	53.7	28.8	7.2
LOS	D	A	A		D	A			A	D	C	A
Approach Delay		15.4			27.5			0.1			39.3	
Approach LOS		B			C			A			D	
Queue Length 50th (ft)	152	40	0		284	0			0	336	84	15
Queue Length 95th (ft)	229	69	m1		#390	0			0	#465	140	92
Internal Link Dist (ft)		634			283			65			481	
Turn Bay Length (ft)	445		230			125				300		210
Base Capacity (vph)	290	1670	768		883	1425			1450	1030	559	707
Starvation Cap Reductn	0	0	0		61	0			0	0	0	0
Spillback Cap Reductn	0	0	0		0	0			9	19	0	0
Storage Cap Reductn	0	0	0		0	0			0	0	0	0
Reduced v/c Ratio	0.69	0.52	0.03		0.95	0.31			0.06	0.95	0.29	0.54

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:WBT, Start of Yellow
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.93
 Intersection Signal Delay: 28.1
 Intersection LOS: C
 Intersection Capacity Utilization 79.3%
 ICU Level of Service D
 Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: Kroger SC/Lavista Rd & Lawrenceville Hwy



Lane Group	Ø1	Ø9
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	9
Permitted Phases		
Total Split (s)	18.0	9.5
Total Lost Time (s)		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

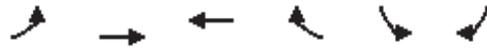
HCM Signalized Intersection Capacity Analysis
8: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
Existing Conditions - PM Peak-Optimized

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		 			 					 			
Traffic Volume (vph)	184	793	19	0	718	409	0	0	84	885	149	349	
Future Volume (vph)	184	793	19	0	718	409	0	0	84	885	149	349	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Grade (%)		1%			0%			0%				0%	
Total Lost time (s)	6.2	8.0	8.0		8.0	4.0			4.0	7.3	7.3	7.3	
Lane Util. Factor	1.00	0.95	1.00		0.95	1.00			1.00	0.97	1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85			0.86	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1585	3169	1418		3185	1425			1450	3090	1676	1425	
Flt Permitted	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1585	3169	1418		3185	1425			1450	3090	1676	1425	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	200	862	21	0	780	445	0	0	91	962	162	379	
RTOR Reduction (vph)	0	0	10	0	0	0	0	0	0	0	0	232	
Lane Group Flow (vph)	200	862	11	0	780	445	0	0	91	962	162	147	
Turn Type	Prot	NA	Perm		NA	Free			Free	Prot	NA	Perm	
Protected Phases	1 9	6			2					7	4		
Permitted Phases		6	6			Free			Free			4	
Actuated Green, G (s)	23.0	58.0	58.0		30.5	110.0			110.0	36.7	36.7	36.7	
Effective Green, g (s)	23.0	58.0	58.0		30.5	110.0			110.0	36.7	36.7	36.7	
Actuated g/C Ratio	0.21	0.53	0.53		0.28	1.00			1.00	0.33	0.33	0.33	
Clearance Time (s)		8.0	8.0		8.0					7.3	7.3	7.3	
Vehicle Extension (s)		3.0	3.0		3.0					3.0	3.0	3.0	
Lane Grp Cap (vph)	331	1670	747		883	1425			1450	1030	559	475	
v/s Ratio Prot	c0.13	0.27			c0.24					c0.31	0.10		
v/s Ratio Perm			0.01			0.31			0.06			0.10	
v/c Ratio	0.60	0.52	0.01		0.88	0.31			0.06	0.93	0.29	0.31	
Uniform Delay, d1	39.4	16.9	12.4		38.0	0.0			0.0	35.5	27.0	27.2	
Progression Factor	0.88	0.46	0.02		0.70	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.5	0.9	0.0		10.9	0.5			0.1	14.7	1.3	1.7	
Delay (s)	37.4	8.7	0.3		37.5	0.5			0.1	50.2	28.3	28.9	
Level of Service	D	A	A		D	A			A	D	C	C	
Approach Delay (s)		13.8			24.0			0.1			42.5		
Approach LOS		B			C			A			D		
Intersection Summary													
HCM 2000 Control Delay			27.7									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.89										
Actuated Cycle Length (s)			110.0									Sum of lost time (s)	26.0
Intersection Capacity Utilization			79.3%									ICU Level of Service	D
Analysis Period (min)			15										
c Critical Lane Group													

Lanes, Volumes, Timings
 9: Lawrenceville Hwy & Old Norcross Rd

Lawrenceville Hwy Study
 Existing Conditions - PM Peak-Optimized



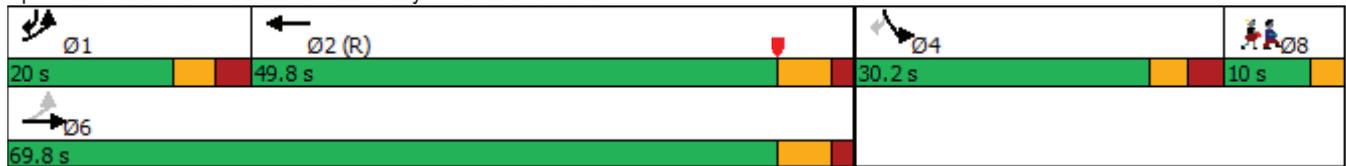
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø8
Lane Configurations							
Traffic Volume (vph)	194	1568	894	67	104	233	
Future Volume (vph)	194	1568	894	67	104	233	
Satd. Flow (prot)	1585	3169	3153	0	1545	1382	
Flt Permitted	0.196				0.950		
Satd. Flow (perm)	327	3169	3153	0	1545	1382	
Satd. Flow (RTOR)			8			186	
Lane Group Flow (vph)	211	1704	1045	0	113	253	
Turn Type	pm+pt	NA	NA		Prot	pm+ov	
Protected Phases	1	6	2		4	1	8
Permitted Phases	6					4	
Total Split (s)	20.0	69.8	49.8		30.2	20.0	10.0
Total Lost Time (s)	6.4	6.4	6.4		6.2	6.4	
Act Effct Green (s)	83.6	83.6	64.1		13.8	33.1	
Actuated g/C Ratio	0.76	0.76	0.58		0.13	0.30	
v/c Ratio	0.53	0.71	0.57		0.59	0.46	
Control Delay	27.5	3.7	13.1		57.2	10.6	
Queue Delay	0.0	0.7	0.2		0.0	0.0	
Total Delay	27.5	4.4	13.3		57.2	10.6	
LOS	C	A	B		E	B	
Approach Delay		6.9	13.3		25.0		
Approach LOS		A	B		C		
Queue Length 50th (ft)	93	44	128		77	35	
Queue Length 95th (ft)	167	m98	213		130	89	
Internal Link Dist (ft)		283	841		415		
Turn Bay Length (ft)	120					165	
Base Capacity (vph)	422	2409	1841		337	568	
Starvation Cap Reductn	0	356	0		0	0	
Spillback Cap Reductn	0	0	205		0	11	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.50	0.83	0.64		0.34	0.45	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 1 (1%), Referenced to phase 2:WBT, Start of Yellow
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.71
 Intersection Signal Delay: 10.9
 Intersection LOS: B
 Intersection Capacity Utilization 67.0%
 ICU Level of Service C
 Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: Lawrenceville Hwy & Old Norcross Rd



HCM Signalized Intersection Capacity Analysis

9: Lawrenceville Hwy & Old Norcross Rd

Lawrenceville Hwy Study
Existing Conditions - PM Peak-Optimized



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	194	1568	894	67	104	233
Future Volume (vph)	194	1568	894	67	104	233
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	0%		6%	
Total Lost time (s)	6.4	6.4	6.4		6.2	6.4
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1585	3169	3152		1545	1382
Flt Permitted	0.20	1.00	1.00		0.95	1.00
Satd. Flow (perm)	326	3169	3152		1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	211	1704	972	73	113	253
RTOR Reduction (vph)	0	0	3	0	0	141
Lane Group Flow (vph)	211	1704	1042	0	113	112
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	1	6	2		4	1
Permitted Phases	6					4
Actuated Green, G (s)	83.6	83.6	64.1		13.8	26.9
Effective Green, g (s)	83.6	83.6	64.1		13.8	26.9
Actuated g/C Ratio	0.76	0.76	0.58		0.13	0.24
Clearance Time (s)	6.4	6.4	6.4		6.2	6.4
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	397	2408	1836		193	337
v/s Ratio Prot	0.06	c0.54	0.33		c0.07	0.04
v/s Ratio Perm	0.34					0.04
v/c Ratio	0.53	0.71	0.57		0.59	0.33
Uniform Delay, d1	7.1	6.9	14.3		45.4	34.2
Progression Factor	5.58	0.32	0.75		1.00	1.00
Incremental Delay, d2	1.2	1.2	1.2		4.5	0.6
Delay (s)	40.9	3.4	12.0		49.9	34.8
Level of Service	D	A	B		D	C
Approach Delay (s)		7.5	12.0		39.4	
Approach LOS		A	B		D	

Intersection Summary

HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	67.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
10: WalMart SC & Lawrenceville Hwy

Lawrenceville Hwy Study
Existing Conditions - PM Peak-Optimized



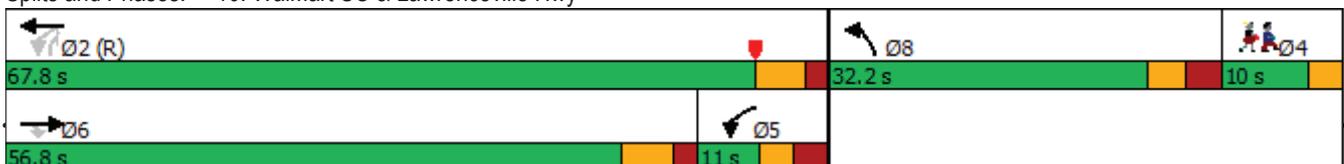
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø4
Lane Configurations	↑↑	↑	↘	↑↑	↘	↗	
Traffic Volume (vph)	1565	107	147	834	127	162	
Future Volume (vph)	1565	107	147	834	127	162	
Satd. Flow (prot)	3185	1425	1585	3169	1545	1382	
Flt Permitted			0.083		0.950		
Satd. Flow (perm)	3185	1425	138	3169	1545	1382	
Satd. Flow (RTOR)		72				176	
Lane Group Flow (vph)	1701	116	160	907	138	176	
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm	
Protected Phases	6		5	2	8		4
Permitted Phases		6	2			2	
Total Split (s)	56.8	56.8	11.0	67.8	32.2	67.8	10.0
Total Lost Time (s)	6.3	6.3	6.0	6.3	6.2	6.3	
Act Effct Green (s)	71.4	71.4	82.7	82.4	15.1	82.4	
Actuated g/C Ratio	0.65	0.65	0.75	0.75	0.14	0.75	
v/c Ratio	0.82	0.12	0.95	0.38	0.65	0.16	
Control Delay	10.7	0.9	86.5	5.8	58.6	1.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	10.7	0.9	86.5	5.8	58.6	1.1	
LOS	B	A	F	A	E	A	
Approach Delay	10.1			17.9	26.4		
Approach LOS	B			B	C		
Queue Length 50th (ft)	132	0	42	100	94	0	
Queue Length 95th (ft)	606	m10	#184	163	151	20	
Internal Link Dist (ft)	841			744	311		
Turn Bay Length (ft)		205	195				
Base Capacity (vph)	2066	950	169	2373	365	1079	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.82	0.12	0.95	0.38	0.38	0.16	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 26 (24%), Referenced to phase 2:WBTL, Start of Yellow
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.95
 Intersection Signal Delay: 14.3
 Intersection LOS: B
 Intersection Capacity Utilization 80.4%
 ICU Level of Service D
 Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: WalMart SC & Lawrenceville Hwy



HCM Signalized Intersection Capacity Analysis
 10: WalMart SC & Lawrenceville Hwy

Lawrenceville Hwy Study
 Existing Conditions - PM Peak-Optimized

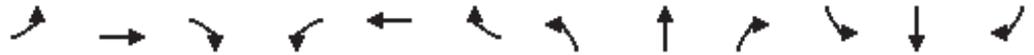


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	↑
Traffic Volume (vph)	1565	107	147	834	127	162
Future Volume (vph)	1565	107	147	834	127	162
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%			1%	6%	
Total Lost time (s)	6.3	6.3	6.0	6.3	6.2	6.3
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3185	1425	1585	3169	1545	1382
Flt Permitted	1.00	1.00	0.08	1.00	0.95	1.00
Satd. Flow (perm)	3185	1425	139	3169	1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1701	116	160	907	138	176
RTOR Reduction (vph)	0	25	0	0	0	44
Lane Group Flow (vph)	1701	91	160	907	138	132
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	8	
Permitted Phases		6	2			2
Actuated Green, G (s)	71.4	71.4	82.7	82.4	15.1	82.4
Effective Green, g (s)	71.4	71.4	82.7	82.4	15.1	82.4
Actuated g/C Ratio	0.65	0.65	0.75	0.75	0.14	0.75
Clearance Time (s)	6.3	6.3	6.0	6.3	6.2	6.3
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2067	924	170	2373	212	1035
v/s Ratio Prot	0.53		c0.04	0.29	c0.09	
v/s Ratio Perm		0.06	c0.66			0.10
v/c Ratio	0.82	0.10	0.94	0.38	0.65	0.13
Uniform Delay, d1	14.5	7.2	29.2	4.9	45.0	3.8
Progression Factor	0.46	0.18	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.8	0.2	51.8	0.5	7.0	0.3
Delay (s)	9.5	1.4	81.0	5.3	51.9	4.1
Level of Service	A	A	F	A	D	A
Approach Delay (s)	9.0			16.7	25.1	
Approach LOS	A			B	C	

Intersection Summary			
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	21.5
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
6: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd

Lawrenceville Hwy Study
Future No Build - AM 2025-Optimized

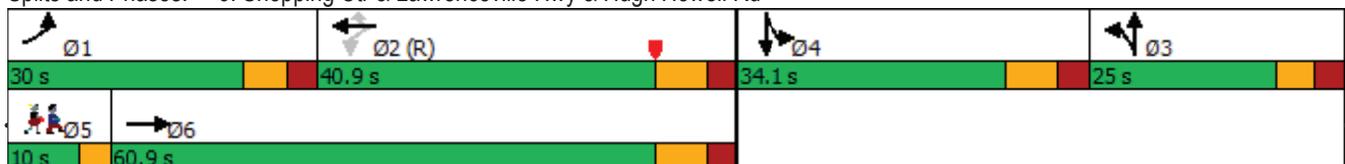


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	476	204	8	3	522	756	5	9	4	214	15	773
Future Volume (vph)	476	204	8	3	522	756	5	9	4	214	15	773
Satd. Flow (prot)	3074	3150	0	1569	3138	1404	0	1528	0	1490	1503	1404
Flt Permitted	0.950			0.608				0.987		0.950	0.958	
Satd. Flow (perm)	3074	3150	0	1004	3138	1404	0	1528	0	1490	1503	1404
Satd. Flow (RTOR)		4				733		4				730
Lane Group Flow (vph)	517	231	0	3	567	822	0	19	0	123	126	840
Turn Type	Prot	NA		Perm	NA	Perm	Split	NA		Split	NA	Free
Protected Phases	1	6			2		3	3		4	4	
Permitted Phases				2		2						Free
Total Split (s)	30.0	60.9		40.9	40.9	40.9	25.0	25.0		34.1	34.1	
Total Lost Time (s)	7.2	8.0		8.0	8.0	8.0		6.7		8.1	8.1	
Act Effct Green (s)	28.5	91.7		56.0	56.0	56.0		7.1		16.2	16.2	130.0
Actuated g/C Ratio	0.22	0.71		0.43	0.43	0.43		0.05		0.12	0.12	1.00
v/c Ratio	0.77	0.10		0.01	0.42	0.81		0.22		0.66	0.67	0.60
Control Delay	55.7	7.8		31.0	30.2	12.3		55.1		41.2	41.7	14.9
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	0.0
Total Delay	55.7	7.8		31.0	30.2	12.3		55.1		41.2	41.7	14.9
LOS	E	A		C	C	B		E		D	D	B
Approach Delay		40.9			19.6			55.1			20.9	
Approach LOS		D			B			E			C	
Queue Length 50th (ft)	211	23		1	158	41		12		116	120	666
Queue Length 95th (ft)	267	63		10	287	#404		39		m118	m122	657
Internal Link Dist (ft)		996			322			254			969	
Turn Bay Length (ft)	245			225						286		
Base Capacity (vph)	673	2223		432	1351	1021		218		298	300	1404
Starvation Cap Reductn	0	0		0	0	0		0		0	0	0
Spillback Cap Reductn	0	0		0	0	0		0		0	0	0
Storage Cap Reductn	0	0		0	0	0		0		0	0	0
Reduced v/c Ratio	0.77	0.10		0.01	0.42	0.81		0.09		0.41	0.42	0.60

Intersection Summary

Cycle Length: 130
 Actuated Cycle Length: 130
 Offset: 119 (92%), Referenced to phase 2:WBTL, Start of Yellow
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.81
 Intersection Signal Delay: 25.2
 Intersection LOS: C
 Intersection Capacity Utilization 90.4%
 ICU Level of Service E
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd



Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Total Split (s)	10.0
Total Lost Time (s)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
6: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd

Lawrenceville Hwy Study
Future No Build - AM 2025-Optimized



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	476	204	8	3	522	756	5	9	4	214	15	773
Future Volume (vph)	476	204	8	3	522	756	5	9	4	214	15	773
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			3%			10%				3%
Total Lost time (s)	7.2	8.0		8.0	8.0	8.0		6.7		8.1	8.1	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85		0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99		0.95	0.96	1.00
Satd. Flow (prot)	3074	3151		1569	3138	1404		1527		1490	1503	1404
Flt Permitted	0.95	1.00		0.61	1.00	1.00		0.99		0.95	0.96	1.00
Satd. Flow (perm)	3074	3151		1004	3138	1404		1527		1490	1503	1404
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	517	222	9	3	567	822	5	10	4	233	16	840
RTOR Reduction (vph)	0	1	0	0	0	440	0	4	0	0	0	0
Lane Group Flow (vph)	517	230	0	3	567	382	0	15	0	123	126	840
Turn Type	Prot	NA		Perm	NA	Perm	Split	NA		Split	NA	Free
Protected Phases	1	6			2		3	3		4		4
Permitted Phases				2		2						Free
Actuated Green, G (s)	28.5	87.6		51.9	51.9	51.9		3.4		16.2	16.2	130.0
Effective Green, g (s)	28.5	87.6		51.9	51.9	51.9		3.4		16.2	16.2	130.0
Actuated g/C Ratio	0.22	0.67		0.40	0.40	0.40		0.03		0.12	0.12	1.00
Clearance Time (s)	7.2	8.0		8.0	8.0	8.0		6.7		8.1	8.1	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)	673	2123		400	1252	560		39		185	187	1404
v/s Ratio Prot	c0.17	0.07			0.18			0.01		0.08	0.08	
v/s Ratio Perm				0.00		0.27						c0.60
v/c Ratio	0.77	0.11		0.01	0.45	0.68		0.39		0.66	0.67	0.60
Uniform Delay, d1	47.6	7.5		23.5	28.6	32.2		62.3		54.3	54.4	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		0.51	0.51	1.00
Incremental Delay, d2	5.3	0.0		0.0	1.2	6.6		6.3		6.9	7.3	1.5
Delay (s)	52.9	7.5		23.6	29.8	38.8		68.6		34.6	35.2	1.5
Level of Service	D	A		C	C	D		E		C	D	A
Approach Delay (s)		38.9			35.1			68.6			9.1	
Approach LOS		D			D			E			A	

Intersection Summary

HCM 2000 Control Delay	27.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	30.0
Intersection Capacity Utilization	90.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
7: Lawrenceville Hwy & Lynburn Dr

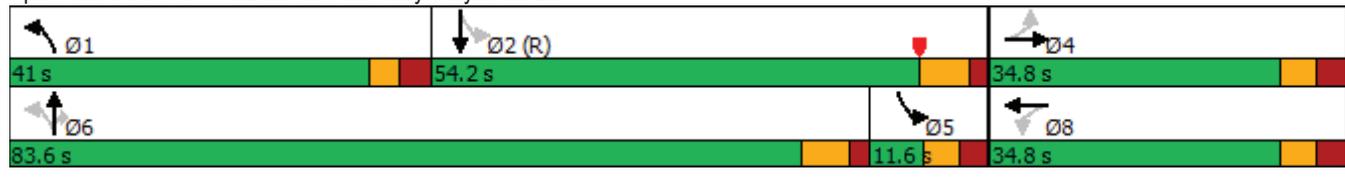
Lawrenceville Hwy Study
Future No Build - AM 2025-Optimized

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↕	↕	↕	↕	↕
Traffic Volume (vph)	32	15	54	52	22	19	390	790	61	17	896	57
Future Volume (vph)	32	15	54	52	22	19	390	790	61	17	896	57
Satd. Flow (prot)	0	1500	0	1545	1512	0	1617	3233	1446	1577	3125	0
Flt Permitted		0.876		0.574			0.155			0.330		
Satd. Flow (perm)	0	1336	0	933	1512	0	264	3233	1446	548	3125	0
Satd. Flow (RTOR)		41			21				86		6	
Lane Group Flow (vph)	0	110	0	57	45	0	424	859	66	18	1036	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4			8			6		6	2		
Total Split (s)	34.8	34.8		34.8	34.8		41.0	83.6	83.6	11.6	54.2	
Total Lost Time (s)		6.5		6.5	6.5		6.1	6.7	6.7	6.4	6.7	
Act Effct Green (s)		12.6		12.6	12.6		100.2	99.6	99.6	65.4	65.1	
Actuated g/C Ratio		0.10		0.10	0.10		0.77	0.77	0.77	0.50	0.50	
v/c Ratio		0.66		0.63	0.27		0.78	0.35	0.06	0.06	0.66	
Control Delay		53.6		84.9	36.3		17.1	3.3	0.1	4.2	9.9	
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		53.6		84.9	36.3		17.1	3.3	0.1	4.2	9.9	
LOS		D		F	D		B	A	A	A	A	
Approach Delay		53.6			63.5			7.5			9.8	
Approach LOS		D			E			A			A	
Queue Length 50th (ft)		57		47	19		47	39	0	1	17	
Queue Length 95th (ft)		116		91	55		m193	101	m0	m5	m524	
Internal Link Dist (ft)		350			139			969			634	
Turn Bay Length (ft)				90			180		200	135		
Base Capacity (vph)		322		203	345		594	2476	1127	316	1568	
Starvation Cap Reductn		0		0	0		0	0	0	0	0	
Spillback Cap Reductn		0		0	0		0	0	0	0	0	
Storage Cap Reductn		0		0	0		0	0	0	0	0	
Reduced v/c Ratio		0.34		0.28	0.13		0.71	0.35	0.06	0.06	0.66	

Intersection Summary

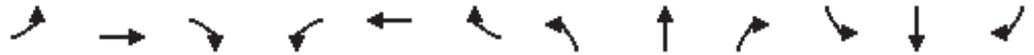
Cycle Length: 130
 Actuated Cycle Length: 130
 Offset: 6 (5%), Referenced to phase 2:SBTL, Start of Yellow
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 12.5
 Intersection LOS: B
 Intersection Capacity Utilization 82.8%
 ICU Level of Service E
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: Lawrenceville Hwy & Lynburn Dr



HCM Signalized Intersection Capacity Analysis
7: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
Future No Build - AM 2025-Optimized



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖	↗		↖	↕	↗	↖	↕	↗
Traffic Volume (vph)	32	15	54	52	22	19	390	790	61	17	896	57
Future Volume (vph)	32	15	54	52	22	19	390	790	61	17	896	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			6%			-3%				2%
Total Lost time (s)		6.5		6.5	6.5		6.1	6.7	6.7	6.4	6.7	
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt		0.93		1.00	0.93		1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.98		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1500		1545	1512		1617	3233	1446	1577	3125	
Flt Permitted		0.88		0.57	1.00		0.15	1.00	1.00	0.33	1.00	
Satd. Flow (perm)		1336		934	1512		263	3233	1446	547	3125	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	16	59	57	24	21	424	859	66	18	974	62
RTOR Reduction (vph)	0	37	0	0	19	0	0	0	17	0	3	0
Lane Group Flow (vph)	0	73	0	57	26	0	424	859	49	18	1033	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4		8	8		1	6	6	5	2	
Permitted Phases	4			8			6		6	2		
Actuated Green, G (s)		12.6		12.6	12.6		95.7	95.7	95.7	65.4	65.1	
Effective Green, g (s)		12.6		12.6	12.6		95.7	95.7	95.7	65.4	65.1	
Actuated g/C Ratio		0.10		0.10	0.10		0.74	0.74	0.74	0.50	0.50	
Clearance Time (s)		6.5		6.5	6.5		6.1	6.7	6.7	6.4	6.7	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		129		90	146		537	2379	1064	291	1564	
v/s Ratio Prot					0.02		c0.20	0.27		0.00	c0.33	
v/s Ratio Perm		0.05		c0.06			c0.38		0.03	0.03		
v/c Ratio		0.57		0.63	0.18		0.79	0.36	0.05	0.06	0.66	
Uniform Delay, d1		56.1		56.5	53.9		25.3	6.2	4.7	16.6	24.2	
Progression Factor		1.00		1.00	1.00		0.54	0.52	0.09	0.17	0.29	
Incremental Delay, d2		5.6		13.7	0.6		4.7	0.3	0.0	0.0	1.0	
Delay (s)		61.7		70.1	54.5		18.4	3.4	0.5	2.9	8.1	
Level of Service		E		E	D		B	A	A	A	A	
Approach Delay (s)		61.7			63.2			8.0			8.0	
Approach LOS		E			E			A			A	

Intersection Summary		
HCM 2000 Control Delay	12.4	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.76	B
Actuated Cycle Length (s)	130.0	Sum of lost time (s)
Intersection Capacity Utilization	82.8%	19.6
Analysis Period (min)	15	ICU Level of Service
		E
c Critical Lane Group		

Lanes, Volumes, Timings
8: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
Future No Build - AM 2025-Optimized

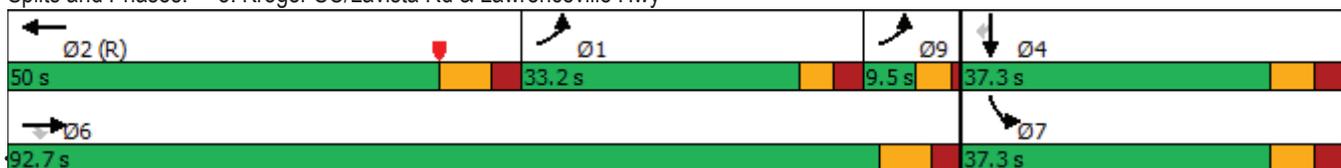


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	331	486	24	0	887	981	0	0	23	211	30	83
Future Volume (vph)	331	486	24	0	887	981	0	0	23	211	30	83
Satd. Flow (prot)	1585	3169	1418	0	3185	1425	0	0	1450	3090	1676	1425
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1585	3169	1418	0	3185	1425	0	0	1450	3090	1676	1425
Satd. Flow (RTOR)			36			349			358			161
Lane Group Flow (vph)	360	528	26	0	964	1066	0	0	25	229	33	90
Turn Type	Prot	NA	Perm		NA	Free			Free	Prot	NA	Perm
Protected Phases	1 9	6				2				7		4
Permitted Phases		6		6		Free		Free				4
Total Split (s)		92.7		92.7		50.0				37.3		37.3
Total Lost Time (s)		8.0		8.0		8.0				7.3		7.3
Act Effct Green (s)	36.5	84.7		84.7		42.0		130.0		30.0		30.0
Actuated g/C Ratio	0.28	0.65		0.65		0.32		1.00		0.23		0.23
v/c Ratio	0.81	0.26		0.03		0.94		0.75		0.02		0.20
Control Delay	65.0	8.0		1.6		45.5		7.3		0.0		43.0
Queue Delay	0.0	0.0		0.0		45.0		0.0		0.0		0.0
Total Delay	65.0	8.0		1.6		90.5		7.3		0.0		43.0
LOS	E	A		A		F		A		D		D
Approach Delay		30.3				46.8						32.0
Approach LOS		C				D						C
Queue Length 50th (ft)	306	148		3		365		536		0		83
Queue Length 95th (ft)	#451	91		5		#545		745		0		121
Internal Link Dist (ft)		634				283		65				481
Turn Bay Length (ft)	445				230				125		300	
Base Capacity (vph)	441	2064		936		1029		1425		1450		713
Starvation Cap Reductn	0	0		0		214		0		0		0
Spillback Cap Reductn	0	0		0		0		0		0		0
Storage Cap Reductn	0	0		0		0		0		0		0
Reduced v/c Ratio	0.82	0.26		0.03		1.18		0.75		0.02		0.20

Intersection Summary

Cycle Length: 130
 Actuated Cycle Length: 130
 Offset: 104 (80%), Referenced to phase 2:WBT, Start of Yellow
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.94
 Intersection Signal Delay: 40.3 Intersection LOS: D
 Intersection Capacity Utilization 73.9% ICU Level of Service D
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 8: Kroger SC/Lavista Rd & Lawrenceville Hwy



Lane Group	Ø1	Ø9
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	9
Permitted Phases		
Total Split (s)	33.2	9.5
Total Lost Time (s)		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

HCM Signalized Intersection Capacity Analysis
8: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
Future No Build - AM 2025-Optimized



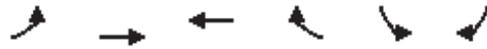
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘		↖	↗			↖	↗	↘	↖
Traffic Volume (vph)	331	486	24	0	887	981	0	0	23	211	30	83
Future Volume (vph)	331	486	24	0	887	981	0	0	23	211	30	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			0%			0%				0%
Total Lost time (s)	6.2	8.0	8.0		8.0	4.0			4.0	7.3	7.3	7.3
Lane Util. Factor	1.00	0.95	1.00		0.95	1.00			1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85			0.86	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00
Satd. Flow (prot)	1585	3169	1418		3185	1425			1450	3090	1676	1425
Flt Permitted	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00
Satd. Flow (perm)	1585	3169	1418		3185	1425			1450	3090	1676	1425
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	360	528	26	0	964	1066	0	0	25	229	33	90
RTOR Reduction (vph)	0	0	9	0	0	0	0	0	0	0	0	69
Lane Group Flow (vph)	360	528	17	0	964	1066	0	0	25	229	33	21
Turn Type	Prot	NA	Perm		NA	Free			Free	Prot	NA	Perm
Protected Phases	1 9	6			2					7	4	
Permitted Phases		6	6			Free			Free			4
Actuated Green, G (s)	38.2	84.7	84.7		42.0	130.0			130.0	30.0	30.0	30.0
Effective Green, g (s)	38.2	84.7	84.7		42.0	130.0			130.0	30.0	30.0	30.0
Actuated g/C Ratio	0.29	0.65	0.65		0.32	1.00			1.00	0.23	0.23	0.23
Clearance Time (s)		8.0	8.0		8.0					7.3	7.3	7.3
Vehicle Extension (s)		3.0	3.0		3.0					3.0	3.0	3.0
Lane Grp Cap (vph)	465	2064	923		1029	1425			1450	713	386	328
v/s Ratio Prot	0.23	0.17			0.30					0.07	0.02	
v/s Ratio Perm			0.01			0.75			0.02			0.01
v/c Ratio	0.77	0.26	0.02		0.94	0.75			0.02	0.32	0.09	0.06
Uniform Delay, d1	42.0	9.5	8.0		42.7	0.0			0.0	41.5	39.2	39.0
Progression Factor	1.16	0.81	0.95		0.79	1.00			1.00	1.00	1.00	1.00
Incremental Delay, d2	7.5	0.3	0.0		11.0	2.2			0.0	0.3	0.4	0.4
Delay (s)	56.0	7.9	7.6		44.8	2.2			0.0	41.8	39.7	39.4
Level of Service	E	A	A		D	A			A	D	D	D
Approach Delay (s)		26.9			22.4			0.0			41.0	
Approach LOS		C			C			A			D	

Intersection Summary

HCM 2000 Control Delay	25.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	73.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
9: Lawrenceville Hwy & Old Norcross Rd

Lawrenceville Hwy Study
Future No Build - AM 2025-Optimized

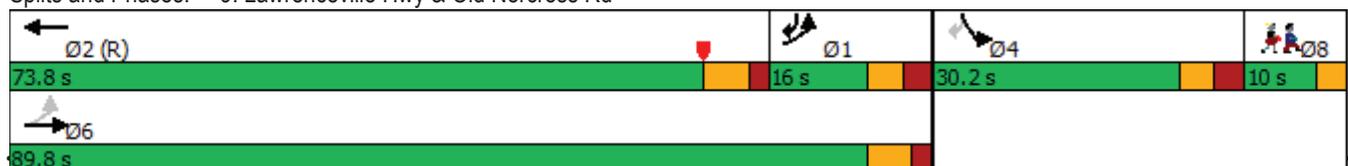


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø8
Lane Configurations							
Traffic Volume (vph)	151	569	1658	36	43	210	
Future Volume (vph)	151	569	1658	36	43	210	
Satd. Flow (prot)	1585	3169	3176	0	1545	1382	
Flt Permitted	0.076				0.950		
Satd. Flow (perm)	127	3169	3176	0	1545	1382	
Satd. Flow (RTOR)			2			111	
Lane Group Flow (vph)	164	618	1841	0	47	228	
Turn Type	pm+pt	NA	NA		Prot	pm+ov	
Protected Phases	1	6	2		4	1	8
Permitted Phases	6					4	
Total Split (s)	16.0	89.8	73.8		30.2	16.0	10.0
Total Lost Time (s)	6.4	6.4	6.4		6.2	6.4	
Act Effct Green (s)	109.8	111.1	93.8		10.8	23.4	
Actuated g/C Ratio	0.84	0.85	0.72		0.08	0.18	
v/c Ratio	0.77	0.23	0.80		0.37	0.67	
Control Delay	58.2	3.1	9.7		64.5	34.2	
Queue Delay	0.0	0.2	10.4		0.0	0.6	
Total Delay	58.2	3.3	20.1		64.5	34.9	
LOS	E	A	C		E	C	
Approach Delay		14.8	20.1		39.9		
Approach LOS		B	C		D		
Queue Length 50th (ft)	80	100	220		38	90	
Queue Length 95th (ft)	#163	121	226		78	177	
Internal Link Dist (ft)		283	841		415		
Turn Bay Length (ft)	120					165	
Base Capacity (vph)	214	2709	2293		285	339	
Starvation Cap Reductn	0	1276	0		0	0	
Spillback Cap Reductn	0	0	451		0	15	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.77	0.43	1.00		0.16	0.70	

Intersection Summary

Cycle Length: 130
 Actuated Cycle Length: 130
 Offset: 0 (0%), Referenced to phase 2:WBT, Start of Yellow
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.80
 Intersection Signal Delay: 20.6 Intersection LOS: C
 Intersection Capacity Utilization 85.7% ICU Level of Service E
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 9: Lawrenceville Hwy & Old Norcross Rd



HCM Signalized Intersection Capacity Analysis
 9: Lawrenceville Hwy & Old Norcross Rd

Lawrenceville Hwy Study
 Future No Build - AM 2025-Optimized



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	151	569	1658	36	43	210
Future Volume (vph)	151	569	1658	36	43	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	0%		6%	
Total Lost time (s)	6.4	6.4	6.4		6.2	6.4
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1585	3169	3175		1545	1382
Flt Permitted	0.08	1.00	1.00		0.95	1.00
Satd. Flow (perm)	127	3169	3175		1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	164	618	1802	39	47	228
RTOR Reduction (vph)	0	0	1	0	0	95
Lane Group Flow (vph)	164	618	1840	0	47	133
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	1	6	2		4	1
Permitted Phases	6					4
Actuated Green, G (s)	108.6	108.6	92.6		8.8	18.4
Effective Green, g (s)	108.6	108.6	92.6		8.8	18.4
Actuated g/C Ratio	0.84	0.84	0.71		0.07	0.14
Clearance Time (s)	6.4	6.4	6.4		6.2	6.4
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	213	2647	2261		104	263
v/s Ratio Prot	c0.06	0.19	c0.58		0.03	c0.04
v/s Ratio Perm	0.58					0.06
v/c Ratio	0.77	0.23	0.81		0.45	0.50
Uniform Delay, d1	28.2	2.2	12.8		58.3	51.6
Progression Factor	1.24	1.22	0.54		1.00	1.00
Incremental Delay, d2	15.1	0.2	2.4		3.1	1.5
Delay (s)	50.2	2.9	9.4		61.4	53.1
Level of Service	D	A	A		E	D
Approach Delay (s)		12.8	9.4		54.5	
Approach LOS		B	A		D	

Intersection Summary

HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	85.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
10: WalMart SC & Lawrenceville Hwy

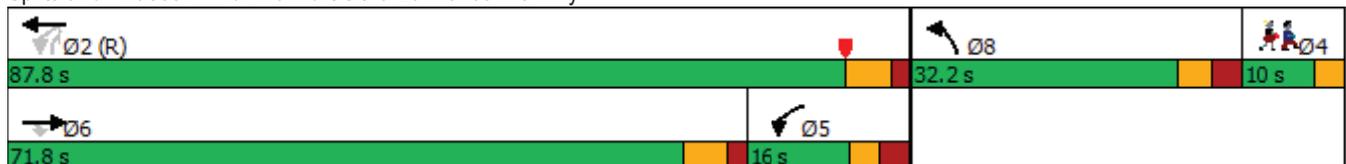


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø4
Lane Configurations	↑↑	↑	↓	↑↑	↓	↑	
Traffic Volume (vph)	496	116	175	1531	163	191	
Future Volume (vph)	496	116	175	1531	163	191	
Satd. Flow (prot)	3185	1425	1585	3169	1545	1382	
Flt Permitted			0.437		0.950		
Satd. Flow (perm)	3185	1425	729	3169	1545	1382	
Satd. Flow (RTOR)		126				208	
Lane Group Flow (vph)	539	126	190	1664	177	208	
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm	
Protected Phases	6		5	2	8		4
Permitted Phases		6	2			2	
Total Split (s)	71.8	71.8	16.0	87.8	32.2	87.8	10.0
Total Lost Time (s)	6.3	6.3	6.0	6.3	6.2	6.3	
Act Effct Green (s)	81.7	81.7	98.0	97.7	19.8	97.7	
Actuated g/C Ratio	0.63	0.63	0.75	0.75	0.15	0.75	
v/c Ratio	0.27	0.13	0.31	0.70	0.75	0.19	
Control Delay	5.1	0.5	7.7	11.2	72.0	1.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	5.1	0.5	7.7	11.2	72.0	1.2	
LOS	A	A	A	B	E	A	
Approach Delay	4.2			10.8	33.7		
Approach LOS	A			B	C		
Queue Length 50th (ft)	40	0	39	341	144	0	
Queue Length 95th (ft)	54	1	75	505	216	22	
Internal Link Dist (ft)	841			744	311		
Turn Bay Length (ft)		205	195				
Base Capacity (vph)	2002	942	615	2382	309	1090	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.27	0.13	0.31	0.70	0.57	0.19	

Intersection Summary

Cycle Length: 130
 Actuated Cycle Length: 130
 Offset: 16 (12%), Referenced to phase 2:WBTL, Start of Yellow
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.75
 Intersection Signal Delay: 12.4
 Intersection LOS: B
 Intersection Capacity Utilization 67.5%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 10: WalMart SC & Lawrenceville Hwy



HCM Signalized Intersection Capacity Analysis
 10: WalMart SC & Lawrenceville Hwy

Lawrenceville Hwy Study
 Future No Build - AM 2025-Optimized



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	↑
Traffic Volume (vph)	496	116	175	1531	163	191
Future Volume (vph)	496	116	175	1531	163	191
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%			1%	6%	
Total Lost time (s)	6.3	6.3	6.0	6.3	6.2	6.3
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3185	1425	1585	3169	1545	1382
Flt Permitted	1.00	1.00	0.44	1.00	0.95	1.00
Satd. Flow (perm)	3185	1425	729	3169	1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	539	126	190	1664	177	208
RTOR Reduction (vph)	0	47	0	0	0	52
Lane Group Flow (vph)	539	79	190	1664	177	156
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	8	
Permitted Phases		6	2			2
Actuated Green, G (s)	81.7	81.7	98.0	97.7	19.8	97.7
Effective Green, g (s)	81.7	81.7	98.0	97.7	19.8	97.7
Actuated g/C Ratio	0.63	0.63	0.75	0.75	0.15	0.75
Clearance Time (s)	6.3	6.3	6.0	6.3	6.2	6.3
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2001	895	615	2381	235	1038
v/s Ratio Prot	0.17		0.02	c0.53	c0.11	
v/s Ratio Perm		0.06	0.21			0.11
v/c Ratio	0.27	0.09	0.31	0.70	0.75	0.15
Uniform Delay, d1	10.8	9.5	6.2	8.5	52.8	4.5
Progression Factor	0.41	0.09	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.2	0.3	1.7	12.8	0.3
Delay (s)	4.8	1.1	6.5	10.2	65.5	4.8
Level of Service	A	A	A	B	E	A
Approach Delay (s)	4.1			9.8	32.7	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	11.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	21.5
Intersection Capacity Utilization	67.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Total Split (s)	10.0
Total Lost Time (s)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

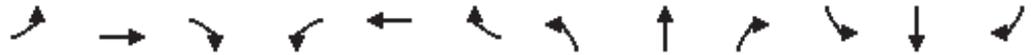
HCM Signalized Intersection Capacity Analysis
6: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd

Lawrenceville Hwy Study
Future No Build - PM 2025 - Optimized

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 			 			 		 	 	
Traffic Volume (vph)	666	495	47	10	427	553	19	31	5	589	38	797
Future Volume (vph)	666	495	47	10	427	553	19	31	5	589	38	797
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			3%			10%			3%	
Total Lost time (s)	7.2	8.0		8.0	8.0	8.0		6.7		8.1	8.1	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85		0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98		0.95	0.96	1.00
Satd. Flow (prot)	3074	3128		1569	3138	1404		1548		1490	1503	1404
Flt Permitted	0.95	1.00		0.36	1.00	1.00		0.98		0.95	0.96	1.00
Satd. Flow (perm)	3074	3128		594	3138	1404		1548		1490	1503	1404
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	724	538	51	11	464	601	21	34	5	640	41	866
RTOR Reduction (vph)	0	4	0	0	0	456	0	3	0	0	0	0
Lane Group Flow (vph)	724	585	0	11	464	145	0	57	0	339	342	866
Turn Type	Prot	NA		Perm	NA	Perm	Split	NA		Split	NA	Free
Protected Phases	1	6			2		3	3		4	4	
Permitted Phases				2		2						Free
Actuated Green, G (s)	34.0	75.0		33.8	33.8	33.8		9.3		32.9	32.9	140.0
Effective Green, g (s)	34.0	75.0		33.8	33.8	33.8		9.3		32.9	32.9	140.0
Actuated g/C Ratio	0.24	0.54		0.24	0.24	0.24		0.07		0.23	0.23	1.00
Clearance Time (s)	7.2	8.0		8.0	8.0	8.0		6.7		8.1	8.1	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)	746	1675		143	757	338		102		350	353	1404
v/s Ratio Prot	c0.24	0.19			0.15			0.04		0.23	c0.23	
v/s Ratio Perm				0.02		0.10						c0.62
v/c Ratio	0.97	0.35		0.08	0.61	0.43		0.56		0.97	0.97	0.62
Uniform Delay, d1	52.5	18.6		41.0	47.3	44.9		63.4		53.0	53.0	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		0.59	0.59	1.00
Incremental Delay, d2	25.7	0.1		1.0	3.7	3.9		6.9		26.4	26.3	1.0
Delay (s)	78.2	18.7		42.1	51.0	48.9		70.2		57.9	57.8	1.0
Level of Service	E	B		D	D	D		E		E	E	A
Approach Delay (s)		51.5			49.7			70.2			26.1	
Approach LOS		D			D			E			C	
Intersection Summary												
HCM 2000 Control Delay			41.5									HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio			0.91									
Actuated Cycle Length (s)			140.0							30.0		
Intersection Capacity Utilization			82.4%									ICU Level of Service E
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 7: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
 Future No Build - PM 2025 - Optimized



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↙	↘		↙	↕	↘	↙	↕	↘
Traffic Volume (vph)	73	40	120	288	96	72	119	930	201	55	1016	80
Future Volume (vph)	73	40	120	288	96	72	119	930	201	55	1016	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			6%			-3%			2%	
Total Lost time (s)		6.5		6.5	6.5		6.1	6.7	6.7	6.4	6.7	
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Fr _t		0.93		1.00	0.94		1.00	1.00	0.85	1.00	0.99	
Fl _t Protected		0.98		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1505		1545	1522		1617	3233	1446	1577	3119	
Fl _t Permitted		0.82		0.55	1.00		0.11	1.00	1.00	0.17	1.00	
Satd. Flow (perm)		1247		894	1522		179	3233	1446	276	3119	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	79	43	130	313	104	78	129	1011	218	60	1104	87
RTOR Reduction (vph)	0	28	0	0	20	0	0	0	90	0	4	0
Lane Group Flow (vph)	0	224	0	313	162	0	129	1011	128	60	1187	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4		8	8		1	6	6	5	2	
Permitted Phases	4			8			6		6	2		
Actuated Green, G (s)		50.6		50.6	50.6		73.8	64.3	64.3	66.1	60.6	
Effective Green, g (s)		50.6		50.6	50.6		73.8	64.3	64.3	66.1	60.6	
Actuated g/C Ratio		0.36		0.36	0.36		0.53	0.46	0.46	0.47	0.43	
Clearance Time (s)		6.5		6.5	6.5		6.1	6.7	6.7	6.4	6.7	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		450		323	550		191	1484	664	181	1350	
v/s Ratio Prot					0.11		c0.05	0.31		0.01	c0.38	
v/s Ratio Perm		0.18		c0.35			0.31		0.09	0.14		
v/c Ratio		0.50		0.97	0.29		0.68	0.68	0.19	0.33	0.88	
Uniform Delay, d ₁		34.8		43.9	31.9		48.1	29.8	22.5	40.1	36.4	
Progression Factor		1.00		1.00	1.00		0.69	0.39	0.04	0.30	0.32	
Incremental Delay, d ₂		0.9		41.2	0.3		4.6	1.3	0.3	0.6	5.3	
Delay (s)		35.7		85.2	32.3		37.6	13.0	1.2	12.7	16.8	
Level of Service		D		F	C		D	B	A	B	B	
Approach Delay (s)		35.7			65.7			13.5			16.6	
Approach LOS		D			E			B			B	

Intersection Summary		
HCM 2000 Control Delay	24.0	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.90	C
Actuated Cycle Length (s)	140.0	Sum of lost time (s)
Intersection Capacity Utilization	95.6%	19.6
Analysis Period (min)	15	ICU Level of Service
		F
c Critical Lane Group		

Lane Group	Ø1	Ø9
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	9
Permitted Phases		
Total Split (s)	24.0	9.5
Total Lost Time (s)		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

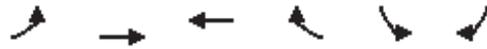
HCM Signalized Intersection Capacity Analysis
8: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
Future No Build - PM 2025 - Optimized

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		 			 					 			
Traffic Volume (vph)	199	855	21	0	775	441	0	0	91	954	161	376	
Future Volume (vph)	199	855	21	0	775	441	0	0	91	954	161	376	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Grade (%)		1%			0%			0%				0%	
Total Lost time (s)	6.2	8.0	8.0		8.0	4.0			4.0	7.3	7.3	7.3	
Lane Util. Factor	1.00	0.95	1.00		0.95	1.00			1.00	0.97	1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85			0.86	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1585	3169	1418		3185	1425			1450	3090	1676	1425	
Flt Permitted	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1585	3169	1418		3185	1425			1450	3090	1676	1425	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	216	929	23	0	842	479	0	0	99	1037	175	409	
RTOR Reduction (vph)	0	0	11	0	0	0	0	0	0	0	0	233	
Lane Group Flow (vph)	216	929	12	0	842	479	0	0	99	1037	175	176	
Turn Type	Prot	NA	Perm		NA	Free			Free	Prot	NA	Perm	
Protected Phases	1 9	6			2					7	4		
Permitted Phases		6	6			Free			Free			4	
Actuated Green, G (s)	29.0	75.0	75.0		41.5	140.0			140.0	49.7	49.7	49.7	
Effective Green, g (s)	29.0	75.0	75.0		41.5	140.0			140.0	49.7	49.7	49.7	
Actuated g/C Ratio	0.21	0.54	0.54		0.30	1.00			1.00	0.36	0.36	0.36	
Clearance Time (s)		8.0	8.0		8.0					7.3	7.3	7.3	
Vehicle Extension (s)		3.0	3.0		3.0					3.0	3.0	3.0	
Lane Grp Cap (vph)	328	1697	759		944	1425			1450	1096	594	505	
v/s Ratio Prot	c0.14	0.29			c0.26					c0.34	0.10		
v/s Ratio Perm			0.01			0.34			0.07			0.12	
v/c Ratio	0.66	0.55	0.02		0.89	0.34			0.07	0.95	0.29	0.35	
Uniform Delay, d1	51.0	21.4	15.2		47.1	0.0			0.0	43.9	32.5	33.2	
Progression Factor	0.75	0.28	0.00		0.78	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.7	1.0	0.0		10.9	0.5			0.1	15.8	1.3	1.9	
Delay (s)	41.8	6.9	0.0		47.8	0.5			0.1	59.6	33.8	35.1	
Level of Service	D	A	A		D	A			A	E	C	D	
Approach Delay (s)		13.2			30.7			0.1			50.7		
Approach LOS		B			C			A			D		
Intersection Summary													
HCM 2000 Control Delay			32.8									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.90										
Actuated Cycle Length (s)			140.0									Sum of lost time (s)	26.0
Intersection Capacity Utilization			84.2%									ICU Level of Service	E
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
 9: Lawrenceville Hwy & Old Norcross Rd

Lawrenceville Hwy Study
 Future No Build - PM 2025 - Optimized



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	210	1690	964	73	113	252
Future Volume (vph)	210	1690	964	73	113	252
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	0%		6%	
Total Lost time (s)	6.4	6.4	6.4		6.2	6.4
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1585	3169	3152		1545	1382
Flt Permitted	0.19	1.00	1.00		0.95	1.00
Satd. Flow (perm)	318	3169	3152		1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	228	1837	1048	79	123	274
RTOR Reduction (vph)	0	0	3	0	0	123
Lane Group Flow (vph)	228	1837	1124	0	123	151
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	1	6	2		4	1
Permitted Phases	6					4
Actuated Green, G (s)	111.0	111.0	91.2		16.4	29.8
Effective Green, g (s)	111.0	111.0	91.2		16.4	29.8
Actuated g/C Ratio	0.79	0.79	0.65		0.12	0.21
Clearance Time (s)	6.4	6.4	6.4		6.2	6.4
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	373	2512	2053		180	294
v/s Ratio Prot	0.06	c0.58	0.36		c0.08	0.05
v/s Ratio Perm	0.43					0.06
v/c Ratio	0.61	0.73	0.55		0.68	0.51
Uniform Delay, d1	8.0	7.1	13.2		59.3	48.7
Progression Factor	6.32	0.34	0.81		1.00	1.00
Incremental Delay, d2	2.6	1.2	1.0		10.2	1.5
Delay (s)	53.1	3.7	11.6		69.5	50.2
Level of Service	D	A	B		E	D
Approach Delay (s)		9.1	11.6		56.2	
Approach LOS		A	B		E	

Intersection Summary			
HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	70.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 10: WalMart SC & Lawrenceville Hwy

Lawrenceville Hwy Study
 Future No Build - PM 2025 - Optimized



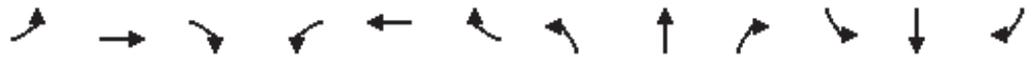
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	↑
Traffic Volume (vph)	1687	116	159	900	137	175
Future Volume (vph)	1687	116	159	900	137	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%			1%	6%	
Total Lost time (s)	6.3	6.3	6.0	6.3	6.2	6.3
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3185	1425	1585	3169	1545	1382
Flt Permitted	1.00	1.00	0.07	1.00	0.95	1.00
Satd. Flow (perm)	3185	1425	109	3169	1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1834	126	173	978	149	190
RTOR Reduction (vph)	0	22	0	0	0	42
Lane Group Flow (vph)	1834	104	173	978	149	148
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	8	
Permitted Phases		6	2			2
Actuated Green, G (s)	93.8	93.8	109.1	108.8	18.7	108.8
Effective Green, g (s)	93.8	93.8	109.1	108.8	18.7	108.8
Actuated g/C Ratio	0.67	0.67	0.78	0.78	0.13	0.78
Clearance Time (s)	6.3	6.3	6.0	6.3	6.2	6.3
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2133	954	179	2462	206	1074
v/s Ratio Prot	0.58		c0.06	0.31	c0.10	
v/s Ratio Perm		0.07	c0.69			0.11
v/c Ratio	0.86	0.11	0.97	0.40	0.72	0.14
Uniform Delay, d1	18.0	8.2	38.7	5.0	58.2	3.9
Progression Factor	0.67	0.24	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.4	0.2	56.9	0.5	11.8	0.3
Delay (s)	15.5	2.1	95.6	5.5	70.0	4.2
Level of Service	B	A	F	A	E	A
Approach Delay (s)	14.6			19.1	33.1	
Approach LOS	B			B	C	

Intersection Summary			
HCM 2000 Control Delay	17.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.5
Intersection Capacity Utilization	85.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Total Split (s)	10.0
Total Lost Time (s)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
 6: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd

Lawrenceville Hwy Study
 Future No Build - AM 2045- Optimized



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↖↗		↖	↖↗	↖		↖↗		↖	↖↗	↖
Traffic Volume (vph)	640	275	11	3	703	1018	6	13	5	288	19	1041
Future Volume (vph)	640	275	11	3	703	1018	6	13	5	288	19	1041
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			3%			10%			3%	
Total Lost time (s)	7.2	8.0		8.0	8.0	8.0		6.7		8.1	8.1	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85		0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99		0.95	0.96	1.00
Satd. Flow (prot)	3074	3151		1569	3138	1404		1531		1490	1503	1404
Flt Permitted	0.95	1.00		0.56	1.00	1.00		0.99		0.95	0.96	1.00
Satd. Flow (perm)	3074	3151		929	3138	1404		1531		1490	1503	1404
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	696	299	12	3	764	1107	7	14	5	313	21	1132
RTOR Reduction (vph)	0	1	0	0	0	413	0	5	0	0	0	0
Lane Group Flow (vph)	696	310	0	3	764	694	0	21	0	166	168	1132
Turn Type	Prot	NA		Perm	NA	Perm	Split	NA		Split	NA	Free
Protected Phases	1	6			2		3	3		4	4	
Permitted Phases				2		2						Free
Actuated Green, G (s)	45.9	108.6		55.5	55.5	55.5		5.5		23.1	23.1	160.0
Effective Green, g (s)	45.9	108.6		55.5	55.5	55.5		5.5		23.1	23.1	160.0
Actuated g/C Ratio	0.29	0.68		0.35	0.35	0.35		0.03		0.14	0.14	1.00
Clearance Time (s)	7.2	8.0		8.0	8.0	8.0		6.7		8.1	8.1	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)	881	2138		322	1088	487		52		215	216	1404
v/s Ratio Prot	0.23	0.10			0.24			0.01		0.11	0.11	
v/s Ratio Perm				0.00		c0.49						c0.81
v/c Ratio	0.79	0.14		0.01	0.70	1.42		0.41		0.77	0.78	0.81
Uniform Delay, d1	52.6	9.2		34.2	45.1	52.2		75.7		65.9	66.0	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		0.59	0.59	1.00
Incremental Delay, d2	4.9	0.0		0.1	3.8	202.6		5.1		1.6	1.6	0.5
Delay (s)	57.5	9.2		34.3	48.9	254.8		80.8		40.5	40.5	0.5
Level of Service	E	A		C	D	F		F		D	D	A
Approach Delay (s)		42.6			170.5			80.8			9.6	
Approach LOS		D			F			F			A	

Intersection Summary		
HCM 2000 Control Delay	86.6	HCM 2000 Level of Service F
HCM 2000 Volume to Capacity ratio	1.21	
Actuated Cycle Length (s)	160.0	Sum of lost time (s) 30.0
Intersection Capacity Utilization	113.6%	ICU Level of Service H
Analysis Period (min)	15	
c Critical Lane Group		

HCM Signalized Intersection Capacity Analysis

7: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
Future No Build - AM 2045- Optimized



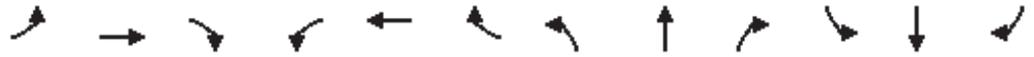
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↙	↘		↙	↕	↘	↙	↕	↘
Traffic Volume (vph)	43	19	73	70	30	25	526	1063	82	22	1205	76
Future Volume (vph)	43	19	73	70	30	25	526	1063	82	22	1205	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			6%			-3%				2%
Total Lost time (s)		6.5		6.5	6.5		6.1	6.7	6.7	6.4	6.7	
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt		0.93		1.00	0.93		1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.98		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1500		1545	1516		1617	3233	1446	1577	3125	
Flt Permitted		0.87		0.48	1.00		0.07	1.00	1.00	0.25	1.00	
Satd. Flow (perm)		1326		785	1516		111	3233	1446	408	3125	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	21	79	76	33	27	572	1155	89	24	1310	83
RTOR Reduction (vph)	0	28	0	0	19	0	0	0	23	0	3	0
Lane Group Flow (vph)	0	119	0	76	41	0	572	1155	66	24	1390	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4		8	8		1	6	6	5	2	
Permitted Phases	4			8			6		6	2		
Actuated Green, G (s)		19.4		19.4	19.4		117.9	117.9	117.9	65.0	64.7	
Effective Green, g (s)		19.4		19.4	19.4		117.9	117.9	117.9	65.0	64.7	
Actuated g/C Ratio		0.12		0.12	0.12		0.74	0.74	0.74	0.41	0.40	
Clearance Time (s)		6.5		6.5	6.5		6.1	6.7	6.7	6.4	6.7	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		160		95	183		614	2382	1065	188	1263	
v/s Ratio Prot					0.03		c0.33	0.36		0.00	c0.44	
v/s Ratio Perm		0.09		c0.10			0.36		0.05	0.05		
v/c Ratio		0.74		0.80	0.22		0.93	0.48	0.06	0.13	1.10	
Uniform Delay, d1		67.9		68.4	63.5		44.5	8.6	5.8	30.0	47.6	
Progression Factor		1.00		1.00	1.00		0.77	0.41	0.01	0.10	0.08	
Incremental Delay, d2		16.9		36.6	0.6		2.9	0.1	0.0	0.0	46.6	
Delay (s)		84.8		105.0	64.1		37.4	3.6	0.1	3.0	50.5	
Level of Service		F		F	E		D	A	A	A	D	
Approach Delay (s)		84.8			87.0			14.1			49.7	
Approach LOS		F			F			B			D	

Intersection Summary

HCM 2000 Control Delay	34.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	19.6
Intersection Capacity Utilization	103.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
8: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
Future No Build - AM 2045- Optimized



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	445	654	32	0	1192	1321	0	0	31	283	40	111
Future Volume (vph)	445	654	32	0	1192	1321	0	0	31	283	40	111
Satd. Flow (prot)	1585	3169	1418	0	3185	1425	0	0	1450	3090	1676	1425
Flt Permitted	0.950			0.950								
Satd. Flow (perm)	1585	3169	1418	0	3185	1425	0	0	1450	3090	1676	1425
Satd. Flow (RTOR)	35			284			260			131		
Lane Group Flow (vph)	484	711	35	0	1296	1436	0	0	34	308	43	121
Turn Type	Prot	NA	Perm		NA	Free			Free	Prot	NA	Perm
Protected Phases	1	9	6	2			7			4		
Permitted Phases	6		6	Free			Free			4		
Total Split (s)	122.7		122.7	67.2			37.3			37.3	37.3	
Total Lost Time (s)	8.0		8.0	8.0			7.3			7.3	7.3	
Act Effct Green (s)	43.1	114.7	114.7	59.2		160.0	160.0		30.0	30.0	30.0	
Actuated g/C Ratio	0.27	0.72	0.72	0.37		1.00	1.00		0.19	0.19	0.19	
v/c Ratio	1.14	0.31	0.03	1.10		1.01	0.02		0.53	0.14	0.32	
Control Delay	125.9	2.5	0.1	82.2		23.8	0.0		62.5	55.7	9.0	
Queue Delay	0.0	0.0	0.0	1.7		0.0	0.0		0.0	0.0	0.0	
Total Delay	125.9	2.5	0.1	84.0		23.8	0.0		62.5	55.7	9.0	
LOS	F	A	A	F		C	A		E	E	A	
Approach Delay	51.0		52.4			48.2						
Approach LOS	D		D			D						
Queue Length 50th (ft)	~538	24	0	~804		~465	0		152	38	0	
Queue Length 95th (ft)	#763	28	m0	m#737		m394	0		204	77	49	
Internal Link Dist (ft)	634		283			65			481			
Turn Bay Length (ft)	445	230		125			300			210		
Base Capacity (vph)	426	2271	1026	1178		1425	1450		579	314	373	
Starvation Cap Reductn	0	0	0	354		0	0		0	0	0	
Spillback Cap Reductn	0	0	0	187		0	0		0	0	7	
Storage Cap Reductn	0	0	0	0		0	0		0	0	0	
Reduced v/c Ratio	1.14	0.31	0.03	1.57		1.01	0.02		0.53	0.14	0.33	

Intersection Summary

Cycle Length: 160
 Actuated Cycle Length: 160
 Offset: 157 (98%), Referenced to phase 2:WBT, Start of Yellow
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.14
 Intersection Signal Delay: 51.1
 Intersection LOS: D
 Intersection Capacity Utilization 90.9%
 ICU Level of Service E
 Analysis Period (min) 15

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

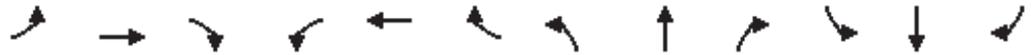
Splits and Phases: 8: Kroger SC/Lavista Rd & Lawrenceville Hwy



Lane Group	Ø1	Ø9
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	9
Permitted Phases		
Total Split (s)	46.0	9.5
Total Lost Time (s)		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

HCM Signalized Intersection Capacity Analysis
 8: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
 Future No Build - AM 2045- Optimized

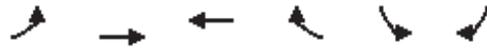


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↘		↑↑	↘			↘	↘↘	↑	↘
Traffic Volume (vph)	445	654	32	0	1192	1321	0	0	31	283	40	111
Future Volume (vph)	445	654	32	0	1192	1321	0	0	31	283	40	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			0%			0%				0%
Total Lost time (s)	6.2	8.0	8.0		8.0	4.0			4.0	7.3	7.3	7.3
Lane Util. Factor	1.00	0.95	1.00		0.95	1.00			1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85			0.86	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00
Satd. Flow (prot)	1585	3169	1418		3185	1425			1450	3090	1676	1425
Flt Permitted	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00
Satd. Flow (perm)	1585	3169	1418		3185	1425			1450	3090	1676	1425
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	484	711	35	0	1296	1436	0	0	34	308	43	121
RTOR Reduction (vph)	0	0	10	0	0	0	0	0	0	0	0	98
Lane Group Flow (vph)	484	711	25	0	1296	1436	0	0	34	308	43	23
Turn Type	Prot	NA	Perm		NA	Free			Free	Prot	NA	Perm
Protected Phases	1 9	6			2					7	4	
Permitted Phases		6	6			Free			Free			4
Actuated Green, G (s)	44.8	114.7	114.7		59.2	160.0			160.0	30.0	30.0	30.0
Effective Green, g (s)	44.8	114.7	114.7		59.2	160.0			160.0	30.0	30.0	30.0
Actuated g/C Ratio	0.28	0.72	0.72		0.37	1.00			1.00	0.19	0.19	0.19
Clearance Time (s)		8.0	8.0		8.0					7.3	7.3	7.3
Vehicle Extension (s)		3.0	3.0		3.0					3.0	3.0	3.0
Lane Grp Cap (vph)	443	2271	1016		1178	1425			1450	579	314	267
v/s Ratio Prot	0.31	0.22			0.41					0.10	0.03	
v/s Ratio Perm			0.02			c1.01			0.02			0.02
v/c Ratio	1.09	0.31	0.02		1.10	1.01			0.02	0.53	0.14	0.08
Uniform Delay, d1	57.6	8.3	6.5		50.4	80.0			0.0	58.7	54.2	53.7
Progression Factor	0.83	0.26	0.00		0.74	1.00			1.00	1.00	1.00	1.00
Incremental Delay, d2	68.0	0.3	0.0		46.5	9.1			0.0	0.9	0.9	0.6
Delay (s)	115.8	2.4	0.1		83.7	89.1			0.0	59.6	55.1	54.3
Level of Service	F	A	A		F	F			A	E	E	D
Approach Delay (s)		47.0			86.5			0.0			57.8	
Approach LOS		D			F			A			E	

Intersection Summary		
HCM 2000 Control Delay	72.0	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.20	E
Actuated Cycle Length (s)	160.0	Sum of lost time (s)
Intersection Capacity Utilization	90.9%	26.0
Analysis Period (min)	15	ICU Level of Service
		E
c Critical Lane Group		

Lanes, Volumes, Timings
9: Lawrenceville Hwy & Old Norcross Rd

Lawrenceville Hwy Study
Future No Build - AM 2045- Optimized



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø8
Lane Configurations							
Traffic Volume (vph)	204	764	2231	48	57	282	
Future Volume (vph)	204	764	2231	48	57	282	
Satd. Flow (prot)	1585	3169	3176	0	1545	1382	
Flt Permitted	0.032				0.950		
Satd. Flow (perm)	53	3169	3176	0	1545	1382	
Satd. Flow (RTOR)			2			79	
Lane Group Flow (vph)	222	830	2477	0	62	307	
Turn Type	pm+pt	NA	NA		Prot	pm+ov	
Protected Phases	1	6	2		4	1	8
Permitted Phases	6					4	
Total Split (s)	20.0	119.8	99.8		30.2	20.0	10.0
Total Lost Time (s)	6.4	6.4	6.4		6.2	6.4	
Act Effct Green (s)	138.2	139.5	118.2		12.5	29.0	
Actuated g/C Ratio	0.86	0.87	0.74		0.08	0.18	
v/c Ratio	1.26	0.30	1.06		0.52	0.97	
Control Delay	198.6	5.7	45.2		85.5	91.8	
Queue Delay	0.0	0.3	19.9		0.0	18.7	
Total Delay	198.6	6.0	65.0		85.5	110.4	
LOS	F	A	E		F	F	
Approach Delay		46.7	65.0		106.2		
Approach LOS		D	E		F		
Queue Length 50th (ft)	~244	178	~442		64	245	
Queue Length 95th (ft)	#423	211	#1687		114	#392	
Internal Link Dist (ft)		283	841		415		
Turn Bay Length (ft)	120					165	
Base Capacity (vph)	176	2762	2346		231	315	
Starvation Cap Reductn	0	1183	3		0	0	
Spillback Cap Reductn	0	0	906		0	21	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	1.26	0.53	1.72		0.27	1.04	

Intersection Summary

Cycle Length: 160
 Actuated Cycle Length: 160
 Offset: 152 (95%), Referenced to phase 2:WBT, Start of Yellow
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.26
 Intersection Signal Delay: 64.0 Intersection LOS: E
 Intersection Capacity Utilization 106.9% ICU Level of Service G
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 9: Lawrenceville Hwy & Old Norcross Rd



HCM Signalized Intersection Capacity Analysis
 9: Lawrenceville Hwy & Old Norcross Rd

Lawrenceville Hwy Study
 Future No Build - AM 2045- Optimized



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↑↑	↑↑		↘	↗
Traffic Volume (vph)	204	764	2231	48	57	282
Future Volume (vph)	204	764	2231	48	57	282
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	0%		6%	
Total Lost time (s)	6.4	6.4	6.4		6.2	6.4
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1585	3169	3175		1545	1382
Flt Permitted	0.03	1.00	1.00		0.95	1.00
Satd. Flow (perm)	54	3169	3175		1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	222	830	2425	52	62	307
RTOR Reduction (vph)	0	0	1	0	0	67
Lane Group Flow (vph)	222	830	2476	0	62	240
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	1	6	2		4	1
Permitted Phases	6					4
Actuated Green, G (s)	136.9	136.9	116.9		10.5	24.1
Effective Green, g (s)	136.9	136.9	116.9		10.5	24.1
Actuated g/C Ratio	0.86	0.86	0.73		0.07	0.15
Clearance Time (s)	6.4	6.4	6.4		6.2	6.4
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	176	2711	2319		101	263
v/s Ratio Prot	c0.11	0.26	0.78		0.04	c0.08
v/s Ratio Perm	c0.97					0.10
v/c Ratio	1.26	0.31	1.07		0.61	0.91
Uniform Delay, d1	64.1	2.3	21.5		72.8	66.9
Progression Factor	0.95	2.19	0.61		1.00	1.00
Incremental Delay, d2	154.1	0.3	34.5		10.6	33.1
Delay (s)	215.2	5.2	47.7		83.4	100.0
Level of Service	F	A	D		F	F
Approach Delay (s)		49.5	47.7		97.2	
Approach LOS		D	D		F	

Intersection Summary

HCM 2000 Control Delay	52.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.31		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	106.9%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
10: WalMart SC & Lawrenceville Hwy

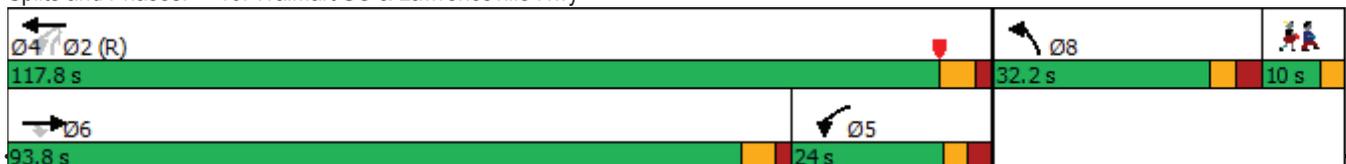


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø4
Lane Configurations	↑↑	↑	↓	↑↑	↓	↑	
Traffic Volume (vph)	667	154	236	2061	218	257	
Future Volume (vph)	667	154	236	2061	218	257	
Satd. Flow (prot)	3185	1425	1585	3169	1545	1382	
Flt Permitted			0.338		0.950		
Satd. Flow (perm)	3185	1425	564	3169	1545	1382	
Satd. Flow (RTOR)		167				279	
Lane Group Flow (vph)	725	167	257	2240	237	279	
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm	
Protected Phases	6		5	2	8		4
Permitted Phases		6	2			2	
Total Split (s)	93.8	93.8	24.0	117.8	32.2	117.8	10.0
Total Lost Time (s)	6.3	6.3	6.0	6.3	6.2	6.3	
Act Effct Green (s)	97.8	97.8	122.1	121.8	25.7	121.8	
Actuated g/C Ratio	0.61	0.61	0.76	0.76	0.16	0.76	
v/c Ratio	0.37	0.18	0.47	0.93	0.96	0.25	
Control Delay	8.5	0.6	12.2	24.2	111.7	1.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	8.5	0.6	12.2	24.2	111.7	1.1	
LOS	A	A	B	C	F	A	
Approach Delay	7.0			23.0	51.9		
Approach LOS	A			C	D		
Queue Length 50th (ft)	98	0	69	908	249	0	
Queue Length 95th (ft)	112	1	98	1078	#424	22	
Internal Link Dist (ft)	841			744	311		
Turn Bay Length (ft)		205	195				
Base Capacity (vph)	1945	935	545	2411	251	1118	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.37	0.18	0.47	0.93	0.94	0.25	

Intersection Summary

Cycle Length: 160
 Actuated Cycle Length: 160
 Offset: 2 (1%), Referenced to phase 2:WBTL, Start of Yellow
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.96
 Intersection Signal Delay: 23.2
 Intersection LOS: C
 Intersection Capacity Utilization 87.1%
 ICU Level of Service E
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 10: WalMart SC & Lawrenceville Hwy



HCM Signalized Intersection Capacity Analysis
 10: WalMart SC & Lawrenceville Hwy

Lawrenceville Hwy Study
 Future No Build - AM 2045- Optimized



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	↑
Traffic Volume (vph)	667	154	236	2061	218	257
Future Volume (vph)	667	154	236	2061	218	257
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%			1%	6%	
Total Lost time (s)	6.3	6.3	6.0	6.3	6.2	6.3
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3185	1425	1585	3169	1545	1382
Flt Permitted	1.00	1.00	0.34	1.00	0.95	1.00
Satd. Flow (perm)	3185	1425	565	3169	1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	725	167	257	2240	237	279
RTOR Reduction (vph)	0	65	0	0	0	67
Lane Group Flow (vph)	725	102	257	2240	237	212
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	8	
Permitted Phases		6	2			2
Actuated Green, G (s)	97.8	97.8	122.1	121.8	25.7	121.8
Effective Green, g (s)	97.8	97.8	122.1	121.8	25.7	121.8
Actuated g/C Ratio	0.61	0.61	0.76	0.76	0.16	0.76
Clearance Time (s)	6.3	6.3	6.0	6.3	6.2	6.3
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1946	871	545	2412	248	1052
v/s Ratio Prot	0.23		0.05	c0.71	c0.15	
v/s Ratio Perm		0.07	0.31			0.15
v/c Ratio	0.37	0.12	0.47	0.93	0.96	0.20
Uniform Delay, d1	15.7	13.0	12.4	15.6	66.6	5.4
Progression Factor	0.50	0.10	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.3	0.6	7.8	44.5	0.4
Delay (s)	8.4	1.5	13.0	23.4	111.1	5.8
Level of Service	A	A	B	C	F	A
Approach Delay (s)	7.1			22.3	54.2	
Approach LOS	A			C	D	

Intersection Summary			
HCM 2000 Control Delay	23.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	21.5
Intersection Capacity Utilization	87.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Total Split (s)	10.0
Total Lost Time (s)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
6: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd

Lawrenceville Hwy Study
Future No Build - PM 2045-Optimized



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	897	666	63	14	575	745	25	41	6	1073	51	793
Future Volume (vph)	897	666	63	14	575	745	25	41	6	1073	51	793
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			3%			10%				3%
Total Lost time (s)	7.2	8.0		8.0	8.0	8.0		6.7		8.1	8.1	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85		0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98		0.95	0.96	1.00
Satd. Flow (prot)	3074	3129		1569	3138	1404		1547		1490	1500	1404
Flt Permitted	0.95	1.00		0.18	1.00	1.00		0.98		0.95	0.96	1.00
Satd. Flow (perm)	3074	3129		292	3138	1404		1547		1490	1500	1404
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	975	724	68	15	625	810	27	45	7	1166	55	862
RTOR Reduction (vph)	0	4	0	0	0	535	0	2	0	0	0	0
Lane Group Flow (vph)	975	788	0	15	625	275	0	77	0	606	615	862
Turn Type	Prot	NA		Perm	NA	Perm	Split	NA		Split	NA	Free
Protected Phases	1	6			2		3	3		4		4
Permitted Phases				2		2						Free
Actuated Green, G (s)	35.8	77.1		34.1	34.1	34.1		13.2		46.9	46.9	160.0
Effective Green, g (s)	35.8	77.1		34.1	34.1	34.1		13.2		46.9	46.9	160.0
Actuated g/C Ratio	0.22	0.48		0.21	0.21	0.21		0.08		0.29	0.29	1.00
Clearance Time (s)	7.2	8.0		8.0	8.0	8.0		6.7		8.1	8.1	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)	687	1507		62	668	299		127		436	439	1404
v/s Ratio Prot	c0.32	0.25			c0.20			0.05		0.41	c0.41	
v/s Ratio Perm				0.05		0.20						c0.61
v/c Ratio	1.42	0.52		0.24	0.94	0.92		0.61		1.39	1.40	0.61
Uniform Delay, d1	62.1	28.7		52.2	61.9	61.6		70.9		56.5	56.5	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		0.85	0.85	1.00
Incremental Delay, d2	197.1	0.3		9.0	22.2	35.0		8.0		176.8	181.7	0.2
Delay (s)	259.2	29.0		61.3	84.1	96.6		78.9		224.8	229.7	0.2
Level of Service	F	C		E	F	F		E		F	F	A
Approach Delay (s)		156.1			90.8			78.9			133.3	
Approach LOS		F			F			E			F	

Intersection Summary

HCM 2000 Control Delay	128.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.23		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	30.0
Intersection Capacity Utilization	106.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
7: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
Future No Build - PM 2045-Optimized

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	98	54	162	388	130	96	160	1253	270	74	1367	108
Future Volume (vph)	98	54	162	388	130	96	160	1253	270	74	1367	108
Satd. Flow (prot)	0	1507	0	1545	1522	0	1617	3233	1446	1577	3119	0
Flt Permitted		0.703		0.500			0.059			0.063		
Satd. Flow (perm)	0	1075	0	813	1522	0	100	3233	1446	105	3119	0
Satd. Flow (RTOR)		40			28				143		6	
Lane Group Flow (vph)	0	342	0	422	245	0	174	1362	293	80	1603	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4			8			6		6	2		
Total Split (s)	72.0	72.0		72.0	72.0		18.0	74.0	74.0	14.0	70.0	
Total Lost Time (s)		6.5		6.5	6.5		6.1	6.7	6.7	6.4	6.7	
Act Effct Green (s)		65.5		65.5	65.5		79.8	67.3	67.3	71.2	63.3	
Actuated g/C Ratio		0.41		0.41	0.41		0.50	0.42	0.42	0.44	0.40	
v/c Ratio		0.74		1.27	0.38		1.07	1.00	0.42	0.69	1.30	
Control Delay		46.2		182.7	31.2		85.5	26.4	1.0	44.7	154.6	
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		46.2		182.7	31.2		85.5	26.4	1.0	44.7	154.6	
LOS		D		F	C		F	C	A	D	F	
Approach Delay		46.2			127.0			27.9			149.4	
Approach LOS		D			F			C			F	
Queue Length 50th (ft)		270		~554	158		~159	~787	10	40	~1102	
Queue Length 95th (ft)		409		#775	236		m119	m230	m2	m45	m#1051	
Internal Link Dist (ft)		350			139			969			634	
Turn Bay Length (ft)				90			180		200	135		
Base Capacity (vph)		463		332	639		162	1359	691	116	1237	
Starvation Cap Reductn		0		0	0		0	0	0	0	3	
Spillback Cap Reductn		0		0	0		0	0	0	0	0	
Storage Cap Reductn		0		0	0		0	0	0	0	0	
Reduced v/c Ratio		0.74		1.27	0.38		1.07	1.00	0.42	0.69	1.30	

Intersection Summary

Cycle Length: 160

Actuated Cycle Length: 160

Offset: 2 (1%), Referenced to phase 2:SBTL, Start of Yellow

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.30

Intersection Signal Delay: 89.2

Intersection LOS: F

Intersection Capacity Utilization 121.3%

ICU Level of Service H

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

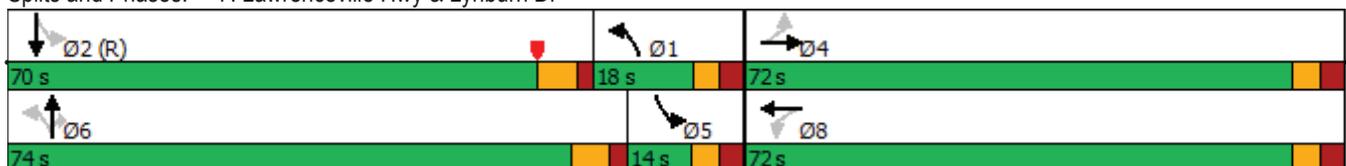
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: Lawrenceville Hwy & Lynburn Dr



HCM Signalized Intersection Capacity Analysis
7: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
Future No Build - PM 2045-Optimized



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖	↗		↖	↕	↗	↖	↕	↗
Traffic Volume (vph)	98	54	162	388	130	96	160	1253	270	74	1367	108
Future Volume (vph)	98	54	162	388	130	96	160	1253	270	74	1367	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			6%			-3%				2%
Total Lost time (s)		6.5		6.5	6.5		6.1	6.7	6.7	6.4	6.7	
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt		0.93		1.00	0.94		1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.98		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1505		1545	1523		1617	3233	1446	1577	3119	
Flt Permitted		0.70		0.50	1.00		0.06	1.00	1.00	0.06	1.00	
Satd. Flow (perm)		1074		813	1523		101	3233	1446	105	3119	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	107	59	176	422	141	104	174	1362	293	80	1486	117
RTOR Reduction (vph)	0	24	0	0	17	0	0	0	83	0	4	0
Lane Group Flow (vph)	0	318	0	422	228	0	174	1362	210	80	1599	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4			8			6		6	2		
Actuated Green, G (s)		65.5		65.5	65.5		79.2	67.3	67.3	70.9	63.3	
Effective Green, g (s)		65.5		65.5	65.5		79.2	67.3	67.3	70.9	63.3	
Actuated g/C Ratio		0.41		0.41	0.41		0.50	0.42	0.42	0.44	0.40	
Clearance Time (s)		6.5		6.5	6.5		6.1	6.7	6.7	6.4	6.7	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		439		332	623		162	1359	608	116	1233	
v/s Ratio Prot					0.15		c0.08	0.42		0.03	c0.51	
v/s Ratio Perm		0.30		c0.52			0.45		0.15	0.27		
v/c Ratio		0.73		1.27	0.37		1.07	1.00	0.35	0.69	1.30	
Uniform Delay, d1		39.7		47.2	32.8		70.6	46.4	31.4	69.3	48.4	
Progression Factor		1.00		1.00	1.00		0.67	0.37	0.05	0.67	0.32	
Incremental Delay, d2		5.9		143.6	0.4		44.3	7.8	0.1	4.4	135.3	
Delay (s)		45.6		190.8	33.2		91.5	24.8	1.8	51.0	151.0	
Level of Service		D		F	C		F	C	A	D	F	
Approach Delay (s)		45.6			132.9			27.4			146.2	
Approach LOS		D			F			C			F	

Intersection Summary

HCM 2000 Control Delay	88.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.27		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	19.6
Intersection Capacity Utilization	121.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
8: Kroger SC/Lavista Rd & Lawrenceville Hwy

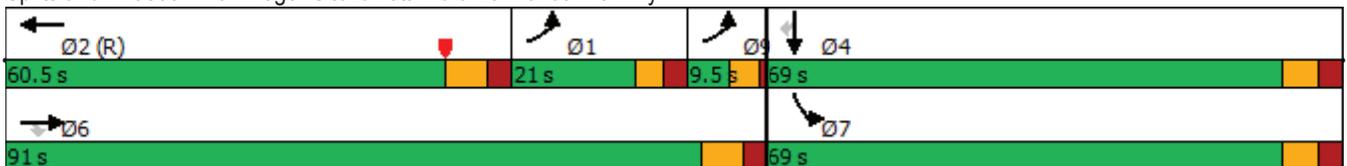
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	268	1151	28	0	1042	595	0	0	122	1285	217	507
Future Volume (vph)	268	1151	28	0	1042	595	0	0	122	1285	217	507
Satd. Flow (prot)	1585	3169	1418	0	3185	1425	0	0	1450	3090	1676	1425
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1585	3169	1418	0	3185	1425	0	0	1450	3090	1676	1425
Satd. Flow (RTOR)			29			181			181			266
Lane Group Flow (vph)	291	1251	30	0	1133	647	0	0	133	1397	236	551
Turn Type	Prot	NA	Perm		NA	Free			Free	Prot	NA	Perm
Protected Phases	1 9	6			2					7	4	
Permitted Phases		6	6			Free			Free			4
Total Split (s)		91.0	91.0		60.5					69.0	69.0	69.0
Total Lost Time (s)		8.0	8.0		8.0					7.3	7.3	7.3
Act Effct Green (s)	24.3	83.0	83.0		52.5	160.0			160.0	61.7	61.7	61.7
Actuated g/C Ratio	0.15	0.52	0.52		0.33	1.00			1.00	0.39	0.39	0.39
v/c Ratio	1.21	0.76	0.04		1.08	0.45			0.09	1.17	0.37	0.77
Control Delay	143.9	6.6	0.0		82.4	0.5			0.1	130.2	37.2	29.8
Queue Delay	0.0	1.0	0.0		8.8	0.0			0.0	1.0	0.0	0.7
Total Delay	143.9	7.5	0.0		91.3	0.5			0.1	131.2	37.2	30.5
LOS	F	A	A		F	A			A	F	D	C
Approach Delay		32.6			58.3			0.1			95.7	
Approach LOS		C			E			A			F	
Queue Length 50th (ft)	~378	91	0		~703	0			0	~895	176	280
Queue Length 95th (ft)	m#407	m93	m0		#835	m0			0	#1032	253	452
Internal Link Dist (ft)		634			283			65			481	
Turn Bay Length (ft)	445		230			125				300		210
Base Capacity (vph)	240	1643	749		1045	1425			1450	1191	646	712
Starvation Cap Reductn	0	169	0		220	0			0	0	0	0
Spillback Cap Reductn	0	155	0		367	0			239	240	0	30
Storage Cap Reductn	0	0	0		0	0			0	0	0	0
Reduced v/c Ratio	1.21	0.85	0.04		1.67	0.45			0.11	1.47	0.37	0.81

Intersection Summary

Cycle Length: 160
 Actuated Cycle Length: 160
 Offset: 151 (94%), Referenced to phase 2:WBT, Start of Yellow
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.21
 Intersection Signal Delay: 64.2 Intersection LOS: E
 Intersection Capacity Utilization 107.1% ICU Level of Service G
 Analysis Period (min) 15

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: Kroger SC/Lavista Rd & Lawrenceville Hwy



Lane Group	Ø1	Ø9
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	9
Permitted Phases		
Total Split (s)	21.0	9.5
Total Lost Time (s)		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

HCM Signalized Intersection Capacity Analysis
8: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
Future No Build - PM 2045-Optimized

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations		 			 					 				
Traffic Volume (vph)	268	1151	28	0	1042	595	0	0	122	1285	217	507		
Future Volume (vph)	268	1151	28	0	1042	595	0	0	122	1285	217	507		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Grade (%)		1%			0%			0%				0%		
Total Lost time (s)	6.2	8.0	8.0		8.0	4.0			4.0	7.3	7.3	7.3		
Lane Util. Factor	1.00	0.95	1.00		0.95	1.00			1.00	0.97	1.00	1.00		
Frt	1.00	1.00	0.85		1.00	0.85			0.86	1.00	1.00	0.85		
Flt Protected	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00		
Satd. Flow (prot)	1585	3169	1418		3185	1425			1450	3090	1676	1425		
Flt Permitted	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00		
Satd. Flow (perm)	1585	3169	1418		3185	1425			1450	3090	1676	1425		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		
Adj. Flow (vph)	291	1251	30	0	1133	647	0	0	133	1397	236	551		
RTOR Reduction (vph)	0	0	14	0	0	0	0	0	0	0	0	163		
Lane Group Flow (vph)	291	1251	16	0	1133	647	0	0	133	1397	236	388		
Turn Type	Prot	NA	Perm		NA	Free			Free	Prot	NA	Perm		
Protected Phases	1 9	6			2					7	4			
Permitted Phases		6	6			Free			Free			4		
Actuated Green, G (s)	26.0	83.0	83.0		52.5	160.0			160.0	61.7	61.7	61.7		
Effective Green, g (s)	26.0	83.0	83.0		52.5	160.0			160.0	61.7	61.7	61.7		
Actuated g/C Ratio	0.16	0.52	0.52		0.33	1.00			1.00	0.39	0.39	0.39		
Clearance Time (s)		8.0	8.0		8.0					7.3	7.3	7.3		
Vehicle Extension (s)		3.0	3.0		3.0					3.0	3.0	3.0		
Lane Grp Cap (vph)	257	1643	735		1045	1425			1450	1191	646	549		
v/s Ratio Prot	c0.18	0.39			c0.36					c0.45	0.14			
v/s Ratio Perm			0.01			0.45			0.09			0.27		
v/c Ratio	1.13	0.76	0.02		1.08	0.45			0.09	1.17	0.37	0.71		
Uniform Delay, d1	67.0	30.6	18.7		53.8	0.0			0.0	49.1	35.1	41.5		
Progression Factor	0.57	0.17	0.00		0.67	1.00			1.00	1.00	1.00	1.00		
Incremental Delay, d2	75.5	1.2	0.0		47.2	0.5			0.1	87.0	1.6	7.5		
Delay (s)	113.9	6.5	0.0		83.4	0.5			0.1	136.2	36.7	48.9		
Level of Service	F	A	A		F	A			A	F	D	D		
Approach Delay (s)		26.2			53.3			0.1			103.4			
Approach LOS		C			D			A			F			
Intersection Summary														
HCM 2000 Control Delay			63.8									HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio			1.18											
Actuated Cycle Length (s)			160.0								26.0		Sum of lost time (s)	
Intersection Capacity Utilization			107.1%										ICU Level of Service	G
Analysis Period (min)			15											
c Critical Lane Group														



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø8
Lane Configurations							
Traffic Volume (vph)	282	2276	1298	98	151	339	
Future Volume (vph)	282	2276	1298	98	151	339	
Satd. Flow (prot)	1585	3169	3150	0	1545	1382	
Flt Permitted	0.062				0.950		
Satd. Flow (perm)	103	3169	3150	0	1545	1382	
Satd. Flow (RTOR)			7			109	
Lane Group Flow (vph)	307	2474	1518	0	164	368	
Turn Type	pm+pt	NA	NA		Prot	pm+ov	
Protected Phases	1	6	2		4	1	8
Permitted Phases	6					4	
Total Split (s)	35.0	119.8	84.8		30.2	35.0	10.0
Total Lost Time (s)	6.4	6.4	6.4		6.2	6.4	
Act Effct Green (s)	125.1	125.1	86.4		22.3	60.8	
Actuated g/C Ratio	0.78	0.78	0.54		0.14	0.38	
v/c Ratio	0.81	1.00	0.89		0.76	0.62	
Control Delay	56.4	26.3	36.1		87.7	31.3	
Queue Delay	48.5	38.2	47.6		0.0	0.2	
Total Delay	104.9	64.5	83.7		87.7	31.5	
LOS	F	E	F		F	C	
Approach Delay		69.0	83.7		48.9		
Approach LOS		E	F		D		
Queue Length 50th (ft)	299	1305	783		168	215	
Queue Length 95th (ft)	#406	m1222	#396		243	312	
Internal Link Dist (ft)		283	841		415		
Turn Bay Length (ft)	120					165	
Base Capacity (vph)	386	2477	1704		245	598	
Starvation Cap Reductn	102	279	0		0	0	
Spillback Cap Reductn	0	494	640		0	21	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	1.08	1.25	1.43		0.67	0.64	

Intersection Summary

Cycle Length: 160
 Actuated Cycle Length: 160
 Offset: 145 (91%), Referenced to phase 2:WBT, Start of Yellow
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.00
 Intersection Signal Delay: 71.4
 Intersection LOS: E
 Intersection Capacity Utilization 89.7%
 ICU Level of Service E
 Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: Lawrenceville Hwy & Old Norcross Rd



HCM Signalized Intersection Capacity Analysis
9: Lawrenceville Hwy & Old Norcross Rd

Lawrenceville Hwy Study
Future No Build - PM 2045-Optimized



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	282	2276	1298	98	151	339
Future Volume (vph)	282	2276	1298	98	151	339
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	0%		6%	
Total Lost time (s)	6.4	6.4	6.4		6.2	6.4
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1585	3169	3152		1545	1382
Flt Permitted	0.06	1.00	1.00		0.95	1.00
Satd. Flow (perm)	104	3169	3152		1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	307	2474	1411	107	164	368
RTOR Reduction (vph)	0	0	3	0	0	72
Lane Group Flow (vph)	307	2474	1515	0	164	296
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	1	6	2		4	1
Permitted Phases	6					4
Actuated Green, G (s)	125.1	125.1	86.4		22.3	54.6
Effective Green, g (s)	125.1	125.1	86.4		22.3	54.6
Actuated g/C Ratio	0.78	0.78	0.54		0.14	0.34
Clearance Time (s)	6.4	6.4	6.4		6.2	6.4
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	380	2477	1702		215	471
v/s Ratio Prot	0.16	c0.78	0.48		c0.11	0.13
v/s Ratio Perm	0.47					0.09
v/c Ratio	0.81	1.00	0.89		0.76	0.63
Uniform Delay, d1	47.7	17.4	32.6		66.3	44.2
Progression Factor	1.05	0.93	0.87		1.00	1.00
Incremental Delay, d2	8.7	9.6	6.3		14.8	2.6
Delay (s)	58.6	25.7	34.7		81.1	46.8
Level of Service	E	C	C		F	D
Approach Delay (s)		29.3	34.7		57.4	
Approach LOS		C	C		E	

Intersection Summary

HCM 2000 Control Delay	34.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	89.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
10: WalMart SC & Lawrenceville Hwy

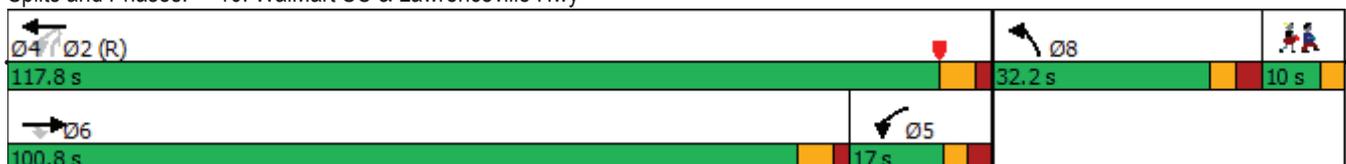


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø4
Lane Configurations	↑↑	↑	↓	↑↑	↓	↑	
Traffic Volume (vph)	2271	156	214	1211	185	236	
Future Volume (vph)	2271	156	214	1211	185	236	
Satd. Flow (prot)	3185	1425	1585	3169	1545	1382	
Flt Permitted			0.035		0.950		
Satd. Flow (perm)	3185	1425	58	3169	1545	1382	
Satd. Flow (RTOR)		66				257	
Lane Group Flow (vph)	2468	170	233	1316	201	257	
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm	
Protected Phases	6		5	2	8		4
Permitted Phases		6	2			2	
Total Split (s)	100.8	100.8	17.0	117.8	32.2	117.8	10.0
Total Lost Time (s)	6.3	6.3	6.0	6.3	6.2	6.3	
Act Effct Green (s)	106.6	106.6	123.9	123.6	23.9	123.6	
Actuated g/C Ratio	0.67	0.67	0.77	0.77	0.15	0.77	
v/c Ratio	1.16	0.18	1.55	0.54	0.87	0.23	
Control Delay	94.6	1.4	318.3	8.3	99.7	1.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	94.6	1.4	318.3	8.3	99.7	1.0	
LOS	F	A	F	A	F	A	
Approach Delay	88.6			54.9	44.3		
Approach LOS	F			D	D		
Queue Length 50th (ft)	~1629	16	~301	267	205	0	
Queue Length 95th (ft)	m#1636	m9	#485	313	#337	21	
Internal Link Dist (ft)	841			744	311		
Turn Bay Length (ft)		205	195				
Base Capacity (vph)	2122	971	150	2448	251	1126	
Starvation Cap Reductn	41	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	1.19	0.18	1.55	0.54	0.80	0.23	

Intersection Summary

Cycle Length: 160
 Actuated Cycle Length: 160
 Offset: 16 (10%), Referenced to phase 2:WBTL, Start of Yellow
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.55
 Intersection Signal Delay: 73.0 Intersection LOS: E
 Intersection Capacity Utilization 109.7% ICU Level of Service H
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: WalMart SC & Lawrenceville Hwy



HCM Signalized Intersection Capacity Analysis
 10: WalMart SC & Lawrenceville Hwy

Lawrenceville Hwy Study
 Future No Build - PM 2045-Optimized



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	↑
Traffic Volume (vph)	2271	156	214	1211	185	236
Future Volume (vph)	2271	156	214	1211	185	236
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%			1%	6%	
Total Lost time (s)	6.3	6.3	6.0	6.3	6.2	6.3
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3185	1425	1585	3169	1545	1382
Flt Permitted	1.00	1.00	0.04	1.00	0.95	1.00
Satd. Flow (perm)	3185	1425	59	3169	1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2468	170	233	1316	201	257
RTOR Reduction (vph)	0	22	0	0	0	58
Lane Group Flow (vph)	2468	148	233	1316	201	199
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	8	
Permitted Phases		6	2			2
Actuated Green, G (s)	106.6	106.6	123.9	123.6	23.9	123.6
Effective Green, g (s)	106.6	106.6	123.9	123.6	23.9	123.6
Actuated g/C Ratio	0.67	0.67	0.77	0.77	0.15	0.77
Clearance Time (s)	6.3	6.3	6.0	6.3	6.2	6.3
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2122	949	150	2448	230	1067
v/s Ratio Prot	0.77		c0.11	0.42	c0.13	
v/s Ratio Perm		0.10	c1.09			0.14
v/c Ratio	1.16	0.16	1.55	0.54	0.87	0.19
Uniform Delay, d1	26.7	9.9	70.0	7.1	66.6	4.8
Progression Factor	0.63	0.20	1.00	1.00	1.00	1.00
Incremental Delay, d2	75.0	0.1	279.1	0.9	28.6	0.4
Delay (s)	91.7	2.1	349.1	7.9	95.1	5.2
Level of Service	F	A	F	A	F	A
Approach Delay (s)	85.9			59.2	44.7	
Approach LOS	F			E	D	

Intersection Summary

HCM 2000 Control Delay	72.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.51		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	21.5
Intersection Capacity Utilization	109.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

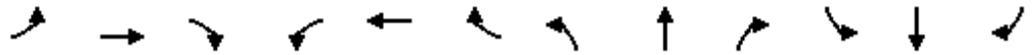
Appendix F

Synchro Output – Alternatives Analysis

2025 AM Peak

HCM Signalized Intersection Capacity Analysis
 100: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd

Lawrenceville Hwy Study
 2025 AM Alternatives



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	476	204	8	3	522	756	5	9	4	214	15	773
Future Volume (vph)	476	204	8	3	522	756	5	9	4	214	15	773
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			3%			10%			3%	
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	4.5
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85		0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99		0.95	0.96	1.00
Satd. Flow (prot)	3074	3151		1569	3138	1404		1527		1490	1503	1404
Flt Permitted	0.95	1.00		0.61	1.00	1.00		0.99		0.95	0.96	1.00
Satd. Flow (perm)	3074	3151		1004	3138	1404		1527		1490	1503	1404
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	517	222	9	3	567	822	5	10	4	233	16	840
RTOR Reduction (vph)	0	2	0	0	0	597	0	3	0	0	0	433
Lane Group Flow (vph)	517	229	0	3	567	225	0	16	0	123	126	407
Turn Type	Prot	NA		Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	7	4			8		2	2		6	6	
Permitted Phases				8		8						6
Actuated Green, G (s)	24.5	60.3		31.3	31.3	31.3		20.5		43.5	43.5	43.5
Effective Green, g (s)	24.5	60.3		31.3	31.3	31.3		20.5		43.5	43.5	43.5
Actuated g/C Ratio	0.18	0.44		0.23	0.23	0.23		0.15		0.32	0.32	0.32
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	546	1378		228	712	318		227		470	474	443
v/s Ratio Prot	c0.17	0.07			c0.18			c0.01		0.08	0.08	
v/s Ratio Perm				0.00		0.16						c0.29
v/c Ratio	0.95	0.17		0.01	0.80	0.71		0.07		0.26	0.27	0.92
Uniform Delay, d1	56.0	23.5		41.3	50.2	49.0		50.4		35.2	35.2	45.4
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	25.6	0.1		0.0	6.2	7.0		0.6		1.4	1.4	26.5
Delay (s)	81.6	23.6		41.3	56.4	56.0		51.0		36.5	36.6	72.0
Level of Service	F	C		D	E	E		D		D	D	E
Approach Delay (s)		63.7			56.1			51.0			63.9	
Approach LOS		E			E			D			E	

Intersection Summary

HCM 2000 Control Delay	60.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	137.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
 101: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd

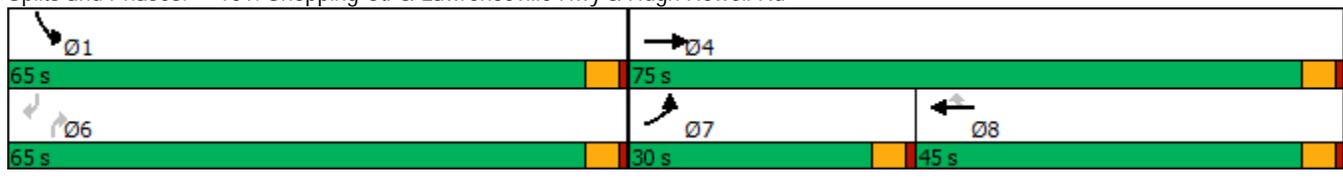
Lawrenceville Hwy Study
 2025 AM Alternatives

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	476	204	8	0	522	756	0	0	7	221	0	781	
Future Volume (vph)	476	204	8	0	522	756	0	0	7	221	0	781	
Satd. Flow (prot)	3074	3150	0	0	3138	1404	0	0	1378	3043	0	1404	
Flt Permitted	0.950									0.950			
Satd. Flow (perm)	3074	3150	0	0	3138	1404	0	0	1378	3043	0	1404	
Satd. Flow (RTOR)						4		774					471
Lane Group Flow (vph)	517	231	0	0	567	822	0	0	8	240	0	849	
Turn Type	Prot	NA			NA	Perm			Perm	Prot		Perm	
Protected Phases	7	4	8					1					
Permitted Phases						8		6			6		
Total Split (s)	30.0	75.0	45.0				45.0	65.0		65.0	65.0		
Total Lost Time (s)	4.5	4.5	4.5				4.5	4.5		4.5	4.5		
Act Effct Green (s)	24.7	62.6	33.4				33.4	60.7		60.7	60.7		
Actuated g/C Ratio	0.19	0.47	0.25				0.25	0.46		0.46	0.46		
v/c Ratio	0.90	0.15	0.72				0.88	0.01		0.17	0.94		
Control Delay	73.5	19.4	50.5				16.5	0.0		22.7	35.6		
Queue Delay	0.0	0.0	0.0				0.0	0.0		0.0	0.0		
Total Delay	73.5	19.4	50.5				16.5	0.0		22.7	35.6		
LOS	E	B	D				B	A		C	D		
Approach Delay	56.8				30.4				32.7				
Approach LOS	E				C				C				
Queue Length 50th (ft)	226	56	236				32	0		62	396		
Queue Length 95th (ft)	#346	82	301				267	0		97	#774		
Internal Link Dist (ft)	1112				1142				556		1030		
Turn Bay Length (ft)	245								286				
Base Capacity (vph)	594	1685	963				967	968		1396	899		
Starvation Cap Reductn	0	0	0				0	0		0	0		
Spillback Cap Reductn	0	0	0				0	0		0	0		
Storage Cap Reductn	0	0	0				0	0		0	0		
Reduced v/c Ratio	0.87	0.14	0.59				0.85	0.01		0.17	0.94		

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 132.4
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.94
 Intersection Signal Delay: 37.2
 Intersection LOS: D
 Intersection Capacity Utilization 77.3%
 ICU Level of Service D
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 101: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd

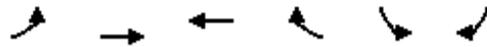


HCM Signalized Intersection Capacity Analysis
 101: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd

Lawrenceville Hwy Study
 2025 AM Alternatives

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	476	204	8	0	522	756	0	0	7	221	0	781
Future Volume (vph)	476	204	8	0	522	756	0	0	7	221	0	781
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			3%			10%			3%	
Total Lost time (s)	4.5	4.5			4.5	4.5			4.5	4.5		4.5
Lane Util. Factor	0.97	0.95			0.95	1.00			1.00	0.97		1.00
Frt	1.00	0.99			1.00	0.85			0.86	1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00			1.00	0.95		1.00
Satd. Flow (prot)	3074	3151			3138	1404			1378	3043		1404
Flt Permitted	0.95	1.00			1.00	1.00			1.00	0.95		1.00
Satd. Flow (perm)	3074	3151			3138	1404			1378	3043		1404
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	517	222	9	0	567	822	0	0	8	240	0	849
RTOR Reduction (vph)	0	2	0	0	0	579	0	0	4	0	0	255
Lane Group Flow (vph)	517	229	0	0	567	243	0	0	4	240	0	594
Turn Type	Prot	NA			NA	Perm			Perm	Prot		Perm
Protected Phases	7	4			8					1		
Permitted Phases						8			6			6
Actuated Green, G (s)	24.7	62.6			33.4	33.4			60.7	60.7		60.7
Effective Green, g (s)	24.7	62.6			33.4	33.4			60.7	60.7		60.7
Actuated g/C Ratio	0.19	0.47			0.25	0.25			0.46	0.46		0.46
Clearance Time (s)	4.5	4.5			4.5	4.5			4.5	4.5		4.5
Vehicle Extension (s)	3.0	3.0			3.0	3.0			3.0	3.0		3.0
Lane Grp Cap (vph)	573	1490			792	354			632	1396		644
v/s Ratio Prot	c0.17	0.07			c0.18					0.08		
v/s Ratio Perm						0.17			0.00			c0.42
v/c Ratio	0.90	0.15			0.72	0.69			0.01	0.17		0.92
Uniform Delay, d1	52.6	19.8			45.1	44.7			19.4	21.0		33.6
Progression Factor	1.00	1.00			1.00	1.00			1.00	1.00		1.00
Incremental Delay, d2	17.4	0.0			3.1	5.5			0.0	0.1		20.8
Delay (s)	70.1	19.8			48.2	50.2			19.4	21.1		54.4
Level of Service	E	B			D	D			B	C		D
Approach Delay (s)		54.6			49.4			19.4			47.1	
Approach LOS		D			D			B			D	
Intersection Summary												
HCM 2000 Control Delay			49.7				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			132.3				Sum of lost time (s)		13.5			
Intersection Capacity Utilization			77.3%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
 102: Lawrenceville Hwy & Hugh Howell Rd

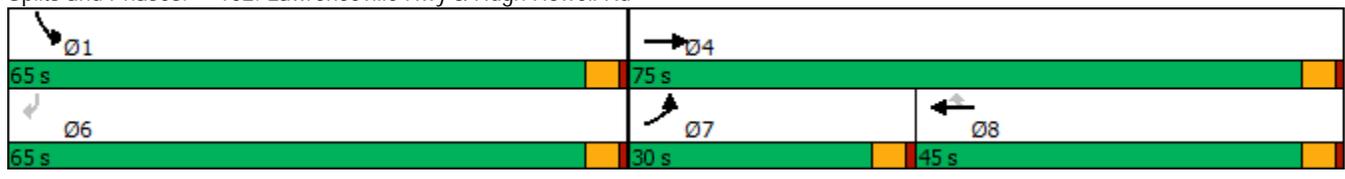


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖↗	↑↑	↑↑	↖	↖↗	↖
Traffic Volume (vph)	476	208	522	756	221	781
Future Volume (vph)	476	208	522	756	221	781
Satd. Flow (prot)	3074	3169	3138	1404	3043	1404
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3074	3169	3138	1404	3043	1404
Satd. Flow (RTOR)				774		471
Lane Group Flow (vph)	517	226	567	822	240	849
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		1	
Permitted Phases				8		6
Total Split (s)	30.0	75.0	45.0	45.0	65.0	65.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Act Effct Green (s)	24.7	62.6	33.4	33.4	60.7	60.7
Actuated g/C Ratio	0.19	0.47	0.25	0.25	0.46	0.46
v/c Ratio	0.90	0.15	0.72	0.88	0.17	0.94
Control Delay	73.5	19.7	50.5	16.5	22.7	35.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.5	19.7	50.5	16.5	22.7	35.6
LOS	E	B	D	B	C	D
Approach Delay		57.1	30.4		32.7	
Approach LOS		E	C		C	
Queue Length 50th (ft)	226	56	236	32	62	396
Queue Length 95th (ft)	#346	81	301	267	97	#774
Internal Link Dist (ft)		1076	973		988	
Turn Bay Length (ft)	245				286	
Base Capacity (vph)	594	1694	963	967	1396	899
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.13	0.59	0.85	0.17	0.94

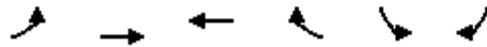
Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 132.4
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.94
 Intersection Signal Delay: 37.3
 Intersection LOS: D
 Intersection Capacity Utilization 77.3%
 ICU Level of Service D
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 102: Lawrenceville Hwy & Hugh Howell Rd



HCM Signalized Intersection Capacity Analysis
 102: Lawrenceville Hwy & Hugh Howell Rd

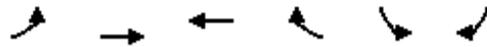


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	476	208	522	756	221	781
Future Volume (vph)	476	208	522	756	221	781
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	3%		3%	
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3074	3169	3138	1404	3043	1404
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3074	3169	3138	1404	3043	1404
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	517	226	567	822	240	849
RTOR Reduction (vph)	0	0	0	579	0	255
Lane Group Flow (vph)	517	226	567	243	240	594
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		1	
Permitted Phases				8		6
Actuated Green, G (s)	24.7	62.6	33.4	33.4	60.7	60.7
Effective Green, g (s)	24.7	62.6	33.4	33.4	60.7	60.7
Actuated g/C Ratio	0.19	0.47	0.25	0.25	0.46	0.46
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	573	1499	792	354	1396	644
v/s Ratio Prot	c0.17	0.07	c0.18		0.08	
v/s Ratio Perm				0.17		c0.42
v/c Ratio	0.90	0.15	0.72	0.69	0.17	0.92
Uniform Delay, d1	52.6	19.8	45.1	44.7	21.0	33.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	17.4	0.0	3.1	5.5	0.1	20.8
Delay (s)	70.1	19.8	48.2	50.2	21.1	54.4
Level of Service	E	B	D	D	C	D
Approach Delay (s)		54.8	49.4		47.1	
Approach LOS		D	D		D	

Intersection Summary

HCM 2000 Control Delay	49.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	132.3	Sum of lost time (s)	13.5
Intersection Capacity Utilization	77.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
 103: Lawrenceville Hwy & Hugh Howell Rd

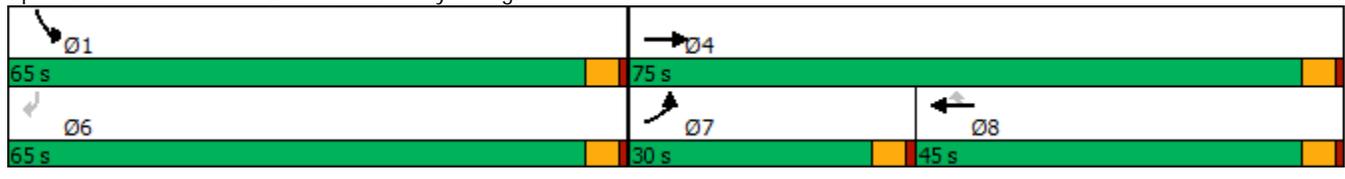


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↗↘	↑↑	↑↑	↗	↗↘	↗
Traffic Volume (vph)	476	208	522	756	221	781
Future Volume (vph)	476	208	522	756	221	781
Satd. Flow (prot)	3074	3169	3138	1404	3043	1404
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3074	3169	3138	1404	3043	1404
Satd. Flow (RTOR)				774		471
Lane Group Flow (vph)	517	226	567	822	240	849
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		1	
Permitted Phases				8		6
Total Split (s)	30.0	75.0	45.0	45.0	65.0	65.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Act Effct Green (s)	24.7	62.6	33.4	33.4	60.7	60.7
Actuated g/C Ratio	0.19	0.47	0.25	0.25	0.46	0.46
v/c Ratio	0.90	0.15	0.72	0.88	0.17	0.94
Control Delay	73.5	19.7	50.5	16.5	22.7	35.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.5	19.7	50.5	16.5	22.7	35.6
LOS	E	B	D	B	C	D
Approach Delay		57.1	30.4		32.7	
Approach LOS		E	C		C	
Queue Length 50th (ft)	226	56	236	32	62	396
Queue Length 95th (ft)	#346	81	301	267	97	#774
Internal Link Dist (ft)		1672	1095		1103	
Turn Bay Length (ft)	1000				286	
Base Capacity (vph)	594	1694	963	967	1396	899
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.13	0.59	0.85	0.17	0.94

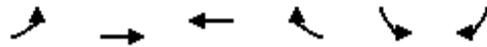
Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 132.4
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.94
 Intersection Signal Delay: 37.3
 Intersection LOS: D
 Intersection Capacity Utilization 77.3%
 ICU Level of Service D
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 103: Lawrenceville Hwy & Hugh Howell Rd



HCM Signalized Intersection Capacity Analysis
 103: Lawrenceville Hwy & Hugh Howell Rd



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖↖	↑↑	↗↗	↗	↘↘	↘
Traffic Volume (vph)	476	208	522	756	221	781
Future Volume (vph)	476	208	522	756	221	781
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	3%		3%	
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3074	3169	3138	1404	3043	1404
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3074	3169	3138	1404	3043	1404
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	517	226	567	822	240	849
RTOR Reduction (vph)	0	0	0	579	0	255
Lane Group Flow (vph)	517	226	567	243	240	594
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		1	
Permitted Phases				8		6
Actuated Green, G (s)	24.7	62.6	33.4	33.4	60.7	60.7
Effective Green, g (s)	24.7	62.6	33.4	33.4	60.7	60.7
Actuated g/C Ratio	0.19	0.47	0.25	0.25	0.46	0.46
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	573	1499	792	354	1396	644
v/s Ratio Prot	c0.17	0.07	c0.18		0.08	
v/s Ratio Perm				0.17		c0.42
v/c Ratio	0.90	0.15	0.72	0.69	0.17	0.92
Uniform Delay, d1	52.6	19.8	45.1	44.7	21.0	33.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	17.4	0.0	3.1	5.5	0.1	20.8
Delay (s)	70.1	19.8	48.2	50.2	21.1	54.4
Level of Service	E	B	D	D	C	D
Approach Delay (s)		54.8	49.4		47.1	
Approach LOS		D	D		D	

Intersection Summary

HCM 2000 Control Delay	49.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	132.3	Sum of lost time (s)	13.5
Intersection Capacity Utilization	77.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

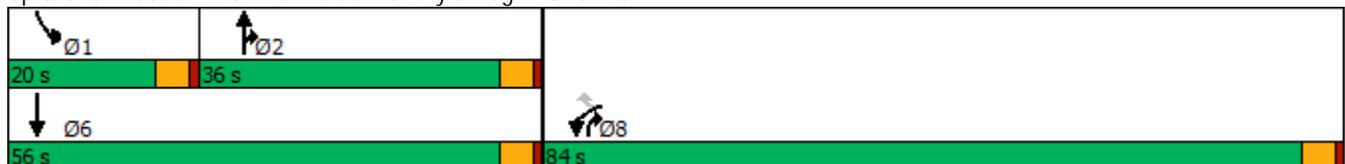
Lanes, Volumes, Timings
 104: Lawrenceville Hwy & Hugh Howell Rd

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	522	756	476	208	221	781
Future Volume (vph)	522	756	476	208	221	781
Satd. Flow (prot)	3090	1425	3185	2508	3090	3185
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3090	1425	3185	2508	3090	3185
Satd. Flow (RTOR)		393		106		
Lane Group Flow (vph)	567	822	517	226	240	849
Turn Type	Prot	Perm	NA	pt+ov	Prot	NA
Protected Phases	8		2	2 8	1	6
Permitted Phases		8				
Total Split (s)	84.0	84.0	36.0		20.0	56.0
Total Lost Time (s)	4.5	4.5	4.5		4.5	4.5
Act Effct Green (s)	54.1	54.1	35.2	93.9	13.2	53.0
Actuated g/C Ratio	0.47	0.47	0.30	0.81	0.11	0.46
v/c Ratio	0.39	0.94	0.54	0.11	0.69	0.59
Control Delay	19.9	33.7	40.9	1.3	63.2	29.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.9	33.7	40.9	1.3	63.2	29.4
LOS	B	C	D	A	E	C
Approach Delay	28.1		28.8			36.8
Approach LOS	C		C			D
Queue Length 50th (ft)	135	346	175	8	89	250
Queue Length 95th (ft)	173	596	297	17	157	428
Internal Link Dist (ft)	1382		1165			1496
Turn Bay Length (ft)				300	286	
Base Capacity (vph)	2172	1118	962	2360	423	1450
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.74	0.54	0.10	0.57	0.59

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 116.3
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.94
 Intersection Signal Delay: 31.2
 Intersection LOS: C
 Intersection Capacity Utilization 74.1%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 104: Lawrenceville Hwy & Hugh Howell Rd



HCM Signalized Intersection Capacity Analysis
 104: Lawrenceville Hwy & Hugh Howell Rd



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	522	756	476	208	221	781
Future Volume (vph)	522	756	476	208	221	781
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	1.00	0.95	0.88	0.97	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3090	1425	3185	2508	3090	3185
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3090	1425	3185	2508	3090	3185
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	567	822	517	226	240	849
RTOR Reduction (vph)	0	210	0	20	0	0
Lane Group Flow (vph)	567	612	517	206	240	849
Turn Type	Prot	Perm	NA	pt+ov	Prot	NA
Protected Phases	8		2	2 8	1	6
Permitted Phases		8				
Actuated Green, G (s)	54.1	54.1	35.3	93.9	13.2	53.0
Effective Green, g (s)	54.1	54.1	35.3	93.9	13.2	53.0
Actuated g/C Ratio	0.47	0.47	0.30	0.81	0.11	0.46
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	1439	664	968	2028	351	1453
v/s Ratio Prot	0.18		0.16	0.08	c0.08	c0.27
v/s Ratio Perm		c0.43				
v/c Ratio	0.39	0.92	0.53	0.10	0.68	0.58
Uniform Delay, d1	20.3	29.0	33.6	2.3	49.4	23.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	18.3	2.1	0.0	5.4	1.7
Delay (s)	20.5	47.4	35.7	2.3	54.9	25.1
Level of Service	C	D	D	A	D	C
Approach Delay (s)	36.4		25.5			31.7
Approach LOS	D		C			C

Intersection Summary

HCM 2000 Control Delay	32.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	116.1	Sum of lost time (s)	13.5
Intersection Capacity Utilization	74.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
105: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd

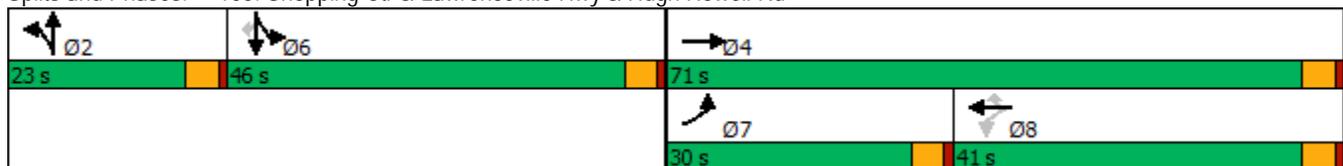
Lawrenceville Hwy Study
2025 AM Alternatives

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	476	204	8	3	522	756	5	9	4	214	15	773
Future Volume (vph)	476	204	8	3	522	756	5	9	4	214	15	773
Satd. Flow (prot)	3074	3150	0	1569	3138	1404	0	1528	0	1490	1503	1404
Flt Permitted	0.950			0.608				0.987		0.950	0.958	
Satd. Flow (perm)	3074	3150	0	1004	3138	1404	0	1528	0	1490	1503	1404
Satd. Flow (RTOR)		4				672		4				611
Lane Group Flow (vph)	517	231	0	3	567	822	0	19	0	123	126	840
Turn Type	Prot	NA		Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	7	4			8		2	2		6	6	
Permitted Phases				8		8						6
Total Split (s)	30.0	71.0		41.0	41.0	41.0	23.0	23.0		46.0	46.0	46.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	4.5
Act Effct Green (s)	24.8	63.1		33.9	33.9	33.9		18.5		41.6	41.6	41.6
Actuated g/C Ratio	0.18	0.46		0.25	0.25	0.25		0.14		0.30	0.30	0.30
v/c Ratio	0.93	0.16		0.01	0.73	0.96		0.09		0.27	0.28	0.99
Control Delay	79.8	21.1		38.7	53.4	33.3		46.4		39.3	39.4	41.2
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	0.0
Total Delay	79.8	21.1		38.7	53.4	33.3		46.4		39.3	39.4	41.2
LOS	E	C		D	D	C		D		D	D	D
Approach Delay		61.7			41.5			46.4			40.7	
Approach LOS		E			D			D			D	
Queue Length 50th (ft)	241	60		2	246	178		12		90	92	303
Queue Length 95th (ft)	#346	87		10	314	#509		38		150	154	#627
Internal Link Dist (ft)		855			1243			430			1063	
Turn Bay Length (ft)	245			225		150				286		
Base Capacity (vph)	573	1536		268	839	867		210		452	456	852
Starvation Cap Reductn	0	0		0	0	0		0		0	0	0
Spillback Cap Reductn	0	0		0	0	0		0		0	0	0
Storage Cap Reductn	0	0		0	0	0		0		0	0	0
Reduced v/c Ratio	0.90	0.15		0.01	0.68	0.95		0.09		0.27	0.28	0.99

Intersection Summary

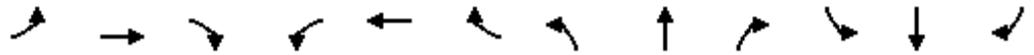
Cycle Length: 140
 Actuated Cycle Length: 136.8
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.99
 Intersection Signal Delay: 45.9
 Intersection LOS: D
 Intersection Capacity Utilization 84.6%
 ICU Level of Service E
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 105: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd



HCM Signalized Intersection Capacity Analysis
 105: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd

Lawrenceville Hwy Study
 2025 AM Alternatives



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	476	204	8	3	522	756	5	9	4	214	15	773
Future Volume (vph)	476	204	8	3	522	756	5	9	4	214	15	773
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			3%			10%				3%
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	4.5
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85		0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99		0.95	0.96	1.00
Satd. Flow (prot)	3074	3151		1569	3138	1404		1527		1490	1503	1404
Flt Permitted	0.95	1.00		0.61	1.00	1.00		0.99		0.95	0.96	1.00
Satd. Flow (perm)	3074	3151		1004	3138	1404		1527		1490	1503	1404
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	517	222	9	3	567	822	5	10	4	233	16	840
RTOR Reduction (vph)	0	2	0	0	0	505	0	3	0	0	0	425
Lane Group Flow (vph)	517	229	0	3	567	317	0	16	0	123	126	415
Turn Type	Prot	NA		Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	7	4			8		2	2		6	6	
Permitted Phases				8		8						6
Actuated Green, G (s)	24.8	63.2		33.9	33.9	33.9		18.5		41.6	41.6	41.6
Effective Green, g (s)	24.8	63.2		33.9	33.9	33.9		18.5		41.6	41.6	41.6
Actuated g/C Ratio	0.18	0.46		0.25	0.25	0.25		0.14		0.30	0.30	0.30
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	557	1455		248	777	347		206		453	457	426
v/s Ratio Prot	c0.17	0.07			0.18			c0.01		0.08	0.08	
v/s Ratio Perm				0.00		c0.23						c0.30
v/c Ratio	0.93	0.16		0.01	0.73	0.91		0.08		0.27	0.28	0.97
Uniform Delay, d1	55.1	21.4		38.8	47.2	50.0		51.7		36.1	36.2	47.1
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	21.8	0.1		0.0	3.5	27.3		0.7		1.5	1.5	37.5
Delay (s)	76.9	21.4		38.8	50.7	77.3		52.4		37.6	37.6	84.6
Level of Service	E	C		D	D	E		D		D	D	F
Approach Delay (s)		59.8			66.4			52.4			73.8	
Approach LOS		E			E			D			E	

Intersection Summary		
HCM 2000 Control Delay	67.3	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.81	E
Actuated Cycle Length (s)	136.8	Sum of lost time (s)
Intersection Capacity Utilization	84.6%	18.0
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		E

Lanes, Volumes, Timings
200: Lawrenceville Hwy & Lynburn Dr

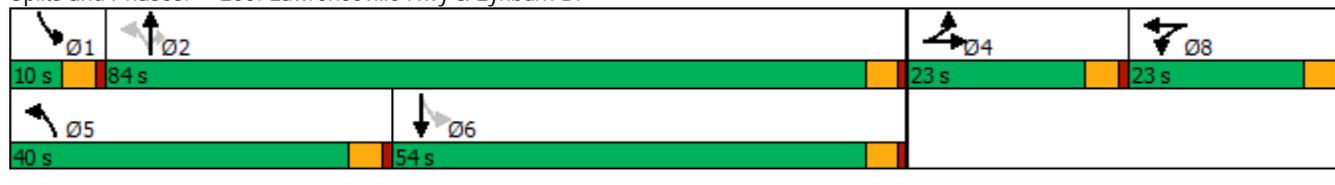


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	15	54	52	22	19	390	790	61	17	896	57
Future Volume (vph)	32	15	54	52	22	19	390	790	61	17	896	57
Satd. Flow (prot)	0	1500	0	1545	1512	0	1617	3233	1446	1577	3125	0
Flt Permitted		0.984		0.950			0.135			0.330		
Satd. Flow (perm)	0	1500	0	1545	1512	0	230	3233	1446	548	3125	0
Satd. Flow (RTOR)		34			21				82		5	
Lane Group Flow (vph)	0	110	0	57	45	0	424	859	66	18	1036	0
Turn Type	Split	NA		Split	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases							2		2	6		
Total Split (s)	23.0	23.0		23.0	23.0		40.0	84.0	84.0	10.0	54.0	
Total Lost Time (s)		4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Act Effct Green (s)		11.7		9.9	9.9		87.5	83.9	83.9	57.2	51.6	
Actuated g/C Ratio		0.10		0.08	0.08		0.73	0.70	0.70	0.48	0.43	
v/c Ratio		0.62		0.45	0.31		0.80	0.38	0.06	0.06	0.77	
Control Delay		53.7		67.1	40.2		36.5	10.4	1.8	11.9	37.0	
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		53.7		67.1	40.2		36.5	10.4	1.8	11.9	37.0	
LOS		D		E	D		D	B	A	B	D	
Approach Delay		53.7			55.2			18.2			36.6	
Approach LOS		D			E			B			D	
Queue Length 50th (ft)		60		45	18		216	125	0	4	390	
Queue Length 95th (ft)		126		94	60		#431	266	15	14	#585	
Internal Link Dist (ft)		515			434			603			658	
Turn Bay Length (ft)				90			180		200	135		
Base Capacity (vph)		263		241	254		583	2257	1034	308	1344	
Starvation Cap Reductn		0		0	0		0	0	0	0	0	
Spillback Cap Reductn		0		0	0		0	0	0	0	0	
Storage Cap Reductn		0		0	0		0	0	0	0	0	
Reduced v/c Ratio		0.42		0.24	0.18		0.73	0.38	0.06	0.06	0.77	

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 120.2
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.80
 Intersection Signal Delay: 28.5 Intersection LOS: C
 Intersection Capacity Utilization 78.0% ICU Level of Service D
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 200: Lawrenceville Hwy & Lynburn Dr



HCM Signalized Intersection Capacity Analysis
200: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
2025 AM Alternatives



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖	↗		↖	↕	↗	↖	↕	↗
Traffic Volume (vph)	32	15	54	52	22	19	390	790	61	17	896	57
Future Volume (vph)	32	15	54	52	22	19	390	790	61	17	896	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			6%			-3%				2%
Total Lost time (s)		4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt		0.93		1.00	0.93		1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.98		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1500		1545	1512		1617	3233	1446	1577	3125	
Flt Permitted		0.98		0.95	1.00		0.13	1.00	1.00	0.33	1.00	
Satd. Flow (perm)		1500		1545	1512		230	3233	1446	547	3125	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	16	59	57	24	21	424	859	66	18	974	62
RTOR Reduction (vph)	0	31	0	0	20	0	0	0	21	0	3	0
Lane Group Flow (vph)	0	79	0	57	25	0	424	859	45	18	1033	0
Turn Type	Split	NA		Split	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases							2		2	6		
Actuated Green, G (s)		11.7		8.4	8.4		90.4	83.9	83.9	56.5	54.5	
Effective Green, g (s)		11.7		8.4	8.4		90.4	83.9	83.9	56.5	54.5	
Actuated g/C Ratio		0.09		0.07	0.07		0.73	0.68	0.68	0.46	0.44	
Clearance Time (s)		4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		141		104	102		518	2187	978	265	1373	
v/s Ratio Prot		c0.05		c0.04	0.02		c0.21	0.27		0.00	0.33	
v/s Ratio Perm							c0.39		0.03	0.03		
v/c Ratio		0.56		0.55	0.25		0.82	0.39	0.05	0.07	0.75	
Uniform Delay, d1		53.7		56.0	54.8		27.5	8.8	6.7	19.0	29.1	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		5.0		5.8	1.3		9.7	0.5	0.1	0.1	3.9	
Delay (s)		58.7		61.8	56.1		37.2	9.4	6.8	19.1	33.0	
Level of Service		E		E	E		D	A	A	B	C	
Approach Delay (s)		58.7			59.3			18.0			32.7	
Approach LOS		E			E			B			C	

Intersection Summary

HCM 2000 Control Delay	27.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	78.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
201: Lawrenceville Hwy & Lynburn Dr

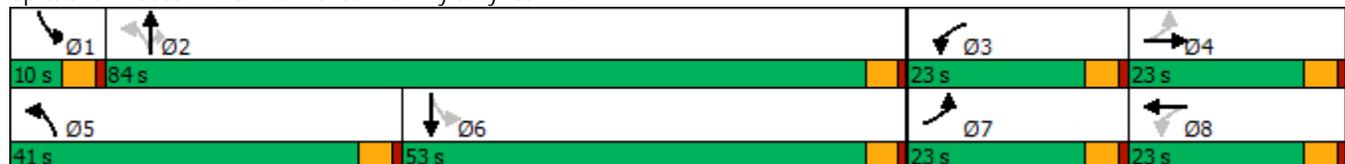
Lawrenceville Hwy Study
2025 AM Alternatives

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	15	54	52	22	19	390	790	61	17	896	57
Future Volume (vph)	32	15	54	52	22	19	390	790	61	17	896	57
Satd. Flow (prot)	1561	1449	0	1545	1512	0	1617	3233	1446	1577	3125	0
Flt Permitted	0.728			0.495			0.151			0.330		
Satd. Flow (perm)	1196	1449	0	805	1512	0	257	3233	1446	548	3125	0
Satd. Flow (RTOR)		59			21				82		5	
Lane Group Flow (vph)	35	75	0	57	45	0	424	859	66	18	1036	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		
Total Split (s)	23.0	23.0		23.0	23.0		41.0	84.0	84.0	10.0	53.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Act Effect Green (s)	13.8	7.6		17.2	11.2		86.8	84.5	84.5	57.8	52.2	
Actuated g/C Ratio	0.12	0.07		0.15	0.10		0.78	0.76	0.76	0.52	0.47	
v/c Ratio	0.20	0.49		0.31	0.27		0.75	0.35	0.06	0.05	0.71	
Control Delay	43.0	30.9		45.3	36.4		28.0	7.9	1.4	10.5	31.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	43.0	30.9		45.3	36.4		28.0	7.9	1.4	10.5	31.6	
LOS	D	C		D	D		C	A	A	B	C	
Approach Delay		34.8			41.4			13.9			31.2	
Approach LOS		C			D			B			C	
Queue Length 50th (ft)	23	12		37	17		177	100	0	4	353	
Queue Length 95th (ft)	53	62		77	57		342	224	12	12	507	
Internal Link Dist (ft)		540			417			619			674	
Turn Bay Length (ft)	150			90			180		200	135		
Base Capacity (vph)	298	294		284	273		653	2440	1111	335	1461	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.12	0.26		0.20	0.16		0.65	0.35	0.06	0.05	0.71	

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 111.9
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.75
 Intersection Signal Delay: 22.8
 Intersection LOS: C
 Intersection Capacity Utilization 74.7%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 201: Lawrenceville Hwy & Lynburn Dr



HCM Signalized Intersection Capacity Analysis
201: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
2025 AM Alternatives



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	15	54	52	22	19	390	790	61	17	896	57
Future Volume (vph)	32	15	54	52	22	19	390	790	61	17	896	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			6%			-3%				2%
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.88		1.00	0.93		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1561	1449		1545	1512		1617	3233	1446	1577	3125	
Flt Permitted	0.73	1.00		0.50	1.00		0.15	1.00	1.00	0.33	1.00	
Satd. Flow (perm)	1196	1449		805	1512		256	3233	1446	547	3125	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	16	59	57	24	21	424	859	66	18	974	62
RTOR Reduction (vph)	0	55	0	0	19	0	0	0	19	0	3	0
Lane Group Flow (vph)	35	20	0	57	26	0	424	859	47	18	1033	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	12.0	7.1		17.2	9.7		89.8	83.3	83.3	57.3	55.3	
Effective Green, g (s)	12.0	7.1		17.2	9.7		89.8	83.3	83.3	57.3	55.3	
Actuated g/C Ratio	0.10	0.06		0.15	0.08		0.76	0.71	0.71	0.49	0.47	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	136	87		164	124		541	2284	1021	283	1465	
v/s Ratio Prot	0.01	0.01		c0.02	0.02		c0.20	0.27		0.00	0.33	
v/s Ratio Perm	0.02			c0.03			c0.40		0.03	0.03		
v/c Ratio	0.26	0.22		0.35	0.21		0.78	0.38	0.05	0.06	0.71	
Uniform Delay, d1	48.7	52.8		44.7	50.5		23.2	6.9	5.2	16.1	24.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.0	1.3		1.3	0.8		7.3	0.5	0.1	0.1	2.9	
Delay (s)	49.7	54.1		46.0	51.3		30.5	7.4	5.3	16.2	27.7	
Level of Service	D	D		D	D		C	A	A	B	C	
Approach Delay (s)		52.7			48.3			14.5			27.5	
Approach LOS		D			D			B			C	

Intersection Summary

HCM 2000 Control Delay	22.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	117.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	74.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
202: Lawrenceville Hwy & Lynburn Dr

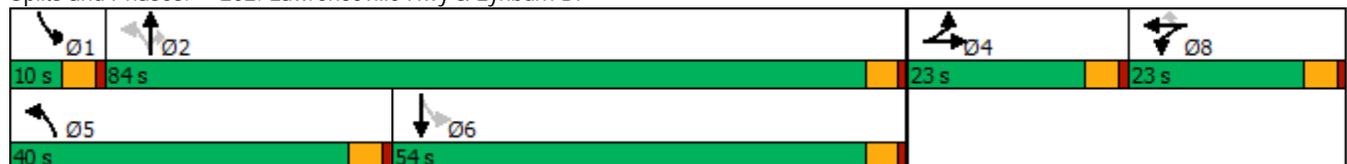
Lawrenceville Hwy Study
2025 AM Alternatives

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	15	54	52	22	19	390	790	61	17	896	57
Future Volume (vph)	32	15	54	52	22	19	390	790	61	17	896	57
Satd. Flow (prot)	0	1500	0	0	1571	1382	1617	3233	1446	1577	3125	0
Flt Permitted		0.984			0.966		0.129			0.330		
Satd. Flow (perm)	0	1500	0	0	1571	1382	220	3233	1446	548	3125	0
Satd. Flow (RTOR)		34				117			82		5	
Lane Group Flow (vph)	0	110	0	0	81	21	424	859	66	18	1036	0
Turn Type	Split	NA		Split	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8	2		2	6		
Total Split (s)	23.0	23.0		23.0	23.0	23.0	40.0	84.0	84.0	10.0	54.0	
Total Lost Time (s)		4.5			4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Act Effct Green (s)		11.7			11.8	11.8	87.8	84.2	84.2	56.7	51.1	
Actuated g/C Ratio		0.10			0.10	0.10	0.72	0.69	0.69	0.46	0.42	
v/c Ratio		0.63			0.54	0.09	0.81	0.39	0.06	0.06	0.79	
Control Delay		55.0			68.6	0.7	38.6	11.2	1.8	12.6	39.1	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		55.0			68.6	0.7	38.6	11.2	1.8	12.6	39.1	
LOS		D			E	A	D	B	A	B	D	
Approach Delay		55.0			54.7			19.4			38.7	
Approach LOS		D			D			B			D	
Queue Length 50th (ft)		60			65	0	228	133	0	4	401	
Queue Length 95th (ft)		128			123	0	#457	281	15	15	#608	
Internal Link Dist (ft)		492			463			594			664	
Turn Bay Length (ft)							180		200	135		
Base Capacity (vph)		259			242	312	571	2228	1022	301	1309	
Starvation Cap Reductn		0			0	0	0	0	0	0	0	
Spillback Cap Reductn		0			0	0	0	0	0	0	0	
Storage Cap Reductn		0			0	0	0	0	0	0	0	
Reduced v/c Ratio		0.42			0.33	0.07	0.74	0.39	0.06	0.06	0.79	

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 122.1
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.81
 Intersection Signal Delay: 30.0
 Intersection LOS: C
 Intersection Capacity Utilization 78.0%
 ICU Level of Service D
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 202: Lawrenceville Hwy & Lynburn Dr



HCM Signalized Intersection Capacity Analysis
202: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
2025 AM Alternatives



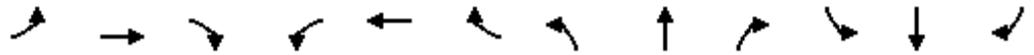
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↕	↗	↖	↑↑	↗	↖	↕↔	
Traffic Volume (vph)	32	15	54	52	22	19	390	790	61	17	896	57
Future Volume (vph)	32	15	54	52	22	19	390	790	61	17	896	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			6%			-3%				2%
Total Lost time (s)		4.5			4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt		0.93			1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.98			0.97	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1500			1571	1382	1617	3233	1446	1577	3125	
Flt Permitted		0.98			0.97	1.00	0.13	1.00	1.00	0.33	1.00	
Satd. Flow (perm)		1500			1571	1382	220	3233	1446	547	3125	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	16	59	57	24	21	424	859	66	18	974	62
RTOR Reduction (vph)	0	31	0	0	0	19	0	0	22	0	3	0
Lane Group Flow (vph)	0	79	0	0	81	2	424	859	44	18	1033	0
Turn Type	Split	NA		Split	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8	2		2	6		
Actuated Green, G (s)		11.7			10.0	10.0	90.7	84.2	84.2	56.1	54.1	
Effective Green, g (s)		11.7			10.0	10.0	90.7	84.2	84.2	56.1	54.1	
Actuated g/C Ratio		0.09			0.08	0.08	0.72	0.67	0.67	0.45	0.43	
Clearance Time (s)		4.5			4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		139			124	109	514	2162	967	260	1342	
v/s Ratio Prot		c0.05			c0.05		c0.21	0.27		0.00	0.33	
v/s Ratio Perm						0.00	c0.38		0.03	0.03		
v/c Ratio		0.57			0.65	0.02	0.82	0.40	0.05	0.07	0.77	
Uniform Delay, d1		54.7			56.3	53.4	28.8	9.4	7.1	19.6	30.6	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		5.3			11.7	0.1	10.4	0.5	0.1	0.1	4.3	
Delay (s)		60.0			68.0	53.5	39.2	10.0	7.2	19.7	34.9	
Level of Service		E			E	D	D	A	A	B	C	
Approach Delay (s)		60.0			65.0			19.0			34.6	
Approach LOS		E			E			B			C	

Intersection Summary

HCM 2000 Control Delay	28.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	125.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	78.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
203: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
2025 AM Alternatives

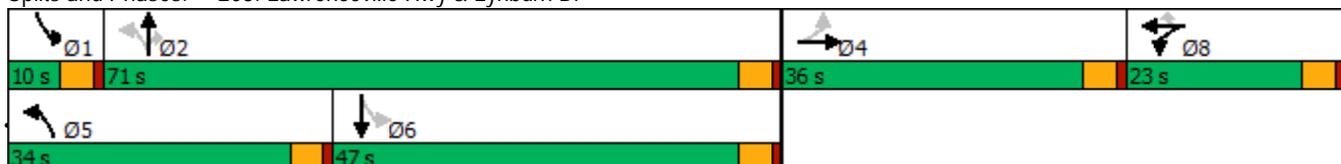


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↙	↑	↗	↙	↑↑	↗	↙	↕	↗
Traffic Volume (vph)	32	15	54	52	22	19	390	790	61	17	896	57
Future Volume (vph)	32	15	54	52	22	19	390	790	61	17	896	57
Satd. Flow (prot)	0	1500	0	1545	1626	1382	1617	3233	1446	1577	3125	0
Flt Permitted		0.221		0.950			0.080			0.330		
Satd. Flow (perm)	0	337	0	1545	1626	1382	136	3233	1446	548	3125	0
Satd. Flow (RTOR)		38				117			82		5	
Lane Group Flow (vph)	0	110	0	57	24	21	424	859	66	18	1036	0
Turn Type	Perm	NA		Split	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4		8	8		5	2		1	6	
Permitted Phases	4					8	2		2	6		
Total Split (s)	36.0	36.0		23.0	23.0	23.0	34.0	71.0	71.0	10.0	47.0	
Total Lost Time (s)		4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Act Effect Green (s)		31.6		10.1	10.1	10.1	76.7	72.9	72.9	48.1	42.6	
Actuated g/C Ratio		0.24		0.08	0.08	0.08	0.59	0.56	0.56	0.37	0.33	
v/c Ratio		1.00		0.47	0.19	0.10	1.01	0.47	0.08	0.07	1.01	
Control Delay		119.3		70.9	59.8	0.9	87.2	19.7	2.6	16.5	73.0	
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		119.3		70.9	59.8	0.9	87.2	19.7	2.6	16.5	73.0	
LOS		F		E	E	A	F	B	A	B	E	
Approach Delay		119.3			53.9			40.1			72.0	
Approach LOS		F			D			D			E	
Queue Length 50th (ft)		-68		47	20	0	-344	210	0	6	-493	
Queue Length 95th (ft)		#205		94	49	0	#582	334	18	19	#665	
Internal Link Dist (ft)		598			486			576			669	
Turn Bay Length (ft)				90		50	180		200	135		
Base Capacity (vph)		110		221	232	298	418	1816	848	247	1030	
Starvation Cap Reductn		0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0		0	0	0	0	0	0	0	0	
Storage Cap Reductn		0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio		1.00		0.26	0.10	0.07	1.01	0.47	0.08	0.07	1.01	

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 129.7
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.01
 Intersection Signal Delay: 56.8
 Intersection LOS: E
 Intersection Capacity Utilization 78.0%
 ICU Level of Service D
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 203: Lawrenceville Hwy & Lynburn Dr



HCM Signalized Intersection Capacity Analysis
203: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
2025 AM Alternatives

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	32	15	54	52	22	19	390	790	61	17	896	57	
Future Volume (vph)	32	15	54	52	22	19	390	790	61	17	896	57	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Grade (%)		4%			6%			-3%				2%	
Total Lost time (s)		4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor		1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95		
Frt		0.93		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		
Flt Protected		0.98		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (prot)		1500		1545	1626	1382	1617	3233	1446	1577	3125		
Flt Permitted		0.22		0.95	1.00	1.00	0.08	1.00	1.00	0.33	1.00		
Satd. Flow (perm)		336		1545	1626	1382	136	3233	1446	547	3125		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	35	16	59	57	24	21	424	859	66	18	974	62	
RTOR Reduction (vph)	0	29	0	0	0	20	0	0	30	0	3	0	
Lane Group Flow (vph)	0	81	0	57	24	1	424	859	36	18	1033	0	
Turn Type	Perm	NA		Split	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		
Protected Phases		4		8	8		5	2		1	6		
Permitted Phases	4					8	2		2	6			
Actuated Green, G (s)		31.6		8.8	8.8	8.8	79.5	72.9	72.9	47.5	45.4		
Effective Green, g (s)		31.6		8.8	8.8	8.8	79.5	72.9	72.9	47.5	45.4		
Actuated g/C Ratio		0.24		0.07	0.07	0.07	0.60	0.55	0.55	0.36	0.34		
Clearance Time (s)		4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)		79		101	107	91	409	1766	790	210	1063		
v/s Ratio Prot				c0.04	0.01		c0.23	0.27		0.00	0.33		
v/s Ratio Perm		c0.24				0.00	c0.39		0.02	0.03			
v/c Ratio		1.03		0.56	0.22	0.02	1.04	0.49	0.05	0.09	0.97		
Uniform Delay, d1		50.9		60.4	59.1	58.2	42.6	18.7	14.1	28.0	43.4		
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2		108.4		7.0	1.1	0.1	54.3	1.0	0.1	0.2	21.5		
Delay (s)		159.3		67.5	60.1	58.3	96.9	19.6	14.2	28.2	64.9		
Level of Service		F		E	E	E	F	B	B	C	E		
Approach Delay (s)		159.3			63.9			43.7			64.3		
Approach LOS		F			E			D			E		
Intersection Summary													
HCM 2000 Control Delay			57.6									HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio			1.02										
Actuated Cycle Length (s)			133.4									Sum of lost time (s)	18.0
Intersection Capacity Utilization			78.0%									ICU Level of Service	D
Analysis Period (min)			15										
c Critical Lane Group													

Lanes, Volumes, Timings
213: Lawrenceville Hwy & Lynburn Dr

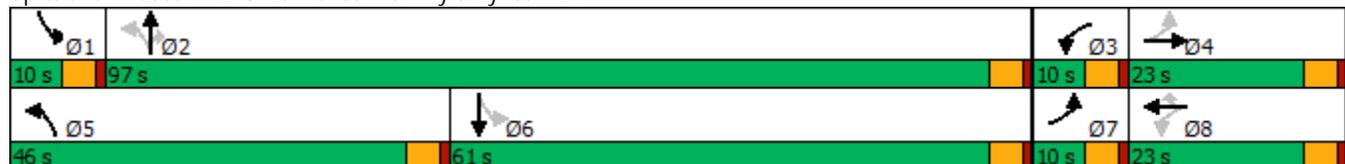
Lawrenceville Hwy Study
2025 AM Alternatives

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	15	54	52	22	19	390	790	61	17	896	57
Future Volume (vph)	32	15	54	52	22	19	390	790	61	17	896	57
Satd. Flow (prot)	1561	1449	0	1545	1626	1382	1617	3233	1446	1577	3125	0
Flt Permitted	0.742			0.563			0.185			0.330		
Satd. Flow (perm)	1219	1449	0	916	1626	1382	315	3233	1446	548	3125	0
Satd. Flow (RTOR)		59				117			82		6	
Lane Group Flow (vph)	35	75	0	57	24	21	424	859	66	18	1036	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Total Split (s)	10.0	23.0		10.0	23.0	23.0	46.0	97.0	97.0	10.0	61.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Act Effect Green (s)	12.0	7.8		12.9	9.8	9.8	97.3	94.8	94.8	71.7	66.1	
Actuated g/C Ratio	0.10	0.07		0.11	0.08	0.08	0.81	0.79	0.79	0.60	0.55	
v/c Ratio	0.25	0.50		0.45	0.18	0.10	0.78	0.33	0.06	0.05	0.60	
Control Delay	52.1	32.3		60.1	58.6	0.8	25.0	5.8	1.0	8.6	24.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	52.1	32.3		60.1	58.6	0.8	25.0	5.8	1.0	8.6	24.0	
LOS	D	C		E	E	A	C	A	A	A	C	
Approach Delay		38.6			47.5			11.6			23.7	
Approach LOS		D			D			B			C	
Queue Length 50th (ft)	24	12		39	18	0	148	86	0	3	292	
Queue Length 95th (ft)	59	64		86	49	0	285	185	10	12	490	
Internal Link Dist (ft)		618			662			865			596	
Turn Bay Length (ft)	150			90		50	180		200	135		
Base Capacity (vph)	138	277		128	255	315	715	2567	1165	376	1732	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.25	0.27		0.45	0.09	0.07	0.59	0.33	0.06	0.05	0.60	

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 119.4
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 19.0
 Intersection LOS: B
 Intersection Capacity Utilization 74.7%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 213: Lawrenceville Hwy & Lynburn Dr



HCM Signalized Intersection Capacity Analysis
213: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
2025 AM Alternatives



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	15	54	52	22	19	390	790	61	17	896	57
Future Volume (vph)	32	15	54	52	22	19	390	790	61	17	896	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			6%			-3%				2%
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.88		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1561	1449		1545	1626	1382	1617	3233	1446	1577	3125	
Flt Permitted	0.74	1.00		0.56	1.00	1.00	0.18	1.00	1.00	0.33	1.00	
Satd. Flow (perm)	1218	1449		915	1626	1382	314	3233	1446	547	3125	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	16	59	57	24	21	424	859	66	18	974	62
RTOR Reduction (vph)	0	56	0	0	0	20	0	0	17	0	3	0
Lane Group Flow (vph)	35	19	0	57	24	1	424	859	49	18	1033	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	10.4	7.3		12.6	8.4	8.4	100.2	93.7	93.7	71.0	69.0	
Effective Green, g (s)	10.4	7.3		12.6	8.4	8.4	100.2	93.7	93.7	71.0	69.0	
Actuated g/C Ratio	0.08	0.06		0.10	0.07	0.07	0.80	0.75	0.75	0.57	0.55	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	109	84		113	109	92	529	2419	1082	326	1722	
v/s Ratio Prot	0.01	0.01		c0.02	0.01		c0.17	0.27		0.00	0.33	
v/s Ratio Perm	0.02			c0.03		0.00	c0.47		0.03	0.03		
v/c Ratio	0.32	0.23		0.50	0.22	0.02	0.80	0.36	0.05	0.06	0.60	
Uniform Delay, d1	53.8	56.3		52.6	55.3	54.5	20.0	5.4	4.1	12.1	18.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.7	1.4		3.5	1.0	0.1	8.5	0.4	0.1	0.1	1.6	
Delay (s)	55.5	57.7		56.1	56.3	54.6	28.5	5.8	4.2	12.2	20.4	
Level of Service	E	E		E	E	D	C	A	A	B	C	
Approach Delay (s)		57.0			55.9			12.9			20.3	
Approach LOS		E			E			B			C	

Intersection Summary

HCM 2000 Control Delay	19.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	125.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	74.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
230: Lawrenceville Hwy & Lynburn Dr

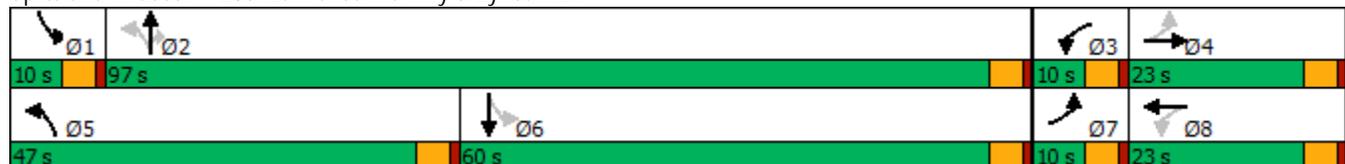
Lawrenceville Hwy Study
2025 AM Alternatives

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	15	54	35	15	13	390	790	61	17	896	57
Future Volume (vph)	32	15	54	35	15	13	390	790	61	17	896	57
Satd. Flow (prot)	1593	1479	0	1593	1559	0	1593	3185	1425	1593	3157	0
Flt Permitted	0.738			0.643			0.186			0.330		
Satd. Flow (perm)	1237	1479	0	1078	1559	0	312	3185	1425	553	3157	0
Satd. Flow (RTOR)		59			14				82		5	
Lane Group Flow (vph)	35	75	0	38	30	0	424	859	66	18	1036	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		
Total Split (s)	10.0	23.0		10.0	23.0		47.0	97.0	97.0	10.0	60.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Act Effct Green (s)	10.7	7.6		10.7	7.6		97.4	95.0	95.0	70.9	65.4	
Actuated g/C Ratio	0.09	0.06		0.09	0.06		0.83	0.81	0.81	0.60	0.56	
v/c Ratio	0.27	0.50		0.31	0.26		0.76	0.33	0.06	0.05	0.59	
Control Delay	53.2	32.0		54.9	42.0		23.5	5.4	1.0	8.9	23.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	53.2	32.0		54.9	42.0		23.5	5.4	1.0	8.9	23.5	
LOS	D	C		D	D		C	A	A	A	C	
Approach Delay		38.7			49.2			10.9			23.2	
Approach LOS		D			D			B			C	
Queue Length 50th (ft)	24	12		26	12		148	84	0	3	292	
Queue Length 95th (ft)	59	63		63	46		286	186	10	12	494	
Internal Link Dist (ft)		745			603			883			668	
Turn Bay Length (ft)	150			90			180		200	135		
Base Capacity (vph)	129	286		122	261		730	2578	1169	383	1761	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.27	0.26		0.31	0.11		0.58	0.33	0.06	0.05	0.59	

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 117.3
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.76
 Intersection Signal Delay: 18.1
 Intersection Capacity Utilization 73.6%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service D

Splits and Phases: 230: Lawrenceville Hwy & Lynburn Dr



HCM Signalized Intersection Capacity Analysis
230: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
2025 AM Alternatives



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	15	54	35	15	13	390	790	61	17	896	57
Future Volume (vph)	32	15	54	35	15	13	390	790	61	17	896	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.88		1.00	0.93		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1593	1479		1593	1559		1593	3185	1425	1593	3157	
Flt Permitted	0.74	1.00		0.64	1.00		0.19	1.00	1.00	0.33	1.00	
Satd. Flow (perm)	1237	1479		1077	1559		312	3185	1425	553	3157	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	16	59	38	16	14	424	859	66	18	974	62
RTOR Reduction (vph)	0	56	0	0	13	0	0	0	16	0	2	0
Lane Group Flow (vph)	35	19	0	38	17	0	424	859	50	18	1034	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	9.3	6.3		9.3	6.3		100.4	93.9	93.9	70.4	68.4	
Effective Green, g (s)	9.3	6.3		9.3	6.3		100.4	93.9	93.9	70.4	68.4	
Actuated g/C Ratio	0.08	0.05		0.08	0.05		0.81	0.76	0.76	0.57	0.56	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	102	75		93	79		540	2427	1086	332	1752	
v/s Ratio Prot	0.01	0.01		c0.01	0.01		c0.18	0.27		0.00	0.33	
v/s Ratio Perm	0.02			c0.02			c0.46		0.04	0.03		
v/c Ratio	0.34	0.25		0.41	0.21		0.79	0.35	0.05	0.05	0.59	
Uniform Delay, d1	53.8	56.2		53.9	56.1		19.1	4.8	3.6	11.7	18.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.0	1.8		2.9	1.3		7.4	0.4	0.1	0.1	1.5	
Delay (s)	55.8	58.0		56.8	57.4		26.5	5.2	3.7	11.8	19.6	
Level of Service	E	E		E	E		C	A	A	B	B	
Approach Delay (s)		57.3			57.1			11.8			19.5	
Approach LOS		E			E			B			B	

Intersection Summary

HCM 2000 Control Delay	18.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	123.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
 300: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
 2025 AM Alternatives

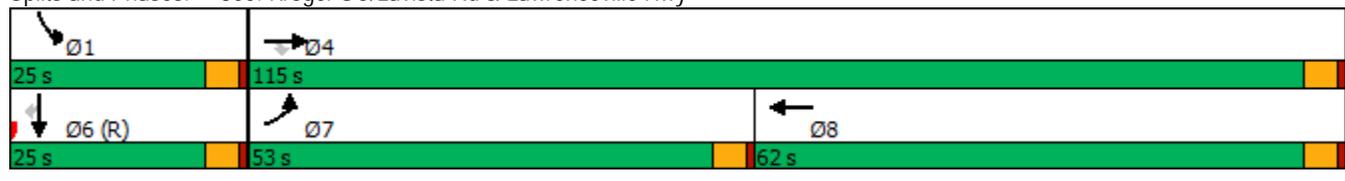
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	331	486	24	0	887	981	0	0	23	211	30	83
Future Volume (vph)	331	486	24	0	887	981	0	0	23	211	30	83
Satd. Flow (prot)	1585	3169	1418	0	3185	1425	0	0	1450	3090	1676	1425
Flt Permitted	0.950										0.950	
Satd. Flow (perm)	1585	3169	1418	0	3185	1425	0	0	1450	3090	1676	1425
Satd. Flow (RTOR)	26			324			409			90		
Lane Group Flow (vph)	360	528	26	0	964	1066	0	0	25	229	33	90
Turn Type	Prot	NA	Perm		NA	Free			Free	Prot	NA	Perm
Protected Phases	7	4			8					1	6	
Permitted Phases	4			Free			Free			6		
Total Split (s)	53.0	115.0	115.0		62.0					25.0	25.0	25.0
Total Lost Time (s)	4.5	4.5	4.5		4.5					4.5	4.5	4.5
Act Effct Green (s)	37.3	91.9	91.9		50.1	140.0			140.0	39.1	39.1	39.1
Actuated g/C Ratio	0.27	0.66	0.66		0.36	1.00			1.00	0.28	0.28	0.28
v/c Ratio	0.85	0.25	0.03		0.85	0.75			0.02	0.27	0.07	0.19
Control Delay	67.0	9.8	1.4		29.4	9.0			0.0	44.1	45.3	10.7
Queue Delay	0.0	0.0	0.0		4.8	0.0			0.0	0.0	0.0	0.0
Total Delay	67.0	9.8	1.4		34.2	9.0			0.0	44.1	45.3	10.7
LOS	E	A	A		C	A			A	D	D	B
Approach Delay	32.1			21.0			35.7					
Approach LOS	C			C			D					
Queue Length 50th (ft)	312	95	0		341	251			0	84	22	0
Queue Length 95th (ft)	397	71	6		m366	m232			0	144	60	51
Internal Link Dist (ft)	856			343			238			413		
Turn Bay Length (ft)	445		230			125				300		225
Base Capacity (vph)	549	2501	1124		1310	1425			1450	862	467	462
Starvation Cap Reductn	0	0	0		275	0			0	0	0	0
Spillback Cap Reductn	0	0	0		0	0			0	0	0	0
Storage Cap Reductn	0	0	0		0	0			0	0	0	0
Reduced v/c Ratio	0.66	0.21	0.02		0.93	0.75			0.02	0.27	0.07	0.19

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 0 (0%), Referenced to phase 2: and 6:SBT, Start of Green, Master Intersection
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.85
 Intersection Signal Delay: 25.4 Intersection LOS: C
 Intersection Capacity Utilization 65.6% ICU Level of Service C
 Analysis Period (min) 15

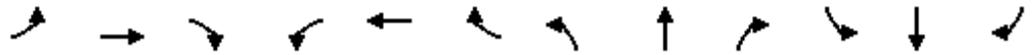
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 300: Kroger SC/Lavista Rd & Lawrenceville Hwy



HCM Signalized Intersection Capacity Analysis
300: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
2025 AM Alternatives



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘		↖	↗			↖	↗	↘	↖
Traffic Volume (vph)	331	486	24	0	887	981	0	0	23	211	30	83
Future Volume (vph)	331	486	24	0	887	981	0	0	23	211	30	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			0%			0%				0%
Total Lost time (s)	4.5	4.5	4.5		4.5	4.0			4.0	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00		0.95	1.00			1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85			0.86	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00
Satd. Flow (prot)	1585	3169	1418		3185	1425			1450	3090	1676	1425
Flt Permitted	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00
Satd. Flow (perm)	1585	3169	1418		3185	1425			1450	3090	1676	1425
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	360	528	26	0	964	1066	0	0	25	229	33	90
RTOR Reduction (vph)	0	0	9	0	0	0	0	0	0	0	0	65
Lane Group Flow (vph)	360	528	17	0	964	1066	0	0	25	229	33	25
Turn Type	Prot	NA	Perm		NA	Free			Free	Prot	NA	Perm
Protected Phases	7	4			8					1	6	
Permitted Phases			4			Free			Free			6
Actuated Green, G (s)	37.3	91.9	91.9		50.1	140.0			140.0	39.1	39.1	39.1
Effective Green, g (s)	37.3	91.9	91.9		50.1	140.0			140.0	39.1	39.1	39.1
Actuated g/C Ratio	0.27	0.66	0.66		0.36	1.00			1.00	0.28	0.28	0.28
Clearance Time (s)	4.5	4.5	4.5		4.5					4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0					3.0	3.0	3.0
Lane Grp Cap (vph)	422	2080	930		1139	1425			1450	862	468	397
v/s Ratio Prot	c0.23	0.17			c0.30					0.07	0.02	
v/s Ratio Perm			0.01			c0.75			0.02			0.02
v/c Ratio	0.85	0.25	0.02		0.85	0.75			0.02	0.27	0.07	0.06
Uniform Delay, d1	48.7	9.9	8.4		41.4	0.0			0.0	39.3	37.1	37.0
Progression Factor	1.00	1.00	1.00		0.63	1.00			1.00	1.00	1.00	1.00
Incremental Delay, d2	15.3	0.1	0.0		2.8	1.7			0.0	0.2	0.3	0.3
Delay (s)	64.0	10.0	8.4		28.7	1.7			0.0	39.4	37.4	37.3
Level of Service	E	A	A		C	A			A	D	D	D
Approach Delay (s)		31.2			14.5			0.0			38.7	
Approach LOS		C			B			A			D	

Intersection Summary		
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.84	C
Actuated Cycle Length (s)	140.0	Sum of lost time (s)
Intersection Capacity Utilization	65.6%	13.5
Analysis Period (min)	15	ICU Level of Service
		C
c Critical Lane Group		

Lanes, Volumes, Timings
301: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
2025 AM Alternatives



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↘		↑↑	↘			↘	↘↘	↑	↘
Traffic Volume (vph)	331	486	24	0	887	981	0	0	23	211	30	83
Future Volume (vph)	331	486	24	0	887	981	0	0	23	211	30	83
Satd. Flow (prot)	1585	3169	1418	0	3185	1425	0	0	1450	3090	1676	1425
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1585	3169	1418	0	3185	1425	0	0	1450	3090	1676	1425
Satd. Flow (RTOR)			26			541			409			90
Lane Group Flow (vph)	360	528	26	0	964	1066	0	0	25	229	33	90
Turn Type	Prot	NA	Perm		NA	Free			Free	Perm	NA	Perm
Protected Phases	7	4			8							6
Permitted Phases			4			Free			Free	6		6
Total Split (s)	53.0	115.0	115.0		62.0					25.0	25.0	25.0
Total Lost Time (s)	4.5	4.5	4.5		4.5					4.5	4.5	4.5
Act Effct Green (s)	37.3	91.9	91.9		50.1	140.0			140.0	39.1	39.1	39.1
Actuated g/C Ratio	0.27	0.66	0.66		0.36	1.00			1.00	0.28	0.28	0.28
v/c Ratio	0.85	0.25	0.03		0.85	0.75			0.02	0.27	0.07	0.19
Control Delay	67.0	9.8	1.4		29.4	9.0			0.0	44.1	45.3	10.7
Queue Delay	0.0	0.0	0.0		3.5	0.0			0.0	0.0	0.0	0.0
Total Delay	67.0	9.8	1.4		32.9	9.0			0.0	44.1	45.3	10.7
LOS	E	A	A		C	A			A	D	D	B
Approach Delay		32.1			20.3							35.7
Approach LOS		C			C							D
Queue Length 50th (ft)	312	95	0		341	251			0	84	22	0
Queue Length 95th (ft)	397	71	6		m366	m233			0	144	60	51
Internal Link Dist (ft)		867			352			296				387
Turn Bay Length (ft)	445		230			225				300		255
Base Capacity (vph)	549	2501	1124		1310	1425			1450	862	467	462
Starvation Cap Reductn	0	0	0		250	0			0	0	0	0
Spillback Cap Reductn	0	0	0		0	0			0	0	0	0
Storage Cap Reductn	0	0	0		0	0			0	0	0	0
Reduced v/c Ratio	0.66	0.21	0.02		0.91	0.75			0.02	0.27	0.07	0.19

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2: and 6:SBTL, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.85

Intersection Signal Delay: 25.0

Intersection LOS: C

Intersection Capacity Utilization 65.6%

ICU Level of Service C

Analysis Period (min) 15

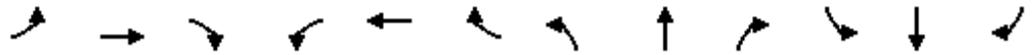
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 301: Kroger SC/Lavista Rd & Lawrenceville Hwy



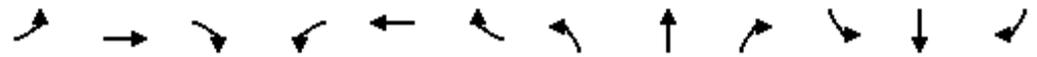
HCM Signalized Intersection Capacity Analysis
301: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
2025 AM Alternatives



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↖	↗	↘		↖	↗			↖	↗	↘	↖	
Traffic Volume (vph)	331	486	24	0	887	981	0	0	23	211	30	83	
Future Volume (vph)	331	486	24	0	887	981	0	0	23	211	30	83	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Grade (%)		1%			0%			0%				0%	
Total Lost time (s)	4.5	4.5	4.5		4.5	4.0			4.0	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95	1.00		0.95	1.00			1.00	0.97	1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85			0.86	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1585	3169	1418		3185	1425			1450	3090	1676	1425	
Flt Permitted	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1585	3169	1418		3185	1425			1450	3090	1676	1425	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	360	528	26	0	964	1066	0	0	25	229	33	90	
RTOR Reduction (vph)	0	0	9	0	0	0	0	0	0	0	0	65	
Lane Group Flow (vph)	360	528	17	0	964	1066	0	0	25	229	33	25	
Turn Type	Prot	NA	Perm		NA	Free			Free	Perm	NA	Perm	
Protected Phases	7	4			8							6	
Permitted Phases			4			Free			Free	6		6	
Actuated Green, G (s)	37.3	91.9	91.9		50.1	140.0			140.0	39.1	39.1	39.1	
Effective Green, g (s)	37.3	91.9	91.9		50.1	140.0			140.0	39.1	39.1	39.1	
Actuated g/C Ratio	0.27	0.66	0.66		0.36	1.00			1.00	0.28	0.28	0.28	
Clearance Time (s)	4.5	4.5	4.5		4.5					4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0		3.0					3.0	3.0	3.0	
Lane Grp Cap (vph)	422	2080	930		1139	1425			1450	862	468	397	
v/s Ratio Prot	c0.23	0.17			c0.30							0.02	
v/s Ratio Perm			0.01			c0.75			0.02	0.07		0.02	
v/c Ratio	0.85	0.25	0.02		0.85	0.75			0.02	0.27	0.07	0.06	
Uniform Delay, d1	48.7	9.9	8.4		41.4	0.0			0.0	39.3	37.1	37.0	
Progression Factor	1.00	1.00	1.00		0.63	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	15.3	0.1	0.0		2.8	1.7			0.0	0.8	0.3	0.3	
Delay (s)	64.0	10.0	8.4		28.8	1.7			0.0	40.0	37.4	37.3	
Level of Service	E	A	A		C	A			A	D	D	D	
Approach Delay (s)		31.2			14.5			0.0			39.1		
Approach LOS		C			B			A			D		
Intersection Summary													
HCM 2000 Control Delay			21.6									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.84										
Actuated Cycle Length (s)			140.0									Sum of lost time (s)	13.5
Intersection Capacity Utilization			65.6%									ICU Level of Service	C
Analysis Period (min)			15										
c Critical Lane Group													

Lanes, Volumes, Timings
 302: Kroger SC/Lavista Rd & Lawrenceville Hwy

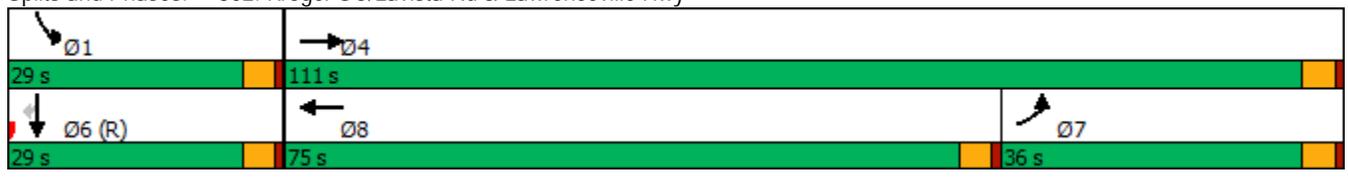


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↑↑	↖		↑↑	↖				↖↗	↑	↖
Traffic Volume (vph)	331	486	24	0	887	981	0	0	23	211	30	83
Future Volume (vph)	331	486	24	0	887	981	0	0	23	211	30	83
Satd. Flow (prot)	3074	3169	1418	0	3185	1425	0	0	1450	3090	1676	1425
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	3074	3169	1418	0	3185	1425	0	0	1450	3090	1676	1425
Satd. Flow (RTOR)			82			324			398			90
Lane Group Flow (vph)	360	528	26	0	964	1066	0	0	25	229	33	90
Turn Type	Prot	NA	Free		NA	Free			Free	Prot	NA	Perm
Protected Phases	7	4			8					1	6	
Permitted Phases			Free		Free				Free			6
Total Split (s)	36.0	111.0			75.0					29.0	29.0	29.0
Total Lost Time (s)	4.5	4.5			4.5					4.5	4.5	4.5
Act Effect Green (s)	21.7	78.9	140.0		52.7	140.0			140.0	52.1	52.1	52.1
Actuated g/C Ratio	0.16	0.56	1.00		0.38	1.00			1.00	0.37	0.37	0.37
v/c Ratio	0.76	0.30	0.02		0.80	0.75			0.02	0.20	0.05	0.15
Control Delay	67.0	15.8	0.0		24.2	9.0			0.0	33.0	33.9	7.8
Queue Delay	0.0	0.0	0.0		0.5	0.0			0.0	0.0	0.0	0.0
Total Delay	67.0	15.8	0.0		24.7	9.0			0.0	33.0	33.9	7.8
LOS	E	B	A		C	A			A	C	C	A
Approach Delay		35.5			16.4						26.7	
Approach LOS		D			B						C	
Queue Length 50th (ft)	163	126	0		353	251			0	72	19	0
Queue Length 95th (ft)	210	119	0		m320	m237			0	123	51	44
Internal Link Dist (ft)		935			378			282			532	
Turn Bay Length (ft)	445		230			125				300		210
Base Capacity (vph)	691	2410	1418		1603	1425			1450	1150	624	586
Starvation Cap Reductn	0	0	0		259	0			0	0	0	0
Spillback Cap Reductn	0	0	0		0	0			0	0	0	0
Storage Cap Reductn	0	0	0		0	0			0	0	0	0
Reduced v/c Ratio	0.52	0.22	0.02		0.72	0.75			0.02	0.20	0.05	0.15

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 50 (36%), Referenced to phase 2: and 6:SBT, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.80
 Intersection Signal Delay: 22.6 Intersection LOS: C
 Intersection Capacity Utilization 55.7% ICU Level of Service B
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 302: Kroger SC/Lavista Rd & Lawrenceville Hwy

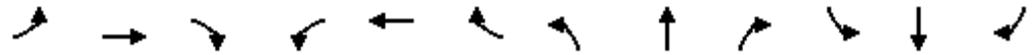


HCM Signalized Intersection Capacity Analysis
302: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
2025 AM Alternatives

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	 	 			 					 			
Traffic Volume (vph)	331	486	24	0	887	981	0	0	23	211	30	83	
Future Volume (vph)	331	486	24	0	887	981	0	0	23	211	30	83	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Grade (%)		1%			0%			0%				0%	
Total Lost time (s)	4.5	4.5	4.0		4.5	4.0			4.0	4.5	4.5	4.5	
Lane Util. Factor	0.97	0.95	1.00		0.95	1.00			1.00	0.97	1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85			0.86	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00	
Satd. Flow (prot)	3074	3169	1418		3185	1425			1450	3090	1676	1425	
Flt Permitted	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00	
Satd. Flow (perm)	3074	3169	1418		3185	1425			1450	3090	1676	1425	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	360	528	26	0	964	1066	0	0	25	229	33	90	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	57	
Lane Group Flow (vph)	360	528	26	0	964	1066	0	0	25	229	33	33	
Turn Type	Prot	NA	Free		NA	Free			Free	Prot	NA	Perm	
Protected Phases	7	4			8					1	6		
Permitted Phases			Free			Free			Free			6	
Actuated Green, G (s)	21.7	78.9	140.0		52.7	140.0			140.0	52.1	52.1	52.1	
Effective Green, g (s)	21.7	78.9	140.0		52.7	140.0			140.0	52.1	52.1	52.1	
Actuated g/C Ratio	0.15	0.56	1.00		0.38	1.00			1.00	0.37	0.37	0.37	
Clearance Time (s)	4.5	4.5			4.5					4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0			3.0					3.0	3.0	3.0	
Lane Grp Cap (vph)	476	1785	1418		1198	1425			1450	1149	623	530	
v/s Ratio Prot	0.12	0.17			0.30					0.07	0.02		
v/s Ratio Perm			0.02			c0.75			0.02			0.02	
v/c Ratio	0.76	0.30	0.02		0.80	0.75			0.02	0.20	0.05	0.06	
Uniform Delay, d1	56.6	16.0	0.0		39.0	0.0			0.0	29.8	28.1	28.3	
Progression Factor	1.00	1.00	1.00		0.56	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.7	0.1	0.0		1.9	1.7			0.0	0.1	0.2	0.2	
Delay (s)	63.4	16.1	0.0		23.7	1.7			0.0	29.9	28.3	28.5	
Level of Service	E	B	A		C	A			A	C	C	C	
Approach Delay (s)		34.3			12.1			0.0			29.4		
Approach LOS		C			B			A			C		
Intersection Summary													
HCM 2000 Control Delay			20.0									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.83										
Actuated Cycle Length (s)			140.0									Sum of lost time (s)	13.5
Intersection Capacity Utilization			55.7%									ICU Level of Service	B
Analysis Period (min)			15										
c Critical Lane Group													

Lanes, Volumes, Timings
303: Kroger SC/Lavista Rd & Lawrenceville Hwy

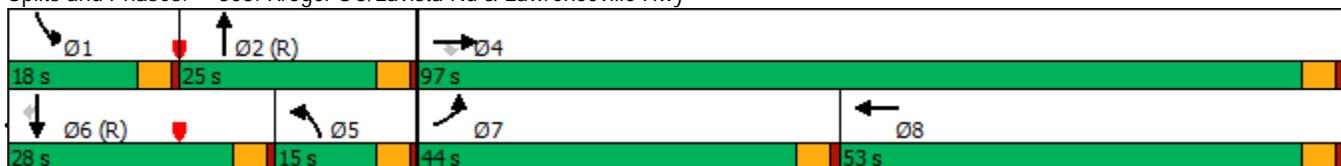


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↑↑	↗		↑↑	↗	↙	↗		↙↗	↑	↗
Traffic Volume (vph)	331	486	24	0	887	981	72	8	23	211	30	83
Future Volume (vph)	331	486	24	0	887	981	72	8	23	211	30	83
Satd. Flow (prot)	1585	3169	1418	0	3185	1425	1593	1492	0	3090	1676	1425
Flt Permitted	0.950						0.950			0.950		
Satd. Flow (perm)	1585	3169	1418	0	3185	1425	1593	1492	0	3090	1676	1425
Satd. Flow (RTOR)			82			324		25				90
Lane Group Flow (vph)	360	528	26	0	964	1066	78	34	0	229	33	90
Turn Type	Prot	NA	Perm		NA	Free	Prot	NA		Prot	NA	Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases			4			Free						6
Total Split (s)	44.0	97.0	97.0		53.0		15.0	25.0		18.0	28.0	28.0
Total Lost Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Act Effct Green (s)	35.4	86.6	86.6		46.7	140.0	10.5	26.4		13.4	29.4	29.4
Actuated g/C Ratio	0.25	0.62	0.62		0.33	1.00	0.08	0.19		0.10	0.21	0.21
v/c Ratio	0.90	0.27	0.03		0.91	0.75	0.66	0.11		0.77	0.09	0.24
Control Delay	75.8	12.1	0.0		35.8	9.1	88.2	25.1		79.5	49.6	11.3
Queue Delay	0.0	0.0	0.0		2.8	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	75.8	12.1	0.0		38.5	9.1	88.2	25.1		79.5	49.6	11.3
LOS	E	B	A		D	A	F	C		E	D	B
Approach Delay		36.9			23.1			69.0			59.3	
Approach LOS		D			C			E			E	
Queue Length 50th (ft)	312	97	0		380	269	70	7		105	26	0
Queue Length 95th (ft)	#458	123	0		m467	m203	#146	41		#166	59	50
Internal Link Dist (ft)		1026			493			316			468	
Turn Bay Length (ft)	445		230			125				300		210
Base Capacity (vph)	447	2093	964		1108	1425	119	301		304	351	370
Starvation Cap Reductn	0	0	0		72	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0		0	0	0
Reduced v/c Ratio	0.81	0.25	0.03		0.93	0.75	0.66	0.11		0.75	0.09	0.24

Intersection Summary

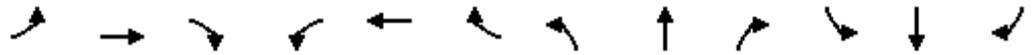
Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 32.0
 Intersection LOS: C
 Intersection Capacity Utilization 72.2%
 ICU Level of Service C
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 303: Kroger SC/Lavista Rd & Lawrenceville Hwy



HCM Signalized Intersection Capacity Analysis
303: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
2025 AM Alternatives



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	331	486	24	0	887	981	72	8	23	211	30	83
Future Volume (vph)	331	486	24	0	887	981	72	8	23	211	30	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			0%			0%				0%
Total Lost time (s)	4.5	4.5	4.5		4.5	4.0	4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00		0.95	1.00	1.00	1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.89		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1585	3169	1418		3185	1425	1593	1492		3090	1676	1425
Flt Permitted	0.95	1.00	1.00		1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1585	3169	1418		3185	1425	1593	1492		3090	1676	1425
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	360	528	26	0	964	1066	78	9	25	229	33	90
RTOR Reduction (vph)	0	0	10	0	0	0	0	20	0	0	0	71
Lane Group Flow (vph)	360	528	16	0	964	1066	78	14	0	229	33	19
Turn Type	Prot	NA	Perm		NA	Free	Prot	NA		Prot	NA	Perm
Protected Phases	7	4			8		5	2		1		6
Permitted Phases			4			Free						6
Actuated Green, G (s)	35.4	86.6	86.6		46.7	140.0	10.5	26.5		13.4	29.4	29.4
Effective Green, g (s)	35.4	86.6	86.6		46.7	140.0	10.5	26.5		13.4	29.4	29.4
Actuated g/C Ratio	0.25	0.62	0.62		0.33	1.00	0.08	0.19		0.10	0.21	0.21
Clearance Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	400	1960	877		1062	1425	119	282		295	351	299
v/s Ratio Prot	c0.23	0.17			c0.30		0.05	0.01		0.07	0.02	
v/s Ratio Perm			0.01			c0.75						0.01
v/c Ratio	0.90	0.27	0.02		0.91	0.75	0.66	0.05		0.78	0.09	0.06
Uniform Delay, d1	50.6	12.2	10.3		44.6	0.0	63.0	46.4		61.8	44.6	44.3
Progression Factor	1.00	1.00	1.00		0.65	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	22.6	0.1	0.0		5.6	1.7	12.3	0.3		12.1	0.5	0.4
Delay (s)	73.2	12.3	10.3		34.7	1.7	75.3	46.8		73.9	45.1	44.7
Level of Service	E	B	B		C	A	E	D		E	D	D
Approach Delay (s)		36.2			17.3			66.6			63.7	
Approach LOS		D			B			E			E	

Intersection Summary		
HCM 2000 Control Delay	28.8	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	0.91	
Actuated Cycle Length (s)	140.0	Sum of lost time (s) 18.0
Intersection Capacity Utilization	72.2%	ICU Level of Service C
Analysis Period (min)	15	
c Critical Lane Group		

Lanes, Volumes, Timings
304: Kroger SC/Lavista Rd & Lawrenceville Hwy

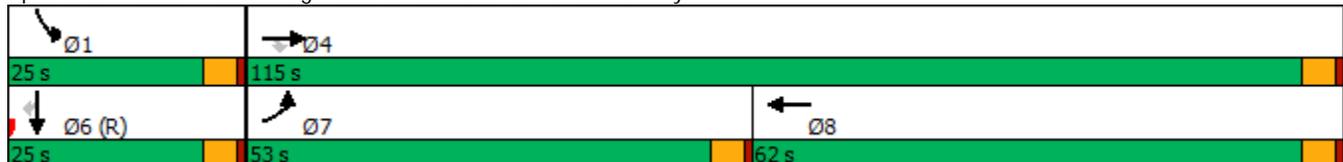
Lawrenceville Hwy Study
2025 AM Alternatives

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	331	486	24	0	887	981	0	0	23	211	30	83
Future Volume (vph)	331	486	24	0	887	981	0	0	23	211	30	83
Satd. Flow (prot)	1585	3169	1418	0	3185	1425	0	0	1450	3090	1676	1425
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1585	3169	1418	0	3185	1425	0	0	1450	3090	1676	1425
Satd. Flow (RTOR)			26			324			409			90
Lane Group Flow (vph)	360	528	26	0	964	1066	0	0	25	229	33	90
Turn Type	Prot	NA	Perm		NA	Free			Free	Prot	NA	Perm
Protected Phases	7	4			8					1	6	
Permitted Phases			4			Free			Free			6
Total Split (s)	53.0	115.0	115.0		62.0					25.0	25.0	25.0
Total Lost Time (s)	4.5	4.5	4.5		4.5					4.5	4.5	4.5
Act Effct Green (s)	37.3	91.9	91.9		50.1	140.0			140.0	39.1	39.1	39.1
Actuated g/C Ratio	0.27	0.66	0.66		0.36	1.00			1.00	0.28	0.28	0.28
v/c Ratio	0.85	0.25	0.03		0.85	0.75			0.02	0.27	0.07	0.19
Control Delay	67.0	9.8	1.4		29.6	9.3			0.0	44.1	45.3	10.7
Queue Delay	0.0	0.0	0.0		3.2	0.0			0.0	0.0	0.0	0.0
Total Delay	67.0	9.8	1.4		32.8	9.3			0.0	44.1	45.3	10.7
LOS	E	A	A		C	A			A	D	D	B
Approach Delay		32.1			20.4							35.7
Approach LOS		C			C							D
Queue Length 50th (ft)	312	95	0		335	320			0	84	22	0
Queue Length 95th (ft)	397	71	6		391	177			0	144	60	51
Internal Link Dist (ft)		1138			371			238				405
Turn Bay Length (ft)	445		230			125				300		210
Base Capacity (vph)	549	2501	1124		1310	1425			1450	862	467	462
Starvation Cap Reductn	0	0	0		244	0			0	0	0	0
Spillback Cap Reductn	0	0	0		0	0			0	0	0	0
Storage Cap Reductn	0	0	0		0	0			0	0	0	0
Reduced v/c Ratio	0.66	0.21	0.02		0.90	0.75			0.02	0.27	0.07	0.19

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 131 (94%), Referenced to phase 2: and 6: SBT, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.85
 Intersection Signal Delay: 25.1
 Intersection LOS: C
 Intersection Capacity Utilization 65.6%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 304: Kroger SC/Lavista Rd & Lawrenceville Hwy



HCM Signalized Intersection Capacity Analysis
 304: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
 2025 AM Alternatives

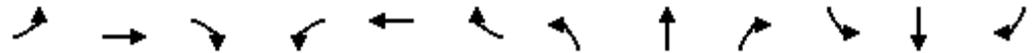


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘		↖	↗			↖	↗	↘	↖
Traffic Volume (vph)	331	486	24	0	887	981	0	0	23	211	30	83
Future Volume (vph)	331	486	24	0	887	981	0	0	23	211	30	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			0%			0%				0%
Total Lost time (s)	4.5	4.5	4.5		4.5	4.0			4.0	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00		0.95	1.00			1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85			0.86	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00
Satd. Flow (prot)	1585	3169	1418		3185	1425			1450	3090	1676	1425
Flt Permitted	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00
Satd. Flow (perm)	1585	3169	1418		3185	1425			1450	3090	1676	1425
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	360	528	26	0	964	1066	0	0	25	229	33	90
RTOR Reduction (vph)	0	0	9	0	0	0	0	0	0	0	0	65
Lane Group Flow (vph)	360	528	17	0	964	1066	0	0	25	229	33	25
Turn Type	Prot	NA	Perm		NA	Free			Free	Prot	NA	Perm
Protected Phases	7	4			8					1		6
Permitted Phases			4			Free			Free			6
Actuated Green, G (s)	37.3	91.9	91.9		50.1	140.0			140.0	39.1	39.1	39.1
Effective Green, g (s)	37.3	91.9	91.9		50.1	140.0			140.0	39.1	39.1	39.1
Actuated g/C Ratio	0.27	0.66	0.66		0.36	1.00			1.00	0.28	0.28	0.28
Clearance Time (s)	4.5	4.5	4.5		4.5					4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0					3.0	3.0	3.0
Lane Grp Cap (vph)	422	2080	930		1139	1425			1450	862	468	397
v/s Ratio Prot	c0.23	0.17			c0.30					0.07	0.02	
v/s Ratio Perm			0.01			c0.75			0.02			0.02
v/c Ratio	0.85	0.25	0.02		0.85	0.75			0.02	0.27	0.07	0.06
Uniform Delay, d1	48.7	9.9	8.4		41.4	0.0			0.0	39.3	37.1	37.0
Progression Factor	1.00	1.00	1.00		0.62	1.00			1.00	1.00	1.00	1.00
Incremental Delay, d2	15.3	0.1	0.0		3.1	1.9			0.0	0.2	0.3	0.3
Delay (s)	64.0	10.0	8.4		28.8	1.9			0.0	39.4	37.4	37.3
Level of Service	E	A	A		C	A			A	D	D	D
Approach Delay (s)		31.2			14.7			0.0			38.7	
Approach LOS		C			B			A			D	

Intersection Summary		
HCM 2000 Control Delay	21.7	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.84	C
Actuated Cycle Length (s)	140.0	Sum of lost time (s)
Intersection Capacity Utilization	65.6%	13.5
Analysis Period (min)	15	ICU Level of Service
		C
c Critical Lane Group		

Lanes, Volumes, Timings
 305: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
 2025 AM Alternatives



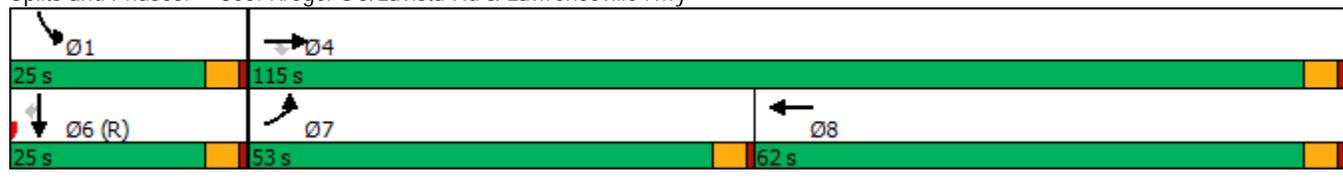
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↑↑	↗		↑↑	↗			↗	↗↗	↑	↗
Traffic Volume (vph)	331	486	24	0	887	981	0	0	23	211	30	83
Future Volume (vph)	331	486	24	0	887	981	0	0	23	211	30	83
Satd. Flow (prot)	1585	3169	1418	0	3185	1425	0	0	1450	3090	1676	1425
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1585	3169	1418	0	3185	1425	0	0	1450	3090	1676	1425
Satd. Flow (RTOR)			26			324			409			90
Lane Group Flow (vph)	360	528	26	0	964	1066	0	0	25	229	33	90
Turn Type	Prot	NA	Perm		NA	Free			Free	Prot	NA	Perm
Protected Phases	7	4			8					1	6	
Permitted Phases			4			Free			Free			6
Total Split (s)	53.0	115.0	115.0		62.0					25.0	25.0	25.0
Total Lost Time (s)	4.5	4.5	4.5		4.5					4.5	4.5	4.5
Act Effct Green (s)	37.3	91.9	91.9		50.1	140.0			140.0	39.1	39.1	39.1
Actuated g/C Ratio	0.27	0.66	0.66		0.36	1.00			1.00	0.28	0.28	0.28
v/c Ratio	0.85	0.25	0.03		0.85	0.75			0.02	0.27	0.07	0.19
Control Delay	67.0	9.8	1.4		29.7	7.3			0.0	44.1	45.3	10.7
Queue Delay	0.0	0.0	0.0		2.0	0.0			0.0	0.0	0.0	0.0
Total Delay	67.0	9.8	1.4		31.6	7.3			0.0	44.1	45.3	10.7
LOS	E	A	A		C	A			A	D	D	B
Approach Delay		32.1			18.9						35.7	
Approach LOS		C			B						D	
Queue Length 50th (ft)	312	95	0		350	183			0	84	22	0
Queue Length 95th (ft)	397	71	6		m355	m189			0	144	60	51
Internal Link Dist (ft)		1228			405			248			482	
Turn Bay Length (ft)	445		230			125				300		210
Base Capacity (vph)	549	2501	1124		1310	1425			1450	862	467	462
Starvation Cap Reductn	0	0	0		202	0			0	0	0	0
Spillback Cap Reductn	0	0	0		0	0			0	0	0	0
Storage Cap Reductn	0	0	0		0	0			0	0	0	0
Reduced v/c Ratio	0.66	0.21	0.02		0.87	0.75			0.02	0.27	0.07	0.19

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 1 (1%), Referenced to phase 2: and 6:SBT, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.85
 Intersection Signal Delay: 24.1
 Intersection LOS: C
 Intersection Capacity Utilization 65.6%
 ICU Level of Service C
 Analysis Period (min) 15

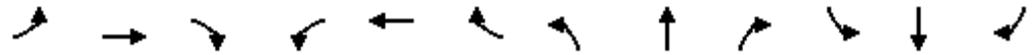
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 305: Kroger SC/Lavista Rd & Lawrenceville Hwy



HCM Signalized Intersection Capacity Analysis
 305: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
 2025 AM Alternatives



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	331	486	24	0	887	981	0	0	23	211	30	83
Future Volume (vph)	331	486	24	0	887	981	0	0	23	211	30	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			0%			0%				0%
Total Lost time (s)	4.5	4.5	4.5		4.5	4.0			4.0	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00		0.95	1.00			1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85			0.86	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00
Satd. Flow (prot)	1585	3169	1418		3185	1425			1450	3090	1676	1425
Flt Permitted	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00
Satd. Flow (perm)	1585	3169	1418		3185	1425			1450	3090	1676	1425
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	360	528	26	0	964	1066	0	0	25	229	33	90
RTOR Reduction (vph)	0	0	9	0	0	0	0	0	0	0	0	65
Lane Group Flow (vph)	360	528	17	0	964	1066	0	0	25	229	33	25
Turn Type	Prot	NA	Perm		NA	Free			Free	Prot	NA	Perm
Protected Phases	7	4			8					1		6
Permitted Phases			4			Free			Free			6
Actuated Green, G (s)	37.3	91.9	91.9		50.1	140.0			140.0	39.1	39.1	39.1
Effective Green, g (s)	37.3	91.9	91.9		50.1	140.0			140.0	39.1	39.1	39.1
Actuated g/C Ratio	0.27	0.66	0.66		0.36	1.00			1.00	0.28	0.28	0.28
Clearance Time (s)	4.5	4.5	4.5		4.5					4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0					3.0	3.0	3.0
Lane Grp Cap (vph)	422	2080	930		1139	1425			1450	862	468	397
v/s Ratio Prot	c0.23	0.17			c0.30					0.07	0.02	
v/s Ratio Perm			0.01			c0.75			0.02			0.02
v/c Ratio	0.85	0.25	0.02		0.85	0.75			0.02	0.27	0.07	0.06
Uniform Delay, d1	48.7	9.9	8.4		41.4	0.0			0.0	39.3	37.1	37.0
Progression Factor	1.00	1.00	1.00		0.64	1.00			1.00	1.00	1.00	1.00
Incremental Delay, d2	15.3	0.1	0.0		2.6	1.5			0.0	0.2	0.3	0.3
Delay (s)	64.0	10.0	8.4		29.1	1.5			0.0	39.4	37.4	37.3
Level of Service	E	A	A		C	A			A	D	D	D
Approach Delay (s)		31.2			14.6			0.0			38.7	
Approach LOS		C			B			A			D	

Intersection Summary		
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.84	C
Actuated Cycle Length (s)	140.0	Sum of lost time (s)
Intersection Capacity Utilization	65.6%	13.5
Analysis Period (min)	15	ICU Level of Service
		C
c Critical Lane Group		

Lanes, Volumes, Timings
 320: Kroger SC/Lavista Rd & Lawrenceville Hwy

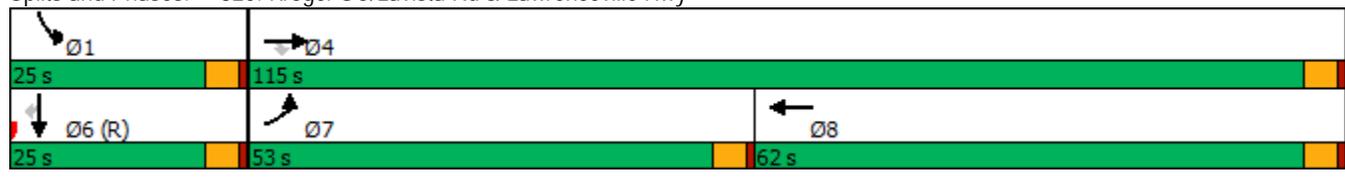
Lawrenceville Hwy Study
 2025 AM Alternatives

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	331	486	24	0	887	981	0	0	23	211	30	83
Future Volume (vph)	331	486	24	0	887	981	0	0	23	211	30	83
Satd. Flow (prot)	1585	3169	1418	0	3185	1425	0	0	1450	3090	1676	1425
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1585	3169	1418	0	3185	1425	0	0	1450	3090	1676	1425
Satd. Flow (RTOR)			26			324			409			90
Lane Group Flow (vph)	360	528	26	0	964	1066	0	0	25	229	33	90
Turn Type	Prot	NA	Perm		NA	Free			Free	Prot	NA	Perm
Protected Phases	7	4			8					1	6	
Permitted Phases			4			Free			Free			6
Total Split (s)	53.0	115.0	115.0		62.0					25.0	25.0	25.0
Total Lost Time (s)	4.5	4.5	4.5		4.5					4.5	4.5	4.5
Act Effect Green (s)	37.3	91.9	91.9		50.1	140.0			140.0	39.1	39.1	39.1
Actuated g/C Ratio	0.27	0.66	0.66		0.36	1.00			1.00	0.28	0.28	0.28
v/c Ratio	0.85	0.25	0.03		0.85	0.75			0.02	0.27	0.07	0.19
Control Delay	67.0	9.8	1.4		28.3	7.9			0.0	44.1	45.3	10.7
Queue Delay	0.0	0.0	0.0		4.9	0.0			0.0	0.0	0.0	0.0
Total Delay	67.0	9.8	1.4		33.3	7.9			0.0	44.1	45.3	10.7
LOS	E	A	A		C	A			A	D	D	B
Approach Delay		32.1			20.0						35.7	
Approach LOS		C			B						D	
Queue Length 50th (ft)	312	95	0		344	227			0	84	22	0
Queue Length 95th (ft)	397	71	6		m369	m240			0	144	60	51
Internal Link Dist (ft)		1043			343			264			413	
Turn Bay Length (ft)	445		230			125				300		210
Base Capacity (vph)	549	2501	1124		1310	1425			1450	862	467	462
Starvation Cap Reductn	0	0	0		277	0			0	0	0	0
Spillback Cap Reductn	0	0	0		0	0			0	0	0	0
Storage Cap Reductn	0	0	0		0	0			0	0	0	0
Reduced v/c Ratio	0.66	0.21	0.02		0.93	0.75			0.02	0.27	0.07	0.19

Intersection Summary

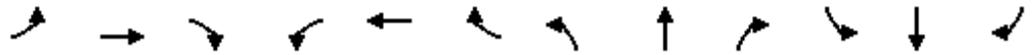
Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 7 (5%), Referenced to phase 2: and 6:SBT, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.85
 Intersection Signal Delay: 24.8
 Intersection LOS: C
 Intersection Capacity Utilization 65.6%
 ICU Level of Service C
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 320: Kroger SC/Lavista Rd & Lawrenceville Hwy



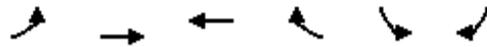
HCM Signalized Intersection Capacity Analysis
320: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
2025 AM Alternatives



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↖	↗	↘		↖	↗			↖	↗	↘	↖	
Traffic Volume (vph)	331	486	24	0	887	981	0	0	23	211	30	83	
Future Volume (vph)	331	486	24	0	887	981	0	0	23	211	30	83	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Grade (%)		1%			0%			0%				0%	
Total Lost time (s)	4.5	4.5	4.5		4.5	4.0			4.0	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95	1.00		0.95	1.00			1.00	0.97	1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85			0.86	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1585	3169	1418		3185	1425			1450	3090	1676	1425	
Flt Permitted	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1585	3169	1418		3185	1425			1450	3090	1676	1425	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	360	528	26	0	964	1066	0	0	25	229	33	90	
RTOR Reduction (vph)	0	0	9	0	0	0	0	0	0	0	0	65	
Lane Group Flow (vph)	360	528	17	0	964	1066	0	0	25	229	33	25	
Turn Type	Prot	NA	Perm		NA	Free			Free	Prot	NA	Perm	
Protected Phases	7	4			8					1		6	
Permitted Phases			4			Free			Free			6	
Actuated Green, G (s)	37.3	91.9	91.9		50.1	140.0			140.0	39.1	39.1	39.1	
Effective Green, g (s)	37.3	91.9	91.9		50.1	140.0			140.0	39.1	39.1	39.1	
Actuated g/C Ratio	0.27	0.66	0.66		0.36	1.00			1.00	0.28	0.28	0.28	
Clearance Time (s)	4.5	4.5	4.5		4.5					4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0		3.0					3.0	3.0	3.0	
Lane Grp Cap (vph)	422	2080	930		1139	1425			1450	862	468	397	
v/s Ratio Prot	c0.23	0.17			c0.30					0.07	0.02		
v/s Ratio Perm			0.01			c0.75			0.02			0.02	
v/c Ratio	0.85	0.25	0.02		0.85	0.75			0.02	0.27	0.07	0.06	
Uniform Delay, d1	48.7	9.9	8.4		41.4	0.0			0.0	39.3	37.1	37.0	
Progression Factor	1.00	1.00	1.00		0.60	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	15.3	0.1	0.0		2.8	1.6			0.0	0.2	0.3	0.3	
Delay (s)	64.0	10.0	8.4		27.7	1.6			0.0	39.4	37.4	37.3	
Level of Service	E	A	A		C	A			A	D	D	D	
Approach Delay (s)		31.2			14.0			0.0			38.7		
Approach LOS		C			B			A			D		
Intersection Summary													
HCM 2000 Control Delay			21.3									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.84										
Actuated Cycle Length (s)			140.0									Sum of lost time (s)	13.5
Intersection Capacity Utilization			65.6%									ICU Level of Service	C
Analysis Period (min)			15										
c Critical Lane Group													

Lanes, Volumes, Timings
 400: Lawrenceville Hwy & Old Norcross Rd

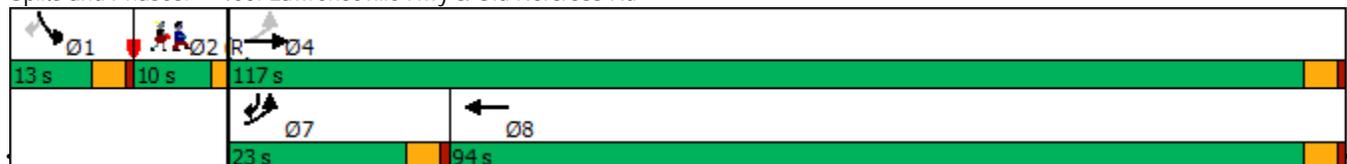


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø2
Lane Configurations	↖	↑↑	↑↑↔		↖	↗	
Traffic Volume (vph)	151	569	1658	36	43	210	
Future Volume (vph)	151	569	1658	36	43	210	
Satd. Flow (prot)	1585	3169	3176	0	1545	1382	
Flt Permitted	0.045				0.950		
Satd. Flow (perm)	75	3169	3176	0	1545	1382	
Satd. Flow (RTOR)			3			111	
Lane Group Flow (vph)	164	618	1841	0	47	228	
Turn Type	pm+pt	NA	NA		Prot	pm+ov	
Protected Phases	7	4	8		1	7	2
Permitted Phases	4					1	
Total Split (s)	23.0	117.0	94.0		13.0	23.0	10.0
Total Lost Time (s)	4.5	4.5	4.5		4.5	4.5	
Act Effct Green (s)	110.8	110.8	89.4		8.1	23.8	
Actuated g/C Ratio	0.79	0.79	0.64		0.06	0.17	
v/c Ratio	0.68	0.25	0.91		0.53	0.70	
Control Delay	38.3	4.3	29.8		85.4	34.7	
Queue Delay	0.0	0.2	8.3		0.0	0.2	
Total Delay	38.3	4.6	38.0		85.4	35.0	
LOS	D	A	D		F	C	
Approach Delay		11.6	38.0		43.6		
Approach LOS		B	D		D		
Queue Length 50th (ft)	67	48	732		42	83	
Queue Length 95th (ft)	143	127	853		#88	168	
Internal Link Dist (ft)		343	622		653		
Turn Bay Length (ft)	120					165	
Base Capacity (vph)	258	2546	2037		96	342	
Starvation Cap Reductn	0	1167	0		0	0	
Spillback Cap Reductn	0	0	189		0	6	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.64	0.45	1.00		0.49	0.68	

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 12 (9%), Referenced to phase 2:Ped and 6:, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 31.4
 Intersection LOS: C
 Intersection Capacity Utilization 76.9%
 ICU Level of Service D
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 400: Lawrenceville Hwy & Old Norcross Rd



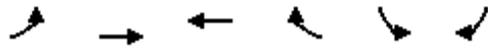
HCM Signalized Intersection Capacity Analysis
400: Lawrenceville Hwy & Old Norcross Rd



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑↑	↗		↙	↘
Traffic Volume (vph)	151	569	1658	36	43	210
Future Volume (vph)	151	569	1658	36	43	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	0%		6%	
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1585	3169	3175		1545	1382
Flt Permitted	0.05	1.00	1.00		0.95	1.00
Satd. Flow (perm)	76	3169	3175		1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	164	618	1802	39	47	228
RTOR Reduction (vph)	0	0	1	0	0	92
Lane Group Flow (vph)	164	618	1840	0	47	136
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	7	4	8		1	7
Permitted Phases	4					1
Actuated Green, G (s)	110.8	110.8	89.4		6.9	23.8
Effective Green, g (s)	110.8	110.8	89.4		6.9	23.8
Actuated g/C Ratio	0.79	0.79	0.64		0.05	0.17
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	242	2508	2027		76	234
v/s Ratio Prot	c0.08	0.19	c0.58		c0.03	0.07
v/s Ratio Perm	0.45					0.03
v/c Ratio	0.68	0.25	0.91		0.62	0.58
Uniform Delay, d1	42.3	3.8	21.8		65.3	53.5
Progression Factor	0.72	1.09	1.00		1.00	1.00
Incremental Delay, d2	7.2	0.1	6.4		14.1	3.6
Delay (s)	37.5	4.2	28.1		79.3	57.1
Level of Service	D	A	C		E	E
Approach Delay (s)		11.2	28.1		60.9	
Approach LOS		B	C		E	

Intersection Summary			
HCM 2000 Control Delay	26.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
401: Lawrenceville Hwy & Old Norcross Rd

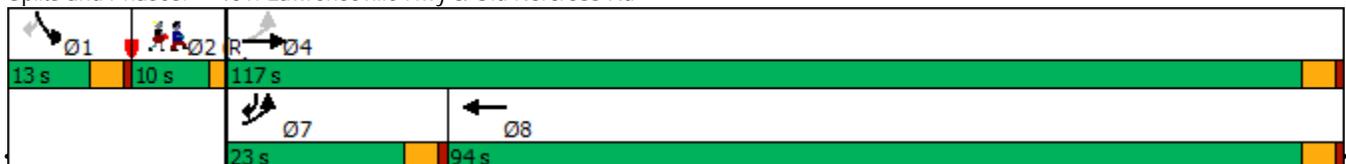


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø2
Lane Configurations							
Traffic Volume (vph)	151	569	1658	36	43	210	
Future Volume (vph)	151	569	1658	36	43	210	
Satd. Flow (prot)	1585	3169	3176	0	1545	1382	
Flt Permitted	0.045				0.950		
Satd. Flow (perm)	75	3169	3176	0	1545	1382	
Satd. Flow (RTOR)			3			111	
Lane Group Flow (vph)	164	618	1841	0	47	228	
Turn Type	pm+pt	NA	NA		Prot	pm+ov	
Protected Phases	7	4	8		1	7	2
Permitted Phases	4					1	
Total Split (s)	23.0	117.0	94.0		13.0	23.0	10.0
Total Lost Time (s)	4.5	4.5	4.5		4.5	4.5	
Act Effct Green (s)	110.8	110.8	89.4		8.1	23.8	
Actuated g/C Ratio	0.79	0.79	0.64		0.06	0.17	
v/c Ratio	0.68	0.25	0.91		0.53	0.70	
Control Delay	38.5	4.3	29.8		85.4	34.7	
Queue Delay	0.0	0.2	3.7		0.0	0.1	
Total Delay	38.5	4.5	33.5		85.4	34.9	
LOS	D	A	C		F	C	
Approach Delay		11.7	33.5		43.5		
Approach LOS		B	C		D		
Queue Length 50th (ft)	67	50	732		42	83	
Queue Length 95th (ft)	143	127	853		#88	168	
Internal Link Dist (ft)		352	531		589		
Turn Bay Length (ft)	120					165	
Base Capacity (vph)	258	2546	2037		96	342	
Starvation Cap Reductn	0	1135	0		0	0	
Spillback Cap Reductn	0	0	136		0	4	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.64	0.44	0.97		0.49	0.67	

Intersection Summary

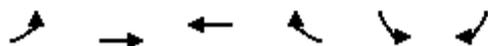
Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 12 (9%), Referenced to phase 2:Ped and 6:, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 28.6
 Intersection LOS: C
 Intersection Capacity Utilization 76.9%
 ICU Level of Service D
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 401: Lawrenceville Hwy & Old Norcross Rd



HCM Signalized Intersection Capacity Analysis
401: Lawrenceville Hwy & Old Norcross Rd

Lawrenceville Hwy Study
2025 AM Alternatives

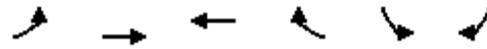


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑↑	↗		↙	↘
Traffic Volume (vph)	151	569	1658	36	43	210
Future Volume (vph)	151	569	1658	36	43	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	0%		6%	
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1585	3169	3175		1545	1382
Flt Permitted	0.05	1.00	1.00		0.95	1.00
Satd. Flow (perm)	76	3169	3175		1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	164	618	1802	39	47	228
RTOR Reduction (vph)	0	0	1	0	0	92
Lane Group Flow (vph)	164	618	1840	0	47	136
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	7	4	8		1	7
Permitted Phases	4					1
Actuated Green, G (s)	110.8	110.8	89.4		6.9	23.8
Effective Green, g (s)	110.8	110.8	89.4		6.9	23.8
Actuated g/C Ratio	0.79	0.79	0.64		0.05	0.17
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	242	2508	2027		76	234
v/s Ratio Prot	c0.08	0.19	c0.58		c0.03	0.07
v/s Ratio Perm	0.45					0.03
v/c Ratio	0.68	0.25	0.91		0.62	0.58
Uniform Delay, d1	42.3	3.8	21.8		65.3	53.5
Progression Factor	0.72	1.09	1.00		1.00	1.00
Incremental Delay, d2	7.2	0.1	6.4		14.1	3.6
Delay (s)	37.8	4.2	28.1		79.3	57.1
Level of Service	D	A	C		E	E
Approach Delay (s)		11.2	28.1		60.9	
Approach LOS		B	C		E	

Intersection Summary

HCM 2000 Control Delay	26.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
402: Lawrenceville Hwy & Old Norcross Rd

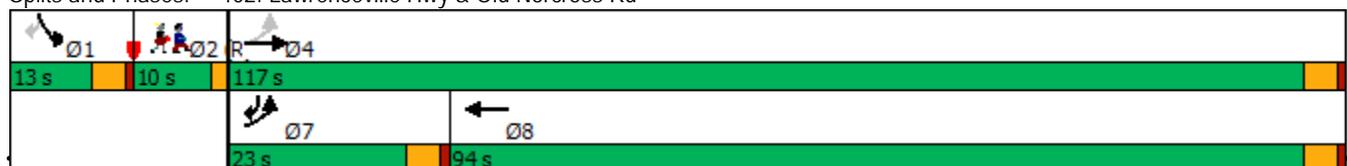


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø2
Lane Configurations	↘	↑↑	↑↑		↘	↗	
Traffic Volume (vph)	151	569	1658	36	43	210	
Future Volume (vph)	151	569	1658	36	43	210	
Satd. Flow (prot)	1585	3169	3176	0	1545	1382	
Flt Permitted	0.045			0.950			
Satd. Flow (perm)	75	3169	3176	0	1545	1382	
Satd. Flow (RTOR)	3			111			
Lane Group Flow (vph)	164	618	1841	0	47	228	
Turn Type	pm+pt	NA	NA		Prot	pm+ov	
Protected Phases	7	4	8		1	7	2
Permitted Phases	4					1	
Total Split (s)	23.0	117.0	94.0		13.0	23.0	10.0
Total Lost Time (s)	4.5	4.5	4.5		4.5	4.5	
Act Effct Green (s)	110.8	110.8	89.4		8.1	23.8	
Actuated g/C Ratio	0.79	0.79	0.64		0.06	0.17	
v/c Ratio	0.68	0.25	0.91		0.53	0.70	
Control Delay	53.3	2.9	29.8		85.4	34.7	
Queue Delay	0.0	0.2	1.2		0.0	0.0	
Total Delay	53.3	3.1	30.9		85.4	34.8	
LOS	D	A	C		F	C	
Approach Delay		13.6	30.9		43.4		
Approach LOS		B	C		D		
Queue Length 50th (ft)	85	42	732		42	83	
Queue Length 95th (ft)	182	49	853		#88	168	
Internal Link Dist (ft)		378	412		572		
Turn Bay Length (ft)	120					165	
Base Capacity (vph)	258	2546	2037		96	342	
Starvation Cap Reductn	0	1072	0		0	0	
Spillback Cap Reductn	0	0	68		0	1	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.64	0.42	0.93		0.49	0.67	

Intersection Summary

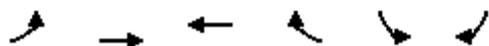
Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 12 (9%), Referenced to phase 2:Ped and 6:, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 27.5 Intersection LOS: C
 Intersection Capacity Utilization 76.9% ICU Level of Service D
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 402: Lawrenceville Hwy & Old Norcross Rd



HCM Signalized Intersection Capacity Analysis
402: Lawrenceville Hwy & Old Norcross Rd

Lawrenceville Hwy Study
2025 AM Alternatives

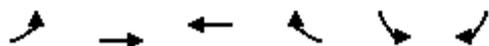


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑↑	↗		↙	↘
Traffic Volume (vph)	151	569	1658	36	43	210
Future Volume (vph)	151	569	1658	36	43	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	0%		6%	
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1585	3169	3175		1545	1382
Flt Permitted	0.05	1.00	1.00		0.95	1.00
Satd. Flow (perm)	76	3169	3175		1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	164	618	1802	39	47	228
RTOR Reduction (vph)	0	0	1	0	0	92
Lane Group Flow (vph)	164	618	1840	0	47	136
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	7	4	8		1	7
Permitted Phases	4					1
Actuated Green, G (s)	110.8	110.8	89.4		6.9	23.8
Effective Green, g (s)	110.8	110.8	89.4		6.9	23.8
Actuated g/C Ratio	0.79	0.79	0.64		0.05	0.17
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	242	2508	2027		76	234
v/s Ratio Prot	c0.08	0.19	c0.58		c0.03	0.07
v/s Ratio Perm	0.45					0.03
v/c Ratio	0.68	0.25	0.91		0.62	0.58
Uniform Delay, d1	42.3	3.8	21.8		65.3	53.5
Progression Factor	1.16	0.72	1.00		1.00	1.00
Incremental Delay, d2	7.2	0.1	6.4		14.1	3.6
Delay (s)	56.4	2.8	28.1		79.3	57.1
Level of Service	E	A	C		E	E
Approach Delay (s)		14.0	28.1		60.9	
Approach LOS		B	C		E	

Intersection Summary

HCM 2000 Control Delay	27.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
 403: Lawrenceville Hwy & Old Norcross Rd

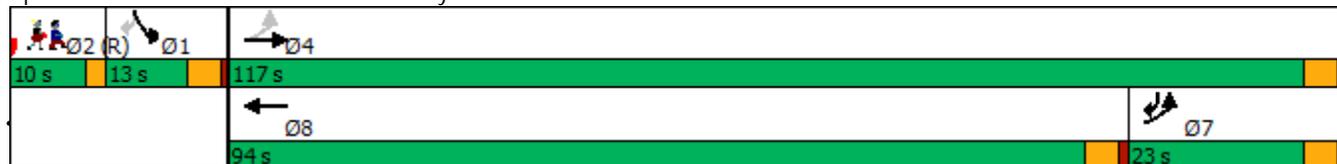


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø2
Lane Configurations	↖	↑↑	↑↔		↖	↗	
Traffic Volume (vph)	151	569	1658	36	43	210	
Future Volume (vph)	151	569	1658	36	43	210	
Satd. Flow (prot)	1585	3169	3176	0	1545	1382	
Flt Permitted	0.051				0.950		
Satd. Flow (perm)	85	3169	3176	0	1545	1382	
Satd. Flow (RTOR)			3			111	
Lane Group Flow (vph)	164	618	1841	0	47	228	
Turn Type	pm+pt	NA	NA		Prot	pm+ov	
Protected Phases	7	4	8		1	7	2
Permitted Phases	4					1	
Total Split (s)	23.0	117.0	94.0		13.0	23.0	10.0
Total Lost Time (s)	4.5	4.5	4.5		4.5	4.5	
Act Effct Green (s)	110.6	110.6	89.4		7.8	23.4	
Actuated g/C Ratio	0.79	0.79	0.64		0.06	0.17	
v/c Ratio	0.67	0.25	0.91		0.55	0.71	
Control Delay	42.5	0.5	29.6		87.6	33.6	
Queue Delay	0.0	0.0	1.5		0.0	0.1	
Total Delay	42.5	0.5	31.1		87.6	33.6	
LOS	D	A	C		F	C	
Approach Delay		9.3	31.1		42.9		
Approach LOS		A	C		D		
Queue Length 50th (ft)	57	3	711		42	84	
Queue Length 95th (ft)	m108	8	853		#88	168	
Internal Link Dist (ft)		493	387		487		
Turn Bay Length (ft)	120					165	
Base Capacity (vph)	266	2546	2033		93	339	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	79		0	2	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.62	0.24	0.94		0.51	0.68	

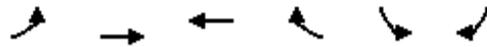
Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 9 (6%), Referenced to phase 2:Ped and 6:, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 26.4
 Intersection LOS: C
 Intersection Capacity Utilization 76.9%
 ICU Level of Service D
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 403: Lawrenceville Hwy & Old Norcross Rd



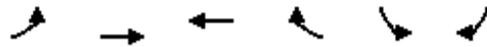
HCM Signalized Intersection Capacity Analysis
403: Lawrenceville Hwy & Old Norcross Rd



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	151	569	1658	36	43	210
Future Volume (vph)	151	569	1658	36	43	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	0%		6%	
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1585	3169	3175		1545	1382
Flt Permitted	0.05	1.00	1.00		0.95	1.00
Satd. Flow (perm)	86	3169	3175		1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	164	618	1802	39	47	228
RTOR Reduction (vph)	0	0	1	0	0	92
Lane Group Flow (vph)	164	618	1840	0	47	136
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	7	4	8		1	7
Permitted Phases	4					1
Actuated Green, G (s)	110.6	110.6	89.4		6.7	23.4
Effective Green, g (s)	110.6	110.6	89.4		6.7	23.4
Actuated g/C Ratio	0.79	0.79	0.64		0.05	0.17
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	246	2503	2027		73	230
v/s Ratio Prot	c0.08	0.19	c0.58		c0.03	0.07
v/s Ratio Perm	0.45					0.03
v/c Ratio	0.67	0.25	0.91		0.64	0.59
Uniform Delay, d1	39.4	3.8	21.8		65.5	53.9
Progression Factor	0.74	0.08	1.00		1.00	1.00
Incremental Delay, d2	6.3	0.0	6.4		17.8	3.8
Delay (s)	35.3	0.3	28.1		83.3	57.7
Level of Service	D	A	C		F	E
Approach Delay (s)		7.7	28.1		62.1	
Approach LOS		A	C		E	

Intersection Summary			
HCM 2000 Control Delay		25.8	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio		0.78	
Actuated Cycle Length (s)		140.0	Sum of lost time (s) 15.5
Intersection Capacity Utilization		76.9%	ICU Level of Service D
Analysis Period (min)		15	
c Critical Lane Group			

Lanes, Volumes, Timings
404: Lawrenceville Hwy & Old Norcross Rd



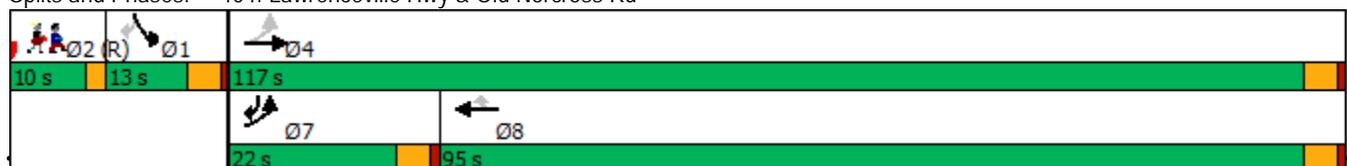
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø2
Lane Configurations							
Traffic Volume (vph)	151	569	1658	36	43	210	
Future Volume (vph)	151	569	1658	36	43	210	
Satd. Flow (prot)	1585	3169	3185	1425	1545	1382	
Flt Permitted	0.053				0.950		
Satd. Flow (perm)	88	3169	3185	1425	1545	1382	
Satd. Flow (RTOR)				27		111	
Lane Group Flow (vph)	164	618	1802	39	47	228	
Turn Type	pm+pt	NA	NA	Perm	Prot	pm+ov	
Protected Phases	7	4	8		1	7	2
Permitted Phases	4			8		1	
Total Split (s)	22.0	117.0	95.0	95.0	13.0	22.0	10.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	
Act Effect Green (s)	111.1	111.1	90.3	90.3	7.8	26.6	
Actuated g/C Ratio	0.79	0.79	0.64	0.64	0.06	0.19	
v/c Ratio	0.67	0.25	0.88	0.04	0.55	0.65	
Control Delay	34.3	4.0	26.6	4.4	87.6	34.4	
Queue Delay	0.0	0.2	1.8	0.0	0.0	0.1	
Total Delay	34.3	4.3	28.4	4.4	87.6	34.5	
LOS	C	A	C	A	F	C	
Approach Delay		10.6	27.9		43.6		
Approach LOS		B	C		D		
Queue Length 50th (ft)	55	22	660	4	42	95	
Queue Length 95th (ft)	134	124	790	17	#88	188	
Internal Link Dist (ft)		371	483		379		
Turn Bay Length (ft)	200			200		165	
Base Capacity (vph)	256	2548	2064	933	93	363	
Starvation Cap Reductn	0	1146	0	0	0	0	
Spillback Cap Reductn	0	0	134	0	0	4	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.64	0.44	0.93	0.04	0.51	0.64	

Intersection Summary

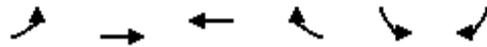
Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 132 (94%), Referenced to phase 2:Ped and 6:, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.88
 Intersection Signal Delay: 24.7
 Intersection LOS: C
 Intersection Capacity Utilization 75.6%
 ICU Level of Service D
 Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 404: Lawrenceville Hwy & Old Norcross Rd



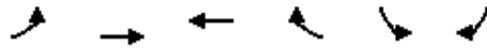
HCM Signalized Intersection Capacity Analysis
404: Lawrenceville Hwy & Old Norcross Rd



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	151	569	1658	36	43	210
Future Volume (vph)	151	569	1658	36	43	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	0%		6%	
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1585	3169	3185	1425	1545	1382
Flt Permitted	0.05	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	88	3169	3185	1425	1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	164	618	1802	39	47	228
RTOR Reduction (vph)	0	0	0	10	0	93
Lane Group Flow (vph)	164	618	1802	29	47	135
Turn Type	pm+pt	NA	NA	Perm	Prot	pm+ov
Protected Phases	7	4	8		1	7
Permitted Phases	4			8		1
Actuated Green, G (s)	111.1	111.1	90.3	90.3	6.7	23.0
Effective Green, g (s)	111.1	111.1	90.3	90.3	6.7	23.0
Actuated g/C Ratio	0.79	0.79	0.64	0.64	0.05	0.16
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	244	2514	2054	919	73	271
v/s Ratio Prot	c0.08	0.19	c0.57		0.03	c0.06
v/s Ratio Perm	0.45			0.02		0.04
v/c Ratio	0.67	0.25	0.88	0.03	0.64	0.50
Uniform Delay, d1	39.1	3.7	20.3	9.0	65.5	53.3
Progression Factor	0.68	1.04	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.0	0.1	4.6	0.0	17.8	1.4
Delay (s)	33.8	3.9	24.9	9.0	83.3	54.7
Level of Service	C	A	C	A	F	D
Approach Delay (s)		10.2	24.6		59.6	
Approach LOS		B	C		E	

Intersection Summary			
HCM 2000 Control Delay	24.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
 405: Lawrenceville Hwy & Old Norcross Rd

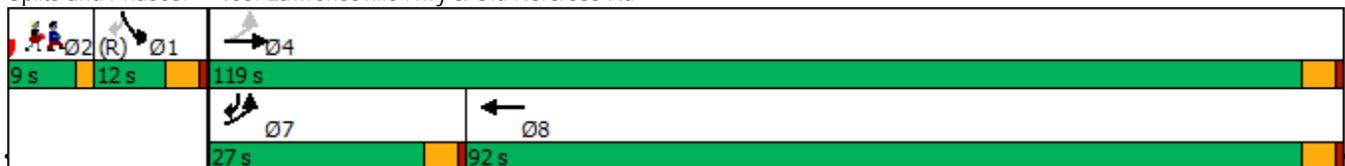


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø2
Lane Configurations	↖	↑↑	↑↑		↖	↗	
Traffic Volume (vph)	151	569	1658	36	43	210	
Future Volume (vph)	151	569	1658	36	43	210	
Satd. Flow (prot)	1585	3169	3176	0	1545	1382	
Flt Permitted	0.043				0.950		
Satd. Flow (perm)	72	3169	3176	0	1545	1382	
Satd. Flow (RTOR)			3				
Lane Group Flow (vph)	164	618	1841	0	47	228	
Turn Type	pm+pt	NA	NA		Prot	pm+ov	
Protected Phases	7	4	8		1	7	2
Permitted Phases	4					1	
Total Split (s)	27.0	119.0	92.0		12.0	27.0	9.0
Total Lost Time (s)	4.5	4.5	4.5		4.5	4.5	
Act Effct Green (s)	112.5	112.5	87.8		7.2	29.7	
Actuated g/C Ratio	0.80	0.80	0.63		0.05	0.21	
v/c Ratio	0.60	0.24	0.92		0.59	0.78	
Control Delay	35.8	3.7	32.3		94.4	69.6	
Queue Delay	0.0	0.2	1.3		0.0	0.0	
Total Delay	35.8	3.9	33.6		94.4	69.6	
LOS	D	A	C		F	E	
Approach Delay		10.6	33.6		73.9		
Approach LOS		B	C		E		
Queue Length 50th (ft)	71	42	713		43	192	
Queue Length 95th (ft)	144	126	891		#99	287	
Internal Link Dist (ft)		405	387		392		
Turn Bay Length (ft)	120					165	
Base Capacity (vph)	301	2591	1996		82	316	
Starvation Cap Reductn	0	1110	0		0	0	
Spillback Cap Reductn	0	0	53		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.54	0.42	0.95		0.57	0.72	

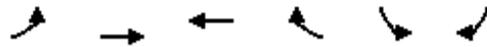
Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 0 (0%), Referenced to phase 2:Ped and 6:, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.92
 Intersection Signal Delay: 31.2
 Intersection LOS: C
 Intersection Capacity Utilization 76.9%
 ICU Level of Service D
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 405: Lawrenceville Hwy & Old Norcross Rd



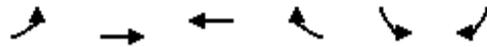
HCM Signalized Intersection Capacity Analysis
405: Lawrenceville Hwy & Old Norcross Rd



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗↗	↖↗		↖	↗
Traffic Volume (vph)	151	569	1658	36	43	210
Future Volume (vph)	151	569	1658	36	43	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	0%		6%	
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1585	3169	3175		1545	1382
Flt Permitted	0.04	1.00	1.00		0.95	1.00
Satd. Flow (perm)	72	3169	3175		1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	164	618	1802	39	47	228
RTOR Reduction (vph)	0	0	1	0	0	0
Lane Group Flow (vph)	164	618	1840	0	47	228
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	7	4	8		1	7
Permitted Phases	4					1
Actuated Green, G (s)	112.5	112.5	87.9		6.0	26.1
Effective Green, g (s)	112.5	112.5	87.9		6.0	26.1
Actuated g/C Ratio	0.80	0.80	0.63		0.04	0.19
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	275	2546	1993		66	302
v/s Ratio Prot	0.09	0.19	c0.58		0.03	c0.11
v/s Ratio Perm	0.39					0.06
v/c Ratio	0.60	0.24	0.92		0.71	0.75
Uniform Delay, d1	41.3	3.4	23.1		66.1	53.9
Progression Factor	0.82	1.04	1.00		1.00	1.00
Incremental Delay, d2	3.4	0.0	7.7		30.3	10.2
Delay (s)	37.2	3.5	30.8		96.4	64.2
Level of Service	D	A	C		F	E
Approach Delay (s)		10.6	30.8		69.7	
Approach LOS		B	C		E	

Intersection Summary			
HCM 2000 Control Delay		29.0	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio		0.84	
Actuated Cycle Length (s)		140.0	Sum of lost time (s) 15.5
Intersection Capacity Utilization		76.9%	ICU Level of Service D
Analysis Period (min)		15	
c Critical Lane Group			

Lanes, Volumes, Timings
420: Lawrenceville Hwy & Old Norcross Rd

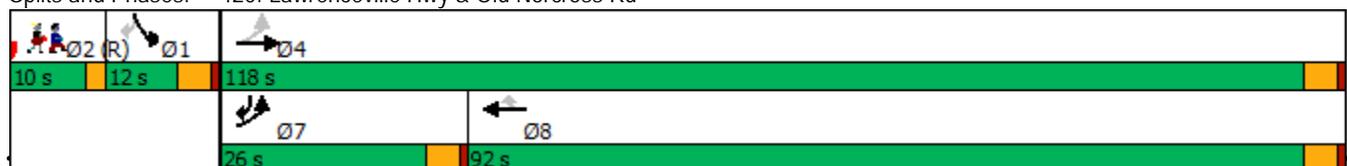


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø2
Lane Configurations							
Traffic Volume (vph)	151	569	1658	36	43	210	
Future Volume (vph)	151	569	1658	36	43	210	
Satd. Flow (prot)	1585	3169	3185	1425	1545	1382	
Flt Permitted	0.047				0.950		
Satd. Flow (perm)	78	3169	3185	1425	1545	1382	
Satd. Flow (RTOR)				25			
Lane Group Flow (vph)	164	618	1802	39	47	228	
Turn Type	pm+pt	NA	NA	Perm	Prot	pm+ov	
Protected Phases	7	4	8		1	7	2
Permitted Phases	4			8		1	
Total Split (s)	26.0	118.0	92.0	92.0	12.0	26.0	10.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	
Act Effect Green (s)	111.8	111.8	87.5	87.5	7.2	29.3	
Actuated g/C Ratio	0.80	0.80	0.62	0.62	0.05	0.21	
v/c Ratio	0.60	0.24	0.91	0.04	0.59	0.79	
Control Delay	34.4	3.9	30.6	5.2	94.4	71.3	
Queue Delay	0.0	0.3	9.3	0.0	0.0	0.0	
Total Delay	34.4	4.2	39.8	5.2	94.4	71.3	
LOS	C	A	D	A	F	E	
Approach Delay		10.5	39.1		75.2		
Approach LOS		B	D		E		
Queue Length 50th (ft)	68	53	692	5	43	192	
Queue Length 95th (ft)	142	128	844	19	#99	289	
Internal Link Dist (ft)		343	342		430		
Turn Bay Length (ft)	200			200		165	
Base Capacity (vph)	293	2569	1998	904	82	306	
Starvation Cap Reductn	0	1193	0	0	0	0	
Spillback Cap Reductn	0	0	196	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.56	0.45	1.00	0.04	0.57	0.75	

Intersection Summary

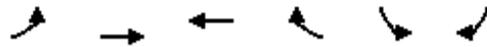
Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 4 (3%), Referenced to phase 2:Ped and 6:, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 34.8
 Intersection LOS: C
 Intersection Capacity Utilization 75.6%
 ICU Level of Service D
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 420: Lawrenceville Hwy & Old Norcross Rd



HCM Signalized Intersection Capacity Analysis
420: Lawrenceville Hwy & Old Norcross Rd

Lawrenceville Hwy Study
2025 AM Alternatives



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	151	569	1658	36	43	210
Future Volume (vph)	151	569	1658	36	43	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	0%		6%	
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1585	3169	3185	1425	1545	1382
Flt Permitted	0.05	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	78	3169	3185	1425	1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	164	618	1802	39	47	228
RTOR Reduction (vph)	0	0	0	9	0	0
Lane Group Flow (vph)	164	618	1802	30	47	228
Turn Type	pm+pt	NA	NA	Perm	Prot	pm+ov
Protected Phases	7	4	8		1	7
Permitted Phases	4			8		1
Actuated Green, G (s)	111.8	111.8	87.6	87.6	6.0	25.7
Effective Green, g (s)	111.8	111.8	87.6	87.6	6.0	25.7
Actuated g/C Ratio	0.80	0.80	0.63	0.63	0.04	0.18
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	274	2530	1992	891	66	298
v/s Ratio Prot	0.08	0.19	c0.57		0.03	c0.11
v/s Ratio Perm	0.39			0.02		0.06
v/c Ratio	0.60	0.24	0.90	0.03	0.71	0.77
Uniform Delay, d1	40.0	3.5	22.6	10.0	66.1	54.3
Progression Factor	0.81	1.06	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.5	0.0	6.3	0.0	30.3	11.1
Delay (s)	35.9	3.8	28.9	10.0	96.4	65.4
Level of Service	D	A	C	B	F	E
Approach Delay (s)		10.5	28.5		70.7	
Approach LOS		B	C		E	

Intersection Summary			
HCM 2000 Control Delay	27.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

2025 PM Peak

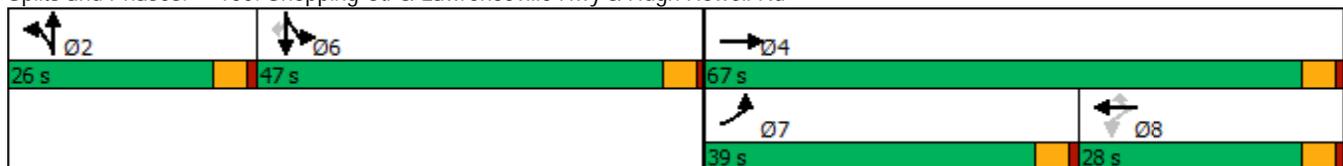
Lanes, Volumes, Timings
 100: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	666	495	47	10	427	553	19	31	5	589	38	797
Future Volume (vph)	666	495	47	10	427	553	19	31	5	589	38	797
Satd. Flow (prot)	3074	3128	0	1569	3138	1404	0	1548	0	1490	1503	1404
Flt Permitted	0.950			0.430				0.983		0.950	0.958	
Satd. Flow (perm)	3074	3128	0	710	3138	1404	0	1548	0	1490	1503	1404
Satd. Flow (RTOR)		9				601		3				729
Lane Group Flow (vph)	724	589	0	11	464	601	0	60	0	339	342	866
Turn Type	Prot	NA		Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	7	4			8		2	2		6	6	
Permitted Phases				8		8						6
Total Split (s)	39.0	67.0		28.0	28.0	28.0	26.0	26.0		47.0	47.0	47.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	4.5
Act Effect Green (s)	34.2	61.9		23.2	23.2	23.2		21.5		42.5	42.5	42.5
Actuated g/C Ratio	0.25	0.44		0.17	0.17	0.17		0.15		0.30	0.30	0.30
v/c Ratio	0.96	0.42		0.09	0.89	0.82		0.25		0.75	0.75	0.93
Control Delay	76.6	27.2		51.7	76.6	14.1		52.6		55.4	55.3	24.7
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	0.0
Total Delay	76.6	27.2		51.7	76.6	14.1		52.6		55.4	55.3	24.7
LOS	E	C		D	E	B		D		E	E	C
Approach Delay		54.4			41.4			52.6			38.2	
Approach LOS		D			D			D			D	
Queue Length 50th (ft)	337	186		9	220	0		46		293	295	149
Queue Length 95th (ft)	#461	237		28	#314	145		93		423	424	#515
Internal Link Dist (ft)		1077			1085			510			1031	
Turn Bay Length (ft)	245			225						286		
Base Capacity (vph)	760	1407		119	528	736		241		454	458	934
Starvation Cap Reductn	0	0		0	0	0		0		0	0	0
Spillback Cap Reductn	0	0		0	0	0		0		0	0	0
Storage Cap Reductn	0	0		0	0	0		0		0	0	0
Reduced v/c Ratio	0.95	0.42		0.09	0.88	0.82		0.25		0.75	0.75	0.93

Intersection Summary

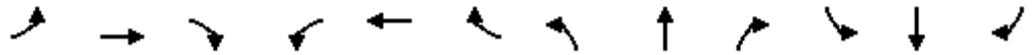
Cycle Length: 140
 Actuated Cycle Length: 139.4
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.96
 Intersection Signal Delay: 44.6
 Intersection LOS: D
 Intersection Capacity Utilization 83.4%
 ICU Level of Service E
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 100: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd



HCM Signalized Intersection Capacity Analysis
 100: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd

Lawrenceville Hwy Study
 2025 AM Alternatives



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↖↗		↖	↖↖	↗		↕		↖	↖↗	↗
Traffic Volume (vph)	666	495	47	10	427	553	19	31	5	589	38	797
Future Volume (vph)	666	495	47	10	427	553	19	31	5	589	38	797
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			3%			10%			3%	
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	4.5
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85		0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98		0.95	0.96	1.00
Satd. Flow (prot)	3074	3128		1569	3138	1404		1548		1490	1503	1404
Flt Permitted	0.95	1.00		0.43	1.00	1.00		0.98		0.95	0.96	1.00
Satd. Flow (perm)	3074	3128		710	3138	1404		1548		1490	1503	1404
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	724	538	51	11	464	601	21	34	5	640	41	866
RTOR Reduction (vph)	0	5	0	0	0	501	0	3	0	0	0	507
Lane Group Flow (vph)	724	584	0	11	464	100	0	57	0	339	342	359
Turn Type	Prot	NA		Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	7	4			8		2	2		6	6	
Permitted Phases				8		8						6
Actuated Green, G (s)	34.2	61.9		23.2	23.2	23.2		21.5		42.5	42.5	42.5
Effective Green, g (s)	34.2	61.9		23.2	23.2	23.2		21.5		42.5	42.5	42.5
Actuated g/C Ratio	0.25	0.44		0.17	0.17	0.17		0.15		0.30	0.30	0.30
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	754	1388		118	522	233		238		454	458	428
v/s Ratio Prot	c0.24	0.19			c0.15			c0.04		0.23	0.23	
v/s Ratio Perm				0.02		0.07						c0.26
v/c Ratio	0.96	0.42		0.09	0.89	0.43		0.24		0.75	0.75	0.84
Uniform Delay, d1	51.9	26.5		49.2	56.8	52.2		51.8		43.6	43.6	45.3
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	23.4	0.2		0.3	16.7	1.3		2.4		10.7	10.6	17.7
Delay (s)	75.3	26.7		49.5	73.5	53.4		54.2		54.3	54.2	62.9
Level of Service	E	C		D	E	D		D		D	D	E
Approach Delay (s)		53.5			62.1			54.2			59.1	
Approach LOS		D			E			D			E	

Intersection Summary		
HCM 2000 Control Delay	58.0	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.78	E
Actuated Cycle Length (s)	139.4	Sum of lost time (s)
Intersection Capacity Utilization	83.4%	18.0
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		E

Lanes, Volumes, Timings
 101: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	666	495	47	0	427	553	0	0	25	608	0	816
Future Volume (vph)	666	495	47	0	427	553	0	0	25	608	0	816
Satd. Flow (prot)	3074	3128	0	0	3138	1404	0	0	1378	3043	0	1404
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	3074	3128	0	0	3138	1404	0	0	1378	3043	0	1404
Satd. Flow (RTOR)		10				601			260			642
Lane Group Flow (vph)	724	589	0	0	464	601	0	0	27	661	0	887
Turn Type	Prot	NA			NA	Perm			Perm	Prot		Perm
Protected Phases	7	4			8					1		
Permitted Phases						8			6			6
Total Split (s)	41.0	73.0			32.0	32.0			67.0	67.0		67.0
Total Lost Time (s)	4.5	4.5			4.5	4.5			4.5	4.5		4.5
Act Effct Green (s)	34.6	64.7			25.5	25.5			62.6	62.6		62.6
Actuated g/C Ratio	0.25	0.47			0.19	0.19			0.46	0.46		0.46
v/c Ratio	0.93	0.40			0.79	0.80			0.03	0.47		0.89
Control Delay	68.6	23.5			63.7	12.8			0.1	27.5		22.1
Queue Delay	0.0	0.0			0.0	0.0			0.0	0.0		0.0
Total Delay	68.6	23.5			63.7	12.8			0.1	27.5		22.1
LOS	E	C			E	B			A	C		C
Approach Delay		48.3			35.0			0.1				24.4
Approach LOS		D			D			A				C
Queue Length 50th (ft)	330	170			212	0			0	216		258
Queue Length 95th (ft)	#440	217			276	138			0	272		#659
Internal Link Dist (ft)		1112			1142			556				1030
Turn Bay Length (ft)	245									286		
Base Capacity (vph)	824	1580			634	763			773	1398		992
Starvation Cap Reductn	0	0			0	0			0	0		0
Spillback Cap Reductn	0	0			0	0			0	0		0
Storage Cap Reductn	0	0			0	0			0	0		0
Reduced v/c Ratio	0.88	0.37			0.73	0.79			0.03	0.47		0.89

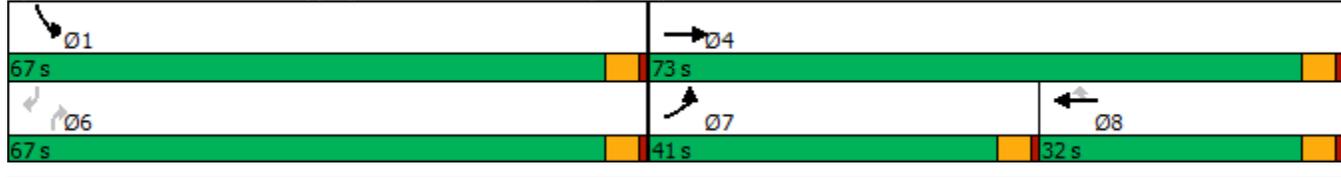
Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 136.3
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.93
 Intersection Signal Delay: 35.1 Intersection LOS: D
 Intersection Capacity Utilization 76.8% ICU Level of Service D
 Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

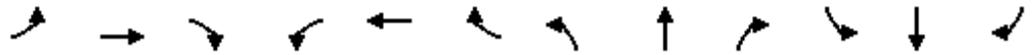
Queue shown is maximum after two cycles.

Splits and Phases: 101: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd



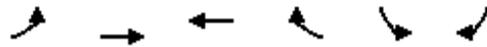
HCM Signalized Intersection Capacity Analysis
 101: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd

Lawrenceville Hwy Study
 2025 AM Alternatives



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	666	495	47	0	427	553	0	0	25	608	0	816
Future Volume (vph)	666	495	47	0	427	553	0	0	25	608	0	816
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			3%			10%			3%	
Total Lost time (s)	4.5	4.5			4.5	4.5			4.5	4.5		4.5
Lane Util. Factor	0.97	0.95			0.95	1.00			1.00	0.97		1.00
Frt	1.00	0.99			1.00	0.85			0.86	1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00			1.00	0.95		1.00
Satd. Flow (prot)	3074	3128			3138	1404			1378	3043		1404
Flt Permitted	0.95	1.00			1.00	1.00			1.00	0.95		1.00
Satd. Flow (perm)	3074	3128			3138	1404			1378	3043		1404
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	724	538	51	0	464	601	0	0	27	661	0	887
RTOR Reduction (vph)	0	5	0	0	0	488	0	0	15	0	0	347
Lane Group Flow (vph)	724	584	0	0	464	113	0	0	12	661	0	540
Turn Type	Prot	NA			NA	Perm			Perm	Prot		Perm
Protected Phases	7	4			8					1		
Permitted Phases						8			6			6
Actuated Green, G (s)	34.6	64.7			25.6	25.6			62.6	62.6		62.6
Effective Green, g (s)	34.6	64.7			25.6	25.6			62.6	62.6		62.6
Actuated g/C Ratio	0.25	0.47			0.19	0.19			0.46	0.46		0.46
Clearance Time (s)	4.5	4.5			4.5	4.5			4.5	4.5		4.5
Vehicle Extension (s)	3.0	3.0			3.0	3.0			3.0	3.0		3.0
Lane Grp Cap (vph)	780	1484			589	263			632	1397		644
v/s Ratio Prot	c0.24	0.19			c0.15					0.22		
v/s Ratio Perm						0.08			0.01			c0.38
v/c Ratio	0.93	0.39			0.79	0.43			0.02	0.47		0.84
Uniform Delay, d1	49.6	23.1			52.8	48.9			20.1	25.5		32.4
Progression Factor	1.00	1.00			1.00	1.00			1.00	1.00		1.00
Incremental Delay, d2	17.0	0.2			6.9	1.1			0.1	0.3		12.4
Delay (s)	66.7	23.3			59.7	50.0			20.2	25.7		44.8
Level of Service	E	C			E	D			C	C		D
Approach Delay (s)		47.2			54.2			20.2			36.6	
Approach LOS		D			D			C			D	
Intersection Summary												
HCM 2000 Control Delay			44.8				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			136.3				Sum of lost time (s)		13.5			
Intersection Capacity Utilization			76.8%				ICU Level of Service			D		
Analysis Period (min)			15									
c	Critical Lane Group											

Lanes, Volumes, Timings
 102: Lawrenceville Hwy & Hugh Howell Rd

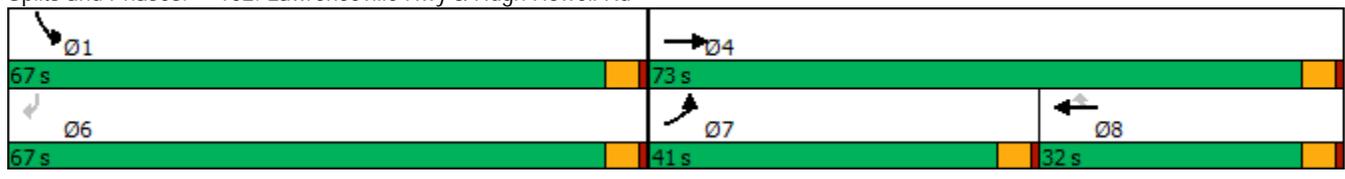


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖↖	↑↑	↑↑	↗	↖↖	↗
Traffic Volume (vph)	666	519	427	553	608	816
Future Volume (vph)	666	519	427	553	608	816
Satd. Flow (prot)	3074	3169	3138	1404	3043	1404
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3074	3169	3138	1404	3043	1404
Satd. Flow (RTOR)				601		642
Lane Group Flow (vph)	724	564	464	601	661	887
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		1	
Permitted Phases				8		6
Total Split (s)	41.0	73.0	32.0	32.0	67.0	67.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Act Effect Green (s)	34.6	64.7	25.5	25.5	62.6	62.6
Actuated g/C Ratio	0.25	0.47	0.19	0.19	0.46	0.46
v/c Ratio	0.93	0.38	0.79	0.80	0.47	0.89
Control Delay	68.6	23.6	63.7	12.8	27.5	22.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.6	23.6	63.7	12.8	27.5	22.1
LOS	E	C	E	B	C	C
Approach Delay		48.9	35.0		24.4	
Approach LOS		D	D		C	
Queue Length 50th (ft)	330	164	212	0	216	258
Queue Length 95th (ft)	#440	210	276	138	272	#659
Internal Link Dist (ft)		1076	973		988	
Turn Bay Length (ft)	245				286	
Base Capacity (vph)	824	1595	634	763	1398	992
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.35	0.73	0.79	0.47	0.89

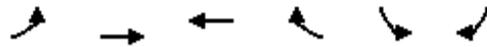
Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 136.3
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.93
 Intersection Signal Delay: 35.4
 Intersection LOS: D
 Intersection Capacity Utilization 76.8%
 ICU Level of Service D
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 102: Lawrenceville Hwy & Hugh Howell Rd



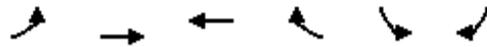
HCM Signalized Intersection Capacity Analysis
 102: Lawrenceville Hwy & Hugh Howell Rd



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	666	519	427	553	608	816
Future Volume (vph)	666	519	427	553	608	816
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	3%		3%	
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3074	3169	3138	1404	3043	1404
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3074	3169	3138	1404	3043	1404
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	724	564	464	601	661	887
RTOR Reduction (vph)	0	0	0	488	0	347
Lane Group Flow (vph)	724	564	464	113	661	540
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		1	
Permitted Phases				8		6
Actuated Green, G (s)	34.6	64.7	25.6	25.6	62.6	62.6
Effective Green, g (s)	34.6	64.7	25.6	25.6	62.6	62.6
Actuated g/C Ratio	0.25	0.47	0.19	0.19	0.46	0.46
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	780	1504	589	263	1397	644
v/s Ratio Prot	c0.24	0.18	c0.15		0.22	
v/s Ratio Perm				0.08		c0.38
v/c Ratio	0.93	0.38	0.79	0.43	0.47	0.84
Uniform Delay, d1	49.6	22.9	52.8	48.9	25.5	32.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	17.0	0.2	6.9	1.1	0.3	12.4
Delay (s)	66.7	23.0	59.7	50.0	25.7	44.8
Level of Service	E	C	E	D	C	D
Approach Delay (s)		47.6	54.2		36.6	
Approach LOS		D	D		D	

Intersection Summary			
HCM 2000 Control Delay	45.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	136.3	Sum of lost time (s)	13.5
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
 103: Lawrenceville Hwy & Hugh Howell Rd

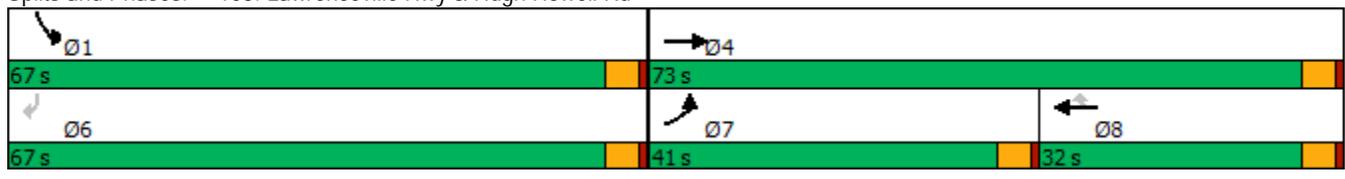


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖↖	↑↑	↑↑	↗	↖↖	↗
Traffic Volume (vph)	666	519	427	553	608	816
Future Volume (vph)	666	519	427	553	608	816
Satd. Flow (prot)	3074	3169	3138	1404	3043	1404
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3074	3169	3138	1404	3043	1404
Satd. Flow (RTOR)				601		642
Lane Group Flow (vph)	724	564	464	601	661	887
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		1	
Permitted Phases				8		6
Total Split (s)	41.0	73.0	32.0	32.0	67.0	67.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Act Effect Green (s)	34.6	64.7	25.5	25.5	62.6	62.6
Actuated g/C Ratio	0.25	0.47	0.19	0.19	0.46	0.46
v/c Ratio	0.93	0.38	0.79	0.80	0.47	0.89
Control Delay	68.6	23.6	63.7	12.8	27.5	22.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.6	23.6	63.7	12.8	27.5	22.1
LOS	E	C	E	B	C	C
Approach Delay		48.9	35.0		24.4	
Approach LOS		D	D		C	
Queue Length 50th (ft)	330	164	212	0	216	258
Queue Length 95th (ft)	#440	210	276	138	272	#659
Internal Link Dist (ft)		1672	1095		1103	
Turn Bay Length (ft)	1000				286	
Base Capacity (vph)	824	1595	634	763	1398	992
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.35	0.73	0.79	0.47	0.89

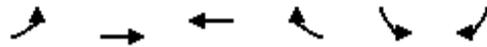
Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 136.3
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.93
 Intersection Signal Delay: 35.4
 Intersection LOS: D
 Intersection Capacity Utilization 76.8%
 ICU Level of Service D
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 103: Lawrenceville Hwy & Hugh Howell Rd



HCM Signalized Intersection Capacity Analysis
 103: Lawrenceville Hwy & Hugh Howell Rd



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	666	519	427	553	608	816
Future Volume (vph)	666	519	427	553	608	816
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	3%		3%	
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3074	3169	3138	1404	3043	1404
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3074	3169	3138	1404	3043	1404
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	724	564	464	601	661	887
RTOR Reduction (vph)	0	0	0	488	0	347
Lane Group Flow (vph)	724	564	464	113	661	540
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		1	
Permitted Phases				8		6
Actuated Green, G (s)	34.6	64.7	25.6	25.6	62.6	62.6
Effective Green, g (s)	34.6	64.7	25.6	25.6	62.6	62.6
Actuated g/C Ratio	0.25	0.47	0.19	0.19	0.46	0.46
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	780	1504	589	263	1397	644
v/s Ratio Prot	c0.24	0.18	c0.15		0.22	
v/s Ratio Perm				0.08		c0.38
v/c Ratio	0.93	0.38	0.79	0.43	0.47	0.84
Uniform Delay, d1	49.6	22.9	52.8	48.9	25.5	32.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	17.0	0.2	6.9	1.1	0.3	12.4
Delay (s)	66.7	23.0	59.7	50.0	25.7	44.8
Level of Service	E	C	E	D	C	D
Approach Delay (s)		47.6	54.2		36.6	
Approach LOS		D	D		D	

Intersection Summary

HCM 2000 Control Delay	45.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	136.3	Sum of lost time (s)	13.5
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

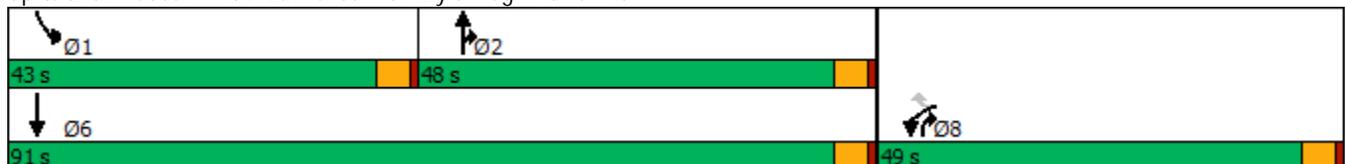
Lanes, Volumes, Timings
 104: Lawrenceville Hwy & Hugh Howell Rd

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	427	553	666	519	608	816
Future Volume (vph)	427	553	666	519	608	816
Satd. Flow (prot)	3090	1425	3185	2508	3090	3185
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3090	1425	3185	2508	3090	3185
Satd. Flow (RTOR)		537		75		
Lane Group Flow (vph)	464	601	724	564	661	887
Turn Type	Prot	Perm	NA	pt+ov	Prot	NA
Protected Phases	8		2	2 8	1	6
Permitted Phases		8				
Total Split (s)	49.0	49.0	48.0		43.0	91.0
Total Lost Time (s)	4.5	4.5	4.5		4.5	4.5
Act Effect Green (s)	28.3	28.3	52.2	85.0	30.2	86.9
Actuated g/C Ratio	0.23	0.23	0.42	0.68	0.24	0.70
v/c Ratio	0.66	0.81	0.54	0.32	0.88	0.40
Control Delay	47.8	15.5	31.7	7.8	59.5	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.8	15.5	31.7	7.8	59.5	9.4
LOS	D	B	C	A	E	A
Approach Delay	29.6		21.2			30.8
Approach LOS	C		C			C
Queue Length 50th (ft)	174	42	221	80	259	134
Queue Length 95th (ft)	228	192	385	135	361	261
Internal Link Dist (ft)	1382		1165			1496
Turn Bay Length (ft)				300	286	
Base Capacity (vph)	1111	856	1336	2060	961	2227
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.70	0.54	0.27	0.69	0.40

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 124.3
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.88
 Intersection Signal Delay: 27.3
 Intersection LOS: C
 Intersection Capacity Utilization 66.0%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 104: Lawrenceville Hwy & Hugh Howell Rd



HCM Signalized Intersection Capacity Analysis
 104: Lawrenceville Hwy & Hugh Howell Rd



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	427	553	666	519	608	816
Future Volume (vph)	427	553	666	519	608	816
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	1.00	0.95	0.88	0.97	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3090	1425	3185	2508	3090	3185
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3090	1425	3185	2508	3090	3185
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	464	601	724	564	661	887
RTOR Reduction (vph)	0	415	0	24	0	0
Lane Group Flow (vph)	464	186	724	540	661	887
Turn Type	Prot	Perm	NA	pt+ov	Prot	NA
Protected Phases	8		2	2	8	1
Permitted Phases		8				6
Actuated Green, G (s)	28.3	28.3	52.2	85.0	30.2	86.9
Effective Green, g (s)	28.3	28.3	52.2	85.0	30.2	86.9
Actuated g/C Ratio	0.23	0.23	0.42	0.68	0.24	0.70
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	704	324	1338	1716	751	2228
v/s Ratio Prot	c0.15		c0.23	0.22	c0.21	0.28
v/s Ratio Perm		0.13				
v/c Ratio	0.66	0.58	0.54	0.31	0.88	0.40
Uniform Delay, d1	43.6	42.6	27.0	7.9	45.3	7.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.2	2.5	1.6	0.1	11.7	0.5
Delay (s)	45.8	45.1	28.6	8.0	56.9	8.3
Level of Service	D	D	C	A	E	A
Approach Delay (s)	45.4		19.6			29.1
Approach LOS	D		B			C

Intersection Summary

HCM 2000 Control Delay	30.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	124.2	Sum of lost time (s)	13.5
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
 105: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd

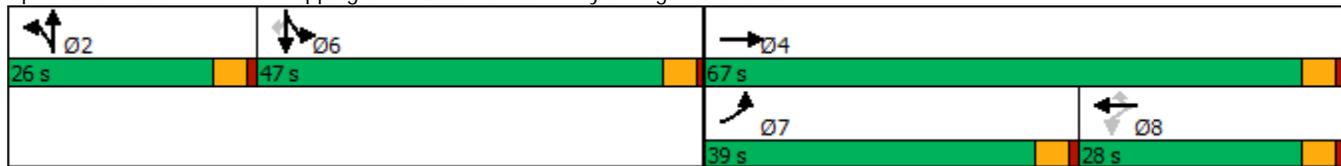
Lawrenceville Hwy Study
 2025 AM Alternatives

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	666	495	47	10	427	553	19	31	5	589	38	797
Future Volume (vph)	666	495	47	10	427	553	19	31	5	589	38	797
Satd. Flow (prot)	3074	3128	0	1569	3138	1404	0	1548	0	1490	1503	1404
Flt Permitted	0.950			0.430				0.983		0.950	0.958	
Satd. Flow (perm)	3074	3128	0	710	3138	1404	0	1548	0	1490	1503	1404
Satd. Flow (RTOR)		9				533		3				729
Lane Group Flow (vph)	724	589	0	11	464	601	0	60	0	339	342	866
Turn Type	Prot	NA		Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	7	4			8		2	2		6	6	
Permitted Phases				8		8						6
Total Split (s)	39.0	67.0		28.0	28.0	28.0	26.0	26.0		47.0	47.0	47.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	4.5
Act Effect Green (s)	34.2	61.9		23.2	23.2	23.2		21.5		42.5	42.5	42.5
Actuated g/C Ratio	0.25	0.44		0.17	0.17	0.17		0.15		0.30	0.30	0.30
v/c Ratio	0.96	0.42		0.09	0.89	0.89		0.25		0.75	0.75	0.93
Control Delay	76.6	27.2		51.7	76.6	24.0		52.6		55.4	55.3	24.7
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	0.0
Total Delay	76.6	27.2		51.7	76.6	24.0		52.6		55.4	55.3	24.7
LOS	E	C		D	E	C		D		E	E	C
Approach Delay		54.4			47.0			52.6			38.2	
Approach LOS		D			D			D			D	
Queue Length 50th (ft)	337	186		9	220	55		46		293	295	149
Queue Length 95th (ft)	#461	237		28	#314	#298		93		423	424	#515
Internal Link Dist (ft)		855			1243			430			1063	
Turn Bay Length (ft)	245			225		150				286		
Base Capacity (vph)	760	1407		119	528	680		241		454	458	934
Starvation Cap Reductn	0	0		0	0	0		0		0	0	0
Spillback Cap Reductn	0	0		0	0	0		0		0	0	0
Storage Cap Reductn	0	0		0	0	0		0		0	0	0
Reduced v/c Ratio	0.95	0.42		0.09	0.88	0.88		0.25		0.75	0.75	0.93

Intersection Summary

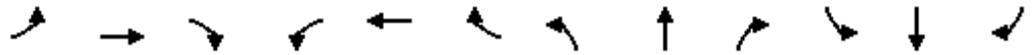
Cycle Length: 140
 Actuated Cycle Length: 139.4
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.96
 Intersection Signal Delay: 46.1
 Intersection LOS: D
 Intersection Capacity Utilization 83.4%
 ICU Level of Service E
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 105: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd



HCM Signalized Intersection Capacity Analysis
 105: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd

Lawrenceville Hwy Study
 2025 AM Alternatives



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↖↗		↖	↖↗	↖		↕		↖	↖↗	↖
Traffic Volume (vph)	666	495	47	10	427	553	19	31	5	589	38	797
Future Volume (vph)	666	495	47	10	427	553	19	31	5	589	38	797
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			3%			10%			3%	
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	4.5
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85		0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98		0.95	0.96	1.00
Satd. Flow (prot)	3074	3128		1569	3138	1404		1548		1490	1503	1404
Flt Permitted	0.95	1.00		0.43	1.00	1.00		0.98		0.95	0.96	1.00
Satd. Flow (perm)	3074	3128		710	3138	1404		1548		1490	1503	1404
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	724	538	51	11	464	601	21	34	5	640	41	866
RTOR Reduction (vph)	0	5	0	0	0	444	0	3	0	0	0	507
Lane Group Flow (vph)	724	584	0	11	464	157	0	57	0	339	342	359
Turn Type	Prot	NA		Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	7	4			8		2	2		6	6	
Permitted Phases				8		8						6
Actuated Green, G (s)	34.2	61.9		23.2	23.2	23.2		21.5		42.5	42.5	42.5
Effective Green, g (s)	34.2	61.9		23.2	23.2	23.2		21.5		42.5	42.5	42.5
Actuated g/C Ratio	0.25	0.44		0.17	0.17	0.17		0.15		0.30	0.30	0.30
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	754	1388		118	522	233		238		454	458	428
v/s Ratio Prot	c0.24	0.19			c0.15			c0.04		0.23	0.23	
v/s Ratio Perm				0.02		0.11						c0.26
v/c Ratio	0.96	0.42		0.09	0.89	0.67		0.24		0.75	0.75	0.84
Uniform Delay, d1	51.9	26.5		49.2	56.8	54.5		51.8		43.6	43.6	45.3
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	23.4	0.2		0.3	16.7	7.4		2.4		10.7	10.6	17.7
Delay (s)	75.3	26.7		49.5	73.5	62.0		54.2		54.3	54.2	62.9
Level of Service	E	C		D	E	E		D		D	D	E
Approach Delay (s)		53.5			66.8			54.2			59.1	
Approach LOS		D			E			D			E	

Intersection Summary

HCM 2000 Control Delay	59.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	139.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	83.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

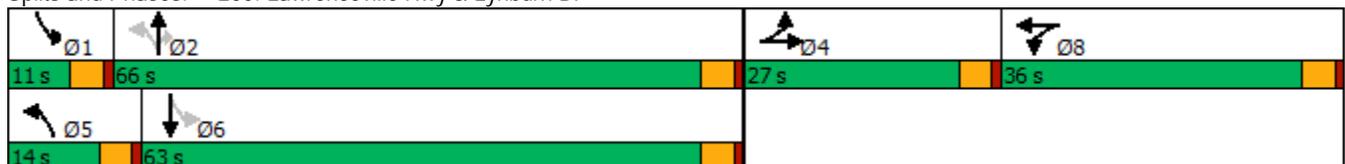
Lanes, Volumes, Timings
 200: Lawrenceville Hwy & Lynburn Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	40	120	288	96	72	119	930	201	55	1016	80
Future Volume (vph)	73	40	120	288	96	72	119	930	201	55	1016	80
Satd. Flow (prot)	0	1505	0	1545	1522	0	1617	3233	1446	1577	3119	0
Flt Permitted		0.985		0.950			0.080			0.175		
Satd. Flow (perm)	0	1505	0	1545	1522	0	136	3233	1446	290	3119	0
Satd. Flow (RTOR)		33			25				169		7	
Lane Group Flow (vph)	0	252	0	313	182	0	129	1011	218	60	1191	0
Turn Type	Split	NA		Split	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases							2		2	6		
Total Split (s)	27.0	27.0		36.0	36.0		14.0	66.0	66.0	11.0	63.0	
Total Lost Time (s)		4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Act Effct Green (s)		22.0		30.1	30.1		71.2	63.8	63.8	64.9	58.6	
Actuated g/C Ratio		0.16		0.22	0.22		0.52	0.46	0.46	0.47	0.42	
v/c Ratio		0.94		0.93	0.52		0.76	0.68	0.29	0.31	0.90	
Control Delay		92.2		87.4	46.7		51.2	33.0	7.4	21.4	47.3	
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		92.2		87.4	46.7		51.2	33.0	7.4	21.4	47.3	
LOS		F		F	D		D	C	A	C	D	
Approach Delay		92.2			72.5			30.6			46.0	
Approach LOS		F			E			C			D	
Queue Length 50th (ft)		202		279	126		60	390	26	27	528	
Queue Length 95th (ft)		#374		#456	207		#164	472	79	52	#672	
Internal Link Dist (ft)		515			434			603			658	
Turn Bay Length (ft)				90			180		200	135		
Base Capacity (vph)		273		352	366		172	1493	758	197	1327	
Starvation Cap Reductn		0		0	0		0	0	0	0	0	
Spillback Cap Reductn		0		0	0		0	0	0	0	0	
Storage Cap Reductn		0		0	0		0	0	0	0	0	
Reduced v/c Ratio		0.92		0.89	0.50		0.75	0.68	0.29	0.30	0.90	

Intersection Summary

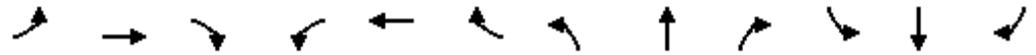
Cycle Length: 140
 Actuated Cycle Length: 138
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.94
 Intersection Signal Delay: 47.2
 Intersection LOS: D
 Intersection Capacity Utilization 89.1%
 ICU Level of Service E
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 200: Lawrenceville Hwy & Lynburn Dr



HCM Signalized Intersection Capacity Analysis
200: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
2025 AM Alternatives



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↙	↘		↙	↕	↘	↙	↕	↘
Traffic Volume (vph)	73	40	120	288	96	72	119	930	201	55	1016	80
Future Volume (vph)	73	40	120	288	96	72	119	930	201	55	1016	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			6%			-3%			2%	
Total Lost time (s)		4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt		0.93		1.00	0.94		1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.98		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1505		1545	1522		1617	3233	1446	1577	3119	
Flt Permitted		0.98		0.95	1.00		0.08	1.00	1.00	0.17	1.00	
Satd. Flow (perm)		1505		1545	1522		136	3233	1446	290	3119	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	79	43	130	313	104	78	129	1011	218	60	1104	87
RTOR Reduction (vph)	0	28	0	0	20	0	0	0	91	0	4	0
Lane Group Flow (vph)	0	224	0	313	162	0	129	1011	127	60	1187	0
Turn Type	Split	NA		Split	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases							2		2	6		
Actuated Green, G (s)		22.0		30.1	30.1		73.1	63.7	63.7	64.5	59.4	
Effective Green, g (s)		22.0		30.1	30.1		73.1	63.7	63.7	64.5	59.4	
Actuated g/C Ratio		0.16		0.22	0.22		0.53	0.46	0.46	0.46	0.43	
Clearance Time (s)		4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		238		334	329		171	1482	663	181	1333	
v/s Ratio Prot		c0.15		c0.20	0.11		c0.05	0.31		0.01	c0.38	
v/s Ratio Perm							0.35		0.09	0.14		
v/c Ratio		0.94		0.94	0.49		0.75	0.68	0.19	0.33	0.89	
Uniform Delay, d1		57.8		53.5	47.7		26.4	29.6	22.3	22.9	36.7	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		42.4		33.0	1.2		17.1	2.6	0.6	1.1	9.2	
Delay (s)		100.2		86.4	48.9		43.5	32.2	22.9	23.9	46.0	
Level of Service		F		F	D		D	C	C	C	D	
Approach Delay (s)		100.2			72.6			31.8			44.9	
Approach LOS		F			E			C			D	

Intersection Summary			
HCM 2000 Control Delay	47.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	138.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	89.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
 201: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
 2025 AM Alternatives

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	40	120	288	96	72	119	930	201	55	1016	80
Future Volume (vph)	73	40	120	288	96	72	119	930	201	55	1016	80
Satd. Flow (prot)	1561	1457	0	1545	1522	0	1617	3233	1446	1577	3119	0
Flt Permitted	0.643			0.221			0.119			0.205		
Satd. Flow (perm)	1056	1457	0	359	1522	0	202	3233	1446	340	3119	0
Satd. Flow (RTOR)		90			24				183		8	
Lane Group Flow (vph)	79	173	0	313	182	0	129	1011	218	60	1191	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		
Total Split (s)	23.0	23.0		33.0	33.0		15.0	72.0	72.0	12.0	69.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Act Effect Green (s)	22.7	12.6		42.8	30.7		77.6	69.9	69.9	72.1	65.2	
Actuated g/C Ratio	0.17	0.10		0.33	0.23		0.59	0.53	0.53	0.55	0.50	
v/c Ratio	0.36	0.78		0.89	0.49		0.59	0.59	0.25	0.24	0.77	
Control Delay	36.8	52.2		65.3	43.4		24.3	24.6	5.2	15.1	32.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	36.8	52.2		65.3	43.4		24.3	24.6	5.2	15.1	32.2	
LOS	D	D		E	D		C	C	A	B	C	
Approach Delay		47.4			57.3			21.4			31.4	
Approach LOS		D			E			C			C	
Queue Length 50th (ft)	48	71		225	120		48	331	15	22	449	
Queue Length 95th (ft)	87	156		#375	205		90	432	63	46	586	
Internal Link Dist (ft)		540			417			619			674	
Turn Bay Length (ft)	150			90			180		200	135		
Base Capacity (vph)	323	284		377	381		234	1725	857	260	1556	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.24	0.61		0.83	0.48		0.55	0.59	0.25	0.23	0.77	

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 130.9
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.89
 Intersection Signal Delay: 32.4
 Intersection LOS: C
 Intersection Capacity Utilization 84.6%
 ICU Level of Service E
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 201: Lawrenceville Hwy & Lynburn Dr



HCM Signalized Intersection Capacity Analysis
201: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
2025 AM Alternatives



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	40	120	288	96	72	119	930	201	55	1016	80
Future Volume (vph)	73	40	120	288	96	72	119	930	201	55	1016	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			6%			-3%				2%
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.89		1.00	0.94		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1561	1458		1545	1522		1617	3233	1446	1577	3119	
Flt Permitted	0.64	1.00		0.22	1.00		0.12	1.00	1.00	0.21	1.00	
Satd. Flow (perm)	1056	1458		359	1522		203	3233	1446	340	3119	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	79	43	130	313	104	78	129	1011	218	60	1104	87
RTOR Reduction (vph)	0	81	0	0	18	0	0	0	87	0	4	0
Lane Group Flow (vph)	79	92	0	313	164	0	129	1011	131	60	1187	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	22.2	13.6		43.8	30.7		79.2	69.9	69.9	72.0	66.3	
Effective Green, g (s)	22.2	13.6		43.8	30.7		79.2	69.9	69.9	72.0	66.3	
Actuated g/C Ratio	0.17	0.10		0.33	0.23		0.60	0.53	0.53	0.54	0.50	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	209	149		347	351		219	1700	760	237	1555	
v/s Ratio Prot	0.02	0.06		c0.17	0.11		c0.04	0.31		0.01	c0.38	
v/s Ratio Perm	0.04			c0.12			0.31		0.09	0.13		
v/c Ratio	0.38	0.62		0.90	0.47		0.59	0.59	0.17	0.25	0.76	
Uniform Delay, d1	48.6	57.2		38.3	44.0		18.4	21.7	16.4	16.0	27.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.1	7.4		25.4	1.0		4.0	1.5	0.5	0.6	3.6	
Delay (s)	49.7	64.6		63.7	45.0		22.5	23.3	16.9	16.5	30.6	
Level of Service	D	E		E	D		C	C	B	B	C	
Approach Delay (s)		59.9			56.8			22.2			29.9	
Approach LOS		E			E			C			C	

Intersection Summary

HCM 2000 Control Delay	33.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	132.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

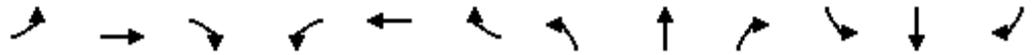
HCM Signalized Intersection Capacity Analysis
202: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
2025 AM Alternatives

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	73	40	120	288	96	72	119	930	201	55	1016	80	
Future Volume (vph)	73	40	120	288	96	72	119	930	201	55	1016	80	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Grade (%)		4%			6%			-3%			2%		
Total Lost time (s)		4.5			4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95		
Frt		0.93			1.00	0.85	1.00	1.00	0.85	1.00	0.99		
Flt Protected		0.98			0.96	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (prot)		1505			1567	1382	1617	3233	1446	1577	3119		
Flt Permitted		0.98			0.96	1.00	0.07	1.00	1.00	0.15	1.00		
Satd. Flow (perm)		1505			1567	1382	114	3233	1446	253	3119		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	79	43	130	313	104	78	129	1011	218	60	1104	87	
RTOR Reduction (vph)	0	27	0	0	0	57	0	0	93	0	4	0	
Lane Group Flow (vph)	0	225	0	0	417	21	129	1011	125	60	1187	0	
Turn Type	Split	NA		Split	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		
Protected Phases	4	4		8	8		5	2		1	6		
Permitted Phases						8	2		2	6			
Actuated Green, G (s)		21.5			37.5	37.5	68.0	59.5	59.5	59.8	55.4		
Effective Green, g (s)		21.5			37.5	37.5	68.0	59.5	59.5	59.8	55.4		
Actuated g/C Ratio		0.15			0.27	0.27	0.48	0.42	0.42	0.42	0.39		
Clearance Time (s)		4.5			4.5	4.5	4.5	4.5	4.5	4.5	4.5		
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)		229			417	367	145	1365	610	148	1226		
v/s Ratio Prot		c0.15			c0.27		c0.05	0.31		0.01	c0.38		
v/s Ratio Perm						0.02	0.37		0.09	0.16			
v/c Ratio		0.98			1.00	0.06	0.89	0.74	0.20	0.41	0.97		
Uniform Delay, d1		59.5			51.7	38.5	34.2	34.2	25.7	26.9	41.9		
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2		54.1			44.1	0.1	43.2	3.7	0.8	1.8	19.1		
Delay (s)		113.6			95.8	38.6	77.4	37.9	26.5	28.7	61.0		
Level of Service		F			F	D	E	D	C	C	E		
Approach Delay (s)		113.6			86.8			39.8			59.4		
Approach LOS		F			F			D			E		
Intersection Summary													
HCM 2000 Control Delay			59.6									HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio			0.97										
Actuated Cycle Length (s)			140.9									Sum of lost time (s)	18.0
Intersection Capacity Utilization			94.7%									ICU Level of Service	F
Analysis Period (min)			15										
c	Critical Lane Group												

Lanes, Volumes, Timings
203: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
2025 AM Alternatives

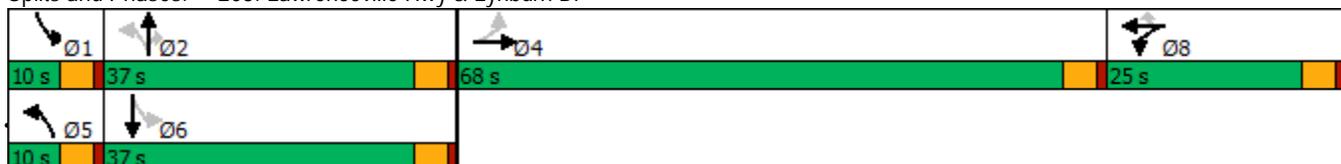


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖	↗	↗	↖	↕	↖	↖	↕	↕
Traffic Volume (vph)	73	40	120	288	96	72	119	930	201	55	1016	80
Future Volume (vph)	73	40	120	288	96	72	119	930	201	55	1016	80
Satd. Flow (prot)	0	1505	0	1545	1626	1382	1617	3233	1446	1577	3119	0
Flt Permitted		0.103		0.950			0.116			0.120		
Satd. Flow (perm)	0	157	0	1545	1626	1382	197	3233	1446	199	3119	0
Satd. Flow (RTOR)		50				82			124		5	
Lane Group Flow (vph)	0	252	0	313	104	78	129	1011	218	60	1191	0
Turn Type	Perm	NA		Split	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4		8	8		5	2		1	6	
Permitted Phases	4					8	2		2	6		
Total Split (s)	68.0	68.0		25.0	25.0	25.0	10.0	37.0	37.0	10.0	37.0	
Total Lost Time (s)		4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Act Effect Green (s)		63.5		20.5	20.5	20.5	38.9	34.5	34.5	38.0	32.5	
Actuated g/C Ratio		0.45		0.15	0.15	0.15	0.28	0.25	0.25	0.27	0.23	
v/c Ratio		2.57		1.38	0.44	0.29	1.17	1.27	0.49	0.56	1.64	
Control Delay		753.1		241.3	60.9	12.5	176.6	173.7	23.7	56.3	327.6	
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		753.1		241.3	60.9	12.5	176.6	173.7	23.7	56.3	327.6	
LOS		F		F	E	B	F	F	C	E	F	
Approach Delay		753.1			167.4			149.9			314.6	
Approach LOS		F			F			F			F	
Queue Length 50th (ft)		-296		-378	88	0	-96	-632	72	40	-827	
Queue Length 95th (ft)		#476		#570	150	45	#237	#768	157	#82	#968	
Internal Link Dist (ft)		598			486			576			669	
Turn Bay Length (ft)				90		50	180		200	135		
Base Capacity (vph)		98		226	238	272	110	796	449	108	727	
Starvation Cap Reductn		0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0		0	0	0	0	0	0	0	0	
Storage Cap Reductn		0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio		2.57		1.38	0.44	0.29	1.17	1.27	0.49	0.56	1.64	

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 2.57
 Intersection Signal Delay: 259.2
 Intersection LOS: F
 Intersection Capacity Utilization 89.1%
 ICU Level of Service E
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 203: Lawrenceville Hwy & Lynburn Dr



HCM Signalized Intersection Capacity Analysis
203: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
2025 AM Alternatives

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	73	40	120	288	96	72	119	930	201	55	1016	80	
Future Volume (vph)	73	40	120	288	96	72	119	930	201	55	1016	80	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Grade (%)		4%			6%			-3%			2%		
Total Lost time (s)		4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor		1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95		
Frt		0.93		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		
Flt Protected		0.98		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (prot)		1505		1545	1626	1382	1617	3233	1446	1577	3119		
Flt Permitted		0.10		0.95	1.00	1.00	0.12	1.00	1.00	0.12	1.00		
Satd. Flow (perm)		157		1545	1626	1382	197	3233	1446	199	3119		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	79	43	130	313	104	78	129	1011	218	60	1104	87	
RTOR Reduction (vph)	0	27	0	0	0	67	0	0	94	0	4	0	
Lane Group Flow (vph)	0	225	0	313	104	11	129	1011	124	60	1187	0	
Turn Type	Perm	NA		Split	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		
Protected Phases		4		8	8		5	2		1	6		
Permitted Phases	4					8	2		2	6			
Actuated Green, G (s)		63.5		20.5	20.5	20.5	40.0	34.5	34.5	37.8	33.4		
Effective Green, g (s)		63.5		20.5	20.5	20.5	40.0	34.5	34.5	37.8	33.4		
Actuated g/C Ratio		0.45		0.15	0.15	0.15	0.28	0.24	0.24	0.27	0.24		
Clearance Time (s)		4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)		70		224	236	201	111	791	354	96	739		
v/s Ratio Prot				c0.20	0.06		c0.05	0.31		0.02	c0.38		
v/s Ratio Perm		c1.43				0.01	0.28		0.09	0.15			
v/c Ratio		3.21		1.40	0.44	0.06	1.16	1.28	0.35	0.62	1.61		
Uniform Delay, d1		38.7		60.2	55.0	51.9	48.4	53.2	44.0	42.4	53.8		
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2		1029.5		203.6	1.3	0.1	135.5	134.9	2.7	12.0	279.2		
Delay (s)		1068.2		263.8	56.3	52.0	183.9	188.1	46.7	54.4	333.0		
Level of Service		F		F	E	D	F	F	D	D	F		
Approach Delay (s)		1068.2			186.8			165.0			319.6		
Approach LOS		F			F			F			F		
Intersection Summary													
HCM 2000 Control Delay			293.7									HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio			2.36										
Actuated Cycle Length (s)			140.9									Sum of lost time (s)	18.0
Intersection Capacity Utilization			89.1%									ICU Level of Service	E
Analysis Period (min)			15										
c	Critical Lane Group												

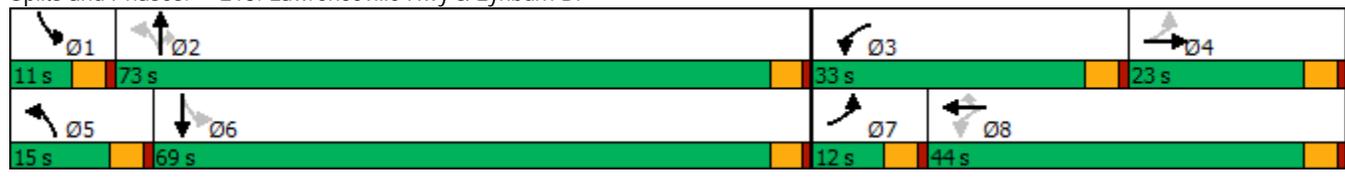
Lanes, Volumes, Timings
213: Lawrenceville Hwy & Lynburn Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	40	120	288	96	72	119	930	201	55	1016	80
Future Volume (vph)	73	40	120	288	96	72	119	930	201	55	1016	80
Satd. Flow (prot)	1561	1457	0	1545	1626	1382	1617	3233	1446	1577	3119	0
Flt Permitted	0.690			0.221			0.118			0.209		
Satd. Flow (perm)	1134	1457	0	359	1626	1382	201	3233	1446	347	3119	0
Satd. Flow (RTOR)		90					82		186		8	
Lane Group Flow (vph)	79	173	0	313	104	78	129	1011	218	60	1191	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Total Split (s)	12.0	23.0		33.0	44.0	44.0	15.0	73.0	73.0	11.0	69.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Act Effect Green (s)	20.0	12.6		42.9	33.6	33.6	78.4	70.7	70.7	71.7	65.3	
Actuated g/C Ratio	0.15	0.10		0.33	0.26	0.26	0.60	0.54	0.54	0.55	0.50	
v/c Ratio	0.40	0.78		0.89	0.25	0.19	0.58	0.58	0.25	0.24	0.76	
Control Delay	40.0	52.4		65.4	41.2	8.2	23.9	24.0	4.9	15.3	32.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	40.0	52.4		65.4	41.2	8.2	23.9	24.0	4.9	15.3	32.2	
LOS	D	D		E	D	A	C	C	A	B	C	
Approach Delay		48.5			51.3			20.9			31.3	
Approach LOS		D			D			C			C	
Queue Length 50th (ft)	48	71		225	73	0	48	325	14	22	449	
Queue Length 95th (ft)	87	156		#375	125	38	89	426	60	46	586	
Internal Link Dist (ft)		618			662			865			596	
Turn Bay Length (ft)	150			90		50	180		200	135		
Base Capacity (vph)	199	284		376	492	476	234	1742	865	251	1557	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.40	0.61		0.83	0.21	0.16	0.55	0.58	0.25	0.24	0.76	

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 131.1
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.89
 Intersection Signal Delay: 31.3
 Intersection LOS: C
 Intersection Capacity Utilization 84.6%
 ICU Level of Service E
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 213: Lawrenceville Hwy & Lynburn Dr



HCM Signalized Intersection Capacity Analysis
213: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
2025 AM Alternatives



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	40	120	288	96	72	119	930	201	55	1016	80
Future Volume (vph)	73	40	120	288	96	72	119	930	201	55	1016	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			6%			-3%				2%
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.89		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1561	1458		1545	1626	1382	1617	3233	1446	1577	3119	
Flt Permitted	0.69	1.00		0.22	1.00	1.00	0.12	1.00	1.00	0.21	1.00	
Satd. Flow (perm)	1133	1458		359	1626	1382	201	3233	1446	347	3119	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	79	43	130	313	104	78	129	1011	218	60	1104	87
RTOR Reduction (vph)	0	81	0	0	0	58	0	0	87	0	4	0
Lane Group Flow (vph)	79	92	0	313	104	20	129	1011	131	60	1187	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	19.4	13.6		43.8	33.5	33.5	79.9	70.6	70.6	71.3	66.3	
Effective Green, g (s)	19.4	13.6		43.8	33.5	33.5	79.9	70.6	70.6	71.3	66.3	
Actuated g/C Ratio	0.15	0.10		0.33	0.25	0.25	0.60	0.53	0.53	0.54	0.50	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	184	149		347	409	348	219	1717	768	232	1555	
v/s Ratio Prot	0.02	0.06		c0.17	0.06		c0.04	0.31		0.01	c0.38	
v/s Ratio Perm	0.04			c0.12		0.01	0.31		0.09	0.13		
v/c Ratio	0.43	0.62		0.90	0.25	0.06	0.59	0.59	0.17	0.26	0.76	
Uniform Delay, d1	51.1	57.2		38.3	39.7	37.7	18.4	21.2	16.1	16.1	27.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.6	7.4		25.4	0.3	0.1	4.0	1.5	0.5	0.6	3.6	
Delay (s)	52.7	64.6		63.7	40.0	37.8	22.4	22.7	16.5	16.7	30.6	
Level of Service	D	E		E	D	D	C	C	B	B	C	
Approach Delay (s)		60.9			54.7			21.7			29.9	
Approach LOS		E			D			C			C	

Intersection Summary

HCM 2000 Control Delay	32.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	132.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
230: Lawrenceville Hwy & Lynburn Dr

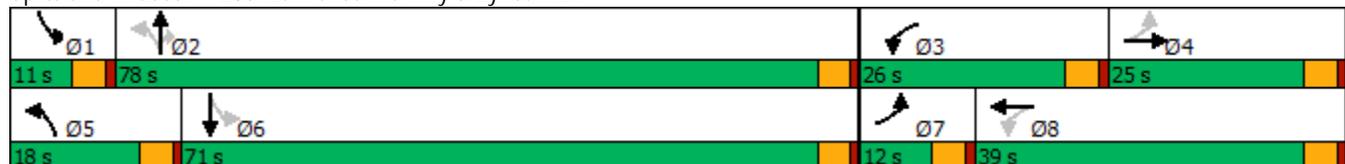
Lawrenceville Hwy Study
2025 AM Alternatives

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	40	120	192	64	48	119	930	201	55	1016	80
Future Volume (vph)	73	40	120	192	64	48	119	930	201	55	1016	80
Satd. Flow (prot)	1593	1487	0	1593	1569	0	1593	3185	1425	1593	3150	0
Flt Permitted	0.679			0.220			0.136			0.228		
Satd. Flow (perm)	1138	1487	0	369	1569	0	228	3185	1425	382	3150	0
Satd. Flow (RTOR)		91			25				200		8	
Lane Group Flow (vph)	79	173	0	209	122	0	129	1011	218	60	1191	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		
Total Split (s)	12.0	25.0		26.0	39.0		18.0	78.0	78.0	11.0	71.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Act Effect Green (s)	20.0	12.6		35.3	26.0		82.6	75.0	75.0	75.7	69.3	
Actuated g/C Ratio	0.16	0.10		0.28	0.20		0.65	0.59	0.59	0.59	0.54	
v/c Ratio	0.39	0.76		0.76	0.36		0.52	0.54	0.24	0.21	0.70	
Control Delay	42.2	48.3		56.3	38.4		17.4	19.4	3.5	12.0	26.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	42.2	48.3		56.3	38.4		17.4	19.4	3.5	12.0	26.0	
LOS	D	D		E	D		B	B	A	B	C	
Approach Delay		46.4			49.7			16.6			25.4	
Approach LOS		D			D			B			C	
Queue Length 50th (ft)	51	68		146	72		39	276	6	17	375	
Queue Length 95th (ft)	92	152		222	131		79	397	49	42	565	
Internal Link Dist (ft)		734			654			720			762	
Turn Bay Length (ft)	150			90			180		200	135		
Base Capacity (vph)	206	316		309	444		293	1868	918	288	1711	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.38	0.55		0.68	0.27		0.44	0.54	0.24	0.21	0.70	

Intersection Summary

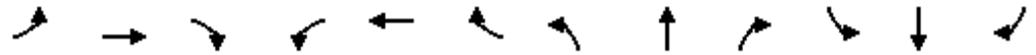
Cycle Length: 140
 Actuated Cycle Length: 127.9
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.76
 Intersection Signal Delay: 25.8
 Intersection LOS: C
 Intersection Capacity Utilization 78.7%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 230: Lawrenceville Hwy & Lynburn Dr



HCM Signalized Intersection Capacity Analysis
230: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
2025 AM Alternatives



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	40	120	192	64	48	119	930	201	55	1016	80
Future Volume (vph)	73	40	120	192	64	48	119	930	201	55	1016	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.89		1.00	0.94		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1593	1488		1593	1569		1593	3185	1425	1593	3150	
Flt Permitted	0.68	1.00		0.22	1.00		0.14	1.00	1.00	0.23	1.00	
Satd. Flow (perm)	1138	1488		368	1569		229	3185	1425	382	3150	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	79	43	130	209	70	52	129	1011	218	60	1104	87
RTOR Reduction (vph)	0	81	0	0	20	0	0	0	84	0	4	0
Lane Group Flow (vph)	79	92	0	209	102	0	129	1011	134	60	1187	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	19.5	13.7		36.3	26.0		84.6	75.1	75.1	75.4	70.4	
Effective Green, g (s)	19.5	13.7		36.3	26.0		84.6	75.1	75.1	75.4	70.4	
Actuated g/C Ratio	0.15	0.11		0.28	0.20		0.65	0.58	0.58	0.58	0.54	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	191	156		273	314		250	1841	823	268	1707	
v/s Ratio Prot	0.02	0.06		c0.11	0.07		c0.04	0.32		0.01	c0.38	
v/s Ratio Perm	0.04			c0.11			0.30		0.09	0.12		
v/c Ratio	0.41	0.59		0.77	0.32		0.52	0.55	0.16	0.22	0.70	
Uniform Delay, d1	49.4	55.4		39.5	44.4		14.4	16.9	12.8	12.7	21.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.5	5.5		12.1	0.6		1.8	1.2	0.4	0.4	2.4	
Delay (s)	50.8	60.9		51.6	45.0		16.2	18.1	13.2	13.1	24.2	
Level of Service	D	E		D	D		B	B	B	B	C	
Approach Delay (s)		57.8			49.2			17.1			23.7	
Approach LOS		E			D			B			C	

Intersection Summary

HCM 2000 Control Delay	26.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	129.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	78.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings

300: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
2025 AM Alternatives



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗		↑↑	↗			↗	↘↗	↑	↗
Traffic Volume (vph)	199	855	21	0	775	441	0	0	91	954	161	376
Future Volume (vph)	199	855	21	0	775	441	0	0	91	954	161	376
Satd. Flow (prot)	1585	3169	1418	0	3185	1425	0	0	1450	3090	1676	1425
Flt Permitted	0.950			0.950								
Satd. Flow (perm)	1585	3169	1418	0	3185	1425	0	0	1450	3090	1676	1425
Satd. Flow (RTOR)			23			167			82			
Lane Group Flow (vph)	216	929	23	0	842	479	0	0	99	1037	175	409
Turn Type	Prot	NA	Perm		NA	Free			Free	Prot	NA	Perm
Protected Phases	7	4			8					1	6	
Permitted Phases			4			Free			Free			
Total Split (s)	31.0	80.0	80.0		49.0					60.0	60.0	60.0
Total Lost Time (s)	4.5	4.5	4.5		4.5					4.5	4.5	4.5
Act Effect Green (s)	22.9	69.1	69.1		41.6	140.0			140.0	61.9	61.9	61.9
Actuated g/C Ratio	0.16	0.49	0.49		0.30	1.00			1.00	0.44	0.44	0.44
v/c Ratio	0.83	0.59	0.03		0.89	0.34			0.07	0.76	0.24	0.48
Control Delay	82.0	26.6	5.5		48.0	0.5			0.1	38.6	27.2	4.5
Queue Delay	0.0	0.0	0.0		5.7	0.0			0.0	0.3	0.0	0.0
Total Delay	82.0	26.6	5.5		53.7	0.5			0.1	38.9	27.2	4.5
LOS	F	C	A		D	A			A	D	C	A
Approach Delay	36.5				34.4			0.1			29.0	
Approach LOS	D				C			A			C	
Queue Length 50th (ft)	190	295	0		384	0			0	421	102	0
Queue Length 95th (ft)	#288	343	14		467	0			0	532	166	69
Internal Link Dist (ft)	856				343			238			413	
Turn Bay Length (ft)	445		230			125				300		225
Base Capacity (vph)	300	1708	775		1012	1425			1450	1366	741	858
Starvation Cap Reductn	0	0	0		124	0			0	0	0	0
Spillback Cap Reductn	0	0	0		0	0			26	56	0	0
Storage Cap Reductn	0	0	0		0	0			0	0	0	0
Reduced v/c Ratio	0.72	0.54	0.03		0.95	0.34			0.07	0.79	0.24	0.48

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2: and 6:SBT, Start of Green, Master Intersection

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 32.1

Intersection LOS: C

Intersection Capacity Utilization 77.5%

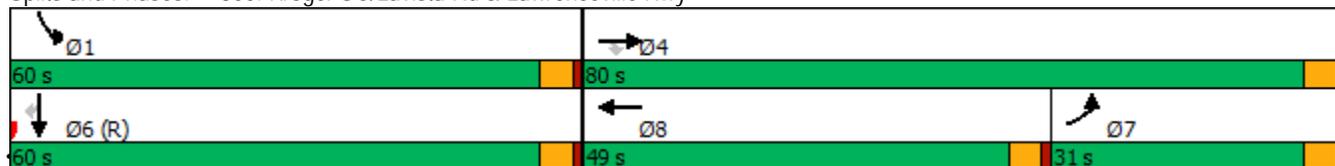
ICU Level of Service D

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 300: Kroger SC/Lavista Rd & Lawrenceville Hwy



HCM Signalized Intersection Capacity Analysis
300: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
2025 AM Alternatives

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		 			 					 			
Traffic Volume (vph)	199	855	21	0	775	441	0	0	91	954	161	376	
Future Volume (vph)	199	855	21	0	775	441	0	0	91	954	161	376	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Grade (%)		1%			0%			0%				0%	
Total Lost time (s)	4.5	4.5	4.5		4.5	4.0			4.0	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95	1.00		0.95	1.00			1.00	0.97	1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85			0.86	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1585	3169	1418		3185	1425			1450	3090	1676	1425	
Flt Permitted	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1585	3169	1418		3185	1425			1450	3090	1676	1425	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	216	929	23	0	842	479	0	0	99	1037	175	409	
RTOR Reduction (vph)	0	0	12	0	0	0	0	0	0	0	0	228	
Lane Group Flow (vph)	216	929	11	0	842	479	0	0	99	1037	175	181	
Turn Type	Prot	NA	Perm		NA	Free			Free	Prot	NA	Perm	
Protected Phases	7	4			8					1	6		
Permitted Phases			4			Free			Free			6	
Actuated Green, G (s)	23.0	69.1	69.1		41.6	140.0			140.0	61.9	61.9	61.9	
Effective Green, g (s)	23.0	69.1	69.1		41.6	140.0			140.0	61.9	61.9	61.9	
Actuated g/C Ratio	0.16	0.49	0.49		0.30	1.00			1.00	0.44	0.44	0.44	
Clearance Time (s)	4.5	4.5	4.5		4.5					4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0		3.0					3.0	3.0	3.0	
Lane Grp Cap (vph)	260	1564	699		946	1425			1450	1366	741	630	
v/s Ratio Prot	c0.14	0.29			c0.26					c0.34	0.10		
v/s Ratio Perm			0.01			0.34			0.07			0.13	
v/c Ratio	0.83	0.59	0.02		0.89	0.34			0.07	0.76	0.24	0.29	
Uniform Delay, d1	56.6	25.4	18.1		47.0	0.0			0.0	32.8	24.3	25.0	
Progression Factor	1.00	1.00	1.00		0.80	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	19.7	0.6	0.0		9.1	0.5			0.1	2.5	0.7	1.1	
Delay (s)	76.3	26.0	18.1		46.5	0.5			0.1	35.3	25.1	26.1	
Level of Service	E	C	B		D	A			A	D	C	C	
Approach Delay (s)		35.2			29.8			0.1			31.9		
Approach LOS		D			C			A			C		
Intersection Summary													
HCM 2000 Control Delay			31.4									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.81										
Actuated Cycle Length (s)			140.0									Sum of lost time (s)	13.5
Intersection Capacity Utilization			77.5%									ICU Level of Service	D
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
301: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
2025 AM Alternatives

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		 			 					 			
Traffic Volume (vph)	199	855	21	0	775	441	0	0	91	954	161	376	
Future Volume (vph)	199	855	21	0	775	441	0	0	91	954	161	376	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Grade (%)		1%			0%			0%				0%	
Total Lost time (s)	4.5	4.5	4.5		4.5	4.0			4.0	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95	1.00		0.95	1.00			1.00	0.97	1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85			0.86	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1585	3169	1418		3185	1425			1450	3090	1676	1425	
Flt Permitted	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1585	3169	1418		3185	1425			1450	3090	1676	1425	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	216	929	23	0	842	479	0	0	99	1037	175	409	
RTOR Reduction (vph)	0	0	12	0	0	0	0	0	0	0	0	228	
Lane Group Flow (vph)	216	929	11	0	842	479	0	0	99	1037	175	181	
Turn Type	Prot	NA	Perm		NA	Free			Free	Perm	NA	Perm	
Protected Phases	7	4			8							6	
Permitted Phases			4			Free			Free	6		6	
Actuated Green, G (s)	23.0	69.1	69.1		41.6	140.0			140.0	61.9	61.9	61.9	
Effective Green, g (s)	23.0	69.1	69.1		41.6	140.0			140.0	61.9	61.9	61.9	
Actuated g/C Ratio	0.16	0.49	0.49		0.30	1.00			1.00	0.44	0.44	0.44	
Clearance Time (s)	4.5	4.5	4.5		4.5					4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0		3.0					3.0	3.0	3.0	
Lane Grp Cap (vph)	260	1564	699		946	1425			1450	1366	741	630	
v/s Ratio Prot	c0.14	0.29			c0.26							0.10	
v/s Ratio Perm			0.01			0.34			0.07	c0.34		0.13	
v/c Ratio	0.83	0.59	0.02		0.89	0.34			0.07	0.76	0.24	0.29	
Uniform Delay, d1	56.6	25.4	18.1		47.0	0.0			0.0	32.8	24.3	25.0	
Progression Factor	1.00	1.00	1.00		0.80	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	19.7	0.6	0.0		9.1	0.5			0.1	4.0	0.7	1.1	
Delay (s)	76.3	26.0	18.1		46.5	0.5			0.1	36.8	25.1	26.1	
Level of Service	E	C	B		D	A			A	D	C	C	
Approach Delay (s)		35.2			29.8			0.1			32.8		
Approach LOS		D			C			A			C		
Intersection Summary													
HCM 2000 Control Delay			31.8									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.81										
Actuated Cycle Length (s)			140.0									Sum of lost time (s)	13.5
Intersection Capacity Utilization			77.5%									ICU Level of Service	D
Analysis Period (min)			15										
c Critical Lane Group													

Lanes, Volumes, Timings
302: Kroger SC/Lavista Rd & Lawrenceville Hwy

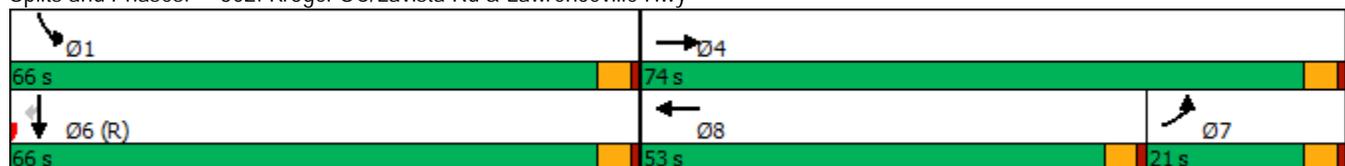


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↑↑	↗		↑↑	↗			↗	↖↗	↑	↗
Traffic Volume (vph)	199	855	21	0	775	441	0	0	91	954	161	376
Future Volume (vph)	199	855	21	0	775	441	0	0	91	954	161	376
Satd. Flow (prot)	3074	3169	1418	0	3185	1425	0	0	1450	3090	1676	1425
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	3074	3169	1418	0	3185	1425	0	0	1450	3090	1676	1425
Satd. Flow (RTOR)			82			167			82			308
Lane Group Flow (vph)	216	929	23	0	842	479	0	0	99	1037	175	409
Turn Type	Prot	NA	Free		NA	Free			Free	Prot	NA	Perm
Protected Phases	7	4			8					1	6	
Permitted Phases			Free			Free			Free			6
Total Split (s)	21.0	74.0			53.0					66.0	66.0	66.0
Total Lost Time (s)	4.5	4.5			4.5					4.5	4.5	4.5
Act Effct Green (s)	14.5	62.0	140.0		43.0	140.0			140.0	69.0	69.0	69.0
Actuated g/C Ratio	0.10	0.44	1.00		0.31	1.00			1.00	0.49	0.49	0.49
v/c Ratio	0.68	0.66	0.02		0.86	0.34			0.07	0.68	0.21	0.48
Control Delay	71.4	32.7	0.0		44.1	0.5			0.1	31.3	22.6	8.3
Queue Delay	0.0	0.0	0.0		1.1	0.0			0.0	0.8	0.0	0.0
Total Delay	71.4	32.7	0.0		45.2	0.5			0.1	32.1	22.6	8.3
LOS	E	C	A		D	A			A	C	C	A
Approach Delay		39.2			29.0			0.1			25.0	
Approach LOS		D			C			A			C	
Queue Length 50th (ft)	98	338	0		383	0			0	371	90	50
Queue Length 95th (ft)	142	378	0		450	0			0	492	153	148
Internal Link Dist (ft)		935			378			282			532	
Turn Bay Length (ft)	445		230			125				300		210
Base Capacity (vph)	363	1573	1418		1103	1425			1450	1521	825	858
Starvation Cap Reductn	0	0	0		99	0			0	0	0	0
Spillback Cap Reductn	0	0	0		0	0			97	208	0	0
Storage Cap Reductn	0	0	0		0	0			0	0	0	0
Reduced v/c Ratio	0.60	0.59	0.02		0.84	0.34			0.07	0.79	0.21	0.48

Intersection Summary

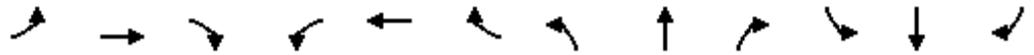
Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 130 (93%), Referenced to phase 2: and 6:SBT, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 29.6
 Intersection LOS: C
 Intersection Capacity Utilization 71.6%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 302: Kroger SC/Lavista Rd & Lawrenceville Hwy



HCM Signalized Intersection Capacity Analysis
 302: Kroger SC/Lavista Rd & Lawrenceville Hwy

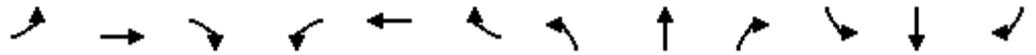
Lawrenceville Hwy Study
 2025 AM Alternatives



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↕	↗		↕	↗			↗	↖↗	↕	↗
Traffic Volume (vph)	199	855	21	0	775	441	0	0	91	954	161	376
Future Volume (vph)	199	855	21	0	775	441	0	0	91	954	161	376
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			0%			0%				0%
Total Lost time (s)	4.5	4.5	4.0		4.5	4.0			4.0	4.5	4.5	4.5
Lane Util. Factor	0.97	0.95	1.00		0.95	1.00			1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85			0.86	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00
Satd. Flow (prot)	3074	3169	1418		3185	1425			1450	3090	1676	1425
Flt Permitted	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00
Satd. Flow (perm)	3074	3169	1418		3185	1425			1450	3090	1676	1425
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	216	929	23	0	842	479	0	0	99	1037	175	409
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	156
Lane Group Flow (vph)	216	929	23	0	842	479	0	0	99	1037	175	253
Turn Type	Prot	NA	Free		NA	Free			Free	Prot	NA	Perm
Protected Phases	7	4			8					1	6	
Permitted Phases			Free			Free			Free			6
Actuated Green, G (s)	14.5	62.0	140.0		43.0	140.0			140.0	69.0	69.0	69.0
Effective Green, g (s)	14.5	62.0	140.0		43.0	140.0			140.0	69.0	69.0	69.0
Actuated g/C Ratio	0.10	0.44	1.00		0.31	1.00			1.00	0.49	0.49	0.49
Clearance Time (s)	4.5	4.5			4.5					4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0			3.0					3.0	3.0	3.0
Lane Grp Cap (vph)	318	1403	1418		978	1425			1450	1522	826	702
v/s Ratio Prot	0.07	c0.29			c0.26					c0.34	0.10	
v/s Ratio Perm			0.02			0.34			0.07			0.18
v/c Ratio	0.68	0.66	0.02		0.86	0.34			0.07	0.68	0.21	0.36
Uniform Delay, d1	60.5	30.7	0.0		45.7	0.0			0.0	27.1	20.1	21.9
Progression Factor	1.00	1.00	1.00		0.79	1.00			1.00	1.00	1.00	1.00
Incremental Delay, d2	5.7	1.2	0.0		6.7	0.5			0.1	1.3	0.6	1.4
Delay (s)	66.2	31.9	0.0		42.6	0.5			0.1	28.4	20.7	23.3
Level of Service	E	C	A		D	A			A	C	C	C
Approach Delay (s)		37.6			27.4			0.1			26.3	
Approach LOS		D			C			A			C	

Intersection Summary		
HCM 2000 Control Delay	29.2	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.75	C
Actuated Cycle Length (s)	140.0	Sum of lost time (s)
Intersection Capacity Utilization	71.6%	13.5
Analysis Period (min)	15	ICU Level of Service
		C
c Critical Lane Group		

Lanes, Volumes, Timings
303: Kroger SC/Lavista Rd & Lawrenceville Hwy



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	199	855	21	0	775	441	142	32	91	954	161	376
Future Volume (vph)	199	855	21	0	775	441	142	32	91	954	161	376
Satd. Flow (prot)	1585	3169	1418	0	3185	1425	1593	1490	0	3090	1676	1425
Flt Permitted	0.950						0.950			0.950		
Satd. Flow (perm)	1585	3169	1418	0	3185	1425	1593	1490	0	3090	1676	1425
Satd. Flow (RTOR)			47			167		41				369
Lane Group Flow (vph)	216	929	23	0	842	479	154	134	0	1037	175	409
Turn Type	Prot	NA	Perm		NA	Free	Prot	NA		Prot	NA	Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases			4			Free						6
Total Split (s)	24.0	65.0	65.0		41.0		27.0	24.0		51.0	48.0	48.0
Total Lost Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Act Effect Green (s)	19.5	60.5	60.5		36.5	140.0	18.1	19.5		46.5	47.9	47.9
Actuated g/C Ratio	0.14	0.43	0.43		0.26	1.00	0.13	0.14		0.33	0.34	0.34
v/c Ratio	0.98	0.68	0.04		1.01	0.34	0.75	0.55		1.01	0.31	0.56
Control Delay	115.6	35.0	1.4		73.9	0.5	80.2	48.1		76.9	36.8	8.7
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0		2.3	0.0	0.0
Total Delay	115.6	35.0	1.4		73.9	0.5	80.2	48.1		79.2	36.8	8.7
LOS	F	D	A		E	A	F	D		E	D	A
Approach Delay		49.3			47.3			65.3			56.8	
Approach LOS		D			D			E			E	
Queue Length 50th (ft)	199	353	0		-426	0	137	79		-496	118	25
Queue Length 95th (ft)	#368	431	5		#563	0	210	152		#644	191	126
Internal Link Dist (ft)		1026			493			316			468	
Turn Bay Length (ft)	445		230			125				300		210
Base Capacity (vph)	220	1369	639		830	1425	256	242		1026	573	730
Starvation Cap Reductn	0	0	0		0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0		8	0	0
Storage Cap Reductn	0	0	0		0	0	0	0		0	0	0
Reduced v/c Ratio	0.98	0.68	0.04		1.01	0.34	0.60	0.55		1.02	0.31	0.56

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 31 (22%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.01

Intersection Signal Delay: 52.5

Intersection LOS: D

Intersection Capacity Utilization 89.4%

ICU Level of Service E

Analysis Period (min) 15

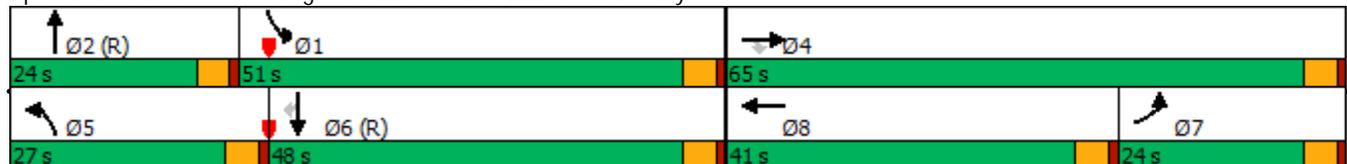
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

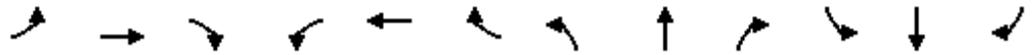
Queue shown is maximum after two cycles.

Splits and Phases: 303: Kroger SC/Lavista Rd & Lawrenceville Hwy



HCM Signalized Intersection Capacity Analysis
303: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
2025 AM Alternatives



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	199	855	21	0	775	441	142	32	91	954	161	376
Future Volume (vph)	199	855	21	0	775	441	142	32	91	954	161	376
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			0%			0%				0%
Total Lost time (s)	4.5	4.5	4.5		4.5	4.0	4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00		0.95	1.00	1.00	1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.89		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1585	3169	1418		3185	1425	1593	1491		3090	1676	1425
Flt Permitted	0.95	1.00	1.00		1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1585	3169	1418		3185	1425	1593	1491		3090	1676	1425
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	216	929	23	0	842	479	154	35	99	1037	175	409
RTOR Reduction (vph)	0	0	13	0	0	0	0	35	0	0	0	243
Lane Group Flow (vph)	216	929	10	0	842	479	154	99	0	1037	175	166
Turn Type	Prot	NA	Perm		NA	Free	Prot	NA		Prot	NA	Perm
Protected Phases	7	4			8		5	2		1		6
Permitted Phases			4			Free						6
Actuated Green, G (s)	19.5	60.5	60.5		36.5	140.0	18.1	19.5		46.5	47.9	47.9
Effective Green, g (s)	19.5	60.5	60.5		36.5	140.0	18.1	19.5		46.5	47.9	47.9
Actuated g/C Ratio	0.14	0.43	0.43		0.26	1.00	0.13	0.14		0.33	0.34	0.34
Clearance Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	220	1369	612		830	1425	205	207		1026	573	487
v/s Ratio Prot	c0.14	0.29			c0.26		c0.10	0.07		c0.34	0.10	
v/s Ratio Perm			0.01			c0.34						0.12
v/c Ratio	0.98	0.68	0.02		1.01	0.34	0.75	0.48		1.01	0.31	0.34
Uniform Delay, d1	60.1	31.9	22.7		51.8	0.0	58.8	55.5		46.8	33.8	34.3
Progression Factor	1.00	1.00	1.00		0.80	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	55.2	1.4	0.0		32.3	0.5	14.3	7.7		30.8	1.4	1.9
Delay (s)	115.3	33.3	22.7		73.9	0.5	73.1	63.2		77.5	35.2	36.2
Level of Service	F	C	C		E	A	E	E		E	D	D
Approach Delay (s)		48.2			47.3			68.5			62.5	
Approach LOS		D			D			E			E	

Intersection Summary		
HCM 2000 Control Delay	54.5	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.96	D
Actuated Cycle Length (s)	140.0	Sum of lost time (s)
Intersection Capacity Utilization	89.4%	18.0
Analysis Period (min)	15	ICU Level of Service
		E
c Critical Lane Group		

HCM Signalized Intersection Capacity Analysis
304: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
2025 AM Alternatives

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		 			 					 			
Traffic Volume (vph)	199	855	21	0	775	441	0	0	91	954	161	376	
Future Volume (vph)	199	855	21	0	775	441	0	0	91	954	161	376	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Grade (%)		1%			0%			0%				0%	
Total Lost time (s)	4.5	4.5	4.5		4.5	4.0			4.0	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95	1.00		0.95	1.00			1.00	0.97	1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85			0.86	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1585	3169	1418		3185	1425			1450	3090	1676	1425	
Flt Permitted	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1585	3169	1418		3185	1425			1450	3090	1676	1425	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	216	929	23	0	842	479	0	0	99	1037	175	409	
RTOR Reduction (vph)	0	0	12	0	0	0	0	0	0	0	0	228	
Lane Group Flow (vph)	216	929	11	0	842	479	0	0	99	1037	175	181	
Turn Type	Prot	NA	Perm		NA	Free			Free	Prot	NA	Perm	
Protected Phases	7	4			8					1	6		
Permitted Phases			4			Free			Free			6	
Actuated Green, G (s)	23.0	69.1	69.1		41.6	140.0			140.0	61.9	61.9	61.9	
Effective Green, g (s)	23.0	69.1	69.1		41.6	140.0			140.0	61.9	61.9	61.9	
Actuated g/C Ratio	0.16	0.49	0.49		0.30	1.00			1.00	0.44	0.44	0.44	
Clearance Time (s)	4.5	4.5	4.5		4.5					4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0		3.0					3.0	3.0	3.0	
Lane Grp Cap (vph)	260	1564	699		946	1425			1450	1366	741	630	
v/s Ratio Prot	c0.14	0.29			c0.26					c0.34	0.10		
v/s Ratio Perm			0.01			0.34			0.07			0.13	
v/c Ratio	0.83	0.59	0.02		0.89	0.34			0.07	0.76	0.24	0.29	
Uniform Delay, d1	56.6	25.4	18.1		47.0	0.0			0.0	32.8	24.3	25.0	
Progression Factor	1.00	1.00	1.00		0.82	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	19.7	0.6	0.0		9.3	0.6			0.1	2.5	0.7	1.1	
Delay (s)	76.3	26.0	18.1		47.7	0.6			0.1	35.3	25.1	26.1	
Level of Service	E	C	B		D	A			A	D	C	C	
Approach Delay (s)		35.2			30.6			0.1			31.9		
Approach LOS		D			C			A			C		
Intersection Summary													
HCM 2000 Control Delay			31.6									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.81										
Actuated Cycle Length (s)			140.0									Sum of lost time (s)	13.5
Intersection Capacity Utilization			77.5%									ICU Level of Service	D
Analysis Period (min)			15										
c Critical Lane Group													

Lanes, Volumes, Timings
 305: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
 2025 AM Alternatives

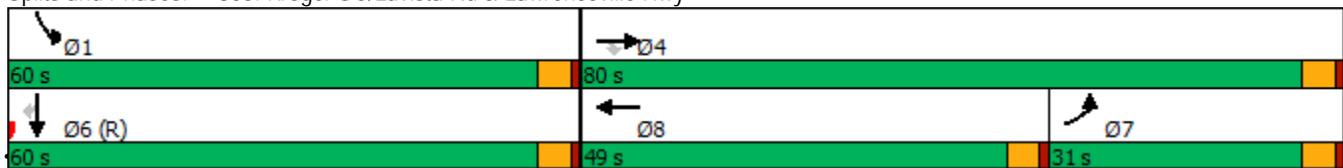


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	199	855	21	0	775	441	0	0	91	954	161	376
Future Volume (vph)	199	855	21	0	775	441	0	0	91	954	161	376
Satd. Flow (prot)	1585	3169	1418	0	3185	1425	0	0	1450	3090	1676	1425
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1585	3169	1418	0	3185	1425	0	0	1450	3090	1676	1425
Satd. Flow (RTOR)	23			167			82			409		
Lane Group Flow (vph)	216	929	23	0	842	479	0	0	99	1037	175	409
Turn Type	Prot	NA	Perm		NA	Free			Free	Prot	NA	Perm
Protected Phases	7	4			8					1	6	
Permitted Phases	4			Free			Free			6		
Total Split (s)	31.0	80.0	80.0		49.0					60.0	60.0	60.0
Total Lost Time (s)	4.5	4.5	4.5		4.5					4.5	4.5	4.5
Act Effct Green (s)	22.9	69.1	69.1		41.6	140.0			140.0	61.9	61.9	61.9
Actuated g/C Ratio	0.16	0.49	0.49		0.30	1.00			1.00	0.44	0.44	0.44
v/c Ratio	0.83	0.59	0.03		0.89	0.34			0.07	0.76	0.24	0.48
Control Delay	82.0	26.6	5.5		49.3	0.5			0.1	38.6	27.2	4.5
Queue Delay	0.0	0.0	0.0		1.9	0.0			0.0	0.2	0.0	0.0
Total Delay	82.0	26.6	5.5		51.2	0.5			0.1	38.8	27.2	4.5
LOS	F	C	A		D	A			A	D	C	A
Approach Delay	36.5			32.8			0.1			28.9		
Approach LOS	D			C			A			C		
Queue Length 50th (ft)	190	295	0		393	0			0	421	102	0
Queue Length 95th (ft)	#288	343	14		471	0			0	532	166	69
Internal Link Dist (ft)	1228			405			248			482		
Turn Bay Length (ft)	445	230		125			300			210		
Base Capacity (vph)	300	1708	775		1012	1425			1450	1366	741	858
Starvation Cap Reductn	0	0	0		71	0			0	0	0	0
Spillback Cap Reductn	0	0	0		0	0			18	40	0	0
Storage Cap Reductn	0	0	0		0	0			0	0	0	0
Reduced v/c Ratio	0.72	0.54	0.03		0.89	0.34			0.07	0.78	0.24	0.48

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 139 (99%), Referenced to phase 2: and 6:SBT, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.89
 Intersection Signal Delay: 31.6 Intersection LOS: C
 Intersection Capacity Utilization 77.5% ICU Level of Service D
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 305: Kroger SC/Lavista Rd & Lawrenceville Hwy



HCM Signalized Intersection Capacity Analysis
 305: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
 2025 AM Alternatives

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		 			 					 			
Traffic Volume (vph)	199	855	21	0	775	441	0	0	91	954	161	376	
Future Volume (vph)	199	855	21	0	775	441	0	0	91	954	161	376	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Grade (%)		1%			0%			0%				0%	
Total Lost time (s)	4.5	4.5	4.5		4.5	4.0			4.0	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95	1.00		0.95	1.00			1.00	0.97	1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85			0.86	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1585	3169	1418		3185	1425			1450	3090	1676	1425	
Flt Permitted	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1585	3169	1418		3185	1425			1450	3090	1676	1425	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	216	929	23	0	842	479	0	0	99	1037	175	409	
RTOR Reduction (vph)	0	0	12	0	0	0	0	0	0	0	0	228	
Lane Group Flow (vph)	216	929	11	0	842	479	0	0	99	1037	175	181	
Turn Type	Prot	NA	Perm		NA	Free			Free	Prot	NA	Perm	
Protected Phases	7	4			8					1	6		
Permitted Phases			4			Free			Free			6	
Actuated Green, G (s)	23.0	69.1	69.1		41.6	140.0			140.0	61.9	61.9	61.9	
Effective Green, g (s)	23.0	69.1	69.1		41.6	140.0			140.0	61.9	61.9	61.9	
Actuated g/C Ratio	0.16	0.49	0.49		0.30	1.00			1.00	0.44	0.44	0.44	
Clearance Time (s)	4.5	4.5	4.5		4.5					4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0		3.0					3.0	3.0	3.0	
Lane Grp Cap (vph)	260	1564	699		946	1425			1450	1366	741	630	
v/s Ratio Prot	c0.14	0.29			c0.26					c0.34	0.10		
v/s Ratio Perm			0.01			0.34			0.07			0.13	
v/c Ratio	0.83	0.59	0.02		0.89	0.34			0.07	0.76	0.24	0.29	
Uniform Delay, d1	56.6	25.4	18.1		47.0	0.0			0.0	32.8	24.3	25.0	
Progression Factor	1.00	1.00	1.00		0.83	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	19.7	0.6	0.0		8.7	0.5			0.1	2.5	0.7	1.1	
Delay (s)	76.3	26.0	18.1		47.8	0.5			0.1	35.3	25.1	26.1	
Level of Service	E	C	B		D	A			A	D	C	C	
Approach Delay (s)		35.2			30.7			0.1			31.9		
Approach LOS		D			C			A			C		
Intersection Summary													
HCM 2000 Control Delay			31.6									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.81										
Actuated Cycle Length (s)			140.0									Sum of lost time (s)	13.5
Intersection Capacity Utilization			77.5%									ICU Level of Service	D
Analysis Period (min)			15										
c Critical Lane Group													

Lanes, Volumes, Timings
320: Kroger SC/Lavista Rd & Lawrenceville Hwy

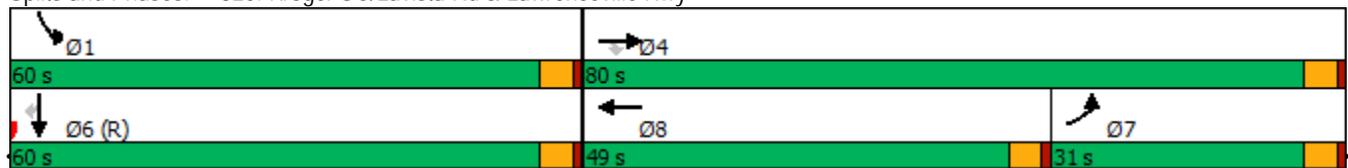
Lawrenceville Hwy Study
2025 AM Alternatives

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	199	855	21	0	775	441	0	0	91	954	161	376
Future Volume (vph)	199	855	21	0	775	441	0	0	91	954	161	376
Satd. Flow (prot)	1585	3169	1418	0	3185	1425	0	0	1450	3090	1676	1425
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1585	3169	1418	0	3185	1425	0	0	1450	3090	1676	1425
Satd. Flow (RTOR)			23			167			82			409
Lane Group Flow (vph)	216	929	23	0	842	479	0	0	99	1037	175	409
Turn Type	Prot	NA	Perm		NA	Free			Free	Prot	NA	Perm
Protected Phases	7	4			8					1	6	
Permitted Phases			4			Free			Free			6
Total Split (s)	31.0	80.0	80.0		49.0					60.0	60.0	60.0
Total Lost Time (s)	4.5	4.5	4.5		4.5					4.5	4.5	4.5
Act Effct Green (s)	22.9	69.1	69.1		41.6	140.0			140.0	61.9	61.9	61.9
Actuated g/C Ratio	0.16	0.49	0.49		0.30	1.00			1.00	0.44	0.44	0.44
v/c Ratio	0.83	0.59	0.03		0.89	0.34			0.07	0.76	0.24	0.48
Control Delay	82.0	26.6	5.5		50.3	0.5			0.1	38.6	27.2	4.5
Queue Delay	0.0	0.0	0.0		4.9	0.0			0.0	0.4	0.0	0.0
Total Delay	82.0	26.6	5.5		55.2	0.5			0.1	39.0	27.2	4.5
LOS	F	C	A		E	A			A	D	C	A
Approach Delay		36.5			35.4			0.1			29.0	
Approach LOS		D			D			A			C	
Queue Length 50th (ft)	190	295	0		392	0			0	421	102	0
Queue Length 95th (ft)	#288	343	14		471	0			0	532	166	69
Internal Link Dist (ft)		1043			343			264			413	
Turn Bay Length (ft)	445		230			125				300		210
Base Capacity (vph)	300	1708	775		1012	1425			1450	1366	741	858
Starvation Cap Reductn	0	0	0		117	0			0	0	0	0
Spillback Cap Reductn	0	0	0		0	0			32	70	0	0
Storage Cap Reductn	0	0	0		0	0			0	0	0	0
Reduced v/c Ratio	0.72	0.54	0.03		0.94	0.34			0.07	0.80	0.24	0.48

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 3 (2%), Referenced to phase 2: and 6:SBT, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.89
 Intersection Signal Delay: 32.4 Intersection LOS: C
 Intersection Capacity Utilization 77.5% ICU Level of Service D
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 320: Kroger SC/Lavista Rd & Lawrenceville Hwy

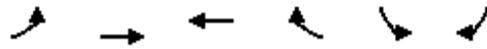


HCM Signalized Intersection Capacity Analysis
320: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
2025 AM Alternatives

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		 			 					 			
Traffic Volume (vph)	199	855	21	0	775	441	0	0	91	954	161	376	
Future Volume (vph)	199	855	21	0	775	441	0	0	91	954	161	376	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Grade (%)		1%			0%			0%				0%	
Total Lost time (s)	4.5	4.5	4.5		4.5	4.0			4.0	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95	1.00		0.95	1.00			1.00	0.97	1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85			0.86	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1585	3169	1418		3185	1425			1450	3090	1676	1425	
Flt Permitted	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1585	3169	1418		3185	1425			1450	3090	1676	1425	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	216	929	23	0	842	479	0	0	99	1037	175	409	
RTOR Reduction (vph)	0	0	12	0	0	0	0	0	0	0	0	228	
Lane Group Flow (vph)	216	929	11	0	842	479	0	0	99	1037	175	181	
Turn Type	Prot	NA	Perm		NA	Free			Free	Prot	NA	Perm	
Protected Phases	7	4			8					1	6		
Permitted Phases			4			Free			Free			6	
Actuated Green, G (s)	23.0	69.1	69.1		41.6	140.0			140.0	61.9	61.9	61.9	
Effective Green, g (s)	23.0	69.1	69.1		41.6	140.0			140.0	61.9	61.9	61.9	
Actuated g/C Ratio	0.16	0.49	0.49		0.30	1.00			1.00	0.44	0.44	0.44	
Clearance Time (s)	4.5	4.5	4.5		4.5					4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0		3.0					3.0	3.0	3.0	
Lane Grp Cap (vph)	260	1564	699		946	1425			1450	1366	741	630	
v/s Ratio Prot	c0.14	0.29			c0.26					c0.34	0.10		
v/s Ratio Perm			0.01			0.34			0.07			0.13	
v/c Ratio	0.83	0.59	0.02		0.89	0.34			0.07	0.76	0.24	0.29	
Uniform Delay, d1	56.6	25.4	18.1		47.0	0.0			0.0	32.8	24.3	25.0	
Progression Factor	1.00	1.00	1.00		0.85	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	19.7	0.6	0.0		9.0	0.5			0.1	2.5	0.7	1.1	
Delay (s)	76.3	26.0	18.1		48.8	0.5			0.1	35.3	25.1	26.1	
Level of Service	E	C	B		D	A			A	D	C	C	
Approach Delay (s)		35.2			31.3			0.1			31.9		
Approach LOS		D			C			A			C		
Intersection Summary													
HCM 2000 Control Delay			31.9									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.81										
Actuated Cycle Length (s)			140.0									Sum of lost time (s)	13.5
Intersection Capacity Utilization			77.5%									ICU Level of Service	D
Analysis Period (min)			15										
c Critical Lane Group													

Lanes, Volumes, Timings
400: Lawrenceville Hwy & Old Norcross Rd

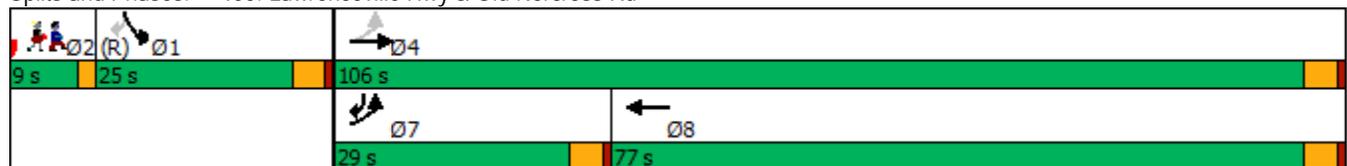


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø2
Lane Configurations							
Traffic Volume (vph)	210	1690	964	73	113	252	
Future Volume (vph)	210	1690	964	73	113	252	
Satd. Flow (prot)	1585	3169	3150	0	1545	1382	
Flt Permitted	0.184				0.950		
Satd. Flow (perm)	307	3169	3150	0	1545	1382	
Satd. Flow (RTOR)			8			163	
Lane Group Flow (vph)	228	1837	1127	0	123	274	
Turn Type	pm+pt	NA	NA		Prot	pm+ov	
Protected Phases	7	4	8		1	7	2
Permitted Phases	4					1	
Total Split (s)	29.0	106.0	77.0		25.0	29.0	9.0
Total Lost Time (s)	4.5	4.5	4.5		4.5	4.5	
Act Effct Green (s)	106.1	106.1	88.6		15.9	33.4	
Actuated g/C Ratio	0.76	0.76	0.63		0.11	0.24	
v/c Ratio	0.65	0.77	0.56		0.70	0.60	
Control Delay	16.0	6.2	17.3		80.0	22.9	
Queue Delay	0.1	0.6	0.6		0.0	0.1	
Total Delay	16.1	6.8	17.8		80.0	23.0	
LOS	B	A	B		F	C	
Approach Delay		7.8	17.8		40.7		
Approach LOS		A	B		D		
Queue Length 50th (ft)	25	125	281		109	90	
Queue Length 95th (ft)	m88	179	446		175	164	
Internal Link Dist (ft)		343	622		653		
Turn Bay Length (ft)	120					165	
Base Capacity (vph)	456	2401	1996		226	554	
Starvation Cap Reductn	9	230	0		0	0	
Spillback Cap Reductn	0	0	439		0	22	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.51	0.85	0.72		0.54	0.52	

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 106 (76%), Referenced to phase 2:Ped and 6:, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.77
 Intersection Signal Delay: 14.6
 Intersection LOS: B
 Intersection Capacity Utilization 66.4%
 ICU Level of Service C
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 400: Lawrenceville Hwy & Old Norcross Rd



HCM Signalized Intersection Capacity Analysis
400: Lawrenceville Hwy & Old Norcross Rd

Lawrenceville Hwy Study
2025 AM Alternatives

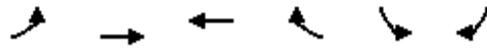


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	210	1690	964	73	113	252
Future Volume (vph)	210	1690	964	73	113	252
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	0%		6%	
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1585	3169	3152		1545	1382
Flt Permitted	0.18	1.00	1.00		0.95	1.00
Satd. Flow (perm)	307	3169	3152		1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	228	1837	1048	79	123	274
RTOR Reduction (vph)	0	0	3	0	0	129
Lane Group Flow (vph)	228	1837	1124	0	123	145
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	7	4	8		1	7
Permitted Phases	4					1
Actuated Green, G (s)	106.1	106.1	88.6		15.9	28.9
Effective Green, g (s)	106.1	106.1	88.6		15.9	28.9
Actuated g/C Ratio	0.76	0.76	0.63		0.11	0.21
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	351	2401	1994		175	329
v/s Ratio Prot	0.06	c0.58	0.36		c0.08	0.04
v/s Ratio Perm	0.43					0.06
v/c Ratio	0.65	0.77	0.56		0.70	0.44
Uniform Delay, d1	9.8	9.8	14.7		59.8	48.5
Progression Factor	1.45	0.40	1.00		1.00	1.00
Incremental Delay, d2	3.2	1.2	0.4		12.1	0.9
Delay (s)	17.4	5.1	15.0		71.8	49.4
Level of Service	B	A	B		E	D
Approach Delay (s)		6.4	15.0		56.4	
Approach LOS		A	B		E	

Intersection Summary

HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
401: Lawrenceville Hwy & Old Norcross Rd

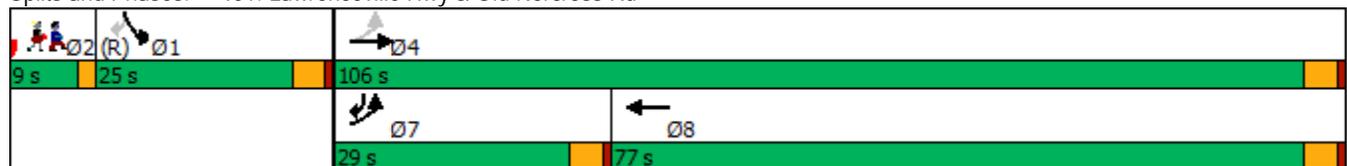


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø2
Lane Configurations							
Traffic Volume (vph)	210	1690	964	73	113	252	
Future Volume (vph)	210	1690	964	73	113	252	
Satd. Flow (prot)	1585	3169	3150	0	1545	1382	
Flt Permitted	0.184				0.950		
Satd. Flow (perm)	307	3169	3150	0	1545	1382	
Satd. Flow (RTOR)			8			163	
Lane Group Flow (vph)	228	1837	1127	0	123	274	
Turn Type	pm+pt	NA	NA		Prot	pm+ov	
Protected Phases	7	4	8		1	7	2
Permitted Phases	4					1	
Total Split (s)	29.0	106.0	77.0		25.0	29.0	9.0
Total Lost Time (s)	4.5	4.5	4.5		4.5	4.5	
Act Effct Green (s)	106.1	106.1	88.6		15.9	33.4	
Actuated g/C Ratio	0.76	0.76	0.63		0.11	0.24	
v/c Ratio	0.65	0.77	0.56		0.70	0.60	
Control Delay	16.0	6.1	17.3		80.0	22.9	
Queue Delay	0.0	0.6	0.3		0.0	0.1	
Total Delay	16.0	6.7	17.6		80.0	23.0	
LOS	B	A	B		F	C	
Approach Delay		7.8	17.6		40.7		
Approach LOS		A	B		D		
Queue Length 50th (ft)	25	125	281		109	90	
Queue Length 95th (ft)	m89	179	446		175	164	
Internal Link Dist (ft)		352	531		589		
Turn Bay Length (ft)	120					165	
Base Capacity (vph)	456	2401	1996		226	554	
Starvation Cap Reductn	0	225	0		0	0	
Spillback Cap Reductn	0	0	324		0	16	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.50	0.84	0.67		0.54	0.51	

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 94 (67%), Referenced to phase 2:Ped and 6:, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.77
 Intersection Signal Delay: 14.5 Intersection LOS: B
 Intersection Capacity Utilization 66.4% ICU Level of Service C
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 401: Lawrenceville Hwy & Old Norcross Rd



HCM Signalized Intersection Capacity Analysis
401: Lawrenceville Hwy & Old Norcross Rd

Lawrenceville Hwy Study
2025 AM Alternatives

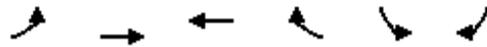


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	210	1690	964	73	113	252
Future Volume (vph)	210	1690	964	73	113	252
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	0%		6%	
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1585	3169	3152		1545	1382
Flt Permitted	0.18	1.00	1.00		0.95	1.00
Satd. Flow (perm)	307	3169	3152		1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	228	1837	1048	79	123	274
RTOR Reduction (vph)	0	0	3	0	0	129
Lane Group Flow (vph)	228	1837	1124	0	123	145
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	7	4	8		1	7
Permitted Phases	4					1
Actuated Green, G (s)	106.1	106.1	88.6		15.9	28.9
Effective Green, g (s)	106.1	106.1	88.6		15.9	28.9
Actuated g/C Ratio	0.76	0.76	0.63		0.11	0.21
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	351	2401	1994		175	329
v/s Ratio Prot	0.06	c0.58	0.36		c0.08	0.04
v/s Ratio Perm	0.43					0.06
v/c Ratio	0.65	0.77	0.56		0.70	0.44
Uniform Delay, d1	9.8	9.8	14.7		59.8	48.5
Progression Factor	1.45	0.40	1.00		1.00	1.00
Incremental Delay, d2	3.2	1.2	0.4		12.1	0.9
Delay (s)	17.4	5.0	15.0		71.8	49.4
Level of Service	B	A	B		E	D
Approach Delay (s)		6.4	15.0		56.4	
Approach LOS		A	B		E	

Intersection Summary

HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
402: Lawrenceville Hwy & Old Norcross Rd

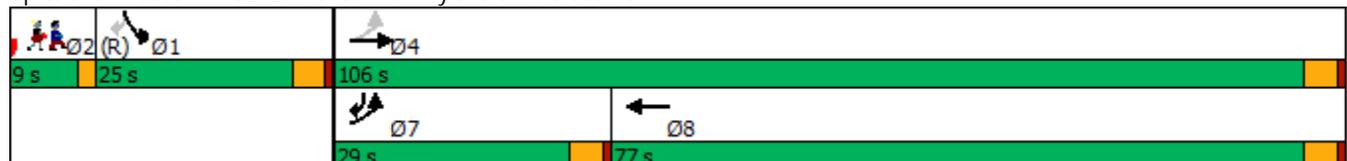


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø2
Lane Configurations	↖	↑↑	↑↑		↖	↗	
Traffic Volume (vph)	210	1690	964	73	113	252	
Future Volume (vph)	210	1690	964	73	113	252	
Satd. Flow (prot)	1585	3169	3150	0	1545	1382	
Flt Permitted	0.184				0.950		
Satd. Flow (perm)	307	3169	3150	0	1545	1382	
Satd. Flow (RTOR)			8			163	
Lane Group Flow (vph)	228	1837	1127	0	123	274	
Turn Type	pm+pt	NA	NA		Prot	pm+ov	
Protected Phases	7	4	8		1	7	2
Permitted Phases	4					1	
Total Split (s)	29.0	106.0	77.0		25.0	29.0	9.0
Total Lost Time (s)	4.5	4.5	4.5		4.5	4.5	
Act Effct Green (s)	106.1	106.1	88.6		15.9	33.4	
Actuated g/C Ratio	0.76	0.76	0.63		0.11	0.24	
v/c Ratio	0.65	0.77	0.56		0.70	0.60	
Control Delay	14.3	8.8	17.3		80.0	22.9	
Queue Delay	0.0	0.6	0.1		0.0	0.0	
Total Delay	14.3	9.4	17.4		80.0	23.0	
LOS	B	A	B		F	C	
Approach Delay		9.9	17.4		40.7		
Approach LOS		A	B		D		
Queue Length 50th (ft)	26	478	281		109	90	
Queue Length 95th (ft)	83	457	446		175	164	
Internal Link Dist (ft)		378	412		572		
Turn Bay Length (ft)	120					165	
Base Capacity (vph)	456	2401	1996		226	554	
Starvation Cap Reductn	0	219	0		0	0	
Spillback Cap Reductn	0	0	172		0	8	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.50	0.84	0.62		0.54	0.50	

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 106 (76%), Referenced to phase 2:Ped and 6:, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.77
 Intersection Signal Delay: 15.7
 Intersection LOS: B
 Intersection Capacity Utilization 66.4%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 402: Lawrenceville Hwy & Old Norcross Rd



HCM Signalized Intersection Capacity Analysis
402: Lawrenceville Hwy & Old Norcross Rd

Lawrenceville Hwy Study
2025 AM Alternatives

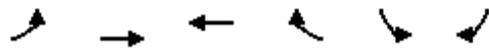


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	210	1690	964	73	113	252
Future Volume (vph)	210	1690	964	73	113	252
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	0%		6%	
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1585	3169	3152		1545	1382
Flt Permitted	0.18	1.00	1.00		0.95	1.00
Satd. Flow (perm)	307	3169	3152		1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	228	1837	1048	79	123	274
RTOR Reduction (vph)	0	0	3	0	0	129
Lane Group Flow (vph)	228	1837	1124	0	123	145
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	7	4	8		1	7
Permitted Phases	4					1
Actuated Green, G (s)	106.1	106.1	88.6		15.9	28.9
Effective Green, g (s)	106.1	106.1	88.6		15.9	28.9
Actuated g/C Ratio	0.76	0.76	0.63		0.11	0.21
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	351	2401	1994		175	329
v/s Ratio Prot	0.06	c0.58	0.36		c0.08	0.04
v/s Ratio Perm	0.43					0.06
v/c Ratio	0.65	0.77	0.56		0.70	0.44
Uniform Delay, d1	9.8	9.8	14.7		59.8	48.5
Progression Factor	1.15	0.64	1.00		1.00	1.00
Incremental Delay, d2	3.3	1.2	0.4		12.1	0.9
Delay (s)	14.5	7.5	15.0		71.8	49.4
Level of Service	B	A	B		E	D
Approach Delay (s)		8.2	15.0		56.4	
Approach LOS		A	B		E	

Intersection Summary

HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
 403: Lawrenceville Hwy & Old Norcross Rd

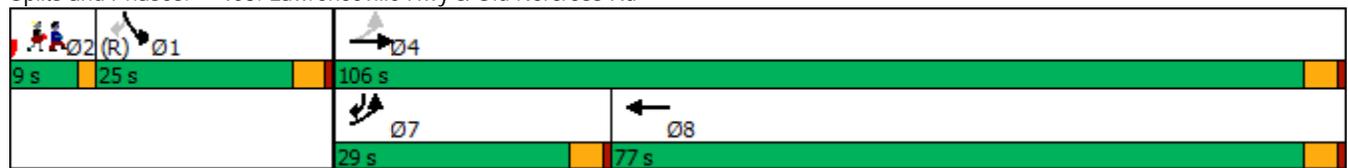


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø2
Lane Configurations	↗	↑↑	↑↑		↖	↗	
Traffic Volume (vph)	210	1690	964	73	113	252	
Future Volume (vph)	210	1690	964	73	113	252	
Satd. Flow (prot)	1585	3169	3150	0	1545	1382	
Flt Permitted	0.184				0.950		
Satd. Flow (perm)	307	3169	3150	0	1545	1382	
Satd. Flow (RTOR)			8			163	
Lane Group Flow (vph)	228	1837	1127	0	123	274	
Turn Type	pm+pt	NA	NA		Prot	pm+ov	
Protected Phases	7	4	8		1	7	2
Permitted Phases	4					1	
Total Split (s)	29.0	106.0	77.0		25.0	29.0	9.0
Total Lost Time (s)	4.5	4.5	4.5		4.5	4.5	
Act Effect Green (s)	106.1	106.1	88.6		15.9	33.4	
Actuated g/C Ratio	0.76	0.76	0.63		0.11	0.24	
v/c Ratio	0.65	0.77	0.56		0.70	0.60	
Control Delay	18.2	4.7	17.3		80.0	22.9	
Queue Delay	0.0	0.8	0.0		0.0	0.0	
Total Delay	18.2	5.4	17.3		80.0	22.9	
LOS	B	A	B		F	C	
Approach Delay		6.9	17.3		40.6		
Approach LOS		A	B		D		
Queue Length 50th (ft)	33	107	281		109	90	
Queue Length 95th (ft)	m76	m180	446		175	164	
Internal Link Dist (ft)		493	387		487		
Turn Bay Length (ft)	120					165	
Base Capacity (vph)	456	2401	1996		226	554	
Starvation Cap Reductn	0	260	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.50	0.86	0.56		0.54	0.49	

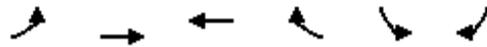
Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 126 (90%), Referenced to phase 2:Ped and 6:, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.77
 Intersection Signal Delay: 13.9 Intersection LOS: B
 Intersection Capacity Utilization 66.4% ICU Level of Service C
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 403: Lawrenceville Hwy & Old Norcross Rd



HCM Signalized Intersection Capacity Analysis
403: Lawrenceville Hwy & Old Norcross Rd



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	210	1690	964	73	113	252
Future Volume (vph)	210	1690	964	73	113	252
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	0%		6%	
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1585	3169	3152		1545	1382
Flt Permitted	0.18	1.00	1.00		0.95	1.00
Satd. Flow (perm)	307	3169	3152		1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	228	1837	1048	79	123	274
RTOR Reduction (vph)	0	0	3	0	0	129
Lane Group Flow (vph)	228	1837	1124	0	123	145
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	7	4	8		1	7
Permitted Phases	4					1
Actuated Green, G (s)	106.1	106.1	88.6		15.9	28.9
Effective Green, g (s)	106.1	106.1	88.6		15.9	28.9
Actuated g/C Ratio	0.76	0.76	0.63		0.11	0.21
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	351	2401	1994		175	329
v/s Ratio Prot	0.06	c0.58	0.36		c0.08	0.04
v/s Ratio Perm	0.43					0.06
v/c Ratio	0.65	0.77	0.56		0.70	0.44
Uniform Delay, d1	9.8	9.8	14.7		59.8	48.5
Progression Factor	2.19	0.32	1.00		1.00	1.00
Incremental Delay, d2	2.1	0.8	0.4		12.1	0.9
Delay (s)	23.5	3.9	15.0		71.8	49.4
Level of Service	C	A	B		E	D
Approach Delay (s)		6.1	15.0		56.4	
Approach LOS		A	B		E	

Intersection Summary			
HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
404: Lawrenceville Hwy & Old Norcross Rd



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø2
Lane Configurations	↘	↑↑	↑↑	↗	↘	↗	
Traffic Volume (vph)	210	1690	964	73	113	252	
Future Volume (vph)	210	1690	964	73	113	252	
Satd. Flow (prot)	1585	3169	3185	1425	1545	1382	
Flt Permitted	0.209				0.950		
Satd. Flow (perm)	349	3169	3185	1425	1545	1382	
Satd. Flow (RTOR)				70		165	
Lane Group Flow (vph)	228	1837	1048	79	123	274	
Turn Type	pm+pt	NA	NA	Perm	Prot	pm+ov	
Protected Phases	7	4	8		1	7	2
Permitted Phases	4			8		1	
Total Split (s)	28.0	106.0	78.0	78.0	25.0	28.0	9.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	
Act Effct Green (s)	106.1	106.1	89.5	89.5	15.9	32.5	
Actuated g/C Ratio	0.76	0.76	0.64	0.64	0.11	0.23	
v/c Ratio	0.62	0.77	0.51	0.08	0.70	0.61	
Control Delay	11.5	6.1	15.7	3.7	80.0	23.4	
Queue Delay	0.0	0.6	0.3	0.0	0.0	0.1	
Total Delay	11.5	6.7	16.0	3.7	80.0	23.5	
LOS	B	A	B	A	F	C	
Approach Delay		7.2	15.1		41.0		
Approach LOS		A	B		D		
Queue Length 50th (ft)	24	126	252	3	109	88	
Queue Length 95th (ft)	m65	179	382	27	175	168	
Internal Link Dist (ft)		371	483		379		
Turn Bay Length (ft)	200			200		165	
Base Capacity (vph)	471	2401	2037	936	226	546	
Starvation Cap Reductn	0	226	0	0	0	0	
Spillback Cap Reductn	0	0	364	0	0	18	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.48	0.84	0.63	0.08	0.54	0.52	

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 98 (70%), Referenced to phase 2:Ped and 6:, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.77

Intersection Signal Delay: 13.4

Intersection LOS: B

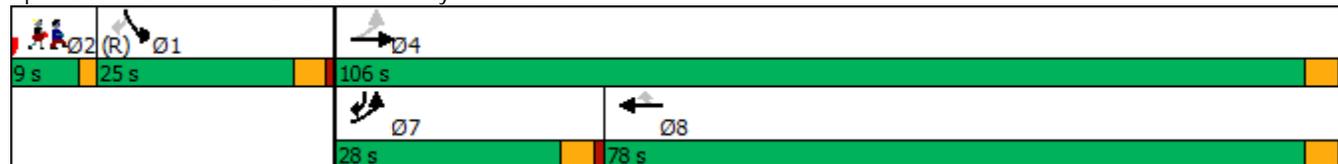
Intersection Capacity Utilization 66.4%

ICU Level of Service C

Analysis Period (min) 15

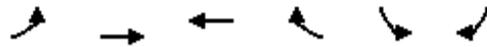
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 404: Lawrenceville Hwy & Old Norcross Rd



HCM Signalized Intersection Capacity Analysis
404: Lawrenceville Hwy & Old Norcross Rd

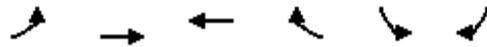
Lawrenceville Hwy Study
2025 AM Alternatives



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	210	1690	964	73	113	252
Future Volume (vph)	210	1690	964	73	113	252
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	0%		6%	
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1585	3169	3185	1425	1545	1382
Flt Permitted	0.21	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	348	3169	3185	1425	1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	228	1837	1048	79	123	274
RTOR Reduction (vph)	0	0	0	25	0	132
Lane Group Flow (vph)	228	1837	1048	54	123	142
Turn Type	pm+pt	NA	NA	Perm	Prot	pm+ov
Protected Phases	7	4	8		1	7
Permitted Phases	4			8		1
Actuated Green, G (s)	106.1	106.1	89.6	89.6	15.9	27.9
Effective Green, g (s)	106.1	106.1	89.6	89.6	15.9	27.9
Actuated g/C Ratio	0.76	0.76	0.64	0.64	0.11	0.20
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	369	2401	2038	912	175	319
v/s Ratio Prot	0.05	c0.58	0.33		c0.08	0.04
v/s Ratio Perm	0.41			0.04		0.06
v/c Ratio	0.62	0.77	0.51	0.06	0.70	0.44
Uniform Delay, d1	8.3	9.8	13.5	9.4	59.8	49.2
Progression Factor	1.06	0.39	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.4	1.2	0.2	0.0	12.1	1.0
Delay (s)	11.2	5.0	13.7	9.5	71.8	50.2
Level of Service	B	A	B	A	E	D
Approach Delay (s)		5.7	13.4		56.9	
Approach LOS		A	B		E	

Intersection Summary			
HCM 2000 Control Delay	13.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
405: Lawrenceville Hwy & Old Norcross Rd

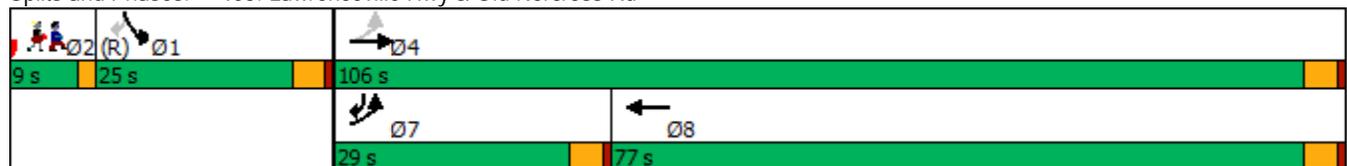


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø2
Lane Configurations							
Traffic Volume (vph)	210	1690	964	73	113	252	
Future Volume (vph)	210	1690	964	73	113	252	
Satd. Flow (prot)	1585	3169	3150	0	1545	1382	
Flt Permitted	0.174				0.950		
Satd. Flow (perm)	290	3169	3150	0	1545	1382	
Satd. Flow (RTOR)			8				
Lane Group Flow (vph)	228	1837	1127	0	123	274	
Turn Type	pm+pt	NA	NA		Prot	pm+ov	
Protected Phases	7	4	8		1	7	2
Permitted Phases	4					1	
Total Split (s)	29.0	106.0	77.0		25.0	29.0	9.0
Total Lost Time (s)	4.5	4.5	4.5		4.5	4.5	
Act Effct Green (s)	106.1	106.1	84.1		15.9	37.9	
Actuated g/C Ratio	0.76	0.76	0.60		0.11	0.27	
v/c Ratio	0.60	0.77	0.60		0.70	0.73	
Control Delay	15.5	6.2	20.1		80.0	57.4	
Queue Delay	0.0	0.6	0.1		0.0	0.0	
Total Delay	15.5	6.7	20.2		80.0	57.4	
LOS	B	A	C		F	E	
Approach Delay		7.7	20.2		64.4		
Approach LOS		A	C		E		
Queue Length 50th (ft)	29	125	320		109	227	
Queue Length 95th (ft)	m96	179	462		175	303	
Internal Link Dist (ft)		405	387		392		
Turn Bay Length (ft)	120					165	
Base Capacity (vph)	446	2401	1894		226	443	
Starvation Cap Reductn	0	216	0		0	0	
Spillback Cap Reductn	0	0	136		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.51	0.84	0.64		0.54	0.62	

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 106 (76%), Referenced to phase 2:Ped and 6:, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.77
 Intersection Signal Delay: 17.9
 Intersection LOS: B
 Intersection Capacity Utilization 66.4%
 ICU Level of Service C
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 405: Lawrenceville Hwy & Old Norcross Rd



HCM Signalized Intersection Capacity Analysis
405: Lawrenceville Hwy & Old Norcross Rd

Lawrenceville Hwy Study
2025 AM Alternatives



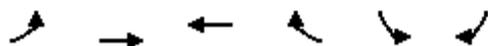
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	210	1690	964	73	113	252
Future Volume (vph)	210	1690	964	73	113	252
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	0%		6%	
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1585	3169	3152		1545	1382
Flt Permitted	0.17	1.00	1.00		0.95	1.00
Satd. Flow (perm)	291	3169	3152		1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	228	1837	1048	79	123	274
RTOR Reduction (vph)	0	0	3	0	0	0
Lane Group Flow (vph)	228	1837	1124	0	123	274
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	7	4	8		1	7
Permitted Phases	4					1
Actuated Green, G (s)	106.1	106.1	84.1		15.9	33.4
Effective Green, g (s)	106.1	106.1	84.1		15.9	33.4
Actuated g/C Ratio	0.76	0.76	0.60		0.11	0.24
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	382	2401	1893		175	374
v/s Ratio Prot	0.07	c0.58	0.36		0.08	c0.09
v/s Ratio Perm	0.38					0.11
v/c Ratio	0.60	0.77	0.59		0.70	0.73
Uniform Delay, d1	10.7	9.8	17.3		59.8	49.2
Progression Factor	1.49	0.40	1.00		1.00	1.00
Incremental Delay, d2	1.9	1.2	0.5		12.1	7.2
Delay (s)	17.8	5.1	17.9		71.8	56.4
Level of Service	B	A	B		E	E
Approach Delay (s)		6.5	17.9		61.2	
Approach LOS		A	B		E	

Intersection Summary

HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
420: Lawrenceville Hwy & Old Norcross Rd

Lawrenceville Hwy Study
2025 AM Alternatives



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	210	1690	964	73	113	252
Future Volume (vph)	210	1690	964	73	113	252
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	0%		6%	
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1585	3169	3185	1425	1545	1382
Flt Permitted	0.20	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	329	3169	3185	1425	1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	228	1837	1048	79	123	274
RTOR Reduction (vph)	0	0	0	28	0	0
Lane Group Flow (vph)	228	1837	1048	51	123	274
Turn Type	pm+pt	NA	NA	Perm	Prot	pm+ov
Protected Phases	7	4	8		1	7
Permitted Phases	4			8		1
Actuated Green, G (s)	106.1	106.1	84.1	84.1	15.9	33.4
Effective Green, g (s)	106.1	106.1	84.1	84.1	15.9	33.4
Actuated g/C Ratio	0.76	0.76	0.60	0.60	0.11	0.24
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	406	2401	1913	856	175	374
v/s Ratio Prot	0.07	c0.58	0.33		0.08	c0.09
v/s Ratio Perm	0.36			0.04		0.11
v/c Ratio	0.56	0.77	0.55	0.06	0.70	0.73
Uniform Delay, d1	9.2	9.8	16.6	11.6	59.8	49.2
Progression Factor	1.21	0.42	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.4	1.2	0.3	0.0	12.1	7.2
Delay (s)	12.4	5.2	17.0	11.6	71.8	56.4
Level of Service	B	A	B	B	E	E
Approach Delay (s)		6.0	16.6		61.2	
Approach LOS		A	B		E	

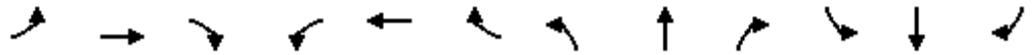
Intersection Summary

HCM 2000 Control Delay	15.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

2045 AM Peak

Lanes, Volumes, Timings
 100: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd

Lawrenceville Hwy Study
 2045 AM Alternatives

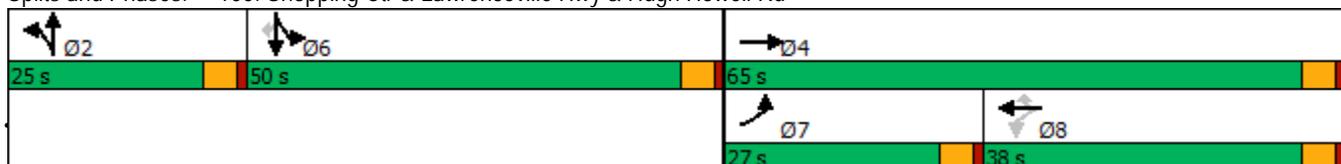


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↕		↔	↕↕	↔		↕↕		↔	↕↕	↔
Traffic Volume (vph)	640	275	11	3	703	1018	6	13	5	288	19	1041
Future Volume (vph)	640	275	11	3	703	1018	6	13	5	288	19	1041
Satd. Flow (prot)	3074	3150	0	1569	3138	1404	0	1531	0	1490	1503	1404
Flt Permitted	0.950			0.563				0.987		0.950	0.958	
Satd. Flow (perm)	3074	3150	0	930	3138	1404	0	1531	0	1490	1503	1404
Satd. Flow (RTOR)		4				785		5				602
Lane Group Flow (vph)	696	311	0	3	764	1107	0	26	0	166	168	1132
Turn Type	Prot	NA		Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	7	4			8		2	2		6	6	
Permitted Phases				8		8						6
Total Split (s)	27.0	65.0		38.0	38.0	38.0	25.0	25.0		50.0	50.0	50.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	4.5
Act Effect Green (s)	22.5	60.5		33.5	33.5	33.5		20.5		45.5	45.5	45.5
Actuated g/C Ratio	0.16	0.43		0.24	0.24	0.24		0.15		0.32	0.32	0.32
v/c Ratio	1.41	0.23		0.01	1.02	1.19		0.11		0.34	0.34	1.31
Control Delay	237.7	25.3		41.0	89.6	108.7		45.7		38.4	38.4	168.4
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	0.0
Total Delay	237.7	25.3		41.0	89.6	108.7		45.7		38.4	38.4	168.4
LOS	F	C		D	F	F		D		D	D	F
Approach Delay		172.1			100.8			45.7			138.8	
Approach LOS		F			F			D			F	
Queue Length 50th (ft)	~437	91		2	~386	~634		17		121	122	~936
Queue Length 95th (ft)	#561	125		11	#517	#903		47		190	191	#1205
Internal Link Dist (ft)		1077			1085			510			1031	
Turn Bay Length (ft)	245			225						286		
Base Capacity (vph)	494	1363		222	750	933		228		484	488	862
Starvation Cap Reductn	0	0		0	0	0		0		0	0	0
Spillback Cap Reductn	0	0		0	0	0		0		0	0	0
Storage Cap Reductn	0	0		0	0	0		0		0	0	0
Reduced v/c Ratio	1.41	0.23		0.01	1.02	1.19		0.11		0.34	0.34	1.31

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.41
 Intersection Signal Delay: 129.6
 Intersection LOS: F
 Intersection Capacity Utilization 108.6%
 ICU Level of Service G
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 100: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd

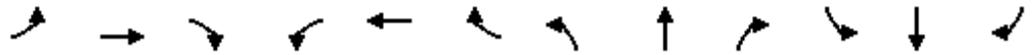


HCM Signalized Intersection Capacity Analysis
 100: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd

Lawrenceville Hwy Study
 2045 AM Alternatives

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	640	275	11	3	703	1018	6	13	5	288	19	1041
Future Volume (vph)	640	275	11	3	703	1018	6	13	5	288	19	1041
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			3%			10%			3%	
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	4.5
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85		0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99		0.95	0.96	1.00
Satd. Flow (prot)	3074	3151		1569	3138	1404		1531		1490	1503	1404
Flt Permitted	0.95	1.00		0.56	1.00	1.00		0.99		0.95	0.96	1.00
Satd. Flow (perm)	3074	3151		929	3138	1404		1531		1490	1503	1404
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	696	299	12	3	764	1107	7	14	5	313	21	1132
RTOR Reduction (vph)	0	2	0	0	0	597	0	4	0	0	0	406
Lane Group Flow (vph)	696	309	0	3	764	510	0	22	0	166	168	726
Turn Type	Prot	NA		Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	7	4			8		2	2		6	6	
Permitted Phases				8		8						6
Actuated Green, G (s)	22.5	60.5		33.5	33.5	33.5		20.5		45.5	45.5	45.5
Effective Green, g (s)	22.5	60.5		33.5	33.5	33.5		20.5		45.5	45.5	45.5
Actuated g/C Ratio	0.16	0.43		0.24	0.24	0.24		0.15		0.32	0.32	0.32
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	494	1361		222	750	335		224		484	488	456
v/s Ratio Prot	c0.23	0.10			0.24			c0.01		0.11	0.11	
v/s Ratio Perm				0.00		c0.36						c0.52
v/c Ratio	1.41	0.23		0.01	1.02	1.52		0.10		0.34	0.34	1.59
Uniform Delay, d1	58.8	25.0		40.6	53.2	53.2		51.7		35.9	35.9	47.2
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	195.8	0.1		0.0	37.6	249.6		0.9		1.9	1.9	276.3
Delay (s)	254.6	25.1		40.7	90.9	302.9		52.6		37.8	37.8	323.6
Level of Service	F	C		D	F	F		D		D	D	F
Approach Delay (s)		183.7			216.0			52.6			258.5	
Approach LOS		F			F			D			F	
Intersection Summary												
HCM 2000 Control Delay			221.8				HCM 2000 Level of Service			F		
HCM 2000 Volume to Capacity ratio			1.29									
Actuated Cycle Length (s)			140.0				Sum of lost time (s)		18.0			
Intersection Capacity Utilization			108.6%				ICU Level of Service		G			
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
101: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd

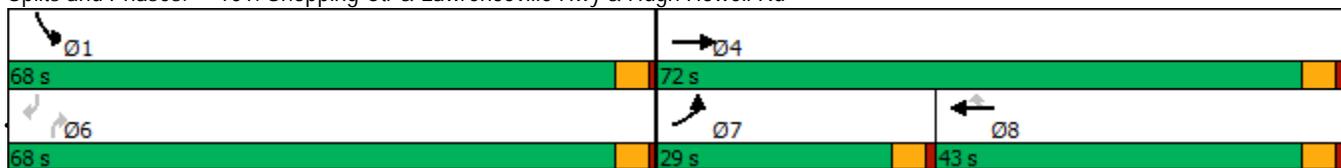


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↖↗	↕			↕	↗			↗	↖↗		↗	
Traffic Volume (vph)	640	275	11	0	703	1018	0	0	10	297	0	1051	
Future Volume (vph)	640	275	11	0	703	1018	0	0	10	297	0	1051	
Satd. Flow (prot)	3074	3150	0	0	3138	1404	0	0	1378	3043	0	1404	
Flt Permitted	0.950										0.950		
Satd. Flow (perm)	3074	3150	0	0	3138	1404	0	0	1378	3043	0	1404	
Satd. Flow (RTOR)	4					788			492		440		
Lane Group Flow (vph)	696	311	0	0	764	1107	0	0	11	323	0	1142	
Turn Type	Prot	NA			NA	Perm			Perm	Prot		Perm	
Protected Phases	7	4	8					1					
Permitted Phases						8			6		6		
Total Split (s)	29.0	72.0	43.0				43.0	68.0		68.0	68.0		
Total Lost Time (s)	4.5	4.5	4.5				4.5	4.5		4.5	4.5		
Act Effct Green (s)	24.5	67.5	38.5				38.5	63.5		63.5	63.5		
Actuated g/C Ratio	0.18	0.48	0.28				0.28	0.45		0.45	0.45		
v/c Ratio	1.30	0.20	0.89				1.16	0.01		0.23	1.30		
Control Delay	191.5	21.0	61.9				96.1	0.0		24.0	166.2		
Queue Delay	0.0	0.0	0.0				0.0	0.0		0.0	0.0		
Total Delay	191.5	21.0	61.9				96.1	0.0		24.0	166.2		
LOS	F	C	E				F	A		C	F		
Approach Delay	138.8		82.1				134.9						
Approach LOS	F		F				F						
Queue Length 50th (ft)	~415	82	352				~636	0		91	~1103		
Queue Length 95th (ft)	#540	114	#462				#904	0		124	#1371		
Internal Link Dist (ft)	1112		1142				556			1030			
Turn Bay Length (ft)	245						286						
Base Capacity (vph)	537	1520	862				957	893		1380	877		
Starvation Cap Reductn	0	0	0				0	0		0	0		
Spillback Cap Reductn	0	0	0				0	0		0	0		
Storage Cap Reductn	0	0	0				0	0		0	0		
Reduced v/c Ratio	1.30	0.20	0.89				1.16	0.01		0.23	1.30		

Intersection Summary

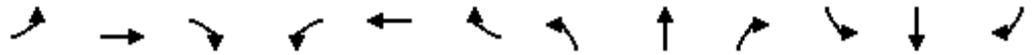
Cycle Length: 140
 Actuated Cycle Length: 140
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.30
 Intersection Signal Delay: 112.8 Intersection LOS: F
 Intersection Capacity Utilization 101.4% ICU Level of Service G
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 101: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd



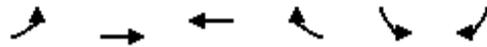
HCM Signalized Intersection Capacity Analysis
 101: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd

Lawrenceville Hwy Study
 2045 AM Alternatives



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	640	275	11	0	703	1018	0	0	10	297	0	1051
Future Volume (vph)	640	275	11	0	703	1018	0	0	10	297	0	1051
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			3%			10%				3%
Total Lost time (s)	4.5	4.5			4.5	4.5			4.5	4.5		4.5
Lane Util. Factor	0.97	0.95			0.95	1.00			1.00	0.97		1.00
Frt	1.00	0.99			1.00	0.85			0.86	1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00			1.00	0.95		1.00
Satd. Flow (prot)	3074	3151			3138	1404			1378	3043		1404
Flt Permitted	0.95	1.00			1.00	1.00			1.00	0.95		1.00
Satd. Flow (perm)	3074	3151			3138	1404			1378	3043		1404
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	696	299	12	0	764	1107	0	0	11	323	0	1142
RTOR Reduction (vph)	0	2	0	0	0	571	0	0	6	0	0	240
Lane Group Flow (vph)	696	309	0	0	764	536	0	0	5	323	0	902
Turn Type	Prot	NA			NA	Perm			Perm	Prot		Perm
Protected Phases	7	4			8					1		
Permitted Phases						8			6			6
Actuated Green, G (s)	24.5	67.5			38.5	38.5			63.5	63.5		63.5
Effective Green, g (s)	24.5	67.5			38.5	38.5			63.5	63.5		63.5
Actuated g/C Ratio	0.18	0.48			0.28	0.28			0.45	0.45		0.45
Clearance Time (s)	4.5	4.5			4.5	4.5			4.5	4.5		4.5
Vehicle Extension (s)	3.0	3.0			3.0	3.0			3.0	3.0		3.0
Lane Grp Cap (vph)	537	1519			862	386			625	1380		636
v/s Ratio Prot	c0.23	0.10			0.24					0.11		
v/s Ratio Perm						c0.38			0.00			c0.64
v/c Ratio	1.30	0.20			0.89	1.39			0.01	0.23		1.42
Uniform Delay, d1	57.8	20.8			48.7	50.8			21.0	23.4		38.2
Progression Factor	1.00	1.00			1.00	1.00			1.00	1.00		1.00
Incremental Delay, d2	146.6	0.1			10.9	189.9			0.0	0.1		197.1
Delay (s)	204.3	20.9			59.5	240.6			21.0	23.5		235.3
Level of Service	F	C			E	F			C	C		F
Approach Delay (s)		147.7			166.7			21.0				188.6
Approach LOS		F			F			C				F
Intersection Summary												
HCM 2000 Control Delay			169.3				HCM 2000 Level of Service			F		
HCM 2000 Volume to Capacity ratio			1.38									
Actuated Cycle Length (s)			140.0				Sum of lost time (s)		13.5			
Intersection Capacity Utilization			101.4%				ICU Level of Service		G			
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
 102: Lawrenceville Hwy & Hugh Howell Rd

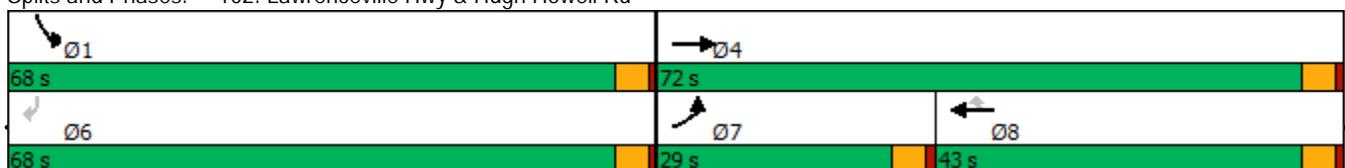


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖↗	↑↑	↑↑	↖	↖↗	↖
Traffic Volume (vph)	640	281	703	1018	297	1051
Future Volume (vph)	640	281	703	1018	297	1051
Satd. Flow (prot)	3074	3169	3138	1404	3043	1404
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3074	3169	3138	1404	3043	1404
Satd. Flow (RTOR)				788		440
Lane Group Flow (vph)	696	305	764	1107	323	1142
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		1	
Permitted Phases				8		6
Total Split (s)	29.0	72.0	43.0	43.0	68.0	68.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Act Effect Green (s)	24.5	67.5	38.5	38.5	63.5	63.5
Actuated g/C Ratio	0.18	0.48	0.28	0.28	0.45	0.45
v/c Ratio	1.30	0.20	0.89	1.16	0.23	1.30
Control Delay	191.5	21.2	61.9	96.1	24.0	166.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	191.5	21.2	61.9	96.1	24.0	166.2
LOS	F	C	E	F	C	F
Approach Delay		139.6	82.1		134.9	
Approach LOS		F	F		F	
Queue Length 50th (ft)	~415	82	352	~636	91	~1103
Queue Length 95th (ft)	#540	113	#462	#904	124	#1371
Internal Link Dist (ft)		1076	973		988	
Turn Bay Length (ft)	245				286	
Base Capacity (vph)	537	1527	862	957	1380	877
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.30	0.20	0.89	1.16	0.23	1.30

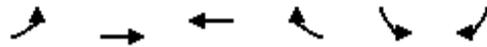
Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.30
 Intersection Signal Delay: 113.2
 Intersection LOS: F
 Intersection Capacity Utilization 101.4%
 ICU Level of Service G
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 102: Lawrenceville Hwy & Hugh Howell Rd



HCM Signalized Intersection Capacity Analysis
 102: Lawrenceville Hwy & Hugh Howell Rd



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	640	281	703	1018	297	1051
Future Volume (vph)	640	281	703	1018	297	1051
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	3%		3%	
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3074	3169	3138	1404	3043	1404
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3074	3169	3138	1404	3043	1404
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	696	305	764	1107	323	1142
RTOR Reduction (vph)	0	0	0	571	0	240
Lane Group Flow (vph)	696	305	764	536	323	902
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		1	
Permitted Phases				8		6
Actuated Green, G (s)	24.5	67.5	38.5	38.5	63.5	63.5
Effective Green, g (s)	24.5	67.5	38.5	38.5	63.5	63.5
Actuated g/C Ratio	0.18	0.48	0.28	0.28	0.45	0.45
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	537	1527	862	386	1380	636
v/s Ratio Prot	c0.23	0.10	0.24		0.11	
v/s Ratio Perm				c0.38		c0.64
v/c Ratio	1.30	0.20	0.89	1.39	0.23	1.42
Uniform Delay, d1	57.8	20.8	48.7	50.8	23.4	38.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	146.6	0.1	10.9	189.9	0.1	197.1
Delay (s)	204.3	20.8	59.5	240.6	23.5	235.3
Level of Service	F	C	E	F	C	F
Approach Delay (s)		148.4	166.7		188.6	
Approach LOS		F	F		F	

Intersection Summary

HCM 2000 Control Delay	169.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.38		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	101.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
 103: Lawrenceville Hwy & Hugh Howell Rd

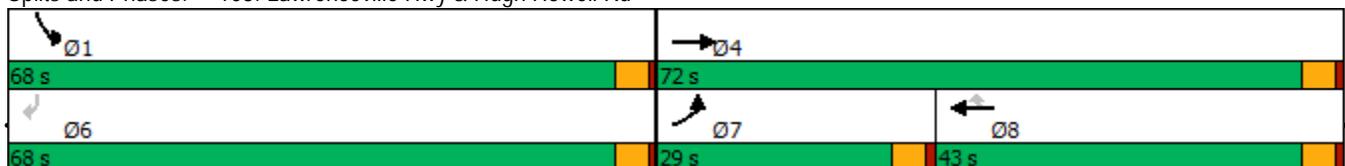


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖↗	↑↑	↑↑	↖	↖↗	↖
Traffic Volume (vph)	640	281	703	1018	297	1051
Future Volume (vph)	640	281	703	1018	297	1051
Satd. Flow (prot)	3074	3169	3138	1404	3043	1404
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3074	3169	3138	1404	3043	1404
Satd. Flow (RTOR)				788		440
Lane Group Flow (vph)	696	305	764	1107	323	1142
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		1	
Permitted Phases				8		6
Total Split (s)	29.0	72.0	43.0	43.0	68.0	68.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Act Effect Green (s)	24.5	67.5	38.5	38.5	63.5	63.5
Actuated g/C Ratio	0.18	0.48	0.28	0.28	0.45	0.45
v/c Ratio	1.30	0.20	0.89	1.16	0.23	1.30
Control Delay	191.5	21.2	61.9	96.1	24.0	166.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	191.5	21.2	61.9	96.1	24.0	166.2
LOS	F	C	E	F	C	F
Approach Delay		139.6	82.1		134.9	
Approach LOS		F	F		F	
Queue Length 50th (ft)	~415	82	352	~636	91	~1103
Queue Length 95th (ft)	#540	113	#462	#904	124	#1371
Internal Link Dist (ft)		1672	1095		1103	
Turn Bay Length (ft)	1000				286	
Base Capacity (vph)	537	1527	862	957	1380	877
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.30	0.20	0.89	1.16	0.23	1.30

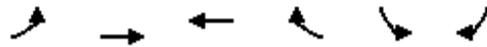
Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.30
 Intersection Signal Delay: 113.2
 Intersection LOS: F
 Intersection Capacity Utilization 101.4%
 ICU Level of Service G
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 103: Lawrenceville Hwy & Hugh Howell Rd



HCM Signalized Intersection Capacity Analysis
 103: Lawrenceville Hwy & Hugh Howell Rd



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	640	281	703	1018	297	1051
Future Volume (vph)	640	281	703	1018	297	1051
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	3%		3%	
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3074	3169	3138	1404	3043	1404
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3074	3169	3138	1404	3043	1404
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	696	305	764	1107	323	1142
RTOR Reduction (vph)	0	0	0	571	0	240
Lane Group Flow (vph)	696	305	764	536	323	902
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		1	
Permitted Phases				8		6
Actuated Green, G (s)	24.5	67.5	38.5	38.5	63.5	63.5
Effective Green, g (s)	24.5	67.5	38.5	38.5	63.5	63.5
Actuated g/C Ratio	0.18	0.48	0.28	0.28	0.45	0.45
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	537	1527	862	386	1380	636
v/s Ratio Prot	c0.23	0.10	0.24		0.11	
v/s Ratio Perm				c0.38		c0.64
v/c Ratio	1.30	0.20	0.89	1.39	0.23	1.42
Uniform Delay, d1	57.8	20.8	48.7	50.8	23.4	38.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	146.6	0.1	10.9	189.9	0.1	197.1
Delay (s)	204.3	20.8	59.5	240.6	23.5	235.3
Level of Service	F	C	E	F	C	F
Approach Delay (s)		148.4	166.7		188.6	
Approach LOS		F	F		F	

Intersection Summary

HCM 2000 Control Delay	169.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.38		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	101.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
 104: Lawrenceville Hwy & Hugh Howell Rd

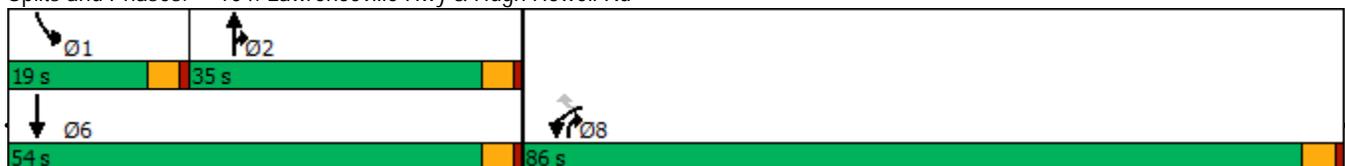


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙↘	↗	↑↑	↗↘	↙↘	↑↑
Traffic Volume (vph)	703	1018	640	281	297	1051
Future Volume (vph)	703	1018	640	281	297	1051
Satd. Flow (prot)	3090	1425	3185	2508	3090	3185
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3090	1425	3185	2508	3090	3185
Satd. Flow (RTOR)		361		27		
Lane Group Flow (vph)	764	1107	696	305	323	1142
Turn Type	Prot	Perm	NA	pt+ov	Prot	NA
Protected Phases	8		2	2 8	1	6
Permitted Phases		8				
Total Split (s)	86.0	86.0	35.0		19.0	54.0
Total Lost Time (s)	4.5	4.5	4.5		4.5	4.5
Act Effect Green (s)	81.5	81.5	30.5	116.5	14.5	49.5
Actuated g/C Ratio	0.58	0.58	0.22	0.83	0.10	0.35
v/c Ratio	0.42	1.13	1.00	0.15	1.01	1.01
Control Delay	17.2	92.0	89.3	2.2	114.1	75.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.2	92.0	89.3	2.2	114.1	75.0
LOS	B	F	F	A	F	E
Approach Delay	61.4		62.8			83.6
Approach LOS	E		E			F
Queue Length 50th (ft)	191	~1022	~338	21	~156	~562
Queue Length 95th (ft)	237	#1291	#474	30	#259	#715
Internal Link Dist (ft)	1382		1165			1496
Turn Bay Length (ft)				300	286	
Base Capacity (vph)	1798	980	693	2091	320	1126
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.42	1.13	1.00	0.15	1.01	1.01

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.13
 Intersection Signal Delay: 69.2
 Intersection LOS: E
 Intersection Capacity Utilization 97.2%
 ICU Level of Service F
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 104: Lawrenceville Hwy & Hugh Howell Rd



HCM Signalized Intersection Capacity Analysis
 104: Lawrenceville Hwy & Hugh Howell Rd



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	703	1018	640	281	297	1051
Future Volume (vph)	703	1018	640	281	297	1051
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	1.00	0.95	0.88	0.97	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3090	1425	3185	2508	3090	3185
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3090	1425	3185	2508	3090	3185
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	764	1107	696	305	323	1142
RTOR Reduction (vph)	0	151	0	5	0	0
Lane Group Flow (vph)	764	956	696	300	323	1142
Turn Type	Prot	Perm	NA	pt+ov	Prot	NA
Protected Phases	8		2	2 8	1	6
Permitted Phases		8				
Actuated Green, G (s)	81.5	81.5	30.5	116.5	14.5	49.5
Effective Green, g (s)	81.5	81.5	30.5	116.5	14.5	49.5
Actuated g/C Ratio	0.58	0.58	0.22	0.83	0.10	0.35
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	1798	829	693	2087	320	1126
v/s Ratio Prot	0.25		0.22	0.12	0.10	c0.36
v/s Ratio Perm		c0.67				
v/c Ratio	0.42	1.15	1.00	0.14	1.01	1.01
Uniform Delay, d1	16.2	29.2	54.8	2.2	62.8	45.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	82.7	35.2	0.0	52.7	30.4
Delay (s)	16.4	111.9	90.0	2.3	115.5	75.6
Level of Service	B	F	F	A	F	E
Approach Delay (s)	72.9		63.3			84.4
Approach LOS	E		E			F

Intersection Summary

HCM 2000 Control Delay	74.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	97.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
 105: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd

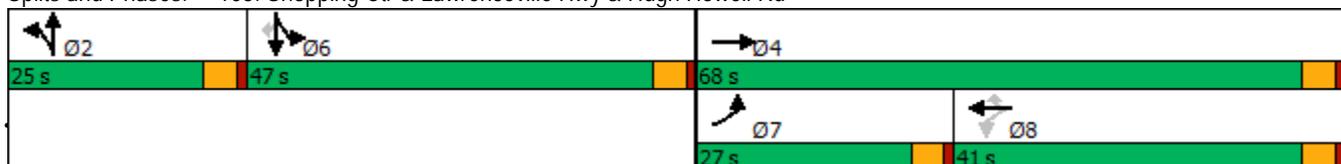


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↕		↖	↕↕	↗		↕↔		↖	↕	↗
Traffic Volume (vph)	640	275	11	3	703	1018	6	13	5	288	19	1041
Future Volume (vph)	640	275	11	3	703	1018	6	13	5	288	19	1041
Satd. Flow (prot)	3074	3150	0	1569	3138	1404	0	1531	0	1490	1503	1404
Flt Permitted	0.950			0.563				0.987		0.950	0.958	
Satd. Flow (perm)	3074	3150	0	930	3138	1404	0	1531	0	1490	1503	1404
Satd. Flow (RTOR)		4				670		5				583
Lane Group Flow (vph)	696	311	0	3	764	1107	0	26	0	166	168	1132
Turn Type	Prot	NA		Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	7	4			8		2	2		6	6	
Permitted Phases				8		8						6
Total Split (s)	27.0	68.0		41.0	41.0	41.0	25.0	25.0		47.0	47.0	47.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	4.5
Act Effect Green (s)	22.5	63.5		36.5	36.5	36.5		20.5		42.5	42.5	42.5
Actuated g/C Ratio	0.16	0.45		0.26	0.26	0.26		0.15		0.30	0.30	0.30
v/c Ratio	1.41	0.22		0.01	0.93	1.29		0.11		0.37	0.37	1.36
Control Delay	237.7	23.4		38.7	69.6	154.7		45.7		41.1	41.1	189.6
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	0.0
Total Delay	237.7	23.4		38.7	69.6	154.7		45.7		41.1	41.1	189.6
LOS	F	C		D	E	F		D		D	D	F
Approach Delay		171.5			119.8			45.7			155.8	
Approach LOS		F			F			D			F	
Queue Length 50th (ft)	~437	87		2	360	~803		17		125	126	~966
Queue Length 95th (ft)	#561	120		10	#484	#1072		47		196	198	#1235
Internal Link Dist (ft)		855			1243			430			1063	
Turn Bay Length (ft)	245			225		150				286		
Base Capacity (vph)	494	1430		242	818	861		228		452	456	832
Starvation Cap Reductn	0	0		0	0	0		0		0	0	0
Spillback Cap Reductn	0	0		0	0	0		0		0	0	0
Storage Cap Reductn	0	0		0	0	0		0		0	0	0
Reduced v/c Ratio	1.41	0.22		0.01	0.93	1.29		0.11		0.37	0.37	1.36

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.41
 Intersection Signal Delay: 143.3
 Intersection LOS: F
 Intersection Capacity Utilization 108.6%
 ICU Level of Service G
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 105: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd



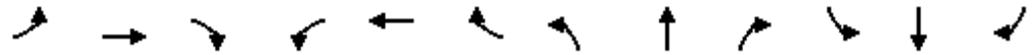
HCM Signalized Intersection Capacity Analysis
 105: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd

Lawrenceville Hwy Study
 2045 AM Alternatives

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 			 			 		 	 	
Traffic Volume (vph)	640	275	11	3	703	1018	6	13	5	288	19	1041
Future Volume (vph)	640	275	11	3	703	1018	6	13	5	288	19	1041
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			3%			10%			3%	
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	4.5
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85		0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99		0.95	0.96	1.00
Satd. Flow (prot)	3074	3151		1569	3138	1404		1531		1490	1503	1404
Flt Permitted	0.95	1.00		0.56	1.00	1.00		0.99		0.95	0.96	1.00
Satd. Flow (perm)	3074	3151		929	3138	1404		1531		1490	1503	1404
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	696	299	12	3	764	1107	7	14	5	313	21	1132
RTOR Reduction (vph)	0	2	0	0	0	495	0	4	0	0	0	406
Lane Group Flow (vph)	696	309	0	3	764	612	0	22	0	166	168	726
Turn Type	Prot	NA		Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	7	4			8		2	2		6	6	
Permitted Phases				8		8						6
Actuated Green, G (s)	22.5	63.5		36.5	36.5	36.5		20.5		42.5	42.5	42.5
Effective Green, g (s)	22.5	63.5		36.5	36.5	36.5		20.5		42.5	42.5	42.5
Actuated g/C Ratio	0.16	0.45		0.26	0.26	0.26		0.15		0.30	0.30	0.30
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	494	1429		242	818	366		224		452	456	426
v/s Ratio Prot	c0.23	0.10			0.24			c0.01		0.11	0.11	
v/s Ratio Perm				0.00		c0.44						c0.52
v/c Ratio	1.41	0.22		0.01	0.93	1.67		0.10		0.37	0.37	1.70
Uniform Delay, d1	58.8	23.2		38.4	50.6	51.8		51.7		38.2	38.2	48.8
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	195.8	0.1		0.0	17.4	313.8		0.9		2.3	2.3	326.8
Delay (s)	254.6	23.2		38.4	68.0	365.6		52.6		40.5	40.5	375.5
Level of Service	F	C		D	E	F		D		D	D	F
Approach Delay (s)		183.1			243.7			52.6			299.2	
Approach LOS		F			F			D			F	
Intersection Summary												
HCM 2000 Control Delay			247.2				HCM 2000 Level of Service			F		
HCM 2000 Volume to Capacity ratio			1.37									
Actuated Cycle Length (s)			140.0				Sum of lost time (s)		18.0			
Intersection Capacity Utilization			108.6%				ICU Level of Service		G			
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
200: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
2045 AM Alternatives

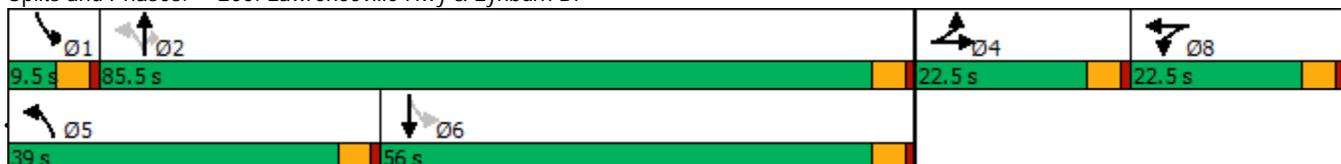


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖	↗		↖	↕	↗	↖	↕	↗
Traffic Volume (vph)	43	19	73	70	30	25	526	1063	82	22	1205	76
Future Volume (vph)	43	19	73	70	30	25	526	1063	82	22	1205	76
Satd. Flow (prot)	0	1499	0	1545	1516	0	1617	3233	1446	1577	3125	0
Flt Permitted		0.984		0.950			0.069			0.246		
Satd. Flow (perm)	0	1499	0	1545	1516	0	117	3233	1446	408	3125	0
Satd. Flow (RTOR)		34			24				82		5	
Lane Group Flow (vph)	0	147	0	76	60	0	572	1155	89	24	1393	0
Turn Type	Split	NA		Split	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases							2		2	6		
Total Split (s)	22.5	22.5		22.5	22.5		39.0	85.5	85.5	9.5	56.0	
Total Lost Time (s)		4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Act Effct Green (s)		14.2		11.8	11.8		90.8	85.3	85.3	56.7	51.7	
Actuated g/C Ratio		0.11		0.09	0.09		0.70	0.65	0.65	0.44	0.40	
v/c Ratio		0.76		0.55	0.38		1.19	0.55	0.09	0.11	1.12	
Control Delay		68.0		72.2	43.9		141.5	15.1	3.2	13.5	103.0	
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		68.0		72.2	43.9		141.5	15.1	3.2	13.5	103.0	
LOS		E		E	D		F	B	A	B	F	
Approach Delay		68.0			59.7			54.3			101.5	
Approach LOS		E			E			D			F	
Queue Length 50th (ft)		94		63	29		-548	290	2	6	-724	
Queue Length 95th (ft)		176		118	76		#846	412	26	18	#948	
Internal Link Dist (ft)		515			434			603			658	
Turn Bay Length (ft)				90			180		200	135		
Base Capacity (vph)		236		213	230		479	2115	974	222	1241	
Starvation Cap Reductn		0		0	0		0	0	0	0	0	
Spillback Cap Reductn		0		0	0		0	0	0	0	0	
Storage Cap Reductn		0		0	0		0	0	0	0	0	
Reduced v/c Ratio		0.62		0.36	0.26		1.19	0.55	0.09	0.11	1.12	

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 130.3
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.19
 Intersection Signal Delay: 74.1
 Intersection LOS: E
 Intersection Capacity Utilization 98.7%
 ICU Level of Service F
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 200: Lawrenceville Hwy & Lynburn Dr



HCM Signalized Intersection Capacity Analysis
200: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
2045 AM Alternatives

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	19	73	70	30	25	526	1063	82	22	1205	76
Future Volume (vph)	43	19	73	70	30	25	526	1063	82	22	1205	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			6%			-3%				2%
Total Lost time (s)		4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt		0.93		1.00	0.93		1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.98		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1500		1545	1516		1617	3233	1446	1577	3125	
Flt Permitted		0.98		0.95	1.00		0.07	1.00	1.00	0.25	1.00	
Satd. Flow (perm)		1500		1545	1516		117	3233	1446	408	3125	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	21	79	76	33	27	572	1155	89	24	1310	83
RTOR Reduction (vph)	0	30	0	0	22	0	0	0	29	0	3	0
Lane Group Flow (vph)	0	117	0	76	38	0	572	1155	60	24	1390	0
Turn Type	Split	NA		Split	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases							2		2	6		
Actuated Green, G (s)		14.2		11.8	11.8		92.7	85.3	85.3	56.5	53.6	
Effective Green, g (s)		14.2		11.8	11.8		92.7	85.3	85.3	56.5	53.6	
Actuated g/C Ratio		0.11		0.09	0.09		0.70	0.65	0.65	0.43	0.41	
Clearance Time (s)		4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		161		137	135		474	2086	933	200	1267	
v/s Ratio Prot		c0.08		c0.05	0.03		c0.32	0.36		0.00	0.44	
v/s Ratio Perm							c0.53		0.04	0.05		
v/c Ratio		0.72		0.55	0.28		1.21	0.55	0.06	0.12	1.10	
Uniform Delay, d1		57.1		57.7	56.2		42.4	12.9	8.7	22.0	39.3	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		14.9		4.8	1.2		111.5	1.1	0.1	0.3	56.2	
Delay (s)		72.0		62.5	57.4		153.9	14.0	8.8	22.3	95.5	
Level of Service		E		E	E		F	B	A	C	F	
Approach Delay (s)		72.0			60.2			57.8			94.2	
Approach LOS		E			E			E			F	
Intersection Summary												
HCM 2000 Control Delay			73.2				HCM 2000 Level of Service				E	
HCM 2000 Volume to Capacity ratio			1.11									
Actuated Cycle Length (s)			132.2				Sum of lost time (s)				18.0	
Intersection Capacity Utilization			98.7%				ICU Level of Service				F	
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
201: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
2045 AM Alternatives



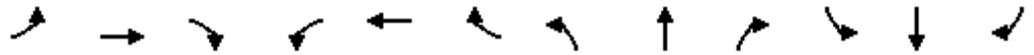
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↑↑	↗	↖	↗	
Traffic Volume (vph)	43	19	73	70	30	25	526	1063	82	22	1205	76
Future Volume (vph)	43	19	73	70	30	25	526	1063	82	22	1205	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			6%			-3%				2%
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.88		1.00	0.93		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1561	1448		1545	1516		1617	3233	1446	1577	3125	
Flt Permitted	0.72	1.00		0.41	1.00		0.07	1.00	1.00	0.25	1.00	
Satd. Flow (perm)	1179	1448		673	1516		119	3233	1446	408	3125	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	21	79	76	33	27	572	1155	89	24	1310	83
RTOR Reduction (vph)	0	74	0	0	22	0	0	0	26	0	3	0
Lane Group Flow (vph)	47	26	0	76	38	0	572	1155	63	24	1390	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	15.3	8.2		18.9	10.0		91.9	84.3	84.3	55.8	52.7	
Effective Green, g (s)	15.3	8.2		18.9	10.0		91.9	84.3	84.3	55.8	52.7	
Actuated g/C Ratio	0.12	0.07		0.15	0.08		0.75	0.69	0.69	0.46	0.43	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	169	96		167	123		513	2224	995	215	1344	
v/s Ratio Prot	0.02	0.02		c0.03	0.03		c0.32	0.36		0.00	0.44	
v/s Ratio Perm	0.02			c0.04			c0.52		0.04	0.05		
v/c Ratio	0.28	0.27		0.46	0.31		1.12	0.52	0.06	0.11	1.03	
Uniform Delay, d1	48.4	54.3		46.1	53.0		38.2	9.3	6.2	19.3	34.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.9	1.5		2.0	1.4		75.2	0.9	0.1	0.2	33.9	
Delay (s)	49.3	55.9		48.1	54.4		113.4	10.1	6.4	19.5	68.8	
Level of Service	D	E		D	D		F	B	A	B	E	
Approach Delay (s)		53.8			50.9			42.5			67.9	
Approach LOS		D			D			D			E	

Intersection Summary

HCM 2000 Control Delay	53.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	122.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	94.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
202: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
2045 AM Alternatives

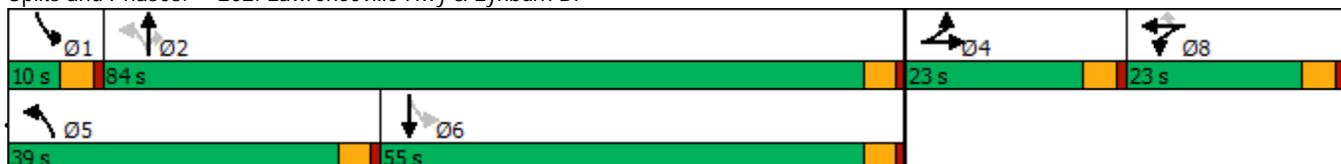


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕↕	↕	↕	↕↕	
Traffic Volume (vph)	43	19	73	70	30	25	526	1063	82	22	1205	76
Future Volume (vph)	43	19	73	70	30	25	526	1063	82	22	1205	76
Satd. Flow (prot)	0	1499	0	0	1571	1382	1617	3233	1446	1577	3125	0
Flt Permitted		0.984			0.966		0.070			0.246		
Satd. Flow (perm)	0	1499	0	0	1571	1382	119	3233	1446	408	3125	0
Satd. Flow (RTOR)		34				117			82		5	
Lane Group Flow (vph)	0	147	0	0	109	27	572	1155	89	24	1393	0
Turn Type	Split	NA		Split	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8	2		2	6		
Total Split (s)	23.0	23.0		23.0	23.0	23.0	39.0	84.0	84.0	10.0	55.0	
Total Lost Time (s)		4.5			4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Act Effct Green (s)		14.4			14.0	14.0	89.8	84.0	84.0	56.2	50.7	
Actuated g/C Ratio		0.11			0.11	0.11	0.68	0.64	0.64	0.43	0.38	
v/c Ratio		0.76			0.66	0.11	1.21	0.56	0.09	0.11	1.16	
Control Delay		68.2			76.0	0.9	146.7	16.7	3.4	14.1	117.3	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		68.2			76.0	0.9	146.7	16.7	3.4	14.1	117.3	
LOS		E			E	A	F	B	A	B	F	
Approach Delay		68.2			61.1			57.0			115.5	
Approach LOS		E			E			E			F	
Queue Length 50th (ft)		96			92	0	-563	312	2	6	-754	
Queue Length 95th (ft)		176			159	0	#854	429	27	19	#967	
Internal Link Dist (ft)		492			463			594			664	
Turn Bay Length (ft)							180		200	135		
Base Capacity (vph)		240			221	295	474	2062	952	223	1205	
Starvation Cap Reductn		0			0	0	0	0	0	0	0	
Spillback Cap Reductn		0			0	0	0	0	0	0	0	
Storage Cap Reductn		0			0	0	0	0	0	0	0	
Reduced v/c Ratio		0.61			0.49	0.09	1.21	0.56	0.09	0.11	1.16	

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 131.7
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.21
 Intersection Signal Delay: 81.2
 Intersection LOS: F
 Intersection Capacity Utilization 98.7%
 ICU Level of Service F
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 202: Lawrenceville Hwy & Lynburn Dr



HCM Signalized Intersection Capacity Analysis
202: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
2045 AM Alternatives



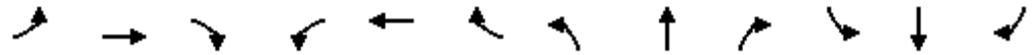
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↔			↕	↕	↕	↕↕	↕	↕	↕↔	
Traffic Volume (vph)	43	19	73	70	30	25	526	1063	82	22	1205	76
Future Volume (vph)	43	19	73	70	30	25	526	1063	82	22	1205	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			6%			-3%				2%
Total Lost time (s)		4.5			4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt		0.93			1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.98			0.97	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1500			1571	1382	1617	3233	1446	1577	3125	
Flt Permitted		0.98			0.97	1.00	0.07	1.00	1.00	0.25	1.00	
Satd. Flow (perm)		1500			1571	1382	119	3233	1446	408	3125	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	21	79	76	33	27	572	1155	89	24	1310	83
RTOR Reduction (vph)	0	30	0	0	0	24	0	0	30	0	3	0
Lane Group Flow (vph)	0	117	0	0	109	3	572	1155	59	24	1390	0
Turn Type	Split	NA		Split	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8	2		2	6		
Actuated Green, G (s)		14.4			14.0	14.0	91.7	84.0	84.0	55.8	52.6	
Effective Green, g (s)		14.4			14.0	14.0	91.7	84.0	84.0	55.8	52.6	
Actuated g/C Ratio		0.11			0.10	0.10	0.69	0.63	0.63	0.42	0.39	
Clearance Time (s)		4.5			4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		161			164	144	469	2032	909	198	1230	
v/s Ratio Prot		c0.08			c0.07		c0.32	0.36		0.00	0.44	
v/s Ratio Perm						0.00	c0.52		0.04	0.05		
v/c Ratio		0.72			0.66	0.02	1.22	0.57	0.06	0.12	1.13	
Uniform Delay, d1		57.7			57.5	53.6	42.8	14.3	9.6	23.0	40.5	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		14.9			9.7	0.1	116.9	1.2	0.1	0.3	69.3	
Delay (s)		72.6			67.3	53.7	159.7	15.5	9.7	23.3	109.8	
Level of Service		E			E	D	F	B	A	C	F	
Approach Delay (s)		72.6			64.6			60.6			108.3	
Approach LOS		E			E			E			F	

Intersection Summary

HCM 2000 Control Delay	80.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	133.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	98.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
203: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
2045 AM Alternatives

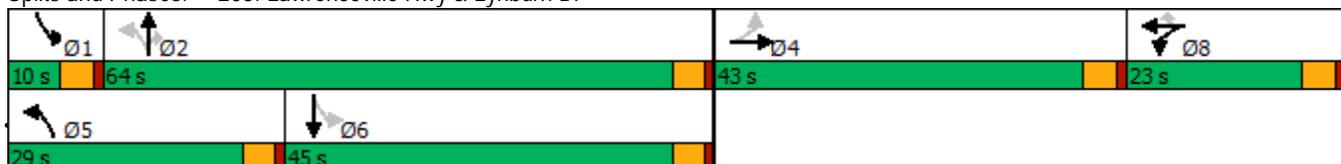


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↖	↗	↗	↖	↕	↖	↖	↕	↕
Traffic Volume (vph)	43	19	73	70	30	25	526	1063	82	22	1205	76
Future Volume (vph)	43	19	73	70	30	25	526	1063	82	22	1205	76
Satd. Flow (prot)	0	1499	0	1545	1626	1382	1617	3233	1446	1577	3125	0
Flt Permitted		0.178		0.950			0.085			0.189		
Satd. Flow (perm)	0	271	0	1545	1626	1382	145	3233	1446	314	3125	0
Satd. Flow (RTOR)		41				117			82		5	
Lane Group Flow (vph)	0	147	0	76	33	27	572	1155	89	24	1393	0
Turn Type	Perm	NA		Split	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4		8	8		5	2		1	6	
Permitted Phases	4					8	2		2	6		
Total Split (s)	43.0	43.0		23.0	23.0	23.0	29.0	64.0	64.0	10.0	45.0	
Total Lost Time (s)		4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Act Effect Green (s)		38.6		11.8	11.8	11.8	69.8	64.0	64.0	46.2	40.7	
Actuated g/C Ratio		0.29		0.09	0.09	0.09	0.53	0.49	0.49	0.35	0.31	
v/c Ratio		1.36		0.55	0.23	0.12	1.62	0.73	0.12	0.15	1.43	
Control Delay		237.7		72.8	59.7	1.0	322.3	32.5	6.0	21.0	235.7	
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		237.7		72.8	59.7	1.0	322.3	32.5	6.0	21.0	235.7	
LOS		F		E	E	A	F	C	A	C	F	
Approach Delay		237.7			55.3			122.5			232.1	
Approach LOS		F			E			F			F	
Queue Length 50th (ft)		~142		64	27	0	~678	445	3	10	~872	
Queue Length 95th (ft)		#296		118	61	0	#955	577	37	27	#1066	
Internal Link Dist (ft)		598			486			576			669	
Turn Bay Length (ft)				90		50	180		200	135		
Base Capacity (vph)		108		218	230	296	352	1576	747	163	971	
Starvation Cap Reductn		0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0		0	0	0	0	0	0	0	0	
Storage Cap Reductn		0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio		1.36		0.35	0.14	0.09	1.63	0.73	0.12	0.15	1.43	

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 131.2
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.63
 Intersection Signal Delay: 168.9
 Intersection LOS: F
 Intersection Capacity Utilization 98.7%
 ICU Level of Service F
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 203: Lawrenceville Hwy & Lynburn Dr



HCM Signalized Intersection Capacity Analysis
203: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
2045 AM Alternatives

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	43	19	73	70	30	25	526	1063	82	22	1205	76	
Future Volume (vph)	43	19	73	70	30	25	526	1063	82	22	1205	76	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Grade (%)		4%			6%			-3%			2%		
Total Lost time (s)		4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor		1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95		
Frt		0.93		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		
Flt Protected		0.98		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (prot)		1500		1545	1626	1382	1617	3233	1446	1577	3125		
Flt Permitted		0.18		0.95	1.00	1.00	0.09	1.00	1.00	0.19	1.00		
Satd. Flow (perm)		271		1545	1626	1382	145	3233	1446	314	3125		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	47	21	79	76	33	27	572	1155	89	24	1310	83	
RTOR Reduction (vph)	0	29	0	0	0	25	0	0	43	0	3	0	
Lane Group Flow (vph)	0	118	0	76	33	2	572	1155	46	24	1390	0	
Turn Type	Perm	NA		Split	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		
Protected Phases		4		8	8		5	2		1	6		
Permitted Phases	4					8	2		2	6			
Actuated Green, G (s)		38.6		10.2	10.2	10.2	71.6	63.9	63.9	45.7	42.5		
Effective Green, g (s)		38.6		10.2	10.2	10.2	71.6	63.9	63.9	45.7	42.5		
Actuated g/C Ratio		0.29		0.08	0.08	0.08	0.53	0.48	0.48	0.34	0.32		
Clearance Time (s)		4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)		78		117	123	105	347	1542	690	137	991		
v/s Ratio Prot				c0.05	0.02		c0.30	0.36		0.00	0.44		
v/s Ratio Perm		c0.43				0.00	c0.58		0.03	0.06			
v/c Ratio		1.51		0.65	0.27	0.02	1.65	0.75	0.07	0.18	1.40		
Uniform Delay, d1		47.7		60.1	58.3	57.2	43.4	28.5	18.9	29.9	45.7		
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2		284.8		11.8	1.2	0.1	304.4	3.4	0.2	0.6	187.1		
Delay (s)		332.5		71.9	59.5	57.3	347.8	31.9	19.1	30.5	232.8		
Level of Service		F		E	E	E	F	C	B	C	F		
Approach Delay (s)		332.5			66.0			130.8			229.4		
Approach LOS		F			E			F			F		
Intersection Summary													
HCM 2000 Control Delay			176.4									HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio			1.55										
Actuated Cycle Length (s)			133.9									Sum of lost time (s)	18.0
Intersection Capacity Utilization			98.7%									ICU Level of Service	F
Analysis Period (min)			15										
c Critical Lane Group													

Lanes, Volumes, Timings
213: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
2045 AM Alternatives

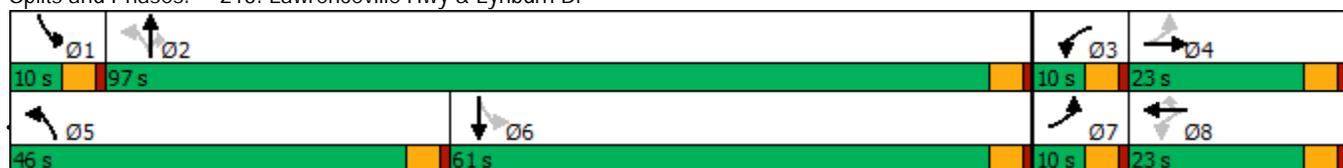


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	19	73	70	30	25	526	1063	82	22	1205	76
Future Volume (vph)	43	19	73	70	30	25	526	1063	82	22	1205	76
Satd. Flow (prot)	1561	1447	0	1545	1626	1382	1617	3233	1446	1577	3125	0
Flt Permitted	0.736			0.477			0.063			0.246		
Satd. Flow (perm)	1209	1447	0	776	1626	1382	107	3233	1446	408	3125	0
Satd. Flow (RTOR)		79				117			89		6	
Lane Group Flow (vph)	47	100	0	76	33	27	572	1155	89	24	1393	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Total Split (s)	10.0	23.0		10.0	23.0	23.0	46.0	97.0	97.0	10.0	61.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Act Effct Green (s)	13.0	8.7		13.0	8.7	8.7	102.7	96.9	96.9	62.1	56.6	
Actuated g/C Ratio	0.10	0.07		0.10	0.07	0.07	0.80	0.76	0.76	0.48	0.44	
v/c Ratio	0.34	0.58		0.68	0.30	0.13	0.99	0.47	0.08	0.10	1.01	
Control Delay	56.3	32.0		81.3	64.5	1.4	73.6	8.1	1.5	11.2	62.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	56.3	32.0		81.3	64.5	1.4	73.6	8.1	1.5	11.2	62.2	
LOS	E	C		F	E	A	E	A	A	B	E	
Approach Delay		39.8			61.3			28.4			61.4	
Approach LOS		D			E			C			E	
Queue Length 50th (ft)	36	17		59	27	0	-439	203	0	6	~650	
Queue Length 95th (ft)	74	76		108	62	0	#736	292	17	15	#851	
Internal Link Dist (ft)		618			662			865			596	
Turn Bay Length (ft)	150			90		50	180		200	135		
Base Capacity (vph)	137	276		111	235	299	575	2441	1113	247	1382	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.34	0.36		0.68	0.14	0.09	0.99	0.47	0.08	0.10	1.01	

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 128.3
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.01
 Intersection Signal Delay: 43.4
 Intersection LOS: D
 Intersection Capacity Utilization 94.3%
 ICU Level of Service F
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 213: Lawrenceville Hwy & Lynburn Dr



HCM Signalized Intersection Capacity Analysis
213: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
2045 AM Alternatives



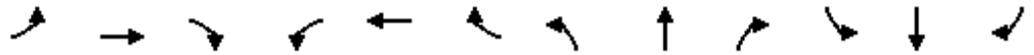
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↖	↗	↖	↑↑	↗	↖	↖↗	
Traffic Volume (vph)	43	19	73	70	30	25	526	1063	82	22	1205	76
Future Volume (vph)	43	19	73	70	30	25	526	1063	82	22	1205	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			6%			-3%				2%
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.88		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1561	1448		1545	1626	1382	1617	3233	1446	1577	3125	
Flt Permitted	0.74	1.00		0.48	1.00	1.00	0.06	1.00	1.00	0.25	1.00	
Satd. Flow (perm)	1209	1448		776	1626	1382	108	3233	1446	408	3125	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	21	79	76	33	27	572	1155	89	24	1310	83
RTOR Reduction (vph)	0	74	0	0	0	25	0	0	23	0	3	0
Lane Group Flow (vph)	47	26	0	76	33	2	572	1155	66	24	1390	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	13.0	8.7		13.0	8.7	8.7	104.6	96.9	96.9	61.7	58.5	
Effective Green, g (s)	13.0	8.7		13.0	8.7	8.7	104.6	96.9	96.9	61.7	58.5	
Actuated g/C Ratio	0.10	0.07		0.10	0.07	0.07	0.80	0.74	0.74	0.47	0.45	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	131	96		102	107	91	564	2389	1068	220	1394	
v/s Ratio Prot	0.01	0.02		c0.02	0.02		c0.32	0.36		0.00	0.44	
v/s Ratio Perm	0.02			c0.05		0.00	c0.49		0.05	0.05		
v/c Ratio	0.36	0.27		0.75	0.31	0.02	1.01	0.48	0.06	0.11	1.00	
Uniform Delay, d1	54.8	58.2		56.8	58.3	57.2	39.8	6.9	4.7	19.5	36.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.7	1.5		25.2	1.6	0.1	41.5	0.7	0.1	0.2	23.4	
Delay (s)	56.5	59.7		82.1	60.0	57.3	81.2	7.6	4.8	19.7	59.6	
Level of Service	E	E		F	E	E	F	A	A	B	E	
Approach Delay (s)		58.7			71.8			30.7			58.9	
Approach LOS		E			E			C			E	

Intersection Summary

HCM 2000 Control Delay	44.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	131.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	94.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
230: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
2045 AM Alternatives

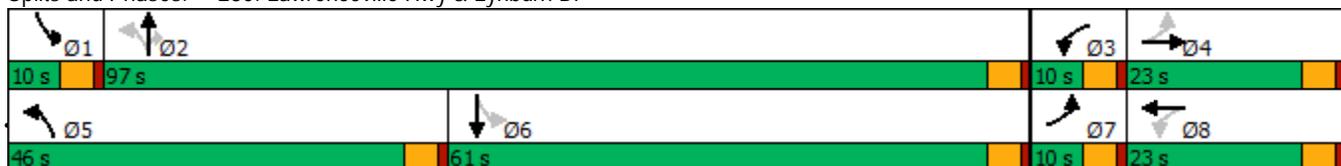


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↑↑	↗	↖	↗↖	
Traffic Volume (vph)	43	19	73	47	20	17	526	1063	82	22	1205	76
Future Volume (vph)	43	19	73	47	20	17	526	1063	82	22	1205	76
Satd. Flow (prot)	1593	1477	0	1593	1562	0	1593	3185	1425	1593	3157	0
Flt Permitted	0.731			0.482			0.063			0.246		
Satd. Flow (perm)	1226	1477	0	808	1562	0	106	3185	1425	412	3157	0
Satd. Flow (RTOR)		79			18				89		6	
Lane Group Flow (vph)	47	100	0	51	40	0	572	1155	89	24	1393	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		
Total Split (s)	10.0	23.0		10.0	23.0		46.0	97.0	97.0	10.0	61.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Act Effect Green (s)	12.6	8.3		12.6	8.3		102.7	96.9	96.9	62.1	56.6	
Actuated g/C Ratio	0.10	0.06		0.10	0.06		0.80	0.76	0.76	0.49	0.44	
v/c Ratio	0.34	0.59		0.45	0.34		1.01	0.48	0.08	0.10	0.99	
Control Delay	56.4	32.5		62.4	44.4		76.4	8.1	1.5	11.1	58.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	56.4	32.5		62.4	44.4		76.4	8.1	1.5	11.1	58.8	
LOS	E	C		E	D		E	A	A	B	E	
Approach Delay		40.2			54.5			29.3			58.0	
Approach LOS		D			D			C			E	
Queue Length 50th (ft)	36	17		39	18		-446	200	0	6	~605	
Queue Length 95th (ft)	74	76		79	56		#742	293	17	15	#842	
Internal Link Dist (ft)		542			756			861			673	
Turn Bay Length (ft)	150			90			180		200	135		
Base Capacity (vph)	137	281		113	241		568	2412	1100	250	1400	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.34	0.36		0.45	0.17		1.01	0.48	0.08	0.10	0.99	

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 127.9
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.01
 Intersection Signal Delay: 42.1
 Intersection LOS: D
 Intersection Capacity Utilization 92.9%
 ICU Level of Service F
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 230: Lawrenceville Hwy & Lynburn Dr



HCM Signalized Intersection Capacity Analysis
230: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
2045 AM Alternatives



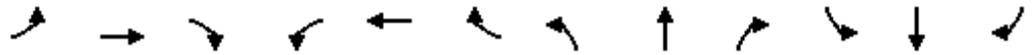
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	19	73	47	20	17	526	1063	82	22	1205	76
Future Volume (vph)	43	19	73	47	20	17	526	1063	82	22	1205	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.88		1.00	0.93		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1593	1478		1593	1563		1593	3185	1425	1593	3157	
Flt Permitted	0.73	1.00		0.48	1.00		0.06	1.00	1.00	0.25	1.00	
Satd. Flow (perm)	1225	1478		808	1563		106	3185	1425	412	3157	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	21	79	51	22	18	572	1155	89	24	1310	83
RTOR Reduction (vph)	0	74	0	0	17	0	0	0	23	0	3	0
Lane Group Flow (vph)	47	26	0	51	23	0	572	1155	66	24	1390	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	12.6	8.3		12.6	8.3		104.6	96.9	96.9	61.7	58.5	
Effective Green, g (s)	12.6	8.3		12.6	8.3		104.6	96.9	96.9	61.7	58.5	
Actuated g/C Ratio	0.10	0.06		0.10	0.06		0.80	0.74	0.74	0.47	0.45	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	130	93		103	99		558	2361	1056	223	1413	
v/s Ratio Prot	0.01	0.02		c0.02	0.01		c0.33	0.36		0.00	0.44	
v/s Ratio Perm	0.02			c0.03			c0.49		0.05	0.05		
v/c Ratio	0.36	0.28		0.50	0.23		1.03	0.49	0.06	0.11	0.98	
Uniform Delay, d1	55.0	58.4		55.2	58.2		39.6	6.9	4.6	19.3	35.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.7	1.6		3.7	1.2		44.6	0.7	0.1	0.2	20.3	
Delay (s)	56.7	60.0		58.9	59.4		84.2	7.6	4.7	19.6	55.9	
Level of Service	E	E		E	E		F	A	A	B	E	
Approach Delay (s)		58.9			59.1			31.6			55.3	
Approach LOS		E			E			C			E	

Intersection Summary		
HCM 2000 Control Delay	43.2	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.99	D
Actuated Cycle Length (s)	130.7	Sum of lost time (s)
Intersection Capacity Utilization	92.9%	18.0
Analysis Period (min)	15	ICU Level of Service
		F

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 300: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
 2045 AM Alternatives



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗		↑↑	↗			↗	↘↗	↑	↗
Traffic Volume (vph)	445	654	32	0	1192	1321	0	0	31	283	40	111
Future Volume (vph)	445	654	32	0	1192	1321	0	0	31	283	40	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			0%			0%				0%
Total Lost time (s)	4.5	4.5	4.5		4.5	4.0			4.0	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00		0.95	1.00			1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85			0.86	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00
Satd. Flow (prot)	1585	3169	1418		3185	1425			1450	3090	1676	1425
Flt Permitted	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00
Satd. Flow (perm)	1585	3169	1418		3185	1425			1450	3090	1676	1425
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	484	711	35	0	1296	1436	0	0	34	308	43	121
RTOR Reduction (vph)	0	0	8	0	0	0	0	0	0	0	0	102
Lane Group Flow (vph)	484	711	27	0	1296	1436	0	0	34	308	43	19
Turn Type	Prot	NA	Perm		NA	Free			Free	Prot	NA	Perm
Protected Phases	7	4			8					1		6
Permitted Phases			4			Free			Free			6
Actuated Green, G (s)	44.9	109.3	109.3		59.9	140.0			140.0	21.7	21.7	21.7
Effective Green, g (s)	44.9	109.3	109.3		59.9	140.0			140.0	21.7	21.7	21.7
Actuated g/C Ratio	0.32	0.78	0.78		0.43	1.00			1.00	0.15	0.15	0.15
Clearance Time (s)	4.5	4.5	4.5		4.5					4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0					3.0	3.0	3.0
Lane Grp Cap (vph)	508	2474	1107		1362	1425			1450	478	259	220
v/s Ratio Prot	0.31	0.22			0.41					0.10	0.03	
v/s Ratio Perm			0.02			c1.01			0.02			0.01
v/c Ratio	0.95	0.29	0.02		0.95	1.01			0.02	0.64	0.17	0.09
Uniform Delay, d1	46.5	4.3	3.4		38.6	70.0			0.0	55.5	51.3	50.7
Progression Factor	1.00	1.00	1.00		0.58	1.00			1.00	1.00	1.00	1.00
Incremental Delay, d2	28.2	0.1	0.0		2.0	9.1			0.0	3.0	1.4	0.8
Delay (s)	74.7	4.4	3.4		24.6	79.1			0.0	58.5	52.7	51.4
Level of Service	E	A	A		C	E			A	E	D	D
Approach Delay (s)		32.1			53.2			0.0			56.2	
Approach LOS		C			D			A			E	

Intersection Summary		
HCM 2000 Control Delay	47.3	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.12	D
Actuated Cycle Length (s)	140.0	Sum of lost time (s)
Intersection Capacity Utilization	84.2%	13.5
Analysis Period (min)	15	ICU Level of Service
		E

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 301: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
 2045 AM Alternatives

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 					 		
Traffic Volume (vph)	445	654	32	0	1192	1321	0	0	31	283	40	111
Future Volume (vph)	445	654	32	0	1192	1321	0	0	31	283	40	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			0%			0%				0%
Total Lost time (s)	4.5	4.5	4.5		4.5	4.0			4.0	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00		0.95	1.00			1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85			0.86	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00
Satd. Flow (prot)	1585	3169	1418		3185	1425			1450	3090	1676	1425
Flt Permitted	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00
Satd. Flow (perm)	1585	3169	1418		3185	1425			1450	3090	1676	1425
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	484	711	35	0	1296	1436	0	0	34	308	43	121
RTOR Reduction (vph)	0	0	8	0	0	0	0	0	0	0	0	102
Lane Group Flow (vph)	484	711	27	0	1296	1436	0	0	34	308	43	19
Turn Type	Prot	NA	Perm		NA	Free			Free	Perm	NA	Perm
Protected Phases	7	4			8							6
Permitted Phases			4			Free			Free	6		6
Actuated Green, G (s)	44.9	109.3	109.3		59.9	140.0			140.0	21.7	21.7	21.7
Effective Green, g (s)	44.9	109.3	109.3		59.9	140.0			140.0	21.7	21.7	21.7
Actuated g/C Ratio	0.32	0.78	0.78		0.43	1.00			1.00	0.15	0.15	0.15
Clearance Time (s)	4.5	4.5	4.5		4.5					4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0					3.0	3.0	3.0
Lane Grp Cap (vph)	508	2474	1107		1362	1425			1450	478	259	220
v/s Ratio Prot	0.31	0.22			0.41						0.03	
v/s Ratio Perm			0.02			c1.01			0.02	0.10		0.01
v/c Ratio	0.95	0.29	0.02		0.95	1.01			0.02	0.64	0.17	0.09
Uniform Delay, d1	46.5	4.3	3.4		38.6	70.0			0.0	55.5	51.3	50.7
Progression Factor	1.00	1.00	1.00		0.59	1.00			1.00	1.00	1.00	1.00
Incremental Delay, d2	28.2	0.1	0.0		2.0	9.1			0.0	6.6	1.4	0.8
Delay (s)	74.7	4.4	3.4		24.6	79.1			0.0	62.1	52.7	51.4
Level of Service	E	A	A		C	E			A	E	D	D
Approach Delay (s)		32.1			53.3			0.0			58.5	
Approach LOS		C			D			A			E	
Intersection Summary												
HCM 2000 Control Delay			47.6									D
HCM 2000 Volume to Capacity ratio			1.12									
Actuated Cycle Length (s)			140.0							13.5		
Intersection Capacity Utilization			84.2%									E
Analysis Period (min)			15									
c Critical Lane Group												

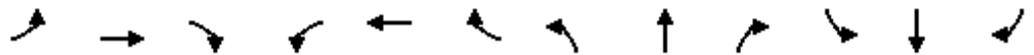
HCM Signalized Intersection Capacity Analysis
302: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
2045 AM Alternatives

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	 	 			 					 			
Traffic Volume (vph)	445	654	32	0	1192	1321	0	0	31	283	40	111	
Future Volume (vph)	445	654	32	0	1192	1321	0	0	31	283	40	111	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Grade (%)		1%			0%			0%				0%	
Total Lost time (s)	4.5	4.5	4.0		4.5	4.0			4.0	4.5	4.5	4.5	
Lane Util. Factor	0.97	0.95	1.00		0.95	1.00			1.00	0.97	1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85			0.86	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00	
Satd. Flow (prot)	3074	3169	1418		3185	1425			1450	3090	1676	1425	
Flt Permitted	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00	
Satd. Flow (perm)	3074	3169	1418		3185	1425			1450	3090	1676	1425	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	484	711	35	0	1296	1436	0	0	34	308	43	121	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	92	
Lane Group Flow (vph)	484	711	35	0	1296	1436	0	0	34	308	43	29	
Turn Type	Prot	NA	Free		NA	Free			Free	Prot	NA	Perm	
Protected Phases	7	4			8					1	6		
Permitted Phases			Free			Free			Free			6	
Actuated Green, G (s)	26.8	97.6	140.0		66.3	140.0			140.0	33.4	33.4	33.4	
Effective Green, g (s)	26.8	97.6	140.0		66.3	140.0			140.0	33.4	33.4	33.4	
Actuated g/C Ratio	0.19	0.70	1.00		0.47	1.00			1.00	0.24	0.24	0.24	
Clearance Time (s)	4.5	4.5			4.5					4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0			3.0					3.0	3.0	3.0	
Lane Grp Cap (vph)	588	2209	1418		1508	1425			1450	737	399	339	
v/s Ratio Prot	0.16	0.22			0.41					0.10	0.03		
v/s Ratio Perm			0.02			c1.01			0.02			0.02	
v/c Ratio	0.82	0.32	0.02		0.86	1.01			0.02	0.42	0.11	0.09	
Uniform Delay, d1	54.3	8.3	0.0		32.7	70.0			0.0	45.1	41.7	41.4	
Progression Factor	1.00	1.00	1.00		0.55	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	9.1	0.1	0.0		0.5	9.1			0.0	0.4	0.5	0.5	
Delay (s)	63.4	8.4	0.0		18.4	79.1			0.0	45.5	42.2	41.9	
Level of Service	E	A	A		B	E			A	D	D	D	
Approach Delay (s)		29.8			50.3			0.0			44.3		
Approach LOS		C			D			A			D		
Intersection Summary													
HCM 2000 Control Delay			43.6									HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			1.12										
Actuated Cycle Length (s)			140.0									Sum of lost time (s)	13.5
Intersection Capacity Utilization			70.9%									ICU Level of Service	C
Analysis Period (min)			15										
c	Critical Lane Group												

Lanes, Volumes, Timings
303: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
2045 AM Alternatives

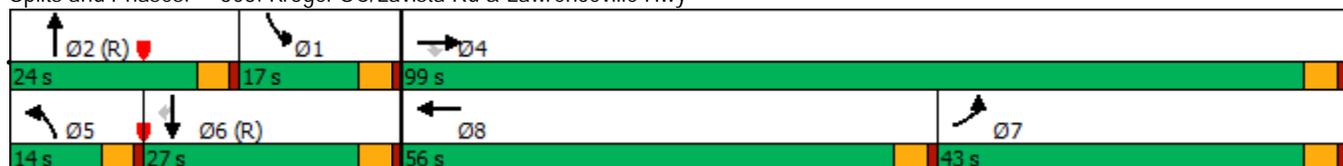


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘		↖	↗	↘	↖	↗	↘	↖	↗
Traffic Volume (vph)	445	654	32	0	1192	1321	96	10	31	283	40	111
Future Volume (vph)	445	654	32	0	1192	1321	96	10	31	283	40	111
Satd. Flow (prot)	1585	3169	1418	0	3185	1425	1593	1487	0	3090	1676	1425
Flt Permitted	0.950						0.950			0.950		
Satd. Flow (perm)	1585	3169	1418	0	3185	1425	1593	1487	0	3090	1676	1425
Satd. Flow (RTOR)			82			325		34				121
Lane Group Flow (vph)	484	711	35	0	1296	1436	104	45	0	308	43	121
Turn Type	Prot	NA	Perm		NA	Free	Prot	NA		Prot	NA	Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases			4			Free						6
Total Split (s)	43.0	99.0	99.0		56.0		14.0	24.0		17.0	27.0	27.0
Total Lost Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Act Effct Green (s)	38.5	94.5	94.5		51.5	140.0	9.5	19.5		12.5	22.5	22.5
Actuated g/C Ratio	0.28	0.68	0.68		0.37	1.00	0.07	0.14		0.09	0.16	0.16
v/c Ratio	1.11	0.33	0.04		1.11	1.01	0.96	0.19		1.12	0.16	0.37
Control Delay	123.6	10.0	0.1		77.4	25.0	141.0	24.3		146.5	52.5	11.7
Queue Delay	0.0	0.0	0.0		0.4	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	123.6	10.0	0.1		77.8	25.0	141.0	24.3		146.5	52.5	11.7
LOS	F	B	A		E	C	F	C		F	D	B
Approach Delay		54.5			50.1			105.8			103.4	
Approach LOS		D			D			F			F	
Queue Length 50th (ft)	~503	132	0		~704	~676	96	9		~165	34	0
Queue Length 95th (ft)	#724	165	0		m521	m405	#219	47		#263	72	58
Internal Link Dist (ft)		1026			493			316			468	
Turn Bay Length (ft)	445		230			125				300		210
Base Capacity (vph)	435	2139	983		1171	1425	108	236		275	269	330
Starvation Cap Reductn	0	0	0		103	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0		0	0	0
Reduced v/c Ratio	1.11	0.33	0.04		1.21	1.01	0.96	0.19		1.12	0.16	0.37

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 80 (57%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.12
 Intersection Signal Delay: 58.6
 Intersection LOS: E
 Intersection Capacity Utilization 90.9%
 ICU Level of Service E
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 303: Kroger SC/Lavista Rd & Lawrenceville Hwy



HCM Signalized Intersection Capacity Analysis
303: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
2045 AM Alternatives



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	445	654	32	0	1192	1321	96	10	31	283	40	111
Future Volume (vph)	445	654	32	0	1192	1321	96	10	31	283	40	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			0%			0%				0%
Total Lost time (s)	4.5	4.5	4.5		4.5	4.0	4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00		0.95	1.00	1.00	1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.89		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1585	3169	1418		3185	1425	1593	1486		3090	1676	1425
Flt Permitted	0.95	1.00	1.00		1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1585	3169	1418		3185	1425	1593	1486		3090	1676	1425
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	484	711	35	0	1296	1436	104	11	34	308	43	121
RTOR Reduction (vph)	0	0	11	0	0	0	0	29	0	0	0	102
Lane Group Flow (vph)	484	711	24	0	1296	1436	104	16	0	308	43	19
Turn Type	Prot	NA	Perm		NA	Free	Prot	NA		Prot	NA	Perm
Protected Phases	7	4			8		5	2		1		6
Permitted Phases			4			Free						6
Actuated Green, G (s)	38.5	94.5	94.5		51.5	140.0	9.5	19.5		12.5	22.5	22.5
Effective Green, g (s)	38.5	94.5	94.5		51.5	140.0	9.5	19.5		12.5	22.5	22.5
Actuated g/C Ratio	0.28	0.68	0.68		0.37	1.00	0.07	0.14		0.09	0.16	0.16
Clearance Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	435	2139	957		1171	1425	108	206		275	269	229
v/s Ratio Prot	0.31	0.22			0.41		0.07	0.01		0.10	0.03	
v/s Ratio Perm			0.02			1.01						0.01
v/c Ratio	1.11	0.33	0.02		1.11	1.01	0.96	0.08		1.12	0.16	0.08
Uniform Delay, d1	50.8	9.5	7.5		44.2	70.0	65.1	52.4		63.8	50.6	50.0
Progression Factor	1.00	1.00	1.00		0.62	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	77.4	0.1	0.0		49.4	9.1	74.3	0.7		90.5	1.3	0.7
Delay (s)	128.2	9.6	7.5		77.0	79.1	139.4	53.1		154.2	51.9	50.7
Level of Service	F	A	A		E	E	F	D		F	D	D
Approach Delay (s)		56.2			78.1			113.3			118.4	
Approach LOS		E			E			F			F	

Intersection Summary

HCM 2000 Control Delay	77.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	90.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
304: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
2045 AM Alternatives

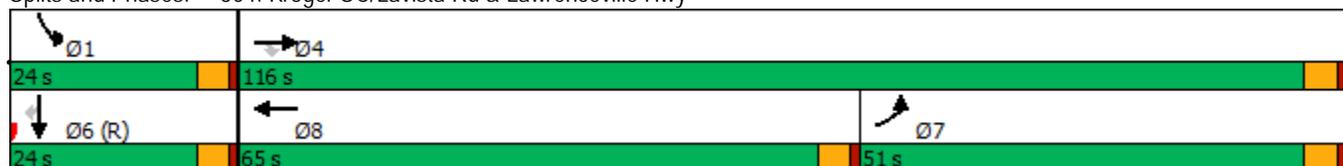


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	445	654	32	0	1192	1321	0	0	31	283	40	111
Future Volume (vph)	445	654	32	0	1192	1321	0	0	31	283	40	111
Satd. Flow (prot)	1585	3169	1418	0	3185	1425	0	0	1450	3090	1676	1425
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1585	3169	1418	0	3185	1425	0	0	1450	3090	1676	1425
Satd. Flow (RTOR)				35			299			121		
Lane Group Flow (vph)	484	711	35	0	1296	1436	0	0	34	308	43	121
Turn Type	Prot	NA	Perm	NA		Free	Free			Prot	NA	Perm
Protected Phases	7	4	8						1	6		
Permitted Phases	4			Free			Free			6		
Total Split (s)	51.0	116.0	116.0	65.0						24.0	24.0	24.0
Total Lost Time (s)	4.5	4.5	4.5	4.5						4.5	4.5	4.5
Act Effct Green (s)	44.9	109.1	109.1	59.8		140.0	140.0			21.9	21.9	21.9
Actuated g/C Ratio	0.32	0.78	0.78	0.43		1.00	1.00			0.16	0.16	0.16
v/c Ratio	0.95	0.29	0.03	0.95		1.01	0.02			0.64	0.16	0.37
Control Delay	76.4	4.6	0.9	25.5		25.0	0.0			63.1	55.1	12.3
Queue Delay	0.0	0.0	0.0	44.8		0.0	0.0			0.0	0.0	0.0
Total Delay	76.4	4.6	0.9	70.3		25.0	0.0			63.1	55.1	12.3
LOS	E	A	A	E		C	A			E	E	B
Approach Delay	32.7		46.5						49.3			
Approach LOS	C			D						D		
Queue Length 50th (ft)	424	75	0	533		~461	0			140	35	0
Queue Length 95th (ft)	#638	94	7	m430		m232	0			193	74	60
Internal Link Dist (ft)	1138			371			238			405		
Turn Bay Length (ft)	445		230			125			300			210
Base Capacity (vph)	526	2523	1136	1376		1425	1450			482	261	324
Starvation Cap Reductn	0	0	0	335		0	0			0	0	0
Spillback Cap Reductn	0	0	0	0		0	0			0	0	0
Storage Cap Reductn	0	0	0	0		0	0			0	0	0
Reduced v/c Ratio	0.92	0.28	0.03	1.24		1.01	0.02			0.64	0.16	0.37

Intersection Summary

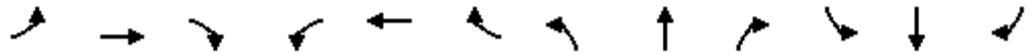
Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 50 (36%), Referenced to phase 2: and 6:SBT, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.01
 Intersection Signal Delay: 42.7 Intersection LOS: D
 Intersection Capacity Utilization 84.2% ICU Level of Service E
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 304: Kroger SC/Lavista Rd & Lawrenceville Hwy



HCM Signalized Intersection Capacity Analysis
 304: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
 2045 AM Alternatives

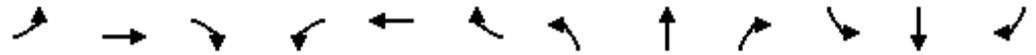


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗		↑↑	↗			↗	↘↗	↑	↗
Traffic Volume (vph)	445	654	32	0	1192	1321	0	0	31	283	40	111
Future Volume (vph)	445	654	32	0	1192	1321	0	0	31	283	40	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			0%			0%				0%
Total Lost time (s)	4.5	4.5	4.5		4.5	4.0			4.0	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00		0.95	1.00			1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85			0.86	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00
Satd. Flow (prot)	1585	3169	1418		3185	1425			1450	3090	1676	1425
Flt Permitted	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00
Satd. Flow (perm)	1585	3169	1418		3185	1425			1450	3090	1676	1425
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	484	711	35	0	1296	1436	0	0	34	308	43	121
RTOR Reduction (vph)	0	0	8	0	0	0	0	0	0	0	0	102
Lane Group Flow (vph)	484	711	27	0	1296	1436	0	0	34	308	43	19
Turn Type	Prot	NA	Perm		NA	Free			Free	Prot	NA	Perm
Protected Phases	7	4			8					1		6
Permitted Phases			4			Free			Free			6
Actuated Green, G (s)	44.9	109.2	109.2		59.8	140.0			140.0	21.8	21.8	21.8
Effective Green, g (s)	44.9	109.2	109.2		59.8	140.0			140.0	21.8	21.8	21.8
Actuated g/C Ratio	0.32	0.78	0.78		0.43	1.00			1.00	0.16	0.16	0.16
Clearance Time (s)	4.5	4.5	4.5		4.5					4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0					3.0	3.0	3.0
Lane Grp Cap (vph)	508	2471	1106		1360	1425			1450	481	260	221
v/s Ratio Prot	0.31	0.22			0.41					0.10	0.03	
v/s Ratio Perm			0.02			c1.01			0.02			0.01
v/c Ratio	0.95	0.29	0.02		0.95	1.01			0.02	0.64	0.17	0.09
Uniform Delay, d1	46.5	4.4	3.5		38.7	70.0			0.0	55.4	51.2	50.6
Progression Factor	1.00	1.00	1.00		0.58	1.00			1.00	1.00	1.00	1.00
Incremental Delay, d2	28.2	0.1	0.0		2.0	9.1			0.0	2.9	1.4	0.8
Delay (s)	74.7	4.4	3.5		24.6	79.1			0.0	58.3	52.6	51.3
Level of Service	E	A	A		C	E			A	E	D	D
Approach Delay (s)		32.1			53.3			0.0			56.0	
Approach LOS		C			D			A			E	

Intersection Summary		
HCM 2000 Control Delay	47.3	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.12	D
Actuated Cycle Length (s)	140.0	Sum of lost time (s)
Intersection Capacity Utilization	84.2%	13.5
Analysis Period (min)	15	ICU Level of Service
		E
c Critical Lane Group		

HCM Signalized Intersection Capacity Analysis
 305: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
 2045 AM Alternatives



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↘		↑↑	↘			↘	↘↘	↑	↘
Traffic Volume (vph)	445	654	32	0	1192	1321	0	0	31	283	40	111
Future Volume (vph)	445	654	32	0	1192	1321	0	0	31	283	40	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			0%			0%				0%
Total Lost time (s)	4.5	4.5	4.5		4.5	4.0			4.0	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00		0.95	1.00			1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85			0.86	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00
Satd. Flow (prot)	1585	3169	1418		3185	1425			1450	3090	1676	1425
Flt Permitted	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00
Satd. Flow (perm)	1585	3169	1418		3185	1425			1450	3090	1676	1425
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	484	711	35	0	1296	1436	0	0	34	308	43	121
RTOR Reduction (vph)	0	0	8	0	0	0	0	0	0	0	0	102
Lane Group Flow (vph)	484	711	27	0	1296	1436	0	0	34	308	43	19
Turn Type	Prot	NA	Perm		NA	Free			Free	Prot	NA	Perm
Protected Phases	7	4			8					1		6
Permitted Phases			4			Free			Free			6
Actuated Green, G (s)	44.9	109.3	109.3		59.9	140.0			140.0	21.7	21.7	21.7
Effective Green, g (s)	44.9	109.3	109.3		59.9	140.0			140.0	21.7	21.7	21.7
Actuated g/C Ratio	0.32	0.78	0.78		0.43	1.00			1.00	0.15	0.15	0.15
Clearance Time (s)	4.5	4.5	4.5		4.5					4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0					3.0	3.0	3.0
Lane Grp Cap (vph)	508	2474	1107		1362	1425			1450	478	259	220
v/s Ratio Prot	0.31	0.22			0.41					0.10	0.03	
v/s Ratio Perm			0.02			c1.01			0.02			0.01
v/c Ratio	0.95	0.29	0.02		0.95	1.01			0.02	0.64	0.17	0.09
Uniform Delay, d1	46.5	4.3	3.4		38.6	70.0			0.0	55.5	51.3	50.7
Progression Factor	1.00	1.00	1.00		0.59	1.00			1.00	1.00	1.00	1.00
Incremental Delay, d2	28.2	0.1	0.0		2.0	9.1			0.0	3.0	1.4	0.8
Delay (s)	74.7	4.4	3.4		24.6	79.1			0.0	58.5	52.7	51.4
Level of Service	E	A	A		C	E			A	E	D	D
Approach Delay (s)		32.1			53.3			0.0			56.2	
Approach LOS		C			D			A			E	

Intersection Summary			
HCM 2000 Control Delay	47.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	84.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 320: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
 2045 AM Alternatives



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↘	↑↑	↘		↑↑	↘			↘	↘↘	↑	↘	
Traffic Volume (vph)	445	654	32	0	1192	1321	0	0	31	283	40	111	
Future Volume (vph)	445	654	32	0	1192	1321	0	0	31	283	40	111	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Grade (%)		1%			0%			0%				0%	
Total Lost time (s)	4.5	4.5	4.5		4.5	4.0			4.0	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95	1.00		0.95	1.00			1.00	0.97	1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85			0.86	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1585	3169	1418		3185	1425			1450	3090	1676	1425	
Flt Permitted	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1585	3169	1418		3185	1425			1450	3090	1676	1425	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	484	711	35	0	1296	1436	0	0	34	308	43	121	
RTOR Reduction (vph)	0	0	8	0	0	0	0	0	0	0	0	102	
Lane Group Flow (vph)	484	711	27	0	1296	1436	0	0	34	308	43	19	
Turn Type	Prot	NA	Perm		NA	Free			Free	Prot	NA	Perm	
Protected Phases	7	4			8					1		6	
Permitted Phases			4			Free			Free			6	
Actuated Green, G (s)	44.9	109.3	109.3		59.9	140.0			140.0	21.7	21.7	21.7	
Effective Green, g (s)	44.9	109.3	109.3		59.9	140.0			140.0	21.7	21.7	21.7	
Actuated g/C Ratio	0.32	0.78	0.78		0.43	1.00			1.00	0.15	0.15	0.15	
Clearance Time (s)	4.5	4.5	4.5		4.5					4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0		3.0					3.0	3.0	3.0	
Lane Grp Cap (vph)	508	2474	1107		1362	1425			1450	478	259	220	
v/s Ratio Prot	0.31	0.22			0.41					0.10	0.03		
v/s Ratio Perm			0.02			c1.01			0.02			0.01	
v/c Ratio	0.95	0.29	0.02		0.95	1.01			0.02	0.64	0.17	0.09	
Uniform Delay, d1	46.5	4.3	3.4		38.6	70.0			0.0	55.5	51.3	50.7	
Progression Factor	1.00	1.00	1.00		0.57	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	28.2	0.1	0.0		2.0	9.1			0.0	3.0	1.4	0.8	
Delay (s)	74.7	4.4	3.4		24.1	79.1			0.0	58.5	52.7	51.4	
Level of Service	E	A	A		C	E			A	E	D	D	
Approach Delay (s)		32.1			53.0			0.0			56.2		
Approach LOS		C			D			A			E		
Intersection Summary													
HCM 2000 Control Delay			47.2									HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			1.12										
Actuated Cycle Length (s)			140.0									Sum of lost time (s)	13.5
Intersection Capacity Utilization			84.2%									ICU Level of Service	E
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
400: Lawrenceville Hwy & Old Norcross Rd

Lawrenceville Hwy Study
2045 AM Alternatives



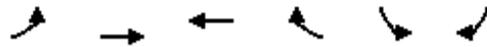
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	204	764	2231	48	57	282
Future Volume (vph)	204	764	2231	48	57	282
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	0%		6%	
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1585	3169	3175		1545	1382
Flt Permitted	0.04	1.00	1.00		0.95	1.00
Satd. Flow (perm)	67	3169	3175		1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	222	830	2425	52	62	307
RTOR Reduction (vph)	0	0	1	0	0	78
Lane Group Flow (vph)	222	830	2476	0	62	229
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	7	4	8		1	7
Permitted Phases	4					1
Actuated Green, G (s)	115.5	115.5	94.5		5.5	22.0
Effective Green, g (s)	115.5	115.5	94.5		5.5	22.0
Actuated g/C Ratio	0.82	0.82	0.68		0.04	0.16
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	234	2614	2143		60	261
v/s Ratio Prot	0.11	0.26	c0.78		0.04	c0.10
v/s Ratio Perm	0.67					0.06
v/c Ratio	0.95	0.32	1.16		1.03	0.88
Uniform Delay, d1	53.9	2.9	22.8		67.2	57.7
Progression Factor	1.05	1.32	1.00		1.00	1.00
Incremental Delay, d2	42.6	0.1	75.7		125.8	26.7
Delay (s)	99.0	3.9	98.4		193.1	84.4
Level of Service	F	A	F		F	F
Approach Delay (s)		24.0	98.4		102.6	
Approach LOS		C	F		F	

Intersection Summary

HCM 2000 Control Delay	78.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	98.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
401: Lawrenceville Hwy & Old Norcross Rd

Lawrenceville Hwy Study
2045 AM Alternatives

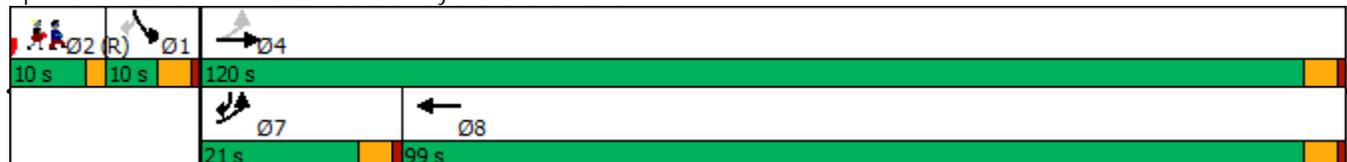


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø2
Lane Configurations							
Traffic Volume (vph)	204	764	2231	48	57	282	
Future Volume (vph)	204	764	2231	48	57	282	
Satd. Flow (prot)	1585	3169	3176	0	1545	1382	
Flt Permitted	0.040				0.950		
Satd. Flow (perm)	67	3169	3176	0	1545	1382	
Satd. Flow (RTOR)			3			92	
Lane Group Flow (vph)	222	830	2477	0	62	307	
Turn Type	pm+pt	NA	NA		Prot	pm+ov	
Protected Phases	7	4	8		1	7	2
Permitted Phases	4					1	
Total Split (s)	21.0	120.0	99.0		10.0	21.0	10.0
Total Lost Time (s)	4.5	4.5	4.5		4.5	4.5	
Act Effct Green (s)	115.5	115.5	94.5		5.5	26.5	
Actuated g/C Ratio	0.82	0.82	0.68		0.04	0.19	
v/c Ratio	0.95	0.32	1.16		1.03	0.91	
Control Delay	90.5	4.2	99.6		188.9	70.2	
Queue Delay	0.0	0.3	0.7		0.0	5.0	
Total Delay	90.5	4.4	100.3		188.9	75.3	
LOS	F	A	F		F	E	
Approach Delay		22.6	100.3		94.4		
Approach LOS		C	F		F		
Queue Length 50th (ft)	168	148	~1401		~60	201	
Queue Length 95th (ft)	#331	128	#1528		#160	#383	
Internal Link Dist (ft)		352	531		589		
Turn Bay Length (ft)	120					165	
Base Capacity (vph)	234	2614	2144		60	336	
Starvation Cap Reductn	0	1029	0		0	0	
Spillback Cap Reductn	0	0	459		0	13	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.95	0.52	1.47		1.03	0.95	

Intersection Summary

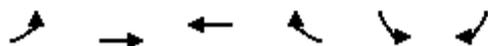
Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 130 (93%), Referenced to phase 2:Ped and 6:, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.16
 Intersection Signal Delay: 78.8
 Intersection LOS: E
 Intersection Capacity Utilization 98.2%
 ICU Level of Service F
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 401: Lawrenceville Hwy & Old Norcross Rd



HCM Signalized Intersection Capacity Analysis
401: Lawrenceville Hwy & Old Norcross Rd

Lawrenceville Hwy Study
2045 AM Alternatives



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	204	764	2231	48	57	282
Future Volume (vph)	204	764	2231	48	57	282
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	0%		6%	
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1585	3169	3175		1545	1382
Flt Permitted	0.04	1.00	1.00		0.95	1.00
Satd. Flow (perm)	67	3169	3175		1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	222	830	2425	52	62	307
RTOR Reduction (vph)	0	0	1	0	0	78
Lane Group Flow (vph)	222	830	2476	0	62	229
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	7	4	8		1	7
Permitted Phases	4					1
Actuated Green, G (s)	115.5	115.5	94.5		5.5	22.0
Effective Green, g (s)	115.5	115.5	94.5		5.5	22.0
Actuated g/C Ratio	0.82	0.82	0.68		0.04	0.16
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	234	2614	2143		60	261
v/s Ratio Prot	0.11	0.26	c0.78		0.04	c0.10
v/s Ratio Perm	0.67					0.06
v/c Ratio	0.95	0.32	1.16		1.03	0.88
Uniform Delay, d1	53.9	2.9	22.8		67.2	57.7
Progression Factor	1.05	1.32	1.00		1.00	1.00
Incremental Delay, d2	42.6	0.1	75.7		125.8	26.7
Delay (s)	99.2	3.9	98.4		193.1	84.4
Level of Service	F	A	F		F	F
Approach Delay (s)		24.0	98.4		102.6	
Approach LOS		C	F		F	

Intersection Summary

HCM 2000 Control Delay	78.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	98.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
402: Lawrenceville Hwy & Old Norcross Rd

Lawrenceville Hwy Study
2045 AM Alternatives

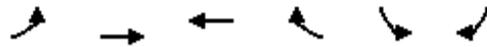


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑↑	↗		↙	↘
Traffic Volume (vph)	204	764	2231	48	57	282
Future Volume (vph)	204	764	2231	48	57	282
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	0%		6%	
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1585	3169	3175		1545	1382
Flt Permitted	0.04	1.00	1.00		0.95	1.00
Satd. Flow (perm)	67	3169	3175		1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	222	830	2425	52	62	307
RTOR Reduction (vph)	0	0	1	0	0	78
Lane Group Flow (vph)	222	830	2476	0	62	229
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	7	4	8		1	7
Permitted Phases	4					1
Actuated Green, G (s)	115.5	115.5	94.5		5.5	22.0
Effective Green, g (s)	115.5	115.5	94.5		5.5	22.0
Actuated g/C Ratio	0.82	0.82	0.68		0.04	0.16
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	234	2614	2143		60	217
v/s Ratio Prot	0.11	0.26	c0.78		0.04	c0.12
v/s Ratio Perm	0.67					0.04
v/c Ratio	0.95	0.32	1.16		1.03	1.06
Uniform Delay, d1	53.9	2.9	22.8		67.2	59.0
Progression Factor	1.24	0.64	1.00		1.00	1.00
Incremental Delay, d2	43.2	0.1	75.7		125.8	77.1
Delay (s)	110.2	1.9	98.4		193.1	136.1
Level of Service	F	A	F		F	F
Approach Delay (s)		24.8	98.4		145.6	
Approach LOS		C	F		F	

Intersection Summary

HCM 2000 Control Delay	83.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	98.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

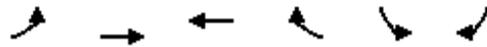
HCM Signalized Intersection Capacity Analysis
403: Lawrenceville Hwy & Old Norcross Rd



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	204	764	2231	48	57	282
Future Volume (vph)	204	764	2231	48	57	282
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	0%		6%	
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1585	3169	3175		1545	1382
Flt Permitted	0.04	1.00	1.00		0.95	1.00
Satd. Flow (perm)	67	3169	3175		1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	222	830	2425	52	62	307
RTOR Reduction (vph)	0	0	1	0	0	78
Lane Group Flow (vph)	222	830	2476	0	62	229
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	7	4	8		1	7
Permitted Phases	4					1
Actuated Green, G (s)	115.5	115.5	94.5		5.5	22.0
Effective Green, g (s)	115.5	115.5	94.5		5.5	22.0
Actuated g/C Ratio	0.82	0.82	0.68		0.04	0.16
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	234	2614	2143		60	261
v/s Ratio Prot	0.11	0.26	c0.78		0.04	c0.10
v/s Ratio Perm	0.67					0.06
v/c Ratio	0.95	0.32	1.16		1.03	0.88
Uniform Delay, d1	53.9	2.9	22.8		67.2	57.7
Progression Factor	1.00	0.64	1.00		1.00	1.00
Incremental Delay, d2	39.7	0.1	75.7		125.8	26.7
Delay (s)	93.5	1.9	98.4		193.1	84.4
Level of Service	F	A	F		F	F
Approach Delay (s)		21.2	98.4		102.6	
Approach LOS		C	F		F	

Intersection Summary				
HCM 2000 Control Delay		78.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio		1.06		
Actuated Cycle Length (s)		140.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization		98.2%	ICU Level of Service	F
Analysis Period (min)		15		
c Critical Lane Group				

Lanes, Volumes, Timings
404: Lawrenceville Hwy & Old Norcross Rd

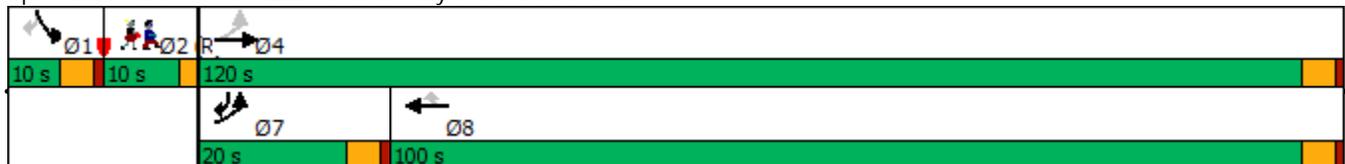


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø2
Lane Configurations							
Traffic Volume (vph)	204	764	2231	48	57	282	
Future Volume (vph)	204	764	2231	48	57	282	
Satd. Flow (prot)	1585	3169	3185	1425	1545	1382	
Flt Permitted	0.040				0.950		
Satd. Flow (perm)	67	3169	3185	1425	1545	1382	
Satd. Flow (RTOR)				30		92	
Lane Group Flow (vph)	222	830	2425	52	62	307	
Turn Type	pm+pt	NA	NA	Perm	Prot	pm+ov	
Protected Phases	7	4	8		1	7	2
Permitted Phases	4			8		1	
Total Split (s)	20.0	120.0	100.0	100.0	10.0	20.0	10.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	
Act Effect Green (s)	115.5	115.5	95.5	95.5	5.5	21.0	
Actuated g/C Ratio	0.82	0.82	0.68	0.68	0.04	0.15	
v/c Ratio	1.00	0.32	1.12	0.05	1.03	1.08	
Control Delay	107.6	2.2	82.8	3.9	188.9	111.5	
Queue Delay	0.0	0.2	0.7	0.0	0.0	8.8	
Total Delay	107.6	2.4	83.5	3.9	188.9	120.2	
LOS	F	A	F	A	F	F	
Approach Delay		24.6	81.8		131.8		
Approach LOS		C	F		F		
Queue Length 50th (ft)	162	48	~1331	6	~60	~211	
Queue Length 95th (ft)	#335	58	#1457	20	#160	#438	
Internal Link Dist (ft)		371	483		379		
Turn Bay Length (ft)	200			200		165	
Base Capacity (vph)	223	2614	2172	981	60	285	
Starvation Cap Reductn	0	987	0	0	0	0	
Spillback Cap Reductn	0	0	472	0	0	13	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	1.00	0.51	1.43	0.05	1.03	1.13	

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 2 (1%), Referenced to phase 2:Ped and 6:, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.12
 Intersection Signal Delay: 71.1
 Intersection LOS: E
 Intersection Capacity Utilization 96.5%
 ICU Level of Service F
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 404: Lawrenceville Hwy & Old Norcross Rd



HCM Signalized Intersection Capacity Analysis
404: Lawrenceville Hwy & Old Norcross Rd

Lawrenceville Hwy Study
2045 AM Alternatives



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	204	764	2231	48	57	282
Future Volume (vph)	204	764	2231	48	57	282
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	0%		6%	
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1585	3169	3185	1425	1545	1382
Flt Permitted	0.04	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	67	3169	3185	1425	1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	222	830	2425	52	62	307
RTOR Reduction (vph)	0	0	0	10	0	78
Lane Group Flow (vph)	222	830	2425	42	62	229
Turn Type	pm+pt	NA	NA	Perm	Prot	pm+ov
Protected Phases	7	4	8		1	7
Permitted Phases	4			8		1
Actuated Green, G (s)	115.5	115.5	95.5	95.5	5.5	21.0
Effective Green, g (s)	115.5	115.5	95.5	95.5	5.5	21.0
Actuated g/C Ratio	0.82	0.82	0.68	0.68	0.04	0.15
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	223	2614	2172	972	60	207
v/s Ratio Prot	0.11	0.26	c0.76		0.04	c0.12
v/s Ratio Perm	0.71			0.03		0.04
v/c Ratio	1.00	0.32	1.12	0.04	1.03	1.11
Uniform Delay, d1	54.9	2.9	22.2	7.3	67.2	59.5
Progression Factor	1.18	0.64	1.00	1.00	1.00	1.00
Incremental Delay, d2	56.9	0.1	59.4	0.0	125.8	93.6
Delay (s)	121.6	1.9	81.7	7.3	193.1	153.1
Level of Service	F	A	F	A	F	F
Approach Delay (s)		27.2	80.1		159.8	
Approach LOS		C	F		F	

Intersection Summary

HCM 2000 Control Delay	73.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	96.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
405: Lawrenceville Hwy & Old Norcross Rd

Lawrenceville Hwy Study
2045 AM Alternatives



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	204	764	2231	48	57	282
Future Volume (vph)	204	764	2231	48	57	282
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	0%		6%	
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1585	3169	3175		1545	1382
Flt Permitted	0.04	1.00	1.00		0.95	1.00
Satd. Flow (perm)	70	3169	3175		1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	222	830	2425	52	62	307
RTOR Reduction (vph)	0	0	1	0	0	0
Lane Group Flow (vph)	222	830	2476	0	62	307
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	7	4	8		1	7
Permitted Phases	4					1
Actuated Green, G (s)	116.5	116.5	91.5		5.5	26.0
Effective Green, g (s)	116.5	116.5	91.5		5.5	26.0
Actuated g/C Ratio	0.83	0.83	0.65		0.04	0.19
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	280	2637	2075		60	256
v/s Ratio Prot	0.12	0.26	c0.78		0.04	c0.18
v/s Ratio Perm	0.55					0.05
v/c Ratio	0.79	0.31	1.19		1.03	1.20
Uniform Delay, d1	50.2	2.7	24.2		67.2	57.0
Progression Factor	0.99	1.19	1.00		1.00	1.00
Incremental Delay, d2	13.5	0.1	92.0		125.8	121.0
Delay (s)	63.2	3.2	116.3		193.1	178.0
Level of Service	E	A	F		F	F
Approach Delay (s)		15.9	116.3		180.5	
Approach LOS		B	F		F	

Intersection Summary

HCM 2000 Control Delay	95.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	98.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
420: Lawrenceville Hwy & Old Norcross Rd

Lawrenceville Hwy Study
2045 AM Alternatives



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	204	764	2231	48	57	282
Future Volume (vph)	204	764	2231	48	57	282
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	0%		6%	
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1585	3169	3185	1425	1545	1382
Flt Permitted	0.04	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	70	3169	3185	1425	1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	222	830	2425	52	62	307
RTOR Reduction (vph)	0	0	0	10	0	0
Lane Group Flow (vph)	222	830	2425	42	62	307
Turn Type	pm+pt	NA	NA	Perm	Prot	pm+ov
Protected Phases	7	4	8		1	7
Permitted Phases	4			8		1
Actuated Green, G (s)	114.5	114.5	90.5	90.5	5.5	25.0
Effective Green, g (s)	114.5	114.5	90.5	90.5	5.5	25.0
Actuated g/C Ratio	0.82	0.82	0.65	0.65	0.04	0.18
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	268	2591	2058	921	60	246
v/s Ratio Prot	0.12	0.26	c0.76		0.04	c0.17
v/s Ratio Perm	0.56			0.03		0.05
v/c Ratio	0.83	0.32	1.18	0.05	1.03	1.25
Uniform Delay, d1	50.7	3.1	24.8	9.0	67.2	57.5
Progression Factor	0.85	1.33	1.00	1.00	1.00	1.00
Incremental Delay, d2	17.7	0.1	85.7	0.0	125.8	140.8
Delay (s)	61.0	4.3	110.4	9.0	193.1	198.3
Level of Service	E	A	F	A	F	F
Approach Delay (s)		16.2	108.3		197.4	
Approach LOS		B	F		F	

Intersection Summary

HCM 2000 Control Delay	91.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	96.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

2045 PM Peak



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	897	666	63	14	575	745	25	41	6	793	51	1073
Future Volume (vph)	897	666	63	14	575	745	25	41	6	793	51	1073
Satd. Flow (prot)	3074	3128	0	1569	3138	1404	0	1547	0	1490	1503	1404
Flt Permitted	0.950			0.352				0.983		0.950	0.958	
Satd. Flow (perm)	3074	3128	0	581	3138	1404	0	1547	0	1490	1503	1404
Satd. Flow (RTOR)		9				654		3				688
Lane Group Flow (vph)	975	792	0	15	625	810	0	79	0	457	460	1166
Turn Type	Prot	NA		Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	7	4			8		2	2		6	6	
Permitted Phases				8		8						6
Total Split (s)	37.0	66.0		29.0	29.0	29.0	25.0	25.0		49.0	49.0	49.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	4.5
Act Effect Green (s)	32.5	61.5		24.5	24.5	24.5		20.5		44.5	44.5	44.5
Actuated g/C Ratio	0.23	0.44		0.18	0.18	0.18		0.15		0.32	0.32	0.32
v/c Ratio	1.37	0.57		0.15	1.14	1.03		0.34		0.97	0.96	1.27
Control Delay	214.8	31.1		53.2	133.4	51.8		56.4		80.8	80.2	149.4
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	0.0
Total Delay	214.8	31.1		53.2	133.4	51.8		56.4		80.8	80.2	149.4
LOS	F	C		D	F	D		E		F	F	F
Approach Delay		132.5			87.0			56.4			119.1	
Approach LOS		F			F			E			F	
Queue Length 50th (ft)	~602	277		12	~348	~265		63		431	433	~889
Queue Length 95th (ft)	#735	343		34	#473	#518		117		#666	#668	#1157
Internal Link Dist (ft)		1077			1085			510			1031	
Turn Bay Length (ft)	245			225						286		
Base Capacity (vph)	713	1379		101	549	785		229		473	477	915
Starvation Cap Reductn	0	0		0	0	0		0		0	0	0
Spillback Cap Reductn	0	0		0	0	0		0		0	0	0
Storage Cap Reductn	0	0		0	0	0		0		0	0	0
Reduced v/c Ratio	1.37	0.57		0.15	1.14	1.03		0.34		0.97	0.96	1.27

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.37

Intersection Signal Delay: 113.9

Intersection LOS: F

Intersection Capacity Utilization 107.1%

ICU Level of Service G

Analysis Period (min) 15

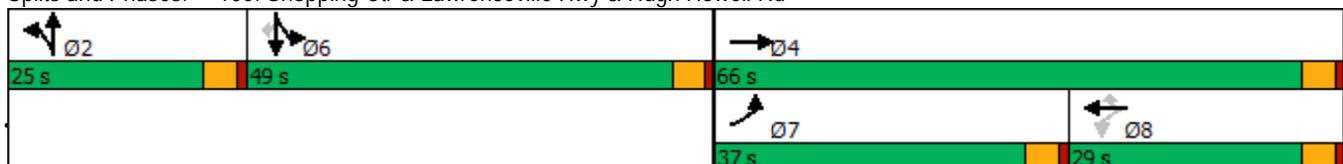
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

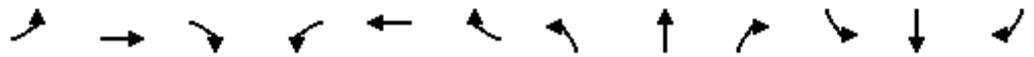
Queue shown is maximum after two cycles.

Splits and Phases: 100: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd



HCM Signalized Intersection Capacity Analysis
 100: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd

Lawrenceville Hwy Study
 2045 PM Alternatives



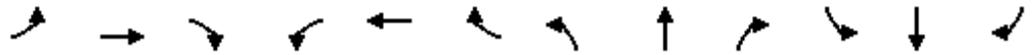
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↔		↔	↕↕	↔		↕↔		↔	↕↔	↔
Traffic Volume (vph)	897	666	63	14	575	745	25	41	6	793	51	1073
Future Volume (vph)	897	666	63	14	575	745	25	41	6	793	51	1073
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			3%			10%				3%
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	4.5
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85		0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98		0.95	0.96	1.00
Satd. Flow (prot)	3074	3129		1569	3138	1404		1547		1490	1503	1404
Flt Permitted	0.95	1.00		0.35	1.00	1.00		0.98		0.95	0.96	1.00
Satd. Flow (perm)	3074	3129		581	3138	1404		1547		1490	1503	1404
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	975	724	68	15	625	810	27	45	7	862	55	1166
RTOR Reduction (vph)	0	5	0	0	0	540	0	3	0	0	0	469
Lane Group Flow (vph)	975	787	0	15	625	270	0	76	0	457	460	697
Turn Type	Prot	NA		Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	7	4			8		2	2		6	6	
Permitted Phases				8		8						6
Actuated Green, G (s)	32.5	61.5		24.5	24.5	24.5		20.5		44.5	44.5	44.5
Effective Green, g (s)	32.5	61.5		24.5	24.5	24.5		20.5		44.5	44.5	44.5
Actuated g/C Ratio	0.23	0.44		0.18	0.18	0.18		0.15		0.32	0.32	0.32
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	713	1374		101	549	245		226		473	477	446
v/s Ratio Prot	c0.32	0.25			c0.20			c0.05		0.31	0.31	
v/s Ratio Perm				0.03		0.19						c0.50
v/c Ratio	1.37	0.57		0.15	1.14	1.10		0.34		0.97	0.96	1.56
Uniform Delay, d1	53.8	29.4		48.9	57.8	57.8		53.7		47.0	47.0	47.8
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	174.3	0.6		0.7	82.6	88.1		4.0		33.8	33.2	263.7
Delay (s)	228.0	30.0		49.6	140.4	145.9		57.7		80.8	80.2	311.4
Level of Service	F	C		D	F	F		E		F	F	F
Approach Delay (s)		139.3			142.5			57.7			209.8	
Approach LOS		F			F			E			F	

Intersection Summary

HCM 2000 Control Delay	166.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	107.1%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 101: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd

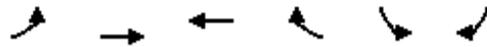
Lawrenceville Hwy Study
 2045 PM Alternatives



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	897	666	63	0	575	745	0	0	33	818	0	1099
Future Volume (vph)	897	666	63	0	575	745	0	0	33	818	0	1099
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			3%			10%				3%
Total Lost time (s)	4.5	4.5			4.5	4.5			4.5	4.5		4.5
Lane Util. Factor	0.97	0.95			0.95	1.00			1.00	0.97		1.00
Frt	1.00	0.99			1.00	0.85			0.86	1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00			1.00	0.95		1.00
Satd. Flow (prot)	3074	3129			3138	1404			1378	3043		1404
Flt Permitted	0.95	1.00			1.00	1.00			1.00	0.95		1.00
Satd. Flow (perm)	3074	3129			3138	1404			1378	3043		1404
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	975	724	68	0	625	810	0	0	36	889	0	1195
RTOR Reduction (vph)	0	5	0	0	0	572	0	0	19	0	0	348
Lane Group Flow (vph)	975	787	0	0	625	238	0	0	17	889	0	847
Turn Type	Prot	NA			NA	Perm			Perm	Prot		Perm
Protected Phases	7	4			8					1		
Permitted Phases						8			6			6
Actuated Green, G (s)	36.5	66.5			25.5	25.5			64.5	64.5		64.5
Effective Green, g (s)	36.5	66.5			25.5	25.5			64.5	64.5		64.5
Actuated g/C Ratio	0.26	0.48			0.18	0.18			0.46	0.46		0.46
Clearance Time (s)	4.5	4.5			4.5	4.5			4.5	4.5		4.5
Vehicle Extension (s)	3.0	3.0			3.0	3.0			3.0	3.0		3.0
Lane Grp Cap (vph)	801	1486			571	255			634	1401		646
v/s Ratio Prot	c0.32	0.25			c0.20					0.29		
v/s Ratio Perm						0.17			0.01			c0.60
v/c Ratio	1.22	0.53			1.09	0.93			0.03	0.63		1.31
Uniform Delay, d1	51.8	25.8			57.2	56.4			20.6	28.8		37.8
Progression Factor	1.00	1.00			1.00	1.00			1.00	1.00		1.00
Incremental Delay, d2	109.0	0.3			66.1	38.7			0.1	0.9		150.7
Delay (s)	160.8	26.1			123.3	95.1			20.7	29.7		188.4
Level of Service	F	C			F	F			C	C		F
Approach Delay (s)		100.4			107.4			20.7				120.7
Approach LOS		F			F			C				F

Intersection Summary			
HCM 2000 Control Delay	109.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.24		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	100.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
 102: Lawrenceville Hwy & Hugh Howell Rd

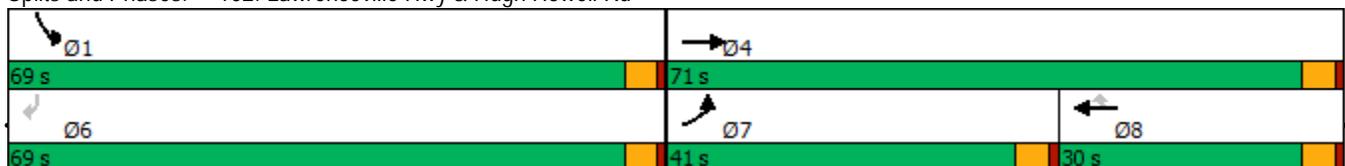


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖↗	↑↑	↑↑	↖	↖↗	↖
Traffic Volume (vph)	897	698	575	745	818	1099
Future Volume (vph)	897	698	575	745	818	1099
Satd. Flow (prot)	3074	3169	3138	1404	3043	1404
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3074	3169	3138	1404	3043	1404
Satd. Flow (RTOR)				699		646
Lane Group Flow (vph)	975	759	625	810	889	1195
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		1	
Permitted Phases				8		6
Total Split (s)	41.0	71.0	30.0	30.0	69.0	69.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Act Effect Green (s)	36.5	66.5	25.5	25.5	64.5	64.5
Actuated g/C Ratio	0.26	0.48	0.18	0.18	0.46	0.46
v/c Ratio	1.22	0.50	1.09	0.98	0.63	1.20
Control Delay	152.7	26.8	118.3	35.6	31.3	117.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	152.7	26.8	118.3	35.6	31.3	117.7
LOS	F	C	F	D	C	F
Approach Delay		97.6	71.6		80.9	
Approach LOS		F	E		F	
Queue Length 50th (ft)	~559	246	~337	130	312	~985
Queue Length 95th (ft)	#692	305	#462	#446	384	#1253
Internal Link Dist (ft)		1076	973		988	
Turn Bay Length (ft)	245				286	
Base Capacity (vph)	801	1505	571	827	1401	995
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.22	0.50	1.09	0.98	0.63	1.20

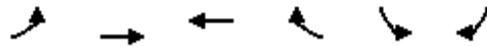
Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.22
 Intersection Signal Delay: 83.9
 Intersection LOS: F
 Intersection Capacity Utilization 100.8%
 ICU Level of Service G
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 102: Lawrenceville Hwy & Hugh Howell Rd



HCM Signalized Intersection Capacity Analysis
 102: Lawrenceville Hwy & Hugh Howell Rd

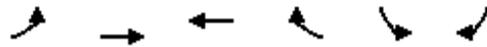


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	897	698	575	745	818	1099
Future Volume (vph)	897	698	575	745	818	1099
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	3%		3%	
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3074	3169	3138	1404	3043	1404
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3074	3169	3138	1404	3043	1404
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	975	759	625	810	889	1195
RTOR Reduction (vph)	0	0	0	572	0	348
Lane Group Flow (vph)	975	759	625	238	889	847
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		1	
Permitted Phases				8		6
Actuated Green, G (s)	36.5	66.5	25.5	25.5	64.5	64.5
Effective Green, g (s)	36.5	66.5	25.5	25.5	64.5	64.5
Actuated g/C Ratio	0.26	0.48	0.18	0.18	0.46	0.46
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	801	1505	571	255	1401	646
v/s Ratio Prot	c0.32	0.24	c0.20		0.29	
v/s Ratio Perm				0.17		c0.60
v/c Ratio	1.22	0.50	1.09	0.93	0.63	1.31
Uniform Delay, d1	51.8	25.4	57.2	56.4	28.8	37.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	109.0	0.3	66.1	38.7	0.9	150.7
Delay (s)	160.8	25.6	123.3	95.1	29.7	188.4
Level of Service	F	C	F	F	C	F
Approach Delay (s)		101.6	107.4		120.7	
Approach LOS		F	F		F	

Intersection Summary

HCM 2000 Control Delay	110.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.24		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	100.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
103: Lawrenceville Hwy & Hugh Howell Rd

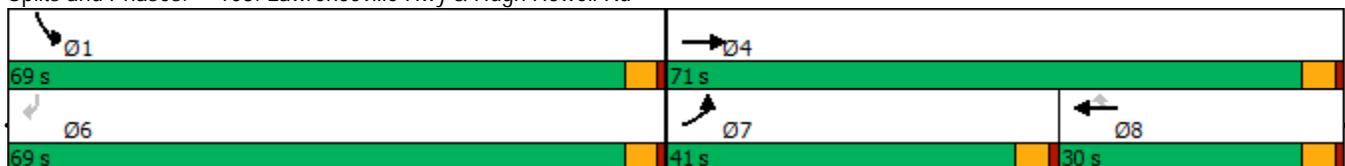


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖↗	↑↑	↑↑	↖	↖↗	↖
Traffic Volume (vph)	897	698	575	745	818	1099
Future Volume (vph)	897	698	575	745	818	1099
Satd. Flow (prot)	3074	3169	3138	1404	3043	1404
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3074	3169	3138	1404	3043	1404
Satd. Flow (RTOR)				699		646
Lane Group Flow (vph)	975	759	625	810	889	1195
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		1	
Permitted Phases				8		6
Total Split (s)	41.0	71.0	30.0	30.0	69.0	69.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Act Effect Green (s)	36.5	66.5	25.5	25.5	64.5	64.5
Actuated g/C Ratio	0.26	0.48	0.18	0.18	0.46	0.46
v/c Ratio	1.22	0.50	1.09	0.98	0.63	1.20
Control Delay	152.7	26.8	118.3	35.6	31.3	117.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	152.7	26.8	118.3	35.6	31.3	117.7
LOS	F	C	F	D	C	F
Approach Delay		97.6	71.6		80.9	
Approach LOS		F	E		F	
Queue Length 50th (ft)	~559	246	~337	130	312	~985
Queue Length 95th (ft)	#692	305	#462	#446	384	#1253
Internal Link Dist (ft)		1672	1095		1103	
Turn Bay Length (ft)	1000				286	
Base Capacity (vph)	801	1505	571	827	1401	995
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.22	0.50	1.09	0.98	0.63	1.20

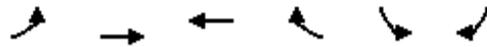
Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.22
 Intersection Signal Delay: 83.9
 Intersection LOS: F
 Intersection Capacity Utilization 100.8%
 ICU Level of Service G
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 103: Lawrenceville Hwy & Hugh Howell Rd



HCM Signalized Intersection Capacity Analysis
 103: Lawrenceville Hwy & Hugh Howell Rd



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	897	698	575	745	818	1099
Future Volume (vph)	897	698	575	745	818	1099
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	3%		3%	
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3074	3169	3138	1404	3043	1404
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3074	3169	3138	1404	3043	1404
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	975	759	625	810	889	1195
RTOR Reduction (vph)	0	0	0	572	0	348
Lane Group Flow (vph)	975	759	625	238	889	847
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		1	
Permitted Phases				8		6
Actuated Green, G (s)	36.5	66.5	25.5	25.5	64.5	64.5
Effective Green, g (s)	36.5	66.5	25.5	25.5	64.5	64.5
Actuated g/C Ratio	0.26	0.48	0.18	0.18	0.46	0.46
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	801	1505	571	255	1401	646
v/s Ratio Prot	c0.32	0.24	c0.20		0.29	
v/s Ratio Perm				0.17		c0.60
v/c Ratio	1.22	0.50	1.09	0.93	0.63	1.31
Uniform Delay, d1	51.8	25.4	57.2	56.4	28.8	37.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	109.0	0.3	66.1	38.7	0.9	150.7
Delay (s)	160.8	25.6	123.3	95.1	29.7	188.4
Level of Service	F	C	F	F	C	F
Approach Delay (s)		101.6	107.4		120.7	
Approach LOS		F	F		F	

Intersection Summary

HCM 2000 Control Delay	110.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.24		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	100.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
 104: Lawrenceville Hwy & Hugh Howell Rd

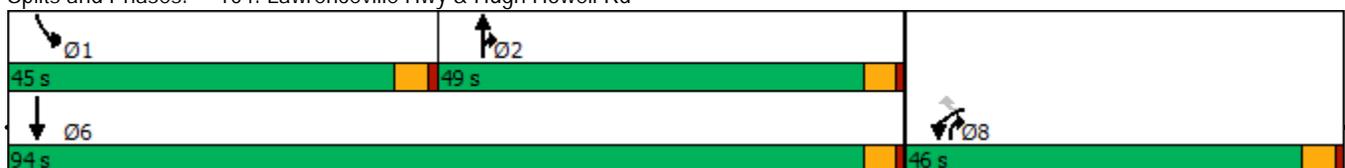


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔	↔	↕↕	↔↔	↔↔	↕↕
Traffic Volume (vph)	575	745	897	698	818	1099
Future Volume (vph)	575	745	897	698	818	1099
Satd. Flow (prot)	3090	1425	3185	2508	3090	3185
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3090	1425	3185	2508	3090	3185
Satd. Flow (RTOR)		528		29		
Lane Group Flow (vph)	625	810	975	759	889	1195
Turn Type	Prot	Perm	NA	pt+ov	Prot	NA
Protected Phases	8		2	2 8	1	6
Permitted Phases		8				
Total Split (s)	46.0	46.0	49.0		45.0	94.0
Total Lost Time (s)	4.5	4.5	4.5		4.5	4.5
Act Effect Green (s)	41.5	41.5	44.5	90.5	40.5	89.5
Actuated g/C Ratio	0.30	0.30	0.32	0.65	0.29	0.64
v/c Ratio	0.68	1.02	0.96	0.47	1.00	0.59
Control Delay	48.0	54.6	67.6	13.1	78.4	16.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	54.6	67.6	13.1	78.4	16.1
LOS	D	D	E	B	E	B
Approach Delay	51.7		43.7			42.6
Approach LOS	D		D			D
Queue Length 50th (ft)	259	-420	460	178	417	311
Queue Length 95th (ft)	328	#673	#602	227	#561	374
Internal Link Dist (ft)	1382		1165			1496
Turn Bay Length (ft)				300	286	
Base Capacity (vph)	915	793	1012	1631	893	2036
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.68	1.02	0.96	0.47	1.00	0.59

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.02
 Intersection Signal Delay: 45.5
 Intersection LOS: D
 Intersection Capacity Utilization 86.3%
 ICU Level of Service E
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 104: Lawrenceville Hwy & Hugh Howell Rd



HCM Signalized Intersection Capacity Analysis
 104: Lawrenceville Hwy & Hugh Howell Rd



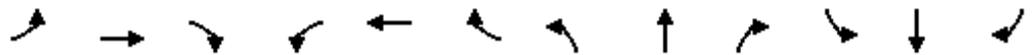
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	575	745	897	698	818	1099
Future Volume (vph)	575	745	897	698	818	1099
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	1.00	0.95	0.88	0.97	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3090	1425	3185	2508	3090	3185
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3090	1425	3185	2508	3090	3185
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	625	810	975	759	889	1195
RTOR Reduction (vph)	0	371	0	10	0	0
Lane Group Flow (vph)	625	439	975	749	889	1195
Turn Type	Prot	Perm	NA	pt+ov	Prot	NA
Protected Phases	8		2	2	8	1
Permitted Phases		8				6
Actuated Green, G (s)	41.5	41.5	44.5	90.5	40.5	89.5
Effective Green, g (s)	41.5	41.5	44.5	90.5	40.5	89.5
Actuated g/C Ratio	0.30	0.30	0.32	0.65	0.29	0.64
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	915	422	1012	1621	893	2036
v/s Ratio Prot	0.20		c0.31	0.30	c0.29	0.38
v/s Ratio Perm		c0.31				
v/c Ratio	0.68	1.04	0.96	0.46	1.00	0.59
Uniform Delay, d1	43.4	49.2	47.0	12.5	49.7	14.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.1	54.3	20.7	0.2	28.8	1.2
Delay (s)	45.6	103.6	67.7	12.7	78.5	15.8
Level of Service	D	F	E	B	E	B
Approach Delay (s)	78.3		43.6			42.6
Approach LOS	E		D			D

Intersection Summary

HCM 2000 Control Delay	52.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	86.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
 105: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd

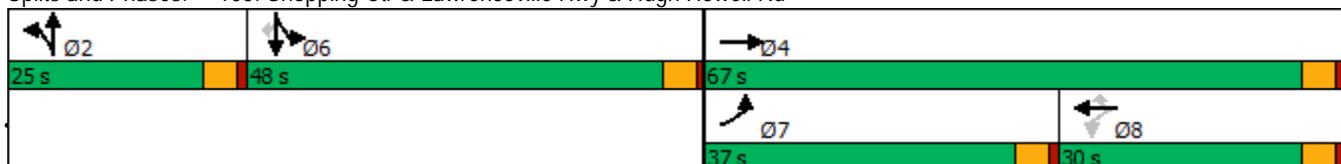


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	897	666	63	14	575	745	25	41	6	793	51	1073
Future Volume (vph)	897	666	63	14	575	745	25	41	6	793	51	1073
Satd. Flow (prot)	3074	3128	0	1569	3138	1404	0	1547	0	1490	1503	1404
Flt Permitted	0.950			0.352				0.983		0.950	0.958	
Satd. Flow (perm)	3074	3128	0	581	3138	1404	0	1547	0	1490	1503	1404
Satd. Flow (RTOR)		9				542		3				680
Lane Group Flow (vph)	975	792	0	15	625	810	0	79	0	457	460	1166
Turn Type	Prot	NA		Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	7	4			8		2	2		6	6	
Permitted Phases				8		8						6
Total Split (s)	37.0	67.0		30.0	30.0	30.0	25.0	25.0		48.0	48.0	48.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	4.5
Act Effct Green (s)	32.5	62.5		25.5	25.5	25.5		20.5		43.5	43.5	43.5
Actuated g/C Ratio	0.23	0.45		0.18	0.18	0.18		0.15		0.31	0.31	0.31
v/c Ratio	1.37	0.57		0.14	1.09	1.16		0.34		0.99	0.99	1.29
Control Delay	214.8	30.3		52.1	118.3	103.5		56.4		87.1	85.9	156.4
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	0.0
Total Delay	214.8	30.3		52.1	118.3	103.5		56.4		87.1	85.9	156.4
LOS	F	C		D	F	F		E		F	F	F
Approach Delay		132.1			109.4			56.4			125.6	
Approach LOS		F			F			E			F	
Queue Length 50th (ft)	~602	273		12	-337	~442		63		435	438	~900
Queue Length 95th (ft)	#735	338		34	#462	#695		117		#676	#678	#1168
Internal Link Dist (ft)		855			1243			430			1063	
Turn Bay Length (ft)	245			225		150				286		
Base Capacity (vph)	713	1401		105	571	699		229		462	467	904
Starvation Cap Reductn	0	0		0	0	0		0		0	0	0
Spillback Cap Reductn	0	0		0	0	0		0		0	0	0
Storage Cap Reductn	0	0		0	0	0		0		0	0	0
Reduced v/c Ratio	1.37	0.57		0.14	1.09	1.16		0.34		0.99	0.99	1.29

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.37
 Intersection Signal Delay: 122.3
 Intersection LOS: F
 Intersection Capacity Utilization 107.1%
 ICU Level of Service G
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 105: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd



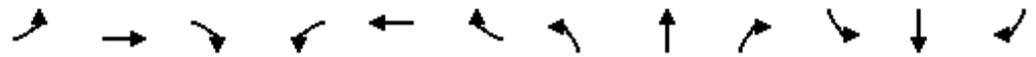
HCM Signalized Intersection Capacity Analysis
 105: Shopping Ctr & Lawrenceville Hwy & Hugh Howell Rd

Lawrenceville Hwy Study
 2045 PM Alternatives

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 		 	 			 		 	 	 
Traffic Volume (vph)	897	666	63	14	575	745	25	41	6	793	51	1073
Future Volume (vph)	897	666	63	14	575	745	25	41	6	793	51	1073
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			3%			10%			3%	
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	4.5
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85		0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98		0.95	0.96	1.00
Satd. Flow (prot)	3074	3129		1569	3138	1404		1547		1490	1503	1404
Flt Permitted	0.95	1.00		0.35	1.00	1.00		0.98		0.95	0.96	1.00
Satd. Flow (perm)	3074	3129		581	3138	1404		1547		1490	1503	1404
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	975	724	68	15	625	810	27	45	7	862	55	1166
RTOR Reduction (vph)	0	5	0	0	0	443	0	3	0	0	0	469
Lane Group Flow (vph)	975	787	0	15	625	367	0	76	0	457	460	697
Turn Type	Prot	NA		Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	7	4			8		2	2		6	6	
Permitted Phases				8		8						6
Actuated Green, G (s)	32.5	62.5		25.5	25.5	25.5		20.5		43.5	43.5	43.5
Effective Green, g (s)	32.5	62.5		25.5	25.5	25.5		20.5		43.5	43.5	43.5
Actuated g/C Ratio	0.23	0.45		0.18	0.18	0.18		0.15		0.31	0.31	0.31
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	713	1396		105	571	255		226		462	467	436
v/s Ratio Prot	c0.32	0.25			0.20			c0.05		0.31	0.31	
v/s Ratio Perm				0.03		c0.26						c0.50
v/c Ratio	1.37	0.56		0.14	1.09	1.44		0.34		0.99	0.99	1.60
Uniform Delay, d1	53.8	28.7		48.1	57.2	57.2		53.7		48.0	47.9	48.2
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	174.3	0.5		0.6	66.1	218.1		4.0		39.3	38.1	280.3
Delay (s)	228.0	29.2		48.7	123.3	275.4		57.7		87.3	86.0	328.5
Level of Service	F	C		D	F	F		E		F	F	F
Approach Delay (s)		138.9			207.5			57.7			222.0	
Approach LOS		F			F			E			F	
Intersection Summary												
HCM 2000 Control Delay			188.4									F
HCM 2000 Volume to Capacity ratio			1.29									
Actuated Cycle Length (s)			140.0							18.0		
Intersection Capacity Utilization			107.1%									G
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
200: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
2045 PM Alternatives

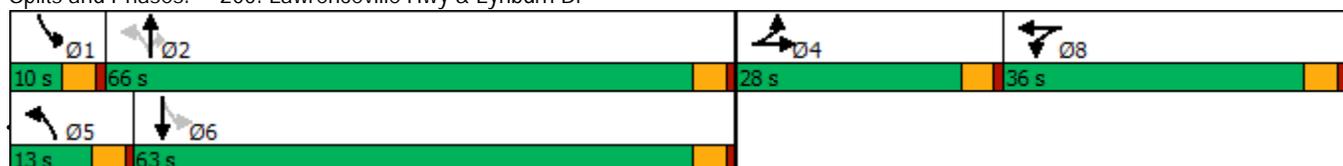


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖	↗		↖	↕	↗	↖	↕	↗
Traffic Volume (vph)	98	54	162	388	130	96	160	1253	270	74	1367	108
Future Volume (vph)	98	54	162	388	130	96	160	1253	270	74	1367	108
Satd. Flow (prot)	0	1507	0	1545	1522	0	1617	3233	1446	1577	3119	0
Flt Permitted		0.985		0.950			0.065			0.068		
Satd. Flow (perm)	0	1507	0	1545	1522	0	111	3233	1446	113	3119	0
Satd. Flow (RTOR)		33			24				169		7	
Lane Group Flow (vph)	0	342	0	422	245	0	174	1362	293	80	1603	0
Turn Type	Split	NA		Split	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases							2		2	6		
Total Split (s)	28.0	28.0		36.0	36.0		13.0	66.0	66.0	10.0	63.0	
Total Lost Time (s)		4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Act Effct Green (s)		23.5		31.5	31.5		70.0	61.5	61.5	64.0	58.5	
Actuated g/C Ratio		0.17		0.22	0.22		0.50	0.44	0.44	0.46	0.42	
v/c Ratio		1.22		1.22	0.68		1.19	0.96	0.40	0.73	1.23	
Control Delay		170.5		166.0	55.2		165.7	54.1	12.4	58.7	144.9	
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		170.5		166.0	55.2		165.7	54.1	12.4	58.7	144.9	
LOS		F		F	E		F	D	B	E	F	
Approach Delay		170.5			125.3			58.0			140.8	
Approach LOS		F			F			E			F	
Queue Length 50th (ft)		~356		~469	186		~143	624	70	37	~946	
Queue Length 95th (ft)		#556		#681	286		#300	#788	145	#116	#1087	
Internal Link Dist (ft)		515			434			603			658	
Turn Bay Length (ft)				90			180		200	135		
Base Capacity (vph)		280		347	361		146	1420	729	109	1307	
Starvation Cap Reductn		0		0	0		0	0	0	0	0	
Spillback Cap Reductn		0		0	0		0	0	0	0	0	
Storage Cap Reductn		0		0	0		0	0	0	0	0	
Reduced v/c Ratio		1.22		1.22	0.68		1.19	0.96	0.40	0.73	1.23	

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.23
 Intersection Signal Delay: 107.3
 Intersection LOS: F
 Intersection Capacity Utilization 114.8%
 ICU Level of Service H
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 200: Lawrenceville Hwy & Lynburn Dr



HCM Signalized Intersection Capacity Analysis
200: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
2045 PM Alternatives



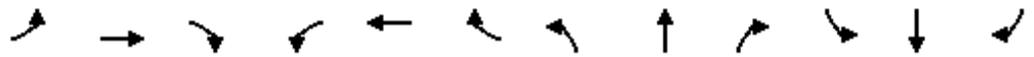
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖	↗		↖	↕	↗	↖	↕	↗
Traffic Volume (vph)	98	54	162	388	130	96	160	1253	270	74	1367	108
Future Volume (vph)	98	54	162	388	130	96	160	1253	270	74	1367	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			6%			-3%				2%
Total Lost time (s)		4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt		0.93		1.00	0.94		1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.98		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1505		1545	1523		1617	3233	1446	1577	3119	
Flt Permitted		0.98		0.95	1.00		0.07	1.00	1.00	0.07	1.00	
Satd. Flow (perm)		1505		1545	1523		111	3233	1446	113	3119	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	107	59	176	422	141	104	174	1362	293	80	1486	117
RTOR Reduction (vph)	0	27	0	0	19	0	0	0	95	0	4	0
Lane Group Flow (vph)	0	315	0	422	226	0	174	1362	198	80	1599	0
Turn Type	Split	NA		Split	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases							2		2	6		
Actuated Green, G (s)		23.5		31.5	31.5		70.0	61.5	61.5	64.0	58.5	
Effective Green, g (s)		23.5		31.5	31.5		70.0	61.5	61.5	64.0	58.5	
Actuated g/C Ratio		0.17		0.22	0.22		0.50	0.44	0.44	0.46	0.42	
Clearance Time (s)		4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		252		347	342		146	1420	635	109	1303	
v/s Ratio Prot		c0.21		c0.27	0.15		c0.07	0.42		0.03	0.51	
v/s Ratio Perm							c0.52		0.14	0.30		
v/c Ratio		1.25		1.22	0.66		1.19	0.96	0.31	0.73	1.23	
Uniform Delay, d1		58.2		54.2	49.4		40.3	38.0	25.5	30.2	40.8	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		140.3		120.8	4.8		135.2	15.9	1.3	22.3	109.2	
Delay (s)		198.5		175.0	54.2		175.5	54.0	26.8	52.6	149.9	
Level of Service		F		F	D		F	D	C	D	F	
Approach Delay (s)		198.5			130.6			61.2			145.3	
Approach LOS		F			F			E			F	

Intersection Summary

HCM 2000 Control Delay	113.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.23		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	114.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
201: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
2045 PM Alternatives

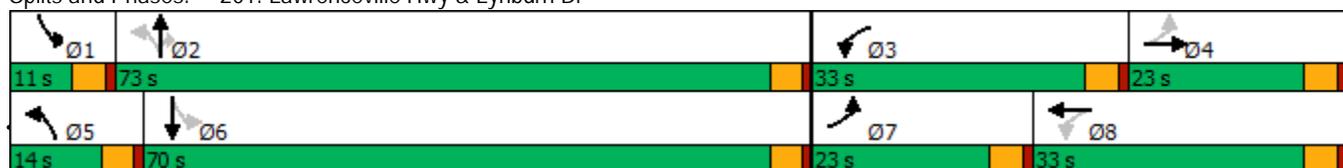


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↑↑	↗	↖	↗↖	
Traffic Volume (vph)	98	54	162	388	130	96	160	1253	270	74	1367	108
Future Volume (vph)	98	54	162	388	130	96	160	1253	270	74	1367	108
Satd. Flow (prot)	1561	1459	0	1545	1522	0	1617	3233	1446	1577	3119	0
Flt Permitted	0.607			0.184			0.058			0.081		
Satd. Flow (perm)	997	1459	0	299	1522	0	99	3233	1446	134	3119	0
Satd. Flow (RTOR)		88			24				185		8	
Lane Group Flow (vph)	107	235	0	422	245	0	174	1362	293	80	1603	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		
Total Split (s)	23.0	23.0		33.0	33.0		14.0	73.0	73.0	11.0	70.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Act Effct Green (s)	29.3	17.2		50.3	33.7		78.1	68.6	68.6	72.0	65.5	
Actuated g/C Ratio	0.21	0.12		0.36	0.24		0.56	0.49	0.49	0.52	0.47	
v/c Ratio	0.41	0.91		1.16	0.63		1.09	0.85	0.36	0.59	1.09	
Control Delay	37.0	74.3		135.7	51.3		131.4	37.5	9.1	34.5	85.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	37.0	74.3		135.7	51.3		131.4	37.5	9.1	34.5	85.7	
LOS	D	E		F	D		F	D	A	C	F	
Approach Delay		62.6			104.7			41.9			83.3	
Approach LOS		E			F			D			F	
Queue Length 50th (ft)	66	136		~408	180		~133	563	53	32	~866	
Queue Length 95th (ft)	112	#291		#622	289		#290	673	119	#75	#1007	
Internal Link Dist (ft)		540			417			619			674	
Turn Bay Length (ft)	150			90			180		200	135		
Base Capacity (vph)	332	271		364	387		159	1596	807	136	1476	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.32	0.87		1.16	0.63		1.09	0.85	0.36	0.59	1.09	

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 138.8
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.16
 Intersection Signal Delay: 68.1
 Intersection LOS: E
 Intersection Capacity Utilization 108.8%
 ICU Level of Service G
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 201: Lawrenceville Hwy & Lynburn Dr



HCM Signalized Intersection Capacity Analysis
201: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
2045 PM Alternatives



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	98	54	162	388	130	96	160	1253	270	74	1367	108
Future Volume (vph)	98	54	162	388	130	96	160	1253	270	74	1367	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			6%			-3%				2%
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.89		1.00	0.94		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1561	1458		1545	1523		1617	3233	1446	1577	3119	
Flt Permitted	0.61	1.00		0.18	1.00		0.06	1.00	1.00	0.08	1.00	
Satd. Flow (perm)	997	1458		300	1523		99	3233	1446	134	3119	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	107	59	176	422	141	104	174	1362	293	80	1486	117
RTOR Reduction (vph)	0	77	0	0	18	0	0	0	94	0	4	0
Lane Group Flow (vph)	107	158	0	422	227	0	174	1362	199	80	1599	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	29.2	17.2		50.2	33.7		78.1	68.6	68.6	72.1	65.6	
Effective Green, g (s)	29.2	17.2		50.2	33.7		78.1	68.6	68.6	72.1	65.6	
Actuated g/C Ratio	0.21	0.12		0.36	0.24		0.56	0.49	0.49	0.52	0.47	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	258	180		364	369		159	1597	714	137	1474	
v/s Ratio Prot	0.04	0.11		c0.24	0.15		c0.07	0.42		0.03	0.51	
v/s Ratio Perm	0.05			c0.18			c0.54		0.14	0.27		
v/c Ratio	0.41	0.88		1.16	0.61		1.09	0.85	0.28	0.58	1.08	
Uniform Delay, d1	46.5	59.8		41.6	46.8		43.6	30.7	20.6	24.1	36.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.1	34.7		98.0	3.0		98.9	6.0	1.0	6.2	50.0	
Delay (s)	47.5	94.5		139.7	49.8		142.4	36.7	21.6	30.3	86.6	
Level of Service	D	F		F	D		F	D	C	C	F	
Approach Delay (s)		79.8			106.7			44.3			83.9	
Approach LOS		E			F			D			F	

Intersection Summary

HCM 2000 Control Delay	70.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	138.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	108.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
202: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
2045 PM Alternatives

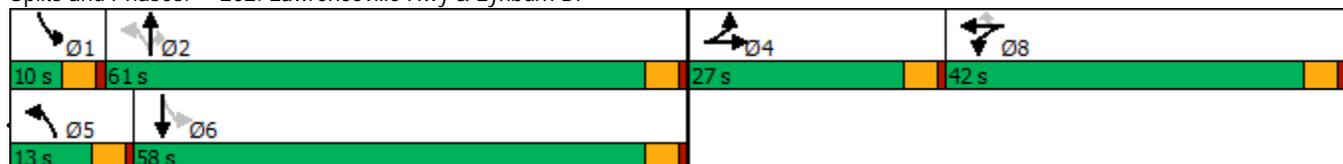


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕↕	↕	↕	↕↕	
Traffic Volume (vph)	98	54	162	388	130	96	160	1253	270	74	1367	108
Future Volume (vph)	98	54	162	388	130	96	160	1253	270	74	1367	108
Satd. Flow (prot)	0	1507	0	0	1568	1382	1617	3233	1446	1577	3119	0
Flt Permitted		0.985			0.964		0.071			0.075		
Satd. Flow (perm)	0	1507	0	0	1568	1382	121	3233	1446	124	3119	0
Satd. Flow (RTOR)		32				82			159		7	
Lane Group Flow (vph)	0	342	0	0	563	104	174	1362	293	80	1603	0
Turn Type	Split	NA		Split	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8	2		2	6		
Total Split (s)	27.0	27.0		42.0	42.0	42.0	13.0	61.0	61.0	10.0	58.0	
Total Lost Time (s)		4.5			4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Act Effct Green (s)		22.5			37.5	37.5	65.0	56.5	56.5	59.0	53.5	
Actuated g/C Ratio		0.16			0.27	0.27	0.46	0.40	0.40	0.42	0.38	
v/c Ratio		1.27			1.34	0.24	1.18	1.04	0.43	0.73	1.34	
Control Delay		189.9			208.4	13.4	162.4	77.9	15.2	59.5	194.1	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		189.9			208.4	13.4	162.4	77.9	15.2	59.5	194.1	
LOS		F			F	B	F	E	B	E	F	
Approach Delay		189.9			178.0			75.9			187.7	
Approach LOS		F			F			E			F	
Queue Length 50th (ft)		-368			-667	15	-143	-705	82	40	-1003	
Queue Length 95th (ft)		#567			#898	63	#300	#845	163	#116	#1144	
Internal Link Dist (ft)		492			463			594			664	
Turn Bay Length (ft)							180		200	135		
Base Capacity (vph)		269			420	430	147	1304	678	109	1196	
Starvation Cap Reductn		0			0	0	0	0	0	0	0	
Spillback Cap Reductn		0			0	0	0	0	0	0	0	
Storage Cap Reductn		0			0	0	0	0	0	0	0	
Reduced v/c Ratio		1.27			1.34	0.24	1.18	1.04	0.43	0.73	1.34	

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.34
 Intersection Signal Delay: 141.2
 Intersection LOS: F
 Intersection Capacity Utilization 122.3%
 ICU Level of Service H
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 202: Lawrenceville Hwy & Lynburn Dr



HCM Signalized Intersection Capacity Analysis
202: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
2045 PM Alternatives

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Traffic Volume (vph)	98	54	162	388	130	96	160	1253	270	74	1367	108		
Future Volume (vph)	98	54	162	388	130	96	160	1253	270	74	1367	108		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Grade (%)		4%			6%			-3%				2%		
Total Lost time (s)		4.5			4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95			
Frt		0.93			1.00	0.85	1.00	1.00	0.85	1.00	0.99			
Flt Protected		0.98			0.96	1.00	0.95	1.00	1.00	0.95	1.00			
Satd. Flow (prot)		1505			1567	1382	1617	3233	1446	1577	3119			
Flt Permitted		0.98			0.96	1.00	0.07	1.00	1.00	0.07	1.00			
Satd. Flow (perm)		1505			1567	1382	120	3233	1446	124	3119			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		
Adj. Flow (vph)	107	59	176	422	141	104	174	1362	293	80	1486	117		
RTOR Reduction (vph)	0	27	0	0	0	60	0	0	95	0	4	0		
Lane Group Flow (vph)	0	315	0	0	563	44	174	1362	198	80	1599	0		
Turn Type	Split	NA		Split	NA	Perm	pm+pt	NA	Perm	pm+pt	NA			
Protected Phases	4	4		8	8		5	2		1	6			
Permitted Phases						8	2		2	6				
Actuated Green, G (s)		22.5			37.5	37.5	65.0	56.5	56.5	59.0	53.5			
Effective Green, g (s)		22.5			37.5	37.5	65.0	56.5	56.5	59.0	53.5			
Actuated g/C Ratio		0.16			0.27	0.27	0.46	0.40	0.40	0.42	0.38			
Clearance Time (s)		4.5			4.5	4.5	4.5	4.5	4.5	4.5	4.5			
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)		241			419	370	146	1304	583	109	1191			
v/s Ratio Prot		c0.21			c0.36		c0.07	0.42		0.03	c0.51			
v/s Ratio Perm						0.03	0.48		0.14	0.28				
v/c Ratio		1.31			1.34	0.12	1.19	1.04	0.34	0.73	1.34			
Uniform Delay, d1		58.8			51.2	38.8	38.7	41.8	28.9	33.4	43.2			
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2		165.1			169.9	0.1	135.2	37.4	1.6	22.3	159.7			
Delay (s)		223.8			221.2	38.9	173.9	79.1	30.4	55.8	203.0			
Level of Service		F			F	D	F	E	C	E	F			
Approach Delay (s)		223.8			192.8			80.3			196.0			
Approach LOS		F			F			F			F			
Intersection Summary														
HCM 2000 Control Delay			150.8									HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio			1.32											
Actuated Cycle Length (s)			140.0								18.0			
Intersection Capacity Utilization			122.3%										ICU Level of Service	H
Analysis Period (min)			15											
c	Critical Lane Group													

Lanes, Volumes, Timings
203: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
2045 PM Alternatives

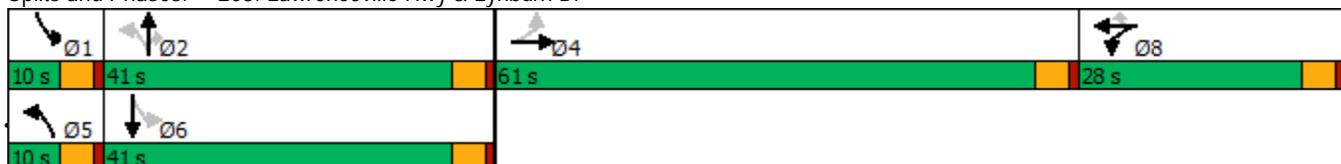


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↑	↔	↔	↑↑	↔	↔	↔	↔
Traffic Volume (vph)	98	54	162	388	130	96	160	1253	270	74	1367	108
Future Volume (vph)	98	54	162	388	130	96	160	1253	270	74	1367	108
Satd. Flow (prot)	0	1507	0	1545	1626	1382	1617	3233	1446	1577	3119	0
Flt Permitted		0.046		0.950			0.110			0.110		
Satd. Flow (perm)	0	70	0	1545	1626	1382	187	3233	1446	183	3119	0
Satd. Flow (RTOR)		46				82			128		6	
Lane Group Flow (vph)	0	342	0	422	141	104	174	1362	293	80	1603	0
Turn Type	Perm	NA		Split	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4		8	8		5	2		1	6	
Permitted Phases	4					8	2		2	6		
Total Split (s)	61.0	61.0		28.0	28.0	28.0	10.0	41.0	41.0	10.0	41.0	
Total Lost Time (s)		4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Act Effct Green (s)		56.5		23.5	23.5	23.5	42.0	36.5	36.5	42.0	36.5	
Actuated g/C Ratio		0.40		0.17	0.17	0.17	0.30	0.26	0.26	0.30	0.26	
v/c Ratio		6.22		1.63	0.52	0.35	1.55	1.62	0.62	0.73	1.96	
Control Delay		2394.8		336.3	60.7	18.8	317.4	317.3	31.6	71.9	465.7	
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		2394.8		336.3	60.7	18.8	317.4	317.3	31.6	71.9	465.7	
LOS		F		F	E	B	F	F	C	E	F	
Approach Delay		2394.8			228.6			271.6			447.0	
Approach LOS		F			F			F			F	
Queue Length 50th (ft)		~549		~552	118	17	~175	~935	134	51	~1196	
Queue Length 95th (ft)		#749		#764	191	73	#334	#1075	238	#114	#1337	
Internal Link Dist (ft)		598			486			576			669	
Turn Bay Length (ft)				90		50	180		200	135		
Base Capacity (vph)		55		259	272	300	112	842	471	109	817	
Starvation Cap Reductn		0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0		0	0	0	0	0	0	0	0	
Storage Cap Reductn		0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio		6.22		1.63	0.52	0.35	1.55	1.62	0.62	0.73	1.96	

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 6.22
 Intersection Signal Delay: 491.1
 Intersection LOS: F
 Intersection Capacity Utilization 114.8%
 ICU Level of Service H
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 203: Lawrenceville Hwy & Lynburn Dr



HCM Signalized Intersection Capacity Analysis
203: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
2045 PM Alternatives

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	98	54	162	388	130	96	160	1253	270	74	1367	108	
Future Volume (vph)	98	54	162	388	130	96	160	1253	270	74	1367	108	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Grade (%)		4%			6%			-3%				2%	
Total Lost time (s)		4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor		1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95		
Frt		0.93		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		
Flt Protected		0.98		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (prot)		1505		1545	1626	1382	1617	3233	1446	1577	3119		
Flt Permitted		0.05		0.95	1.00	1.00	0.11	1.00	1.00	0.11	1.00		
Satd. Flow (perm)		71		1545	1626	1382	186	3233	1446	182	3119		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	107	59	176	422	141	104	174	1362	293	80	1486	117	
RTOR Reduction (vph)	0	27	0	0	0	68	0	0	95	0	4	0	
Lane Group Flow (vph)	0	315	0	422	141	36	174	1362	198	80	1599	0	
Turn Type	Perm	NA		Split	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		
Protected Phases		4		8	8		5	2		1	6		
Permitted Phases	4					8	2		2	6			
Actuated Green, G (s)		56.5		23.5	23.5	23.5	42.0	36.5	36.5	42.0	36.5		
Effective Green, g (s)		56.5		23.5	23.5	23.5	42.0	36.5	36.5	42.0	36.5		
Actuated g/C Ratio		0.40		0.17	0.17	0.17	0.30	0.26	0.26	0.30	0.26		
Clearance Time (s)		4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)		28		259	272	231	112	842	376	109	813		
v/s Ratio Prot				c0.27	0.09		c0.06	0.42		0.03	c0.51		
v/s Ratio Perm		c4.43				0.03	0.40		0.14	0.19			
v/c Ratio		11.23		1.63	0.52	0.15	1.55	1.62	0.53	0.73	1.97		
Uniform Delay, d1		41.8		58.2	53.1	49.8	46.9	51.8	44.4	40.1	51.8		
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2		4675.0		300.2	1.7	0.3	288.1	283.4	5.2	22.3	439.3		
Delay (s)		4716.8		358.4	54.8	50.1	335.0	335.2	49.6	62.4	491.0		
Level of Service		F		F	D	D	F	F	D	E	F		
Approach Delay (s)		4716.8			246.2			289.4			470.7		
Approach LOS		F			F			F			F		
Intersection Summary													
HCM 2000 Control Delay			685.4									HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio			6.06										
Actuated Cycle Length (s)			140.0									Sum of lost time (s)	18.0
Intersection Capacity Utilization			114.8%									ICU Level of Service	H
Analysis Period (min)			15										
c	Critical Lane Group												

Lanes, Volumes, Timings
213: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
2045 PM Alternatives

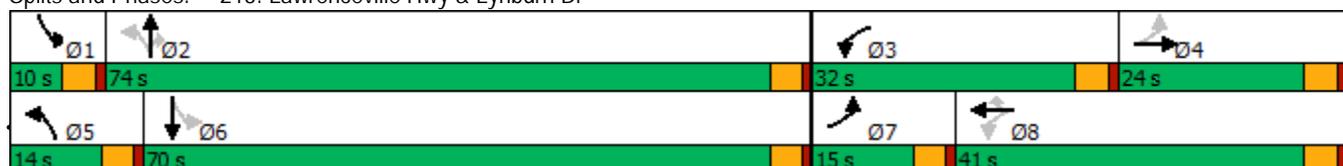


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↗	↖	↕	↗	↖	↗	
Traffic Volume (vph)	98	54	162	388	130	96	160	1253	270	74	1367	108
Future Volume (vph)	98	54	162	388	130	96	160	1253	270	74	1367	108
Satd. Flow (prot)	1561	1459	0	1545	1626	1382	1617	3233	1446	1577	3119	0
Flt Permitted	0.667			0.182			0.058			0.087		
Satd. Flow (perm)	1096	1459	0	296	1626	1382	99	3233	1446	144	3119	0
Satd. Flow (RTOR)		89					82		188		8	
Lane Group Flow (vph)	107	235	0	422	141	104	174	1362	293	80	1603	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Total Split (s)	15.0	24.0		32.0	41.0	41.0	14.0	74.0	74.0	10.0	70.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Act Effct Green (s)	27.4	17.5		49.5	35.1	35.1	79.0	69.5	69.5	71.0	65.5	
Actuated g/C Ratio	0.20	0.13		0.36	0.25	0.25	0.57	0.50	0.50	0.51	0.47	
v/c Ratio	0.43	0.90		1.19	0.34	0.25	1.08	0.84	0.36	0.61	1.08	
Control Delay	38.1	71.1		146.3	44.8	13.9	128.2	35.6	8.6	35.5	83.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	38.1	71.1		146.3	44.8	13.9	128.2	35.6	8.6	35.5	83.2	
LOS	D	E		F	D	B	F	D	A	D	F	
Approach Delay		60.8			104.2			40.0			80.9	
Approach LOS		E			F			D			F	
Queue Length 50th (ft)	66	134		~415	105	15	~131	555	51	32	~866	
Queue Length 95th (ft)	112	#280		#630	169	64	#289	662	115	#68	#1007	
Internal Link Dist (ft)		618			662			865			596	
Turn Bay Length (ft)	150			90		50	180		200	135		
Base Capacity (vph)	257	282		355	429	425	161	1628	821	131	1484	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.42	0.83		1.19	0.33	0.24	1.08	0.84	0.36	0.61	1.08	

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 138
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.19
 Intersection Signal Delay: 66.3
 Intersection LOS: E
 Intersection Capacity Utilization 108.8%
 ICU Level of Service G
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 213: Lawrenceville Hwy & Lynburn Dr



HCM Signalized Intersection Capacity Analysis
213: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
2045 PM Alternatives



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	98	54	162	388	130	96	160	1253	270	74	1367	108
Future Volume (vph)	98	54	162	388	130	96	160	1253	270	74	1367	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			6%			-3%				2%
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.89		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1561	1458		1545	1626	1382	1617	3233	1446	1577	3119	
Flt Permitted	0.67	1.00		0.18	1.00	1.00	0.06	1.00	1.00	0.09	1.00	
Satd. Flow (perm)	1096	1458		296	1626	1382	98	3233	1446	145	3119	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	107	59	176	422	141	104	174	1362	293	80	1486	117
RTOR Reduction (vph)	0	78	0	0	0	61	0	0	93	0	4	0
Lane Group Flow (vph)	107	157	0	422	141	43	174	1362	200	80	1599	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	27.4	17.5		49.5	35.1	35.1	79.0	69.5	69.5	71.0	65.5	
Effective Green, g (s)	27.4	17.5		49.5	35.1	35.1	79.0	69.5	69.5	71.0	65.5	
Actuated g/C Ratio	0.20	0.13		0.36	0.25	0.25	0.57	0.50	0.50	0.51	0.47	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	250	184		355	413	351	160	1628	728	131	1480	
v/s Ratio Prot	0.03	0.11		c0.24	0.09		c0.07	0.42		0.02	0.51	
v/s Ratio Perm	0.05			c0.19		0.03	c0.55		0.14	0.29		
v/c Ratio	0.43	0.85		1.19	0.34	0.12	1.09	0.84	0.27	0.61	1.08	
Uniform Delay, d1	47.6	59.0		41.4	42.0	39.6	43.6	29.4	19.7	23.6	36.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.2	30.0		109.7	0.5	0.2	96.5	5.3	0.9	8.2	48.3	
Delay (s)	48.8	89.0		151.1	42.5	39.8	140.1	34.7	20.7	31.8	84.6	
Level of Service	D	F		F	D	D	F	C	C	C	F	
Approach Delay (s)		76.4			110.8			42.4			82.1	
Approach LOS		E			F			D			F	

Intersection Summary

HCM 2000 Control Delay	69.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	138.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	108.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
230: Lawrenceville Hwy & Lynburn Dr

Lawrenceville Hwy Study
2045 PM Alternatives



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	98	54	162	226	87	64	160	1253	270	74	1367	108
Future Volume (vph)	98	54	162	226	87	64	160	1253	270	74	1367	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.89		1.00	0.94		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1593	1488		1593	1570		1593	3185	1425	1593	3150	
Flt Permitted	0.65	1.00		0.19	1.00		0.05	1.00	1.00	0.11	1.00	
Satd. Flow (perm)	1094	1488		310	1570		87	3185	1425	187	3150	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	107	59	176	246	95	70	174	1362	293	80	1486	117
RTOR Reduction (vph)	0	77	0	0	19	0	0	0	91	0	4	0
Lane Group Flow (vph)	107	158	0	246	146	0	174	1362	202	80	1599	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	27.1	17.1		40.1	25.6		89.2	76.9	76.9	80.6	72.6	
Effective Green, g (s)	27.1	17.1		40.1	25.6		89.2	76.9	76.9	80.6	72.6	
Actuated g/C Ratio	0.20	0.12		0.29	0.18		0.64	0.56	0.56	0.58	0.52	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	250	183		261	290		189	1768	791	190	1651	
v/s Ratio Prot	0.03	0.11		c0.13	0.09		c0.08	0.43		0.02	c0.51	
v/s Ratio Perm	0.05			c0.15			0.51		0.14	0.22		
v/c Ratio	0.43	0.86		0.94	0.50		0.92	0.77	0.26	0.42	0.97	
Uniform Delay, d1	48.0	59.5		42.7	50.7		44.5	23.9	16.0	17.6	31.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.2	31.7		40.1	1.4		43.5	3.3	0.8	1.5	15.8	
Delay (s)	49.2	91.2		82.7	52.1		88.0	27.2	16.7	19.1	47.6	
Level of Service	D	F		F	D		F	C	B	B	D	
Approach Delay (s)		78.1			70.5			31.3			46.3	
Approach LOS		E			E			C			D	

Intersection Summary

HCM 2000 Control Delay	44.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	138.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	98.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
300: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
2045 PM Alternatives



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘		↖	↗			↖	↗	↘	↙
Traffic Volume (vph)	268	1151	28	0	1042	595	0	0	122	1285	217	507
Future Volume (vph)	268	1151	28	0	1042	595	0	0	122	1285	217	507
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			0%			0%				0%
Total Lost time (s)	4.5	4.5	4.5		4.5	4.0			4.0	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00		0.95	1.00			1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85			0.86	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00
Satd. Flow (prot)	1585	3169	1418		3185	1425			1450	3090	1676	1425
Flt Permitted	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00
Satd. Flow (perm)	1585	3169	1418		3185	1425			1450	3090	1676	1425
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	291	1251	30	0	1133	647	0	0	133	1397	236	551
RTOR Reduction (vph)	0	0	12	0	0	0	0	0	0	0	0	222
Lane Group Flow (vph)	291	1251	18	0	1133	647	0	0	133	1397	236	329
Turn Type	Prot	NA	Perm		NA	Free			Free	Prot	NA	Perm
Protected Phases	7	4			8					1		6
Permitted Phases			4			Free			Free			6
Actuated Green, G (s)	23.5	72.5	72.5		44.5	140.0			140.0	58.5	58.5	58.5
Effective Green, g (s)	23.5	72.5	72.5		44.5	140.0			140.0	58.5	58.5	58.5
Actuated g/C Ratio	0.17	0.52	0.52		0.32	1.00			1.00	0.42	0.42	0.42
Clearance Time (s)	4.5	4.5	4.5		4.5					4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0					3.0	3.0	3.0
Lane Grp Cap (vph)	266	1641	734		1012	1425			1450	1291	700	595
v/s Ratio Prot	c0.18	0.39			c0.36					c0.45	0.14	
v/s Ratio Perm			0.01			0.45			0.09			0.23
v/c Ratio	1.09	0.76	0.02		1.12	0.45			0.09	1.08	0.34	0.55
Uniform Delay, d1	58.2	26.9	16.5		47.8	0.0			0.0	40.8	27.6	30.8
Progression Factor	1.00	1.00	1.00		0.70	1.00			1.00	1.00	1.00	1.00
Incremental Delay, d2	82.6	2.2	0.0		61.4	0.5			0.1	50.4	1.3	3.7
Delay (s)	140.9	29.0	16.5		94.8	0.5			0.1	91.2	28.9	34.5
Level of Service	F	C	B		F	A			A	F	C	C
Approach Delay (s)		49.5			60.5			0.1			70.1	
Approach LOS		D			E			A			E	

Intersection Summary

HCM 2000 Control Delay	59.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	100.5%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
301: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
2045 PM Alternatives



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	268	1151	28	0	1042	595	0	0	122	1285	217	507
Future Volume (vph)	268	1151	28	0	1042	595	0	0	122	1285	217	507
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			0%			0%				0%
Total Lost time (s)	4.5	4.5	4.5		4.5	4.0			4.0	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00		0.95	1.00			1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85			0.86	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00
Satd. Flow (prot)	1585	3169	1418		3185	1425			1450	3090	1676	1425
Flt Permitted	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00
Satd. Flow (perm)	1585	3169	1418		3185	1425			1450	3090	1676	1425
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	291	1251	30	0	1133	647	0	0	133	1397	236	551
RTOR Reduction (vph)	0	0	12	0	0	0	0	0	0	0	0	222
Lane Group Flow (vph)	291	1251	18	0	1133	647	0	0	133	1397	236	329
Turn Type	Prot	NA	Perm		NA	Free			Free	Perm	NA	Perm
Protected Phases	7	4			8							6
Permitted Phases			4			Free			Free	6		6
Actuated Green, G (s)	23.5	72.5	72.5		44.5	140.0			140.0	58.5	58.5	58.5
Effective Green, g (s)	23.5	72.5	72.5		44.5	140.0			140.0	58.5	58.5	58.5
Actuated g/C Ratio	0.17	0.52	0.52		0.32	1.00			1.00	0.42	0.42	0.42
Clearance Time (s)	4.5	4.5	4.5		4.5					4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0					3.0	3.0	3.0
Lane Grp Cap (vph)	266	1641	734		1012	1425			1450	1291	700	595
v/s Ratio Prot	c0.18	0.39			c0.36							0.14
v/s Ratio Perm			0.01			0.45			0.09	c0.45		0.23
v/c Ratio	1.09	0.76	0.02		1.12	0.45			0.09	1.08	0.34	0.55
Uniform Delay, d1	58.2	26.9	16.5		47.8	0.0			0.0	40.8	27.6	30.8
Progression Factor	1.00	1.00	1.00		0.70	1.00			1.00	1.00	1.00	1.00
Incremental Delay, d2	82.6	2.2	0.0		61.4	0.5			0.1	50.4	1.3	3.7
Delay (s)	140.9	29.0	16.5		94.9	0.5			0.1	91.2	28.9	34.5
Level of Service	F	C	B		F	A			A	F	C	C
Approach Delay (s)		49.5			60.6			0.1			70.1	
Approach LOS		D			E			A			E	

Intersection Summary

HCM 2000 Control Delay	59.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	100.5%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
302: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
2045 PM Alternatives



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↖↖	↖↗		↖↖	↖↗			↖↗	↖↖	↖↖	↖↗
Traffic Volume (vph)	268	1151	28	0	1042	595	0	0	122	1285	217	507
Future Volume (vph)	268	1151	28	0	1042	595	0	0	122	1285	217	507
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			0%			0%				0%
Total Lost time (s)	4.5	4.5	4.0		4.5	4.0			4.0	4.5	4.5	4.5
Lane Util. Factor	0.97	0.95	1.00		0.95	1.00			1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85			0.86	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00
Satd. Flow (prot)	3074	3169	1418		3185	1425			1450	3090	1676	1425
Flt Permitted	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00
Satd. Flow (perm)	3074	3169	1418		3185	1425			1450	3090	1676	1425
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	291	1251	30	0	1133	647	0	0	133	1397	236	551
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	133
Lane Group Flow (vph)	291	1251	30	0	1133	647	0	0	133	1397	236	418
Turn Type	Prot	NA	Free		NA	Free			Free	Prot	NA	Perm
Protected Phases	7	4			8					1		6
Permitted Phases			Free			Free			Free			6
Actuated Green, G (s)	13.5	67.5	140.0		49.5	140.0			140.0	63.5	63.5	63.5
Effective Green, g (s)	13.5	67.5	140.0		49.5	140.0			140.0	63.5	63.5	63.5
Actuated g/C Ratio	0.10	0.48	1.00		0.35	1.00			1.00	0.45	0.45	0.45
Clearance Time (s)	4.5	4.5			4.5					4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0			3.0					3.0	3.0	3.0
Lane Grp Cap (vph)	296	1527	1418		1126	1425			1450	1401	760	646
v/s Ratio Prot	c0.09	0.39			c0.36					c0.45	0.14	
v/s Ratio Perm			0.02			0.45			0.09			0.29
v/c Ratio	0.98	0.82	0.02		1.01	0.45			0.09	1.00	0.31	0.65
Uniform Delay, d1	63.1	31.0	0.0		45.2	0.0			0.0	38.2	24.3	29.6
Progression Factor	1.00	1.00	1.00		0.68	1.00			1.00	1.00	1.00	1.00
Incremental Delay, d2	47.4	3.6	0.0		21.2	0.6			0.1	23.2	1.1	4.9
Delay (s)	110.5	34.6	0.0		52.0	0.6			0.1	61.3	25.4	34.5
Level of Service	F	C	A		D	A			A	E	C	C
Approach Delay (s)		48.0			33.3			0.1			50.7	
Approach LOS		D			C			A			D	

Intersection Summary

HCM 2000 Control Delay	43.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	92.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
303: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
2045 PM Alternatives



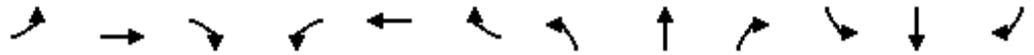
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	268	1151	28	0	1042	595	287	65	122	1285	217	507
Future Volume (vph)	268	1151	28	0	1042	595	287	65	122	1285	217	507
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			0%			0%			0%	
Total Lost time (s)	4.5	4.5	4.5		4.5	4.0	4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00		0.95	1.00	1.00	1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1585	3169	1418		3185	1425	1593	1513		3090	1676	1425
Flt Permitted	0.95	1.00	1.00		1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1585	3169	1418		3185	1425	1593	1513		3090	1676	1425
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	291	1251	30	0	1133	647	312	71	133	1397	236	551
RTOR Reduction (vph)	0	0	17	0	0	0	0	13	0	0	0	220
Lane Group Flow (vph)	291	1251	13	0	1133	647	312	191	0	1397	236	331
Turn Type	Prot	NA	Perm		NA	Free	Prot	NA		Prot	NA	Perm
Protected Phases	7	4			8		5	2		1		6
Permitted Phases			4			Free						6
Actuated Green, G (s)	19.5	62.5	62.5		38.5	140.0	26.5	19.5		44.5	37.5	37.5
Effective Green, g (s)	19.5	62.5	62.5		38.5	140.0	26.5	19.5		44.5	37.5	37.5
Actuated g/C Ratio	0.14	0.45	0.45		0.28	1.00	0.19	0.14		0.32	0.27	0.27
Clearance Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	220	1414	633		875	1425	301	210		982	448	381
v/s Ratio Prot	c0.18	0.39			c0.36		c0.20	0.13		c0.45	0.14	
v/s Ratio Perm			0.01			0.45						0.23
v/c Ratio	1.32	0.88	0.02		1.29	0.45	1.04	0.91		1.42	0.53	0.87
Uniform Delay, d1	60.2	35.5	21.7		50.8	0.0	56.8	59.4		47.8	43.7	48.9
Progression Factor	1.00	1.00	1.00		0.70	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	173.3	7.0	0.0		137.2	0.5	61.7	42.4		196.2	4.4	22.5
Delay (s)	233.6	42.4	21.7		172.7	0.5	118.4	101.7		243.9	48.1	71.4
Level of Service	F	D	C		F	A	F	F		F	D	E
Approach Delay (s)		77.4			110.1			111.8			179.2	
Approach LOS		E			F			F			F	

Intersection Summary

HCM 2000 Control Delay	126.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.32		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	116.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
304: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
2045 PM Alternatives



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗		↑↑	↗			↗	↘↗	↑	↗
Traffic Volume (vph)	268	1151	28	0	1042	595	0	0	122	1285	217	507
Future Volume (vph)	268	1151	28	0	1042	595	0	0	122	1285	217	507
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			0%			0%				0%
Total Lost time (s)	4.5	4.5	4.5		4.5	4.0			4.0	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00		0.95	1.00			1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85			0.86	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00
Satd. Flow (prot)	1585	3169	1418		3185	1425			1450	3090	1676	1425
Flt Permitted	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00
Satd. Flow (perm)	1585	3169	1418		3185	1425			1450	3090	1676	1425
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	291	1251	30	0	1133	647	0	0	133	1397	236	551
RTOR Reduction (vph)	0	0	12	0	0	0	0	0	0	0	0	222
Lane Group Flow (vph)	291	1251	18	0	1133	647	0	0	133	1397	236	329
Turn Type	Prot	NA	Perm		NA	Free			Free	Prot	NA	Perm
Protected Phases	7	4			8					1		6
Permitted Phases			4			Free			Free			6
Actuated Green, G (s)	23.5	72.5	72.5		44.5	140.0			140.0	58.5	58.5	58.5
Effective Green, g (s)	23.5	72.5	72.5		44.5	140.0			140.0	58.5	58.5	58.5
Actuated g/C Ratio	0.17	0.52	0.52		0.32	1.00			1.00	0.42	0.42	0.42
Clearance Time (s)	4.5	4.5	4.5		4.5					4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0					3.0	3.0	3.0
Lane Grp Cap (vph)	266	1641	734		1012	1425			1450	1291	700	595
v/s Ratio Prot	c0.18	0.39			c0.36					c0.45	0.14	
v/s Ratio Perm			0.01			0.45			0.09			0.23
v/c Ratio	1.09	0.76	0.02		1.12	0.45			0.09	1.08	0.34	0.55
Uniform Delay, d1	58.2	26.9	16.5		47.8	0.0			0.0	40.8	27.6	30.8
Progression Factor	1.00	1.00	1.00		0.75	1.00			1.00	1.00	1.00	1.00
Incremental Delay, d2	82.6	2.2	0.0		62.7	0.6			0.1	50.4	1.3	3.7
Delay (s)	140.9	29.0	16.5		98.3	0.6			0.1	91.2	28.9	34.5
Level of Service	F	C	B		F	A			A	F	C	C
Approach Delay (s)		49.5			62.8			0.1			70.1	
Approach LOS		D			E			A			E	

Intersection Summary		
HCM 2000 Control Delay	60.5	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.10	E
Actuated Cycle Length (s)	140.0	Sum of lost time (s)
Intersection Capacity Utilization	100.5%	13.5
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		G

Lanes, Volumes, Timings
305: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
2045 PM Alternatives



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	268	1151	28	0	1042	595	0	0	122	1285	217	507
Future Volume (vph)	268	1151	28	0	1042	595	0	0	122	1285	217	507
Satd. Flow (prot)	1585	3169	1418	0	3185	1425	0	0	1450	3090	1676	1425
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1585	3169	1418	0	3185	1425	0	0	1450	3090	1676	1425
Satd. Flow (RTOR)				25						82		
Lane Group Flow (vph)	291	1251	30	0	1133	647	0	0	133	1397	236	551
Turn Type	Prot	NA	Perm	NA		Free			Free	Prot	NA	Perm
Protected Phases	7	4					8			1	6	
Permitted Phases				4			Free		Free		6	
Total Split (s)	28.0	77.0	77.0	49.0					63.0		63.0	63.0
Total Lost Time (s)	4.5	4.5	4.5	4.5					4.5		4.5	4.5
Act Effct Green (s)	23.5	72.5	72.5	44.5		140.0			140.0	58.5	58.5	58.5
Actuated g/C Ratio	0.17	0.52	0.52	0.32		1.00			1.00	0.42	0.42	0.42
v/c Ratio	1.09	0.76	0.04	1.12		0.45			0.09	1.08	0.34	0.67
Control Delay	135.6	30.7	7.1	94.7		0.5			0.1	89.3	29.3	13.9
Queue Delay	0.0	0.0	0.0	0.4		0.0			0.0	9.9	0.0	0.0
Total Delay	135.6	30.8	7.1	95.1		0.5			0.1	99.2	29.3	13.9
LOS	F	C	A	F		A			A	F	C	B
Approach Delay	49.7					60.7	0.1				70.1	
Approach LOS	D					E	A				E	
Queue Length 50th (ft)	~299	465	2	~630		0			0	~731	144	119
Queue Length 95th (ft)	#486	557	19	#758		m0			0	#869	214	258
Internal Link Dist (ft)	1228					405	248				482	
Turn Bay Length (ft)	445		230					125		300		210
Base Capacity (vph)	266	1641	746	1012		1425			1450	1291	700	817
Starvation Cap Reductn	0	0	0	77		0			0	0	0	0
Spillback Cap Reductn	0	2	0	0		0			290	516	0	0
Storage Cap Reductn	0	0	0	0		0			0	0	0	0
Reduced v/c Ratio	1.09	0.76	0.04	1.21		0.45			0.11	1.80	0.34	0.67

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 115 (82%), Referenced to phase 2: and 6: SBT, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.12

Intersection Signal Delay: 59.9

Intersection LOS: E

Intersection Capacity Utilization 100.5%

ICU Level of Service G

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

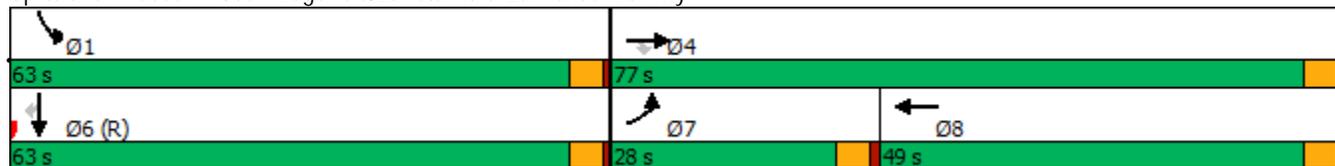
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

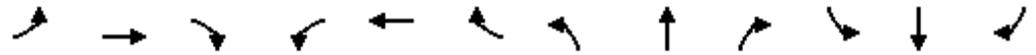
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 305: Kroger SC/Lavista Rd & Lawrenceville Hwy



HCM Signalized Intersection Capacity Analysis
305: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
2045 PM Alternatives



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗		↑↑	↗			↗	↘↗	↑	↗
Traffic Volume (vph)	268	1151	28	0	1042	595	0	0	122	1285	217	507
Future Volume (vph)	268	1151	28	0	1042	595	0	0	122	1285	217	507
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			0%			0%				0%
Total Lost time (s)	4.5	4.5	4.5		4.5	4.0			4.0	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00		0.95	1.00			1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85			0.86	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00
Satd. Flow (prot)	1585	3169	1418		3185	1425			1450	3090	1676	1425
Flt Permitted	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00
Satd. Flow (perm)	1585	3169	1418		3185	1425			1450	3090	1676	1425
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	291	1251	30	0	1133	647	0	0	133	1397	236	551
RTOR Reduction (vph)	0	0	12	0	0	0	0	0	0	0	0	222
Lane Group Flow (vph)	291	1251	18	0	1133	647	0	0	133	1397	236	329
Turn Type	Prot	NA	Perm		NA	Free			Free	Prot	NA	Perm
Protected Phases	7	4			8					1		6
Permitted Phases			4			Free			Free			6
Actuated Green, G (s)	23.5	72.5	72.5		44.5	140.0			140.0	58.5	58.5	58.5
Effective Green, g (s)	23.5	72.5	72.5		44.5	140.0			140.0	58.5	58.5	58.5
Actuated g/C Ratio	0.17	0.52	0.52		0.32	1.00			1.00	0.42	0.42	0.42
Clearance Time (s)	4.5	4.5	4.5		4.5					4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0					3.0	3.0	3.0
Lane Grp Cap (vph)	266	1641	734		1012	1425			1450	1291	700	595
v/s Ratio Prot	c0.18	0.39			c0.36					c0.45	0.14	
v/s Ratio Perm			0.01			0.45			0.09			0.23
v/c Ratio	1.09	0.76	0.02		1.12	0.45			0.09	1.08	0.34	0.55
Uniform Delay, d1	58.2	26.9	16.5		47.8	0.0			0.0	40.8	27.6	30.8
Progression Factor	1.00	1.00	1.00		0.72	1.00			1.00	1.00	1.00	1.00
Incremental Delay, d2	82.6	2.2	0.0		61.3	0.5			0.1	50.4	1.3	3.7
Delay (s)	140.9	29.0	16.5		95.8	0.5			0.1	91.2	28.9	34.5
Level of Service	F	C	B		F	A			A	F	C	C
Approach Delay (s)		49.5			61.2			0.1			70.1	
Approach LOS		D			E			A			E	

Intersection Summary	
HCM 2000 Control Delay	60.0 HCM 2000 Level of Service E
HCM 2000 Volume to Capacity ratio	1.10
Actuated Cycle Length (s)	140.0 Sum of lost time (s) 13.5
Intersection Capacity Utilization	100.5% ICU Level of Service G
Analysis Period (min)	15
c Critical Lane Group	

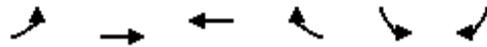
HCM Signalized Intersection Capacity Analysis
 320: Kroger SC/Lavista Rd & Lawrenceville Hwy

Lawrenceville Hwy Study
 2045 PM Alternatives

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		 			 					 			
Traffic Volume (vph)	268	1151	28	0	1042	595	0	0	122	1285	217	507	
Future Volume (vph)	268	1151	28	0	1042	595	0	0	122	1285	217	507	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Grade (%)		1%			0%			0%			0%		
Total Lost time (s)	4.5	4.5	4.5		4.5	4.0			4.0	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95	1.00		0.95	1.00			1.00	0.97	1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85			0.86	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1585	3169	1418		3185	1425			1450	3090	1676	1425	
Flt Permitted	0.95	1.00	1.00		1.00	1.00			1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1585	3169	1418		3185	1425			1450	3090	1676	1425	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	291	1251	30	0	1133	647	0	0	133	1397	236	551	
RTOR Reduction (vph)	0	0	12	0	0	0	0	0	0	0	0	222	
Lane Group Flow (vph)	291	1251	18	0	1133	647	0	0	133	1397	236	329	
Turn Type	Prot	NA	Perm		NA	Free			Free	Prot	NA	Perm	
Protected Phases	7	4			8					1	6		
Permitted Phases			4			Free			Free			6	
Actuated Green, G (s)	23.5	72.5	72.5		44.5	140.0			140.0	58.5	58.5	58.5	
Effective Green, g (s)	23.5	72.5	72.5		44.5	140.0			140.0	58.5	58.5	58.5	
Actuated g/C Ratio	0.17	0.52	0.52		0.32	1.00			1.00	0.42	0.42	0.42	
Clearance Time (s)	4.5	4.5	4.5		4.5					4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0		3.0					3.0	3.0	3.0	
Lane Grp Cap (vph)	266	1641	734		1012	1425			1450	1291	700	595	
v/s Ratio Prot	c0.18	0.39			c0.36					c0.45	0.14		
v/s Ratio Perm			0.01			0.45			0.09			0.23	
v/c Ratio	1.09	0.76	0.02		1.12	0.45			0.09	1.08	0.34	0.55	
Uniform Delay, d1	58.2	26.9	16.5		47.8	0.0			0.0	40.8	27.6	30.8	
Progression Factor	1.00	1.00	1.00		0.81	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	82.6	2.2	0.0		61.8	0.6			0.1	50.4	1.3	3.7	
Delay (s)	140.9	29.0	16.5		100.5	0.6			0.1	91.2	28.9	34.5	
Level of Service	F	C	B		F	A			A	F	C	C	
Approach Delay (s)		49.5			64.2			0.1			70.1		
Approach LOS		D			E			A			E		
Intersection Summary													
HCM 2000 Control Delay			60.9									HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio			1.10										
Actuated Cycle Length (s)			140.0									Sum of lost time (s)	13.5
Intersection Capacity Utilization			100.5%									ICU Level of Service	G
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
400: Lawrenceville Hwy & Old Norcross Rd

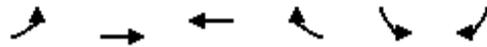
Lawrenceville Hwy Study
2045 PM Alternatives



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	282	2276	1298	98	151	339
Future Volume (vph)	282	2276	1298	98	151	339
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	0%		6%	
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1585	3169	3152		1545	1382
Flt Permitted	0.07	1.00	1.00		0.95	1.00
Satd. Flow (perm)	113	3169	3152		1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	307	2474	1411	107	164	368
RTOR Reduction (vph)	0	0	4	0	0	87
Lane Group Flow (vph)	307	2474	1514	0	164	281
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	7	4	8		1	7
Permitted Phases	4					1
Actuated Green, G (s)	107.5	107.5	77.8		14.5	39.7
Effective Green, g (s)	107.5	107.5	77.8		14.5	39.7
Actuated g/C Ratio	0.77	0.77	0.56		0.10	0.28
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	351	2433	1751		160	391
v/s Ratio Prot	0.16	c0.78	0.48		c0.11	0.13
v/s Ratio Perm	0.51					0.07
v/c Ratio	0.87	1.02	0.86		1.02	0.72
Uniform Delay, d1	42.7	16.2	26.6		62.8	45.1
Progression Factor	1.10	0.62	1.00		1.00	1.00
Incremental Delay, d2	10.3	16.4	4.7		77.9	6.2
Delay (s)	57.3	26.6	31.3		140.6	51.4
Level of Service	E	C	C		F	D
Approach Delay (s)		30.0	31.3		78.9	
Approach LOS		C	C		E	

Intersection Summary				
HCM 2000 Control Delay		35.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio		1.00		
Actuated Cycle Length (s)		140.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization		86.7%	ICU Level of Service	E
Analysis Period (min)		15		
c Critical Lane Group				

Lanes, Volumes, Timings
401: Lawrenceville Hwy & Old Norcross Rd

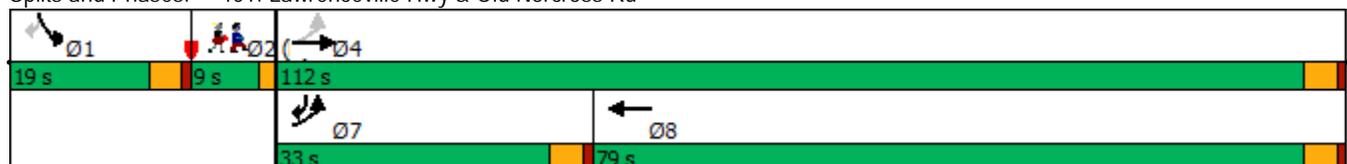


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø2
Lane Configurations							
Traffic Volume (vph)	282	2276	1298	98	151	339	
Future Volume (vph)	282	2276	1298	98	151	339	
Satd. Flow (prot)	1585	3169	3150	0	1545	1382	
Flt Permitted	0.068				0.950		
Satd. Flow (perm)	113	3169	3150	0	1545	1382	
Satd. Flow (RTOR)			8			121	
Lane Group Flow (vph)	307	2474	1518	0	164	368	
Turn Type	pm+pt	NA	NA		Prot	pm+ov	
Protected Phases	7	4	8		1	7	2
Permitted Phases	4					1	
Total Split (s)	33.0	112.0	79.0		19.0	33.0	9.0
Total Lost Time (s)	4.5	4.5	4.5		4.5	4.5	
Act Effct Green (s)	107.5	107.5	77.8		14.5	39.7	
Actuated g/C Ratio	0.77	0.77	0.56		0.10	0.28	
v/c Ratio	0.87	1.02	0.87		1.02	0.77	
Control Delay	52.8	28.2	33.8		138.1	36.9	
Queue Delay	0.2	33.0	47.3		0.0	0.5	
Total Delay	53.0	61.1	81.1		138.1	37.4	
LOS	D	E	F		F	D	
Approach Delay		60.2	81.1		68.5		
Approach LOS		E	F		E		
Queue Length 50th (ft)	193	~1251	628		~159	176	
Queue Length 95th (ft)	m231	m#1048	758		#310	283	
Internal Link Dist (ft)		352	531		589		
Turn Bay Length (ft)	120					165	
Base Capacity (vph)	386	2433	1752		160	508	
Starvation Cap Reductn	3	196	0		0	0	
Spillback Cap Reductn	0	0	486		0	18	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.80	1.11	1.20		1.02	0.75	

Intersection Summary

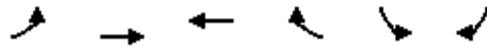
Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 133 (95%), Referenced to phase 2:Ped and 6:, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.02
 Intersection Signal Delay: 67.7
 Intersection LOS: E
 Intersection Capacity Utilization 86.7%
 ICU Level of Service E
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 401: Lawrenceville Hwy & Old Norcross Rd



HCM Signalized Intersection Capacity Analysis
401: Lawrenceville Hwy & Old Norcross Rd

Lawrenceville Hwy Study
2045 PM Alternatives

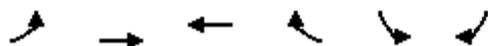


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↶	↶↶	↶↶		↶	↶
Traffic Volume (vph)	282	2276	1298	98	151	339
Future Volume (vph)	282	2276	1298	98	151	339
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	0%		6%	
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1585	3169	3152		1545	1382
Flt Permitted	0.07	1.00	1.00		0.95	1.00
Satd. Flow (perm)	113	3169	3152		1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	307	2474	1411	107	164	368
RTOR Reduction (vph)	0	0	4	0	0	87
Lane Group Flow (vph)	307	2474	1514	0	164	281
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	7	4	8		1	7
Permitted Phases	4					1
Actuated Green, G (s)	107.5	107.5	77.8		14.5	39.7
Effective Green, g (s)	107.5	107.5	77.8		14.5	39.7
Actuated g/C Ratio	0.77	0.77	0.56		0.10	0.28
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	351	2433	1751		160	391
v/s Ratio Prot	0.16	c0.78	0.48		c0.11	0.13
v/s Ratio Perm	0.51					0.07
v/c Ratio	0.87	1.02	0.86		1.02	0.72
Uniform Delay, d1	42.7	16.2	26.6		62.8	45.1
Progression Factor	1.09	0.64	1.00		1.00	1.00
Incremental Delay, d2	10.3	16.4	4.7		77.9	6.2
Delay (s)	57.0	26.8	31.3		140.6	51.4
Level of Service	E	C	C		F	D
Approach Delay (s)		30.1	31.3		78.9	
Approach LOS		C	C		E	

Intersection Summary				
HCM 2000 Control Delay		35.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio		1.00		
Actuated Cycle Length (s)		140.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization		86.7%	ICU Level of Service	E
Analysis Period (min)		15		
c	Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
402: Lawrenceville Hwy & Old Norcross Rd

Lawrenceville Hwy Study
2045 PM Alternatives

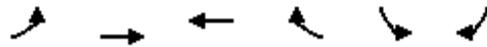


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	282	2276	1298	98	151	339
Future Volume (vph)	282	2276	1298	98	151	339
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	0%		6%	
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1585	3169	3152		1545	1382
Flt Permitted	0.07	1.00	1.00		0.95	1.00
Satd. Flow (perm)	113	3169	3152		1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	307	2474	1411	107	164	368
RTOR Reduction (vph)	0	0	4	0	0	77
Lane Group Flow (vph)	307	2474	1514	0	164	291
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	7	4	8		1	7
Permitted Phases	4					1
Actuated Green, G (s)	107.5	107.5	77.8		15.5	40.7
Effective Green, g (s)	107.5	107.5	77.8		15.5	40.7
Actuated g/C Ratio	0.77	0.77	0.56		0.11	0.29
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	351	2433	1751		171	446
v/s Ratio Prot	0.16	c0.78	0.48		c0.11	0.12
v/s Ratio Perm	0.51					0.09
v/c Ratio	0.87	1.02	0.86		0.96	0.65
Uniform Delay, d1	42.7	16.2	26.6		61.9	43.4
Progression Factor	1.01	0.78	1.00		1.00	1.00
Incremental Delay, d2	10.9	16.8	4.7		56.1	3.4
Delay (s)	54.0	29.5	31.3		118.0	46.8
Level of Service	D	C	C		F	D
Approach Delay (s)		32.2	31.3		68.8	
Approach LOS		C	C		E	

Intersection Summary

HCM 2000 Control Delay	35.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	86.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
403: Lawrenceville Hwy & Old Norcross Rd

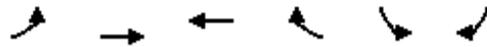


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↶	↷	↷		↶	↷
Traffic Volume (vph)	282	2276	1298	98	151	339
Future Volume (vph)	282	2276	1298	98	151	339
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	0%		6%	
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1585	3169	3152		1545	1382
Flt Permitted	0.07	1.00	1.00		0.95	1.00
Satd. Flow (perm)	113	3169	3152		1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	307	2474	1411	107	164	368
RTOR Reduction (vph)	0	0	4	0	0	87
Lane Group Flow (vph)	307	2474	1514	0	164	281
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	7	4	8		1	7
Permitted Phases	4					1
Actuated Green, G (s)	107.5	107.5	77.8		14.5	39.7
Effective Green, g (s)	107.5	107.5	77.8		14.5	39.7
Actuated g/C Ratio	0.77	0.77	0.56		0.10	0.28
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	351	2433	1751		160	391
v/s Ratio Prot	0.16	c0.78	0.48		c0.11	0.13
v/s Ratio Perm	0.51					0.07
v/c Ratio	0.87	1.02	0.86		1.02	0.72
Uniform Delay, d1	42.7	16.2	26.6		62.8	45.1
Progression Factor	1.23	0.45	1.00		1.00	1.00
Incremental Delay, d2	2.4	10.5	4.7		77.9	6.2
Delay (s)	54.7	17.9	31.3		140.6	51.4
Level of Service	D	B	C		F	D
Approach Delay (s)		21.9	31.3		78.9	
Approach LOS		C	C		E	

Intersection Summary				
HCM 2000 Control Delay		31.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio		1.00		
Actuated Cycle Length (s)		140.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization		86.7%	ICU Level of Service	E
Analysis Period (min)		15		
c	Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
404: Lawrenceville Hwy & Old Norcross Rd

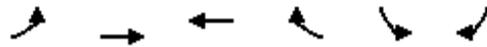
Lawrenceville Hwy Study
2045 PM Alternatives



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	282	2276	1298	98	151	339
Future Volume (vph)	282	2276	1298	98	151	339
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	0%		6%	
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1585	3169	3185	1425	1545	1382
Flt Permitted	0.10	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	162	3169	3185	1425	1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	307	2474	1411	107	164	368
RTOR Reduction (vph)	0	0	0	32	0	90
Lane Group Flow (vph)	307	2474	1411	75	164	278
Turn Type	pm+pt	NA	NA	Perm	Prot	pm+ov
Protected Phases	7	4	8		1	7
Permitted Phases	4			8		1
Actuated Green, G (s)	107.5	107.5	80.8	80.8	14.5	36.7
Effective Green, g (s)	107.5	107.5	80.8	80.8	14.5	36.7
Actuated g/C Ratio	0.77	0.77	0.58	0.58	0.10	0.26
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	350	2433	1838	822	160	362
v/s Ratio Prot	0.14	c0.78	0.44		c0.11	0.12
v/s Ratio Perm	0.53			0.05		0.08
v/c Ratio	0.88	1.02	0.77	0.09	1.02	0.77
Uniform Delay, d1	36.6	16.2	22.5	13.2	62.8	47.7
Progression Factor	1.01	0.97	1.00	1.00	1.00	1.00
Incremental Delay, d2	10.5	16.4	2.0	0.0	77.9	9.4
Delay (s)	47.4	32.3	24.5	13.3	140.6	57.1
Level of Service	D	C	C	B	F	E
Approach Delay (s)		33.9	23.7		82.9	
Approach LOS		C	C		F	

Intersection Summary				
HCM 2000 Control Delay		36.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio		1.00		
Actuated Cycle Length (s)		140.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization		86.7%	ICU Level of Service	E
Analysis Period (min)		15		
c Critical Lane Group				

Lanes, Volumes, Timings
405: Lawrenceville Hwy & Old Norcross Rd



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø2
Lane Configurations							
Traffic Volume (vph)	282	2276	1298	98	151	339	
Future Volume (vph)	282	2276	1298	98	151	339	
Satd. Flow (prot)	1585	3169	3150	0	1545	1382	
Flt Permitted	0.071				0.950		
Satd. Flow (perm)	118	3169	3150	0	1545	1382	
Satd. Flow (RTOR)			9				
Lane Group Flow (vph)	307	2474	1518	0	164	368	
Turn Type	pm+pt	NA	NA		Prot	pm+ov	
Protected Phases	7	4	8		1	7	2
Permitted Phases	4					1	
Total Split (s)	31.0	112.0	81.0		20.0	31.0	8.0
Total Lost Time (s)	4.5	4.5	4.5		4.5	4.5	
Act Effct Green (s)	107.5	107.5	78.9		15.5	44.1	
Actuated g/C Ratio	0.77	0.77	0.56		0.11	0.32	
v/c Ratio	0.90	1.02	0.85		0.96	0.84	
Control Delay	48.2	38.4	32.1		120.0	62.8	
Queue Delay	0.0	14.4	47.5		0.0	0.0	
Total Delay	48.2	52.8	79.6		120.0	62.8	
LOS	D	D	E		F	E	
Approach Delay		52.3	79.6		80.4		
Approach LOS		D	E		F		
Queue Length 50th (ft)	193	~1270	612		151	305	
Queue Length 95th (ft)	m233	m#1218	732		#299	#464	
Internal Link Dist (ft)		405	387		392		
Turn Bay Length (ft)	120					165	
Base Capacity (vph)	368	2433	1778		171	459	
Starvation Cap Reductn	0	90	0		0	0	
Spillback Cap Reductn	0	0	482		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.83	1.06	1.17		0.96	0.80	

Intersection Summary

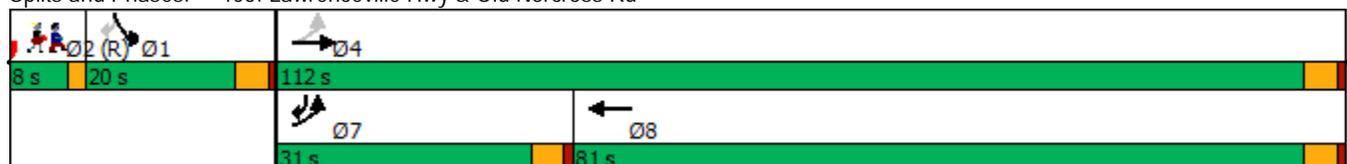
Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 121 (86%), Referenced to phase 2:Ped and 6:, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.02
 Intersection Signal Delay: 63.9
 Intersection LOS: E
 Intersection Capacity Utilization 86.7%
 ICU Level of Service E
 Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 405: Lawrenceville Hwy & Old Norcross Rd



HCM Signalized Intersection Capacity Analysis
405: Lawrenceville Hwy & Old Norcross Rd

Lawrenceville Hwy Study
2045 PM Alternatives



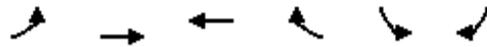
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	282	2276	1298	98	151	339
Future Volume (vph)	282	2276	1298	98	151	339
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	0%		6%	
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1585	3169	3152		1545	1382
Flt Permitted	0.07	1.00	1.00		0.95	1.00
Satd. Flow (perm)	118	3169	3152		1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	307	2474	1411	107	164	368
RTOR Reduction (vph)	0	0	4	0	0	0
Lane Group Flow (vph)	307	2474	1514	0	164	368
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	7	4	8		1	7
Permitted Phases	4					1
Actuated Green, G (s)	107.5	107.5	78.9		15.5	39.6
Effective Green, g (s)	107.5	107.5	78.9		15.5	39.6
Actuated g/C Ratio	0.77	0.77	0.56		0.11	0.28
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	343	2433	1776		171	435
v/s Ratio Prot	0.15	c0.78	0.48		c0.11	0.15
v/s Ratio Perm	0.53					0.12
v/c Ratio	0.90	1.02	0.85		0.96	0.85
Uniform Delay, d1	42.6	16.2	25.7		61.9	47.3
Progression Factor	0.91	1.36	1.00		1.00	1.00
Incremental Delay, d2	12.5	16.4	4.2		56.1	14.1
Delay (s)	51.2	38.5	29.9		118.0	61.4
Level of Service	D	D	C		F	E
Approach Delay (s)		39.9	29.9		78.8	
Approach LOS		D	C		E	

Intersection Summary

HCM 2000 Control Delay	41.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	86.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
420: Lawrenceville Hwy & Old Norcross Rd

Lawrenceville Hwy Study
2045 PM Alternatives



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	282	2276	1298	98	151	339
Future Volume (vph)	282	2276	1298	98	151	339
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		1%	0%		6%	
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1585	3169	3185	1425	1545	1382
Flt Permitted	0.09	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	145	3169	3185	1425	1545	1382
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	307	2474	1411	107	164	368
RTOR Reduction (vph)	0	0	0	31	0	0
Lane Group Flow (vph)	307	2474	1411	76	164	368
Turn Type	pm+pt	NA	NA	Perm	Prot	pm+ov
Protected Phases	7	4	8		1	7
Permitted Phases	4			8		1
Actuated Green, G (s)	107.5	107.5	77.1	77.1	14.5	40.4
Effective Green, g (s)	107.5	107.5	77.1	77.1	14.5	40.4
Actuated g/C Ratio	0.77	0.77	0.55	0.55	0.10	0.29
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	377	2433	1754	784	160	398
v/s Ratio Prot	0.15	c0.78	0.44		c0.11	0.17
v/s Ratio Perm	0.47			0.05		0.10
v/c Ratio	0.81	1.02	0.80	0.10	1.02	0.92
Uniform Delay, d1	37.3	16.2	25.4	14.9	62.8	48.3
Progression Factor	1.01	0.88	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.9	16.4	2.8	0.1	77.9	27.0
Delay (s)	43.4	30.7	28.2	15.0	140.6	75.3
Level of Service	D	C	C	B	F	E
Approach Delay (s)		32.1	27.2		95.4	
Approach LOS		C	C		F	

Intersection Summary				
HCM 2000 Control Delay		37.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio		1.00		
Actuated Cycle Length (s)		140.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization		86.7%	ICU Level of Service	E
Analysis Period (min)		15		
c Critical Lane Group				

Appendix G

GDOT Quick Response Project Sketch

Hugh Howell Road



Eradicate Thru Arrows

Remove Signal Heads, Detectors and Signs

Reconstruct island for channelized right turn lane.

Retain Existing Ped Pole

Convert driveway to right in only.

Adjust crosswalk striping.

Install Median Island

Remove signalized left turn lane from Hugh Howell westbound to commercial driveway.

This Driveway No Longer Exists

LEGEND	
ASPHALT	(Dark Grey)
CONCRETE	(Light Grey)
SIDEWALK	(Yellow)
GRASS	(Green)
EDGE OF PAVEMENT	(Thin Green Line)

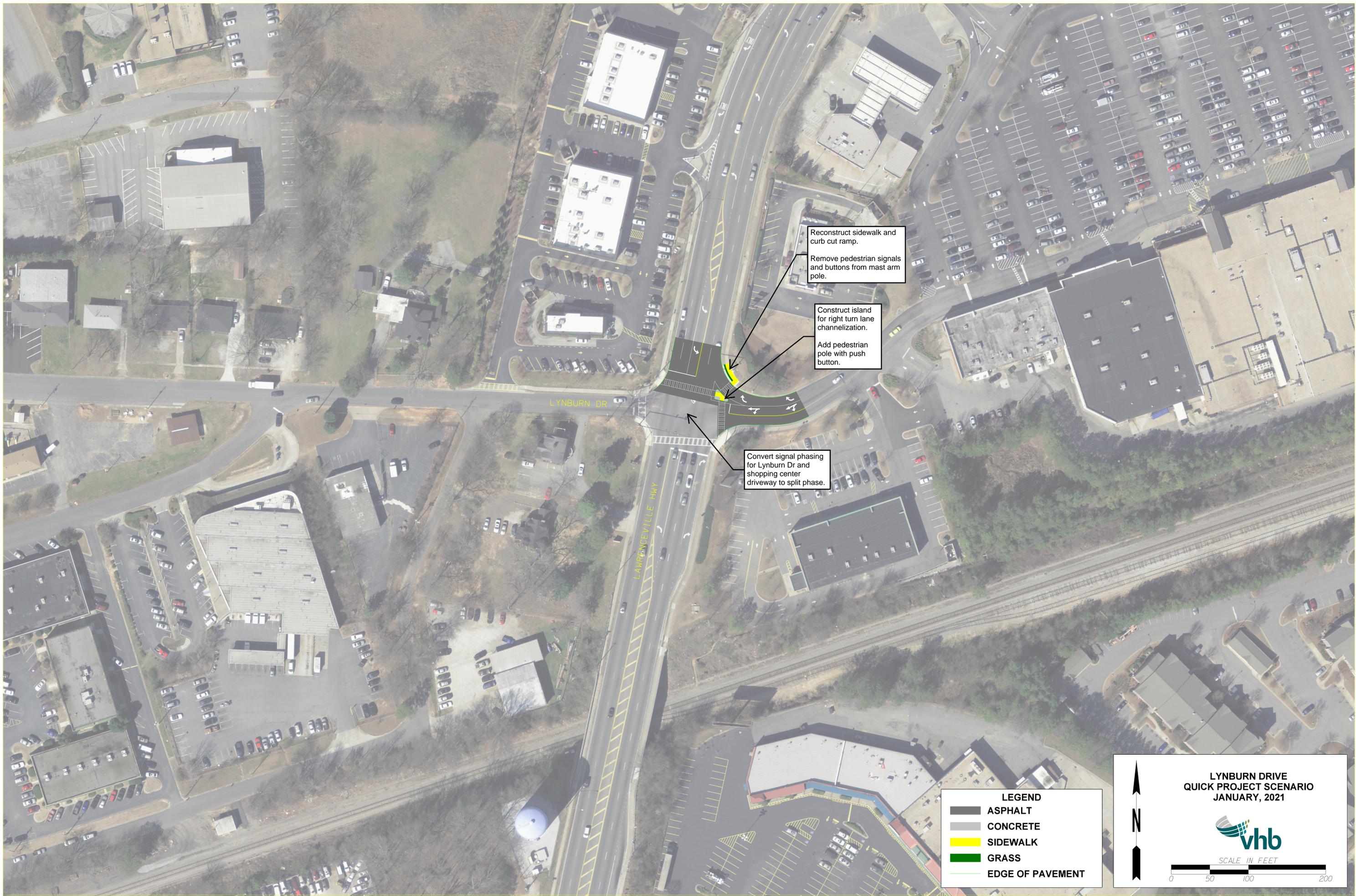
HIGH HOWELL ROAD
QUICK PROJECT SCENARIO
JANUARY, 2021

SCALE IN FEET

Appendix H

GDOT Quick Response Project Sketch

Lynburn Drive



Reconstruct sidewalk and curb cut ramp.

Remove pedestrian signals and buttons from mast arm pole.

Construct island for right turn lane channelization.

Add pedestrian pole with push button.

Convert signal phasing for Lynburn Dr and shopping center driveway to split phase.

LEGEND	
	ASPHALT
	CONCRETE
	SIDEWALK
	GRASS
	EDGE OF PAVEMENT

LYNBURN DRIVE
QUICK PROJECT SCENARIO
JANUARY, 2021



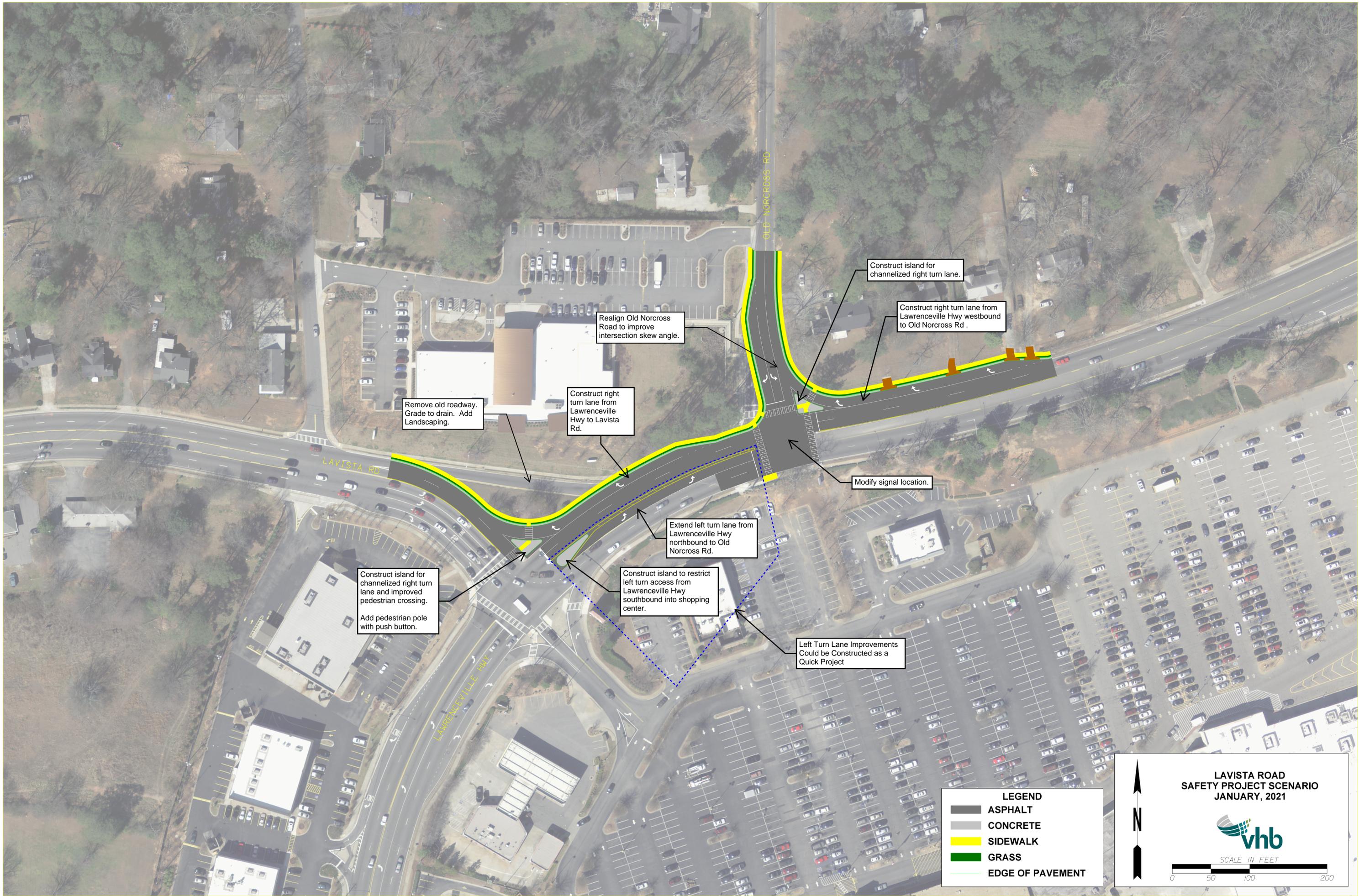
SCALE IN FEET



Appendix I

ARC Safety Project Sketch

Lavista Road/Old Norcross Road



Remove old roadway. Grade to drain. Add Landscaping.

Realign Old Norcross Road to improve intersection skew angle.

Construct right turn lane from Lawrenceville Hwy to Lavista Rd.

Construct island for channelized right turn lane.

Construct right turn lane from Lawrenceville Hwy westbound to Old Norcross Rd.

Modify signal location.

Extend left turn lane from Lawrenceville Hwy northbound to Old Norcross Rd.

Construct island to restrict left turn access from Lawrenceville Hwy southbound into shopping center.

Construct island for channelized right turn lane and improved pedestrian crossing. Add pedestrian pole with push button.

Left Turn Lane Improvements Could be Constructed as a Quick Project

LEGEND

	ASPHALT
	CONCRETE
	SIDEWALK
	GRASS
	EDGE OF PAVEMENT

LAVISTA ROAD SAFETY PROJECT SCENARIO
JANUARY, 2021

SCALE IN FEET