



GAINESVILLE LEFT-TURN LANE QUEUE ANALYSIS STUDY

City of Gainesville, GA

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Jim Hood Rd in Gainesville GA– Queue Analysis Report
City of Gainesville, GA

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1 Project Description

This queue analysis report was prepared to evaluate queuing and blocking potential on the west approach of the signalized intersection of Cleveland Highway (SR 11) and Jim Hood Road/Nopone Road due to an adjacent future development that is anticipated to be built out by the end of 2024. As part of this analysis, a traffic impact analysis was also conducted to assess the impact of the proposed development on the adjacent signalized intersection.

The proposed development’s site is located on the southwest quadrant of the intersection of Cleveland Highway (SR 11) and Jim Hood Road/Nopone Road in the City of Gainesville in Hall County, GA. The ±6.35-acre site is currently undeveloped. The proposed project consists of an 11,000 square-foot grocery store, a 4,000-foot restaurant, a 3,250-foot convenience store, and a 10-pump gas station with an anticipated buildout year of 2024. A site location map is shown in **Figure 1**, and an aerial map is shown in **Figure 2**.

Access to the site is proposed via two (2) driveways. Access on Jim Hood Drive is proposed to be via one (1) full access driveway. Access on Cleveland Highway (SR 11) is proposed to be via one (1) right-in/right out (Ri/Ro) access driveway. A preliminary site plan is included in **Appendix A**. Data used in the analysis consisted of the preliminary site plan provided by the project engineers, peak hour traffic counts collected by LOWE ENGINEERS, and Georgia Department of Transportation (GDOT) web-based applications and published information.

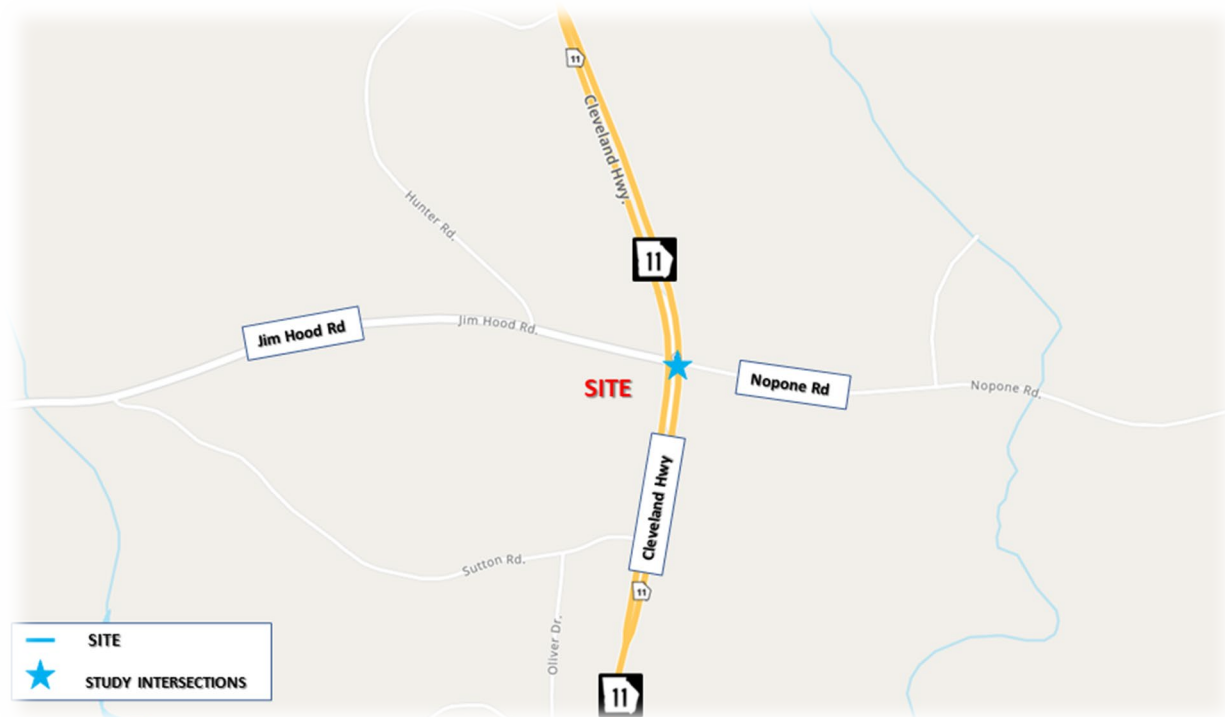


Figure 1: Site Location Map



Figure 2: Aerial View of the Site Location

2 Study Area

The study area was determined based on the nearest significant intersections from the proposed site access driveways. Accordingly, the analysis considered the project’s impact on the following intersections:

- Cleveland Highway (SR 11) at Jim Hood Road/Nopone Road (an existing signalized intersection)
- Jim Hood Road at Site Driveway A (a proposed full access driveway)
- Cleveland Highway (SR 11) at Site Driveway B (a proposed Ri/Ro driveway)

3 Existing Conditions

3.1 Adjacent Roadway Facilities

Cleveland Highway (SR 11) is a four-lane divided roadway and runs primarily north-south in the study area. The roadway is functionally classified by GDOT as an urban principal arterial-other and has a posted speed limit of 55 mph. Sidewalks are not present along both sides of the roadway.

Jim Hood Road is a two-lane undivided roadway and runs primarily east-west in the study area. The roadway is functionally classified by GDOT as an urban minor collector and has a posted speed limit of 45 mph. Sidewalks are not provided along both sides of the roadway.

Nopone Road is a two-lane undivided roadway and runs primarily east-west in the study area. The roadway is functionally classified by GDOT as a rural minor collector and has a posted speed limit of 45 mph. Sidewalks are not provided along both sides of the roadway.

3.2 Existing Lane Geometry and Traffic Control

The existing lane geometry and traffic control for the study intersection are shown in **Figure 3**.

3.3 Traffic Data

Existing turning movement counts were collected at the intersection of Cleveland Highway (SR 11) and Jim Hood Road/Nopone Road on Thursday April 20th, 2023. The AM peak hour of vehicular traffic flow occurred from 7:15 to 8:15 AM, while the PM peak hour of vehicular traffic flow occurred from 4:45 to 5:45 PM. An additional 24-hour bidirectional vehicle classification count was collected on Jim Hood Road west of Cleveland Highway (SR 11). The existing (2023) AM and PM peak hour vehicular turning movement volumes are displayed in **Figure 4**. Raw (2023) traffic data is included in **Appendix B**.

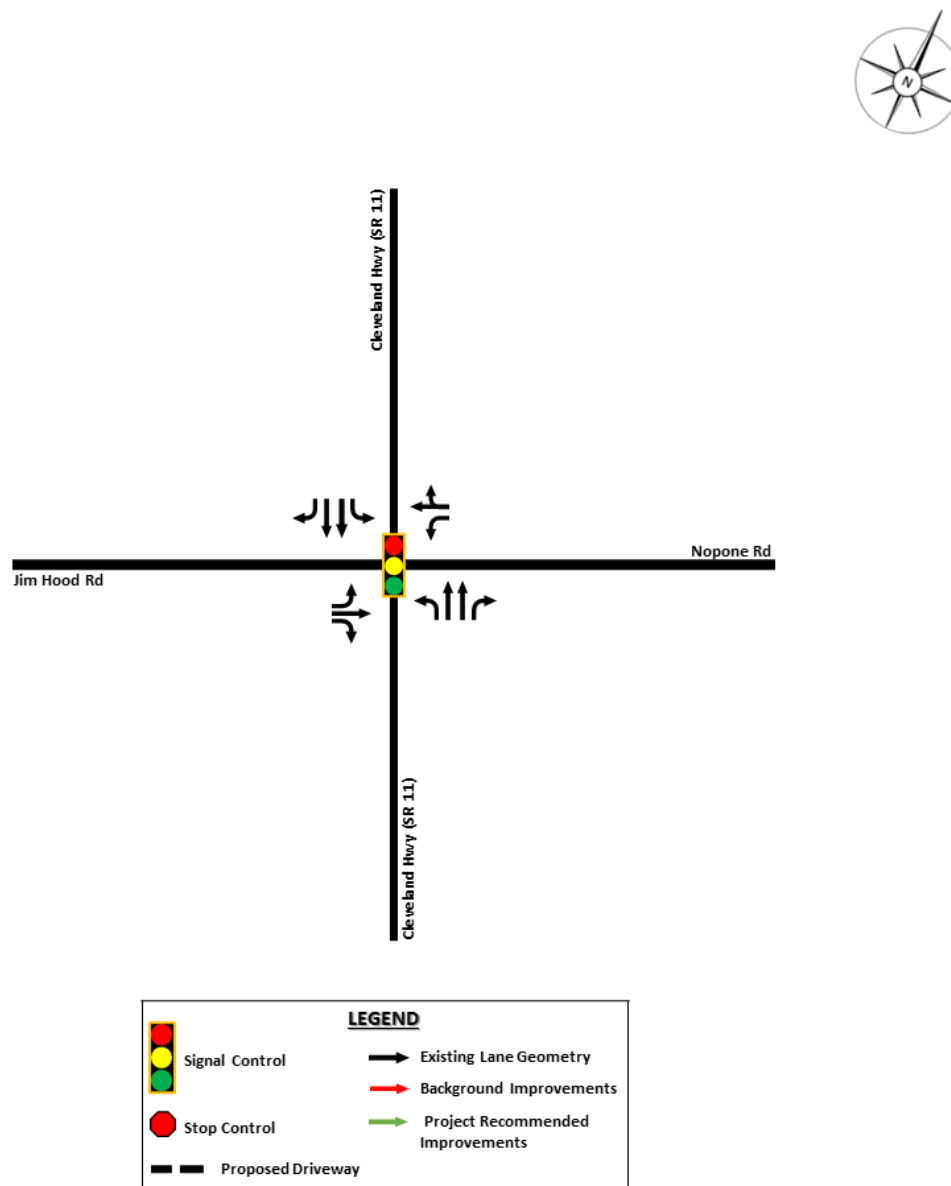


Figure 3: Existing (2023) Lane Geometry and Traffic Control

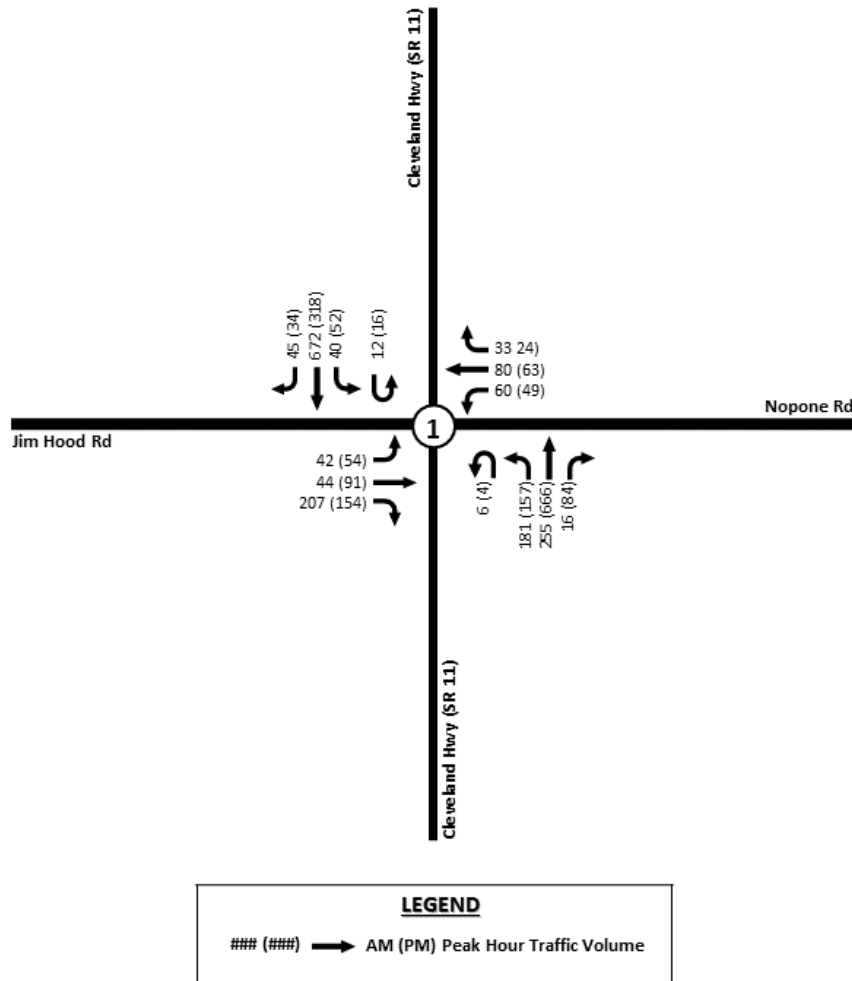


Figure 4: Existing (2023) Traffic Volumes

3.4 Existing Capacity Analysis

A capacity analysis for the intersection of Cleveland Highway (SR 11) and Jim Hood Road/Nopone Road was performed under existing (2023) conditions based on the Highway Capacity Manual 6th Edition (HCM 6), whenever applicable, during the AM and PM peak hours using Synchro 11. Existing conditions represent the existing study intersection geometrical layout, the existing traffic control, and the existing (2023) vehicular turning movement counts during the AM and PM peak hours. Capacity analysis results, including vehicular control delay and level of service (LOS) at the movement and intersection levels, are summarized in **Table 1**. Average vehicular delays are shown in seconds per vehicle. LOS is a grading system defined by the HCM where A is the best, and F is the worst. Signal timing plans and detailed capacity analysis reports under existing (2023) conditions can be found in **Appendix C**.

Table 1: Existing Conditions Capacity Analysis

ID	Intersection	Traffic Control	Movement	AM Peak Hour		PM Peak Hour	
				Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
1	Cleveland Hwy (SR 11) & Jim Hood Rd/Nopone Rd	Signal	EBL	23.8	C	20.7	C
			EBT	25.7	C	24.1	C
			EBR	0.0	A	0.0	A
			WBL	23.3	C	20.8	C
			WBTR	27.2	C	24.0	C
			NBL	14.2	B	13.4	B
			NBT	13.1	B	17.1	B
			NBR	0.0	A	0.0	A
			SBL	13.8	B	14.5	B
			SBT	19.7	B	17.6	B
			SBR	0.0	A	0.0	A
Intersection			18.7	B	17.8	B	

U-Turning movements are ignored in Synchro

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

As indicated in **Table 1**, the existing (2023) capacity analysis revealed the following results:

- During the AM and PM peak hours, all turning movements currently operate acceptably at LOS C or better.
- The intersection operates sufficiently at an overall LOS B during both peak hours.

3.5 Existing Queue Analysis

A detailed queue analysis for the intersection of Cleveland Highway (SR 11) and Jim Hood Road/Nopone Road was performed under existing (2023) traffic conditions using a combination of two traffic simulation tools: Synchro 11 and SimTraffic 11. 95th percentile queue lengths from Synchro and maximum queue lengths from SimTraffic were considered and reported separately for each turn movement. Detailed SimTraffic reports showing simulation summary in addition to queueing and blocking analysis results are provided in **Appendix D**. The critical queue length for a turn lane was determined based on the greater of its 95th percentile queue length from Synchro and its maximum queue length from SimTraffic.

Table 2 summarizes maximum queue lengths and recommended storage bay lengths for auxiliary turn lanes at the study intersection. Full width turn lane lengths were rounded up to the nearest 25 feet. A taper length of 100 feet was utilized. A minimum queue length of 100 feet was considered whenever minimal queue lengths were estimated. The total storage bay length for a turn lane is composed of a full-width turn-lane length and a taper length.

Table 2: Existing Conditions Queue Analysis

ID	Intersection	Movement	AM Peak Hour		PM Peak Hour		Max Queue Length (ft)	Full Width Length (ft)	Taper Length (ft)	Storage Bay Length* (ft)
			Synchro (ft)	SimTraffic (ft)	Synchro (ft)	SimTraffic (ft)				
1	Cleveland Hwy (SR 11) & Jim Hood Rd/Nopone Rd	EBL	25	65	50	70	70	75	100	175
		EBR	0	67	0	13	67	75	100	175
		WBL	50	90	25	80	90	100	100	200
		NBL	75	224	75	206	224	225	100	325
		NBR	0	0	0	127	127	150	100	250
		SBL	25	128	25	90	128	150	100	250
		SBR	0	146	0	0	146	150	100	250

*Storage bay length includes taper length

4 Background Conditions

4.1 Background Lane Geometry and Traffic Control

Lane geometry and traffic control under background (2024) conditions are depicted in **Figure 5**

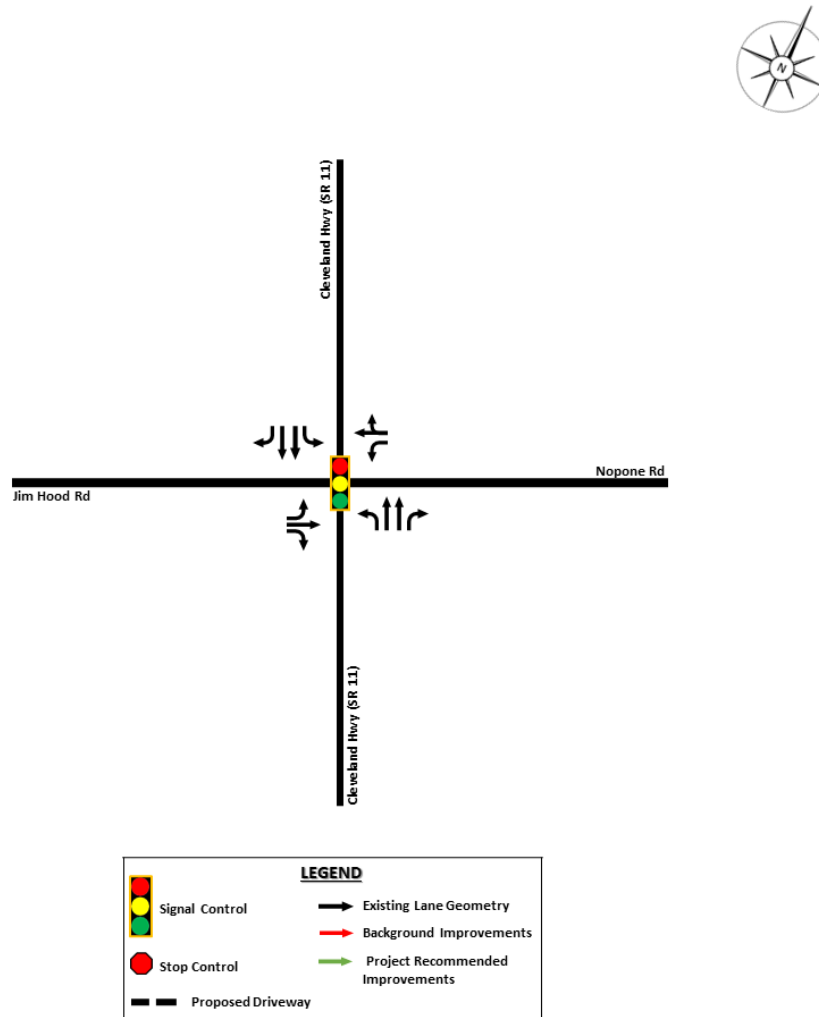


Figure 5: Background (2024) Lane Geometry and Traffic Control

4.2 Background Traffic

Historical traffic counts were obtained from GDOT’s Traffic Analysis and Data Application (TADA) web-based application. Historical annual average daily traffic (AADT) volumes were extracted for the period from 2015 to 2021 from the GDOT’s short-term count stations located on Cleveland Highway (Station ID 139-0147), Jim Hood Road (Station ID 139-8158), and Nopone Road (Station ID 139-8159). Historical population data for Hall County and the city of Gainesville was obtained from U.S. Census Bureau, if available, and published information. Calculations of background traffic growth were based on a combination of historical trends in traffic volumes in the study area and actual county and city census data to determine an appropriate annual growth rate. In accordance with the requirements of GDOT’s Design Traffic Forecasting Manual, a minimum growth rate of 0.5% should always be considered whenever minimal growth is observed. By taking an average growth rate for the historical traffic trends on Cleveland Highway (2.19%), Jim Hood Road (3.74%), Nopone Road (1.43%), Hall County census population growth (1.31%), and City of Gainesville census population growth (2.41%), an estimated average annual growth rate of 2.22% was calculated. A growth rate of 2.30%, therefore, was considered to reflect the projected traffic growth in the study area. Traffic and population data used in the growth rate analysis is included in **Appendix E**. Background (2024) AM and PM peak hour vehicular turning movement volumes are displayed in **Figure 6**.

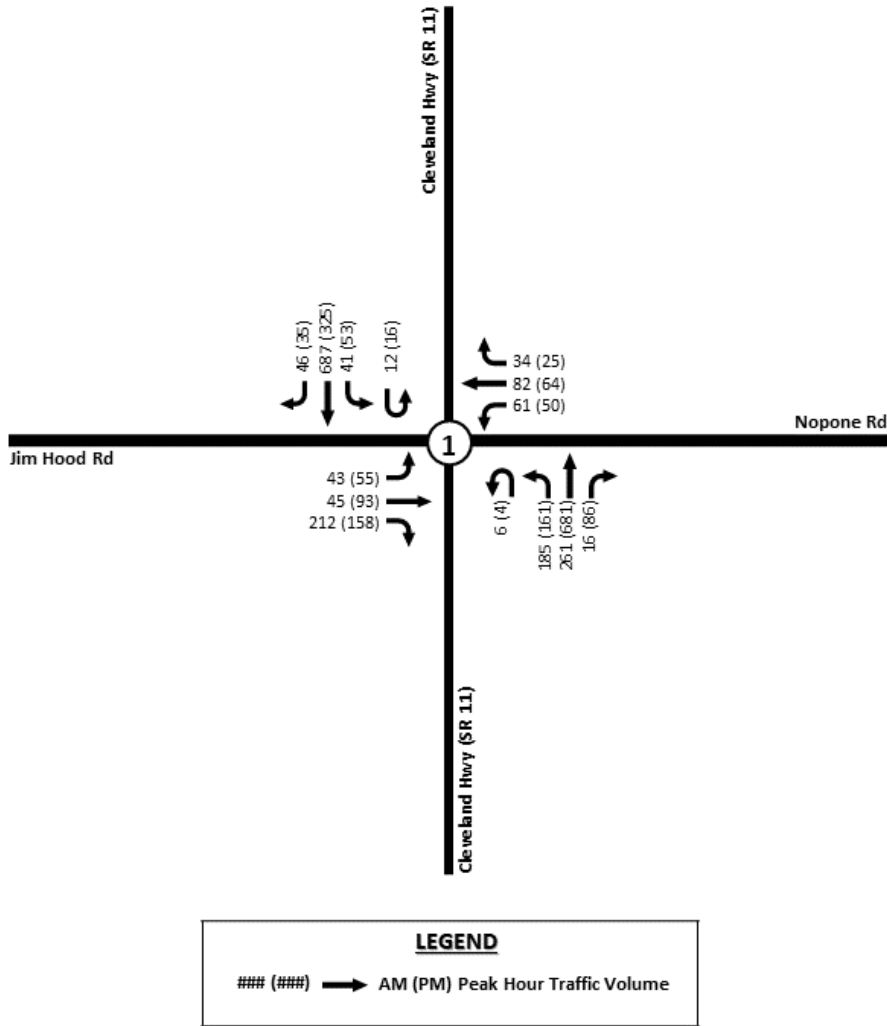


Figure 6: Background (2024) Traffic Volumes

4.3 Background Capacity Analysis

A capacity analysis for the intersection of Cleveland Highway (SR 11) and Jim Hood Road/Nopone Road was performed under background (2024) conditions based on the HCM 6’s methodology, whenever applicable, during the AM and PM peak hours using Synchro 11. Background conditions represent the future study intersection geometrical layout, the future traffic control, and projected (2024) vehicular turning movement counts during the AM and PM peak hours. Capacity analysis results, including vehicular control delay and LOS at the movement and intersection levels, are summarized in **Table 3**. Average vehicular delays are shown in seconds per vehicle. LOS is a grading system defined by the HCM where A is the best, and F is the worst. Detailed capacity analysis reports under background (2024) conditions can be found in **Appendix F**.

Table 3: Background Conditions Capacity Analysis

ID	Intersection	Traffic Control	Movement	AM Peak Hour		PM Peak Hour	
				Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
1	Cleveland Hwy (SR 11) & Jim Hood Rd/Nopone Rd	Signal	EBL	24.2	C	21.0	C
			EBT	26.2	C	24.5	C
			EBR	0.0	A	0.0	A
			WBL	23.7	C	21.1	C
			WBTR	27.7	C	24.4	C
			NBL	14.3	B	13.4	B
			NBT	13.1	B	17.1	B
			NBR	0.0	A	0.0	A
			SBL	13.7	B	14.5	B
			SBT	19.8	B	17.6	B
			SBR	0.0	A	0.0	A
Intersection			18.9	B	17.9	B	

U-Turning movements are ignored in Synchro

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

As shown in **Table 3**, the background (2024) conditions capacity analysis revealed the following results:

- During the AM and PM peak hours, all turning movements will continue to operate adequately at LOS C or better.
- The intersection will continue to operate sufficiently at an overall LOS B during both peak hours.

4.4 Background Queue Analysis

A detailed queue analysis for the subject signalized intersection was performed under background (2024) conditions using a combination of two traffic simulation tools: Synchro 11 and SimTraffic 11. 95th percentile queue lengths from Synchro and maximum queue lengths from SimTraffic were considered and reported separately for each turn movement. Detailed SimTraffic reports showing simulation summary in addition to queueing and blocking analysis results are provided in **Appendix G**. The critical queue length

for a turn lane was determined based on the greater of the 95th percentile queue length from Synchro and the maximum queue length from SimTraffic.

Table 4 summarizes maximum queue lengths and recommended storage bay lengths for auxiliary turn lanes at the study intersection. Full width turn lane lengths were rounded up to the nearest 25 feet. A taper length of 100 feet was utilized. A minimum queue length of 100 feet was considered whenever minimal queue lengths were estimated. The total storage bay length for a turn lane is composed of a full-width turn-lane length and a taper length.

Table 4: Background Conditions Queue Analysis

ID	Intersection	Movement	AM Peak Hour		PM Peak Hour		Max Queue Length (ft)	Full Width Length (ft)	Taper Length (ft)	Storage Bay Length* (ft)
			Synchro (ft)	SimTraffic (ft)	Synchro (ft)	SimTraffic (ft)				
1	Cleveland Hwy (SR 11) & Jim Hood Rd/Nopone Rd	EBL	25	59	50	81	81	100	100	200
		EBR	0	85	0	30	85	100	100	200
		WBL	50	79	25	81	81	100	100	200
		NBL	75	210	75	214	214	225	100	325
		NBR	0	0	0	221	221	225	100	325
		SBL	25	241	25	104	241	250	100	350
		SBR	0	236	0	0	236	250	100	350

*Storage bay length includes taper length

5 Build Conditions

5.1 Trip Generation

A trip generation analysis was performed for the proposed development using the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition. Pass-by rates were based on the latest ITE Trip Generation Manual. The resulting trip generation analysis is summarized in **Table 5**. ITE information sheets are provided in **Appendix H**.

Table 5: Trip Generation Analysis

Land Use Information	Reduction %	Project Trips			Equation Used ¹	In / Out Distribution
		Total	Inbound	Outbound		
850 - Supermarket					11,000	SF
Daily		1,457	729	728	$T = 83.39(X) + 539.33$	50% / 50%
AM Peak Hour		31	18	13	$T = 2.86(X)$	59% / 41%
PM Peak Hour		129	65	64	$\ln(T) = 0.81\ln(X) + 2.92$	50% / 50%
Reductions for Pass-By Trips						
Daily	24%	350	175	175		
AM Peak Hour	0%	0	0	0		
PM Peak Hour	24%	31	16	15		
945 - Convenience Store/Gas Station (GFA 2-4k)					10	VFP
Daily		2,433	1,217	1,216	$T = 158.28(X) + 850.23$	50% / 50%
AM Peak Hour		161	81	80	$T = 16.06(X)$	50% / 50%
PM Peak Hour		184	92	92	$T = 18.42(X)$	50% / 50%
Reductions for Pass-By Trips						
Daily	75%	1,825	913	912		
AM Peak Hour	76%	122	62	60		
PM Peak Hour	75%	138	69	69		
932 - High-Turnover (Sit-Down) Restaurant					4,000	SF
Daily		429	215	214	$T = 107.2(X)$	50% / 50%
AM Peak Hour		38	21	17	$T = 9.57(X)$	55% / 45%
PM Peak Hour		36	22	14	$T = 9.05(X)$	61% / 39%
Reductions for Pass-By Trips						
Daily	43%	184	92	92		
AM Peak Hour	0%	0	0	0		
PM Peak Hour	43%	15	9	6		
New External Vehicle Trips						
Daily		4,319	2,161	2,158		
AM Peak Hour		230	120	110		
PM Peak Hour		349	179	170		
Total Pass-By Trips						
Daily		2,359	1,180	1,179		
AM Peak Hour		122	62	60		
PM Peak Hour		184	94	90		
Net New External Vehicle Trips						
Daily		1,960	981	979		
AM Peak Hour		108	58	50		
PM Peak Hour		165	85	80		

¹ Where: T = Trips; X = Density by Variable

Source: ITE Trip Generation Manual, 11th Edition

The proposed development is anticipated to generate 4,319 new daily vehicle trips, of which 2,161 trips are entering and 2,158 trips are exiting. The AM peak hour is anticipated to generate 230 new vehicle trips, of which 120 trips are entering and 110 trips are exiting. of the 120 entering trips, 62 are pass-by trips and 58 are primary trips. Of the 110 exiting trips, 60 are pass-by trips and 50 are primary trips. The PM peak hour is anticipated to generate 349 new vehicle trips, of which 179 trips are entering and 170 trips are exiting. Of the 179 entering trips, 94 are pass-by trips and 85 are primary trips. Of the 170 exiting trips, 90 are pass-by trips and 80 are primary trips.

5.2 Trip Distribution

A trip distribution pattern was estimated based on local knowledge of land-use densities in the study area, professional engineering judgement, existing traffic patterns, and the location of the proposed development with respect to the study network to accurately reflect prevailing travel patterns in the vicinity of the site and the surrounding transportation network. The estimated project trip distribution on the study intersections is presented in **Figure 7**. Project vehicular trips coming from the south would make a left-turn or U-turn (50% each route) at the signalized intersection of Cleveland Highway and Nopone Road. This assumption was made due to the fact that some drivers are likely to make a U-turn followed by another right turn into the site. Such vehicles when exiting do not have to drive through the signal; instead, they would just make a right out of the site onto Cleveland Highway and continue driving south. The other possible scenario is that drivers could make a left-turn at the signal and then make another left-turn after finding a gap within eastbound through traffic. Directional project trips were then assigned to the study intersections. AM and PM peak hour project trips are displayed in **Figure 8**. Pass-by trips are added to the site access driveways and subtracted from the adjacent through movement. The estimated pass-by trip distribution and pass-by directional trips on the study intersections are presented in **Figure 9** and **Figure 10**.

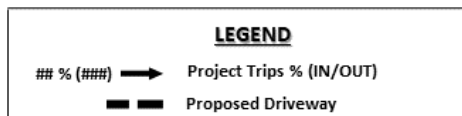
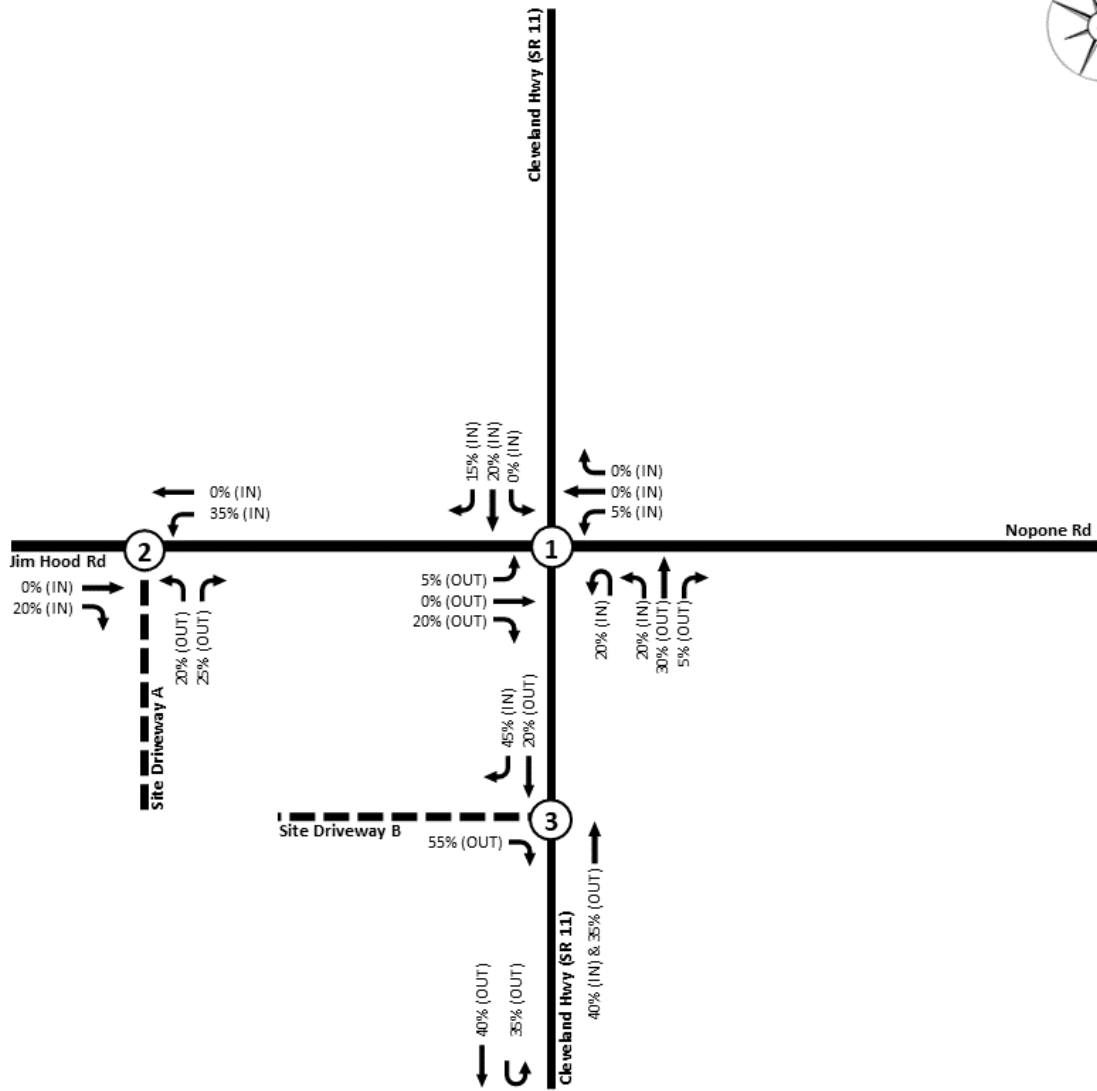


Figure 7: Project Trip Distribution

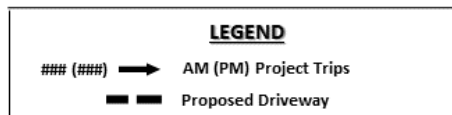
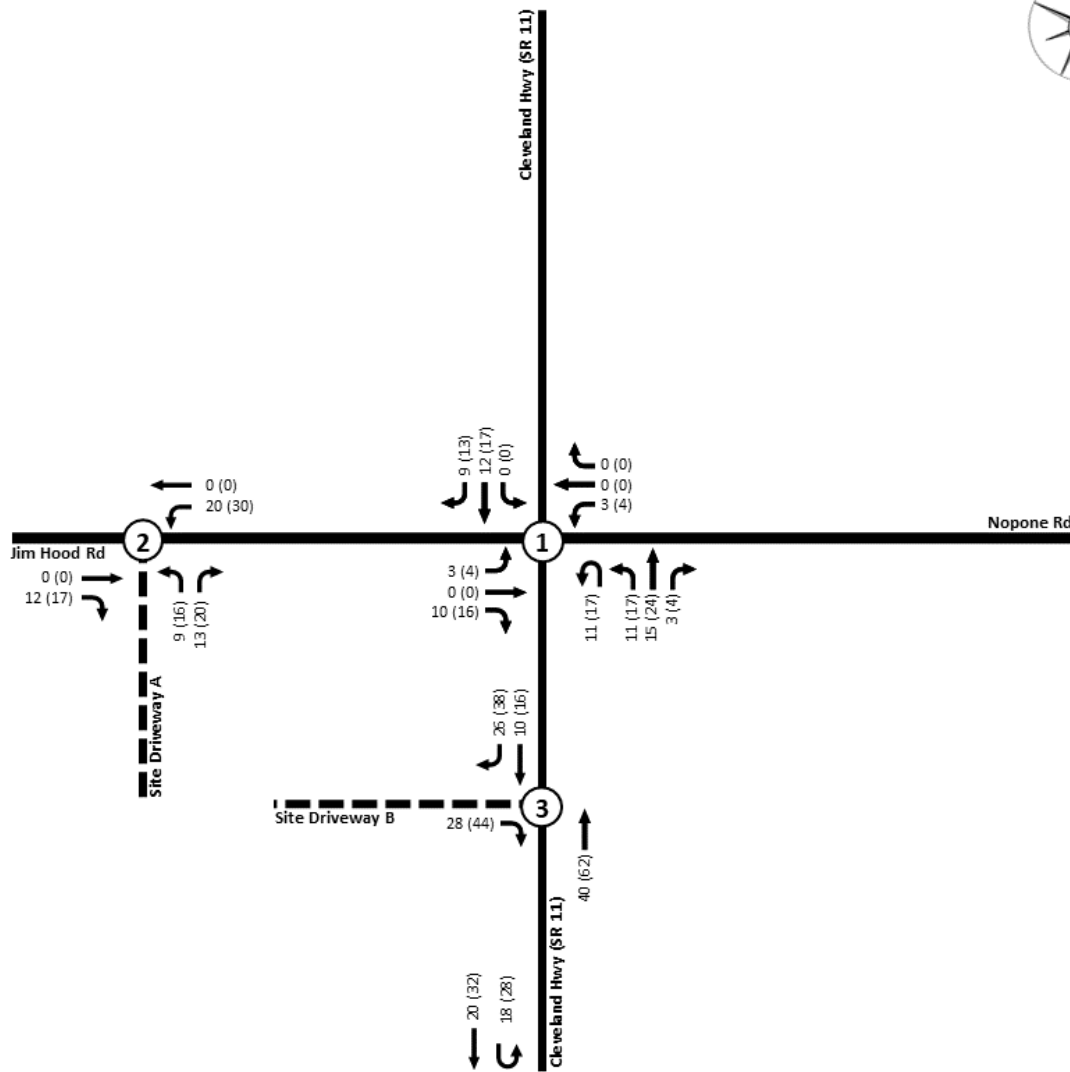


Figure 8: Assignment of Project Trips

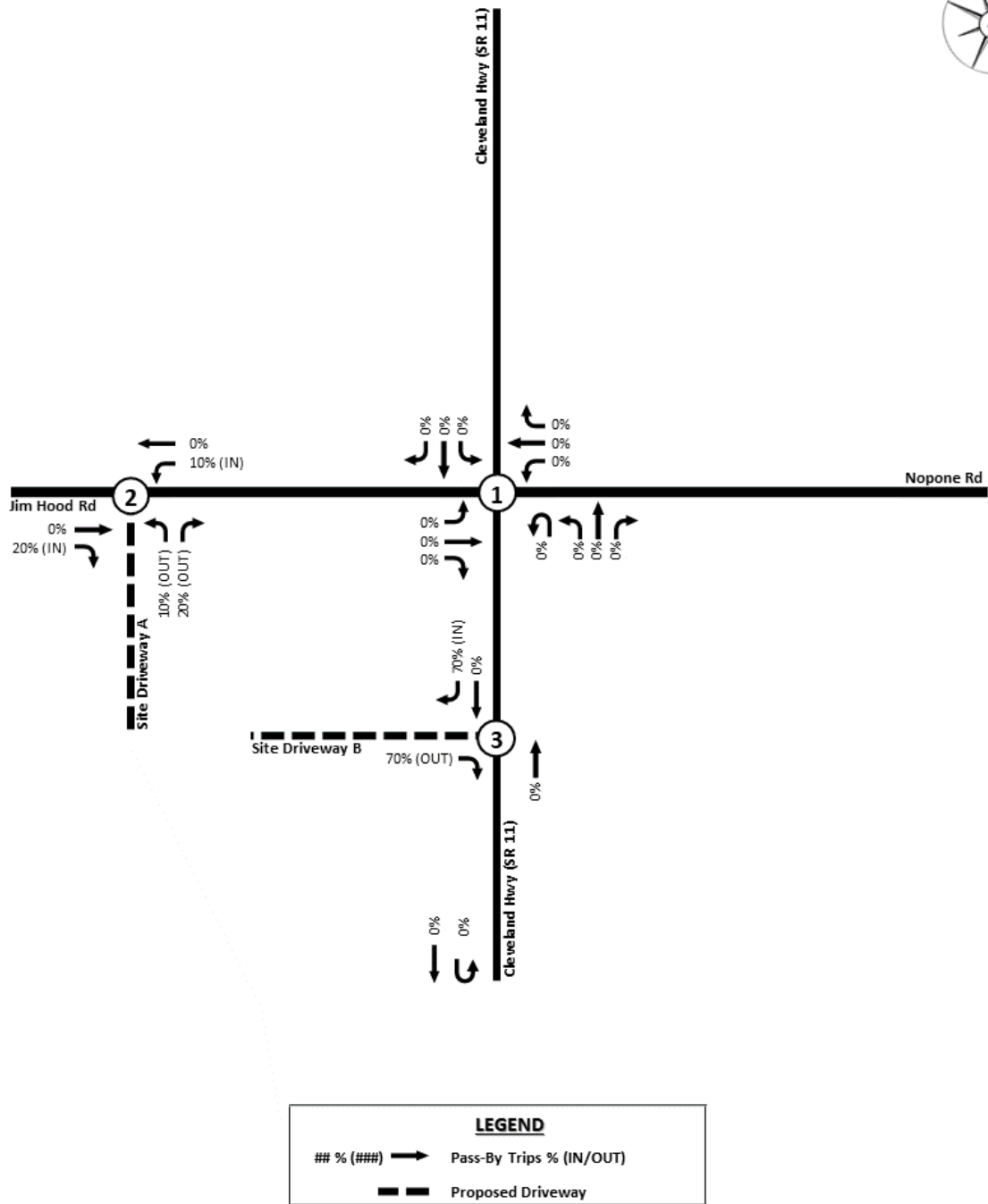
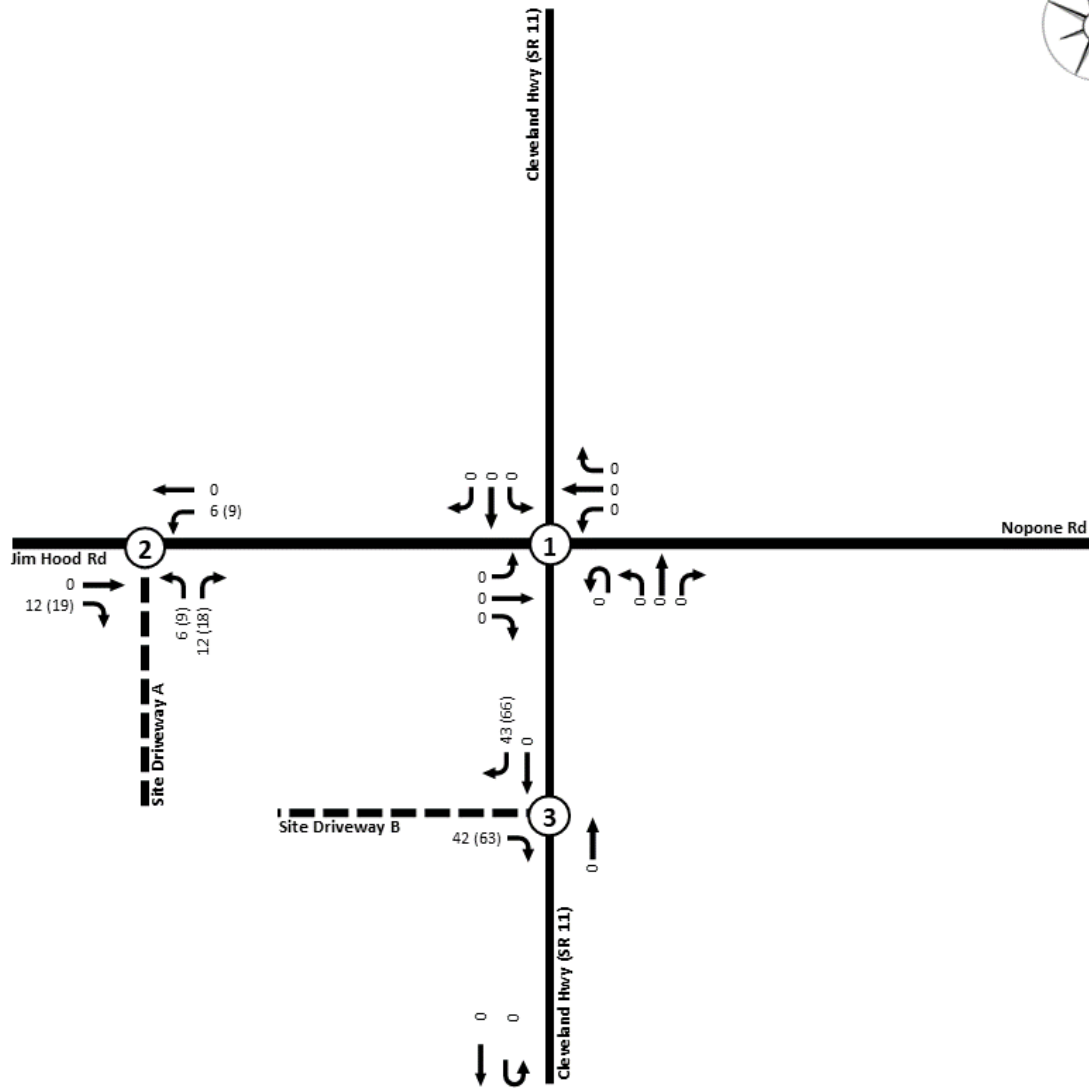


Figure 9: Pass-By Trip Distribution



LEGEND

% (###) → AM (PM) Pass-By Trips

--- Proposed Driveway

Figure 10: Assignment of Pass-By Trips

5.3 Build Lane Geometry and Traffic Control

Lane geometry and traffic control under build (2024) conditions for the study intersections are illustrated in **Figure 11**.

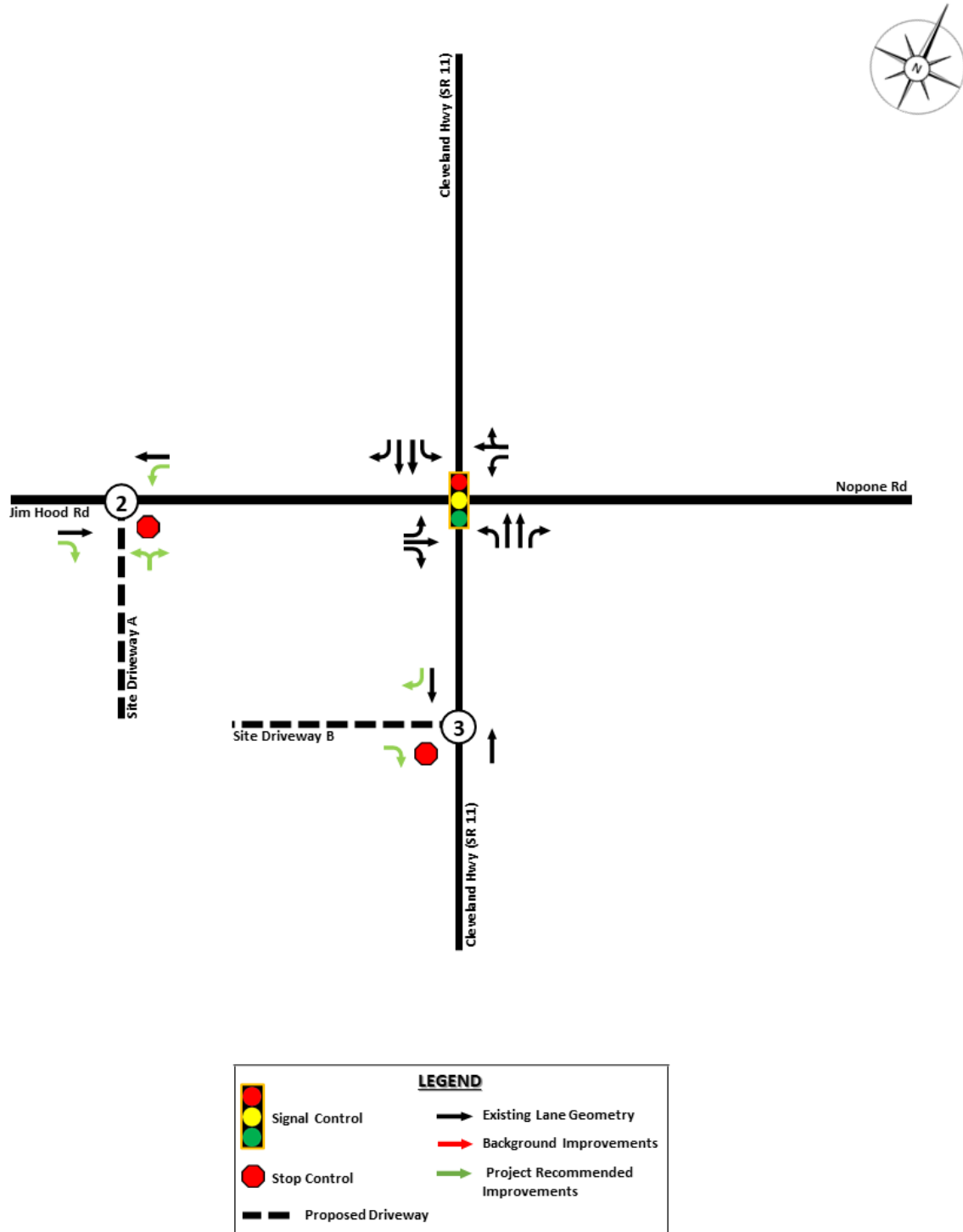


Figure 11: Build (2024) Lane Geometry and Traffic Control

5.4 Build Capacity Analysis

A capacity analysis for the study intersections was performed under build (2024) conditions based on the HCM 6's methodology, whenever applicable, during the AM and PM peak hours using Synchro 11. Build conditions represent future study intersection geometrical layouts, future traffic control, and projected (2024) intersection vehicular turning movement volumes during the AM and PM peak hours. Projected (2024) intersection volumes were computed by applying the calculated annual growth rate to the existing (2023) turning movement volumes and then adding the project-generated directional trips. Projected build (2024) AM and PM peak hour vehicular turning movement volumes for the study intersections are presented in **Figure 12**.

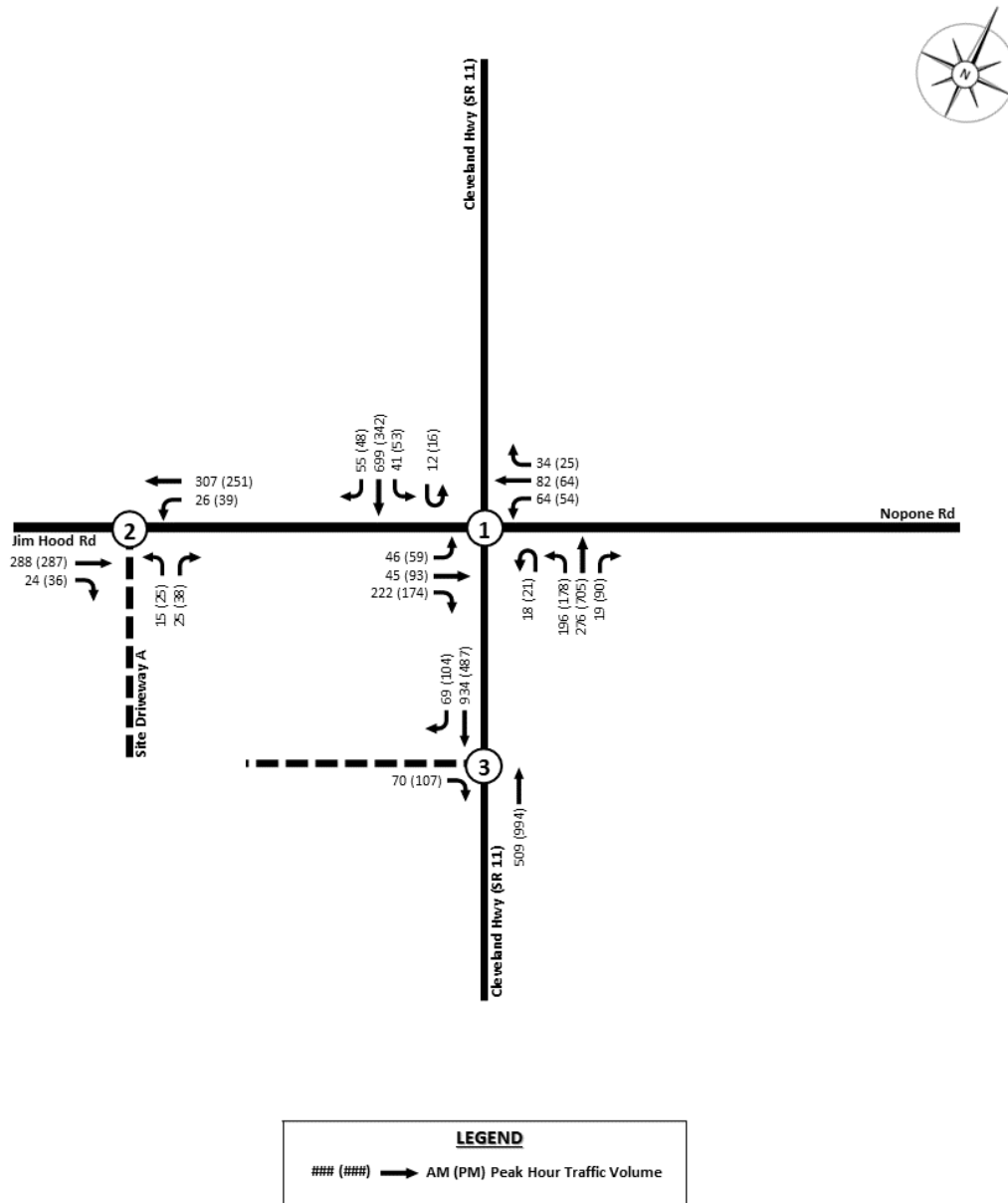


Figure 12: Build (2024) Traffic Volumes

Capacity analysis results, including vehicular control delay and LOS at the movement and intersection levels, are summarized in **Table 6**. Average vehicular delays are shown in seconds per vehicle. LOS is a grading system defined by the HCM where A is the best, and F is the worst. Detailed capacity analysis reports under build (2024) conditions can be found in **Appendix F**.

Table 6: Build Conditions Capacity Analysis

ID	Intersection	Traffic Control	Movement	AM Peak Hour		PM Peak Hour	
				Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
1	Cleveland Hwy (SR 11) & Jim Hood Rd/Nopone Rd	Signal	EBL	24.7	C	21.4	C
			EBT	26.8	C	25.1	C
			EBR	0.0	A	0.0	A
			WBL	24.1	C	21.5	C
			WBTR	28.4	C	25.1	C
			NBL	14.4	B	13.5	B
			NBT	13.1	B	17.1	B
			NBR	0.0	A	0.0	A
			SBL	13.9	B	14.8	B
			SBT	20.1	C	18.1	B
			SBR	0.0	A	0.0	A
	Intersection		19.0	B	18.1	B	
2	Jim Hood Rd & Site Driveway A	TWSC	EBT	0.0	A	0.0	A
			EBR	0.0	A	0.0	A
			WBL	8.0	A	8.1	A
			WBT	0.0	A	0.0	A
			NBLR	12.1	B	12.4	B
			Intersection	1.0	--	1.6	--
3	Cleveland Hwy (SR 11) & Site Driveway B	TWSC	EBR	13.3	B	10.8	B
			NBT	0.0	A	0.0	A
			SBT	0.0	A	0.0	A
			SBR	0.0	A	0.0	A
			Intersection	0.6	--	0.7	--

U-Turning movements are ignored in Synchro

Unsignalized Delay for [NBR, EBR, SBR] is excluded from calculations of the intersection delay at signalized intersections

As indicated in **Table 6**, the build (2024) conditions capacity analysis for revealed the following results:

Cleveland Highway (SR 11) at Jim Hood Road/Nopone Road

- During the AM and PM peak hours, all turning movements will continue to operate adequately at LOS C or better.
- The intersection will continue to operate sufficiently at an overall LOS B during both peak hours.

Jim Hood Road at Site Driveway A

- During the AM and PM peak hours, all turning movements will operate at LOS B or better.
- The intersection will continue to operate adequately with negligible delay during both peak hours.

Cleveland Highway (SR 11) at Site Driveway B

- During the AM and PM peak hours, all turning movements will continue to operate at LOS B or better.
- The intersection will continue to operate sufficiently with negligible delay during both peak hours.

5.5 Build Queue Analysis

A detailed queue analysis for the subject signalized intersection was performed under build (2024) conditions using a combination of two traffic simulation tools: Synchro 11 and SimTraffic 11. 95th percentile queue lengths from Synchro and maximum queue lengths from SimTraffic were considered and reported separately for each turn movement. Detailed SimTraffic reports showing simulation summary in addition to queueing and blocking analysis results are provided in **Appendix G**. The critical queue length for a turn lane was determined based on the greater of the 95th percentile queue length from Synchro and the maximum queue length from SimTraffic.

Table 7 summarizes maximum queue lengths and recommended storage bay lengths for auxiliary turn lanes at the study intersection. Full width turn lane lengths were rounded up to the nearest 25 feet. A taper length of 100 feet was utilized. A minimum queue length of 100 feet was considered whenever minimal queue lengths were estimated. The total storage bay length for a turn lane is composed of a full-width turn-lane length and a taper length.

Table 7: Build Conditions Queue Analysis

ID	Intersection	Movement	AM Peak Hour		PM Peak Hour		Max Queue Length (ft)	Full Width Length (ft)	Taper Length (ft)	Storage Bay Length* (ft)
			Synchro (ft)	SimTraffic (ft)	Synchro (ft)	SimTraffic (ft)				
1	Cleveland Hwy (SR 11) & Jim Hood Rd/Nopone Rd	EBL	50	74	50	91	91	100	100	200
		EBR	0	39	0	21	39	50	100	150
		WBL	50	87	50	81	87	100	100	200
		NBL	75	191	75	155	191	200	100	300
		NBR	0	0	0	0	0	0	100	100
		SBL	25	47	25	80	80	100	100	200
		SBR	0	0	0	0	0	0	100	100

*Storage bay length includes taper length

5.6 Turn Lane Warrant Analysis

The development is proposed to be accessed via two (2) access driveways on Jim Hood Road and Cleveland Highway (SR 11). Jim Hood Road is a two-lane undivided roadway with an estimated AADT volume of 4,900 vehicles and has a posted speed limit of 45 mph. Cleveland Highway (SR 11) is a four-lane divided roadway with an estimated AADT volume of 12,000 vehicles and has a posted speed limit of 55 mph. A review of warrants for turn lanes was conducted on the proposed site access driveways in accordance with 2023 GDOT Regulations for Driveway and Encroachment Control to ensure smooth traffic flow, maintain capacity, and eliminate unnecessary delay to through traffic on Jim Hood Road and Cleveland Highway (SR 11) during peak hours. If warranted, the required total turn lane lengths will be calculated per Table

4-8 and Table 4-9 of 2023 GDOT Regulations for Driveway and Encroachment Control. A summary of turn lane warrant analysis for the proposed site access driveways is presented in **Table 8**. An excerpt from 2023 GDOT Regulations for Driveway and Encroachment Control is provided in **Appendix I**.

Table 8: Turn Lane Warrant Analysis

Location	Warrant For	# of Lanes	Speed Limit (mph)	AADT Category	Total RT/LT Volume (vpd)	Volume Threshold (vpd)	Warrant Met ?
Jim Hood Rd @ Site Driveway A	Right Turn Lane	2	40 to 50 MPH	<6,000	433	150	Yes
Cleveland Hwy @ Site Driveway B	Right Turn Lane	> 2	55 to 60 MPH	≥10,000	1268	50	Yes
Jim Hood Rd @ Site Driveway A	Left Turn Lane	2	40 to 50 MPH	<6,000	462	250	Yes

5.6.1 Auxiliary Right Turn Lanes

The warrant analysis result shows that an eastbound right turn lane is warranted on Jim Hood Road at Site Driveway A. Based on a posted speed limit of 45 mph, therefore, an eastbound right turn deceleration lane of 175 feet with a 100-foot taper should be constructed on Jim Hood Road at Site Driveway A.

The warrant analysis result also shows that a southbound right turn lane is warranted on Cleveland Highway (SR 11) at Site Driveway B. Based on a posted speed limit of 55 mph, therefore, a southbound right turn deceleration lane of 250 feet with a 100-foot taper should be constructed on Cleveland Highway (SR 11) at Site Driveway B.

5.6.2 Auxiliary Left Turn Lanes

The warrant analysis result shows that a westbound left turn lane is warranted on Jim Hood Road at Site Driveway A. Based on a posted speed limit of 45 mph, therefore, a westbound left turn deceleration lane of 235 feet with a 100-foot taper should be constructed on Jim Hood Road at Site Driveway A. By considering projected queue lengths on the westbound left-turn lane on Jim Hood Rd, however, it is found that the 95th percentile queue lengths at the project buildout during the AM and PM peak hours are expected to be 2.5 feet only.

5.6.3 Auxiliary Turn Lanes Summary

Jim Hood Road should be improved by installing a single eastbound right turn deceleration lane of 175 feet with a 100-foot taper and a single westbound left turn lane of 235 feet with a 100-foot taper at Site Driveway A. Cleveland Highway (SR 11) should be improved by installing a single southbound right turn deceleration lane of 250 feet with a 100-foot taper at Site Driveway B.

6 Conclusions and Recommendations

This queue analysis study was conducted to mainly evaluate queuing conditions and blocking potential on the west approach of the signalized intersection of Cleveland Highway (SR 11) and Jim Hood Road/Nopone Road due to an adjacent future development on the southwest quadrant of the subject intersection. As part of this analysis, a traffic impact analysis was also conducted to consider the impact of the proposed development on the adjacent signalized intersection.

The project site is located on the southwest quadrant of the intersection of Cleveland Highway (SR 11) and Jim Hood Road/Nopone Road in the City of Gainesville in Hall County, GA. The project is composed of an 11,000 square-foot grocery store, a 4,000-foot restaurant, a 3,250-foot convenience store, and a 10-pump gas station with an anticipated buildout year of 2024. The analysis evaluated the development's impact on the adjacent study intersections within the project's influence area. The results of the analysis as documented herein are summarized below:

- The proposed development is projected to generate 4,319 new daily vehicle trips, of which 2,161 trips are entering and 2,158 trips are exiting. The AM peak hour is anticipated to generate 230 new vehicle trips, of which 120 trips are entering and 110 trips are exiting. Of the 120 entering trips, 62 are pass-by trips and 58 are primary trips. Of the 110 exiting trips, 60 are pass-by trips and 50 are primary trips. The PM peak hour is anticipated to generate 349 new vehicle trips, of which 179 trips are entering and 170 trips are exiting. Of the 179 entering trips, 94 are pass-by trips and 85 are primary trips. Of the 170 exiting trips, 90 are pass-by trips and 80 are primary trips.
- The intersection capacity analysis shows that the intersection of Cleveland Highway (SR 11) and Jim Hood Road/Nopone Road currently operates sufficiently and will continue to do so at the project buildout.
- The queueing analysis indicates that the total storage bay length required to accommodate eastbound left-turning vehicles on Jim Hood Road at the project buildout is found to be 200 feet (including a 100-foot taper). The turn lane warrant analysis, however, shows that a single westbound left turn lane of 235 feet with a 100-foot taper is warranted and required on Jim Hood Road at Site Driveway A. By considering projected queue lengths on the westbound left-turn lane on Jim Hood Rd, however, it is found that the 95th percentile queue lengths at the project buildout during the AM and PM peak hours are expected to be 2.5 feet only. Therefore, a total distance of approximately 435 feet is required on Jim Hood Road between the stop bar of the eastbound left-turn lane and the proposed Site Driveway A to safely and efficiently accommodate future turn movements into the proposed development without adversely impacting the intersection of Cleveland Highway (SR 11) and Jim Hood Road/Nopone Road.
- The proposed two site access driveways are both projected to operate at an adequate LOS at the project buildout.
- Jim Hood Road should be improved by installing a single eastbound right turn deceleration lane of 175 feet with a 100-foot taper and a single westbound left turn lane of 235 feet with a 100-foot taper at Site Driveway A. Cleveland Highway (SR 11) should be improved by installing a single southbound right turn deceleration lane of 250 feet with a 100-foot taper at Site Driveway B.

Appendix A: Preliminary Site Plan

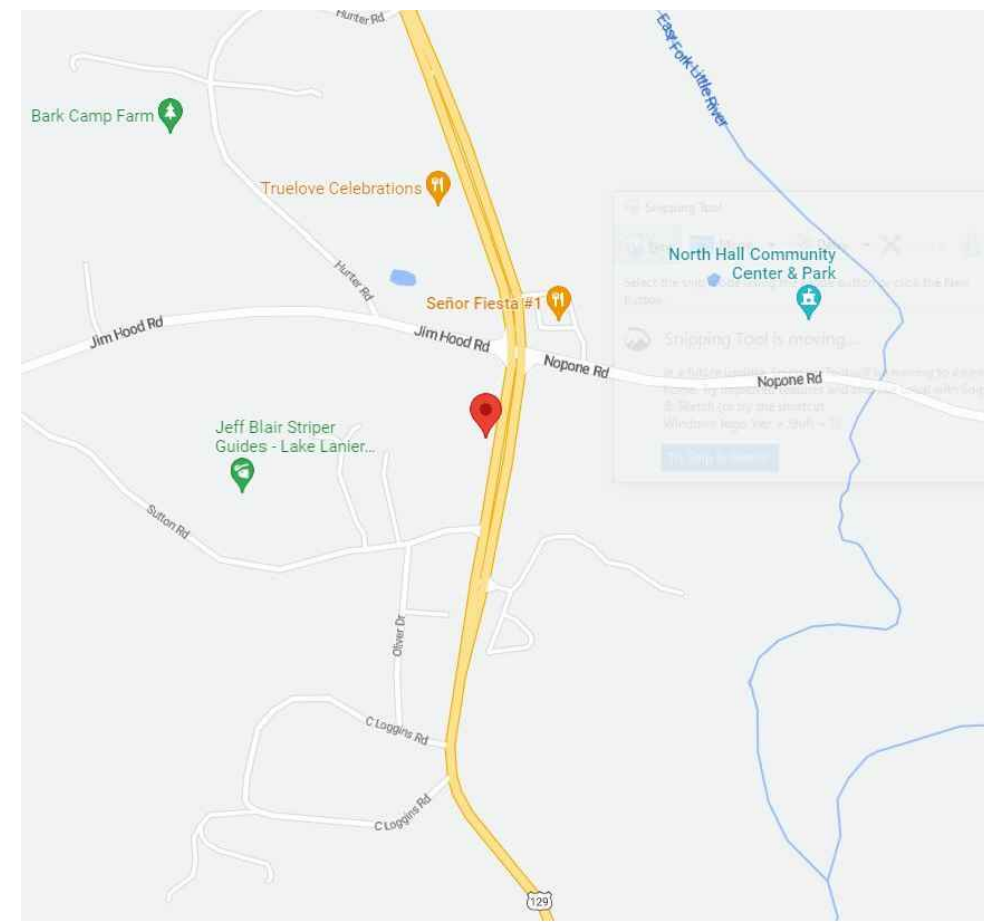
GENERAL NOTES:

OWNER: RAJ UMANI
PHONE:

DEVELOPER: VANTAGE COMMERCIAL CONTRACTORS LLC
3060 OAK DRIVE
LAWRENCEVILLE, GA 30044
CONTACT: VIRAL PAREKH
PHONE: 404-884-3834

ENGINEER: PLAND ENGINEERING AND ARCHITECTURE
CONTACT: REGINALD CRAYTON, P.E.
PHONE: 404-428-3445

SITE ADDRESS: 4053 CLEVELAND HWY
GAINESVILLE, GA 30506



VICINITY MAP:

- PARCEL NUMBER: 12025 000036
- PARCEL AREA: 6.35 ACRES, 276,594 SF
- CURRENT ZONING: AR-III (AGRICULTURAL RESIDENTIAL - III)
PROPOSED ZONING: S-S (SUBURBAN SHOPPING DISTRICT)
- DISTRICT: 12TH
- LAND LOT: 25
- SURVEY OBTAINED FROM W.L.B ASSOCIATES, INC
349 CHERYL COURT, JONESBORO, GA 30238
- ALL CONTRACTORS UTILIZING THIS PLAN SET AND THE INFORMATION CONTAINED THEREON SHOULD CALL 1800-282-7411 3 DAYS BEFORE BEGINNING CONSTRUCTION.
- PROPOSED BUILDINGS USE:
CONVENIENCE STORE WITH FUELING STATION
NUMBER OF STORIES: 1
PROPOSED BUILDING AREA = 3250 SF
- RESTAURANT
NUMBER OF STORIES: 1
PROPOSED BUILDING AREA = 4,000 SF
- GROCERY STORE
NUMBER OF STORIES: 1
PROPOSED BUILDING AREA = 11,000 SF
- MIN LOT AREA: 15,000 SF
- MIN LOT FRONTAGE: 100
- MINIMUM FRONT YARD SETBACK: 30 FEET
- MINIMUM SIDE YARD SETBACK: 20 FEET
- MINIMUM REAR YARD SETBACK: 10 FEET
- PARKING REQUIREMENT:
CONVENIENCE STORE WITH FUELING STATION: MINIMUM REQUIRED 1 SPACE PER 200 SF, 16 SPACES PROVIDED, 16 SPACES REQUIRED
RESTAURANT: 9.5 SPACES PER 1,000 SF, 43 SPACES PROVIDED, 38 SPACES REQUIRED
GROCERY STORE: 1 SPACE PER 200 SF, 79 SPACES PROVIDED, 55 SPACES REQUIRED
- PUBLIC WATER SERVICE WILL BE PROVIDED TO THE PROPERTY BY THE CITY OF GAINESVILLE.
- SEWER/SEWAGE WILL BE HANDLED ON SITE BY A SEPTIC SYSTEM.

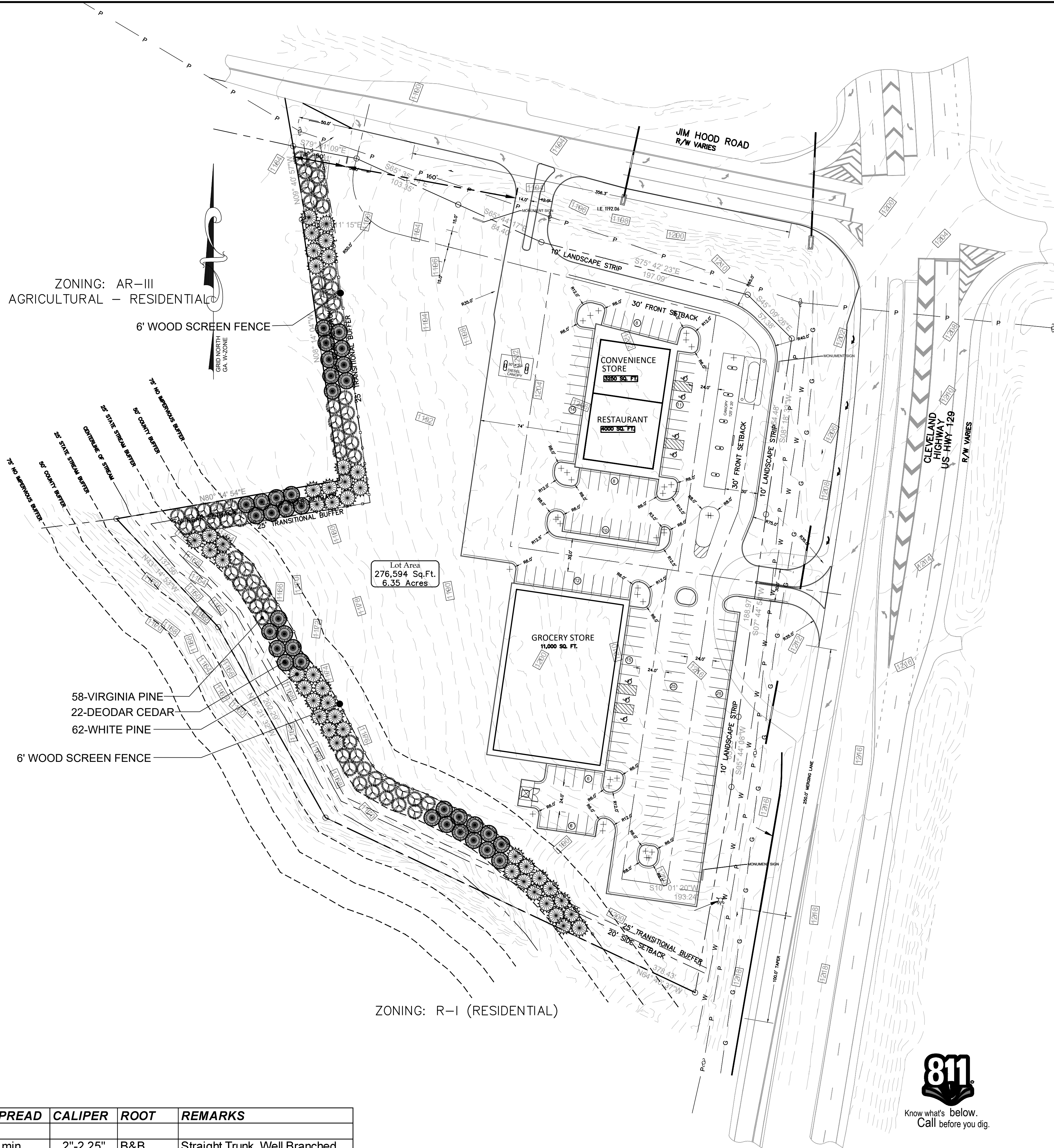
ZONING: AR-III
AGRICULTURAL - RESIDENTIAL

6' WOOD SCREEN FENCE

25' 10' LANDSCAPE STRIP
25' 5' STATE STREET BUFFER
25' 5' COUNTY STREET BUFFER
25' 10' LANDSCAPE STRIP

58-VIRGINIA PINE
22-DEODAR CEDAR
62-WHITE PINE
6' WOOD SCREEN FENCE

ZONING: R-I (RESIDENTIAL)



Lot Area
276,594 Sq.Ft.
6.35 Acres

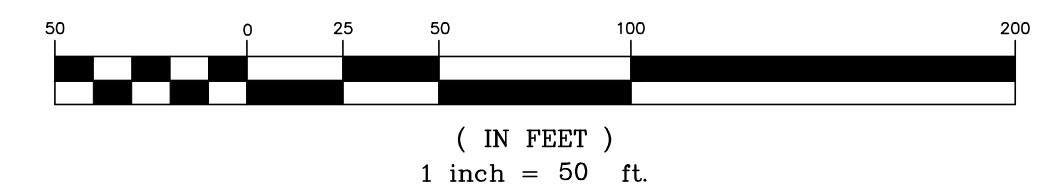
GROCERY STORE
11,000 SQ. FT.

CONVENIENCE STORE
3250 SQ. FT.

RESTAURANT
4000 SQ. FT.



GRAPHIC SCALE



QTY	BOTANICAL NAME	COMMON NAME	HEIGHT	SPREAD	CALIPER	ROOT	REMARKS
TREES							
22	Cedrus deodara	Deodar Cedar	4-7'	4' min	2"-2.25"	B&B	Straight Trunk, Well Branched
58	Pinus thunbergii	Black Pine	4-7'	4' min	2"-2.25"	B&B	Straight Trunk, Well Branched
62	Pinus virginiana	Virginia Pine	4-7'	4' min	2"-2.25"	B&B	Straight Trunk, Well Branched
142	TREE TOTAL						TREE UNIT TOTAL



E-SEAL AND SIGNATURE
E-SEALED: E-SEALED-DATE



6075 BARFILED ROAD
SANDY SPRINGS, GA 30328
DIRECT: 404-644-2457
reggie@getpland.net
www.getpland.net

#	DATE	REVISION DESCRIPTION

COPYRIGHT NOTICE: THIS PLAN SET IS THE PROPERTY OF PLAND ENGINEERING AND ARCHITECTURE. ANY REPRODUCTION OR TRANSMISSION OF THIS PLAN SET WITHOUT THE WRITTEN CONSENT OF PLAND ENGINEERING AND ARCHITECTURE IS PROHIBITED. THE DESIGNER ASSUMES NO LIABILITY FOR THE ACCURACY OF THE INFORMATION PROVIDED HEREIN. THE USER OF THIS PLAN SET SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND FOR THE FULL PERFORMANCE AND COMPLETION OF THE PROJECT. THE DESIGNER DOES NOT WARRANT THE ACCURACY OF THE INFORMATION PROVIDED HEREIN. THE USER OF THIS PLAN SET SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND FOR THE FULL PERFORMANCE AND COMPLETION OF THE PROJECT. THE DESIGNER DOES NOT WARRANT THE ACCURACY OF THE INFORMATION PROVIDED HEREIN.

SHEET DESCRIPTION:
PRELIMINARY BUFFER PLAN
LOCATION:
4053 CLEVELAND HWY
GAINESVILLE, GA 30506

CHECKED BY:
RC

DRAWN BY:
RC

CIVIL

JOB NO: SHEET
L.1

DATE:
3/3/2023

NOT RELEASED FOR CONSTRUCTION

Appendix B: Raw Traffic Data

 [Click here for Map](#)

Peak Hour Turning Movement Count

Gainesville, GA



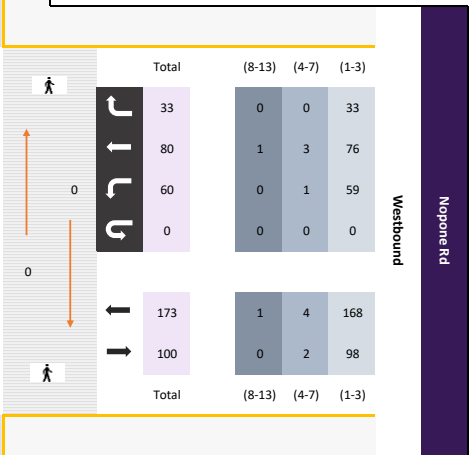
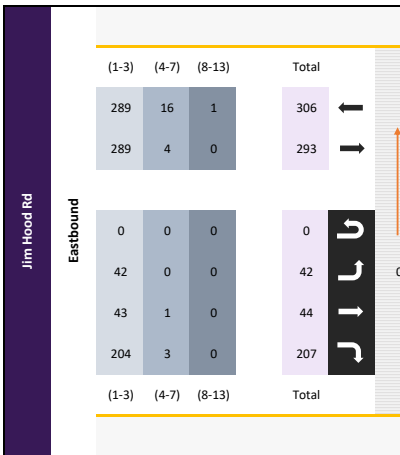
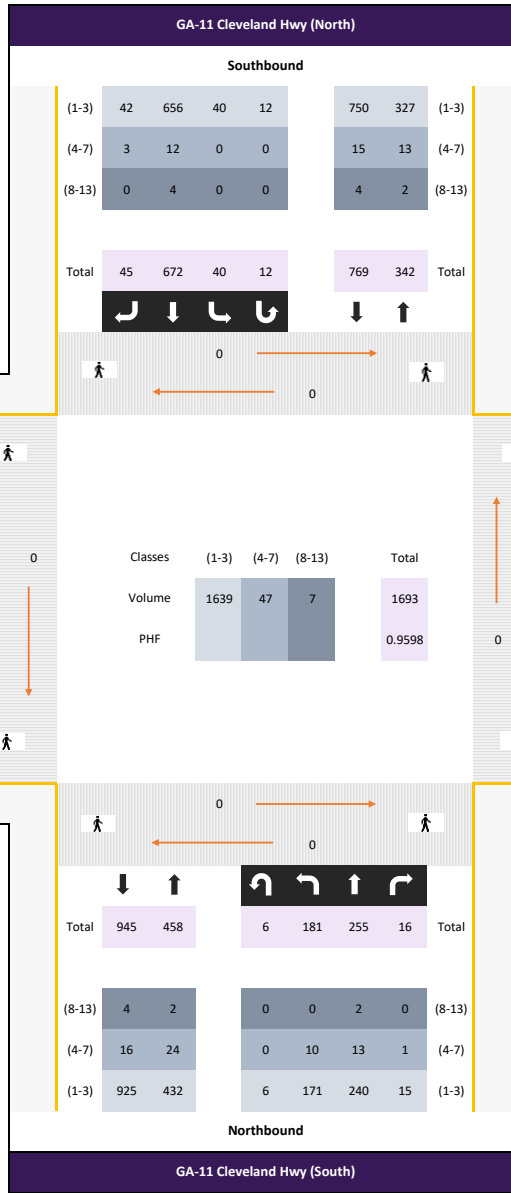
www.marrtraffic.com

Thursday, April 20, 2023	
Period	0700 - 0900
Peak Hour	0715 - 0815

* the Peak Hour Diagram does not include Bikes

Session Parameters

(Drop Down Menu)



Classes	(1-3)	(4-7)	(8-13)	Total
Volume	1639	47	7	1693
PHF				0.9598

 [Click here for Map](#)

Peak Hour Turning Movement Count

Gainesville, GA



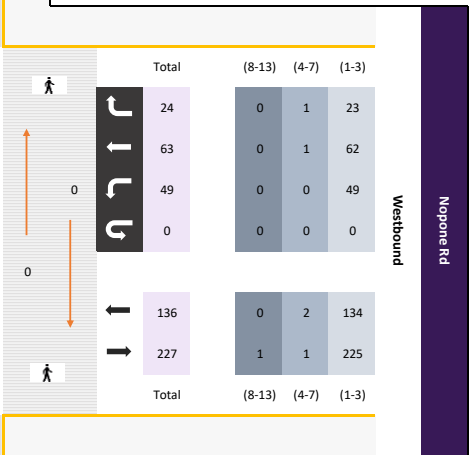
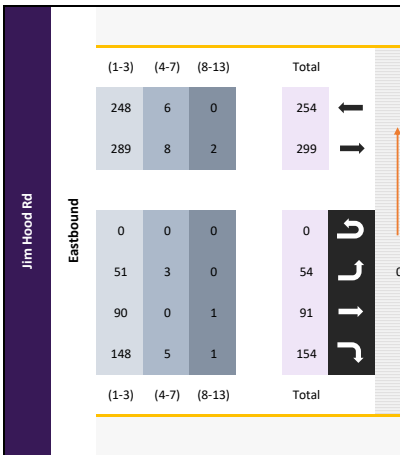
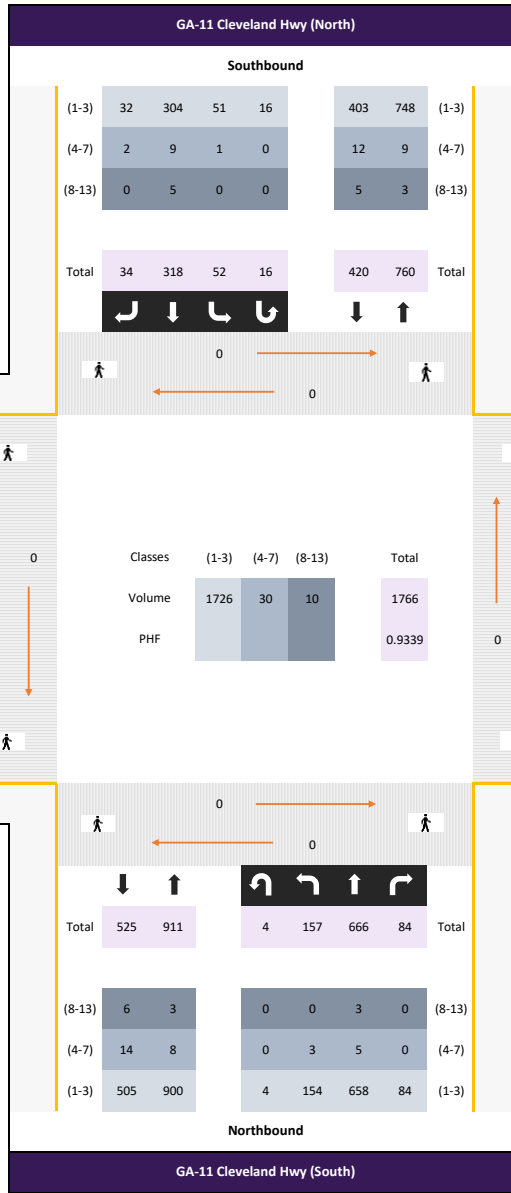
www.marrtraffic.com

Thursday, April 20, 2023	
Period	1600 - 1800
Peak Hour	1645 - 1745

* the Peak Hour Diagram does not include Bikes

Session Parameters

(Drop Down Menu)



Bi-Directional Class Count || NB EB 15min

Gainesville, GA



Site 2
Jim Hood Rd,
west of GA-11 Cleveland Hwy (North)

Date
Thursday, April 20, 2023

Weather
Fair
72°F

Lat/Long
34.405325°, -83.805734°

[Click here for Map](#)

0000 - 2400 (24h Session) (04-20-2023)
NB EB 15min

Time	Eastbound (Movement 2.1)													15min Total	60min Total	
	1	2	3	4	5	6	7	8	9	10	11	12	13			
0000-0015	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4	
0015-0030	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4	
0030-0045	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	
0045-0100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
0100-0115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0115-0130	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2	
0130-0145	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	
0145-0200	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	4
0200-0215	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0215-0230	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	
0230-0245	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0245-0300	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2	3
0300-0315	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
0315-0330	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0330-0345	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2	
0345-0400	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2	5
0400-0415	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	
0415-0430	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3	
0430-0445	0	3	3	0	0	0	0	0	0	0	0	0	0	0	6	
0445-0500	0	2	2	0	0	0	0	0	0	0	0	0	0	0	4	15
0500-0515	0	4	2	0	0	0	0	0	1	0	0	0	0	0	7	
0515-0530	0	4	4	0	0	0	0	0	0	0	0	0	0	0	8	
0530-0545	0	2	5	0	0	0	0	0	0	0	0	0	0	0	7	
0545-0600	0	6	5	0	0	0	0	0	0	0	0	0	0	0	11	33
0600-0615	0	7	8	2	0	0	0	0	0	0	0	0	0	0	17	
0615-0630	0	18	2	1	0	0	0	0	0	0	0	0	0	0	21	
0630-0645	0	13	6	1	0	0	0	0	0	0	0	0	0	0	20	
0645-0700	0	33	10	2	0	0	0	0	0	0	0	0	0	0	45	103
0700-0715	1	29	13	0	0	1	0	0	0	0	0	0	0	0	44	
0715-0730	0	41	18	2	0	0	0	0	0	0	0	0	0	0	61	
0730-0745	0	51	23	0	0	0	0	0	0	0	0	0	0	0	74	
0745-0800	0	56	24	0	0	0	0	0	0	0	0	0	0	0	80	259
0800-0815	0	54	22	2	0	0	0	0	0	0	0	0	0	0	78	
0815-0830	0	58	19	4	1	0	0	0	1	0	0	0	0	0	83	
0830-0845	0	29	18	0	1	0	0	0	2	0	0	0	0	0	50	
0845-0900	0	36	11	2	0	0	0	0	0	0	0	0	0	0	49	260
0900-0915	0	21	6	2	0	0	0	0	0	0	0	0	0	0	29	
0915-0930	0	24	10	0	0	1	0	0	0	1	0	0	0	0	36	
0930-0945	0	26	18	0	0	0	0	1	0	0	0	0	0	0	45	
0945-1000	0	19	12	0	0	0	0	0	0	0	0	0	0	0	31	141
1000-1015	0	18	12	0	1	1	0	0	0	0	0	0	0	0	32	
1015-1030	0	28	15	2	0	0	0	0	0	0	0	0	0	0	45	
1030-1045	0	23	8	0	1	0	0	0	0	0	0	0	0	0	32	
1045-1100	0	23	13	1	1	0	0	0	0	0	0	0	0	0	38	147
1100-1115	0	19	12	0	3	0	0	0	0	0	0	0	0	0	34	
1115-1130	1	19	14	0	1	0	0	0	0	0	0	0	0	0	35	
1130-1145	0	21	6	1	2	0	0	0	0	0	0	0	0	0	30	
1145-1200	0	23	12	0	2	0	0	0	0	0	0	0	0	0	37	136
1200-1215	0	21	13	0	1	1	0	0	0	0	0	0	0	0	36	
1215-1230	0	16	11	1	0	0	0	1	1	0	0	0	0	0	30	
1230-1245	0	18	8	0	1	0	0	0	1	0	0	0	0	0	28	
1245-1300	0	20	8	1	1	0	0	0	0	0	0	0	0	0	30	124
1300-1315	0	30	13	0	1	0	0	0	0	0	0	0	0	0	44	
1315-1330	0	22	9	0	2	0	0	0	0	0	0	0	0	0	33	
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1400-1415	0	37	12	1	0	0	0	0	0	0	0	0	0	0	50	
1415-1430	0	22	11	0	3	2	0	0	0	0	0	0	0	0	38	
1430-1445	0	34	14	2	2	0	0	0	0	0	0	0	0	0	52	
1445-1500	0	42	7	1	1	0	0	0	1	1	0	0	0	0	53	193
1500-1515	0	26	16	0	0	0	0	0	1	0	0	0	0	0	43	
1515-1530	0	32	8	1	1	0	0	0	1	0	0	0	0	0	43	
1530-1545	0	42	14	1	0	0	0	0	0	0	0	0	0	0	57	
1545-1600	0	49	13	5	2	0	0	0	0	0	0	0	0	0	69	212
1600-1615	0	49	9	1	2	0	0	0	1	0	0	0	0	0	62	
1615-1630	0	36	11	0	1	0	0	0	0	0	0	0	0	0	48	
1630-1645	0	37	16	1	2	0	0	0	0	0	0	0	0	0	56	
1645-1700	0	46	14	0	2	0	0	0	0	0	0	0	0	0	63	229
1700-1715	1	53	23	0	1	0	0	0	0	0	0	0	0	0	78	
1715-1730	0	51	19	0	2	0	0	0	1	0	0	0	0	0	73	
1730-1745	0	57	25	0	2	0	0	0	0	1	0	0	0	0	85	
1745-1800	2	40	16	0	2	1	0	0	0	0	0	0	0	0	61	297
1800-1815	2	42	11	0	0	0	0	0	0	0	0	0	0	0	55	
1815-1830	2	49	20	0	1	0	0	1	0	0	0	0	0	0	73	
1830-1845	0	34	12	0	2	1	0	0	0	0	0	0	0	0	49	
1845-1900	0	23	20	0	0	0	0	0	0	0	0	0	0	0	43	
1900-1915	0	24	14	0	0	0	0	0	0	0	0	0	0	0	38	220
1915-1930	1	32	15	0	0	0	0	0	0	0	0	0	0	0	48	
1930-1945	0	22	4	0	0	0	0	0	0	0	0	0	0	0	26	
1945-2000	0	27	13	0	1	0	0	0	0	0	0	0	0	0	41	153
2000-2015	0	14	5	0	1	0	0	0	0	0	0	0	0	0	20	
2015-2030	0	11	6	0	0	0	0	0	0	0	0	0	0	0	17	
2030-2045	1	42	9	0	0	0	0	0	0	0	0	0	0	0	52	
2045-2100	0	71	19	0	0	0	0	0	0	0	0	0	0	0	90	179
2100-2115	0	35	10	0	0	0	0	0	0	0	0	0	0	0	45	
2115-2130	0	10	8	0	0	0	0	0	0	0	0	0	0	0	18	
2130-2145	0	8	3	0	0	0	0	0	0	0	0	0	0	0	11	
2145-2200	0	9	5	0	0	0	0	0	0	0	0	0	0	0	14	88
2200-2215	0	2	2	0	0	0	0	0	0	0	0	0	0	0	4	
2215-2230	0	7	1	0	0	0	0	0	0	0	0	0	0	0	8	
2230-2245	0	3	2	0	0	0	0	0	0	0	0	0	0	0	5	
2245-2300	0	2	1	0	0	0	0	0	0	0	0	0	0	0	3	20
2300-2315	0	3	5	0	0	0	0	0	0	0	0	0	0	0	8	
2315-2330	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	
2330-2345	0	3	1	0	0	0	0	0	0	0	0	0	0	0	4	
2345-0000	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2	15

Session Total	12	2045	832	40	52	8	0	8	7	2	0	0	0	0	3006
Session Average	0.13	21.30	8.67	0.42	0.54	0.08	0.00	0.08	0.07	0.02	0.00	0.00	0.00	0.00	31.31
Session Percentage	0.40	68.03	27.68	1.33	1.73	0.27	0.00	0.27	0.23	0.07	0.00	0.00	0.00	0.00	

AM Peak Hour	0615 - 0715	0730 - 0830
--------------	-------------	-------------

Bi-Directional Class Count | SB WB 15min

Gainesville, GA



Site 2
 Jim Hood Rd,
 west of GA-11 Cleveland Hwy (North)

Date
 Thursday, April 20, 2023

Weather
 Fair
 72°F

Lat/Long
 34.405325°, -83.805734°

[Click here for Map](#)

0000 - 2400 (24h Session) (04-20-2023)
 SB WB 15min

Time	Westbound (Movement 2.2)													15min Total	60min Total
	1	2	3	4	5	6	7	8	9	10	11	12	13		
0000-0015	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
0015-0030	0	3	1	0	0	0	0	0	0	0	0	0	0	4	
0030-0045	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
0045-0100	0	1	0	0	0	0	0	0	0	0	0	0	0	1	7
0100-0115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0115-0130	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
0130-0145	0	3	0	0	0	0	0	0	0	0	0	0	0	3	
0145-0200	0	1	0	0	0	0	0	0	0	0	0	0	0	1	5
0200-0215	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
0215-0230	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0230-0245	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0245-0300	0	3	0	0	0	0	0	0	0	0	0	0	0	3	4
0300-0315	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
0315-0330	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0330-0345	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
0345-0400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
0400-0415	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0415-0430	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
0430-0445	1	3	1	0	0	0	0	0	0	0	0	0	0	5	
0445-0500	0	2	0	0	0	0	0	0	0	0	0	0	0	2	8
0500-0515	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
0515-0530	0	4	1	0	0	0	0	0	0	0	0	0	0	5	
0530-0545	0	4	2	0	0	0	0	0	0	0	0	0	0	6	
0545-0600	0	9	4	0	0	0	0	0	0	0	0	0	0	13	25
0600-0615	0	4	2	0	0	0	0	0	0	0	0	0	0	6	
0615-0630	0	6	5	2	0	0	0	0	0	0	0	0	0	13	
0630-0645	0	19	9	0	0	0	0	0	0	0	0	0	0	28	
0645-0700	0	24	12	0	0	0	0	0	0	0	0	0	0	36	83
0700-0715	0	31	10	1	0	0	0	1	0	0	0	0	0	43	
0715-0730	0	48	13	0	0	0	0	0	0	0	0	0	0	61	
0730-0745	0	53	23	2	0	0	0	1	0	0	0	0	0	79	
0745-0800	0	53	14	5	2	0	0	0	0	0	0	0	0	74	257
0800-0815	0	68	17	3	3	1	0	0	0	0	0	0	0	92	
0815-0830	0	25	13	1	1	0	0	0	0	0	0	0	0	40	
0830-0845	0	17	7	0	2	0	0	0	0	0	0	0	0	26	
0845-0900	0	19	12	2	1	0	0	0	1	1	0	0	0	36	194
0900-0915	0	12	15	0	1	0	0	0	0	0	0	0	0	28	
0915-0930	0	22	8	0	0	0	0	1	0	0	0	0	0	31	
0930-0945	0	21	10	0	3	0	0	0	0	0	0	0	0	34	
0945-1000	0	17	9	1	1	0	0	1	0	0	0	0	0	29	122
1000-1015	0	23	12	2	0	0	0	0	0	0	0	0	0	37	
1015-1030	0	15	8	1	1	0	0	0	0	0	0	0	0	25	
1030-1045	0	15	7	0	2	0	0	2	1	0	0	0	0	27	
1045-1100	0	22	6	0	2	0	0	0	0	0	0	0	0	30	119
1100-1115	0	14	14	0	0	1	0	0	0	0	0	0	0	29	
1115-1130	0	19	8	0	1	0	0	0	0	0	0	0	0	28	
1130-1145	1	18	5	1	3	0	0	0	0	0	0	0	0	28	
1145-1200	0	23	14	0	0	0	0	0	1	0	0	0	0	38	123
1200-1215	0	33	8	0	0	0	0	0	0	0	0	0	0	41	
1215-1230	0	28	8	1	1	0	0	0	0	0	0	0	0	38	
1230-1245	0	29	7	2	2	0	0	0	2	1	0	0	0	40	144
1245-1300	0	16	8	0	0	0	0	1	0	0	0	0	0	25	
1300-1315	0	23	10	0	0	0	0	0	0	0	0	0	0	33	
1315-1330	0	23	11	1	1	1	0	1	0	0	0	0	0	38	
1330-1345	2	23	11	0	1	1	0	0	0	0	0	0	0	38	
1345-1400	0	27	5	0	0	0	0	0	0	0	0	0	0	32	141
1400-1415	0	23	12	2	1	0	0	0	1	0	0	0	0	39	
1415-1430	0	34	14	0	0	0	0	0	0	0	0	0	0	48	
1430-1445	0	28	12	0	0	0	0	0	0	0	0	0	0	40	
1445-1500	1	30	6	3	0	0	0	0	1	0	0	0	0	41	168
1500-1515	0	36	19	3	0	0	0	1	0	0	0	0	0	59	
1515-1530	0	50	15	2	1	1	0	0	0	0	0	0	0	69	
1530-1545	0	57	11	0	1	0	0	0	0	0	0	0	0	69	
1545-1600	0	37	17	1	0	0	0	0	0	0	0	0	0	55	252
1600-1615	0	31	10	1	1	0	0	0	0	0	0	0	0	43	
1615-1630	0	54	19	2	1	1	0	0	0	0	0	0	0	77	
1630-1645	0	32	17	1	1	0	0	0	0	0	0	0	0	51	
1645-1700	1	37	15	0	0	0	0	0	0	0	0	0	0	53	224
1700-1715	1	52	25	1	1	1	0	0	0	0	0	0	0	81	
1715-1730	0	40	15	0	1	1	0	0	0	0	0	0	0	57	
1730-1745	0	47	15	0	1	0	0	0	0	0	0	0	0	63	
1745-1800	1	39	18	0	1	0	0	0	0	0	0	0	0	59	260
1800-1815	1	68	22	0	0	0	0	0	1	0	0	0	0	92	
1815-1830	0	69	18	0	1	0	0	0	0	0	0	0	0	88	
1830-1845	2	44	13	0	0	0	0	0	0	0	0	0	0	59	
1845-1900	0	28	11	0	0	0	0	0	0	0	0	0	0	39	278
1900-1915	0	23	14	0	1	0	0	0	0	0	0	0	0	38	
1915-1930	1	49	13	0	0	0	0	0	0	0	0	0	0	63	
1930-1945	2	38	15	0	0	0	0	0	0	0	0	0	0	55	
1945-2000	0	34	9	0	1	0	0	0	0	0	0	0	0	44	200
2000-2015	0	19	12	0	0	0	0	0	0	0	0	0	0	31	
2015-2030	0	22	5	1	0	0	0	0	0	0	0	0	0	28	
2030-2045	0	19	17	0	0	0	0	0	0	0	0	0	0	36	
2045-2100	0	34	15	0	0	0	0	0	0	0	0	0	0	49	144
2100-2115	0	29	9	0	0	0	0	0	0	0	0	0	0	38	
2115-2130	0	32	21	0	0	0	0	0	0	0	0	0	0	53	
2130-2145	0	15	5	0	0	0	0	0	0	0	0	0	0	20	
2145-2200	0	10	6	0	0	0	0	0	0	0	0	0	0	16	127
2200-2215	0	9	6	0	0	0	0	0	0	0	0	0	0	15	
2215-2230	0	4	4	0	0	0	0	0	0	0	0	0	0	8	
2230-2245	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
2245-2300	0	3	2	0	0	0	0	0	0	0	0	0	0	5	29
2300-2315	0	2	1	0	0	0	0	0	0	0	0	0	0	3	
2315-2330	0	2	2	0	0	0	0	0	0	0	0	0	0	4	
2330-2345	0	4	2	0	0	0	0	0	0	0	0	0	0	6	
2345-0000	1	3	4	0	0	0	0	0	0	0	0	0	0	8	21

Session Total	15	2018	797	42	40	9	0	8	7	1	0	0	0	2937
Session Average	0.16	21.02	8.30	0.44	0.42	0.09	0.00	0.08	0.07	0.01	0.00	0.00	0.00	30.59
Session Percentage	0.51	68.71	27.14	1.43	1.36	0.31	0.00	0.27	0.24	0.03	0.00	0.00	0.00	
AM Peak Hour	-	0715-0815	0715-0815	0730-0830	0745-0845	0715-0815	-	0945-1045	0800-0900	0800-0900	-	-	-	0715-0815
AM Peak Volume	0	222	67	11	8	1	0	3	1	1	0	0	0	306
Noon Peak Hour	1245-1345	1445-1545	1430-1530	1430-1530	1045-1145	1245-1345	-	1000-1100	1400-1500	-	-	-	-	1445-1545
Noon Peak Volume	2	173	52	8	6	2	0	2	2	0	0	0	0	238
PM Peak Hour	1745-1845	1730-1830	1615-1715	1500-1600	1700-1800	1615-1715	-	-	1500-1600	-	-	-	-	

Bi-Directional Class Count | Bi-Directional 15min

Gainesville, GA



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Site 2
Jim Hood Rd,
west of GA-11 Cleveland Hwy (North)

Date
Thursday, April 20, 2023

Weather
Fair
72°F

Lat/Long
34.405325°, -83.805734°

0000 - 2400 (24h Session) (04-20-2023)
Bi-Directional 15min

Time	Bi-Directional 15min													15min Total	60min Total
	1	2	3	4	5	6	7	8	9	10	11	12	13		
0000-0015	0	5	0	0	0	0	0	0	0	0	0	0	0	5	
0015-0030	0	7	1	0	0	0	0	0	0	0	0	0	0	8	
0030-0045	0	3	0	0	0	0	0	0	0	0	0	0	0	3	
0045-0100	0	1	0	0	0	0	0	0	0	0	0	0	0	1	17
0100-0115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0115-0130	1	2	0	0	0	0	0	0	0	0	0	0	0	3	
0130-0145	0	4	0	0	0	0	0	0	0	0	0	0	0	4	
0145-0200	0	2	0	0	0	0	0	0	0	0	0	0	0	2	9
0200-0215	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
0215-0230	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
0230-0245	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0245-0300	0	4	1	0	0	0	0	0	0	0	0	0	0	5	7
0300-0315	0	1	1	0	0	0	0	0	0	0	0	0	0	2	
0315-0330	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0330-0345	0	2	1	0	0	0	0	0	0	0	0	0	0	3	
0345-0400	0	1	1	0	0	0	0	0	0	0	0	0	0	2	7
0400-0415	0	2	0	0	0	0	0	0	0	0	0	0	0	2	
0415-0430	0	4	0	0	0	0	0	0	0	0	0	0	0	4	
0430-0445	1	6	4	0	0	0	0	0	0	0	0	0	0	11	
0445-0500	0	4	2	0	0	0	0	0	0	0	0	0	0	6	23
0500-0515	0	4	3	0	0	0	0	0	1	0	0	0	0	8	
0515-0530	0	8	5	0	0	0	0	0	0	0	0	0	0	13	
0530-0545	0	6	7	0	0	0	0	0	0	0	0	0	0	13	
0545-0600	0	15	9	0	0	0	0	0	0	0	0	0	0	24	58
0600-0615	0	11	10	2	0	0	0	0	0	0	0	0	0	23	
0615-0630	0	24	7	3	0	0	0	0	7	0	0	0	0	34	
0630-0645	0	32	15	1	0	0	0	0	0	0	0	0	0	48	
0645-0700	0	57	22	2	0	0	0	0	0	0	0	0	0	81	186
0700-0715	1	60	23	1	0	1	0	1	0	0	0	0	0	87	
0715-0730	0	89	31	2	0	0	0	0	0	0	0	0	0	122	
0730-0745	0	104	46	2	0	0	0	1	0	0	0	0	0	153	
0745-0800	0	109	38	5	2	0	0	0	0	0	0	0	0	154	516
0800-0815	0	122	39	5	3	1	0	0	0	0	0	0	0	170	
0815-0830	0	83	32	5	2	0	0	0	1	0	0	0	0	123	
0830-0845	0	46	25	0	0	0	0	0	2	0	0	0	0	76	
0845-0900	0	55	23	4	1	0	0	0	1	1	0	0	0	85	454
0900-0915	0	33	21	2	1	0	0	0	0	0	0	0	0	57	
0915-0930	0	46	18	0	0	1	0	1	0	1	0	0	0	67	
0930-0945	0	47	28	0	3	0	0	1	0	0	0	0	0	79	
0945-1000	0	36	21	1	1	0	0	1	0	0	0	0	0	60	263
1000-1015	0	41	24	2	1	1	0	0	0	0	0	0	0	69	
1015-1030	0	43	23	3	1	0	0	0	0	0	0	0	0	70	
1030-1045	0	38	15	0	3	0	0	2	0	2	1	0	0	59	
1045-1100	0	45	19	1	3	0	0	0	0	0	0	0	0	68	266
1100-1115	0	33	26	0	3	1	0	0	0	0	0	0	0	63	
1115-1130	1	38	22	0	2	0	0	0	0	0	0	0	0	63	
1130-1145	1	39	11	2	5	0	0	0	0	0	0	0	0	58	
1145-1200	0	46	26	0	2	0	0	0	1	0	0	0	0	75	259
1200-1215	0	54	21	0	1	1	0	0	0	0	0	0	0	77	
1215-1230	0	44	19	2	1	0	0	1	1	0	0	0	0	68	
1230-1245	0	47	15	2	3	0	0	1	0	0	0	0	0	68	268
1245-1300	0	36	16	1	1	0	0	0	1	0	0	0	0	55	
1300-1315	0	53	23	0	1	0	0	0	0	0	0	0	0	77	
1315-1330	0	45	20	1	3	1	0	1	0	0	0	0	0	71	
1330-1345	2	43	17	2	4	1	0	0	0	0	0	0	0	69	
1345-1400	0	65	17	0	2	0	0	0	0	0	0	0	0	84	301
1400-1415	0	60	24	3	1	0	0	0	1	0	0	0	0	89	
1415-1430	0	56	25	0	3	2	0	0	0	0	0	0	0	86	
1430-1445	0	62	26	2	2	0	0	0	0	0	0	0	0	92	
1445-1500	1	72	13	0	1	0	0	0	1	2	0	0	0	94	361
1500-1515	0	62	35	3	0	0	0	0	2	0	0	0	0	102	
1515-1530	0	82	23	3	2	1	0	0	1	0	0	0	0	112	
1530-1545	0	99	25	1	1	0	0	0	0	0	0	0	0	126	
1545-1600	0	86	30	6	2	0	0	0	0	0	0	0	0	124	464
1600-1615	0	80	19	2	3	0	0	0	1	0	0	0	0	105	
1615-1630	0	90	30	2	2	1	0	0	0	0	0	0	0	127	
1630-1645	0	69	33	2	2	1	0	0	0	0	0	0	0	105	
1645-1700	1	83	19	0	3	0	0	0	1	0	0	0	0	116	453
1700-1715	2	105	48	1	2	1	0	0	0	0	0	0	0	159	
1715-1730	0	91	34	0	3	1	0	1	0	0	0	0	0	130	
1730-1745	0	104	40	0	3	0	0	0	0	1	0	0	0	148	
1745-1800	3	79	34	0	3	1	0	0	0	0	0	0	0	120	557
1800-1815	3	110	33	0	0	0	0	0	1	0	0	0	0	147	
1815-1830	2	118	38	0	2	0	0	1	0	0	0	0	0	161	
1830-1845	2	78	25	0	2	1	0	0	0	0	0	0	0	108	
1845-1900	0	51	31	0	0	0	0	0	0	0	0	0	0	82	498
1900-1915	0	47	28	0	1	0	0	0	0	0	0	0	0	76	
1915-1930	2	81	28	0	0	0	0	0	0	0	0	0	0	111	
1930-1945	2	60	19	0	0	0	0	0	0	0	0	0	0	81	
1945-2000	0	61	22	0	2	0	0	0	0	0	0	0	0	85	353
2000-2015	0	33	17	0	1	0	0	0	0	0	0	0	0	51	
2015-2030	0	33	11	1	0	0	0	0	0	0	0	0	0	45	
2030-2045	1	61	26	0	0	0	0	0	0	0	0	0	0	88	
2045-2100	0	105	34	0	0	0	0	0	0	0	0	0	0	139	323
2100-2115	0	54	19	0	0	0	0	0	0	0	0	0	0	83	
2115-2130	0	42	29	0	0	0	0	0	0	0	0	0	0	71	
2130-2145	0	23	8	0	0	0	0	0	0	0	0	0	0	31	
2145-2200	0	19	11	0	0	0	0	0	0	0	0	0	0	30	215
2200-2215	0	11	8	0	0	0	0	0	0	0	0	0	0	19	
2215-2230	0	11	5	0	0	0	0	0	0	0	0	0	0	16	
2230-2245	0	4	2	0	0	0	0	0	0	0	0	0	0	6	
2245-2300	0	5	3	0	0	0	0	0	0	0	0	0	0	8	49
2300-2315	0	5	6	0	0	0	0	0	0	0	0	0	0	11	
2315-2330	0	3	2	0	0	0	0	0	0	0	0	0	0	5	
2330-2345	0	7	3	0	0	0	0	0	0	0	0	0	0	10	
2345-0000	1	4	5	0	0	0	0	0	0	0	0	0	0	10	36

Session Total	27	4063	1629	82	92	17	0	16	14	3	0	0	0	5943
Session Average	0.28	42.32	16.97	0.85	0.96	0.18	0.00	0.17	0.15	0.03	0.00	0.00	0.00	61.91
Session Percentage	0.45	68.37	27.41	1.38	1.55	0.29	0.00	0.27	0.24	0.05	0.00	0.00	0.00	

AM Peak Hour	0615-0715	0715-0815	0730-0830	0730-0830	0745-0845	0915-1015	-	0830-0930	0800-0900	0830-0930	-	-	-	0730-0830
AM Peak Volume	1	424	155	17	10	2	0	3	2	2	0	0	0	600

Noon Peak Hour	1045-1145	1445-1545	1415-1515	1430-1530	1045-1145	1330-1430	-	1200-1300	1430-1530	-	-	-	-	1445-1545
Noon Peak Volume	2	315	99	12	13	3	0	3	5	0	0	0	0	434

PM Peak Hour	1745-1845	1730-1830	1700-1800	1500-1600	1
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Bi-Directional Class Count || Volume Summary 15min



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Gainesville, GA

Site 2

Jim Hood Rd,
west of GA-11 Cleveland Hwy (North)

Date

Thursday, April 20, 2023

Weather

Fair
72°F

Lat/Long

34.405325°, -83.805734°

0000 - 2400 (24h Session) (04-20-2023)

Volume Summary 15min

TIME	Volume Summary 15min		15min Total	60min Total
	EB	WB		
0000 - 0015	4	1	5	
0015 - 0030	4	4	8	
0030 - 0045	2	1	3	
0045 - 0100	0	1	1	17
0100 - 0115	0	0	0	
0115 - 0130	2	1	3	
0130 - 0145	1	3	4	
0145 - 0200	1	1	2	9
0200 - 0215	0	1	1	
0215 - 0230	1	0	1	
0230 - 0245	0	0	0	
0245 - 0300	2	3	5	7
0300 - 0315	1	1	2	
0315 - 0330	0	0	0	
0330 - 0345	2	1	3	
0345 - 0400	2	0	2	7
0400 - 0415	2	0	2	
0415 - 0430	3	1	4	
0430 - 0445	6	5	11	
0445 - 0500	4	2	6	23
0500 - 0515	7	1	8	
0515 - 0530	8	5	13	
0530 - 0545	7	6	13	
0545 - 0600	11	13	24	58
0600 - 0615	17	6	23	
0615 - 0630	21	13	34	
0630 - 0645	20	28	48	
0645 - 0700	45	36	81	186
0700 - 0715	44	43	87	
0715 - 0730	61	61	122	
0730 - 0745	74	79	153	
0745 - 0800	80	74	154	516
0800 - 0815	78	92	170	
0815 - 0830	83	40	123	
0830 - 0845	50	26	76	
0845 - 0900	49	36	85	454
0900 - 0915	29	28	57	
0915 - 0930	36	31	67	
0930 - 0945	45	34	79	
0945 - 1000	31	29	60	263
1000 - 1015	32	37	69	
1015 - 1030	45	25	70	
1030 - 1045	32	27	59	
1045 - 1100	38	30	68	266
1100 - 1115	34	29	63	
1115 - 1130	35	28	63	
1130 - 1145	30	28	58	
1145 - 1200	37	38	75	259

Time	Volume Summary 15min		15min Total	60min Total
	EB	WB		
1200 - 1215	36	41	77	
1215 - 1230	30	38	68	
1230 - 1245	28	40	68	
1245 - 1300	30	25	55	268
1300 - 1315	44	33	77	
1315 - 1330	33	38	71	
1330 - 1345	31	38	69	
1345 - 1400	52	32	84	301
1400 - 1415	50	39	89	
1415 - 1430	38	48	86	
1430 - 1445	52	40	92	
1445 - 1500	53	41	94	361
1500 - 1515	43	59	102	
1515 - 1530	43	69	112	
1530 - 1545	57	69	126	
1545 - 1600	69	55	124	464
1600 - 1615	62	43	105	
1615 - 1630	48	77	125	
1630 - 1645	56	51	107	
1645 - 1700	63	53	116	453
1700 - 1715	78	81	159	
1715 - 1730	73	57	130	
1730 - 1745	85	63	148	
1745 - 1800	61	59	120	557
1800 - 1815	55	92	147	
1815 - 1830	73	88	161	
1830 - 1845	49	59	108	
1845 - 1900	43	39	82	498
1900 - 1915	38	38	76	
1915 - 1930	48	63	111	
1930 - 1945	26	55	81	
1945 - 2000	41	44	85	353
2000 - 2015	20	31	51	
2015 - 2030	17	28	45	
2030 - 2045	52	36	88	
2045 - 2100	90	49	139	323
2100 - 2115	45	38	83	
2115 - 2130	18	53	71	
2130 - 2145	11	20	31	
2145 - 2200	14	16	30	215
2200 - 2215	4	15	19	
2215 - 2230	8	8	16	
2230 - 2245	5	1	6	
2245 - 2300	3	5	8	49
2300 - 2315	8	3	11	
2315 - 2330	1	4	5	
2330 - 2345	4	6	10	
2345 - 0000	2	8	10	36

Session Total	3006	2937	5943
Session Average	31.31	30.59	61.91
Session Percentage	50.58	49.42	

Bi-Directional Class Count || NB EB 60min

Gainesville, GA



Site 2
Jim Hood Rd,
west of GA-11 Cleveland Hwy (North)

Date
Thursday, April 20, 2023

Weather
Fair
72°F

Lat/Long
34.405325°, -83.805734°

0000 - 2400 (24h Session) (04-20-2023)

NB EB 60min

TIME	Eastbound (Movement 2.1)													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	
0000 - 0100	0	10	0	0	0	0	0	0	0	0	0	0	0	10
0100 - 0200	1	3	0	0	0	0	0	0	0	0	0	0	0	4
0200 - 0300	0	2	1	0	0	0	0	0	0	0	0	0	0	3
0300 - 0400	0	2	3	0	0	0	0	0	0	0	0	0	0	5
0400 - 0500	0	10	5	0	0	0	0	0	0	0	0	0	0	15
0500 - 0600	0	16	16	0	0	0	0	0	1	0	0	0	0	33
0600 - 0700	0	71	26	6	0	0	0	0	0	0	0	0	0	103
0700 - 0800	1	177	78	2	0	1	0	0	0	0	0	0	0	259
0800 - 0900	0	177	70	8	2	0	0	2	1	0	0	0	0	260
0900 - 1000	0	90	46	2	0	1	0	1	0	1	0	0	0	141
1000 - 1100	0	92	48	3	3	1	0	0	0	0	0	0	0	147
1100 - 1200	1	82	44	1	8	0	0	0	0	0	0	0	0	136
1200 - 1300	0	75	40	2	3	1	0	2	1	0	0	0	0	124
1300 - 1400	0	110	40	2	8	0	0	0	0	0	0	0	0	160
1400 - 1500	0	135	44	4	6	2	0	1	1	0	0	0	0	193
1500 - 1600	0	149	51	7	3	0	0	0	2	0	0	0	0	212
1600 - 1700	0	168	50	3	7	0	0	0	1	0	0	0	0	229
1700 - 1800	3	201	83	0	7	1	0	1	0	1	0	0	0	297
1800 - 1900	4	148	63	0	3	1	0	1	0	0	0	0	0	220
1900 - 2000	1	105	46	0	1	0	0	0	0	0	0	0	0	153
2000 - 2100	1	138	39	0	1	0	0	0	0	0	0	0	0	179
2100 - 2200	0	62	26	0	0	0	0	0	0	0	0	0	0	88
2200 - 2300	0	14	6	0	0	0	0	0	0	0	0	0	0	20
2300 - 2400	0	8	7	0	0	0	0	0	0	0	0	0	0	15

Session Total	12	2045	832	40	52	8	0	8	7	2	0	0	0	3006
Session Average	0.50	85.21	34.67	1.67	2.17	0.33	0.00	0.33	0.29	0.08	0.00	0.00	0.00	125.25
Session Percentage	0.40	68.03	27.68	1.33	1.73	0.27	0.00	0.27	0.23	0.07	0.00	0.00	0.00	

AM Peak Hour	0700 - 0800	0700 - 0800	0700 - 0800	0800 - 0900	0800 - 0900	0700 - 0800	-	0800 - 0900	0500 - 0600	0900 - 1000	-	-	-	0800 - 0900
AM Peak Volume	1	177	78	8	2	1	0	2	1	1	0	0	0	260

Noon Peak Hour	1100 - 1200	1400 - 1500	1000 - 1100	1400 - 1500	1100 - 1200	1400 - 1500	-	1200 - 1300	1200 - 1300	-	-	-	-	1400 - 1500
Noon Peak Volume	1	135	48	4	8	2	0	2	1	0	0	0	0	193

PM Peak Hour	1800 - 1900	1700 - 1800	1700 - 1800	1500 - 1600	1600 - 1700	1700 - 1800	-	1700 - 1800	1500 - 1600	1700 - 1800	-	-	-	1700 - 1800
PM Peak Volume	4	201	83	7	7	1	0	1	2	1	0	0	0	297

Bi-Directional Class Count || SB WB 60min



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Gainesville, GA

Site 2
Jim Hood Rd,
west of GA-11 Cleveland Hwy (North)

Date
Thursday, April 20, 2023

Weather
Fair
72°F

Lat/Long
34.405325°, -83.805734°

0000 - 2400 (24h Session) (04-20-2023)

SB WB 60min

TIME	Westbound (Movement 2.2)													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	
0000 - 0100	0	6	1	0	0	0	0	0	0	0	0	0	0	7
0100 - 0200	0	5	0	0	0	0	0	0	0	0	0	0	0	5
0200 - 0300	0	4	0	0	0	0	0	0	0	0	0	0	0	4
0300 - 0400	0	2	0	0	0	0	0	0	0	0	0	0	0	2
0400 - 0500	1	6	1	0	0	0	0	0	0	0	0	0	0	8
0500 - 0600	0	17	8	0	0	0	0	0	0	0	0	0	0	25
0600 - 0700	0	53	28	2	0	0	0	0	0	0	0	0	0	83
0700 - 0800	0	185	60	8	2	0	0	2	0	0	0	0	0	257
0800 - 0900	0	129	49	6	7	1	0	0	1	1	0	0	0	194
0900 - 1000	0	72	42	1	5	0	0	2	0	0	0	0	0	122
1000 - 1100	0	75	33	3	5	0	0	2	1	0	0	0	0	119
1100 - 1200	1	74	41	1	4	1	0	0	1	0	0	0	0	123
1200 - 1300	0	106	31	3	3	0	0	1	0	0	0	0	0	144
1300 - 1400	2	96	37	1	2	2	0	1	0	0	0	0	0	141
1400 - 1500	1	115	44	5	1	0	0	0	2	0	0	0	0	168
1500 - 1600	0	180	62	6	2	1	0	0	1	0	0	0	0	252
1600 - 1700	1	154	61	4	2	2	0	0	0	0	0	0	0	224
1700 - 1800	2	178	73	1	4	2	0	0	0	0	0	0	0	260
1800 - 1900	3	209	64	0	1	0	0	0	1	0	0	0	0	278
1900 - 2000	3	144	51	0	2	0	0	0	0	0	0	0	0	200
2000 - 2100	0	94	49	1	0	0	0	0	0	0	0	0	0	144
2100 - 2200	0	86	41	0	0	0	0	0	0	0	0	0	0	127
2200 - 2300	0	17	12	0	0	0	0	0	0	0	0	0	0	29
2300 - 2400	1	11	9	0	0	0	0	0	0	0	0	0	0	21

Session Total	15	2018	797	42	40	9	0	8	7	1	0	0	0	2937
Session Average	0.63	84.08	33.21	1.75	1.67	0.38	0.00	0.33	0.29	0.04	0.00	0.00	0.00	122.38
Session Percentage	0.51	68.71	27.14	1.43	1.36	0.31	0.00	0.27	0.24	0.03	0.00	0.00	0.00	

AM Peak Hour	-	0700 - 0800	0700 - 0800	0700 - 0800	0800 - 0900	0800 - 0900	-	0700 - 0800	0800 - 0900	0800 - 0900	-	-	-	0700 - 0800
AM Peak Volume	0	185	60	8	7	1	0	2	1	1	0	0	0	257

Noon Peak Hour	1300 - 1400	1400 - 1500	1400 - 1500	1400 - 1500	1000 - 1100	1300 - 1400	-	1000 - 1100	1400 - 1500	-	-	-	-	1400 - 1500
Noon Peak Volume	2	115	44	5	5	2	0	2	2	0	0	0	0	168

PM Peak Hour	1800 - 1900	1800 - 1900	1700 - 1800	1500 - 1600	1700 - 1800	1600 - 1700	-	-	1500 - 1600	-	-	-	-	1800 - 1900
PM Peak Volume	3	209	73	6	4	2	0	0	1	0	0	0	0	278

Bi-Directional Class Count || Bi-Directional 60min



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Gainesville, GA

Site 2

Jim Hood Rd,
west of GA-11 Cleveland Hwy (North)

Date

Thursday, April 20, 2023

Weather

Fair
72°F

Lat/Long

34.405325°, -83.805734°

0000 - 2400 (24h Session) (04-20-2023)

Bi-Directional 60min

TIME	Bi-Directional 60min													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	
0000 - 0100	0	16	1	0	0	0	0	0	0	0	0	0	0	17
0100 - 0200	1	8	0	0	0	0	0	0	0	0	0	0	0	9
0200 - 0300	0	6	1	0	0	0	0	0	0	0	0	0	0	7
0300 - 0400	0	4	3	0	0	0	0	0	0	0	0	0	0	7
0400 - 0500	1	16	6	0	0	0	0	0	0	0	0	0	0	23
0500 - 0600	0	33	24	0	0	0	0	0	1	0	0	0	0	58
0600 - 0700	0	124	54	8	0	0	0	0	0	0	0	0	0	186
0700 - 0800	1	362	138	10	2	1	0	2	0	0	0	0	0	516
0800 - 0900	0	306	119	14	9	1	0	2	2	1	0	0	0	454
0900 - 1000	0	162	88	3	5	1	0	3	0	1	0	0	0	263
1000 - 1100	0	167	81	6	8	1	0	2	1	0	0	0	0	266
1100 - 1200	2	156	85	2	12	1	0	0	1	0	0	0	0	259
1200 - 1300	0	181	71	5	6	1	0	3	1	0	0	0	0	268
1300 - 1400	2	206	77	3	10	2	0	1	0	0	0	0	0	301
1400 - 1500	1	250	88	9	7	2	0	1	3	0	0	0	0	361
1500 - 1600	0	329	113	13	5	1	0	0	3	0	0	0	0	464
1600 - 1700	1	322	111	7	9	2	0	0	1	0	0	0	0	453
1700 - 1800	5	379	156	1	11	3	0	1	0	1	0	0	0	557
1800 - 1900	7	357	127	0	4	1	0	1	1	0	0	0	0	498
1900 - 2000	4	249	97	0	3	0	0	0	0	0	0	0	0	353
2000 - 2100	1	232	88	1	1	0	0	0	0	0	0	0	0	323
2100 - 2200	0	148	67	0	0	0	0	0	0	0	0	0	0	215
2200 - 2300	0	31	18	0	0	0	0	0	0	0	0	0	0	49
2300 - 2400	1	19	16	0	0	0	0	0	0	0	0	0	0	36

Session Total	27	4063	1629	82	92	17	0	16	14	3	0	0	0	5943
Session Average	1.13	169.29	67.88	3.42	3.83	0.71	0.00	0.67	0.58	0.13	0.00	0.00	0.00	247.63
Session Percentage	0.45	68.37	27.41	1.38	1.55	0.29	0.00	0.27	0.24	0.05	0.00	0.00	0.00	

AM Peak Hour	0700 - 0800	0700 - 0800	0700 - 0800	0800 - 0900	0800 - 0900	0700 - 0800	-	0900 - 1000	0800 - 0900	0800 - 0900	-	-	-	0700 - 0800
AM Peak Volume	1	362	138	14	9	1	0	3	2	1	0	0	0	516

Noon Peak Hour	1100 - 1200	1400 - 1500	1400 - 1500	1400 - 1500	1100 - 1200	1300 - 1400	-	1200 - 1300	1400 - 1500	-	-	-	-	1400 - 1500
Noon Peak Volume	2	250	88	9	12	2	0	3	3	0	0	0	0	361

PM Peak Hour	1800 - 1900	1700 - 1800	1700 - 1800	1500 - 1600	1700 - 1800	1700 - 1800	-	1700 - 1800	1500 - 1600	1700 - 1800	-	-	-	1700 - 1800
PM Peak Volume	7	379	156	13	11	3	0	1	3	1	0	0	0	557

Bi-Directional Class Count || Volume Summary 60min



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Gainesville, GA

Site 2

Jim Hood Rd,
west of GA-11 Cleveland Hwy (North)

Date

Thursday, April 20, 2023

Weather

Fair
72°F

Lat/Long

34.405325°, -83.805734°

0000 - 2400 (24h Session) (04-20-2023)

Volume Summary 60min

Volume Summary 60min			
TIME	EB	WB	Total
0000 - 0100	10	7	17
0100 - 0200	4	5	9
0200 - 0300	3	4	7
0300 - 0400	5	2	7
0400 - 0500	15	8	23
0500 - 0600	33	25	58
0600 - 0700	103	83	186
0700 - 0800	259	257	516
0800 - 0900	260	194	454
0900 - 1000	141	122	263
1000 - 1100	147	119	266
1100 - 1200	136	123	259

Volume Summary 60min			
Time	EB	WB	Total
1200 - 1300	124	144	268
1300 - 1400	160	141	301
1400 - 1500	193	168	361
1500 - 1600	212	252	464
1600 - 1700	229	224	453
1700 - 1800	297	260	557
1800 - 1900	220	278	498
1900 - 2000	153	200	353
2000 - 2100	179	144	323
2100 - 2200	88	127	215
2200 - 2300	20	29	49
2300 - 2400	15	21	36

Session Total	3006	2937	5943
Session Average	125.25	122.38	247.63
Session Percentage	50.58	49.42	

Bi-Directional Class Count || Graphical Analysis NB EB

Gainesville, GA

Site 2

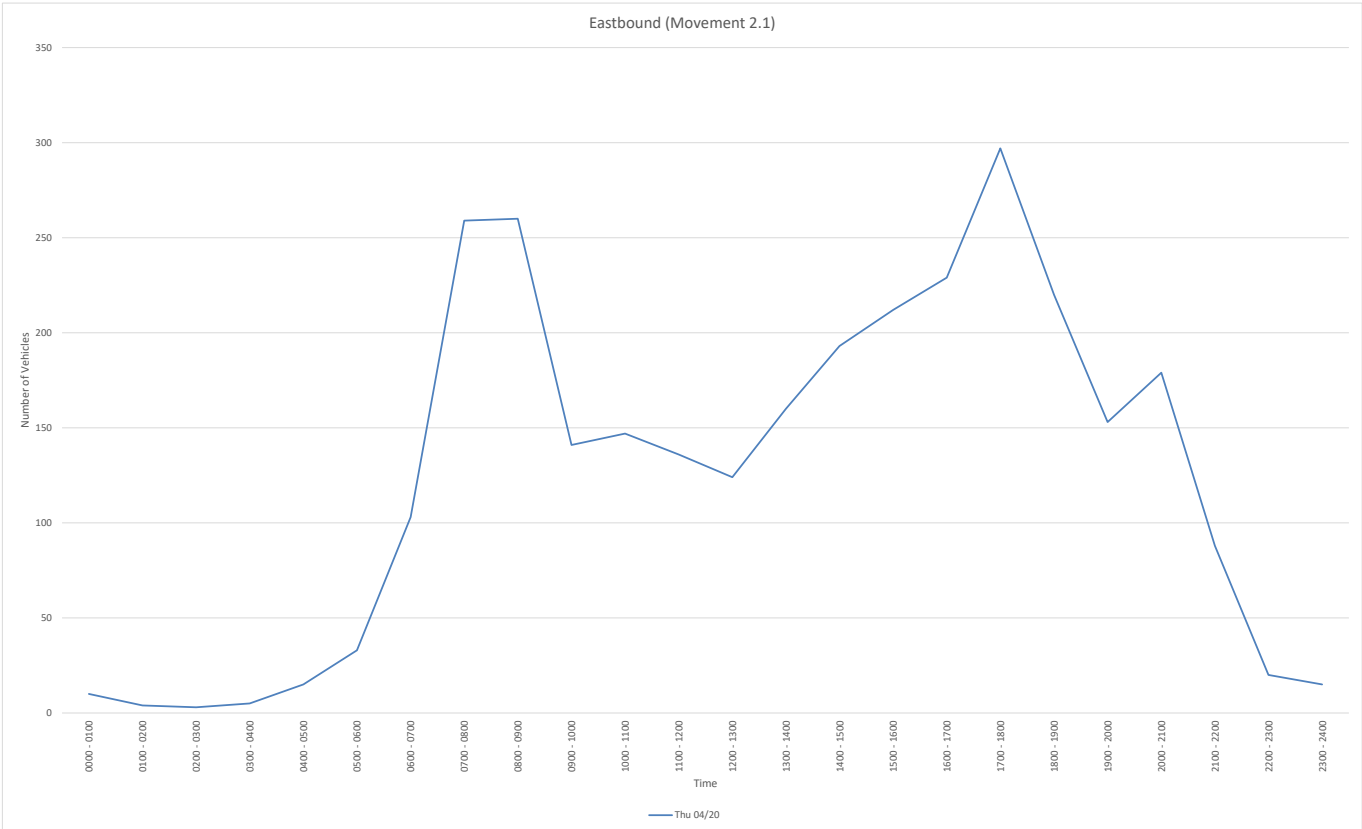
Jim Hood Rd,
west of GA-11 Cleveland Hwy (North)

Lat/Long

34.405325°, -83.805734°

0000 - 2400 (Weekday 24h Session)

Graphical Analysis NB EB



Bi-Directional Class Count || Graphical Analysis SB WB

Gainesville, GA

Site 2

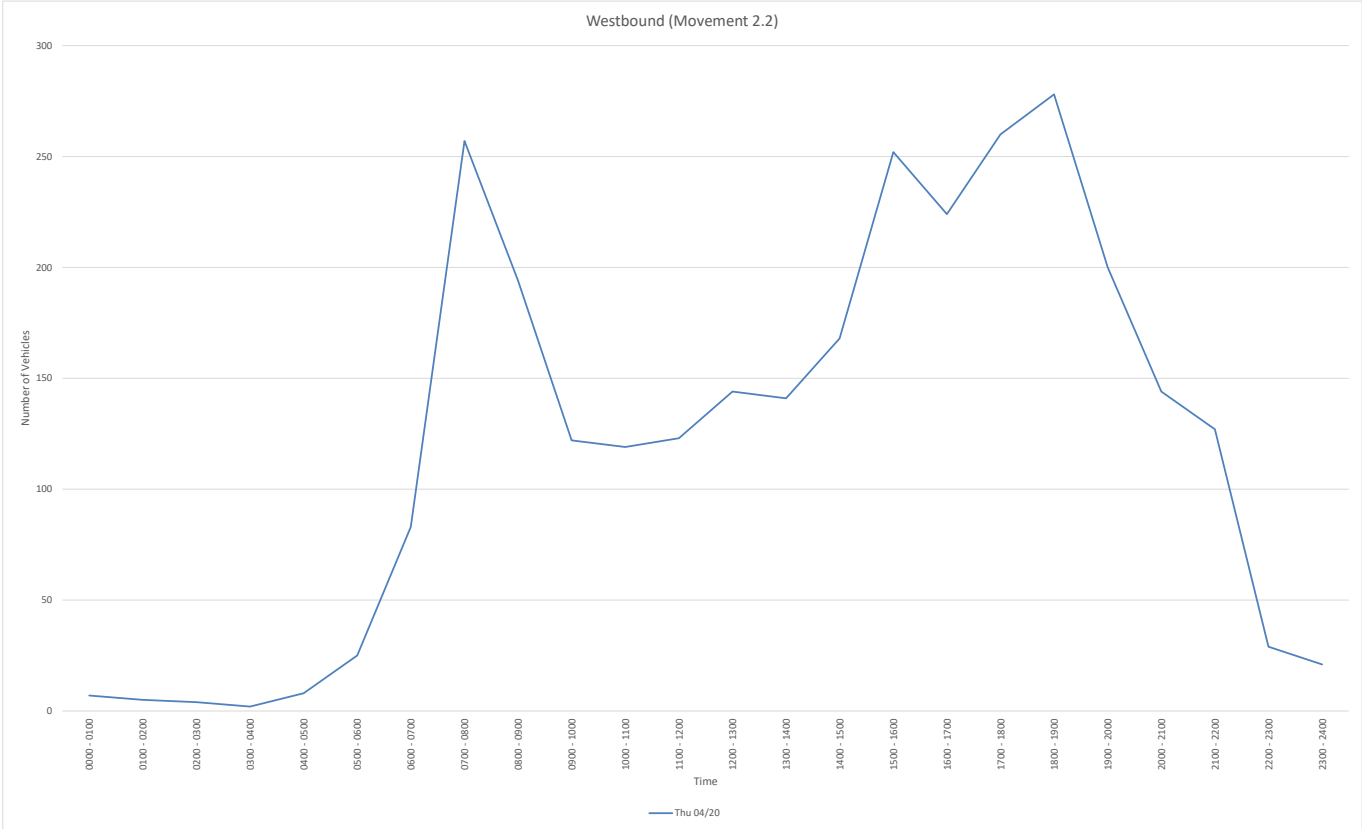
Jim Hood Rd,
west of GA-11 Cleveland Hwy (North)

Lat/Long

34.405325°, -83.805734°

0000 - 2400 (Weekday 24h Session)

Graphical Analysis SB WB



**Appendix C: Signal Timing Plans & Existing Conditions Capacity
Analysis Reports**

GDOT

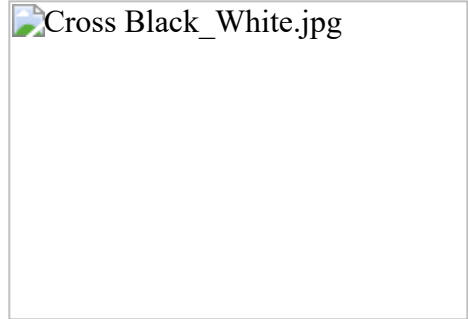
MaxTime Timing Shee

Hall 22

Administration

Unit Information

Controller ID	1013
Main St.	SR 11
Side St.	Jim Hood(Nopone)



Adapter	IP Address	Subnet Mask	Default Gateway	ARP	DHCP
1	10.251.146.6	255.255.255.240	10.251.146.1	Disable	
2	10.20.70.51	255.255.255.0	0.0.0.0	Disable	

Serial Ports:

Port	Description	Function	Address	Baud	Bits	Stop	Parity	Flow	CTS	RTS
1	Port 2/C21S	None	1	9600	8	1	None	None	0	0
2	Aux P3/C22S	None	1	9600	8	1	None	None	0	0
3	SDLC Port 1	None	1	9600	8	1	None	None	0	0
4	Com A/C50S	None	1	9600	8	1	None	None	0	0
5	FIO	None	1	9600	8	1	None	None	0	0
6	DISPLAY/C60M	None	1	9600	8	1	None	None	0	0
7	SP7	None	1	9600	8	1	None	None	0	0
8	SP8/Com B	None	1	9600	8	1	None	None	0	0

Unit Parameters

Startup Flash	0	Auto Ped Clr	Disable	Red Revert	5.0	Backup Time	900	Ext Mode	Enable
All Red Exit	6	Grn Flash Freq.	60	Yel Flash Freq.	60	MCE Enable	Enable	Free Seq.	1
MCE Seq.	1	Start Yellow	0.0	Start Red	0.0	Start Clear Hold	6		

Phase Parameters

Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Walk Time	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Clear Time	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Don't Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Green	5	15	3	8	5	15	3	8	0	0	1	1	1	1	1	1	1	1	1	1
Min Green 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Passage	3.0	7.5	3.0	4.3	3.0	7.5	3.0	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max-1	25	60	20	35	25	60	20	25	0	0	1	1	1	1	1	1	1	1	1	1
Max-2	25	60	20	35	25	60	20	25	0	0	0	0	0	0	0	0	0	0	0	0
Max-3	15	45	15	25	15	45	15	25	0	0	1	1	1	1	1	1	1	1	1	1
Yel Change	3.7	5.7	3.5	4.2	3.0	5.7	3.1	4.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	3.0	1.5	3.0	2.1	3.0	1.5	3.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Add Red Clear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Red Revert	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Added Initial	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Max Initial	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time B4 Reduce	0	17	0	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars B4 Reduce	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time To Reduce	0	17	0	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0
Reduce By	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Min Gap	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dyn Max Limit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dyn Max Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advance Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Ped	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alt Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alt Ped Cir																			
Pre Green	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pre Clearance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Phases	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Walk Time	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Clear Time	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Don't Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Green	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Min Green 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Max-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Max-3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Yel Change	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Add Red Clear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Red Revert	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Added Initial	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Initial	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time B4 Reduce	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars B4 Reduce	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time To Reduce	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Reduce By	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dyn Max Limit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dyn Max Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advance Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Ped	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alt Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alt Ped Clr																				
Pre Green	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pre Clearance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Phase Options

Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Enable	X	X	X	X	X	X	X	X												
Auto Flash Ent.				X				X												
Auto Flash Exit		X				X														
Non Actuated I																				
Non Actuated II																				
Non Lock Mem	X		X	X	X		X	X												
Min Veh Recall																				
Max Veh Recall																				
Ped Recall																				
Soft Veh Recall																				
Dual Entry		X		X		X		X												

HCM 6th Signalized Intersection Summary
 1: Cleveland Hwy (SR 11) & Jim Hood Rd/Nopone Rd

Jim Hood Rd in Gainesville GA
 Existing 2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (veh/h)	42	44	207	60	80	33	6	181	255	16	12	40
Future Volume (veh/h)	42	44	207	60	80	33	6	181	255	16	12	40
Initial Q (Qb), veh	0	0	0	0	0	0		0	0	0		0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00		1.00		1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1900	1870	1885	1870	1826	1900		1811	1811	1811		1900
Adj Flow Rate, veh/h	44	46	0	62	83	34		189	266	0		42
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96		0.96	0.96	0.96		0.96
Percent Heavy Veh, %	0	2	1	2	5	0		6	6	6		0
Cap, veh/h	269	229		324	175	71		398	1328			538
Arrive On Green	0.03	0.12	0.00	0.04	0.14	0.14		0.11	0.39	0.00		0.04
Sat Flow, veh/h	1810	1870	1598	1781	1231	504		1725	3441	1535		1810
Grp Volume(v), veh/h	44	46	0	62	0	117		189	266	0		42
Grp Sat Flow(s),veh/h/ln	1810	1870	1598	1781	0	1735		1725	1721	1535		1810
Q Serve(g_s), s	1.3	1.4	0.0	1.9	0.0	4.0		4.6	3.3	0.0		1.0
Cycle Q Clear(g_c), s	1.3	1.4	0.0	1.9	0.0	4.0		4.6	3.3	0.0		1.0
Prop In Lane	1.00		1.00	1.00		0.29		1.00		1.00		1.00
Lane Grp Cap(c), veh/h	269	229		324	0	246		398	1328			538
V/C Ratio(X)	0.16	0.20		0.19	0.00	0.48		0.48	0.20			0.08
Avail Cap(c_a), veh/h	785	1028		809	0	681		892	3243			1175
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00		1.00	1.00	0.00		1.00
Uniform Delay (d), s/veh	23.6	25.1	0.0	23.0	0.0	25.1		13.4	13.0	0.0		13.7
Incr Delay (d2), s/veh	0.3	0.6	0.0	0.3	0.0	2.0		0.9	0.1	0.0		0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0
%ile BackOfQ(95%),veh/ln	1.0	1.1	0.0	1.3	0.0	2.9		2.6	1.8	0.0		0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.8	25.7	0.0	23.3	0.0	27.2		14.2	13.1	0.0		13.8
LnGrp LOS	C	C		C	A	C		B	B			B
Approach Vol, veh/h		90			179				455			
Approach Delay, s/veh		24.8			25.8				13.6			
Approach LOS		C			C				B			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.4	27.0	9.2	14.1	8.6	31.8	7.9	15.3				
Change Period (Y+Rc), s	* 6.7	7.2	6.5	* 6.3	6.0	7.2	6.1	* 6.3				
Max Green Setting (Gmax), s	* 25	60.0	20.0	* 35	25.0	60.0	20.0	* 25				
Max Q Clear Time (g_c+l1), s	6.6	12.8	3.9	3.4	3.0	5.3	3.3	6.0				
Green Ext Time (p_c), s	0.4	7.0	0.1	0.2	0.1	2.3	0.1	0.7				

Intersection Summary

HCM 6th Ctrl Delay	18.7
HCM 6th LOS	B

Notes

User approved ignoring U-Turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

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

HCM 6th Signalized Intersection Summary
 1: Cleveland Hwy (SR 11) & Jim Hood Rd/Nopone Rd

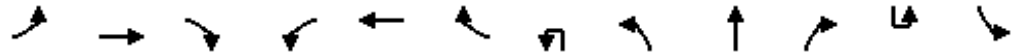
Jim Hood Rd in Gainesville GA
 Existing 2023



Movement	SBT	SBR
Lane Configurations	↑↑	↗
Traffic Volume (veh/h)	672	45
Future Volume (veh/h)	672	45
Initial Q (Qb), veh	0	0
Ped-Bike Adj(A_pbT)		1.00
Parking Bus, Adj	1.00	1.00
Work Zone On Approach	No	
Adj Sat Flow, veh/h/ln	1870	1796
Adj Flow Rate, veh/h	700	0
Peak Hour Factor	0.96	0.96
Percent Heavy Veh, %	2	7
Cap, veh/h	1103	
Arrive On Green	0.31	0.00
Sat Flow, veh/h	3554	1522
Grp Volume(v), veh/h	700	0
Grp Sat Flow(s),veh/h/ln	1777	1522
Q Serve(g_s), s	10.8	0.0
Cycle Q Clear(g_c), s	10.8	0.0
Prop In Lane		1.00
Lane Grp Cap(c), veh/h	1103	
V/C Ratio(X)	0.63	
Avail Cap(c_a), veh/h	3349	
HCM Platoon Ratio	1.00	1.00
Upstream Filter(l)	1.00	0.00
Uniform Delay (d), s/veh	18.9	0.0
Incr Delay (d2), s/veh	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0
%ile BackOfQ(95%),veh/ln	6.7	0.0
Unsig. Movement Delay, s/veh		
LnGrp Delay(d),s/veh	19.7	0.0
LnGrp LOS	B	
Approach Vol, veh/h	742	
Approach Delay, s/veh	19.4	
Approach LOS	B	
Timer - Assigned Phs		

HCM 6th Signalized Intersection Summary
 1: Cleveland Hwy (SR 11) & Jim Hood Rd/Nopone Rd

Jim Hood Rd in Gainesville GA
 Existing 2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (veh/h)	54	91	154	49	63	24	4	157	666	84	16	52
Future Volume (veh/h)	54	91	154	49	63	24	4	157	666	84	16	52
Initial Q (Qb), veh	0	0	0	0	0	0		0	0	0		0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00		1.00		1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1811	1885	1841	1900	1870	1841		1870	1885	1900		1870
Adj Flow Rate, veh/h	58	98	0	53	68	26		169	716	0		56
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93		0.93	0.93	0.93		0.93
Percent Heavy Veh, %	6	1	4	0	2	4		2	1	0		2
Cap, veh/h	307	256		305	179	68		497	1172			333
Arrive On Green	0.04	0.14	0.00	0.03	0.14	0.14		0.10	0.33	0.00		0.05
Sat Flow, veh/h	1725	1885	1560	1810	1289	493		1781	3582	1610		1781
Grp Volume(v), veh/h	58	98	0	53	0	94		169	716	0		56
Grp Sat Flow(s),veh/h/ln	1725	1885	1560	1810	0	1782		1781	1791	1610		1781
Q Serve(g_s), s	1.7	2.7	0.0	1.4	0.0	2.8		3.8	9.7	0.0		1.3
Cycle Q Clear(g_c), s	1.7	2.7	0.0	1.4	0.0	2.8		3.8	9.7	0.0		1.3
Prop In Lane	1.00		1.00	1.00		0.28		1.00		1.00		1.00
Lane Grp Cap(c), veh/h	307	256		305	0	247		497	1172			333
V/C Ratio(X)	0.19	0.38		0.17	0.00	0.38		0.34	0.61			0.17
Avail Cap(c_a), veh/h	837	1143		868	0	772		1090	3723			1013
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00		1.00	1.00	0.00		1.00
Uniform Delay (d), s/veh	20.4	22.7	0.0	20.5	0.0	22.6		13.0	16.3	0.0		14.2
Incr Delay (d2), s/veh	0.3	1.3	0.0	0.3	0.0	1.4		0.4	0.7	0.0		0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0
%ile BackOfQ(95%),veh/ln	1.1	2.1	0.0	1.0	0.0	2.0		2.2	5.7	0.0		0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.7	24.1	0.0	20.8	0.0	24.0		13.4	17.1	0.0		14.5
LnGrp LOS	C	C		C	A	C		B	B			B
Approach Vol, veh/h		156			147				885			
Approach Delay, s/veh		22.8			22.8				16.4			
Approach LOS		C			C				B			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.5	22.6	8.5	14.2	9.0	26.1	8.4	14.3				
Change Period (Y+Rc), s	* 6.7	7.2	6.5	* 6.3	6.0	7.2	6.1	* 6.3				
Max Green Setting (Gmax), s	* 25	60.0	20.0	* 35	25.0	60.0	20.0	* 25				
Max Q Clear Time (g_c+l1), s	5.8	6.6	3.4	4.7	3.3	11.7	3.7	4.8				
Green Ext Time (p_c), s	0.4	3.0	0.1	0.6	0.1	7.2	0.1	0.5				

Intersection Summary

HCM 6th Ctrl Delay	17.8
HCM 6th LOS	B

Notes

User approved ignoring U-Turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

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

HCM 6th Signalized Intersection Summary
 1: Cleveland Hwy (SR 11) & Jim Hood Rd/Nopone Rd

Jim Hood Rd in Gainesville GA
 Existing 2023



Movement	SBT	SBR
Lane Configurations	↑↑	↗
Traffic Volume (veh/h)	318	34
Future Volume (veh/h)	318	34
Initial Q (Qb), veh	0	0
Ped-Bike Adj(A_pbT)		1.00
Parking Bus, Adj	1.00	1.00
Work Zone On Approach	No	
Adj Sat Flow, veh/h/ln	1841	1811
Adj Flow Rate, veh/h	342	0
Peak Hour Factor	0.93	0.93
Percent Heavy Veh, %	4	6
Cap, veh/h	931	
Arrive On Green	0.27	0.00
Sat Flow, veh/h	3497	1535
Grp Volume(v), veh/h	342	0
Grp Sat Flow(s),veh/h/ln	1749	1535
Q Serve(g_s), s	4.6	0.0
Cycle Q Clear(g_c), s	4.6	0.0
Prop In Lane		1.00
Lane Grp Cap(c), veh/h	931	
V/C Ratio(X)	0.37	
Avail Cap(c_a), veh/h	3635	
HCM Platoon Ratio	1.00	1.00
Upstream Filter(l)	1.00	0.00
Uniform Delay (d), s/veh	17.2	0.0
Incr Delay (d2), s/veh	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.7	0.0
Unsig. Movement Delay, s/veh		
LnGrp Delay(d),s/veh	17.6	0.0
LnGrp LOS	B	
Approach Vol, veh/h	398	
Approach Delay, s/veh	17.1	
Approach LOS	B	
Timer - Assigned Phs		

Appendix D: Existing Conditions Queue Analysis Reports

Summary of All Intervals

Run Number	1	2	3	4	5	6	7
Start Time	7:00	7:00	7:00	7:00	7:00	7:00	7:00
End Time	8:15	8:15	8:15	8:15	8:15	8:15	8:15
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	1657	1770	1711	1634	1613	1697	1705
Vehs Exited	1662	1788	1721	1629	1601	1694	1690
Starting Vehs	37	40	37	40	36	32	23
Ending Vehs	32	22	27	45	48	35	38
Travel Distance (mi)	1080	1164	1113	1062	1045	1101	1100
Travel Time (hr)	34.4	37.5	35.9	33.4	32.8	35.8	35.1
Total Delay (hr)	10.3	11.6	11.1	9.8	9.5	11.1	10.5
Total Stops	935	977	979	887	847	963	930
Fuel Used (gal)	38.4	41.4	39.7	37.5	36.8	38.9	39.1

Summary of All Intervals

Run Number	8	9	10	Avg
Start Time	7:00	7:00	7:00	7:00
End Time	8:15	8:15	8:15	8:15
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	1708	1637	1746	1687
Vehs Exited	1716	1627	1758	1689
Starting Vehs	41	31	48	36
Ending Vehs	33	41	36	35
Travel Distance (mi)	1118	1063	1140	1099
Travel Time (hr)	36.5	34.1	36.5	35.2
Total Delay (hr)	11.6	10.4	11.1	10.7
Total Stops	985	965	949	941
Fuel Used (gal)	40.2	38.1	40.2	39.0

Interval #0 Information Seeding

Start Time	7:00
End Time	7:15
Total Time (min)	15
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	7:15						
End Time	8:15						
Total Time (min)	60						
Volumes adjusted by Growth Factors.							
Run Number	1	2	3	4	5	6	7
Vehs Entered	1657	1770	1711	1634	1613	1697	1705
Vehs Exited	1662	1788	1721	1629	1601	1694	1690
Starting Vehs	37	40	37	40	36	32	23
Ending Vehs	32	22	27	45	48	35	38
Travel Distance (mi)	1080	1164	1113	1062	1045	1101	1100
Travel Time (hr)	34.4	37.5	35.9	33.4	32.8	35.8	35.1
Total Delay (hr)	10.3	11.6	11.1	9.8	9.5	11.1	10.5
Total Stops	935	977	979	887	847	963	930
Fuel Used (gal)	38.4	41.4	39.7	37.5	36.8	38.9	39.1

Interval #1 Information Recording

Start Time	7:15			
End Time	8:15			
Total Time (min)	60			
Volumes adjusted by Growth Factors.				
Run Number	8	9	10	Avg
Vehs Entered	1708	1637	1746	1687
Vehs Exited	1716	1627	1758	1689
Starting Vehs	41	31	48	36
Ending Vehs	33	41	36	35
Travel Distance (mi)	1118	1063	1140	1099
Travel Time (hr)	36.5	34.1	36.5	35.2
Total Delay (hr)	11.6	10.4	11.1	10.7
Total Stops	985	965	949	941
Fuel Used (gal)	40.2	38.1	40.2	39.0

Intersection: 1: Cleveland Hwy (SR 11) & Jim Hood Rd/Nopone Rd

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	
Directions Served	L	T	R	L	TR	UL	T	T	UL	T	T	
Maximum Queue (ft)	76	85	45	92	164	157	127	114	55	197	192	
Average Queue (ft)	27	24	3	33	65	72	47	29	19	114	101	
95th Queue (ft)	62	60	23	70	126	135	102	77	45	178	167	
Link Distance (ft)	1240				1646		1069		1069		2666	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	215		195		215		360		355			
Storage Blk Time (%)	0											
Queuing Penalty (veh)	0											

Summary of All Intervals

Run Number	1	2	3	4	5	6	7
Start Time	4:30	4:30	4:30	4:30	4:30	4:30	4:30
End Time	5:45	5:45	5:45	5:45	5:45	5:45	5:45
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	1786	1778	1797	1733	1703	1717	1810
Vehs Exited	1783	1775	1805	1724	1693	1721	1801
Starting Vehs	31	33	44	27	35	37	31
Ending Vehs	34	36	36	36	45	33	40
Travel Distance (mi)	1161	1170	1186	1135	1120	1122	1182
Travel Time (hr)	36.5	37.9	38.5	35.4	34.5	34.7	37.6
Total Delay (hr)	10.3	11.4	11.6	9.8	9.3	9.3	10.9
Total Stops	887	952	983	871	841	869	972
Fuel Used (gal)	40.9	41.3	42.1	39.7	38.9	38.9	41.9

Summary of All Intervals

Run Number	8	9	10	Avg
Start Time	4:30	4:30	4:30	4:30
End Time	5:45	5:45	5:45	5:45
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	1791	1786	1849	1777
Vehs Exited	1775	1800	1853	1773
Starting Vehs	28	51	39	35
Ending Vehs	44	37	35	37
Travel Distance (mi)	1171	1181	1216	1164
Travel Time (hr)	36.9	37.2	38.6	36.8
Total Delay (hr)	10.5	10.6	11.1	10.5
Total Stops	938	942	935	919
Fuel Used (gal)	41.0	41.5	42.4	40.9

Interval #0 Information Seeding

Start Time	4:30
End Time	4:45
Total Time (min)	15
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	4:45						
End Time	5:45						
Total Time (min)	60						
Volumes adjusted by Growth Factors.							
Run Number	1	2	3	4	5	6	7
Vehs Entered	1786	1778	1797	1733	1703	1717	1810
Vehs Exited	1783	1775	1805	1724	1693	1721	1801
Starting Vehs	31	33	44	27	35	37	31
Ending Vehs	34	36	36	36	45	33	40
Travel Distance (mi)	1161	1170	1186	1135	1120	1122	1182
Travel Time (hr)	36.5	37.9	38.5	35.4	34.5	34.7	37.6
Total Delay (hr)	10.3	11.4	11.6	9.8	9.3	9.3	10.9
Total Stops	887	952	983	871	841	869	972
Fuel Used (gal)	40.9	41.3	42.1	39.7	38.9	38.9	41.9

Interval #1 Information Recording

Start Time	4:45			
End Time	5:45			
Total Time (min)	60			
Volumes adjusted by Growth Factors.				
Run Number	8	9	10	Avg
Vehs Entered	1791	1786	1849	1777
Vehs Exited	1775	1800	1853	1773
Starting Vehs	28	51	39	35
Ending Vehs	44	37	35	37
Travel Distance (mi)	1171	1181	1216	1164
Travel Time (hr)	36.9	37.2	38.6	36.8
Total Delay (hr)	10.5	10.6	11.1	10.5
Total Stops	938	942	935	919
Fuel Used (gal)	41.0	41.5	42.4	40.9

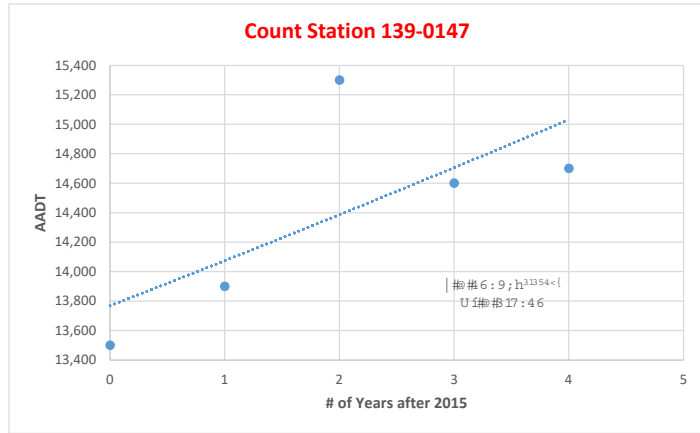
Intersection: 1: Cleveland Hwy (SR 11) & Jim Hood Rd/Nopone Rd

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	TR	UL	T	T	UL	T	T
Maximum Queue (ft)	83	99	24	68	117	131	201	167	77	129	117
Average Queue (ft)	34	43	1	28	47	55	102	73	28	64	48
95th Queue (ft)	69	83	14	61	91	103	174	144	61	109	97
Link Distance (ft)	1240				1646		1069	1069	2666		2666
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	215		195		215		360		355		
Storage Blk Time (%)											
Queuing Penalty (veh)											

Appendix E: Growth Rate Analysis Worksheets

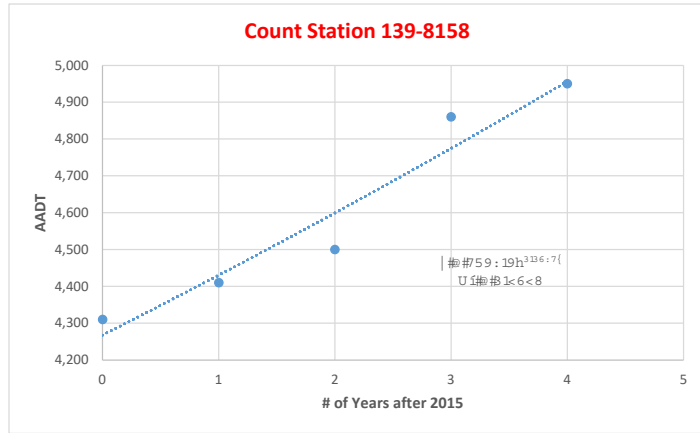
Historic AADT

Roadway	Cleveland Hwy		
Source	GDOT TADA		
Link	https://gdottrafficdata.drakewell.com/site		
Count Station	139-0147		
Functional Class	Principal Arterial - Other (Urban)		
Year	A/E	AADT	Change % from Last Year
2021	E	12,600	6.8%
2020	A	11,800	-19.7%
2019	E	14,700	0.7%
2018	A	14,600	-4.6%
2017	A	15,300	10.1%
2016	E	13,900	3.0%
2015	E	13,500	Base
Historic Exponential Growth Rate			
From	To	2.19%	
2015	2019		



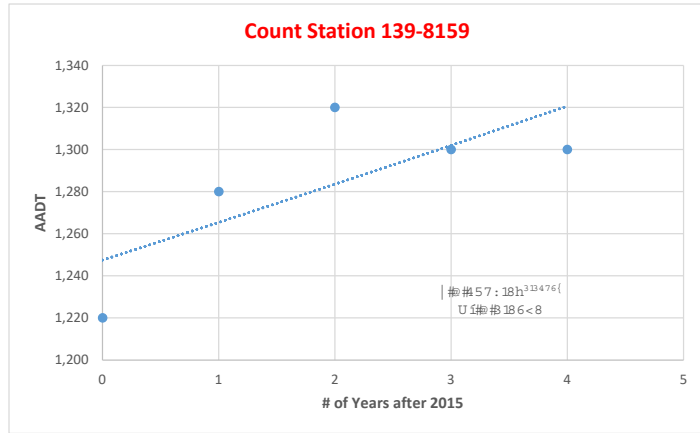
Historic AADT

Roadway	Jim Hood Rd		
Source	GDOT TADA		
Link	https://gdottrafficdata.drakewell.com/site/		
Count Station	139-8158		
Functional Class	Minor Collector (Urban)		
Year	A/E	AADT	Change % from Last Year
2021	E	4,890	6.3%
2020	E	4,600	-7.1%
2019	E	4,950	1.9%
2018	A	4,860	8.0%
2017	E	4,500	2.0%
2016	E	4,410	2.3%
2015	E	4,310	Base
Historic Exponential Growth Rate			
From	To	3.74%	
2015	2019		



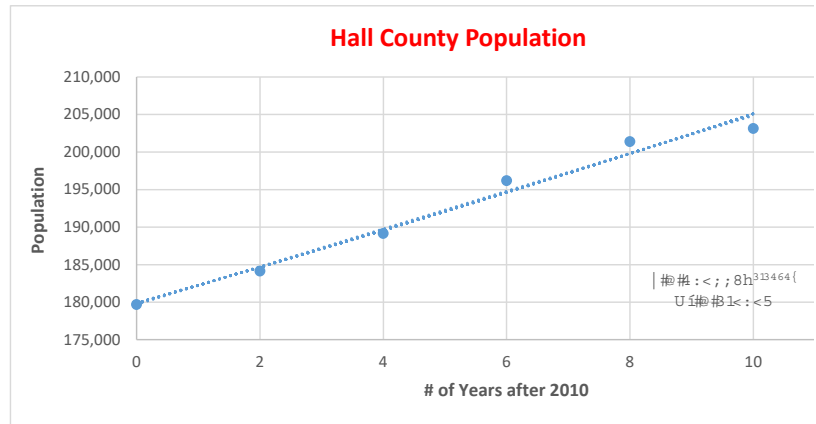
Historic AADT

Roadway	Nopone Rd		
Source	GDOT TADA		
Link	https://gdottrafficdata.drakewell.com/site/		
Count Station	139-8159		
Functional Class	Minor Collector (Rural)		
Year	A/E	AADT	Change % from Last Year
2021	A	1,850	48.0%
2020	E	1,250	-3.8%
2019	E	1,300	0.0%
2018	E	1,300	-1.5%
2017	A	1,320	3.1%
2016	E	1,280	4.9%
2015	E	1,220	Base
Historic Exponential Growth Rate			
From	To	1.43%	
2015	2019		



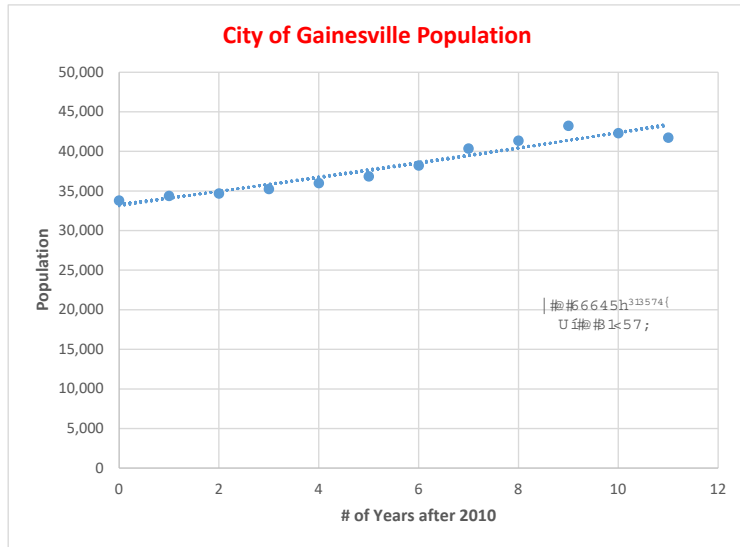
Population Data

Location	Hall County	
Source	US Census	
Year	Population	Change % from Last Year
2020	203,136	0.9%
2018	201,396	2.7%
2016	196,176	3.7%
2014	189,156	2.7%
2012	184,136	2.5%
2010	179,684	Base
Historic Exponential Growth Rate		
From	To	1.31%
2010	2020	



Population Data

Location	City of Gainesville	
Source	US Census	
Year	Population	Change % from Last Year
2021	41,730	-1.3%
2020	42,296	-2.2%
2019	43,232	4.6%
2018	41,350	2.4%
2017	40,366	5.6%
2016	38,214	3.7%
2015	36,849	2.3%
2014	36,006	2.1%
2013	35,257	1.6%
2012	34,691	0.9%
2011	34,374	1.7%
2010	33,804	Base
Historic Exponential Growth Rate		
From	To	
2010	2021	2.41%



Appendix F: Projected Conditions Capacity Analysis Reports

HCM 6th Signalized Intersection Summary
 1: Cleveland Hwy (SR 11) & Jim Hood Rd/Nopone Rd

Jim Hood Rd in Gainesville GA
 Background 2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (veh/h)	43	45	212	61	82	34	6	185	261	16	12	41
Future Volume (veh/h)	43	45	212	61	82	34	6	185	261	16	12	41
Initial Q (Qb), veh	0	0	0	0	0	0		0	0	0		0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00		1.00		1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1900	1870	1885	1870	1826	1900		1811	1811	1811		1900
Adj Flow Rate, veh/h	45	47	0	64	85	35		193	272	0		43
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96		0.96	0.96	0.96		0.96
Percent Heavy Veh, %	0	2	1	2	5	0		6	6	6		0
Cap, veh/h	265	227		323	173	71		397	1346			541
Arrive On Green	0.03	0.12	0.00	0.04	0.14	0.14		0.11	0.39	0.00		0.04
Sat Flow, veh/h	1810	1870	1598	1781	1229	506		1725	3441	1535		1810
Grp Volume(v), veh/h	45	47	0	64	0	120		193	272	0		43
Grp Sat Flow(s),veh/h/ln	1810	1870	1598	1781	0	1735		1725	1721	1535		1810
Q Serve(g_s), s	1.4	1.5	0.0	2.0	0.0	4.1		4.7	3.4	0.0		1.0
Cycle Q Clear(g_c), s	1.4	1.5	0.0	2.0	0.0	4.1		4.7	3.4	0.0		1.0
Prop In Lane	1.00		1.00	1.00		0.29		1.00		1.00		1.00
Lane Grp Cap(c), veh/h	265	227		323	0	245		397	1346			541
V/C Ratio(X)	0.17	0.21		0.20	0.00	0.49		0.49	0.20			0.08
Avail Cap(c_a), veh/h	772	1014		797	0	672		881	3198			1167
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00		1.00	1.00	0.00		1.00
Uniform Delay (d), s/veh	23.9	25.6	0.0	23.4	0.0	25.6		13.4	13.0	0.0		13.7
Incr Delay (d2), s/veh	0.3	0.6	0.0	0.3	0.0	2.2		0.9	0.1	0.0		0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0
%ile BackOfQ(95%),veh/ln	1.0	1.1	0.0	1.4	0.0	3.0		2.6	1.9	0.0		0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.2	26.2	0.0	23.7	0.0	27.7		14.3	13.1	0.0		13.7
LnGrp LOS	C	C		C	A	C		B	B			B
Approach Vol, veh/h		92			184				465			
Approach Delay, s/veh		25.2			26.3				13.6			
Approach LOS		C			C				B			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.6	27.5	9.3	14.1	8.7	32.4	8.0	15.4				
Change Period (Y+Rc), s	* 6.7	7.2	6.5	* 6.3	6.0	7.2	6.1	* 6.3				
Max Green Setting (Gmax), s	* 25	60.0	20.0	* 35	25.0	60.0	20.0	* 25				
Max Q Clear Time (g_c+l1), s	6.7	13.2	4.0	3.5	3.0	5.4	3.4	6.1				
Green Ext Time (p_c), s	0.4	7.2	0.1	0.2	0.1	2.4	0.1	0.7				

Intersection Summary

HCM 6th Ctrl Delay	18.9
HCM 6th LOS	B

Notes

User approved ignoring U-Turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

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

HCM 6th Signalized Intersection Summary
 1: Cleveland Hwy (SR 11) & Jim Hood Rd/Nopone Rd

Jim Hood Rd in Gainesville GA
 Background 2024



Movement	SBT	SBR
Lane Configurations	↑↑	↗
Traffic Volume (veh/h)	687	46
Future Volume (veh/h)	687	46
Initial Q (Qb), veh	0	0
Ped-Bike Adj(A_pbT)		1.00
Parking Bus, Adj	1.00	1.00
Work Zone On Approach	No	
Adj Sat Flow, veh/h/ln	1870	1796
Adj Flow Rate, veh/h	716	0
Peak Hour Factor	0.96	0.96
Percent Heavy Veh, %	2	7
Cap, veh/h	1120	
Arrive On Green	0.32	0.00
Sat Flow, veh/h	3554	1522
Grp Volume(v), veh/h	716	0
Grp Sat Flow(s),veh/h/ln	1777	1522
Q Serve(g_s), s	11.2	0.0
Cycle Q Clear(g_c), s	11.2	0.0
Prop In Lane		1.00
Lane Grp Cap(c), veh/h	1120	
V/C Ratio(X)	0.64	
Avail Cap(c_a), veh/h	3303	
HCM Platoon Ratio	1.00	1.00
Upstream Filter(I)	1.00	0.00
Uniform Delay (d), s/veh	19.0	0.0
Incr Delay (d2), s/veh	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0
%ile BackOfQ(95%),veh/ln	6.9	0.0
Unsig. Movement Delay, s/veh		
LnGrp Delay(d),s/veh	19.8	0.0
LnGrp LOS	B	
Approach Vol, veh/h	759	
Approach Delay, s/veh	19.5	
Approach LOS	B	
Timer - Assigned Phs		

HCM 6th Signalized Intersection Summary
 1: Cleveland Hwy (SR 11) & Jim Hood Rd/Nopone Rd

Jim Hood Rd in Gainesville GA
 Background 2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (veh/h)	55	93	158	50	64	25	4	161	681	86	16	53
Future Volume (veh/h)	55	93	158	50	64	25	4	161	681	86	16	53
Initial Q (Qb), veh	0	0	0	0	0	0		0	0	0		0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00		1.00		1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1811	1885	1841	1900	1870	1841		1870	1885	1900		1870
Adj Flow Rate, veh/h	59	100	0	54	69	27		173	732	0		57
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93		0.93	0.93	0.93		0.93
Percent Heavy Veh, %	6	1	4	0	2	4		2	1	0		2
Cap, veh/h	303	254		301	176	69		500	1191			332
Arrive On Green	0.04	0.13	0.00	0.04	0.14	0.14		0.10	0.33	0.00		0.05
Sat Flow, veh/h	1725	1885	1560	1810	1280	501		1781	3582	1610		1781
Grp Volume(v), veh/h	59	100	0	54	0	96		173	732	0		57
Grp Sat Flow(s),veh/h/ln	1725	1885	1560	1810	0	1780		1781	1791	1610		1781
Q Serve(g_s), s	1.7	2.8	0.0	1.5	0.0	2.9		3.9	10.0	0.0		1.3
Cycle Q Clear(g_c), s	1.7	2.8	0.0	1.5	0.0	2.9		3.9	10.0	0.0		1.3
Prop In Lane	1.00		1.00	1.00		0.28		1.00		1.00		1.00
Lane Grp Cap(c), veh/h	303	254		301	0	244		500	1191			332
V/C Ratio(X)	0.19	0.39		0.18	0.00	0.39		0.35	0.61			0.17
Avail Cap(c_a), veh/h	825	1130		857	0	762		1082	3681			1003
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00		1.00	1.00	0.00		1.00
Uniform Delay (d), s/veh	20.6	23.1	0.0	20.8	0.0	23.0		13.0	16.3	0.0		14.2
Incr Delay (d2), s/veh	0.3	1.4	0.0	0.3	0.0	1.5		0.4	0.7	0.0		0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0
%ile BackOfQ(95%),veh/ln	1.1	2.2	0.0	1.0	0.0	2.1		2.2	5.9	0.0		0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.0	24.5	0.0	21.1	0.0	24.4		13.4	17.1	0.0		14.5
LnGrp LOS	C	C		C	A	C		B	B			B
Approach Vol, veh/h		159			150				905			
Approach Delay, s/veh		23.2			23.2				16.4			
Approach LOS		C			C				B			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.7	23.0	8.6	14.2	9.0	26.6	8.4	14.3				
Change Period (Y+Rc), s	* 6.7	7.2	6.5	* 6.3	6.0	7.2	6.1	* 6.3				
Max Green Setting (Gmax), s	* 25	60.0	20.0	* 35	25.0	60.0	20.0	* 25				
Max Q Clear Time (g_c+l1), s	5.9	6.7	3.5	4.8	3.3	12.0	3.7	4.9				
Green Ext Time (p_c), s	0.4	3.1	0.1	0.7	0.1	7.4	0.1	0.5				

Intersection Summary

HCM 6th Ctrl Delay	17.9
HCM 6th LOS	B

Notes

User approved ignoring U-Turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

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

HCM 6th Signalized Intersection Summary
 1: Cleveland Hwy (SR 11) & Jim Hood Rd/Nopone Rd

Jim Hood Rd in Gainesville GA
 Background 2024



Movement	SBT	SBR
Lane Configurations	↑↑	↗
Traffic Volume (veh/h)	325	35
Future Volume (veh/h)	325	35
Initial Q (Qb), veh	0	0
Ped-Bike Adj(A_pbT)		1.00
Parking Bus, Adj	1.00	1.00
Work Zone On Approach	No	
Adj Sat Flow, veh/h/ln	1841	1811
Adj Flow Rate, veh/h	349	0
Peak Hour Factor	0.93	0.93
Percent Heavy Veh, %	4	6
Cap, veh/h	945	
Arrive On Green	0.27	0.00
Sat Flow, veh/h	3497	1535
Grp Volume(v), veh/h	349	0
Grp Sat Flow(s),veh/h/ln	1749	1535
Q Serve(g_s), s	4.7	0.0
Cycle Q Clear(g_c), s	4.7	0.0
Prop In Lane		1.00
Lane Grp Cap(c), veh/h	945	
V/C Ratio(X)	0.37	
Avail Cap(c_a), veh/h	3594	
HCM Platoon Ratio	1.00	1.00
Upstream Filter(l)	1.00	0.00
Uniform Delay (d), s/veh	17.3	0.0
Incr Delay (d2), s/veh	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.8	0.0
Unsig. Movement Delay, s/veh		
LnGrp Delay(d),s/veh	17.6	0.0
LnGrp LOS	B	
Approach Vol, veh/h	406	
Approach Delay, s/veh	17.2	
Approach LOS	B	
Timer - Assigned Phs		

HCM 6th Signalized Intersection Summary
 1: Cleveland Hwy (SR 11) & Jim Hood Rd/Nopone Rd

Jim Hood Rd in Gainesville GA
 Build 2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (veh/h)	46	45	222	64	82	34	18	196	276	19	12	41
Future Volume (veh/h)	46	45	222	64	82	34	18	196	276	19	12	41
Initial Q (Qb), veh	0	0	0	0	0	0		0	0	0		0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00		1.00		1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1900	1870	1885	1870	1826	1900		1811	1811	1811		1900
Adj Flow Rate, veh/h	48	47	0	67	85	35		204	288	0		43
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96		0.96	0.96	0.96		0.96
Percent Heavy Veh, %	0	2	1	2	5	0		6	6	6		0
Cap, veh/h	265	223		322	171	70		400	1368			537
Arrive On Green	0.03	0.12	0.00	0.05	0.14	0.14		0.11	0.40	0.00		0.04
Sat Flow, veh/h	1810	1870	1598	1781	1229	506		1725	3441	1535		1810
Grp Volume(v), veh/h	48	47	0	67	0	120		204	288	0		43
Grp Sat Flow(s),veh/h/ln	1810	1870	1598	1781	0	1735		1725	1721	1535		1810
Q Serve(g_s), s	1.5	1.5	0.0	2.1	0.0	4.2		5.0	3.6	0.0		1.0
Cycle Q Clear(g_c), s	1.5	1.5	0.0	2.1	0.0	4.2		5.0	3.6	0.0		1.0
Prop In Lane	1.00		1.00	1.00		0.29		1.00		1.00		1.00
Lane Grp Cap(c), veh/h	265	223		322	0	242		400	1368			537
V/C Ratio(X)	0.18	0.21		0.21	0.00	0.50		0.51	0.21			0.08
Avail Cap(c_a), veh/h	758	997		784	0	660		866	3144			1151
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00		1.00	1.00	0.00		1.00
Uniform Delay (d), s/veh	24.4	26.1	0.0	23.8	0.0	26.1		13.4	13.0	0.0		13.8
Incr Delay (d2), s/veh	0.3	0.7	0.0	0.3	0.0	2.2		1.0	0.1	0.0		0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0
%ile BackOfQ(95%),veh/ln	1.1	1.2	0.0	1.5	0.0	3.1		2.8	2.0	0.0		0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.7	26.8	0.0	24.1	0.0	28.4		14.4	13.1	0.0		13.9
LnGrp LOS	C	C		C	A	C		B	B			B
Approach Vol, veh/h		95			187				492			
Approach Delay, s/veh		25.7			26.8				13.6			
Approach LOS		C			C				B			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.0	28.1	9.5	14.1	8.7	33.3	8.2	15.4				
Change Period (Y+Rc), s	* 6.7	7.2	6.5	* 6.3	6.0	7.2	6.1	* 6.3				
Max Green Setting (Gmax), s	* 25	60.0	20.0	* 35	25.0	60.0	20.0	* 25				
Max Q Clear Time (g_c+l1), s	7.0	13.5	4.1	3.5	3.0	5.6	3.5	6.2				
Green Ext Time (p_c), s	0.5	7.3	0.1	0.2	0.1	2.5	0.1	0.7				

Intersection Summary

HCM 6th Ctrl Delay	19.0
HCM 6th LOS	B

Notes

User approved ignoring U-Turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

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

HCM 6th Signalized Intersection Summary
 1: Cleveland Hwy (SR 11) & Jim Hood Rd/Nopone Rd

Jim Hood Rd in Gainesville GA
 Build 2024



Movement	SBT	SBR
Lane Configurations	↑↑	↗
Traffic Volume (veh/h)	699	55
Future Volume (veh/h)	699	55
Initial Q (Qb), veh	0	0
Ped-Bike Adj(A_pbT)		1.00
Parking Bus, Adj	1.00	1.00
Work Zone On Approach	No	
Adj Sat Flow, veh/h/ln	1870	1796
Adj Flow Rate, veh/h	728	0
Peak Hour Factor	0.96	0.96
Percent Heavy Veh, %	2	7
Cap, veh/h	1130	
Arrive On Green	0.32	0.00
Sat Flow, veh/h	3554	1522
Grp Volume(v), veh/h	728	0
Grp Sat Flow(s),veh/h/ln	1777	1522
Q Serve(g_s), s	11.5	0.0
Cycle Q Clear(g_c), s	11.5	0.0
Prop In Lane		1.00
Lane Grp Cap(c), veh/h	1130	
V/C Ratio(X)	0.64	
Avail Cap(c_a), veh/h	3247	
HCM Platoon Ratio	1.00	1.00
Upstream Filter(l)	1.00	0.00
Uniform Delay (d), s/veh	19.2	0.0
Incr Delay (d2), s/veh	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0
%ile BackOfQ(95%),veh/ln	7.2	0.0
Unsig. Movement Delay, s/veh		
LnGrp Delay(d),s/veh	20.1	0.0
LnGrp LOS	C	
Approach Vol, veh/h	771	
Approach Delay, s/veh	19.8	
Approach LOS	B	
Timer - Assigned Phs		

Intersection						
Int Delay, s/veh	1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Vol, veh/h	288	24	26	307	15	25
Future Vol, veh/h	288	24	26	307	15	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	175	235	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	313	26	28	334	16	27
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	339	0	703	313
Stage 1	-	-	-	-	313	-
Stage 2	-	-	-	-	390	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1220	-	404	727
Stage 1	-	-	-	-	741	-
Stage 2	-	-	-	-	684	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1220	-	395	727
Mov Cap-2 Maneuver	-	-	-	-	395	-
Stage 1	-	-	-	-	741	-
Stage 2	-	-	-	-	668	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0.6	12.1			
HCM LOS	B					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	553	-	-	1220	-	
HCM Lane V/C Ratio	0.079	-	-	0.023	-	
HCM Control Delay (s)	12.1	-	-	8	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-	

Intersection

Int Delay, s/veh 0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↕↕	↕↕	↗
Traffic Vol, veh/h	0	70	0	509	934	69
Future Vol, veh/h	0	70	0	509	934	69
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	250
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	76	0	553	1015	75

Major/Minor

	Minor2	Major1	Major2
Conflicting Flow All	- 508	- 0	- 0
Stage 1	- -	- -	- -
Stage 2	- -	- -	- -
Critical Hdwy	- 6.94	- -	- -
Critical Hdwy Stg 1	- -	- -	- -
Critical Hdwy Stg 2	- -	- -	- -
Follow-up Hdwy	- 3.32	- -	- -
Pot Cap-1 Maneuver	0 510	0 -	- -
Stage 1	0 -	0 -	- -
Stage 2	0 -	0 -	- -
Platoon blocked, %		- -	- -
Mov Cap-1 Maneuver	- 510	- -	- -
Mov Cap-2 Maneuver	- -	- -	- -
Stage 1	- -	- -	- -
Stage 2	- -	- -	- -

Approach

	EB	NB	SB
HCM Control Delay, s	13.3	0	0
HCM LOS	B		

Minor Lane/Major Mvmt

	NBTEBLn1	SBT	SBR
Capacity (veh/h)	- 510	- -	- -
HCM Lane V/C Ratio	- 0.149	- -	- -
HCM Control Delay (s)	- 13.3	- -	- -
HCM Lane LOS	- B	- -	- -
HCM 95th %tile Q(veh)	- 0.5	- -	- -

HCM 6th Signalized Intersection Summary
 1: Cleveland Hwy (SR 11) & Jim Hood Rd/Nopone Rd

Jim Hood Rd in Gainesville GA
 Build 2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (veh/h)	59	93	174	54	64	25	21	178	705	90	16	53
Future Volume (veh/h)	59	93	174	54	64	25	21	178	705	90	16	53
Initial Q (Qb), veh	0	0	0	0	0	0		0	0	0		0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00		1.00		1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1811	1885	1841	1900	1870	1841		1870	1885	1900		1870
Adj Flow Rate, veh/h	63	100	0	58	69	27		191	758	0		57
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93		0.93	0.93	0.93		0.93
Percent Heavy Veh, %	6	1	4	0	2	4		2	1	0		2
Cap, veh/h	303	250		301	173	68		504	1220			328
Arrive On Green	0.04	0.13	0.00	0.04	0.13	0.13		0.11	0.34	0.00		0.05
Sat Flow, veh/h	1725	1885	1560	1810	1280	501		1781	3582	1610		1781
Grp Volume(v), veh/h	63	100	0	58	0	96		191	758	0		57
Grp Sat Flow(s),veh/h/ln	1725	1885	1560	1810	0	1780		1781	1791	1610		1781
Q Serve(g_s), s	1.9	2.9	0.0	1.6	0.0	2.9		4.4	10.5	0.0		1.3
Cycle Q Clear(g_c), s	1.9	2.9	0.0	1.6	0.0	2.9		4.4	10.5	0.0		1.3
Prop In Lane	1.00		1.00	1.00		0.28		1.00		1.00		1.00
Lane Grp Cap(c), veh/h	303	250		301	0	240		504	1220			328
V/C Ratio(X)	0.21	0.40		0.19	0.00	0.40		0.38	0.62			0.17
Avail Cap(c_a), veh/h	808	1109		840	0	748		1056	3612			985
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00		1.00	1.00	0.00		1.00
Uniform Delay (d), s/veh	21.1	23.6	0.0	21.2	0.0	23.5		13.1	16.4	0.0		14.5
Incr Delay (d2), s/veh	0.3	1.5	0.0	0.3	0.0	1.5		0.5	0.7	0.0		0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0
%ile BackOfQ(95%),veh/ln	1.2	2.2	0.0	1.1	0.0	2.1		2.5	6.2	0.0		0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.4	25.1	0.0	21.5	0.0	25.1		13.5	17.1	0.0		14.8
LnGrp LOS	C	C		C	A	C		B	B			B
Approach Vol, veh/h		163			154				949			
Approach Delay, s/veh		23.7			23.7				16.4			
Approach LOS		C			C				B			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.3	23.2	8.8	14.2	9.1	27.5	8.7	14.3				
Change Period (Y+Rc), s	* 6.7	7.2	6.5	* 6.3	6.0	7.2	6.1	* 6.3				
Max Green Setting (Gmax), s	* 25	60.0	20.0	* 35	25.0	60.0	20.0	* 25				
Max Q Clear Time (g_c+l1), s	6.4	7.1	3.6	4.9	3.3	12.5	3.9	4.9				
Green Ext Time (p_c), s	0.4	3.3	0.1	0.7	0.1	7.7	0.1	0.5				

Intersection Summary

HCM 6th Ctrl Delay	18.1
HCM 6th LOS	B

Notes

User approved ignoring U-Turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

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

HCM 6th Signalized Intersection Summary
 1: Cleveland Hwy (SR 11) & Jim Hood Rd/Nopone Rd

Jim Hood Rd in Gainesville GA
 Build 2024



Movement	SBT	SBR
Lane Configurations	↑↑	↗
Traffic Volume (veh/h)	342	48
Future Volume (veh/h)	342	48
Initial Q (Qb), veh	0	0
Ped-Bike Adj(A_pbT)		1.00
Parking Bus, Adj	1.00	1.00
Work Zone On Approach	No	
Adj Sat Flow, veh/h/ln	1841	1811
Adj Flow Rate, veh/h	368	0
Peak Hour Factor	0.93	0.93
Percent Heavy Veh, %	4	6
Cap, veh/h	943	
Arrive On Green	0.27	0.00
Sat Flow, veh/h	3497	1535
Grp Volume(v), veh/h	368	0
Grp Sat Flow(s),veh/h/ln	1749	1535
Q Serve(g_s), s	5.1	0.0
Cycle Q Clear(g_c), s	5.1	0.0
Prop In Lane		1.00
Lane Grp Cap(c), veh/h	943	
V/C Ratio(X)	0.39	
Avail Cap(c_a), veh/h	3526	
HCM Platoon Ratio	1.00	1.00
Upstream Filter(l)	1.00	0.00
Uniform Delay (d), s/veh	17.7	0.0
Incr Delay (d2), s/veh	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.1	0.0
Unsig. Movement Delay, s/veh		
LnGrp Delay(d),s/veh	18.1	0.0
LnGrp LOS	B	
Approach Vol, veh/h	425	
Approach Delay, s/veh	17.7	
Approach LOS	B	
Timer - Assigned Phs		

Intersection

Int Delay, s/veh 1.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Vol, veh/h	287	36	39	251	25	38
Future Vol, veh/h	287	36	39	251	25	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	175	235	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	312	39	42	273	27	41

Major/Minor

	Major1	Major2	Minor1		
Conflicting Flow All	0	0	351	0	669 312
Stage 1	-	-	-	-	312 -
Stage 2	-	-	-	-	357 -
Critical Hdwy	-	-	4.12	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	2.218	-	3.518 3.318
Pot Cap-1 Maneuver	-	-	1208	-	423 728
Stage 1	-	-	-	-	742 -
Stage 2	-	-	-	-	708 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1208	-	408 728
Mov Cap-2 Maneuver	-	-	-	-	408 -
Stage 1	-	-	-	-	742 -
Stage 2	-	-	-	-	683 -

Approach

	EB	WB	NB
HCM Control Delay, s	0	1.1	12.4
HCM LOS			B

Minor Lane/Major Mvmt

	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	555	-	-	1208	-
HCM Lane V/C Ratio	0.123	-	-	0.035	-
HCM Control Delay (s)	12.4	-	-	8.1	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

Intersection

Int Delay, s/veh 0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↕↕	↕↕	↗
Traffic Vol, veh/h	0	107	0	994	487	104
Future Vol, veh/h	0	107	0	994	487	104
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	250
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	116	0	1080	529	113

Major/Minor

	Minor2	Major1	Major2
Conflicting Flow All	- 265	- 0	- 0
Stage 1	- -	- -	- -
Stage 2	- -	- -	- -
Critical Hdwy	- 6.94	- -	- -
Critical Hdwy Stg 1	- -	- -	- -
Critical Hdwy Stg 2	- -	- -	- -
Follow-up Hdwy	- 3.32	- -	- -
Pot Cap-1 Maneuver	0 733	0 -	- -
Stage 1	0 -	0 -	- -
Stage 2	0 -	0 -	- -
Platoon blocked, %		- -	- -
Mov Cap-1 Maneuver	- 733	- -	- -
Mov Cap-2 Maneuver	- -	- -	- -
Stage 1	- -	- -	- -
Stage 2	- -	- -	- -

Approach

	EB	NB	SB
HCM Control Delay, s	10.8	0	0
HCM LOS	B		

Minor Lane/Major Mvmt

	NBTEBLn1	SBT	SBR
Capacity (veh/h)	- 733	- -	- -
HCM Lane V/C Ratio	- 0.159	- -	- -
HCM Control Delay (s)	- 10.8	- -	- -
HCM Lane LOS	- B	- -	- -
HCM 95th %tile Q(veh)	- 0.6	- -	- -

Appendix G: Projected Conditions Queue Analysis Reports

Summary of All Intervals

Run Number	1	2	3	4	5	6	7
Start Time	7:00	7:00	7:00	7:00	7:00	7:00	7:00
End Time	8:15	8:15	8:15	8:15	8:15	8:15	8:15
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	1746	1776	1691	1700	1680	1735	1751
Vehs Exited	1755	1780	1712	1691	1683	1753	1748
Starting Vehs	40	33	52	30	40	44	29
Ending Vehs	31	29	31	39	37	26	32
Travel Distance (mi)	1131	1154	1106	1092	1096	1134	1141
Travel Time (hr)	36.9	38.3	35.6	34.9	35.2	36.2	36.9
Total Delay (hr)	11.5	12.5	11.0	10.5	10.8	10.9	11.6
Total Stops	1021	1068	982	935	932	964	1017
Fuel Used (gal)	40.6	41.8	39.4	38.8	39.0	40.0	41.0

Summary of All Intervals

Run Number	8	9	10	Avg
Start Time	7:00	7:00	7:00	7:00
End Time	8:15	8:15	8:15	8:15
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	1754	1720	1674	1722
Vehs Exited	1743	1722	1683	1728
Starting Vehs	30	43	44	38
Ending Vehs	41	41	35	32
Travel Distance (mi)	1132	1120	1076	1118
Travel Time (hr)	36.7	35.1	34.2	36.0
Total Delay (hr)	11.3	10.3	10.1	11.0
Total Stops	1004	952	940	980
Fuel Used (gal)	40.3	39.5	38.5	39.9

Interval #0 Information Seeding

Start Time	7:00
End Time	7:15
Total Time (min)	15
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	7:15
End Time	8:15
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	1746	1776	1691	1700	1680	1735	1751
Vehs Exited	1755	1780	1712	1691	1683	1753	1748
Starting Vehs	40	33	52	30	40	44	29
Ending Vehs	31	29	31	39	37	26	32
Travel Distance (mi)	1131	1154	1106	1092	1096	1134	1141
Travel Time (hr)	36.9	38.3	35.6	34.9	35.2	36.2	36.9
Total Delay (hr)	11.5	12.5	11.0	10.5	10.8	10.9	11.6
Total Stops	1021	1068	982	935	932	964	1017
Fuel Used (gal)	40.6	41.8	39.4	38.8	39.0	40.0	41.0

Interval #1 Information Recording

Start Time	7:15
End Time	8:15
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	1754	1720	1674	1722
Vehs Exited	1743	1722	1683	1728
Starting Vehs	30	43	44	38
Ending Vehs	41	41	35	32
Travel Distance (mi)	1132	1120	1076	1118
Travel Time (hr)	36.7	35.1	34.2	36.0
Total Delay (hr)	11.3	10.3	10.1	11.0
Total Stops	1004	952	940	980
Fuel Used (gal)	40.3	39.5	38.5	39.9

Intersection: 1: Cleveland Hwy (SR 11) & Jim Hood Rd/Nopone Rd

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	
Directions Served	L	T	R	L	TR	UL	T	T	UL	T	T	
Maximum Queue (ft)	67	72	80	82	157	162	119	88	59	212	207	
Average Queue (ft)	26	26	7	33	62	74	44	28	18	120	109	
95th Queue (ft)	58	59	42	68	123	132	91	65	44	188	181	
Link Distance (ft)	1240				1646		1069		1069		2666	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	215		195		215		360		355			
Storage Blk Time (%)					0				0			
Queuing Penalty (veh)					0				0			

Summary of All Intervals

Run Number	1	2	3	4	5	6	7
Start Time	4:30	4:30	4:30	4:30	4:30	4:30	4:30
End Time	5:45	5:45	5:45	5:45	5:45	5:45	5:45
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	1814	1814	1792	1728	1762	1805	1864
Vehs Exited	1819	1826	1807	1739	1754	1810	1856
Starting Vehs	33	35	39	45	46	41	30
Ending Vehs	28	23	24	34	54	36	38
Travel Distance (mi)	1194	1192	1186	1137	1157	1186	1217
Travel Time (hr)	37.3	38.3	37.8	35.4	36.2	36.7	38.2
Total Delay (hr)	10.4	11.3	11.0	9.7	10.1	9.9	10.7
Total Stops	931	999	988	866	918	899	966
Fuel Used (gal)	41.9	42.6	41.6	39.5	40.7	41.5	42.6

Summary of All Intervals

Run Number	8	9	10	Avg
Start Time	4:30	4:30	4:30	4:30
End Time	5:45	5:45	5:45	5:45
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	1785	1771	1873	1801
Vehs Exited	1789	1754	1879	1803
Starting Vehs	34	24	40	37
Ending Vehs	30	41	34	34
Travel Distance (mi)	1175	1165	1228	1184
Travel Time (hr)	37.0	36.6	39.1	37.3
Total Delay (hr)	10.5	10.4	11.3	10.5
Total Stops	918	902	987	936
Fuel Used (gal)	41.0	40.3	43.0	41.5

Interval #0 Information Seeding

Start Time	4:30
End Time	4:45
Total Time (min)	15
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	4:45
End Time	5:45
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	1814	1814	1792	1728	1762	1805	1864
Vehs Exited	1819	1826	1807	1739	1754	1810	1856
Starting Vehs	33	35	39	45	46	41	30
Ending Vehs	28	23	24	34	54	36	38
Travel Distance (mi)	1194	1192	1186	1137	1157	1186	1217
Travel Time (hr)	37.3	38.3	37.8	35.4	36.2	36.7	38.2
Total Delay (hr)	10.4	11.3	11.0	9.7	10.1	9.9	10.7
Total Stops	931	999	988	866	918	899	966
Fuel Used (gal)	41.9	42.6	41.6	39.5	40.7	41.5	42.6

Interval #1 Information Recording

Start Time	4:45
End Time	5:45
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	1785	1771	1873	1801
Vehs Exited	1789	1754	1879	1803
Starting Vehs	34	24	40	37
Ending Vehs	30	41	34	34
Travel Distance (mi)	1175	1165	1228	1184
Travel Time (hr)	37.0	36.6	39.1	37.3
Total Delay (hr)	10.5	10.4	11.3	10.5
Total Stops	918	902	987	936
Fuel Used (gal)	41.0	40.3	43.0	41.5

Intersection: 1: Cleveland Hwy (SR 11) & Jim Hood Rd/Nopone Rd

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	TR	UL	T	T	UL	T	T
Maximum Queue (ft)	79	100	6	78	111	122	187	157	81	141	127
Average Queue (ft)	31	41	0	29	47	54	100	78	30	68	53
95th Queue (ft)	65	83	5	64	94	102	165	142	64	120	105
Link Distance (ft)	1240			1646			1069	1069		2666	2666
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	215		195		215		360		355		
Storage Blk Time (%)											
Queuing Penalty (veh)											

Summary of All Intervals

Run Number	1	2	3	4	5	6	7
Start Time	7:00	7:00	7:00	7:00	7:00	7:00	7:00
End Time	8:15	8:15	8:15	8:15	8:15	8:15	8:15
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	1911	1985	1927	1893	1939	1922	1980
Vehs Exited	1914	1972	1909	1893	1946	1917	1986
Starting Vehs	36	35	37	36	42	37	32
Ending Vehs	33	48	55	36	35	42	26
Travel Distance (mi)	1134	1164	1135	1114	1160	1132	1170
Travel Time (hr)	36.8	39.4	37.8	37.5	38.0	38.3	38.1
Total Delay (hr)	11.0	12.9	11.9	11.9	11.7	12.5	11.5
Total Stops	1110	1214	1171	1171	1157	1176	1115
Fuel Used (gal)	41.5	43.3	41.8	41.3	42.4	42.0	42.7

Summary of All Intervals

Run Number	8	9	10	Avg
Start Time	7:00	7:00	7:00	7:00
End Time	8:15	8:15	8:15	8:15
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	1975	1972	1949	1945
Vehs Exited	1975	1965	1943	1942
Starting Vehs	36	34	31	34
Ending Vehs	36	41	37	37
Travel Distance (mi)	1171	1158	1159	1150
Travel Time (hr)	38.5	38.7	38.6	38.2
Total Delay (hr)	11.7	12.4	12.4	12.0
Total Stops	1193	1201	1142	1165
Fuel Used (gal)	42.7	42.8	42.9	42.3

Interval #0 Information Seeding

Start Time	7:00
End Time	7:15
Total Time (min)	15
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	7:15
End Time	8:15
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	1911	1985	1927	1893	1939	1922	1980
Vehs Exited	1914	1972	1909	1893	1946	1917	1986
Starting Vehs	36	35	37	36	42	37	32
Ending Vehs	33	48	55	36	35	42	26
Travel Distance (mi)	1134	1164	1135	1114	1160	1132	1170
Travel Time (hr)	36.8	39.4	37.8	37.5	38.0	38.3	38.1
Total Delay (hr)	11.0	12.9	11.9	11.9	11.7	12.5	11.5
Total Stops	1110	1214	1171	1171	1157	1176	1115
Fuel Used (gal)	41.5	43.3	41.8	41.3	42.4	42.0	42.7

Interval #1 Information Recording

Start Time	7:15
End Time	8:15
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	1975	1972	1949	1945
Vehs Exited	1975	1965	1943	1942
Starting Vehs	36	34	31	34
Ending Vehs	36	41	37	37
Travel Distance (mi)	1171	1158	1159	1150
Travel Time (hr)	38.5	38.7	38.6	38.2
Total Delay (hr)	11.7	12.4	12.4	12.0
Total Stops	1193	1201	1142	1165
Fuel Used (gal)	42.7	42.8	42.9	42.3

Intersection: 1: Cleveland Hwy (SR 11) & Jim Hood Rd/Nopone Rd

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	TR	UL	T	T	UL	T	T
Maximum Queue (ft)	74	76	39	87	144	191	144	112	47	236	244
Average Queue (ft)	29	27	3	38	61	85	61	27	19	130	119
95th Queue (ft)	62	60	30	76	116	150	114	78	42	207	200
Link Distance (ft)		279			1655		422	422		2665	2665
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	215		195	215		360			355		
Storage Blk Time (%)	0										
Queuing Penalty (veh)	0										

Intersection: 2: Driveway A & Jim Hood Rd

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	33	48
Average Queue (ft)	8	18
95th Queue (ft)	31	39
Link Distance (ft)		329
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	235	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Cleveland Hwy (SR 11) & Driveway B

Movement	EB
Directions Served	R
Maximum Queue (ft)	57
Average Queue (ft)	24
95th Queue (ft)	47
Link Distance (ft)	304
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 0

Summary of All Intervals

Run Number	1	2	3	4	5	6	7
Start Time	4:30	4:30	4:30	4:30	4:30	4:30	4:30
End Time	5:45	5:45	5:45	5:45	5:45	5:45	5:45
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	2062	2176	2105	2062	2049	2191	2124
Vehs Exited	2067	2161	2105	2058	2059	2184	2127
Starting Vehs	45	27	53	36	40	44	37
Ending Vehs	40	42	53	40	30	51	34
Travel Distance (mi)	1204	1288	1246	1213	1224	1284	1264
Travel Time (hr)	39.0	41.3	41.0	39.9	39.9	41.6	41.5
Total Delay (hr)	11.2	11.6	12.2	11.9	11.6	11.9	12.3
Total Stops	1194	1233	1239	1236	1196	1263	1248
Fuel Used (gal)	42.8	45.5	44.5	43.0	42.9	46.2	44.9

Summary of All Intervals

Run Number	8	9	10	Avg
Start Time	4:30	4:30	4:30	4:30
End Time	5:45	5:45	5:45	5:45
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	2088	2105	2209	2118
Vehs Exited	2077	2101	2199	2114
Starting Vehs	34	35	32	35
Ending Vehs	45	39	42	41
Travel Distance (mi)	1217	1242	1309	1249
Travel Time (hr)	39.6	41.0	43.0	40.8
Total Delay (hr)	11.6	12.2	12.7	11.9
Total Stops	1252	1269	1264	1240
Fuel Used (gal)	44.0	44.8	46.5	44.5

Interval #0 Information Seeding

Start Time	4:30
End Time	4:45
Total Time (min)	15
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	4:45
End Time	5:45
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	2062	2176	2105	2062	2049	2191	2124
Vehs Exited	2067	2161	2105	2058	2059	2184	2127
Starting Vehs	45	27	53	36	40	44	37
Ending Vehs	40	42	53	40	30	51	34
Travel Distance (mi)	1204	1288	1246	1213	1224	1284	1264
Travel Time (hr)	39.0	41.3	41.0	39.9	39.9	41.6	41.5
Total Delay (hr)	11.2	11.6	12.2	11.9	11.6	11.9	12.3
Total Stops	1194	1233	1239	1236	1196	1263	1248
Fuel Used (gal)	42.8	45.5	44.5	43.0	42.9	46.2	44.9

Interval #1 Information Recording

Start Time	4:45
End Time	5:45
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	2088	2105	2209	2118
Vehs Exited	2077	2101	2199	2114
Starting Vehs	34	35	32	35
Ending Vehs	45	39	42	41
Travel Distance (mi)	1217	1242	1309	1249
Travel Time (hr)	39.6	41.0	43.0	40.8
Total Delay (hr)	11.6	12.2	12.7	11.9
Total Stops	1252	1269	1264	1240
Fuel Used (gal)	44.0	44.8	46.5	44.5

Intersection: 1: Cleveland Hwy (SR 11) & Jim Hood Rd/Nopone Rd

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	TR	UL	T	T	UL	T	T
Maximum Queue (ft)	91	103	21	81	102	155	203	178	80	140	136
Average Queue (ft)	34	48	1	33	46	69	116	86	31	64	59
95th Queue (ft)	70	92	14	69	87	123	185	154	65	112	108
Link Distance (ft)		279			1655		422	422		2665	2665
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	215		195	215		360			355		
Storage Blk Time (%)											
Queuing Penalty (veh)											

Intersection: 2: Driveway A & Jim Hood Rd

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	53	58
Average Queue (ft)	11	25
95th Queue (ft)	39	46
Link Distance (ft)		329
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	235	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Cleveland Hwy (SR 11) & Driveway B

Movement	EB
Directions Served	R
Maximum Queue (ft)	67
Average Queue (ft)	30
95th Queue (ft)	52
Link Distance (ft)	304
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 0

Appendix H: ITE Trip Generation Sheets

Land Use: 850 Supermarket

Description

A supermarket is a free-standing retail store that sells a complete assortment of food, beverage, food preparation materials, and household products. A supermarket may also provide additional products and services such as a bakery, dry cleaning, floral arrangements, greeting cards, a limited-service bank, and a pharmacy.

Additional Data

In prior editions of *Trip Generation Manual*, a separate land use code was assigned to a discount supermarket. With the addition of new supermarket data points, an examination of the database reveals very little difference between trip generation rates for the traditional supermarket and a reported discount supermarket. This examination looked at both the small discount supermarkets and the large discount supermarkets. As a result, all types of supermarkets are included in this land use database.

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (<https://www.ite.org/technical-resources/topics/trip-and-parking-generation/>).

The sites were surveyed in the 1980s, the 1990s, the 2000s, the 2010s, and the 2020s in Alberta (CAN), California, Colorado, Connecticut, District of Columbia, Florida, Georgia, Illinois, Kentucky, Maryland, Minnesota, Nevada, New Jersey, New York, Ontario (CAN), Oregon, Pennsylvania, South Dakota, Texas, Vermont, Virginia, Washington, and Wisconsin.

Source Numbers

213, 221, 236, 251, 273, 305, 359, 365, 438, 440, 442, 447, 448, 514, 520, 537, 552, 577, 610, 715, 716, 728, 738, 746, 854, 870, 882, 893, 917, 926, 935, 946, 959, 961, 966, 975, 1004, 1009, 1025, 1058, 1063, 1064

Supermarket (850)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

Setting/Location: General Urban/Suburban

Number of Studies: 22

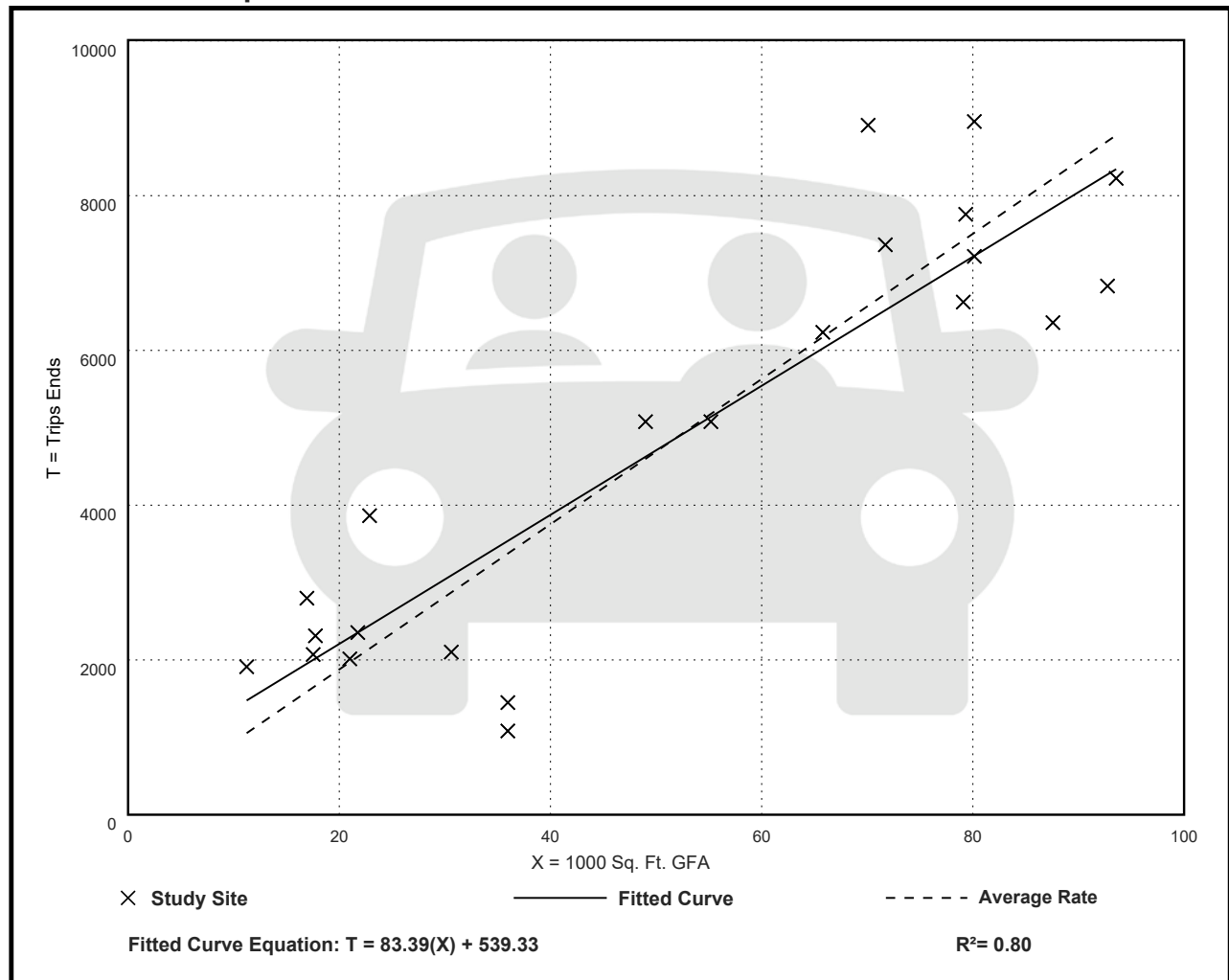
Avg. 1000 Sq. Ft. GFA: 52

Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
93.84	30.09 - 170.24	27.05

Data Plot and Equation



Supermarket (850)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Weekday,

Peak Hour of Adjacent Street Traffic,

One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

Number of Studies: 34

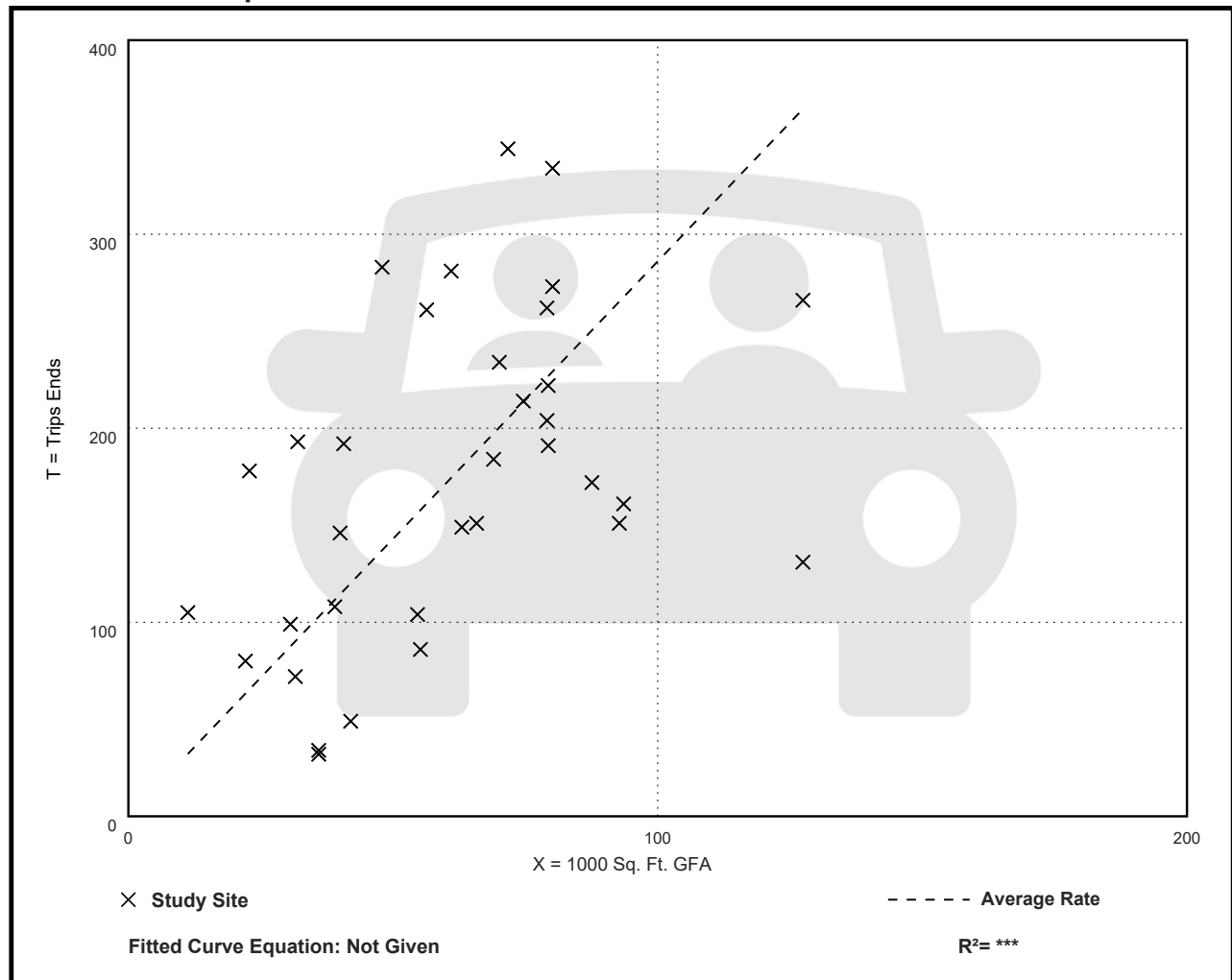
Avg. 1000 Sq. Ft. GFA: 61

Directional Distribution: 59% entering, 41% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
2.86	0.89 - 9.35	1.45

Data Plot and Equation



Supermarket (850)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Weekday,

Peak Hour of Adjacent Street Traffic,

One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 104

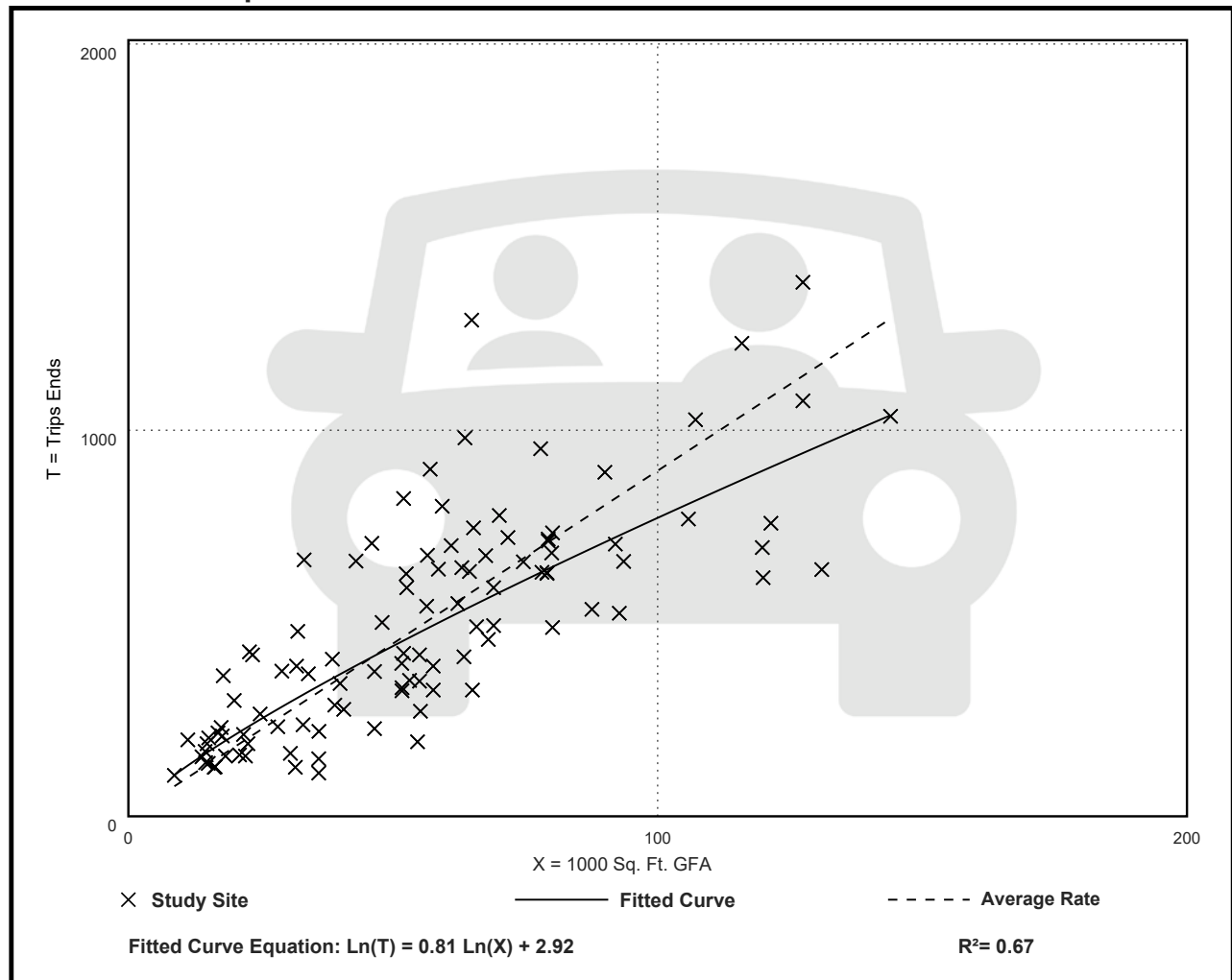
Avg. 1000 Sq. Ft. GFA: 55

Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
8.95	3.11 - 20.30	3.32

Data Plot and Equation



Land Use: 932

High-Turnover (Sit-Down) Restaurant

Description

This land use consists of sit-down, full-service eating establishments with a typical duration of stay of 60 minutes or less. This type of restaurant is usually moderately priced, frequently belongs to a restaurant chain, and is commonly referred to as casual dining. Generally, these restaurants serve lunch and dinner; they may also be open for breakfast and are sometimes open 24 hours a day. These restaurants typically do not accept reservations. A patron commonly waits to be seated, is served by wait staff, orders from a menu, and pays after the meal.

Some facilities offer carry-out for a small proportion of its customers. Some facilities within this land use may also contain a bar area for serving food and alcoholic drinks.

Fast casual restaurant (Land Use 930), fine dining restaurant (Land Use 931), fast-food restaurant without drive-through window (Land Use 933), and fast-food restaurant with drive-through window (Land Use 934) are related uses.

Additional Data

Users should exercise caution when applying statistics during the AM peak periods, as the sites contained in the database for this land use may or may not be open for breakfast. In cases where it was confirmed that the sites were not open for breakfast, data for the AM peak hour of the adjacent street traffic were removed from the database.

If the restaurant has outdoor seating, its area is not included in the overall gross floor area. For a restaurant that has significant outdoor seating, the number of seats may be more reliable than GFA as an independent variable on which to establish a trip generation rate.

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (<https://www.ite.org/technical-resources/topics/trip-and-parking-generation/>).

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Alberta (CAN), California, Florida, Georgia, Indiana, Kentucky, Massachusetts, Minnesota, New Hampshire, New Jersey, New York, Ohio, Oklahoma, Oregon, Pennsylvania, South Carolina, South Dakota, Texas, Vermont, and Wisconsin.

Source Numbers

126, 269, 275, 280, 300, 301, 305, 338, 340, 341, 358, 384, 424, 432, 437, 438, 444, 507, 555, 577, 589, 617, 618, 728, 868, 884, 885, 903, 927, 939, 944, 961, 962, 977, 1048

High-Turnover (Sit-Down) Restaurant (932)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

Setting/Location: General Urban/Suburban

Number of Studies: 50

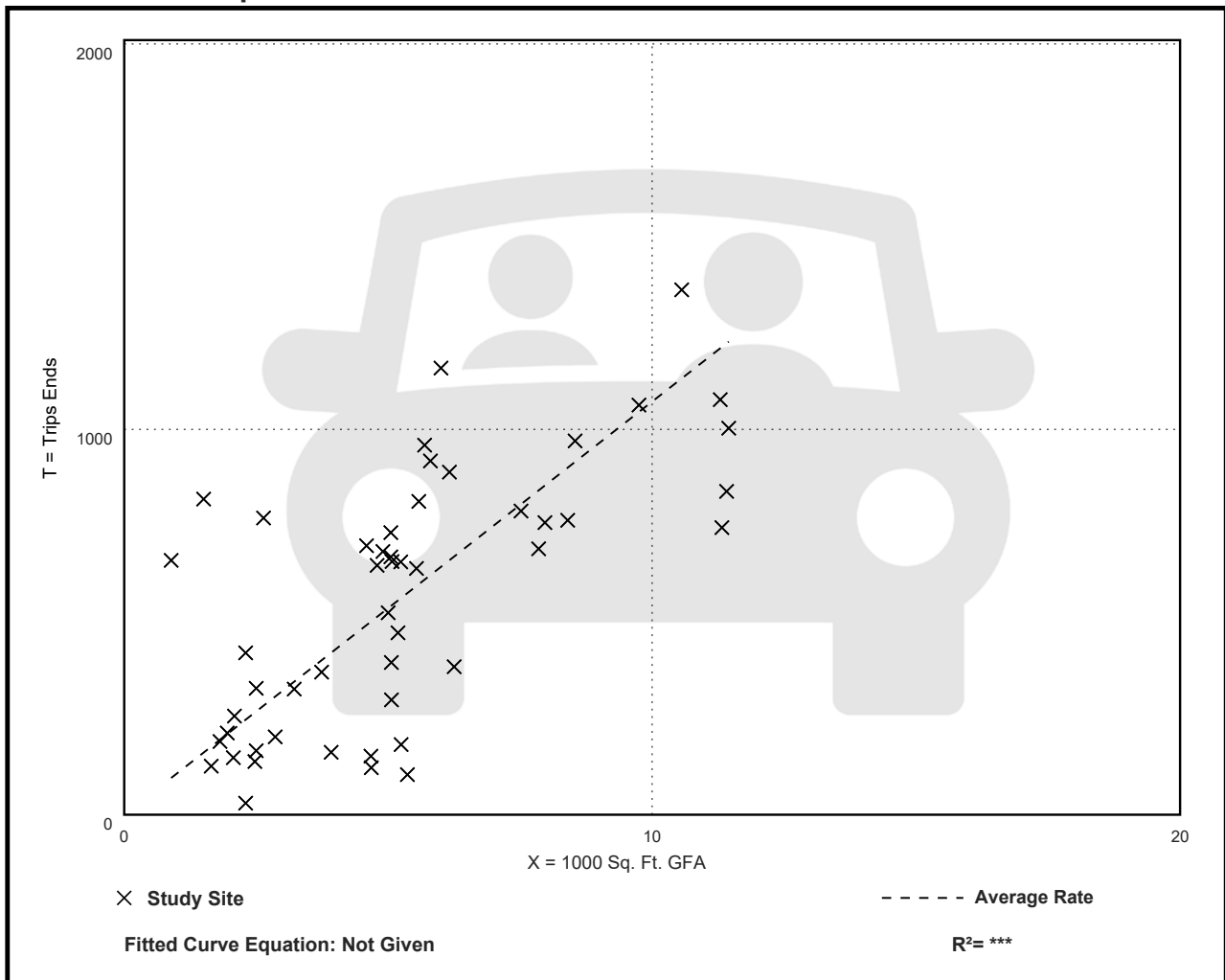
Avg. 1000 Sq. Ft. GFA: 5

Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
107.20	13.04 - 742.41	66.72

Data Plot and Equation



High-Turnover (Sit-Down) Restaurant (932)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Weekday,

Peak Hour of Adjacent Street Traffic,

One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

Number of Studies: 37

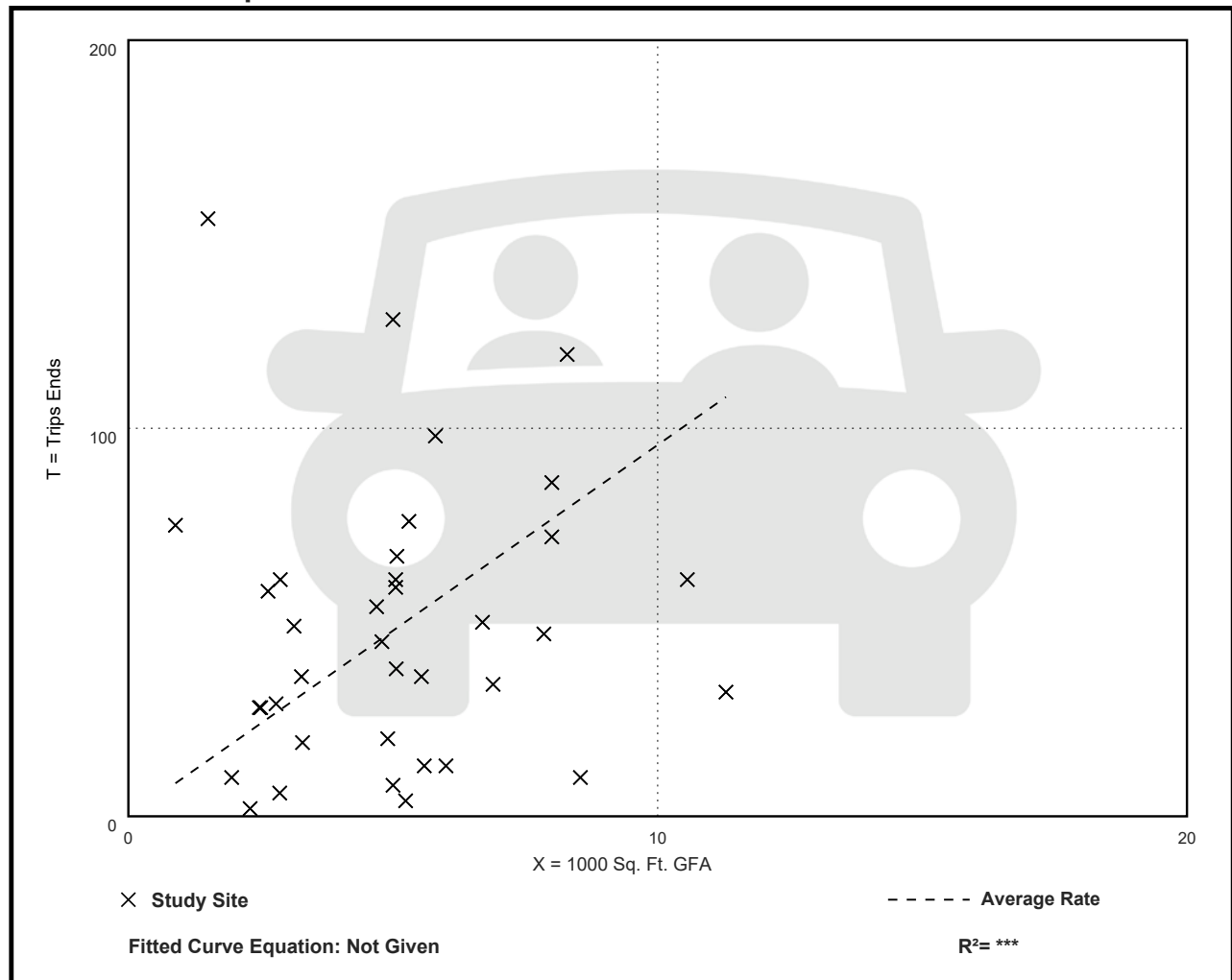
Avg. 1000 Sq. Ft. GFA: 5

Directional Distribution: 55% entering, 45% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
9.57	0.76 - 102.39	11.61

Data Plot and Equation



High-Turnover (Sit-Down) Restaurant (932)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Weekday,

Peak Hour of Adjacent Street Traffic,

One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 104

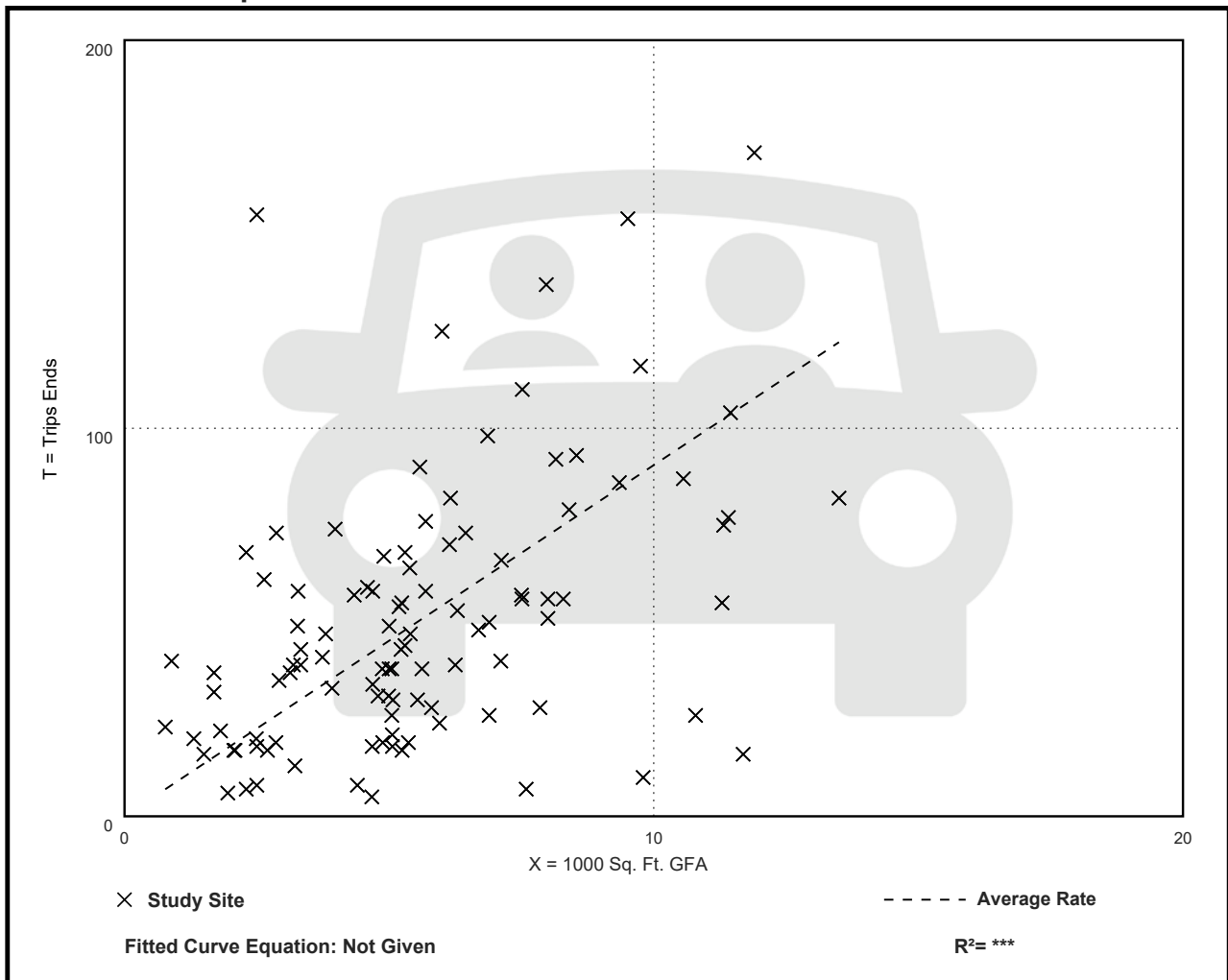
Avg. 1000 Sq. Ft. GFA: 6

Directional Distribution: 61% entering, 39% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
9.05	0.92 - 62.00	6.18

Data Plot and Equation



Land Use: 945

Convenience Store/Gas Station

Description

A convenience store/gas station is a facility with a co-located convenience store and gas station. The convenience store sells grocery and other everyday items that a person may need or want as a matter of convenience. The gas station sells automotive fuels such as gasoline and diesel.

A convenience store/gas station is typically located along a major thoroughfare to optimize motorist convenience. Extended hours of operation (with many open 24 hours, 7 days a week) are common at these facilities.

The convenience store product mix typically includes pre-packaged grocery items, beverages, dairy products, snack foods, confectionary, tobacco products, over-the-counter drugs, and toiletries. A convenience store may sell alcohol, often limited to beer and wine. Coffee and pre-made sandwiches are also commonly sold at a convenience store. Made-to-order food orders are sometimes offered. Some stores offer limited seating.

The sites in this land use include both self-pump and attendant-pumped fueling positions and both pre-pay and post-pay operations.

Convenience store (Land Use 851), gasoline/service station (Land Use 944), and truck stop (Land Use 950) are related uses.

Land Use Subcategory

Multiple subcategories were added to this land use to allow for multi-variable evaluation of sites with single-variable data plots. All study sites are assigned to one of three subcategories, based on the number of vehicle fueling positions (VFP) at the site: between 2 and 8 VFP, between 9 and 15 VFP, and between 16 and 24 VFP. For each VFP range subcategory, data plots are presented with GFA as the independent variable for all time periods and trip types for which data are available. The use of both GFA and VFP (as the independent variable and land use subcategory, respectively) provides a significant improvement in the reliability of a trip generation estimate when compared to the single-variable data plots in prior editions of *Trip Generation Manual*.

Further, the study sites were also assigned to one of three other subcategories, based on the gross floor area (GFA) of the convenience store at the site: between 2,000 and 4,000 square feet, between 4,000 and 5,500 square feet, and between 5,500 and 10,000 square feet. For each GFA subcategory range, data plots are presented with VFP as the independent variable for all time periods and trip types for which data are available. The use of both VFP and GFA (as the independent variable and land use subcategory, respectively) provides a significant improvement in the reliability of a trip generation estimate when compared to the single-variable data plots in prior editions of *Trip Generation Manual*.

When analyzing the convenience store/gas station land use with each combination of GFA and VFP values as described above, the two sets of data plots will produce two estimates of site-generated trips. Both values can be considered when determining a site trip generation estimate.

Data plots are also provided for three additional independent variables: AM peak hour traffic on adjacent street, PM peak hour traffic on adjacent street, and employees. These independent variables are intended to be analyzed as single independent variables and do not have sub-categories associated with them. Within the data plots and within the ITETripGen web app, these plots are found under the land use subcategory “none.”

Additional Data

ITE recognizes there are existing convenience store/gas station sites throughout North America that are larger than the sites presented in the data plots. However, the ITE database does not include any site with more than 24 VFP or any site with gross floor area greater than 10,000 square feet. Submission of trip generation data for larger sites is encouraged.

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (<https://www.ite.org/technical-resources/topics/trip-and-parking-generation/>).

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Alberta (CAN), Arkansas, California, Connecticut, Delaware, Florida, Indiana, Iowa, Kentucky, Maryland, Massachusetts, Minnesota, Nevada, New Hampshire, New Jersey, Pennsylvania, Rhode Island, South Dakota, Texas, Utah, Vermont, Washington, and Wisconsin.

Source Numbers

221, 245, 274, 288, 300, 340, 350, 351, 352, 355, 359, 385, 440, 617, 718, 810, 813, 844, 850, 853, 864, 865, 867, 869, 882, 883, 888, 904, 926, 927, 936, 938, 954, 960, 962, 977, 1004, 1024, 1025, 1027, 1052

Convenience Store/Gas Station - GFA (2-4k) (945)

Vehicle Trip Ends vs: Vehicle Fueling Positions
On a: Weekday

Setting/Location: General Urban/Suburban

Number of Studies: 48

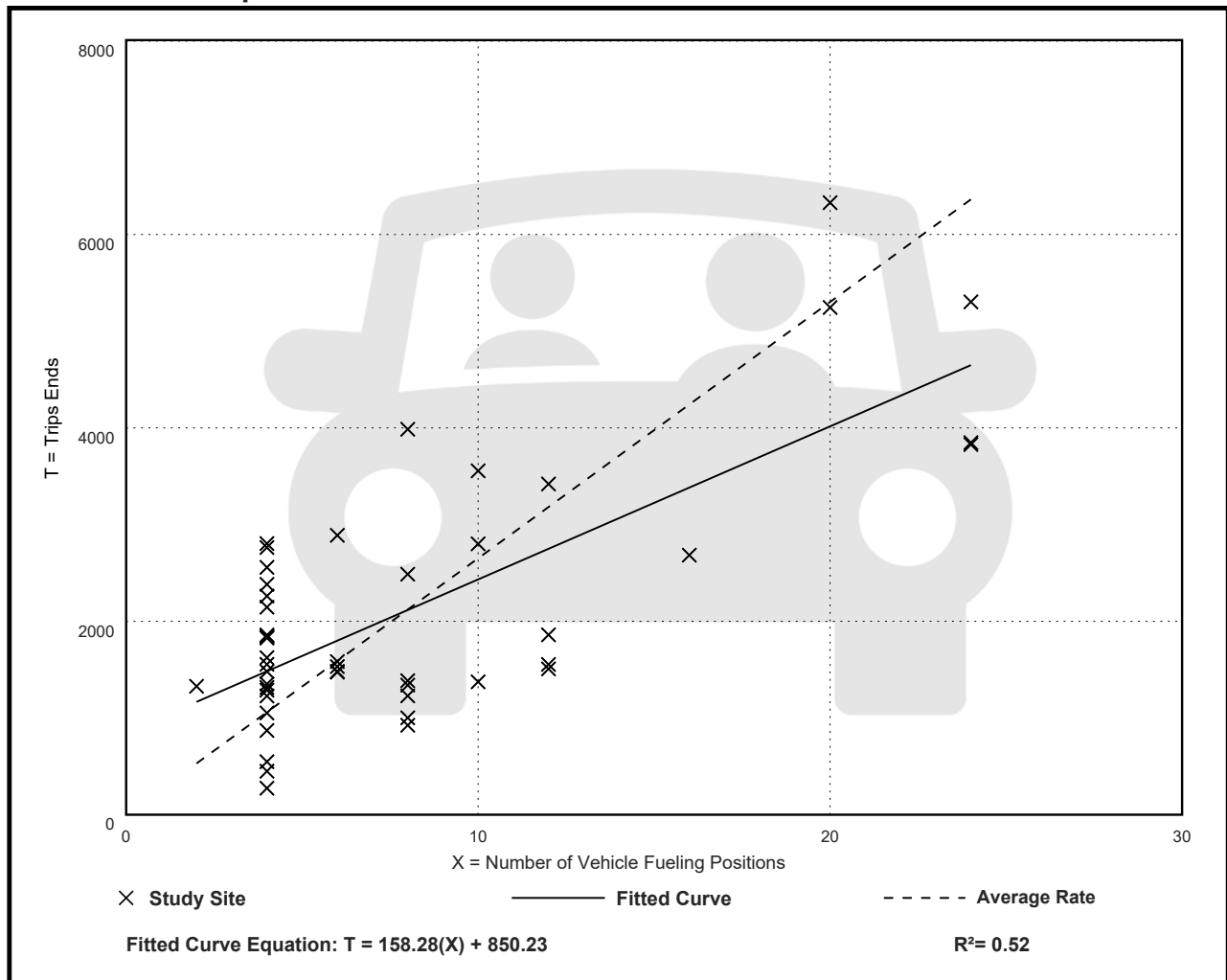
Avg. Num. of Vehicle Fueling Positions: 8

Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Vehicle Fueling Position

Average Rate	Range of Rates	Standard Deviation
265.12	68.50 - 701.00	142.37

Data Plot and Equation



Convenience Store/Gas Station - GFA (2-4k) (945)

Vehicle Trip Ends vs: Vehicle Fueling Positions

On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

Number of Studies: 76

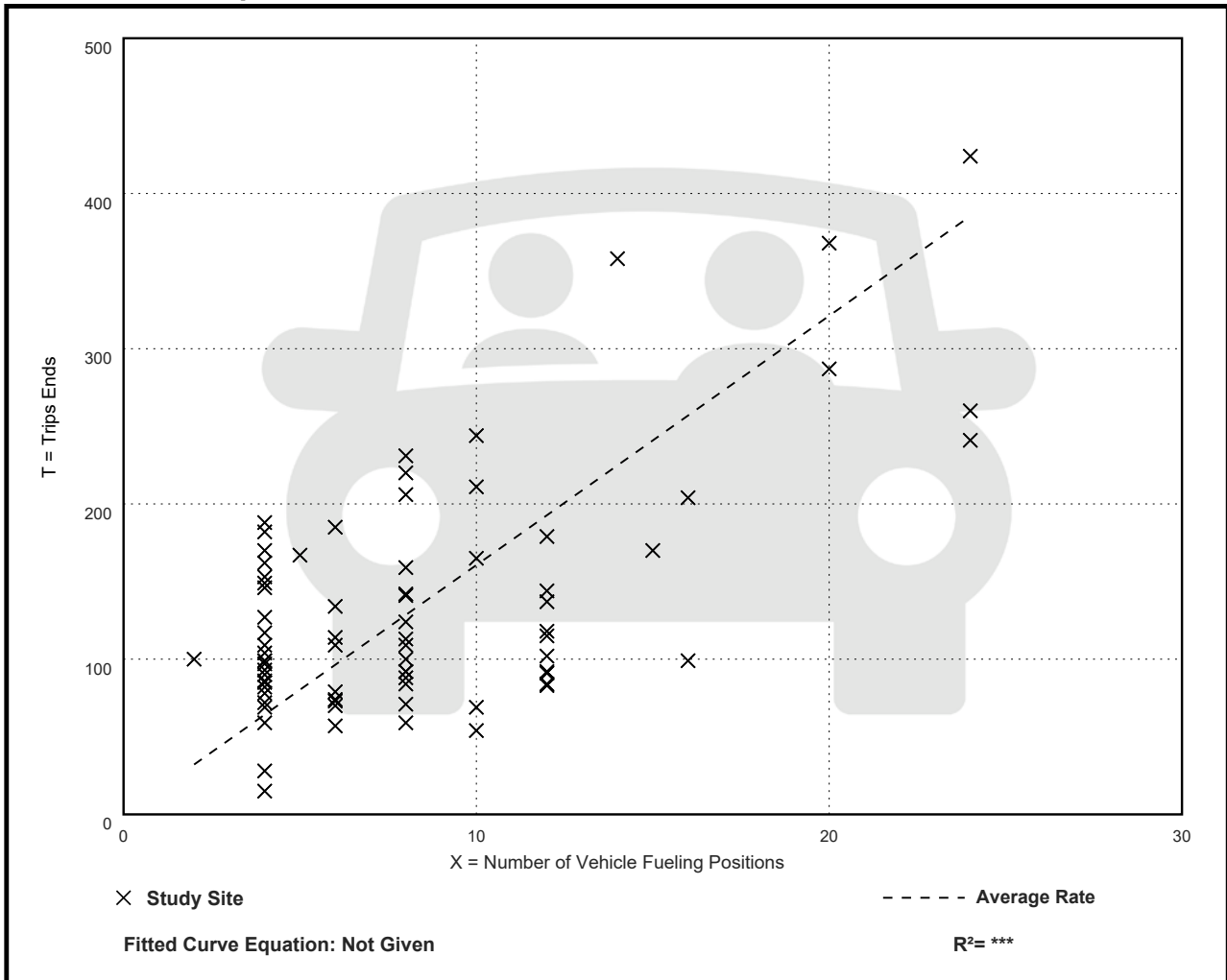
Avg. Num. of Vehicle Fueling Positions: 8

Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Vehicle Fueling Position

Average Rate	Range of Rates	Standard Deviation
16.06	3.75 - 50.00	8.79

Data Plot and Equation



Convenience Store/Gas Station - GFA (2-4k) (945)

Vehicle Trip Ends vs: Vehicle Fueling Positions

On a: Weekday,

Peak Hour of Adjacent Street Traffic,

One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 93

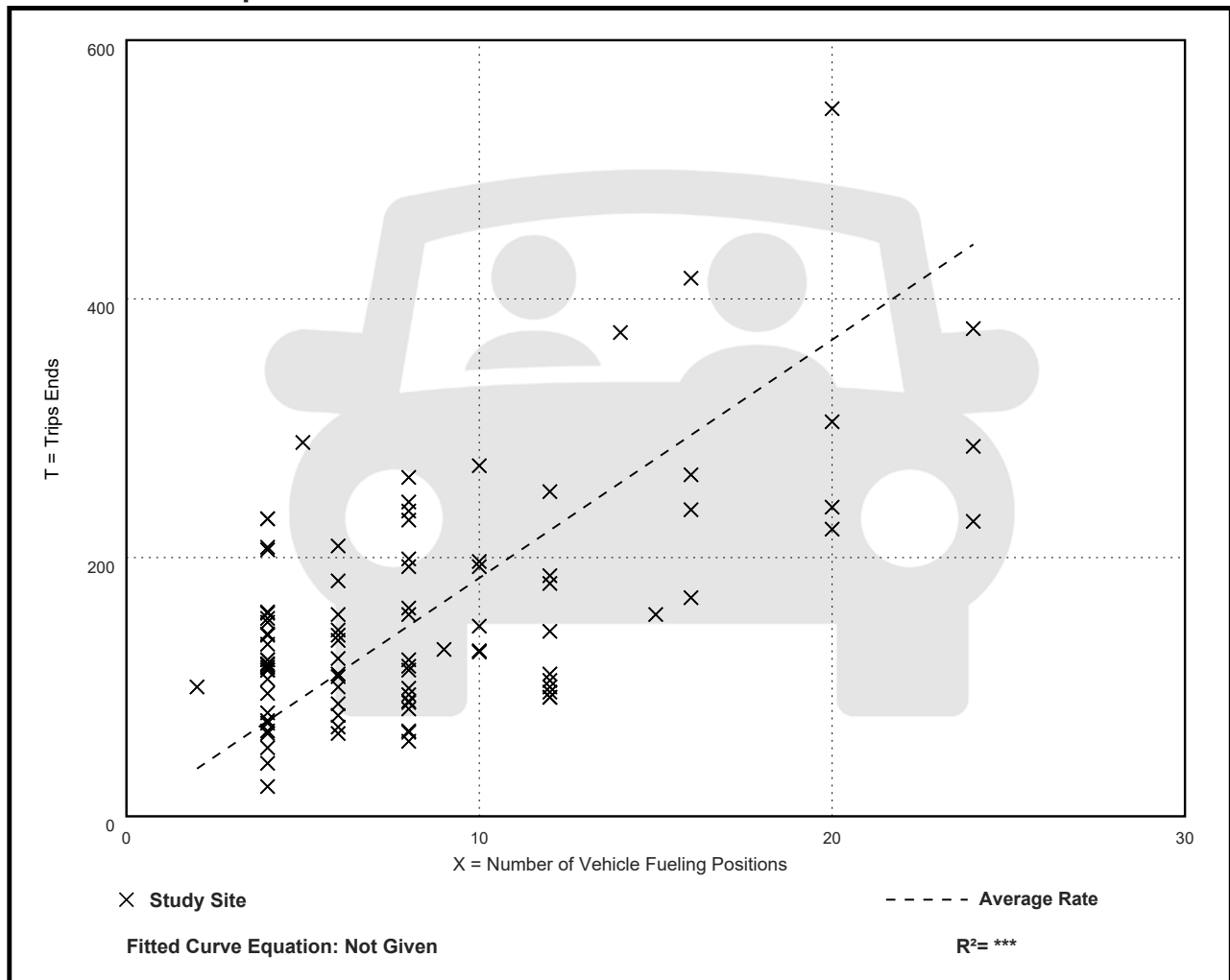
Avg. Num. of Vehicle Fueling Positions: 8

Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Vehicle Fueling Position

Average Rate	Range of Rates	Standard Deviation
18.42	5.75 - 57.80	10.16

Data Plot and Equation



Appendix I: Turn Lane Warrant Standards

4.9 Auxiliary Turn Lanes

4.9.1 When Deceleration Lanes Are Required

The provisions of this section should generally apply to auxiliary lanes installed on the approach to an intersection that provide for deceleration and storage of vehicles waiting to turn right or left. Such lanes are always beneficial and will be required in conjunction with commercial driveway permits when projected traffic volumes exceed minimum levels as provided in the sections below.

All existing utilities which would be under new pavement or in auxiliary/deceleration lanes should be relocated before final grading and paving, and at no cost to DOT. Existing utilities which are found to be not in conflict with construction may be allowed if a Retention Request is processed by the utility owner and approved by the Department.

4.9.1.1 Minimum Requirements for Right Turn Deceleration Lanes

Right turn deceleration lanes must be constructed at no cost to the Department if the daily site generated Right Turn Volumes (RTV) based on ITE Trip Generation (assuming a reasonable distribution of entry volumes) meet or exceed the values shown in Table 4-6. Passing lane sections fall under the criteria for two or more lanes.

Posted Speed	2 Lane Routes		More than 2 Lanes on Main Road	
	AADT		AADT	
	< 6,000	>=6,000	<10,000	>=10,000
35 MPH or Less	200 RTV a day	100 RTV a day	200 RTV a day	100 RTV a day
40 to 50 MPH	150 RTV a day	75 RTV a day	150 RTV a day	75 RTV a day
55 to 60 MPH	100 RTV a day	50 RTV a day	100 RTV a day	50 RTV a day
>= 65 MPH	Always	Always	Always	Always

Table 4-6 Minimum Volumes Requiring Right Turn Lanes

In the event the District Traffic Engineer determines that field conditions or other factors indicate that it would be in the best interest of the Department, use the form in **Appendix F** to document a waiver for the deceleration lane requirement, the District Traffic Engineer must document the recommendations using the form in **Appendix F**. The recommendations shall be approved by the District Engineer and be attached to the Permit. The District Traffic Engineer may also require the addition of a Right Turn lane, even when the conditions in Table 4-6 are not met, if roadway geometry or field conditions indicate that the safety of the traveling public would be improved. The recommendation must be documented and approved by the District Traffic Engineer for inclusion with the Permit.

The R/W for auxiliary/deceleration lanes may be dedicated in fee simple to the Department for the Department to maintain or the applicant must sign an agreement with the Department to maintain the lane to the Department’s standards and to hold harmless the Department in the event that section of roadway is identified in any liability action. A Limited Warranty Deed is not acceptable when R/W is donated to the Department. See section 2.5 for details regarding RW dedication procedures.

The pavement specifications for auxiliary/deceleration lanes must be Georgia DOT Standard Specifications for Construction of Roads and Bridges, or be as described and approved by the Chief Engineer in cases where a lesser design may be acceptable, or where a proposed project is expected to tie in.

4.9.1.2 Minimum Requirements for Left Turn Lanes

Left turn lanes must be constructed at no cost to the Department if the daily site generated Left Turn Volumes (LTV) based on ITE Trip Generation (assuming a reasonable distribution of entry volumes) meet or exceed the values shown in Table 4-7a **Condition 1**. If the LTVs are below the requirements for **Condition 1**, the applicant may be required to construct a Right Hand Passing Lane (see **Figure 4-7** if they meet the criteria in Table 4-7b **Condition 2**). The District Traffic Engineer will use engineering judgment to determine if the field conditions would allow construction of the Right Hand Passing Lane. Passing lane sections fall under the criteria for two or more lanes.

Condition 1

LEFT TURN REQUIREMENTS-FULL CONSTRUCTION				
Posted Speed	2 Lane Routes		More than 2 Lanes on Main Road	
	ADT		ADT	
	<6,000	>=6,000	<10,000	>=10,000
35 MPH or Less	300 LTV a day	200 LTV a day	400 LTV a day	300 LTV a day
40 to 50 MPH	250 LTV a day	175 LTV a day	325 LTV a day	250 LTV a day
>= 55 MPH	200 LTV a day	150 LTV a day	250 LTV a day	200 LTV a day

Table 4-7a Minimum Volumes Requiring Left Turn Lanes

Condition 2

LEFT TURN REQUIREMENTS w/Right Hand Passing Lane Option		
Posted Speed	2 Lane Routes only	
	ADT	
	<4,000	>=4,000
35 MPH or Less	200 LTV a day	125 LTV a day
40 to 45 MPH	100 LTV a day	75 LTV a day
50 to 55 MPH	75 LTV a day	50 LTV a day

Table 4-7b Minimum Volumes Requiring Right Hand Passing Lanes

SPEED (MPH)	FULL WIDTH STORAGE, FT.	TAPER, FT.
25	50	50
30	75	50
35	100	50
40	150	50
45	175	100
50	225	100
55	250	100
60	300	100
65	350	100

Table 4-8 Minimum Right Turn Deceleration Lengths

When traffic studies are conducted, the length of full-width lane needed for storage should be determined. If the length of full-width storage is greater than the length of full-width storage shown in Table 4-8, the longer length should be provided.

At signalized intersections, the amount of storage for both right and left turns can be based on the number of vehicles arriving during 1.5 signal cycles.

For unsignalized intersections, left turn storage should accommodate vehicles arriving during a two-minute period. Minimal storage is required for right turn lanes utilizing yield control at unsignalized intersections.

4.9.3 Acceleration Lanes

Acceleration lanes are generally not provided on low speed highways. Acceleration lanes may be required at locations where grade, sight distance or traffic is such that the Department determines they are needed. When operating speeds on the highway are 55 MPH and above, full-width acceleration lanes designed to meet the AASHTO minimum length should be considered.

4.9.4 Left Turn Lane Design

The design of left turn lanes should consider the intended function and the characteristics of the highway. In many cases, it is necessary to widen the existing roadway to introduce the left turn lane. In most cases vehicles approaching the turn lane are shifted to the right (especially when using symmetrical widening). The left turning traffic is then shifted back into the lane. Through traffic is returned to its original lane beyond the intersection. When the highway has a median that is at least 20 feet wide, the left turn lane can typically be developed out of the median, avoiding the need for transitions.

The basic design elements of left turn lanes are illustrated in Table 4-9. This example shows symmetrical widening, which basically requires the through traffic on each side to shift by one half of the lane width. Some circumstances may dictate that all widening be achieved on one side, which requires a full lane shift for through traffic on the side where the additional width is developed. Table 4-9 provides guidelines for selecting the proper length of approach taper. When shifts are not 6' or 12', use table 4-9 bay taper.

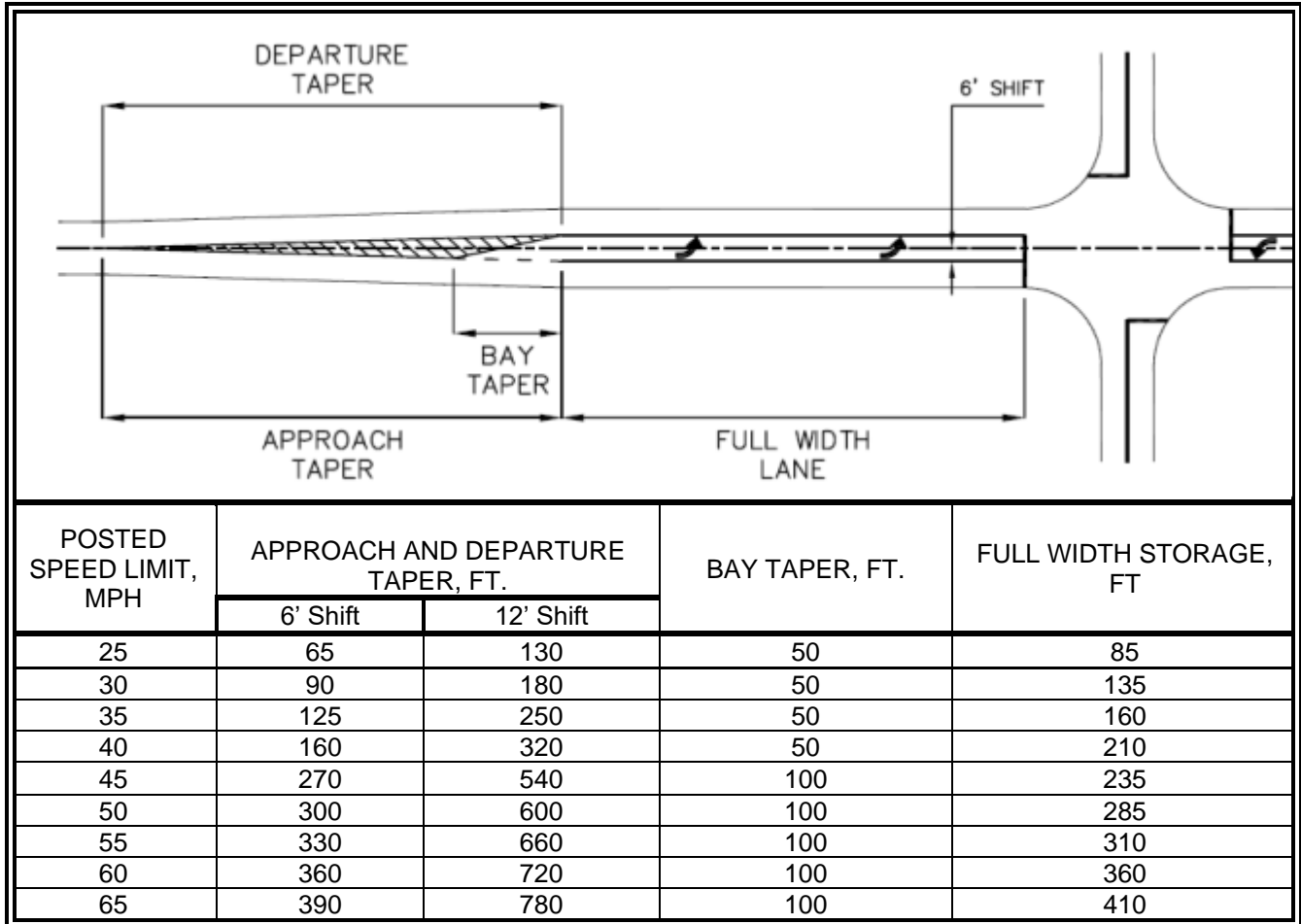


Table 4-9 Minimum Design Elements of Left Turn Lanes

The example shown in Table 4-9 has straight-line tapers. These are acceptable but other designs may also be used, including the following: partial tangent tapers, symmetrical reverse curve, and asymmetrical reverse curve. See latest edition of AASHTO Green Book for details.

The required length of full-width storage shall be based on storage length and a deceleration length that allows vehicles to safely decelerate without a possible conflict with another vehicle (Refer to [Construction Detail M-3A](#)). This should be determined in the traffic study. The amount of storage is dependent on the type of traffic control in effect. For signalized intersections, the storage should be sufficient to accommodate the number of vehicles arriving during 1.5 signal cycles, using peak hour volumes. At stop-controlled intersections, the storage is typically based on the number of vehicles arriving during a two-minute period within the peak hour.