Old Ivy Residences

Traffic Impact Analysis
Albemarle County, Virginia

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Prepared For:

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TABLE OF CONTENTS

TABLE OF CONTENTS I
APPENDICES II
LIST OF TABLES III
LIST OF FIGURES IV
1 EXECUTIVE SUMMARY 1-1
1.1 PROJECT OVERVIEW 1-1
1.2 PROJECT SCOPE 1-2
1.3 STUDY FINDINGS 1-3
1.4 RECOMMENDATIONS 1-4
2 ANALYSIS OF EXISTING CONDITIONS 2-1
2.1 CAPACITY ANALYSES 2-1
2.2 EXISTING CONDITIONS 2-3
2.3 2021 EXISTING CONDITIONS ANALYSIS 2-4
3 ANALYSIS OF BACKGROUND CONDITIONS 3-1
3.1 2025 BACKGROUND TRAFFIC GROWTH 3-1
3.2 2025 BACKGROUND CONDITIONS ANALYSIS 3-1
4 SITE TRIP GENERATION AND DISTRIBUTION 4-1
4.1 TRIP GENERATION 4-1
4.2 SITE TRIP DISTRIBUTION 4-1
4.3 SITE TRIP ASSIGNMENT 4-1
5 ANALYSIS OF FUTURE CONDITIONS WITH DEVELOPMENT 5-1
5.1 2025 TOTAL TRAFFIC VOLUMES 5-1
5.2 2025 FUTURE CONDITIONS ANALYSIS 5-1
5.3 YEAR-TO-YEAR ANALYSIS COMPARISON 5-3
6 TURN LANE WARRANT ANALYSIS 6-1
6.1 2025 FUTURE CONDITIONS ANALYSIS 6-1
7 CONCLUSIONS AND RECOMMENDATIONS 7-1
7.1 STUDY FINDINGS 7-1
7.2 RECOMMENDATIONS 7-2

APPENDICES

Appendix A – Traffic Counts

Appendix B – Synchro Analysis for 2021 Existing Conditions

Appendix C – Synchro Analysis for 2025 Background Conditions

Appendix D – Synchro Analysis for 2025 Total Future Conditions

LIST OF TABLES

TABLE 1-1: TRIP GENERATION COMPARISON 1-1

TABLE 2-1: LEVEL OF SERVICE DEFINITIONS 2-1

TABLE 2-2: SIGNALIZED AND UNSIGNALIZED INTERSECTION LEVEL OF SERVICE CRITERIA 2-2

TABLE 2-3: LOS, DELAY, AND QUEUE LENGTH SUMMARY – 2021 EXISTING CONDITIONS 2-5

TABLE 3-1: LOS, DELAY, AND QUEUE LENGTH SUMMARY 2025 BACKGROUND CONDITIONS 3-2

TABLE 4-1: TRIP GENERATION SUMMARY 4-1

TABLE 5-1: LOS, DELAY, AND QUEUE LENGTH SUMMARY 2025 FUTURE CONDITIONS 5-2

TABLE 5-2: LOS, DELAY, AND QUEUE LENGTH SUMMARY 2025 FUTURE CONDITIONS 5-4

LIST OF FIGURES

FIGURE 1-1: VICINITY MAP
FIGURE 1-2: CONCEPTUAL PLAN
FIGURE 1-3: STUDY INTERSECTIONS
FIGURE 2-1: 2021 EXISTING VOLUMES
FIGURE 2-2: 2021 ADJUSTED EXISTING VOLUMES
FIGURE 2-3: EXISTING GEOMETRY
FIGURE 3-1: 2025 BACKGROUND VOLUMES
FIGURE 4-1: GLOBAL TRIP DISTRIBUTION
FIGURE 4-2: TRIP DISTRIBUTION
FIGURE 4-3: GENERATED TRIPS
FIGURE 5-1: 2025 FUTURE VOLUMES
FIGURE 5-2: FUTURE GEOMETRY
FIGURE 6-1: 2025 FUTURE VOLUMES – AM PEAK, LEFT TURN WARRANT EB OLD IVY ROAD AT PROPOSED SITE ENTRANCE
FIGURE 6-2: 2025 FUTURE VOLUMES – PM PEAK, LEFT TURN WARRANT EB OLD IVY ROAD AT PROPOSED SITE ENTRANCE
FIGURE 6-3: 2025 FUTURE VOLUMES, RIGHT TURN WARRANT WB OLD IVY ROAD AT PROPOSED SITE ENTRANCE

1 EXECUTIVE SUMMARY

This report presents the findings of the traffic impact analysis (TIA) prepared for the proposed Old Ivy Residences residential development in Albemarle County, Virginia. The TIA has been prepared in accordance with the procedures outlined in the Virginia Department of Transportation's (VDOT) Traffic Impact Analysis Regulations and the *Traffic Operations and Safety Analysis Manual, version 2.0 (TOSAM).*

A scoping meeting with Albemarle County, the City of Charlottesville, and VDOT was held on April 29, 2021, to determine the scope of the TIA. It was determined that, based on the size of the proposed development, a VDOT Chapter 527 TIA was not required. However, Albemarle County requested the completion of a TIA to determine the impacts of the proposed site entrance and the surrounding roadway network to the site entrance.

1.1 PROJECT OVERVIEW

The proposed development is located north of Old Ivy Road, south of Leonard Sandridge Parkway, east of US Route 29/Route 250, and west of Harvest Drive as shown in Figure 1-1 (all figures are located at the end of their respective chapter).

The proposed development will consist of 80 single family detached homes, 60 single family detached duets, 335 units of multi-family housing, and 50 units of multifamily housing townhomes; this is the maximum development allowed under zoning. Access to the site will be provided via one (1) entrance on Old Ivy Road. The conceptual site plan can be found in Figure 1-2.

When complete, the proposed development will generate a total of 4,326 average daily trips, 284 AM peak hour trips (67 in and 217 out), and 349 PM peak Hour trips (220 in and 129 out), as shown in Table 1-1.

Table 1-1: Trip Generation Comparison

LAND USE	ITE CODE	AMOUNT	UNITS	WEEKDAY						
				ADT	AM PEAK HOUR			PM PEAK HOUR		
					IN	OUT	TOTAL	IN	OUT	TOTAL
Single-Family Detached Housing	210	80	Dwelling Units	847	15	47	62	52	30	82
Single-Family Detached Housing - Duets	210	60	Dwelling Units	650	12	35	47	39	23	62
Multi-Family Housing (Low-Rise) - Apartments	220	335	Dwelling Units	2,492	35	116	150	109	64	173
Multi-Family Housing (Low-Rise) - Townhomes	220	50	Dwelling Units	337	6	19	25	20	12	32
TOTAL		**525**	**Dwelling Units**	4,326	67	217	284	220	129	349

SOURCE: Institute of Transportation Engineers' *Trip Generation Manual* 10th Edition (2017)

As agreed upon during the scoping meeting with Albemarle County and VDOT, the study limits include the following existing intersections (see Figure 1-3):

1. Ivy Road and Canterbury Road/Route 846 (signalized)
2. Old Ivy Road and US Route 29/Route 250 Off-Ramp (unsignalized)
3. Old Ivy Road and Faulconer Drive (unsignalized)
4. Old Ivy Road and US Route 29/Route 250 On-Ramp (unsignalized)
5. Old Ivy Road and Ivy Road (signalized)
6. Proposed Site Entrance and Old Ivy Road (unsignalized) – 2025 Build Conditions Only

For purposes of this analysis, the development was assumed to be complete and occupied by 2025.

It is specifically noted that this study was prepared during the COVID-19 pandemic and traffic patterns and volumes were atypical. In order to accommodate for the discrepancy, a 10% adjustment factor was applied to the field counts.

Based on the 2018 VDOT STARS study for US Route 250 (Ivy Road) there are several proposed improvements regarding signal timings, median improvements, and pavement striping. As of July 2021, none of the proposed improvements had been implemented and no funding has been identified. It is not anticipated that the proposed improvements will be implemented prior to the development of the site (i.e. 2025).

1.2 PROJECT SCOPE

Per the scope of services, the following steps were taken to determine the potential traffic impacts associated with the proposed project:

1. Data Collection – Peak hour (7-9 AM and 4-6 PM) directional turning movement counts were performed on Thursday, May 6, 2021, at five (5) intersections within the study area. The raw data collected has been included in Appendix A.

2. Background Traffic Growth – A 1% growth rate was applied to the existing 2021 volumes to reach the background 2025 volumes.

3. Trip Generation – Traffic generated by the proposed development was estimated using the 10th edition of the Institute of Transportation Engineers' (ITE) *Trip Generation Manual*.

4. Traffic Distributions – The distribution of trips generated by the proposed development was based on the existing traffic volumes, the nature of the use, the surrounding roadway network, and local knowledge of traffic patterns in the area.

5. Traffic Projections – Future traffic volumes were determined using the existing traffic counts, a 1% background growth rate, and the trips generated by the proposed site.

6. Operational and Queuing Analysis – Level of service, delay, and queuing calculations were completed at the study intersections for 2021 existing, 2025 background, and 2025 future conditions using SYNCHRO Version 10 with SimTraffic. The 95th percentile queue lengths (SYNCHRO) and maximum queues (SimTraffic) were reviewed at the study intersections.

1.3 STUDY FINDINGS

Based on the operational analyses the following is offered:

- Under the 2021 existing and 2025 background conditions:
    - The signalized intersection of Ivy Road and Canterbury Road operates at an overall LOS D in the AM and PM peaks, with queues in both mainline approaches and the southbound approach that create access issues to nearby entrances and intersections.
    - At the unsignalized intersection of Old Ivy Road and US Route 29/250 Off-Ramp, the combination of queues from the Ivy Road/Canterbury Road signal and the high volume from the US Route 29/250 Off-Ramp block access for the eastbound and westbound movements of Old Ivy Road, effectively creating a 4-way stop intersection. The US Route 29/250 Off Ramp experiences queues that extend to mainline US Route 29/250.
    - The unsignalized intersection of Old Ivy Road and Faulconer Road sees queuing issues for southbound traffic attempting to make a left onto Old Ivy Road during both peak hours. The queues at Old Ivy Road extend downstream into the US Route 29/250 Off-Ramp, which could create safety and operational issues on the ramp.
    - The unsignalized intersection of Old Ivy Road at the US Route 29/250 On-Ramp does not have any operational or queuing issues of note, with maximum queues of approximately 300' in the EB direction which do not interfere with other intersections or access points.
    - The signalized intersection of Ivy Road and Old Ivy Road operates at an overall LOS B in both the AM and PM peak. The only queuing issues noted are for through movement queues blocking access to nearby commercial entrances.
    - On either end of the study corridor, there are narrow railroad bridges over Old Ivy Road that severely limit the ability to widen the roadway and sometimes require vehicles to operate as if there were only a single lane. This constraint impacts the intersections of Old Ivy Road at Ivy Road, Old Ivy Road at US Route 29/250 Off-Ramp, and Ivy Road at Canterbury Road.

- Under 2025 total future conditions with the traffic from the proposed Old Ivy Road Development:
    - Overall, all existing intersections see an increase in delays and queuing with the addition of the proposed site traffic.
    - The signalized intersection of Ivy Road and Canterbury Road continues to create operational issues for the US Route 29/250 Off-Ramp, Old Ivy Road, and Faulconer Road. Without improvements to the signalized intersection or the off-ramp, operations on Old Ivy Road will not improve.
    - At the unsignalized intersection of Old Ivy Road at the US Route 29/250 On-Ramp, the additional site traffic does not significantly increase delays along Old Ivy Road.
    - At the signalized intersection of Old Ivy Road and Ivy Road, the increased traffic volumes do not significantly change the operations of the existing signal.
    - The proposed site entrance does not introduce any queueing or delays for mainline Old Ivy Road and the proposed turn lanes can fully accommodate the site-generated traffic.

1.4 RECOMMENDATIONS

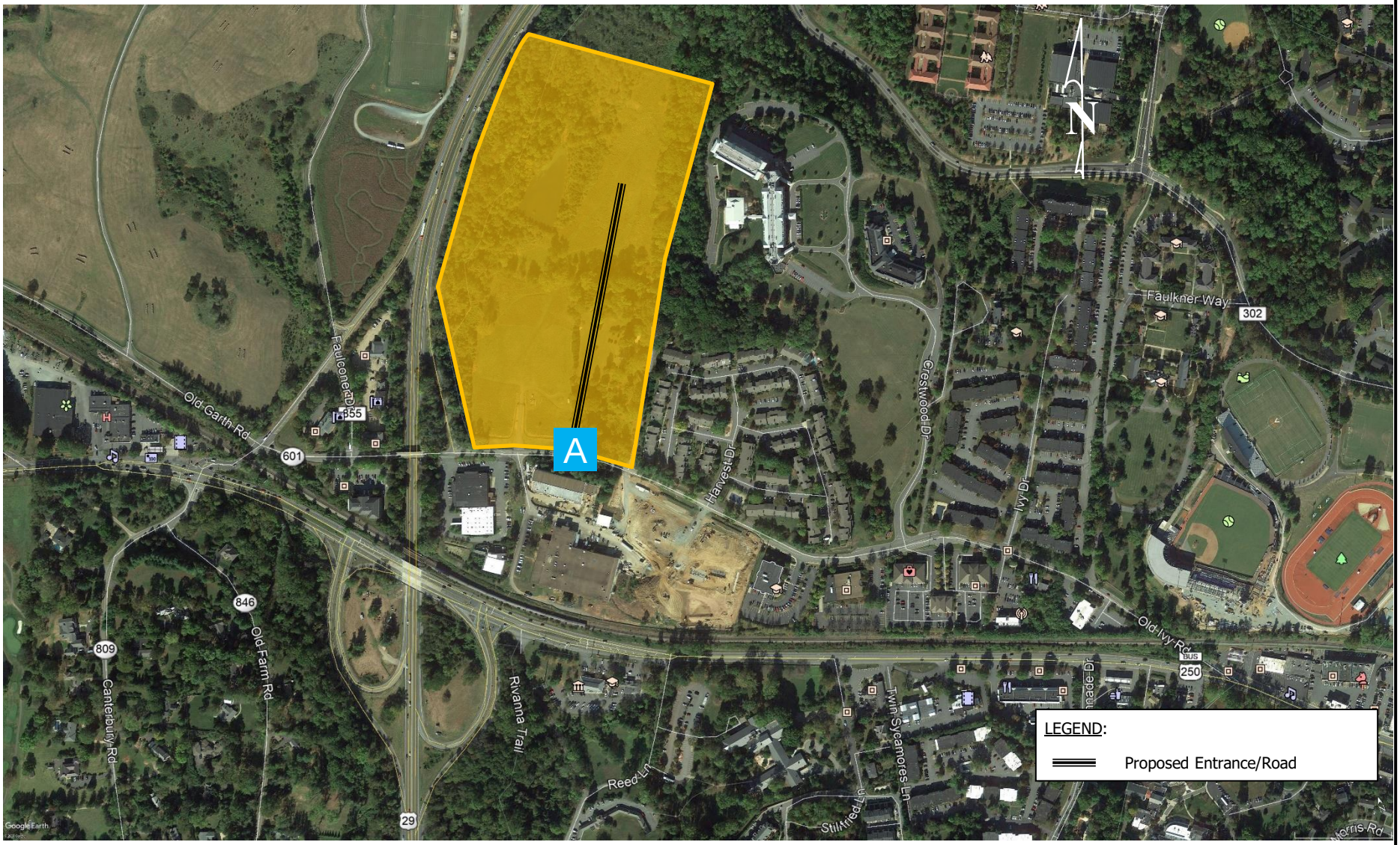
In order to accommodate the increased traffic volumes associated with the proposed Old Ivy Residences residential development, the following operational and capacity improvements are recommended:

1. Install an eastbound left turn lane on Old Ivy Road at the proposed site entrance, minimum 100' storage and 100' taper.

2. Install a westbound right turn lane on Old Ivy Road at the proposed site entrance, minimum 100' storage and 100' taper.

3. Install a westbound right turn lane on Old Ivy Road at the US Route 29/250 on-ramp.

All recommended improvements are on Old Ivy Road across the frontage of property controlled by the development of Old Ivy Residences. The proposed improvements are expected to be constructable within existing right-of-way and along the development frontage.



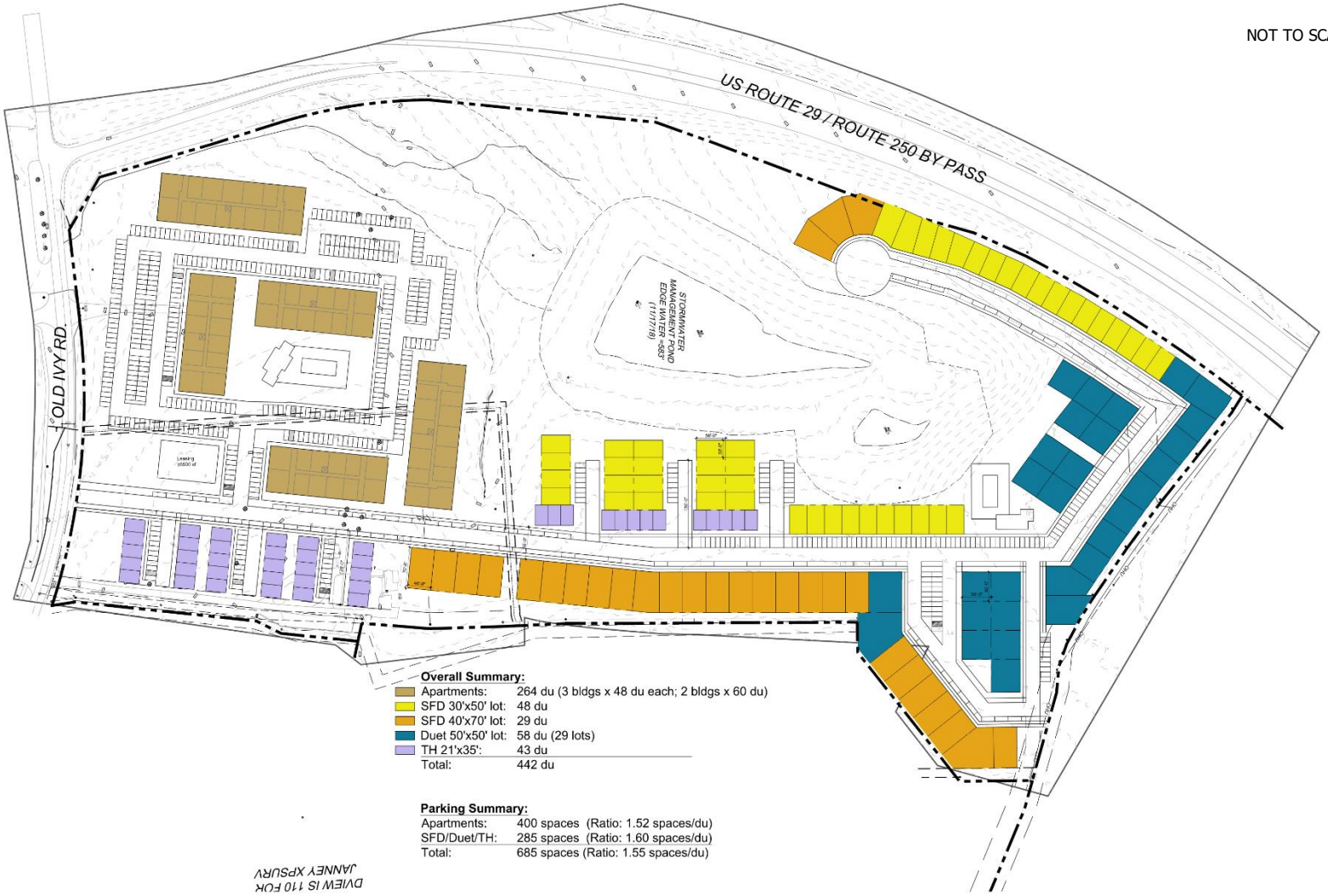
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Vicinity Map
Old Ivy Residences – Traffic Impact Analysis
Albemarle County, Virginia

Figure 1-1

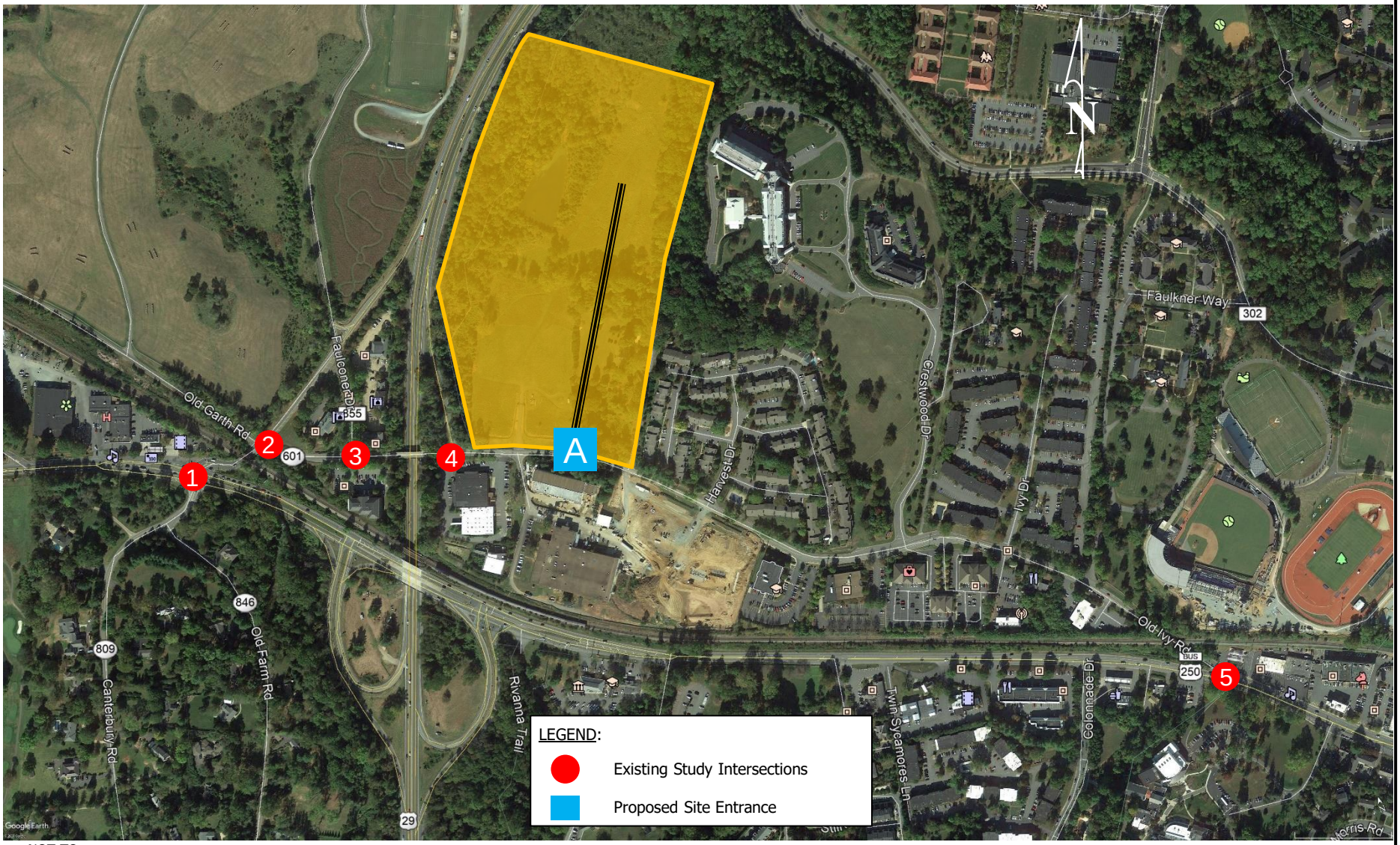
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Conceptual Layout
Old Ivy Residences – Traffic Impact Analysis
Albemarle County, Virginia

Figure
1-2



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Study Intersections
Old Ivy Residences – Traffic Impact Analysis
Albemarle County, Virginia

Figure 1-3

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2 ANALYSIS OF EXISTING CONDITIONS

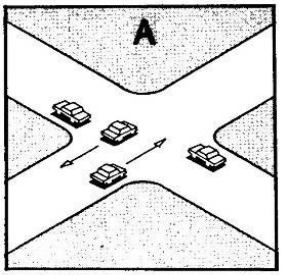
2.1 CAPACITY ANALYSES

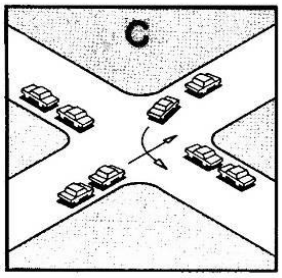
Capacity analysis allows traffic engineers to determine the impacts of traffic on the surrounding roadway network. The Transportation Research Board's (TRB) *Highway Capacity Manual* (HCM) methodologies govern how the capacity analyses are conducted and how the results are interpreted. There are six letter grades of Levels of Service (LOS) from A to F, with LOS A representing the best operating conditions and LOS F the worst operating conditions. Table 2-1 shows in detail how each of these levels of service are interpreted.

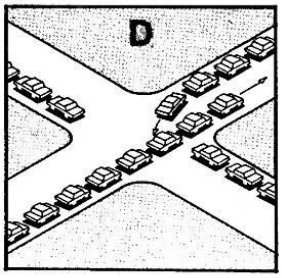
Table 2-1: Level of Service Definitions

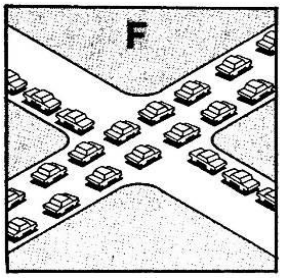
Level of Service	Roadway Segments or Controlled Access Highways	Intersections
A	Free flow, low traffic density.	No vehicle waits longer than one signal indication.
B	Delay is not unreasonable, stable traffic flow.	On a rare occasion motorists wait through more than one signal indication.
C	Stable condition, movements somewhat restricted due to higher volumes, but not objectionable for motorists.	Intermittently drivers wait through more than one signal indication, and occasionally backups may develop behind left turning vehicles, traffic flow still stable and acceptable.
D	Movements more restricted, queues and delays may occur during short peaks, but lower demands occur often enough to permit clearing, thus preventing excessive backups.	Delays at intersections may become extensive with some, especially left-turning vehicles waiting two or more signal indications, but enough cycles with lower demand occur to permit periodic clearance, thus preventing excessive backups.
E	Actual capacity of the roadway invloves delay to all motorists due to congestion.	Very long queues may create lengthly delays, especially for left-turning vehicles.
F	Forced flow with demand volumes greater than capacity resulting in complete congestion. Volumes drop to zero in extreme cases.	Backups from locations downstream restrict or prevent movement of vehicles out of approach creating a storage ares during part or all of an hour.

SOURCE: *"A Policy on Design of Design of Urban Highways and Arterial Streets"* - AASHTO, 1973 based upon material published in *"Highway Capacity Manual"*, National Academy of Sciences, 1965.









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For signalized and unsignalized intersections, level of service is defined in terms of **delay**, a measure of driver discomfort, frustration, fuel consumption and lost travel time. Table 2-2 summarizes the delay associated with each LOS category:

Table 2-2: Signalized and Unsignalized Intersection Level of Service Criteria

Signalized Intersections		Unsignalized Intersections	
Level of Service	Control Delay per Vehicle (sec/veh)	Level of Service	Average Control Delay (sec/veh)
A	≤ 10	A	0 to 10
B	> 10 to ≤ 20	B	> 10 to ≤ 15
C	> 20 to ≤ 35	C	> 15 to ≤ 25
D	> 35 to ≤ 55	D	> 25 to ≤ 35
E	> 55 to ≤ 80	E	> 35 to ≤ 50
F	> 80	F	> 50

Source: Exhibit 16-2 and Exhibit 17-2 from TRB's "Highway Capacity Manual 2000"

Generally, the standard acceptable minimum for the overall intersection is LOS D, while the standard acceptable minimum for an individual traffic movement is LOS E.

Capacity analyses were performed to assess existing (2021), background (2025), and future (2025) operational conditions. The signalized and unsignalized intersections were analyzed using SYNCHRO Version 10 based on HCM 2000 methodologies with the following assumptions:

- Level terrain;
- 12-foot lane widths;
- No parking activity or bus stops;
- Existing peak hour factor as determined by the traffic counts (by intersection) for existing scenario;
- The higher of the existing peak hour factor as determined by traffic counts (by intersection) or a peak hour factor of 0.92.
- Heavy vehicle percentage as determined by the traffic counts (by movement); and
- Traffic signals timing data provided by VDOT on May 18, 2021.

HCM 2000 methodologies were utilized for analysis as opposed to the latest HCM Sixth Edition or HCM 2010 methodologies. This selection is due to the non-standard NEMA phasing that is present at all of the signalized intersections. The HCM Sixth Edition and HCM 2010 methodologies only provide measures of effectiveness for signalized intersections following strict NEMA phasing.

Queuing analysis allows traffic engineers to identify where vehicles queues are not adequately accommodated by existing storage bays and impact adjacent travel lanes.

Queuing analyses were conducted using both the HCM 2000 methodology (as calculated by SYNCHRO) and SimTraffic simulations. The Synchro 95th percentile queue is the maximum back of queue for a particular lane within a lane group considering 95th percentile traffic volumes. The SimTraffic maximum queues are the average maximum queues after 10 runs of 60 minutes each.

Note that it is possible for the 95th percentile queue to be higher than the SimTraffic maximum queue due to the method in which each software calculates its respective value. The 95th percentile queue is based on an HCM formula while the SimTraffic maximum queue varies based on simulation results.

2.2 EXISTING CONDITIONS

Existing count data was obtained from directional turning movement (DTM) counts at the five (5) study intersections:

1. Ivy Road and Canterbury Road/Route 846 (signalized)
2. Old Ivy Road and US Route 29/Route 250 Off-Ramp (unsignalized)
3. Old Ivy Road and Faulconer Drive (unsignalized)
4. Old Ivy Road and US Route 29/Route 250 On-Ramp (unsignalized)
5. Old Ivy Road and Ivy Road (signalized)

The turning movement counts were collected on Thursday, May 6, 2021, between 7 – 9 AM and 4 – 6 PM. The data collection provided pedestrian counts for the entire duration and heavy vehicles by movement for the peak hours. The 2021 existing volumes are shown on Figure 2-1 (all figures located at the end of the chapter). The complete count data for the turning movement counts is provided in Appendix A.

In order to determine the common peak hour, the peak hour of each of the five study intersections were compared. The most common peak hour with the highest volumes across a majority of the intersections was selected as the overall peak hour. This method was selected to maintain balance between the study intersections. The AM peak hour was found to be 8:00 AM to 9:00 AM and the PM peak hour was found to be 4:30 PM – 5:30 PM.

It is noted that this study was prepared during the COVID-19 pandemic and traffic patterns and volumes were atypical. In order to accommodate for the discrepancy, a 10% adjustment factor was applied to the field counts. The 2021 adjusted existing volumes are shown on Figure 2-2.

The existing roadways within the study area include the following:

- Old Ivy Road is a two-lane, undivided major collector with a posted speed limit of 35 mph. According to 2019 VDOT count data, Old Ivy Road services 8,300 vehicles per day.

- Ivy Road (US Route 250) is a 2-lane, undivided Minor Arterial with a posted speed limit of 35 mph to the west of the US Route 29 interchange and classified as an Other Principal Arterial to the east. According to 2019 VDOT count data, Ivy Road services 13,000 vehicles per day between Dick Woods Road and US Route 29 and 58,000 vehicles per day between US Route 29 and the Charlottesville city limits.

- Falconer Drive is a two-lane, undivided local road with a posted speed limit of 30 mph. According to 2019 VDOT count data, Faulconer Drive services 1,300 vehicles per day.

The existing roadway geometry for each study intersection can be found on Figure 2-3.

Per a 2018 STARS study for Ivy Road there are several proposed improvements regarding signal timings and pavement striping. As of May of 2021, none of the proposed improvements have been implemented and it is not anticipated that they will be implemented prior to the development of the site.

Due to software limitations, to accurately model intersections with significant spillback, a three-way stop geometry was utilized for SimTraffic and the field conditions geometry was used for LOS conditions for the intersection of Old Ivy Road and US Route 29/250 Off-Ramp.

2.3 2021 EXISTING CONDITIONS ANALYSIS

Table 2-3 summarizes the 2021 existing intersection LOS, delay, and queues based on the 2021 adjusted existing traffic volumes shown on Figure 2-2 and the existing intersection geometry and traffic controls shown on Figure 2-3. The corresponding SYNCHRO worksheets are included in Appendix B.

Level of service calculations for the five (5) existing intersections within the study area were performed using the methodology described above. To evaluate the impacts of the traffic generated by the proposed development, analyses were completed for the AM and PM peak hours:

1. Weekday AM peak hour of the adjacent street (8:00 AM – 9:00 AM); and
2. Weekday PM peak hour of the adjacent street (4:30 PM – 5:30 PM).

The signalized intersection of Ivy Road and Canterbury Road operates at an overall LOS D in the AM with a delay of 48.2 seconds/vehicle and at LOS D in the PM peak with a delay of 45.9 seconds/vehicle. There are multiple movements that operate at LOS E and F during both peak hours. The maximum queue for the eastbound left is 394 feet in the AM peak and 554 feet in the PM peak. For the westbound through-right approach, the maximum queue in the AM peak is 629 feet and the maximum queue in the PM peak is 610 feet. The queues for the mainline through and turning movements extend beyond the existing storage length and may create operational issues with other intersections along Ivy Road. The southbound approach has queues in excess of 200 feet during both peak hours, which indicates that queues from Ivy Road are impacting Old Ivy Road on the western end.

At the unsignalized intersection of Old Ivy Road and US Route 29/250 Off-Ramp, the eastbound approach operates at LOS F in the AM peak with 87.3 seconds/vehicle of delay and LOS D in the PM peak with 27.5 seconds/vehicle delay. The westbound approach operates at LOS F in the AM and LOS E in the PM peak with a delay of 167.7 seconds/vehicle in the AM peak and 47.1 seconds/vehicle in the PM peak. Although the southbound approach operates at LOS A during both peak hours, the maximum queue is 1,160 feet in the AM peak and 1,156 feet in the PM peak due to the operations of the Ivy Road at Canterbury Road signal.

At the unsignalized intersection of Old Ivy Road and Faulconer Road, the southbound approach operates at LOS F in the AM peak and LOS C in the PM peak with a delay of 349.1 seconds/vehicle in the AM peak and 20 seconds/vehicle in the PM peak. In the AM peak, the maximum queue in the southbound direction is 325 feet and 121 feet in the PM peak. The eastbound and westbound approaches of Old Ivy Road operate at LOS A during both peak hours.

At the unsignalized intersection of Old Ivy Road at the US Route 29/250 On-Ramp, the mainline eastbound and westbound approaches operate at LOS A during both peak hours. The northbound approach operates at LOS A during the AM peak hour and at LOS F during the PM peak hour. However, the maximum queue on the northbound approach during either peak hour is 21 feet, or approximately 1 vehicle. There are no queuing issues at this intersection.

The signalized intersection of Ivy Road and Old Ivy Road operates at an overall LOS B in both the AM and PM peak with a delay of 13.3 seconds/vehicle in the AM peak and 13.2 seconds/vehicle in the PM peak. All movements and approaches operate at LOS C or better during both peak hours. The only queuing issues noted at this intersection are the through maneuvers blocking access to entrances along Ivy Road.

Table 2-3: LOS, Delay, and Queue Length Summary – 2021 Existing Conditions

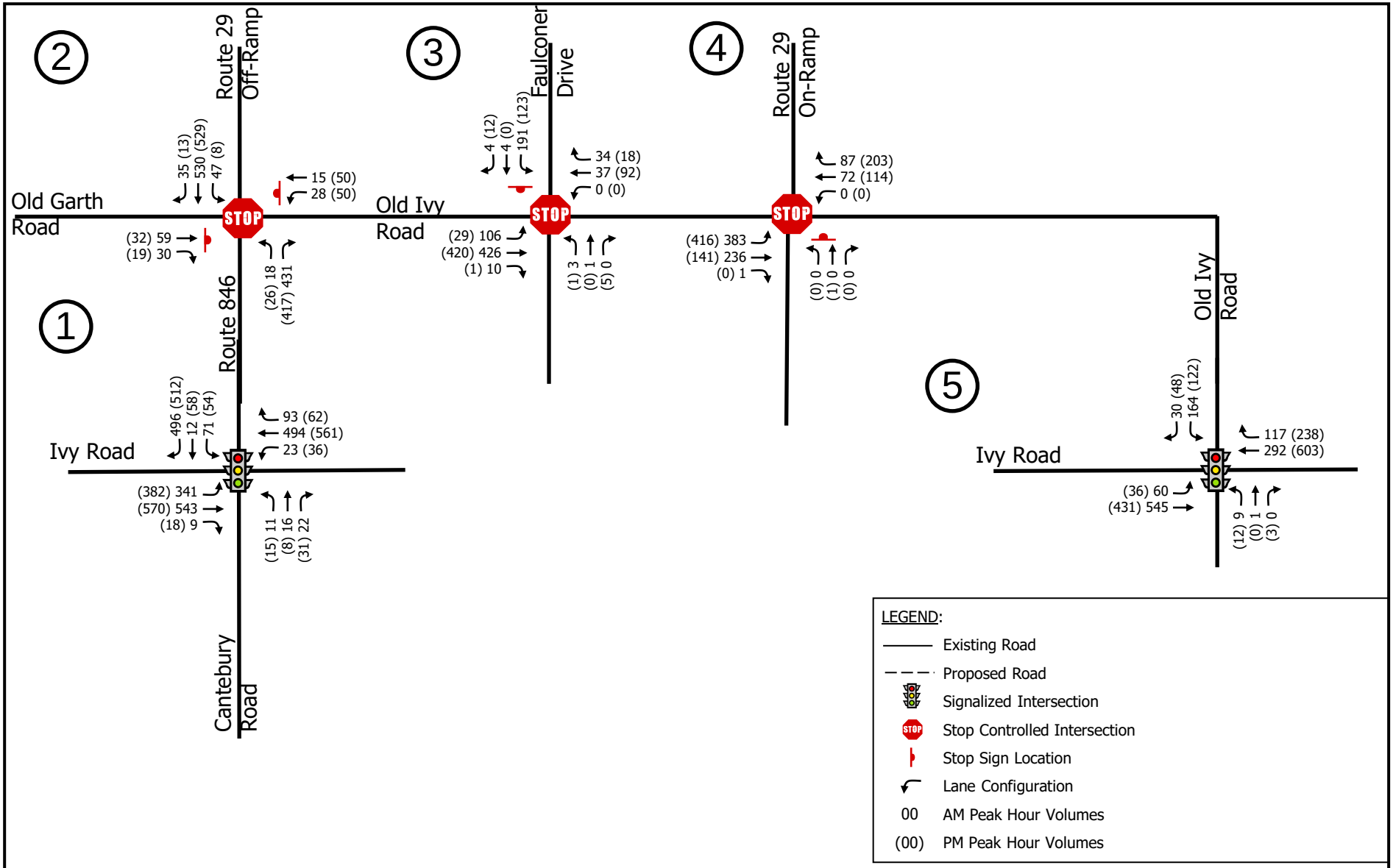
Intersection and Type of Control	Movement and Approach	Effective Turn Lane Storage (ft)	AM PEAK HOUR				PM PEAK HOUR			
			Delay [1] (sec/veh)	LOS [1]	SYNCHRO 95th Percentile Queue Length (ft)	SimTraffic Maximum Queue Length (ft)	Delay [1] (sec/veh)	LOS [1]	SYNCHRO 95th Percentile Queue Length (ft)	SimTraffic Maximum Queue Length (ft)
1.Ivy Road(E-W) at	EB Left		58.4	E	#460	394	56.8	E	#523	554
Cantebury Road/Route 846 (N-S)	EB Thru		17.8	B	477	321	16.9	B	464	374
Signalized	EB Right	450	9.9	A	0	26	9.7	A	0	32
	EB Approach		*33.2*	*C*	--	--	*32.5*	*C*	--	--
	WB Left	200	19.1	B	17	199	18.5	B	23	200
	WB Thru-Right		64.5	E	#850	629	58.4	E	#821	610
	WB Approach		*62.8*	*E*	--	--	*56.2*	*E*	--	--
	NB Left-Thru		55.4	E	59	80	55.2	E	51	84
	NB Right	180	53.8	D	0	52	53.9	D	0	64
	NB Approach		*54.7*	*D*	--	--	*54.5*	*D*	--	--
	SB Thru-Left		58.9	E	132	212	67.3	E	116	214
	SB Right	75	54.7	D	#440	76	53.9	D	#483	75
	SB Approach		*55.3*	*E*	--	--	*55.6*	*E*	--	--
	Overall		**48.2**	**D**	**--**	**--**	**45.9**	**D**	**--**	**--**
2.Old Ivy Road (E-W) at	EB Thru-Right		87.3	F	123	116	27.5	D	26	93
29 Off Ramp/Route 846 (N-S)	*EB Approach*		*87.3*	*F*	--	--	*27.5*	*D*	--	--
Unsignalized	WB Left-Thru		167.7	F	98	75	47.1	E	83	118
	WB Approach		*167.7*	*F*	--	--	*47.1*	*E*	--	--
	NB L-T-R		0.7	A	2	71	0.9	A	3	69
	NB Approach		*0.7*	*A*	--	--	*0.9*	*A*	--	--
	SB L-T-R	190	1.5	A	2	1160	0.3	A	1	1156
	SB Approach		*1.5*	*A*	--	--	*0.3*	*A*	--	--
3.Old Ivy Road (E-W) at	EB Left-Thru		2.6	A	9	111	0.7	A	2	53
Faulconer Road/Commercial Ent	EB Right	150	0.0	A	0	0	0.0	A	0	0
Unsignalized	*EB Approach*		*2.6*	*A*	--	--	*0.7*	*A*	--	--
	WB L-T-R		0.0	A	0	0	0.0	A	0	0
	WB Approach		*0.0*	A	--	--	*0.0*	A	--	--
	NB L-T-R		25.3	D	2	30	11.7	B	1	28
	NB Approach		*25.3*	*D*	--	--	*11.7*	*B*	--	--
	SB Left-Thru		349.1	F	506	325	20.0	C	45	121
	SB Right	190	0.0	A	0	88	0.0	A	0	30
	SB Approach		*349.1*	*F*	--	--	*20.0*	*C*	--	--
4. Old Ivy Road (E-W) at	EB L-T-R		7.4	A	46	166	8.8	A	52	279
Route 29 On-Ramp/	*EB Approach*		*7.4*	*A*	--	--	*8.8*	*A*	--	--
Commercial Entrance (N-S)	WB Left-Thru		0.0	†	0	0	0.0	†	0	3
Unsignalized	WB Right	50	0.0	A	0	44	0.0	A	0	49
	WB Approach		*0.0*	*†*	--	--	*0.0*	*†*	--	--
	NB L-T-R		0.0	†	0	0	57.5	†	1	21
	NB Approach		*0.0*	*A*	--	--	*57.5*	*F*	--	--
5.Ivy Road(E-W) at	EB Left	90	7.9	A	43	81	8.0	A	32	72
Old Ivy Road (N-S)	EB Thru		13.3	B	#421	241	10.1	B	253	153
Signalized	*EB Approach*		*12.7*	*B*	--	--	*9.9*	*A*	--	--
	WB Thru		9.2	A	169	174	14.5	B	#467	328
	WB Right		7.6	A	29	66	7.5	A	39	80
	Wb Approach		*8.8*	*A*	--	--	*12.5*	*B*	--	--
	NB L-T-R		32.7	C	20	39	28.5	C	0	45
	NB Approach		*32.7*	*C*	--	--	*28.5*	*C*	--	--
	SB L-T-R		23.7	C	98	178	23.8	C	82	166
	SB Approach		*23.7*	*C*	--	--	*23.8*	*C*	--	--
	Overall		**13.3**	**B**	**--**	**--**	**13.2**	**B**	**--**	**--**

[1] *Overall intersection LOS and delay reported for signalized intersections and roundabouts only.*

† SYNCHRO does not provide level of service or delay for unsignalized movements with no conflicting volumes.
# - 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

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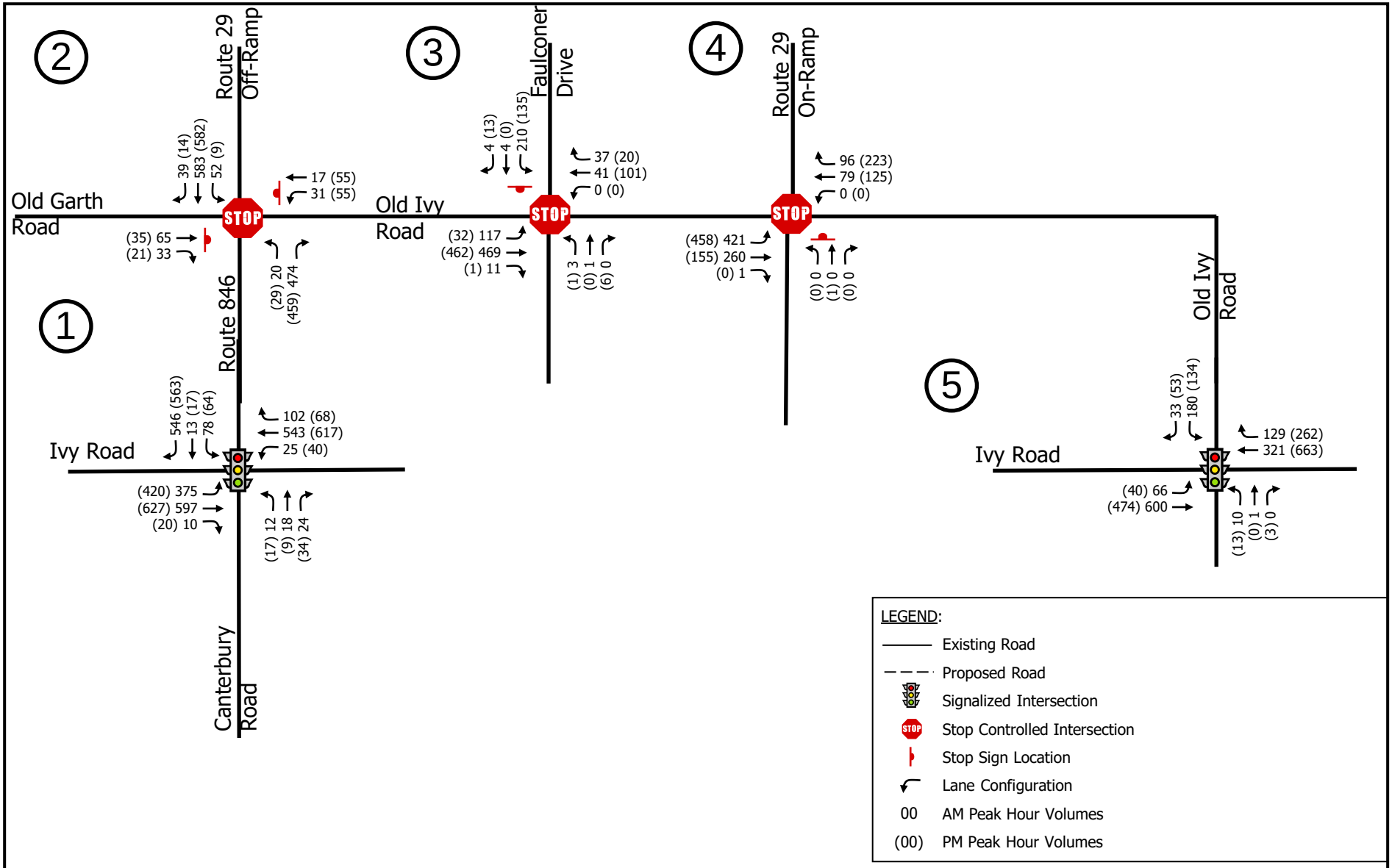
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2021 Existing Volumes
Old Ivy Residences – Traffic Impact Analysis
Albemarle County, Virginia

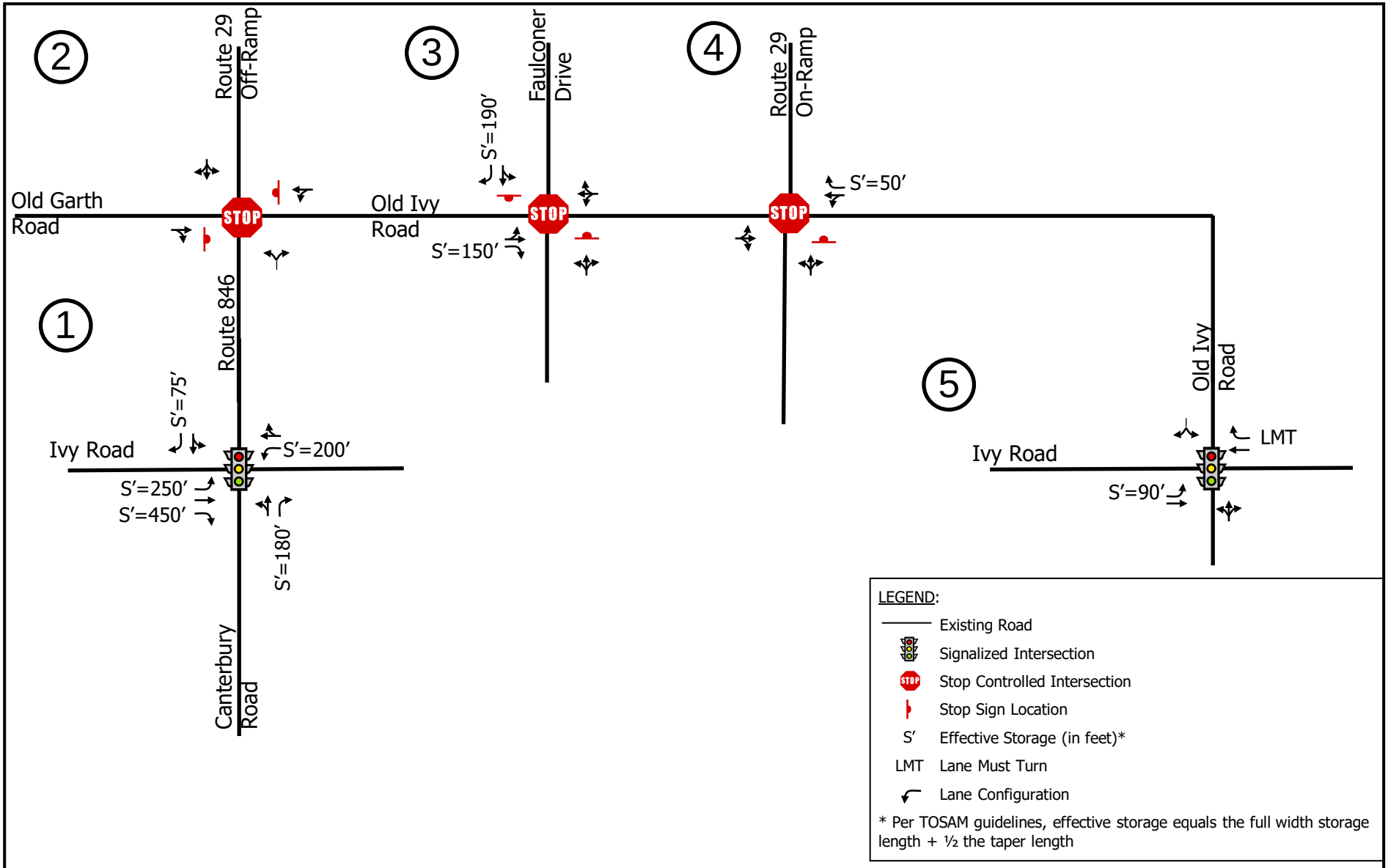
Figure
2-1



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2021 Adjusted Existing Volumes
Old Ivy Residences – Traffic Impact Analysis
Albemarle County, Virginia

Figure
2-2



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Existing Geometry
Old Ivy Residences – Traffic Impact Analysis
Albemarle County, Virginia

Figure
2-3

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3 ANALYSIS OF BACKGROUND CONDITIONS

3.1 2025 BACKGROUND TRAFFIC GROWTH

The background 2025 volumes were analyzed assuming the existing intersection geometry in conjunction with projected background traffic volumes. The background traffic volumes were developed based on a 1% annual growth rate. The growth rate was compounded annually for the 4-year period from 2021 to 2025. The resulting 2025 existing volumes plus background growth are shown on Figure 3-1.

3.2 2025 BACKGROUND CONDITIONS ANALYSIS

Table 3-1 summarizes the 2025 background intersection LOS, delay, and queues based on the 2025 background traffic volumes shown on Figure 3-1 and the existing intersection geometry and traffic controls shown on Figure 2-3. The corresponding SYNCHRO worksheets are included in Appendix C.

The signalized intersection of Ivy Road and Canterbury Road continues to operate at an overall LOS D in both peak hours with a delay of 53 seconds/vehicle in the AM peak and 54 seconds/vehicle in the PM peak. The mainline eastbound and westbound approaches operate at LOS C or worse during both peak hours with queues that are in excess of 400 feet during both peak hours. The southbound approach has queues in excess of 200 feet during both peak hours, which indicates that queues from Ivy Road are impacting Old Ivy Road on the western end.

At the unsignalized intersection of Old Ivy Road and the US Route 29/250 Off-Ramp the eastbound and westbound approaches operate at LOS F during both peak hours with queues in excess of 100 feet during both peak hours. Although the southbound approach operates at LOS A during both peak hours, the maximum queue is 1,164 feet in the AM peak and 1,147 feet in the PM peak due to the operations of the Ivy Road at Canterbury Road signal.

At the unsignalized intersection of Old Ivy Road and Faulconer Road the southbound approach operates at LOS F in the AM peak and LOS D in the PM peak with a delay of 85.7 seconds/vehicle in the AM peak and 25.1 seconds/vehicle in the PM peak. In the southbound direction the maximum queue is 138 feet in the PM peak and 232 feet in the AM peak. The eastbound and westbound approaches of Old Ivy Road operate at LOS A during both peak hours.

At the unsignalized intersection of Old Ivy Road at the US Route 29/250 On-Ramp, the mainline eastbound and westbound approaches operate at LOS A during both peak hours. The northbound approach operates at LOS A during the AM peak hour and at LOS F during the PM peak hour. However, the maximum queue on the northbound approach during either peak hour is 38 feet, or approximately 2 vehicles. There are no queuing issues at this intersection.

The signalized intersection of Ivy Road and Old Ivy Road operates at an overall LOS B in both the AM and PM peak hours. All movements and approaches operate at LOS C or better during both peak hours. The only queuing issues noted at this intersection are the through maneuvers blocking access to entrances along Ivy Road.

All operational and queuing issues noted in the 2021 existing conditions are found to be equal or worse under the 2025 background conditions.

Table 3-1: LOS, Delay, and Queue Length Summary 2025 Background Conditions

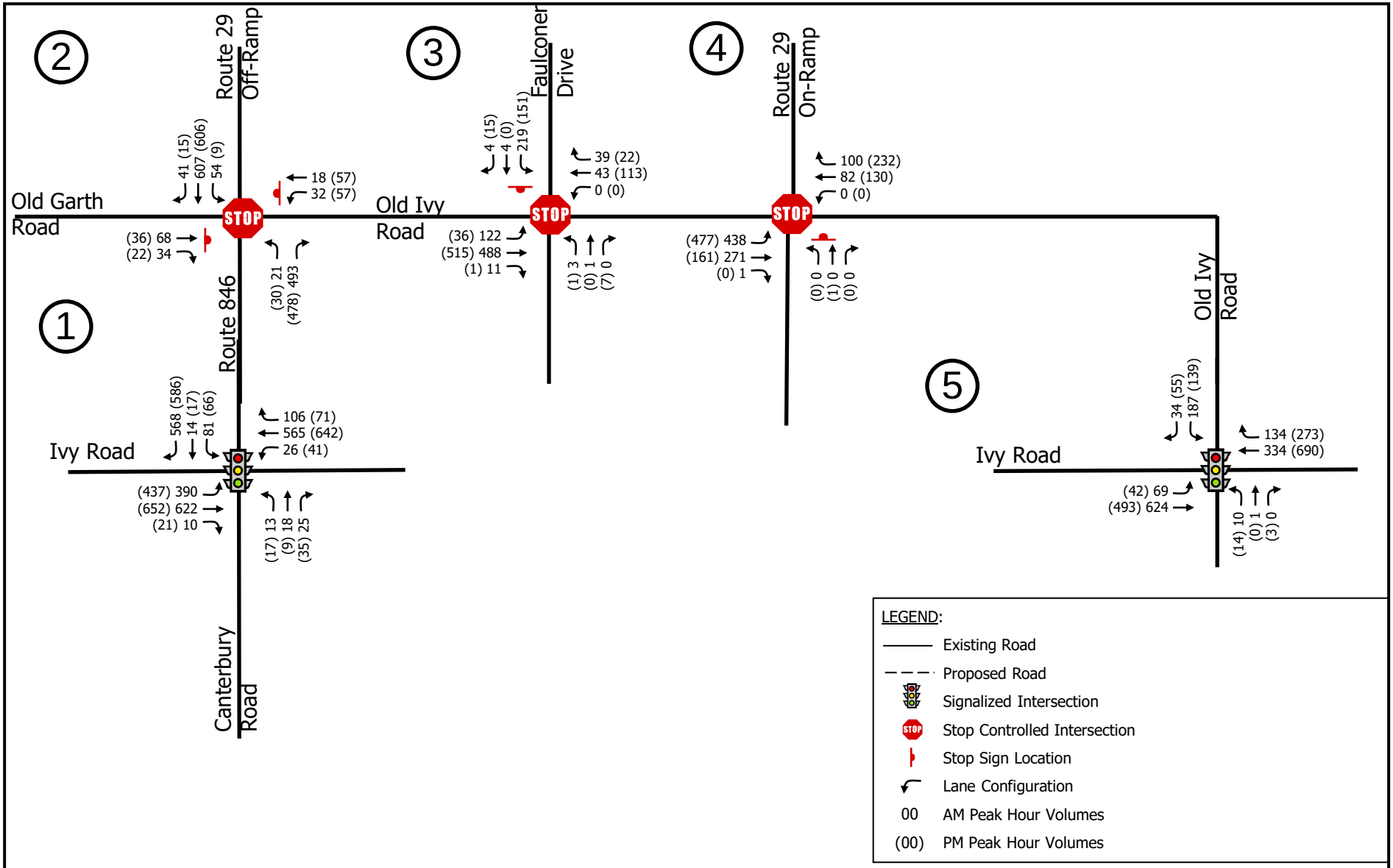
Intersection and Type of Control	Movement and Approach	Effective Turn Lane Storage (ft)	AM PEAK HOUR				PM PEAK HOUR			
			Delay [1] (sec/veh)	LOS [1]	SYNCHRO 95th Percentile Queue Length (ft)	SimTraffic Maximum Queue Length (ft)	Delay [1] (sec/veh)	LOS [1]	SYNCHRO 95th Percentile Queue Length (ft)	SimTraffic Maximum Queue Length (ft)
1.Ivy Road(E-W) at	EB Left		56.9	E	#484	456	53.8	D	#550	609
Cantebury Road/Route 846 (N-S)	EB Thru		18.2	B	499	420	18.8	B	493	415
Signalized	EB Right	450	9.9	A	0	29	10.4	B	0	31
	EB Approach		*32.9*	*C*	--	--	*32.4*	*C*	--	--
	WB Left	200	20.0	B	18	199	20.4	C	23	200
	WB Thru-Right		80.6	F	#885	638	92.2	F	#872	620
	WB Approach		*78.4*	*E*	--	--	*88.3*	*F*	--	--
	NB Left-Thru		55.4	E	60	90	55.2	E	51	82
	NB Right	180	53.8	D	0	41	53.9	D	0	66
	NB Approach		*54.7*	*D*	--	--	*54.5*	*D*	--	--
	SB Thru-Left		59.9	E	135	213	56.8	E	119	214
	SB Right	75	56.6	E	#511	76	50.2	D	#576	76
	SB Approach		*57.1*	*E*	--	--	*51.0*	*D*	--	--
	Overall		**53.0**	**D**	**--**	**--**	**54.0**	**D**	**--**	**--**
2.Old Ivy Road (E-W) at	EB Thru-Right		69.8	F	105	138	30.2	*D*	30	80
29 Off Ramp/Route 846 (N-S)	*EB Approach*		*69.8*	*F*	--	--	*30.2*	*D*	--	--
Unsignalized	WB Left-Thru		108.1	F	77	86	58.7	*F*	101	141
	WB Approach		*108.1*	*F*	--	--	*58.7*	*F*	--	--
	NB L-T-R		0.7	A	2	73	0.9	*A*	3	71
	NB Approach		*0.7*	*A*	--	--	*0.9*	*A*	--	--
	SB L-T-R	190	1.5	A	5	1164	0.3	A	1	1147
	SB Approach		*1.5*	*A*	--	--	*0.3*	*A*	--	--
3.Old Ivy Road (E-W) at	EB Left-Thru		2.3	A	7	87	0.8	A	2	58
Faulconer Road/Commercial Ent	EB Right	150	0.0	A	0	3	0.0	A	0	0
Unsignalized	*EB Approach*		*2.3*	*A*	--	--	*0.0*	*A*	--	--
	WB L-T-R		0.0	A	0	6	0.0	A	0	2
	WB Approach		*0.0*	*A*	--	--	*0.0*	*A*	--	--
	NB L-T-R		19.4	C	1	28	12.3	B	1	28
	NB Approach		*19.4*	*C*	--	--	*12.3*	*B*	--	--
	SB Left-Thru		85.7	F	221	232	25.1	D	65	138
	SB Right	190	0.0	A	0	46	0.0	A	0	47
	SB Approach		*85.7*	*F*	--	--	*25.1*	*D*	--	--
4. Old Ivy Road (E-W) at	EB L-T-R		7.0	A	39	160	9.1	A	57	310
Route 29 On-Ramp/	*EB Approach*		*7.0*	*A*	--	--	*9.1*	*A*	--	--
Commercial Entrance (N-S)	WB Left-Thru		0.0	*A*	0	0	0.0	†	0	5
Unsignalized	WB Right	50	0.0	A	0	0	0.0	A	0	44
	WB Approach		*0.0*	*A*	--	--	*0.0*	*†*	--	--
	NB L-T-R		0.0	A	0	38	64.8	†	1	17
	NB Approach		*0.0*	*A*	--	--	*64.8*	*F*	--	--
5.Ivy Road(E-W) at	EB Left	90	7.9	A	46	89	8.3	A	34	78
Old Ivy Road (N-S)	EB Thru		13.7	B	#452	254	10.3	B	260	190
Signalized	*EB Approach*		*13.1*	*B*	--	--	*10.2*	*B*	--	--
	WB Thru		9.2	A	178	158	15.1	B	#481	322
	WB Right		7.6	A	29	77	7.7	A	41	92
	Wb Approach		*8.8*	*A*	--	--	*13.0*	*B*	--	--
	NB L-T-R		33.9	C	20	50	28.6	C	0	49
	NB Approach		*33.9*	*C*	--	--	*28.6*	*C*	--	--
	SB L-T-R		24.5	C	103	185	23.8	C	83	160
	SB Approach		*24.5*	*C*	--	--	*23.8*	*C*	--	--
	Overall		**13.6**	**B**	**--**	**--**	**13.5**	**B**	**--**	**--**

[1] *Overall intersection LOS and delay reported for signalized intersections and roundabouts only.*

† SYNCHRO does not provide level of service or delay for unsignalized movements with no conflicting volumes.

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

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2025 Background Volumes
Old Ivy Residences – Traffic Impact Analysis
Albemarle County, Virginia

Figure
3-1

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4 SITE TRIP GENERATION AND DISTRIBUTION

4.1 TRIP GENERATION

The site-generated traffic volumes shown in Table 4-1 were estimated using the 10th edition of the Institute of Transportation Engineers' (ITE) *Trip Generation Manual* and were calculated using the number of dwelling units as the independent variable.

Table 4-1: Trip Generation Summary

LAND USE	ITE CODE	AMOUNT	UNITS	WEEKDAY						
				ADT	AM PEAK HOUR			PM PEAK HOUR		
					IN	OUT	TOTAL	IN	OUT	TOTAL
Single-Family Detached Housing	210	80	Dwelling Units	847	15	47	62	52	30	82
Single-Family Detached Housing - Duets	210	60	Dwelling Units	650	12	35	47	39	23	62
Multi-Family Housing (Low-Rise) - Apartments	220	335	Dwelling Units	2,492	35	116	150	109	64	173
Multi-Family Housing (Low-Rise) - Townhomes	220	50	Dwelling Units	337	6	19	25	20	12	32
TOTAL		**525**	**Dwelling Units**	4,326	67	217	284	220	129	349

SOURCE: Institute of Transportation Engineers' *Trip Generation Manual* 10th Edition (2017)

When complete, the proposed development will generate a total of 4,326 average daily trips, 284 AM peak hour trips (67 in and 217 out), and 349 PM peak Hour trips (220 in and 129 out), as shown in Table 4-1.

4.2 SITE TRIP DISTRIBUTION

The distribution of site trips generated by the proposed residential development was based on the existing traffic volumes, the nature of the use, the surrounding roadway network, and local knowledge of traffic patterns in the area.

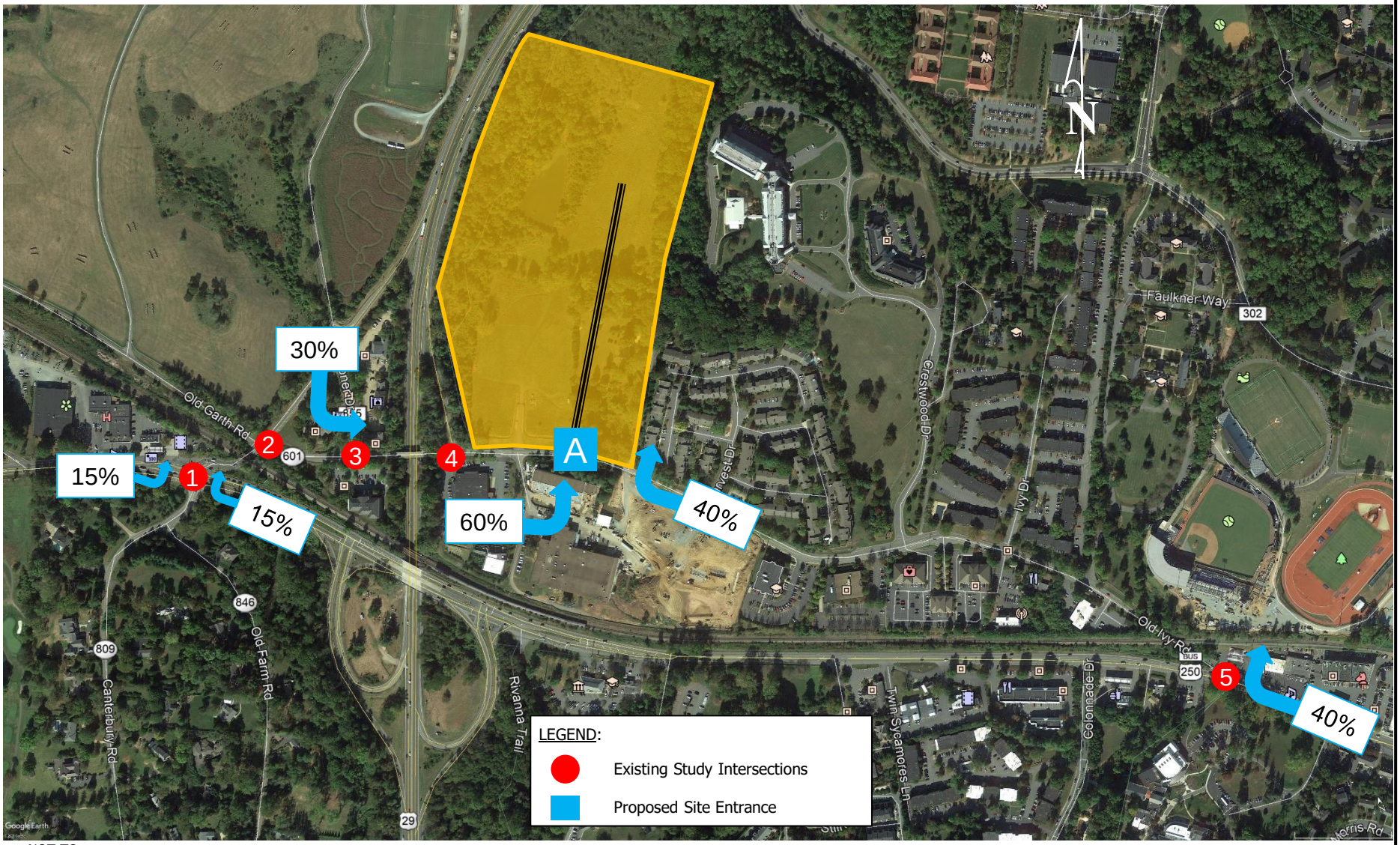
The global trip distributions are shown on Figure 4-1 and the proposed trip distributions by study intersection are shown on Figure 4-2.

4.3 SITE TRIP ASSIGNMENT

The trip distribution percentages for the site trips were applied to the trip generation volumes shown in Table 4-1 to calculate the site trips for the surrounding roadway network. The resulting site generated trips are shown on Figure 4-3.

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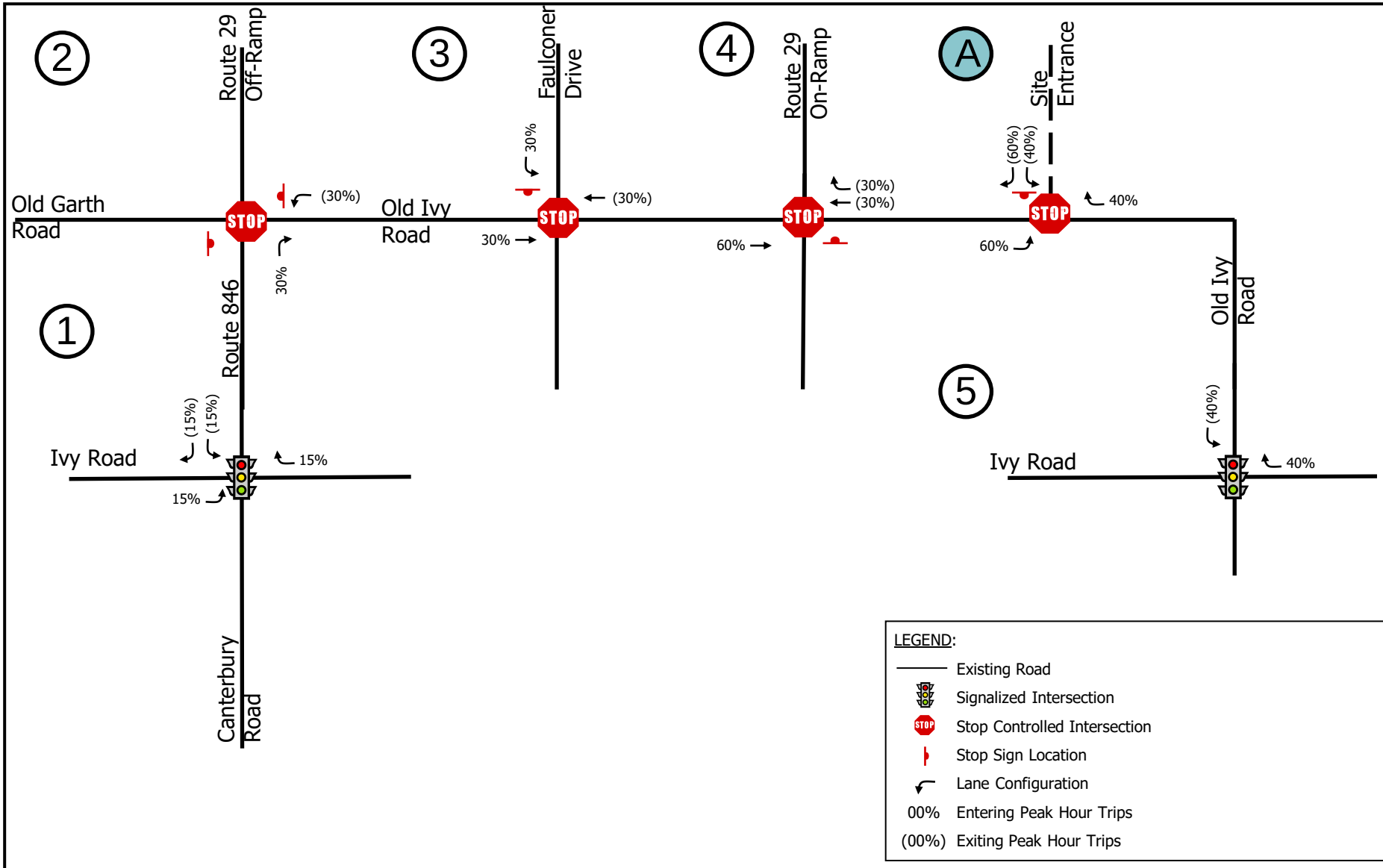


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Global Trip Distribution
Old Ivy Residences – Traffic Impact Analysis
Albemarle County, Virginia

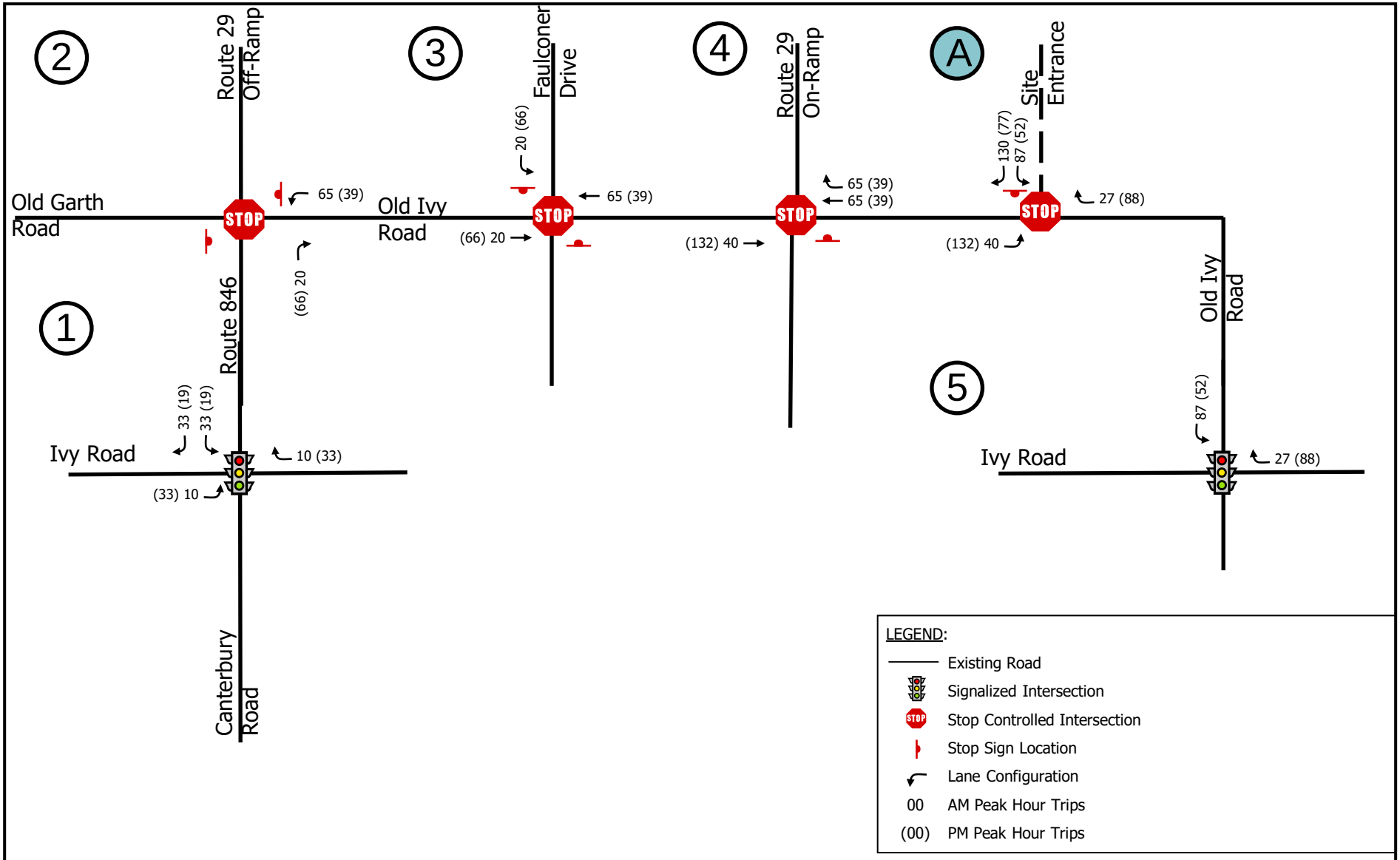
Figure 4-1



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Trip Distribution
Old Ivy Residences – Traffic Impact Analysis
Albemarle County, Virginia

Figure
4-2



TIMMONS GROUP
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Generated Trips
Old Ivy Residences – Traffic Impact Analysis
Albemarle County, Virginia

Figure
4-3

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5 ANALYSIS OF FUTURE CONDITIONS WITH DEVELOPMENT

5.1 2025 TOTAL TRAFFIC VOLUMES

To complete the analysis of the 2025 future conditions (with the proposed development), the estimated site trips were added to the background 2025 volumes. The projected total future (background + site) volumes were then used to complete the capacity analysis.

To generate the 2025 total future traffic volumes, the site trips shown on Figure 4-1 and the background 2025 traffic volumes shown in Figure 3-1 were combined. The resulting 2025 total future traffic volumes are shown in Figure 5-1.

5.2 2025 FUTURE CONDITIONS ANALYSIS

Table 5-1 summarizes the 2025 future intersection LOS, delay, and queues based on the 2025 future traffic volumes shown on Figure 5-1 and the future intersection geometry and traffic controls shown on Figure 5-2. The corresponding SYNCHRO worksheets are included in Appendix D.

The signalized intersection of Ivy Road and Canterbury Road operates at an overall LOS E in both peak hours. The mainline eastbound and westbound approaches operate at LOS C or worse during both peak hours with queues that are in excess of 300 feet during the AM peak hour and 500 feet during the PM peak hour. The southbound approach has queues in excess of 200 feet during both peak hours, which indicates that queues from Ivy Road are impacting Old Ivy Road on the western end.

At the unsignalized intersection of Old Ivy Road and the US Route 29/250 Off-Ramp, the eastbound and westbound approaches continue to operate at LOS F during both peak hours with queues in excess of 100 feet during both peak hours. Although the southbound approach operates at LOS A during both peak hours, the maximum queue is 1,163 feet in the AM peak and 1,150 feet in the PM peak due to the operations of the Ivy Road at Canterbury Road signal.

At the unsignalized intersection of Old Ivy Road and Faulconer Road, the southbound approach operates at LOS F in the AM and PM peaks. In the southbound direction the maximum queue is 280 feet in the AM peak and 218 feet in the PM peak. The eastbound and westbound approaches of Old Ivy Road operate at LOS A during both peak hours.

At the unsignalized intersection of Old Ivy Road at the US Route 29/250 On-Ramp, the mainline eastbound and westbound approaches operate at LOS A during both peak hours. The northbound approach operates at LOS A during the AM peak hour and at LOS F during the PM peak hour. However, the maximum queue on the northbound approach during either peak hour is 44 feet, or approximately 2 vehicles. There are no queuing issues at this intersection.

The signalized intersection of Ivy Road and Old Ivy Road operates at an overall LOS B in both the AM and PM peak hours. All movements and approaches operate at LOS C or better during both peak hours. The through maneuver queues will continue to block access to entrances along Ivy Road.

At the proposed site entrance, the southbound approach operates at a LOS B in the AM peak and LOS C in the PM peak. In the eastbound direction, there is a maximum queue of 40 feet in the AM peak and 70 feet in the PM peak. The mainline movements along Old Ivy Road at the proposed site entrance are not adversely impacted by the introduction of the site traffic and the queues will not impact through traffic.

Table 5-1: LOS, Delay, and Queue Length Summary 2025 Future Conditions

Intersection and Type of Control	Movement and Approach	Effective Turn Lane Storage (ft)	AM PEAK HOUR				PM PEAK HOUR			
			Delay [1] (sec/veh)	LOS [1]	SYNCHRO 95th Percentile Queue Length (ft)	SimTraffic Maximum Queue Length (ft)	Delay [1] (sec/veh)	LOS [1]	SYNCHRO 95th Percentile Queue Length (ft)	SimTraffic Maximum Queue Length (ft)
1.Ivy Road(E-W) at	EB Left		52.1	D	#498	525	71.6	E	#611	674
Cantebury Road/Route 846 (N-S)	EB Thru		18.8	B	499	404	19.0	B	493	446
Signalized	EB Right	450	10.2	B	0	28	10.5	B	0	29
	EB Approach		*31.6*	*C*	--	--	*40.5*	*D*	--	--
	WB Left	200	22.1	C	18	199	20.9	C	23	200
	WB Thru-Right		112.1	F	#904	638	113.7	F	#930	629
	WB Approach		*108.8*	*F*	--	--	*108.9*	*F*	--	--
	NB Left-Thru		55.4	E	60	68	55.2	E	51	74
	NB Right	180	53.8	D	0	43	53.9	D	0	55
	NB Approach		*54.7*	*D*	--	--	*54.5*	*D*	--	--
	SB Thru-Left		71.4	E	#196	213	61.7	E	141	212
	SB Right	75	56.9	E	#651	75	54.5	D	#653	76
	SB Approach		*59.5*	*E*	--	--	*55.6*	*E*	--	--
	Overall		**61.8**	**E**	**--**	**--**	**64.7**	**E**	**--**	**--**
2.Old Ivy Road (E-W) at	EB Thru-Right		75.7	F	110	108	34.4	*D*	35	92
29 Off Ramp/Route 846 (N-S)	*EB Approach*		*75.7*	*F*	--	--	*34.4*	*D*	--	--
Unsignalized	WB Left-Thru		544.2	F	285	141	140.1	F	205	180
	WB Approach		*544.2*	*F*	--	--	*140.1*	*F*	--	--
	NB L-T-R		0.7	A	2	71	0.9	A	3	79
	NB Approach		*0.7*	*A*	--	--	*0.9*	*A*	--	--
	SB L-T-R	190	1.5	A	5	1163	0.3	A	1	1150
	SB Approach		*1.5*	*A*	--	--	*0.3*	*A*	--	--
3.Old Ivy Road (E-W) at	EB Left-Thru		2.3	A	8	101	0.7	A	2	98
Faulconer Road/Commercial Ent	EB Right	150	0.0	A	0	0	0.0	A	0	0
Unsignalized	*EB Approach*		*2.3*	*A*	--	--	*0.7*	*A*	--	--
	WB L-T-R		0.0	A	0	3	0.0	A	0	4
	WB Approach		*0.0*	*A*	--	--	*0.0*	*A*	--	--
	NB L-T-R		21.8	C	0	25	13.2	B	1	30
	NB Approach		*21.8*	*C*	--	--	*13.2*	*B*	--	--
	SB Left-Thru		176.1	F	1	280	62.1	F	183	218
	SB Right	190	0.0	A	336	70	0.0	A	0	75
	SB Approach		*176.1*	*F*	--	--	*62.1*	*F*	--	--
4. Old Ivy Road (E-W) at	EB L-T-R		7.7	A	47	212	9.4	A	64	320
Route 29 On-Ramp/	*EB Approach*		*7.7*	*A*	--	--	*9.4*	*A*	--	--
Commercial Entrance (N-S)	WB Left-Thru		0.0	A	0	2	0.0	A	0	0
Unsignalized	WB Right	150	0.0	A	0	37	0.0	A	0	44
	WB Approach		*0.0*	A	--	--	*0.0*	*A*	--	--
	NB L-T-R		0.0	A	0	0	93.1	F	2	16
	NB Approach		*0.0*	*A*	--	--	*93.1*	*F*	--	--
5.Ivy Road(E-W) at	EB Left	250	9.2	A	48	82	9.2	A	38	87
Old Ivy Road (N-S)	EB Thru		16.6	B	#475	323	11.2	B	285	257
Signalized	*EB Approach*		*15.8*	*B*	--	--	*11.1*	*B*	--	--
	WB Thru		10.8	B	189	206	16.8	B	#519	349
	WB Right		8.9	A	34	72	8.6	A	50	111
	Wb Approach		*10.2*	*B*	--	--	*14.0*	*B*	--	--
	NB L-T-R		34.5	C	21	40	29.5	C	0	45
	NB Approach		*34.5*	*C*	--	--	*29.5*	*C*	--	--
	SB L-T-R		28.9	C	166	241	25.1	C	117	202
	SB Approach		*28.9*	*C*	--	--	*25.1*	*C*	--	--
	Overall		**16.8**	**B**	**--**	**--**	**14.8**	**B**	**--**	**--**
A. Old Ivy Road (E-W) at	EB Left	150	7.8	A	3	40	8.7	A	11	70
Site Entrance (N)	EB Thru		*0.0*	A	--	--	*0.0*	A	--	--
Unsignalized	*EB Approach*		*1.0*	*A*	--	--	*3.9*	*A*	--	--
	WB Thru		0.0	†	0	0	0.0	†	0	0
	WB Right	150	0.0	†	0	0	0.0	†	0	17
	WB Approach		*0.0*	*†*	--	--	*0.0*	*†*	--	--
	SB Left-Right		14.5	B	45	103	16.2	C	32	108
	SB Approach		*14.5*	*B*	--	--	*16.2*	*C*	--	--

[1] *Overall intersection LOS and delay reported for signalized intersections and roundabouts only.*

† SYNCHRO does not provide level of service or delay for unsignalized movements with no conflicting volumes.

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

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5.3 YEAR-TO-YEAR ANALYSIS COMPARISON

Table 5-2 provides a comparison of the 2021 existing, 2025 background, and 2025 future intersection LOS and delay, as provided throughout the report.

At the signalized intersection of Ivy Road and Canterbury Road, the overall intersection operates with multiple issues and delays under all 3 analyzed conditions. The additional site traffic will add delay to the southbound approach, the westbound through-right movement, and the eastbound left turn movement. Overall, this intersection operates poorly today and in background conditions and the introduction of site traffic will only marginally increase delays.

At the unsignalized intersection of Old Ivy Road and the US Route 29/250 Off-Ramp, the volume of traffic on the southbound approach from the US Route 29/250 Off-Ramp overwhelms all other movements at the intersection. Under existing and background conditions, the Old Ivy Road eastbound and westbound approaches operate with high delays and limited opportunities to enter the intersection. The addition of site traffic increases the delays for westbound Old Ivy Road to access Canterbury Road and the adjacent signal to US Route 250 (Ivy Road).

At the unsignalized intersection of Old Ivy Road and Faulconer Road, mainline Old Ivy Road in both directions operates well under all analyzed conditions. The northbound approach of Faulconer Road operates well but experiences much lower volumes, which contribute to the acceptable operations. The southbound approach of Faulconer Road experiences major delays during both the AM and PM peak hour during all 3 analyzed conditions. The heavy volume of traffic using the US Route 29/250 Off-Ramp and then traveling to Old Ivy Road via Faulconer Road are in conflict with the high through volumes on Old Ivy Road. The queues and delays for the southbound approach have the potential to create queuing and safety issues for the US Route 29/250 Off-Ramp under all 3 analyzed conditions.

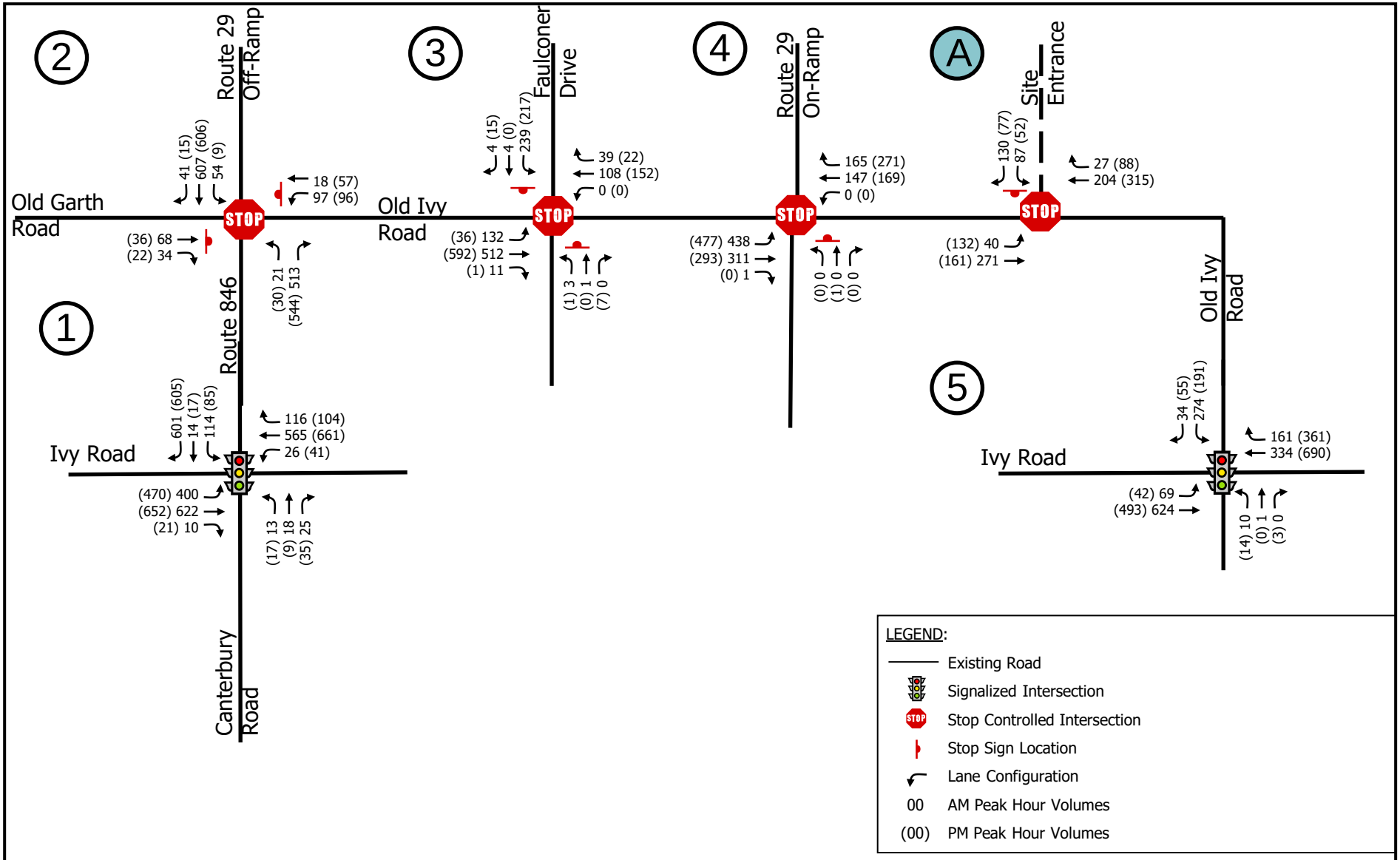
At the unsignalized intersection of Old Ivy Road and the US Route 29/250 On-Ramp, all 3 analyzed conditions show acceptable levels of service and minimal delays. The addition of site traffic does not impact the operations of the Old Ivy Road mainline approaches. The northbound approach from the parking lot of an adjacent development currently operates with a level of service F and continues to do so under background and future conditions. However, this approach has less than 5 vehicles, which is the basis for the high delay on that approach.

At the signalized intersection of Old Ivy Road and Ivy Road, there are no operational issues under existing, background, or future conditions. The addition of site traffic will not adversely affect the signal operations and there are minimal to no queuing issues observed. The signal will continue to operate with acceptable levels of service and delay under all analyzed conditions.

Table 5-2: LOS, Delay, and Queue Length Summary 2025 Future Conditions

Intersection and Type of Control	Movement and Approach	2021 Existing Conditions				2025 Background Conditions				2025 Total Conditions			
		AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR	
		Delay [1] (sec/veh)	LOS [1]	Delay [1] (sec/veh)	LOS [1]	Delay [1] (sec/veh)	LOS [1]	Delay [1] (sec/veh)	LOS [1]	Delay [1] (sec/veh)	LOS [1]	Delay [1] (sec/veh)	LOS [1]
1.Ivy Road(E-W) at	EB Left	58.4	E	56.8	E	56.9	E	53.8	D	52.1	D	71.6	E
Cantebury Road/Route 846 (N-S)	EB Thru	17.8	B	16.9	B	18.2	B	18.8	B	18.8	B	19.0	B
Signalized	EB Right	9.9	A	9.7	A	9.9	A	10.4	B	10.2	B	10.5	B
	EB Approach	*33.2*	*C*	*32.5*	*C*	*32.9*	*C*	*32.4*	*C*	*31.6*	*C*	*40.5*	*D*
	WB Left	19.1	B	18.5	B	20.0	B	20.4	C	22.1	C	20.9	C
	WB Thru-Right	64.5	E	58.4	E	80.6	F	92.2	F	112.1	F	113.7	F
	WB Approach	*62.8*	*E*	*56.2*	*E*	*78.4*	*E*	*88.3*	*F*	*108.8*	*F*	*108.9*	*F*
	NB Left-Thru	55.4	E	55.2	E	55.4	E	55.2	E	55.4	E	55.2	E
	NB Right	53.8	D	53.9	D	53.8	D	53.9	D	53.8	D	53.9	D
	NB Approach	*54.7*	*D*	*54.5*	*D*	*54.7*	*D*	*54.5*	*D*	*54.7*	*D*	*54.5*	*D*
	SB Thru-Left	58.9	E	67.3	E	59.9	E	56.8	E	71.4	E	61.7	E
	SB Right	54.7	D	53.9	D	56.6	E	50.2	D	56.9	E	54.5	D
	SB Approach	*55.3*	*E*	*55.6*	*E*	*57.1*	*E*	*51.0*	*D*	*59.5*	*E*	*55.6*	*E*
	Overall	**48.2**	**D**	**45.9**	**D**	**53.0**	**D**	**54.0**	**D**	**61.8**	**E**	**64.7**	**E**
2.Old Ivy Road (E-W) at	EB Thru-Right	87.3	F	27.5	D	69.8	F	30.2	*D*	75.7	F	34.4	*D*
29 Off Ramp/Route 846 (N-S)	*EB Approach*	*87.3*	*F*	*27.5*	*D*	*69.8*	*F*	*30.2*	*D*	*75.7*	*F*	*34.4*	*D*
Unsignalized	WB Left-Thru	167.7	F	47.1	E	108.1	F	58.7	*F*	544.2	F	140.1	F
	WB Approach	*167.7*	*F*	*47.1*	*E*	*108.1*	*F*	*58.7*	*F*	*544.2*	*F*	*140.1*	*F*
	NB L-T-R	0.7	A	0.9	A	0.7	A	0.9	*A*	0.7	A	0.9	A
	NB Approach	*0.7*	*A*	*0.9*	*A*	*0.7*	*A*	*0.9*	*A*	*0.7*	*A*	*0.9*	*A*
	SB L-T-R	1.5	A	0.3	A	1.5	A	0.3	A	1.5	A	0.3	A
	SB Approach	*1.5*	*A*	*0.3*	*A*	*1.5*	*A*	*0.3*	*A*	*1.5*	*A*	*0.3*	*A*
3.Old Ivy Road (E-W) at	EB Left-Thru	2.6	A	0.7	A	2.3	A	0.8	A	2.3	A	0.7	A
Faulconer Road/Commercial Ent	EB Right	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A
Unsignalized	*EB Approach*	*2.6*	*A*	*0.7*	*A*	*2.3*	*A*	*0.0*	*A*	*2.3*	*A*	*0.7*	*A*
	WB L-T-R	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A
	WB Approach	*0.0*	A	*0.0*	A	*0.0*	*A*	*0.0*	*A*	*0.0*	*A*	*0.0*	*A*
	NB L-T-R	25.3	D	11.7	B	19.4	C	12.3	B	21.8	C	13.2	B
	NB Approach	*25.3*	*D*	*11.7*	*B*	*19.4*	*C*	*12.3*	*B*	*21.8*	*C*	*13.2*	*B*
	SB Left-Thru	349.1	F	20.0	C	85.7	F	25.1	D	176.1	F	62.1	F
	SB Right	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A
	SB Approach	*349.1*	*F*	*20.0*	*C*	*85.7*	*F*	*25.1*	*D*	*176.1*	*F*	*62.1*	*F*
4. Old Ivy Road (E-W) at	EB L-T-R	7.4	A	8.8	A	7.0	A	9.1	A	7.7	A	9.4	A
Route 29 On-Ramp/	*EB Approach*	*7.4*	*A*	*8.8*	*A*	*7.0*	*A*	*9.1*	*A*	*7.7*	*A*	*9.4*	*A*
Commercial Entrance (N-S)	WB Left-Thru	0.0	†	0.0	†	0.0	*A*	0.0	†	0.0	A	0.0	A
Unsignalized	WB Right	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A
	WB Approach	*0.0*	†	*0.0*	†	*0.0*	*A*	*0.0*	†	*0.0*	A	*0.0*	*A*
	NB L-T-R	0.0	†	57.5	†	0.0	A	64.8	†	0.0	A	93.1	F
	NB Approach	*0.0*	*A*	*57.5*	*F*	*0.0*	*A*	*64.8*	*F*	*0.0*	*A*	*93.1*	*F*
5.Ivy Road(E-W) at	EB Left	7.9	A	8.0	A	7.9	A	8.3	A	9.2	A	9.2	A
Old Ivy Road (N-S)	EB Thru	13.3	B	10.1	B	13.7	B	10.3	B	16.6	B	11.2	B
Signalized	*EB Approach*	*12.7*	*B*	*9.9*	*A*	*13.1*	*B*	*10.2*	*B*	*15.8*	*B*	*11.1*	*B*
	WB Thru	9.2	A	14.5	B	9.2	A	15.1	B	10.8	B	16.8	B
	WB Right	7.6	A	7.5	A	7.6	A	7.7	A	8.9	A	8.6	A
	Wb Approach	*8.8*	*A*	*12.5*	*B*	*8.8*	*A*	*13.0*	*B*	*10.2*	*B*	*14.0*	*B*
	NB L-T-R	32.7	C	28.5	C	33.9	C	28.6	C	34.5	C	29.5	C
	NB Approach	*32.7*	*C*	*28.5*	*C*	*33.9*	*C*	*28.6*	*C*	*34.5*	*C*	*29.5*	*C*
	SB L-T-R	23.7	C	23.8	C	24.5	C	23.8	C	28.9	C	25.1	C
	SB Approach	*23.7*	*C*	*23.8*	*C*	*24.5*	*C*	*23.8*	*C*	*28.9*	*C*	*25.1*	*C*
	Overall	**13.3**	**B**	**13.2**	**B**	**13.6**	**B**	**13.5**	**B**	**16.8**	**B**	**14.8**	**B**

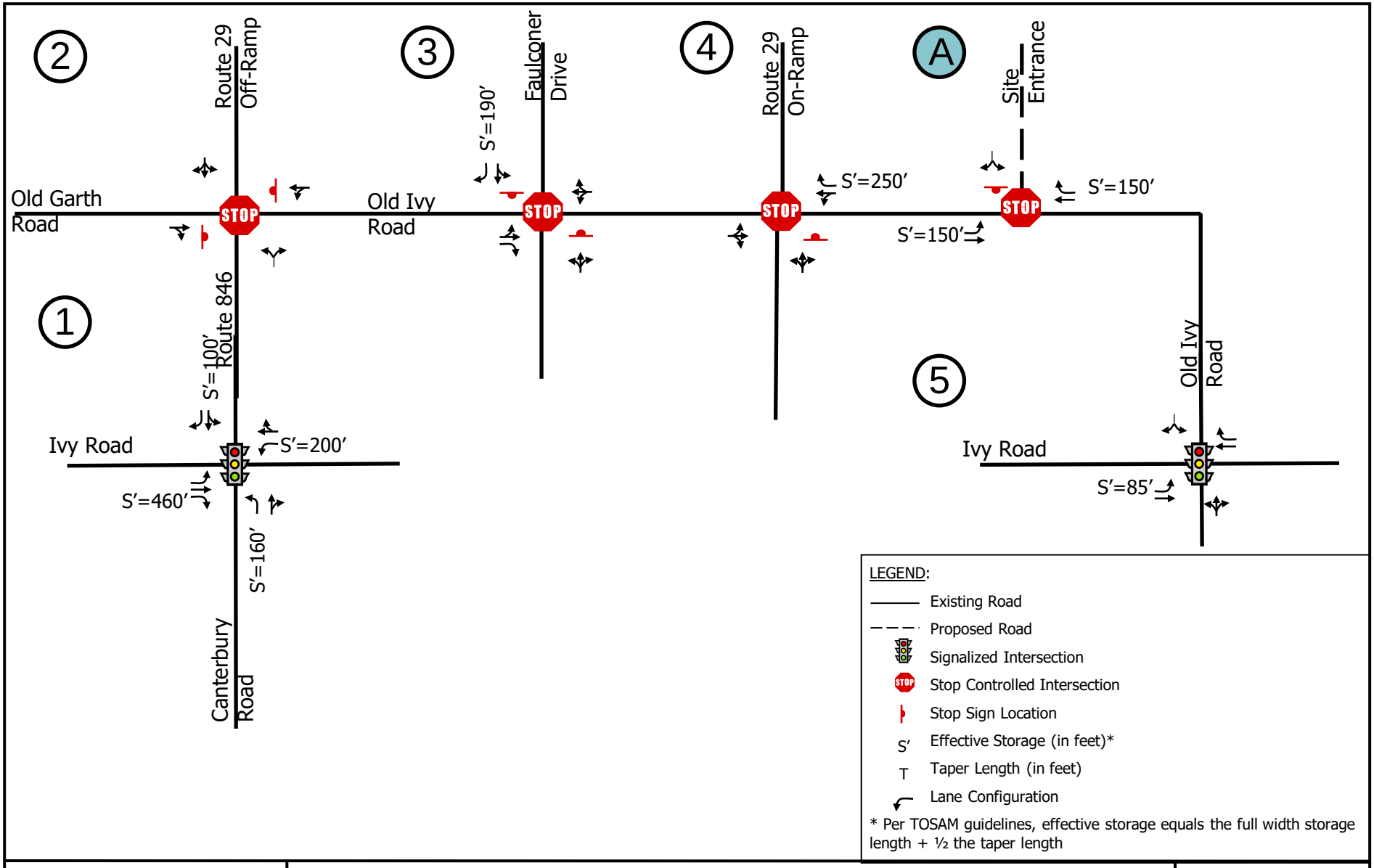
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2025 Future Volumes
Old Ivy Residences – Traffic Impact Analysis
Albemarle County, Virginia

Figure
5-1



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Future Geometry
Old Ivy Residences – Traffic Impact Analysis
Albemarle County, Virginia

Figure
5-2

6 TURN LANE WARRANT ANALYSIS

6.1 2025 FUTURE CONDITIONS ANALYSIS

Using 2025 future traffic volumes on Figure 5-1 and the appropriate turn lane warrant nomographs from Appendix F of the VDOT *Road Design Manual*, a turn lane warrant analysis was completed for the proposed site entrance on Old Ivy Road.

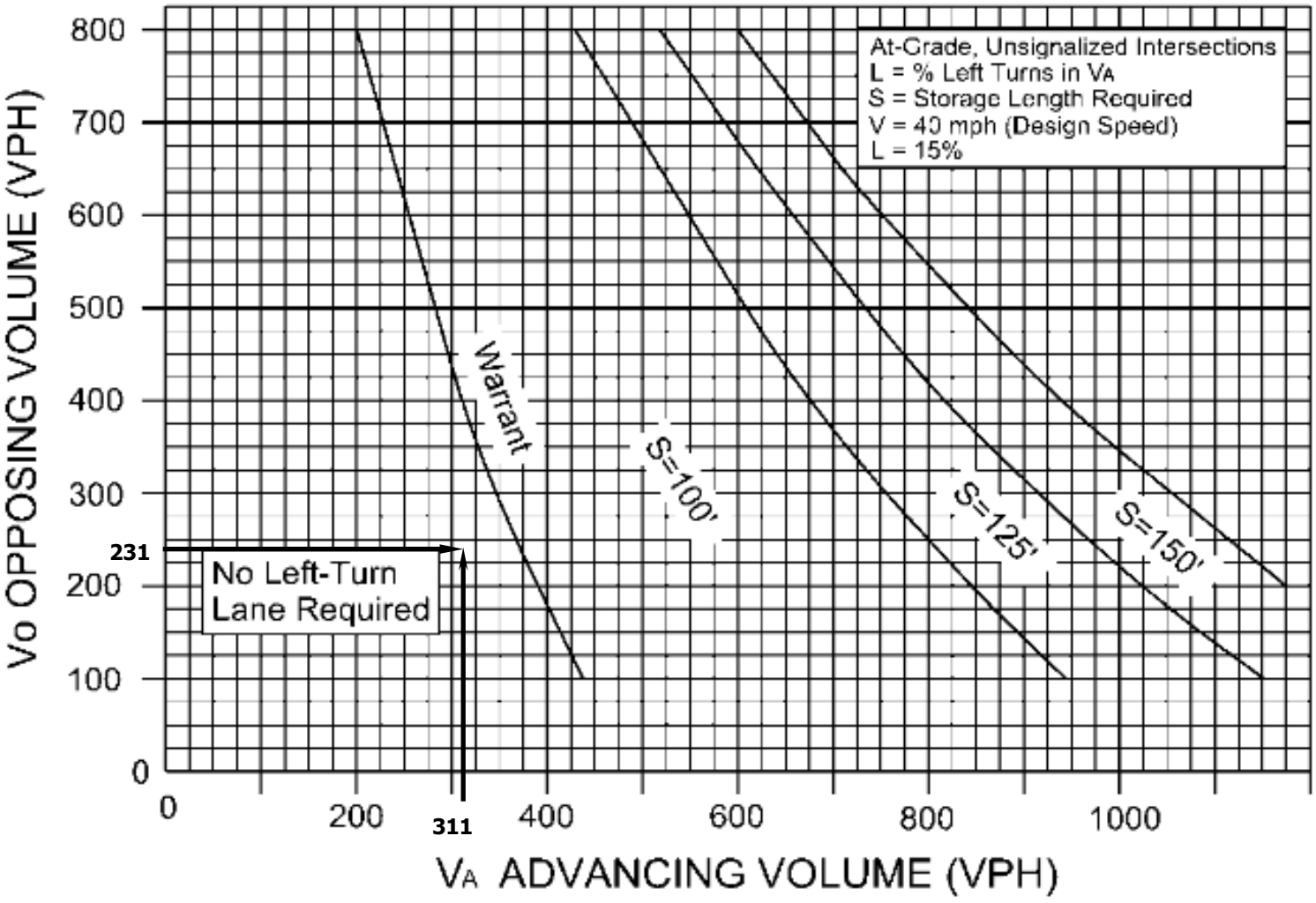
The turn lane warrants were completed for the eastbound left and the westbound right turning movements from Old Ivy Road into the proposed site entrance.

Under 2025 future conditions, both an eastbound left and a westbound right turn lane are warranted on Old Ivy Road at the proposed site entrance. The left and right turn lane warrants can be found in Figures 6-1 through 6-3.

Based on the posted speed limit (35 MPH) and the functional classification of Old Ivy Road (urban collector), a minimum taper of 100' and a minimum storage of 100' is required for all turn lanes per the VDOT *Road Design Manual*.

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WARRANT FOR LEFT-TURN STORAGE LANES
ON TWO-LANE HIGHWAYS (40 MPH)
FIGURE 3-7 VDOT ROAD DESIGN MANUAL APPENDIX F



LEGEND
AM Peak Hour
PM Peak Hour

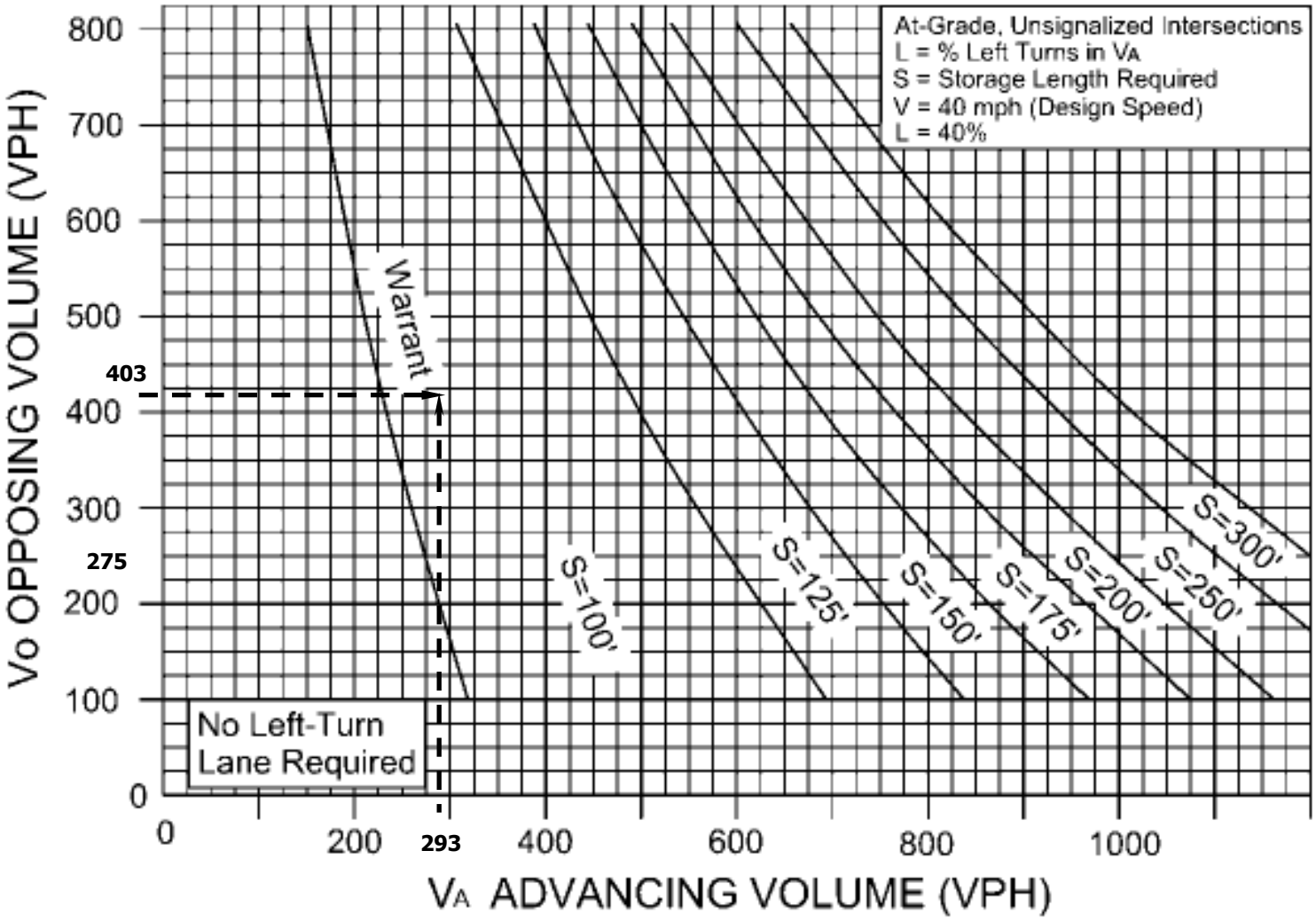
NO LEFT TURN LANE WARRANTED

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Left-Turn Lane Warrant
2025 Total Future Volume - AM Peak
EB Old Ivy Road at Proposed Site Entrance

Figure
6-1

WARRANT FOR LEFT-TURN STORAGE LANES
ON TWO-LANE HIGHWAYS (40 MPH)
FIGURE 3-10 VDOT ROAD DESIGN MANUAL APPENDIX F

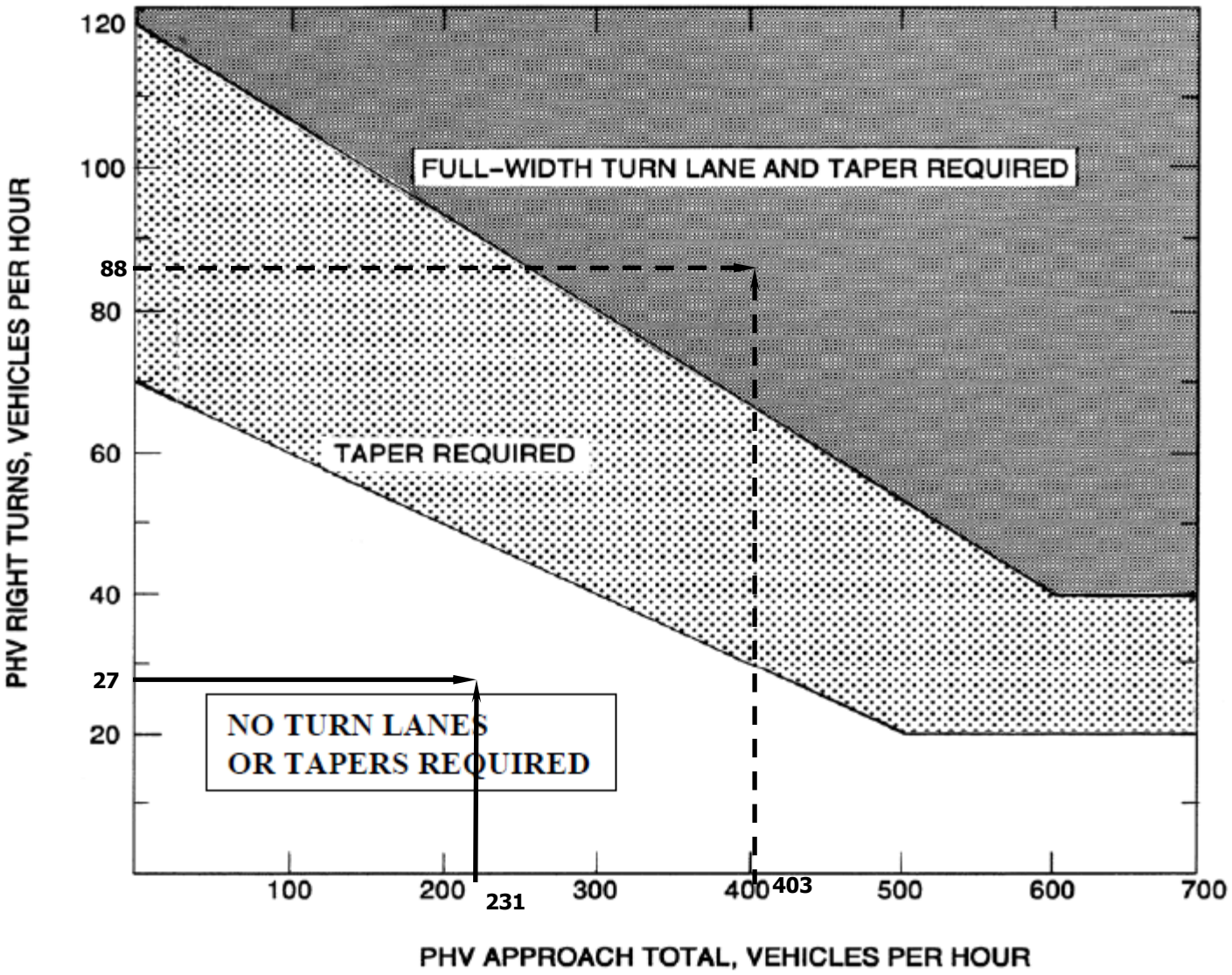


LEGEND
AM Peak Hour
PM Peak Hour

LEFT TURN LANE WARRANTED

TIMMONS GROUP YOUR VISION ACHIEVED THROUGH OURS.	Left-Turn Lane Warrant 2025 Total Future Volume - PM Peak EB Old Ivy Road at Proposed Site Entrance	Figure 6-2

GUIDELINES FOR RIGHT TURN TREATMENT (2-LANE HIGHWAY)
FIGURE 3-26 VDOT ROAD DESIGN MANUAL APPENDIX F



RIGHT TURN LANE AND TAPER WARRANTED

LEGEND
AM Peak Hour
PM Peak Hour

TIMMONS GROUP YOUR VISION ACHIEVED THROUGH OURS.	Right-Turn Lane Guideline 2025 Total Future Volume WB Old Ivy Road at Proposed Site Entrance	Figure 6-3

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7 CONCLUSIONS AND RECOMMENDATIONS

7.1 STUDY FINDINGS

Based on the operational analyses the following is offered:

- Under the 2021 existing and 2025 background conditions:
    - The signalized intersection of Ivy Road and Canterbury Road operates at an overall LOS D in the AM and PM peaks, with queues in both mainline approaches and the southbound approach that create access issues to nearby entrances and intersections.
    - At the unsignalized intersection of Old Ivy Road and US Route 29/250 Off-Ramp, the combination of queues from the Ivy Road/Canterbury Road signal and the high volume from the US Route 29/250 Off-Ramp block access for the eastbound and westbound movements of Old Ivy Road, effectively creating a 4-way stop intersection. The US Route 29/250 Off Ramp experiences queues that extend to mainline US Route 29/250.
    - The unsignalized intersection of Old Ivy Road and Faulconer Road sees queuing issues for southbound traffic attempting to make a left onto Old Ivy Road during both peak hours. The queues at Old Ivy Road extend downstream into the US Route 29/250 Off-Ramp, which could create safety and operational issues on the ramp.
    - The unsignalized intersection of Old Ivy Road at the US Route 29/250 On-Ramp does not have any operational or queuing issues of note, with maximum queues of approximately 300' in the EB direction which do not interfere with other intersections or access points.
    - The signalized intersection of Ivy Road and Old Ivy Road operates at an overall LOS B in both the AM and PM peak. The only queuing issues noted are for through movement queues blocking access to nearby commercial entrances.
    - On either end of the study corridor, there are narrow railroad bridges over Old Ivy Road that severely limit the ability to widen the roadway and sometimes require vehicles to operate as if there were only a single lane. This constraint impacts the intersections of Old Ivy Road at Ivy Road, Old Ivy Road at US Route 29/250 Off-Ramp, and Ivy Road at Canterbury Road.

- Under 2025 total future conditions with the traffic from the proposed Old Ivy Road Development:
    - Overall, all existing intersections see an increase in delays and queuing with the addition of the proposed site traffic.
    - The signalized intersection of Ivy Road and Canterbury Road continues to create operational issues for the US Route 29/250 Off-Ramp, Old Ivy Road, and Faulconer Road. Without improvements to the signalized intersection or the off-ramp, operations on Old Ivy Road will not improve.
    - At the unsignalized intersection of Old Ivy Road at the US Route 29/250 On-Ramp, the additional site traffic does not significantly increase delays along Old Ivy Road.
    - At the signalized intersection of Old Ivy Road and Ivy Road, the increased traffic volumes do not significantly change the operations of the existing signal.
    - The proposed site entrance does not introduce any queueing or delays for mainline Old Ivy Road and the proposed turn lanes can fully accommodate the site-generated traffic.

7.2 RECOMMENDATIONS

In order to accommodate the increased traffic volumes associated with the proposed Old Ivy Residences residential development, the following operational and capacity improvements are recommended:

1. Install an eastbound left turn lane on Old Ivy Road at the proposed site entrance, minimum 100' storage and 100' taper.

2. Install a westbound right turn lane on Old Ivy Road at the proposed site entrance, minimum 100' storage and 100' taper.

3. Install a westbound right turn lane on Old Ivy Road at the US Route 29/250 on-ramp, minimum 100' storage and 100' taper.

All recommended improvements are on Old Ivy Road across the frontage of property controlled by the development of Old Ivy Residences. The proposed improvements are expected to be constructable within existing right-of-way and on the development frontage.

Appendix A

Traffic Counts

Data Collection Group

LSmith@DataCollectionGroup.net

File Name : Canterbury and Ivy
Site Code :
Start Date : 5/6/2021
Page No : 1

Groups Printed- Passenger Veh - Trucks

	Old Garth From North					Ivy From East					Canterbury From South					Ivy From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	71	1	19	0	91	12	49	2	0	63	0	1	1	0	2	0	82	39	0	121	277
07:15 AM	59	0	16	0	75	15	59	0	0	74	2	1	0	0	3	0	80	65	0	145	297
07:30 AM	84	1	9	0	94	27	115	2	0	144	1	2	1	0	4	1	130	93	0	224	466
07:45 AM	140	3	8	0	151	24	129	3	0	156	4	2	2	0	8	3	145	94	0	242	557
Total	354	5	52	0	411	78	352	7	0	437	7	6	4	0	17	4	437	291	0	732	1597
08:00 AM	113	2	30	0	145	32	117	6	0	155	3	3	3	0	9	2	175	101	0	278	587
08:15 AM	127	3	27	0	157	26	117	2	0	145	6	6	1	0	13	0	128	94	0	222	537
08:30 AM	128	1	9	0	138	16	122	5	0	143	5	5	6	0	16	2	101	59	0	162	459
08:45 AM	128	6	5	0	139	19	138	10	1	168	8	2	1	0	11	5	139	87	0	231	549
Total	496	12	71	0	579	93	494	23	1	611	22	16	11	0	49	9	543	341	0	893	2132
04:00 PM	146	2	26	0	174	20	157	4	0	181	4	1	2	0	7	2	163	84	1	250	612
04:15 PM	132	3	11	0	146	9	133	2	0	144	7	4	5	0	16	5	135	82	0	222	528
04:30 PM	126	5	10	0	141	12	140	7	0	159	8	2	2	0	12	4	141	115	0	260	572
04:45 PM	133	1	15	0	149	20	128	9	0	157	6	1	4	0	11	2	136	98	0	236	553
Total	537	11	62	0	610	61	558	22	0	641	25	8	13	0	46	13	575	379	1	968	2265
05:00 PM	101	3	16	0	120	18	149	15	0	182	9	3	5	0	17	7	151	70	1	229	548
05:15 PM	152	6	17	0	175	12	144	5	0	161	8	2	4	0	14	5	142	99	0	246	596
05:30 PM	115	3	5	0	123	7	129	8	0	144	7	3	5	1	16	2	122	95	0	219	502
05:45 PM	139	2	14	0	155	14	92	6	0	112	2	3	4	0	9	0	100	70	0	170	446
Total	507	14	52	0	573	51	514	34	0	599	26	11	18	1	56	14	515	334	1	864	2092
Grand Total	1894	42	237	0	2173	283	1918	86	1	2288	80	41	46	1	168	40	2070	1345	2	3457	8086
Apprch %	87.2	1.9	10.9	0		12.4	83.8	3.8	0		47.6	24.4	27.4	0.6		1.2	59.9	38.9	0.1		
Total %	23.4	0.5	2.9	0	26.9	3.5	23.7	1.1	0	28.3	1	0.5	0.6	0	2.1	0.5	25.6	16.6	0	42.8	
Passenger Veh	1848	42	231	0	2121	280	1856	84	1	2221	77	41	45	1	164	40	2023	1312	2	3377	7883
% Passenger Veh	97.6	100	97.5	0	97.6	98.9	96.8	97.7	100	97.1	96.2	100	97.8	100	97.6	100	97.7	97.5	100	97.7	97.5
Trucks	46	0	6	0	52	3	62	2	0	67	3	0	1	0	4	0	47	33	0	80	203
% Trucks	2.4	0	2.5	0	2.4	1.1	3.2	2.3	0	2.9	3.8	0	2.2	0	2.4	0	2.3	2.5	0	2.3	2.5

Data Collection Group

LSmith@DataCollectionGroup.net

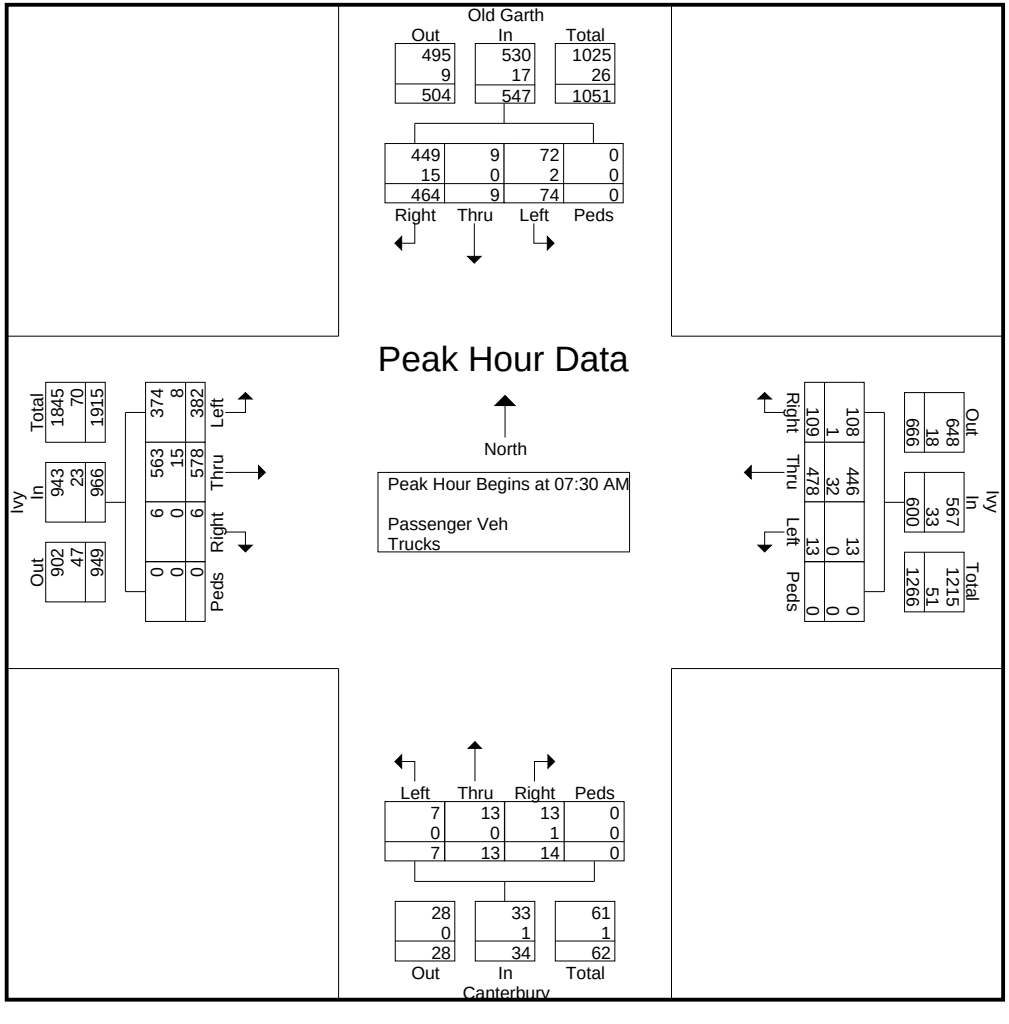
File Name : Canterbury and Ivy
Site Code :
Start Date : 5/6/2021
Page No : 2

	Old Garth From North					Ivy From East					Canterbury From South					Ivy From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	84	1	9	0	94	27	115	2	0	144	1	2	1	0	4	1	130	93	0	224	466
07:45 AM	**140**	**3**	8	0	151	24	**129**	3	0	**156**	4	2	2	0	8	**3**	145	94	0	242	557
08:00 AM	113	2	**30**	0	145	**32**	117	**6**	0	155	3	3	**3**	0	9	2	**175**	**101**	0	**278**	**587**
08:15 AM	127	3	27	0	**157**	26	117	2	0	145	**6**	**6**	1	0	**13**	0	128	94	0	222	537
Total Volume	464	9	74	0	547	109	478	13	0	600	14	13	7	0	34	6	578	382	0	966	2147
% App. Total	84.8	1.6	13.5	0		18.2	79.7	2.2	0		41.2	38.2	20.6	0		0.6	59.8	39.5	0		
PHF	.829	.750	.617	.000	.871	.852	.926	.542	.000	.962	.583	.542	.583	.000	.654	.500	.826	.946	.000	.869	.914
Passenger Veh	449	9	72	0	530	108	446	13	0	567	13	13	7	0	33	6	563	374	0	943	2073
% Passenger Veh	96.8	100	97.3	0	96.9	99.1	93.3	100	0	94.5	92.9	100	100	0	97.1	100	97.4	97.9	0	97.6	96.6
Trucks	15	0	2	0	17	1	32	0	0	33	1	0	0	0	1	0	15	8	0	23	74
% Trucks	3.2	0	2.7	0	3.1	0.9	6.7	0	0	5.5	7.1	0	0	0	2.9	0	2.6	2.1	0	2.4	3.4

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File Name : Canterbury and Ivy
Site Code :
Start Date : 5/6/2021
Page No : 3



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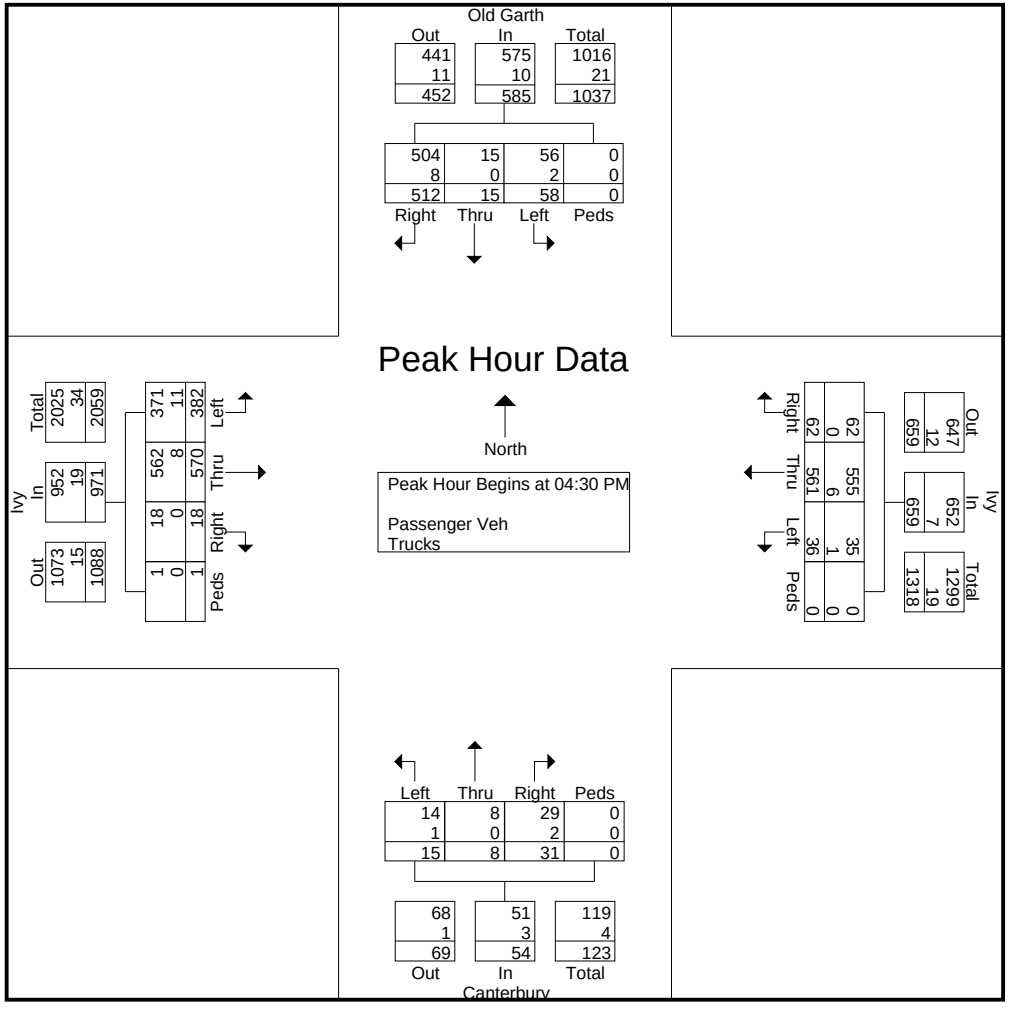
File Name : Canterbury and Ivy
Site Code :
Start Date : 5/6/2021

	Old Garth From North					Ivy From East					Canterbury From South					Ivy From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	126	5	10	0	141	12	140	7	0	159	8	2	2	0	12	4	141	**115**	0	**260**	572
04:45 PM	133	1	15	0	149	**20**	128	9	0	157	6	1	4	0	11	2	136	98	0	236	553
05:00 PM	101	3	16	0	120	18	**149**	**15**	0	**182**	**9**	**3**	**5**	0	**17**	**7**	**151**	70	**1**	229	548
05:15 PM	**152**	**6**	**17**	0	**175**	12	144	5	0	161	8	2	4	0	14	5	142	99	0	246	**596**
Total Volume	512	15	58	0	585	62	561	36	0	659	31	8	15	0	54	18	570	382	1	971	2269
% App. Total	87.5	2.6	9.9	0		9.4	85.1	5.5	0		57.4	14.8	27.8	0		1.9	58.7	39.3	0.1		
PHF	.842	.625	.853	.000	.836	.775	.941	.600	.000	.905	.861	.667	.750	.000	.794	.643	.944	.830	.250	.934	.952
Passenger Veh	504	15	56	0	575	62	555	35	0	652	29	8	14	0	51	18	562	371	1	952	2230
% Passenger Veh	98.4	100	96.6	0	98.3	100	98.9	97.2	0	98.9	93.5	100	93.3	0	94.4	100	98.6	97.1	100	98.0	98.3
Trucks	8	0	2	0	10	0	6	1	0	7	2	0	1	0	3	0	8	11	0	19	39
% Trucks	1.6	0	3.4	0	1.7	0	1.1	2.8	0	1.1	6.5	0	6.7	0	5.6	0	1.4	2.9	0	2.0	1.7

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File Name : Canterbury and Ivy
Site Code :
Start Date : 5/6/2021
Page No : 5



Data Collection Group

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File Name : Cantebury and Old Ivy
Site Code :
Start Date : 5/6/2021
Page No : 1

Groups Printed- Passenger Veh - Trucks

	29.250 SB Off Ramp/Canterbury From North					Old Ivy From East					Canterbury From South					Old Garth From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	1	84	2	0	87	0	1	5	0	6	54	0	3	0	57	5	3	0	0	8	158
07:15 AM	1	70	3	0	74	0	0	7	0	7	78	0	2	0	80	2	9	0	0	11	172
07:30 AM	0	85	7	0	92	0	0	3	0	3	118	0	3	0	121	4	12	0	0	16	232
07:45 AM	5	148	6	0	159	0	1	3	0	4	116	0	4	0	120	5	12	0	0	17	300
Total	7	387	18	0	412	0	2	18	0	20	366	0	12	0	378	16	36	0	0	52	862
08:00 AM	10	127	35	0	172	0	3	8	0	11	138	0	2	0	140	7	19	0	0	26	349
08:15 AM	16	146	11	0	173	0	7	7	0	14	116	0	9	0	125	10	10	0	0	20	332
08:30 AM	5	124	1	0	130	0	4	8	0	12	77	0	4	0	81	4	14	0	0	18	241
08:45 AM	4	133	0	0	137	0	1	5	0	6	100	0	3	0	103	9	16	0	0	25	271
Total	35	530	47	0	612	0	15	28	0	43	431	0	18	0	449	30	59	0	0	89	1193
04:00 PM	10	147	3	0	160	0	5	10	0	15	101	0	9	0	110	5	7	0	0	12	297
04:15 PM	5	140	1	0	146	0	5	10	0	15	86	0	6	0	92	7	8	0	0	15	268
04:30 PM	3	124	1	0	128	0	18	13	0	31	121	0	9	0	130	3	7	0	0	10	299
04:45 PM	0	137	3	0	140	0	12	13	0	25	113	0	5	0	118	5	10	0	0	15	298
Total	18	548	8	0	574	0	40	46	0	86	421	0	29	0	450	20	32	0	0	52	1162
05:00 PM	2	114	4	0	120	0	7	18	0	25	81	0	9	0	90	2	6	0	0	8	243
05:15 PM	8	154	0	1	163	0	13	6	0	19	102	0	3	0	105	9	9	0	0	18	305
05:30 PM	8	125	1	0	134	0	7	7	0	14	103	0	3	0	106	4	4	0	0	8	262
05:45 PM	5	132	2	0	139	0	10	11	0	21	84	0	7	0	91	4	4	0	0	8	259
Total	23	525	7	1	556	0	37	42	0	79	370	0	22	0	392	19	23	0	0	42	1069
Grand Total	83	1990	80	1	2154	0	94	134	0	228	1588	0	81	0	1669	85	150	0	0	235	4286
Apprch %	3.9	92.4	3.7	0		0	41.2	58.8	0		95.1	0	4.9	0		36.2	63.8	0	0		
Total %	1.9	46.4	1.9	0	50.3	0	2.2	3.1	0	5.3	37.1	0	1.9	0	38.9	2	3.5	0	0	5.5	
Passenger Veh	82	1944	80	1	2107	0	94	128	0	222	1559	0	81	0	1640	83	150	0	0	233	4202
% Passenger Veh	98.8	97.7	100	100	97.8	0	100	95.5	0	97.4	98.2	0	100	0	98.3	97.6	100	0	0	99.1	98
Trucks	1	46	0	0	47	0	0	6	0	6	29	0	0	0	29	2	0	0	0	2	84
% Trucks	1.2	2.3	0	0	2.2	0	0	4.5	0	2.6	1.8	0	0	0	1.7	2.4	0	0	0	0.9	2

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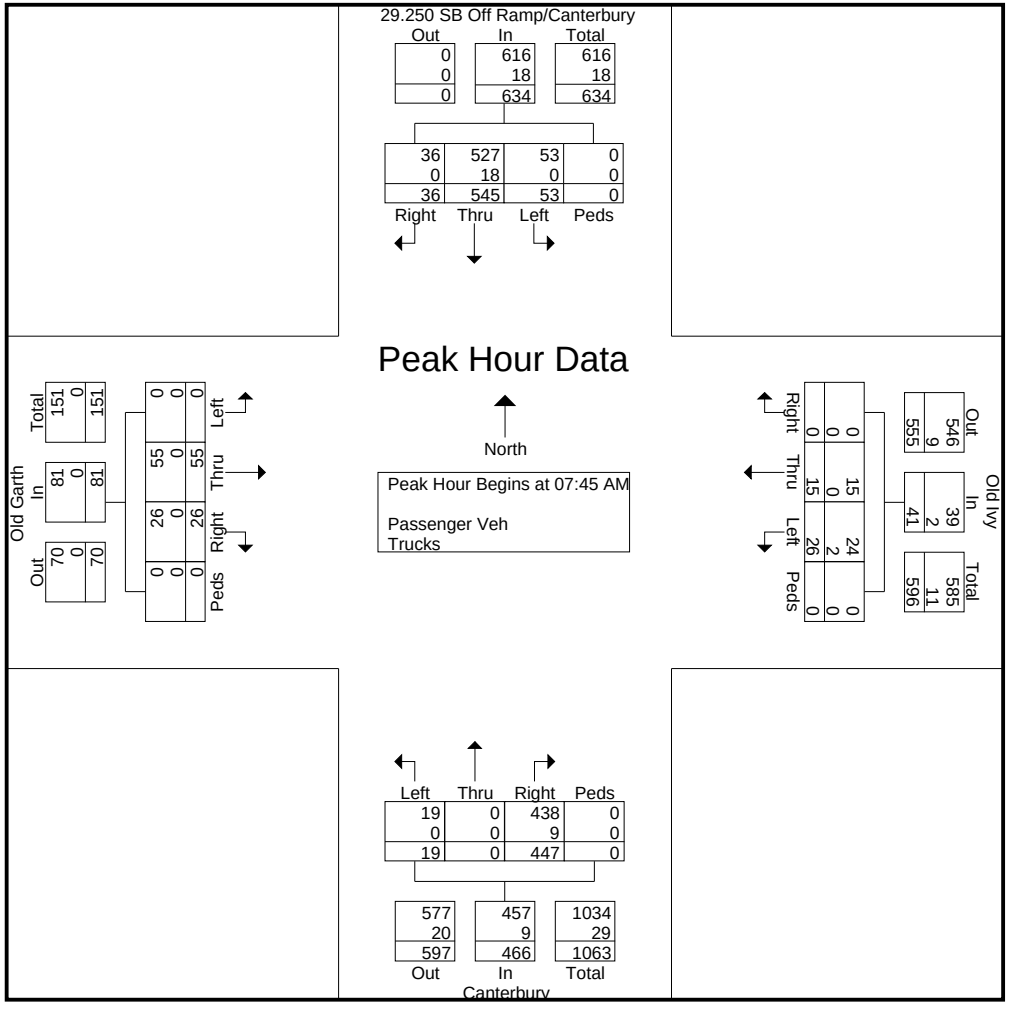
File Name : Cantebury and Old Ivy
Site Code :
Start Date : 5/6/2021
Page No : 2

	29.250 SB Off Ramp/Canterbury From North					Old Ivy From East					Canterbury From South					Old Garth From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	5	**148**	6	0	159	0	1	3	0	4	116	0	4	0	120	5	12	0	0	17	300
08:00 AM	10	127	**35**	0	172	0	3	**8**	0	11	**138**	0	2	0	**140**	7	**19**	0	0	**26**	**349**
08:15 AM	**16**	146	11	0	**173**	0	**7**	7	0	**14**	116	0	**9**	0	125	**10**	10	0	0	20	332
08:30 AM	5	124	1	0	130	0	4	8	0	12	77	0	4	0	81	4	14	0	0	18	241
Total Volume	36	545	53	0	634	0	15	26	0	41	447	0	19	0	466	26	55	0	0	81	1222
% App. Total	5.7	86	8.4	0		0	36.6	63.4	0		95.9	0	4.1	0		32.1	67.9	0	0		
PHF	.563	.921	.379	.000	.916	.000	.536	.813	.000	.732	.810	.000	.528	.000	.832	.650	.724	.000	.000	.779	.875
Passenger Veh	36	527	53	0	616	0	15	24	0	39	438	0	19	0	457	26	55	0	0	81	1193
% Passenger Veh	100	96.7	100	0	97.2	0	100	92.3	0	95.1	98.0	0	100	0	98.1	100	100	0	0	100	97.6
Trucks	0	18	0	0	18	0	0	2	0	2	9	0	0	0	9	0	0	0	0	0	29
% Trucks	0	3.3	0	0	2.8	0	0	7.7	0	4.9	2.0	0	0	0	1.9	0	0	0	0	0	2.4

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File Name : Cantebury and Old Ivy
Site Code :
Start Date : 5/6/2021
Page No : 3



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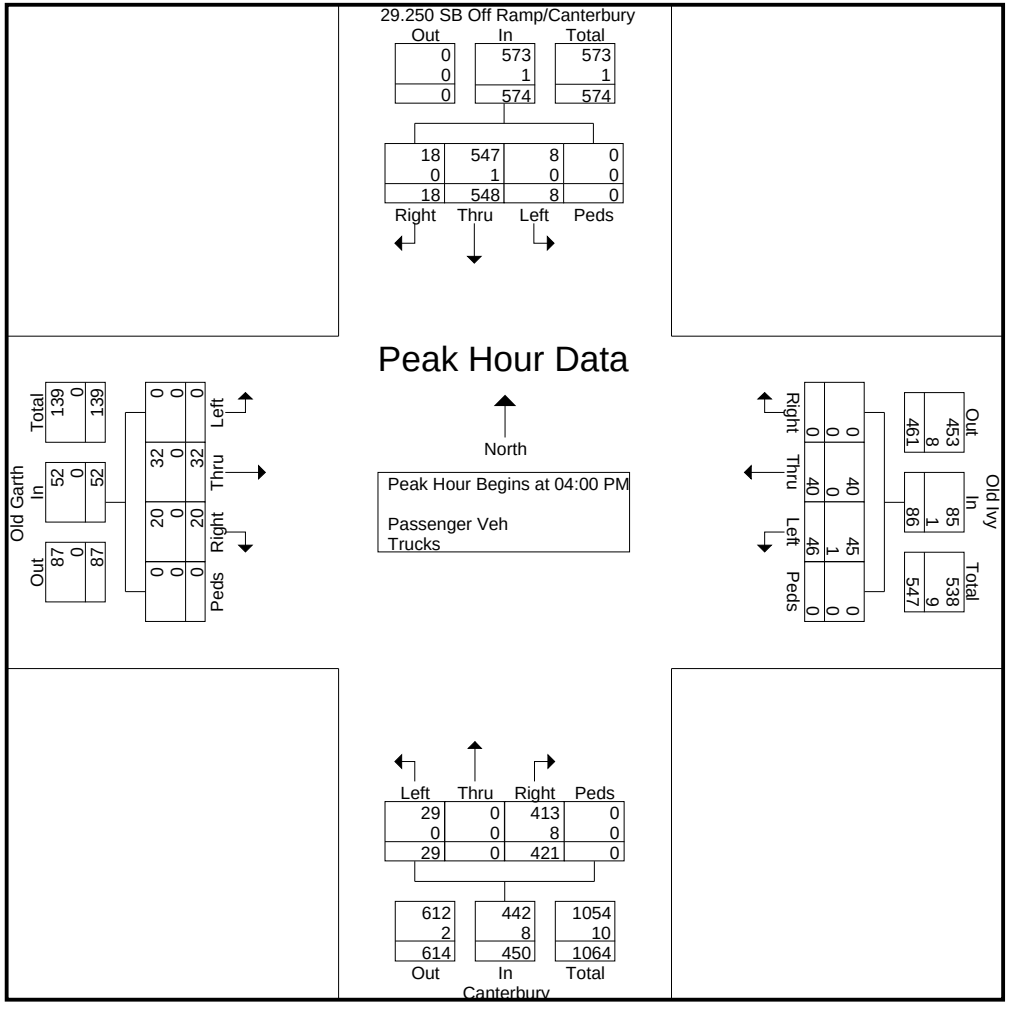
File Name : Cantebury and Old Ivy
Site Code :
Start Date : 5/6/2021

	29.250 SB Off Ramp/Canterbury From North					Old Ivy From East					Canterbury From South					Old Garth From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	**10**	**147**	**3**	0	**160**	0	5	10	0	15	101	0	**9**	0	110	5	7	0	0	12	297
04:15 PM	5	140	1	0	146	0	5	10	0	15	86	0	6	0	92	**7**	8	0	0	**15**	268
04:30 PM	3	124	1	0	128	0	**18**	**13**	0	**31**	**121**	0	9	0	**130**	3	7	0	0	10	**299**
04:45 PM	0	137	3	0	140	0	12	13	0	25	113	0	5	0	118	5	**10**	0	0	15	298
Total Volume	18	548	8	0	574	0	40	46	0	86	421	0	29	0	450	20	32	0	0	52	1162
% App. Total	3.1	95.5	1.4	0		0	46.5	53.5	0		93.6	0	6.4	0		38.5	61.5	0	0		
PHF	.450	.932	.667	.000	.897	.000	.556	.885	.000	.694	.870	.000	.806	.000	.865	.714	.800	.000	.000	.867	.972
Passenger Veh	18	547	8	0	573	0	40	45	0	85	413	0	29	0	442	20	32	0	0	52	1152
% Passenger Veh	100	99.8	100	0	99.8	0	100	97.8	0	98.8	98.1	0	100	0	98.2	100	100	0	0	100	99.1
Trucks	0	1	0	0	1	0	0	1	0	1	8	0	0	0	8	0	0	0	0	0	10
% Trucks	0	0.2	0	0	0.2	0	0	2.2	0	1.2	1.9	0	0	0	1.8	0	0	0	0	0	0.9

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File Name : Cantebury and Old Ivy
Site Code :
Start Date : 5/6/2021
Page No : 5



Data Collection Group

757.478.6761
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File Name : Old Ivy and Faulconer
Site Code : 00033668
Start Date : 5/6/2021
Page No : 1

Groups Printed- Passenger Veh - Trucks

	Faulconer From North					Old Ivy From East					Driveway From South					Old Ivy From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	0	1	8	0	9	2	6	0	0	8	0	0	0	0	0	0	59	2	0	61	78
07:15 AM	0	1	12	0	13	5	7	0	0	12	0	0	0	0	0	1	82	7	0	90	115
07:30 AM	1	0	7	0	8	10	5	0	0	15	1	0	0	0	1	3	90	36	0	129	153
07:45 AM	0	3	37	0	40	17	6	0	0	23	0	0	0	0	0	2	87	51	0	140	203
Total	1	5	64	0	70	34	24	0	0	58	1	0	0	0	1	6	318	96	0	420	549
08:00 AM	2	1	57	0	60	22	8	0	0	30	0	0	0	0	0	2	129	64	0	195	285
08:15 AM	0	2	72	0	74	5	15	0	0	20	0	0	0	0	0	4	97	30	0	131	225
08:30 AM	1	1	32	0	34	5	10	0	0	15	0	0	3	0	3	3	87	8	0	98	150
08:45 AM	1	0	30	0	31	2	4	0	0	6	0	1	0	0	1	1	113	4	0	118	156
Total	4	4	191	0	199	34	37	0	0	71	0	1	3	0	4	10	426	106	0	542	816
*** BREAK ***																					
04:00 PM	1	0	52	0	53	6	12	1	0	19	3	0	4	0	7	0	101	12	0	113	192
04:15 PM	0	0	45	0	45	3	16	0	0	19	3	0	0	0	3	2	90	4	0	96	163
04:30 PM	2	0	25	0	27	2	32	0	1	35	2	0	0	0	2	0	115	4	0	119	183
04:45 PM	3	0	23	0	26	5	22	0	0	27	0	0	1	0	1	1	111	7	0	119	173
Total	6	0	145	0	151	16	82	1	1	100	8	0	5	0	13	3	417	27	0	447	711
05:00 PM	6	0	33	0	39	7	19	0	0	26	3	0	0	0	3	0	93	6	0	99	167
05:15 PM	1	0	42	0	43	4	19	0	0	23	0	0	0	1	1	0	101	12	0	113	180
05:30 PM	1	1	26	0	28	3	11	0	0	14	1	0	0	0	1	0	104	4	0	108	151
05:45 PM	3	0	33	0	36	6	19	0	0	25	1	0	0	0	1	0	84	6	0	90	152
Total	11	1	134	0	146	20	68	0	0	88	5	0	0	1	6	0	382	28	0	410	650
Grand Total	22	10	534	0	566	104	211	1	1	317	14	1	8	1	24	19	1543	257	0	1819	2726
Apprch %	3.9	1.8	94.3	0		32.8	66.6	0.3	0.3		58.3	4.2	33.3	4.2		1	84.8	14.1	0		
Total %	0.8	0.4	19.6	0	20.8	3.8	7.7	0	0	11.6	0.5	0	0.3	0	0.9	0.7	56.6	9.4	0	66.7	
Passenger Veh	22	10	525	0	557	102	204	0	1	307	14	1	7	1	23	19	1505	256	0	1780	2667
% Passenger Veh	100	100	98.3	0	98.4	98.1	96.7	0	100	96.8	100	100	87.5	100	95.8	100	97.5	99.6	0	97.9	97.8
Trucks	0	0	9	0	9	2	7	1	0	10	0	0	1	0	1	0	38	1	0	39	59
% Trucks	0	0	1.7	0	1.6	1.9	3.3	100	0	3.2	0	0	12.5	0	4.2	0	2.5	0.4	0	2.1	2.2

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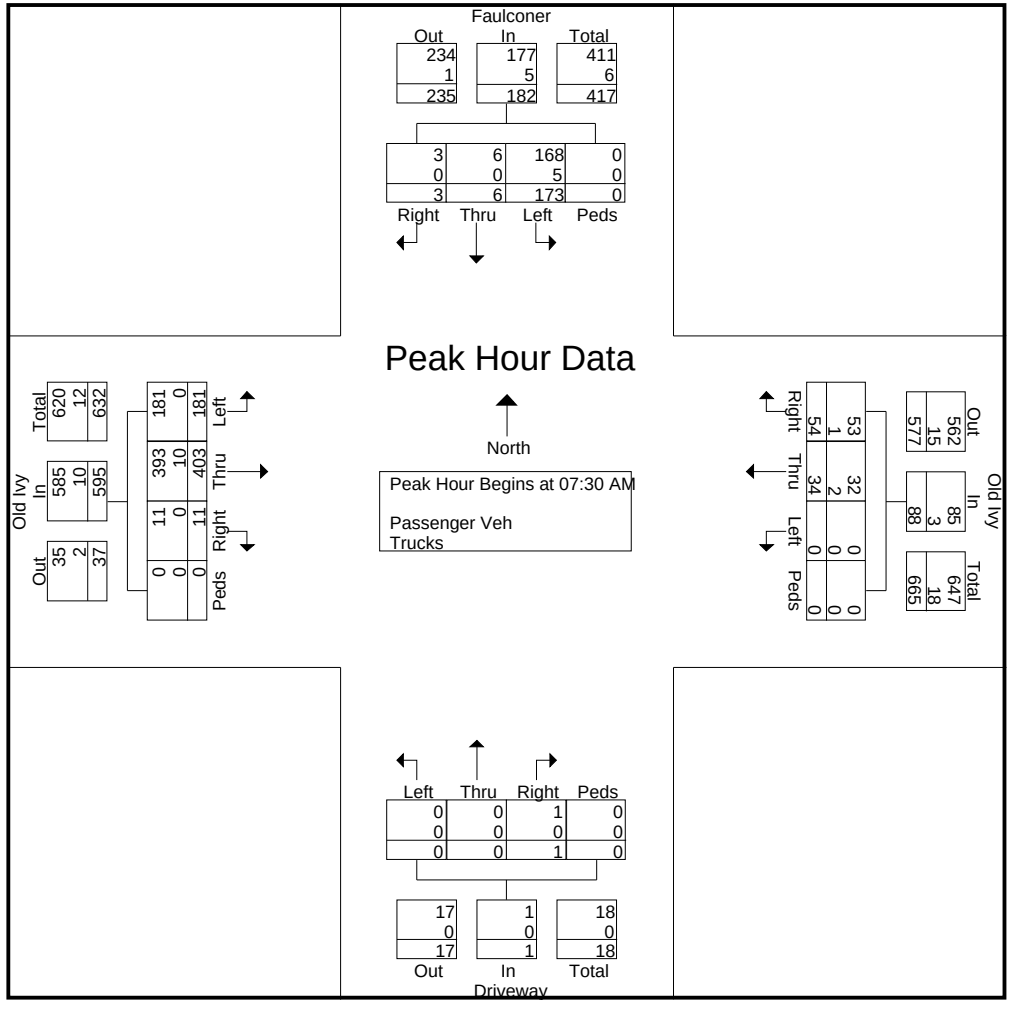
File Name : Old Ivy and Faulconer
Site Code : 00033668
Start Date : 5/6/2021

	Faulconer From North					Old Ivy From East					Driveway From South					Old Ivy From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	1	0	7	0	8	10	5	0	0	15	**1**	0	0	0	**1**	3	90	36	0	129	153
07:45 AM	0	**3**	37	0	40	17	6	0	0	23	0	0	0	0	0	2	87	51	0	140	203
08:00 AM	**2**	1	57	0	60	**22**	8	0	0	**30**	0	0	0	0	0	2	**129**	**64**	0	**195**	**285**
08:15 AM	0	2	**72**	0	**74**	5	**15**	0	0	20	0	0	0	0	0	**4**	97	30	0	131	225
Total Volume	3	6	173	0	182	54	34	0	0	88	1	0	0	0	1	11	403	181	0	595	866
% App. Total	1.6	3.3	95.1	0		61.4	38.6	0	0		100	0	0	0		1.8	67.7	30.4	0		
PHF	.375	.500	.601	.000	.615	.614	.567	.000	.000	.733	.250	.000	.000	.000	.250	.688	.781	.707	.000	.763	.760
Passenger Veh	3	6	168	0	177	53	32	0	0	85	1	0	0	0	1	11	393	181	0	585	848
% Passenger Veh	100	100	97.1	0	97.3	98.1	94.1	0	0	96.6	100	0	0	0	100	100	97.5	100	0	98.3	97.9
Trucks	0	0	5	0	5	1	2	0	0	3	0	0	0	0	0	0	10	0	0	10	18
% Trucks	0	0	2.9	0	2.7	1.9	5.9	0	0	3.4	0	0	0	0	0	0	2.5	0	0	1.7	2.1

Data Collection Group

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File Name : Old Ivy and Faulconer
Site Code : 00033668
Start Date : 5/6/2021
Page No : 3



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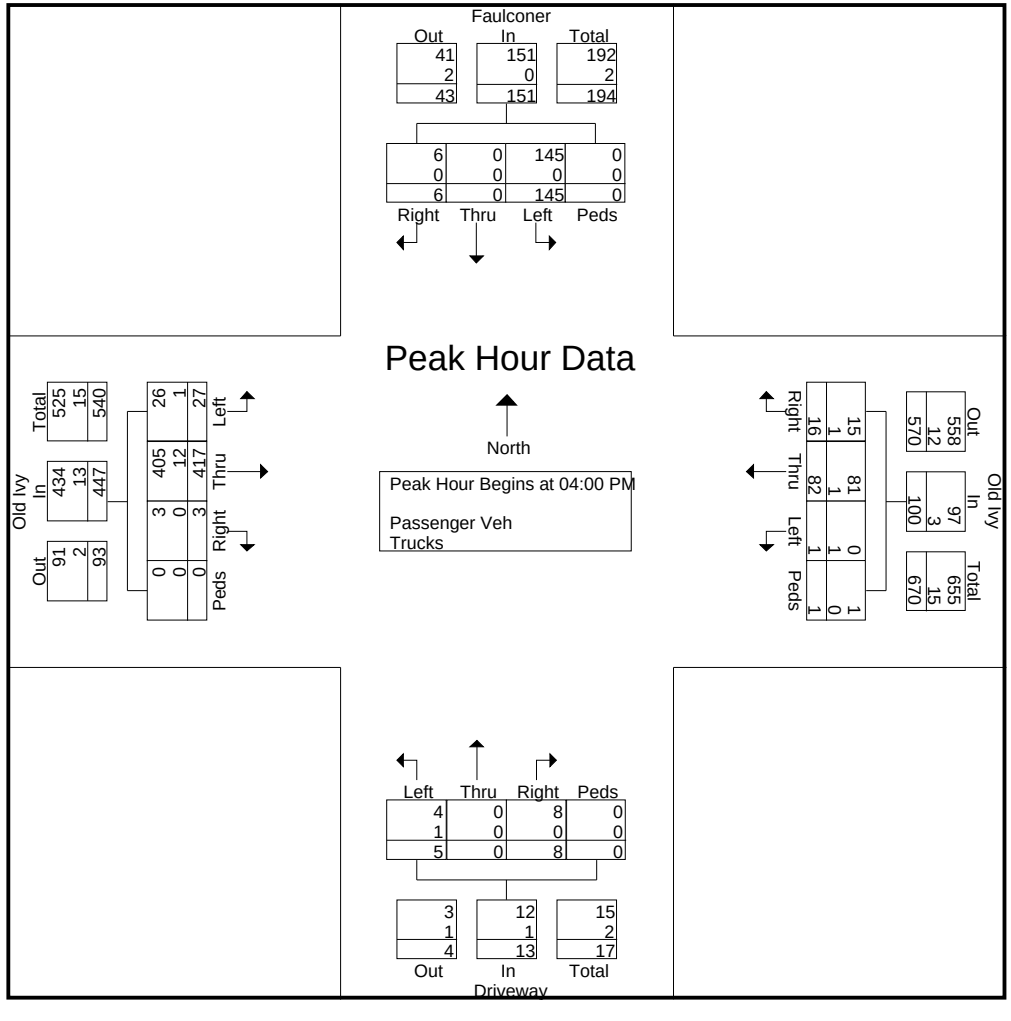
File Name : Old Ivy and Faulconer
Site Code : 00033668
Start Date : 5/6/2021

	Faulconer From North					Old Ivy From East					Driveway From South					Old Ivy From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	1	0	**52**	0	**53**	**6**	12	**1**	0	19	**3**	0	**4**	0	**7**	0	101	**12**	0	113	**192**
04:15 PM	0	0	45	0	45	3	16	0	0	19	3	0	0	0	3	**2**	90	4	0	96	163
04:30 PM	2	0	25	0	27	2	**32**	0	**1**	**35**	2	0	0	0	2	0	**115**	4	0	**119**	183
04:45 PM	**3**	0	23	0	26	5	22	0	0	27	0	0	1	0	1	1	111	7	0	119	173
Total Volume	6	0	145	0	151	16	82	1	1	100	8	0	5	0	13	3	417	27	0	447	711
% App. Total	4	0	96	0		16	82	1	1		61.5	0	38.5	0		0.7	93.3	6	0		
PHF	.500	.000	.697	.000	.712	.667	.641	.250	.250	.714	.667	.000	.313	.000	.464	.375	.907	.563	.000	.939	.926
Passenger Veh	6	0	145	0	151	15	81	0	1	97	8	0	4	0	12	3	405	26	0	434	694
% Passenger Veh	100	0	100	0	100	93.8	98.8	0	100	97.0	100	0	80.0	0	92.3	100	97.1	96.3	0	97.1	97.6
Trucks	0	0	0	0	0	1	1	1	0	3	0	0	1	0	1	0	12	1	0	13	17
% Trucks	0	0	0	0	0	6.3	1.2	100	0	3.0	0	0	20.0	0	7.7	0	2.9	3.7	0	2.9	2.4

Data Collection Group

757.478.6761
LSmith@DataCollectionGroup.net

File Name : Old Ivy and Faulconer
Site Code : 00033668
Start Date : 5/6/2021
Page No : 5



Data Collection Group

LSmith@DataCollectionGroup.net

File Name : Old Ivy and 29-250 NB On Ramp
Site Code :
Start Date : 5/6/2021
Page No : 1

Groups Printed- Passenger Veh - Trucks

	29/250 On Ramp From North					Old Ivy From East					Driveway From South					Old Ivy From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	9	8	0	0	17	0	0	0	0	0	2	14	52	0	68	85
07:15 AM	0	0	0	0	0	11	12	0	0	23	0	0	1	0	1	3	21	64	0	88	112
07:30 AM	0	0	0	0	0	6	14	0	0	20	0	0	0	0	0	0	21	77	0	98	118
07:45 AM	0	0	0	0	0	17	23	0	0	40	0	0	0	0	0	0	38	78	0	116	156
Total	0	0	0	0	0	43	57	0	0	100	0	0	1	0	1	5	94	271	0	370	471
08:00 AM	0	0	0	0	0	21	33	0	0	54	0	0	0	0	0	1	64	120	0	185	239
08:15 AM	0	0	0	0	0	21	20	0	0	41	0	0	0	0	0	0	70	104	0	174	215
08:30 AM	0	0	0	0	0	24	13	0	0	37	0	0	0	0	0	0	43	75	0	118	155
08:45 AM	0	0	0	0	0	21	6	0	0	27	0	0	0	0	0	0	59	84	0	143	170
Total	0	0	0	0	0	87	72	0	0	159	0	0	0	0	0	1	236	383	0	620	779
04:00 PM	0	0	0	0	0	56	19	0	0	75	0	0	0	0	0	0	37	115	0	152	227
04:15 PM	0	0	0	0	0	33	17	0	0	50	0	0	0	0	0	0	38	102	0	140	190
04:30 PM	0	0	0	0	0	46	35	0	0	81	0	0	0	1	1	0	26	127	0	153	235
04:45 PM	0	0	0	0	0	48	29	0	0	77	0	1	0	0	1	0	26	109	0	135	213
Total	0	0	0	0	0	183	100	0	0	283	0	1	0	1	2	0	127	453	0	580	865
05:00 PM	0	0	0	0	0	64	26	0	0	90	0	0	0	0	0	0	44	85	0	129	219
05:15 PM	0	0	0	1	1	45	24	0	0	69	0	0	0	1	1	0	45	95	0	140	211
05:30 PM	0	0	0	0	0	49	14	0	0	63	0	0	0	0	0	1	27	103	0	131	194
05:45 PM	0	0	0	0	0	42	24	0	0	66	0	0	0	0	0	0	38	80	0	118	184
Total	0	0	0	1	1	200	88	0	0	288	0	0	0	1	1	1	154	363	0	518	808
Grand Total	0	0	0	1	1	513	317	0	0	830	0	1	1	2	4	7	611	1470	0	2088	2923
Apprch %	0	0	0	100		61.8	38.2	0	0		0	25	25	50		0.3	29.3	70.4	0		
Total %	0	0	0	0	0	17.6	10.8	0	0	28.4	0	0	0	0.1	0.1	0.2	20.9	50.3	0	71.4	
Passenger Veh	0	0	0	1	1	508	311	0	0	819	0	1	0	2	3	6	600	1445	0	2051	2874
% Passenger Veh	0	0	0	100	100	99	98.1	0	0	98.7	0	100	0	100	75	85.7	98.2	98.3	0	98.2	98.3
Trucks	0	0	0	0	0	5	6	0	0	11	0	0	1	0	1	1	11	25	0	37	49
% Trucks	0	0	0	0	0	1	1.9	0	0	1.3	0	0	100	0	25	14.3	1.8	1.7	0	1.8	1.7

Data Collection Group

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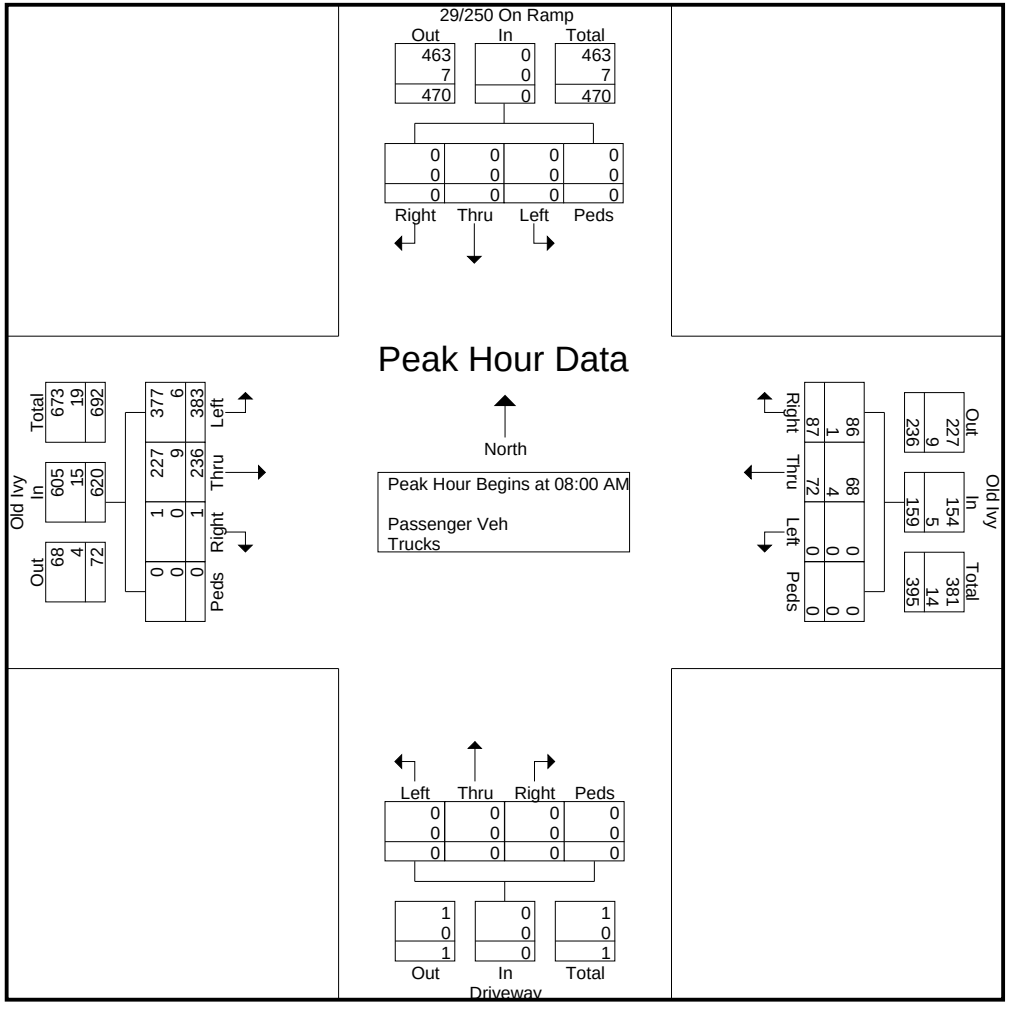
File Name : Old Ivy and 29-250 NB On Ramp
Site Code :
Start Date : 5/6/2021

	29/250 On Ramp From North					Old Ivy From East					Driveway From South					Old Ivy From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	0	0	0	0	21	**33**	0	0	**54**	0	0	0	0	0	**1**	64	**120**	0	**185**	**239**
08:15 AM	0	0	0	0	0	21	20	0	0	41	0	0	0	0	0	0	**70**	104	0	174	215
08:30 AM	0	0	0	0	0	**24**	13	0	0	37	0	0	0	0	0	0	43	75	0	118	155
08:45 AM	0	0	0	0	0	21	6	0	0	27	0	0	0	0	0	0	59	84	0	143	170
Total Volume	0	0	0	0	0	87	72	0	0	159	0	0	0	0	0	1	236	383	0	620	779
% App. Total	0	0	0	0		54.7	45.3	0	0		0	0	0	0		0.2	38.1	61.8	0		
PHF	.000	.000	.000	.000	.000	.906	.545	.000	.000	.736	.000	.000	.000	.000	.000	.250	.843	.798	.000	.838	.815
Passenger Veh	0	0	0	0	0	86	68	0	0	154	0	0	0	0	0	1	227	377	0	605	759
% Passenger Veh	0	0	0	0	0	98.9	94.4	0	0	96.9	0	0	0	0	0	100	96.2	98.4	0	97.6	97.4
Trucks	0	0	0	0	0	1	4	0	0	5	0	0	0	0	0	0	9	6	0	15	20
% Trucks	0	0	0	0	0	1.1	5.6	0	0	3.1	0	0	0	0	0	0	3.8	1.6	0	2.4	2.6

Data Collection Group

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File Name : Old Ivy and 29-250 NB On Ramp
Site Code :
Start Date : 5/6/2021
Page No : 3



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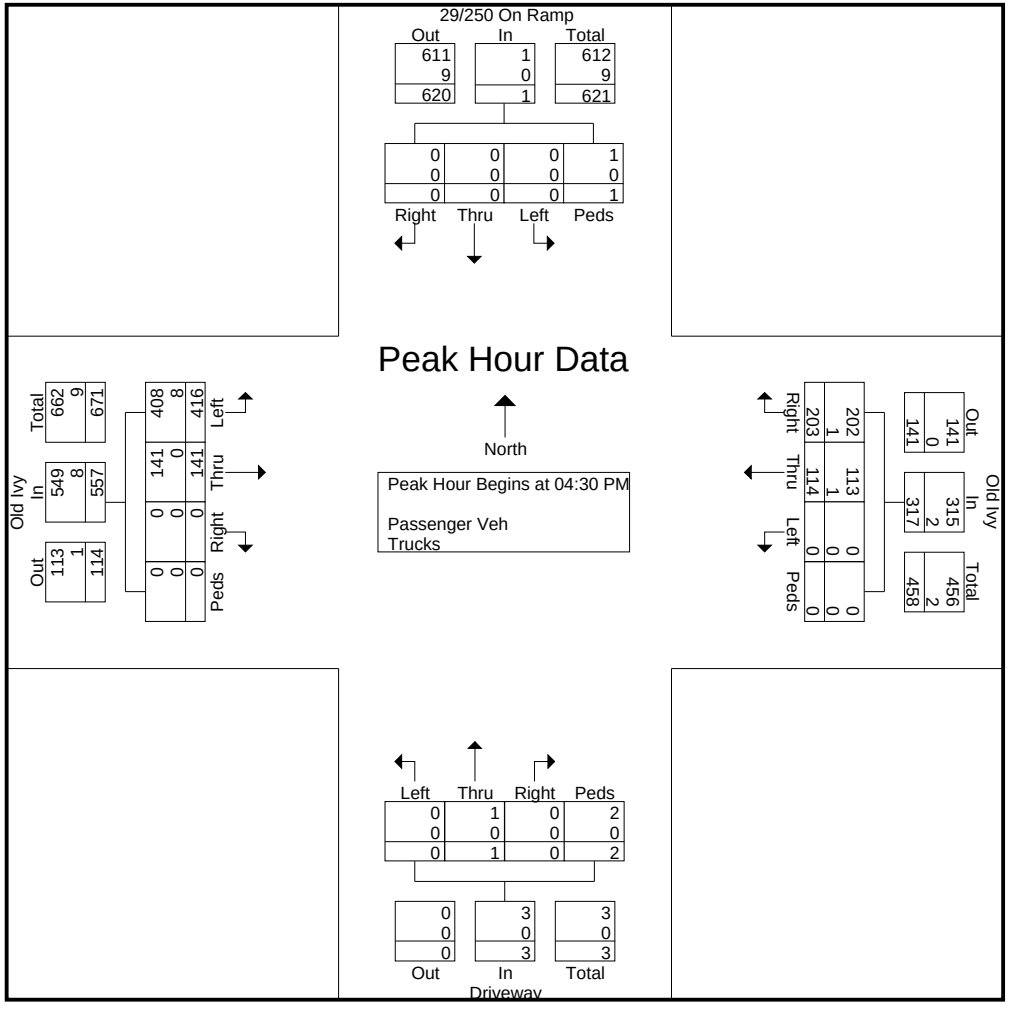
File Name : Old Ivy and 29-250 NB On Ramp
Site Code :
Start Date : 5/6/2021
Page No : 4

	29/250 On Ramp From North					Old Ivy From East					Driveway From South					Old Ivy From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 06:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	0	0	0	0	46	**35**	0	0	81	0	0	0	**1**	**1**	0	26	**127**	0	**153**	**235**
04:45 PM	0	0	0	0	0	48	29	0	0	77	0	**1**	0	0	1	0	26	109	0	135	213
05:00 PM	0	0	0	0	0	**64**	26	0	0	**90**	0	0	0	0	0	0	44	85	0	129	219
05:15 PM	0	0	0	**1**	**1**	45	24	0	0	69	0	0	0	1	1	0	**45**	95	0	140	211
Total Volume	0	0	0	1	1	203	114	0	0	317	0	1	0	2	3	0	141	416	0	557	878
% App. Total	0	0	0	100		64	36	0	0		0	33.3	0	66.7		0	25.3	74.7	0		
PHF	.000	.000	.000	.250	.250	.793	.814	.000	.000	.881	.000	.250	.000	.500	.750	.000	.783	.819	.000	.910	.934
Passenger Veh	0	0	0	1	1	202	113	0	0	315	0	1	0	2	3	0	141	408	0	549	868
% Passenger Veh	0	0	0	100	100	99.5	99.1	0	0	99.4	0	100	0	100	100	0	100	98.1	0	98.6	98.9
Trucks	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	0	0	8	0	8	10
% Trucks	0	0	0	0	0	0.5	0.9	0	0	0.6	0	0	0	0	0	0	0	1.9	0	1.4	1.1

Data Collection Group

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File Name : Old Ivy and 29-250 NB On Ramp
Site Code :
Start Date : 5/6/2021
Page No : 5



Data Collection Group

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File Name : Ivy and Old Ivy
Site Code :
Start Date : 5/6/2021
Page No : 1

Groups Printed- Passenger Veh - Trucks

	Driveway From North						Ivy From East						Saint Annes From South						Ivy From West						Old Ivy From Northwest						
Start Time	Hard Right	Right	Thru	Left	Peds	App. Total	Right	Bear Right	Thru	Left	Peds	App. Total	Right	Thru	Bear Left	Left	Peds	App. Total	Right	Thru	Left	Hard Left	Peds	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Int. Total
07:00 AM	0	0	0	1	0	1	0	10	33	0	0	43	1	0	0	0	0	1	0	71	1	4	0	76	4	0	8	0	0	12	133
07:15 AM	1	0	0	0	0	1	0	13	51	0	0	64	0	0	0	0	0	0	0	70	0	5	0	75	0	0	19	0	0	19	159
07:30 AM	0	0	0	0	0	0	0	20	55	0	0	75	0	0	0	1	0	1	0	122	0	5	0	127	2	0	15	0	0	17	220
07:45 AM	0	0	0	0	0	0	0	39	57	0	0	96	0	0	0	0	0	0	0	134	0	20	0	154	4	0	29	0	0	33	283
Total	1	0	0	1	0	2	0	82	196	0	0	278	1	0	0	1	0	2	0	397	1	34	0	432	10	0	71	0	0	81	795
08:00 AM	1	0	0	0	0	1	0	30	97	0	0	127	0	0	0	0	0	0	0	135	0	25	0	160	7	0	34	2	0	43	331
08:15 AM	3	0	0	0	0	3	0	28	56	0	0	84	0	0	0	1	0	1	0	119	0	17	0	136	9	0	54	1	0	64	288
08:30 AM	0	0	0	0	0	0	0	34	69	0	0	103	0	0	1	3	0	4	0	134	0	8	0	142	9	0	33	0	0	42	291
08:45 AM	1	0	0	0	0	1	0	25	70	0	0	95	0	0	0	5	0	5	0	157	0	10	0	167	5	0	38	2	0	45	313
Total	5	0	0	0	0	5	0	117	292	0	0	409	0	0	1	9	0	10	0	545	0	60	0	605	30	0	159	5	0	194	1223
04:00 PM	2	0	0	0	1	3	0	55	136	0	0	191	0	0	0	1	0	1	0	102	0	9	0	111	10	0	36	2	0	48	354
04:15 PM	1	1	0	0	1	3	0	52	136	0	0	188	1	0	0	0	0	1	0	117	0	7	0	124	10	0	26	2	0	38	354
04:30 PM	1	1	0	0	4	6	0	60	122	0	0	182	0	0	0	1	0	1	0	100	0	7	0	107	12	0	30	4	0	46	342
04:45 PM	1	1	0	0	0	2	1	64	137	0	0	202	0	0	0	2	0	2	0	109	0	13	0	122	7	0	27	3	0	37	365
Total	5	3	0	0	6	14	1	231	531	0	0	763	1	0	0	4	0	5	0	428	0	36	0	464	39	0	119	11	0	169	1415
05:00 PM	3	1	0	1	1	6	0	65	163	0	0	228	3	0	0	9	0	12	0	119	0	9	0	128	14	0	29	1	0	44	418
05:15 PM	1	1	0	0	0	2	0	48	181	0	0	229	0	0	0	0	0	0	0	103	0	7	0	110	11	0	26	1	0	38	379
05:30 PM	1	0	0	0	1	2	0	50	126	0	0	176	0	0	0	2	0	2	0	93	0	6	0	99	6	0	25	2	0	33	312
05:45 PM	0	2	0	0	0	2	0	52	109	0	0	161	0	0	0	4	0	4	0	86	1	6	0	93	6	0	14	3	0	23	283
Total	5	4	0	1	2	12	0	215	579	0	0	794	3	0	0	15	0	18	0	401	1	28	0	430	37	0	94	7	0	138	1392
Grand Total	16	7	0	2	8	33	1	645	1598	0	0	2244	5	0	1	29	0	35	0	1771	2	158	0	1931	116	0	443	23	0	582	4825
Apprch %	48.5	21.2	0	6.1	24.2		0	28.7	71.2	0	0		14.3	0	2.9	82.9	0		0	91.7	0.1	8.2	0		19.9	0	76.1	4	0		
Total %	0.3	0.1	0	0	0.2	0.7	0	13.4	33.1	0	0	46.5	0.1	0	0	0.6	0	0.7	0	36.7	0	3.3	0	40	2.4	0	9.2	0.5	0	12.1	
Passenger Veh																															
% Passenger Veh	100	100	0	100	100	100	100	98.3	97.5	0	0	97.7	100	0	100	100	0	100	0	98.2	100	100	0	98.4	100	0	98	100	0	98.5	98.1
Trucks	0	0	0	0	0	0	0	11	40	0	0	51	0	0	0	0	0	0	0	31	0	0	0	31	0	0	9	0	0	9	91
% Trucks	0	0	0	0	0	0	0	1.7	2.5	0	0	2.3	0	0	0	0	0	0	0	1.8	0	0	0	1.6	0	0	2	0	0	1.5	1.9

Data Collection Group

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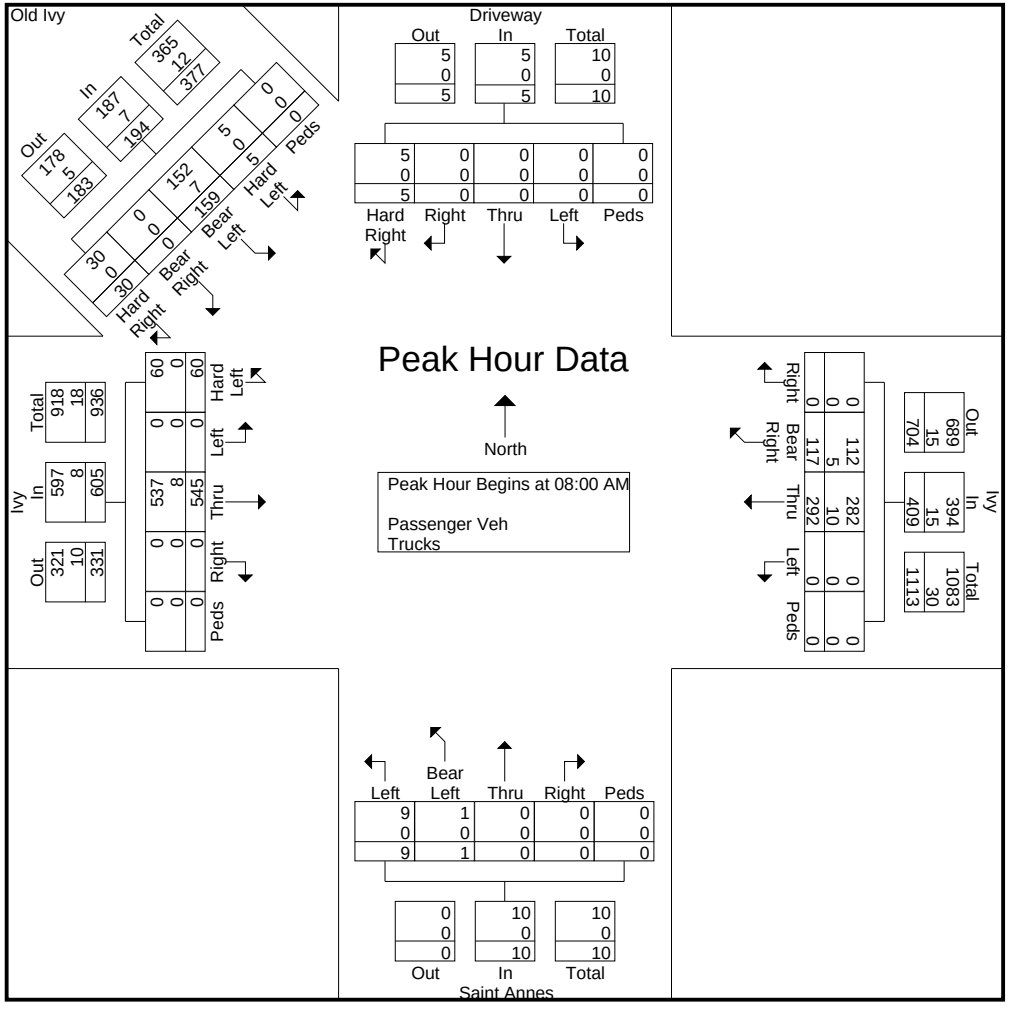
File Name : Ivy and Old Ivy
Site Code :
Start Date : 5/6/2021
Page No : 2

	Driveway From North						Ivy From East						Saint Annes From South						Ivy From West						Old Ivy From Northwest						
Start Time	Hard Right	Right	Thru	Left	Peds	App. Total	Right	Bear Right	Thru	Left	Peds	App. Total	Right	Thru	Bear Left	Left	Peds	App. Total	Right	Thru	Left	Hard Left	Peds	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																															
Peak Hour for Entire Intersection Begins at 08:00 AM																															
08:00 AM	1	0	0	0	0	1	0	30	97	0	0	127	0	0	0	0	0	0	0	135	0	25	0	160	7	0	34	2	0	43	**331**
08:15 AM	**3**	0	0	0	0	**3**	0	28	56	0	0	84	0	0	0	1	0	1	0	119	0	17	0	136	**9**	0	**54**	1	0	**64**	288
08:30 AM	0	0	0	0	0	0	0	**34**	69	0	0	103	0	0	**1**	3	0	4	0	134	0	8	0	142	9	0	33	0	0	42	291
08:45 AM	1	0	0	0	0	1	0	25	70	0	0	95	0	0	0	**5**	0	**5**	0	**157**	0	10	0	**167**	5	0	38	2	0	45	313
Total Volume	5	0	0	0	0	5	0	117	292	0	0	409	0	0	1	9	0	10	0	545	0	60	0	605	30	0	159	5	0	194	1223
% App. Total	100	0	0	0	0		0	28.6	71.4	0	0		0	0	10	90	0		0	90.1	0	9.9	0		15.5	0	82	2.6	0		
PHF	.417	.000	.000	.000	.000	.417	.000	.860	.753	.000	.000	.805	.000	.000	.250	.450	.000	.500	.000	.868	.000	.600	.000	.906	.833	.000	.736	.625	.000	.758	.924
Passenger Veh	5	0	0	0	0	5	0	112	282	0	0	394	0	0	1	9	0	10	0	537	0	60	0	597	30	0	152	5	0	187	1193
% Passenger Veh	100	0	0	0	0	100	0	95.7	96.6	0	0	96.3	0	0	100	100	0	100	0	98.5	0	100	0	98.7	100	0	95.6	100	0	96.4	97.5
Trucks	0	0	0	0	0	0	0	5	10	0	0	15	0	0	0	0	0	0	0	8	0	0	0	8	0	0	7	0	0	7	30
% Trucks	0	0	0	0	0	0	0	4.3	3.4	0	0	3.7	0	0	0	0	0	0	0	1.5	0	0	0	1.3	0	0	4.4	0	0	3.6	2.5

Data Collection Group

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File Name : Ivy and Old Ivy
Site Code :
Start Date : 5/6/2021
Page No : 3



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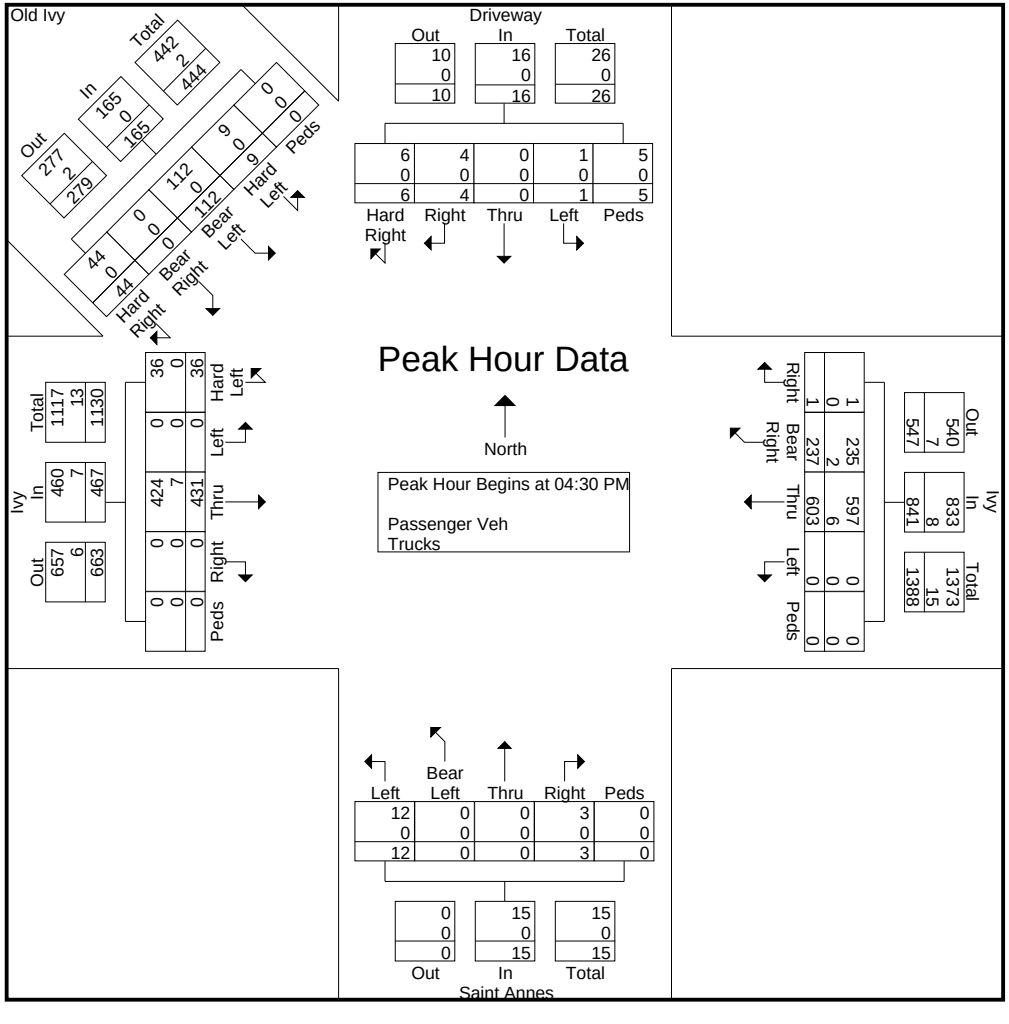
File Name : Ivy and Old Ivy
Site Code :
Start Date : 5/6/2021
Page No : 4

	Driveway From North						Ivy From East						Saint Annes From South						Ivy From West						Old Ivy From Northwest						
Start Time	Hard Right	Right	Thru	Left	Peds	App. Total	Right	Bear Right	Thru	Left	Peds	App. Total	Right	Thru	Bear Left	Left	Peds	App. Total	Right	Thru	Left	Hard Left	Peds	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																															
Peak Hour for Entire Intersection Begins at 04:30 PM																															
04:30 PM	1	1	0	0	4	6	0	60	122	0	0	182	0	0	0	1	0	1	0	100	0	7	0	107	12	0	30	**4**	0	**46**	342
04:45 PM	1	1	0	0	0	2	**1**	64	137	0	0	202	0	0	0	2	0	2	0	109	0	**13**	0	122	7	0	27	3	0	37	365
05:00 PM	**3**	1	0	**1**	1	6	0	**65**	163	0	0	228	**3**	0	0	**9**	0	**12**	0	**119**	0	9	0	**128**	**14**	0	29	1	0	44	**418**
05:15 PM	1	1	0	0	0	2	0	48	**181**	0	0	**229**	0	0	0	0	0	0	0	103	0	7	0	110	11	0	26	1	0	38	379
Total Volume	6	4	0	1	5	16	1	237	603	0	0	841	3	0	0	12	0	15	0	431	0	36	0	467	44	0	112	9	0	165	1504
% App. Total	37.5	25	0	6.2	31.2		0.1	28.2	71.7	0	0		20	0	0	80	0		0	92.3	0	7.7	0		26.7	0	67.9	5.5	0		
PHF	.500	1.00	.000	.250	.313	.667	.250	.912	.833	.000	.000	.918	.250	.000	.000	.333	.000	.313	.000	.905	.000	.692	.000	.912	.786	.000	.933	.563	.000	.897	.900
Passenger Veh	6	4	0	1	5	16	1	235	597	0	0	833	3	0	0	12	0	15	0	424	0	36	0	460	44	0	112	9	0	165	1489
% Passenger Veh	100	100	0	100	100	100	100	99.2	99.0	0	0	99.0	100	0	0	100	0	100	0	98.4	0	100	0	98.5	100	0	100	100	0	100	99.0
Trucks	0	0	0	0	0	0	0	2	6	0	0	8	0	0	0	0	0	0	0	7	0	0	0	7	0	0	0	0	0	0	15
% Trucks	0	0	0	0	0	0	0	0.8	1.0	0	0	1.0	0	0	0	0	0	0	0	1.6	0	0	0	1.5	0	0	0	0	0	0	1.0

Data Collection Group

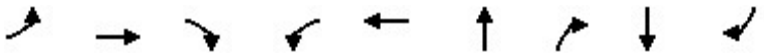
LSmith@DataCollectionGroup.net

File Name : Ivy and Old Ivy
Site Code :
Start Date : 5/6/2021
Page No : 5



Appendix B

Synchro Analysis for 2021 Existing Conditions

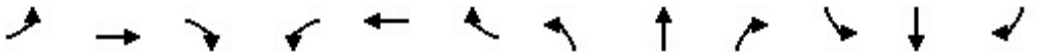


Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	412	656	11	27	709	33	26	100	600
v/c Ratio	0.91	0.56	0.01	0.06	0.96	0.26	0.08	0.64	0.92
Control Delay	58.1	18.0	0.0	11.0	60.1	58.6	0.5	70.6	40.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.1	18.0	0.0	11.0	60.1	58.6	0.5	70.6	40.5
Queue Length 50th (ft)	251	341	0	6	~613	25	0	76	188
Queue Length 95th (ft)	#460	477	0	17	#850	59	0	132	#440
Internal Link Dist (ft)		843			543	551		203	
Turn Bay Length (ft)			450	200			180		75
Base Capacity (vph)	467	1164	1075	421	740	147	338	199	662
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.56	0.01	0.06	0.96	0.22	0.08	0.50	0.91

Intersection Summary

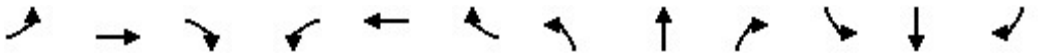
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	375	597	10	25	543	102	12	18	24	78	13	546
Future Volume (vph)	375	597	10	25	543	102	12	18	24	78	13	546
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.8	7.8	7.8	7.8	7.8			6.5	6.5		5.4	7.8
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.98	1.00		0.96	1.00
Satd. Flow (prot)	1770	1845	1615	1736	1760			1863	1538		1761	1553
Flt Permitted	0.07	1.00	1.00	0.42	1.00			0.98	1.00		0.96	1.00
Satd. Flow (perm)	136	1845	1615	759	1760			1863	1538		1761	1553
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	412	656	11	27	597	112	13	20	26	86	14	600
RTOR Reduction (vph)	0	0	4	0	5	0	0	0	25	0	0	181
Lane Group Flow (vph)	412	656	7	27	704	0	0	33	1	0	100	419
Heavy Vehicles (%)	2%	3%	0%	4%	6%	2%	0%	0%	5%	4%	0%	4%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Perm	Split	NA	pm+ov
Protected Phases	5	2		1	6		4	4		3	3	5
Permitted Phases	2		2	6					4			3
Actuated Green, G (s)	83.1	71.3	71.3	52.9	48.9			6.5	6.5		10.7	37.1
Effective Green, g (s)	83.1	71.3	71.3	52.9	48.9			6.5	6.5		10.7	37.1
Actuated g/C Ratio	0.69	0.59	0.59	0.44	0.41			0.05	0.05		0.09	0.31
Clearance Time (s)	7.8	7.8	7.8	7.8	7.8			6.5	6.5		5.4	7.8
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0			1.5	1.5		1.5	2.0
Lane Grp Cap (vph)	453	1096	959	367	717			100	83		157	480
v/s Ratio Prot	c0.20	0.36		0.00	c0.40			c0.02			0.06	c0.19
v/s Ratio Perm	0.43		0.00	0.03					0.00			0.08
v/c Ratio	0.91	0.60	0.01	0.07	0.98			0.33	0.02		0.64	0.87
Uniform Delay, d1	37.0	15.3	9.9	19.1	35.1			54.7	53.7		52.8	39.2
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	21.4	2.4	0.0	0.0	29.4			0.7	0.0		6.1	15.5
Delay (s)	58.4	17.8	9.9	19.1	64.5			55.4	53.8		58.9	54.7
Level of Service	E	B	A	B	E			E	D		E	D
Approach Delay (s)		33.2			62.8			54.7			55.3	
Approach LOS		C			E			D			E	

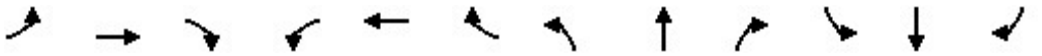
Intersection Summary			
HCM 2000 Control Delay	48.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	27.5
Intersection Capacity Utilization	93.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	65	33	31	17	0	20	0	474	52	583	39
Future Volume (Veh/h)	0	65	33	31	17	0	20	0	474	52	583	39
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	76	39	36	20	0	24	0	558	61	686	46
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								283				
pX, platoon unblocked	0.88	0.88		0.88	0.88	0.88				0.88		
vC, conflicting volume	1168	1437	709	1235	1181	279	732			558		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1121	1428	709	1198	1136	108	732			426		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	100	30	91	30	88	100	97			94		
cM capacity (veh/h)	137	109	438	51	163	834	882			1004		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	115	56	582	793
Volume Left	0	36	24	61
Volume Right	39	0	558	46
cSH	146	68	882	1004
Volume to Capacity	0.79	0.82	0.03	0.06
Queue Length 95th (ft)	122	97	2	5
Control Delay (s)	86.3	164.3	0.7	1.5
Lane LOS	F	F	A	A
Approach Delay (s)	86.3	164.3	0.7	1.5
Approach LOS	F	F		

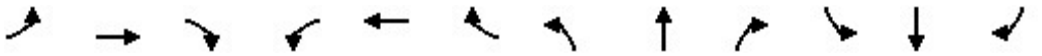
Intersection Summary				
Average Delay	13.4			
Intersection Capacity Utilization	69.4%	ICU Level of Service	C	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	469	11	0	41	37	3	1	0	210	4	4
Future Volume (Veh/h)	117	469	11	0	41	37	3	1	0	210	4	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Hourly flow rate (vph)	163	651	15	0	57	51	4	1	0	292	6	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												8
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	108			666			1066	1085	651	1060	1074	82
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	108			666			1066	1085	651	1060	1074	82
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	89			100			98	99	100	0	97	99
cM capacity (veh/h)	1495			933			180	195	472	184	197	983

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	814	15	108	5	304
Volume Left	163	0	0	4	292
Volume Right	0	15	51	0	6
cSH	1495	1700	933	183	187
Volume to Capacity	0.11	0.01	0.00	0.03	1.63
Queue Length 95th (ft)	9	0	0	2	506
Control Delay (s)	2.6	0.0	0.0	25.3	349.1
Lane LOS	A			D	F
Approach Delay (s)	2.6		0.0	25.3	349.1
Approach LOS				D	F

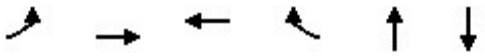
Intersection Summary				
Average Delay	87.0			
Intersection Capacity Utilization	58.9%	ICU Level of Service		B
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	421	260	1	0	79	96	0	0	0	0	0	0
Future Volume (Veh/h)	421	260	1	0	79	96	0	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	520	321	1	0	98	119	0	0	0	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	217			322			1460	1578	322	1460	1460	98
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	217			322			1460	1578	322	1460	1460	98
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	62			100			100	100	100	100	100	100
cM capacity (veh/h)	1353			1249			75	67	719	75	79	958

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	842	98	119	0
Volume Left	520	0	0	0
Volume Right	1	0	119	0
cSH	1353	1249	1700	1700
Volume to Capacity	0.38	0.00	0.07	0.00
Queue Length 95th (ft)	46	0	0	0
Control Delay (s)	7.4	0.0	0.0	0.0
Lane LOS	A			A
Approach Delay (s)	7.4	0.0		0.0
Approach LOS				A

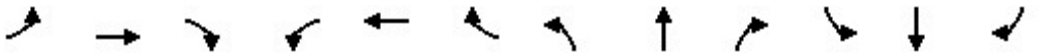
Intersection Summary				
Average Delay	5.9			
Intersection Capacity Utilization	49.7%	ICU Level of Service	A	
Analysis Period (min)	15			



Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	72	652	349	140	12	232
v/c Ratio	0.13	0.63	0.34	0.15	0.07	0.58
Control Delay	9.0	14.5	9.8	2.8	27.0	17.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.0	14.5	9.8	2.8	27.0	17.0
Queue Length 50th (ft)	8	108	47	0	3	28
Queue Length 95th (ft)	43	#421	169	29	20	98
Internal Link Dist (ft)		1062	920		247	459
Turn Bay Length (ft)	90					
Base Capacity (vph)	599	1075	1055	947	611	676
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.61	0.33	0.15	0.02	0.34

Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	600	0	0	321	129	10	1	0	180	0	33
Future Volume (vph)	66	600	0	0	321	129	10	1	0	180	0	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0			7.0	7.0		6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	1.00			1.00	0.85		1.00			0.98	
Flt Protected	0.95	1.00			1.00	1.00		0.96			0.96	
Satd. Flow (prot)	1805	1881			1845	1553		1781			1726	
Flt Permitted	0.55	1.00			1.00	1.00		0.96			0.96	
Satd. Flow (perm)	1048	1881			1845	1553		1781			1726	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	72	652	0	0	349	140	11	1	0	196	0	36
RTOR Reduction (vph)	0	0	0	0	0	69	0	0	0	0	108	0
Lane Group Flow (vph)	72	652	0	0	349	71	0	12	0	0	124	0
Heavy Vehicles (%)	0%	1%	0%	0%	3%	4%	2%	2%	2%	4%	0%	0%
Turn Type	Perm	NA			NA	Perm	Split	NA		Split	NA	
Protected Phases		2			2		4	4		3	3	
Permitted Phases	2					2						
Actuated Green, G (s)	29.5	29.5			29.5	29.5		0.9			9.1	
Effective Green, g (s)	29.5	29.5			29.5	29.5		0.9			9.1	
Actuated g/C Ratio	0.50	0.50			0.50	0.50		0.02			0.16	
Clearance Time (s)	7.0	7.0			7.0	7.0		6.0			6.0	
Vehicle Extension (s)	4.0	4.0			4.0	4.0		2.0			3.0	
Lane Grp Cap (vph)	528	948			930	783		27			268	
v/s Ratio Prot		c0.35			0.19			c0.01			c0.07	
v/s Ratio Perm	0.07					0.05						
v/c Ratio	0.14	0.69			0.38	0.09		0.44			0.46	
Uniform Delay, d1	7.7	11.0			8.9	7.5		28.6			22.5	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	0.2	2.3			0.3	0.1		4.2			1.3	
Delay (s)	7.9	13.3			9.2	7.6		32.7			23.7	
Level of Service	A	B			A	A		C			C	
Approach Delay (s)		12.7			8.8			32.7			23.7	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	58.5	Sum of lost time (s)	19.0
Intersection Capacity Utilization	70.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 1: Cantebury Road /Route 846 & Ivy Road

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	TR	LT	R	LT	R
Maximum Queue (ft)	394	321	26	199	629	80	52	212	76
Average Queue (ft)	197	149	3	39	467	25	13	184	73
95th Queue (ft)	330	277	16	148	719	60	36	252	83
Link Distance (ft)	882	882			586	575		201	
Upstream Blk Time (%)					23			18	
Queuing Penalty (veh)					0			115	
Storage Bay Dist (ft)			450	200			180		75
Storage Blk Time (%)		0		0	43			25	26
Queuing Penalty (veh)		0		0	11			137	23

Intersection: 2: Route 846/Route 29 Off-Ramp & Old Garth Road/Old Ivy Road

Movement	EB	WB	NB	SB
Directions Served	TR	LT	LTR	LTR
Maximum Queue (ft)	112	75	71	1160
Average Queue (ft)	45	30	18	1130
95th Queue (ft)	87	62	55	1158
Link Distance (ft)	394	299	201	1106
Upstream Blk Time (%)				97
Queuing Penalty (veh)				0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Commercial Entrance/Faulconer Driver & Old Ivy Road

Movement	EB	NB	SB	SB
Directions Served	LT	LTR	LT	R
Maximum Queue (ft)	111	30	325	88
Average Queue (ft)	17	3	116	9
95th Queue (ft)	65	18	277	64
Link Distance (ft)	299	171	352	
Upstream Blk Time (%)			5	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)				190
Storage Blk Time (%)	0		12	0
Queuing Penalty (veh)	0		1	0

Intersection: 4: Commercial Entrance/Route 29 On-Ramp & Old Ivy Road

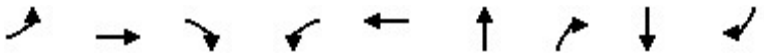
Movement	EB	WB
Directions Served	LTR	R
Maximum Queue (ft)	166	44
Average Queue (ft)	63	14
95th Queue (ft)	125	42
Link Distance (ft)	332	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		50
Storage Blk Time (%)		0
Queuing Penalty (veh)		0

Intersection: 5: Commerical Entrance/Old Ivy Road & Ivy Road

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	T	T	R	LTR	LTR
Maximum Queue (ft)	81	241	174	66	39	178
Average Queue (ft)	14	85	75	29	11	91
95th Queue (ft)	54	187	146	58	33	151
Link Distance (ft)		1037	956	956	277	420
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	90					
Storage Blk Time (%)	0	5				
Queuing Penalty (veh)	0	3				

Network Summary

Network wide Queuing Penalty: 291

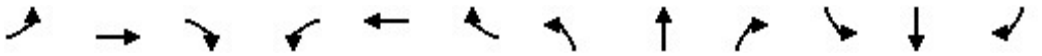


Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	442	660	21	42	721	27	36	85	593
v/c Ratio	0.90	0.54	0.02	0.10	0.91	0.23	0.11	0.58	0.93
Control Delay	56.9	18.2	0.1	10.7	51.6	58.1	0.7	68.3	44.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.9	18.2	0.1	10.7	51.6	58.1	0.7	68.3	44.7
Queue Length 50th (ft)	285	333	0	9	~557	20	0	65	214
Queue Length 95th (ft)	#523	464	0	23	#821	51	0	116	#483
Internal Link Dist (ft)		843			543	551		203	
Turn Bay Length (ft)			450	200			180		75
Base Capacity (vph)	490	1215	1097	429	789	139	337	187	636
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.54	0.02	0.10	0.91	0.19	0.11	0.45	0.93

Intersection Summary

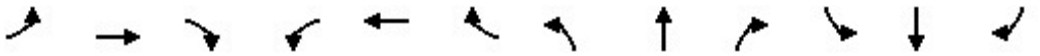
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	420	627	20	40	617	68	17	9	34	64	17	563
Future Volume (vph)	420	627	20	40	617	68	17	9	34	64	17	563
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.8	7.8	7.8	7.8	7.8			6.5	6.5		5.4	7.8
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.97	1.00		0.96	1.00
Satd. Flow (prot)	1752	1881	1615	1752	1855			1757	1524		1786	1583
Flt Permitted	0.07	1.00	1.00	0.41	1.00			0.97	1.00		0.96	1.00
Satd. Flow (perm)	131	1881	1615	764	1855			1757	1524		1786	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	442	660	21	42	649	72	18	9	36	67	18	593
RTOR Reduction (vph)	0	0	8	0	3	0	0	0	34	0	0	163
Lane Group Flow (vph)	442	660	13	42	718	0	0	27	2	0	85	430
Heavy Vehicles (%)	3%	1%	0%	3%	1%	0%	7%	0%	6%	3%	0%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Perm	Split	NA	pm+ov
Protected Phases	5	2		1	6		4	4		3	3	5
Permitted Phases	2		2	6					4			3
Actuated Green, G (s)	85.6	72.1	72.1	54.3	48.6			6.4	6.4		8.3	37.5
Effective Green, g (s)	85.6	72.1	72.1	54.3	48.6			6.4	6.4		8.3	37.5
Actuated g/C Ratio	0.71	0.60	0.60	0.45	0.41			0.05	0.05		0.07	0.31
Clearance Time (s)	7.8	7.8	7.8	7.8	7.8			6.5	6.5		5.4	7.8
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0			1.5	1.5		1.5	2.0
Lane Grp Cap (vph)	487	1130	970	392	751			93	81		123	494
v/s Ratio Prot	c0.22	0.35		0.01	c0.39			c0.02			0.05	c0.21
v/s Ratio Perm	0.43		0.01	0.04					0.00			0.06
v/c Ratio	0.91	0.58	0.01	0.11	0.96			0.29	0.02		0.69	0.87
Uniform Delay, d1	36.7	14.7	9.6	18.4	34.7			54.6	53.8		54.6	39.0
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	20.1	2.2	0.0	0.0	23.7			0.6	0.0		12.7	14.9
Delay (s)	56.8	16.9	9.7	18.5	58.4			55.2	53.9		67.3	53.9
Level of Service	E	B	A	B	E			E	D		E	D
Approach Delay (s)		32.5			56.2			54.5			55.6	
Approach LOS		C			E			D			E	

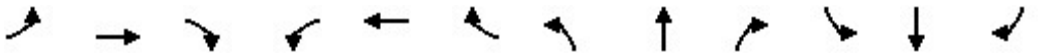
Intersection Summary			
HCM 2000 Control Delay	45.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	27.5
Intersection Capacity Utilization	96.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	35	21	55	55	0	29	0	459	9	582	14
Future Volume (Veh/h)	0	35	21	55	55	0	29	0	459	9	582	14
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	37	22	59	59	0	31	0	488	10	619	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								283				
pX, platoon unblocked	0.87	0.87		0.87	0.87	0.87				0.87		
vC, conflicting volume	982	1196	626	993	960	244	634			488		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	902	1150	626	915	876	50	634			331		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	78	95	65	75	100	97			99		
cM capacity (veh/h)	178	166	478	168	240	887	959			1073		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	59	118	519	644
Volume Left	0	59	31	10
Volume Right	22	0	488	15
cSH	219	198	959	1073
Volume to Capacity	0.27	0.60	0.03	0.01
Queue Length 95th (ft)	26	83	3	1
Control Delay (s)	27.3	46.9	0.9	0.3
Lane LOS	D	E	A	A
Approach Delay (s)	27.3	46.9	0.9	0.3
Approach LOS	D	E		

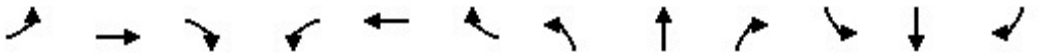
Intersection Summary				
Average Delay	5.8			
Intersection Capacity Utilization	66.9%	ICU Level of Service	C	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	462	1	0	101	20	1	0	6	135	0	13
Future Volume (Veh/h)	32	462	1	0	101	20	1	0	6	135	0	13
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	33	481	1	0	105	21	1	0	6	141	0	14
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												8
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	126			482			670	673	481	668	664	116
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	126			482			670	673	481	668	664	116
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			100	100	99	61	100	99
cM capacity (veh/h)	1473			1091			362	371	589	363	375	942

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	514	1	126	7	155
Volume Left	33	0	0	1	141
Volume Right	0	1	21	6	14
cSH	1473	1700	1091	541	399
Volume to Capacity	0.02	0.00	0.00	0.01	0.39
Queue Length 95th (ft)	2	0	0	1	45
Control Delay (s)	0.7	0.0	0.0	11.7	20.0
Lane LOS	A			B	C
Approach Delay (s)	0.7		0.0	11.7	20.0
Approach LOS				B	C

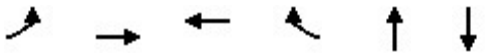
Intersection Summary				
Average Delay	4.4			
Intersection Capacity Utilization	56.8%	ICU Level of Service		B
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	458	155	0	0	125	223	0	1	0	0	0	0
Future Volume (Veh/h)	458	155	0	0	125	223	0	1	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.92	0.93	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	492	167	0	0	134	240	0	1	0	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	374			167			1285	1525	167	1286	1285	134
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	374			167			1285	1525	167	1286	1285	134
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	58			100			100	99	100	100	100	100
cM capacity (veh/h)	1184			1423			96	70	877	95	96	915

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	659	134	240	1
Volume Left	492	0	0	0
Volume Right	0	0	240	0
cSH	1184	1423	1700	70
Volume to Capacity	0.42	0.00	0.14	0.01
Queue Length 95th (ft)	52	0	0	1
Control Delay (s)	8.8	0.0	0.0	57.5
Lane LOS	A			F
Approach Delay (s)	8.8	0.0		57.5
Approach LOS				F

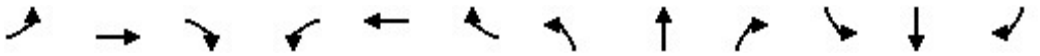
Intersection Summary				
Average Delay	5.7			
Intersection Capacity Utilization	60.7%	ICU Level of Service	B	
Analysis Period (min)	15			



Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	44	527	737	291	17	208
v/c Ratio	0.18	0.50	0.69	0.28	0.06	0.55
Control Delay	10.4	10.7	15.3	2.4	0.5	15.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.4	10.7	15.3	2.4	0.5	15.4
Queue Length 50th (ft)	5	76	125	1	0	22
Queue Length 95th (ft)	32	253	#467	39	0	82
Internal Link Dist (ft)		1062	920		247	459
Turn Bay Length (ft)	90					
Base Capacity (vph)	247	1058	1068	1031	691	685
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.50	0.69	0.28	0.02	0.30

Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	474	0	0	663	262	13	0	3	134	0	53
Future Volume (vph)	40	474	0	0	663	262	13	0	3	134	0	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0			7.0	7.0		6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	1.00			1.00	0.85		0.98			0.96	
Flt Protected	0.95	1.00			1.00	1.00		0.96			0.97	
Satd. Flow (prot)	1805	1863			1881	1599		1781			1764	
Flt Permitted	0.23	1.00			1.00	1.00		0.96			0.97	
Satd. Flow (perm)	435	1863			1881	1599		1781			1764	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	44	527	0	0	737	291	14	0	3	149	0	59
RTOR Reduction (vph)	0	0	0	0	0	136	0	17	0	0	110	0
Lane Group Flow (vph)	44	527	0	0	737	155	0	0	0	0	98	0
Heavy Vehicles (%)	0%	2%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA			NA	Perm	Split	NA		Split	NA	
Protected Phases		2			2		4	4		3	3	
Permitted Phases	2					2						
Actuated Green, G (s)	30.4	30.4			30.4	30.4		0.7			8.2	
Effective Green, g (s)	30.4	30.4			30.4	30.4		0.7			8.2	
Actuated g/C Ratio	0.52	0.52			0.52	0.52		0.01			0.14	
Clearance Time (s)	7.0	7.0			7.0	7.0		6.0			6.0	
Vehicle Extension (s)	4.0	4.0			4.0	4.0		2.0			3.0	
Lane Grp Cap (vph)	226	971			980	833		21			248	
v/s Ratio Prot		0.28			c0.39			c0.00			c0.06	
v/s Ratio Perm	0.10					0.10						
v/c Ratio	0.19	0.54			0.75	0.19		0.01			0.40	
Uniform Delay, d1	7.4	9.3			11.0	7.4		28.5			22.8	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	0.6	0.8			3.5	0.1		0.1			1.0	
Delay (s)	8.0	10.1			14.5	7.5		28.5			23.8	
Level of Service	A	B			B	A		C			C	
Approach Delay (s)		9.9			12.5			28.5			23.8	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	58.3	Sum of lost time (s)	19.0
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 1: Cantebury Road /Route 846 & Ivy Road

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	TR	LT	R	LT	R
Maximum Queue (ft)	554	374	32	200	610	84	64	214	75
Average Queue (ft)	262	164	5	58	516	25	17	200	74
95th Queue (ft)	493	318	22	183	736	64	46	230	82
Link Distance (ft)	882	882			586	575		201	
Upstream Blk Time (%)	0				34			27	
Queuing Penalty (veh)	0				0			179	
Storage Bay Dist (ft)			450	200			180		75
Storage Blk Time (%)		0		0	50			26	35
Queuing Penalty (veh)		0		1	20			146	28

Intersection: 2: Route 846/Route 29 Off-Ramp & Old Garth Road/Old Ivy Road

Movement	EB	WB	NB	SB
Directions Served	TR	LT	LTR	LTR
Maximum Queue (ft)	93	118	69	1156
Average Queue (ft)	34	53	17	1071
95th Queue (ft)	73	97	51	1318
Link Distance (ft)	394	299	201	1106
Upstream Blk Time (%)				84
Queuing Penalty (veh)				0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Commercial Entrance/Faulconer Driver & Old Ivy Road

Movement	EB	NB	SB	SB
Directions Served	LT	LTR	LT	R
Maximum Queue (ft)	53	28	121	30
Average Queue (ft)	4	5	49	12
95th Queue (ft)	25	22	92	35
Link Distance (ft)	299	171	352	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				190
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Commercial Entrance/Route 29 On-Ramp & Old Ivy Road

Movement	EB	WB	WB	NB
Directions Served	LTR	LT	R	LTR
Maximum Queue (ft)	279	3	49	21
Average Queue (ft)	118	0	30	2
95th Queue (ft)	226	3	51	13
Link Distance (ft)	332	2715		193
Upstream Blk Time (%)	0			
Queuing Penalty (veh)	0			
Storage Bay Dist (ft)			50	
Storage Blk Time (%)			1	
Queuing Penalty (veh)			1	

Intersection: 5: Commerical Entrance/Old Ivy Road & Ivy Road

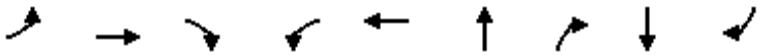
Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	T	T	R	LTR	LTR
Maximum Queue (ft)	72	153	328	80	45	166
Average Queue (ft)	11	49	139	40	12	77
95th Queue (ft)	42	125	253	68	37	132
Link Distance (ft)		1037	956	956	277	420
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	90					
Storage Blk Time (%)	0	2				
Queuing Penalty (veh)	1	1				

Network Summary

Network wide Queuing Penalty: 376

Appendix C

Synchro Analysis for 2025 Background Conditions

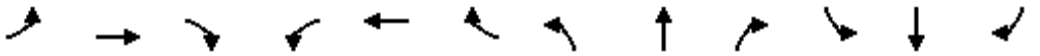


Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	424	676	11	28	729	34	27	103	617
v/c Ratio	0.90	0.58	0.01	0.07	1.01	0.27	0.08	0.65	0.93
Control Delay	57.0	18.5	0.0	11.1	73.7	58.7	0.5	71.3	43.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.0	18.5	0.0	11.1	73.7	58.7	0.5	71.3	43.2
Queue Length 50th (ft)	264	359	0	6	~645	26	0	78	210
Queue Length 95th (ft)	#484	499	0	18	#885	60	0	135	#511
Internal Link Dist (ft)		843			543	551		203	
Turn Bay Length (ft)			450	200			180		75
Base Capacity (vph)	474	1163	1073	405	719	147	338	199	663
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.58	0.01	0.07	1.01	0.23	0.08	0.52	0.93

Intersection Summary

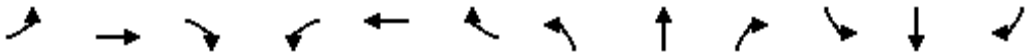
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	390	622	10	26	565	106	13	18	25	81	14	568
Future Volume (vph)	390	622	10	26	565	106	13	18	25	81	14	568
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.8	7.8	7.8	7.8	7.8			6.5	6.5		5.4	7.8
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.98	1.00		0.96	1.00
Satd. Flow (prot)	1770	1845	1615	1736	1761			1862	1538		1762	1553
Flt Permitted	0.07	1.00	1.00	0.41	1.00			0.98	1.00		0.96	1.00
Satd. Flow (perm)	135	1845	1615	745	1761			1862	1538		1762	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	424	676	11	28	614	115	14	20	27	88	15	617
RTOR Reduction (vph)	0	0	4	0	5	0	0	0	26	0	0	172
Lane Group Flow (vph)	424	676	7	28	724	0	0	34	1	0	103	445
Heavy Vehicles (%)	2%	3%	0%	4%	6%	2%	0%	0%	5%	4%	0%	4%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Perm	Split	NA	pm+ov
Protected Phases	5	2		1	6		4	4		3	3	5
Permitted Phases	2		2	6					4			3
Actuated Green, G (s)	83.0	71.3	71.3	51.4	47.5			6.5	6.5		10.8	38.5
Effective Green, g (s)	83.0	71.3	71.3	51.4	47.5			6.5	6.5		10.8	38.5
Actuated g/C Ratio	0.69	0.59	0.59	0.43	0.40			0.05	0.05		0.09	0.32
Clearance Time (s)	7.8	7.8	7.8	7.8	7.8			6.5	6.5		5.4	7.8
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0			1.5	1.5		1.5	2.0
Lane Grp Cap (vph)	470	1096	959	351	697			100	83		158	498
v/s Ratio Prot	c0.21	0.37		0.00	c0.41			c0.02			0.06	c0.21
v/s Ratio Perm	0.42		0.00	0.03					0.00			0.08
v/c Ratio	0.90	0.62	0.01	0.08	1.04			0.34	0.02		0.65	0.89
Uniform Delay, d1	37.0	15.6	9.9	19.9	36.2			54.7	53.7		52.8	38.8
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	19.9	2.6	0.0	0.0	44.4			0.7	0.0		7.1	17.8
Delay (s)	56.9	18.2	9.9	20.0	80.6			55.4	53.8		59.9	56.6
Level of Service	E	B	A	B	F			E	D		E	E
Approach Delay (s)		32.9			78.4			54.7			57.1	
Approach LOS		C			E			D			E	

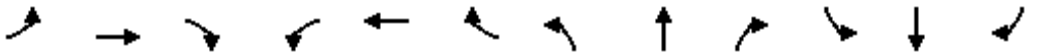
Intersection Summary			
HCM 2000 Control Delay	53.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	27.5
Intersection Capacity Utilization	96.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	68	34	32	18	0	21	0	493	54	607	41
Future Volume (Veh/h)	0	68	34	32	18	0	21	0	493	54	607	41
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	74	37	35	20	0	23	0	536	59	660	45
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								283				
pX, platoon unblocked	0.87	0.87		0.87	0.87	0.87				0.87		
vC, conflicting volume	1124	1382	682	1188	1137	268	705			536		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1069	1365	682	1143	1084	87	705			395		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	100	38	92	46	89	100	97			94		
cM capacity (veh/h)	150	119	453	65	175	852	902			1025		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	111	55	559	764
Volume Left	0	35	23	59
Volume Right	37	0	536	45
cSH	158	84	902	1025
Volume to Capacity	0.70	0.65	0.03	0.06
Queue Length 95th (ft)	104	77	2	5
Control Delay (s)	69.1	106.5	0.7	1.5
Lane LOS	F	F	A	A
Approach Delay (s)	69.1	106.5	0.7	1.5
Approach LOS	F	F		

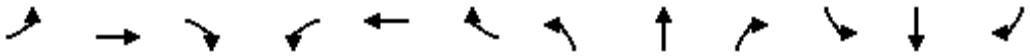
Intersection Summary				
Average Delay	10.1			
Intersection Capacity Utilization	71.6%	ICU Level of Service	C	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	122	488	11	0	43	39	3	1	0	219	4	4
Future Volume (Veh/h)	122	488	11	0	43	39	3	1	0	219	4	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	133	530	12	0	47	42	3	1	0	238	4	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												8
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	89			542			868	885	530	864	876	68
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	89			542			868	885	530	864	876	68
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	91			100			99	100	100	6	98	100
cM capacity (veh/h)	1519			1037			253	261	553	254	264	1001

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	663	12	89	4	246
Volume Left	133	0	0	3	238
Volume Right	0	12	42	0	4
cSH	1519	1700	1037	255	258
Volume to Capacity	0.09	0.01	0.00	0.02	0.95
Queue Length 95th (ft)	7	0	0	1	221
Control Delay (s)	2.3	0.0	0.0	19.4	85.7
Lane LOS	A			C	F
Approach Delay (s)	2.3		0.0	19.4	85.7
Approach LOS				C	F

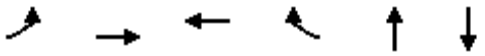
Intersection Summary				
Average Delay	22.4			
Intersection Capacity Utilization	60.8%	ICU Level of Service		B
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	438	271	1	0	82	100	0	0	0	0	0	0
Future Volume (Veh/h)	438	271	1	0	82	100	0	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	476	295	1	0	89	109	0	0	0	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	198			296			1336	1446	296	1336	1337	89
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	198			296			1336	1446	296	1336	1337	89
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	65			100			100	100	100	100	100	100
cM capacity (veh/h)	1375			1277			95	86	744	95	100	969

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	772	89	109	0
Volume Left	476	0	0	0
Volume Right	1	0	109	0
cSH	1375	1277	1700	1700
Volume to Capacity	0.35	0.00	0.06	0.00
Queue Length 95th (ft)	39	0	0	0
Control Delay (s)	7.0	0.0	0.0	0.0
Lane LOS	A			A
Approach Delay (s)	7.0	0.0		0.0
Approach LOS				A

Intersection Summary				
Average Delay	5.6			
Intersection Capacity Utilization	51.4%	ICU Level of Service	A	
Analysis Period (min)	15			



Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	75	678	363	146	12	240
v/c Ratio	0.13	0.65	0.35	0.16	0.07	0.60
Control Delay	9.3	15.2	9.9	2.7	27.3	17.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.3	15.2	9.9	2.7	27.3	17.6
Queue Length 50th (ft)	9	117	50	0	3	31
Queue Length 95th (ft)	46	#452	178	29	20	103
Internal Link Dist (ft)		1062	920		247	459
Turn Bay Length (ft)	90					
Base Capacity (vph)	567	1044	1024	927	593	660
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.65	0.35	0.16	0.02	0.36

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	624	0	0	334	134	10	1	0	187	0	34
Future Volume (vph)	69	624	0	0	334	134	10	1	0	187	0	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0			7.0	7.0		6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	1.00			1.00	0.85		1.00			0.98	
Flt Protected	0.95	1.00			1.00	1.00		0.96			0.96	
Satd. Flow (prot)	1805	1881			1845	1553		1781			1727	
Flt Permitted	0.54	1.00			1.00	1.00		0.96			0.96	
Satd. Flow (perm)	1022	1881			1845	1553		1781			1727	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	75	678	0	0	363	146	11	1	0	203	0	37
RTOR Reduction (vph)	0	0	0	0	0	71	0	0	0	0	108	0
Lane Group Flow (vph)	75	678	0	0	363	75	0	12	0	0	132	0
Heavy Vehicles (%)	0%	1%	0%	0%	3%	4%	2%	2%	2%	4%	0%	0%
Turn Type	Perm	NA			NA	Perm	Split	NA		Split	NA	
Protected Phases		2			2		4	4		3	3	
Permitted Phases	2					2						
Actuated Green, G (s)	30.6	30.6			30.6	30.6		0.9			9.3	
Effective Green, g (s)	30.6	30.6			30.6	30.6		0.9			9.3	
Actuated g/C Ratio	0.51	0.51			0.51	0.51		0.02			0.16	
Clearance Time (s)	7.0	7.0			7.0	7.0		6.0			6.0	
Vehicle Extension (s)	4.0	4.0			4.0	4.0		2.0			3.0	
Lane Grp Cap (vph)	522	962			944	794		26			268	
v/s Ratio Prot		c0.36			0.20			c0.01			c0.08	
v/s Ratio Perm	0.07					0.05						
v/c Ratio	0.14	0.70			0.38	0.09		0.46			0.49	
Uniform Delay, d1	7.7	11.2			8.9	7.5		29.2			23.1	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	0.2	2.5			0.4	0.1		4.7			1.4	
Delay (s)	7.9	13.7			9.2	7.6		33.9			24.5	
Level of Service	A	B			A	A		C			C	
Approach Delay (s)		13.1			8.8			33.9			24.5	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	59.8	Sum of lost time (s)	19.0
Intersection Capacity Utilization	70.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 1: Cantebury Road /Route 846 & Ivy Road

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	TR	LT	R	LT	R
Maximum Queue (ft)	456	420	29	199	638	90	41	213	76
Average Queue (ft)	231	159	3	33	540	29	12	185	73
95th Queue (ft)	387	313	17	131	750	71	31	250	81
Link Distance (ft)	882	882			586	575		201	
Upstream Blk Time (%)					38			17	
Queuing Penalty (veh)					0			115	
Storage Bay Dist (ft)			450	200			180		75
Storage Blk Time (%)		0		0	51			23	27
Queuing Penalty (veh)		0		0	13			132	26

Intersection: 2: Route 846/Route 29 Off-Ramp & Old Garth Road/Old Ivy Road

Movement	EB	WB	NB	SB
Directions Served	TR	LT	LTR	LTR
Maximum Queue (ft)	138	86	73	1164
Average Queue (ft)	51	34	19	1132
95th Queue (ft)	104	68	57	1159
Link Distance (ft)	394	299	201	1106
Upstream Blk Time (%)				99
Queuing Penalty (veh)				0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Commercial Entrance/Faulconer Driver & Old Ivy Road

Movement	EB	WB	NB	SB	SB
Directions Served	LT	LTR	LTR	LT	R
Maximum Queue (ft)	87	3	28	232	46
Average Queue (ft)	15	0	4	90	5
95th Queue (ft)	55	2	19	171	30
Link Distance (ft)	299	332	171	352	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					190
Storage Blk Time (%)				2	0
Queuing Penalty (veh)				0	0

Intersection: 4: Commercial Entrance/Route 29 On-Ramp & Old Ivy Road

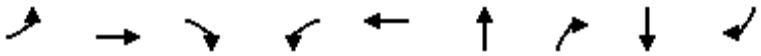
Movement	EB	WB
Directions Served	LTR	R
Maximum Queue (ft)	160	38
Average Queue (ft)	67	13
95th Queue (ft)	132	40
Link Distance (ft)	332	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		50
Storage Blk Time (%)		0
Queuing Penalty (veh)		0

Intersection: 5: Commerical Entrance/Old Ivy Road & Ivy Road

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	T	T	R	LTR	LTR
Maximum Queue (ft)	89	254	158	77	50	185
Average Queue (ft)	17	92	77	31	11	93
95th Queue (ft)	63	197	138	63	35	154
Link Distance (ft)		1037	956	956	277	420
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	90					
Storage Blk Time (%)	0	6				
Queuing Penalty (veh)	0	4				

Network Summary

Network wide Queuing Penalty: 291

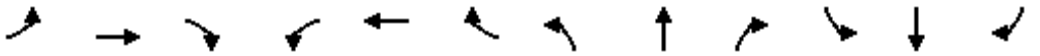


Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	460	686	22	43	751	27	37	87	617
v/c Ratio	0.90	0.60	0.02	0.11	1.04	0.23	0.12	0.59	0.91
Control Delay	55.4	19.5	0.0	10.8	80.9	58.1	0.7	68.8	41.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.4	19.5	0.0	10.8	80.9	58.1	0.7	68.8	41.3
Queue Length 50th (ft)	300	354	0	10	~631	20	0	66	250
Queue Length 95th (ft)	#550	493	0	23	#872	51	0	119	#576
Internal Link Dist (ft)		843			543	551		203	
Turn Bay Length (ft)			450	200			180		75
Base Capacity (vph)	513	1148	1045	394	722	139	337	187	680
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.60	0.02	0.11	1.04	0.19	0.11	0.47	0.91

Intersection Summary

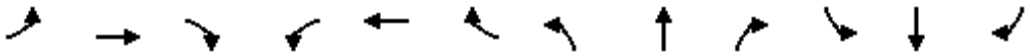
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	437	652	21	41	642	71	17	9	35	66	17	586
Future Volume (vph)	437	652	21	41	642	71	17	9	35	66	17	586
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.8	7.8	7.8	7.8	7.8			6.5	6.5		5.4	7.8
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.97	1.00		0.96	1.00
Satd. Flow (prot)	1752	1881	1615	1752	1855			1757	1524		1785	1583
Flt Permitted	0.08	1.00	1.00	0.40	1.00			0.97	1.00		0.96	1.00
Satd. Flow (perm)	139	1881	1615	746	1855			1757	1524		1785	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	460	686	22	43	676	75	18	9	37	69	18	617
RTOR Reduction (vph)	0	0	9	0	3	0	0	0	35	0	0	150
Lane Group Flow (vph)	460	686	13	43	748	0	0	27	2	0	87	467
Heavy Vehicles (%)	3%	1%	0%	3%	1%	0%	7%	0%	6%	3%	0%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Perm	Split	NA	pm+ov
Protected Phases	5	2		1	6		4	4		3	3	5
Permitted Phases	2		2	6					4			3
Actuated Green, G (s)	83.9	70.4	70.4	50.9	45.2			6.4	6.4		10.0	40.9
Effective Green, g (s)	83.9	70.4	70.4	50.9	45.2			6.4	6.4		10.0	40.9
Actuated g/C Ratio	0.70	0.59	0.59	0.42	0.38			0.05	0.05		0.08	0.34
Clearance Time (s)	7.8	7.8	7.8	7.8	7.8			6.5	6.5		5.4	7.8
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0			1.5	1.5		1.5	2.0
Lane Grp Cap (vph)	512	1103	947	364	698			93	81		148	539
v/s Ratio Prot	c0.23	0.36		0.01	c0.40			c0.02			0.05	c0.22
v/s Ratio Perm	0.40		0.01	0.04					0.00			0.07
v/c Ratio	0.90	0.62	0.01	0.12	1.07			0.29	0.02		0.59	0.87
Uniform Delay, d1	35.9	16.1	10.3	20.4	37.4			54.6	53.8		53.0	37.0
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	17.9	2.6	0.0	0.1	54.8			0.6	0.0		3.8	13.2
Delay (s)	53.8	18.8	10.4	20.4	92.2			55.2	53.9		56.8	50.2
Level of Service	D	B	B	C	F			E	D		E	D
Approach Delay (s)		32.4			88.3			54.5			51.0	
Approach LOS		C			F			D			D	

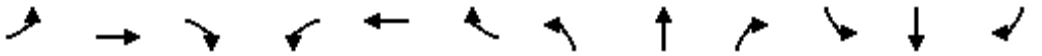
Intersection Summary			
HCM 2000 Control Delay	54.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	27.5
Intersection Capacity Utilization	99.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	36	22	57	57	0	30	0	478	9	606	15
Future Volume (Veh/h)	0	36	22	57	57	0	30	0	478	9	606	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	38	23	61	61	0	32	0	509	10	645	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								283				
pX, platoon unblocked	0.85	0.85		0.85	0.85	0.85				0.85		
vC, conflicting volume	1022	1246	653	1034	1000	254	661			509		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	939	1202	653	953	913	39	661			338		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	75	95	60	73	100	97			99		
cM capacity (veh/h)	161	152	462	151	225	885	937			1051		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	61	122	541	671
Volume Left	0	61	32	10
Volume Right	23	0	509	16
cSH	203	181	937	1051
Volume to Capacity	0.30	0.67	0.03	0.01
Queue Length 95th (ft)	30	101	3	1
Control Delay (s)	30.1	58.5	0.9	0.3
Lane LOS	D	F	A	A
Approach Delay (s)	30.1	58.5	0.9	0.3
Approach LOS	D	F		

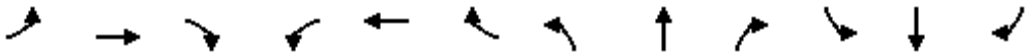
Intersection Summary				
Average Delay	6.9			
Intersection Capacity Utilization	69.2%	ICU Level of Service	C	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	515	1	0	113	22	1	0	7	151	0	15
Future Volume (Veh/h)	36	515	1	0	113	22	1	0	7	151	0	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	38	536	1	0	118	23	1	0	7	157	0	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												8
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	141			537			750	753	536	748	742	130
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	141			537			750	753	536	748	742	130
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			100	100	99	51	100	98
cM capacity (veh/h)	1455			1041			318	332	549	319	337	926

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	574	1	141	8	173
Volume Left	38	0	0	1	157
Volume Right	0	1	23	7	16
cSH	1455	1700	1041	503	351
Volume to Capacity	0.03	0.00	0.00	0.02	0.49
Queue Length 95th (ft)	2	0	0	1	65
Control Delay (s)	0.8	0.0	0.0	12.3	25.1
Lane LOS	A			B	D
Approach Delay (s)	0.8		0.0	12.3	25.1
Approach LOS				B	D

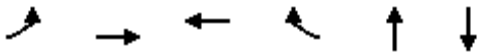
Intersection Summary				
Average Delay	5.4			
Intersection Capacity Utilization	61.4%	ICU Level of Service		B
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	477	161	0	0	130	232	0	1	0	0	0	0
Future Volume (Veh/h)	477	161	0	0	130	232	0	1	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.92	0.93	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	513	173	0	0	140	249	0	1	0	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	389			173			1339	1588	173	1340	1339	140
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	389			173			1339	1588	173	1340	1339	140
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	56			100			100	98	100	100	100	100
cM capacity (veh/h)	1170			1416			85	61	871	84	86	908

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	686	140	249	1
Volume Left	513	0	0	0
Volume Right	0	0	249	0
cSH	1170	1416	1700	61
Volume to Capacity	0.44	0.00	0.15	0.02
Queue Length 95th (ft)	57	0	0	1
Control Delay (s)	9.1	0.0	0.0	64.8
Lane LOS	A			F
Approach Delay (s)	9.1	0.0		64.8
Approach LOS				F

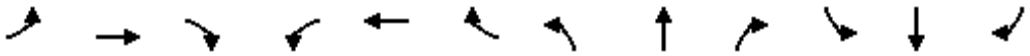
Intersection Summary			
Average Delay	5.9		
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)	15		



Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	46	536	750	297	18	211
v/c Ratio	0.20	0.51	0.70	0.29	0.07	0.55
Control Delay	11.0	10.9	15.8	2.5	0.5	15.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.0	10.9	15.8	2.5	0.5	15.5
Queue Length 50th (ft)	5	78	129	1	0	22
Queue Length 95th (ft)	34	260	#481	41	0	83
Internal Link Dist (ft)		1062	920		247	459
Turn Bay Length (ft)	90					
Base Capacity (vph)	233	1056	1066	1029	690	684
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.51	0.70	0.29	0.03	0.31

Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	493	0	0	690	273	14	0	3	139	0	55
Future Volume (vph)	42	493	0	0	690	273	14	0	3	139	0	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0			7.0	7.0		6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	1.00			1.00	0.85		0.98			0.96	
Flt Protected	0.95	1.00			1.00	1.00		0.96			0.97	
Satd. Flow (prot)	1805	1863			1881	1599		1783			1764	
Flt Permitted	0.22	1.00			1.00	1.00		0.96			0.97	
Satd. Flow (perm)	412	1863			1881	1599		1783			1764	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	46	536	0	0	750	297	15	0	3	151	0	60
RTOR Reduction (vph)	0	0	0	0	0	137	0	18	0	0	110	0
Lane Group Flow (vph)	46	536	0	0	750	160	0	0	0	0	101	0
Heavy Vehicles (%)	0%	2%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA			NA	Perm	Split	NA		Split	NA	
Protected Phases		2			2		4	4		3	3	
Permitted Phases	2					2						
Actuated Green, G (s)	30.4	30.4			30.4	30.4		0.7			8.4	
Effective Green, g (s)	30.4	30.4			30.4	30.4		0.7			8.4	
Actuated g/C Ratio	0.52	0.52			0.52	0.52		0.01			0.14	
Clearance Time (s)	7.0	7.0			7.0	7.0		6.0			6.0	
Vehicle Extension (s)	4.0	4.0			4.0	4.0		2.0			3.0	
Lane Grp Cap (vph)	214	968			977	830		21			253	
v/s Ratio Prot		0.29			c0.40			c0.00			c0.06	
v/s Ratio Perm	0.11					0.10						
v/c Ratio	0.21	0.55			0.77	0.19		0.01			0.40	
Uniform Delay, d1	7.6	9.5			11.2	7.5		28.6			22.8	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	0.7	0.9			3.9	0.2		0.1			1.0	
Delay (s)	8.3	10.3			15.1	7.7		28.6			23.8	
Level of Service	A	B			B	A		C			C	
Approach Delay (s)		10.2			13.0			28.6			23.8	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	13.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	58.5	Sum of lost time (s)	19.0
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 1: Cantebury Road /Route 846 & Ivy Road

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	TR	LT	R	LT	R
Maximum Queue (ft)	609	415	31	200	620	82	66	214	76
Average Queue (ft)	302	175	4	49	561	24	17	201	74
95th Queue (ft)	575	373	20	164	727	60	44	226	77
Link Distance (ft)	882	882			586	575		201	
Upstream Blk Time (%)	0	0			47			27	
Queuing Penalty (veh)	0	0			0			185	
Storage Bay Dist (ft)			450	200			180		75
Storage Blk Time (%)				0	55			25	37
Queuing Penalty (veh)				1	23			146	31

Intersection: 2: Route 846/Route 29 Off-Ramp & Old Garth Road/Old Ivy Road

Movement	EB	WB	NB	SB
Directions Served	TR	LT	LTR	LTR
Maximum Queue (ft)	80	141	71	1147
Average Queue (ft)	32	55	19	1103
95th Queue (ft)	63	111	56	1277
Link Distance (ft)	394	299	201	1106
Upstream Blk Time (%)		0		93
Queuing Penalty (veh)		0		0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Commercial Entrance/Faulconer Driver & Old Ivy Road

Movement	EB	NB	SB	SB
Directions Served	LT	LTR	LT	R
Maximum Queue (ft)	58	28	138	47
Average Queue (ft)	6	6	54	13
95th Queue (ft)	31	23	102	42
Link Distance (ft)	299	171	352	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				190
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Commercial Entrance/Route 29 On-Ramp & Old Ivy Road

Movement	EB	WB	NB
Directions Served	LTR	R	LTR
Maximum Queue (ft)	310	44	17
Average Queue (ft)	121	29	1
95th Queue (ft)	235	50	9
Link Distance (ft)	332		193
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	1		
Storage Bay Dist (ft)		50	
Storage Blk Time (%)		1	
Queuing Penalty (veh)		1	

Intersection: 5: Commerical Entrance/Old Ivy Road & Ivy Road

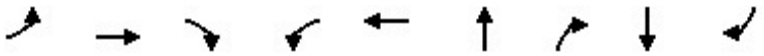
Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	T	T	R	LTR	LTR
Maximum Queue (ft)	78	190	322	92	49	160
Average Queue (ft)	13	54	146	44	15	77
95th Queue (ft)	50	146	256	76	41	132
Link Distance (ft)		1037	956	956	277	420
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	90					
Storage Blk Time (%)	1	2				
Queuing Penalty (veh)	4	1				

Network Summary

Network wide Queuing Penalty: 391

Appendix D

Synchro Analysis for 2025 Total Future Conditions

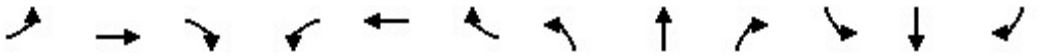


Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	435	676	11	28	740	34	27	139	653
v/c Ratio	0.88	0.59	0.01	0.07	1.09	0.27	0.08	0.79	0.94
Control Delay	53.2	18.8	0.0	11.4	98.4	58.7	0.5	81.9	44.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.2	18.8	0.0	11.4	98.4	58.7	0.5	81.9	44.7
Queue Length 50th (ft)	282	362	0	7	~663	26	0	105	240
Queue Length 95th (ft)	#498	499	0	18	#904	60	0	#196	#651
Internal Link Dist (ft)		843			543	551		203	
Turn Bay Length (ft)			450	200			180		75
Base Capacity (vph)	496	1153	1066	377	677	147	338	199	692
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.59	0.01	0.07	1.09	0.23	0.08	0.70	0.94

Intersection Summary

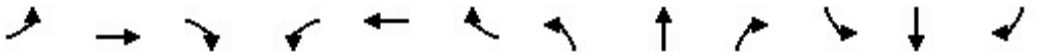
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	400	622	10	26	565	116	13	18	25	114	14	601
Future Volume (vph)	400	622	10	26	565	116	13	18	25	114	14	601
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.8	7.8	7.8	7.8	7.8			6.5	6.5		5.4	7.8
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.98	1.00		0.96	1.00
Satd. Flow (prot)	1770	1845	1615	1736	1758			1862	1538		1756	1553
Flt Permitted	0.08	1.00	1.00	0.41	1.00			0.98	1.00		0.96	1.00
Satd. Flow (perm)	142	1845	1615	745	1758			1862	1538		1756	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	435	676	11	28	614	126	14	20	27	124	15	653
RTOR Reduction (vph)	0	0	5	0	6	0	0	0	26	0	0	166
Lane Group Flow (vph)	435	676	6	28	734	0	0	34	1	0	139	487
Heavy Vehicles (%)	2%	3%	0%	4%	6%	2%	0%	0%	5%	4%	0%	4%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Perm	Split	NA	pm+ov
Protected Phases	5	2		1	6		4	4		3	3	5
Permitted Phases	2		2	6					4			3
Actuated Green, G (s)	81.7	70.6	70.6	47.9	44.6			6.5	6.5		12.1	41.4
Effective Green, g (s)	81.7	70.6	70.6	47.9	44.6			6.5	6.5		12.1	41.4
Actuated g/C Ratio	0.68	0.59	0.59	0.40	0.37			0.05	0.05		0.10	0.34
Clearance Time (s)	7.8	7.8	7.8	7.8	7.8			6.5	6.5		5.4	7.8
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0			1.5	1.5		1.5	2.0
Lane Grp Cap (vph)	494	1085	950	324	653			100	83		177	535
v/s Ratio Prot	0.21	0.37		0.00	c0.42			c0.02			0.08	c0.22
v/s Ratio Perm	0.38		0.00	0.03					0.00			0.09
v/c Ratio	0.88	0.62	0.01	0.09	1.12			0.34	0.02		0.79	0.91
Uniform Delay, d1	35.9	16.1	10.2	22.0	37.7			54.7	53.7		52.7	37.5
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	16.2	2.7	0.0	0.0	74.4			0.7	0.0		18.7	19.4
Delay (s)	52.1	18.8	10.2	22.1	112.1			55.4	53.8		71.4	56.9
Level of Service	D	B	B	C	F			E	D		E	E
Approach Delay (s)		31.6			108.8			54.7			59.5	
Approach LOS		C			F			D			E	

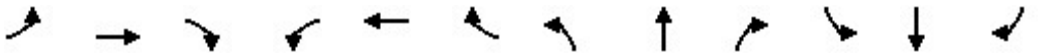
Intersection Summary			
HCM 2000 Control Delay	61.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	27.5
Intersection Capacity Utilization	99.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	68	34	97	18	0	21	0	513	54	607	41
Future Volume (Veh/h)	0	68	34	97	18	0	21	0	513	54	607	41
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	74	37	105	20	0	23	0	558	59	660	45
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								283				
pX, platoon unblocked	0.87	0.87		0.87	0.87	0.87				0.87		
vC, conflicting volume	1136	1404	682	1200	1148	279	705			558		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1079	1390	682	1153	1093	89	705			411		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	100	35	92	0	88	100	97			94		
cM capacity (veh/h)	146	114	453	60	171	843	902			1002		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	111	125	581	764
Volume Left	0	105	23	59
Volume Right	37	0	558	45
cSH	152	67	902	1002
Volume to Capacity	0.73	1.86	0.03	0.06
Queue Length 95th (ft)	110	284	2	5
Control Delay (s)	75.1	538.1	0.7	1.5
Lane LOS	F	F	A	A
Approach Delay (s)	75.1	538.1	0.7	1.5
Approach LOS	F	F		

Intersection Summary				
Average Delay	48.8			
Intersection Capacity Utilization	75.6%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	122	512	11	0	108	39	3	1	0	239	4	4
Future Volume (Veh/h)	122	512	11	0	108	39	3	1	0	239	4	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	133	557	12	0	117	42	3	1	0	260	4	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												8
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	159			569			965	982	557	962	973	138
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	159			569			965	982	557	962	973	138
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	91			100			99	100	100	0	98	100
cM capacity (veh/h)	1433			1013			216	228	534	217	231	916

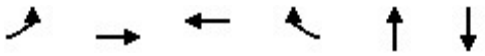
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	690	12	159	4	268
Volume Left	133	0	0	3	260
Volume Right	0	12	42	0	4
cSH	1433	1700	1013	219	220
Volume to Capacity	0.09	0.01	0.00	0.02	1.22
Queue Length 95th (ft)	8	0	0	1	336
Control Delay (s)	2.4	0.0	0.0	21.8	176.1
Lane LOS	A			C	F
Approach Delay (s)	2.3		0.0	21.8	176.1
Approach LOS				C	F

Intersection Summary				
Average Delay	43.2			
Intersection Capacity Utilization	68.1%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	438	311	1	0	147	165	0	0	0	0	0	0
Future Volume (Veh/h)	438	311	1	0	147	165	0	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	476	338	1	0	160	179	0	0	0	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	339			339			1450	1630	338	1450	1451	160
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	339			339			1450	1630	338	1450	1451	160
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	61			100			100	100	100	100	100	100
cM capacity (veh/h)	1220			1231			76	62	704	76	80	885

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	815	160	179	0
Volume Left	476	0	0	0
Volume Right	1	0	179	0
cSH	1220	1231	1700	1700
Volume to Capacity	0.39	0.00	0.11	0.00
Queue Length 95th (ft)	47	0	0	0
Control Delay (s)	7.7	0.0	0.0	0.0
Lane LOS	A			A
Approach Delay (s)	7.7	0.0		0.0
Approach LOS				A

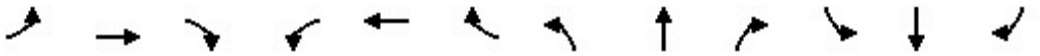
Intersection Summary				
Average Delay	5.5			
Intersection Capacity Utilization	57.6%	ICU Level of Service		B
Analysis Period (min)	15			



Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	75	678	363	175	12	335
v/c Ratio	0.14	0.69	0.37	0.19	0.08	0.71
Control Delay	10.7	17.8	11.5	2.9	28.9	22.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.7	17.8	11.5	2.9	28.9	22.4
Queue Length 50th (ft)	11	144	61	0	4	60
Queue Length 95th (ft)	48	#475	189	34	21	166
Internal Link Dist (ft)		1062	920		247	459
Turn Bay Length (ft)	90					
Base Capacity (vph)	523	988	969	898	561	632
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.69	0.37	0.19	0.02	0.53

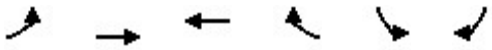
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	624	0	0	334	161	10	1	0	274	0	34
Future Volume (vph)	69	624	0	0	334	161	10	1	0	274	0	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0			7.0	7.0		6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	1.00			1.00	0.85		1.00			0.99	
Flt Protected	0.95	1.00			1.00	1.00		0.96			0.96	
Satd. Flow (prot)	1805	1881			1845	1553		1781			1730	
Flt Permitted	0.52	1.00			1.00	1.00		0.96			0.96	
Satd. Flow (perm)	995	1881			1845	1553		1781			1730	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	75	678	0	0	363	175	11	1	0	298	0	37
RTOR Reduction (vph)	0	0	0	0	0	90	0	0	0	0	103	0
Lane Group Flow (vph)	75	678	0	0	363	85	0	12	0	0	232	0
Heavy Vehicles (%)	0%	1%	0%	0%	3%	4%	2%	2%	2%	4%	0%	0%
Turn Type	Perm	NA			NA	Perm	Split	NA		Split	NA	
Protected Phases		2			2		4	4		3	3	
Permitted Phases	2					2						
Actuated Green, G (s)	30.5	30.5			30.5	30.5		1.0			12.4	
Effective Green, g (s)	30.5	30.5			30.5	30.5		1.0			12.4	
Actuated g/C Ratio	0.48	0.48			0.48	0.48		0.02			0.20	
Clearance Time (s)	7.0	7.0			7.0	7.0		6.0			6.0	
Vehicle Extension (s)	4.0	4.0			4.0	4.0		2.0			3.0	
Lane Grp Cap (vph)	482	912			894	753		28			341	
v/s Ratio Prot		c0.36			0.20			c0.01			c0.13	
v/s Ratio Perm	0.08					0.05						
v/c Ratio	0.16	0.74			0.41	0.11		0.43			0.68	
Uniform Delay, d1	9.0	13.0			10.4	8.8		30.7			23.4	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	0.2	3.5			0.4	0.1		3.8			5.5	
Delay (s)	9.2	16.6			10.8	8.9		34.5			28.9	
Level of Service	A	B			B	A		C			C	
Approach Delay (s)		15.8			10.2			34.5			28.9	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	16.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	62.9	Sum of lost time (s)	19.0
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	40	271	204	27	87	130
Future Volume (Veh/h)	40	271	204	27	87	130
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	43	295	222	29	95	141
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	251				603	222
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	251				603	222
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				79	83
cM capacity (veh/h)	1314				447	818

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	43	295	222	29	236
Volume Left	43	0	0	0	95
Volume Right	0	0	0	29	141
cSH	1314	1700	1700	1700	613
Volume to Capacity	0.03	0.17	0.13	0.02	0.39
Queue Length 95th (ft)	3	0	0	0	45
Control Delay (s)	7.8	0.0	0.0	0.0	14.5
Lane LOS	A				B
Approach Delay (s)	1.0		0.0		14.5
Approach LOS					B

Intersection Summary			
Average Delay	4.6		
Intersection Capacity Utilization	36.9%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection: 1: Cantebury Road /Route 846 & Ivy Road

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	TR	LT	R	LT	R
Maximum Queue (ft)	453	386	26	199	640	68	43	214	75
Average Queue (ft)	226	152	2	34	582	27	12	189	73
95th Queue (ft)	392	292	16	134	713	60	32	248	82
Link Distance (ft)	882	882			586	575		201	
Upstream Blk Time (%)					51			22	
Queuing Penalty (veh)					0			159	
Storage Bay Dist (ft)			450	200			180		75
Storage Blk Time (%)		0		0	57			30	24
Queuing Penalty (veh)		0		0	15			180	31

Intersection: 2: Route 846/Route 29 Off-Ramp & Old Garth Road/Old Ivy Road

Movement	EB	WB	NB	SB
Directions Served	TR	LT	LTR	LTR
Maximum Queue (ft)	117	149	69	1163
Average Queue (ft)	50	60	21	1129
95th Queue (ft)	99	116	60	1150
Link Distance (ft)	394	299	201	1106
Upstream Blk Time (%)				100
Queuing Penalty (veh)				0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Commercial Entrance/Faulconer Driver & Old Ivy Road

Movement	EB	WB	NB	SB	SB
Directions Served	LT	LTR	LTR	LT	R
Maximum Queue (ft)	89	3	25	268	41
Average Queue (ft)	20	0	4	115	5
95th Queue (ft)	64	3	18	235	34
Link Distance (ft)	299	332	171	352	
Upstream Blk Time (%)				2	
Queuing Penalty (veh)				0	
Storage Bay Dist (ft)					190
Storage Blk Time (%)	0			6	0
Queuing Penalty (veh)	0			0	0

Intersection: 4: Commercial Entrance/Route 29 On-Ramp & Old Ivy Road

Movement	EB	WB
Directions Served	LTR	R
Maximum Queue (ft)	198	39
Average Queue (ft)	86	6
95th Queue (ft)	159	22
Link Distance (ft)	332	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		250
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Commerical Entrance/Old Ivy Road & Ivy Road

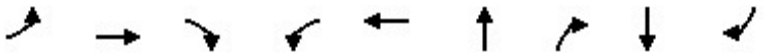
Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	T	T	R	LTR	LTR
Maximum Queue (ft)	85	320	206	71	40	238
Average Queue (ft)	16	107	82	35	11	126
95th Queue (ft)	59	241	151	61	34	207
Link Distance (ft)		1037	956	956	277	420
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	90					
Storage Blk Time (%)	0	8				
Queuing Penalty (veh)	0	6				

Intersection: 6: Old Ivy Road & Site Entrance

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	44	103
Average Queue (ft)	8	50
95th Queue (ft)	31	83
Link Distance (ft)		414
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	150	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 391

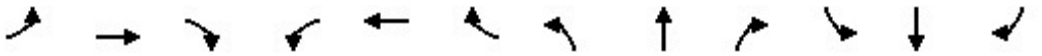


Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	495	686	22	43	785	27	37	107	637
v/c Ratio	0.97	0.60	0.02	0.11	1.10	0.23	0.12	0.68	0.93
Control Delay	70.3	19.7	0.0	11.0	99.5	58.1	0.7	74.0	45.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.3	19.7	0.0	11.0	99.5	58.1	0.7	74.0	45.4
Queue Length 50th (ft)	~376	358	0	10	~687	20	0	81	~267
Queue Length 95th (ft)	#611	493	0	23	#930	51	0	141	#653
Internal Link Dist (ft)		843			543	551		203	
Turn Bay Length (ft)			450	200			180		75
Base Capacity (vph)	508	1143	1041	387	714	139	337	186	682
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.60	0.02	0.11	1.10	0.19	0.11	0.58	0.93

Intersection Summary

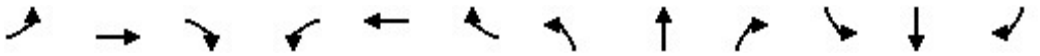
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	470	652	21	41	642	104	17	9	35	85	17	605
Future Volume (vph)	470	652	21	41	642	104	17	9	35	85	17	605
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.8	7.8	7.8	7.8	7.8			6.5	6.5		5.4	7.8
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.97	1.00		0.96	1.00
Satd. Flow (prot)	1752	1881	1615	1752	1845			1757	1524		1780	1583
Flt Permitted	0.08	1.00	1.00	0.40	1.00			0.97	1.00		0.96	1.00
Satd. Flow (perm)	140	1881	1615	746	1845			1757	1524		1780	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	495	686	22	43	676	109	18	9	37	89	18	637
RTOR Reduction (vph)	0	0	9	0	5	0	0	0	35	0	0	149
Lane Group Flow (vph)	495	686	13	43	780	0	0	27	2	0	107	488
Heavy Vehicles (%)	3%	1%	0%	3%	1%	0%	7%	0%	6%	3%	0%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Perm	Split	NA	pm+ov
Protected Phases	5	2		1	6		4	4		3	3	5
Permitted Phases	2		2	6					4			3
Actuated Green, G (s)	83.2	70.1	70.1	50.2	44.9			6.4	6.4		10.7	41.2
Effective Green, g (s)	83.2	70.1	70.1	50.2	44.9			6.4	6.4		10.7	41.2
Actuated g/C Ratio	0.69	0.58	0.58	0.42	0.37			0.05	0.05		0.09	0.34
Clearance Time (s)	7.8	7.8	7.8	7.8	7.8			6.5	6.5		5.4	7.8
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0			1.5	1.5		1.5	2.0
Lane Grp Cap (vph)	506	1098	943	356	690			93	81		158	543
v/s Ratio Prot	c0.25	0.36		0.01	c0.42			c0.02			0.06	c0.23
v/s Ratio Perm	0.43		0.01	0.05					0.00			0.08
v/c Ratio	0.98	0.62	0.01	0.12	1.13			0.29	0.02		0.68	0.90
Uniform Delay, d1	37.7	16.3	10.5	20.8	37.5			54.6	53.8		53.0	37.4
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	33.9	2.7	0.0	0.1	76.1			0.6	0.0		8.7	17.1
Delay (s)	71.6	19.0	10.5	20.9	113.7			55.2	53.9		61.7	54.5
Level of Service	E	B	B	C	F			E	D		E	D
Approach Delay (s)		40.5			108.9			54.5			55.6	
Approach LOS		D			F			D			E	

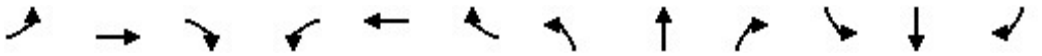
Intersection Summary			
HCM 2000 Control Delay	64.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	27.5
Intersection Capacity Utilization	102.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	36	22	96	57	0	30	0	544	9	606	15
Future Volume (Veh/h)	0	36	22	96	57	0	30	0	544	9	606	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	38	23	102	61	0	32	0	579	10	645	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								283				
pX, platoon unblocked	0.83	0.83		0.83	0.83	0.83				0.83		
vC, conflicting volume	1057	1316	653	1068	1034	290	661			579		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	969	1280	653	983	942	50	661			397		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	72	95	25	71	100	97			99		
cM capacity (veh/h)	147	134	462	136	211	855	937			979		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	61	163	611	671
Volume Left	0	102	32	10
Volume Right	23	0	579	16
cSH	182	157	937	979
Volume to Capacity	0.33	1.04	0.03	0.01
Queue Length 95th (ft)	35	205	3	1
Control Delay (s)	34.3	139.6	0.9	0.3
Lane LOS	D	F	A	A
Approach Delay (s)	34.3	139.6	0.9	0.3
Approach LOS	D	F		

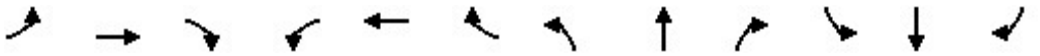
Intersection Summary				
Average Delay	17.0			
Intersection Capacity Utilization	75.3%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	592	1	0	152	22	1	0	7	217	0	15
Future Volume (Veh/h)	36	592	1	0	152	22	1	0	7	217	0	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	38	617	1	0	158	23	1	0	7	226	0	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												8
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	181			618			870	874	617	870	864	170
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	181			618			870	874	617	870	864	170
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			100	100	99	14	100	98
cM capacity (veh/h)	1407			972			263	282	494	264	286	880

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	655	1	181	8	242
Volume Left	38	0	0	1	226
Volume Right	0	1	23	7	16
cSH	1407	1700	972	445	282
Volume to Capacity	0.03	0.00	0.00	0.02	0.86
Queue Length 95th (ft)	2	0	0	1	183
Control Delay (s)	0.7	0.0	0.0	13.2	62.1
Lane LOS	A			B	F
Approach Delay (s)	0.7		0.0	13.2	62.1
Approach LOS				B	F

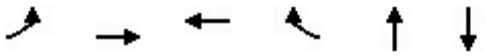
Intersection Summary				
Average Delay	14.4			
Intersection Capacity Utilization	71.2%	ICU Level of Service	C	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	477	293	0	0	169	271	0	1	0	0	0	0
Future Volume (Veh/h)	477	293	0	0	169	271	0	1	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.92	0.93	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	513	315	0	0	182	291	0	1	0	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	473			315			1523	1814	315	1524	1523	182
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	473			315			1523	1814	315	1524	1523	182
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	53			100			100	98	100	100	100	100
cM capacity (veh/h)	1089			1257			61	42	725	60	62	861

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	828	182	291	1
Volume Left	513	0	0	0
Volume Right	0	0	291	0
cSH	1089	1257	1700	42
Volume to Capacity	0.47	0.00	0.17	0.02
Queue Length 95th (ft)	64	0	0	2
Control Delay (s)	9.4	0.0	0.0	93.1
Lane LOS	A			F
Approach Delay (s)	9.4	0.0		93.1
Approach LOS				F

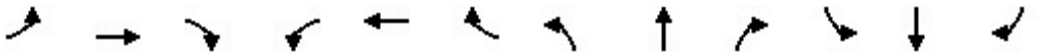
Intersection Summary				
Average Delay	6.1			
Intersection Capacity Utilization	71.9%	ICU Level of Service	C	
Analysis Period (min)	15			



Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	46	536	750	392	18	268
v/c Ratio	0.22	0.52	0.72	0.37	0.07	0.63
Control Delay	12.8	12.2	17.7	2.8	0.5	18.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.8	12.2	17.7	2.8	0.5	18.6
Queue Length 50th (ft)	6	87	145	2	0	39
Queue Length 95th (ft)	38	285	#519	50	0	117
Internal Link Dist (ft)		1062	920		247	459
Turn Bay Length (ft)	90					
Base Capacity (vph)	212	1026	1035	1049	674	672
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.52	0.72	0.37	0.03	0.40

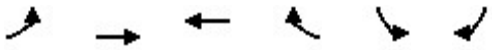
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	493	0	0	690	361	14	0	3	191	0	55
Future Volume (vph)	42	493	0	0	690	361	14	0	3	191	0	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0			7.0	7.0		6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	1.00			1.00	0.85		0.98			0.97	
Flt Protected	0.95	1.00			1.00	1.00		0.96			0.96	
Satd. Flow (prot)	1805	1863			1881	1599		1783			1774	
Flt Permitted	0.20	1.00			1.00	1.00		0.96			0.96	
Satd. Flow (perm)	386	1863			1881	1599		1783			1774	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	46	536	0	0	750	392	15	0	3	208	0	60
RTOR Reduction (vph)	0	0	0	0	0	186	0	18	0	0	107	0
Lane Group Flow (vph)	46	536	0	0	750	206	0	0	0	0	161	0
Heavy Vehicles (%)	0%	2%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA			NA	Perm	Split	NA		Split	NA	
Protected Phases		2			2		4	4		3	3	
Permitted Phases	2					2						
Actuated Green, G (s)	30.5	30.5			30.5	30.5		0.7			10.0	
Effective Green, g (s)	30.5	30.5			30.5	30.5		0.7			10.0	
Actuated g/C Ratio	0.51	0.51			0.51	0.51		0.01			0.17	
Clearance Time (s)	7.0	7.0			7.0	7.0		6.0			6.0	
Vehicle Extension (s)	4.0	4.0			4.0	4.0		2.0			3.0	
Lane Grp Cap (vph)	195	943			952	810		20			294	
v/s Ratio Prot		0.29			c0.40			c0.00			c0.09	
v/s Ratio Perm	0.12					0.13						
v/c Ratio	0.24	0.57			0.79	0.25		0.01			0.55	
Uniform Delay, d1	8.3	10.3			12.2	8.4		29.4			23.0	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	0.9	1.0			4.6	0.2		0.1			2.1	
Delay (s)	9.2	11.2			16.8	8.6		29.5			25.1	
Level of Service	A	B			B	A		C			C	
Approach Delay (s)		11.1			14.0			29.5			25.1	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	14.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	60.2	Sum of lost time (s)	19.0
Intersection Capacity Utilization	63.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	132	161	315	88	52	77
Future Volume (Veh/h)	132	161	315	88	52	77
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	143	175	342	96	57	84
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	438				803	342
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	438				803	342
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	87				81	88
cM capacity (veh/h)	1122				308	701

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	143	175	342	96	141
Volume Left	143	0	0	0	57
Volume Right	0	0	0	96	84
cSH	1122	1700	1700	1700	462
Volume to Capacity	0.13	0.10	0.20	0.06	0.31
Queue Length 95th (ft)	11	0	0	0	32
Control Delay (s)	8.7	0.0	0.0	0.0	16.2
Lane LOS	A				C
Approach Delay (s)	3.9		0.0		16.2
Approach LOS					C

Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	41.5%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection: 1: Cantebury Road /Route 846 & Ivy Road

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	TR	LT	R	LT	R
Maximum Queue (ft)	621	504	29	200	624	72	55	212	76
Average Queue (ft)	330	171	5	69	588	22	16	200	73
95th Queue (ft)	578	366	22	206	689	57	41	224	86
Link Distance (ft)	882	882			586	575		201	
Upstream Blk Time (%)	0	0			59			27	
Queuing Penalty (veh)	0	0			0			196	
Storage Bay Dist (ft)			450	200			180		75
Storage Blk Time (%)		0		0	60			32	29
Queuing Penalty (veh)		0		1	24			191	29

Intersection: 2: Route 846/Route 29 Off-Ramp & Old Garth Road/Old Ivy Road

Movement	EB	WB	NB	SB
Directions Served	TR	LT	LTR	LTR
Maximum Queue (ft)	85	184	84	1150
Average Queue (ft)	33	76	25	1116
95th Queue (ft)	66	151	66	1210
Link Distance (ft)	394	299	201	1106
Upstream Blk Time (%)		0		98
Queuing Penalty (veh)		0		0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Commercial Entrance/Faulconer Driver & Old Ivy Road

Movement	EB	WB	NB	SB	SB
Directions Served	LT	LTR	LTR	LT	R
Maximum Queue (ft)	90	5	30	218	76
Average Queue (ft)	10	0	6	97	16
95th Queue (ft)	51	5	24	182	53
Link Distance (ft)	299	332	171	352	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					190
Storage Blk Time (%)	0			2	0
Queuing Penalty (veh)	0			0	0

Intersection: 4: Commercial Entrance/Route 29 On-Ramp & Old Ivy Road

Movement	EB	WB	NB
Directions Served	LTR	R	LTR
Maximum Queue (ft)	324	47	16
Average Queue (ft)	148	12	1
95th Queue (ft)	273	33	10
Link Distance (ft)	332		194
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	2		
Storage Bay Dist (ft)		250	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: Commerical Entrance/Old Ivy Road & Ivy Road

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	T	T	R	LTR	LTR
Maximum Queue (ft)	86	244	352	116	43	194
Average Queue (ft)	21	67	166	55	13	99
95th Queue (ft)	68	169	285	93	37	164
Link Distance (ft)		1037	956	956	277	420
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	90					
Storage Blk Time (%)	4	3				
Queuing Penalty (veh)	18	1				

Intersection: 19: Old Ivy Road & Site Entrance

Movement	EB	WB	SB
Directions Served	L	R	LR
Maximum Queue (ft)	70	12	96
Average Queue (ft)	29	1	43
95th Queue (ft)	61	7	74
Link Distance (ft)			592
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	150	150	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 464