



## Traffic Impact Assessment – Step 4 Analysis

*Heafey Group*

**Type of Document:**

Final Report

**Project Name:**

6171 Hazeldean Road Development

**Project Number:**

OTT-00268780-A0

**Prepared By:**

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**Date Submitted:**

2021-09-24

# A11654128 Canada Inc. (Heafey Group)

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**Date Submitted:**

September 24, 2021

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## 1 Screening Form

EXP completed a TIA screening form for the proposed development for confirmation of the need for completion of a Traffic Impact Assessment (TIA). A copy of the completed screening form is attached to this report as **Appendix A**.

The proposed development satisfies two of the three triggers (Trip Generation, Location) due to the size of the development and its connection to a spine bicycle route (Hazeldean Road).



## 2 Scoping Report

### 2.1 Proposed Development

11654128 Canada Inc. (Heafey Group) is proposing a 529-unit, mixed-use subdivision consisting of the following dwelling types:

- 20 Single Detached;
- 150 Townhomes;
- 240 Condominium Units (48 units per building, 5 buildings); and
- 160 Apartment Units (One 9-story building).
- Commercial space (19,400 ft<sup>2</sup>)

The development will provide 504 parking spaces throughout the development, including underground parking for the apartment blocks. A concept site plan is shown in **Figure 1** (below) and is provided in full-size in Appendix B.

The development will provide internal connectivity throughout the site through private roadways and will provide connections to Hazeldean Rd and Kimpton Dr.



Figure 1 - Site Plan

The proposed development is in a General Urban Area (Section 3.6.1 of the Official Plan) which is located within Zone Arterial Mainstreet Subzone AM9. The property is currently vacant with few existing trees.

The proposed development is to be constructed in a single phase with construction starting in 2021 and completed and full occupancy by 2024.

Vehicular access to the proposed development will be provided by a signalized intersection on Hazeldean Road, approximately 280m east of the Hazeldean Road and Carp Road intersection. A second access to the development is proposed approximately 320m east of the Kimpton Drive (Echowoods Avenue) and Carp Road intersection. The proposed intersection would be the fourth leg of the 'stop controlled' intersection of Samantha Eastop Avenue and Kimpton Drive intersection.

## 2.2 Study Area

The proposed study area is as outlined below and highlighted in **Figure 2**:

- Hazeldean Road and Carp Road Intersection;
- Hazeldean Road and Stittsville Main Street Intersection;
- Carp Road and Stittsville Main Street Intersection;
- Carp Road and Kittiwake Drive/Echowoods Avenue Intersection;
- Kimpton Drive and Samantha Eastop Drive Intersection; and
- All boundary roads to the proposed development (Hazeldean Road, Carp Road, Stittsville Main Street, Echowoods Avenue, Kimpton Drive, Samantha Eastop Drive).

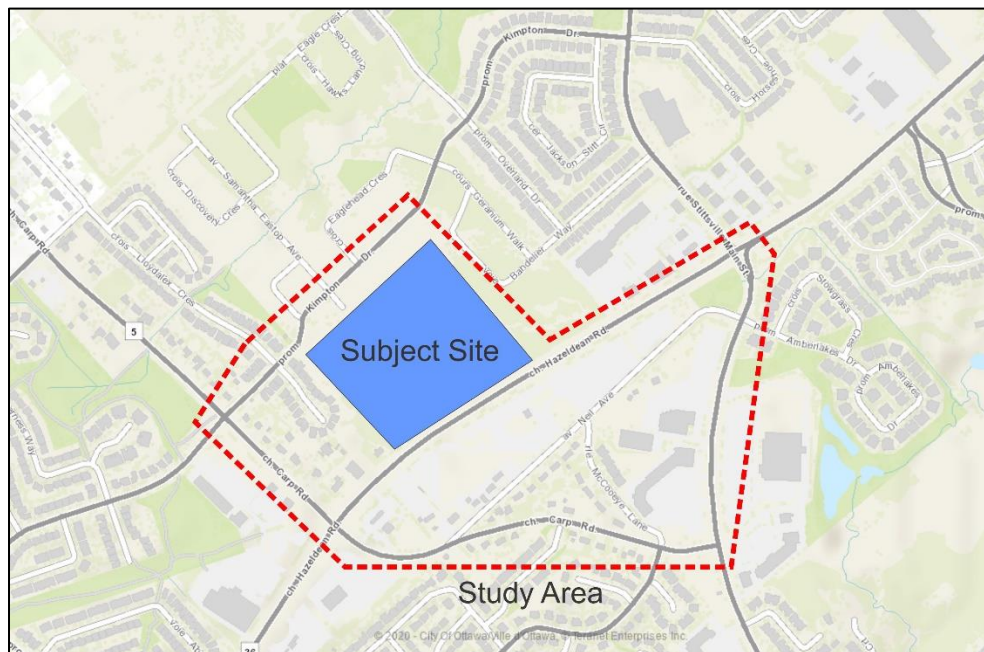


Figure 2 - Proposed Study Area

## 2.3 Existing Conditions

### 2.3.1 Area Road Network

The roadways within the study area network are described below including information on their cross-sections, parking, speed limits and left-turn storage.

**Hazeldean Road** is an east-west, City-owned, arterial roadway which extends from Spruce Ridge Road in the west to Eagleson Road in the east (where it continues as Robertson Road). Through the study area, Hazeldean Road has a four-lane divided cross section, with bike lanes on both sides of the roadway. West of Carp Road, Hazeldean Road's westbound movement drops to a single through lane. No parking is permitted on Hazeldean Road. The

posted speed limit through the study area is 60km/h. Within the study area, Hazeldean has an eastbound left-turn storage of approximately 80 metres and a westbound left-turn storage of approximately 30 metres at the intersection of Carp Road. Hazeldean also has an eastbound left-turn storage of approximately 34 metres and an exceptionally long westbound left-turn storage of approximately 288 metres at the intersection of Stittsville Main Street.

**Carp Road** is a north-south, City-owned arterial roadway which extends between Galleta Side Road in the north to Stittsville Main Street in the south. Within the study area, Carp Road has a two-way undivided cross section, with bike lanes on both sides of the roadway in several areas. No parking is permitted on Carp Road. The posted speed limit through the study area is 60km/h. Within the study area, Carp Road has a southbound left-turn storage of approximately 30 metres and a northbound left-turn storage of approximately 25 metres at the intersection with Kittiwake Dr / Echwoods Ave. At the intersection with Hazeldean Rd, the southbound left-turn storage length is approximately 70 metres and a northbound left-turn storage length of approximately 27 metres. At the intersection with Stittsville Main St, the eastbound left-turn storage length is approximately 30 metres and the westbound left-turn storage length is approximately 15 metres.

**Stittsville Main Street** is a north-south, City-owned roadway which extends between a cul-de-sac (aligned with Maple Grove Road) in the north and Flewellyn Road in the south (where it continues as Huntley Road). North of Hazeldean Road, it is classified as a major collector, and south of Hazeldean Road it is classified as an arterial. Within the study area, Stittsville Main Street has a two-way undivided cross section, with a bike lane on the east side of the road at the Hazeldean Road intersection. No parking is permitted on Stittsville Main Street within the study area. The posted speed limit within the study area is 50km/h. At the intersection with Hazeldean Rd, Stittsville has a southbound left-turn storage of approximately 46 metres and a northbound left-turn storage of approximately 24 metres. At the intersection with Carp Rd, it has a southbound left-turn storage length of approximately 30 metres and a northbound left-turn storage of approximately 32 metres.

**Kimpton Drive** is an east-west, City-owned, collector roadway which extends between Llyodalex Crescent in the west (where it continues as Echowoods Drive) and Stittsville Main Street in the east (where it continues as Horseshoe Crescent). It has a two-way undivided cross section, with parking permitted and no bike lanes. The posted speed limit is 50km/h.

**Echowoods Avenue** is an east-west, City-owned, collector roadway which extends between Carp Road in the west (where it continues as Kittiwake Drive), and Llyodalex Crescent in the east (where it continues as Kimpton Drive). It has a two-way undivided cross section, with parking permitted and no bike lanes. The posted speed limit is 50km/h.

**Kittiwake Drive** is an east-west, City-owned, collector roadway which extends between Hazeldean Road in the west (where it continues as West Ridge Drive) and Carp Road in the east (where it continues as Echowoods Avenue). It has a two-way undivided cross section, with parking permitted and no bike lanes. The posted speed limit is 40km/h. At its intersection with Carp Rd, it provides an eastbound left-turn storage of approximately 15 metres.

### 2.3.2 Existing Study Area Intersections

The proposed study intersection lane configurations and traffic controls are illustrated in **Figure 3**. The following is a description of the study area intersections.

#### **Hazeldean Road / Carp Road**

The Hazeldean Road/Carp Road intersection is a signalized four-way intersection. The eastbound and northbound approaches consist of two through lanes and one auxiliary left-turn lane. The westbound and southbound approaches consist of one through lane, one auxiliary left-turn lane and one auxiliary channelized right-turn lane. The westbound, northbound and southbound lanes provide bike lanes.

#### **Hazeldean Road / Stittsville Main Street**

The Hazeldean Road/Stittsville Main Street intersection is a signalized four-way intersection. The eastbound and westbound approaches consist of two through lanes and one auxiliary left-turn lane. The northbound approach consists of one through lane, one auxiliary left-turn lane and one auxiliary channelized right-turn lane. The southbound approach consists of one through lane, one auxiliary left-turn lane and one auxiliary right-turn lane. The eastbound, westbound and southbound approaches provide cycle lanes.

#### **Carp Road / Stittsville Main Street**

The Carp Road/Stittsville Main Street intersection is a signalized four-way intersection. The eastbound approach consists of one through lane, one auxiliary left-turn lane and one auxiliary channelized right-turn lane. The westbound approach consists of one through lane and one auxiliary left-turn lane. The northbound approach consists of one through lane and one auxiliary left-turn lane. The southbound approach consists of one through lane, one auxiliary left-turn lane and one auxiliary channelized right-turn lane. No cycling lanes are provided at the intersection.

#### **Carp Road / Echowoods Drive-Kittiwake Drive**

The Carp Road/Echowoods Drive-Kittiwake Drive intersection is a signalized four-way intersection. The northbound approach consists of one through lane and one auxiliary left-turn lane. The southbound approach consists of one through lane, one auxiliary left-turn lane and one auxiliary right-turn lane. The eastbound and westbound approaches consist of one through lane. No cycling lanes are provided at the intersection.

#### **Samantha Eastop Avenue / Kimpton Drive**

The Samantha Eastop Avenue/Kimpton Drive intersection is an unsignalized four-way intersection. All four approaches consist of a single through lane. Kimpton Drive is the major movement through the intersection, with Samantha Eastop Avenue having stop control.

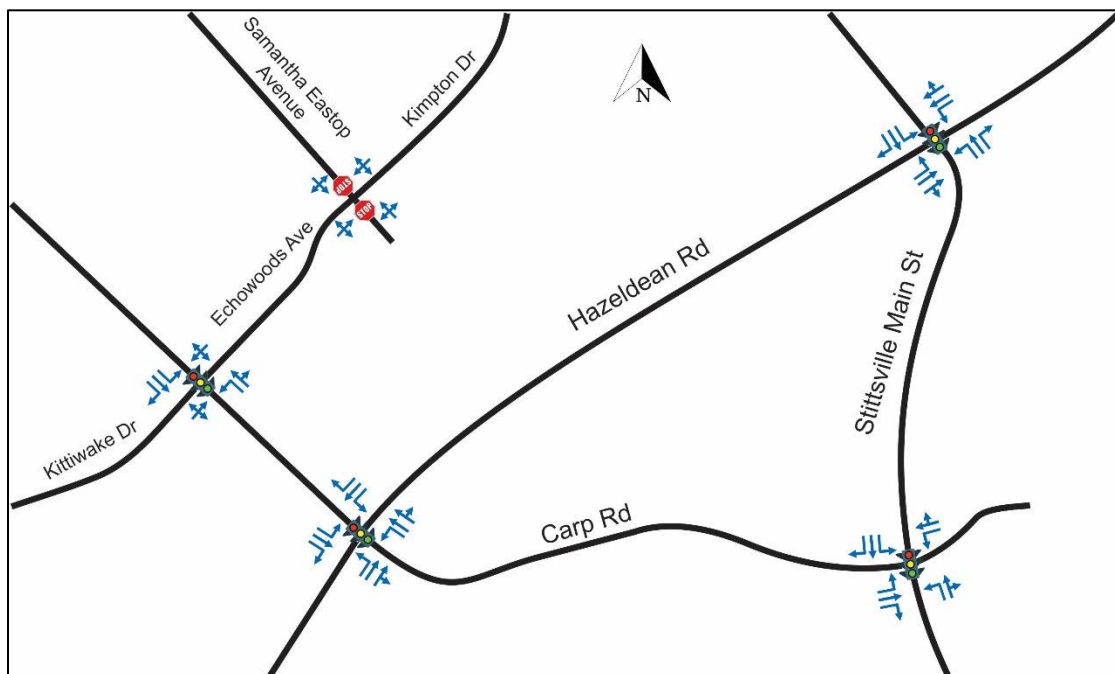


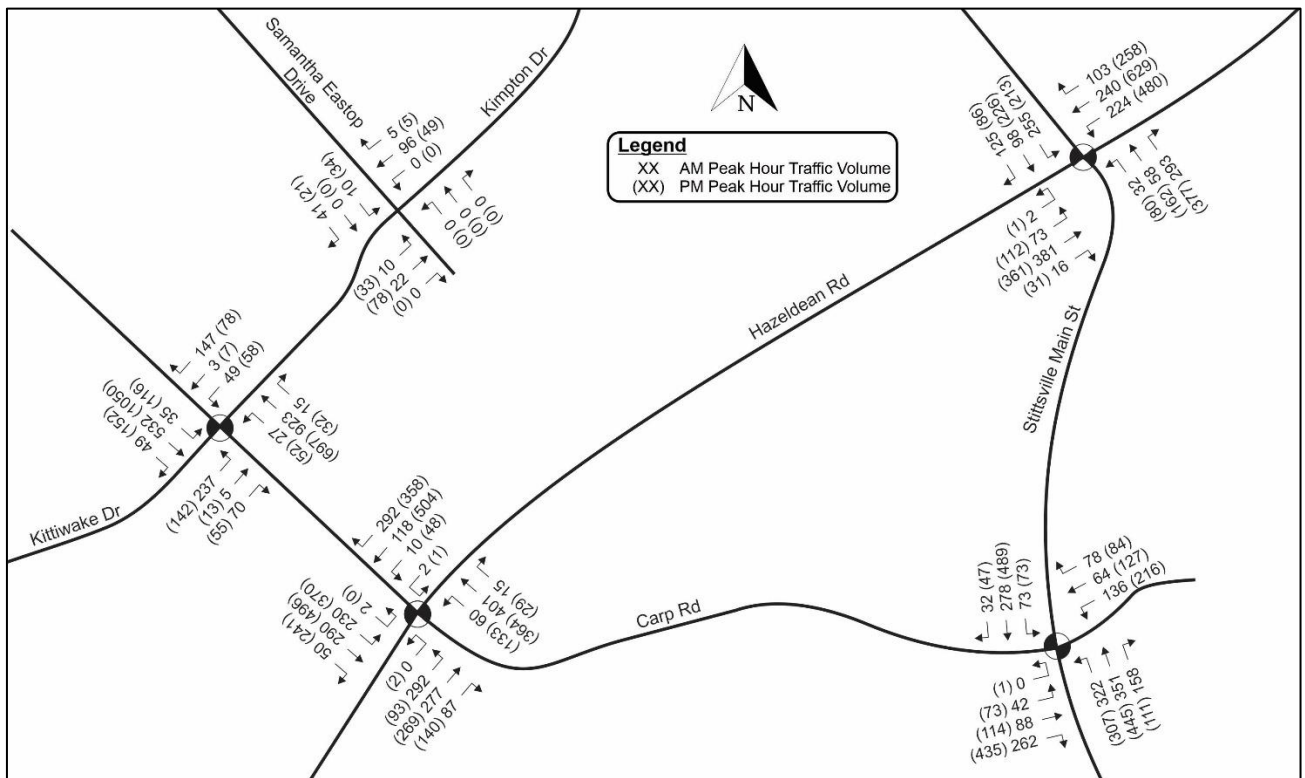
Figure 3 - Existing Traffic Control and Lane Configuration

### 2.3.3 Peak Hour Travel Demands

The existing peak hour traffic volumes are illustrated below in **Figure 4** and were collected by the City of Ottawa in 2017 and could not be updated due to the Covid-19 pandemic. The peak hour traffic volume count data is included in **Appendix C**.

To estimate 2020 traffic conditions, a uniform growth rate was applied to the collected volume counts. Assuming the base year of 2017, a vehicular growth rate of 2.0% per annum was applied, resulting in a total growth of 6.0%. While U-turns are shown on volume figures, they are not analyzed due to the implications on the analysis software. U-turn maneuvers are uncommon occurrences and have therefore been removed from the analysis.

The Kimpton Drive/Samantha Eastop Avenue intersection did not exist in 2017, and as estimated using the traffic volumes in the *6111 and 6141 Hazeldean Road Stittsville, Ontario Proposed Residential Development Transportation Impact Study* dated April 2014 and prepared by CastleGlenn Consultants. The traffic volumes from this study were then redistributed to match the trip distribution in Section 3.1.4 of this report.



**Figure 4 - Existing (2020) Volumes**

The existing traffic operations were assessed using Synchro software and the results provided in **Appendix D** summarized in **Table 1**.

**Table 1 - Existing (2020) Traffic Operations Analysis**

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement(s)			Overall		
	LoS	v/c	Movement	Delay (s)	v/c	LOS
<b>Signalized</b>						
Carp Rd & Kittiwake Dr / Echowoods Ave	E	0.97	EBL	61.1 (63.0)	1.05 (1.06)	F (F)
	F	1.14	NBT			
	(F)	(1.16)	SBT			
Carp Rd & Hazeldean Rd	F (F)	1.19 (1.05)	EBL	60.3 (53.5)	0.78 (1.04)	C (F)
	(E)	(0.91)	WBT			
	(F)	(1.18)	SBL			
Carp Rd & Stittsville Main St	(F)	(1.02)	NBL	19.0 (52.3)	0.65 (0.94)	B (E)
	(E)	(0.91)	NBTR			
	(F)	(1.07)	SBT			
Hazeldean Rd & Stittsville Main St	(E)	(0.91)	WBL	33.4 (41.0)	0.65 (0.91)	B (E)
<b>Unsignalized</b>						
Kimpton Dr & Samantha Eastop Dr	-	-	-	3.0 (3.7)	-	A (A)

Based on the existing conditions traffic operations analysis, several movements are considered either critical or over capacity.

During the AM peak hour, the eastbound left at Carp Road & Kittiwake Drive/Echowoods Avenue is critical, while the northbound through at Carp Road & Kittiwake Drive/Echowoods Avenue and the eastbound left at Carp Road & Hazeldean Road are over capacity. The overall v/c is over capacity at Carp Road & Kittiwake Drive/Echowoods Avenue.

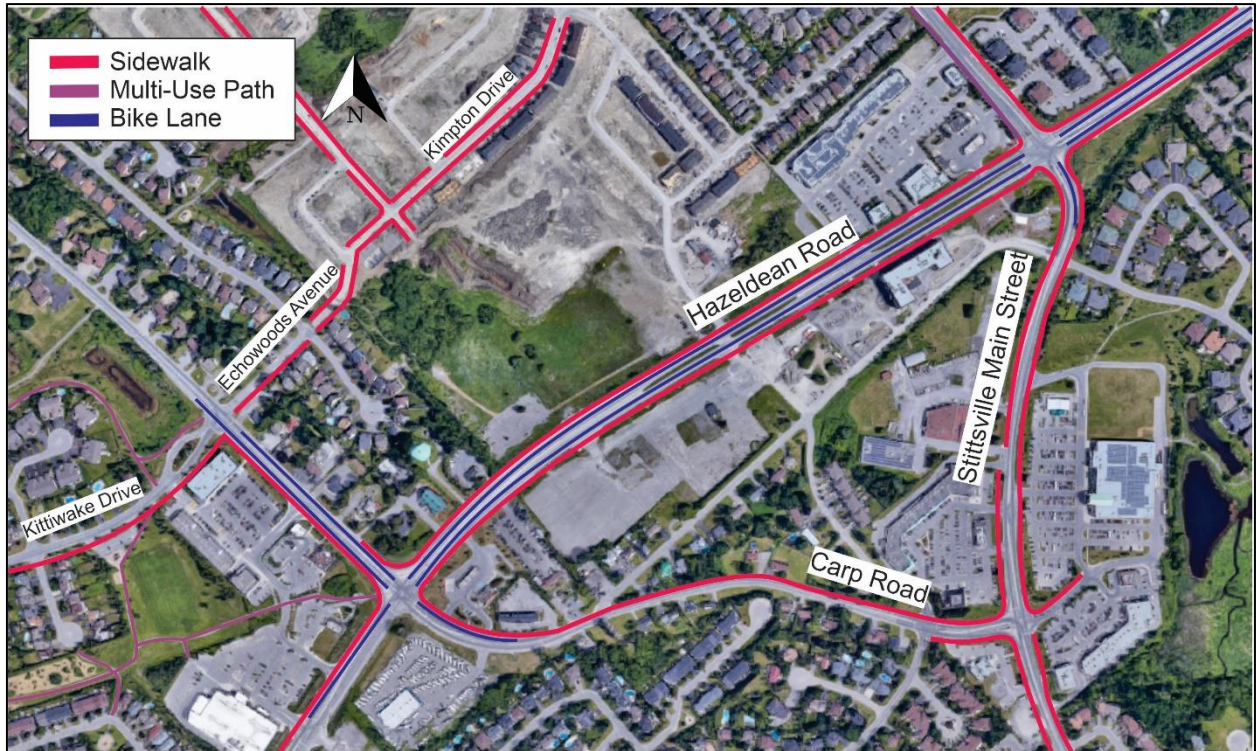
During the PM peak hour, some movements are critical: the westbound through at Carp Road & Hazeldean Road, the northbound through-right at Carp Road & Stittsville Main Street and the westbound left at Hazeldean and Stittsville Main Street. The overall v/c at Carp Road & Stittsville Main Street and Hazeldean Road & Stittsville Main Street are also critical. Several movements are over capacity: the southbound through at Carp Road & Kittiwake Drive/Echowoods Avenue, the eastbound left and southbound left at Carp Road & Hazeldean Road, and the northbound left and southbound through at Carp Road & Stittsville Main Street. Additionally, the overall v/c at Carp Road & Kittiwake Drive/Echowoods Avenue and Carp Road & Hazeldean Road are over capacity.

#### 2.3.4 Existing Driveways to Adjacent Developments

An existing driveway exists opposite the site on Hazeldean Road. However, it is blocked off and the parcel is vacant.

### 2.3.5 Pedestrian/Cycling Network

The pedestrian and cycling infrastructure within the study area is outlined in **Figure 5**.



**Figure 5 - Pedestrian and Cycling Infrastructure**

With respect to cyclists, according to the City of Ottawa Cycling Plan, Hazeldean Road, Carp Road and Stittsville Main Street (south of Hazeldean Road) are classified as “Spine Routes”. Kitiwake Drive is classified as a “Local Route”, and Stittsville Main Street (north of Hazeldean Road) is classified as a “Pathway Link”.

### 2.3.6 Transit Network

Transit service within the vicinity of the site is currently provided by OC Transpo Routes #61, #162, #261, #262, #303. The current bus stops are described in **Table 2**.

**Table 2 - OC Transpo Routes**

Stop Location	OC Transpo Routes	Direction
Kittiwake / Sundew (#2019)	#162, #262	Westbound
Kittiwake / Wilderness (#2020)	#162, #262	Eastbound
Hazeldean / Carp (#1594)	#61, #162	Westbound
Hazeldean / Carp (#1881)	#61, #162	Eastbound
Carp / McCooye (#1592)	#61	Northbound
Carp / Hobin (#1838)	#61	Southbound
Stittsville Main / Carp (#0347)	#61, #261, #301	Northbound
Stittsville Main / Carp (#0346)	#61, #261, #301	Southbound
Stittsville Main / Ad. 1224 (#2185)	#261	Northbound
Stittsville Main / Ad. 1224 (#2186)	#261	Southbound
Hazeldean / Stittsville Main (#4676)	#61, #162	Westbound
Hazeldean / Stittsville Main (#1589)	#61, #162	Eastbound

A detailed map of the approximate stop locations has been provided below in **Figure 6** for reference.



**Figure 6 - Existing OC Transpo Area Network**



### 2.3.7 Existing Road Safety Conditions

Collision history for the study area intersections (2014-2018, inclusive) was obtained from the City of Ottawa. Refer to **Appendix E** for the collision details report. The City requires a safety review to be conducted if at least six (6) collisions have occurred for any one movement or of a discernible pattern over a five (5) year period. A review of the boundary streets' historical collision records indicates collisions at the following intersections include:

- **Carp Road and Echowoods Ave/Kittiwake Drive** – A total of 10 collisions were recorded. The impact types are seven (7 or 70%) rear end, one (1 or 10%) approaching, one (1 or 10%) angle and one (1 or 10%) sideswipe. One of the collisions was classified as resulting in a non-fatal injury while the rest were classified resulting in property damage only.
- **Carp Road and Hazeldean Road** – A total of 75 collisions were recorded. The impact types are forty-one (41 or 55%) rear end, nineteen (19 or 25%) turning movement, ten (10 or 13%) angle and five (5 or 7%) single motor vehicle (SMV) other. Fourteen (14) collisions were classified as resulting in a non-fatal, one (1) was classified as non-reportable and the rest were classified resulting in property damage only.
- **Carp Road and Stittsville Main Street** – A total of 51 collisions were recorded. The impact types are thirty-seven (37 or 72%) rear end, nine (9 or 18%) turning movement, two (2 or 4%) sideswipe, one (1 or 2%) angle, one (1 or 2%) SMV and one (1 or 2%) classified as other. Five (5) collisions were classified as resulting in a non-fatal while the were classified resulting in property damage only.
- **Hazeldean Road and Stittsville Main Street** – A total of 61 collisions were recorded. The impact types are thirty-eight (38 or 62%) rear end, fourteen (14 or 23%) turning movement, four (4 or 7%) angle, three (3 or 5%) sideswipe and two (2 or 3%) single motor vehicle. Eleven (11) collisions were classified as resulting in a non-fatal injury while the rest were classified resulting in property damage only.

Most collisions that occurred at the above-mentioned intersections are rear end making a right-turn movement. The proposed development's generated traffic is not anticipated to significantly contribute to the collision patterns within the identified study area due to the proposed locations of the site access roads as identified in Section 1.1.

## 2.4 Planned Conditions

### 2.4.1 Transportation Network Plans

Arterial road widening is proposed on Carp Road between Highway 417 and Hazeldean Road as identified on the 2031 Road Network Concept and Affordable Network Concept (Map 10 and Map 11 of the City of Ottawa Transportation Master Plan).

A transit priority corridor is anticipated for Hazeldean Road and Stittsville Main Street is identified on the Rapid Transit and Transit Priority – 2031 Network Concept and Affordable Network Plans (Maps 4 and 5 of the City of Ottawa Transportation Master Plan).

### 2.4.2 Other Developments

A number of developments have been identified within the surrounding area. The list below outlines their location, purpose, buildout year and number of trips.

- **6111 and 6141 Hazeldean Road (residential development)**: located north of Hazeldean Road between Carp Road and Stittsville Main Street. A traffic impact assessment was prepared by CastleGlenn Consultants in April 2014. The development is a subdivision, consisting of 454 residential units and various new municipal roads. The Kimpton Drive & Samantha Eastop Avenue intersection is originally apart of this development. The development buildout is expected for 2020 and will generated 241 new AM trips and 304 new PM trips. Development trips are added into the background scenarios using the trip distribution provided in **Table 6**.

- **6111 Hazeldean Road (carwash development):** located north of Hazeldean, immediately west of the Jackson Trails Centre Main Access. A traffic impact assessment was prepared by D.J. Halpenny & Associates Ltd. In February 2021. Based on a review of the study, the site is expected to primarily consist of pass-by trips and would only add 26 primary trips in the AM peak and 61 trips in the PM peak. When distributed throughout the study area, the impact to the study area intersections are expected to be minimal and has therefore not been included in this analysis. Additionally, the TIA for this background development has considered the traffic impact of the subject site (6171 Hazeldean) and would therefore encompass the evaluation of both sites.
- **5924 Hazeldean Road:** located at the southwest corner of Hazeldean Road and Victor Street. A traffic impact assessment was prepared by EXP Services in March 2019. The development is a 86-unit townhouse complex, slated for build out in 2020. The development will generate 40 new AM trips and 48 new PM trips. These trips are assumed to be apart of the background growth, due to the distance of the development from the study area intersections.
- **1145 Carp Road:** located in the northeast corner of Carp Road and Hazeldean Road. A traffic impact assessment was prepared by Stantec in May 2019. The development is a 34-unit residential building, and a restaurant and dental office building, slated for build out in 2020. The development will generate 48 new AM trips and 52 new PM trips. Development trips are added into the background scenarios.
- **6150 Hazeldean Road:** located on the south side Hazeldean Road approximately 450 meters east of Carp Road. A traffic impact assessment was prepared by CastleGlenn Consultants in May 2019. The development is a restaurant and a 2-storey office building, slated for build out in 2020. The development will generate 17 new AM trips and 67 new PM trips. Development trips are added into the background scenarios.
- **5986-5992 Hazeldean Road:** located at the southeast corner of Hazeldean Road and Springbrook Drive. A traffic impact assessment was prepared by Dillon Consulting in September 2019. The development is a three-storey mixed-use building, slated for build out in 2020. The development will generate 16 new AM trips and 17 new PM trips. These trips are assumed to be apart of the background growth, due to the low number of trips and distance of the development from the study area intersections.
- **2113 Carp Road:** located at the northwest corner of Carp Road and Westbrook Road. A traffic impact study was not submitted for this development, so instead the site plan by KWC Architects in November 2019 is referenced. The development is an automobile body shop. Due to the lack of TIA screening form, it is assumed that trip generation is minor enough to not trigger any warrants, and therefore trips are assumed to be amalgamated into background growth.
- **103 Walgreen Road:** located on Walgreen Road south of Westbrook Road. A traffic impact study was not submitted for this development, so instead the site plan by McIntosh Perry in August 2015 is referenced. The development is an automobile repair shop. Due to the lack of TIA screening form, it is assumed that trip generation is minor enough to not trigger any warrants, and therefore trips are assumed to be amalgamated into background growth.
- **1981 Maple Grove Road:** located northeast of Maple Grove Road and Stittsville Main Street. A traffic impact assessment was prepared by IBI in February 2018. The development is 196-unit residential subdivision slated for build out in 2020. The development will generate 89 new AM trips and 11 new PM trips. These trips are assumed to be apart of the background growth, due to the distance of the development from the study area intersections.

## 2.5 Time Periods

It is proposed that the residential development will generate peak traffic volumes during the weekday in the AM and PM peak periods.

## 2.6 Horizon Years

Based upon the anticipated size of the proposed residential development (529 residential units) and the impact of the proposed adjacent developments, it is anticipated both of the horizon periods (full occupancy and 5 years following full occupancy) will be required for analysis.

Full occupancy is anticipated for 2024, thus being the first horizon period. The 5-years post full occupancy will be for 2029, being the second horizon period.

## 2.7 Exemptions Review

The proposed development satisfies the 'Trip Generation' trigger on the 2017 TIA Screening Form. Based upon Table 4 of the City of Ottawa TIA Guidelines, the following exemptions apply to the proposed development:

- ..... Module 4.2.2 – As adequate parking is provided per the City of Ottawa planning guidelines, and
- ..... Module 4.8 – As the total number of trips is below the 200 person-trip limits for the AM9 zone.

## 3 Forecasting

### 3.1 Proposed Development

#### 3.1.1 Development-Generated Travel Demand

Residential trip generation rates for the proposed development were derived from the 2009 TRANS Trip Generation Study. Commercial trip generation rates were derived from ITE Trip Generation Manual 10<sup>th</sup> Edition. The trip generation is summarized in **Table 3**. The rates were derived from Tables 3.12 and 3.13 in the study, outlining the vehicle trips for the land use type. Due to the mixed-use nature of the site, an internal capture reduction has been applied to the total trips and is calculated based on the methodology found in the NCHRP Project 8-51. Internal trips typically represent secondary trips that would have been made to another location but can instead be replaced with local trips within the site. This local trips would be pedestrian trips and would not increase the amount of transit or vehicular trip.

**Table 3 - Trip Generation**

Land Use	Overall		2009 Trans Study - Single Detached		2009 Trans Study - Townhouses		2009 Trans Study - High Rise Condominiums		2009 Trans Study - Mid Rise Apartments		(ITE #820) Shopping Center	
	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
<b>AM Peak Hour</b>												
Direction	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
Units / 1000 SqFt GFA	-		20		150		240		160		19.4	
Average Rate	-		0.7		0.54		0.46		0.29		0.94	
Gross Trips	269		14		81		110		46		18	
Vehicle Occupancy Rate	-		55%		55%		44%		44%		78%	
People Trips	551		25		148		250		105		23	
	171	380	7	18	55	93	70	180	25	80	14	9
Distribution	-		29%	71%	37%	63%	28%	72%	24%	76%	62%	38%
Modal Split Reduction	-		49%		49%		49%		49%		49%	
Internal Capture Reduction	-		1%	1%	1%	1%	1%	1%	1%	1%	16%	14%
<b>New Vehicle Trips</b>	<b>273</b>		<b>13</b>		<b>73</b>		<b>125</b>		<b>53</b>		<b>9</b>	
	<b>84</b>	<b>189</b>	<b>4</b>	<b>9</b>	<b>27</b>	<b>46</b>	<b>35</b>	<b>90</b>	<b>13</b>	<b>40</b>	<b>5</b>	<b>4</b>
<b>PM Peak Hour</b>												
Direction	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
Units / 1000 SqFt GFA	-		20		150		240		160		19.4	
Average Rate	-		0.9		0.71		0.46		0.37		3.81	
Gross Trips	368		18		107		110		59		74	
Vehicle Occupancy Rate	-		64%		61%		44%		44%		78%	
People Trips	682		28		175		250		134		95	
	385	297	17	11	93	82	145	105	84	50	46	49
Distribution	-		62%	38%	53%	47%	58%	42%	62%	38%	48%	52%
Modal Split Reduction	-		41%		41%		41%		41%		41%	
Internal Capture Reduction	-		6%	3%	6%	3%	6%	3%	6%	3%	10%	26%
Pass-by Reduction	-		-		-		-		-		34%	

Pass-by Trips	7	7	-	-	-	-	7	7				
New Vehicle Trips	345		15		96		137		73		24	
	197	148	9	6	50	46	78	59	45	28	15	9

The proposed development is expected to generate 273 two-way vehicle trips during the AM peak, and 345 two-way vehicle trips during the PM peak. Additionally, 14 PM passby trips will be routed to the development.

### 3.1.2 Mode Share

The subject development is located within the Kanata/Stittsville neighbourhood and its existing modal split for the development is provided in **Table 4**. The information source, from the 2011 Origin-Destination Survey by Trans Committee, is included as **Appendix F**. Trips within the “other” category account for various modes of travel not included in the prior categories, such as school buses, paratransit, motorcycles and taxis.

**Table 4 – Existing Travel Mode Proportions**

Mode	AM Peak Hour			PM Peak Hour		
	From District	Within District	Proportion	To District	Within District	Proportion
Auto Driver	15360	13630	51%	17660	21240	59%
Auto Passenger	2450	5050	13%	4270	8570	19%
Transit	6230	1210	13%	5980	670	10%
Bicycle	30	220	0%	100	260	1%
Walk	0	5730	10%	0	4570	7%
Other	1900	4510	11%	910	2160	5%
Total	25970	30350		28920	37470	

The proposed mode share for the development is outlined in **Table 5**. Auto trips have been derived from the trip generation assumptions in the 2009 TRANS Trip Generation Study, with the other travel modes proportioned out based on the 2011 Origin-Destination Survey provided above. The development expects slightly lower auto driver trips compared to the overall neighborhood.

**Table 5 - Proposed Travel Mode Proportions**

Mode	AM Peak Hour			PM Peak Hour		
	Proportion	In	Out	Proportion	In	Out
Auto Driver	50%	84	189	51%	197	148
Auto Passenger	14%	24	52	23%	87	71
Transit	14%	24	52	12%	46	36
Bicycle	0.5%	1	2	1%	2	2
Walk	11%	18	40	8%	32	24
Other	12%	20	45	6%	21	16
Total		171	380		385	297

Based on the proposed travel modes, the non-auto mode-share would be 25% in the AM peak period and 21% in the PM peak period.

### 3.1.3 Trip Distribution

Trip distribution was devised by determining the proportions of trips in relation to the Kanata/Stittsville neighbourhood. Using the 2011 Origin-Destination Survey for both AM and PM peak periods (provided as **Appendix F**), a matrix was devised to determine the entry and exit points of trips. The plaza located at 1261 Stittsville Main Street is included as “East Plaza”, as a potential origin and destination point.

Any trips with an origin and destination within Kanata/Stittsville will be distributed based on the TMCs. Most trips occurring outside the neighbourhood are routed via Carp Road, with a small portion routed via Stittsville Main Street. The TMC counts were proportioned out based on the access points for the major roads. These were multiplied by the TMC percentage from the O-D data.

It is noted that the north access of the site does not currently, nor had it previously shown any northbound through or northbound right trips across or onto Kimpton. The vehicle volumes for this movement are based on the existing traffic. Based on the distribution of traffic and availability of the south access, all site-related trips at the north access are expected to make a northbound left-turn. It is noted that the existing conditions at this location had previously indicated traffic to/from the south leg, but was removed based on the City’s comment on October 14, 2020.

**Table 6** outlines the resultant trip distribution for the development. Over half of trips enter and exit the study area via Carp Road, due to its interchange with Highway 417. It is believed that not every trip entering and exiting north via Carp Road would access the development via the Samantha Eastop Drive access, so half of the trips were assigned to travel via Hazeldean Road, going through the Hazeldean Road & Carp Road intersection.

**Table 6 – Overall Vehicle Trip Distribution & Assignment**

Direction	AM IN		AM OUT		PM IN		PM OUT	
West Hazeldean	13%	11	4%	7	7%	13	14%	20
East Hazeldean	8%	7	8%	15	12%	25	11%	17
North Carp (via Kimpton)	27%	22	35%	67	30%	60	25%	37
North Carp (via Hazeldean)	27%	22	35%	67	30%	60	25%	37
South Stittsville Main	20%	17	12%	23	14%	28	20%	30
East Plaza	6%	5	5%	10	6%	11	5%	7

**Table 7** outlines the trip distribution for the passby trips – which will only access the site via the Hazeldean Road access. Distribution was split based on the existing travel directions in each peak hour.

**Table 7 – Pass-by Trip Distribution & Assignment**

Pass-by Distribution	PM	
West Hazeldean	42%	6
East Hazeldean	58%	8

### 3.1.4 Trip Assignment

The visual assignment of trips is illustrated in **Figure 7**. Trips to and from Carp Road use the access on Samantha Eastop Drive, while all others use the access on Hazeldean Road.

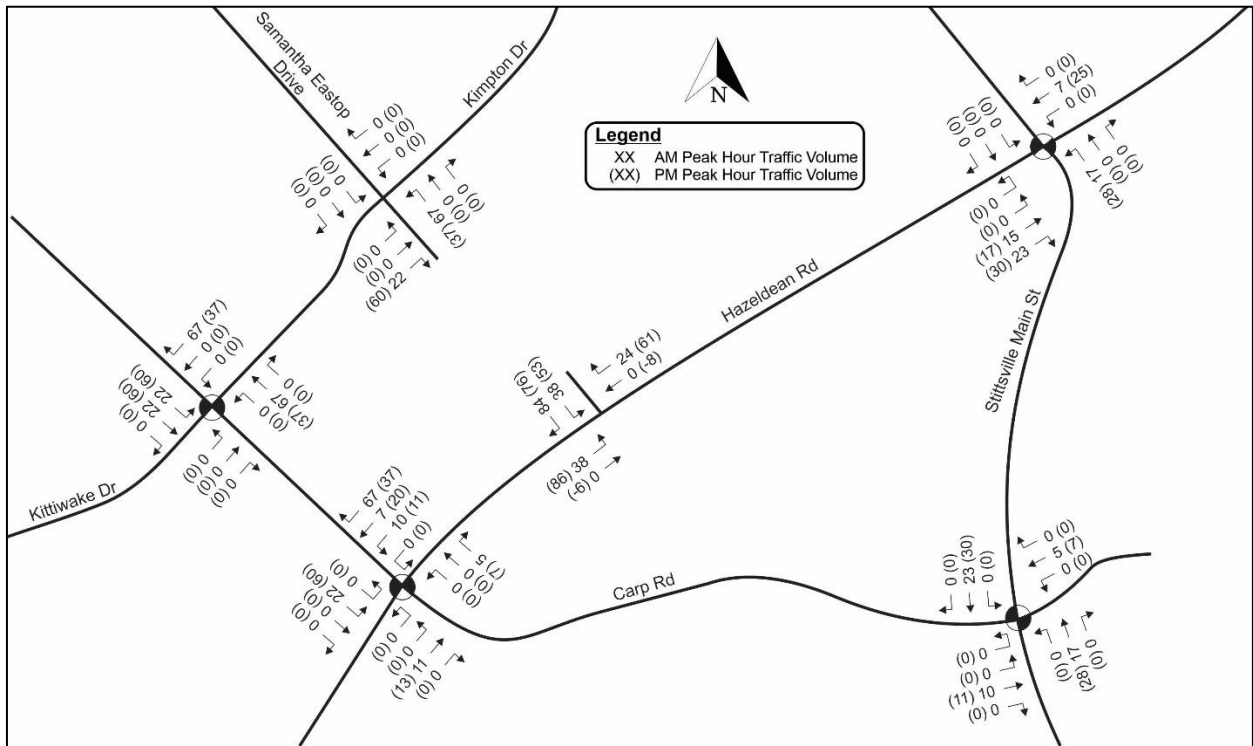


Figure 7 – Site Trip Volumes

### 3.2 Background Network Travel Demands

#### 3.2.1 Transportation Network Plans

The City of Ottawa Transportation Master Plan was consulted to determine the road network changes in the study area. The 2031 Road Network Concept (Map 10) shows that Carp Road will be widened to four lanes between Hazeldean Road and Highway 417. However, as the widening is not forecasting within the City’s 10-year capital budget, it is expected it will not occur within the horizon years.

The lane configuration is based on the June 2015 Alternative A, developed by Parsons. The lane configuration changes the southbound exclusive right-turn lane at Kittiwake Drive into a through-right lane. An additional southbound left turn lane is added southbound at Hazeldean Road.

#### 3.2.2 Background Traffic Growth

Background growth was estimated by using a uniform a 2.0% annual vehicular growth rate. The 2024 conditions will have an increase of 8.0% from the existing conditions. The 2029 conditions will have an increase of 20.0% from the existing conditions.

#### 3.2.3 Other Developments

A number of developments have been identified within the surrounding area as discussed in Section 2.4.2.

### 3.3 Demand Rationalization

#### 3.3.1 Future Background (2024) Traffic

The future background traffic volumes for 2024 are provided in **Figure 8**.

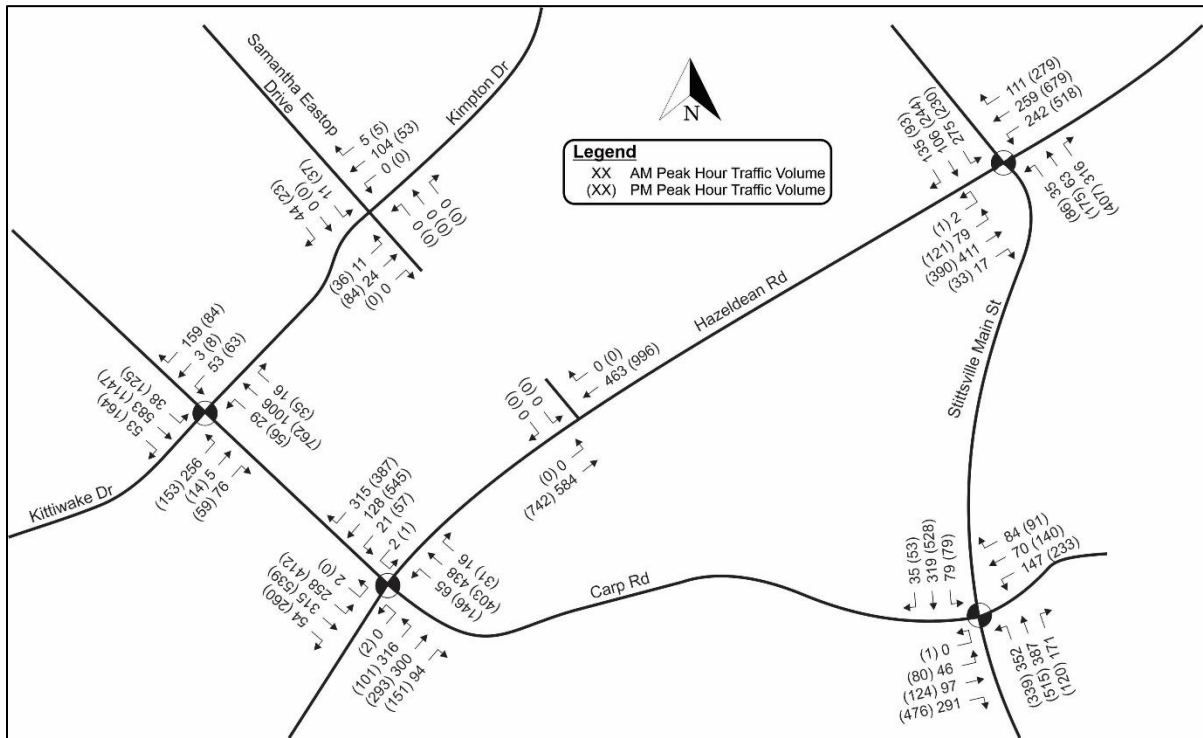


Figure 8 – Future Background (2024) Traffic Volumes

The future background traffic operations analysis for 2024 is provided as **Table 8**. Full outputs are provided in **Appendix G**. It is noted that the peak hour factors for all future scenarios were set to 1.00 as per the *Ottawa TIA Guidelines*.



Table 8 – Future Background (2024) Traffic Operations Analysis

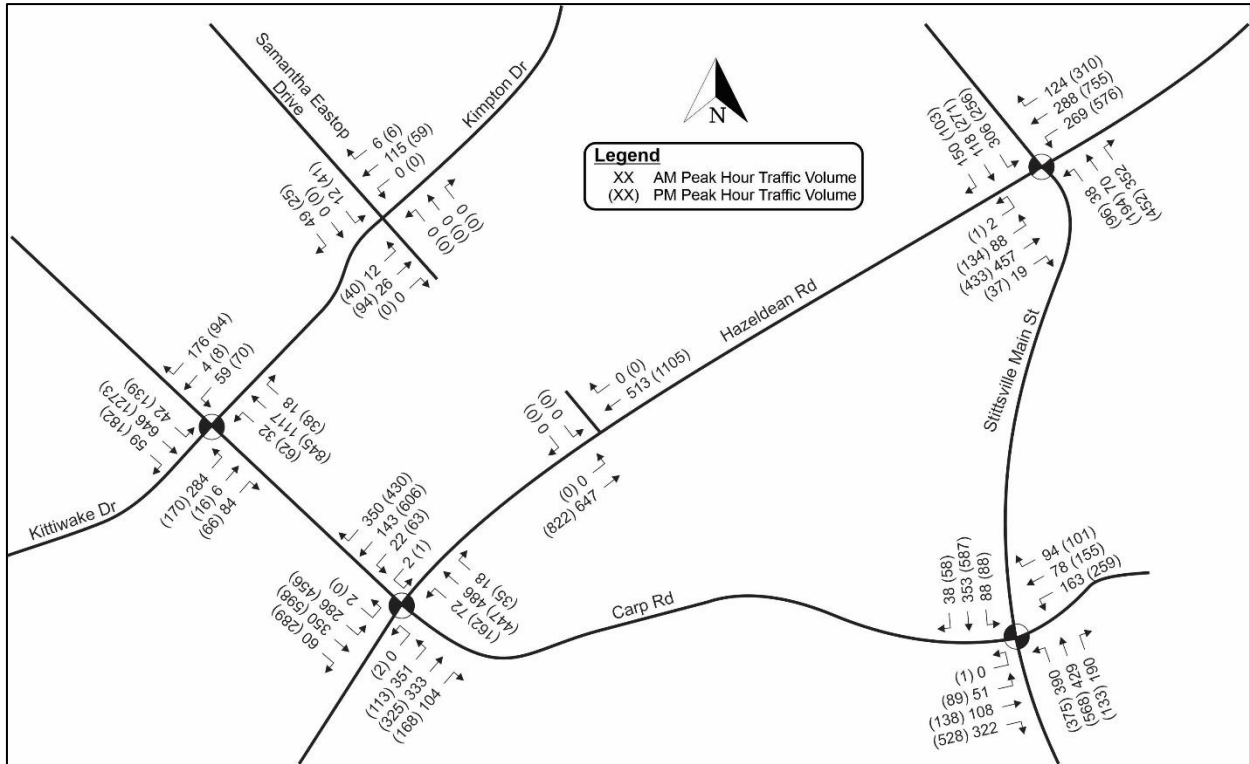
Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement(s)			Overall		
	LoS	v/c	Movement	Delay (s)	v/c	LOS
<b>Signalized</b>						
Carp Rd & Kittiwake Dr / Echowoods Ave	E	0.95	EBL	54.5 (57.4)	1.02 (1.04)	F (F)
	F	1.10	NBT			
	(F)	(1.13)	SBT			
Carp Rd & Hazeldean Rd	F (E)	1.16 (0.97)	EBL	58.1 (51.7)	0.77 (0.99)	C (E)
	(E)	(0.90)	WBT			
	(F)	(1.16)	SBL			
Carp Rd & Stittsville Main St	(E)	(0.98)	NBL	18.9 (49.4)	0.64 (0.91)	B (E)
	(E)	(0.93)	NBTR			
	(F)	(1.04)	SBT			
Hazeldean Rd & Stittsville Main St	-	-	-	32.8 (39.2)	0.63 (0.88)	C (D)
<b>Unsignalized</b>						
Kimpton Dr & Samantha Eastop Dr	-	-	-	3.0 (3.7)	-	A (A)

The 2024 background traffic operations indicate that minor changes occur between this scenario and the existing operations scenario. No additional movements are considered critical or over capacity. Several movements see improved functionality due to the change in peak hour factors as discussed above per the *Ottawa TIA Guidelines*. The westbound left at Hazeldean Road and Stittsville Main Street is no longer considered critical in the PM peak hour. Additionally, the PM overall v/c at Hazeldean Road and Stittsville Main Street is no longer critical while the overall v/c at Carp Road & Hazeldean Road is no longer over capacity.

It is noted that several movements are expected to continue to operate over capacity in the 2024 background condition. Some movements are shown with reduced v/c ratios as the PHF is adjusted to 1.0 and signal timing plans are further optimized.

### 3.3.2 Future Background (2029) Traffic

The future background traffic volumes for 2029 are provided in **Figure 9**.



The future background traffic operations analysis for 2029 is provided as **Table 9**. Full outputs are provided in **Appendix H**.

Table 9 – Future Background (2029) Traffic Operations Analysis

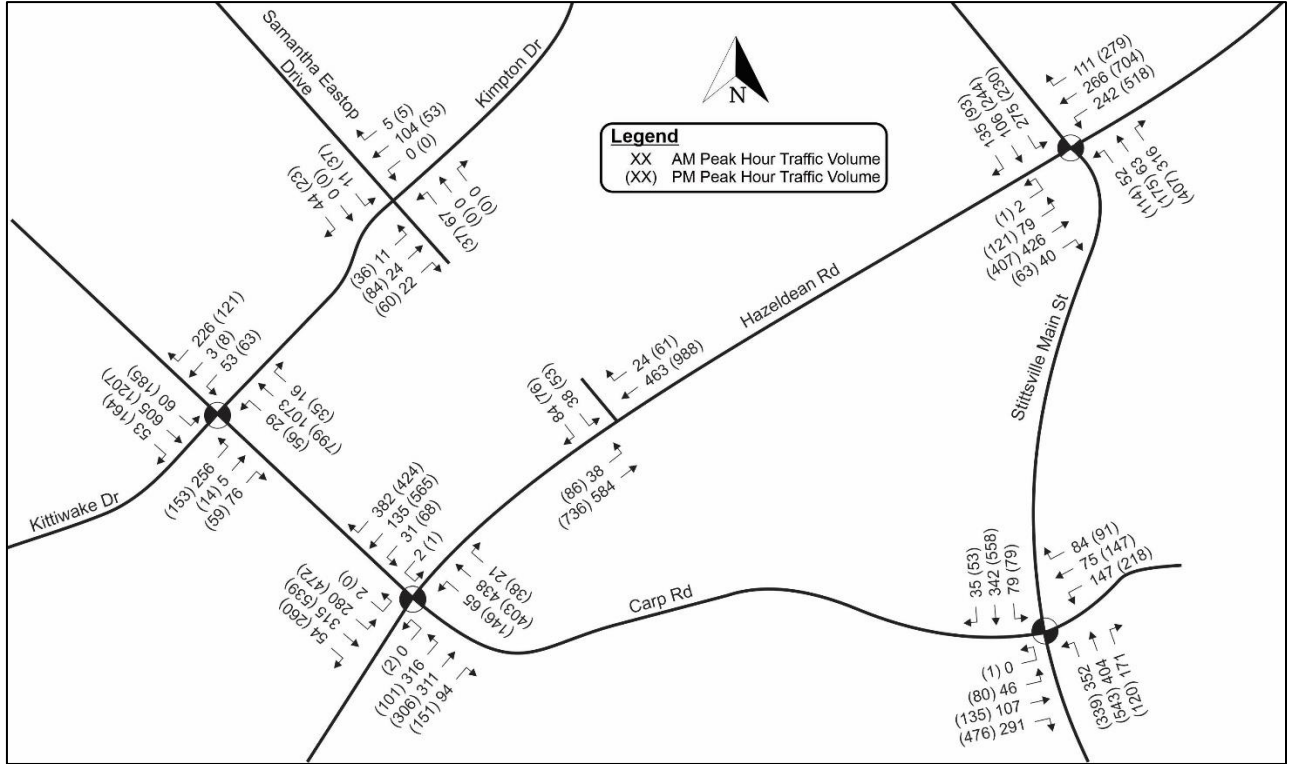
Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement(s)			Overall		
	LoS	v/c	Movement	Delay (s)	v/c	LOS
<b>Signalized</b>						
Carp Rd & Kittiwake Dr / Echowoods Ave	F	1.04	EBL	90.8 (89.7)	1.15 (1.16)	F (F)
	F (E)	1.28 (0.90)	NBT			
	(F)	(1.29)	SBT			
Carp Rd & Hazeldean Rd	F (F)	1.62 (1.23)	EBL	83.1 (73.7)	0.91 (1.24)	E (F)
	(E)	(0.93)	WBT			
	(F)	(1.47)	SBL			
	(E)	(1.03)	SBT			
Carp Rd & Stittsville Main St	(F)	(1.28)	NBL	20.5 (84.2)	0.72 (1.12)	C (F)
	(F)	(1.12)	NBTR			
	(F)	(1.16)	SBT			
Hazeldean Rd & Stittsville Main St	(F)	(1.03)	WBL	34.3 (48.0)	0.69 (1.01)	B (F)
<b>Unsignalized</b>						
Kimpton Dr & Samantha Eastop Dr	-	-	-	3.0 (3.7)	-	A (A)

The 2029 background operations indicate major changes will occur between this scenario and the 2024 scenario. During the AM peak, the eastbound left at Carp Road & Kittiwake Drive / Echowoods Drive is now over capacity.

Significant increases in delays and volumes occur during the PM peak hour. The northbound through at Carp Road & Kittiwake Drive / Echowoods Drive is now critical. The westbound left at Hazeldean Road & Stittsville Main Street is now critical and over capacity. The southbound through at Carp Road & Hazeldean Road, The northbound through and northbound through-right at Carp Road & Stittsville Main Street are now over capacity. Additionally, all overall v/c's at every signalized intersection are expected to operate over capacity.

### 3.3.3 Future Total (2024) Traffic

The future total traffic volumes for 2024 are provided in **Figure 10**.



**Figure 10 – Future Total (2024) Traffic Volumes**

The City has requested the future total traffic analysis prior to submission of Step 4, which is being provided for reference. The future total traffic analysis for 2024 is provided in **Table 10** with full outputs provided in **Appendix I**.

**Table 10 – Future Total (2024) Traffic Operations Analysis**

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement(s)			Overall		
	LoS	v/c	Movement	Delay (s)	v/c	LOS
<b>Signalized</b>						
Carp Rd & Kittiwake Dr / Echowoods Ave	F	1.05	EBL	81.4 (74.1)	1.13 (1.12)	F (F)
	F	1.23	NBT			
	(F)	(1.21)	SBT			
Carp Rd & Hazeldean Rd	F (F)	1.15 (1.04)	EBL	56.4 (66.2)	0.79 (1.08)	C (F)
	(E)	(0.91)	WBT			
	(F)	(1.37)	SBL			
Carp Rd & Stittsville Main St	(E)	(0.98)	NBL	19.2 (55.3)	0.65 (0.92)	B (E)
	(E)	(0.97)	NBTR			
	(F)	(1.10)	SBT			
Hazeldean Rd & Stittsville Main St	(E)	(0.91)	WBL	34.0 (41.1)	0.63 (0.90)	B (E)
<b>Unsignalized</b>						
Kimpton Dr & Samantha Eastop Dr	-	-	-	4.6 (3.9)	-	A (A)
Hazeldean Rd & 6171 Hazeldean	-	-	-	1.6 (2.0)	-	A (A)

Changes in the 2024 future total scenario indicate several changes in the network operations with the addition of the site trips described in Section 3.1.4. Comparing with the 2024 background operations, a number of changes occur. During the AM peak hour, the eastbound left movement at Carp Road & Kittiwake Drive / Echowoods Drive is now over capacity.

During the PM peak hour, the eastbound left at Carp Road & Hazeldean Road and the westbound left at Hazeldean Road & Stittsville Main Street are now critical, with the former also over capacity. The northbound through at Carp Road & Kittiwake Drive is not considered critical.

3.3.4 Future Total (2029) Traffic

The future total traffic volumes for 2029 are provided in **Figure 11**.

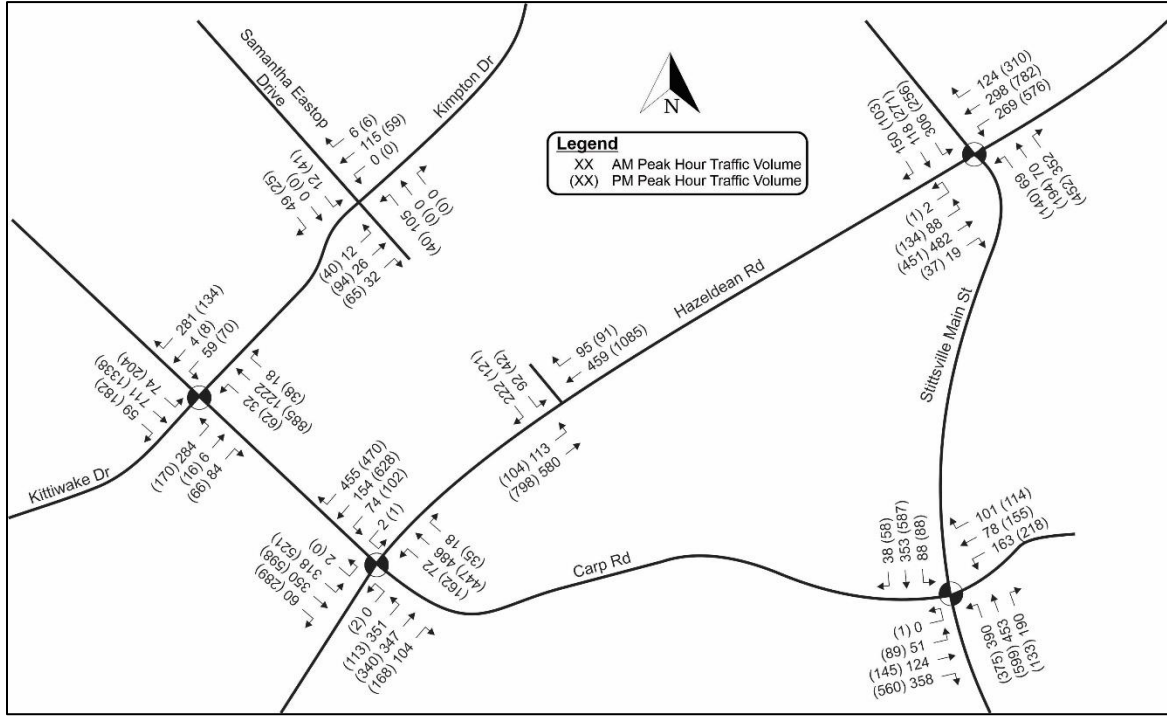


Figure 11 – Future Total (2029) Traffic Volumes

The City has requested the future total traffic analysis prior to submission of Step 4, which is being provided for reference. The future total traffic analysis for 2029 is provided in **Table 11** with full outputs provided in **Appendix J**.

**Table 11 – Future Total (2029) Traffic Operations Analysis**

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement(s)			Overall		
	LOS	v/c	Movement	Delay (s)	v/c	LOS
<b>Signalized</b>						
Carp Rd & Kittiwake Dr / Echowoods Ave	F	1.23	EBL	113.2 (114.0)	1.27 (1.26)	F (F)
	F (F)	1.36 (0.100)	NBT			
	(F)	(1.36)	SBT			
Carp Rd & Hazeldean Rd	F (F)	1.26 (1.45)	EBL	64.1 (91.1)	0.89 (1.37)	D (F)
	(E)	(0.97)	WBT			
	(F)	(1.66)	SBL			
	(F)	(1.03)	SBT			
Carp Rd & Stittsville Main St	(F)	(1.26)	NBL	20.9 (91.8)	0.73 (1.10)	C (F)
	(F)	(1.16)	NBTR			
	(F)	(1.21)	SBT			
Hazeldean Rd & Stittsville Main St	E	0.91	SBL	36.4 (50.2)	0.69 (1.04)	B (F)
	(F)	(1.10)	WBL			
<b>Unsignalized</b>						
Kimpton Dr & Samantha Eastop Dr	-	-	-	4.6 (4.0)	-	A (A)
Hazeldean Rd & 6171 Hazeldean	-	-	-	1.4 (2.1)	-	A (A)

Changes in the 2029 future total scenario indicate several changes in the network operations with the addition of the site trips described in Section 3.1.4. Comparing with the 2029 background operations, a number of changes occur.

During the AM peak hour, the southbound left at Hazeldean Road & Stittsville Main Street is now considered critical. All other movements have increased capacity restraints. During the PM peak hour, the eastbound left at Carp Road & Kittiwake Drive / Echowoods Avenue and eastbound right at Carp Road & Stittsville Main Street are now critical.

Major capacity issues are indicated at Carp Road & Hazeldean Road as well as Carp Road & Kittiwake Drive / Echowoods Avenue during both the background and total traffic operations. While site trips will put further strain on the network, the primary reasons for capacity restraints and delays are due to background conditions.

### 3.3.5 Demand Mitigations

The traffic operations analysis for the background and total conditions in 2024 and 2029 indicate a variety of movements will be critical or over-capacity. While the development trips will have an impact on some individual movements, all intersections were found to operate critically with capacity issues in the existing or background scenarios.

The most critical intersections in the study area are those along Carp Road. The eastbound left and northbound through at Carp Road and Kittiwake Drive / Echowoods Avenue is of concern to the development due to the proximity and the additional site trips that are anticipated to be assigned. The intersection of Carp Road and Hazeldean Road has capacity issues initially observed for the existing and future background conditions which continue to the future total condition. However, it is observed that the eastbound left and southbound left are of a concern with higher volumes anticipated due to both background developments and site generated trips.

To mitigate capacity issues, a sensitivity analysis was conducted based on the 2029 Future Total conditions, to determine the amount of overall volume reduction required for the intersections to operate within capacity. **Table 12** outlines the lowest reduction scenario found – with 25% of all vehicular volumes removed from the network to provide adequate efficiency. The northbound through movement on Carp Road at Kittiwake Drive / Echowoods Drive would operate at capacity. The detailed calculations are provided in **Appendix J**.

**Table 12 - Future Total (2029) & 25% Volume Reduction Traffic Operations Analysis**

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement(s)			Overall		
	LOS	v/c	Movement	Delay (s)	v/c	LOS
<b>Signalized</b>						
Carp Rd & Kittiwake Dr / Echowoods Ave	E	0.97	NBT	35.2 (31.3)	0.91 (0.91)	E (E)
	(E)	(0.96)	SBT			
Carp Rd & Hazeldean Rd	E	0.97	EBL	48.5 (44.3)	0.65 (0.82)	B (D)
	(E)	(0.96)	SBL			
Carp Rd & Stittsville Main St	-	-	-	17.5 (31.3)	0.53 (0.71)	A (C)
Hazeldean Rd & Stittsville Main St	-	-	-	30.2 (34.6)	0.52 (0.74)	A (C)
<b>Unsignalized</b>						
Kimpton Dr & Samantha Eastop Dr	-	-	-	4.3 (3.7)	-	A (A)
Hazeldean Rd & 6171 Hazeldean	-	-	-	1.3 (1.4)	-	A (A)

To help encourage traffic mitigation, an increased focus on public transportation, active transportation, and other transportation demand management measures in the study area would be required from the City. Additional service routes and an increase in transit headways would allow local residents to commute using transit instead of by single passenger vehicle. Implementing active transportation infrastructure such as multi-use paths, cycling facilities and other streetscape furniture could also improve non-auto travel. Overall, the developer, City and other background developers should identify other potential measures to encourage non single occupant vehicle (SOV) travel throughout the study area.

Within the area, there are no other major arterials that could be considered to redistribute traffic.

Additionally, it is recognized that Carp Road is planned for widening in the 2031 horizon year between Highway 417 and Hazeldean Road which would provide additional capacity. The widening is beyond the study horizon years and should be considered for analysis in conjunction with the widening study.

In order to provide sufficient capacity for movements in the study area, the following mitigations were implemented:

- The signal timings at Carp Road & Kittiwake Avenue, and Carp Road & Hazeldean Road were optimized to better reflect and handle the traffic conditions. Cycle lengths for all periods were set to 120 seconds.
- A westbound right-turn lane on Echowoods Avenue was implemented to handle the increased volumes.



## 4 Analysis

### 4.1 Development Design

The development will have two access points – one to the north of the development via Samantha Eastop Drive, and one to the south onto Hazeldean Road. Internally, these accesses are not directly connected to discourage cut-through traffic.

The access on Hazeldean Road is designed to municipal standards and aligned with an unused access on the south side of Hazeldean Road, which, when developed, will create a four-legged intersection.

#### 4.1.1 Pedestrian Connectivity

Within the site, sidewalks are provided throughout the site to connect residents to the surrounding street networks along Hazeldean Rd and Kimpton Dr. A dedicated pedestrian connection will be provided through the storm water holding area on the southeast. The pedestrian network throughout the site is shown in **Figure 12**.

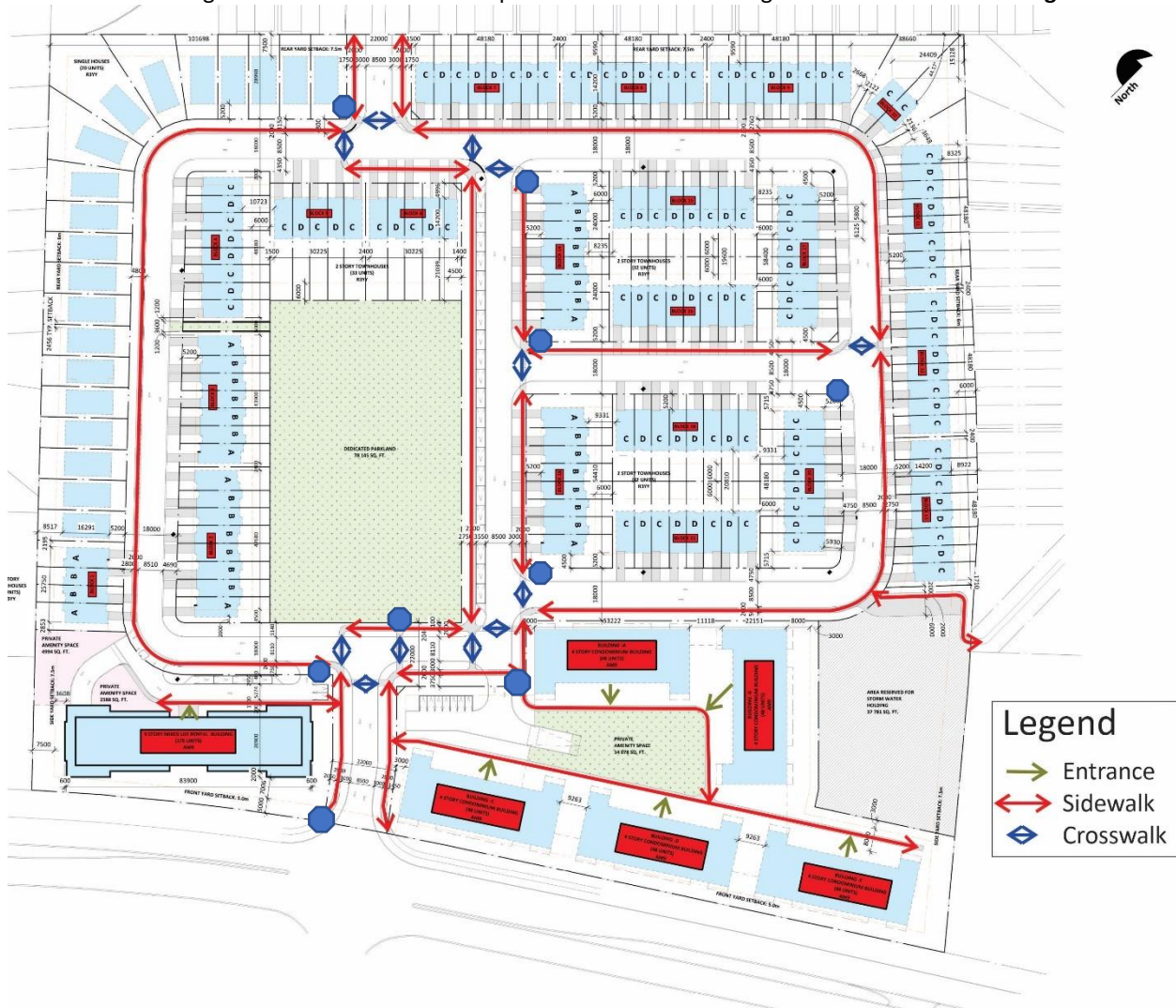
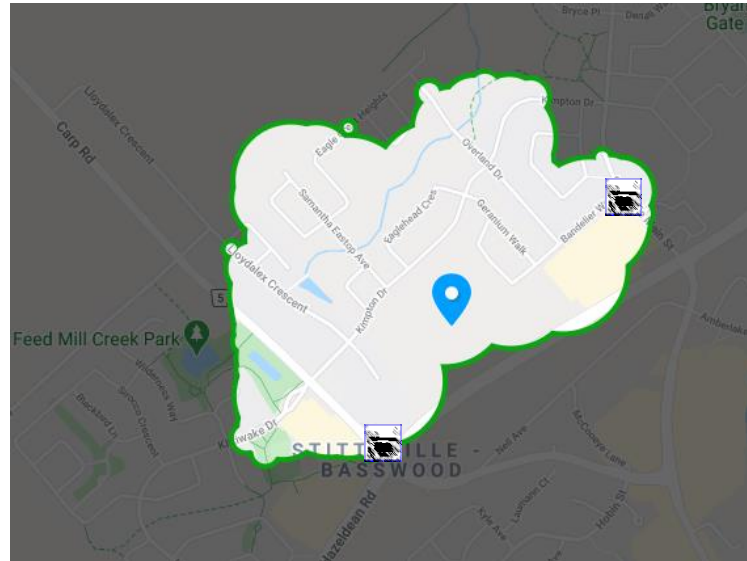


Figure 12 – Site Pedestrian Network

**Figure 14** illustrates a map of all locations within a 10-minute walking distance to the site, which is approximately 900 metres. Additionally, it is shown that the site is within walking distance to two transit stops, the bus stops located at Carp Rd and Hazeldean Rd, and the bus stops located at Bandelier Way and Stittsville Main St.



**Figure 13 - Ten Minute Walking Distance<sup>1</sup>**

#### 4.1.2 New Street Networks

Based on the City's Strategic Road Safety Action Plan, the City's policy does not define design elements to achieve a 30 km/h operating speed, but provides guidelines on their implementation. The following information would be applicable to the proposed development.

- Speed limit signs should be placed at locations that do not conflict with other visual information;
- Visual cues of an approaching 30 km/h zone should be provided;
- Only one lane in each direction for two-lane roads with a width of 7 metres or less for both lanes combined (not including parking). For roads with a pavement width greater than 7 metres, parking must be permitted on at least one side of the roadway; and
- The AADT does not exceed 2,500 vehicles per day.

These guidelines should be considered in the development of the site.

#### 4.2 Parking

Each detached house and townhouse unit is providing at a minimum two parking spaces, with one parking space provided in a garage, and the other in their driveway. Bicycle parking for the townhouses and detached houses will be within their garage.

The condominium is required to provide 240 resident, 48 visitor and 90 bicycle parking spaces and is providing that amount.

The rental building is required to provide 160 resident, 32 visitor, 58 commercial and 88 bicycle parking spaces and is providing that amount.

<sup>1</sup> Map generated from <https://www.walkscore.com/>

### 4.3 Boundary Streets

The boundary streets for the proposed development are Carp Road, Hazeldean Road, Stittsville Main Street and Echowoods Ave/Kimpton Drive as identified in section 2.3.2.

#### 4.3.1 Multimodal Level of Service - Segments

The multimodal level of service (MMLOS) was completed on the boundary street segments within the study area. The full calculations for the MMLOS is provided as **Appendix K**. Target LOS were based on the “General Urban Area” in Exhibit 22 of the Multimodal LOS Guidelines. Intersections and segments within 300 metres of St. Stephen School on Stittsville Main Street are instead based on the targets for the policy area. The MMLOS for each intersection is described in Section 4.9.1.

Worst-case scenarios for each location were assuming during the analysis. **Table 13** summarizes the pedestrian LOS, If a segment has one sidewalk on one side of the roadway, that location was analyzed. **Table 14** summarizes the bicycle LOS. **Table 15** summarizes the transit LOS, with segments where existing OTranspo routes do not travel on being indicated as non applicable. **Table 16** summarizes the truck LOS, only on segments indicated as a trucking route.

**Table 13 - Pedestrian Multimodal Level of Service (Segments)**

Street	Segment	Level of Service	Target Level of Service
Hazeldean Road	West of Carp Road (north side only)	F	C
	Between Carp Road & Stittsville Main Street	F	A
	East of Stittsville Main Street	F	A
Carp Road	North of Kittiwake Avenue / Echowoods Avenue	F	C
	Between Kittiwake Avenue & Hazeldean Road (west side only)	F	C
	Between Hazeldean Road & Stittsville Main Street	F	C
Stittsville Main Street	North of Hazeldean Road	A	A
	Between Hazeldean Road & Carp Road	F	C
	South of Carp Road	D	C
Kittiwake Drive	West of Carp Road (south side only)	A	C
Echowoods Avenue / Kimpton Drive	Between Carp Road & Stittsville Main street	C	C

The results indicate that several segments are worse than the targeted LOS of C. All segments on Hazeldean Road and the segments on Carp Road are F, mostly due to the high speeds and lack of boulevard separation between the sidewalks and the roadway. Stittsville Main Street between Hazeldean Road and Carp Road is considered F as some sidewalk segments abut the road.

**Table 14 - Bicycle Multimodal Level of Service (Segments)**

Street	Segment	Level of Service	Target Level of Service
Hazeldean Road	West of Carp Road	F	C
	Between Carp Road & Stittsville Main Street	E	C
	East of Stittsville Main Street	F	C
Carp Road	North of Kittiwake Avenue / Echowoods Avenue	E	C
	Between Kittiwake Avenue & Hazeldean Road	E	C
	Between Hazeldean Road & Stittsville Main Street	F	C
Stittsville Main Street	North of Hazeldean Road	C	D
	Between Hazeldean Road & Carp Road	F	C
	South of Carp Road	F	C
Kittiwake Drive	West of Carp Road	B	B
Echowoods Avenue / Kimpton Drive	Between Carp Road & Stittsville Main street	F	D

The LOS for bicycle segments is considered less than the target LOS for most segments. Lack of dedicated cycling facilities and high road speeds are the main reasons as to why many segments fall to D. Hazeldean Road west of Carp Road has no facilities and a high operating speed, designating the segment to fail.

**Table 15 - Transit Multimodal Level of Service (Segments)**

Street	Segment	Level of Service	Target Level of Service
Hazeldean Road	West of Carp Road	N/A	N/A
	Between Carp Road & Stittsville Main Street	D	D
	East of Stittsville Main Street	D	D
Carp Road	North of Kittiwake Avenue / Echowoods Avenue	D	D
	Between Kittiwake Avenue & Hazeldean Road	D	D
	Between Hazeldean Road & Stittsville Main Street	D	D
Stittsville Main Street	North of Hazeldean Road	D	D
	Between Hazeldean Road & Carp Road	D	D
	South of Carp Road	D	D
Kittiwake Drive	West of Carp Road	D	D
Echowoods Avenue / Kimpton Drive	Between Carp Road & Stittsville Main street	N/A	N/A

The transit LOS is met on the boundary streets. Transit vehicles can expect to travel through the study area at least at 80% of the posted speed.

**Table 16 - Truck Multimodal Level of Service (Segments)**

Street	Segment	Level of Service	Target Level of Service
Hazeldean Road	West of Carp Road	A	D
	Between Carp Road & Stittsville Main Street	A	D
	East of Stittsville Main Street	A	D
Carp Road	North of Kittiwake Avenue / Echowoods Avenue	B	D
	Between Kittiwake Avenue & Hazeldean Road	A	D
	Between Hazeldean Road & Stittsville Main Street	D	D
Stittsville Main Street	North of Hazeldean Road	N/A	N/A
	Between Hazeldean Road & Carp Road	B	D
	South of Carp Road	B	D
Kittiwake Drive	West of Carp Road	N/A	N/A
Echowoods Avenue / Kimpton Drive	Between Carp Road & Stittsville Main street	N/A	N/A

The truck LOS is met on the boundary streets. Lane widths and travel lanes ensure that trucks can move efficiently on the designated routes.

Pedestrian and Bicycle LOS conditions on the boundary street segments are considered underwhelming based on the target LOS as per the guidelines. Many of the causes for low LOS stem from high operating speeds and lack of facilities. Transit and Truck LOS conditions are met.

Multimodal conditions for the boundary street segments are the same in both future background and future total scenarios, as no alterations are proposed.

#### 4.3.2 Road Safety Conditions

The collisions outlined in Section 2.3.7 were further analyzed to determine any prevailing patterns, which the City's TIA guidelines indicate as the same collision occurring 6 times or greater in a span of five years. **Table 17** outlines the patterns found.

**Table 17 – Reoccurring Collision Analysis**

Intersection	Collision Type	Collision Number	Vehicle 1 Direction	Vehicle 1 Action	Vehicle 2 Direction	Vehicle 2 Action
Hazeldean Road & Carp Road	Rear End	13	Westbound, making right turn	Following to close	Westbound, making right turn	Driving properly
	Turning Movement	6	Southbound, turning left	Failing to yield right-of-way	Northbound, driving through	Driving properly
Hazeldean Road & Stittsville Main Street	Rear End	13	Northbound, making right turn	Following to close	Northbound, making right turn	Driving properly
	Turning Movement	6	Westbound, turning left	Failing to yield right-of-way	Eastbound, driving through	Driving properly
Carp Road & Stittsville Main Street	Rear End	13	Eastbound, turning right	Following to close	Eastbound, turning right	Driving properly

A prevailing pattern similarly occurs with the rear end collisions at all three intersections and are found to all occur within a right turn channel. Both turning movement locations were previously identified as critical movements in the existing operations analysis. The southbound left at Hazeldean Road & Carp Road is already a fully protected phase.

Some mitigative measures to reduce collisions could be considered by the City as follows:

- Turning movement collisions can be mitigated through converting the signal control to fully protected left turn phasing.
- Rear End collisions may be mitigated through any combination of the following changes:
  - Removal of the right-turn channel
  - Right turn channel to be upgraded to a Smart Channel based on the Ottawa Pedestrian Plan
  - Dedicated receiving lane provided for right-turn channel
- An evaluation of the clearance intervals at the signals can be conducted to improve operations

#### 4.4 Access Intersections

Two accesses to the development are proposed: an access onto Hazeldean Road, and another access which merges with Samantha Eastop Drive.

The Hazeldean access will be located at a pre-existing access along the north side of Hazeldean Road. The access width is proposed to be 8.5 metres, with a boulevard width of 3.0 metres and a sidewalk width of 2.0 metres. The access right of way is proposed to be 22.0 metres. The access slightly slants, but provides a radius of 21.0 metres on the west bank and 21.5 metres of the east bank. The access connecting to Hazeldean Road has a length of 49.0 metres between the property line and the crosswalk along the development's inner circular road.

The Samantha Eastop access will be located connecting to a pre-existing right-of-way on the north side of the development, providing access to Kimpton Drive. The access width is proposed to be 8.5 metres, with a boulevard width of 3.0 metres and a sidewalk width of 2.0 metres. The access right of way is proposed to be 22.0 metres. As this route is simply a connected right-of-way, the radius design is not applicable. This access provides a length of 28.0 metres between the property line and the crosswalk along the development's inner circular road.

Both accesses will only require stop controls at their respective intersections. The operations analysis conducted in Section 3.3.3 and 3.3.4 indicate no issues with capacity or queuing at either access.

#### 4.5 Transportation Demand Management

The development is proposed to have a non-auto modal split of 25% for trips made in the AM peak hour and 20% for trips made in the PM peak hour, due to the nature of the development and availability of transit and other facilities. The development will provide sidewalk connections to the pre-existing network and contain at a sidewalk on at least one side of all roadways.

Transportation Demand Management (TDM) refers to a variety of methods that are undertaken to encourage non-auto modes of travel and to reduce single-occupant vehicle (SOV) traffic to and from a specific site. Given the mixed-use nature of the development, a variety of TDM measures should be considered for implementation. The City's TDM Measures Checklist categorizes many of these measures in the following list:

- TDM Program Management
- Parking
- Walking & Cycling
- Transit
- Ridesharing
- Carsharing & bikesharing
- TDM Marketing & Communications
- Other Incentives & Amenities

Additionally, there are specific measures that would be appropriate for residential or non-residential sites. The applicable TDM measures recommended to be implemented are provided in the checklist as shown in **Table 18**. The TDM checklist is based on the City's list<sup>2</sup> for the applicable measures.

**Table 18 – TDM Checklist**

Category	TDM Measure	Description	Applicable to Residential / Non-Residential	Proposed?
TDM Program Management	Program Coordinator	It is recommended that a TDM Coordinator be designated to manage the implementation and ongoing support of TDM measures. The TDM Coordinator should liaise with both the residential and non-residential parties to prepare an integrated approach.	Residential Non-Residential	Yes
	Travel Surveys	It is recommended that a travel survey be conducted when the site reaches a minimum of 50% occupancy to establish a baseline. Following this, a follow-up survey should be conducted on a periodic basis to measure the success of the recommended TDM measures and to identify areas for improvement.	Residential Non-Residential	Yes
Walking and Cycling	Information on Active Transportation Routes and Destinations	Information on nearby walking / cycling routes should be prepared in a TDM information package and provided for all residents and employees.	Residential Non-Residential	Yes
	Bicycle Skills Training	If there is an appropriate level of interest in training, a bicycle training session could be made available. Services are made available from organizations such as CAN-BIKE which offer both online and in-person training sessions. The provision of these sessions would be subject to the owner's discretion.	Residential Non-Residential	Yes
	Valet Bike Parking	Not recommended based on the nature of the development.	Non-Residential	Yes
Transit	Transit Information	Information on nearby transit routes should be made available in the TDM information package. The information should be discussed with OC Transpo staff to ensure the appropriate information is provided.	Residential Non-Residential	Yes
	Transit Fare Incentives	It is recommended for a subsidized transit pass to be provided for all first-time residents within the first year of occupancy. It is recommended that the subsidized transit pass should be distributed when the building reaches a minimum of 50% occupancy. Subsidized transit passes should also be considered to be provided for all employees. The exact value and provision of these transit passes is subject to the Owner's Discretion.	Residential Non-Residential	Yes

<sup>2</sup> [https://documents.ottawa.ca/sites/documents/files/tdm\\_measures\\_checklist\\_en.pdf](https://documents.ottawa.ca/sites/documents/files/tdm_measures_checklist_en.pdf)

	Enhanced Public Transit Service	Contracts with OC Transpo can be considered to provide enhanced transit services to the site.	Residential Non-Residential	Yes
	Private Transit Service	Should there be sufficient interest, a shuttle bus service could be arranged for special events or to service demands that are not provided by OC Transpo.	Residential Non-Residential	Yes
Ridesharing	Ridematching Service	Ridesharing services such as OttawaRideMatch.com should be promoted and provided as a dedicated portal.	Non-Residential	Yes
	Carpool Parking Price Incentives	Incentives could be considered for registered carpools such as monetary incentives, priority parking or recognition.	Non-Residential	Yes
	Vanpool	Should there be sufficient interest, a vanpooling service could be arranged for long-distance commuters.	Non-Residential	Yes
Carsharing & Bikesharing	Bikeshare Memberships	Should a bike share network be made available within the area, subsidized memberships or provision of a bikeshare location could be considered for both employees and residents.	Residential Non-Residential	Yes
	Bikeshare Stations	A bike share station should be considered based on appropriateness and consultation with a local bikeshare company.	Residential	Dependent on consultation
	Carshare Vehicles & Membership	Should a car share network be made available within the area, subsidized memberships or carshare spaces could be considered.	Residential Non-Residential	Yes
Parking	Priced Parking	For residential spaces, parking should be unbundled from each unit and paid for separately. For all non-residential parking, including visitors or employees, parking could be charged for either short-term or long-term parking.	Residential Non-Residential	Yes
TDM Marketing & Communications	Multimodal Travel Information	A TDM information package should be prepared for both residential and non-residential uses. Each information package should be tailored to explaining the available TDM measures for residents or non-residents. The package should provide information on available active transportation networks and programs, transit networks and TDM programs.	Residential Non-Residential	Yes
	Personalized Trip Planning	A TDM specialist could be invited to offer personalized trip planning to new residents or employees. This would help them to explore their options on the available travel modes to best select one that would suit their lifestyle.	Residential Non-Residential	Yes
	Promotions	Specific promotional material such as trials or incentives could be provided to maintain awareness, build understanding and encourage people to try alternate travel modes.	Non-Residential	Yes
Other Incentives & Amenities	Emergency Ride Home	An emergency ride home (ERH) service could be provided to provide flexibility in case of emergencies by providing or reimbursing taxi / rideshare services.	Non-Residential	Yes



		Emergencies can range from needing to leave work in the middle of the day or having to stay late.		
	Alternative Work Arrangements	Alternate work arrangements can come in the form of flexible work hours, compressed workweeks or providing the infrastructure and formal policies for telework.  However, given the service-industry related nature of the commercial developments, these alternative work arrangements may not be appropriate.	Non-Residential	No
	Local business travel options	Information on nearby local businesses could be provided to reduce the need for personal vehicles from employees. This could provide services such as daycare services, groceries and / or restaurants.	Non-Residential	Yes
	Commuter incentives	Also known as “cash in lieu of parking”, a taxable mode-neutral commuter allowance could be provided for employees.	Non-Residential	Yes
	On-site amenities	Given the nature of the development, on-site amenities such as showers / change rooms would not be appropriate.	Non-Residential	No

It is noted that the Stittsville Corners plaza is within 450m of the proposed site and includes retail, recreation as well as grocery stores. The Jackson Trails plaza is also located within 300m of the site.

#### 4.6 Neighborhood Traffic Management

Site traffic will be accommodated by Hazeldean Road and Kimpton Drive. No modifications are required on either to limit impact on surrounding roadways.

The network volumes along Kimpton were analyzed using the City’s TIA Guidelines. Based on the existing traffic volumes illustrated in **Figure 4**, Kimpton Drive is classified as a collector road, due to peak hour volumes being greater than 120, the maximum for a local road classification and less than 300 vehicles per hour. Future traffic volumes in 2029 as illustrated in **Figure 11** determine that the peak hour volumes remain less than 300, which determines that Kimpton Drive will remain a collector road in future scenarios and development trips do not change it’s classification.

#### 4.7 Transit

Based on the transit mode share identified in Section 3.1.2, the development is expected to generate 76 transit trips in the AM peak hour and 82 transit trips in the PM peak hour. With the extensive transit network within the area, the site is not expected to contribute to a significant increase in transit trips. Any future transit improvements should be determined at the discretion of OC Transpo.

Transit trips for the stops closest to the development were provided by OC Transpo and are detailed in **Table 19**. It is noted that capacity information for these routes was not attainable due to the variations in bus sizes on each route, and an assessment to determine if there is sufficient capacity should be conducted by OC Transpo.

Table 19 - Transit Passengers

Stop No.	Location	Route	Direction	AM (06:00-09:00)			PM (15:00-18:00)			24-HR		
				On <sup>3</sup>	Off <sup>4</sup>	Pass at Dep. <sup>5</sup>	On	Off	Pass at Dep.	On	Off	Pass at Dep.
1589	Hazeldean / Stittsville Main	61	EB	12	0	7	5	1	8	43	3	7
		162	NB	-	-	-	-	-	-	0	0	1
4676	Hazeldean / Stittsville Main	61	WB	0	1	6	0	10	12	2	43	8
		162	SB	-	-	-	0	0	0	0	3	1
1881	Hazeldean / Carp	61	EB	7	0	6	10	7	8	39	9	6
		162	NB	-	-	-	-	-	-	0	0	1
1594	Hazeldean / Carp	61	WB	0	10	4	1	3	11	7	40	6
		162	SB	-	-	-	0	0	0	0	0	1
1592	Carp / McCooeey	61	EB	8	4	5	6	2	7	22	8	6
1838	Carp / Hobin	61	WB	0	2	4	1	1	11	7	14	6
2186	Stittsville Main / AD. 1224	61	WB	-	-	-	-	-	-	-	-	-
		261	IB	0	0	6	-	-	-	0	0	5
346	Stittsville Main / Carp	61	WB	0	6	3	2	18	6	7	40	5
		261	IB	3	0	7	-	-	-	2	0	6
347	Stittsville Main / Carp	61	EB	4	1	5	5	4	7	23	10	5
		261	OB	-	-	-	0	4	2	0	4	2
		283	OB	-	-	-	0	2	0	0	2	0
2019	Kittiwake / Sundew	162	NB	-	-	-	-	-	-	0	0	1
		262	IB	34	0	29	-	-	-	38	0	29
2020	Kittiwake / Carp	162	SB	-	-	-	0	0	0	1	0	1
		262	OB	-	-	-	0	34	18	0	47	17
2185	Stittsville Main / AD. 1224	261	OB	-	-	-	0	0	2	0	0	2

The three routes during the peak hour are:

- Route 61, a local route which travels “westbound” towards Stittsville and the CARDELREC Recreation Complex, and “eastbound” through Kanata and to Tunney’s Pasture via the 417. During the AM peak hour, 2 buses head westbound and 4 buses head eastbound. During the PM peak hour, 4 buses head westbound and 2 buses head eastbound.
- Route 261, an express route which travels eastbound in the AM through Stittsville, Kanata’ commercial area and to Tunney’s Pasture via the 417. Returns westbound in the PM. During the peak hour, 2 buses pass through the study area in their respective direction.

<sup>3</sup> Also known as “Boardings”

<sup>4</sup> Also known as “Alightings”

<sup>5</sup> Average load at departure

- Route 262, which travels eastbound to Tunney’s Pasture via the 417 and returns westbound in the PM. During the peak hour, 2 buses pass through the study area in their respective direction.

The major difference between 261 and 262 is the latter is the faster option for arriving in Ottawa proper.

The trip distribution was derived from the distributions established in Table 6, with some minor adjustments. As no buses travel westbound on Hazeldean, the westbound trip percentage is redistributed to the other directions of travel. Trips travelling east on Hazeldean are assigned to Route 61, as these are assumed to correspond with more local trips. The trips travelling north via Carp are assumed to be the trips headed into Kanata and Ottawa proper and are assigned as follows: 45% of north trips are assigned to Route 261, 45% are assigned to Route 262 and 10% are assigned to Route 61. As the express buses only travel in one direction in the peak hour, trips in the reverse direction are assigned to Route 61 instead. Trips travelling south via Stittsville Main are split via Route 61 and Route 261, and trips travelling to the Plaza are assigned to Route 61.

The transit trips are delineated in the following three tables: **Table 20** outlines the directional distribution and route assignment. **Table 21** outlines the number of site trips assigned to each route, **Table 22** outlines the number of additional trips added to each bus within the peak hour.

**Table 20 – Transit Trip Distribution**

Direction	AM IN		AM OUT		PM IN		PM OUT	
	%	Bus	%	Bus	%	Bus	%	Bus
East Hazeldean	9%	61 WB	9%	61 EB	13%	61 WB	12%	61 EB
North Carp	61%	61 WB	73%	61 EB/261/262	65%	61 WB/261/262	59%	61 EB
South Stittsville Main	23%	61 EB	13%	61 WB/261	15%	61 EB/261	24%	61 WB
East Plaza	7%	61 EB	6%	61 WB	6%	61 EB	5%	61 WB

**Table 21 - Transit Trip Assignment**

Route	AM IN		AM OUT		PM IN		PM OUT	
	%	Trips	%	Trips	%	Trips	%	Trips
61 Westbound	71%	17	12%	6	20%	9	29%	10
61 Eastbound	29%	7	16%	8	14%	6	71%	26
261 (Eastbound AM, Westbound PM)	-	-	39%	21	37%	18	-	-
262 (Eastbound AM, Westbound PM)	-	-	33%	17	29%	13	-	-

**Table 22 - Additional Transit Trips**

Route	AM IN		AM OUT		PM IN		PM OUT	
	Pk Hr Buses	Trips / Bus	Pk Hr Buses	Trips / Bus	Pk Hr Buses	Trips / Bus	Pk Hr Buses	Trips / Bus
61 Westbound	2	9	2	3	4	2	4	3
61 Eastbound	4	2	4	2	2	3	2	13
261 (Eastbound AM, Westbound PM)	-	-	2	11	2	9	-	-
262 (Eastbound AM, Westbound PM)	-	-	2	9	2	7	-	-

Passengers using Route 261 will board at stop 2186 (Stittsville Main / AD. 1224) and alight at stop 2185 (Stittsville Main / AD. 1224). Passengers using Route 262 will board at stop 2019 (Kittiwake / Sundew) and alight at stop 2020 (Kittiwake / Carp). It is noted that a new bus stop is recommended to be provided west of the access on Hazeldean. The provision of this stop is to be determined by the Client and the City.

## 4.8 Network Concept

As per the City of Ottawa’s Transportation Master Plan, Map 11, Carp Road has been indicated to be widened from two lanes to four lanes between Hazeldean Road and Highway 417. This occurrence was expected to occur between 2021 and 2025. However, correspondence with the City has determined that the widening will not occur prior to the 2029 horizon year.

## 4.9 Network Intersections

### 4.9.1 Multimodal Level of Service - Intersections

The multimodal level of service (MMLOS) was completed on the boundary street signalized intersections within the study area. The full calculations for the MMLOS is provided as **Appendix K**. Target LOS were based on the “General Urban Area” in Exhibit 22 of the Multimodal LOS Guidelines. The MMLOS for each segment is shown in Section 4.3.1.

Worst-case future scenarios for each location were assuming during the analysis. **Table 23** summarizes the pedestrian LOS. **Table 24** summarizes the bicycle LOS. **Table 25** summarizes the transit LOS, considering approaches where existing OTranspo routes do not travel on being indicated as non applicable. **Table 26** summarizes the truck LOS, only on approaches that are both a trucking route, and the right turn would be departing onto another trucking route.

**Table 23 - Pedestrian Multimodal Level of Service (Intersections)**

Intersection	Level of Service	Target Level of Service
Hazeldean Rd & Carp Rd	E	C
Carp Rd & Kittiwake Dr / Echowoods Ave	D	C
Carp Rd & Stittsville Main St	E	C
Hazeldean Rd & Stittsville Main St	F	A

Pedestrian LOS is not met at any intersection within the study area. Several individual crosswalks are under target LOS due to the number of lanes crossed, the right channels are large radius, and the lack of crosswalk treatments. All crosswalks are not met at Hazeldean Road & Carp Road, and Hazeldean Road & Stittsville Main Street.

**Table 24 - Bicycle Multimodal Level of Service (Intersections)**

Intersection	Level of Service	Target Level of Service
Hazeldean Rd & Carp Rd	F	C
Carp Rd & Kittiwake Dr / Echowoods Ave	F	B
Carp Rd & Stittsville Main St	F	C
Hazeldean Rd & Stittsville Main St	F	C

Bicycle LOS is well under the target LOS in the study area. Only one approach meets the target LOS, being the northbound approach at Stittsville Main Street & Hazeldean Road. Most issues arise from the high operating speeds and the lack of facilities for making left turns, with most approaches requiring at least one lane be crossed.

**Table 25 - Transit Multimodal Level of Service (Intersections)**

Intersection	Level of Service	Target Level of Service
Hazeldean Rd & Carp Rd	F	D
Carp Rd & Kittiwake Dr / Echowoods Ave	F	D
Carp Rd & Stittsville Main St	F	D
Hazeldean Rd & Stittsville Main St	F	D

Transit LOS is not met at any approach within the study area. All approaches can expect a through delay of 40 seconds are greater. Signal timing optimization may assist with this issue.

**Table 26 – Truck Multimodal Level of Service (Intersections)**

Intersection	Level of Service	Target Level of Service
Hazeldean Rd & Carp Rd	E	D
Carp Rd & Kittiwake Dr / Echowoods Ave	N/A	D
Carp Rd & Stittsville Main St	F	D
Hazeldean Rd & Stittsville Main St	E	D

Truck LOS is mostly met, with only one approach having an LOS of F. The eastbound approach on Carp Road & Stittsville Main Street has a small turning radius. All other approaches are met or not applicable.

Multimodal conditions for the study area intersections remain the same in both future background and future total scenarios, as no alterations are proposed.

#### 4.9.2 Mitigation Measures

If demand mitigations outlined in Section 3.3.5 are unable to be fully met, the following mitigative implementations are recommended to improve traffic operations to an acceptable level:

- An exclusive westbound right lane at the intersection of Carp Road & Kittiwake Drive / Echowoods Avenue
- Extension of the southbound left turn lane at the intersection of Carp Road & Hazeldean Road
- Signal timing optimizations at Carp Road & Kittiwake Drive / Echowoods Avenue and Carp Road & Hazeldean Road

An exclusive westbound right turn lane with storage is proposed at the intersection of Carp Road & Kittiwake Drive / Echowoods Avenue, to alleviate the delays caused by development trips. The storage length for this turn-lane would be 45 metres based on the 95<sup>th</sup> percentile queue for the AM peak hour and would have a taper length of 45 metres. Details regarding the lane configuration for the westbound movement are provided in the RMA package submittal.

The southbound lane at Carp Road & Hazeldean Road is proposed to have a 30 metre extension from its current queue length, to accommodate the impact of site trips. **Table 27** illustrates the 95<sup>th</sup> percentile queue lengths for the future background, future total and future total mitigated scenarios in 2029. The queue is expected to increase by 30 metres during the AM peak hour with site trips included in the network.

**Table 27 - Southbound Left Queuing Storage Analysis**

Storage Length	Background 2029	Total 2029	Mitigated 2029
AM (m)	79.7	103.2	93.7
AM (increase)		23.5	14
PM (m)	104.7	115.9	105.7
PM (increase)		11.2	1

Note that the storage length is subject to further design and should consider the queue lengths outlined in this study.

Signal timings were optimized to account for the geometric changes in the road network. Cycle lengths were not adjusted, and offsets were not adjusted at Carp Road & Hazeldean Road. The modified signal timings are illustrated in **Figure 14** and **Figure 15** respectively.

**Figure 14 – Carp Road & Kittiwake Drive / Echowoods Avenue Optimized Signal Timings**



Figure 15 – Carp Road & Hazeldean Road Optimized Signal Timings



The traffic operations for the mitigative implementations are outlined in **Table 28** for the effected intersections. The full outputs are provided in **Appendix J**. Traffic reductions were not considered for the mitigation analysis.

Table 28 - Future Total 2029 with Mitigations Traffic Operations Analysis

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement(s)			Overall		
	LOS	v/c	Movement	Delay (s)	v/c	LOS
<b>Signalized</b>						
Carp Rd & Kittiwake Dr / Echwoods Ave	F	1.09	EBL	61.5 (82.7)	1.10 (1.18)	F (F)
	F	1.13	NBT			
	(F)	(1.27)	SBT			
Carp Rd & Hazeldean Rd	F (F)	1.19 (1.28)	EBL	55.5 (65.4)	0.87 (1.21)	D (F)
	(E)	(0.94)	WBT			
	(F)	(1.12)	NBL			
	(F)	(1.31)	SBL			
	(E)	(0.91)	SBT			

The mitigative changes have a positive effect on the road network – while no movements drop from critical capacity, major improvements are seen in the delays and v/c ratios in most locations.

A warrant for an exclusive northbound left turn lane at Samantha Eastop Drive & Kimpton Drive was requested by the City. However, based on the existing traffic volumes, assumptions and trip distribution and assignment for the intersection, this would not be achievable. Actual traffic volumes were not provided for this location as previously described in Section 2.3.3. Left turns at this approach are 100% in all assumptions and further scenarios and approaching and opposing volumes are both 0. Under future conditions, this movement is expected to experience a delay of approximately 5 seconds in the AM period and 4 seconds in the PM peak period. While the majority of movements are expected to make left-turns at this movement, the minor delay would not identify a need for a dedicated left-turn lane.

The need for a left-turn lane should be monitored and considered when the overall road network is fully developed.

## Appendix A – TIA Screening Form



**City of Ottawa 2017 TIA Guidelines Screening Form**

**1. Description of Proposed Development**

Municipal Address	6171 Hazeldean Road
Description of Location	Site is located along Hazeldean Road
Land Use Classification	General Urban Area, Arterial Main Street (AM9)
Development Size (units)	20 singles, 154 towns, 180 Condo, 175 apartments (529 units total)
Development Size (m <sup>2</sup> )	90,253
Number of Accesses and Locations	Two (2) site accesses along Hazeldean Road & Kimpton Drive
Phase of Development	No phasing
Buildout Year	2024

**If available, please attach a sketch of the development or site plan to this form.**

**2. Trip Generation Trigger**

Considering the Development’s Land Use type and Size (as filled out in the previous section), please refer to the Trip Generation Trigger checks below.

Land Use Type	Minimum Development Size
Single-family homes	40 units
Townhomes or apartments	90 units
Office	3,500 m <sup>2</sup>
Industrial	5,000 m <sup>2</sup>
Fast-food restaurant or coffee shop	100 m <sup>2</sup>
Destination retail	1,000 m <sup>2</sup>
Gas station or convenience market	75 m <sup>2</sup>

*\* If the development has a land use type other than what is presented in the table above, estimates of person-trip generation may be made based on average trip generation characteristics represented in the current edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual.*

**If the proposed development size is greater than the sizes identified above, the Trip Generation Trigger is satisfied.**

### 3. Location Triggers

	Yes	No
Does the development propose a new driveway to a boundary street that is designated as part of the City’s Transit Priority, Rapid Transit or Spine Bicycle Networks?	X	
Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone?*		X

\*DPA and TOD are identified in the City of Ottawa Official Plan (DPA in Section 2.5.1 and Schedules A and B; TOD in Annex 6). See Chapter 4 for a list of City of Ottawa Planning and Engineering documents that support the completion of TIA).

**If any of the above questions were answered with ‘Yes,’ the Location Trigger is satisfied.**

### 4. Safety Triggers

	Yes	No
Are posted speed limits on a boundary street are 80 km/hr or greater?		X
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?		X
Is the proposed driveway within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions)?		X
Is the proposed driveway within auxiliary lanes of an intersection?		X
Does the proposed driveway make use of an existing median break that serves an existing site?		X
Is there is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?		X
Does the development include a drive-thru facility?		X

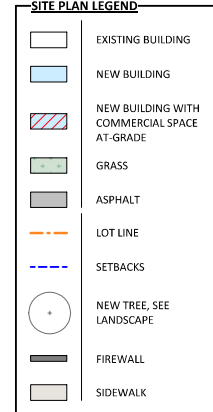
**If any of the above questions were answered with ‘Yes,’ the Safety Trigger is satisfied.**

### 5. Summary

	Yes	No
Does the development satisfy the Trip Generation Trigger?	X	
Does the development satisfy the Location Trigger?		X
Does the development satisfy the Safety Trigger?		X

**If none of the triggers are satisfied, the TIA Study is complete. If one or more of the triggers is satisfied, the TIA Study must continue into the next stage (Screening and Scoping).**

## Appendix B - Site Plan



### LOTS AREAS

NAME	AREAS (sq m)	NAME	AREAS (sq m)
L01	13,937	L68	183
L02	5,056	L69	176
L03	232	L70	176
L04	181	L71	181
L05	181	L72	173
L06	241	L73	222
L07	316	L74	343
L08	317	L75	181
L09	317	L76	182
L10	316	L77	187
L11	316	L78	188
L12	316	L79	186
L13	316	L80	185
L14	316	L81	345
L15	316	L82	222
L16	316	L83	173
L17	316	L84	183
L18	316	L85	176
L19	461	L86	176
L20	728	L87	183
L21	319	L88	173
L22	534	L89	222
L23	312	L90	312
L24	306	L91	173
L25	306	L92	173
L26	306	L93	176
L27	367	L94	177
L28	274	L95	172
L29	168	L96	173
L30	178	L97	312
L31	171	L98	218
L32	171	L99	169
L33	178	L100	179
L34	168	L101	173
L35	216	L102	173
L36	216	L103	179
L37	168	L104	169
L38	178	L105	218
L39	171	L106	312
L40	171	L107	174
L41	178	L108	175
L42	168	L109	180
L43	216	L110	181
L44	216	L111	179
L45	168	L112	180
L46	178	L113	328
L47	171	L114	218
L48	172	L115	169
L49	178	L116	179
L50	168	L117	173
L51	419	L118	173
L52	479	L119	179
L53	503	L120	169
L54	424	L121	218
L55	162	L122	357
L56	170	L123	186
L57	175	L124	180
L58	165	L125	188
L59	171	L126	187
L60	162	L127	192
L61	209	L128	181
L62	210	L129	232
L63	164	L130	248
L64	173	L131	186
L65	168	L132	185
L66	168	L133	184
L67	175	L134	183
L68	166	L135	242
L69	212	L136	180
L70	211	L137	222
L71	164	L138	172
L72	179	L139	180
L73	166	L140	173
L74	166	L141	172
L75	173	L142	317
L76	164	L143	289
L77	226	L144	194
L78	342	L145	205
L79	179	L146	194
L80	179	L147	249
L81	183	L148	249
L82	183	L149	194
L83	179	L150	194
L84	179	L151	332
L85	342	L152	824
L86	222	L153	3,599
L87	173		

### SITE INFORMATION & DEVELOPMENT STATISTICS

LOT PIN: 04487-1709

**SITE AREA**

- TOTAL SITE AREA: ~90,187 sq m (9.02ha)
- TOTAL DEVELOPABLE AREA: ~78,087 sq m (7.81ha)
- NET SITE AREA: ~57,497 sq m (5.75ha)

**UNITS**

- SINGLES HOUSES: 20 UNITS
- TOWNHOUSES: 150 UNITS
- CONDOS: 5 BUILDINGS OF EACH 48 UNITS / TOTAL OF 240 UNITS
- APARTMENT BUILDING: 160 UNITS
- COMMERCIAL SPACES: ~1,800 sq m / ~19,400 sq ft

TOTAL NUMBER OF UNITS: 570

**ZONING** R3YY

	REQUIRED	PROVIDED
MINIMUM LOT WIDTH		
DETACHED DWELLING	9 m	7.9 m
TOWNHOUSE	6 m	5.8 m
MINIMUM LOT AREA		
DETACHED DWELLING	240 sq m	306 sq m
TOWNHOUSE	150 sq m	162 sq m
MAXIMUM BUILDING HEIGHT	14.5 m	~15 m
SETBACKS		
MINIMUM FRONT YARD:	6 m	5.2 m
MINIMUM CORNER SIDE YARD:	4.5 m	3.19 m
MINIMUM INTERIOR SIDE YARD:		
DETACHED HOUSE:	0.6 m	1.2 m
TOWNHOUSE:		1.2 m
MINIMUM REAR YARD:	6 m	6/7.5 m
ZONING	REQUIRED	PROVIDED
		AM9
MINIMUM LOT WIDTH	NO MIN.	
MINIMUM LOT AREA	NO MIN.	
MAXIMUM BUILDING HEIGHT	15 m	30.2 m
SETBACKS		
MINIMUM FRONT YARD & CORNER SIDE YARD:		
NON-RESIDENTIAL OR MIXED-USE:	NO MIN.	5 m
RESIDENTIAL:		3 m
MINIMUM INTERIOR SIDE YARD:		
ABUTTING A RESIDENTIAL ZONE:	7.5 m	7.5 m
ALL OTHER CASES:	NO MIN.	
MINIMUM REAR YARD:		
NON-RESIDENTIAL OR MIXED-USE:	10 m	10 m
ABUTTING A STREET:	3 m	3 m
ABUTTING A RESIDENTIAL ZONE:	7.5 m	7.5 m
FOR A RESIDENTIAL BUILDING:	7.5 m	7.5 m
ALL OTHER CASES:	NO MIN.	
PARKING RATES		
R4 - DETACHED DWELLING:	1 p/unit = 20	40 (DOUBLE GARAGES)
VISITOR:	0	40 (DOUBLE DRIVE AISLES)
R9 - TOWNHOUSES:	1 p/unit = 150	150 (GARAGES)
VISITOR:	0	150 DRIVE AISLES
R12 - CONDOS:	1 p/unit = 240	240
VISITOR:	0.2 p/unit = 48	7 ext. + 29 int.
R12 - APARTMENTS:	1 p/unit = 160	160
VISITOR:	0.2 p/unit = 32	32
N79 - RETAIL STORE:	3.4 p/100 m <sup>2</sup> GFA = 62	45
GROSS FLOOR AREA		
SINGLES:		304 sq m
TOWNHOUSE A:		267 sq m
TOWNHOUSE B:		239 sq m
TOWNHOUSE C:		232 sq m
TOWNHOUSE C (CORNER UNIT):		236 sq m
TOWNHOUSE D:		225 sq m
TOTAL MODEL 01 (ABBBBBB)		1,968 sq m
TOTAL MODEL 02 (ABBBBB)		1,490 sq m
TOTAL MODEL 03 (ABBA)		1,012 sq m
TOTAL MODEL 04 (CDCCDC)		1,836 sq m
TOTAL MODEL 05 (CCDC)		1,154 sq m
TOTAL MODEL 06 (CC)		472 sq m
CONDOS BUILDINGS (A,B,C,D,E):		TOTAL: 20,700 sq m
RESIDENTIAL:		4,140 sq m
APARTMENT BUILDING 2:		TOTAL: 16,200 sq m
RESIDENTIAL:		14,400 sq m
COMMERCIAL SPACE:		1,800 sq m



6171 HAZELDEAN ROAD - SITE PLAN  
1:500

PROJECT

HAZELDEAN HORIZONS

OWNER

LATITUDE HOMES

1202, CARP ROAD, STITTSVILLE, ON K2S 1B9

ARCHITECTURAL

PMA ARCHITECTS

5001, CHEMIN DES QUATRE-BOURGEOIS, QUÉBEC (QC) G1W 2H4

LAPALME RHEULT ARCHITECTS ASSOCIÉS

53, SAINT-RAYMOND BOULEVARD, GATINEAU, QC J8Y 1R8

ENGINEERS

exp.

2850, QUEENSWAY DRIVE, SUITE 100, OTTAWA, ON K2B 8H6

PLANNER

FOTENN Planning + Design

DESIGNER

Co-LaBB DESIGN

98, BLANCHARD STREET, SUITE 123, SAINTE-THERÈSE, QC J7E 4J9

SURVEYOR

Fairhall Moffatt & Woodland

100, TERRY FOX DRIVE, SUITE 100, KANATA, ON K2L 4S6

KEY PLAN

ARCHITECT SEAL

REVISIONS

NO.	DESCRIPTION	DATE
1	FOR COORDINATION	2021-09-08

NOTE

1. ASSUMES TYPICAL RESIDENTIAL FLOOR HEIGHT OF 3m.

2. THE BASE PLAN (LOT LINES, EXISTING ROADS AND SURROUNDING AREAS) IS BASED ON THE TOPOGRAPHICAL PLAN OF SURVEY OF FAIRHALL MOFFATT & WOODLAND LTD.

3. DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0,3048.

FOR COORDINATION DO NOT USE FOR CONSTRUCTION 2021-09-08

DATE: 2021-09-08

DESIGNED: PM

DRAWN: PP

PROJECT No: 21055

CHECKED: PP

SHEET TITLE: SITE PLAN

SHEET No: A100

BIM 360://HAZELDEAN-KANATA/20019\_HAZELDEAN\_SITE\_PLAN\_R21.DWG

## Appendix C – Traffic Data

## Turning Movement Count - Study Results

### CARP RD @ ECHOWOODS AVE/KITTIWAKE DR

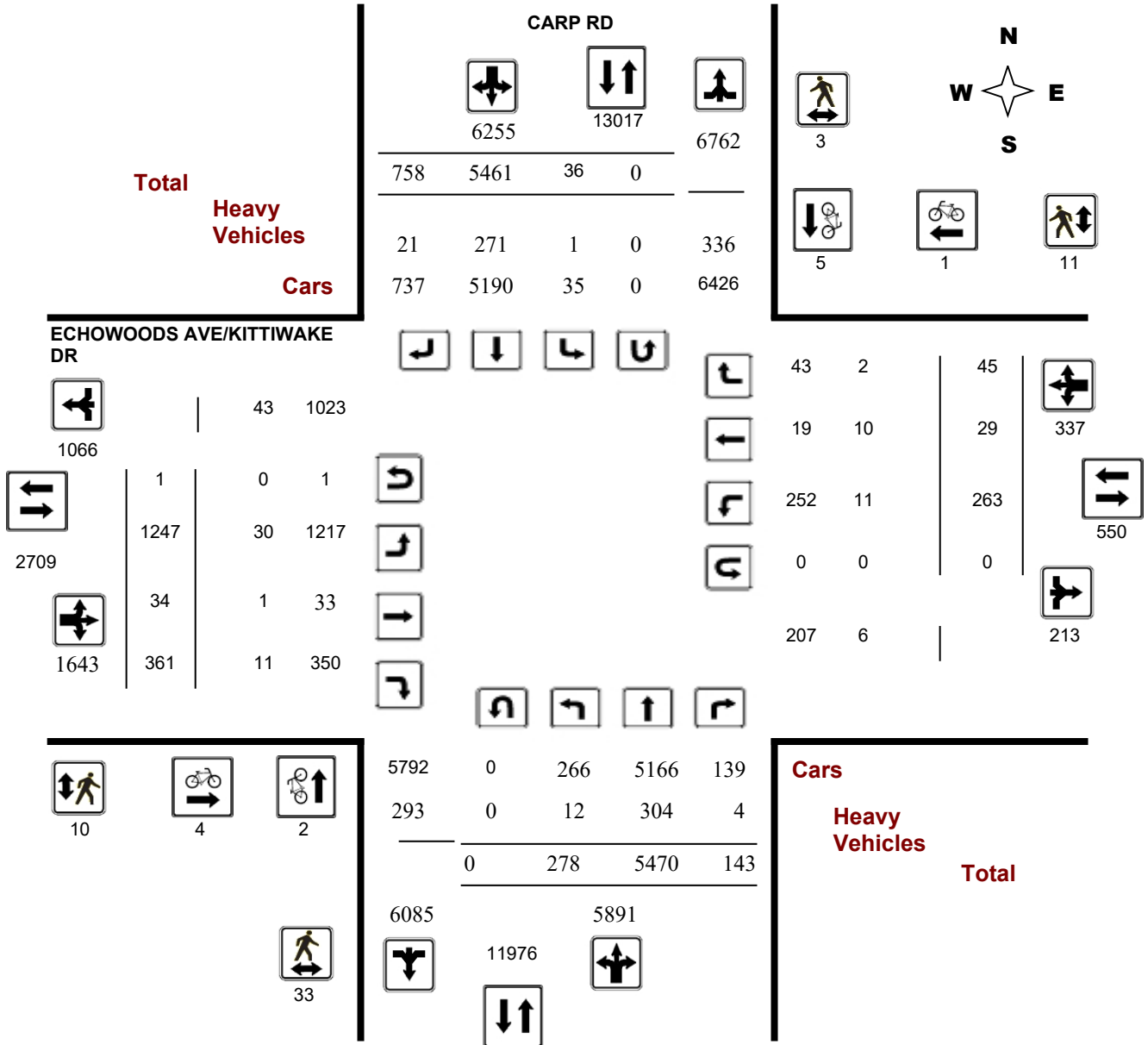
**Survey Date:** Thursday, May 04, 2017

**WO No:** 36996

**Start Time:** 07:00

**Device:** Miovision

### Full Study Diagram



## Turning Movement Count - Study Results

### CARP RD @ ECHOWOODS AVE/KITTIWAKE DR

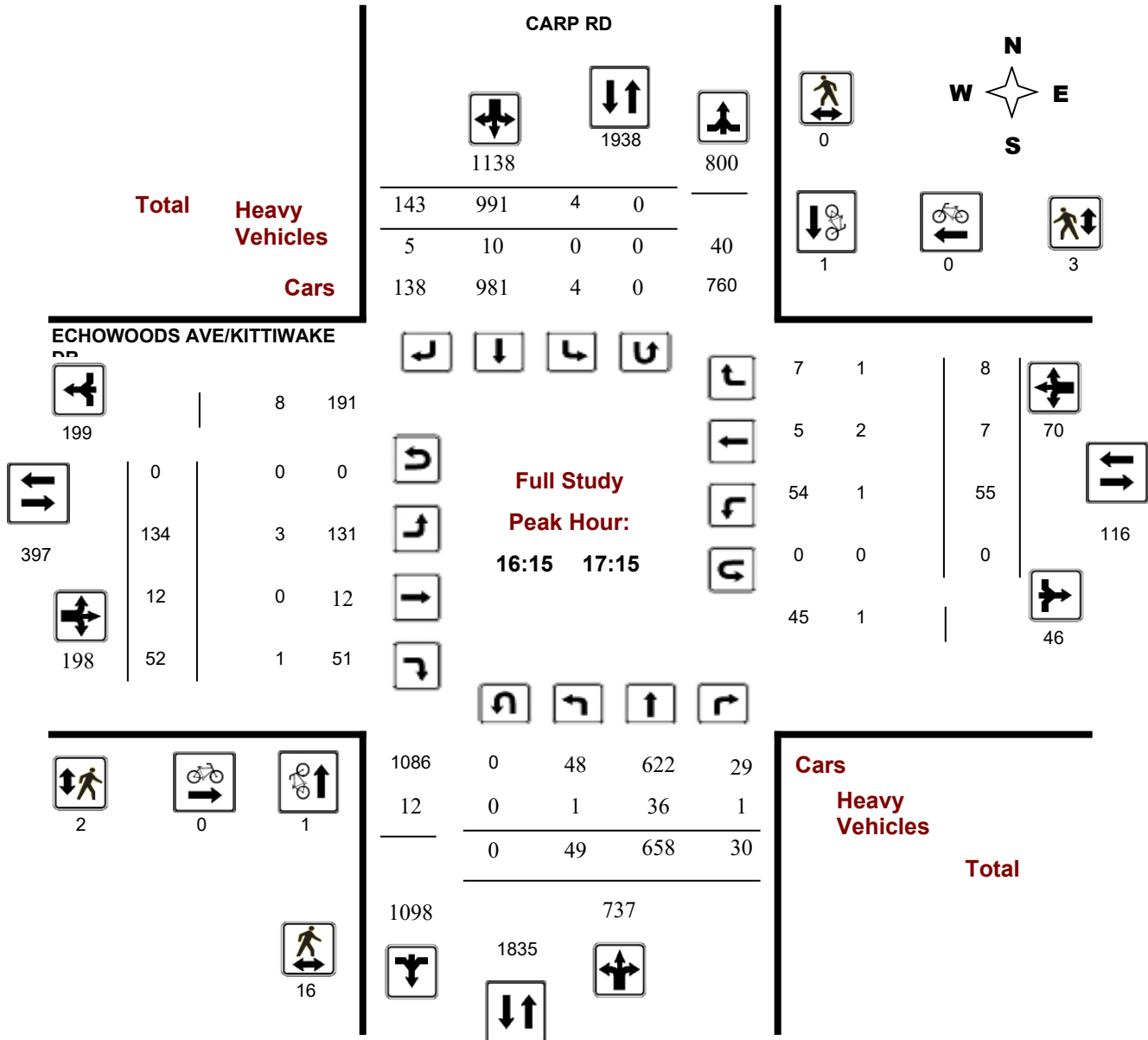
**Survey Date:** Thursday, May 04, 2017

**WO No:** 36996

**Start Time:** 07:00

**Device:** Miovision

### Full Study Peak Hour Diagram



## Turning Movement Count - Peak Hour Diagram

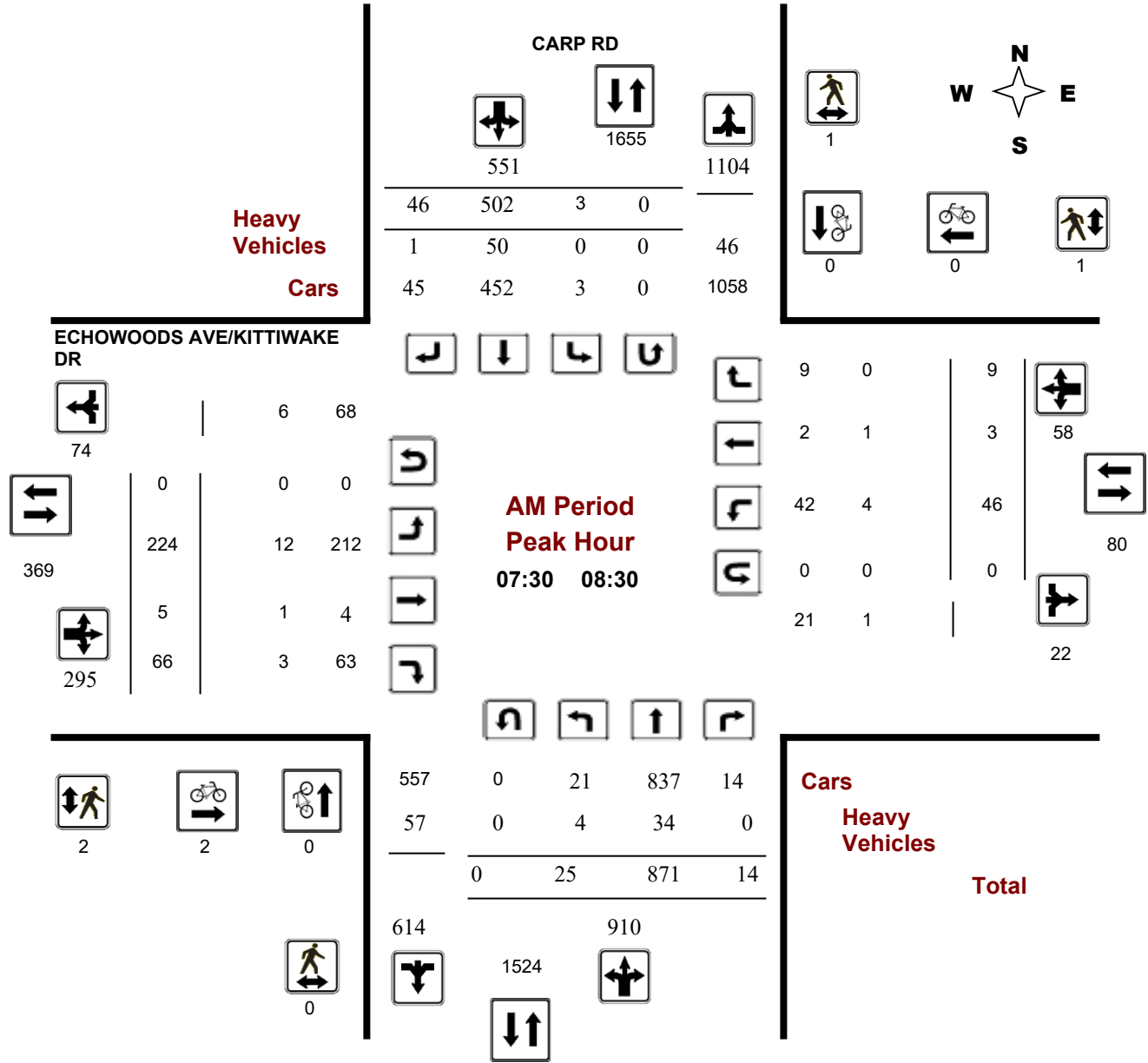
### CARP RD @ ECHOWOODS AVE/KITTIWAKE DR

**Survey Date:** Thursday, May 04, 2017

**Start Time:** 07:00

**WO No:** 36996

**Device:** Miovision

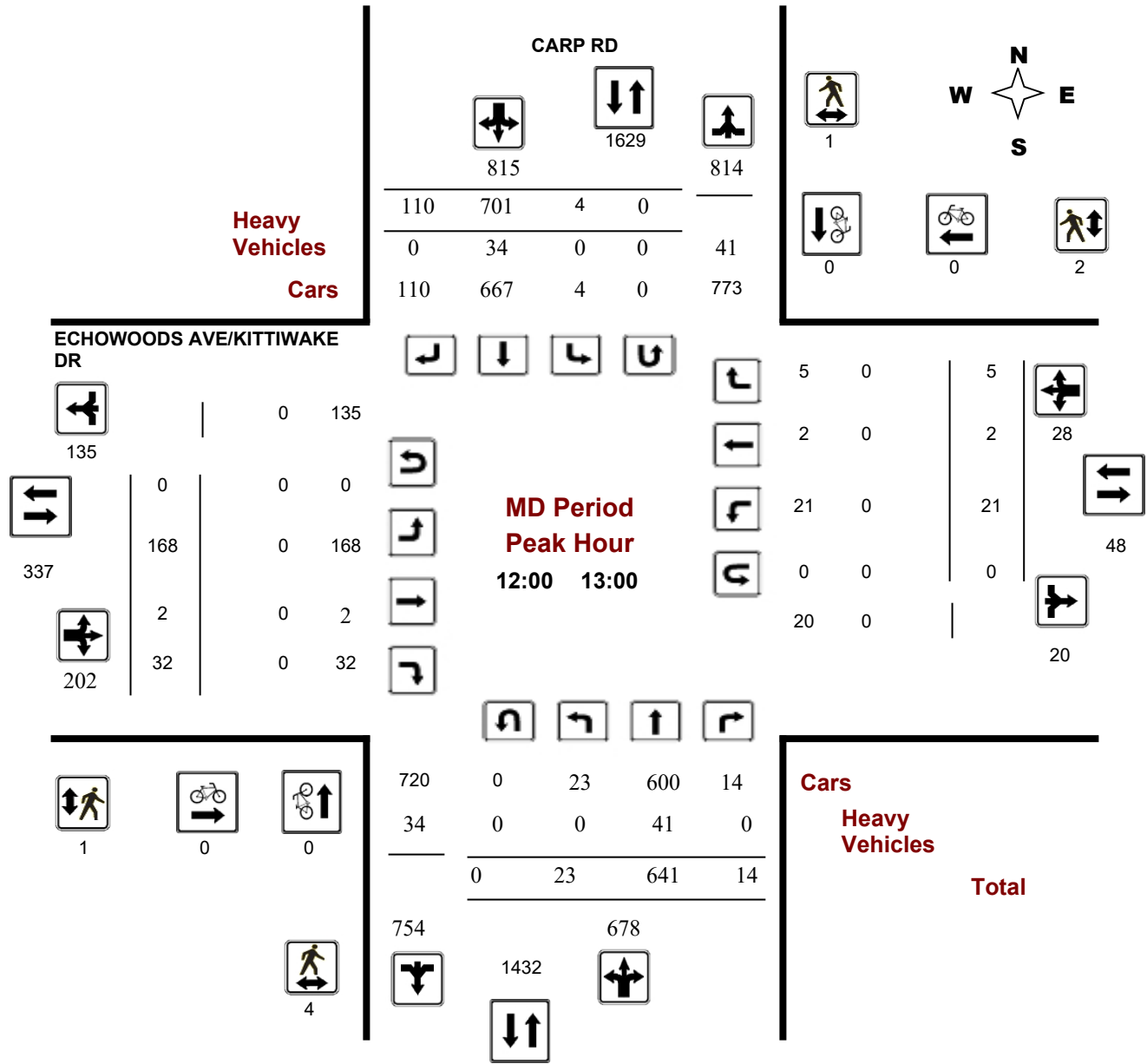




## Turning Movement Count - Peak Hour Diagram CARP RD @ ECHOWOODS AVE/KITTIWAKE DR

**Survey Date:** Thursday, May 04, 2017  
**Start Time:** 07:00

**WO No:** 36996  
**Device:** Miovision

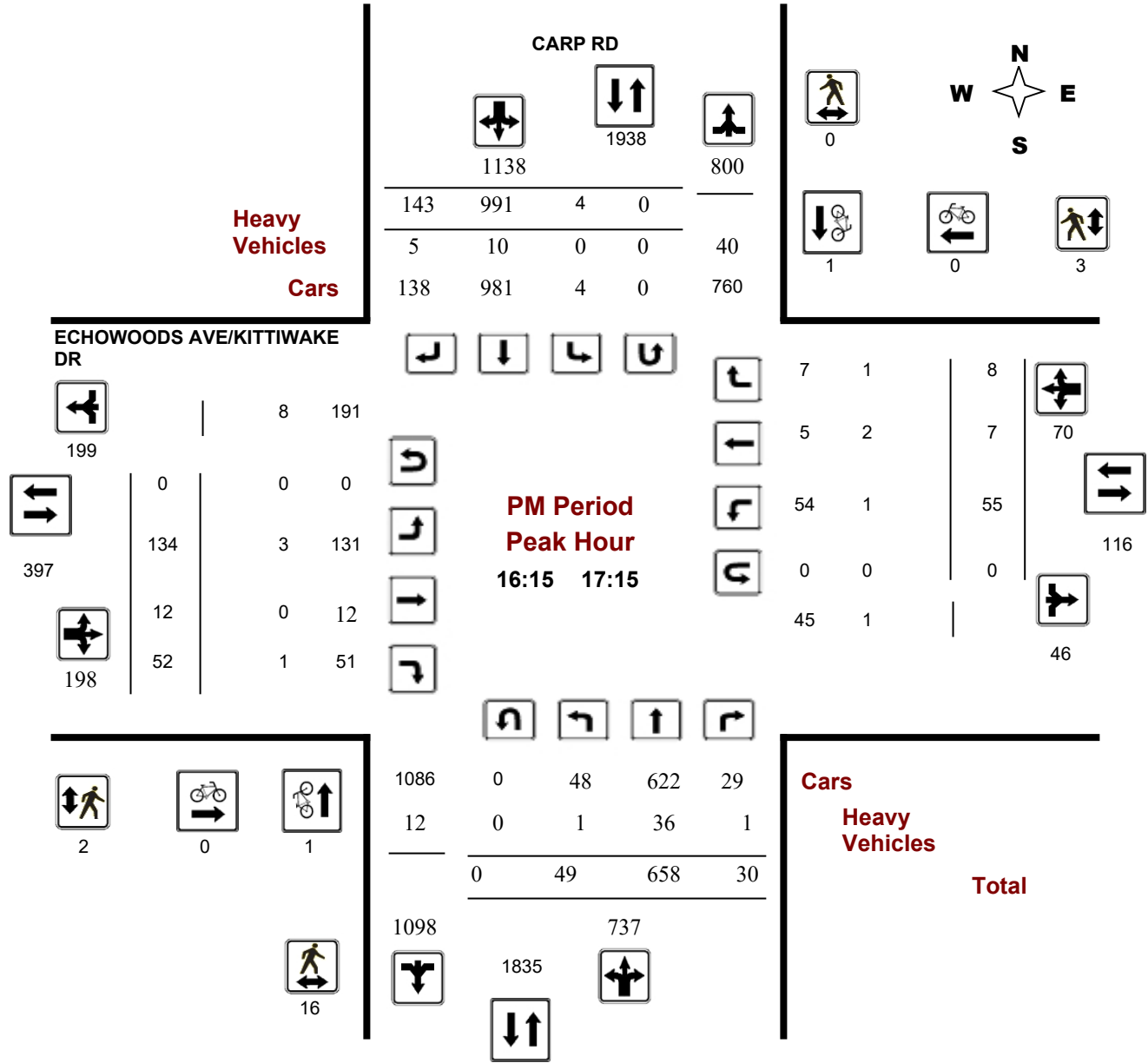


**Comments**

## Turning Movement Count - Peak Hour Diagram CARP RD @ ECHOWOODS AVE/KITTIWAKE DR

**Survey Date:** Thursday, May 04, 2017  
**Start Time:** 07:00

**WO No:** 36996  
**Device:** Miovision



**Comments**



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### CARP RD @ ECHOWOODS AVE/KITTIWAKE DR

**Survey Date:** Thursday, May 04, 2017

**WO No:** 36996

**Start Time:** 07:00

**Device:** Miovision

### Full Study Summary (8 HR Standard)

**Survey Date:** Thursday, May 04, 2017

**Total Observed U-Turns**

**AADT Factor**

Northbound: 0      Southbound: 0  
 Eastbound: 1      Westbound: 0

.90

Period	CARP RD										ECHOWOODS AVE/KITTIWAKE DR										Grand Total
	Northbound					Southbound					Eastbound					Westbound					
	LT	ST	RT	NB TOT	STR TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	STR TOT	LT	ST	RT	WB TOT	STR TOT	
07:00 08:00	12	903	10	925	7	461	38	506	1431	216	5	51	272	38	4	16	58	330	1761		
08:00 09:00	28	802	14	844	4	470	54	528	1372	201	6	68	275	41	3	7	51	326	1698		
09:00 10:00	22	743	16	781	4	466	42	512	1293	142	1	34	177	19	0	4	23	200	1493		
11:30 12:30	19	578	9	606	4	657	102	763	1369	146	2	32	180	17	1	4	22	202	1571		
12:30 13:30	31	628	18	677	0	639	88	727	1404	162	1	33	196	16	3	4	23	219	1623		
15:00 16:00	58	594	23	675	9	823	129	961	1636	117	3	39	159	31	6	0	37	196	1832		
16:00 17:00	46	666	27	739	6	973	128	1107	1846	108	11	45	164	63	7	7	77	241	2087		
17:00 18:00	62	556	26	644	2	972	177	1151	1795	155	5	59	219	38	5	3	46	265	2060		
<b>Sub Total</b>	278	5470	143	5891	36	5461	758	6255	12146	1247	34	361	1642	263	29	45	337	1979	14125		
<b>U Turns</b>				0				0	0				1				0	1	1		
<b>Total</b>	278	5470	143	5891	36	5461	758	6255	12146	1247	34	361	1643	263	29	45	337	1980	14126		
<b>EQ 12Hr</b>	386	7603	199	8188	50	7591	1054	8694	16883	1733	47	502	2284	366	40	63	468	2752	19635		
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.													<b>1.39</b>								
<b>AVG 12Hr</b>	328	6449	169	6945	42	6439	894	7375	15195	1470	40	426	1937	310	34	53	397	2477	17672		
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.													<b>0.9</b>								
<b>AVG 24Hr</b>	429	8448	221	9099	56	8434	1171	9661	18760	1926	53	558	2538	406	45	70	520	3058	21818		
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.													<b>1.31</b>								

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### CARP RD @ ECHOWOODS AVE/KITTIWAKE DR

**Survey Date:** Thursday, May 04, 2017

**WO No:** 36996

**Start Time:** 07:00

**Device:** Miovision

### Full Study 15 Minute Increments

#### CARP RD

#### ECHOWOODS AVE/KITTIWAKE DR

Northbound

Southbound

Eastbound

Westbound

Time Period	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00 07:15	3	219	2	224	3	108	14	125	34	50	2	11	63	7	1	6	14	34	426
07:15 07:30	1	218	0	219	1	98	5	104	25	52	1	9	62	8	1	4	13	25	398
07:30 07:45	2	212	3	217	1	128	8	137	19	68	1	13	82	12	1	3	16	19	452
07:45 08:00	6	254	5	265	2	127	11	140	24	46	1	18	65	11	1	3	15	24	485
08:00 08:15	9	188	4	201	0	114	15	129	23	51	2	13	66	12	1	2	15	23	411
08:15 08:30	8	217	2	227	0	133	12	145	23	59	1	22	82	11	0	1	12	23	466
08:30 08:45	4	206	5	215	2	103	10	115	23	38	2	15	55	9	1	4	14	23	399
08:45 09:00	7	191	3	201	2	120	17	139	19	53	1	18	72	9	1	0	10	19	422
09:00 09:15	5	187	4	196	0	113	13	126	23	38	0	8	46	3	0	1	4	23	372
09:15 09:30	4	219	4	227	1	124	11	136	22	34	0	9	43	2	0	0	2	22	408
09:30 09:45	8	186	4	198	1	113	8	122	22	38	0	10	48	7	0	0	7	22	375
09:45 10:00	5	151	4	160	2	116	10	128	17	32	1	7	40	7	0	3	10	17	338
11:30 11:45	3	149	1	153	0	138	16	154	28	32	0	5	37	3	0	0	3	28	347
11:45 12:00	3	129	1	133	0	166	27	193	20	35	1	12	48	3	1	1	5	20	379
12:00 12:15	4	149	1	154	3	177	36	216	16	31	0	7	38	4	0	1	5	16	413
12:15 12:30	9	151	6	166	1	176	23	200	17	48	1	8	57	7	0	2	9	17	432
12:30 12:45	4	159	3	166	0	153	27	180	20	47	1	11	59	6	2	1	9	20	414
12:45 13:00	6	182	4	192	0	195	24	219	22	42	0	6	48	4	0	1	5	22	464
13:00 13:15	13	141	6	160	0	132	18	150	10	39	0	11	50	3	1	2	6	10	366
13:15 13:30	8	146	5	159	0	159	19	178	25	34	0	5	39	3	0	0	3	25	379
15:00 15:15	14	141	4	159	2	174	32	208	20	33	1	11	45	5	2	0	7	20	419
15:15 15:30	15	142	3	160	0	207	35	242	18	20	1	10	31	11	0	0	11	18	444
15:30 15:45	16	168	10	194	4	212	30	246	18	28	1	9	38	11	0	0	11	18	489
15:45 16:00	13	143	6	162	3	230	32	265	19	36	0	9	45	4	4	0	8	19	480
16:00 16:15	13	163	8	184	2	240	27	269	20	17	2	10	29	16	2	0	18	20	500
16:15 16:30	7	165	9	181	1	255	37	293	19	27	4	14	45	21	0	2	23	19	542
16:30 16:45	17	174	7	198	0	229	29	258	11	34	2	11	47	13	3	4	20	11	523
16:45 17:00	9	164	3	176	3	249	35	287	14	30	3	10	43	13	2	1	16	14	522
17:00 17:15	16	155	11	182	0	258	42	300	9	43	3	17	63	8	2	1	11	9	556
17:15 17:30	21	142	4	167	0	248	37	285	8	43	0	20	63	12	1	1	14	8	529
17:30 17:45	8	136	4	148	0	246	48	294	17	30	2	10	43	13	0	0	13	17	498
17:45 18:00	17	123	7	147	2	220	50	272	8	39	0	12	51	5	2	1	8	8	478
<b>Total:</b>	<b>278</b>	<b>5470</b>	<b>143</b>	<b>5891</b>	<b>36</b>	<b>5461</b>	<b>758</b>	<b>6255</b>	<b>613</b>	<b>1247</b>	<b>34</b>	<b>361</b>	<b>1643</b>	<b>263</b>	<b>29</b>	<b>45</b>	<b>337</b>	<b>613</b>	<b>14,126</b>

Note: U-Turns are included in Totals.



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### CARP RD @ ECHOWOODS AVE/KITTIWAKE DR

**Survey Date:** Thursday, May 04, 2017

**WO No:** 36996

**Start Time:** 07:00

**Device:** Miovision

### Full Study Cyclist Volume

Time Period	CARP RD			ECHOWOODS AVE/KITTIWAKE DR			Grand Total
	Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	
07:00 07:15	1	1	2	0	0	0	2
07:15 07:30	0	0	0	0	0	0	0
07:30 07:45	0	0	0	0	0	0	0
07:45 08:00	0	0	0	0	0	0	0
08:00 08:15	0	0	0	1	0	1	1
08:15 08:30	0	0	0	1	0	1	1
08:30 08:45	0	0	0	0	0	0	0
08:45 09:00	0	0	0	0	0	0	0
09:00 09:15	0	0	0	0	0	0	0
09:15 09:30	0	0	0	1	0	1	1
09:30 09:45	0	0	0	0	0	0	0
09:45 10:00	0	0	0	0	0	0	0
11:30 11:45	0	0	0	0	0	0	0
11:45 12:00	0	0	0	0	0	0	0
12:00 12:15	0	0	0	0	0	0	0
12:15 12:30	0	0	0	0	0	0	0
12:30 12:45	0	0	0	0	0	0	0
12:45 13:00	0	0	0	0	0	0	0
13:00 13:15	0	2	2	0	0	0	2
13:15 13:30	0	0	0	0	0	0	0
15:00 15:15	0	0	0	0	0	0	0
15:15 15:30	0	1	1	0	0	0	1
15:30 15:45	0	0	0	0	0	0	0
15:45 16:00	0	0	0	0	0	0	0
16:00 16:15	0	0	0	0	0	0	0
16:15 16:30	0	0	0	0	0	0	0
16:30 16:45	0	0	0	0	0	0	0
16:45 17:00	1	1	2	0	0	0	2
17:00 17:15	0	0	0	0	0	0	0
17:15 17:30	0	0	0	0	0	0	0
17:30 17:45	0	0	0	1	0	1	1
17:45 18:00	0	0	0	0	1	1	1
<b>Total</b>	<b>2</b>	<b>5</b>	<b>7</b>	<b>4</b>	<b>1</b>	<b>5</b>	<b>12</b>



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### CARP RD @ ECHOWOODS AVE/KITTIWAKE DR

**Survey Date:** Thursday, May 04, 2017

**WO No:** 36996

**Start Time:** 07:00

**Device:** Miovision

### Full Study Pedestrian Volume

#### CARP RD

#### ECHOWOODS AVE/KITTIWAKE DR

Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	0	0	0	0	0	0	0
07:15 07:30	0	0	0	1	1	2	2
07:30 07:45	0	1	1	1	0	1	2
07:45 08:00	0	0	0	0	0	0	0
08:00 08:15	0	0	0	0	1	1	1
08:15 08:30	0	0	0	1	0	1	1
08:30 08:45	2	0	2	0	1	1	3
08:45 09:00	0	0	0	1	1	2	2
09:00 09:15	2	0	2	2	0	2	4
09:15 09:30	0	0	0	0	0	0	0
09:30 09:45	0	0	0	0	0	0	0
09:45 10:00	2	0	2	0	0	0	2
11:30 11:45	1	0	1	0	0	0	1
11:45 12:00	0	0	0	0	0	0	0
12:00 12:15	0	0	0	0	0	0	0
12:15 12:30	0	0	0	0	0	0	0
12:30 12:45	1	1	2	1	2	3	5
12:45 13:00	3	0	3	0	0	0	3
13:00 13:15	0	0	0	0	2	2	2
13:15 13:30	0	1	1	1	0	1	2
15:00 15:15	1	0	1	0	0	0	1
15:15 15:30	3	0	3	0	0	0	3
15:30 15:45	0	0	0	0	0	0	0
15:45 16:00	2	0	2	0	0	0	2
16:00 16:15	0	0	0	0	0	0	0
16:15 16:30	3	0	3	0	0	0	3
16:30 16:45	13	0	13	0	1	1	14
16:45 17:00	0	0	0	2	1	3	3
17:00 17:15	0	0	0	0	1	1	1
17:15 17:30	0	0	0	0	0	0	0
17:30 17:45	0	0	0	0	0	0	0
17:45 18:00	0	0	0	0	0	0	0
<b>Total</b> .....	<b>33</b>	<b>3</b>	<b>36</b>	<b>10</b>	<b>11</b>	<b>21</b>	<b>57</b>



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### CARP RD @ ECHOWOODS AVE/KITTIWAKE DR

**Survey Date:** Thursday, May 04, 2017

**WO No:** 36996

**Start Time:** 07:00

**Device:** Miovision

### Full Study Heavy Vehicles

#### CARP RD

#### ECHOWOODS AVE/KITTIWAKE DR

Northbound

Southbound

Eastbound

Westbound

Time Period	Northbound			N TOT	Southbound			S TOT	STR TOT	Eastbound			E TOT	Westbound			W TOT	STR TOT	Grand Total	
	LT	ST	RT		LT	ST	RT			LT	ST	RT		LT	ST	RT				
07:00 07:15	0	4	0	4	1	23	6	30	34	2	0	0	2	1	1	0	2	4	38	
07:15 07:30	0	11	0	11	0	13	1	14	25	2	0	0	2	0	1	1	2	4	29	
07:30 07:45	0	5	0	5	0	14	0	14	19	2	0	1	3	1	0	0	1	4	23	
07:45 08:00	1	8	0	9	0	15	0	15	24	3	0	1	4	1	0	0	1	5	29	
08:00 08:15	2	11	0	13	0	10	0	10	23	5	1	0	6	1	1	0	2	8	31	
08:15 08:30	1	10	0	11	0	11	1	12	23	2	0	1	3	1	0	0	1	4	27	
08:30 08:45	0	11	0	11	0	12	0	12	23	2	0	0	2	1	0	0	1	3	26	
08:45 09:00	0	6	1	7	0	11	1	12	19	0	0	1	1	1	1	0	2	3	22	
09:00 09:15	1	15	0	16	0	7	0	7	23	0	0	1	1	0	0	0	0	1	24	
09:15 09:30	0	13	0	13	0	9	0	9	22	1	0	0	1	0	0	0	0	1	23	
09:30 09:45	0	11	0	11	0	10	1	11	22	1	0	0	1	0	0	0	0	1	23	
09:45 10:00	0	11	0	11	0	6	0	6	17	1	0	1	2	0	0	0	0	2	19	
11:30 11:45	0	13	0	13	0	14	1	15	28	0	0	0	0	0	0	0	0	0	28	
11:45 12:00	0	11	0	11	0	9	0	9	20	0	0	0	0	0	0	0	0	0	20	
12:00 12:15	0	11	0	11	0	5	0	5	16	0	0	0	0	0	0	0	0	0	16	
12:15 12:30	0	8	0	8	0	9	0	9	17	0	0	0	0	0	0	0	0	0	17	
12:30 12:45	0	10	0	10	0	10	0	10	20	0	0	0	0	0	0	0	0	0	20	
12:45 13:00	0	12	0	12	0	10	0	10	22	0	0	0	0	0	0	0	0	0	22	
13:00 13:15	1	5	0	6	0	4	0	4	10	0	0	0	0	0	0	0	0	0	10	
13:15 13:30	0	11	0	11	0	14	0	14	25	0	0	1	1	0	0	0	0	1	26	
15:00 15:15	2	10	0	12	0	8	0	8	20	1	0	0	1	0	2	0	2	3	23	
15:15 15:30	0	11	0	11	0	7	0	7	18	0	0	0	0	2	0	0	2	2	20	
15:30 15:45	1	12	0	13	0	5	0	5	18	0	0	1	1	0	0	0	0	1	19	
15:45 16:00	1	10	1	12	0	6	1	7	19	2	0	0	2	0	0	0	0	2	21	
16:00 16:15	1	11	0	12	0	7	1	8	20	1	0	2	3	1	1	0	2	5	25	
16:15 16:30	0	14	1	15	0	3	1	4	19	1	0	0	1	1	0	1	2	3	22	
16:30 16:45	0	7	0	7	0	3	1	4	11	2	0	1	3	0	1	0	1	4	15	
16:45 17:00	0	10	0	10	0	3	1	4	14	0	0	0	0	0	0	0	0	0	14	
17:00 17:15	1	5	0	6	0	1	2	3	9	0	0	0	0	0	1	0	1	1	10	
17:15 17:30	0	4	0	4	0	3	1	4	8	2	0	0	2	0	1	0	1	3	11	
17:30 17:45	0	9	0	9	0	7	1	8	17	0	0	0	0	0	0	0	0	0	17	
17:45 18:00	0	4	1	5	0	2	1	3	8	0	0	0	0	0	0	0	0	0	8	
<b>Total:</b>	None	12	304	4	320	1	271	21	293	613	30	1	11	42	11	10	2	23	65	678



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### CARP RD @ ECHOWOODS AVE/KITTIWAKE DR

**Survey Date:** Thursday, May 04, 2017

**WO No:** 36996

**Start Time:** 07:00

**Device:** Miovision

### Full Study 15 Minute U-Turn Total

CARP RD

ECHOWOODS AVE/KITTIWAKE DR

Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	0
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	0	0	0
07:45	08:00	0	0	0	0	0
08:00	08:15	0	0	0	0	0
08:15	08:30	0	0	0	0	0
08:30	08:45	0	0	0	0	0
08:45	09:00	0	0	0	0	0
09:00	09:15	0	0	0	0	0
09:15	09:30	0	0	0	0	0
09:30	09:45	0	0	0	0	0
09:45	10:00	0	0	0	0	0
11:30	11:45	0	0	0	0	0
11:45	12:00	0	0	0	0	0
12:00	12:15	0	0	0	0	0
12:15	12:30	0	0	0	0	0
12:30	12:45	0	0	0	0	0
12:45	13:00	0	0	0	0	0
13:00	13:15	0	0	0	0	0
13:15	13:30	0	0	0	0	0
15:00	15:15	0	0	0	0	0
15:15	15:30	0	0	0	0	0
15:30	15:45	0	0	0	0	0
15:45	16:00	0	0	0	0	0
16:00	16:15	0	0	0	0	0
16:15	16:30	0	0	0	0	0
16:30	16:45	0	0	0	0	0
16:45	17:00	0	0	0	0	0
17:00	17:15	0	0	0	0	0
17:15	17:30	0	0	0	0	0
17:30	17:45	0	0	1	0	1
17:45	18:00	0	0	0	0	0
Total		0	0	1	0	1



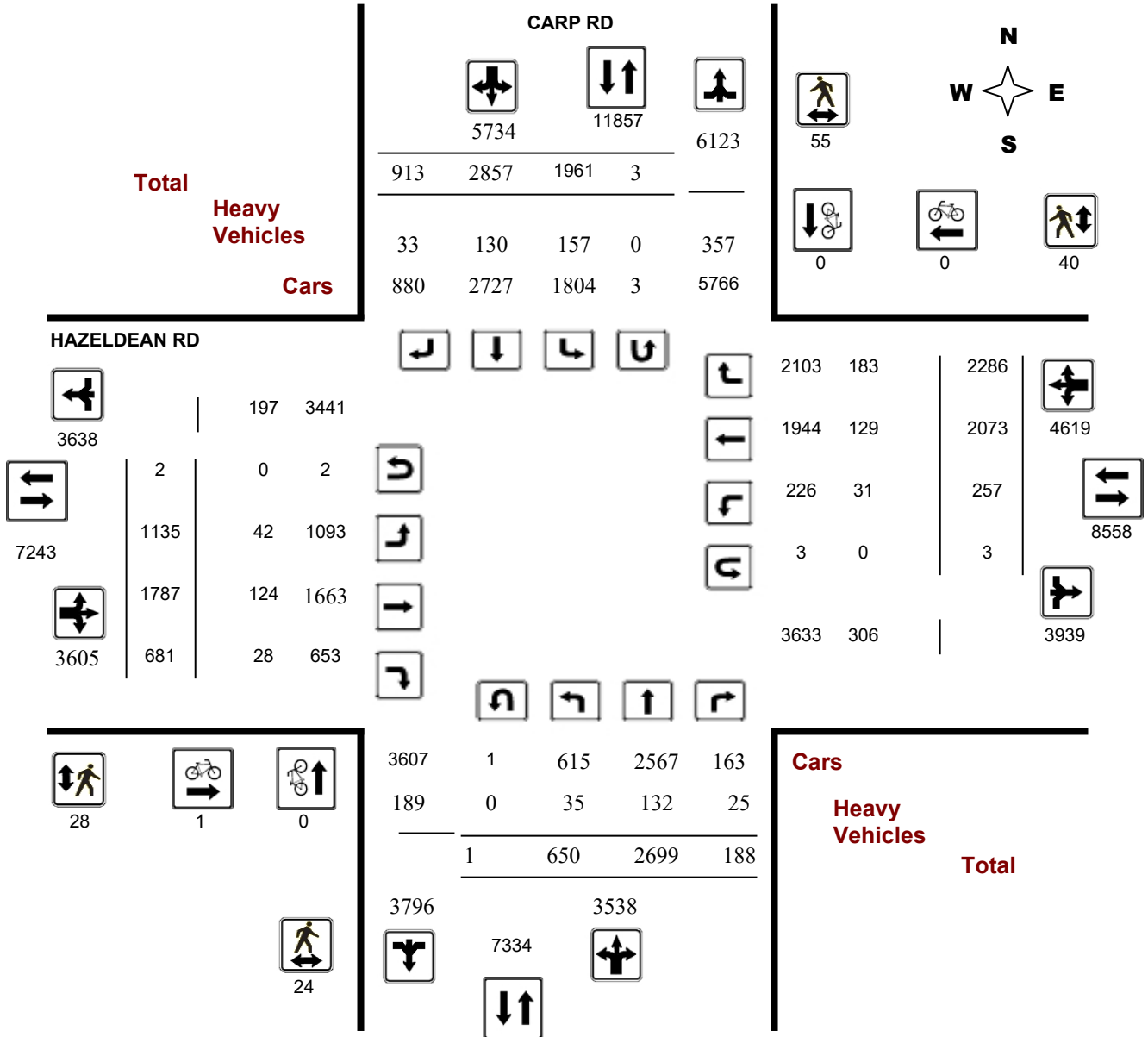
**Survey Date:** Thursday, November 23, 2017

**WO No:** 37338

**Start Time:** 07:00

**Device:** Miovision

### Full Study Diagram



## Turning Movement Count - Study Results

### CARP RD @ HAZELDEAN RD

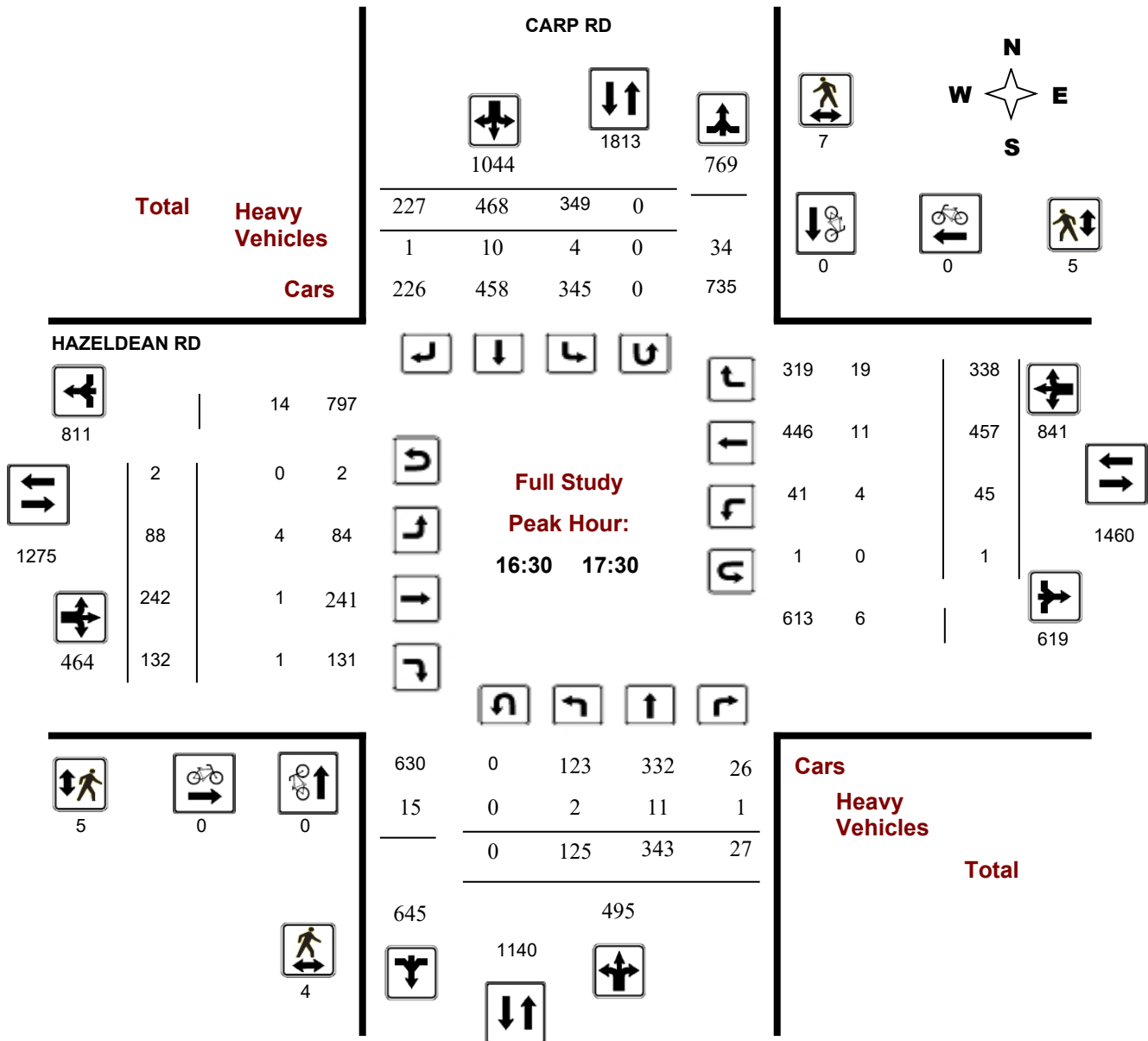
**Survey Date:** Thursday, November 23, 2017

**WO No:** 37338

**Start Time:** 07:00

**Device:** Miovision

### Full Study Peak Hour Diagram



## Turning Movement Count - Peak Hour Diagram

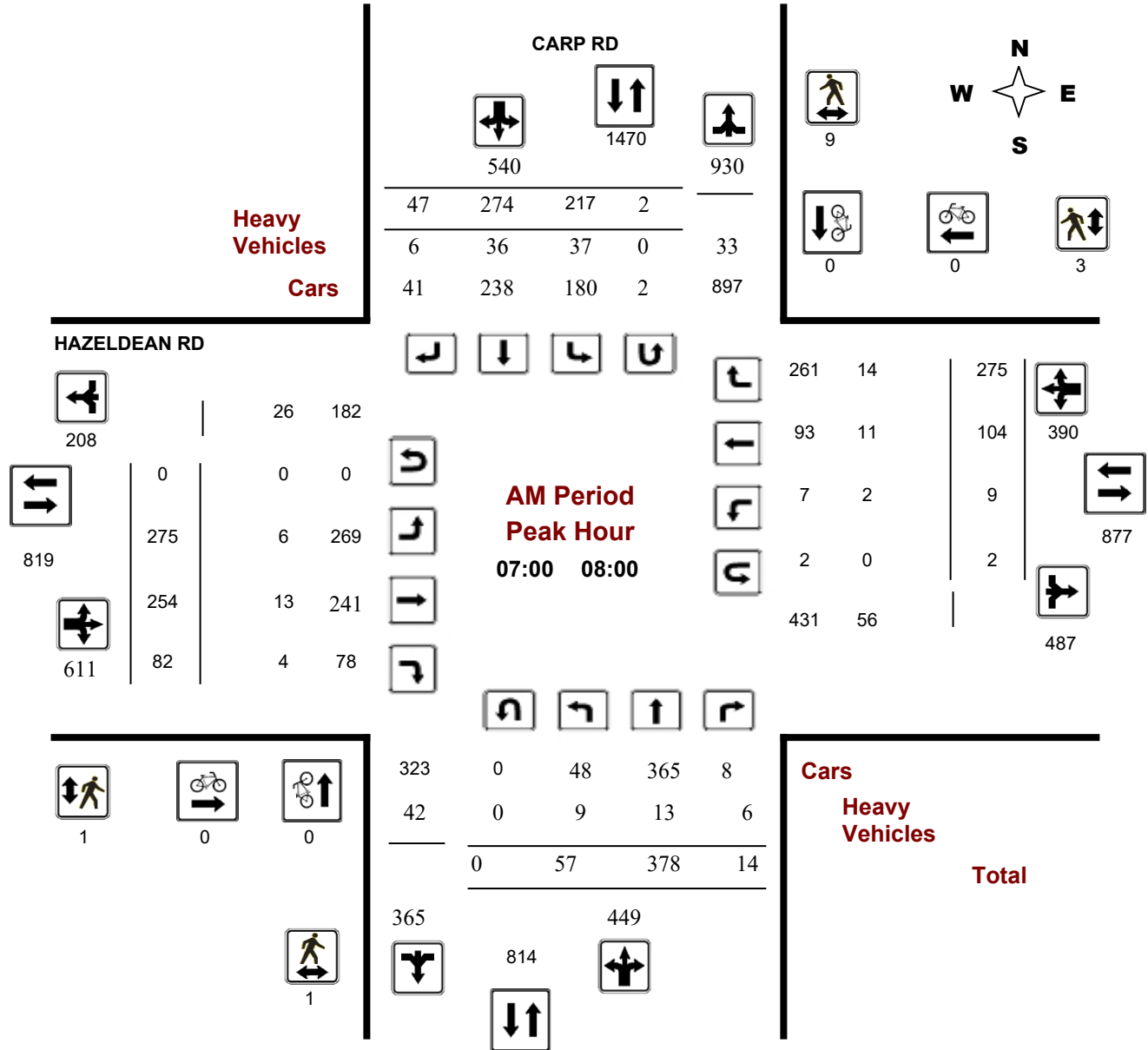
### CARP RD @ HAZELDEAN RD

**Survey Date:** Thursday, November 23, 2017

**Start Time:** 07:00

**WO No:** 37338

**Device:** Miovision





# Transportation Services - Traffic Services

## Turning Movement Count - Peak Hour Diagram

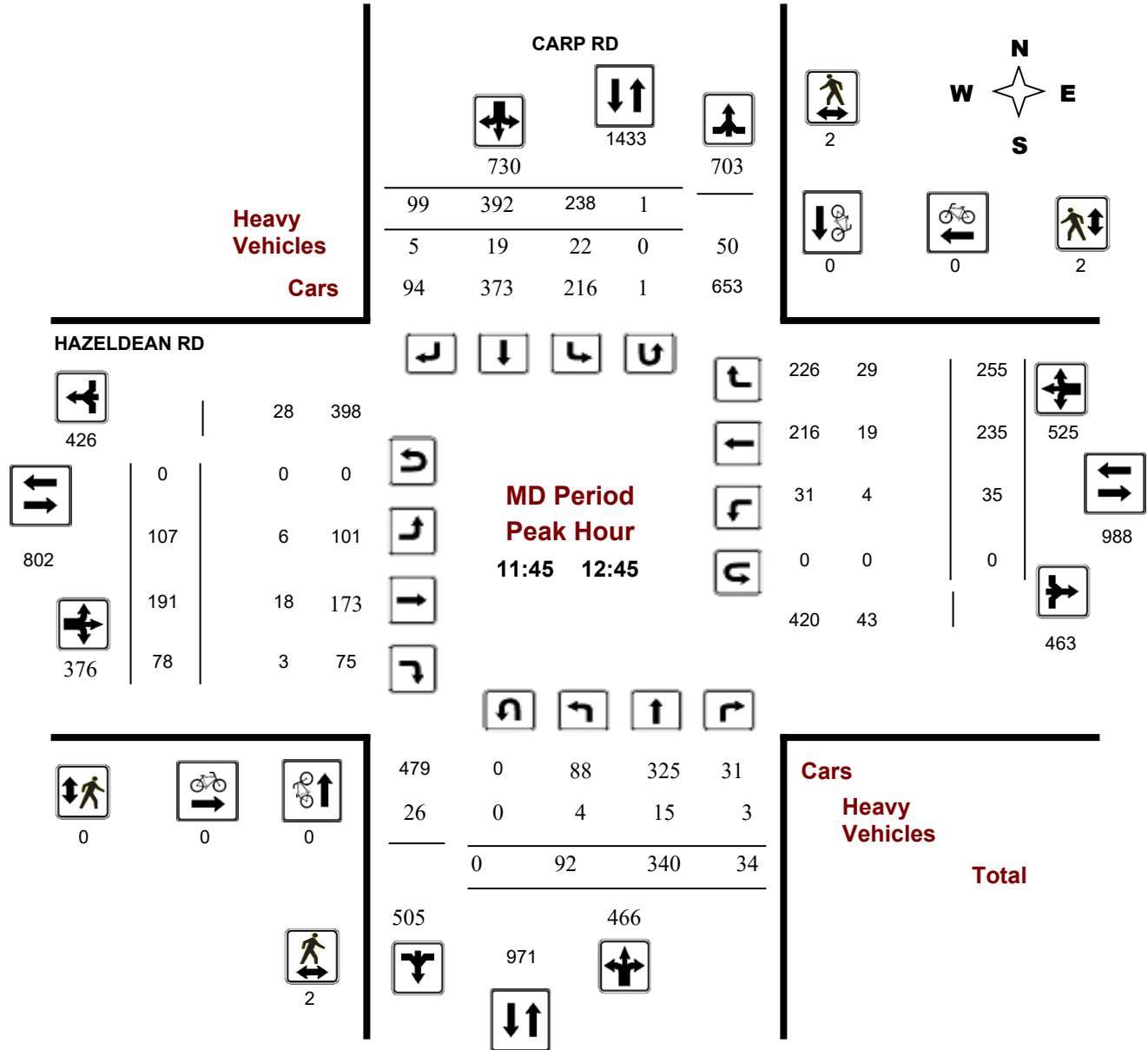
### CARP RD @ HAZELDEAN RD

**Survey Date:** Thursday, November 23, 2017

**Start Time:** 07:00

**WO No:** 37338

**Device:** Miovision



## Turning Movement Count - Peak Hour Diagram

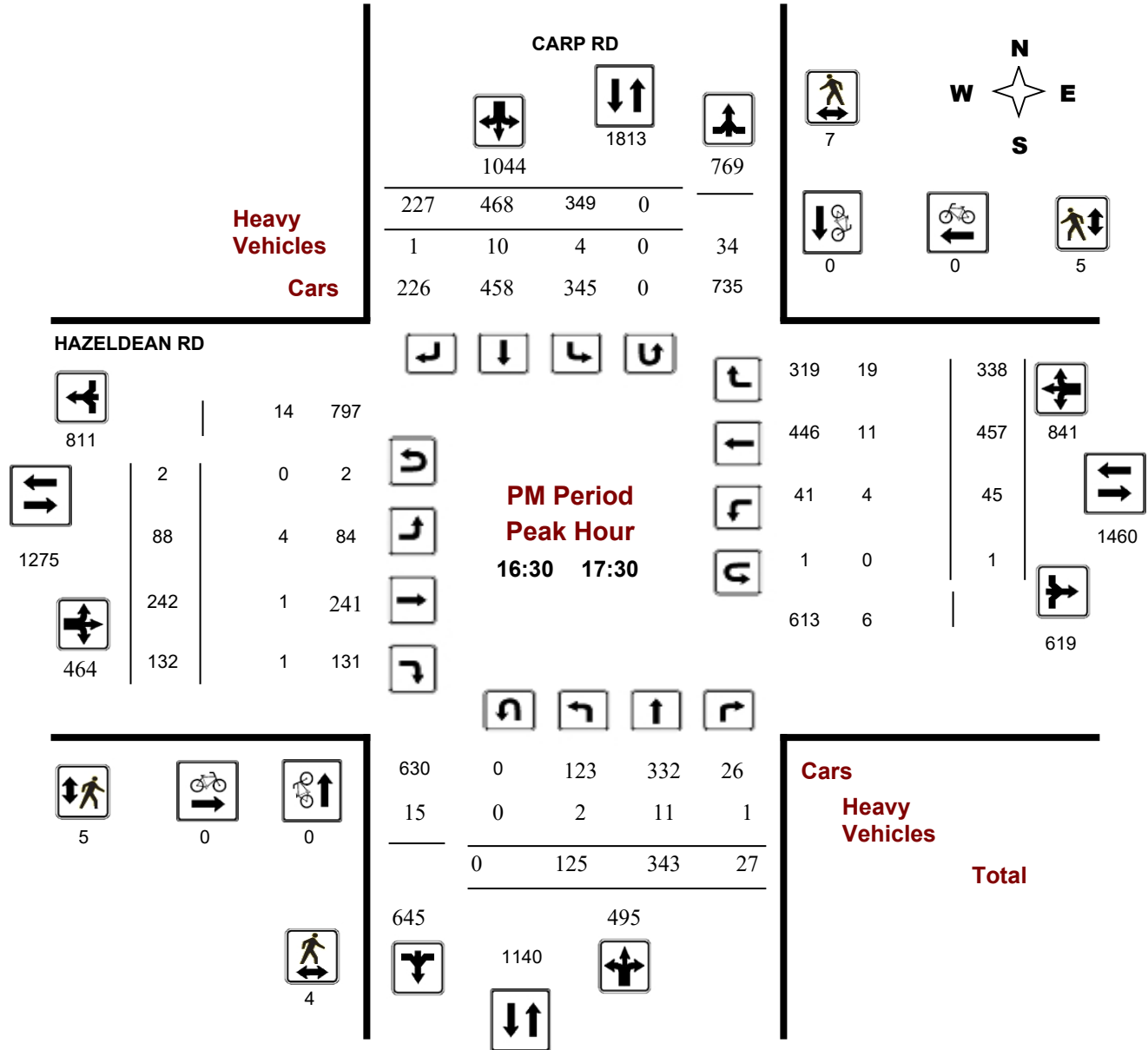
### CARP RD @ HAZELDEAN RD

**Survey Date:** Thursday, November 23, 2017

**Start Time:** 07:00

**WO No:** 37338

**Device:** Miovision





# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### CARP RD @ HAZELDEAN RD

**Survey Date:** Thursday, November 23, 2017

**WO No:** 37338

**Start Time:** 07:00

**Device:** Miovision

### Full Study Summary (8 HR Standard)

**Survey Date:** Thursday, November 23, 2017

**Total Observed U-Turns**

**AADT Factor**

Northbound: 1      Southbound: 3  
 Eastbound: 2      Westbound: 3  
 .90

Period	CARP RD									HAZELDEAN RD									STR TOT	Grand Total
	Northbound			Southbound			Eastbound			Westbound			WB TOT							
	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT		EB TOT	LT	ST	RT			
07:00 08:00	57	378	14	449	217	274	47	538	987	275	254	82	611	9	104	275	388	999	1986	
08:00 09:00	46	362	22	430	192	259	46	497	927	224	243	83	550	28	118	286	432	982	1909	
09:00 10:00	51	334	20	405	194	252	49	495	900	137	214	78	429	23	115	221	359	788	1688	
11:30 12:30	90	305	29	424	241	396	99	736	1160	101	183	83	367	32	233	249	514	881	2041	
12:30 13:30	72	333	30	435	196	296	83	575	1010	120	201	72	393	37	239	274	550	943	1953	
15:00 16:00	104	309	21	434	291	442	158	891	1325	78	211	78	367	43	386	364	793	1160	2485	
16:00 17:00	111	336	27	474	301	481	205	987	1461	103	247	93	443	35	457	330	822	1265	2726	
17:00 18:00	119	342	25	486	329	457	226	1012	1498	97	234	112	443	50	421	287	758	1201	2699	
<b>Sub Total</b>	650	2699	188	3537	1961	2857	913	5731	9268	1135	1787	681	3603	257	2073	2286	4616	8219	17487	
<b>U Turns</b>				1				3	4				2				3	5	9	
<b>Total</b>	650	2699	188	3538	1961	2857	913	5734	9272	1135	1787	681	3605	257	2073	2286	4619	8224	17496	
<b>EQ 12Hr</b>	903	3752	261	4918	2726	3971	1269	7970	12888	1578	2484	947	5011	357	2881	3178	6420	11431	24319	
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.																<b>1.39</b>				
<b>AVG 12Hr</b>	766	3182	222	4171	2312	3368	1076	6760	11599	1338	2107	803	4250	303	2444	2695	5446	10288	21887	
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.																<b>0.9</b>				
<b>AVG 24Hr</b>	1004	4169	290	5464	3029	4413	1410	8856	14320	1753	2760	1052	5568	397	3202	3531	7134	12702	27022	
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.																<b>1.31</b>				

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### CARP RD @ HAZELDEAN RD

**Survey Date:** Thursday, November 23, 2017

**WO No:** 37338

**Start Time:** 07:00

**Device:** Miovision

### Full Study 15 Minute Increments

#### CARP RD

#### HAZELDEAN RD

Northbound

Southbound

Eastbound

Westbound

Time Period	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00 07:15	9	90	5	104	59	66	18	143	38	77	58	20	155	1	17	61	79	38	481
07:15 07:30	17	98	1	116	50	83	8	141	27	73	54	22	149	2	20	74	97	27	503
07:30 07:45	11	110	2	123	51	61	12	124	25	67	68	20	155	2	31	62	96	25	498
07:45 08:00	20	80	6	106	57	64	9	132	17	58	74	20	152	4	36	78	118	17	508
08:00 08:15	13	94	6	113	53	54	14	121	25	49	44	24	117	2	24	66	92	25	443
08:15 08:30	12	90	7	109	42	69	9	120	15	76	79	17	172	9	33	87	129	15	530
08:30 08:45	8	82	7	97	43	65	11	119	11	48	53	20	121	10	33	65	108	11	445
08:45 09:00	13	96	2	111	54	71	12	137	14	51	67	22	140	7	28	68	103	14	491
09:00 09:15	16	82	5	103	39	63	16	118	26	52	57	20	129	7	25	52	84	26	434
09:15 09:30	16	109	5	130	55	64	6	125	29	37	57	26	120	7	30	58	95	29	470
09:30 09:45	7	82	5	94	57	65	13	135	21	26	47	22	95	5	32	54	91	21	415
09:45 10:00	12	61	5	78	43	60	14	117	12	22	53	10	85	4	28	57	89	12	369
11:30 11:45	20	54	4	78	57	88	21	166	11	28	49	23	100	5	58	68	131	11	475
11:45 12:00	30	75	9	114	70	101	27	199	17	23	42	24	89	6	63	71	140	17	542
12:00 12:15	24	89	7	120	57	97	23	177	15	27	44	19	90	9	61	56	126	15	513
12:15 12:30	16	87	9	112	57	110	28	195	16	23	48	17	88	12	51	54	117	16	512
12:30 12:45	22	89	9	120	54	84	21	159	20	34	57	18	109	8	60	74	142	20	530
12:45 13:00	20	92	8	120	51	68	14	133	12	28	54	22	104	15	65	82	162	12	519
13:00 13:15	13	81	5	99	48	84	20	152	23	27	39	20	86	5	69	47	121	23	458
13:15 13:30	17	71	8	96	43	60	28	131	20	31	51	12	94	9	45	71	125	20	446
15:00 15:15	27	76	4	107	75	106	37	218	22	23	47	13	83	11	97	91	199	22	607
15:15 15:30	26	94	4	124	56	103	43	202	10	21	68	19	108	12	75	77	164	10	598
15:30 15:45	32	62	5	99	68	112	44	224	16	24	42	18	84	12	105	92	209	16	616
15:45 16:00	19	77	8	105	92	121	34	247	16	10	54	28	92	8	109	104	221	16	665
16:00 16:15	26	74	5	105	73	127	41	241	11	33	51	17	101	8	126	80	214	11	661
16:15 16:30	23	105	5	133	63	103	58	224	12	26	72	18	116	7	105	74	186	12	659
16:30 16:45	35	59	5	99	86	131	52	269	13	21	54	34	110	8	114	95	217	13	695
16:45 17:00	27	98	12	137	79	120	54	253	4	23	70	24	117	12	112	81	205	4	712
17:00 17:15	37	87	7	131	99	121	55	275	6	21	56	37	115	8	134	81	224	6	745
17:15 17:30	26	99	3	128	85	96	66	247	6	23	62	37	122	17	97	81	195	6	692
17:30 17:45	31	74	10	115	75	131	55	261	2	25	58	19	102	17	104	64	185	2	663
17:45 18:00	25	82	5	112	70	109	50	229	0	28	58	19	105	8	86	61	155	0	601
<b>Total:</b>	<b>650</b>	<b>2699</b>	<b>188</b>	<b>3538</b>	<b>1961</b>	<b>2857</b>	<b>913</b>	<b>5734</b>	<b>512</b>	<b>1135</b>	<b>1787</b>	<b>681</b>	<b>3605</b>	<b>257</b>	<b>2073</b>	<b>2286</b>	<b>4619</b>	<b>512</b>	<b>17,496</b>

Note: U-Turns are included in Totals.



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### CARP RD @ HAZELDEAN RD

**Survey Date:** Thursday, November 23, 2017

**WO No:** 37338

**Start Time:** 07:00

**Device:** Miovision

### Full Study Cyclist Volume

Time Period	CARP RD			HAZELDEAN RD			Grand Total
	Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	
07:00 07:15	0	0	0	0	0	0	0
07:15 07:30	0	0	0	0	0	0	0
07:30 07:45	0	0	0	0	0	0	0
07:45 08:00	0	0	0	0	0	0	0
08:00 08:15	0	0	0	0	0	0	0
08:15 08:30	0	0	0	0	0	0	0
08:30 08:45	0	0	0	0	0	0	0
08:45 09:00	0	0	0	0	0	0	0
09:00 09:15	0	0	0	0	0	0	0
09:15 09:30	0	0	0	0	0	0	0
09:30 09:45	0	0	0	1	0	1	1
09:45 10:00	0	0	0	0	0	0	0
11:30 11:45	0	0	0	0	0	0	0
11:45 12:00	0	0	0	0	0	0	0
12:00 12:15	0	0	0	0	0	0	0
12:15 12:30	0	0	0	0	0	0	0
12:30 12:45	0	0	0	0	0	0	0
12:45 13:00	0	0	0	0	0	0	0
13:00 13:15	0	0	0	0	0	0	0
13:15 13:30	0	0	0	0	0	0	0
15:00 15:15	0	0	0	0	0	0	0
15:15 15:30	0	0	0	0	0	0	0
15:30 15:45	0	0	0	0	0	0	0
15:45 16:00	0	0	0	0	0	0	0
16:00 16:15	0	0	0	0	0	0	0
16:15 16:30	0	0	0	0	0	0	0
16:30 16:45	0	0	0	0	0	0	0
16:45 17:00	0	0	0	0	0	0	0
17:00 17:15	0	0	0	0	0	0	0
17:15 17:30	0	0	0	0	0	0	0
17:30 17:45	0	0	0	0	0	0	0
17:45 18:00	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>





# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### CARP RD @ HAZELDEAN RD

**Survey Date:** Thursday, November 23, 2017

**WO No:** 37338

**Start Time:** 07:00

**Device:** Miovision

### Full Study Pedestrian Volume

#### CARP RD

#### HAZELDEAN RD

Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	0	1	1	0	1	1	2
07:15 07:30	1	6	7	1	1	2	9
07:30 07:45	0	0	0	0	0	0	0
07:45 08:00	0	2	2	0	1	1	3
08:00 08:15	3	1	4	3	1	4	8
08:15 08:30	0	4	4	1	3	4	8
08:30 08:45	2	3	5	1	0	1	6
08:45 09:00	0	3	3	0	0	0	3
09:00 09:15	1	0	1	1	0	1	2
09:15 09:30	0	3	3	0	2	2	5
09:30 09:45	1	1	2	1	1	2	4
09:45 10:00	3	1	4	2	2	4	8
11:30 11:45	0	1	1	2	0	2	3
11:45 12:00	2	0	2	0	0	0	2
12:00 12:15	0	0	0	0	0	0	0
12:15 12:30	0	1	1	0	1	1	2
12:30 12:45	0	1	1	0	1	1	2
12:45 13:00	1	0	1	1	2	3	4
13:00 13:15	0	4	4	0	0	0	4
13:15 13:30	0	2	2	0	1	1	3
15:00 15:15	1	4	5	2	7	9	14
15:15 15:30	1	2	3	1	0	1	4
15:30 15:45	1	1	2	4	4	8	10
15:45 16:00	2	3	5	2	2	4	9
16:00 16:15	0	0	0	0	3	3	3
16:15 16:30	1	0	1	1	0	1	2
16:30 16:45	1	3	4	1	2	3	7
16:45 17:00	1	3	4	1	1	2	6
17:00 17:15	1	1	2	1	2	3	5
17:15 17:30	1	0	1	2	0	2	3
17:30 17:45	0	3	3	0	0	0	3
17:45 18:00	0	1	1	0	2	2	3
<b>Total .....</b>	<b>24</b>	<b>55</b>	<b>79</b>	<b>28</b>	<b>40</b>	<b>68</b>	<b>147</b>



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### CARP RD @ HAZELDEAN RD

**Survey Date:** Thursday, November 23, 2017

**WO No:** 37338

**Start Time:** 07:00

**Device:** Miovision

### Full Study Heavy Vehicles

#### CARP RD

#### HAZELDEAN RD

Northbound

Southbound

Eastbound

Westbound

Time Period	Northbound			N TOT	Southbound			S TOT	STR TOT	Eastbound			E TOT	Westbound			W TOT	STR TOT	Grand Total	
	LT	ST	RT		LT	ST	RT			LT	ST	RT		LT	ST	RT				
07:00 07:15	0	1	1	2	18	15	3	36	38	1	2	3	6	0	1	2	3	9	47	
07:15 07:30	4	7	1	12	9	5	1	15	27	1	3	1	5	1	1	5	7	12	39	
07:30 07:45	3	2	1	6	7	10	2	19	25	1	4	0	5	0	5	4	9	14	39	
07:45 08:00	2	3	3	8	3	6	0	9	17	3	4	0	7	1	4	3	8	15	32	
08:00 08:15	2	9	2	13	8	3	1	12	25	0	4	1	5	0	3	2	5	10	35	
08:15 08:30	0	4	1	5	3	6	1	10	15	2	7	1	10	3	5	5	13	23	38	
08:30 08:45	0	0	0	0	6	4	1	11	11	1	5	4	10	1	6	6	13	23	34	
08:45 09:00	0	5	1	6	2	2	4	8	14	0	4	0	4	2	3	8	13	17	31	
09:00 09:15	2	13	1	16	7	1	2	10	26	0	6	3	9	0	8	3	11	20	46	
09:15 09:30	1	16	1	18	8	3	0	11	29	1	7	1	9	2	6	4	12	21	50	
09:30 09:45	1	3	1	5	6	8	2	16	21	1	5	1	7	0	3	6	9	16	37	
09:45 10:00	2	3	0	5	3	4	0	7	12	0	5	0	5	0	3	8	11	16	28	
11:30 11:45	1	2	1	4	3	3	1	7	11	3	1	2	6	0	5	8	13	19	30	
11:45 12:00	2	4	0	6	7	3	1	11	17	2	5	1	8	2	7	10	19	27	44	
12:00 12:15	1	6	0	7	3	4	1	8	15	2	5	1	8	1	5	7	13	21	36	
12:15 12:30	0	5	1	6	7	2	1	10	16	1	3	0	4	1	4	4	9	13	29	
12:30 12:45	1	0	2	3	5	10	2	17	20	1	5	1	7	0	3	8	11	18	38	
12:45 13:00	0	3	1	4	3	4	1	8	12	3	7	2	12	1	4	13	18	30	42	
13:00 13:15	0	6	0	6	12	3	2	17	23	2	4	1	7	1	8	7	16	23	46	
13:15 13:30	2	1	2	5	9	4	2	15	20	0	6	0	6	1	2	6	9	15	35	
15:00 15:15	0	5	1	6	7	6	3	16	22	3	5	0	8	1	5	15	21	29	51	
15:15 15:30	1	3	0	4	2	3	1	6	10	1	3	2	6	1	8	7	16	22	32	
15:30 15:45	2	3	1	6	9	1	0	10	16	3	3	2	8	0	6	2	8	16	32	
15:45 16:00	4	5	0	9	2	5	0	7	16	0	5	0	5	3	2	8	13	18	34	
16:00 16:15	1	3	1	5	3	3	0	6	11	2	7	0	9	1	3	3	7	16	27	
16:15 16:30	0	9	0	9	1	2	0	3	12	4	4	0	8	0	2	6	8	16	28	
16:30 16:45	2	5	0	7	0	5	1	6	13	1	0	1	2	1	8	9	18	20	33	
16:45 17:00	0	3	0	3	0	1	0	1	4	2	1	0	3	1	1	4	6	9	13	
17:00 17:15	0	2	1	3	1	2	0	3	6	1	0	0	1	2	1	4	7	8	14	
17:15 17:30	0	1	0	1	3	2	0	5	6	0	0	0	0	0	1	2	3	3	9	
17:30 17:45	1	0	1	2	0	0	0	0	2	0	3	0	3	4	3	0	7	10	12	
17:45 18:00	0	0	0	0	0	0	0	0	0	0	1	0	1	0	3	4	7	8	8	
<b>Total:</b>	None	35	132	25	192	157	130	33	320	512	42	124	28	194	31	129	183	343	537	1,049



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### CARP RD @ HAZELDEAN RD

**Survey Date:** Thursday, November 23, 2017

**WO No:** 37338

**Start Time:** 07:00

**Device:** Miovision

### Full Study 15 Minute U-Turn Total

CARP RD

HAZELDEAN RD

Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	0
07:15	07:30	0	0	0	1	1
07:30	07:45	0	0	0	1	1
07:45	08:00	0	2	0	0	2
08:00	08:15	0	0	0	0	0
08:15	08:30	0	0	0	0	0
08:30	08:45	0	0	0	0	0
08:45	09:00	0	0	0	0	0
09:00	09:15	0	0	0	0	0
09:15	09:30	0	0	0	0	0
09:30	09:45	0	0	0	0	0
09:45	10:00	0	0	0	0	0
11:30	11:45	0	0	0	0	0
11:45	12:00	0	1	0	0	1
12:00	12:15	0	0	0	0	0
12:15	12:30	0	0	0	0	0
12:30	12:45	0	0	0	0	0
12:45	13:00	0	0	0	0	0
13:00	13:15	0	0	0	0	0
13:15	13:30	0	0	0	0	0
15:00	15:15	0	0	0	0	0
15:15	15:30	0	0	0	0	0
15:30	15:45	0	0	0	0	0
15:45	16:00	1	0	0	0	1
16:00	16:15	0	0	0	0	0
16:15	16:30	0	0	0	0	0
16:30	16:45	0	0	1	0	1
16:45	17:00	0	0	0	0	0
17:00	17:15	0	0	1	1	2
17:15	17:30	0	0	0	0	0
17:30	17:45	0	0	0	0	0
17:45	18:00	0	0	0	0	0
Total		1	3	2	3	9

## Turning Movement Count - Study Results

### CARP RD @ STITTSVILLE MAIN ST

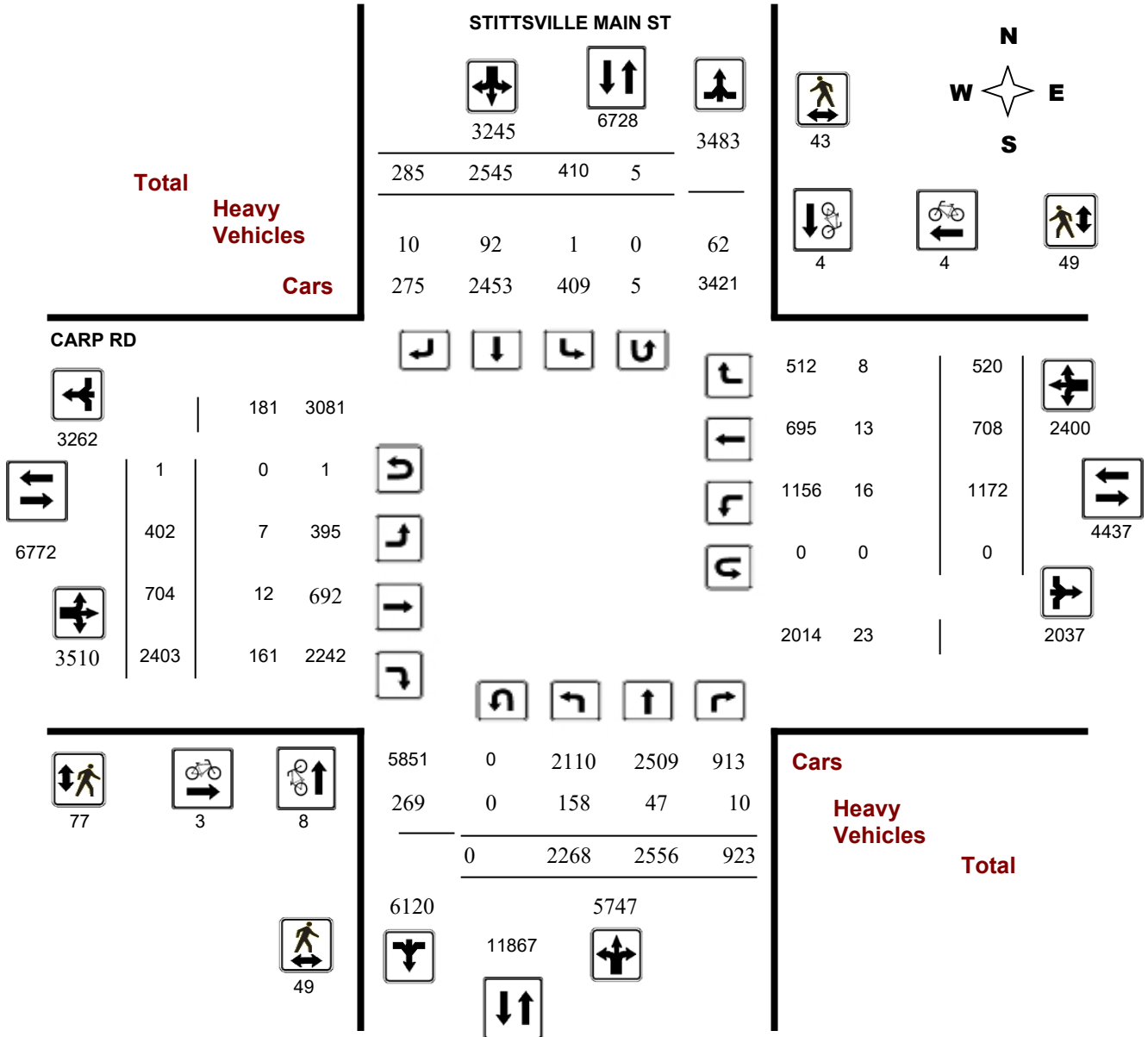
**Survey Date:** Thursday, May 04, 2017

**WO No:** 36999

**Start Time:** 07:00

**Device:** Miovision

### Full Study Diagram



## Turning Movement Count - Study Results

### CARP RD @ STITTSVILLE MAIN ST

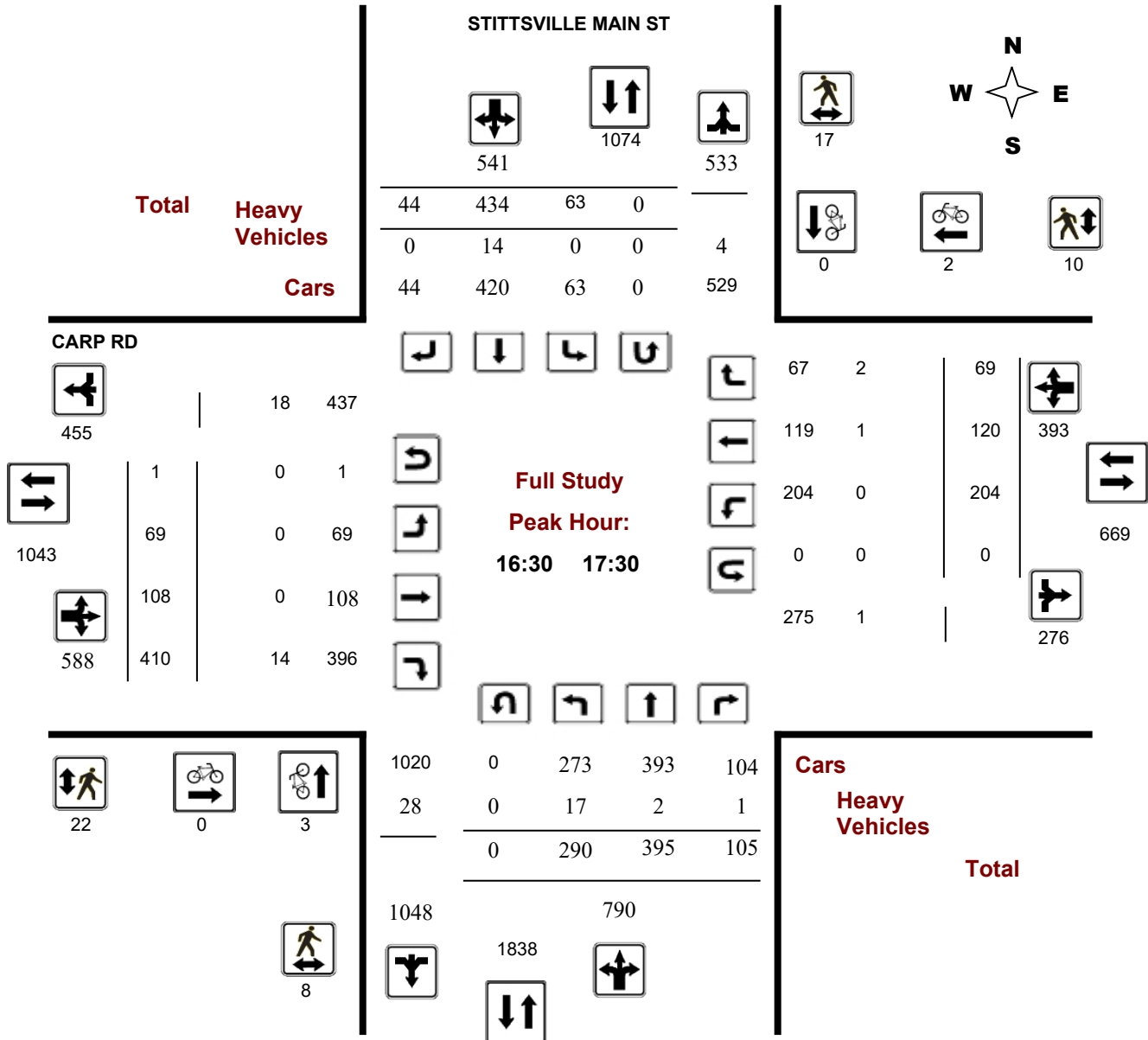
**Survey Date:** Thursday, May 04, 2017

**WO No:** 36999

**Start Time:** 07:00

**Device:** Miovision

### Full Study Peak Hour Diagram



## Turning Movement Count - Peak Hour Diagram

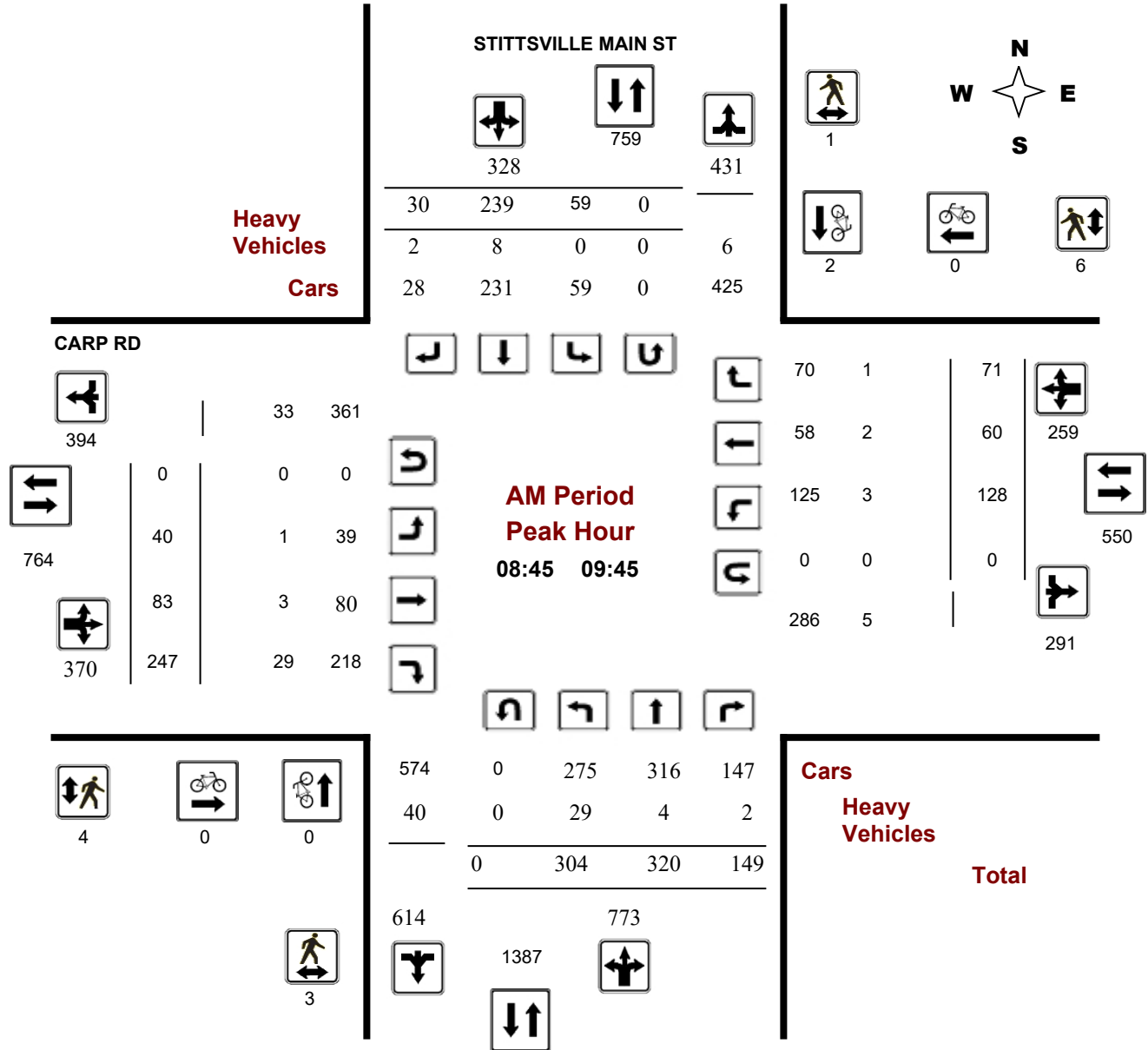
### CARP RD @ STITTSVILLE MAIN ST

**Survey Date:** Thursday, May 04, 2017

**Start Time:** 07:00

**WO No:** 36999

**Device:** Miovision



## Turning Movement Count - Peak Hour Diagram

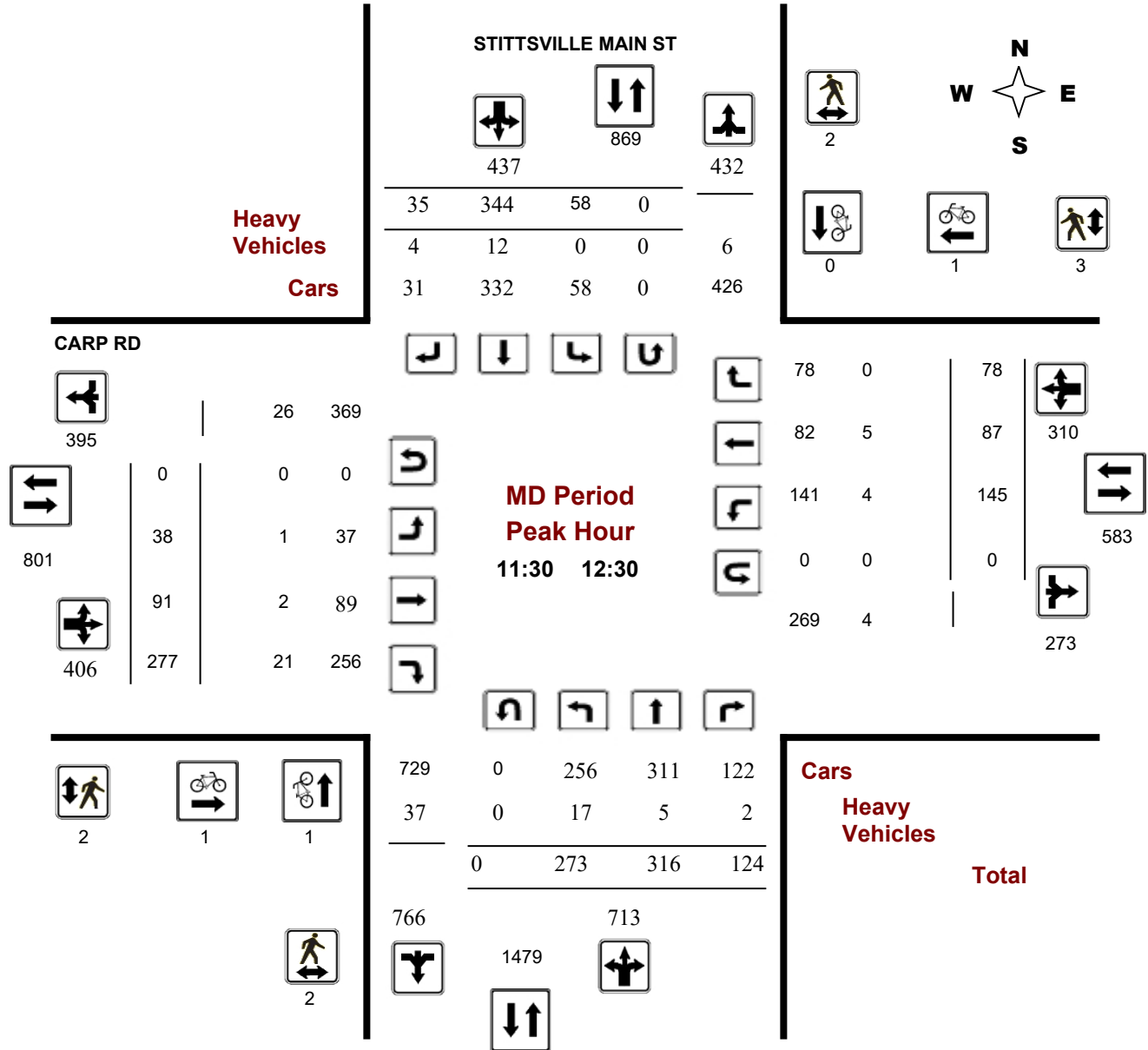
### CARP RD @ STITTSVILLE MAIN ST

**Survey Date:** Thursday, May 04, 2017

**Start Time:** 07:00

**WO No:** 36999

**Device:** Miovision



**Comments**

## Turning Movement Count - Peak Hour Diagram

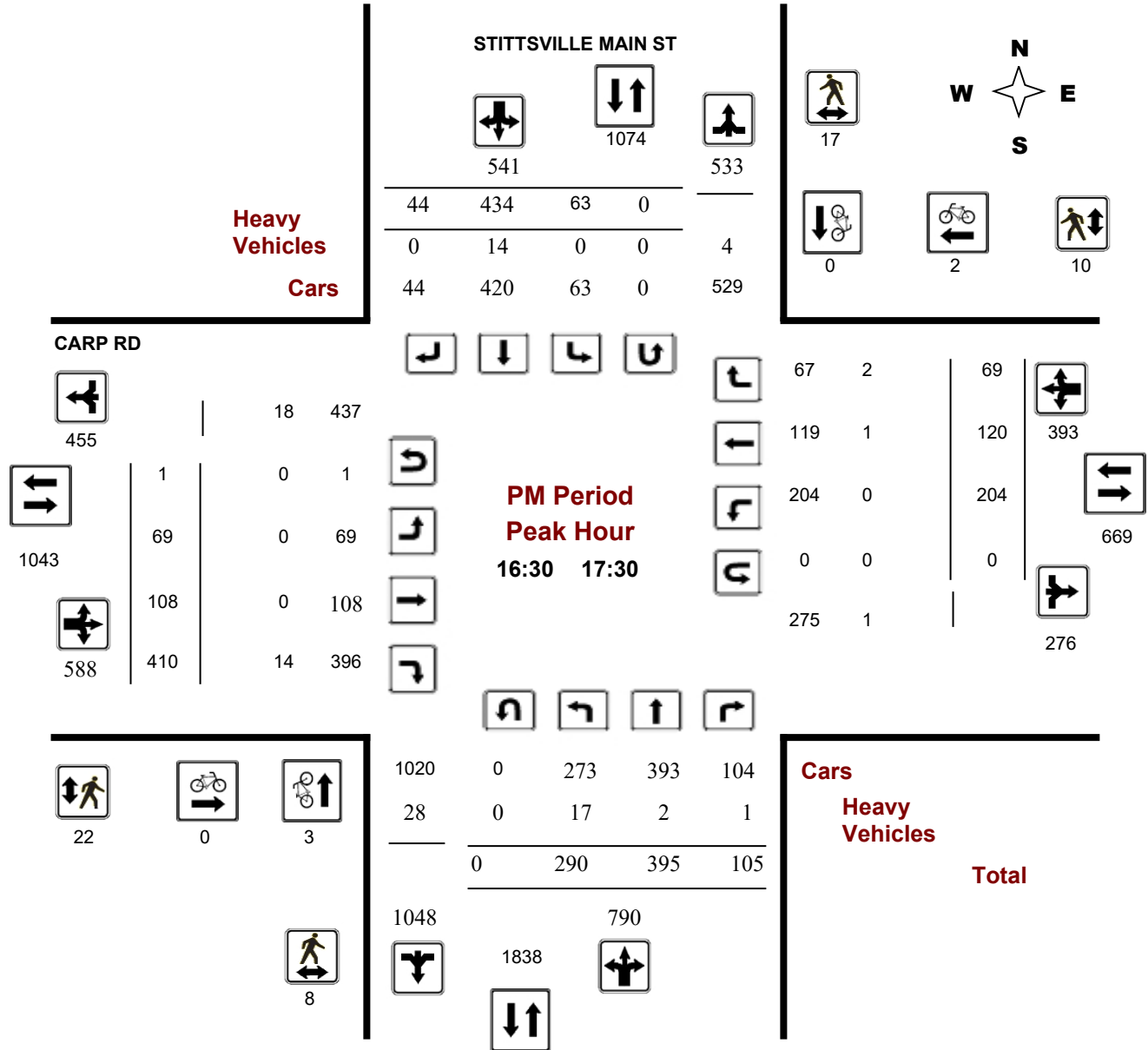
### CARP RD @ STITTSVILLE MAIN ST

**Survey Date:** Thursday, May 04, 2017

**Start Time:** 07:00

**WO No:** 36999

**Device:** Miovision







# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### CARP RD @ STITTSVILLE MAIN ST

**Survey Date:** Thursday, May 04, 2017

**WO No:** 36999

**Start Time:** 07:00

**Device:** Miovision

### Full Study Summary (8 HR Standard)

**Survey Date:** Thursday, May 04, 2017

**Total Observed U-Turns**

**AADT Factor**

Northbound: 0      Southbound: 5  
 Eastbound: 1      Westbound: 0

.90

**STITTSVILLE MAIN ST**

**CARP RD**

Period	Northbound					Southbound					Eastbound					Westbound					Grand Total
	LT	ST	RT	NB TOT	STR TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	STR TOT	LT	ST	RT	WB TOT	STR TOT	
07:00 08:00	314	238	118	670	887	32	160	25	217	887	47	59	218	324	507	75	56	52	183	507	1394
08:00 09:00	304	288	124	716	1007	48	222	21	291	1007	40	72	239	351	566	94	65	56	215	566	1573
09:00 10:00	291	326	148	765	1087	54	241	27	322	1087	43	76	229	348	616	128	66	74	268	616	1703
11:30 12:30	273	316	124	713	1150	58	344	35	437	1150	38	91	277	406	716	145	87	78	310	716	1866
12:30 13:30	249	305	97	651	1021	52	285	33	370	1021	56	85	277	418	738	163	78	79	320	738	1759
15:00 16:00	263	325	107	695	1232	62	415	60	537	1232	54	98	356	508	865	179	118	60	357	865	2097
16:00 17:00	290	385	116	791	1296	50	424	31	505	1296	65	112	390	567	947	197	126	57	380	947	2243
17:00 18:00	284	373	89	746	1307	54	454	53	561	1307	59	111	417	587	954	191	112	64	367	954	2261
<b>Sub Total</b>	2268	2556	923	5747	8987	410	2545	285	3240	8987	402	704	2403	3509	5909	1172	708	520	2400	5909	14896
<b>U Turns</b>				0	5				5	5				1	0				0	1	6
<b>Total</b>	2268	2556	923	5747	8992	410	2545	285	3245	8992	402	704	2403	3510	5910	1172	708	520	2400	5910	14902
<b>EQ 12Hr</b>	3153	3553	1283	7988	12499	570	3538	396	4511	12499	559	979	3340	4879	8215	1629	984	723	3336	8215	20714
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.																			<b>1.39</b>		
<b>AVG 12Hr</b>	2674	3014	1088	6776	11249	483	3001	336	3826	11249	474	830	2833	4138	7394	1382	835	613	2830	7394	18643
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.																			<b>0.9</b>		
<b>AVG 24Hr</b>	3503	3948	1426	8876	13888	633	3931	440	5012	13888	621	1087	3711	5421	9128	1810	1093	803	3707	9128	23016
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.																			<b>1.31</b>		
Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.																					



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### CARP RD @ STITTSVILLE MAIN ST

**Survey Date:** Thursday, May 04, 2017

**WO No:** 36999

**Start Time:** 07:00

**Device:** Miovision

### Full Study 15 Minute Increments

#### STITTSVILLE MAIN ST

#### CARP RD

Northbound

Southbound

Eastbound

Westbound

Time Period	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00 07:15	75	45	27	147	5	38	6	49	7	9	11	48	68	13	12	11	36	7	300
07:15 07:30	77	59	22	158	6	40	7	53	9	11	14	51	76	9	17	18	44	9	331
07:30 07:45	83	65	33	181	7	32	7	46	10	12	13	58	83	25	14	9	48	10	358
07:45 08:00	79	69	36	184	14	50	5	69	22	15	21	61	97	28	13	14	55	22	405
08:00 08:15	85	79	34	198	8	43	6	57	13	12	20	53	85	23	13	13	49	13	389
08:15 08:30	72	73	37	182	12	57	2	71	10	15	16	63	94	22	28	17	67	10	414
08:30 08:45	80	69	27	176	7	57	3	67	10	7	17	54	78	19	8	16	43	10	364
08:45 09:00	67	67	26	160	21	65	10	96	6	6	19	69	94	30	16	10	56	6	406
09:00 09:15	83	76	46	205	16	52	6	74	17	9	21	54	84	33	16	14	63	17	426
09:15 09:30	80	105	48	233	9	57	7	73	12	15	24	68	107	31	15	29	75	12	488
09:30 09:45	74	72	29	175	13	65	7	85	10	10	19	56	85	34	13	18	65	10	410
09:45 10:00	54	73	25	152	16	67	7	90	12	9	12	51	72	30	22	13	65	12	379
11:30 11:45	77	68	35	180	9	83	7	99	6	10	27	54	91	30	18	24	72	6	442
11:45 12:00	60	82	32	174	21	85	9	115	17	7	19	90	116	40	21	17	78	17	483
12:00 12:15	80	80	32	192	14	94	12	120	11	8	25	72	105	41	29	19	89	11	506
12:15 12:30	56	86	25	167	14	82	7	103	6	13	20	61	94	34	19	18	71	6	435
12:30 12:45	52	90	33	175	9	59	5	73	9	17	18	66	101	43	11	18	72	9	421
12:45 13:00	76	78	23	177	16	82	11	109	9	15	25	86	126	34	22	26	82	9	494
13:00 13:15	72	76	26	174	16	71	11	98	10	10	21	56	87	51	22	17	90	10	449
13:15 13:30	49	61	15	125	11	73	6	92	11	14	21	69	104	35	23	18	76	11	397
15:00 15:15	64	79	32	175	16	105	16	139	12	13	23	89	125	43	23	10	76	12	515
15:15 15:30	59	71	24	154	17	96	9	122	11	14	26	85	125	48	28	24	100	11	501
15:30 15:45	66	83	21	170	18	115	21	154	9	12	22	93	127	50	35	15	100	9	551
15:45 16:00	74	92	30	196	11	99	14	125	8	15	27	89	131	38	32	11	81	8	533
16:00 16:15	83	87	30	200	12	90	14	116	8	14	19	95	128	43	29	16	88	8	532
16:15 16:30	66	82	27	175	13	119	2	134	12	14	44	91	149	48	29	11	88	12	546
16:30 16:45	75	108	23	206	15	106	6	127	10	21	25	105	152	53	34	13	100	10	585
16:45 17:00	66	108	36	210	10	109	9	128	9	16	24	99	139	53	34	17	104	9	581
17:00 17:15	73	107	17	197	21	108	14	143	8	16	28	115	159	54	28	15	97	8	596
17:15 17:30	76	72	29	177	17	111	15	143	7	16	31	91	138	44	24	24	92	7	550
17:30 17:45	68	86	26	180	8	112	14	134	3	19	29	114	162	53	33	15	101	3	577
17:45 18:00	67	108	17	192	8	123	10	141	4	8	23	97	128	40	27	10	77	4	538
Total:	2268	2556	923	5747	410	2545	285	3245	318	402	704	2403	3510	1172	708	520	2400	318	14,902

Note: U-Turns are included in Totals.



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### CARP RD @ STITTSVILLE MAIN ST

**Survey Date:** Thursday, May 04, 2017

**WO No:** 36999

**Start Time:** 07:00

**Device:** Miovision

### Full Study Cyclist Volume

#### STITTSVILLE MAIN ST

#### CARP RD

Time Period		STITTSVILLE MAIN ST			CARP RD			Grand Total
		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	
07:00	07:15	0	0	0	0	1	1	1
07:15	07:30	0	0	0	1	0	1	1
07:30	07:45	0	0	0	0	0	0	0
07:45	08:00	0	0	0	0	0	0	0
08:00	08:15	0	0	0	0	0	0	0
08:15	08:30	0	0	0	0	0	0	0
08:30	08:45	1	0	1	0	0	0	1
08:45	09:00	0	1	1	0	0	0	1
09:00	09:15	0	0	0	0	0	0	0
09:15	09:30	0	0	0	0	0	0	0
09:30	09:45	0	1	1	0	0	0	1
09:45	10:00	0	0	0	0	0	0	0
11:30	11:45	0	0	0	0	0	0	0
11:45	12:00	0	0	0	0	0	0	0
12:00	12:15	0	0	0	1	0	1	1
12:15	12:30	1	0	1	0	1	1	2
12:30	12:45	0	1	1	0	0	0	1
12:45	13:00	0	0	0	1	0	1	1
13:00	13:15	0	1	1	0	0	0	1
13:15	13:30	1	0	1	0	0	0	1
15:00	15:15	0	0	0	0	0	0	0
15:15	15:30	0	0	0	0	0	0	0
15:30	15:45	0	0	0	0	0	0	0
15:45	16:00	0	0	0	0	0	0	0
16:00	16:15	0	0	0	0	0	0	0
16:15	16:30	2	0	2	0	0	0	2
16:30	16:45	1	0	1	0	0	0	1
16:45	17:00	2	0	2	0	2	2	4
17:00	17:15	0	0	0	0	0	0	0
17:15	17:30	0	0	0	0	0	0	0
17:30	17:45	0	0	0	0	0	0	0
17:45	18:00	0	0	0	0	0	0	0
<b>Total</b>		<b>8</b>	<b>4</b>	<b>12</b>	<b>3</b>	<b>4</b>	<b>7</b>	<b>19</b>



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### CARP RD @ STITTSVILLE MAIN ST

**Survey Date:** Thursday, May 04, 2017

**WO No:** 36999

**Start Time:** 07:00

**Device:** Miovision

### Full Study Pedestrian Volume

STITTSVILLE MAIN ST

CARP RD

Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	0	0	0	2	0	2	2
07:15 07:30	0	0	0	0	1	1	1
07:30 07:45	0	0	0	0	1	1	1
07:45 08:00	3	0	3	0	0	0	3
08:00 08:15	3	2	5	1	0	1	6
08:15 08:30	0	0	0	2	0	2	2
08:30 08:45	0	0	0	0	0	0	0
08:45 09:00	0	0	0	0	1	1	1
09:00 09:15	0	1	1	1	3	4	5
09:15 09:30	3	0	3	2	2	4	7
09:30 09:45	0	0	0	1	0	1	1
09:45 10:00	3	2	5	2	0	2	7
11:30 11:45	1	0	1	2	0	2	3
11:45 12:00	1	0	1	0	2	2	3
12:00 12:15	0	1	1	0	1	1	2
12:15 12:30	0	1	1	0	0	0	1
12:30 12:45	4	1	5	3	2	5	10
12:45 13:00	1	0	1	3	2	5	6
13:00 13:15	4	0	4	5	0	5	9
13:15 13:30	1	1	2	2	2	4	6
15:00 15:15	2	4	6	2	4	6	12
15:15 15:30	1	1	2	7	2	9	11
15:30 15:45	2	3	5	3	2	5	10
15:45 16:00	5	4	9	7	0	7	16
16:00 16:15	6	3	9	3	6	9	18
16:15 16:30	1	1	2	5	1	6	8
16:30 16:45	4	4	8	8	2	10	18
16:45 17:00	2	7	9	9	3	12	21
17:00 17:15	1	3	4	1	2	3	7
17:15 17:30	1	3	4	4	3	7	11
17:30 17:45	0	1	1	1	6	7	8
17:45 18:00	0	0	0	1	1	2	2
<b>Total</b> .....	<b>49</b>	<b>43</b>	<b>92</b>	<b>77</b>	<b>49</b>	<b>126</b>	<b>218</b>



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### CARP RD @ STITTSVILLE MAIN ST

**Survey Date:** Thursday, May 04, 2017

**WO No:** 36999

**Start Time:** 07:00

**Device:** Miovision

### Full Study Heavy Vehicles

#### STITTSVILLE MAIN ST

#### CARP RD

Northbound                      Southbound                      Eastbound                      Westbound

Time Period	Northbound			N TOT	Southbound			S TOT	STR TOT	Eastbound			E TOT	Westbound			W TOT	STR TOT	Grand Total
	LT	ST	RT		LT	ST	RT			LT	ST	RT		LT	ST	RT			
07:00 07:15	5	1	0	6	0	1	0	1	7	0	0	12	12	0	0	0	0	12	19
07:15 07:30	3	1	0	4	0	5	0	5	9	0	0	4	4	0	1	1	2	6	15
07:30 07:45	4	3	1	8	0	2	0	2	10	0	2	7	9	1	1	0	2	11	21
07:45 08:00	8	6	1	15	0	7	0	7	22	1	1	2	4	2	1	2	5	9	31
08:00 08:15	9	4	0	13	0	0	0	0	13	1	1	4	6	1	0	0	1	7	20
08:15 08:30	2	2	2	6	1	3	0	4	10	1	0	3	4	0	0	1	1	5	15
08:30 08:45	5	1	0	6	0	4	0	4	10	0	0	4	4	0	0	0	0	4	14
08:45 09:00	4	1	0	5	0	1	0	1	6	0	1	7	8	1	1	0	2	10	16
09:00 09:15	12	1	1	14	0	3	0	3	17	0	0	7	7	0	0	0	0	7	24
09:15 09:30	7	1	1	9	0	2	1	3	12	0	0	6	6	0	1	1	2	8	20
09:30 09:45	6	1	0	7	0	2	1	3	10	1	2	9	12	2	0	0	2	14	24
09:45 10:00	6	2	0	8	0	4	0	4	12	0	1	5	6	0	1	0	1	7	19
11:30 11:45	2	0	1	3	0	1	2	3	6	0	2	6	8	1	1	0	2	10	16
11:45 12:00	7	2	1	10	0	6	1	7	17	0	0	10	10	1	1	0	2	12	29
12:00 12:15	6	1	0	7	0	3	1	4	11	0	0	4	4	1	3	0	4	8	19
12:15 12:30	2	2	0	4	0	2	0	2	6	1	0	1	2	1	0	0	1	3	9
12:30 12:45	4	3	0	7	0	2	0	2	9	1	1	5	7	0	0	1	1	8	17
12:45 13:00	4	1	0	5	0	1	3	4	9	0	0	7	7	2	0	0	2	9	18
13:00 13:15	5	2	0	7	0	3	0	3	10	0	0	1	1	0	1	0	1	2	12
13:15 13:30	6	2	0	8	0	3	0	3	11	0	1	11	12	2	0	0	2	14	25
15:00 15:15	3	2	1	6	0	6	0	6	12	0	0	4	4	0	0	0	0	4	16
15:15 15:30	7	0	0	7	0	3	1	4	11	0	0	6	6	1	0	0	1	7	18
15:30 15:45	3	1	0	4	0	5	0	5	9	0	0	4	4	0	0	0	0	4	13
15:45 16:00	4	0	0	4	0	4	0	4	8	0	0	5	5	0	0	0	0	5	13
16:00 16:15	4	2	0	6	0	2	0	2	8	1	0	0	1	0	0	0	0	1	9
16:15 16:30	8	1	0	9	0	3	0	3	12	0	0	5	5	0	0	0	0	5	17
16:30 16:45	7	0	0	7	0	3	0	3	10	0	0	4	4	0	0	0	0	4	14
16:45 17:00	4	1	0	5	0	4	0	4	9	0	0	5	5	0	0	1	1	6	15
17:00 17:15	2	1	0	3	0	5	0	5	8	0	0	2	2	0	1	0	1	3	11
17:15 17:30	4	0	1	5	0	2	0	2	7	0	0	3	3	0	0	1	1	4	11
17:30 17:45	2	1	0	3	0	0	0	0	3	0	0	3	3	0	0	0	0	3	6
17:45 18:00	3	1	0	4	0	0	0	0	4	0	0	5	5	0	0	0	0	5	9
<b>Total:</b> None	158	47	10	215	1	92	10	103	318	7	12	161	180	16	13	8	37	217	535



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### CARP RD @ STITTSVILLE MAIN ST

**Survey Date:** Thursday, May 04, 2017

**WO No:** 36999

**Start Time:** 07:00

**Device:** Miovision

### Full Study 15 Minute U-Turn Total

STITTSVILLE MAIN ST

CARP RD

Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	0
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	0	0	0
07:45	08:00	0	0	0	0	0
08:00	08:15	0	0	0	0	0
08:15	08:30	0	0	0	0	0
08:30	08:45	0	0	0	0	0
08:45	09:00	0	0	0	0	0
09:00	09:15	0	0	0	0	0
09:15	09:30	0	0	0	0	0
09:30	09:45	0	0	0	0	0
09:45	10:00	0	0	0	0	0
11:30	11:45	0	0	0	0	0
11:45	12:00	0	0	0	0	0
12:00	12:15	0	0	0	0	0
12:15	12:30	0	0	0	0	0
12:30	12:45	0	0	0	0	0
12:45	13:00	0	0	0	0	0
13:00	13:15	0	0	0	0	0
13:15	13:30	0	2	0	0	2
15:00	15:15	0	2	0	0	2
15:15	15:30	0	0	0	0	0
15:30	15:45	0	0	0	0	0
15:45	16:00	0	1	0	0	1
16:00	16:15	0	0	0	0	0
16:15	16:30	0	0	0	0	0
16:30	16:45	0	0	1	0	1
16:45	17:00	0	0	0	0	0
17:00	17:15	0	0	0	0	0
17:15	17:30	0	0	0	0	0
17:30	17:45	0	0	0	0	0
17:45	18:00	0	0	0	0	0
Total		0	5	1	0	6

## Turning Movement Count - Study Results STITTSVILLE MAIN ST @ HAZELDEAN RD

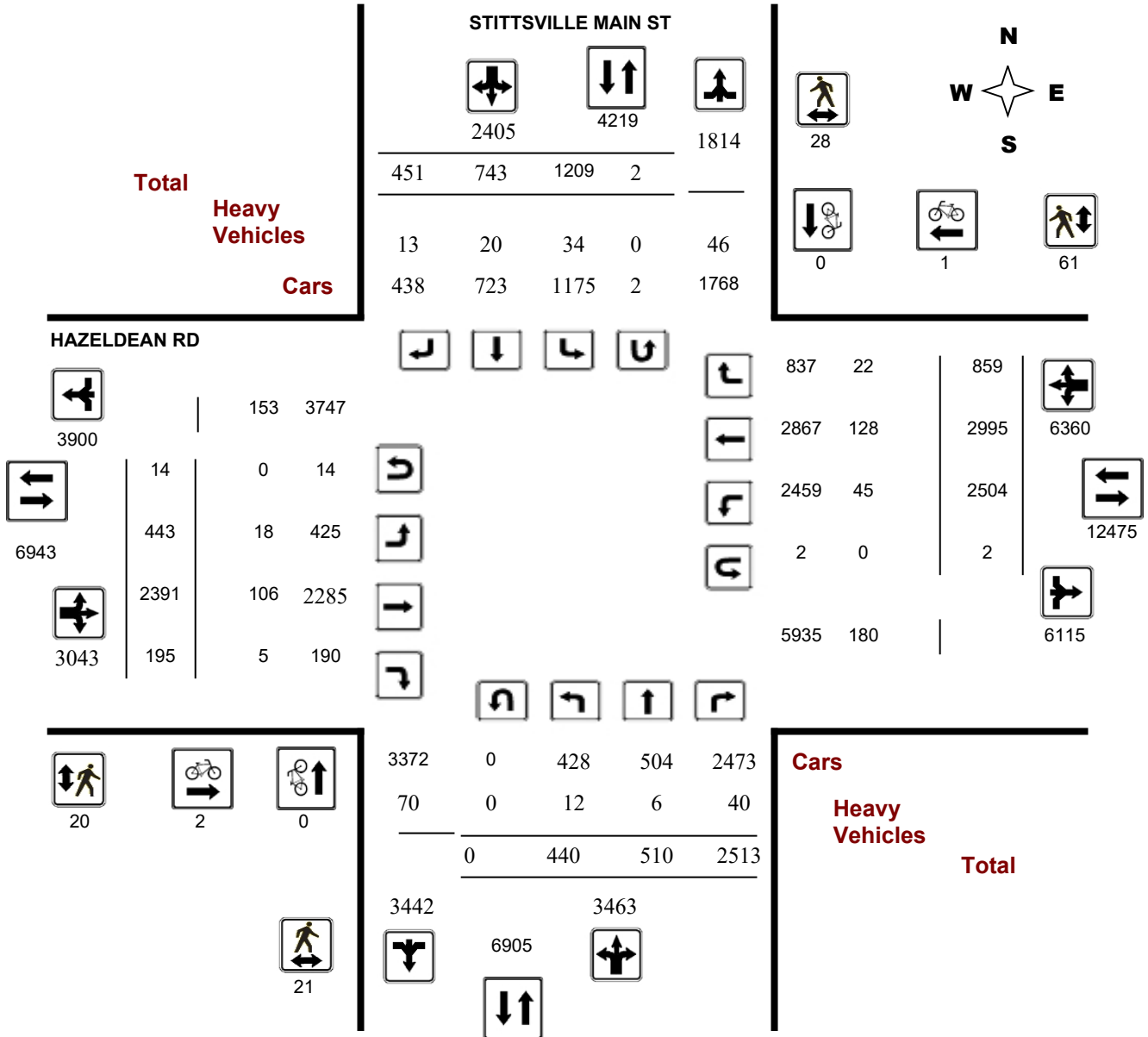
**Survey Date:** Wednesday, March 23, 2016

**WO No:** 35821

**Start Time:** 07:00

**Device:** Miovision

### Full Study Diagram



## Turning Movement Count - Study Results STITTSVILLE MAIN ST @ HAZELDEAN RD

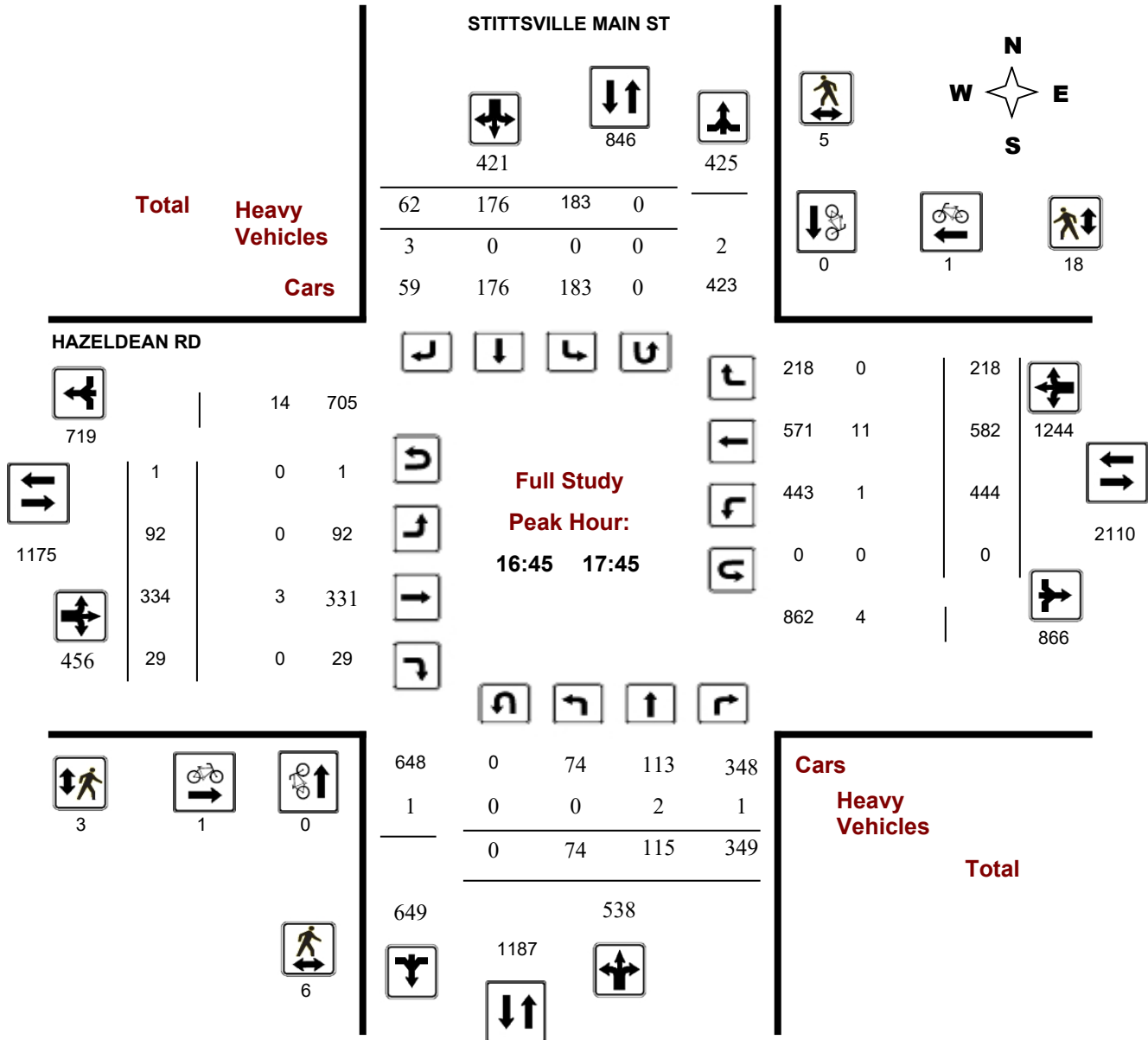
**Survey Date:** Wednesday, March 23, 2016

**WO No:** 35821

**Start Time:** 07:00

**Device:** Miovision

### Full Study Peak Hour Diagram





## Turning Movement Count - Peak Hour Diagram

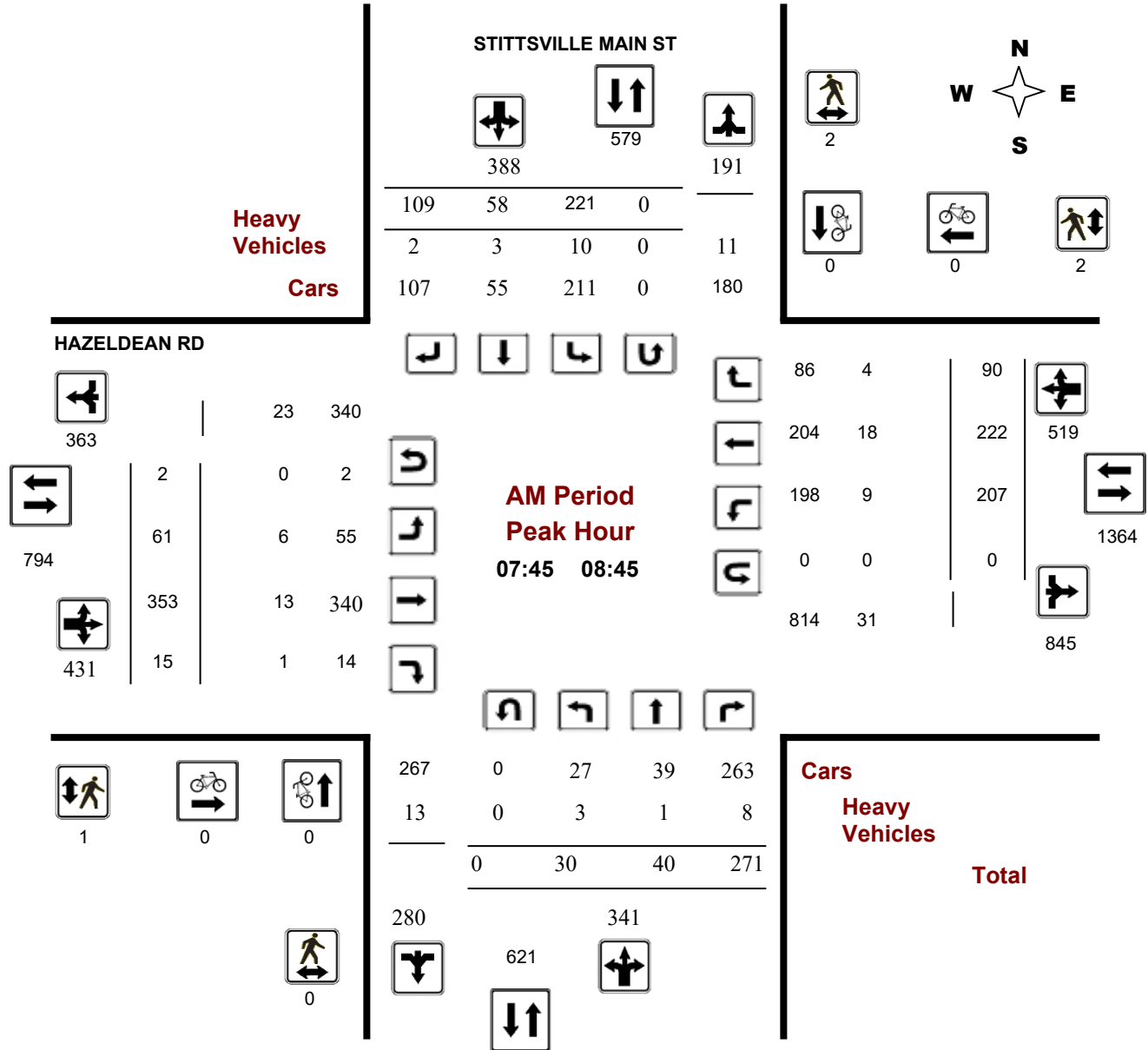
### STITTSVILLE MAIN ST @ HAZELDEAN RD

**Survey Date:** Wednesday, March 23, 2016

**Start Time:** 07:00

**WO No:** 35821

**Device:** Miovision



## Turning Movement Count - Peak Hour Diagram

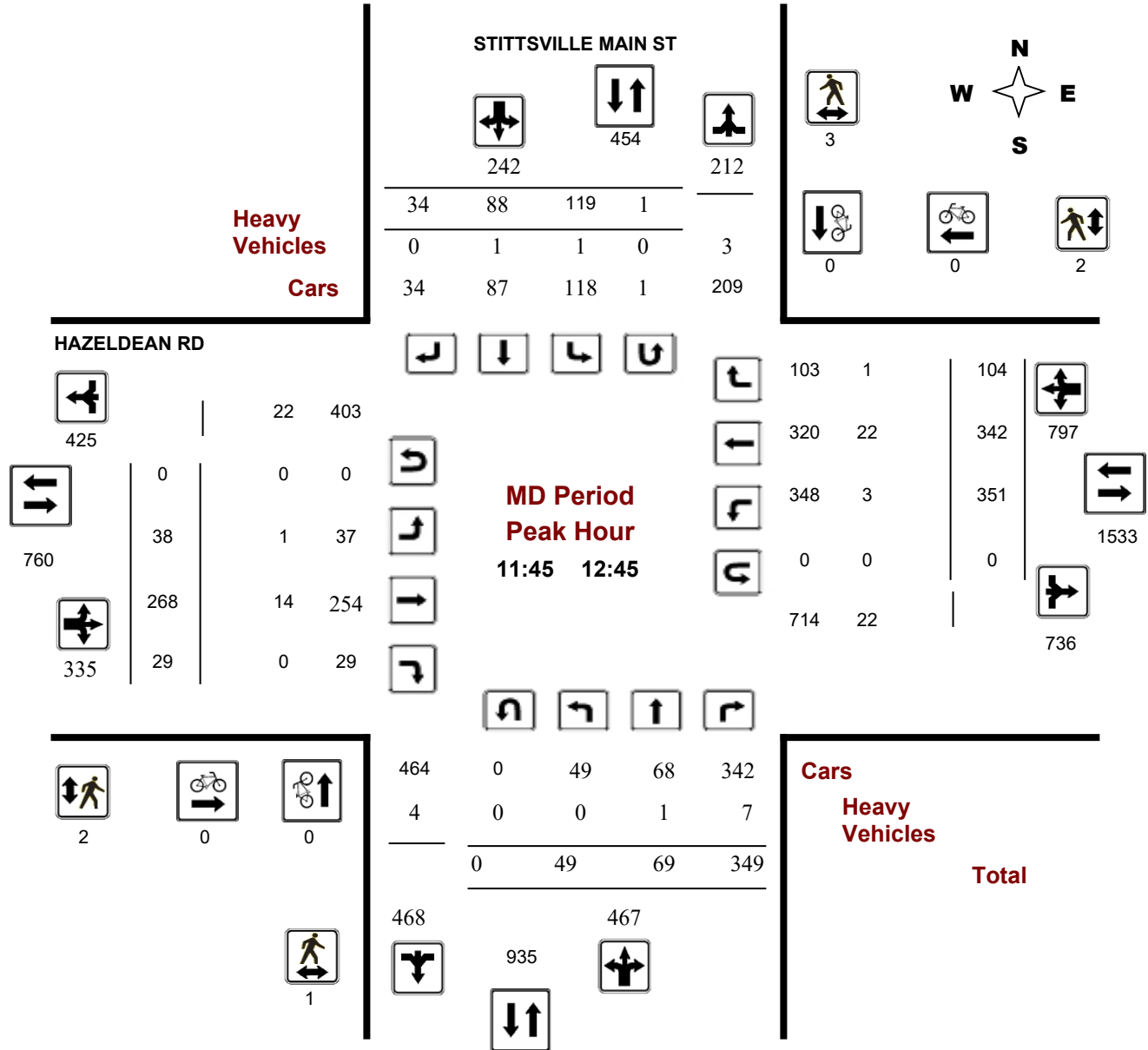
### STITTSVILLE MAIN ST @ HAZELDEAN RD

**Survey Date:** Wednesday, March 23, 2016

**Start Time:** 07:00

**WO No:** 35821

**Device:** Miovision



## Turning Movement Count - Peak Hour Diagram

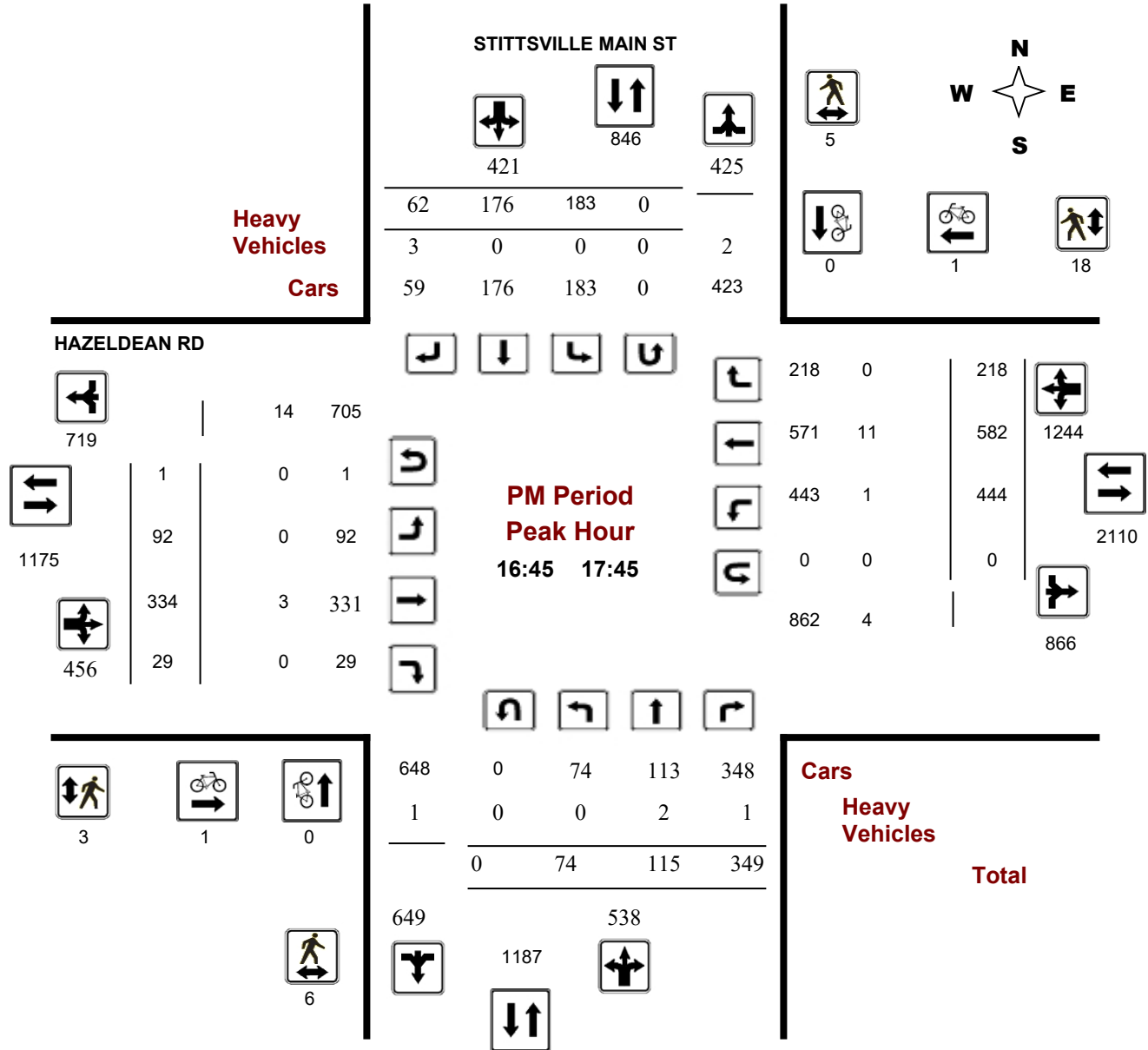
### STITTSVILLE MAIN ST @ HAZELDEAN RD

**Survey Date:** Wednesday, March 23, 2016

**WO No:** 35821

**Start Time:** 07:00

**Device:** Miovision





# Transportation Services - Traffic Services

## Turning Movement Count - Study Results STITTSVILLE MAIN ST @ HAZELDEAN RD

**Survey Date:** Wednesday, March 23, 2016

**WO No:** 35821

**Start Time:** 07:00

**Device:** Miovision

### Full Study Summary (8 HR Standard)

**Survey Date:** Wednesday, March 23, 2016

**Total Observed U-Turns**  
 Northbound: 0      Southbound: 2  
 Eastbound: 14      Westbound: 2

**AADT Factor**  
1.00

#### STITTSVILLE MAIN ST

#### HAZELDEAN RD

Period	STITTSVILLE MAIN ST					HAZELDEAN RD					STR TOT	Grand Total							
	Northbound			Southbound		Eastbound			Westbound										
	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	19	24	262	305	156	41	91	288	593	41	332	15	388	112	199	30	341	729	1322
08:00 09:00	29	41	262	332	197	61	98	356	688	59	311	20	390	238	226	97	561	951	1639
09:00 10:00	41	41	251	333	118	46	40	204	537	19	261	16	296	188	247	61	496	792	1329
11:30 12:30	60	66	306	432	122	84	32	238	670	38	261	29	328	355	326	104	785	1113	1783
12:30 13:30	61	51	359	471	111	85	38	234	705	34	271	24	329	332	355	92	779	1108	1813
15:00 16:00	76	67	369	512	173	130	43	346	858	64	280	29	373	404	484	95	983	1356	2214
16:00 17:00	75	104	351	530	151	138	50	339	869	94	316	35	445	443	580	190	1213	1658	2527
17:00 18:00	79	116	353	548	181	158	59	398	946	94	359	27	480	432	578	190	1200	1680	2626
<b>Sub Total</b>	440	510	2513	3463	1209	743	451	2403	5866	443	2391	195	3029	2504	2995	859	6358	9387	15253
<b>U Turns</b>	0			0	2			2	2	14			14	2			2	16	18
<b>Total</b>	440	510	2513	3463	1211	743	451	2405	5868	457	2391	195	3043	2506	2995	859	6360	9403	15271
<b>EQ 12Hr</b>	612	709	3493	4814	1683	1033	627	3343	8157	635	3323	271	4229	3483	4163	1194	8840	13069	21226
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.																	<b>1.39</b>		
<b>AVG 12Hr</b>	612	709	3493	4814	1683	1033	627	3343	8157	635	3323	271	4229	3483	4163	1194	8840	13069	21226
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.																	<b>1.00</b>		
<b>AVG 24Hr</b>	802	929	4576	6307	2205	1353	821	4379	10686	832	4353	355	5540	4563	5454	1564	11581	17121	27807
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.																	<b>1.31</b>		

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### STITTSVILLE MAIN ST @ HAZELDEAN RD

**Survey Date:** Wednesday, March 23, 2016

**WO No:** 35821

**Start Time:** 07:00

**Device:** Miovision

### Full Study 15 Minute Increments

#### STITTSVILLE MAIN ST

#### HAZELDEAN RD

Northbound

Southbound

Eastbound

Westbound

Time Period	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00 07:15	5	6	69	80	29	10	17	56	136	12	66	3	81	14	36	7	57	138	274
07:15 07:30	2	4	55	61	36	9	18	63	124	10	67	6	83	34	54	8	96	179	303
07:30 07:45	6	9	67	82	33	10	27	70	152	11	91	3	105	24	56	7	87	192	344
07:45 08:00	6	5	71	82	58	12	29	99	181	8	108	3	119	40	53	8	101	220	401
08:00 08:15	7	13	64	84	45	10	21	76	160	18	78	2	98	50	70	28	148	246	406
08:15 08:30	9	13	69	91	68	17	29	114	205	27	78	3	108	67	48	31	146	254	459
08:30 08:45	8	9	67	84	50	19	30	99	183	10	89	7	106	50	51	23	124	230	413
08:45 09:00	5	6	62	73	34	15	18	67	140	6	66	8	80	71	57	15	143	223	363
09:00 09:15	6	9	77	92	31	9	12	52	144	1	67	5	73	56	57	14	127	200	344
09:15 09:30	15	15	53	83	27	14	12	53	136	6	67	5	78	31	61	13	105	183	319
09:30 09:45	10	10	58	78	21	11	8	40	118	5	65	3	73	38	61	13	112	185	303
09:45 10:00	10	7	63	80	39	12	8	59	139	7	62	3	72	64	68	21	153	225	364
11:30 11:45	19	18	57	94	27	22	9	58	152	7	62	7	76	89	66	19	174	250	402
11:45 12:00	14	19	77	110	34	21	4	59	169	8	72	6	86	76	90	23	189	275	444
12:00 12:15	14	16	88	118	26	23	9	58	176	5	58	6	69	110	91	30	231	300	476
12:15 12:30	13	13	84	110	35	18	10	63	173	18	69	10	97	80	79	32	191	288	461
12:30 12:45	8	21	100	129	25	26	11	62	191	7	69	7	83	85	82	19	186	269	460
12:45 13:00	15	8	91	114	24	21	6	51	165	6	78	6	90	69	81	29	179	269	434
13:00 13:15	22	11	79	112	34	21	6	61	173	11	63	6	80	98	89	20	207	287	460
13:15 13:30	16	11	89	116	29	17	15	61	177	10	61	5	76	80	103	24	207	283	460
15:00 15:15	18	12	94	124	59	42	17	118	242	12	61	6	79	102	111	21	234	313	555
15:15 15:30	19	16	92	127	46	30	14	90	217	20	64	9	93	103	116	29	248	341	558
15:30 15:45	24	14	83	121	35	29	3	67	188	14	76	4	94	102	135	16	253	347	535
15:45 16:00	15	25	100	140	34	29	9	72	212	26	79	10	115	97	122	29	248	363	575
16:00 16:15	23	18	79	120	39	31	13	83	203	22	83	3	108	122	152	37	311	419	622
16:15 16:30	19	33	103	155	32	38	8	78	233	25	83	10	118	105	148	44	297	415	648
16:30 16:45	20	30	79	129	39	26	12	77	206	29	79	11	119	116	130	55	301	420	626
16:45 17:00	13	23	90	126	41	43	17	101	227	20	71	11	102	100	150	54	304	406	633
17:00 17:15	20	22	116	158	57	36	15	108	266	24	94	9	127	123	157	61	341	468	734
17:15 17:30	21	42	71	134	36	46	15	97	231	32	95	4	131	97	145	52	294	425	656
17:30 17:45	20	28	72	120	49	51	15	115	235	17	74	5	96	124	130	51	305	401	636
17:45 18:00	18	24	94	136	39	25	14	78	214	23	96	9	128	89	146	26	261	389	603
<b>Total:</b>	<b>440</b>	<b>510</b>	<b>2513</b>	<b>3463</b>	<b>1211</b>	<b>743</b>	<b>451</b>	<b>2405</b>	<b>5868</b>	<b>457</b>	<b>2391</b>	<b>195</b>	<b>3043</b>	<b>2506</b>	<b>2995</b>	<b>859</b>	<b>6360</b>	<b>5868</b>	<b>15,271</b>

Note: U-Turns are included in Totals.



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### STITTSVILLE MAIN ST @ HAZELDEAN RD

**Survey Date:** Wednesday, March 23, 2016

**WO No:** 35821

**Start Time:** 07:00

**Device:** Miovision

### Full Study Cyclist Volume

#### STITTSVILLE MAIN ST

#### HAZELDEAN RD

Time Period		STITTSVILLE MAIN ST			HAZELDEAN RD			Grand Total
		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	
07:00	07:15	0	0	0	0	0	0	0
07:15	07:30	0	0	0	0	0	0	0
07:30	07:45	0	0	0	0	0	0	0
07:45	08:00	0	0	0	0	0	0	0
08:00	08:15	0	0	0	0	0	0	0
08:15	08:30	0	0	0	0	0	0	0
08:30	08:45	0	0	0	0	0	0	0
08:45	09:00	0	0	0	0	0	0	0
09:00	09:15	0	0	0	0	0	0	0
09:15	09:30	0	0	0	0	0	0	0
09:30	09:45	0	0	0	0	0	0	0
09:45	10:00	0	0	0	0	0	0	0
11:30	11:45	0	0	0	0	0	0	0
11:45	12:00	0	0	0	0	0	0	0
12:00	12:15	0	0	0	0	0	0	0
12:15	12:30	0	0	0	0	0	0	0
12:30	12:45	0	0	0	0	0	0	0
12:45	13:00	0	0	0	0	0	0	0
13:00	13:15	0	0	0	0	0	0	0
13:15	13:30	0	0	0	0	0	0	0
15:00	15:15	0	0	0	0	0	0	0
15:15	15:30	0	0	0	0	0	0	0
15:30	15:45	0	0	0	0	0	0	0
15:45	16:00	0	0	0	1	0	1	1
16:00	16:15	0	0	0	0	0	0	0
16:15	16:30	0	0	0	0	0	0	0
16:30	16:45	0	0	0	0	0	0	0
16:45	17:00	0	0	0	0	0	0	0
17:00	17:15	0	0	0	1	0	1	1
17:15	17:30	0	0	0	0	0	0	0
17:30	17:45	0	0	0	0	1	1	1
17:45	18:00	0	0	0	0	0	0	0
Total		0	0	0	2	1	3	3



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results STITTSVILLE MAIN ST @ HAZELDEAN RD

**Survey Date:** Wednesday, March 23, 2016

**WO No:** 35821

**Start Time:** 07:00

**Device:** Miovision

### Full Study Pedestrian Volume

**STITTSVILLE MAIN ST**

**HAZELDEAN RD**

Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	0	0	0	0	0	0	0
07:15 07:30	0	0	0	0	0	0	0
07:30 07:45	0	0	0	0	1	1	1
07:45 08:00	0	1	1	0	2	2	3
08:00 08:15	0	0	0	0	0	0	0
08:15 08:30	0	0	0	0	0	0	0
08:30 08:45	0	1	1	1	0	1	2
08:45 09:00	0	4	4	0	0	0	4
09:00 09:15	0	1	1	0	4	4	5
09:15 09:30	0	1	1	0	1	1	2
09:30 09:45	2	0	2	1	4	5	7
09:45 10:00	1	0	1	1	1	2	3
11:30 11:45	1	0	1	1	0	1	2
11:45 12:00	0	0	0	1	1	2	2
12:00 12:15	0	0	0	0	0	0	0
12:15 12:30	1	3	4	1	0	1	5
12:30 12:45	0	0	0	0	1	1	1
12:45 13:00	3	0	3	3	2	5	8
13:00 13:15	0	1	1	1	0	1	2
13:15 13:30	0	0	0	0	1	1	1
15:00 15:15	1	1	2	1	4	5	7
15:15 15:30	1	0	1	0	2	2	3
15:30 15:45	2	1	3	0	4	4	7
15:45 16:00	0	2	2	3	1	4	6
16:00 16:15	0	1	1	0	4	4	5
16:15 16:30	1	3	4	1	4	5	9
16:30 16:45	1	1	2	1	4	5	7
16:45 17:00	0	0	0	1	0	1	1
17:00 17:15	0	2	2	1	1	2	4
17:15 17:30	1	2	3	1	3	4	7
17:30 17:45	5	1	6	0	14	14	20
17:45 18:00	1	2	3	1	2	3	6
<b>Total</b> .....	<b>21</b>	<b>28</b>	<b>49</b>	<b>20</b>	<b>61</b>	<b>81</b>	<b>130</b>



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### STITTSVILLE MAIN ST @ HAZELDEAN RD

**Survey Date:** Wednesday, March 23, 2016

**WO No:** 35821

**Start Time:** 07:00

**Device:** Miovision

### Full Study Heavy Vehicles

#### STITTSVILLE MAIN ST

#### HAZELDEAN RD

Northbound

Southbound

Eastbound

Westbound

Time Period	Northbound			N TOT	Southbound			S TOT	STR TOT	Eastbound			E TOT	Westbound			W TOT	STR TOT	Grand Total	
	LT	ST	RT		LT	ST	RT			LT	ST	RT		LT	ST	RT				
07:00	07:15	0	0	3	3	1	2	0	3	6	4	13	1	18	1	1	0	2	20	26
07:15	07:30	1	0	0	1	2	2	1	5	6	1	5	0	6	0	6	1	7	13	19
07:30	07:45	0	0	1	1	4	4	0	8	9	1	1	1	3	1	0	1	2	5	14
07:45	08:00	1	0	2	3	3	0	0	3	6	0	2	1	3	2	2	0	4	7	13
08:00	08:15	1	1	1	3	1	0	0	1	4	1	3	0	4	1	7	1	9	13	17
08:15	08:30	1	0	3	4	4	2	2	8	12	3	6	0	9	4	5	3	12	21	33
08:30	08:45	0	0	2	2	2	1	0	3	5	2	2	0	4	2	4	0	6	10	15
08:45	09:00	0	0	0	0	0	1	2	3	3	0	9	0	9	3	6	1	10	19	22
09:00	09:15	0	0	1	1	0	0	0	0	1	0	3	0	3	3	9	1	13	16	17
09:15	09:30	1	0	1	2	1	0	0	1	3	0	1	0	1	2	8	0	10	11	14
09:30	09:45	1	0	2	3	0	3	0	3	6	0	4	0	4	3	10	1	14	18	24
09:45	10:00	1	0	1	2	2	0	1	3	5	0	6	1	7	3	6	2	11	18	23
11:30	11:45	0	0	0	0	0	0	0	0	0	1	2	0	3	0	2	2	4	7	7
11:45	12:00	0	1	2	3	1	0	0	1	4	0	6	0	6	2	5	0	7	13	17
12:00	12:15	0	0	3	3	0	0	0	0	3	0	2	0	2	1	4	0	5	7	10
12:15	12:30	0	0	1	1	0	1	0	1	2	1	3	0	4	0	8	1	9	13	15
12:30	12:45	0	0	1	1	0	0	0	0	1	0	3	0	3	0	5	0	5	8	9
12:45	13:00	0	0	1	1	0	0	0	0	1	1	2	0	3	2	2	0	4	7	8
13:00	13:15	2	0	1	3	3	0	0	3	6	0	4	0	4	1	3	0	4	8	14
13:15	13:30	0	0	2	2	1	1	0	2	4	0	3	0	3	0	4	0	4	7	11
15:00	15:15	3	0	2	5	4	0	2	6	11	1	5	0	6	4	2	2	8	14	25
15:15	15:30	0	0	3	3	1	2	0	3	6	0	2	0	2	3	7	2	12	14	20
15:30	15:45	0	0	2	2	0	0	0	0	2	1	5	0	6	3	3	0	6	12	14
15:45	16:00	0	0	2	2	1	0	0	1	3	0	0	0	0	1	2	0	3	3	6
16:00	16:15	0	1	0	1	1	1	1	3	4	1	3	0	4	2	1	2	5	9	13
16:15	16:30	0	1	1	2	1	0	1	2	4	0	1	0	1	0	3	1	4	5	9
16:30	16:45	0	0	1	1	1	0	0	1	2	0	5	1	6	0	1	1	2	8	10
16:45	17:00	0	0	1	1	0	0	1	1	2	0	0	0	0	0	3	0	3	3	5
17:00	17:15	0	1	0	1	0	0	1	1	2	0	1	0	1	1	5	0	6	7	9
17:15	17:30	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2	2
17:30	17:45	0	1	0	1	0	0	1	1	2	0	1	0	1	0	2	0	2	3	5
17:45	18:00	0	0	0	0	0	0	0	0	0	0	2	0	2	0	1	0	1	3	3
Total:	None	12	6	40	58	34	20	13	67	125	18	106	5	129	45	128	22	195	324	449





# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### STITTSVILLE MAIN ST @ HAZELDEAN RD

**Survey Date:** Wednesday, March 23, 2016

**WO No:** 35821

**Start Time:** 07:00

**Device:** Miovision

### Full Study 15 Minute U-Turn Total

STITTSVILLE MAIN ST

HAZELDEAN RD

Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	0
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	0	0	0
07:45	08:00	0	0	0	0	0
08:00	08:15	0	0	1	0	1
08:15	08:30	0	0	0	0	0
08:30	08:45	0	0	1	0	1
08:45	09:00	0	0	0	0	0
09:00	09:15	0	0	0	1	1
09:15	09:30	0	0	0	0	0
09:30	09:45	0	0	0	0	0
09:45	10:00	0	0	0	0	0
11:30	11:45	0	0	0	0	0
11:45	12:00	0	0	0	0	0
12:00	12:15	0	0	0	0	0
12:15	12:30	0	0	0	0	0
12:30	12:45	0	1	0	0	1
12:45	13:00	0	0	0	0	0
13:00	13:15	0	0	0	0	0
13:15	13:30	0	0	0	0	0
15:00	15:15	0	0	0	0	0
15:15	15:30	0	1	4	0	5
15:30	15:45	0	0	1	0	1
15:45	16:00	0	0	3	0	3
16:00	16:15	0	0	0	0	0
16:15	16:30	0	0	0	0	0
16:30	16:45	0	0	2	0	2
16:45	17:00	0	0	0	0	0
17:00	17:15	0	0	0	0	0
17:15	17:30	0	0	1	0	1
17:30	17:45	0	0	0	0	0
17:45	18:00	0	0	1	1	2
Total		0	2	14	2	18

# Traffic Signal Timing

City of Ottawa, Transportation Services Department

## Traffic Signal Operations Unit

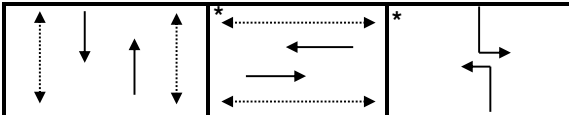
<b>Intersection:</b>	<i>Main:</i> Carp	<i>Side:</i> Hazeldean
<b>Controller:</b>	MS-3200	<b>TSD:</b> 5639
<b>Author:</b>	R. Doueidar	<b>Date:</b> 06-Mar-2020

### Existing Timing Plans†

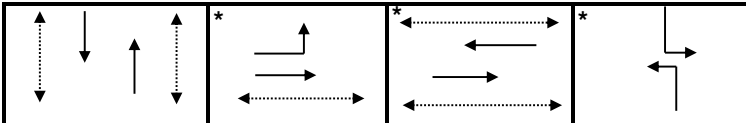
	Plan				Ped Minimum Time		
	AM Peak 1	Off Peak 2	PM Peak 3	Night 4	Walk	DW	A+R
<b>Cycle</b>	115	110	120	85			
<b>Offset</b>	107	X	8	X			
NB Thru	35	35	40	32	7	18	3.7+2.4
SB Thru	35	35	40	32	7	18	3.7+2.4
EB Left	15	-	-	-	-	-	3.7+2.4
EB Thru	53	40	52	38	7	24	3.7+2.9
WB Thru	38	40	52	38	7	24	3.7+2.9
SB Left (fp)	27	35	28	15	-	-	3.7+2.3
NB Left (fp)	27	35	28	15	-	-	3.7+2.3

### Phasing Sequence‡

#### Plans: 2, 3 & 4



#### Plan: 1



### Schedule

Weekday		Saturday		Sunday	
Time	Plan	Time	Plan	Time	Plan
00:10	4	00:10	4	00:10	4
06:30	1	09:00	2	08:00	2
09:30	2	22:30	4	22:30	4
15:00	3				
19:00	2				
23:00	4				

### Notes

- †: Time for each direction includes amber and all red intervals
- ‡: Start of first phase should be used as reference point for offset
- Asterisk (\*) Indicates actuated phase
- (fp): Fully Protected Left Turn
- ◄.....► Pedestrian signal

Cost is \$58.78 (\$52.02 + HST)

# Traffic Signal Timing

City of Ottawa, Transportation Services Department

## Traffic Signal Operations Unit

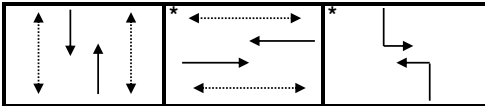
**Intersection:** *Main:* Stittsville Main *Side:* Carp  
**Controller:** MS-3200 **TSD:** 6045  
**Author:** R. Doueidar **Date:** 06-Mar-2020

### Existing Timing Plans†

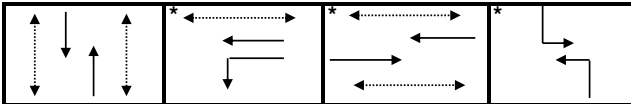
	Plan				Ped Minimum Time		
	AM Peak 1	Off Peak 2	PM Peak 3	Night 4	Walk	DW	A+R
<b>Cycle</b>	80	90	90	60			
<b>Offset</b>	0	2	2	X			
NB Thru	35	33	32	31	7	17	3.3+2.2
SB Thru	35	33	32	31	7	17	3.3+2.2
WBLT	-	13	15	-	-	-	3.3+1.8
WB Thru	30	42	44	29	7	16	3.3+1.8
EB Thru	30	29	29	29	7	16	3.3+1.8
NBLT	15	15	14	-	-	-	3.3+2.2
SBLT	15	15	14	-	-	-	3.3+2.2

### Phasing Sequence‡

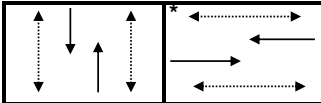
Plan: 1



Plan: 2 & 3



Plan: 4



### Schedule

Weekday		Saturday		Sunday	
Time	Plan	Time	Plan	Time	Plan
00:10	4	00:10	4	00:10	4
06:30	1	09:00	2	08:00	2
09:30	2	10:30	3	11:00	3
15:00	3	18:30	2	18:30	2
18:30	2	22:00	4	22:00	4
22:00	4				

### Notes

†: Time for each direction includes amber and all red intervals  
‡: Start of first phase should be used as reference point for offset  
Asterix (\*) Indicates actuated phase  
(fp): Fully Protected Left Turn

◄.....► Pedestrian signal

Cost is \$58.78 (\$52.02 + HST)

# Traffic Signal Timing

City of Ottawa, Transportation Services Department

## Traffic Signal Operations Unit

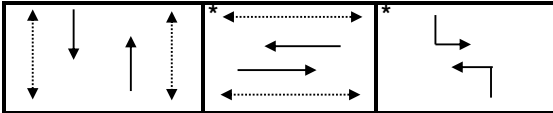
<b>Intersection:</b>	<i>Main:</i> Carp	<i>Side:</i> Echowoods/Kittiwake
<b>Controller:</b>	MS-3200	TSD: 6585
<b>Author:</b>	R. Doueidar	Date: 06-Mar-2020

### Existing Timing Plans†

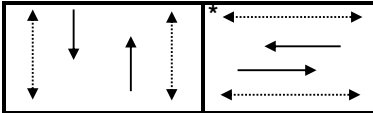
	Plan				Ped Minimum Time		
	AM Peak 1	Off Peak 2	PM Peak 3	Night 4	Walk	DW	A+R
<b>Cycle</b>	115	100	120	80			
<b>Offset</b>	7	X	11	X			
NB Thru	63	55	63	45	7	17	3.7+2.3
SB Thru	63	55	63	45	7	17	3.7+2.3
EB Thru	40	34	35	35	7	16	3.0+3.3
WB Thru	40	34	35	35	7	16	3.0+3.3
NB Left	12	11	22	-	-	-	3.7+1.9
SB Left	12	11	22	-	-	-	3.7+1.9

### Phasing Sequence‡

#### Plans: 1, 2 & 3



#### Plan: 4



### Schedule

Weekday		Saturday		Sunday	
Time	Plan	Time	Plan	Time	Plan
00:10	4	00:10	4	00:10	4
06:30	1	09:00	2	08:00	2
09:30	2	22:30	4	23:30	4
15:00	3				
19:00	2				
23:00	4				

### Notes

†: Time for each direction includes amber and all red intervals  
 ‡: Start of first phase should be used as reference point for offset  
 Asterisk (\*) Indicates actuated phase  
 (fp): Fully Protected Left Turn

←.....→ Pedestrian signal

Cost is \$58.78 (\$52.02 + HST)

# Traffic Signal Timing

City of Ottawa, Transportation Services Department

## Traffic Signal Operations Unit

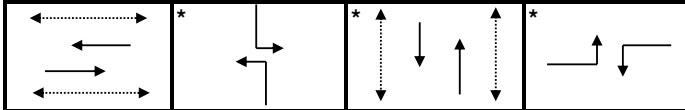
<b>Intersection:</b>	<i>Main:</i> Hazeldean	<i>Side:</i> Stittsville Main
<b>Controller:</b>	<b>MS 3200</b>	<b>TSD: 6641</b>
<b>Author:</b>	Matthew Anderson	<b>Date:</b> 30-Oct-2020

### Existing Timing Plans†

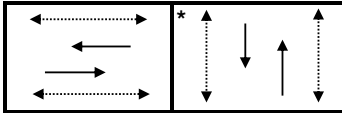
	Plan					Ped Minimum Time		
	AM Peak 1	Off Peak 2	PM Peak 3	Night 4	Saturday 12	Walk	DW	A+R
<b>Cycle</b>	115	120	120	85	115			
<b>Offset</b>	85	X	113	X	X			
NB Thru	47	42	42	45	42	7	23	3.7+3.0
SB Thru	47	42	42	45	42	7	23	3.7+3.0
EB Thru	19	16	19	-	16	-	-	3.3+3.0
WB Thru	19	16	19	-	16	-	-	3.3+3.0
NB Left	37	37	37	40	37	7	23	3.3+3.6
SB Left	37	37	37	40	37	7	23	3.3+3.6
EB Left	12	25	22	-	20	-	-	3.7+2.8
WB Left	12	25	22	-	20	-	-	3.7+2.8

### Phasing Sequence‡

Plan: 1,2,3,12



Plan: 4



### Schedule

Weekday		Saturday		Sunday	
Time	Plan	Time	Plan	Time	Plan
0:15	4	0:15	4	0:15	4
6:30	1	8:00	2	8:00	2
9:30	2	10:00	5	22:00	4
15:00	3	22:00	2		
18:30	2				
23:30	4				

### NOTES

- †: Time for each direction includes amber and all red intervals
- ‡: Start of first phase should be used as reference point for offset
- Asterisk (\*) Indicates actuated phase
- (fp): Fully Protected Left Turn
- ◄.....► Pedestrian signal

Cost is \$58.78 (\$52.02 + HST)

## Appendix D - Existing Synchro Outputs

HCM Signalized Intersection Capacity Analysis  
 1: Carp Rd & Kittiwake Dr/Echwoods Ave

Existing (2020)  
 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	237	5	70	49	3	147	27	923	15	35	532	49
Future Volume (vph)	237	5	70	49	3	147	27	923	15	35	532	49
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	3.9	3.9	3.7	3.7	4.8	3.7	3.6	3.7	3.7	3.3	3.5	3.1
Total Lost time (s)	6.3	6.3			6.0		5.6	6.0		5.6	5.7	5.7
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frbp, ped/bikes	1.00	0.99			0.98		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.86			0.90		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1680	1490			1737		1474	1746		1653	1618	1382
Flt Permitted	0.54	1.00			0.90		0.29	1.00		0.07	1.00	1.00
Satd. Flow (perm)	957	1490			1588		449	1746		114	1618	1382
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)	263	6	78	54	3	163	30	1026	17	39	591	54
RTOR Reduction (vph)	0	56	0	0	90	0	0	0	0	0	0	25
Lane Group Flow (vph)	263	28	0	0	130	0	30	1043	0	39	591	29
Confl. Peds. (#/hr)	1					1	2		1	1		2
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	5%	20%	5%	9%	33%	0%	16%	4%	0%	0%	10%	2%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	32.8	32.8			33.1		64.3	60.5		64.6	60.8	60.8
Effective Green, g (s)	32.8	32.8			33.1		64.3	60.5		64.6	60.8	60.8
Actuated g/C Ratio	0.29	0.29			0.29		0.56	0.53		0.56	0.53	0.53
Clearance Time (s)	6.3	6.3			6.0		5.6	6.0		5.6	5.7	5.7
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	272	424			457		284	918		114	855	730
v/s Ratio Prot		0.02					0.00	c0.60		c0.01	0.37	
v/s Ratio Perm	c0.27				0.08		0.06			0.18		0.02
v/c Ratio	0.97	0.07			0.28		0.11	1.14		0.34	0.69	0.04
Uniform Delay, d1	40.6	29.9			31.8		13.4	27.2		25.7	20.1	13.0
Progression Factor	1.00	1.00			1.00		0.74	0.69		1.00	1.00	1.00
Incremental Delay, d2	45.0	0.1			0.3		0.1	71.3		1.8	4.6	0.1
Delay (s)	85.6	30.0			32.1		10.1	90.0		27.5	24.7	13.1
Level of Service	F	C			C		B	F		C	C	B
Approach Delay (s)		72.1			32.1			87.8			23.9	
Approach LOS		E			C			F			C	

Intersection Summary		
HCM 2000 Control Delay	61.4	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.05	E
Actuated Cycle Length (s)	115.0	Sum of lost time (s)
Intersection Capacity Utilization	94.2%	17.9
Analysis Period (min)	15	ICU Level of Service
		F

c Critical Lane Group

Timing Report, Sorted By Phase  
 1: Carp Rd & Kittiwake Dr/Echwoods Ave

Existing (2020)  
 AM Peak Hour



Phase Number	1	2	4	5	6	8
Movement	SBL	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	12	63	40	12	63	40
Maximum Split (%)	10.4%	54.8%	34.8%	10.4%	54.8%	34.8%
Minimum Split (s)	10.6	30	29.3	10.6	29.7	29
Yellow Time (s)	3.7	3.7	3	3.7	3.7	3
All-Red Time (s)	1.9	2.3	3.3	1.9	2	3
Minimum Initial (s)	5	10	10	5	10	10
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		17	16		17	16
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	110	7	70	110	7	70
End Time (s)	7	70	110	7	70	110
Yield/Force Off (s)	1.4	64	103.7	1.4	64.3	104
Yield/Force Off 170(s)	1.4	47	87.7	1.4	47.3	88
Local Start Time (s)	103	0	63	103	0	63
Local Yield (s)	109.4	57	96.7	109.4	57.3	97
Local Yield 170(s)	109.4	40	80.7	109.4	40.3	81

Intersection Summary

Cycle Length	115
Control Type	Actuated-Coordinated
Natural Cycle	150
Offset: 7 (6%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 1: Carp Rd & Kittiwake Dr/Echwoods Ave



























# HCM Signalized Intersection Capacity Analysis

## 2: Carp Rd & Hazeldean Rd

Existing (2020)  
AM Peak Hour

													
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	
Lane Configurations		 							 				
Traffic Volume (vph)	292	277	87	2	10	118	292	60	401	15	2	230	
Future Volume (vph)	292	277	87	2	10	118	292	60	401	15	2	230	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Lane Width	3.6	3.9	3.7	3.7	3.8	3.4	3.9	3.9	3.4	3.7	3.7	3.6	
Total Lost time (s)	6.1	6.6			6.6	6.6	6.6	6.0	6.1			6.0	
Lane Util. Factor	1.00	0.95			1.00	1.00	1.00	1.00	0.95			1.00	
Frbp, ped/bikes	1.00	0.99			1.00	1.00	0.96	1.00	1.00			1.00	
Flpb, ped/bikes	0.99	1.00			1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.96			1.00	1.00	0.85	1.00	0.99			1.00	
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00			0.95	
Satd. Flow (prot)	1667	3228			1467	1586	1448	1523	3181			1463	
Flt Permitted	0.44	1.00			0.51	1.00	1.00	0.95	1.00			0.95	
Satd. Flow (perm)	779	3228			794	1586	1448	1523	3181			1463	
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)	324	308	97	2	11	131	324	67	446	17	2	256	
RTOR Reduction (vph)	0	32	0	0	0	0	281	0	2	0	0	0	
Lane Group Flow (vph)	324	373	0	0	13	131	43	67	461	0	0	258	
Confl. Peds. (#/hr)	10		1	3	1		10	1		3	10	3	
Heavy Vehicles (%)	2%	5%	5%	0%	22%	11%	5%	16%	3%	43%	0%	17%	
Turn Type	pm+pt	NA		Perm	Perm	NA	Perm	Prot	NA		Prot	Prot	
Protected Phases	7	4				8		5	2		1	1	
Permitted Phases	4			8	8		8						
Actuated Green, G (s)	30.4	30.4			15.4	15.4	15.4	9.2	38.3			27.6	
Effective Green, g (s)	30.4	30.4			15.4	15.4	15.4	9.2	38.3			27.6	
Actuated g/C Ratio	0.26	0.26			0.13	0.13	0.13	0.08	0.33			0.24	
Clearance Time (s)	6.1	6.6			6.6	6.6	6.6	6.0	6.1			6.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)	274	853			106	212	193	121	1059			351	
v/s Ratio Prot	c0.09	0.12				0.08		0.04	0.14			c0.18	
v/s Ratio Perm	c0.22				0.02		0.03						
v/c Ratio	1.18	0.44			0.12	0.62	0.22	0.55	0.44			0.74	
Uniform Delay, d1	41.5	35.2			43.9	47.0	44.5	50.9	29.9			40.3	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00			0.78	
Incremental Delay, d2	113.0	0.4			0.5	5.3	0.6	5.4	1.3			6.4	
Delay (s)	154.6	35.5			44.4	52.3	45.1	56.3	31.2			37.8	
Level of Service	F	D			D	D	D	E	C			D	
Approach Delay (s)		88.4				47.1			34.4				
Approach LOS		F				D			C				
<b>Intersection Summary</b>													
HCM 2000 Control Delay			53.4									HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.78										
Actuated Cycle Length (s)			115.0									Sum of lost time (s)	24.8
Intersection Capacity Utilization			93.9%									ICU Level of Service	F
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis  
 2: Carp Rd & Hazeldean Rd

Existing (2020)  
 AM Peak Hour



Movement	SBT	SBR
Lane Configurations	↑	↗
Traffic Volume (vph)	290	50
Future Volume (vph)	290	50
Ideal Flow (vphpl)	1800	1800
Lane Width	3.6	3.5
Total Lost time (s)	6.1	6.1
Lane Util. Factor	1.00	1.00
Frpb, ped/bikes	1.00	0.98
Flpb, ped/bikes	1.00	1.00
Frt	1.00	0.85
Flt Protected	1.00	1.00
Satd. Flow (prot)	1593	1309
Flt Permitted	1.00	1.00
Satd. Flow (perm)	1593	1309
Peak-hour factor, PHF	0.90	0.90
Adj. Flow (vph)	322	56
RTOR Reduction (vph)	0	28
Lane Group Flow (vph)	322	28
Confl. Peds. (#/hr)		1
Heavy Vehicles (%)	13%	13%
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Actuated Green, G (s)	56.7	56.7
Effective Green, g (s)	56.7	56.7
Actuated g/C Ratio	0.49	0.49
Clearance Time (s)	6.1	6.1
Vehicle Extension (s)	3.0	3.0
Lane Grp Cap (vph)	785	645
v/s Ratio Prot	c0.20	
v/s Ratio Perm		0.02
v/c Ratio	0.41	0.04
Uniform Delay, d1	18.5	15.1
Progression Factor	1.77	1.00
Incremental Delay, d2	1.3	0.1
Delay (s)	34.1	15.2
Level of Service	C	B
Approach Delay (s)	33.9	
Approach LOS	C	
<b>Intersection Summary</b>		

Timing Report, Sorted By Phase  
2: Carp Rd & Hazeldean Rd

Existing (2020)  
AM Peak Hour

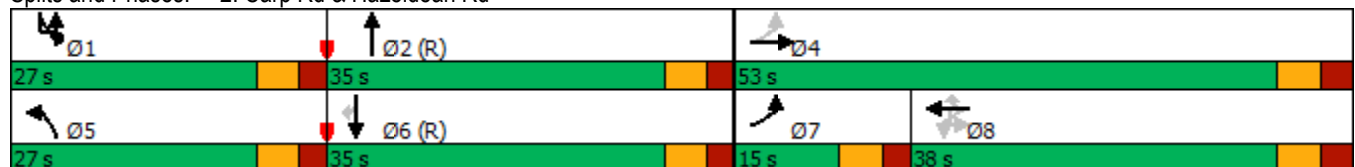


Phase Number	1	2	4	5	6	7	8
Movement	SBL	NBT	EBTL	NBL	SBT	EBL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lag
Lead-Lag Optimize							
Recall Mode	None	C-Max	None	None	C-Max	None	None
Maximum Split (s)	27	35	53	27	35	15	38
Maximum Split (%)	23.5%	30.4%	46.1%	23.5%	30.4%	13.0%	33.0%
Minimum Split (s)	11	31.1	37.6	11	31.1	11.1	37.6
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.3	2.4	2.9	2.3	2.4	2.4	2.9
Minimum Initial (s)	5	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0
Walk Time (s)		7	7		7		7
Flash Dont Walk (s)		18	24		18		24
Dual Entry	No	Yes	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	80	107	27	80	107	27	42
End Time (s)	107	27	80	107	27	42	80
Yield/Force Off (s)	101	20.9	73.4	101	20.9	35.9	73.4
Yield/Force Off 170(s)	101	2.9	49.4	101	2.9	35.9	49.4
Local Start Time (s)	88	0	35	88	0	35	50
Local Yield (s)	109	28.9	81.4	109	28.9	43.9	81.4
Local Yield 170(s)	109	10.9	57.4	109	10.9	43.9	57.4

Intersection Summary

Cycle Length	115
Control Type	Actuated-Coordinated
Natural Cycle	105
Offset: 107 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 2: Carp Rd & Hazeldean Rd



HCM Signalized Intersection Capacity Analysis  
 3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)

Existing (2020)  
 AM Peak Hour



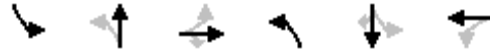
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗		↖	↗		↖	↗	↘
Traffic Volume (vph)	42	88	262	136	64	78	322	351	158	73	278	32
Future Volume (vph)	42	88	262	136	64	78	322	351	158	73	278	32
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	3.5	3.2	3.9	3.6	3.6	3.7	3.5	3.6	3.7	3.1	3.5	3.5
Total Lost time (s)	5.1	5.1	5.1	5.1	5.1		5.5	5.5		5.5	5.5	5.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	0.99		1.00	0.99		1.00	1.00	0.97
Flpb, ped/bikes	1.00	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	0.92		1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1656	1686	1511	1669	1600		1655	1667		1581	1745	1442
Flt Permitted	0.61	1.00	1.00	0.69	1.00		0.45	1.00		0.38	1.00	1.00
Satd. Flow (perm)	1065	1686	1511	1218	1600		781	1667		632	1745	1442
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)	47	98	291	151	71	87	358	390	176	81	309	36
RTOR Reduction (vph)	0	0	234	0	64	0	0	15	0	0	0	20
Lane Group Flow (vph)	47	98	57	151	94	0	358	551	0	81	309	16
Confl. Peds. (#/hr)	1		3	3		1	4		6	6		4
Confl. Bikes (#/hr)												2
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		2			6			6
Actuated Green, G (s)	15.7	15.7	15.7	15.7	15.7		53.7	42.3		42.2	36.3	36.3
Effective Green, g (s)	15.7	15.7	15.7	15.7	15.7		53.7	42.3		42.2	36.3	36.3
Actuated g/C Ratio	0.20	0.20	0.20	0.20	0.20		0.67	0.53		0.53	0.45	0.45
Clearance Time (s)	5.1	5.1	5.1	5.1	5.1		5.5	5.5		5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	209	330	296	239	314		654	881		403	791	654
v/s Ratio Prot		0.06			0.06		c0.08	c0.33		0.01	0.18	
v/s Ratio Perm	0.04		0.04	c0.12		0.29			0.09			0.01
v/c Ratio	0.22	0.30	0.19	0.63	0.30		0.55	0.63		0.20	0.39	0.02
Uniform Delay, d1	27.0	27.4	26.9	29.5	27.4		6.3	13.3		9.6	14.5	12.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	0.5	0.3	5.4	0.5		0.9	3.3		0.2	1.5	0.1
Delay (s)	27.6	27.9	27.2	34.9	28.0		7.3	16.6		9.9	16.0	12.1
Level of Service	C	C	C	C	C		A	B		A	B	B
Approach Delay (s)		27.4			31.3			13.0			14.5	
Approach LOS		C			C			B			B	

Intersection Summary

HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	16.1
Intersection Capacity Utilization	74.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Timing Report, Sorted By Phase  
 3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)

Existing (2020)  
 AM Peak Hour

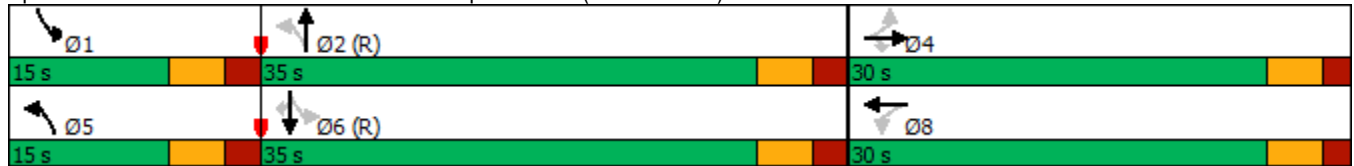


Phase Number	1	2	4	5	6	8
Movement	SBL	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	15	35	30	15	35	30
Maximum Split (%)	18.8%	43.8%	37.5%	18.8%	43.8%	37.5%
Minimum Split (s)	10.5	29.5	28.1	10.5	29.5	28.1
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.2	2.2	1.8	2.2	2.2	1.8
Minimum Initial (s)	5	10	10	5	10	10
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		17	16		17	16
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	65	0	35	65	0	35
End Time (s)	0	35	65	0	35	65
Yield/Force Off (s)	74.5	29.5	59.9	74.5	29.5	59.9
Yield/Force Off 170(s)	74.5	12.5	43.9	74.5	12.5	43.9
Local Start Time (s)	65	0	35	65	0	35
Local Yield (s)	74.5	29.5	59.9	74.5	29.5	59.9
Local Yield 170(s)	74.5	12.5	43.9	74.5	12.5	43.9

Intersection Summary

















Cycle Length	80
Control Type	Actuated-Coordinated
Natural Cycle	70
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)



HCM Unsignalized Intersection Capacity Analysis  
4: Samantha Eastop Dr & Kimber Dr

Existing (2020)  
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	13	10	5	55	5	41	5	10	10	5	41
Future Volume (Veh/h)	10	13	10	5	55	5	41	5	10	10	5	41
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	14	11	6	61	6	46	6	11	11	6	46
Pedestrians		5			5			5			5	
Lane Width (m)		4.8			4.8			4.8			4.8	
Walking Speed (m/s)		1.0			1.0			1.0			1.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)		322										
pX, platoon unblocked												
vC, conflicting volume	72			30			176	130	30	142	133	74
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	72			30			176	130	30	142	133	74
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 %	99			100			94	99	99	99	99	95
cM capacity (veh/h)	1518			1572			721	742	1031	789	739	975
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	36	73	63	63								
Volume Left	11	6	46	11								
Volume Right	11	6	11	46								
cSH	1518	1572	763	910								
Volume to Capacity	0.01	0.00	0.08	0.07								
Queue Length 95th (m)	0.2	0.1	1.9	1.6								
Control Delay (s)	2.3	0.6	10.1	9.3								
Lane LOS	A	A	B	A								
Approach Delay (s)	2.3	0.6	10.1	9.3								
Approach LOS			B	A								
Intersection Summary												
Average Delay			5.7									
Intersection Capacity Utilization			23.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis  
1: Carp Rd & Kittiwake Dr/Echwoods Ave

Existing (2020)  
PM Peak Hour



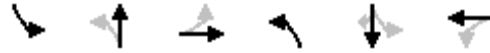
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	142	13	55	58	7	78	52	697	32	116	1050	152
Future Volume (vph)	142	13	55	58	7	78	52	697	32	116	1050	152
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	3.9	3.9	3.7	3.7	4.8	3.7	3.6	3.7	3.7	3.3	3.5	3.1
Total Lost time (s)	6.3	6.3			6.0		5.6	6.0		5.6	5.7	5.7
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frbp, ped/bikes	1.00	0.97			1.00		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00			0.99		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.88			0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1732	1557			1742		1474	1739		1653	1618	1381
Flt Permitted	0.58	1.00			0.84		0.06	1.00		0.17	1.00	1.00
Satd. Flow (perm)	1059	1557			1484		89	1739		297	1618	1381
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)	158	14	61	64	8	87	58	774	36	129	1167	169
RTOR Reduction (vph)	0	50	0	0	39	0	0	1	0	0	0	31
Lane Group Flow (vph)	158	25	0	0	120	0	58	809	0	129	1167	138
Confl. Peds. (#/hr)			17	17			2		3	3		2
Confl. Bikes (#/hr)									1			1
Heavy Vehicles (%)	2%	0%	2%	9%	33%	0%	16%	4%	0%	0%	10%	2%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	21.6	21.6			21.9		76.1	70.0		85.2	74.7	74.7
Effective Green, g (s)	21.6	21.6			21.9		76.1	70.0		85.2	74.7	74.7
Actuated g/C Ratio	0.18	0.18			0.18		0.63	0.58		0.71	0.62	0.62
Clearance Time (s)	6.3	6.3			6.0		5.6	6.0		5.6	5.7	5.7
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	190	280			270		126	1014		329	1007	859
v/s Ratio Prot		0.02					0.02	0.47		c0.03	c0.72	
v/s Ratio Perm	c0.15				0.08		0.27			0.24		0.10
v/c Ratio	0.83	0.09			0.44		0.46	0.80		0.39	1.16	0.16
Uniform Delay, d1	47.4	41.0			43.6		27.2	19.5		13.6	22.6	9.5
Progression Factor	1.00	1.00			1.00		1.50	0.78		1.00	1.00	1.00
Incremental Delay, d2	25.5	0.1			1.2		2.2	5.5		0.8	82.8	0.4
Delay (s)	72.9	41.1			44.8		43.1	20.7		14.4	105.4	9.9
Level of Service	E	D			D		D	C		B	F	A
Approach Delay (s)		62.7			44.8			22.2			86.4	
Approach LOS		E			D			C			F	

Intersection Summary		
HCM 2000 Control Delay	61.5	HCM 2000 Level of Service E
HCM 2000 Volume to Capacity ratio	1.06	
Actuated Cycle Length (s)	120.0	Sum of lost time (s) 17.9
Intersection Capacity Utilization	94.0%	ICU Level of Service F
Analysis Period (min)	15	

c Critical Lane Group

Timing Report, Sorted By Phase  
 1: Carp Rd & Kittiwake Dr/Echwoods Ave

Existing (2020)  
 PM Peak Hour

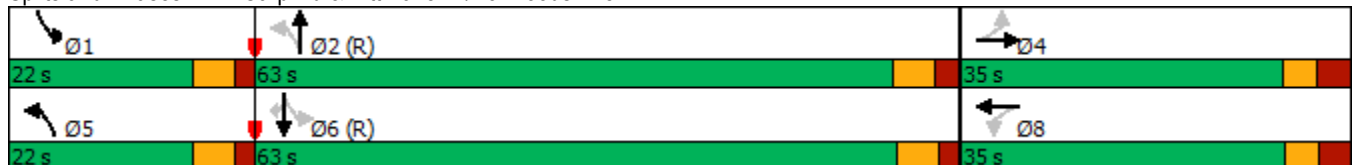


Phase Number	1	2	4	5	6	8
Movement	SBL	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	22	63	35	22	63	35
Maximum Split (%)	18.3%	52.5%	29.2%	18.3%	52.5%	29.2%
Minimum Split (s)	10.6	30	29.3	10.6	29.7	29
Yellow Time (s)	3.7	3.7	3	3.7	3.7	3
All-Red Time (s)	1.9	2.3	3.3	1.9	2	3
Minimum Initial (s)	5	10	10	5	10	10
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		17	16		17	16
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	109	11	74	109	11	74
End Time (s)	11	74	109	11	74	109
Yield/Force Off (s)	5.4	68	102.7	5.4	68.3	103
Yield/Force Off 170(s)	5.4	51	86.7	5.4	51.3	87
Local Start Time (s)	98	0	63	98	0	63
Local Yield (s)	114.4	57	91.7	114.4	57.3	92
Local Yield 170(s)	114.4	40	75.7	114.4	40.3	76

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	150
Offset: 11 (9%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 1: Carp Rd & Kittiwake Dr/Echwoods Ave





# HCM Signalized Intersection Capacity Analysis

## 2: Carp Rd & Hazeldean Rd

Existing (2020)  
PM Peak Hour



Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	2	93	269	140	1	48	504	358	133	364	29	370
Future Volume (vph)	2	93	269	140	1	48	504	358	133	364	29	370
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	3.7	3.6	3.9	3.7	3.7	3.8	3.4	3.9	3.9	3.4	3.7	3.6
Total Lost time (s)		6.6	6.6			6.6	6.6	6.6	6.0	6.1		6.0
Lane Util. Factor		1.00	0.95			1.00	1.00	1.00	1.00	0.95		1.00
Frbp, ped/bikes		1.00	0.99			1.00	1.00	0.97	1.00	1.00		1.00
Flpb, ped/bikes		0.99	1.00			0.99	1.00	1.00	1.00	1.00		1.00
Frt		1.00	0.95			1.00	1.00	0.85	1.00	0.99		1.00
Flt Protected		0.95	1.00			0.95	1.00	1.00	0.95	1.00		0.95
Satd. Flow (prot)		1698	3299			1593	1725	1442	1732	3204		1693
Flt Permitted		0.15	1.00			0.43	1.00	1.00	0.95	1.00		0.95
Satd. Flow (perm)		276	3299			720	1725	1442	1732	3204		1693
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)	2	103	299	156	1	53	560	398	148	404	32	411
RTOR Reduction (vph)	0	0	59	0	0	0	0	243	0	5	0	0
Lane Group Flow (vph)	0	105	396	0	0	54	560	155	148	431	0	411
Confl. Peds. (#/hr)	5	7		4	5	4		7	5		5	5
Heavy Vehicles (%)	5%	0%	1%	0%	0%	9%	2%	6%	2%	3%	4%	1%
Turn Type	Perm	Perm	NA		Perm	Perm	NA	Perm	Prot	NA		Prot
Protected Phases			4				8		5	2		1
Permitted Phases	4	4			8	8		8				
Actuated Green, G (s)		42.8	42.8			42.8	42.8	42.8	15.5	33.9		24.6
Effective Green, g (s)		42.8	42.8			42.8	42.8	42.8	15.5	33.9		24.6
Actuated g/C Ratio		0.36	0.36			0.36	0.36	0.36	0.13	0.28		0.21
Clearance Time (s)		6.6	6.6			6.6	6.6	6.6	6.0	6.1		6.0
Vehicle Extension (s)		3.0	3.0			3.0	3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)		98	1176			256	615	514	223	905		347
v/s Ratio Prot			0.12				0.32		0.09	0.13		c0.24
v/s Ratio Perm		c0.38				0.07		0.11				
v/c Ratio		1.07	0.34			0.21	0.91	0.30	0.66	0.48		1.18
Uniform Delay, d1		38.6	28.2			26.9	36.8	27.8	49.8	35.7		47.7
Progression Factor		1.00	1.00			1.00	1.00	1.00	1.00	1.00		1.20
Incremental Delay, d2		111.5	0.2			0.4	17.7	0.3	7.2	1.8		85.9
Delay (s)		150.1	28.4			27.3	54.5	28.2	57.0	37.5		143.1
Level of Service		F	C			C	D	C	E	D		F
Approach Delay (s)			51.2				42.7			42.4		
Approach LOS			D				D			D		
<b>Intersection Summary</b>												
HCM 2000 Control Delay			57.1				HCM 2000 Level of Service		E			
HCM 2000 Volume to Capacity ratio			1.05									
Actuated Cycle Length (s)			120.0				Sum of lost time (s)		18.7			
Intersection Capacity Utilization			97.1%				ICU Level of Service		F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
 2: Carp Rd & Hazeldean Rd

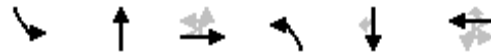
Existing (2020)  
 PM Peak Hour



Movement	SBT	SBR
Lane Configurations	↑	↗
Traffic Volume (vph)	496	241
Future Volume (vph)	496	241
Ideal Flow (vphpl)	1800	1800
Lane Width	3.6	3.5
Total Lost time (s)	6.1	6.1
Lane Util. Factor	1.00	1.00
Frbp, ped/bikes	1.00	0.97
Flpb, ped/bikes	1.00	1.00
Frt	1.00	0.85
Flt Protected	1.00	1.00
Satd. Flow (prot)	1765	1465
Flt Permitted	1.00	1.00
Satd. Flow (perm)	1765	1465
Peak-hour factor, PHF	0.90	0.90
Adj. Flow (vph)	551	268
RTOR Reduction (vph)	0	141
Lane Group Flow (vph)	551	127
Confl. Peds. (#/hr)		5
Heavy Vehicles (%)	2%	0%
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Actuated Green, G (s)	43.0	43.0
Effective Green, g (s)	43.0	43.0
Actuated g/C Ratio	0.36	0.36
Clearance Time (s)	6.1	6.1
Vehicle Extension (s)	3.0	3.0
Lane Grp Cap (vph)	632	524
v/s Ratio Prot	c0.31	
v/s Ratio Perm		0.09
v/c Ratio	0.87	0.24
Uniform Delay, d1	35.9	27.1
Progression Factor	1.12	2.02
Incremental Delay, d2	1.7	0.1
Delay (s)	42.0	54.8
Level of Service	D	D
Approach Delay (s)	78.6	
Approach LOS	E	
<b>Intersection Summary</b>		

Timing Report, Sorted By Phase  
2: Carp Rd & Hazeldean Rd

Existing (2020)  
PM Peak Hour

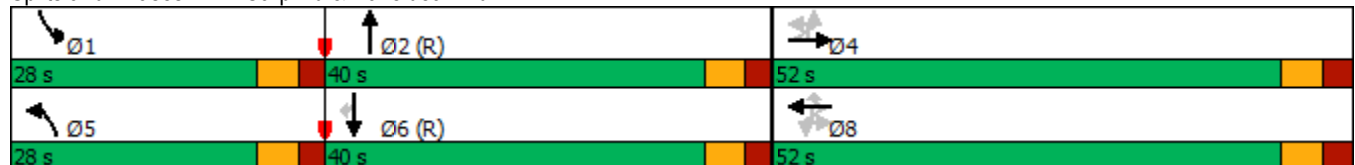


Phase Number	1	2	4	5	6	8
Movement	SBL	NBT	EBTL	NBL	SBT	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	28	40	52	28	40	52
Maximum Split (%)	23.3%	33.3%	43.3%	23.3%	33.3%	43.3%
Minimum Split (s)	11	31.1	37.6	11	31.1	37.6
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.3	2.4	2.9	2.3	2.4	2.9
Minimum Initial (s)	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		18	24		18	24
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	100	8	48	100	8	48
End Time (s)	8	48	100	8	48	100
Yield/Force Off (s)	2	41.9	93.4	2	41.9	93.4
Yield/Force Off 170(s)	2	23.9	69.4	2	23.9	69.4
Local Start Time (s)	92	0	40	92	0	40
Local Yield (s)	114	33.9	85.4	114	33.9	85.4
Local Yield 170(s)	114	15.9	61.4	114	15.9	61.4

Intersection Summary

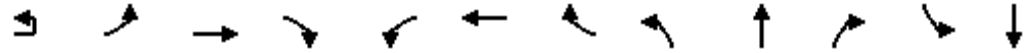
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	110
Offset: 8 (7%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 2: Carp Rd & Hazeldean Rd



HCM Signalized Intersection Capacity Analysis  
 3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)

Existing (2020)  
 PM Peak Hour



Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	
Lane Configurations		↖	↗	↖	↖	↗		↖	↗		↖	↗	
Traffic Volume (vph)	1	73	114	435	216	127	84	307	445	111	73	489	
Future Volume (vph)	1	73	114	435	216	127	84	307	445	111	73	489	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Lane Width	3.7	3.5	3.2	3.9	3.6	3.6	3.7	3.5	3.6	3.7	3.1	3.5	
Total Lost time (s)		5.1	5.1	5.1	5.1	5.1		5.5	5.5		5.5	5.5	
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frbp, ped/bikes		1.00	1.00	0.96	1.00	0.98		1.00	0.99		1.00	1.00	
Flpb, ped/bikes		0.94	1.00	1.00	0.99	1.00		1.00	1.00		1.00	1.00	
Frt		1.00	1.00	0.85	1.00	0.94		1.00	0.97		1.00	1.00	
Flt Protected		0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1591	1720	1481	1700	1624		1595	1714		1614	1728	
Flt Permitted		0.61	1.00	1.00	0.51	1.00		0.12	1.00		0.19	1.00	
Satd. Flow (perm)		1026	1720	1481	918	1624		210	1714		322	1728	
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)	1	81	127	483	240	141	93	341	494	123	81	543	
RTOR Reduction (vph)	0	0	0	266	0	29	0	0	9	0	0	0	
Lane Group Flow (vph)	0	82	127	217	240	205	0	341	608	0	81	543	
Confl. Peds. (#/hr)	23	19		8	8		19	23		11	11		
Confl. Bikes (#/hr)							2			3			
Heavy Vehicles (%)	0%	0%	0%	3%	0%	1%	3%	6%	1%	1%	0%	3%	
Turn Type	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases			4		3	8		5	2		1	6	
Permitted Phases	4	4		4	8		2				6		
Actuated Green, G (s)		17.7	17.7	17.7	32.7	32.7		46.7	34.9		32.8	26.5	
Effective Green, g (s)		17.7	17.7	17.7	32.7	32.7		46.7	34.9		32.8	26.5	
Actuated g/C Ratio		0.20	0.20	0.20	0.36	0.36		0.52	0.39		0.36	0.29	
Clearance Time (s)		5.1	5.1	5.1	5.1	5.1		5.5	5.5		5.5	5.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		201	338	291	419	590		335	664		207	508	
v/s Ratio Prot			0.07		c0.06	0.13		c0.17	0.35		0.03	0.31	
v/s Ratio Perm		0.08		c0.15	0.14		c0.36				0.11		
v/c Ratio		0.41	0.38	0.75	0.57	0.35		1.02	0.92		0.39	1.07	
Uniform Delay, d1		31.6	31.4	34.0	21.4	20.9		25.9	26.2		20.5	31.8	
Progression Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.4	0.7	10.0	1.9	0.4		53.8	19.5		1.2	59.6	
Delay (s)		32.9	32.1	44.0	23.3	21.2		79.7	45.7		21.7	91.4	
Level of Service		C	C	D	C	C		E	D		C	F	
Approach Delay (s)			40.5			22.3			57.8			77.7	
Approach LOS			D			C			E			E	
<b>Intersection Summary</b>													
HCM 2000 Control Delay			52.3		HCM 2000 Level of Service					D			
HCM 2000 Volume to Capacity ratio			0.94										
Actuated Cycle Length (s)			90.0		Sum of lost time (s)					21.2			
Intersection Capacity Utilization			87.1%		ICU Level of Service					E			
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)

Existing (2020)  
 PM Peak Hour

Movement	SBR
Lane Configurations	7
Traffic Volume (vph)	47
Future Volume (vph)	47
Ideal Flow (vphpl)	1800
Lane Width	3.5
Total Lost time (s)	5.5
Lane Util. Factor	1.00
Frbp, ped/bikes	0.94
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1419
Flt Permitted	1.00
Satd. Flow (perm)	1419
Peak-hour factor, PHF	0.90
Adj. Flow (vph)	52
RTOR Reduction (vph)	37
Lane Group Flow (vph)	15
Confl. Peds. (#/hr)	23
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	26.5
Effective Green, g (s)	26.5
Actuated g/C Ratio	0.29
Clearance Time (s)	5.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	417
v/s Ratio Prot	
v/s Ratio Perm	0.01
v/c Ratio	0.04
Uniform Delay, d1	22.6
Progression Factor	1.00
Incremental Delay, d2	0.2
Delay (s)	22.8
Level of Service	C
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Timing Report, Sorted By Phase  
 3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)

Existing (2020)  
 PM Peak Hour

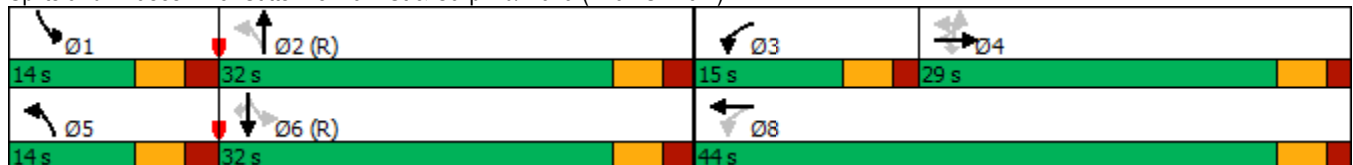


Phase Number	1	2	3	4	5	6	8
Movement	SBL	NBTL	WBL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	
Lead-Lag Optimize							
Recall Mode	None	C-Max	None	None	None	C-Max	None
Maximum Split (s)	14	32	15	29	14	32	44
Maximum Split (%)	15.6%	35.6%	16.7%	32.2%	15.6%	35.6%	48.9%
Minimum Split (s)	10.5	29.5	10.1	28.1	10.5	29.5	28.1
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.2	2.2	1.8	1.8	2.2	2.2	1.8
Minimum Initial (s)	5	10	5	10	5	10	10
Vehicle Extension (s)	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0
Walk Time (s)		7		7		7	7
Flash Dont Walk (s)		17		16		17	16
Dual Entry	No	Yes	No	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	78	2	34	49	78	2	34
End Time (s)	2	34	49	78	2	34	78
Yield/Force Off (s)	86.5	28.5	43.9	72.9	86.5	28.5	72.9
Yield/Force Off 170(s)	86.5	11.5	43.9	56.9	86.5	11.5	56.9
Local Start Time (s)	76	0	32	47	76	0	32
Local Yield (s)	84.5	26.5	41.9	70.9	84.5	26.5	70.9
Local Yield 170(s)	84.5	9.5	41.9	54.9	84.5	9.5	54.9

Intersection Summary

















Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 2 (2%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)



HCM Unsignalized Intersection Capacity Analysis  
4: Samantha Eastop Dr & Kimber Dr

Existing (2020)  
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	45	33	5	28	5	21	5	34	34	5	21
Future Volume (Veh/h)	33	45	33	5	28	5	21	5	34	34	5	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	37	50	37	6	31	6	23	6	38	38	6	23
Pedestrians		5			5			5			5	
Lane Width (m)		4.8			4.8			4.8			4.8	
Walking Speed (m/s)		1.0			1.0			1.0			1.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)		322										
pX, platoon unblocked												
vC, conflicting volume	42			92			224	202	78	240	217	44
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	42			92			224	202	78	240	217	44
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			97	99	96	94	99	98
cM capacity (veh/h)	1557			1493			678	666	969	652	653	1012
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	124	43	67	67								
Volume Left	37	6	23	38								
Volume Right	37	6	38	23								
cSH	1557	1493	816	743								
Volume to Capacity	0.02	0.00	0.08	0.09								
Queue Length 95th (m)	0.5	0.1	1.9	2.1								
Control Delay (s)	2.3	1.1	9.8	10.3								
Lane LOS	A	A	A	B								
Approach Delay (s)	2.3	1.1	9.8	10.3								
Approach LOS			A	B								
Intersection Summary												
Average Delay			5.6									
Intersection Capacity Utilization			26.7%		ICU Level of Service				A			
Analysis Period (min)			15									

## Appendix E – Collision Details Report





# COLLISION DIAGRAM

LOCATION: Carp Road & Kittiwake Drive / Echowoods Avenue  
 CITY: Ottawa, ON  
 PERIOD: January 2014 to December 2018






DATE: June 26, 2020  
 PREPARED BY: M.C.

## Carp Road



Kittiwake Drive

Echowoods Avenue

 DW  
 DD  
 DD  
 DD  
 DD  
  
 08/14/2014  
 09/01/2016  
 05/06/2016  
 01/24/2018  
 09/14/2018

DD  01/17/2018

07/18/2017

DD 

12/08/2016

NS 

07/11/2016






DD 

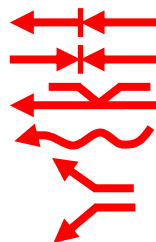
01/15/2015

DD 

## Carp Road

### LEGEND

-  Vehicle Path
-  Pedestrian Path
-  Fixed Object
-  Personal Injury
-  Fatality



- Rear-end Collision
- Head-on Collision
- Side Swipe
- Out Of Control
- Right-turning Vehicle
- Left-turning Vehicle

### Conditions

D W

- |               |                     |
|---------------|---------------------|
| Time of Day   | Roadway             |
| D – Daytime   | D – Dry    W – Wet  |
| N – Nighttime | I – Icy    S – Snow |



# COLLISION DIAGRAM

LOCATION: Carp Road & Hazeldean Road  
 CITY: Ottawa, ON  
 PERIOD: January 2014 to December 2018

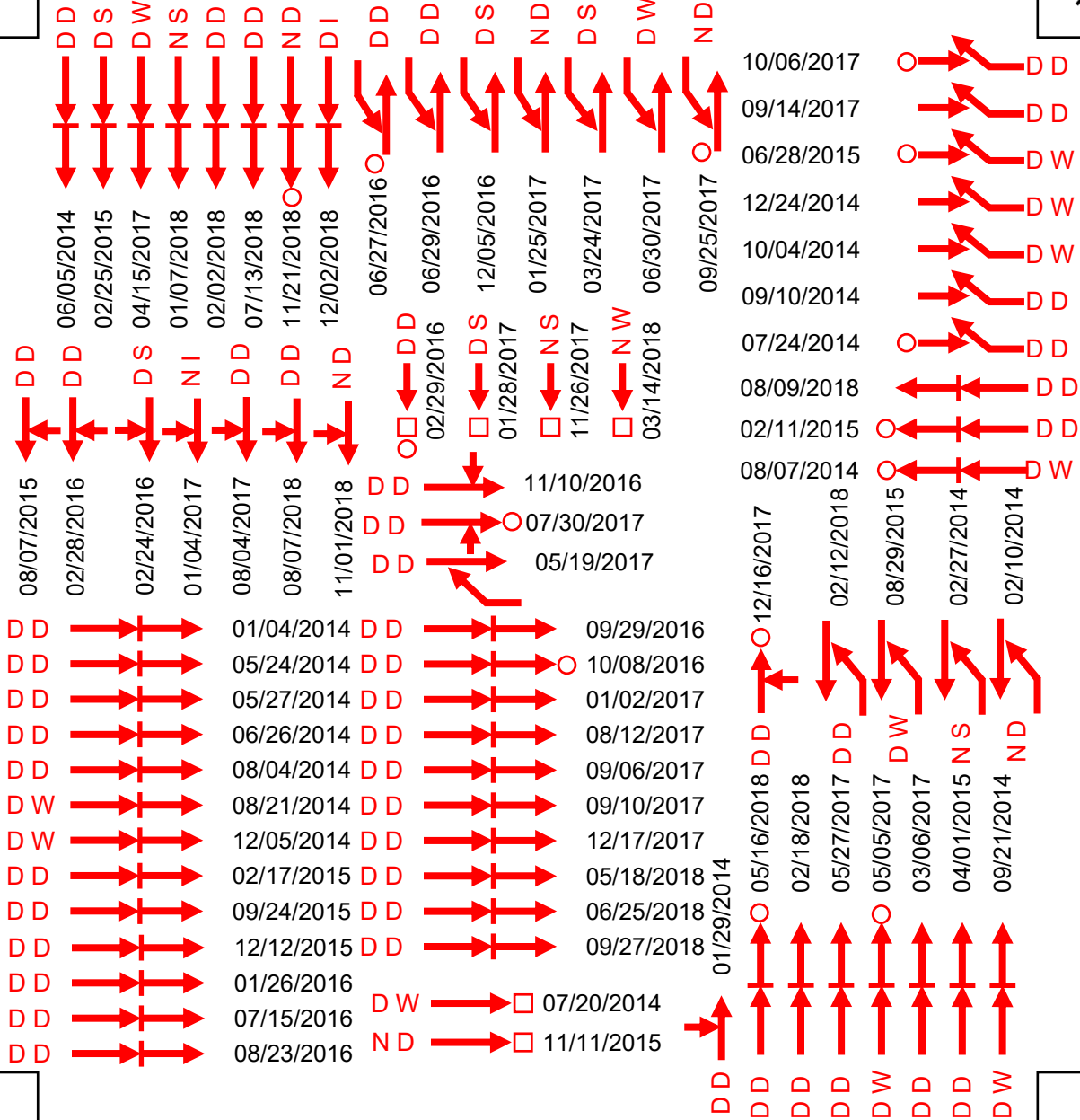
DATE: June 26, 2020  
 PREPARED BY: M.C.

## Carp Road



Hazeldean Road

Hazeldean Road



### LEGEND

- Vehicle Path
- Pedestrian Path
- Fixed Object
- Personal Injury
- Fatality

- Rear-end Collision
- Head-on Collision
- Side Swipe
- Out Of Control
- Right-turning Vehicle
- Left-turning Vehicle

### Conditions

- D W**
- Time of Day      Roadway
- D – Daytime
  - N – Nighttime
  - D – Dry
  - I – Icy
  - W – Wet
  - S – Snow

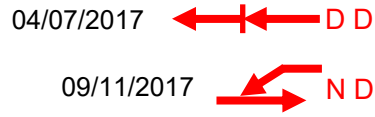
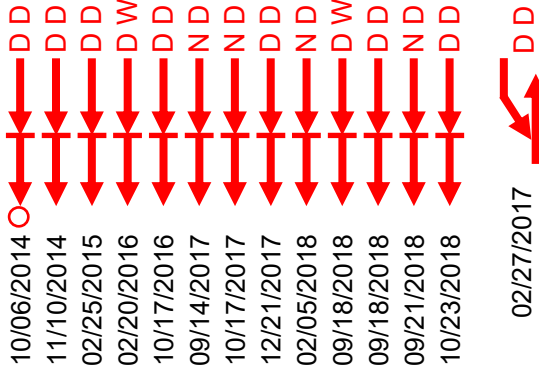


# COLLISION DIAGRAM

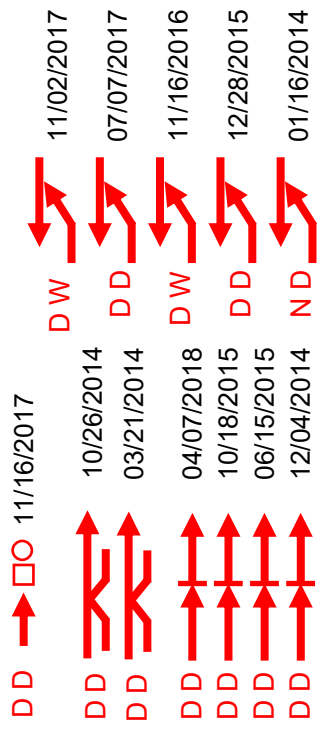
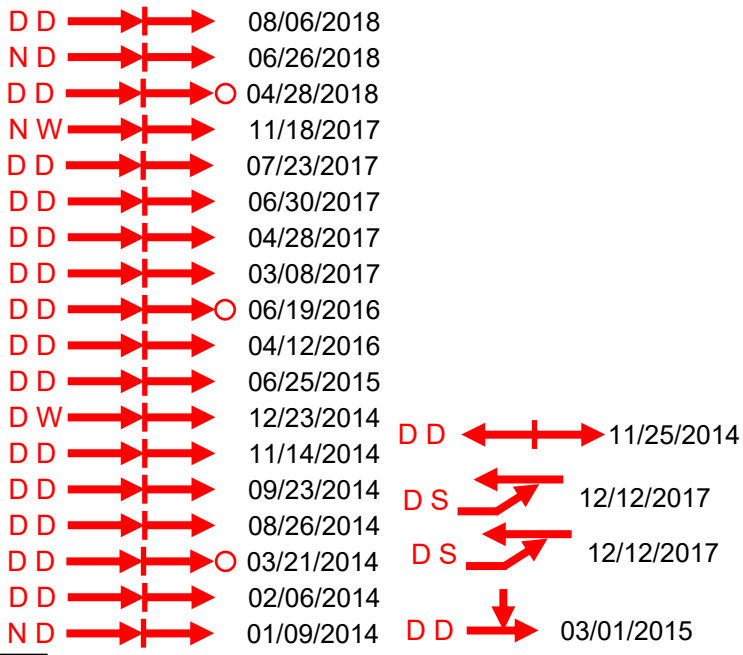
LOCATION: Carp Road & Stittsville Main Street  
 CITY: Ottawa, ON  
 PERIOD: January 2014 to December 2018

DATE: June 26, 2020  
 PREPARED BY: M.C.

## Stittsville Main Street



## Carp Road



## 1261 Stittsville Main

## Stittsville Main Street

### LEGEND

- ← Vehicle Path
- ← Pedestrian Path
- Fixed Object
- Personal Injury
- ⊗ Fatality

- ←←← Rear-end Collision
- ←→ Head-on Collision
- ←K Side Swipe
- ←~ Out Of Control
- ←↘ Right-turning Vehicle
- ←↙ Left-turning Vehicle

### Conditions

- D W**
- Time of Day      Roadway
- D – Daytime
  - N – Nighttime
  - D – Dry
  - I – Icy
  - W – Wet
  - S – Snow



# COLLISION DIAGRAM

LOCATION: Hazeldean Road & Stittsville Main Street  
 CITY: Ottawa, ON  
 PERIOD: January 2014 to December 2018

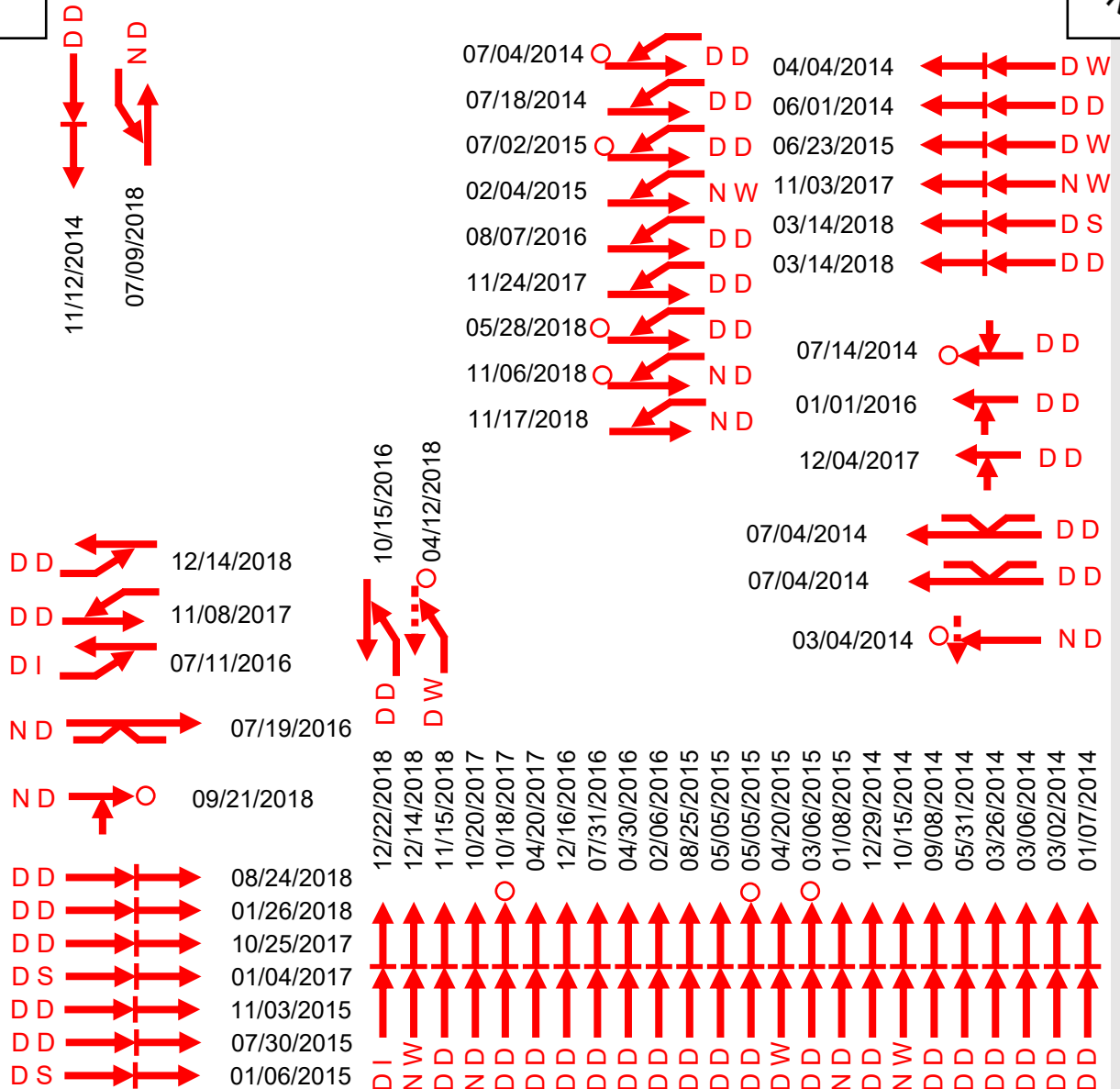
DATE: Dec. 11, 2020  
 PREPARED BY: M.C.

## Stittsville Main Street



Hazeldean Road

Hazeldean Road



### LEGEND

- Vehicle Path
- Pedestrian Path
- Fixed Object
- Personal Injury
- Fatality

- Rear-end Collision
- Head-on Collision
- Side Swipe
- Out Of Control
- Right-turning Vehicle
- Left-turning Vehicle

### Conditions

D W

- |             |               |         |          |
|-------------|---------------|---------|----------|
| Time of Day |               | Roadway |          |
| D – Daytime | N – Nighttime | D – Dry | W – Wet  |
|             |               | I – Icy | S – Snow |



# City Operations - Transportation Services

## Collision Details Report - Public Version

**From:** January 1, 2014    **To:** December 31, 2018

**Location:** CARP RD @ ECHOWOODS AVE/KITTIWAKE DR

**Traffic Control:** Traffic signal

**Total Collisions:** 10

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2014-Aug-14, Thu, 17:04	Rain	Rear end	P.D. only	Wet	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Pick-up truck	Other motor vehicle	
2015-Jan-15, Thu, 14:46	Clear	Rear end	P.D. only	Wet	North	Stopped	Automobile, station wagon	Other motor vehicle	
					North	Stopped	Automobile, station wagon	Other motor vehicle	
					North	Going ahead	Pick-up truck	Other motor vehicle	
2016-Sep-01, Thu, 16:45	Clear	Rear end	P.D. only	Dry	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2016-May-06, Fri, 15:59	Clear	Rear end	P.D. only	Dry	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2016-Jul-11, Mon, 12:07	Clear	Rear end	Non-fatal injury	Dry	North	Going ahead	Pick-up truck	Other motor vehicle	
					North	Stopped	Pick-up truck	Other motor vehicle	

2016-Dec-08, Thu,19:56	Snow	Approaching	P.D. only	Packed snow	North	Going ahead	Automobile, station wagon	Skidding/sliding
					South	Turning left	Automobile, station wagon	Other
2017-Jul-18, Tue,15:44	Clear	Angle	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Stopped	Intercity bus	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
2018-Jan-24, Wed,15:30	Clear	Rear end	P.D. only	Dry	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
2018-Jan-17, Wed,07:41	Clear	Sideswipe	P.D. only	Slush	West	Turning right	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2018-Sep-14, Fri,11:29	Clear	Rear end	P.D. only	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Slowing or stopping	Delivery van	Other motor vehicle

**Location:** CARP RD @ HAZELDEAN RD

**Traffic Control:** Traffic signal

**Total Collisions:** 77

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Jan-04, Sat,14:55	Clear	Rear end	P.D. only	Wet	West	Turning right	Automobile, station wagon	Other motor vehicle	

					West	Turning right	Automobile, station wagon	Other motor vehicle
2014-Jan-29, Wed,08:10	Clear	Angle	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Pick-up truck	Other motor vehicle
2014-Feb-10, Mon,17:09	Clear	Turning movement	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Pick-up truck	Other motor vehicle
2014-Feb-27, Thu,17:58	Snow	Turning movement	P.D. only	Loose snow	North	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2014-May-24, Sat,13:15	Clear	Rear end	P.D. only	Dry	West	Turning right	Automobile, station wagon	Other motor vehicle
					West	Turning right	Pick-up truck	Other motor vehicle
2014-May-27, Tue,11:15	Clear	Rear end	P.D. only	Dry	West	Turning right	Automobile, station wagon	Other motor vehicle
					West	Turning right	Automobile, station wagon	Other motor vehicle
2014-Jun-05, Thu,09:09	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Stopped	Pick-up truck	Other motor vehicle
2014-Jun-26, Thu,17:12	Clear	Rear end	P.D. only	Dry	West	Changing lanes	Pick-up truck	Other motor vehicle

					West	Stopped	Automobile, station wagon	Other motor vehicle
					West	Stopped	Pick-up truck	Other motor vehicle
2014-Jul-24, Thu,12:23	Clear	Turning movement	Non-fatal injury	Dry	East	Turning left	Truck and trailer	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2014-Aug-04, Mon,16:00	Rain	Rear end	P.D. only	Wet	West	Going ahead	Pick-up truck	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2014-Jul-20, Sun,08:33	Rain	SMV other	P.D. only	Wet	West	Slowing or stopping	Automobile, station wagon	Curb
2014-Aug-07, Thu,08:46	Clear	Rear end	Non-fatal injury	Dry	East	Going ahead	Pick-up truck	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Passenger van	Other motor vehicle
2014-Aug-21, Thu,18:15	Rain	Rear end	P.D. only	Wet	West	Going ahead	Pick-up truck	Other motor vehicle
					West	Going ahead	Pick-up truck	Other motor vehicle
2014-Sep-21, Sun,11:58	Rain	Rear end	P.D. only	Wet	North	Turning left	Pick-up truck	Skidding/sliding
					North	Turning left	Pick-up truck	Other motor vehicle



2014-Dec-05, Fri,08:42	Clear	Rear end	P.D. only	Dry	West	Turning right	Pick-up truck	Other motor vehicle
					West	Turning right	School bus	Other motor vehicle
2014-Sep-10, Wed,14:18	Clear	Turning movement	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2014-Oct-04, Sat,09:44	Rain	Turning movement	P.D. only	Wet	East	Turning left	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2014-Dec-24, Wed,12:40	Rain	Turning movement	P.D. only	Wet	East	Making "U" turn	Unknown	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Apr-01, Wed,11:08	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
2015-Feb-11, Wed,08:18	Clear	Rear end	Non-fatal injury	Dry	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
					East	Stopped	Passenger van	Other motor vehicle
2015-Feb-25, Wed,07:30	Snow	Rear end	P.D. only	Loose snow	South	Going ahead	Truck - closed	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle

2015-Feb-17, Tue,10:35	Clear	Rear end	P.D. only	Dry	West	Turning right	Pick-up truck	Other motor vehicle
					West	Turning right	Automobile, station wagon	Other motor vehicle
2015-Aug-29, Sat,18:42	Rain	Turning movement	P.D. only	Wet	North	Turning left	Pick-up truck	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Jun-28, Sun,15:48	Rain	Turning movement	Non-fatal injury	Wet	East	Turning left	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Passenger van	Other motor vehicle
2015-Aug-07, Fri,09:57	Clear	Angle	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Turning right	Automobile, station wagon	Other motor vehicle
2016-Jun-07, Tue,11:51	Clear	Turning movement	Non-fatal injury	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Pick-up truck	Other motor vehicle
2015-Nov-11, Wed,20:30	Clear	SMV other	P.D. only	Dry	West	Turning right	Automobile, station wagon	Pole (sign, parking meter)
2016-Feb-24, Wed,14:29	Snow	Angle	P.D. only	Loose snow	South	Slowing or stopping	Automobile, station wagon	Skidding/sliding
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2016-Feb-28, Sun,09:37	Clear	Angle	P.D. only	Wet	South	Going ahead	Unknown	Other motor vehicle

					East	Going ahead	Automobile, station wagon	Other motor vehicle
2016-Feb-29, Mon,09:46	Clear	SMV other	Non-fatal injury	Slush	South	Going ahead	Automobile, station wagon	Pole (utility, power)
2016-Jan-26, Tue,10:55	Clear	Rear end	P.D. only	Dry	West	Turning right	Automobile, station wagon	Other motor vehicle
					West	Turning right	Pick-up truck	Other motor vehicle
2015-Sep-24, Thu,15:33	Clear	Rear end	P.D. only	Dry	West	Turning right	Pick-up truck	Other motor vehicle
					West	Turning right	Automobile, station wagon	Other motor vehicle
2015-Dec-12, Sat,13:53	Clear	Rear end	P.D. only	Dry	West	Turning right	Pick-up truck	Other motor vehicle
					West	Turning right	Automobile, station wagon	Other motor vehicle
2016-Jun-29, Wed,12:07	Clear	Turning movement	P.D. only	Dry	South	Turning left	Pick-up truck	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2016-Aug-23, Tue,12:57	Clear	Rear end	P.D. only	Dry	West	Turning right	Automobile, station wagon	Other motor vehicle
					West	Turning right	Automobile, station wagon	Other motor vehicle
2016-Jul-15, Fri,09:30	Clear	Rear end	P.D. only	Dry	West	Turning right	Pick-up truck	Other motor vehicle
					West	Turning right	Pick-up truck	Other motor vehicle

2016-Nov-10, Thu,07:15	Clear	Angle	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Turning left	Truck - dump	Other motor vehicle
2016-Oct-08, Sat,12:43	Clear	Rear end	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Turning right	Automobile, station wagon	Other motor vehicle
2016-Sep-29, Thu,13:36	Clear	Rear end	P.D. only	Dry	West	Turning right	Pick-up truck	Other motor vehicle
					West	Turning right	Automobile, station wagon	Other motor vehicle
2017-Jan-02, Mon,10:53	Clear	Rear end	P.D. only	Dry	West	Turning right	Pick-up truck	Other motor vehicle
					West	Turning right	Pick-up truck	Other motor vehicle
2017-Jan-04, Wed,20:00	Freezing Rain	Angle	P.D. only	Ice	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle
2017-Oct-06, Fri,12:27	Clear	Turning movement	Non-fatal injury	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Sep-14, Thu,15:41	Clear	Turning movement	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Pick-up truck	Other motor vehicle

2017-Sep-06, Wed,17:10	Clear	Rear end	P.D. only	Dry	West	Turning right	Pick-up truck	Other motor vehicle
					West	Turning right	Pick-up truck	Other motor vehicle
2017-Sep-25, Mon,19:40	Clear	Turning movement	Non-fatal injury	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Aug-12, Sat,10:23	Clear	Rear end	P.D. only	Dry	West	Turning right	Automobile, station wagon	Other motor vehicle
					West	Turning right	Automobile, station wagon	Other motor vehicle
2017-Jan-25, Wed,19:16	Clear	Turning movement	P.D. only	Wet	South	Turning left	Passenger van	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Jan-28, Sat,09:44	Snow	SMV other	P.D. only	Wet	South	Turning right	Automobile, station wagon	Pole (utility, power)
2016-Dec-05, Mon,08:07	Snow	Turning movement	P.D. only	Loose snow	South	Turning left	Truck - closed	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Mar-24, Fri,08:18	Snow	Turning movement	P.D. only	Loose snow	South	Turning left	School bus	Other motor vehicle
					North	Going ahead	Delivery van	Other motor vehicle
2017-Apr-15, Sat,14:21	Rain	Rear end	P.D. only	Wet	South	Going ahead	Pick-up truck	Other motor vehicle

					South	Stopped	Pick-up truck	Other motor vehicle
					South	Stopped	Pick-up truck	Other motor vehicle
					South	Stopped	Pick-up truck	Other motor vehicle
2017-May-05, Fri, 15:49	Rain	Rear end	Non-fatal injury	Wet	North	Slowing or stopping	Pick-up truck	Other motor vehicle
					North	Stopped	Pick-up truck	Other motor vehicle
2017-Mar-06, Mon, 12:08	Clear	Rear end	P.D. only	Dry	North	Turning right	Pick-up truck	Other motor vehicle
					North	Turning right	Pick-up truck	Other motor vehicle
2017-May-27, Sat, 12:52	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
2017-May-19, Fri, 16:46	Clear	Turning movement	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Turning left	Passenger van	Other motor vehicle
2017-Jun-30, Fri, 12:44	Rain	Turning movement	P.D. only	Wet	South	Turning left	Pick-up truck	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Sep-10, Sun, 14:00	Clear	Rear end	P.D. only	Dry	West	Turning right	Automobile, station wagon	Other motor vehicle
					West	Turning right	Automobile, station wagon	Other motor vehicle

2017-Dec-17, Sun,13:39	Clear	Rear end	P.D. only	Wet	West	Turning right	Automobile, station wagon	Other motor vehicle
					West	Turning right	Pick-up truck	Other motor vehicle
2017-Jul-30, Sun,14:17	Clear	Angle	Non-fatal injury	Dry	West	Going ahead	Bicycle	Other motor vehicle
					North	Going ahead	Pick-up truck	Cyclist
2017-Aug-04, Fri,13:00	Clear	Angle	P.D. only	Dry	South	Going ahead	Pick-up truck	Other motor vehicle
					West	Going ahead	Pick-up truck	Other motor vehicle
2017-Nov-26, Sun,19:34	Snow	SMV other	P.D. only	Ice	South	Turning right	Automobile, station wagon	Skidding/sliding
2017-Dec-16, Sat,09:13	Clear	Angle	Non-fatal injury	Ice	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2018-Jan-07, Sun,18:27	Snow	Rear end	Non-reportable	Loose snow	South	Unknown	Automobile, station wagon	Other motor vehicle
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle
2018-Feb-02, Fri,09:15	Clear	Rear end	P.D. only	Dry	South	Going ahead	Pick-up truck	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle

2018-Mar-14, Wed,22:45	Rain	SMV other	P.D. only	Ice	South	Turning right	Automobile, station wagon	Skidding/sliding
2018-Feb-18, Sun,10:22	Clear	Rear end	P.D. only	Dry	North	Merging	Automobile, station wagon	Other motor vehicle
					North	Merging	Automobile, station wagon	Other motor vehicle
2018-Feb-12, Mon,08:45	Clear	Turning movement	P.D. only	Slush	North	Turning left	Truck - tractor	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2018-May-18, Fri,09:20	Clear	Rear end	P.D. only	Dry	West	Turning right	Automobile, station wagon	Other motor vehicle
					West	Turning right	Automobile, station wagon	Other motor vehicle
2018-May-16, Wed,10:44	Clear	Rear end	Non-fatal injury	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
2018-Jul-13, Fri,10:09	Clear	Rear end	P.D. only	Dry	South	Turning left	Truck - dump	Other motor vehicle
					South	Turning left	Automobile, station wagon	Other motor vehicle
2018-Jun-25, Mon,16:09	Clear	Rear end	P.D. only	Dry	West	Turning right	Automobile, station wagon	Other motor vehicle
					West	Turning right	Automobile, station wagon	Other motor vehicle
2018-Nov-21, Wed,17:08	Clear	Rear end	Non-fatal injury	Ice	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle



					South	Stopped	Automobile, station wagon	Other motor vehicle
2018-Dec-02, Sun, 14:42	Freezing Rain	Rear end	P.D. only	Slush	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
2018-Sep-27, Thu, 13:55	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2018-Aug-09, Thu, 17:30	Rain	Rear end	P.D. only	Wet	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
2018-Aug-07, Tue, 08:54	Clear	Angle	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Truck - closed	Other
2018-Nov-01, Thu, 17:04	Clear	Angle	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle

**Location:** CARP RD @ STITTSVILLE MAIN ST

**Traffic Control:** Traffic signal

**Total Collisions:** 51

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
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2014-Jan-16, Thu,18:40	Clear	Turning movement	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2014-Jan-09, Thu,17:25	Clear	Rear end	P.D. only	Dry	East	Turning right	Automobile, station wagon	Other motor vehicle
					East	Turning right	Automobile, station wagon	Other motor vehicle
2014-Feb-06, Thu,14:15	Clear	Rear end	P.D. only	Wet	East	Turning right	Automobile, station wagon	Other motor vehicle
					East	Turning right	Automobile, station wagon	Other motor vehicle
2014-Mar-21, Fri,14:15	Clear	Sideswipe	P.D. only	Dry	North	Changing lanes	Automobile, station wagon	Other motor vehicle
					North	Turning left	Pick-up truck	Other motor vehicle
2014-Mar-21, Fri,08:58	Clear	Rear end	Non-fatal injury	Dry	East	Turning right	Pick-up truck	Other motor vehicle
					East	Turning right	Passenger van	Other motor vehicle
2014-Aug-26, Tue,17:15	Clear	Rear end	P.D. only	Dry	East	Turning right	Pick-up truck	Other motor vehicle
					East	Turning right	Automobile, station wagon	Other motor vehicle
2014-Sep-23, Tue,11:55	Clear	Rear end	P.D. only	Dry	East	Turning right	Pick-up truck	Other motor vehicle
					East	Turning right	Delivery van	Other motor vehicle

2014-Oct-06, Mon,14:50	Clear	Rear end	Non-fatal injury	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle
					South	Turning right	Pick-up truck	Other motor vehicle

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2014-Dec-04, Thu,13:00	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle
					North	Stopped	Pick-up truck	Other motor vehicle

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2014-Nov-25, Tue,11:14	Clear	Other	P.D. only	Dry	East	Reversing	Pick-up truck	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle

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2014-Nov-10, Mon,09:50	Clear	Rear end	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle
					South	Turning right	Automobile, station wagon	Other motor vehicle

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2014-Nov-14, Fri,07:41	Clear	Rear end	P.D. only	Dry	East	Turning right	Passenger van	Other motor vehicle
					East	Turning right	Automobile, station wagon	Other motor vehicle

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2014-Oct-26, Sun,11:55	Clear	Sideswipe	P.D. only	Dry	North	Changing lanes	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Unknown	Other motor vehicle

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2014-Dec-23, Tue,14:42	Rain	Rear end	P.D. only	Wet	East	Turning right	Unknown	Other motor vehicle
					East	Turning right	Automobile, station wagon	Other motor vehicle
					East	Turning right	Pick-up truck	Other motor vehicle

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2015-Apr-23, Thu,15:10	Clear	Turning movement	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Jun-25, Thu,14:42	Clear	Rear end	P.D. only	Dry	East	Turning right	Pick-up truck	Other motor vehicle
					East	Turning right	Pick-up truck	Other motor vehicle
2015-Mar-01, Sun,11:41	Clear	Angle	P.D. only	Dry	East	Going ahead	Pick-up truck	Other motor vehicle
					North	Going ahead	Pick-up truck	Other motor vehicle
2015-Feb-25, Wed,15:35	Clear	Rear end	P.D. only	Dry	South	Going ahead	Pick-up truck	Other motor vehicle
					South	Stopped	Pick-up truck	Other motor vehicle
2015-Jun-15, Mon,09:49	Clear	Rear end	P.D. only	Dry	North	Going ahead	Pick-up truck	Other motor vehicle
					North	Stopped	Pick-up truck	Other motor vehicle
2016-Feb-20, Sat,08:50	Rain	Rear end	P.D. only	Wet	South	Turning right	Passenger van	Other motor vehicle
					South	Turning right	Pick-up truck	Other motor vehicle
2016-Jun-19, Sun,13:00	Clear	Rear end	Non-fatal injury	Dry	East	Slowing or stopping	Passenger van	Other motor vehicle
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle

2015-Oct-18, Sun,12:33	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					North	Stopped	Ambulance	Other motor vehicle
2016-Apr-12, Tue,13:00	Clear	Rear end	P.D. only	Dry	East	Turning right	Automobile, station wagon	Other motor vehicle
					East	Turning right	Pick-up truck	Other motor vehicle
2015-Dec-28, Mon,09:50	Clear	Turning movement	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2016-Oct-17, Mon,09:18	Clear	Rear end	P.D. only	Dry	South	Turning right	Pick-up truck	Other motor vehicle
					South	Turning right	Automobile, station wagon	Other motor vehicle
2016-Nov-16, Wed,09:23	Rain	Turning movement	P.D. only	Wet	North	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Pick-up truck	Other motor vehicle
2016-Dec-30, Fri,20:12	Clear	Rear end	P.D. only	Loose snow	South	Going ahead	Pick-up truck	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
2017-Mar-08, Wed,17:58	Clear	Rear end	P.D. only	Dry	East	Turning right	Automobile, station wagon	Other motor vehicle
					East	Turning right	Pick-up truck	Other motor vehicle

2017-Feb-27, Mon,13:50	Clear	Turning movement	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Pick-up truck	Other motor vehicle
2017-Apr-28, Fri,18:45	Clear	Rear end	P.D. only	Dry	East	Turning right	Automobile, station wagon	Other motor vehicle
					East	Turning right	Pick-up truck	Other motor vehicle
2017-Apr-07, Fri,15:46	Clear	Rear end	P.D. only	Dry	West	Turning right	Automobile, station wagon	Other motor vehicle
					West	Turning right	Automobile, station wagon	Other motor vehicle
2017-Jun-30, Fri,18:49	Clear	Rear end	P.D. only	Dry	East	Turning right	Pick-up truck	Other motor vehicle
					East	Turning right	Automobile, station wagon	Other motor vehicle
2017-Jul-07, Fri,11:37	Clear	Turning movement	P.D. only	Dry	North	Turning left	Truck and trailer	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Dec-12, Tue,08:33	Snow	Turning movement	P.D. only	Loose snow	East	Turning left	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Jul-23, Sun,09:51	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle

2017-Nov-18, Sat,15:52	Rain	Rear end	P.D. only	Wet	East	Turning right	Automobile, station wagon	Other motor vehicle	
					East	Turning right	Automobile, station wagon	Other motor vehicle	
2017-Sep-14, Thu,19:30	Clear	Rear end	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle	
					South	Turning right	Automobile, station wagon	Other motor vehicle	
2017-Nov-16, Thu,06:55	Rain	SMV other	Non-fatal injury	Wet	North	Turning left	Automobile, station wagon	Pedestrian	1
2017-Dec-21, Thu,18:30	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Sep-11, Mon,19:17	Clear	Turning movement	P.D. only	Dry	West	Turning left	Unknown	Other motor vehicle	
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Oct-17, Tue,13:00	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Apr-07, Sat,13:49	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	
					North	Unknown	Unknown	Other motor vehicle	
2018-Apr-28, Sat,12:07	Clear	Rear end	Non-fatal injury	Dry	East	Turning right	Automobile, station wagon	Other motor vehicle	

					East	Turning right	Automobile, station wagon	Other motor vehicle
2018-Feb-05, Mon,09:55	Rain	Rear end	P.D. only	Wet	South	Merging	Police vehicle	Other motor vehicle
					South	Merging	Automobile, station wagon	Other motor vehicle
2018-Jun-26, Tue,21:05	Clear	Rear end	P.D. only	Dry	East	Turning right	Passenger van	Other motor vehicle
					East	Turning right	Automobile, station wagon	Other motor vehicle
2018-Oct-23, Tue,16:49	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2018-Nov-02, Fri,07:00	Rain	Turning movement	P.D. only	Wet	North	Turning left	Pick-up truck	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2018-Sep-18, Tue,17:30	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
					South	Stopped	Pick-up truck	Other motor vehicle
2018-Sep-18, Tue,12:23	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle



2018-Sep-21, Fri,22:00	Clear	Rear end	P.D. only	Wet	South	Stopped	Automobile, station wagon	Other motor vehicle
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle

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2018-Aug-06, Mon,17:24	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Turning right	Automobile, station wagon	Other motor vehicle

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# Transportation Services - Traffic Services

## Collision Details Report - Public Version

From: January 1, 2014 To: December 31, 2018

**Location:** STITTSVILLE MAIN ST @ HAZELDEAN RD

**Traffic Control:** Traffic signal

**Total Collisions:** 61

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2014-Jan-07, Tue,12:10	Clear	Rear end	P.D. only	Wet	North	Turning right	Pick-up truck	Other motor vehicle	0
					North	Turning right	Pick-up truck	Other motor vehicle	
2014-Mar-02, Sun,13:15	Clear	Rear end	P.D. only	Wet	North	Turning right	Pick-up truck	Other motor vehicle	0
					North	Turning right	Automobile, station wagon	Other motor vehicle	
2014-Mar-04, Tue,18:45	Clear	SMV other	Non-fatal injury	Loose snow	West	Turning right	Pick-up truck	Pedestrian	2
2014-Mar-06, Thu,16:10	Clear	Rear end	P.D. only	Dry	North	Turning right	Automobile, station wagon	Other motor vehicle	0
					North	Turning right	Automobile, station wagon	Other motor vehicle	
2014-Mar-26, Wed,07:30	Clear	Rear end	P.D. only	Dry	North	Turning right	Automobile, station wagon	Other motor vehicle	0
					North	Turning right	Pick-up truck	Other motor vehicle	
2014-Apr-04, Fri,18:21	Rain	Rear end	P.D. only	Wet	West	Slowing or stopping	Passenger van	Other motor vehicle	0
					West	Stopped	Municipal transit bus	Other motor vehicle	
2014-May-31, Sat,09:49	Clear	Rear end	P.D. only	Dry	North	Turning right	Pick-up truck	Other motor vehicle	0
					North	Turning right	Automobile, station wagon	Other motor vehicle	
2014-Jun-01, Sun,11:59	Clear	Rear end	P.D. only	Dry	West	Turning left	Pick-up truck	Other motor vehicle	0
					West	Turning left	Pick-up truck	Other motor vehicle	
2014-Jul-04, Fri,11:24	Clear	Turning movement	Non-fatal injury	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2014-Jul-04, Fri,12:45	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Unknown	Other motor vehicle	0
					West	Going ahead	Pick-up truck	Other motor vehicle	
2014-Jul-04, Fri,13:40	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Pick-up truck	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2014-Jul-14, Mon,06:00	Clear	Angle	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Turning left	Automobile, station wagon	Other motor vehicle	



# Transportation Services - Traffic Services

## Collision Details Report - Public Version

From: January 1, 2014 To: December 31, 2018

**Location:** STITTSVILLE MAIN ST @ HAZELDEAN RD

**Traffic Control:** Traffic signal

**Total Collisions:** 61

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2014-Jul-18, Fri,12:47	Clear	Turning movement	P.D. only	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2014-Sep-08, Mon,17:15	Clear	Rear end	P.D. only	Dry	North	Going ahead	Pick-up truck	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2014-Oct-15, Wed,20:55	Rain	Rear end	P.D. only	Wet	North	Turning right	Pick-up truck	Other motor vehicle	0
					North	Turning right	Automobile, station wagon	Other motor vehicle	
2014-Nov-12, Wed,08:15	Clear	Rear end	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle	0
					South	Turning left	Automobile, station wagon	Other motor vehicle	
2014-Dec-29, Mon,12:00	Clear	Rear end	P.D. only	Dry	North	Turning right	Automobile, station wagon	Other motor vehicle	0
					North	Turning right	Automobile, station wagon	Other motor vehicle	
2015-Jan-06, Tue,17:09	Snow	Rear end	P.D. only	Ice	East	Slowing or stopping	Pick-up truck	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2015-Jan-08, Thu,19:05	Clear	Rear end	P.D. only	Slush	North	Turning right	Automobile, station wagon	Other motor vehicle	0
					North	Turning right	Pick-up truck	Other motor vehicle	
2015-Feb-04, Wed,20:45	Rain	Turning movement	P.D. only	Slush	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2015-Mar-06, Fri,16:51	Clear	Rear end	Non-fatal injury	Dry	North	Turning right	Automobile, station wagon	Other motor vehicle	0
					North	Turning right	Pick-up truck	Other motor vehicle	
2015-Apr-20, Mon,13:32	Rain	Rear end	P.D. only	Wet	North	Turning right	Automobile, station wagon	Other motor vehicle	0
					North	Turning right	Pick-up truck	Other motor vehicle	
2015-May-05, Tue,13:43	Clear	Rear end	Non-fatal injury	Dry	North	Turning right	Pick-up truck	Other motor vehicle	0
					North	Turning right	Automobile, station wagon	Other motor vehicle	
2015-May-05, Tue,15:39	Clear	Rear end	P.D. only	Dry	North	Turning right	Automobile, station wagon	Other motor vehicle	0
					North	Turning right	Pick-up truck	Other motor vehicle	



# Transportation Services - Traffic Services

## Collision Details Report - Public Version

**From:** January 1, 2014    **To:** December 31, 2018

**Location:** STITTSVILLE MAIN ST @ HAZELDEAN RD

**Traffic Control:** Traffic signal

**Total Collisions:** 61

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Jun-23, Tue,16:05	Rain	Rear end	P.D. only	Wet	West	Slowing or stopping	Pick-up truck	Other motor vehicle	0
					West	Stopped	Passenger van	Other motor vehicle	
2015-Jul-02, Thu,16:05	Clear	Turning movement	Non-fatal injury	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Pick-up truck	Other motor vehicle	
2015-Jul-30, Thu,12:10	Clear	Rear end	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Turning left	Automobile, station wagon	Other motor vehicle	
2015-Aug-25, Tue,15:51	Clear	Rear end	P.D. only	Dry	North	Turning right	Pick-up truck	Other motor vehicle	0
					North	Turning right	Automobile, station wagon	Other motor vehicle	
2015-Nov-03, Tue,12:31	Clear	Rear end	P.D. only	Dry	East	Turning right	Unknown	Other motor vehicle	0
					East	Turning right	Automobile, station wagon	Other motor vehicle	
2016-Jan-01, Fri,17:33	Clear	Angle	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2016-Feb-06, Sat,10:35	Clear	Rear end	P.D. only	Dry	North	Turning right	Pick-up truck	Other motor vehicle	0
					North	Turning right	Automobile, station wagon	Other motor vehicle	
2016-Apr-30, Sat,11:07	Clear	Rear end	P.D. only	Dry	North	Turning right	Pick-up truck	Other motor vehicle	0
					North	Turning right	Pick-up truck	Other motor vehicle	
2016-Jul-11, Mon,13:45	Clear	Turning movement	P.D. only	Dry	East	Turning left	Passenger van	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2016-Jul-19, Tue,23:55	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2016-Jul-31, Sun,11:58	Clear	Rear end	P.D. only	Dry	North	Going ahead	Passenger van	Other motor vehicle	0
					North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2016-Aug-07, Sun,15:39	Clear	Turning movement	P.D. only	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	



# Transportation Services - Traffic Services

## Collision Details Report - Public Version

From: January 1, 2014 To: December 31, 2018

**Location:** STITTSVILLE MAIN ST @ HAZELDEAN RD

**Traffic Control:** Traffic signal

**Total Collisions:** 61

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2016-Oct-15, Sat,18:05	Clear	Turning movement	P.D. only	Dry	North	Turning left	Pick-up truck	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2016-Dec-16, Fri,13:20	Clear	Rear end	P.D. only	Dry	North	Turning right	Automobile, station wagon	Other motor vehicle	0
					North	Turning right	Passenger van	Other motor vehicle	
2017-Jan-04, Wed,14:48	Snow	Rear end	P.D. only	Ice	East	Slowing or stopping	Pick-up truck	Other motor vehicle	0
					East	Stopped	Passenger van	Other motor vehicle	
2017-Apr-20, Thu,10:45	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					North	Turning right	Automobile, station wagon	Other motor vehicle	
2017-Oct-18, Wed,17:10	Clear	Rear end	Non-fatal injury	Dry	North	Turning right	Automobile, station wagon	Other motor vehicle	0
					North	Turning right	Automobile, station wagon	Other motor vehicle	
2017-Oct-20, Fri,21:48	Clear	Rear end	P.D. only	Dry	North	Turning right	Automobile, station wagon	Other motor vehicle	0
					North	Turning right	Automobile, station wagon	Other motor vehicle	
2017-Oct-25, Wed,17:39	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Pick-up truck	Other motor vehicle	
2017-Nov-03, Fri,18:28	Rain	Rear end	P.D. only	Wet	West	Turning right	Automobile, station wagon	Other motor vehicle	0
					West	Turning right	Automobile, station wagon	Other motor vehicle	
2017-Nov-08, Wed,14:41	Clear	Turning movement	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Turning left	Automobile, station wagon	Other motor vehicle	
2017-Nov-24, Fri,16:27	Clear	Turning movement	P.D. only	Dry	West	Making "U" turn	Pick-up truck	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Dec-04, Mon,13:33	Clear	Angle	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	



# Transportation Services - Traffic Services

## Collision Details Report - Public Version

From: January 1, 2014 To: December 31, 2018

**Location:** STITTSVILLE MAIN ST @ HAZELDEAN RD

**Traffic Control:** Traffic signal

**Total Collisions:** 61

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2018-Jan-26, Fri,17:06	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Mar-14, Wed,16:05	Snow	Rear end	P.D. only	Slush	West	Slowing or stopping	Automobile, station wagon	Skidding/sliding	0
					West	Turning left	Automobile, station wagon	Other motor vehicle	
2018-Apr-12, Thu,16:38	Fog, mist, smoke, SMV other dust		Non-fatal injury	Dry	North	Turning left	Automobile, station wagon	Pedestrian	1
2018-May-28, Mon,13:06	Clear	Turning movement	Non-fatal injury	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Jul-19, Thu,09:59	Clear	Turning movement	P.D. only	Dry	South	Turning right	Truck - dump	Other motor vehicle	0
					North	Turning left	Automobile, station wagon	Other motor vehicle	
2018-Aug-24, Fri,14:34	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Sep-21, Fri,23:55	Strong wind	Angle	Non-fatal injury	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Pick-up truck	Other motor vehicle	
2018-Nov-06, Tue,17:28	Clear	Turning movement	Non-fatal injury	Wet	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Nov-15, Thu,13:15	Clear	Rear end	P.D. only	Dry	North	Turning right	Automobile, station wagon	Other motor vehicle	0
					North	Turning right	Passenger van	Other motor vehicle	
2018-Nov-17, Sat,16:18	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Nov-17, Sat,17:25	Clear	Turning movement	P.D. only	Wet	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Dec-14, Fri,15:45	Freezing Rain	Turning movement	P.D. only	Wet	East	Turning left	Pick-up truck	Other motor vehicle	0
					West	Going ahead	Pick-up truck	Other motor vehicle	



# Transportation Services - Traffic Services

## Collision Details Report - Public Version

From: January 1, 2014 To: December 31, 2018

**Location:** STITTSVILLE MAIN ST @ HAZELDEAN RD

**Traffic Control:** Traffic signal

**Total Collisions:** 61

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2018-Dec-14, Fri,19:16	Rain	Rear end	P.D. only	Slush	North	Going ahead	Unknown	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Dec-22, Sat,15:11	Freezing Rain	Rear end	P.D. only	Slush	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	

## **Appendix F – Ottawa 2011 O-D Survey, Kanata-Stittsville**



# Kanata - Stittsville

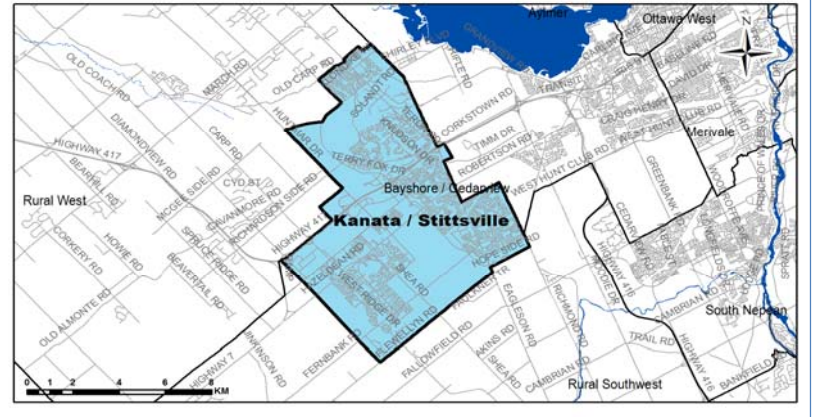
## Demographic Characteristics

Population	105,210	Actively Travelled	83,460
Employed Population	49,640	Number of Vehicles	64,540
Households	38,010	Area (km <sup>2</sup> )	82.6

Occupation Status (age 5+)	Male	Female	Total
Full Time Employed	24,670	19,590	44,260
Part Time Employed	1,540	3,840	5,380
Student	13,630	13,410	27,040
Retiree	6,480	8,350	14,820
Unemployed	850	940	1,790
Homemaker	160	3,310	3,470
Other	350	1,010	1,360
<b>Total:</b>	<b>47,690</b>	<b>50,440</b>	<b>98,120</b>

Traveller Characteristics	Male	Female	Total
Transit Pass Holders	5,940	6,920	12,860
Licensed Drivers	36,280	36,790	73,070
Telecommuters	200	380	580
Trips made by residents	135,300	143,330	278,630

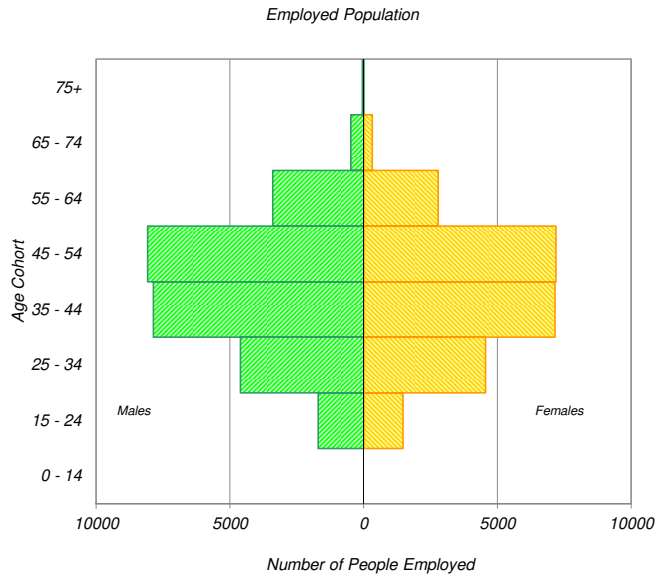
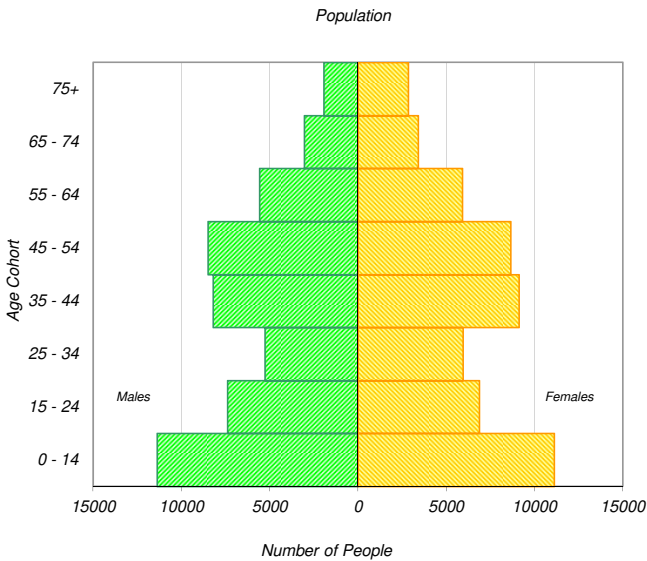
Selected Indicators	
Daily Trips per Person (age 5+)	2.84
Vehicles per Person	0.61
Number of Persons per Household	2.77
Daily Trips per Household	7.33
Vehicles per Household	1.70
Workers per Household	1.31
Population Density (Pop/km <sup>2</sup> )	1270



Household Size		
1 person	5,810	15%
2 persons	11,660	31%
3 persons	7,490	20%
4 persons	8,890	23%
5+ persons	4,160	11%
<b>Total:</b>	<b>38,010</b>	<b>100%</b>

Households by Vehicle Availability		
0 vehicles	1,050	3%
1 vehicle	14,090	37%
2 vehicles	19,110	50%
3 vehicles	3,000	8%
4+ vehicles	770	2%
<b>Total:</b>	<b>38,010</b>	<b>100%</b>

Households by Dwelling Type		
Single-detached	21,610	57%
Semi-detached	3,890	10%
Townhouse	10,550	28%
Apartment/Condo	1,960	5%
<b>Total:</b>	<b>38,010</b>	<b>100%</b>

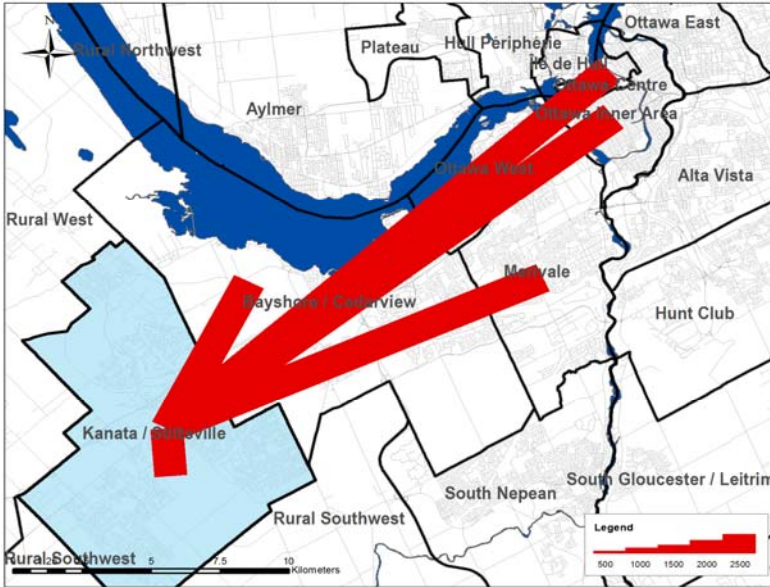


\* In 2005 data was only collected for household members aged 11+ therefore these results cannot be compared to the 2011 data.

## Travel Patterns

### Top Five Destinations of Trips from Kanata - Stittsville

#### AM Peak Period



### Summary of Trips to and from Kanata - Stittsville

#### AM Peak Period (6:30 - 8:59)

Districts	Destinations of Trips From		Origins of Trips To	
	District	% Total	District	% Total
Ottawa Centre	4,560	8%	140	0%
Ottawa Inner Area	3,350	6%	970	2%
Ottawa East	660	1%	260	1%
Beacon Hill	280	0%	170	0%
Alta Vista	1,810	3%	660	1%
Hunt Club	490	1%	420	1%
Merivale	3,410	6%	1,200	3%
Ottawa West	2,020	4%	840	2%
Bayshore / Cedarview	5,010	9%	2,420	5%
Orléans	290	1%	500	1%
Rural East	100	0%	30	0%
Rural Southeast	50	0%	260	1%
South Gloucester / Leitrim	60	0%	140	0%
South Nepean	690	1%	1,800	4%
Rural Southwest	1,130	2%	1,850	4%
Kanata / Stittsville	30,360	54%	30,360	66%
Rural West	1,050	2%	3,250	7%
Île de Hull	670	1%	30	0%
Hull Périphérie	160	0%	30	0%
Plateau	100	0%	230	0%
Aylmer	0	0%	190	0%
Rural Northwest	20	0%	60	0%
Pointe Gatineau	20	0%	80	0%
Gatineau Est	0	0%	60	0%
Rural Northeast	30	0%	50	0%
Buckingham / Masson-Angers	30	0%	10	0%
<b>Ontario Sub-Total:</b>	<b>55,320</b>	<b>98%</b>	<b>45,270</b>	<b>98%</b>
<b>Québec Sub-Total:</b>	<b>1,030</b>	<b>2%</b>	<b>740</b>	<b>2%</b>
<b>Total:</b>	<b>56,350</b>	<b>100%</b>	<b>46,010</b>	<b>100%</b>

### Trips by Trip Purpose

24 Hours	From District		To District		Within District	
Work or related	27,180	29%	17,020	18%	14,550	9%
School	7,070	7%	2,500	3%	15,110	9%
Shopping	6,070	6%	9,150	10%	22,480	14%
Leisure	8,450	9%	10,590	11%	17,090	11%
Medical	2,520	3%	1,170	1%	2,660	2%
Pick-up / drive passenger	6,570	7%	5,470	6%	15,190	9%
Return Home	33,610	35%	45,620	48%	65,770	41%
Other	3,560	4%	3,590	4%	8,440	5%
<b>Total:</b>	<b>95,030</b>	<b>100%</b>	<b>95,110</b>	<b>100%</b>	<b>161,290</b>	<b>100%</b>

AM Peak (06:30 - 08:59)	From District		To District		Within District	
Work or related	18,030	69%	11,020	70%	7,430	24%
School	4,890	19%	2,280	15%	11,740	39%
Shopping	170	1%	320	2%	760	3%
Leisure	340	1%	400	3%	780	3%
Medical	330	1%	230	1%	350	1%
Pick-up / drive passenger	1,260	5%	580	4%	4,760	16%
Return Home	290	1%	380	2%	1,980	7%
Other	670	3%	430	3%	2,560	8%
<b>Total:</b>	<b>25,980</b>	<b>100%</b>	<b>15,640</b>	<b>100%</b>	<b>30,360</b>	<b>100%</b>

PM Peak (15:30 - 17:59)	From District		To District		Within District	
Work or related	390	2%	350	1%	930	2%
School	370	2%	0	0%	90	0%
Shopping	1,030	5%	1,910	7%	5,100	14%
Leisure	2,140	11%	3,080	11%	4,130	11%
Medical	230	1%	180	1%	400	1%
Pick-up / drive passenger	1,980	10%	1,980	7%	3,410	9%
Return Home	12,130	64%	20,550	71%	21,560	58%
Other	680	4%	860	3%	1,850	5%
<b>Total:</b>	<b>18,950</b>	<b>100%</b>	<b>28,910</b>	<b>100%</b>	<b>37,470</b>	<b>100%</b>

Peak Period (%)	Total:	% of 24 Hours	Within District (%)
24 Hours	351,430		46%
AM Peak Period	71,980	20%	42%
PM Peak Period	85,330	24%	44%

### Trips by Primary Travel Mode

24 Hours	From District		To District		Within District	
Auto Driver	63,470	67%	63,830	67%	92,190	57%
Auto Passenger	15,220	16%	14,920	16%	31,880	20%
Transit	12,200	13%	12,270	13%	4,050	3%
Bicycle	360	0%	410	0%	960	1%
Walk	40	0%	50	0%	21,080	13%
Other	3,730	4%	3,660	4%	11,130	7%
<b>Total:</b>	<b>95,020</b>	<b>100%</b>	<b>95,140</b>	<b>100%</b>	<b>161,290</b>	<b>100%</b>

AM Peak (06:30 - 08:59)	From District		To District		Within District	
Auto Driver	15,360	59%	11,530	74%	13,630	45%
Auto Passenger	2,450	9%	1,160	7%	5,050	17%
Transit	6,230	24%	1,290	8%	1,210	4%
Bicycle	30	0%	80	1%	220	1%
Walk	0	0%	40	0%	5,730	19%
Other	1,900	7%	1,560	10%	4,510	15%
<b>Total:</b>	<b>25,970</b>	<b>100%</b>	<b>15,660</b>	<b>100%</b>	<b>30,350</b>	<b>100%</b>

PM Peak (15:30 - 17:59)	From District		To District		Within District	
Auto Driver	13,850	73%	17,660	61%	21,240	57%
Auto Passenger	3,240	17%	4,270	15%	8,570	23%
Transit	1,270	7%	5,980	21%	670	2%
Bicycle	40	0%	100	0%	260	1%
Walk	40	0%	0	0%	4,570	12%
Other	520	3%	910	3%	2,160	6%
<b>Total:</b>	<b>18,960</b>	<b>100%</b>	<b>28,920</b>	<b>100%</b>	<b>37,470</b>	<b>100%</b>

Avg Vehicle Occupancy	From District		To District		Within District	
24 Hours	1.24		1.23		1.35	
AM Peak Period	1.16		1.10		1.37	
PM Peak Period	1.23		1.24		1.40	

Transit Modal Split	From District		To District		Within District	
24 Hours	13%		13%		3%	
AM Peak Period	26%		9%		6%	
PM Peak Period	7%		21%		2%	

**2011 ORIGIN-DESTINATION SURVEY IN THE NATIONAL CAPITAL REGION  
PERSON TRIPS BY TRANS DISTRICTS**

**TRIP PURPOSES: ALL**

**MODES: AUTO DRIVER**

**TIME PERIOD: AM Peak Period (06:30 to 08:59)**

Origin \ Destination	Ottawa							
	Ottawa Centre	Inner Area	Ottawa East	Beacon Hill	Alta Vista	Hunt Club	Merivale	Ottawa West
001 - Ottawa Centre	400	300	300	100	400	200	300	200
050 - Ottawa Inner Area	1,600	3,500	800	600	2,300	700	1,400	700
100 - Ottawa East	900	1,100	2,400	900	1,400	400	900	300
120 - Beacon Hill	800	500	1,200	1,600	1,400	100	400	300
140 - Alta Vista	1,200	1,900	1,000	1,100	6,300	1,300	1,700	600
180 - Hunt Club	1,100	1,100	600	200	3,300	3,700	1,400	300
200 - Merivale	2,000	1,800	600	300	2,200	800	6,000	2,100
240 - Ottawa West	900	1,100	100	100	800	300	1,700	2,700
260 - Bayshore / Cedarview	1,000	1,200	200	300	1,600	200	2,500	1,900
300 - Orléans	2,000	1,700	1,900	2,500	4,200	800	1,200	1,000
350 - Rural East	300	100	100	300	400	100	200	100
360 - Rural Southeast	400	500	100	200	1,200	800	800	100
400 - South Gloucester / Leitrim	400	300	200	200	1,200	600	600	200
425 - South Nepean	1,100	1,100	500	300	1,700	800	2,900	900
450 - Rural Southwest	300	500	100	100	600	200	800	300
<b>500 - Kanata / Stittsville</b>	<b>1,600</b>	<b>1,400</b>	<b>400</b>	<b>200</b>	<b>1,200</b>	<b>500</b>	<b>2,600</b>	<b>1,200</b>
560 - Rural West	200	100	100	100	100	100	700	100
600 - Île de Hull	200	200	200	100	200	-	-	100
625 - Hull Périphérie	700	700	400	200	300	-	200	200
650 - Plateau	500	400	100	100	400	100	200	400
700 - Aylmer	800	600	200	100	400	200	400	600
750 - Rural Northwest	400	200	100	100	300	100	200	200
800 - Pointe Gatineau	600	600	300	400	600	100	300	300
820 - Gatineau Est	500	400	200	200	200	100	200	200
840 - Rural Northeast	300	400	100	-	300	-	-	100
845 - Buckingham / Masson-Angers	-	200	100	100	100	-	-	100
900 - External	-	-	-	-	-	-	-	-
Total	20,200	21,800	12,500	10,600	33,100	12,100	27,500	15,400

Bayshore / Cedarview	South							Kanata / Stittsville	Rural West	Île de Hull	Hull Périphérie
	Orléans	Rural East	Rural Southeast	Gloucester / Leitrim	South Nepean	Rural Southwest					
200	100	-	-	-	-	-	100	-	100	200	
500	400	-	-	200	300	200	600	-	500	300	
200	300	-	-	-	100	-	200	100	400	300	
200	500	-	-	-	-	-	100	-	200	200	
700	800	-	100	100	400	100	500	-	400	300	
400	300	-	100	300	300	100	300	100	200	100	
1,800	300	-	-	300	500	100	900	100	300	100	
1,300	200	-	100	-	100	100	700	100	200	100	
5,100	200	-	-	100	500	200	1,900	400	200	100	
900	11,400	400	100	100	100	100	400	100	900	400	
-	800	400	-	-	-	-	-	-	-	-	
200	200	100	1,500	300	400	100	300	-	100	-	
100	-	-	100	1,500	200	100	100	-	100	-	
2,200	100	-	200	100	5,800	500	1,700	-	300	100	
700	-	-	100	200	600	1,600	1,000	-	100	100	
<b>3,600</b>	<b>200</b>	<b>-</b>	<b>-</b>	<b>100</b>	<b>600</b>	<b>500</b>	<b>13,600</b>	<b>600</b>	<b>300</b>	<b>100</b>	
500	-	-	-	100	-	100	2,100	1,700	-	-	
-	100	-	-	-	-	-	-	-	600	400	
300	100	-	-	-	-	-	-	-	1,300	4,900	
100	100	-	-	-	-	-	200	-	700	2,000	
400	100	-	-	-	-	-	200	100	1,100	1,400	
100	-	-	-	-	-	-	100	-	400	900	
100	100	-	-	-	-	-	100	-	1,100	3,000	
100	100	-	-	-	-	-	100	-	800	1,500	
100	-	-	100	-	-	-	-	-	600	1,400	
-	-	-	-	-	-	-	-	-	200	700	
100	-	-	-	-	-	-	-	100	-	-	
<b>19,800</b>	<b>16,600</b>	<b>1,300</b>	<b>2,700</b>	<b>3,600</b>	<b>10,200</b>	<b>3,900</b>	<b>25,200</b>	<b>3,300</b>	<b>11,100</b>	<b>18,800</b>	

						Buckingham /			
Plateau	Aylmer	Rural Northwest	Pointe Gatineau	Gatineau Est	Rural Northeast	Masson-Angers	External	Total	
-	-	-	-	-	-	-	-	3,000	
-	200	-	100	100	-	-	200	15,000	
-	-	-	100	100	100	-	100	10,100	
-	-	-	100	-	-	-	100	7,800	
-	-	-	-	100	-	-	-	18,800	
-	-	-	-	100	-	-	100	14,300	
-	100	-	-	-	-	-	200	20,700	
-	100	-	-	-	100	-	100	11,000	
-	-	-	-	100	-	-	100	18,100	
-	-	-	200	-	-	-	400	31,000	
-	-	-	-	-	-	-	200	3,100	
-	-	-	-	-	-	-	300	7,800	
-	-	-	-	-	-	-	100	6,300	
-	100	-	-	-	-	-	100	20,500	
-	-	-	-	-	-	-	300	7,500	
100	-	-	-	-	-	-	300	29,100	
-	-	-	-	-	-	-	500	6,600	
100	-	-	200	-	-	-	-	2,500	
300	500	200	1,100	300	200	100	100	12,300	
900	400	100	300	200	-	-	-	7,200	
100	4,200	300	600	200	-	-	100	12,000	
100	500	1,900	400	-	-	-	100	6,100	
100	200	100	5,200	1,700	500	300	100	15,500	
100	300	-	2,900	5,000	300	400	100	13,800	
100	200	200	1,600	1,100	1,600	700	100	9,000	
-	100	100	800	1,000	300	3,300	100	7,100	
-	-	-	-	-	-	-	100	400	
2,000	6,700	3,000	13,600	10,000	3,300	4,900	3,900	317,100	

	IN	OUT
N CARP (ALL BUT 450, 500)	42%	52%
S STITTSVILLE MAIN (450)	4%	2%
TMC (500)	54%	47%

**2011 ORIGIN-DESTINATION SURVEY IN THE NATIONAL CAPITAL REGION  
PERSON TRIPS BY TRANS DISTRICTS**

**TRIP PURPOSES: ALL**

**MODES: AUTO DRIVER**

**TIME PERIOD: PM Peak Period (15:30 to 17:59)**

Origin \ Destination	Ottawa							
	Ottawa Centre	Inner Area	Ottawa East	Beacon Hill	Alta Vista	Hunt Club	Merivale	Ottawa West
001 - Ottawa Centre	700	1,500	900	500	1,300	1,200	1,600	1,100
050 - Ottawa Inner Area	800	5,300	1,800	500	2,500	1,200	2,000	1,000
100 - Ottawa East	200	1,200	4,900	1,400	1,600	700	500	300
120 - Beacon Hill	100	700	1,400	3,300	1,100	200	200	200
140 - Alta Vista	200	2,600	2,000	1,300	9,600	3,700	2,300	1,100
180 - Hunt Club	300	1,100	400	300	2,400	5,300	1,000	500
200 - Merivale	400	1,900	800	400	1,800	1,900	9,300	2,700
240 - Ottawa West	300	1,400	300	200	700	500	3,000	4,600
260 - Bayshore / Cedarview	400	900	200	200	800	500	3,300	2,300
300 - Orléans	300	700	600	1,000	1,400	400	200	100
350 - Rural East	-	-	-	-	100	-	100	-
360 - Rural Southeast	-	100	-	-	200	200	200	100
400 - South Gloucester / Leitrim	-	300	100	100	300	300	200	100
425 - South Nepean	100	500	-	100	300	300	1,000	200
450 - Rural Southwest	100	200	-	-	100	200	300	100
<b>500 - Kanata / Stittsville</b>	<b>200</b>	<b>1,000</b>	<b>200</b>	<b>100</b>	<b>500</b>	<b>500</b>	<b>1,300</b>	<b>800</b>
560 - Rural West	100	100	100	-	100	100	200	200
600 - Île de Hull	200	500	300	100	300	200	300	200
625 - Hull Périphérie	200	400	200	200	200	200	300	200
650 - Plateau	200	100	-	-	100	-	-	-
700 - Aylmer	100	100	-	-	-	-	100	-
750 - Rural Northwest	-	-	-	-	100	-	100	-
800 - Pointe Gatineau	100	100	100	100	100	-	100	-
820 - Gatineau Est	-	-	100	100	100	-	-	-
840 - Rural Northeast	-	-	-	-	-	-	-	100
845 - Buckingham / Masson-Angers	-	-	100	-	-	-	-	-
900 - External	-	100	100	100	100	100	200	100
Total	5,000	20,800	14,600	10,000	25,800	17,700	27,800	16,000

South										
Bayshore / Cedarview	Orléans	Rural East	Rural Southeast	Gloucester / Leitrim	South Nepean	Rural Southwest	Kanata / Stittsville	Rural West	Île de Hull	Hull Périphérie
800	1,900	200	400	300	900	300	1,500	100	200	700
1,300	1,600	100	700	500	1,300	500	1,300	200	200	700
200	2,300	100	300	100	300	100	500	100	200	200
300	2,700	100	300	200	200	100	300	-	-	200
1,300	4,500	400	1,300	1,100	1,700	500	1,400	300	100	400
300	800	100	600	800	700	300	500	100	-	100
4,300	900	300	500	600	3,400	900	2,600	600	100	200
2,100	800	-	100	100	900	300	1,200	200	100	200
8,000	800	100	200	200	2,400	600	4,000	600	-	200
300	18,300	1,100	200	100	100	100	500	100	100	200
-	700	400	100	-	-	-	-	-	-	-
100	100	100	1,500	200	100	300	-	-	-	-
100	200	-	600	1,500	200	300	100	100	-	-
1,000	100	-	200	200	8,400	900	800	-	-	-
500	-	-	400	200	500	1,700	1,000	100	-	-
<b>2,800</b>	<b>500</b>	<b>-</b>	<b>300</b>	<b>200</b>	<b>1,300</b>	<b>900</b>	<b>21,200</b>	<b>2,700</b>	<b>-</b>	<b>-</b>
400	100	-	-	-	100	-	1,100	2,000	-	-
200	600	-	100	100	200	100	400	-	300	1,700
100	400	-	-	-	100	100	200	-	700	6,100
-	-	-	-	-	-	-	100	-	100	1,100
-	100	-	-	-	100	-	-	-	100	900
-	100	-	-	-	-	-	100	-	-	200
-	100	-	-	-	-	-	100	-	400	1,900
-	-	-	-	-	-	-	100	-	100	700
100	-	-	-	-	-	-	-	-	100	400
-	-	100	-	-	-	-	-	-	200	200
100	400	100	300	100	-	400	600	500	-	100
<b>24,300</b>	<b>38,000</b>	<b>3,200</b>	<b>8,100</b>	<b>6,500</b>	<b>22,900</b>	<b>8,400</b>	<b>39,600</b>	<b>7,700</b>	<b>3,000</b>	<b>16,400</b>



						Buckingham /			
Plateau	Aylmer	Rural Northwest	Pointe Gatineau	Gatineau Est	Rural Northeast	Masson-Angers	External	Total	
500	600	300	700	300	500	-	-	19,000	
300	500	300	700	300	300	100	100	26,100	
100	200	100	300	200	200	100	-	16,400	
-	200	100	300	100	200	-	-	12,500	
300	500	200	700	500	200	200	100	38,500	
100	100	100	100	100	100	-	-	16,200	
-	300	300	300	200	100	-	200	35,000	
500	400	100	300	100	100	100	-	18,600	
100	400	200	100	100	100	-	200	26,900	
-	100	-	100	200	100	-	100	26,400	
-	-	-	-	-	-	-	100	1,500	
-	-	-	-	-	-	-	200	3,400	
-	-	-	-	-	-	-	-	4,500	
-	-	-	-	-	100	-	-	14,200	
-	-	-	-	-	-	-	200	5,600	
100	100	100	100	100	-	-	100	35,100	
-	100	-	-	-	-	-	100	4,800	
900	1,100	500	1,200	800	800	300	-	11,400	
2,400	1,400	1,100	2,800	1,700	1,200	800	100	21,100	
1,800	500	100	100	-	200	-	-	4,400	
500	6,000	500	300	200	100	100	-	9,200	
100	300	1,900	200	200	300	100	100	3,800	
200	700	200	8,500	3,900	1,400	900	-	18,900	
200	200	-	2,900	6,000	1,100	700	-	12,300	
-	-	200	600	500	2,000	400	-	4,400	
100	-	-	500	300	700	4,000	-	6,200	
-	-	100	200	100	100	200	300	4,400	
8,200	13,700	6,400	21,000	15,900	9,900	8,000	1,900	400,800	

	IN	OUT
N CARP (ALL BUT 450, 500)	44%	37%
S STITTSVILLE MAIN (450)	3%	3%
TMC (500)	54%	60%

## **Appendix G – Future Background (2024) Synchro Outputs**

1: Carp Rd & Kittiwake Dr/Echwoods Ave



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	256	81	215	29	1022	38	583	53
v/c Ratio	0.95	0.17	0.40	0.09	1.06	0.26	0.65	0.07
Control Delay	85.2	8.6	15.7	8.0	65.0	13.8	24.2	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	85.2	8.6	15.7	8.0	65.0	13.8	24.2	1.3
Queue Length 50th (m)	51.1	0.7	13.8	1.1	~246.9	3.0	91.8	0.0
Queue Length 95th (m)	#95.9	11.1	32.6	m2.9 m	#283.9	7.0	132.2	2.5
Internal Link Dist (m)		169.7	117.2		263.2		262.3	
Turn Bay Length (m)	15.0			25.0		30.0		32.0
Base Capacity (vph)	281	490	558	328	961	152	894	801
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.17	0.39	0.09	1.06	0.25	0.65	0.07

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

HCM Signalized Intersection Capacity Analysis  
1: Carp Rd & Kittiwake Dr/Echwoods Ave

Background AM (2024)



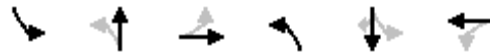
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	256	5	76	53	3	159	29	1006	16	38	583	53
Future Volume (vph)	256	5	76	53	3	159	29	1006	16	38	583	53
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	3.9	3.9	3.7	3.7	4.8	3.7	3.6	3.7	3.7	3.3	3.5	3.1
Total Lost time (s)	6.3	6.3			6.0		5.6	6.0		5.6	5.7	5.7
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frbp, ped/bikes	1.00	0.99			0.98		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.86			0.90		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1680	1490			1737		1474	1746		1653	1618	1382
Flt Permitted	0.54	1.00			0.90		0.30	1.00		0.07	1.00	1.00
Satd. Flow (perm)	962	1490			1589		464	1746		113	1618	1382
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	256	5	76	53	3	159	29	1006	16	38	583	53
RTOR Reduction (vph)	0	55	0	0	90	0	0	0	0	0	0	25
Lane Group Flow (vph)	256	26	0	0	125	0	29	1022	0	38	583	28
Confl. Peds. (#/hr)	1					1	2		1	1		2
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	5%	20%	5%	9%	33%	0%	16%	4%	0%	0%	10%	2%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	32.2	32.2			32.5		64.9	61.1		65.2	61.4	61.4
Effective Green, g (s)	32.2	32.2			32.5		64.9	61.1		65.2	61.4	61.4
Actuated g/C Ratio	0.28	0.28			0.28		0.56	0.53		0.57	0.53	0.53
Clearance Time (s)	6.3	6.3			6.0		5.6	6.0		5.6	5.7	5.7
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	269	417			449		295	927		114	863	737
v/s Ratio Prot		0.02					0.00	c0.58		c0.01	0.36	
v/s Ratio Perm	c0.27				0.08		0.05			0.18		0.02
v/c Ratio	0.95	0.06			0.28		0.10	1.10		0.33	0.68	0.04
Uniform Delay, d1	40.6	30.3			32.1		12.9	26.9		25.7	19.5	12.8
Progression Factor	1.00	1.00			1.00		0.80	0.66		1.00	1.00	1.00
Incremental Delay, d2	41.6	0.1			0.3		0.1	58.2		1.7	4.2	0.1
Delay (s)	82.2	30.4			32.4		10.4	76.0		27.4	23.8	12.9
Level of Service	F	C			C		B	E		C	C	B
Approach Delay (s)		69.8			32.4			74.2			23.1	
Approach LOS		E			C			E			C	

Intersection Summary		
HCM 2000 Control Delay	54.5	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.02	D
Actuated Cycle Length (s)	115.0	Sum of lost time (s)
Intersection Capacity Utilization	101.0%	17.9
Analysis Period (min)	15	ICU Level of Service
		G

c Critical Lane Group

Timing Report, Sorted By Phase  
 1: Carp Rd & Kittiwake Dr/Echwoods Ave

Background AM (2024)



Phase Number	1	2	4	5	6	8
Movement	SBL	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	12	63	40	12	63	40
Maximum Split (%)	10.4%	54.8%	34.8%	10.4%	54.8%	34.8%
Minimum Split (s)	10.6	30	29.3	10.6	29.7	29
Yellow Time (s)	3.7	3.7	3	3.7	3.7	3
All-Red Time (s)	1.9	2.3	3.3	1.9	2	3
Minimum Initial (s)	5	10	10	5	10	10
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		17	16		17	16
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	110	7	70	110	7	70
End Time (s)	7	70	110	7	70	110
Yield/Force Off (s)	1.4	64	103.7	1.4	64.3	104
Yield/Force Off 170(s)	1.4	47	87.7	1.4	47.3	88
Local Start Time (s)	103	0	63	103	0	63
Local Yield (s)	109.4	57	96.7	109.4	57.3	97
Local Yield 170(s)	109.4	40	80.7	109.4	40.3	81

Intersection Summary

Cycle Length	115
Control Type	Actuated-Coordinated
Natural Cycle	150
Offset: 7 (6%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 1: Carp Rd & Kittiwake Dr/Echwoods Ave



Queues  
2: Carp Rd & Hazeldean Rd

Background AM (2024)



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	316	394	21	128	315	65	454	258	315	54
v/c Ratio	1.14	0.45	0.21	0.62	0.68	0.48	0.43	0.73	0.39	0.07
Control Delay	135.8	32.3	44.3	55.9	17.5	60.5	32.8	42.1	38.2	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	135.8	32.3	44.3	55.9	17.5	60.5	32.8	42.1	38.2	3.6
Queue Length 50th (m)	~70.8	32.1	4.2	26.1	11.9	13.0	38.2	52.8	66.3	0.0
Queue Length 95th (m)	#110.6	41.3	10.8	42.1	35.7	25.0	58.4	79.1	94.5	m1.1
Internal Link Dist (m)		252.9		257.2			422.0		263.2	
Turn Bay Length (m)	80.0		30.0			27.0		70.0		
Base Capacity (vph)	276	1328	213	433	623	278	1064	353	807	736
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.14	0.30	0.10	0.30	0.51	0.23	0.43	0.73	0.39	0.07

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

HCM Signalized Intersection Capacity Analysis  
2: Carp Rd & Hazeldean Rd

Background AM (2024)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Traffic Volume (vph)	316	300	94	21	128	315	65	438	16	258	315	54		
Future Volume (vph)	316	300	94	21	128	315	65	438	16	258	315	54		
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800		
Lane Width	3.6	3.9	3.7	3.8	3.4	3.9	3.9	3.4	3.7	3.6	3.6	3.5		
Total Lost time (s)	6.1	6.6		6.6	6.6	6.6	6.0	6.1		6.0	6.1	6.1		
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00		
Frbp, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	1.00		1.00	1.00	0.98		
Flpb, ped/bikes	0.99	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85		
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		
Satd. Flow (prot)	1666	3228		1431	1586	1445	1523	3184		1462	1593	1309		
Flt Permitted	0.45	1.00		0.52	1.00	1.00	0.95	1.00		0.95	1.00	1.00		
Satd. Flow (perm)	785	3228		783	1586	1445	1523	3184		1462	1593	1309		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Adj. Flow (vph)	316	300	94	21	128	315	65	438	16	258	315	54		
RTOR Reduction (vph)	0	32	0	0	0	274	0	2	0	0	0	27		
Lane Group Flow (vph)	316	362	0	21	128	41	65	452	0	258	315	27		
Confl. Peds. (#/hr)	11		1	1		11	1		3	3		1		
Heavy Vehicles (%)	2%	5%	5%	22%	11%	5%	16%	3%	43%	17%	13%	13%		
Turn Type	pm+pt	NA		Perm	NA	Perm	Prot	NA		Prot	NA	Perm		
Protected Phases	7	4			8		5	2		1	6			
Permitted Phases	4			8		8						6		
Actuated Green, G (s)	30.1	30.1		15.1	15.1	15.1	9.1	38.4		27.8	57.1	57.1		
Effective Green, g (s)	30.1	30.1		15.1	15.1	15.1	9.1	38.4		27.8	57.1	57.1		
Actuated g/C Ratio	0.26	0.26		0.13	0.13	0.13	0.08	0.33		0.24	0.50	0.50		
Clearance Time (s)	6.1	6.6		6.6	6.6	6.6	6.0	6.1		6.0	6.1	6.1		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		
Lane Grp Cap (vph)	273	844		102	208	189	120	1063		353	790	649		
v/s Ratio Prot	c0.09	0.11			0.08		0.04	c0.14		c0.18	0.20			
v/s Ratio Perm	c0.21			0.03		0.03						0.02		
v/c Ratio	1.16	0.43		0.21	0.62	0.22	0.54	0.43		0.73	0.40	0.04		
Uniform Delay, d1	41.7	35.3		44.6	47.2	44.7	50.9	29.7		40.2	18.2	14.9		
Progression Factor	1.00	1.00		0.94	0.94	2.03	1.00	1.00		0.78	1.78	1.00		
Incremental Delay, d2	103.9	0.4		1.0	5.3	0.6	4.9	1.2		6.3	1.2	0.1		
Delay (s)	145.6	35.6		43.1	49.6	91.2	55.9	31.0		37.8	33.6	15.0		
Level of Service	F	D		D	D	F	E	C		D	C	B		
Approach Delay (s)		84.6			77.6			34.1			33.7			
Approach LOS		F			E			C			C			
<b>Intersection Summary</b>														
HCM 2000 Control Delay			58.1									HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio			0.77											
Actuated Cycle Length (s)			115.0							24.8				
Intersection Capacity Utilization			87.9%										ICU Level of Service	E
Analysis Period (min)			15											
c Critical Lane Group														



Timing Report, Sorted By Phase  
2: Carp Rd & Hazeldean Rd

Background AM (2024)

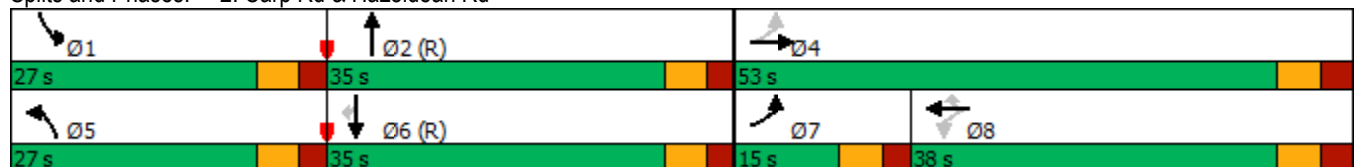


Phase Number	1	2	4	5	6	7	8
Movement	SBL	NBT	EBTL	NBL	SBT	EBL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lag
Lead-Lag Optimize							
Recall Mode	None	C-Max	None	None	C-Max	None	None
Maximum Split (s)	27	35	53	27	35	15	38
Maximum Split (%)	23.5%	30.4%	46.1%	23.5%	30.4%	13.0%	33.0%
Minimum Split (s)	11	31.1	37.6	11	31.1	11.1	37.6
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.3	2.4	2.9	2.3	2.4	2.4	2.9
Minimum Initial (s)	5	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0
Walk Time (s)		7	7		7		7
Flash Dont Walk (s)		18	24		18		24
Dual Entry	No	Yes	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	80	107	27	80	107	27	42
End Time (s)	107	27	80	107	27	42	80
Yield/Force Off (s)	101	20.9	73.4	101	20.9	35.9	73.4
Yield/Force Off 170(s)	101	2.9	49.4	101	2.9	35.9	49.4
Local Start Time (s)	88	0	35	88	0	35	50
Local Yield (s)	109	28.9	81.4	109	28.9	43.9	81.4
Local Yield 170(s)	109	10.9	57.4	109	10.9	43.9	57.4

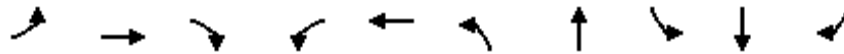
Intersection Summary

Cycle Length	115
Control Type	Actuated-Coordinated
Natural Cycle	95
Offset: 107 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 2: Carp Rd & Hazeldean Rd



3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	46	97	291	147	154	352	558	79	319	35
v/c Ratio	0.22	0.30	0.56	0.63	0.42	0.54	0.60	0.18	0.40	0.05
Control Delay	28.1	28.7	7.7	41.4	17.3	9.7	17.8	7.4	18.1	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.1	28.7	7.7	41.4	17.3	9.7	17.8	7.4	18.1	0.1
Queue Length 50th (m)	5.5	11.8	0.0	19.2	9.2	17.0	48.5	3.2	28.6	0.0
Queue Length 95th (m)	12.4	21.2	15.7	32.5	21.3	36.8	#109.7	9.0	54.7	0.0
Internal Link Dist (m)		289.2			73.8		147.6		545.1	
Turn Bay Length (m)	30.0		30.0	15.0		32.0		30.0		22.0
Base Capacity (vph)	335	524	670	379	552	649	928	485	800	717
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.19	0.43	0.39	0.28	0.54	0.60	0.16	0.40	0.05

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
 3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)

Background AM (2024)

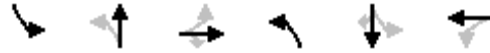


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	97	291	147	70	84	352	387	171	79	319	35
Future Volume (vph)	46	97	291	147	70	84	352	387	171	79	319	35
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	3.5	3.2	3.9	3.6	3.6	3.7	3.5	3.6	3.7	3.1	3.5	3.5
Total Lost time (s)	5.1	5.1	5.1	5.1	5.1		5.5	5.5		5.5	5.5	5.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	0.99		1.00	0.99		1.00	1.00	0.97
Flpb, ped/bikes	1.00	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	0.92		1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1656	1686	1511	1669	1601		1655	1668		1581	1745	1442
Flt Permitted	0.62	1.00	1.00	0.69	1.00		0.44	1.00		0.39	1.00	1.00
Satd. Flow (perm)	1077	1686	1511	1220	1601		770	1668		649	1745	1442
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	46	97	291	147	70	84	352	387	171	79	319	35
RTOR Reduction (vph)	0	0	235	0	63	0	0	14	0	0	0	19
Lane Group Flow (vph)	46	97	56	147	91	0	352	544	0	79	319	16
Confl. Peds. (#/hr)	1		3	3		1	4		6	6		4
Confl. Bikes (#/hr)												2
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)	15.3	15.3	15.3	15.3	15.3		54.1	42.7		42.6	36.7	36.7
Effective Green, g (s)	15.3	15.3	15.3	15.3	15.3		54.1	42.7		42.6	36.7	36.7
Actuated g/C Ratio	0.19	0.19	0.19	0.19	0.19		0.68	0.53		0.53	0.46	0.46
Clearance Time (s)	5.1	5.1	5.1	5.1	5.1		5.5	5.5		5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	205	322	288	233	306		652	890		414	800	661
v/s Ratio Prot		0.06			0.06		c0.08	c0.33		0.01	0.18	
v/s Ratio Perm	0.04		0.04	c0.12			0.28			0.09		0.01
v/c Ratio	0.22	0.30	0.19	0.63	0.30		0.54	0.61		0.19	0.40	0.02
Uniform Delay, d1	27.3	27.8	27.2	29.8	27.7		6.2	12.9		9.4	14.3	11.9
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	0.5	0.3	5.5	0.5		0.9	3.1		0.2	1.5	0.1
Delay (s)	27.9	28.3	27.5	35.2	28.3		7.0	16.0		9.6	15.8	11.9
Level of Service	C	C	C	D	C		A	B		A	B	B
Approach Delay (s)		27.7			31.7			12.5			14.4	
Approach LOS		C			C			B			B	

Intersection Summary		
HCM 2000 Control Delay	18.9	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.64	B
Actuated Cycle Length (s)	80.0	Sum of lost time (s)
Intersection Capacity Utilization	76.3%	16.1
Analysis Period (min)	15	ICU Level of Service
		D
c Critical Lane Group		

Timing Report, Sorted By Phase  
 3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)

Background AM (2024)

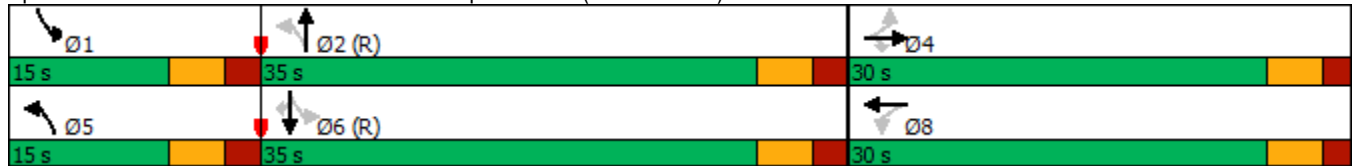


Phase Number	1	2	4	5	6	8
Movement	SBL	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	15	35	30	15	35	30
Maximum Split (%)	18.8%	43.8%	37.5%	18.8%	43.8%	37.5%
Minimum Split (s)	10.5	29.5	28.1	10.5	29.5	28.1
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.2	2.2	1.8	2.2	2.2	1.8
Minimum Initial (s)	5	10	10	5	10	10
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		17	16		17	16
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	65	0	35	65	0	35
End Time (s)	0	35	65	0	35	65
Yield/Force Off (s)	74.5	29.5	59.9	74.5	29.5	59.9
Yield/Force Off 170(s)	74.5	12.5	43.9	74.5	12.5	43.9
Local Start Time (s)	65	0	35	65	0	35
Local Yield (s)	74.5	29.5	59.9	74.5	29.5	59.9
Local Yield 170(s)	74.5	12.5	43.9	74.5	12.5	43.9

Intersection Summary

Cycle Length	80
Control Type	Actuated-Coordinated
Natural Cycle	70
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)



HCM Unsignalized Intersection Capacity Analysis  
 4: Samantha Eastop Dr & Kimpton Dr

Background AM (2024)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	11	24	0	0	104	5	0	0	0	11	0	44
Future Volume (Veh/h)	11	24	0	0	104	5	0	0	0	11	0	44
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	11	24	0	0	104	5	0	0	0	11	0	44
Pedestrians		5			5			5			5	
Lane Width (m)		4.8			4.8			4.8			4.8	
Walking Speed (m/s)		1.0			1.0			1.0			1.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)		322										
pX, platoon unblocked												
vC, conflicting volume	114			29			206	165	34	162	162	116
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	114			29			206	165	34	162	162	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 %	99			100			100	100	100	99	100	95
cM capacity (veh/h)	1465			1574			695	713	1025	779	715	923
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	35	109	0	55								
Volume Left	11	0	0	11								
Volume Right	0	5	0	44								
cSH	1465	1574	1700	890								
Volume to Capacity	0.01	0.00	0.00	0.06								
Queue Length 95th (m)	0.2	0.0	0.0	1.4								
Control Delay (s)	2.4	0.0	0.0	9.3								
Lane LOS	A		A	A								
Approach Delay (s)	2.4	0.0	0.0	9.3								
Approach LOS			A	A								
Intersection Summary												
Average Delay			3.0									
Intersection Capacity Utilization			21.5%		ICU Level of Service				A			
Analysis Period (min)			15									

## 6: Stittsville Main St &amp; Hazeldean Rd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	79	428	242	370	35	63	316	275	106	135
v/c Ratio	0.15	0.31	0.42	0.24	0.16	0.36	0.74	0.96	0.33	0.31
Control Delay	14.7	26.5	12.9	14.8	32.5	53.2	18.7	83.5	45.6	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.7	26.5	12.9	14.8	32.5	53.2	18.7	83.5	45.6	6.1
Queue Length 50th (m)	8.3	25.4	20.0	18.1	5.6	12.6	4.5	~52.3	20.7	0.0
Queue Length 95th (m)	m13.8	34.1	37.8	32.1	11.8	23.3	29.2	#66.2	34.8	10.7
Internal Link Dist (m)		606.0		143.1		545.1			139.3	
Turn Bay Length (m)	34.0		288.0		24.0		17.0	46.0		38.0
Base Capacity (vph)	524	1391	574	1571	283	587	739	287	587	679
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.31	0.42	0.24	0.12	0.11	0.43	0.96	0.18	0.20

## 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.

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

HCM Signalized Intersection Capacity Analysis  
6: Stittsville Main St & Hazeldean Rd

Background AM (2024)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	411	17	242	259	111	35	63	316	275	106	135
Future Volume (vph)	79	411	17	242	259	111	35	63	316	275	106	135
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	4.5	3.5	3.7	3.9	3.5	3.7	3.7	3.3	4.3	3.4	3.4	4.6
Total Lost time (s)	6.5	6.3		6.5	6.3		6.9	7.0	7.0	6.9	6.7	6.7
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1708	3229		1699	3003		1571	1689	1578	1591	1676	1645
Flt Permitted	0.53	1.00		0.41	1.00		0.69	1.00	1.00	0.49	1.00	1.00
Satd. Flow (perm)	956	3229		730	3003		1139	1689	1578	820	1676	1645
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	79	411	17	242	259	111	35	63	316	275	106	135
RTOR Reduction (vph)	0	2	0	0	29	0	0	0	256	0	0	109
Lane Group Flow (vph)	79	426	0	242	341	0	35	63	60	275	106	26
Confl. Peds. (#/hr)	2					2	1		2	2		1
Heavy Vehicles (%)	10%	4%	7%	4%	8%	4%	10%	3%	3%	5%	5%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8		8	4		4
Actuated Green, G (s)	53.2	46.7		68.1	55.1		19.7	14.6	14.6	33.9	21.9	21.9
Effective Green, g (s)	53.2	46.7		68.1	55.1		19.7	14.6	14.6	33.9	21.9	21.9
Actuated g/C Ratio	0.46	0.41		0.59	0.48		0.17	0.13	0.13	0.29	0.19	0.19
Clearance Time (s)	6.5	6.3		6.5	6.3		6.9	7.0	7.0	6.9	6.7	6.7
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	484	1311		557	1438		214	214	200	322	319	313
v/s Ratio Prot	0.01	0.13		c0.06	0.11		0.01	0.04		c0.09	0.06	
v/s Ratio Perm	0.07			c0.20			0.02		0.04	c0.16		0.02
v/c Ratio	0.16	0.33		0.43	0.24		0.16	0.29	0.30	0.85	0.33	0.08
Uniform Delay, d1	17.4	23.4		11.7	17.6		40.4	45.5	45.6	36.9	40.2	38.3
Progression Factor	1.32	1.15		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.6		0.5	0.4		0.4	0.8	0.9	19.2	0.6	0.1
Delay (s)	23.1	27.4		12.3	18.0		40.7	46.3	46.4	56.1	40.8	38.4
Level of Service	C	C		B	B		D	D	D	E	D	D
Approach Delay (s)		26.7			15.7			45.9			48.3	
Approach LOS		C			B			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			32.8				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			115.0				Sum of lost time (s)			26.7		
Intersection Capacity Utilization			68.7%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

Timing Report, Sorted By Phase  
6: Stittsville Main St & Hazeldean Rd

Background AM (2024)

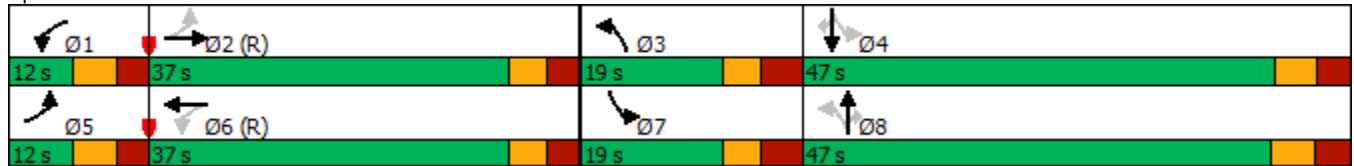


Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBTL	EBL	WBTL	SBL	NBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	12	37	19	47	12	37	19	47
Maximum Split (%)	10.4%	32.2%	16.5%	40.9%	10.4%	32.2%	16.5%	40.9%
Minimum Split (s)	11.5	36.3	11.9	36.7	11.5	36.3	16.9	37
Yellow Time (s)	3.7	3.3	3.3	3.7	3.7	3.3	3.3	3.7
All-Red Time (s)	2.8	3	3.6	3	2.8	3	3.6	3.3
Minimum Initial (s)	5	10	5	10	5	10	10	10
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		23		23		23		23
Dual Entry	No	Yes	No	Yes	No	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	73	85	7	26	73	85	7	26
End Time (s)	85	7	26	73	85	7	26	73
Yield/Force Off (s)	78.5	0.7	19.1	66.3	78.5	0.7	19.1	66
Yield/Force Off 170(s)	78.5	92.7	19.1	43.3	78.5	92.7	19.1	43
Local Start Time (s)	103	0	37	56	103	0	37	56
Local Yield (s)	108.5	30.7	49.1	96.3	108.5	30.7	49.1	96
Local Yield 170(s)	108.5	7.7	49.1	73.3	108.5	7.7	49.1	73

Intersection Summary

Cycle Length	115
Control Type	Actuated-Coordinated
Natural Cycle	105
Offset: 85 (74%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	

Splits and Phases: 6: Stittsville Main St & Hazeldean Rd





1: Carp Rd & Kittiwake Dr/Echwoods Ave























Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	153	73	155	56	797	125	1147	164
v/c Ratio	0.82	0.23	0.51	0.40	0.77	0.37	1.11	0.18
Control Delay	78.1	14.7	35.4	28.9	26.0	9.0	89.5	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.1	14.7	35.4	28.9	26.0	9.0	89.5	6.7
Queue Length 50th (m)	32.1	2.6	21.0	4.1	73.9	7.2	~292.2	6.9
Queue Length 95th (m)	50.8	13.3	37.4	m15.3 m	#232.3	15.6	#395.4	19.1
Internal Link Dist (m)		169.7	117.2		263.2		262.3	
Turn Bay Length (m)	15.0			25.0		30.0		32.0
Base Capacity (vph)	254	417	394	252	1032	418	1029	907
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.18	0.39	0.22	0.77	0.30	1.11	0.18

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

HCM Signalized Intersection Capacity Analysis  
1: Carp Rd & Kittiwake Dr/Echwoods Ave

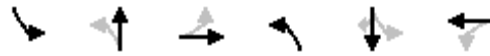
Background PM (2024)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	153	14	59	63	8	84	56	762	35	125	1147	164
Future Volume (vph)	153	14	59	63	8	84	56	762	35	125	1147	164
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	3.9	3.9	3.7	3.7	4.8	3.7	3.6	3.7	3.7	3.3	3.5	3.1
Total Lost time (s)	6.3	6.3			6.0		5.6	6.0		5.6	5.7	5.7
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frbp, ped/bikes	1.00	0.97			1.00		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00			0.99		1.00	1.00		1.00	1.00	1.00
Frtp	1.00	0.88			0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1732	1557			1741		1474	1739		1653	1618	1381
Flt Permitted	0.58	1.00			0.83		0.06	1.00		0.19	1.00	1.00
Satd. Flow (perm)	1066	1557			1483		87	1739		327	1618	1381
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	153	14	59	63	8	84	56	762	35	125	1147	164
RTOR Reduction (vph)	0	49	0	0	39	0	0	1	0	0	0	30
Lane Group Flow (vph)	153	24	0	0	116	0	56	796	0	125	1147	134
Confl. Peds. (#/hr)			18	18			2		3	3		2
Confl. Bikes (#/hr)									1			1
Heavy Vehicles (%)	2%	0%	2%	9%	33%	0%	16%	4%	0%	0%	10%	2%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	21.1	21.1			21.4		77.3	71.2		85.0	75.2	75.2
Effective Green, g (s)	21.1	21.1			21.4		77.3	71.2		85.0	75.2	75.2
Actuated g/C Ratio	0.18	0.18			0.18		0.64	0.59		0.71	0.63	0.63
Clearance Time (s)	6.3	6.3			6.0		5.6	6.0		5.6	5.7	5.7
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	187	273			264		126	1031		339	1013	865
v/s Ratio Prot		0.02					0.02	0.46		c0.03	c0.71	
v/s Ratio Perm	c0.14				0.08		0.26			0.23		0.10
v/c Ratio	0.82	0.09			0.44		0.44	0.77		0.37	1.13	0.15
Uniform Delay, d1	47.6	41.4			44.0		27.4	18.3		12.4	22.4	9.3
Progression Factor	1.00	1.00			1.00		1.55	0.98		1.00	1.00	1.00
Incremental Delay, d2	23.4	0.1			1.2		2.1	4.8		0.7	72.1	0.4
Delay (s)	71.0	41.5			45.1		44.5	22.8		13.1	94.5	9.6
Level of Service	E	D			D		D	C		B	F	A
Approach Delay (s)		61.5			45.1			24.3			77.7	
Approach LOS		E			D			C			E	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			57.4									HCM 2000 Level of Service E
HCM 2000 Volume to Capacity ratio			1.04									
Actuated Cycle Length (s)			120.0									Sum of lost time (s) 17.9
Intersection Capacity Utilization			99.8%									ICU Level of Service F
Analysis Period (min)			15									

c Critical Lane Group

Timing Report, Sorted By Phase  
 1: Carp Rd & Kittiwake Dr/Echwoods Ave

Background PM (2024)



Phase Number	1	2	4	5	6	8
Movement	SBL	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	22	63	35	22	63	35
Maximum Split (%)	18.3%	52.5%	29.2%	18.3%	52.5%	29.2%
Minimum Split (s)	10.6	30	29.3	10.6	29.7	29
Yellow Time (s)	3.7	3.7	3	3.7	3.7	3
All-Red Time (s)	1.9	2.3	3.3	1.9	2	3
Minimum Initial (s)	5	10	10	5	10	10
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		17	16		17	16
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	109	11	74	109	11	74
End Time (s)	11	74	109	11	74	109
Yield/Force Off (s)	5.4	68	102.7	5.4	68.3	103
Yield/Force Off 170(s)	5.4	51	86.7	5.4	51.3	87
Local Start Time (s)	98	0	63	98	0	63
Local Yield (s)	114.4	57	91.7	114.4	57.3	92
Local Yield 170(s)	114.4	40	75.7	114.4	40.3	76

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	150
Offset: 11 (9%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 1: Carp Rd & Kittiwake Dr/Echwoods Ave



Queues  
2: Carp Rd & Hazeldean Rd

Background PM (2024)



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	101	444	57	545	387	146	434	412	539	260
v/c Ratio	0.97	0.36	0.22	0.90	0.52	0.66	0.48	1.16	0.84	0.39
Control Delay	121.6	23.1	15.9	43.1	4.6	63.5	37.2	125.7	42.8	14.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	121.6	23.1	15.9	43.1	4.6	63.5	37.2	125.7	42.8	14.3
Queue Length 50th (m)	20.5	28.2	6.9	108.9	21.0	30.6	40.4	~120.0	97.1	14.3
Queue Length 95th (m)	#52.8	40.3	m6.0	#159.2	0.0	47.9	54.8 m	#107.8	m94.8	m17.2
Internal Link Dist (m)		252.9		257.2			422.0		263.2	
Turn Bay Length (m)	80.0		30.0			27.0		70.0		
Base Capacity (vph)	111	1303	277	652	778	317	910	354	642	674
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.34	0.21	0.84	0.50	0.46	0.48	1.16	0.84	0.39

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.

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

HCM Signalized Intersection Capacity Analysis  
2: Carp Rd & Hazeldean Rd

Background PM (2024)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	101	293	151	57	545	387	146	403	31	412	539	260
Future Volume (vph)	101	293	151	57	545	387	146	403	31	412	539	260
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	3.6	3.9	3.7	3.8	3.4	3.9	3.9	3.4	3.7	3.6	3.6	3.5
Total Lost time (s)	6.6	6.6		6.6	6.6	6.6	6.0	6.1		6.0	6.1	6.1
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00
Frbp, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1703	3300		1598	1725	1439	1732	3205		1693	1765	1465
Flt Permitted	0.17	1.00		0.44	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	296	3300		734	1725	1439	1732	3205		1693	1765	1465
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	101	293	151	57	545	387	146	403	31	412	539	260
RTOR Reduction (vph)	0	57	0	0	0	244	0	5	0	0	0	141
Lane Group Flow (vph)	101	387	0	57	545	143	146	429	0	412	539	119
Confl. Peds. (#/hr)	8		4	4		8	5		5	5		5
Heavy Vehicles (%)	0%	1%	0%	9%	2%	6%	2%	3%	4%	1%	2%	0%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						6
Actuated Green, G (s)	42.3	42.3		42.3	42.3	42.3	15.4	33.9		25.1	43.6	43.6
Effective Green, g (s)	42.3	42.3		42.3	42.3	42.3	15.4	33.9		25.1	43.6	43.6
Actuated g/C Ratio	0.35	0.35		0.35	0.35	0.35	0.13	0.28		0.21	0.36	0.36
Clearance Time (s)	6.6	6.6		6.6	6.6	6.6	6.0	6.1		6.0	6.1	6.1
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	104	1163		258	608	507	222	905		354	641	532
v/s Ratio Prot		0.12			0.32		0.08	0.13		c0.24	c0.31	
v/s Ratio Perm	c0.34			0.08		0.10						0.08
v/c Ratio	0.97	0.33		0.22	0.90	0.28	0.66	0.47		1.16	0.84	0.22
Uniform Delay, d1	38.2	28.5		27.3	36.8	27.9	49.8	35.7		47.5	35.0	26.5
Progression Factor	1.00	1.00		0.53	0.69	0.77	1.00	1.00		1.21	1.12	2.11
Incremental Delay, d2	78.6	0.2		0.4	14.6	0.3	6.9	1.8		76.8	1.3	0.1
Delay (s)	116.9	28.7		14.9	40.1	21.9	56.7	37.4		134.0	40.6	55.8
Level of Service	F	C		B	D	C	E	D		F	D	E
Approach Delay (s)		45.0			31.5			42.3			75.7	
Approach LOS		D			C			D			E	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			51.7				HCM 2000 Level of Service				D	
HCM 2000 Volume to Capacity ratio			0.99									
Actuated Cycle Length (s)			120.0				Sum of lost time (s)				18.7	
Intersection Capacity Utilization			102.2%				ICU Level of Service				G	
Analysis Period (min)			15									
c Critical Lane Group												

Timing Report, Sorted By Phase  
2: Carp Rd & Hazeldean Rd

Background PM (2024)

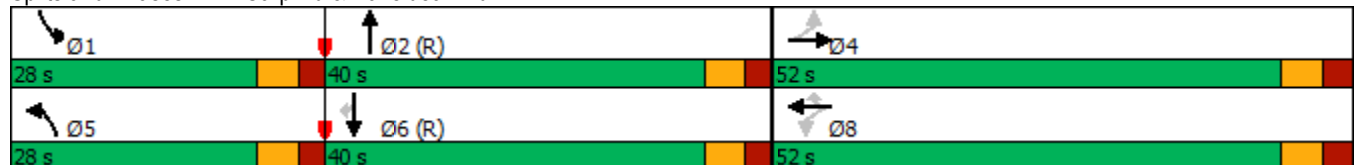


Phase Number	1	2	4	5	6	8
Movement	SBL	NBT	EBTL	NBL	SBT	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	28	40	52	28	40	52
Maximum Split (%)	23.3%	33.3%	43.3%	23.3%	33.3%	43.3%
Minimum Split (s)	11	31.1	37.6	11	31.1	37.6
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.3	2.4	2.9	2.3	2.4	2.9
Minimum Initial (s)	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		18	24		18	24
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	100	8	48	100	8	48
End Time (s)	8	48	100	8	48	100
Yield/Force Off (s)	2	41.9	93.4	2	41.9	93.4
Yield/Force Off 170(s)	2	23.9	69.4	2	23.9	69.4
Local Start Time (s)	92	0	40	92	0	40
Local Yield (s)	114	33.9	85.4	114	33.9	85.4
Local Yield 170(s)	114	15.9	61.4	114	15.9	61.4

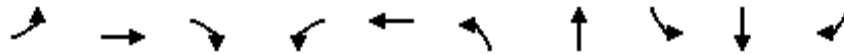
Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	100
Offset: 8 (7%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 2: Carp Rd & Hazeldean Rd



3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	80	124	476	233	231	339	635	79	528	53
v/c Ratio	0.40	0.38	0.86	0.57	0.38	1.00	0.90	0.35	1.04	0.10
Control Delay	35.7	33.4	26.4	26.2	17.7	78.5	46.8	18.0	83.6	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.7	33.4	26.4	26.2	17.7	78.5	46.8	18.0	83.6	0.4
Queue Length 50th (m)	11.3	17.4	21.1	27.3	21.2	41.1	95.2	5.9	~91.6	0.0
Queue Length 95th (m)	21.4	28.9	53.9	39.0	33.4	#115.9	#184.6	14.4	#145.8	0.0
Internal Link Dist (m)		289.2			73.8		147.6		545.1	
Turn Bay Length (m)	30.0		30.0	15.0		32.0		30.0		22.0
Base Capacity (vph)	282	456	639	412	727	339	704	245	508	524
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.27	0.74	0.57	0.32	1.00	0.90	0.32	1.04	0.10

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.

HCM Signalized Intersection Capacity Analysis  
 3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)

Background PM (2024)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	124	476	233	140	91	339	515	120	79	528	53
Future Volume (vph)	80	124	476	233	140	91	339	515	120	79	528	53
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	3.5	3.2	3.9	3.6	3.6	3.7	3.5	3.6	3.7	3.1	3.5	3.5
Total Lost time (s)	5.1	5.1	5.1	5.1	5.1		5.5	5.5		5.5	5.5	5.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	0.98		1.00	0.99		1.00	1.00	0.93
Flpb, ped/bikes	0.97	1.00	1.00	0.99	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.94		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1641	1720	1478	1699	1623		1595	1717		1614	1728	1413
Flt Permitted	0.61	1.00	1.00	0.51	1.00		0.12	1.00		0.18	1.00	1.00
Satd. Flow (perm)	1061	1720	1478	917	1623		210	1717		307	1728	1413
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	80	124	476	233	140	91	339	515	120	79	528	53
RTOR Reduction (vph)	0	0	272	0	30	0	0	8	0	0	0	37
Lane Group Flow (vph)	80	124	204	233	201	0	339	627	0	79	528	16
Confl. Peds. (#/hr)	21		9	9		21	25		12	12		25
Confl. Bikes (#/hr)						2			3			
Heavy Vehicles (%)	0%	0%	3%	0%	1%	3%	6%	1%	1%	0%	3%	0%
Turn Type	Perm	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)	17.1	17.1	17.1	32.1	32.1		47.3	35.5		32.8	26.5	26.5
Effective Green, g (s)	17.1	17.1	17.1	32.1	32.1		47.3	35.5		32.8	26.5	26.5
Actuated g/C Ratio	0.19	0.19	0.19	0.36	0.36		0.53	0.39		0.36	0.29	0.29
Clearance Time (s)	5.1	5.1	5.1	5.1	5.1		5.5	5.5		5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	201	326	280	413	578		345	677		203	508	416
v/s Ratio Prot		0.07		c0.06	0.12		c0.17	0.37		0.03	0.31	
v/s Ratio Perm	0.08		c0.14	0.14			c0.35			0.11		0.01
v/c Ratio	0.40	0.38	0.73	0.56	0.35		0.98	0.93		0.39	1.04	0.04
Uniform Delay, d1	31.9	31.8	34.3	21.8	21.3		25.5	26.0		20.6	31.8	22.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.3	0.7	9.1	1.8	0.4		43.5	20.6		1.2	50.5	0.2
Delay (s)	33.2	32.6	43.4	23.6	21.6		69.0	46.6		21.8	82.3	22.8
Level of Service	C	C	D	C	C		E	D		C	F	C
Approach Delay (s)		40.2			22.6			54.4			70.3	
Approach LOS		D			C			D			E	

Intersection Summary		
HCM 2000 Control Delay	49.4	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.91	D
Actuated Cycle Length (s)	90.0	Sum of lost time (s)
Intersection Capacity Utilization	92.0%	21.2
Analysis Period (min)	15	ICU Level of Service
		F

c Critical Lane Group



Timing Report, Sorted By Phase  
 3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)

Background PM (2024)

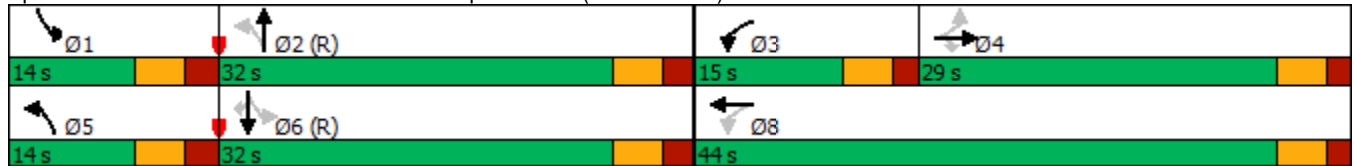


Phase Number	1	2	3	4	5	6	8
Movement	SBL	NBTL	WBL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	
Lead-Lag Optimize							
Recall Mode	None	C-Max	None	None	None	C-Max	None
Maximum Split (s)	14	32	15	29	14	32	44
Maximum Split (%)	15.6%	35.6%	16.7%	32.2%	15.6%	35.6%	48.9%
Minimum Split (s)	10.5	29.5	10.1	28.1	10.5	29.5	28.1
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.2	2.2	1.8	1.8	2.2	2.2	1.8
Minimum Initial (s)	5	10	5	10	5	10	10
Vehicle Extension (s)	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0
Walk Time (s)		7		7		7	7
Flash Dont Walk (s)		17		16		17	16
Dual Entry	No	Yes	No	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	78	2	34	49	78	2	34
End Time (s)	2	34	49	78	2	34	78
Yield/Force Off (s)	86.5	28.5	43.9	72.9	86.5	28.5	72.9
Yield/Force Off 170(s)	86.5	11.5	43.9	56.9	86.5	11.5	56.9
Local Start Time (s)	76	0	32	47	76	0	32
Local Yield (s)	84.5	26.5	41.9	70.9	84.5	26.5	70.9
Local Yield 170(s)	84.5	9.5	41.9	54.9	84.5	9.5	54.9

Intersection Summary

















Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 2 (2%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)



HCM Unsignalized Intersection Capacity Analysis  
4: Samantha Eastop Dr & Kimpton Dr

Background PM (2024)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	84	0	0	53	5	0	0	0	37	0	23
Future Volume (Veh/h)	36	84	0	0	53	5	0	0	0	37	0	23
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	36	84	0	0	53	5	0	0	0	37	0	23
Pedestrians		5			5			5			5	
Lane Width (m)		4.8			4.8			4.8			4.8	
Walking Speed (m/s)		1.0			1.0			1.0			1.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)		322										
pX, platoon unblocked												
vC, conflicting volume	63			89			244	224	94	222	222	66
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	63			89			244	224	94	222	222	66
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	100	95	100	98
cM capacity (veh/h)	1529			1496			665	650	950	704	652	985
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	120	58	0	60								
Volume Left	36	0	0	37								
Volume Right	0	5	0	23								
cSH	1529	1496	1700	791								
Volume to Capacity	0.02	0.00	0.00	0.08								
Queue Length 95th (m)	0.5	0.0	0.0	1.7								
Control Delay (s)	2.4	0.0	0.0	9.9								
Lane LOS	A		A	A								
Approach Delay (s)	2.4	0.0	0.0	9.9								
Approach LOS			A	A								
Intersection Summary												
Average Delay			3.7									
Intersection Capacity Utilization			26.5%		ICU Level of Service				A			
Analysis Period (min)			15									

6: Stittsville Main St & Hazeldean Rd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	121	423	518	958	86	175	407	230	244	93
v/c Ratio	0.40	0.43	0.88	0.68	0.31	0.61	0.77	0.73	0.66	0.20
Control Delay	28.6	47.6	38.7	30.6	30.2	54.3	20.9	45.9	52.9	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.6	47.6	38.7	30.6	30.2	54.3	20.9	45.9	52.9	1.7
Queue Length 50th (m)	17.2	45.7	66.0	80.4	13.3	35.8	17.1	39.2	50.7	0.0
Queue Length 95th (m)	m21.7	m49.7	#150.6	#135.0	21.4	51.4	46.5	52.3	70.8	1.7
Internal Link Dist (m)		606.0		143.1		545.1			139.3	
Turn Bay Length (m)	34.0		288.0		24.0		17.0	46.0		38.0
Base Capacity (vph)	394	987	590	1413	313	435	636	317	444	516
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.43	0.88	0.68	0.27	0.40	0.64	0.73	0.55	0.18

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
6: Stittsville Main St & Hazeldean Rd

Background PM (2024)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	121	390	33	518	679	279	86	175	407	230	244	93
Future Volume (vph)	121	390	33	518	679	279	86	175	407	230	244	93
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	4.5	3.5	3.7	3.9	3.5	3.7	3.7	3.3	4.3	3.4	3.4	4.6
Total Lost time (s)	6.5	6.3		6.5	6.3		6.9	7.0	7.0	6.9	6.7	6.7
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.96	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	0.99		1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1880	3303		1729	3205		1693	1740	1588	1660	1760	1594
Flt Permitted	0.26	1.00		0.35	1.00		0.48	1.00	1.00	0.46	1.00	1.00
Satd. Flow (perm)	513	3303		642	3205		860	1740	1588	798	1760	1594
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	121	390	33	518	679	279	86	175	407	230	244	93
RTOR Reduction (vph)	0	5	0	0	31	0	0	0	263	0	0	73
Lane Group Flow (vph)	121	418	0	518	927	0	86	175	144	230	244	20
Confl. Peds. (#/hr)	5		6	6		5	3		21	21		3
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	0%	1%	0%	2%	0%	0%	2%	0%	0%	0%	0%	5%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8		8	4		4
Actuated Green, G (s)	43.8	34.3		66.5	50.5		29.5	21.2	21.2	37.4	25.3	25.3
Effective Green, g (s)	43.8	34.3		66.5	50.5		29.5	21.2	21.2	37.4	25.3	25.3
Actuated g/C Ratio	0.36	0.29		0.55	0.42		0.25	0.18	0.18	0.31	0.21	0.21
Clearance Time (s)	6.5	6.3		6.5	6.3		6.9	7.0	7.0	6.9	6.7	6.7
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	295	944		588	1348		269	307	280	335	371	336
v/s Ratio Prot	0.03	0.13		c0.19	0.29		0.02	0.10		c0.07	0.14	
v/s Ratio Perm	0.12			c0.30			0.06		0.09	c0.14		0.01
v/c Ratio	0.41	0.44		0.88	0.69		0.32	0.57	0.52	0.69	0.66	0.06
Uniform Delay, d1	26.0	35.0		18.5	28.3		36.0	45.2	44.7	33.9	43.4	37.8
Progression Factor	1.60	1.39		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	1.0		14.4	2.9		0.7	2.5	1.6	5.7	4.2	0.1
Delay (s)	42.2	49.6		32.9	31.2		36.7	47.8	46.4	39.6	47.6	37.9
Level of Service	D	D		C	C		D	D	D	D	D	D
Approach Delay (s)		48.0			31.8			45.5			42.8	
Approach LOS		D			C			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			39.2				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.88									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			26.7			
Intersection Capacity Utilization			108.2%			ICU Level of Service			G			
Analysis Period (min)			15									

c Critical Lane Group

Timing Report, Sorted By Phase  
6: Stittsville Main St & Hazeldean Rd

Background PM (2024)

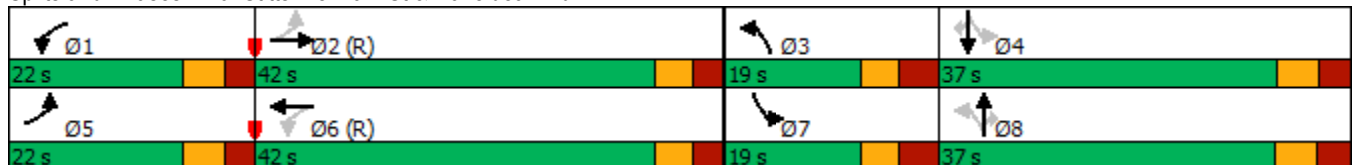


Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBTL	EBL	WBTL	SBL	NBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	22	42	19	37	22	42	19	37
Maximum Split (%)	18.3%	35.0%	15.8%	30.8%	18.3%	35.0%	15.8%	30.8%
Minimum Split (s)	11.7	36.3	11.9	36.7	11.5	36.3	16.9	37
Yellow Time (s)	3.7	3.3	3.3	3.7	3.7	3.3	3.3	3.7
All-Red Time (s)	2.8	3	3.6	3	2.8	3	3.6	3.3
Minimum Initial (s)	5	10	5	10	5	10	10	10
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		23		23		23		23
Dual Entry	No	Yes	No	Yes	No	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	91	113	35	54	91	113	35	54
End Time (s)	113	35	54	91	113	35	54	91
Yield/Force Off (s)	106.5	28.7	47.1	84.3	106.5	28.7	47.1	84
Yield/Force Off 170(s)	106.5	5.7	47.1	61.3	106.5	5.7	47.1	61
Local Start Time (s)	98	0	42	61	98	0	42	61
Local Yield (s)	113.5	35.7	54.1	91.3	113.5	35.7	54.1	91
Local Yield 170(s)	113.5	12.7	54.1	68.3	113.5	12.7	54.1	68

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	115
Offset: 113 (94%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	

Splits and Phases: 6: Stittsville Main St & Hazeldean Rd



## **Appendix H – Future Background (2029) Synchro Outputs**

1: Carp Rd & Kittiwake Dr/Echwoods Ave



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	284	90	239	32	1135	42	646	59
v/c Ratio	1.04	0.18	0.43	0.12	1.26	0.28	0.74	0.08
Control Delay	107.2	8.4	17.9	6.2	141.2	14.4	28.1	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	107.2	8.4	17.9	6.2	141.2	14.4	28.1	1.7
Queue Length 50th (m)	~63.9	0.9	18.1	0.8	~303.1	3.3	108.1	0.0
Queue Length 95th (m)	#111.8	11.6	39.0	m2.3 m	#296.5	7.5	156.1	3.4
Internal Link Dist (m)		169.7	117.2		263.2		262.3	
Turn Bay Length (m)	15.0			25.0		30.0		32.0
Base Capacity (vph)	272	496	554	278	903	152	874	784
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.04	0.18	0.43	0.12	1.26	0.28	0.74	0.08

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

HCM Signalized Intersection Capacity Analysis  
1: Carp Rd & Kittiwake Dr/Echwoods Ave

Background AM (2029)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	284	6	84	59	4	176	32	1117	18	42	646	59
Future Volume (vph)	284	6	84	59	4	176	32	1117	18	42	646	59
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	3.9	3.9	3.7	3.7	4.8	3.7	3.6	3.7	3.7	3.3	3.5	3.1
Total Lost time (s)	6.3	6.3			6.0		5.6	6.0		5.6	5.7	5.7
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frbp, ped/bikes	1.00	0.99			0.98		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.86			0.90		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1680	1490			1737		1474	1746		1653	1618	1382
Flt Permitted	0.53	1.00			0.90		0.25	1.00		0.07	1.00	1.00
Satd. Flow (perm)	929	1490			1580		385	1746		116	1618	1382
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	284	6	84	59	4	176	32	1117	18	42	646	59
RTOR Reduction (vph)	0	59	0	0	87	0	0	0	0	0	0	28
Lane Group Flow (vph)	284	31	0	0	152	0	32	1135	0	42	646	31
Confl. Peds. (#/hr)	1					1	2		1	1		2
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	5%	20%	5%	9%	33%	0%	16%	4%	0%	0%	10%	2%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	33.7	33.7			34.0		62.1	58.3		65.0	59.9	59.9
Effective Green, g (s)	33.7	33.7			34.0		62.1	58.3		65.0	59.9	59.9
Actuated g/C Ratio	0.29	0.29			0.30		0.54	0.51		0.57	0.52	0.52
Clearance Time (s)	6.3	6.3			6.0		5.6	6.0		5.6	5.7	5.7
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	272	436			467		243	885		133	842	719
v/s Ratio Prot		0.02					0.00	c0.65		c0.01	0.40	
v/s Ratio Perm	c0.31				0.10		0.07			0.16		0.02
v/c Ratio	1.04	0.07			0.32		0.13	1.28		0.32	0.77	0.04
Uniform Delay, d1	40.6	29.3			31.6		15.0	28.4		25.1	22.0	13.5
Progression Factor	1.00	1.00			1.00		0.60	0.57		1.00	1.00	1.00
Incremental Delay, d2	66.6	0.1			0.4		0.1	131.8		1.4	6.6	0.1
Delay (s)	107.2	29.4			32.0		9.2	148.1		26.4	28.6	13.6
Level of Service	F	C			C		A	F		C	C	B
Approach Delay (s)		88.5			32.0			144.3			27.3	
Approach LOS		F			C			F			C	

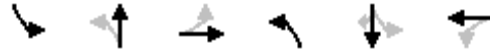
Intersection Summary		
HCM 2000 Control Delay	90.8	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.15	F
Actuated Cycle Length (s)	115.0	Sum of lost time (s)
Intersection Capacity Utilization	110.4%	17.9
Analysis Period (min)	15	ICU Level of Service
		H

c Critical Lane Group



Timing Report, Sorted By Phase  
 1: Carp Rd & Kittiwake Dr/Echwoods Ave

Background AM (2029)



Phase Number	1	2	4	5	6	8
Movement	SBL	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	12	63	40	12	63	40
Maximum Split (%)	10.4%	54.8%	34.8%	10.4%	54.8%	34.8%
Minimum Split (s)	10.6	30	29.3	10.6	29.7	29
Yellow Time (s)	3.7	3.7	3	3.7	3.7	3
All-Red Time (s)	1.9	2.3	3.3	1.9	2	3
Minimum Initial (s)	5	10	10	5	10	10
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		17	16		17	16
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	110	7	70	110	7	70
End Time (s)	7	70	110	7	70	110
Yield/Force Off (s)	1.4	64	103.7	1.4	64.3	104
Yield/Force Off 170(s)	1.4	47	87.7	1.4	47.3	88
Local Start Time (s)	103	0	63	103	0	63
Local Yield (s)	109.4	57	96.7	109.4	57.3	97
Local Yield 170(s)	109.4	40	80.7	109.4	40.3	81

Intersection Summary

Cycle Length	115
Control Type	Actuated-Coordinated
Natural Cycle	150
Offset: 7 (6%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 1: Carp Rd & Kittiwake Dr/Echwoods Ave



Queues  
2: Carp Rd & Hazeldean Rd

Background AM (2029)



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	351	437	22	143	350	72	504	286	350	60
v/c Ratio	1.60	0.55	0.21	0.64	0.69	0.51	0.44	0.81	0.42	0.08
Control Delay	320.4	36.6	40.6	53.5	15.5	61.2	32.2	42.3	35.8	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	320.4	36.6	40.6	53.5	15.5	61.2	32.2	42.3	35.8	3.6
Queue Length 50th (m)	~104.9	38.2	4.2	29.0	18.9	14.5	41.3	58.8	73.1	0.0
Queue Length 95th (m)	#145.7	48.1	11.0	46.3	42.7	27.0	67.5	m79.7	103.0	m0.3
Internal Link Dist (m)		252.9		257.2			422.0		263.2	
Turn Bay Length (m)	80.0		30.0			27.0		70.0		
Base Capacity (vph)	219	1207	202	427	644	160	1138	385	840	761
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.60	0.36	0.11	0.33	0.54	0.45	0.44	0.74	0.42	0.08

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

# HCM Signalized Intersection Capacity Analysis

## 2: Carp Rd & Hazeldean Rd

Background AM (2029)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	351	333	104	22	143	350	72	486	18	286	350	60
Future Volume (vph)	351	333	104	22	143	350	72	486	18	286	350	60
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	3.6	3.9	3.7	3.8	3.4	3.9	3.9	3.4	3.7	3.6	3.6	3.5
Total Lost time (s)	6.1	6.6		6.6	6.6	6.6	6.0	6.1		6.0	6.1	6.1
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00
Frbp, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	0.99	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1666	3229		1431	1586	1443	1523	3183		1462	1593	1309
Flt Permitted	0.43	1.00		0.50	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	747	3229		751	1586	1443	1523	3183		1462	1593	1309
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	351	333	104	22	143	350	72	486	18	286	350	60
RTOR Reduction (vph)	0	31	0	0	0	301	0	2	0	0	0	29
Lane Group Flow (vph)	351	406	0	22	143	49	72	502	0	286	350	31
Confl. Peds. (#/hr)	12		1	1		12	1		4	4		1
Heavy Vehicles (%)	2%	5%	5%	22%	11%	5%	16%	3%	43%	17%	13%	13%
Turn Type	pm+pt	NA		Perm	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8		8						6
Actuated Green, G (s)	27.3	27.3		16.2	16.2	16.2	9.5	41.1		27.9	59.5	59.5
Effective Green, g (s)	27.3	27.3		16.2	16.2	16.2	9.5	41.1		27.9	59.5	59.5
Actuated g/C Ratio	0.24	0.24		0.14	0.14	0.14	0.08	0.36		0.24	0.52	0.52
Clearance Time (s)	6.1	6.6		6.6	6.6	6.6	6.0	6.1		6.0	6.1	6.1
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	217	766		105	223	203	125	1137		354	824	677
v/s Ratio Prot	c0.07	0.13			0.09		0.05	0.16		c0.20	c0.22	
v/s Ratio Perm	c0.31			0.03		0.03						0.02
v/c Ratio	1.62	0.53		0.21	0.64	0.24	0.58	0.44		0.81	0.42	0.05
Uniform Delay, d1	44.5	38.2		43.7	46.7	43.9	50.8	28.2		41.0	17.2	13.7
Progression Factor	1.00	1.00		0.87	0.89	1.76	1.00	1.00		0.71	1.75	1.00
Incremental Delay, d2	298.1	0.7		1.0	6.1	0.6	6.3	1.2		9.8	1.2	0.1
Delay (s)	342.6	38.9		39.2	47.5	78.1	57.1	29.4		38.9	31.2	13.8
Level of Service	F	D		D	D	E	E	C		D	C	B
Approach Delay (s)		174.2			67.9			32.9			32.9	
Approach LOS		F			E			C			C	

Intersection Summary		
HCM 2000 Control Delay	83.1	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.91	F
Actuated Cycle Length (s)	115.0	Sum of lost time (s)
Intersection Capacity Utilization	92.6%	24.8
Analysis Period (min)	15	ICU Level of Service
		F

c Critical Lane Group

Timing Report, Sorted By Phase  
2: Carp Rd & Hazeldean Rd

Background AM (2029)

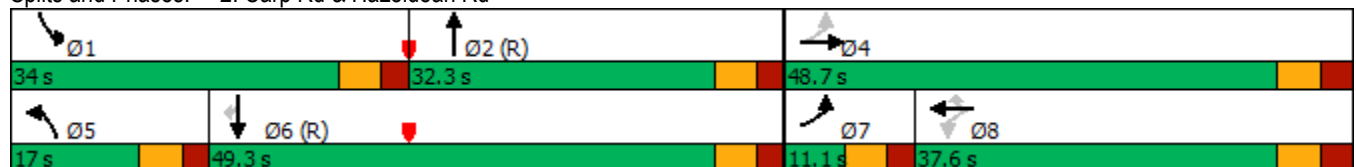


Phase Number	1	2	4	5	6	7	8
Movement	SBL	NBT	EBTL	NBL	SBT	EBL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lag
Lead-Lag Optimize							
Recall Mode	None	C-Max	None	None	C-Max	None	None
Maximum Split (s)	34	32.3	48.7	17	49.3	11.1	37.6
Maximum Split (%)	29.6%	28.1%	42.3%	14.8%	42.9%	9.7%	32.7%
Minimum Split (s)	11	31.1	37.6	11	31.1	11.1	37.6
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.3	2.4	2.9	2.3	2.4	2.4	2.9
Minimum Initial (s)	5	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0
Walk Time (s)		7	7		7		7
Flash Dont Walk (s)		18	24		18		24
Dual Entry	No	Yes	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	73	107	24.3	73	90	24.3	35.4
End Time (s)	107	24.3	73	90	24.3	35.4	73
Yield/Force Off (s)	101	18.2	66.4	84	18.2	29.3	66.4
Yield/Force Off 170(s)	101	0.2	42.4	84	0.2	29.3	42.4
Local Start Time (s)	81	0	32.3	81	98	32.3	43.4
Local Yield (s)	109	26.2	74.4	92	26.2	37.3	74.4
Local Yield 170(s)	109	8.2	50.4	92	8.2	37.3	50.4

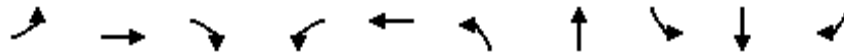
Intersection Summary

Cycle Length	115
Control Type	Actuated-Coordinated
Natural Cycle	105
Offset: 107 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 2: Carp Rd & Hazeldean Rd



## 3: Stittsville Main St &amp; Carp Rd/Plaza (1261 S. Main)



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	51	108	322	163	172	390	619	88	353	38
v/c Ratio	0.25	0.31	0.57	0.66	0.44	0.64	0.69	0.23	0.47	0.06
Control Delay	27.3	27.7	7.3	41.3	17.7	14.9	22.1	8.6	20.4	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.3	27.7	7.3	41.3	17.7	14.9	22.1	8.6	20.4	0.2
Queue Length 50th (m)	6.1	13.0	0.0	21.2	11.1	20.6	59.7	3.8	35.9	0.0
Queue Length 95th (m)	12.9	22.3	15.8	34.7	23.3	#57.4	#139.3	10.7	61.4	0.0
Internal Link Dist (m)		289.2			73.8		147.6		545.1	
Turn Bay Length (m)	30.0		30.0	15.0		32.0		30.0		22.0
Base Capacity (vph)	316	524	691	375	552	606	899	425	754	681
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.21	0.47	0.43	0.31	0.64	0.69	0.21	0.47	0.06

## Intersection Summary

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

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis  
 3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)

Background AM (2029)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	108	322	163	78	94	390	429	190	88	353	38
Future Volume (vph)	51	108	322	163	78	94	390	429	190	88	353	38
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	3.5	3.2	3.9	3.6	3.6	3.7	3.5	3.6	3.7	3.1	3.5	3.5
Total Lost time (s)	5.1	5.1	5.1	5.1	5.1		5.5	5.5		5.5	5.5	5.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	0.99		1.00	0.99		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.92		1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1656	1686	1508	1666	1601		1655	1667		1581	1745	1439
Flt Permitted	0.58	1.00	1.00	0.69	1.00		0.40	1.00		0.33	1.00	1.00
Satd. Flow (perm)	1019	1686	1508	1206	1601		693	1667		549	1745	1439
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	51	108	322	163	78	94	390	429	190	88	353	38
RTOR Reduction (vph)	0	0	256	0	63	0	0	15	0	0	0	22
Lane Group Flow (vph)	51	108	66	163	109	0	390	604	0	88	353	16
Confl. Peds. (#/hr)	1		4	4		1	5		7	7		5
Confl. Bikes (#/hr)												2
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)	16.4	16.4	16.4	16.4	16.4		53.0	41.3		40.8	34.6	34.6
Effective Green, g (s)	16.4	16.4	16.4	16.4	16.4		53.0	41.3		40.8	34.6	34.6
Actuated g/C Ratio	0.20	0.20	0.20	0.20	0.20		0.66	0.52		0.51	0.43	0.43
Clearance Time (s)	5.1	5.1	5.1	5.1	5.1		5.5	5.5		5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	208	345	309	247	328		614	860		359	754	622
v/s Ratio Prot		0.06			0.07		c0.10	c0.36		0.02	0.20	
v/s Ratio Perm	0.05		0.04	c0.14			0.32			0.11		0.01
v/c Ratio	0.25	0.31	0.21	0.66	0.33		0.64	0.70		0.25	0.47	0.03
Uniform Delay, d1	26.6	27.0	26.4	29.2	27.1		7.3	14.7		10.6	16.2	13.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	0.5	0.3	6.2	0.6		2.2	4.8		0.4	2.1	0.1
Delay (s)	27.2	27.5	26.8	35.5	27.7		9.4	19.4		11.0	18.2	13.1
Level of Service	C	C	C	D	C		A	B		B	B	B
Approach Delay (s)		27.0			31.5			15.6			16.5	
Approach LOS		C			C			B			B	

Intersection Summary		
HCM 2000 Control Delay	20.5	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.72	C
Actuated Cycle Length (s)	80.0	Sum of lost time (s)
Intersection Capacity Utilization	79.7%	16.1
Analysis Period (min)	15	ICU Level of Service
		D
c Critical Lane Group		

Timing Report, Sorted By Phase  
 3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)

Background AM (2029)

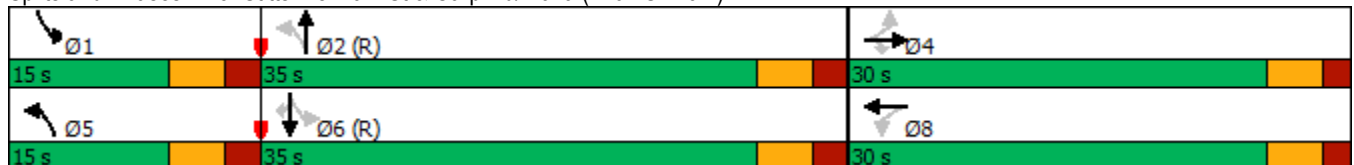


Phase Number	1	2	4	5	6	8
Movement	SBL	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	15	35	30	15	35	30
Maximum Split (%)	18.8%	43.8%	37.5%	18.8%	43.8%	37.5%
Minimum Split (s)	10.5	29.5	28.1	10.5	29.5	28.1
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.2	2.2	1.8	2.2	2.2	1.8
Minimum Initial (s)	5	10	10	5	10	10
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		17	16		17	16
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	65	0	35	65	0	35
End Time (s)	0	35	65	0	35	65
Yield/Force Off (s)	74.5	29.5	59.9	74.5	29.5	59.9
Yield/Force Off 170(s)	74.5	12.5	43.9	74.5	12.5	43.9
Local Start Time (s)	65	0	35	65	0	35
Local Yield (s)	74.5	29.5	59.9	74.5	29.5	59.9
Local Yield 170(s)	74.5	12.5	43.9	74.5	12.5	43.9

Intersection Summary

















Cycle Length	80
Control Type	Actuated-Coordinated
Natural Cycle	75
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)



HCM Unsignalized Intersection Capacity Analysis  
4: Samantha Eastop Dr & Kimpton Dr

Background AM (2029)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	26	0	0	115	6	0	0	0	12	0	49
Future Volume (Veh/h)	12	26	0	0	115	6	0	0	0	12	0	49
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	12	26	0	0	115	6	0	0	0	12	0	49
Pedestrians		5			5			5			5	
Lane Width (m)		4.8			4.8			4.8			4.8	
Walking Speed (m/s)		1.0			1.0			1.0			1.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)		322										
pX, platoon unblocked												
vC, conflicting volume	126			31			227	181	36	178	178	128
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	126			31			227	181	36	178	178	128
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 %	99			100			100	100	100	98	100	95
cM capacity (veh/h)	1451			1571			669	698	1023	761	700	910
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	38	121	0	61								
Volume Left	12	0	0	12								
Volume Right	0	6	0	49								
cSH	1451	1571	1700	876								
Volume to Capacity	0.01	0.00	0.00	0.07								
Queue Length 95th (m)	0.2	0.0	0.0	1.6								
Control Delay (s)	2.4	0.0	0.0	9.4								
Lane LOS	A		A	A								
Approach Delay (s)	2.4	0.0	0.0	9.4								
Approach LOS			A	A								
<b>Intersection Summary</b>												
Average Delay			3.0									
Intersection Capacity Utilization			25.2%		ICU Level of Service				A			
Analysis Period (min)			15									



6: Stittsville Main St & Hazeldean Rd

























Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	88	476	269	412	38	70	352	306	118	150
v/c Ratio	0.20	0.41	0.48	0.28	0.16	0.33	0.82	0.99	0.33	0.32
Control Delay	16.9	29.3	15.6	17.5	29.3	48.2	28.4	86.4	42.3	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.9	29.3	15.6	17.5	29.3	48.2	28.4	86.4	42.3	7.0
Queue Length 50th (m)	8.2	24.6	23.3	21.3	6.0	13.9	17.3	~64.1	23.0	0.0
Queue Length 95th (m)	m14.8	66.4	47.8	40.4	11.7	23.7	44.5	#88.3	35.4	13.3
Internal Link Dist (m)		606.0		143.1		545.1			139.3	
Turn Bay Length (m)	34.0		288.0		24.0		17.0	46.0		38.0
Base Capacity (vph)	449	1161	559	1495	307	587	722	310	587	679
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.41	0.48	0.28	0.12	0.12	0.49	0.99	0.20	0.22

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

HCM Signalized Intersection Capacity Analysis  
6: Stittsville Main St & Hazeldean Rd

Background AM (2029)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	457	19	269	288	124	38	70	352	306	118	150
Future Volume (vph)	88	457	19	269	288	124	38	70	352	306	118	150
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	4.5	3.5	3.7	3.9	3.5	3.7	3.7	3.3	4.3	3.4	3.4	4.6
Total Lost time (s)	6.5	6.3		6.5	6.3		6.9	7.0	7.0	6.9	6.7	6.7
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1708	3229		1699	3002		1571	1689	1578	1591	1676	1645
Flt Permitted	0.51	1.00		0.35	1.00		0.68	1.00	1.00	0.51	1.00	1.00
Satd. Flow (perm)	918	3229		619	3002		1126	1689	1578	853	1676	1645
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	88	457	19	269	288	124	38	70	352	306	118	150
RTOR Reduction (vph)	0	2	0	0	31	0	0	0	226	0	0	118
Lane Group Flow (vph)	88	474	0	269	381	0	38	70	126	306	118	32
Confl. Peds. (#/hr)	2					2	1		2	2		1
Heavy Vehicles (%)	10%	4%	7%	4%	8%	4%	10%	3%	3%	5%	5%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8		8	4		4
Actuated Green, G (s)	45.6	38.6		65.6	52.1		22.2	17.1	17.1	36.4	24.4	24.4
Effective Green, g (s)	45.6	38.6		65.6	52.1		22.2	17.1	17.1	36.4	24.4	24.4
Actuated g/C Ratio	0.40	0.34		0.57	0.45		0.19	0.15	0.15	0.32	0.21	0.21
Clearance Time (s)	6.5	6.3		6.5	6.3		6.9	7.0	7.0	6.9	6.7	6.7
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	412	1083		545	1360		237	251	234	347	355	349
v/s Ratio Prot	0.01	0.15		c0.09	0.13		0.01	0.04		c0.09	0.07	
v/s Ratio Perm	0.07			c0.19			0.02		0.08	c0.19		0.02
v/c Ratio	0.21	0.44		0.49	0.28		0.16	0.28	0.54	0.88	0.33	0.09
Uniform Delay, d1	22.1	29.7		13.6	19.7		38.4	43.5	45.3	36.1	38.4	36.4
Progression Factor	1.23	0.98		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	1.1		0.7	0.5		0.3	0.6	2.4	22.1	0.6	0.1
Delay (s)	27.3	30.4		14.3	20.2		38.7	44.1	47.6	58.2	39.0	36.5
Level of Service	C	C		B	C		D	D	D	E	D	D
Approach Delay (s)		29.9			17.9			46.4			48.6	
Approach LOS		C			B			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			34.3				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.69									
Actuated Cycle Length (s)			115.0				Sum of lost time (s)			26.7		
Intersection Capacity Utilization			72.0%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

Timing Report, Sorted By Phase  
6: Stittsville Main St & Hazeldean Rd

Background AM (2029)

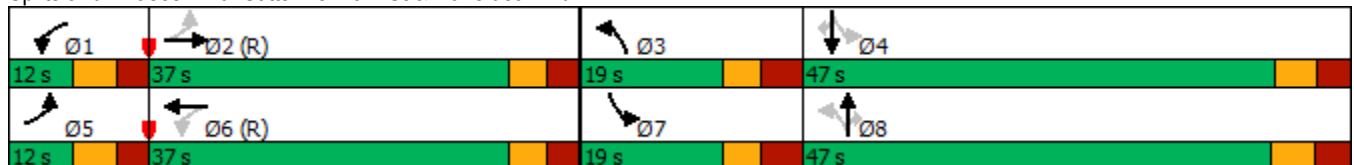


Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBTL	EBL	WBTL	SBL	NBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	12	37	19	47	12	37	19	47
Maximum Split (%)	10.4%	32.2%	16.5%	40.9%	10.4%	32.2%	16.5%	40.9%
Minimum Split (s)	11.5	36.3	11.9	36.7	11.5	36.3	16.9	37
Yellow Time (s)	3.7	3.3	3.3	3.7	3.7	3.3	3.3	3.7
All-Red Time (s)	2.8	3	3.6	3	2.8	3	3.6	3.3
Minimum Initial (s)	5	10	5	10	5	10	10	10
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		23		23		23		23
Dual Entry	No	Yes	No	Yes	No	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	73	85	7	26	73	85	7	26
End Time (s)	85	7	26	73	85	7	26	73
Yield/Force Off (s)	78.5	0.7	19.1	66.3	78.5	0.7	19.1	66
Yield/Force Off 170(s)	78.5	92.7	19.1	43.3	78.5	92.7	19.1	43
Local Start Time (s)	103	0	37	56	103	0	37	56
Local Yield (s)	108.5	30.7	49.1	96.3	108.5	30.7	49.1	96
Local Yield 170(s)	108.5	7.7	49.1	73.3	108.5	7.7	49.1	73

Intersection Summary

Cycle Length	115
Control Type	Actuated-Coordinated
Natural Cycle	105
Offset: 85 (74%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	

Splits and Phases: 6: Stittsville Main St & Hazeldean Rd



1: Carp Rd & Kittiwake Dr/Echwoods Ave























Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	170	82	172	62	883	139	1273	182
v/c Ratio	0.86	0.23	0.53	0.43	0.89	0.51	1.27	0.21
Control Delay	81.6	14.0	36.1	29.2	35.3	14.9	154.3	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.6	14.0	36.1	29.2	35.3	14.9	154.3	7.7
Queue Length 50th (m)	35.6	2.8	23.9	5.0	178.4	8.8	~357.0	9.0
Queue Length 95th (m)	#60.2	14.4	42.1	m15.5 m	#265.8	21.1	#455.3	22.6
Internal Link Dist (m)		169.7	117.2		263.2		262.3	
Turn Bay Length (m)	15.0			25.0		30.0		32.0
Base Capacity (vph)	249	421	392	253	987	336	1002	885
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.19	0.44	0.25	0.89	0.41	1.27	0.21

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

HCM Signalized Intersection Capacity Analysis  
1: Carp Rd & Kittiwake Dr/Echwoods Ave

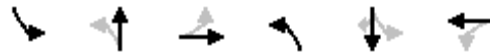
Background PM (2029)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	16	66	70	8	94	62	845	38	139	1273	182
Future Volume (vph)	170	16	66	70	8	94	62	845	38	139	1273	182
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	3.9	3.9	3.7	3.7	4.8	3.7	3.6	3.7	3.7	3.3	3.5	3.1
Total Lost time (s)	6.3	6.3			6.0		5.6	6.0		5.6	5.7	5.7
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frbp, ped/bikes	1.00	0.97			1.00		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00			0.99		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.88			0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1732	1554			1740		1474	1739		1653	1618	1381
Flt Permitted	0.57	1.00			0.83		0.06	1.00		0.11	1.00	1.00
Satd. Flow (perm)	1043	1554			1475		91	1739		194	1618	1381
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	170	16	66	70	8	94	62	845	38	139	1273	182
RTOR Reduction (vph)	0	53	0	0	39	0	0	1	0	0	0	32
Lane Group Flow (vph)	170	29	0	0	133	0	62	882	0	139	1273	150
Confl. Peds. (#/hr)			20	20			2		4	4		2
Confl. Bikes (#/hr)									1			1
Heavy Vehicles (%)	2%	0%	2%	9%	33%	0%	16%	4%	0%	0%	10%	2%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	22.9	22.9			23.2		74.3	68.0		84.4	73.2	73.2
Effective Green, g (s)	22.9	22.9			23.2		74.3	68.0		84.4	73.2	73.2
Actuated g/C Ratio	0.19	0.19			0.19		0.62	0.57		0.70	0.61	0.61
Clearance Time (s)	6.3	6.3			6.0		5.6	6.0		5.6	5.7	5.7
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	199	296			285		128	985		272	986	842
v/s Ratio Prot		0.02					0.03	0.51		c0.05	c0.79	
v/s Ratio Perm	c0.16				0.09		0.27			0.31		0.11
v/c Ratio	0.85	0.10			0.47		0.48	0.90		0.51	1.29	0.18
Uniform Delay, d1	46.9	40.0			42.9		26.9	22.9		18.9	23.4	10.2
Progression Factor	1.00	1.00			1.00		1.42	0.98		1.00	1.00	1.00
Incremental Delay, d2	28.2	0.1			1.2		2.3	10.1		1.6	138.6	0.5
Delay (s)	75.1	40.2			44.1		40.3	32.4		20.5	162.0	10.7
Level of Service	E	D			D		D	C		C	F	B
Approach Delay (s)		63.7			44.1			32.9			132.4	
Approach LOS		E			D			C			F	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			89.7									F
HCM 2000 Volume to Capacity ratio			1.16									
Actuated Cycle Length (s)			120.0							17.9		
Intersection Capacity Utilization			107.4%									G
Analysis Period (min)			15									

c Critical Lane Group

Timing Report, Sorted By Phase  
 1: Carp Rd & Kittiwake Dr/Echwoods Ave

Background PM (2029)



Phase Number	1	2	4	5	6	8
Movement	SBL	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	22	63	35	22	63	35
Maximum Split (%)	18.3%	52.5%	29.2%	18.3%	52.5%	29.2%
Minimum Split (s)	10.6	30	29.3	10.6	29.7	29
Yellow Time (s)	3.7	3.7	3	3.7	3.7	3
All-Red Time (s)	1.9	2.3	3.3	1.9	2	3
Minimum Initial (s)	5	10	10	5	10	10
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		17	16		17	16
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	109	11	74	109	11	74
End Time (s)	11	74	109	11	74	109
Yield/Force Off (s)	5.4	68	102.7	5.4	68.3	103
Yield/Force Off 170(s)	5.4	51	86.7	5.4	51.3	87
Local Start Time (s)	98	0	63	98	0	63
Local Yield (s)	114.4	57	91.7	114.4	57.3	92
Local Yield 170(s)	114.4	40	75.7	114.4	40.3	76

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	150
Offset: 11 (9%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 1: Carp Rd & Kittiwake Dr/Echwoods Ave



Queues  
2: Carp Rd & Hazeldean Rd

Background PM (2029)



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	113	493	63	606	430	162	482	456	598	289
v/c Ratio	1.23	0.38	0.24	0.93	0.55	0.69	0.53	1.47	1.03	0.47
Control Delay	202.3	22.8	14.9	43.5	4.3	63.8	38.3	253.3	63.8	19.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	202.3	22.8	14.9	43.5	4.3	63.8	38.3	253.3	63.8	19.4
Queue Length 50th (m)	~30.1	32.7	6.6	127.8	15.1	33.9	45.8	~140.1	~136.9	21.8
Queue Length 95th (m)	#63.9	45.6	m5.9	#189.4	m0.0	52.0	61.2 m	#104.7	m95.7	m19.6
Internal Link Dist (m)		252.9		257.2			422.0		263.2	
Turn Bay Length (m)	80.0		30.0			27.0		70.0		
Base Capacity (vph)	92	1303	260	652	778	317	910	310	581	613
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.23	0.38	0.24	0.93	0.55	0.51	0.53	1.47	1.03	0.47

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

# HCM Signalized Intersection Capacity Analysis

## 2: Carp Rd & Hazeldean Rd

Background PM (2029)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	113	325	168	63	606	430	162	447	35	456	598	289
Future Volume (vph)	113	325	168	63	606	430	162	447	35	456	598	289
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	3.6	3.9	3.7	3.8	3.4	3.9	3.9	3.4	3.7	3.6	3.6	3.5
Total Lost time (s)	6.6	6.6		6.6	6.6	6.6	6.0	6.1		6.0	6.1	6.1
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00
Frbp, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1710	3298		1597	1725	1439	1732	3204		1693	1765	1461
Flt Permitted	0.14	1.00		0.41	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	244	3298		689	1725	1439	1732	3204		1693	1765	1461
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	113	325	168	63	606	430	162	447	35	456	598	289
RTOR Reduction (vph)	0	55	0	0	0	234	0	5	0	0	0	132
Lane Group Flow (vph)	113	438	0	63	606	196	162	477	0	456	598	157
Confl. Peds. (#/hr)	8		5	5		8	6		6	6		6
Heavy Vehicles (%)	0%	1%	0%	9%	2%	6%	2%	3%	4%	1%	2%	0%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						6
Actuated Green, G (s)	45.4	45.4		45.4	45.4	45.4	16.4	33.9		22.0	39.5	39.5
Effective Green, g (s)	45.4	45.4		45.4	45.4	45.4	16.4	33.9		22.0	39.5	39.5
Actuated g/C Ratio	0.38	0.38		0.38	0.38	0.38	0.14	0.28		0.18	0.33	0.33
Clearance Time (s)	6.6	6.6		6.6	6.6	6.6	6.0	6.1		6.0	6.1	6.1
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	92	1247		260	652	544	236	905		310	580	480
v/s Ratio Prot		0.13			0.35		0.09	0.15		c0.27	c0.34	
v/s Ratio Perm	c0.46			0.09		0.14						0.11
v/c Ratio	1.23	0.35		0.24	0.93	0.36	0.69	0.53		1.47	1.03	0.33
Uniform Delay, d1	37.3	26.7		25.5	35.8	26.8	49.4	36.3		49.0	40.2	30.3
Progression Factor	1.00	1.00		0.49	0.63	0.42	1.00	1.00		1.18	1.11	1.71
Incremental Delay, d2	167.3	0.2		0.4	17.6	0.4	8.0	2.2		213.6	20.3	0.2
Delay (s)	204.6	26.9		12.9	40.1	11.5	57.4	38.5		271.5	65.1	51.9
Level of Service	F	C		B	D	B	E	D		F	E	D
Approach Delay (s)		60.1			27.3			43.2			132.3	
Approach LOS		E			C			D			F	

### Intersection Summary

HCM 2000 Control Delay	73.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.24		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.7
Intersection Capacity Utilization	108.9%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Timing Report, Sorted By Phase  
2: Carp Rd & Hazeldean Rd

Background PM (2029)

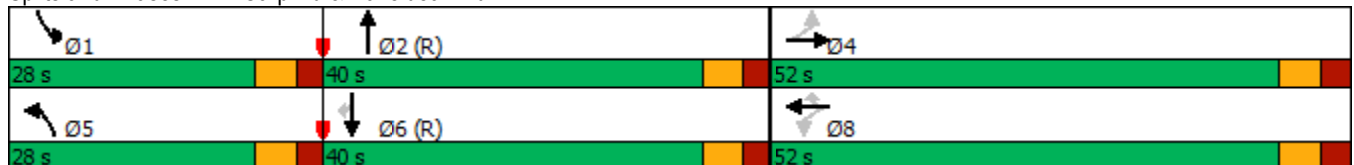


Phase Number	1	2	4	5	6	8
Movement	SBL	NBT	EBTL	NBL	SBT	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	28	40	52	28	40	52
Maximum Split (%)	23.3%	33.3%	43.3%	23.3%	33.3%	43.3%
Minimum Split (s)	11	31.1	37.6	11	31.1	37.6
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.3	2.4	2.9	2.3	2.4	2.9
Minimum Initial (s)	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		18	24		18	24
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	100	8	48	100	8	48
End Time (s)	8	48	100	8	48	100
Yield/Force Off (s)	2	41.9	93.4	2	41.9	93.4
Yield/Force Off 170(s)	2	23.9	69.4	2	23.9	69.4
Local Start Time (s)	92	0	40	92	0	40
Local Yield (s)	114	33.9	85.4	114	33.9	85.4
Local Yield 170(s)	114	15.9	61.4	114	15.9	61.4

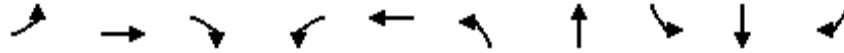
Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	130
Offset: 8 (7%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 2: Carp Rd & Hazeldean Rd



## 3: Stittsville Main St &amp; Carp Rd/Plaza (1261 S. Main)



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	89	138	528	259	256	375	701	88	587	58
v/c Ratio	0.39	0.36	0.92	0.59	0.39	1.31	1.08	0.42	1.16	0.11
Control Delay	33.2	30.9	36.8	24.9	16.9	189.5	92.0	20.5	121.8	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.2	30.9	36.8	24.9	16.9	189.5	92.0	20.5	121.8	0.4
Queue Length 50th (m)	11.4	17.6	33.3	26.8	21.2	~80.2	~147.7	7.9	~111.3	0.0
Queue Length 95th (m)	23.4	31.7	#86.9	43.3	37.6	#129.3	#208.9	15.8	#167.5	0.0
Internal Link Dist (m)		289.2			73.8		147.6		545.1	
Turn Bay Length (m)	30.0		30.0	15.0		32.0		30.0		22.0
Base Capacity (vph)	275	456	622	442	726	286	647	228	508	522
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.30	0.85	0.59	0.35	1.31	1.08	0.39	1.16	0.11

## 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.

HCM Signalized Intersection Capacity Analysis  
 3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)

Background PM (2029)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	138	528	259	155	101	375	568	133	88	587	58
Future Volume (vph)	89	138	528	259	155	101	375	568	133	88	587	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	3.5	3.2	3.9	3.6	3.6	3.7	3.5	3.6	3.7	3.1	3.5	3.5
Total Lost time (s)	5.1	5.1	5.1	5.1	5.1		5.5	5.5		5.5	5.5	5.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.96	1.00	0.97		1.00	0.99		1.00	1.00	0.93
Flpb, ped/bikes	0.97	1.00	1.00	0.99	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.94		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1638	1720	1475	1698	1620		1595	1716		1615	1728	1405
Flt Permitted	0.60	1.00	1.00	0.51	1.00		0.12	1.00		0.15	1.00	1.00
Satd. Flow (perm)	1036	1720	1475	919	1620		210	1716		257	1728	1405
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	89	138	528	259	155	101	375	568	133	88	587	58
RTOR Reduction (vph)	0	0	244	0	28	0	0	8	0	0	0	41
Lane Group Flow (vph)	89	138	284	259	228	0	375	693	0	88	587	17
Confl. Peds. (#/hr)	23		10	10		23	28		13	13		28
Confl. Bikes (#/hr)						2			4			
Heavy Vehicles (%)	0%	0%	3%	0%	1%	3%	6%	1%	1%	0%	3%	0%
Turn Type	Perm	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)	20.0	20.0	20.0	35.0	35.0		44.4	32.4		33.0	26.5	26.5
Effective Green, g (s)	20.0	20.0	20.0	35.0	35.0		44.4	32.4		33.0	26.5	26.5
Actuated g/C Ratio	0.22	0.22	0.22	0.39	0.39		0.49	0.36		0.37	0.29	0.29
Clearance Time (s)	5.1	5.1	5.1	5.1	5.1		5.5	5.5		5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	230	382	327	443	630		294	617		192	508	413
v/s Ratio Prot		0.08		c0.06	0.14		c0.18	0.40		0.03	0.34	
v/s Ratio Perm	0.09		c0.19	0.16			c0.45			0.13		0.01
v/c Ratio	0.39	0.36	0.87	0.58	0.36		1.28	1.12		0.46	1.16	0.04
Uniform Delay, d1	29.8	29.6	33.7	20.1	19.6		25.1	28.8		22.1	31.8	22.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.1	0.6	20.8	2.0	0.4		147.8	74.9		1.7	90.4	0.2
Delay (s)	30.9	30.2	54.5	22.0	19.9		172.9	103.7		23.8	122.1	22.9
Level of Service	C	C	D	C	B		F	F		C	F	C
Approach Delay (s)		47.3			21.0			127.8			102.5	
Approach LOS		D			C			F			F	

Intersection Summary		
HCM 2000 Control Delay	84.2	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.12	F
Actuated Cycle Length (s)	90.0	Sum of lost time (s)
Intersection Capacity Utilization	98.8%	21.2
Analysis Period (min)	15	ICU Level of Service
		F

c Critical Lane Group

Timing Report, Sorted By Phase  
 3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)

Background PM (2029)

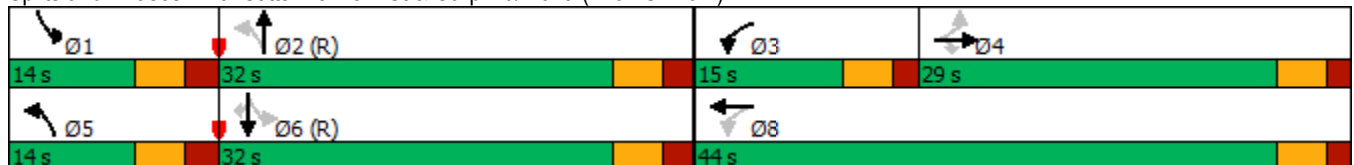


Phase Number	1	2	3	4	5	6	8
Movement	SBL	NBTL	WBL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	
Lead-Lag Optimize							
Recall Mode	None	C-Max	None	None	None	C-Max	None
Maximum Split (s)	14	32	15	29	14	32	44
Maximum Split (%)	15.6%	35.6%	16.7%	32.2%	15.6%	35.6%	48.9%
Minimum Split (s)	10.5	29.5	10.1	28.1	10.5	29.5	28.1
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.2	2.2	1.8	1.8	2.2	2.2	1.8
Minimum Initial (s)	5	10	5	10	5	10	10
Vehicle Extension (s)	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0
Walk Time (s)		7		7		7	7
Flash Dont Walk (s)		17		16		17	16
Dual Entry	No	Yes	No	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	78	2	34	49	78	2	34
End Time (s)	2	34	49	78	2	34	78
Yield/Force Off (s)	86.5	28.5	43.9	72.9	86.5	28.5	72.9
Yield/Force Off 170(s)	86.5	11.5	43.9	56.9	86.5	11.5	56.9
Local Start Time (s)	76	0	32	47	76	0	32
Local Yield (s)	84.5	26.5	41.9	70.9	84.5	26.5	70.9
Local Yield 170(s)	84.5	9.5	41.9	54.9	84.5	9.5	54.9

Intersection Summary

















Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	110
Offset: 2 (2%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)



HCM Unsignalized Intersection Capacity Analysis  
4: Samantha Eastop Dr & Kimpton Dr

Background PM (2029)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	94	0	0	59	6	0	0	0	41	0	25
Future Volume (Veh/h)	40	94	0	0	59	6	0	0	0	41	0	25
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	40	94	0	0	59	6	0	0	0	41	0	25
Pedestrians		5			5			5			5	
Lane Width (m)		4.8			4.8			4.8			4.8	
Walking Speed (m/s)		1.0			1.0			1.0			1.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)		322										
pX, platoon unblocked												
vC, conflicting volume	70			99			271	249	104	246	246	72
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	70			99			271	249	104	246	246	72
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	100	94	100	97
cM capacity (veh/h)	1520			1484			636	628	938	677	630	977
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	134	65	0	66								
Volume Left	40	0	0	41								
Volume Right	0	6	0	25								
cSH	1520	1484	1700	766								
Volume to Capacity	0.03	0.00	0.00	0.09								
Queue Length 95th (m)	0.6	0.0	0.0	2.0								
Control Delay (s)	2.4	0.0	0.0	10.1								
Lane LOS	A		A	B								
Approach Delay (s)	2.4	0.0	0.0	10.1								
Approach LOS			A	B								
Intersection Summary												
Average Delay			3.7									
Intersection Capacity Utilization			27.8%		ICU Level of Service				A			
Analysis Period (min)			15									

## 6: Stittsville Main St &amp; Hazeldean Rd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	134	470	576	1065	96	194	452	256	271	103
v/c Ratio	0.50	0.48	1.05	0.79	0.38	0.63	0.83	0.80	0.78	0.24
Control Delay	29.8	48.4	75.9	35.7	30.8	53.7	26.9	51.3	60.8	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.8	48.4	75.9	35.7	30.8	53.7	26.9	51.3	60.8	2.7
Queue Length 50th (m)	19.1	51.2	~87.1	98.9	14.5	39.2	27.9	43.1	56.3	0.0
Queue Length 95th (m)	m22.0	m50.1	#191.6	#166.7	23.2	56.1	61.1	57.9	78.1	3.8
Internal Link Dist (m)		606.0		143.1		545.1			139.3	
Turn Bay Length (m)	34.0		288.0		24.0		17.0	46.0		38.0
Base Capacity (vph)	349	987	550	1356	286	435	636	320	444	515
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.48	1.05	0.79	0.34	0.45	0.71	0.80	0.61	0.20

## 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.

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

HCM Signalized Intersection Capacity Analysis  
6: Stittsville Main St & Hazeldean Rd

Background PM (2029)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	134	433	37	576	755	310	96	194	452	256	271	103
Future Volume (vph)	134	433	37	576	755	310	96	194	452	256	271	103
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	4.5	3.5	3.7	3.9	3.5	3.7	3.7	3.3	4.3	3.4	3.4	4.6
Total Lost time (s)	6.5	6.3		6.5	6.3		6.9	7.0	7.0	6.9	6.7	6.7
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.96	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00
Fr <sub>t</sub>	1.00	0.99		1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Fl <sub>t</sub> Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1880	3302		1730	3204		1694	1740	1585	1659	1760	1592
Fl <sub>t</sub> Permitted	0.18	1.00		0.33	1.00		0.36	1.00	1.00	0.45	1.00	1.00
Satd. Flow (perm)	359	3302		594	3204		649	1740	1585	783	1760	1592
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	134	433	37	576	755	310	96	194	452	256	271	103
RTOR Reduction (vph)	0	6	0	0	31	0	0	0	263	0	0	83
Lane Group Flow (vph)	134	464	0	576	1034	0	96	194	189	256	271	20
Confl. Peds. (#/hr)	6		7	7		6	4		23	23		4
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	0%	1%	0%	2%	0%	0%	2%	0%	0%	0%	0%	5%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8	8	4	4	
Permitted Phases	2			6			8		8	4		4
Actuated Green, G (s)	45.8	35.6		66.3	49.6		31.4	21.4	21.4	35.9	23.8	23.8
Effective Green, g (s)	45.8	35.6		66.3	49.6		31.4	21.4	21.4	35.9	23.8	23.8
Actuated g/C Ratio	0.38	0.30		0.55	0.41		0.26	0.18	0.18	0.30	0.20	0.20
Clearance Time (s)	6.5	6.3		6.5	6.3		6.9	7.0	7.0	6.9	6.7	6.7
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	266	979		557	1324		256	310	282	322	349	315
v/s Ratio Prot	0.04	0.14		c0.21	0.32		0.03	0.11		c0.08	0.15	
v/s Ratio Perm	0.15			c0.36			0.07		0.12	c0.16		0.01
v/c Ratio	0.50	0.47		1.03	0.78		0.38	0.63	0.67	0.80	0.78	0.06
Uniform Delay, d1	25.4	34.5		20.7	30.5		35.0	45.6	46.0	36.6	45.6	39.1
Progression Factor	1.59	1.40		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.7		47.2	4.6		0.9	3.9	6.1	12.7	10.4	0.1
Delay (s)	41.1	48.9		67.9	35.1		35.9	49.5	52.1	49.3	55.9	39.1
Level of Service	D	D		E	D		D	D	D	D	E	D
Approach Delay (s)		47.2			46.6			49.4			50.5	
Approach LOS		D			D			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			48.0								HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			1.01									
Actuated Cycle Length (s)			120.0							26.7		
Intersection Capacity Utilization			114.1%								ICU Level of Service	H
Analysis Period (min)			15									

c Critical Lane Group

Timing Report, Sorted By Phase  
6: Stittsville Main St & Hazeldean Rd

Background PM (2029)

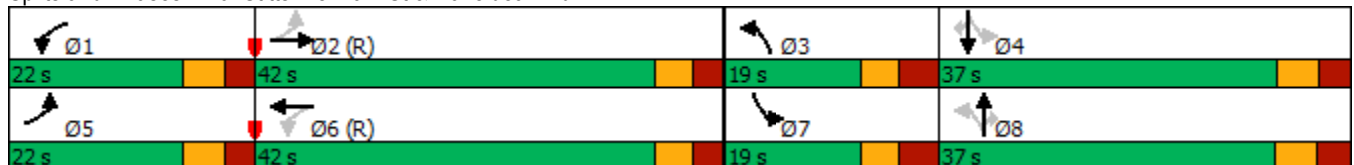


Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBTL	EBL	WBTL	SBL	NBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	22	42	19	37	22	42	19	37
Maximum Split (%)	18.3%	35.0%	15.8%	30.8%	18.3%	35.0%	15.8%	30.8%
Minimum Split (s)	11.7	36.3	11.9	36.7	11.5	36.3	16.9	37
Yellow Time (s)	3.7	3.3	3.3	3.7	3.7	3.3	3.3	3.7
All-Red Time (s)	2.8	3	3.6	3	2.8	3	3.6	3.3
Minimum Initial (s)	5	10	5	10	5	10	10	10
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		23		23		23		23
Dual Entry	No	Yes	No	Yes	No	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	91	113	35	54	91	113	35	54
End Time (s)	113	35	54	91	113	35	54	91
Yield/Force Off (s)	106.5	28.7	47.1	84.3	106.5	28.7	47.1	84
Yield/Force Off 170(s)	106.5	5.7	47.1	61.3	106.5	5.7	47.1	61
Local Start Time (s)	98	0	42	61	98	0	42	61
Local Yield (s)	113.5	35.7	54.1	91.3	113.5	35.7	54.1	91
Local Yield 170(s)	113.5	12.7	54.1	68.3	113.5	12.7	54.1	68

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	125
Offset: 113 (94%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	

Splits and Phases: 6: Stittsville Main St & Hazeldean Rd





## **Appendix I – Future Total (2024) Synchro Outputs**

1: Carp Rd & Kittiwake Dr/Echwoods Ave























Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	256	81	282	29	1089	60	605	53
v/c Ratio	1.05	0.17	0.47	0.10	1.21	0.40	0.69	0.07
Control Delay	113.0	8.6	16.3	8.1	122.5	19.4	26.0	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	113.0	8.6	16.3	8.1	122.5	19.4	26.0	1.3
Queue Length 50th (m)	~58.0	0.7	18.6	1.2	~276.9	4.8	97.2	0.0
Queue Length 95th (m)	#104.3	11.1	41.6	m2.7 m	#317.4	11.3	140.0	2.5
Internal Link Dist (m)		169.7	117.2		263.2		262.3	
Turn Bay Length (m)	15.0			25.0		30.0		32.0
Base Capacity (vph)	243	490	594	302	902	152	874	784
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.05	0.17	0.47	0.10	1.21	0.39	0.69	0.07

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

HCM Signalized Intersection Capacity Analysis  
 1: Carp Rd & Kittiwake Dr/Echwoods Ave

Total AM (2024)

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	256	5	76	53	3	226	29	1073	16	60	605	53	
Future Volume (vph)	256	5	76	53	3	226	29	1073	16	60	605	53	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Lane Width	3.9	3.9	3.7	3.7	4.8	3.7	3.6	3.7	3.7	3.3	3.5	3.1	
Total Lost time (s)	6.3	6.3			6.0		5.6	6.0		5.6	5.7	5.7	
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00	
Frbp, ped/bikes	1.00	0.99			0.98		1.00	1.00		1.00	1.00	0.98	
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00	
Frt	1.00	0.86			0.89		1.00	1.00		1.00	1.00	0.85	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	1681	1490			1734		1474	1747		1653	1618	1382	
Flt Permitted	0.47	1.00			0.92		0.28	1.00		0.07	1.00	1.00	
Satd. Flow (perm)	830	1490			1619		434	1747		116	1618	1382	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Adj. Flow (vph)	256	5	76	53	3	226	29	1073	16	60	605	53	
RTOR Reduction (vph)	0	54	0	0	116	0	0	0	0	0	0	25	
Lane Group Flow (vph)	256	27	0	0	166	0	29	1089	0	60	605	28	
Confl. Peds. (#/hr)	1					1	2		1	1		2	
Confl. Bikes (#/hr)			2										
Heavy Vehicles (%)	5%	20%	5%	9%	33%	0%	16%	4%	0%	0%	10%	2%	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm	
Protected Phases		4			8		5	2		1	6		
Permitted Phases	4			8			2			6		6	
Actuated Green, G (s)	33.7	33.7			34.0		62.1	58.3		65.0	59.9	59.9	
Effective Green, g (s)	33.7	33.7			34.0		62.1	58.3		65.0	59.9	59.9	
Actuated g/C Ratio	0.29	0.29			0.30		0.54	0.51		0.57	0.52	0.52	
Clearance Time (s)	6.3	6.3			6.0		5.6	6.0		5.6	5.7	5.7	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	243	436			478		268	885		133	842	719	
v/s Ratio Prot		0.02					0.00	c0.62		c0.02	0.37		
v/s Ratio Perm	c0.31				0.10		0.05			0.23		0.02	
v/c Ratio	1.05	0.06			0.35		0.11	1.23		0.45	0.72	0.04	
Uniform Delay, d1	40.6	29.3			31.8		14.4	28.4		25.4	21.1	13.5	
Progression Factor	1.00	1.00			1.00		0.80	0.65		1.00	1.00	1.00	
Incremental Delay, d2	72.5	0.1			0.4		0.1	110.7		2.4	5.2	0.1	
Delay (s)	113.2	29.3			32.2		11.7	129.2		27.8	26.3	13.6	
Level of Service	F	C			C		B	F		C	C	B	
Approach Delay (s)		93.0			32.2			126.2			25.5		
Approach LOS		F			C			F			C		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			81.4									HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio			1.13										
Actuated Cycle Length (s)			115.0									Sum of lost time (s)	17.9
Intersection Capacity Utilization			109.0%									ICU Level of Service	G
Analysis Period (min)			15										

c Critical Lane Group

Timing Report, Sorted By Phase  
 1: Carp Rd & Kittiwake Dr/Echwoods Ave

Total AM (2024)



Phase Number	1	2	4	5	6	8
Movement	SBL	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	12	63	40	12	63	40
Maximum Split (%)	10.4%	54.8%	34.8%	10.4%	54.8%	34.8%
Minimum Split (s)	10.6	30	29.3	10.6	29.7	29
Yellow Time (s)	3.7	3.7	3	3.7	3.7	3
All-Red Time (s)	1.9	2.3	3.3	1.9	2	3
Minimum Initial (s)	5	10	10	5	10	10
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		17	16		17	16
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	110	7	70	110	7	70
End Time (s)	7	70	110	7	70	110
Yield/Force Off (s)	1.4	64	103.7	1.4	64.3	104
Yield/Force Off 170(s)	1.4	47	87.7	1.4	47.3	88
Local Start Time (s)	103	0	63	103	0	63
Local Yield (s)	109.4	57	96.7	109.4	57.3	97
Local Yield 170(s)	109.4	40	80.7	109.4	40.3	81

Intersection Summary

Cycle Length	115
Control Type	Actuated-Coordinated
Natural Cycle	150
Offset: 7 (6%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 1: Carp Rd & Kittiwake Dr/Echwoods Ave



## 2: Carp Rd &amp; Hazeldean Rd



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	316	405	31	135	382	65	459	280	315	54
v/c Ratio	1.13	0.45	0.29	0.62	0.72	0.48	0.49	0.71	0.40	0.07
Control Delay	131.6	32.3	48.5	57.0	15.8	60.5	36.0	39.8	39.4	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	131.6	32.3	48.5	57.0	15.8	60.5	36.0	39.8	39.4	3.3
Queue Length 50th (m)	~67.9	32.9	6.1	27.3	8.1	13.0	40.9	58.7	66.5	0.0
Queue Length 95th (m)	#109.8	42.4	14.4	43.3	33.3	25.0	59.0	#89.5	94.5	m0.0
Internal Link Dist (m)		252.9		257.2			422.0		263.2	
Turn Bay Length (m)	80.0		30.0			27.0		70.0		
Base Capacity (vph)	279	1328	211	433	672	278	945	397	797	729
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.13	0.30	0.15	0.31	0.57	0.23	0.49	0.71	0.40	0.07

## 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.

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

# HCM Signalized Intersection Capacity Analysis

Total AM (2024)

## 2: Carp Rd & Hazeldean Rd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	316	311	94	31	135	382	65	438	21	280	315	54	
Future Volume (vph)	316	311	94	31	135	382	65	438	21	280	315	54	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Lane Width	3.6	3.9	3.7	3.8	3.4	3.9	3.9	3.4	3.7	3.6	3.6	3.5	
Total Lost time (s)	6.1	6.6		6.6	6.6	6.6	6.0	6.1		6.0	6.1	6.1	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00	
Frbp, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	1.00		1.00	1.00	0.98	
Flpb, ped/bikes	0.99	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	1666	3232		1431	1586	1445	1523	3166		1462	1593	1309	
Flt Permitted	0.44	1.00		0.51	1.00	1.00	0.95	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	771	3232		774	1586	1445	1523	3166		1462	1593	1309	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Adj. Flow (vph)	316	311	94	31	135	382	65	438	21	280	315	54	
RTOR Reduction (vph)	0	30	0	0	0	330	0	3	0	0	0	28	
Lane Group Flow (vph)	316	375	0	31	135	52	65	456	0	280	315	26	
Confl. Peds. (#/hr)	11		1	1		11	1		3	3		1	
Heavy Vehicles (%)	2%	5%	5%	22%	11%	5%	16%	3%	43%	17%	13%	13%	
Turn Type	pm+pt	NA		Perm	NA	Perm	Prot	NA		Prot	NA	Perm	
Protected Phases	7	4			8		5	2		1	6		
Permitted Phases	4			8		8						6	
Actuated Green, G (s)	30.8	30.8		15.8	15.8	15.8	9.1	34.3		31.2	56.4	56.4	
Effective Green, g (s)	30.8	30.8		15.8	15.8	15.8	9.1	34.3		31.2	56.4	56.4	
Actuated g/C Ratio	0.27	0.27		0.14	0.14	0.14	0.08	0.30		0.27	0.49	0.49	
Clearance Time (s)	6.1	6.6		6.6	6.6	6.6	6.0	6.1		6.0	6.1	6.1	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	275	865		106	217	198	120	944		396	781	641	
v/s Ratio Prot	c0.09	0.12			0.09		0.04	c0.14		c0.19	0.20		
v/s Ratio Perm	c0.22			0.04		0.04						0.02	
v/c Ratio	1.15	0.43		0.29	0.62	0.27	0.54	0.48		0.71	0.40	0.04	
Uniform Delay, d1	41.3	34.9		44.6	46.8	44.4	50.9	33.1		37.8	18.6	15.2	
Progression Factor	1.00	1.00		0.98	0.98	1.69	1.00	1.00		0.81	1.80	1.00	
Incremental Delay, d2	100.7	0.3		1.5	5.4	0.7	4.9	1.8		4.5	1.2	0.1	
Delay (s)	142.0	35.2		45.1	51.1	75.9	55.9	34.9		35.2	34.7	15.3	
Level of Service	F	D		D	D	E	E	C		D	C	B	
Approach Delay (s)		82.0			68.0			37.5			33.3		
Approach LOS		F			E			D			C		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			56.4		HCM 2000 Level of Service						E		
HCM 2000 Volume to Capacity ratio			0.79										
Actuated Cycle Length (s)			115.0		Sum of lost time (s)					24.8			
Intersection Capacity Utilization			89.5%		ICU Level of Service					E			
Analysis Period (min)			15										
c Critical Lane Group													

Timing Report, Sorted By Phase  
2: Carp Rd & Hazeldean Rd

Total AM (2024)

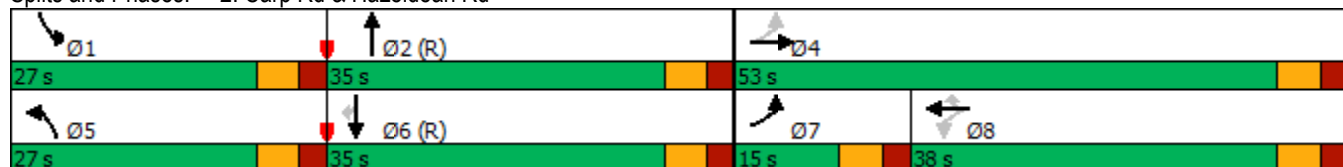


Phase Number	1	2	4	5	6	7	8
Movement	SBL	NBT	EBTL	NBL	SBT	EBL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lag
Lead-Lag Optimize							
Recall Mode	None	C-Max	None	None	C-Max	None	None
Maximum Split (s)	27	35	53	27	35	15	38
Maximum Split (%)	23.5%	30.4%	46.1%	23.5%	30.4%	13.0%	33.0%
Minimum Split (s)	11	31.1	37.6	11	31.1	11.1	37.6
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.3	2.4	2.9	2.3	2.4	2.4	2.9
Minimum Initial (s)	5	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0
Walk Time (s)		7	7		7		7
Flash Dont Walk (s)		18	24		18		24
Dual Entry	No	Yes	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	80	107	27	80	107	27	42
End Time (s)	107	27	80	107	27	42	80
Yield/Force Off (s)	101	20.9	73.4	101	20.9	35.9	73.4
Yield/Force Off 170(s)	101	2.9	49.4	101	2.9	35.9	49.4
Local Start Time (s)	88	0	35	88	0	35	50
Local Yield (s)	109	28.9	81.4	109	28.9	43.9	81.4
Local Yield 170(s)	109	10.9	57.4	109	10.9	43.9	57.4

Intersection Summary

Cycle Length	115
Control Type	Actuated-Coordinated
Natural Cycle	105
Offset: 107 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

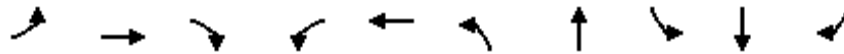
Splits and Phases: 2: Carp Rd & Hazeldean Rd



Queues

Total AM (2024)

3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	46	107	291	147	159	352	575	79	342	35
v/c Ratio	0.23	0.33	0.55	0.63	0.43	0.57	0.62	0.19	0.43	0.05
Control Delay	27.8	29.0	7.6	40.8	18.3	10.5	18.8	7.6	18.6	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.8	29.0	7.6	40.8	18.3	10.5	18.8	7.6	18.6	0.1
Queue Length 50th (m)	5.5	13.1	0.0	19.2	10.4	17.0	51.1	3.2	31.2	0.0
Queue Length 95th (m)	12.2	22.7	15.5	32.1	22.5	38.0	#118.3	9.3	59.1	0.0
Internal Link Dist (m)		289.2			73.8		147.6		545.1	
Turn Bay Length (m)	30.0		30.0	15.0		32.0		30.0		22.0
Base Capacity (vph)	329	524	670	376	550	625	923	471	799	716
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.20	0.43	0.39	0.29	0.56	0.62	0.17	0.43	0.05

























Intersection Summary

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



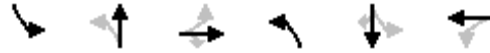
HCM Signalized Intersection Capacity Analysis  
 3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)

Total AM (2024)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	107	291	147	75	84	352	404	171	79	342	35
Future Volume (vph)	46	107	291	147	75	84	352	404	171	79	342	35
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	3.5	3.2	3.9	3.6	3.6	3.7	3.5	3.6	3.7	3.1	3.5	3.5
Total Lost time (s)	5.1	5.1	5.1	5.1	5.1		5.5	5.5		5.5	5.5	5.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	0.99		1.00	0.99		1.00	1.00	0.97
Flpb, ped/bikes	1.00	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	0.92		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1656	1686	1511	1669	1606		1656	1671		1581	1745	1442
Flt Permitted	0.61	1.00	1.00	0.69	1.00		0.42	1.00		0.37	1.00	1.00
Satd. Flow (perm)	1059	1686	1511	1209	1606		734	1671		619	1745	1442
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	46	107	291	147	75	84	352	404	171	79	342	35
RTOR Reduction (vph)	0	0	235	0	59	0	0	14	0	0	0	19
Lane Group Flow (vph)	46	107	56	147	100	0	352	561	0	79	342	16
Confl. Peds. (#/hr)	1		3	3		1	4		6	6		4
Confl. Bikes (#/hr)												2
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)	15.5	15.5	15.5	15.5	15.5		53.9	42.5		42.5	36.6	36.6
Effective Green, g (s)	15.5	15.5	15.5	15.5	15.5		53.9	42.5		42.5	36.6	36.6
Actuated g/C Ratio	0.19	0.19	0.19	0.19	0.19		0.67	0.53		0.53	0.46	0.46
Clearance Time (s)	5.1	5.1	5.1	5.1	5.1		5.5	5.5		5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	205	326	292	234	311		630	887		399	798	659
v/s Ratio Prot		0.06			0.06		c0.08	c0.34		0.01	0.20	
v/s Ratio Perm	0.04		0.04	c0.12			0.29			0.09		0.01
v/c Ratio	0.22	0.33	0.19	0.63	0.32		0.56	0.63		0.20	0.43	0.02
Uniform Delay, d1	27.2	27.8	27.0	29.6	27.7		6.4	13.2		9.5	14.6	11.9
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	0.6	0.3	5.2	0.6		1.1	3.4		0.2	1.7	0.1
Delay (s)	27.7	28.4	27.3	34.8	28.3		7.5	16.7		9.8	16.3	12.0
Level of Service	C	C	C	C	C		A	B		A	B	B
Approach Delay (s)		27.6			31.4			13.2			14.9	
Approach LOS		C			C			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			19.2			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			80.0			Sum of lost time (s)			16.1			
Intersection Capacity Utilization			76.5%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Timing Report, Sorted By Phase  
 3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)

Total AM (2024)

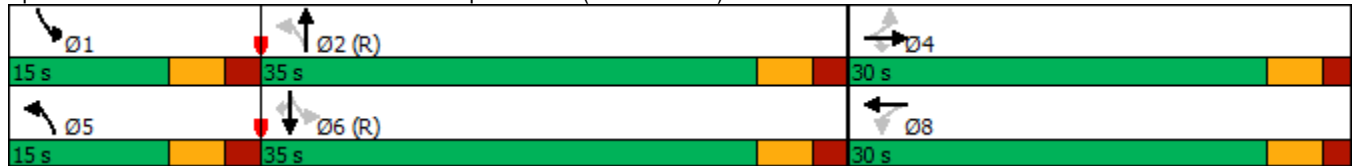


Phase Number	1	2	4	5	6	8
Movement	SBL	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	15	35	30	15	35	30
Maximum Split (%)	18.8%	43.8%	37.5%	18.8%	43.8%	37.5%
Minimum Split (s)	10.5	29.5	28.1	10.5	29.5	28.1
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.2	2.2	1.8	2.2	2.2	1.8
Minimum Initial (s)	5	10	10	5	10	10
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		17	16		17	16
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	65	0	35	65	0	35
End Time (s)	0	35	65	0	35	65
Yield/Force Off (s)	74.5	29.5	59.9	74.5	29.5	59.9
Yield/Force Off 170(s)	74.5	12.5	43.9	74.5	12.5	43.9
Local Start Time (s)	65	0	35	65	0	35
Local Yield (s)	74.5	29.5	59.9	74.5	29.5	59.9
Local Yield 170(s)	74.5	12.5	43.9	74.5	12.5	43.9

Intersection Summary

















Cycle Length	80
Control Type	Actuated-Coordinated
Natural Cycle	75
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)



HCM Unsignalized Intersection Capacity Analysis  
 4: Samantha Eastop Dr & Kimpton Dr

Total AM (2024)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	24	22	0	104	5	67	0	0	11	0	44
Future Volume (Veh/h)	11	24	22	0	104	5	67	0	0	11	0	44
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	11	24	22	0	104	5	67	0	0	11	0	44
Pedestrians		5			5			5			5	
Lane Width (m)		4.8			4.8			4.8			4.8	
Walking Speed (m/s)		1.0			1.0			1.0			1.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)		322										
pX, platoon unblocked												
vC, conflicting volume	114			51			218	176	45	174	184	116
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	114			51			218	176	45	174	184	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 %	99			100			90	100	100	99	100	95
cM capacity (veh/h)	1465			1545			683	703	1011	767	695	923
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	57	109	67	55								
Volume Left	11	0	67	11								
Volume Right	22	5	0	44								
cSH	1465	1545	683	887								
Volume to Capacity	0.01	0.00	0.10	0.06								
Queue Length 95th (m)	0.2	0.0	2.3	1.4								
Control Delay (s)	1.5	0.0	10.8	9.3								
Lane LOS	A		B	A								
Approach Delay (s)	1.5	0.0	10.8	9.3								
Approach LOS			B	A								
<b>Intersection Summary</b>												
Average Delay			4.6									
Intersection Capacity Utilization			28.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
 5: Hazeldean Rd & 6171 Hazeldean

Total AM (2024)



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	38	584	463	24	38	84
Future Volume (Veh/h)	38	584	463	24	38	84
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	42	649	514	27	42	93
Pedestrians					5	
Lane Width (m)					4.8	
Walking Speed (m/s)					1.0	
Percent Blockage					1	
Right turn flare (veh)						
Median type		Raised	Raised			
Median storage veh		1	1			
Upstream signal (m)		281				
pX, platoon unblocked					0.97	
vC, conflicting volume	546				941	276
vC1, stage 1 conf vol					532	
vC2, stage 2 conf vol					408	
vCu, unblocked vol	546				887	276
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	96				89	87
cM capacity (veh/h)	1013				390	717
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	42	324	324	343	198	135
Volume Left	42	0	0	0	0	42
Volume Right	0	0	0	0	27	93
cSH	1013	1700	1700	1700	1700	569
Volume to Capacity	0.04	0.19	0.19	0.20	0.12	0.24
Queue Length 95th (m)	0.9	0.0	0.0	0.0	0.0	6.4
Control Delay (s)	8.7	0.0	0.0	0.0	0.0	13.3
Lane LOS	A					B
Approach Delay (s)	0.5			0.0		13.3
Approach LOS						B
Intersection Summary						
Average Delay			1.6			
Intersection Capacity Utilization			35.4%		ICU Level of Service	A
Analysis Period (min)			15			

## 6: Stittsville Main St &amp; Hazeldean Rd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	79	466	242	377	52	63	316	275	106	135
v/c Ratio	0.15	0.34	0.43	0.24	0.22	0.36	0.74	0.95	0.39	0.34
Control Delay	14.1	26.8	13.2	15.1	33.4	52.7	18.7	81.8	49.6	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.1	26.8	13.2	15.1	33.4	52.7	18.7	81.8	49.6	6.7
Queue Length 50th (m)	8.0	28.5	20.0	18.6	8.4	12.6	4.7	~52.0	20.9	0.0
Queue Length 95th (m)	m14.2	41.4	38.0	33.0	15.9	23.2	29.4	#65.5	35.4	10.9
Internal Link Dist (m)		606.0		143.1		545.1			139.3	
Turn Bay Length (m)	34.0		288.0		24.0		17.0	46.0		38.0
Base Capacity (vph)	511	1351	561	1567	285	587	739	289	587	679
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.34	0.43	0.24	0.18	0.11	0.43	0.95	0.18	0.20

## 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.

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

HCM Signalized Intersection Capacity Analysis  
6: Stittsville Main St & Hazeldean Rd

Total AM (2024)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	426	40	242	266	111	52	63	316	275	106	135
Future Volume (vph)	79	426	40	242	266	111	52	63	316	275	106	135
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	4.5	3.5	3.7	3.9	3.5	3.7	3.7	3.3	4.3	3.4	3.4	4.6
Total Lost time (s)	6.5	6.3		6.5	6.3		6.9	7.0	7.0	6.9	6.7	6.7
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1708	3202		1699	3005		1571	1689	1578	1591	1676	1645
Flt Permitted	0.53	1.00		0.39	1.00		0.69	1.00	1.00	0.53	1.00	1.00
Satd. Flow (perm)	949	3202		689	3005		1139	1689	1578	888	1676	1645
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	79	426	40	242	266	111	52	63	316	275	106	135
RTOR Reduction (vph)	0	5	0	0	28	0	0	0	258	0	0	113
Lane Group Flow (vph)	79	461	0	242	349	0	52	63	58	275	106	22
Confl. Peds. (#/hr)	2					2	1		2	2		1
Heavy Vehicles (%)	10%	4%	7%	4%	8%	4%	10%	3%	3%	5%	5%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8		8	4		4
Actuated Green, G (s)	53.5	47.0		69.3	56.3		20.7	13.4	13.4	30.6	18.5	18.5
Effective Green, g (s)	53.5	47.0		69.3	56.3		20.7	13.4	13.4	30.6	18.5	18.5
Actuated g/C Ratio	0.47	0.41		0.60	0.49		0.18	0.12	0.12	0.27	0.16	0.16
Clearance Time (s)	6.5	6.3		6.5	6.3		6.9	7.0	7.0	6.9	6.7	6.7
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	484	1308		553	1471		232	196	183	310	269	264
v/s Ratio Prot	0.01	0.14		c0.06	0.12		0.01	0.04		c0.09	0.06	
v/s Ratio Perm	0.07			c0.20			0.03		0.04	c0.14		0.01
v/c Ratio	0.16	0.35		0.44	0.24		0.22	0.32	0.32	0.89	0.39	0.08
Uniform Delay, d1	17.2	23.5		11.3	17.0		40.0	46.6	46.6	39.3	43.2	41.0
Progression Factor	1.24	1.12		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.7		0.6	0.4		0.5	1.0	1.0	24.8	1.0	0.1
Delay (s)	21.5	27.0		11.9	17.3		40.5	47.6	47.6	64.1	44.2	41.2
Level of Service	C	C		B	B		D	D	D	E	D	D
Approach Delay (s)		26.2			15.2			46.7			54.0	
Approach LOS		C			B			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			34.0				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			115.0				Sum of lost time (s)			26.7		
Intersection Capacity Utilization			68.7%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

Timing Report, Sorted By Phase  
6: Stittsville Main St & Hazeldean Rd

Total AM (2024)

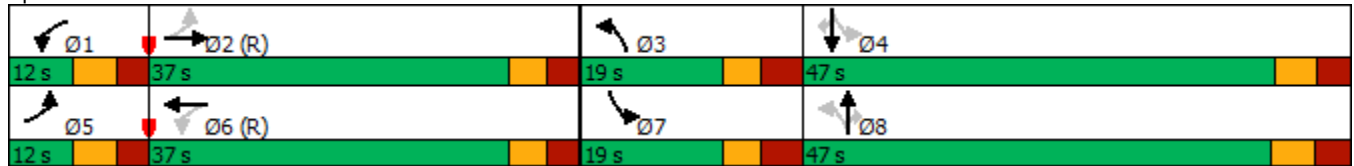


Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBTL	EBL	WBTL	SBL	NBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	12	37	19	47	12	37	19	47
Maximum Split (%)	10.4%	32.2%	16.5%	40.9%	10.4%	32.2%	16.5%	40.9%
Minimum Split (s)	11.5	36.3	11.9	36.7	11.5	36.3	16.9	37
Yellow Time (s)	3.7	3.3	3.3	3.7	3.7	3.3	3.3	3.7
All-Red Time (s)	2.8	3	3.6	3	2.8	3	3.6	3.3
Minimum Initial (s)	5	10	5	10	5	10	10	10
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		23		23		23		23
Dual Entry	No	Yes	No	Yes	No	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	73	85	7	26	73	85	7	26
End Time (s)	85	7	26	73	85	7	26	73
Yield/Force Off (s)	78.5	0.7	19.1	66.3	78.5	0.7	19.1	66
Yield/Force Off 170(s)	78.5	92.7	19.1	43.3	78.5	92.7	19.1	43
Local Start Time (s)	103	0	37	56	103	0	37	56
Local Yield (s)	108.5	30.7	49.1	96.3	108.5	30.7	49.1	96
Local Yield 170(s)	108.5	7.7	49.1	73.3	108.5	7.7	49.1	73

Intersection Summary

Cycle Length	115
Control Type	Actuated-Coordinated
Natural Cycle	105
Offset: 85 (74%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	

Splits and Phases: 6: Stittsville Main St & Hazeldean Rd



1: Carp Rd & Kittiwake Dr/Echwoods Ave



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	153	73	192	56	834	185	1207	164
v/c Ratio	0.87	0.22	0.56	0.40	0.87	0.58	1.19	0.18
Control Delay	87.2	14.3	33.6	27.0	34.8	16.7	121.5	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.2	14.3	33.6	27.0	34.8	16.7	121.5	7.0
Queue Length 50th (m)	32.2	2.5	24.3	4.1	165.7	11.9	~325.1	7.2
Queue Length 95th (m)	#56.4	13.3	43.3	m13.8 m	#252.1	30.3	#423.3	19.2
Internal Link Dist (m)		169.7	117.2		263.2		262.3	
Turn Bay Length (m)	15.0			25.0		30.0		32.0
Base Capacity (vph)	226	417	420	252	963	356	1011	893
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.18	0.46	0.22	0.87	0.52	1.19	0.18





















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



HCM Signalized Intersection Capacity Analysis  
 1: Carp Rd & Kittiwake Dr/Echwoods Ave

Total PM (2024)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	153	14	59	63	8	121	56	799	35	185	1207	164
Future Volume (vph)	153	14	59	63	8	121	56	799	35	185	1207	164
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	3.9	3.9	3.7	3.7	4.8	3.7	3.6	3.7	3.7	3.3	3.5	3.1
Total Lost time (s)	6.3	6.3			6.0		5.6	6.0		5.6	5.7	5.7
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frbp, ped/bikes	1.00	0.97			1.00		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00			0.99		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.88			0.91		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1732	1557			1745		1474	1740		1653	1618	1381
Flt Permitted	0.52	1.00			0.86		0.06	1.00		0.13	1.00	1.00
Satd. Flow (perm)	944	1557			1530		94	1740		223	1618	1381
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	153	14	59	63	8	121	56	799	35	185	1207	164
RTOR Reduction (vph)	0	48	0	0	54	0	0	1	0	0	0	31
Lane Group Flow (vph)	153	25	0	0	138	0	56	833	0	185	1207	133
Confl. Peds. (#/hr)			18	18			2		3	3		2
Confl. Bikes (#/hr)									1			1
Heavy Vehicles (%)	2%	0%	2%	9%	33%	0%	16%	4%	0%	0%	10%	2%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	22.4	22.4			22.7		72.4	66.3		85.6	73.9	73.9
Effective Green, g (s)	22.4	22.4			22.7		72.4	66.3		85.6	73.9	73.9
Actuated g/C Ratio	0.19	0.19			0.19		0.60	0.55		0.71	0.62	0.62
Clearance Time (s)	6.3	6.3			6.0		5.6	6.0		5.6	5.7	5.7
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	176	290			289		126	961		318	996	850
v/s Ratio Prot		0.02					0.02	0.48		c0.06	c0.75	
v/s Ratio Perm	c0.16				0.09		0.24			0.35		0.10
v/c Ratio	0.87	0.09			0.48		0.44	0.87		0.58	1.21	0.16
Uniform Delay, d1	47.4	40.3			43.4		26.6	23.0		18.2	23.0	9.8
Progression Factor	1.00	1.00			1.00		1.33	0.99		1.00	1.00	1.00
Incremental Delay, d2	33.6	0.1			1.2		2.1	8.8		2.7	104.7	0.4
Delay (s)	81.0	40.5			44.6		37.4	31.7		20.9	127.8	10.2
Level of Service	F	D			D		D	C		C	F	B
Approach Delay (s)		67.9			44.6			32.1			102.7	
Approach LOS		E			D			C			F	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			74.1									HCM 2000 Level of Service E
HCM 2000 Volume to Capacity ratio			1.12									
Actuated Cycle Length (s)			120.0									Sum of lost time (s) 17.9
Intersection Capacity Utilization			108.6%									ICU Level of Service G
Analysis Period (min)			15									

c Critical Lane Group

Timing Report, Sorted By Phase  
 1: Carp Rd & Kittiwake Dr/Echwoods Ave

Total PM (2024)



Phase Number	1	2	4	5	6	8
Movement	SBL	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	22	63	35	22	63	35
Maximum Split (%)	18.3%	52.5%	29.2%	18.3%	52.5%	29.2%
Minimum Split (s)	10.6	30	29.3	10.6	29.7	29
Yellow Time (s)	3.7	3.7	3	3.7	3.7	3
All-Red Time (s)	1.9	2.3	3.3	1.9	2	3
Minimum Initial (s)	5	10	10	5	10	10
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		17	16		17	16
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	109	11	74	109	11	74
End Time (s)	11	74	109	11	74	109
Yield/Force Off (s)	5.4	68	102.7	5.4	68.3	103
Yield/Force Off 170(s)	5.4	51	86.7	5.4	51.3	87
Local Start Time (s)	98	0	63	98	0	63
Local Yield (s)	114.4	57	91.7	114.4	57.3	92
Local Yield 170(s)	114.4	40	75.7	114.4	40.3	76

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	150
Offset: 11 (9%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 1: Carp Rd & Kittiwake Dr/Echwoods Ave



## 2: Carp Rd &amp; Hazeldean Rd



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	101	457	68	565	424	146	441	472	539	260
v/c Ratio	1.04	0.37	0.26	0.91	0.55	0.66	0.49	1.37	0.85	0.39
Control Delay	143.5	23.6	17.2	44.9	4.9	63.5	37.3	211.4	43.9	14.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	143.5	23.6	17.2	44.9	4.9	63.5	37.3	211.4	43.9	14.8
Queue Length 50th (m)	21.5	30.1	8.0	115.2	20.5	30.6	41.1	~148.1	95.5	15.4
Queue Length 95th (m)	#54.9	42.4	m7.5	#169.4	0.0	47.9	55.6 m	#120.8	m84.1	m15.1
Internal Link Dist (m)		252.9		257.2			422.0		263.2	
Turn Bay Length (m)	80.0		30.0			27.0		70.0		
Base Capacity (vph)	102	1300	272	652	791	317	908	344	631	666
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.99	0.35	0.25	0.87	0.54	0.46	0.49	1.37	0.85	0.39

## 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.

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

# HCM Signalized Intersection Capacity Analysis

## 2: Carp Rd & Hazeldean Rd

Total PM (2024)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	101	306	151	68	565	424	146	403	38	472	539	260
Future Volume (vph)	101	306	151	68	565	424	146	403	38	472	539	260
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	3.6	3.9	3.7	3.8	3.4	3.9	3.9	3.4	3.7	3.6	3.6	3.5
Total Lost time (s)	6.6	6.6		6.6	6.6	6.6	6.0	6.1		6.0	6.1	6.1
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00
Frbp, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1703	3306		1598	1725	1439	1732	3197		1693	1765	1465
Flt Permitted	0.15	1.00		0.43	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	271	3306		721	1725	1439	1732	3197		1693	1765	1465
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	101	306	151	68	565	424	146	403	38	472	539	260
RTOR Reduction (vph)	0	52	0	0	0	255	0	6	0	0	0	143
Lane Group Flow (vph)	101	405	0	68	565	169	146	435	0	472	539	117
Confl. Peds. (#/hr)	8		4	4		8	5		5	5		5
Heavy Vehicles (%)	0%	1%	0%	9%	2%	6%	2%	3%	4%	1%	2%	0%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						6
Actuated Green, G (s)	43.0	43.0		43.0	43.0	43.0	15.4	33.9		24.4	42.9	42.9
Effective Green, g (s)	43.0	43.0		43.0	43.0	43.0	15.4	33.9		24.4	42.9	42.9
Actuated g/C Ratio	0.36	0.36		0.36	0.36	0.36	0.13	0.28		0.20	0.36	0.36
Clearance Time (s)	6.6	6.6		6.6	6.6	6.6	6.0	6.1		6.0	6.1	6.1
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	97	1184		258	618	515	222	903		344	630	523
v/s Ratio Prot		0.12			0.33		0.08	0.14		c0.28	c0.31	
v/s Ratio Perm	c0.37			0.09		0.12						0.08
v/c Ratio	1.04	0.34		0.26	0.91	0.33	0.66	0.48		1.37	0.86	0.22
Uniform Delay, d1	38.5	28.2		27.3	36.7	28.0	49.8	35.8		47.8	35.7	26.9
Progression Factor	1.00	1.00		0.55	0.70	0.68	1.00	1.00		1.20	1.13	2.18
Incremental Delay, d2	103.0	0.2		0.5	16.5	0.3	6.9	1.8		169.2	1.5	0.1
Delay (s)	141.5	28.3		15.6	42.1	19.5	56.7	37.6		226.4	41.9	58.9
Level of Service	F	C		B	D	B	E	D		F	D	E
Approach Delay (s)		48.8			31.3			42.3			113.9	
Approach LOS		D			C			D			F	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			66.2				HCM 2000 Level of Service				E	
HCM 2000 Volume to Capacity ratio			1.08									
Actuated Cycle Length (s)			120.0				Sum of lost time (s)				18.7	
Intersection Capacity Utilization			106.8%				ICU Level of Service				G	
Analysis Period (min)			15									
c Critical Lane Group												

Timing Report, Sorted By Phase  
2: Carp Rd & Hazeldean Rd

Total PM (2024)

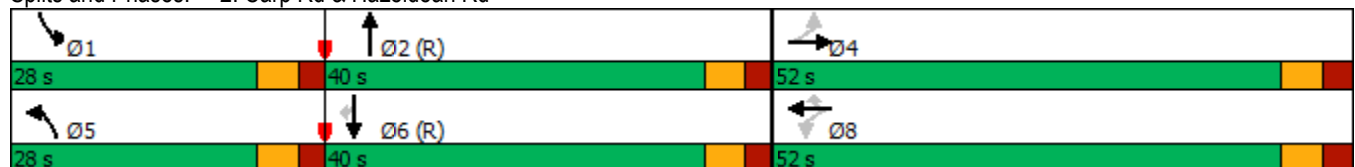


Phase Number	1	2	4	5	6	8
Movement	SBL	NBT	EBTL	NBL	SBT	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	28	40	52	28	40	52
Maximum Split (%)	23.3%	33.3%	43.3%	23.3%	33.3%	43.3%
Minimum Split (s)	11	31.1	37.6	11	31.1	37.6
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.3	2.4	2.9	2.3	2.4	2.9
Minimum Initial (s)	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		18	24		18	24
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	100	8	48	100	8	48
End Time (s)	8	48	100	8	48	100
Yield/Force Off (s)	2	41.9	93.4	2	41.9	93.4
Yield/Force Off 170(s)	2	23.9	69.4	2	23.9	69.4
Local Start Time (s)	92	0	40	92	0	40
Local Yield (s)	114	33.9	85.4	114	33.9	85.4
Local Yield 170(s)	114	15.9	61.4	114	15.9	61.4

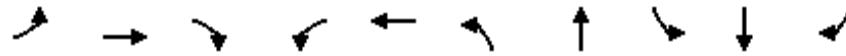
Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	120
Offset: 8 (7%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 2: Carp Rd & Hazeldean Rd



## 3: Stittsville Main St &amp; Carp Rd/Plaza (1261 S. Main)



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	80	135	476	218	238	339	663	79	558	53
v/c Ratio	0.40	0.41	0.86	0.54	0.39	1.00	0.94	0.38	1.10	0.10
Control Delay	35.7	34.1	26.6	25.5	18.2	78.6	52.6	18.9	101.7	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.7	34.1	26.6	25.5	18.2	78.6	52.6	18.9	101.7	0.4
Queue Length 50th (m)	11.3	19.0	21.5	25.2	22.3	41.3	~104.1	6.0	~101.6	0.0
Queue Length 95th (m)	21.4	31.1	54.3	36.6	34.8	#115.9	#195.0	14.4	#157.2	0.0
Internal Link Dist (m)		289.2			73.8		147.6		545.1	
Turn Bay Length (m)	30.0		30.0	15.0		32.0		30.0		22.0
Base Capacity (vph)	280	456	637	404	728	339	705	230	508	524
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.30	0.75	0.54	0.33	1.00	0.94	0.34	1.10	0.10

## 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.

HCM Signalized Intersection Capacity Analysis  
 3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)

Total PM (2024)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	135	476	218	147	91	339	543	120	79	558	53
Future Volume (vph)	80	135	476	218	147	91	339	543	120	79	558	53
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	3.5	3.2	3.9	3.6	3.6	3.7	3.5	3.6	3.7	3.1	3.5	3.5
Total Lost time (s)	5.1	5.1	5.1	5.1	5.1		5.5	5.5		5.5	5.5	5.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.96	1.00	0.98		1.00	0.99		1.00	1.00	0.93
Flpb, ped/bikes	0.97	1.00	1.00	0.99	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.94		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1641	1720	1478	1700	1628		1595	1720		1614	1728	1413
Flt Permitted	0.61	1.00	1.00	0.49	1.00		0.12	1.00		0.15	1.00	1.00
Satd. Flow (perm)	1055	1720	1478	882	1628		210	1720		256	1728	1413
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	80	135	476	218	147	91	339	543	120	79	558	53
RTOR Reduction (vph)	0	0	270	0	28	0	0	8	0	0	0	37
Lane Group Flow (vph)	80	135	206	218	210	0	339	655	0	79	558	16
Confl. Peds. (#/hr)	21		9	9		21	25		12	12		25
Confl. Bikes (#/hr)						2			3			
Heavy Vehicles (%)	0%	0%	3%	0%	1%	3%	6%	1%	1%	0%	3%	0%
Turn Type	Perm	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)	17.2	17.2	17.2	32.1	32.1		47.3	35.4		32.9	26.5	26.5
Effective Green, g (s)	17.2	17.2	17.2	32.1	32.1		47.3	35.4		32.9	26.5	26.5
Actuated g/C Ratio	0.19	0.19	0.19	0.36	0.36		0.53	0.39		0.37	0.29	0.29
Clearance Time (s)	5.1	5.1	5.1	5.1	5.1		5.5	5.5		5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	201	328	282	403	580		345	676		190	508	416
v/s Ratio Prot		0.08		c0.06	0.13		c0.17	c0.38		0.03	c0.32	
v/s Ratio Perm	0.08		c0.14	0.13			0.35			0.12		0.01
v/c Ratio	0.40	0.41	0.73	0.54	0.36		0.98	0.97		0.42	1.10	0.04
Uniform Delay, d1	31.9	32.0	34.2	21.6	21.4		25.7	26.8		20.9	31.8	22.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.3	0.8	9.1	1.5	0.4		43.5	27.8		1.5	69.5	0.2
Delay (s)	33.2	32.8	43.3	23.1	21.8		69.2	54.6		22.4	101.2	22.8
Level of Service	C	C	D	C	C		E	D		C	F	C
Approach Delay (s)		40.1			22.4			59.5			86.2	
Approach LOS		D			C			E			F	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			55.3									E
HCM 2000 Volume to Capacity ratio			0.92									
Actuated Cycle Length (s)			90.0							21.2		
Intersection Capacity Utilization			93.8%									F
Analysis Period (min)			15									

c Critical Lane Group

Timing Report, Sorted By Phase  
 3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)

Total PM (2024)

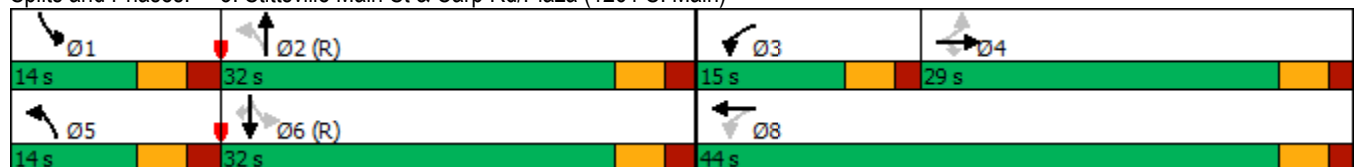


Phase Number	1	2	3	4	5	6	8
Movement	SBL	NBTL	WBL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	
Lead-Lag Optimize							
Recall Mode	None	C-Max	None	None	None	C-Max	None
Maximum Split (s)	14	32	15	29	14	32	44
Maximum Split (%)	15.6%	35.6%	16.7%	32.2%	15.6%	35.6%	48.9%
Minimum Split (s)	10.5	29.5	10.1	28.1	10.5	29.5	28.1
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.2	2.2	1.8	1.8	2.2	2.2	1.8
Minimum Initial (s)	5	10	5	10	5	10	10
Vehicle Extension (s)	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0
Walk Time (s)		7		7		7	7
Flash Dont Walk (s)		17		16		17	16
Dual Entry	No	Yes	No	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	78	2	34	49	78	2	34
End Time (s)	2	34	49	78	2	34	78
Yield/Force Off (s)	86.5	28.5	43.9	72.9	86.5	28.5	72.9
Yield/Force Off 170(s)	86.5	11.5	43.9	56.9	86.5	11.5	56.9
Local Start Time (s)	76	0	32	47	76	0	32
Local Yield (s)	84.5	26.5	41.9	70.9	84.5	26.5	70.9
Local Yield 170(s)	84.5	9.5	41.9	54.9	84.5	9.5	54.9

Intersection Summary

Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 2 (2%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

















Splits and Phases: 3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)





HCM Unsignalized Intersection Capacity Analysis  
4: Samantha Eastop Dr & Kimpton Dr

Total PM (2024)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	84	60	0	53	5	37	0	0	37	0	23
Future Volume (Veh/h)	36	84	60	0	53	5	37	0	0	37	0	23
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	36	84	60	0	53	5	37	0	0	37	0	23
Pedestrians		5			5			5			5	
Lane Width (m)		4.8			4.8			4.8			4.8	
Walking Speed (m/s)		1.0			1.0			1.0			1.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)		322										
pX, platoon unblocked												
vC, conflicting volume	63			149			274	254	124	252	282	66
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	63			149			274	254	124	252	282	66
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			94	100	100	95	100	98
cM capacity (veh/h)	1529			1423			635	626	914	673	604	985
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	180	58	37	60								
Volume Left	36	0	37	37								
Volume Right	60	5	0	23								
cSH	1529	1423	635	766								
Volume to Capacity	0.02	0.00	0.06	0.08								
Queue Length 95th (m)	0.5	0.0	1.3	1.8								
Control Delay (s)	1.6	0.0	11.0	10.1								
Lane LOS	A		B	B								
Approach Delay (s)	1.6	0.0	11.0	10.1								
Approach LOS			B	B								
<b>Intersection Summary</b>												
Average Delay			3.9									
Intersection Capacity Utilization			29.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
 5: Hazeldean Rd & 6171 Hazeldean

Total PM (2024)



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	86	736	988	61	53	76
Future Volume (Veh/h)	86	736	988	61	53	76
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	86	736	988	61	53	76
Pedestrians					5	
Lane Width (m)					4.8	
Walking Speed (m/s)					1.0	
Percent Blockage					1	
Right turn flare (veh)						
Median type		Raised	Raised			
Median storage veh		1	1			
Upstream signal (m)		281				
pX, platoon unblocked						
vC, conflicting volume	1054				1564	530
vC1, stage 1 conf vol					1024	
vC2, stage 2 conf vol					540	
vCu, unblocked vol	1054				1564	530
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	87				75	85
cM capacity (veh/h)	664				211	496
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	86	368	368	659	390	129
Volume Left	86	0	0	0	0	53
Volume Right	0	0	0	0	61	76
cSH	664	1700	1700	1700	1700	319
Volume to Capacity	0.13	0.22	0.22	0.39	0.23	0.40
Queue Length 95th (m)	3.1	0.0	0.0	0.0	0.0	13.2
Control Delay (s)	11.2	0.0	0.0	0.0	0.0	23.8
Lane LOS	B					C
Approach Delay (s)	1.2			0.0		23.8
Approach LOS						C
Intersection Summary						
Average Delay			2.0			
Intersection Capacity Utilization			54.0%		ICU Level of Service	A
Analysis Period (min)			15			

## 6: Stittsville Main St &amp; Hazeldean Rd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	121	470	518	983	114	175	407	230	244	93
v/c Ratio	0.42	0.48	0.92	0.70	0.42	0.59	0.76	0.71	0.75	0.22
Control Delay	29.2	49.4	44.9	31.9	32.4	52.8	20.2	44.0	60.1	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.2	49.4	44.9	31.9	32.4	52.8	20.2	44.0	60.1	1.9
Queue Length 50th (m)	17.8	51.2	68.2	86.0	17.6	35.2	16.9	38.4	50.7	0.0
Queue Length 95th (m)	m20.8	m50.1	#157.5	#141.6	27.1	51.4	46.5	52.3	70.8	1.7
Internal Link Dist (m)		606.0		143.1		545.1			139.3	
Turn Bay Length (m)	34.0		288.0		24.0		17.0	46.0		38.0
Base Capacity (vph)	384	983	565	1396	291	435	636	325	444	516
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.48	0.92	0.70	0.39	0.40	0.64	0.71	0.55	0.18

## Intersection Summary

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

Queue shown is maximum after two cycles.

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

HCM Signalized Intersection Capacity Analysis  
6: Stittsville Main St & Hazeldean Rd

Total PM (2024)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	121	407	63	518	704	279	114	175	407	230	244	93
Future Volume (vph)	121	407	63	518	704	279	114	175	407	230	244	93
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	4.5	3.5	3.7	3.9	3.5	3.7	3.7	3.3	4.3	3.4	3.4	4.6
Total Lost time (s)	6.5	6.3		6.5	6.3		6.9	7.0	7.0	6.9	6.7	6.7
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.96	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00
Fr <sub>t</sub>	1.00	0.98		1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Fl <sub>t</sub> Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1880	3271		1730	3210		1694	1740	1588	1658	1760	1594
Fl <sub>t</sub> Permitted	0.24	1.00		0.33	1.00		0.40	1.00	1.00	0.50	1.00	1.00
Satd. Flow (perm)	478	3271		595	3210		707	1740	1588	865	1760	1594
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	121	407	63	518	704	279	114	175	407	230	244	93
RTOR Reduction (vph)	0	11	0	0	29	0	0	0	265	0	0	76
Lane Group Flow (vph)	121	459	0	518	954	0	114	175	142	230	244	17
Confl. Peds. (#/hr)	5		6	6		5	3		21	21		3
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	0%	1%	0%	2%	0%	0%	2%	0%	0%	0%	0%	5%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8		8	4		4
Actuated Green, G (s)	45.3	35.7		67.2	51.1		31.1	20.5	20.5	34.4	22.3	22.3
Effective Green, g (s)	45.3	35.7		67.2	51.1		31.1	20.5	20.5	34.4	22.3	22.3
Actuated g/C Ratio	0.38	0.30		0.56	0.43		0.26	0.17	0.17	0.29	0.19	0.19
Clearance Time (s)	6.5	6.3		6.5	6.3		6.9	7.0	7.0	6.9	6.7	6.7
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	292	973		569	1366		270	297	271	327	327	296
v/s Ratio Prot	0.03	0.14		c0.19	0.30		0.04	0.10		c0.07	c0.14	
v/s Ratio Perm	0.12			c0.32			0.07		0.09	0.13		0.01
v/c Ratio	0.41	0.47		0.91	0.70		0.42	0.59	0.53	0.70	0.75	0.06
Uniform Delay, d <sub>1</sub>	25.0	34.5		18.5	28.2		35.5	45.9	45.3	36.2	46.2	40.2
Progression Factor	1.66	1.45		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d <sub>2</sub>	0.4	0.7		18.8	3.0		1.1	3.0	1.8	6.7	8.9	0.1
Delay (s)	42.1	50.5		37.2	31.1		36.6	48.8	47.2	42.9	55.1	40.3
Level of Service	D	D		D	C		D	D	D	D	E	D
Approach Delay (s)		48.8			33.2			45.9			47.7	
Approach LOS		D			C			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			41.1									D
HCM 2000 Volume to Capacity ratio			0.90									
Actuated Cycle Length (s)			120.0									26.7
Intersection Capacity Utilization			108.2%									G
Analysis Period (min)			15									
c Critical Lane Group												

Timing Report, Sorted By Phase  
6: Stittsville Main St & Hazeldean Rd

Total PM (2024)

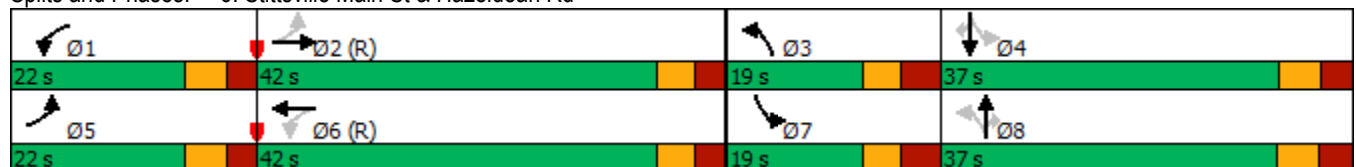


Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBTL	EBL	WBTL	SBL	NBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	22	42	19	37	22	42	19	37
Maximum Split (%)	18.3%	35.0%	15.8%	30.8%	18.3%	35.0%	15.8%	30.8%
Minimum Split (s)	11.7	36.3	11.9	36.7	11.5	36.3	16.9	37
Yellow Time (s)	3.7	3.3	3.3	3.7	3.7	3.3	3.3	3.7
All-Red Time (s)	2.8	3	3.6	3	2.8	3	3.6	3.3
Minimum Initial (s)	5	10	5	10	5	10	10	10
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		23		23		23		23
Dual Entry	No	Yes	No	Yes	No	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	91	113	35	54	91	113	35	54
End Time (s)	113	35	54	91	113	35	54	91
Yield/Force Off (s)	106.5	28.7	47.1	84.3	106.5	28.7	47.1	84
Yield/Force Off 170(s)	106.5	5.7	47.1	61.3	106.5	5.7	47.1	61
Local Start Time (s)	98	0	42	61	98	0	42	61
Local Yield (s)	113.5	35.7	54.1	91.3	113.5	35.7	54.1	91
Local Yield 170(s)	113.5	12.7	54.1	68.3	113.5	12.7	54.1	68

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	115
Offset: 113 (94%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	

Splits and Phases: 6: Stittsville Main St & Hazeldean Rd



## Appendix J – Future Total (2029) Synchro Outputs

1: Carp Rd & Kittiwake Dr/Echwoods Ave



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	284	90	306	32	1202	64	668	59
v/c Ratio	1.23	0.18	0.53	0.12	1.33	0.43	0.76	0.08
Control Delay	171.4	8.4	20.5	8.7	175.4	20.9	29.4	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	171.4	8.4	20.5	8.7	175.4	20.9	29.4	1.7
Queue Length 50th (m)	~72.6	0.9	26.1	1.4	~327.2	5.1	114.4	0.0
Queue Length 95th (m)	#120.5	11.6	51.1	m2.7 m	#354.4	12.6	#168.9	3.4
Internal Link Dist (m)		169.7	117.2		263.2		262.3	
Turn Bay Length (m)	15.0			25.0		30.0		32.0
Base Capacity (vph)	231	496	580	264	902	152	874	784
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.23	0.18	0.53	0.12	1.33	0.42	0.76	0.08

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

HCM Signalized Intersection Capacity Analysis  
 1: Carp Rd & Kittiwake Dr/Echwoods Ave

Total AM (2029)

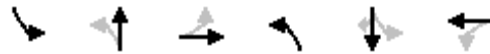
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	284	6	84	59	4	243	32	1184	18	64	668	59
Future Volume (vph)	284	6	84	59	4	243	32	1184	18	64	668	59
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	3.9	3.9	3.7	3.7	4.8	3.7	3.6	3.7	3.7	3.3	3.5	3.1
Total Lost time (s)	6.3	6.3			6.0		5.6	6.0		5.6	5.7	5.7
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frbp, ped/bikes	1.00	0.99			0.98		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.86			0.89		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1490			1734		1474	1746		1653	1618	1382
Flt Permitted	0.45	1.00			0.92		0.23	1.00		0.07	1.00	1.00
Satd. Flow (perm)	791	1490			1609		359	1746		116	1618	1382
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	284	6	84	59	4	243	32	1184	18	64	668	59
RTOR Reduction (vph)	0	59	0	0	105	0	0	0	0	0	0	28
Lane Group Flow (vph)	284	31	0	0	201	0	32	1202	0	64	668	31
Confl. Peds. (#/hr)	1					1	2		1	1		2
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	5%	20%	5%	9%	33%	0%	16%	4%	0%	0%	10%	2%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	33.7	33.7			34.0		62.1	58.3		65.0	59.9	59.9
Effective Green, g (s)	33.7	33.7			34.0		62.1	58.3		65.0	59.9	59.9
Actuated g/C Ratio	0.29	0.29			0.30		0.54	0.51		0.57	0.52	0.52
Clearance Time (s)	6.3	6.3			6.0		5.6	6.0		5.6	5.7	5.7
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	231	436			475		230	885		133	842	719
v/s Ratio Prot		0.02					0.00	c0.69		c0.02	0.41	
v/s Ratio Perm	c0.36				0.12		0.07			0.25		0.02
v/c Ratio	1.23	0.07			0.42		0.14	1.36		0.48	0.79	0.04
Uniform Delay, d1	40.6	29.3			32.6		15.4	28.4		25.4	22.5	13.5
Progression Factor	1.00	1.00			1.00		0.85	0.63		1.00	1.00	1.00
Incremental Delay, d2	135.1	0.1			0.6		0.2	165.3		2.7	7.6	0.1
Delay (s)	175.8	29.4			33.2		13.3	183.3		28.1	30.1	13.6
Level of Service	F	C			C		B	F		C	C	B
Approach Delay (s)		140.6			33.2			178.9			28.7	
Approach LOS		F			C			F			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			113.2									F
HCM 2000 Volume to Capacity ratio			1.27									
Actuated Cycle Length (s)			115.0							17.9		
Intersection Capacity Utilization			118.4%									H
Analysis Period (min)			15									

c Critical Lane Group



Timing Report, Sorted By Phase  
 1: Carp Rd & Kittiwake Dr/Echwoods Ave

Total AM (2029)

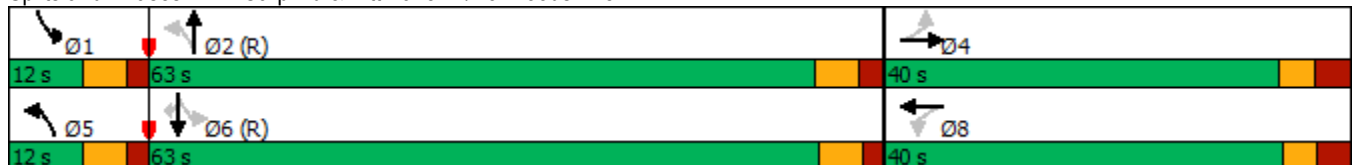


Phase Number	1	2	4	5	6	8
Movement	SBL	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	12	63	40	12	63	40
Maximum Split (%)	10.4%	54.8%	34.8%	10.4%	54.8%	34.8%
Minimum Split (s)	10.6	30	29.3	10.6	29.7	29
Yellow Time (s)	3.7	3.7	3	3.7	3.7	3
All-Red Time (s)	1.9	2.3	3.3	1.9	2	3
Minimum Initial (s)	5	10	10	5	10	10
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		17	16		17	16
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	110	7	70	110	7	70
End Time (s)	7	70	110	7	70	110
Yield/Force Off (s)	1.4	64	103.7	1.4	64.3	104
Yield/Force Off 170(s)	1.4	47	87.7	1.4	47.3	88
Local Start Time (s)	103	0	63	103	0	63
Local Yield (s)	109.4	57	96.7	109.4	57.3	97
Local Yield 170(s)	109.4	40	80.7	109.4	40.3	81

Intersection Summary

Cycle Length	115
Control Type	Actuated-Coordinated
Natural Cycle	150
Offset: 7 (6%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 1: Carp Rd & Kittiwake Dr/Echwoods Ave



Queues  
2: Carp Rd & Hazeldean Rd

Total AM (2029)


























Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	351	448	32	150	417	72	509	308	350	60
v/c Ratio	1.25	0.48	0.29	0.63	0.73	0.51	0.63	0.70	0.45	0.08
Control Delay	171.2	32.1	44.6	54.5	15.8	61.0	41.7	39.6	41.6	4.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	171.2	32.1	44.6	54.5	15.8	61.0	41.7	39.6	41.6	4.0
Queue Length 50th (m)	~84.3	36.8	6.2	30.5	19.3	14.4	49.3	64.9	74.4	0.0
Queue Length 95th (m)	#128.0	46.0	14.0	46.2	43.8	27.0	65.9 m	#103.2 m	102.0	m0.0
Internal Link Dist (m)		252.9		257.2			422.0		263.2	
Turn Bay Length (m)	80.0		30.0			27.0		70.0		
Base Capacity (vph)	281	1328	202	433	697	278	812	440	772	711
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.25	0.34	0.16	0.35	0.60	0.26	0.63	0.70	0.45	0.08

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

HCM Signalized Intersection Capacity Analysis  
2: Carp Rd & Hazeldean Rd

Total AM (2029)

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Traffic Volume (vph)	351	344	104	32	150	417	72	486	23	308	350	60		
Future Volume (vph)	351	344	104	32	150	417	72	486	23	308	350	60		
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800		
Lane Width	3.6	3.9	3.7	3.8	3.4	3.9	3.9	3.4	3.7	3.6	3.6	3.5		
Total Lost time (s)	6.1	6.6		6.6	6.6	6.6	6.0	6.1		6.0	6.1	6.1		
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00		
Frbp, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	1.00		1.00	1.00	0.98		
Flpb, ped/bikes	0.99	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85		
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		
Satd. Flow (prot)	1666	3232		1431	1586	1443	1523	3166		1462	1593	1309		
Flt Permitted	0.42	1.00		0.49	1.00	1.00	0.95	1.00		0.95	1.00	1.00		
Satd. Flow (perm)	742	3232		743	1586	1443	1523	3166		1462	1593	1309		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Adj. Flow (vph)	351	344	104	32	150	417	72	486	23	308	350	60		
RTOR Reduction (vph)	0	30	0	0	0	355	0	3	0	0	0	32		
Lane Group Flow (vph)	351	418	0	32	150	62	72	506	0	308	350	28		
Confl. Peds. (#/hr)	12		1	1		12	1		4	4		1		
Heavy Vehicles (%)	2%	5%	5%	22%	11%	5%	16%	3%	43%	17%	13%	13%		
Turn Type	pm+pt	NA		Perm	NA	Perm	Prot	NA		Prot	NA	Perm		
Protected Phases	7	4			8		5	2		1	6			
Permitted Phases	4			8		8						6		
Actuated Green, G (s)	32.2	32.2		17.2	17.2	17.2	9.5	29.4		34.7	54.6	54.6		
Effective Green, g (s)	32.2	32.2		17.2	17.2	17.2	9.5	29.4		34.7	54.6	54.6		
Actuated g/C Ratio	0.28	0.28		0.15	0.15	0.15	0.08	0.26		0.30	0.47	0.47		
Clearance Time (s)	6.1	6.6		6.6	6.6	6.6	6.0	6.1		6.0	6.1	6.1		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		
Lane Grp Cap (vph)	279	904		111	237	215	125	809		441	756	621		
v/s Ratio Prot	c0.10	0.13			0.09		0.05	c0.16		c0.21	0.22			
v/s Ratio Perm	c0.25			0.04		0.04						0.02		
v/c Ratio	1.26	0.46		0.29	0.63	0.29	0.58	0.63		0.70	0.46	0.05		
Uniform Delay, d1	40.7	34.2		43.5	45.9	43.5	50.8	37.9		35.5	20.3	16.2		
Progression Factor	1.00	1.00		0.93	0.95	1.93	1.00	1.00		0.86	1.72	1.00		
Incremental Delay, d2	141.9	0.4		1.4	5.4	0.7	6.3	3.6		3.5	1.5	0.1		
Delay (s)	182.5	34.6		41.6	48.9	84.7	57.1	41.6		33.9	36.4	16.3		
Level of Service	F	C		D	D	F	E	D		C	D	B		
Approach Delay (s)		99.6			73.4			43.5			33.7			
Approach LOS		F			E			D			C			
<b>Intersection Summary</b>														
HCM 2000 Control Delay			64.1									HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio			0.89											
Actuated Cycle Length (s)			115.0							24.8				
Intersection Capacity Utilization			94.1%										ICU Level of Service	F
Analysis Period (min)			15											
c Critical Lane Group														

Timing Report, Sorted By Phase  
2: Carp Rd & Hazeldean Rd

Total AM (2029)

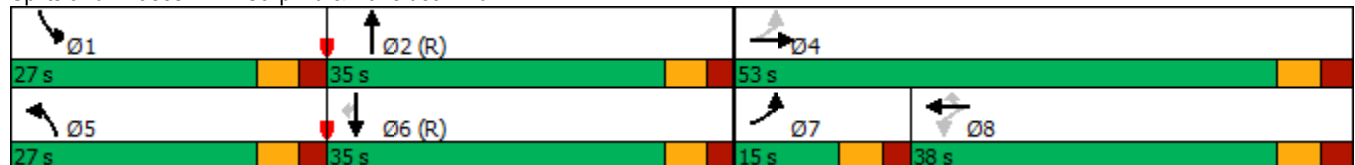


Phase Number	1	2	4	5	6	7	8
Movement	SBL	NBT	EBTL	NBL	SBT	EBL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lag
Lead-Lag Optimize							
Recall Mode	None	C-Max	None	None	C-Max	None	None
Maximum Split (s)	27	35	53	27	35	15	38
Maximum Split (%)	23.5%	30.4%	46.1%	23.5%	30.4%	13.0%	33.0%
Minimum Split (s)	11	31.1	37.6	11	31.1	11.1	37.6
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.3	2.4	2.9	2.3	2.4	2.4	2.9
Minimum Initial (s)	5	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0
Walk Time (s)		7	7		7		7
Flash Dont Walk (s)		18	24		18		24
Dual Entry	No	Yes	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	80	107	27	80	107	27	42
End Time (s)	107	27	80	107	27	42	80
Yield/Force Off (s)	101	20.9	73.4	101	20.9	35.9	73.4
Yield/Force Off 170(s)	101	2.9	49.4	101	2.9	35.9	49.4
Local Start Time (s)	88	0	35	88	0	35	50
Local Yield (s)	109	28.9	81.4	109	28.9	43.9	81.4
Local Yield 170(s)	109	10.9	57.4	109	10.9	43.9	57.4

Intersection Summary

Cycle Length	115
Control Type	Actuated-Coordinated
Natural Cycle	105
Offset: 107 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

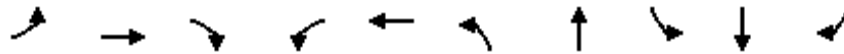
Splits and Phases: 2: Carp Rd & Hazeldean Rd



Queues

Total AM (2029)

3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	51	118	322	163	177	390	636	88	376	38
v/c Ratio	0.25	0.34	0.57	0.66	0.46	0.66	0.71	0.24	0.50	0.06
Control Delay	27.4	28.2	7.2	41.4	18.8	15.9	23.0	8.8	21.0	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.4	28.2	7.2	41.4	18.8	15.9	23.0	8.8	21.0	0.2
Queue Length 50th (m)	6.1	14.3	0.0	21.2	12.4	20.7	62.9	3.8	39.0	0.0
Queue Length 95th (m)	12.9	23.9	15.8	34.6	25.0	#60.7	#145.3	10.8	66.0	0.0
Internal Link Dist (m)		289.2			73.8		147.6		545.1	
Turn Bay Length (m)	30.0		30.0	15.0		32.0		30.0		22.0
Base Capacity (vph)	311	524	691	371	550	587	897	412	753	680
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.23	0.47	0.44	0.32	0.66	0.71	0.21	0.50	0.06

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
 3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)

Total AM (2029)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	118	322	163	83	94	390	446	190	88	376	38
Future Volume (vph)	51	118	322	163	83	94	390	446	190	88	376	38
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	3.5	3.2	3.9	3.6	3.6	3.7	3.5	3.6	3.7	3.1	3.5	3.5
Total Lost time (s)	5.1	5.1	5.1	5.1	5.1		5.5	5.5		5.5	5.5	5.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	0.99		1.00	0.99		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.92		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1656	1686	1508	1667	1605		1656	1670		1582	1745	1439
Flt Permitted	0.57	1.00	1.00	0.68	1.00		0.38	1.00		0.31	1.00	1.00
Satd. Flow (perm)	1001	1686	1508	1195	1605		656	1670		521	1745	1439
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	51	118	322	163	83	94	390	446	190	88	376	38
RTOR Reduction (vph)	0	0	256	0	59	0	0	15	0	0	0	22
Lane Group Flow (vph)	51	118	66	163	118	0	390	621	0	88	376	16
Confl. Peds. (#/hr)	1		4	4		1	5		7	7		5
Confl. Bikes (#/hr)												2
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)	16.5	16.5	16.5	16.5	16.5		52.9	41.2		40.7	34.5	34.5
Effective Green, g (s)	16.5	16.5	16.5	16.5	16.5		52.9	41.2		40.7	34.5	34.5
Actuated g/C Ratio	0.21	0.21	0.21	0.21	0.21		0.66	0.52		0.51	0.43	0.43
Clearance Time (s)	5.1	5.1	5.1	5.1	5.1		5.5	5.5		5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	206	347	311	246	331		595	860		347	752	620
v/s Ratio Prot		0.07			0.07		c0.11	c0.37		0.02	0.22	
v/s Ratio Perm	0.05		0.04	c0.14			0.33			0.11		0.01
v/c Ratio	0.25	0.34	0.21	0.66	0.36		0.66	0.72		0.25	0.50	0.03
Uniform Delay, d1	26.6	27.1	26.4	29.2	27.2		7.5	15.0		10.8	16.5	13.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	0.6	0.3	6.6	0.7		2.6	5.2		0.4	2.4	0.1
Delay (s)	27.2	27.7	26.7	35.7	27.9		10.2	20.2		11.2	18.9	13.2
Level of Service	C	C	C	D	C		B	C		B	B	B
Approach Delay (s)		27.0			31.6			16.4			17.1	
Approach LOS		C			C			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			20.9				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			80.0				Sum of lost time (s)			16.1		
Intersection Capacity Utilization			80.7%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

Timing Report, Sorted By Phase  
 3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)

Total AM (2029)

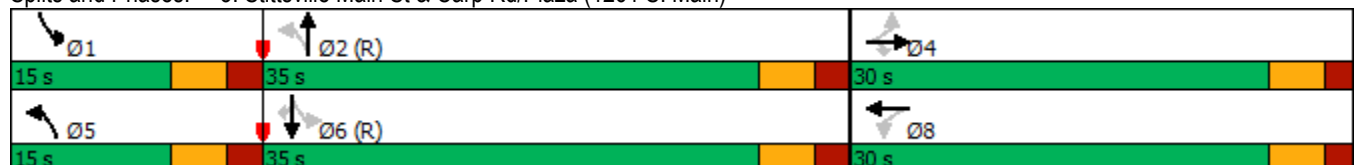


Phase Number	1	2	4	5	6	8
Movement	SBL	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	15	35	30	15	35	30
Maximum Split (%)	18.8%	43.8%	37.5%	18.8%	43.8%	37.5%
Minimum Split (s)	10.5	29.5	28.1	10.5	29.5	28.1
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.2	2.2	1.8	2.2	2.2	1.8
Minimum Initial (s)	5	10	10	5	10	10
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		17	16		17	16
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	65	0	35	65	0	35
End Time (s)	0	35	65	0	35	65
Yield/Force Off (s)	74.5	29.5	59.9	74.5	29.5	59.9
Yield/Force Off 170(s)	74.5	12.5	43.9	74.5	12.5	43.9
Local Start Time (s)	65	0	35	65	0	35
Local Yield (s)	74.5	29.5	59.9	74.5	29.5	59.9
Local Yield 170(s)	74.5	12.5	43.9	74.5	12.5	43.9

Intersection Summary

















Cycle Length	80
Control Type	Actuated-Coordinated
Natural Cycle	75
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)



HCM Unsignalized Intersection Capacity Analysis  
4: Samantha Eastop Dr & Kimpton Dr

Total AM (2029)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	26	22	0	115	6	67	0	0	12	0	49
Future Volume (Veh/h)	12	26	22	0	115	6	67	0	0	12	0	49
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	12	26	22	0	115	6	67	0	0	12	0	49
Pedestrians		5			5			5			5	
Lane Width (m)		4.8			4.8			4.8			4.8	
Walking Speed (m/s)		1.0			1.0			1.0			1.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)		322										
pX, platoon unblocked												
vC, conflicting volume	126			53			238	192	47	189	200	128
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	126			53			238	192	47	189	200	128
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 %	99			100			90	100	100	98	100	95
cM capacity (veh/h)	1451			1542			658	688	1009	748	681	910
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	60	121	67	61								
Volume Left	12	0	67	12								
Volume Right	22	6	0	49								
cSH	1451	1542	658	873								
Volume to Capacity	0.01	0.00	0.10	0.07								
Queue Length 95th (m)	0.2	0.0	2.4	1.6								
Control Delay (s)	1.6	0.0	11.1	9.4								
Lane LOS	A		B	A								
Approach Delay (s)	1.6	0.0	11.1	9.4								
Approach LOS			B	A								
Intersection Summary												
Average Delay			4.6									
Intersection Capacity Utilization			32.3%		ICU Level of Service				A			
Analysis Period (min)			15									



HCM Unsignalized Intersection Capacity Analysis  
 5: Hazeldean Rd & 6171 Hazeldean

Total AM (2029)



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	38	647	513	24	38	84
Future Volume (Veh/h)	38	647	513	24	38	84
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	38	647	513	24	38	84
Pedestrians					5	
Lane Width (m)					4.8	
Walking Speed (m/s)					1.0	
Percent Blockage					1	
Right turn flare (veh)						
Median type		Raised	Raised			
Median storage (veh)		1	1			
Upstream signal (m)		281				
pX, platoon unblocked					0.96	
vC, conflicting volume	542				930	274
vC1, stage 1 conf vol					530	
vC2, stage 2 conf vol					400	
vCu, unblocked vol	542				845	274
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	96				91	88
cM capacity (veh/h)	1016				401	719
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	38	324	324	342	195	122
Volume Left	38	0	0	0	0	38
Volume Right	0	0	0	0	24	84
cSH	1016	1700	1700	1700	1700	577
Volume to Capacity	0.04	0.19	0.19	0.20	0.11	0.21
Queue Length 95th (m)	0.8	0.0	0.0	0.0	0.0	5.6
Control Delay (s)	8.7	0.0	0.0	0.0	0.0	12.9
Lane LOS	A					B
Approach Delay (s)	0.5			0.0		12.9
Approach LOS						B
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization			36.8%		ICU Level of Service	A
Analysis Period (min)			15			

6: Stittsville Main St & Hazeldean Rd

























Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	88	514	269	419	55	70	352	306	118	150
v/c Ratio	0.20	0.46	0.49	0.28	0.21	0.33	0.81	0.97	0.38	0.35
Control Delay	16.4	33.0	15.9	17.9	30.1	47.7	27.7	82.4	45.7	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.4	33.0	15.9	17.9	30.1	47.7	27.7	82.4	45.7	7.6
Queue Length 50th (m)	9.2	31.4	23.6	22.1	8.7	13.9	17.3	~62.3	23.2	0.0
Queue Length 95th (m)	m16.3	70.4	48.3	41.6	15.2	23.5	44.2	#85.6	35.8	13.4
Internal Link Dist (m)		606.0		143.1		545.1			139.3	
Turn Bay Length (m)	34.0		288.0		24.0		17.0	46.0		38.0
Base Capacity (vph)	433	1107	553	1487	309	587	722	315	587	679
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.46	0.49	0.28	0.18	0.12	0.49	0.97	0.20	0.22

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

HCM Signalized Intersection Capacity Analysis  
6: Stittsville Main St & Hazeldean Rd

Total AM (2029)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	472	42	269	295	124	55	70	352	306	118	150
Future Volume (vph)	88	472	42	269	295	124	55	70	352	306	118	150
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	4.5	3.5	3.7	3.9	3.5	3.7	3.7	3.3	4.3	3.4	3.4	4.6
Total Lost time (s)	6.5	6.3		6.5	6.3		6.9	7.0	7.0	6.9	6.7	6.7
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1708	3205		1699	3004		1571	1689	1578	1591	1676	1645
Flt Permitted	0.51	1.00		0.32	1.00		0.68	1.00	1.00	0.55	1.00	1.00
Satd. Flow (perm)	912	3205		572	3004		1126	1689	1578	920	1676	1645
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	88	472	42	269	295	124	55	70	352	306	118	150
RTOR Reduction (vph)	0	5	0	0	30	0	0	0	229	0	0	122
Lane Group Flow (vph)	88	509	0	269	389	0	55	70	123	306	118	28
Confl. Peds. (#/hr)	2					2	1		2	2		1
Heavy Vehicles (%)	10%	4%	7%	4%	8%	4%	10%	3%	3%	5%	5%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8		8	4		4
Actuated Green, G (s)	45.2	38.2		66.7	53.2		23.3	16.0	16.0	33.2	21.1	21.1
Effective Green, g (s)	45.2	38.2		66.7	53.2		23.3	16.0	16.0	33.2	21.1	21.1
Actuated g/C Ratio	0.39	0.33		0.58	0.46		0.20	0.14	0.14	0.29	0.18	0.18
Clearance Time (s)	6.5	6.3		6.5	6.3		6.9	7.0	7.0	6.9	6.7	6.7
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	406	1064		547	1389		256	234	219	336	307	301
v/s Ratio Prot	0.01	0.16		c0.09	0.13		0.01	0.04		c0.10	0.07	
v/s Ratio Perm	0.07			c0.19			0.03		0.08	c0.17		0.02
v/c Ratio	0.22	0.48		0.49	0.28		0.21	0.30	0.56	0.91	0.38	0.09
Uniform Delay, d1	22.3	30.5		13.3	19.1		37.9	44.5	46.2	38.3	41.2	39.0
Progression Factor	1.15	1.06		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	1.4		0.7	0.5		0.4	0.7	3.3	27.7	0.8	0.1
Delay (s)	25.9	33.6		14.0	19.6		38.3	45.2	49.5	66.0	42.0	39.1
Level of Service	C	C		B	B		D	D	D	E	D	D
Approach Delay (s)		32.5			17.4			47.6			54.1	
Approach LOS		C			B			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			36.4				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.69									
Actuated Cycle Length (s)			115.0				Sum of lost time (s)			26.7		
Intersection Capacity Utilization			73.3%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

Timing Report, Sorted By Phase  
6: Stittsville Main St & Hazeldean Rd

Total AM (2029)

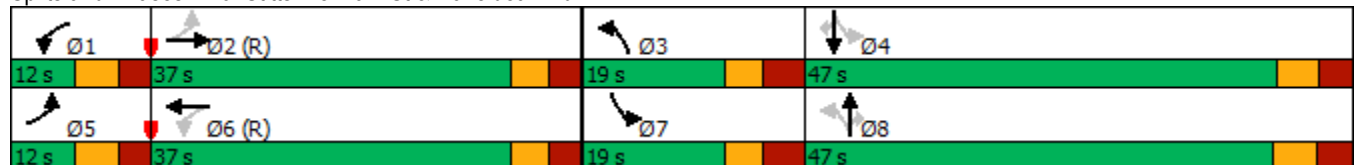


Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBTL	EBL	WBTL	SBL	NBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	12	37	19	47	12	37	19	47
Maximum Split (%)	10.4%	32.2%	16.5%	40.9%	10.4%	32.2%	16.5%	40.9%
Minimum Split (s)	11.5	36.3	11.9	36.7	11.5	36.3	16.9	37
Yellow Time (s)	3.7	3.3	3.3	3.7	3.7	3.3	3.3	3.7
All-Red Time (s)	2.8	3	3.6	3	2.8	3	3.6	3.3
Minimum Initial (s)	5	10	5	10	5	10	10	10
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		23		23		23		23
Dual Entry	No	Yes	No	Yes	No	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	73	85	7	26	73	85	7	26
End Time (s)	85	7	26	73	85	7	26	73
Yield/Force Off (s)	78.5	0.7	19.1	66.3	78.5	0.7	19.1	66
Yield/Force Off 170(s)	78.5	92.7	19.1	43.3	78.5	92.7	19.1	43
Local Start Time (s)	103	0	37	56	103	0	37	56
Local Yield (s)	108.5	30.7	49.1	96.3	108.5	30.7	49.1	96
Local Yield 170(s)	108.5	7.7	49.1	73.3	108.5	7.7	49.1	73

Intersection Summary

Cycle Length	115
Control Type	Actuated-Coordinated
Natural Cycle	105
Offset: 85 (74%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	

Splits and Phases: 6: Stittsville Main St & Hazeldean Rd



## 1: Carp Rd &amp; Kittiwake Dr/Echwoods Ave



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	170	82	209	62	920	199	1333	182
v/c Ratio	0.89	0.22	0.57	0.43	1.00	0.80	1.36	0.21
Control Delay	87.8	13.6	34.5	27.0	54.4	52.2	193.8	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.8	13.6	34.5	27.0	54.4	52.2	193.8	8.1
Queue Length 50th (m)	35.2	2.7	27.1	4.9	~218.7	28.9	~393.2	9.7
Queue Length 95th (m)	#65.9	14.4	48.5	m13.7 m	#277.9	#57.5	#482.9	22.6
Internal Link Dist (m)		169.7	117.2		263.2		262.3	
Turn Bay Length (m)	15.0			25.0		30.0		32.0
Base Capacity (vph)	224	421	416	253	924	281	979	867
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.19	0.50	0.25	1.00	0.71	1.36	0.21

## 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.

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

HCM Signalized Intersection Capacity Analysis  
 1: Carp Rd & Kittiwake Dr/Echwoods Ave

Total PM (2029)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	170	16	66	70	8	131	62	882	38	199	1333	182	
Future Volume (vph)	170	16	66	70	8	131	62	882	38	199	1333	182	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Lane Width	3.9	3.9	3.7	3.7	4.8	3.7	3.6	3.7	3.7	3.3	3.5	3.1	
Total Lost time (s)	6.3	6.3			6.0		5.6	6.0		5.6	5.7	5.7	
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.97			1.00		1.00	1.00		1.00	1.00	0.97	
Flpb, ped/bikes	1.00	1.00			0.99		1.00	1.00		1.00	1.00	1.00	
Frt	1.00	0.88			0.92		1.00	0.99		1.00	1.00	0.85	
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	1732	1554			1745		1474	1740		1653	1618	1381	
Flt Permitted	0.51	1.00			0.86		0.06	1.00		0.06	1.00	1.00	
Satd. Flow (perm)	938	1554			1519		97	1740		100	1618	1381	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Adj. Flow (vph)	170	16	66	70	8	131	62	882	38	199	1333	182	
RTOR Reduction (vph)	0	53	0	0	52	0	0	1	0	0	0	33	
Lane Group Flow (vph)	170	29	0	0	157	0	62	919	0	199	1333	149	
Confl. Peds. (#/hr)			20	20			2		4	4		2	
Confl. Bikes (#/hr)									1			1	
Heavy Vehicles (%)	2%	0%	2%	9%	33%	0%	16%	4%	0%	0%	10%	2%	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm	
Protected Phases		4			8		5	2		1	6		
Permitted Phases	4			8			2			6		6	
Actuated Green, G (s)	24.5	24.5			24.8		70.1	63.7		83.5	71.5	71.5	
Effective Green, g (s)	24.5	24.5			24.8		70.1	63.7		83.5	71.5	71.5	
Actuated g/C Ratio	0.20	0.20			0.21		0.58	0.53		0.70	0.60	0.60	
Clearance Time (s)	6.3	6.3			6.0		5.6	6.0		5.6	5.7	5.7	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	191	317			313		130	923		249	964	822	
v/s Ratio Prot		0.02					0.03	0.53		c0.09	c0.82		
v/s Ratio Perm	c0.18				0.10		0.25			0.46		0.11	
v/c Ratio	0.89	0.09			0.50		0.48	1.00		0.80	1.38	0.18	
Uniform Delay, d1	46.4	38.7			42.1		26.3	28.0		37.5	24.2	11.0	
Progression Factor	1.00	1.00			1.00		1.31	0.99		1.00	1.00	1.00	
Incremental Delay, d2	36.3	0.1			1.3		2.0	24.5		16.2	178.8	0.5	
Delay (s)	82.7	38.9			43.4		36.4	52.3		53.8	203.0	11.5	
Level of Service	F	D			D		D	D		D	F	B	
Approach Delay (s)		68.4			43.4			51.3			165.3		
Approach LOS		E			D			D			F		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			114.1									HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio			1.26										
Actuated Cycle Length (s)			120.0									Sum of lost time (s)	17.9
Intersection Capacity Utilization			117.6%									ICU Level of Service	H
Analysis Period (min)			15										

c Critical Lane Group

Timing Report, Sorted By Phase  
 1: Carp Rd & Kittiwake Dr/Echwoods Ave

Total PM (2029)



Phase Number	1	2	4	5	6	8
Movement	SBL	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	22	63	35	22	63	35
Maximum Split (%)	18.3%	52.5%	29.2%	18.3%	52.5%	29.2%
Minimum Split (s)	10.6	30	29.3	10.6	29.7	29
Yellow Time (s)	3.7	3.7	3	3.7	3.7	3
All-Red Time (s)	1.9	2.3	3.3	1.9	2	3
Minimum Initial (s)	5	10	10	5	10	10
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		17	16		17	16
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	109	11	74	109	11	74
End Time (s)	11	74	109	11	74	109
Yield/Force Off (s)	5.4	68	102.7	5.4	68.3	103
Yield/Force Off 170(s)	5.4	51	86.7	5.4	51.3	87
Local Start Time (s)	98	0	63	98	0	63
Local Yield (s)	114.4	57	91.7	114.4	57.3	92
Local Yield 170(s)	114.4	40	75.7	114.4	40.3	76

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	150
Offset: 11 (9%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 1: Carp Rd & Kittiwake Dr/Echwoods Ave



Queues  
2: Carp Rd & Hazeldean Rd

Total PM (2029)



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	113	506	74	626	467	162	489	516	598	289
v/c Ratio	1.45	0.39	0.29	0.96	0.59	0.69	0.54	1.66	1.03	0.47
Control Delay	291.1	23.4	16.0	48.4	4.7	63.8	38.4	335.5	64.6	20.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	291.1	23.4	16.0	48.4	4.7	63.8	38.4	335.5	64.6	20.6
Queue Length 50th (m)	~33.3	34.4	7.5	135.0	14.0	33.9	46.4	~168.6	~136.6	24.2
Queue Length 95th (m)	#67.2	47.6	m6.7	#199.6	m0.0	52.0	62.1 m	#115.9	m84.8	m18.0
Internal Link Dist (m)		252.9		257.2			422.0		263.2	
Turn Bay Length (m)	80.0		30.0			27.0		70.0		
Base Capacity (vph)	78	1300	254	652	790	317	908	310	581	609
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.45	0.39	0.29	0.96	0.59	0.51	0.54	1.66	1.03	0.47

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.

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



HCM Signalized Intersection Capacity Analysis  
2: Carp Rd & Hazeldean Rd

Total PM (2029)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Traffic Volume (vph)	113	338	168	74	626	467	162	447	42	516	598	289		
Future Volume (vph)	113	338	168	74	626	467	162	447	42	516	598	289		
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800		
Lane Width	3.6	3.9	3.7	3.8	3.4	3.9	3.9	3.4	3.7	3.6	3.6	3.5		
Total Lost time (s)	6.6	6.6		6.6	6.6	6.6	6.0	6.1		6.0	6.1	6.1		
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00		
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	1.00		1.00	1.00	0.97		
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		
Fr <sub>t</sub>	1.00	0.95		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85		
Fl <sub>t</sub> Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		
Satd. Flow (prot)	1710	3303		1597	1725	1439	1732	3196		1693	1765	1461		
Fl <sub>t</sub> Permitted	0.12	1.00		0.40	1.00	1.00	0.95	1.00		0.95	1.00	1.00		
Satd. Flow (perm)	207	3303		674	1725	1439	1732	3196		1693	1765	1461		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Adj. Flow (vph)	113	338	168	74	626	467	162	447	42	516	598	289		
RTOR Reduction (vph)	0	52	0	0	0	246	0	6	0	0	0	128		
Lane Group Flow (vph)	113	454	0	74	626	221	162	483	0	516	598	161		
Confl. Peds. (#/hr)	8		5	5		8	6		6	6		6		
Heavy Vehicles (%)	0%	1%	0%	9%	2%	6%	2%	3%	4%	1%	2%	0%		
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	Perm		
Protected Phases		4			8		5	2		1	6			
Permitted Phases	4			8		8						6		
Actuated Green, G (s)	45.4	45.4		45.4	45.4	45.4	16.4	33.9		22.0	39.5	39.5		
Effective Green, g (s)	45.4	45.4		45.4	45.4	45.4	16.4	33.9		22.0	39.5	39.5		
Actuated g/C Ratio	0.38	0.38		0.38	0.38	0.38	0.14	0.28		0.18	0.33	0.33		
Clearance Time (s)	6.6	6.6		6.6	6.6	6.6	6.0	6.1		6.0	6.1	6.1		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		
Lane Grp Cap (vph)	78	1249		254	652	544	236	902		310	580	480		
v/s Ratio Prot		0.14			0.36		0.09	0.15		c0.30	c0.34			
v/s Ratio Perm	c0.55			0.11		0.15						0.11		
v/c Ratio	1.45	0.36		0.29	0.96	0.41	0.69	0.54		1.66	1.03	0.34		
Uniform Delay, d <sub>1</sub>	37.3	26.9		26.1	36.4	27.4	49.4	36.4		49.0	40.2	30.3		
Progression Factor	1.00	1.00		0.50	0.63	0.39	1.00	1.00		1.18	1.14	1.73		
Incremental Delay, d <sub>2</sub>	259.8	0.2		0.5	22.7	0.4	8.0	2.3		300.3	20.3	0.2		
Delay (s)	297.1	27.1		13.6	45.6	11.1	57.4	38.7		358.0	66.1	52.6		
Level of Service	F	C		B	D	B	E	D		F	E	D		
Approach Delay (s)		76.4			29.8			43.3			170.7			
Approach LOS		E			C			D			F			
<b>Intersection Summary</b>														
HCM 2000 Control Delay			91.1									HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio			1.37											
Actuated Cycle Length (s)			120.0								18.7			
Intersection Capacity Utilization			113.5%										ICU Level of Service	H
Analysis Period (min)			15											
c Critical Lane Group														

Timing Report, Sorted By Phase  
2: Carp Rd & Hazeldean Rd

Total PM (2029)

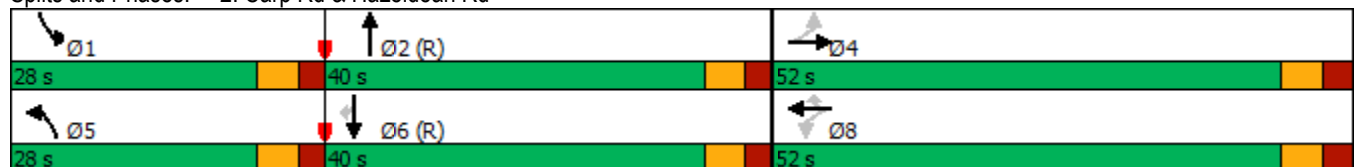


Phase Number	1	2	4	5	6	8
Movement	SBL	NBT	EBTL	NBL	SBT	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	28	40	52	28	40	52
Maximum Split (%)	23.3%	33.3%	43.3%	23.3%	33.3%	43.3%
Minimum Split (s)	11	31.1	37.6	11	31.1	37.6
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.3	2.4	2.9	2.3	2.4	2.9
Minimum Initial (s)	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		18	24		18	24
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	100	8	48	100	8	48
End Time (s)	8	48	100	8	48	100
Yield/Force Off (s)	2	41.9	93.4	2	41.9	93.4
Yield/Force Off 170(s)	2	23.9	69.4	2	23.9	69.4
Local Start Time (s)	92	0	40	92	0	40
Local Yield (s)	114	33.9	85.4	114	33.9	85.4
Local Yield 170(s)	114	15.9	61.4	114	15.9	61.4

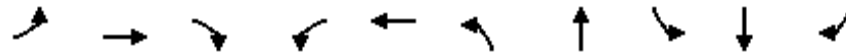
Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	150
Offset: 8 (7%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 2: Carp Rd & Hazeldean Rd



## 3: Stittsville Main St &amp; Carp Rd/Plaza (1261 S. Main)



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	89	149	528	218	263	375	729	88	617	58
v/c Ratio	0.39	0.39	0.92	0.51	0.40	1.29	1.12	0.42	1.21	0.11
Control Delay	33.5	31.7	34.9	22.9	17.5	181.8	103.0	20.5	144.3	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.5	31.7	34.9	22.9	17.5	181.8	103.0	20.5	144.3	0.4
Queue Length 50th (m)	11.4	19.1	31.5	21.9	22.4	~80.2	~157.1	7.9	~121.3	0.0
Queue Length 95th (m)	23.4	33.9	#84.6	36.6	39.1	#129.3	#219.4	15.8	#178.6	0.0
Internal Link Dist (m)		289.2			73.8		147.6		545.1	
Turn Bay Length (m)	30.0		30.0	15.0		32.0		30.0		22.0
Base Capacity (vph)	273	456	628	431	726	290	653	228	508	522
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.33	0.84	0.51	0.36	1.29	1.12	0.39	1.21	0.11

## 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.

HCM Signalized Intersection Capacity Analysis  
 3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)

Total PM (2029)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	149	528	218	162	101	375	596	133	88	617	58
Future Volume (vph)	89	149	528	218	162	101	375	596	133	88	617	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	3.5	3.2	3.9	3.6	3.6	3.7	3.5	3.6	3.7	3.1	3.5	3.5
Total Lost time (s)	5.1	5.1	5.1	5.1	5.1		5.5	5.5		5.5	5.5	5.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	0.97		1.00	0.99		1.00	1.00	0.93
Flpb, ped/bikes	0.97	1.00	1.00	0.99	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.94		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1638	1720	1475	1699	1625		1595	1718		1615	1728	1405
Flt Permitted	0.60	1.00	1.00	0.49	1.00		0.12	1.00		0.15	1.00	1.00
Satd. Flow (perm)	1029	1720	1475	885	1625		210	1718		257	1728	1405
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	89	149	528	218	162	101	375	596	133	88	617	58
RTOR Reduction (vph)	0	0	252	0	27	0	0	8	0	0	0	41
Lane Group Flow (vph)	89	149	276	218	236	0	375	721	0	88	617	17
Confl. Peds. (#/hr)	23		10	10		23	28		13	13		28
Confl. Bikes (#/hr)						2			4			
Heavy Vehicles (%)	0%	0%	3%	0%	1%	3%	6%	1%	1%	0%	3%	0%
Turn Type	Perm	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)	19.9	19.9	19.9	34.8	34.8		44.6	32.6		33.0	26.5	26.5
Effective Green, g (s)	19.9	19.9	19.9	34.8	34.8		44.6	32.6		33.0	26.5	26.5
Actuated g/C Ratio	0.22	0.22	0.22	0.39	0.39		0.50	0.36		0.37	0.29	0.29
Clearance Time (s)	5.1	5.1	5.1	5.1	5.1		5.5	5.5		5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	227	380	326	430	628		297	622		192	508	413
v/s Ratio Prot		0.09		c0.06	0.15		c0.18	0.42		0.03	0.36	
v/s Ratio Perm	0.09		c0.19	0.14			c0.45			0.13		0.01
v/c Ratio	0.39	0.39	0.85	0.51	0.38		1.26	1.16		0.46	1.21	0.04
Uniform Delay, d1	29.9	29.9	33.6	19.7	19.8		25.2	28.7		22.1	31.8	22.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.1	0.7	18.1	0.9	0.4		142.4	88.5		1.7	113.6	0.2
Delay (s)	31.0	30.6	51.7	20.6	20.2		167.6	117.2		23.8	145.4	22.9
Level of Service	C	C	D	C	C		F	F		C	F	C
Approach Delay (s)		45.2			20.4			134.3			122.0	
Approach LOS		D			C			F			F	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			91.8				HCM 2000 Level of Service			F		
HCM 2000 Volume to Capacity ratio			1.10									
Actuated Cycle Length (s)			90.0				Sum of lost time (s)			21.2		
Intersection Capacity Utilization			100.1%				ICU Level of Service			G		
Analysis Period (min)			15									

c Critical Lane Group

Timing Report, Sorted By Phase  
 3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)

Total PM (2029)

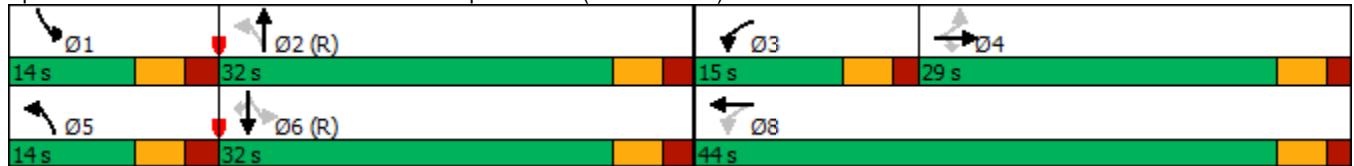


Phase Number	1	2	3	4	5	6	8
Movement	SBL	NBTL	WBL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	
Lead-Lag Optimize							
Recall Mode	None	C-Max	None	None	None	C-Max	None
Maximum Split (s)	14	32	15	29	14	32	44
Maximum Split (%)	15.6%	35.6%	16.7%	32.2%	15.6%	35.6%	48.9%
Minimum Split (s)	10.5	29.5	10.1	28.1	10.5	29.5	28.1
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.2	2.2	1.8	1.8	2.2	2.2	1.8
Minimum Initial (s)	5	10	5	10	5	10	10
Vehicle Extension (s)	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0
Walk Time (s)		7		7		7	7
Flash Dont Walk (s)		17		16		17	16
Dual Entry	No	Yes	No	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	78	2	34	49	78	2	34
End Time (s)	2	34	49	78	2	34	78
Yield/Force Off (s)	86.5	28.5	43.9	72.9	86.5	28.5	72.9
Yield/Force Off 170(s)	86.5	11.5	43.9	56.9	86.5	11.5	56.9
Local Start Time (s)	76	0	32	47	76	0	32
Local Yield (s)	84.5	26.5	41.9	70.9	84.5	26.5	70.9
Local Yield 170(s)	84.5	9.5	41.9	54.9	84.5	9.5	54.9

Intersection Summary

















Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	110
Offset: 2 (2%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)



HCM Unsignalized Intersection Capacity Analysis  
 4: Samantha Eastop Dr & Kimpton Dr

Total PM (2029)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	94	60	0	59	6	37	0	0	41	0	25
Future Volume (Veh/h)	40	94	60	0	59	6	37	0	0	41	0	25
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	40	94	60	0	59	6	37	0	0	41	0	25
Pedestrians		5			5			5			5	
Lane Width (m)		4.8			4.8			4.8			4.8	
Walking Speed (m/s)		1.0			1.0			1.0			1.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)		322										
pX, platoon unblocked												
vC, conflicting volume	70			159			301	279	134	276	306	72
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	70			159			301	279	134	276	306	72
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			94	100	100	94	100	97
cM capacity (veh/h)	1520			1411			607	604	903	647	584	977
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	194	65	37	66								
Volume Left	40	0	37	41								
Volume Right	60	6	0	25								
cSH	1520	1411	607	742								
Volume to Capacity	0.03	0.00	0.06	0.09								
Queue Length 95th (m)	0.6	0.0	1.4	2.0								
Control Delay (s)	1.7	0.0	11.3	10.3								
Lane LOS	A		B	B								
Approach Delay (s)	1.7	0.0	11.3	10.3								
Approach LOS			B	B								
<b>Intersection Summary</b>												
Average Delay			4.0									
Intersection Capacity Utilization			30.2%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
 5: Hazeldean Rd & 6171 Hazeldean

Total PM (2029)



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	86	816	1097	61	53	76
Future Volume (Veh/h)	86	816	1097	61	53	76
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	86	816	1097	61	53	76
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		Raised	Raised			
Median storage veh		1	1			
Upstream signal (m)		281				
pX, platoon unblocked						
vC, conflicting volume	1158				1708	579
vC1, stage 1 conf vol					1128	
vC2, stage 2 conf vol					580	
vCu, unblocked vol	1158				1708	579
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	86				72	84
cM capacity (veh/h)	611				187	463
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	86	408	408	731	427	129
Volume Left	86	0	0	0	0	53
Volume Right	0	0	0	0	61	76
cSH	611	1700	1700	1700	1700	288
Volume to Capacity	0.14	0.24	0.24	0.43	0.25	0.45
Queue Length 95th (m)	3.4	0.0	0.0	0.0	0.0	15.3
Control Delay (s)	11.9	0.0	0.0	0.0	0.0	27.2
Lane LOS	B					D
Approach Delay (s)	1.1			0.0		27.2
Approach LOS						D
Intersection Summary						
Average Delay			2.1			
Intersection Capacity Utilization			57.1%		ICU Level of Service	B
Analysis Period (min)			15			

## 6: Stittsville Main St &amp; Hazeldean Rd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	134	517	576	1090	124	194	452	256	271	103
v/c Ratio	0.53	0.53	1.11	0.82	0.47	0.61	0.82	0.78	0.79	0.24
Control Delay	29.1	49.8	96.6	37.6	32.6	52.1	25.8	49.0	61.5	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.1	49.8	96.6	37.6	32.6	52.1	25.8	49.0	61.5	2.7
Queue Length 50th (m)	19.9	57.0	~101.9	105.2	18.7	38.6	27.4	42.3	56.3	0.0
Queue Length 95th (m)	m20.9	m51.1	#199.8	#173.2	28.9	56.1	61.1	57.9	78.1	3.8
Internal Link Dist (m)		606.0		143.1		545.1			139.3	
Turn Bay Length (m)	34.0		288.0		24.0		17.0	46.0		38.0
Base Capacity (vph)	337	983	520	1337	284	435	636	327	444	515
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.53	1.11	0.82	0.44	0.45	0.71	0.78	0.61	0.20

## 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.

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



HCM Signalized Intersection Capacity Analysis  
6: Stittsville Main St & Hazeldean Rd

Total PM (2029)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	134	450	67	576	780	310	124	194	452	256	271	103
Future Volume (vph)	134	450	67	576	780	310	124	194	452	256	271	103
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	4.5	3.5	3.7	3.9	3.5	3.7	3.7	3.3	4.3	3.4	3.4	4.6
Total Lost time (s)	6.5	6.3		6.5	6.3		6.9	7.0	7.0	6.9	6.7	6.7
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.96	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00
Fr <sub>t</sub>	1.00	0.98		1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Fl <sub>t</sub> Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1881	3273		1730	3208		1694	1740	1585	1658	1760	1592
Fl <sub>t</sub> Permitted	0.16	1.00		0.29	1.00		0.35	1.00	1.00	0.47	1.00	1.00
Satd. Flow (perm)	320	3273		536	3208		617	1740	1585	826	1760	1592
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	134	450	67	576	780	310	124	194	452	256	271	103
RTOR Reduction (vph)	0	10	0	0	30	0	0	0	261	0	0	83
Lane Group Flow (vph)	134	507	0	576	1060	0	124	194	191	256	271	20
Confl. Peds. (#/hr)	6		7	7		6	4		23	23		4
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	0%	1%	0%	2%	0%	0%	2%	0%	0%	0%	0%	5%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8		8	4		4
Actuated Green, G (s)	45.8	35.6		65.6	48.9		33.0	22.1	22.1	35.7	23.6	23.6
Effective Green, g (s)	45.8	35.6		65.6	48.9		33.0	22.1	22.1	35.7	23.6	23.6
Actuated g/C Ratio	0.38	0.30		0.55	0.41		0.28	0.18	0.18	0.30	0.20	0.20
Clearance Time (s)	6.5	6.3		6.5	6.3		6.9	7.0	7.0	6.9	6.7	6.7
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	254	970		526	1307		267	320	291	329	346	313
v/s Ratio Prot	0.04	0.15		c0.21	0.33		0.04	0.11		c0.08	c0.15	
v/s Ratio Perm	0.16			c0.38			0.09		0.12	0.15		0.01
v/c Ratio	0.53	0.52		1.10	0.81		0.46	0.61	0.66	0.78	0.78	0.06
Uniform Delay, d1	25.7	35.1		20.5	31.5		34.4	45.0	45.4	36.6	45.8	39.2
Progression Factor	1.65	1.44		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.2		67.7	5.6		1.3	3.2	5.3	11.0	11.0	0.1
Delay (s)	42.7	50.9		88.2	37.0		35.7	48.2	50.7	47.6	56.8	39.3
Level of Service	D	D		F	D		D	D	D	D	E	D
Approach Delay (s)		49.2			54.7			47.6			50.2	
Approach LOS		D			D			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			51.5				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			1.04									
Actuated Cycle Length (s)			120.0				Sum of lost time (s)			26.7		
Intersection Capacity Utilization			114.1%				ICU Level of Service			H		
Analysis Period (min)			15									

c Critical Lane Group

Timing Report, Sorted By Phase  
6: Stittsville Main St & Hazeldean Rd

Total PM (2029)

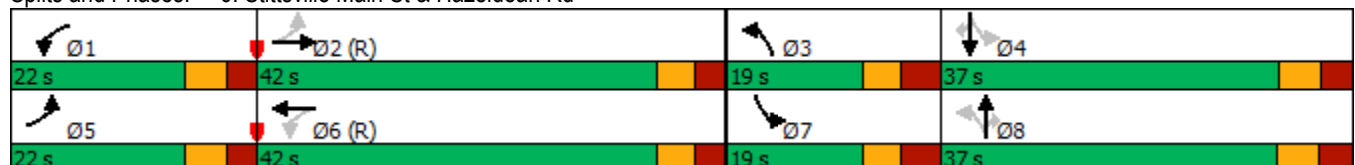


Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBTL	EBL	WBTL	SBL	NBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	22	42	19	37	22	42	19	37
Maximum Split (%)	18.3%	35.0%	15.8%	30.8%	18.3%	35.0%	15.8%	30.8%
Minimum Split (s)	11.7	36.3	11.9	36.7	11.5	36.3	16.9	37
Yellow Time (s)	3.7	3.3	3.3	3.7	3.7	3.3	3.3	3.7
All-Red Time (s)	2.8	3	3.6	3	2.8	3	3.6	3.3
Minimum Initial (s)	5	10	5	10	5	10	10	10
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		23		23		23		23
Dual Entry	No	Yes	No	Yes	No	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	91	113	35	54	91	113	35	54
End Time (s)	113	35	54	91	113	35	54	91
Yield/Force Off (s)	106.5	28.7	47.1	84.3	106.5	28.7	47.1	84
Yield/Force Off 170(s)	106.5	5.7	47.1	61.3	106.5	5.7	47.1	61
Local Start Time (s)	98	0	42	61	98	0	42	61
Local Yield (s)	113.5	35.7	54.1	91.3	113.5	35.7	54.1	91
Local Yield 170(s)	113.5	12.7	54.1	68.3	113.5	12.7	54.1	68

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	125
Offset: 113 (94%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	

Splits and Phases: 6: Stittsville Main St & Hazeldean Rd



Queues  
1: Carp Rd & Kittiwake Dr/Echwoods Ave

Total AM (2029) & Mitigated



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	284	90	63	243	32	1202	64	668	59
v/c Ratio	1.09	0.24	0.29	0.60	0.09	1.11	0.48	0.65	0.06
Control Delay	127.6	11.3	44.4	23.5	2.8	77.9	24.2	18.1	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	127.6	11.3	44.4	23.5	2.8	77.9	24.2	18.1	1.2
Queue Length 50th (m)	~69.4	1.1	11.6	17.6	0.7	~309.0	4.0	92.3	0.0
Queue Length 95th (m)	#118.2	13.5	23.9	43.0	m1.1 m	#338.4	13.5	131.9	2.8
Internal Link Dist (m)		169.7	117.2			263.2		262.3	
Turn Bay Length (m)	15.0				25.0		30.0		32.0
Base Capacity (vph)	260	373	216	405	349	1080	133	1034	912
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.09	0.24	0.29	0.60	0.09	1.11	0.48	0.65	0.06

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.

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

HCM Signalized Intersection Capacity Analysis  
 1: Carp Rd & Kittiwake Dr/Echwoods Ave

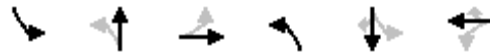
Total AM (2029) & Mitigated

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	284	6	84	59	4	243	32	1184	18	64	668	59
Future Volume (vph)	284	6	84	59	4	243	32	1184	18	64	668	59
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	3.9	3.9	3.7	3.7	3.0	2.9	3.6	3.7	3.7	3.3	3.5	3.1
Total Lost time (s)	6.3	6.3			6.0	6.0	5.6	6.0		5.6	5.7	5.7
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frbp, ped/bikes	1.00	0.99			1.00	0.98	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.86			1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1679	1489			1452	1379	1474	1746		1653	1618	1381
Flt Permitted	0.72	1.00			0.68	1.00	0.30	1.00		0.05	1.00	1.00
Satd. Flow (perm)	1265	1489			1040	1379	463	1746		93	1618	1381
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	284	6	84	59	4	243	32	1184	18	64	668	59
RTOR Reduction (vph)	0	67	0	0	0	118	0	0	0	0	0	22
Lane Group Flow (vph)	284	23	0	0	63	125	32	1202	0	64	668	37
Confl. Peds. (#/hr)	1					1	2		1	1		2
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	5%	20%	5%	9%	33%	0%	16%	4%	0%	0%	10%	2%
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	24.7	24.7			25.0	25.0	76.3	73.1		78.8	74.5	74.5
Effective Green, g (s)	24.7	24.7			25.0	25.0	76.3	73.1		78.8	74.5	74.5
Actuated g/C Ratio	0.21	0.21			0.21	0.21	0.64	0.61		0.66	0.62	0.62
Clearance Time (s)	6.3	6.3			6.0	6.0	5.6	6.0		5.6	5.7	5.7
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	260	306			216	287	321	1063		116	1004	857
v/s Ratio Prot		0.02					0.00	c0.69		c0.02	0.41	
v/s Ratio Perm	c0.22				0.06	0.09	0.06			0.34		0.03
v/c Ratio	1.09	0.08			0.29	0.44	0.10	1.13		0.55	0.67	0.04
Uniform Delay, d1	47.6	38.4			40.0	41.4	9.9	23.5		28.9	14.7	8.9
Progression Factor	1.00	1.00			1.00	1.00	0.41	0.61		1.00	1.00	1.00
Incremental Delay, d2	82.7	0.1			0.8	1.1	0.1	67.0		5.6	3.5	0.1
Delay (s)	130.3	38.6			40.8	42.4	4.1	81.4		34.4	18.2	9.0
Level of Service	F	D			D	D	A	F		C	B	A
Approach Delay (s)		108.3			42.1			79.4			18.8	
Approach LOS		F			D			E			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			61.5		HCM 2000 Level of Service					E		
HCM 2000 Volume to Capacity ratio			1.10									
Actuated Cycle Length (s)			120.0		Sum of lost time (s)					17.9		
Intersection Capacity Utilization			114.9%		ICU Level of Service					H		
Analysis Period (min)			15									

c Critical Lane Group

Timing Report, Sorted By Phase  
 1: Carp Rd & Kittiwake Dr/Echwoods Ave

Total AM (2029) & Mitigated



Phase Number	1	2	4	5	6	8
Movement	SBL	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	11	78	31	11	78	31
Maximum Split (%)	9.2%	65.0%	25.8%	9.2%	65.0%	25.8%
Minimum Split (s)	10.6	30	29.3	10.6	29.7	29
Yellow Time (s)	3.7	3.7	3	3.7	3.7	3
All-Red Time (s)	1.9	2.3	3.3	1.9	2	3
Minimum Initial (s)	5	10	10	5	10	10
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		17	16		17	16
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	2	13	91	2	13	91
End Time (s)	13	91	2	13	91	2
Yield/Force Off (s)	7.4	85	115.7	7.4	85.3	116
Yield/Force Off 170(s)	7.4	68	99.7	7.4	68.3	100
Local Start Time (s)	109	0	78	109	0	78
Local Yield (s)	114.4	72	102.7	114.4	72.3	103
Local Yield 170(s)	114.4	55	86.7	114.4	55.3	87

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	150
Offset: 13 (11%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 1: Carp Rd & Kittiwake Dr/Echwoods Ave



Queues  
2: Carp Rd & Hazeldean Rd

Total AM (2029) & Mitigated



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	351	448	32	150	417	72	509	308	350	60
v/c Ratio	1.18	0.47	0.29	0.64	0.73	0.52	0.55	0.81	0.45	0.08
Control Delay	144.3	32.6	50.0	59.8	12.4	64.3	40.1	49.6	39.6	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	144.3	32.6	50.0	59.8	12.4	64.3	40.1	49.6	39.6	3.1
Queue Length 50th (m)	~82.6	38.2	6.3	31.1	0.0	15.2	49.6	64.9	72.7	0.0
Queue Length 95th (m)	#125.9	47.2	14.3	47.2	26.4	27.9	72.0	#97.3	108.2	m1.3
Internal Link Dist (m)		252.9		257.2			422.0		263.2	
Turn Bay Length (m)	80.0		30.0			27.0		70.0		
Base Capacity (vph)	298	1327	194	415	684	155	931	387	771	707
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.18	0.34	0.16	0.36	0.61	0.46	0.55	0.80	0.45	0.08

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.

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

HCM Signalized Intersection Capacity Analysis  
2: Carp Rd & Hazeldean Rd

Total AM (2029) & Mitigated

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Traffic Volume (vph)	351	344	104	32	150	417	72	486	23	308	350	60		
Future Volume (vph)	351	344	104	32	150	417	72	486	23	308	350	60		
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800		
Lane Width	3.6	3.9	3.7	3.8	3.4	3.9	3.9	3.4	3.7	3.6	3.6	3.5		
Total Lost time (s)	6.1	6.6		6.6	6.6	6.6	6.0	6.1		6.0	6.1	6.1		
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00		
Frbp, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	1.00		1.00	1.00	0.98		
Flpb, ped/bikes	0.99	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85		
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		
Satd. Flow (prot)	1666	3232		1431	1586	1441	1523	3166		1462	1593	1309		
Flt Permitted	0.42	1.00		0.49	1.00	1.00	0.95	1.00		0.95	1.00	1.00		
Satd. Flow (perm)	731	3232		743	1586	1441	1523	3166		1462	1593	1309		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Adj. Flow (vph)	351	344	104	32	150	417	72	486	23	308	350	60		
RTOR Reduction (vph)	0	28	0	0	0	355	0	3	0	0	0	32		
Lane Group Flow (vph)	351	420	0	32	150	62	72	506	0	308	350	28		
Confl. Peds. (#/hr)	12		1	1		12	1		4	4		1		
Heavy Vehicles (%)	2%	5%	5%	22%	11%	5%	16%	3%	43%	17%	13%	13%		
Turn Type	pm+pt	NA		Perm	NA	Perm	Prot	NA		Prot	NA	Perm		
Protected Phases	7	4			8		5	2		1	6			
Permitted Phases	4			8		8						6		
Actuated Green, G (s)	34.7	34.7		17.7	17.7	17.7	9.7	35.2		31.4	56.9	56.9		
Effective Green, g (s)	34.7	34.7		17.7	17.7	17.7	9.7	35.2		31.4	56.9	56.9		
Actuated g/C Ratio	0.29	0.29		0.15	0.15	0.15	0.08	0.29		0.26	0.47	0.47		
Clearance Time (s)	6.1	6.6		6.6	6.6	6.6	6.0	6.1		6.0	6.1	6.1		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		
Lane Grp Cap (vph)	296	934		109	233	212	123	928		382	755	620		
v/s Ratio Prot	c0.11	0.13			0.09		0.05	c0.16		c0.21	0.22			
v/s Ratio Perm	c0.23			0.04		0.04						0.02		
v/c Ratio	1.19	0.45		0.29	0.64	0.29	0.59	0.55		0.81	0.46	0.05		
Uniform Delay, d1	41.4	34.8		45.6	48.2	45.6	53.2	35.7		41.5	21.3	17.0		
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		0.85	1.56	1.00		
Incremental Delay, d2	112.5	0.3		1.5	6.0	0.8	6.9	2.3		9.8	1.7	0.1		
Delay (s)	153.8	35.2		47.1	54.2	46.3	60.1	38.0		45.2	34.9	17.1		
Level of Service	F	D		D	D	D	E	D		D	C	B		
Approach Delay (s)		87.3			48.3			40.7			37.9			
Approach LOS		F			D			D			D			
<b>Intersection Summary</b>														
HCM 2000 Control Delay			55.5									HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio			0.87											
Actuated Cycle Length (s)			120.0								24.8			
Intersection Capacity Utilization			94.1%										ICU Level of Service	F
Analysis Period (min)			15											
c Critical Lane Group														

Timing Report, Sorted By Phase  
2: Carp Rd & Hazeldean Rd

Total AM (2029) & Mitigated

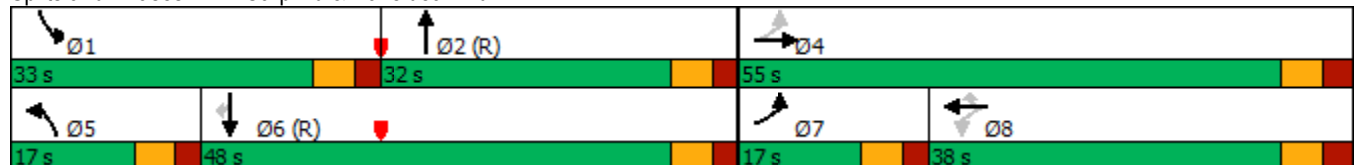


Phase Number	1	2	4	5	6	7	8
Movement	SBL	NBT	EBTL	NBL	SBT	EBL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lag
Lead-Lag Optimize							
Recall Mode	None	C-Max	None	None	C-Max	None	None
Maximum Split (s)	33	32	55	17	48	17	38
Maximum Split (%)	27.5%	26.7%	45.8%	14.2%	40.0%	14.2%	31.7%
Minimum Split (s)	11	31.1	37.6	11	31.1	11.1	37.6
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.3	2.4	2.9	2.3	2.4	2.4	2.9
Minimum Initial (s)	5	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0
Walk Time (s)		7	7		7		7
Flash Dont Walk (s)		18	24		18		24
Dual Entry	No	Yes	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	87	0	32	87	104	32	49
End Time (s)	0	32	87	104	32	49	87
Yield/Force Off (s)	114	25.9	80.4	98	25.9	42.9	80.4
Yield/Force Off 170(s)	114	7.9	56.4	98	7.9	42.9	56.4
Local Start Time (s)	87	0	32	87	104	32	49
Local Yield (s)	114	25.9	80.4	98	25.9	42.9	80.4
Local Yield 170(s)	114	7.9	56.4	98	7.9	42.9	56.4

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	105
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 2: Carp Rd & Hazeldean Rd





Queues  
1: Carp Rd & Kittiwake Dr/Echwoods Ave

Total PM (2029) & Mitigated
























Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	170	82	78	131	62	920	199	1333	182
v/c Ratio	0.80	0.26	0.46	0.38	0.50	0.89	0.72	1.25	0.19
Control Delay	74.1	15.7	53.0	10.1	27.2	31.0	28.1	145.2	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.1	15.7	53.0	10.1	27.2	31.0	28.1	145.2	5.9
Queue Length 50th (m)	35.4	2.9	15.2	0.0	2.3	192.0	12.1	~375.5	8.4
Queue Length 95th (m)	#57.8	15.2	28.9	14.9	m6.1 m	#250.6	#44.5	#452.1	17.9
Internal Link Dist (m)		169.7	117.2			263.2		262.3	
Turn Bay Length (m)	15.0				25.0		30.0		32.0
Base Capacity (vph)	254	359	202	387	124	1038	279	1063	935
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	0.67	0.23	0.39	0.34	0.50	0.89	0.71	1.25	0.19

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

HCM Signalized Intersection Capacity Analysis  
1: Carp Rd & Kittiwake Dr/Echwoods Ave

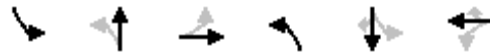
Total PM (2029) & Mitigated

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	170	16	66	70	8	131	62	882	38	199	1333	182	
Future Volume (vph)	170	16	66	70	8	131	62	882	38	199	1333	182	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Lane Width	3.9	3.9	3.7	3.7	3.0	2.9	3.6	3.7	3.7	3.3	3.5	3.1	
Total Lost time (s)	6.3	6.3			6.0	6.0	5.6	6.0		5.6	5.7	5.7	
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Frbp, ped/bikes	1.00	0.96			1.00	1.00	1.00	1.00		1.00	1.00	0.98	
Flpb, ped/bikes	1.00	1.00			0.97	1.00	1.00	1.00		1.00	1.00	1.00	
Frt	1.00	0.88			1.00	0.85	1.00	0.99		1.00	1.00	0.85	
Flt Protected	0.95	1.00			0.96	1.00	0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	1732	1551			1406	1411	1474	1740		1653	1618	1381	
Flt Permitted	0.71	1.00			0.69	1.00	0.06	1.00		0.11	1.00	1.00	
Satd. Flow (perm)	1288	1551			1014	1411	87	1740		198	1618	1381	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Adj. Flow (vph)	170	16	66	70	8	131	62	882	38	199	1333	182	
RTOR Reduction (vph)	0	55	0	0	0	109	0	1	0	0	0	28	
Lane Group Flow (vph)	170	27	0	0	78	22	62	919	0	199	1333	154	
Confl. Peds. (#/hr)			20	20			2		4	4		2	
Confl. Bikes (#/hr)			2										
Heavy Vehicles (%)	2%	0%	2%	9%	33%	0%	16%	4%	0%	0%	10%	2%	
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	
Protected Phases		4			8		5	2		1	6		
Permitted Phases	4			8		8	2			6		6	
Actuated Green, G (s)	19.8	19.8			20.1	20.1	76.3	71.5		88.2	77.8	77.8	
Effective Green, g (s)	19.8	19.8			20.1	20.1	76.3	71.5		88.2	77.8	77.8	
Actuated g/C Ratio	0.17	0.17			0.17	0.17	0.64	0.60		0.74	0.65	0.65	
Clearance Time (s)	6.3	6.3			6.0	6.0	5.6	6.0		5.6	5.7	5.7	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	212	255			169	236	110	1036		276	1049	895	
v/s Ratio Prot		0.02					0.02	0.53		c0.06	c0.82		
v/s Ratio Perm	c0.13				0.08	0.02	0.33			0.46		0.11	
v/c Ratio	0.80	0.11			0.46	0.09	0.56	0.89		0.72	1.27	0.17	
Uniform Delay, d1	48.2	42.6			45.1	42.2	28.1	20.8		21.2	21.1	8.3	
Progression Factor	1.00	1.00			1.00	1.00	1.10	0.99		1.00	1.00	1.00	
Incremental Delay, d2	19.2	0.2			2.0	0.2	4.6	8.2		8.9	129.4	0.4	
Delay (s)	67.4	42.8			47.1	42.4	35.5	28.9		30.1	150.5	8.8	
Level of Service	E	D			D	D	D	C		C	F	A	
Approach Delay (s)		59.4			44.1			29.3			121.5		
Approach LOS		E			D			C			F		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			82.7		HCM 2000 Level of Service						F		
HCM 2000 Volume to Capacity ratio			1.18										
Actuated Cycle Length (s)			120.0		Sum of lost time (s)						17.9		
Intersection Capacity Utilization			110.7%		ICU Level of Service						H		
Analysis Period (min)			15										

c Critical Lane Group

Timing Report, Sorted By Phase  
 1: Carp Rd & Kittiwake Dr/Echwoods Ave

Total PM (2029) & Mitigated



Phase Number	1	2	4	5	6	8
Movement	SBL	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	16	74	30	11	79	30
Maximum Split (%)	13.3%	61.7%	25.0%	9.2%	65.8%	25.0%
Minimum Split (s)	10.6	30	29.3	10.6	29.7	29
Yellow Time (s)	3.7	3.7	3	3.7	3.7	3
All-Red Time (s)	1.9	2.3	3.3	1.9	2	3
Minimum Initial (s)	5	10	10	5	10	10
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		17	16		17	16
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	14	30	104	14	25	104
End Time (s)	30	104	14	25	104	14
Yield/Force Off (s)	24.4	98	7.7	19.4	98.3	8
Yield/Force Off 170(s)	24.4	81	111.7	19.4	81.3	112
Local Start Time (s)	104	0	74	104	115	74
Local Yield (s)	114.4	68	97.7	109.4	68.3	98
Local Yield 170(s)	114.4	51	81.7	109.4	51.3	82

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	150
Offset: 30 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 1: Carp Rd & Kittiwake Dr/Echwoods Ave



Queues  
2: Carp Rd & Hazeldean Rd

Total PM (2029) & Mitigated



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	113	506	74	626	467	162	489	516	598	289
v/c Ratio	1.28	0.38	0.28	0.94	0.58	1.12	0.68	1.31	0.91	0.47
Control Delay	223.7	22.7	25.5	47.4	7.0	162.1	47.3	171.0	37.6	18.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	223.7	22.7	25.5	47.4	7.0	162.1	47.3	171.0	37.6	18.0
Queue Length 50th (m)	~31.0	33.8	5.9	54.7	0.3	~40.6	50.5	~143.1	136.8	38.9
Queue Length 95th (m)	#64.9	46.9	m12.8	#189.2	m26.5	#79.8	67.5 m	#105.7	m108.6	m28.3
Internal Link Dist (m)		252.9		257.2			422.0		263.2	
Turn Bay Length (m)	80.0		30.0			27.0		70.0		
Base Capacity (vph)	88	1328	262	667	802	144	722	395	660	618
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.28	0.38	0.28	0.94	0.58	1.13	0.68	1.31	0.91	0.47

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.

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

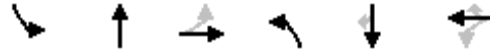
HCM Signalized Intersection Capacity Analysis  
2: Carp Rd & Hazeldean Rd

Total PM (2029) & Mitigated

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	113	338	168	74	626	467	162	447	42	516	598	289
Future Volume (vph)	113	338	168	74	626	467	162	447	42	516	598	289
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	3.6	3.9	3.7	3.8	3.4	3.9	3.9	3.4	3.7	3.6	3.6	3.5
Total Lost time (s)	6.6	6.6		6.6	6.6	6.6	6.0	6.1		6.0	6.1	6.1
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00
Frbp, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1710	3303		1597	1725	1439	1732	3196		1693	1765	1461
Flt Permitted	0.13	1.00		0.40	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	228	3303		679	1725	1439	1732	3196		1693	1765	1461
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	113	338	168	74	626	467	162	447	42	516	598	289
RTOR Reduction (vph)	0	52	0	0	0	246	0	6	0	0	0	71
Lane Group Flow (vph)	113	454	0	74	626	221	162	483	0	516	598	218
Confl. Peds. (#/hr)	8		5	5		8	6		6	6		6
Heavy Vehicles (%)	0%	1%	0%	9%	2%	6%	2%	3%	4%	1%	2%	0%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						6
Actuated Green, G (s)	46.4	46.4		46.4	46.4	46.4	10.0	26.9		28.0	44.9	44.9
Effective Green, g (s)	46.4	46.4		46.4	46.4	46.4	10.0	26.9		28.0	44.9	44.9
Actuated g/C Ratio	0.39	0.39		0.39	0.39	0.39	0.08	0.22		0.23	0.37	0.37
Clearance Time (s)	6.6	6.6		6.6	6.6	6.6	6.0	6.1		6.0	6.1	6.1
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	88	1277		262	667	556	144	716		395	660	546
v/s Ratio Prot		0.14			0.36		0.09	0.15		c0.30	c0.34	
v/s Ratio Perm	c0.50			0.11		0.15						0.15
v/c Ratio	1.28	0.36		0.28	0.94	0.40	1.12	0.67		1.31	0.91	0.40
Uniform Delay, d1	36.8	26.2		25.3	35.4	26.7	55.0	42.5		46.0	35.6	27.6
Progression Factor	1.00	1.00		0.88	0.74	0.94	1.00	1.00		0.76	0.97	1.05
Incremental Delay, d2	190.0	0.2		0.5	18.2	0.4	112.5	5.0		139.6	2.2	0.2
Delay (s)	226.8	26.3		22.8	44.4	25.4	167.5	47.6		174.6	36.7	29.1
Level of Service	F	C		C	D	C	F	D		F	D	C
Approach Delay (s)		62.9			35.4			77.4			85.9	
Approach LOS		E			D			E			F	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			65.4				HCM 2000 Level of Service				E	
HCM 2000 Volume to Capacity ratio			1.21									
Actuated Cycle Length (s)			120.0				Sum of lost time (s)			18.7		
Intersection Capacity Utilization			113.5%				ICU Level of Service			H		
Analysis Period (min)			15									
c Critical Lane Group												

Timing Report, Sorted By Phase  
2: Carp Rd & Hazeldean Rd

Total PM (2029) & Mitigated



Phase Number	1	2	4	5	6	8
Movement	SBL	NBT	EBTL	NBL	SBT	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	34	33	53	16	51	53
Maximum Split (%)	28.3%	27.5%	44.2%	13.3%	42.5%	44.2%
Minimum Split (s)	11	31.1	37.6	11	31.1	37.6
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.3	2.4	2.9	2.3	2.4	2.9
Minimum Initial (s)	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		18	24		18	24
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	77	111	24	77	93	24
End Time (s)	111	24	77	93	24	77
Yield/Force Off (s)	105	17.9	70.4	87	17.9	70.4
Yield/Force Off 170(s)	105	119.9	46.4	87	119.9	46.4
Local Start Time (s)	86	0	33	86	102	33
Local Yield (s)	114	26.9	79.4	96	26.9	79.4
Local Yield 170(s)	114	8.9	55.4	96	8.9	55.4

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	150
Offset: 111 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 2: Carp Rd & Hazeldean Rd



Queues

Total AM (2029) 25% Reduced

1: Carp Rd & Kittiwake Dr/Echwoods Ave























Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	213	68	229	24	902	48	501	44
v/c Ratio	0.88	0.15	0.41	0.06	0.95	0.31	0.55	0.05
Control Delay	75.3	9.3	11.3	7.5	38.7	14.7	20.8	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.3	9.3	11.3	7.5	38.7	14.7	20.8	0.6
Queue Length 50th (m)	40.9	0.7	8.6	0.8	~193.7	3.8	72.6	0.0
Queue Length 95th (m)	#77.8	10.3	26.6	m2.5 m	#252.2	8.3	105.3	1.1
Internal Link Dist (m)		169.7	117.2		263.2		262.3	
Turn Bay Length (m)	15.0			25.0		30.0		32.0
Base Capacity (vph)	263	481	602	393	947	159	915	817
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.14	0.38	0.06	0.95	0.30	0.55	0.05

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

HCM Signalized Intersection Capacity Analysis  
1: Carp Rd & Kittiwake Dr/Echwoods Ave

Total AM (2029) 25% Reduced

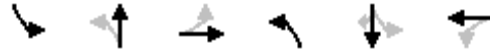
													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	213	5	63	44	3	182	24	888	14	48	501	44	
Future Volume (vph)	213	5	63	44	3	182	24	888	14	48	501	44	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Lane Width	3.9	3.9	3.7	3.7	4.8	3.7	3.6	3.7	3.7	3.3	3.5	3.1	
Total Lost time (s)	6.3	6.3			6.0		5.6	6.0		5.6	5.7	5.7	
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00	
Frbp, ped/bikes	1.00	0.99			0.98		1.00	1.00		1.00	1.00	0.98	
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00	
Frt	1.00	0.86			0.89		1.00	1.00		1.00	1.00	0.85	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	1680	1490			1734		1473	1746		1653	1618	1382	
Flt Permitted	0.51	1.00			0.93		0.38	1.00		0.07	1.00	1.00	
Satd. Flow (perm)	901	1490			1626		584	1746		123	1618	1382	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Adj. Flow (vph)	213	5	63	44	3	182	24	888	14	48	501	44	
RTOR Reduction (vph)	0	46	0	0	125	0	0	0	0	0	0	20	
Lane Group Flow (vph)	213	22	0	0	104	0	24	902	0	48	501	24	
Confl. Peds. (#/hr)	1					1	2		1	1		2	
Confl. Bikes (#/hr)			2										
Heavy Vehicles (%)	5%	20%	5%	9%	33%	0%	16%	4%	0%	0%	10%	2%	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm	
Protected Phases		4			8		5	2		1	6		
Permitted Phases	4			8			2			6		6	
Actuated Green, G (s)	30.8	30.8			31.1		65.0	61.2		67.9	62.8	62.8	
Effective Green, g (s)	30.8	30.8			31.1		65.0	61.2		67.9	62.8	62.8	
Actuated g/C Ratio	0.27	0.27			0.27		0.57	0.53		0.59	0.55	0.55	
Clearance Time (s)	6.3	6.3			6.0		5.6	6.0		5.6	5.7	5.7	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	241	399			439		359	929		140	883	754	
v/s Ratio Prot		0.01					0.00	c0.52		c0.02	0.31		
v/s Ratio Perm	c0.24				0.06		0.04			0.19		0.02	
v/c Ratio	0.88	0.05			0.24		0.07	0.97		0.34	0.57	0.03	
Uniform Delay, d1	40.4	31.3			32.7		11.8	26.0		21.5	17.2	12.1	
Progression Factor	1.00	1.00			1.00		0.77	0.70		1.00	1.00	1.00	
Incremental Delay, d2	29.4	0.1			0.3		0.1	20.8		1.5	2.6	0.1	
Delay (s)	69.8	31.3			33.0		9.2	39.0		23.0	19.8	12.1	
Level of Service	E	C			C		A	D		C	B	B	
Approach Delay (s)		60.5			33.0			38.2			19.5		
Approach LOS		E			C			D			B		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			35.2									HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.91										
Actuated Cycle Length (s)			115.0									Sum of lost time (s)	17.9
Intersection Capacity Utilization			92.8%									ICU Level of Service	F
Analysis Period (min)			15										

c Critical Lane Group



Timing Report, Sorted By Phase  
 1: Carp Rd & Kittiwake Dr/Echwoods Ave

Total AM (2029) 25% Reduced



Phase Number	1	2	4	5	6	8
Movement	SBL	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	12	63	40	12	63	40
Maximum Split (%)	10.4%	54.8%	34.8%	10.4%	54.8%	34.8%
Minimum Split (s)	10.6	30	29.3	10.6	29.7	29
Yellow Time (s)	3.7	3.7	3	3.7	3.7	3
All-Red Time (s)	1.9	2.3	3.3	1.9	2	3
Minimum Initial (s)	5	10	10	5	10	10
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		17	16		17	16
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	110	7	70	110	7	70
End Time (s)	7	70	110	7	70	110
Yield/Force Off (s)	1.4	64	103.7	1.4	64.3	104
Yield/Force Off 170(s)	1.4	47	87.7	1.4	47.3	88
Local Start Time (s)	103	0	63	103	0	63
Local Yield (s)	109.4	57	96.7	109.4	57.3	97
Local Yield 170(s)	109.4	40	80.7	109.4	40.3	81

Intersection Summary

Cycle Length	115
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 7 (6%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 1: Carp Rd & Kittiwake Dr/Echwoods Ave



Queues

Total AM (2029) 25% Reduced

2: Carp Rd & Hazeldean Rd



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	263	336	24	113	313	54	382	231	263	45
v/c Ratio	0.96	0.40	0.24	0.59	0.70	0.43	0.32	0.74	0.32	0.06
Control Delay	84.7	32.0	49.2	58.6	17.2	59.9	28.5	45.8	35.2	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	84.7	32.0	49.2	58.6	17.2	59.9	28.5	45.8	35.2	2.8
Queue Length 50th (m)	48.6	26.8	4.7	22.9	0.0	10.8	29.2	47.5	54.4	0.0
Queue Length 95th (m)	#82.5	36.2	12.4	39.4	29.8	22.1	47.8	68.7	80.4	m2.0
Internal Link Dist (m)		252.9		257.2			422.0		263.2	
Turn Bay Length (m)	80.0		30.0			27.0		70.0		
Base Capacity (vph)	274	1328	225	433	621	278	1183	321	834	756
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.25	0.11	0.26	0.50	0.19	0.32	0.72	0.32	0.06

Intersection Summary

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

Queue shown is maximum after two cycles.

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

HCM Signalized Intersection Capacity Analysis  
2: Carp Rd & Hazeldean Rd

Total AM (2029) 25% Reduced

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Traffic Volume (vph)	263	258	78	24	113	313	54	365	17	231	263	45		
Future Volume (vph)	263	258	78	24	113	313	54	365	17	231	263	45		
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800		
Lane Width	3.6	3.9	3.7	3.8	3.4	3.9	3.9	3.4	3.7	3.6	3.6	3.5		
Total Lost time (s)	6.1	6.6		6.6	6.6	6.6	6.0	6.1		6.0	6.1	6.1		
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00		
Frbp, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	1.00		1.00	1.00	0.98		
Flpb, ped/bikes	0.99	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85		
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		
Satd. Flow (prot)	1664	3232		1431	1586	1443	1523	3168		1462	1593	1309		
Flt Permitted	0.47	1.00		0.55	1.00	1.00	0.95	1.00		0.95	1.00	1.00		
Satd. Flow (perm)	823	3232		828	1586	1443	1523	3168		1462	1593	1309		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Adj. Flow (vph)	263	258	78	24	113	313	54	365	17	231	263	45		
RTOR Reduction (vph)	0	31	0	0	0	275	0	3	0	0	0	22		
Lane Group Flow (vph)	263	305	0	24	113	38	54	379	0	231	263	23		
Confl. Peds. (#/hr)	12		1	1		12	1		4	4		1		
Heavy Vehicles (%)	2%	5%	5%	22%	11%	5%	16%	3%	43%	17%	13%	13%		
Turn Type	pm+pt	NA		Perm	NA	Perm	Prot	NA		Prot	NA	Perm		
Protected Phases	7	4			8		5	2		1	6			
Permitted Phases	4			8		8						6		
Actuated Green, G (s)	28.9	28.9		13.9	13.9	13.9	8.3	42.9		24.5	59.1	59.1		
Effective Green, g (s)	28.9	28.9		13.9	13.9	13.9	8.3	42.9		24.5	59.1	59.1		
Actuated g/C Ratio	0.25	0.25		0.12	0.12	0.12	0.07	0.37		0.21	0.51	0.51		
Clearance Time (s)	6.1	6.6		6.6	6.6	6.6	6.0	6.1		6.0	6.1	6.1		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		
Lane Grp Cap (vph)	271	812		100	191	174	109	1181		311	818	672		
v/s Ratio Prot	c0.07	0.09			0.07		0.04	0.12		c0.16	c0.17			
v/s Ratio Perm	c0.17			0.03		0.03						0.02		
v/c Ratio	0.97	0.38		0.24	0.59	0.22	0.50	0.32		0.74	0.32	0.03		
Uniform Delay, d1	41.8	35.6		45.8	47.9	45.6	51.3	25.7		42.3	16.3	13.8		
Progression Factor	1.00	1.00		0.99	0.98	1.71	1.00	1.00		0.78	1.85	1.00		
Incremental Delay, d2	46.3	0.3		1.2	4.8	0.6	3.5	0.7		8.2	0.9	0.1		
Delay (s)	88.1	35.9		46.7	51.8	78.5	54.8	26.4		41.3	31.1	13.9		
Level of Service	F	D		D	D	E	D	C		D	C	B		
Approach Delay (s)		58.8			70.1			29.9			34.0			
Approach LOS		E			E			C			C			
<b>Intersection Summary</b>														
HCM 2000 Control Delay			48.5									HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio			0.65											
Actuated Cycle Length (s)			115.0							24.8				
Intersection Capacity Utilization			74.9%										ICU Level of Service	D
Analysis Period (min)			15											
c Critical Lane Group														

Timing Report, Sorted By Phase  
2: Carp Rd & Hazeldean Rd

Total AM (2029) 25% Reduced

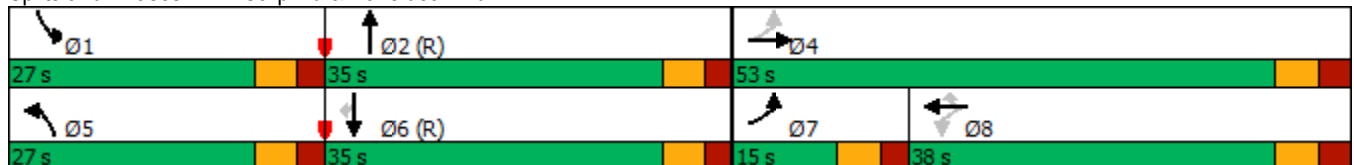


Phase Number	1	2	4	5	6	7	8
Movement	SBL	NBT	EBTL	NBL	SBT	EBL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lag
Lead-Lag Optimize							
Recall Mode	None	C-Max	None	None	C-Max	None	None
Maximum Split (s)	27	35	53	27	35	15	38
Maximum Split (%)	23.5%	30.4%	46.1%	23.5%	30.4%	13.0%	33.0%
Minimum Split (s)	11	31.1	37.6	11	31.1	11.1	37.6
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.3	2.4	2.9	2.3	2.4	2.4	2.9
Minimum Initial (s)	5	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0
Walk Time (s)		7	7		7		7
Flash Dont Walk (s)		18	24		18		24
Dual Entry	No	Yes	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	80	107	27	80	107	27	42
End Time (s)	107	27	80	107	27	42	80
Yield/Force Off (s)	101	20.9	73.4	101	20.9	35.9	73.4
Yield/Force Off 170(s)	101	2.9	49.4	101	2.9	35.9	49.4
Local Start Time (s)	88	0	35	88	0	35	50
Local Yield (s)	109	28.9	81.4	109	28.9	43.9	81.4
Local Yield 170(s)	109	10.9	57.4	109	10.9	43.9	57.4

Intersection Summary

Cycle Length	115
Control Type	Actuated-Coordinated
Natural Cycle	95
Offset: 107 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

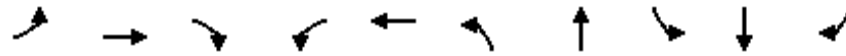
Splits and Phases: 2: Carp Rd & Hazeldean Rd



Queues

Total AM (2029) 25% Reduced

3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	38	89	242	122	133	293	478	66	282	29
v/c Ratio	0.19	0.31	0.52	0.58	0.40	0.42	0.50	0.13	0.33	0.04
Control Delay	28.8	30.4	8.3	40.6	17.6	7.2	13.9	6.3	15.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.8	30.4	8.3	40.6	17.6	7.2	13.9	6.3	15.7	0.1
Queue Length 50th (m)	4.6	11.1	0.0	16.0	7.6	12.4	36.1	2.4	22.3	0.0
Queue Length 95th (m)	11.0	20.6	15.2	28.5	19.3	27.5	73.6	7.2	47.9	0.0
Internal Link Dist (m)	289.2		73.8			147.6		545.1		
Turn Bay Length (m)	30.0		30.0	15.0		32.0		30.0		22.0
Base Capacity (vph)	359	524	636	381	548	698	963	565	854	757
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.17	0.38	0.32	0.24	0.42	0.50	0.12	0.33	0.04

Intersection Summary

HCM Signalized Intersection Capacity Analysis  
 3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)

Total AM (2029) 25% Reduced



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	89	242	122	62	71	293	335	143	66	282	29
Future Volume (vph)	38	89	242	122	62	71	293	335	143	66	282	29
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	3.5	3.2	3.9	3.6	3.6	3.7	3.5	3.6	3.7	3.1	3.5	3.5
Total Lost time (s)	5.1	5.1	5.1	5.1	5.1		5.5	5.5		5.5	5.5	5.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.97	1.00	0.99		1.00	0.99		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.92		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1655	1686	1508	1666	1605		1654	1670		1579	1745	1439
Flt Permitted	0.66	1.00	1.00	0.70	1.00		0.49	1.00		0.46	1.00	1.00
Satd. Flow (perm)	1155	1686	1508	1226	1605		852	1670		772	1745	1439
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	38	89	242	122	62	71	293	335	143	66	282	29
RTOR Reduction (vph)	0	0	200	0	59	0	0	13	0	0	0	15
Lane Group Flow (vph)	38	89	42	122	74	0	293	465	0	66	282	14
Confl. Peds. (#/hr)	1		4	4		1	5		7	7		5
Confl. Bikes (#/hr)												2
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)	13.8	13.8	13.8	13.8	13.8		55.4	44.5		44.8	39.2	39.2
Effective Green, g (s)	13.8	13.8	13.8	13.8	13.8		55.4	44.5		44.8	39.2	39.2
Actuated g/C Ratio	0.17	0.17	0.17	0.17	0.17		0.69	0.56		0.56	0.49	0.49
Clearance Time (s)	5.1	5.1	5.1	5.1	5.1		5.5	5.5		5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	199	290	260	211	276		699	928		488	855	705
v/s Ratio Prot		0.05			0.05		c0.06	c0.28		0.01	0.16	
v/s Ratio Perm	0.03		0.03	c0.10			0.23			0.07		0.01
v/c Ratio	0.19	0.31	0.16	0.58	0.27		0.42	0.50		0.14	0.33	0.02
Uniform Delay, d1	28.3	28.9	28.2	30.4	28.7		5.1	10.9		8.1	12.4	10.5
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	0.6	0.3	3.8	0.5		0.4	1.9		0.1	1.0	0.1
Delay (s)	28.8	29.5	28.5	34.2	29.3		5.5	12.8		8.2	13.4	10.6
Level of Service	C	C	C	C	C		A	B		A	B	B
Approach Delay (s)		28.8			31.6			10.0			12.3	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	17.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	16.1
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Timing Report, Sorted By Phase  
 3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)

Total AM (2029) 25% Reduced

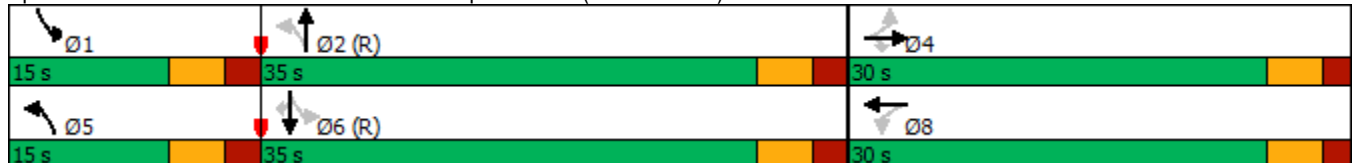


Phase Number	1	2	4	5	6	8
Movement	SBL	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	15	35	30	15	35	30
Maximum Split (%)	18.8%	43.8%	37.5%	18.8%	43.8%	37.5%
Minimum Split (s)	10.5	29.5	28.1	10.5	29.5	28.1
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.2	2.2	1.8	2.2	2.2	1.8
Minimum Initial (s)	5	10	10	5	10	10
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		17	16		17	16
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	65	0	35	65	0	35
End Time (s)	0	35	65	0	35	65
Yield/Force Off (s)	74.5	29.5	59.9	74.5	29.5	59.9
Yield/Force Off 170(s)	74.5	12.5	43.9	74.5	12.5	43.9
Local Start Time (s)	65	0	35	65	0	35
Local Yield (s)	74.5	29.5	59.9	74.5	29.5	59.9
Local Yield 170(s)	74.5	12.5	43.9	74.5	12.5	43.9

Intersection Summary

















Cycle Length	80
Control Type	Actuated-Coordinated
Natural Cycle	70
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)



HCM Unsignalized Intersection Capacity Analysis  
4: Samantha Eastop Dr & Kimpton Dr

Total AM (2029) 25% Reduced

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	20	17	0	86	5	50	0	0	9	0	37
Future Volume (Veh/h)	9	20	17	0	86	5	50	0	0	9	0	37
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	9	20	17	0	86	5	50	0	0	9	0	37
Pedestrians		5			5			5			5	
Lane Width (m)		4.8			4.8			4.8			4.8	
Walking Speed (m/s)		1.0			1.0			1.0			1.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)		322										
pX, platoon unblocked												
vC, conflicting volume	96			42			182	148	38	145	154	98
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	96			42			182	148	38	145	154	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 %	99			100			93	100	100	99	100	96
cM capacity (veh/h)	1488			1557			728	730	1020	801	724	945
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	46	91	50	46								
Volume Left	9	0	50	9								
Volume Right	17	5	0	37								
cSH	1488	1557	728	913								
Volume to Capacity	0.01	0.00	0.07	0.05								
Queue Length 95th (m)	0.1	0.0	1.5	1.1								
Control Delay (s)	1.5	0.0	10.3	9.2								
Lane LOS	A		B	A								
Approach Delay (s)	1.5	0.0	10.3	9.2								
Approach LOS			B	A								
Intersection Summary												
Average Delay			4.3									
Intersection Capacity Utilization			27.0%		ICU Level of Service				A			
Analysis Period (min)			15									



HCM Unsignalized Intersection Capacity Analysis  
5: Hazeldean Rd & 6171 Hazeldean

Total AM (2029) 25% Reduced



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	29	485	385	18	29	63
Future Volume (Veh/h)	29	485	385	18	29	63
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	29	485	385	18	29	63
Pedestrians					5	
Lane Width (m)					4.8	
Walking Speed (m/s)					1.0	
Percent Blockage					1	
Right turn flare (veh)						
Median type		Raised	Raised			
Median storage veh		1	1			
Upstream signal (m)		281				
pX, platoon unblocked					0.99	
vC, conflicting volume	408				700	206
vC1, stage 1 conf vol					399	
vC2, stage 2 conf vol					300	
vCu, unblocked vol	408				685	206
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	97				94	92
cM capacity (veh/h)	1140				476	794
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	29	242	242	257	146	92
Volume Left	29	0	0	0	0	29
Volume Right	0	0	0	0	18	63
cSH	1140	1700	1700	1700	1700	656
Volume to Capacity	0.03	0.14	0.14	0.15	0.09	0.14
Queue Length 95th (m)	0.5	0.0	0.0	0.0	0.0	3.4
Control Delay (s)	8.2	0.0	0.0	0.0	0.0	11.4
Lane LOS	A					B
Approach Delay (s)	0.5			0.0		11.4
Approach LOS						B
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			31.2%		ICU Level of Service	A
Analysis Period (min)			15			

Queues

Total AM (2029) 25% Reduced

6: Stittsville Main St & Hazeldean Rd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	66	386	202	314	41	53	264	230	89	113
v/c Ratio	0.12	0.26	0.35	0.20	0.18	0.32	0.67	0.81	0.29	0.26
Control Delay	14.9	24.5	11.7	13.6	33.5	52.6	14.7	60.5	45.9	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.9	24.5	11.7	13.6	33.5	52.6	14.7	60.5	45.9	3.7
Queue Length 50th (m)	7.1	23.1	16.3	14.4	6.5	10.5	0.0	41.8	17.3	0.0
Queue Length 95th (m)	m12.0	31.3	30.5	25.7	13.6	20.7	21.7	#68.3	30.6	5.7
Internal Link Dist (m)		606.0		143.1		545.1			139.3	
Turn Bay Length (m)	34.0		288.0		24.0		17.0	46.0		38.0
Base Capacity (vph)	571	1482	582	1592	280	587	721	283	587	679
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.26	0.35	0.20	0.15	0.09	0.37	0.81	0.15	0.17

Intersection Summary

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

Queue shown is maximum after two cycles.

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

HCM Signalized Intersection Capacity Analysis  
6: Stittsville Main St & Hazeldean Rd

Total AM (2029) 25% Reduced

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	354	32	202	221	93	41	53	264	230	89	113
Future Volume (vph)	66	354	32	202	221	93	41	53	264	230	89	113
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	4.5	3.5	3.7	3.9	3.5	3.7	3.7	3.3	4.3	3.4	3.4	4.6
Total Lost time (s)	6.5	6.3		6.5	6.3		6.9	7.0	7.0	6.9	6.7	6.7
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1708	3204		1699	3004		1571	1689	1578	1591	1676	1645
Flt Permitted	0.56	1.00		0.45	1.00		0.70	1.00	1.00	0.49	1.00	1.00
Satd. Flow (perm)	1009	3204		810	3004		1156	1689	1578	828	1676	1645
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	66	354	32	202	221	93	41	53	264	230	89	113
RTOR Reduction (vph)	0	5	0	0	28	0	0	0	231	0	0	92
Lane Group Flow (vph)	66	381	0	202	286	0	41	53	33	230	89	21
Confl. Peds. (#/hr)	2					2	1		2	2		1
Heavy Vehicles (%)	10%	4%	7%	4%	8%	4%	10%	3%	3%	5%	5%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8	8	7	4	
Permitted Phases	2			6			8		8	4		4
Actuated Green, G (s)	56.4	50.2		67.6	55.8		19.6	14.2	14.2	33.3	21.2	21.2
Effective Green, g (s)	56.4	50.2		67.6	55.8		19.6	14.2	14.2	33.3	21.2	21.2
Actuated g/C Ratio	0.49	0.44		0.59	0.49		0.17	0.12	0.12	0.29	0.18	0.18
Clearance Time (s)	6.5	6.3		6.5	6.3		6.9	7.0	7.0	6.9	6.7	6.7
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	532	1398		567	1457		216	208	194	320	308	303
v/s Ratio Prot	0.01	0.12		c0.04	0.10		0.01	0.03		c0.08	0.05	
v/s Ratio Perm	0.05			c0.17			0.02		0.02	c0.13		0.01
v/c Ratio	0.12	0.27		0.36	0.20		0.19	0.25	0.17	0.72	0.29	0.07
Uniform Delay, d1	15.5	20.7		11.4	16.8		40.6	45.6	45.1	34.9	40.4	38.7
Progression Factor	1.44	1.22		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.4		0.4	0.3		0.4	0.6	0.4	7.5	0.5	0.1
Delay (s)	22.5	25.8		11.8	17.1		41.1	46.3	45.5	42.4	40.9	38.8
Level of Service	C	C		B	B		D	D	D	D	D	D
Approach Delay (s)		25.3			15.0			45.1			41.2	
Approach LOS		C			B			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			30.2				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			115.0				Sum of lost time (s)			26.7		
Intersection Capacity Utilization			65.7%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

Timing Report, Sorted By Phase  
6: Stittsville Main St & Hazeldean Rd

Total AM (2029) 25% Reduced

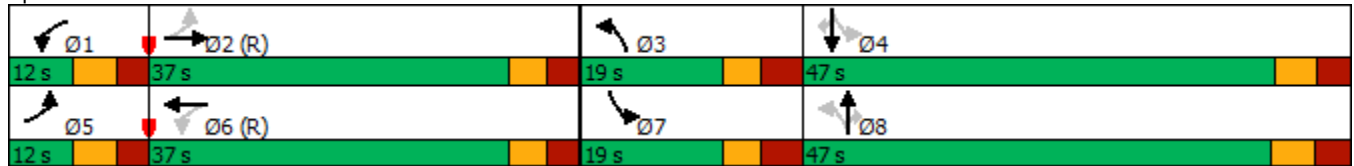


Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBTL	EBL	WBTL	SBL	NBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	12	37	19	47	12	37	19	47
Maximum Split (%)	10.4%	32.2%	16.5%	40.9%	10.4%	32.2%	16.5%	40.9%
Minimum Split (s)	11.5	36.3	11.9	36.7	11.5	36.3	16.9	37
Yellow Time (s)	3.7	3.3	3.3	3.7	3.7	3.3	3.3	3.7
All-Red Time (s)	2.8	3	3.6	3	2.8	3	3.6	3.3
Minimum Initial (s)	5	10	5	10	5	10	10	10
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		23		23		23		23
Dual Entry	No	Yes	No	Yes	No	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	73	85	7	26	73	85	7	26
End Time (s)	85	7	26	73	85	7	26	73
Yield/Force Off (s)	78.5	0.7	19.1	66.3	78.5	0.7	19.1	66
Yield/Force Off 170(s)	78.5	92.7	19.1	43.3	78.5	92.7	19.1	43
Local Start Time (s)	103	0	37	56	103	0	37	56
Local Yield (s)	108.5	30.7	49.1	96.3	108.5	30.7	49.1	96
Local Yield 170(s)	108.5	7.7	49.1	73.3	108.5	7.7	49.1	73

Intersection Summary

Cycle Length	115
Control Type	Actuated-Coordinated
Natural Cycle	105
Offset: 85 (74%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	

Splits and Phases: 6: Stittsville Main St & Hazeldean Rd



Queues

Total PM (2029) 25% Reduced

1: Carp Rd & Kittiwake Dr/Echwoods Ave



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	128	62	157	47	691	149	1000	137
v/c Ratio	0.80	0.21	0.52	0.24	0.64	0.35	0.94	0.15
Control Delay	80.1	15.9	30.9	11.5	20.4	7.8	39.2	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.1	15.9	30.9	11.5	20.4	7.8	39.2	5.2
Queue Length 50th (m)	27.0	2.2	17.8	3.0	61.5	8.0	190.7	4.3
Queue Length 95th (m)	43.8	12.3	34.3	m8.1	176.1	17.7	#320.5	14.1
Internal Link Dist (m)		169.7	117.2		263.2		262.3	
Turn Bay Length (m)	15.0			25.0		30.0		32.0
Base Capacity (vph)	239	409	420	314	1074	507	1060	932
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.15	0.37	0.15	0.64	0.29	0.94	0.15

Intersection Summary





















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

Queue shown is maximum after two cycles.

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

HCM Signalized Intersection Capacity Analysis  
1: Carp Rd & Kittiwake Dr/Echwoods Ave

Total PM (2029) 25% Reduced

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	128	12	50	53	6	98	47	662	29	149	1000	137
Future Volume (vph)	128	12	50	53	6	98	47	662	29	149	1000	137
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	3.9	3.9	3.7	3.7	4.8	3.7	3.6	3.7	3.7	3.3	3.5	3.1
Total Lost time (s)	6.3	6.3			6.0		5.6	6.0		5.6	5.7	5.7
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frbp, ped/bikes	1.00	0.97			1.00		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00			0.99		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.88			0.92		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1732	1554			1744		1474	1740		1653	1618	1381
Flt Permitted	0.55	1.00			0.86		0.12	1.00		0.27	1.00	1.00
Satd. Flow (perm)	1001	1554			1531		188	1740		466	1618	1381
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	128	12	50	53	6	98	47	662	29	149	1000	137
RTOR Reduction (vph)	0	42	0	0	55	0	0	1	0	0	0	29
Lane Group Flow (vph)	128	20	0	0	102	0	47	690	0	149	1000	108
Confl. Peds. (#/hr)			20	20			2		4	4		2
Confl. Bikes (#/hr)									1			1
Heavy Vehicles (%)	2%	0%	2%	9%	33%	0%	16%	4%	0%	0%	10%	2%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	19.3	19.3			19.6		79.6	74.0		86.3	77.5	77.5
Effective Green, g (s)	19.3	19.3			19.6		79.6	74.0		86.3	77.5	77.5
Actuated g/C Ratio	0.16	0.16			0.16		0.66	0.62		0.72	0.65	0.65
Clearance Time (s)	6.3	6.3			6.0		5.6	6.0		5.6	5.7	5.7
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	160	249			250		184	1073		422	1044	891
v/s Ratio Prot		0.01					0.01	0.40		c0.03	c0.62	
v/s Ratio Perm	c0.13				0.07		0.16			0.23		0.08
v/c Ratio	0.80	0.08			0.41		0.26	0.64		0.35	0.96	0.12
Uniform Delay, d1	48.5	42.8			45.0		16.1	14.6		8.7	19.7	8.2
Progression Factor	1.00	1.00			1.00		1.48	1.03		1.00	1.00	1.00
Incremental Delay, d2	24.1	0.1			1.1		0.7	2.7		0.5	19.4	0.3
Delay (s)	72.6	42.9			46.1		24.5	17.8		9.3	39.1	8.4
Level of Service	E	D			D		C	B		A	D	A
Approach Delay (s)		62.9			46.1			18.2			32.4	
Approach LOS		E			D			B			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			31.3									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.91									
Actuated Cycle Length (s)			120.0									Sum of lost time (s) 17.9
Intersection Capacity Utilization			91.0%									ICU Level of Service E
Analysis Period (min)			15									

c Critical Lane Group

Timing Report, Sorted By Phase  
 1: Carp Rd & Kittiwake Dr/Echwoods Ave

Total PM (2029) 25% Reduced



Phase Number	1	2	4	5	6	8
Movement	SBL	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	22	63	35	22	63	35
Maximum Split (%)	18.3%	52.5%	29.2%	18.3%	52.5%	29.2%
Minimum Split (s)	10.6	30	29.3	10.6	29.7	29
Yellow Time (s)	3.7	3.7	3	3.7	3.7	3
All-Red Time (s)	1.9	2.3	3.3	1.9	2	3
Minimum Initial (s)	5	10	10	5	10	10
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		17	16		17	16
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	109	11	74	109	11	74
End Time (s)	11	74	109	11	74	109
Yield/Force Off (s)	5.4	68	102.7	5.4	68.3	103
Yield/Force Off 170(s)	5.4	51	86.7	5.4	51.3	87
Local Start Time (s)	98	0	63	98	0	63
Local Yield (s)	114.4	57	91.7	114.4	57.3	92
Local Yield 170(s)	114.4	40	75.7	114.4	40.3	76

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	120
Offset: 11 (9%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 1: Carp Rd & Kittiwake Dr/Echwoods Ave



Queues  
2: Carp Rd & Hazeldean Rd

Total PM (2029) 25% Reduced



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	85	380	56	470	350	122	367	387	449	217
v/c Ratio	0.69	0.34	0.21	0.84	0.50	0.62	0.40	0.97	0.63	0.30
Control Delay	62.5	23.7	19.3	42.3	6.1	63.5	35.7	78.7	37.4	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.5	23.7	19.3	42.3	6.1	63.5	35.7	78.7	37.4	10.7
Queue Length 50th (m)	15.6	24.7	9.6	98.4	26.6	25.6	33.2	~91.7	60.9	7.5
Queue Length 95th (m)	#35.4	34.0	m10.2	128.7	8.2	41.7	46.1 m#	122.9	m84.5	m15.2
Internal Link Dist (m)		252.9		257.2			422.0		263.2	
Turn Bay Length (m)	80.0		30.0			27.0		70.0		
Base Capacity (vph)	144	1300	304	652	762	317	908	401	715	721
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.29	0.18	0.72	0.46	0.38	0.40	0.97	0.63	0.30

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.

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



# HCM Signalized Intersection Capacity Analysis

## 2: Carp Rd & Hazeldean Rd

Total PM (2029) 25% Reduced

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	254	126	56	470	350	122	335	32	387	449	217
Future Volume (vph)	85	254	126	56	470	350	122	335	32	387	449	217
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	3.6	3.9	3.7	3.8	3.4	3.9	3.9	3.4	3.7	3.6	3.6	3.5
Total Lost time (s)	6.6	6.6		6.6	6.6	6.6	6.0	6.1		6.0	6.1	6.1
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	0.99	1.00		0.99	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Fr <sub>t</sub>	1.00	0.95		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Fl <sub>t</sub> Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1701	3303		1595	1725	1439	1732	3196		1693	1765	1461
Fl <sub>t</sub> Permitted	0.21	1.00		0.48	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	383	3303		804	1725	1439	1732	3196		1693	1765	1461
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	85	254	126	56	470	350	122	335	32	387	449	217
RTOR Reduction (vph)	0	55	0	0	0	237	0	6	0	0	0	129
Lane Group Flow (vph)	85	325	0	56	470	113	122	361	0	387	449	88
Confl. Peds. (#/hr)	8		5	5		8	6		6	6		6
Heavy Vehicles (%)	0%	1%	0%	9%	2%	6%	2%	3%	4%	1%	2%	0%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						6
Actuated Green, G (s)	38.9	38.9		38.9	38.9	38.9	13.7	33.9		28.5	48.7	48.7
Effective Green, g (s)	38.9	38.9		38.9	38.9	38.9	13.7	33.9		28.5	48.7	48.7
Actuated g/C Ratio	0.32	0.32		0.32	0.32	0.32	0.11	0.28		0.24	0.41	0.41
Clearance Time (s)	6.6	6.6		6.6	6.6	6.6	6.0	6.1		6.0	6.1	6.1
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	124	1070		260	559	466	197	902		402	716	592
v/s Ratio Prot		0.10			c0.27		0.07	0.11		c0.23	c0.25	
v/s Ratio Perm	0.22			0.07		0.08						0.06
v/c Ratio	0.69	0.30		0.22	0.84	0.24	0.62	0.40		0.96	0.63	0.15
Uniform Delay, d <sub>1</sub>	35.2	30.4		29.5	37.7	29.8	50.7	34.8		45.2	28.4	22.5
Progression Factor	1.00	1.00		0.64	0.78	1.36	1.00	1.00		1.25	1.12	2.54
Incremental Delay, d <sub>2</sub>	14.6	0.2		0.4	10.4	0.3	5.7	1.3		21.4	1.9	0.2
Delay (s)	49.8	30.6		19.2	39.7	40.7	56.4	36.2		78.1	33.7	57.5
Level of Service	D	C		B	D	D	E	D		E	C	E
Approach Delay (s)		34.1			38.8			41.2			54.9	
Approach LOS		C			D			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			44.3				HCM 2000 Level of Service				D	
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			120.0				Sum of lost time (s)				18.7	
Intersection Capacity Utilization			95.6%				ICU Level of Service				F	
Analysis Period (min)			15									
c Critical Lane Group												

Timing Report, Sorted By Phase  
2: Carp Rd & Hazeldean Rd

Total PM (2029) 25% Reduced

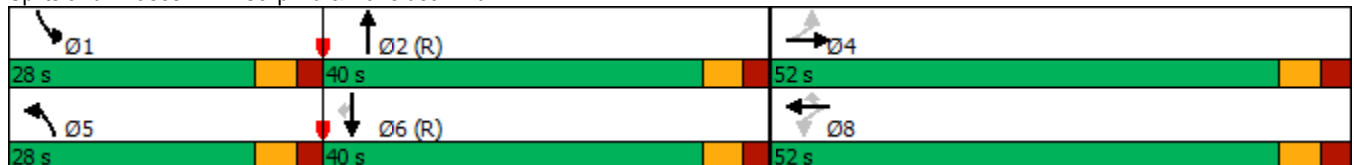


Phase Number	1	2	4	5	6	8
Movement	SBL	NBT	EBTL	NBL	SBT	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	28	40	52	28	40	52
Maximum Split (%)	23.3%	33.3%	43.3%	23.3%	33.3%	43.3%
Minimum Split (s)	11	31.1	37.6	11	31.1	37.6
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.3	2.4	2.9	2.3	2.4	2.9
Minimum Initial (s)	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		18	24		18	24
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	100	8	48	100	8	48
End Time (s)	8	48	100	8	48	100
Yield/Force Off (s)	2	41.9	93.4	2	41.9	93.4
Yield/Force Off 170(s)	2	23.9	69.4	2	23.9	69.4
Local Start Time (s)	92	0	40	92	0	40
Local Yield (s)	114	33.9	85.4	114	33.9	85.4
Local Yield 170(s)	114	15.9	61.4	114	15.9	61.4

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 8 (7%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

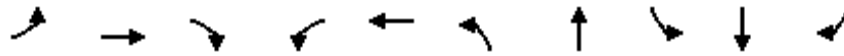
Splits and Phases: 2: Carp Rd & Hazeldean Rd



Queues

Total PM (2029) 25% Reduced

3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)

























Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	67	112	396	164	198	281	547	66	463	44
v/c Ratio	0.40	0.43	0.72	0.45	0.37	0.67	0.70	0.20	0.88	0.08
Control Delay	40.2	38.4	12.4	26.3	19.2	25.8	29.1	13.2	50.4	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.2	38.4	12.4	26.3	19.2	25.8	29.1	13.2	50.4	0.3
Queue Length 50th (m)	10.0	16.8	2.1	20.1	18.8	21.3	67.3	4.2	69.1	0.0
Queue Length 95th (m)	19.0	27.4	24.1	29.1	29.6	#77.5	#148.3	12.0	#121.7	0.0
Internal Link Dist (m)		289.2			73.8		147.6		545.1	
Turn Bay Length (m)	30.0		30.0	15.0		32.0		30.0		22.0
Base Capacity (vph)	288	456	671	369	726	420	780	353	525	534
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.25	0.59	0.44	0.27	0.67	0.70	0.19	0.88	0.08

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
 3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)

Total PM (2029) 25% Reduced

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	112	396	164	122	76	281	447	100	66	463	44
Future Volume (vph)	67	112	396	164	122	76	281	447	100	66	463	44
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	3.5	3.2	3.9	3.6	3.6	3.7	3.5	3.6	3.7	3.1	3.5	3.5
Total Lost time (s)	5.1	5.1	5.1	5.1	5.1		5.5	5.5		5.5	5.5	5.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	0.97		1.00	0.99		1.00	1.00	0.93
Flpb, ped/bikes	0.97	1.00	1.00	0.99	1.00		1.00	1.00		1.00	1.00	1.00
Fr <sub>t</sub>	1.00	1.00	0.85	1.00	0.94		1.00	0.97		1.00	1.00	0.85
Fl <sub>t</sub> Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1633	1720	1475	1698	1624		1592	1718		1609	1728	1405
Fl <sub>t</sub> Permitted	0.63	1.00	1.00	0.50	1.00		0.17	1.00		0.38	1.00	1.00
Satd. Flow (perm)	1089	1720	1475	892	1624		284	1718		648	1728	1405
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	67	112	396	164	122	76	281	447	100	66	463	44
RTOR Reduction (vph)	0	0	323	0	30	0	0	7	0	0	0	31
Lane Group Flow (vph)	67	112	73	164	168	0	281	540	0	66	463	13
Confl. Peds. (#/hr)	23		10	10		23	28		13	13		28
Confl. Bikes (#/hr)						2			4			
Heavy Vehicles (%)	0%	0%	3%	0%	1%	3%	6%	1%	1%	0%	3%	0%
Turn Type	Perm	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)	13.7	13.7	13.7	28.3	28.3		51.1	39.4		33.6	27.4	27.4
Effective Green, g (s)	13.7	13.7	13.7	28.3	28.3		51.1	39.4		33.6	27.4	27.4
Actuated g/C Ratio	0.15	0.15	0.15	0.31	0.31		0.57	0.44		0.37	0.30	0.30
Clearance Time (s)	5.1	5.1	5.1	5.1	5.1		5.5	5.5		5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	165	261	224	365	510		425	752		308	526	427
v/s Ratio Prot		0.07		c0.05	0.10		c0.13	c0.31		0.01	c0.27	
v/s Ratio Perm	0.06		0.05	c0.09			0.24			0.07		0.01
v/c Ratio	0.41	0.43	0.33	0.45	0.33		0.66	0.72		0.21	0.88	0.03
Uniform Delay, d1	34.5	34.6	34.0	23.6	23.6		14.1	20.7		18.6	29.7	22.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.6	1.1	0.9	0.9	0.4		3.8	5.8		0.4	18.7	0.1
Delay (s)	36.1	35.7	34.9	24.5	24.0		18.0	26.6		18.9	48.4	22.1
Level of Service	D	D	C	C	C		B	C		B	D	C
Approach Delay (s)		35.2			24.2			23.6			43.0	
Approach LOS		D			C			C			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			31.3				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			90.0				Sum of lost time (s)			21.2		
Intersection Capacity Utilization			84.2%				ICU Level of Service			E		
Analysis Period (min)			15									

c Critical Lane Group

Timing Report, Sorted By Phase  
 3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)

Total PM (2029) 25% Reduced

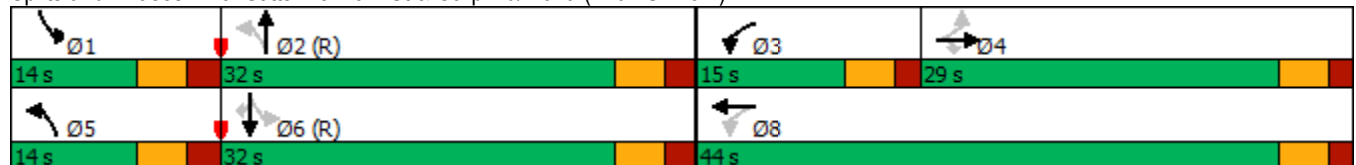


Phase Number	1	2	3	4	5	6	8
Movement	SBL	NBTL	WBL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	
Lead-Lag Optimize							
Recall Mode	None	C-Max	None	None	None	C-Max	None
Maximum Split (s)	14	32	15	29	14	32	44
Maximum Split (%)	15.6%	35.6%	16.7%	32.2%	15.6%	35.6%	48.9%
Minimum Split (s)	10.5	29.5	10.1	28.1	10.5	29.5	28.1
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.2	2.2	1.8	1.8	2.2	2.2	1.8
Minimum Initial (s)	5	10	5	10	5	10	10
Vehicle Extension (s)	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0
Walk Time (s)		7		7		7	7
Flash Dont Walk (s)		17		16		17	16
Dual Entry	No	Yes	No	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	78	2	34	49	78	2	34
End Time (s)	2	34	49	78	2	34	78
Yield/Force Off (s)	86.5	28.5	43.9	72.9	86.5	28.5	72.9
Yield/Force Off 170(s)	86.5	11.5	43.9	56.9	86.5	11.5	56.9
Local Start Time (s)	76	0	32	47	76	0	32
Local Yield (s)	84.5	26.5	41.9	70.9	84.5	26.5	70.9
Local Yield 170(s)	84.5	9.5	41.9	54.9	84.5	9.5	54.9

Intersection Summary

















Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 2 (2%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)



HCM Unsignalized Intersection Capacity Analysis  
 4: Samantha Eastop Dr & Kimpton Dr

Total PM (2029) 25% Reduced

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	71	45	0	44	5	28	0	0	31	0	19
Future Volume (Veh/h)	30	71	45	0	44	5	28	0	0	31	0	19
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	30	71	45	0	44	5	28	0	0	31	0	19
Pedestrians		5			5			5			5	
Lane Width (m)		4.8			4.8			4.8			4.8	
Walking Speed (m/s)		1.0			1.0			1.0			1.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)		322										
pX, platoon unblocked												
vC, conflicting volume	54			121			229	212	104	210	232	56
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	54			121			229	212	104	210	232	56
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			96	100	100	96	100	98
cM capacity (veh/h)	1541			1457			685	663	939	719	646	997
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	146	49	28	50								
Volume Left	30	0	28	31								
Volume Right	45	5	0	19								
cSH	1541	1457	685	804								
Volume to Capacity	0.02	0.00	0.04	0.06								
Queue Length 95th (m)	0.4	0.0	0.9	1.4								
Control Delay (s)	1.6	0.0	10.5	9.8								
Lane LOS	A		B	A								
Approach Delay (s)	1.6	0.0	10.5	9.8								
Approach LOS			B	A								
<b>Intersection Summary</b>												
Average Delay			3.7									
Intersection Capacity Utilization			27.0%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
5: Hazeldean Rd & 6171 Hazeldean

Total PM (2029) 25% Reduced



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	65	612	823	46	40	57
Future Volume (Veh/h)	65	612	823	46	40	57
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	65	612	823	46	40	57
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		Raised	Raised			
Median storage veh		1	1			
Upstream signal (m)		281				
pX, platoon unblocked						
vC, conflicting volume	869				1282	434
vC1, stage 1 conf vol					846	
vC2, stage 2 conf vol					436	
vCu, unblocked vol	869				1282	434
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	92				85	90
cM capacity (veh/h)	784				274	575
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	65	306	306	549	320	97
Volume Left	65	0	0	0	0	40
Volume Right	0	0	0	0	46	57
cSH	784	1700	1700	1700	1700	396
Volume to Capacity	0.08	0.18	0.18	0.32	0.19	0.25
Queue Length 95th (m)	1.9	0.0	0.0	0.0	0.0	6.7
Control Delay (s)	10.0	0.0	0.0	0.0	0.0	17.0
Lane LOS	B					C
Approach Delay (s)	1.0			0.0		17.0
Approach LOS						C
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization			45.4%		ICU Level of Service	A
Analysis Period (min)			15			

Queues

Total PM (2029) 25% Reduced

6: Stittsville Main St & Hazeldean Rd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	101	388	432	818	93	146	339	192	203	77
v/c Ratio	0.28	0.34	0.70	0.54	0.35	0.58	0.68	0.61	0.71	0.20
Control Delay	25.8	42.7	22.6	24.7	33.2	56.0	13.3	41.5	60.7	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.8	42.7	22.6	24.7	33.2	56.0	13.3	41.5	60.7	1.2
Queue Length 50th (m)	14.9	41.8	48.8	61.0	14.9	30.1	4.0	32.8	42.3	0.0
Queue Length 95th (m)	m20.4	m49.1	#85.1	93.2	24.2	45.6	27.9	46.4	61.6	0.0
Internal Link Dist (m)		606.0		143.1		545.1			139.3	
Turn Bay Length (m)	34.0		288.0		24.0		17.0	46.0		38.0
Base Capacity (vph)	476	1154	618	1510	295	435	634	315	444	515
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.34	0.70	0.54	0.32	0.34	0.53	0.61	0.46	0.15

Intersection Summary

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

























Queue shown is maximum after two cycles.

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



HCM Signalized Intersection Capacity Analysis  
6: Stittsville Main St & Hazeldean Rd

Total PM (2029) 25% Reduced

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Traffic Volume (vph)	101	338	50	432	585	233	93	146	339	192	203	77
Future Volume (vph)	101	338	50	432	585	233	93	146	339	192	203	77
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	4.5	3.5	3.7	3.9	3.5	3.7	3.7	3.3	4.3	3.4	3.4	4.6
Total Lost time (s)	6.5	6.3		6.5	6.3		6.9	7.0	7.0	6.9	6.7	6.7
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.96	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	0.98		1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1879	3273		1728	3207		1693	1740	1585	1654	1760	1592
Flt Permitted	0.34	1.00		0.41	1.00		0.48	1.00	1.00	0.53	1.00	1.00
Satd. Flow (perm)	671	3273		751	3207		855	1740	1585	923	1760	1592
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	101	338	50	432	585	233	93	146	339	192	203	77
RTOR Reduction (vph)	0	9	0	0	27	0	0	0	272	0	0	64
Lane Group Flow (vph)	101	379	0	432	791	0	93	146	67	192	203	13
Confl. Peds. (#/hr)	6		7	7		6	4		23	23		4
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	0%	1%	0%	2%	0%	0%	2%	0%	0%	0%	0%	5%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8		8	4		4
Actuated Green, G (s)	50.5	42.0		70.5	55.5		27.4	17.4	17.4	31.5	19.6	19.6
Effective Green, g (s)	50.5	42.0		70.5	55.5		27.4	17.4	17.4	31.5	19.6	19.6
Actuated g/C Ratio	0.42	0.35		0.59	0.46		0.23	0.14	0.14	0.26	0.16	0.16
Clearance Time (s)	6.5	6.3		6.5	6.3		6.9	7.0	7.0	6.9	6.7	6.7
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	367	1145		620	1483		265	252	229	314	287	260
v/s Ratio Prot	0.02	0.12		c0.13	0.25		0.03	0.08		c0.06	c0.12	
v/s Ratio Perm	0.10			c0.28			0.05		0.04	0.10		0.01
v/c Ratio	0.28	0.33		0.70	0.53		0.35	0.58	0.29	0.61	0.71	0.05
Uniform Delay, d1	21.3	28.7		14.4	23.0		37.9	47.9	45.8	37.0	47.5	42.3
Progression Factor	1.68	1.43		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.6		3.4	1.4		0.8	3.2	0.7	3.5	7.7	0.1
Delay (s)	36.1	41.6		17.8	24.4		38.7	51.1	46.5	40.5	55.2	42.4
Level of Service	D	D		B	C		D	D	D	D	E	D
Approach Delay (s)		40.5			22.1			46.4			47.1	
Approach LOS		D			C			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			34.6				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			120.0				Sum of lost time (s)			26.7		
Intersection Capacity Utilization			100.8%				ICU Level of Service			G		
Analysis Period (min)			15									

c Critical Lane Group

Timing Report, Sorted By Phase  
6: Stittsville Main St & Hazeldean Rd

Total PM (2029) 25% Reduced

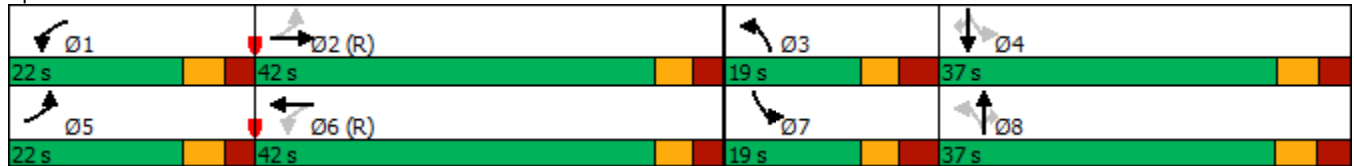


Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBTL	EBL	WBTL	SBL	NBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	22	42	19	37	22	42	19	37
Maximum Split (%)	18.3%	35.0%	15.8%	30.8%	18.3%	35.0%	15.8%	30.8%
Minimum Split (s)	11.7	36.3	11.9	36.7	11.5	36.3	16.9	37
Yellow Time (s)	3.7	3.3	3.3	3.7	3.7	3.3	3.3	3.7
All-Red Time (s)	2.8	3	3.6	3	2.8	3	3.6	3.3
Minimum Initial (s)	5	10	5	10	5	10	10	10
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		23		23		23		23
Dual Entry	No	Yes	No	Yes	No	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	91	113	35	54	91	113	35	54
End Time (s)	113	35	54	91	113	35	54	91
Yield/Force Off (s)	106.5	28.7	47.1	84.3	106.5	28.7	47.1	84
Yield/Force Off 170(s)	106.5	5.7	47.1	61.3	106.5	5.7	47.1	61
Local Start Time (s)	98	0	42	61	98	0	42	61
Local Yield (s)	113.5	35.7	54.1	91.3	113.5	35.7	54.1	91
Local Yield 170(s)	113.5	12.7	54.1	68.3	113.5	12.7	54.1	68

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	105
Offset: 113 (94%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	

Splits and Phases: 6: Stittsville Main St & Hazeldean Rd



## **Appendix K – Multimodal Level of Service Data Sheet**

Multimodal Analysis - Existing and Future Background Scenarios

Intersections		Hazeldean Rd & Carp Rd				Carp Rd & Kittiwake Dr / Echowoods Ave				Carp Rd & Stittsville Main St				Hazeldean Rd & Stittsville Main St			
		North	South	East	West	North	South	East	West	North	South	East	West	North	South	East	West
Pedestrian	Lanes	5	4	5	5	4	3	2	2	4	4	3	5	4	4	6	5
	Median	Yes	Yes	Yes	Yes	No	No	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
	Island Refuge	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	Conflicting Left Turns	Prot+Perm	Permissive	Protected	Protected	Permissive	Permissive	Prot+Perm	Prot+Perm	Permissive	Prot+Perm	Prot+Perm	Prot+Perm	Prot+Perm	Prot+Perm	Prot+Perm	Prot+Perm
	Conflicting Right Turns	Permissive/Yield	Permissive/Yield	Permissive/Yield	Permissive/Yield	Permissive/Yield	Permissive/Yield	Permissive/Yield	Permissive/Yield	Permissive/Yield	Permissive/Yield	Permissive/Yield	Permissive/Yield	Permissive/Yield	Permissive/Yield	Permissive/Yield	Permissive/Yield
	RTOR	Allowed	Allowed	Allowed	Allowed	Allowed	Allowed	Allowed	Allowed	Allowed	Allowed	Allowed	Allowed	Allowed	Allowed	Allowed	Allowed
	Ped Leading Interval	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	Corner Radius (largest)	RT Channel	10-15m	RT Channel	RT Channel	15-25m	10-15m	5-10m	15-25m	RT Channel	RT Channel	15-25m	RT Channel	15-25m	RT Channel	RT Channel	10-15m
	Crosswalk Type	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard
Level of Service	E (43)	D (55)	D (51)	D (51)	D (51)	C (70)	B (86)	B (83)	D (58)	D (58)	C (68)	E (43)	D (53)	D (58)	F (28)	E (40)	
Cyclist	Type of Bikeway	Bike Lanes	Pocket Bike Lanes	Pocket Bike Lanes	Mixed Traffic	Mixed Traffic	Pocket Bike Lanes	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Pocket Bike Lanes	Mixed Traffic	Bike Lanes	Bike Lanes
	Turning speed (25km to 80km)	<=25 km/h	<=25 km/h	<=25 km/h	<=25 km/h	<=25 km/h	<=25 km/h	<=25 km/h	<=25 km/h	<=25 km/h	<=25 km/h	<=25 km/h	<=25 km/h	<=25 km/h	<=25 km/h	<=25 km/h	<=25 km/h
	Introduction of Right-Turn Lane		Right of Bike Lane	Right of Bike Lane			Right of Bike Lane							Right of Bike Lane			
	Right Turn Storage Length		<=50 m	<=50 m			<=50 m				<=50 m	<=50 m		<=50 m	<=50 m		
	Dual Right Turn	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	Shared Through-Right	Yes	No	No	Yes	Yes	No	Yes	Yes	Yes	No	No	Yes	No	No	Yes	Yes
	Bike Box	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	Number of Lanes Crossed for LTs	2 or more	1	1	2 or more	1	1	None	None	1	2 or more	2 or more	1	1	2 or more	2 or more	2 or more
	Operating Speed on Approach	>=60 km/h	>=60 km/h	>=60 km/h	>=60 km/h	>=60 km/h	>=60 km/h	50 km/h	>=60 km/h	>=60 km/h	>=60 km/h	>=60 km/h	>=60 km/h	>=60 km/h	50 km/h	>=60 km/h	>=60 km/h
	Dual Left Turn Lanes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Level of Service	F	E	E	F	F	E	D	D	F	F	F	F	E	F	F	F	
Transit	Average Signal Delay	>40 sec	>40 sec	>40 sec	>40 sec	>40 sec	>40 sec	>40 sec	>40 sec	>40 sec	>40 sec	>40 sec	>40 sec	>40 sec	>40 sec	>40 sec	>40 sec
	Level of Service	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Truck	Turning Radius (smallest)	10 to 15 m	>15 m	10 to 15 m	>15 m					>15 m	>15 m	<10 m	10 to 15 m	>15 m			10 to 15 m
	Number of Receiving Lanes	More than One	One	One	One	N/A	N/A	N/A	N/A	One	One	One	One	More than One	N/A	N/A	One
	Level of Service	B	C	E	C	N/A	N/A	N/A	N/A	C	C	F	E	A	N/A	N/A	E
Auto	Level of Service	F				F				E				E			

Segments		Hazeldean Rd	Section			Carp Rd	Section			Stittsville Main St	Section			Kittiwake / Echowoods / Kimpton	Section		
			W of Carp	Carp to Main	E of Main		N of Echo	Echo to Hazel	Hazel to Main		N of Hazel	Hazel to Carp	S of Carp		W of Carp	Carp to Main	
Pedestrian	Sidewalk Width		>2.0 m	1.5 m	1.8 m		None	>2.0 m	>2.0 m		>2.0 m	1.8 m	1.8 m		1.8 m	1.8 m	
	Boulevard Width		0 m	0 m	0 m		0 m	0 m	0 m		>2 m	0 m	>2 m		>2 m	0 m	
	AADT		>3000	>3000	>3000		>3000	>3000	>3000		<=3000	>3000	>3000		<=3000	<=3000	
	On-Street Parking		No	Yes	No		No	No	No		No	No	No		No	Yes	
	Operating Speed		>60 km/h	>60 km/h	>60 km/h		>60 km/h	>60 km/h	>60 km/h		>30 - 50 km/h	>50 - 60 km/h	>50 - 60 km/h		>30 - 50 km/h	>50 - 60 km/h	
Level of Service		F	F	F		F	F	F		A	F	D		A	C	N/A	
Cyclist	Type of Bikeway		Mixed Traffic	Bike Lane	Bike Lane		Bike Lane	Bike Lane	Mixed Traffic		Mixed Traffic	Mixed Traffic	Mixed Traffic		Mixed Traffic	Mixed Traffic	
	Number of Travel Lanes		3	4 (Median)	4 (Median)		2	3	2		2 (Res.)	2	2		2 (Res.)	2 (Res.)	
	Bike Lane Width		>1.8 m	>1.8 m	>1.8 m		>1.8 m	>1.8 m	N/A								
	Operating Speed		>=70 km/h	>=70 km/h	>=70 km/h		>=70 km/h	>=70 km/h	60 km/h		50 km/h	60 km/h	60 km/h		50 km/h	60 km/h	
	Bike Lane Blockages		Rare	Rare	Rare		Rare	Rare									
	Unsignalized Lane Crossings		N/A	N/A	N/A		N/A	<3	<3		<3	<3	<3		<3	<3	
	Median Refuge (> 1.8 m)						No	No	No		No	No	No		No	No	
	Sidestreet Operating Speed						60 km/h	60 km/h	60 km/h		60 km/h	60 km/h	60 km/h		50 km/h	60 km/h	
	Level of Service		F	E	E		E	E	F		C	F	F		B	F	N/A
Transit	Facility Type			Mixed Traffic	Mixed Traffic		Mixed Traffic	Mixed Traffic	Mixed Traffic		Mixed Traffic	Mixed Traffic	Mixed Traffic		Mixed Traffic		
	Friction / Congestion / Incident Potential			Vt/Vp>=0.8	Vt/Vp>=0.8		Vt/Vp>=0.8	Vt/Vp>=0.8	Vt/Vp>=0.8		Vt/Vp>=0.8	Vt/Vp>=0.8	Vt/Vp>=0.8		Vt/Vp>=0.8		
	Level of Service		N/A	D	D		D	D	D		D	D	D		D	N/A	N/A
Truck	Lane Width		<=3.5	<=3.5	<=3.5		>3.7	<=3.5	<=3.3			>3.7	>3.7				
	Travel Lanes per Direction		More than One	More than One	More than One		One	More than One	One			One	One		N/A	N/A	N/A
	Level of Service		A	A	A		B	A	D		N/A	B	B		N/A	N/A	N/A
Auto	Level of Service		N/A				N/A				N/A				N/A		

Multimodal Analysis - Future Total Scenarios

Intersections		Hazeldean Rd & Carp Rd				Carp Rd & Kittiwake Dr / Echowoods Ave				Carp Rd & Stittsville Main St				Hazeldean Rd & Stittsville Main St			
		North	South	East	West	North	South	East	West	North	South	East	West	North	South	East	West
Pedestrian	Lanes	5	4	5	5	4	3	2	2	4	4	3	5	4	4	6	5
	Median	Yes	Yes	Yes	Yes	No	No	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
	Island Refuge	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	Conflicting Left Turns	Prot+Perm	Permissive	Protected	Protected	Permissive	Permissive	Prot+Perm	Prot+Perm	Permissive	Prot+Perm	Prot+Perm	Prot+Perm	Prot+Perm	Prot+Perm	Prot+Perm	Prot+Perm
	Conflicting Right Turns	Permissive/Yield	Permissive/Yield	Permissive/Yield	Permissive/Yield	Permissive/Yield	Permissive/Yield	Permissive/Yield	Permissive/Yield	Permissive/Yield	Permissive/Yield	Permissive/Yield	Permissive/Yield	Permissive/Yield	Permissive/Yield	Permissive/Yield	Permissive/Yield
	RTOR	Allowed	Allowed	Allowed	Allowed	Allowed	Allowed	Allowed	Allowed	Allowed	Allowed	Allowed	Allowed	Allowed	Allowed	Allowed	Allowed
	Ped Leading Interval	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	Corner Radius (largest)	RT Channel	10-15m	RT Channel	RT Channel	15-25m	10-15m	5-10m	15-25m	RT Channel	RT Channel	15-25m	RT Channel	15-25m	RT Channel	RT Channel	10-15m
	Crosswalk Type	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard
Level of Service	E (43)	D (55)	D (51)	D (51)	D (51)	C (70)	B (86)	B (83)	D (58)	D (58)	C (68)	E (43)	D (53)	D (58)	F (28)	E (40)	
Level of Service	<b>E</b>				<b>D</b>				<b>E</b>				<b>F</b>				
Cyclist	Type of Bikeway	Bike Lanes	Pocket Bike Lanes	Pocket Bike Lanes	Mixed Traffic	Mixed Traffic	Pocket Bike Lanes	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Pocket Bike Lanes	Mixed Traffic	Bike Lanes	Bike Lanes
	Turning speed (25km to 80km)	<=25 km/h	<=25 km/h	<=25 km/h	<=25 km/h	<=25 km/h	<=25 km/h	<=25 km/h	<=25 km/h	<=25 km/h	<=25 km/h	<=25 km/h	<=25 km/h	<=25 km/h	<=25 km/h	<=25 km/h	<=25 km/h
	Introduction of Right-Turn Lane		Right of Bike Lane	Right of Bike Lane			Right of Bike Lane							Right of Bike Lane			
	Right Turn Storage Length		<=50 m	<=50 m			<=50 m				<=50 m	<=50 m		<=50 m	<=50 m		
	Dual Right Turn	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	Shared Through-Right	Yes	No	No	Yes	Yes	No	Yes	Yes	Yes	No	No	Yes	No	No	Yes	Yes
	Bike Box	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	Number of Lanes Crossed for LTs	2 or more	1	1	2 or more	1	1	None	1	1	2 or more	2 or more	1	1	2 or more	2 or more	2 or more
	Operating Speed on Approach	>=60 km/h	>=60 km/h	>=60 km/h	>=60 km/h	>=60 km/h	>=60 km/h	50 km/h	>=60 km/h	>=60 km/h	>=60 km/h	>=60 km/h	>=60 km/h	>=60 km/h	50 km/h	>=60 km/h	>=60 km/h
Dual Left Turn Lanes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	
Level of Service	F	E	E	F	F	E	D	F	F	F	F	F	E	F	F	F	
Level of Service	<b>F</b>				<b>F</b>				<b>F</b>				<b>F</b>				
Transit	Average Signal Delay	>40 sec	>40 sec	>40 sec	>40 sec	>40 sec	>40 sec	>40 sec	>40 sec	>40 sec	>40 sec	>40 sec	>40 sec	>40 sec	>40 sec	>40 sec	>40 sec
	Level of Service	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Level of Service	<b>F</b>				<b>F</b>				<b>F</b>				<b>F</b>				
Truck	Turning Radius (smallest)	10 to 15 m	>15 m	10 to 15 m	>15 m					>15 m	>15 m	<10 m	10 to 15 m	>15 m			10 to 15 m
	Number of Receiving Lanes	More than One	One	One	One	N/A	N/A	N/A	N/A	One	One	One	One	More than One	N/A	N/A	One
	Level of Service	B	C	E	C	N/A	N/A	N/A	N/A	C	C	F	E	A	N/A	N/A	E
Level of Service	<b>E</b>				<b>N/A</b>				<b>F</b>				<b>E</b>				
Auto	Level of Service	<b>F</b>				<b>F</b>				<b>E</b>				<b>E</b>			

Segments		Hazeldean Rd	Section			Carp Rd	Section			Stittsville Main St	Section			Kittiwake / Echowoods / Kimpton	Section		
			W of Carp	Carp to Main	E of Main		N of Echo	Echo to Hazel	Hazel to Main		N of Hazel	Hazel to Carp	S of Carp		W of Carp	Carp to Main	
Pedestrian	Sidewalk Width		>2.0 m	1.5 m	1.8 m		None	>2.0 m	>2.0 m		>2.0 m	1.8 m	1.8 m		1.8 m	1.8 m	
	Boulevard Width		0 m	0 m	0 m		0 m	0 m	0 m		>2 m	0 m	>2 m		>2 m	0 m	
	AADT		>3000	>3000	>3000		>3000	>3000	>3000		<=3000	>3000	>3000		<=3000	<=3000	
	On-Street Parking		No	Yes	No		No	No	No		No	No	No		No	Yes	
	Operating Speed		>60 km/h	>60 km/h	>60 km/h		>60 km/h	>60 km/h	>60 km/h		>30 - 50 km/h	>50 - 60 km/h	>50 - 60 km/h		>30 - 50 km/h	>50 - 60 km/h	
Level of Service		F	F	F		F	F	F		A	F	D		A	C	N/A	
Level of Service		<b>F</b>				<b>F</b>				<b>F</b>				<b>C</b>			
Cyclist	Type of Bikeway		Mixed Traffic	Bike Lane	Bike Lane		Bike Lane	Bike Lane	Mixed Traffic		Mixed Traffic	Mixed Traffic	Mixed Traffic		Mixed Traffic	Mixed Traffic	
	Number of Travel Lanes		3	4 (Median)	4 (Median)		2	3	2		2 (Res.)	2	2		2 (Res.)	2 (Res.)	
	Bike Lane Width		>1.8 m	>1.8 m	>1.8 m		>1.8 m	>1.8 m	N/A								
	Operating Speed		>=70 km/h	>=70 km/h	>=70 km/h		>=70 km/h	>=70 km/h	60 km/h		50 km/h	60 km/h	60 km/h		50 km/h	60 km/h	
	Bike Lane Blockages		Rare	Rare	Rare		Rare	Rare									
	Unsignalized Lane Crossings		N/A	N/A	N/A		N/A	<3	<3		<3	<3	<3		<3	<3	
	Median Refuge (> 1.8 m)						No	No			No	No	No		No	No	
	Sidestreet Operating Speed						50 km/h	50 km/h			50 km/h	50 km/h	50 km/h		<=40 km/h	50 km/h	
	Level of Service		F	E	E		E	E	F		B	F	F		B	F	N/A
Level of Service		<b>F</b>				<b>F</b>				<b>F</b>				<b>F</b>			
Transit	Facility Type			Mixed Traffic	Mixed Traffic		Mixed Traffic	Mixed Traffic	Mixed Traffic		Mixed Traffic	Mixed Traffic	Mixed Traffic		Mixed Traffic		
	Friction / Congestion / Incident Potential			Vt/Vp>=0.8	Vt/Vp>=0.8		Vt/Vp>=0.8	Vt/Vp>=0.8	Vt/Vp>=0.8		Vt/Vp>=0.8	Vt/Vp>=0.8	Vt/Vp>=0.8		Vt/Vp>=0.8		
	Level of Service		N/A	D	D		D	D	D		D	D	D		D	N/A	N/A
Level of Service		<b>D</b>				<b>D</b>				<b>D</b>				<b>D</b>			
Truck	Lane Width		<=3.5	<=3.5	<=3.5		>3.7	<=3.5	<=3.3			>3.7	>3.7				
	Travel Lanes per Direction		More than One	More than One	More than One		One	More than One	One			One	One		N/A	N/A	N/A
	Level of Service		A	A	A		B	A	D		N/A	B	B		N/A	N/A	N/A
Level of Service		<b>A</b>				<b>D</b>				<b>B</b>				<b>N/A</b>			
Auto	Level of Service		<b>N/A</b>				<b>N/A</b>				<b>N/A</b>				<b>N/A</b>		