



## 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:**

2021-04-16

# A11654128 Canada Inc. (Heafey Group)

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**Date Submitted:**

April 16, 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;
- 154 Townhomes;
- 180 Condominium Units (36 units per building, 5 buildings); and
- 175 Apartment Units (One 9-story building).
- Marijuana Dispensary (1300 ft<sup>2</sup>)
- Coffee shop and hair salon (2800 ft<sup>2</sup>)

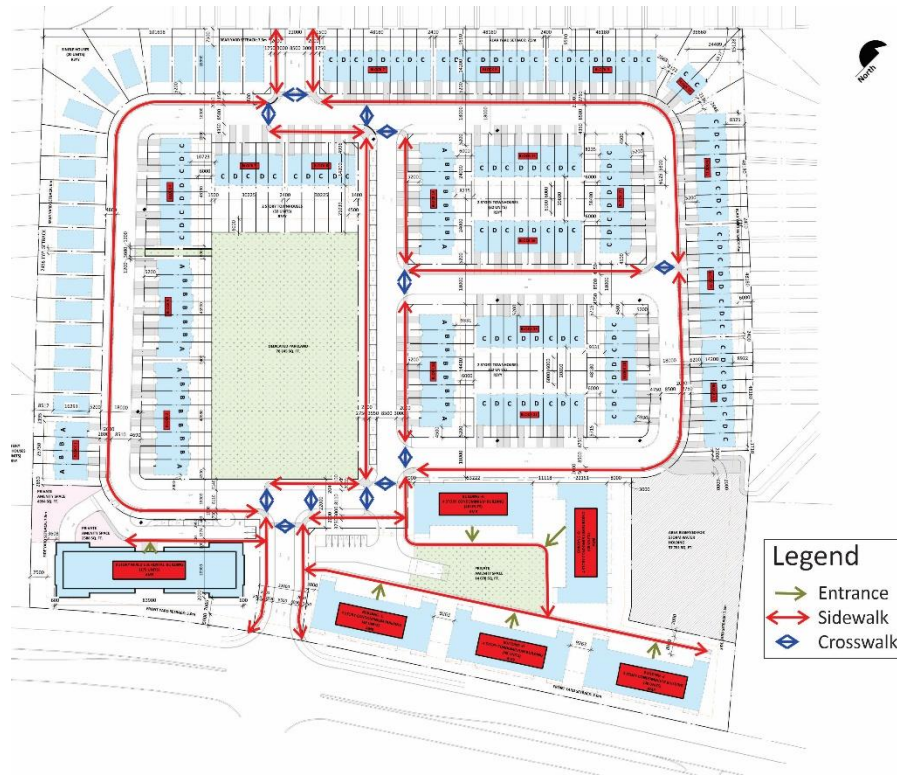
The development will provide 449 parking spaces throughout the development, including underground parking for the apartment blocks. A concept site plan is shown in **Figure 1** (below) and is provided in full-size in Appendix B.

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 internal pedestrian network including sidewalks and pedestrian crossing locations is illustrated in **Figure 2**.



**Figure 2 – Internal Pedestrian Network**

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 3**:

- 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 3 - 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 4**. 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 unsignaled 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.

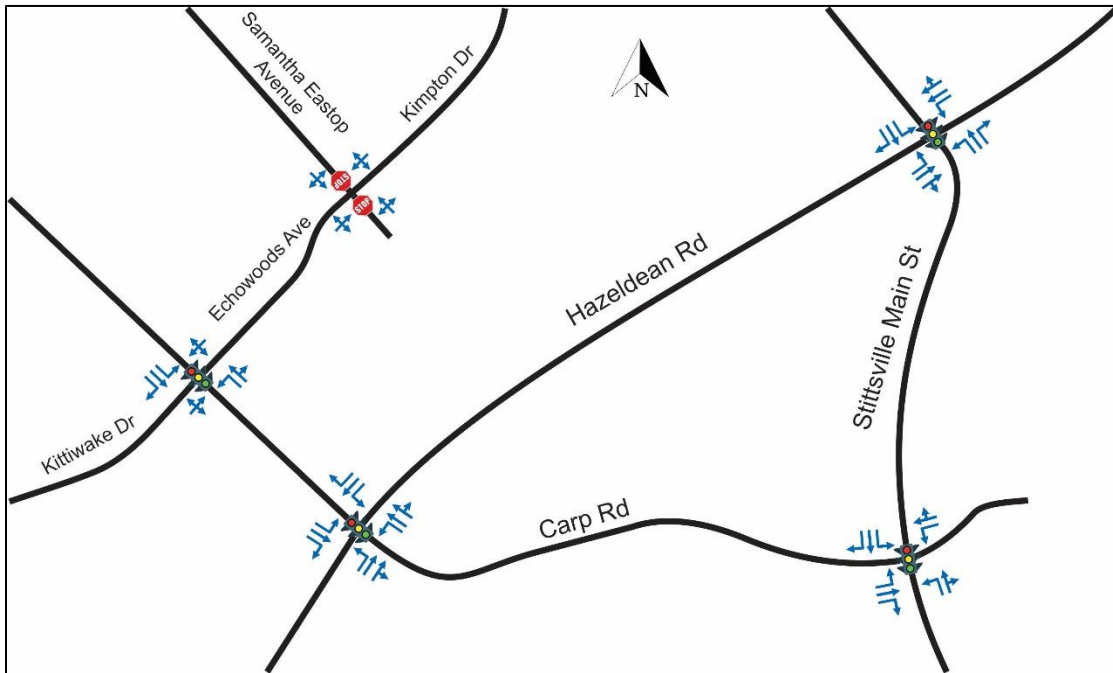


Figure 4 - Existing Traffic Control and Lane Configuration

### 2.3.3 Peak Hour Travel Demands

The existing peak hour traffic volumes are illustrated below in **Figure 5** 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.

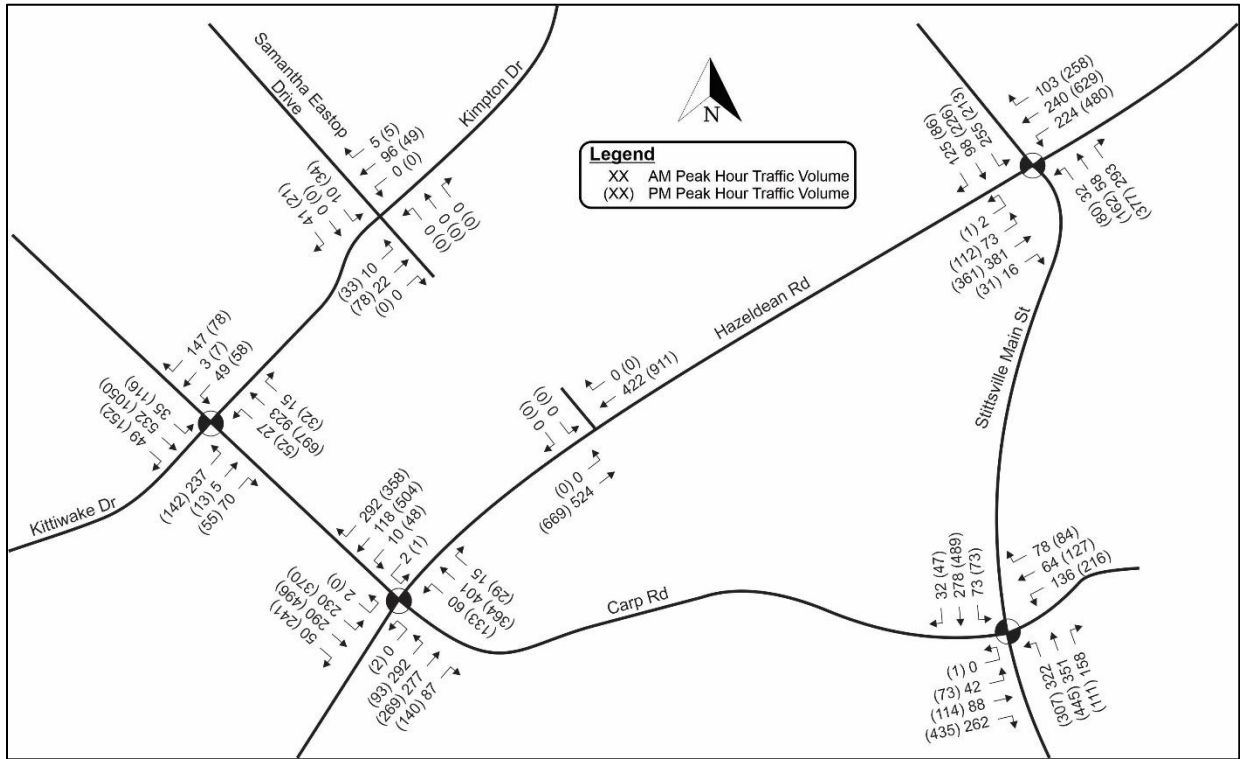


Figure 5 - Existing (2020) Volumes

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 6**.



**Figure 6 - 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 7** for reference.



**Figure 7 - 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.

**Table 3 - Trip Generation**

Land Use	Independent Variable	Parameters	AM Peak Hour		PM Peak Hour	
			In	Out	In	Out
Single Detached (2009 TRANS)	20 units	Scenario	Suburban, Base Rate		Suburban, Base Rate	
		Rate / Eq.	0.7		0.9	
		Total Trips	14		18	
		Distribution	29%	71%	62%	38%
		<b>Vehicle Trips</b>	<b>4</b>	<b>10</b>	<b>11</b>	<b>7</b>
		Vehicle Trip %	55%		64%	
		<b>Person Trips</b>	<b>7</b>	<b>18</b>	<b>17</b>	<b>11</b>
Townhouses (2009 TRANS)	147 units	Scenario	Suburban, Base Rate		Suburban, Base Rate	
		Rate / Eq.	0.54		0.71	
		Total Trips	79		104	
		Distribution	37%	63%	53%	47%
		<b>Vehicle Trips</b>	<b>29</b>	<b>50</b>	<b>55</b>	<b>49</b>
		Vehicle Trip %	55%		61%	
		<b>Person Trips</b>	<b>53</b>	<b>91</b>	<b>90</b>	<b>80</b>
High-Rise Condominiums (2009 TRANS)	169 units	Scenario	Suburban, Base Rate		Suburban, Base Rate	
		Rate / Eq.	0.46		0.46	
		Total Trips	78		78	
		Distribution	28%	72%	58%	42%
		<b>Vehicle Trips</b>	<b>22</b>	<b>56</b>	<b>45</b>	<b>33</b>
		Vehicle Trip %	44%		44%	
		<b>Person Trips</b>	<b>50</b>	<b>127</b>	<b>102</b>	<b>75</b>
Mid-Rise Apartments (2009 TRANS)	240 units	Scenario	Suburban, Base Rate		Suburban, Base Rate	
		Rate / Eq.	0.29		0.37	
		Total Trips	70		89	
		Distribution	24%	76%	62%	38%
		<b>Vehicle Trips</b>	<b>17</b>	<b>53</b>	<b>55</b>	<b>34</b>
		Vehicle Trip %	44%		44%	
		<b>Person Trips</b>	<b>39</b>	<b>120</b>	<b>125</b>	<b>77</b>
Marijuana Dispensary (ITE #882)	1300 sqft	Scenario	Peak Hour of Adjacent Street Traffic		Peak Hour of Adjacent Street Traffic	
		Rate / Eq.	10.44		21.83	

Land Use	Independent Variable	Parameters	AM Peak Hour		PM Peak Hour	
			In	Out	In	Out
		Total Trips	14		28	
		Distribution	56%	44%	50%	50%
		<b>Vehicle Trips</b>	<b>8</b>	<b>6</b>	<b>14</b>	<b>14</b>
		Vehicle Trip %	51%		59%	
		<b>Person Trips</b>	<b>16</b>	<b>12</b>	<b>24</b>	<b>24</b>
Hair Salon / Coffee Shop (#936)	2800 sqft	Scenario	Peak Hour of Adjacent Street Traffic		Peak Hour of Adjacent Street Traffic	
		Rate / Eq.	101.14		36.31	
		Total Trips	283		102	
		Distribution	24%	76%	62%	38%
		Passby %	43%		43%	
		<b>Vehicle Trips</b>	<b>39</b>	<b>123</b>	<b>36</b>	<b>22</b>
		Vehicle Trip %	51%		59%	
<b>Person Trips</b>	<b>76</b>	<b>241</b>	<b>61</b>	<b>37</b>		
<b>TOTAL (VEHICLE TRIPS)</b>			<b>417</b>		<b>375</b>	
			<b>119</b>	<b>298</b>	<b>216</b>	<b>159</b>
<b>TOTAL (PERSON TRIPS)</b>			<b>850</b>		<b>723</b>	
			<b>241</b>	<b>609</b>	<b>419</b>	<b>304</b>
<b>PASSBY (VEHICLE TRIPS)</b>			<b>121</b>		<b>44</b>	

The proposed development is expected to generate 417 two-way vehicle trips during the AM peak, and 375 two-way vehicle trips during the PM peak. Additionally, 121 AM passby trips and 44 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 In	AM Out	Proportion	PM In	PM Out	Proportion
Auto Driver	119	298	49%	216	159	52%
Auto Passenger	33	86	14%	94	68	22%
Transit	33	84	14%	49	35	12%
Bicycle	1	3	0%	3	2	1%
Walk	26	65	11%	34	24	8%
Other	29	73	12%	23	16	5%
Total	241	609		419	304	

Based on the proposed travel modes, the non-auto mode-share would be 25% in the AM peak period and 20% 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.

**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 Trip Distribution**

Direction	AM IN	AM OUT	PM IN	PM OUT
West Hazeldean	13%	4%	7%	14%
East Hazeldean	8%	8%	12%	11%
North Carp (via Kimpton)	27%	35.5%	30.5%	25%
North Carp (via Hazeldean)	27%	35.5%	30.5%	25%
South Stittsville Main	20%	12%	14%	20%
East Plaza	5%	5%	6%	5%

**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 – Passby Trip Distribution**

Direction	AM	PM
West Hazeldean	55%	42%
East Hazeldean	45%	58%

### 3.1.4 Trip Assignment

The numerical breakdown of site trips is provided as **Table 8** for new trips, and **Table 9** for passby trips.

**Table 8 – Trip Assignment Breakdown (New Trips)**

Direction	AM IN	AM OUT	PM IN	PM OUT
West Hazeldean	14	11	15	22
East Hazeldean	10	25	27	18
North Carp (via Kimber)	32	105	65	40
North Carp (via Hazeldean)	32	105	65	40
South Stittsville Main	24	36	31	32
East Plaza	7	16	13	7

**Table 9 – Trip Assignment Breakdown (Passby Trips)**

Direction	AM	PM
West Hazeldean	67	24
East Hazeldean	54	20

The visual assignment of trips is illustrated in **Figure 8**. Trips to and from Carp Road use the access on Samantha Eastop Drive, while all others use the access on Hazeldean Road.



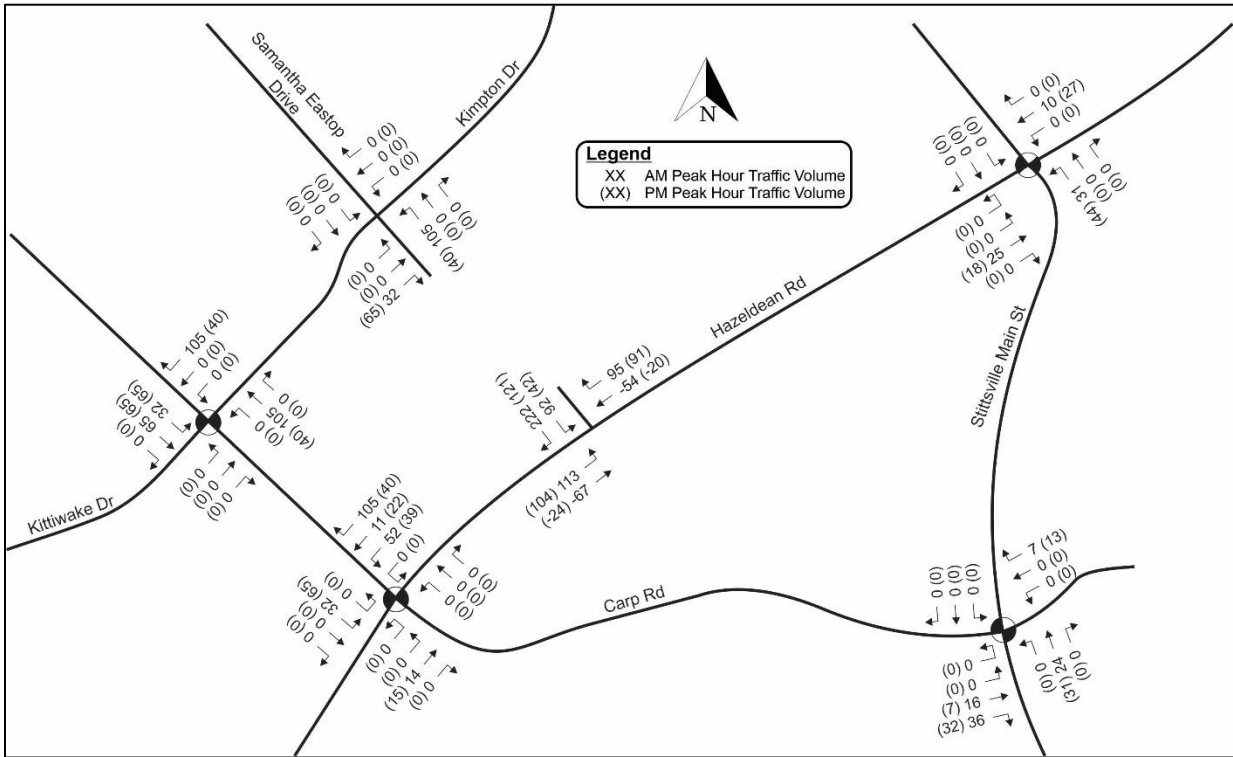


Figure 8 – Site Trip Volumes

### 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.

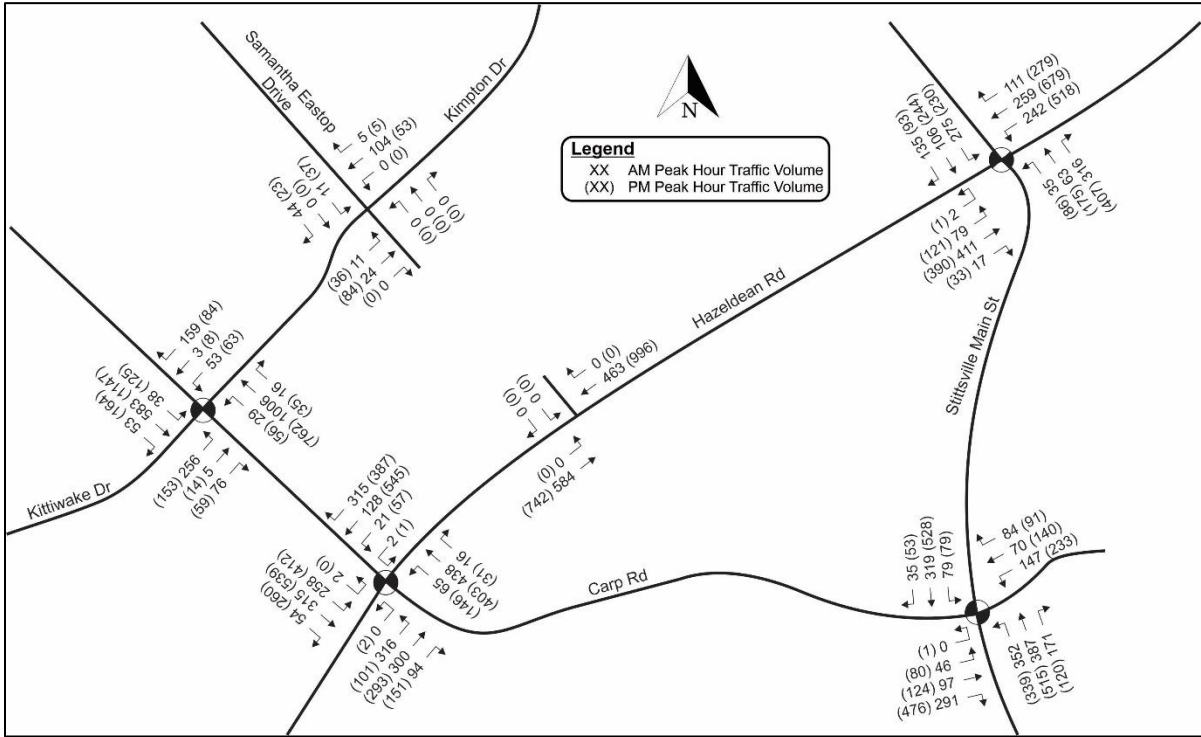
#### 3.2.3 Other Developments

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 9**.



**Figure 9 – Future Background (2024) Traffic Volumes**

The future background traffic operations analysis for 2024 is provided as **Table 10**. 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 10 – Future Background (2024) Traffic Operations Analysis**

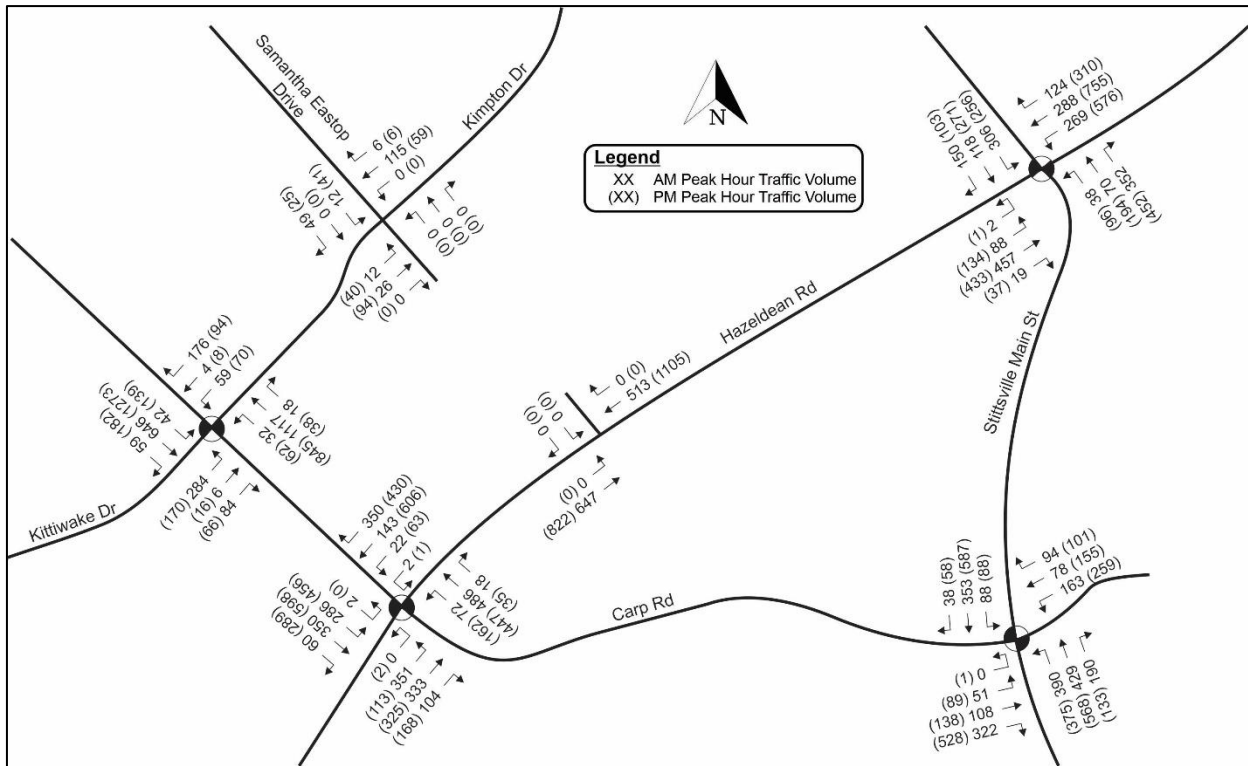
Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement(s)			Overall		
	LoS	v/c	Movement	Delay (s)	v/c	LOS
<b>Signalized</b>						
Carp Rd & Kittiwake Dr / Echowoods Ave	E	0.95	EBL	54.5 (57.4)	1.02 (1.04)	F (F)
	F	1.10	NBT			
	(F)	(1.13)	SBT			
Carp Rd & Hazeldean Rd	F (E)	1.16 (0.97)	EBL	58.1 (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 10**.



The future background traffic operations analysis for 2029 is provided as **Table 11**. Full outputs are provided in **Appendix H**.

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

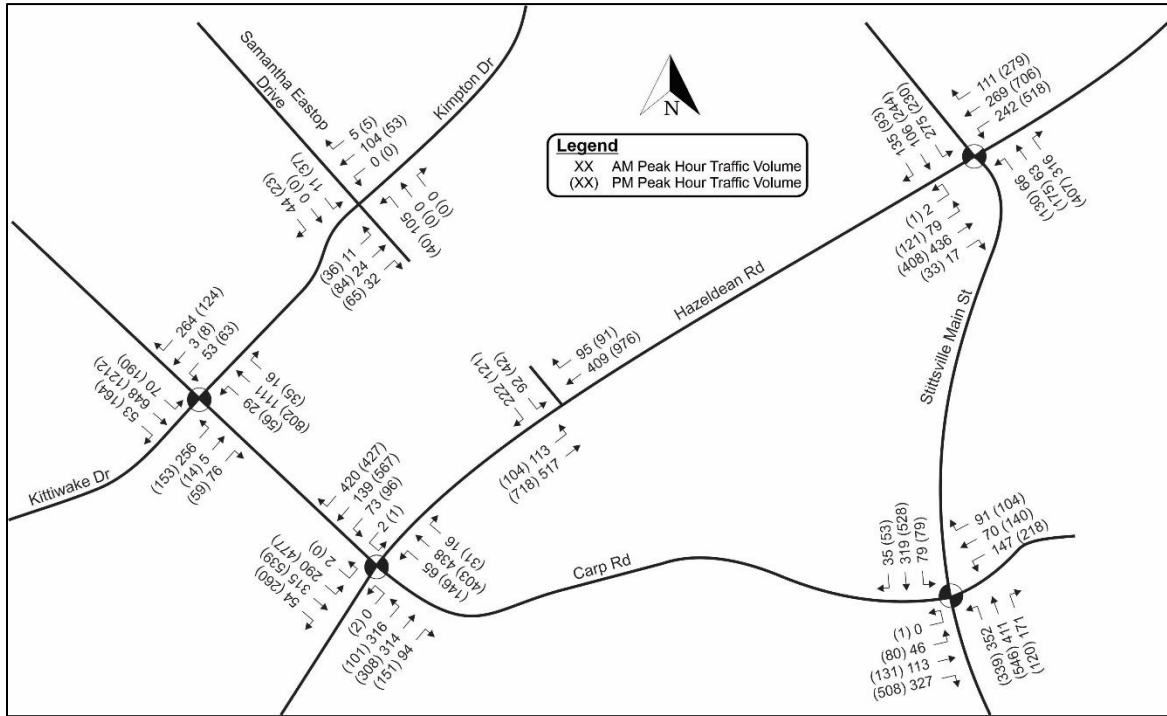
Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement(s)			Overall		
	LoS	v/c	Movement	Delay (s)	v/c	LOS
<b>Signalized</b>						
Carp Rd & Kittiwake Dr / Echowoods Ave	F	1.04	EBL	90.8 (89.7)	1.15 (1.16)	F (F)
	F (E)	1.28 (0.90)	NBT			
	(F)	(1.29)	SBT			
Carp Rd & Hazeldean Rd	F (F)	1.62 (1.23)	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 11**.



**Figure 11 – 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 12** with full outputs provided in **Appendix I**.

Table 12 – Future Total (2024) Traffic Operations Analysis

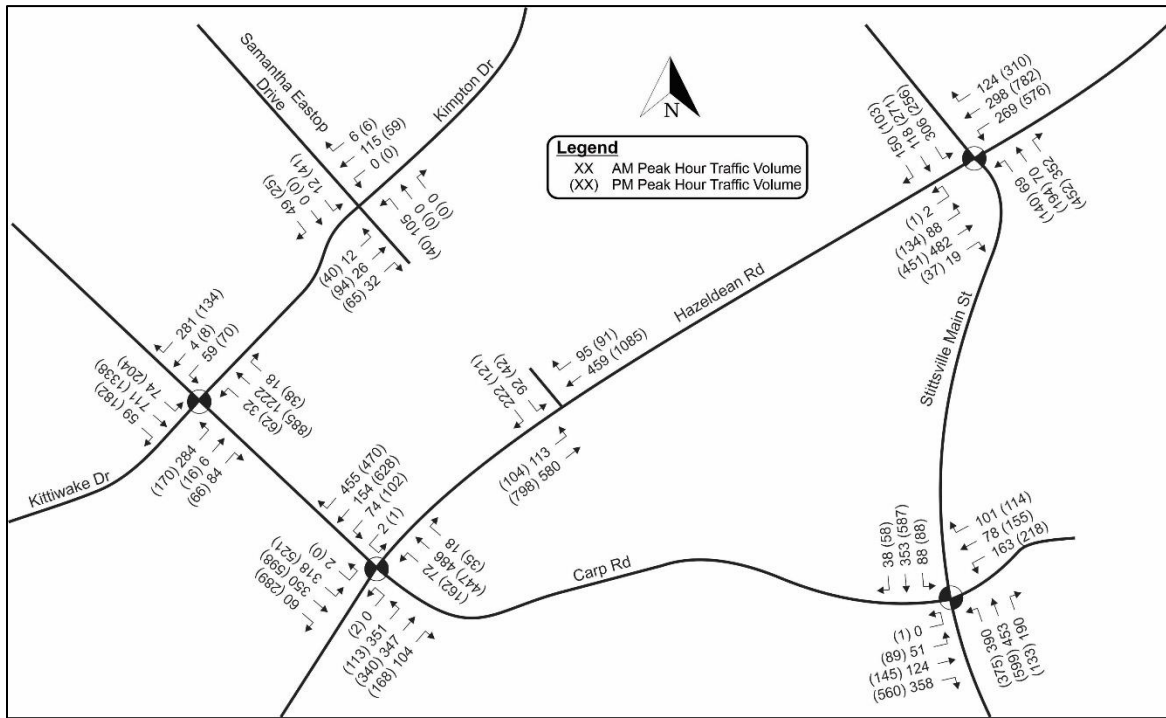
Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement(s)			Overall		
	LoS	v/c	Movement	Delay (s)	v/c	LOS
<b>Signalized</b>						
Carp Rd & Kittiwake Dr / Echowoods Ave	F	1.16	EBL	93.2 (75.2)	1.19 (1.13)	F (F)
	F	1.27	NBT			
	(F)	(1.22)	SBT			
Carp Rd & Hazeldean Rd	F (F)	1.08 (1.06)	EBL	51.5 (67.7)	0.80 (1.09)	D (F)
	(E)	(0.91)	WBT			
	(F)	(1.40)	SBL			
Carp Rd & Stittsville Main St	(F)	(1.05)	NBL	19.3 (56.3)	0.66 (0.95)	B (E)
	(F)	(1.01)	NBTR			
	(F)	(1.04)	SBL			
Hazeldean Rd & Stittsville Main St	(E)	(0.90)	EBL	33.8 (40.6)	0.63 (0.89)	B (D)
<b>Unsignalized</b>						
Kimpton Dr & Samantha Eastop Dr	-	-	-	5.3 (3.9)	-	A (A)
Hazeldean Rd & 6171 Hazeldean	-	-	-	6.0 (2.4)	-	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 left and northbound through-right movements at Carp Road & Stittsville Main Street are over capacity, while the southbound through at the same intersection is no longer critical.

### 3.3.4 Future Total (2029) Traffic

The future total traffic volumes for 2029 are provided in **Figure 12**.



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 13** with full outputs provided in **Appendix J**.



**Table 13 – 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 (E)	1.35 (0.99)	EBL	126.5 (109.0)	1.34 (1.27)	F (F)
	F (F)	1.40 (0.98)	NBT			
	(F)	(1.36)	SBT			
Carp Rd & Hazeldean Rd	F (F)	1.20 (1.53)	EBL	58.4 (91.3)	0.90 (1.41)	E (F)
	(E)	(0.97)	WBT			
	(F)	(1.66)	SBL			
	(F)	(1.02)	SBT			
Carp Rd & Stittsville Main St	(E)	(0.90)	EBR	20.9 (94.7)	0.74 (1.15)	C (F)
	(F)	(1.33)	NBL			
	(F)	(1.20)	NBTR			
	(F)	(1.16)	SBT			
Hazeldean Rd & Stittsville Main St	E	0.91	SBL	36.2 (50.2)	0.69 (1.02)	B (F)
	(F)	(1.07)	WBL			
<b>Unsignalized</b>						
Kimpton Dr & Samantha Eastop Dr	-	-	-	5.3 (4.0)	-	A (A)
Hazeldean Rd & 6171 Hazeldean	-	-	-	4.9 (2.5)	-	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 14** 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 14 - 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	0.96	EBL	40.6 (31.7)	0.96 (0.91)	E (E)
	E	1.00	NBT			
	(E)	(0.96)	SBT			
Carp Rd & Hazeldean Rd	E	0.95	EBL	46.4 (44.4)	0.66 (0.82)	B (D)
	(E)	(0.98)	SBL			
Carp Rd & Stittsville Main St	-	-	-	17.8 (30.2)	0.53 (0.69)	A (B)
Hazeldean Rd & Stittsville Main St	-	-	-	30.9 (34.5)	0.51 (0.73)	A (C)
<b>Unsignalized</b>						
Kimpton Dr & Samantha Eastop Dr	-	-	-	4.9 (3.7)	-	A (A)
Hazeldean Rd & 6171 Hazeldean	-	-	-	3.4 (1.7)	-	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:

- Carp Road & Kittiwake Drive / Echowoods Avenue
  - Additional westbound right-turn lane;
  - Signals optimized to 85 seconds in the AM, 90 seconds in the PM.
- Hazeldean Road & Carp Road
  - Signals optimized to 115 seconds in the AM, 120 seconds in the PM.
- Carp Road & Stittsville Main Street
  - Signals optimized to 80 seconds in the AM, 110 seconds in the PM



## 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 13**.

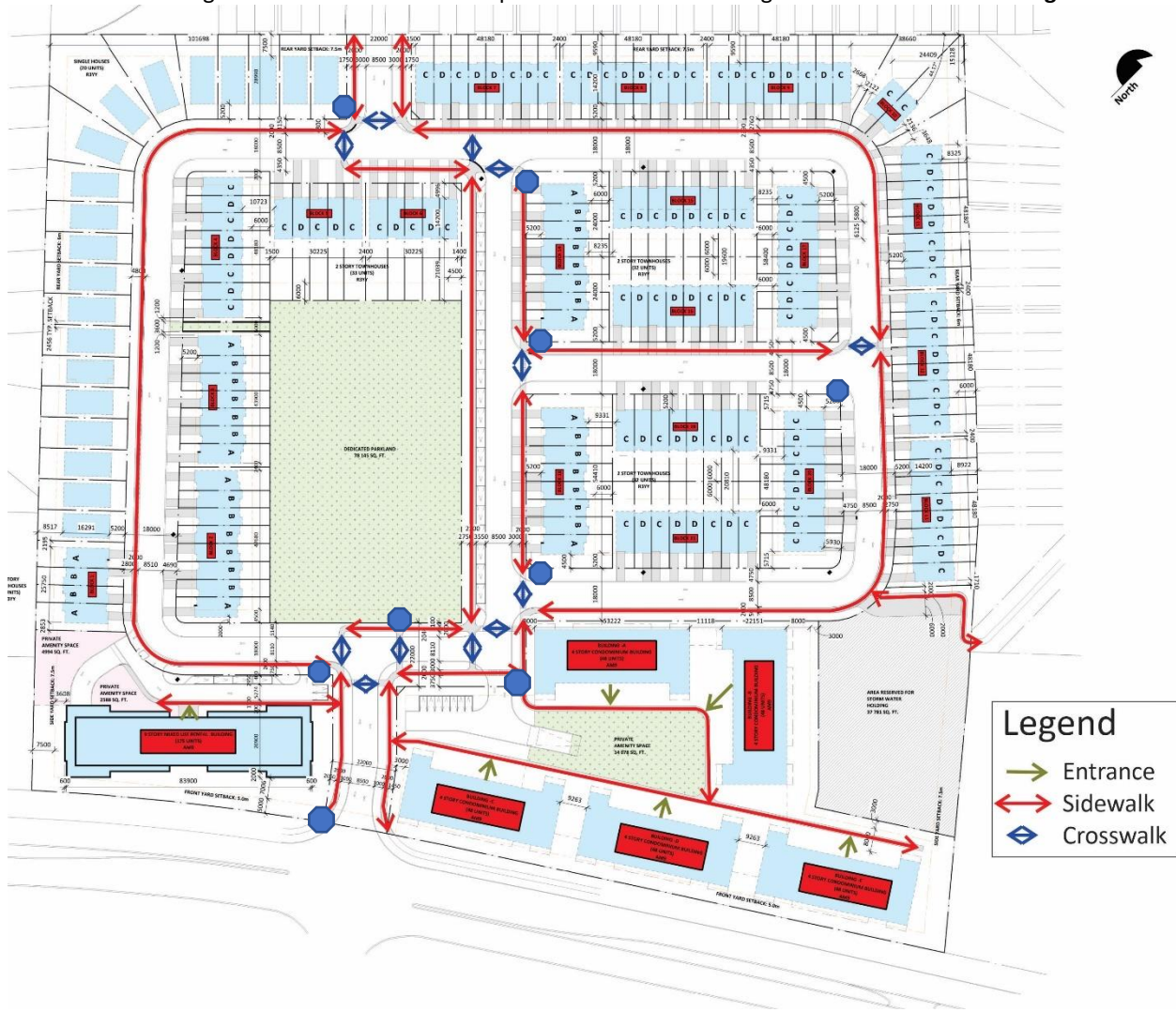
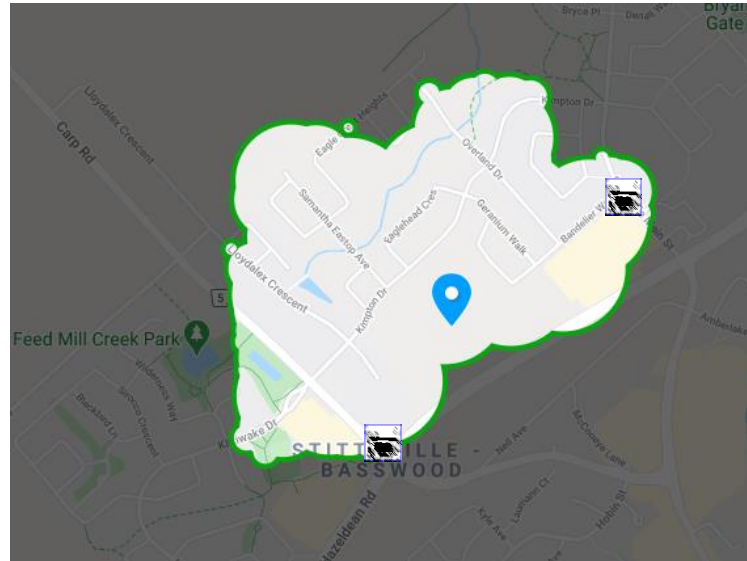


Figure 13 – Site Pedestrian Network

**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 14 - 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 216 resident, 36 visitor and 90 bicycle parking spaces and is providing that amount.

The rental building is required to provide 210 resident, 35 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. The MMLOS for each intersection is described in Section 4.9.1.

Worst-case scenarios for each location were assuming during the analysis. **Table 15** summarizes the pedestrian LOS, If a segment has one sidewalk on one side of the roadway, that location was analyzed. **Table 16** summarizes the bicycle LOS. **Table 17** summarizes the transit LOS, with segments where existing OTranspo routes do not travel on being indicated as non applicable. **Table 18** summarizes the truck LOS, only on segments indicated as a trucking route.

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

Street	Segment	Level of Service	Target Level of Service
Hazeldean Road	West of Carp Road (north side only)	E	C
	Between Carp Road & Stittsville Main Street	F	C
	East of Stittsville Main Street	F	C
Carp Road	North of Kittiwake Avenue / Echowoods Avenue	F	C
	Between Kittiwake Avenue & Hazeldean Road (west side only)	E	C
	Between Hazeldean Road & Stittsville Main Street	C	C
Stittsville Main Street	North of Hazeldean Road	A	C
	Between Hazeldean Road & Carp Road	D	C
	South of Carp Road	C	C
Kittiwake Drive	West of Carp Road (south side only)	A	C
Echowoods Avenue / Kimpton Drive	Between Carp Road & Stittsville Main street	B	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 either E or 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 D as some sidewalk segments abut the road.

**Table 16 - 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	C	C
	East of Stittsville Main Street	C	C
Carp Road	North of Kittiwake Avenue / Echowoods Avenue	C	C
	Between Kittiwake Avenue & Hazeldean Road	D	C
	Between Hazeldean Road & Stittsville Main Street	D	C
Stittsville Main Street	North of Hazeldean Road	B	D
	Between Hazeldean Road & Carp Road	D	C
	South of Carp Road	D	C
Kittiwake Drive	West of Carp Road	A	B
Echowoods Avenue / Kimpton Drive	Between Carp Road & Stittsville Main street	B	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 17 - 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 18 - Truck Multimodal Level of Service (Segments)**

Street	Segment	Level of Service	Target Level of Service
Hazeldean Road	West of Carp Road	A	E
	Between Carp Road & Stittsville Main Street	A	E
	East of Stittsville Main Street	A	E
Carp Road	North of Kittiwake Avenue / Echowoods Avenue	B	E
	Between Kittiwake Avenue & Hazeldean Road	A	E
	Between Hazeldean Road & Stittsville Main Street	D	E
Stittsville Main Street	North of Hazeldean Road	N/A	N/A
	Between Hazeldean Road & Carp Road	B	E
	South of Carp Road	B	E
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 19** outlines the patterns found.

**Table 19 – 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 20**. The TDM checklist is based on the City’s list<sup>2</sup> for the applicable measures.

**Table 20 – 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 5**, 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 12** 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 117 transit trips in the AM peak hour and 84 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.

#### 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 21** summarizes the pedestrian LOS. **Table 22** summarizes the bicycle LOS. **Table 23** summarizes the transit LOS, considering approaches where existing OTranspo routes do not travel on being indicated as non applicable. **Table 24** 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 21 - 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	C

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 22 - 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	C
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 23 - 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 24 – Truck Multimodal Level of Service (Intersections)**

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

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 55 metres based on the 95<sup>th</sup> percentile queue 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 25** 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.

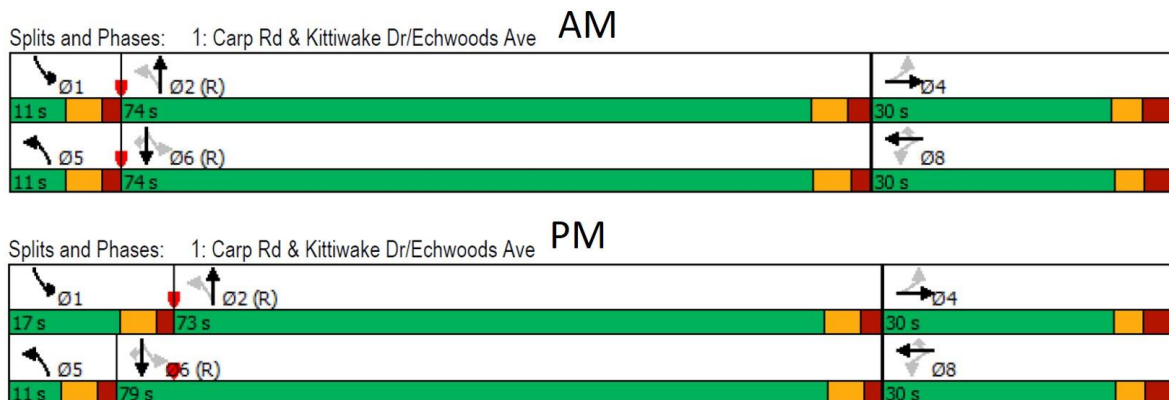
**Table 25 - Southbound Left Queuing Storage Analysis**

Storage Length	Background 2029	Total 2029	Mitigated 2029
AM (m)	79.7	110	110
AM (increase)		30	30
PM (m)	104.7	120.8	109.9
PM (increase)		16	5

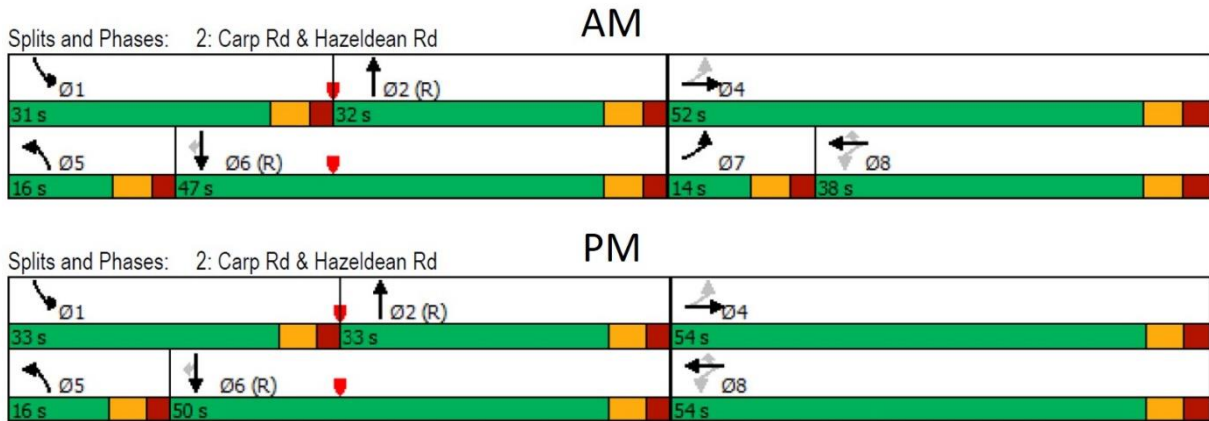
Note that the storage length is subject to further design and should consider the queue lengths outlined in this study.

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 15** and **Figure 16** respectively.

**Figure 15 – Carp Road & Kittiwake Drive / Echowoods Avenue Optimized Signal Timings**



**Figure 16 – Carp Road & Hazeldean Road Optimized Signal Timings**



The traffic operations for the mitigative implementations are outlined in **Table 26** for the effected intersections. The full outputs are provided in **Appendix J**. Traffic reductions were not considered for the mitigation analysis.

**Table 26 - 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 / Echowoods Ave	F (E)	1.09 (0.99)	EBL	69.1 (109.0)	1.13 (1.18)	F (F)
	F (E)	1.18 (0.90)	NBT			
	(F)	(1.28)	SBT			
Carp Rd & Hazeldean Rd	F (F)	1.26 (1.18)	EBL	59.5 (64.3)	0.91 (1.18)	E (F)
	(E)	(0.92)	WBT			
	(F)	(1.12)	NBL			
	(F)	(1.37)	SBL			
	(E)	(0.93)	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



## Appendix C – Traffic Data

## Turning Movement Count - Study Results

### CARP RD @ ECHOWOODS AVE/KITTIWAKE DR

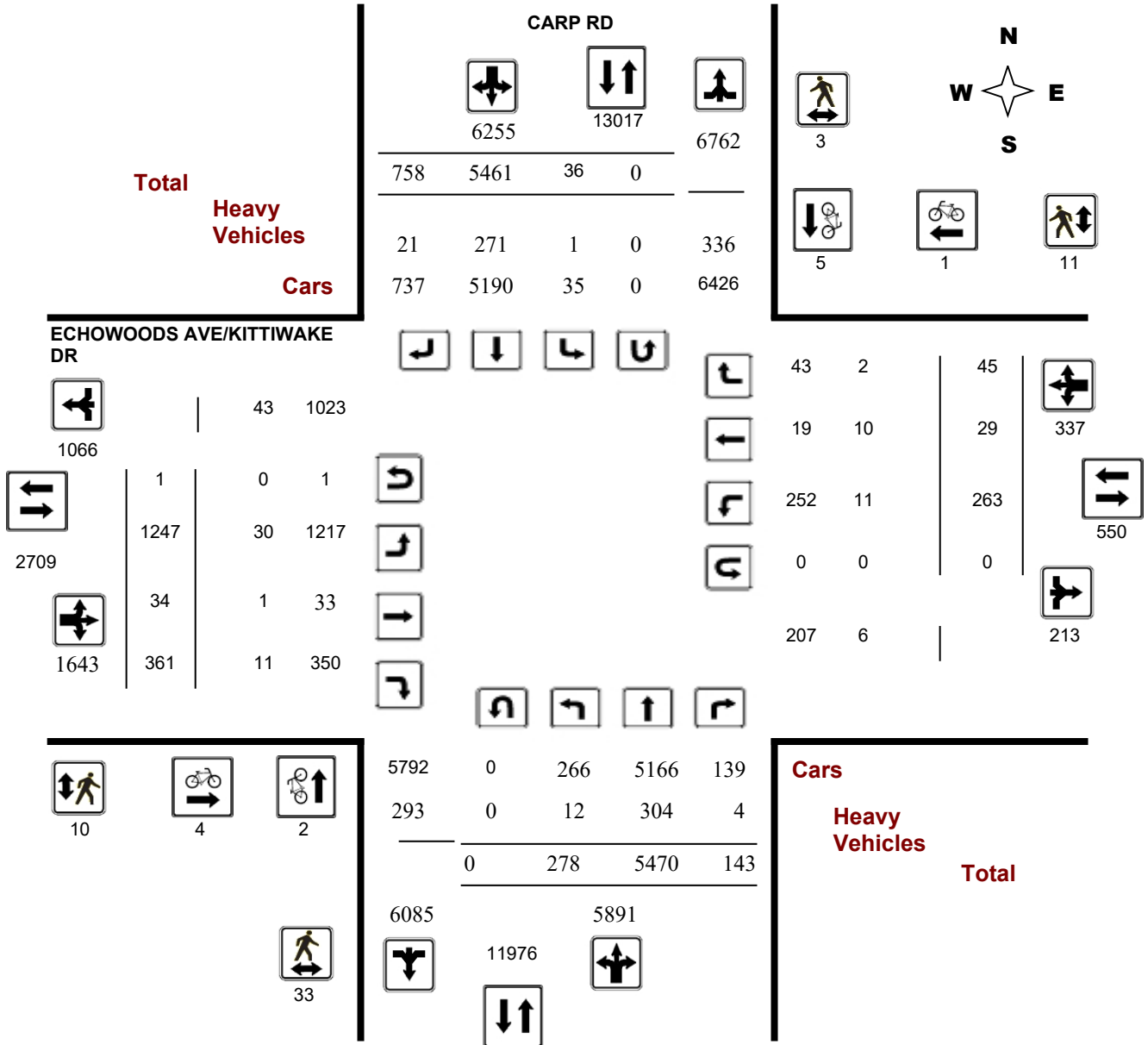
**Survey Date:** Thursday, May 04, 2017

**WO No:** 36996

**Start Time:** 07:00

**Device:** Miovision

### Full Study Diagram



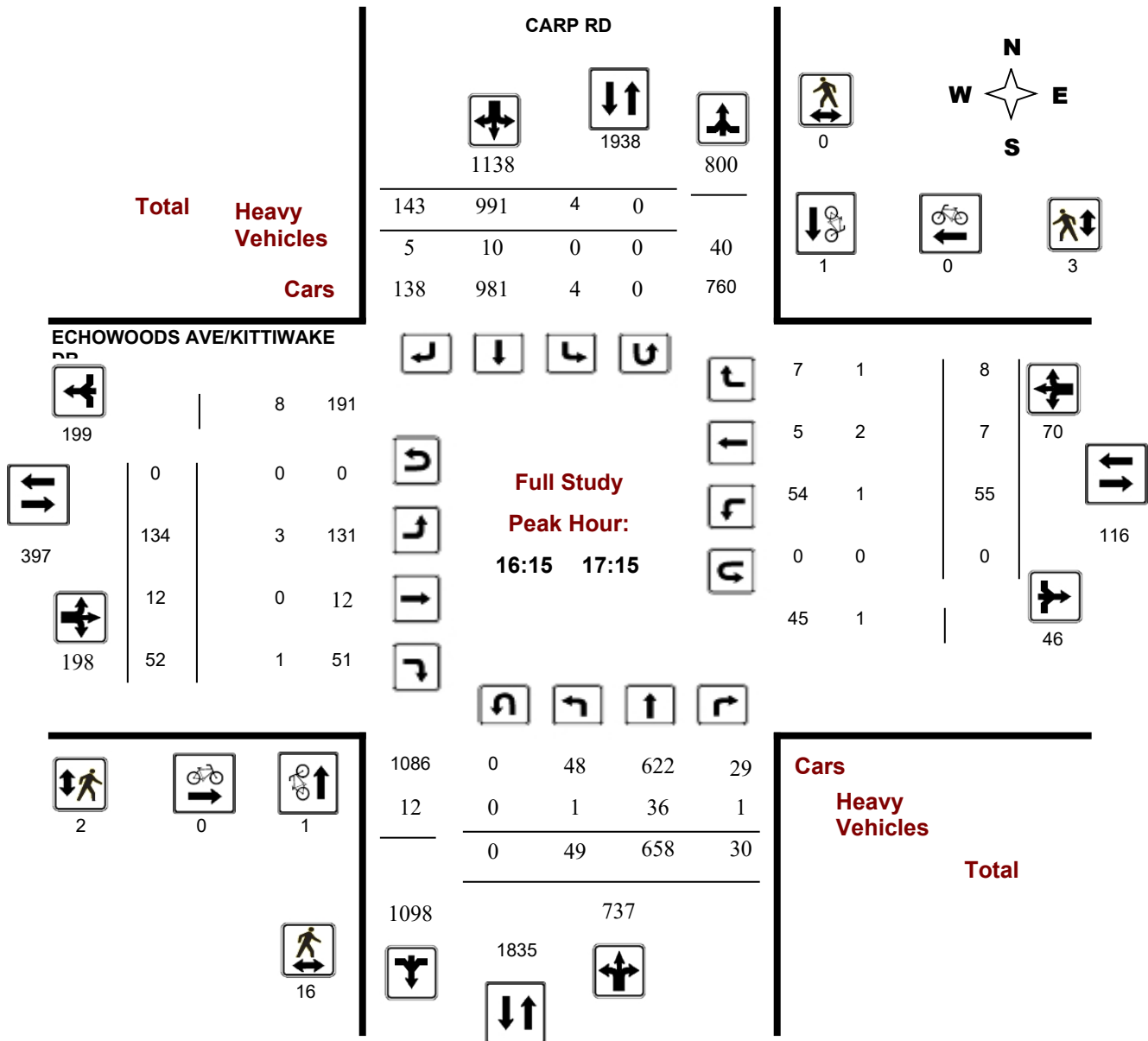
**Survey Date:** Thursday, May 04, 2017

**WO No:** 36996

**Start Time:** 07:00

**Device:** Miovision

### Full Study Peak Hour Diagram



## Turning Movement Count - Peak Hour Diagram

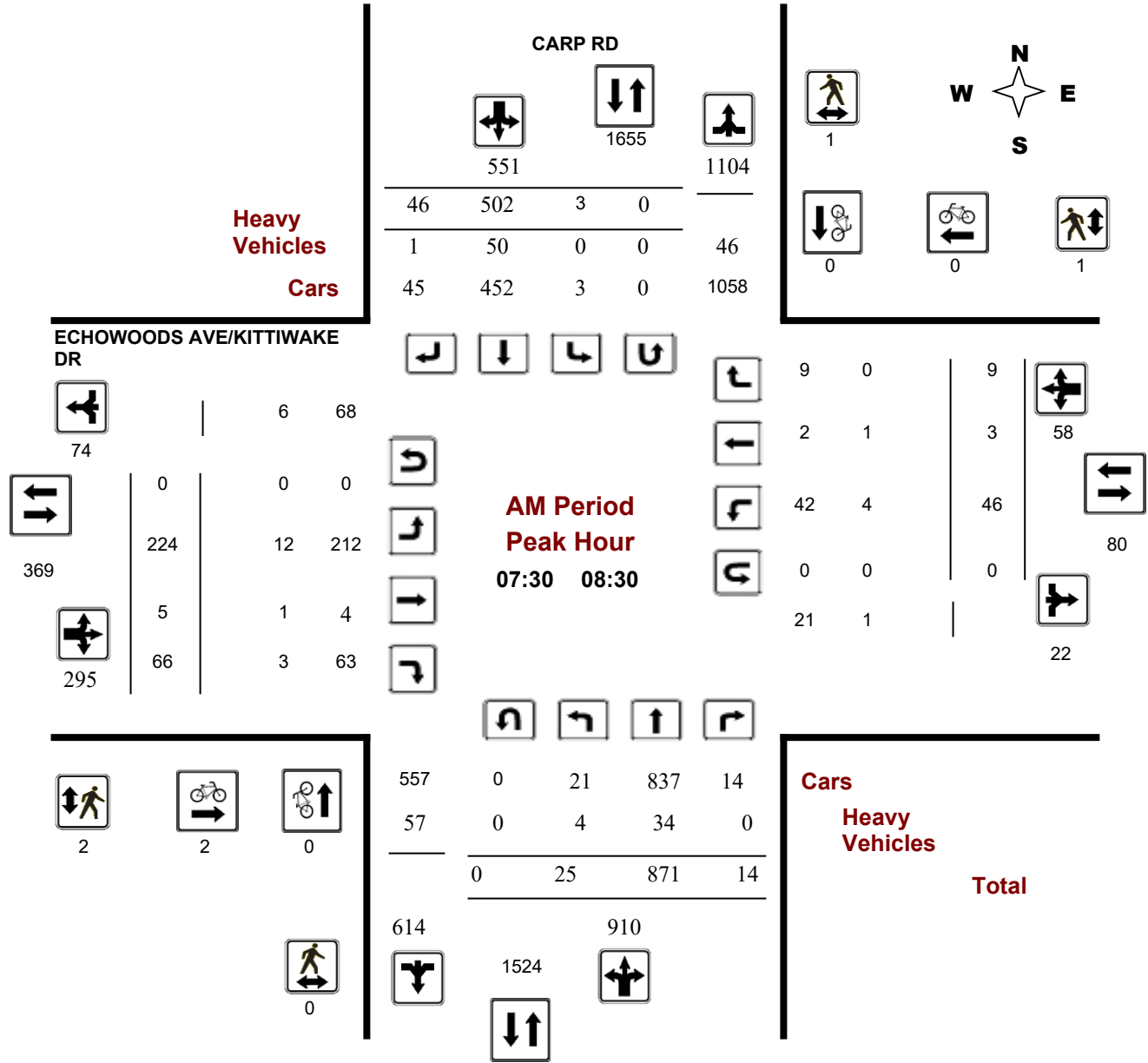
### CARP RD @ ECHOWOODS AVE/KITTIWAKE DR

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

**Start Time:** 07:00

**WO No:** 36996

**Device:** Miovision





## Turning Movement Count - Peak Hour Diagram

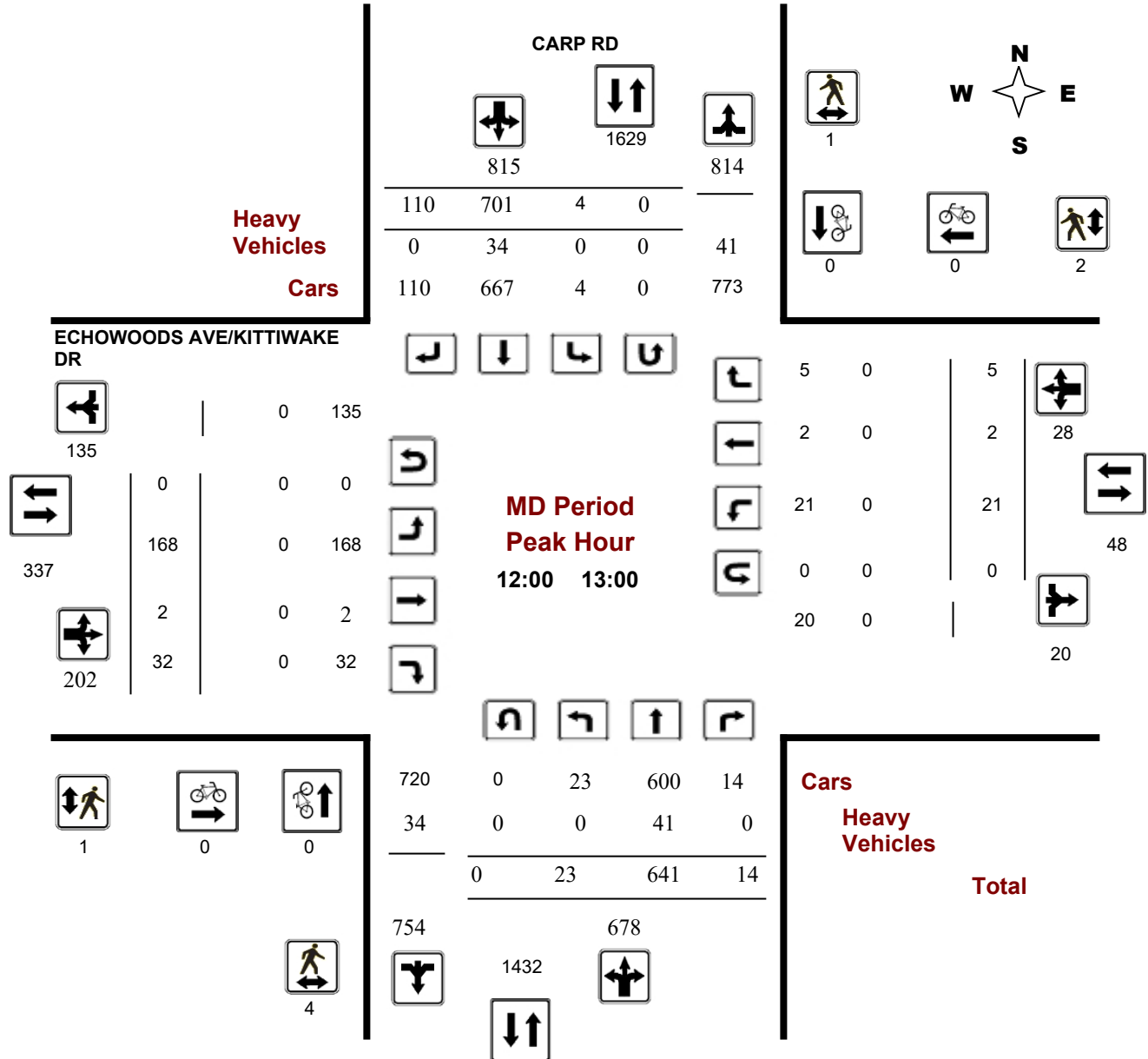
### CARP RD @ ECHOWOODS AVE/KITTIWAKE DR

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

**Start Time:** 07:00

**WO No:** 36996

**Device:** Miovision



## Turning Movement Count - Peak Hour Diagram

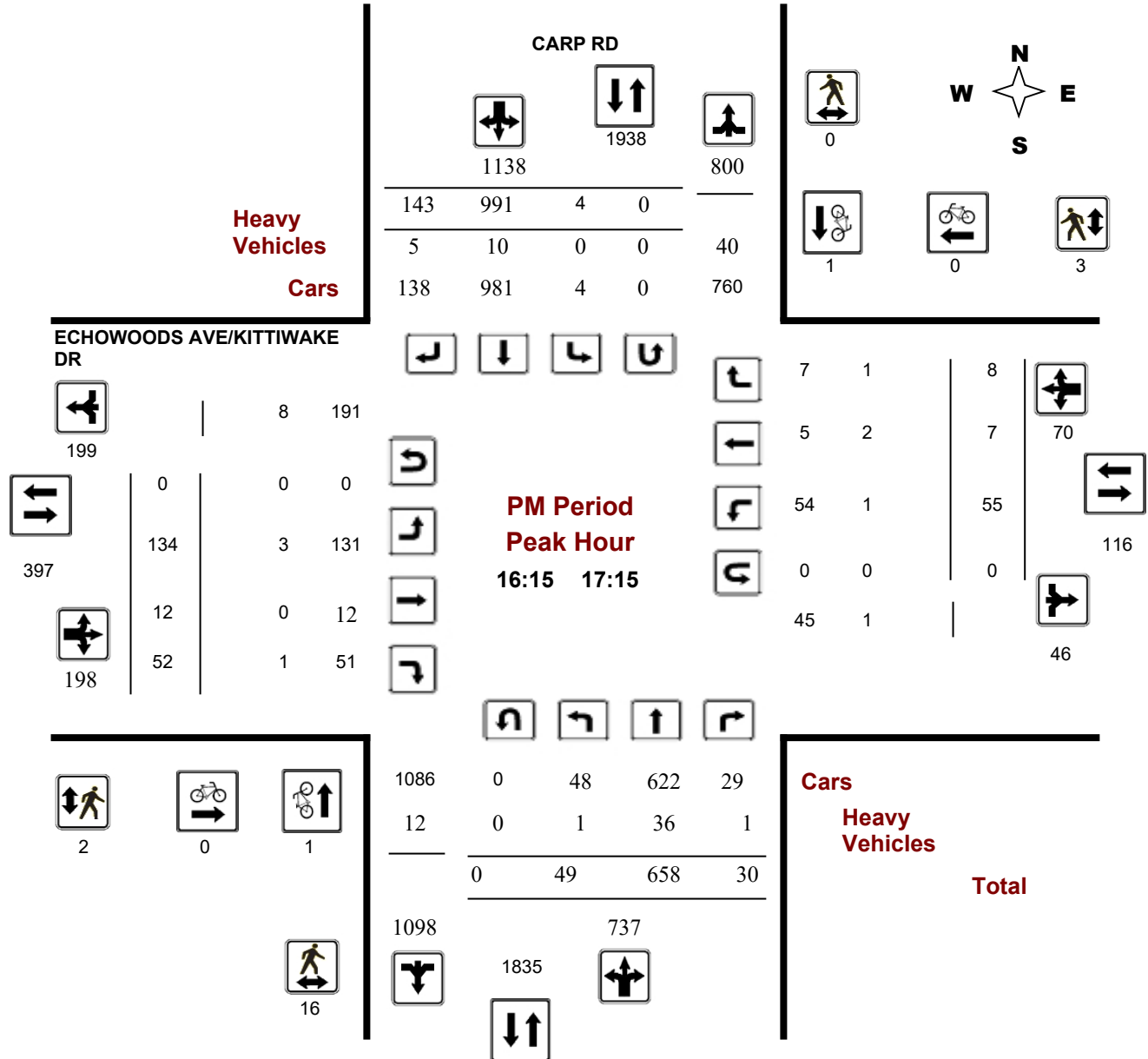
### CARP RD @ ECHOWOODS AVE/KITTIWAKE DR

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

**Start Time:** 07:00

**WO No:** 36996

**Device:** Miovision





# 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	
Total:	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



## Turning Movement Count - Study Results

### CARP RD @ HAZELDEAN RD

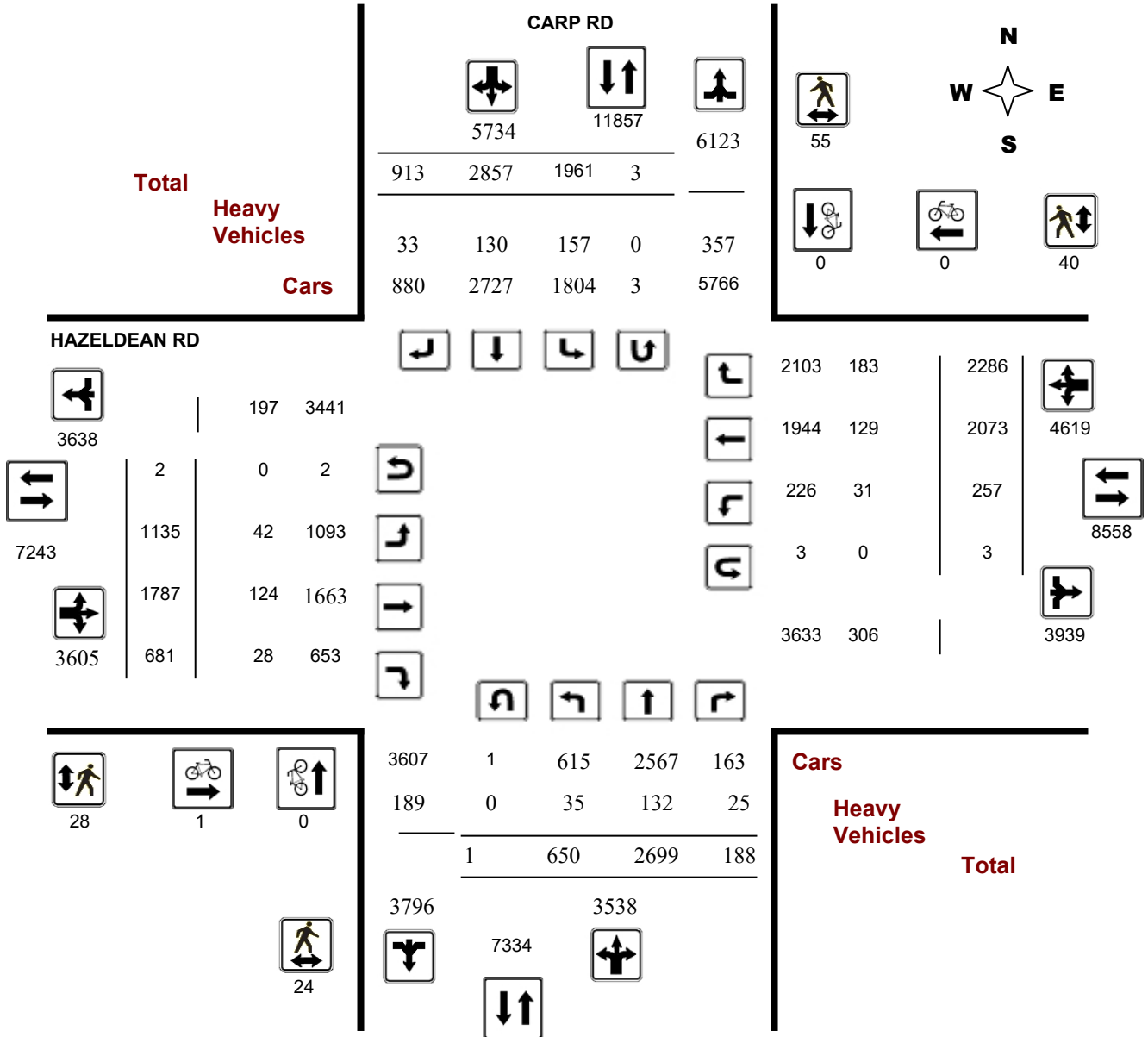
**Survey Date:** Thursday, November 23, 2017

**WO No:** 37338

**Start Time:** 07:00

**Device:** Miovision

### Full Study Diagram



## Turning Movement Count - Study Results

### CARP RD @ HAZELDEAN RD

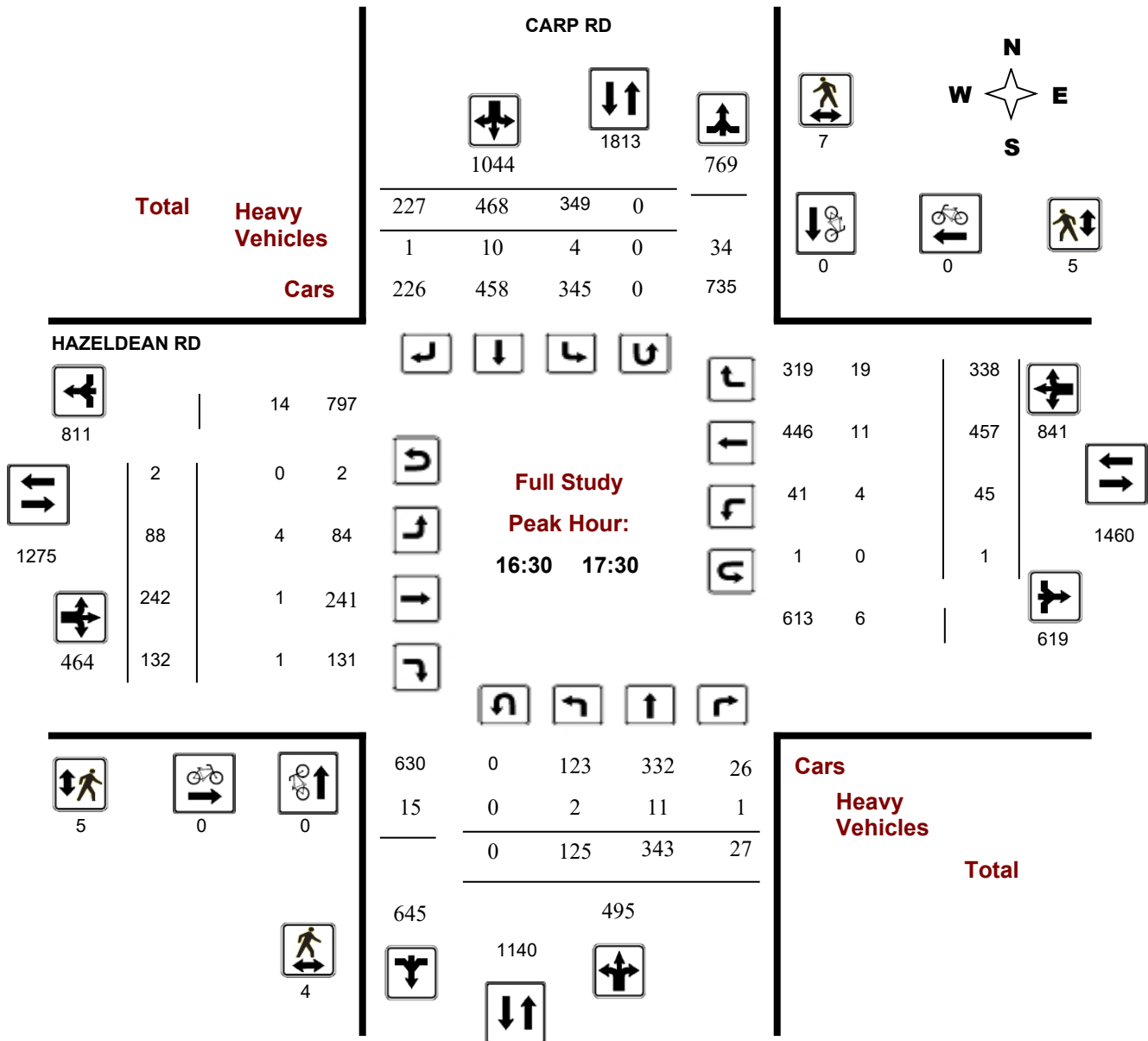
**Survey Date:** Thursday, November 23, 2017

**WO No:** 37338

**Start Time:** 07:00

**Device:** Miovision

### Full Study Peak Hour Diagram



## Turning Movement Count - Peak Hour Diagram

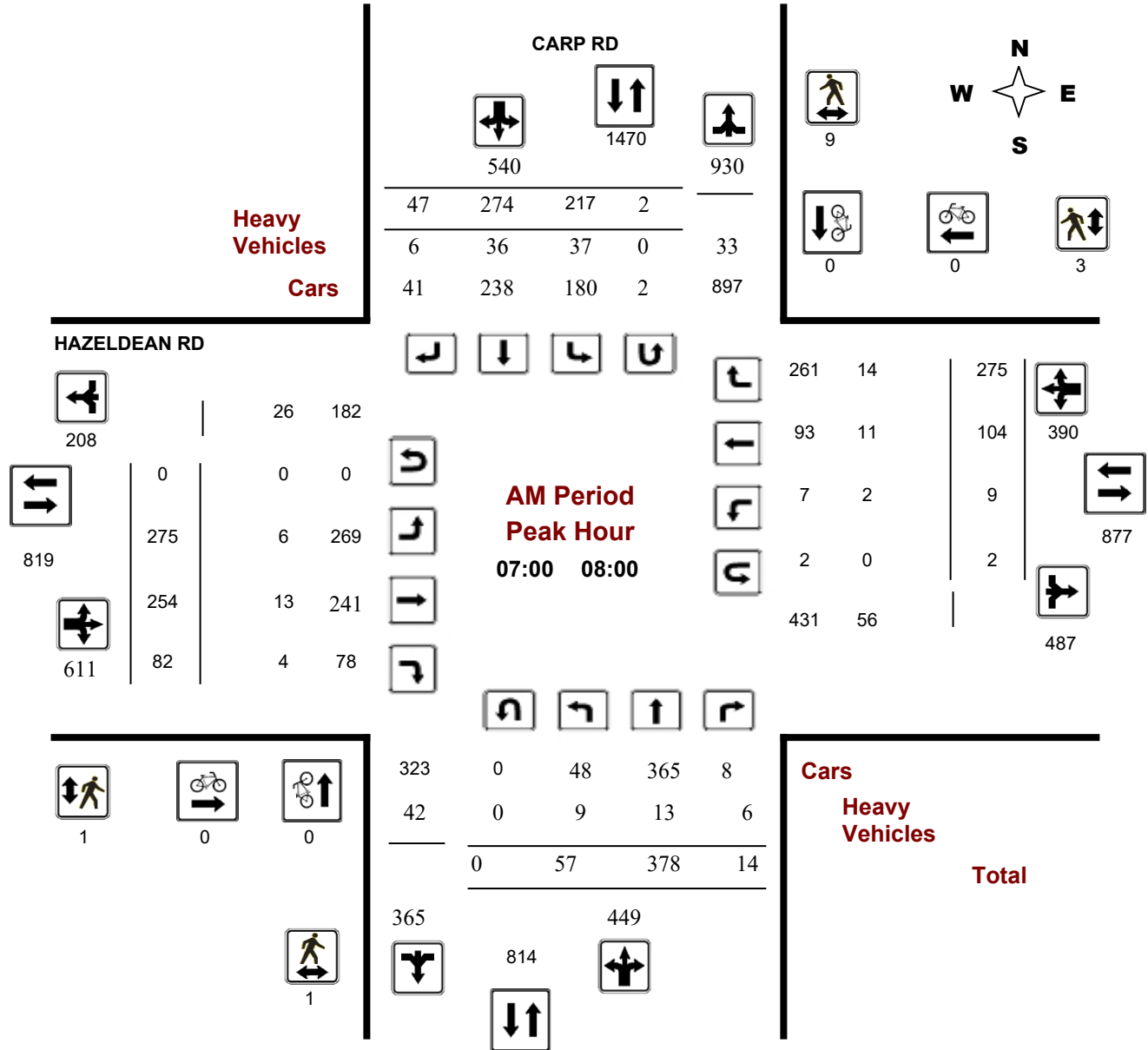
### CARP RD @ HAZELDEAN RD

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

**Start Time:** 07:00

**WO No:** 37338

**Device:** Miovision



## Turning Movement Count - Peak Hour Diagram

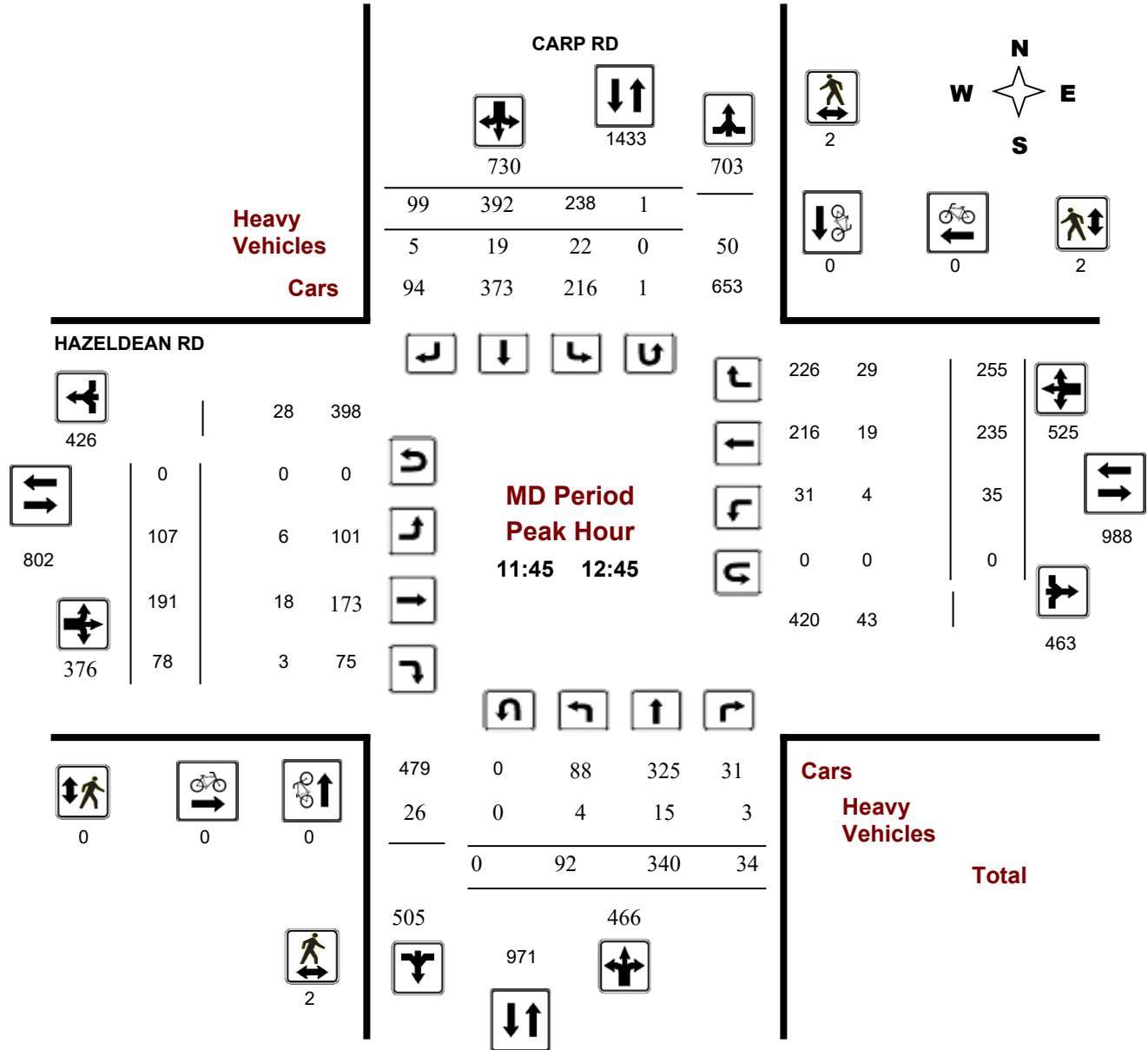
### CARP RD @ HAZELDEAN RD

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

**Start Time:** 07:00

**WO No:** 37338

**Device:** Miovision



**Comments**

## Turning Movement Count - Peak Hour Diagram

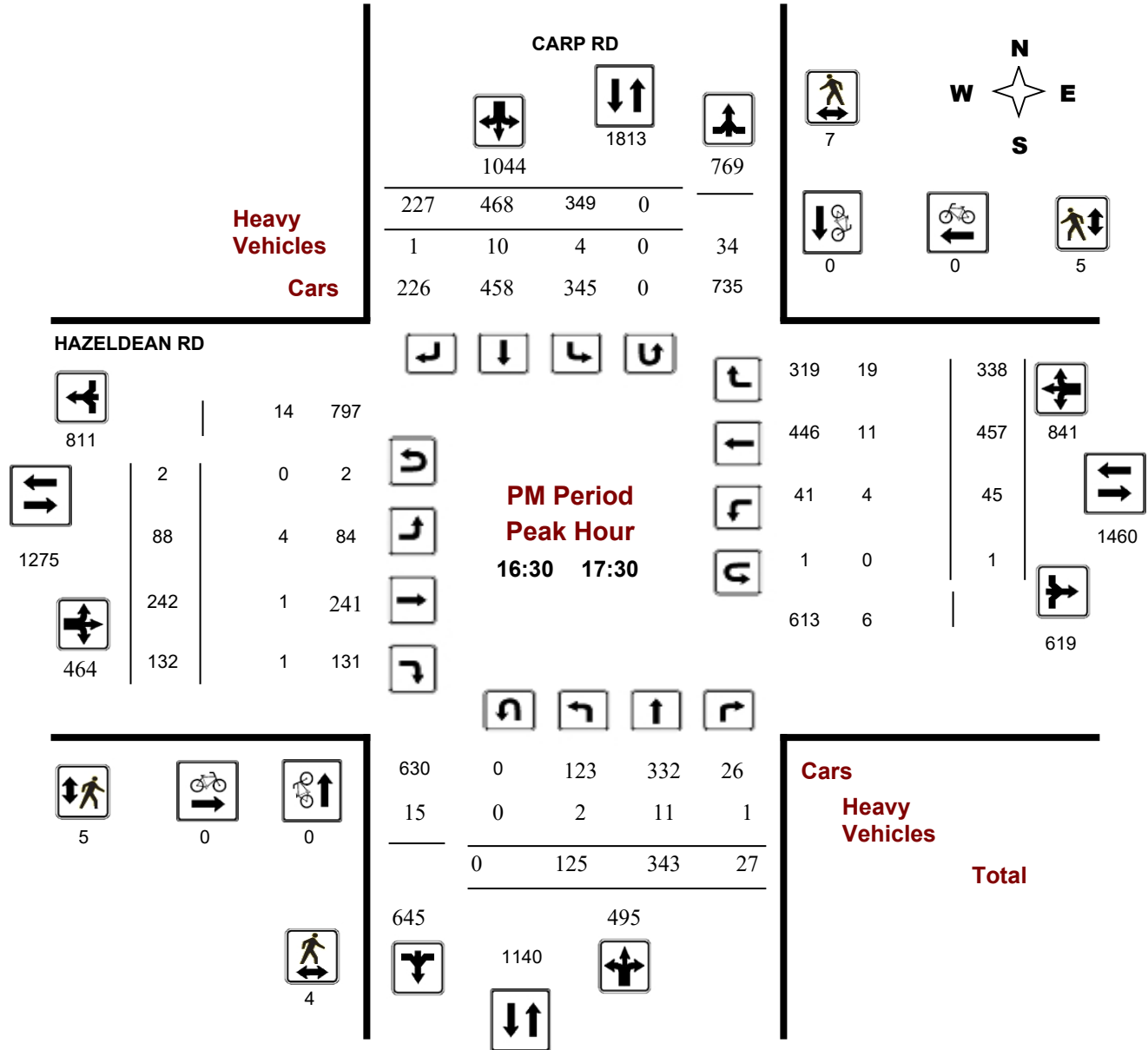
### CARP RD @ HAZELDEAN RD

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

**Start Time:** 07:00

**WO No:** 37338

**Device:** Miovision



**Comments**



# 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

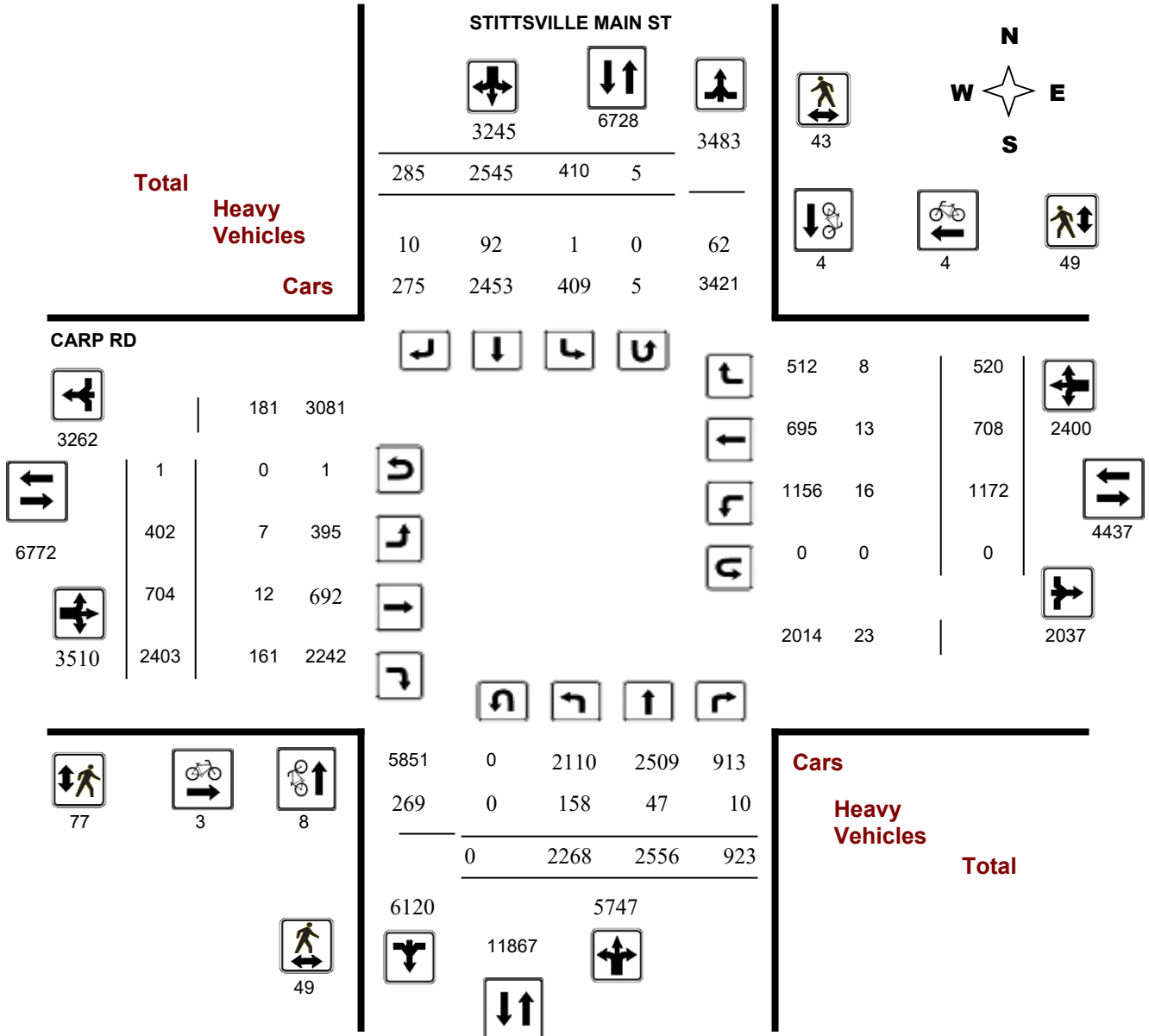
**Survey Date:** Thursday, May 04, 2017

**Start Time:** 07:00

**WO No:** 36999

**Device:** Miovision

### Full Study Diagram



## Turning Movement Count - Study Results

### CARP RD @ STITTSVILLE MAIN ST

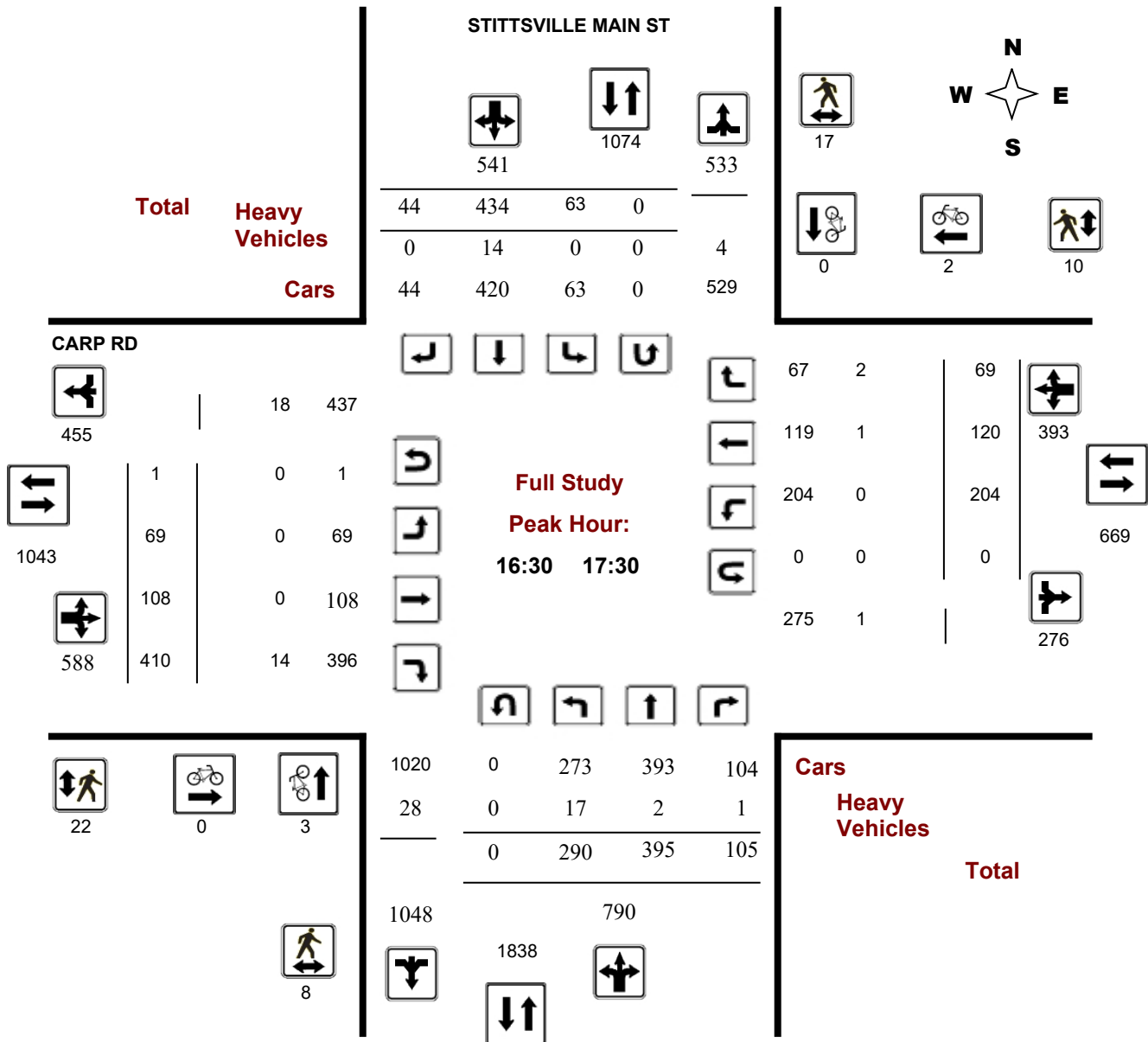
**Survey Date:** Thursday, May 04, 2017

**WO No:** 36999

**Start Time:** 07:00

**Device:** Miovision

### Full Study Peak Hour Diagram



## Turning Movement Count - Peak Hour Diagram

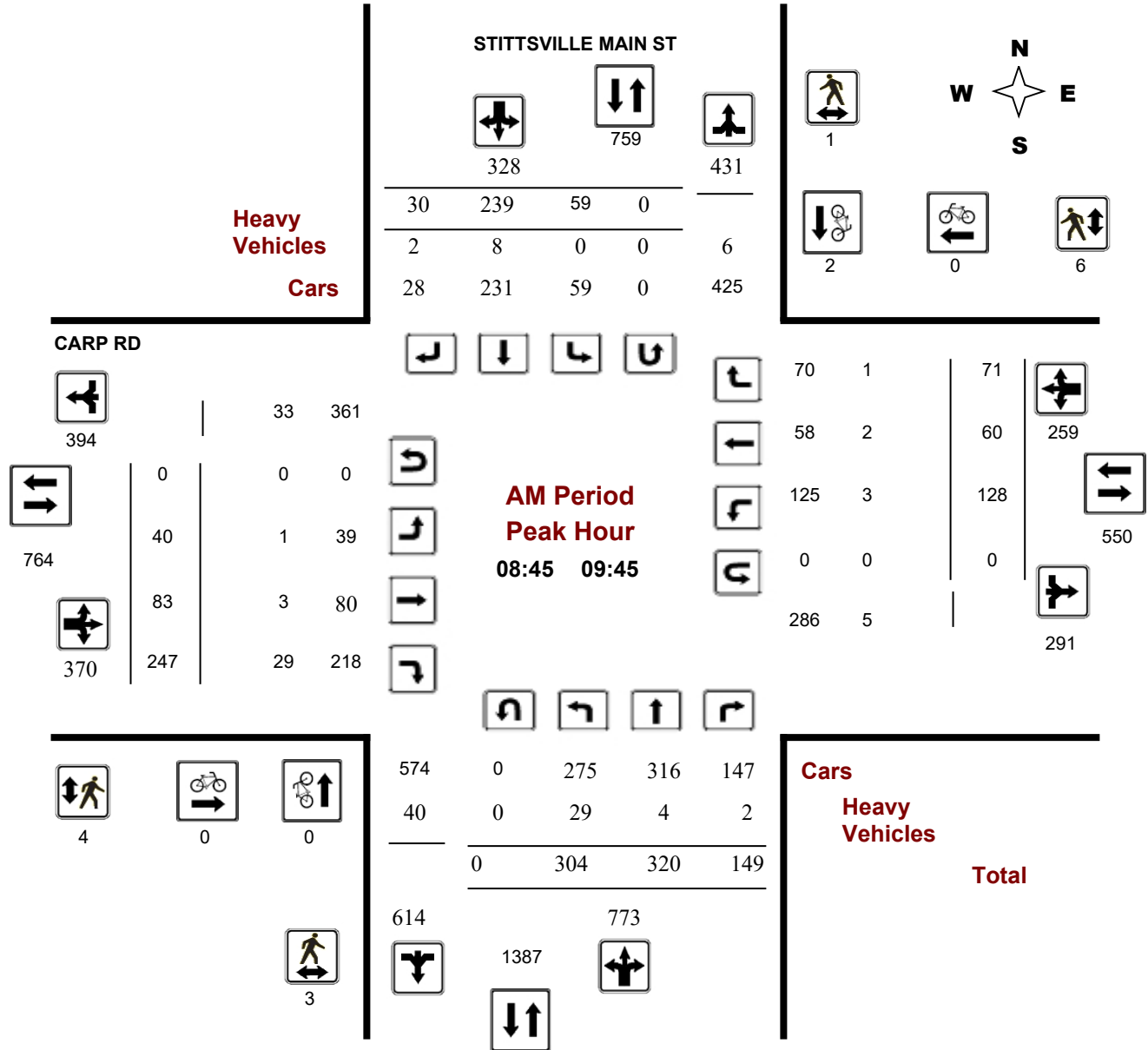
### CARP RD @ STITTSVILLE MAIN ST

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

**Start Time:** 07:00

**WO No:** 36999

**Device:** Miovision



**Comments**

## Turning Movement Count - Peak Hour Diagram

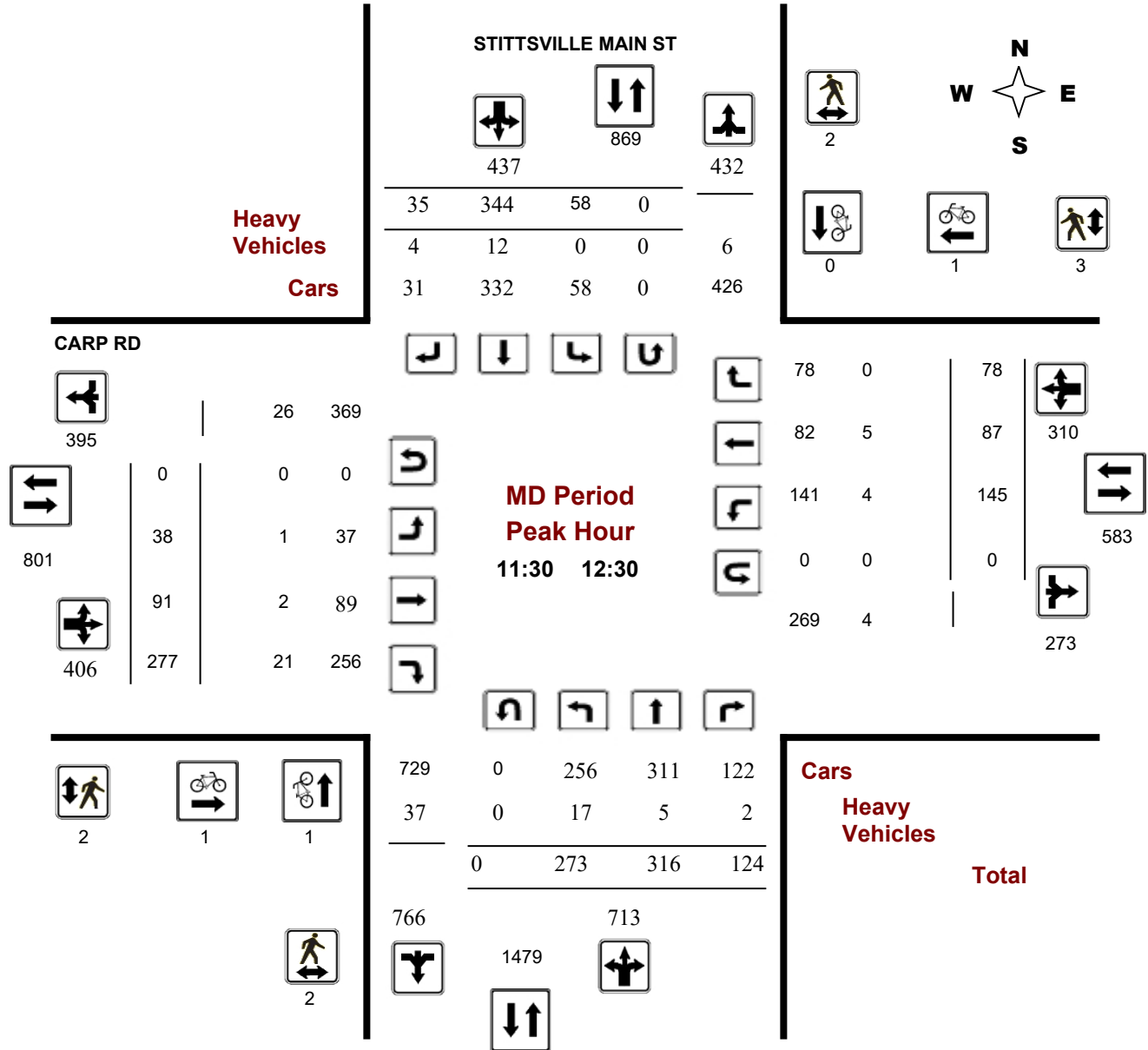
### CARP RD @ STITTSVILLE MAIN ST

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

**Start Time:** 07:00

**WO No:** 36999

**Device:** Miovision



## Turning Movement Count - Peak Hour Diagram

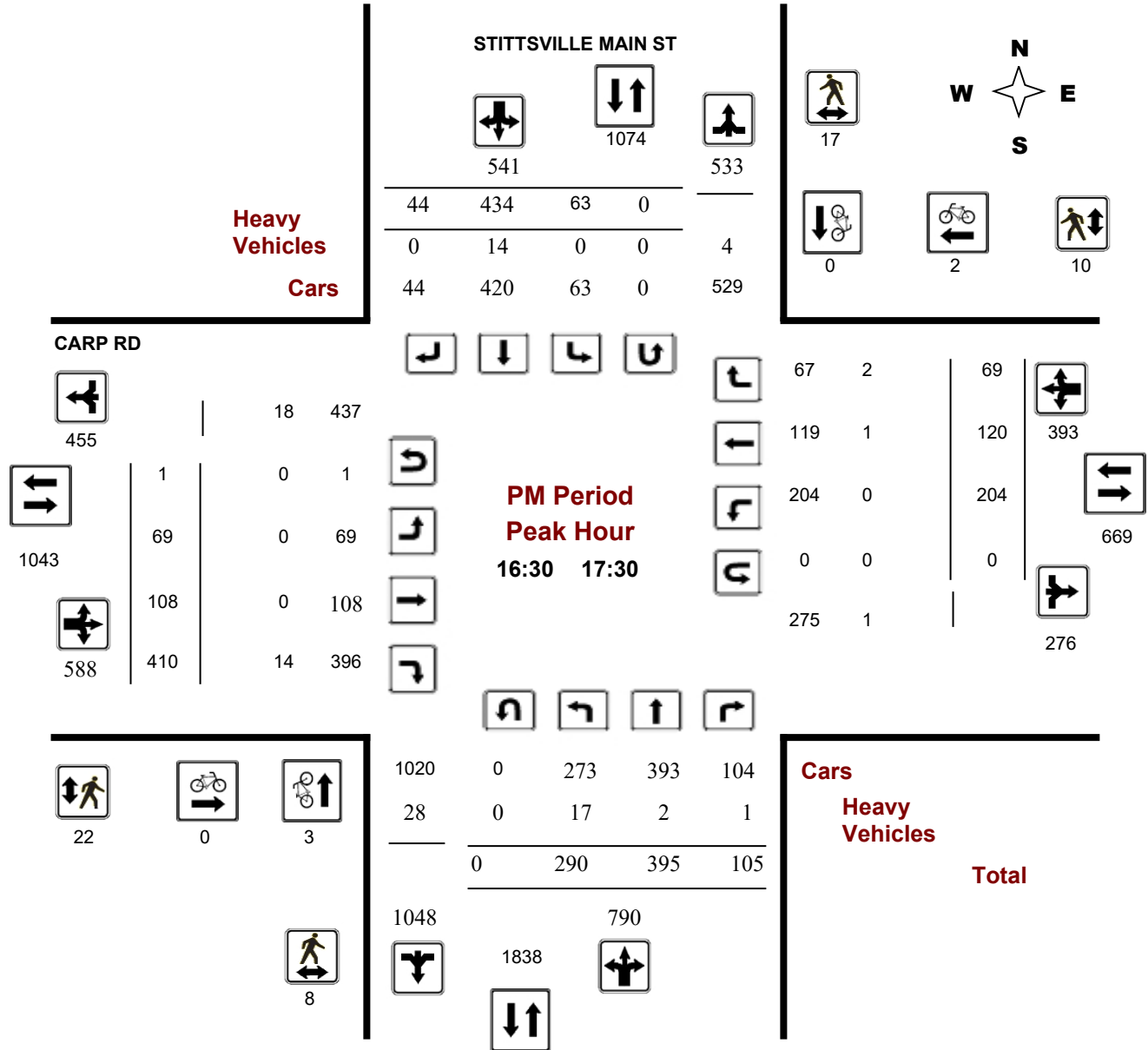
### CARP RD @ STITTSVILLE MAIN ST

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

**AADT Factor**  
 .90

#### STITTSVILLE MAIN ST

#### CARP RD

Period	Northbound					Southbound					Eastbound					Westbound					Grand Total
	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT			
07:00 08:00	314	238	118	670	32	160	25	217	887	47	59	218	324	75	56	52	183	507	1394		
08:00 09:00	304	288	124	716	48	222	21	291	1007	40	72	239	351	94	65	56	215	566	1573		
09:00 10:00	291	326	148	765	54	241	27	322	1087	43	76	229	348	128	66	74	268	616	1703		
11:30 12:30	273	316	124	713	58	344	35	437	1150	38	91	277	406	145	87	78	310	716	1866		
12:30 13:30	249	305	97	651	52	285	33	370	1021	56	85	277	418	163	78	79	320	738	1759		
15:00 16:00	263	325	107	695	62	415	60	537	1232	54	98	356	508	179	118	60	357	865	2097		
16:00 17:00	290	385	116	791	50	424	31	505	1296	65	112	390	567	197	126	57	380	947	2243		
17:00 18:00	284	373	89	746	54	454	53	561	1307	59	111	417	587	191	112	64	367	954	2261		
<b>Sub Total</b>	2268	2556	923	5747	410	2545	285	3240	8987	402	704	2403	3509	1172	708	520	2400	5909	14896		
<b>U Turns</b>				0				5	5				1				0	1	6		
<b>Total</b>	2268	2556	923	5747	410	2545	285	3245	8992	402	704	2403	3510	1172	708	520	2400	5910	14902		
<b>EQ 12Hr</b>	3153	3553	1283	7988	570	3538	396	4511	12499	559	979	3340	4879	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	483	3001	336	3826	11249	474	830	2833	4138	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	633	3931	440	5012	13888	621	1087	3711	5421	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
<b>Total:</b>	<b>2268</b>	<b>2556</b>	<b>923</b>	<b>5747</b>	<b>410</b>	<b>2545</b>	<b>285</b>	<b>3245</b>	<b>318</b>	<b>402</b>	<b>704</b>	<b>2403</b>	<b>3510</b>	<b>1172</b>	<b>708</b>	<b>520</b>	<b>2400</b>	<b>318</b>	<b>14,902</b>

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

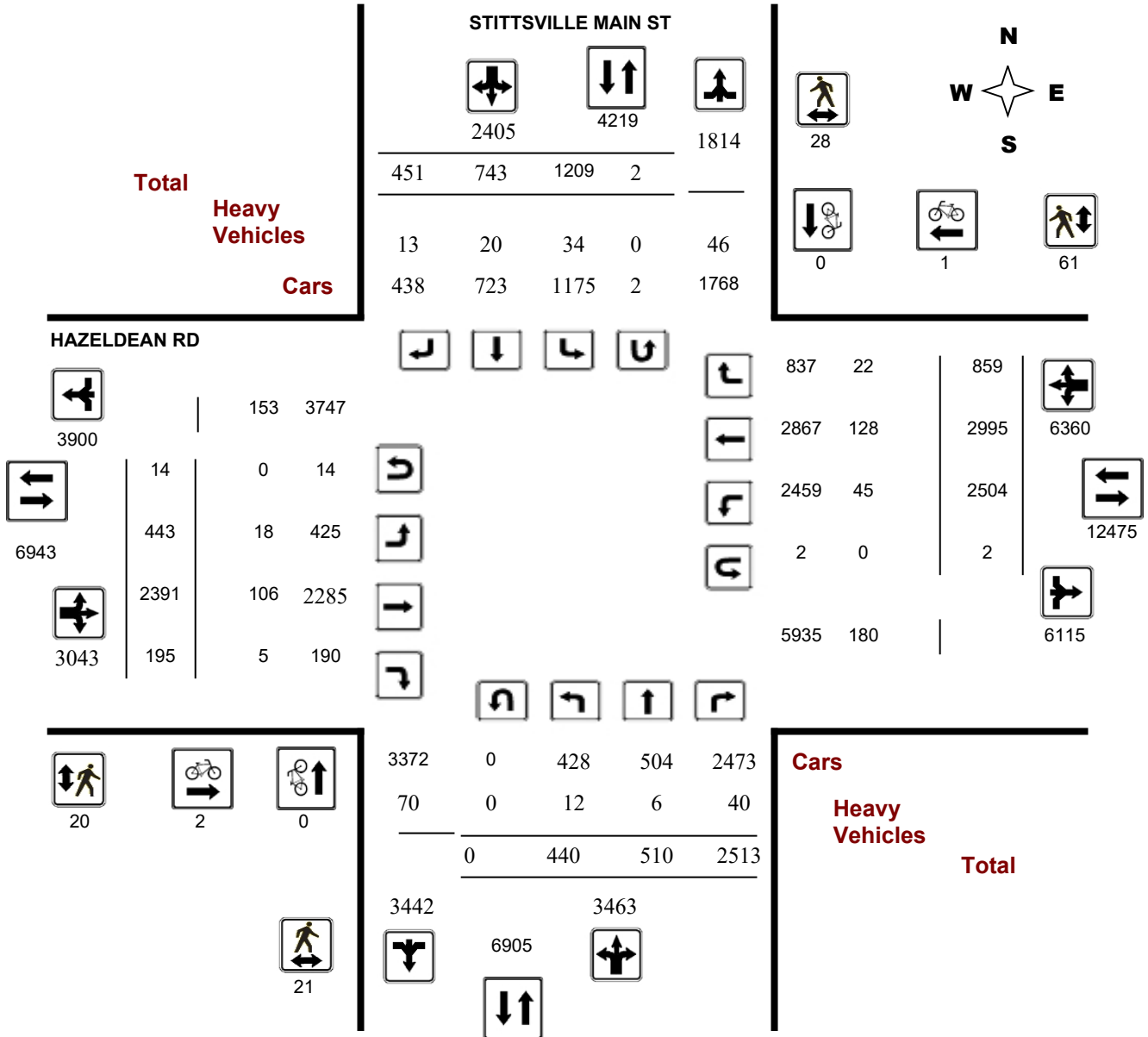
**Survey Date:** Wednesday, March 23, 2016

**WO No:** 35821

**Start Time:** 07:00

**Device:** Miovision

### Full Study Diagram



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

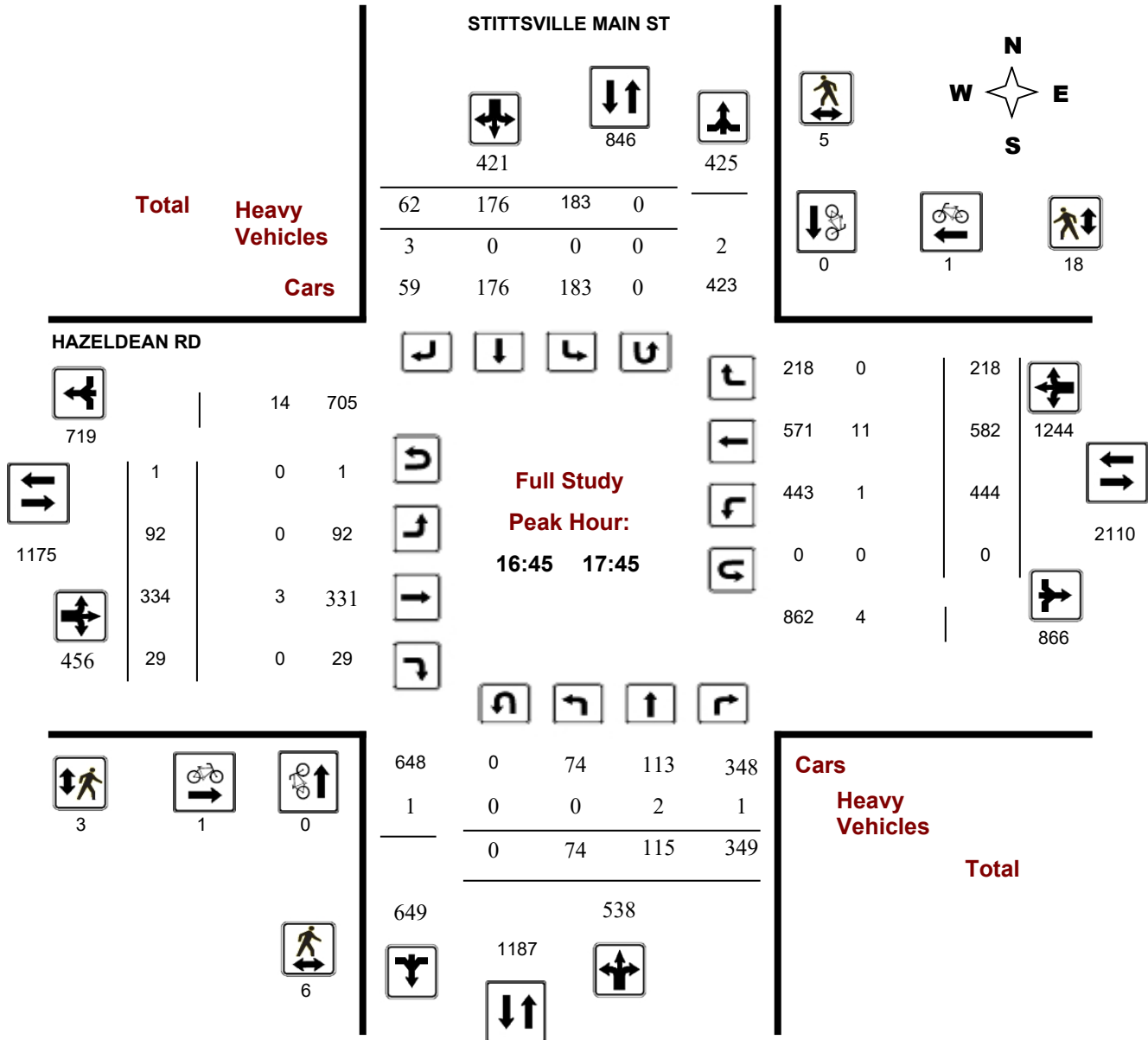
**Survey Date:** Wednesday, March 23, 2016

**WO No:** 35821

**Start Time:** 07:00

**Device:** Miovision

### Full Study Peak Hour Diagram





## Turning Movement Count - Peak Hour Diagram

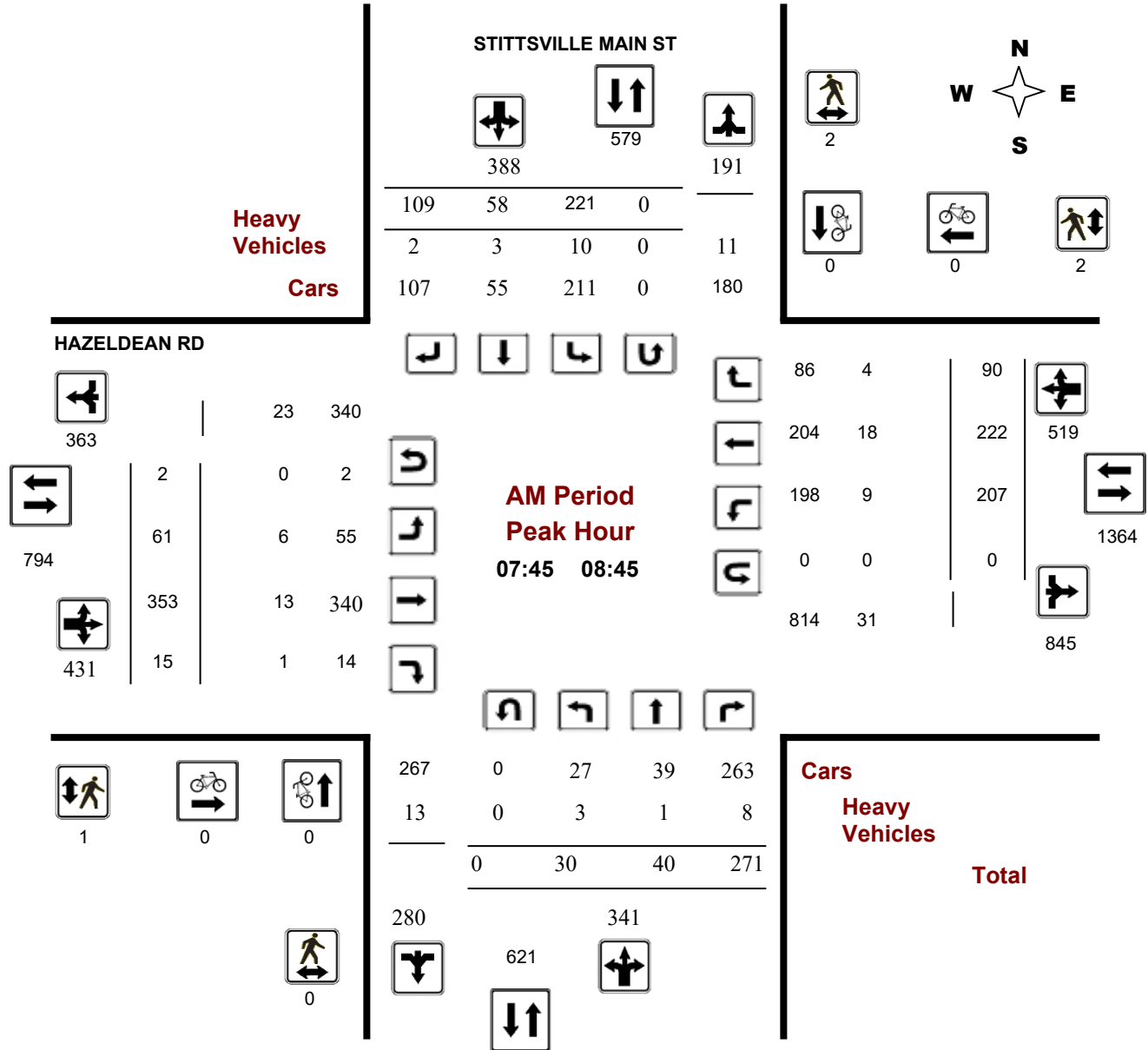
### STITTSVILLE MAIN ST @ HAZELDEAN RD

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

**Start Time:** 07:00

**WO No:** 35821

**Device:** Miovision



## Turning Movement Count - Peak Hour Diagram

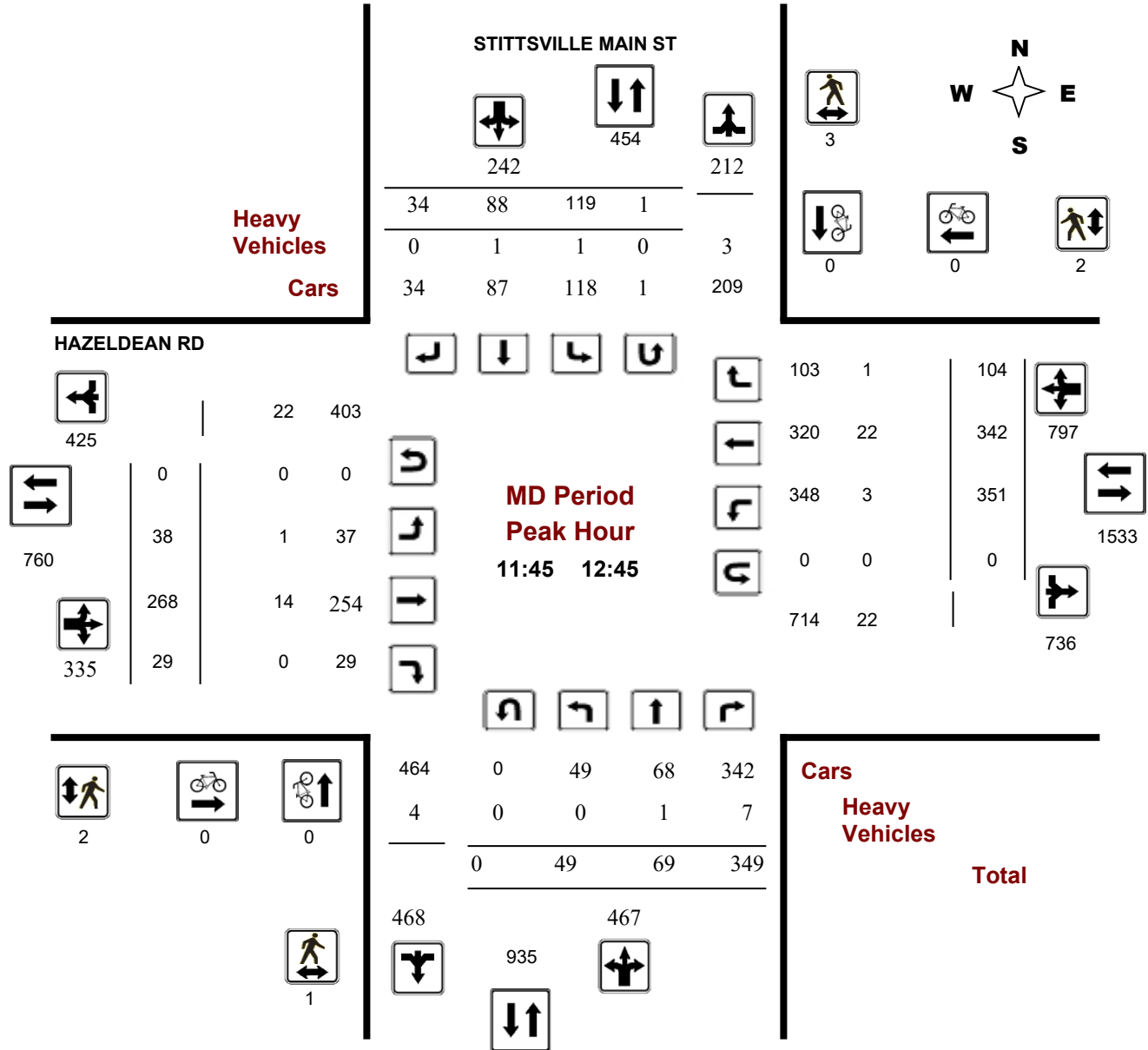
### STITTSVILLE MAIN ST @ HAZELDEAN RD

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

**Start Time:** 07:00

**WO No:** 35821

**Device:** Miovision



**Comments**

## Turning Movement Count - Peak Hour Diagram

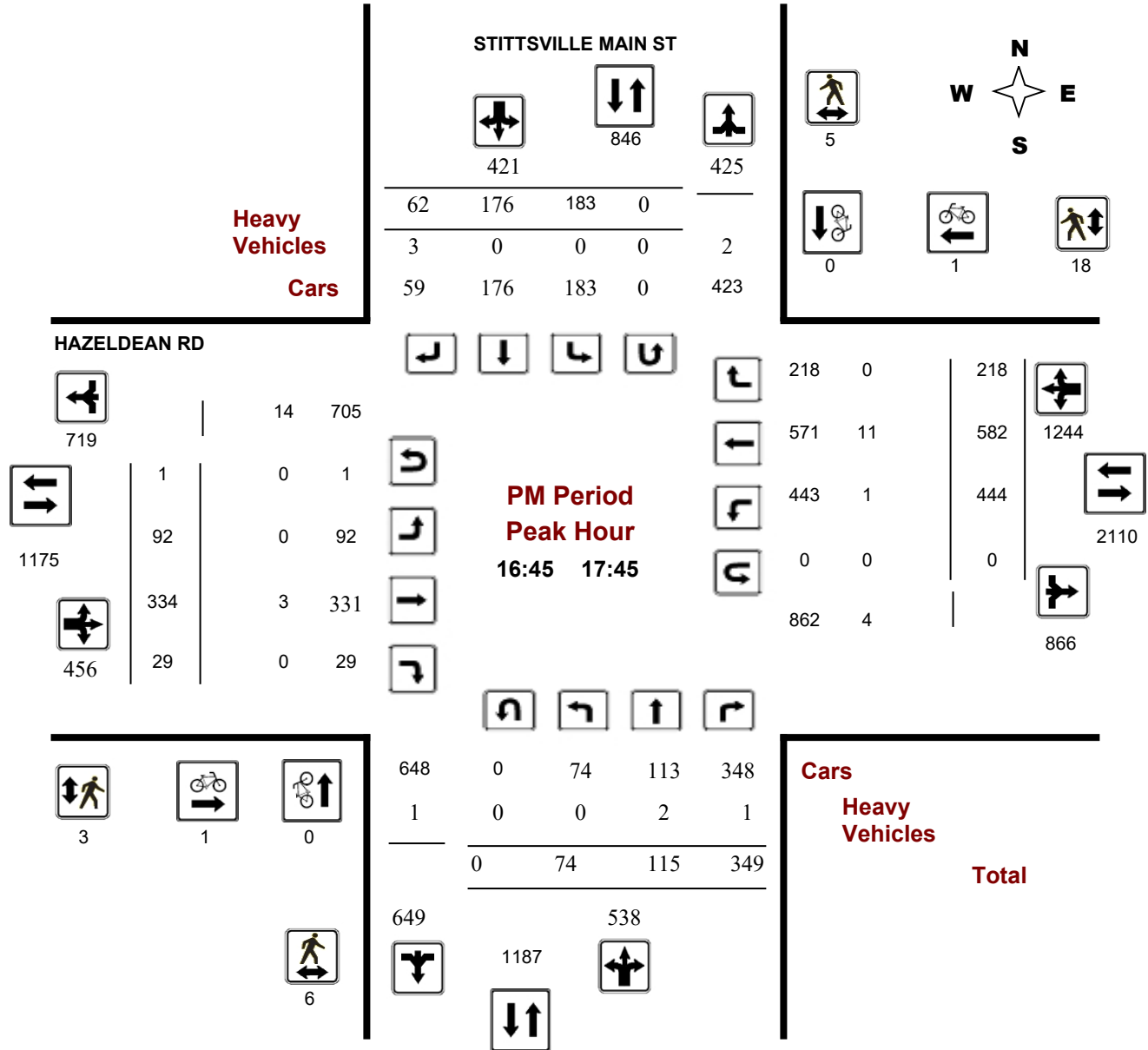
### STITTSVILLE MAIN ST @ HAZELDEAN RD

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

**Start Time:** 07:00

**WO No:** 35821

**Device:** Miovision





# 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
<b>Total:</b> 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

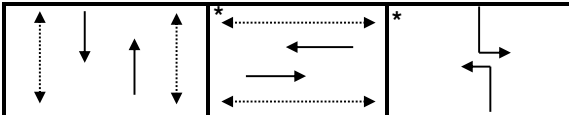
<b>Intersection:</b>	<i>Main:</i> Carp	<i>Side:</i> Hazeldean
<b>Controller:</b>	MS-3200	<b>TSD:</b> 5639
<b>Author:</b>	R. Doueidar	<b>Date:</b> 06-Mar-2020

### Existing Timing Plans†

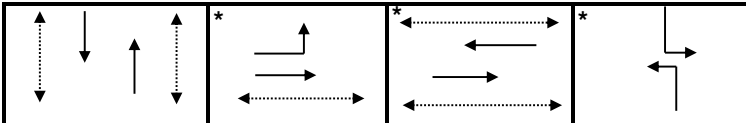
	Plan				Ped Minimum Time		
	AM Peak 1	Off Peak 2	PM Peak 3	Night 4	Walk	DW	A+R
<b>Cycle</b>	115	110	120	85			
<b>Offset</b>	107	X	8	X			
NB Thru	35	35	40	32	7	18	3.7+2.4
SB Thru	35	35	40	32	7	18	3.7+2.4
EB Left	15	-	-	-	-	-	3.7+2.4
EB Thru	53	40	52	38	7	24	3.7+2.9
WB Thru	38	40	52	38	7	24	3.7+2.9
SB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

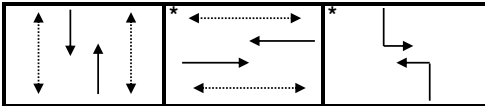
<b>Intersection:</b>	<i>Main:</i> Stittsville Main	<i>Side:</i> Carp
<b>Controller:</b>	MS-3200	TSD: 6045
<b>Author:</b>	R. Doueidar	<b>Date:</b> 06-Mar-2020

### Existing Timing Plans†

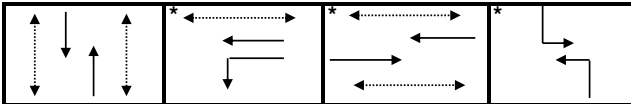
	Plan				Ped Minimum Time		
	AM Peak 1	Off Peak 2	PM Peak 3	Night 4	Walk	DW	A+R
<b>Cycle</b>	80	90	90	60			
<b>Offset</b>	0	2	2	X			
NB Thru	35	33	32	31	7	17	3.3+2.2
SB Thru	35	33	32	31	7	17	3.3+2.2
WBLT	-	13	15	-	-	-	3.3+1.8
WB Thru	30	42	44	29	7	16	3.3+1.8
EB Thru	30	29	29	29	7	16	3.3+1.8
NBLT	15	15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

### Phasing Sequence‡

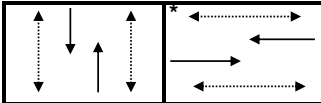
Plan: 1



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

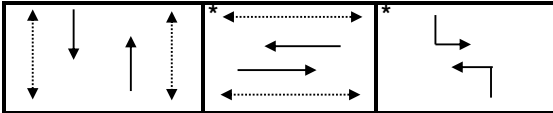
<b>Intersection:</b>	<i>Main:</i> Carp	<i>Side:</i> Echowoods/Kittiwake
<b>Controller:</b>	MS-3200	TSD: 6585
<b>Author:</b>	R. Doueidar	Date: 06-Mar-2020

### Existing Timing Plans†

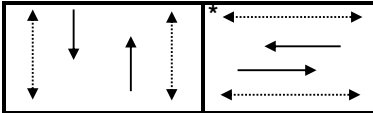
	Plan				Ped Minimum Time		
	AM Peak 1	Off Peak 2	PM Peak 3	Night 4	Walk	DW	A+R
<b>Cycle</b>	115	100	120	80			
<b>Offset</b>	7	X	11	X			
NB Thru	63	55	63	45	7	17	3.7+2.3
SB Thru	63	55	63	45	7	17	3.7+2.3
EB Thru	40	34	35	35	7	16	3.0+3.3
WB Thru	40	34	35	35	7	16	3.0+3.3
NB Left	12	11	22	-	-	-	3.7+1.9
SB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

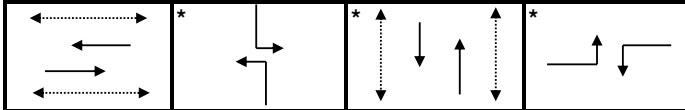
<b>Intersection:</b>	<i>Main:</i> Hazeldean	<i>Side:</i> Stittsville Main
<b>Controller:</b>	<b>MS 3200</b>	<b>TSD: 6641</b>
<b>Author:</b>	Matthew Anderson	<b>Date:</b> 30-Oct-2020

### Existing Timing Plans<sup>†</sup>

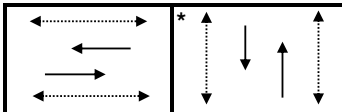
	Plan					Ped Minimum Time		
	AM Peak 1	Off Peak 2	PM Peak 3	Night 4	Saturday 12	Walk	DW	A+R
<b>Cycle</b>	115	120	120	85	115			
<b>Offset</b>	85	X	113	X	X			
NB Thru	47	42	42	45	42	7	23	3.7+3.0
SB Thru	47	42	42	45	42	7	23	3.7+3.0
EB Thru	19	16	19	-	16	-	-	3.3+3.0
WB Thru	19	16	19	-	16	-	-	3.3+3.0
NB Left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

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

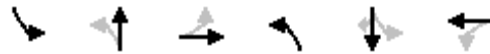
Existing (2020)  
 AM Peak Hour

												
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	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			61.4									E
HCM 2000 Volume to Capacity ratio			1.05									
Actuated Cycle Length (s)			115.0							17.9		
Intersection Capacity Utilization			94.2%									F
Analysis Period (min)			15									

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

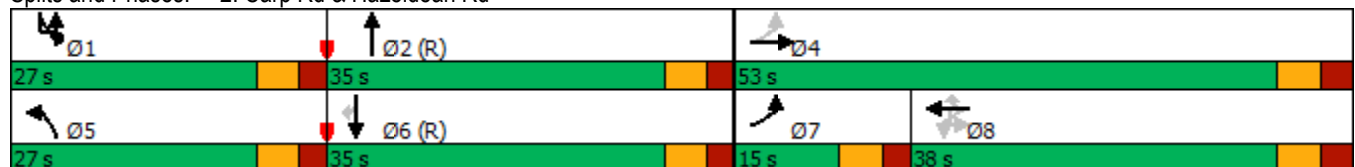


Phase Number	1	2	4	5	6	7	8
Movement	SBL	NBT	EBTL	NBL	SBT	EBL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lag
Lead-Lag Optimize							
Recall Mode	None	C-Max	None	None	C-Max	None	None
Maximum Split (s)	27	35	53	27	35	15	38
Maximum Split (%)	23.5%	30.4%	46.1%	23.5%	30.4%	13.0%	33.0%
Minimum Split (s)	11	31.1	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

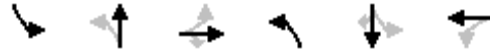


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↗		↖	↗		↖	↑	↗
Traffic Volume (vph)	42	88	262	136	64	78	322	351	158	73	278	32
Future Volume (vph)	42	88	262	136	64	78	322	351	158	73	278	32
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
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
HCM 2000 Volume to Capacity ratio	0.65	B
Actuated Cycle Length (s)	80.0	Sum of lost time (s)
Intersection Capacity Utilization	74.2%	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)

Existing (2020)  
 AM Peak Hour

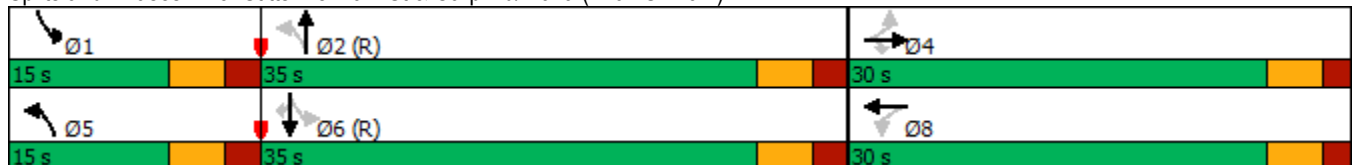


Phase Number	1	2	4	5	6	8
Movement	SBL	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	15	35	30	15	35	30
Maximum Split (%)	18.8%	43.8%	37.5%	18.8%	43.8%	37.5%
Minimum Split (s)	10.5	29.5	28.1	10.5	29.5	28.1
Yellow 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



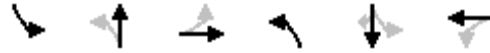
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	142	13	55	58	7	78	52	697	32	116	1050	152
Future Volume (vph)	142	13	55	58	7	78	52	697	32	116	1050	152
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	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
HCM 2000 Volume to Capacity ratio	1.06	E
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	94.0%	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)  
 PM Peak Hour

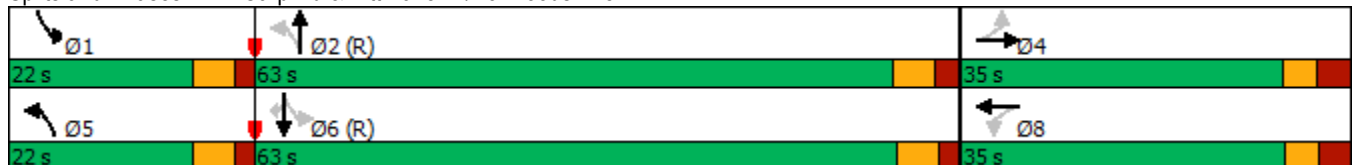


Phase Number	1	2	4	5	6	8
Movement	SBL	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	22	63	35	22	63	35
Maximum Split (%)	18.3%	52.5%	29.2%	18.3%	52.5%	29.2%
Minimum Split (s)	10.6	30	29.3	10.6	29.7	29
Yellow Time (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

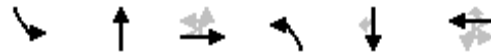
Existing (2020)  
PM Peak Hour



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

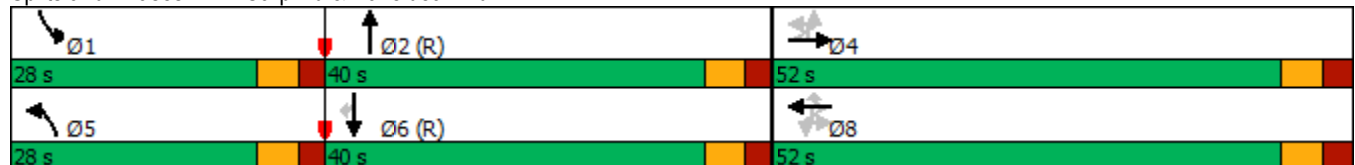


Phase Number	1	2	4	5	6	8
Movement	SBL	NBT	EBTL	NBL	SBT	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	28	40	52	28	40	52
Maximum Split (%)	23.3%	33.3%	43.3%	23.3%	33.3%	43.3%
Minimum Split (s)	11	31.1	37.6	11	31.1	37.6
Yellow Time (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

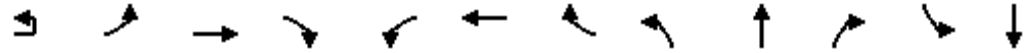
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	110
Offset: 8 (7%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

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

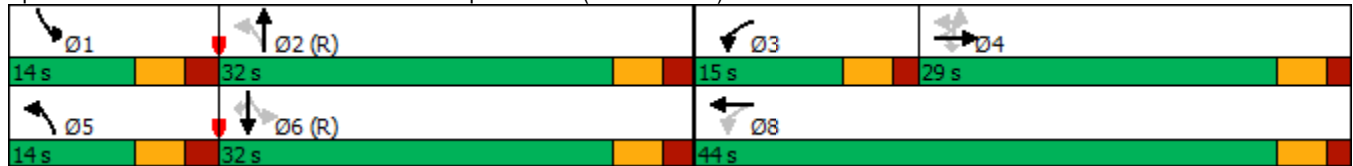


Phase Number	1	2	3	4	5	6	8
Movement	SBL	NBTL	WBL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	
Lead-Lag Optimize							
Recall Mode	None	C-Max	None	None	None	C-Max	None
Maximum Split (s)	14	32	15	29	14	32	44
Maximum Split (%)	15.6%	35.6%	16.7%	32.2%	15.6%	35.6%	48.9%
Minimum Split (s)	10.5	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								
<b>Intersection Summary</b>												
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 

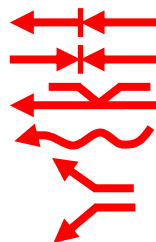
01/15/2015

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  
 D – Daytime  
 N – Nighttime

Roadway  
 D – Dry W – Wet  
 I – Icy S – Snow



# COLLISION DIAGRAM

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

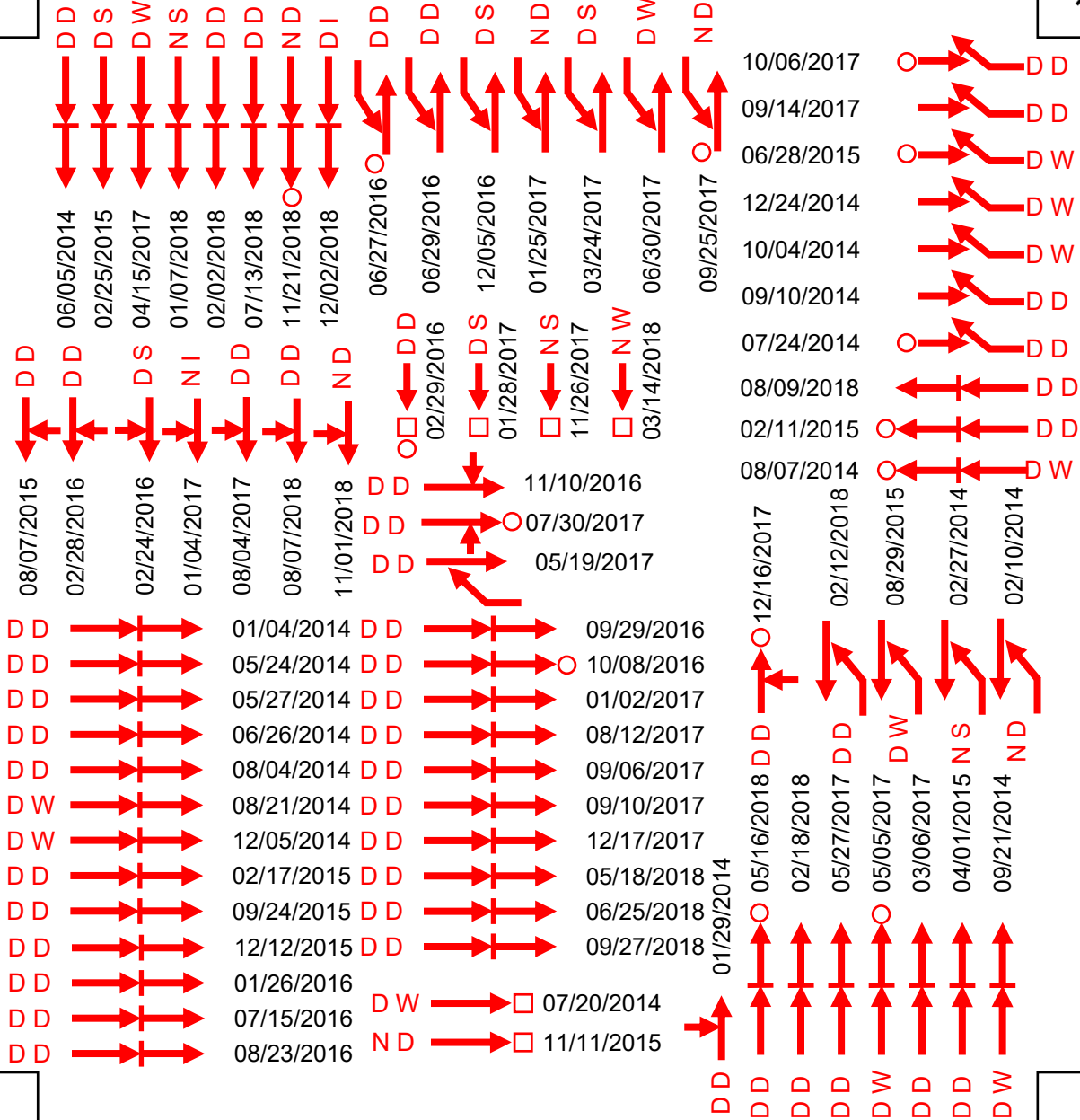
DATE: June 26, 2020  
 PREPARED BY: M.C.

## 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

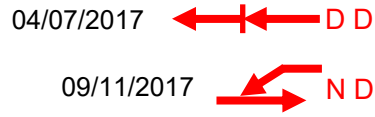
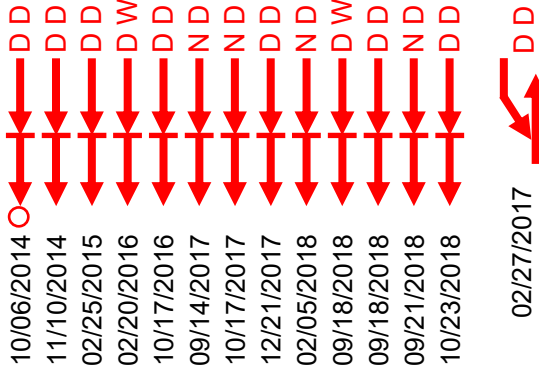


# COLLISION DIAGRAM

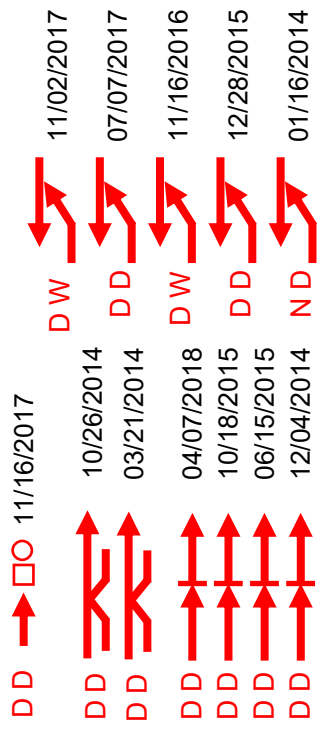
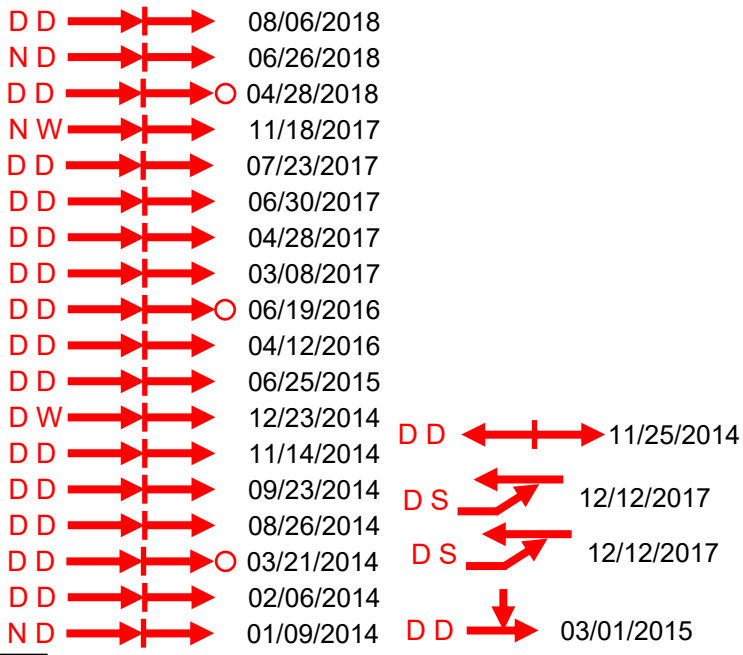
LOCATION: Carp Road & Stittsville Main Street  
 CITY: Ottawa, ON  
 PERIOD: January 2014 to December 2018

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      D – Dry      W – Wet  
 N – Nighttime      I – Icy      S – Snow



# COLLISION DIAGRAM

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

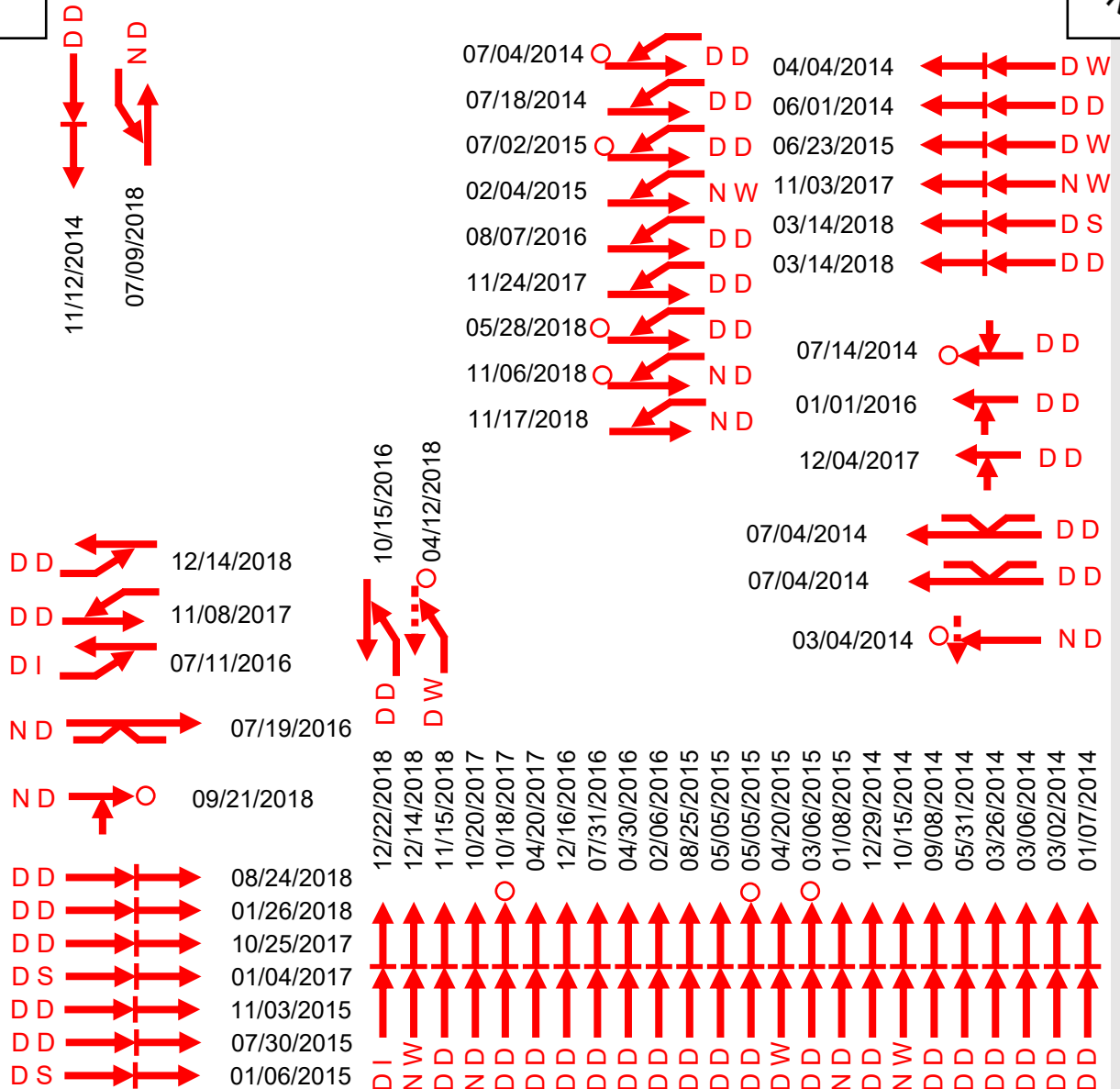
DATE: Dec. 11, 2020  
 PREPARED BY: M.C.

## Stittsville Main Street



Hazeldean Road

Hazeldean Road



## Stittsville Main Street

### 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: D - Daytime, N - Nighttime  
 Roadway: 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 Manoeuvre	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

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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

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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

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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

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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

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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

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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

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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)
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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
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					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

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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	



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Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	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

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**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

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**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

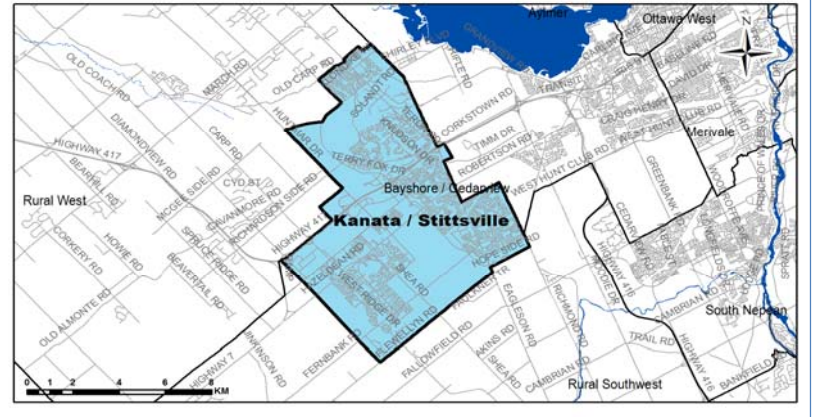
## Demographic Characteristics

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

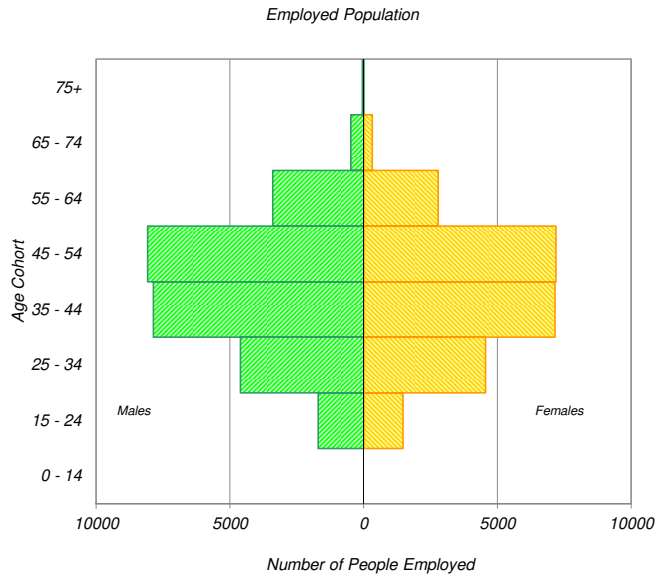
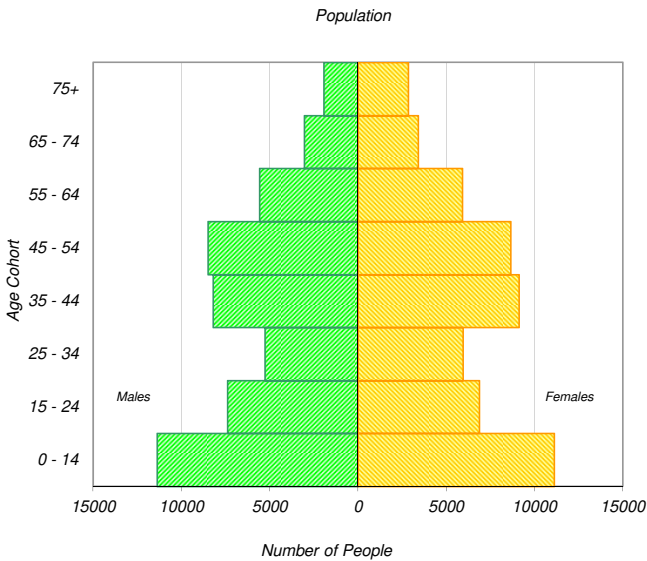
Selected Indicators	
Daily Trips per Person (age 5+)	2.84
Vehicles per Person	0.61
Number of Persons per Household	2.77
Daily Trips per Household	7.33
Vehicles per Household	1.70
Workers per Household	1.31
Population Density (Pop/km <sup>2</sup> )	1270



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>

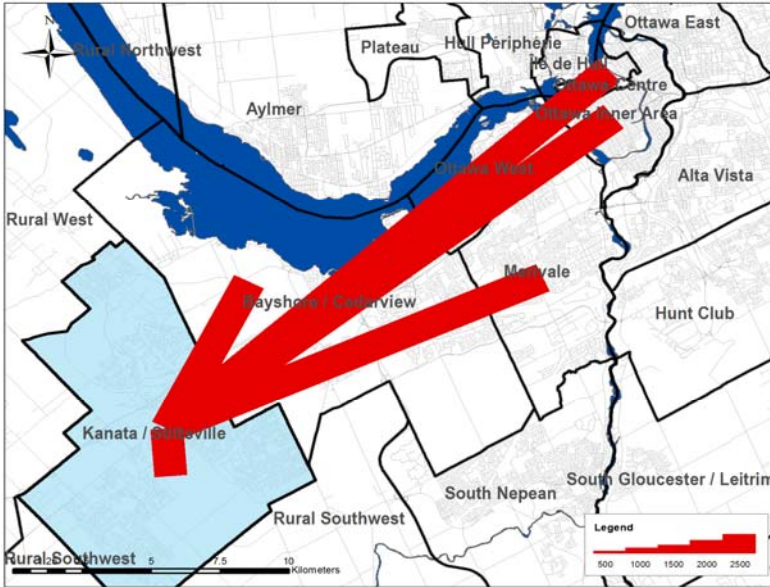


\* In 2005 data was only collected for household members aged 11+ therefore these results cannot be compared to the 2011 data.

## 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>



Plateau	Aylmer	Rural Northwest	Pointe Gatineau	Gatineau Est	Buckingham /			Total
					Rural Northeast	Masson- Angers	External	
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)

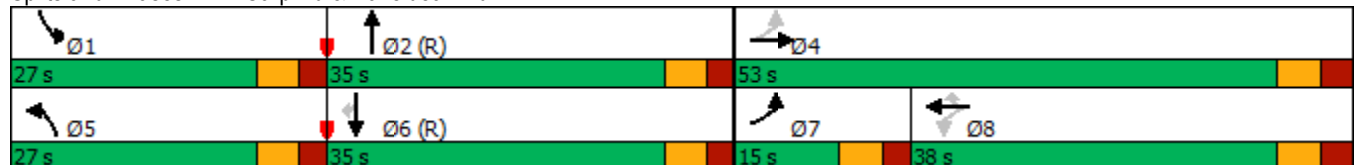


Phase Number	1	2	4	5	6	7	8
Movement	SBL	NBT	EBTL	NBL	SBT	EBL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lag
Lead-Lag Optimize							
Recall Mode	None	C-Max	None	None	C-Max	None	None
Maximum Split (s)	27	35	53	27	35	15	38
Maximum Split (%)	23.5%	30.4%	46.1%	23.5%	30.4%	13.0%	33.0%
Minimum Split (s)	11	31.1	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

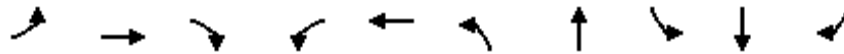
Intersection Summary

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)

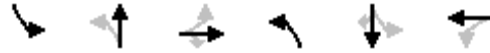


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	97	291	147	70	84	352	387	171	79	319	35
Future Volume (vph)	46	97	291	147	70	84	352	387	171	79	319	35
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	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)

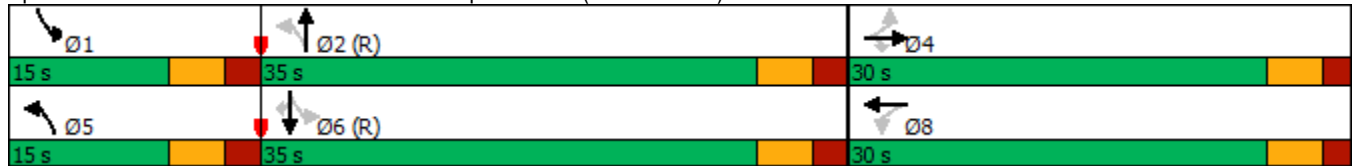


Phase Number	1	2	4	5	6	8
Movement	SBL	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	15	35	30	15	35	30
Maximum Split (%)	18.8%	43.8%	37.5%	18.8%	43.8%	37.5%
Minimum Split (s)	10.5	29.5	28.1	10.5	29.5	28.1
Yellow 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								
<b>Intersection Summary</b>												
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	8	7	4	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)

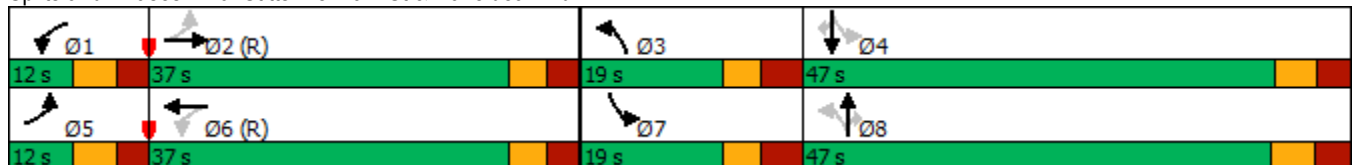


Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBTL	EBL	WBTL	SBL	NBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	12	37	19	47	12	37	19	47
Maximum Split (%)	10.4%	32.2%	16.5%	40.9%	10.4%	32.2%	16.5%	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

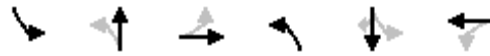
Background PM (2024)

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	
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			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.

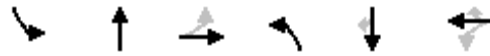
HCM Signalized Intersection Capacity Analysis  
2: Carp Rd & Hazeldean Rd

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)

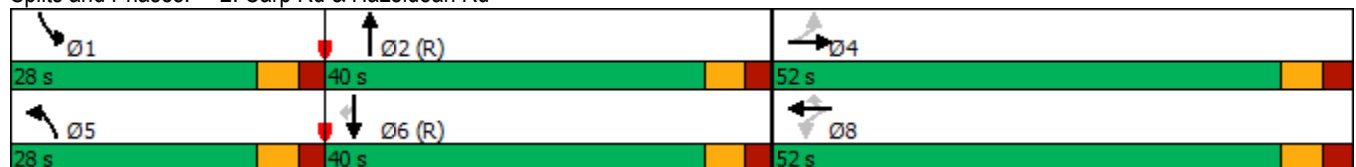


Phase Number	1	2	4	5	6	8
Movement	SBL	NBT	EBTL	NBL	SBT	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	28	40	52	28	40	52
Maximum Split (%)	23.3%	33.3%	43.3%	23.3%	33.3%	43.3%
Minimum Split (s)	11	31.1	37.6	11	31.1	37.6
Yellow Time (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

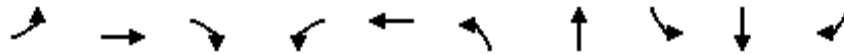
Intersection Summary

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
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)	1641	1720	1478	1699	1623		1595	1717		1614	1728	1413
Fl <sub>t</sub> 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)

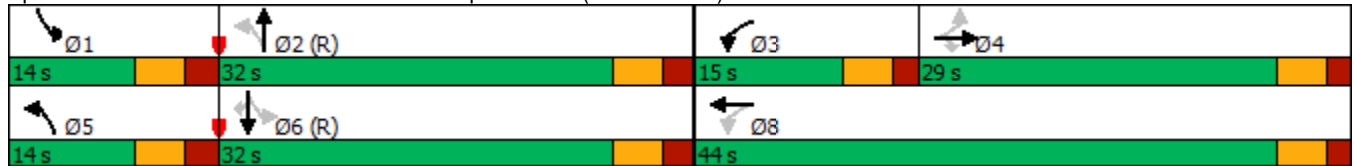


Phase Number	1	2	3	4	5	6	8
Movement	SBL	NBTL	WBL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	
Lead-Lag Optimize							
Recall Mode	None	C-Max	None	None	None	C-Max	None
Maximum Split (s)	14	32	15	29	14	32	44
Maximum Split (%)	15.6%	35.6%	16.7%	32.2%	15.6%	35.6%	48.9%
Minimum Split (s)	10.5	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)

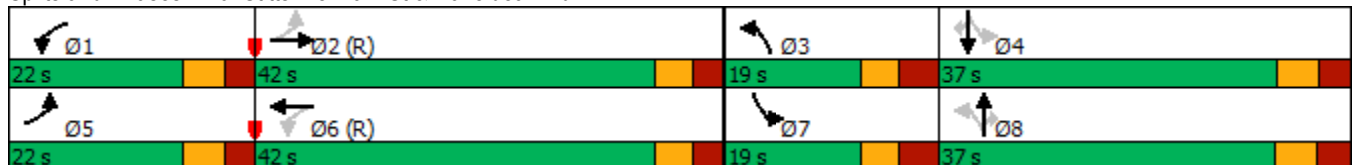


Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBTL	EBL	WBTL	SBL	NBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	22	42	19	37	22	42	19	37
Maximum Split (%)	18.3%	35.0%	15.8%	30.8%	18.3%	35.0%	15.8%	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	

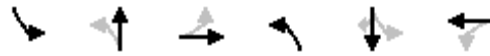
Intersection Summary		
HCM 2000 Control Delay	90.8	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.15	F
Actuated Cycle Length (s)	115.0	Sum of lost time (s)
Intersection Capacity Utilization	110.4%	17.9
Analysis Period (min)	15	ICU Level of Service
		H

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	F
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	92.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

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

Background AM (2029)

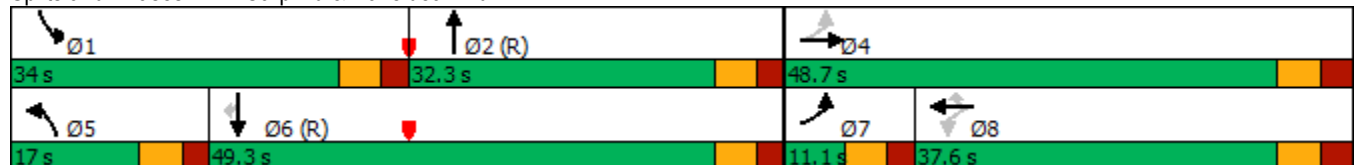


Phase Number	1	2	4	5	6	7	8
Movement	SBL	NBT	EBTL	NBL	SBT	EBL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lag
Lead-Lag Optimize							
Recall Mode	None	C-Max	None	None	C-Max	None	None
Maximum Split (s)	34	32.3	48.7	17	49.3	11.1	37.6
Maximum Split (%)	29.6%	28.1%	42.3%	14.8%	42.9%	9.7%	32.7%
Minimum Split (s)	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

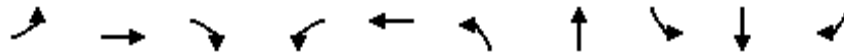
Intersection Summary

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 C
HCM 2000 Volume to Capacity ratio	0.72	
Actuated Cycle Length (s)	80.0	Sum of lost time (s) 16.1
Intersection Capacity Utilization	79.7%	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)

Background AM (2029)

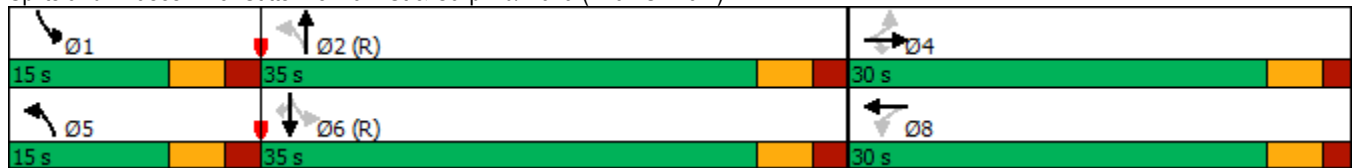


Phase Number	1	2	4	5	6	8
Movement	SBL	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	15	35	30	15	35	30
Maximum Split (%)	18.8%	43.8%	37.5%	18.8%	43.8%	37.5%
Minimum Split (s)	10.5	29.5	28.1	10.5	29.5	28.1
Yellow 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
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
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								
Intersection Summary												
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)

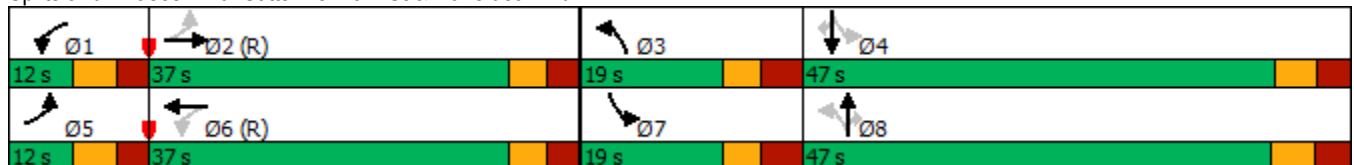


Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBTL	EBL	WBTL	SBL	NBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	12	37	19	47	12	37	19	47
Maximum Split (%)	10.4%	32.2%	16.5%	40.9%	10.4%	32.2%	16.5%	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)

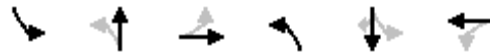


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	16	66	70	8	94	62	845	38	139	1273	182
Future Volume (vph)	170	16	66	70	8	94	62	845	38	139	1273	182
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	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)

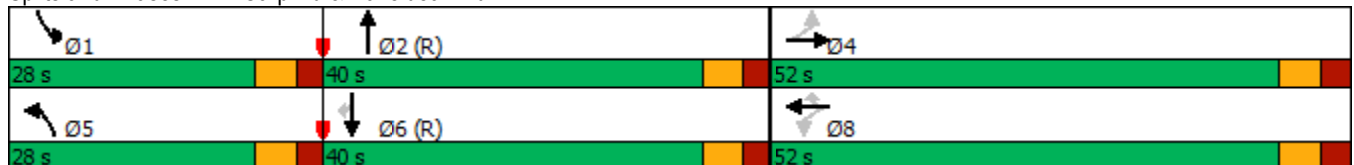


Phase Number	1	2	4	5	6	8
Movement	SBL	NBT	EBTL	NBL	SBT	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	28	40	52	28	40	52
Maximum Split (%)	23.3%	33.3%	43.3%	23.3%	33.3%	43.3%
Minimum Split (s)	11	31.1	37.6	11	31.1	37.6
Yellow Time (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

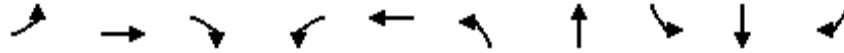
Intersection Summary

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)

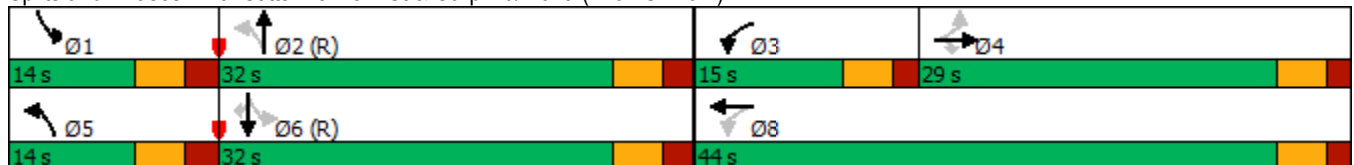


Phase Number	1	2	3	4	5	6	8
Movement	SBL	NBTL	WBL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	
Lead-Lag Optimize							
Recall Mode	None	C-Max	None	None	None	C-Max	None
Maximum Split (s)	14	32	15	29	14	32	44
Maximum Split (%)	15.6%	35.6%	16.7%	32.2%	15.6%	35.6%	48.9%
Minimum Split (s)	10.5	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								
<b>Intersection Summary</b>												
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	
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	
Frnt	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	3302		1730	3204		1694	1740	1585	1659	1760	1592	
Flt 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									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

Background PM (2029)

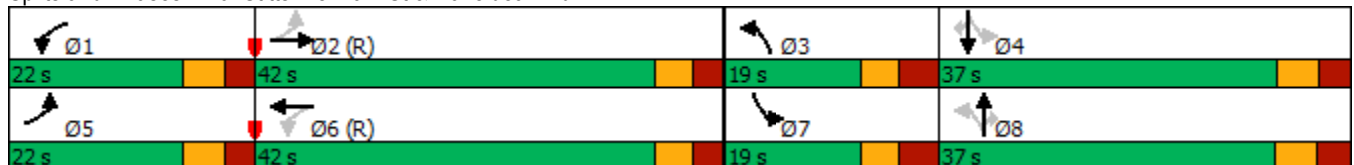


Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBTL	EBL	WBTL	SBL	NBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	22	42	19	37	22	42	19	37
Maximum Split (%)	18.3%	35.0%	15.8%	30.8%	18.3%	35.0%	15.8%	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	320	29	1127	70	648	53
v/c Ratio	1.16	0.17	0.54	0.11	1.25	0.47	0.74	0.07
Control Delay	147.8	8.6	20.4	8.5	141.0	23.3	28.3	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	147.8	8.6	20.4	8.5	141.0	23.3	28.3	1.3
Queue Length 50th (m)	~62.7	0.7	27.2	1.2	~294.5	5.6	108.7	0.0
Queue Length 95th (m)	#108.9	11.1	53.1	m2.7 m	#341.9	14.4	156.8	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)	221	490	593	276	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	1.16	0.17	0.54	0.11	1.25	0.46	0.74	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	264	29	1111	16	70	648	53	
Future Volume (vph)	256	5	76	53	3	264	29	1111	16	70	648	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			1733		1474	1747		1653	1618	1382	
Flt Permitted	0.43	1.00			0.93		0.25	1.00		0.07	1.00	1.00	
Satd. Flow (perm)	755	1490			1631		382	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	264	29	1111	16	70	648	53	
RTOR Reduction (vph)	0	54	0	0	111	0	0	0	0	0	0	25	
Lane Group Flow (vph)	256	27	0	0	209	0	29	1127	0	70	648	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)	221	436			482		242	885		133	842	719	
v/s Ratio Prot		0.02					0.00	c0.64		c0.02	0.40		
v/s Ratio Perm	c0.34				0.13		0.06			0.27		0.02	
v/c Ratio	1.16	0.06			0.43		0.12	1.27		0.53	0.77	0.04	
Uniform Delay, d1	40.6	29.3			32.7		15.0	28.4		25.5	22.0	13.5	
Progression Factor	1.00	1.00			1.00		0.84	0.68		1.00	1.00	1.00	
Incremental Delay, d2	109.9	0.1			0.6		0.2	129.2		3.7	6.7	0.1	
Delay (s)	150.5	29.3			33.3		12.8	148.5		29.2	28.7	13.6	
Level of Service	F	C			C		B	F		C	C	B	
Approach Delay (s)		121.4			33.3			145.1			27.7		
Approach LOS		F			C			F			C		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			93.2									HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio			1.19										
Actuated Cycle Length (s)			115.0									Sum of lost time (s)	17.9
Intersection Capacity Utilization			113.5%									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 (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	408	73	139	420	65	454	290	315	54
v/c Ratio	1.07	0.43	0.62	0.57	0.73	0.48	0.51	0.73	0.41	0.08
Control Delay	108.1	30.4	64.5	52.0	13.4	60.5	37.5	42.3	41.3	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	108.1	30.4	64.5	52.0	13.4	60.5	37.5	42.3	41.3	2.9
Queue Length 50th (m)	~63.9	32.7	14.6	27.8	4.5	13.0	41.6	61.7	67.1	0.0
Queue Length 95th (m)	#93.3	39.8	26.3	41.0	27.9	25.0	58.4 m#103.8	m94.2	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)	296	1328	210	433	699	278	896	397	771	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	1.07	0.31	0.35	0.32	0.60	0.23	0.51	0.73	0.41	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 (2024)

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Traffic Volume (vph)	316	314	94	73	139	420	65	438	16	290	315	54		
Future Volume (vph)	316	314	94	73	139	420	65	438	16	290	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	3233		1431	1586	1445	1523	3184		1462	1593	1309		
Flt Permitted	0.45	1.00		0.51	1.00	1.00	0.95	1.00		0.95	1.00	1.00		
Satd. Flow (perm)	796	3233		772	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	314	94	73	139	420	65	438	16	290	315	54		
RTOR Reduction (vph)	0	29	0	0	0	355	0	2	0	0	0	28		
Lane Group Flow (vph)	316	379	0	73	139	65	65	452	0	290	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)	32.7	32.7		17.7	17.7	17.7	9.1	32.3		31.3	54.5	54.5		
Effective Green, g (s)	32.7	32.7		17.7	17.7	17.7	9.1	32.3		31.3	54.5	54.5		
Actuated g/C Ratio	0.28	0.28		0.15	0.15	0.15	0.08	0.28		0.27	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)	293	919		118	244	222	120	894		397	754	620		
v/s Ratio Prot	c0.08	0.12			0.09		0.04	c0.14		c0.20	0.20			
v/s Ratio Perm	c0.22			0.09		0.04						0.02		
v/c Ratio	1.08	0.41		0.62	0.57	0.29	0.54	0.51		0.73	0.42	0.04		
Uniform Delay, d1	40.5	33.4		45.5	45.1	43.1	50.9	34.7		38.0	19.8	16.2		
Progression Factor	1.00	1.00		0.98	0.98	1.46	1.00	1.00		0.83	1.73	1.00		
Incremental Delay, d2	75.1	0.3		9.3	3.0	0.7	4.9	2.0		5.0	1.2	0.1		
Delay (s)	115.6	33.7		53.9	47.3	63.5	55.9	36.7		36.7	35.6	16.3		
Level of Service	F	C		D	D	E	E	D		D	D	B		
Approach Delay (s)		69.4			58.9			39.1			34.5			
Approach LOS		E			E			D			C			
<b>Intersection Summary</b>														
HCM 2000 Control Delay			51.5									HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio			0.80											
Actuated Cycle Length (s)			115.0							24.8				
Intersection Capacity Utilization			90.2%										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)

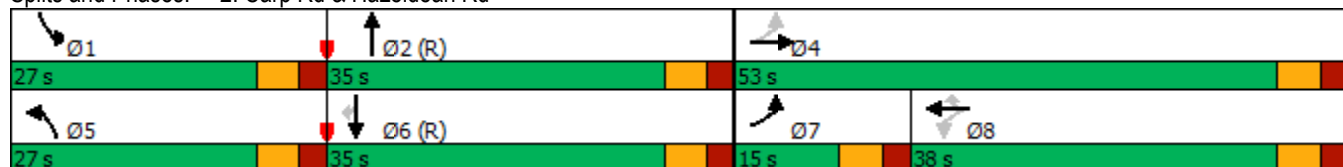


Phase Number	1	2	4	5	6	7	8
Movement	SBL	NBT	EBTL	NBL	SBT	EBL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lag
Lead-Lag Optimize							
Recall Mode	None	C-Max	None	None	C-Max	None	None
Maximum Split (s)	27	35	53	27	35	15	38
Maximum Split (%)	23.5%	30.4%	46.1%	23.5%	30.4%	13.0%	33.0%
Minimum Split (s)	11	31.1	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	

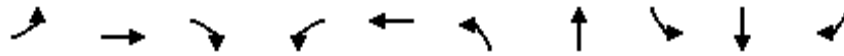
Splits and Phases: 2: Carp Rd & Hazeldean Rd



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	113	327	147	161	352	582	79	319	35
v/c Ratio	0.23	0.35	0.59	0.63	0.43	0.55	0.63	0.19	0.40	0.05
Control Delay	27.8	29.3	7.8	40.9	16.6	10.2	19.1	7.7	18.2	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	29.3	7.8	40.9	16.6	10.2	19.1	7.7	18.2	0.1
Queue Length 50th (m)	5.5	13.9	0.0	19.2	9.2	17.2	52.2	3.2	28.8	0.0
Queue Length 95th (m)	12.2	23.7	16.3	32.1	21.3	38.1	#120.6	9.3	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)	327	524	695	374	554	642	923	466	797	715
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	0.22	0.47	0.39	0.29	0.55	0.63	0.17	0.40	0.05























Intersection Summary

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



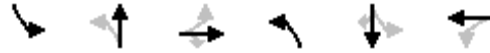
HCM Signalized Intersection Capacity Analysis  
 3: Stittsville Main St & Carp Rd/Plaza (1261 S. Main)

Total AM (2024)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	113	327	147	70	91	352	411	171	79	319	35
Future Volume (vph)	46	113	327	147	70	91	352	411	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	0.96		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	1595		1655	1672		1581	1745	1442
Flt Permitted	0.60	1.00	1.00	0.68	1.00		0.44	1.00		0.37	1.00	1.00
Satd. Flow (perm)	1051	1686	1511	1202	1595		769	1672		609	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	113	327	147	70	91	352	411	171	79	319	35
RTOR Reduction (vph)	0	0	264	0	69	0	0	14	0	0	0	19
Lane Group Flow (vph)	46	113	63	147	92	0	352	568	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)	15.5	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)	203	326	292	232	309		648	888		395	798	659
v/s Ratio Prot		0.07			0.06		c0.08	c0.34		0.01	0.18	
v/s Ratio Perm	0.04		0.04	c0.12			0.29			0.09		0.01
v/c Ratio	0.23	0.35	0.22	0.63	0.30		0.54	0.64		0.20	0.40	0.02
Uniform Delay, d1	27.2	27.9	27.1	29.6	27.6		6.3	13.3		9.5	14.4	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	0.4	5.6	0.5		0.9	3.5		0.3	1.5	0.1
Delay (s)	27.8	28.5	27.5	35.2	28.1		7.2	16.8		9.8	15.9	12.0
Level of Service	C	C	C	D	C		A	B		A	B	B
Approach Delay (s)		27.8			31.5			13.2			14.5	
Approach LOS		C			C			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			19.3				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			80.0				Sum of lost time (s)			16.1		
Intersection Capacity Utilization			76.7%				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 (2024)

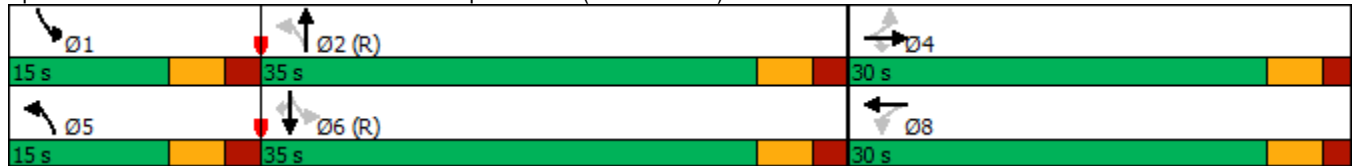


Phase Number	1	2	4	5	6	8
Movement	SBL	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	15	35	30	15	35	30
Maximum Split (%)	18.8%	43.8%	37.5%	18.8%	43.8%	37.5%
Minimum Split (s)	10.5	29.5	28.1	10.5	29.5	28.1
Yellow 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

Total AM (2024)

## 4: Samantha Eastop Dr & Kimpton Dr

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	24	32	0	104	5	105	0	0	11	0	44
Future Volume (Veh/h)	11	24	32	0	104	5	105	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	32	0	104	5	105	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			61			222	181	50	178	194	116
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	114			61			222	181	50	178	194	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			85	100	100	99	100	95
cM capacity (veh/h)	1465			1532			678	698	1005	761	686	923
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	67	109	105	55								
Volume Left	11	0	105	11								
Volume Right	32	5	0	44								
cSH	1465	1532	678	885								
Volume to Capacity	0.01	0.00	0.15	0.06								
Queue Length 95th (m)	0.2	0.0	3.8	1.4								
Control Delay (s)	1.3	0.0	11.3	9.3								
Lane LOS	A		B	A								
Approach Delay (s)	1.3	0.0	11.3	9.3								
Approach LOS			B	A								
<b>Intersection Summary</b>												
Average Delay			5.3									
Intersection Capacity Utilization			30.9%		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)	113	517	409	95	92	222
Future Volume (Veh/h)	113	517	409	95	92	222
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)	126	574	454	106	102	247
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	565				1051	285
vC1, stage 1 conf vol					512	
vC2, stage 2 conf vol					539	
vCu, unblocked vol	565				1051	285
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				68	65
cM capacity (veh/h)	996				323	707
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	126	287	287	303	257	349
Volume Left	126	0	0	0	0	102
Volume Right	0	0	0	0	106	247
cSH	996	1700	1700	1700	1700	525
Volume to Capacity	0.13	0.17	0.17	0.18	0.15	0.66
Queue Length 95th (m)	3.0	0.0	0.0	0.0	0.0	34.1
Control Delay (s)	9.1	0.0	0.0	0.0	0.0	24.4
Lane LOS	A					C
Approach Delay (s)	1.6			0.0		24.4
Approach LOS						C
Intersection Summary						
Average Delay			6.0			
Intersection Capacity Utilization			51.6%		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)	79	453	242	380	66	63	316	275	106	135
v/c Ratio	0.15	0.33	0.43	0.24	0.27	0.35	0.74	0.94	0.40	0.34
Control Delay	13.9	26.9	13.3	15.4	33.9	52.0	18.4	79.7	50.2	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.9	26.9	13.3	15.4	33.9	52.0	18.4	79.7	50.2	6.8
Queue Length 50th (m)	8.0	28.3	20.0	18.8	10.7	12.6	4.9	~52.4	21.1	0.0
Queue Length 95th (m)	m14.9	44.6	38.3	33.6	19.2	23.1	29.5	#64.4	35.6	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)	510	1359	563	1558	288	587	738	292	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	0.33	0.43	0.24	0.23	0.11	0.43	0.94	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	436	17	242	269	111	66	63	316	275	106	135
Future Volume (vph)	79	436	17	242	269	111	66	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	3230		1699	3006		1571	1689	1578	1591	1676	1645
Flt Permitted	0.53	1.00		0.39	1.00		0.69	1.00	1.00	0.55	1.00	1.00
Satd. Flow (perm)	947	3230		703	3006		1139	1689	1578	927	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	436	17	242	269	111	66	63	316	275	106	135
RTOR Reduction (vph)	0	2	0	0	27	0	0	0	256	0	0	114
Lane Group Flow (vph)	79	451	0	242	353	0	66	63	60	275	106	21
Confl. Peds. (#/hr)	2						2	1		2	2	
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	46.9		69.0	55.9		21.7	13.7	13.7	30.2	18.1	18.1
Effective Green, g (s)	53.5	46.9		69.0	55.9		21.7	13.7	13.7	30.2	18.1	18.1
Actuated g/C Ratio	0.47	0.41		0.60	0.49		0.19	0.12	0.12	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)	484	1317		556	1461		244	201	187	313	263	258
v/s Ratio Prot	0.01	0.14		c0.06	0.12		0.02	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	0.34		0.44	0.24		0.27	0.31	0.32	0.88	0.40	0.08
Uniform Delay, d1	17.2	23.4		11.4	17.2		39.5	46.3	46.4	39.4	43.6	41.4
Progression Factor	1.20	1.11		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.7		0.5	0.4		0.6	0.9	1.0	23.2	1.0	0.1
Delay (s)	20.8	26.8		12.0	17.6		40.1	47.2	47.4	62.6	44.6	41.5
Level of Service	C	C		B	B		D	D	D	E	D	D
Approach Delay (s)		25.9			15.4			46.3			53.4	
Approach LOS		C			B			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			33.8				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

Total AM (2024)

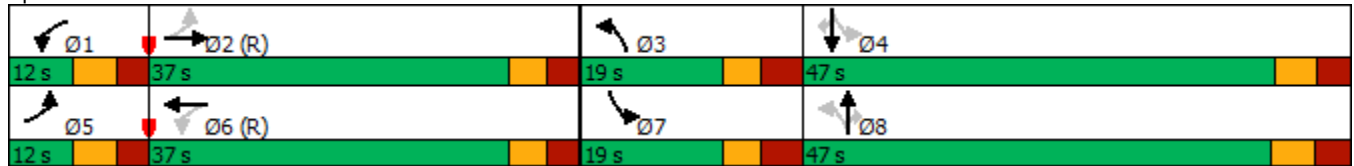


Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBTL	EBL	WBTL	SBL	NBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	12	37	19	47	12	37	19	47
Maximum Split (%)	10.4%	32.2%	16.5%	40.9%	10.4%	32.2%	16.5%	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	195	56	837	190	1212	164
v/c Ratio	0.88	0.22	0.57	0.40	0.87	0.60	1.20	0.18
Control Delay	89.4	14.3	33.5	26.5	35.3	18.4	123.6	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.4	14.3	33.5	26.5	35.3	18.4	123.6	7.0
Queue Length 50th (m)	32.2	2.5	24.4	3.9	167.8	12.2	~327.3	7.2
Queue Length 95th (m)	#57.0	13.3	43.9	m13.5 m	#253.6	32.9	#425.5	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)	223	417	422	253	958	353	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	0.69	0.18	0.46	0.22	0.87	0.54	1.20	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	124	56	802	35	190	1212	164
Future Volume (vph)	153	14	59	63	8	124	56	802	35	190	1212	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			1746		1474	1740		1653	1618	1381
Flt Permitted	0.51	1.00			0.86		0.06	1.00		0.12	1.00	1.00
Satd. Flow (perm)	933	1557			1533		94	1740		215	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	124	56	802	35	190	1212	164
RTOR Reduction (vph)	0	48	0	0	56	0	0	1	0	0	0	31
Lane Group Flow (vph)	153	25	0	0	139	0	56	836	0	190	1212	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		72.1	66.0		85.6	73.9	73.9
Effective Green, g (s)	22.4	22.4			22.7		72.1	66.0		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)	174	290			289		126	957		317	996	850
v/s Ratio Prot		0.02					0.02	0.48		c0.07	c0.75	
v/s Ratio Perm	c0.16				0.09		0.24			0.36		0.10
v/c Ratio	0.88	0.09			0.48		0.44	0.87		0.60	1.22	0.16
Uniform Delay, d1	47.5	40.3			43.4		26.6	23.4		18.7	23.0	9.8
Progression Factor	1.00	1.00			1.00		1.34	0.98		1.00	1.00	1.00
Incremental Delay, d2	35.9	0.1			1.3		2.1	9.3		3.0	106.9	0.4
Delay (s)	83.4	40.5			44.7		37.6	32.2		21.7	129.9	10.2
Level of Service	F	D			D		D	C		C	F	B
Approach Delay (s)		69.5			44.7			32.5			104.2	
Approach LOS		E			D			C			F	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			75.2									E
HCM 2000 Volume to Capacity ratio			1.13									
Actuated Cycle Length (s)			120.0							17.9		
Intersection Capacity Utilization			109.1%									H
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	459	96	567	427	146	434	477	539	260
v/c Ratio	1.04	0.37	0.37	0.91	0.55	0.66	0.48	1.40	0.86	0.39
Control Delay	142.1	23.6	20.9	45.9	4.7	63.5	37.2	222.3	44.0	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	142.1	23.6	20.9	45.9	4.7	63.5	37.2	222.3	44.0	14.8
Queue Length 50th (m)	21.5	30.3	12.7	116.3	15.6	30.6	40.4	~150.1	95.4	15.4
Queue Length 95th (m)	#54.9	42.6	m13.6	#170.6	0.2	47.9	54.8 m	#122.6	m83.8	m15.0
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)	102	1301	272	652	793	317	910	341	628	664
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	0.35	0.87	0.54	0.46	0.48	1.40	0.86	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	308	151	96	567	427	146	403	31	477	539	260
Future Volume (vph)	101	308	151	96	567	427	146	403	31	477	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)	1704	3307		1598	1725	1439	1732	3205		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	3307		719	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	308	151	96	567	427	146	403	31	477	539	260
RTOR Reduction (vph)	0	51	0	0	0	256	0	5	0	0	0	143
Lane Group Flow (vph)	101	408	0	96	567	171	146	429	0	477	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)	43.2	43.2		43.2	43.2	43.2	15.4	33.9		24.2	42.7	42.7
Effective Green, g (s)	43.2	43.2		43.2	43.2	43.2	15.4	33.9		24.2	42.7	42.7
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	1190		258	621	518	222	905		341	628	521
v/s Ratio Prot		0.12			0.33		0.08	0.13		c0.28	c0.31	
v/s Ratio Perm	c0.37			0.13		0.12						0.08
v/c Ratio	1.04	0.34		0.37	0.91	0.33	0.66	0.47		1.40	0.86	0.22
Uniform Delay, d1	38.4	28.0		28.4	36.6	27.9	49.8	35.7		47.9	35.8	27.1
Progression Factor	1.00	1.00		0.61	0.73	0.61	1.00	1.00		1.20	1.13	2.18
Incremental Delay, d2	103.0	0.2		0.8	16.4	0.3	6.9	1.8		181.1	1.5	0.1
Delay (s)	141.4	28.2		18.1	43.0	17.3	56.7	37.4		238.4	42.1	59.2
Level of Service	F	C		B	D	B	E	D		F	D	E
Approach Delay (s)		48.6			30.8			42.3			119.0	
Approach LOS		D			C			D			F	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			67.6				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			107.2%				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)

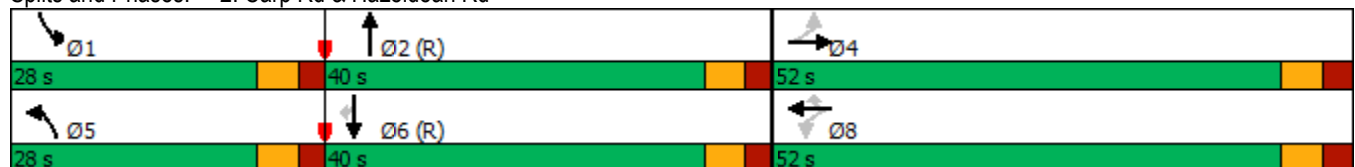


Phase Number	1	2	4	5	6	8
Movement	SBL	NBT	EBTL	NBL	SBT	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	28	40	52	28	40	52
Maximum Split (%)	23.3%	33.3%	43.3%	23.3%	33.3%	43.3%
Minimum Split (s)	11	31.1	37.6	11	31.1	37.6
Yellow Time (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

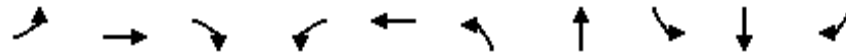
Intersection Summary

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 & Carp Rd/Plaza (1261 S. Main)



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	80	131	508	218	244	339	666	79	528	53
v/c Ratio	0.37	0.37	0.88	0.51	0.39	1.08	0.98	0.38	1.04	0.10
Control Delay	33.8	32.2	29.0	23.8	16.9	101.0	61.4	19.4	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	33.8	32.2	29.0	23.8	16.9	101.0	61.4	19.4	83.6	0.4
Queue Length 50th (m)	10.7	17.5	25.1	23.5	20.6	~54.9	~123.2	6.5	~91.6	0.0
Queue Length 95th (m)	21.4	30.3	#72.1	36.6	34.9	#115.9	#196.3	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)	278	456	643	425	725	315	681	228	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	0.29	0.79	0.51	0.34	1.08	0.98	0.35	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)

Total PM (2024)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	131	508	218	140	104	339	546	120	79	528	53
Future Volume (vph)	80	131	508	218	140	104	339	546	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	0.97		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)	1641	1720	1478	1699	1610		1595	1720		1614	1728	1413
Flt Permitted	0.61	1.00	1.00	0.51	1.00		0.12	1.00		0.15	1.00	1.00
Satd. Flow (perm)	1049	1720	1478	918	1610		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	131	508	218	140	104	339	546	120	79	528	53
RTOR Reduction (vph)	0	0	272	0	33	0	0	7	0	0	0	37
Lane Group Flow (vph)	80	131	236	218	211	0	339	659	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)	18.5	18.5	18.5	33.4	33.4		46.0	34.2		32.8	26.5	26.5
Effective Green, g (s)	18.5	18.5	18.5	33.4	33.4		46.0	34.2		32.8	26.5	26.5
Actuated g/C Ratio	0.21	0.21	0.21	0.37	0.37		0.51	0.38		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)	215	353	303	425	597		322	653		188	508	416
v/s Ratio Prot		0.08		c0.06	0.13		c0.16	0.38		0.03	0.31	
v/s Ratio Perm	0.08		c0.16	0.13			c0.37			0.12		0.01
v/c Ratio	0.37	0.37	0.78	0.51	0.35		1.05	1.01		0.42	1.04	0.04
Uniform Delay, d1	30.8	30.7	33.8	20.6	20.5		25.5	27.9		21.4	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	12.0	1.0	0.4		64.7	37.3		1.5	50.5	0.2
Delay (s)	31.8	31.4	45.8	21.7	20.9		90.2	65.2		22.9	82.3	22.8
Level of Service	C	C	D	C	C		F	E		C	F	C
Approach Delay (s)		41.6			21.2			73.7			70.4	
Approach LOS		D			C			E			E	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			56.3	HCM 2000 Level of Service				E				
HCM 2000 Volume to Capacity ratio			0.95									
Actuated Cycle Length (s)			90.0	Sum of lost time (s)				21.2				
Intersection Capacity Utilization			92.4%	ICU Level of Service				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)

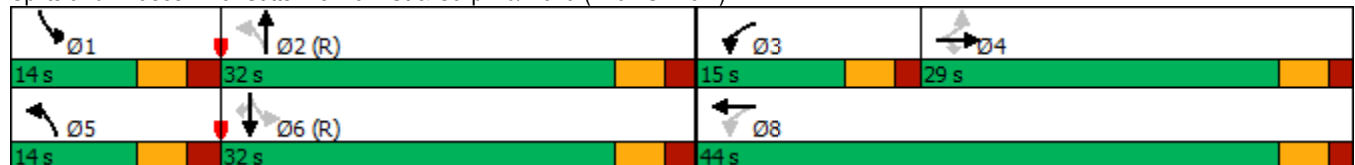


Phase Number	1	2	3	4	5	6	8
Movement	SBL	NBTL	WBL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	
Lead-Lag Optimize							
Recall Mode	None	C-Max	None	None	None	C-Max	None
Maximum Split (s)	14	32	15	29	14	32	44
Maximum Split (%)	15.6%	35.6%	16.7%	32.2%	15.6%	35.6%	48.9%
Minimum Split (s)	10.5	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	65	0	53	5	40	0	0	37	0	23
Future Volume (Veh/h)	36	84	65	0	53	5	40	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	65	0	53	5	40	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			154			277	256	126	254	286	66
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	63			154			277	256	126	254	286	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	94	100	98
cM capacity (veh/h)	1529			1417			633	624	912	671	600	985
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	185	58	40	60								
Volume Left	36	0	40	37								
Volume Right	65	5	0	23								
cSH	1529	1417	633	764								
Volume to Capacity	0.02	0.00	0.06	0.08								
Queue Length 95th (m)	0.5	0.0	1.4	1.8								
Control Delay (s)	1.6	0.0	11.1	10.1								
Lane LOS	A		B	B								
Approach Delay (s)	1.6	0.0	11.1	10.1								
Approach LOS			B	B								
<b>Intersection Summary</b>												
Average Delay			3.9									
Intersection Capacity Utilization			29.5%		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)	104	718	976	91	42	121
Future Volume (Veh/h)	104	718	976	91	42	121
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)	104	718	976	91	42	121
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	1072				1594	538
vC1, stage 1 conf vol					1026	
vC2, stage 2 conf vol					567	
vCu, unblocked vol	1072				1594	538
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 %	84				79	75
cM capacity (veh/h)	654				204	489
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	104	359	359	651	416	163
Volume Left	104	0	0	0	0	42
Volume Right	0	0	0	0	91	121
cSH	654	1700	1700	1700	1700	359
Volume to Capacity	0.16	0.21	0.21	0.38	0.24	0.45
Queue Length 95th (m)	3.9	0.0	0.0	0.0	0.0	15.9
Control Delay (s)	11.5	0.0	0.0	0.0	0.0	23.1
Lane LOS	B					C
Approach Delay (s)	1.5			0.0		23.1
Approach LOS						C
Intersection Summary						
Average Delay			2.4			
Intersection Capacity Utilization			58.0%		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)	121	441	518	985	130	175	407	230	244	93
v/c Ratio	0.42	0.45	0.91	0.71	0.47	0.58	0.76	0.70	0.75	0.22
Control Delay	29.4	49.8	43.0	32.2	33.5	52.2	19.9	43.4	60.4	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	29.4	49.8	43.0	32.2	33.5	52.2	19.9	43.4	60.4	1.9
Queue Length 50th (m)	18.0	48.5	69.2	87.4	20.1	35.0	16.8	38.0	50.7	0.0
Queue Length 95th (m)	m20.2	m47.2	#152.2	#142.0	30.5	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)	381	988	572	1388	290	435	636	328	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	0.45	0.91	0.71	0.45	0.40	0.64	0.70	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	408	33	518	706	279	130	175	407	230	244	93
Future Volume (vph)	121	408	33	518	706	279	130	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
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	3305		1730	3210		1694	1740	1588	1657	1760	1594
Fl <sub>t</sub> Permitted	0.24	1.00		0.35	1.00		0.39	1.00	1.00	0.51	1.00	1.00
Satd. Flow (perm)	469	3305		632	3210		690	1740	1588	885	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	408	33	518	706	279	130	175	407	230	244	93
RTOR Reduction (vph)	0	5	0	0	29	0	0	0	264	0	0	76
Lane Group Flow (vph)	121	436	0	518	956	0	130	175	143	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		66.9	50.8		31.8	20.8	20.8	34.3	22.2	22.2
Effective Green, g (s)	45.3	35.7		66.9	50.8		31.8	20.8	20.8	34.3	22.2	22.2
Actuated g/C Ratio	0.38	0.30		0.56	0.42		0.27	0.17	0.17	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)	289	983		578	1358		274	301	275	330	325	294
v/s Ratio Prot	0.03	0.13		c0.18	0.30		0.04	0.10		c0.07	c0.14	
v/s Ratio Perm	0.12			c0.31			0.08		0.09	0.13		0.01
v/c Ratio	0.42	0.44		0.90	0.70		0.47	0.58	0.52	0.70	0.75	0.06
Uniform Delay, d <sub>1</sub>	25.1	34.1		18.3	28.4		35.4	45.6	45.1	36.2	46.3	40.3
Progression Factor	1.68	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	0.6		16.4	3.1		1.3	2.8	1.8	6.3	9.4	0.1
Delay (s)	42.6	50.2		34.7	31.5		36.7	48.4	46.9	42.5	55.7	40.4
Level of Service	D	D		C	C		D	D	D	D	E	D
Approach Delay (s)		48.5			32.6			45.4			47.8	
Approach LOS		D			C			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			40.6				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.89									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			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

Total PM (2024)

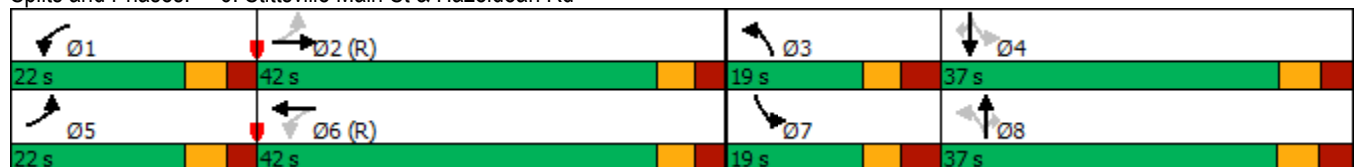


Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBTL	EBL	WBTL	SBL	NBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	22	42	19	37	22	42	19	37
Maximum Split (%)	18.3%	35.0%	15.8%	30.8%	18.3%	35.0%	15.8%	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	344	32	1240	74	711	59
v/c Ratio	1.35	0.18	0.59	0.14	1.37	0.49	0.81	0.08
Control Delay	220.5	8.4	24.2	8.9	194.2	24.9	32.4	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	220.5	8.4	24.2	8.9	194.2	24.9	32.4	1.7
Queue Length 50th (m)	~77.2	0.9	34.7	1.4	~344.7	6.0	127.5	0.0
Queue Length 95th (m)	#125.2	11.6	62.8	m2.7 m	#378.0	15.8	#197.3	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)	210	496	581	238	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	1.35	0.18	0.59	0.13	1.37	0.49	0.81	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	281	32	1222	18	74	711	59	
Future Volume (vph)	284	6	84	59	4	281	32	1222	18	74	711	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			1733		1474	1747		1653	1618	1382	
Flt Permitted	0.41	1.00			0.93		0.20	1.00		0.07	1.00	1.00	
Satd. Flow (perm)	719	1490			1621		308	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)	284	6	84	59	4	281	32	1222	18	74	711	59	
RTOR Reduction (vph)	0	59	0	0	102	0	0	0	0	0	0	28	
Lane Group Flow (vph)	284	31	0	0	242	0	32	1240	0	74	711	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)	210	436			479		204	885		133	842	719	
v/s Ratio Prot		0.02					0.01	c0.71		c0.02	0.44		
v/s Ratio Perm	c0.39				0.15		0.08			0.29		0.02	
v/c Ratio	1.35	0.07			0.50		0.16	1.40		0.56	0.84	0.04	
Uniform Delay, d1	40.6	29.3			33.5		16.3	28.4		25.6	23.6	13.5	
Progression Factor	1.00	1.00			1.00		0.86	0.65		1.00	1.00	1.00	
Incremental Delay, d2	186.5	0.1			0.8		0.2	184.4		5.0	10.1	0.1	
Delay (s)	227.2	29.4			34.4		14.2	202.9		30.5	33.7	13.6	
Level of Service	F	C			C		B	F		C	C	B	
Approach Delay (s)		179.6			34.4			198.2			32.0		
Approach LOS		F			C			F			C		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			126.4									HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio			1.34										
Actuated Cycle Length (s)			115.0									Sum of lost time (s)	17.9
Intersection Capacity Utilization			123.0%									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)

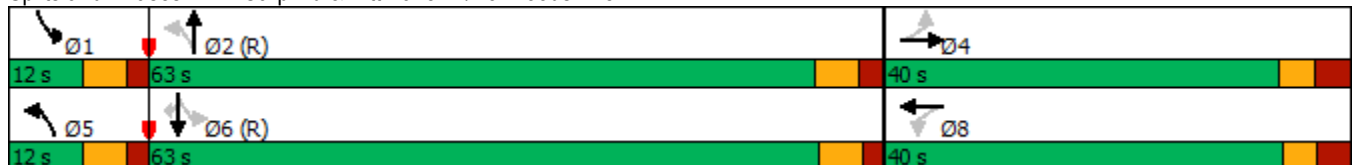


Phase Number	1	2	4	5	6	8
Movement	SBL	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	12	63	40	12	63	40
Maximum Split (%)	10.4%	54.8%	34.8%	10.4%	54.8%	34.8%
Minimum Split (s)	10.6	30	29.3	10.6	29.7	29
Yellow Time (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	451	74	154	455	72	504	318	350	60
v/c Ratio	1.19	0.46	0.62	0.60	0.74	0.51	0.63	0.74	0.47	0.09
Control Delay	148.8	30.7	62.5	51.2	14.1	61.0	42.1	42.3	43.2	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	148.8	30.7	62.5	51.2	14.1	61.0	42.1	42.3	43.2	3.9
Queue Length 50th (m)	~81.9	36.8	15.0	31.0	14.0	14.4	48.7	67.3	74.9	0.0
Queue Length 95th (m)	#114.5	43.7	26.7	45.0	37.9	27.0	65.3 m	#110.0	m96.9	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)	295	1328	202	433	721	278	802	428	751	696
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	1.19	0.34	0.37	0.36	0.63	0.26	0.63	0.74	0.47	0.09

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	347	104	74	154	455	72	486	18	318	350	60	
Future Volume (vph)	351	347	104	74	154	455	72	486	18	318	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	3233		1431	1586	1443	1523	3183		1462	1593	1309	
Flt Permitted	0.43	1.00		0.49	1.00	1.00	0.95	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	759	3233		741	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	347	104	74	154	455	72	486	18	318	350	60	
RTOR Reduction (vph)	0	29	0	0	0	377	0	2	0	0	0	32	
Lane Group Flow (vph)	351	422	0	74	154	78	72	502	0	318	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)	33.7	33.7		18.7	18.7	18.7	9.5	28.9		33.7	53.1	53.1	
Effective Green, g (s)	33.7	33.7		18.7	18.7	18.7	9.5	28.9		33.7	53.1	53.1	
Actuated g/C Ratio	0.29	0.29		0.16	0.16	0.16	0.08	0.25		0.29	0.46	0.46	
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)	292	947		120	257	234	125	799		428	735	604	
v/s Ratio Prot	c0.09	0.13			0.10		0.05	c0.16		c0.22	0.22		
v/s Ratio Perm	c0.26			0.10		0.05						0.02	
v/c Ratio	1.20	0.45		0.62	0.60	0.33	0.58	0.63		0.74	0.48	0.05	
Uniform Delay, d1	40.0	33.1		44.8	44.7	42.6	50.8	38.3		36.7	21.4	17.0	
Progression Factor	1.00	1.00		0.96	0.96	1.53	1.00	1.00		0.86	1.68	1.00	
Incremental Delay, d2	119.0	0.3		9.0	3.7	0.8	6.3	3.7		4.6	1.5	0.1	
Delay (s)	159.0	33.4		51.9	46.7	66.1	57.1	42.0		36.2	37.3	17.1	
Level of Service	F	C		D	D	E	E	D		D	D	B	
Approach Delay (s)		88.4			60.2			43.9			35.2		
Approach LOS		F			E			D			D		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			58.4		HCM 2000 Level of Service						E		
HCM 2000 Volume to Capacity ratio			0.90										
Actuated Cycle Length (s)			115.0		Sum of lost time (s)						24.8		
Intersection Capacity Utilization			94.9%		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)

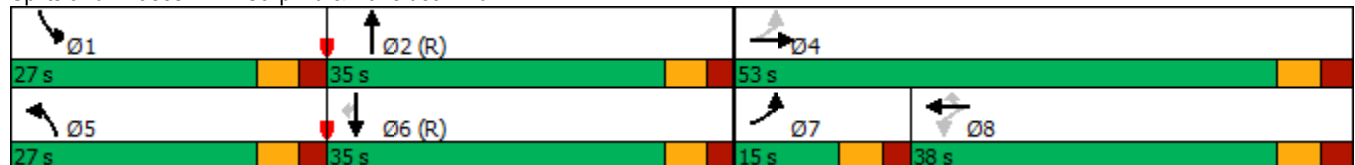


Phase Number	1	2	4	5	6	7	8
Movement	SBL	NBT	EBTL	NBL	SBT	EBL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lag
Lead-Lag Optimize							
Recall Mode	None	C-Max	None	None	C-Max	None	None
Maximum Split (s)	27	35	53	27	35	15	38
Maximum Split (%)	23.5%	30.4%	46.1%	23.5%	30.4%	13.0%	33.0%
Minimum Split (s)	11	31.1	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	

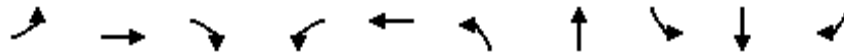
Splits and Phases: 2: Carp Rd & Hazeldean Rd



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	124	358	163	179	390	643	88	353	38
v/c Ratio	0.25	0.36	0.60	0.67	0.45	0.65	0.72	0.24	0.46	0.05
Control Delay	27.4	28.5	7.5	41.5	17.4	15.3	23.3	8.8	19.8	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	28.5	7.5	41.5	17.4	15.3	23.3	8.8	19.8	0.2
Queue Length 50th (m)	6.1	15.1	0.0	21.3	11.2	20.7	64.0	3.8	34.8	0.0
Queue Length 95th (m)	12.9	24.8	16.5	34.6	23.7	#58.3	#147.9	10.8	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)	309	524	715	369	554	598	897	408	771	694
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	0.17	0.24	0.50	0.44	0.32	0.65	0.72	0.22	0.46	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 (2029)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	124	358	163	78	101	390	453	190	88	353	38
Future Volume (vph)	51	124	358	163	78	101	390	453	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
Fr <sub>t</sub>	1.00	1.00	0.85	1.00	0.92		1.00	0.96		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)	1656	1686	1508	1667	1596		1655	1671		1582	1745	1439
Fl <sub>t</sub> Permitted	0.57	1.00	1.00	0.68	1.00		0.40	1.00		0.30	1.00	1.00
Satd. Flow (perm)	993	1686	1508	1188	1596		703	1671		497	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	124	358	163	78	101	390	453	190	88	353	38
RTOR Reduction (vph)	0	0	284	0	67	0	0	15	0	0	0	21
Lane Group Flow (vph)	51	124	74	163	112	0	390	628	0	88	353	17
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		41.6	35.4	35.4
Effective Green, g (s)	16.5	16.5	16.5	16.5	16.5		52.9	41.2		41.6	35.4	35.4
Actuated g/C Ratio	0.21	0.21	0.21	0.21	0.21		0.66	0.52		0.52	0.44	0.44
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)	204	347	311	245	329		607	860		342	772	636
v/s Ratio Prot		0.07			0.07		c0.10	c0.38		0.02	0.20	
v/s Ratio Perm	0.05		0.05	c0.14			0.33			0.11		0.01
v/c Ratio	0.25	0.36	0.24	0.67	0.34		0.64	0.73		0.26	0.46	0.03
Uniform Delay, d <sub>1</sub>	26.6	27.2	26.5	29.2	27.1		7.3	15.1		10.5	15.6	12.6
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d <sub>2</sub>	0.6	0.6	0.4	6.7	0.6		2.3	5.4		0.4	1.9	0.1
Delay (s)	27.2	27.8	26.9	35.9	27.7		9.6	20.5		10.9	17.5	12.7
Level of Service	C	C	C	D	C		A	C		B	B	B
Approach Delay (s)		27.1			31.6			16.4			15.9	
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			0.74									
Actuated Cycle Length (s)			80.0				Sum of lost time (s)			16.1		
Intersection Capacity Utilization			80.0%				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)

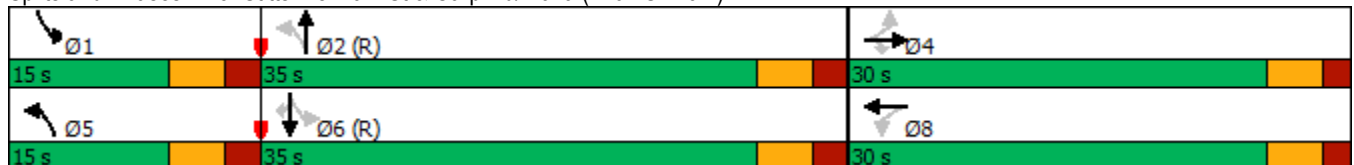


Phase Number	1	2	4	5	6	8
Movement	SBL	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	15	35	30	15	35	30
Maximum Split (%)	18.8%	43.8%	37.5%	18.8%	43.8%	37.5%
Minimum Split (s)	10.5	29.5	28.1	10.5	29.5	28.1
Yellow 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	32	0	115	6	105	0	0	12	0	49
Future Volume (Veh/h)	12	26	32	0	115	6	105	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	32	0	115	6	105	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			63			243	197	52	194	210	128
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	126			63			243	197	52	194	210	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			84	100	100	98	100	95
cM capacity (veh/h)	1451			1529			653	684	1002	743	672	910
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	70	121	105	61								
Volume Left	12	0	105	12								
Volume Right	32	6	0	49								
cSH	1451	1529	653	871								
Volume to Capacity	0.01	0.00	0.16	0.07								
Queue Length 95th (m)	0.2	0.0	4.0	1.6								
Control Delay (s)	1.3	0.0	11.6	9.4								
Lane LOS	A		B	A								
Approach Delay (s)	1.3	0.0	11.6	9.4								
Approach LOS			B	A								
<b>Intersection Summary</b>												
Average Delay			5.3									
Intersection Capacity Utilization			34.9%		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)	113	580	459	95	92	222
Future Volume (Veh/h)	113	580	459	95	92	222
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)	113	580	459	95	92	222
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	559				1028	282
vC1, stage 1 conf vol					512	
vC2, stage 2 conf vol					516	
vCu, unblocked vol	559				1028	282
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 %	89				72	69
cM capacity (veh/h)	1001				334	710
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	113	290	290	306	248	314
Volume Left	113	0	0	0	0	92
Volume Right	0	0	0	0	95	222
cSH	1001	1700	1700	1700	1700	534
Volume to Capacity	0.11	0.17	0.17	0.18	0.15	0.59
Queue Length 95th (m)	2.7	0.0	0.0	0.0	0.0	26.4
Control Delay (s)	9.1	0.0	0.0	0.0	0.0	20.9
Lane LOS	A					C
Approach Delay (s)	1.5			0.0		20.9
Approach LOS						C
Intersection Summary						
Average Delay			4.9			
Intersection Capacity Utilization			53.1%		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	501	269	422	69	70	352	306	118	150
v/c Ratio	0.20	0.45	0.49	0.28	0.25	0.32	0.81	0.97	0.39	0.35
Control Delay	16.2	33.0	16.0	18.1	30.8	47.4	27.9	81.7	46.5	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.2	33.0	16.0	18.1	30.8	47.4	27.9	81.7	46.5	7.8
Queue Length 50th (m)	9.1	31.6	23.8	22.6	11.0	13.8	17.6	~62.0	23.3	0.0
Queue Length 95th (m)	m16.6	68.5	48.4	42.2	18.1	23.5	44.6	#85.5	36.3	13.6
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)	436	1122	553	1482	311	587	721	316	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	0.45	0.49	0.28	0.22	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	482	19	269	298	124	69	70	352	306	118	150	
Future Volume (vph)	88	482	19	269	298	124	69	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	3230		1699	3005		1571	1689	1578	1591	1676	1645	
Flt Permitted	0.51	1.00		0.33	1.00		0.68	1.00	1.00	0.57	1.00	1.00	
Satd. Flow (perm)	909	3230		589	3005		1126	1689	1578	954	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	482	19	269	298	124	69	70	352	306	118	150	
RTOR Reduction (vph)	0	2	0	0	29	0	0	0	227	0	0	123	
Lane Group Flow (vph)	88	499	0	269	393	0	69	70	125	306	118	27	
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)	45.5	38.5		66.5	53.0		24.2	16.2	16.2	32.7	20.6	20.6	
Effective Green, g (s)	45.5	38.5		66.5	53.0		24.2	16.2	16.2	32.7	20.6	20.6	
Actuated g/C Ratio	0.40	0.33		0.58	0.46		0.21	0.14	0.14	0.28	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)	408	1081		548	1384		267	237	222	338	300	294	
v/s Ratio Prot	0.01	0.15		c0.09	0.13		0.02	0.04		c0.10	0.07		
v/s Ratio Perm	0.07			c0.19			0.04		0.08	c0.16		0.02	
v/c Ratio	0.22	0.46		0.49	0.28		0.26	0.30	0.56	0.91	0.39	0.09	
Uniform Delay, d1	22.1	30.1		13.3	19.2		37.5	44.3	46.1	38.5	41.7	39.4	
Progression Factor	1.13	1.06		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	1.3		0.7	0.5		0.5	0.7	3.3	26.4	0.9	0.1	
Delay (s)	25.3	33.2		14.0	19.7		38.0	45.0	49.4	64.9	42.5	39.5	
Level of Service	C	C		B	B		D	D	D	E	D	D	
Approach Delay (s)		32.1			17.5			47.1			53.7		
Approach LOS		C			B			D			D		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			36.2									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			72.8%									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)

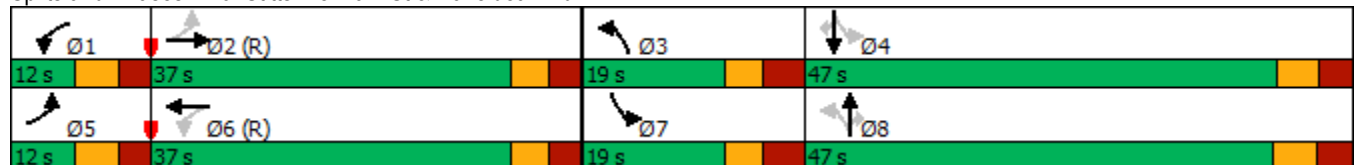


Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBTL	EBL	WBTL	SBL	NBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	12	37	19	47	12	37	19	47
Maximum Split (%)	10.4%	32.2%	16.5%	40.9%	10.4%	32.2%	16.5%	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	212	62	923	204	1338	182
v/c Ratio	0.99	0.24	0.61	0.43	0.98	0.79	1.34	0.21
Control Delay	115.2	14.0	36.4	27.1	49.6	49.3	181.7	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	115.2	14.0	36.4	27.1	49.6	49.3	181.7	7.7
Queue Length 50th (m)	36.8	2.8	28.3	4.6	~209.2	28.6	~386.0	9.0
Queue Length 95th (m)	#67.7	14.4	49.0	m13.6 m	#276.9	#59.5	#485.1	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)	215	421	419	253	942	288	1002	886
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	0.79	0.19	0.51	0.25	0.98	0.71	1.34	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	134	62	885	38	204	1338	182	
Future Volume (vph)	170	16	66	70	8	134	62	885	38	204	1338	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	
Frft	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	1554			1745		1474	1740		1653	1618	1381	
Flt Permitted	0.50	1.00			0.86		0.06	1.00		0.06	1.00	1.00	
Satd. Flow (perm)	903	1554			1522		96	1740		105	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	134	62	885	38	204	1338	182	
RTOR Reduction (vph)	0	53	0	0	55	0	0	1	0	0	0	32	
Lane Group Flow (vph)	170	29	0	0	157	0	62	922	0	204	1338	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)	22.8	22.8			23.1		71.3	64.9		85.2	73.2	73.2	
Effective Green, g (s)	22.8	22.8			23.1		71.3	64.9		85.2	73.2	73.2	
Actuated g/C Ratio	0.19	0.19			0.19		0.59	0.54		0.71	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)	171	295			292		130	941		260	986	842	
v/s Ratio Prot		0.02					0.03	0.53		c0.09	c0.83		
v/s Ratio Perm	c0.19				0.10		0.26			0.46		0.11	
v/c Ratio	0.99	0.10			0.54		0.48	0.98		0.78	1.36	0.18	
Uniform Delay, d1	48.5	40.1			43.6		26.4	26.9		36.7	23.4	10.2	
Progression Factor	1.00	1.00			1.00		1.28	0.98		1.00	1.00	1.00	
Incremental Delay, d2	66.8	0.1			1.9		2.0	20.8		14.3	167.3	0.5	
Delay (s)	115.3	40.2			45.5		35.8	47.3		51.0	190.7	10.7	
Level of Service	F	D			D		D	D		D	F	B	
Approach Delay (s)		90.9			45.5			46.5			155.2		
Approach LOS		F			D			D			F		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			109.0									HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio			1.27										
Actuated Cycle Length (s)			120.0									Sum of lost time (s)	17.9
Intersection Capacity Utilization			118.2%									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



## 2: Carp Rd &amp; Hazeldean Rd



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	113	508	102	628	470	162	482	521	598	289
v/c Ratio	1.55	0.39	0.41	0.97	0.60	0.69	0.53	1.66	1.02	0.47
Control Delay	336.6	23.7	20.1	52.1	4.7	63.8	38.3	332.9	61.4	20.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	336.6	23.7	20.1	52.1	4.7	63.8	38.3	332.9	61.4	20.0
Queue Length 50th (m)	~34.4	34.7	12.1	135.7	12.3	33.9	45.8	~170.9	~136.9	22.5
Queue Length 95th (m)	#68.2	48.0	m13.8	#200.7	m0.7	52.0	61.2	m#120.8	m87.9	m18.7
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)	73	1300	253	652	791	317	910	314	585	611
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	1.55	0.39	0.40	0.96	0.59	0.51	0.53	1.66	1.02	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	340	168	102	628	470	162	447	35	521	598	289
Future Volume (vph)	113	340	168	102	628	470	162	447	35	521	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	3304		1597	1725	1439	1732	3204		1693	1765	1461
Flt Permitted	0.11	1.00		0.40	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	197	3304		670	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	340	168	102	628	470	162	447	35	521	598	289
RTOR Reduction (vph)	0	51	0	0	0	248	0	5	0	0	0	127
Lane Group Flow (vph)	113	457	0	102	628	222	162	477	0	521	598	162
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)	45.1	45.1		45.1	45.1	45.1	16.4	33.9		22.3	39.8	39.8
Effective Green, g (s)	45.1	45.1		45.1	45.1	45.1	16.4	33.9		22.3	39.8	39.8
Actuated g/C Ratio	0.38	0.38		0.38	0.38	0.38	0.14	0.28		0.19	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)	74	1241		251	648	540	236	905		314	585	484
v/s Ratio Prot		0.14			0.36		0.09	0.15		c0.31	c0.34	
v/s Ratio Perm	c0.57			0.15		0.15						0.11
v/c Ratio	1.53	0.37		0.41	0.97	0.41	0.69	0.53		1.66	1.02	0.33
Uniform Delay, d1	37.5	27.1		27.6	36.8	27.7	49.4	36.3		48.9	40.1	30.1
Progression Factor	1.00	1.00		0.56	0.67	0.36	1.00	1.00		1.18	1.12	1.66
Incremental Delay, d2	294.0	0.2		0.9	24.7	0.4	8.0	2.2		297.9	17.3	0.2
Delay (s)	331.5	27.3		16.3	49.3	10.4	57.4	38.5		355.8	62.1	50.3
Level of Service	F	C		B	D	B	E	D		F	E	D
Approach Delay (s)		82.7			31.3			43.2			168.4	
Approach LOS		F			C			D			F	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			91.3				HCM 2000 Level of Service			F		
HCM 2000 Volume to Capacity ratio			1.41									
Actuated Cycle Length (s)			120.0				Sum of lost time (s)			18.7		
Intersection Capacity Utilization			113.9%				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)

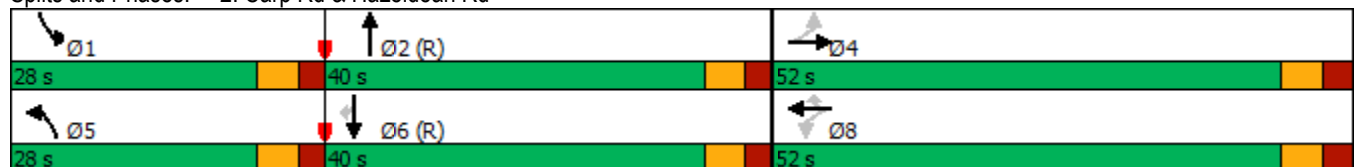


Phase Number	1	2	4	5	6	8
Movement	SBL	NBT	EBTL	NBL	SBT	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	28	40	52	28	40	52
Maximum Split (%)	23.3%	33.3%	43.3%	23.3%	33.3%	43.3%
Minimum Split (s)	11	31.1	37.6	11	31.1	37.6
Yellow Time (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

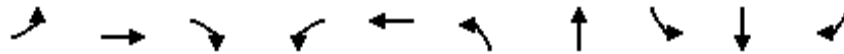
Intersection Summary

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 & Carp Rd/Plaza (1261 S. Main)



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	89	145	560	218	269	375	732	88	587	58
v/c Ratio	0.38	0.36	0.94	0.49	0.40	1.38	1.15	0.42	1.16	0.11
Control Delay	32.7	30.6	39.7	21.9	16.6	218.4	117.8	20.7	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	32.7	30.6	39.7	21.9	16.6	218.4	117.8	20.7	121.8	0.4
Queue Length 50th (m)	11.4	18.5	37.4	21.9	22.1	~80.5	~158.1	7.9	~111.3	0.0
Queue Length 95th (m)	23.5	33.1	#95.1	36.6	39.3	#129.6	#220.4	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)	271	456	633	447	724	272	634	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	0.32	0.88	0.49	0.37	1.38	1.15	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)

Total PM (2029)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	145	560	218	155	114	375	599	133	88	587	58
Future Volume (vph)	89	145	560	218	155	114	375	599	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)	1639	1720	1475	1699	1609		1595	1718		1615	1728	1405
Flt Permitted	0.59	1.00	1.00	0.51	1.00		0.13	1.00		0.15	1.00	1.00
Satd. Flow (perm)	1024	1720	1475	910	1609		212	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	145	560	218	155	114	375	599	133	88	587	58
RTOR Reduction (vph)	0	0	253	0	31	0	0	8	0	0	0	41
Lane Group Flow (vph)	89	145	307	218	238	0	375	724	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)	20.8	20.8	20.8	35.7	35.7		43.4	31.7		33.0	26.5	26.5
Effective Green, g (s)	20.8	20.8	20.8	35.7	35.7		43.4	31.7		33.0	26.5	26.5
Actuated g/C Ratio	0.23	0.23	0.23	0.40	0.40		0.48	0.35		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)	236	397	340	446	638		282	605		192	508	413
v/s Ratio Prot		0.08		c0.05	0.15		c0.17	0.42		0.03	0.34	
v/s Ratio Perm	0.09		c0.21	0.14			c0.47			0.13		0.01
v/c Ratio	0.38	0.37	0.90	0.49	0.37		1.33	1.20		0.46	1.16	0.04
Uniform Delay, d1	29.1	29.1	33.6	19.0	19.2		24.7	29.1		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	1.0	0.6	26.0	0.8	0.4		170.8	103.6		1.7	90.4	0.2
Delay (s)	30.2	29.6	59.6	19.9	19.6		195.5	132.8		23.8	122.1	22.9
Level of Service	C	C	E	B	B		F	F		C	F	C
Approach Delay (s)		50.8			19.7			154.0			102.5	
Approach LOS		D			B			F			F	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			94.7				HCM 2000 Level of Service			F		
HCM 2000 Volume to Capacity ratio			1.15									
Actuated Cycle Length (s)			90.0				Sum of lost time (s)			21.2		
Intersection Capacity Utilization			98.6%				ICU Level of Service			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 (2029)

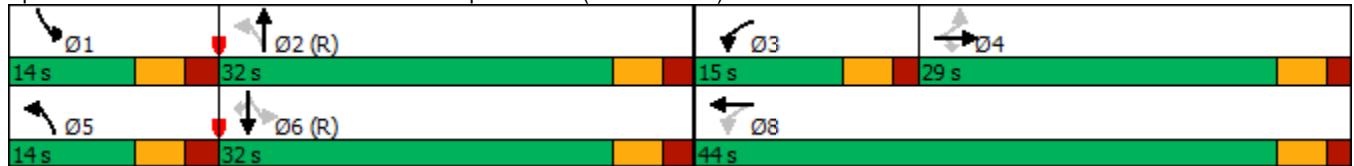


Phase Number	1	2	3	4	5	6	8
Movement	SBL	NBTL	WBL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	
Lead-Lag Optimize							
Recall Mode	None	C-Max	None	None	None	C-Max	None
Maximum Split (s)	14	32	15	29	14	32	44
Maximum Split (%)	15.6%	35.6%	16.7%	32.2%	15.6%	35.6%	48.9%
Minimum Split (s)	10.5	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	65	0	59	6	40	0	0	41	0	25
Future Volume (Veh/h)	40	94	65	0	59	6	40	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	65	0	59	6	40	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			164			304	282	136	278	311	72
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	70			164			304	282	136	278	311	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			93	100	100	94	100	97
cM capacity (veh/h)	1520			1405			605	602	900	645	580	977
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	199	65	40	66								
Volume Left	40	0	40	41								
Volume Right	65	6	0	25								
cSH	1520	1405	605	740								
Volume to Capacity	0.03	0.00	0.07	0.09								
Queue Length 95th (m)	0.6	0.0	1.5	2.0								
Control Delay (s)	1.7	0.0	11.4	10.3								
Lane LOS	A		B	B								
Approach Delay (s)	1.7	0.0	11.4	10.3								
Approach LOS			B	B								
<b>Intersection Summary</b>												
Average Delay			4.0									
Intersection Capacity Utilization			30.5%		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)	104	798	1085	91	42	121
Future Volume (Veh/h)	104	798	1085	91	42	121
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)	104	798	1085	91	42	121
<b>Pedestrians</b>						
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				
<b>pX, platoon unblocked</b>						
vC, conflicting volume	1176			1738	588	
vC1, stage 1 conf vol					1130	
vC2, stage 2 conf vol					607	
vCu, unblocked vol	1176			1738	588	
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 %	83			77	74	
cM capacity (veh/h)	601			180	457	
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	104	399	399	723	453	163
Volume Left	104	0	0	0	0	42
Volume Right	0	0	0	0	91	121
cSH	601	1700	1700	1700	1700	328
Volume to Capacity	0.17	0.23	0.23	0.43	0.27	0.50
Queue Length 95th (m)	4.3	0.0	0.0	0.0	0.0	18.4
Control Delay (s)	12.2	0.0	0.0	0.0	0.0	26.4
Lane LOS	B			D		
Approach Delay (s)	1.4			0.0	26.4	
Approach LOS				D		
<b>Intersection Summary</b>						
Average Delay			2.5			
Intersection Capacity Utilization			61.1%	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	488	576	1092	140	194	452	256	271	103
v/c Ratio	0.54	0.49	1.09	0.81	0.52	0.60	0.82	0.78	0.79	0.24
Control Delay	29.7	50.0	89.0	37.5	34.1	51.6	25.5	48.4	61.9	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	29.7	50.0	89.0	37.5	34.1	51.6	25.5	48.4	61.9	2.7
Queue Length 50th (m)	20.0	54.1	~97.0	106.1	21.2	38.5	27.3	42.0	56.3	0.0
Queue Length 95th (m)	m20.9	m48.5	#192.1	#170.1	32.2	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)	337	988	530	1340	282	435	636	329	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	0.49	1.09	0.81	0.50	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	451	37	576	782	310	140	194	452	256	271	103
Future Volume (vph)	134	451	37	576	782	310	140	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)	1881	3304		1730	3208		1694	1740	1585	1658	1760	1592
Fl <sub>t</sub> Permitted	0.16	1.00		0.31	1.00		0.34	1.00	1.00	0.48	1.00	1.00
Satd. Flow (perm)	321	3304		572	3208		603	1740	1585	838	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	451	37	576	782	310	140	194	452	256	271	103
RTOR Reduction (vph)	0	5	0	0	30	0	0	0	261	0	0	83
Lane Group Flow (vph)	134	483	0	576	1062	0	140	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)	45.6	35.7		65.5	49.1		33.4	22.2	22.2	35.5	23.4	23.4
Effective Green, g (s)	45.6	35.7		65.5	49.1		33.4	22.2	22.2	35.5	23.4	23.4
Actuated g/C Ratio	0.38	0.30		0.55	0.41		0.28	0.18	0.18	0.30	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)	250	982		537	1312		269	321	293	330	343	310
v/s Ratio Prot	0.04	0.15		c0.21	0.33		0.05	0.11		c0.08	c0.15	
v/s Ratio Perm	0.16			c0.38			0.10		0.12	0.15		0.01
v/c Ratio	0.54	0.49		1.07	0.81		0.52	0.60	0.65	0.78	0.79	0.06
Uniform Delay, d1	25.9	34.7		21.1	31.3		34.5	44.9	45.3	36.7	46.0	39.4
Progression Factor	1.67	1.45		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.2		59.8	5.5		1.8	3.2	5.1	10.9	11.7	0.1
Delay (s)	43.4	50.3		80.8	36.8		36.3	48.1	50.5	47.5	57.7	39.5
Level of Service	D	D		F	D		D	D	D	D	E	D
Approach Delay (s)		48.8			52.0			47.4			50.6	
Approach LOS		D			D			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			50.2				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			1.02									
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)

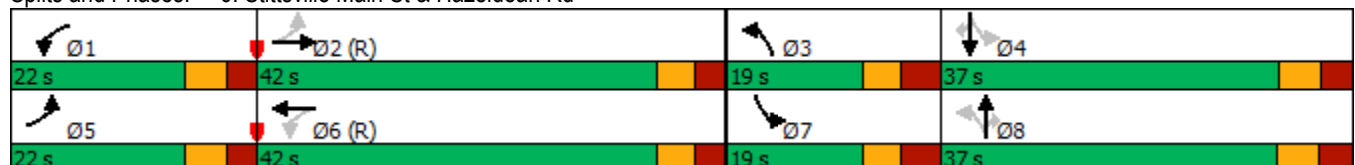


Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBTL	EBL	WBTL	SBL	NBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	22	42	19	37	22	42	19	37
Maximum Split (%)	18.3%	35.0%	15.8%	30.8%	18.3%	35.0%	15.8%	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) 25% Reduced



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	213	68	258	24	931	56	533	44
v/c Ratio	0.96	0.15	0.44	0.07	0.98	0.38	0.58	0.05
Control Delay	92.3	9.3	11.5	7.7	44.9	18.5	21.7	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	92.3	9.3	11.5	7.7	44.9	18.5	21.7	0.6
Queue Length 50th (m)	42.0	0.7	9.7	0.9	~208.5	4.5	79.7	0.0
Queue Length 95th (m)	#82.2	10.3	29.2	m2.6 m	#268.3	10.9	115.3	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)	243	481	620	373	946	152	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	0.88	0.14	0.42	0.06	0.98	0.37	0.58	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

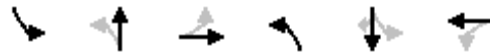
Total AM (2029) 25% Reduced

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	213	5	63	44	3	211	24	917	14	56	533	44
Future Volume (vph)	213	5	63	44	3	211	24	917	14	56	533	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)	1681	1490			1733		1473	1746		1653	1618	1382
Flt Permitted	0.47	1.00			0.94		0.35	1.00		0.06	1.00	1.00
Satd. Flow (perm)	832	1490			1636		546	1746		111	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	211	24	917	14	56	533	44
RTOR Reduction (vph)	0	46	0	0	142	0	0	0	0	0	0	20
Lane Group Flow (vph)	213	22	0	0	116	0	24	931	0	56	533	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)	222	399			442		339	929		133	883	754
v/s Ratio Prot		0.01					0.00	c0.53		c0.02	0.33	
v/s Ratio Perm	c0.26				0.07		0.04			0.23		0.02
v/c Ratio	0.96	0.05			0.26		0.07	1.00		0.42	0.60	0.03
Uniform Delay, d1	41.5	31.3			33.0		12.1	26.9		23.2	17.7	12.1
Progression Factor	1.00	1.00			1.00		0.79	0.70		1.00	1.00	1.00
Incremental Delay, d2	48.4	0.1			0.3		0.1	27.3		2.1	3.1	0.1
Delay (s)	89.8	31.3			33.3		9.6	46.0		25.4	20.7	12.1
Level of Service	F	C			C		A	D		C	C	B
Approach Delay (s)		75.7			33.3			45.1			20.5	
Approach LOS		E			C			D			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			40.4				HCM 2000 Level of Service				D	
HCM 2000 Volume to Capacity ratio			0.96									
Actuated Cycle Length (s)			115.0			Sum of lost time (s)				17.9		
Intersection Capacity Utilization			96.2%			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	110
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) 25% Reduced



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	263	338	56	116	341	54	379	239	263	45
v/c Ratio	0.94	0.39	0.54	0.58	0.71	0.43	0.33	0.75	0.32	0.06
Control Delay	79.8	31.3	63.9	57.1	15.5	59.9	29.7	45.5	36.0	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.8	31.3	63.9	57.1	15.5	59.9	29.7	45.5	36.0	2.4
Queue Length 50th (m)	48.4	26.9	11.2	23.4	0.0	10.8	29.5	48.9	54.9	0.0
Queue Length 95th (m)	#75.6	35.1	22.3	37.8	26.1	22.1	48.5	74.7	81.0	m0.9
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)	280	1328	225	433	641	278	1149	327	825	750
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	0.94	0.25	0.25	0.27	0.53	0.19	0.33	0.73	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	260	78	56	116	341	54	365	14	239	263	45		
Future Volume (vph)	263	260	78	56	116	341	54	365	14	239	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	3233		1431	1586	1443	1523	3181		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)	825	3233		826	1586	1443	1523	3181		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	260	78	56	116	341	54	365	14	239	263	45		
RTOR Reduction (vph)	0	30	0	0	0	298	0	2	0	0	0	22		
Lane Group Flow (vph)	263	308	0	56	116	43	54	377	0	239	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)	29.6	29.6		14.6	14.6	14.6	8.3	41.5		25.2	58.4	58.4		
Effective Green, g (s)	29.6	29.6		14.6	14.6	14.6	8.3	41.5		25.2	58.4	58.4		
Actuated g/C Ratio	0.26	0.26		0.13	0.13	0.13	0.07	0.36		0.22	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)	277	832		104	201	183	109	1147		320	808	664		
v/s Ratio Prot	c0.07	0.10			0.07		0.04	0.12		c0.16	c0.17			
v/s Ratio Perm	c0.17			0.07		0.03						0.02		
v/c Ratio	0.95	0.37		0.54	0.58	0.24	0.50	0.33		0.75	0.33	0.03		
Uniform Delay, d1	41.2	35.0		47.0	47.3	45.2	51.3	26.6		41.9	16.7	14.2		
Progression Factor	1.00	1.00		1.00	0.99	1.48	1.00	1.00		0.79	1.83	1.00		
Incremental Delay, d2	40.0	0.3		5.3	4.0	0.7	3.5	0.8		8.0	0.9	0.1		
Delay (s)	81.2	35.3		52.1	50.7	67.4	54.8	27.4		41.0	31.5	14.3		
Level of Service	F	D		D	D	E	D	C		D	C	B		
Approach Delay (s)		55.4			61.9			30.8			34.3			
Approach LOS		E			E			C			C			
<b>Intersection Summary</b>														
HCM 2000 Control Delay			46.4									HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio			0.66											
Actuated Cycle Length (s)			115.0								24.8			
Intersection Capacity Utilization			83.7%										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 (2029) 25% Reduced

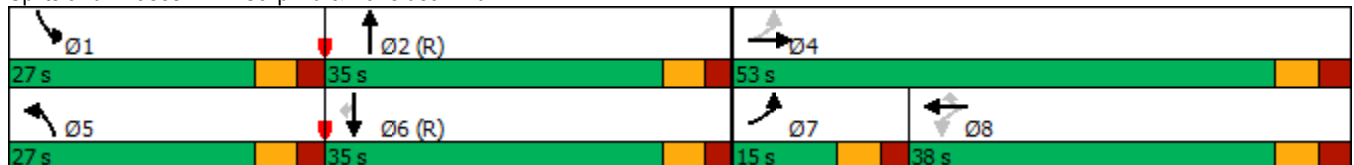


Phase Number	1	2	4	5	6	7	8
Movement	SBL	NBT	EBTL	NBL	SBT	EBL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lag
Lead-Lag Optimize							
Recall Mode	None	C-Max	None	None	C-Max	None	None
Maximum Split (s)	27	35	53	27	35	15	38
Maximum Split (%)	23.5%	30.4%	46.1%	23.5%	30.4%	13.0%	33.0%
Minimum Split (s)	11	31.1	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

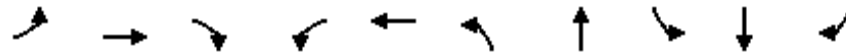




Queues

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	93	269	122	135	293	483	66	265	29
v/c Ratio	0.19	0.32	0.56	0.58	0.40	0.42	0.50	0.13	0.31	0.04
Control Delay	28.8	30.7	8.5	40.7	16.9	7.1	14.0	6.3	15.5	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	30.7	8.5	40.7	16.9	7.1	14.0	6.3	15.5	0.1
Queue Length 50th (m)	4.6	11.6	0.0	16.0	7.2	12.4	36.6	2.4	20.7	0.0
Queue Length 95th (m)	11.0	21.2	15.9	28.5	19.1	27.5	74.7	7.2	45.0	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)	357	524	654	380	549	712	965	561	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	0.18	0.41	0.32	0.25	0.41	0.50	0.12	0.31	0.04

Intersection Summary

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

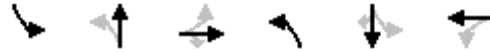
Total AM (2029) 25% Reduced



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	93	269	122	59	76	293	340	143	66	265	29
Future Volume (vph)	38	93	269	122	59	76	293	340	143	66	265	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	1596		1654	1671		1579	1745	1439
Flt Permitted	0.66	1.00	1.00	0.70	1.00		0.50	1.00		0.46	1.00	1.00
Satd. Flow (perm)	1146	1686	1508	1222	1596		878	1671		765	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	93	269	122	59	76	293	340	143	66	265	29
RTOR Reduction (vph)	0	0	223	0	63	0	0	13	0	0	0	15
Lane Group Flow (vph)	38	93	46	122	72	0	293	470	0	66	265	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)	197	290	260	210	275		713	929		485	855	705
v/s Ratio Prot		0.06			0.05		c0.06	c0.28		0.01	0.15	
v/s Ratio Perm	0.03		0.03	c0.10			0.23			0.07		0.01
v/c Ratio	0.19	0.32	0.18	0.58	0.26		0.41	0.51		0.14	0.31	0.02
Uniform Delay, d1	28.3	29.0	28.3	30.4	28.7		5.0	11.0		8.1	12.3	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	4.0	0.5		0.4	2.0		0.1	0.9	0.1
Delay (s)	28.8	29.6	28.6	34.5	29.2		5.4	12.9		8.2	13.2	10.6
Level of Service	C	C	C	C	C		A	B		A	B	B
Approach Delay (s)		28.9			31.7			10.1			12.1	
Approach LOS		C			C			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			17.8				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

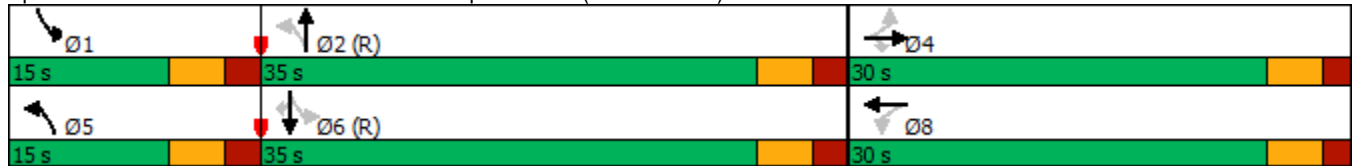


Phase Number	1	2	4	5	6	8
Movement	SBL	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	15	35	30	15	35	30
Maximum Split (%)	18.8%	43.8%	37.5%	18.8%	43.8%	37.5%
Minimum Split (s)	10.5	29.5	28.1	10.5	29.5	28.1
Yellow 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	24	0	86	5	79	0	0	9	0	37
Future Volume (Veh/h)	9	20	24	0	86	5	79	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	24	0	86	5	79	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			49			186	151	42	148	160	98
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	96			49			186	151	42	148	160	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			89	100	100	99	100	96
cM capacity (veh/h)	1488			1547			724	726	1015	797	718	945
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	53	91	79	46								
Volume Left	9	0	79	9								
Volume Right	24	5	0	37								
cSH	1488	1547	724	912								
Volume to Capacity	0.01	0.00	0.11	0.05								
Queue Length 95th (m)	0.1	0.0	2.6	1.1								
Control Delay (s)	1.3	0.0	10.6	9.2								
Lane LOS	A		B	A								
Approach Delay (s)	1.3	0.0	10.6	9.2								
Approach LOS			B	A								
<b>Intersection Summary</b>												
Average Delay			4.9									
Intersection Capacity Utilization			28.9%		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)	85	435	344	71	69	167
Future Volume (Veh/h)	85	435	344	71	69	167
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)	85	435	344	71	69	167
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	420				772	212
vC1, stage 1 conf vol					384	
vC2, stage 2 conf vol					388	
vCu, unblocked vol	420				772	212
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				84	79
cM capacity (veh/h)	1128				427	787
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	85	218	218	229	186	236
Volume Left	85	0	0	0	0	69
Volume Right	0	0	0	0	71	167
cSH	1128	1700	1700	1700	1700	632
Volume to Capacity	0.08	0.13	0.13	0.13	0.11	0.37
Queue Length 95th (m)	1.7	0.0	0.0	0.0	0.0	12.1
Control Delay (s)	8.5	0.0	0.0	0.0	0.0	14.1
Lane LOS	A					B
Approach Delay (s)	1.4			0.0		14.1
Approach LOS						B
Intersection Summary						
Average Delay			3.4			
Intersection Capacity Utilization			42.5%		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	376	202	317	52	53	264	230	89	113
v/c Ratio	0.12	0.25	0.34	0.20	0.23	0.32	0.67	0.81	0.34	0.29
Control Delay	14.4	24.4	11.7	13.7	34.3	52.6	14.7	60.0	49.3	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.4	24.4	11.7	13.7	34.3	52.6	14.7	60.0	49.3	4.2
Queue Length 50th (m)	7.0	23.0	16.3	14.7	8.4	10.5	0.0	41.8	17.4	0.0
Queue Length 95th (m)	m12.3	32.3	30.5	26.2	16.2	20.7	21.7	#68.1	31.0	5.8
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)	571	1493	591	1591	280	587	721	284	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	0.25	0.34	0.20	0.19	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	362	14	202	224	93	52	53	264	230	89	113
Future Volume (vph)	66	362	14	202	224	93	52	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	3230		1699	3005		1571	1689	1578	1591	1676	1645
Flt Permitted	0.56	1.00		0.46	1.00		0.70	1.00	1.00	0.53	1.00	1.00
Satd. Flow (perm)	1006	3230		829	3005		1156	1689	1578	885	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	362	14	202	224	93	52	53	264	230	89	113
RTOR Reduction (vph)	0	2	0	0	27	0	0	0	235	0	0	95
Lane Group Flow (vph)	66	374	0	202	290	0	52	53	29	230	89	18
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)	57.9	51.7		68.9	57.2		20.1	12.8	12.8	30.0	17.9	17.9
Effective Green, g (s)	57.9	51.7		68.9	57.2		20.1	12.8	12.8	30.0	17.9	17.9
Actuated g/C Ratio	0.50	0.45		0.60	0.50		0.17	0.11	0.11	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)	544	1452		585	1494		228	187	175	305	260	256
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			0.03		0.02	c0.12		0.01
v/c Ratio	0.12	0.26		0.35	0.19		0.23	0.28	0.17	0.75	0.34	0.07
Uniform Delay, d1	14.7	19.7		10.8	16.1		40.5	46.9	46.3	37.6	43.3	41.4
Progression Factor	1.39	1.21		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		0.5	0.8	0.5	10.1	0.8	0.1
Delay (s)	20.6	24.3		11.1	16.4		41.0	47.7	46.7	47.7	44.1	41.6
Level of Service	C	C		B	B		D	D	D	D	D	D
Approach Delay (s)		23.8			14.3			46.1			45.3	
Approach LOS		C			B			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			30.9				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.51									
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

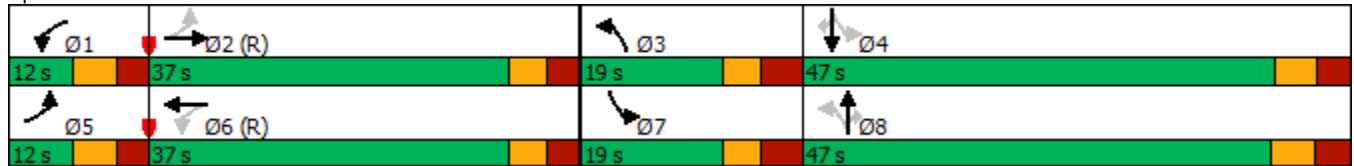


Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBTL	EBL	WBTL	SBL	NBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	12	37	19	47	12	37	19	47
Maximum Split (%)	10.4%	32.2%	16.5%	40.9%	10.4%	32.2%	16.5%	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	160	47	693	153	1004	137
v/c Ratio	0.81	0.21	0.52	0.24	0.65	0.36	0.95	0.15
Control Delay	81.9	15.9	30.8	11.4	20.3	7.9	39.8	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.9	15.9	30.8	11.4	20.3	7.9	39.8	5.2
Queue Length 50th (m)	27.1	2.2	18.0	3.0	61.6	8.3	192.4	4.3
Queue Length 95th (m)	43.9	12.3	34.7	m7.8	177.1	18.2	#321.8	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)	236	409	422	312	1071	504	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	0.38	0.15	0.65	0.30	0.95	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	101	47	664	29	153	1004	137
Future Volume (vph)	128	12	50	53	6	101	47	664	29	153	1004	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			0.91		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	1554			1745		1474	1740		1653	1618	1381
Flt Permitted	0.54	1.00			0.87		0.12	1.00		0.27	1.00	1.00
Satd. Flow (perm)	988	1554			1535		185	1740		461	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	101	47	664	29	153	1004	137
RTOR Reduction (vph)	0	42	0	0	57	0	0	1	0	0	0	29
Lane Group Flow (vph)	128	20	0	0	103	0	47	692	0	153	1004	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		79.4	73.8		86.5	77.5	77.5
Effective Green, g (s)	19.3	19.3			19.6		79.4	73.8		86.5	77.5	77.5
Actuated g/C Ratio	0.16	0.16			0.16		0.66	0.61		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)	158	249			250		182	1070		421	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	0.81	0.08			0.41		0.26	0.65		0.36	0.96	0.12
Uniform Delay, d1	48.6	42.8			45.0		16.3	14.8		8.8	19.9	8.2
Progression Factor	1.00	1.00			1.00		1.46	1.02		1.00	1.00	1.00
Incremental Delay, d2	25.9	0.1			1.1		0.7	2.8		0.5	20.0	0.3
Delay (s)	74.5	42.9			46.1		24.4	17.8		9.4	39.9	8.4
Level of Service	E	D			D		C	B		A	D	A
Approach Delay (s)		64.2			46.1			18.2			33.0	
Approach LOS		E			D			B			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			31.7									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			91.2%									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 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	381	77	471	353	122	361	391	449	217
v/c Ratio	0.69	0.34	0.30	0.84	0.50	0.62	0.40	0.98	0.63	0.30
Control Delay	62.3	23.7	22.6	43.1	5.8	63.5	35.7	80.9	37.5	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	62.3	23.7	22.6	43.1	5.8	63.5	35.7	80.9	37.5	10.7
Queue Length 50th (m)	15.6	24.9	13.4	98.7	25.5	25.6	32.6	~93.5	61.1	7.6
Queue Length 95th (m)	#35.4	34.1	16.1	128.4	7.4	41.7	45.4 m	#125.1	m83.8	m15.0
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)	144	1299	303	652	763	317	910	400	714	720
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	0.25	0.72	0.46	0.38	0.40	0.98	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	255	126	77	471	353	122	335	26	391	449	217
Future Volume (vph)	85	255	126	77	471	353	122	335	26	391	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	3304		1595	1725	1439	1732	3205		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	3304		803	1725	1439	1732	3205		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	255	126	77	471	353	122	335	26	391	449	217
RTOR Reduction (vph)	0	55	0	0	0	238	0	5	0	0	0	129
Lane Group Flow (vph)	85	326	0	77	471	115	122	356	0	391	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)	39.0	39.0		39.0	39.0	39.0	13.7	33.9		28.4	48.6	48.6
Effective Green, g (s)	39.0	39.0		39.0	39.0	39.0	13.7	33.9		28.4	48.6	48.6
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	1073		260	560	467	197	905		400	714	591
v/s Ratio Prot		0.10			c0.27		0.07	0.11		c0.23	c0.25	
v/s Ratio Perm	0.22			0.10		0.08						0.06
v/c Ratio	0.69	0.30		0.30	0.84	0.25	0.62	0.39		0.98	0.63	0.15
Uniform Delay, d1	35.2	30.3		30.2	37.6	29.7	50.7	34.7		45.5	28.5	22.6
Progression Factor	1.00	1.00		0.69	0.80	1.24	1.00	1.00		1.25	1.12	2.54
Incremental Delay, d2	14.6	0.2		0.6	10.4	0.3	5.7	1.3		24.3	1.9	0.2
Delay (s)	49.7	30.5		21.5	40.4	37.2	56.4	36.0		81.3	33.8	57.6
Level of Service	D	C		C	D	D	E	D		F	C	E
Approach Delay (s)		34.0			37.6			41.2			56.3	
Approach LOS		C			D			D			E	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			44.4			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			95.9%			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

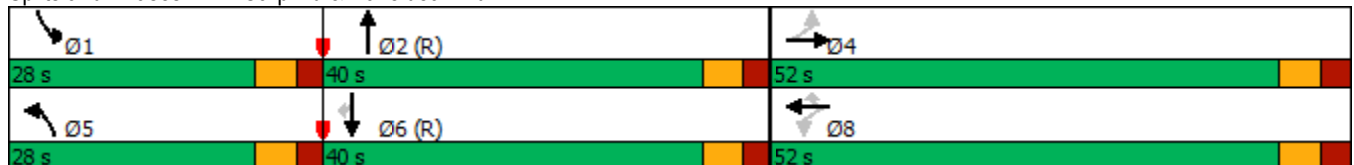


Phase Number	1	2	4	5	6	8
Movement	SBL	NBT	EBTL	NBL	SBT	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	28	40	52	28	40	52
Maximum Split (%)	23.3%	33.3%	43.3%	23.3%	33.3%	43.3%
Minimum Split (s)	11	31.1	37.6	11	31.1	37.6
Yellow Time (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	

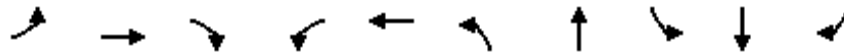
Splits and Phases: 2: Carp Rd & Hazeldean Rd



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	109	420	164	202	281	549	66	440	44
v/c Ratio	0.40	0.41	0.75	0.44	0.37	0.65	0.71	0.21	0.84	0.08
Control Delay	39.4	37.3	14.2	25.8	18.2	24.4	29.5	13.6	45.5	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	39.4	37.3	14.2	25.8	18.2	24.4	29.5	13.6	45.5	0.3
Queue Length 50th (m)	10.0	16.3	4.6	20.1	18.4	21.0	67.4	4.2	64.5	0.0
Queue Length 95th (m)	18.5	26.1	27.7	28.1	28.4	#78.8	#152.6	12.4	#113.0	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)	288	456	676	373	724	430	776	347	526	535
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	0.24	0.62	0.44	0.28	0.65	0.71	0.19	0.84	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	109	420	164	116	86	281	449	100	66	440	44
Future Volume (vph)	67	109	420	164	116	86	281	449	100	66	440	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
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)	1634	1720	1475	1698	1608		1591	1719		1609	1728	1405
Flt Permitted	0.63	1.00	1.00	0.50	1.00		0.20	1.00		0.37	1.00	1.00
Satd. Flow (perm)	1085	1720	1475	900	1608		329	1719		633	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	109	420	164	116	86	281	449	100	66	440	44
RTOR Reduction (vph)	0	0	328	0	35	0	0	7	0	0	0	31
Lane Group Flow (vph)	67	109	92	164	167	0	281	542	0	66	440	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)	14.0	14.0	14.0	28.6	28.6		50.8	39.2		33.6	27.5	27.5
Effective Green, g (s)	14.0	14.0	14.0	28.6	28.6		50.8	39.2		33.6	27.5	27.5
Actuated g/C Ratio	0.16	0.16	0.16	0.32	0.32		0.56	0.44		0.37	0.31	0.31
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)	168	267	229	370	510		435	748		302	528	429
v/s Ratio Prot		0.06		c0.05	0.10		c0.13	c0.32		0.01	c0.25	
v/s Ratio Perm	0.06		0.06	c0.09			0.24			0.07		0.01
v/c Ratio	0.40	0.41	0.40	0.44	0.33		0.65	0.72		0.22	0.83	0.03
Uniform Delay, d1	34.2	34.3	34.2	23.4	23.4		13.8	20.9		18.6	29.1	21.9
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	1.6	1.0	1.2	0.8	0.4		3.3	6.0		0.4	14.3	0.1
Delay (s)	35.8	35.3	35.4	24.2	23.7		17.0	27.0		19.0	43.4	22.0
Level of Service	D	D	D	C	C		B	C		B	D	C
Approach Delay (s)		35.4			23.9			23.6			38.8	
Approach LOS		D			C			C			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			30.2	HCM 2000 Level of Service				C				
HCM 2000 Volume to Capacity ratio			0.69									
Actuated Cycle Length (s)			90.0	Sum of lost time (s)				21.2				
Intersection Capacity Utilization			83.1%	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

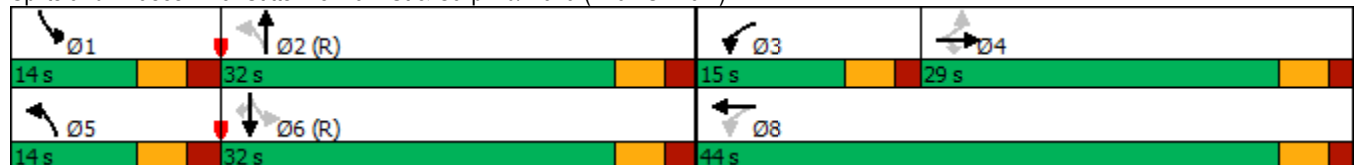


Phase Number	1	2	3	4	5	6	8
Movement	SBL	NBTL	WBL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	
Lead-Lag Optimize							
Recall Mode	None	C-Max	None	None	None	C-Max	None
Maximum Split (s)	14	32	15	29	14	32	44
Maximum Split (%)	15.6%	35.6%	16.7%	32.2%	15.6%	35.6%	48.9%
Minimum Split (s)	10.5	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	49	0	44	5	30	0	0	31	0	19
Future Volume (Veh/h)	30	71	49	0	44	5	30	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	49	0	44	5	30	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			125			231	214	106	212	236	56
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	54			125			231	214	106	212	236	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			1452			683	661	936	717	643	997
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	150	49	30	50								
Volume Left	30	0	30	31								
Volume Right	49	5	0	19								
cSH	1541	1452	683	802								
Volume to Capacity	0.02	0.00	0.04	0.06								
Queue Length 95th (m)	0.4	0.0	1.0	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			27.2%		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)	78	599	814	68	32	91
Future Volume (Veh/h)	78	599	814	68	32	91
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)	78	599	814	68	32	91
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	882				1304	441
vC1, stage 1 conf vol					848	
vC2, stage 2 conf vol					456	
vCu, unblocked vol	882				1304	441
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 %	90				88	84
cM capacity (veh/h)	775				267	570
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	78	300	300	543	339	123
Volume Left	78	0	0	0	0	32
Volume Right	0	0	0	0	68	91
cSH	775	1700	1700	1700	1700	440
Volume to Capacity	0.10	0.18	0.18	0.32	0.20	0.28
Queue Length 95th (m)	2.3	0.0	0.0	0.0	0.0	7.9
Control Delay (s)	10.2	0.0	0.0	0.0	0.0	16.3
Lane LOS	B					C
Approach Delay (s)	1.2			0.0		16.3
Approach LOS						C
Intersection Summary						
Average Delay			1.7			
Intersection Capacity Utilization			48.4%		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	366	432	820	105	146	339	192	203	77
v/c Ratio	0.28	0.31	0.69	0.55	0.39	0.57	0.67	0.61	0.71	0.20
Control Delay	26.2	43.1	22.4	24.9	33.8	55.2	13.1	41.0	61.1	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	26.2	43.1	22.4	24.9	33.8	55.2	13.1	41.0	61.1	1.2
Queue Length 50th (m)	15.0	39.9	49.6	61.9	16.8	29.8	4.0	32.5	42.3	0.0
Queue Length 95th (m)	m20.1	m46.7	83.0	93.5	26.7	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)	473	1166	624	1502	294	435	634	318	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	0.31	0.69	0.55	0.36	0.34	0.53	0.60	0.46	0.15

Intersection Summary

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	28	432	587	233	105	146	339	192	203	77
Future Volume (vph)	101	338	28	432	587	233	105	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	0.99		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)	1879	3304		1727	3208		1693	1740	1585	1654	1760	1592
Flt Permitted	0.33	1.00		0.43	1.00		0.47	1.00	1.00	0.54	1.00	1.00
Satd. Flow (perm)	659	3304		781	3208		833	1740	1585	947	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	28	432	587	233	105	146	339	192	203	77
RTOR Reduction (vph)	0	5	0	0	27	0	0	0	271	0	0	64
Lane Group Flow (vph)	101	361	0	432	793	0	105	146	68	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)	50.7	42.2		70.2	55.2		28.1	17.7	17.7	31.4	19.5	19.5
Effective Green, g (s)	50.7	42.2		70.2	55.2		28.1	17.7	17.7	31.4	19.5	19.5
Actuated g/C Ratio	0.42	0.35		0.59	0.46		0.23	0.15	0.15	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)	364	1161		626	1475		269	256	233	317	286	258
v/s Ratio Prot	0.02	0.11		c0.12	0.25		0.03	0.08		c0.06	c0.12	
v/s Ratio Perm	0.10			c0.28			0.06		0.04	0.10		0.01
v/c Ratio	0.28	0.31		0.69	0.54		0.39	0.57	0.29	0.61	0.71	0.05
Uniform Delay, d1	21.2	28.3		14.5	23.2		37.6	47.6	45.6	37.1	47.6	42.4
Progression Factor	1.70	1.44		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.5		3.3	1.4		0.9	3.1	0.7	3.3	7.8	0.1
Delay (s)	36.3	41.2		17.7	24.7		38.6	50.7	46.3	40.3	55.4	42.5
Level of Service	D	D		B	C		D	D	D	D	E	D
Approach Delay (s)		40.1			22.3			46.0			47.2	
Approach LOS		D			C			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			34.5				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.73									
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

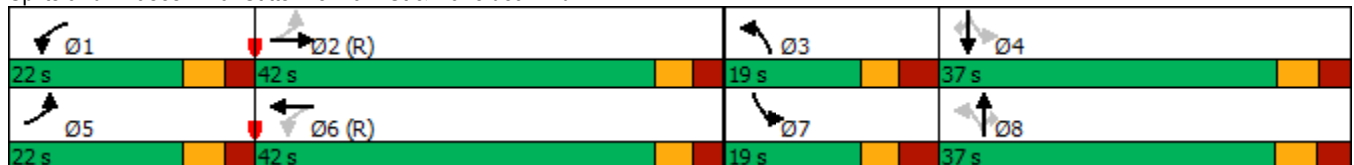


Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBTL	EBL	WBTL	SBL	NBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	22	42	19	37	22	42	19	37
Maximum Split (%)	18.3%	35.0%	15.8%	30.8%	18.3%	35.0%	15.8%	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



Queues

Total AM (2029) & Mitigated

1: Carp Rd & Kittiwake Dr/Echwoods Ave
























Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	284	90	63	281	32	1240	74	711	59
v/c Ratio	1.09	0.24	0.29	0.70	0.10	1.16	0.54	0.70	0.07
Control Delay	126.1	11.1	42.7	30.5	3.1	96.9	27.9	19.7	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	126.1	11.1	42.7	30.5	3.1	96.9	27.9	19.7	1.1
Queue Length 50th (m)	~66.4	1.0	11.1	26.4	0.6	~314.0	4.5	100.4	0.0
Queue Length 95th (m)	#114.3	13.1	22.8	54.9	m1.3 m	#334.6	#16.4	145.4	2.7
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	217	401	320	1066	138	1022	904
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.09	0.24	0.29	0.70	0.10	1.16	0.54	0.70	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 (2029) & Mitigated

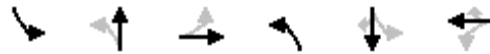
													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	284	6	84	59	4	281	32	1222	18	74	711	59	
Future Volume (vph)	284	6	84	59	4	281	32	1222	18	74	711	59	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Lane Width	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	1747		1653	1618	1382	
Flt Permitted	0.72	1.00			0.68	1.00	0.27	1.00		0.06	1.00	1.00	
Satd. Flow (perm)	1265	1489			1040	1379	415	1747		99	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	281	32	1222	18	74	711	59	
RTOR Reduction (vph)	0	67	0	0	0	114	0	0	0	0	0	23	
Lane Group Flow (vph)	284	23	0	0	63	167	32	1240	0	74	711	36	
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)	23.7	23.7			24.0	24.0	72.3	69.1		74.8	70.5	70.5	
Effective Green, g (s)	23.7	23.7			24.0	24.0	72.3	69.1		74.8	70.5	70.5	
Actuated g/C Ratio	0.21	0.21			0.21	0.21	0.63	0.60		0.65	0.61	0.61	
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			217	287	290	1049		122	991	847	
v/s Ratio Prot		0.02					0.00	c0.71		c0.02	0.44		
v/s Ratio Perm	c0.22				0.06	0.12	0.07			0.37		0.03	
v/c Ratio	1.09	0.08			0.29	0.58	0.11	1.18		0.61	0.72	0.04	
Uniform Delay, d1	45.6	36.8			38.3	41.0	10.4	23.0		27.4	15.4	8.8	
Progression Factor	1.00	1.00			1.00	1.00	0.46	0.52		1.00	1.00	1.00	
Incremental Delay, d2	82.7	0.1			0.7	3.0	0.1	88.0		8.3	4.5	0.1	
Delay (s)	128.3	36.9			39.1	44.0	4.9	99.9		35.7	19.8	8.9	
Level of Service	F	D			D	D	A	F		D	B	A	
Approach Delay (s)		106.3			43.1			97.5			20.5		
Approach LOS		F			D			F			C		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			69.1		HCM 2000 Level of Service						E		
HCM 2000 Volume to Capacity ratio			1.13										
Actuated Cycle Length (s)			115.0		Sum of lost time (s)						17.9		
Intersection Capacity Utilization			119.4%		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	74	30	11	74	30
Maximum Split (%)	9.6%	64.3%	26.1%	9.6%	64.3%	26.1%
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	5	79	109	5	79
End Time (s)	5	79	109	5	79	109
Yield/Force Off (s)	114.4	73	102.7	114.4	73.3	103
Yield/Force Off 170(s)	114.4	56	86.7	114.4	56.3	87
Local Start Time (s)	104	0	74	104	0	74
Local Yield (s)	109.4	68	97.7	109.4	68.3	98
Local Yield 170(s)	109.4	51	81.7	109.4	51.3	82

Intersection Summary

Cycle Length	115
Control Type	Actuated-Coordinated
Natural Cycle	150
Offset: 5 (4%), 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	451	74	154	455	72	504	318	350	60
v/c Ratio	1.25	0.48	0.62	0.60	0.75	0.53	0.57	0.79	0.45	0.08
Control Delay	172.9	31.6	62.6	51.2	14.4	63.6	39.9	45.4	38.0	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	172.9	31.6	62.6	51.2	14.4	63.6	39.9	45.4	38.0	2.2
Queue Length 50th (m)	~86.5	37.5	14.8	30.6	14.1	14.4	47.6	64.3	70.3	0.0
Queue Length 95th (m)	#119.8	44.5	26.8	45.2	37.9	27.7	67.8	#110.2	104.3	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)	280	1300	202	433	713	148	884	403	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	0.35	0.37	0.36	0.64	0.49	0.57	0.79	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	347	104	74	154	455	72	486	18	318	350	60	
Future Volume (vph)	351	347	104	74	154	455	72	486	18	318	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	3233		1431	1586	1443	1523	3183		1462	1593	1309	
Flt Permitted	0.43	1.00		0.49	1.00	1.00	0.95	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	759	3233		741	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	347	104	74	154	455	72	486	18	318	350	60	
RTOR Reduction (vph)	0	29	0	0	0	368	0	2	0	0	0	32	
Lane Group Flow (vph)	351	422	0	74	154	87	72	502	0	318	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)	32.7	32.7		18.7	18.7	18.7	9.0	31.9		31.7	54.6	54.6	
Effective Green, g (s)	32.7	32.7		18.7	18.7	18.7	9.0	31.9		31.7	54.6	54.6	
Actuated g/C Ratio	0.28	0.28		0.16	0.16	0.16	0.08	0.28		0.28	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)	278	919		120	257	234	119	882		403	756	621	
v/s Ratio Prot	c0.09	0.13			0.10		0.05	c0.16		c0.22	0.22		
v/s Ratio Perm	c0.27			0.10		0.06						0.02	
v/c Ratio	1.26	0.46		0.62	0.60	0.37	0.61	0.57		0.79	0.46	0.05	
Uniform Delay, d1	40.9	33.9		44.8	44.7	42.9	51.3	35.7		38.6	20.3	16.2	
Progression Factor	1.00	1.00		0.96	0.96	1.31	1.00	1.00		0.84	1.55	1.00	
Incremental Delay, d2	143.8	0.4		9.0	3.7	1.0	8.4	2.7		7.9	1.6	0.1	
Delay (s)	184.6	34.2		52.0	46.6	57.2	59.7	38.3		40.1	33.1	16.3	
Level of Service	F	C		D	D	E	E	D		D	C	B	
Approach Delay (s)		100.1			54.3			41.0			34.8		
Approach LOS		F			D			D			C		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			59.6		HCM 2000 Level of Service						E		
HCM 2000 Volume to Capacity ratio			0.91										
Actuated Cycle Length (s)			115.0		Sum of lost time (s)					24.8			
Intersection Capacity Utilization			94.9%		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

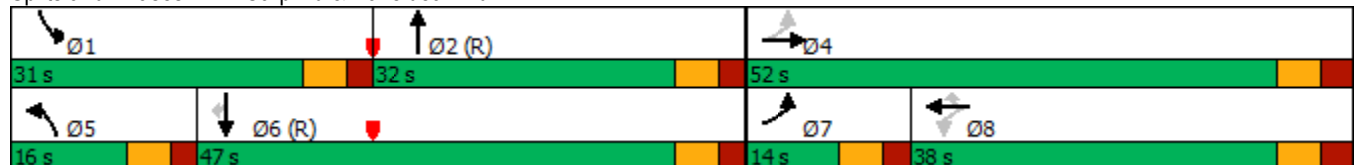


Phase Number	1	2	4	5	6	7	8
Movement	SBL	NBT	EBTL	NBL	SBT	EBL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lag
Lead-Lag Optimize							
Recall Mode	None	C-Max	None	None	C-Max	None	None
Maximum Split (s)	31	32	52	16	47	14	38
Maximum Split (%)	27.0%	27.8%	45.2%	13.9%	40.9%	12.2%	33.0%
Minimum Split (s)	11	31.1	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)	76	107	24	76	92	24	38
End Time (s)	107	24	76	92	24	38	76
Yield/Force Off (s)	101	17.9	69.4	86	17.9	31.9	69.4
Yield/Force Off 170(s)	101	114.9	45.4	86	114.9	31.9	45.4
Local Start Time (s)	84	0	32	84	100	32	46
Local Yield (s)	109	25.9	77.4	94	25.9	39.9	77.4
Local Yield 170(s)	109	7.9	53.4	94	7.9	39.9	53.4

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  
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	134	62	923	204	1338	182
v/c Ratio	0.81	0.27	0.46	0.39	0.51	0.89	0.74	1.25	0.19
Control Delay	75.4	15.9	53.5	10.3	29.0	33.7	30.2	144.3	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.4	15.9	53.5	10.3	29.0	33.7	30.2	144.3	5.7
Queue Length 50th (m)	35.3	2.9	15.2	0.0	1.8	206.8	14.6	~377.5	8.4
Queue Length 95th (m)	#60.8	15.3	29.1	15.0	m6.8 m#	256.3	#46.6	#451.1	17.4
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)	246	350	196	381	122	1032	284	1068	940
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	0.69	0.23	0.40	0.35	0.51	0.89	0.72	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

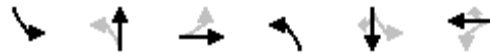
Total PM (2029) & Mitigated

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	170	16	66	70	8	134	62	885	38	204	1338	182	
Future Volume (vph)	170	16	66	70	8	134	62	885	38	204	1338	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		190	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	134	62	885	38	204	1338	182	
RTOR Reduction (vph)	0	55	0	0	0	112	0	1	0	0	0	28	
Lane Group Flow (vph)	170	27	0	0	78	22	62	922	0	204	1338	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)	19.7	19.7			20.0	20.0	75.7	71.1		88.3	78.1	78.1	
Effective Green, g (s)	19.7	19.7			20.0	20.0	75.7	71.1		88.3	78.1	78.1	
Actuated g/C Ratio	0.16	0.16			0.17	0.17	0.63	0.59		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)	211	254			169	235	108	1030		277	1053	898	
v/s Ratio Prot		0.02					0.02	0.53		c0.07	c0.83		
v/s Ratio Perm	c0.13				0.08	0.02	0.34			0.47		0.11	
v/c Ratio	0.81	0.11			0.46	0.10	0.57	0.89		0.74	1.27	0.17	
Uniform Delay, d1	48.3	42.7			45.1	42.3	28.1	21.2		23.4	21.0	8.2	
Progression Factor	1.00	1.00			1.00	1.00	1.12	1.07		1.00	1.00	1.00	
Incremental Delay, d2	19.6	0.2			2.0	0.2	5.3	9.0		9.8	129.4	0.4	
Delay (s)	67.9	42.8			47.1	42.5	36.7	31.8		33.1	150.3	8.6	
Level of Service	E	D			D	D	D	C		C	F	A	
Approach Delay (s)		59.8			44.2			32.1			121.5		
Approach LOS		E			D			C			F		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			83.7		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			111.0%		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

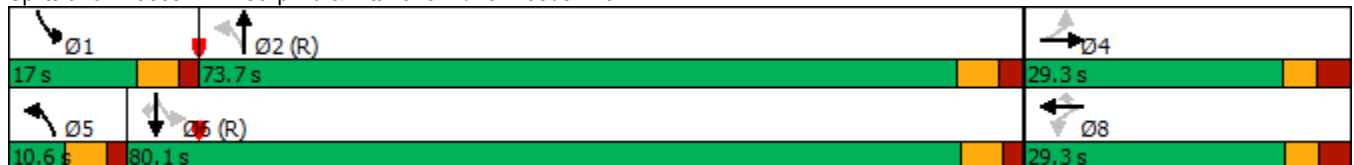


Phase Number	1	2	4	5	6	8
Movement	SBL	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	17	73.7	29.3	10.6	80.1	29.3
Maximum Split (%)	14.2%	61.4%	24.4%	8.8%	66.8%	24.4%
Minimum Split (s)	10.6	30	29.3	10.6	29.7	29
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)	32	49	2.7	32	42.6	2.7
End Time (s)	49	2.7	32	42.6	2.7	32
Yield/Force Off (s)	43.4	116.7	25.7	37	117	26
Yield/Force Off 170(s)	43.4	99.7	9.7	37	100	10
Local Start Time (s)	103	0	73.7	103	113.6	73.7
Local Yield (s)	114.4	67.7	96.7	108	68	97
Local Yield 170(s)	114.4	50.7	80.7	108	51	81

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	150
Offset: 49 (41%), 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	508	102	628	470	162	482	521	598	289
v/c Ratio	1.18	0.37	0.38	0.92	0.58	1.12	0.67	1.37	0.93	0.47
Control Delay	182.5	22.1	19.3	42.8	3.6	162.1	47.2	199.7	38.0	17.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	182.5	22.1	19.3	42.8	3.6	162.1	47.2	199.7	38.0	17.3
Queue Length 50th (m)	~29.2	33.5	9.7	136.2	0.9	~40.6	49.9	~148.5	136.5	37.6
Queue Length 95th (m)	#63.0	46.3	m10.5	m#197.6	m2.8	#79.8	66.7	m#110.8	m109.1	m27.3
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)	96	1355	269	681	815	144	722	380	645	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	1.18	0.37	0.38	0.92	0.58	1.13	0.67	1.37	0.93	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	340	168	102	628	470	162	447	35	521	598	289
Future Volume (vph)	113	340	168	102	628	470	162	447	35	521	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	3304		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)	245	3304		682	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	340	168	102	628	470	162	447	35	521	598	289
RTOR Reduction (vph)	0	51	0	0	0	247	0	5	0	0	0	75
Lane Group Flow (vph)	113	457	0	102	628	223	162	477	0	521	598	214
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)	47.4	47.4		47.4	47.4	47.4	10.0	26.9		27.0	43.9	43.9
Effective Green, g (s)	47.4	47.4		47.4	47.4	47.4	10.0	26.9		27.0	43.9	43.9
Actuated g/C Ratio	0.39	0.39		0.39	0.39	0.39	0.08	0.22		0.22	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)	96	1305		269	681	568	144	718		380	645	534
v/s Ratio Prot		0.14			0.36		0.09	0.15		c0.31	c0.34	
v/s Ratio Perm	c0.46			0.15		0.16						0.15
v/c Ratio	1.18	0.35		0.38	0.92	0.39	1.12	0.66		1.37	0.93	0.40
Uniform Delay, d1	36.3	25.5		25.8	34.5	26.0	55.0	42.4		46.5	36.5	28.3
Progression Factor	1.00	1.00		0.59	0.69	0.26	1.00	1.00		0.78	0.94	1.01
Incremental Delay, d2	147.2	0.2		0.8	15.8	0.4	112.5	4.8		168.5	2.9	0.2
Delay (s)	183.5	25.7		15.9	39.6	7.1	167.5	47.3		204.8	37.1	28.9
Level of Service	F	C		B	D	A	F	D		F	D	C
Approach Delay (s)		54.4			24.9			77.5			97.5	
Approach LOS		D			C			E			F	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			64.7				HCM 2000 Level of Service			E		
HCM 2000 Volume to Capacity ratio			1.18									
Actuated Cycle Length (s)			120.0				Sum of lost time (s)			18.7		
Intersection Capacity Utilization			113.9%				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

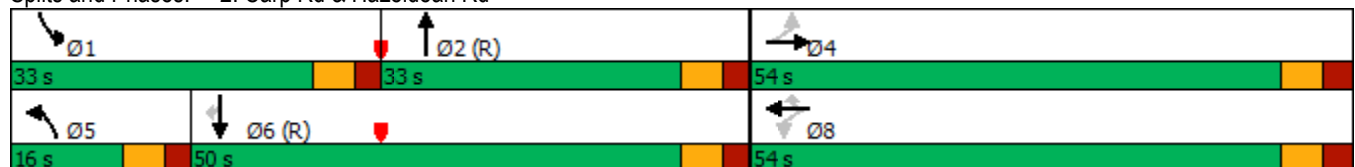


Phase Number	1	2	4	5	6	8
Movement	SBL	NBT	EBTL	NBL	SBT	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	33	33	54	16	50	54
Maximum Split (%)	27.5%	27.5%	45.0%	13.3%	41.7%	45.0%
Minimum Split (s)	11	31.1	37.6	11	31.1	37.6
Yellow Time (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)	95	8	41	95	111	41
End Time (s)	8	41	95	111	41	95
Yield/Force Off (s)	2	34.9	88.4	105	34.9	88.4
Yield/Force Off 170(s)	2	16.9	64.4	105	16.9	64.4
Local Start Time (s)	87	0	33	87	103	33
Local Yield (s)	114	26.9	80.4	97	26.9	80.4
Local Yield 170(s)	114	8.9	56.4	97	8.9	56.4

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



## **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				D				E				F				
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	<=40 km/h	50 km/h	50 km/h	50 km/h	50 km/h	50 km/h	50 km/h	<=40 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				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			
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					One	One	One	One	More than One			One
	Level of Service	E				N/A				F				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		>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	>50 - 60 km/h	>50 - 60 km/h	>50 - 60 km/h		>50 - 60 km/h	>50 - 60 km/h	>30 - 50 km/h		>30 - 50 km/h	>30 - 50 km/h	>30 - 50 km/h		>30 - 50 km/h	>30 - 50 km/h	N/A
Level of Service	F				F				D				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		<=40 km/h	50 km/h	50 km/h		<=40 km/h	50 km/h	
	Operating Speed	60 km/h	60 km/h	60 km/h		60 km/h	60 km/h	50 km/h		<=40 km/h	50 km/h	50 km/h		<=40 km/h	50 km/h	
	Bike Lane Blockages	Rare	Rare	Rare		Rare	Rare			<3	<3	<3		<3	<3	
	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	N/A	
Level of Service	F				D				D				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	N/A	N/A
Level of Service	D				D				D				D			
Truck	Lane Width	<=3.5	<=3.5	<=3.5		>3.7	<=3.5	<=3.3		>3.7	One	>3.7				
	Travel Lanes per Direction	More than One	More than One	More than One		One	More than One	One		One	One	One		N/A	N/A	N/A
Level of Service	A				D				B				N/A			
Auto	Level of Service	N/A				N/A				N/A				N/A		

Multimodal Analysis - Future Total Scenario

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	3	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)	C (68)	D (58)	D (58)	C (68)	E (43)	D (53)	D (58)	F (28)	E (40)	
		E				D				E				F				
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	<=40 km/h	50 km/h	50 km/h	50 km/h	50 km/h	50 km/h	50 km/h	50 km/h	<=40 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	D	F	F	D	C	D	F	F		
		F				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	
		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					One	One	One	One	More than One			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	
		E				N/A				F				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		>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		>50 - 60 km/h	>50 - 60 km/h	>50 - 60 km/h		>50 - 60 km/h	>50 - 60 km/h	>30 - 50 km/h		>30 - 50 km/h	>30 - 50 km/h	>30 - 50 km/h		>30 - 50 km/h	>30 - 50 km/h	N/A
	Level of Service		E	F	F		F	E	C		A	D	C		A	B	N/A
			F				F				D				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		60 km/h	60 km/h	60 km/h		60 km/h	60 km/h	50 km/h		<=40 km/h	50 km/h	50 km/h		<=40 km/h	50 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		F	C	C		C	50 km/h	50 km/h		50 km/h	50 km/h	50 km/h		<=40 km/h	50 km/h	N/A
Level of Service		F				D				D				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	N/A	N/A
	Level of Service		N/A	D	D		D	D	D		D	D	D		D	N/A	N/A
			D				D				D				D		
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				
	Level of Service		A	A	A		B	A	D		N/A	B	B		N/A	N/A	N/A
			A				D				B				N/A		
Auto	Level of Service		N/A				N/A				N/A				N/A		