6310 Hazeldean Road

Transportation Impact Assessment

Step 1 Screening Report

Step 2 Scoping Report

Step 3 Strategy Report

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1 Screening

This study has been prepared according to the City of Ottawa's 2017 Transportation Impact Assessment (TIA) Guidelines, incorporating the 2023 Revision to Transportation Impact Assessment Guidelines. Accordingly, a Step 1 Screening Form has been prepared and is included as Appendix A, along with the Certification Form for the TIA Study PM. As shown in the Screening Form, a TIA is required, and this study has been prepared to support a zoning bylaw amendment application.

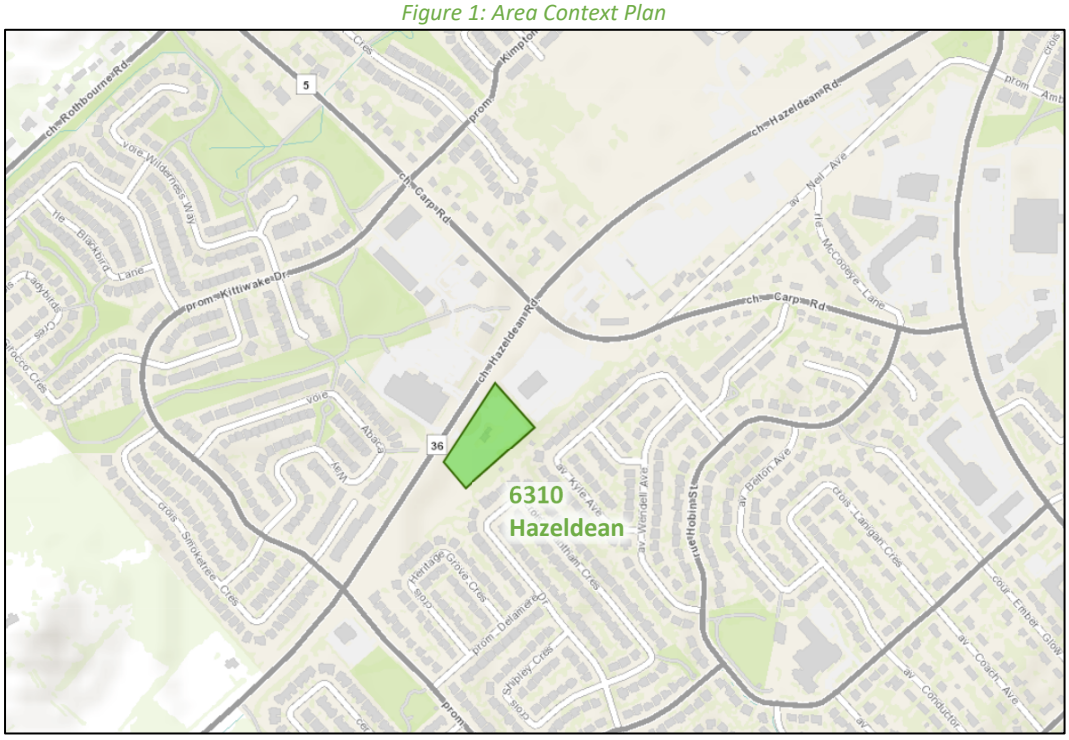
2 Existing and Planned Conditions

2.1 Proposed Development

The existing site, located at 6310 Hazeldean Road, is zoned as Arterial Mainstreet Zone (AM9[2102]). The proposed redevelopment consists of 431 apartment units in two buildings. A full-movements access will remain at the existing signalized intersection on Hazeldean Road. The redevelopment proposed 475 vehicle parking spaces and 395 bike parking spaces. The anticipated full build-out and occupancy horizon is 2027 with construction occurring in a single phase. The site is located within Hazeldean Arterial Mainstreet design priority areas.

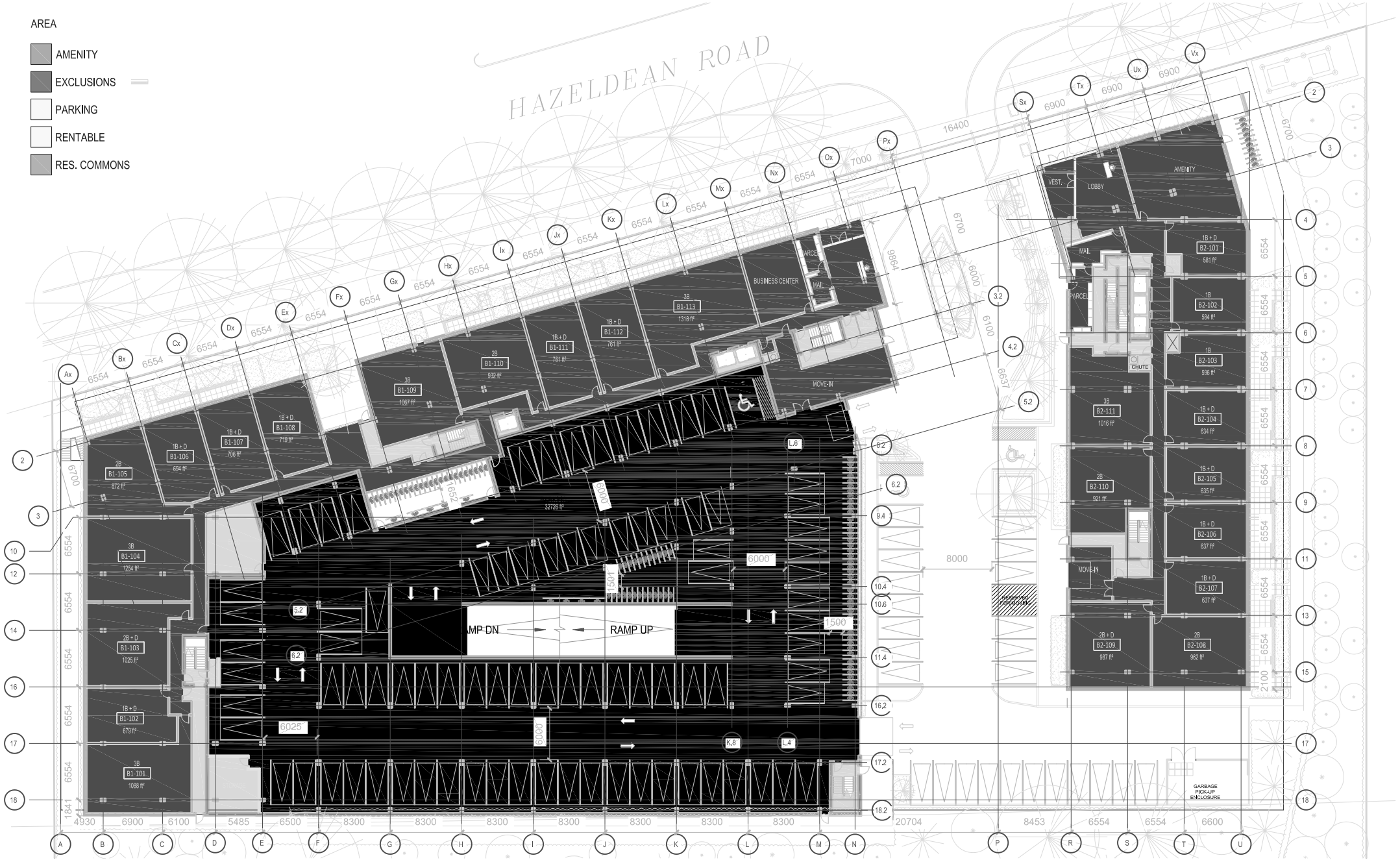
Figure 1 illustrates the study area context. Figure 2 illustrates the proposed concept plan.

Figure 1: Area Context Plan



Source: http://maps.ottawa.ca/geoOttawa/ Accessed: September 19, 2023

Figure 2: Concept Plan



2.2 Existing Conditions

2.2.1 Area Road Network

Hazeldean Road: Hazeldean Road is a City of Ottawa arterial road with a two-lane cross-section west of the signalized Farmboy access, and a divided four-lane cross-section to the east. The cross-section is rural with gravel shoulders west of Kittiwake Drive, rural with paved shoulders between Kittiwake Drive and the unsignalized western inbound Farmboy driveway, semi-urban with a paved shoulder on the south side between the inbound Farmboy access and Carp Road, and urban east of Carp Road. Within the study area, gravel shoulders are provided on both sides of the road west of Kittiwake Drive/West Ridge Drive, and transition to paved shoulders east of Kittiwake Drive/West Ridge Drive. Sidewalks are present on the north side of the road along the Farmboy frontage and east to Carp Road, and on both sides east of Carp Road. Bike lanes are present on both sides of the road east of Carp Road, and a westbound bike lane continues west of Carp Road and transitions to a paved shoulder on the west side of the inbound unsignalized Farmboy access. West of the edge of urban development, approximately 195 metres west of Kittiwake Drive, the posted speed limit is 80 km/h to the west and the posted speed limit is 60 km/h to the east. The City-protected right-of-way is 37.5 metres. Hazeldean Road is designated as a truck route.

Carp Road: Carp Road is a City of Ottawa arterial road with a two-lane cross-section that is rural north of Kittiwake Drive, semi-urban with a curb on the west side between Kittiwake Drive and Carp Road, semi-urban with a curb on the east side between Carp Road and Hobin Street, and urban south of Hobin Street. Bike lanes are present on both sides of the road north of Hazeldean Road within the study area. South of Hazeldean Road, a bike lane is present on the east side of the road approaching Hazeldean Road, and a paved shoulder is present on the west side of the road. Sidewalks are provided on the west side of the road between Kittiwake Drive/Echowoods Avenue and Hazeldean Road, on the east side between Hazeldean Road and McCooeye Lane/Hobin Street, and on both sides between McCooeye Lane/Hobin Street and Stittsville Main Street. The posted speed limit is 50km/h. The City-protected right-of-way is 33.2 metres north of Echowoods Avenue, 33.4 metres between Hazeldean Road and Echowoods Avenue, and 23.0 metres between Hazeldean Road and Stittsville Main Street. Carp Road is designated as a truck route.

West Ridge Drive: West Ridge Drive is a City of Ottawa collector road with a two-lane urban cross-section. The sidewalk is provided on the west side of the road. The speed limit is 40 km/h, and the City-protected right-of-way is 24.0 metres.

Kittiwake Drive: Kittiwake Drive is a City of Ottawa collector road with a two-lane urban cross-section with a sidewalk provided on the south/east side of the road. The posted speed limit is 40 km/h, and the existing right-of-way is 26.0 metres.

Echowoods Avenue: Echowoods Avenue is a City of Ottawa collector road with a two-lane urban cross-section with a sidewalk on the south side of the road. The posed speed limit is 40 km/h, and the existing right-of-way is 18.0 metres.

Hobin Street: Hobin Street is a City of Ottawa collector road with a two-lane rural cross-section including gravel shoulders and the speed limit is 40 km/h. The City-protected right-of-way is 24.0 metres within the study area.

McCooeye Lane: McCooeye Lane is a City of Ottawa local road with a two-lane rural cross-section including gravel shoulders. The unposed speed limit is assumed to be 50 km/h. The existing right of way is 26.0 metres.

2.2.2 Existing Intersections

The existing signalized area intersections within one kilometre of the site have been summarized below:

Hazeldean Road at West Ridge Drive/Kittiwake Drive	The intersection of West Ridge Drive/Kittiwake Drive at Hazeldean Road is a signalized intersection. The northbound approach consists of a shared left-turn/through lane and a right-turn movement lane. The southbound, eastbound, and westbound approaches each consist of an auxiliary left-turn lane and a shared through/right-turn lane. Trucks are restricted on the north and south legs.
Hazeldean Road at Stittsville Corners Mall	The intersection of Hazeldean Road at the Stittsville Corners Mall is a signalized intersection. The private northbound approach consists of a shared all-movement lane, and the private southbound approach consists of a shared left-turn/through lane and a right-turn lane. The eastbound approach consists of an auxiliary left-turn lane, a through lane, a through/right-turn lane, and a bike lane, and the westbound approach consists of an auxiliary left-turn lane, a through lane, a bike lane, and an auxiliary right-turn lane. No turn restrictions were noted.
Hazeldean Road at Carp Road	The intersection of Carp Road at Hazeldean Road is a signalized intersection. The northbound approach consists of an auxiliary left-turn lane, a through lane, an auxiliary shared through/right lane, and a bike lane. The southbound and westbound approaches each approach consist of an auxiliary left-turn lane, a through lane, a bike lane, and a channelized right-turn lane. The eastbound approach consists of an auxiliary left-turn lane, a through lane, and a shared through/right-turn lane. No turn restrictions were noted.
Hazeldean Road at Jackson Trails Centre Mall	The intersection of Hazeldean Road at the Jackson Trails Centre Mall is a signalized T-intersection. The private southbound approach consists of a shared all-movement lane that functions as a left-turn lane and an auxiliary right-turn lane. The eastbound approach consists of an auxiliary left-turn lane, two through lanes, and a bike lane, and the westbound approach consists of a through lane, a shared through/right-turn lane, and a bike lane. No turn restrictions were noted.
Carp Road at Kittiwake Drive/Echowoods Avenue	The intersection of Carp Road at Kittiwake Drive/Echowoods Avenue is a signalized intersection. The northbound approach consists of an auxiliary left-turn lane and a shared through/right-turn lane, and the southbound approach consists of an auxiliary left-turn, a through lane, a bike lane, and an auxiliary right-turn. The eastbound approach consists of a left-turn lane and a shared through/right-turn lane, and the westbound approach consists of a shared all-movement lane. No turn restrictions were noted.
Carp Road at McCooeye Lane /Hobin Street	The intersection of Carp Road at McCooeye Lane/Hobin Street is a signalized intersection. Carp Road is considered as N-S movements, and McCooeye Lane/Hobin Street is E-W movements. The northbound and southbound approaches each consist of an auxiliary left-turn lane and a shared through/right-turn lane, and the eastbound and westbound approaches each consists of a shared all-movement lane. No turn restrictions were noted.

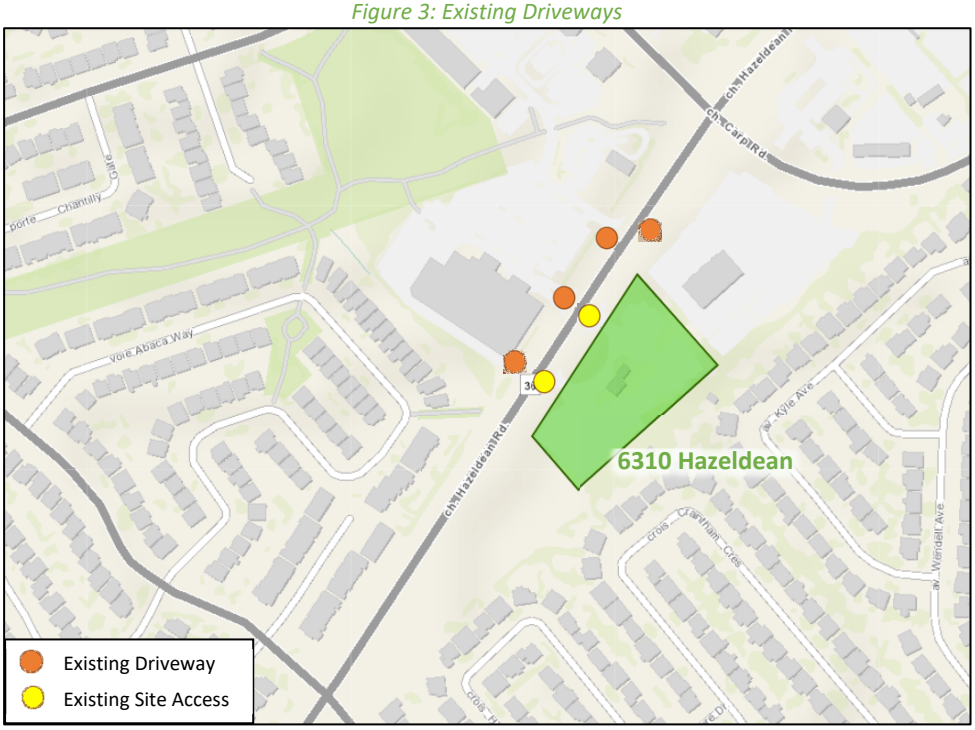
Carp Road at Stittsville Main Street

The intersection of Carp Road at Stittsville Main Street is a signalized intersection. The northbound approach consists of a left-turn lane and a shared through/right-turn lane, and the southbound approach consists of an auxiliary left-turn, a through lane, and an auxiliary channelized right-turn. The eastbound approach consists of an auxiliary left-turn, a through lane, and an auxiliary channelized right-turn lane, and the westbound approach consists of a left-turn lane and a shared through/right-turn movement lane. No turn restrictions were noted.

2.2.3 Existing Driveways

Within 200 metres of the site accesses, two existing driveways to the site on the south side of Hazeldean Road, and three existing driveways to a retail plaza are present on the north side of Hazeldean Road. Figure 3 illustrates the existing driveways.

Figure 3: Existing Driveways



Source: http://maps.ottawa.ca/geoOttawa/Accessed: September 20, 2023

2.2.4 Cycling and Pedestrian Facilities

Figure 4 illustrates the pedestrian facilities in the study area and Figure 5 illustrates the cycling facilities.

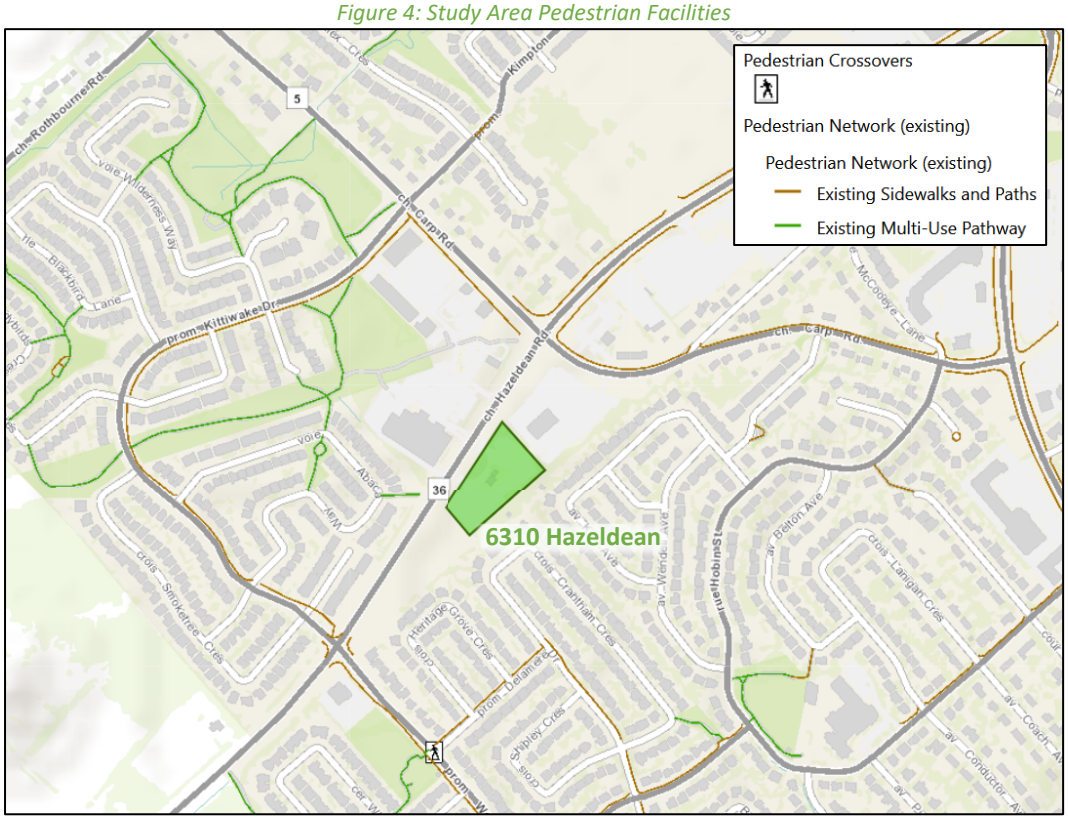
Sidewalks and asphalt pathways are provided on the north side of Hazeldean Road between Kittiwake Drive/West Ridge Drive and Carp Road and of Carp Road east of Stittsville Main Street, on the south side of Echowoods Avenue and Kittiwake Drive, on the east side of Carp Road between Hazeldean Road and McCooeye Lane/Hobin Street, on the west side of Carp Road between Kittiwake Drive/Echowoods Avenue and Hazeldean Road and of West Ridge Drive, and on both sides of Hazeldean Road east of Carp Road, of Carp Road between McCooeye Lane/Hobin Street and Stittsville Main Street, of Stittsville Main Street.

Bike lanes are provided on the south side of Hazeldean Road east of Carp Road, on the north side of Hazeldean Road east of Stittsville Corners Mall access, on the east side of Carp Road approaching Hazeldean Road to Kittiwake Drive/Echowoods Avenue, and on the west side of Carp Road north of Hazeldean Road.

Paved shoulders are presented on the west side of Carp Road between Hazeldean Road and McCooeye Lane/Hobin Street, on both sides between Kittiwake Drive/West Ridge Drive and Stittsville Corners Mall access, and on the south side between Stittsville Corners Mall access and Carp Road.

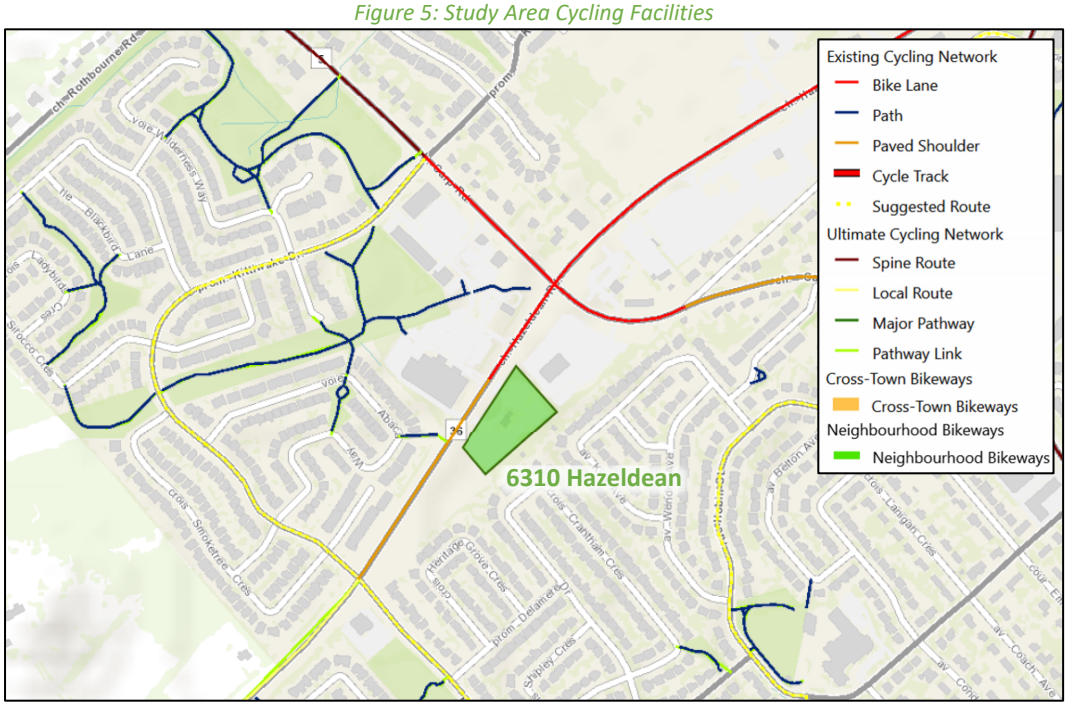
Carp Road, Hazeldean Road east of Kittiwake Drive, Stittsville Main Street south of Hazeldean Road are spine routes, and Hazeldean Road west of Kittiwake Drive, West Ridge Drive, Hobin Street, and McCooeye Lane are local routes.

Figure 4: Study Area Pedestrian Facilities



Source: http://maps.ottawa.ca/geoOttawa/ Accessed: September 20, 2023

Figure 5: Study Area Cycling Facilities



Source: http://maps.ottawa.ca/geoOttawa/ Accessed: September 20, 2023

Pedestrian and cyclist volumes included in study area intersection counts, presented in Section 2.2.7, have been compiled and are illustrated in Figure 6 and Figure 7, respectively.

Figure 6: Existing Pedestrian Volumes

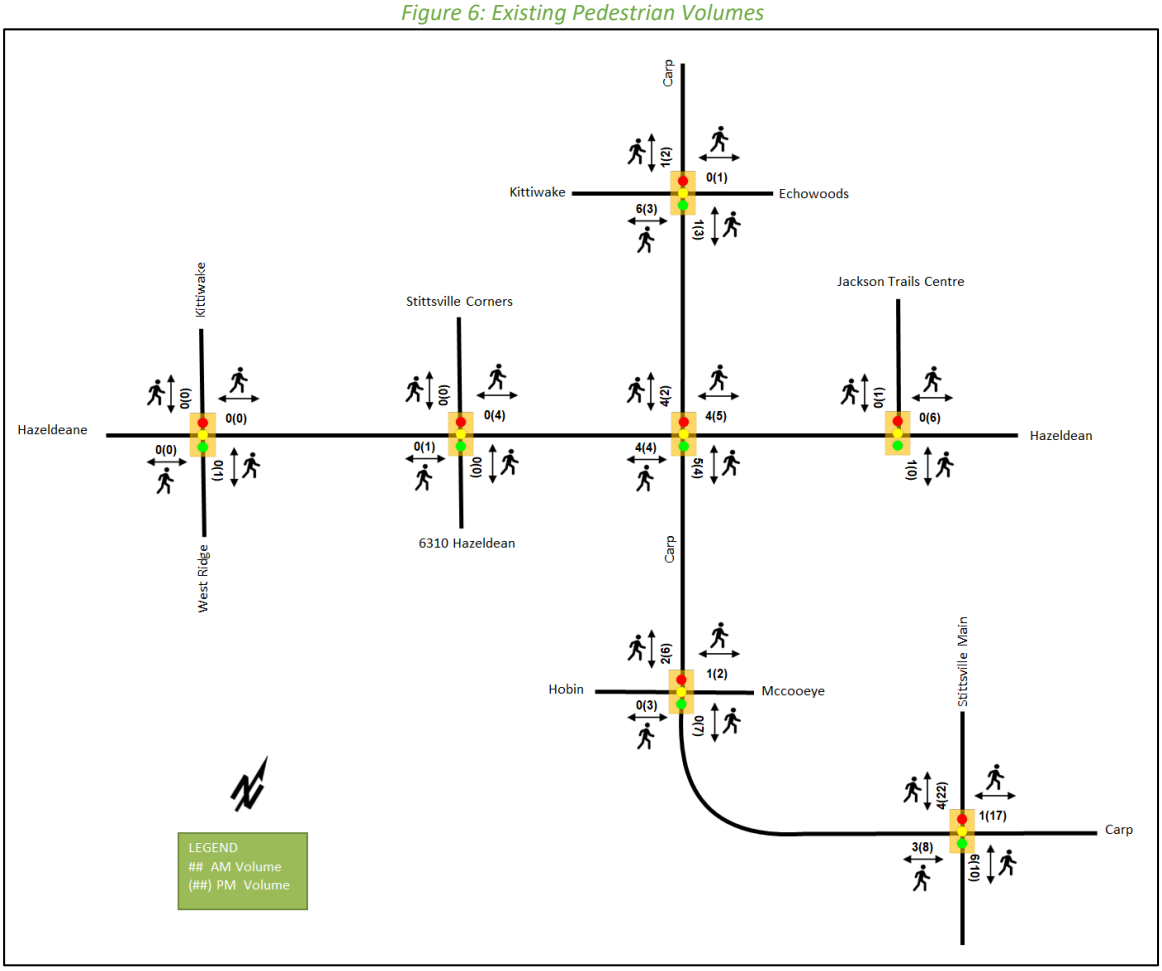
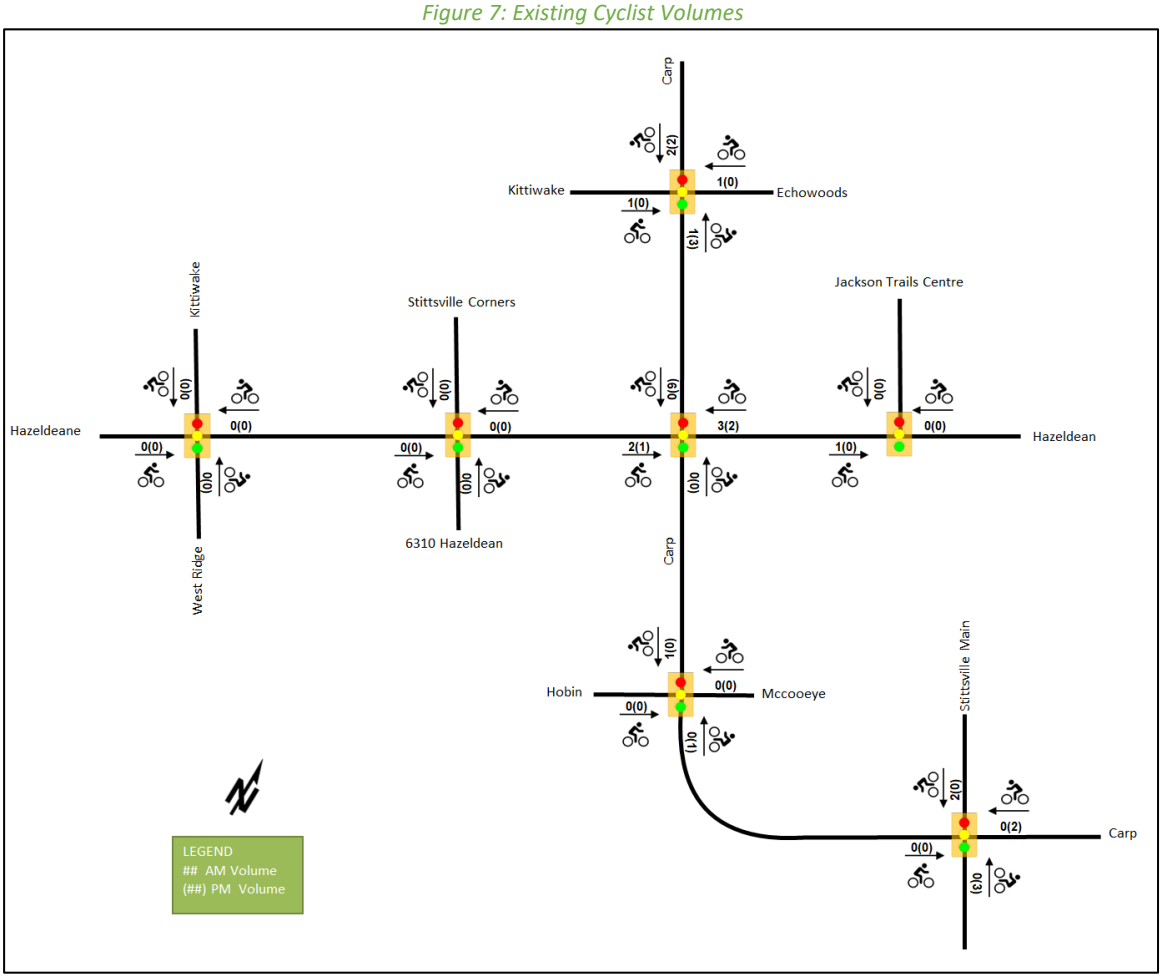


Figure 7: Existing Cyclist Volumes



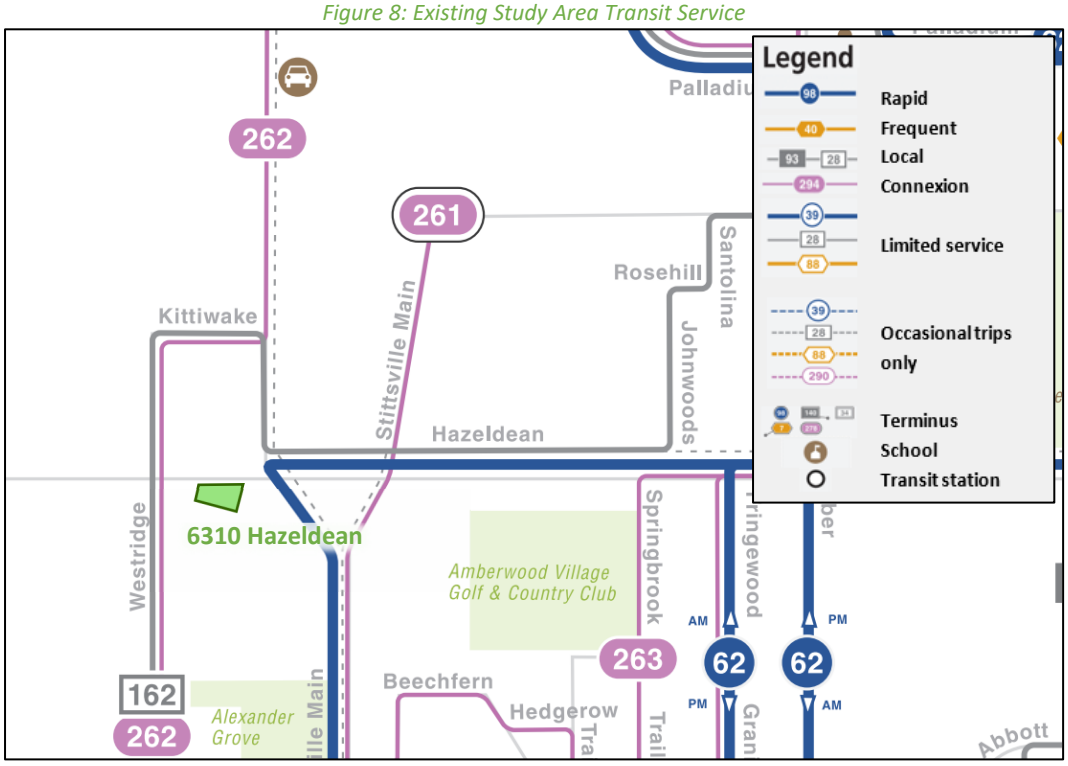
2.2.5 Existing Transit

Figure 8 illustrates the transit system map in the study area and Figure 9 illustrates nearby transit stops. All transit information is from September 20, 2023 and is included for general information purposes and context to the surrounding area.

Within the study area, route # 61 travels along Hazeldean Road and Carp Road, route # 162 travels along Hazeldean Road, Carp Road, and Kittiwake Drive, and route # 262 travels along Kittiwake Drive and West Ridge Drive. Primary stops are located at Carp Road at Hazeldean Road intersection. The frequency of these routes within proximity of the proposed site based on September 20, 2023 service levels are:

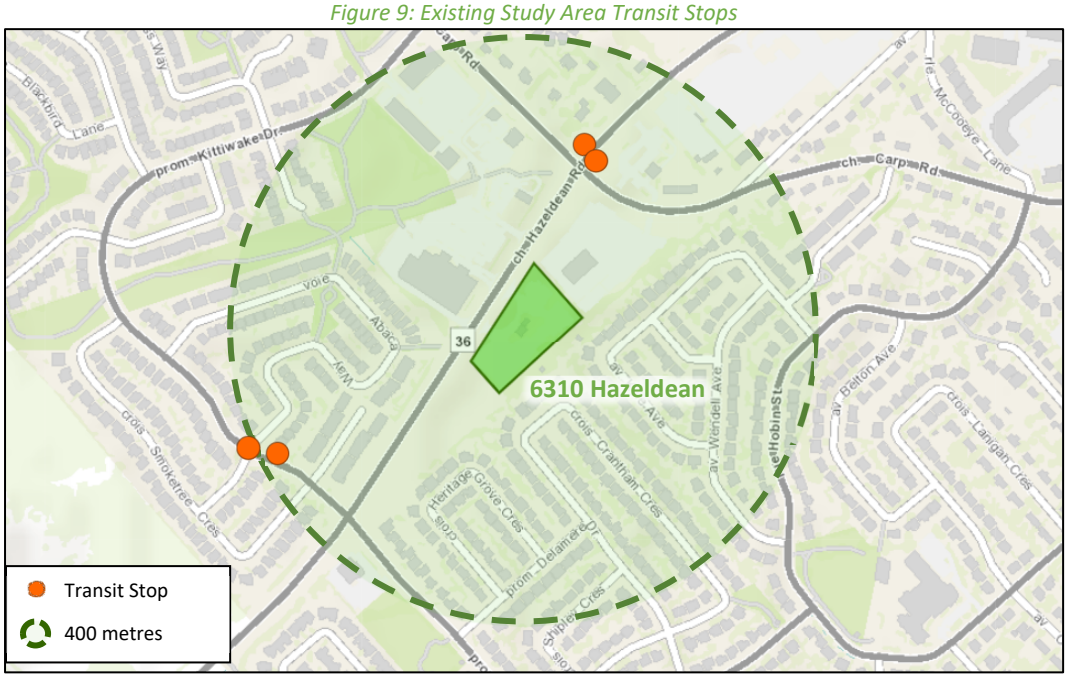
- Route # 61 – 10-15-minute service in the peak period/direction, 30-minute service all-day
- Route # 162 – Three afternoon buses and four late evening buses per day
- Route # 262 – 30-minute service in the peak period/direction

Figure 8: Existing Study Area Transit Service



Source: http://www.octranspo.com/ Accessed: September 20, 2023

Figure 9: Existing Study Area Transit Stops



Source: http://www.octranspo.com/ Accessed: September 20, 2023

2.2.6 Existing Area Traffic Management Measures

On-road messaging of the 50 km/h speed limit is present on Carp Road south of Hazeldean Road.

2.2.7 Existing Peak Hour Travel Demand

Existing turning movement counts were acquired from the City of Ottawa and The Traffic Specialist for the existing study area intersections. Table 1 summarizes the intersection count dates. As City's request, the existing traffic counts are unbalanced in the existing condition, and discrepancies have been noted along Hazeldean Road.

Table 1: Intersection Count Date

Intersection	Count Date	Source
Hazeldean Rd @ West Ridge Dr/Kittiwake Dr	Tuesday, January 11, 2022	City of Ottawa
Hazeldean Rd @ Stittsville Corners Mall	Wednesday, January 19, 2022	City of Ottawa
Hazeldean Rd @ Jackson Trails Centre Mall	Tuesday, January 11, 2022	City of Ottawa
Hazeldean Rd @ Carp Rd	Wednesday, August 23, 2023	The Traffic Specialist
Carp Rd @ Echowoods Ave/Kittiwake Dr	Wednesday, August 23, 2023	The Traffic Specialist
Carp Road at McCooeye Lane/Hobin Street	Thursday, May 04, 2017	City of Ottawa
Carp Road at Stittsville Main Street	Thursday, May 04, 2017	City of Ottawa

Figure 10 illustrates the existing traffic counts and Table 2 summarizes the existing intersection operations. The level of service for signalized intersections is based on volume to capacity ratio (v/c) calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection, and average delay for unsignalized intersections. Detailed turning movement count data is included in Appendix B and the Synchro worksheets are provided in Appendix C.

Figure 10: Existing Traffic Counts

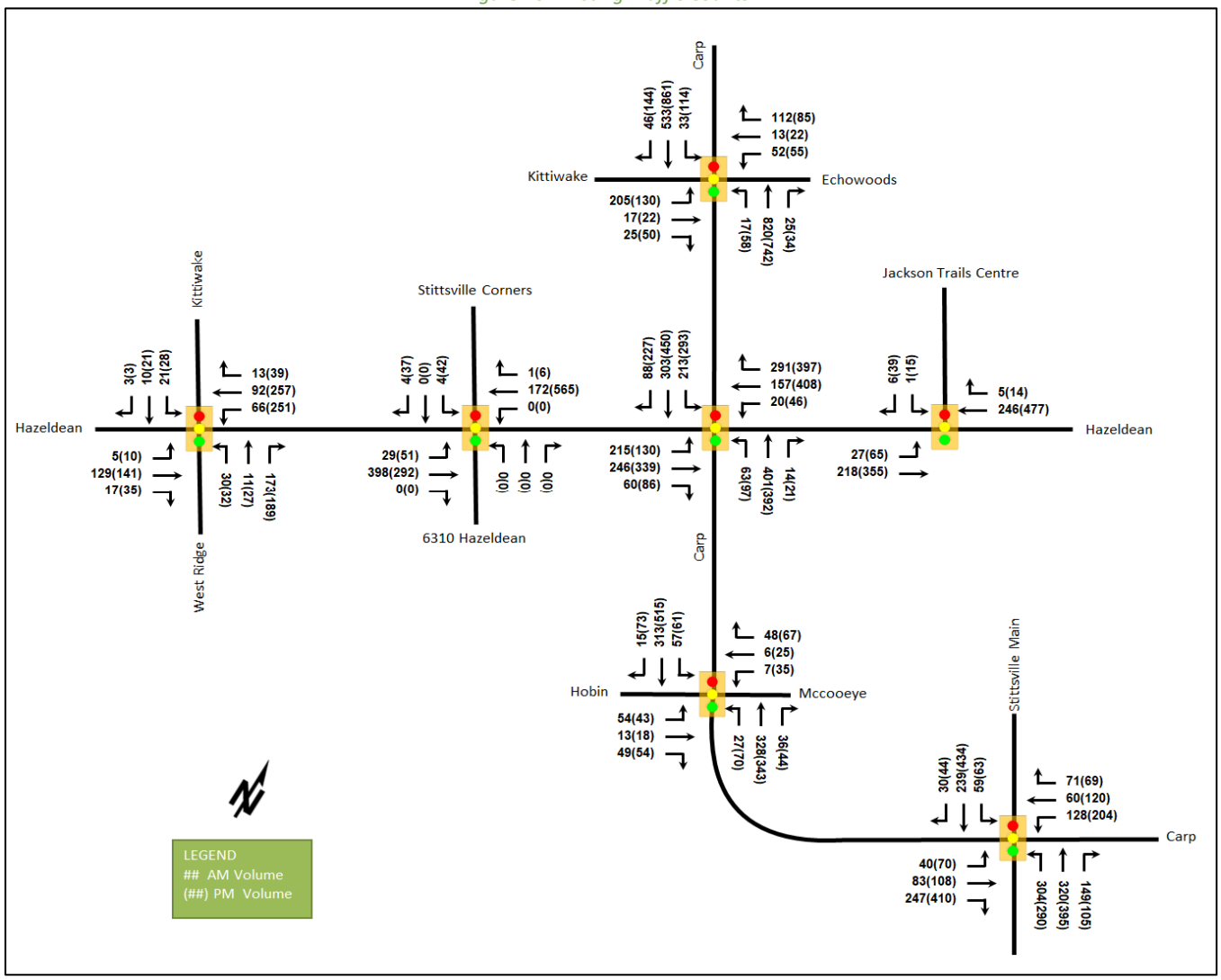


Table 2: Existing Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Hazeldean Rd at West Ridge Dr /Kittiwake Dr *Signalized*	EBL	A	0.01	4.2	1.2	A	0.01	3.4	2.2
	EBT/R	A	0.14	4.5	12.1	A	0.14	3.2	18.4
	WBL	A	0.10	4.7	6.8	A	0.31	4.8	65.1
	WBT/R	A	0.10	4.2	8.9	A	0.24	3.2	46.8
	NBL/T	A	0.23	26.7	12.7	A	0.46	64.6	29.0
	NBR	A	0.49	9.2	15.0	B	0.63	15.4	22.0
	SBL	A	0.12	24.9	8.0	A	0.25	57.0	16.4
	SBT/R	A	0.05	21.2	5.4	A	0.16	48.9	13.6
	Overall	**A**	**0.16**	**8.6**	-	**A**	**0.33**	**11.8**	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Hazeldean Rd at Stittsville Corners Mall/6310 Hazeldean Rd ***Signalized***	EBL	A	0.03	1.0	2.8	A	0.09	3.4	6.8
	EBT/R	A	0.14	0.7	12.4	A	0.12	2.7	13.7
	WBL	-	-	-	-	-	-	-	-
	WBT	A	0.12	1.4	20.2	A	0.42	2.9	m40.8
	WBR	A	0.00	0.0	m0.0	A	0.01	0.2	m0.0
	NB	-	-	-	-	-	-	-	-
	SBL	A	0.04	54.0	4.7	A	0.41	66.8	23.7
	SBR	A	0.03	0.2	0.0	A	0.25	19.3	10.7
	Overall	**A**	**0.15**	**1.3**	**-**	**A**	**0.44**	**6.2**	**-**
Hazeldean at Jackson Trails Centre Mall ***Signalized***	EBL	A	0.03	1.1	2.8	A	0.11	2.7	5.7
	EBT	A	0.08	0.8	7.2	A	0.14	2.3	11.3
	WBT/R	A	0.09	0.8	8.2	A	0.20	2.4	15.7
	SBL	A	0.01	48.0	1.9	A	0.13	53.5	11.1
	SBR	A	0.06	28.3	4.5	A	0.27	19.5	11.1
	Overall	**A**	**0.10**	**1.2**	**-**	**A**	**0.20**	**3.9**	**-**
Hazeldean Rd at Carp Rd ***Signalized***	EBL	E	0.94	**82.7**	**#69.0**	D	0.86	71.6	**#57.6**
	EBT/R	A	0.40	33.0	39.2	A	0.39	27.6	58.5
	WBL	A	0.16	43.8	11.1	A	0.25	38.8	21.4
	WBT	B	0.66	60.0	56.3	E	0.93	71.3	**#167.8**
	WBR	B	0.64	10.6	23.0	B	0.63	8.6	32.9
	NBL	A	0.57	73.1	**#34.1**	C	0.72	**82.6**	**#50.6**
	NBT/R	A	0.37	28.6	56.2	A	0.57	46.8	75.1
	SBL	C	0.80	62.5	**#141.0**	D	0.88	60.2	m106.4
	SBT	A	0.39	37.4	114.1	C	0.75	57.2	m159.5
	SBR	A	0.13	13.4	19.7	A	0.36	18.0	m33.4
	Overall	**B**	**0.70**	**40.3**	**-**	**D**	**0.88**	**45.1**	**-**
Carp Rd at Echowoods Ave/Kittiwake Dr ***Signalized***	EBL	E	0.93	**86.0**	**#93.9**	E	0.92	**106.1**	**#74.4**
	EBT/R	A	0.11	17.6	12.6	A	0.26	19.9	19.1
	WB	A	0.48	27.8	46.6	B	0.67	52.6	59.6
	NBL	A	0.05	9.1	m3.1	A	0.27	5.2	m3.5
	NBT/R	E	0.92	36.2	**m#321.2**	C	0.80	14.7	m56.0
	SBL	A	0.23	12.8	7.8	A	0.43	10.1	14.5
	SBT	A	0.58	19.9	146.0	D	0.82	25.2	259.8
	SBR	A	0.06	1.4	2.9	A	0.16	5.3	16.3
	Overall	**E**	**0.92**	**34.3**	**-**	**D**	**0.84**	**25.5**	**-**
Carp Rd at McCooeye Ln/Hobin St ***Signalized***	EB	A	0.50	25.6	23.3	A	0.57	32.4	27.0
	WB	A	0.24	12.7	10.5	A	0.56	29.1	27.7
	NBL	A	0.04	3.7	m2.2	A	0.17	5.8	m5.5
	NBT/R	A	0.33	3.9	20.5	A	0.36	7.3	m25.7
	SBL	A	0.10	5.7	9.3	A	0.11	5.2	9.6
	SBT/R	A	0.29	6.0	43.1	A	0.53	8.1	91.6
	Overall	**A**	**0.36**	**7.9**	**-**	**A**	**0.52**	**11.7**	**-**

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Carp Rd at Stittsville Main St *Signalized*	EBL	A	0.19	30.1	15.0	A	0.41	41.7	m25.0
	EBT	A	0.27	30.9	25.4	A	0.38	38.9	35.3
	EBR	A	0.57	16.6	35.7	D	0.84	31.3	72.4
	WBL	B	0.61	39.8	33.3	A	0.58	27.6	41.7
	WBT/R	A	0.40	16.6	21.3	A	0.36	18.0	33.2
	NBL	A	0.54	11.2	42.8	D	0.89	53.4	**#116.8**
	NBT/R	A	0.57	17.3	**#111.5**	C	0.78	35.8	**#170.3**
	SBL	A	0.14	7.6	9.2	A	0.24	15.2	14.2
	SBT	A	0.34	17.6	49.1	E	0.95	62.0	**#139.7**
	SBR	A	0.05	0.1	0.0	A	0.09	0.4	0.0
	Overall	**B**	**0.62**	**18.1**	**-**	**D**	**0.83**	**39.0**	**-**

Notes: Saturation flow rate of 1800 veh/h/lane
Queue is measured in metres
Peak Hour Factor = 0.90
Delay = average vehicle delay in seconds
m = metered queue
# = volume for the 95th %ile cycle exceeds capacity

At the Hazeldean Road and Carp Road intersection, the eastbound, northbound, and southbound left-turn movements may be subject to extended queues during the AM peak hour with the eastbound left-turn movement also experiencing high delays. During the PM peak hour, the eastbound and northbound left-turn, and westbound through movements may be subject to extended queues with the northbound left-turn movement also experiencing high delays.

At the intersection of Carp Road at Echowoods Avenue/Kittiwake Drive Boulevard, the eastbound left-turn movement may be subject to extended queues and high delays during both peak hours, and the northbound through/right-turn movement may be subject to extended queues during the AM peak hour.

At the intersection of Carp Road at Stittsville Main Street, the northbound shared through/right-turn movements during AM peak hour and the northbound and southbound through movements during PM peak hour may be subject to extended queues.

It is noted that the difference between the 2022 and the 2023 volumes on the network, specifically eastbound and westbound along Hazeldean Road for approximately 130-230 vehicles increase during the AM peak and approximately 130-335 vehicles increase during the PM peak. The network volumes will be balanced as part of the background analysis.

2.2.8 Collision Analysis

Collision data have been acquired from the City of Ottawa open data website (data.ottawa.ca) for five years prior to the commencement of this TIA for the surrounding study area road network. Table 3 summarizes the collision types and conditions in the study area, Figure 11 illustrates the intersections and segments analyzed, and Table 4 summarizes the total collisions for each of these locations. Collision data are included in Appendix D.

Table 3: Study Area Collision Summary, 2018-2022

		Number	%
Total Collisions		**60**	**100%**
Classification	**Fatality**	0	0%
	Non-Fatal Injury	7	12%
	Property Damage Only	53	88%
Initial Impact Type	**Angle**	4	7%
	Rear end	34	57%
	Sideswipe	8	13%

		Number	%
Total Collisions		**60**	**100%**
	Turning Movement	6	10%
	SMV Other	5	8%
	Other	3	5%
Road Surface Condition	**Dry**	39	65%
	Wet	11	18%
	Loose Snow	2	3%
	Slush	2	3%
	Packed Snow	2	3%
	Ice	4	7%
Pedestrian Involved		0	0%
Cyclists Involved		2	3%

Figure 11: Study Area Collision Records

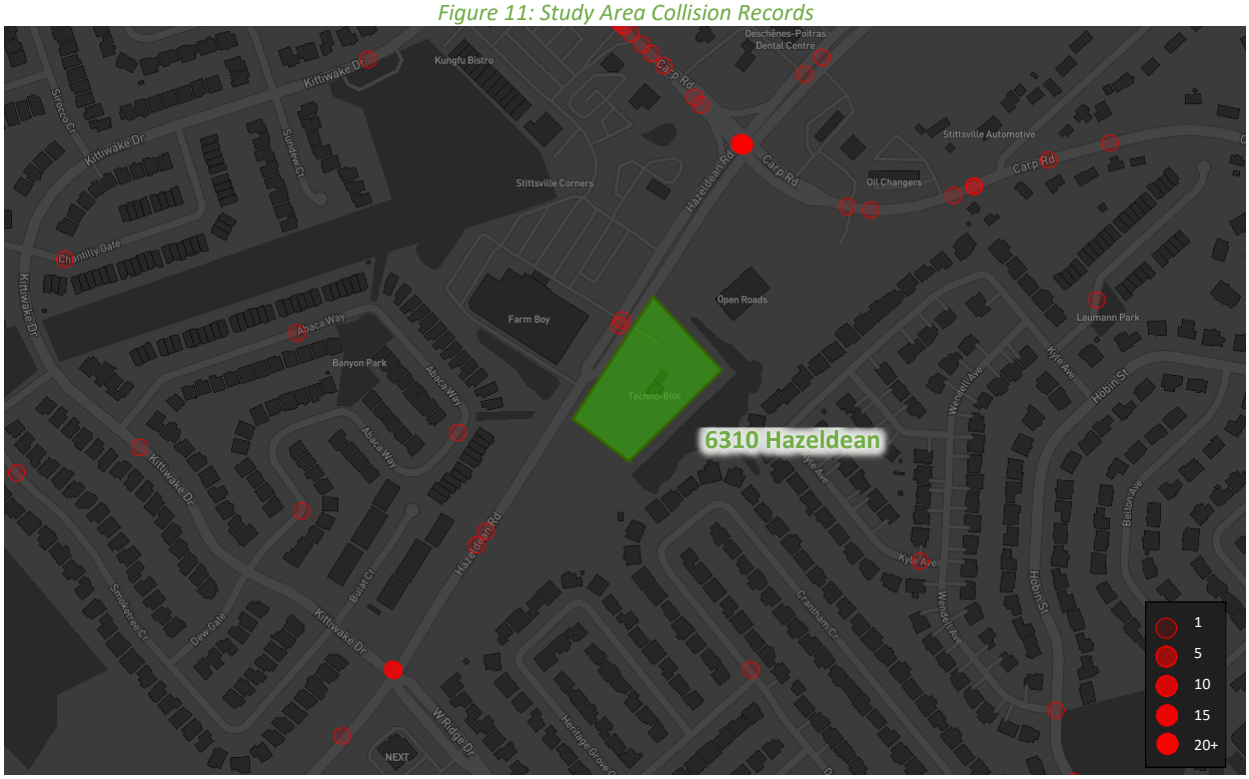


Table 4: Summary of Collision Locations, 2018-2022

	Number	%
Intersections / Segments	**60**	**100%**
Hazeldean Rd @ Carp Rd	46	77%
Hazeldean Rd @ West Ridge Dr	11	18%
Hazeldean Rd btwn Kittiwake Dr & Carp Rd	3	5%

Within the study area, the intersections of Hazeldean Road at Carp Road and at West Ridge Drive are noted to have experienced higher collisions than other locations. Table 5 and Table 6 summarize the collision types and conditions for each location.

Table 5: Hazeldean Road at Carp Road Collision Summary

		Number	%
Total Collisions		**46**	**100%**
Classification	**Fatality**	0	0%
	Non-Fatal Injury	6	13%
	Property Damage Only	40	87%
Initial Impact Type	**Angle**	3	7%
	Rear end	29	63%
	Turning Movement	5	11%
	SMV Other	3	7%
	Other	2	4%
Road Surface Condition	**Dry**	30	65%
	Wet	9	20%
	Loose Snow	1	2%
	Slush	2	4%
	Packed Snow	1	2%
	Ice	3	7%
Pedestrian Involved		0	0%
Cyclists Involved		1	2%

The Hazeldean Road at Carp Road intersection had a total of 46 collisions during the 2018-2022 time period, with 40 involving property damage only and the remaining six having non-fatal injuries. The collision types are most represented by the rear end with 29 collisions, followed by turning movement with five collisions, angle and "SMV other" each with three collisions, and with the remaining collision type represented by "Other". Weather conditions do not affect collisions at this location. Given the City's future design and planned improvements for this intersection, no further examination is required as part of this study.

Table 6: Hazeldean Road at West Ridge Drive Collision Summary

		Number	%
Total Collisions		**11**	**100%**
Classification	**Fatality**	0	0%
	Non-Fatal Injury	1	9%
	Property Damage Only	10	91%
Initial Impact Type	**Angle**	1	9%
	Rear end	4	36%
	Sideswipe	3	27%
	Turning Movement	1	9%
	SMV Other	1	9%
	Other	1	9%
Road Surface Condition	**Dry**	8	73%
	Wet	2	18%
	Packed Snow	1	9%
Pedestrian Involved		0	0%
Cyclists Involved		1	9%

The Hazeldean Road at West Ridge Drive intersection had a total of eleven collisions during the 2018-2022 time period, with ten involving property damage only and the remaining one having non-fatal injuries. The collision types are most represented by rear end with four collisions, followed by sideswipe with three collisions, and with the remaining collision types spilt between angle, turning movement, "SMV other", and "Other". Weather

conditions do not affect collisions at this location. No patterns are identified with the collision types, therefore no further examination is required as part of this study.

2.3 Planned Conditions

2.3.1 Changes to the Area Transportation Network

2.3.1.1 Transportation Master Plan (TMP) (2013)

The Transportation Master Plan's (TMP) Rapid Transit and Transit Priority Network identify isolated transit priority measures along Hazeldean Road east of Stittsville Main Steet and Stittsville Main Steet south of Hazeldean Road within the Ultimate Network Concepts diagram, however, the Stittsville Main Steet south of Hazeldean Road does not appear within the Affordable Network diagram. The Affordable Network identifies the widening of Carp Road between Hazeldean Road and Highway 41 by Phase 2 (2020 to 2025).

2.3.1.2 Transportation Master Plan Part 1 (2023)

Within the study area, there are no projects in the Active Transportation Project List. Sidewalks along Hobin Street from Carp Road to Crossing Bridge Park are included in the Active Transportation Project List.

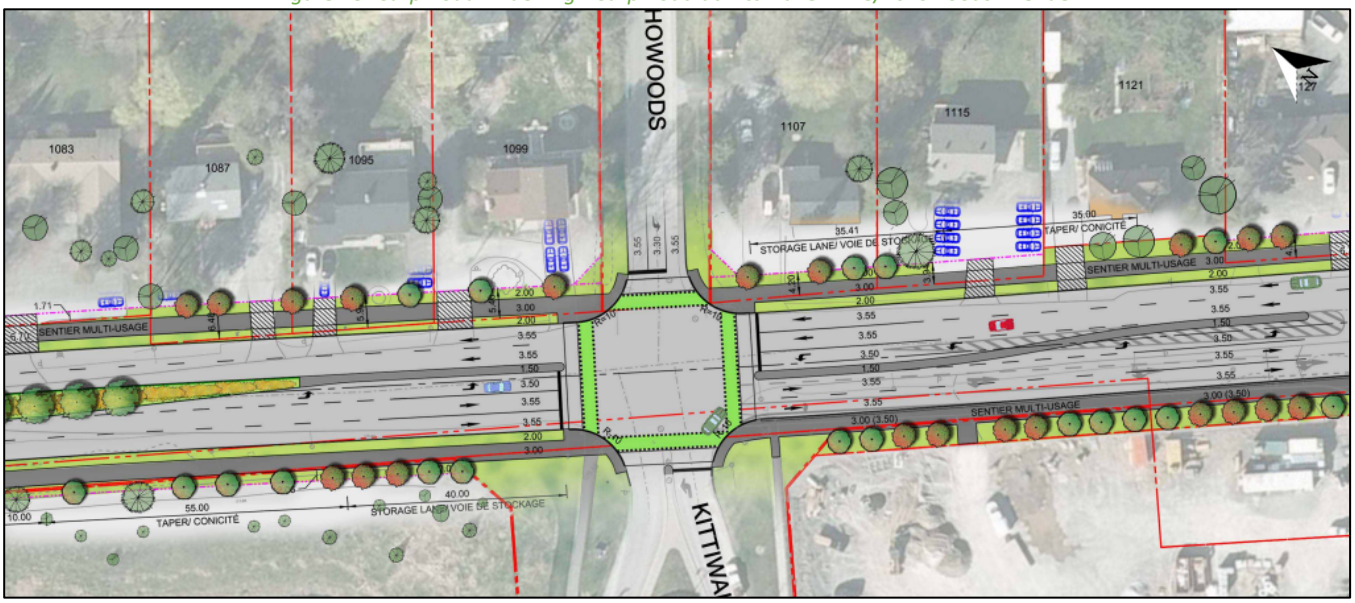
2.3.1.3 Carp Road Widening Environmental Assessment

The widening will include changes to the cross-section of Carp Road from a two-lane to a five-lane cross-section including a two-way left-turn lane south of Westbrook Road, dividing median along the Carp Road approaches to the intersections, and multi-use pathways on both sides of the road. Figure 12 and Figure 13 illustrate examples of the changes anticipated to the area intersections. The changes at the intersections of Hazeldean Road at Carp Road and Carp Road at Kittiwake Drive/Echowoods Avenue will be included in future conditions.

Figure 12: Carp Road Widening - Hazeldean Road at Carp Road

Source: https://documents.ottawa.ca/sites/documents/files/documents/carp_landscape_en.pdf Accessed: September 11, 2023

Figure 13: Carp Road Widening - Carp Road at Kittiwake Drive/Echowoods Avenue



Source: https://documents.ottawa.ca/sites/documents/files/documents/carp_landscape_en.pdf Accessed: September 11, 2023

2.3.2 Other Study Area Developments

6171 Hazeldean Road

The proposed development application includes a plan of subdivision for the construction of a total of 529 units with 20 single detached, 150 townhomes, 240 condominium units, 160 apartment units, and a 19,400 ft^2 commercial space. The anticipated full build-out and occupancy horizon is 2024. The development is predicted to generate 273 new AM and 345 new PM two-way peak-hour auto trips. (EXP Services Inc., 2021)

37 Wildpine Court

The proposed development application includes a zoning amendment to allow the construction of 29 new townhomes on both public and private streets. No TIA is required for this development.

1174 Carp Road

The proposed development application includes a site plan to allow the construction of approximately 400 senior's housing units within a 12-storey tower on nine- and five-storey podia. The anticipated full build-out and occupancy horizon is 2026. The file has been initiated and no TIA is available at this time.

3 Study Area and Time Periods

3.1 Study Area

The study area will include the intersections of:

- Hazeldean Road at:
  - West Ridge Drive/Kittiwake Drive
  - Stittsville Corners Mall/6310 Hazeldean Road
  - Jackson Trails Centre Mall
- Carp Road at:
  - Hazeldean Road
  - Kittiwake Drive/Echowoods Avenue
  - McCooeye Lane/Hobin Street (Existing Condition)

- Stittsville Main Street (Existing Condition)

The intersections of Carp Road and McCooeye Lane/Hobin Street and Carp Road and Stittsville Main Street are within one kilometre of the site. It is noted that the development would generate low volumes on any turning movements at these intersections, and these intersections will not be analyzed beyond the existing conditions.

The boundary road will be Hazeldean Road and no screenlines are present within proximity to the site.

3.2 Time Periods

As the proposed development is composed entirely of residential units the AM and PM peak hours will be examined.

3.3 Horizon Years

The anticipated build-out year is 2027. As a result, the full build-out plus five years horizon year is 2032.

4 Development-Generated Travel Demand

4.1 Mode Shares

Examining the mode shares recommended in the TRANS Trip Generation Manual (2020) for the subject district, derived from the most recent National Capital Region Origin-Destination survey (OD Survey), the existing average district mode shares by land use for Kanata/Stittsville have been summarized in Table 7.

Table 7: TRANS Trip Generation Manual Recommended Mode Shares – Kanata/Stittsville

Travel Mode	Multi-Unit (High-Rise)	
	AM	PM
Auto Driver	43%	55%
Auto Passenger	26%	19%
Transit	28%	21%
Cycling	0%	0%
Walking	4%	5%
Total	**100%**	**100%**

4.2 Trip Generation

This TIA has been prepared using the vehicle and person trip rates for the residential dwellings using the TRANS Trip Generation Manual (2020). Table 8 summarizes the person trip rates for the proposed residential land uses for each peak period.

Table 8: Trip Generation Person Trip Rates by Peak Period

Land Use	Land Use Code	Peak Period	Person Trip Rates
Multi-Unit (High-Rise)	221 & 222 (TRANS)	AM	0.80
		PM	0.90

Using the above person trip rates, the total person trip generation has been estimated. Table 9 summarizes the total person trip generation for the residential land uses.

Table 9: Total Residential Person Trip Generation by Peak Period

Land Use	Units	AM Peak Period			PM Peak Period		
		In	Out	Total	In	Out	Total
Multi-Unit (High-Rise)	431	107	238	345	225	163	388

Using the above mode share targets, and the person trip rates, the person trips by mode have been projected. Trip generation by peak hour has been forecasted using the prescribed peak period conversion factors presented in the TRANS Trip Generation Manual (2020) for the residential component. Table 10 summarizes the residential trip generation.

Table 10: Trip Generation by Mode

Travel Mode		AM Peak Hour				PM Peak Hour			
		Mode Share	In	Out	Total	Mode Share	In	Out	Total
Multi-Unit (High-Rise)	Auto Driver	**43%**	21	50	71	**55%**	53	41	94
	Auto Passenger	**26%**	13	30	43	**19%**	18	15	33
	Transit	**28%**	16	37	53	**21%**	21	17	38
	Cycling	**0%**	0	0	0	**0%**	0	0	0
	Walking	**4%**	2	6	8	**5%**	6	4	10
	Total	**100%**	**52**	**123**	**175**	**100%**	**98**	**77**	**175**

As shown above, a total of 71 AM and 94 PM new peak hour two-way vehicle trips are projected as a result of the proposed development.

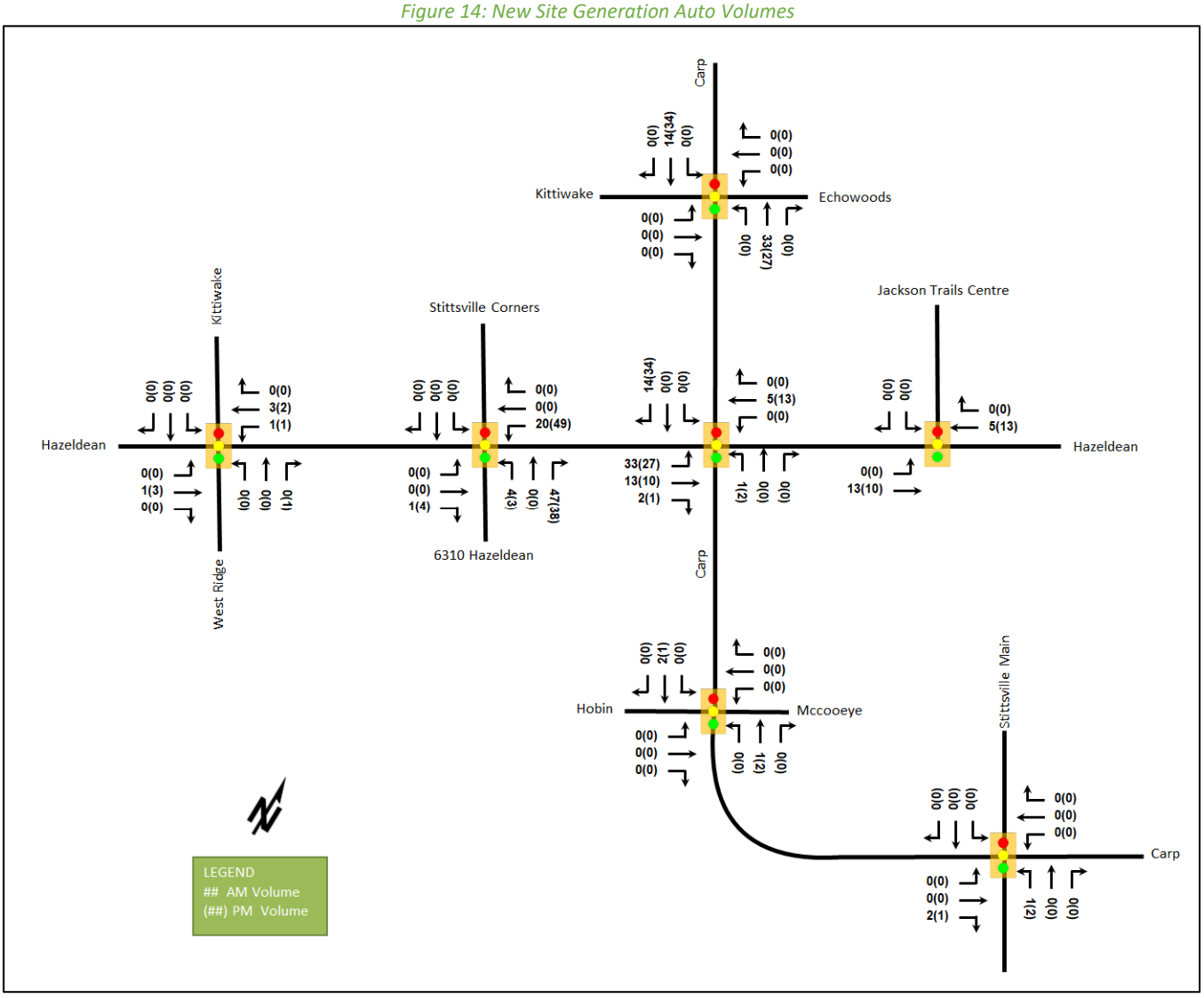
4.3 Trip Distribution

To understand the travel patterns of the subject development, the OD Survey has been reviewed to determine the travel for the residential component, and these patterns were applied based on the build-out of Kanata/Stittsville. Using the distribution, turning movement splits, and access to major transportation infrastructure, the trips generated by the site have been assigned to the study area road network. Table 11 summarizes the distributions and the proportional assignment to the study area roadways, and Figure 14 illustrates the new site generated volumes.

Table 11: OD Survey Distribution – Kanata/Stittsville

To/From	Residential % of Trips	Via
North	30%	30% Carp Road (N)
South	5%	3% Carp/Stittsville Main (S) 2% West Ridge Drive (S)
East	60%	35% Carp Road (N) 25% Hazeldean Road (E)
West	5%	5% Hazeldean Road (W)
Total	**100%**	**100%**

Figure 14: New Site Generation Auto Volumes



5 Exemption Review

Table 12 summarizes the exemptions for this TIA.

Table 12: Exemption Review

Module	Element	Explanation	Exempt/Required
Site Design and TDM			
4.1 Development Design	4.1.2 Circulation and Access	Only required for site plan and zoning by-law applications	Required
	4.1.3 New Street Networks	Only required for plans of subdivision	Exempt
4.2 Parking	4.2.1 Parking Supply	Only required for site plan and zoning by-law applications	Required
4.3 Boundary Street Design		All applications	Required

Module	Element	Explanation	Exempt/Required
4.5 Transportation Demand Management	All Elements	Only required when the development generates more than 60 person-trips	Required
Network Impact			
3.2 Background Network Travel Demand	All Elements	Only required when one or more other Network Impact Modules are triggered when the development generates more than 75 auto or transit trips	Required
3.3 Demand Rationalization		Only required when one or more other Network Impact Modules when the development generates more than 75 auto trips	Required
4.6 Neighbourhood Traffic Calming	4.6.1 Adjacent Neighbourhoods	If the development meets all of the following criteria along the route(s) site generated traffic is expected to utilize between an arterial road and the site's access: 1. Access to Collector or Local; 2. "Significant sensitive land use presence" exists, where there is at least two of the following adjacent to the subject street segment: • School (within 250m walking distance); • Park; • Retirement / Older Adult Facility (i.e. long-term care and retirement homes); • Licenced Child Care Centre; • Community Centre; or • 50%, or greater, of adjacent property along the route(s) is occupied by residential lands and a minimum of 10 occupied residential units are present on the route. 3. Application is for Zoning By-Law Amendment or Draft Plan of Subdivision; 4. At least 75 site-generated auto trips; 5. Site Trip Infiltration is expected. Site traffic will increase peak hour vehicle volumes along the route by 50% or more.	Exempt
4.7 Transit	4.7.1 Transit Route Capacity	Only required when the development generates more than 75 transit trips	Exempt
	4.7.2 Transit Priority Requirements	Only required when the development generates more than 75 auto trips	Required

Module	Element	Explanation	Exempt/Required
4.8 Network Concept		Only required when proposed development generates more than 200 person-trips during the peak hour in excess of equivalent volume permitted by established zoning	Exempt
4.9 Intersection Design	4.9.1 Intersection Control	Only required when the development generates more than 75 auto trips	Required
	4.9.2 Intersection Design	Only required when the development generates more than 75 auto trips	Required

6 Development Design

6.1 Design for Sustainable Modes

The proposed development is residential buildings with parking provided on the ground and second levels. The bicycle parking spaces are proposed both external and internal including a total of 395 spaces. Bicycle storage rooms are located on the single underground level and the ground floor and second floor parking levels, and bike racks are located externally. Main local bus stops are located within 200 metres of the site entrances at Hazeldean Road at Carp Road intersection. Hard surface connections from the building entrances are tie in the existing pedestrian facilities at the intersection.

The infrastructure TDM checklist is provided in Appendix E.

6.2 Circulation and Access

Access is provided via the existing intersection on Hazeldean Road. Garbage pick-up is proposed at the southwest corner of the parcel. A surface parking space is reserved for moving. The garbage collection vehicle and move-in/deliveries truck turning template were reviewed to confirm movements will be permitted on site. The turning templates are provided in Appendix F.

7 Parking

7.1 Parking Supply

The site provides 475 vehicle parking spaces including 394 regular parking, 75 small parking, and six barrier-free parking spaces. The proposed parking will provide a parking ratio of 1.1 spaces per unit. The minimum parking requirement is 1.2 spaces per unit, which is 517 spaces, and the site provides 42 fewer parking spaces than the requirement. The minimum visitor parking requirement is 0.2 spaces per unit, which is 86 spaces, it is recommended that the minimum visitor parking space to be provided and the parking reduction be applied to the resident spaces. Based on City of Ottawa Traffic and Parking (By-law No. 2017-301), the minimum number of accessible spaces required is five spaces, and it meets the requirements.

A total of 395 bicycle parking spaces are proposed including ten exterior bike racks on the east side of the parcel, and the rest of the bike parking spaces will be provided on the single underground level and the ground floor and second floor parking levels. The minimum bicycle parking provision is 216 at a ratio of 0.5 spaces per unit, and the proposed bicycle parking exceeds the minimum requirement.

Given the site location being closer to Jackson Trails Centre Mall and Stittsville Corners Mall and the addition 179 bicycle parking proposed, which encourages the use of non-auto modal shares, the vehicle parking is considered to be sufficient for this development.

8 Boundary Street Design

Table 13 summarizes the MMLOS analysis for the boundary street of Hazeldean Road. The existing and future conditions for both streets will be the same and are considered in one row. The boundary street analysis is based on Arterial Mainstreet. The MMLOS worksheets have been provided in Appendix G.

Table 13: Boundary Street MMLOS Analysis

Segment	Pedestrian LOS		Bicycle LOS		Transit LOS		Truck LOS	
	PLOS	Target	BLOS	Target	TLOS	Target	TrLOS	Target
Hazeldean Road	F	C	F	C	N/A	N/A	B	D

The pedestrian LOS will not be met along the segment of Hazeldean Road. To meet the theoretical pedestrian LOS targets, the operating speed would need to be lower than 50 km/h and a 2.0 metre sidewalk would be needed along Hazeldean Road.

The bicycle LOS will not be met along the segment of Hazeldean Road. Although a curbside bike lane is required along Hazeldean Road to meet the theoretical bicycle LOS targets, the paved shoulder along Hazeldean Road functions as a similar facility and provides additional space for the bicycle. No improvements are required for this mode.

9 Transportation Demand Management

9.1 Context for TDM

The mode shares used within the TIA represent the recommended shares for the Kanata/Stittsville. Overall, the modal shares are likely to be achieved and supporting TDM measures should be provided.

The subject site is within the Hazeldean Arterial Mainstreet design priority area. Total bedrooms within the development are subject to the final unit count and layout selections by purchasers, and no age restrictions are noted.

9.2 Need and Opportunity

The subject site has been assumed to rely predominantly on auto travel, and those assumptions have been carried through the analysis. The unmodified district mode shares have been applied, risks to other network users from failing to meet mode share targets are low.

9.3 TDM Program

The “suite of post occupancy TDM measures” has been summarized in the TDM checklists. The checklist is provided in Appendix E. The key TDM measures recommended include:

- Display area walking, cycling, and transit maps with route schedules
- Provide a multimodal travel option information package to new residents
- Inclusion of a 1-year Presto card for first time new apartment rental, with a set time frame for this offer (e.g. 6-months) from the initial opening of the site
- Unbundle parking cost from the purchase or rental cost

10 Background Network Travel Demands

10.1 Transportation Network Plans

The transportation network plans were discussed in Section 2.3. The widening of Carp Road is the only confirmed project within the study horizons and is considered at future horizons.

10.2 Background Growth

A review of the background projections from the City's TRANS Regional Model for the 2011 and 2031 horizons was completed to determine the background growth for each of the study area roadways. The TRANS model plots are provided in Appendix H.

In general, the growth rates in the study area derived from the two TRANS model horizons are projected to be positive in all directions. When comparing the existing volumes to 2031 horizons, the existing volumes for all directions in the study area have exceeded the forecasted volumes. Given the TRANS model rates are low, the growth rates derived were rounded to the nearest 0.25% and will be applied to the appropriate roadway mainline volume and to the appropriate major turning movements at the intersections to account for external area growth. Table 14 summarizes the growth rates from the TRANS model, and Table 15 summarizes the growth rates applied within the study area.

Table 14: TRANS Regional Model Projections – Study Area Growth Rates

Street	TRANS Rate	
	Eastbound	Westbound
Hazeldean Rd	0.55%	0.09%
	Northbound	**Southbound**
Carp Rd	2.62%	0.24%

Table 15: Study Area Growth Rates Applied

Street	AM Peak Hour		PM Peak Hour	
	Eastbound	Westbound	Eastbound	Westbound
Hazeldean Rd	0.50%	0%	0%	0.50%
	Northbound	**Southbound**	**Northbound**	**Southbound**
Carp Rd	2.50%	0.25%	0.25%	2.50%

10.3 Other Developments

The background developments explicitly considered in the background conditions (Section 10.2) include:

- 6171 Hazeldean Road
- 1174 Carp Road

The background development volumes within the study area have been provided in Appendix I.

11 Demand Rationalization

11.1 2027 Future Background Operations

As noted in Section 2.2.7, due to the difference between the 2022 and the 2023 volumes on the network, approximately 130-230 vehicles during the AM peak and approximately 130-335 vehicles during the PM peak were added to the 2022 counts along Hazeldean Road on the eastbound and westbound movements for balancing the volumes for the future analysis. Figure 15 illustrates the 2027 background volumes and Table 16 summarizes the 2027 background intersection operations. The level of service for signalized intersections is based on HCM 2010 calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection, and HCM average delay for unsignalized intersections. The synchro worksheets for the 2027 future background horizon are provided in Appendix J.

Figure 15: 2027 Future Background Volumes

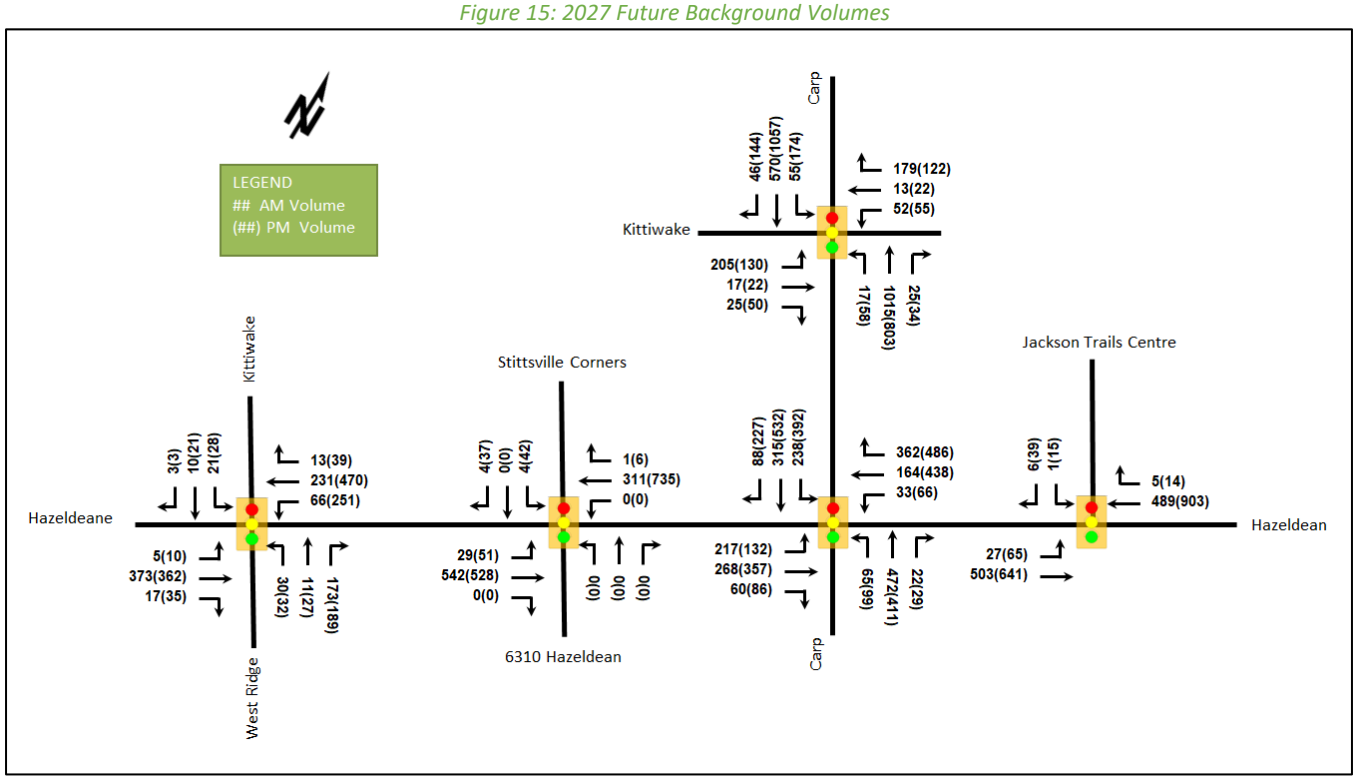


Table 16: 2027 Future Background Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
Hazeldean Rd at West Ridge Dr /Kittiwake Dr *Signalized*	EBL	A	0.01	4.2	1.1	A	0.02	3.4	2.0
	EBT/R	A	0.34	6.0	30.4	A	0.29	4.1	41.5
	WBL	A	0.11	4.8	6.4	A	0.34	9.0	70.0
	WBT/R	A	0.22	5.0	18.0	A	0.37	8.8	121.9
	NBL/T	A	0.21	26.5	12.0	A	0.42	63.1	26.7
	NBR	A	0.47	9.2	14.2	A	0.60	15.2	20.6
	SBL	A	0.11	24.8	7.4	A	0.23	56.7	15.4
	SBT/R	A	0.05	21.2	5.0	A	0.15	48.6	12.6
	Overall	**A**	**0.32**	**7.8**	-	**A**	**0.37**	**12.1**	-
Hazeldean Rd at Stittsville Corners Mall/6310 Hazeldean Rd *Signalized*	EBL	A	0.03	1.0	2.6	A	0.10	3.7	7.8
	EBT/R	A	0.17	0.8	15.4	A	0.19	3.0	27.2
	WBL	-	-	-	-	-	-	-	-
	WBT	A	0.19	0.8	7.3	A	0.49	2.9	m19.8
	WBR	A	0.00	0.0	m0.0	A	0.00	0.0	m0.0
	NB	-	-	-	-	-	-	-	-
	SBL/T	A	0.04	54.0	4.7	A	0.38	65.8	21.9
	SBR	A	0.03	0.2	0.0	A	0.23	19.9	10.6
	Overall	**A**	**0.20**	**1.0**	-	**A**	**0.50**	**5.3**	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
Hazeldean at Jackson Trails Centre Mall ***Signalized***	EBL	A	0.04	1.2	2.6	A	0.14	3.2	5.7
	EBT	A	0.16	0.9	14.7	A	0.23	2.5	19.0
	WBT/R	A	0.17	0.9	14.6	A	0.33	2.9	29.4
	SBL	A	0.01	48.0	1.9	A	0.11	53.2	10.2
	SBR	A	0.05	29.0	4.2	A	0.25	19.7	10.7
	Overall	**A**	**0.18**	**1.1**	-	**A**	**0.33**	**3.6**	-
Hazeldean Rd at Carp Rd ***Signalized***	EBL	D	0.85	65.2	57.4	C	0.77	55.8	**#36.3**
	EBT/R	A	0.39	33.3	37.9	A	0.37	24.8	37.2
	WBL	A	0.24	46.8	15.1	A	0.31	40.9	26.3
	WBT	B	0.64	59.4	53.2	E	0.91	69.5	**#159.3**
	WBR	B	0.70	12.5	27.6	B	0.66	8.0	30.2
	NBL	A	0.55	72.6	30.4	B	0.67	79.3	**#43.9**
	NBT/R	A	0.33	23.7	60.2	A	0.43	37.9	67.7
	SBL	B	0.65	57.2	**#55.9**	C	0.75	51.0	64.5
	SBT	A	0.36	35.4	104.7	C	0.78	50.9	**#188.1**
	SBR	A	0.12	13.8	15.4	A	0.33	17.8	46.3
	Overall	**A**	**0.59**	**36.1**	-	**D**	**0.85**	**40.3**	-
Carp Rd at Echowoods Ave/Kittiwake Dr ***Signalized***	EBL	E	0.92	**86.9**	**#83.2**	D	0.82	**88.4**	**#61.9**
	EBT/R	A	0.11	18.1	11.6	A	0.25	20.4	18.1
	WBL	A	0.17	36.0	19.7	A	0.28	50.3	24.8
	WBT/R	A	0.40	10.9	24.4	A	0.42	15.2	23.3
	NBL	A	0.04	8.9	m2.7	A	0.20	4.7	m2.2
	NBT/R	A	0.55	17.0	129.6	A	0.40	13.1	79.6
	SBL	A	0.19	10.6	10.4	A	0.41	8.4	19.2
	SBT/R	A	0.31	13.2	58.3	A	0.55	12.7	103.5
	Overall	**B**	**0.64**	**22.1**	-	**A**	**0.60**	**17.2**	-

Notes:
Saturation flow rate of 1800 veh/h/lane
PHF = 1.00
Delay = average driver delay in seconds
v/c = volume to capacity ratio
Q = 95th percentile queue measured in metres
m = metered queue
# = volume for the 95th %ile cycle exceeds capacity

Intersections of Hazeldean Road at West Ridge Drive /Kittiwake Drive, Hazeldean Road at Stittsville Corners Mall/6310 Hazeldean Road, and Hazeldean at Jackson Trails Centre Mall will operate similarly to existing condition with the incremental improvement to the intersection operations and balancing along Hazeldean Road. It is predominantly a result of the peak hour factor adjustment to 1.00 for forecasted conditions.

The anticipated widening of Carp Road will improve operations at the intersections of Hazeldean Road at Carp Road and Carp Road at Echowoods Avenue/Kittiwake Drive. The overall LOS at Hazeldean Road at Carp Road intersection will be decreased from 0.70 to 0.59 during AM peak hour, and from 0.88 to 0.85 during PM peak hour. During PM peak hour, the westbound and southbound through movements will be over theoretical capacity. The overall LOS at Carp Road at Echowoods Avenue/Kittiwake Drive will be decreased from 0.92 to 0.64 during AM peak hour, and from 0.84 to 0.60 during PM peak hour.

11.2 2032 Future Background Operations

As noted in Section 2.2.7, due to the difference between the 2022 and the 2023 volumes on the network, approximately 130-230 vehicles during the AM peak and approximately 130-335 vehicles during the PM peak were added to the 2022 counts along Hazeldean Road on the eastbound and westbound movements for balancing the volumes for the future analysis. Figure 16 illustrates the 2032 background volumes and Table 17 summarizes the 2032 background intersection operations. The level of service for signalized intersections is based on HCM 2010

calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection, and HCM average delay for unsignalized intersections. The synchro worksheets for the 2032 future background horizon are provided in Appendix K.

Figure 16: 2032 Future Background Volumes

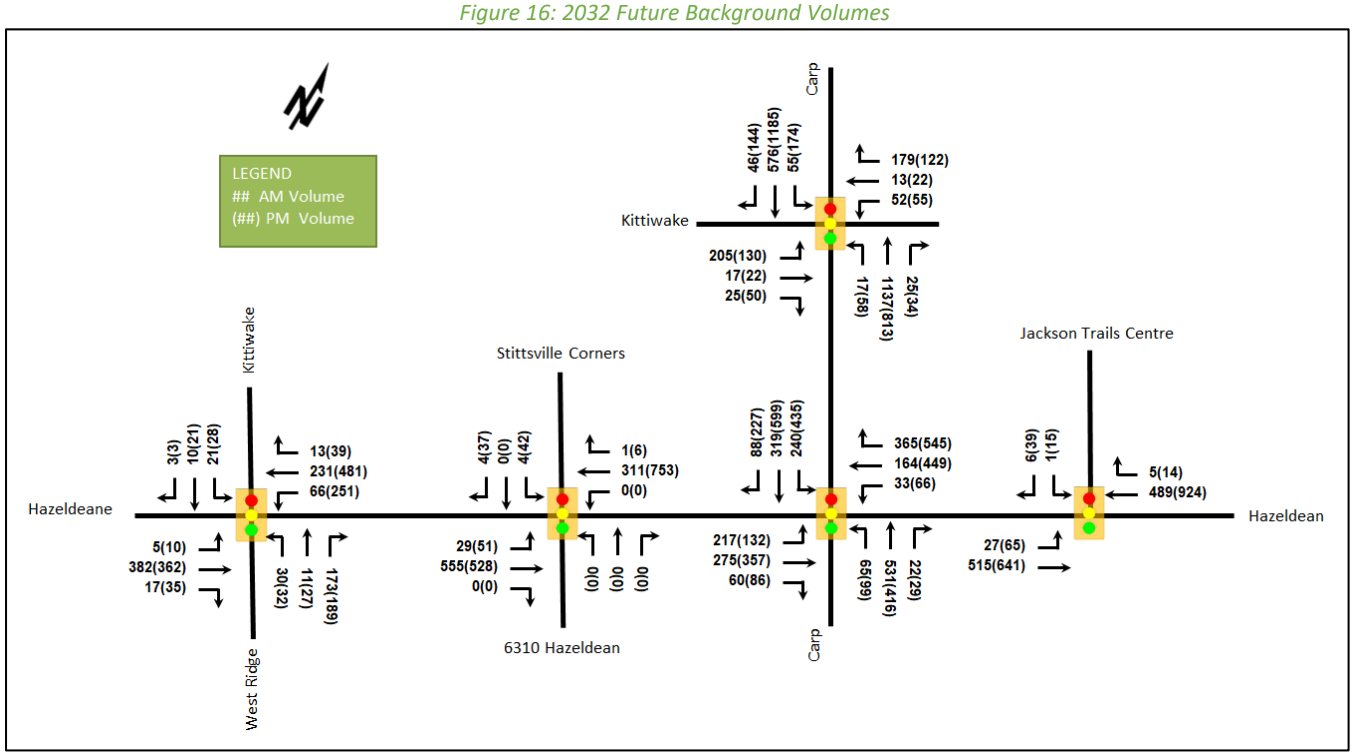


Table 17: 2032 Future Background Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
Hazeldean Rd at West Ridge Dr /Kittiwake Dr *Signalized*	EBL	A	0.01	4.2	1.1	A	0.02	3.4	2.0
	EBT/R	A	0.35	6.1	31.3	A	0.29	4.1	41.5
	WBL	A	0.11	4.8	6.4	A	0.34	8.7	69.1
	WBT/R	A	0.22	5.0	18.0	A	0.38	8.7	125.4
	NBL/T	A	0.21	26.5	12.0	A	0.42	63.1	26.7
	NBR	A	0.47	9.2	14.2	A	0.60	15.2	20.6
	SBL	A	0.11	24.8	7.4	A	0.23	56.7	15.4
	SBT/R	A	0.05	21.2	5.0	A	0.15	48.6	12.6
	Overall	**A**	**0.32**	**7.8**	-	**A**	**0.38**	**12.0**	-
Hazeldean Rd at Stittsville Corners Mall/6310 Hazeldean Rd *Signalized*	EBL	A	0.03	1.0	2.6	A	0.10	3.8	7.8
	EBT/R	A	0.18	0.8	15.8	A	0.19	3.0	27.2
	WBL	-	-	-	-	-	-	-	-
	WBT	A	0.19	0.7	6.5	A	0.51	3.1	m22.3
	WBR	A	0.00	0.0	m0.0	A	0.00	0.0	m0.0
	NB	-	-	-	-	-	-	-	-
	SBL/T	A	0.04	54.0	4.7	A	0.38	65.8	21.9
	SBR	A	0.03	0.2	0.0	A	0.23	19.9	10.6
	Overall	**A**	**0.20**	**1.0**	-	**A**	**0.51**	**5.4**	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
Hazeldean at Jackson Trails Centre Mall *Signalized*	EBL	A	0.04	1.2	2.6	A	0.15	3.2	5.7
	EBT	A	0.17	0.9	15.2	A	0.23	2.5	19.0
	WBT/R	A	0.17	0.9	14.6	A	0.33	2.9	30.2
	SBL	A	0.01	48.0	1.9	A	0.11	53.2	10.2
	SBR	A	0.05	29.0	4.2	A	0.25	19.7	10.7
	Overall	**A**	**0.19**	**1.1**	-	**A**	**0.33**	**3.6**	-
Hazeldean Rd at Carp Rd *Signalized*	EBL	D	0.85	65.2	57.5	C	0.78	57.2	**#37.3**
	EBT/R	A	0.40	33.6	39.0	A	0.36	24.5	37.2
	WBL	A	0.24	46.9	15.1	A	0.31	40.6	26.3
	WBT	B	0.64	59.4	53.2	E	0.92	70.0	**#165.7**
	WBR	C	0.74	16.8	37.2	B	0.70	9.2	37.7
	NBL	A	0.55	72.6	30.4	B	0.67	79.3	**#43.9**
	NBT/R	A	0.37	24.4	68.1	A	0.47	40.0	70.0
	SBL	B	0.65	56.8	**#56.3**	C	0.77	49.2	70.3
	SBT	A	0.36	35.5	105.7	D	0.89	59.4	**#227.6**
	SBR	A	0.12	13.8	15.4	A	0.34	19.0	50.8
	Overall	**A**	**0.59**	**36.7**	-	**E**	**0.91**	**42.0**	-
Carp Rd at Echowoods Ave/Kittiwake Dr *Signalized*	EBL	E	0.92	**86.9**	**#83.2**	D	0.86	**96.6**	**#62.5**
	EBT/R	A	0.11	18.1	11.6	A	0.26	20.6	18.1
	WBL	A	0.17	36.0	19.7	A	0.29	51.0	24.8
	WBT/R	A	0.41	14.2	29.2	A	0.43	15.5	23.3
	NBL	A	0.04	9.1	m2.7	A	0.23	4.9	m2.3
	NBT/R	B	0.61	18.8	150.0	A	0.41	11.9	78.7
	SBL	A	0.22	11.2	10.4	A	0.41	8.3	19.2
	SBT/R	A	0.32	13.2	58.9	A	0.60	13.6	121.9
	Overall	**B**	**0.65**	**23.0**	-	**B**	**0.65**	**17.5**	-

Notes:
Saturation flow rate of 1800 veh/h/lane
PHF = 1.00
Delay = average driver delay in seconds
v/c = volume to capacity ratio
Q = 95th percentile queue measured in metres
m = metered queue
# = volume for the 95th %ile cycle exceeds capacity

During both AM and PM peak hours, the study area intersection will operate similar to 2027 future background conditions. No additional capacity issues are noted.

11.3 Modal Share Sensitivity and Demand Rationalization Conclusions

11.3.1 Network Rationalization

No capacity constraints are noted in the background conditions. No further rationalization for background travel demand is required for this study.

11.3.2 Development Rationalization

The proposed trip generation rates and modal shares are consistent with the surrounding area context and do not unduly impact the surrounding road network. No site-specific demand rationalization is considered necessary as part of this TIA.

12 Transit

12.1 Transit Priority

Site traffic is anticipated to have negligible impact on transit movements throughout the study area. All intersections' transit LOS scores are similar between the background and total conditions.

13 Intersection Design

13.1 Intersection Control

No change to the existing signalized control is recommended for the network intersections.

13.2 Intersection Design

13.2.1 2027 Future Total Intersection Operations

As noted in Section 2.2.7, due to the difference between the 2022 and the 2023 volumes on the network, approximately 130-230 vehicles during the AM peak and approximately 130-335 vehicles during the PM peak were added to the 2022 counts along Hazeldean Road on the eastbound and westbound movements for balancing the volumes for the future analysis. The 2027 future total intersection volumes are illustrated in Figure 17 and the intersection operations are summarized below in Table 18. The level of service for signalized intersections is based on v/c calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection, and average delay for unsignalized intersections. The synchro worksheets for 2027 future total conditions have been provided in Appendix L.

Figure 17: 2027 Future Total Volumes

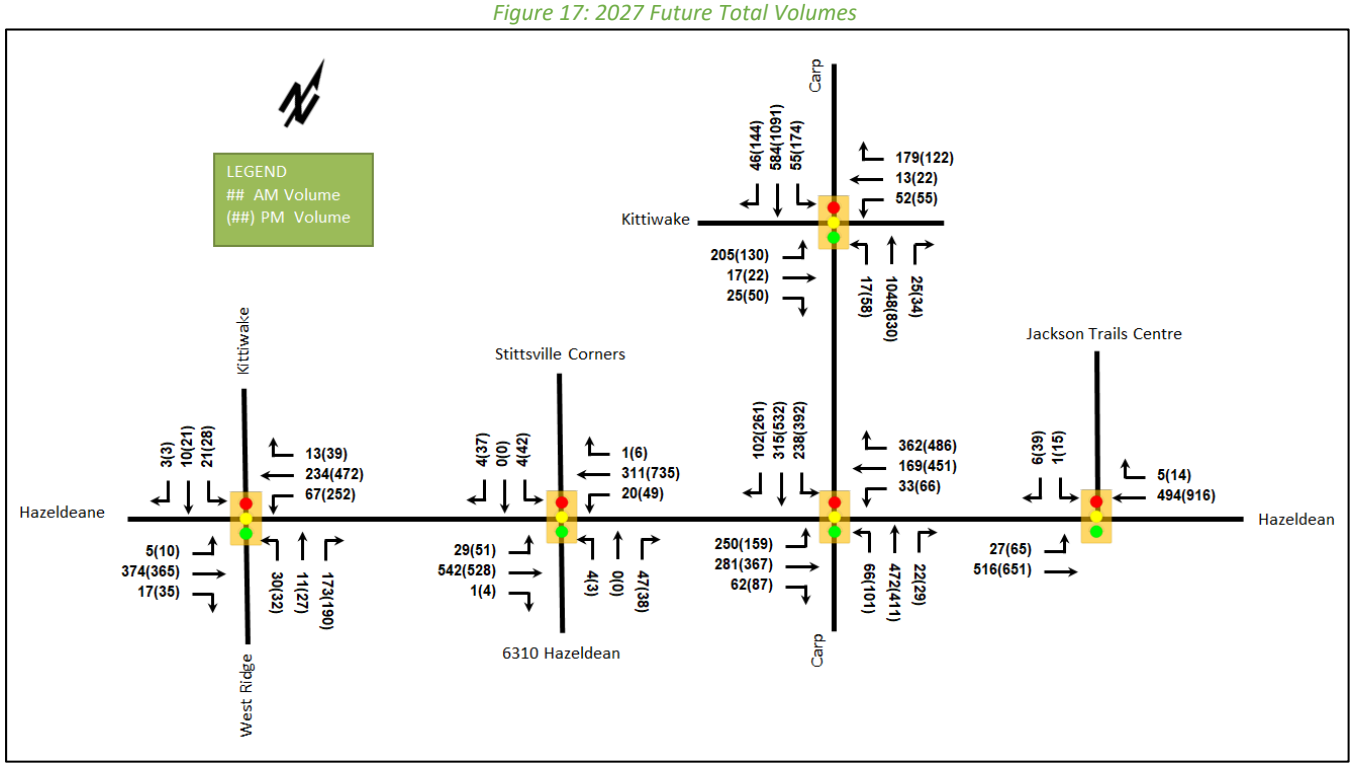


Table 18: 2027 Future Total Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
Hazeldean Rd at West Ridge Dr /Kittiwake Dr *Signalized*	EBL	A	0.01	4.2	1.1	A	0.02	3.4	2.0
	EBT/R	A	0.35	6.0	30.6	A	0.29	4.1	42.0
	WBL	A	0.11	4.8	6.5	A	0.34	8.9	67.3
	WBT/R	A	0.22	5.1	18.3	A	0.37	8.6	116.8
	NBL/T	A	0.21	26.5	12.0	A	0.42	63.1	26.7
	NBR	A	0.47	9.2	14.2	A	0.60	15.2	20.6
	SBL	A	0.11	24.8	7.4	A	0.23	56.7	15.4
	SBT/R	A	0.05	21.2	5.0	A	0.15	48.6	12.6
	Overall	**A**	**0.32**	**7.8**	-	**A**	**0.38**	**12.0**	-
Hazeldean Rd at Stittsville Corners Mall/6310 Hazeldean Rd *Signalized*	EBL	A	0.04	2.2	2.6	A	0.10	3.8	7.9
	EBT/R	A	0.19	2.3	15.4	A	0.19	3.0	27.8
	WBL	A	0.03	0.9	m1.2	A	0.07	1.4	m1.9
	WBT	A	0.21	1.0	9.8	A	0.49	2.7	m24.3
	WBR	A	0.00	0.0	m0.0	A	0.00	0.0	m0.0
	NB	A	0.32	22.4	13.4	A	0.25	22.0	11.5
	SBL	A	0.04	54.2	4.7	A	0.39	66.3	21.9
	SBR	A	0.03	0.2	0.0	A	0.23	19.8	10.5
	Overall	**A**	**0.21**	**3.1**	-	**A**	**0.50**	**5.5**	-
Hazeldean at Jackson Trails Centre Mall *Signalized*	EBL	A	0.04	1.2	2.6	A	0.15	3.2	5.7
	EBT	A	0.17	0.9	15.2	A	0.23	2.5	19.3
	WBT/R	A	0.17	0.9	14.7	A	0.33	2.9	29.8
	SBL	A	0.01	48.0	1.9	A	0.11	53.2	10.2
	SBR	A	0.05	29.0	4.2	A	0.25	19.7	10.7
	Overall	**A**	**0.19**	**1.1**	-	**A**	**0.33**	**3.6**	-
Hazeldean Rd at Carp Rd *Signalized*	EBL	E	0.98	**89.7**	**#76.3**	E	0.95	**88.7**	**#55.0**
	EBT/R	A	0.40	32.3	40.9	A	0.37	24.8	39.8
	WBL	A	0.24	46.6	15.1	A	0.31	40.7	26.3
	WBT	B	0.65	59.6	55.1	E	0.92	71.0	**#167.3**
	WBR	B	0.70	13.3	29.9	B	0.66	8.8	34.9
	NBL	A	0.55	72.8	31.0	B	0.68	**80.1**	**#45.8**
	NBT/R	A	0.34	23.9	60.2	A	0.44	38.2	67.7
	SBL	B	0.65	57.1	**#56.0**	C	0.75	50.8	64.3
	SBT	A	0.36	35.7	104.9	C	0.79	51.8	**#188.8**
	SBR	A	0.14	15.1	19.6	A	0.37	18.1	53.3
	Overall	**B**	**0.63**	**39.2**	-	**D**	**0.90**	**42.3**	-
Carp Rd at Echowoods Ave/Kittiwake Dr *Signalized*	EBL	E	0.92	**86.9**	**#83.2**	D	0.86	**96.6**	**#62.5**
	EBT/R	A	0.11	18.1	11.6	A	0.26	20.6	18.1
	WBL	A	0.17	36.0	19.7	A	0.29	51.0	24.8
	WBT/R	A	0.40	11.7	25.8	A	0.43	15.5	23.3
	NBL	A	0.04	9.5	m2.8	A	0.20	4.3	m2.0
	NBT/R	A	0.56	18.1	m129.2	A	0.41	12.2	m77.4
	SBL	A	0.20	10.8	10.4	A	0.42	8.4	19.2
	SBT/R	A	0.32	13.2	59.8	A	0.56	12.8	108.0
	Overall	**B**	**0.65**	**22.6**	-	**B**	**0.62**	**17.3**	-

Notes:

Saturation flow rate of 1800 veh/h/lane
PHF = 1.00
Delay = average driver delay in seconds
v/c = volume to capacity ratio

Q = 95th percentile queue measured in metres
m = metered queue
# = volume for the 95th %ile cycle exceeds capacity

During both AM and PM peak hours, the study area intersection will operate similar to 2027 future background conditions. No additional capacity issues are noted.

13.2.2 2032 Future Total Intersection Operations

As noted in Section 2.2.7, due to the difference between the 2022 and the 2023 volumes on the network, approximately 130-230 vehicles during the AM peak and approximately 130-335 vehicles during the PM peak were added to the 2022 counts along Hazeldean Road on the eastbound and westbound movements for balancing the volumes for the future analysis. The 2032 future total intersection volumes are illustrated in Figure 18 and the intersection operations are summarized below in Table 19. The level of service for signalized intersections is based on v/c calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection, and average delay for unsignalized intersections. The synchro worksheets for 2032 future total conditions have been provided in Appendix M.

Figure 18: 2032 Future Total Volumes

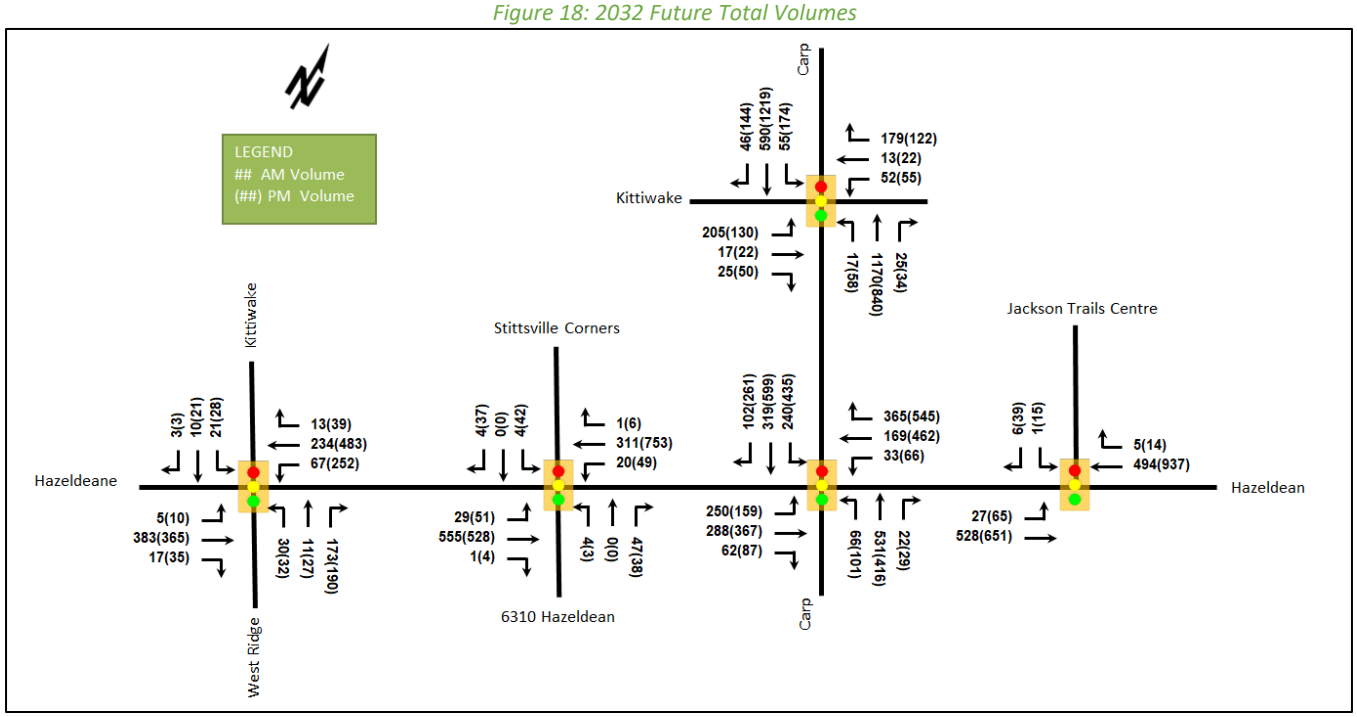


Table 19: 2032 Future Total Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
Hazeldean Rd at West Ridge Dr /Kittiwake Dr *Signalized*	EBL	A	0.01	4.2	1.1	A	0.02	3.4	2.0
	EBT/R	A	0.35	6.1	31.5	A	0.29	4.1	42.0
	WBL	A	0.11	4.9	6.4	A	0.34	8.7	66.0
	WBT/R	A	0.22	5.1	18.3	A	0.38	8.6	120.3
	NBL/T	A	0.21	26.5	12.0	A	0.42	63.1	26.7
	NBR	A	0.47	9.2	14.2	A	0.60	15.2	20.6
	SBL	A	0.11	24.8	7.4	A	0.23	56.7	15.4
	SBT/R	A	0.05	21.2	5.0	A	0.15	48.6	12.6
	Overall	**A**	**0.32**	**7.8**	-	**A**	**0.38**	**11.9**	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
Hazeldean Rd at Stittsville Corners Mall/6310 Hazeldean Rd ***Signalized***	EBL	A	0.04	2.2	2.6	A	0.10	3.8	7.9
	EBT/R	A	0.20	2.3	15.8	A	0.19	3.0	27.8
	WBL	A	0.03	0.9	m1.2	A	0.07	1.5	m2.1
	WBT	A	0.21	1.0	9.8	A	0.51	2.9	m26.8
	WBR	A	0.00	0.0	m0.0	A	0.00	0.0	m0.0
	NB	A	0.32	22.4	13.4	A	0.25	22.0	11.5
	SBL/T	A	0.04	54.2	4.7	A	0.39	66.3	21.9
	SBR	A	0.03	0.2	0.0	A	0.23	19.8	10.5
	Overall	**A**	**0.21**	**3.1**	-	**A**	**0.51**	**5.6**	-
Hazeldean at Jackson Trails Centre Mall ***Signalized***	EBL	A	0.04	1.2	2.6	A	0.15	3.3	5.8
	EBT	A	0.17	0.9	15.5	A	0.23	2.5	19.3
	WBT/R	A	0.17	0.9	14.7	A	0.34	2.9	30.8
	SBL	A	0.01	48.0	1.9	A	0.11	53.2	10.2
	SBR	A	0.05	29.0	4.2	A	0.25	19.7	10.7
	Overall	**A**	**0.19**	**1.1**	-	**A**	**0.34**	**3.6**	-
Hazeldean Rd at Carp Rd ***Signalized***	EBL	E	0.98	**89.6**	**#75.6**	E	0.96	**90.9**	**#56.6**
	EBT/R	A	0.41	32.5	41.9	A	0.37	24.5	39.8
	WBL	A	0.24	46.7	15.1	A	0.31	40.4	26.3
	WBT	B	0.65	59.6	55.1	E	0.93	71.5	**#173.1**
	WBR	C	0.74	17.7	39.3	C	0.71	10.0	43.3
	NBL	A	0.55	72.8	31.0	B	0.68	**80.1**	**#45.8**
	NBT/R	A	0.38	24.6	68.1	A	0.47	40.4	70.0
	SBL	B	0.65	56.7	**#56.4**	C	0.77	48.7	70.3
	SBT	A	0.36	35.8	105.9	D	0.90	60.8	**#227.7**
	SBR	A	0.14	15.1	19.2	A	0.39	19.5	58.7
	Overall	**B**	**0.64**	**39.6**	-	**E**	**0.96**	**44.1**	-
Carp Rd at Echowoods Ave/Kittiwake Dr ***Signalized***	EBL	E	0.92	**86.9**	**#83.2**	D	0.86	**96.6**	**#62.5**
	EBT/R	A	0.11	18.1	11.6	A	0.26	20.6	18.1
	WBL	A	0.17	36.0	19.7	A	0.29	51.0	24.8
	WBT/R	A	0.42	14.9	30.1	A	0.43	15.5	23.3
	NBL	A	0.04	9.5	m2.9	A	0.23	4.8	m2.1
	NBT/R	B	0.63	19.8	m150.1	A	0.42	11.4	m76.9
	SBL	A	0.23	11.4	10.4	A	0.42	8.5	19.2
	SBT/R	A	0.32	13.3	60.5	B	0.62	14.0	127.3
	Overall	**B**	**0.70**	**23.5**	-	**B**	**0.66**	**17.4**	-

Notes:
Saturation flow rate of 1800 veh/h/lane
PHF = 1.00
Delay = average driver delay in seconds
v/c = volume to capacity ratio
Q = 95th percentile queue measured in metres
m = metered queue
# = volume for the 95th %ile cycle exceeds capacity

The network intersection operations for the 2032 future total horizon are anticipated to operate similarly to the 2032 future background conditions.

13.2.3 Intersection MMLOS

Table 20 summarizes the MMLOS analysis for the network intersections within the study area. The analysis of intersection along Hazeldean Road is based on Arterial Main Street, Carp Road at Kittiwake Drive/ Echowoods Avenue and Carp Road at McCooeye Lane /Hobin Street intersections are based on General Urban Area, and Carp Road at Stittsville Main Street intersection is based on Traditional Mainstreet. The MMLOS worksheets have been provided in Appendix G.

Table 20: Study Area Intersection MMLOS Analysis

Intersection	Horizon	Pedestrian LOS		Bicycle LOS		Transit LOS		Truck LOS		Auto LOS	
		PLOS	Target	BLOS	Target	TLOS	Target	TrLOS	Target	ALOS	Target
Hazeldean Rd at West Ridge Dr/Kittiwake Dr	Existing /Future	F	C	F	C	N/A	N/A	N/A	N/A	A	D
Hazeldean Rd at Stittsville Corners Mall /6310 Hazeldean Rd	Existing /Future	F	C	F	C	N/A	N/A	N/A	N/A	A	D
Hazeldean Rd at Jackson Trails Centre Mall	Existing /Future	F	C	F	C	N/A	N/A	N/A	N/A	A	D
Hazeldean Rd at Carp Rd	Existing	F	C	F	C	N/A	N/A	C	D	D	D
	Future	F	C	F	C	N/A	N/A	C	D	E	D
Carp Rd at Echowoods Ave/ Kittiwake Dr	Existing	F	C	F	B	N/A	N/A	N/A	N/A	D	D
	Future	F	C	A	B	N/A	N/A	N/A	N/A	B	D
Carp Rd at McCooeye Ln /Hobin St	Existing /Future	F	C	E	B	N/A	N/A	N/A	N/A	A	D
Carp Rd at Stittsville Main St	Existing /Future	F	B	F	C	F	D	C	D	D	D

The pedestrian LOS targets will not be met at the existing or future intersections within the study area. As typical for arterial roads, the crossing distance does not permit the targets to be met. To meet pedestrian LOS targets, the maximum crossing distance on all pedestrian crossings would need to be reduced to three lane-widths.

In addition to the geometric changes required to meet the PLOS targets for pedestrian exposure to traffic at signalized intersections (PETSI), the pedestrian delay LOS would require all crossings to have reductions in the cycle length and a balancing of phase times to reach an average delay of less than 30 seconds. Generally the priority of the signal timing for Hazeldean Road or Carp Road have a pedestrian delay below 30 seconds and the crossing delays for these arterials exceeds 30 seconds. Without significant impact on the intersection capacity these values are not likely to be able to be met with the required do not walk, amber, and all-red values. Generally, changes required to optimize pedestrian delay result in failure of auto and transit LOS and unnecessarily burden the pedestrian LOS. No signal timing changes are recommended on this basis.

The bicycle LOS targets will not be met at the existing or future intersections within the study area except for the future intersection of Carp Road at Echowoods Avenue/Kittiwake Drive. To meet bicycle LOS targets, the left-turn configurations would need to be two-stage or include turn boxes or protected facilities would be required at the intersections.

The transit LOS targets will not be met at the existing or future intersection of Carp Road at Stittsville Main Street.

The auto LOS targets will not be met at the future intersection of Hazeldean Road at Carp Road due to background growth with the existing threshold of LOS D. Given the City is moving to a lower auto threshold, no improvements are required for this mode.

The existing road network requires wide ranging pedestrian and cycling facilities to decrease the gap of the MMLOS results and the target thresholds for the study area intersections. The nature of these improvements would require a study similar to the Carp Road Widening improvements and connections to other facilities. This

scope of work is well beyond the proposed development responsibility and should be identified in the City's long range planning and ongoing missing links projects.

13.2.4 Recommended Design Elements

No study area intersection design elements are proposed as part of this study.

14 Summary of Improvements Indicated and Modifications Options

The following summarizes the analysis and results presented in this TIA report:

Proposed Site and Screening

- The proposed redevelopment consists of 431 apartment units in two buildings
- The redevelopment proposed 475 vehicle parking spaces and 395 bike parking spaces
- A full-movements access will be remained at the existing signalized intersection on Hazeldean Road
- The development is proposed to be completed as a single phase by 2027
- The trip generation trigger, location trigger, and safety triggers were met for the TIA Screening

Existing Conditions

- Hazeldean Road, Carp Road, Stittsville Main Street are arterial roads, and West Ridge Drive, Kittiwake Drive, Echowoods Avenue, and Hobin Street are collector roads in the study area
- Sidewalk and asphalt pathway are provided on Hazeldean road east of Kittiwake Drive /West Ridge Drive, Carp Road south of Kittiwake Drive/ Echowoods Avenue, Echowoods Avenue, Kittiwake Drive, and West Ridge Drive
- Bike lanes are provided on the south side of Hazeldean Road east of Carp Road, on the north side of Hazeldean Road east of Stittsville Corners Mall access, on the east side of Carp Road approaching Hazeldean Road to Kittiwake Drive/Echowoods Avenue, and on the west side of Carp Road north of Hazeldean
- The high volumes roadways have produced a high number of collisions at the study area intersections, primarily at the Carp Road at Hazeldean Road intersection, which has 88% of the collisions within the study area
- The collisions types at Hazeldean Road at Carp Road intersection are overwhelmingly associated with congestion at the intersection, which it is not considered a pattern and only a localized issue due to construction or other transient circumstances, and no further examination is required as part of this study
- Extended queues or high delays may be exhibited on several movements at the intersections of Carp Road at Hazeldean Road, at Echowoods Avenue/Kittiwake Drive, and at Stittsville Main Street in the existing condition

Development Generated Travel Demand

- The proposed development is forecasted to produce 175 two-way people trips during the AM peak hour and 175 two-way people trips during the PM peak hour
- Of the forecasted people trips, 71 two-way trips will be vehicle trips during the AM peak hour and 94two-way trips will be vehicle trips during the PM peak hour
- Of the forecasted trips, 30% are anticipated to travel north, 5% to both the south and the west, and 60% to the east

Development Design

- The bicycle parking spaces are proposed both external and internal including a total of 395 spaces
- Bicycle storage rooms are located on the single underground level and the ground floor and second floor parking levels, and bike racks are located external

- Main local bus stops are located within 200 metres of the site entrances at Hazeldean Road at Carp Road intersection
- Hard surface connections are provided from the building entrances to existing intersection pedestrian facilities.
- The garbage collection vehicle and move-in/deliveries truck turning template were reviewed to confirm movements will be permitted on site

Parking

- The site provides 475 vehicle parking spaces including 394 regular parking, 75 small parking, and six barrier-free parking spaces, and the site provides 42 fewer parking spaces than the requirement
- The accessible spaces meets City of Ottawa Traffic and Parking requirements
- A total of 395 bicycle parking spaces are proposed
- The visitor parking, 86 spaces, should be provided and the reduction in parking spaces should be applied to the resident component
- The development proposed 179 more bicycle parking, which encourages the use of non-auto modal shares, and vehicle parking is considered to be sufficient for this development

Boundary Street Design

- The pedestrian LOS will not be met along the segment of Hazeldean Road, and at least 2.0 metres sidewalk and less than 50 km/h operating speed would need to meet the targets
- The bicycle LOS will not be met along the segment of Hazeldean Road
- The paved shoulder along Hazeldean Road provide a similar function as a curbside bike lane, and no improvements are required for bicycle

TDM

- Supportive TDM measures to be included within the proposed development should include:
    - Display area walking, cycling, and transit maps with route schedules
    - Provide a multimodal travel option information package to new residents
    - Inclusion of a 1-year Presto card for first time new apartment rental, with a set time frame for this offer (e.g. 6-months) from the initial opening of the site
    - Unbundle parking cost from the purchase or rental cost

Background Conditions

- Due to the difference between the 2022 and the 2023 volumes on the network, approximately 130-230 vehicles during the AM peak and approximately 130-335 vehicles during the PM peak were added to the 2022 counts along Hazeldean Road on the eastbound and westbound movements for balancing the volumes for the future analysis
- The background growth rates included 0.50% in the peak directions along Hazeldean Road, and 2.50% in the peak direction and 0.25% in the off-peak direction along Carp Road
- The plan of subdivision at 6171 Hazeldean Road and site plan at 1174 Carp Road are the explicit developments considered in the background conditions
- The anticipated widening of Carp Road will improve operations at the intersections of Hazeldean Road at Carp Road and Carp Road at Echowoods Avenue/Kittiwake Drive

Transit

- Site traffic is anticipated to have negligible impact on transit movements throughout the study area. All intersections' transit LOS scores are similar between the background and total conditions

Network Intersection Design

- Generally, the network intersections are anticipated to operate similarly to the future background conditions
- The pedestrian LOS targets will not be met at the existing or future intersections within the study area, and cannot be met along the arterial roadways
- The bicycle LOS targets will not be met at the existing or future intersections within the study area except for the future intersection of Carp Road at Echowoods Avenue/Kittiwake Drive, and it is limited by the lack of dedicated facilities and improved left-turn configurations
- The transit LOS targets will not be met at the existing or future intersection of Carp Road at Stittsville Main Street
- The auto LOS targets will not be met at the future intersection of Hazeldean Road at Carp Road due to background growth with the existing threshold of LOS D
- Given the City is moving to a lower auto threshold, no improvements are required for auto
- The existing road network requires wide ranging pedestrian and cycling facilities to decrease the gap of the MMLOS results and the target thresholds for the study area intersections. The nature of these improvements are similar to the Carp Road Widening improvements and connections to other facilities. This scope of work is well beyond the proposed development responsibility and should be identified in the City's long range planning and ongoing missing links projects

15 Conclusion

It is recommended that, from a transportation perspective, the proposed development applications proceed.

Prepared By:

Yu-Chu Chen, EIT
Transportation Engineering-Intern

Reviewed By:

Andrew Harte, P.Eng.
Senior Transportation Engineer

Appendix A

TIA Screening Form and PM Certification Form

6 Plaza Court
Ottawa, ON K2H 7W1

City of Ottawa 2023 Revisions to 2017 TIA Guidelines
Step 1 - Screening Form

Date: 22-Sep-23
Project Number: 2023-114
Project Reference: 6310 Hazeldean Road

1.1 Description of Proposed Development	
Municipal Address	6310 Hazeldean Road
Description of Location	Ward 6. On the south side of Hazeldean Road between Carp Road and Kittiwake Drive/West Ridge Drive
Land Use Classification	Arterial Mainstreet Zone (AM9[2102])
Development Size	390 apartment units
Accesses	One existing access on Hazeldean Road
Phase of Development	Single
Buildout Year	2027
TIA Requirement	Full TIA Required

1.2 Trip Generation Trigger		
Land Use Type	Multi-Family (High-Rise)	
Development Size	390	Units
Trip Generation Trigger	Yes	

1.3 Location Triggers		
Does the development propose a new driveway to a boundary street that is designated as part of the Transit Priority Network, Rapid Transit network or Cross-Town Bikeways?	No	
Is the development in a Hub, a Protected Major Transit Station Area (PMTSA), or a Design Priority Area (DPA)?	Yes	Hazeldean Arterial Mainstreet design priority areas
Location Trigger	Yes	

1.4. Safety Triggers	
Are posted speed limits on a boundary street 80 km/hr or greater?	No
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?	No
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)?	Yes
Is the proposed driveway within auxiliary lanes of an intersection?	No
Does the proposed driveway make use of an existing median break that serves an existing site?	No
Is there is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?	No
Does the development include a drive-thru facility?	No
Safety Trigger	Yes

Certification Form for TIA Study PM

TIA Plan Reports

On April 14, 2022, the Province's Bill 109 received Royal Assent providing legislative direction to implement the More Homes for Everyone Act, 2022 aiming to increase the supply of a range of housing options to make housing more affordable. Revisions have been made to the TIA guidelines to comply with Bill 109 and streamline the process for applicants and staff.

Individuals submitting TIA reports will be responsible for all aspects of development-related transportation assessment and reporting, and undertaking such work, in accordance and compliance with the City of Ottawa's Official Plan, the Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines.

By submitting the attached TIA report (and any associated documents) and signing this document, the individual acknowledges that they meet the four criteria listed below.

CERTIFICATION

- ☑ I have reviewed and have a sound understanding of the objectives, needs and requirements of the City of Ottawa's Official Plan, Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines; (Update effective July 2023)
- ☑ I have a sound knowledge of industry standard practice with respect to the preparation of transportation impact assessment reports, including multi modal level of service review;
- ☑ I have substantial experience (more than 5 years) in undertaking and delivering transportation impact studies (analysis, reporting and geometric design) with strong background knowledge in transportation planning, engineering or traffic operations; and
- ☑ I am either a licensed or registered[1] professional in good standing, whose field of expertise
  - ☑ is either transportation engineering
  - ☐ or transportation planning.

[1] License of registration body that oversees the profession is required to have a code of conduct and ethics guidelines that will ensure appropriate conduct and representation for transportation planning and/or transportation engineering works.

City Of Ottawa
Planning, Real Estate and Economic Development
110 Laurier Avenue West, 4th fl.
Ottawa, ON
K1P 1J1
Tel. : 613-580-2424
Fax: 613-560-6006

Revision Date: June 2023

Dated at Ottawa (City) this 17 day of August , 20 23 .

Name : Andrew Harte

Professional title: Senior Transportation Engineer / Vice-President Ottawa

Signature of individual certifier that s/he/they meet the above criteria

Office Contact Information (Please Print)
Address: 6 Plaza Court
City / Postal Code: Ottawa, K2H 7W1
Telephone / Extension: 613-697-3797
Email Address: andrew.harte@cghtransportation.com

Stamp

LICENSED PROFESSIONAL ENGINEER
A. J. HARTE
100149314
PROVINCE OF ONTARIO

Revision Date: June 2023

Appendix B

Turning Movement Counts

Transportation Services - Traffic Services

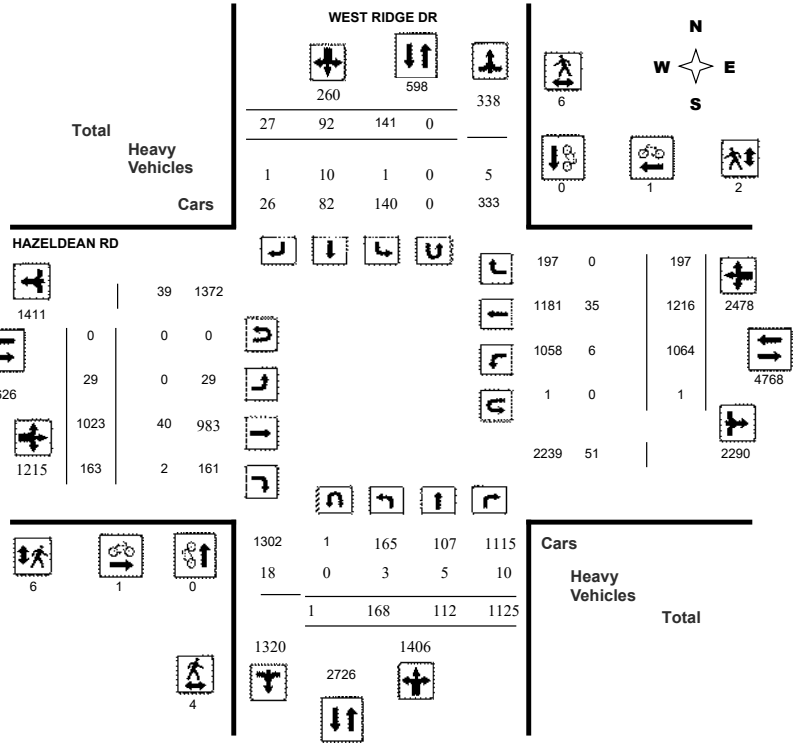
Turning Movement Count - Study Results

HAZELDEAN RD @ WEST RIDGE DR

Survey Date: Tuesday, January 11, 2022 **WO No:** 40027

Start Time: 07:00 **Device:** Miovision

Full Study Diagram



Transportation Services - Traffic Services

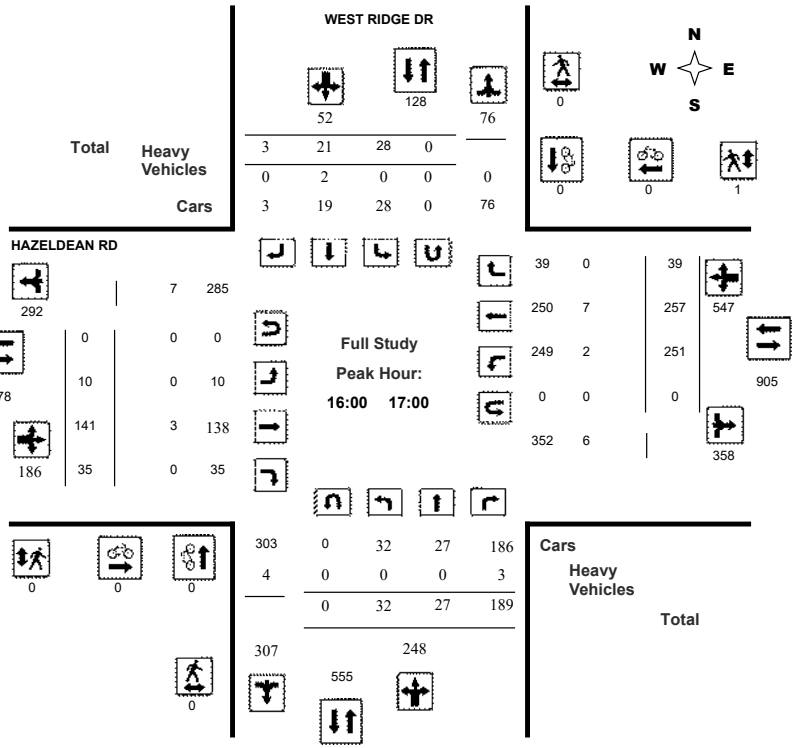
Turning Movement Count - Study Results

HAZELDEAN RD @ WEST RIDGE DR

Survey Date: Tuesday, January 11, 2022 **WO No:** 40027

Start Time: 07:00 **Device:** Miovision

Full Study Peak Hour Diagram



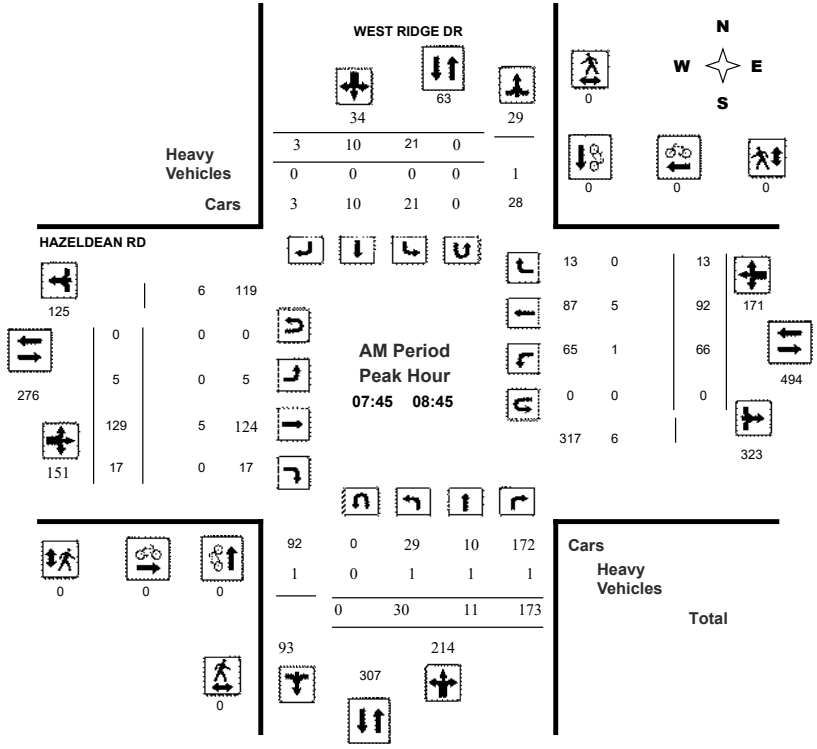
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

HAZELDEAN RD @ WEST RIDGE DR

Survey Date: Tuesday, January 11, 2022 **WO No:** 40027

Start Time: 07:00 **Device:** Miovision



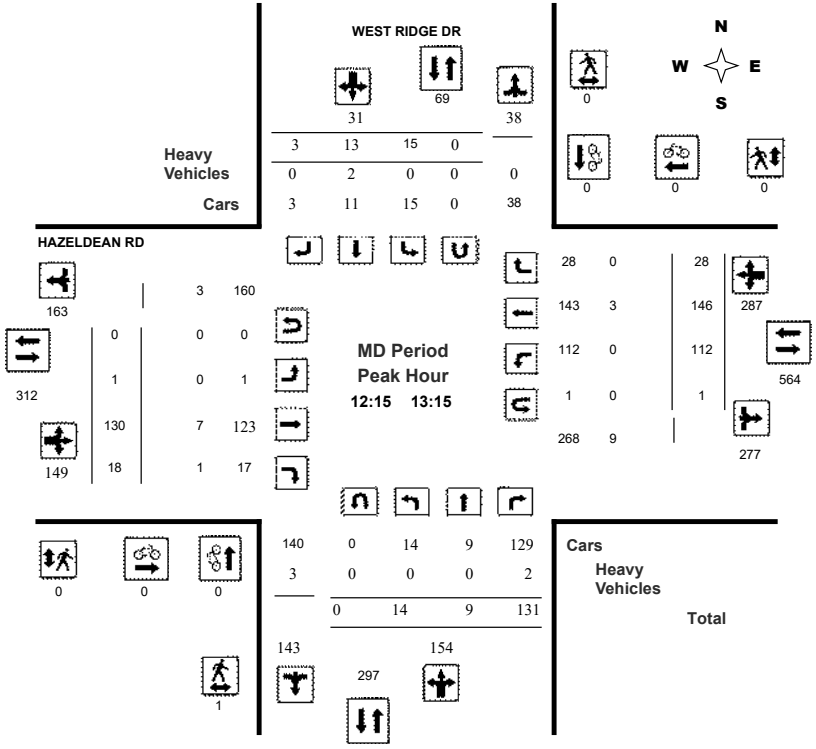
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

HAZELDEAN RD @ WEST RIDGE DR

Survey Date: Tuesday, January 11, 2022 **WO No:** 40027

Start Time: 07:00 **Device:** Miovision



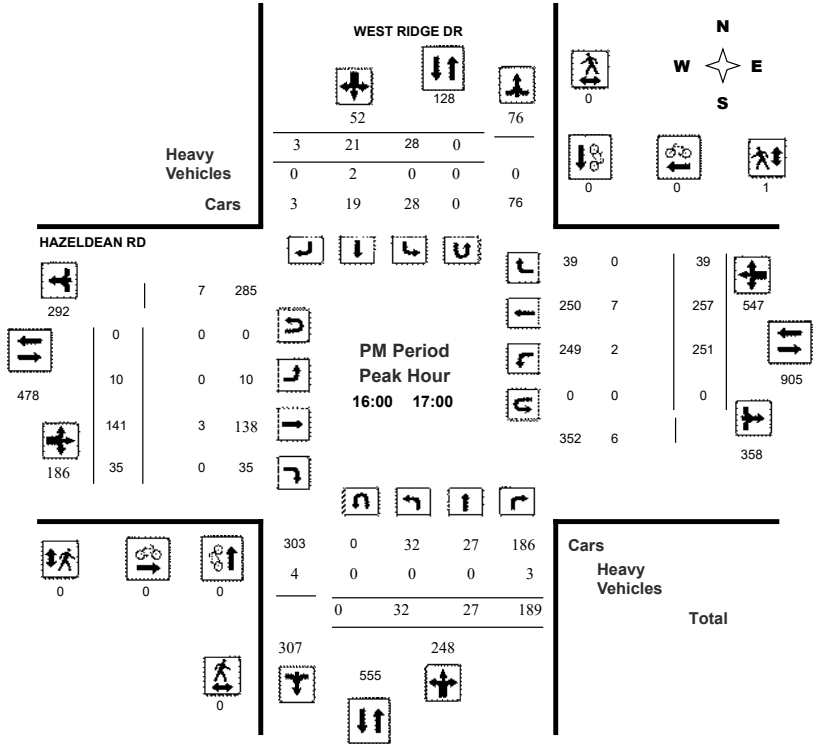
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

HAZELDEAN RD @ WEST RIDGE DR

Survey Date: Tuesday, January 11, 2022 **WO No:** 40027

Start Time: 07:00 **Device:** Miovision



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

HAZELDEAN RD @ WEST RIDGE DR

Survey Date: Tuesday, January 11, 2022 **WO No:** 40027

Start Time: 07:00 **Device:** Miovision

Full Study Summary (8 HR Standard)

Survey Date: Tuesday, January 11, 2022

Total Observed U-Turns

Northbound: 1 Southbound: 0

Eastbound: 0 Westbound: 1

AADT Factor 1.10

	WEST RIDGE DR								HAZELDEAN RD									
	Northbound				Southbound				Eastbound				Westbound					
Period	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	33	12	142	**187**	10	5	5	**20**	**207**	2	139	10	**151**	32	73	3	**108**	**259**	**466**
08:00 09:00	22	9	170	**201**	21	11	3	**35**	**236**	4	123	21	**148**	76	91	18	**185**	**333**	**569**
09:00 10:00	23	5	132	**160**	7	4	3	**14**	**174**	0	115	13	**128**	85	93	21	**199**	**327**	**501**
11:30 12:30	12	10	117	**139**	18	9	4	**31**	**170**	2	136	7	**145**	110	139	14	**263**	**408**	**578**
12:30 13:30	15	10	118	**143**	16	9	4	**29**	**172**	1	117	18	**136**	110	147	31	**288**	**424**	**596**
15:00 16:00	18	19	136	**173**	20	14	3	**37**	**210**	3	140	23	**166**	185	235	25	**445**	**611**	**821**
16:00 17:00	32	27	189	**248**	28	21	3	**52**	**300**	10	141	35	**186**	251	257	39	**547**	**733**	**1033**
17:00 18:00	13	20	121	**154**	21	19	2	**42**	**196**	7	112	36	**155**	215	181	46	**442**	**597**	**793**
Sub Total	168	112	1125	**1405**	141	92	27	**260**	**1665**	29	1023	163	**1215**	1064	1216	197	**2477**	**3692**	**5357**
U Turns				**1**				**0**	**1**				**0**				**1**	**1**	**2**
Total	168	112	1125	**1406**	141	92	27	**260**	**1666**	29	1023	163	**1215**	1064	1216	197	**2478**	**3693**	**5359**
EQ 12Hr	234	156	1564	**1954**	196	128	38	**361**	**2316**	40	1422	227	**1689**	1479	1690	274	**3444**	**5133**	**7449**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	257	172	1720	**2149**	216	184	54	**397**	**2548**	44	1564	250	**1858**	1627	1859	301	**3788**	**5646**	**8194**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**1.10**					
AVG 24Hr	337	225	2253	**2815**	283	241	71	**520**	**3338**	58	2049	328	**2434**	2131	2435	394	**4962**	**7396**	**10734**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														**1.31**					

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

Transportation Services - Traffic Services

Turning Movement Count - Study Results

HAZELDEAN RD @ WEST RIDGE DR

Survey Date: Tuesday, January 11, 2022 **WO No:** 40027

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute Increments

		WEST RIDGE DR									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	8	1	28	37	2	0	1	3	40	1	29	3	33	4	15	0	19	52	92
07:15	07:30	9	1	30	40	2	1	2	5	45	0	33	2	35	9	21	0	30	65	110
07:30	07:45	6	5	39	50	3	0	2	5	55	0	43	4	47	8	17	2	27	74	129
07:45	08:00	10	5	45	60	3	4	0	7	67	1	34	1	36	11	20	1	32	68	135
08:00	08:15	5	3	54	62	3	2	2	7	69	1	25	1	27	19	24	3	46	73	142
08:15	08:30	8	2	40	50	5	3	0	8	58	1	33	6	40	18	20	3	41	81	139
08:30	08:45	7	1	34	42	10	1	1	12	54	2	37	9	48	18	28	6	52	100	154
08:45	09:00	2	3	42	47	3	5	0	8	55	0	28	5	33	21	19	6	46	79	134
09:00	09:15	8	1	37	47	1	1	1	3	50	0	31	4	35	23	25	4	52	87	137
09:15	09:30	6	0	29	35	5	1	1	7	42	0	32	2	34	22	29	4	55	89	131
09:30	09:45	3	2	34	39	0	1	1	2	41	0	21	3	24	24	15	4	43	67	108
09:45	10:00	6	2	32	40	1	1	0	2	42	0	31	4	35	16	24	9	49	84	126
11:30	11:45	5	3	24	32	4	2	2	8	40	2	33	2	37	18	37	2	57	94	134
11:45	12:00	0	3	28	31	7	0	1	8	39	0	33	1	34	27	32	6	65	99	138
12:00	12:15	4	2	31	37	3	2	1	6	43	0	36	2	38	33	31	2	66	104	147
12:15	12:30	3	2	34	39	4	5	0	9	48	0	34	2	36	32	39	4	75	111	159
12:30	12:45	1	2	30	33	2	2	0	4	37	1	30	4	35	29	32	9	71	106	143
12:45	13:00	6	1	34	41	3	2	2	7	48	0	26	6	32	31	37	6	74	106	154
13:00	13:15	4	4	33	41	6	4	1	11	52	0	40	6	46	20	38	9	67	113	165
13:15	13:30	4	3	21	28	5	1	1	7	35	0	21	2	23	30	40	7	77	100	135
15:00	15:15	8	7	29	44	5	2	1	8	52	1	22	8	31	45	48	3	96	127	179
15:15	15:30	1	3	32	36	5	2	0	7	43	1	40	2	43	44	61	6	111	154	197
15:30	15:45	3	2	42	47	9	4	1	14	61	0	41	10	51	39	71	7	117	168	229
15:45	16:00	6	7	33	46	1	6	1	8	54	1	37	3	41	57	55	9	121	162	216
16:00	16:15	9	9	57	75	7	7	0	14	89	3	33	9	45	59	66	10	135	180	269
16:15	16:30	7	7	43	57	4	3	2	9	66	2	47	8	57	64	57	6	127	184	250
16:30	16:45	10	5	51	66	10	6	1	17	83	2	33	7	42	72	79	11	162	204	287
16:45	17:00	6	6	38	50	7	5	0	12	62	3	28	11	42	56	55	12	123	165	227
17:00	17:15	2	6	31	39	5	9	0	14	53	5	33	12	50	62	69	10	141	191	244
17:15	17:30	6	5	42	53	5	3	1	9	62	0	34	10	44	68	48	14	130	174	236
17:30	17:45	4	5	19	28	6	5	1	12	40	1	26	8	35	47	37	12	96	131	171
17:45	18:00	1	4	29	34	5	2	0	7	41	1	19	6	26	38	27	10	75	101	142
Total:		168	112	1125	1406	141	92	27	260	1666	29	1023	163	1215	1064	1216	197	2478	3693	5,359

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

HAZELDEAN RD @ WEST RIDGE DR

Survey Date: Tuesday, January 11, 2022 **WO No:** 40027

Start Time: 07:00 **Device:** Miovision

Full Study Cyclist Volume

		WEST RIDGE DR			HAZELDEAN RD			
Time Period		Northbound	Southbound	Street Total	Eastbound	Westbound	Street 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	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	1	0	1	1
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	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	1	1	1
17:45	18:00	0	0	0	0	0	0	0
Total		0	0	**0**	1	1	2	2

Transportation Services - Traffic Services

Turning Movement Count - Study Results

HAZELDEAN RD @ WEST RIDGE DR

Survey Date: Tuesday, January 11, 2022 **WO No:** 40027

Start Time: 07:00 **Device:** Miovision

Full Study Pedestrian Volume

		WEST RIDGE DR			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	2	0	**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**	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	2	**2**	2	0	**2**	**4**
12:00	12:15	0	2	**2**	2	0	**2**	**4**
12:15	12:30	0	0	**0**	0	0	**0**	**0**
12:30	12:45	1	0	**1**	0	0	**0**	**1**
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	2	**2**	2	0	**2**	**4**
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	1	**1**	**1**
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	1	0	**1**	0	1	**1**	**2**
17:30	17:45	0	0	**0**	0	0	**0**	**0**
17:45	18:00	0	0	**0**	0	0	**0**	**0**
Total	.....	4	6	**10**	6	2	**8**	**18**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

HAZELDEAN RD @ WEST RIDGE DR

Survey Date: Tuesday, January 11, 2022 **WO No:** 40027

Start Time: 07:00 **Device:** Miovision

Full Study Heavy Vehicles

		WEST RIDGE DR								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	0	1	0	**2**	0	0	0	**1**	**3**	0	0	1	**2**	0	1	0	**1**	**3**	**3**
07:15	07:30	1	0	0	**1**	0	0	0	**0**	**1**	0	1	0	**4**	0	2	0	**3**	**7**	**4**
07:30	07:45	0	1	0	**1**	0	0	0	**1**	**2**	0	2	0	**3**	0	1	0	**3**	**6**	**4**
07:45	08:00	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**2**	0	2	0	**2**	**4**	**2**
08:00	08:15	0	1	0	**2**	0	0	0	**1**	**3**	0	1	0	**1**	1	0	0	**2**	**3**	**3**
08:15	08:30	1	0	1	**2**	0	0	0	**0**	**2**	0	1	0	**2**	0	0	0	**2**	**4**	**3**
08:30	08:45	0	0	0	**0**	0	0	0	**0**	**0**	0	3	0	**6**	0	3	0	**6**	**12**	**6**
08:45	09:00	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**4**	0	2	0	**4**	**8**	**4**
09:00	09:15	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**6**	0	4	0	**6**	**12**	**6**
09:15	09:30	0	0	1	**1**	0	0	0	**0**	**1**	0	1	0	**2**	0	1	0	**3**	**5**	**3**
09:30	09:45	0	0	0	**2**	0	0	0	**0**	**2**	0	1	0	**1**	2	0	0	**3**	**4**	**3**
09:45	10:00	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**2**	0	0	0	**2**	**4**	**2**
11:30	11:45	0	0	0	**1**	0	0	1	**1**	**2**	0	1	0	**5**	1	3	0	**5**	**10**	**6**
11:45	12:00	0	0	0	**0**	1	0	0	**1**	**1**	0	3	0	**3**	0	0	0	**4**	**7**	**4**
12:00	12:15	0	0	0	**1**	0	1	0	**1**	**2**	0	0	0	**0**	0	0	0	**0**	**0**	**1**
12:15	12:30	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	0	0	**1**	**2**	**1**
12:30	12:45	0	0	0	**1**	0	1	0	**1**	**2**	0	3	0	**4**	0	1	0	**4**	**8**	**5**
12:45	13:00	0	0	1	**2**	0	0	0	**0**	**2**	0	2	1	**4**	0	1	0	**4**	**8**	**5**
13:00	13:15	0	0	1	**2**	0	1	0	**1**	**3**	0	1	0	**2**	0	1	0	**3**	**5**	**4**
13:15	13:30	0	1	0	**1**	0	0	0	**1**	**2**	0	0	0	**2**	0	2	0	**2**	**4**	**3**
15:00	15:15	1	0	1	**3**	0	1	0	**1**	**4**	0	0	0	**2**	0	1	0	**2**	**4**	**4**
15:15	15:30	0	1	1	**2**	0	0	0	**1**	**3**	0	2	0	**2**	0	0	0	**3**	**5**	**4**
15:30	15:45	0	0	0	**1**	0	1	0	**1**	**2**	0	2	0	**3**	0	1	0	**3**	**6**	**4**
15:45	16:00	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**2**	0	1	0	**2**	**4**	**2**
16:00	16:15	0	0	1	**2**	0	1	0	**1**	**3**	0	0	0	**1**	0	1	0	**2**	**3**	**3**
16:15	16:30	0	0	1	**1**	0	0	0	**0**	**1**	0	1	0	**6**	0	5	0	**7**	**13**	**7**
16:30	16:45	0	0	1	**3**	0	1	0	**1**	**4**	0	0	0	**0**	1	0	0	**2**	**2**	**3**
16:45	17:00	0	0	0	**1**	0	0	0	**0**	**1**	0	2	0	**3**	1	1	0	**4**	**7**	**4**
17:00	17:15	0	0	0	**1**	0	1	0	**1**	**2**	0	1	0	**1**	0	0	0	**1**	**2**	**2**
17:15	17:30	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	0	0	**0**	**0**	**0**
17:30	17:45	0	0	1	**2**	0	1	0	**1**	**3**	0	1	0	**2**	0	1	0	**3**	**5**	**4**
17:45	18:00	0	0	0	**1**	0	1	0	**1**	**2**	0	3	0	**3**	0	0	0	**3**	**6**	**4**
Total:	None	3	5	10	**36**	1	10	1	**17**	**53**	0	40	2	**81**	6	35	0	**92**	**173**	**113**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

HAZELDEAN RD @ WEST RIDGE DR

Survey Date: Tuesday, January 11, 2022 **WO No:** 40027

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute U-Turn Total

Time Period		WEST RIDGE DR Northbound U-Turn Total	WEST RIDGE DR Southbound U-Turn Total	HAZELDEAN RD Eastbound U-Turn Total	HAZELDEAN RD 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	1	0	0	0	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	0	0	1	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	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	0	0	0
17:45	18:00	0	0	0	0	0
Total		1	0	0	1	2

Transportation Services - Traffic Services

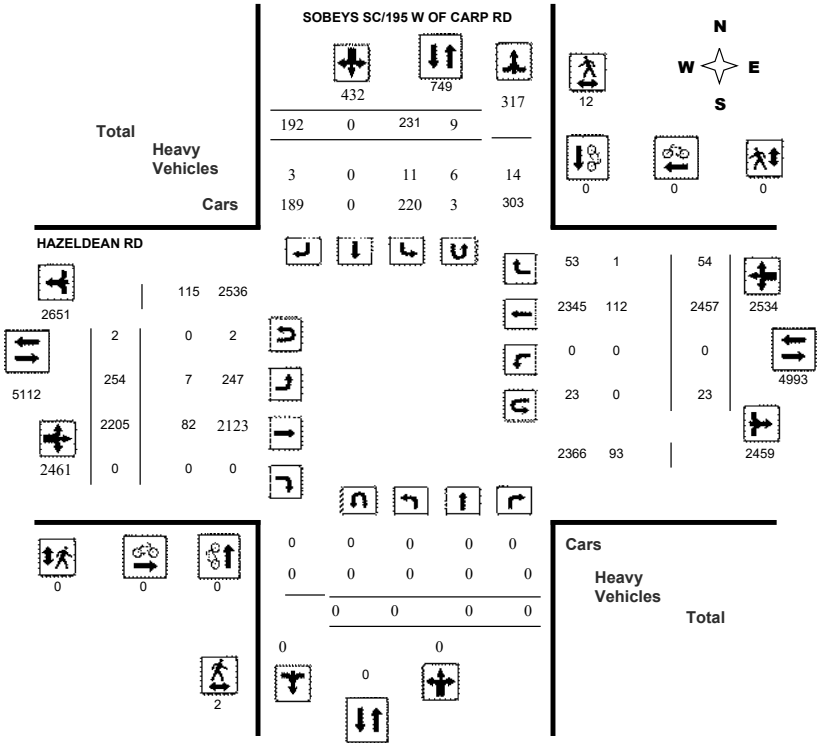
Turning Movement Count - Study Results

HAZELDEAN RD @ SOBEYS SC/195 W OF CARP RD

Survey Date: Wednesday, January 19, 2022 **WO No:** 40051

Start Time: 07:00 **Device:** Miovision

Full Study Diagram



Transportation Services - Traffic Services

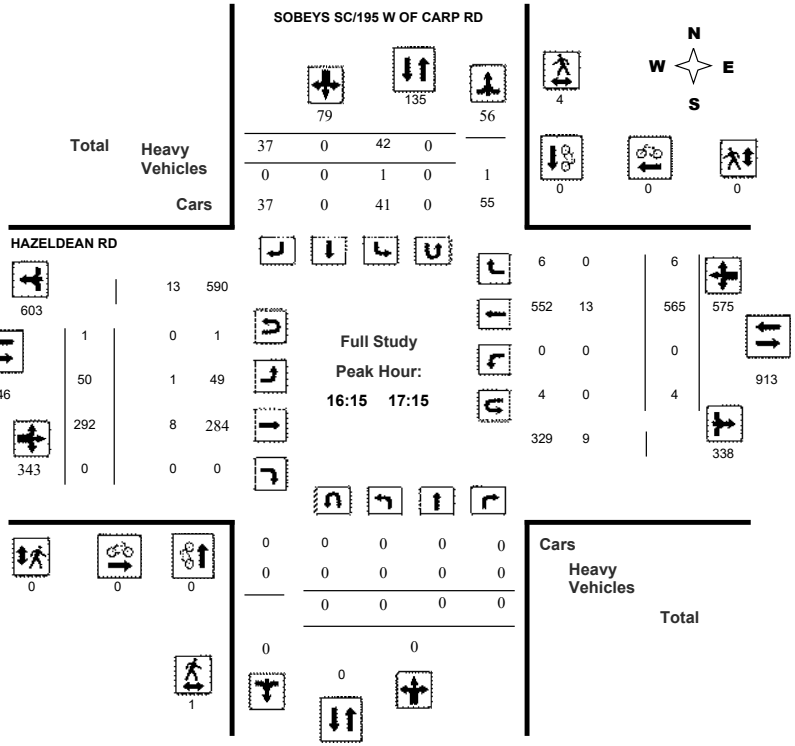
Turning Movement Count - Study Results

HAZELDEAN RD @ SOBEYS SC/195 W OF CARP RD

Survey Date: Wednesday, January 19, 2022 **WO No:** 40051

Start Time: 07:00 **Device:** Miovision

Full Study Peak Hour Diagram



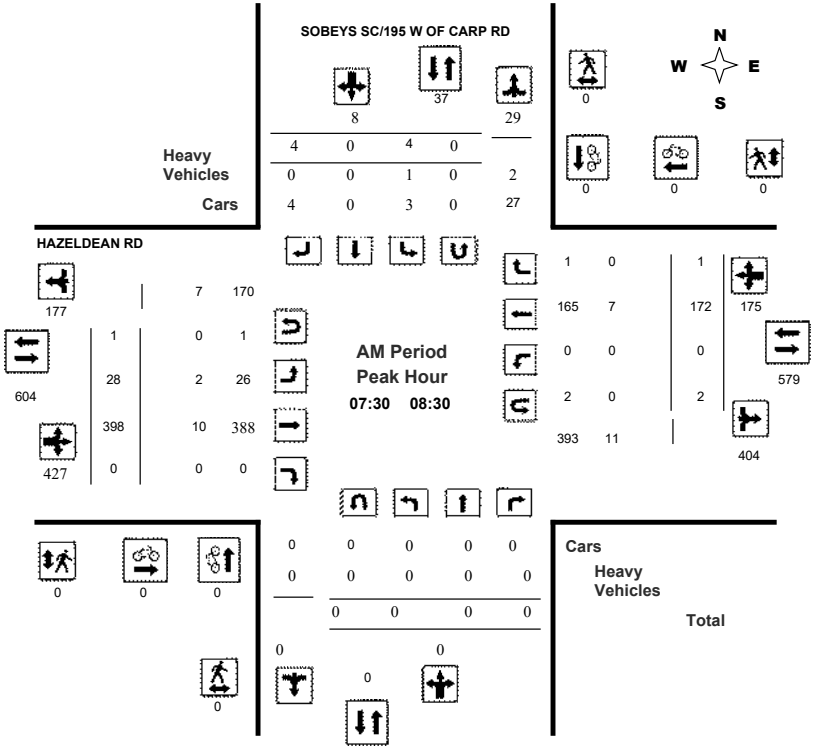
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

HAZELDEAN RD @ SOBEYS SC/195 W OF CARP RD

Survey Date: Wednesday, January 19, 2022 **WO No:** 40051

Start Time: 07:00 **Device:** Miovision



Comments

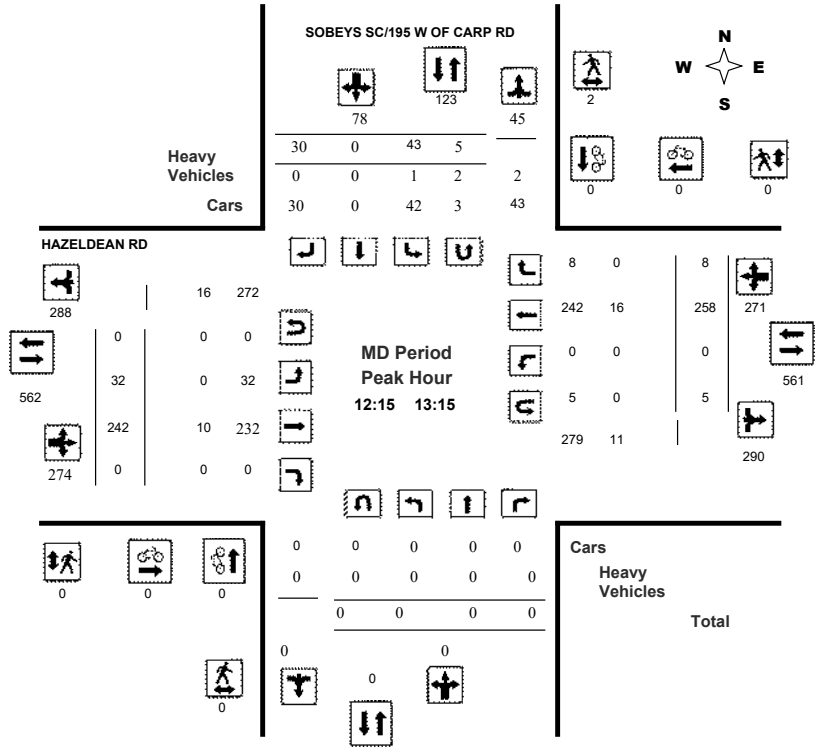
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

HAZELDEAN RD @ SOBEYS SC/195 W OF CARP RD

Survey Date: Wednesday, January 19, 2022 **WO No:** 40051

Start Time: 07:00 **Device:** Miovision



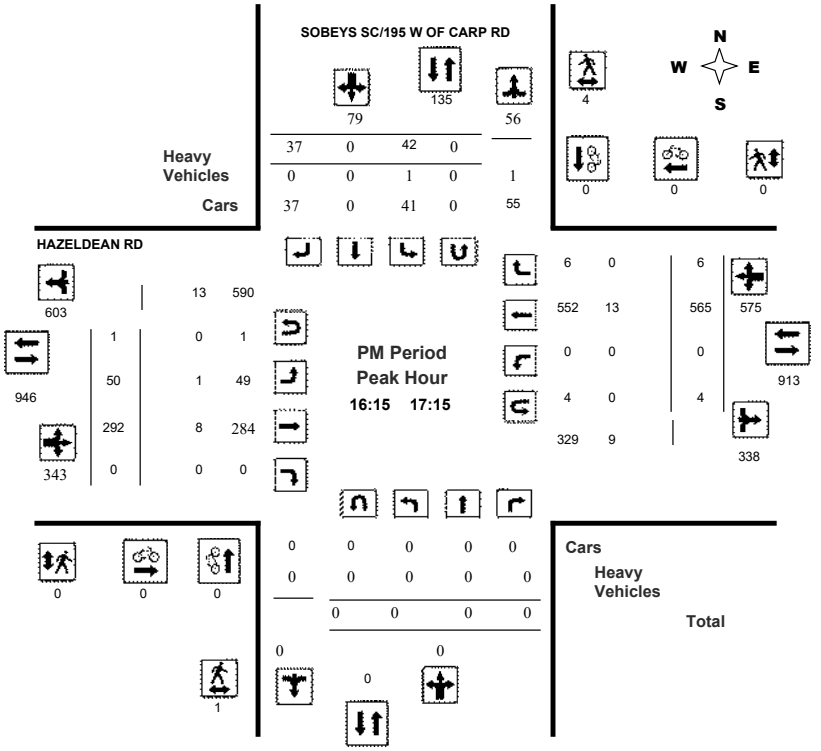
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

HAZELDEAN RD @ SOBEYS SC/195 W OF CARP RD

Survey Date: Wednesday, January 19, 2022 **WO No:** 40051

Start Time: 07:00 **Device:** Miovision



Transportation Services - Traffic Services

Turning Movement Count - Study Results

HAZELDEAN RD @ SOBEYS SC/195 W OF CARP RD

Survey Date: Wednesday, January 19, 2022 **WO No:** 40051

Start Time: 07:00 **Device:** Miovision

Full Study Summary (8 HR Standard)

Survey Date: Wednesday, January 19, 202

Total Observed U-Turns

Northbound: 0 Southbound: 9

Eastbound: 2 Westbound: 23

AADT Factor 1.00

	SOBEYS SC/195 W OF CARP RD								HAZELDEAN RD									
	Northbound				Southbound				Eastbound				Westbound					
Period	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	0	0	0	**0**	2	0	5	**7**	**7**	29	401	0	**430**	0	144	3	**147**	**577**	**584**
08:00 09:00	0	0	0	**0**	8	0	6	**14**	**14**	23	314	0	**337**	0	201	0	**201**	**538**	**552**
09:00 10:00	0	0	0	**0**	20	0	7	**27**	**27**	17	236	0	**253**	0	192	2	**194**	**447**	**474**
11:30 12:30	0	0	0	**0**	38	0	26	**64**	**64**	44	200	0	**244**	0	222	8	**230**	**474**	**538**
12:30 13:30	0	0	0	**0**	41	0	27	**68**	**68**	30	236	0	**266**	0	250	9	**259**	**525**	**593**
15:00 16:00	0	0	0	**0**	43	0	37	**80**	**80**	31	283	0	**314**	0	435	15	**450**	**764**	**844**
16:00 17:00	0	0	0	**0**	43	0	42	**85**	**85**	44	292	0	**336**	0	565	3	**568**	**904**	**989**
17:00 18:00	0	0	0	**0**	36	0	42	**78**	**78**	36	243	0	**279**	0	448	14	**462**	**741**	**819**
Sub Total	0	0	0	**0**	231	0	192	**423**	**423**	254	2205	0	**2459**	0	2457	54	**2511**	**4970**	**5393**
U Turns	0			**0**	9			**9**	**9**	**2**			**2**	23			**23**	**25**	**34**
Total	0	0	0	**0**	240	0	192	**432**	**432**	256	2205	0	**2461**	23	2457	54	**2534**	**4995**	**5427**
EQ 12Hr	0	0	0	**0**	334	0	267	**601**	**601**	356	3065	0	**3421**	32	3415	75	**3522**	**6943**	**7544**

Note: These values are calculated by multiplying the totals by the appropriate expansion factor. **1.39**

AVG 12Hr	0	0	0	**0**	334	0	267	**601**	**601**	356	3065	0	**3421**	32	3415	75	**3522**	**6943**	**7544**

Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor. **1.00**

AVG 24Hr	0	0	0	**0**	438	0	350	**788**	**788**	466	4015	0	**4481**	42	4474	98	**4614**	**9095**	**9883**

Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor. **1.31**

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

Transportation Services - Traffic Services

Turning Movement Count - Study Results

HAZELDEAN RD @ SOBEYS SC/195 W OF CARP RD

Survey Date: Wednesday, January 19, 2022 **WO No:** 40051

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute Increments

		SOBEYS SC/195 W OF 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	0	0	0	0	0	0	2	2	**2**	6	81	0	87	1	34	1	36	**123**	**125**
07:15	07:30	0	0	0	0	1	0	2	3	**3**	9	89	0	98	2	35	1	38	**136**	**139**
07:30	07:45	0	0	0	0	1	0	0	1	**1**	8	100	0	108	1	35	1	37	**145**	**146**
07:45	08:00	0	0	0	0	0	0	1	1	**1**	6	131	0	137	0	40	0	40	**177**	**178**
08:00	08:15	0	0	0	0	1	0	1	2	**2**	9	74	0	83	1	53	0	54	**137**	**139**
08:15	08:30	0	0	0	0	2	0	2	4	**4**	6	93	0	99	0	44	0	44	**143**	**147**
08:30	08:45	0	0	0	0	3	0	2	5	**5**	5	74	0	79	0	50	0	50	**129**	**134**
08:45	09:00	0	0	0	0	2	0	1	3	**3**	4	73	0	77	0	54	0	54	**131**	**134**
09:00	09:15	0	0	0	0	5	0	1	6	**6**	2	62	0	64	0	45	0	45	**109**	**115**
09:15	09:30	0	0	0	0	6	0	0	6	**6**	8	57	0	65	0	54	2	56	**121**	**127**
09:30	09:45	0	0	0	0	5	0	4	9	**9**	5	56	0	61	0	52	0	52	**113**	**122**
09:45	10:00	0	0	0	0	8	0	2	10	**10**	2	61	0	63	0	41	0	41	**104**	**114**
11:30	11:45	0	0	0	0	8	0	5	13	**13**	8	58	0	66	0	52	3	55	**121**	**134**
11:45	12:00	0	0	0	0	14	0	9	23	**23**	12	44	0	56	1	56	1	58	**114**	**137**
12:00	12:15	0	0	0	0	9	0	4	13	**13**	13	46	0	59	2	52	1	55	**114**	**127**
12:15	12:30	0	0	0	0	7	0	8	15	**15**	11	52	0	63	1	62	3	66	**129**	**144**
12:30	12:45	0	0	0	0	17	0	9	26	**26**	5	58	0	63	2	61	1	64	**127**	**153**
12:45	13:00	0	0	0	0	19	0	6	25	**25**	8	53	0	61	0	74	2	76	**137**	**162**
13:00	13:15	0	0	0	0	5	0	7	12	**12**	8	79	0	87	2	61	2	65	**152**	**164**
13:15	13:30	0	0	0	0	5	0	5	10	**10**	9	46	0	55	1	54	4	59	**114**	**124**
15:00	15:15	0	0	0	0	11	0	7	18	**18**	6	65	0	71	1	91	5	97	**168**	**186**
15:15	15:30	0	0	0	0	13	0	16	29	**29**	7	70	0	77	0	109	1	110	**187**	**216**
15:30	15:45	0	0	0	0	7	0	4	11	**11**	7	75	0	82	0	125	4	129	**211**	**222**
15:45	16:00	0	0	0	0	12	0	10	22	**22**	11	73	0	84	1	110	5	116	**200**	**222**
16:00	16:15	0	0	0	0	8	0	13	21	**21**	1	67	0	68	0	135	2	137	**205**	**226**
16:15	16:30	0	0	0	0	13	0	9	22	**22**	16	72	0	88	1	141	1	143	**231**	**253**
16:30	16:45	0	0	0	0	9	0	12	21	**21**	16	75	0	91	0	152	0	152	**243**	**264**
16:45	17:00	0	0	0	0	13	0	8	21	**21**	12	78	0	90	1	137	0	138	**228**	**249**
17:00	17:15	0	0	0	0	7	0	8	15	**15**	7	67	0	74	2	135	5	142	**216**	**231**
17:15	17:30	0	0	0	0	13	0	9	22	**22**	9	70	0	79	1	107	5	113	**192**	**214**
17:30	17:45	0	0	0	0	11	0	16	27	**27**	13	62	0	75	2	115	2	119	**194**	**221**
17:45	18:00	0	0	0	0	5	0	9	14	**14**	7	44	0	51	0	91	2	93	**144**	**158**
Total:		0	0	0	0	240	0	192	432	**432**	256	2205	0	2461	23	2457	54	2534	**432**	**5,427**

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

HAZELDEAN RD @ SOBEYS SC/195 W OF CARP RD

Survey Date: Wednesday, January 19, 2022 **WO No:** 40051

Start Time: 07:00 **Device:** Miovision

Full Study Cyclist Volume

Time Period		SOBEYS SC/195 W OF CARP RD			HAZELDEAN RD			
		Northbound	Southbound	Street Total	Eastbound	Westbound	Street 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	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**	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**
Total		0	0	**0**	0	0	**0**	**0**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

HAZELDEAN RD @ SOBEYS SC/195 W OF CARP RD

Survey Date: Wednesday, January 19, 2022 **WO No:** 40051

Start Time: 07:00 **Device:** Miovision

Full Study Pedestrian Volume

Time Period		SOBEYS SC/195 W OF CARP RD			HAZELDEAN RD			
		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	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	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**	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	2	**2**	0	0	**0**	**2**
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	1	2	**3**	0	0	**0**	**3**
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	1	**1**	0	0	**0**	**1**
16:15	16:30	0	1	**1**	0	0	**0**	**1**
16:30	16:45	0	1	**1**	0	0	**0**	**1**
16:45	17:00	1	1	**2**	0	0	**0**	**2**
17:00	17:15	0	1	**1**	0	0	**0**	**1**
17:15	17:30	0	0	**0**	0	0	**0**	**0**
17:30	17:45	0	2	**2**	0	0	**0**	**2**
17:45	18:00	0	0	**0**	0	0	**0**	**0**
Total	.....	2	12	**14**	0	0	**0**	**14**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

HAZELDEAN RD @ SOBEYS SC/195 W OF CARP RD

Survey Date: Wednesday, January 19, 2022 **WO No:** 40051

Start Time: 07:00 **Device:** Miovision

Full Study Heavy Vehicles

SOBEYS SC/195 W OF CARP RD **HAZELDEAN RD**

Time Period		Northbound				Southbound					Eastbound				Westbound					
		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	0	0	0	**0**	0	0	0	**0**	**0**	0	7	0	**7**	0	7	0	**7**	**14**	**14**
07:15	07:30	0	0	0	**0**	0	0	0	**0**	**0**	0	6	0	**6**	0	1	0	**1**	**7**	**7**
07:30	07:45	0	0	0	**0**	0	0	0	**0**	**0**	0	3	0	**3**	0	3	0	**3**	**6**	**6**
07:45	08:00	0	0	0	**0**	0	0	0	**0**	**0**	0	4	0	**4**	0	1	0	**1**	**5**	**5**
08:00	08:15	0	0	0	**0**	1	0	0	**1**	**1**	2	0	0	**2**	0	1	0	**1**	**3**	**4**
08:15	08:30	0	0	0	**0**	0	0	0	**0**	**0**	0	3	0	**3**	0	2	0	**2**	**5**	**5**
08:30	08:45	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	3	0	**3**	**3**	**3**
08:45	09:00	0	0	0	**0**	2	0	0	**2**	**2**	0	4	0	**4**	0	7	0	**7**	**11**	**13**
09:00	09:15	0	0	0	**0**	0	0	0	**0**	**0**	0	3	0	**3**	0	4	0	**4**	**7**	**7**
09:15	09:30	0	0	0	**0**	1	0	0	**1**	**1**	0	3	0	**3**	0	5	1	**6**	**9**	**12**
09:30	09:45	0	0	0	**0**	1	0	0	**1**	**1**	0	2	0	**2**	0	4	0	**4**	**6**	**9**
09:45	10:00	0	0	0	**0**	2	0	0	**2**	**2**	0	4	0	**4**	0	3	0	**3**	**7**	**9**
11:30	11:45	0	0	0	**0**	1	0	0	**1**	**1**	0	1	0	**1**	0	4	0	**4**	**5**	**6**
11:45	12:00	0	0	0	**0**	1	0	1	**2**	**2**	0	4	0	**4**	0	3	0	**3**	**7**	**9**
12:00	12:15	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	4	0	**4**	**5**	**5**
12:15	12:30	0	0	0	**0**	0	0	0	**0**	**0**	0	3	0	**3**	0	1	0	**1**	**4**	**4**
12:30	12:45	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	7	0	**7**	**7**	**9**
12:45	13:00	0	0	0	**0**	1	0	0	**1**	**1**	0	3	0	**3**	0	6	0	**6**	**9**	**10**
13:00	13:15	0	0	0	**0**	0	0	0	**0**	**0**	0	4	0	**4**	0	2	0	**2**	**6**	**6**
13:15	13:30	0	0	0	**0**	0	0	0	**0**	**0**	0	3	0	**3**	0	3	0	**3**	**6**	**6**
15:00	15:15	0	0	0	**0**	0	0	0	**0**	**0**	0	5	0	**5**	0	5	0	**5**	**10**	**10**
15:15	15:30	0	0	0	**0**	0	0	2	**2**	**2**	2	4	0	**6**	0	4	0	**4**	**10**	**12**
15:30	15:45	0	0	0	**0**	0	0	0	**0**	**0**	1	2	0	**3**	0	5	0	**5**	**8**	**8**
15:45	16:00	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	4	0	**4**	**5**	**5**
16:00	16:15	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	4	0	**4**	**5**	**5**
16:15	16:30	0	0	0	**0**	1	0	0	**1**	**1**	0	4	0	**4**	0	3	0	**3**	**7**	**8**
16:30	16:45	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**2**	0	3	0	**3**	**5**	**5**
16:45	17:00	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	6	0	**6**	**6**	**6**
17:00	17:15	0	0	0	**0**	0	0	0	**0**	**0**	1	2	0	**3**	0	1	0	**1**	**4**	**4**
17:15	17:30	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	3	0	**3**	**4**	**4**
17:30	17:45	0	0	0	**0**	0	0	0	**0**	**0**	1	2	0	**3**	0	2	0	**2**	**5**	**5**
17:45	18:00	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	1	0	**1**	**1**	**1**
Total:	None	0	0	0	**0**	11	0	3	**14**	**14**	7	82	0	**89**	0	112	1	**113**	**202**	**222**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

HAZELDEAN RD @ SOBEYS SC/195 W OF CARP RD

Survey Date: Wednesday, January 19, 2022 **WO No:** 40051

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute U-Turn Total

SOBEYS SC/195 W OF 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	1	**1**
07:15	07:30	0	0	0	2	**2**
07:30	07:45	0	0	0	1	**1**
07:45	08:00	0	0	0	0	**0**
08:00	08:15	0	0	1	1	**2**
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	2	0	0	**2**
09:30	09:45	0	2	0	0	**2**
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	1	**1**
12:00	12:15	0	0	0	2	**2**
12:15	12:30	0	0	0	1	**1**
12:30	12:45	0	5	0	2	**7**
12:45	13:00	0	0	0	0	**0**
13:00	13:15	0	0	0	2	**2**
13:15	13:30	0	0	0	1	**1**
15:00	15:15	0	0	0	1	**1**
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	1	**1**
16:00	16:15	0	0	0	0	**0**
16:15	16:30	0	0	0	1	**1**
16:30	16:45	0	0	1	0	**1**
16:45	17:00	0	0	0	1	**1**
17:00	17:15	0	0	0	2	**2**
17:15	17:30	0	0	0	1	**1**
17:30	17:45	0	0	0	2	**2**
17:45	18:00	0	0	0	0	**0**
Total		0	9	2	23	**34**

Transportation Services - Traffic Services

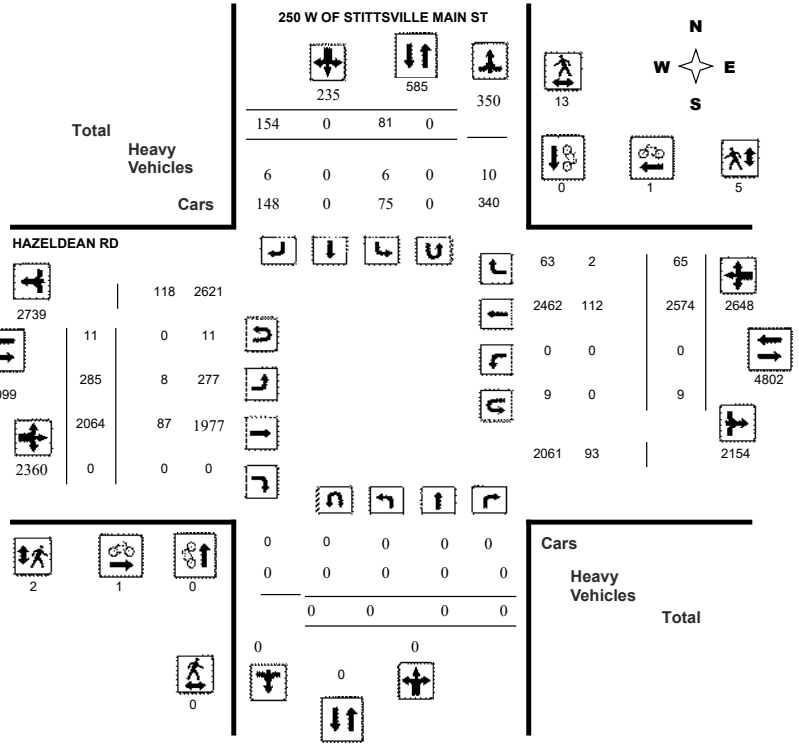
Turning Movement Count - Study Results

250 W OF STITTSVILLE MAIN ST @ HAZELDEAN RD

Survey Date: Tuesday, January 11, 2022 **WO No:** 40033

Start Time: 07:00 **Device:** Miovision

Full Study Diagram



Transportation Services - Traffic Services

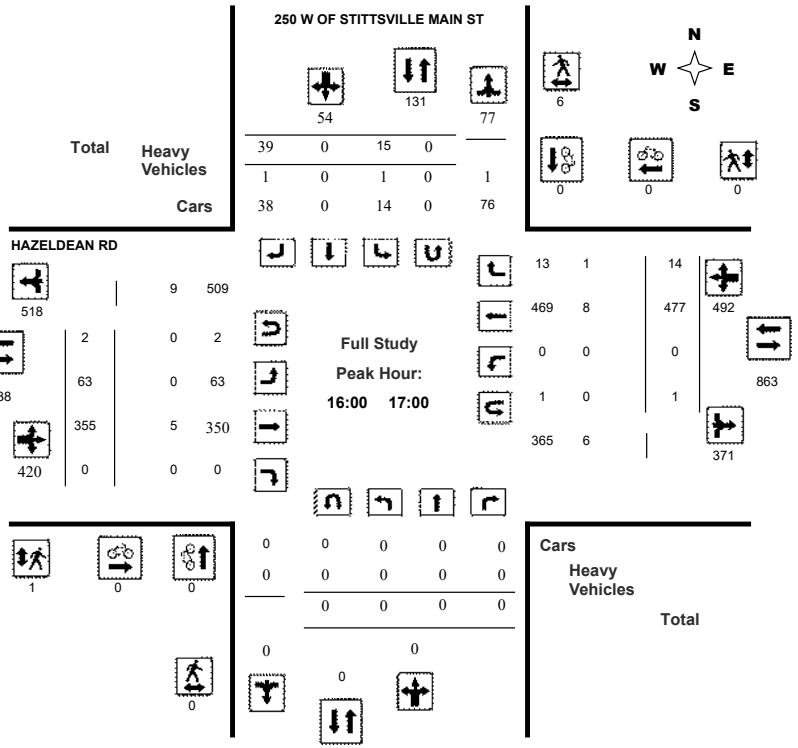
Turning Movement Count - Study Results

250 W OF STITTSVILLE MAIN ST @ HAZELDEAN RD

Survey Date: Tuesday, January 11, 2022 **WO No:** 40033

Start Time: 07:00 **Device:** Miovision

Full Study Peak Hour Diagram



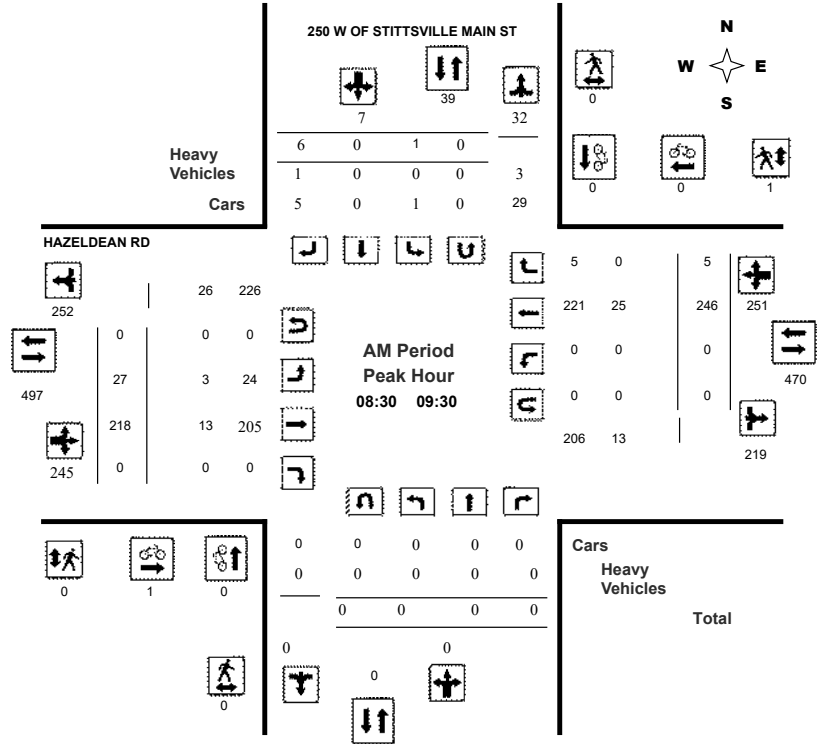
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

250 W OF STITTSVILLE MAIN ST @ HAZELDEAN RD

Survey Date: Tuesday, January 11, 2022 **WO No:** 40033

Start Time: 07:00 **Device:** Miovision



Comments

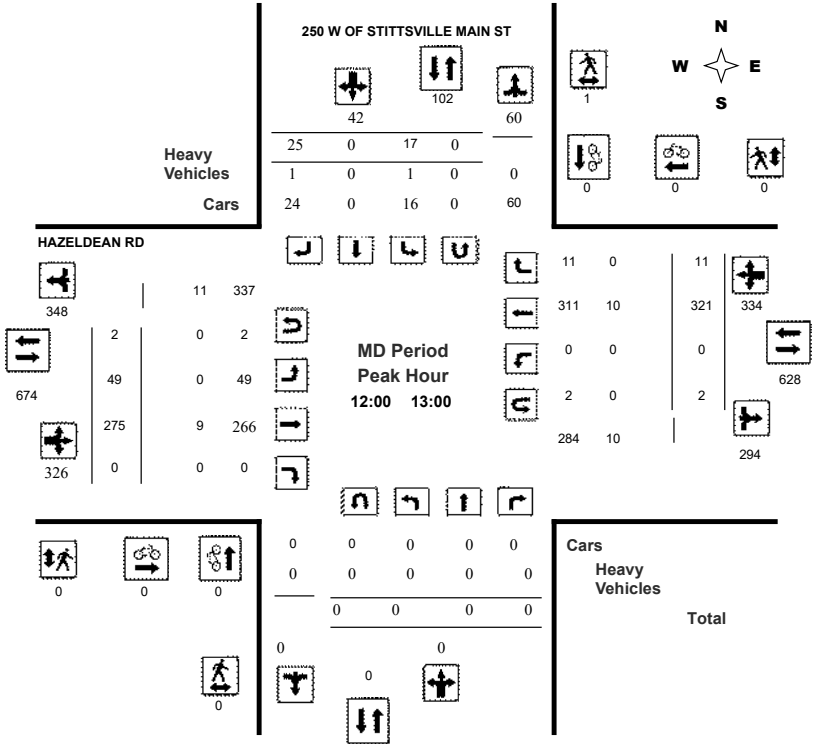
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

250 W OF STITTSVILLE MAIN ST @ HAZELDEAN RD

Survey Date: Tuesday, January 11, 2022 **WO No:** 40033

Start Time: 07:00 **Device:** Miovision



Comments

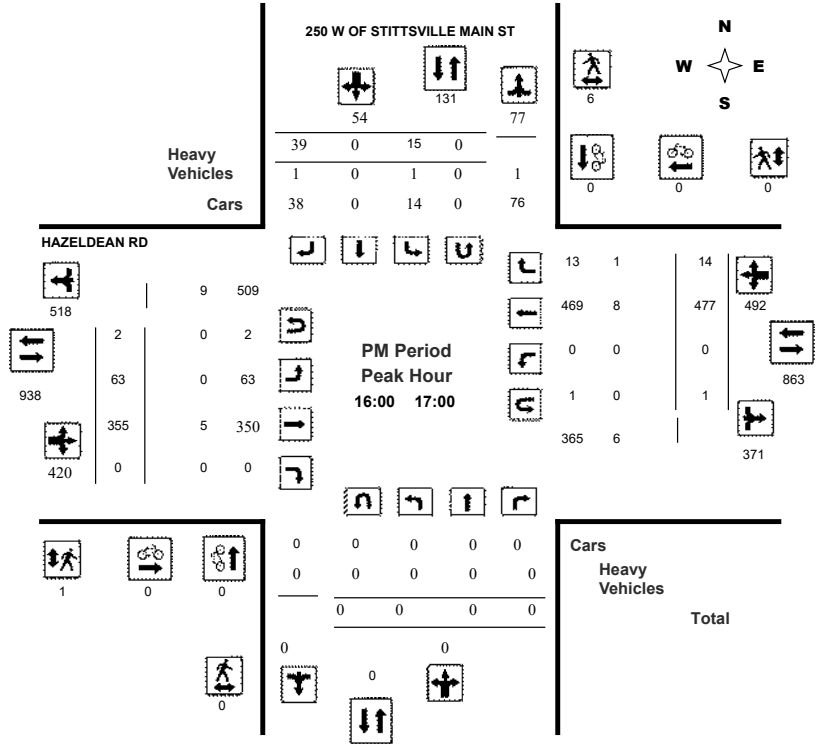
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

250 W OF STITTSVILLE MAIN ST @ HAZELDEAN RD

Survey Date: Tuesday, January 11, 2022 **WO No:** 40033

Start Time: 07:00 **Device:** Miovision



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

250 W OF STITTSVILLE MAIN ST @ HAZELDEAN RD

Survey Date: Tuesday, January 11, 2022 **WO No:** 40033

Start Time: 07:00 **Device:** Miovision

Full Study Summary (8 HR Standard)

Survey Date: Tuesday, January 11, 2022

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 11 Westbound: 9

AADT Factor 1.10

	250 W OF STITTSVILLE MAIN ST								HAZELDEAN RD									
	Northbound				Southbound				Eastbound				Westbound					
Period	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	0	0	0	**0**	1	0	3	**4**	**4**	9	191	0	**200**	0	176	1	**177**	**377**	**381**
08:00 09:00	0	0	0	**0**	3	0	4	**7**	**7**	19	218	0	**237**	0	239	5	**244**	**481**	**488**
09:00 10:00	0	0	0	**0**	2	0	10	**12**	**12**	25	216	0	**241**	0	249	0	**249**	**490**	**502**
11:30 12:30	0	0	0	**0**	13	0	20	**33**	**33**	41	279	0	**320**	0	314	10	**324**	**644**	**677**
12:30 13:30	0	0	0	**0**	15	0	20	**35**	**35**	47	250	0	**297**	0	314	13	**327**	**624**	**659**
15:00 16:00	0	0	0	**0**	20	0	29	**49**	**49**	39	280	0	**319**	0	427	12	**439**	**758**	**807**
16:00 17:00	0	0	0	**0**	15	0	39	**54**	**54**	63	355	0	**418**	0	477	14	**491**	**909**	**963**
17:00 18:00	0	0	0	**0**	12	0	29	**41**	**41**	42	275	0	**317**	0	378	10	**388**	**705**	**746**
Sub Total	0	0	0	**0**	81	0	154	**235**	**235**	285	2064	0	**2349**	0	2574	65	**2639**	**4988**	**5223**
U Turns				**0**				**0**	**0**				**11**				**9**	**20**	**20**
Total	0	0	0	**0**	81	0	154	**235**	**235**	285	2064	0	**2360**	0	2574	65	**2648**	**5008**	**5243**
EQ 12Hr	0	0	0	**0**	113	0	214	**327**	**327**	396	2869	0	**3280**	0	3578	90	**3681**	**6961**	**7288**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.																	**1.39**		
AVG 12Hr	0	0	0	**0**	124	0	308	**360**	**360**	436	3156	0	**3608**	0	3936	99	**4049**	**7657**	**8017**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.																	**1.10**		
AVG 24Hr	0	0	0	**0**	162	0	403	**472**	**472**	571	4134	0	**4726**	0	5156	130	**5304**	**10031**	**10502**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.																	**1.31**		

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

Transportation Services - Traffic Services

Turning Movement Count - Study Results

250 W OF STITTSVILLE MAIN ST @ HAZELDEAN RD

Survey Date: Tuesday, January 11, 2022 **WO No:** 40033

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute Increments

		250 W OF 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	0	0	0	0	0	0	0	0	0	1	39	0	41	0	35	0	35	76	76
07:15	07:30	0	0	0	0	1	0	1	2	2	4	39	0	43	0	42	0	42	85	87
07:30	07:45	0	0	0	0	0	0	2	2	2	2	53	0	55	0	38	0	38	93	95
07:45	08:00	0	0	0	0	0	0	0	0	0	2	60	0	63	0	61	1	62	125	125
08:00	08:15	0	0	0	0	2	0	0	2	2	2	54	0	56	0	56	0	56	112	114
08:15	08:30	0	0	0	0	0	0	1	1	1	4	58	0	62	0	56	0	57	119	120
08:30	08:45	0	0	0	0	0	0	2	2	2	10	58	0	68	0	64	2	66	134	136
08:45	09:00	0	0	0	0	1	0	1	2	2	3	48	0	51	0	63	3	66	117	119
09:00	09:15	0	0	0	0	0	0	0	0	0	3	65	0	68	0	58	0	58	126	126
09:15	09:30	0	0	0	0	0	0	3	3	3	11	47	0	58	0	61	0	61	119	122
09:30	09:45	0	0	0	0	0	0	4	4	4	4	48	0	52	0	63	0	63	115	119
09:45	10:00	0	0	0	0	2	0	3	5	5	7	56	0	63	0	67	0	67	130	135
11:30	11:45	0	0	0	0	2	0	4	6	6	9	75	0	84	0	70	3	73	157	163
11:45	12:00	0	0	0	0	2	0	3	5	5	9	57	0	67	0	82	2	84	151	156
12:00	12:15	0	0	0	0	5	0	9	14	14	15	72	0	87	0	85	3	88	175	189
12:15	12:30	0	0	0	0	4	0	4	8	8	8	75	0	83	0	77	2	80	163	171
12:30	12:45	0	0	0	0	6	0	6	12	12	11	62	0	75	0	81	5	87	162	174
12:45	13:00	0	0	0	0	2	0	6	8	8	15	66	0	81	0	78	1	79	160	168
13:00	13:15	0	0	0	0	2	0	4	6	6	14	70	0	84	0	78	6	84	168	174
13:15	13:30	0	0	0	0	5	0	4	9	9	7	52	0	61	0	77	1	79	140	149
15:00	15:15	0	0	0	0	4	0	6	10	10	12	58	0	70	0	101	3	104	174	184
15:15	15:30	0	0	0	0	5	0	7	12	12	8	56	0	64	0	113	5	119	183	195
15:30	15:45	0	0	0	0	7	0	9	16	16	12	95	0	108	0	109	1	110	218	234
15:45	16:00	0	0	0	0	4	0	7	11	11	7	71	0	79	0	104	3	109	188	199
16:00	16:15	0	0	0	0	4	0	7	11	11	18	95	0	113	0	143	3	146	259	270
16:15	16:30	0	0	0	0	5	0	9	14	14	18	76	0	95	0	105	1	106	201	215
16:30	16:45	0	0	0	0	2	0	15	17	17	14	98	0	113	0	128	7	135	248	265
16:45	17:00	0	0	0	0	4	0	8	12	12	13	86	0	99	0	101	3	105	204	216
17:00	17:15	0	0	0	0	4	0	11	15	15	10	72	0	82	0	112	2	114	196	211
17:15	17:30	0	0	0	0	3	0	9	12	12	16	80	0	96	0	106	2	108	204	216
17:30	17:45	0	0	0	0	1	0	4	5	5	12	75	0	87	0	94	3	98	185	190
17:45	18:00	0	0	0	0	4	0	5	9	9	4	48	0	52	0	66	3	69	121	130
Total:		0	0	0	0	81	0	154	235	235	285	2064	0	2360	0	2574	65	2648	5008	5,243

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

250 W OF STITTSVILLE MAIN ST @ HAZELDEAN RD

Survey Date: Tuesday, January 11, 2022 **WO No:** 40033

Start Time: 07:00 **Device:** Miovision

Full Study Cyclist Volume

		250 W OF STITTSVILLE MAIN ST			HAZELDEAN RD			
Time Period		Northbound	Southbound	Street Total	Eastbound	Westbound	Street 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	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	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	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	1	1	1
17:30	17:45	0	0	0	0	0	0	0
17:45	18:00	0	0	0	0	0	0	0
Total		0	0	**0**	1	1	2	2

Transportation Services - Traffic Services

Turning Movement Count - Study Results

250 W OF STITTSVILLE MAIN ST @ HAZELDEAN RD

Survey Date: Tuesday, January 11, 2022 **WO No:** 40033

Start Time: 07:00 **Device:** Miovision

Full Study Pedestrian Volume

250 W OF 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**	1	0	**1**	**1**
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	1	**1**	**1**
08:00 08:15	0	0	**0**	0	0	**0**	**0**
08:15 08:30	0	1	**1**	0	0	**0**	**1**
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	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	1	**1**	0	0	**0**	**1**
11:30 11:45	0	1	**1**	0	0	**0**	**1**
11:45 12:00	0	1	**1**	0	0	**0**	**1**
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	1	**1**	0	0	**0**	**1**
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	2	**2**	0	0	**0**	**2**
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	2	**2**	**2**
15:45 16:00	0	0	**0**	0	0	**0**	**0**
16:00 16:15	0	2	**2**	1	0	**1**	**3**
16:15 16:30	0	3	**3**	0	0	**0**	**3**
16:30 16:45	0	1	**1**	0	0	**0**	**1**
16:45 17:00	0	0	**0**	0	0	**0**	**0**
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**
Total	0	13	**13**	2	5	**7**	**20**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

250 W OF STITTSVILLE MAIN ST @ HAZELDEAN RD

Survey Date: Tuesday, January 11, 2022 **WO No:** 40033

Start Time: 07:00 **Device:** Miovision

Full Study Heavy Vehicles

250 W OF 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	0	0	0	**0**	0	0	0	**1**	**1**	1	2	0	**5**	0	2	0	**4**	**9**	**5**
07:15	07:30	0	0	0	**0**	1	0	1	**3**	**3**	1	5	0	**9**	0	2	0	**8**	**17**	**10**
07:30	07:45	0	0	0	**0**	0	0	0	**0**	**0**	0	3	0	**8**	0	5	0	**8**	**16**	**8**
07:45	08:00	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**9**	0	7	0	**9**	**18**	**9**
08:00	08:15	0	0	0	**0**	0	0	0	**0**	**0**	0	3	0	**6**	0	3	0	**6**	**12**	**6**
08:15	08:30	0	0	0	**0**	0	0	0	**0**	**0**	0	4	0	**6**	0	2	0	**6**	**12**	**6**
08:30	08:45	0	0	0	**0**	0	0	0	**1**	**1**	1	2	0	**10**	0	7	0	**9**	**19**	**10**
08:45	09:00	0	0	0	**0**	0	0	0	**1**	**1**	1	3	0	**9**	0	5	0	**8**	**17**	**9**
09:00	09:15	0	0	0	**0**	0	0	0	**0**	**0**	0	6	0	**11**	0	5	0	**11**	**22**	**11**
09:15	09:30	0	0	0	**0**	0	0	1	**2**	**2**	1	2	0	**12**	0	8	0	**10**	**22**	**12**
09:30	09:45	0	0	0	**0**	0	0	0	**1**	**1**	1	2	0	**7**	0	4	0	**6**	**13**	**7**
09:45	10:00	0	0	0	**0**	0	0	0	**0**	**0**	0	3	0	**12**	0	9	0	**12**	**24**	**12**
11:30	11:45	0	0	0	**0**	0	0	0	**0**	**0**	0	5	0	**6**	0	1	0	**6**	**12**	**6**
11:45	12:00	0	0	0	**0**	1	0	0	**3**	**3**	2	2	0	**11**	0	7	0	**10**	**21**	**12**
12:00	12:15	0	0	0	**0**	1	0	1	**2**	**2**	0	3	0	**6**	0	2	0	**6**	**12**	**7**
12:15	12:30	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**5**	0	3	0	**5**	**10**	**5**
12:30	12:45	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**4**	0	3	0	**4**	**8**	**4**
12:45	13:00	0	0	0	**0**	0	0	0	**0**	**0**	0	3	0	**5**	0	2	0	**5**	**10**	**5**
13:00	13:15	0	0	0	**0**	0	0	1	**1**	**1**	0	7	0	**13**	0	5	0	**12**	**25**	**13**
13:15	13:30	0	0	0	**0**	1	0	1	**2**	**2**	0	1	0	**7**	0	5	0	**7**	**14**	**8**
15:00	15:15	0	0	0	**0**	1	0	0	**1**	**1**	0	5	0	**7**	0	2	0	**8**	**15**	**8**
15:15	15:30	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**3**	0	1	0	**3**	**6**	**3**
15:30	15:45	0	0	0	**0**	0	0	0	**0**	**0**	0	7	0	**12**	0	5	0	**12**	**24**	**12**
15:45	16:00	0	0	0	**0**	0	0	0	**1**	**1**	0	2	0	**5**	0	3	1	**6**	**11**	**6**
16:00	16:15	0	0	0	**0**	0	0	1	**1**	**1**	0	1	0	**5**	0	3	0	**4**	**9**	**5**
16:15	16:30	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**3**	0	2	0	**3**	**6**	**3**
16:30	16:45	0	0	0	**0**	0	0	0	**1**	**1**	0	0	0	**2**	0	2	1	**3**	**5**	**3**
16:45	17:00	0	0	0	**0**	1	0	0	**1**	**1**	0	3	0	**4**	0	1	0	**5**	**9**	**5**
17:00	17:15	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**2**	0	1	0	**2**	**4**	**2**
17:15	17:30	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	0	0	**0**	**0**	**0**
17:30	17:45	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**6**	0	4	0	**6**	**12**	**6**
17:45	18:00	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**3**	0	1	0	**3**	**6**	**3**
Total:	None	0	0	0	**0**	6	0	6	**22**	**22**	8	87	0	**213**	0	112	2	**207**	**420**	**221**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

250 W OF STITTSVILLE MAIN ST @ HAZELDEAN RD

Survey Date: Tuesday, January 11, 2022 **WO No:** 40033

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute U-Turn Total

		250 W OF 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	1	0	1
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	0	0	0
07:45	08:00	0	0	1	0	1
08:00	08:15	0	0	0	0	0
08:15	08:30	0	0	0	1	1
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	1	0	1
12:00	12:15	0	0	0	0	0
12:15	12:30	0	0	0	1	1
12:30	12:45	0	0	2	1	3
12:45	13:00	0	0	0	0	0
13:00	13:15	0	0	0	0	0
13:15	13:30	0	0	2	1	3
15:00	15:15	0	0	0	0	0
15:15	15:30	0	0	0	1	1
15:30	15:45	0	0	1	0	1
15:45	16:00	0	0	1	2	3
16:00	16:15	0	0	0	0	0
16:15	16:30	0	0	1	0	1
16:30	16:45	0	0	1	0	1
16:45	17:00	0	0	0	1	1
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	1	1
17:45	18:00	0	0	0	0	0
Total		0	0	11	9	20

Transportation Services - Traffic Services

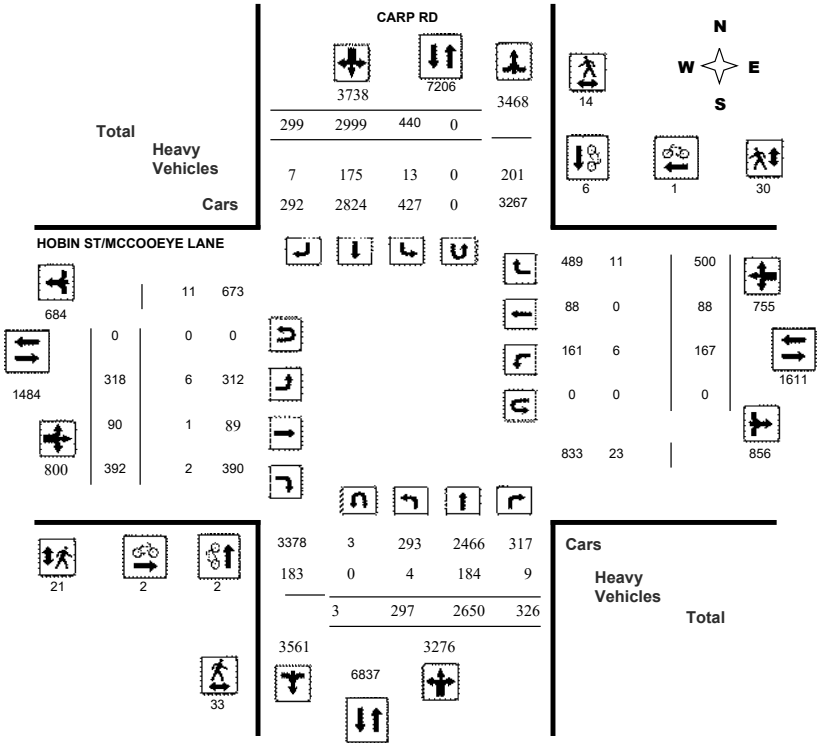
Turning Movement Count - Study Results

CARP RD @ HOBIN ST/MCCOOEYE LANE

Survey Date: Thursday, May 04, 2017 **WO No:** 36998

Start Time: 07:00 **Device:** Miovision

Full Study Diagram



Transportation Services - Traffic Services

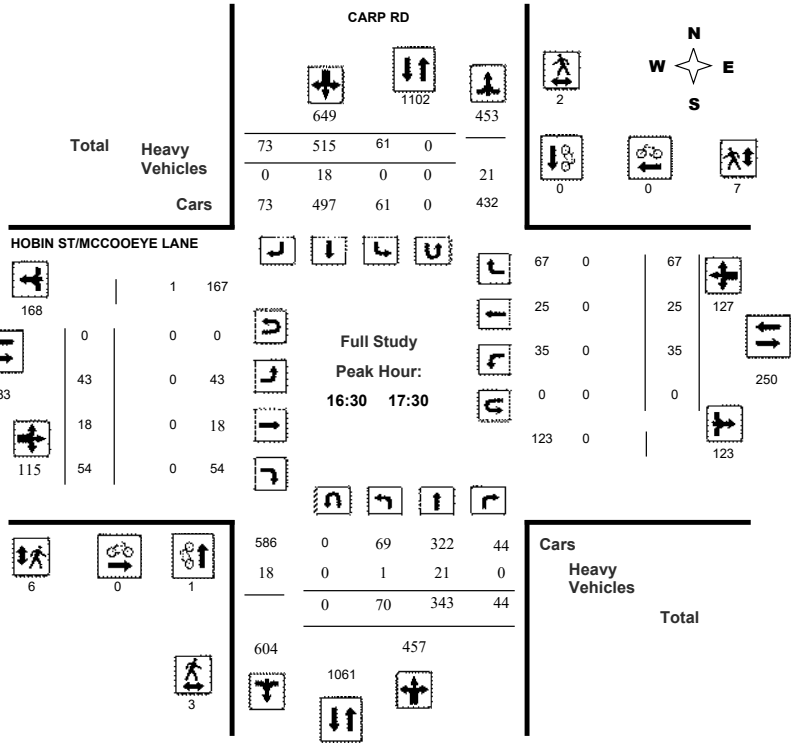
Turning Movement Count - Study Results

CARP RD @ HOBIN ST/MCCOOEYE LANE

Survey Date: Thursday, May 04, 2017 **WO No:** 36998

Start Time: 07:00 **Device:** Miovision

Full Study Peak Hour Diagram



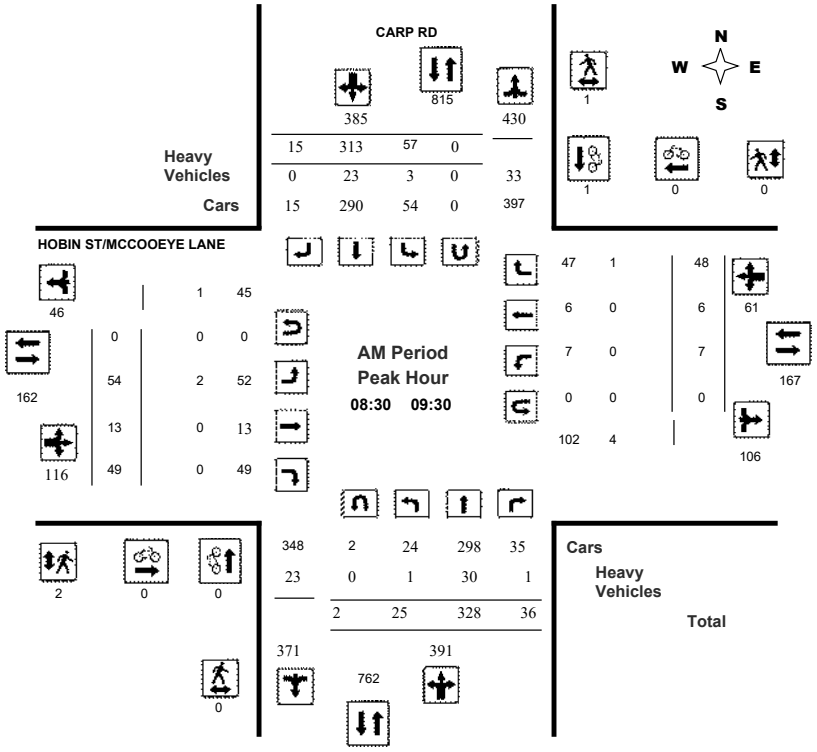
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

CARP RD @ HOBIN ST/MCCOOEYE LANE

Survey Date: Thursday, May 04, 2017 **WO No:** 36998

Start Time: 07:00 **Device:** Miovision



Comments

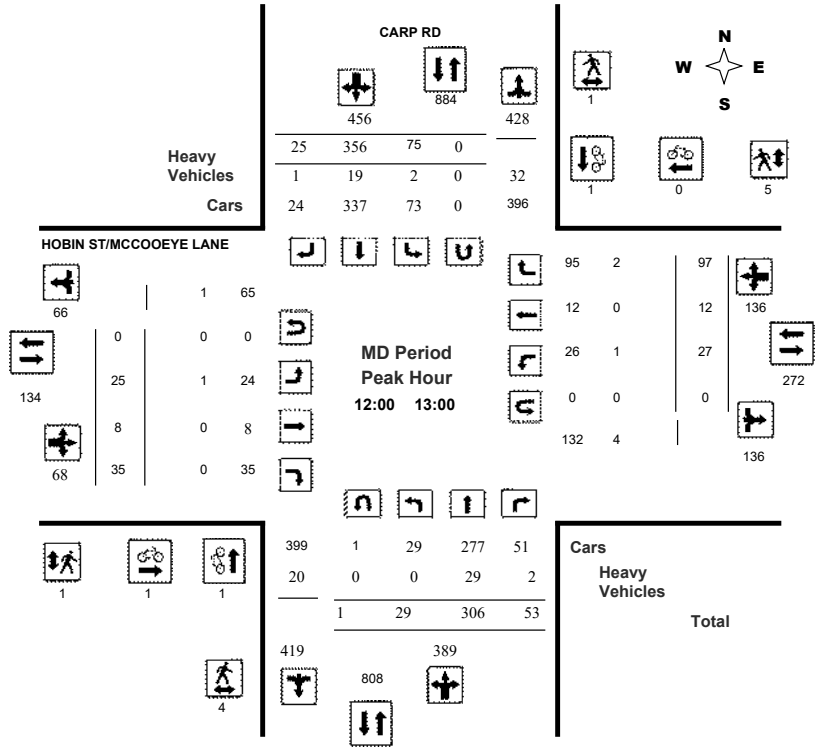
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

CARP RD @ HOBIN ST/MCCOOEYE LANE

Survey Date: Thursday, May 04, 2017 **WO No:** 36998

Start Time: 07:00 **Device:** Miovision



Comments

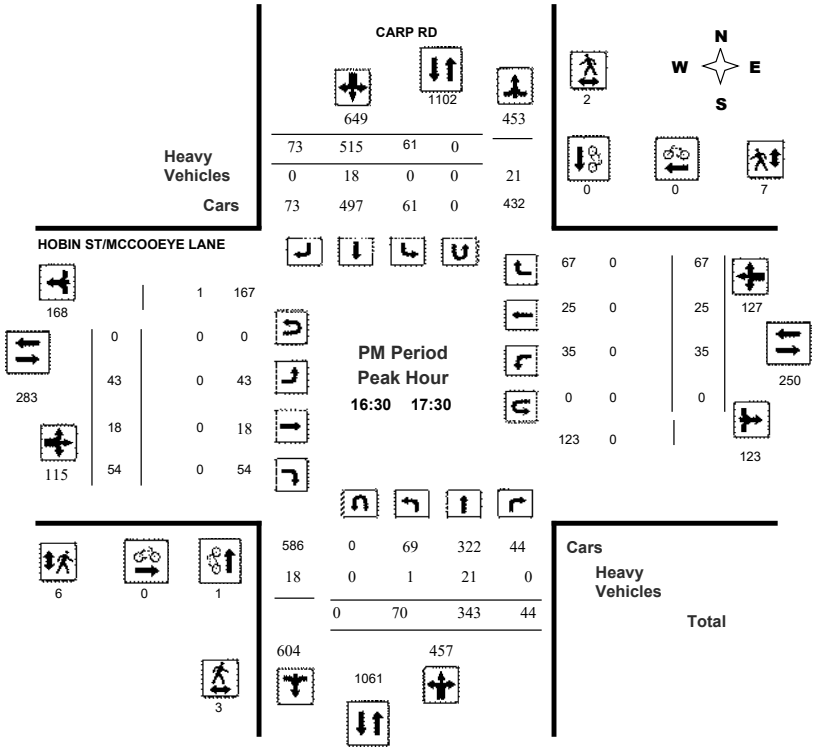
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

CARP RD @ HOBIN ST/MCCOOEYE LANE

Survey Date: Thursday, May 04, 2017 **WO No:** 36998

Start Time: 07:00 **Device:** Miovision



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

CARP RD @ HOBIN ST/MCCOOEYE LANE

Survey Date: Thursday, May 04, 2017 **WO No:** 36998

Start Time: 07:00 **Device:** Miovision

Full Study Summary (8 HR Standard)

Survey Date: Thursday, May 04, 2017

Total Observed U-Turns

Northbound: 3 Southbound: 0

Eastbound: 0 Westbound: 0

AADT Factor .90

	CARP RD								HOBIN ST/MCCOOEYE LANE									
	Northbound				Southbound				Eastbound				Westbound					
Period	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	11	352	27	**390**	40	255	17	**312**	**702**	72	8	63	**143**	10	3	43	**56**	**199**	**901**
08:00 09:00	22	343	23	**388**	48	293	17	**358**	**746**	43	16	52	**111**	8	2	49	**59**	**170**	**916**
09:00 10:00	27	317	43	**387**	50	293	11	**354**	**741**	51	7	49	**107**	10	6	54	**70**	**177**	**918**
11:30 12:30	24	311	60	**395**	65	368	19	**452**	**847**	26	11	33	**70**	20	8	86	**114**	**184**	**1031**
12:30 13:30	30	294	39	**363**	73	345	28	**446**	**809**	23	7	43	**73**	32	14	80	**126**	**199**	**1008**
15:00 16:00	39	353	48	**440**	51	440	59	**550**	**990**	24	13	47	**84**	24	13	72	**109**	**193**	**1183**
16:00 17:00	60	362	38	**460**	65	507	69	**641**	**1101**	47	14	45	**106**	33	23	58	**114**	**220**	**1321**
17:00 18:00	84	318	48	**450**	48	498	79	**625**	**1075**	32	14	60	**106**	30	19	58	**107**	**213**	**1288**
Sub Total	297	2650	326	**3273**	440	2999	299	**3738**	**7011**	318	90	392	**800**	167	88	500	**755**	**1555**	**8566**
U Turns	3			**3**	0			**0**	**3**	**0**			**0**	0			**0**	**0**	**3**
Total	300	2650	326	**3276**	440	2999	299	**3738**	**7014**	318	90	392	**800**	167	88	500	**755**	**1555**	**8569**
EQ 12Hr	417	3683	453	**4553**	612	4169	416	**5197**	**9750**	442	125	545	**1112**	232	122	695	**1049**	**2161**	**11911**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	375	3315	408	**4098**	551	3752	374	**4677**	**8775**	398	112	490	**1000**	209	110	626	**945**	**1945**	**10720**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**.90**					
AVG 24Hr	491	4343	534	**5368**	722	4915	490	**6127**	**11495**	521	147	642	**1310**	274	144	820	**1238**	**2548**	**14043**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														**1.31**					

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 @ HOBIN ST/MCCOOEYE LANE

Survey Date: Thursday, May 04, 2017 **WO No:** 36998

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute Increments

		CARP RD									HOBIN ST/MCCOOEYE LANE									
		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	2	77	9	88	12	61	4	77	**165**	17	0	8	25	0	1	11	12	**37**	**202**
07:15	07:30	0	99	3	102	10	55	5	70	**172**	17	4	13	34	2	0	16	18	**52**	**224**
07:30	07:45	5	94	5	104	4	68	4	76	**180**	21	2	18	41	3	1	8	12	**53**	**233**
07:45	08:00	4	82	10	96	14	71	4	89	**185**	17	2	24	43	5	1	8	14	**57**	**242**
08:00	08:15	8	88	8	104	14	68	7	89	**193**	13	4	17	34	3	0	15	18	**52**	**245**
08:15	08:30	2	96	3	101	6	74	3	83	**184**	10	5	13	28	1	0	13	14	**42**	**226**
08:30	08:45	6	86	2	94	16	69	5	90	**184**	11	4	10	25	0	1	11	12	**37**	**221**
08:45	09:00	8	73	10	91	12	82	2	96	**187**	9	3	12	24	4	1	10	15	**39**	**226**
09:00	09:15	9	82	9	100	15	70	6	91	**191**	17	3	17	37	1	2	14	17	**54**	**245**
09:15	09:30	4	87	15	106	14	92	2	108	**214**	17	3	10	30	2	2	13	17	**47**	**261**
09:30	09:45	7	79	9	95	8	70	2	80	**175**	9	1	12	22	7	1	15	23	**45**	**220**
09:45	10:00	7	69	10	86	13	61	1	75	**161**	8	0	10	18	0	1	12	13	**31**	**192**
11:30	11:45	5	82	17	104	12	80	4	96	**200**	10	5	12	27	4	2	16	22	**49**	**249**
11:45	12:00	4	69	12	85	18	117	6	141	**226**	4	0	6	10	4	3	20	27	**37**	**263**
12:00	12:15	7	95	18	120	18	90	3	111	**231**	6	2	8	16	6	1	25	32	**48**	**279**
12:15	12:30	9	65	13	87	17	81	6	104	**191**	6	4	7	17	6	2	25	33	**50**	**241**
12:30	12:45	7	53	8	68	19	82	6	107	**175**	5	1	8	14	10	0	28	38	**52**	**227**
12:45	13:00	7	93	14	114	21	103	10	134	**248**	8	1	12	21	5	9	19	33	**54**	**302**
13:00	13:15	9	84	11	104	20	72	6	98	**202**	4	1	12	17	5	1	11	17	**34**	**236**
13:15	13:30	7	64	6	77	13	88	6	107	**184**	6	4	11	21	12	4	22	38	**59**	**243**
15:00	15:15	7	87	10	104	12	111	9	132	**236**	9	4	10	23	9	2	7	18	**41**	**277**
15:15	15:30	10	71	12	93	12	111	14	137	**230**	1	2	10	13	4	2	18	24	**37**	**267**
15:30	15:45	10	103	11	124	13	107	20	140	**264**	3	5	10	18	7	4	22	33	**51**	**315**
15:45	16:00	12	92	15	119	14	111	16	141	**260**	11	2	17	30	4	5	25	34	**64**	**324**
16:00	16:15	14	101	9	124	16	117	17	150	**274**	10	4	7	21	8	5	11	24	**45**	**319**
16:15	16:30	17	78	14	109	14	134	16	164	**273**	12	3	12	27	7	4	15	26	**53**	**326**
16:30	16:45	18	89	8	115	19	124	16	159	**274**	15	4	14	33	12	7	16	35	**68**	**342**
16:45	17:00	11	94	7	112	16	132	20	168	**280**	10	3	12	25	6	7	16	29	**54**	**334**
17:00	17:15	20	82	10	112	12	134	16	162	**274**	8	3	15	26	10	5	13	28	**54**	**328**
17:15	17:30	21	78	19	118	14	125	21	160	**278**	10	8	13	31	7	6	22	35	**66**	**344**
17:30	17:45	21	82	10	113	8	129	26	163	**276**	6	2	18	26	6	4	15	25	**51**	**327**
17:45	18:00	22	76	9	107	14	110	16	140	**247**	8	1	14	23	7	4	8	19	**42**	**289**
Total:		300	2650	326	3276	440	2999	299	3738	**7014**	318	90	392	800	167	88	500	755	**7014**	**8,569**

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

CARP RD @ HOBIN ST/MCCOOEYE LANE

Survey Date: Thursday, May 04, 2017 **WO No:** 36998

Start Time: 07:00 **Device:** Miovision

Full Study Cyclist Volume

		CARP RD			HOBIN ST/MCCOOEYE LANE			
Time Period		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00	07:15	0	0	**0**	0	0	**0**	**0**
07:15	07:30	0	1	**1**	0	0	**0**	**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	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	1	**1**	0	0	**0**	**1**
09:30	09:45	0	1	**1**	0	0	**0**	**1**
09:45	10:00	0	2	**2**	0	1	**1**	**3**
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	1	**1**	0	0	**0**	**1**
12:15	12:30	1	0	**1**	0	0	**0**	**1**
12:30	12:45	0	0	**0**	0	0	**0**	**0**
12:45	13:00	0	0	**0**	1	0	**1**	**1**
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	1	0	**1**	0	0	**0**	**1**
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**
Total		2	6	**8**	2	1	**3**	**11**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

CARP RD @ HOBIN ST/MCCOOEYE LANE

Survey Date: Thursday, May 04, 2017 **WO No:** 36998

Start Time: 07:00 **Device:** Miovision

Full Study Pedestrian Volume

		CARP RD			HOBIN ST/MCCOOEYE LANE			
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	1	**1**	**1**
07:15	07:30	0	1	**1**	1	0	**1**	**2**
07:30	07:45	2	1	**3**	1	0	**1**	**4**
07:45	08:00	0	0	**0**	1	0	**1**	**1**
08:00	08:15	5	0	**5**	1	0	**1**	**6**
08:15	08:30	0	0	**0**	0	2	**2**	**2**
08:30	08:45	0	1	**1**	0	0	**0**	**1**
08:45	09:00	0	0	**0**	0	0	**0**	**0**
09:00	09:15	0	0	**0**	2	0	**2**	**2**
09:15	09:30	0	0	**0**	0	0	**0**	**0**
09:30	09:45	0	1	**1**	0	3	**3**	**4**
09:45	10:00	0	2	**2**	1	0	**1**	**3**
11:30	11:45	0	0	**0**	1	0	**1**	**1**
11:45	12:00	0	1	**1**	0	0	**0**	**1**
12:00	12:15	1	0	**1**	0	2	**2**	**3**
12:15	12:30	1	0	**1**	0	0	**0**	**1**
12:30	12:45	0	1	**1**	1	1	**2**	**3**
12:45	13:00	2	0	**2**	0	2	**2**	**4**
13:00	13:15	1	1	**2**	1	1	**2**	**4**
13:15	13:30	4	1	**5**	3	1	**4**	**9**
15:00	15:15	1	0	**1**	0	3	**3**	**4**
15:15	15:30	1	0	**1**	0	1	**1**	**2**
15:30	15:45	3	1	**4**	0	3	**3**	**7**
15:45	16:00	2	0	**2**	0	0	**0**	**2**
16:00	16:15	1	0	**1**	1	2	**3**	**4**
16:15	16:30	2	0	**2**	0	1	**1**	**3**
16:30	16:45	2	2	**4**	1	4	**5**	**9**
16:45	17:00	0	0	**0**	0	3	**3**	**3**
17:00	17:15	0	0	**0**	2	0	**2**	**2**
17:15	17:30	1	0	**1**	3	0	**3**	**4**
17:30	17:45	1	1	**2**	0	0	**0**	**2**
17:45	18:00	3	0	**3**	1	0	**1**	**4**
Total	.....	33	14	**47**	21	30	**51**	**98**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

CARP RD @ HOBIN ST/MCCOOEYE LANE

Survey Date: Thursday, May 04, 2017 **WO No:** 36998

Start Time: 07:00 **Device:** Miovision

Full Study Heavy Vehicles

CARP RD **HOBIN ST/MCCOOEYE LANE**

Time Period		Northbound				Southbound					Eastbound				Westbound					
		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	0	4	0	**4**	1	11	1	**13**	**17**	0	0	0	**0**	0	0	0	**0**	**0**	**17**
07:15	07:30	0	6	0	**6**	1	6	1	**8**	**14**	0	0	0	**0**	0	0	2	**2**	**2**	**16**
07:30	07:45	0	3	0	**3**	0	8	0	**8**	**11**	0	0	1	**1**	0	0	0	**0**	**1**	**12**
07:45	08:00	0	10	1	**11**	2	3	0	**5**	**16**	0	0	0	**0**	1	0	0	**1**	**1**	**17**
08:00	08:15	1	8	1	**10**	1	7	1	**9**	**19**	0	0	0	**0**	0	0	2	**2**	**2**	**21**
08:15	08:30	0	3	0	**3**	0	3	0	**3**	**6**	0	0	0	**0**	1	0	1	**2**	**2**	**8**
08:30	08:45	0	7	0	**7**	2	3	0	**5**	**12**	0	0	0	**0**	0	0	1	**1**	**1**	**13**
08:45	09:00	1	4	0	**5**	0	8	0	**8**	**13**	0	0	0	**0**	0	0	0	**0**	**0**	**13**
09:00	09:15	0	11	0	**11**	0	7	0	**7**	**18**	2	0	0	**2**	0	0	0	**0**	**2**	**20**
09:15	09:30	0	8	1	**9**	1	5	0	**6**	**15**	0	0	0	**0**	0	0	0	**0**	**0**	**15**
09:30	09:45	0	5	0	**5**	0	10	0	**10**	**15**	0	0	0	**0**	1	0	2	**3**	**3**	**18**
09:45	10:00	0	9	0	**9**	0	3	0	**3**	**12**	0	0	0	**0**	0	0	0	**0**	**0**	**12**
11:30	11:45	0	7	0	**7**	2	6	1	**9**	**16**	2	0	0	**2**	0	0	1	**1**	**3**	**19**
11:45	12:00	0	4	2	**6**	0	9	0	**9**	**15**	0	0	0	**0**	0	0	0	**0**	**0**	**15**
12:00	12:15	0	12	1	**13**	0	5	0	**5**	**18**	0	0	0	**0**	0	0	0	**0**	**0**	**18**
12:15	12:30	0	5	0	**5**	0	2	0	**2**	**7**	1	0	0	**1**	0	0	0	**0**	**1**	**8**
12:30	12:45	0	3	0	**3**	2	5	0	**7**	**10**	0	0	0	**0**	1	0	1	**2**	**2**	**12**
12:45	13:00	0	9	1	**10**	0	7	1	**8**	**18**	0	0	0	**0**	0	0	1	**1**	**1**	**19**
13:00	13:15	0	4	1	**5**	0	2	2	**4**	**9**	0	0	0	**0**	0	0	0	**0**	**0**	**9**
13:15	13:30	0	7	0	**7**	0	11	0	**11**	**18**	0	1	0	**1**	1	0	0	**1**	**2**	**20**
15:00	15:15	0	4	0	**4**	0	5	0	**5**	**9**	0	0	0	**0**	0	0	0	**0**	**0**	**9**
15:15	15:30	0	7	0	**7**	0	6	0	**6**	**13**	0	0	0	**0**	0	0	0	**0**	**0**	**13**
15:30	15:45	0	4	0	**4**	0	3	0	**3**	**7**	0	0	0	**0**	1	0	0	**1**	**1**	**8**
15:45	16:00	0	5	0	**5**	0	3	0	**3**	**8**	1	0	1	**2**	0	0	0	**0**	**2**	**10**
16:00	16:15	0	4	0	**4**	1	5	0	**6**	**10**	0	0	0	**0**	0	0	0	**0**	**0**	**10**
16:15	16:30	0	6	1	**7**	0	6	0	**6**	**13**	0	0	0	**0**	0	0	0	**0**	**0**	**13**
16:30	16:45	1	8	0	**9**	0	6	0	**6**	**15**	0	0	0	**0**	0	0	0	**0**	**0**	**15**
16:45	17:00	0	5	0	**5**	0	6	0	**6**	**11**	0	0	0	**0**	0	0	0	**0**	**0**	**11**
17:00	17:15	0	4	0	**4**	0	2	0	**2**	**6**	0	0	0	**0**	0	0	0	**0**	**0**	**6**
17:15	17:30	0	4	0	**4**	0	4	0	**4**	**8**	0	0	0	**0**	0	0	0	**0**	**0**	**8**
17:30	17:45	0	2	0	**2**	0	3	0	**3**	**5**	0	0	0	**0**	0	0	0	**0**	**0**	**5**
17:45	18:00	1	2	0	**3**	0	5	0	**5**	**8**	0	0	0	**0**	0	0	0	**0**	**0**	**8**
Total:	None	4	184	9	**197**	13	175	7	**195**	**392**	6	1	2	**9**	6	0	11	**17**	**26**	**418**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

CARP RD @ HOBIN ST/MCCOOEYE LANE

Survey Date: Thursday, May 04, 2017 **WO No:** 36998

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute U-Turn Total

CARP RD **HOBIN ST/MCCOOEYE LANE**

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	1	0	0	0	**1**
08:45	09:00	1	0	0	0	**1**
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	1	0	0	0	**1**
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	0	0	**0**
17:45	18:00	0	0	0	0	**0**
Total		3	0	0	0	**3**

Turning Movement Count
Summary Report Including Peak Hours, AADT and Expansion Factors
All Vehicles Except Bicycles

Carp Road & Echowoods Avenue/Kittiwake Drive — Stittsville, ON

Survey Date: Wednesday, August 23, 2023 **Start Time:** 0700 **AADT Factor:** 0.9
Weather AM: Clear/Sunny 14° C **Survey Duration:** 8 Hrs. **Survey Hours:** 0700-1000, 1130-1330 & 1500-1800
Weather PM: Overcast 27° C **Surveyor(s):** T. Carmody

	Kittiwake Dr.					Echowoods Ave.					Carp Rd.					Carp Rd.					
	Eastbound					Westbound					Northbound					Southbound					
Time Period	LT	ST	RT	UT	E/B Tot	LT	ST	RT	UT	W/B Tot	Street Total	LT	ST	RT	UT	N/B Tot	LT	ST	RT	UT	S/B Tot	Street Total	Grand Total
0700-0800	185	4	18	0	207	19	7	92	0	118	325	6	723	15	0	744	24	445	31	0	500	1244	1569
0800-0900	183	16	25	0	224	47	14	123	0	184	408	20	819	30	0	869	36	535	47	0	618	1487	1895
0900-1000	129	9	16	0	154	29	12	70	0	111	265	13	637	18	0	668	24	524	61	0	609	1277	1542
1130-1230	156	23	35	0	214	29	10	60	0	99	313	32	645	21	0	698	46	670	101	0	817	1515	1828
1230-1330	141	20	34	0	195	28	10	47	0	85	280	31	654	21	0	706	42	700	78	0	820	1526	1806
1500-1600	99	27	16	0	142	38	8	53	0	99	241	32	672	35	1	740	92	760	83	0	935	1675	1916
1600-1700	103	20	40	0	163	49	19	90	0	158	321	39	752	48	0	839	94	827	124	0	1045	1884	2205
1700-1800	136	28	54	0	218	44	16	80	0	140	358	62	678	29	0	769	120	854	138	0	1112	1881	2239
Totals	1132	147	238	0	1517	283	96	615	0	994	2511	235	5580	217	1	6033	478	5315	663	0	6456	12489	15000

Equivalent 12 & 24-hour Vehicle Volumes Including the Annual Average Daily Traffic (AADT) Factor Applicable to the Day and Month of the Turning Movement Count

Expansion factors are applied exclusively to standard weekday 8-hour turning movement counts conducted during the hours of 0700h - 1000h, 1130h - 1330h and 1500h - 1800h

Equivalent 12-hour vehicle volumes. These volumes are calculated by multiplying the 8-hour totals by the 8 ➡12 expansion factor of 1.39

Equ. 12 Hr	1573	204	331	0	2109	393	133	855	0	1382	3490	327	7756	302	1	8386	664	7388	922	0	8974	17360	20850

Average daily 12-hour vehicle volumes. These volumes are calculated by multiplying the equivalent 12-hour totals by the AADT factor of: 0.9

AADT 12-hr	1416	184	298	0	1898	354	120	769	0	1243	3141	294	6981	271	1	7547	598	6649	829	0	8076	15624	18765

24-Hour AADT. These volumes are calculated by multiplying the average daily 12-hour vehicle volumes by the 12 ➡24 expansion factor of 1.31

AADT 24 Hr	1855	241	390	0	2486	464	157	1008	0	1629	4115	385	9145	356	2	9887	783	8710	1087	0	10580	20467	24582

AADT and expansion factors provided by the City of Ottawa

AM Peak Hour Factor ➡ 0.97												Highest Hourly Vehicle Volume Between 0700h & 1000h										
AM Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
0745-0845	205	17	25	0	247	52	13	112	0	177	424	17	820	25	0	862	33	533	46	0	612	1474	1898
OFF Peak Hour Factor ➡ 0.98												Highest Hourly Vehicle Volume Between 1130h & 1330h										
OFF Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
1145-1245	173	25	37	0	235	26	8	50	0	84	319	32	653	20	0	705	51	737	102	0	890	1595	1914
PM Peak Hour Factor ➡ 0.94												Highest Hourly Vehicle Volume Between 1500h & 1800h										
PM Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
1630-1730	130	22	50	0	202	55	22	85	0	162	364	58	742	34	0	834	114	861	144	0	1119	1953	2317

Comments:

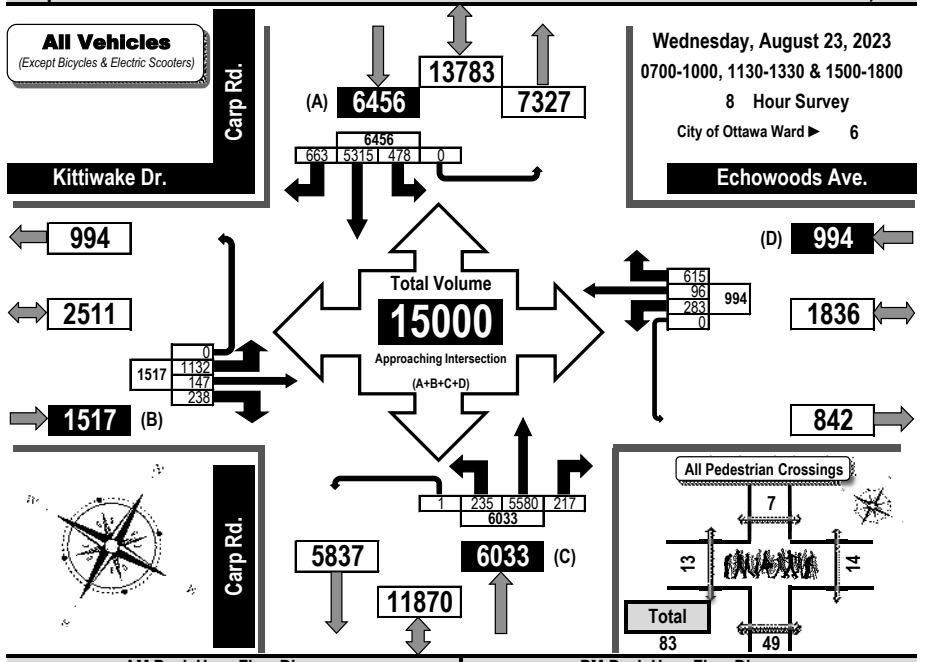
OC Transpo and Para Transpo buses and school buses comprise 4.76% of the heavy vehicle traffic. The bicycle totals include 11 varieties of E-bicycles and E-scooters (stand-up types). A total of 6 bicycles and E-bicycles/E-scooters used the bicycle lane along the west side of Carp Road south of Kittiwake Drive.

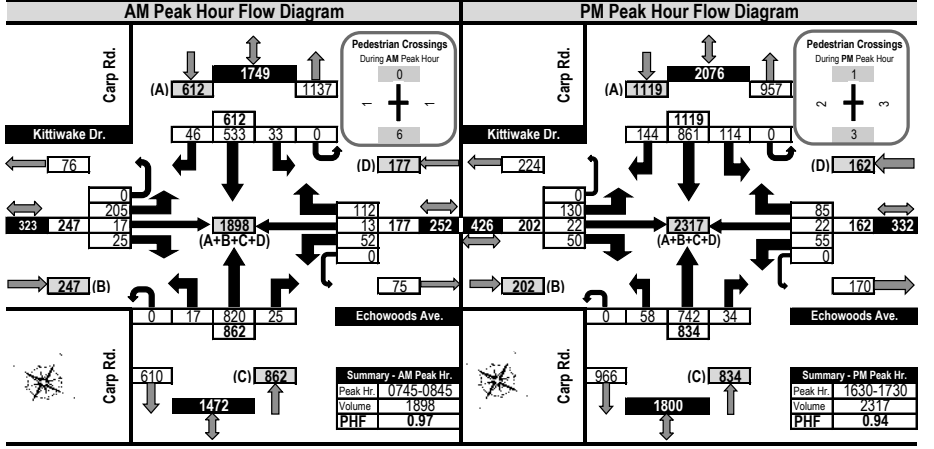
Notes:

1. Includes all vehicle types except bicycles, electric bicycles, and electric scooters.
2. When expansion and AADT factors are applied, the results will differ slightly due to rounding.

Turning Movement Count
Summary, AM and PM Peak Hour Flow Diagrams
All Vehicles Except Bicycles

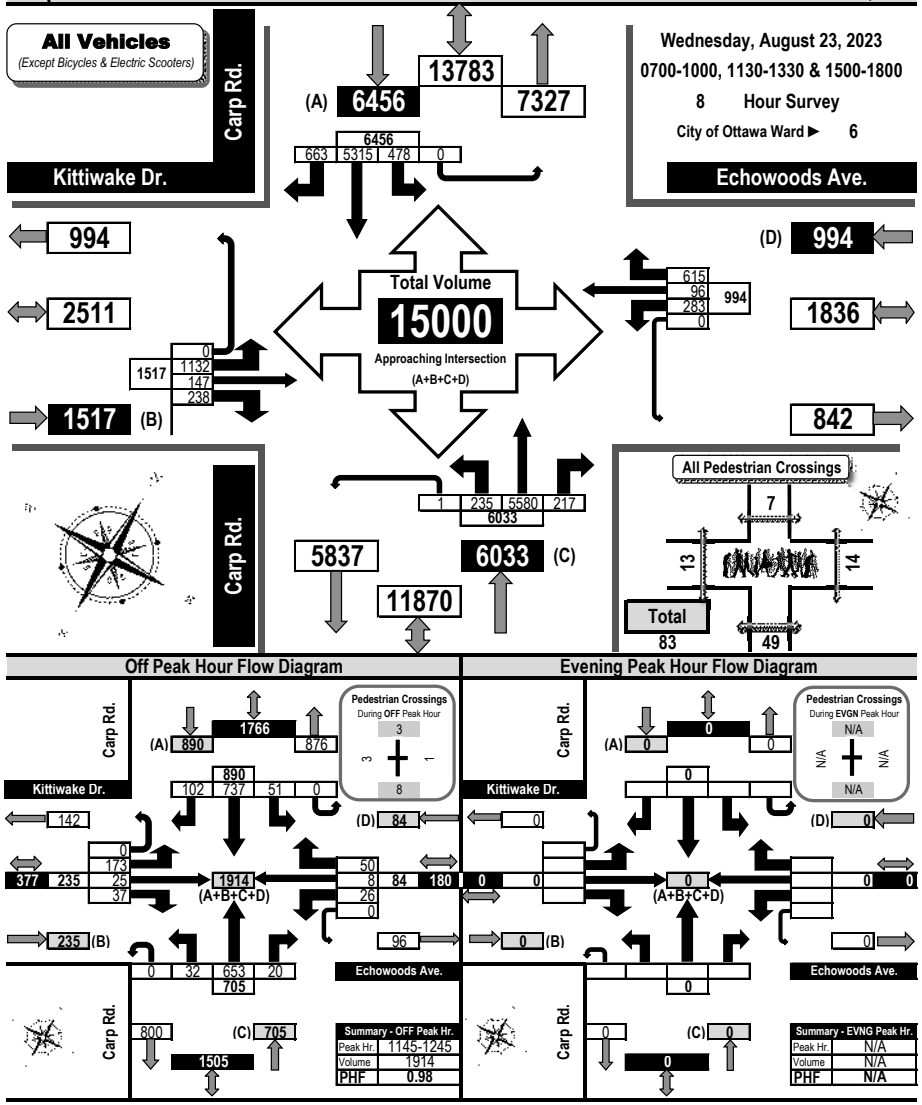
Carp Road & Echowoods Avenue/Kittiwake Drive — Stittsville, ON





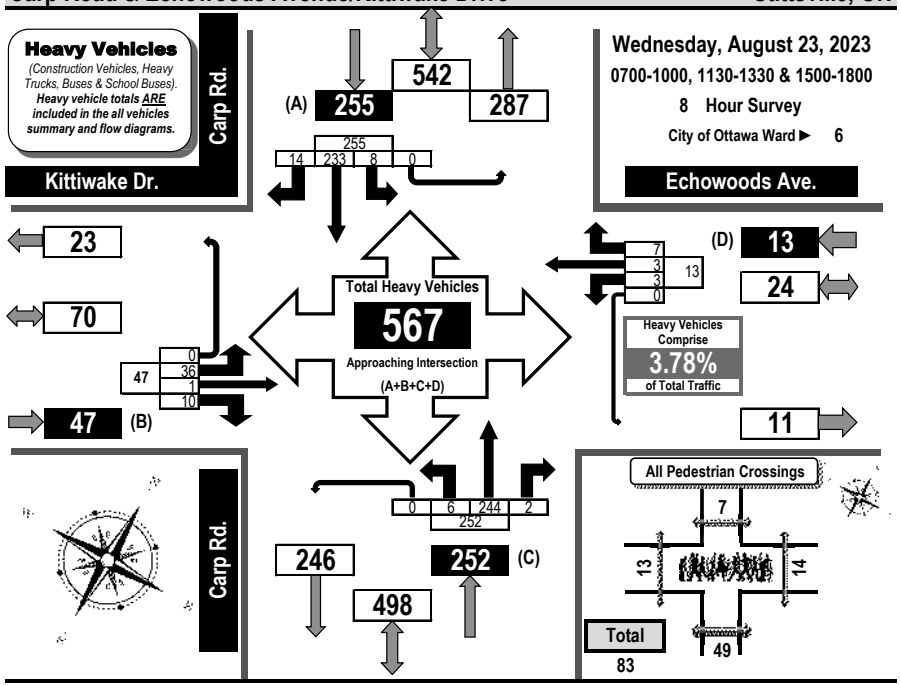
Turning Movement Count
Summary, OFF and EVENING Peak Hour Flow Diagrams
All Vehicles Except Bicycles

Carp Road & Echowoods Avenue/Kittiwake Drive — **Stittsville, ON**



Turning Movement Count
Heavy Vehicle Summary (FHWA Class 4-13)
Flow Diagram

Carp Road & Echowoods Avenue/Kittiwake Drive — **Stittsville, ON**

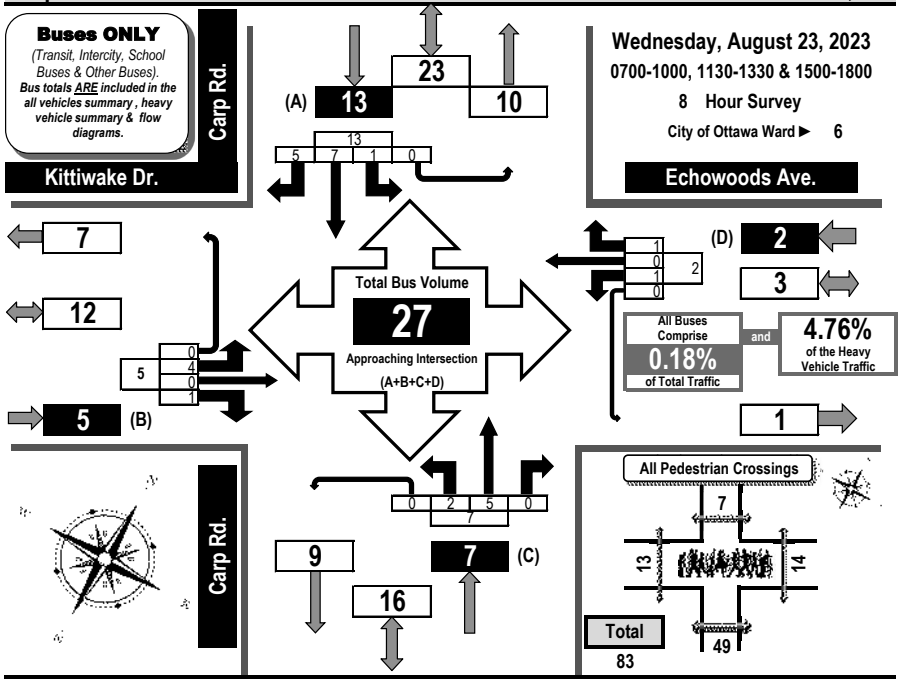


	Kittiwake Dr.					Echowoods Ave.					Carp Rd.					Carp Rd.					
	Eastbound					Westbound					Northbound					Southbound					
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
0700-0800	10	0	2	0	12	0	0	0	0	0	0	14	0	0	14	3	52	1	0	56	82
0800-0900	7	0	2	0	9	0	0	1	0	1	2	26	0	0	28	0	33	0	0	33	71
0900-1000	3	1	0	0	4	0	1	1	0	2	0	33	0	0	33	0	38	1	0	39	78
1130-1230	8	0	4	0	12	1	2	1	0	4	1	36	1	0	38	2	34	2	0	38	92
1230-1330	4	0	0	0	4	0	0	0	0	0	2	42	0	0	44	1	34	2	0	37	85
1500-1600	3	0	1	0	4	1	0	2	0	3	1	33	1	0	35	1	19	2	0	22	64
1600-1700	0	0	0	0	0	0	0	0	0	0	0	42	0	0	42	1	15	2	0	18	60
1700-1800	1	0	1	0	2	1	0	2	0	3	0	18	0	0	18	0	8	4	0	12	35
Totals	36	1	10	0	47	3	3	7	0	13	6	244	2	0	252	8	233	14	0	255	567

Comments:
OC Transpo and Para Transpo buses and school buses comprise 4.76% of the heavy vehicle traffic. The bicycle totals include 11 varieties of E-bicycles and E-scooters (stand-up types). A total of 6 bicycles and E-bicycles/E-scooters used the bicycle lane along the west side of Carp Road south of Kittiwake Drive.

Turning Movement Count
All Buses Summary (FHWA Class 4 ONLY)
Flow Diagram

Carp Road & Echowoods Avenue/Kittiwake Drive — **Stittsville, ON**



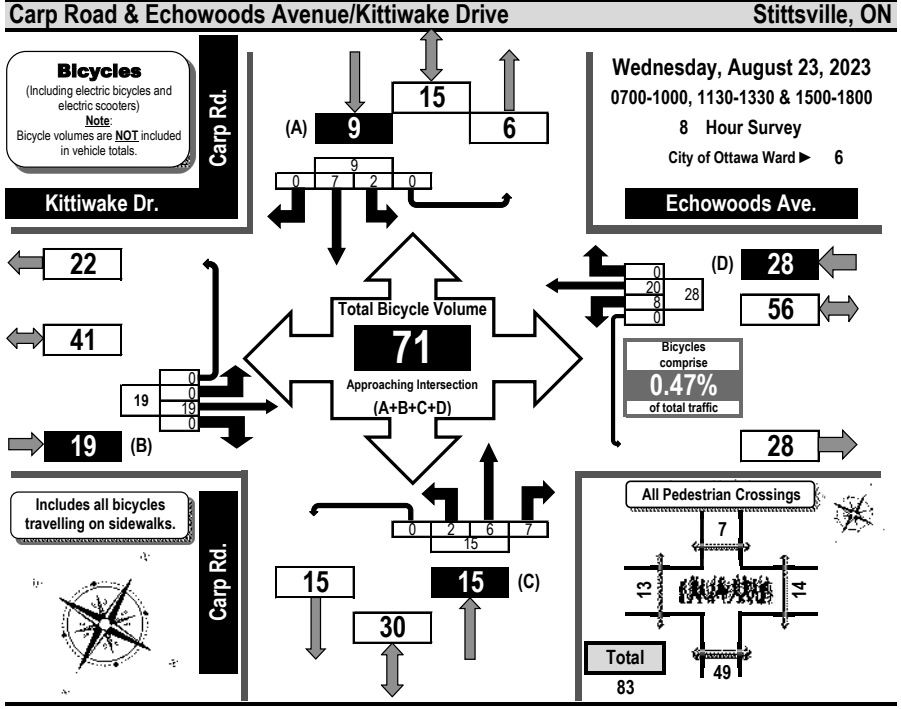
	Kittiwake Dr.					Echowoods Ave.					Carp Rd.					Carp Rd.					
	Eastbound					Westbound					Northbound					Southbound					
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
0700-0800	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	3
0800-0900	1	0	0	0	1	0	0	1	0	1	0	1	0	0	1	0	2	0	0	2	5
0900-1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
1130-1230	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
1230-1330	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
1500-1600	1	0	1	0	2	1	0	0	0	1	1	1	0	0	2	1	1	1	0	3	8
1600-1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	3	3
1700-1800	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	2	0	2	5
Totals	4	0	1	0	5	1	0	1	0	2	2	5	0	0	7	1	7	5	0	13	27

Comments:

OC Transpo and Para Transpo buses and school buses comprise 4.76% of the heavy vehicle traffic. The bicycle totals include 11 varieties of E-bicycles and E-scooters (stand-up types). A total of 6 bicycles and E-bicycles/E-scooters used the bicycle lane along the west side of Carp Road south of Kittiwake Drive.

Turning Movement Count
Bicycle Summary
Flow Diagram

Carp Road & Echowoods Avenue/Kittiwake Drive — **Stittsville, ON**



	Kittiwake Dr.					Echowoods Ave.					Carp Rd.					Carp Rd.					
	Eastbound					Westbound					Northbound					Southbound					
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
0700-0800	0	2	0	0	2	0	0	0	0	0	1	4	0	0	5	1	0	0	0	1	8
0800-0900	0	1	0	0	1	1	2	0	0	3	0	2	0	0	2	0	0	0	0	0	6
0900-1000	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	1	2
1130-1230	0	3	0	0	3	2	6	0	0	8	1	0	3	0	4	0	1	0	0	1	16
1230-1330	0	6	0	0	6	1	3	0	0	4	0	0	2	0	2	0	0	0	0	0	12
1500-1600	0	1	0	0	1	1	3	0	0	4	0	0	2	0	2	0	1	0	0	1	8
1600-1700	0	2	0	0	2	2	2	0	0	4	0	0	0	0	0	0	1	0	0	1	7
1700-1800	0	4	0	0	4	0	4	0	0	4	0	0	0	0	0	1	3	0	0	4	12
Totals	0	19	0	0	19	8	20	0	0	28	2	6	7	0	15	2	7	0	0	9	71

Comments:

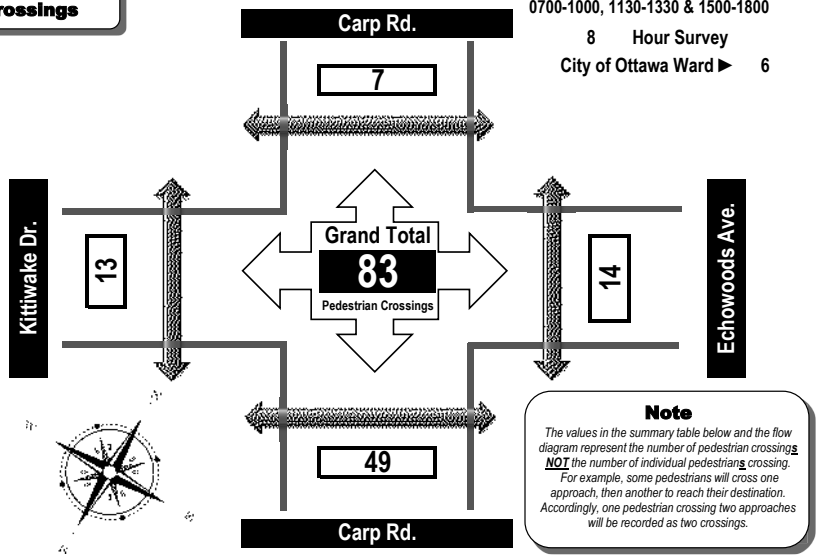
OC Transpo and Para Transpo buses and school buses comprise 4.76% of the heavy vehicle traffic. The bicycle totals include 11 varieties of E-bicycles and E-scooters (stand-up types). A total of 6 bicycles and E-bicycles/E-scooters used the bicycle lane along the west side of Carp Road south of Kittiwake Drive.

Turning Movement Count
Pedestrian Crossings Summary and Flow Diagram

Carp Road & Echowoods Avenue/Kittiwake Drive — **Stittsville, ON**

Pedestrian Crossings

Wednesday, August 23, 2023
0700-1000, 1130-1330 & 1500-1800
8 Hour Survey
City of Ottawa Ward ► 6



Note
*The values in the summary table below and the flow diagram represent the number of pedestrian crossings **NOT** the number of individual pedestrians crossing. For example, some pedestrians will cross one approach, then another to reach their destination. Accordingly, one pedestrian crossing two approaches will be recorded as two crossings.*

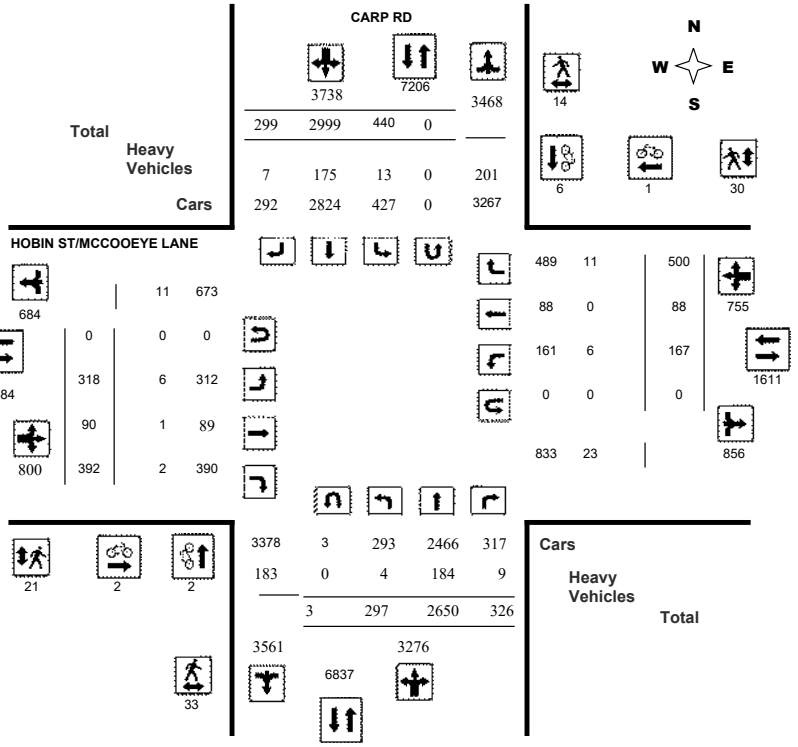
Time Period	West Side Crossing Kittiwake Dr.	East Side Crossing Echowoods Ave.	Street Total	South Side Crossing Carp Rd.	North Side Crossing Carp Rd.	Street Total	Grand Total
0700-0800	3	3	6	3	0	3	9
0800-0900	1	1	2	8	0	8	10
0900-1000	0	0	0	4	0	4	4
1130-1230	3	1	4	7	0	7	11
1230-1330	1	0	1	8	4	12	13
1500-1600	0	0	0	5	2	7	7
1600-1700	2	8	10	9	1	10	20
1700-1800	3	1	4	5	0	5	9
Totals	13	14	27	49	7	56	83

Comments:
OC Transpo and Para Transpo buses and school buses comprise 4.76% of the heavy vehicle traffic. The bicycle totals include 11 varieties of E-bicycles and E-scooters (stand-up types). A total of 6 bicycles and E-bicycles/E-scooters used the bicycle lane along the west side of Carp Road south of Kittiwake Drive.

Transportation Services - Traffic Services
Turning Movement Count - Study Results
CARP RD @ HOBIN ST/MCCOOEYE LANE

Survey Date: Thursday, May 04, 2017 **WO No:** 36998
Start Time: 07:00 **Device:** Miovision

Full Study Diagram



Transportation Services - Traffic Services

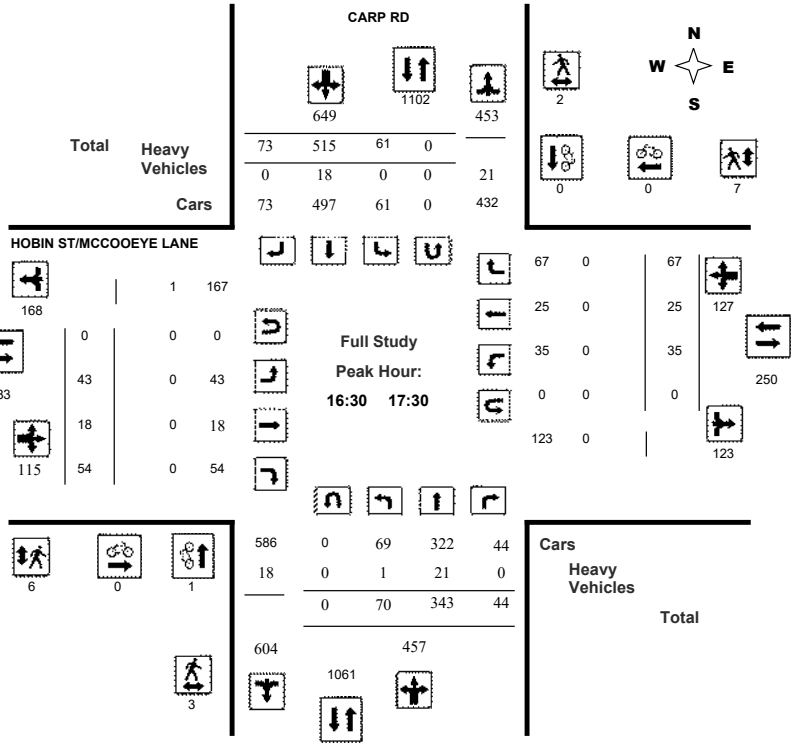
Turning Movement Count - Study Results

CARP RD @ HOBIN ST/MCCOOEYE LANE

Survey Date: Thursday, May 04, 2017 **WO No:** 36998

Start Time: 07:00 **Device:** Miovision

Full Study Peak Hour Diagram



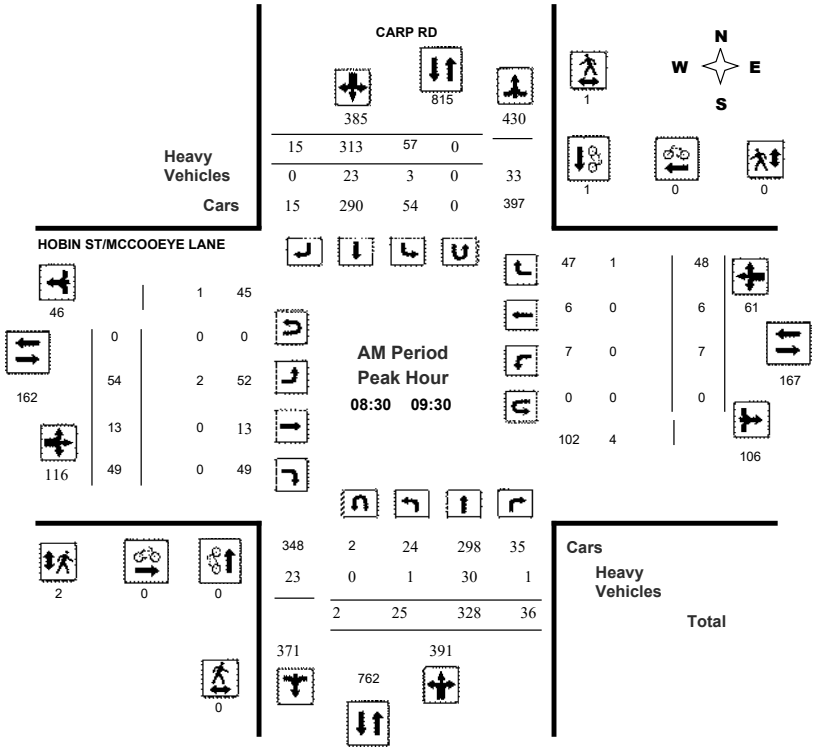
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

CARP RD @ HOBIN ST/MCCOOEYE LANE

Survey Date: Thursday, May 04, 2017 **WO No:** 36998

Start Time: 07:00 **Device:** Miovision



Comments

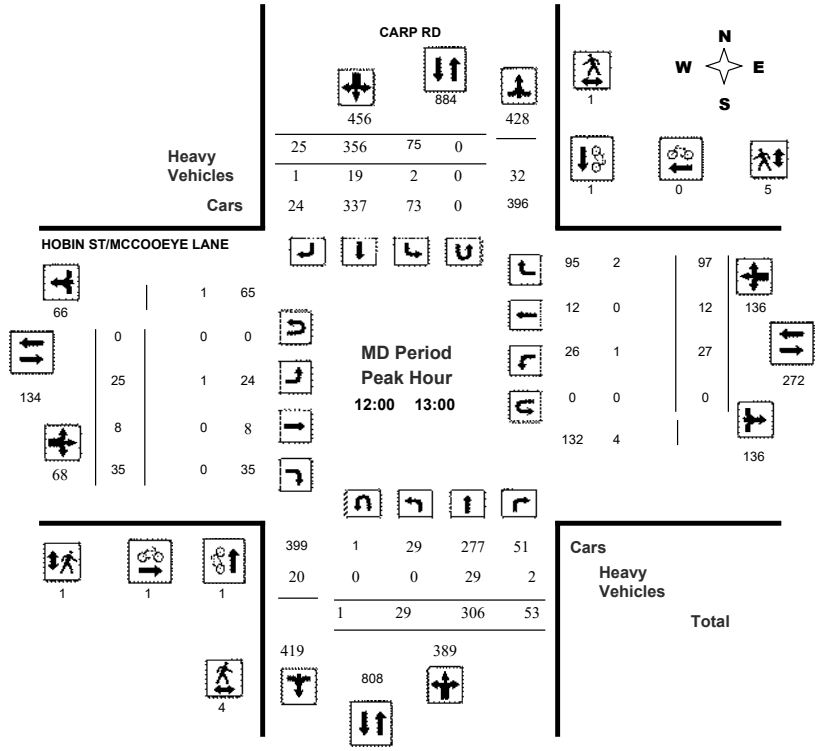
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

CARP RD @ HOBIN ST/MCCOOEYE LANE

Survey Date: Thursday, May 04, 2017 **WO No:** 36998

Start Time: 07:00 **Device:** Miovision



Comments

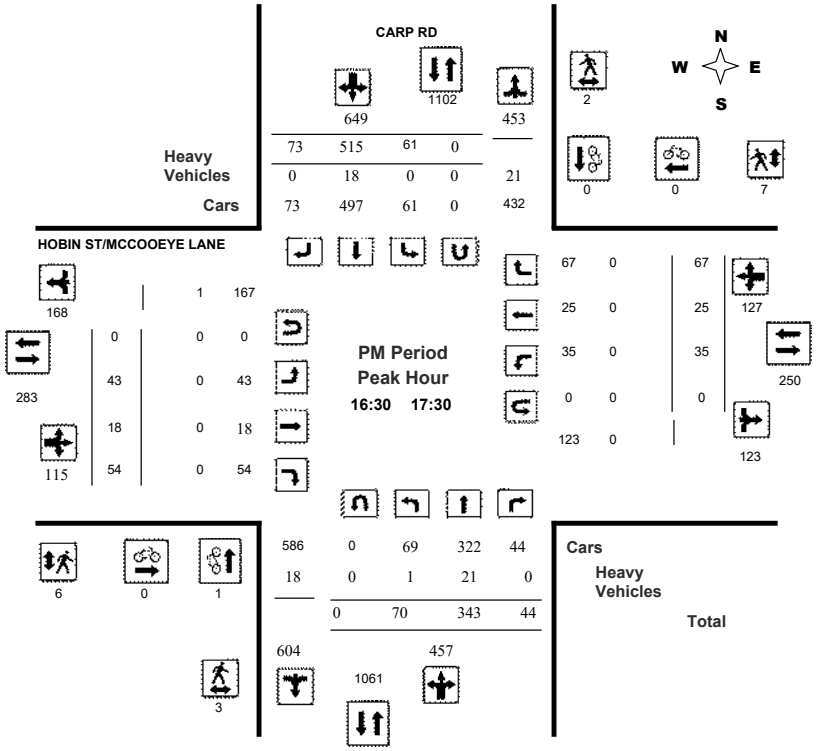
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

CARP RD @ HOBIN ST/MCCOOEYE LANE

Survey Date: Thursday, May 04, 2017 **WO No:** 36998

Start Time: 07:00 **Device:** Miovision



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

CARP RD @ HOBIN ST/MCCOOEYE LANE

Survey Date: Thursday, May 04, 2017 **WO No:** 36998

Start Time: 07:00 **Device:** Miovision

Full Study Summary (8 HR Standard)

Survey Date: Thursday, May 04, 2017

Total Observed U-Turns

Northbound: 3 Southbound: 0

Eastbound: 0 Westbound: 0

AADT Factor .90

	CARP RD								HOBIN ST/MCCOOEYE LANE									
	Northbound				Southbound				Eastbound				Westbound					
Period	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	11	352	27	**390**	40	255	17	**312**	**702**	72	8	63	**143**	10	3	43	**56**	**199**	**901**
08:00 09:00	22	343	23	**388**	48	293	17	**358**	**746**	43	16	52	**111**	8	2	49	**59**	**170**	**916**
09:00 10:00	27	317	43	**387**	50	293	11	**354**	**741**	51	7	49	**107**	10	6	54	**70**	**177**	**918**
11:30 12:30	24	311	60	**395**	65	368	19	**452**	**847**	26	11	33	**70**	20	8	86	**114**	**184**	**1031**
12:30 13:30	30	294	39	**363**	73	345	28	**446**	**809**	23	7	43	**73**	32	14	80	**126**	**199**	**1008**
15:00 16:00	39	353	48	**440**	51	440	59	**550**	**990**	24	13	47	**84**	24	13	72	**109**	**193**	**1183**
16:00 17:00	60	362	38	**460**	65	507	69	**641**	**1101**	47	14	45	**106**	33	23	58	**114**	**220**	**1321**
17:00 18:00	84	318	48	**450**	48	498	79	**625**	**1075**	32	14	60	**106**	30	19	58	**107**	**213**	**1288**
Sub Total	297	2650	326	**3273**	440	2999	299	**3738**	**7011**	318	90	392	**800**	167	88	500	**755**	**1555**	**8566**
U Turns	3			**3**	0			**0**	**3**	**0**			**0**	0			**0**	**0**	**3**
Total	300	2650	326	**3276**	440	2999	299	**3738**	**7014**	318	90	392	**800**	167	88	500	**755**	**1555**	**8569**
EQ 12Hr	417	3683	453	**4553**	612	4169	416	**5197**	**9750**	442	125	545	**1112**	232	122	695	**1049**	**2161**	**11911**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	375	3315	408	**4098**	551	3752	374	**4677**	**8775**	398	112	490	**1000**	209	110	626	**945**	**1945**	**10720**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**.90**					
AVG 24Hr	491	4343	534	**5368**	722	4915	490	**6127**	**11495**	521	147	642	**1310**	274	144	820	**1238**	**2548**	**14043**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														**1.31**					

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 @ HOBIN ST/MCCOOEYE LANE

Survey Date: Thursday, May 04, 2017 **WO No:** 36998

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute Increments

		CARP RD									HOBIN ST/MCCOOEYE LANE									
		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	2	77	9	88	12	61	4	77	**165**	17	0	8	25	0	1	11	12	**37**	**202**
07:15	07:30	0	99	3	102	10	55	5	70	**172**	17	4	13	34	2	0	16	18	**52**	**224**
07:30	07:45	5	94	5	104	4	68	4	76	**180**	21	2	18	41	3	1	8	12	**53**	**233**
07:45	08:00	4	82	10	96	14	71	4	89	**185**	17	2	24	43	5	1	8	14	**57**	**242**
08:00	08:15	8	88	8	104	14	68	7	89	**193**	13	4	17	34	3	0	15	18	**52**	**245**
08:15	08:30	2	96	3	101	6	74	3	83	**184**	10	5	13	28	1	0	13	14	**42**	**226**
08:30	08:45	6	86	2	94	16	69	5	90	**184**	11	4	10	25	0	1	11	12	**37**	**221**
08:45	09:00	8	73	10	91	12	82	2	96	**187**	9	3	12	24	4	1	10	15	**39**	**226**
09:00	09:15	9	82	9	100	15	70	6	91	**191**	17	3	17	37	1	2	14	17	**54**	**245**
09:15	09:30	4	87	15	106	14	92	2	108	**214**	17	3	10	30	2	2	13	17	**47**	**261**
09:30	09:45	7	79	9	95	8	70	2	80	**175**	9	1	12	22	7	1	15	23	**45**	**220**
09:45	10:00	7	69	10	86	13	61	1	75	**161**	8	0	10	18	0	1	12	13	**31**	**192**
11:30	11:45	5	82	17	104	12	80	4	96	**200**	10	5	12	27	4	2	16	22	**49**	**249**
11:45	12:00	4	69	12	85	18	117	6	141	**226**	4	0	6	10	4	3	20	27	**37**	**263**
12:00	12:15	7	95	18	120	18	90	3	111	**231**	6	2	8	16	6	1	25	32	**48**	**279**
12:15	12:30	9	65	13	87	17	81	6	104	**191**	6	4	7	17	6	2	25	33	**50**	**241**
12:30	12:45	7	53	8	68	19	82	6	107	**175**	5	1	8	14	10	0	28	38	**52**	**227**
12:45	13:00	7	93	14	114	21	103	10	134	**248**	8	1	12	21	5	9	19	33	**54**	**302**
13:00	13:15	9	84	11	104	20	72	6	98	**202**	4	1	12	17	5	1	11	17	**34**	**236**
13:15	13:30	7	64	6	77	13	88	6	107	**184**	6	4	11	21	12	4	22	38	**59**	**243**
15:00	15:15	7	87	10	104	12	111	9	132	**236**	9	4	10	23	9	2	7	18	**41**	**277**
15:15	15:30	10	71	12	93	12	111	14	137	**230**	1	2	10	13	4	2	18	24	**37**	**267**
15:30	15:45	10	103	11	124	13	107	20	140	**264**	3	5	10	18	7	4	22	33	**51**	**315**
15:45	16:00	12	92	15	119	14	111	16	141	**260**	11	2	17	30	4	5	25	34	**64**	**324**
16:00	16:15	14	101	9	124	16	117	17	150	**274**	10	4	7	21	8	5	11	24	**45**	**319**
16:15	16:30	17	78	14	109	14	134	16	164	**273**	12	3	12	27	7	4	15	26	**53**	**326**
16:30	16:45	18	89	8	115	19	124	16	159	**274**	15	4	14	33	12	7	16	35	**68**	**342**
16:45	17:00	11	94	7	112	16	132	20	168	**280**	10	3	12	25	6	7	16	29	**54**	**334**
17:00	17:15	20	82	10	112	12	134	16	162	**274**	8	3	15	26	10	5	13	28	**54**	**328**
17:15	17:30	21	78	19	118	14	125	21	160	**278**	10	8	13	31	7	6	22	35	**66**	**344**
17:30	17:45	21	82	10	113	8	129	26	163	**276**	6	2	18	26	6	4	15	25	**51**	**327**
17:45	18:00	22	76	9	107	14	110	16	140	**247**	8	1	14	23	7	4	8	19	**42**	**289**
Total:		300	2650	326	3276	440	2999	299	3738	**7014**	318	90	392	800	167	88	500	755	**7014**	**8,569**

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

CARP RD @ HOBIN ST/MCCOOEYE LANE

Survey Date: Thursday, May 04, 2017 **WO No:** 36998

Start Time: 07:00 **Device:** Miovision

Full Study Cyclist Volume

		CARP RD			HOBIN ST/MCCOOEYE LANE			
Time Period		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00	07:15	0	0	**0**	0	0	**0**	**0**
07:15	07:30	0	1	**1**	0	0	**0**	**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	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	1	**1**	0	0	**0**	**1**
09:30	09:45	0	1	**1**	0	0	**0**	**1**
09:45	10:00	0	2	**2**	0	1	**1**	**3**
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	1	**1**	0	0	**0**	**1**
12:15	12:30	1	0	**1**	0	0	**0**	**1**
12:30	12:45	0	0	**0**	0	0	**0**	**0**
12:45	13:00	0	0	**0**	1	0	**1**	**1**
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	1	0	**1**	0	0	**0**	**1**
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**
Total		2	6	**8**	2	1	**3**	**11**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

CARP RD @ HOBIN ST/MCCOOEYE LANE

Survey Date: Thursday, May 04, 2017 **WO No:** 36998

Start Time: 07:00 **Device:** Miovision

Full Study Pedestrian Volume

		CARP RD			HOBIN ST/MCCOOEYE LANE			
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	1	**1**	**1**
07:15	07:30	0	1	**1**	1	0	**1**	**2**
07:30	07:45	2	1	**3**	1	0	**1**	**4**
07:45	08:00	0	0	**0**	1	0	**1**	**1**
08:00	08:15	5	0	**5**	1	0	**1**	**6**
08:15	08:30	0	0	**0**	0	2	**2**	**2**
08:30	08:45	0	1	**1**	0	0	**0**	**1**
08:45	09:00	0	0	**0**	0	0	**0**	**0**
09:00	09:15	0	0	**0**	2	0	**2**	**2**
09:15	09:30	0	0	**0**	0	0	**0**	**0**
09:30	09:45	0	1	**1**	0	3	**3**	**4**
09:45	10:00	0	2	**2**	1	0	**1**	**3**
11:30	11:45	0	0	**0**	1	0	**1**	**1**
11:45	12:00	0	1	**1**	0	0	**0**	**1**
12:00	12:15	1	0	**1**	0	2	**2**	**3**
12:15	12:30	1	0	**1**	0	0	**0**	**1**
12:30	12:45	0	1	**1**	1	1	**2**	**3**
12:45	13:00	2	0	**2**	0	2	**2**	**4**
13:00	13:15	1	1	**2**	1	1	**2**	**4**
13:15	13:30	4	1	**5**	3	1	**4**	**9**
15:00	15:15	1	0	**1**	0	3	**3**	**4**
15:15	15:30	1	0	**1**	0	1	**1**	**2**
15:30	15:45	3	1	**4**	0	3	**3**	**7**
15:45	16:00	2	0	**2**	0	0	**0**	**2**
16:00	16:15	1	0	**1**	1	2	**3**	**4**
16:15	16:30	2	0	**2**	0	1	**1**	**3**
16:30	16:45	2	2	**4**	1	4	**5**	**9**
16:45	17:00	0	0	**0**	0	3	**3**	**3**
17:00	17:15	0	0	**0**	2	0	**2**	**2**
17:15	17:30	1	0	**1**	3	0	**3**	**4**
17:30	17:45	1	1	**2**	0	0	**0**	**2**
17:45	18:00	3	0	**3**	1	0	**1**	**4**
Total	.....	33	14	**47**	21	30	**51**	**98**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

CARP RD @ HOBIN ST/MCCOOEYE LANE

Survey Date: Thursday, May 04, 2017 **WO No:** 36998

Start Time: 07:00 **Device:** Miovision

Full Study Heavy Vehicles

CARP RD **HOBIN ST/MCCOOEYE LANE**

Time Period		Northbound				Southbound					Eastbound				Westbound					
		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	0	4	0	**4**	1	11	1	**13**	**17**	0	0	0	**0**	0	0	0	**0**	**0**	**17**
07:15	07:30	0	6	0	**6**	1	6	1	**8**	**14**	0	0	0	**0**	0	0	2	**2**	**2**	**16**
07:30	07:45	0	3	0	**3**	0	8	0	**8**	**11**	0	0	1	**1**	0	0	0	**0**	**1**	**12**
07:45	08:00	0	10	1	**11**	2	3	0	**5**	**16**	0	0	0	**0**	1	0	0	**1**	**1**	**17**
08:00	08:15	1	8	1	**10**	1	7	1	**9**	**19**	0	0	0	**0**	0	0	2	**2**	**2**	**21**
08:15	08:30	0	3	0	**3**	0	3	0	**3**	**6**	0	0	0	**0**	1	0	1	**2**	**2**	**8**
08:30	08:45	0	7	0	**7**	2	3	0	**5**	**12**	0	0	0	**0**	0	0	1	**1**	**1**	**13**
08:45	09:00	1	4	0	**5**	0	8	0	**8**	**13**	0	0	0	**0**	0	0	0	**0**	**0**	**13**
09:00	09:15	0	11	0	**11**	0	7	0	**7**	**18**	2	0	0	**2**	0	0	0	**0**	**2**	**20**
09:15	09:30	0	8	1	**9**	1	5	0	**6**	**15**	0	0	0	**0**	0	0	0	**0**	**0**	**15**
09:30	09:45	0	5	0	**5**	0	10	0	**10**	**15**	0	0	0	**0**	1	0	2	**3**	**3**	**18**
09:45	10:00	0	9	0	**9**	0	3	0	**3**	**12**	0	0	0	**0**	0	0	0	**0**	**0**	**12**
11:30	11:45	0	7	0	**7**	2	6	1	**9**	**16**	2	0	0	**2**	0	0	1	**1**	**3**	**19**
11:45	12:00	0	4	2	**6**	0	9	0	**9**	**15**	0	0	0	**0**	0	0	0	**0**	**0**	**15**
12:00	12:15	0	12	1	**13**	0	5	0	**5**	**18**	0	0	0	**0**	0	0	0	**0**	**0**	**18**
12:15	12:30	0	5	0	**5**	0	2	0	**2**	**7**	1	0	0	**1**	0	0	0	**0**	**1**	**8**
12:30	12:45	0	3	0	**3**	2	5	0	**7**	**10**	0	0	0	**0**	1	0	1	**2**	**2**	**12**
12:45	13:00	0	9	1	**10**	0	7	1	**8**	**18**	0	0	0	**0**	0	0	1	**1**	**1**	**19**
13:00	13:15	0	4	1	**5**	0	2	2	**4**	**9**	0	0	0	**0**	0	0	0	**0**	**0**	**9**
13:15	13:30	0	7	0	**7**	0	11	0	**11**	**18**	0	1	0	**1**	1	0	0	**1**	**2**	**20**
15:00	15:15	0	4	0	**4**	0	5	0	**5**	**9**	0	0	0	**0**	0	0	0	**0**	**0**	**9**
15:15	15:30	0	7	0	**7**	0	6	0	**6**	**13**	0	0	0	**0**	0	0	0	**0**	**0**	**13**
15:30	15:45	0	4	0	**4**	0	3	0	**3**	**7**	0	0	0	**0**	1	0	0	**1**	**1**	**8**
15:45	16:00	0	5	0	**5**	0	3	0	**3**	**8**	1	0	1	**2**	0	0	0	**0**	**2**	**10**
16:00	16:15	0	4	0	**4**	1	5	0	**6**	**10**	0	0	0	**0**	0	0	0	**0**	**0**	**10**
16:15	16:30	0	6	1	**7**	0	6	0	**6**	**13**	0	0	0	**0**	0	0	0	**0**	**0**	**13**
16:30	16:45	1	8	0	**9**	0	6	0	**6**	**15**	0	0	0	**0**	0	0	0	**0**	**0**	**15**
16:45	17:00	0	5	0	**5**	0	6	0	**6**	**11**	0	0	0	**0**	0	0	0	**0**	**0**	**11**
17:00	17:15	0	4	0	**4**	0	2	0	**2**	**6**	0	0	0	**0**	0	0	0	**0**	**0**	**6**
17:15	17:30	0	4	0	**4**	0	4	0	**4**	**8**	0	0	0	**0**	0	0	0	**0**	**0**	**8**
17:30	17:45	0	2	0	**2**	0	3	0	**3**	**5**	0	0	0	**0**	0	0	0	**0**	**0**	**5**
17:45	18:00	1	2	0	**3**	0	5	0	**5**	**8**	0	0	0	**0**	0	0	0	**0**	**0**	**8**
Total:	None	4	184	9	**197**	13	175	7	**195**	**392**	6	1	2	**9**	6	0	11	**17**	**26**	**418**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

CARP RD @ HOBIN ST/MCCOOEYE LANE

Survey Date: Thursday, May 04, 2017 **WO No:** 36998

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute U-Turn Total

CARP RD **HOBIN ST/MCCOOEYE LANE**

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	1	0	0	0	**1**
08:45	09:00	1	0	0	0	**1**
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	1	0	0	0	**1**
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	0	0	**0**
17:45	18:00	0	0	0	0	**0**
Total		3	0	0	0	**3**

Transportation Services - Traffic Services

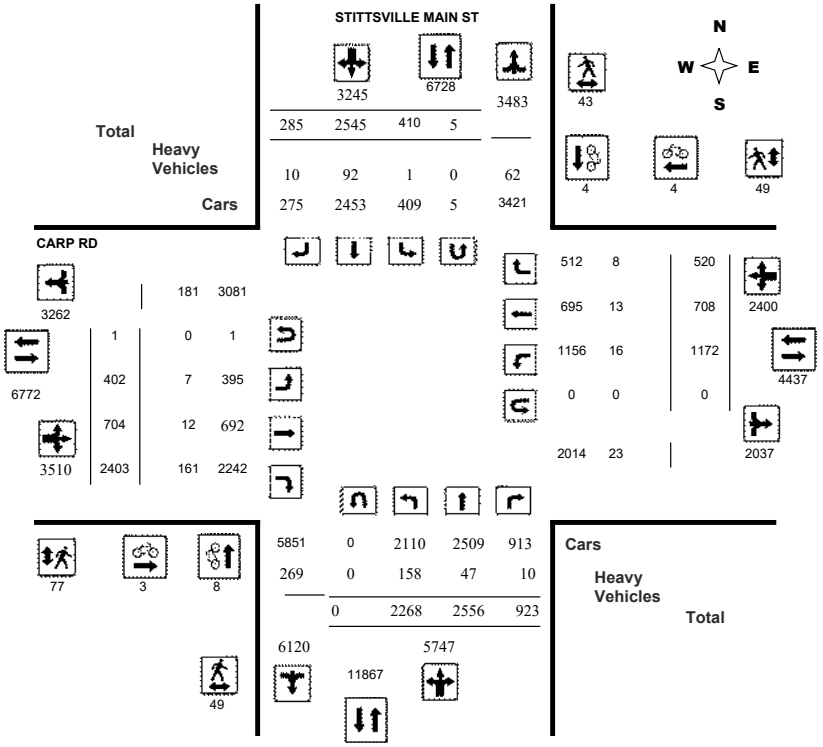
Turning Movement Count - Study Results

CARP RD @ STITTSVILLE MAIN ST

Survey Date: Thursday, May 04, 2017 **WO No:** 36999

Start Time: 07:00 **Device:** Miovision

Full Study Diagram



Transportation Services - Traffic Services

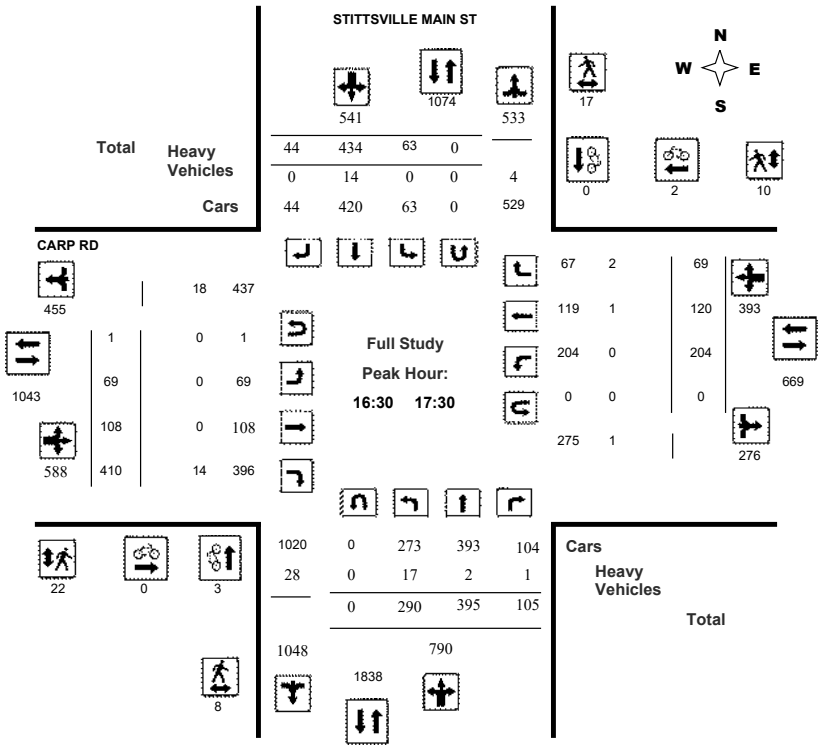
Turning Movement Count - Study Results

CARP RD @ STITTSVILLE MAIN ST

Survey Date: Thursday, May 04, 2017 **WO No:** 36999

Start Time: 07:00 **Device:** Miovision

Full Study Peak Hour Diagram



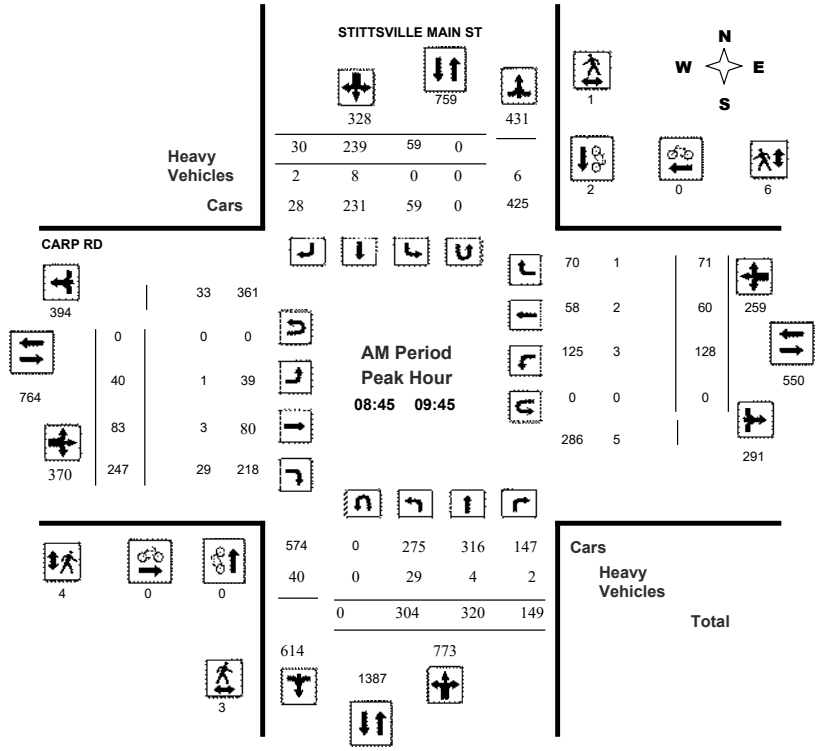
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

CARP RD @ STITTSVILLE MAIN ST

Survey Date: Thursday, May 04, 2017 **WO No:** 36999

Start Time: 07:00 **Device:** Miovision



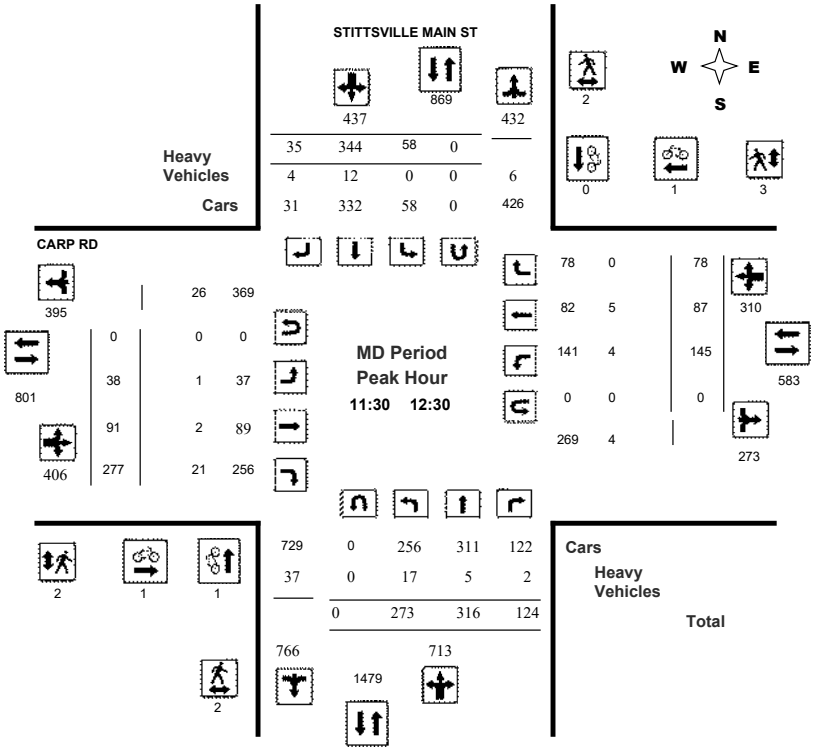
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

CARP RD @ STITTSVILLE MAIN ST

Survey Date: Thursday, May 04, 2017 **WO No:** 36999

Start Time: 07:00 **Device:** Miovision



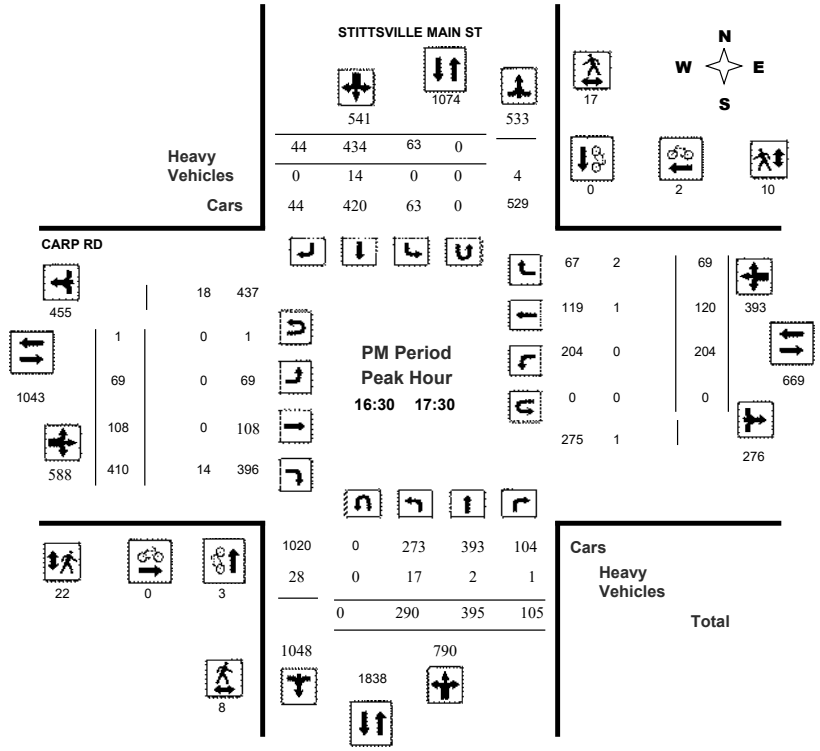
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

CARP RD @ STITTSVILLE MAIN ST

Survey Date: Thursday, May 04, 2017 **WO No:** 36999

Start Time: 07:00 **Device:** Miovision



Comments

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									
	Northbound				Southbound				Eastbound				Westbound					
Period	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	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**
Sub Total	2268	2556	923	**5747**	410	2545	285	**3240**	**8987**	402	704	2403	**3509**	1172	708	520	**2400**	**5909**	**14896**
U Turns				**0**				**5**	**5**				**1**				**0**	**1**	**6**
Total	2268	2556	923	**5747**	410	2545	285	**3245**	**8992**	402	704	2403	**3510**	1172	708	520	**2400**	**5910**	**14902**
EQ 12Hr	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.														**1.39**					
AVG 12Hr	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.														**0.9**					
AVG 24Hr	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.														**1.31**					

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

Transportation Services - Traffic Services

Turning Movement Count - Study Results

CARP RD @ STITTSVILLE MAIN ST

Survey Date: Thursday, May 04, 2017 **WO No:** 36999

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute Increments

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

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

CARP RD @ STITTSVILLE MAIN ST

Survey Date: Thursday, May 04, 2017 **WO No:** 36999

Start Time: 07:00 **Device:** Miovision

Full Study Cyclist Volume

		STITTSVILLE MAIN ST			CARP RD			
Time Period		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand 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
Total		8	4	12	3	4	7	19

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**
Total	49	43	**92**	77	49	**126**	**218**

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		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	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**
Total:	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

Time Period		STITTSVILLE MAIN ST Northbound U-Turn Total	STITTSVILLE MAIN ST Southbound U-Turn Total	CARP RD Eastbound U-Turn Total	CARP RD 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

Appendix C

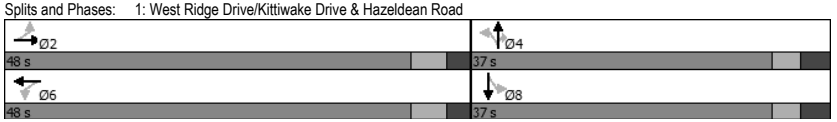
Synchro Intersection Worksheets – Existing Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	129	17	66	92	13	30	11	173	21	10	3
Future Volume (vph)	5	129	17	66	92	13	30	11	173	21	10	3
Satd. Flow (prot)	1658	1685	0	1658	1670	0	0	1642	1483	1658	1689	0
Flt Permitted	0.682			0.654				0.775		0.728		
Satd. Flow (perm)	1190	1685	0	1141	1670	0	0	1319	1483	1270	1689	0
Satd. Flow (RTOR)		11			11				192		3	
Lane Group Flow (vph)	6	162	0	73	116	0	0	45	192	23	14	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4		4	8		
Detector Phase	2	2		6	6		4	4	4	8	8	
Switch Phase												
Minimum Initial (s)	28.0	28.0		28.0	28.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	36.3	36.3		36.3	36.3		33.1	33.1	33.1	27.1	27.1	
Total Split (s)	48.0	48.0		48.0	48.0		37.0	37.0	37.0	37.0	37.0	
Total Split (%)	56.5%	56.5%		56.5%	56.5%		43.5%	43.5%	43.5%	43.5%	43.5%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.6	2.6		2.6	2.6		3.1	3.1	3.1	3.1	3.1	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.3	6.3		6.3	6.3			6.1	6.1	6.1	6.1	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		None	None	None	None	None	
Act Effct Green (s)	44.7	44.7		44.7	44.7			10.3	10.3	10.3	10.3	
Actuated g/C Ratio	0.66	0.66		0.66	0.66			0.15	0.15	0.15	0.15	
v/c Ratio	0.01	0.14		0.10	0.10			0.23	0.49	0.12	0.05	
Control Delay	4.2	4.5		4.7	4.2			26.7	9.2	24.9	21.2	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	4.2	4.5		4.7	4.2			26.7	9.2	24.9	21.2	
LOS	A	A		A	A			C	A	C	C	
Approach Delay		4.5			4.4			12.5			23.5	
Approach LOS		A			A			B			C	
Queue Length 50th (m)	0.2	5.8		2.7	3.9			4.7	0.0	2.4	1.1	
Queue Length 95th (m)	1.2	12.1		6.8	8.9			12.7	15.0	8.0	5.4	
Internal Link Dist (m)		182.4			355.8			521.0			146.6	
Turn Bay Length (m)	66.0			98.0					10.0	24.5		
Base Capacity (vph)	788	1120		756	1110			608	787	585	780	
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	0.01	0.14		0.10	0.10			0.07	0.24	0.04	0.02	

Intersection Summary
Cycle Length: 85
Actuated Cycle Length: 67.5
Natural Cycle: 70
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.49

Intersection Signal Delay: 8.6 — Intersection LOS: A
Intersection Capacity Utilization 71.3% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: West Ridge Drive/Kittiwake Drive & Hazeldean Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	398	0	0	172	1	0	0	0	4	0	4
Future Volume (vph)	29	398	0	0	172	1	0	0	0	4	0	4
Satd. Flow (prot)	1580	3283	0	1745	1712	1483	0	1745	0	0	1353	1483
Flt Permitted	0.637											
Satd. Flow (perm)	1060	3283	0	1745	1712	1483	0	1745	0	0	1424	1483
Satd. Flow (RTOR)						29						27
Lane Group Flow (vph)	32	442	0	0	191	1	0	0	0	0	4	4
Turn Type	Perm	NA		Perm	NA	Perm				custom	NA	custom
Protected Phases		2			6			4			4	
Permitted Phases	2			6		6	4			8		8
Detector Phase	2	2		6	6	6	4	4		8	4	8
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	30.1	30.1		30.1	30.1	30.1	34.3	34.3		34.3	34.3	34.3
Total Split (s)	90.0	90.0		90.0	90.0	90.0	35.0	35.0		35.0	35.0	35.0
Total Split (%)	72.0%	72.0%		72.0%	72.0%	72.0%	28.0%	28.0%		28.0%	28.0%	28.0%
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3		3.3	3.3	3.3
All-Red Time (s)	2.4	2.4		2.4	2.4	2.4	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1	6.1		6.3			6.3	6.3
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max	C-Max	None	None		None	None	None
Act Effct Green (s)	120.5	120.5			120.5	120.5					10.0	10.0
Actuated g/C Ratio	0.96	0.96			0.96	0.96					0.08	0.08
v/c Ratio	0.03	0.14			0.12	0.00					0.04	0.03
Control Delay	1.0	0.7			1.4	0.0					54.0	0.2
Queue Delay	0.0	0.0			0.0	0.0					0.0	0.0
Total Delay	1.0	0.7			1.4	0.0					54.0	0.2
LOS	A	A			A	A					D	A
Approach Delay		0.8			1.4						27.1	
Approach LOS		A			A						C	
Queue Length 50th (m)	0.0	0.0			0.0	0.0					0.9	0.0
Queue Length 95th (m)	2.8	12.4			20.2	m0.0					4.7	0.0
Internal Link Dist (m)		355.8			168.3			30.9			31.1	
Turn Bay Length (m)	140.0					100.0						
Base Capacity (vph)	1022	3165			1651	1431					326	361
Starvation Cap Reductn	0	0			0	0					0	0
Spillback Cap Reductn	0	0			0	0					0	0
Storage Cap Reductn	0	0			0	0					0	0
Reduced v/c Ratio	0.03	0.14			0.12	0.00					0.01	0.01

Intersection Summary

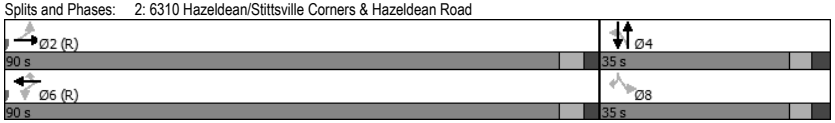
Cycle Length: 125
Actuated Cycle Length: 125
Offset: 14 (11%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.14

Intersection Signal Delay: 1.3	Intersection LOS: A
Intersection Capacity Utilization 43.7%	ICU Level of Service A
Analysis Period (min) 15	

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

Splits and Phases: 2: 6310 Hazeldean/Stittsville Corners & Hazeldean Road



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø7
Lane Configurations							
Traffic Volume (vph)	27	218	246	5	1	6	
Future Volume (vph)	27	218	246	5	1	6	
Satd. Flow (prot)	1523	3191	3070	0	1658	1293	
Flt Permitted	0.580				0.950		
Satd. Flow (perm)	930	3191	3070	0	1658	1293	
Satd. Flow (RTOR)			3			7	
Lane Group Flow (vph)	30	242	279	0	1	7	
Turn Type	Perm	NA	NA		Prot	Perm	
Protected Phases		2	6		8		7
Permitted Phases	2					8	
Detector Phase	2	2	6		8	8	
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0		10.0	10.0	1.0
Minimum Split (s)	24.4	24.4	33.4		34.3	34.3	5.0
Total Split (s)	75.7	75.7	75.7		34.3	34.3	5.0
Total Split (%)	65.8%	65.8%	65.8%		29.8%	29.8%	4%
Yellow Time (s)	3.7	3.7	3.7		3.3	3.3	2.0
All-Red Time (s)	2.7	2.7	2.7		3.0	3.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.4	6.4	6.4		6.3	6.3	
Lead/Lag					Lag	Lag	Lead
Lead-Lag Optimize?					Yes	Yes	Yes
Recall Mode	C-Max	C-Max	C-Max		None	None	None
Act Effct Green (s)	110.5	110.5	110.5		10.0	10.0	
Actuated g/C Ratio	0.96	0.96	0.96		0.09	0.09	
v/c Ratio	0.03	0.08	0.09		0.01	0.06	
Control Delay	1.1	0.8	0.8		48.0	28.3	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	1.1	0.8	0.8		48.0	28.3	
LOS	A	A	A		D	C	
Approach Delay		0.8	0.8		30.8		
Approach LOS		A	A		C		
Queue Length 50th (m)	0.0	0.0	0.0		0.2	0.0	
Queue Length 95th (m)	2.8	7.2	8.2		1.9	4.5	
Internal Link Dist (m)		634.2	235.6		86.5		
Turn Bay Length (m)	49.0					13.5	
Base Capacity (vph)	893	3065	2949		403	320	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.03	0.08	0.09		0.00	0.02	

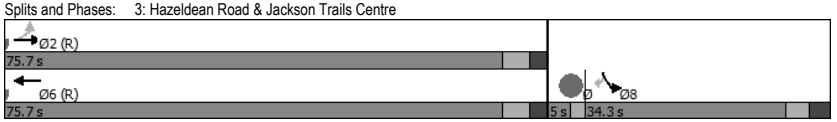
Intersection Summary

Cycle Length: 115
Actuated Cycle Length: 115
Offset: 75 (65%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.09

Intersection Signal Delay: 1.2	Intersection LOS: A
Intersection Capacity Utilization 40.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: Hazeldean Road & Jackson Trails Centre



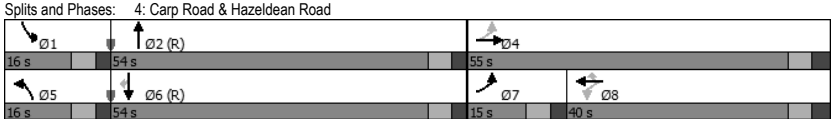
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	215	246	60	20	157	291	63	401	14	213	303	88
Future Volume (vph)	215	246	60	20	157	291	63	401	14	213	303	88
Satd. Flow (prot)	1626	2998	0	1537	1648	1469	1523	3253	0	1580	1712	1375
Flt Permitted	0.381			0.547			0.950			0.950		
Satd. Flow (perm)	650	2998	0	881	1648	1441	1514	3253	0	1574	1712	1335
Satd. Flow (RTOR)		28				323		3				137
Lane Group Flow (vph)	239	340	0	22	174	323	70	462	0	237	337	98
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
Detector Phase	7	4		8	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0	10.0	5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	11.1	39.6		39.6	39.6	39.6	11.0	32.1		11.0	32.1	32.1
Total Split (s)	15.0	55.0		40.0	40.0	40.0	16.0	54.0		16.0	54.0	54.0
Total Split (%)	12.0%	44.0%		32.0%	32.0%	32.0%	12.8%	43.2%		12.8%	43.2%	43.2%
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.7	3.7		3.7	3.7	3.7
All-Red Time (s)	2.4	2.9		2.9	2.9	2.9	2.3	2.4		2.3	2.4	2.4
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.1	6.6		6.6	6.6	6.6	6.0	6.1		6.0	6.1	6.1
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	35.5	35.0		20.0	20.0	20.0	10.1	47.9		23.4	63.7	63.7
Actuated g/C Ratio	0.28	0.28		0.16	0.16	0.16	0.08	0.38		0.19	0.51	0.51
v/c Ratio	0.94	0.40		0.16	0.66	0.64	0.57	0.37		0.80	0.39	0.13
Control Delay	82.7	33.0		43.8	60.0	10.6	73.1	28.6		62.5	37.4	13.4
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	82.7	33.0		43.8	60.0	10.6	73.1	28.6		62.5	37.4	13.4
LOS	F	C		D	E	B	E	C		E	D	B
Approach Delay		53.5			28.6			34.5			42.7	
Approach LOS		D			C			C			D	
Queue Length 50th (m)	50.3	33.2		4.8	41.3	0.0	16.7	42.2		58.5	57.2	1.2
Queue Length 95th (m)	#69.0	39.2		11.1	56.3	23.0	#34.1	56.2		#141.0	114.1	19.7
Internal Link Dist (m)		168.3			634.2			616.4			97.8	
Turn Bay Length (m)	95.0			53.5			41.0			80.0		
Base Capacity (vph)	254	1177		235	440	621	133	1248		295	872	747
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	0.29		0.09	0.40	0.52	0.53	0.37		0.80	0.39	0.13

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 107 (86%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.94
Intersection Signal Delay: 40.3 — Intersection LOS: D
Intersection Capacity Utilization 78.4% — ICU Level of Service D
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Carp Road & Hazeldean Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	205	17	25	52	13	112	17	820	25	33	533	46
Future Volume (vph)	205	17	25	52	13	112	17	820	25	33	533	46
Satd. Flow (prot)	1642	1516	0	0	1552	0	1510	1721	0	1658	1679	1483
Flt Permitted	0.557				0.891		0.329			0.085		
Satd. Flow (perm)	963	1516	0	0	1400	0	523	1721	0	148	1679	1448
Satd. Flow (RTOR)		28			70			2				78
Lane Group Flow (vph)	228	47	0	0	196	0	19	939	0	37	592	51
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
Detector Phase	4	4		8	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	30.3	30.3		29.3	29.3		10.6	32.0		10.6	32.0	32.0
Total Split (s)	43.0	43.0		43.0	43.0		11.0	71.0		11.0	71.0	71.0
Total Split (%)	34.4%	34.4%		34.4%	34.4%		8.8%	56.8%		8.8%	56.8%	56.8%
Yellow Time (s)	3.0	3.0		3.0	3.0		3.7	3.7		3.7	3.7	3.7
All-Red Time (s)	3.3	3.3		3.3	3.3		1.9	2.3		1.9	2.3	2.3
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3			6.3		5.6	6.0		5.6	6.0	6.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	32.0	32.0			32.0		77.6	73.9		78.8	76.3	76.3
Actuated g/C Ratio	0.26	0.26			0.26		0.62	0.59		0.63	0.61	0.61
v/c Ratio	0.93	0.11			0.48		0.05	0.92		0.23	0.58	0.06
Control Delay	86.0	17.6			27.8		9.1	36.2		12.8	19.9	1.4
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	86.0	17.6			27.8		9.1	36.2		12.8	19.9	1.4
LOS	F	B			C		A	D		B	B	A
Approach Delay		74.3			27.8			35.7			18.1	
Approach LOS		E			C			D			B	
Queue Length 50th (m)	53.1	3.4			25.0		1.0	~249.0		3.3	79.4	0.0
Queue Length 95th (m)	#93.9	12.6			46.6		m3.1	m#321.2		7.8	146.0	2.9
Internal Link Dist (m)		65.8			95.1			144.9			438.0	
Turn Bay Length (m)	65.5						24.5			36.0		36.8
Base Capacity (vph)	282	464			460		368	1017		163	1024	913
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.81	0.10			0.43		0.05	0.92		0.23	0.58	0.06

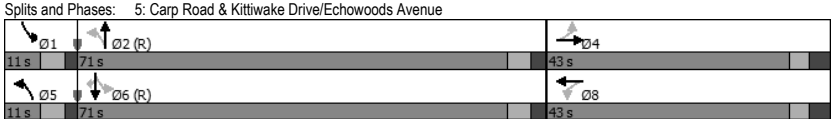
Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 7 (6%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.93
Intersection Signal Delay: 34.3 — Intersection LOS: C
Intersection Capacity Utilization 87.0% — ICU Level of Service E
Analysis Period (min) 15

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

Splits and Phases: 5: Carp Road & Kittiwake Drive/Echowoods Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	13	49	7	6	48	27	328	36	57	313	15
Future Volume (vph)	54	13	49	7	6	48	27	328	36	57	313	15
Satd. Flow (prot)	0	1593	0	0	1526	0	1626	1617	0	1610	1654	0
Flt Permitted		0.832			0.963		0.544			0.518		
Satd. Flow (perm)	0	1356	0	0	1479	0	929	1617	0	878	1654	0
Satd. Flow (RTOR)		46			53			12			5	
Lane Group Flow (vph)	0	128	0	0	68	0	30	404	0	63	365	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	27.6	27.6		27.6	27.6		29.8	29.8		29.8	29.8	
Total Split (s)	28.0	28.0		28.0	28.0		52.0	52.0		52.0	52.0	
Total Split (%)	35.0%	35.0%		35.0%	35.0%		65.0%	65.0%		65.0%	65.0%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.3	2.3		2.3	2.3		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.6			5.6		5.8	5.8		5.8	5.8	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)		13.0			13.0		59.9	59.9		59.9	59.9	
Actuated g/C Ratio		0.16			0.16		0.75	0.75		0.75	0.75	
v/c Ratio		0.50			0.24		0.04	0.33		0.10	0.29	
Control Delay		25.6			12.7		3.7	3.6		5.7	6.0	
Queue Delay		0.0			0.0		0.0	0.2		0.0	0.0	
Total Delay		25.6			12.7		3.7	3.9		5.7	6.0	
LOS		C			B		A	A		A	A	
Approach Delay		25.6			12.7			3.9			5.9	
Approach LOS		C			B			A			A	
Queue Length 50th (m)		11.8			2.1		0.8	10.7		2.3	15.3	
Queue Length 95th (m)		23.3			10.5		m2.2	20.5		9.3	43.1	
Internal Link Dist (m)		50.8			31.9			88.7			616.4	
Turn Bay Length (m)							28.0			44.0		
Base Capacity (vph)		412			452		695	1213		657	1239	
Starvation Cap Reductn		0			0		0	288		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.31			0.15		0.04	0.44		0.10	0.29	

Intersection Summary

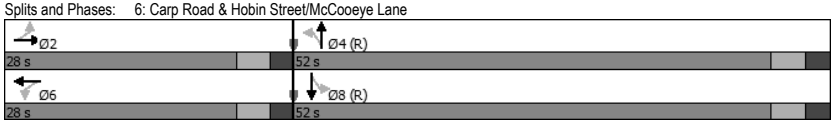
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 65 (81%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.50

Intersection Signal Delay: 7.9	Intersection LOS: A
Intersection Capacity Utilization 56.9%	ICU Level of Service B
Analysis Period (min) 15	

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

Splits and Phases: 6: Carp Road & Hobin Street/McCooeye Lane

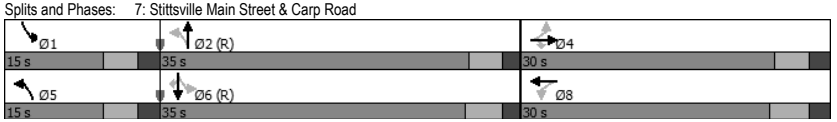


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	83	247	128	60	71	304	320	149	59	239	30
Future Volume (vph)	40	83	247	128	60	71	304	320	149	59	239	30
Satd. Flow (prot)	1642	1712	1351	1658	1578	0	1537	1646	0	1658	1728	1414
Flt Permitted	0.664			0.697			0.487			0.416		
Satd. Flow (perm)	1146	1712	1317	1211	1578	0	785	1646	0	724	1728	1374
Satd. Flow (RTOR)			274		76			34				115
Lane Group Flow (vph)	44	92	274	142	146	0	338	522	0	66	266	33
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
Detector Phase	4	4	4	8	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0		5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	29.5	29.5	29.5	29.9	29.9		10.5	29.1		10.5	29.5	29.5
Total Split (s)	30.0	30.0	30.0	30.0	30.0		15.0	35.0		15.0	35.0	35.0
Total Split (%)	37.5%	37.5%	37.5%	37.5%	37.5%		18.8%	43.8%		18.8%	43.8%	43.8%
Yellow Time (s)	3.3	3.3	3.3	3.7	3.7		3.3	3.3		3.3	3.7	3.7
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2		2.2	1.8		2.2	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.9	5.9		5.5	5.1		5.5	5.5	5.5
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	15.8	15.8	15.8	15.4	15.4		52.3	43.6		42.9	36.1	36.1
Actuated g/C Ratio	0.20	0.20	0.20	0.19	0.19		0.65	0.54		0.54	0.45	0.45
v/c Ratio	0.19	0.27	0.57	0.61	0.40		0.54	0.57		0.14	0.34	0.05
Control Delay	30.1	30.9	16.6	39.8	16.6		11.2	17.3		7.6	17.6	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	30.1	30.9	16.6	39.8	16.6		11.2	17.3		7.6	17.6	0.1
LOS	C	C	B	D	B		B	B		A	B	A
Approach Delay		21.3			28.1			14.9			14.2	
Approach LOS		C			C			B			B	
Queue Length 50th (m)	6.1	12.8	0.3	20.1	9.2		18.4	47.2		2.9	25.5	0.0
Queue Length 95th (m)	15.0	25.4	35.7	33.3	21.3		42.8	#111.5		9.2	49.1	0.0
Internal Link Dist (m)		88.7			74.0			130.8			407.0	
Turn Bay Length (m)	38.0		53.0	21.5			79.5			52.0		37.5
Base Capacity (vph)	350	524	593	364	528		624	911		523	780	683
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	0.13	0.18	0.46	0.39	0.28		0.54	0.57		0.13	0.34	0.05

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

Maximum v/c Ratio: 0.61
Intersection Signal Delay: 18.1 — Intersection LOS: B
Intersection Capacity Utilization 74.1% — ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Stittsville Main Street & Carp Road



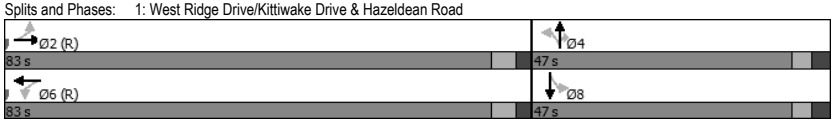
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	141	35	251	257	39	32	27	189	28	21	3
Future Volume (vph)	10	141	35	251	257	39	32	27	189	28	21	3
Satd. Flow (prot)	1658	1693	0	1658	1696	0	0	1698	1483	1658	1604	0
Flt Permitted	0.562			0.634				0.816		0.714		
Satd. Flow (perm)	981	1693	0	1106	1696	0	0	1424	1449	1242	1604	0
Satd. Flow (RTOR)		17			10				210		3	
Lane Group Flow (vph)	11	196	0	279	329	0	0	66	210	31	26	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4		4	8		
Detector Phase	2	2		6	6		4	4	4	8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	36.3	36.3		36.3	36.3		27.1	27.1	27.1	27.1	27.1	
Total Split (s)	83.0	83.0		83.0	83.0		47.0	47.0	47.0	47.0	47.0	
Total Split (%)	63.8%	63.8%		63.8%	63.8%		36.2%	36.2%	36.2%	36.2%	36.2%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.6	2.6		2.6	2.6		3.1	3.1	3.1	3.1	3.1	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.3	6.3		6.3	6.3			6.1	6.1	6.1	6.1	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None	None	None	None	
Act Effct Green (s)	104.6	104.6		104.6	104.6			13.0	13.0	13.0	13.0	
Actuated g/C Ratio	0.80	0.80		0.80	0.80			0.10	0.10	0.10	0.10	
v/c Ratio	0.01	0.14		0.31	0.24			0.46	0.63	0.25	0.16	
Control Delay	3.4	3.2		4.8	3.2			64.6	15.4	57.0	48.9	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	3.4	3.2		4.8	3.2			64.6	15.4	57.0	48.9	
LOS	A	A		A	A			E	B	E	D	
Approach Delay		3.2			3.9			27.2			53.3	
Approach LOS		A			A			C			D	
Queue Length 50th (m)	0.4	7.4		11.3	9.3			16.5	0.0	7.6	5.6	
Queue Length 95th (m)	2.2	18.4		65.1	46.8			29.0	22.0	16.4	13.6	
Internal Link Dist (m)		182.4			355.8			521.0			146.6	
Turn Bay Length (m)	66.0			98.0					10.0	24.5		
Base Capacity (vph)	788	1365		889	1366			448	599	390	506	
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	0.01	0.14		0.31	0.24			0.15	0.35	0.08	0.05	

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 126 (97%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.63
Intersection Signal Delay: 11.8 — Intersection LOS: B
Intersection Capacity Utilization 51.0% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 1: West Ridge Drive/Kittiwake Drive & Hazeldean Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	292	0	0	565	6	0	0	0	42	0	37
Future Volume (vph)	51	292	0	0	565	6	0	0	0	42	0	37
Satd. Flow (prot)	1658	3283	0	1745	1745	1483	0	1745	0	0	1658	1483
Flt Permitted	0.405										0.757	
Satd. Flow (perm)	705	3283	0	1745	1745	1438	0	1745	0	0	1321	1483
Satd. Flow (RTOR)						28						41
Lane Group Flow (vph)	57	324	0	0	628	7	0	0	0	0	47	41
Turn Type	Perm	NA		Perm	NA	Perm				custom	NA	custom
Protected Phases		2			6			4			4	
Permitted Phases	2			6		6	4			8		8
Detector Phase	2	2		6	6	6	4	4		8	4	8
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	30.1	30.1		34.1	34.1	34.1	34.3	34.3		34.3	34.3	34.3
Total Split (s)	93.0	93.0		93.0	93.0	93.0	37.0	37.0		37.0	37.0	37.0
Total Split (%)	71.5%	71.5%		71.5%	71.5%	71.5%	28.5%	28.5%		28.5%	28.5%	28.5%
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3		3.3	3.3	3.3
All-Red Time (s)	2.4	2.4		2.4	2.4	2.4	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1	6.1		6.3			6.3	6.3
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max	C-Max	None	None		None	None	None
Act Effct Green (s)	110.8	110.8			110.8	110.8					11.3	11.3
Actuated g/C Ratio	0.85	0.85			0.85	0.85					0.09	0.09
v/c Ratio	0.09	0.12			0.42	0.01					0.41	0.25
Control Delay	3.4	2.7			2.7	0.2					66.8	19.3
Queue Delay	0.0	0.0			0.2	0.0					0.0	0.0
Total Delay	3.4	2.7			2.9	0.2					66.8	19.3
LOS	A	A			A	A					E	B
Approach Delay		2.8			2.9						44.6	
Approach LOS		A			A						D	
Queue Length 50th (m)	2.0	6.0			20.9	0.0					11.8	0.0
Queue Length 95th (m)	6.8	13.7			m40.8	m0.0					23.7	10.7
Internal Link Dist (m)		355.8			168.3			30.9			31.1	
Turn Bay Length (m)	140.0					100.0						
Base Capacity (vph)	601	2798			1487	1230					311	381
Starvation Cap Reductn	0	0			263	0					0	0
Spillback Cap Reductn	0	0			0	0					0	0
Storage Cap Reductn	0	0			0	0					0	0
Reduced v/c Ratio	0.09	0.12			0.51	0.01					0.15	0.11

Intersection Summary

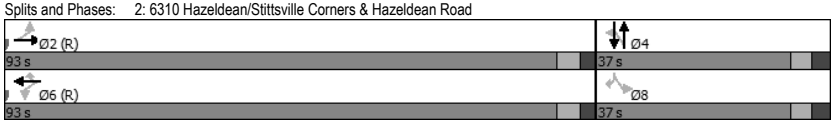
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 35 (27%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.42

Intersection Signal Delay: 6.2	Intersection LOS: A
Intersection Capacity Utilization 63.4%	ICU Level of Service B
Analysis Period (min) 15	

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

Splits and Phases: 2: 6310 Hazeldean/Stittsville Corners & Hazeldean Road



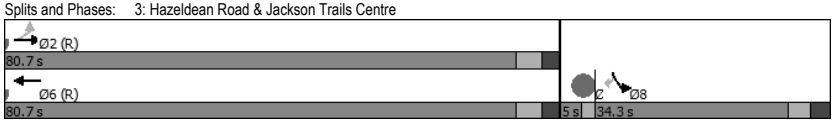
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø7
Lane Configurations							
Traffic Volume (vph)	65	355	477	14	15	39	
Future Volume (vph)	65	355	477	14	15	39	
Satd. Flow (prot)	1658	3316	3298	0	1580	1469	
Flt Permitted	0.448				0.950		
Satd. Flow (perm)	777	3316	3298	0	1580	1469	
Satd. Flow (RTOR)			5			43	
Lane Group Flow (vph)	72	394	546	0	17	43	
Turn Type	Perm	NA	NA		Prot	Perm	
Protected Phases		2	6		8		7
Permitted Phases	2					8	
Detector Phase	2	2	6		8	8	
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0		10.0	10.0	1.0
Minimum Split (s)	24.4	24.4	33.4		34.3	34.3	5.0
Total Split (s)	80.7	80.7	80.7		34.3	34.3	5.0
Total Split (%)	67.3%	67.3%	67.3%		28.6%	28.6%	4%
Yellow Time (s)	3.7	3.7	3.7		3.3	3.3	2.0
All-Red Time (s)	2.7	2.7	2.7		3.0	3.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.4	6.4	6.4		6.3	6.3	
Lead/Lag					Lag	Lag	Lead
Lead-Lag Optimize?					Yes	Yes	Yes
Recall Mode	C-Max	C-Max	C-Max		None	None	None
Act Effct Green (s)	101.8	101.8	101.8		10.0	10.0	
Actuated g/C Ratio	0.85	0.85	0.85		0.08	0.08	
v/c Ratio	0.11	0.14	0.20		0.13	0.27	
Control Delay	2.7	2.3	2.4		53.5	19.5	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	2.7	2.3	2.4		53.5	19.5	
LOS	A	A	A		D	B	
Approach Delay		2.3	2.4		29.1		
Approach LOS		A	A		C		
Queue Length 50th (m)	2.8	8.3	12.0		3.8	0.0	
Queue Length 95th (m)	5.7	11.3	15.7		11.1	11.1	
Internal Link Dist (m)		634.2	235.6		86.5		
Turn Bay Length (m)	49.0					13.5	
Base Capacity (vph)	659	2814	2800		368	375	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.11	0.14	0.20		0.05	0.11	

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 99 (83%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.27

Intersection Signal Delay: 3.9	Intersection LOS: A
Intersection Capacity Utilization 47.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: Hazeldean Road & Jackson Trails Centre

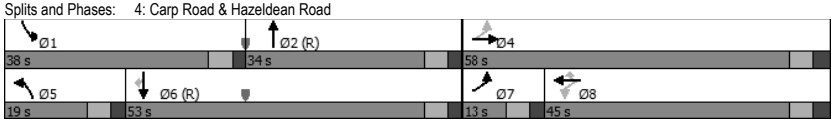


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	339	86	46	408	397	97	392	21	293	450	227
Future Volume (vph)	130	339	86	46	408	397	97	392	21	293	450	227
Satd. Flow (prot)	1658	3154	0	1470	1745	1455	1658	3185	0	1658	1745	1483
Flt Permitted	0.137			0.481			0.950			0.950		
Satd. Flow (perm)	239	3154	0	741	1745	1427	1654	3185	0	1653	1745	1433
Satd. Flow (RTOR)		29				421		4				240
Lane Group Flow (vph)	144	473	0	51	453	441	108	459	0	326	500	252
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
Detector Phase	7	4		8	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0	10.0	5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	11.1	39.6		39.6	39.6	39.6	11.0	32.1		11.0	32.1	32.1
Total Split (s)	13.0	58.0		45.0	45.0	45.0	19.0	34.0		38.0	53.0	53.0
Total Split (%)	10.0%	44.6%		34.6%	34.6%	34.6%	14.6%	26.2%		29.2%	40.8%	40.8%
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.7	3.7		3.7	3.7	3.7
All-Red Time (s)	2.4	2.9		2.9	2.9	2.9	2.3	2.4		2.3	2.4	2.4
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.1	6.6		6.6	6.6	6.6	6.0	6.1		6.0	6.1	6.1
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	50.0	49.5		36.5	36.5	36.5	11.9	32.8		29.0	49.9	49.9
Actuated g/C Ratio	0.38	0.38		0.28	0.28	0.28	0.09	0.25		0.22	0.38	0.38
v/c Ratio	0.86	0.39		0.25	0.93	0.63	0.72	0.57		0.88	0.75	0.36
Control Delay	73.7	29.4		38.8	71.3	8.6	82.6	46.8		60.2	57.2	18.0
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	73.7	29.4		38.8	71.3	8.6	82.6	46.8		60.2	57.2	18.0
LOS	E	C		D	E	A	F	D		E	E	B
Approach Delay		39.7			40.2			53.6			48.9	
Approach LOS		D			D			D			D	
Queue Length 50th (m)	26.0	45.3		9.9	110.6	3.7	27.1	56.3		84.8	129.5	20.7
Queue Length 95th (m)	#60.5	62.6		21.4	#167.8	32.9	#50.6	75.1		m106.4	m159.5	m33.4
Internal Link Dist (m)		168.3			634.2			616.4			97.4	
Turn Bay Length (m)	95.0			53.5			41.0			80.0		
Base Capacity (vph)	167	1264		218	515	718	165	806		408	670	698
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	0.86	0.37		0.23	0.88	0.61	0.65	0.57		0.80	0.75	0.36

Intersection Summary
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 8 (6%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.93
Intersection Signal Delay: 45.4 — Intersection LOS: D
Intersection Capacity Utilization 90.5% — ICU Level of Service E
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Carp Road & Hazeldean Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	22	50	55	22	85	58	742	34	114	861	144
Future Volume (vph)	130	22	50	55	22	85	58	742	34	114	861	144
Satd. Flow (prot)	1658	1520	0	0	1594	0	1658	1668	0	1658	1745	1483
Flt Permitted	0.523				0.855		0.152			0.192		
Satd. Flow (perm)	913	1520	0	0	1375	0	265	1668	0	335	1745	1446
Satd. Flow (RTOR)		56			37			4				75
Lane Group Flow (vph)	144	80	0	0	179	0	64	862	0	127	957	160
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
Detector Phase	4	4		8	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	29.3	29.3		29.3	29.3		10.6	32.0		10.6	32.0	32.0
Total Split (s)	30.0	30.0		30.0	30.0		11.0	89.0		11.0	89.0	89.0
Total Split (%)	23.1%	23.1%		23.1%	23.1%		8.5%	68.5%		8.5%	68.5%	68.5%
Yellow Time (s)	3.0	3.0		3.0	3.0		3.7	3.7		3.7	3.7	3.7
All-Red Time (s)	3.3	3.3		3.3	3.3		1.9	2.3		1.9	2.3	2.3
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3			6.3		5.6	6.0		5.6	6.0	6.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	22.4	22.4			22.4		90.0	84.1		91.3	86.5	86.5
Actuated g/C Ratio	0.17	0.17			0.17		0.69	0.65		0.70	0.67	0.67
v/c Ratio	0.92	0.26			0.67		0.27	0.80		0.43	0.82	0.16
Control Delay	106.1	19.9			52.6		5.2	14.5		10.1	25.2	5.3
Queue Delay	0.0	0.0			0.0		0.0	0.2		0.0	0.0	0.0
Total Delay	106.1	19.9			52.6		5.2	14.7		10.1	25.2	5.3
LOS	F	B			D		A	B		B	C	A
Approach Delay		75.3			52.6			14.1			21.1	
Approach LOS		E			D			B			C	
Queue Length 50th (m)	36.2	5.2			34.1		2.1	62.5		8.6	183.6	7.8
Queue Length 95th (m)	#74.4	19.1			59.6		m3.5	m56.0		14.5	259.8	16.3
Internal Link Dist (m)		73.3			85.0			145.3			438.0	
Turn Bay Length (m)	65.5						24.0			36.0		36.8
Base Capacity (vph)	166	322			280		241	1080		292	1161	987
Starvation Cap Reductn	0	0			0		0	17		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	0.87	0.25			0.64		0.27	0.81		0.43	0.82	0.16

Intersection Summary

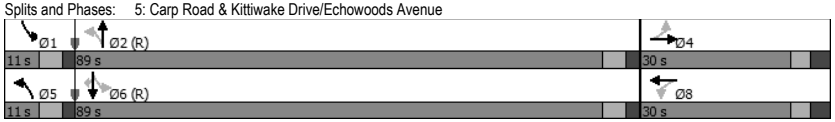
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 11 (8%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92
Intersection Signal Delay: 25.5 — Intersection LOS: C
Intersection Capacity Utilization 83.5% — ICU Level of Service E
Analysis Period (min) 15

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

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

Splits and Phases: 5: Carp Road & Kittiwake Drive/Echowoods Avenue



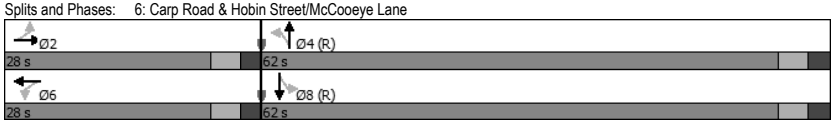
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	18	54	35	25	67	70	343	44	61	515	73
Future Volume (vph)	43	18	54	35	25	67	70	343	44	61	515	73
Satd. Flow (prot)	0	1586	0	0	1578	0	1658	1652	0	1658	1691	0
Flt Permitted		0.774			0.853		0.364			0.497		
Satd. Flow (perm)	0	1249	0	0	1364	0	633	1652	0	862	1691	0
Satd. Flow (RTOR)		47			59			14			15	
Lane Group Flow (vph)	0	128	0	0	141	0	78	430	0	68	653	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	27.6	27.6		27.6	27.6		29.8	29.8		29.8	29.8	
Total Split (s)	28.0	28.0		28.0	28.0		62.0	62.0		62.0	62.0	
Total Split (%)	31.1%	31.1%		31.1%	31.1%		68.9%	68.9%		68.9%	68.9%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.3	2.3		2.3	2.3		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.6			5.6		5.8	5.8		5.8	5.8	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)		13.2			13.2		65.4	65.4		65.4	65.4	
Actuated g/C Ratio		0.15			0.15		0.73	0.73		0.73	0.73	
v/c Ratio		0.57			0.56		0.17	0.36		0.11	0.53	
Control Delay		32.4			29.1		5.8	6.1		5.2	8.1	
Queue Delay		0.0			0.0		0.0	1.2		0.0	0.0	
Total Delay		32.4			29.1		5.8	7.3		5.2	8.1	
LOS		C			C		A	A		A	A	
Approach Delay		32.4			29.1			7.1			7.9	
Approach LOS		C			C			A			A	
Queue Length 50th (m)		13.4			13.5		3.3	18.0		2.6	35.3	
Queue Length 95th (m)		27.0			27.7		m5.5	m25.7		9.6	91.6	
Internal Link Dist (m)		112.2			60.6			88.7			616.4	
Turn Bay Length (m)							28.0			44.0		
Base Capacity (vph)		346			383		459	1203		626	1232	
Starvation Cap Reductn		0			0		0	540		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.37			0.37		0.17	0.65		0.11	0.53	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 76 (84%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.57
Intersection Signal Delay: 11.7 — Intersection LOS: B
Intersection Capacity Utilization 67.5% — ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Carp Road & Hobin Street/McCooeye Lane

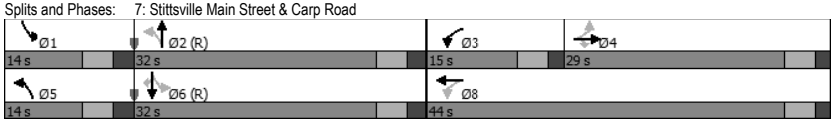


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	108	410	204	120	69	290	395	105	63	434	44
Future Volume (vph)	70	108	410	204	120	69	290	395	105	63	434	44
Satd. Flow (prot)	1658	1745	1469	1658	1611	0	1595	1674	0	1658	1728	1483
Flt Permitted	0.626			0.511			0.134			0.316		
Satd. Flow (perm)	1065	1745	1417	881	1611	0	222	1674	0	549	1728	1394
Satd. Flow (RTOR)			351		41			15				154
Lane Group Flow (vph)	78	120	456	227	210	0	322	556	0	70	482	49
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
Detector Phase	4	4	4	3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0		5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	28.1	28.1	28.1	10.1	28.1		10.5	29.5		10.5	29.5	29.5
Total Split (s)	29.0	29.0	29.0	15.0	44.0		14.0	32.0		14.0	32.0	32.0
Total Split (%)	32.2%	32.2%	32.2%	16.7%	48.9%		15.6%	35.6%		15.6%	35.6%	35.6%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3		3.3	3.3		3.3	3.3	3.3
All-Red Time (s)	1.8	1.8	1.8	1.8	1.8		2.2	2.2		2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.1	5.1	5.1	5.1	5.1		5.5	5.5		5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lag	Lead			Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	16.1	16.1	16.1	31.1	31.1		46.2	37.7		33.7	26.5	26.5
Actuated g/C Ratio	0.18	0.18	0.18	0.35	0.35		0.51	0.42		0.37	0.29	0.29
v/c Ratio	0.41	0.38	0.84	0.58	0.36		0.89	0.78		0.24	0.95	0.09
Control Delay	41.7	38.9	31.2	27.6	18.0		53.4	35.8		15.2	62.0	0.4
Queue Delay	0.0	0.0	0.1	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	41.7	38.9	31.3	27.6	18.0		53.4	35.8		15.2	62.0	0.4
LOS	D	D	C	C	B		D	D		B	E	A
Approach Delay		33.9			23.0			42.2			51.5	
Approach LOS		C			C			D			D	
Queue Length 50th (m)	13.3	20.2	28.0	30.7	22.1		36.9	78.6		5.2	81.2	0.0
Queue Length 95th (m)	m25.0	35.3	72.4	41.7	33.2		#116.8	#170.3		14.2	#139.7	0.0
Internal Link Dist (m)		88.7			74.0			130.8			407.0	
Turn Bay Length (m)	38.0		53.0	21.5			79.5			52.0		37.5
Base Capacity (vph)	282	463	634	390	719		362	710		318	508	519
Starvation Cap Reductn	0	0	7	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	0.26	0.73	0.58	0.29		0.89	0.78		0.22	0.95	0.09

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

Maximum v/c Ratio: 0.95
Intersection Signal Delay: 39.0 — Intersection LOS: D
Intersection Capacity Utilization 82.0% — ICU Level of Service E
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: Stittsville Main Street & Carp Road



Appendix D

Collision Data

Accident Date	Accident Year	Accident Time	Location	Environment Condition	Light	Traffic Control	Traffic Control Condition	Classification Of Accident	Initial Impact Type	Road Surface Condition	# Vehicles	# Motorcycles	# Bicycles	# Pedestrians
2/2/2018	2018	9:15	CARP RD @ HAZELDEAN RD (0000086)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
2/12/2018	2018	8:45	CARP RD @ HAZELDEAN RD (0000086)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	05 - Turning movement	04 - Slush	0	0	0	0
2/18/2018	2018	10:22	CARP RD @ HAZELDEAN RD (0000086)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
3/14/2018	2018	22:45	CARP RD @ HAZELDEAN RD (0000086)	02 - Rain	07 - Dark	01 - Traffic signal	0	03 - P.D. only	07 - SMV other	06 - Ice	0	0	0	0
5/16/2018	2018	10:44	CARP RD @ HAZELDEAN RD (0000086)	01 - Clear	01 - Daylight	01 - Traffic signal	0	02 - Non-fatal injury	03 - Rear end	01 - Dry	0	0	0	0
5/18/2018	2018	9:20	CARP RD @ HAZELDEAN RD (0000086)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
6/25/2018	2018	16:09	CARP RD @ HAZELDEAN RD (0000086)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
7/13/2018	2018	10:09	CARP RD @ HAZELDEAN RD (0000086)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
8/7/2018	2018	8:54	CARP RD @ HAZELDEAN RD (0000086)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	02 - Angle	01 - Dry	0	0	0	0
8/9/2018	2018	17:30	CARP RD @ HAZELDEAN RD (0000086)	02 - Rain	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	02 - Wet	0	0	0	0
9/27/2018	2018	13:55	CARP RD @ HAZELDEAN RD (0000086)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
11/1/2018	2018	17:04	CARP RD @ HAZELDEAN RD (0000086)	01 - Clear	05 - Dusk	01 - Traffic signal	0	03 - P.D. only	02 - Angle	01 - Dry	0	0	0	0
11/21/2018	2018	17:08	CARP RD @ HAZELDEAN RD (0000086)	01 - Clear	07 - Dark	01 - Traffic signal	0	02 - Non-fatal injury	03 - Rear end	06 - Ice	0	0	0	0
12/2/2018	2018	14:42	CARP RD @ HAZELDEAN RD (0000086)	04 - Freezing Rain	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	04 - Slush	0	0	0	0
1/23/2019	2019	7:10	CARP RD @ HAZELDEAN RD (0000086)	03 - Snow	03 - Dawn	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	03 - Loose snow	0	0	0	0
4/20/2019	2019	13:53	CARP RD @ HAZELDEAN RD (0000086)	02 - Rain	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	02 - Wet	0	0	0	0
4/28/2019	2019	3:30	CARP RD @ HAZELDEAN RD (0000086)	01 - Clear	07 - Dark	01 - Traffic signal	0	03 - P.D. only	07 - SMV other	02 - Wet	0	0	0	0
5/17/2019	2019	11:23	CARP RD @ HAZELDEAN RD (0000086)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	02 - Angle	01 - Dry	0	0	1	0
8/23/2019	2019	10:40	CARP RD @ HAZELDEAN RD (0000086)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
12/31/2019	2019	12:05	CARP RD @ HAZELDEAN RD (0000086)	04 - Freezing Rain	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	07 - SMV other	06 - Ice	0	0	0	0
1/3/2020	2020	9:44	CARP RD @ HAZELDEAN RD (0000086)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	04 - Sideswipe	01 - Dry	0	0	0	0
1/28/2020	2020	7:50	CARP RD @ HAZELDEAN RD (0000086)	01 - Clear	03 - Dawn	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	02 - Wet	0	0	0	0
2/24/2020	2020	20:30	CARP RD @ HAZELDEAN RD (0000086)	01 - Clear	07 - Dark	01 - Traffic signal	0	03 - P.D. only	05 - Turning movement	01 - Dry	0	0	0	0
3/9/2020	2020	16:51	CARP RD @ HAZELDEAN RD (0000086)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
6/17/2020	2020	15:39	CARP RD @ HAZELDEAN RD (0000086)	01 - Clear	01 - Daylight	01 - Traffic signal	0	02 - Non-fatal injury	05 - Turning movement	01 - Dry	0	1	0	0
10/13/2020	2020	16:03	CARP RD @ HAZELDEAN RD (0000086)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	02 - Wet	0	0	0	0
11/7/2020	2020	15:00	CARP RD @ HAZELDEAN RD (0000086)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
1/13/2021	2021	15:00	CARP RD @ HAZELDEAN RD (0000086)	03 - Snow	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	04 - Sideswipe	02 - Wet	0	0	0	0
2/13/2021	2021	10:46	CARP RD @ HAZELDEAN RD (0000086)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	99 - Other	01 - Dry	0	0	0	0
2/16/2021	2021	13:12	CARP RD @ HAZELDEAN RD (0000086)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	05 - Packed snow	0	0	0	0
4/25/2021	2021	14:17	CARP RD @ HAZELDEAN RD (0000086)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	04 - Sideswipe	01 - Dry	0	0	0	0
8/5/2021	2021	14:25	CARP RD @ HAZELDEAN RD (0000086)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	04 - Sideswipe	01 - Dry	0	0	0	0
8/9/2021	2021	11:15	CARP RD @ HAZELDEAN RD (0000086)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
8/23/2021	2021	12:35	CARP RD @ HAZELDEAN RD (0000086)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
8/26/2021	2021	12:35	CARP RD @ HAZELDEAN RD (0000086)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
9/1/2021	2021	16:20	CARP RD @ HAZELDEAN RD (0000086)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
9/23/2021	2021	16:12	CARP RD @ HAZELDEAN RD (0000086)	02 - Rain	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	02 - Wet	0	0	0	0
9/25/2021	2021	10:15	CARP RD @ HAZELDEAN RD (0000086)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
10/1/2021	2021	16:04	CARP RD @ HAZELDEAN RD (0000086)	01 - Clear	01 - Daylight	01 - Traffic signal	0	02 - Non-fatal injury	03 - Rear end	01 - Dry	0	0	0	0
10/21/2021	2021	13:57	CARP RD @ HAZELDEAN RD (0000086)	02 - Rain	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	05 - Turning movement	02 - Wet	0	0	0	0
10/24/2021	2021	8:00	CARP RD @ HAZELDEAN RD (0000086)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
1/6/2022	2022	13:00	CARP RD @ HAZELDEAN RD (0000086)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
3/30/2022	2022	7:43	CARP RD @ HAZELDEAN RD (0000086)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	99 - Other	01 - Dry	0	0	0	0
4/11/2022	2022	15:50	CARP RD @ HAZELDEAN RD (0000086)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
4/19/2022	2022	17:55	CARP RD @ HAZELDEAN RD (0000086)	02 - Rain	01 - Daylight	01 - Traffic signal	0	02 - Non-fatal injury	03 - Rear end	02 - Wet	0	0	0	0
9/27/2022	2022	16:15	CARP RD @ HAZELDEAN RD (0000086)	01 - Clear	01 - Daylight	01 - Traffic signal	0	02 - Non-fatal injury	04 - Sideswipe	01 - Dry	0	0	0	0
5/12/2018	2018	10:18	HAZELDEAN RD @ WEST RIDGE DR (0010365)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	04 - Sideswipe	01 - Dry	0	1	0	0
12/15/2018	2018	18:05	HAZELDEAN RD @ WEST RIDGE DR (0010365)	01 - Clear	07 - Dark	01 - Traffic signal	0	03 - P.D. only	99 - Other	02 - Wet	0	0	0	0
1/10/2019	2019	18:00	HAZELDEAN RD @ WEST RIDGE DR (0010365)	01 - Clear	07 - Dark	01 - Traffic signal	0	03 - P.D. only	04 - Sideswipe	01 - Dry	0	0	0	0
4/7/2019	2019	14:30	HAZELDEAN RD @ WEST RIDGE DR (0010365)	01 - Clear	01 - Daylight	01 - Traffic signal	0	02 - Non-fatal injury	05 - Turning movement	01 - Dry	0	0	0	0
5/3/2019	2019	13:17	HAZELDEAN RD @ WEST RIDGE DR (0010365)	02 - Rain	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	02 - Wet	0	0	0	0
12/16/2019	2019	7:48	HAZELDEAN RD @ WEST RIDGE DR (0010365)	03 - Snow	03 - Dawn	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	05 - Packed snow	0	0	0	0
1/17/2020	2020	9:32	HAZELDEAN RD @ WEST RIDGE DR (0010365)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	07 - SMV other	01 - Dry	0	0	0	0
6/19/2020	2020	10:35	HAZELDEAN RD @ WEST RIDGE DR (0010365)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	02 - Angle	01 - Dry	0	0	1	0
5/26/2021	2021	17:00	HAZELDEAN RD @ WEST RIDGE DR (0010365)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	04 - Sideswipe	01 - Dry	0	0	0	0
11/5/2021	2021	15:45	HAZELDEAN RD @ WEST RIDGE DR (0010365)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
11/7/2021	2021	13:36	HAZELDEAN RD @ WEST RIDGE DR (0010365)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
2/3/2018	2018	8:18	HAZELDEAN RD btwn CARP RD & KITTIWAKE DR (__3ZA3EI)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	03 - Rear end	03 - Loose snow	0	0	0	0
5/25/2020	2020	12:45	HAZELDEAN RD btwn CARP RD & KITTIWAKE DR (__3ZA3EI)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	05 - Turning movement	01 - Dry	0	0	0	0
2/24/2021	2021	16:33	HAZELDEAN RD btwn CARP RD & KITTIWAKE DR (__3ZA3EI)	03 - Snow	01 - Daylight	10 - No control	0	03 - P.D. only	07 - SMV other	06 - Ice	0	0	0	0

Appendix E

TDM Checklist

CGH TRANSPORTATION

TDM-Supportive Development Design and Infrastructure Checklist:
Residential Developments (multi-family or condominium)

Legend

REQUIRED	The Official Plan or Zoning By-law provides related guidance that must be followed
BASIC	The measure is generally feasible and effective, and in most cases would benefit the development and its users
BETTER	The measure could maximize support for users of sustainable modes, and optimize development performance

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	1.	**WALKING & CYCLING: ROUTES**	
	1.1	**Building location & access points**	
BASIC	1.1.1	Locate building close to the street, and do not locate parking areas between the street and building entrances	☐
BASIC	1.1.2	Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	☐
BASIC	1.1.3	Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	☐
	1.2	**Facilities for walking & cycling**	
REQUIRED	1.2.1	Provide convenient, direct access to stations or major stops along rapid transit routes within 600 metres; minimize walking distances from buildings to rapid transit; provide pedestrian-friendly, weather-protected (where possible) environment between rapid transit accesses and building entrances; ensure quality linkages from sidewalks through building entrances to integrated stops/stations *(see Official Plan policy 4.3.3)*	☐
REQUIRED	1.2.2	Provide safe, direct and attractive pedestrian access from public sidewalks to building entrances through such measures as: reducing distances between public sidewalks and major building entrances; providing walkways from public streets to major building entrances; within a site, providing walkways along the front of adjoining buildings, between adjacent buildings, and connecting areas where people may congregate, such as courtyards and transit stops; and providing weather protection through canopies, colonnades, and other design elements wherever possible *(see Official Plan policy 4.3.12)*	☑

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
REQUIRED	1.2.3	Provide sidewalks of smooth, well-drained walking surfaces of contrasting materials or treatments to differentiate pedestrian areas from vehicle areas, and provide marked pedestrian crosswalks at intersection sidewalks *(see Official Plan policy 4.3.10)*	☑
REQUIRED	1.2.4	Make sidewalks and open space areas easily accessible through features such as gradual grade transition, depressed curbs at street corners and convenient access to extra-wide parking spaces and ramps *(see Official Plan policy 4.3.10)*	☑
REQUIRED	1.2.5	Include adequately spaced inter-block/street cycling and pedestrian connections to facilitate travel by active transportation. Provide links to the existing or planned network of public sidewalks, multi-use pathways and on-road cycle routes. Where public sidewalks and multi-use pathways intersect with roads, consider providing traffic control devices to give priority to cyclists and pedestrians *(see Official Plan policy 4.3.11)*	☑
BASIC	1.2.6	Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	☐
BASIC	1.2.7	Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	☐
BASIC	1.2.8	Design roads used for access or circulation by cyclists using a target operating speed of no more than 30 km/h, or provide a separated cycling facility	☐
	1.3	**Amenities for walking & cycling**	
BASIC	1.3.1	Provide lighting, landscaping and benches along walking and cycling routes between building entrances and streets, sidewalks and trails	☐
BASIC	1.3.2	Provide wayfinding signage for site access (where required, e.g. when multiple buildings or entrances exist) and egress (where warranted, such as when directions to reach transit stops/stations, trails or other common destinations are not obvious)	☐

	TDM-supportive design & infrastructure measures: *Residential developments*		Check if completed & add descriptions, explanations or plan/drawing references
	2.	**WALKING & CYCLING: END-OF-TRIP FACILITIES**	
	2.1	**Bicycle parking**	
REQUIRED	2.1.1	Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible *(see Official Plan policy 4.3.6)*	☑
REQUIRED	2.1.2	Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas *(see Zoning By-law Section 111)*	☑
REQUIRED	2.1.3	Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored *(see Zoning By-law Section 111)*	☑
BASIC	2.1.4	Provide bicycle parking spaces equivalent to the expected number of resident-owned bicycles, plus the expected peak number of visitor cyclists	☐
	2.2	**Secure bicycle parking**	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single residential building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers *(see Zoning By-law Section 111)*	☑
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to at least the number of units at condominiums or multi-family residential developments	☐
	2.3	**Bicycle repair station**	
BETTER	2.3.1	Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	☐
	3.	**TRANSIT**	
	3.1	**Customer amenities**	
BASIC	3.1.1	Provide shelters, lighting and benches at any on-site transit stops	☐
BASIC	3.1.2	Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	☐
BETTER	3.1.3	Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	☐

TDM-Supportive Development Design and Infrastructure Checklist **City of Ottawa**
Version 1.0 (30 June 2017)

	TDM-supportive design & infrastructure measures: *Residential developments*		Check if completed & add descriptions, explanations or plan/drawing references
	4.	**RIDESHARING**	
	4.1	**Pick-up & drop-off facilities**	
BASIC	4.1.1	Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	☐
	5.	**CARSHARING & BIKESHARING**	
	5.1	**Carshare parking spaces**	
BETTER	5.1.1	Provide up to three carshare parking spaces in an R3, R4 or R5 Zone for specified residential uses *(see Zoning By-law Section 94)*	☐
	5.2	**Bikeshare station location**	
BETTER	5.2.1	Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	☐
	6.	**PARKING**	
	6.1	**Number of parking spaces**	
REQUIRED	6.1.1	Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	☑
BASIC	6.1.2	Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking	☐
BASIC	6.1.3	Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly *(see Zoning By-law Section 104)*	☐
BETTER	6.1.4	Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking *(see Zoning By-law Section 111)*	☐
	6.2	**Separate long-term & short-term parking areas**	
BETTER	6.2.1	Provide separate areas for short-term and long-term parking (using signage or physical barriers) to permit access controls and simplify enforcement (i.e. to discourage residents from parking in visitor spaces, and vice versa)	☐

TDM Measures Checklist:
Residential Developments (multi-family, condominium or subdivision)

Legend

BASIC — The measure is generally feasible and effective, and in most cases would benefit the development and its users

BETTER — The measure could maximize support for users of sustainable modes, and optimize development performance

★ — The measure is one of the most dependably effective tools to encourage the use of sustainable modes

			TDM measures: *Residential developments*	Check if proposed & add descriptions
		1.	**TDM PROGRAM MANAGEMENT**	
		1.1	**Program coordinator**	
BASIC	★	1.1.1	Designate an internal coordinator, or contract with an external coordinator	☐
		1.2	**Travel surveys**	
BETTER		1.2.1	Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress	☐
		2.	**WALKING AND CYCLING**	
		2.1	**Information on walking/cycling routes & destinations**	
BASIC		2.1.1	Display local area maps with walking/cycling access routes and key destinations at major entrances *(multi-family, condominium)*	☑
		2.2	**Bicycle skills training**	
BETTER		2.2.1	Offer on-site cycling courses for residents, or subsidize off-site courses	☐

			TDM measures: *Residential developments*	Check if proposed & add descriptions
		3.	**TRANSIT**	
		3.1	**Transit information**	
BASIC		3.1.1	Display relevant transit schedules and route maps at entrances *(multi-family, condominium)*	☑
BETTER		3.1.2	Provide real-time arrival information display at entrances *(multi-family, condominium)*	☐
		3.2	**Transit fare incentives**	
BASIC	★	3.2.1	Offer PRESTO cards preloaded with one monthly transit pass on residence purchase/move-in, to encourage residents to use transit	☐
BETTER		3.2.2	Offer at least one year of free monthly transit passes on residence purchase/move-in	☑
		3.3	**Enhanced public transit service**	
BETTER	★	3.3.1	Contract with OC Transpo to provide early transit services until regular services are warranted by occupancy levels *(subdivision)*	☐
		3.4	**Private transit service**	
BETTER		3.4.1	Provide shuttle service for seniors homes or lifestyle communities (e.g. scheduled mall or supermarket runs)	☐
		4.	**CARSHARING & BIKESHARING**	
		4.1	**Bikeshare stations & memberships**	
BETTER		4.1.1	Contract with provider to install on-site bikeshare station (*multi-family)*	☐
BETTER		4.1.2	Provide residents with bikeshare memberships, either free or subsidized *(multi-family)*	☐
		4.2	**Carshare vehicles & memberships**	
BETTER		4.2.1	Contract with provider to install on-site carshare vehicles and promote their use by residents	☐
BETTER		4.2.2	Provide residents with carshare memberships, either free or subsidized	☐
		5.	**PARKING**	
		5.1	**Priced parking**	
BASIC	★	5.1.1	Unbundle parking cost from purchase price *(condominium)*	☐
BASIC	★	5.1.2	Unbundle parking cost from monthly rent *(multi-family)*	☑

			TDM measures: *Residential developments*	Check if proposed & add descriptions
		6.	**TDM MARKETING & COMMUNICATIONS**	
		6.1	**Multimodal travel information**	
BASIC	★	6.1.1	Provide a multimodal travel option information package to new residents	☑
		6.2	**Personalized trip planning**	
BETTER	★	6.2.1	Offer personalized trip planning to new residents	☐

Appendix F

Turning Templates

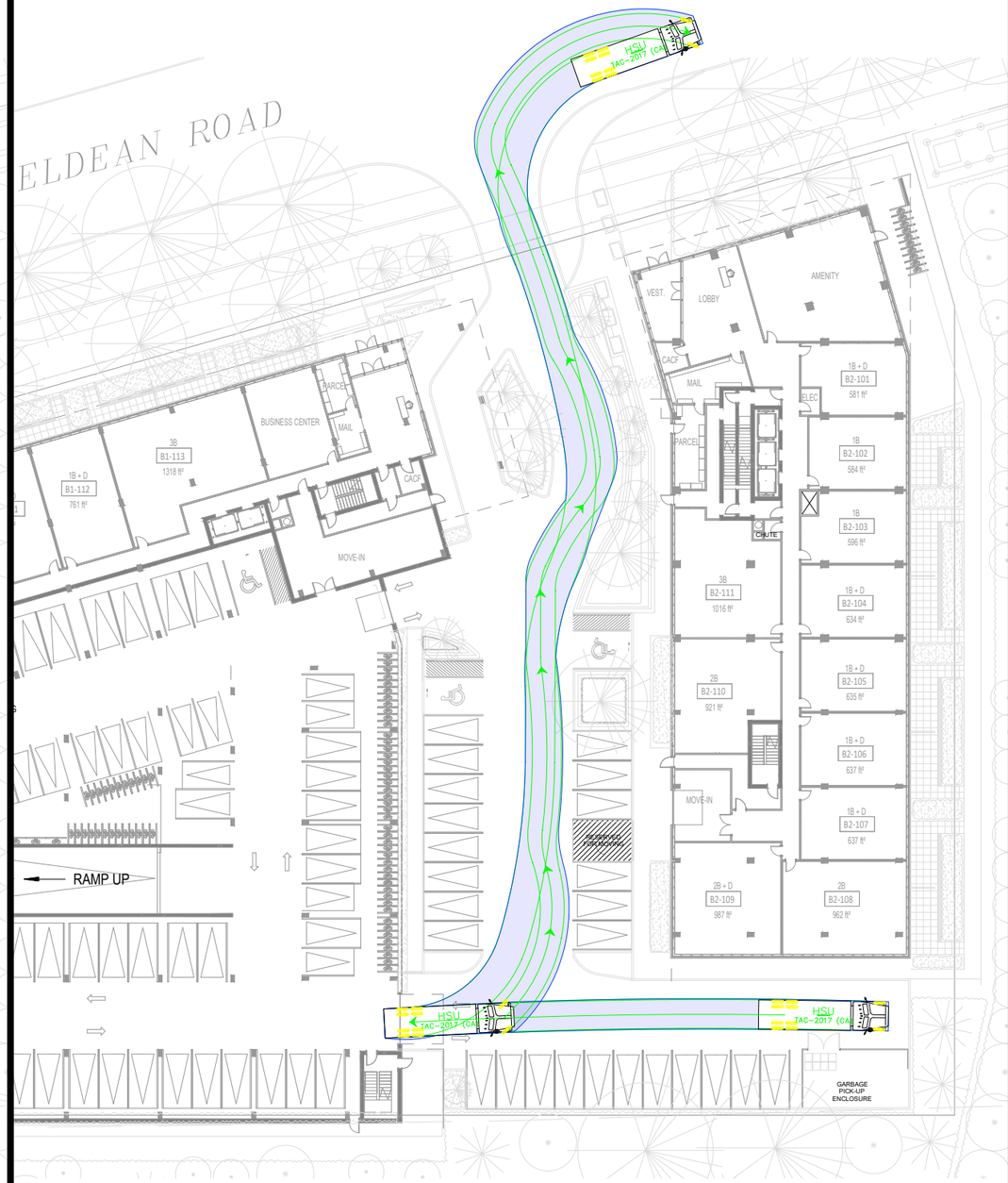
CGH TRANSPORTATION

A

Garabge **Inbound**
Movement

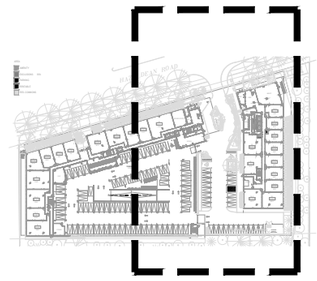
B

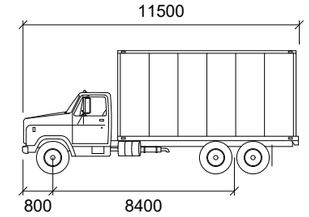
Garabge **Outbound**
Movement



Notes:

Key Plan:





HSU

	mm
Width	: 2600
Track	: 2600
Lock to Lock Time	: 6.0
Steering Angle	: 40.0

REV:	DESCRIPTION:	BY:	DATE:
01	Issued for Review:	AN	2023-12-14

STATUS:

CGH Transportation
6 Plaza Court
Ottawa, ON
K2H 7W1
(343) 999-9117

CLIENT: Devmont
5139 Av. de Courtrai Suite 300
Montréal, QC H3W 0A9
(514) 525-2929

ARCHITECT:

SITE: 6310 Hazeldean Road

TITLE: Turning Movement Analysis
Garbage Turning Movements

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
NTS	2023-12-14	AN	AH

PROJECT NO:	DRAWING NO:	REVISION:
2023-114	001	01

A

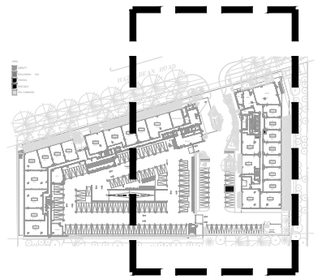
LSU **Inbound**
Movement

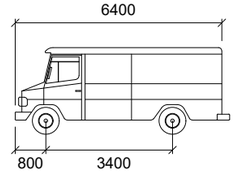
B

LSU **Outbound**
Movement

Notes:

Key Plan:





LSU

	mm
Width	: 2600
Track	: 2600
Lock to Lock Time	: 6.0
Steering Angle	: 40.3

REV:	DESCRIPTION:	BY:	DATE:
01	Issued for Review:	AN	2023-12-14

STATUS:

CGH Transportation
6 Plaza Court
Ottawa, ON
K2H 7W1
(343) 999-9117

CLIENT: Devmont
5139 Av. de Courtrai Suite 300
Montréal, QC H3W 0A9
(514) 525-2929

ARCHITECT:

SITE: 6310 Hazeldean Road

TITLE: Turning Movement Analysis
LSU Turning Movements

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
NTS	2023-12-14	AN	AH

PROJECT NO:	DRAWING NO:	REVISION:
2023-114	002	01

Appendix G

MMLOS Analysis

CGH TRANSPORTATION

Multi-Modal Level of Service - Intersections Form

Consultant	CGH Transportation Inc.	Project	6310 Hazeldean Road
Scenario	Existing/Future	Date	12/13/2023
Comments			

INTERSECTIONS	Hazeldean Rd at West Ridge Dr/Kittiwake Dr				Hazeldean Rd at Stittsville Corners Mall				Hazeldean Rd at Jackson Trails Centre Mall				Hazeldean Rd at Carp Rd (Existing)				Hazeldean Rd at Carp Rd (Future)				Carp Rd at Echowoods Ave/Kittiwake Dr (Existing)				Carp Rd at Echowoods Ave/Kittiwake Dr (Future)				Carp Rd at McCooeye Ln /Hobin St				Carp Rd at Stittsville Main St			
Crossing Side	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Pedestrian	Lanes	6	8	5	5	6	6	8	7	7		7	7	6	8	6	7	6	8	6	7	6	6	4	7	6	6	4	7	6	5	5	5	5	6	6	5
	Median	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m		No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m
	Conflicting Left Turns	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive		Protected	No left turn / Prohib.	Protected/ Permissive	Permissive	Protected	Protected	Protected/ Permissive	Permissive	Protected	Protected	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Protected/ Permissive	Protected/ Permissive	Protected/ Permissive
	Conflicting Right Turns	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control		No right turn	Protected	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control
	Right Turns on Red (RTOR) ?	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed		RTOR prohibited	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed
	Ped Signal Leading Interval?	No	No	No	No	No	No	No	No	Yes		No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	Right Turn Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel		No Right Turn	No Right Turn	Conv/I without Receiving Lane	No Channel	No Channel	Conv/I without Receiving Lane	Conv/I without Receiving Lane	No Channel	No Channel	Conv/I without Receiving Lane	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	Conv/I without Receiving Lane	No Channel	Conv/I without Receiving Lane
	Corner Radius	15-25m	10-15m	10-15m	10-15m	5-10m	10-15m	10-15m	10-15m	15-25m		No Right Turn	10-15m	>25m	10-15m	10-15m	>25m	>25m	10-15m	10-15m	>25m	5-10m	10-15m	5-10m	15-25m	5-10m	10-15m	10-15m	10-15m	5-10m	5-10m	10-15m	10-15m	5-10m	15-25m	15-25m	>25m
	Crosswalk Type	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings		Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings
	PETSI Score	**18**	**-12**	**37**	**37**	**21**	**20**	**-12**	**4**	**4**		**30**	**17**	**21**	**-12**	**28**	**13**	**21**	**-12**	**28**	**13**	**21**	**20**	**64**	**2**	**21**	**20**	**63**	**4**	**21**	**26**	**37**	**37**	**36**	**22**	**18**	**26**
	Ped. Exposure to Traffic LoS	**F**	**F**	**E**	**E**	**F**	**F**	**F**	**F**	**F**	-	**E**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**D**	**F**	**F**	**F**	**D**	**F**	**F**	**E**	**E**	**E**	**F**	**F**	**F**	**E**
	Cycle Length	85	85	85	85	125	125	125	125	115		115	115	130	125	125	125	130	125	125	125	125	125	130	130	125	125	130	130	80	80	90	90	90	90	80	90
	Effective Walk Time	17	17	19	19	8	8	67	67	7		50	70	28	8	7	22	28	8	7	22	46	46	8	8	46	46	8	8	31	31	7	7	9	9	9	8
	Average Pedestrian Delay	**27**	**27**	**26**	**26**	**58**	**58**	**13**	**13**	**51**		**16**	**9**	**48**	**58**	**56**	**42**	**48**	**58**	**56**	**42**	**28**	**28**	**57**	**67**	**28**	**28**	**57**	**67**	**18**	**18**	**39**		**36**	**36**	**32**	**37**
	Pedestrian Delay LoS	**C**	**C**	**C**	**C**	**E**	**E**	**B**	**B**	**E**	-	**B**	**A**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**C**	**C**	**E**	**E**	**C**	**C**	**E**	**E**	**B**	**B**	**D**	**D**	**D**	**D**	**D**	**D**
	Level of Service	**F**	**F**	**E**	**E**	**F**	**F**	**F**	**F**	**F**	-	**E**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**E**	**F**	**F**	**F**	**E**	**F**	**F**	**E**	**E**	**E**	**E**	**F**	**F**	**E**
		F				**F**				**F**				**F**				**F**				**F**				**F**				**F**				**F**			
Bicycle	**Approach From**	**NORTH**	**SOUTH**	**EAST**	**WEST**	**NORTH**	**SOUTH**	**EAST**	**WEST**	**NORTH**	**SOUTH**	**EAST**	**WEST**	**NORTH**	**SOUTH**	**EAST**	**WEST**	**NORTH**	**SOUTH**	**EAST**	**WEST**	**NORTH**	**SOUTH**	**EAST**	**WEST**	**NORTH**	**SOUTH**	**EAST**	**WEST**	**NORTH**	**SOUTH**	**EAST**	**WEST**	**NORTH**	**SOUTH**	**EAST**	**WEST**
	Bicycle Lane Arrangement on Approach	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Pocket Bike Lane	Curb Bike Lane, Cycletrack or MUP	Mixed Traffic		Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Mixed Traffic	Mixed Traffic	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic
	Right Turn Lane Configuration							> 50 m Introduced right turn lane						Not Applicable	Not Applicable	Not Applicable		Bike lane shifts to the left of right turn	Not Applicable	Not Applicable		Not Applicable	Not Applicable			Not Applicable	Not Applicable							> 50 m			> 50 m
	Right Turning Speed							≤ 25 km/h						Not Applicable	Not Applicable	Not Applicable		Not Applicable	Not Applicable	Not Applicable		Not Applicable	Not Applicable			Not Applicable	Not Applicable							>25 km/h			≥25 km/h
	Cyclist relative to RT motorists	**#N/A**	**#N/A**	**#N/A**	**#N/A**	**#N/A**	**#N/A**	**D**	**Not Applicable**	**#N/A**	-	**Not Applicable**	**Not Applicable**	**Not Applicable**	**Not Applicable**	**Not Applicable**	**Not Applicable**	**Not Applicable**	**Not Applicable**	**Not Applicable**	**Not Applicable**	**Not Applicable**	**Not Applicable**	**#N/A**	**#N/A**	**Not Applicable**	**Not Applicable**	**Not Applicable**	**Not Applicable**	**#N/A**	**#N/A**	**#N/A**	**#N/A**	**F**	**#N/A**	**#N/A**	**E**
	Separated or Mixed Traffic	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**	**Separated**	**Separated**	**Mixed Traffic**	-	**Separated**	**Separated**	**Separated**	**Separated**	**Separated**	**Separated**	**Separated**	**Separated**	**Separated**	**Separated**	**Separated**	**Separated**	**Mixed Traffic**	**Mixed Traffic**	**Separated**	**Separated**	**Separated**	**Separated**	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**
	Left Turn Approach	One lane crossed	One lane crossed	One lane crossed	One lane crossed	One lane crossed	No lane crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	No lane crossed		1 lane crossed	≥ 2 lanes crossed	1 lane crossed	≥ 2 lanes crossed	1 lane crossed	≥ 2 lanes crossed	1 lane crossed	≥ 2 lanes crossed	1 lane crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	1 lane crossed	No lane crossed	One lane crossed	2-stage, LT box	2-stage, LT box	2-stage, LT box	2-stage, LT box	One lane crossed	One lane crossed	No lane crossed	No lane crossed	≥ 2 lanes crossed	One lane crossed	One lane crossed	≥ 2 lanes crossed
	Operating Speed	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	≤ 60 km/h	≤ 60 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	≤ 60 km/h	≤ 60 km/h	> 50 to ≤ 60 km/h		≤ 60 km/h	≤ 60 km/h	> 50 to ≤ 60 km/h	> 50 to ≤ 60 km/h	≤ 60 km/h	≤ 60 km/h	> 50 to ≤ 60 km/h	> 50 to ≤ 60 km/h	≤ 60 km/h	≤ 60 km/h	> 50 to ≤ 60 km/h	> 50 to ≤ 60 km/h	> 50 to ≤ 60 km/h	> 40 to ≤ 50 km/h	> 50 to ≤ 60 km/h	> 50 to ≤ 60 km/h	> 50 to ≤ 60 km/h	> 40 to ≤ 50 km/h	> 50 to ≤ 60 km/h	> 50 to ≤ 60 km/h	> 50 to ≤ 60 km/h	> 50 to ≤ 60 km/h	> 50 to ≤ 60 km/h	> 50 to ≤ 60 km/h	> 50 to ≤ 60 km/h	> 50 to ≤ 60 km/h
	Left Turning Cyclist	**D**	**D**	**F**	**F**	**D**	**B**	**F**	**F**	**C**	-	**E**	**F**	**D**	**F**	**E**	**F**	**D**	**F**	**E**	**F**	**F**	**D**	**C**	**D**	**A**	**A**	**A**	**A**	**E**	**E**	**B**	**C**	**F**	**E**	**E**	**F**
	Level of Service	**#N/A**	**#N/A**	**#N/A**	**#N/A**	**#N/A**	**#N/A**	**F**	**F**	**#N/A**	-	**E**	**F**	**D**	**F**	**E**	**F**	**D**	**F**	**E**	**F**	**F**	**D**	**#N/A**	**#N/A**	**A**	**A**	**A**	**A**	**#N/A**	**#N/A**	**#N/A**	**#N/A**	**F**	**#N/A**	**#N/A**	**F**
		F				**F**				**F**				**F**				**F**				**F**				**A**				**E**				**F**			
Transit	Average Signal Delay																																	> 40 sec	≤ 40 sec		≤ 40 sec
	Level of Service	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**F**	**E**	-	**E**
		-				-				-				-				-				-				-				-				**F**			
Truck	Effective Corner Radius													> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m													> 15 m	> 15 m	> 15 m	> 15 m
	Number of Receiving Lanes on Departure from Intersection													1	1	≥ 2	1	1	1	≥ 2	1													1	1	1	1
	Level of Service	-	-	-	-	-	-	-	-	-	-	-	-	**C**	**C**	**A**	**C**	**C**	**C**	**A**	**C**	-	-	-	-	-	-	-	-	-	-	-	-	**C**	**C**	**C**	**C**
		-				-				-				**C**				**C**				-				-				-				**C**			
Auto	Volume to Capacity Ratio	0.0 - 0.60				0.0 - 0.60				0.0 - 0.60				0.81 - 0.90				0.91 - 1.00				0.81 - 0.90				0.61 - 0.70				0.0 - 0.60				0.81 - 0.90			
	Level of Service	**A**				**A**				**A**				**D**				**E**				**D**				**B**				**A**				**D**			

Multi-Modal Level of Service - Segments Form

Consultant	**CGH Transportation Inc.**	**Project**	**6310 Hazeldean Road**
Scenario	**Existing/Future**	**Date**	**12/13/2023**
Comments			

SEGMENTS			Hazeldean Rd	Section	Section
			Existing/Future	2	3
Pedestrian	Sidewalk Width Boulevard Width		≥ 2 m < 0.5		
	Avg Daily Curb Lane Traffic Volume		> 3000		
	Operating Speed On-Street Parking		> 30 to 50 km/h no		
	Exposure to Traffic PLoS	**-**	**C**	**-**	**-**
	Effective Sidewalk Width				
	Pedestrian Volume				
	Crowding PLoS		**-**	**-**	**-**
	Level of Service		**-**	**-**	**-**
Bicycle	Type of Cycling Facility		Mixed Traffic		
	Number of Travel Lanes		4-5 lanes total		
	Operating Speed		≥ 60 km/h		
	# of Lanes & Operating Speed LoS		**F**	**-**	**-**
	Bike Lane (+ Parking Lane) Width				
	Bike Lane Width LoS	**F**	**-**	**-**	**-**
	Bike Lane Blockages				
	Blockage LoS		**-**	**-**	**-**
	Median Refuge Width (no median = < 1.8 m)		< 1.8 m refuge		
	No. of Lanes at Unsignalized Crossing		≤ 3 lanes		
	Sidestreet Operating Speed		>60 to <65 km/h		
	Unsignalized Crossing - Lowest LoS		**D**	**-**	**-**
	Level of Service		**F**	**-**	**-**
Transit	Facility Type				
	Friction or Ratio Transit:Posted Speed	**-**			
	Level of Service		**-**	**-**	**-**
Truck	Truck Lane Width		> 3.7 m		
	Travel Lanes per Direction	**B**	1		
	Level of Service		**B**	**-**	**-**

Appendix H

TRANS Model Plots

CGH TRANSPORTATION

TRANS Regional Model

Version 2.16 - Assigned Dec, 2021

AM Peak Hour Total Traffic Volume

Stittsville Growth

2011 Model - Basecase

User Initials: TIMW
Plot Prepared: Dec, 2021
EMME Scenario: 23711

TRANS

Legend

AM Peak Hour Total Traffic Volume

1000 2000 3000 4000 5000

N

Distance (m)

500 1000 1500 2000

The TRANS model is continuously refined & maintained, and all information is provided in good faith. However, model outputs are provided "as is", and no warranty or guarantee is provided as to the accuracy, reliability or reasonableness of the results. In using this data, you agree to accept any and all risks arising from any incorrect, incomplete, or misleading information.

Recipients are required to use caution and professional judgement in using and interpreting model outputs. In particular, caution should be used when focusing on a geographically limited area (such as a single road or intersection), as the model is primarily designed to simulate regional-scale phenomena and has been calibrated at a regional level.

As general good practice, it is recommended that the user confirm the network coding within the area of interest, and compare base year forecasts against traffic count data to assess the extent to which the model may be over- or under-estimating the travel demand.

TRANS Regional Model

Version 2.16 - Assigned Dec, 2021

AM Peak Hour Total Traffic Volume

Stittsville Growth

2031 Model - Basecase

User Initials: TIMW
Plot Prepared: Dec, 2021
EMME Scenario: 21811

TRANS

Legend

AM Peak Hour Total Traffic Volume

1000 2000 3000 4000 5000

N

Distance (m)

500 1000 1500 2000

STITTSVILLE

STANLEY CORNERS

David Manchester Rd

Fernbank Road

Flewellyn Road

Shea Road

Highway 7

Appendix I

Background Development Volumes

CGH TRANSPORTATION

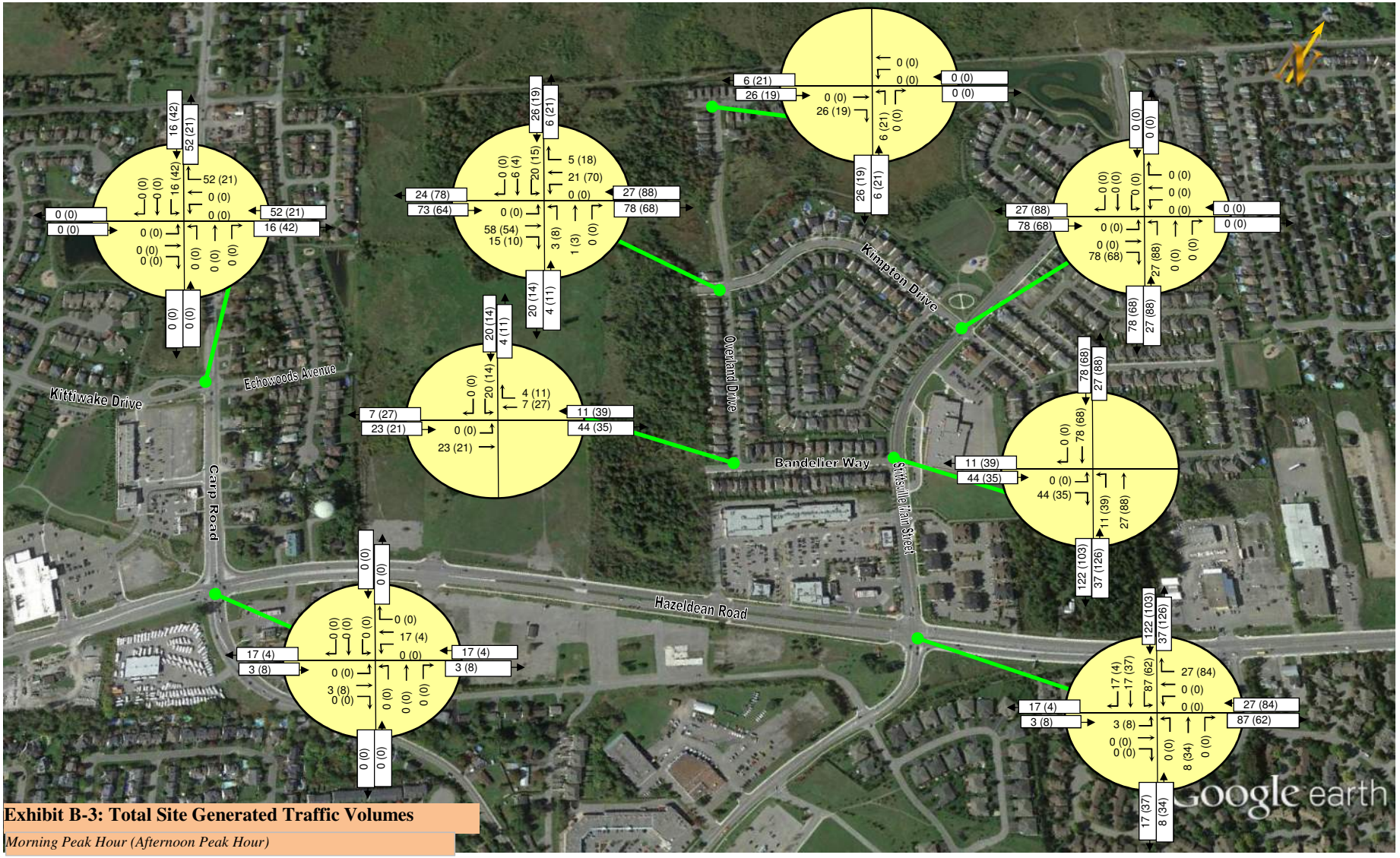


Exhibit B-3: Total Site Generated Traffic Volumes

Morning Peak Hour (Afternoon Peak Hour)

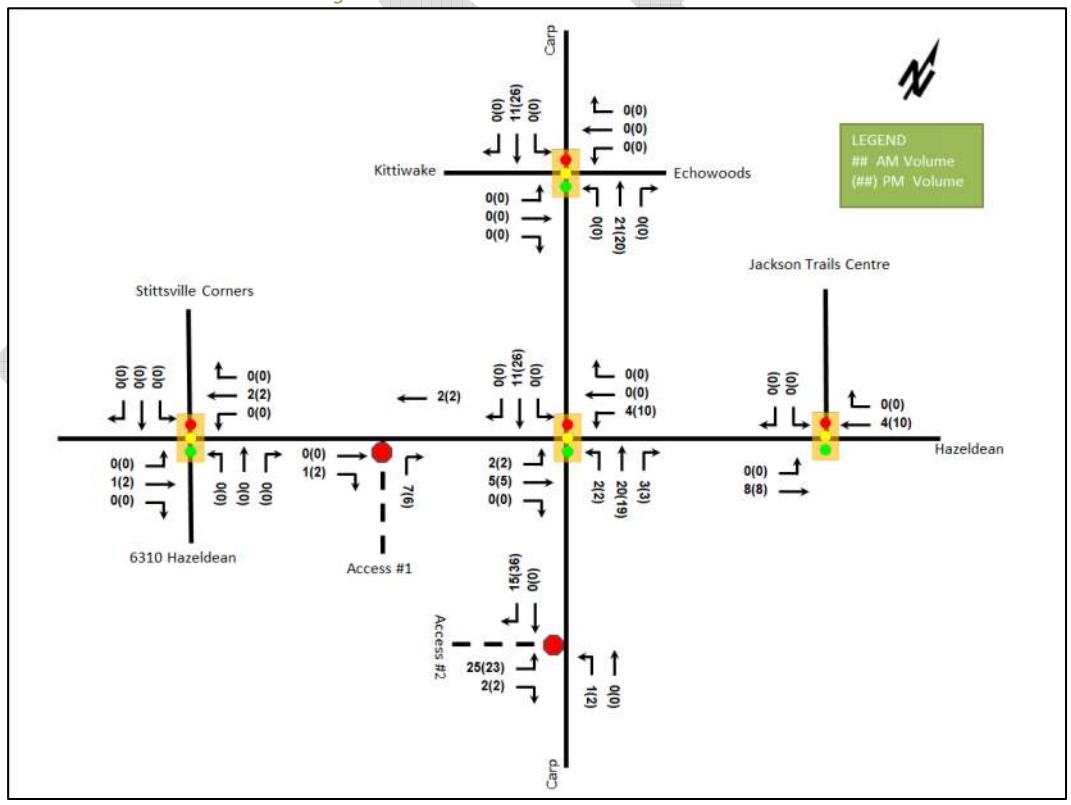
4.4 Trip Assignment

Using the distribution outlined above, turning movement splits, and access to major transportation infrastructure, the trips generated by the site have been assigned to the study area road network. Table 12 summarizes the proportional assignment to the study area roadways, and Figure 14 illustrates the new site generated volumes.

Table 12: Trip Assignment

To/From	Via
North	30% Carp Road (N)
South	5% Carp Road (S)
East	35% Carp Road (N) 25% Hazeldean Road (E)
West	5% Hazeldean Road (W)
Total	**100%**

Figure 14: New Site Generation Auto Volumes

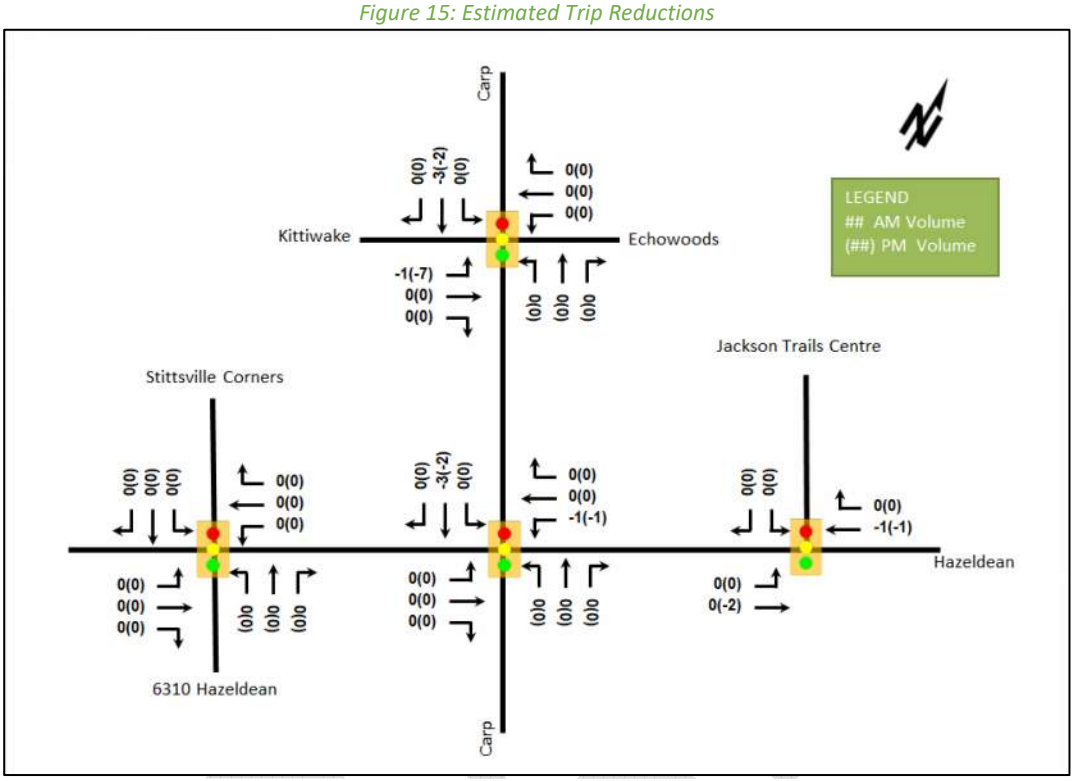


4.5 Trip Reductions

Based on the existing RV sales building of approximately 10,000 sq. ft. using the ITE trip generation rates for the land use of Recreational Vehicle Sales (LUC 842), and the commercial generator mode shares for Kanata/Stittsville,

the estimated trip generation of the existing site is 6 AM and 10 PM peak hour two-way vehicle trips. The trip assignment of the estimated reduced volumes is illustrated in Figure 15.

Figure 15: Estimated Trip Reductions



Appendix J

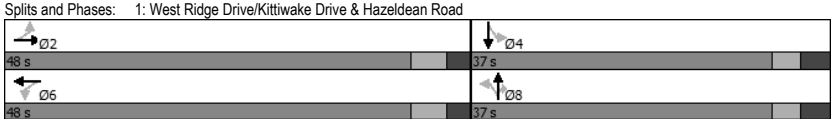
Synchro Intersection Worksheets – 2027 Future Background Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	373	17	66	231	13	30	11	173	21	10	3
Future Volume (vph)	5	373	17	66	231	13	30	11	173	21	10	3
Satd. Flow (prot)	1658	1701	0	1658	1684	0	0	1642	1483	1658	1684	0
Flt Permitted	0.607			0.531				0.776		0.730		
Satd. Flow (perm)	1059	1701	0	927	1684	0	0	1320	1483	1274	1684	0
Satd. Flow (RTOR)		4			5				173		3	
Lane Group Flow (vph)	5	390	0	66	244	0	0	41	173	21	13	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8		8	4		
Detector Phase	2	2		6	6		8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	28.0	28.0		28.0	28.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	36.3	36.3		36.3	36.3		27.1	27.1	27.1	27.1	27.1	
Total Split (s)	48.0	48.0		48.0	48.0		37.0	37.0	37.0	37.0	37.0	
Total Split (%)	56.5%	56.5%		56.5%	56.5%		43.5%	43.5%	43.5%	43.5%	43.5%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.6	2.6		2.6	2.6		3.1	3.1	3.1	3.1	3.1	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.3	6.3		6.3	6.3			6.1	6.1	6.1	6.1	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		None	None	None	None	None	
Act Effct Green (s)	45.1	45.1		45.1	45.1			10.2	10.2	10.2	10.2	
Actuated g/C Ratio	0.67	0.67		0.67	0.67			0.15	0.15	0.15	0.15	
v/c Ratio	0.01	0.34		0.11	0.22			0.21	0.47	0.11	0.05	
Control Delay	4.2	6.0		4.8	5.0			26.5	9.2	24.8	21.2	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	4.2	6.0		4.8	5.0			26.5	9.2	24.8	21.2	
LOS	A	A		A	A			C	A	C	C	
Approach Delay		6.0			5.0			12.5			23.4	
Approach LOS		A			A			B			C	
Queue Length 50th (m)	0.2	17.3		2.5	9.7			4.3	0.0	2.2	1.0	
Queue Length 95th (m)	1.1	30.4		6.4	18.0			12.0	14.2	7.4	5.0	
Internal Link Dist (m)		115.7			359.5			126.0			49.9	
Turn Bay Length (m)	66.0			98.0					10.0	24.5		
Base Capacity (vph)	704	1133		617	1122			605	774	584	774	
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	0.01	0.34		0.11	0.22			0.07	0.22	0.04	0.02	

Intersection Summary
Cycle Length: 85
Actuated Cycle Length: 67.8
Natural Cycle: 65
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.47

Intersection Signal Delay: 7.8 — Intersection LOS: A
Intersection Capacity Utilization 71.3% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: West Ridge Drive/Kittiwake Drive & Hazeldean Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	542	0	0	311	1	0	0	0	4	0	4
Future Volume (vph)	29	542	0	0	311	1	0	0	0	4	0	4
Satd. Flow (prot)	1580	3283	0	1745	1712	1483	0	1745	0	0	1353	1483
Flt Permitted	0.571											
Satd. Flow (perm)	950	3283	0	1745	1712	1483	0	1745	0	0	1424	1483
Satd. Flow (RTOR)						29						27
Lane Group Flow (vph)	29	542	0	0	311	1	0	0	0	0	4	4
Turn Type	Perm	NA		Perm	NA	Perm				custom	NA	custom
Protected Phases		2			6			4			4	
Permitted Phases	2			6		6	4			8		8
Detector Phase	2	2		6	6	6	4	4		8	4	8
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	30.1	30.1		30.1	30.1	30.1	34.3	34.3		34.3	34.3	34.3
Total Split (s)	90.0	90.0		90.0	90.0	90.0	35.0	35.0		35.0	35.0	35.0
Total Split (%)	72.0%	72.0%		72.0%	72.0%	72.0%	28.0%	28.0%		28.0%	28.0%	28.0%
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3		3.3	3.3	3.3
All-Red Time (s)	2.4	2.4		2.4	2.4	2.4	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1	6.1		6.3			6.3	6.3
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max	C-Max	None	None		None	None	None
Act Effct Green (s)	120.5	120.5			120.5	120.5					10.0	10.0
Actuated g/C Ratio	0.96	0.96			0.96	0.96					0.08	0.08
v/c Ratio	0.03	0.17			0.19	0.00					0.04	0.03
Control Delay	1.0	0.8			0.7	0.0					54.0	0.2
Queue Delay	0.0	0.0			0.0	0.0					0.0	0.0
Total Delay	1.0	0.8			0.7	0.0					54.0	0.2
LOS	A	A			A	A					D	A
Approach Delay		0.8			0.7						27.1	
Approach LOS		A			A						C	
Queue Length 50th (m)	0.0	0.0			0.0	0.0					0.9	0.0
Queue Length 95th (m)	2.6	15.4			6.5	m0.0					4.7	0.0
Internal Link Dist (m)		359.5			168.3			30.9			31.1	
Turn Bay Length (m)	140.0					100.0						
Base Capacity (vph)	916	3165			1651	1431					326	361
Starvation Cap Reductn	0	0			0	0					0	0
Spillback Cap Reductn	0	0			0	0					0	0
Storage Cap Reductn	0	0			0	0					0	0
Reduced v/c Ratio	0.03	0.17			0.19	0.00					0.01	0.01

Intersection Summary

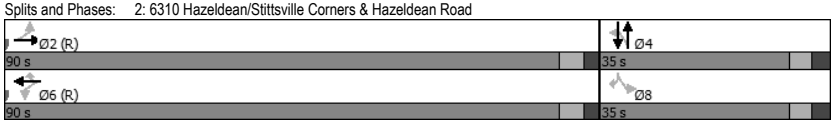
Cycle Length: 125
Actuated Cycle Length: 125
Offset: 37 (30%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.19

Intersection Signal Delay: 1.0	Intersection LOS: A
Intersection Capacity Utilization 44.1%	ICU Level of Service A
Analysis Period (min) 15	

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

Splits and Phases: 2: 6310 Hazeldean/Stittsville Corners & Hazeldean Road



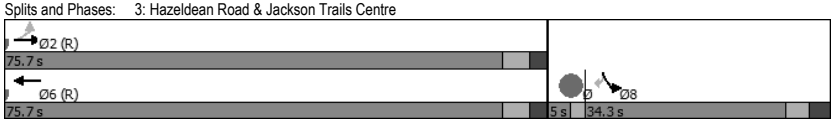
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø7
Lane Configurations							
Traffic Volume (vph)	27	503	489	5	1	6	
Future Volume (vph)	27	503	489	5	1	6	
Satd. Flow (prot)	1523	3191	3071	0	1658	1293	
Flt Permitted	0.471				0.950		
Satd. Flow (perm)	755	3191	3071	0	1658	1293	
Satd. Flow (RTOR)			2			6	
Lane Group Flow (vph)	27	503	494	0	1	6	
Turn Type	Perm	NA	NA		Prot	Perm	
Protected Phases		2	6		8		7
Permitted Phases	2					8	
Detector Phase	2	2	6		8	8	
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0		10.0	10.0	1.0
Minimum Split (s)	24.4	24.4	33.4		34.3	34.3	5.0
Total Split (s)	75.7	75.7	75.7		34.3	34.3	5.0
Total Split (%)	65.8%	65.8%	65.8%		29.8%	29.8%	4%
Yellow Time (s)	3.7	3.7	3.7		3.3	3.3	2.0
All-Red Time (s)	2.7	2.7	2.7		3.0	3.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.4	6.4	6.4		6.3	6.3	
Lead/Lag					Lag	Lag	Lead
Lead-Lag Optimize?					Yes	Yes	Yes
Recall Mode	C-Max	C-Max	C-Max		None	None	None
Act Effct Green (s)	110.5	110.5	110.5		10.0	10.0	
Actuated g/C Ratio	0.96	0.96	0.96		0.09	0.09	
v/c Ratio	0.04	0.16	0.17		0.01	0.05	
Control Delay	1.2	0.9	0.9		48.0	29.0	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	1.2	0.9	0.9		48.0	29.0	
LOS	A	A	A		D	C	
Approach Delay		0.9	0.9		31.7		
Approach LOS		A	A		C		
Queue Length 50th (m)	0.0	0.0	0.0		0.2	0.0	
Queue Length 95th (m)	2.6	14.7	14.6		1.9	4.2	
Internal Link Dist (m)		634.2	235.6		86.5		
Turn Bay Length (m)	49.0					13.5	
Base Capacity (vph)	725	3065	2950		403	319	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.04	0.16	0.17		0.00	0.02	

Intersection Summary
Cycle Length: 115
Actuated Cycle Length: 115
Offset: 75 (65%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.17

Intersection Signal Delay: 1.1	Intersection LOS: A
Intersection Capacity Utilization 42.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: Hazeldean Road & Jackson Trails Centre



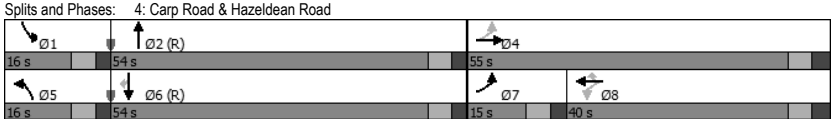
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	217	268	60	33	164	362	65	472	22	238	315	88
Future Volume (vph)	217	268	60	33	164	362	65	472	22	238	315	88
Satd. Flow (prot)	1626	3008	0	1537	1648	1469	1523	3242	0	3066	1712	1375
Flt Permitted	0.396			0.554			0.950			0.950		
Satd. Flow (perm)	676	3008	0	892	1648	1441	1514	3242	0	3047	1712	1335
Satd. Flow (RTOR)		25				351		4				137
Lane Group Flow (vph)	217	328	0	33	164	362	65	494	0	238	315	88
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
Detector Phase	7	4		8	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0	10.0	5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	11.1	39.6		39.6	39.6	39.6	11.0	32.1		11.0	32.1	32.1
Total Split (s)	15.0	55.0		40.0	40.0	40.0	16.0	54.0		16.0	54.0	54.0
Total Split (%)	12.0%	44.0%		32.0%	32.0%	32.0%	12.8%	43.2%		12.8%	43.2%	43.2%
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.7	3.7		3.7	3.7	3.7
All-Red Time (s)	2.4	2.9		2.9	2.9	2.9	2.3	2.4		2.3	2.4	2.4
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.1	6.6		6.6	6.6	6.6	6.0	6.1		6.0	6.1	6.1
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	35.0	34.5		19.5	19.5	19.5	9.7	56.9		14.9	64.5	64.5
Actuated g/C Ratio	0.28	0.28		0.16	0.16	0.16	0.08	0.46		0.12	0.52	0.52
v/c Ratio	0.85	0.39		0.24	0.64	0.70	0.55	0.33		0.65	0.36	0.12
Control Delay	65.2	33.3		46.8	59.4	12.5	72.6	23.7		57.2	35.4	13.8
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	65.2	33.3		46.8	59.4	12.5	72.6	23.7		57.2	35.4	13.8
LOS	E	C		D	E	B	E	C		E	D	B
Approach Delay		46.0			28.3			29.4			40.5	
Approach LOS		D			C			C			D	
Queue Length 50th (m)	45.3	32.4		7.3	38.9	2.4	15.5	39.8		29.1	38.0	0.0
Queue Length 95th (m)	57.4	37.9		15.1	53.2	27.6	30.4	60.2		#55.9	104.7	15.4
Internal Link Dist (m)		168.3			634.2			336.3			266.7	
Turn Bay Length (m)	95.0			53.5			41.0			80.0		
Base Capacity (vph)	256	1180		238	440	642	130	1478		364	883	755
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	0.85	0.28		0.14	0.37	0.56	0.50	0.33		0.65	0.36	0.12

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 107 (86%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.85
Intersection Signal Delay: 36.1 — Intersection LOS: D
Intersection Capacity Utilization 74.5% — ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Carp Road & Hazeldean Road



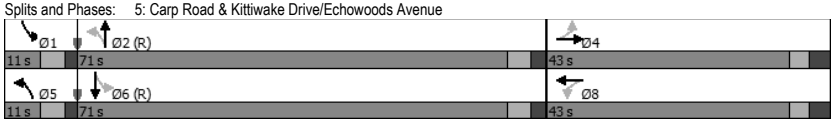
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	205	17	25	52	13	179	17	1015	25	55	570	46
Future Volume (vph)	205	17	25	52	13	179	17	1015	25	55	570	46
Satd. Flow (prot)	1642	1516	0	1658	1483	0	1510	3269	0	1658	3159	0
Flt Permitted	0.533			0.730			0.404			0.202		
Satd. Flow (perm)	921	1516	0	1262	1483	0	642	3269	0	352	3159	0
Satd. Flow (RTOR)		25			158			3			10	
Lane Group Flow (vph)	205	42	0	52	192	0	17	1040	0	55	616	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	10.0		5.0	10.0	
Minimum Split (s)	30.3	30.3		29.3	29.3		10.6	32.0		10.6	32.0	
Total Split (s)	43.0	43.0		43.0	43.0		11.0	71.0		11.0	71.0	
Total Split (%)	34.4%	34.4%		34.4%	34.4%		8.8%	56.8%		8.8%	56.8%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.7	3.7		3.7	3.7	
All-Red Time (s)	3.3	3.3		3.3	3.3		1.9	2.3		1.9	2.3	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.3	6.3		6.3	6.3		5.6	6.0		5.6	6.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	30.5	30.5		30.5	30.5		77.8	72.9		80.4	77.8	
Actuated g/C Ratio	0.24	0.24		0.24	0.24		0.62	0.58		0.64	0.62	
v/c Ratio	0.92	0.11		0.17	0.40		0.04	0.55		0.19	0.31	
Control Delay	86.9	18.1		36.0	10.9		8.9	17.0		10.6	13.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	86.9	18.1		36.0	10.9		8.9	17.0		10.6	13.2	
LOS	F	B		D	B		A	B		B	B	
Approach Delay		75.2			16.2			16.9			12.9	
Approach LOS		E			B			B			B	
Queue Length 50th (m)	48.4	3.2		10.0	6.4		0.8	89.9		4.6	32.0	
Queue Length 95th (m)	#83.2	11.6		19.7	24.4		m2.7	129.6		10.4	58.3	
Internal Link Dist (m)		65.8			95.1			266.7			438.0	
Turn Bay Length (m)	65.5						24.5			36.0		
Base Capacity (vph)	270	462		370	547		438	1908		288	1970	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.76	0.09		0.14	0.35		0.04	0.55		0.19	0.31	

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 7 (6%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92
Intersection Signal Delay: 22.1 — Intersection LOS: C
Intersection Capacity Utilization 79.2% — ICU Level of Service D
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Carp Road & Kittiwake Drive/Echowoods Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	362	35	251	470	39	32	27	189	28	21	3
Future Volume (vph)	10	362	35	251	470	39	32	27	189	28	21	3
Satd. Flow (prot)	1658	1722	0	1658	1710	0	0	1700	1483	1658	1602	0
Flt Permitted	0.460			0.524				0.818		0.719		
Satd. Flow (perm)	803	1722	0	914	1710	0	0	1427	1483	1255	1602	0
Satd. Flow (RTOR)		7			6				189		3	
Lane Group Flow (vph)	10	397	0	251	509	0	0	59	189	28	24	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4		4	8		
Detector Phase	2	2		6	6		4	4	4	8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	36.3	36.3		36.3	36.3		27.1	27.1	27.1	27.1	27.1	
Total Split (s)	83.0	83.0		83.0	83.0		47.0	47.0	47.0	47.0	47.0	
Total Split (%)	63.8%	63.8%		63.8%	63.8%		36.2%	36.2%	36.2%	36.2%	36.2%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.6	2.6		2.6	2.6		3.1	3.1	3.1	3.1	3.1	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.3	6.3		6.3	6.3			6.1	6.1	6.1	6.1	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None	None	None	None	
Act Effct Green (s)	104.8	104.8		104.8	104.8			12.8	12.8	12.8	12.8	
Actuated g/C Ratio	0.81	0.81		0.81	0.81			0.10	0.10	0.10	0.10	
v/c Ratio	0.02	0.29		0.34	0.37			0.42	0.60	0.23	0.15	
Control Delay	3.4	4.1		9.0	8.8			63.1	15.2	56.7	48.6	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	3.4	4.1		9.0	8.8			63.1	15.2	56.7	48.6	
LOS	A	A		A	A			E	B	E	D	
Approach Delay		4.0			8.8			26.6			53.0	
Approach LOS		A			A			C			D	
Queue Length 50th (m)	0.4	18.0		30.7	72.2			14.8	0.0	6.9	5.1	
Queue Length 95th (m)	2.0	41.5		70.0	121.9			26.7	20.6	15.4	12.6	
Internal Link Dist (m)		96.2			363.2			170.2			47.0	
Turn Bay Length (m)	66.0			98.0					10.0	24.5		
Base Capacity (vph)	647	1390		737	1380			448	596	394	506	
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	0.02	0.29		0.34	0.37			0.13	0.32	0.07	0.05	

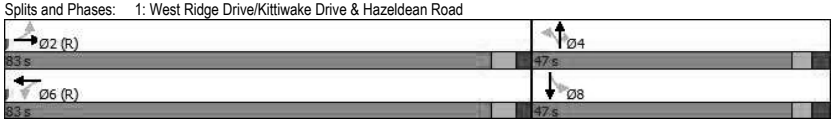
Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 126 (97%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 12.1	Intersection LOS: B
Intersection Capacity Utilization 62.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: West Ridge Drive/Kittiwake Drive & Hazeldean Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	528	0	0	735	6	0	0	0	42	0	37
Future Volume (vph)	51	528	0	0	735	6	0	0	0	42	0	37
Satd. Flow (prot)	1658	3283	0	1745	1745	1483	0	1745	0	0	1658	1483
Flt Permitted	0.355										0.757	
Satd. Flow (perm)	620	3283	0	1745	1745	1438	0	1745	0	0	1321	1483
Satd. Flow (RTOR)						28						37
Lane Group Flow (vph)	51	528	0	0	735	6	0	0	0	0	42	37
Turn Type	Perm	NA		Perm	NA	Perm				custom	NA	custom
Protected Phases		2			6			4			4	
Permitted Phases	2			6		6	4			8		8
Detector Phase	2	2		6	6	6	4	4		8	4	8
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	30.1	30.1		34.1	34.1	34.1	34.3	34.3		34.3	34.3	34.3
Total Split (s)	93.0	93.0		93.0	93.0	93.0	37.0	37.0		37.0	37.0	37.0
Total Split (%)	71.5%	71.5%		71.5%	71.5%	71.5%	28.5%	28.5%		28.5%	28.5%	28.5%
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3		3.3	3.3	3.3
All-Red Time (s)	2.4	2.4		2.4	2.4	2.4	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1	6.1		6.3			6.3	6.3
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max	C-Max	None	None		None	None	None
Act Effct Green (s)	111.1	111.1			111.1	111.1					11.0	11.0
Actuated g/C Ratio	0.85	0.85			0.85	0.85					0.08	0.08
v/c Ratio	0.10	0.19			0.49	0.00					0.38	0.23
Control Delay	3.7	3.0			2.6	0.0					65.8	19.9
Queue Delay	0.0	0.0			0.3	0.0					0.0	0.0
Total Delay	3.7	3.0			2.9	0.0					65.8	19.9
LOS	A	A			A	A					E	B
Approach Delay		3.0			2.8						44.3	
Approach LOS		A			A						D	
Queue Length 50th (m)	1.9	10.8			6.3	0.0					10.5	0.0
Queue Length 95th (m)	7.8	27.2			m19.8	m0.0					21.9	10.6
Internal Link Dist (m)		363.2			168.3			30.9			31.1	
Turn Bay Length (m)	140.0					100.0						
Base Capacity (vph)	529	2804			1490	1232					311	378
Starvation Cap Reductn	0	0			252	0					0	0
Spillback Cap Reductn	0	0			0	0					0	0
Storage Cap Reductn	0	0			0	0					0	0
Reduced v/c Ratio	0.10	0.19			0.59	0.00					0.14	0.10

Intersection Summary

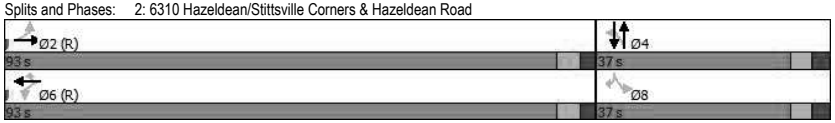
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 47 (36%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.49

Intersection Signal Delay: 5.3	Intersection LOS: A
Intersection Capacity Utilization 63.4%	ICU Level of Service B
Analysis Period (min) 15	

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

Splits and Phases: 2: 6310 Hazeldean/Stittsville Corners & Hazeldean Road



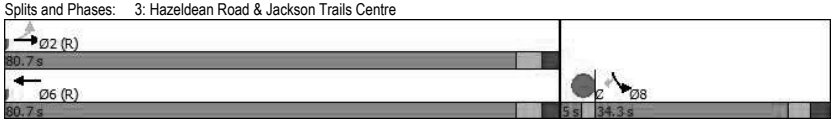
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø7
Lane Configurations							
Traffic Volume (vph)	65	641	903	14	15	39	
Future Volume (vph)	65	641	903	14	15	39	
Satd. Flow (prot)	1658	3316	3307	0	1580	1469	
Flt Permitted	0.308				0.950		
Satd. Flow (perm)	536	3316	3307	0	1580	1469	
Satd. Flow (RTOR)			2			39	
Lane Group Flow (vph)	65	641	917	0	15	39	
Turn Type	Perm	NA	NA		Prot	Perm	
Protected Phases		2	6		8		7
Permitted Phases	2					8	
Detector Phase	2	2	6		8	8	
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0		10.0	10.0	1.0
Minimum Split (s)	24.4	24.4	33.4		34.3	34.3	5.0
Total Split (s)	80.7	80.7	80.7		34.3	34.3	5.0
Total Split (%)	67.3%	67.3%	67.3%		28.6%	28.6%	4%
Yellow Time (s)	3.7	3.7	3.7		3.3	3.3	2.0
All-Red Time (s)	2.7	2.7	2.7		3.0	3.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.4	6.4	6.4		6.3	6.3	
Lead/Lag					Lag	Lag	Lead
Lead-Lag Optimize?					Yes	Yes	Yes
Recall Mode	C-Max	C-Max	C-Max		None	None	None
Act Effct Green (s)	101.8	101.8	101.8		10.0	10.0	
Actuated g/C Ratio	0.85	0.85	0.85		0.08	0.08	
v/c Ratio	0.14	0.23	0.33		0.11	0.25	
Control Delay	3.2	2.5	2.9		53.2	19.7	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	3.2	2.5	2.9		53.2	19.7	
LOS	A	A	A		D	B	
Approach Delay		2.6	2.9		29.0		
Approach LOS		A	A		C		
Queue Length 50th (m)	2.6	14.7	23.4		3.3	0.0	
Queue Length 95th (m)	5.7	19.0	29.4		10.2	10.7	
Internal Link Dist (m)		634.2	235.6		86.5		
Turn Bay Length (m)	49.0					13.5	
Base Capacity (vph)	454	2814	2806		368	372	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.14	0.23	0.33		0.04	0.10	

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 99 (83%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.33

Intersection Signal Delay: 3.6	Intersection LOS: A
Intersection Capacity Utilization 59.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3: Hazeldean Road & Jackson Trails Centre



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	132	357	86	66	438	486	99	411	29	392	532	227
Future Volume (vph)	132	357	86	66	438	486	99	411	29	392	532	227
Satd. Flow (prot)	1658	3159	0	1470	1745	1455	1658	3175	0	3216	1745	1483
Flt Permitted	0.147			0.495			0.950			0.950		
Satd. Flow (perm)	257	3159	0	763	1745	1427	1654	3175	0	3199	1745	1433
Satd. Flow (RTOR)		27				480		5				203
Lane Group Flow (vph)	132	443	0	66	438	486	99	440	0	392	532	227
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
Detector Phase	7	4		8	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0	10.0	5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	11.1	39.6		39.6	39.6	39.6	11.0	32.1		11.0	32.1	32.1
Total Split (s)	13.0	58.0		45.0	45.0	45.0	19.0	34.0		38.0	53.0	53.0
Total Split (%)	10.0%	44.6%		34.6%	34.6%	34.6%	14.6%	26.2%		29.2%	40.8%	40.8%
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.7	3.7		3.7	3.7	3.7
All-Red Time (s)	2.4	2.9		2.9	2.9	2.9	2.3	2.4		2.3	2.4	2.4
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.1	6.6		6.6	6.6	6.6	6.0	6.1		6.0	6.1	6.1
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	49.3	48.8		35.8	35.8	35.8	11.6	41.3		21.1	50.9	50.9
Actuated g/C Ratio	0.38	0.38		0.28	0.28	0.28	0.09	0.32		0.16	0.39	0.39
v/c Ratio	0.77	0.37		0.31	0.91	0.66	0.67	0.43		0.75	0.78	0.33
Control Delay	55.8	24.8		40.9	69.5	8.0	79.3	37.9		51.0	50.9	17.8
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	55.8	24.8		40.9	69.5	8.0	79.3	37.9		51.0	50.9	17.8
LOS	E	C		D	E	A	E	D		D	D	B
Approach Delay		32.0			37.4			45.5			44.4	
Approach LOS		C			D			D			D	
Queue Length 50th (m)	19.3	32.0		13.1	105.6	1.1	24.7	47.7		50.3	143.4	22.1
Queue Length 95th (m)	#36.3	37.2		26.3	#159.3	30.2	#43.9	67.7		64.5	#188.1	46.3
Internal Link Dist (m)		168.3			634.2			339.9			266.7	
Turn Bay Length (m)	95.0			53.5			41.0			80.0		
Base Capacity (vph)	171	1265		225	515	759	165	1013		791	683	684
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	0.77	0.35		0.29	0.85	0.64	0.60	0.43		0.50	0.78	0.33

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 129 (99%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.91
Intersection Signal Delay: 40.3 — Intersection LOS: D
Intersection Capacity Utilization 88.6% — ICU Level of Service E
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Carp Road & Hazeldean Road

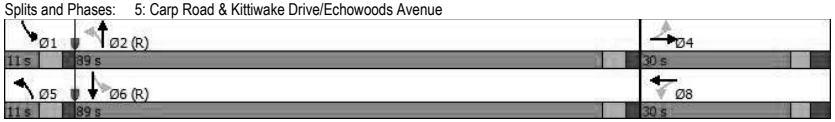
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	22	50	55	22	122	58	803	34	174	1057	144
Future Volume (vph)	130	22	50	55	22	122	58	803	34	174	1057	144
Satd. Flow (prot)	1658	1545	0	1658	1506	0	1658	3173	0	1658	3246	0
Flt Permitted	0.565			0.710			0.191			0.296		
Satd. Flow (perm)	985	1545	0	1233	1506	0	333	3173	0	516	3246	0
Satd. Flow (RTOR)		50			122			6			23	
Lane Group Flow (vph)	130	72	0	55	144	0	58	837	0	174	1201	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	10.0		5.0	10.0	
Minimum Split (s)	29.3	29.3		29.3	29.3		10.6	32.0		10.6	32.0	
Total Split (s)	30.0	30.0		30.0	30.0		11.0	89.0		11.0	89.0	
Total Split (%)	23.1%	23.1%		23.1%	23.1%		8.5%	68.5%		8.5%	68.5%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.7	3.7		3.7	3.7	
All-Red Time (s)	3.3	3.3		3.3	3.3		1.9	2.3		1.9	2.3	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.3	6.3		6.3	6.3		5.6	6.0		5.6	6.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	21.0	21.0		21.0	21.0		90.9	84.9		93.1	87.8	
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.70	0.65		0.72	0.68	
v/c Ratio	0.82	0.25		0.28	0.42		0.20	0.40		0.41	0.55	
Control Delay	88.4	20.4		50.3	15.2		4.7	13.1		8.4	12.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	88.4	20.4		50.3	15.2		4.7	13.1		8.4	12.7	
LOS	F	C		D	B		A	B		A	B	
Approach Delay		64.2			24.9			12.5			12.2	
Approach LOS		E			C			B			B	
Queue Length 50th (m)	31.7	4.7		12.2	4.7		3.2	73.1		12.2	84.9	
Queue Length 95th (m)	#61.9	18.1		24.8	23.3		m2.2	79.6		19.2	103.5	
Internal Link Dist (m)		73.3			85.0			266.7			438.0	
Turn Bay Length (m)	65.5						24.5			36.0		
Base Capacity (vph)	179	322		224	374		289	2073		424	2198	
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	0.73	0.22		0.25	0.39		0.20	0.40		0.41	0.55	

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 29 (22%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.82
Intersection Signal Delay: 17.2 — Intersection LOS: B
Intersection Capacity Utilization 78.0% — ICU Level of Service D
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Carp Road & Kittiwake Drive/Echowoods Avenue



Appendix K

Synchro Intersection Worksheets – 2032 Future Background Conditions

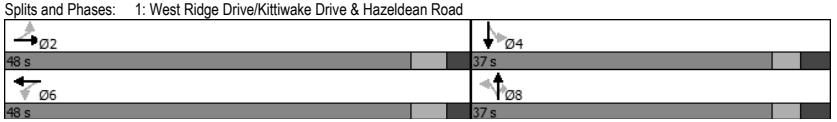
CGH TRANSPORTATION

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	382	17	66	231	13	30	11	173	21	10	3
Future Volume (vph)	5	382	17	66	231	13	30	11	173	21	10	3
Satd. Flow (prot)	1658	1703	0	1658	1684	0	0	1642	1483	1658	1684	0
Flt Permitted	0.607			0.525				0.776		0.730		
Satd. Flow (perm)	1059	1703	0	916	1684	0	0	1320	1483	1274	1684	0
Satd. Flow (RTOR)		4			5				173		3	
Lane Group Flow (vph)	5	399	0	66	244	0	0	41	173	21	13	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8		8	4		
Detector Phase	2	2		6	6		8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	28.0	28.0		28.0	28.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	36.3	36.3		36.3	36.3		27.1	27.1	27.1	27.1	27.1	
Total Split (s)	48.0	48.0		48.0	48.0		37.0	37.0	37.0	37.0	37.0	
Total Split (%)	56.5%	56.5%		56.5%	56.5%		43.5%	43.5%	43.5%	43.5%	43.5%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.6	2.6		2.6	2.6		3.1	3.1	3.1	3.1	3.1	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.3	6.3		6.3	6.3			6.1	6.1	6.1	6.1	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		None	None	None	None	None	
Act Effct Green (s)	45.1	45.1		45.1	45.1			10.2	10.2	10.2	10.2	
Actuated g/C Ratio	0.67	0.67		0.67	0.67			0.15	0.15	0.15	0.15	
v/c Ratio	0.01	0.35		0.11	0.22			0.21	0.47	0.11	0.05	
Control Delay	4.2	6.1		4.8	5.0			26.5	9.2	24.8	21.2	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	4.2	6.1		4.8	5.0			26.5	9.2	24.8	21.2	
LOS	A	A		A	A			C	A	C	C	
Approach Delay		6.0			5.0			12.5			23.4	
Approach LOS		A			A			B			C	
Queue Length 50th (m)	0.2	17.8		2.5	9.7			4.3	0.0	2.2	1.0	
Queue Length 95th (m)	1.1	31.3		6.4	18.0			12.0	14.2	7.4	5.0	
Internal Link Dist (m)		115.7			359.5			126.0			49.9	
Turn Bay Length (m)	66.0			98.0					10.0	24.5		
Base Capacity (vph)	704	1134		609	1122			605	774	584	774	
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	0.01	0.35		0.11	0.22			0.07	0.22	0.04	0.02	

Intersection Summary
Cycle Length: 85
Actuated Cycle Length: 67.8
Natural Cycle: 65
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.47

Intersection Signal Delay: 7.8 — Intersection LOS: A
Intersection Capacity Utilization 71.3% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: West Ridge Drive/Kittiwake Drive & Hazeldean Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	555	0	0	311	1	0	0	0	4	0	4
Future Volume (vph)	29	555	0	0	311	1	0	0	0	4	0	4
Satd. Flow (prot)	1580	3283	0	1745	1712	1483	0	1745	0	0	1353	1483
Flt Permitted	0.571											
Satd. Flow (perm)	950	3283	0	1745	1712	1483	0	1745	0	0	1424	1483
Satd. Flow (RTOR)						29						27
Lane Group Flow (vph)	29	555	0	0	311	1	0	0	0	0	4	4
Turn Type	Perm	NA		Perm	NA	Perm				custom	NA	custom
Protected Phases		2			6			4			4	
Permitted Phases	2			6		6	4			8		8
Detector Phase	2	2		6	6	6	4	4		8	4	8
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	30.1	30.1		30.1	30.1	30.1	34.3	34.3		34.3	34.3	34.3
Total Split (s)	90.0	90.0		90.0	90.0	90.0	35.0	35.0		35.0	35.0	35.0
Total Split (%)	72.0%	72.0%		72.0%	72.0%	72.0%	28.0%	28.0%		28.0%	28.0%	28.0%
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3		3.3	3.3	3.3
All-Red Time (s)	2.4	2.4		2.4	2.4	2.4	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1	6.1		6.3			6.3	6.3
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max	C-Max	None	None		None	None	None
Act Effct Green (s)	120.5	120.5			120.5	120.5					10.0	10.0
Actuated g/C Ratio	0.96	0.96			0.96	0.96					0.08	0.08
v/c Ratio	0.03	0.18			0.19	0.00					0.04	0.03
Control Delay	1.0	0.8			0.7	0.0					54.0	0.2
Queue Delay	0.0	0.0			0.0	0.0					0.0	0.0
Total Delay	1.0	0.8			0.7	0.0					54.0	0.2
LOS	A	A			A	A					D	A
Approach Delay		0.8			0.7						27.1	
Approach LOS		A			A						C	
Queue Length 50th (m)	0.0	0.0			0.0	0.0					0.9	0.0
Queue Length 95th (m)	2.6	15.8			6.5	m0.0					4.7	0.0
Internal Link Dist (m)		359.5			168.3			30.9			31.1	
Turn Bay Length (m)	140.0					100.0						
Base Capacity (vph)	916	3165			1651	1431					326	361
Starvation Cap Reductn	0	0			0	0					0	0
Spillback Cap Reductn	0	0			0	0					0	0
Storage Cap Reductn	0	0			0	0					0	0
Reduced v/c Ratio	0.03	0.18			0.19	0.00					0.01	0.01

Intersection Summary

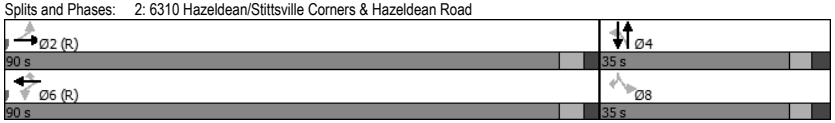
Cycle Length: 125
Actuated Cycle Length: 125
Offset: 37 (30%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.19

Intersection Signal Delay: 1.0	Intersection LOS: A
Intersection Capacity Utilization 44.1%	ICU Level of Service A
Analysis Period (min) 15	

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

Splits and Phases: 2: 6310 Hazeldean/Stittsville Corners & Hazeldean Road



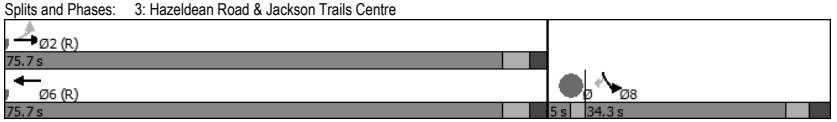
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø7
Lane Configurations							
Traffic Volume (vph)	27	515	489	5	1	6	
Future Volume (vph)	27	515	489	5	1	6	
Satd. Flow (prot)	1523	3191	3071	0	1658	1293	
Flt Permitted	0.471				0.950		
Satd. Flow (perm)	755	3191	3071	0	1658	1293	
Satd. Flow (RTOR)			2			6	
Lane Group Flow (vph)	27	515	494	0	1	6	
Turn Type	Perm	NA	NA		Prot	Perm	
Protected Phases		2	6		8		7
Permitted Phases	2					8	
Detector Phase	2	2	6		8	8	
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0		10.0	10.0	1.0
Minimum Split (s)	24.4	24.4	33.4		34.3	34.3	5.0
Total Split (s)	75.7	75.7	75.7		34.3	34.3	5.0
Total Split (%)	65.8%	65.8%	65.8%		29.8%	29.8%	4%
Yellow Time (s)	3.7	3.7	3.7		3.3	3.3	2.0
All-Red Time (s)	2.7	2.7	2.7		3.0	3.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.4	6.4	6.4		6.3	6.3	
Lead/Lag					Lag	Lag	Lead
Lead-Lag Optimize?					Yes	Yes	Yes
Recall Mode	C-Max	C-Max	C-Max		None	None	None
Act Effct Green (s)	110.5	110.5	110.5		10.0	10.0	
Actuated g/C Ratio	0.96	0.96	0.96		0.09	0.09	
v/c Ratio	0.04	0.17	0.17		0.01	0.05	
Control Delay	1.2	0.9	0.9		48.0	29.0	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	1.2	0.9	0.9		48.0	29.0	
LOS	A	A	A		D	C	
Approach Delay		0.9	0.9		31.7		
Approach LOS		A	A		C		
Queue Length 50th (m)	0.0	0.0	0.0		0.2	0.0	
Queue Length 95th (m)	2.6	15.2	14.6		1.9	4.2	
Internal Link Dist (m)		634.2	235.6		86.5		
Turn Bay Length (m)	49.0					13.5	
Base Capacity (vph)	725	3065	2950		403	319	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.04	0.17	0.17		0.00	0.02	

Intersection Summary
Cycle Length: 115
Actuated Cycle Length: 115
Offset: 75 (65%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.17

Intersection Signal Delay: 1.1	Intersection LOS: A
Intersection Capacity Utilization 42.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: Hazeldean Road & Jackson Trails Centre



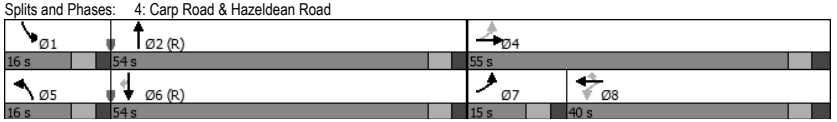
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	217	275	60	33	164	365	65	531	22	240	319	88
Future Volume (vph)	217	275	60	33	164	365	65	531	22	240	319	88
Satd. Flow (prot)	1626	3008	0	1537	1648	1469	1523	3248	0	3066	1712	1375
Flt Permitted	0.396			0.550			0.950			0.950		
Satd. Flow (perm)	676	3008	0	886	1648	1441	1514	3248	0	3049	1712	1335
Satd. Flow (RTOR)		24				322		4				137
Lane Group Flow (vph)	217	335	0	33	164	365	65	553	0	240	319	88
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
Detector Phase	7	4		8	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0	10.0	5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	11.1	39.6		39.6	39.6	39.6	11.0	32.1		11.0	32.1	32.1
Total Split (s)	15.0	55.0		40.0	40.0	40.0	16.0	54.0		16.0	54.0	54.0
Total Split (%)	12.0%	44.0%		32.0%	32.0%	32.0%	12.8%	43.2%		12.8%	43.2%	43.2%
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.7	3.7		3.7	3.7	3.7
All-Red Time (s)	2.4	2.9		2.9	2.9	2.9	2.3	2.4		2.3	2.4	2.4
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.1	6.6		6.6	6.6	6.6	6.0	6.1		6.0	6.1	6.1
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	35.0	34.5		19.5	19.5	19.5	9.7	56.7		15.1	64.5	64.5
Actuated g/C Ratio	0.28	0.28		0.16	0.16	0.16	0.08	0.45		0.12	0.52	0.52
v/c Ratio	0.85	0.40		0.24	0.64	0.74	0.55	0.37		0.65	0.36	0.12
Control Delay	65.2	33.6		46.9	59.4	16.8	72.6	24.4		56.8	35.5	13.8
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	65.2	33.6		46.9	59.4	16.8	72.6	24.4		56.8	35.5	13.8
LOS	E	C		D	E	B	E	C		E	D	B
Approach Delay		46.0			31.0			29.4			40.4	
Approach LOS		D			C			C			D	
Queue Length 50th (m)	45.3	33.3		7.3	38.9	9.5	15.5	45.8		29.3	38.5	0.0
Queue Length 95th (m)	57.5	39.0		15.1	53.2	37.2	30.4	68.1		#56.3	105.7	15.4
Internal Link Dist (m)		168.3			634.2			336.3			266.7	
Turn Bay Length (m)	95.0			53.5			41.0			80.0		
Base Capacity (vph)	256	1179		236	440	620	130	1476		369	883	755
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	0.85	0.28		0.14	0.37	0.59	0.50	0.37		0.65	0.36	0.12

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 107 (86%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.85
Intersection Signal Delay: 36.7 — Intersection LOS: D
Intersection Capacity Utilization 74.7% — ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Carp Road & Hazeldean Road



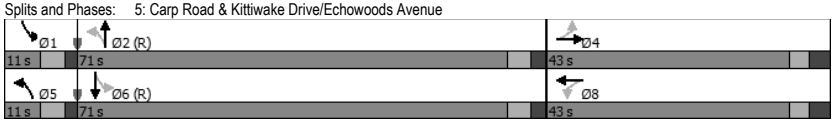
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	205	17	25	52	13	179	17	1137	25	55	576	46
Future Volume (vph)	205	17	25	52	13	179	17	1137	25	55	576	46
Satd. Flow (prot)	1642	1516	0	1658	1483	0	1510	3273	0	1658	3159	0
Flt Permitted	0.533			0.730			0.401			0.165		
Satd. Flow (perm)	921	1516	0	1262	1483	0	637	3273	0	288	3159	0
Satd. Flow (RTOR)		25			137			3			10	
Lane Group Flow (vph)	205	42	0	52	192	0	17	1162	0	55	622	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	10.0		5.0	10.0	
Minimum Split (s)	30.3	30.3		29.3	29.3		10.6	32.0		10.6	32.0	
Total Split (s)	43.0	43.0		43.0	43.0		11.0	71.0		11.0	71.0	
Total Split (%)	34.4%	34.4%		34.4%	34.4%		8.8%	56.8%		8.8%	56.8%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.7	3.7		3.7	3.7	
All-Red Time (s)	3.3	3.3		3.3	3.3		1.9	2.3		1.9	2.3	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.3	6.3		6.3	6.3		5.6	6.0		5.6	6.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	30.5	30.5		30.5	30.5		77.8	72.9		80.4	77.8	
Actuated g/C Ratio	0.24	0.24		0.24	0.24		0.62	0.58		0.64	0.62	
v/c Ratio	0.92	0.11		0.17	0.41		0.04	0.61		0.22	0.32	
Control Delay	86.9	18.1		36.0	14.2		9.1	18.8		11.2	13.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	86.9	18.1		36.0	14.2		9.1	18.8		11.2	13.2	
LOS	F	B		D	B		A	B		B	B	
Approach Delay		75.2			18.8			18.6			13.0	
Approach LOS		E			B			B			B	
Queue Length 50th (m)	48.4	3.2		10.0	10.5		0.9	108.4		4.6	32.4	
Queue Length 95th (m)	#83.2	11.6		19.7	29.2		m2.7	150.0		10.4	58.9	
Internal Link Dist (m)		65.8			95.1			266.7			438.0	
Turn Bay Length (m)	65.5						24.5			36.0		
Base Capacity (vph)	270	462		370	532		435	1911		250	1970	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.76	0.09		0.14	0.36		0.04	0.61		0.22	0.32	

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 7 (6%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92
Intersection Signal Delay: 23.0 — Intersection LOS: C
Intersection Capacity Utilization 82.7% — ICU Level of Service E
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Carp Road & Kittiwake Drive/Echowoods Avenue



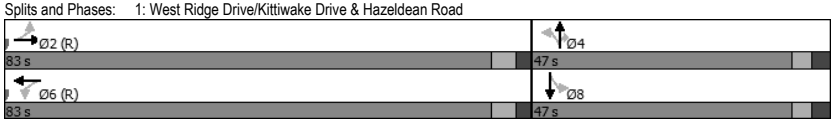
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	362	35	251	481	39	32	27	189	28	21	3
Future Volume (vph)	10	362	35	251	481	39	32	27	189	28	21	3
Satd. Flow (prot)	1658	1722	0	1658	1710	0	0	1700	1483	1658	1602	0
Flt Permitted	0.454			0.524				0.818		0.719		
Satd. Flow (perm)	792	1722	0	914	1710	0	0	1427	1483	1255	1602	0
Satd. Flow (RTOR)		7			5				189		3	
Lane Group Flow (vph)	10	397	0	251	520	0	0	59	189	28	24	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4		4	8		
Detector Phase	2	2		6	6		4	4	4	8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	36.3	36.3		36.3	36.3		27.1	27.1	27.1	27.1	27.1	
Total Split (s)	83.0	83.0		83.0	83.0		47.0	47.0	47.0	47.0	47.0	
Total Split (%)	63.8%	63.8%		63.8%	63.8%		36.2%	36.2%	36.2%	36.2%	36.2%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.6	2.6		2.6	2.6		3.1	3.1	3.1	3.1	3.1	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.3	6.3		6.3	6.3			6.1	6.1	6.1	6.1	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None	None	None	None	
Act Effct Green (s)	104.8	104.8		104.8	104.8			12.8	12.8	12.8	12.8	
Actuated g/C Ratio	0.81	0.81		0.81	0.81			0.10	0.10	0.10	0.10	
v/c Ratio	0.02	0.29		0.34	0.38			0.42	0.60	0.23	0.15	
Control Delay	3.4	4.1		8.7	8.7			63.1	15.2	56.7	48.6	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	3.4	4.1		8.7	8.7			63.1	15.2	56.7	48.6	
LOS	A	A		A	A			E	B	E	D	
Approach Delay		4.0			8.7			26.6			53.0	
Approach LOS		A			A			C			D	
Queue Length 50th (m)	0.4	18.0		29.0	71.6			14.8	0.0	6.9	5.1	
Queue Length 95th (m)	2.0	41.5		69.1	125.4			26.7	20.6	15.4	12.6	
Internal Link Dist (m)		96.2			363.2			170.2			47.0	
Turn Bay Length (m)	66.0			98.0					10.0	24.5		
Base Capacity (vph)	638	1390		737	1380			448	596	394	506	
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	0.02	0.29		0.34	0.38			0.13	0.32	0.07	0.05	

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 126 (97%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.60
Intersection Signal Delay: 12.0 — Intersection LOS: B
Intersection Capacity Utilization 63.2% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 1: West Ridge Drive/Kittiwake Drive & Hazeldean Road



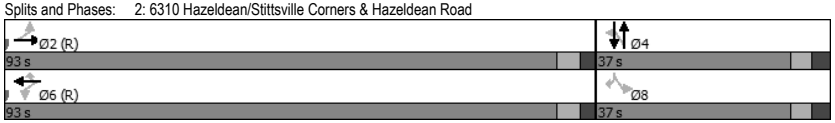
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	528	0	0	753	6	0	0	0	42	0	37
Future Volume (vph)	51	528	0	0	753	6	0	0	0	42	0	37
Satd. Flow (prot)	1658	3283	0	1745	1745	1483	0	1745	0	0	1658	1483
Flt Permitted	0.347										0.757	
Satd. Flow (perm)	604	3283	0	1745	1745	1438	0	1745	0	0	1321	1483
Satd. Flow (RTOR)						28						37
Lane Group Flow (vph)	51	528	0	0	753	6	0	0	0	0	42	37
Turn Type	Perm	NA		Perm	NA	Perm				custom	NA	custom
Protected Phases		2			6			4			4	
Permitted Phases	2			6		6	4			8		8
Detector Phase	2	2		6	6	6	4	4		8	4	8
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	30.1	30.1		34.1	34.1	34.1	34.3	34.3		34.3	34.3	34.3
Total Split (s)	93.0	93.0		93.0	93.0	93.0	37.0	37.0		37.0	37.0	37.0
Total Split (%)	71.5%	71.5%		71.5%	71.5%	71.5%	28.5%	28.5%		28.5%	28.5%	28.5%
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3		3.3	3.3	3.3
All-Red Time (s)	2.4	2.4		2.4	2.4	2.4	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1	6.1		6.3			6.3	6.3
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max	C-Max	None	None		None	None	None
Act Effct Green (s)	111.1	111.1			111.1	111.1					11.0	11.0
Actuated g/C Ratio	0.85	0.85			0.85	0.85					0.08	0.08
v/c Ratio	0.10	0.19			0.51	0.00					0.38	0.23
Control Delay	3.8	3.0			2.8	0.0					65.8	19.9
Queue Delay	0.0	0.0			0.3	0.0					0.0	0.0
Total Delay	3.8	3.0			3.1	0.0					65.8	19.9
LOS	A	A			A	A					E	B
Approach Delay		3.0			3.1						44.3	
Approach LOS		A			A						D	
Queue Length 50th (m)	1.9	10.8			6.6	0.0					10.5	0.0
Queue Length 95th (m)	7.8	27.2			m22.3	m0.0					21.9	10.6
Internal Link Dist (m)		363.2			168.3			30.9			31.1	
Turn Bay Length (m)	140.0					100.0						
Base Capacity (vph)	515	2804			1490	1232					311	378
Starvation Cap Reductn	0	0			249	0					0	0
Spillback Cap Reductn	0	0			0	0					0	0
Storage Cap Reductn	0	0			0	0					0	0
Reduced v/c Ratio	0.10	0.19			0.61	0.00					0.14	0.10

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 47 (36%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.51
Intersection Signal Delay: 5.4 — Intersection LOS: A
Intersection Capacity Utilization 63.4% — ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: 6310 Hazeldean/Stittsville Corners & Hazeldean Road



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø7
Lane Configurations							
Traffic Volume (vph)	65	641	924	14	15	39	
Future Volume (vph)	65	641	924	14	15	39	
Satd. Flow (prot)	1658	3316	3307	0	1580	1469	
Flt Permitted	0.300				0.950		
Satd. Flow (perm)	522	3316	3307	0	1580	1469	
Satd. Flow (RTOR)			2			39	
Lane Group Flow (vph)	65	641	938	0	15	39	
Turn Type	Perm	NA	NA		Prot	Perm	
Protected Phases		2	6		8		7
Permitted Phases	2					8	
Detector Phase	2	2	6		8	8	
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0		10.0	10.0	1.0
Minimum Split (s)	24.4	24.4	33.4		34.3	34.3	5.0
Total Split (s)	80.7	80.7	80.7		34.3	34.3	5.0
Total Split (%)	67.3%	67.3%	67.3%		28.6%	28.6%	4%
Yellow Time (s)	3.7	3.7	3.7		3.3	3.3	2.0
All-Red Time (s)	2.7	2.7	2.7		3.0	3.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.4	6.4	6.4		6.3	6.3	
Lead/Lag					Lag	Lag	Lead
Lead-Lag Optimize?					Yes	Yes	Yes
Recall Mode	C-Max	C-Max	C-Max		None	None	None
Act Effct Green (s)	101.8	101.8	101.8		10.0	10.0	
Actuated g/C Ratio	0.85	0.85	0.85		0.08	0.08	
v/c Ratio	0.15	0.23	0.33		0.11	0.25	
Control Delay	3.2	2.5	2.9		53.2	19.7	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	3.2	2.5	2.9		53.2	19.7	
LOS	A	A	A		D	B	
Approach Delay		2.6	2.9		29.0		
Approach LOS		A	A		C		
Queue Length 50th (m)	2.6	14.7	24.3		3.3	0.0	
Queue Length 95th (m)	5.7	19.0	30.2		10.2	10.7	
Internal Link Dist (m)		634.2	235.6		86.5		
Turn Bay Length (m)	49.0					13.5	
Base Capacity (vph)	443	2814	2806		368	372	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.15	0.23	0.33		0.04	0.10	

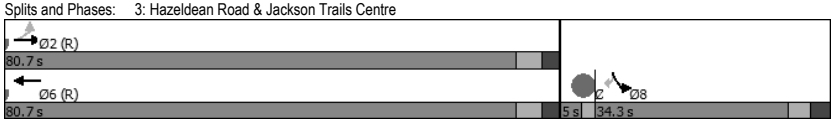
Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 99 (83%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.33

Intersection Signal Delay: 3.6	Intersection LOS: A
Intersection Capacity Utilization 60.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3: Hazeldean Road & Jackson Trails Centre



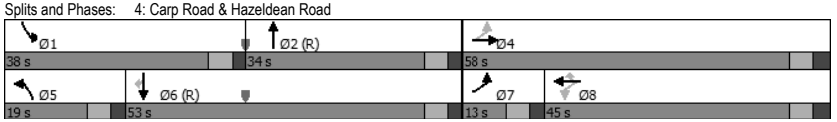
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	132	357	86	66	449	545	99	416	29	435	599	227
Future Volume (vph)	132	357	86	66	449	545	99	416	29	435	599	227
Satd. Flow (prot)	1658	3159	0	1470	1745	1455	1658	3175	0	3216	1745	1483
Flt Permitted	0.142			0.495			0.950			0.950		
Satd. Flow (perm)	247	3159	0	763	1745	1427	1654	3175	0	3199	1745	1433
Satd. Flow (RTOR)		27				525		5				181
Lane Group Flow (vph)	132	443	0	66	449	545	99	445	0	435	599	227
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
Detector Phase	7	4		8	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0	10.0	5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	11.1	39.6		39.6	39.6	39.6	11.0	32.1		11.0	32.1	32.1
Total Split (s)	13.0	58.0		45.0	45.0	45.0	19.0	34.0		38.0	53.0	53.0
Total Split (%)	10.0%	44.6%		34.6%	34.6%	34.6%	14.6%	26.2%		29.2%	40.8%	40.8%
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.7	3.7		3.7	3.7	3.7
All-Red Time (s)	2.4	2.9		2.9	2.9	2.9	2.3	2.4		2.3	2.4	2.4
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.1	6.6		6.6	6.6	6.6	6.0	6.1		6.0	6.1	6.1
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	50.0	49.5		36.5	36.5	36.5	11.6	39.0		22.8	50.2	50.2
Actuated g/C Ratio	0.38	0.38		0.28	0.28	0.28	0.09	0.30		0.18	0.39	0.39
v/c Ratio	0.78	0.36		0.31	0.92	0.70	0.67	0.47		0.77	0.89	0.34
Control Delay	57.2	24.5		40.6	70.0	9.2	79.3	40.0		49.2	59.4	19.0
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	57.2	24.5		40.6	70.0	9.2	79.3	40.0		49.2	59.4	19.0
LOS	E	C		D	E	A	E	D		D	E	B
Approach Delay		32.0			36.9			47.2			48.6	
Approach LOS		C			D			D			D	
Queue Length 50th (m)	19.3	32.0		13.1	109.3	3.7	24.7	49.4		55.8	163.6	25.8
Queue Length 95th (m)	#37.3	37.2		26.3	#165.7	37.7	#43.9	70.0		70.3	#227.6	50.8
Internal Link Dist (m)		168.3			634.2			339.9			266.7	
Turn Bay Length (m)	95.0			53.5			41.0			80.0		
Base Capacity (vph)	169	1265		225	515	791	165	955		791	674	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	0.78	0.35		0.29	0.87	0.69	0.60	0.47		0.55	0.89	0.34

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 129 (99%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92
Intersection Signal Delay: 42.0 — Intersection LOS: D
Intersection Capacity Utilization 92.8% — ICU Level of Service F
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Carp Road & Hazeldean Road



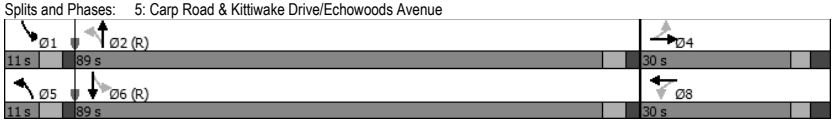
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	22	50	55	22	122	58	813	34	174	1185	144
Future Volume (vph)	130	22	50	55	22	122	58	813	34	174	1185	144
Satd. Flow (prot)	1658	1545	0	1658	1506	0	1658	3173	0	1658	3253	0
Flt Permitted	0.558			0.710			0.159			0.293		
Satd. Flow (perm)	972	1545	0	1233	1506	0	277	3173	0	510	3253	0
Satd. Flow (RTOR)		50			122			6			20	
Lane Group Flow (vph)	130	72	0	55	144	0	58	847	0	174	1329	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	10.0		5.0	10.0	
Minimum Split (s)	29.3	29.3		29.3	29.3		10.6	32.0		10.6	32.0	
Total Split (s)	30.0	30.0		30.0	30.0		11.0	89.0		11.0	89.0	
Total Split (%)	23.1%	23.1%		23.1%	23.1%		8.5%	68.5%		8.5%	68.5%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.7	3.7		3.7	3.7	
All-Red Time (s)	3.3	3.3		3.3	3.3		1.9	2.3		1.9	2.3	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.3	6.3		6.3	6.3		5.6	6.0		5.6	6.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	20.2	20.2		20.2	20.2		91.6	85.4		93.8	88.3	
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.70	0.66		0.72	0.68	
v/c Ratio	0.86	0.26		0.29	0.43		0.23	0.41		0.41	0.60	
Control Delay	96.6	20.6		51.0	15.5		4.9	11.9		8.3	13.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	96.6	20.6		51.0	15.5		4.9	11.9		8.3	13.6	
LOS	F	C		D	B		A	B		A	B	
Approach Delay		69.5			25.3			11.5			13.0	
Approach LOS		E			C			B			B	
Queue Length 50th (m)	32.2	4.8		12.4	4.8		1.9	72.3		11.6	100.6	
Queue Length 95th (m)	#62.5	18.1		24.8	23.3		m2.3	78.7		19.2	121.9	
Internal Link Dist (m)		73.3			85.0			266.7			438.0	
Turn Bay Length (m)	65.5						24.5			36.0		
Base Capacity (vph)	177	322		224	374		257	2085		425	2215	
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	0.73	0.22		0.25	0.39		0.23	0.41		0.41	0.60	

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 29 (22%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.86
Intersection Signal Delay: 17.5 — Intersection LOS: B
Intersection Capacity Utilization 81.7% — ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Carp Road & Kittiwake Drive/Echowoods Avenue



Appendix L

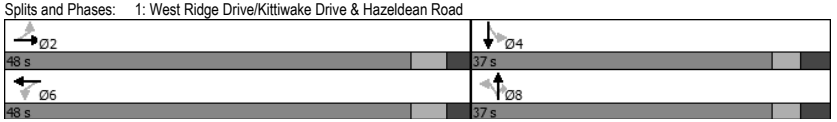
Synchro Intersection Worksheets – 2027 Future Total Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	374	17	67	234	13	30	11	173	21	10	3
Future Volume (vph)	5	374	17	67	234	13	30	11	173	21	10	3
Satd. Flow (prot)	1658	1701	0	1658	1684	0	0	1642	1483	1658	1684	0
Flt Permitted	0.606			0.531				0.776		0.730		
Satd. Flow (perm)	1058	1701	0	927	1684	0	0	1320	1483	1274	1684	0
Satd. Flow (RTOR)		4			5				173		3	
Lane Group Flow (vph)	5	391	0	67	247	0	0	41	173	21	13	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8		8	4		
Detector Phase	2	2		6	6		8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	28.0	28.0		28.0	28.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	36.3	36.3		36.3	36.3		27.1	27.1	27.1	27.1	27.1	
Total Split (s)	48.0	48.0		48.0	48.0		37.0	37.0	37.0	37.0	37.0	
Total Split (%)	56.5%	56.5%		56.5%	56.5%		43.5%	43.5%	43.5%	43.5%	43.5%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.6	2.6		2.6	2.6		3.1	3.1	3.1	3.1	3.1	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.3	6.3		6.3	6.3			6.1	6.1	6.1	6.1	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		None	None	None	None	None	
Act Effct Green (s)	45.1	45.1		45.1	45.1			10.2	10.2	10.2	10.2	
Actuated g/C Ratio	0.67	0.67		0.67	0.67			0.15	0.15	0.15	0.15	
v/c Ratio	0.01	0.35		0.11	0.22			0.21	0.47	0.11	0.05	
Control Delay	4.2	6.0		4.8	5.1			26.5	9.2	24.8	21.2	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	4.2	6.0		4.8	5.1			26.5	9.2	24.8	21.2	
LOS	A	A		A	A			C	A	C	C	
Approach Delay		6.0			5.0			12.5			23.4	
Approach LOS		A			A			B			C	
Queue Length 50th (m)	0.2	17.4		2.5	9.8			4.3	0.0	2.2	1.0	
Queue Length 95th (m)	1.1	30.6		6.5	18.3			12.0	14.2	7.4	5.0	
Internal Link Dist (m)		115.7			359.5			126.0			49.9	
Turn Bay Length (m)	66.0			98.0					10.0	24.5		
Base Capacity (vph)	704	1133		617	1122			605	774	584	774	
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	0.01	0.35		0.11	0.22			0.07	0.22	0.04	0.02	

Intersection Summary
Cycle Length: 85
Actuated Cycle Length: 67.8
Natural Cycle: 65
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.47

Intersection Signal Delay: 7.8 — Intersection LOS: A
Intersection Capacity Utilization 71.3% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: West Ridge Drive/Kittiwake Drive & Hazeldean Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	542	1	20	311	1	4	0	47	4	0	4
Future Volume (vph)	29	542	1	20	311	1	4	0	47	4	0	4
Satd. Flow (prot)	1580	3284	0	1658	1712	1483	0	1523	0	0	1353	1483
Flt Permitted	0.571			0.449				0.971			0.893	
Satd. Flow (perm)	950	3284	0	784	1712	1483	0	1484	0	0	1272	1483
Satd. Flow (RTOR)						29		47				27
Lane Group Flow (vph)	29	543	0	20	311	1	0	51	0	0	4	4
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		custom	NA	custom
Protected Phases		2			6			4			4	
Permitted Phases	2			6		6	4			8		8
Detector Phase	2	2		6	6	6	4	4		8	4	8
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	30.1	30.1		30.1	30.1	30.1	34.3	34.3		34.3	34.3	34.3
Total Split (s)	90.0	90.0		90.0	90.0	90.0	35.0	35.0		35.0	35.0	35.0
Total Split (%)	72.0%	72.0%		72.0%	72.0%	72.0%	28.0%	28.0%		28.0%	28.0%	28.0%
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3		3.3	3.3	3.3
All-Red Time (s)	2.4	2.4		2.4	2.4	2.4	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1	6.1		6.3			6.3	6.3
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max	C-Max	None	None		None	None	None
Act Effct Green (s)	107.1	107.1		107.1	107.1	107.1		10.0			10.0	10.0
Actuated g/C Ratio	0.86	0.86		0.86	0.86	0.86		0.08			0.08	0.08
v/c Ratio	0.04	0.19		0.03	0.21	0.00		0.32			0.04	0.03
Control Delay	2.2	2.3		0.9	1.0	0.0		22.4			54.2	0.2
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	2.2	2.3		0.9	1.0	0.0		22.4			54.2	0.2
LOS	A	A		A	A	A		C			D	A
Approach Delay		2.3			0.9			22.4			27.3	
Approach LOS		A			A			C			C	
Queue Length 50th (m)	1.1	11.8		0.0	0.4	0.0		0.9			0.9	0.0
Queue Length 95th (m)	2.6	15.4		m1.2	9.8	m0.0		13.4			4.7	0.0
Internal Link Dist (m)		359.5			168.3			30.9			31.1	
Turn Bay Length (m)	140.0			30.0		100.0						
Base Capacity (vph)	813	2813		671	1466	1274		376			292	361
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	0.04	0.19		0.03	0.21	0.00		0.14			0.01	0.01

Intersection Summary

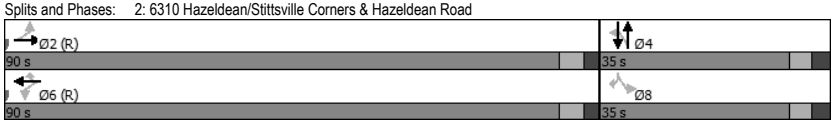
Cycle Length: 125
Actuated Cycle Length: 125
Offset: 37 (30%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.32

Intersection Signal Delay: 3.1	Intersection LOS: A
Intersection Capacity Utilization 49.5%	ICU Level of Service A
Analysis Period (min) 15	

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

Splits and Phases: 2: 6310 Hazeldean/Stittsville Corners & Hazeldean Road



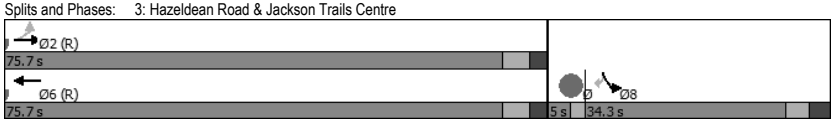
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø7
Lane Configurations							
Traffic Volume (vph)	27	516	494	5	1	6	
Future Volume (vph)	27	516	494	5	1	6	
Satd. Flow (prot)	1523	3191	3071	0	1658	1293	
Flt Permitted	0.469				0.950		
Satd. Flow (perm)	752	3191	3071	0	1658	1293	
Satd. Flow (RTOR)			2			6	
Lane Group Flow (vph)	27	516	499	0	1	6	
Turn Type	Perm	NA	NA		Prot	Perm	
Protected Phases		2	6		8		7
Permitted Phases	2					8	
Detector Phase	2	2	6		8	8	
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0		10.0	10.0	1.0
Minimum Split (s)	24.4	24.4	33.4		34.3	34.3	5.0
Total Split (s)	75.7	75.7	75.7		34.3	34.3	5.0
Total Split (%)	65.8%	65.8%	65.8%		29.8%	29.8%	4%
Yellow Time (s)	3.7	3.7	3.7		3.3	3.3	2.0
All-Red Time (s)	2.7	2.7	2.7		3.0	3.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.4	6.4	6.4		6.3	6.3	
Lead/Lag					Lag	Lag	Lead
Lead-Lag Optimize?					Yes	Yes	Yes
Recall Mode	C-Max	C-Max	C-Max		None	None	None
Act Effct Green (s)	110.5	110.5	110.5		10.0	10.0	
Actuated g/C Ratio	0.96	0.96	0.96		0.09	0.09	
v/c Ratio	0.04	0.17	0.17		0.01	0.05	
Control Delay	1.2	0.9	0.9		48.0	29.0	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	1.2	0.9	0.9		48.0	29.0	
LOS	A	A	A		D	C	
Approach Delay		0.9	0.9		31.7		
Approach LOS		A	A		C		
Queue Length 50th (m)	0.0	0.0	0.0		0.2	0.0	
Queue Length 95th (m)	2.6	15.2	14.7		1.9	4.2	
Internal Link Dist (m)		634.2	235.6		86.5		
Turn Bay Length (m)	49.0					13.5	
Base Capacity (vph)	722	3065	2950		403	319	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.04	0.17	0.17		0.00	0.02	

Intersection Summary
Cycle Length: 115
Actuated Cycle Length: 115
Offset: 75 (65%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.17

Intersection Signal Delay: 1.1	Intersection LOS: A
Intersection Capacity Utilization 42.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: Hazeldean Road & Jackson Trails Centre

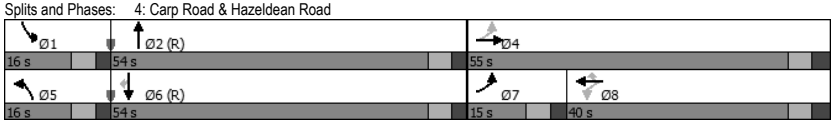


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	250	281	62	33	169	362	66	472	22	238	315	102
Future Volume (vph)	250	281	62	33	169	362	66	472	22	238	315	102
Satd. Flow (prot)	1626	3008	0	1537	1648	1469	1523	3242	0	3066	1712	1375
Flt Permitted	0.389			0.546			0.950			0.950		
Satd. Flow (perm)	664	3008	0	879	1648	1441	1514	3242	0	3047	1712	1335
Satd. Flow (RTOR)		24				343		4				137
Lane Group Flow (vph)	250	343	0	33	169	362	66	494	0	238	315	102
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
Detector Phase	7	4		8	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0	10.0	5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	11.1	39.6		39.6	39.6	39.6	11.0	32.1		11.0	32.1	32.1
Total Split (s)	15.0	55.0		40.0	40.0	40.0	16.0	54.0		16.0	54.0	54.0
Total Split (%)	12.0%	44.0%		32.0%	32.0%	32.0%	12.8%	43.2%		12.8%	43.2%	43.2%
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.7	3.7		3.7	3.7	3.7
All-Red Time (s)	2.4	2.9		2.9	2.9	2.9	2.3	2.4		2.3	2.4	2.4
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.1	6.6		6.6	6.6	6.6	6.0	6.1		6.0	6.1	6.1
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	35.3	34.8		19.8	19.8	19.8	9.8	56.6		14.9	64.2	64.2
Actuated g/C Ratio	0.28	0.28		0.16	0.16	0.16	0.08	0.45		0.12	0.51	0.51
v/c Ratio	0.98	0.40		0.24	0.65	0.70	0.55	0.34		0.65	0.36	0.14
Control Delay	89.7	32.3		46.6	59.6	13.3	72.8	23.9		57.1	35.7	15.1
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	89.7	32.3		46.6	59.6	13.3	72.8	23.9		57.1	35.7	15.1
LOS	F	C		D	E	B	E	C		E	D	B
Approach Delay		56.5			29.1			29.6			40.3	
Approach LOS		E			C			C			D	
Queue Length 50th (m)	~54.7	34.2		7.3	40.1	4.1	15.8	40.1		29.0	38.1	0.0
Queue Length 95th (m)	#76.3	40.9		15.1	55.1	29.9	31.0	60.2		#56.0	104.9	19.6
Internal Link Dist (m)		168.3			634.2			336.3			266.7	
Turn Bay Length (m)	95.0			53.5			41.0			80.0		
Base Capacity (vph)	256	1179		234	440	636	130	1470		364	878	752
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	0.98	0.29		0.14	0.38	0.57	0.51	0.34		0.65	0.36	0.14

Intersection Summary
Cycle Length: 125
Actuated Cycle Length: 125
Offset: 107 (86%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.98
Intersection Signal Delay: 39.2 — Intersection LOS: D
Intersection Capacity Utilization 76.5% — ICU Level of Service D
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Carp Road & Hazeldean Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	205	17	25	52	13	179	17	1048	25	55	584	46
Future Volume (vph)	205	17	25	52	13	179	17	1048	25	55	584	46
Satd. Flow (prot)	1642	1516	0	1658	1483	0	1510	3273	0	1658	3159	0
Flt Permitted	0.533			0.730			0.397			0.192		
Satd. Flow (perm)	921	1516	0	1262	1483	0	630	3273	0	335	3159	0
Satd. Flow (RTOR)		25			152			3			10	
Lane Group Flow (vph)	205	42	0	52	192	0	17	1073	0	55	630	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	10.0		5.0	10.0	
Minimum Split (s)	30.3	30.3		29.3	29.3		10.6	32.0		10.6	32.0	
Total Split (s)	43.0	43.0		43.0	43.0		11.0	71.0		11.0	71.0	
Total Split (%)	34.4%	34.4%		34.4%	34.4%		8.8%	56.8%		8.8%	56.8%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.7	3.7		3.7	3.7	
All-Red Time (s)	3.3	3.3		3.3	3.3		1.9	2.3		1.9	2.3	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.3	6.3		6.3	6.3		5.6	6.0		5.6	6.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	30.5	30.5		30.5	30.5		77.8	72.9		80.4	77.8	
Actuated g/C Ratio	0.24	0.24		0.24	0.24		0.62	0.58		0.64	0.62	
v/c Ratio	0.92	0.11		0.17	0.40		0.04	0.56		0.20	0.32	
Control Delay	86.9	18.1		36.0	11.7		9.5	18.1		10.8	13.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	86.9	18.1		36.0	11.7		9.5	18.1		10.8	13.2	
LOS	F	B		D	B		A	B		B	B	
Approach Delay		75.2			16.9			18.0			13.0	
Approach LOS		E			B			B			B	
Queue Length 50th (m)	48.4	3.2		10.0	7.6		0.9	96.3		4.6	32.9	
Queue Length 95th (m)	#83.2	11.6		19.7	25.8		m2.8	m129.2		10.4	59.8	
Internal Link Dist (m)		65.8			95.1			266.7			438.0	
Turn Bay Length (m)	65.5						24.5			36.0		
Base Capacity (vph)	270	462		370	542		431	1911		277	1970	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.76	0.09		0.14	0.35		0.04	0.56		0.20	0.32	

Intersection Summary

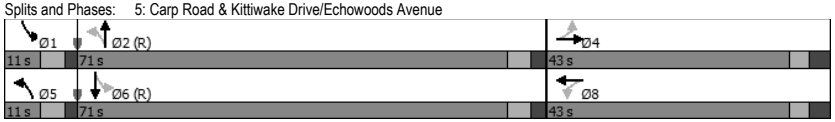
Cycle Length: 125
Actuated Cycle Length: 125
Offset: 7 (6%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92
Intersection Signal Delay: 22.6 — Intersection LOS: C
Intersection Capacity Utilization 80.1% — ICU Level of Service D
Analysis Period (min) 15

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

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

Splits and Phases: 5: Carp Road & Kittiwake Drive/Echowoods Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	365	35	252	472	39	32	27	190	28	21	3
Future Volume (vph)	10	365	35	252	472	39	32	27	190	28	21	3
Satd. Flow (prot)	1658	1722	0	1658	1710	0	0	1700	1483	1658	1602	0
Flt Permitted	0.459			0.522				0.818		0.719		
Satd. Flow (perm)	801	1722	0	911	1710	0	0	1427	1483	1255	1602	0
Satd. Flow (RTOR)		6			6				190		3	
Lane Group Flow (vph)	10	400	0	252	511	0	0	59	190	28	24	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4		4	8		
Detector Phase	2	2		6	6		4	4	4	8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	36.3	36.3		36.3	36.3		27.1	27.1	27.1	27.1	27.1	
Total Split (s)	83.0	83.0		83.0	83.0		47.0	47.0	47.0	47.0	47.0	
Total Split (%)	63.8%	63.8%		63.8%	63.8%		36.2%	36.2%	36.2%	36.2%	36.2%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.6	2.6		2.6	2.6		3.1	3.1	3.1	3.1	3.1	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.3	6.3		6.3	6.3			6.1	6.1	6.1	6.1	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None	None	None	None	
Act Effct Green (s)	104.8	104.8		104.8	104.8			12.8	12.8	12.8	12.8	
Actuated g/C Ratio	0.81	0.81		0.81	0.81			0.10	0.10	0.10	0.10	
v/c Ratio	0.02	0.29		0.34	0.37			0.42	0.60	0.23	0.15	
Control Delay	3.4	4.1		8.9	8.6			63.1	15.2	56.7	48.6	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	3.4	4.1		8.9	8.6			63.1	15.2	56.7	48.6	
LOS	A	A		A	A			E	B	E	D	
Approach Delay		4.1			8.7			26.6			53.0	
Approach LOS		A			A			C			D	
Queue Length 50th (m)	0.4	18.3		29.7	69.7			14.8	0.0	6.9	5.1	
Queue Length 95th (m)	2.0	42.0		67.3	116.8			26.7	20.6	15.4	12.6	
Internal Link Dist (m)		96.2			363.2			170.2			47.0	
Turn Bay Length (m)	66.0			98.0					10.0	24.5		
Base Capacity (vph)	645	1389		734	1380			448	596	394	506	
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	0.02	0.29		0.34	0.37			0.13	0.32	0.07	0.05	

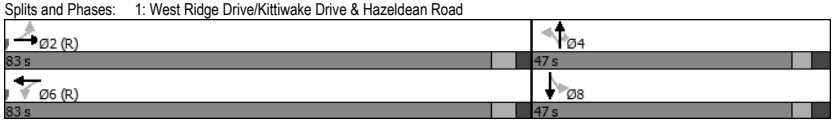
Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 126 (97%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 12.0	Intersection LOS: B
Intersection Capacity Utilization 62.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: West Ridge Drive/Kittiwake Drive & Hazeldean Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	528	4	49	735	6	3	0	38	42	0	37
Future Volume (vph)	51	528	4	49	735	6	3	0	38	42	0	37
Satd. Flow (prot)	1658	3280	0	1658	1745	1483	0	1521	0	0	1658	1483
Flt Permitted	0.355			0.454				0.973			0.730	
Satd. Flow (perm)	618	3280	0	791	1745	1438	0	1486	0	0	1274	1483
Satd. Flow (RTOR)		1				28		38				37
Lane Group Flow (vph)	51	532	0	49	735	6	0	41	0	0	42	37
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		custom	NA	custom
Protected Phases		2			6			4			4	
Permitted Phases	2			6		6	4			8		8
Detector Phase	2	2		6	6	6	4	4		8	4	8
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	30.1	30.1		34.1	34.1	34.1	34.3	34.3		34.3	34.3	34.3
Total Split (s)	93.0	93.0		93.0	93.0	93.0	37.0	37.0		37.0	37.0	37.0
Total Split (%)	71.5%	71.5%		71.5%	71.5%	71.5%	28.5%	28.5%		28.5%	28.5%	28.5%
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3		3.3	3.3	3.3
All-Red Time (s)	2.4	2.4		2.4	2.4	2.4	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1	6.1		6.3			6.3	6.3
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max	C-Max	None	None		None	None	None
Act Effct Green (s)	111.0	111.0		111.0	111.0	111.0		11.1			11.1	11.1
Actuated g/C Ratio	0.85	0.85		0.85	0.85	0.85		0.09			0.09	0.09
v/c Ratio	0.10	0.19		0.07	0.49	0.00		0.25			0.39	0.23
Control Delay	3.8	3.0		1.4	2.4	0.0		22.0			66.3	19.8
Queue Delay	0.0	0.0		0.0	0.3	0.0		0.0			0.0	0.0
Total Delay	3.8	3.0		1.4	2.7	0.0		22.0			66.3	19.8
LOS	A	A		A	A	A		C			E	B
Approach Delay		3.1			2.6			22.0			44.5	
Approach LOS		A			A			C			D	
Queue Length 50th (m)	1.9	10.8		0.4	6.8	0.0		0.7			10.5	0.0
Queue Length 95th (m)	7.9	27.8		m1.9	m24.3	m0.0		11.5			21.9	10.5
Internal Link Dist (m)		363.2			168.3			30.9			31.1	
Turn Bay Length (m)	140.0			30.0		100.0						
Base Capacity (vph)	527	2800		675	1489	1231		379			300	378
Starvation Cap Reductn	0	0		0	254	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	0.10	0.19		0.07	0.60	0.00		0.11			0.14	0.10

Intersection Summary

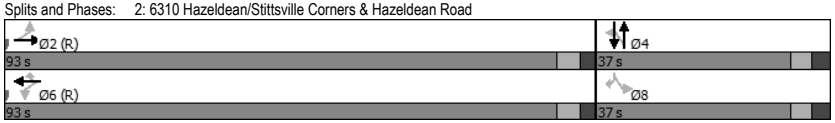
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 47 (36%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.49

Intersection Signal Delay: 5.5	Intersection LOS: A
Intersection Capacity Utilization 73.1%	ICU Level of Service D
Analysis Period (min) 15	

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

Splits and Phases: 2: 6310 Hazeldean/Stittsville Corners & Hazeldean Road



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø7
Lane Configurations							
Traffic Volume (vph)	65	651	916	14	15	39	
Future Volume (vph)	65	651	916	14	15	39	
Satd. Flow (prot)	1658	3316	3307	0	1580	1469	
Flt Permitted	0.303				0.950		
Satd. Flow (perm)	527	3316	3307	0	1580	1469	
Satd. Flow (RTOR)			2			39	
Lane Group Flow (vph)	65	651	930	0	15	39	
Turn Type	Perm	NA	NA		Prot	Perm	
Protected Phases		2	6		8		7
Permitted Phases	2					8	
Detector Phase	2	2	6		8	8	
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0		10.0	10.0	1.0
Minimum Split (s)	24.4	24.4	33.4		34.3	34.3	5.0
Total Split (s)	80.7	80.7	80.7		34.3	34.3	5.0
Total Split (%)	67.3%	67.3%	67.3%		28.6%	28.6%	4%
Yellow Time (s)	3.7	3.7	3.7		3.3	3.3	2.0
All-Red Time (s)	2.7	2.7	2.7		3.0	3.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.4	6.4	6.4		6.3	6.3	
Lead/Lag					Lag	Lag	Lead
Lead-Lag Optimize?					Yes	Yes	Yes
Recall Mode	C-Max	C-Max	C-Max		None	None	None
Act Effct Green (s)	101.8	101.8	101.8		10.0	10.0	
Actuated g/C Ratio	0.85	0.85	0.85		0.08	0.08	
v/c Ratio	0.15	0.23	0.33		0.11	0.25	
Control Delay	3.2	2.5	2.9		53.2	19.7	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	3.2	2.5	2.9		53.2	19.7	
LOS	A	A	A		D	B	
Approach Delay		2.6	2.9		29.0		
Approach LOS		A	A		C		
Queue Length 50th (m)	2.6	15.1	24.0		3.3	0.0	
Queue Length 95th (m)	5.7	19.3	29.8		10.2	10.7	
Internal Link Dist (m)		634.2	235.6		86.5		
Turn Bay Length (m)	49.0					13.5	
Base Capacity (vph)	447	2814	2806		368	372	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.15	0.23	0.33		0.04	0.10	

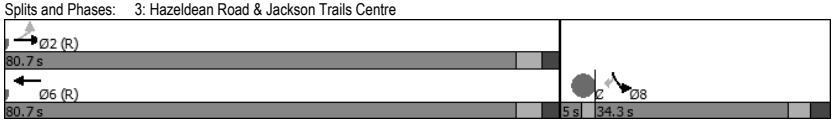
Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 99 (83%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.33

Intersection Signal Delay: 3.6	Intersection LOS: A
Intersection Capacity Utilization 59.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3: Hazeldean Road & Jackson Trails Centre



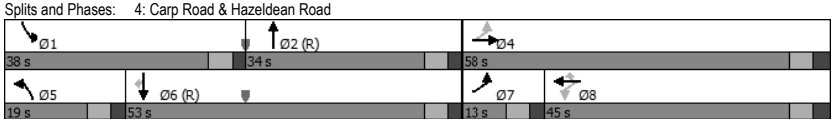
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	159	367	87	66	451	486	101	411	29	392	532	261
Future Volume (vph)	159	367	87	66	451	486	101	411	29	392	532	261
Satd. Flow (prot)	1658	3159	0	1470	1745	1455	1658	3175	0	3216	1745	1483
Flt Permitted	0.138			0.490			0.950			0.950		
Satd. Flow (perm)	240	3159	0	755	1745	1427	1654	3175	0	3199	1745	1433
Satd. Flow (RTOR)		26				466		5				234
Lane Group Flow (vph)	159	454	0	66	451	486	101	440	0	392	532	261
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
Detector Phase	7	4		8	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0	10.0	5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	11.1	39.6		39.6	39.6	39.6	11.0	32.1		11.0	32.1	32.1
Total Split (s)	13.0	58.0		45.0	45.0	45.0	19.0	34.0		38.0	53.0	53.0
Total Split (%)	10.0%	44.6%		34.6%	34.6%	34.6%	14.6%	26.2%		29.2%	40.8%	40.8%
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.7	3.7		3.7	3.7	3.7
All-Red Time (s)	2.4	2.9		2.9	2.9	2.9	2.3	2.4		2.3	2.4	2.4
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.1	6.6		6.6	6.6	6.6	6.0	6.1		6.0	6.1	6.1
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	49.9	49.4		36.4	36.4	36.4	11.6	40.8		21.1	50.3	50.3
Actuated g/C Ratio	0.38	0.38		0.28	0.28	0.28	0.09	0.31		0.16	0.39	0.39
v/c Ratio	0.95	0.37		0.31	0.92	0.66	0.68	0.44		0.75	0.79	0.37
Control Delay	88.7	24.8		40.7	71.0	8.8	80.1	38.2		50.8	51.8	18.1
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	88.7	24.8		40.7	71.0	8.8	80.1	38.2		50.8	51.8	18.1
LOS	F	C		D	E	A	F	D		D	D	B
Approach Delay		41.4			38.9			46.0			44.1	
Approach LOS		D			D			D			D	
Queue Length 50th (m)	23.4	33.3		13.1	109.9	3.7	25.2	47.7		50.5	143.8	26.2
Queue Length 95th (m)	#55.0	39.8		26.3	#167.3	34.9	#45.8	67.7		64.3	#188.8	53.3
Internal Link Dist (m)		168.3			634.2			339.9			266.7	
Turn Bay Length (m)	95.0			53.5			41.0			80.0		
Base Capacity (vph)	167	1264		223	515	749	165	999		791	674	697
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	0.95	0.36		0.30	0.88	0.65	0.61	0.44		0.50	0.79	0.37

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 129 (99%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.95
Intersection Signal Delay: 42.3 — Intersection LOS: D
Intersection Capacity Utilization 90.9% — ICU Level of Service E
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Carp Road & Hazeldean Road



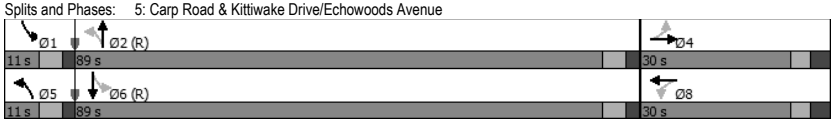
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	22	50	55	22	122	58	830	34	174	1091	144
Future Volume (vph)	130	22	50	55	22	122	58	830	34	174	1091	144
Satd. Flow (prot)	1658	1545	0	1658	1506	0	1658	3173	0	1658	3249	0
Flt Permitted	0.558			0.710			0.183			0.287		
Satd. Flow (perm)	972	1545	0	1233	1506	0	319	3173	0	500	3249	0
Satd. Flow (RTOR)		50			122			6			22	
Lane Group Flow (vph)	130	72	0	55	144	0	58	864	0	174	1235	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	10.0		5.0	10.0	
Minimum Split (s)	29.3	29.3		29.3	29.3		10.6	32.0		10.6	32.0	
Total Split (s)	30.0	30.0		30.0	30.0		11.0	89.0		11.0	89.0	
Total Split (%)	23.1%	23.1%		23.1%	23.1%		8.5%	68.5%		8.5%	68.5%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.7	3.7		3.7	3.7	
All-Red Time (s)	3.3	3.3		3.3	3.3		1.9	2.3		1.9	2.3	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.3	6.3		6.3	6.3		5.6	6.0		5.6	6.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	20.2	20.2		20.2	20.2		91.6	85.4		93.8	88.3	
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.70	0.66		0.72	0.68	
v/c Ratio	0.86	0.26		0.29	0.43		0.20	0.41		0.42	0.56	
Control Delay	96.6	20.6		51.0	15.5		4.3	12.2		8.4	12.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	96.6	20.6		51.0	15.5		4.3	12.2		8.4	12.8	
LOS	F	C		D	B		A	B		A	B	
Approach Delay		69.5			25.3			11.7			12.3	
Approach LOS		E			C			B			B	
Queue Length 50th (m)	32.2	4.8		12.4	4.8		2.4	72.7		11.6	89.0	
Queue Length 95th (m)	#62.5	18.1		24.8	23.3		m2.0	m77.4		19.2	108.0	
Internal Link Dist (m)		73.3			85.0			266.7			438.0	
Turn Bay Length (m)	65.5						24.5			36.0		
Base Capacity (vph)	177	322		224	374		285	2085		418	2212	
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	0.73	0.22		0.25	0.39		0.20	0.41		0.42	0.56	

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 29 (22%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.86
Intersection Signal Delay: 17.3 — Intersection LOS: B
Intersection Capacity Utilization 79.0% — ICU Level of Service D
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Carp Road & Kittiwake Drive/Echowoods Avenue



Appendix M

Synchro Intersection Worksheets – 2032 Future Total Conditions

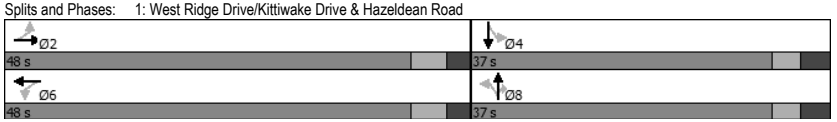
CGH TRANSPORTATION

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	383	17	67	234	13	30	11	173	21	10	3
Future Volume (vph)	5	383	17	67	234	13	30	11	173	21	10	3
Satd. Flow (prot)	1658	1703	0	1658	1684	0	0	1642	1483	1658	1684	0
Flt Permitted	0.606			0.525				0.776		0.730		
Satd. Flow (perm)	1058	1703	0	916	1684	0	0	1320	1483	1274	1684	0
Satd. Flow (RTOR)		4			5				173		3	
Lane Group Flow (vph)	5	400	0	67	247	0	0	41	173	21	13	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8		8	4		
Detector Phase	2	2		6	6		8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	28.0	28.0		28.0	28.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	36.3	36.3		36.3	36.3		27.1	27.1	27.1	27.1	27.1	
Total Split (s)	48.0	48.0		48.0	48.0		37.0	37.0	37.0	37.0	37.0	
Total Split (%)	56.5%	56.5%		56.5%	56.5%		43.5%	43.5%	43.5%	43.5%	43.5%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.6	2.6		2.6	2.6		3.1	3.1	3.1	3.1	3.1	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.3	6.3		6.3	6.3			6.1	6.1	6.1	6.1	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		None	None	None	None	None	
Act Effct Green (s)	45.1	45.1		45.1	45.1			10.2	10.2	10.2	10.2	
Actuated g/C Ratio	0.67	0.67		0.67	0.67			0.15	0.15	0.15	0.15	
v/c Ratio	0.01	0.35		0.11	0.22			0.21	0.47	0.11	0.05	
Control Delay	4.2	6.1		4.9	5.1			26.5	9.2	24.8	21.2	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	4.2	6.1		4.9	5.1			26.5	9.2	24.8	21.2	
LOS	A	A		A	A			C	A	C	C	
Approach Delay		6.1			5.0			12.5			23.4	
Approach LOS		A			A			B			C	
Queue Length 50th (m)	0.2	17.9		2.5	9.8			4.3	0.0	2.2	1.0	
Queue Length 95th (m)	1.1	31.5		6.4	18.3			12.0	14.2	7.4	5.0	
Internal Link Dist (m)		115.7			359.5			126.0			49.9	
Turn Bay Length (m)	66.0			98.0					10.0	24.5		
Base Capacity (vph)	704	1134		609	1122			605	774	584	774	
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	0.01	0.35		0.11	0.22			0.07	0.22	0.04	0.02	

Intersection Summary
Cycle Length: 85
Actuated Cycle Length: 67.8
Natural Cycle: 65
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.47

Intersection Signal Delay: 7.8 — Intersection LOS: A
Intersection Capacity Utilization 71.3% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: West Ridge Drive/Kittiwake Drive & Hazeldean Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	555	1	20	311	1	4	0	47	4	0	4
Future Volume (vph)	29	555	1	20	311	1	4	0	47	4	0	4
Satd. Flow (prot)	1580	3284	0	1658	1712	1483	0	1523	0	0	1353	1483
Flt Permitted	0.571			0.444				0.971			0.893	
Satd. Flow (perm)	950	3284	0	775	1712	1483	0	1484	0	0	1272	1483
Satd. Flow (RTOR)						29		47				27
Lane Group Flow (vph)	29	556	0	20	311	1	0	51	0	0	4	4
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		custom	NA	custom
Protected Phases		2			6			4			4	
Permitted Phases	2			6		6	4			8		8
Detector Phase	2	2		6	6	6	4	4		8	4	8
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	30.1	30.1		30.1	30.1	30.1	34.3	34.3		34.3	34.3	34.3
Total Split (s)	90.0	90.0		90.0	90.0	90.0	35.0	35.0		35.0	35.0	35.0
Total Split (%)	72.0%	72.0%		72.0%	72.0%	72.0%	28.0%	28.0%		28.0%	28.0%	28.0%
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3		3.3	3.3	3.3
All-Red Time (s)	2.4	2.4		2.4	2.4	2.4	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1	6.1		6.3			6.3	6.3
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max	C-Max	None	None		None	None	None
Act Effct Green (s)	107.1	107.1		107.1	107.1	107.1		10.0			10.0	10.0
Actuated g/C Ratio	0.86	0.86		0.86	0.86	0.86		0.08			0.08	0.08
v/c Ratio	0.04	0.20		0.03	0.21	0.00		0.32			0.04	0.03
Control Delay	2.2	2.3		0.9	1.0	0.0		22.4			54.2	0.2
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	2.2	2.3		0.9	1.0	0.0		22.4			54.2	0.2
LOS	A	A		A	A	A		C			D	A
Approach Delay		2.3			0.9			22.4			27.3	
Approach LOS		A			A			C			C	
Queue Length 50th (m)	1.1	12.2		0.0	0.4	0.0		0.9			0.9	0.0
Queue Length 95th (m)	2.6	15.8		m1.2	9.8	m0.0		13.4			4.7	0.0
Internal Link Dist (m)		359.5			168.3			30.9			31.1	
Turn Bay Length (m)	140.0			30.0		100.0						
Base Capacity (vph)	813	2813		664	1466	1274		376			292	361
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	0.04	0.20		0.03	0.21	0.00		0.14			0.01	0.01

Intersection Summary

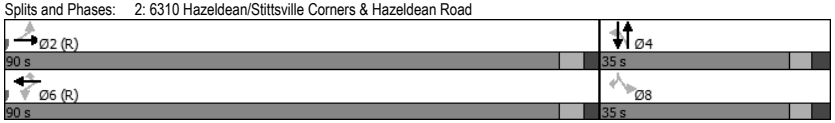
Cycle Length: 125
Actuated Cycle Length: 125
Offset: 37 (30%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.32

Intersection Signal Delay: 3.1	Intersection LOS: A
Intersection Capacity Utilization 49.5%	ICU Level of Service A
Analysis Period (min) 15	

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

Splits and Phases: 2: 6310 Hazeldean/Stittsville Corners & Hazeldean Road



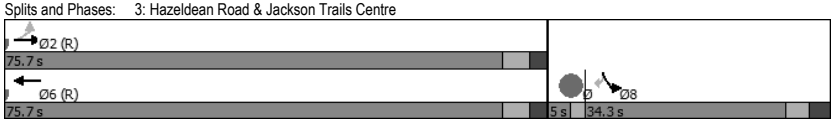
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø7
Lane Configurations							
Traffic Volume (vph)	27	528	494	5	1	6	
Future Volume (vph)	27	528	494	5	1	6	
Satd. Flow (prot)	1523	3191	3071	0	1658	1293	
Flt Permitted	0.469				0.950		
Satd. Flow (perm)	752	3191	3071	0	1658	1293	
Satd. Flow (RTOR)			2			6	
Lane Group Flow (vph)	27	528	499	0	1	6	
Turn Type	Perm	NA	NA		Prot	Perm	
Protected Phases		2	6		8		7
Permitted Phases	2					8	
Detector Phase	2	2	6		8	8	
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0		10.0	10.0	1.0
Minimum Split (s)	24.4	24.4	33.4		34.3	34.3	5.0
Total Split (s)	75.7	75.7	75.7		34.3	34.3	5.0
Total Split (%)	65.8%	65.8%	65.8%		29.8%	29.8%	4%
Yellow Time (s)	3.7	3.7	3.7		3.3	3.3	2.0
All-Red Time (s)	2.7	2.7	2.7		3.0	3.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.4	6.4	6.4		6.3	6.3	
Lead/Lag					Lag	Lag	Lead
Lead-Lag Optimize?					Yes	Yes	Yes
Recall Mode	C-Max	C-Max	C-Max		None	None	None
Act Effct Green (s)	110.5	110.5	110.5		10.0	10.0	
Actuated g/C Ratio	0.96	0.96	0.96		0.09	0.09	
v/c Ratio	0.04	0.17	0.17		0.01	0.05	
Control Delay	1.2	0.9	0.9		48.0	29.0	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	1.2	0.9	0.9		48.0	29.0	
LOS	A	A	A		D	C	
Approach Delay		0.9	0.9		31.7		
Approach LOS		A	A		C		
Queue Length 50th (m)	0.0	0.0	0.0		0.2	0.0	
Queue Length 95th (m)	2.6	15.5	14.7		1.9	4.2	
Internal Link Dist (m)		634.2	235.6		86.5		
Turn Bay Length (m)	49.0					13.5	
Base Capacity (vph)	722	3065	2950		403	319	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.04	0.17	0.17		0.00	0.02	

Intersection Summary
Cycle Length: 115
Actuated Cycle Length: 115
Offset: 75 (65%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.17

Intersection Signal Delay: 1.1	Intersection LOS: A
Intersection Capacity Utilization 42.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: Hazeldean Road & Jackson Trails Centre



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	250	288	62	33	169	365	66	531	22	240	319	102
Future Volume (vph)	250	288	62	33	169	365	66	531	22	240	319	102
Satd. Flow (prot)	1626	3008	0	1537	1648	1469	1523	3248	0	3066	1712	1375
Flt Permitted	0.389			0.542			0.950			0.950		
Satd. Flow (perm)	664	3008	0	873	1648	1441	1514	3248	0	3049	1712	1335
Satd. Flow (RTOR)		24				315		4				137
Lane Group Flow (vph)	250	350	0	33	169	365	66	553	0	240	319	102
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
Detector Phase	7	4		8	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0	10.0	5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	11.1	39.6		39.6	39.6	39.6	11.0	32.1		11.0	32.1	32.1
Total Split (s)	15.0	55.0		40.0	40.0	40.0	16.0	54.0		16.0	54.0	54.0
Total Split (%)	12.0%	44.0%		32.0%	32.0%	32.0%	12.8%	43.2%		12.8%	43.2%	43.2%
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.7	3.7		3.7	3.7	3.7
All-Red Time (s)	2.4	2.9		2.9	2.9	2.9	2.3	2.4		2.3	2.4	2.4
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.1	6.6		6.6	6.6	6.6	6.0	6.1		6.0	6.1	6.1
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	35.3	34.8		19.8	19.8	19.8	9.8	56.4		15.1	64.2	64.2
Actuated g/C Ratio	0.28	0.28		0.16	0.16	0.16	0.08	0.45		0.12	0.51	0.51
v/c Ratio	0.98	0.41		0.24	0.65	0.74	0.55	0.38		0.65	0.36	0.14
Control Delay	89.6	32.5		46.7	59.6	17.7	72.8	24.6		56.7	35.8	15.1
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	89.6	32.5		46.7	59.6	17.7	72.8	24.6		56.7	35.8	15.1
LOS	F	C		D	E	B	E	C		E	D	B
Approach Delay		56.3			31.9			29.7			40.2	
Approach LOS		E			C			C			D	
Queue Length 50th (m)	~54.5	35.1		7.3	40.1	11.0	15.8	46.1		29.2	38.7	0.0
Queue Length 95th (m)	#75.6	41.9		15.1	55.1	39.3	31.0	68.1		#56.4	105.9	19.2
Internal Link Dist (m)		168.3			634.2			336.3			266.7	
Turn Bay Length (m)	95.0			53.5			41.0			80.0		
Base Capacity (vph)	256	1179		233	440	615	130	1468		369	878	752
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	0.98	0.30		0.14	0.38	0.59	0.51	0.38		0.65	0.36	0.14

Intersection Summary

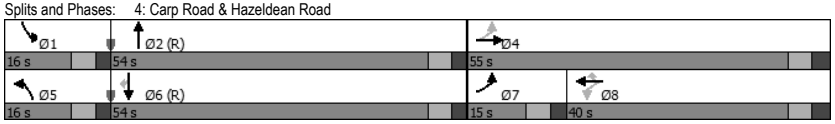
Cycle Length: 125
Actuated Cycle Length: 125
Offset: 107 (86%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.98
Intersection Signal Delay: 39.6 — Intersection LOS: D
Intersection Capacity Utilization 76.6% — ICU Level of Service D
Analysis Period (min) 15

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

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

Splits and Phases: 4: Carp Road & Hazeldean Road



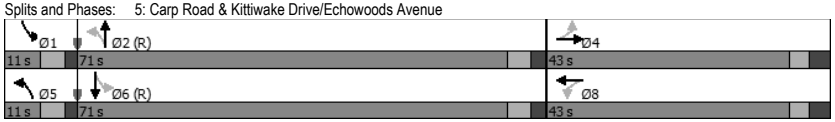
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	205	17	25	52	13	179	17	1170	25	55	590	46
Future Volume (vph)	205	17	25	52	13	179	17	1170	25	55	590	46
Satd. Flow (prot)	1642	1516	0	1658	1483	0	1510	3273	0	1658	3159	0
Flt Permitted	0.533			0.730			0.393			0.156		
Satd. Flow (perm)	921	1516	0	1262	1483	0	624	3273	0	272	3159	0
Satd. Flow (RTOR)		25			133			2			10	
Lane Group Flow (vph)	205	42	0	52	192	0	17	1195	0	55	636	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	10.0		5.0	10.0	
Minimum Split (s)	30.3	30.3		29.3	29.3		10.6	32.0		10.6	32.0	
Total Split (s)	43.0	43.0		43.0	43.0		11.0	71.0		11.0	71.0	
Total Split (%)	34.4%	34.4%		34.4%	34.4%		8.8%	56.8%		8.8%	56.8%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.7	3.7		3.7	3.7	
All-Red Time (s)	3.3	3.3		3.3	3.3		1.9	2.3		1.9	2.3	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.3	6.3		6.3	6.3		5.6	6.0		5.6	6.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	30.5	30.5		30.5	30.5		77.8	72.9		80.4	77.8	
Actuated g/C Ratio	0.24	0.24		0.24	0.24		0.62	0.58		0.64	0.62	
v/c Ratio	0.92	0.11		0.17	0.42		0.04	0.63		0.23	0.32	
Control Delay	86.9	18.1		36.0	14.9		9.5	19.8		11.4	13.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	86.9	18.1		36.0	14.9		9.5	19.8		11.4	13.3	
LOS	F	B		D	B		A	B		B	B	
Approach Delay		75.2			19.4			19.7			13.1	
Approach LOS		E			B			B			B	
Queue Length 50th (m)	48.4	3.2		10.0	11.3		0.9	115.1		4.6	33.4	
Queue Length 95th (m)	#83.2	11.6		19.7	30.1		m2.9	m150.1		10.4	60.5	
Internal Link Dist (m)		65.8			95.1			266.7			438.0	
Turn Bay Length (m)	65.5						24.5			36.0		
Base Capacity (vph)	270	462		370	529		427	1910		240	1970	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.76	0.09		0.14	0.36		0.04	0.63		0.23	0.32	

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 7 (6%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92
Intersection Signal Delay: 23.5 — Intersection LOS: C
Intersection Capacity Utilization 83.7% — ICU Level of Service E
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Carp Road & Kittiwake Drive/Echowoods Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	365	35	252	483	39	32	27	190	28	21	3
Future Volume (vph)	10	365	35	252	483	39	32	27	190	28	21	3
Satd. Flow (prot)	1658	1722	0	1658	1710	0	0	1700	1483	1658	1602	0
Flt Permitted	0.453			0.522				0.818		0.719		
Satd. Flow (perm)	791	1722	0	911	1710	0	0	1427	1483	1255	1602	0
Satd. Flow (RTOR)		6			5				190		3	
Lane Group Flow (vph)	10	400	0	252	522	0	0	59	190	28	24	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4		4	8		
Detector Phase	2	2		6	6		4	4	4	8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	36.3	36.3		36.3	36.3		27.1	27.1	27.1	27.1	27.1	
Total Split (s)	83.0	83.0		83.0	83.0		47.0	47.0	47.0	47.0	47.0	
Total Split (%)	63.8%	63.8%		63.8%	63.8%		36.2%	36.2%	36.2%	36.2%	36.2%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.6	2.6		2.6	2.6		3.1	3.1	3.1	3.1	3.1	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.3	6.3		6.3	6.3			6.1	6.1	6.1	6.1	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None	None	None	None	
Act Effct Green (s)	104.8	104.8		104.8	104.8			12.8	12.8	12.8	12.8	
Actuated g/C Ratio	0.81	0.81		0.81	0.81			0.10	0.10	0.10	0.10	
v/c Ratio	0.02	0.29		0.34	0.38			0.42	0.60	0.23	0.15	
Control Delay	3.4	4.1		8.7	8.6			63.1	15.2	56.7	48.6	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	3.4	4.1		8.7	8.6			63.1	15.2	56.7	48.6	
LOS	A	A		A	A			E	B	E	D	
Approach Delay		4.1			8.6			26.6			53.0	
Approach LOS		A			A			C			D	
Queue Length 50th (m)	0.4	18.3		29.1	72.3			14.8	0.0	6.9	5.1	
Queue Length 95th (m)	2.0	42.0		66.0	120.3			26.7	20.6	15.4	12.6	
Internal Link Dist (m)		96.2			363.2			170.2			47.0	
Turn Bay Length (m)	66.0			98.0					10.0	24.5		
Base Capacity (vph)	637	1389		734	1380			448	596	394	506	
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	0.02	0.29		0.34	0.38			0.13	0.32	0.07	0.05	

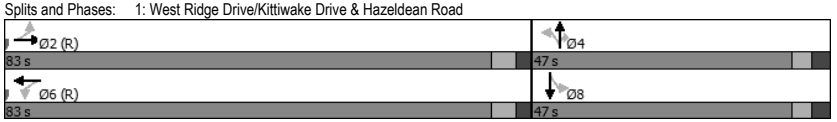
Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 126 (97%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 11.9	Intersection LOS: B
Intersection Capacity Utilization 63.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: West Ridge Drive/Kittiwake Drive & Hazeldean Road

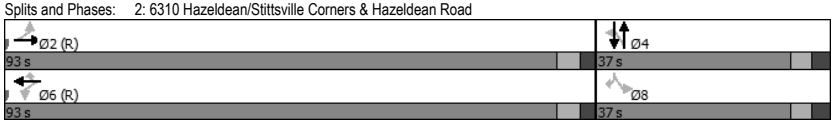


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	528	4	49	753	6	3	0	38	42	0	37
Future Volume (vph)	51	528	4	49	753	6	3	0	38	42	0	37
Satd. Flow (prot)	1658	3280	0	1658	1745	1483	0	1521	0	0	1658	1483
Flt Permitted	0.347			0.454				0.973			0.730	
Satd. Flow (perm)	606	3280	0	791	1745	1438	0	1486	0	0	1274	1483
Satd. Flow (RTOR)		1				28		38				37
Lane Group Flow (vph)	51	532	0	49	753	6	0	41	0	0	42	37
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		custom	NA	custom
Protected Phases		2			6			4			4	
Permitted Phases	2			6		6	4			8		8
Detector Phase	2	2		6	6	6	4	4		8	4	8
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	30.1	30.1		34.1	34.1	34.1	34.3	34.3		34.3	34.3	34.3
Total Split (s)	93.0	93.0		93.0	93.0	93.0	37.0	37.0		37.0	37.0	37.0
Total Split (%)	71.5%	71.5%		71.5%	71.5%	71.5%	28.5%	28.5%		28.5%	28.5%	28.5%
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3		3.3	3.3	3.3
All-Red Time (s)	2.4	2.4		2.4	2.4	2.4	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1	6.1		6.3			6.3	6.3
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max	C-Max	None	None		None	None	None
Act Effct Green (s)	111.0	111.0		111.0	111.0	111.0		11.1			11.1	11.1
Actuated g/C Ratio	0.85	0.85		0.85	0.85	0.85		0.09			0.09	0.09
v/c Ratio	0.10	0.19		0.07	0.51	0.00		0.25			0.39	0.23
Control Delay	3.8	3.0		1.5	2.6	0.0		22.0			66.3	19.8
Queue Delay	0.0	0.0		0.0	0.3	0.0		0.0			0.0	0.0
Total Delay	3.8	3.0		1.5	2.9	0.0		22.0			66.3	19.8
LOS	A	A		A	A	A		C			E	B
Approach Delay		3.1			2.8			22.0			44.5	
Approach LOS		A			A			C			D	
Queue Length 50th (m)	1.9	10.8		0.4	6.6	0.0		0.7			10.5	0.0
Queue Length 95th (m)	7.9	27.8		m2.1	m26.8	m0.0		11.5			21.9	10.5
Internal Link Dist (m)		363.2			168.3			30.9			31.1	
Turn Bay Length (m)	140.0			30.0		100.0						
Base Capacity (vph)	517	2800		675	1489	1231		379			300	378
Starvation Cap Reductn	0	0		0	251	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	0.10	0.19		0.07	0.61	0.00		0.11			0.14	0.10

Intersection Summary
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 47 (36%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.51
Intersection Signal Delay: 5.6 — Intersection LOS: A
Intersection Capacity Utilization 74.1% — ICU Level of Service D
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: 6310 Hazeldean/Stittsville Corners & Hazeldean Road



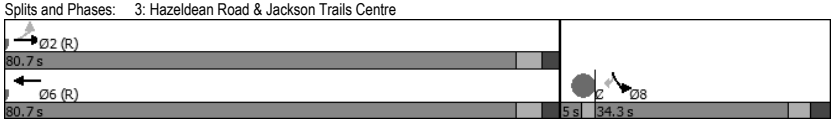
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø7
Lane Configurations							
Traffic Volume (vph)	65	651	937	14	15	39	
Future Volume (vph)	65	651	937	14	15	39	
Satd. Flow (prot)	1658	3316	3307	0	1580	1469	
Flt Permitted	0.296				0.950		
Satd. Flow (perm)	515	3316	3307	0	1580	1469	
Satd. Flow (RTOR)			2			39	
Lane Group Flow (vph)	65	651	951	0	15	39	
Turn Type	Perm	NA	NA		Prot	Perm	
Protected Phases		2	6		8		7
Permitted Phases	2					8	
Detector Phase	2	2	6		8	8	
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0		10.0	10.0	1.0
Minimum Split (s)	24.4	24.4	33.4		34.3	34.3	5.0
Total Split (s)	80.7	80.7	80.7		34.3	34.3	5.0
Total Split (%)	67.3%	67.3%	67.3%		28.6%	28.6%	4%
Yellow Time (s)	3.7	3.7	3.7		3.3	3.3	2.0
All-Red Time (s)	2.7	2.7	2.7		3.0	3.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.4	6.4	6.4		6.3	6.3	
Lead/Lag					Lag	Lag	Lead
Lead-Lag Optimize?					Yes	Yes	Yes
Recall Mode	C-Max	C-Max	C-Max		None	None	None
Act Effct Green (s)	101.8	101.8	101.8		10.0	10.0	
Actuated g/C Ratio	0.85	0.85	0.85		0.08	0.08	
v/c Ratio	0.15	0.23	0.34		0.11	0.25	
Control Delay	3.3	2.5	2.9		53.2	19.7	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	3.3	2.5	2.9		53.2	19.7	
LOS	A	A	A		D	B	
Approach Delay		2.6	2.9		29.0		
Approach LOS		A	A		C		
Queue Length 50th (m)	2.6	15.1	24.7		3.3	0.0	
Queue Length 95th (m)	5.8	19.3	30.8		10.2	10.7	
Internal Link Dist (m)		634.2	235.6		86.5		
Turn Bay Length (m)	49.0					13.5	
Base Capacity (vph)	437	2814	2806		368	372	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.15	0.23	0.34		0.04	0.10	

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 99 (83%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.34

Intersection Signal Delay: 3.6	Intersection LOS: A
Intersection Capacity Utilization 60.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3: Hazeldean Road & Jackson Trails Centre



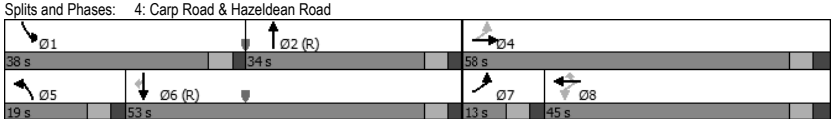
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	159	367	87	66	462	545	101	416	29	435	599	261
Future Volume (vph)	159	367	87	66	462	545	101	416	29	435	599	261
Satd. Flow (prot)	1658	3159	0	1470	1745	1455	1658	3175	0	3216	1745	1483
Flt Permitted	0.134			0.490			0.950			0.950		
Satd. Flow (perm)	233	3159	0	755	1745	1427	1654	3175	0	3199	1745	1433
Satd. Flow (RTOR)		26				510		5				208
Lane Group Flow (vph)	159	454	0	66	462	545	101	445	0	435	599	261
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
Detector Phase	7	4		8	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0	10.0	5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	11.1	39.6		39.6	39.6	39.6	11.0	32.1		11.0	32.1	32.1
Total Split (s)	13.0	58.0		45.0	45.0	45.0	19.0	34.0		38.0	53.0	53.0
Total Split (%)	10.0%	44.6%		34.6%	34.6%	34.6%	14.6%	26.2%		29.2%	40.8%	40.8%
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.7	3.7		3.7	3.7	3.7
All-Red Time (s)	2.4	2.9		2.9	2.9	2.9	2.3	2.4		2.3	2.4	2.4
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.1	6.6		6.6	6.6	6.6	6.0	6.1		6.0	6.1	6.1
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	50.6	50.1		37.1	37.1	37.1	11.6	38.4		22.8	49.6	49.6
Actuated g/C Ratio	0.39	0.39		0.29	0.29	0.29	0.09	0.30		0.18	0.38	0.38
v/c Ratio	0.96	0.37		0.31	0.93	0.71	0.68	0.47		0.77	0.90	0.39
Control Delay	90.9	24.5		40.4	71.5	10.0	80.1	40.4		48.7	60.8	19.5
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	90.9	24.5		40.4	71.5	10.0	80.1	40.4		48.7	60.8	19.5
LOS	F	C		D	E	B	F	D		D	E	B
Approach Delay		41.7			38.4			47.7			48.4	
Approach LOS		D			D			D			D	
Queue Length 50th (m)	23.4	33.3		13.1	113.6	6.5	25.2	49.4		55.9	163.8	30.7
Queue Length 95th (m)	#56.6	39.8		26.3	#173.1	43.3	#45.8	70.0		70.3	#227.7	58.7
Internal Link Dist (m)		168.3			634.2			339.9			266.7	
Turn Bay Length (m)	95.0			53.5			41.0			80.0		
Base Capacity (vph)	166	1264		223	515	780	165	941		791	665	675
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.96	0.36		0.30	0.90	0.70	0.61	0.47		0.55	0.90	0.39

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 129 (99%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.96
Intersection Signal Delay: 44.1 — Intersection LOS: D
Intersection Capacity Utilization 95.1% — ICU Level of Service F
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Carp Road & Hazeldean Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	22	50	55	22	122	58	840	34	174	1219	144
Future Volume (vph)	130	22	50	55	22	122	58	840	34	174	1219	144
Satd. Flow (prot)	1658	1545	0	1658	1506	0	1658	3172	0	1658	3254	0
Flt Permitted	0.558			0.710			0.151			0.283		
Satd. Flow (perm)	972	1545	0	1233	1506	0	263	3172	0	493	3254	0
Satd. Flow (RTOR)		50			122			6			19	
Lane Group Flow (vph)	130	72	0	55	144	0	58	874	0	174	1363	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	10.0		5.0	10.0	
Minimum Split (s)	29.3	29.3		29.3	29.3		10.6	32.0		10.6	32.0	
Total Split (s)	30.0	30.0		30.0	30.0		11.0	89.0		11.0	89.0	
Total Split (%)	23.1%	23.1%		23.1%	23.1%		8.5%	68.5%		8.5%	68.5%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.7	3.7		3.7	3.7	
All-Red Time (s)	3.3	3.3		3.3	3.3		1.9	2.3		1.9	2.3	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.3	6.3		6.3	6.3		5.6	6.0		5.6	6.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	20.2	20.2		20.2	20.2		91.6	85.4		93.8	88.3	
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.70	0.66		0.72	0.68	
v/c Ratio	0.86	0.26		0.29	0.43		0.23	0.42		0.42	0.62	
Control Delay	96.6	20.6		51.0	15.5		4.8	11.4		8.5	14.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	96.6	20.6		51.0	15.5		4.8	11.4		8.5	14.0	
LOS	F	C		D	B		A	B		A	B	
Approach Delay		69.5			25.3			11.0			13.4	
Approach LOS		E			C			B			B	
Queue Length 50th (m)	32.2	4.8		12.4	4.8		1.7	72.0		11.6	105.2	
Queue Length 95th (m)	#62.5	18.1		24.8	23.3		m2.1	m76.9		19.2	127.3	
Internal Link Dist (m)		73.3			85.0			266.7			438.0	
Turn Bay Length (m)	65.5						24.5			36.0		
Base Capacity (vph)	177	322		224	374		248	2084		414	2215	
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	0.73	0.22		0.25	0.39		0.23	0.42		0.42	0.62	

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 29 (22%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.86
Intersection Signal Delay: 17.4 — Intersection LOS: B
Intersection Capacity Utilization 82.7% — ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Carp Road & Kittiwake Drive/Echowoods Avenue