370 Codd's Road and 800 Winisik Street

Transportation Impact Assessment

Step 1 Screening Report

Step 2 Scoping Report

Step 3 Strategy Report

Prepared for:

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PN: 2025-089

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1 Screening

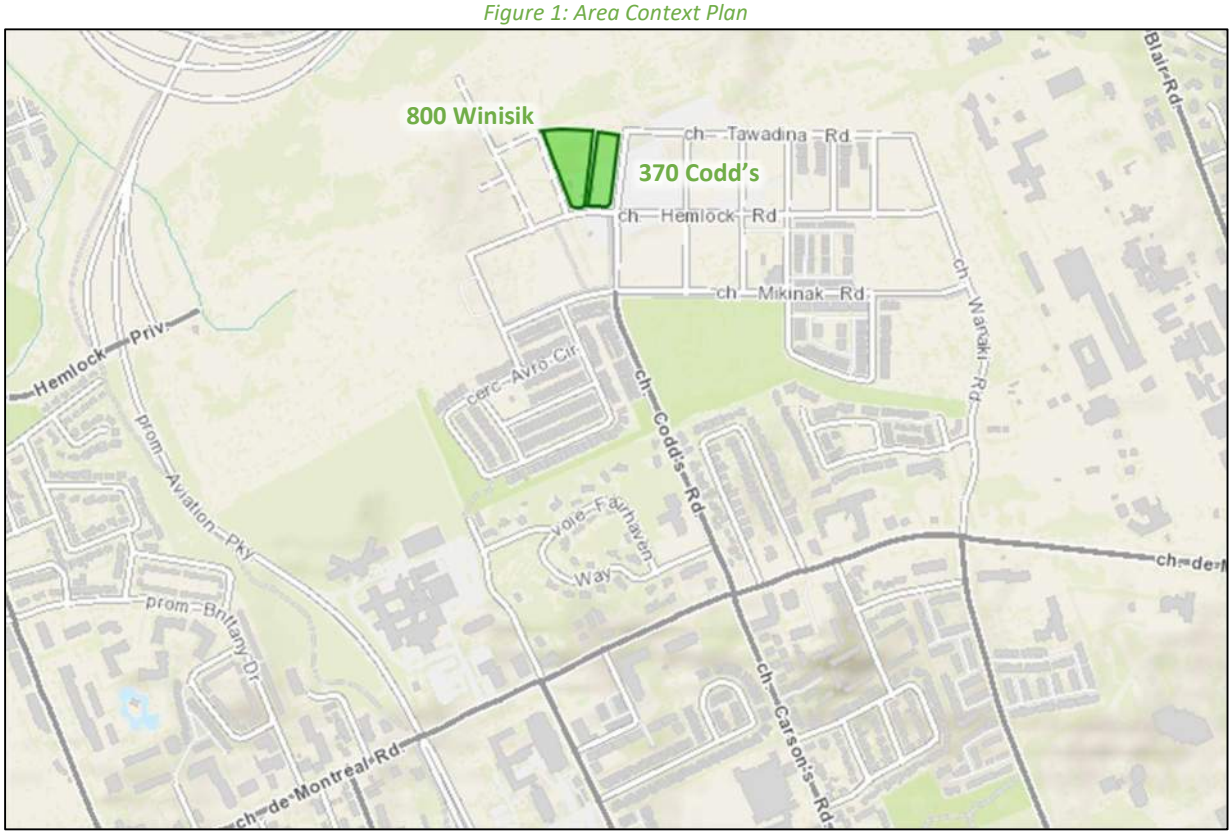
This study has been prepared according to the City of Ottawa's 2017 Transportation Impact Assessment (TIA) Guidelines, incorporating the 2023 Revision to Transportation Impact Assessment Guidelines. Accordingly, a Step 1 Screening Form has been prepared and is included as Appendix A, along with the Certification Form for the TIA Study PM. As shown in the Screening Form, a TIA is required, and this study has been prepared to support two site plan control applications for 370 Codd's Road and 800 Winisik Street.

2 Existing and Planned Conditions

2.1 Proposed Development

The proposed site includes two parcels located at 370 Codd's Road (Block 2) and 800 Winisik Street (Block 3), currently zoned as Minor Corridor Zone 1 (CM1A H(20)). The proposed development comprises Wateridge Phase 4 Blocks 2 and 3, including two six-storey buildings on Block 2 and three six-storey buildings on Block 3, for a total of 510 residential units. Underground parking is proposed on each block, and Block 3 also includes a loop driveway accommodating surface parking spaces. A multi-use pathway is located between the blocks, providing a north-south active transportation connection. The proposed accesses configuration consists of a two-way full-movement access on Codd's Road and a two-way full movement access on Winisik Street. All roadway facilities are being constructed by others and are beyond the scope of this application. The anticipated build-out is 2029. The site is located within the Former CFB Rockcliffe Community Design Plan and is subject to the Wateridge Village Secondary Plan. 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: March 16, 2026

LEGEND OF SYMBOLS

- PRIMARY ENTRANCE
- SECONDARY ENTRANCE / EXIT
- PROPOSED TREES
- TREES BY OTHERS
- PROPOSED FIRE HYDRANT
- BICYCLE PARKING (X2)

No.	Date	Émis pour / Object
01	2025-08-20	CHDP SUBMISSION
02	2026-01-06	DRAFT SCHEMATIC SITE PLAN
03	2026-01-20	SCHEMATIC SITE PLAN
04	2026-03-30	DRAFT SPC SITE PLAN
05	2026-06-08	DRAFT SPC SITE PLAN COORD

Ingénieur / *Engineer*
(Mécanique & Électricité / *Mechanical & Electrical*)

GWAL

Ingénieur / *Engineer*
(Structure / *Structure*)

D+M STRUCTURAL ENGINEERING

Architecte/ *Architect*
(paysagiste / *Landscape*)

NAK design strategies

Ingénieur / *Engineer*
(Civil / *Civil*)

LRL ENGINEERING

Client / *Client*

NEW COMMONS DEVELOPMENT

Architecte / *Architect*

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Montréal QC H4C 1A9
T. 514 861-5122

fig. 2
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Note:

L'entrepreneur doit vérifier toutes les dimensions et informations sur le site et aviser immédiatement l'architecte de toutes erreurs ou omissions.

Contractor shall verify all information and dimensions on site and immediately report any errors or omissions to the architect.

Projet / *Project*

Wateridge Village Block 2 & 3

370 Codd's Rd, Ottawa, ON K1K 3X3

800 Winisik St, Ottawa, ON K1K 3X3

Titre / *Title*

Site Plan

Dessiné par / *Drawn by*	No. projet / *Project number*	
GS	*2513 / 2514*	
Vérifié par / *Verified by*	No. dessin / *Drawing number*	Révision / Revision
RC		0
Échelle / Scale		
1:300		
Date de création du dessin / *Drawing creation date*		
2026-01-20		A100

2.2 Existing Conditions

2.2.1 Area Road Network

Montreal Road: Montreal Road is a City of Ottawa arterial road with a four-lane urban cross-section that is divided within the study area with exception of the mid-section between Lang's Road and Codd's Road/Carson's Road where a two-way left turn lane is present. Sidewalks and bike lanes are located on both sides of the road. The posted speed limit is 60 km/h, and the City-protected right of way is 37.5 within the study area. Montreal Road is a truck route.

Codd's Road: Codd's Road is a City of Ottawa collector road with a two-lane urban cross-section including a sidewalk on the east side of the road and a pathway on the west side south of Hemlock Road and a local road with a two-lane urban cross-section including sidewalks on both sides of the road north of Hemlock Road. The unposted speed limit is assumed to be 40 km/h. The existing right of way is 20.0 metres north of Hemlock Road and 26.0 metres south of Hemlock Road for approximately 435 metres, transiting back to 20.0 metres.

Carson's Road: Carson's Road is a City of Ottawa collector road with a two-lane urban cross-section including sidewalks on both sides of the road. The posted speed limit is 50 km/h, and the existing right of way is 20.0 metres.

Hemlock Road: Hemlock Road is a City of Ottawa collector road with a two-lane urban cross-section including sidewalks and cycletracks on both sides of the road. The unposted speed limit is assumed to be 40 km/h, and the existing right of way is 26.0 metres west of Codd's Road and 24.0 metres between Codd's Road and Michael Stoqua Street, transiting back to 26.0 metres.

2.2.2 Existing Intersections

The key study area intersections within one kilometre of the site have been summarized below:

Hemlock Road at Codd's Road	The intersection of Hemlock Road at Codd's Road is an unsignalized intersection with all-way stop control. All approaches consist of a shared all-movements lane. No turn restrictions were noted.
Montreal Road at Codd's Road/ Carson's Road	The intersection of Montreal Road at Codd's Road/Carsons Road is a signalized intersection. 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 consist of an auxiliary left-turn lane, a through lane, and a shared through/right-turn lane. No turn restrictions were noted.

2.2.3 Existing Driveways

There are no existing driveways within 200 metres of the proposed site accesses.

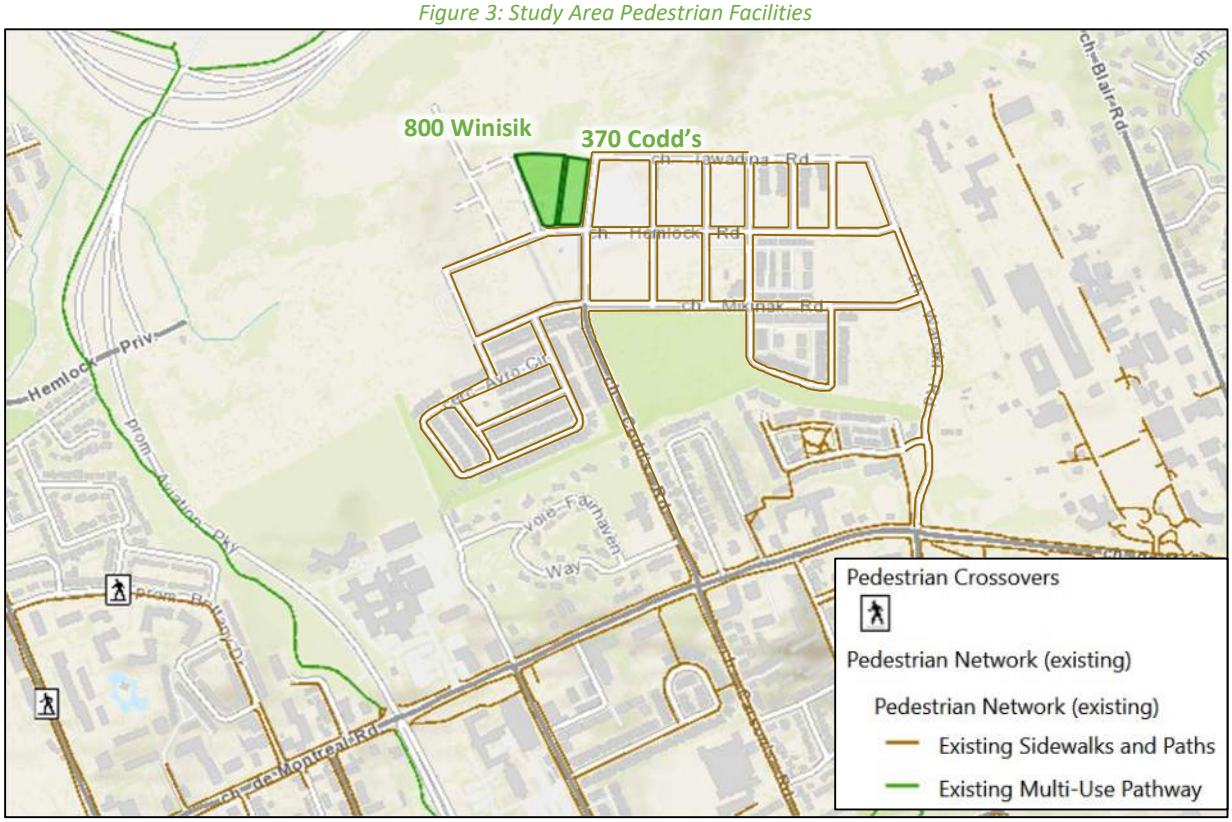
2.2.4 Cycling and Pedestrian Facilities

Figure 3 illustrates the pedestrian facilities in the study area and Figure 4 illustrates the cycling facilities.

Sidewalks are provided along both sides of Hemlock Road, Codd's Road, Carson's Road, and Montreal Road.

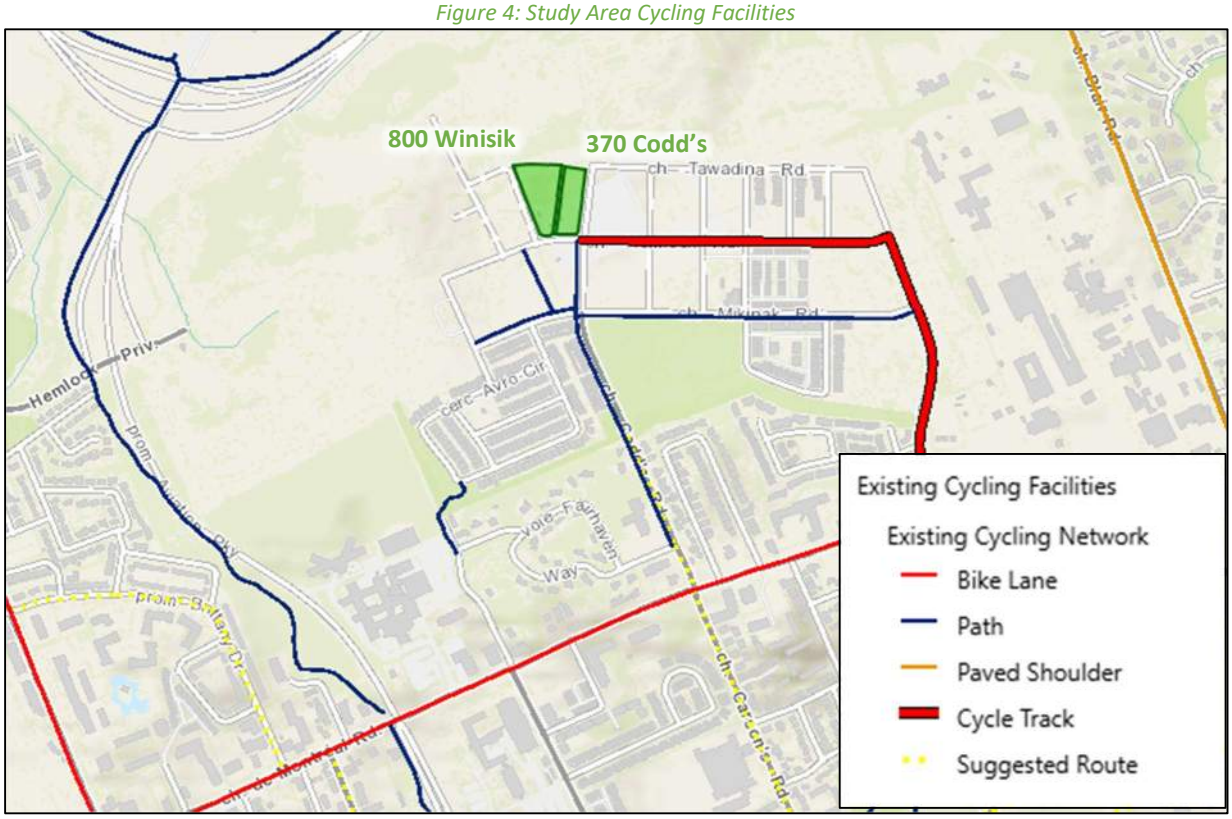
Cycling facilities include cycletracks on both sides of Hemlock Road, a pathway on the west side of Codd's Road between Blackthorne Avenue and Hemlock Road, and bike lanes on both sides of Montreal Road. Hemlock Road, Wanaki Road, Montreal Road, and the Aviation Pathway are cross-town bikeways.

Figure 3: Study Area Pedestrian Facilities



Source: http://maps.ottawa.ca/geoOttawa/ Accessed: March 16, 2026

Figure 4: Study Area Cycling Facilities



Source: http://maps.ottawa.ca/geoOttawa/ Accessed: March 16, 2026

Pedestrian and cyclist volumes included in study area intersection counts, presented in Section 2.2.7, have been compiled and are illustrated in Figure 5 and Figure 6, respectively. The City of Ottawa notes that the active mode volumes collected in winter may be lower than summer conditions, although this cannot be confirmed.

Figure 5: Existing Pedestrian Volumes

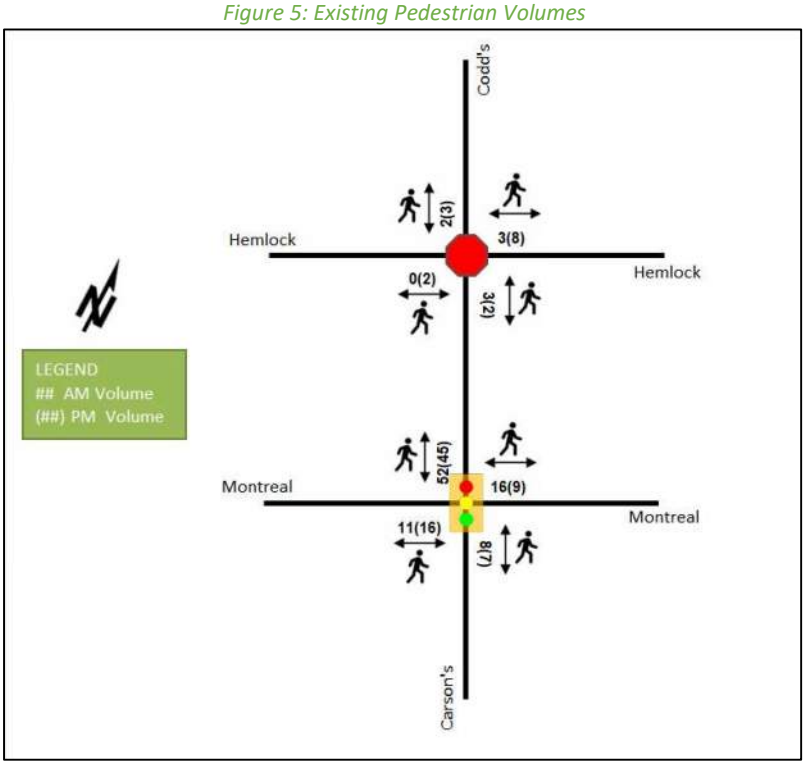
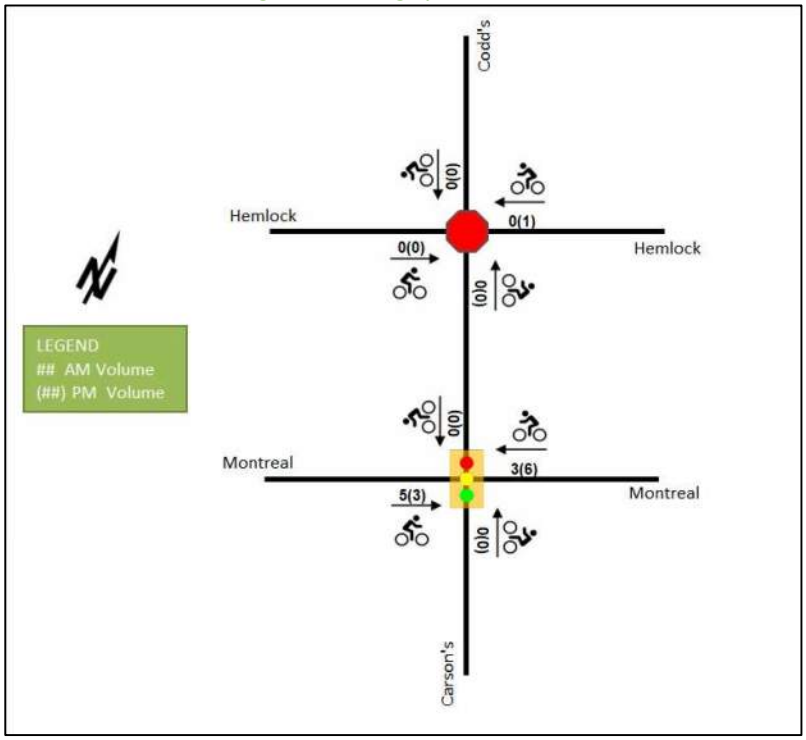


Figure 6: Existing Cyclist Volumes



2.2.5 Existing Transit

Figure 7 illustrates the transit system map in the study area and Figure 8 illustrates nearby transit stops. All transit information is from March 16, 2026, and is included for general information purposes and context to the surrounding area.

Within the study area, the route #12 travels along Montreal Road, and routes #17 and #25 travel along Montreal Road and Codd's Road. The frequency of these routes within proximity of the proposed site based on March 16, 2026, service levels are:

- Route #12 – 15-minute service all day, 30-minute service early mornings and late nights
- Route #17 – 30-minute service, operating in the peak direction during peak hours only
- Route #25 – 15-minute service all day, 30-minute service early mornings and late nights

Figure 7: Existing Study Area Transit Service

Source: http://www.octranspo.com/ Accessed: March 16, 2026

Figure 8: Existing Study Area Transit Stops

Source: http://www.octranspo.com/ Accessed: March 16, 2026

2.2.6 Existing Area Traffic Management Measures

Traffic management measures include bulb-outs to narrow approaches to intersections (e.g. reduced crossing distance) and on-street parking are provided along Hemlock Road and Codd's Road.

2.2.7 Existing Peak Hour Travel Demand

Existing turning movement counts were acquired from J & S Traffic Services for the existing study area intersections. Table 1 summarizes the intersection count dates.

Table 1: Intersection Count Date

Intersection	Count Date
Hemlock Road at Codd's Road	Thursday, February 12, 2026
Montreal Road at Codd's Road/Carsons Road	Thursday, November 06, 2025

Figure 9 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 MMLOS Guidelines weighted v/c methodology for the overall intersection, per direction from Transportation Engineering Services, 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 9: Existing Traffic Counts

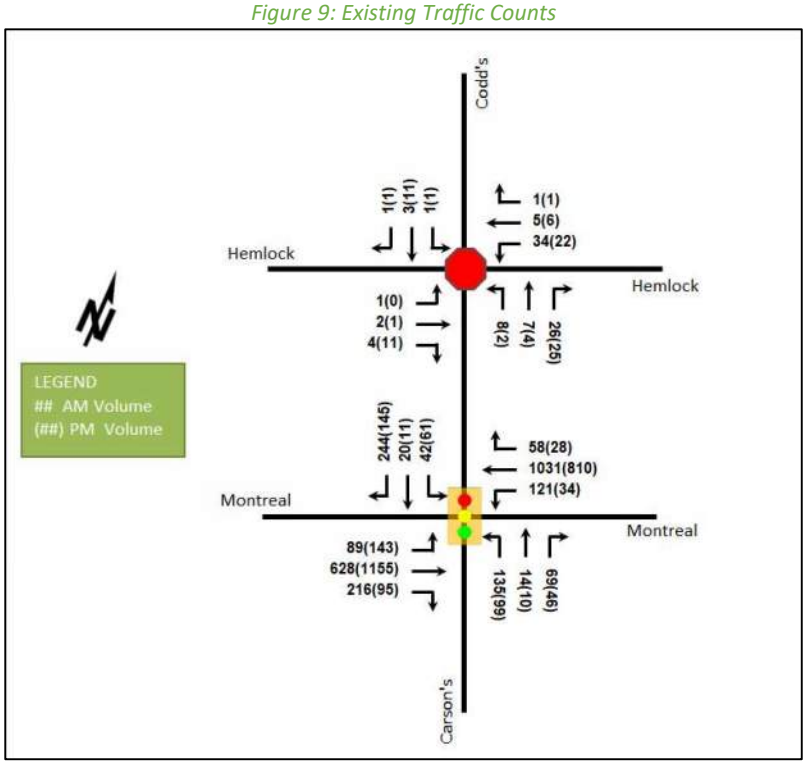


Table 2: Existing Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Hemlock Road at Codd's Road *Unsignalized*	EB	A	0.01	6.8	0.0	A	0.01	6.6	0.0
	WB	A	0.06	7.7	1.5	A	0.04	7.7	0.8
	NB	A	0.05	7.1	1.5	A	0.03	6.7	0.8
	SB	A	0.01	7.0	0.0	A	0.02	7.1	0.0
	Overall	**A**	-	**7.3**	-	**A**	-	**7.1**	-
Montreal Road at Codd's Road/ Carson's Road *Signalized*	EBL	A	0.40	13.2	15.5	A	0.41	9.6	19.8
	EBT/R	A	0.46	11.1	68.8	A	0.60	11.3	108.5
	WBL	A	0.47	25.5	40.4	A	0.21	18.5	12.6
	WBT/R	B	0.68	23.0	137.6	A	0.49	16.8	90.8
	NBL	E	1.00	118.6	**#73.5**	B	0.61	57.9	42.2
	NBT/R	A	0.21	11.2	15.3	A	0.18	14.5	13.2
	SBL	A	0.16	34.5	18.2	A	0.29	42.4	26.2
	SBT/R	B	0.61	20.7	51.4	A	0.43	10.8	20.6
	Overall	**B**	**0.69**	**23.5**	-	**A**	**0.60**	**15.6**	-

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

During both the AM and PM peak hours, the study area intersections operate satisfactorily. At the intersection of Montreal Road and Codd's Road/Carson's Road, the northbound left movement operates at the theoretical capacity and may exhibit extended queues during the AM peak hour.

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 (2018-2022). Table 3 summarizes

the collision types and conditions in the study area, Figure 10 illustrates the intersections and segments analyzed, and Table 4 summarizes the total collisions for each of the locations analyzed. Collision data are included in Appendix D.

Table 3: Study Area Collision Summary, 2018-2022

		Number	%
Total Collisions		3	**100%**
Classification	**Fatality**	0	0%
	Non-Fatal Injury	1	33%
	Property Damage Only	2	67%
Initial Impact Type	**Approaching**	0	0%
	Angle	1	33%
	Rear end	0	0%
	Sideswipe	0	0%
	Turning Movement	0	0%
	SMV Unattended	2	67%
	SMV Other	0	0%
	Other	0	0%
Road Surface Condition	**Dry**	2	67%
	Wet	0	0%
	Loose Snow	0	0%
	Slush	0	0%
	Packed Snow	1	33%
	Ice	0	0%
	Unknown	0	0%
Pedestrian Involved		0	0%
Cyclists Involved		1	33%

Figure 10: Study Area Collision Records

Table 4: Summary of Collision Locations, 2018-2022

	Number	%
Intersections / Segments	**3**	**100%**
Hemlock Road between Bareille-Snow Street and Codd's Road	2	67%
Codd's Road between End and Blackthorne Avenue	1	33%

Within the study area, the segment of Hemlock Road between Bareille-Snow Street and Codd's Road experienced two collisions, and the segment of Codd's Road between End and Blackthorne Avenue experienced one collision during the 2018-2022 time period. Of these collisions, two involved property damage only and one involved a non-fatal injury. The collision types are most represented by SMV unattended with two collisions and angle with one collision. Within the study area, one cyclist collision occurred at the segment of Hemlock Road between Bareille-Snow Street and Codd's Road on July 14, 2022, during daylight and clear conditions. The collision occurred in a shared operating space prior to the construction of cycletracks along Hemlock Road. Weather conditions do not affect collisions at these locations. No further collision review 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

The recently approved Transportation Master Plan includes a Capital Infrastructure Plan identifying transportation investments to support the forecasted growth and strategic connectivity and livability targets for the City. It also identifies committed projects, and a subset of priority projects that are expected to be implemented by 2046 based on current affordability assumptions. Area projects anticipated to impact travel in the study area that are included within the Capital Infrastructure Plan are:

- Transit Network
    - Priority Network
        - Continuous Bus Lanes on Montreal Road between St. Laurent Boulevard and Blair Road
- Road Network
    - Ultimate Network
        - Extension of Hemlock Road between Vedette Way and Aviation Pathway as a major collector road

2.3.1.2 Montreal-Blair Transit Priority EA

Montreal-Blair Road Transit Priority Corridor Planning and Environmental Assessment Study proposes transit priority measures from St. Laurent Boulevard to Shefford Road, to be coordinated with the Montreal Road Revitalization Project. The plan includes a focus on isolated transit priority measures and the enhancement of the pedestrian and cycling facilities within the corridor. The EA was completed in 2022, and the improvements are assumed to be implemented by 2046, which is beyond the study horizons.

2.3.1.3 Community Design Plan Former CFB Rockcliffe Community

The Community Design Plan for Former CFB Rockcliffe Community identifies the land use designation for the subject site as Low-to-Mid Rise Mixed-Use, with a minimum density of 105 units per hectare.

As part of the Community Design Plan, a number of road and active transportation projects are planned, including the extension of Hemlock Road and the construction of local roads west of Codd's Road, north of Hemlock Road, and west of Vedette Way.

Potential north-south MUP connections are noted extending from Hemlock Road, west of Codd's Road, continuing between the two subject parcels to the north, where they connect to the east-west MUP. This east-west MUP ultimately connects to the Sir-George-Étienne-Cartier parkway cycling route. Additional potential MUP connections to the west and east of the CDP are also noted.

2.3.2 Other Study Area Developments

150 & 200 Codd's Road

The proposed development application includes a site plan application for the construction of 185 townhouses. A memorandum was provided outlining the changes in unit type and noted that the trip generation was previously considered in the Wateridge Village Phases 6-8 TIA. (Novatech, 2026)

100 Bareille-Snow Street

The proposed development application includes a site plan application for the construction of Phase 1 of a three-phase planned development, consisting of a retirement home building with 188 units. No TIA is available for this development.

Wateridge Village Phase 6, 7, & 8

The proposed development application includes a plan of subdivision application for the construction of residential dwellings, seniors' apartment dwellings, and retirement homes within Phases 6, 7, and 8 of Wateridge Village. The development is expected to generate 432 new AM peak hour tow-way auto trips and 487 new PM peak hour two-way auto trips. The anticipated build-out horizon is assumed to be 2034. The application includes the developments located at 150 & 200 Codd's Road and 100 Bareille-Snow Street.

125 & 135 Oshedinaa Street

The proposed development application includes a site plan application for the construction of two four-storey apartments for a total of 200 units. The development is expected to generate 39 new AM peak hour tow-way auto trips and 41 new PM peak hour two-way auto trips. The anticipated build-out horizon is assumed to be 2029. (Arcadis, 2025)

1255 Hemlock Road

The proposed development application includes a site plan application for the construction of a four-storey residential apartment building consisting of 89 units. No TIA is available for this development.

Wateridge Village Phase 4

The proposed development application includes a plan of subdivision application for the construction of three-to four-story mixed-use buildings containing a total of 642 dwelling units and approximately 37,000 sq. ft ground floor commercial space, to be built by 2028. The development is expected to generate 143 new AM peak hour tow-way auto trips and 120 new PM peak hour two-way auto trips. The application includes the subject sites as well as the developments located at 125 and 135 Oshedinaa Street and 1255 Hemlock Road. (Dillon Consulting, 2022)

101 Vedette Way (Wateridge Village Phase 3A)

The proposed development application includes a site plan application for the construction of nine stacked townhouse blocks with a total of 172 residential units. The development is expected to generate 25 new AM peak hour tow-way auto trips and 25 new PM peak hour two-way auto trips. The development is currently under construction. (Novatech, 2022)

Wateridge Village Phases 3 & 5

The proposed development application includes a plan of subdivision application for the construction of 745 low to mid-rise resident units, 1081 high-rise residential units, and mixed-use commercial/retail component. The development was initially anticipated to be built out by 2025 and to generate 519 new AM peak hour tow-way auto trips and 531 new PM peak hour two-way auto trips. The development will be assumed to built out by 2029. The application also includes 101 Vedette Way with 186 low- to mid-rise residential units. (J.L.Richards, 2021)

615 Mikinak Road (Wateridge Village Block 105)

The proposed development application includes a site plan application for the construction of 111 townhouse dwellings to be built by 2026. The development is expected to generate 33 new AM peak hour tow-way auto trips and 34 new PM peak hour two-way auto trips. (Novatech, 2025)

1000 Tawadina Road, 375 Codd's Road, 1345 & 1375 Hemlock Road

The proposed development application includes a site plan application for the construction of three nine-storey buildings with a total of 482 residential units and approximately 672 sq. m ground floor commercial component to be built by 2026. The development is expected to generate 65 new AM peak hour tow-way auto trips and 67 new PM peak hour two-way auto trips. (IBI Group, 2023)

1050 Tawadina Road

The proposed development application includes a site plan application for the construction of two nine storey mid-rise residential buildings with a total of 254 dwellings. The development was initially anticipated to be built out by 2024 and to generate 35 new AM peak hour tow-way auto trips and 35 new PM peak hour two-way auto trips. The development will be assumed to built out by 2029. (Novatech, 2022)

681 Mikinak Road (Wateridge Village Phase 1B)

The proposed development application includes a site plan application for the construction of four mid-rise condominium buildings with a total of 373 residential units and 4,345 sq. m of ground floor commercial component. The development was initially anticipated to be built out by 2025 and to generate 144 new AM peak hour tow-way auto trips and 222 new PM peak hour two-way auto trips. The development is currently being constructed and will be assumed to built out by 2029. (Novatech, 2021)

550 Wanaki Road

The proposed development application includes an official plan and zoning by-law amendment application for the construction of a French Catholic Elementary School with 16 classrooms and six portables for a total of 351 students. The development is expected to generate 120 new AM peak hour tow-way auto trips and 120 new PM peak hour two-way auto trips. (Parsons, 2025)

875 Montreal Road

The proposed development application includes a site plan application for the construction of two buildings, to be constructed in two phases. Phase 1 development includes a two-storey mixed-use building with 257 square metres of commercial area and one residential unit. Phase 2, anticipated to follow in rapid succession, includes a three-storey mixed-use building with 163 square metres of commercial area and three residential units. The development was initially anticipated to be built out by 2022; however, only Phase 1 has been completed to date. The anticipated trip generation is fewer than 10 person trips during the peak hours. (CGH Transportation, 2021)

971 Montreal Road

The proposed development application includes a site plan application for the construction of a nine-storey mid-rise building with 78 units. The development was initially anticipated to be built out by 2025, and the trip generation trigger for a TIA was not met. (CGH Transportation, 2021)

807-825 Montreal Road

The proposed development application includes a site plan application for the construction of 149 low-to mid-rise apartment with approximately 600 sq. m ground floor commercial component. The development was initially anticipated to be built out by 2020 and to generate 59 new AM peak hour tow-way auto trips and 65 new PM peak hour two-way auto trips. The development will be assumed to built out by 2029. (CGH Transportation, 2019)

120 Den Haag Drive

The proposed development application includes a site plan application for the construction of an 8-storey building and a 4-storey building with a total of 172 residential units, and approximately of 75 square metres of ground floor commercial space. The development was initially anticipated to be built out by 2024 and to generate 42 new AM peak hour tow-way auto trips and 51 new PM peak hour two-way auto trips. The development will be assumed to built out by 2029. (IBI, 2020)

3 Study Area and Time Periods

3.1 Study Area

The study area will include the intersections of

- Hemlock Road at Codd's Road
- Montreal Road at Codd's Road/Carsons Road
- Codd's Road at Site Access (future conditions)
- Winisik Street at Site Access (future conditions)

The boundary roads will be Codd's Road, Winisik Street, and Hemlock Road and no screenlines are present within proximity to the site.

3.2 Time Periods

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

3.3 Horizon Years

The anticipated build-out year is 2029. As a result, the full build-out plus five years horizon year is 2034.

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 Beacon Hill have been summarized in Table 5.

.

Table 5: TRANS Trip Generation Manual Recommended Mode Shares – Beacon Hill

Travel Mode	Multi-Unit (High-Rise)	
	AM	PM
Auto Driver	48%	52%
Auto Passenger	9%	16%
Transit	30%	28%
Cycling	3%	0%
Walking	10%	4%
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 6 summarizes the person trip rates for the proposed residential land uses for each peak period.

Table 6: Trip Generation Person Trip Rates by Peak Period

Land Use	Land Use Code	Peak Period	Vehicle Trip Rate	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 7 summarizes the total person trip generation for the residential land uses.

Table 7: 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	510	126	282	408	266	193	459

Using the above mode share targets, 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 8 summarizes the residential trip generation by mode and peak hour.

Table 8: 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	**48%**	28	66	94	**52%**	59	46	105
	Auto Passenger	**9%**	5	13	18	**16%**	18	14	32
	Transit	**30%**	20	47	67	**28%**	34	27	61
	Cycling	**3%**	2	5	7	**0%**	0	0	0
	Walking	**10%**	7	17	24	**4%**	5	4	9
	Total	**100%**	**62**	**148**	**210**	**100%**	**116**	**91**	**207**

As shown above, a total of 94 AM and 105 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 Beacon Hill. Table 9 below summarizes the distributions.

Table 9: OD Survey Distribution – Beacon Hill

To/From	Residential % of Trips
North	5%
South	30%
East	30%
West	35%
Total	**100%**

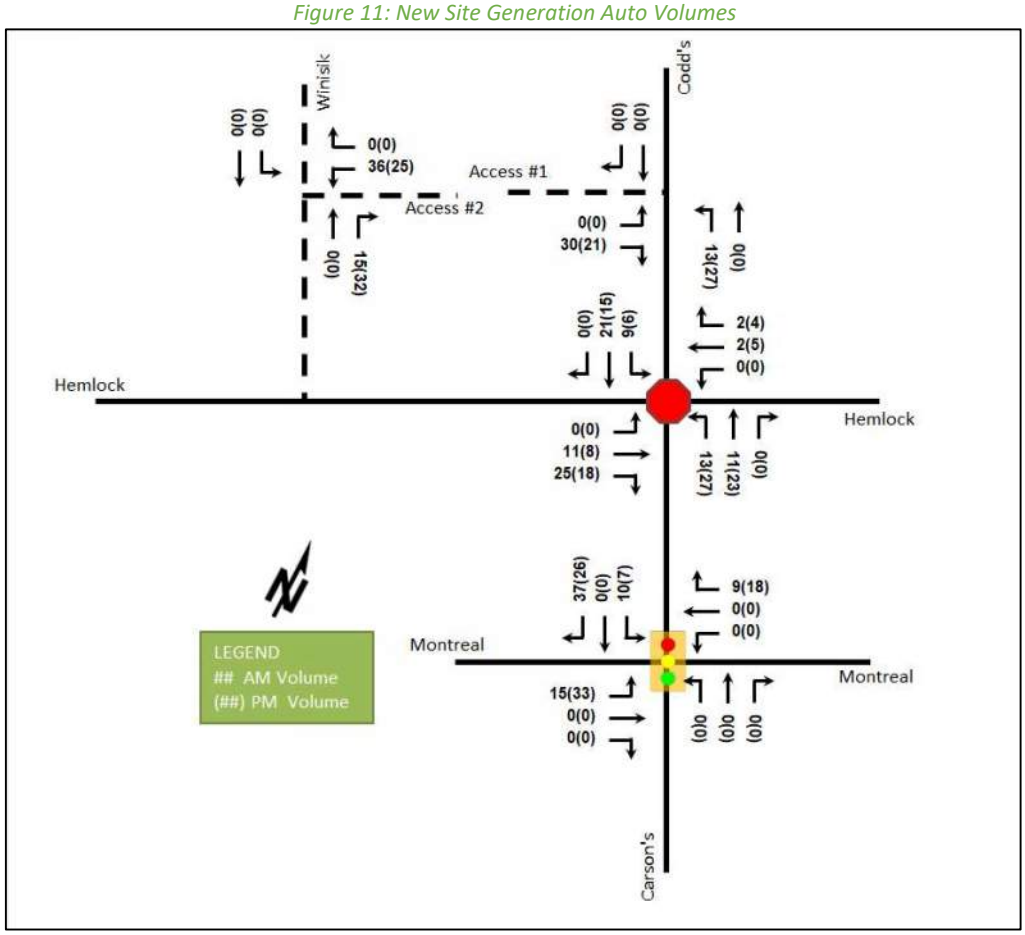
4.4 Trip Assignment

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 10 summarizes the proportional assignment to the study area roadways, and Figure 11 illustrates the new site generated volumes.

Table 10: Trip Assignment

To/From	Inbound Via	Outbound Via
North	5% Montreal Rd (W)	5% Montreal Rd (W)
South	15% Montreal Rd (W) 10% Montreal Rd (E) 5% Hemlock Road (E)	15% Montreal Rd (W) 5% Montreal Rd (E) 10% Hemlock Road (E)
East	20% Montreal Rd (E) 10% Hemlock Road (E)	10% Montreal Rd (E) 20% Hemlock Road (E)
West	35% Montreal Rd (W)	35% Montreal Rd (W)
Total	**100%**	**100%**

Figure 11: New Site Generation Auto Volumes



5 Exemption Review

Table 11 summarizes the exemptions for this TIA.

Table 11: Exemption Review

Module	Element	Explanation	Exempt/Required
Site Design and TDM			
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
Parking	4.2.1 Parking Supply	Only required for site plan and zoning by-law applications	Required
Boundary Street Design		All applications	Required
Transportation Demand Management	All Elements	Only required when the development generates more than 60 person-trips	Required
Network Impact			
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
Demand Rationalization		Only required when one or more other Network Impact Modules when the development generates more than 75 auto trips	Required
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

Module	Element	Explanation	Exempt/Required
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
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
Intersection Design	4.4.1-2/4.9.1 Intersection Control	Only required when the development generates more than 75 auto trips	Required
	4.4.3/4.9.2 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 on Block 2 consists of two six-storey buildings. Vehicular parking is primarily provided underground, and bicycle parking is primarily accommodated within secure bicycle storage rooms located underground. Elevators are additionally provided from the parking levels for cyclist's ease of use. Short-term bicycle parking racks are also provided near main entrance of each building. A multi-use pathway is located between the blocks, providing a north-south active transportation connection from Hemlock Road. Hard surface connections are proposed between the building entrances and the multi-use pathway as well as to the boundary street of Codd's Road, facilitating pedestrian and cyclist circulation throughout the site.

The proposed development on Block 3 consists of three six-storey buildings. Vehicular parking is primarily provided underground and bicycle parking is primarily provided within secure bicycle storage rooms located underground. Elevators are additionally provided from the parking levels for cyclist's ease of use. Short-term bicycle parking racks are also provided near main entrance of each building. Surface vehicle parking spaces are provided along the internal drive aisle connecting to Winisik Street. Hard surface connections are proposed between the building entrances and the multi-use pathway as well as to the boundary street of Winisik Street, facilitating pedestrian and cyclist circulation to and from the site.

All roadway facilities are being constructed by others and are beyond the scope of this application. These facilities include a 1.8-metre sidewalk along Hemlock Road and Winisik Street, and a 2.0-metre sidewalk along Codd's Road, and a cycletrack along both sides of Hemlock Road. Connections from the site to these facilities are proposed.

Bus stops are located on both sides of Hemlock Road within a 200-metre walk of the building entrances.

The infrastructure TDM checklist is provided in Appendix E.

6.2 Circulation and Access

Vehicular access to the underground parking garage on Block 2 is provided via ramps located on Codd's Road for the northernmost building.

Vehicular access to the underground parking garage on Block 3 is provided via ramps located on Winisik Street serving the northernmost building. Block 3 also includes a 6.0-metre-wide internal drive aisle that provides access

to the surface parking spaces and serves as a fire route. The garbage truck can be accommodated on the internal drive aisle. Turning templates are provided in Appendix F.

7 Parking

7.1 Parking Supply

Block 2 is proposed to include 132 below-grade vehicle parking spaces, two below-grade motorbike/scooter parking spaces, 232 below-grade bicycle parking, and 16 at-grade short-term bicycle parking spaces.

Block 3 is proposed to include 237 below-grade vehicle parking spaces, three below-grade motorbike/scooter parking spaces, 283 below-grade bicycle parking spaces, 18 at-grade short-term bicycle parking spaces, and six at-grade vehicle parking spaces.

According to the Zoning By-Law 2026-050 for Area B, a maximum parking ratio of 1.25 spaces per dwelling unit is permitted for a building with 11 or more dwelling units. Therefore, the maximum permitted parking supply is 290 spaces for Block 2 and 348 spaces for Block 3. The Zoning By-Law 2026-050 also requires a minimum 20 visitor parking spaces. The proposed vehicle parking spaces on Blocks 2 and 3 are below the maximum permitted by the Zoning By-law

The Zoning By-Law 2026-050 also requires a minimum of two short-term bicycle parking spaces with an additional 0.1 spaces per unit above 20 residential units and 1.0 long-term bicycle parking space per unit.

For Block 2, a minimum requirement of 23 short-term bicycle parking spaces and 232 long-term bicycle parking spaces is required. The proposed bicycle parking supply meets the minimum long-term bicycle parking requirements but is seven spaces below the minimum short-term bicycle parking requirement. Therefore, an additional seven short-term bicycle parking spaces would need to be provided

For Block 3, a minimum requirement of 28 short-term bicycle parking spaces and 278 long-term bicycle parking spaces is required. The proposed bicycle parking supply meets the minimum long-term bicycle parking requirements but is 10 spaces below the minimum short-term bicycle parking requirement. Therefore, an additional 10 short-term bicycle parking spaces would need to be provided.

8 Boundary Street Design

Table 12 summarizes the MMLOS analysis for the boundary streets of Hemlock Road, Codd's Road, and Winisik Street. The boundary street analysis is based on the policy area of "Inner Urban" area. The MMLOS worksheets has been provided in Appendix G.

Table 12: Boundary Street MMLOS Analysis

Segment	Conditions	Pedestrian LOS		Bicycle LOS		Transit LOS		Public Realm LOS	
		PLOS	Target	BLOS	Target	TLOS	Target	PRLOS	Target
Hemlock Road	Existing/Future	A	A	A	A	C	E	B	B
Codd's Road	Existing/Future	**B**	A	B	B	-	-	B	B
Winisik Street	Future	A	A	B	B	-	-	B	B

Codd's Road will not meet the pedestrian LOS target in the existing and future conditions. To meet the pedestrian LOS target, a 1.5-2.99-metre boulevard would be required.

Hemlock Road and Winisik Street will meet the pedestrian, bicycle, and Public Realm LOS targets in the existing and future conditions.

9 Transportation Demand Management

9.1 Context for TDM

The mode shares used within the TIA represent the unmodified district mode shares. Overall, the modal shares are likely to be achieved and supporting TDM measures should be provided.

The subject site is within the Former CFB Rockcliffe Community Design Plan and is subject to the Wateridge Village Secondary Plan.

Total bedrooms within the development is subject to the final unit count and layout selections by purchasers. No age restrictions are noted.

9.2 Need and Opportunity

The subject site has been assumed to rely predominantly on auto travel, followed by transit, and those assumptions have been carried through the analysis. The study area intersections are anticipated to have residual capacity and as the unmodified district mode shares have been applied, the risks of not meeting the mode share targets are low.

9.3 TDM Program

The "suite of post occupancy TDM measures" has been summarized in the TDM checklists for the residential land uses. The checklist is provided in Appendix E. The key TDM measures recommended for both Blocks 2 and 3 include:

- Display local area maps with walking and cycling routes and key destinations at major entrances
- Display relevant transit schedules and route maps at entrances
- Provide a multimodal travel option information package to new residents
- Inclusion of a 1-month Presto card for first time 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 purchase or rental costs

10 Background Network Travel Demands

10.1 Transportation Network Plans

The transportation network plans were discussed in Section 2.3. and will be considered in the analysis.

10.2 Background Growth

A review of the background projections from the City's TRANS Regional Model for the 2022 and 2046 horizons was completed to determine the background growth for the study area roadway. As growth within the City is not a linear process, comparisons of existing volumes to the forecasted 2046 volumes have been included to determine how the regional development has occurred and the impact on the study area. Table 13 summarizes the result of the model, and the TRANS model plots are provided in Appendix H.

Table 13: Study Area Growth Rates – AM Peak Hour

Street	Directional Growth % from 2022 to 2046		Directional Growth % from Existing to 2046	
	Eastbound	Westbound	Eastbound	Westbound
Montreal Road	1.09%	0.36%	1.10%	1.21%

The growth rates from the existing volumes to 2046 will be used to generate the study area growth rates. These growth rates have also been adjusted to account for the explicit background developments. Growth rates will be

applied to the mainline and major turning movements for the appropriate roads during the AM peak hour, rounded to the nearest 0.25%, and reversed for the PM peak hour. It should be noted that the growth along Codd's Road is expected to be captured by the explicit background developments. Table 14 summarizes the recommended growth rates to be considered within the study area.

Table 14: Recommended Area Growth Rates

Street	AM Peak Hour		PM Peak Hour	
	Eastbound	Westbound	Eastbound	Westbound
Montreal Road	1.00%	1.00%	1.00%	1.00%

10.3 Other Developments

The background developments explicitly considered in the background conditions include:

- Wateridge Village Phase 6, 7, & 8
- Wateridge Village Phase 4
- 125 & 135 Oshedinaa Street
- 1255 Hemlock Road
- Wateridge Village Phases 3 & 5
- 101 Vedette Way (Wateridge Village Phase 3A)
- 615 Mikinak Road (Wateridge Village Block 105)
- 1000 Tawadina Road, 375 Codd's Road, 1345 & 1375 Hemlock Road
- 1050 Tawadina Road
- 681 Mikinak Road (Wateridge Village Phase 1B)
- 807-825 Montreal Road
- 120 Den Haag Drive

Wateridge Village Phases 6, 7, & 8 have been included in the 2034 future horizon. Wateridge Village Phase 4 includes the subject sites (Block 2 and 3), the developments at 125 & 135 Oshedinaa Street, and 1255 Hemlock Road. Therefore, the trips associated with the subject sites have been removed from the total Phase 4 trips, and the increase in dwelling units at 125 & 135 Oshedinaa Street and 1255 Hemlock Road has been accounted for. Wateridge Village Phases 3 & 5 includes the development at 101 Vedette Way with low-rise dwellings. Given a new application has been submitted for 101 Vedette Way proposing high-rise dwellings, the trips associated with the previous low-rise development have been removed from Wateridge Village Phases 3 & 5 and replaced with the trips associated with the proposed high-rise development.

The trip generation for the developments at 681 Mikinak Road, 807-825 Montreal Road, and 120 Den Haag Drive have been updated to the TRANS 2020 methodology.

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

11 Demand Rationalization

11.1 2029 Future Background Intersection Operations

Figure 12 illustrates the 2029 background volumes and Table 15 summarizes the 2029 background intersection operations. The level of service for signalized intersections is based on volume to capacity ratio (v/c) calculations for individual lane movements and MMLOS Guidelines weighted v/c methodology for the overall intersection, per direction from Transportation Engineering Services, and average delay for unsignalized intersections. The synchro worksheets for the 2029 future background horizon are provided in Appendix J.

Figure 12: 2029 Future Background Volumes

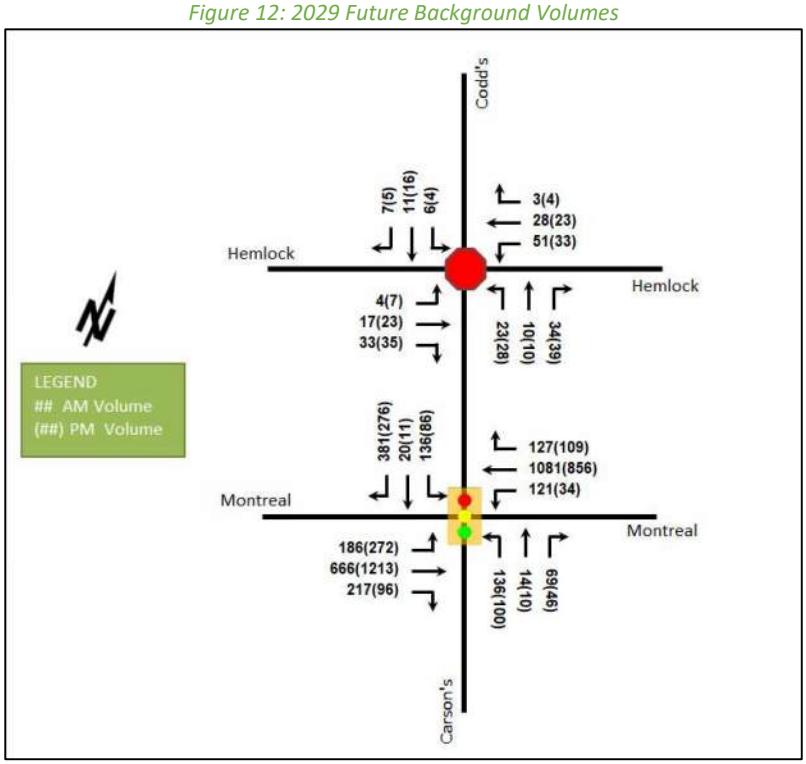


Table 15: 2029 Future Background Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Hemlock Road at Codd's Road *Unsignalized*	EB	A	0.06	7.1	1.5	A	0.07	7.2	1.5
	WB	A	0.10	8.1	2.3	A	0.08	8.0	1.5
	NB	A	0.08	7.6	1.5	A	0.09	7.4	2.3
	SB	A	0.03	7.3	0.8	A	0.03	7.3	0.8
	Overall	**A**	-	**7.6**	-	**A**	-	**7.5**	-
Montreal Road at Codd's Road/ Carson's Road *Signalized*	EBL	C	0.78	35.8	**#38.1**	C	0.74	22.3	**#47.0**
	EBT/R	A	0.45	12.0	63.6	A	0.59	12.8	110.8
	WBL	A	0.43	24.6	34.5	A	0.18	19.4	11.3
	WBT/R	C	0.73	26.1	138.1	A	0.55	20.2	99.9
	NBL	**F**	**1.24**	**200.5**	**#79.2**	C	0.77	77.3	**#46.1**
	NBT/R	A	0.18	11.1	14.3	A	0.15	13.5	11.8
	SBL	A	0.41	39.8	45.2	A	0.32	40.2	30.5
	SBT/R	C	0.77	32.3	**#89.5**	A	0.57	11.4	30.4
	Overall	**C**	**0.78**	**31.2**	-	**B**	**0.61**	**18.7**	-

Notes: Saturation flow rate of 1800 veh/h/lane
Queue is measured in metres
Peak Hour Factor = 1.00
Delay = average vehicle delay in seconds
m = metered queue
# = volume for the 95th %ile cycle exceeds capacity

At the intersection of Montreal Road at Codd's Road/ Carson's Road, the eastbound left and southbound through/right movements may exhibit extended queues, and the northbound left movement is expected to be over theoretical capacity during the AM peak hour. During the PM peak hour, the eastbound left and northbound left movement may exhibit extended queues.

These issues could be mitigated through signal timing modifications and inclusion of a protected/permissive phasing for the northbound left movement would reduce the v/c of all movements at the intersection below 1.00,

although queuing concerns may remain on the eastbound left, westbound through, and northbound left movements during the AM peak hour. An operational review by the City is recommended prior to implementation.

11.2 2034 Future Background Intersection Operations

Figure 13 illustrates the 2034 background volumes and Table 16 summarizes the 2034 background intersection operations. The level of service for signalized intersections is based on volume to capacity ratio (v/c) calculations for individual lane movements and MMLOS Guidelines weighted v/c methodology for the overall intersection, per direction from Transportation Engineering Services, and average delay for unsignalized intersections. The synchro worksheets for the 2034 future background horizon are provided in Appendix K.

Figure 13: 2034 Future Background Volumes

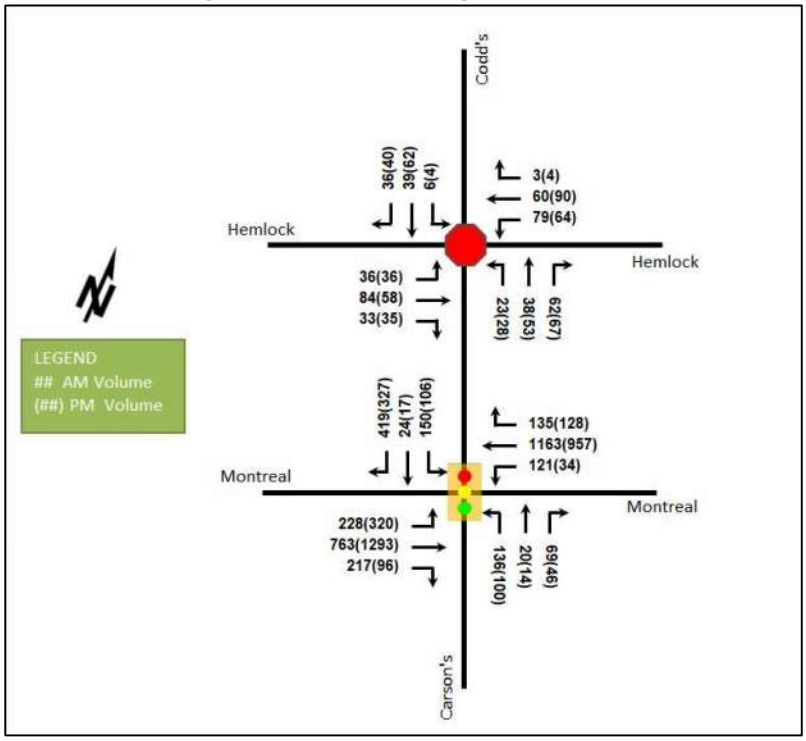


Table 16: 2034 Future Background Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Hemlock Road at Codd's Road *Unsignalized*	EB	A	0.19	8.6	5.3	A	0.17	8.6	4.5
	WB	A	0.20	9.2	5.3	A	0.23	9.6	6.8
	NB	A	0.16	8.6	4.5	A	0.19	8.6	5.3
	SB	A	0.10	8.1	2.3	A	0.14	8.4	3.8
	Overall	**A**	-	**8.7**	-	**A**	-	**8.9**	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Montreal Road at Codd's Road/ Carson's Road *Signalized*	EBL	**F**	**1.07**	**101.5**	**#84.3**	E	0.92	48.6	**#83.8**
	EBT/R	A	0.50	12.9	74.5	B	0.62	13.4	122.3
	WBL	A	0.47	26.9	36.6	A	0.21	20.5	11.6
	WBT/R	C	0.79	28.1	155.1	B	0.65	22.9	118.0
	NBL	**F**	**1.64**	**365.6**	**#86.0**	**F**	**1.11**	**171.5**	**#57.9**
	NBT/R	A	0.19	12.1	15.9	A	0.16	14.2	12.9
	SBL	A	0.46	41.1	49.6	A	0.39	42.4	36.6
	SBT/R	D	0.86	42.7	**#122.6**	B	0.70	21.7	55.7
	Overall	**D**	**0.90**	**44.0**	-	**C**	**0.74**	**26.1**	-

Notes: Saturation flow rate of 1800 veh/h/lane
Queue is measured in metres
Peak Hour Factor = 1.00
Delay = average vehicle delay in seconds
m = metered queue
# = volume for the 95th %ile cycle exceeds capacity

At the intersection of Montreal Road at Codd's Road/ Carson's Road, the southbound through/right movement may exhibit extended queues, and the eastbound left and northbound left movements are expected to be over theoretical capacity during the AM peak hour. During the PM peak hour, the eastbound left movement may exhibit extended queues, and the northbound left movement is expected to be over theoretical capacity.

These issues could be mitigated through signal timing modifications and inclusion of a protected/permissive phasing for the northbound left movement would reduce the v/c of all movements at the intersection below 1.00, although queuing concerns may remain on the eastbound left, westbound through, northbound left, and southbound through movements during the AM peak hour and on the eastbound left, westbound through, and northbound left movements during the PM peak hour. An operational review by the City is recommended prior to implementation.

12 Transit

12.1 Transit Priority

Changes in the transit level of service due to the subject development traffic from existing to the future background and future total conditions have been summarized in Appendix L.

The transit movements impacted by the development traffic include the southbound through/right and northbound left movements at the intersection of Montreal Road at Codd's Road/ Carson's Road with the current signal timing. The inclusion of the protected/permissive phasing for the northbound left movement at this intersection may result in transit movements impacted by the development traffic including the westbound through movement. The implementation of continuous bus lanes on Montreal Road is expected to improve transit operating conditions and review of side street connections should be completed at that time.

13 Access Intersection Design

13.1 Location and Design of Access

The Geometric Design Guide for Canadian Roads (TAC, 2017) suggests minimum corner clearance value of 15.0 metres for driveways along local roads. The Private Approach By-Law requires a 3.0-meter offset from the adjacent property line and a 45-meter offset from the adjacent road right-of-way. The Private Approach By-Law permits a maximum width of 9.0 metres at the highway line and 19.0 metres in width at the curb line or roadway edge for a two-way access.

The proposed access for Block 2 is a two-way full-movement access on Codd's Road. The access is located approximately 1.0 metre from the northern property line, and approximately 144.0 metres from Hemlock Road. According to the Wateridge Village Concept Plan, a park is planned immediately north of the site. Given that no vehicular access is anticipated for the future park, the 1.0-metre offset from the northern property line is considered adequate, and the proposed access meets the TAC and Private Approach By-Law offset requirements. The access is proposed to be 5.9-metre-wide at its typical dimension and 11.9-metre at the curb line with corner radii of 3.0 meters on both sides. The access meets the Private Approach By-Law width requirements.

The proposed access for Block 2 is a two-way full-movement access on Winisik Street. The access is located approximately 7.0 metres from the northern property line and approximately 165 metres from Hemlock Road. The access meets the TAC and Private Approach By-Law offset requirements. The access is proposed to be 6.0-metre-wide at its typical dimension and 12.0-metre at the curb line with corner radii of 3.0 metres on both sides. The access meets the Private Approach By-Law width requirements.

The proposed access on Block 2 on Codd's Road provides approximately 8.0 metres between the back of the sidewalk and the top of the slope, extending beyond 36.0 metres through the ramp. The ramp length is adequate for throat length considerations and the back of sidewalk setback of the ramp allows vehicle to level out before crossing the sidewalk and adequate sightlines.

The proposed access on Block 3 on Winisik Street provides approximately 5.3 metres between the back of the sidewalk and the top of the slope, extending beyond 21.0 metres through the ramp. The ramp length is adequate for throat length considerations, and it is recommended that the sidewalk bend away from the ramp to accommodate an additional 2.2 metres of setback between the back of sidewalk and the top of the slope. This would allow vehicle to level out before crossing the sidewalk and adequate sightlines.

According to the TAC Geometric Design Guidelines, for apartment land use more than 200 units, no suggested minimum clear throat length is provided for accesses onto local roads.

13.2 Intersection Control

The site accesses will have a stop-control on the minor approach.

13.3 Access Intersection Design

13.3.1 2029 Future Total Access Intersection Operations

The 2029 future total intersection volumes are illustrated in Figure 14 and the intersection operations are summarized below in Table 17. The level of service is based on average delay for unsignalized intersections. The synchro worksheets have been provided in Appendix M.

Figure 14: 2029 Future Total Volumes

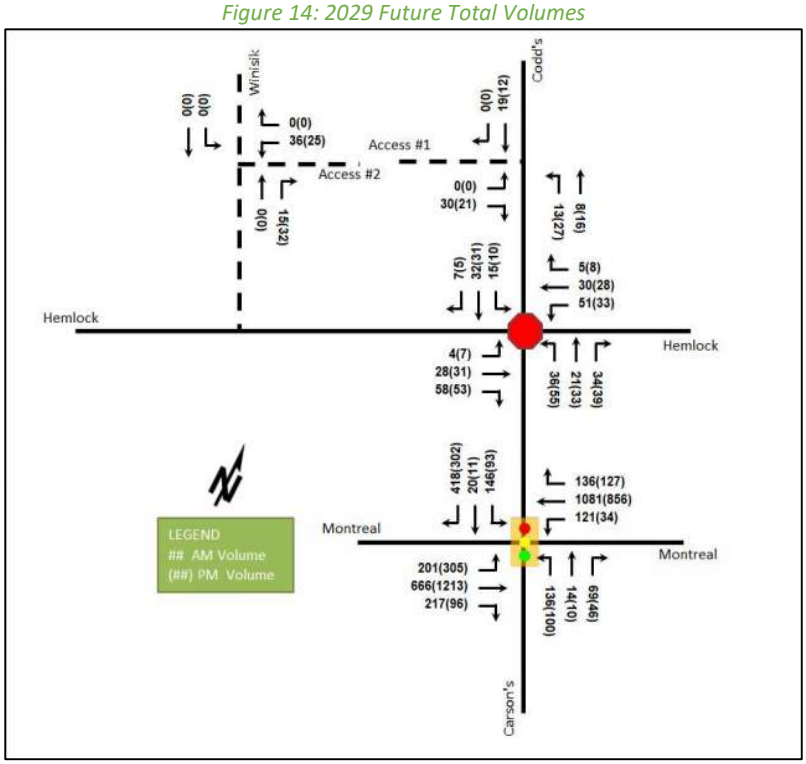


Table 17: 2029 Future Total Access Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Codd's Road at Site Access *Unsignalized*	EB	A	0.03	8.5	0.8	A	0.02	8.4	0.8
	NB	A	0.01	7.3	0.0	A	0.02	7.3	0.8
	SB	-	-	-	-	-	-	-	-
	Overall	**A**	**-**	**5.0**	**-**	**A**	**-**	**4.9**	**-**
Winisik Street at Site Access *Unsignalized*	WB	A	0.04	8.7	0.8	A	0.03	8.7	0.8
	NB	-	-	-	-	-	-	-	-
	SB	-	-	-	-	-	-	-	-
	Overall	**A**	**-**	**6.0**	**-**	**A**	**-**	**3.7**	**-**

Notes: Saturation flow rate of 1800 veh/h/lane
Queue is measured in metres
Peak Hour Factor = 1.00
Delay = average vehicle delay in seconds
m = metered queue
# = volume for the 95th %ile cycle exceeds capacity

The access intersections are anticipated to operate well at the 2029 future total horizon. No capacity issues are noted.

13.3.2 2034 Future Total Access Intersection Operations

The 2034 future total intersection volumes are illustrated in Figure 15 and the intersection operations are summarized below in Table 18. The level of service is based on volume average delay for unsignalized intersections. The synchro worksheets have been provided in Appendix N.

Figure 15: 2034 Future Total Volumes

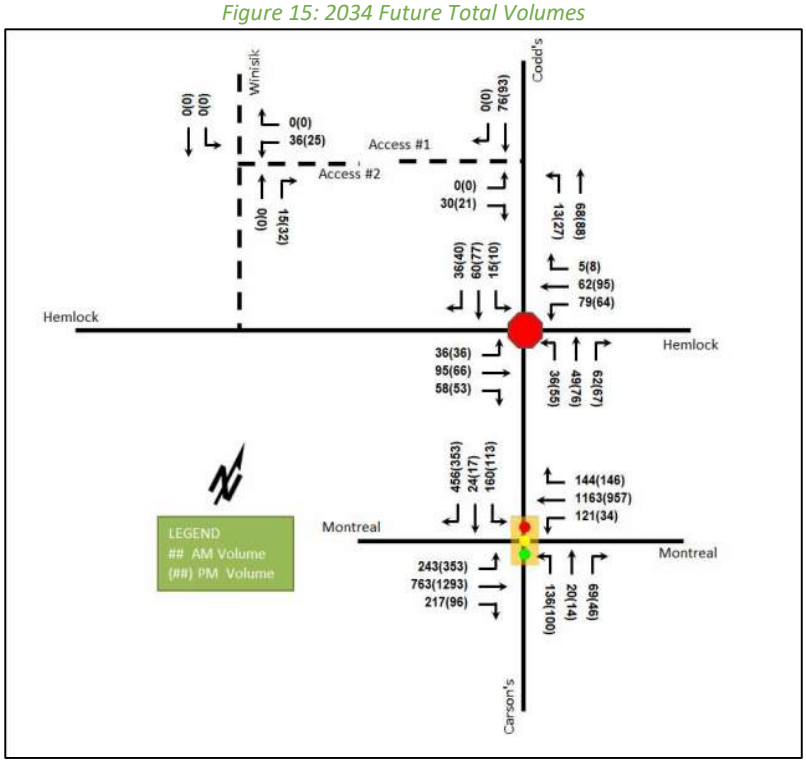


Table 18: 2034 Future Total Access Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Codd's Road at Site Access *Unsignalized*	EB	A	0.03	8.8	0.8	A	0.02	8.8	0.8
	NB	A	0.01	7.4	0.0	A	0.02	7.4	0.8
	SB	-	-	-	-	-	-	-	-
	Overall	**A**	**-**	**1.9**	**-**	**A**	**-**	**1.7**	**-**
Winisik Street at Site Access *Unsignalized*	WB	A	0.04	8.7	0.8	A	0.03	8.7	0.8
	NB	-	-	-	-	-	-	-	-
	SB	-	-	-	-	-	-	-	-
	Overall	**A**	**-**	**6.0**	**-**	**A**	**-**	**3.7**	**-**

Notes: Saturation flow rate of 1800 veh/h/lane
Queue is measured in metres
Peak Hour Factor = 1.00
Delay = average vehicle delay in seconds
m = metered queue
# = volume for the 95th %ile cycle exceeds capacity

The access intersections are anticipated to operate well at the 2034 future total horizon. No capacity issues are noted.

13.3.3 Access Intersection MMLOS

Based on the projected volumes, the site access will have stop-control on the minor approach.

13.3.4 Recommended Design Elements

The access is recommended to comply with the City standard SC7.1.

14 Intersection Design

14.1 Intersection Control

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

14.2 Intersection Design

14.2.1 2029 Future Total Intersection Operations

The protected/permissive phasing for the northbound left movement has been incorporated into the intersection of Montral Road at Codd's Road/Carson's Road, as noted in the background conditions. The intersection operations are summarized below in Table 19. The level of service for signalized intersections is based on volume to capacity ratio (v/c) calculations for individual lane movements and MMLOS Guidelines weighted v/c methodology for the overall intersection, per direction from Transportation Engineering Services, and average delay for unsignalized intersections. The synchro worksheets have been provided in Appendix M.

Table 19: 2029 Future Total Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Hemlock Road at Codd's Road *Unsignalized*	EB	A	0.10	7.4	2.3	A	0.10	7.6	2.3
	WB	A	0.11	8.3	3.0	A	0.09	8.3	2.3
	NB	A	0.11	8.0	3.0	A	0.15	8.0	3.8
	SB	A	0.07	7.7	1.5	A	0.06	7.7	1.5
	Overall	**A**	-	**7.9**	-	**A**	-	**7.9**	-
Montreal Road at Codd's Road/ Carson's Road *Signalized*	EBL	C	0.80	50.0	**#67.6**	C	0.80	39.2	76.8
	EBT/R	A	0.48	16.0	82.6	B	0.67	19.4	135.3
	WBL	A	0.51	38.3	45.5	A	0.25	36.9	16.0
	WBT/R	D	0.88	41.5	**#201.3**	C	0.80	40.9	**#161.7**
	NBL	E	0.93	91.5	**#51.3**	A	0.58	44.0	29.8
	NBT/R	A	0.16	8.7	12.4	A	0.11	10.8	10.6
	SBL	A	0.59	50.9	49.7	A	0.39	45.6	34.4
	SBT/R	D	0.86	33.7	80.1	B	0.61	10.7	27.3
	Overall	**D**	**0.87**	**35.6**	-	**C**	**0.75**	**28.6**	-

Notes: Saturation flow rate of 1800 veh/h/lane
Queue is measured in metres
Peak Hour Factor = 1.00
Delay = average vehicle delay in seconds
m = metered queue
# = volume for the 95th %ile cycle exceeds capacity

As noted in the 2029 future background conditions, with the inclusion of the protected/permissive phasing for the northbound left movement, the v/c of all movements at the intersection of Montreal Road at Codd's Road/ Carson's Road is expected to below 1.00, although queuing concerns may remain on the eastbound left, westbound through, and northbound left movements during the AM peak hour, similar to the 2029 future background conditions. During the PM peak hour, the westbound through may exhibit extended queues.

14.2.2 2034 Future Total Intersection Operations

The protected/permissive phasing for the northbound left movement has been incorporated into the intersection of Montral Road at Codd's Road/Carson's Road, as noted in the background conditions. The intersection operations are summarized below in Table 20. The level of service for signalized intersections is based on volume to capacity ratio (v/c) calculations for individual lane movements and MMLOS Guidelines weighted v/c methodology for the overall intersection, per direction from Transportation Engineering Services, and average delay for unsignalized intersections. The synchro worksheets have been provided in Appendix N.

Table 20: 2034 Future Total Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Hemlock Road at Codd's Road *Unsignalized*	EB	A	0.24	9.1	6.8	A	0.21	9.1	6.0
	WB	A	0.21	9.6	6.0	B	0.25	10.1	7.5
	NB	A	0.20	9.1	5.3	A	0.26	9.5	7.5
	SB	A	0.15	8.7	3.8	A	0.17	8.9	4.5
	Overall	**A**	-	**9.1**	-	**A**	-	**9.4**	-
Montreal Road at Codd's Road/ Carson's Road *Signalized*	EBL	E	0.98	85.5	**#98.0**	E	0.98	77.5	**#138.2**
	EBT/R	A	0.55	17.5	90.3	B	0.70	19.7	146.2
	WBL	A	0.59	41.8	44.8	A	0.28	33.1	14.8
	WBT/R	E	0.99	56.7	**#207.6**	D	0.90	45.3	**#165.8**
	NBL	E	0.93	91.3	**#55.8**	C	0.73	61.7	**#32.3**
	NBT/R	A	0.16	9.8	14.3	A	0.12	11.7	11.8
	SBL	A	0.60	51.4	56.5	A	0.48	48.6	41.0
	SBT/R	E	0.97	58.7	**#131.6**	B	0.70	15.6	42.8
	Overall	**E**	**0.98**	**47.4**	-	**D**	**0.87**	**35.2**	-

Notes: Saturation flow rate of 1800 veh/h/lane
Queue is measured in metres
Peak Hour Factor = 1.00
Delay = average vehicle delay in seconds
m = metered queue
# = volume for the 95th %ile cycle exceeds capacity

As noted in the 2034 future background conditions, with the inclusion of the protected/permissive phasing for the northbound left movement, the v/c of all movements at the intersection of Montreal Road at Codd's Road/ Carson's Road is expected to below 1.00, although queuing concerns may remain on the eastbound left, westbound through, northbound left, and southbound through movements during the AM peak hour and on the eastbound left, westbound through, and northbound left movements during the PM peak hour, similar to the 2034 future background conditions.

14.2.3 Intersection MMLOS

Table 21 summarizes the MMLOS analysis for the signalized intersections of Montreal Road at Codd's Road/ Carson's Road. The existing conditions will account for both the existing and build-out horizons. The TMP identifies continuous bus lanes on Montreal Road between St. Laurent Boulevard and Blair Road. Therefore, Montreal-Blair Transit Priority Corridor Planning and Environmental Assessment design has been incorporated into the pedestrian and cycling analysis. The intersection analysis is based on the policy area of "Mainstreet Corridor (Outside a Hub)". The MMLOS worksheets has been provided in Appendix G.

Table 21: Study Area Intersection MMLOS Analysis

Intersection	Conditions	Pedestrian LOS		Bicycle LOS		Transit LOS		Auto LOS	
		PLOS	Target	BLOS	Target	TLOS	Target	ALOS	Target
Montreal Road at Codd's Road/Carson's Road	Existing	C	B	E	B	B	B	B	E
	EA Design	D		D		-		-	

The pedestrian and bicycle LOS targets will not be met at the intersection of Montreal Road at Codd's Road/ Carson's Road in the existing and future conditions. To meet the pedestrian LOS target, the maximum number of travel lane crossed at each pedestrian crossing would need to be reduced to three lanes on the east/west legs or alternatively a smart channel with a raised crossing, a maximum of four travel lanes crossed, and fully protected left-turn lanes would be required. To meet the bicycle LOS target, either a unidirectional crossride on the south/north legs and fully protected westbound/eastbound left-turn lanes would be required or a smart channel with raised crossing on the west leg combined with a unidirectional crossride on all legs.

14.2.4 Recommended Design Elements

No study area intersection design elements are proposed for the network intersections as part of this study.

15 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 site includes Wateridge Phase 4 Blocks 2 and 3, including two six-storey buildings on Block 2 and three six-storey buildings on Block 3, for a total of 510 residential units
- A multi-use pathway is located between the blocks, providing a north-south active transportation connection
- The proposed accesses configuration consists of a two-way full-movement access on Codd's Road and a two-way full movement access on Winisik Street
- All roadway facilities are being constructed by others and are beyond the scope of this application
- The anticipated build-out is 2029
- The site is located within the Former CFB Rockcliffe Community Design Plan and is subject to the Wateridge Village Secondary Plan

TIA Screening and Exemptions

- The TIA Screening form indicated a full TIA was required due to trip generation trigger and this study has been prepared to support two site plan control applications
- The exemption review for the TIA did not require new street networks, neighbourhood traffic calming review, transit route capacity review, and network concept review

Existing Conditions

- Montreal Road is an arterial road, and Codd's Road south of Hemlock Road, Carson's Road, and Hemlock Road are collector roads and Codd's Road north of Hemlock Road is a local road in the study area
- Future roadways include Winisik Street as a local road
- Sidewalks are provided along both sides of Hemlock Road, Codd's Road, Carson's Road, and Montreal Road
- Cycletracks are provided along both sides of Hemlock Road, a pathway is present on the west side of Codd's Road between Blackthorne Avenue and Hemlock Road, and bike lanes are provided on both sides of Montreal Road
- During both the AM and PM peak hours, the study area intersections operate satisfactorily with exception of the northbound left movement at the intersection of Montreal Road at Codd's Road/ Carson's Road operating at the theoretical capacity
- One cyclist collision occurred at the segment of Hemlock Road between Bareille-Snow Street and Codd's Road in a shared operating space prior to the construction of cycletracks along Hemlock Road

Planned Conditions

- Continuous Bus Lanes on Montreal Road between St. Laurent Boulevard and Blair Road is identified as a priority project within the TMP Transit Network
- Extension of Hemlock Road between Vedette Way and Aviation Pathway as a major collector road is identified within the TMP Ultimate Road Network

Development Generated Travel Demand

- The proposed development is forecasted produce 210 two-way people trips during the AM peak hour and 207 two-way people trips during the PM peak hour
- Of the forecasted people trips, 94 two-way trips will be vehicle trips during the AM peak hour, and 105 two-way trips will be vehicle trips during the PM peak hour
- Of the forecasted trips, 5% are anticipated to travel north, 30% to both the east and south, and 35% to both the west and south

Development Design

- Vehicular parking is primarily provided underground and bicycle parking is primarily provided within secure bicycle storage rooms underground
- Short-term bicycle parking racks are also provided near main entrance of each building
- Surface vehicle parking spaces are provided along the internal drive aisle connecting to Winisik Street (Block 3)
- A multi-use pathway is located between the blocks, providing a north-south active transportation connection from Hemlock Road
- Hard surface connections are proposed between the building entrances and the multi-use pathway as well as to the boundary streets of Codd's Road, Winisik Street and Hemlock Road, facilitating pedestrian and cyclist circulation throughout the site
- All roadway facilities are being constructed by others and are beyond the scope of this application
- These facilities include a 1.8-metre sidewalk along Hemlock Road and Winisik Street, and a 2.0-metre sidewalk along Codd's Road, and a cycletrack along both sides of Hemlock Road
- Connections from the site to these facilities are proposed
- Bus stops are located on both sides of Hemlock Road within a 200-metre walk of the building entrances
- The garbage truck and emergency service vehicles can be accommodated on the internal drive aisle

Parking

- Block 2 is proposed to include 132 below-grade vehicle parking spaces, two below-grade motorbike/scooter parking spaces, 232 below-grade bicycle parking, and 16 at-grade short-term bicycle parking spaces
- Block 3 is proposed to include 237 below-grade vehicle parking spaces, three below-grade motorbike/scooter parking spaces, 283 below-grade bicycle parking spaces, 18 at-grade short-term bicycle parking spaces, and six at-grade vehicle parking spaces
- The proposed vehicle parking spaces is below the maximum permitted by the Zoning By-law
- The proposed bicycle parking supply meets the minimum long-term bicycle parking requirements but is seven spaces below the minimum short-term bicycle parking requirement on Block 2 and 10 spaces below the minimum requirement on Block 3
- Additional 17 short-term bicycle parking spaces would need to be provided

Boundary Street Design

- Codd's Road will not meet the pedestrian LOS target in the existing and future conditions
- To meet the pedestrian LOS target, a 1.5-2.99-metre boulevard would be required

- Hemlock Road and Winisik Street will meet the pedestrian, bicycle, and Public Realm LOS targets in the existing and future conditions

TDM

- Supportive TDM measures to be included within both Blocks 2 and 3 should include:
  - Display local area maps with walking and cycling routes and key destinations at major entrances
  - Display relevant transit schedules and route maps at entrances
  - Provide a multimodal travel option information package to new residents
  - Inclusion of a 1-month Presto card for first time 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 purchase or rental costs

Background Conditions

- The background developments were explicitly included in the background conditions, along with a total background growth applied on the study area roadways along the mainline volumes
- During both the AM and PM peak hours, capacity issues were noted on the intersection of Montreal Road at Codd's Road/ Carson's Road in the future background conditions, which would be mitigated by signal timing adjustments and the inclusion of a protected/permissive phasing for the northbound left movement

Transit

- The transit movements impacted by the development traffic include the southbound through/right and northbound left movements at the intersection of Montreal Road at Codd's Road/ Carson's Road
- The implementation of continuous bus lanes on Montreal Road is expected to improve transit operating conditions

Intersection Design

- The proposed access on Block 2 on Codd's Road is proposed to be 5.9-metre-wide at its typical dimension and 11.9-metre at the curb line with corner radii of 3.0 meters on both sides
- The proposed access on Block 3 on Winisik Street is proposed to be 6.0-metre-wide at its typical dimension and 12.0-metre at the curb line with corner radii of 3.0 metres on both sides
- Both accesses on Blocks 2 and 3 meet the TAC and Private Approach By-Law offset requirements
- Both accesses meet the Private Approach By-Law width requirements and the proposed throat lengths are considered adequate
- It is recommended that the sidewalk on Winisik Street bend away from the ramp to accommodate an additional 2.2 metres of setback between the back of sidewalk and the top of the slope
- The site accesses will have a stop-control on the minor approach and are anticipated to operate well in the future total horizons
- The protected/permissive phasing for the northbound left movement at intersection of Montral Road at Codd's Road/Carson's Road has been incorporated into the future total analysis, as noted in the background conditions
- During both the AM and PM peak hours, the study area intersections at the future total conditions are expected to operate similarly to the corresponding future background conditions, with the inclusion of the protected/permissive phasing for the northbound left movement

- The pedestrian and bicycle LOS targets will not be met at the intersection of Montreal Road at Codd's Road/ Carson's Road in the existing and future conditions
- To meet the pedestrian LOS target, the maximum number of travel lane crossed at each pedestrian crossing would need to be reduced to three lanes on the east/west legs or alternatively a smart channel with a raised crossing, a maximum of four travel lanes crossed, and fully protected left-turn lanes would be required
- To meet the bicycle LOS target, either a unidirectional crossride on the south/north legs and fully protected westbound/eastbound left-turn lanes would be required or a smart channel with raised crossing on the west leg combined with a unidirectional crossride on all legs

16 Conclusion

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

Prepared By:

Reihaneh Azhdar

Reihaneh Azhdar
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: 2026-06-12
Project Number: 2025-089
Project Reference: Wateridge Village P4, Blocks 2 and 3

1.1 Description of Proposed Development	
Municipal Address	370 Codd's Rd and 800 Winisik St
Description of Location	Northwest quadrant of Codd's Rd at Hemlock Rd intersection and northeast quadrant of Winisik St at Hemlock Rd intersection
Land Use Classification	Minor Corridor Zone 1 (CM1A H(20))
Development Size	Two six-storey buildings on Block 2 and three six-storey buildings on Block 3, for a total of 510 residential units
Accesses	One two-way full-movement access on Codd's Road and one on Winisik Street
Phase of Development	Multiple
Buildout Year	2029
TIA Requirement	Full TIA Required

1.2 Trip Generation Trigger		
Land Use Type	Multi-Family (High-Rise)	
Development Size	510	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)?	No
Location Trigger	No

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)?	No
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	No

Appendix B

Turning Movement Counts

Turning Movement Count
Summary Report
Including AM and PM Peak Hours
All Vehicles Except Bicycles and Personal E-Transportation

Carson's Road/Codd's Road & Montreal Road — Ottawa, ON

Survey Date: Thursday, November 06, 2025 **Start Time:** 0700 **AADT Factor:** 0.9

Weather AM: Overcast +1° C **Survey Duration:** 6 Hrs. **Survey Hours:** 0700-1000 & 1500-1800

Weather PM: Mostly Sunny +4° C **Surveyor(s):** J. Mousseau

	Montreal Rd. Eastbound					Montreal Rd. Westbound						Carson's Rd. Northbound					Codd's Rd. 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	85	536	155	1	**777**	108	920	66	0	**1094**	**1871**	86	9	37	0	**132**	29	15	200	0	**244**	**376**	**2247**
0800-0900	122	748	161	0	**1031**	48	990	37	0	**1075**	**2106**	99	11	56	0	**166**	46	14	211	0	**271**	**437**	**2543**
0900-1000	98	697	84	0	**879**	18	790	29	1	**838**	**1717**	43	5	24	0	**72**	26	8	117	0	**151**	**223**	**1940**
1500-1600	123	1097	99	2	**1321**	29	837	32	1	**899**	**2220**	89	7	44	0	**140**	55	10	156	0	**221**	**361**	**2581**
1600-1700	174	1169	74	2	**1419**	42	741	36	3	**822**	**2241**	77	14	37	0	**128**	65	20	143	0	**228**	**356**	**2597**
1700-1800	207	1098	105	1	**1411**	36	769	27	3	**835**	**2246**	61	12	40	0	**113**	35	14	125	0	**174**	**287**	**2533**
Totals	809	5345	678	6	**6838**	281	5047	227	8	**5563**	**12401**	455	58	238	0	**751**	256	81	952	0	**1289**	**2040**	**14441**

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	n/a	n/a	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a	**n/a**	**n/a**	n/a	n/a	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a	**n/a**	**n/a**	**n/a**

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	n/a	n/a	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a	**n/a**	**n/a**	n/a	n/a	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a	**n/a**	**n/a**	**n/a**

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	n/a	n/a	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a	**n/a**	**n/a**	n/a	n/a	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a	**n/a**	**n/a**	**n/a**

AADT and expansion factors provided by the City of Ottawa

AM Peak Hour Factor ➡ 0.87												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. Total
0730-0830	88	628	216	1	**933**	121	1031	58	0	**1210**	**2143**	135	14	69	0	**218**	42	20	244	0	**306**	**524**	**2667**

PM Peak Hour Factor ➡ 0.95												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.
1515-1615	139	1155	95	4	**1393**	33	810	28	1	**872**	**2265**	99	10	46	0	**155**	61	11	145	0	**217**	**372**	**2637**

Comments:

OC Transpo and Para Transpo buses, private buses and school buses comprise 46.62% of the heavy vehicle traffic.

Notes:

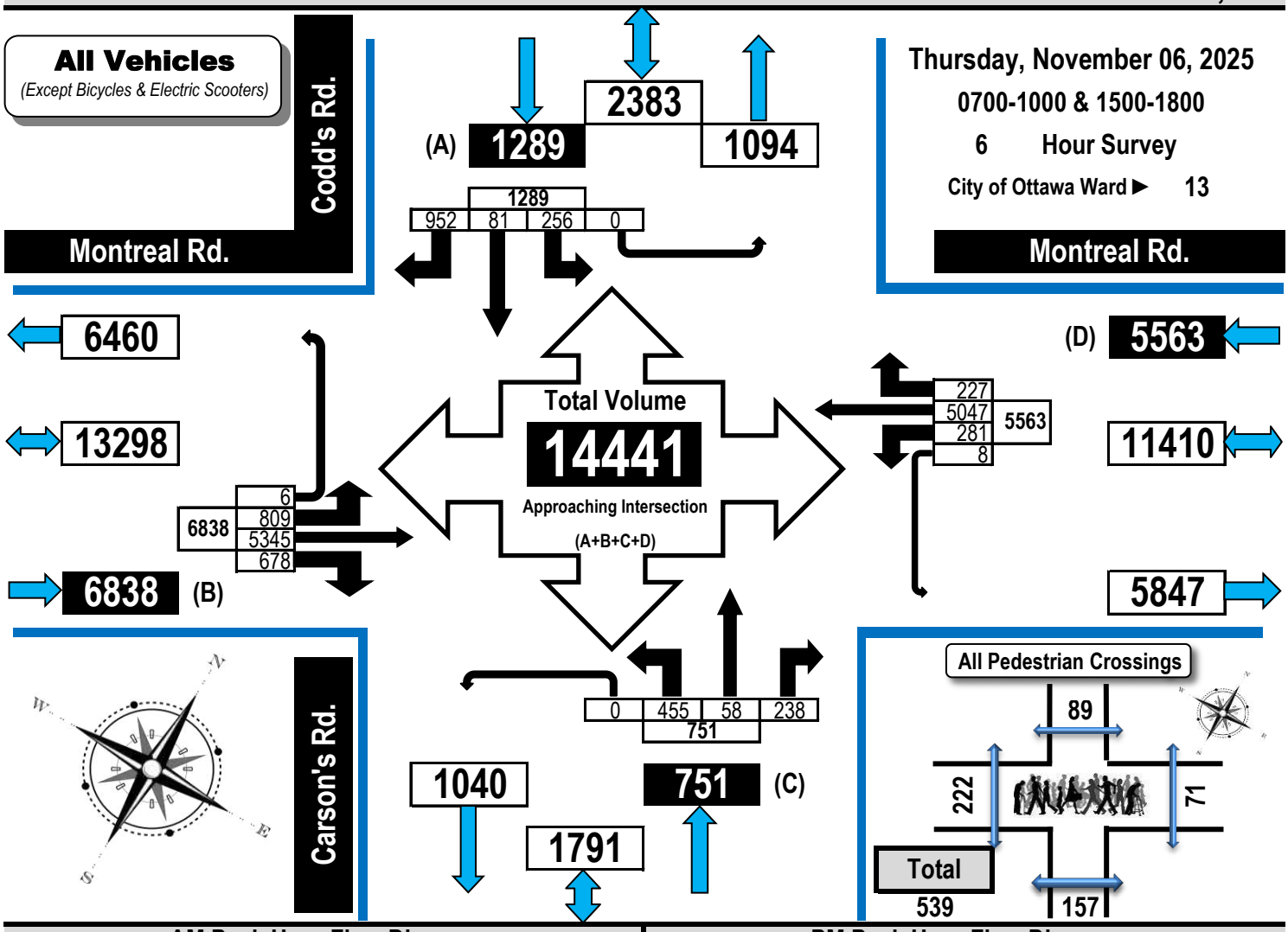
1. Includes all vehicle types except bicycles, electric bicycles, and electric scooters.
2. When expansion and AADT factors are applied, the results will differ slightly due to rounding.

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

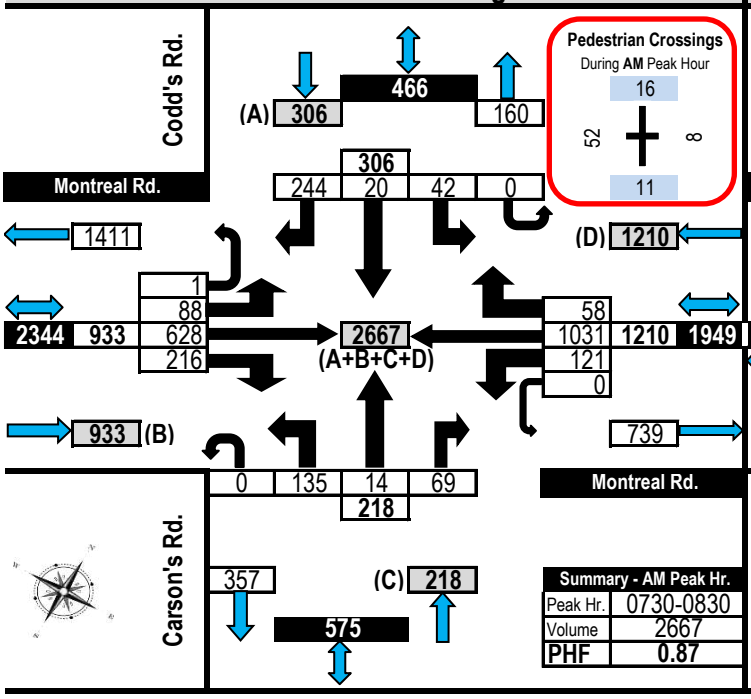
Carson's Road/Codd's Road & Montreal Road — Ottawa, ON

All Vehicles
(Except Bicycles & Electric Scooters)

Thursday, November 06, 2025
0700-1000 & 1500-1800
6 Hour Survey
City of Ottawa Ward ▶ 13

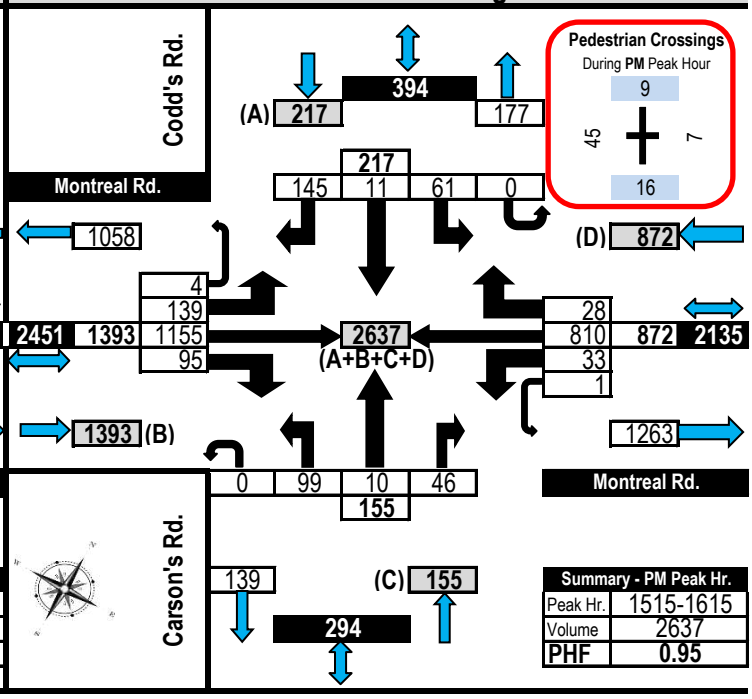


AM Peak Hour Flow Diagram



Summary - AM Peak Hr.	
Peak Hr.	0730-0830
Volume	2667
PHF	0.87

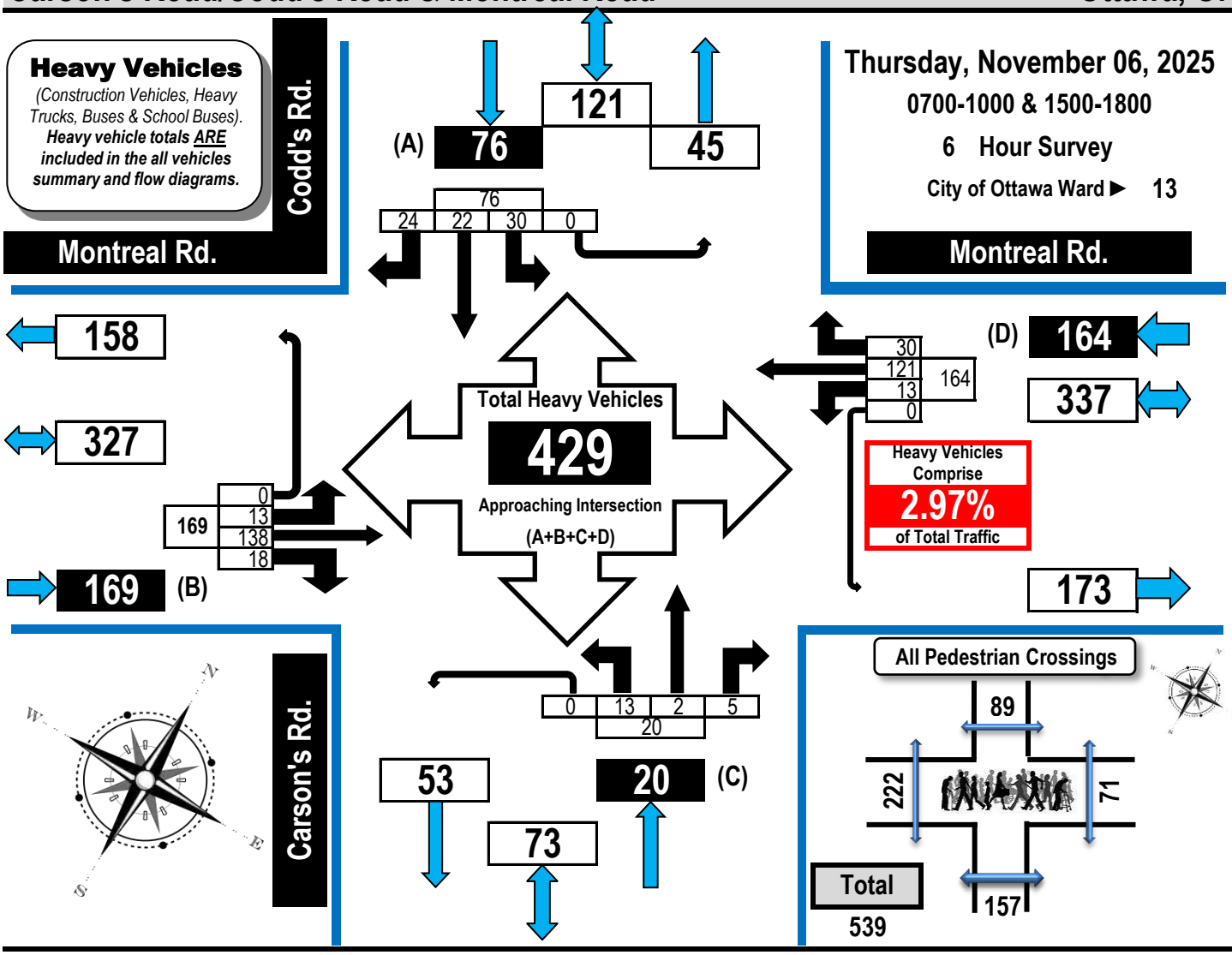
PM Peak Hour Flow Diagram



Summary - PM Peak Hr.	
Peak Hr.	1515-1615
Volume	2637
PHF	0.95

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

Carson's Road/Codd's Road & Montreal Road — Ottawa, ON



	Montreal Rd. Eastbound					Montreal Rd. Westbound					Carson's Rd. Northbound					Codd's Rd. 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	23	13	0	38	5	21	10	0	36	8	1	2	0	11	3	2	3	0	8	93
0800-0900	2	25	0	0	27	1	35	7	0	43	2	1	1	0	4	9	3	7	0	19	93
0900-1000	4	31	5	0	40	2	23	6	0	31	1	0	1	0	2	4	5	3	0	12	85
1500-1600	5	18	0	0	23	2	23	5	0	30	1	0	0	0	1	4	4	4	0	12	66
1600-1700	0	21	0	0	21	2	11	2	0	15	0	0	1	0	1	8	5	3	0	16	53
1700-1800	0	20	0	0	20	1	8	0	0	9	1	0	0	0	1	2	3	4	0	9	39
Totals	13	138	18	0	169	13	121	30	0	164	13	2	5	0	20	30	22	24	0	76	429

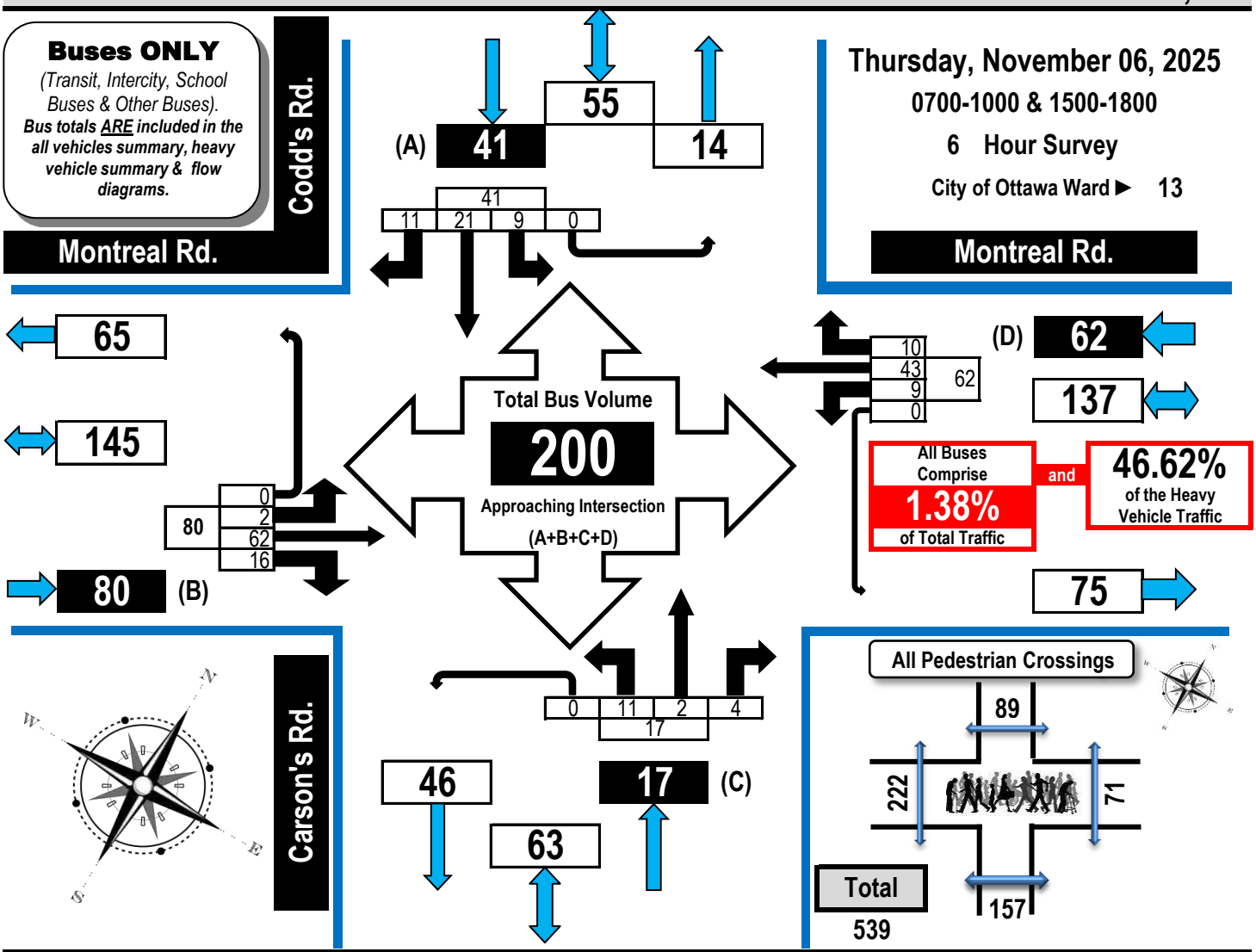
Comments:
OC Transpo and Para Transpo buses, private buses and school buses comprise 46.62% of the heavy vehicle traffic.

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

Carson's Road/Codd's Road & Montreal Road — Ottawa, ON

Buses ONLY
(Transit, Intercity, School Buses & Other Buses).
Bus totals ARE included in the all vehicles summary, heavy vehicle summary & flow diagrams.

Thursday, November 06, 2025
0700-1000 & 1500-1800
6 Hour Survey
City of Ottawa Ward ► 13

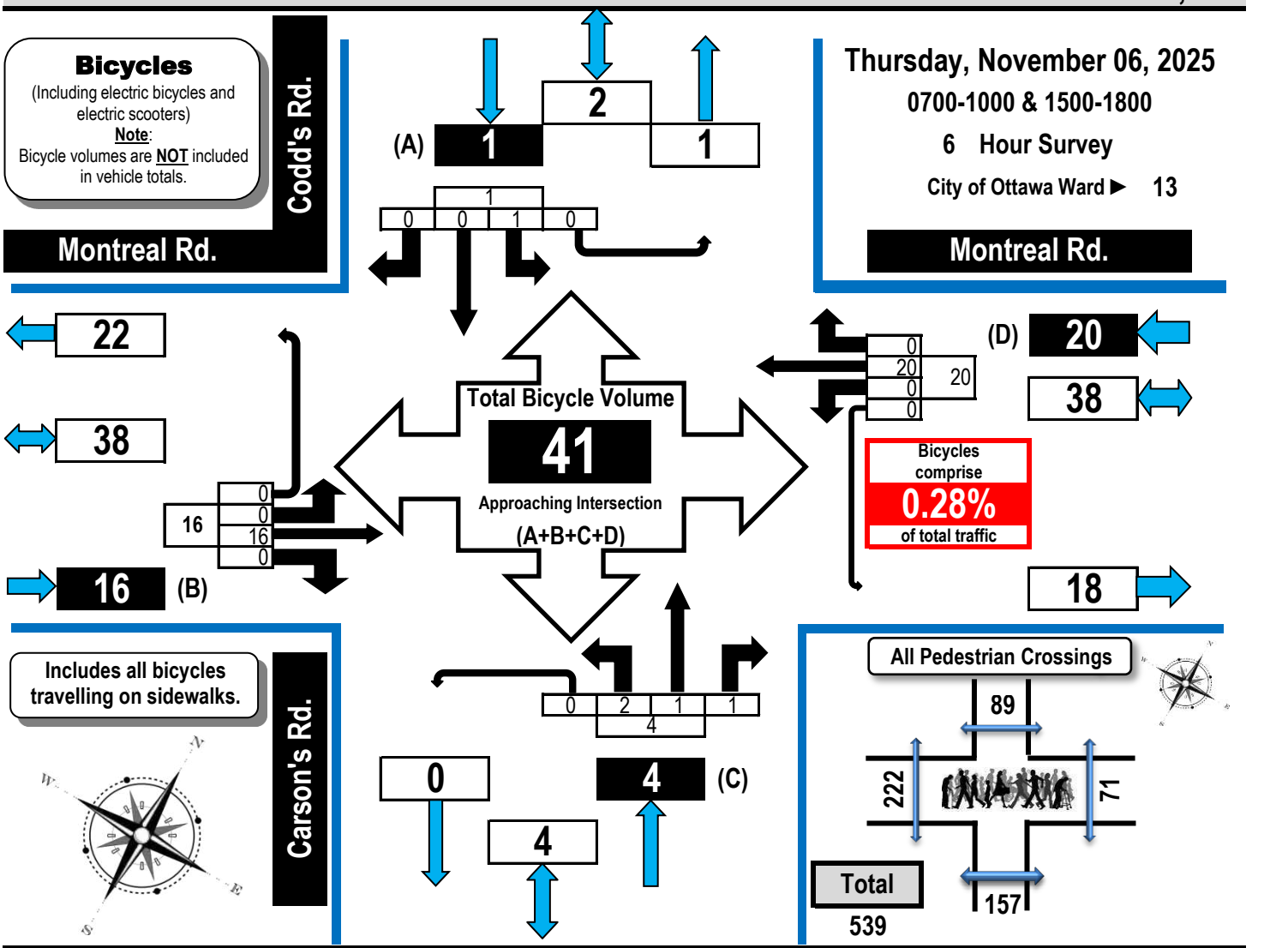


	Montreal Rd. Eastbound					Montreal Rd. Westbound					Carson's Rd. Northbound					Codd's Rd. Southbound					
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
0700-0800	0	11	13	0	24	5	6	4	0	15	7	1	2	0	10	0	2	2	0	4	53
0800-0900	1	15	0	0	16	1	14	3	0	18	2	1	1	0	4	3	3	3	0	9	47
0900-1000	0	11	3	0	14	0	4	0	0	4	1	0	0	0	1	0	4	1	0	5	24
1500-1600	1	6	0	0	7	2	10	2	0	14	1	0	0	0	1	0	4	1	0	5	27
1600-1700	0	10	0	0	10	1	6	1	0	8	0	0	1	0	1	4	5	2	0	11	30
1700-1800	0	9	0	0	9	0	3	0	0	3	0	0	0	0	0	2	3	2	0	7	19
Totals	2	62	16	0	80	9	43	10	0	62	11	2	4	0	17	9	21	11	0	41	200

Comments:
OC Transpo and Para Transpo buses, private buses and school buses comprise 46.62% of the heavy vehicle traffic.

Turning Movement Count
Bicycles and Personal E-Transportation Summary
Flow Diagram

Carson's Road/Codd's Road & Montreal Road — Ottawa, ON



	Montreal Rd. Eastbound					Montreal Rd. Westbound					Carson's Rd. Northbound					Codd's Rd. 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	5	0	0	5	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	8
0800-0900	0	4	0	0	4	0	5	0	0	5	0	0	0	0	0	0	0	0	0	0	9
0900-1000	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	2
1500-1600	0	3	0	0	3	0	6	0	0	6	0	0	0	0	0	0	0	0	0	0	9
1600-1700	0	2	0	0	2	0	4	0	0	4	2	1	0	0	3	0	0	0	0	0	9
1700-1800	0	1	0	0	1	0	1	0	0	1	0	0	1	0	1	1	0	0	0	1	4
Totals	0	16	0	0	16	0	20	0	0	20	2	1	1	0	4	1	0	0	0	1	41

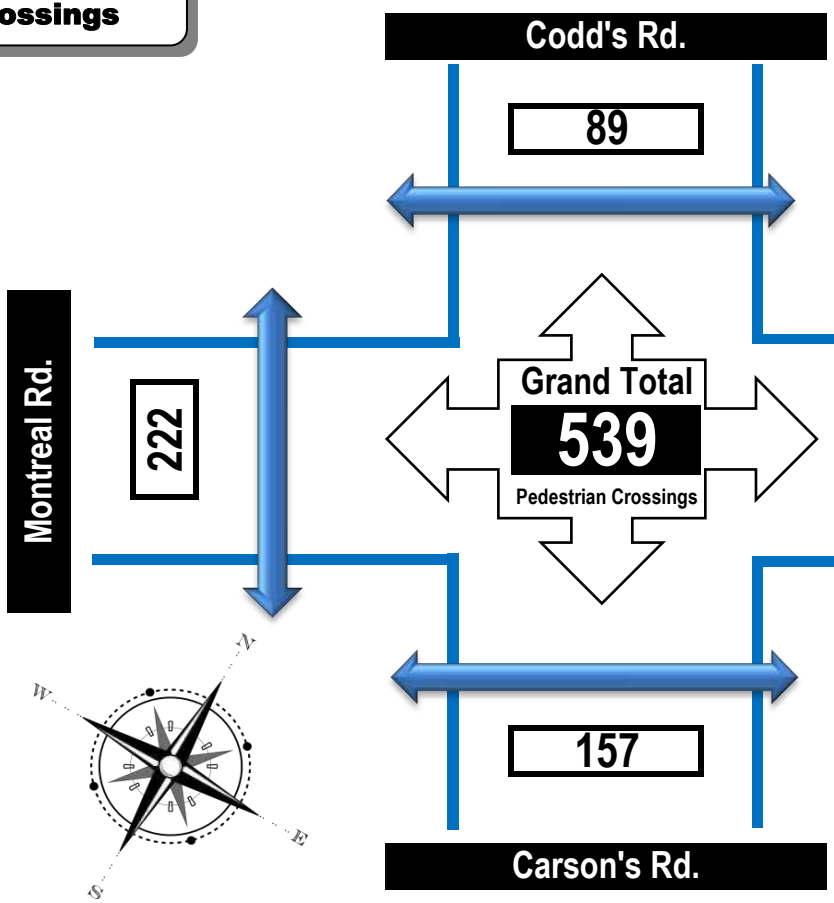
Comments:
OC Transpo and Para Transpo buses, private buses and school buses comprise 46.62% of the heavy vehicle traffic.

Turning Movement Count
Pedestrian Crossings Summary and Flow Diagram

Carson's Road/Codd's Road & Montreal Road — Ottawa, ON

Pedestrian Crossings

Thursday, November 06, 2025
0700-1000 & 1500-1800
6 Hour Survey
City of Ottawa Ward ► 13



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 Montreal Rd.	East Side Crossing Montreal Rd.	Street Total	South Side Crossing Carson's Rd.	North Side Crossing Codd's Rd.	Street Total	Grand Total
0700-0800	35	6	41	20	19	39	80
0800-0900	49	8	57	24	13	37	94
0900-1000	25	9	34	20	11	31	65
1500-1600	46	9	55	17	8	25	80
1600-1700	35	18	53	42	20	62	115
1700-1800	32	21	53	34	18	52	105
Totals	**222**	**71**	**293**	**157**	**89**	**246**	**539**

Comments:
OC Transpo and Para Transpo buses, private buses and school buses comprise 46.62% of the heavy vehicle traffic.

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

Codd's Road & Hemlock Road — Ottawa, ON

Survey Date: Thursday, February 12, 2026 **Start Time:** 0700 **AADT Factor:** 0.9
Weather AM: Mostly Sunny -10° C **Survey Duration:** 8 Hrs. **Survey Hours:** 0700-1000, 1130-1330 & 1500-1800
Weather PM: Mostly Sunny -5° C **Surveyor(s):** J. Mousseau

	Hemlock Rd. Eastbound					Hemlock Rd. Westbound						Codd's Rd. Northbound					Codd's Rd. 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	0	3	4	0	7	28	0	0	0	28	35	4	6	7	1	18	0	3	0	0	3	21	56
0800-0900	0	3	3	0	6	36	1	0	1	38	44	5	3	25	1	34	1	3	1	0	5	39	83
0900-1000	1	3	5	0	9	25	5	1	0	31	40	7	15	14	0	36	1	1	0	0	2	38	78
1130-1230	0	3	2	0	5	22	2	0	0	24	29	2	3	24	0	29	0	5	1	0	6	35	64
1230-1330	0	2	3	0	5	22	1	0	0	23	28	4	7	22	0	33	1	2	2	0	5	38	66
1500-1600	0	3	0	0	3	34	2	1	0	37	40	3	2	16	1	22	1	3	2	0	6	28	68
1600-1700	0	1	3	0	4	23	3	0	0	26	30	2	3	20	0	25	1	11	1	0	13	38	68
1700-1800	0	1	10	0	11	22	5	1	1	29	40	0	4	26	1	31	1	9	1	0	11	42	82
Totals	1	19	30	0	50	212	19	3	2	236	286	27	43	154	4	228	6	37	8	0	51	279	565

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	1	26	42	0	70	295	26	4	3	328	398	38	60	214	6	317	8	51	11	0	71	388	785

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	1	24	38	0	63	265	24	4	3	295	358	34	54	193	5	285	8	46	10	0	64	349	707

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	2	31	49	0	82	347	31	5	3	387	469	44	70	252	7	374	10	61	13	0	84	457	926

AADT and expansion factors provided by the City of Ottawa

AM Peak Hour Factor ➡ 0.89												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.
0830-0930	1	2	4	0	7	33	5	1	1	40	47	7	7	26	1	41	1	3	1	0	5	46	93
OFF Peak Hour Factor ➡ 0.77												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.
1200-1300	0	3	2	0	5	25	1	0	0	26	31	2	6	26	0	34	1	6	2	0	9	43	74
PM Peak Hour Factor ➡ 0.85												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.
1645-1745	0	1	11	0	12	21	6	1	1	29	41	1	4	25	1	31	1	11	1	0	13	44	85

Comments:

OC Transpo buses and school buses comprise 49.40% of the heavy vehicle traffic. New home construction is continuing in this area.

Notes:

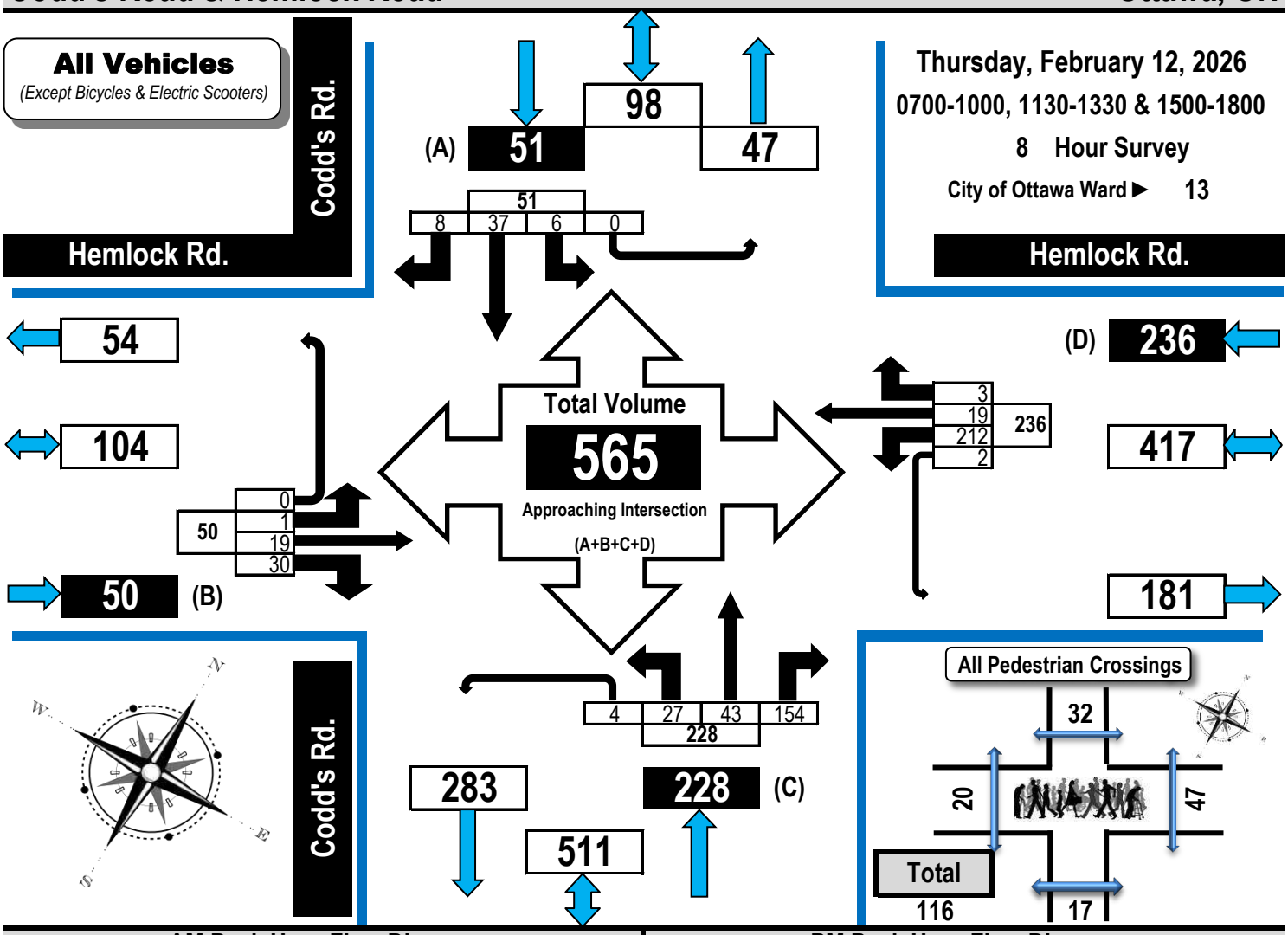
1. Includes all vehicle types except bicycles, electric bicycles, and electric scooters.
2. When expansion and AADT factors are applied, the results will differ slightly due to rounding.

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

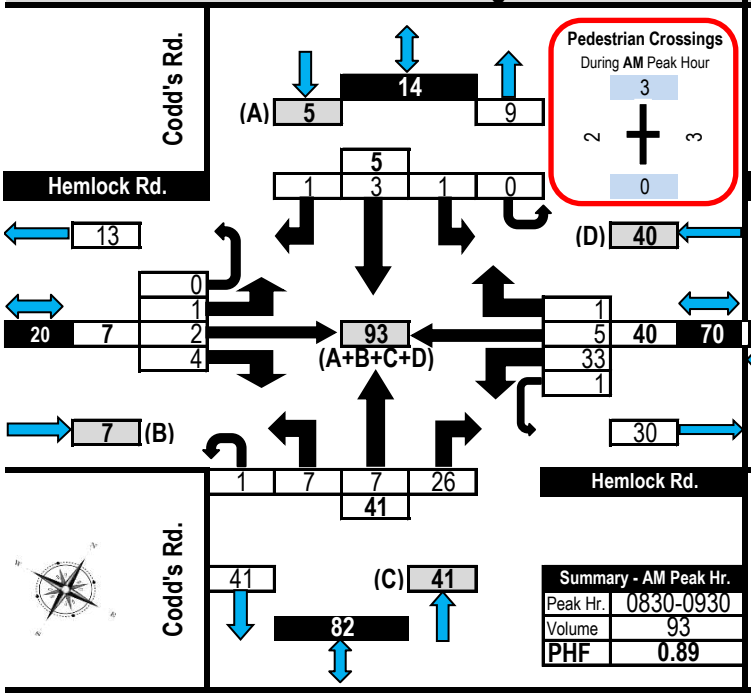
Codd's Road & Hemlock Road — Ottawa, ON

All Vehicles
(Except Bicycles & Electric Scooters)

Thursday, February 12, 2026
0700-1000, 1130-1330 & 1500-1800
8 Hour Survey
City of Ottawa Ward ► 13

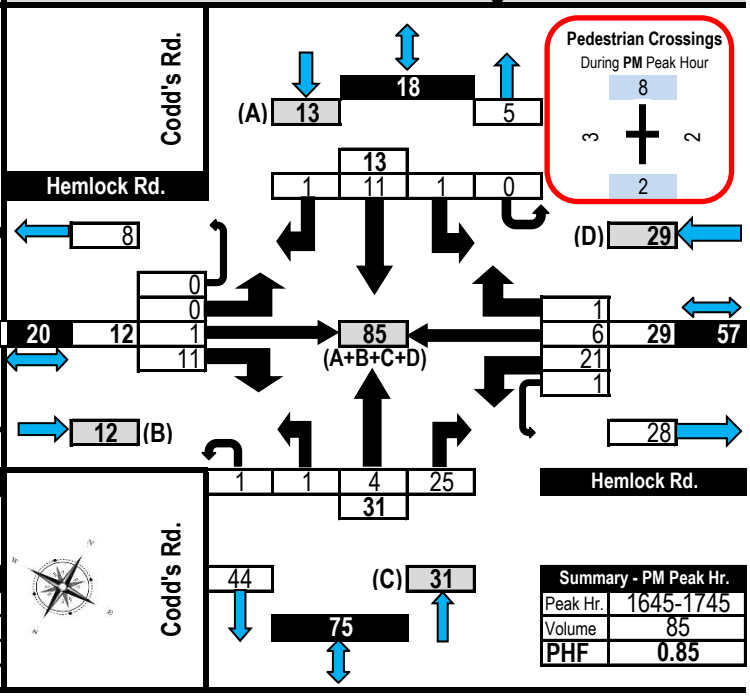


AM Peak Hour Flow Diagram



Summary - AM Peak Hr.	
Peak Hr.	0830-0930
Volume	93
PHF	0.89

PM Peak Hour Flow Diagram



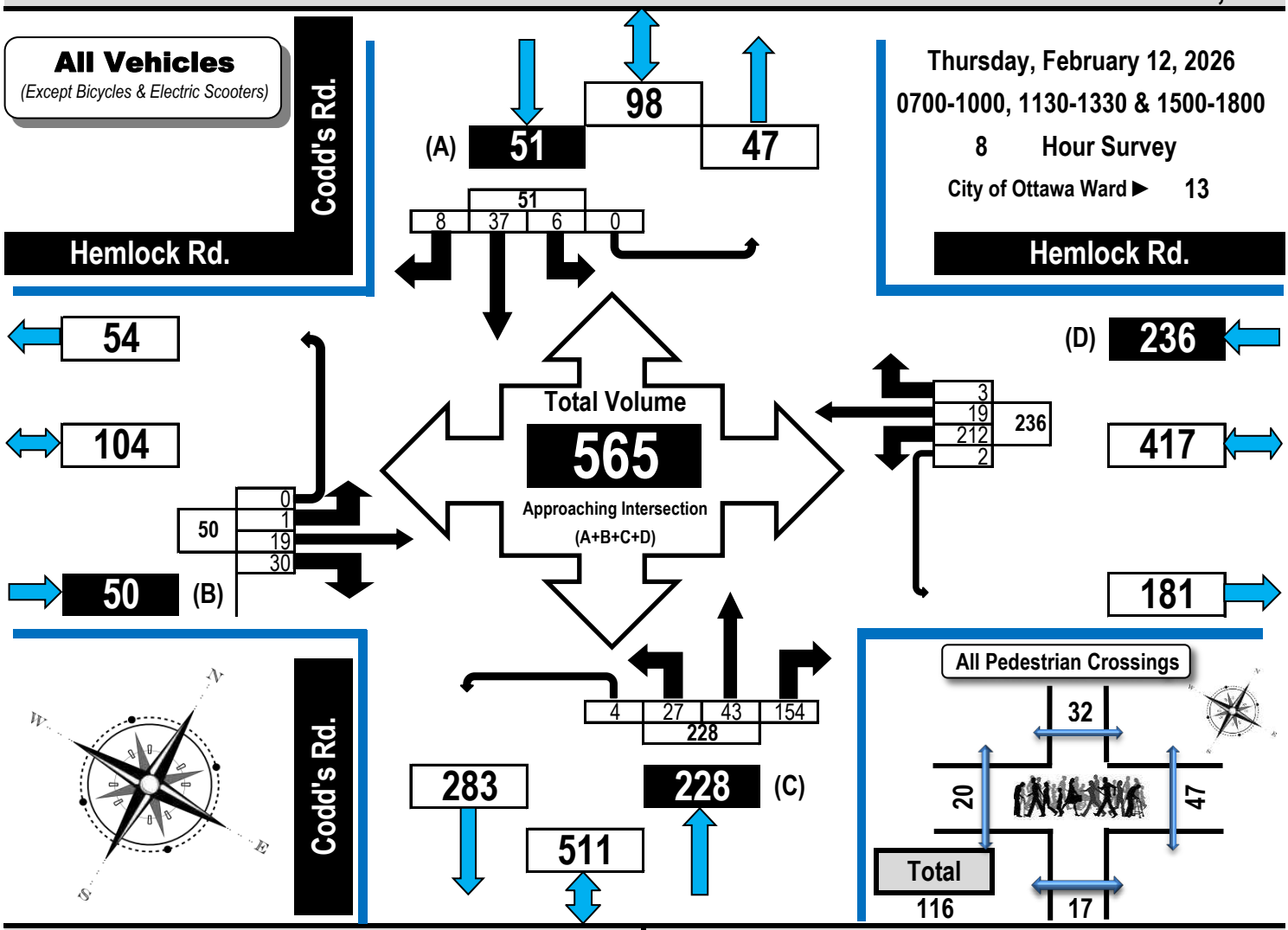
Summary - PM Peak Hr.	
Peak Hr.	1645-1745
Volume	85
PHF	0.85

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

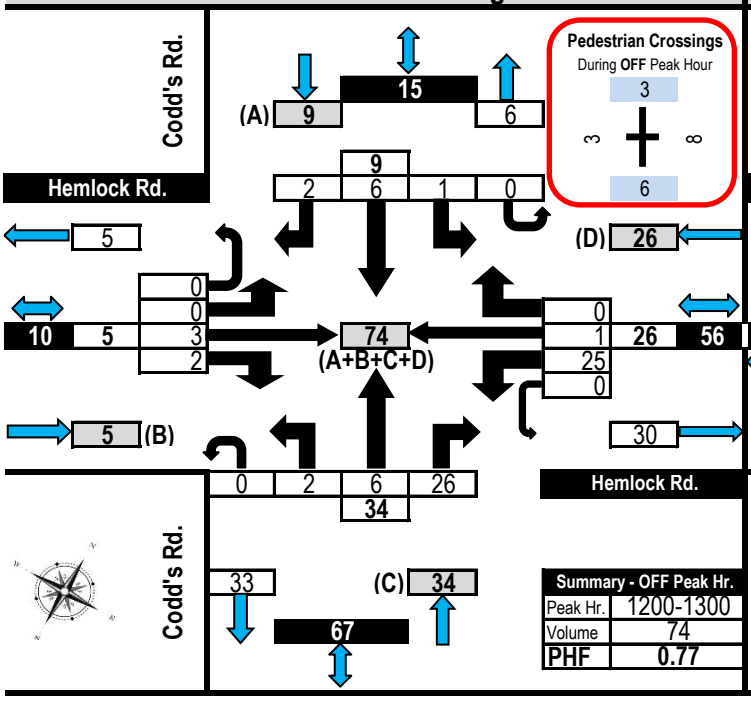
Codd's Road & Hemlock Road — Ottawa, ON

All Vehicles
(Except Bicycles & Electric Scooters)

Thursday, February 12, 2026
0700-1000, 1130-1330 & 1500-1800
8 Hour Survey
City of Ottawa Ward ▶ 13

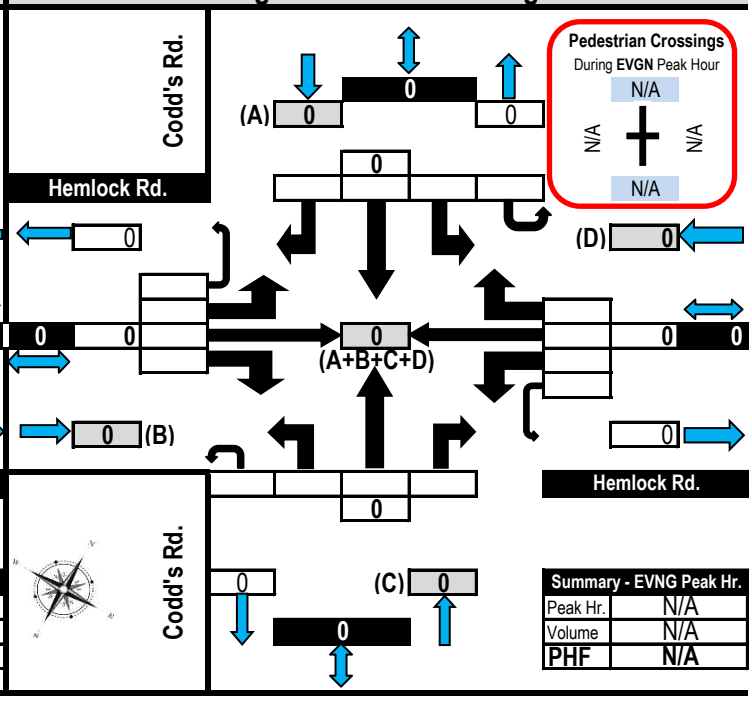


Off Peak Hour Flow Diagram



Summary - OFF Peak Hr.	
Peak Hr.	1200-1300
Volume	74
PHF	0.77

Evening Peak Hour Flow Diagram



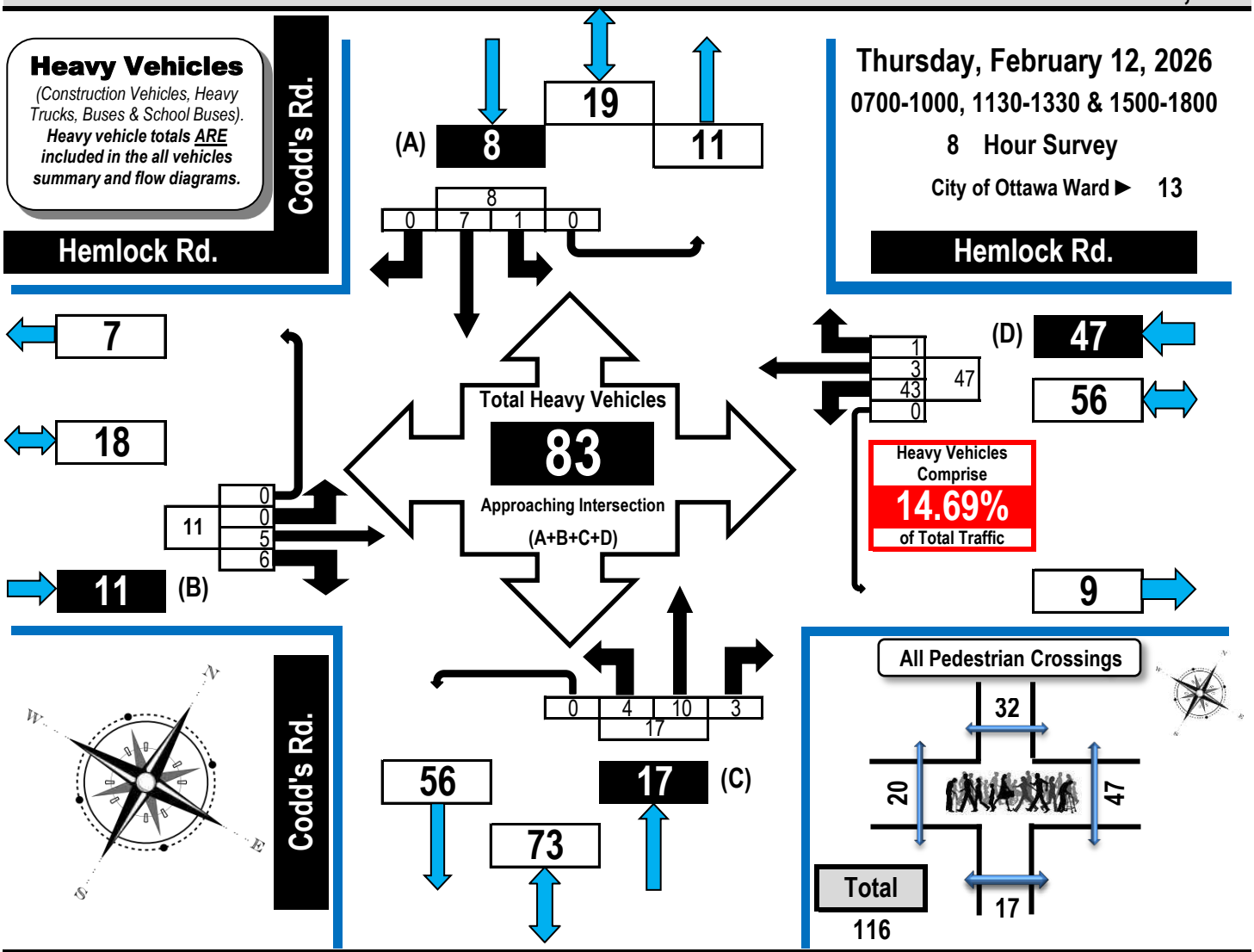
Summary - EVNG Peak Hr.	
Peak Hr.	N/A
Volume	N/A
PHF	N/A

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

Codd's Road & Hemlock Road — Ottawa, ON

Heavy Vehicles
(Construction Vehicles, Heavy Trucks, Buses & School Buses).
Heavy vehicle totals ARE included in the all vehicles summary and flow diagrams.

Thursday, February 12, 2026
0700-1000, 1130-1330 & 1500-1800
8 Hour Survey
City of Ottawa Ward ► 13



	Hemlock Rd. Eastbound					Hemlock Rd. Westbound					Codd's Rd. Northbound					Codd's Rd. 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	1	1	0	2	7	0	0	0	7	2	2	0	0	4	0	2	0	0	2	15
0800-0900	0	0	1	0	1	4	1	0	0	5	1	3	1	0	5	1	1	0	0	2	13
0900-1000	0	1	2	0	3	6	2	1	0	9	1	3	0	0	4	0	1	0	0	1	17
1130-1230	0	0	1	0	1	5	0	0	0	5	0	1	2	0	3	0	0	0	0	0	9
1230-1330	0	1	0	0	1	6	0	0	0	6	0	1	0	0	1	0	1	0	0	1	9
1500-1600	0	2	0	0	2	4	0	0	0	4	0	0	0	0	0	0	1	0	0	1	7
1600-1700	0	0	0	0	0	6	0	0	0	6	0	0	0	0	0	0	1	0	0	1	7
1700-1800	0	0	1	0	1	5	0	0	0	5	0	0	0	0	0	0	0	0	0	0	6
Totals	0	5	6	0	11	43	3	1	0	47	4	10	3	0	17	1	7	0	0	8	83

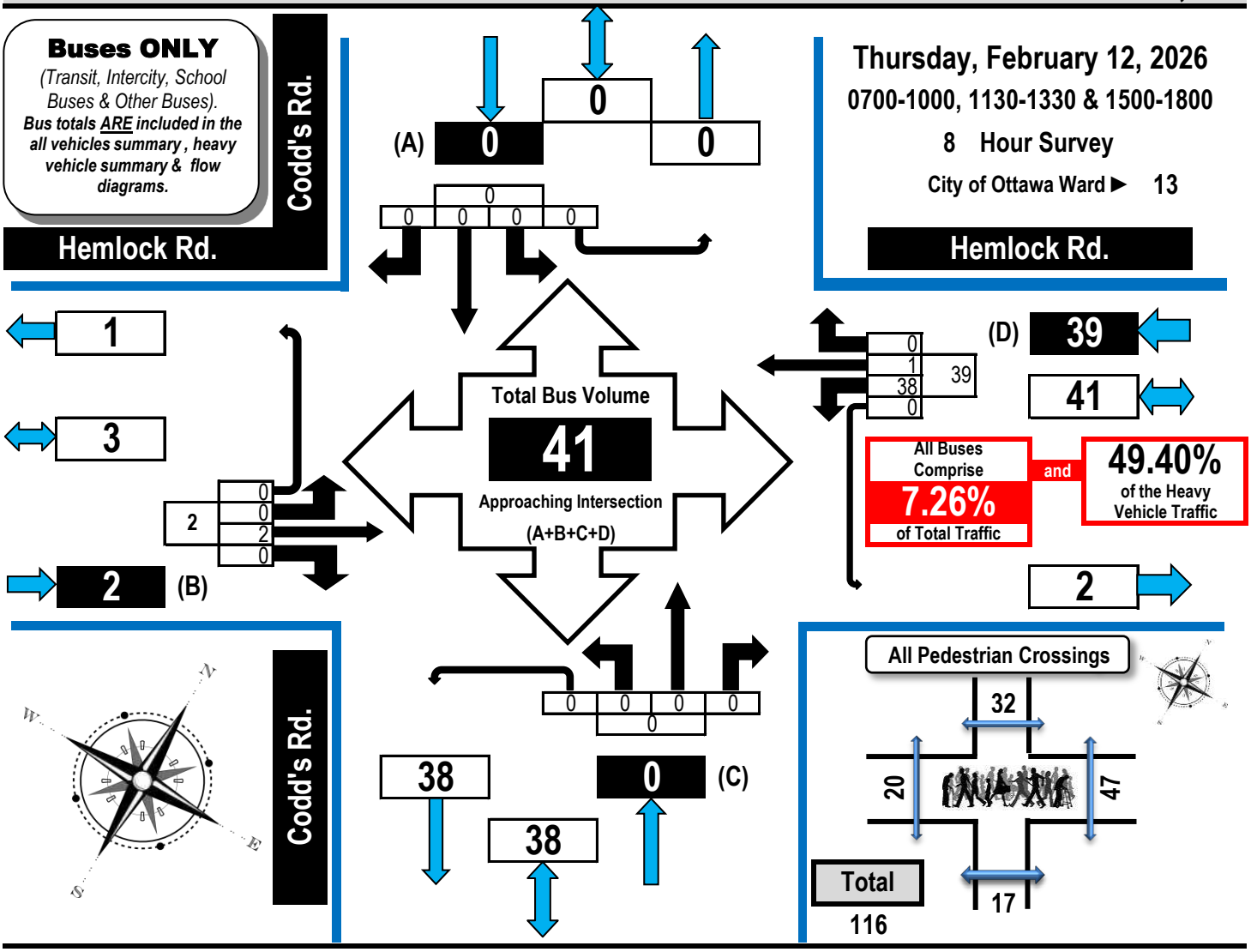
Comments:
OC Transpo buses and school buses comprise 49.40% of the heavy vehicle traffic. New home construction is continuing in this area.

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

Codd's Road & Hemlock Road — Ottawa, ON

Buses ONLY
(Transit, Intercity, School Buses & Other Buses).
Bus totals ARE included in the all vehicles summary , heavy vehicle summary & flow diagrams.

Thursday, February 12, 2026
0700-1000, 1130-1330 & 1500-1800
8 Hour Survey
City of Ottawa Ward ► 13



	Hemlock Rd. Eastbound					Hemlock Rd. Westbound					Codd's Rd. Northbound					Codd's Rd. 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	1	0	0	1	6	0	0	0	6	0	0	0	0	0	0	0	0	0	0	7
0800-0900	0	0	0	0	0	3	1	0	0	4	0	0	0	0	0	0	0	0	0	0	4
0900-1000	0	0	0	0	0	5	0	0	0	5	0	0	0	0	0	0	0	0	0	0	5
1130-1230	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3
1230-1330	0	0	0	0	0	6	0	0	0	6	0	0	0	0	0	0	0	0	0	0	6
1500-1600	0	1	0	0	1	4	0	0	0	4	0	0	0	0	0	0	0	0	0	0	5
1600-1700	0	0	0	0	0	6	0	0	0	6	0	0	0	0	0	0	0	0	0	0	6
1700-1800	0	0	0	0	0	5	0	0	0	5	0	0	0	0	0	0	0	0	0	0	5
Totals	0	2	0	0	2	38	1	0	0	39	0	0	0	0	0	0	0	0	0	0	41

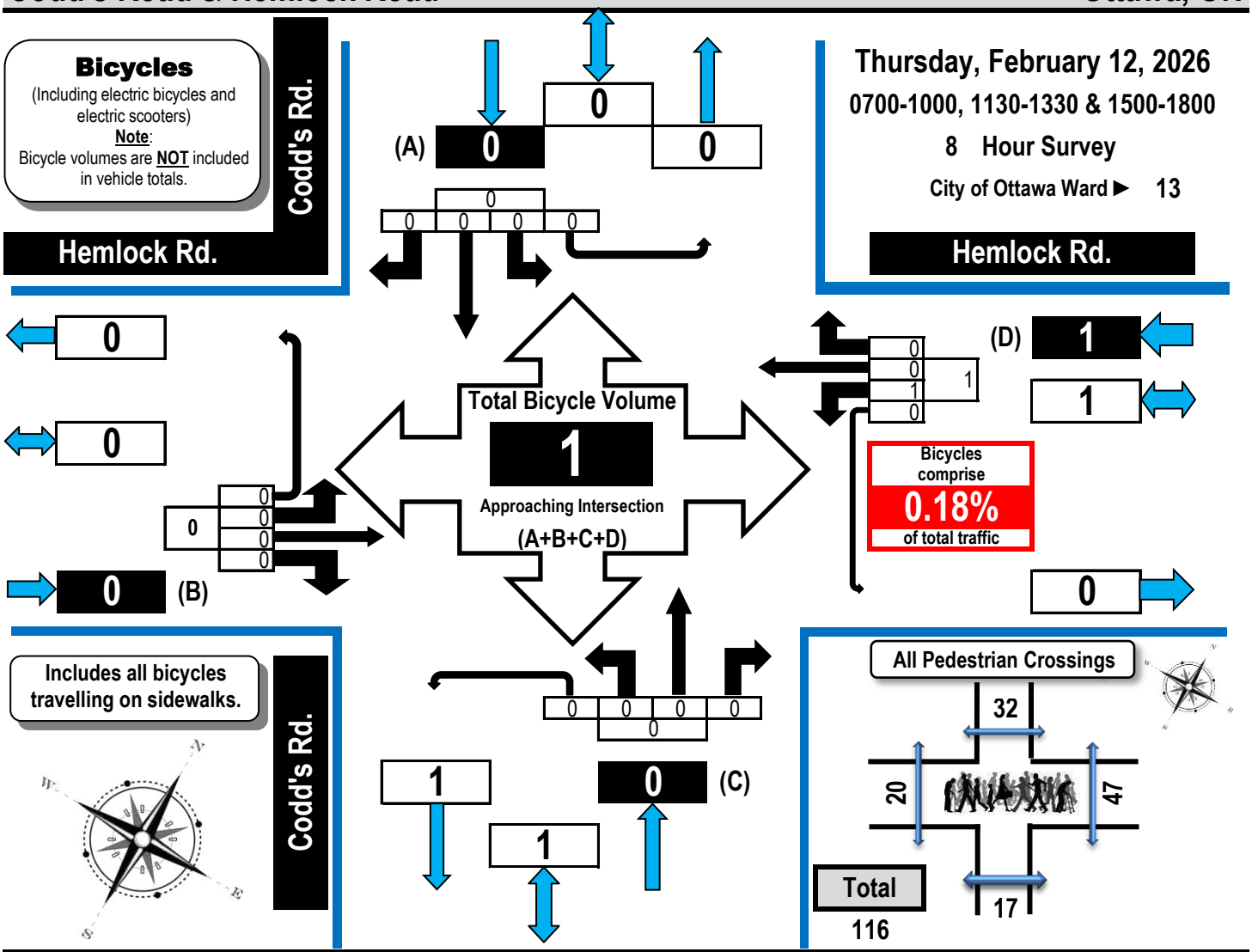
Comments:
OC Transpo buses and school buses comprise 49.40% of the heavy vehicle traffic. New home construction is continuing in this area.

Turning Movement Count
Bicycles and Personal E-Transportation Summary
Flow Diagram

Codd's Road & Hemlock Road — Ottawa, ON

Bicycles
(Including electric bicycles and electric scooters)
Note:
Bicycle volumes are NOT included in vehicle totals.

Thursday, February 12, 2026
0700-1000, 1130-1330 & 1500-1800
8 Hour Survey
City of Ottawa Ward ► 13



Includes all bicycles travelling on sidewalks.

	Hemlock Rd. Eastbound					Hemlock Rd. Westbound					Codd's Rd. Northbound					Codd's Rd. 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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0800-0900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0900-1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1130-1230	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1230-1330	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1500-1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600-1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700-1800	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Totals	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1

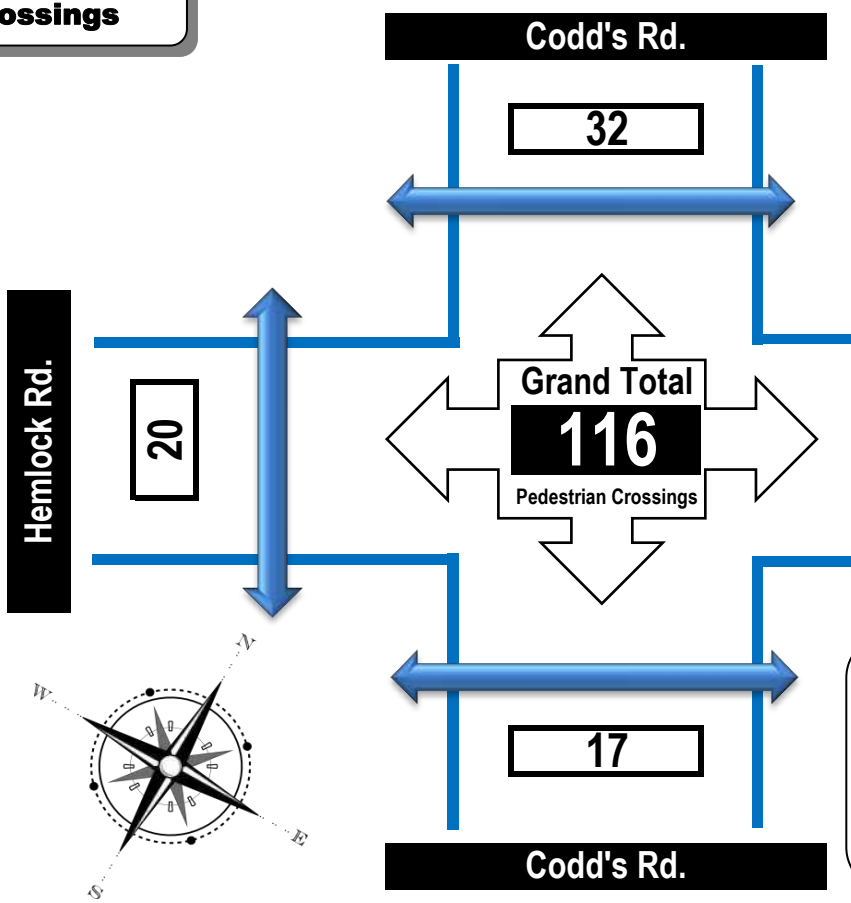
Comments:
OC Transpo buses and school buses comprise 49.40% of the heavy vehicle traffic. New home construction is continuing in this area.

Turning Movement Count
Pedestrian Crossings Summary and Flow Diagram

Codd's Road & Hemlock Road — Ottawa, ON

Pedestrian Crossings

Thursday, February 12, 2026
0700-1000, 1130-1330 & 1500-1800
8 Hour Survey
City of Ottawa Ward ► 13



Note
*The values in the summary table below and the flow diagram represent the number of pedestrian crossing**s** **NOT** the number of individual pedestrian**s** 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 Hemlock Rd.	East Side Crossing Hemlock Rd.	Street Total	South Side Crossing Codd's Rd.	North Side Crossing Codd's Rd.	Street Total	Grand Total
0700-0800	2	8	10	1	3	4	14
0800-0900	1	3	4	2	1	3	7
0900-1000	3	3	6	2	3	5	11
1130-1230	3	7	10	2	3	5	15
1230-1330	1	5	6	4	2	6	12
1500-1600	4	11	15	3	5	8	23
1600-1700	4	5	9	1	9	10	19
1700-1800	2	5	7	2	6	8	15
Totals	**20**	**47**	**67**	**17**	**32**	**49**	**116**

Comments:
OC Transpo buses and school buses comprise 49.40% of the heavy vehicle traffic. New home construction is continuing in this area.

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)	1	2	4	34	5	1	8	7	26	1	3	1
Future Volume (vph)	1	2	4	34	5	1	8	7	26	1	3	1
Satd. Flow (prot)	0	1140	0	0	1386	0	0	1449	0	0	1422	0
Flt Permitted		0.993			0.959			0.990			0.990	
Satd. Flow (perm)	0	1140	0	0	1386	0	0	1449	0	0	1422	0
Lane Group Flow (vph)	0	7	0	0	45	0	0	46	0	0	5	0
Sign Control		Stop			Stop			Stop			Stop	

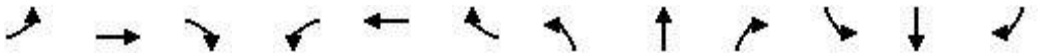
Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 20.6%	ICU Level of Service A
Analysis Period (min) 15	

Intersection	
Intersection Delay, s/veh	7.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	2	4	34	5	1	8	7	26	1	3	1
Future Vol, veh/h	1	2	4	34	5	1	8	7	26	1	3	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	50	50	18	40	100	13	43	2	2	33	2
Mvmt Flow	1	2	4	38	6	1	9	8	29	1	3	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	6.8	7.7	7.1	7
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	20%	14%	85%	20%
Vol Thru, %	17%	29%	12%	60%
Vol Right, %	63%	57%	3%	20%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	41	7	40	5
LT Vol	8	1	34	1
Through Vol	7	2	5	3
RT Vol	26	4	1	1
Lane Flow Rate	46	8	44	6
Geometry Grp	1	1	1	1
Degree of Util (X)	0.049	0.008	0.055	0.006
Departure Headway (Hd)	3.876	3.742	4.455	3.98
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	922	954	805	896
Service Time	1.908	1.774	2.476	2.019
HCM Lane V/C Ratio	0.05	0.008	0.055	0.007
HCM Control Delay	7.1	6.8	7.7	7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0	0.2	0



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	628	216	121	1031	58	135	14	69	42	20	244
Future Volume (vph)	89	628	216	121	1031	58	135	14	69	42	20	244
Satd. Flow (prot)	1676	3123	0	1644	3294	0	1613	1492	0	1598	1399	0
Flt Permitted	0.137			0.305			0.366			0.697		
Satd. Flow (perm)	242	3123	0	525	3294	0	598	1492	0	1162	1399	0
Satd. Flow (RTOR)		74			7			77			173	
Lane Group Flow (vph)	99	938	0	134	1210	0	150	93	0	47	293	0
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	9.7	29.0		29.0	29.0		33.5	33.5		33.5	33.5	
Total Split (s)	13.0	80.0		67.0	67.0		40.0	40.0		40.0	40.0	
Total Split (%)	10.8%	66.7%		55.8%	55.8%		33.3%	33.3%		33.3%	33.3%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	1.0	2.3		2.3	2.3		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)	4.7	6.0		6.0	6.0		6.3	6.3		6.3	6.3	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	78.8	77.5		65.2	65.2		30.2	30.2		30.2	30.2	
Actuated g/C Ratio	0.66	0.65		0.54	0.54		0.25	0.25		0.25	0.25	
v/c Ratio	0.40	0.46		0.47	0.68		1.00	0.21		0.16	0.61	
Control Delay	13.2	11.1		25.5	23.0		118.6	11.2		34.5	20.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	13.2	11.1		25.5	23.0		118.6	11.2		34.5	20.7	
LOS	B	B		C	C		F	B		C	C	
Approach Delay		11.3			23.3			77.5			22.6	
Approach LOS		B			C			E			C	
Queue Length 50th (m)	8.6	54.1		20.2	111.8		33.9	2.8		8.3	22.9	
Queue Length 95th (m)	15.5	68.8		40.4	137.6		#73.5	15.3		18.2	51.4	
Internal Link Dist (m)		184.2			350.5			226.5			53.3	
Turn Bay Length (m)	100.0			65.0			25.0			40.0		
Base Capacity (vph)	258	2042		284	1791		167	474		326	517	
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	0.38	0.46		0.47	0.68		0.90	0.20		0.14	0.57	

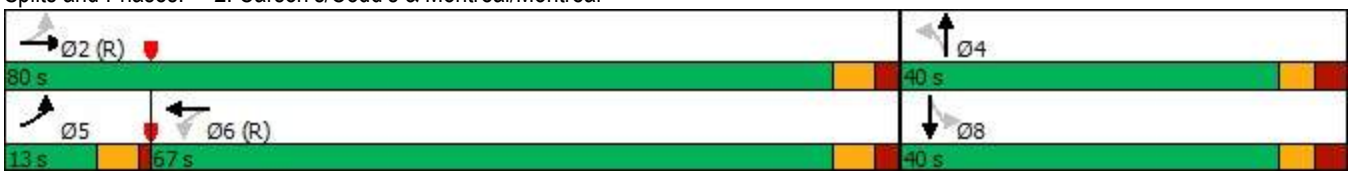
Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 5 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

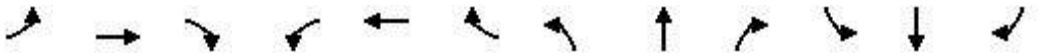
Maximum v/c Ratio: 1.00

Intersection Signal Delay: 23.5	Intersection LOS: C
Intersection Capacity Utilization 87.3%	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: 2: Carson's/Codd's & Montréal/Montréal





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1	11	22	6	1	2	4	25	1	11	1
Future Volume (vph)	0	1	11	22	6	1	2	4	25	1	11	1
Satd. Flow (prot)	0	1436	0	0	1451	0	0	1547	0	0	1721	0
Flt Permitted					0.964			0.997			0.996	
Satd. Flow (perm)	0	1436	0	0	1451	0	0	1547	0	0	1721	0
Lane Group Flow (vph)	0	13	0	0	32	0	0	34	0	0	14	0
Sign Control		Stop			Stop			Stop			Stop	

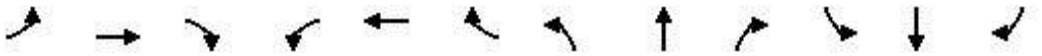
Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 20.5%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	7.1
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1	11	22	6	1	2	4	25	1	11	1
Future Vol, veh/h	0	1	11	22	6	1	2	4	25	1	11	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	9	23	2	2	2	2	2	2	2	2
Mvmt Flow	0	1	12	24	7	1	2	4	28	1	12	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	6.6	7.7	6.7	7.1
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	6%	0%	76%	8%
Vol Thru, %	13%	8%	21%	85%
Vol Right, %	81%	92%	3%	8%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	31	12	29	13
LT Vol	2	0	22	1
Through Vol	4	1	6	11
RT Vol	25	11	1	1
Lane Flow Rate	34	13	32	14
Geometry Grp	1	1	1	1
Degree of Util (X)	0.034	0.013	0.04	0.016
Departure Headway (Hd)	3.554	3.494	4.519	4.01
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	1006	1024	795	892
Service Time	1.58	1.515	2.531	2.036
HCM Lane V/C Ratio	0.034	0.013	0.04	0.016
HCM Control Delay	6.7	6.6	7.7	7.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0	0.1	0



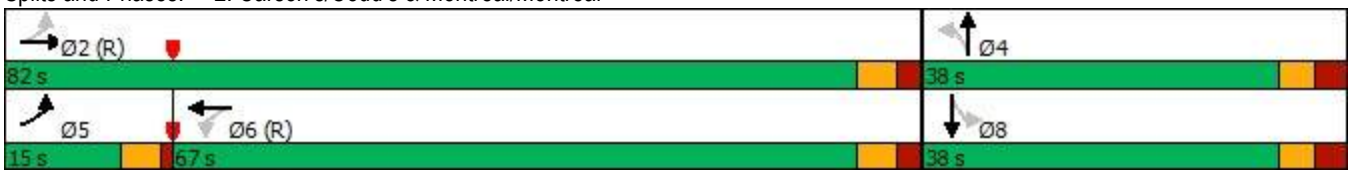
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	143	1155	95	34	810	28	99	10	46	61	11	145
Future Volume (vph)	143	1155	95	34	810	28	99	10	46	61	11	145
Satd. Flow (prot)	1660	3307	0	1613	3285	0	1676	1521	0	1598	1373	0
Flt Permitted	0.235			0.181			0.540			0.717		
Satd. Flow (perm)	410	3307	0	306	3285	0	911	1521	0	1196	1373	0
Satd. Flow (RTOR)		14			4			51			161	
Lane Group Flow (vph)	159	1389	0	38	931	0	110	62	0	68	173	0
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	9.7	29.0		29.0	29.0		33.5	33.5		33.5	33.5	
Total Split (s)	15.0	82.0		67.0	67.0		38.0	38.0		38.0	38.0	
Total Split (%)	12.5%	68.3%		55.8%	55.8%		31.7%	31.7%		31.7%	31.7%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	1.0	2.3		2.3	2.3		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)	4.7	6.0		6.0	6.0		6.3	6.3		6.3	6.3	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	85.3	84.0		69.9	69.9		23.7	23.7		23.7	23.7	
Actuated g/C Ratio	0.71	0.70		0.58	0.58		0.20	0.20		0.20	0.20	
v/c Ratio	0.41	0.60		0.21	0.49		0.61	0.18		0.29	0.43	
Control Delay	9.6	11.3		18.5	16.8		57.9	14.5		42.4	10.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	9.6	11.3		18.5	16.8		57.9	14.5		42.4	10.8	
LOS	A	B		B	B		E	B		D	B	
Approach Delay		11.1			16.9			42.3			19.7	
Approach LOS		B			B			D			B	
Queue Length 50th (m)	11.9	87.5		4.4	68.3		23.0	2.0		13.2	2.2	
Queue Length 95th (m)	19.8	108.5		12.6	90.8		42.2	13.2		26.2	20.6	
Internal Link Dist (m)		184.2			350.5			226.5			53.3	
Turn Bay Length (m)	100.0			65.0			25.0			40.0		
Base Capacity (vph)	403	2319		178	1915		240	439		315	481	
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	0.39	0.60		0.21	0.49		0.46	0.14		0.22	0.36	

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 16 (13%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.61

Intersection Signal Delay: 15.6	Intersection LOS: B
Intersection Capacity Utilization 94.7%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 2: Carson's/Codd's & Montréal/Montréal



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
2020-02-05	2020	7:30	HEMLOCK RD btwn BAREILLE-SNOW ST & CODD'S RD (e___2JOI)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	06 - SMV unattended vehicle	05 - Packed snow	1	0	0	0
2022-07-14	2022	8:03	HEMLOCK RD btwn BAREILLE-SNOW ST & CODD'S RD (e 2JOI)	01 - Clear	01 - Daylight	10 - No control	0	02 - Non-fatal injury	06 - SMV unattended vehicle	01 - Dry	1	0	1	0
2018-04-11	2018	13:27	CODD'S RD btwn END & BLACKTHORNE AVE (__3Z0CTT)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	02 - Angle	01 - Dry	2	0	0	0

Collision Summary Report

Location: HEMLOCK RD btwn CODD'S RD & BAREILLE-SNOW ST
Geo ID: e___2JOI
Municipality: Ottawa (OT)
Jurisdiction:
Traffic Control: No control
Total Collisions: 2

Collision ID	Date/Time	Env	Impact Type	Classification	Direction	Surface Cond'n	Vehicle Manoeuver	Vehicle Type	First Event	Driver Action	No. Ped
220184233	2022-Jul-14, Thu, 8:03	Clear	SMV unattended vehicle	Non-fatal injury	East	Dry	Unknown	Bicycle	Unattended vehicle	Driving properly	0
Comments:											
200033981	2020-Feb-5, Wed, 7:30	Clear	SMV unattended vehicle	P.D. only	East	Packed snow	Reversing	Pick-up truck	Unattended vehicle	Other	0
Comments:											

Appendix E

TDM Checklist

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	☐

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)	☐

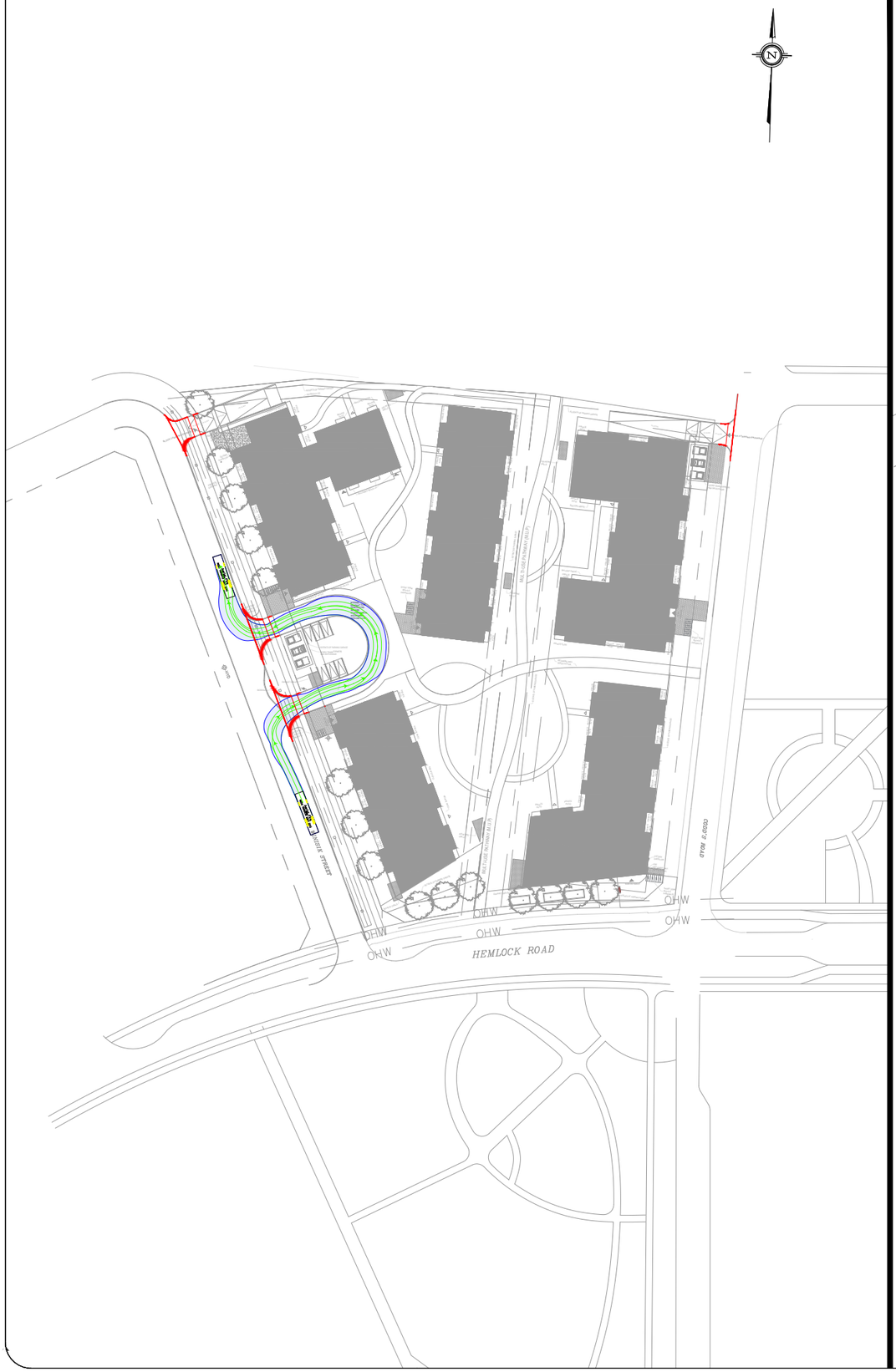
		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	2.	**WALKING & CYCLING: END-OF-TRIP FACILITIES**	
	2.1	**Bicycle parking**	
REQUIRED	2.1.1	Provide bicycle parking in highly visible and lighted 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 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)	☐

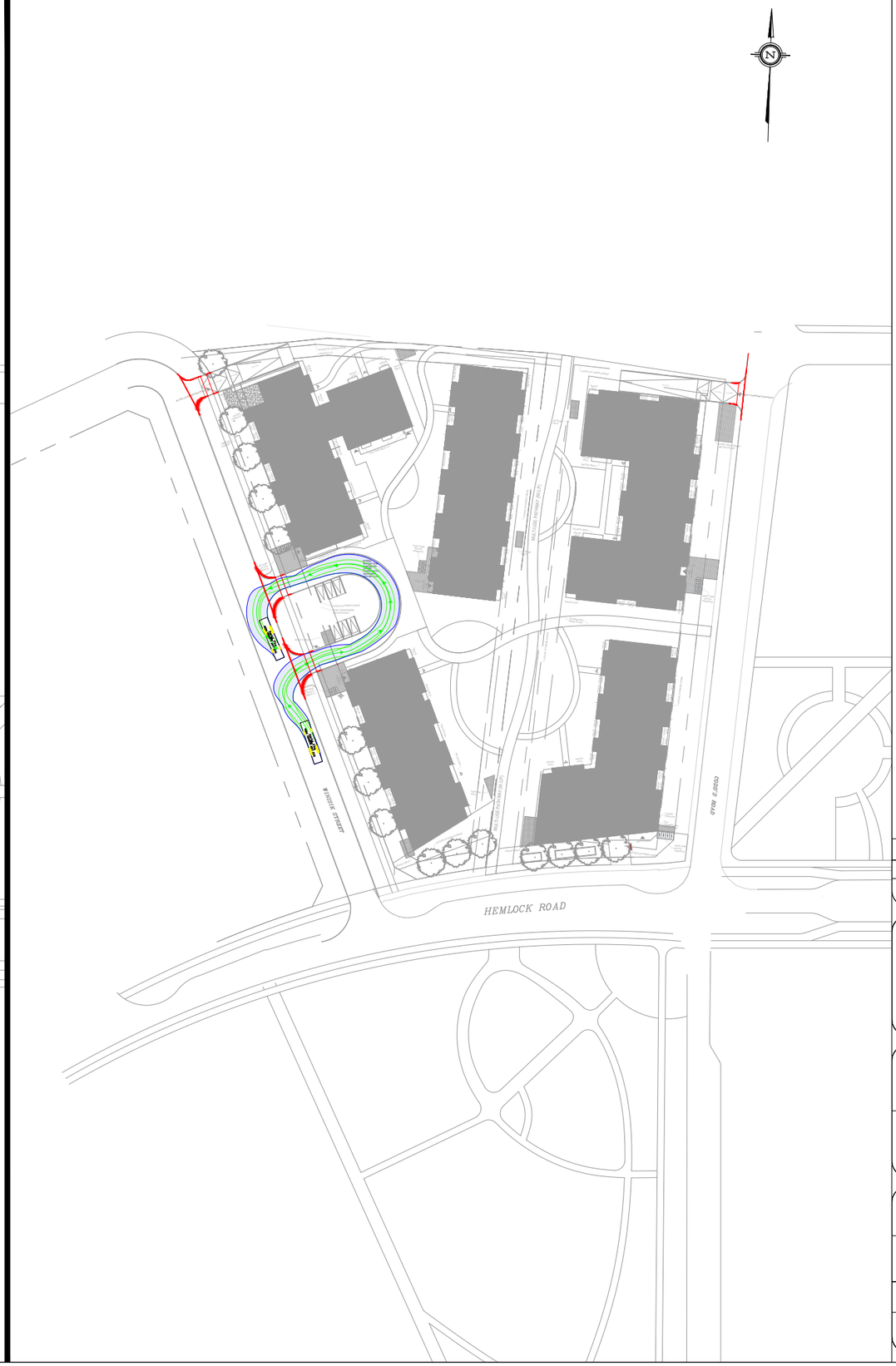
Appendix F

Turning Templates

Fire Truck Entry



Fire Truck Exit



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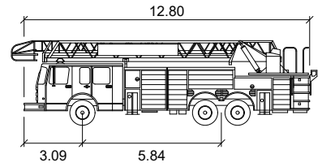


Aerial Fire

	meters
Width	: 2.54
Track	: 2.54
Lock to Lock Time	: 6.0
Steering Angle	: 37.0

REV:	DESCRIPTION:	BY:	DATE:
01	Issued for Review:	CH	2026-06-16

STATUS:

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

CLIENT: Figurr Architects Collective
252 Argyle Ave, Ottawa ON
K2P 1B9

ARCHITECT:

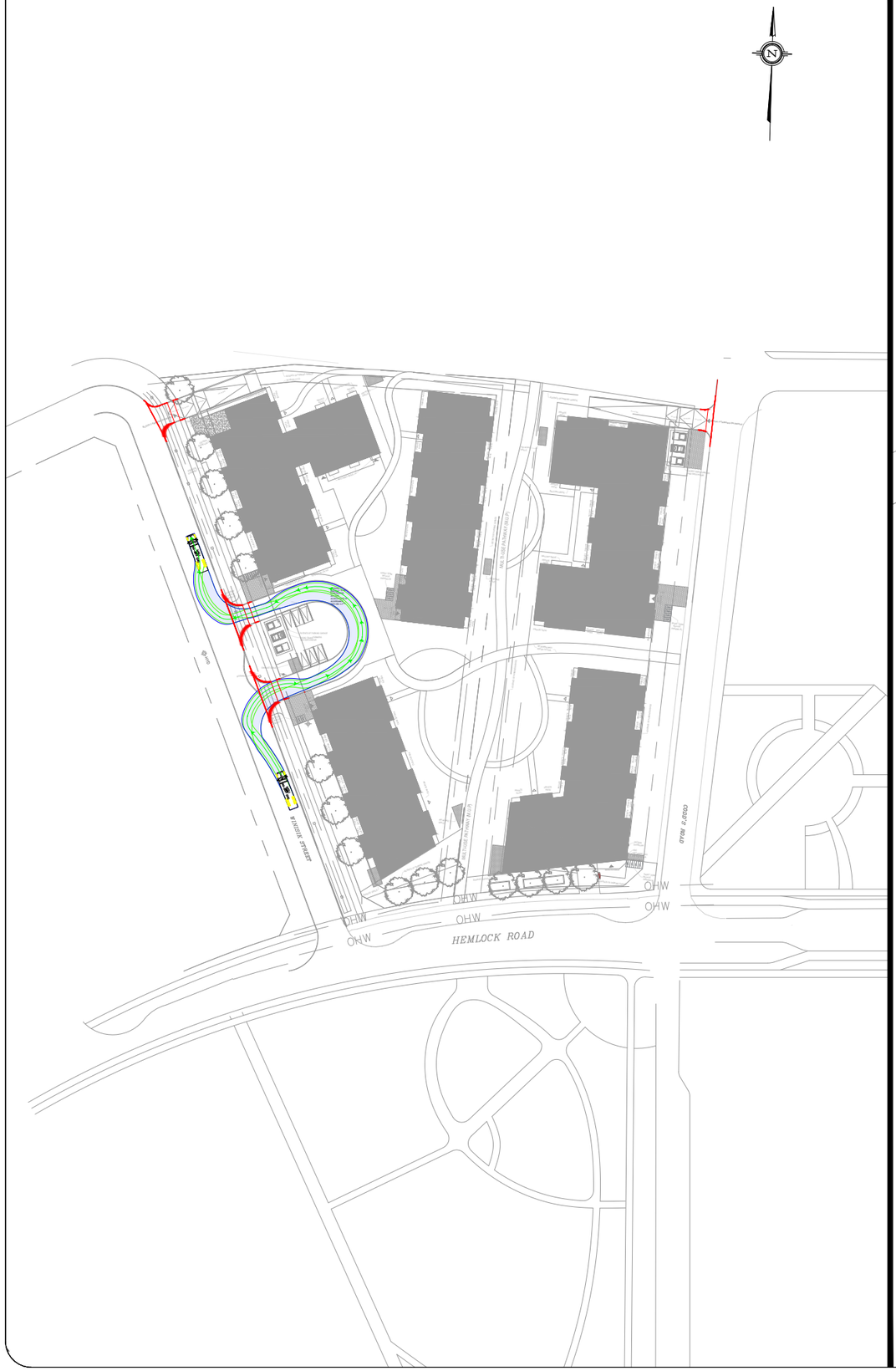
SITE: Wateridge

TITLE: Draft Access Review
Turning Templates

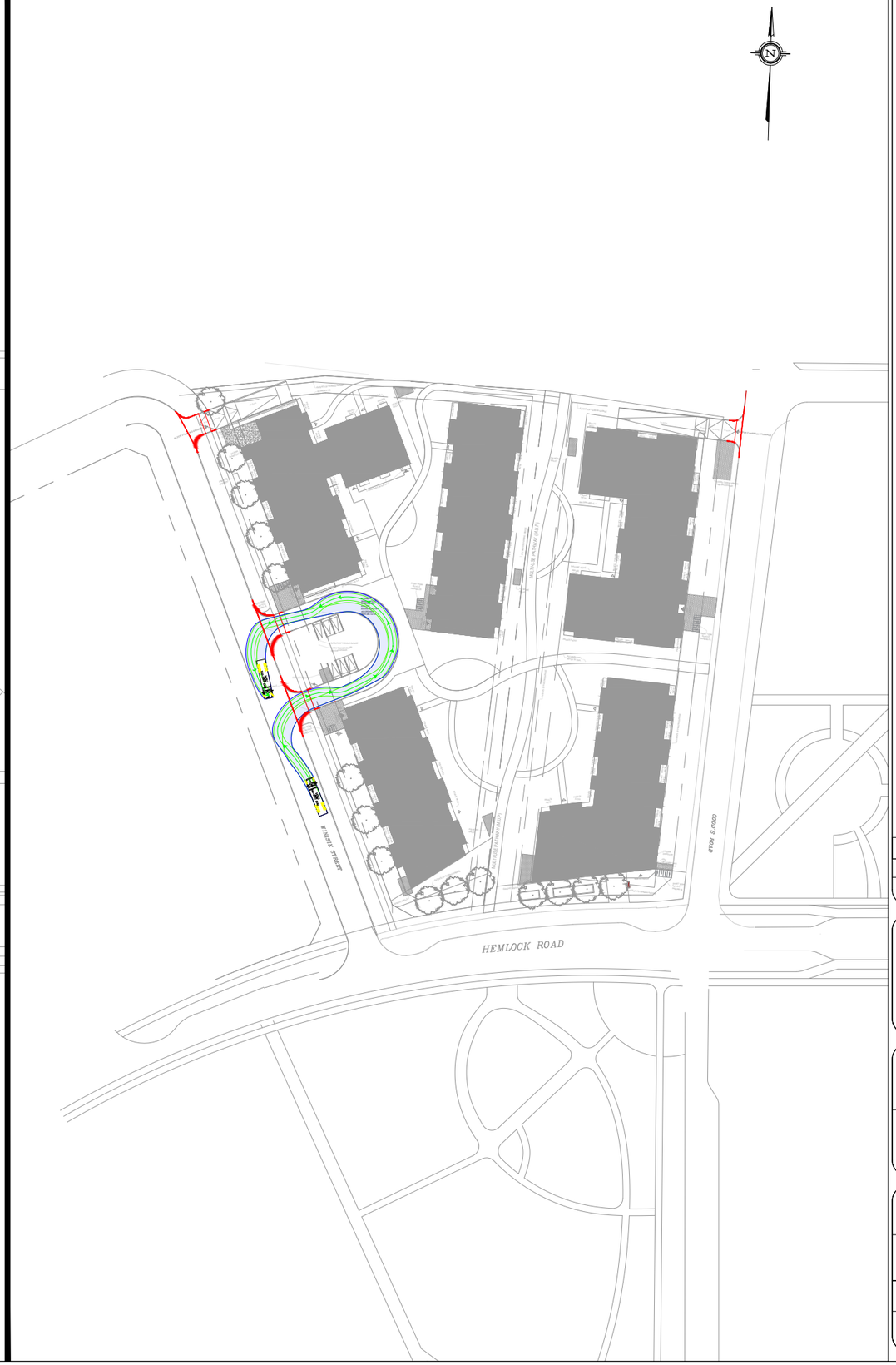
SCALE AT A3:	DATE:	DRAWN:	CHECKED:
NTS	2026-06-16	CH	RA

PROJECT NO:	DRAWING NO:	REVISION:
2025-089	001	01

HSU Truck Entry



HSU Truck Exit



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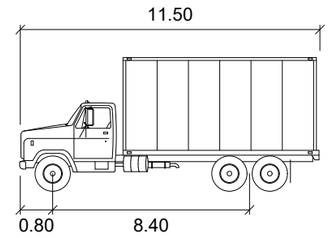


HSU

	meters
Width	: 2.60
Track	: 2.60
Lock to Lock Time	: 6.0
Steering Angle	: 40.0

REV:	DESCRIPTION:	BY:	DATE:
01	Issued for Review:	CH	2026-06-16

STATUS:

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

CLIENT: Figurr Architects Collective
252 Argyle Ave, Ottawa ON
K2P 1B9

ARCHITECT:

SITE: Wateridge

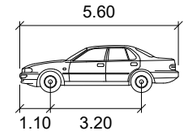
TITLE: Draft Access Review
Turning Templates

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
NTS	2026-06-16	CH	RA
PROJECT NO:	DRAWING NO:		REVISION:
2025-089	002		01

P Car Ramp Entry and Exit

P Car Ramp Entry and Exit

Notes:



P

		meters
Width	:	2.00
Track	:	2.00
Lock to Lock Time	:	6.0
Steering Angle	:	35.9

REV:	DESCRIPTION:	BY:	DATE:
01	Issued for Review:	CH	2026-06-16

STATUS:

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

CLIENT: Figurr Architects Collective
252 Argyle Ave, Ottawa ON
K2P 1B9

ARCHITECT:

SITE: Wateridge

TITLE: Draft Access Review
Turning Templates

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
NTS	2026-06-16	CH	RA

PROJECT NO:	DRAWING NO:	REVISION:
2025-089	003	01

Appendix G

MMLOS Analysis

CGH TRANSPORTATION

Multi-Modal Level of Service - Segments Form

Project: 370 Codd's Rd & 800 Winisik St
Consultant: CGH Transportation Inc.
Date: 2026-06-09
Scenario: Existing/Future

		Segment Name	Hemlock Street (Existing/Future)		Codd's Road (Existing/Future)		Winisik Street (Future)	
		OP Transect / Policy Area	wn Core, Inner Urban,Hub and/or Special		wn Core, Inner Urban,Hub and/or Special		wn Core, Inner Urban,Hub and/or Special	
		Segment Component	Majority (>50%)		Majority (>50%)		Majority (>50%)	
		Side of Street	N		W		E	
Pedestrian		PLOS Inputs						
	Posted Speed (km/h)		40 km/h		30 km/h		30 km/h	
	Two-Way ADT		2,550		1,000		600	
	Pedestrian Facility		Sidewalk		Sidewalk		Sidewalk	
	Does the facility meet the TMP Sidewalk or MUP Policy? If not, for MUPs, does the location have a low volume of peak daily users AND are pedestrian volumes likely less than 20% of total users?		Yes		Yes		Yes	
	Facility Width (m)		1.80m		2.00m		1.80m	
	Offset from Motor Vehicle Travel Lanes (m)		≥ 3.0m		< 0.5m		≥ 3.0m	
	Presence of Adjacent Parking?		Yes		-		Yes	
	General Purpose Curb Lane ADT		≤ 3000		≤ 3000		≤ 3000	
	Max. Distance between Controlled Crossings (m)		≤ 200m		-	-	-	-
	Score		5.00	-	4.25	-	-	5.00
	PLOS		A	-	B	-	-	A
	Target PLOS		A		A		A	
Bicycle	BLOS Inputs							
	Cycling Route Classification		Cross-Town Bikeway		Elsewhere		Elsewhere	
	Cycling Facility		Cycle Track	Input PLOS First	Shared Operating Space	Input PLOS First	Input PLOS First	Shared Operating Space
	Is the minimum level of separation provided according to OTM Book 18 Pre-Selection Nomograph - Rural Context (Figure 5.6)? (for paved shoulders)		-		-			-
	Facility Operation		-		-			-
	Pedestrian/Cyclist Volume		-		-			-
	Facility Width		-		-			-
	Boulevard/Buffer Width (excluding curb)		-		-			-
	Unsignalized Roadway Crossing Type (where cyclists are required to yield)		Cross-Street		Cross-Street			Cross-Street
	Number of Travel Lanes at Crossing		≤ 2		≤ 2			≤ 2
	Crossing includes Median Refuge (≥ 2.7m)		No		No			No
	Cross-street Posted Speed (km/h)		≤ 30 km/h		40 km/h			40 km/h
	Cycling Path Blockages (e.g. bus stops and/or loading zones)		-		Rare			Rare
	Score		5.00	-	4.85	-	-	4.85
	BLOS		A	-	A	-	-	A
	Target BLOS		A		B		B	
Transit	TLOS Inputs							
	Transit Facility		Mixed Traffic		Select Transit Designation		Select Transit Designation	
	Facility Type		Mixed Traffic					
	Expected Transit Running Time		Slightly Impeded					
	Transit Travel Speed (if available)		Enter Speed (if available)					
	TLOS		C	-	-	-	-	-
	Target TLOS		E (D for frequent transit routes)		-		-	
Public Realm	PRLOS Inputs							
	Context		Other Streets	Input PLOS and BLOS First	Other Streets	Input PLOS and BLOS First	Input PLOS and BLOS First	Other Streets
	Inner Boulevard Width		1.5-1.99m		≤ 0.6m			2.0-3.99m
	Middle Boulevard Width		≤ 0.5m		≤ 0.5m			≤ 0.5m
	Outer Boulevard (Frontage) Width		2.0-2.99m		2.0-2.99m			≤ 0.5m
	Transit Route on Segment?		Yes		No			No
	Bus Stop Elements		Curbside platform with no shelter		-			-
	Number of Midblock Traffic Lanes (both travel directions)		≤ 2		≤ 2		≤ 2	
	Score		24.90	-	24.60	-	-	23.10
	PRLOS		B	-	B	-	-	B
			B		B		B	

Multi-Modal Level of Service - Intersections Form

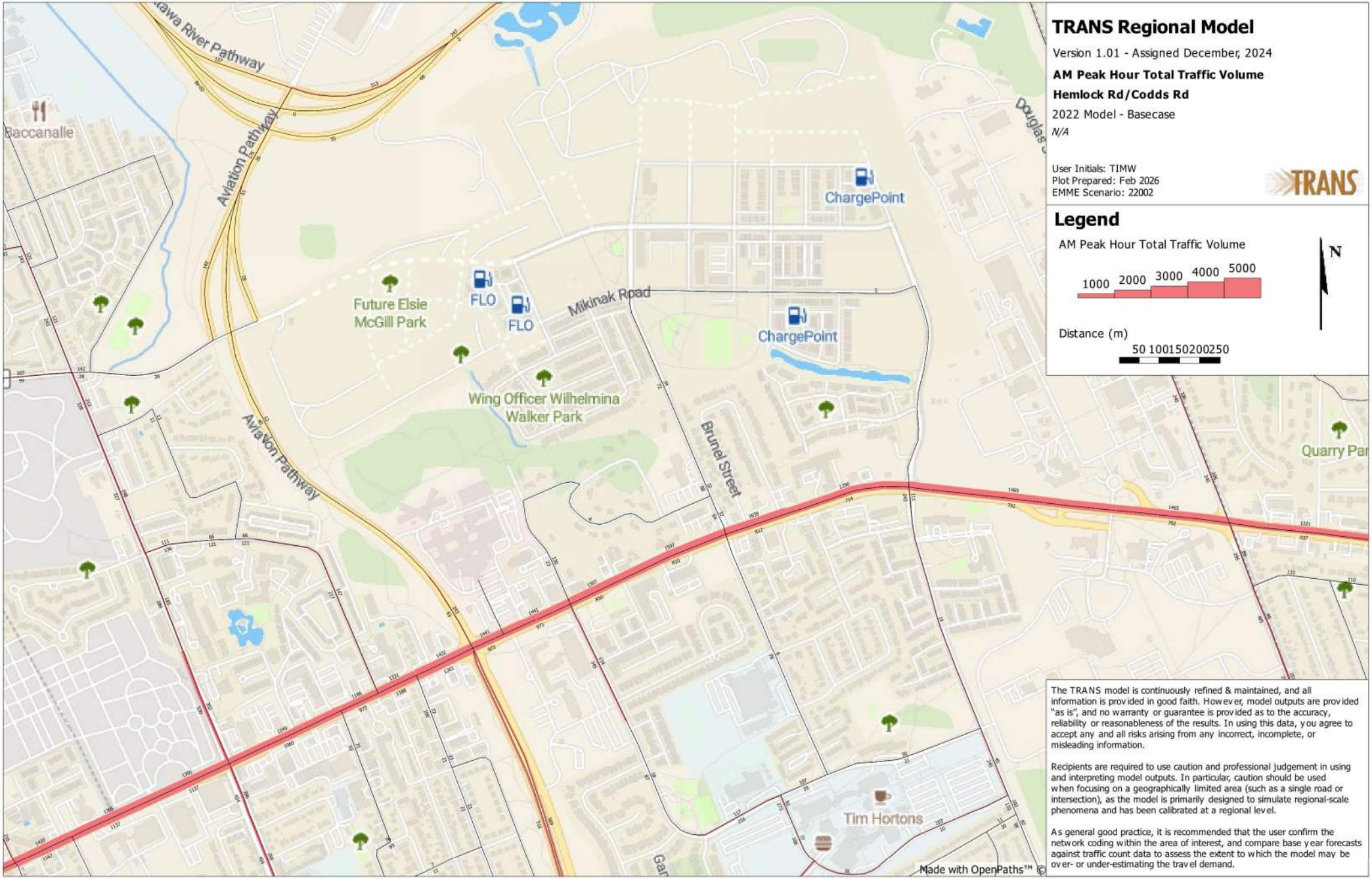
Project: 370 Codd's Rd & 800 Winisik St
Consultant: CGH Transportation Inc.
Date: 2026-06-09
Scenario: Existing/Future

	Intersection Name	Montreal Road at Codd's Road/ Carson's Road (Existing)				Montreal Road at Codd's Road/ Carson's Road (EA)			
	OP Transect / Policy Area	**Mainstreet Corridor (outside a Hub)**				**Mainstreet Corridor (outside a Hub)**			
Pedestrian	**PLOS Inputs**								
	Pedestrians Crossing the	**North Leg**	**South Leg**	**East Leg**	**West Leg**	**North Leg**	**South Leg**	**East Leg**	**West Leg**
	Number of Travel Lanes Crossed	4	4	5	5	4	4	7	7
	Median Refuge (≥2.7m)	No	No	No	No	No	No	No	No
	Crosswalk Treatment	Zebra Stripe Hi-Vis Markings	Zebra Stripe Hi-Vis Markings	Zebra Stripe Hi-Vis Markings	Zebra Stripe Hi-Vis Markings	Zebra Stripe Hi-Vis Markings	Zebra Stripe Hi-Vis Markings	Zebra Stripe Hi-Vis Markings	Zebra Stripe Hi-Vis Markings
	Signal Cycle Length (sec)	120.0				120.0			
	Effective Walk Time (sec)	14.0	14.0	45.0	58.0	14.0	14.0	45.0	58.0
	Conflict with Right-Turn Vehicles (For PLOS & BLOS)	**WBR**	**EBR**	**NBR**	**SBR**	**WBR**	**EBR**	**NBR**	**SBR**
	Right-Turn Geometry	Right-Turn With No Channel	Right-Turn With No Channel	Right-Turn With No Channel	Right-Turn With No Channel	Right-Turn With No Channel	Right-Turn With No Channel	Right-Turn With No Channel	Right-Turn With No Channel
	Right-Turn Signal Phasing	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
	Right-Turn Volume	≤ 150 veh/h	> 150 to 300 veh/h	≤ 150 veh/h	> 150 to 300 veh/h	≤ 150 veh/h	> 150 to 300 veh/h	≤ 150 veh/h	> 300 veh/h
	Right-Turn Effective Corner Radius	> 8m	> 8m	> 8m	> 8m	> 8m	> 8m	> 8m	> 8m
	Cross-street Posted Speed (km/h)	60 km/h		50 km/h		60 km/h		50 km/h	
	Conflict with Left-Turn Vehicles (For PLOS & BLOS)	**EBL**	**WBL**	**SBL**	**NBL**	**EBL**	**WBL**	**SBL**	**NBL**
	Left-Turn Signal Phasing	Perm or Prot+Perm	Perm or Prot+Perm	Perm or Prot+Perm	Perm or Prot+Perm	Perm or Prot+Perm	Perm or Prot+Perm	Perm or Prot+Perm	Perm or Prot+Perm
	Left-Turn Volume	> 100 veh/h	> 100 veh/h	> 50 to 100 veh/h	> 100 veh/h	> 100 veh/h	> 100 veh/h	> 100 veh/h	> 100 veh/h
	Left-Turn Opposing Lanes	-	-	≤ 1	-	-	-	-	-
	Score	**3.25**	**2.95**	**3.30**	**2.80**	**3.25**	**2.95**	**1.90**	**1.45**
	PLOS	**C**	**C**	**C**	**C**	**C**	**C**	**D**	**E**
		C				**D**			
	Target PLOS	**B**				**B**			
Bicycle	**BLOS Inputs**								
	Cycling Route Classification	**Cross-Town Bikeway**				**Cross-Town Bikeway**			
	Cyclists Crossing the	**North Leg**	**South Leg**	**East Leg**	**West Leg**	**North Leg**	**South Leg**	**East Leg**	**West Leg**
	Type of Cycling Facility Across Leg	Mixed Traffic	Mixed Traffic	Bike Lane Through Intersection	Bike Lane Through Intersection	Mixed Traffic	Mixed Traffic	Crossride	Crossride
	Two-Way ADT (in Cyclist Travel Direction)	3,750		22,650		6,450		28,800	
	Floating Bike Lane or Right-Turn Lane Crossover Approaching the Crossing?	No	No	No	No	No	No	No	No
	Crossride Operation	-	-	-	-	-	-	Unidirectional	Unidirectional
	Target Crossride Setback Met?	-	-	-	-	-	-	Yes	Yes
	Right-Turn Vehicle Volume from Adjacent Roadway > 100 veh/h?	-	-	-	-	-	-	-	-
	Cyclist Left-Turn Operation	**WBL**	**EBL**	**NBL**	**SBL**	**WBL**	**EBL**	**NBL**	**SBL**
	Cyclist Left-Turn Treatment Type	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane	Protected Corner	Protected Corner	Protected Corner	Protected Corner
	Vehicle Lanes Crossed by Cyclists	Two or More Lanes Crossed	Two or More Lanes Crossed	No Lane Crossed	No Lane Crossed	-	-	-	-
	Score	**-10**	**-30**	**85**	**15**	**40**	**20**	**100**	**60**
	BLOS	**F**	**F**	**C**	**E**	**D**	**E**	**B**	**D**
		E				**D**			
	Target BLOS	**B**				**B**			
Transit	**TLOS Inputs**								
	Transit Facility	**TP - Continuous Lanes**				**TP - Continuous Lanes**			
	Vehicles Travelling	**Southbound**	**Northbound**	**Westbound**	**Eastbound**	**Southbound**	**Northbound**	**Westbound**	**Eastbound**
	Average Transit Delay (if available)	21-35 sec	11-20 sec	21-35 sec	11-20 sec				
	Example Transit Priority Treatment	-	-	-	-				
	TLOS	**C**	**B**	**C**	**B**	**-**	**-**	**-**	**-**
		B				**-**			
	Target TLOS	**B**				**B**			
Auto	**AutoLOS Inputs**								
	Overall Intersection Volume to Capacity Ratio	0.61 to 0.70							
	Individual Movements V/C Ratios and Queue Lengths	See Separate Traffic Operations Table				See Separate Traffic Operations Table			
	AutoLOS	**B**				**-**			
	Target AutoLOS	**E**				**E**			

Appendix H

TRANS Regional Model

CGH TRANSPORTATION



TRANS Regional Model

Version 1.01 - Assigned December, 2024

AM Peak Hour Total Traffic Volume

Hemlock Rd/Codds Rd

2022 Model - Basecase

N/A

User Initials: TIMW
Plot Prepared: Feb 2026
EMME Scenario: 22002

TRANS

Legend

AM Peak Hour Total Traffic Volume

1000 2000 3000 4000 5000

N

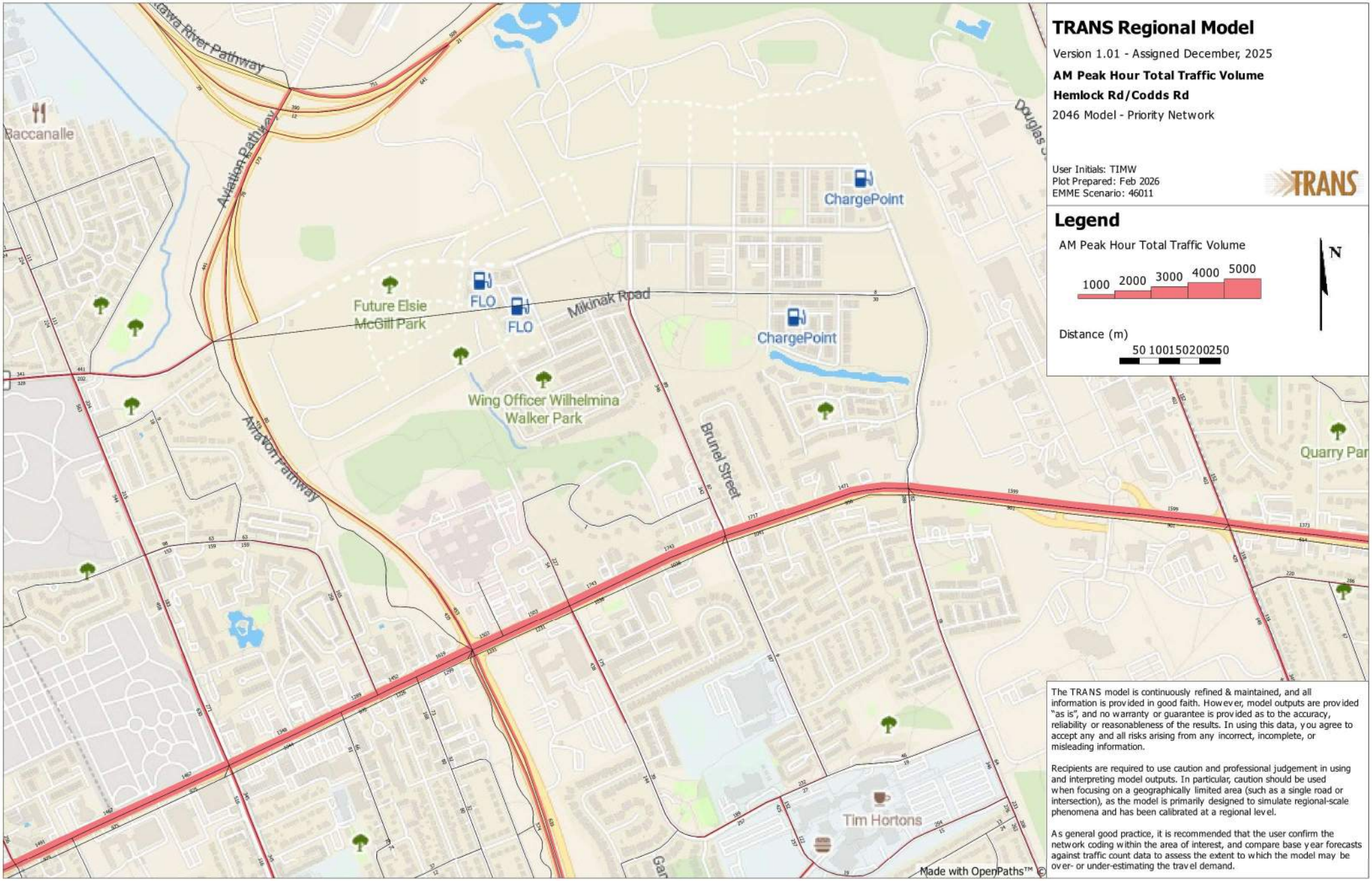
Distance (m)

50 100150200250

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 1.01 - Assigned December, 2025

AM Peak Hour Total Traffic Volume

Hemlock Rd/Codds Rd

2046 Model - Priority Network

User Initials: TIMW
Plot Prepared: Feb 2026
EMME Scenario: 46011

TRANS

Legend

AM Peak Hour Total Traffic Volume

1000 2000 3000 4000 5000

N

Distance (m)

50 100150200250

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.

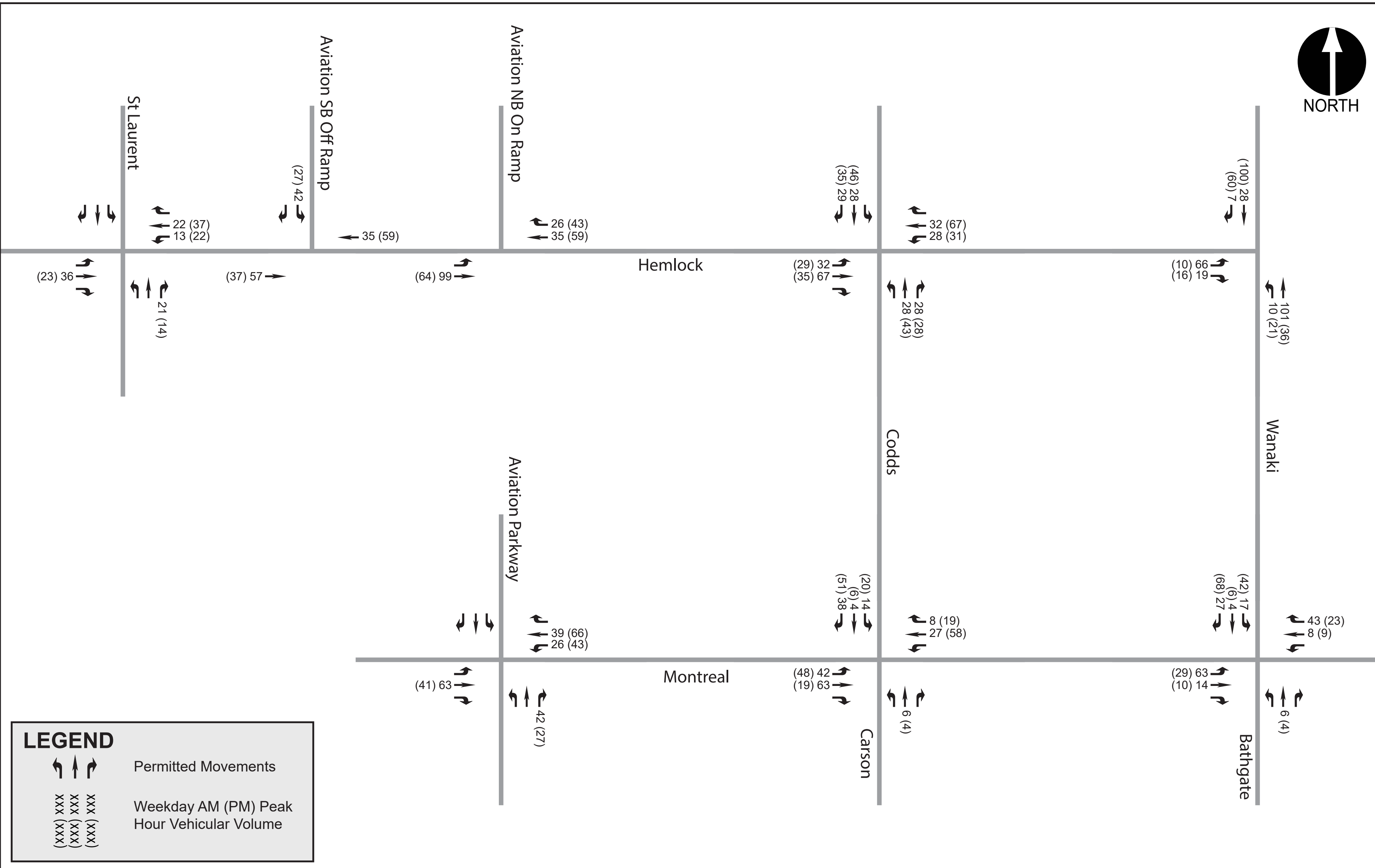
Recipients are required to use caution and professional judgement in using and interpreting model outputs. In particular, caution should be used when focusing on a geographically limited area (such as a single road or intersection), as the model is primarily designed to simulate regional-scale phenomena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

Appendix I

Background Developments

CGH TRANSPORTATION



ARCADIS

IBI GROUP

Wateridge Village Phase 6, 7 & 8
Transportation Impact Assessment

Exhibit 7:
Site-Generated
Traffic (Phase 6, 7 & 8)

PROJECT No. 139653

SCALE: N.T.S.

Figure 15: Site Generated Traffic Volumes

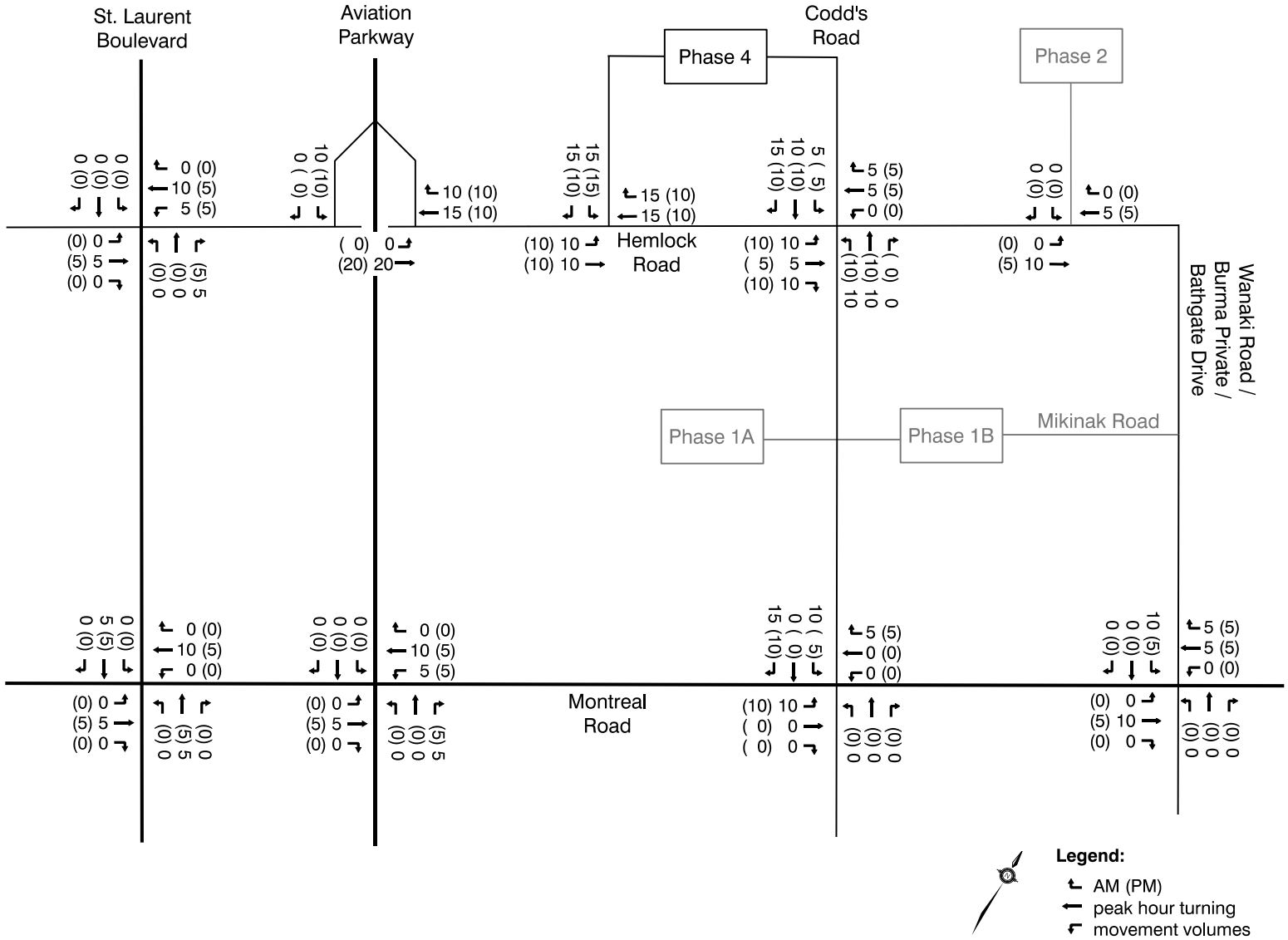


Table 1: Approximated Site-Generated Traffic from Wateridge Phase 4 TIA – 123 Units

LUC 221 & 222 - Multi-Unit (High-Rise)	Mode Share		Weekday AM Peak Hour			Weekday PM Peak Hour		
	AM	PM	In	Out	Total	In	Out	Total
Auto Driver	48%	52%	7	18	25	15	11	26
Auto Passenger	9%	16%	1	6	7	5	3	8
Transit	30%	28%	5	10	15	9	6	15
Cycling	3%	0%	1	0	1	0	0	0
Walking	10%	4%	2	1	3	1	1	2
Total	**100%**	**100%**	**16**	**35**	**51**	**30**	**21**	**51**

Applying 2020 TRANS Trip Generation methodology, and assuming mode share consistent with the Phase 4 TIA for 202 dwelling units, resulted in the trip generation outlined in **Table 2** below.

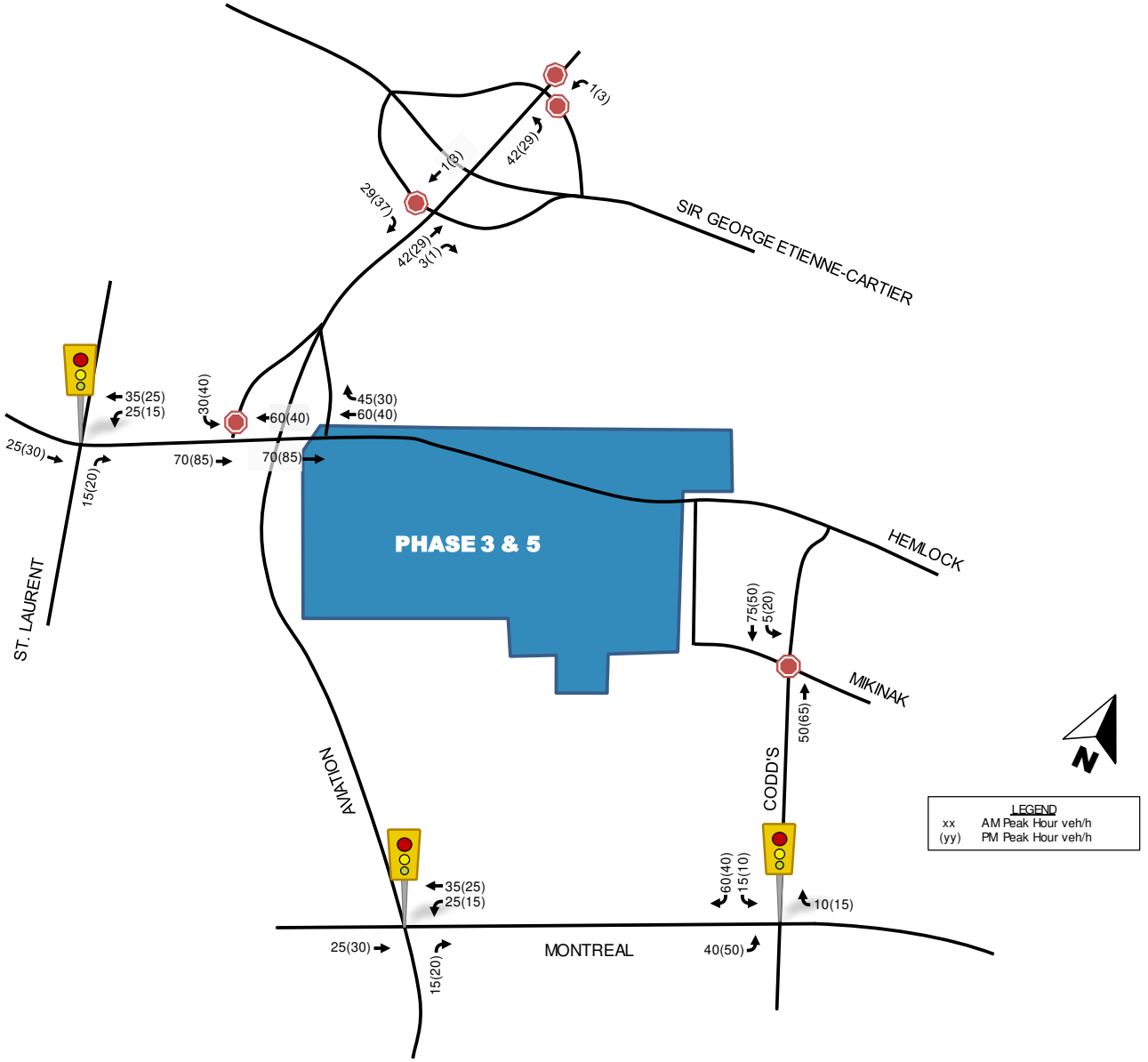
Table 2: Approximated Site-Generated Traffic from Wateridge Phase 4 TIA – 200 Units

LUC 221 & 222 - Multi-Unit (High-Rise)	Mode Share		Weekday AM Peak Hour			Weekday PM Peak Hour		
	AM	PM	In	Out	Total	In	Out	Total
Auto Driver	48%	52%	11	28	39	24	17	41
Auto Passenger	9%	16%	2	9	11	8	5	13
Transit	30%	28%	8	17	25	14	10	24
Cycling	3%	0%	1	0	1	0	0	0
Walking	10%	4%	3	3	6	2	2	4
Total	**100%**	**100%**	**25**	**57**	**82**	**48**	**34**	**82**

The net increase in site-generated trips resulting from a comparison of **Table 1** and **Table 2** is summarized in **Table 3** below.

Table 3: Additional Site-Generated Traffic from Wateridge Phase 4 TIA – 200 Units

LUC 221 & 222 - Multi-Unit (High-Rise)	Mode Share		Weekday AM Peak Hour			Weekday PM Peak Hour		
	AM	PM	In	Out	Total	In	Out	Total
Auto Driver	48%	52%	4	10	14	9	6	15
Auto Passenger	9%	16%	1	3	4	3	2	5
Transit	30%	28%	3	7	10	5	4	9
Cycling	3%	0%	0	0	0	0	0	0
Walking	10%	4%	1	2	3	1	1	2
Total	**100%**	**100%**	**9**	**22**	**31**	**18**	**13**	**31**



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Ottawa, ON Canada
K1Z 5M2
Tel: 613 728 3571
Fax: 613 728 6012

Figure 11: Wateridge Phase 2A, 2B Site-Generated Trips

Trip distribution is summarized below:

- 20% to/from the north via Aviation Parkway
- 30% to/from the east via Montreal Road
- 15% to/from the south via Aviation Parkway
- 15% to/from the west via Montreal Road
- 20% to/from the west via Hemlock Road

Site generated traffic volumes are shown in **Figure 8**.

Figure 8: Site Generated Traffic Volumes

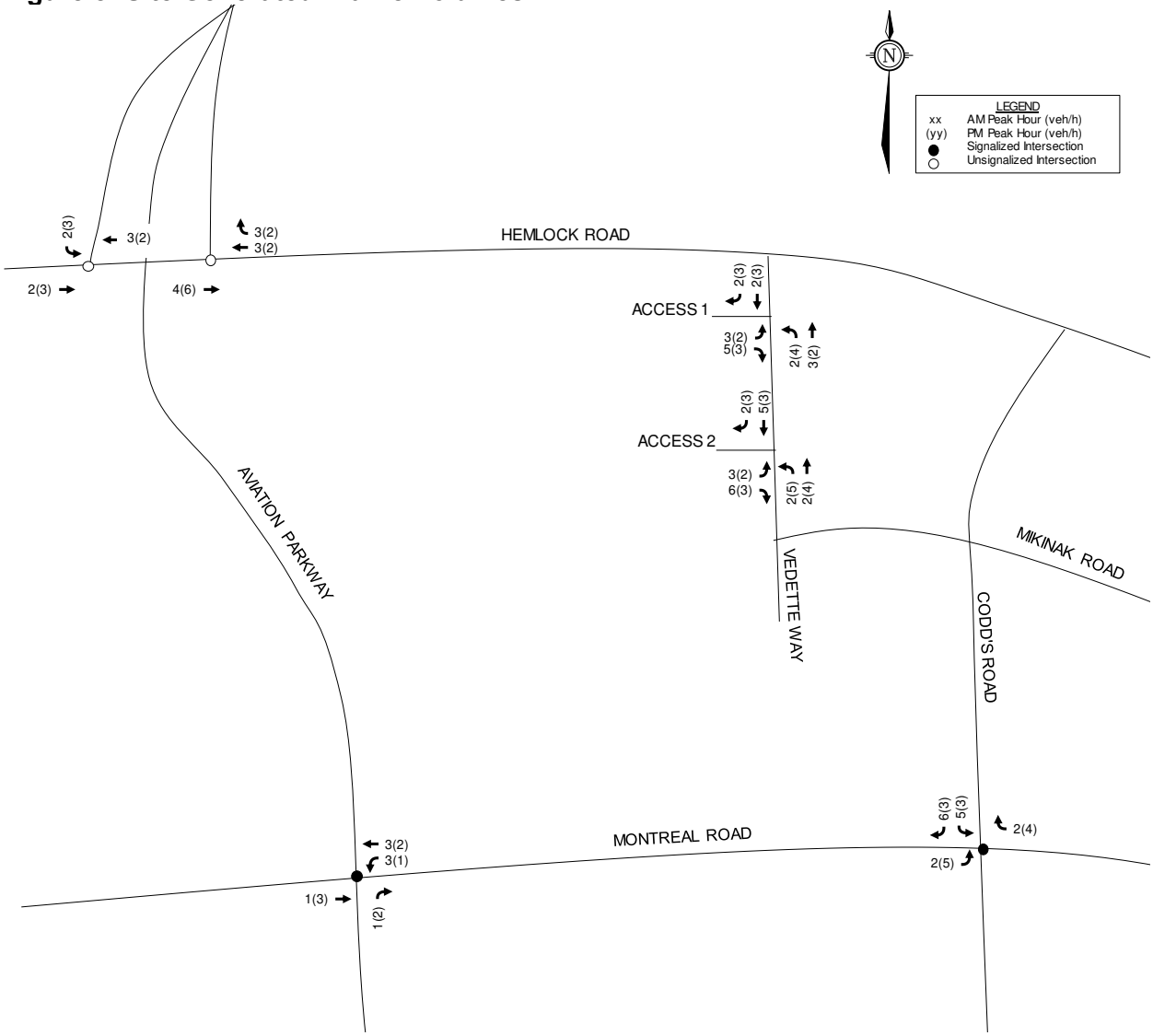


Table 4: Proposed Residential – Peak Period Trips by Mode Share

Travel Mode	Mode Share	AM Peak Period			PM Peak Period		
		IN	OUT	TOT	IN	OUT	TOT
Residential Person Trips		**45**	**105**	***150***	**98**	**77**	***175***
Auto Driver	45%	20	47	*67*	44	35	*79*
Auto Passenger	15%	7	16	*23*	15	11	*26*
Transit	30%	13	32	*45*	29	23	*52*
Cyclist	0%	-	-	*0*	-	-	*0*
Pedestrian	10%	5	10	*15*	10	8	*18*

Table 4 of the *TRANS Trip Generation Manual* includes adjustment factors to convert the estimated number of trips generated for each mode from peak period to peak hour. A breakdown of the peak hour trips by mode is shown in **Table 5**.

Table 5: Proposed Residential – Peak Hour Trips by Mode Share

Travel Mode	Adj. Factor		AM Peak Hour			PM Peak Hour		
	AM	PM	IN	OUT	TOT	IN	OUT	TOT
Auto Driver	0.48	0.44	10	23	*33*	19	15	*34*
Auto Passenger	0.48	0.44	3	8	*11*	6	5	*11*
Transit	0.55	0.47	7	17	*24*	14	11	*25*
Cyclist	0.58	0.48	-	-	*0*	-	-	*0*
Pedestrian	0.58	0.52	3	6	*9*	5	4	*9*
Peak Hour Person Trips			**23**	**54**	***77***	**44**	**35**	***79***

From the previous table, the proposed development is estimated to generate 77 person trips (including 33 vehicle trips) during the AM peak hour, and 79 person trips (including 34 vehicle trips) during the PM peak hour.

2.6 Exemptions Review

This module reviews possible exemptions from the final TIA, as outlined in the *2023 Revised TIA Guidelines*. The applicable exemptions for this site are shown in **Table 6**.

Table 6: TIA Exemptions

Module	Element	Exemption Criteria	Status
4.1 Development Design	*4.1.2* Circulation and Access	• Required for site plan control and zoning by-law amendment applications	Not Exempt
	4.1.3 New Street Networks	• Required for draft plan of subdivision applications	Exempt
4.2 Parking	*All elements*	• Required for site plan control and zoning by-law amendment applications	Not Exempt

4.2.2.3 Trip Generation by Mode

The mode share targets from **Table 4** were applied to the number of development generated peak period person-trips to determine the number of trips per travel mode. The peak period to peak hour adjustment factors from Table 4 of the 2020 TRANS Trip Generation Summary Report were subsequently applied in order to convert to peak hour trips, shown in **Table 5** below.

Table 5 – Residential Peak Hour Person-Trips by Mode

MODE	AM Peak Hour			PM Peak Hour		
	IN	OUT	TOTAL	IN	OUT	TOTAL
Auto Driver	20	45	65	38	29	67
Auto Passenger	7	16	23	14	11	25
Transit	22	51	73	42	29	71
Cycling	3	4	7	4	3	7
Walking	10	22	32	18	14	32
Total	62	138	**200**	116	86	**202**

As the Rockcliffe CDP previously accounted for development of 143 units/ha for the subject lands, the trips associated with those units are not included in the volumes from this proposed development at the regional study area intersections. The reduced trips were generated using the 2009 TRANS Trip Generation Residential Trip Rates Study Report to remain consistent with the methodology applied in the Wateridge Phase 2A/2B TIA. The resulting trips that were previously accounted for are outlined below in **Table 6**.

Table 6 – Residential Peak Hour Person-Trips Accounted for in CDP

MODE	AM Peak Hour			PM Peak Hour		
	IN	OUT	TOTAL	IN	OUT	TOTAL
Auto Driver	9	31	40	27	16	43
Auto Passenger	3	11	15	10	6	16
Transit	9	31	40	27	16	43
Cycling	1	3	3	2	1	4
Walking	4	12	16	15	7	21
Total	26	88	**114**	80	47	**127**

These trips were then subtracted from the 2020 TRANS generated peak hour trips proportionally from each building to provide a realistic trip distribution from each access driveway. The resulting

using the minimum CDP density target (i.e. 99 units) and the 2009 TRANS Trip Generation methodology, providing the results outlined in **Table 1** below.

Table 1 - Approximated Site-Generated Traffic from Wateridge Phase 2A/2B TIA using 2009 TRANS – 99 dwelling units

	Weekday AM Peak Hour				Weekday PM Peak Hour		
Mode (Mode Share)	In	Out	Total		In	Out	Total
Auto Driver (35%)	5	17	22		15	9	24
Auto Passenger (13%)	2	7	9		6	3	9
Transit (35%)	5	17	22		15	9	24
Bike (3%)	0	2	2		1	1	2
Walk (14%)	2	7	9		6	4	10
Subtotal:	**15**	**50**	**65**		**43**	**26**	**69**

Applying the recently-adopted 2020 TRANS Trip Generation methodology and assuming a mode share consistent with the Phase 2A/2B TIA for 254 dwelling units, resulted in the trip generation outlined in **Table 2** below.

Table 2 - Approximated Site-Generated Traffic from Wateridge Phase 2A/2B TIA using 2020 TRANS – 254 dwelling units

	Weekday AM Peak Hour				Weekday PM Peak Hour		
Mode (Mode Share)	In	Out	Total		In	Out	Total
Auto Driver (35%)	11	24	35		20	15	35
Auto Passenger (13%)	4	9	13		8	5	13
Transit (35%)	12	27	39		22	16	38
Bike (3%)	1	2	3		2	1	3
Walk (14%)	5	11	16		10	7	17
Subtotal:	**33**	**73**	**106**		**62**	**44**	**106**

The net increase in site-generated trips resulting from a comparison of **Table 2** and **Table 1** is summarized in **Table 3** below.

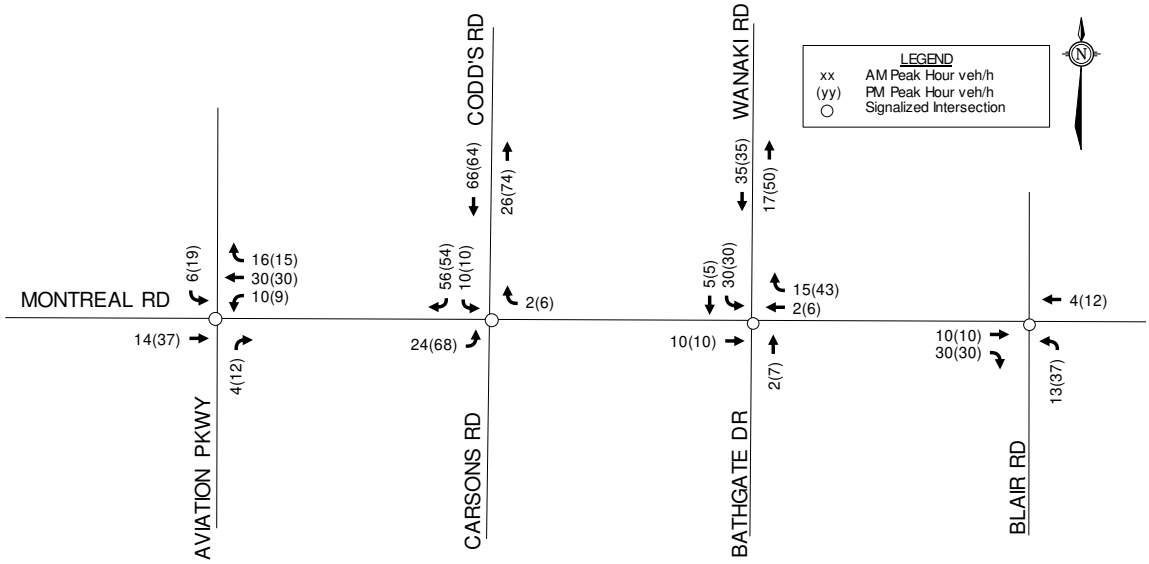
Table 3 - Additional Site-Generated Traffic Since Wateridge Phase 2A/2B TIA using 2020 TRANS – 254 dwelling units

	Weekday AM Peak Hour				Weekday PM Peak Hour		
Mode (Mode Share)	In	Out	Total		In	Out	Total
Auto Driver (35%)	6	7	13		5	6	11
Auto Passenger (13%)	2	2	4		2	2	4
Transit (35%)	7	10	17		7	7	14
Bike (3%)	1	0	1		1	0	1
Walk (14%)	3	4	7		4	3	7
Subtotal:	**18**	**23**	**41**		**19**	**18**	**37**

As indicated in **Table 3** above, the overall increase from 99 to 254 dwelling units with the application of the 2020 TRANS methodology would result up to 13 additional two-way vehicular trips during the weekday morning and afternoon peak hours. Overall, the additional vehicular trips resulting from the proposed site plan in comparison to the minimum target density in the CDP would generate a negligible increase in traffic, especially when divided amongst the two proposed site access driveways and the three regionally-connected site access intersections (i.e. connections to Montreal Road & the Aviation Parkway).

Based on the results above, the Trip Generation Trigger was NOT satisfied.

Figure 4: Site Generated Traffic Volumes



5.2 Background Traffic

A review of background traffic and other area developments was provided in Section 3.2 and 3.3 of the 2016 Phase 1B TIS.

A Site Plan application was submitted in October 2018 for a three storey 40-unit apartment building at 745 Mikinak Road. Trip generation for 49 residential units was considered for this block in the 2016 Phase 1B TIS. A Screening form dated July 2018 confirmed that no further TIA assessment was required for the Site Plan Application.

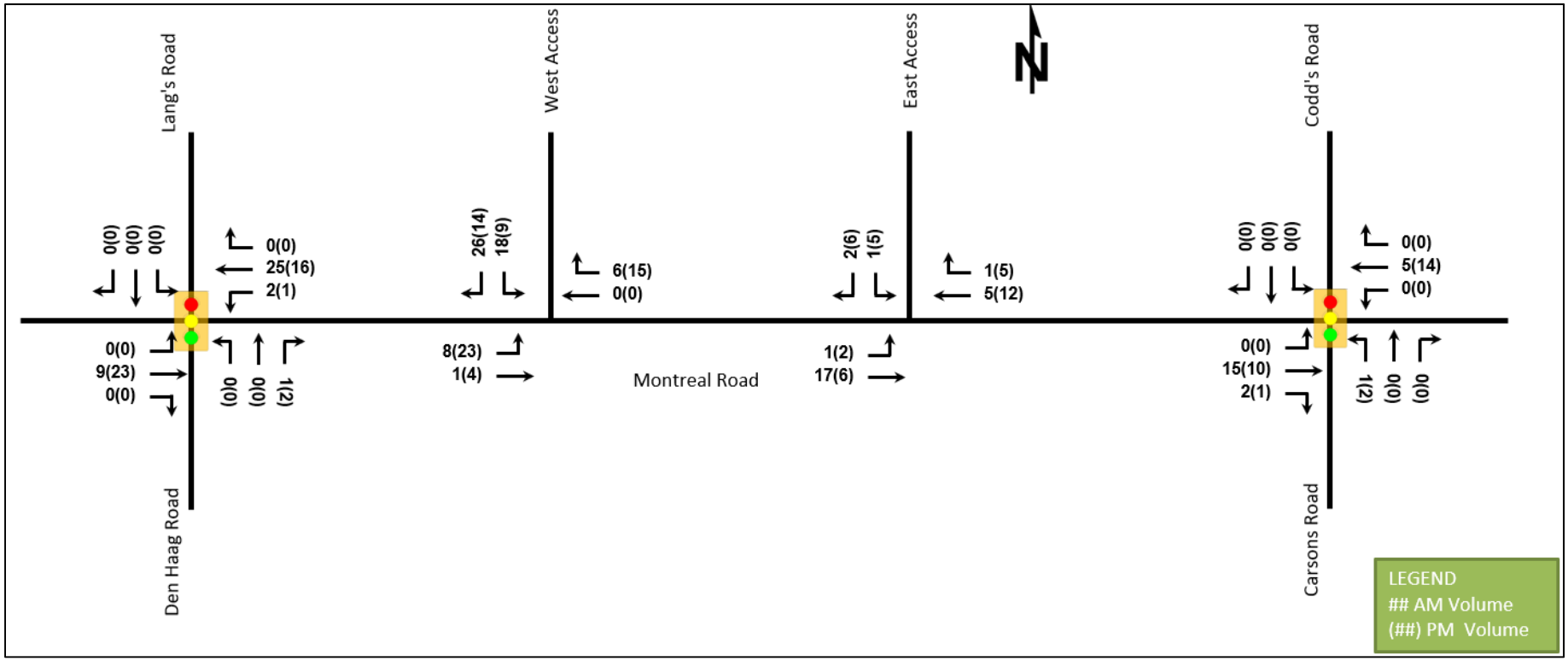
A Site Plan application was submitted in July 2019 for a low-rise (three storey) apartment building at 455 Wanaki Road. The development will serve Habitat for Humanity, a non-profit low-income housing organization. The proposed apartment building will accommodate fewer than 13 dwelling units and the anticipated traffic impact will be negligible.

A Transportation Overview and subsequent Addendum were prepared by Novatech in August 2017 and December 2017 for Blocks 15, 22 and 24 of Phase 1B. A TIA report was later prepared by Novatech in February 2019 and revised in October 2019 for Block 15 of Phase 1B. Block 22 is proposed to accommodate 51 townhouses, Block 24 is proposed to accommodate 125 townhouses, and Block 15 is proposed to accommodate 192 townhouses, for a total of 368 units across the three sites. Trip generation for 415 residential units was considered for these blocks in the 2016 Phase 1B TIS.

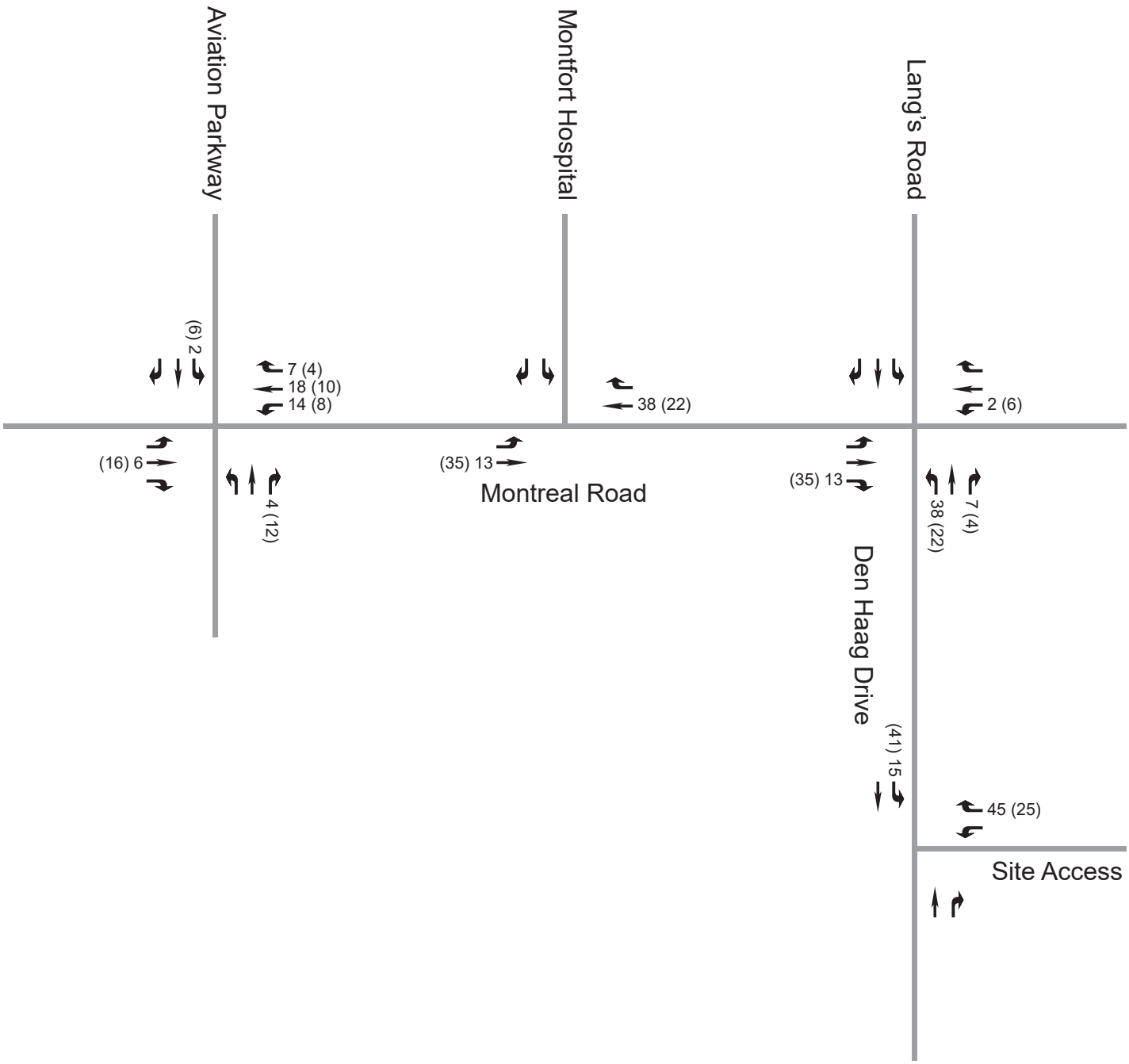
A Site Plan application was submitted in December 2019 for two low-rise (two- and three- storey) mixed used buildings at 875 Montreal Road. A total of 4 residential units along with 420 square meters of ground floor commercial are proposed. A TIA report, dated November 2019, was submitted with the application. The estimated date of full occupancy is 2022.

The Wateridge Village Phase 1B TIS accounted for traffic generated by the office/retail development at 807-825 Montreal Road. The Phase 1B TIS accounted for this site as generating 265 and 280 vehicles per hour in the AM and PM peak hours, respectively. The concept for that

Figure 7: Site Generated Traffic



120 Den Haag Drive



LEGEND

Permitted Movements

xxx (xxx)
xxx (xxx)
xxx (xxx)

Weekday AM (PM) Peak Hour Vehicular Volume

IBI

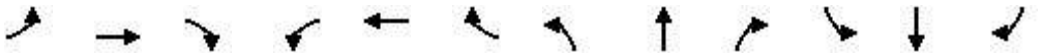
800 Montreal Road
Transportation Impact Assessment

Exhibit 5:
Site Generated
AM & PM Peak Hour
Traffic Volumes

PROJECT No. 125532
DATE: December 2020
SCALE: N.T.S.

Appendix J

Synchro Intersection Worksheets – 2029 Future Background Conditions



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	17	33	51	28	3	23	10	34	6	11	7
Future Volume (vph)	4	17	33	51	28	3	23	10	34	6	11	7
Satd. Flow (prot)	0	1110	0	0	1337	0	0	1456	0	0	1454	0
Flt Permitted		0.996			0.970			0.983			0.988	
Satd. Flow (perm)	0	1110	0	0	1337	0	0	1456	0	0	1454	0
Lane Group Flow (vph)	0	54	0	0	82	0	0	67	0	0	24	0
Sign Control		Stop			Stop			Stop			Stop	

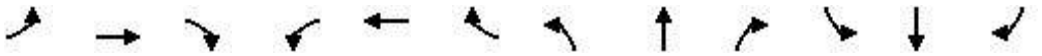
Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 25.3%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	7.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	17	33	51	28	3	23	10	34	6	11	7
Future Vol, veh/h	4	17	33	51	28	3	23	10	34	6	11	7
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	50	50	18	40	100	13	43	2	2	33	2
Mvmt Flow	4	17	33	51	28	3	23	10	34	6	11	7
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.1	8.1	7.6	7.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	34%	7%	62%	25%
Vol Thru, %	15%	31%	34%	46%
Vol Right, %	51%	61%	4%	29%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	67	54	82	24
LT Vol	23	4	51	6
Through Vol	10	17	28	11
RT Vol	34	33	3	7
Lane Flow Rate	67	54	82	24
Geometry Grp	1	1	1	1
Degree of Util (X)	0.077	0.057	0.103	0.027
Departure Headway (Hd)	4.139	3.803	4.509	4.097
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	854	930	790	860
Service Time	2.219	1.874	2.562	2.188
HCM Lane V/C Ratio	0.078	0.058	0.104	0.028
HCM Control Delay	7.6	7.1	8.1	7.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.2	0.3	0.1



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	186	666	217	121	1081	127	136	14	69	136	20	381
Future Volume (vph)	186	666	217	121	1081	127	136	14	69	136	20	381
Satd. Flow (prot)	1676	3128	0	1644	3236	0	1613	1491	0	1598	1392	0
Flt Permitted	0.123			0.322			0.238			0.703		
Satd. Flow (perm)	217	3128	0	554	3236	0	395	1491	0	1171	1392	0
Satd. Flow (RTOR)		68			15			69			182	
Lane Group Flow (vph)	186	883	0	121	1208	0	136	83	0	136	401	0
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	9.7	29.0		29.0	29.0		33.5	33.5		33.5	33.5	
Total Split (s)	13.0	80.0		67.0	67.0		40.0	40.0		40.0	40.0	
Total Split (%)	10.8%	66.7%		55.8%	55.8%		33.3%	33.3%		33.3%	33.3%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	1.0	2.3		2.3	2.3		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)	4.7	6.0		6.0	6.0		6.3	6.3		6.3	6.3	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	75.3	74.0		61.0	61.0		33.7	33.7		33.7	33.7	
Actuated g/C Ratio	0.63	0.62		0.51	0.51		0.28	0.28		0.28	0.28	
v/c Ratio	0.78	0.45		0.43	0.73		1.24	0.18		0.41	0.77	
Control Delay	35.8	12.0		24.6	26.1		200.5	11.1		39.8	32.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	35.8	12.0		24.6	26.1		200.5	11.1		39.8	32.3	
LOS	D	B		C	C		F	B		D	C	
Approach Delay		16.1			25.9			128.7			34.2	
Approach LOS		B			C			F			C	
Queue Length 50th (m)	17.1	49.8		17.3	112.1		~39.5	2.4		26.1	48.9	
Queue Length 95th (m)	#38.1	63.6		34.5	138.1		#79.2	14.3		45.2	#89.5	
Internal Link Dist (m)		184.2			350.5			226.5			53.3	
Turn Bay Length (m)	100.0			65.0			25.0			40.0		
Base Capacity (vph)	237	1955		281	1652		110	468		328	521	
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	0.78	0.45		0.43	0.73		1.24	0.18		0.41	0.77	

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 5 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

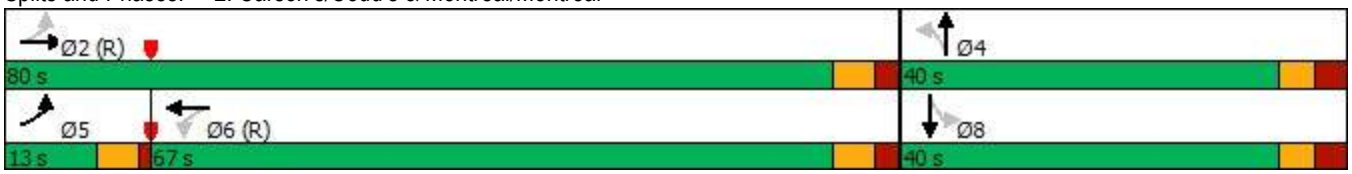
Maximum v/c Ratio: 1.24

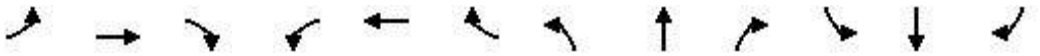
Intersection Signal Delay: 31.2	Intersection LOS: C
Intersection Capacity Utilization 104.5%	ICU Level of Service G
Analysis Period (min) 15	

~ 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: 2: Carson's/Codd's & Montréal/Montréal





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	23	35	33	23	4	28	10	39	4	16	5
Future Volume (vph)	7	23	35	33	23	4	28	10	39	4	16	5
Satd. Flow (prot)	0	1552	0	0	1512	0	0	1597	0	0	1684	0
Flt Permitted		0.995			0.973			0.982			0.992	
Satd. Flow (perm)	0	1552	0	0	1512	0	0	1597	0	0	1684	0
Lane Group Flow (vph)	0	65	0	0	60	0	0	77	0	0	25	0
Sign Control		Stop			Stop			Stop			Stop	

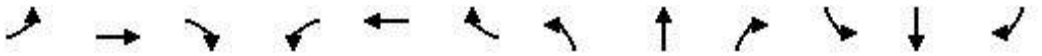
Intersection Summary		
Control Type: Unsignalized		
Intersection Capacity Utilization 27.2%	ICU Level of Service A	
Analysis Period (min) 15		

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	23	35	33	23	4	28	10	39	4	16	5
Future Vol, veh/h	7	23	35	33	23	4	28	10	39	4	16	5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	9	23	2	2	2	2	2	2	2	2
Mvmt Flow	7	23	35	33	23	4	28	10	39	4	16	5
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.2	8	7.4	7.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	36%	11%	55%	16%
Vol Thru, %	13%	35%	38%	64%
Vol Right, %	51%	54%	7%	20%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	77	65	60	25
LT Vol	28	7	33	4
Through Vol	10	23	23	16
RT Vol	39	35	4	5
Lane Flow Rate	77	65	60	25
Geometry Grp	1	1	1	1
Degree of Util (X)	0.084	0.07	0.076	0.029
Departure Headway (Hd)	3.937	3.854	4.588	4.121
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	899	920	776	857
Service Time	2.011	1.919	2.644	2.204
HCM Lane V/C Ratio	0.086	0.071	0.077	0.029
HCM Control Delay	7.4	7.2	8	7.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	0.2	0.2	0.1



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	272	1213	96	34	856	109	100	10	46	86	11	276
Future Volume (vph)	272	1213	96	34	856	109	100	10	46	86	11	276
Satd. Flow (prot)	1660	3307	0	1613	3201	0	1676	1521	0	1598	1377	0
Flt Permitted	0.210			0.202			0.339			0.720		
Satd. Flow (perm)	367	3307	0	342	3201	0	582	1521	0	1201	1377	0
Satd. Flow (RTOR)		13			17			46			253	
Lane Group Flow (vph)	272	1309	0	34	965	0	100	56	0	86	287	0
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	9.7	29.0		29.0	29.0		33.5	33.5		33.5	33.5	
Total Split (s)	15.0	82.0		67.0	67.0		38.0	38.0		38.0	38.0	
Total Split (%)	12.5%	68.3%		55.8%	55.8%		31.7%	31.7%		31.7%	31.7%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	1.0	2.3		2.3	2.3		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)	4.7	6.0		6.0	6.0		6.3	6.3		6.3	6.3	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	82.0	80.7		64.9	64.9		27.0	27.0		27.0	27.0	
Actuated g/C Ratio	0.68	0.67		0.54	0.54		0.22	0.22		0.22	0.22	
v/c Ratio	0.74	0.59		0.18	0.55		0.77	0.15		0.32	0.57	
Control Delay	22.3	12.8		19.4	20.2		77.3	13.5		40.2	11.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	22.3	12.8		19.4	20.2		77.3	13.5		40.2	11.4	
LOS	C	B		B	C		E	B		D	B	
Approach Delay		14.4			20.2			54.4			18.1	
Approach LOS		B			C			D			B	
Queue Length 50th (m)	24.3	87.3		4.2	79.7		21.3	1.8		16.4	6.2	
Queue Length 95th (m)	#47.0	110.8		11.3	99.9		#46.1	11.8		30.5	30.4	
Internal Link Dist (m)		184.2			350.5			226.5			53.3	
Turn Bay Length (m)	100.0			65.0			25.0			40.0		
Base Capacity (vph)	370	2227		184	1739		153	435		317	549	
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	0.74	0.59		0.18	0.55		0.65	0.13		0.27	0.52	

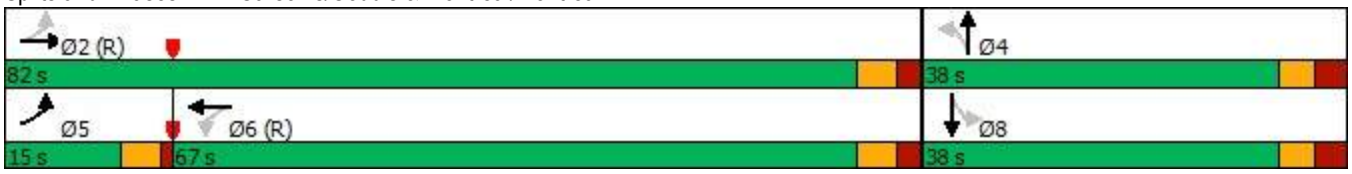
Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 16 (13%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.77

Intersection Signal Delay: 18.7	Intersection LOS: B
Intersection Capacity Utilization 98.3%	ICU Level of Service F
Analysis Period (min) 15	

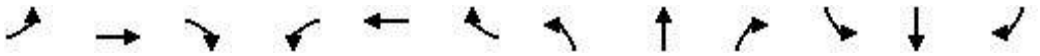
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Carson's/Codd's & Montréal/Montréal



Appendix K

Synchro Intersection Worksheets – 2034 Future Background Conditions



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	84	33	79	60	3	23	38	62	6	39	36
Future Volume (vph)	36	84	33	79	60	3	23	38	62	6	39	36
Satd. Flow (prot)	0	1231	0	0	1338	0	0	1408	0	0	1425	0
Flt Permitted		0.988			0.973			0.991			0.996	
Satd. Flow (perm)	0	1231	0	0	1338	0	0	1408	0	0	1425	0
Lane Group Flow (vph)	0	153	0	0	142	0	0	123	0	0	81	0
Sign Control		Stop			Stop			Stop			Stop	

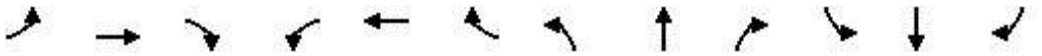
Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 35.6%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	8.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	36	84	33	79	60	3	23	38	62	6	39	36
Future Vol, veh/h	36	84	33	79	60	3	23	38	62	6	39	36
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	50	50	18	40	100	13	43	2	2	33	2
Mvmt Flow	36	84	33	79	60	3	23	38	62	6	39	36
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.6	9.2	8.6	8.1
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	19%	24%	56%	7%
Vol Thru, %	31%	55%	42%	48%
Vol Right, %	50%	22%	2%	44%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	123	153	142	81
LT Vol	23	36	79	6
Through Vol	38	84	60	39
RT Vol	62	33	3	36
Lane Flow Rate	123	153	142	81
Geometry Grp	1	1	1	1
Degree of Util (X)	0.159	0.192	0.195	0.102
Departure Headway (Hd)	4.66	4.506	4.956	4.541
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	769	796	723	787
Service Time	2.694	2.539	2.992	2.578
HCM Lane V/C Ratio	0.16	0.192	0.196	0.103
HCM Control Delay	8.6	8.6	9.2	8.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.6	0.7	0.7	0.3



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	228	763	217	121	1163	135	136	20	69	150	24	419
Future Volume (vph)	228	763	217	121	1163	135	136	20	69	150	24	419
Satd. Flow (prot)	1676	3145	0	1644	3237	0	1613	1505	0	1598	1394	0
Flt Permitted	0.100			0.292			0.178			0.699		
Satd. Flow (perm)	176	3145	0	503	3237	0	296	1505	0	1165	1394	0
Satd. Flow (RTOR)		57			15			69			171	
Lane Group Flow (vph)	228	980	0	121	1298	0	136	89	0	150	443	0
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	9.7	29.0		29.0	29.0		33.5	33.5		33.5	33.5	
Total Split (s)	13.0	80.0		67.0	67.0		40.0	40.0		40.0	40.0	
Total Split (%)	10.8%	66.7%		55.8%	55.8%		33.3%	33.3%		33.3%	33.3%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	1.0	2.3		2.3	2.3		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)	4.7	6.0		6.0	6.0		6.3	6.3		6.3	6.3	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	75.3	74.0		61.0	61.0		33.7	33.7		33.7	33.7	
Actuated g/C Ratio	0.63	0.62		0.51	0.51		0.28	0.28		0.28	0.28	
v/c Ratio	1.07	0.50		0.47	0.79		1.64	0.19		0.46	0.86	
Control Delay	101.5	12.9		26.9	28.1		365.6	12.1		41.1	42.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	101.5	12.9		26.9	28.1		365.6	12.1		41.1	42.7	
LOS	F	B		C	C		F	B		D	D	
Approach Delay		29.7			28.0			225.7			42.3	
Approach LOS		C			C			F			D	
Queue Length 50th (m)	~34.5	59.1		17.8	126.0		~46.3	3.4		29.2	64.4	
Queue Length 95th (m)	#84.3	74.5		36.6	155.1		#86.0	15.9		49.6	#122.6	
Internal Link Dist (m)		184.2			350.5			226.5			53.3	
Turn Bay Length (m)	100.0			65.0			25.0			40.0		
Base Capacity (vph)	214	1961		255	1652		83	472		327	514	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	1.07	0.50		0.47	0.79		1.64	0.19		0.46	0.86	

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 5 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

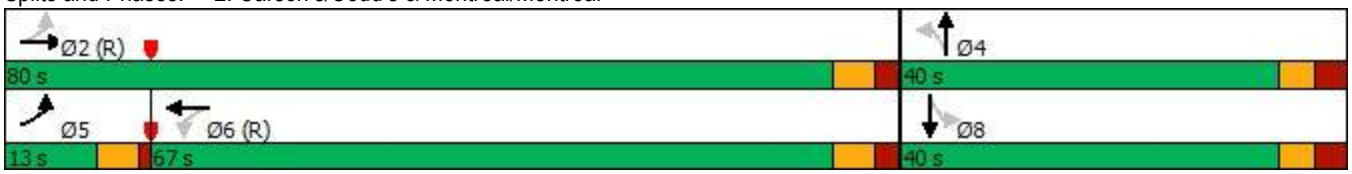
Maximum v/c Ratio: 1.64

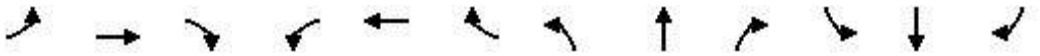
Intersection Signal Delay: 44.0	Intersection LOS: D
Intersection Capacity Utilization 112.3%	ICU Level of Service H
Analysis Period (min) 15	

~ 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: 2: Carson's/Codd's & Montréal/Montréal





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	58	35	64	90	4	28	53	67	4	62	40
Future Volume (vph)	36	58	35	64	90	4	28	53	67	4	62	40
Satd. Flow (prot)	0	1627	0	0	1574	0	0	1624	0	0	1653	0
Flt Permitted		0.986			0.980			0.991			0.998	
Satd. Flow (perm)	0	1627	0	0	1574	0	0	1624	0	0	1653	0
Lane Group Flow (vph)	0	129	0	0	158	0	0	148	0	0	106	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 36.4%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	8.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	36	58	35	64	90	4	28	53	67	4	62	40
Future Vol, veh/h	36	58	35	64	90	4	28	53	67	4	62	40
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	9	23	2	2	2	2	2	2	2	2
Mvmt Flow	36	58	35	64	90	4	28	53	67	4	62	40
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.6	9.6	8.6	8.4
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	19%	28%	41%	4%
Vol Thru, %	36%	45%	57%	58%
Vol Right, %	45%	27%	3%	38%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	148	129	158	106
LT Vol	28	36	64	4
Through Vol	53	58	90	62
RT Vol	67	35	4	40
Lane Flow Rate	148	129	158	106
Geometry Grp	1	1	1	1
Degree of Util (X)	0.186	0.165	0.224	0.135
Departure Headway (Hd)	4.535	4.617	5.093	4.6
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	789	774	703	777
Service Time	2.576	2.662	3.136	2.643
HCM Lane V/C Ratio	0.188	0.167	0.225	0.136
HCM Control Delay	8.6	8.6	9.6	8.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.7	0.6	0.9	0.5

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	320	1293	96	34	957	128	100	14	46	106	17	327
Future Volume (vph)	320	1293	96	34	957	128	100	14	46	106	17	327
Satd. Flow (prot)	1660	3311	0	1613	3195	0	1676	1536	0	1598	1375	0
Flt Permitted	0.165			0.185			0.233			0.718		
Satd. Flow (perm)	288	3311	0	313	3195	0	400	1536	0	1197	1375	0
Satd. Flow (RTOR)		12			18			46			230	
Lane Group Flow (vph)	320	1389	0	34	1085	0	100	60	0	106	344	0
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	9.7	29.0		29.0	29.0		33.5	33.5		33.5	33.5	
Total Split (s)	15.0	82.0		67.0	67.0		38.0	38.0		38.0	38.0	
Total Split (%)	12.5%	68.3%		55.8%	55.8%		31.7%	31.7%		31.7%	31.7%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	1.0	2.3		2.3	2.3		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)	4.7	6.0		6.0	6.0		6.3	6.3		6.3	6.3	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	82.0	80.7		62.8	62.8		27.0	27.0		27.0	27.0	
Actuated g/C Ratio	0.68	0.67		0.52	0.52		0.22	0.22		0.22	0.22	
v/c Ratio	0.92	0.62		0.21	0.65		1.11	0.16		0.39	0.70	
Control Delay	48.6	13.4		20.5	22.9		171.5	14.2		42.4	21.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	48.6	13.4		20.5	22.9		171.5	14.2		42.4	21.7	
LOS	D	B		C	C		F	B		D	C	
Approach Delay		20.0			22.9			112.5			26.6	
Approach LOS		C			C			F			C	
Queue Length 50th (m)	35.2	96.5		4.3	94.9		23.5	2.5		20.5	23.0	
Queue Length 95th (m)	#83.8	122.3		11.6	118.0		#57.9	12.9		36.6	55.7	
Internal Link Dist (m)		184.2			350.5			226.5			53.3	
Turn Bay Length (m)	100.0			65.0			25.0			40.0		
Base Capacity (vph)	347	2229		164	1679		105	439		316	532	
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	0.92	0.62		0.21	0.65		0.95	0.14		0.34	0.65	

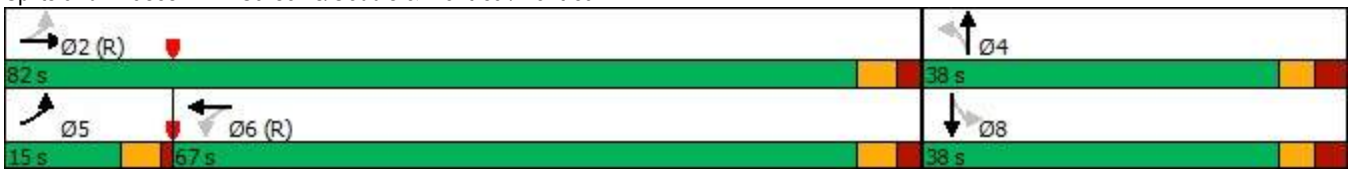
Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 16 (13%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.11

Intersection Signal Delay: 26.1	Intersection LOS: C
Intersection Capacity Utilization 104.6%	ICU Level of Service G
Analysis Period (min) 15	

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

Splits and Phases: 2: Carson's/Codd's & Montréal/Montréal



Appendix L

Transit Level of Service Summary

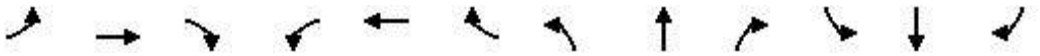
CGH TRANSPORTATION

Transit Level of Service Summary

Route	Movement	Existing		2029 Future Background		2034 Future Background		Without pm/pt for NBL				With pm/pt for NBL			
								2029 Future Total		2034 Future Total		2029 Future Total		2034 Future Total	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Route 12	Eastbound through at Montreal Road at Codd's Road/ Carson's Road	11.1 (A)	11.3 (A)	12.0 (A)	12.8 (A)	12.9 (A)	13.4 (B)	12.0 (A)	13.7 (A)	12.9 (A)	14.4 (B)	16.0 (A)	19.4 (B)	17.5 (A)	19.7 (B)
	Westbound through at Montreal Road at Codd's Road/ Carson's Road	23.0 (B)	16.8 (A)	26.1 (C)	20.2 (A)	28.1 (C)	22.9 (B)	26.3 (C)	21.7 (A)	28.4 (C)	24.3 (B)	41.5 (D)	40.9 (C)	56.7 (E)	45.3 (D)
Route 17	Eastbound through at Montreal Road at Codd's Road/ Carson's Road	11.1 (A)	11.3 (A)	12.0 (A)	12.8 (A)	12.9 (A)	13.4 (B)	12.0 (A)	13.7 (A)	12.9 (A)	14.4 (B)	16.0 (A)	19.4 (B)	17.5 (A)	19.7 (B)
	Southbound right at Montreal Road at Codd's Road/ Carson's Road	20.7 (B)	10.8 (A)	32.3 (C)	11.4 (A)	42.7 (D)	21.7 (B)	39.2 (D)	13.6 (A)	54.3 (E)	23.9 (C)	33.7 (D)	10.7 (B)	58.7 (E)	15.6 (B)
Route 25	Eastbound through/right at Montreal Road at Codd's Road/ Carson's Road	11.1 (A)	11.3 (A)	12.0 (A)	12.8 (A)	12.9 (A)	13.4 (B)	12.0 (A)	13.7 (A)	12.9 (A)	14.4 (B)	16.0 (A)	19.4 (B)	17.5 (A)	19.7 (B)
	Westbound through at Montreal Road at Codd's Road/ Carson's Road	23.0 (B)	16.8 (A)	26.1 (C)	20.2 (A)	28.1 (C)	22.9 (B)	26.3 (C)	21.7 (A)	28.4 (C)	24.3 (B)	41.5 (D)	40.9 (C)	56.7 (E)	45.3 (D)
	Southbound through at Montreal Road at Codd's Road/ Carson's Road	20.7 (B)	10.8 (A)	32.3 (C)	11.4 (A)	42.7 (D)	21.7 (B)	39.2 (D)	13.6 (A)	54.3 (E)	23.9 (C)	33.7 (D)	10.7 (B)	58.7 (E)	15.6 (B)
	Northbound through at Montreal Road at Codd's Road/ Carson's Road	11.2 (A)	14.5 (A)	11.1 (A)	13.5 (A)	12.1 (A)	14.2 (A)	11.1 (A)	13.3 (A)	12.1 (A)	14.0 (A)	8.7 (A)	10.8 (A)	9.8 (A)	11.7 (A)
	Northbound left at Montreal Road at Codd's Road/ Carson's Road	118.6 (E)	57.9 (B)	**200.5 (F)**	77.3 (C)	**365.6 (F)**	**171.5 (F)**	**341.1 (F)**	74.8 (C)	**677.7 (F)**	**164.0 (F)**	91.5 (E)	44.0 (A)	91.3 (E)	61.7 (C)

Appendix M

Synchro Intersection Worksheets – 2029 Future Total Conditions



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	28	58	51	30	5	36	21	34	15	32	7
Future Volume (vph)	4	28	58	51	30	5	36	21	34	15	32	7
Satd. Flow (prot)	0	1097	0	0	1314	0	0	1432	0	0	1432	0
Flt Permitted		0.998			0.971			0.981			0.986	
Satd. Flow (perm)	0	1097	0	0	1314	0	0	1432	0	0	1432	0
Lane Group Flow (vph)	0	90	0	0	86	0	0	91	0	0	54	0
Sign Control		Stop			Stop			Stop			Stop	

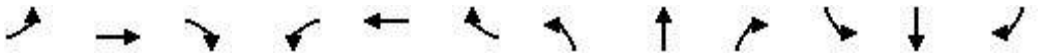
Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 27.5%	ICU Level of Service A
Analysis Period (min) 15	

Intersection	
Intersection Delay, s/veh	7.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	28	58	51	30	5	36	21	34	15	32	7
Future Vol, veh/h	4	28	58	51	30	5	36	21	34	15	32	7
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	50	50	18	40	100	13	43	2	2	33	2
Mvmt Flow	4	28	58	51	30	5	36	21	34	15	32	7
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.4	8.3	8	7.7
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	40%	4%	59%	28%
Vol Thru, %	23%	31%	35%	59%
Vol Right, %	37%	64%	6%	13%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	91	90	86	54
LT Vol	36	4	51	15
Through Vol	21	28	30	32
RT Vol	34	58	5	7
Lane Flow Rate	91	90	86	54
Geometry Grp	1	1	1	1
Degree of Util (X)	0.112	0.1	0.113	0.066
Departure Headway (Hd)	4.434	3.99	4.714	4.412
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	811	901	763	814
Service Time	2.448	2.002	2.727	2.426
HCM Lane V/C Ratio	0.112	0.1	0.113	0.066
HCM Control Delay	8	7.4	8.3	7.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.4	0.3	0.4	0.2



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	201	666	217	121	1081	136	136	14	69	146	20	418
Future Volume (vph)	201	666	217	121	1081	136	136	14	69	146	20	418
Satd. Flow (prot)	1676	3128	0	1644	3229	0	1613	1491	0	1598	1392	0
Flt Permitted	0.079			0.322			0.125			0.703		
Satd. Flow (perm)	139	3128	0	554	3229	0	212	1491	0	1171	1392	0
Satd. Flow (RTOR)		55			13			69			270	
Lane Group Flow (vph)	201	883	0	121	1217	0	136	83	0	146	438	0
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases	5	2			6		7	4			8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		6	6		7	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		5.0	10.0		10.0	10.0	
Minimum Split (s)	9.7	29.0		29.0	29.0		11.3	33.5		33.5	33.5	
Total Split (s)	19.0	69.0		50.0	50.0		13.0	51.0		38.0	38.0	
Total Split (%)	15.8%	57.5%		41.7%	41.7%		10.8%	42.5%		31.7%	31.7%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	1.0	2.3		2.3	2.3		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)	4.7	6.0		6.0	6.0		6.3	6.3		6.3	6.3	
Lead/Lag	Lead			Lag	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes			Yes	Yes		Yes			Yes	Yes	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	70.4	69.1		51.3	51.3		38.6	38.6		25.6	25.6	
Actuated g/C Ratio	0.59	0.58		0.43	0.43		0.32	0.32		0.21	0.21	
v/c Ratio	0.80	0.48		0.51	0.88		0.93	0.16		0.59	0.86	
Control Delay	50.0	16.0		38.3	41.5		91.5	8.7		50.9	33.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	50.0	16.0		38.3	41.5		91.5	8.7		50.9	33.7	
LOS	D	B		D	D		F	A		D	C	
Approach Delay		22.3			41.2			60.1			38.0	
Approach LOS		C			D			E			D	
Queue Length 50th (m)	29.7	58.8		21.7	142.4		23.2	2.2		30.6	40.1	
Queue Length 95th (m)	#67.6	82.6		45.5	#201.3		#51.3	12.4		49.7	80.1	
Internal Link Dist (m)		184.2			350.5			226.5			53.3	
Turn Bay Length (m)	100.0			65.0			25.0			40.0		
Base Capacity (vph)	270	1825		236	1386		146	598		309	566	
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	0.74	0.48		0.51	0.88		0.93	0.14		0.47	0.77	

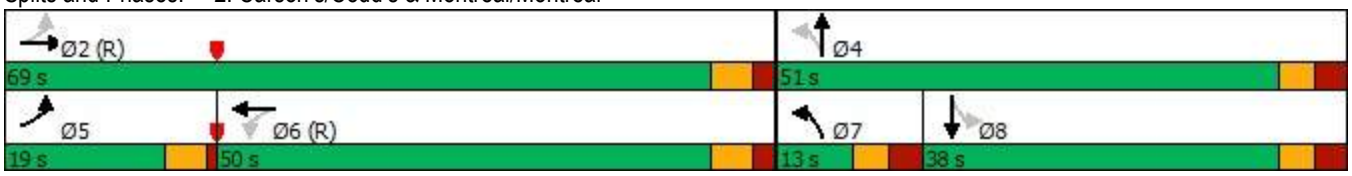
Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 5 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.93

Intersection Signal Delay: 35.6	Intersection LOS: D
Intersection Capacity Utilization 107.7%	ICU Level of Service G
Analysis Period (min) 15	

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

Splits and Phases: 2: Carson's/Codd's & Montréal/Montréal



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	30	13	8	19	0
Future Volume (vph)	0	30	13	8	19	0
Satd. Flow (prot)	1510	0	0	1468	1338	0
Flt Permitted				0.970		
Satd. Flow (perm)	1510	0	0	1468	1338	0
Lane Group Flow (vph)	30	0	0	21	19	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 17.9%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	30	13	8	19	0
Future Vol, veh/h	0	30	13	8	19	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	43	33	2
Mvmt Flow	0	30	13	8	19	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	53	19	19	0	-	0
Stage 1	19	-	-	-	-	-
Stage 2	34	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	955	1059	1597	-	-	-
Stage 1	1004	-	-	-	-	-
Stage 2	988	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	947	1059	1597	-	-	-
Mov Cap-2 Maneuver	947	-	-	-	-	-
Stage 1	996	-	-	-	-	-
Stage 2	988	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.5	4.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1597	-	1059	-	-
HCM Lane V/C Ratio	0.008	-	0.028	-	-
HCM Control Delay (s)	7.3	0	8.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	36	0	0	15	0	0
Future Volume (vph)	36	0	0	15	0	0
Satd. Flow (prot)	1658	0	1510	0	0	1745
Flt Permitted	0.950					
Satd. Flow (perm)	1658	0	1510	0	0	1745
Lane Group Flow (vph)	36	0	15	0	0	0
Sign Control	Stop		Free			Free

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 13.3%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	36	0	0	15	0	0
Future Vol, veh/h	36	0	0	15	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	36	0	0	15	0	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	9	8	0	0	15	0
Stage 1	8	-	-	-	-	-
Stage 2	1	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	1011	1074	-	-	1603	-
Stage 1	1015	-	-	-	-	-
Stage 2	1022	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	1011	1074	-	-	1603	-
Mov Cap-2 Maneuver	1011	-	-	-	-	-
Stage 1	1015	-	-	-	-	-
Stage 2	1022	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1011	1603	-
HCM Lane V/C Ratio	-	-	0.036	-	-
HCM Control Delay (s)	-	-	8.7	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	31	53	33	28	8	55	33	39	10	31	5
Future Volume (vph)	7	31	53	33	28	8	55	33	39	10	31	5
Satd. Flow (prot)	0	1539	0	0	1527	0	0	1638	0	0	1700	0
Flt Permitted		0.996			0.977			0.979			0.989	
Satd. Flow (perm)	0	1539	0	0	1527	0	0	1638	0	0	1700	0
Lane Group Flow (vph)	0	91	0	0	69	0	0	127	0	0	46	0
Sign Control		Stop			Stop			Stop			Stop	

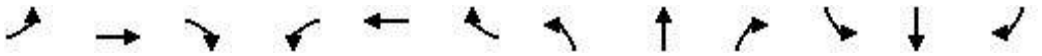
Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 32.1%	ICU Level of Service A
Analysis Period (min) 15	

Intersection	
Intersection Delay, s/veh	7.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	31	53	33	28	8	55	33	39	10	31	5
Future Vol, veh/h	7	31	53	33	28	8	55	33	39	10	31	5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	9	23	2	2	2	2	2	2	2	2
Mvmt Flow	7	31	53	33	28	8	55	33	39	10	31	5
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.6	8.3	8	7.7
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	43%	8%	48%	22%
Vol Thru, %	26%	34%	41%	67%
Vol Right, %	31%	58%	12%	11%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	127	91	69	46
LT Vol	55	7	33	10
Through Vol	33	31	28	31
RT Vol	39	53	8	5
Lane Flow Rate	127	91	69	46
Geometry Grp	1	1	1	1
Degree of Util (X)	0.15	0.103	0.092	0.056
Departure Headway (Hd)	4.253	4.071	4.8	4.413
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	846	884	749	814
Service Time	2.264	2.082	2.813	2.427
HCM Lane V/C Ratio	0.15	0.103	0.092	0.057
HCM Control Delay	8	7.6	8.3	7.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.5	0.3	0.3	0.2



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	305	1213	96	34	856	127	100	10	46	93	11	302
Future Volume (vph)	305	1213	96	34	856	127	100	10	46	93	11	302
Satd. Flow (prot)	1660	3307	0	1613	3185	0	1676	1521	0	1598	1377	0
Flt Permitted	0.127			0.210			0.183			0.720		
Satd. Flow (perm)	222	3307	0	355	3185	0	315	1521	0	1201	1377	0
Satd. Flow (RTOR)		11			14			46			302	
Lane Group Flow (vph)	305	1309	0	34	983	0	100	56	0	93	313	0
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases	5	2			6		7	4			8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		6	6		7	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		5.0	10.0		10.0	10.0	
Minimum Split (s)	9.7	29.0		29.0	29.0		11.3	33.5		33.5	33.5	
Total Split (s)	29.0	73.0		44.0	44.0		13.0	47.0		34.0	34.0	
Total Split (%)	24.2%	60.8%		36.7%	36.7%		10.8%	39.2%		28.3%	28.3%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	1.0	2.3		2.3	2.3		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)	4.7	6.0		6.0	6.0		6.3	6.3		6.3	6.3	
Lead/Lag	Lead			Lag	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes			Yes	Yes		Yes			Yes	Yes	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	72.4	71.1		45.9	45.9		36.6	36.6		23.6	23.6	
Actuated g/C Ratio	0.60	0.59		0.38	0.38		0.30	0.30		0.20	0.20	
v/c Ratio	0.80	0.67		0.25	0.80		0.58	0.11		0.39	0.61	
Control Delay	39.2	19.4		36.9	40.9		44.0	10.8		45.6	10.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	39.2	19.4		36.9	40.9		44.0	10.8		45.6	10.7	
LOS	D	B		D	D		D	B		D	B	
Approach Delay		23.1			40.7			32.1			18.7	
Approach LOS		C			D			C			B	
Queue Length 50th (m)	45.5	110.4		5.9	114.6		16.6	1.6		18.5	2.1	
Queue Length 95th (m)	76.8	135.3		16.0	#161.7		29.8	10.6		34.4	27.3	
Internal Link Dist (m)		184.2			350.5			226.5			53.3	
Turn Bay Length (m)	100.0			65.0			25.0			40.0		
Base Capacity (vph)	428	1963		135	1225		171	546		277	550	
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	0.71	0.67		0.25	0.80		0.58	0.10		0.34	0.57	

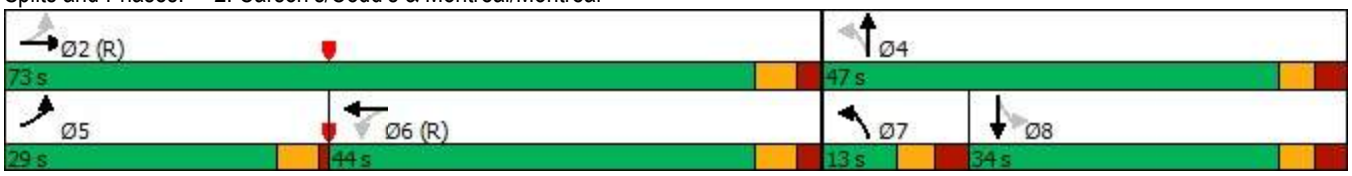
Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 16 (13%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 28.6	Intersection LOS: C
Intersection Capacity Utilization 97.3%	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: 2: Carson's/Codd's & Montréal/Montréal



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	21	27	16	12	0
Future Volume (vph)	0	21	27	16	12	0
Satd. Flow (prot)	1510	0	0	1693	1745	0
Flt Permitted				0.970		
Satd. Flow (perm)	1510	0	0	1693	1745	0
Lane Group Flow (vph)	21	0	0	43	12	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 19.1%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	21	27	16	12	0
Future Vol, veh/h	0	21	27	16	12	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	21	27	16	12	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	82	12	12	0	-	0
Stage 1	12	-	-	-	-	-
Stage 2	70	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	920	1069	1607	-	-	-
Stage 1	1011	-	-	-	-	-
Stage 2	953	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	904	1069	1607	-	-	-
Mov Cap-2 Maneuver	904	-	-	-	-	-
Stage 1	994	-	-	-	-	-
Stage 2	953	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.4	4.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1607	-	1069	-	-
HCM Lane V/C Ratio	0.017	-	0.02	-	-
HCM Control Delay (s)	7.3	0	8.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	25	0	0	32	0	0
Future Volume (vph)	25	0	0	32	0	0
Satd. Flow (prot)	1658	0	1510	0	0	1745
Flt Permitted	0.950					
Satd. Flow (perm)	1658	0	1510	0	0	1745
Lane Group Flow (vph)	25	0	32	0	0	0
Sign Control	Stop		Free			Free

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 13.3%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	3.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	25	0	0	32	0	0
Future Vol, veh/h	25	0	0	32	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	25	0	0	32	0	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	17	16	0	0	32	0
Stage 1	16	-	-	-	-	-
Stage 2	1	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	1001	1063	-	-	1580	-
Stage 1	1007	-	-	-	-	-
Stage 2	1022	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	1001	1063	-	-	1580	-
Mov Cap-2 Maneuver	1001	-	-	-	-	-
Stage 1	1007	-	-	-	-	-
Stage 2	1022	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1001	1580	-
HCM Lane V/C Ratio	-	-	0.025	-	-
HCM Control Delay (s)	-	-	8.7	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Appendix N

Synchro Intersection Worksheets – 2034 Future Total Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	95	58	79	62	5	36	49	62	15	60	36
Future Volume (vph)	36	95	58	79	62	5	36	49	62	15	60	36
Satd. Flow (prot)	0	1201	0	0	1325	0	0	1401	0	0	1423	0
Flt Permitted		0.991			0.974			0.988			0.993	
Satd. Flow (perm)	0	1201	0	0	1325	0	0	1401	0	0	1423	0
Lane Group Flow (vph)	0	189	0	0	146	0	0	147	0	0	111	0
Sign Control		Stop			Stop			Stop			Stop	

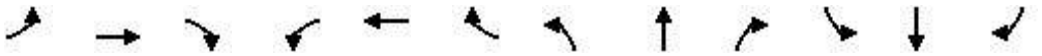
Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 41.5%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	9.1
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	36	95	58	79	62	5	36	49	62	15	60	36
Future Vol, veh/h	36	95	58	79	62	5	36	49	62	15	60	36
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	50	50	18	40	100	13	43	2	2	33	2
Mvmt Flow	36	95	58	79	62	5	36	49	62	15	60	36
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.1	9.6	9.1	8.7
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	24%	19%	54%	14%
Vol Thru, %	33%	50%	42%	54%
Vol Right, %	42%	31%	3%	32%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	147	189	146	111
LT Vol	36	36	79	15
Through Vol	49	95	62	60
RT Vol	62	58	5	36
Lane Flow Rate	147	189	146	111
Geometry Grp	1	1	1	1
Degree of Util (X)	0.199	0.242	0.209	0.147
Departure Headway (Hd)	4.869	4.605	5.144	4.769
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	734	777	695	747
Service Time	2.925	2.656	3.2	2.829
HCM Lane V/C Ratio	0.2	0.243	0.21	0.149
HCM Control Delay	9.1	9.1	9.6	8.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.7	0.9	0.8	0.5



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	243	763	217	121	1163	144	136	20	69	160	24	456
Future Volume (vph)	243	763	217	121	1163	144	136	20	69	160	24	456
Satd. Flow (prot)	1676	3145	0	1644	3230	0	1613	1505	0	1598	1392	0
Flt Permitted	0.074			0.292			0.118			0.699		
Satd. Flow (perm)	131	3145	0	503	3230	0	200	1505	0	1165	1392	0
Satd. Flow (RTOR)		48			13			69			227	
Lane Group Flow (vph)	243	980	0	121	1307	0	136	89	0	160	480	0
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases	5	2			6		7	4			8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		6	6		7	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		5.0	10.0		10.0	10.0	
Minimum Split (s)	9.7	29.0		29.0	29.0		11.3	33.5		33.5	33.5	
Total Split (s)	17.0	72.0		55.0	55.0		13.0	48.0		35.0	35.0	
Total Split (%)	14.2%	60.0%		45.8%	45.8%		10.8%	40.0%		29.2%	29.2%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	1.0	2.3		2.3	2.3		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)	4.7	6.0		6.0	6.0		6.3	6.3		6.3	6.3	
Lead/Lag	Lead			Lag	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes			Yes	Yes		Yes			Yes	Yes	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	68.5	67.2		49.0	49.0		40.5	40.5		27.5	27.5	
Actuated g/C Ratio	0.57	0.56		0.41	0.41		0.34	0.34		0.23	0.23	
v/c Ratio	0.98	0.55		0.59	0.99		0.93	0.16		0.60	0.97	
Control Delay	85.5	17.5		41.8	56.7		91.3	9.8		51.4	58.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	85.5	17.5		41.8	56.7		91.3	9.8		51.4	58.7	
LOS	F	B		D	E		F	A		D	E	
Approach Delay		31.0			55.4			59.1			56.9	
Approach LOS		C			E			E			E	
Queue Length 50th (m)	~47.2	71.7		21.9	156.8		22.7	3.1		33.4	65.2	
Queue Length 95th (m)	#98.0	90.3		44.8	#207.6		#55.8	14.3		56.5	#131.6	
Internal Link Dist (m)		184.2			350.5			226.5			53.3	
Turn Bay Length (m)	100.0			65.0			25.0			40.0		
Base Capacity (vph)	248	1781		205	1326		146	568		278	505	
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	0.98	0.55		0.59	0.99		0.93	0.16		0.58	0.95	

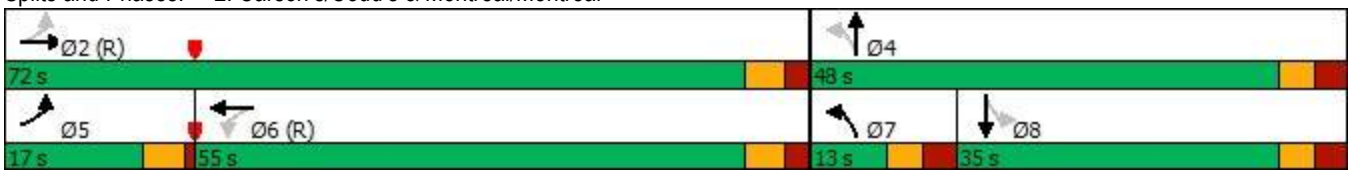
Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 5 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.99

Intersection Signal Delay: 47.4	Intersection LOS: D
Intersection Capacity Utilization 115.5%	ICU Level of Service H
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: 2: Carson's/Codd's & Montréal/Montréal



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	30	13	68	76	0
Future Volume (vph)	0	30	13	68	76	0
Satd. Flow (prot)	1510	0	0	1294	1338	0
Flt Permitted				0.992		
Satd. Flow (perm)	1510	0	0	1294	1338	0
Lane Group Flow (vph)	30	0	0	81	76	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 21.2%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	30	13	68	76	0
Future Vol, veh/h	0	30	13	68	76	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	43	33	2
Mvmt Flow	0	30	13	68	76	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	170	76	76	0	-	0
Stage 1	76	-	-	-	-	-
Stage 2	94	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	820	985	1523	-	-	-
Stage 1	947	-	-	-	-	-
Stage 2	930	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	813	985	1523	-	-	-
Mov Cap-2 Maneuver	813	-	-	-	-	-
Stage 1	938	-	-	-	-	-
Stage 2	930	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	1.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1523	-	985	-	-
HCM Lane V/C Ratio	0.009	-	0.03	-	-
HCM Control Delay (s)	7.4	0	8.8	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	36	0	0	15	0	0
Future Volume (vph)	36	0	0	15	0	0
Satd. Flow (prot)	1658	0	1510	0	0	1745
Flt Permitted	0.950					
Satd. Flow (perm)	1658	0	1510	0	0	1745
Lane Group Flow (vph)	36	0	15	0	0	0
Sign Control	Stop		Free			Free

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 13.3%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	36	0	0	15	0	0
Future Vol, veh/h	36	0	0	15	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	36	0	0	15	0	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	9	8	0	0	15	0
Stage 1	8	-	-	-	-	-
Stage 2	1	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	1011	1074	-	-	1603	-
Stage 1	1015	-	-	-	-	-
Stage 2	1022	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	1011	1074	-	-	1603	-
Mov Cap-2 Maneuver	1011	-	-	-	-	-
Stage 1	1015	-	-	-	-	-
Stage 2	1022	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1011	1603	-
HCM Lane V/C Ratio	-	-	0.036	-	-
HCM Control Delay (s)	-	-	8.7	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	66	53	64	95	8	55	76	67	10	77	40
Future Volume (vph)	36	66	53	64	95	8	55	76	67	10	77	40
Satd. Flow (prot)	0	1609	0	0	1577	0	0	1642	0	0	1663	0
Flt Permitted		0.989			0.981			0.986			0.996	
Satd. Flow (perm)	0	1609	0	0	1577	0	0	1642	0	0	1663	0
Lane Group Flow (vph)	0	155	0	0	167	0	0	198	0	0	127	0
Sign Control		Stop			Stop			Stop			Stop	

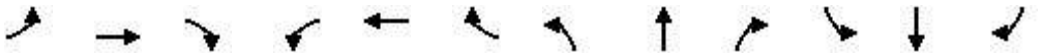
Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 41.1%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	9.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	36	66	53	64	95	8	55	76	67	10	77	40
Future Vol, veh/h	36	66	53	64	95	8	55	76	67	10	77	40
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	9	23	2	2	2	2	2	2	2	2
Mvmt Flow	36	66	53	64	95	8	55	76	67	10	77	40
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.1	10.1	9.5	8.9
HCM LOS	A	B	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	28%	23%	38%	8%
Vol Thru, %	38%	43%	57%	61%
Vol Right, %	34%	34%	5%	31%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	198	155	167	127
LT Vol	55	36	64	10
Through Vol	76	66	95	77
RT Vol	67	53	8	40
Lane Flow Rate	198	155	167	127
Geometry Grp	1	1	1	1
Degree of Util (X)	0.262	0.206	0.246	0.17
Departure Headway (Hd)	4.757	4.779	5.306	4.822
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	750	744	671	738
Service Time	2.82	2.852	3.378	2.893
HCM Lane V/C Ratio	0.264	0.208	0.249	0.172
HCM Control Delay	9.5	9.1	10.1	8.9
HCM Lane LOS	A	A	B	A
HCM 95th-tile Q	1	0.8	1	0.6



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	353	1293	96	34	957	146	100	14	46	113	17	353
Future Volume (vph)	353	1293	96	34	957	146	100	14	46	113	17	353
Satd. Flow (prot)	1660	3311	0	1613	3180	0	1676	1536	0	1598	1376	0
Flt Permitted	0.086			0.191			0.134			0.718		
Satd. Flow (perm)	150	3311	0	323	3180	0	232	1536	0	1197	1376	0
Satd. Flow (RTOR)		10			16			46			317	
Lane Group Flow (vph)	353	1389	0	34	1103	0	100	60	0	113	370	0
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases	5	2			6		7	4			8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		6	6		7	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		5.0	10.0		10.0	10.0	
Minimum Split (s)	9.7	29.0		29.0	29.0		11.3	33.5		33.5	33.5	
Total Split (s)	22.0	74.0		52.0	52.0		12.0	46.0		34.0	34.0	
Total Split (%)	18.3%	61.7%		43.3%	43.3%		10.0%	38.3%		28.3%	28.3%	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	1.0	2.3		2.3	2.3		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)	4.7	6.0		6.0	6.0		6.3	6.3		6.3	6.3	
Lead/Lag	Lead			Lag	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes			Yes	Yes		Yes			Yes	Yes	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	73.4	72.1		46.0	46.0		35.6	35.6		23.6	23.6	
Actuated g/C Ratio	0.61	0.60		0.38	0.38		0.30	0.30		0.20	0.20	
v/c Ratio	0.98	0.70		0.28	0.90		0.73	0.12		0.48	0.70	
Control Delay	77.5	19.7		33.1	45.3		61.7	11.7		48.6	15.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	77.5	19.7		33.1	45.3		61.7	11.7		48.6	15.6	
LOS	E	B		C	D		E	B		D	B	
Approach Delay		31.4			44.9			42.9			23.3	
Approach LOS		C			D			D			C	
Queue Length 50th (m)	~79.9	119.5		5.5	125.7		16.8	2.3		22.9	10.1	
Queue Length 95th (m)	#138.2	146.2		14.8	#165.8		#32.3	11.8		41.0	42.8	
Internal Link Dist (m)		184.2			350.5			226.5			53.3	
Turn Bay Length (m)	100.0			65.0			25.0			40.0		
Base Capacity (vph)	361	1993		123	1228		137	538		276	561	
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	0.98	0.70		0.28	0.90		0.73	0.11		0.41	0.66	

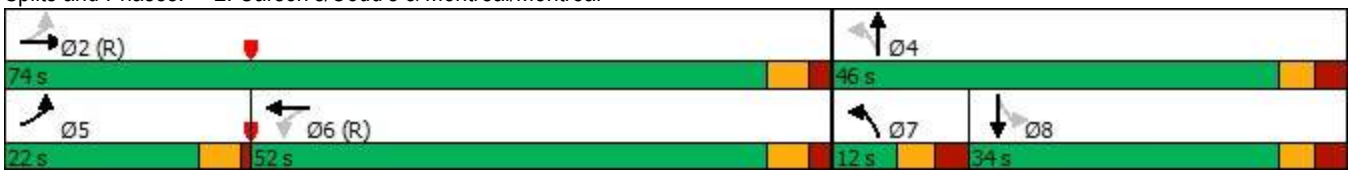
Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 16 (13%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.98

Intersection Signal Delay: 35.2	Intersection LOS: D
Intersection Capacity Utilization 106.4%	ICU Level of Service G
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: 2: Carson's/Codd's & Montréal/Montréal



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	21	27	88	93	0
Future Volume (vph)	0	21	27	88	93	0
Satd. Flow (prot)	1510	0	0	1724	1745	0
Flt Permitted				0.988		
Satd. Flow (perm)	1510	0	0	1724	1745	0
Lane Group Flow (vph)	21	0	0	115	93	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 23.1%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	21	27	88	93	0
Future Vol, veh/h	0	21	27	88	93	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	21	27	88	93	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	235	93	93	0	-	0
Stage 1	93	-	-	-	-	-
Stage 2	142	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	753	964	1501	-	-	-
Stage 1	931	-	-	-	-	-
Stage 2	885	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	739	964	1501	-	-	-
Mov Cap-2 Maneuver	739	-	-	-	-	-
Stage 1	913	-	-	-	-	-
Stage 2	885	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	1.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1501	-	964	-	-
HCM Lane V/C Ratio	0.018	-	0.022	-	-
HCM Control Delay (s)	7.4	0	8.8	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	25	0	0	32	0	0
Future Volume (vph)	25	0	0	32	0	0
Satd. Flow (prot)	1658	0	1510	0	0	1745
Flt Permitted	0.950					
Satd. Flow (perm)	1658	0	1510	0	0	1745
Lane Group Flow (vph)	25	0	32	0	0	0
Sign Control	Stop		Free			Free

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 13.3%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	3.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	25	0	0	32	0	0
Future Vol, veh/h	25	0	0	32	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	25	0	0	32	0	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	17	16	0	0	32	0
Stage 1	16	-	-	-	-	-
Stage 2	1	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	1001	1063	-	-	1580	-
Stage 1	1007	-	-	-	-	-
Stage 2	1022	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	1001	1063	-	-	1580	-
Mov Cap-2 Maneuver	1001	-	-	-	-	-
Stage 1	1007	-	-	-	-	-
Stage 2	1022	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1001	1580	-
HCM Lane V/C Ratio	-	-	0.025	-	-
HCM Control Delay (s)	-	-	8.7	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-