2851 Baycrest Drive

Transportation Impact Assessment

Step 1 Screening Report

Step 2 Scoping Report

Step 3 Forecasting Report

Step 4 Strategy Report

Prepared for:

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December 2021

PN: 2020-104

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1 Screening

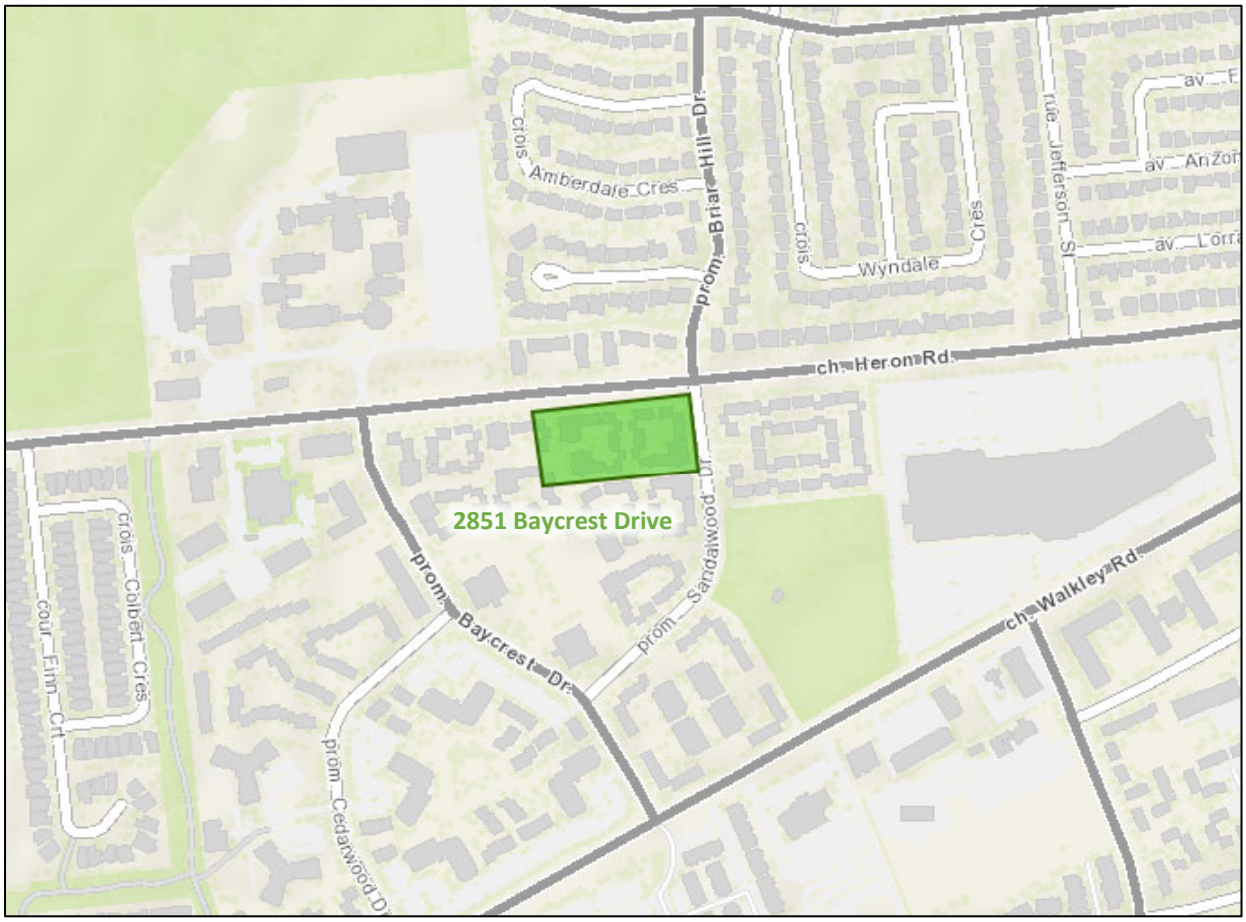
This study has been prepared according to the City of Ottawa's 2017 Transportation Impact Assessment (TIA) Guidelines. Accordingly, a Step 1 Screening Form has been prepared and is included as Appendix A, along with the Certification Form for the TIA Study PM. As shown in the Screening Form, a TIA is required including the Design Review component and the Network Impact Component. This study has been prepared to support a site plan application.

2 Existing and Planned Conditions

2.1 Proposed Development

The proposed redevelopment has a total of three phases. The proposed phase 1 development, located at 2851 Baycrest Drive, is currently zoned as Residential Fifth Density Zone (R5B H (18)). Phase 1 development is planned to include one 6-storey building and two 7-storey buildings, with a total of 305 residential units, 298 residential parking spaces, 58 visitor parking spaces, and 153 bicycle parking spaces. The anticipated full build-out and occupancy horizon for the first phase is 2024. Access will be provided to Sandalwood Drive, approximately where the existing private approach is located. Ultimately, the internal road will connect between Sandalwood Drive and Baycrest Drive once future phases are complete. 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: August 4, 2021

KEY PLAN

PROPERTY DESCRIPTION

SIX STOREY RESIDENTIAL BUILDINGS	
CITY OF OTTAWA PIN NUMBER	04
MUNICIPAL ADDRESS	Heron Road

SITE INFORMATION

LOT AREA:	11,873.9 m²
LOT FRONTAGE:	139.2 m
LOT DEPTH:	77.33 m

BUILDING INFORMATION

BUILDING AREA:	BUILDING A: 1,813 m², BUILDING B: 1,656 m², BUILDING C: 1,597 m²
GROSS FLOOR AREA:	BUILDING A: 10,750 m², BUILDING B: 10,606 m², BUILDING C: 9,423 m²
PROPOSED USE:	APARTMENT DWELLINGS, MID-RISE

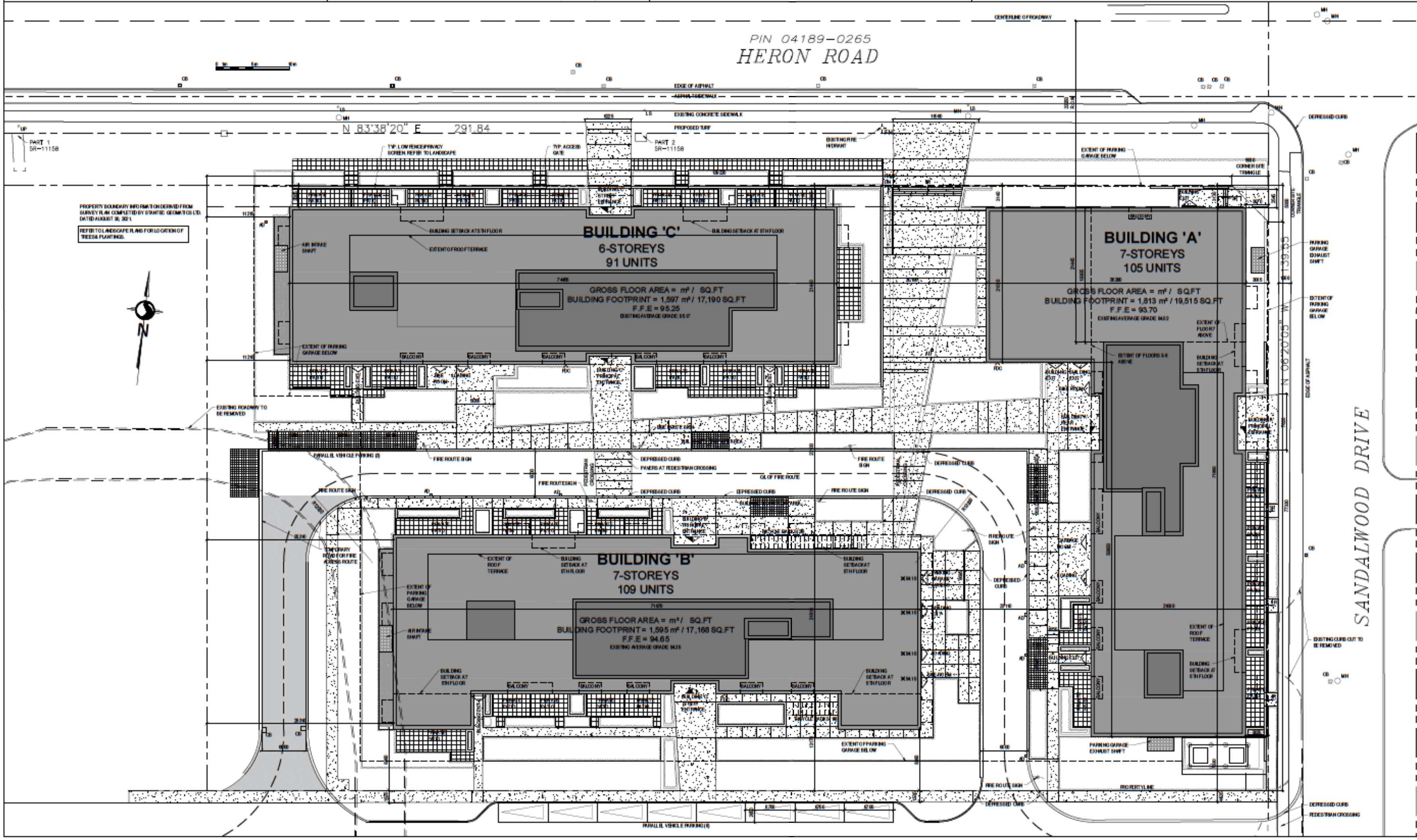
UNIT BREAKDOWN:

BUILDING A	BUILDING B	BUILDING C	TOTAL PROPOSED
12- STUDIO	7- STUDIO	1- STUDIO	20- STUDIO
50-1 BEDROOM	59- 1 BEDROOM	31- 1 BEDROOM	140- 1 BEDROOM
21-2 BEDROOM	17-2 BEDROOM	39- 2 BEDROOM	77-2 BEDROOM
15- 3 BEDROOM	15-3 BEDROOM	8-3 BEDROOM	38-3 BEDROOM
5- 3 BEDROOM TOWN	9- 3 BEDROOM TOWN	8-3 BEDROOM TOWN	22-3 BEDROOM TOWN
2- 4 BEDROOM TOWN	2- 4 BEDROOM TOWN	4- 4 BEDROOM TOWN	8- 4 BEDROOM TOWN
105 UNITS	109 UNITS	91 UNITS	305 UNITS

ZONING TABLE R5

CITY OF OTTAWA ZONING BY-LAW No. 2008-250	REQUIRED	PROPOSED
MINIMUM LOT AREA	1,400 m² for a Planned Unit Dev.	11,873.9 m²
MINIMUM LOT WIDTH	n/a	
FRONT YARD SETBACK	3 m	3 m (SANDALWOOD DRIVE)
HYDRO SETBACK	6m	n/a
CORNER SIDE YARD SETBACK	3 m	3 m (HERON ROAD)
MINIMUM INTERIOR SIDE YARD SETBACK	N/A	7.3 m (BUILDING A) 8.4 m (BUILDING B)
REAR YARD SETBACK	N/A	11.2 m (BUILDING C) 25.3 m (BUILDING B)
MAXIMUM BUILDING HEIGHT	18 m	BUILDING A: 19.08 m (6 STOREYS) BUILDING B: 22.72 m (7 STOREYS) BUILDING C: 22.52 m (7 STOREYS)
MAXIMUM FLOOR SPACE INDEX	N/A	
VEHICLE PARKING REQUIREMENTS (AREA Y, SCHEDULE 1A)	Residential Area C: 1.2 spaces/unit, less first 12 units 1.2 per dwelling unit = 352 spaces	296 SPACES (249 REGULAR, 46 SMALL, 1 ACCESSIBLE)
VISITOR PARKING REQUIREMENTS (AREA Y, SCHEDULE 1A)	0.2 / DWELLING UNIT AFTER 12 UNITS 59 SPACES REQUIRED	12 SPACES (EXTERIOR) 48 SPACES (P1)
AMENITY AREA REQUIREMENTS	6m² per dwelling unit = 1,830m² 50% Communal = 915m²	-516m² INTERIOR AMENITY (Bldg A) -1,757m² BALCONIES / PRIVATE TERRACE -1,424m² TOTAL ROOFTOP TOTAL = 3,697m²
BICYCLE PARKING SPACES	0.5 per dwelling unit = 153	117 INTERIOR STORAGE SPACES (BLDG A: 55, BLDG B: 46, BLDG C: 16) 36 EXTERIOR SPACES TOTAL = 153

LEGEND



No.	Date	Revision
1	2021-08-23	PRELIMINARY COORDINATION
2	2021-09-29	COORDINATION
3	2021-11-15	COORDINATION
4	2021-12-22	SITE PLAN CONTROL

FOTENN Planning + Design

Gino J. Aiello landscape architect

IBI

hazelview INVESTMENTS

figurr

ONTARIO ASSOCIATION OF ARCHITECTS
ROBERTO CAMPOS
LICENCE
7401

HERONGATE
HG-5

SITE PLAN

Drawn by	MD
Project number	2135
Verified by	RC
Scale	AS SHOWN
Drawing date	2021-08-23
Revision	0

A105

2.2 Existing Conditions

2.2.1 Area Road Network

Heron Road: Heron Road is a City of Ottawa arterial road with a divided, four-lane urban cross-section. Sidewalks are provided on both sides of the road and a cycle track is located along the south side of the roadway between Heron-Walkley Park and Jefferson Street. The posted speed limit is 50 km/h within the study area and the City-protected right of way is 44.5 metres between Prince of Wales Drive and Walkley Road. Heron Road is designated as a truck route.

Walkley Road: Walkley Road is a City of Ottawa arterial road with a divided, four-lane urban cross-section. Sidewalks are located on both sides of the roadway. The posted speed limit is 50 km/h within the study area and the City-protected right of way is 37.5 metres. Walkley Road is designated as a truck route.

Baycrest Drive: Baycrest Drive is a City of Ottawa collector road with a two-lane urban cross-section. Sidewalks are provided on both sides of the road. The unposted speed limit is assumed to be 50 km/h and the existing right of way is 20.0 metres. On-street parking is restricted on the east side of the road.

Sandalwood Drive: Sandalwood Drive is a City of Ottawa local road with a two-lane urban cross-section. Sidewalks are provided on both sides of the road. The unposted speed limit is assumed to be 50 km/h and the existing right of way is 20.0 metres. On-street parking is restricted on the east side of the road.

Cedarwood Drive: Cedarwood Drive is a City of Ottawa local road with a two-lane urban cross-section. Sidewalks are provided on both sides of the road. The unposted speed limit is assumed to be 50 km/h and the existing right of way is 20.0 metres. On-street parking is restricted on the west side of the road.

2.2.2 Existing Intersections

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

Heron Road at Baycrest Drive	The intersection of Heron Road and Baycrest Drive is a signalized intersection. The northbound approach consists of a shared all movement lane, and the southbound approach consists of an auxiliary left-turn lane and a shared through/right-turn lane. The eastbound and westbound approaches each consists of an auxiliary left-turn lane, a through lane, and a shared through/right-turn lane. The cycle track on the eastbound approach transitions to a curbside bike lane for an at grade crossing of the intersection. No turn restrictions were noted.
Baycrest Drive at Cedarwood Drive	Baycrest Drive and Sandalwood Drive is a three-leg intersection with an all-way stop-control. All approaches consist of a shared all-movement lane. No turning restrictions were noted.
Baycrest Drive at Sandalwood Drive	Baycrest Drive and Sandalwood Drive is a minor stop-controlled intersection, with the stop sign on the Sandalwood Drive approach. All approaches consist of a shared all movement lane, and the westbound approach is private access. No turning restrictions were noted.

Baycrest Drive at Walkley Road

The intersection of Walkley Road and Baycrest Drive is a signalized intersection. The northbound approach consists of a shared all movement lane from a private approach, and the southbound approach consists of an auxiliary left-turn lane. The eastbound and westbound approaches each consists of an auxiliary left-turn lane, a through lane, and a shared through/right-turn lane. No turn restrictions were noted.

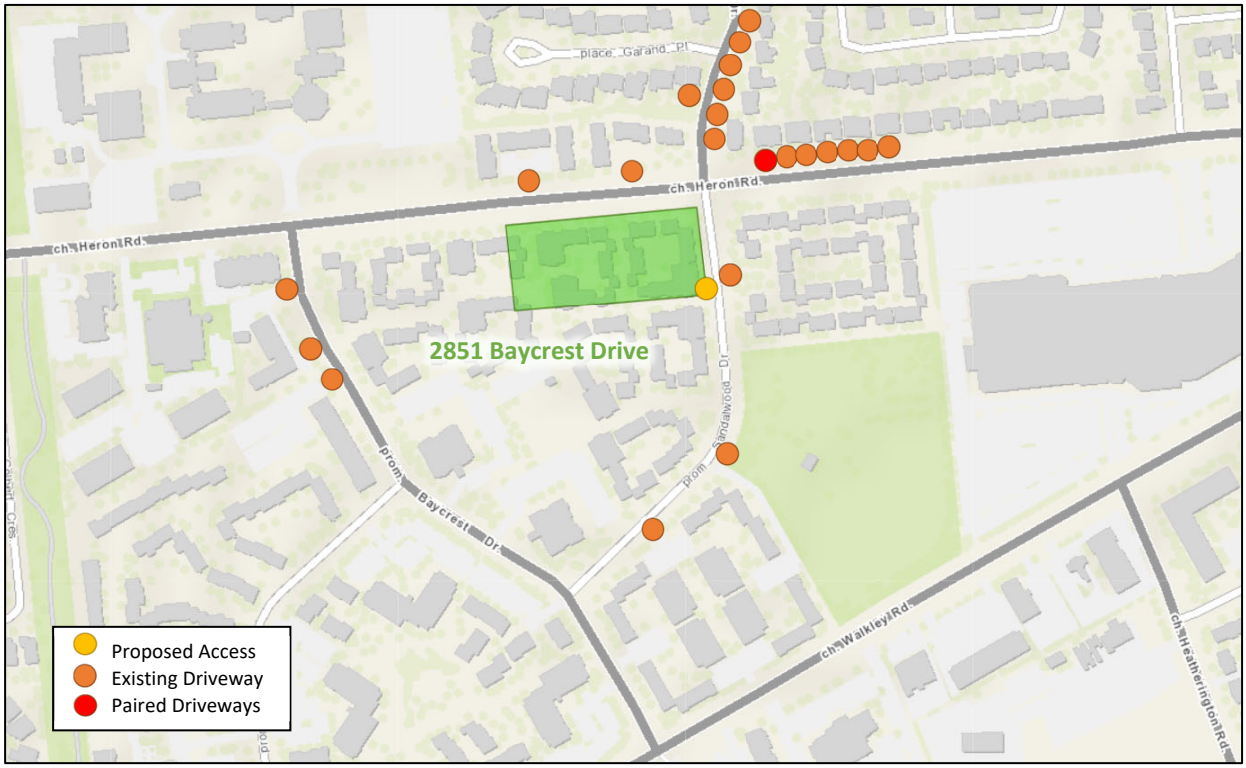
Heron Road at Briar Hill Drive/ Sandalwood Drive

The intersection of Heron Road and Briar Hill Drive/ Sandalwood Drive is a signalized intersection. The northbound approach consists of an auxiliary left-turn lane and a shared through/right-turn lane, and the southbound approach consists of an auxiliary shared through/left-turn lane and a right-turn lane. The eastbound and westbound approaches each consists of an auxiliary left-turn lane, a through lane, and a shared through/right-turn lane. The cycle track on the eastbound approach transitions to a curbside bike lane for an at grade crossing of the intersection. No turn restrictions were noted.

2.2.3 Existing Driveways

Within 200 metres of the site accesses, three driveways to apartment buildings are located on Baycrest Drive, two driveways to townhouses, eight to semi-detached are present on Heron Road, and seven to detached dwellings are present on Briar Hill Drive. Driveways are also present on Sandalwood Drive to apartment buildings, a park, and townhouses. None of the driveways within the area of consideration are significant traffic generators. Figure 3 illustrates the existing driveways.

Figure 3: Existing Driveways



Source: http://maps.ottawa.ca/geoOttawa/ Accessed: August 4, 2021

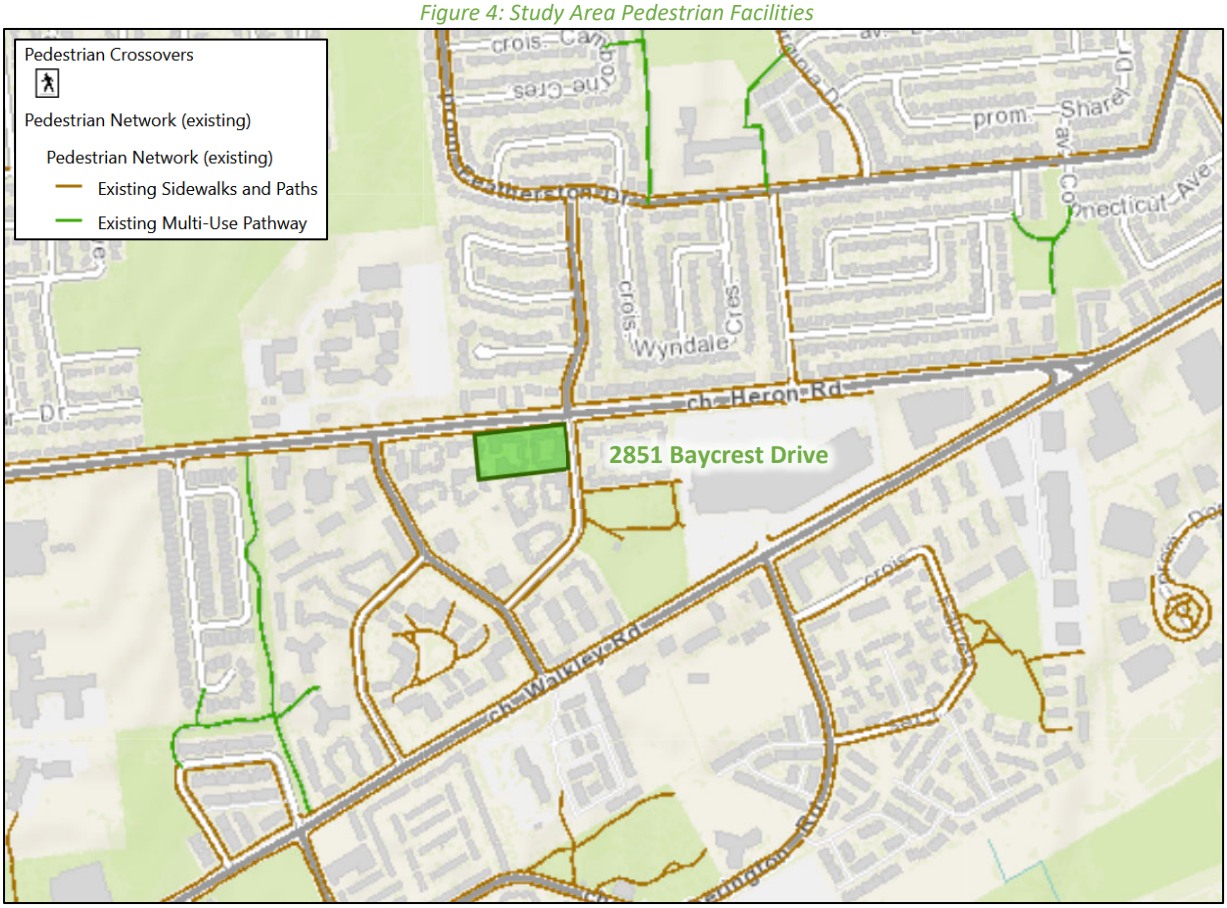
2.2.4 Cycling and Pedestrian Facilities

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

Sidewalks are provided along both sides of the arterial and collector roads within the study area and on the south side of Fairlea Crescent and the east side of Jefferson Street. No sidewalk is provided on Finn Court.

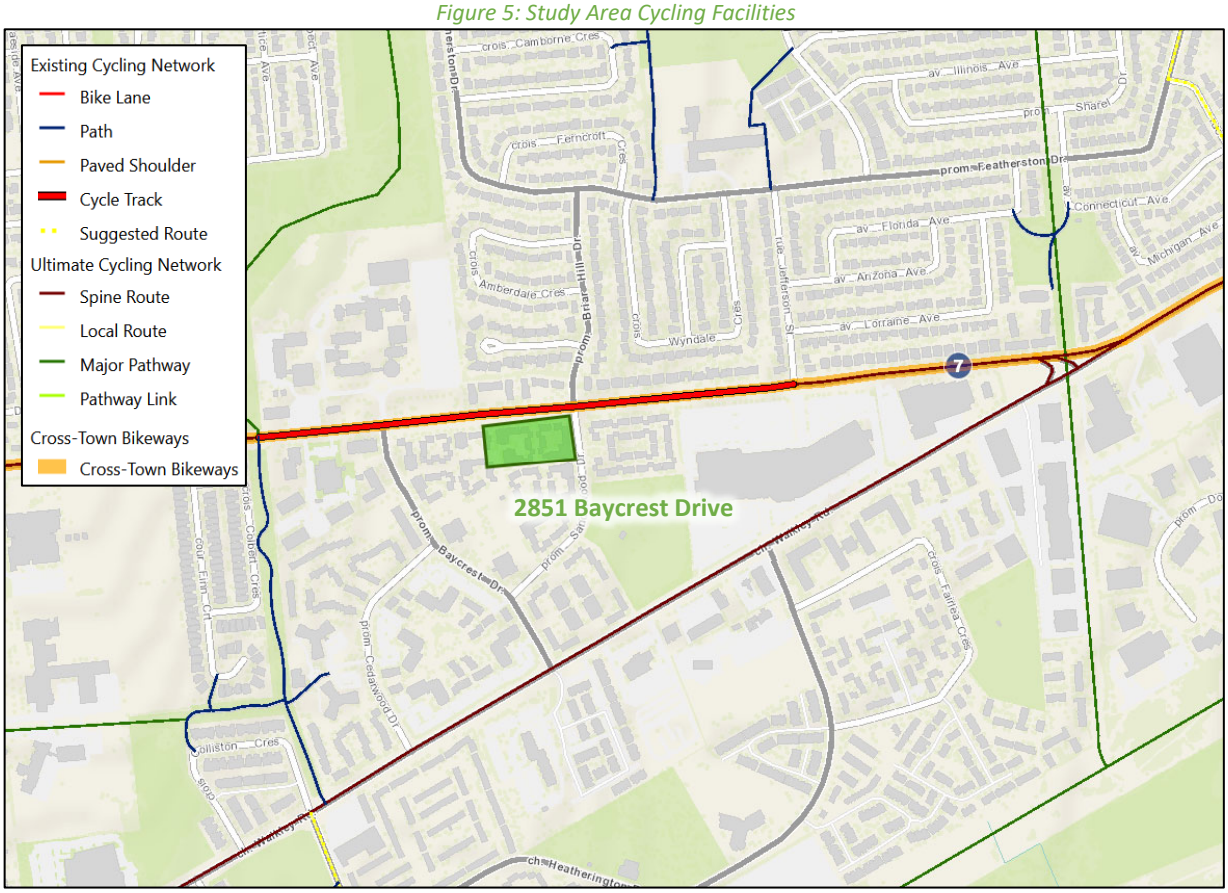
Cycling facilities include a cycle track along a portion of Heron Road, a multi-use pathway between Heron Road and Walkley Road in Heron-Walkley Park, and two multi-use pathways on Featherston Drive between Wyndale Crescent and Jefferson Street. Heron Road and Walkley Road are spine routes. A major pathway is provided in Orlando Park and Heron-Walkley Park. Heron Road to Walkley Road is designated as a crosstown bikeway.

Figure 4: Study Area Pedestrian Facilities



Source: http://maps.ottawa.ca/geoOttawa/ Accessed: August 4, 2021

Figure 5: Study Area Cycling Facilities



Source: http://maps.ottawa.ca/geoOttawa/ Accessed: August 4,202

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

Figure 6: Existing Pedestrian Volumes

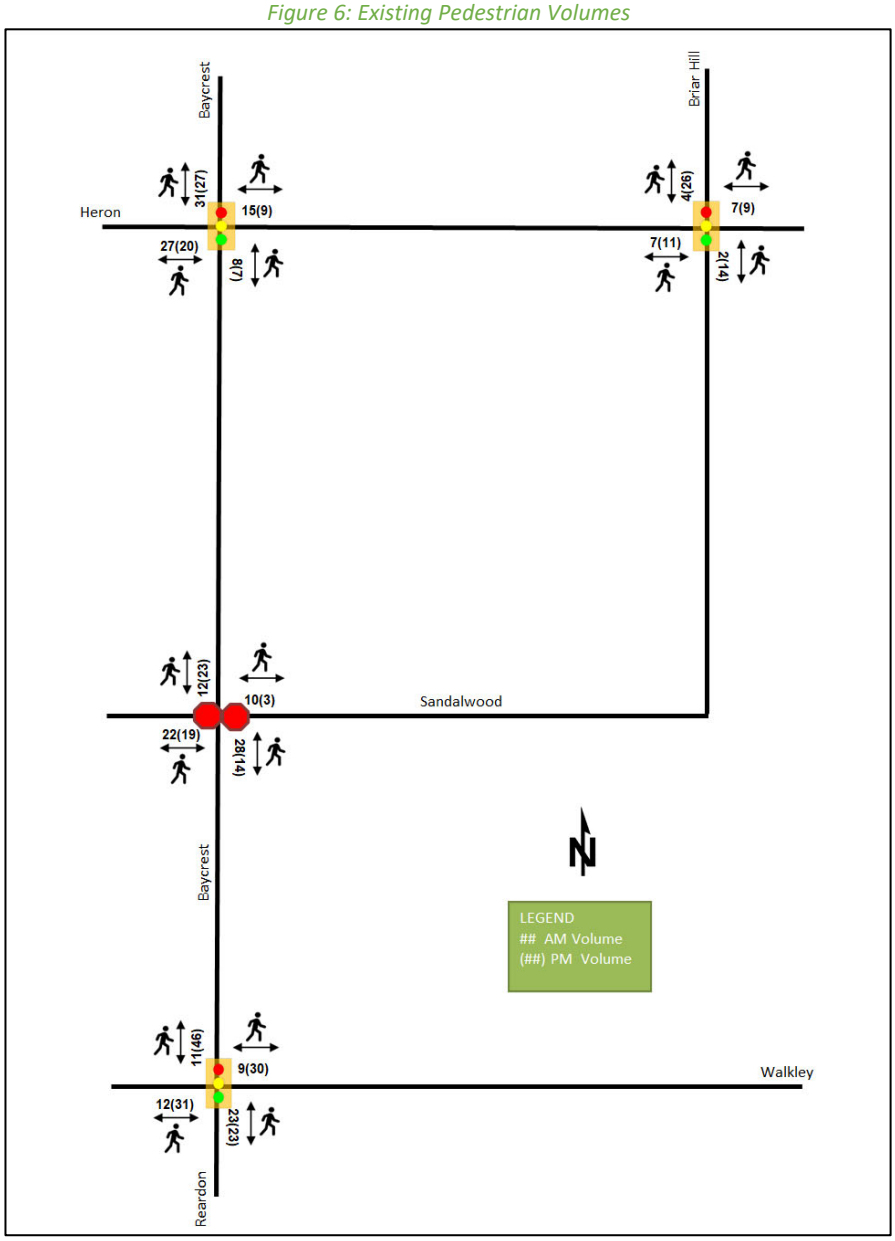
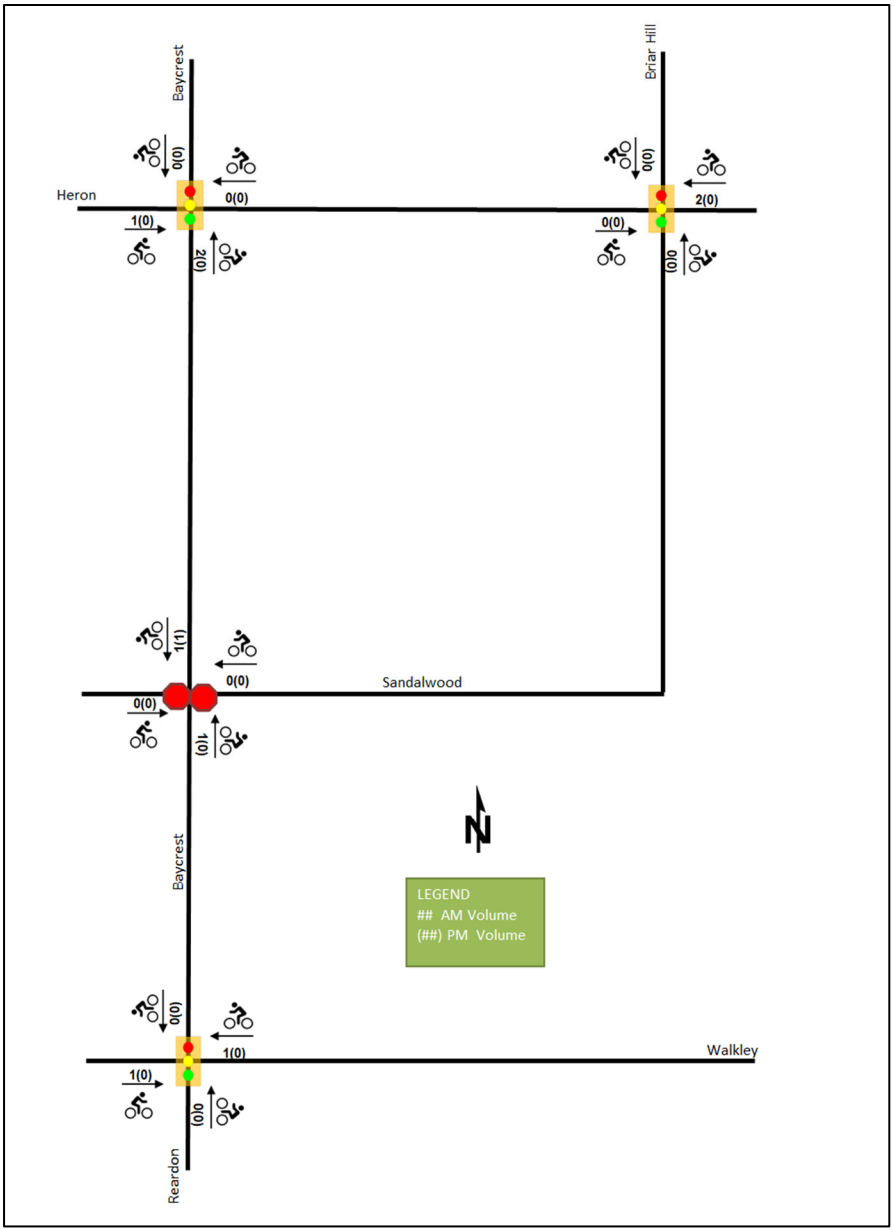


Figure 7: Existing Cyclist Volumes



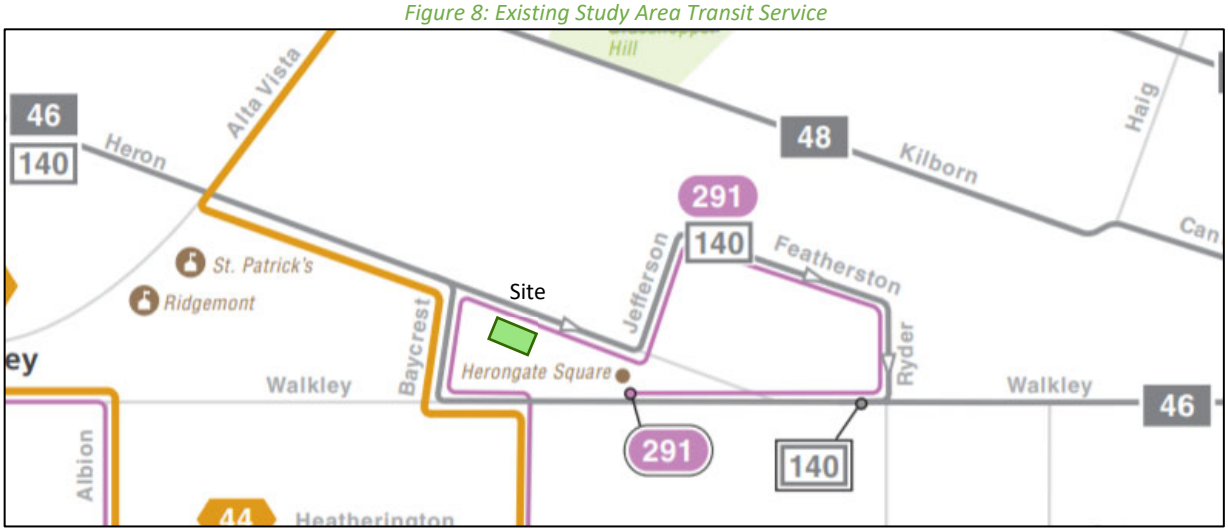
2.2.5 Existing Transit

Within the study area, routes #44, #46, #140, and #291 travel along Heron Road, Baycrest Drive, and continuing along Walkley Road. Primary stops are located at Heron Road at Sandalwood Drive, Heron Road at Briar Hill Drive, and Heron Road at Baycrest Drive intersections. The frequency of these routes within proximity of the proposed site currently are:

- Route # 44 – 15-minute service all day, 30-minute service after 7 PM
- Route # 46 –15-minute service all day, 30-minute service during the off-peak times
- Route # 140 – 30-minute service between 9 AM and 3:30 PM
- Route # 291– 30-minute service in the peak period/direction

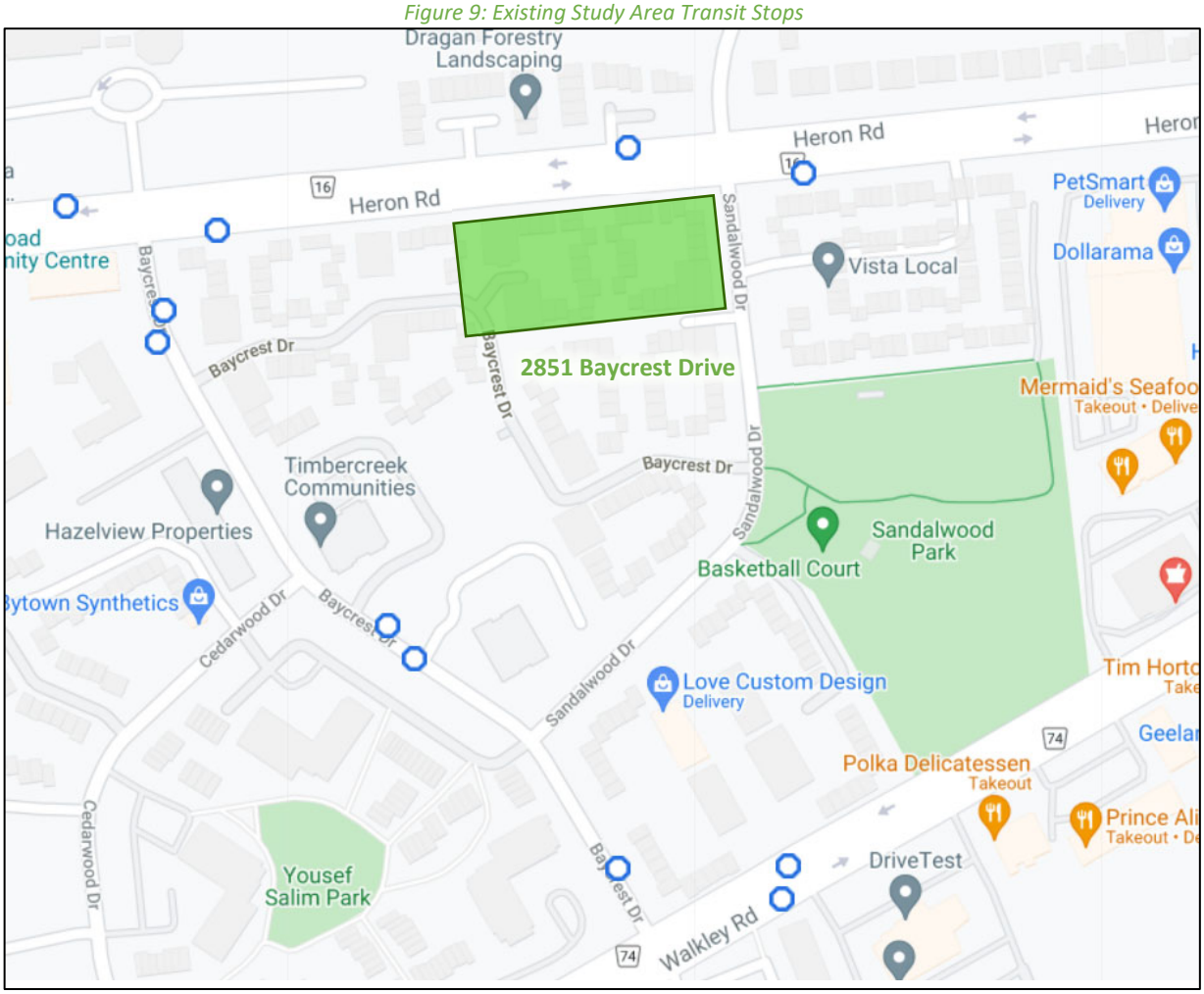
Figure 8 illustrates the transit system map in the study area and Figure 9 illustrates nearby transit stops.

Figure 8: Existing Study Area Transit Service



Source: http://www.octranspo.com/ Accessed: August 4, 2021

Figure 9: Existing Study Area Transit Stops



Source: http://www.octranspo.com/ Accessed: July 15, 2021

2.2.6 Existing Area Traffic Management Measures

There are no existing area traffic management measures within the Study Area.

2.2.7 Existing Peak Hour Travel Demand

Existing turning movement counts were acquired from the City of Ottawa for the existing Study Area intersection. Table 1 summarizes the intersection count dates.

Table 1: Intersection Count Date

Intersection	Count Date
Heron Road at Baycrest Drive	Wednesday, November 16, 2016
Baycrest Drive at Sandalwood Drive	Wednesday, October 24, 2018
Baycrest Drive at Walkley Road	Wednesday, November 16, 2016
Heron Road at Briar Hill Drive/ Sandalwood Drive	Wednesday, November 16, 2016

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

Figure 10: Existing Traffic Counts

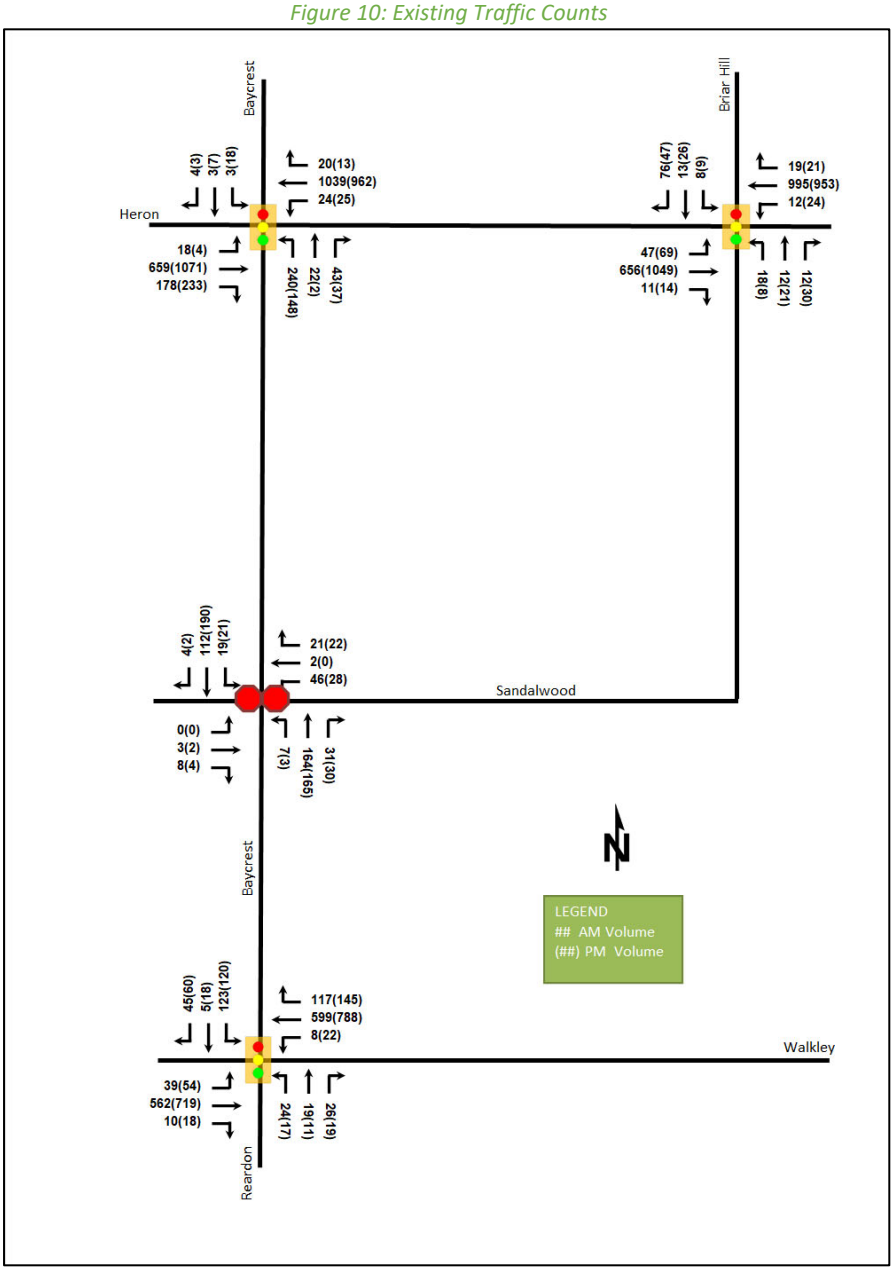


Table 2: Existing Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
Baycrest Drive & Heron Road *Signalized*	EBL	A	0.13	15.8	7.0	A	0.02	8.8	1.8
	EBT/R	A	0.53	14.7	81.1	C	0.71	14.0	127.3
	WBL	A	0.13	18.2	m8.8	A	0.20	15.6	m9.1
	WBT/R	B	0.66	24.6	136.8	A	0.51	14.3	123.9
	NB	D	0.82	41.9	71.4	C	0.71	41.4	48.2
	SBL	A	0.01	16.3	1.8	A	0.07	23.6	7.4
	SBT/R	A	0.01	12.3	2.7	A	0.03	19.2	4.5
	Overall	**C**	**0.72**	**23.1**	-	**B**	**0.70**	**16.2**	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
Baycrest Drive & Sandalwood Drive *Unsignalized*	EB	B	0.02	10.2	0.8	B	0.01	11.0	0.0
	WB	B	0.14	12.6	3.8	B	0.10	12.1	2.3
	NB	A	0.01	7.5	0.0	A	0.00	7.8	0.0
	SB	A	0.02	7.9	0.8	A	0.02	7.8	0.8
	Overall	**A**	-	**2.9**	-	**A**	-	**1.8**	-
Walkley Road & Baycrest Drive *Signalized*	EBL	A	0.13	10.7	8.9	A	0.25	13.1	12.8
	EBT/R	A	0.31	8.9	39.1	A	0.42	10.2	51.5
	WBL	A	0.02	9.6	2.8	A	0.08	9.6	5.3
	WBT/R	A	0.39	9.1	49.3	A	0.54	11.4	69.4
	NB	A	0.21	13.6	12.2	A	0.15	14.9	10.9
	SBL	A	0.50	27.4	26.2	A	0.48	30.4	30.5
	SBT/R	A	0.14	6.8	7.0	A	0.22	9.3	11.6
	Overall	**A**	**0.45**	**10.6**	-	**A**	**0.52**	**12.1**	-
Sandalwood Drive /Briar Hill Drive & Heron Road *Signalized*	EBL	A	0.17	6.8	m14.9	A	0.29	15.1	m14.2
	EBT/R	A	0.30	5.1	79.6	A	0.53	14.8	132.3
	WBL	A	0.03	6.4	3.6	A	0.12	11.2	6.8
	WBT/R	A	0.46	7.0	86.8	A	0.48	11.0	80.3
	NBL	A	0.12	32.0	m7.9	A	0.03	24.6	m3.9
	NBT/R	A	0.11	20.5	m7.6	A	0.14	15.5	m11.3
	SBL/T	A	0.10	30.1	8.0	A	0.11	23.5	11.7
	SBT/R	A	0.29	11.6	10.9	A	0.14	7.3	7.5
	Overall	**A**	**0.43**	**7.1**	-	**A**	**0.44**	**13.2**	-

Notes: Saturation flow rate of 1800 veh/h/lane
PHF = 0.90
m = metered queue
# = volumes for the 95th %ile cycle exceeds capacity

During both the AM and PM peak hours, the study area intersections operate well. No capacity issues are noted.

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 are road network. Table 3 summarizes the collision types and conditions in the study area, Figure 11 illustrates the intersections and segments analyzed, and Table 4 summarizes the total collisions for each of these locations. Collision data are included in Appendix D.

Table 3: Study Area Collision Summary, 2015-2019

		Number	%
Total Collisions		**35**	**100%**
Classification	**Fatality**	0	0%
	Non-Fatal Injury	7	20%
	Property Damage Only	28	80%
Initial Impact Type	**Angle**	8	23%
	Rear end	5	14%
	Sideswipe	5	14%
	Turning Movement	5	14%
	SMV Unattended	7	20%
	SMV Other	2	6%
	Other	3	9%
Road Surface Condition	**Dry**	16	46%
	Wet	14	40%
	Loose Snow	3	9%

		Number	%
Total Collisions		**35**	**100%**
	Slush	2	6%
Pedestrian Involved		0	0%
Cyclists Involved		0	0%

Figure 11: Study Area Collision Records – Representation of 2015-2019

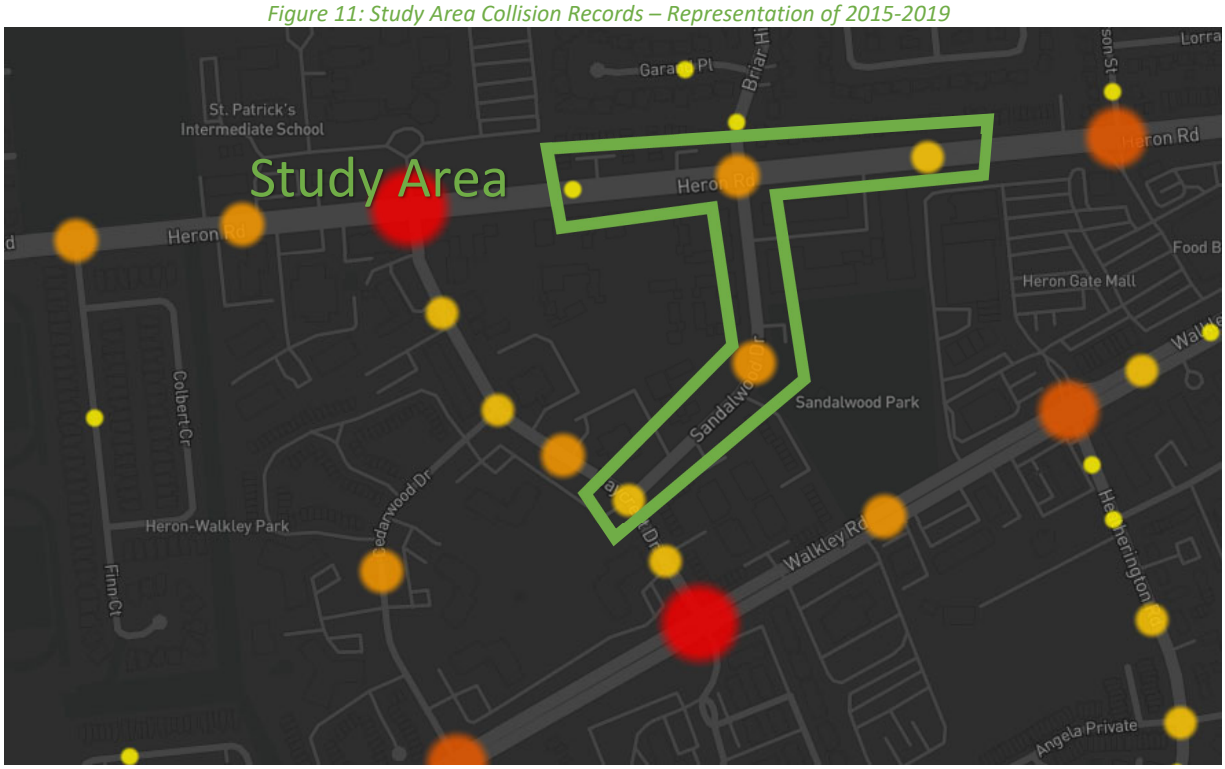


Table 4: Summary of Collision Locations, 2015-2019

	Number	%
Intersections / Segments	**35**	**100%**
Heron Rd @ Briar Hill Dr/Sandalwood Dr	14	40%
Baycrest Dr @ Sandalwood Dr	4	11%
Heron Rd btwn Baycrest Dr & Sandalwood Dr	3	9%
Sandalwood Dr btwn Baycrest Dr & Heron Rd	10	29%
Heron Rd btwn Sandalwood Dr & Jefferson St	4	11%

Within the study area, the intersection of Heron Road at Briar Hill Drive/Sandalwood Drive is noted to have experienced higher collisions than other locations. Table 5 summarizes the collision types and conditions for the location.

Table 5: Heron Road at Briar Hill Drive/Sandalwood Drive Collision Summary

		Number	%
Total Collisions		**14**	**100%**
Classification	**Fatality**	0	0%
	Non-Fatal Injury	4	29%
	Property Damage Only	10	71%
Initial Impact Type	**Angle**	5	36%
	Rear end	4	29%
	Turning Movement	4	29%
	Other	1	7%

		Number	%
Total Collisions		**14**	**100%**
Road Surface Condition	**Dry**	7	50%
	Wet	5	36%
	Slush	2	14%
Pedestrian Involved		0	0%
Cyclists Involved		0	0%

The Heron Road at Briar Hill Drive/Sandalwood Drive intersection had a total of 14 collisions during the 2015-2019 time period, with ten involving property damage only and the remaining four having non-fatal injuries. The collision types are most represented by the angle with five collisions, followed by turning movement and rear end each with four collisions, with the remaining one other collision. Weather conditions are not considered to affect collisions at this location. Overall, the collisions do not denote a pattern at this intersection and no mitigation is recommended.

2.3 Planned Conditions

2.3.1 Changes to the Area Transportation Network

The Transportation Master Plan's (TMP) Rapid Transit and Transit Priority Network identify at Grade bus rapid transit corridor along Heron Road and isolated transit priority measure along Walkley Road within the Ultimate Network Concepts Network Concept diagram, however, these do not appear within the Affordable Network diagram.

2.3.2 Other Study Area Developments

Hazelview Heron Gate Official Plan Amendment

The application supports the ZBA/OPA process to permit the re-development of the area. The proposal retains 5 of the existing residential buildings, municipally addressed as 2861 Baycrest Drive, 2851 Baycrest Drive, 2840 Baycrest Drive, 2850 Cedarwood Drive, and 2870 Cedarwood Drive. The proposed buildings range from maximum heights of 40 storeys to 25 storeys with 5443 new proposed units and 957 existing units. The proposed redevelopment area is forecasted to produce a total of 3,431 two-way people trips during the AM peak hour and a total of 3,581 two-way people trips during the PM peak hour. The redevelopment will be a phased process over 20+ years and no additional phases are identified at this time.

3 Study Area and Time Periods

3.1 Study Area

The study area will include the intersections of:

- Heron Road at:
  - Sandalwood Drive/Briar Hill Drive
  - Baycrest Drive
- Sandalwood Drive at:
  - Baycrest Drive
- Walkley Road at:
  - Baycrest Drive

The boundary roads will be Heron Road, Baycrest Drive, and Sandalwood Drive, and no screenlines are present within proximity to the site.

3.2 Time Periods

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

3.3 Horizon Years

The anticipated build-out year is 2024. As a result, the full build-out plus five years horizon year is 2029.

4 Exemption Review

Table 6 summarizes the exemptions for this TIA.

Table 6: Exemption Review

Module	Element	Explanation	Exempt/Required
Design Review Component			
4.1 Development Design	4.1.2 Circulation and Access	Only required for site plans	Required
	4.1.3 New Street Networks	Only required for plans of subdivision	Exempt
4.2 Parking	4.2.1 Parking Supply	Only required for site plans	Required
	4.2.2 Spillover Parking	Only required for site plans where parking supply is 15% below unconstrained demand	Exempt
Network Impact Component			
4.5 Transportation Demand Management	All Elements	Not required for site plans expected to have fewer than 60 employees and/or students on location at any given time	Required
4.6 Neighbourhood Traffic Management	4.6.1 Adjacent Neighbourhoods	Only required when the development relies on local or collector streets for access and total volumes exceed ATM capacity thresholds	Required
4.8 Network Concept		Only required when proposed development generates more than 200 person-trips during the peak hour in excess of equivalent volume permitted by established zoning	Exempt

5 Development-Generated Travel Demand

5.1 Mode Shares

Examining the mode shares presented in the TRANS Trip Generation Manual (2020) for Alta Vista derived from the most recent National Capital Region Origin-Destination survey (OD Survey), the existing mode shares by land use and peak period for Alta Vista have been summarized in Table 7.

Table 7: Mode Shares – Alta Vista

Travel Mode	Multi-Unit (High-Rise)	
	AM	PM
Auto Driver	38%	45%
Auto Passenger	12%	16%
Transit	42%	28%
Cycling	2%	2%
Walking	7%	9%
Total	**100%**	**100%**

5.2 Trip Generation

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

Table 8: Residential Trip Generation Person Trip Rates by Peak Period

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

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

Table 9: Total Residential Person Trip Generation by Peak Period

Land Use	Units	AM Peak Period			PM Peak Period		
		In	Out	Total	In	Out	Total
Multi-Unit (High-Rise)	305	76	168	244	160	116	275

Using the above mode share targets and using the person trip rates, the person trips by mode have been projected. Table 10 summarizes the residential trip generation by mode and peak hour using the peak hour adjustment factor.

Table 10: Total 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**	**38%**	14	31	45	**45%**	32	23	55
	Auto Passenger	**12%**	4	10	14	**16%**	11	8	19
	Transit	**42%**	17	39	56	**28%**	21	15	36
	Cycling	**2%**	1	2	3	**2%**	1	1	2
	Walking	**7%**	3	7	10	**9%**	7	5	13
	Total	**100%**	**38**	**84**	**122**	**100%**	**70**	**51**	**121**

As shown above, a total of 45 new AM and 55 new PM peak hour two-way vehicle trips are projected as a result of the proposed development.

5.3 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 Alta Vista area. Table 12 below summarizes the distributions.

Table 11: OD Survey Distribution – Alta Vista

To/From	Residential % of Trips
North	35%
South	25%
East	20%
West	20%
Total	**100%**

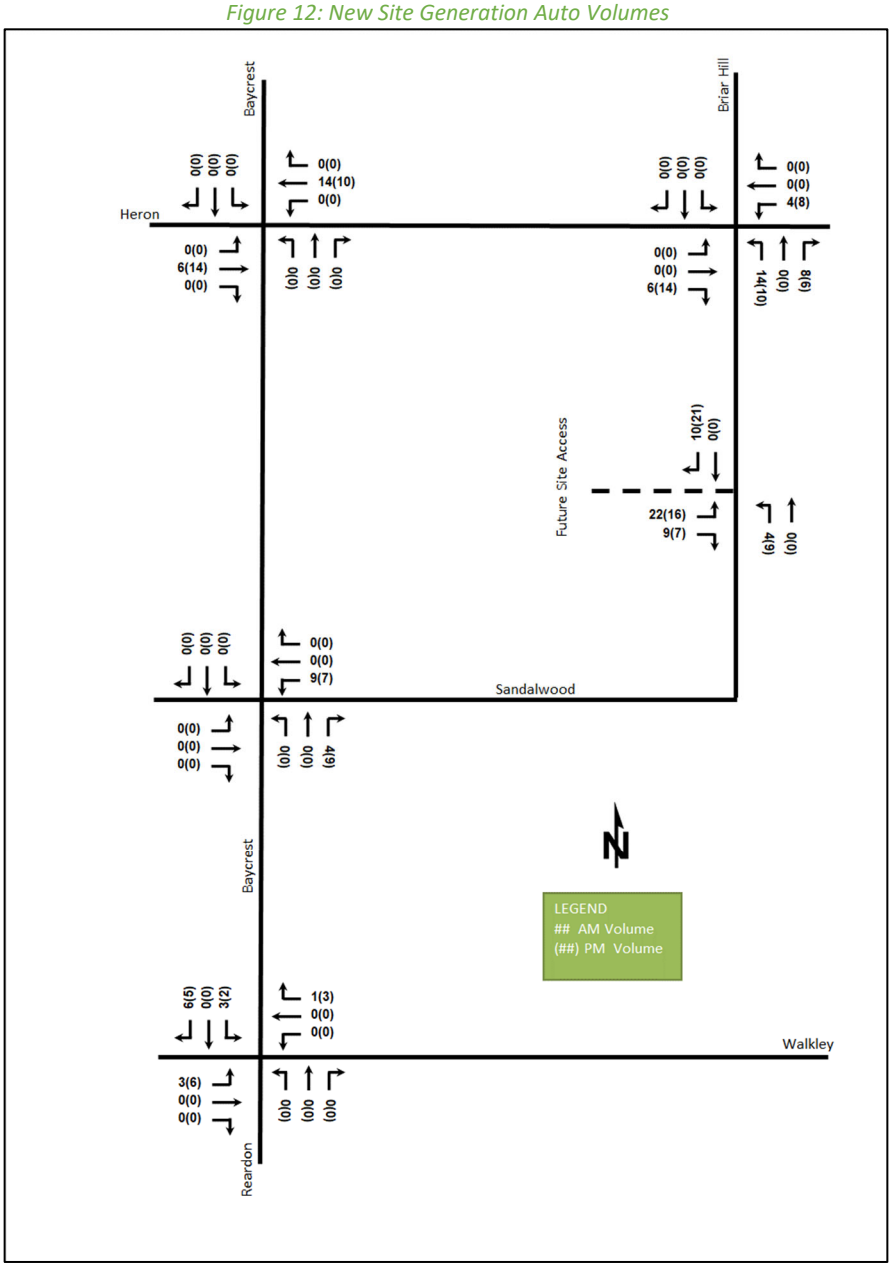
5.4 Trip Assignment

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

Table 12: Trip Assignment

To/From	Residential % of Trips
North	30% Heron Road (W), 5% Heron Road (E)
South	10% Walkley Road (E), 15% Walkley Road (W)
East	20% Heron Road (E)
West	15% Heron Road (W), 5% Walkley Road (W)
Total	**100%**

Figure 12: New Site Generation Auto Volumes



6 Background Network Travel Demands

6.1 Transportation Network Plans

The transportation network plans were discussed in Section 2.3. The Heron Road BRT is the only confirmed project within the study now understood to be beyond the existing 2031 horizon with no confirmed date and is not considered to have any notable impact on the study area traffic volumes and travel patterns.

6.2 Background Growth

A review of the background projections from the City's TRANS Regional Model for the 2011 and 2031 horizons was completed to determine the background growth for each of the study area roadways.

In general, the TRANS forecasted volumes illustrate minimal or negative growth rates from 2011 to 2031. When compared to the existing volumes, the background growth in the area has not proceeded in a linear rate. Heron Road and Walkley Road have grown higher than the forecasted volumes. Given that roadways have a finite capacity and cannot grow unconstrained, the growth rates from the existing volumes to 2031 will be used to generate the study area growth rates. Table 13 summarizes the growth rates applied within the study area, and the projections are provided in Appendix E.

Table 13: Applied Study Area Growth Rates

Street	AM Peak Hour		PM Peak Hour	
	Eastbound	**Westbound**	**Eastbound**	**Westbound**
Heron Rd	0.50%	-	-	0.50%
Walkley Rd	-	-	-	-
	Northbound	**Southbound**	**Northbound**	**Southbound**
Briar Hill Dr	5.00%	5.00%	5.00%	5.00%

6.3 Other Developments

No background developments need to be considered in the background conditions at the time of this report.

7 Demand Rationalization

7.1 2024 Future Background Operations

Figure 13 illustrates the 2024 background volumes and Table 14 summarizes the 2024 background intersection operations. The level of service for signalized intersections is based on the v/c calculation for individual lane movements and HCM 2000 v/c calculations for the overall intersection, and HCM average delay for unsignalized intersections. The synchro worksheets for the 2024 future background horizon are provided in Appendix F.

Figure 13: 2024 Future Background Volumes

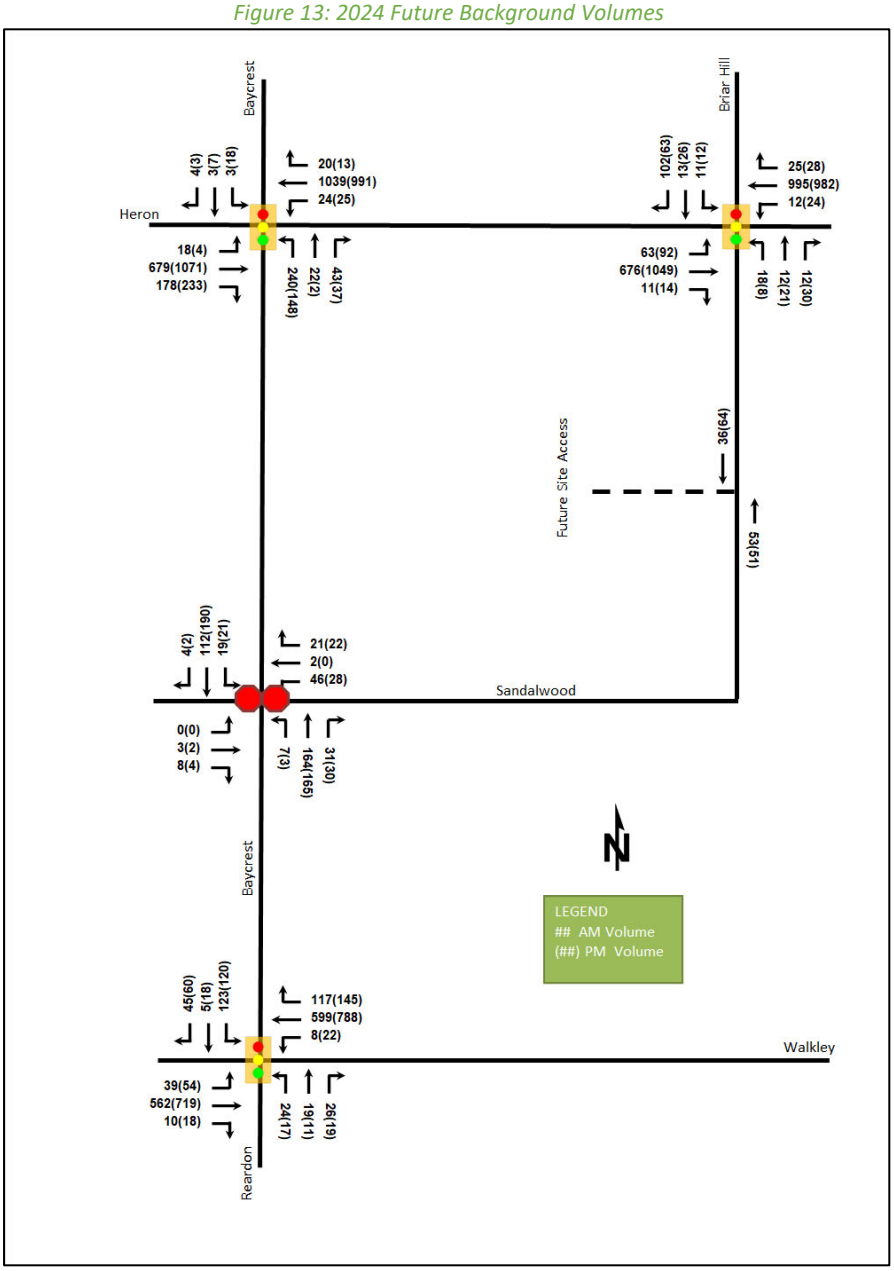


Table 14: 2024 Future Background Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
Baycrest Drive & Heron Road *Signalized*	EBL	A	0.09	12.9	5.8	A	0.01	8.8	1.7
	EBT/R	A	0.47	12.7	69.1	B	0.63	12.0	105.0
	WBL	A	0.10	15.6	m8.1	A	0.14	12.0	m8.0
	WBT/R	A	0.57	20.9	118.3	A	0.46	13.2	110.3
	NB	C	0.79	41.8	65.0	B	0.66	39.0	43.0
	SBL	A	0.01	17.7	1.9	A	0.07	23.7	6.8
	SBT/R	A	0.01	13.4	2.8	A	0.03	19.1	4.3
	Overall	**B**	**0.64**	**20.5**	-	**B**	**0.63**	**14.5**	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
Baycrest Drive & Sandalwood Drive *Unsignalized*	EB	B	0.02	10.0	0.0	B	0.01	10.7	0.0
	WB	B	0.12	12.1	3.0	B	0.08	11.6	2.3
	NB	A	0.01	7.5	0.0	A	0.00	7.7	0.0
	SB	A	0.02	7.9	0.0	A	0.02	7.7	0.0
	Overall	**A**	-	**2.8**	-	**A**	-	**1.8**	-
Walkley Road & Baycrest Drive *Signalized*	EBL	A	0.10	10.2	8.1	A	0.17	11.1	10.8
	EBT/R	A	0.27	8.5	34.7	A	0.35	9.2	45.1
	WBL	A	0.02	9.5	2.6	A	0.06	9.4	4.9
	WBT/R	A	0.35	8.6	43.1	A	0.45	9.9	59.5
	NB	A	0.19	13.5	11.2	A	0.14	14.7	10.2
	SBL	A	0.45	26.3	23.6	A	0.44	29.1	27.7
	SBT/R	A	0.13	6.9	6.5	A	0.21	9.5	10.9
	Overall	**A**	**0.40**	**10.2**	-	**A**	**0.47**	**10.9**	-
Sandalwood Drive /Briar Hill Drive & Heron Road *Signalized*	EBL	A	0.18	8.2	m21.2	A	0.31	17.0	m25.3
	EBT/R	A	0.27	6.1	72.1	A	0.48	14.6	119.2
	WBL	A	0.02	6.4	3.4	A	0.09	10.5	6.0
	WBT/R	A	0.42	6.6	75.0	A	0.45	10.6	72.7
	NBL	A	0.10	32.1	m7.2	A	0.03	25.5	m3.8
	NBT/R	A	0.10	21.4	m7.7	A	0.13	16.3	m11.1
	SBL/T	A	0.10	30.2	8.3	A	0.11	23.5	11.4
	SBT/R	A	0.33	10.0	11.1	A	0.16	7.0	8.3
	Overall	**A**	**0.39**	**7.4**	-	**A**	**0.40**	**13.0**	-

Notes: Saturation flow rate of 1800 veh/h/lane
PHF = 1.00
m = metered queue
# = volumes for the 95th %ile cycle exceeds capacity

During both the AM and PM peak hours, the study area intersections operate well and similarly to the existing conditions. No capacity issues are noted.

7.2 2029 Future Background Operations

Figure 14 illustrates the 2029 background volumes and Table 15 summarizes the 2029 background intersection operations. The level of service for signalized intersections is based on the v/c calculation calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection, and HCM average delay for unsignalized intersections. The synchro worksheets for the 2029 future background horizon are provided in Appendix G.

Figure 14: 2029 Future Background Volumes

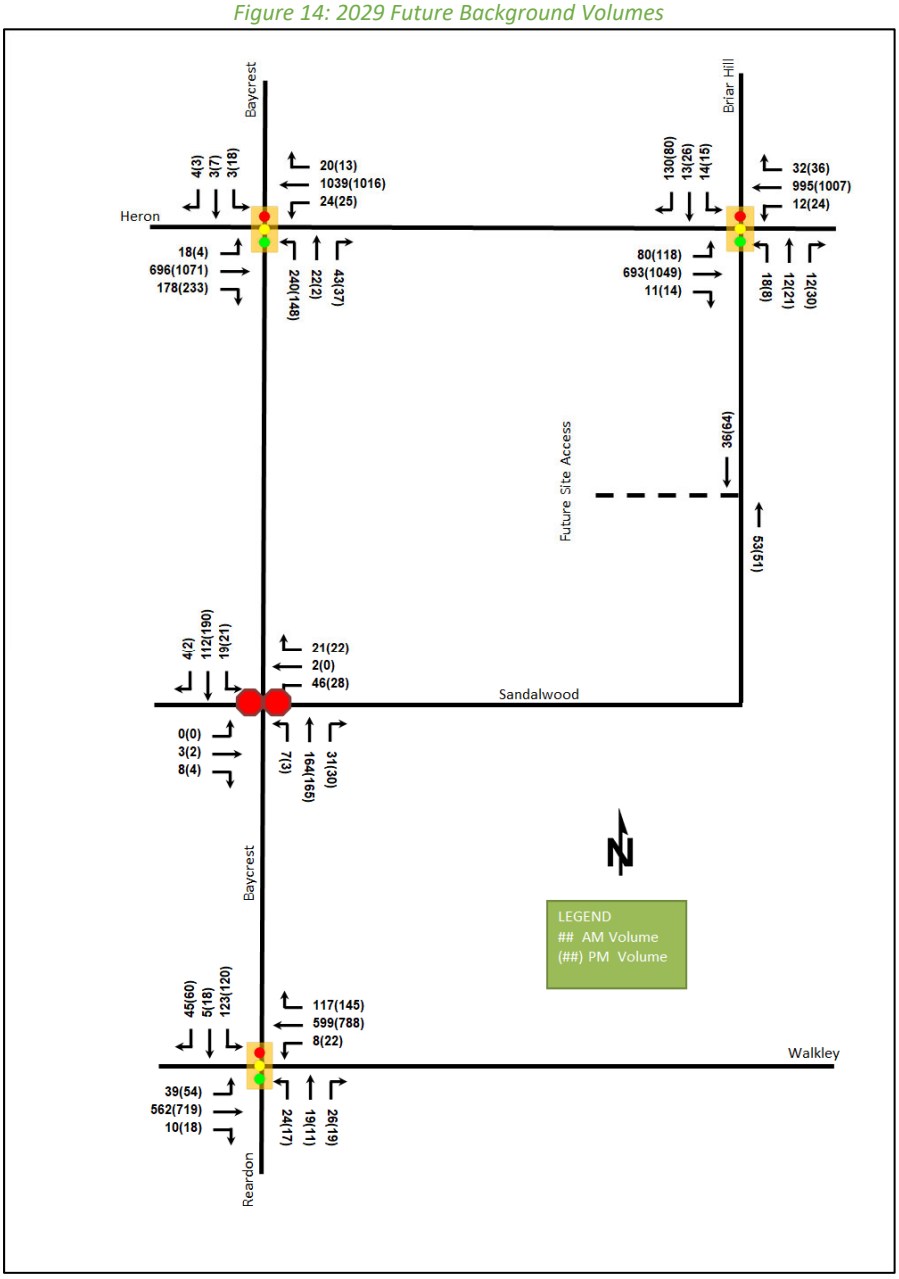


Table 15: 2029 Future Background Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
Baycrest Drive & Heron Road *Signalized*	EBL	A	0.09	12.9	5.8	A	0.01	8.8	1.7
	EBT/R	A	0.48	12.8	71.0	B	0.63	12.0	105.0
	WBL	A	0.10	15.2	m7.6	A	0.14	11.6	m7.6
	WBT/R	A	0.57	21.2	116.0	A	0.47	13.2	112.9
	NB	C	0.79	41.8	65.0	B	0.66	39.0	43.0
	SBL	A	0.01	17.7	1.9	A	0.07	23.7	6.8
	SBT/R	A	0.01	13.4	2.8	A	0.03	19.1	4.3
	Overall	**B**	**0.64**	**20.6**	-	**B**	**0.63**	**14.5**	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
Baycrest Drive & Sandalwood Drive ***Unsignalized***	EB	B	0.02	10.0	0.0	B	0.01	10.7	0.0
	WB	B	0.12	12.1	3.0	B	0.08	11.6	2.3
	NB	A	0.01	7.5	0.0	A	0.00	7.7	0.0
	SB	A	0.02	7.9	0.0	A	0.02	7.7	0.0
	Overall	**A**	-	**2.8**	-	**A**	-	**1.8**	-
Walkley Road & Baycrest Drive ***Signalized***	EBL	A	0.10	10.2	8.1	A	0.17	11.1	10.8
	EBT/R	A	0.27	8.5	34.7	A	0.35	9.2	45.1
	WBL	A	0.02	9.5	2.6	A	0.06	9.4	4.9
	WBT/R	A	0.35	8.6	43.1	A	0.45	9.9	59.5
	NB	A	0.19	13.5	11.2	A	0.14	14.7	10.2
	SBL	A	0.45	26.3	23.6	A	0.44	29.1	27.7
	SBT/R	A	0.13	6.9	6.5	A	0.21	9.5	10.9
	Overall	**A**	**0.40**	**10.2**	-	**A**	**0.47**	**10.9**	-
Sandalwood Drive /Briar Hill Drive & Heron Road ***Signalized***	EBL	A	0.25	10.1	m27.5	A	0.42	21.1	m34.9
	EBT/R	A	0.30	7.3	73.6	A	0.48	14.6	118.5
	WBL	A	0.03	6.4	3.4	A	0.09	10.5	6.0
	WBT/R	A	0.45	7.2	75.8	A	0.47	10.8	76.2
	NBL	A	0.11	32.2	m7.3	A	0.03	25.5	m3.8
	NBT/R	A	0.10	21.5	m7.6	A	0.13	16.2	m11.1
	SBL/T	A	0.12	30.6	8.9	A	0.12	23.7	12.1
	SBT/R	A	0.43	14.8	16.3	A	0.20	6.7	9.3
	Overall	**A**	**0.41**	**8.5**	-	**A**	**0.40**	**13.2**	-

Notes: Saturation flow rate of 1800 veh/h/lane
PHF = 1.00
m = metered queue
# = volumes for the 95th %ile cycle exceeds capacity

During both the AM and PM peak hours, the study area intersections operate well similarly to the 2024 background conditions. No capacity issues are noted.

7.3 Modal Share Sensitivity

No capacity constraints are noted within the study area. As such, no rationalization of the modal share and projected volumes is required.

8 Development Design

8.1 Design for Sustainable Modes

The proposed development is residential buildings. Parking is provided underground and bicycle parking is provided internal to the building. Hard surface connections are provided between all building entrances.

8.2 Circulation and Access

The site access is provided as an all-movements driveway onto Sandalwood Drive provides access to the internal parking and garbage collection. Emergency services should be able to access the site via Sandalwood Drive to the private road.

9 Parking

9.1 Parking Supply

The site provides 298 vehicle parking spaces for residents, 58 visitor parking spaces, and 153 bicycle spaces. From the zoning by-law, the required parking for the proposed site is 364 vehicle spaces for tenants, 58 vehicle spaces

for visitors, and 152 bicycle spaces. While below the minimum parking requirements the Heron Gate Secondary Plan encourages reducing parking where possible. The visitor parking and cycling spaces are satisfied and the decreased parking amount is results in a ratio of 0.98 spaces per unit. This is approximately a space per unit and not anticipated to be a substantial decrease to the parking rate for this development parcel.

10 Boundary Street Design

Table 16 summarizes the MMLOS analysis for the boundary streets of Sandalwood Drive and Heron Road. The existing and future conditions for both streets will be the same and are considered in one row. The intersection analysis is based on the land use designation of "General Urban Area". The MMLOS worksheets have been provided in Appendix H.

Table 16: Boundary Street MMLOS Analysis

Segment	Pedestrian LOS		Bicycle LOS		Transit LOS		Truck LOS	
	PLOS	Target	BLOS	Target	TLOS	Target	TrLOS	Target
Sandalwood Drive	C	C	D	D	-	-	-	-
Heron Road	**E**	C	A	B	**D**	B	A	D

The pedestrian LOS will not be met along Heron Road due to the high operating speeds of the arterial roadway. To meet pedestrian LOS targets, increase the sidewalk to be at least 2 meters and the boulevard width to be larger than 2 meters.

The transit LOS will not be met along Heron Road. To meet transit LOS, bus lane or separated ROW would be required.

11 Access Intersections Design

11.1 Location and Design of Access

The site will access Sandalwood Drive via full-movement access.

11.2 Intersection Control

Based upon the projected volumes, the site access will have stop-control on the minor approach. No further traffic control is necessary to address operational issues.

11.3 Access Intersection Design

11.3.1 2024 Future Total Access Intersection Operations

The 2024 future total intersection volumes are illustrated in Figure 15 and the access intersection operations are summarized below in Table 17. Synchro 11 has been used to model the unsignalized intersections and HCM 2010 methodology was used for unsignalized intersection operations. The synchro worksheets have been provided in Appendix I.

Figure 15: 2024 Future Total Volumes

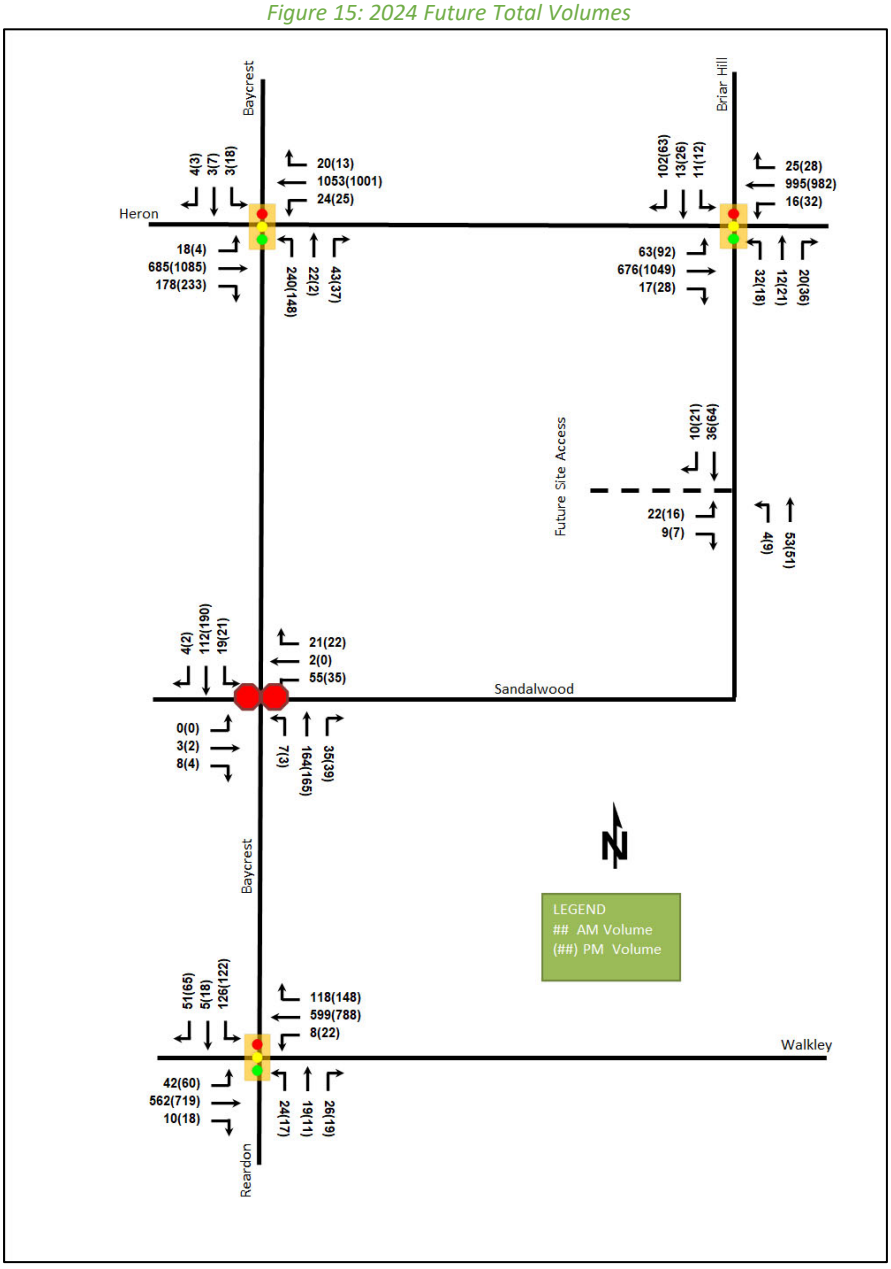


Table 17: 2024 Future Total Access Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
Sandalwood Drive & Access *Unsignalized*	EBL/R	A	0.03	9.0	0.8	A	0.03	9.2	0.8
	NBL/T	A	0.00	7.3	0.0	A	0.01	7.4	0.0
	SBT/R	-	-	-	-	-	-	-	-
	Overall	**A**	**-**	**2.3**	**-**	**A**	**-**	**1.6**	**-**

Notes: Saturation flow rate of 1800 veh/h/lane
PHF = 1.00
m = metered queue
# = volumes for the 95th %ile cycle exceeds capacity

The 2024 future total access intersection operates satisfactorily.

11.3.2 2029 Future Total Access Intersection Operations

The 2029 future total intersection volumes are illustrated in Figure 16 and the access intersection operations are summarized below in Table 18. Synchro 11 has been used to model the unsignalized intersections and HCM 2010 methodology was used for unsignalized intersection operations. The synchro worksheets have been provided in Appendix J.

Figure 16: 2029 Future Total Volumes

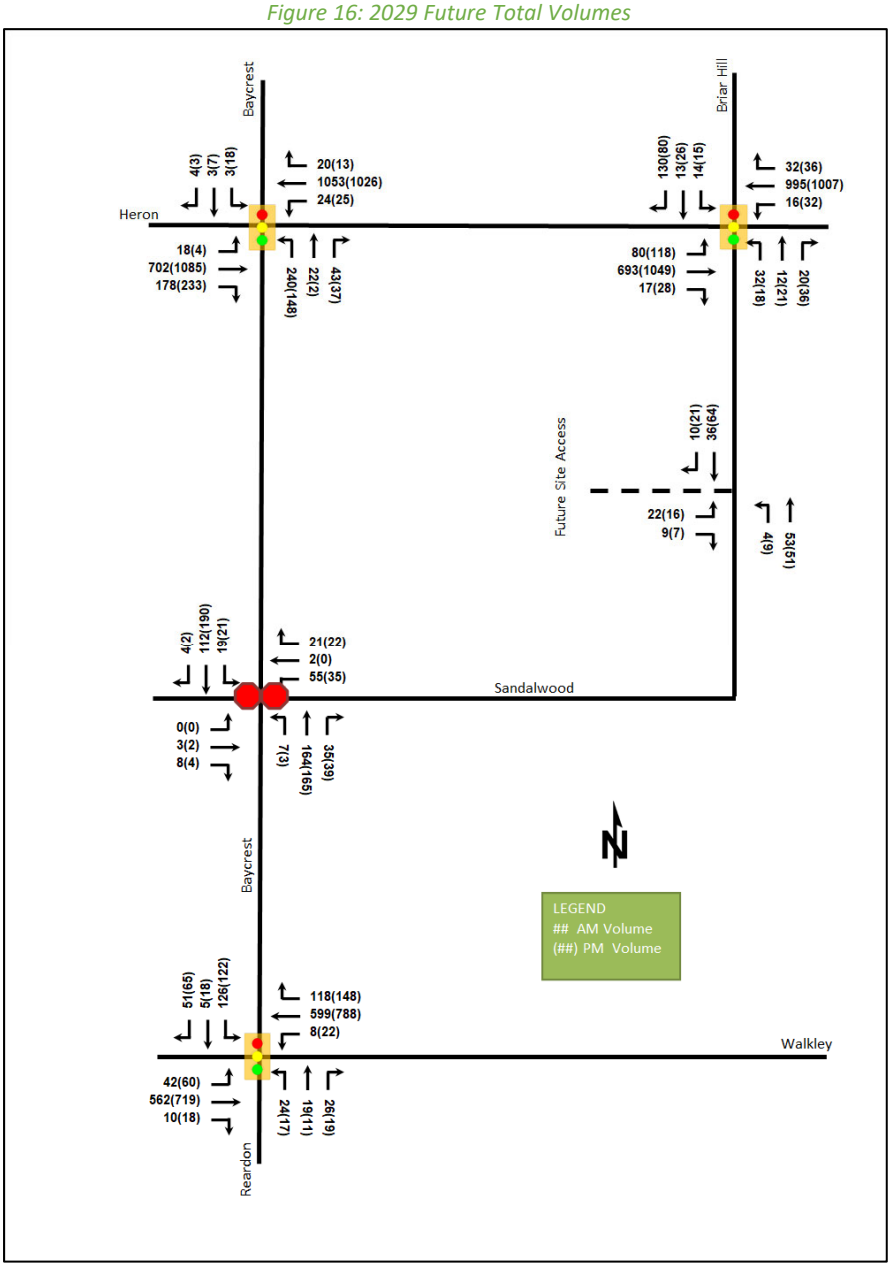


Table 18: 2029 Future Total Access Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
Sandalwood Drive & Access *Unsignalized*	EBL/R	A	0.03	9.0	0.8	A	0.03	9.2	0.8
	NBL/T	A	0.00	7.3	0.0	A	0.01	7.4	0.0
	SBT/R	-	-	-	-	-	-	-	-
	Overall	**A**	**-**	**2.3**	**-**	**A**	**-**	**1.7**	**-**

Notes: Saturation flow rate of 1800 veh/h/lane
PHF = 1.00
m = metered queue
# = volumes for the 95th %ile cycle exceeds capacity

The 2029 future total access intersection operates satisfactorily.

11.3.3 Access Intersection MMLOS

The access intersection is unsignalized, and therefore no access intersection MMLOS analysis has been conducted.

11.3.4 Recommended Design Elements

The design elements for the site intersection are consistent with the CDP recommendations.

12 Transportation Demand Management

12.1 Context for TDM

The Heron Road BRT is now understood to be beyond the existing 2031 horizon with no confirmed date. Therefore, 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 to encourage shifts towards sustainable modes.

The subject site is not within a design priority area. The total bedroom count within the development is 305 bedrooms across all three buildings. Unit types may be subject to change although should remain within this range.

12.2 Need and Opportunity

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

12.3 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 K. The key TDM measures recommended include:

- Display local area maps with walking and cycling routes, and transit route information and schedules at
- major entrances
- Provide a multimodal travel option information package to new residents
- Contract with providers to install on-site bikeshare (or other micro-mobility, e.g. scooter share) and carshare spaces
- Inclusion of a 1-year Presto card for first time new townhome purchase and 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

13 Neighbourhood Traffic Management

Site traffic is proposed to access the arterial network via Sandalwood Drive. The TIA Guidelines propose a threshold of 120 vehicles per peak hour for the classification of local roads, equivalent to 2 cars per minute, which per City guidance is to be interpreted as two-way volumes.

The existing volumes on Sandalwood Drive are 89 two-way vehicles in the AM peak hour and 115 two-way vehicles in the PM peak hour. Overall, the site is anticipated to generate approximately 45 and 55 two-way vehicle trips during the AM and PM peak hours, respectively, all of which will access Sandalwood Drive. While over the prescribed theoretical local road capacity, this volume increase is not considered a significant impact on Sandalwood Drive or requires any traffic management.

14 Transit

14.1 Route Capacity

In Section 5.1 the trip generation by mode was estimated, including an estimate of the number of transit trips that will be generated by the proposed development. Table 19 summarizes the transit trip generation.

Table 19: Trip Generation by Transit Mode

Travel Mode	Mode Share	AM Peak Period			PM Peak Period		
Transit	42% (28%)	In	Out	Total	In	Out	Total
		17	39	56	21	15	36

The proposed development is anticipated to generate an additional 53 AM peak hour transit trips and 34 PM peak hour transit trips. Of these trips, 39 outbound AM trips and 21 inbound PM trips are anticipated. From the trip distribution found in Section 5.2, these values can be further broken down.

Site-generated outbound AM trips break down to 14 trips to the north, nine trips to the south, and eight trips each to the east and west. Site-generated inbound PM trips break down to seven trips to the north, six trips to the south, and four trips each to the east and west.

The existing transit routes provide up to 12 buses at Heron Road at Baycrest Drive intersections in the peak period/direction, which would result in an under two passengers increase per bus. Therefore, no service changes are anticipated as being required to accommodate site-generated transit trips.

14.2 Transit Priority

Examining delay, negligible impacts are noted on the rapid transit movements of the eastbound through and westbound through movements at Sandalwood Drive /Briar Hill Drive and Heron Road intersections, and of the eastbound right-turn, northbound left-turn, westbound left-turn, and northbound right-turn movements at Baycrest Drive and Heron Road intersection.

Negligible impacts are also noted on the movements to and from Walkley Road.

15 Network Intersection Design

15.1 Network Intersection Control

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

15.2 Network Intersection Design

15.2.1 2024 Future Total Network Intersection Operations

The 2024 future total network intersection operations are summarized below in Table 20. The level of service for signalized intersections is based on the v/c calculation calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection, and HCM average delay for unsignalized intersections. The synchro worksheets have been provided in Appendix I.

Table 20: 2024 Future Total Network Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
Baycrest Drive & Heron Road *Signalized*	EBL	A	0.09	13.1	5.9	A	0.01	8.8	1.7
	EBT/R	A	0.47	12.7	69.7	B	0.63	12.1	107.1
	WBL	A	0.10	15.5	m8.1	A	0.14	11.9	m7.8
	WBT/R	A	0.58	20.8	118.4	A	0.47	13.0	109.7
	NB	C	0.79	41.8	65.0	B	0.66	39.0	43.0
	SBL	A	0.01	17.7	1.9	A	0.07	23.7	6.8
	SBT/R	A	0.01	13.4	2.8	A	0.03	19.1	4.3
	Overall	**B**	**0.65**	**20.4**	-	**B**	**0.63**	**14.5**	-
Baycrest Drive & Sandalwood Drive *Unsignalized*	EB	B	0.02	10.0	0.0	B	0.01	10.7	0.0
	WB	B	0.14	12.3	3.8	B	0.10	11.9	2.3
	NB	A	0.01	7.5	0.0	A	0.00	7.7	0.0
	SB	A	0.02	7.9	0.0	A	0.02	7.7	0.0
	Overall	**A**	-	**3.0**	-	**A**	-	**1.9**	-
Walkley Road & Baycrest Drive *Signalized*	EBL	A	0.11	10.3	8.5	A	0.19	11.4	11.9
	EBT/R	A	0.28	8.5	34.7	A	0.35	9.2	45.1
	WBL	A	0.02	9.5	2.6	A	0.06	9.4	4.9
	WBT/R	A	0.35	8.7	43.1	A	0.45	9.9	59.7
	NB	A	0.19	13.5	11.2	A	0.14	14.7	10.2
	SBL	A	0.46	26.5	24.0	A	0.45	29.3	28.2
	SBT/R	A	0.14	6.7	6.9	A	0.22	9.2	11.3
	Overall	**A**	**0.40**	**10.2**	-	**A**	**0.47**	**10.9**	-
Sandalwood Drive /Briar Hill Drive & Heron Road *Signalized*	EBL	A	0.18	8.2	m21.3	A	0.31	16.9	m25.0
	EBT/R	A	0.28	6.2	72.9	A	0.48	14.7	120.8
	WBL	A	0.03	6.4	4.1	A	0.12	11.0	7.5
	WBT/R	A	0.42	6.6	75.0	A	0.45	10.6	72.7
	NBL	A	0.19	33.9	m11.1	A	0.06	25.0	m6.7
	NBT/R	A	0.13	18.3	m8.4	A	0.15	14.3	m11.4
	SBL/T	A	0.10	30.3	8.3	A	0.11	23.5	11.4
	SBT/R	A	0.33	10.0	11.1	A	0.16	7.0	8.3
	Overall	**A**	**0.40**	**7.4**	-	**A**	**0.41**	**13.0**	-

Notes: Saturation flow rate of 1800 veh/h/lane
PHF = 1.00
m = metered queue
# = volumes for the 95th %ile cycle exceeds capacity

The intersections for the 2024 future total horizon in the study area generally operate similarly to the 2024 future background conditions during the peak hours. No new capacity issues are noted.

15.2.2 2029 Future Total Network Intersection Operations

The 2029 future total network intersection operations are summarized below in Table 21. The level of service for signalized intersections is based on the v/c calculation calculations for individual lane movements and HCM 2000

v/c calculations for the overall intersection, and HCM average delay for unsignalized intersections. The synchro worksheets have been provided in Appendix J.

Table 21: 2029 Future Total Network Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
Baycrest Drive & Heron Road *Signalized*	EBL	A	0.09	13.1	5.9	A	0.01	8.8	1.7
	EBT/R	A	0.48	12.9	71.7	B	0.63	12.1	107.1
	WBL	A	0.10	15.1	m7.5	A	0.14	11.6	m7.6
	WBT/R	A	0.58	21.1	116.2	A	0.48	13.0	112.0
	NB	C	0.79	41.8	65.0	B	0.66	39.0	43.0
	SBL	A	0.01	17.7	1.9	A	0.07	23.7	6.8
	SBT/R	A	0.01	13.4	2.8	A	0.03	19.1	4.3
	Overall	**B**	**0.65**	**20.5**	**-**	**B**	**0.63**	**14.5**	**-**
Baycrest Drive & Sandalwood Drive *Unsignalized*	EB	B	0.02	10.0	0.0	B	0.01	10.7	0.0
	WB	B	0.14	12.3	3.8	B	0.10	11.9	2.3
	NB	A	0.01	7.5	0.0	A	0.00	7.7	0.0
	SB	A	0.02	7.9	0.0	A	0.02	7.7	0.0
	Overall	**A**	**-**	**3.0**	**-**	**A**	**-**	**1.9**	**-**
Walkley Road & Baycrest Drive *Signalized*	EBL	A	0.11	10.3	8.5	A	0.19	11.4	11.9
	EBT/R	A	0.28	8.5	34.7	A	0.35	9.2	45.1
	WBL	A	0.02	9.5	2.6	A	0.06	9.4	4.9
	WBT/R	A	0.35	8.7	43.1	A	0.45	9.9	59.7
	NB	A	0.19	13.5	11.2	A	0.14	14.7	10.2
	SBL	A	0.46	26.5	24.0	A	0.45	29.3	28.2
	SBT/R	A	0.14	6.7	6.9	A	0.22	9.2	11.3
	Overall	**A**	**0.40**	**10.2**	**-**	**A**	**0.47**	**10.9**	**-**
Sandalwood Drive /Briar Hill Drive & Heron Road *Signalized*	EBL	A	0.25	10.0	m27.7	A	0.42	20.9	m34.3
	EBT/R	A	0.30	7.3	74.4	A	0.48	14.6	120.3
	WBL	A	0.04	6.4	4.1	A	0.12	11.0	7.5
	WBT/R	A	0.45	7.2	75.8	A	0.47	10.8	76.2
	NBL	A	0.19	33.8	m11.2	A	0.06	24.8	m6.8
	NBT/R	A	0.13	18.1	m8.4	A	0.15	14.2	m11.4
	SBL/T	A	0.12	30.7	8.9	A	0.12	23.7	12.1
	SBT/R	A	0.43	14.8	16.3	A	0.20	6.7	9.3
	Overall	**A**	**0.41**	**8.7**	**-**	**A**	**0.41**	**13.2**	**-**

Notes: Saturation flow rate of 1800 veh/h/lane
PHF = 1.00
m = metered queue
# = volumes for the 95th %ile cycle exceeds capacity

The intersections for the 2029 future total horizon in the study area operate similarly to the 2029 future background conditions during the peak hours. No new capacity issues are noted.

15.2.3 Network Intersection MMLOS

Table 22 summarizes the MMLOS analysis for the network intersections of Baycrest Drive at Heron Road, Walkley Road at Baycrest Drive, and Sandalwood Drive and Briar Hill Drive at Heron Road. The existing and future conditions for both intersections will be the same and are considered in one row. The Baycrest Drive and Heron Road intersection analysis is based on the policy area within 300m of a school, the Walkley Road and Baycrest Drive intersection analysis is based on the land use designation of “Arterial Main Street”, and the Sandalwood Drive /Briar Hill Drive and Heron Road intersection analysis is based on the land use designation of “General Uber Area”. The MMLOS worksheets have been provided in Appendix H.

Table 22: Study Area Intersection MMLOS Analysis

Intersection	Pedestrian LOS		Bicycle LOS		Transit LOS		Truck LOS		Auto LOS	
	PLOS	Target	BLOS	Target	TLOS	Target	TrLOS	Target	ALOS	Target
Baycrest Drive & Heron Road	F	A	F	A	F	A	-	-	B	E
Walkley Road & Baycrest Drive	F	B	F	C	D	D	-	-	A	D
Sandalwood Drive /Briar Hill Drive & Heron Road	F	C	F	B	C	B	-	-	A	D

The pedestrian LOS targets will not be met at the intersections throughout the study area. As typical for arterial roads, the crossing distance does not permit the targets to be met. To meet pedestrian LOS targets, the maximum crossing distance on all pedestrian crossings would need to be reduced to 7.0 metres or two lane-widths at Baycrest Drive and Heron Road intersection and Sandalwood Drive /Briar Hill Drive and Heron Road intersection and reduced to 10.5 metres or three lane-widths at Walkley Road and Baycrest Drive intersection.

The bicycle LOS targets will not be met at the intersections throughout the study area. To meet bicycle LOS at the intersections, the left-turn configurations would need to be two-stage or include turn boxes, and protected facilities would be required at the intersection approaches.

The transit LOS targets will not be met at the intersections of Baycrest Drive at Heron Road and Sandalwood Drive/Briar Hill Drive at Heron Road intersection. To meet transit LOS, the delay would need to be reduced to below 10 seconds on all transit movements.

15.2.4 Recommended Design Elements

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

16 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 305 residential units
- Access is proposed onto Sandalwood Drive via a full-moves access
- The development is proposed to be completed as a single phase by 2024
- The Trip Generation Trigger and Safety Triggers were met for the TIA Screening

Existing Conditions

- Heron Road and Walkley Road are arterial roads, and Baycrest Drive is a collector road in the study area
- Sidewalks are provided along both sides of the arterial and collector roads within the study area
- A cycle track is provided along a portion of Heron Road, a multi-use is provided pathway between Heron Road and Walkley Road in Heron-Walkley Park, and two multi-use pathways are provided on Featherston Drive between Wyndale Crescent and Jefferson Street
- Heron Road and Walkley Road are spine routes. A major pathway is provided in Orlando Park and Heron-Walkley Park. Heron Road to Walkley Road is designated as a crosstown bikeway
- The high volumes roadways have produced a high number of collisions at the study area intersections, primarily at the Heron Road at Briar Hill Drive/Sandalwood Drive (40% or 14 collisions), predominantly represented by the angle

- The study area intersections operate well during both the AM and PM peak hours

Development Generated Travel Demand

- The proposed development is forecasted to produce 122 two-way people trips during the AM peak hour and 121 two-way people trips during the PM peak hour
- Of the forecasted people trips, 45 two-way trips will be vehicle trips during the AM peak hour and 55 two-way trips are projected as a result of the proposed development based on a 38% AM and 45% PM modal share target
- Of the forecasted trips, 35% are anticipated to travel north, 25% to the south, and 20% each to the east and the west

Background Conditions

- The background developments were explicitly included in the background conditions, along with a total background growth of 0.5% per annum along with the mainline volumes on Heron Road and 5% per annum along with the mainline volumes on Briar Hill Drive
- The study area intersections at both background horizons will operate similar to the existing conditions

Development Design

- Parking is provided underground and bicycle parking is provided internal to the building
- Internal parking, garbage collection and emergency services should be accessed the site via all-movement access onto Sandalwood Drive

Parking

- The site provides 298 vehicle parking spaces for residents, 58 visitor parking spaces, and 153 bicycle spaces, which the visitor parking and cycling spaces are satisfied and the decreased parking amount is results in a ratio of 0.98 spaces per unit

Boundary Street Design

- The pedestrian LOS will not be met along Heron Road due to the high operating speeds of the arterial roadway, which require at least 2 meters of sidewalk and larger than 2 meters of Boulevard width
- The transit LOS will not be met along Heron Road which could be met by adding a bus lane or separated ROW

Access Intersections Design

- The site will access Sandalwood Drive via a full-movement access and have a stop-control on the minor approach
- The 2024 and 2029 future total access intersection operates satisfactorily

TDM

- Supportive TDM measures to be included within the proposed development should include:
    - Display local area maps with walking and cycling routes, and transit route information and schedules at major entrances
    - Provide a multimodal travel option information package to new residents
    - Contract with providers to install on-site bikeshare (or other micro-mobility, e.g. scooter share) and carshare spaces

- Inclusion of a 1-year Presto card for first time new townhome purchase and 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

NTM

- The site is anticipated to generate approximately 44 and 54 two-way vehicle trips during the AM and PM peak hours, respectively. The volume increase is not considered a significant impact on Sandalwood Drive or require any traffic management

Transit

- The development is forecasted to generate a peak direction transit trips of 56 outbound AM peak hour trips and 36 inbound PM peak hour trips
- The existing transit routes provide up to 12 buses at Heron Road at Baycrest Drive intersections in the peak period/direction, which would result in under two passengers increase per bus
- No service changes are anticipated as being required to accommodate site-generated transit trips
- Negligible impacts to the transit movement delay are noted from the additional site traffic volumes

Network Intersection Design

- Generally, the network intersections operating in the future total horizons will operate similarly to the future background conditions
- The pedestrian LOS targets will not be met at the intersections throughout the study area, which require crossing distances need to be reduced lane widths
- The transit LOS targets will not be met at the intersections of Baycrest Drive at Heron Road and Sandalwood Drive and Briar Hill Drive at Heron Road intersection, and the delay would need to be reduced to below 10 seconds on all transit movement

17 Conclusion

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

Prepared By:

Yu-Chu Chen, B.Eng.
Transportation Planner

Reviewed By:

Andrew Harte, P.Eng.
Senior Transportation Engineer

Appendix A

TIA Screening Form and PM Certification Form

13 Markham Avenue
Ottawa ON K2G 3Z1

City of Ottawa 2017 TIA Guidelines
Step 1 - Screening Form

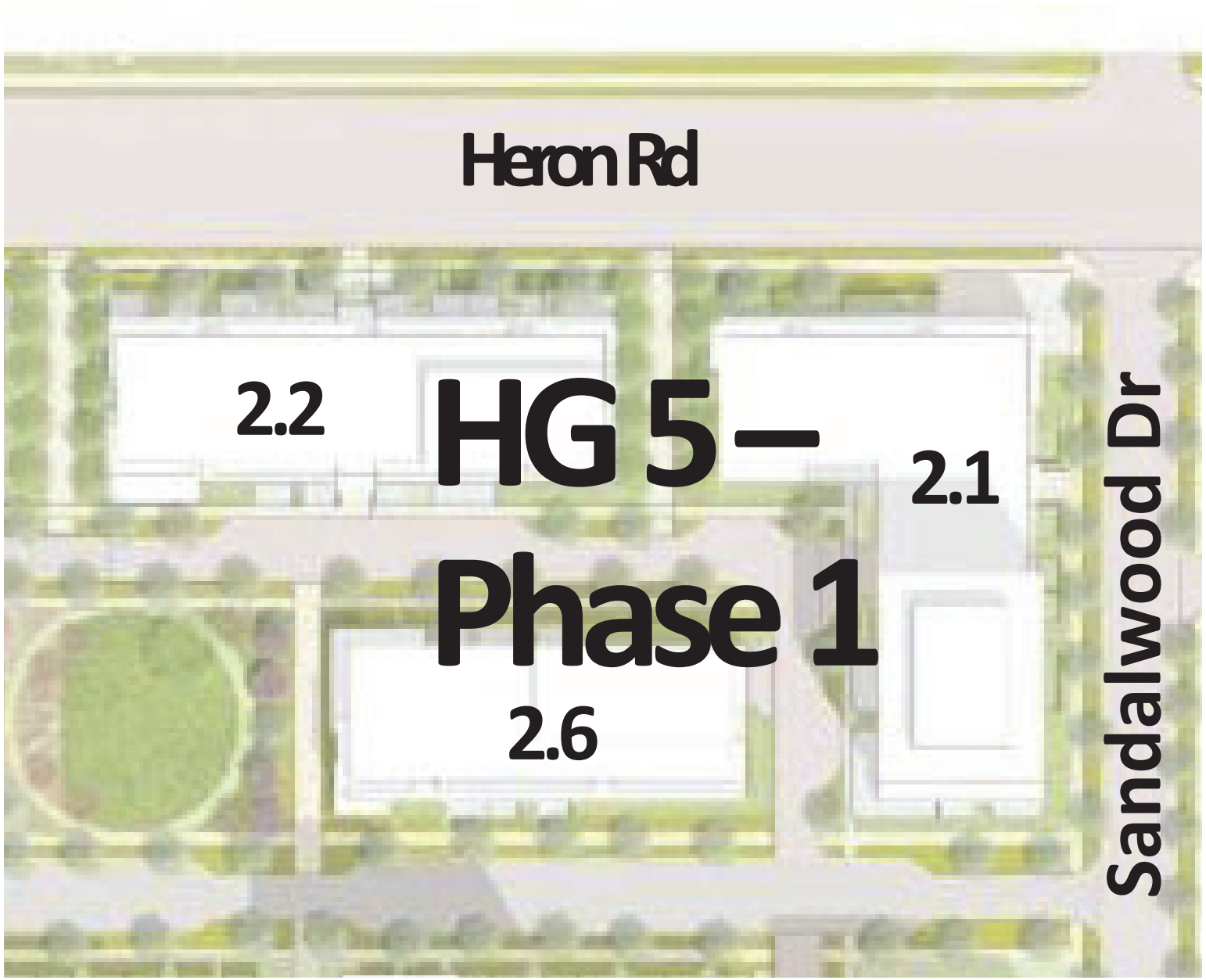
Date: 08-Jul-21
Project Number: 2020-104
Project Reference: Heron Gate 5 p1

1.1 Description of Proposed Development	
Municipal Address	2851 Baycrest Dr
Description of Location	Southwest quadrant of Heron Rd at Briar Hill Dr / Sandalwood Dr intersection
Land Use Classification	Residential Fifth Density (R5B H(18))
Development Size	289 dwelling units in three 6-storey buildings
Accesses	One via Sandalwood Dr, one ultimately onto Baycrest Dr
Phase of Development	First Phase
Buildout Year	2024
TIA Requirement	Full TIA Required

1.2 Trip Generation Trigger		
Land Use Type	Townhomes or apartments	
Development Size	289	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 City's Transit Priority, Rapid Transit or Spine Bicycle Networks?	No
Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone?	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)?	Yes
Is the proposed driveway within auxiliary lanes of an intersection?	No
Does the proposed driveway make use of an existing median break that serves an existing site?	No
Is there is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?	No
Does the development include a drive-thru facility?	No
Safety Trigger	Yes


Heron Rd
2.2
HG 5 –
Phase 1
2.1
2.6
Sandalwood Dr

TIA Plan Reports

On 14 June 2017, the Council of the City of Ottawa adopted new Transportation Impact Assessment (TIA) Guidelines. In adopting the guidelines, Council established a requirement for those preparing and delivering transportation impact assessments and reports to sign a letter of certification.

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

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

CERTIFICATION

1. I have reviewed and have a sound understanding of the objectives, needs and requirements of the City of Ottawa's Official Plan, Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines;
2. I have a sound knowledge of industry standard practice with respect to the preparation of transportation impact assessment reports, including multi modal level of service review;
3. I have substantial experience (more than 5 years) in undertaking and delivering transportation impact studies (analysis, reporting and geometric design) with strong background knowledge in transportation planning, engineering or traffic operations; and
4. I am either a licensed[1] or registered[2] professional in good standing, whose field of expertise [check √ appropriate field(s)] is either transportation engineering √ or transportation planning □.

[1,2] License of registration body that oversees the profession is required to have a code of conduct and ethics guidelines that will ensure appropriate conduct and representation for transportation planning and/or transportation engineering works.

City Of Ottawa
Infrastructure Services and Community Sustainability
Planning and Growth Management
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Ottawa, ON K1P 1J1
Tel. : 613-580-2424
Fax: 613-560-6006

Ville d'Ottawa
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Urbanisme et Gestion de la croissance
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Tél. : 613-580-2424
Télécopieur: 613-560-6006

Dated at ___Ottawa_____ this __20__ day of _____September_____, 2018.
(City)

Name: _____Andrew Harte_____
(Please Print)

Professional Title: _____Professional Engineer_____

_____
Signature of Individual certifier that s/he meets the above four criteria

Office Contact Information (Please Print)
Address: 13 Markham Avenue
City / Postal Code: Ottawa / K2G 3Z1
Telephone / Extension: (613) 697-3797
E-Mail Address: Andrew.Harte@CGHTransportation.com

Appendix B

Turning Movement Counts

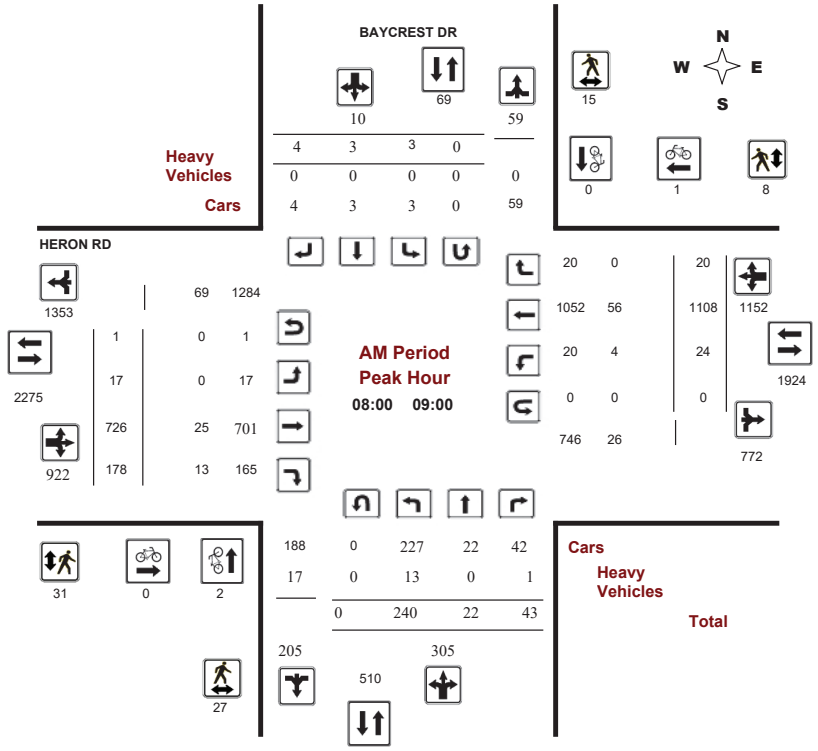
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

HERON RD @ BAYCREST DR

Survey Date: Wednesday, November 16, 2016 **WO No:** 36544

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



Comments

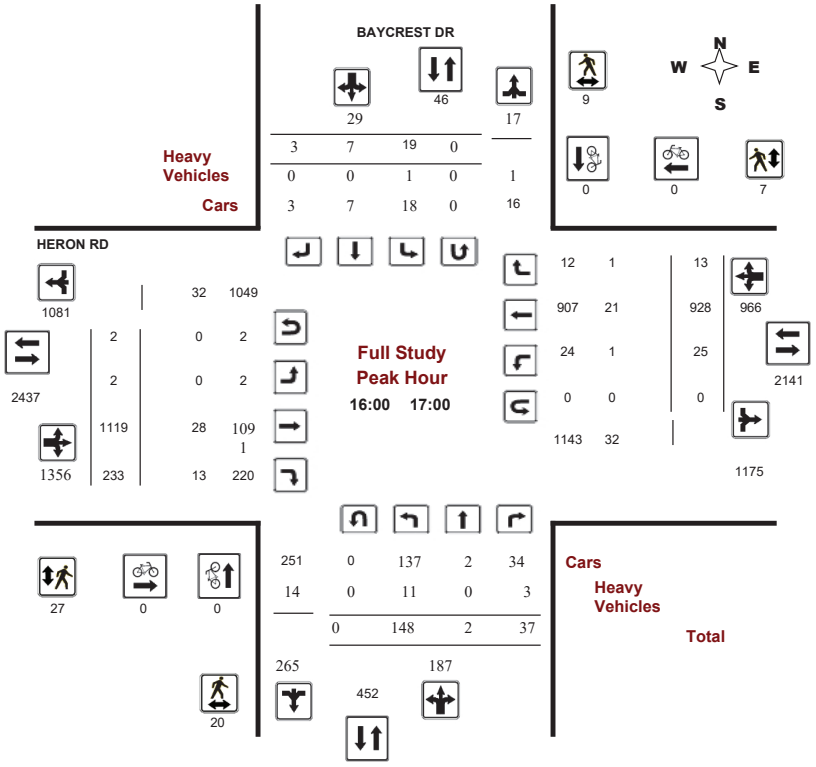
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

HERON RD @ BAYCREST DR

Survey Date: Wednesday, November 16, 2016 **WO No:** 36544

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



Comments

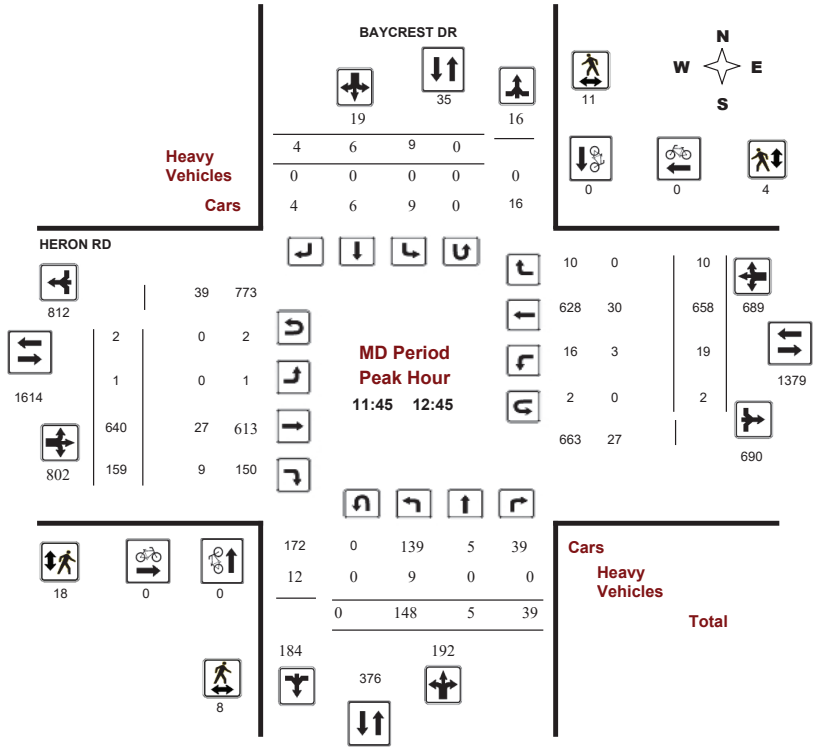
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

HERON RD @ BAYCREST DR

Survey Date: Wednesday, November 16, 2016 **WO No:** 36544

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



Comments

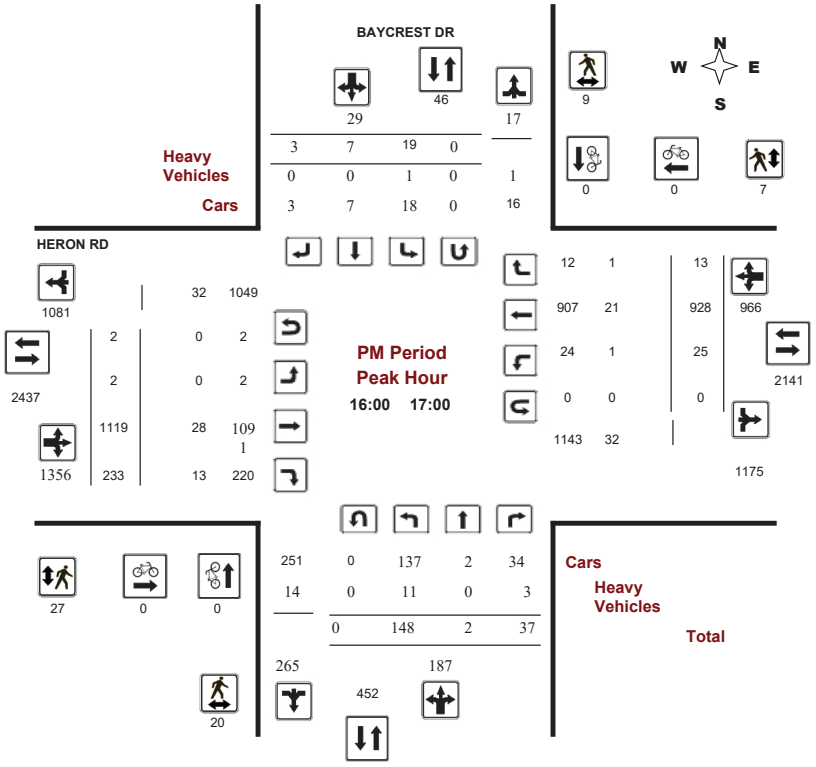
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

HERON RD @ BAYCREST DR

Survey Date: Wednesday, November 16, 2016 **WO No:** 36544

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



Comments

Transportation Services - Traffic Services

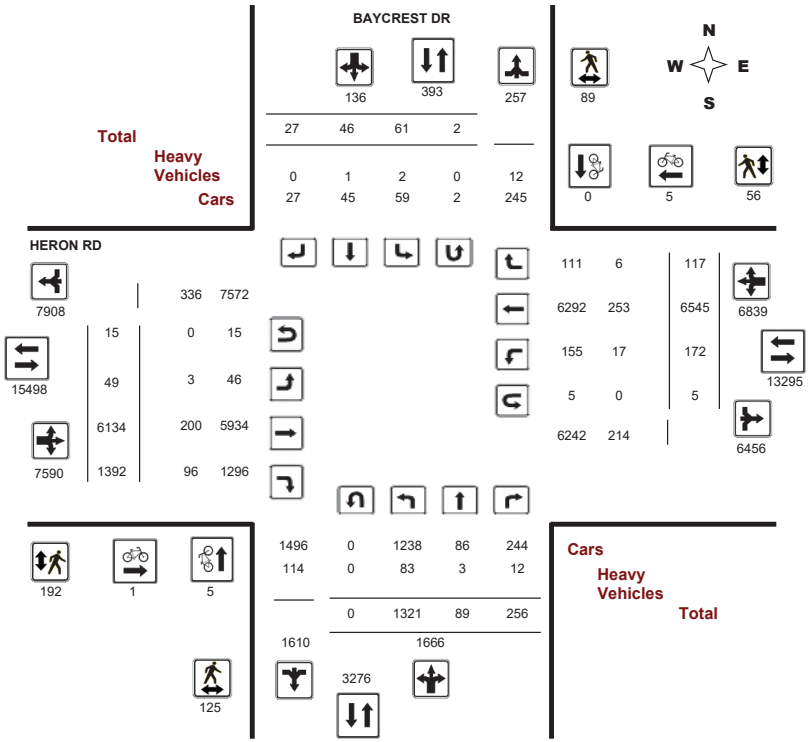
Turning Movement Count - Full Study Diagram

HERON RD @ BAYCREST DR

Survey Date: Wednesday, November 16, 2016

WO#: 36544

Device: Miovision



Comments

Transportation Services - Traffic Services

Work Order 36544

Turning Movement Count - Full Study Summary Report

HERON RD @ BAYCREST DR

Survey Date: Wednesday, November 16, 2016

Total Observed U-Turns

Northbound: 0 Southbound: 2

Eastbound: 15 Westbound: 5

AADT Factor .90

Full Study

	BAYCREST DR									HERON RD									
	Northbound				Southbound					Eastbound				Westbound					
Period	LT	ST	RT	**NB TOT**	LT	ST	RT	**SB TOT**	**STR TOT**	LT	ST	RT	**EB TOT**	LT	ST	RT	**WB TOT**	**STR TOT**	**Grand Total**
07:00 08:00	178	24	14	**216**	13	12	6	**31**	**247**	5	597	95	**697**	16	984	31	**1031**	**1728**	**1975**
08:00 09:00	240	22	43	**305**	3	3	4	**10**	**315**	17	726	178	**921**	24	1108	20	**1152**	**2073**	**2388**
09:00 10:00	169	27	25	**221**	2	5	5	**12**	**233**	9	531	126	**666**	16	649	27	**692**	**1358**	**1591**
11:30 12:30	130	4	39	**173**	10	13	6	**29**	**202**	2	640	150	**792**	18	669	9	**696**	**1488**	**1690**
12:30 13:30	138	2	12	**152**	2	2	1	**5**	**157**	0	568	159	**727**	18	608	9	**635**	**1362**	**1519**
15:00 16:00	151	7	40	**198**	11	4	0	**15**	**213**	10	986	241	**1237**	36	837	7	**880**	**2117**	**2330**
16:00 17:00	148	2	37	**187**	19	7	3	**29**	**216**	2	1119	233	**1354**	25	928	13	**966**	**2320**	**2536**
17:00 18:00	167	1	46	**214**	1	0	2	**3**	**217**	4	967	210	**1181**	19	762	1	**782**	**1963**	**2180**
Sub Total	1321	89	256	**1666**	61	46	27	**134**	**1800**	49	6134	1392	**7575**	172	6545	117	**6834**	**14409**	**16209**
U Turns				**0**				**2**	**2**				**15**				**5**	**20**	**22**
Total	1321	89	256	**1666**	61	46	27	**136**	**1802**	49	6134	1392	**7590**	172	6545	117	**6839**	**14429**	**16231**
EQ 12Hr	1836	124	356	**2316**	85	64	38	**189**	**2505**	68	8526	1935	**10550**	239	9098	163	**9506**	**20056**	**22561**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.													**1.39**						
AVG 12Hr	1653	111	320	**2084**	76	58	34	**170**	**2254**	61	7674	1741	**9495**	215	8188	146	**8556**	**18051**	**20305**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.													**.90**						
AVG 24Hr	2165	146	420	**2730**	100	75	44	**223**	**2953**	80	10052	2281	**12439**	282	10726	192	**11208**	**23647**	**26600**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.													**1.31**						

Comments:

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

Transportation Services - Traffic Services

W.O. 36544

Turning Movement Count - 15 Minute Summary Report

HERON RD @ BAYCREST DR

Survey Date: Wednesday, November 16, 2016

Total Observed U-Turns

Northbound: 0 Southbound: 2

Eastbound: 15 Westbound: 5

		BAYCREST DR									HERON RD									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	34	3	4	**41**	2	1	0	**3**	**44**	0	91	23	**114**	6	196	2	**204**	**318**	**362**
07:15	07:30	48	4	4	**56**	0	1	1	**2**	**58**	0	141	25	**166**	4	219	5	**228**	**394**	**452**
07:30	07:45	58	10	3	**71**	1	5	2	**8**	**79**	2	174	23	**199**	3	270	11	**284**	**483**	**562**
07:45	08:00	38	7	3	**48**	10	5	3	**18**	**66**	3	191	24	**218**	3	299	13	**315**	**533**	**599**
08:00	08:15	63	1	12	**76**	0	0	1	**1**	**77**	0	171	31	**202**	5	288	1	**294**	**496**	**573**
08:15	08:30	75	1	5	**81**	1	0	0	**1**	**82**	5	174	52	**232**	3	290	2	**295**	**527**	**609**
08:30	08:45	59	9	15	**83**	1	1	2	**4**	**87**	3	170	41	**214**	8	252	5	**265**	**479**	**566**
08:45	09:00	43	11	11	**65**	1	2	1	**4**	**69**	9	211	54	**274**	8	278	12	**298**	**572**	**641**
09:00	09:15	45	15	5	**65**	1	3	2	**6**	**71**	7	165	35	**207**	9	194	15	**218**	**425**	**496**
09:15	09:30	36	10	8	**54**	1	1	3	**5**	**59**	0	138	37	**175**	3	155	4	**162**	**337**	**396**
09:30	09:45	47	2	7	**56**	0	1	0	**1**	**57**	1	120	25	**147**	1	167	2	**170**	**317**	**374**
09:45	10:00	41	0	5	**46**	0	0	0	**0**	**46**	1	108	29	**138**	3	133	6	**143**	**281**	**327**
11:30	11:45	28	1	9	**38**	2	8	2	**12**	**50**	1	156	28	**186**	5	162	2	**169**	**355**	**405**
11:45	12:00	37	2	10	**49**	7	4	2	**13**	**62**	0	153	44	**198**	6	150	1	**157**	**355**	**417**
12:00	12:15	24	1	8	**33**	0	1	2	**3**	**36**	0	160	39	**199**	4	175	2	**181**	**380**	**416**
12:15	12:30	41	0	12	**53**	1	0	0	**1**	**54**	1	171	39	**212**	3	182	4	**190**	**402**	**456**
12:30	12:45	46	2	9	**57**	1	1	0	**2**	**59**	0	156	37	**193**	6	151	3	**161**	**354**	**413**
12:45	13:00	30	0	2	**32**	1	0	0	**1**	**33**	0	148	35	**184**	6	160	3	**169**	**353**	**386**
13:00	13:15	30	0	0	**30**	0	1	1	**2**	**32**	0	134	36	**170**	2	179	1	**182**	**352**	**384**
13:15	13:30	32	0	1	**33**	0	0	0	**0**	**33**	0	130	51	**184**	4	118	2	**124**	**308**	**341**
15:00	15:15	42	1	5	**48**	1	0	0	**1**	**49**	2	224	50	**276**	9	204	2	**215**	**491**	**540**
15:15	15:30	30	2	13	**45**	3	1	0	**4**	**49**	3	250	69	**322**	4	184	0	**188**	**510**	**559**
15:30	15:45	35	2	8	**45**	2	1	0	**3**	**48**	4	236	63	**304**	12	233	3	**248**	**552**	**600**
15:45	16:00	44	2	14	**60**	5	2	0	**7**	**67**	1	276	59	**336**	11	216	2	**230**	**566**	**633**
16:00	16:15	45	1	5	**51**	5	4	0	**9**	**60**	0	288	59	**347**	9	257	6	**272**	**619**	**679**
16:15	16:30	46	0	9	**55**	4	0	0	**4**	**59**	1	276	55	**332**	5	200	3	**208**	**540**	**599**
16:30	16:45	24	1	11	**36**	0	0	0	**0**	**36**	1	282	54	**339**	5	229	0	**234**	**573**	**609**
16:45	17:00	33	0	12	**45**	10	3	3	**16**	**61**	0	273	65	**338**	6	242	4	**252**	**590**	**651**
17:00	17:15	30	0	10	**40**	1	0	0	**2**	**42**	1	257	55	**314**	4	231	0	**235**	**549**	**591**
17:15	17:30	50	0	14	**64**	0	0	1	**2**	**66**	0	261	53	**314**	5	204	1	**210**	**524**	**590**
17:30	17:45	55	0	13	**68**	0	0	0	**0**	**68**	1	234	60	**296**	6	177	0	**184**	**480**	**548**
17:45	18:00	32	1	9	**42**	0	0	1	**1**	**43**	2	215	42	**260**	4	150	0	**154**	**414**	**457**
TOTAL:		1321	89	256	**1666**	61	46	27	**136**	**1802**	49	6134	1392	**7590**	172	6545	117	**6839**	**14429**	**16231**

Note: U-Turns are included in Totals.

Comment:

Transportation Services - Traffic Services

Turning Movement Count - Cyclist Volume Report

Work Order 36544

HERON RD @ BAYCREST DR

Count Date: Wednesday, November 16, 2016 **Start Time:** 07:00

	BAYCREST DR			HERON RD			
Time Period	Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00 08:00	1	0	**1**	1	2	**3**	**4**
08:00 09:00	2	0	**2**	0	1	**1**	**3**
09:00 10:00	2	0	**2**	0	0	**0**	**2**
11:30 12:30	0	0	**0**	0	1	**1**	**1**
12:30 13:30	0	0	**0**	0	0	**0**	**0**
15:00 16:00	0	0	**0**	0	1	**1**	**1**
16:00 17:00	0	0	**0**	0	0	**0**	**0**
17:00 18:00	0	0	**0**	0	0	**0**	**0**
Total	5	0	**5**	1	5	**6**	**11**

Comment:

Note: These volumes consists of bicycles only (no mopeds or motorcycles) and ARE NOT included in the Turning Movement Count Summary.

Transportation Services - Traffic Services

W.O. 36544

Turning Movement Count - Heavy Vehicle Report

HERON RD @ BAYCREST DR

Survey Date: Wednesday, November 16, 2016

Time Period		BAYCREST DR Northbound LT	ST	RT	N TOT	Southbound LT	ST	RT	S TOT	STR TOT	HERON RD Eastbound LT	ST	RT	E TOT	Westbound LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	08:00	8	3	0	**11**	1	1	0	**2**	**13**	1	8	11	**20**	5	51	4	**60**	**80**	**93**
08:00	09:00	13	0	1	**14**	0	0	0	**0**	**14**	0	25	13	**38**	4	56	0	**60**	**98**	**112**
09:00	10:00	13	0	1	**14**	0	0	0	**0**	**14**	1	25	11	**37**	1	32	1	**34**	**71**	**85**
11:30	12:30	5	0	0	**5**	0	0	0	**0**	**5**	0	25	7	**32**	2	28	0	**30**	**62**	**67**
12:30	13:30	14	0	0	**14**	0	0	0	**0**	**14**	0	30	14	**44**	1	24	0	**25**	**69**	**83**
15:00	16:00	9	0	4	**13**	0	0	0	**0**	**13**	1	30	15	**46**	3	30	0	**33**	**79**	**92**
16:00	17:00	11	0	3	**14**	1	0	0	**1**	**15**	0	28	13	**41**	1	21	1	**23**	**64**	**79**
17:00	18:00	10	0	3	**13**	0	0	0	**0**	**13**	0	29	12	**41**	0	11	0	**11**	**52**	**65**
Sub Total		83	3	12	**98**	2	1	0	**3**	**101**	3	200	96	**299**	17	253	6	**276**	**575**	**676**
U-Turns (Heavy Vehicles)					**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total		83	3	12	**0**	2	1	0	**3**	**101**	3	200	96	**299**	17	253	6	**276**	**575**	**676**

Heavy Vehicles include Buses, Single-Unit Trucks and Articulated Trucks. Further, they ARE included in the Turning Movement Count Summary.

Transportation Services - Traffic Services

Work Order 36544

Turning Movement Count - Pedestrian Volume Report

HERON RD @ BAYCREST DR

Count Date: Wednesday, November 16, 2016 **Start Time:** 07:00

Time Period		NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00	07:15	2	0	**2**	1	0	**1**	**3**
07:15	07:30	2	2	**4**	3	2	**5**	**9**
07:30	07:45	2	4	**6**	6	3	**9**	**15**
07:45	08:00	3	0	**3**	15	1	**16**	**19**
07:00	08:00	9	6	**15**	25	6	**31**	**46**
08:00	08:15	2	3	**5**	2	0	**2**	**7**
08:15	08:30	7	3	**10**	3	0	**3**	**13**
08:30	08:45	4	4	**8**	14	4	**18**	**26**
08:45	09:00	14	5	**19**	12	4	**16**	**35**
08:00	09:00	27	15	**42**	31	8	**39**	**81**
09:00	09:15	14	3	**17**	15	0	**15**	**32**
09:15	09:30	3	3	**6**	4	3	**7**	**13**
09:30	09:45	1	2	**3**	4	2	**6**	**9**
09:45	10:00	0	3	**3**	2	1	**3**	**6**
09:00	10:00	18	11	**29**	25	6	**31**	**60**
11:30	11:45	2	5	**7**	19	3	**22**	**29**
11:45	12:00	1	3	**4**	9	1	**10**	**14**
12:00	12:15	1	3	**4**	1	1	**2**	**6**
12:15	12:30	3	3	**6**	5	0	**5**	**11**
11:30	12:30	7	14	**21**	34	5	**39**	**60**
12:30	12:45	3	2	**5**	3	2	**5**	**10**
12:45	13:00	7	2	**9**	2	2	**4**	**13**
13:00	13:15	1	2	**3**	5	1	**6**	**9**
13:15	13:30	1	2	**3**	2	2	**4**	**7**
12:30	13:30	12	8	**20**	12	7	**19**	**39**
15:00	15:15	0	3	**3**	9	5	**14**	**17**
15:15	15:30	4	7	**11**	6	2	**8**	**19**
15:30	15:45	1	7	**8**	9	4	**13**	**21**
15:45	16:00	2	4	**6**	9	0	**9**	**15**
15:00	16:00	7	21	**28**	33	11	**44**	**72**
16:00	16:15	3	1	**4**	13	0	**13**	**17**
16:15	16:30	9	2	**11**	2	4	**6**	**17**
16:30	16:45	3	1	**4**	2	1	**3**	**7**
16:45	17:00	5	5	**10**	10	2	**12**	**22**
16:00	17:00	20	9	**29**	27	7	**34**	**63**
17:00	17:15	6	3	**9**	4	1	**5**	**14**
17:15	17:30	8	2	**10**	1	3	**4**	**14**
17:30	17:45	6	0	**6**	0	1	**1**	**7**
17:45	18:00	5	0	**5**	0	1	**1**	**6**
17:00	18:00	25	5	**30**	5	6	**11**	**41**
Total	.....	125	89	**214**	192	56	**248**	**462**

Comment:

Transportation Services - Traffic Services

Work Order 36544

Turning Movement Count - 15 Min U-Turn Total Report

HERON RD @ BAYCREST DR

Survey Date: Wednesday, November 16, 2016

Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	0
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	0	0	0
07:45	08:00	0	0	0	0	0
08:00	08:15	0	0	0	0	0
08:15	08:30	0	0	1	0	1
08:30	08:45	0	0	0	0	0
08:45	09:00	0	0	0	0	0
09:00	09:15	0	0	0	0	0
09:15	09:30	0	0	0	0	0
09:30	09:45	0	0	1	0	1
09:45	10:00	0	0	0	1	1
11:30	11:45	0	0	1	0	1
11:45	12:00	0	0	1	0	1
12:00	12:15	0	0	0	0	0
12:15	12:30	0	0	1	1	2
12:30	12:45	0	0	0	1	1
12:45	13:00	0	0	1	0	1
13:00	13:15	0	0	0	0	0
13:15	13:30	0	0	3	0	3
15:00	15:15	0	0	0	0	0
15:15	15:30	0	0	0	0	0
15:30	15:45	0	0	1	0	1
15:45	16:00	0	0	0	1	1
16:00	16:15	0	0	0	0	0
16:15	16:30	0	0	0	0	0
16:30	16:45	0	0	2	0	2
16:45	17:00	0	0	0	0	0
17:00	17:15	0	1	1	0	2
17:15	17:30	0	1	0	0	1
17:30	17:45	0	0	1	1	2
17:45	18:00	0	0	1	0	1
Total		0	2	15	5	22

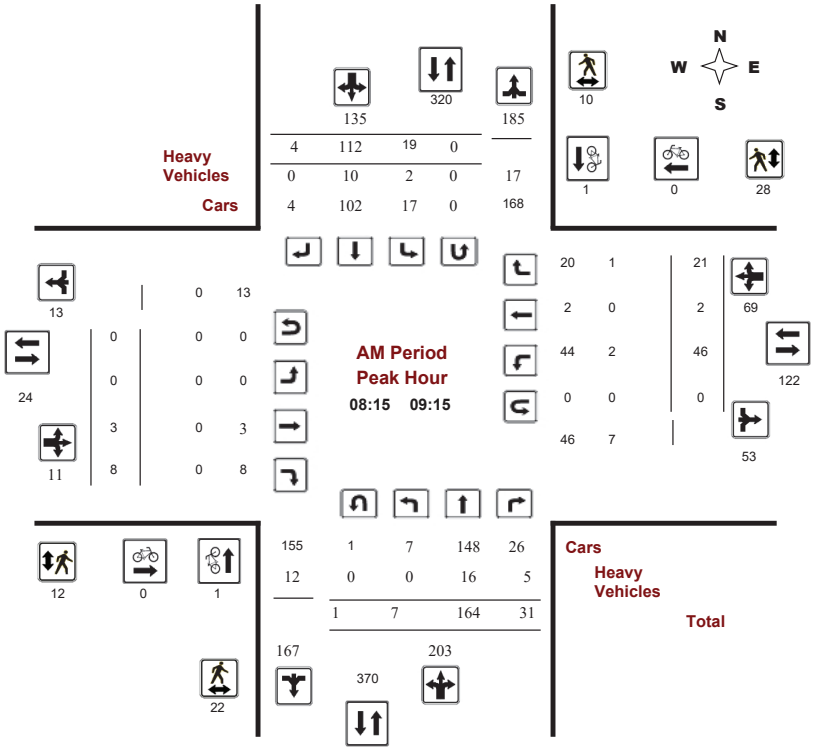
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BAYCREST DR @ SANDALWOOD DR

Survey Date: Wednesday, October 24, 2018 **WO No:** 38074

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



Comments

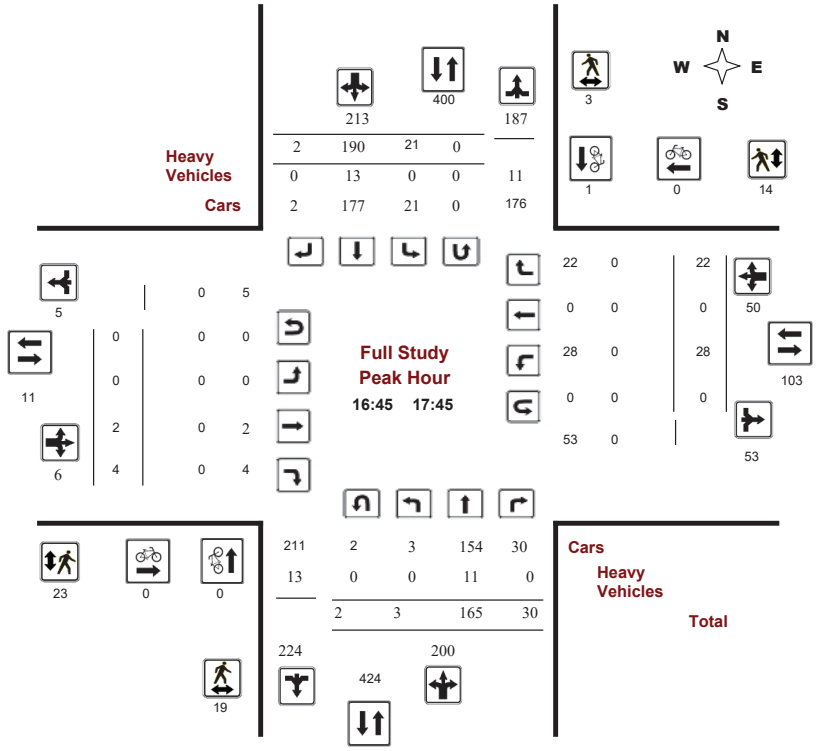
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BAYCREST DR @ SANDALWOOD DR

Survey Date: Wednesday, October 24, 2018 **WO No:** 38074

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



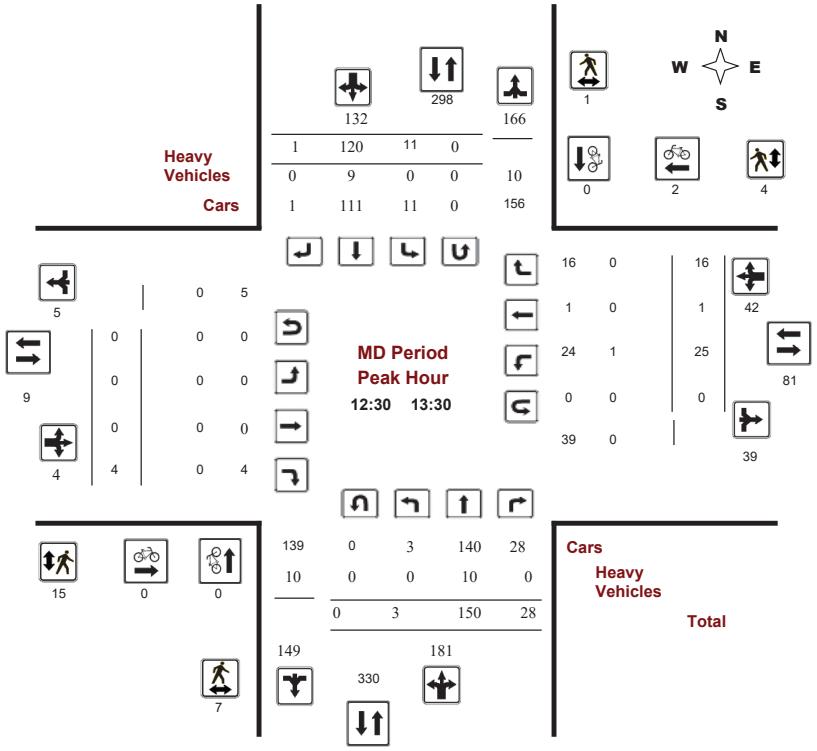
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BAYCREST DR @ SANDALWOOD DR

Survey Date: Wednesday, October 24, 2018 **WO No:** 38074

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



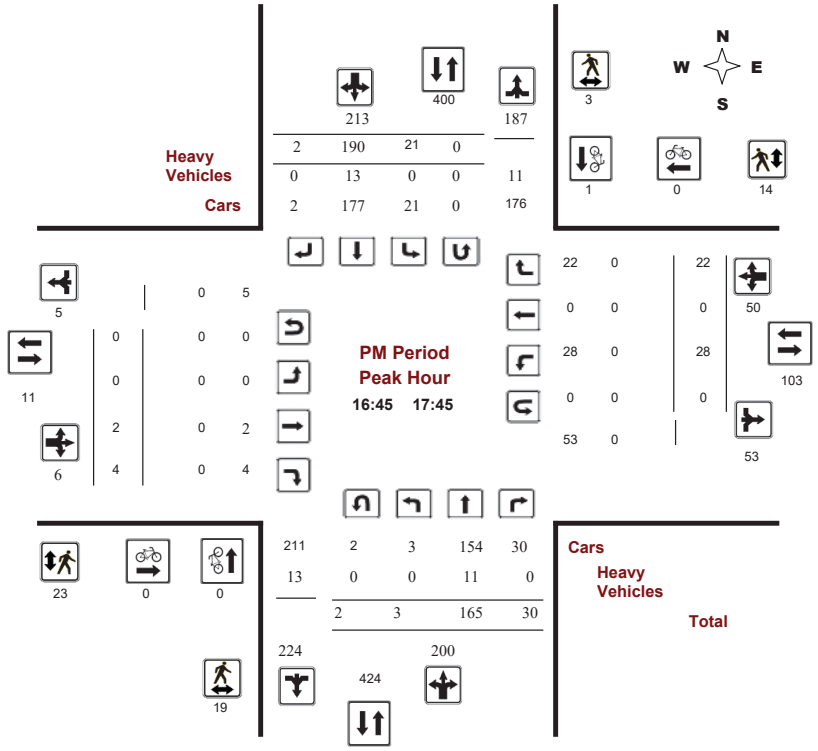
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BAYCREST DR @ SANDALWOOD DR

Survey Date: Wednesday, October 24, 2018 **WO No:** 38074

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



Comments

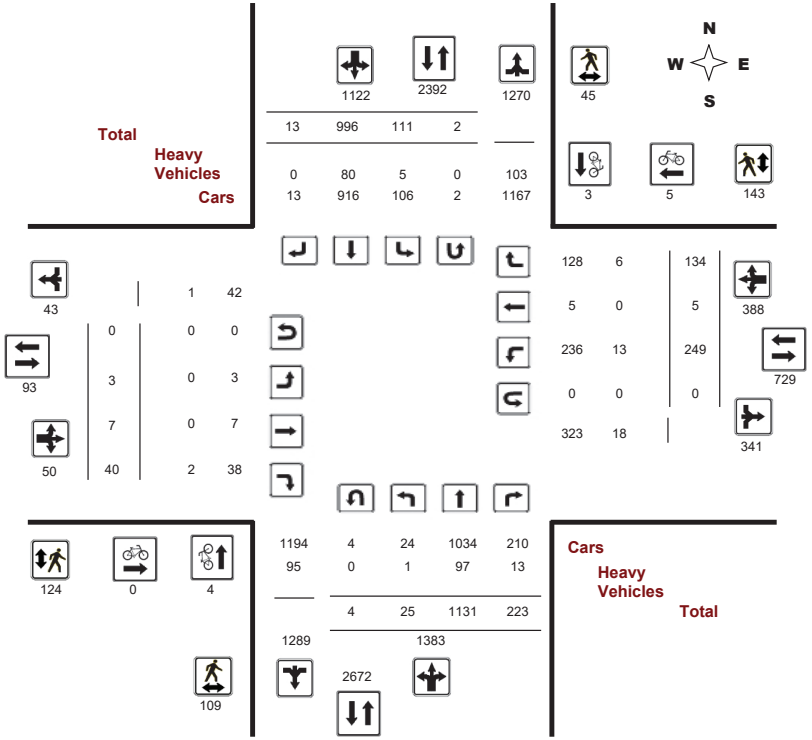
Transportation Services - Traffic Services

Turning Movement Count - Full Study Diagram

BAYCREST DR @ SANDALWOOD DR

Survey Date: Wednesday, October 24, 2018 **WO#:** 38074

Device: Miovision



Comments

Transportation Services - Traffic Services

Work Order 38074

Turning Movement Count - Full Study Summary Report

BAYCREST DR @ SANDALWOOD DR

Survey Date: Wednesday, October 24, 201

Total Observed U-Turns

Northbound: 4 Southbound: 2

Eastbound: 0 Westbound: 0

AADT Factor .90

Full Study

	Northbound				Southbound					Eastbound				Westbound					
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	0	131	11	**142**	4	83	0	**87**	**229**	0	1	3	**4**	20	0	10	**30**	**34**	**263**
08:00 09:00	5	158	35	**198**	17	101	4	**122**	**320**	0	3	8	**11**	39	2	19	**60**	**71**	**391**
09:00 10:00	7	130	29	**166**	12	102	1	**115**	**281**	0	0	8	**8**	43	0	14	**57**	**65**	**346**
11:30 12:30	2	132	29	**163**	11	97	1	**109**	**272**	1	0	3	**4**	32	0	15	**47**	**51**	**323**
12:30 13:30	3	150	28	**181**	11	120	1	**132**	**313**	0	0	4	**4**	25	1	16	**42**	**46**	**359**
15:00 16:00	3	135	32	**170**	20	149	3	**172**	**342**	2	1	5	**8**	37	1	22	**60**	**68**	**410**
16:00 17:00	4	115	34	**153**	17	161	2	**180**	**333**	0	0	7	**7**	30	0	20	**50**	**57**	**390**
17:00 18:00	1	180	25	**206**	19	183	1	**203**	**409**	0	2	2	**4**	23	1	18	**42**	**46**	**455**
Sub Total	25	1131	223	**1379**	111	996	13	**1120**	**2499**	3	7	40	**50**	249	5	134	**388**	**438**	**2937**
U Turns				**4**				**2**	**6**				**0**				**0**	**0**	**6**
Total	25	1131	223	**1383**	111	996	13	**1122**	**2505**	3	7	40	**50**	249	5	134	**388**	**438**	**2943**
EQ 12Hr	35	1572	310	**1922**	154	1384	18	**1560**	**3482**	4	10	56	**70**	346	7	186	**539**	**609**	**4091**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.													**1.39**						
AVG 12Hr	31	1415	279	**1730**	139	1246	16	**1404**	**3134**	4	9	50	**63**	311	6	168	**485**	**548**	**3682**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.													**.90**						
AVG 24Hr	41	1853	365	**2266**	182	1632	21	**1839**	**4105**	5	11	66	**82**	408	8	220	**636**	**718**	**4823**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.													**1.31**						

Comments:

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

Transportation Services - Traffic Services

W.O. 38074

Turning Movement Count - 15 Minute Summary Report

BAYCREST DR @ SANDALWOOD DR

Survey Date: Wednesday, October 24, 2018

Total Observed U-Turns

Northbound: 4 Southbound: 2

Eastbound: 0 Westbound: 0

	Northbound				Southbound					Eastbound				Westbound					
Time Period	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00 07:15	0	27	3	**30**	2	21	0	**24**	**54**	0	0	0	**0**	5	0	2	**7**	**7**	**61**
07:15 07:30	0	29	0	**29**	0	17	0	**17**	**46**	0	0	1	**1**	3	0	1	**4**	**5**	**51**
07:30 07:45	0	41	4	**45**	0	26	0	**26**	**71**	0	0	1	**1**	7	0	6	**13**	**14**	**85**
07:45 08:00	0	34	4	**38**	2	19	0	**21**	**59**	0	1	1	**2**	5	0	1	**6**	**8**	**67**
08:00 08:15	1	32	12	**45**	4	25	0	**29**	**74**	0	0	2	**2**	7	0	4	**11**	**13**	**87**
08:15 08:30	0	44	4	**49**	5	35	2	**42**	**91**	0	1	1	**2**	14	1	5	**20**	**22**	**113**
08:30 08:45	2	32	7	**41**	4	24	0	**28**	**69**	0	1	2	**3**	9	0	2	**11**	**14**	**83**
08:45 09:00	2	50	12	**64**	4	17	2	**23**	**87**	0	1	3	**4**	9	1	8	**18**	**22**	**109**
09:00 09:15	3	38	8	**49**	6	36	0	**42**	**91**	0	0	2	**2**	14	0	6	**20**	**22**	**113**
09:15 09:30	0	29	7	**36**	4	24	0	**28**	**64**	0	0	3	**3**	13	0	4	**17**	**20**	**84**
09:30 09:45	2	33	7	**42**	0	24	0	**24**	**66**	0	0	1	**1**	11	0	1	**12**	**13**	**79**
09:45 10:00	2	30	7	**39**	2	18	1	**21**	**60**	0	0	2	**2**	5	0	3	**8**	**10**	**70**
11:30 11:45	0	36	5	**41**	3	23	0	**26**	**67**	0	0	2	**2**	6	0	5	**11**	**13**	**80**
11:45 12:00	0	40	5	**45**	3	16	0	**19**	**64**	1	0	0	**1**	10	0	3	**13**	**14**	**78**
12:00 12:15	1	24	11	**36**	2	31	0	**33**	**69**	0	0	0	**0**	7	0	2	**9**	**9**	**78**
12:15 12:30	1	32	8	**41**	3	27	1	**31**	**72**	0	0	1	**1**	9	0	5	**14**	**15**	**87**
12:30 12:45	0	30	8	**38**	3	34	0	**37**	**75**	0	0	0	**0**	6	0	3	**9**	**9**	**84**
12:45 13:00	0	48	7	**55**	0	24	1	**25**	**80**	0	0	1	**1**	4	0	3	**7**	**8**	**88**
13:00 13:15	3	38	6	**47**	4	32	0	**36**	**83**	0	0	3	**3**	8	0	1	**9**	**12**	**95**
13:15 13:30	0	34	7	**41**	4	30	0	**34**	**75**	0	0	0	**0**	7	1	9	**17**	**17**	**92**
15:00 15:15	1	27	3	**31**	4	27	1	**32**	**63**	1	0	2	**3**	5	0	3	**8**	**11**	**74**
15:15 15:30	0	33	11	**44**	4	46	1	**51**	**95**	0	1	1	**2**	6	1	4	**11**	**13**	**108**
15:30 15:45	0	33	11	**44**	6	42	0	**48**	**92**	0	0	1	**1**	9	0	5	**14**	**15**	**107**
15:45 16:00	2	42	7	**51**	6	34	1	**41**	**92**	1	0	1	**2**	17	0	10	**27**	**29**	**121**
16:00 16:15	0	27	5	**32**	4	40	1	**46**	**78**	0	0	2	**2**	11	0	4	**15**	**17**	**95**
16:15 16:30	1	25	7	**34**	3	31	0	**34**	**68**	0	0	1	**1**	9	0	5	**14**	**15**	**83**
16:30 16:45	0	26	9	**35**	7	42	0	**49**	**84**	0	0	2	**2**	2	0	4	**6**	**8**	**92**
16:45 17:00	3	37	13	**53**	3	48	1	**52**	**105**	0	0	2	**2**	8	0	7	**15**	**17**	**122**
17:00 17:15	0	48	5	**55**	6	42	0	**48**	**103**	0	0	0	**0**	3	0	7	**10**	**10**	**113**
17:15 17:30	0	43	9	**52**	7	45	0	**52**	**104**	0	1	0	**1**	11	0	4	**15**	**16**	**120**
17:30 17:45	0	37	3	**40**	5	55	1	**61**	**101**	0	1	2	**3**	6	0	4	**10**	**13**	**114**
17:45 18:00	1	52	8	**61**	1	41	0	**42**	**103**	0	0	0	**0**	3	1	3	**7**	**7**	**110**
TOTAL:	25	1131	223	**1383**	111	996	13	**1122**	**2505**	3	7	40	**50**	249	5	134	**388**	**438**	**2943**

Note: U-Turns are included in Totals.

Comment:

Transportation Services - Traffic Services

Turning Movement Count - Cyclist Volume Report

Work Order 38074

BAYCREST DR @ SANDALWOOD DR

Count Date: Wednesday, October 24, 2018 **Start Time:** 07:00

Time Period	Northbound	Southbound	**Street Total**	Eastbound	Westbound	**Street Total**	**Grand Total**
07:00 08:00	0	0	**0**	0	0	**0**	**0**
08:00 09:00	1	1	**2**	0	0	**0**	**2**
09:00 10:00	0	0	**0**	0	0	**0**	**0**
11:30 12:30	0	0	**0**	0	1	**1**	**1**
12:30 13:30	0	0	**0**	0	2	**2**	**2**
15:00 16:00	0	1	**1**	0	0	**0**	**1**
16:00 17:00	3	0	**3**	0	2	**2**	**5**
17:00 18:00	0	1	**1**	0	0	**0**	**1**
Total	4	3	**7**	0	5	**5**	**12**

Comment:

Note: These volumes consists of bicycles only (no mopeds or motorcycles) and ARE NOT included in the Turning Movement Count Summary.

Transportation Services - Traffic Services

W.O. 38074

Turning Movement Count - Heavy Vehicle Report

BAYCREST DR @ SANDALWOOD DR

Survey Date: Wednesday, October 24, 2018

	Northbound				Southbound					Eastbound				Westbound					
Time Period	LT	ST	RT	**N TOT**	LT	ST	RT	**S TOT**	**STR TOT**	LT	ST	RT	**E TOT**	LT	ST	RT	**W TOT**	**STR TOT**	**Grand Total**
07:00 08:00	0	12	2	**14**	0	14	0	**14**	**28**	0	0	0	**0**	0	0	1	**1**	**1**	**29**
08:00 09:00	1	15	4	**20**	3	10	0	**13**	**33**	0	0	0	**0**	2	0	2	**4**	**4**	**37**
09:00 10:00	0	14	2	**16**	0	8	0	**8**	**24**	0	0	0	**0**	2	0	0	**2**	**2**	**26**
11:30 12:30	0	12	1	**13**	1	7	0	**8**	**21**	0	0	1	**1**	1	0	0	**1**	**2**	**23**
12:30 13:30	0	10	0	**10**	0	9	0	**9**	**19**	0	0	0	**0**	1	0	0	**1**	**1**	**20**
15:00 16:00	0	8	2	**10**	0	6	0	**6**	**16**	0	0	1	**1**	2	0	3	**5**	**6**	**22**
16:00 17:00	0	16	1	**17**	1	13	0	**14**	**31**	0	0	0	**0**	5	0	0	**5**	**5**	**36**
17:00 18:00	0	10	1	**11**	0	13	0	**13**	**24**	0	0	0	**0**	0	0	0	**0**	**0**	**24**
Sub Total	1	97	13	**111**	5	80	0	**85**	**196**	0	0	2	**2**	13	0	6	**19**	**21**	**217**
U-Turns (Heavy Vehicles)				**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total	1	97	13	**0**	5	80	0	**85**	**196**	0	0	2	**2**	13	0	6	**19**	**21**	**217**

Heavy Vehicles include Buses, Single-Unit Trucks and Articulated Trucks. Further, they ARE included in the Turning Movement Count Summary.

Transportation Services - Traffic Services

Work Order 38074

Turning Movement Count - Pedestrian Volume Report

BAYCREST DR @ SANDALWOOD DR

Count Date: Wednesday, October 24, 2018 **Start Time:** 07:00

Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	0	0	0	2	0	2	2
07:15 07:30	1	0	1	2	1	3	4
07:30 07:45	1	0	1	4	0	4	5
07:45 08:00	7	2	9	5	0	5	14
07:00 08:00	9	2	11	13	1	14	25
08:00 08:15	7	2	9	5	12	17	26
08:15 08:30	1	1	2	3	2	5	7
08:30 08:45	7	3	10	0	9	9	19
08:45 09:00	13	4	17	5	12	17	34
08:00 09:00	28	10	38	13	35	48	86
09:00 09:15	1	2	3	4	5	9	12
09:15 09:30	0	1	1	0	1	1	2
09:30 09:45	1	0	1	1	4	5	6
09:45 10:00	0	0	0	0	0	0	0
09:00 10:00	2	3	5	5	10	15	20
11:30 11:45	0	0	0	4	5	9	9
11:45 12:00	1	0	1	3	2	5	6
12:00 12:15	0	0	0	2	2	4	4
12:15 12:30	1	2	3	3	1	4	7
11:30 12:30	2	2	4	12	10	22	26
12:30 12:45	3	0	3	3	1	4	7
12:45 13:00	0	0	0	2	1	3	3
13:00 13:15	3	0	3	6	1	7	10
13:15 13:30	1	1	2	4	1	5	7
12:30 13:30	7	1	8	15	4	19	27
15:00 15:15	6	5	11	7	11	18	29
15:15 15:30	3	3	6	5	9	14	20
15:30 15:45	12	2	14	5	16	21	35
15:45 16:00	2	0	2	5	10	15	17
15:00 16:00	23	10	33	22	46	68	101
16:00 16:15	10	7	17	10	10	20	37
16:15 16:30	5	4	9	7	11	18	27
16:30 16:45	2	2	4	4	0	4	8
16:45 17:00	4	2	6	9	1	10	16
16:00 17:00	21	15	36	30	22	52	88
17:00 17:15	5	0	5	6	6	12	17
17:15 17:30	5	0	5	5	3	8	13
17:30 17:45	5	1	6	3	4	7	13
17:45 18:00	2	1	3	0	2	2	5
17:00 18:00	17	2	19	14	15	29	48
Total	109	45	154	124	143	267	421

Comment:

Transportation Services - Traffic Services

Work Order 38074

Turning Movement Count - 15 Min U-Turn Total Report

BAYCREST DR @ SANDALWOOD DR

Survey Date: Wednesday, October 24, 2018

Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	1	0	0	1
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	0	0	0
07:45	08:00	0	0	0	0	0
08:00	08:15	0	0	0	0	0
08:15	08:30	1	0	0	0	1
08:30	08:45	0	0	0	0	0
08:45	09:00	0	0	0	0	0
09:00	09:15	0	0	0	0	0
09:15	09:30	0	0	0	0	0
09:30	09:45	0	0	0	0	0
09:45	10:00	0	0	0	0	0
11:30	11:45	0	0	0	0	0
11:45	12:00	0	0	0	0	0
12:00	12:15	0	0	0	0	0
12:15	12:30	0	0	0	0	0
12:30	12:45	0	0	0	0	0
12:45	13:00	0	0	0	0	0
13:00	13:15	0	0	0	0	0
13:15	13:30	0	0	0	0	0
15:00	15:15	0	0	0	0	0
15:15	15:30	0	0	0	0	0
15:30	15:45	0	0	0	0	0
15:45	16:00	0	0	0	0	0
16:00	16:15	0	1	0	0	1
16:15	16:30	1	0	0	0	1
16:30	16:45	0	0	0	0	0
16:45	17:00	0	0	0	0	0
17:00	17:15	2	0	0	0	2
17:15	17:30	0	0	0	0	0
17:30	17:45	0	0	0	0	0
17:45	18:00	0	0	0	0	0
Total		4	2	0	0	6

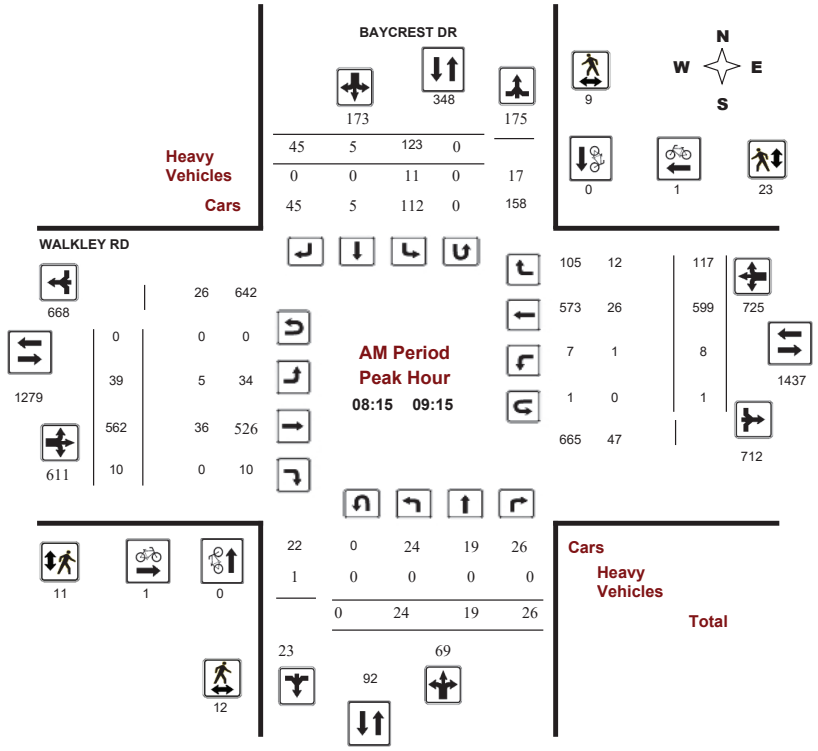
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BAYCREST DR @ WALKLEY RD

Survey Date: Wednesday, November 16, 2016 **WO No:** 36488

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



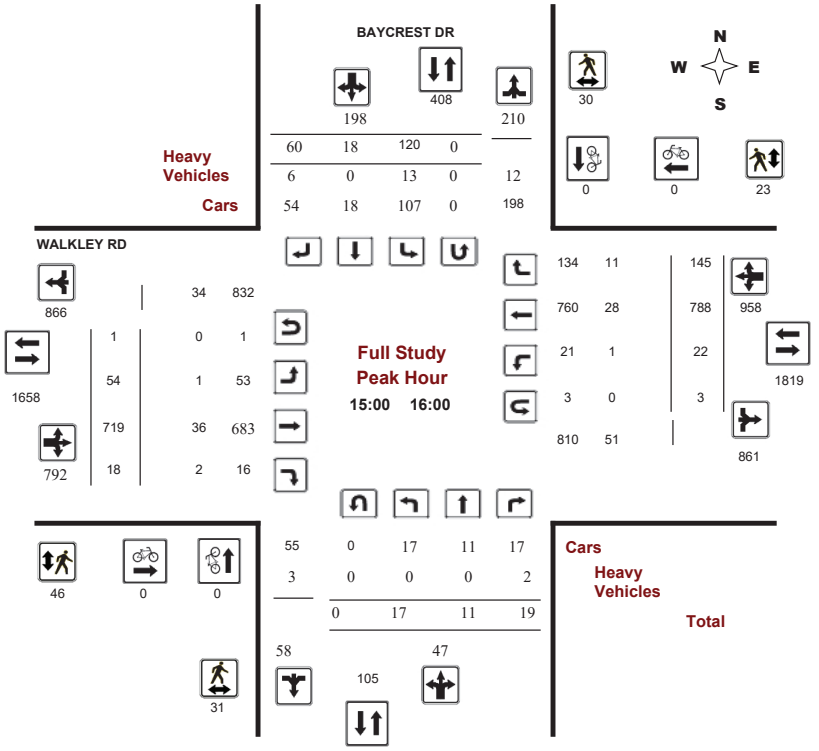
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BAYCREST DR @ WALKLEY RD

Survey Date: Wednesday, November 16, 2016 **WO No:** 36488

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



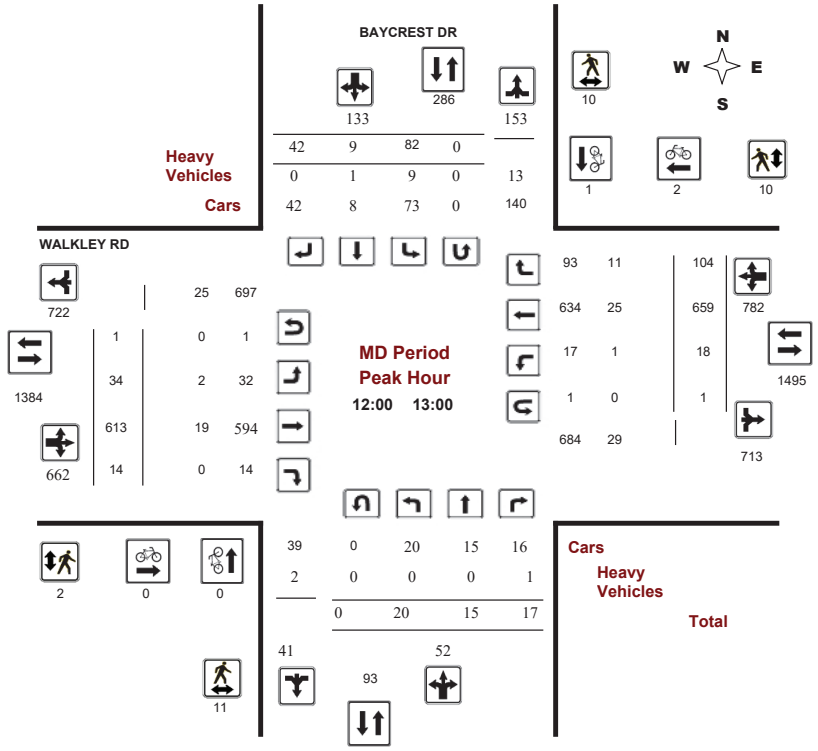
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BAYCREST DR @ WALKLEY RD

Survey Date: Wednesday, November 16, 2016 **WO No:** 36488

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



Comments

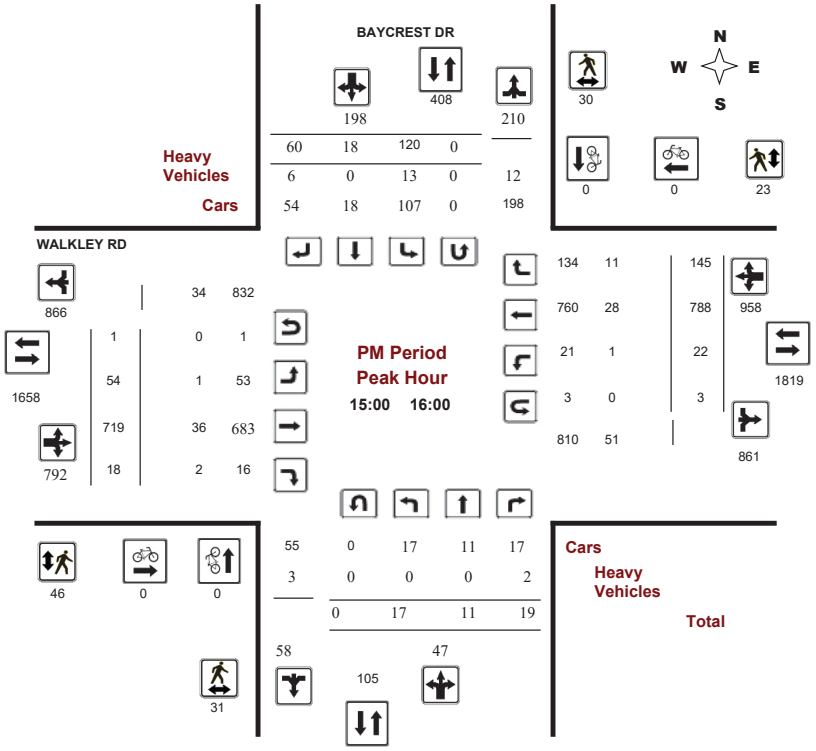
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BAYCREST DR @ WALKLEY RD

Survey Date: Wednesday, November 16, 2016 **WO No:** 36488

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



Comments

Transportation Services - Traffic Services

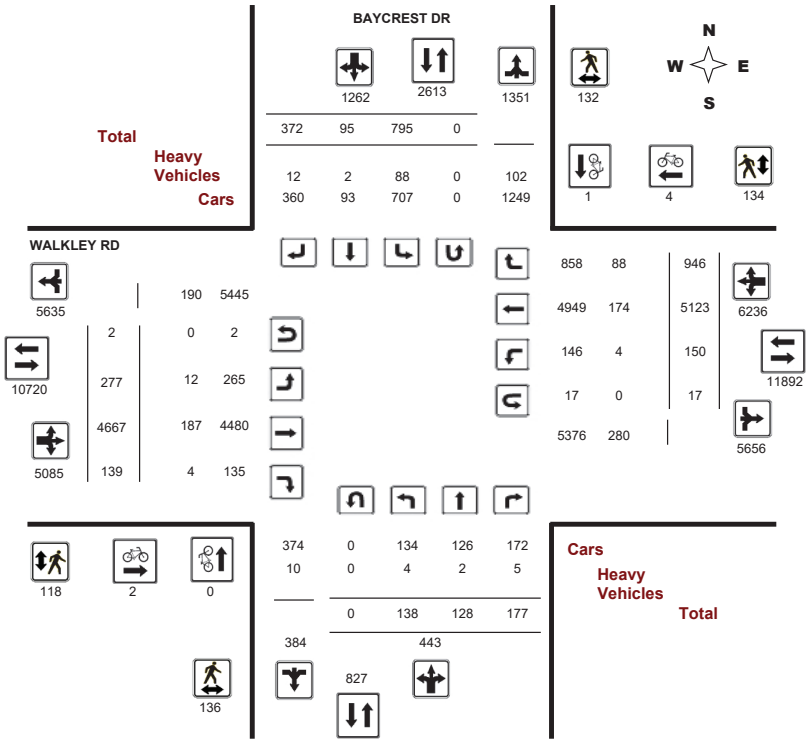
Turning Movement Count - Full Study Diagram

BAYCREST DR @ WALKLEY RD

Survey Date: Wednesday, November 16, 2016

WO#: 36488

Device: Miovision



Comments

Transportation Services - Traffic Services

Work Order 36488

Turning Movement Count - Full Study Summary Report

BAYCREST DR @ WALKLEY RD

Survey Date: Wednesday, November 16, 2016

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 2 Westbound: 17

AADT Factor .90

Full Study

	BAYCREST DR									WALKLEY RD									
	Northbound				Southbound					Eastbound				Westbound					
Period	LT	ST	RT	**NB TOT**	LT	ST	RT	**SB TOT**	**STR TOT**	LT	ST	RT	**EB TOT**	LT	ST	RT	**WB TOT**	**STR TOT**	**Grand Total**
07:00 08:00	19	24	31	**74**	93	5	38	**136**	**210**	14	454	5	**473**	9	513	107	**629**	**1102**	**1312**
08:00 09:00	25	22	25	**72**	110	6	51	**167**	**239**	34	576	9	**619**	7	587	119	**713**	**1332**	**1571**
09:00 10:00	13	17	20	**50**	82	2	36	**120**	**170**	26	518	11	**555**	11	529	129	**669**	**1224**	**1394**
11:30 12:30	10	11	16	**37**	81	4	48	**133**	**170**	32	594	11	**637**	22	645	119	**786**	**1423**	**1593**
12:30 13:30	16	14	14	**44**	100	13	40	**153**	**197**	34	567	15	**616**	14	604	92	**710**	**1326**	**1523**
15:00 16:00	17	11	19	**47**	120	18	60	**198**	**245**	54	719	18	**791**	22	788	145	**955**	**1746**	**1991**
16:00 17:00	22	10	26	**58**	103	22	55	**180**	**238**	34	642	31	**707**	35	795	115	**945**	**1652**	**1890**
17:00 18:00	16	19	26	**61**	106	25	44	**175**	**236**	49	597	39	**685**	30	662	120	**812**	**1497**	**1733**
Sub Total	138	128	177	**443**	795	95	372	**1262**	**1705**	277	4667	139	**5083**	150	5123	946	**6219**	**11302**	**13007**
U Turns				**0**				**0**	**0**				**2**				**17**	**19**	**19**
Total	138	128	177	**443**	795	95	372	**1262**	**1705**	277	4667	139	**5085**	150	5123	946	**6236**	**11321**	**13026**
EQ 12Hr	192	178	246	**616**	1105	132	517	**1754**	**2370**	385	6487	193	**7068**	208	7121	1315	**8668**	**15736**	**18106**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.													**1.39**						
AVG 12Hr	173	160	221	**554**	995	119	465	**1579**	**2133**	347	5838	174	**6361**	188	6409	1183	**7801**	**14162**	**16295**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.													**.90**						
AVG 24Hr	226	210	290	**726**	1303	156	610	**2068**	**2794**	454	7648	228	**8333**	246	8396	1550	**10220**	**18553**	**21347**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.													**1.31**						

Comments:

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

Transportation Services - Traffic Services

W.O. 36488

Turning Movement Count - 15 Minute Summary Report

BAYCREST DR @ WALKLEY RD

Survey Date: Wednesday, November 16, 2016

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 2 Westbound: 17

		BAYCREST DR								WALKLEY RD									
		Northbound				Southbound				Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	2	3	4	**9**	20	2	8	**30**	**39**	0	84	2	**86**	2	96	20	**118**	**204**	**243**
07:15	07:30	5	9	6	**20**	26	1	5	**32**	**52**	5	116	0	**121**	0	130	27	**157**	**278**	**330**
07:30	07:45	5	7	10	**22**	24	0	15	**39**	**61**	2	110	3	**115**	5	132	27	**164**	**279**	**340**
07:45	08:00	7	5	11	**23**	23	2	10	**35**	**58**	7	144	0	**151**	2	155	33	**190**	**341**	**399**
08:00	08:15	4	5	8	**17**	23	1	17	**41**	**58**	5	141	4	**150**	1	133	37	**172**	**322**	**380**
08:15	08:30	9	5	6	**20**	24	3	16	**43**	**63**	5	130	2	**137**	2	139	26	**167**	**304**	**367**
08:30	08:45	6	8	3	**17**	29	1	8	**38**	**55**	15	127	2	**144**	1	170	27	**198**	**342**	**397**
08:45	09:00	6	4	8	**18**	34	1	10	**45**	**63**	9	178	1	**188**	3	145	29	**178**	**366**	**429**
09:00	09:15	3	2	9	**14**	36	0	11	**47**	**61**	10	127	5	**142**	2	145	35	**182**	**324**	**385**
09:15	09:30	3	5	2	**10**	22	0	11	**33**	**43**	2	150	3	**155**	3	113	33	**149**	**304**	**347**
09:30	09:45	1	8	5	**14**	6	1	7	**14**	**28**	6	118	2	**126**	5	144	34	**184**	**310**	**338**
09:45	10:00	6	2	4	**12**	18	1	7	**26**	**38**	8	123	1	**132**	1	127	27	**157**	**289**	**327**
11:30	11:45	1	1	5	**7**	24	1	16	**41**	**48**	9	135	2	**146**	3	149	30	**184**	**330**	**378**
11:45	12:00	0	4	3	**7**	20	3	8	**31**	**38**	7	148	2	**157**	5	146	32	**185**	**342**	**380**
12:00	12:15	4	2	4	**10**	22	0	14	**36**	**46**	10	134	4	**148**	7	175	24	**206**	**354**	**400**
12:15	12:30	5	4	4	**13**	15	0	10	**25**	**38**	6	177	3	**186**	7	175	33	**216**	**402**	**440**
12:30	12:45	4	8	4	**16**	25	5	7	**37**	**53**	9	143	4	**157**	2	155	24	**181**	**338**	**391**
12:45	13:00	7	1	5	**13**	20	4	11	**35**	**48**	9	159	3	**171**	2	154	23	**179**	**350**	**398**
13:00	13:15	0	3	2	**5**	23	1	11	**35**	**40**	7	128	7	**142**	5	142	19	**166**	**308**	**348**
13:15	13:30	5	2	3	**10**	32	3	11	**46**	**56**	9	137	1	**147**	5	153	26	**184**	**331**	**387**
15:00	15:15	2	2	4	**8**	29	5	12	**46**	**54**	14	175	3	**192**	5	199	39	**244**	**436**	**490**
15:15	15:30	2	3	7	**12**	31	4	20	**55**	**67**	11	187	2	**200**	4	185	34	**225**	**425**	**492**
15:30	15:45	6	1	4	**11**	34	4	10	**48**	**59**	11	175	6	**193**	4	207	33	**244**	**437**	**496**
15:45	16:00	7	5	4	**16**	26	5	18	**49**	**65**	18	182	7	**207**	9	197	39	**245**	**452**	**517**
16:00	16:15	5	2	6	**13**	25	5	14	**44**	**57**	7	168	3	**178**	5	201	40	**246**	**424**	**481**
16:15	16:30	8	4	8	**20**	25	5	13	**43**	**63**	4	154	12	**170**	11	203	27	**241**	**411**	**474**
16:30	16:45	2	3	8	**13**	20	4	15	**39**	**52**	11	167	7	**185**	11	208	20	**239**	**424**	**476**
16:45	17:00	7	1	4	**12**	33	8	13	**54**	**66**	12	153	9	**174**	8	183	28	**221**	**395**	**461**
17:00	17:15	4	5	6	**15**	34	10	15	**59**	**74**	10	167	7	**184**	10	191	26	**228**	**412**	**486**
17:15	17:30	7	3	3	**13**	23	6	8	**37**	**50**	7	138	10	**155**	5	192	42	**239**	**394**	**444**
17:30	17:45	4	6	5	**15**	28	5	14	**47**	**62**	11	147	15	**173**	8	170	26	**204**	**377**	**439**
17:45	18:00	1	5	12	**18**	21	4	7	**32**	**50**	21	145	7	**173**	7	109	26	**143**	**316**	**366**
TOTAL:		138	128	177	**443**	795	95	372	**1262**	**1705**	277	4667	139	**5085**	150	5123	946	**6236**	**11321**	**13026**

Note: U-Turns are included in Totals.

Comment:

Transportation Services - Traffic Services

Turning Movement Count - Cyclist Volume Report

Work Order 36488

BAYCREST DR @ WALKLEY RD

Count Date: Wednesday, November 16, 2016 **Start Time:** 07:00

	BAYCREST DR			WALKLEY RD			
Time Period	Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00 08:00	0	0	**0**	0	0	**0**	**0**
08:00 09:00	0	0	**0**	1	1	**2**	**2**
09:00 10:00	0	0	**0**	0	0	**0**	**0**
11:30 12:30	0	0	**0**	0	2	**2**	**2**
12:30 13:30	0	1	**1**	0	1	**1**	**2**
15:00 16:00	0	0	**0**	0	0	**0**	**0**
16:00 17:00	0	0	**0**	0	0	**0**	**0**
17:00 18:00	0	0	**0**	1	0	**1**	**1**
Total	0	1	**1**	2	4	**6**	**7**

Comment:

Note: These volumes consists of bicycles only (no mopeds or motorcycles) and ARE NOT included in the Turning Movement Count Summary.

Transportation Services - Traffic Services

W.O. 36488

Turning Movement Count - Heavy Vehicle Report

BAYCREST DR @ WALKLEY RD

Survey Date: Wednesday, November 16, 2016

Time Period		BAYCREST DR Northbound LT	ST	RT	N TOT	Southbound LT	ST	RT	S TOT	STR TOT	WALKLEY RD Eastbound LT	ST	RT	E TOT	Westbound LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	08:00	0	0	0	**0**	13	0	1	**14**	**14**	0	31	0	**31**	0	36	12	**48**	**79**	**93**
08:00	09:00	0	0	0	**0**	13	0	1	**14**	**14**	6	30	0	**36**	1	30	11	**42**	**78**	**92**
09:00	10:00	1	0	0	**1**	9	1	0	**10**	**11**	3	33	0	**36**	0	18	11	**29**	**65**	**76**
11:30	12:30	0	0	0	**0**	9	0	1	**10**	**10**	1	19	0	**20**	0	26	9	**35**	**55**	**65**
12:30	13:30	1	1	1	**3**	9	1	1	**11**	**14**	1	16	0	**17**	2	25	10	**37**	**54**	**68**
15:00	16:00	0	0	2	**2**	13	0	6	**19**	**21**	1	36	2	**39**	1	28	11	**40**	**79**	**100**
16:00	17:00	2	0	2	**4**	11	0	2	**13**	**17**	0	15	2	**17**	0	7	12	**19**	**36**	**53**
17:00	18:00	0	1	0	**1**	11	0	0	**11**	**12**	0	7	0	**7**	0	4	12	**16**	**23**	**35**
Sub Total		4	2	5	**11**	88	2	12	**102**	**113**	12	187	4	**203**	4	174	88	**266**	**469**	**582**
U-Turns (Heavy Vehicles)					**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total		4	2	5	**0**	88	2	12	**102**	**113**	12	187	4	**203**	4	174	88	**266**	**469**	**582**

Heavy Vehicles include Buses, Single-Unit Trucks and Articulated Trucks. Further, they ARE included in the Turning Movement Count Summary.

Transportation Services - Traffic Services

Work Order 36488

Turning Movement Count - Pedestrian Volume Report

BAYCREST DR @ WALKLEY RD

Count Date: Wednesday, November 16, 2016 **Start Time:** 07:00

Time Period		NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00	07:15	1	2	**3**	1	2	**3**	**6**
07:15	07:30	2	0	**2**	0	2	**2**	**4**
07:30	07:45	0	3	**3**	1	8	**9**	**12**
07:45	08:00	1	8	**9**	20	0	**20**	**29**
07:00	08:00	4	13	**17**	22	12	**34**	**51**
08:00	08:15	10	10	**20**	10	9	**19**	**39**
08:15	08:30	2	4	**6**	1	5	**6**	**12**
08:30	08:45	5	1	**6**	5	6	**11**	**17**
08:45	09:00	0	3	**3**	4	6	**10**	**13**
08:00	09:00	17	18	**35**	20	26	**46**	**81**
09:00	09:15	5	1	**6**	1	6	**7**	**13**
09:15	09:30	3	3	**6**	0	3	**3**	**9**
09:30	09:45	4	2	**6**	4	2	**6**	**12**
09:45	10:00	4	0	**4**	2	1	**3**	**7**
09:00	10:00	16	6	**22**	7	12	**19**	**41**
11:30	11:45	4	3	**7**	1	1	**2**	**9**
11:45	12:00	4	2	**6**	1	7	**8**	**14**
12:00	12:15	1	5	**6**	0	4	**4**	**10**
12:15	12:30	3	1	**4**	0	0	**0**	**4**
11:30	12:30	12	11	**23**	2	12	**14**	**37**
12:30	12:45	2	2	**4**	1	4	**5**	**9**
12:45	13:00	5	2	**7**	1	2	**3**	**10**
13:00	13:15	4	2	**6**	0	2	**2**	**8**
13:15	13:30	6	2	**8**	2	3	**5**	**13**
12:30	13:30	17	8	**25**	4	11	**15**	**40**
15:00	15:15	6	15	**21**	30	4	**34**	**55**
15:15	15:30	8	1	**9**	7	7	**14**	**23**
15:30	15:45	8	5	**13**	9	3	**12**	**25**
15:45	16:00	9	9	**18**	0	9	**9**	**27**
15:00	16:00	31	30	**61**	46	23	**69**	**130**
16:00	16:15	5	9	**14**	4	9	**13**	**27**
16:15	16:30	6	6	**12**	0	3	**3**	**15**
16:30	16:45	2	3	**5**	2	5	**7**	**12**
16:45	17:00	8	5	**13**	6	4	**10**	**23**
16:00	17:00	21	23	**44**	12	21	**33**	**77**
17:00	17:15	3	5	**8**	2	6	**8**	**16**
17:15	17:30	7	11	**18**	1	3	**4**	**22**
17:30	17:45	3	3	**6**	1	3	**4**	**10**
17:45	18:00	5	4	**9**	1	5	**6**	**15**
17:00	18:00	18	23	**41**	5	17	**22**	**63**
Total	.....	136	132	**268**	118	134	**252**	**520**

Comment:

Transportation Services - Traffic Services

Work Order 36488

Turning Movement Count - 15 Min U-Turn Total Report

BAYCREST DR @ WALKLEY RD

Survey Date: Wednesday, November 16, 2016

Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	0
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	0	0	0
07:45	08:00	0	0	0	0	0
08:00	08:15	0	0	0	1	1
08:15	08:30	0	0	0	0	0
08:30	08:45	0	0	0	0	0
08:45	09:00	0	0	0	1	1
09:00	09:15	0	0	0	0	0
09:15	09:30	0	0	0	0	0
09:30	09:45	0	0	0	1	1
09:45	10:00	0	0	0	2	2
11:30	11:45	0	0	0	2	2
11:45	12:00	0	0	0	2	2
12:00	12:15	0	0	0	0	0
12:15	12:30	0	0	0	1	1
12:30	12:45	0	0	1	0	1
12:45	13:00	0	0	0	0	0
13:00	13:15	0	0	0	0	0
13:15	13:30	0	0	0	0	0
15:00	15:15	0	0	0	1	1
15:15	15:30	0	0	0	2	2
15:30	15:45	0	0	1	0	1
15:45	16:00	0	0	0	0	0
16:00	16:15	0	0	0	0	0
16:15	16:30	0	0	0	0	0
16:30	16:45	0	0	0	0	0
16:45	17:00	0	0	0	2	2
17:00	17:15	0	0	0	1	1
17:15	17:30	0	0	0	0	0
17:30	17:45	0	0	0	0	0
17:45	18:00	0	0	0	1	1
Total		0	0	2	17	19

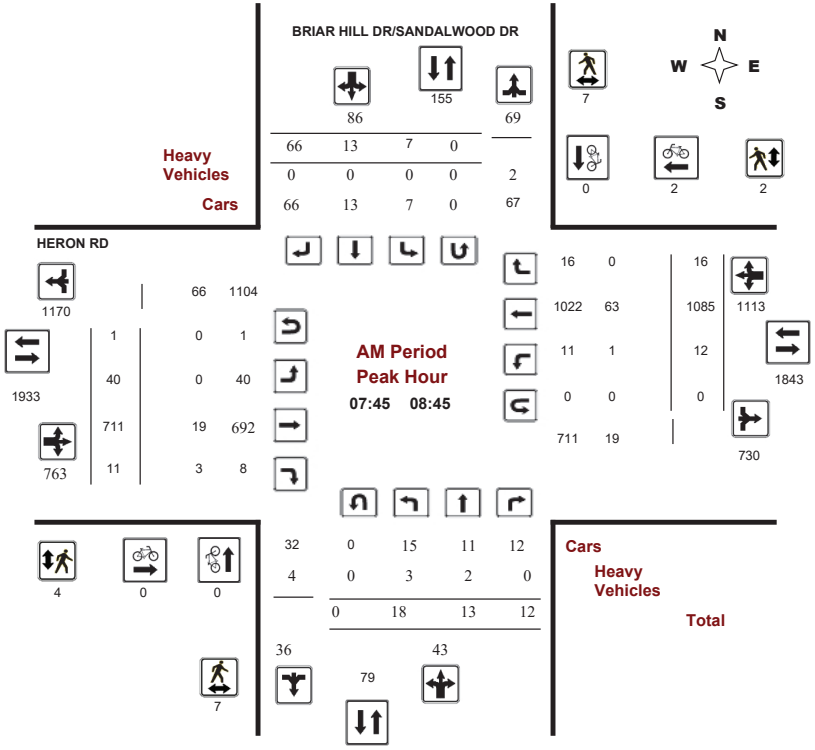
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

HERON RD @ BRIAR HILL DR/SANDALWOOD DR

Survey Date: Wednesday, November 16, 2016 **WO No:** 36492

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



Comments

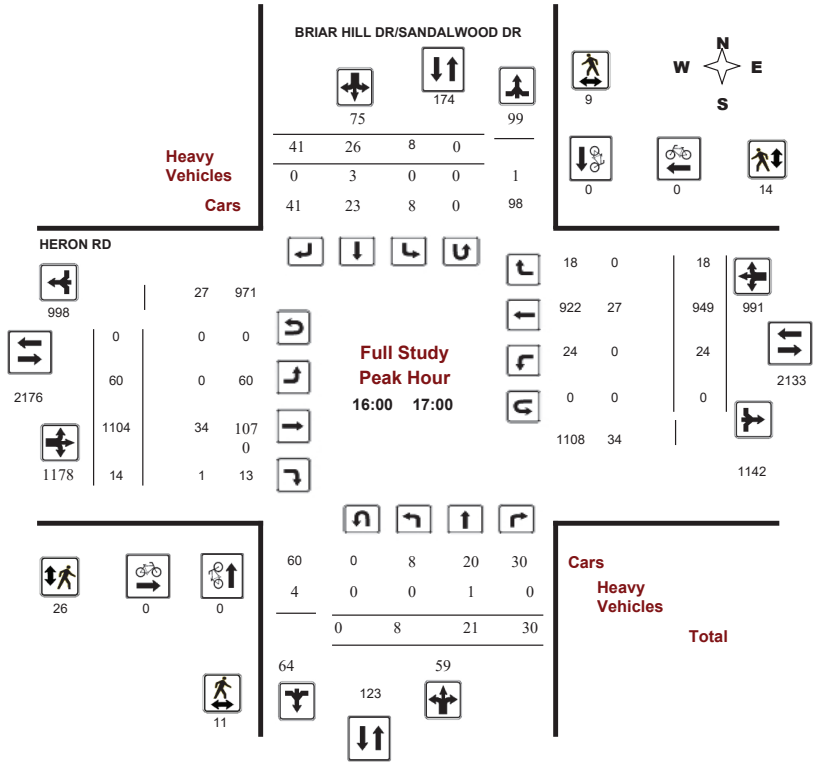
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

HERON RD @ BRIAR HILL DR/SANDALWOOD DR

Survey Date: Wednesday, November 16, 2016 **WO No:** 36492

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



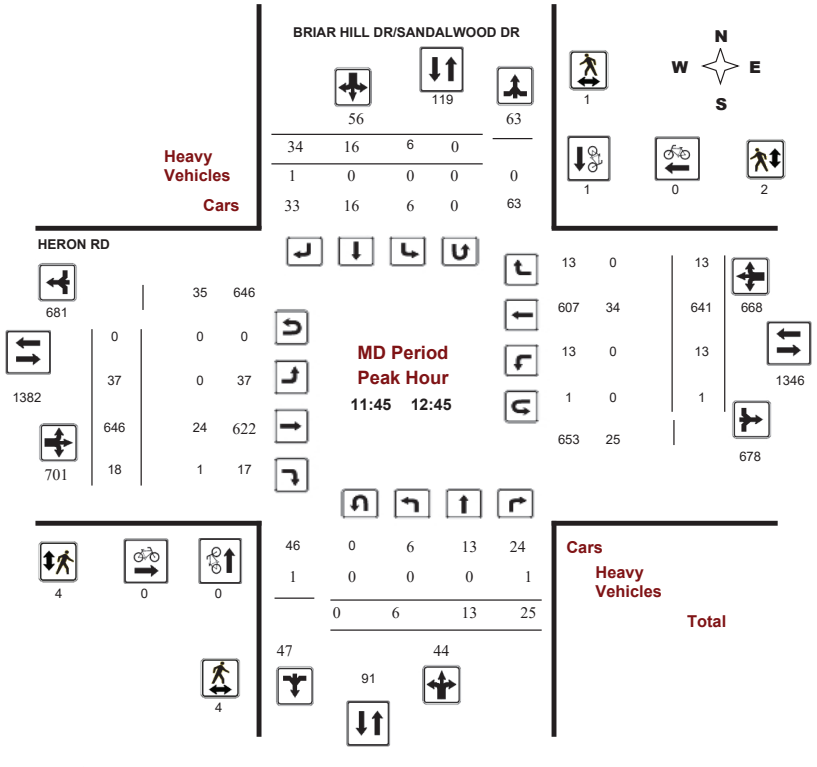
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

HERON RD @ BRIAR HILL DR/SANDALWOOD DR

Survey Date: Wednesday, November 16, 2016 **WO No:** 36492

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



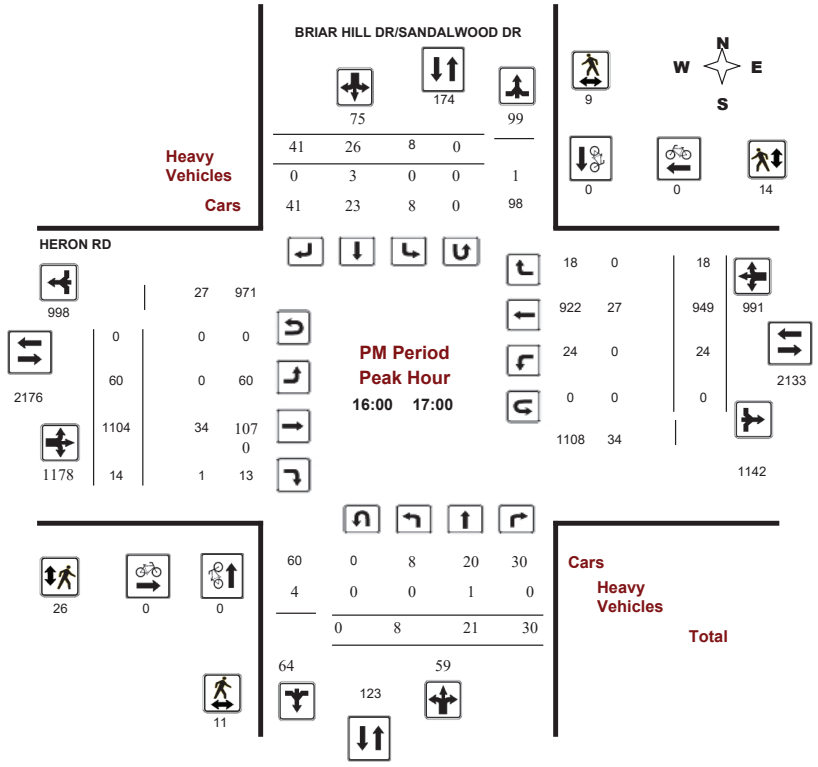
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

HERON RD @ BRIAR HILL DR/SANDALWOOD DR

Survey Date: Wednesday, November 16, 2016 **WO No:** 36492

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



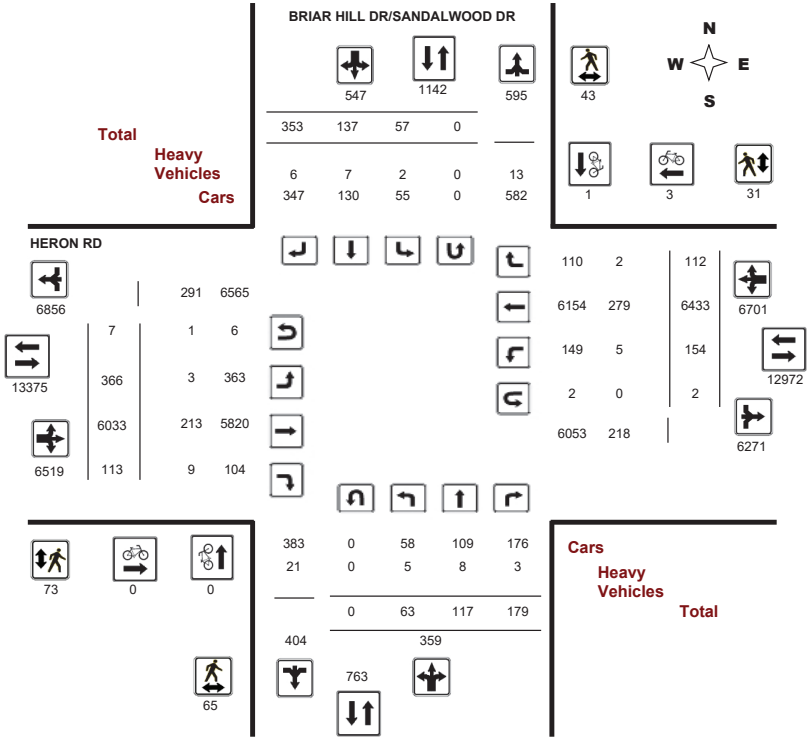
Transportation Services - Traffic Services

Turning Movement Count - Full Study Diagram

HERON RD @ BRIAR HILL DR/SANDALWOOD DR

Survey Date: Wednesday, November 16, 2016 **WO#:** 36492

Device: Miovision



Transportation Services - Traffic Services

Work Order 36492

Turning Movement Count - Full Study Summary Report

HERON RD @ BRIAR HILL DR/SANDALWOOD DR

Survey Date: Wednesday, November 16, 2016

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 7 Westbound: 2

AADT Factor .90

Full Study

	BRIAR HILL DR/SANDALWOOD DR									HERON RD									
	Northbound				Southbound					Eastbound				Westbound					
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	9	7	13	**29**	8	5	51	**64**	**93**	19	592	7	**618**	8	946	9	**963**	**1581**	**1674**
08:00 09:00	15	19	16	**50**	6	17	63	**86**	**136**	43	691	12	**746**	16	1069	13	**1098**	**1844**	**1980**
09:00 10:00	6	14	25	**45**	8	21	47	**76**	**121**	39	543	12	**594**	18	686	9	**713**	**1307**	**1428**
11:30 12:30	8	12	19	**39**	6	15	27	**48**	**87**	36	641	15	**692**	14	650	12	**676**	**1368**	**1455**
12:30 13:30	9	12	21	**42**	6	11	40	**57**	**99**	42	562	12	**616**	20	546	13	**579**	**1195**	**1294**
15:00 16:00	4	17	34	**55**	8	25	50	**83**	**138**	50	925	24	**999**	23	806	19	**848**	**1847**	**1985**
16:00 17:00	8	21	30	**59**	8	26	41	**75**	**134**	60	1104	14	**1178**	24	949	18	**991**	**2169**	**2303**
17:00 18:00	4	15	21	**40**	7	17	34	**58**	**98**	77	975	17	**1069**	31	781	19	**831**	**1900**	**1998**
Sub Total	63	117	179	**359**	57	137	353	**547**	**906**	366	6033	113	**6512**	154	6433	112	**6699**	**13211**	**14117**
U Turns				**0**				**0**	**0**				**7**				**2**	**9**	**9**
Total	63	117	179	**359**	57	137	353	**547**	**906**	366	6033	113	**6519**	154	6433	112	**6701**	**13220**	**14126**
EQ 12Hr	88	163	249	**499**	79	190	491	**760**	**1259**	509	8386	157	**9061**	214	8942	156	**9314**	**18375**	**19634**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.													**1.39**						
AVG 12Hr	79	146	224	**449**	71	171	442	**684**	**1133**	458	7547	141	**8155**	193	8048	140	**8383**	**16538**	**17671**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.													**.90**						
AVG 24Hr	103	192	293	**588**	93	225	578	**896**	**1484**	600	9887	185	**10683**	252	10542	184	**10982**	**21665**	**23149**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.													**1.31**						

Comments:

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

Transportation Services - Traffic Services

W.O. 36492

Turning Movement Count - 15 Minute Summary Report

HERON RD @ BRIAR HILL DR/SANDALWOOD DR

Survey Date: Wednesday, November 16, 2016

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 7 Westbound: 2

BRIAR HILL DR/SANDALWOOD DR **HERON RD**

	Northbound				Southbound					Eastbound				Westbound					
Time Period	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00 07:15	1	0	4	**5**	0	0	7	**7**	**12**	2	108	1	**111**	3	191	1	**195**	**306**	**318**
07:15 07:30	1	0	3	**4**	4	0	10	**14**	**18**	2	130	2	**134**	1	216	3	**220**	**354**	**372**
07:30 07:45	2	2	4	**8**	1	1	13	**15**	**23**	6	163	1	**170**	3	275	0	**278**	**448**	**471**
07:45 08:00	5	5	2	**12**	3	4	21	**28**	**40**	9	191	3	**203**	1	264	5	**270**	**473**	**513**
08:00 08:15	3	3	5	**11**	0	4	24	**28**	**39**	4	177	5	**186**	3	281	4	**288**	**474**	**513**
08:15 08:30	5	1	3	**9**	2	1	11	**14**	**23**	10	162	1	**174**	5	284	4	**293**	**467**	**490**
08:30 08:45	5	4	2	**11**	2	4	10	**16**	**27**	17	181	2	**200**	3	256	3	**262**	**462**	**489**
08:45 09:00	2	11	6	**19**	2	8	18	**28**	**47**	12	171	4	**188**	5	248	2	**255**	**443**	**490**
09:00 09:15	1	8	15	**24**	0	10	16	**26**	**50**	15	181	4	**200**	5	220	4	**229**	**429**	**479**
09:15 09:30	0	3	5	**8**	4	7	14	**25**	**33**	15	130	5	**151**	7	160	0	**167**	**318**	**351**
09:30 09:45	2	1	5	**8**	1	2	11	**14**	**22**	4	129	1	**135**	2	168	3	**173**	**308**	**330**
09:45 10:00	3	2	0	**5**	3	2	6	**11**	**16**	5	103	2	**110**	4	138	2	**144**	**254**	**270**
11:30 11:45	2	1	3	**6**	1	0	7	**8**	**14**	10	158	3	**173**	5	156	1	**162**	**335**	**349**
11:45 12:00	2	2	6	**10**	3	6	4	**13**	**23**	8	154	4	**166**	1	154	4	**159**	**325**	**348**
12:00 12:15	4	6	5	**15**	1	5	7	**13**	**28**	9	159	6	**174**	4	176	5	**186**	**360**	**388**
12:15 12:30	0	3	5	**8**	1	4	9	**14**	**22**	9	170	2	**181**	4	164	2	**170**	**351**	**373**
12:30 12:45	0	2	9	**11**	1	1	14	**16**	**27**	11	163	6	**180**	4	147	2	**153**	**333**	**360**
12:45 13:00	2	1	3	**6**	1	3	10	**14**	**20**	10	142	4	**157**	6	148	5	**159**	**316**	**336**
13:00 13:15	4	7	4	**15**	0	4	5	**9**	**24**	13	114	0	**127**	5	133	2	**140**	**267**	**291**
13:15 13:30	3	2	5	**10**	4	3	11	**18**	**28**	8	143	2	**153**	5	118	4	**127**	**280**	**308**
15:00 15:15	0	7	9	**16**	2	0	7	**9**	**25**	8	216	4	**228**	2	191	7	**200**	**428**	**453**
15:15 15:30	1	4	6	**11**	1	3	10	**14**	**25**	10	236	8	**254**	4	187	2	**193**	**447**	**472**
15:30 15:45	1	3	9	**13**	1	5	15	**21**	**34**	17	212	5	**234**	11	203	8	**222**	**456**	**490**
15:45 16:00	2	3	10	**15**	4	17	18	**39**	**54**	15	261	7	**283**	6	225	2	**233**	**516**	**570**
16:00 16:15	0	6	7	**13**	2	11	16	**29**	**42**	9	286	4	**299**	7	264	0	**271**	**570**	**612**
16:15 16:30	2	5	6	**13**	1	5	10	**16**	**29**	14	266	1	**281**	6	213	6	**225**	**506**	**535**
16:30 16:45	4	2	7	**13**	4	3	6	**13**	**26**	9	281	6	**296**	6	223	7	**236**	**532**	**558**
16:45 17:00	2	8	10	**20**	1	7	9	**17**	**37**	28	271	3	**302**	5	249	5	**259**	**561**	**598**
17:00 17:15	1	6	5	**12**	2	5	5	**12**	**24**	22	274	6	**302**	10	245	5	**260**	**562**	**586**
17:15 17:30	2	1	3	**6**	0	3	9	**12**	**18**	20	264	6	**290**	11	202	4	**217**	**507**	**525**
17:30 17:45	1	3	6	**10**	4	8	12	**24**	**34**	21	220	3	**244**	6	172	7	**186**	**430**	**464**
17:45 18:00	0	5	7	**12**	1	1	8	**10**	**22**	14	217	2	**233**	4	162	3	**169**	**402**	**424**
TOTAL:	63	117	179	**359**	57	137	353	**547**	**906**	366	6033	113	**6519**	154	6433	112	**6701**	**13220**	**14126**

Note: U-Turns are included in Totals.

Comment:

Transportation Services - Traffic Services

Turning Movement Count - Cyclist Volume Report

Work Order 36492

HERON RD @ BRIAR HILL DR/SANDALWOOD DR

Count Date: Wednesday, November 16, 2016 **Start Time:** 07:00

	BRIAR HILL DR/SANDALWOOD DR			HERON RD			
Time Period	Northbound	Southbound	**Street Total**	Eastbound	Westbound	**Street Total**	**Grand Total**
07:00 08:00	0	0	**0**	0	1	**1**	**1**
08:00 09:00	0	0	**0**	0	2	**2**	**2**
09:00 10:00	0	0	**0**	0	0	**0**	**0**
11:30 12:30	0	1	**1**	0	0	**0**	**1**
12:30 13:30	0	0	**0**	0	0	**0**	**0**
15:00 16:00	0	0	**0**	0	0	**0**	**0**
16:00 17:00	0	0	**0**	0	0	**0**	**0**
17:00 18:00	0	0	**0**	0	0	**0**	**0**
Total	0	1	**1**	0	3	**3**	**4**

Comment:

Note: These volumes consists of bicycles only (no mopeds or motorcycles) and ARE NOT included in the Turning Movement Count Summary.

Transportation Services - Traffic Services

W.O. 36492

Turning Movement Count - Heavy Vehicle Report

HERON RD @ BRIAR HILL DR/SANDALWOOD DR

Survey Date: Wednesday, November 16, 2016

	BRIAR HILL DR/SANDALWOOD DR									HERON RD									
	Northbound				Southbound					Eastbound				Westbound					
Time Period	LT	ST	RT	**N TOT**	LT	ST	RT	**S TOT**	**STR TOT**	LT	ST	RT	**E TOT**	LT	ST	RT	**W TOT**	**STR TOT**	**Grand Total**
07:00 08:00	0	0	0	**0**	0	0	1	**1**	**1**	0	9	1	**10**	1	64	0	**65**	**75**	**76**
08:00 09:00	3	5	1	**9**	0	0	1	**1**	**10**	0	19	3	**22**	1	58	1	**60**	**82**	**92**
09:00 10:00	0	1	0	**1**	0	0	0	**0**	**1**	0	28	1	**29**	0	33	0	**33**	**62**	**63**
11:30 12:30	0	0	1	**1**	0	0	1	**1**	**2**	0	26	1	**28**	0	28	0	**28**	**56**	**58**
12:30 13:30	1	0	0	**1**	1	0	1	**2**	**3**	0	33	0	**33**	1	29	1	**31**	**64**	**67**
15:00 16:00	1	1	0	**2**	1	4	2	**7**	**9**	3	35	2	**40**	2	28	0	**30**	**70**	**79**
16:00 17:00	0	1	0	**1**	0	3	0	**3**	**4**	0	34	1	**35**	0	27	0	**27**	**62**	**66**
17:00 18:00	0	0	1	**1**	0	0	0	**0**	**1**	0	29	0	**29**	0	12	0	**12**	**41**	**42**
Sub Total	5	8	3	**16**	2	7	6	**15**	**31**	3	213	9	**226**	5	279	2	**286**	**512**	**543**
U-Turns (Heavy Vehicles)				**0**				**0**	**0**				**1**				**0**	**1**	**1**
Total	5	8	3	**0**	2	7	6	**15**	**31**	3	213	9	**227**	5	279	2	**286**	**513**	**544**

Heavy Vehicles include Buses, Single-Unit Trucks and Articulated Trucks. Further, they ARE included in the Turning Movement Count Summary.

Transportation Services - Traffic Services

Work Order 36492

Turning Movement Count - Pedestrian Volume Report

HERON RD @ BRIAR HILL DR/SANDALWOOD DR

Count Date: Wednesday, November 16, 2016 **Start Time:** 07:00

Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	0	2	2	0	0	0	2
07:15 07:30	0	2	2	0	0	0	2
07:30 07:45	0	2	2	1	0	1	3
07:45 08:00	2	1	3	0	0	0	3
07:00 08:00	2	7	9	1	0	1	10
08:00 08:15	1	1	2	0	1	1	3
08:15 08:30	0	3	3	1	0	1	4
08:30 08:45	4	2	6	3	1	4	10
08:45 09:00	1	0	1	10	3	13	14
08:00 09:00	6	6	12	14	5	19	31
09:00 09:15	6	1	7	3	3	6	13
09:15 09:30	1	5	6	1	0	1	7
09:30 09:45	1	1	2	0	0	0	2
09:45 10:00	5	0	5	4	0	4	9
09:00 10:00	13	7	20	8	3	11	31
11:30 11:45	6	0	6	0	0	0	6
11:45 12:00	1	0	1	3	1	4	5
12:00 12:15	0	1	1	1	1	2	3
12:15 12:30	2	0	2	0	0	0	2
11:30 12:30	9	1	10	4	2	6	16
12:30 12:45	1	0	1	0	0	0	1
12:45 13:00	3	2	5	0	1	1	6
13:00 13:15	0	0	0	1	0	1	1
13:15 13:30	0	1	1	0	0	0	1
12:30 13:30	4	3	7	1	1	2	9
15:00 15:15	0	3	3	0	2	2	5
15:15 15:30	3	2	5	1	0	1	6
15:30 15:45	2	2	4	1	2	3	7
15:45 16:00	1	2	3	8	0	8	11
15:00 16:00	6	9	15	10	4	14	29
16:00 16:15	5	2	7	21	12	33	40
16:15 16:30	4	2	6	5	2	7	13
16:30 16:45	0	1	1	0	0	0	1
16:45 17:00	2	4	6	0	0	0	6
16:00 17:00	11	9	20	26	14	40	60
17:00 17:15	3	1	4	3	1	4	8
17:15 17:30	3	0	3	1	0	1	4
17:30 17:45	7	0	7	4	1	5	12
17:45 18:00	1	0	1	1	0	1	2
17:00 18:00	14	1	15	9	2	11	26
Total	65	43	108	73	31	104	212

Comment:

Transportation Services - Traffic Services

Work Order 36492

Turning Movement Count - 15 Min U-Turn Total Report

HERON RD @ BRIAR HILL DR/SANDALWOOD DR

Survey Date: Wednesday, November 16, 2016

Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	0
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	0	0	0
07:45	08:00	0	0	0	0	0
08:00	08:15	0	0	0	0	0
08:15	08:30	0	0	1	0	1
08:30	08:45	0	0	0	0	0
08:45	09:00	0	0	1	0	1
09:00	09:15	0	0	0	0	0
09:15	09:30	0	0	1	0	1
09:30	09:45	0	0	1	0	1
09:45	10:00	0	0	0	0	0
11:30	11:45	0	0	2	0	2
11:45	12:00	0	0	0	0	0
12:00	12:15	0	0	0	1	1
12:15	12:30	0	0	0	0	0
12:30	12:45	0	0	0	0	0
12:45	13:00	0	0	1	0	1
13:00	13:15	0	0	0	0	0
13:15	13:30	0	0	0	0	0
15:00	15:15	0	0	0	0	0
15:15	15:30	0	0	0	0	0
15:30	15:45	0	0	0	0	0
15:45	16:00	0	0	0	0	0
16:00	16:15	0	0	0	0	0
16:15	16:30	0	0	0	0	0
16:30	16:45	0	0	0	0	0
16:45	17:00	0	0	0	0	0
17:00	17:15	0	0	0	0	0
17:15	17:30	0	0	0	0	0
17:30	17:45	0	0	0	1	1
17:45	18:00	0	0	0	0	0
Total		0	0	7	2	9

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)	18	659	178	24	1039	20	240	22	43	3	3	4
Future Volume (vph)	18	659	178	24	1039	20	240	22	43	3	3	4
Satd. Flow (prot)	1658	3106	0	1445	3210	0	0	1605	0	1658	1558	0
Flt Permitted	0.162			0.244				0.767		0.640		
Satd. Flow (perm)	282	3106	0	368	3210	0	0	1251	0	1112	1558	0
Satd. Flow (RTOR)		49			3			12			4	
Lane Group Flow (vph)	20	930	0	27	1176	0	0	339	0	3	7	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	30.7	30.7		30.7	30.7		35.0	35.0		35.0	35.0	
Total Split (s)	45.0	45.0		45.0	45.0		45.0	45.0		45.0	45.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	1.4	1.4		1.4	1.4		2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	4.7	4.7		4.7	4.7			6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	50.0	50.0		50.0	50.0			29.3		29.3	29.3	
Actuated g/C Ratio	0.56	0.56		0.56	0.56			0.33		0.33	0.33	
v/c Ratio	0.13	0.53		0.13	0.66			0.82		0.01	0.01	
Control Delay	15.8	14.7		18.2	24.6			41.9		16.3	12.3	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	15.8	14.7		18.2	24.6			41.9		16.3	12.3	
LOS	B	B		B	C			D		B	B	
Approach Delay		14.8			24.4			41.9			13.5	
Approach LOS		B			C			D			B	
Queue Length 50th (m)	1.6	47.7		3.2	103.7			51.1		0.4	0.4	
Queue Length 95th (m)	7.0	81.1		m8.8	136.8			71.4		1.8	2.7	
Internal Link Dist (m)		622.7			289.3			338.9			31.1	
Turn Bay Length (m)	35.5			42.5						24.5		
Base Capacity (vph)	156	1746		204	1783			548		481	677	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.13	0.53		0.13	0.66			0.62		0.01	0.01	

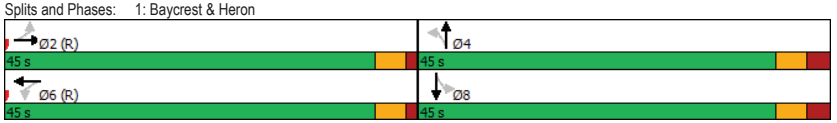
Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 51 (57%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 23.1	Intersection LOS: C
Intersection Capacity Utilization 64.7%	ICU Level of Service C
Analysis Period (min) 15	

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

Splits and Phases: 1: Baycrest & Heron



Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	3	8	46	2	21	7	164	31	19	112	4
Future Vol, veh/h	0	3	8	46	2	21	7	164	31	19	112	4
Conflicting Peds, #/hr	10	0	22	22	0	10	12	0	28	28	0	12
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	4	2	5	2	10	16	11	9	2
Mvmt Flow	0	3	9	51	2	23	8	182	34	21	124	4

Major/Minor	Minor2			Minor1				Major1			Major2	
Conflicting Flow All	418	440	160	439	425	237	140	0	0	244	0	0
Stage 1	180	180	-	243	243	-	-	-	-	-	-	-
Stage 2	238	260	-	196	182	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.14	6.52	6.25	4.12	-	-	4.21	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.14	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.14	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.536	4.018	3.345	2.218	-	-	2.299	-	-
Pot Cap-1 Maneuver	545	511	885	525	521	795	1443	-	-	1271	-	-
Stage 1	822	750	-	756	705	-	-	-	-	-	-	-
Stage 2	765	693	-	801	749	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	508	483	862	488	493	772	1430	-	-	1243	-	-
Mov Cap-2 Maneuver	508	483	-	488	493	-	-	-	-	-	-	-
Stage 1	810	730	-	735	685	-	-	-	-	-	-	-
Stage 2	729	674	-	762	729	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.2	12.6	0.3	1.1
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1430	-	-	710	550	1243	-	-
HCM Lane V/C Ratio	0.005	-	-	0.017	0.139	0.017	-	-
HCM Control Delay (s)	7.5	0	-	10.2	12.6	7.9	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.5	0.1	-	-

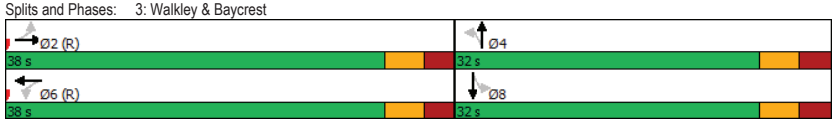
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	562	10	8	599	117	24	19	26	123	5	45
Future Volume (vph)	39	562	10	8	599	117	24	19	26	123	5	45
Satd. Flow (prot)	1496	3181	0	1496	3126	0	0	1609	0	1551	1483	0
Flt Permitted	0.332			0.408				0.883		0.707		
Satd. Flow (perm)	521	3181	0	637	3126	0	0	1441	0	1135	1483	0
Satd. Flow (RTOR)		3			43			29			50	
Lane Group Flow (vph)	43	635	0	9	796	0	0	77	0	137	56	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	25.9	25.9		25.9	25.9		31.1	31.1		31.1	31.1	
Total Split (s)	38.0	38.0		38.0	38.0		32.0	32.0		32.0	32.0	
Total Split (%)	54.3%	54.3%		54.3%	54.3%		45.7%	45.7%		45.7%	45.7%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.6	2.6		2.6	2.6		2.8	2.8		2.8	2.8	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	5.9	5.9		5.9	5.9			6.1		6.1	6.1	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	45.4	45.4		45.4	45.4			17.0		17.0	17.0	
Actuated g/C Ratio	0.65	0.65		0.65	0.65			0.24		0.24	0.24	
v/c Ratio	0.13	0.31		0.02	0.39			0.21		0.50	0.14	
Control Delay	10.7	8.9		9.6	9.1			13.6		27.4	6.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	10.7	8.9		9.6	9.1			13.6		27.4	6.8	
LOS	B	A		A	A			B		C	A	
Approach Delay		9.0			9.1			13.6			21.4	
Approach LOS		A			A			B			C	
Queue Length 50th (m)	2.0	17.3		0.4	21.8			5.3		16.5	0.7	
Queue Length 95th (m)	8.9	39.1		2.8	49.3			12.2		26.2	7.0	
Internal Link Dist (m)		436.7			968.3			49.0			107.8	
Turn Bay Length (m)	46.0			34.0						22.0		
Base Capacity (vph)	338	2066		413	2044			551		419	580	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.13	0.31		0.02	0.39			0.14		0.33	0.10	

Intersection Summary
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 17 (24%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.50

Intersection Signal Delay: 10.6	Intersection LOS: B
Intersection Capacity Utilization 60.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3: Walkley & Baycrest



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	656	11	12	995	19	18	12	12	8	13	76
Future Volume (vph)	47	656	11	12	995	19	18	12	12	8	13	76
Satd. Flow (prot)	1658	3263	0	1566	3181	0	1445	1507	0	0	1712	1483
Flt Permitted	0.229			0.364			0.742				0.888	
Satd. Flow (perm)	399	3263	0	597	3181	0	1125	1507	0	0	1549	1460
Satd. Flow (RTOR)		3			3			13				73
Lane Group Flow (vph)	52	741	0	13	1127	0	20	26	0	0	23	84
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		8
Detector Phase	2	2		6	6		4	4		8	8	8
Switch Phase												
Minimum Initial (s)	1.0	1.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	24.3	24.3		24.3	24.3		35.1	35.1		35.1	35.1	35.1
Total Split (s)	54.9	54.9		54.9	54.9		35.1	35.1		35.1	35.1	35.1
Total Split (%)	61.0%	61.0%		61.0%	61.0%		39.0%	39.0%		39.0%	39.0%	39.0%
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	3.3
All-Red Time (s)	2.0	2.0		2.0	2.0		2.8	2.8		2.8	2.8	2.8
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Lost Time (s)	5.3	5.3		5.3	5.3		6.1	6.1			6.1	6.1
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	None
Act Effct Green (s)	69.1	69.1		69.1	69.1		13.8	13.8			13.8	13.8
Actuated g/C Ratio	0.77	0.77		0.77	0.77		0.15	0.15			0.15	0.15
v/c Ratio	0.17	0.30		0.03	0.46		0.12	0.11			0.10	0.29
Control Delay	6.8	5.1		6.4	7.0		32.1	20.6			30.1	11.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Delay	6.8	5.1		6.4	7.0		32.1	20.6			30.1	11.6
LOS	A	A		A	A		C	C			C	B
Approach Delay		5.3			7.0			25.6			15.6	
Approach LOS		A			A			C			B	
Queue Length 50th (m)	0.7	9.8		0.4	29.7		3.4	2.3			3.7	1.8
Queue Length 95th (m)	m14.9	79.6		3.6	86.8		m7.9	m7.6			8.0	10.9
Internal Link Dist (m)		289.3			348.2			331.2			132.9	
Turn Bay Length (m)	46.5			50.0			30.0					
Base Capacity (vph)	306	2505		458	2442		362	494			499	519
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	0.17	0.30		0.03	0.46		0.06	0.05			0.05	0.16

Intersection Summary

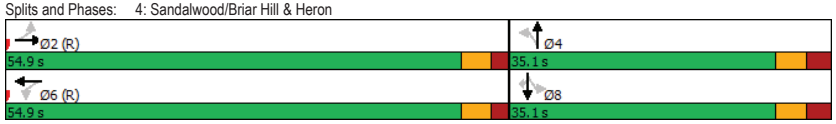
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.46

Intersection Signal Delay: 7.2	Intersection LOS: A
Intersection Capacity Utilization 63.9%	ICU Level of Service B
Analysis Period (min) 15	

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

Splits and Phases: 4: Sandalwood/Briar Hill & Heron



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	1071	233	25	962	13	148	2	37	18	7	3
Future Volume (vph)	4	1071	233	25	962	13	148	2	37	18	7	3
Satd. Flow (prot)	1658	3147	0	1626	3305	0	0	1549	0	1610	1657	0
Flt Permitted	0.219			0.124				0.763		0.684		
Satd. Flow (perm)	381	3147	0	212	3305	0	0	1205	0	1154	1657	0
Satd. Flow (RTOR)		47			2			15			3	
Lane Group Flow (vph)	4	1449	0	28	1083	0	0	207	0	20	11	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	29.7	29.7		29.7	29.7		35.0	35.0		35.0	35.0	
Total Split (s)	55.0	55.0		55.0	55.0		35.0	35.0		35.0	35.0	
Total Split (%)	61.1%	61.1%		61.1%	61.1%		38.9%	38.9%		38.9%	38.9%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	1.4	1.4		1.4	1.4		2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	4.7	4.7		4.7	4.7			6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	58.3	58.3		58.3	58.3			21.0		21.0	21.0	
Actuated g/C Ratio	0.65	0.65		0.65	0.65			0.23		0.23	0.23	
v/c Ratio	0.02	0.71		0.20	0.51			0.71		0.07	0.03	
Control Delay	8.8	14.0		15.6	14.3			41.4		23.6	19.2	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	8.8	14.0		15.6	14.3			41.4		23.6	19.2	
LOS	A	B		B	B			D		C	B	
Approach Delay		13.9			14.3			41.4			22.0	
Approach LOS		B			B			D			C	
Queue Length 50th (m)	0.2	70.1		1.8	81.0			31.2		2.8	1.1	
Queue Length 95th (m)	1.8	127.3		m9.1	123.9			48.2		7.4	4.5	
Internal Link Dist (m)		622.7			289.3			339.0			31.1	
Turn Bay Length (m)	35.5			42.5						24.5		
Base Capacity (vph)	246	2055		137	2141			398		371	535	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.02	0.71		0.20	0.51			0.52		0.05	0.02	

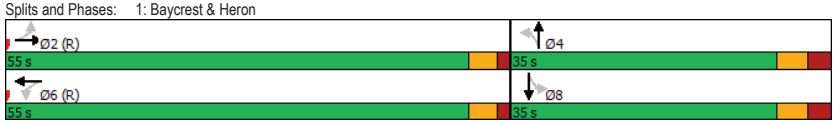
Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 14 (16%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 16.2	Intersection LOS: B
Intersection Capacity Utilization 67.6%	ICU Level of Service C
Analysis Period (min) 15	

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

Splits and Phases: 1: Baycrest & Heron



Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	2	4	28	0	22	3	165	30	21	190	2
Future Vol, veh/h	0	2	4	28	0	22	3	165	30	21	190	2
Conflicting Peds, #/hr	3	0	19	19	0	3	23	0	14	14	0	23
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	7	2	2	7	2
Mvmt Flow	0	2	4	31	0	24	3	183	33	23	211	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	502	517	254	500	502	217	236	0	0	230	0	0
Stage 1	281	281	-	220	220	-	-	-	-	-	-	-
Stage 2	221	236	-	280	282	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	480	462	785	481	471	823	1331	-	-	1338	-	-
Stage 1	726	678	-	782	721	-	-	-	-	-	-	-
Stage 2	781	710	-	727	678	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	448	438	760	456	447	812	1307	-	-	1323	-	-
Mov Cap-2 Maneuver	448	438	-	456	447	-	-	-	-	-	-	-
Stage 1	711	652	-	771	711	-	-	-	-	-	-	-
Stage 2	753	700	-	695	652	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11	12.1	0.1	0.8
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1307	-	-	610	565	1323	-	-
HCM Lane V/C Ratio	0.003	-	-	0.011	0.098	0.018	-	-
HCM Control Delay (s)	7.8	0	-	11	12.1	7.8	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.3	0.1	-	-

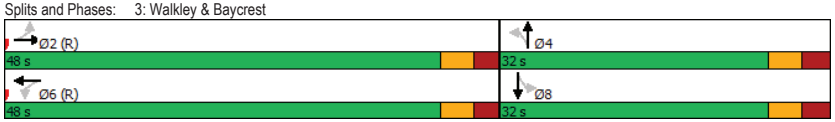
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	719	18	22	788	145	17	11	19	120	18	60
Future Volume (vph)	54	719	18	22	788	145	17	11	19	120	18	60
Satd. Flow (prot)	1658	3197	0	1610	3120	0	0	1542	0	1523	1393	0
Flt Permitted	0.232			0.315				0.889		0.723		
Satd. Flow (perm)	401	3197	0	525	3120	0	0	1376	0	1136	1393	0
Satd. Flow (RTOR)		5			40			21			67	
Lane Group Flow (vph)	60	819	0	24	1037	0	0	52	0	133	87	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	25.9	25.9		25.9	25.9		31.1	31.1		31.1	31.1	
Total Split (s)	48.0	48.0		48.0	48.0		32.0	32.0		32.0	32.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.6	2.6		2.6	2.6		2.8	2.8		2.8	2.8	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	5.9	5.9		5.9	5.9			6.1		6.1	6.1	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	48.6	48.6		48.6	48.6			19.4		19.4	19.4	
Actuated g/C Ratio	0.61	0.61		0.61	0.61			0.24		0.24	0.24	
v/c Ratio	0.25	0.42		0.08	0.54			0.15		0.48	0.22	
Control Delay	13.1	10.2		9.6	11.4			14.9		30.4	9.3	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	13.1	10.2		9.6	11.4			14.9		30.4	9.3	
LOS	B	B		A	B			B		C	A	
Approach Delay		10.4			11.3			14.9			22.0	
Approach LOS		B			B			B			C	
Queue Length 50th (m)	4.6	37.6		1.7	51.2			3.3		15.6	2.1	
Queue Length 95th (m)	12.8	51.5		5.3	69.4			10.9		30.5	11.6	
Internal Link Dist (m)		436.7			968.3			49.0			107.8	
Turn Bay Length (m)	46.0			34.0						22.0		
Base Capacity (vph)	243	1945		319	1912			459		367	496	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.25	0.42		0.08	0.54			0.11		0.36	0.18	

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.54

Intersection Signal Delay: 12.1	Intersection LOS: B
Intersection Capacity Utilization 70.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: Walkley & Baycrest



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	1049	14	24	953	21	8	21	30	9	26	47
Future Volume (vph)	69	1049	14	24	953	21	8	21	30	9	26	47
Satd. Flow (prot)	1658	3273	0	1658	3271	0	1658	1550	0	0	1605	1483
Flt Permitted	0.224			0.195			0.732				0.935	
Satd. Flow (perm)	390	3273	0	339	3271	0	1248	1550	0	0	1516	1430
Satd. Flow (RTOR)		2			4			33				52
Lane Group Flow (vph)	77	1182	0	27	1082	0	9	56	0	0	39	52
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		8
Detector Phase	2	2		6	6		4	4		8	8	8
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	24.3	24.3		24.3	24.3		35.1	35.1		35.1	35.1	35.1
Total Split (s)	54.9	54.9		54.9	54.9		35.1	35.1		35.1	35.1	35.1
Total Split (%)	61.0%	61.0%		61.0%	61.0%		39.0%	39.0%		39.0%	39.0%	39.0%
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	3.3
All-Red Time (s)	2.0	2.0		2.0	2.0		2.8	2.8		2.8	2.8	2.8
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Lost Time (s)	5.3	5.3		5.3	5.3		6.1	6.1			6.1	6.1
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	None
Act Effct Green (s)	61.5	61.5		61.5	61.5		21.4	21.4			21.4	21.4
Actuated g/C Ratio	0.68	0.68		0.68	0.68		0.24	0.24			0.24	0.24
v/c Ratio	0.29	0.53		0.12	0.48		0.03	0.14			0.11	0.14
Control Delay	15.1	14.8		11.2	11.0		24.9	15.7			23.5	7.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Delay	15.1	14.8		11.2	11.0		24.9	15.7			23.5	7.3
LOS	B	B		B	B		C	B			C	A
Approach Delay		14.8			11.0			17.0			14.3	
Approach LOS		B			B			B			B	
Queue Length 50th (m)	10.7	107.4		2.1	61.5		1.2	3.9			4.7	0.0
Queue Length 95th (m)	m14.2	132.3		6.8	80.3		m4.0	m11.4			11.7	7.5
Internal Link Dist (m)		289.3			348.2			328.6			132.9	
Turn Bay Length (m)	46.5			50.0			30.0					
Base Capacity (vph)	266	2236		231	2235		402	521			488	496
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	0.29	0.53		0.12	0.48		0.02	0.11			0.08	0.10

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 60 (67%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.53

Intersection Signal Delay: 13.2	Intersection LOS: B
Intersection Capacity Utilization 74.9%	ICU Level of Service D
Analysis Period (min) 15	

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

Splits and Phases: 4: Sandalwood/Briar Hill & Heron

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
2/4/2015	2015	15:00	HERON RD @ BRIAR HILL DR/SANDALWOOD DR	03 - Snow	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	04 - Slush
3/11/2015	2015	12:55	HERON RD @ BRIAR HILL DR/SANDALWOOD DR	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	02 - Angle	01 - Dry
1/6/2016	2016	14:48	HERON RD @ BRIAR HILL DR/SANDALWOOD DR	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	05 - Turning movement	02 - Wet
2/18/2016	2016	12:57	HERON RD @ BRIAR HILL DR/SANDALWOOD DR	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	02 - Angle	02 - Wet
2/15/2017	2017	18:05	HERON RD @ BRIAR HILL DR/SANDALWOOD DR	03 - Snow	07 - Dark	01 - Traffic signal		03 - P.D. only	03 - Rear end	04 - Slush
12/31/2017	2017	18:33	HERON RD @ BRIAR HILL DR/SANDALWOOD DR	01 - Clear	07 - Dark	01 - Traffic signal		03 - P.D. only	03 - Rear end	02 - Wet
2/13/2018	2018	21:18	HERON RD @ BRIAR HILL DR/SANDALWOOD DR (0007190)	01 - Clear	07 - Dark	01 - Traffic signal		02 - Non-fatal injury	05 - Turning movement	01 - Dry
3/17/2018	2018	18:40	HERON RD @ BRIAR HILL DR/SANDALWOOD DR (0007190)	01 - Clear	05 - Dusk	01 - Traffic signal		03 - P.D. only	02 - Angle	01 - Dry
4/14/2018	2018	8:30	HERON RD @ BRIAR HILL DR/SANDALWOOD DR (0007190)	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	02 - Angle	01 - Dry
8/11/2018	2018	17:14	HERON RD @ BRIAR HILL DR/SANDALWOOD DR (0007190)	01 - Clear	01 - Daylight	01 - Traffic signal		02 - Non-fatal injury	05 - Turning movement	01 - Dry
10/11/2018	2018	15:29	HERON RD @ BRIAR HILL DR/SANDALWOOD DR (0007190)	01 - Clear	01 - Daylight	01 - Traffic signal		02 - Non-fatal injury	05 - Turning movement	02 - Wet
4/29/2019	2019	14:52	HERON RD @ BRIAR HILL DR/SANDALWOOD DR (0007190)	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	02 - Angle	01 - Dry
8/30/2019	2019	8:42	HERON RD @ BRIAR HILL DR/SANDALWOOD DR (0007190)	01 - Clear	01 - Daylight	01 - Traffic signal		02 - Non-fatal injury	03 - Rear end	02 - Wet
10/25/2019	2019	9:00	HERON RD @ BRIAR HILL DR/SANDALWOOD DR (0007190)	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	99 - Other	01 - Dry
9/14/2016	2016	21:37	HERON RD btwn BAYCREST DR & SANDALWOOD DR	01 - Clear	07 - Dark	10 - No control		02 - Non-fatal injury	04 - Sideswipe	01 - Dry
11/1/2017	2017	9:02	HERON RD btwn BAYCREST DR & SANDALWOOD DR	02 - Rain	01 - Daylight	10 - No control		03 - P.D. only	05 - Turning movement	02 - Wet
7/10/2019	2019	12:25	HERON RD btwn BAYCREST DR & SANDALWOOD DR (__3ZA3AF)	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	04 - Sideswipe	01 - Dry
5/11/2015	2015	18:02	SANDALWOOD DR btwn BAYCREST DR & HERON RD	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	06 - SMV unattended vehicle	01 - Dry
10/8/2015	2015	0:00	SANDALWOOD DR btwn BAYCREST DR & HERON RD	02 - Rain	00 - Unknown	10 - No control		03 - P.D. only	06 - SMV unattended vehicle	02 - Wet
12/5/2016	2016	0:00	SANDALWOOD DR btwn BAYCREST DR & HERON RD	03 - Snow	00 - Unknown	10 - No control		03 - P.D. only	06 - SMV unattended vehicle	03 - Loose snow
7/21/2017	2017	12:52	SANDALWOOD DR btwn BAYCREST DR & HERON RD	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	99 - Other	01 - Dry
4/3/2017	2017	0:00	SANDALWOOD DR btwn BAYCREST DR & HERON RD	02 - Rain	07 - Dark	10 - No control		03 - P.D. only	06 - SMV unattended vehicle	02 - Wet
1/7/2018	2018	Unknown	SANDALWOOD DR btwn BAYCREST DR & HERON RD (__3ZA9YZ)	03 - Snow	00 - Unknown	10 - No control		03 - P.D. only	06 - SMV unattended vehicle	03 - Loose snow
2/24/2018	2018	18:30	SANDALWOOD DR btwn BAYCREST DR & HERON RD (__3ZA9YZ)	01 - Clear	07 - Dark	10 - No control		03 - P.D. only	04 - Sideswipe	02 - Wet
2/28/2018	2018	20:48	SANDALWOOD DR btwn BAYCREST DR & HERON RD (__3ZA9YZ)	01 - Clear	07 - Dark	10 - No control		02 - Non-fatal injury	07 - SMV other	02 - Wet
3/27/2018	2018	8:42	SANDALWOOD DR btwn BAYCREST DR & HERON RD (__3ZA9YZ)	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	06 - SMV unattended vehicle	01 - Dry
6/15/2018	2018	9:02	SANDALWOOD DR btwn BAYCREST DR & HERON RD (__3ZA9YZ)	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	02 - Angle	01 - Dry
2/10/2015	2015	20:11	BAYCREST DR @ SANDALWOOD DR	01 - Clear	07 - Dark	03 - Yield sign		03 - P.D. only	99 - Other	01 - Dry
10/29/2016	2016	12:28	BAYCREST DR @ SANDALWOOD DR	01 - Clear	01 - Daylight	03 - Yield sign		03 - P.D. only	02 - Angle	02 - Wet
9/21/2017	2017	0:00	BAYCREST DR @ SANDALWOOD DR	01 - Clear	00 - Unknown	03 - Yield sign		03 - P.D. only	06 - SMV unattended vehicle	01 - Dry
4/6/2018	2018	18:59	BAYCREST DR @ SANDALWOOD DR (0007085)	03 - Snow	05 - Dusk	03 - Yield sign		03 - P.D. only	02 - Angle	02 - Wet
12/9/2017	2017	23:22	HERON RD btwn SANDALWOOD DR & JEFFERSON ST	03 - Snow	07 - Dark	10 - No control		03 - P.D. only	07 - SMV other	03 - Loose snow
5/29/2018	2018	9:07	HERON RD btwn SANDALWOOD DR & JEFFERSON ST (__3ZA3AG)	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	04 - Sideswipe	01 - Dry
7/24/2018	2018	15:16	HERON RD btwn SANDALWOOD DR & JEFFERSON ST (__3ZA3AG)	02 - Rain	01 - Daylight	10 - No control		02 - Non-fatal injury	03 - Rear end	02 - Wet
3/11/2019	2019	14:05	HERON RD btwn SANDALWOOD DR & JEFFERSON ST (__3ZA3AG)	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	04 - Sideswipe	02 - Wet

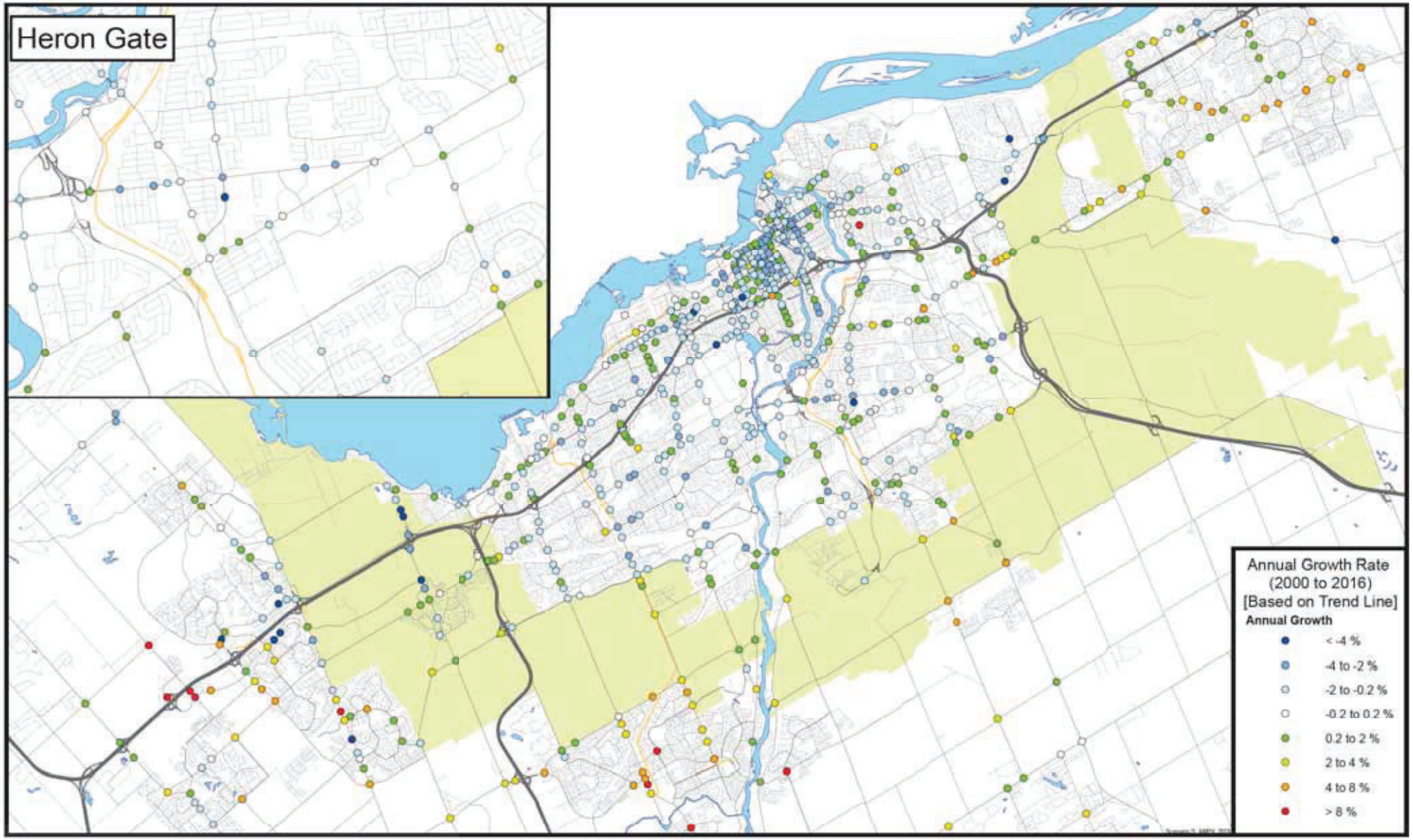
Appendix E

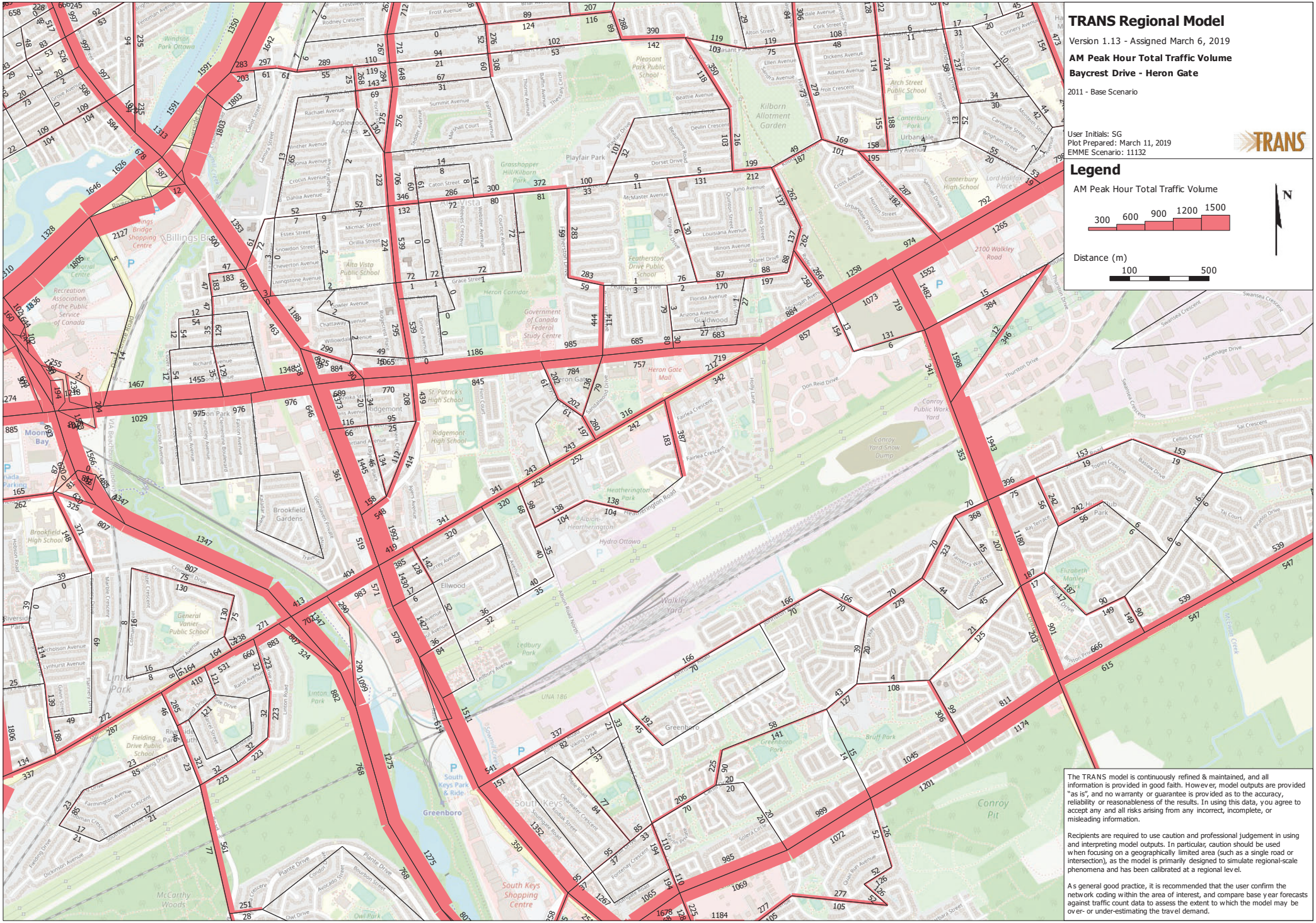
City TRANS Forecasts – Background Growth

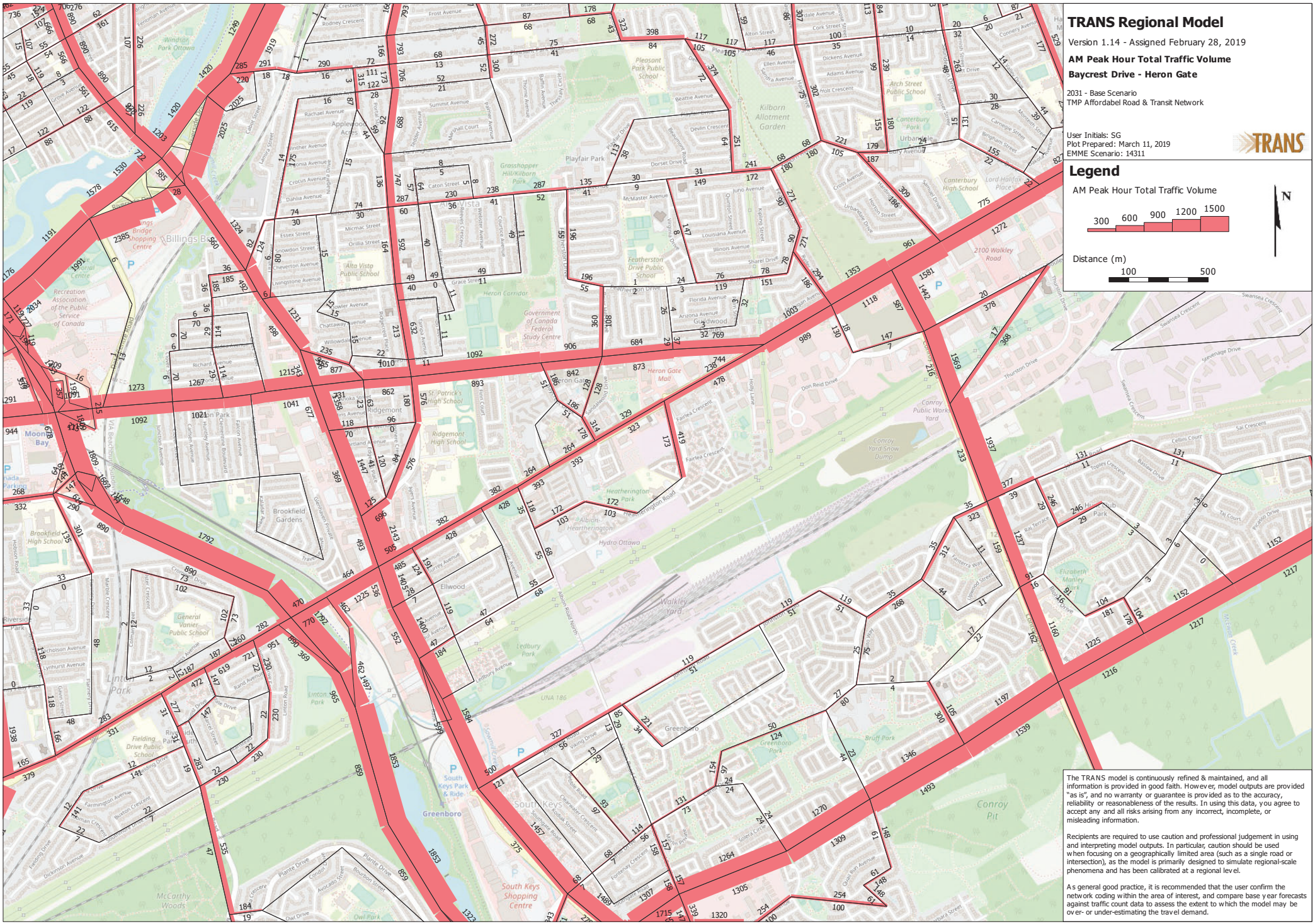
CGH TRANSPORTATION

INTERSECTION TRAFFIC GROWTH RATE, AM PEAK PERIOD

Total Vehicular Volume Entering the Intersection, 2000 to 2016




TRANS Regional Model
Version 1.13 - Assigned March 6, 2019
AM Peak Hour Total Traffic Volume
Baycrest Drive - Heron Gate
2011 - Base Scenario
User Initials: SG
Plot Prepared: March 11, 2019
EMME Scenario: 11132
TRANS
Legend
AM Peak Hour Total Traffic Volume
300 600 900 1200 1500
Distance (m)
100 500
N
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 1.14 - Assigned February 28, 2019
AM Peak Hour Total Traffic Volume
Baycrest Drive - Heron Gate
2031 - Base Scenario
TMP Affordabel Road & Transit Network
User Initials: SG
Plot Prepared: March 11, 2019
EMME Scenario: 14311
TRANS
Legend
AM Peak Hour Total Traffic Volume
300 600 900 1200 1500
Distance (m)
100 500
N
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 F

Synchro Intersection Worksheets – 2024 Future Background Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	679	178	24	1039	20	240	22	43	3	3	4
Future Volume (vph)	18	679	178	24	1039	20	240	22	43	3	3	4
Satd. Flow (prot)	1658	3111	0	1445	3210	0	0	1605	0	1658	1558	0
Flt Permitted	0.206			0.280				0.767		0.652		
Satd. Flow (perm)	358	3111	0	421	3210	0	0	1251	0	1133	1558	0
Satd. Flow (RTOR)		47			3			12			4	
Lane Group Flow (vph)	18	857	0	24	1059	0	0	305	0	3	7	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	30.7	30.7		30.7	30.7		35.0	35.0		35.0	35.0	
Total Split (s)	45.0	45.0		45.0	45.0		45.0	45.0		45.0	45.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	1.4	1.4		1.4	1.4		2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	4.7	4.7		4.7	4.7			6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	52.1	52.1		52.1	52.1			27.2		27.2	27.2	
Actuated g/C Ratio	0.58	0.58		0.58	0.58			0.30		0.30	0.30	
v/c Ratio	0.09	0.47		0.10	0.57			0.79		0.01	0.01	
Control Delay	12.9	12.7		15.6	20.9			41.8		17.7	13.4	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	12.9	12.7		15.6	20.9			41.8		17.7	13.4	
LOS	B	B		B	C			D		B	B	
Approach Delay		12.7			20.8			41.8			14.7	
Approach LOS		B			C			D			B	
Queue Length 50th (m)	1.4	41.4		2.7	86.7			44.8		0.4	0.4	
Queue Length 95th (m)	5.8	69.1		m8.1	118.3			65.0		1.9	2.8	
Internal Link Dist (m)		622.7			289.3			338.4			31.1	
Turn Bay Length (m)	35.5			42.5						24.5		
Base Capacity (vph)	207	1822		243	1860			548		490	677	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.09	0.47		0.10	0.57			0.56		0.01	0.01	

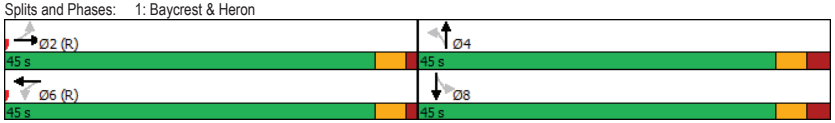
Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 51 (57%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 20.5	Intersection LOS: C
Intersection Capacity Utilization 64.7%	ICU Level of Service C
Analysis Period (min) 15	

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

Splits and Phases: 1: Baycrest & Heron



Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	3	8	46	2	21	7	164	31	19	112	4
Future Vol, veh/h	0	3	8	46	2	21	7	164	31	19	112	4
Conflicting Peds, #/hr	10	0	22	22	0	10	12	0	28	28	0	12
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	4	2	5	2	10	16	11	9	2
Mvmt Flow	0	3	8	46	2	21	7	164	31	19	112	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	379	401	148	402	388	218	128	0	0	223	0	0
Stage 1	164	164	-	222	222	-	-	-	-	-	-	-
Stage 2	215	237	-	180	166	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.14	6.52	6.25	4.12	-	-	4.21	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.14	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.14	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.536	4.018	3.345	2.218	-	-	2.299	-	-
Pot Cap-1 Maneuver	579	538	899	555	547	814	1458	-	-	1294	-	-
Stage 1	838	762	-	776	720	-	-	-	-	-	-	-
Stage 2	787	709	-	817	761	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	544	511	875	518	519	790	1444	-	-	1266	-	-
Mov Cap-2 Maneuver	544	511	-	518	519	-	-	-	-	-	-	-
Stage 1	826	743	-	755	701	-	-	-	-	-	-	-
Stage 2	754	690	-	780	742	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10	12.1	0.3	1.1
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1444	-	-	733	579	1266	-	-
HCM Lane V/C Ratio	0.005	-	-	0.015	0.119	0.015	-	-
HCM Control Delay (s)	7.5	0	-	10	12.1	7.9	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.4	0	-	-

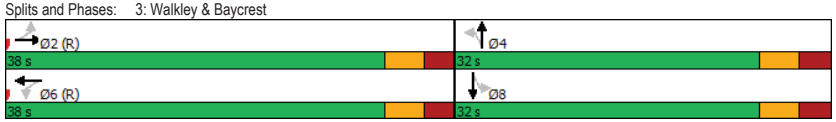
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	562	10	8	599	117	24	19	26	123	5	45
Future Volume (vph)	39	562	10	8	599	117	24	19	26	123	5	45
Satd. Flow (prot)	1496	3181	0	1496	3122	0	0	1609	0	1551	1481	0
Flt Permitted	0.369			0.437				0.887		0.712		
Satd. Flow (perm)	578	3181	0	682	3122	0	0	1447	0	1142	1481	0
Satd. Flow (RTOR)		3			43			26			45	
Lane Group Flow (vph)	39	572	0	8	716	0	0	69	0	123	50	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	25.9	25.9		25.9	25.9		31.1	31.1		31.1	31.1	
Total Split (s)	38.0	38.0		38.0	38.0		32.0	32.0		32.0	32.0	
Total Split (%)	54.3%	54.3%		54.3%	54.3%		45.7%	45.7%		45.7%	45.7%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.6	2.6		2.6	2.6		2.8	2.8		2.8	2.8	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	5.9	5.9		5.9	5.9			6.1		6.1	6.1	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	45.8	45.8		45.8	45.8			16.6		16.6	16.6	
Actuated g/C Ratio	0.65	0.65		0.65	0.65			0.24		0.24	0.24	
v/c Ratio	0.10	0.27		0.02	0.35			0.19		0.45	0.13	
Control Delay	10.2	8.5		9.5	8.6			13.5		26.3	6.9	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	10.2	8.5		9.5	8.6			13.5		26.3	6.9	
LOS	B	A		A	A			B		C	A	
Approach Delay		8.6			8.6			13.5			20.7	
Approach LOS		A			A			B			C	
Queue Length 50th (m)	1.7	14.5		0.3	18.0			4.8		14.9	0.5	
Queue Length 95th (m)	8.1	34.7		2.6	43.1			11.2		23.6	6.5	
Internal Link Dist (m)		436.7			968.3			49.0			107.8	
Turn Bay Length (m)	46.0			34.0						22.0		
Base Capacity (vph)	378	2081		446	2056			551		422	576	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.10	0.27		0.02	0.35			0.13		0.29	0.09	

Intersection Summary
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 17 (24%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.45

Intersection Signal Delay: 10.2	Intersection LOS: B
Intersection Capacity Utilization 60.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3: Walkley & Baycrest



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	676	11	12	995	25	18	12	12	11	13	102
Future Volume (vph)	63	676	11	12	995	25	18	12	12	11	13	102
Satd. Flow (prot)	1658	3263	0	1566	3178	0	1445	1507	0	0	1707	1483
Flt Permitted	0.262			0.387			0.742				0.868	
Satd. Flow (perm)	456	3263	0	634	3178	0	1125	1507	0	0	1513	1460
Satd. Flow (RTOR)		3			4			12				96
Lane Group Flow (vph)	63	687	0	12	1020	0	18	24	0	0	24	102
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		8
Detector Phase	2	2		6	6		4	4		8	8	8
Switch Phase												
Minimum Initial (s)	1.0	1.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	24.3	24.3		24.3	24.3		35.1	35.1		35.1	35.1	35.1
Total Split (s)	54.9	54.9		54.9	54.9		35.1	35.1		35.1	35.1	35.1
Total Split (%)	61.0%	61.0%		61.0%	61.0%		39.0%	39.0%		39.0%	39.0%	39.0%
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	3.3
All-Red Time (s)	2.0	2.0		2.0	2.0		2.8	2.8		2.8	2.8	2.8
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Lost Time (s)	5.3	5.3		5.3	5.3		6.1	6.1			6.1	6.1
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	None
Act Effct Green (s)	69.1	69.1		69.1	69.1		13.8	13.8			13.8	13.8
Actuated g/C Ratio	0.77	0.77		0.77	0.77		0.15	0.15			0.15	0.15
v/c Ratio	0.18	0.27		0.02	0.42		0.10	0.10			0.10	0.33
Control Delay	8.2	6.1		6.4	6.6		32.1	21.4			30.2	10.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Delay	8.2	6.1		6.4	6.6		32.1	21.4			30.2	10.0
LOS	A	A		A	A		C	C			C	B
Approach Delay		6.3			6.6			26.0			13.9	
Approach LOS		A			A			C			B	
Queue Length 50th (m)	1.6	16.3		0.4	25.5		3.1	2.1			3.8	1.0
Queue Length 95th (m)	m21.2	72.1		3.4	75.0		m7.2	m7.7			8.3	11.1
Internal Link Dist (m)		289.3			348.2			334.5			132.9	
Turn Bay Length (m)	46.5			50.0			30.0					
Base Capacity (vph)	350	2505		486	2440		362	493			487	535
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	0.18	0.27		0.02	0.42		0.05	0.05			0.05	0.19

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
4: Sandalwood/Briar Hill & Heron

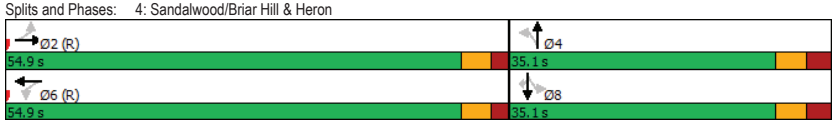
12/07/2021

Maximum v/c Ratio: 0.42

Intersection Signal Delay: 7.4	Intersection LOS: A
Intersection Capacity Utilization 64.1%	ICU Level of Service C
Analysis Period (min) 15	

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

Splits and Phases: 4: Sandalwood/Briar Hill & Heron



Lanes, Volumes, Timings
1: Baycrest & Heron

12/07/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	1071	233	25	991	13	148	2	37	18	7	3
Future Volume (vph)	4	1071	233	25	991	13	148	2	37	18	7	3
Satd. Flow (prot)	1658	3147	0	1626	3305	0	0	1549	0	1610	1648	0
Flt Permitted	0.246			0.160				0.764		0.688		
Satd. Flow (perm)	428	3147	0	273	3305	0	0	1206	0	1161	1648	0
Satd. Flow (RTOR)		47			2			15			3	
Lane Group Flow (vph)	4	1304	0	25	1004	0	0	187	0	18	10	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	29.7	29.7		29.7	29.7		35.0	35.0		35.0	35.0	
Total Split (s)	55.0	55.0		55.0	55.0		35.0	35.0		35.0	35.0	
Total Split (%)	61.1%	61.1%		61.1%	61.1%		38.9%	38.9%		38.9%	38.9%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	1.4	1.4		1.4	1.4		2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	4.7	4.7		4.7	4.7			6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	59.1	59.1		59.1	59.1			20.2		20.2	20.2	
Actuated g/C Ratio	0.66	0.66		0.66	0.66			0.22		0.22	0.22	
v/c Ratio	0.01	0.63		0.14	0.46			0.66		0.07	0.03	
Control Delay	8.8	12.0		12.0	13.2			39.0		23.7	19.1	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	8.8	12.0		12.0	13.2			39.0		23.7	19.1	
LOS	A	B		B	B			D		C	B	
Approach Delay		11.9			13.1			39.0			22.0	
Approach LOS		B			B			D			C	
Queue Length 50th (m)	0.2	54.3		1.1	69.7			28.0		2.6	1.0	
Queue Length 95th (m)	1.7	105.0		m8.0	110.3			43.0		6.8	4.3	
Internal Link Dist (m)		622.7			289.3			339.4			31.1	
Turn Bay Length (m)	35.5			42.5						24.5		
Base Capacity (vph)	281	2081		179	2169			398		374	533	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.01	0.63		0.14	0.46			0.47		0.05	0.02	

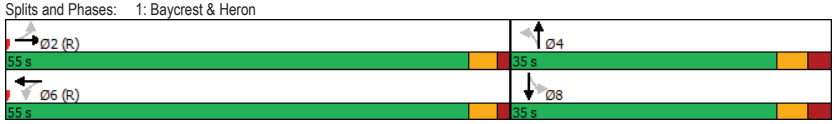
Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 14 (16%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 14.5	Intersection LOS: B
Intersection Capacity Utilization 67.6%	ICU Level of Service C
Analysis Period (min) 15	

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

Splits and Phases: 1: Baycrest & Heron



Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	2	4	28	0	22	3	165	30	21	190	2
Future Vol, veh/h	0	2	4	28	0	22	3	165	30	21	190	2
Conflicting Peds, #/hr	3	0	19	19	0	3	23	0	14	14	0	23
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	7	2	2	7	2
Mvmt Flow	0	2	4	28	0	22	3	165	30	21	190	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	456	471	233	455	457	197	215	0	0	209	0	0
Stage 1	256	256	-	200	200	-	-	-	-	-	-	-
Stage 2	200	215	-	255	257	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	515	491	806	515	500	844	1355	-	-	1362	-	-
Stage 1	749	696	-	802	736	-	-	-	-	-	-	-
Stage 2	802	725	-	749	695	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	484	467	780	490	476	833	1331	-	-	1347	-	-
Mov Cap-2 Maneuver	484	467	-	490	476	-	-	-	-	-	-	-
Stage 1	733	672	-	791	726	-	-	-	-	-	-	-
Stage 2	777	715	-	720	671	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.7	11.6	0.1	0.8
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1331	-	-	638	598	1347	-	-
HCM Lane V/C Ratio	0.002	-	-	0.009	0.084	0.016	-	-
HCM Control Delay (s)	7.7	0	-	10.7	11.6	7.7	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.3	0	-	-

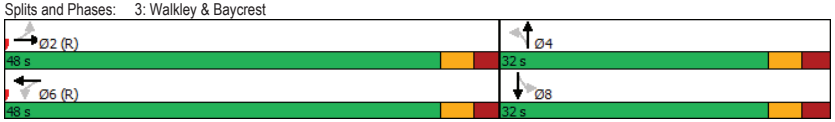
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	719	18	22	788	145	17	11	19	120	18	60
Future Volume (vph)	54	719	18	22	788	145	17	11	19	120	18	60
Satd. Flow (prot)	1658	3197	0	1610	3120	0	0	1542	0	1523	1395	0
Flt Permitted	0.276			0.356				0.890		0.726		
Satd. Flow (perm)	475	3197	0	592	3120	0	0	1378	0	1140	1395	0
Satd. Flow (RTOR)		5			40			19			60	
Lane Group Flow (vph)	54	737	0	22	933	0	0	47	0	120	78	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	25.9	25.9		25.9	25.9		31.1	31.1		31.1	31.1	
Total Split (s)	48.0	48.0		48.0	48.0		32.0	32.0		32.0	32.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.6	2.6		2.6	2.6		2.8	2.8		2.8	2.8	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	5.9	5.9		5.9	5.9			6.1		6.1	6.1	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	53.2	53.2		53.2	53.2			19.2		19.2	19.2	
Actuated g/C Ratio	0.66	0.66		0.66	0.66			0.24		0.24	0.24	
v/c Ratio	0.17	0.35		0.06	0.45			0.14		0.44	0.21	
Control Delay	11.1	9.2		9.4	9.9			14.7		29.1	9.5	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	11.1	9.2		9.4	9.9			14.7		29.1	9.5	
LOS	B	A		A	A			B		C	A	
Approach Delay		9.3			9.8			14.7			21.4	
Approach LOS		A			A			B			C	
Queue Length 50th (m)	4.0	32.7		1.5	43.6			3.0		13.9	1.9	
Queue Length 95th (m)	10.8	45.1		4.9	59.5			10.2		27.7	10.9	
Internal Link Dist (m)		436.7			968.3			49.0			107.8	
Turn Bay Length (m)	46.0			34.0						22.0		
Base Capacity (vph)	316	2127		393	2088			458		369	492	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.17	0.35		0.06	0.45			0.10		0.33	0.16	

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.45

Intersection Signal Delay: 10.9	Intersection LOS: B
Intersection Capacity Utilization 70.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: Walkley & Baycrest



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	1049	14	24	982	28	8	21	30	12	26	63
Future Volume (vph)	92	1049	14	24	982	28	8	21	30	12	26	63
Satd. Flow (prot)	1658	3273	0	1658	3268	0	1658	1550	0	0	1609	1483
Flt Permitted	0.247			0.230			0.732				0.919	
Satd. Flow (perm)	429	3273	0	400	3268	0	1248	1550	0	0	1497	1430
Satd. Flow (RTOR)		2			5			30				63
Lane Group Flow (vph)	92	1063	0	24	1010	0	8	51	0	0	38	63
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		8
Detector Phase	2	2		6	6		4	4		8	8	8
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	24.3	24.3		24.3	24.3		35.1	35.1		35.1	35.1	35.1
Total Split (s)	54.9	54.9		54.9	54.9		35.1	35.1		35.1	35.1	35.1
Total Split (%)	61.0%	61.0%		61.0%	61.0%		39.0%	39.0%		39.0%	39.0%	39.0%
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	3.3
All-Red Time (s)	2.0	2.0		2.0	2.0		2.8	2.8		2.8	2.8	2.8
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Lost Time (s)	5.3	5.3		5.3	5.3		6.1	6.1			6.1	6.1
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	None
Act Effct Green (s)	61.5	61.5		61.5	61.5		21.4	21.4			21.4	21.4
Actuated g/C Ratio	0.68	0.68		0.68	0.68		0.24	0.24			0.24	0.24
v/c Ratio	0.31	0.48		0.09	0.45		0.03	0.13			0.11	0.16
Control Delay	17.0	14.6		10.5	10.6		25.5	16.3			23.5	7.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Delay	17.0	14.6		10.5	10.6		25.5	16.3			23.5	7.0
LOS	B	B		B	B		C	B			C	A
Approach Delay		14.8			10.6			17.5			13.2	
Approach LOS		B			B			B			B	
Queue Length 50th (m)	12.9	90.8		1.9	55.6		1.1	3.5			4.5	0.0
Queue Length 95th (m)	m25.3	119.2		6.0	72.7		m3.8	m11.1			11.4	8.3
Internal Link Dist (m)		289.3			348.2			328.4			132.9	
Turn Bay Length (m)	46.5			50.0			30.0					
Base Capacity (vph)	293	2236		273	2234		402	519			482	503
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	0.31	0.48		0.09	0.45		0.02	0.10			0.08	0.13

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 60 (67%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.48

Intersection Signal Delay: 13.0	Intersection LOS: B
Intersection Capacity Utilization 76.0%	ICU Level of Service D
Analysis Period (min) 15	

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

Splits and Phases: 4: Sandalwood/Briar Hill & Heron

Appendix G

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)	18	696	178	24	1039	20	240	22	43	3	3	4
Future Volume (vph)	18	696	178	24	1039	20	240	22	43	3	3	4
Satd. Flow (prot)	1658	3113	0	1445	3210	0	0	1605	0	1658	1558	0
Flt Permitted	0.206			0.273				0.767		0.652		
Satd. Flow (perm)	358	3113	0	411	3210	0	0	1251	0	1133	1558	0
Satd. Flow (RTOR)		46			3			12			4	
Lane Group Flow (vph)	18	874	0	24	1059	0	0	305	0	3	7	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	30.7	30.7		30.7	30.7		35.0	35.0		35.0	35.0	
Total Split (s)	45.0	45.0		45.0	45.0		45.0	45.0		45.0	45.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	1.4	1.4		1.4	1.4		2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	4.7	4.7		4.7	4.7			6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	52.1	52.1		52.1	52.1			27.2		27.2	27.2	
Actuated g/C Ratio	0.58	0.58		0.58	0.58			0.30		0.30	0.30	
v/c Ratio	0.09	0.48		0.10	0.57			0.79		0.01	0.01	
Control Delay	12.9	12.8		15.2	21.2			41.8		17.7	13.4	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	12.9	12.8		15.2	21.2			41.8		17.7	13.4	
LOS	B	B		B	C			D		B	B	
Approach Delay		12.8			21.1			41.8			14.7	
Approach LOS		B			C			D			B	
Queue Length 50th (m)	1.4	42.6		2.6	83.5			44.8		0.4	0.4	
Queue Length 95th (m)	5.8	71.0		m7.6	116.0			65.0		1.9	2.8	
Internal Link Dist (m)		622.7			289.3			338.6			31.1	
Turn Bay Length (m)	35.5			42.5						24.5		
Base Capacity (vph)	207	1822		237	1860			548		490	677	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.09	0.48		0.10	0.57			0.56		0.01	0.01	

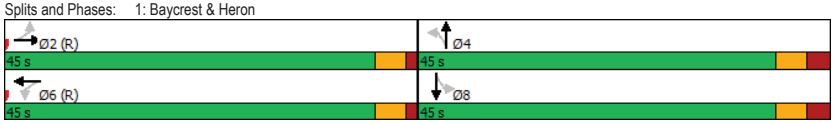
Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 51 (57%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 20.6	Intersection LOS: C
Intersection Capacity Utilization 64.7%	ICU Level of Service C
Analysis Period (min) 15	

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

Splits and Phases: 1: Baycrest & Heron



Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	3	8	46	2	21	7	164	31	19	112	4
Future Vol, veh/h	0	3	8	46	2	21	7	164	31	19	112	4
Conflicting Peds, #/hr	10	0	22	22	0	10	12	0	28	28	0	12
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	4	2	5	2	10	16	11	9	2
Mvmt Flow	0	3	8	46	2	21	7	164	31	19	112	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	379	401	148	402	388	218	128	0	0	223	0	0
Stage 1	164	164	-	222	222	-	-	-	-	-	-	-
Stage 2	215	237	-	180	166	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.14	6.52	6.25	4.12	-	-	4.21	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.14	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.14	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.536	4.018	3.345	2.218	-	-	2.299	-	-
Pot Cap-1 Maneuver	579	538	899	555	547	814	1458	-	-	1294	-	-
Stage 1	838	762	-	776	720	-	-	-	-	-	-	-
Stage 2	787	709	-	817	761	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	544	511	875	518	519	790	1444	-	-	1266	-	-
Mov Cap-2 Maneuver	544	511	-	518	519	-	-	-	-	-	-	-
Stage 1	826	743	-	755	701	-	-	-	-	-	-	-
Stage 2	754	690	-	780	742	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10	12.1	0.3	1.1
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1444	-	-	733	579	1266	-	-
HCM Lane V/C Ratio	0.005	-	-	0.015	0.119	0.015	-	-
HCM Control Delay (s)	7.5	0	-	10	12.1	7.9	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.4	0	-	-

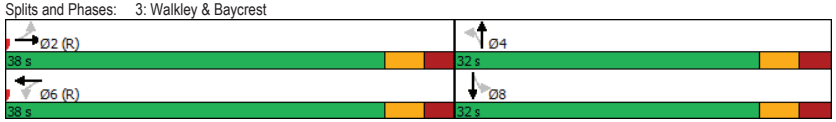
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	562	10	8	599	117	24	19	26	123	5	45
Future Volume (vph)	39	562	10	8	599	117	24	19	26	123	5	45
Satd. Flow (prot)	1496	3181	0	1496	3122	0	0	1609	0	1551	1481	0
Flt Permitted	0.369			0.437				0.887		0.712		
Satd. Flow (perm)	578	3181	0	682	3122	0	0	1447	0	1142	1481	0
Satd. Flow (RTOR)		3			43			26			45	
Lane Group Flow (vph)	39	572	0	8	716	0	0	69	0	123	50	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	25.9	25.9		25.9	25.9		31.1	31.1		31.1	31.1	
Total Split (s)	38.0	38.0		38.0	38.0		32.0	32.0		32.0	32.0	
Total Split (%)	54.3%	54.3%		54.3%	54.3%		45.7%	45.7%		45.7%	45.7%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.6	2.6		2.6	2.6		2.8	2.8		2.8	2.8	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	5.9	5.9		5.9	5.9			6.1		6.1	6.1	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	45.8	45.8		45.8	45.8			16.6		16.6	16.6	
Actuated g/C Ratio	0.65	0.65		0.65	0.65			0.24		0.24	0.24	
v/c Ratio	0.10	0.27		0.02	0.35			0.19		0.45	0.13	
Control Delay	10.2	8.5		9.5	8.6			13.5		26.3	6.9	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	10.2	8.5		9.5	8.6			13.5		26.3	6.9	
LOS	B	A		A	A			B		C	A	
Approach Delay		8.6			8.6			13.5			20.7	
Approach LOS		A			A			B			C	
Queue Length 50th (m)	1.7	14.5		0.3	18.0			4.8		14.9	0.5	
Queue Length 95th (m)	8.1	34.7		2.6	43.1			11.2		23.6	6.5	
Internal Link Dist (m)		436.7			968.3			49.0			107.8	
Turn Bay Length (m)	46.0			34.0						22.0		
Base Capacity (vph)	378	2081		446	2056			551		422	576	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.10	0.27		0.02	0.35			0.13		0.29	0.09	

Intersection Summary
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 17 (24%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.45

Intersection Signal Delay: 10.2	Intersection LOS: B
Intersection Capacity Utilization 60.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3: Walkley & Baycrest



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	693	11	12	995	32	18	12	12	14	13	130
Future Volume (vph)	80	693	11	12	995	32	18	12	12	14	13	130
Satd. Flow (prot)	1658	3263	0	1566	3175	0	1445	1507	0	0	1701	1483
Flt Permitted	0.255			0.377			0.740				0.859	
Satd. Flow (perm)	444	3263	0	618	3175	0	1122	1507	0	0	1498	1460
Satd. Flow (RTOR)		3			6			12				96
Lane Group Flow (vph)	80	704	0	12	1027	0	18	24	0	0	27	130
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		8
Detector Phase	2	2		6	6		4	4		8	8	8
Switch Phase												
Minimum Initial (s)	1.0	1.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	24.3	24.3		24.3	24.3		35.1	35.1		35.1	35.1	35.1
Total Split (s)	54.9	54.9		54.9	54.9		35.1	35.1		35.1	35.1	35.1
Total Split (%)	61.0%	61.0%		61.0%	61.0%		39.0%	39.0%		39.0%	39.0%	39.0%
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	3.3
All-Red Time (s)	2.0	2.0		2.0	2.0		2.8	2.8		2.8	2.8	2.8
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Lost Time (s)	5.3	5.3		5.3	5.3		6.1	6.1			6.1	6.1
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	None
Act Effct Green (s)	64.8	64.8		64.8	64.8		13.8	13.8			13.8	13.8
Actuated g/C Ratio	0.72	0.72		0.72	0.72		0.15	0.15			0.15	0.15
v/c Ratio	0.25	0.30		0.03	0.45		0.11	0.10			0.12	0.43
Control Delay	10.1	7.3		6.4	7.2		32.2	21.5			30.6	14.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Delay	10.1	7.3		6.4	7.2		32.2	21.5			30.6	14.8
LOS	B	A		A	A		C	C			C	B
Approach Delay		7.6			7.2			26.1			17.5	
Approach LOS		A			A			C			B	
Queue Length 50th (m)	2.7	16.7		0.4	25.8		3.1	2.1			4.3	5.4
Queue Length 95th (m)	m27.5	73.6		3.4	75.8		m7.3	m7.6			8.9	16.3
Internal Link Dist (m)		289.3			348.2			330.0			132.9	
Turn Bay Length (m)	46.5			50.0			30.0					
Base Capacity (vph)	319	2349		445	2287		361	493			482	535
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	0.25	0.30		0.03	0.45		0.05	0.05			0.06	0.24

Intersection Summary

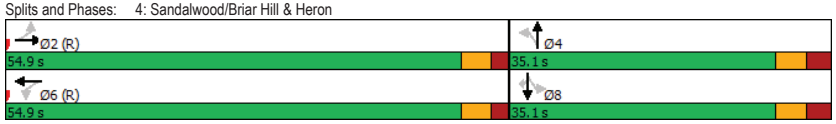
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.45

Intersection Signal Delay: 8.5	Intersection LOS: A
Intersection Capacity Utilization 64.9%	ICU Level of Service C
Analysis Period (min) 15	

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

Splits and Phases: 4: Sandalwood/Briar Hill & Heron



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	1071	233	25	1016	13	148	2	37	18	7	3
Future Volume (vph)	4	1071	233	25	1016	13	148	2	37	18	7	3
Satd. Flow (prot)	1658	3147	0	1626	3305	0	0	1549	0	1610	1648	0
Flt Permitted	0.238			0.160				0.764		0.688		
Satd. Flow (perm)	414	3147	0	273	3305	0	0	1206	0	1161	1648	0
Satd. Flow (RTOR)		47			2			15			3	
Lane Group Flow (vph)	4	1304	0	25	1029	0	0	187	0	18	10	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	29.7	29.7		29.7	29.7		35.0	35.0		35.0	35.0	
Total Split (s)	55.0	55.0		55.0	55.0		35.0	35.0		35.0	35.0	
Total Split (%)	61.1%	61.1%		61.1%	61.1%		38.9%	38.9%		38.9%	38.9%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	1.4	1.4		1.4	1.4		2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	4.7	4.7		4.7	4.7			6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	59.1	59.1		59.1	59.1			20.2		20.2	20.2	
Actuated g/C Ratio	0.66	0.66		0.66	0.66			0.22		0.22	0.22	
v/c Ratio	0.01	0.63		0.14	0.47			0.66		0.07	0.03	
Control Delay	8.8	12.0		11.6	13.2			39.0		23.7	19.1	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	8.8	12.0		11.6	13.2			39.0		23.7	19.1	
LOS	A	B		B	B			D		C	B	
Approach Delay		11.9			13.1			39.0			22.0	
Approach LOS		B			B			D			C	
Queue Length 50th (m)	0.2	54.3		1.1	71.6			28.0		2.6	1.0	
Queue Length 95th (m)	1.7	105.0		m7.6	112.9			43.0		6.8	4.3	
Internal Link Dist (m)		622.7			289.3			338.9			31.1	
Turn Bay Length (m)	35.5			42.5						24.5		
Base Capacity (vph)	271	2081		179	2169			398		374	533	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.01	0.63		0.14	0.47			0.47		0.05	0.02	

Intersection Summary

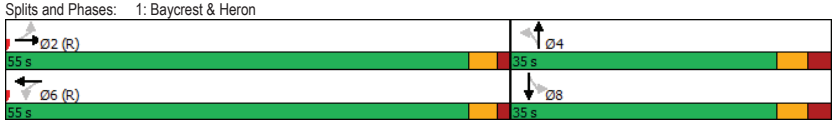
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 14 (16%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 14.5	Intersection LOS: B
Intersection Capacity Utilization 67.6%	ICU Level of Service C
Analysis Period (min) 15	

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

Splits and Phases: 1: Baycrest & Heron



Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	2	4	28	0	22	3	165	30	21	190	2
Future Vol, veh/h	0	2	4	28	0	22	3	165	30	21	190	2
Conflicting Peds, #/hr	3	0	19	19	0	3	23	0	14	14	0	23
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	7	2	2	7	2
Mvmt Flow	0	2	4	28	0	22	3	165	30	21	190	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	456	471	233	455	457	197	215	0	0	209	0	0
Stage 1	256	256	-	200	200	-	-	-	-	-	-	-
Stage 2	200	215	-	255	257	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	515	491	806	515	500	844	1355	-	-	1362	-	-
Stage 1	749	696	-	802	736	-	-	-	-	-	-	-
Stage 2	802	725	-	749	695	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	484	467	780	490	476	833	1331	-	-	1347	-	-
Mov Cap-2 Maneuver	484	467	-	490	476	-	-	-	-	-	-	-
Stage 1	733	672	-	791	726	-	-	-	-	-	-	-
Stage 2	777	715	-	720	671	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.7	11.6	0.1	0.8
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1331	-	-	638	598	1347	-	-
HCM Lane V/C Ratio	0.002	-	-	0.009	0.084	0.016	-	-
HCM Control Delay (s)	7.7	0	-	10.7	11.6	7.7	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.3	0	-	-

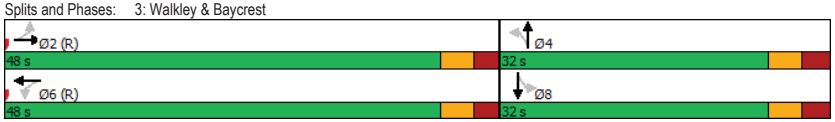
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	719	18	22	788	145	17	11	19	120	18	60
Future Volume (vph)	54	719	18	22	788	145	17	11	19	120	18	60
Satd. Flow (prot)	1658	3197	0	1610	3120	0	0	1542	0	1523	1395	0
Flt Permitted	0.276			0.356				0.890		0.726		
Satd. Flow (perm)	475	3197	0	592	3120	0	0	1378	0	1140	1395	0
Satd. Flow (RTOR)		5			40			19			60	
Lane Group Flow (vph)	54	737	0	22	933	0	0	47	0	120	78	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	25.9	25.9		25.9	25.9		31.1	31.1		31.1	31.1	
Total Split (s)	48.0	48.0		48.0	48.0		32.0	32.0		32.0	32.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.6	2.6		2.6	2.6		2.8	2.8		2.8	2.8	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	5.9	5.9		5.9	5.9			6.1		6.1	6.1	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	53.2	53.2		53.2	53.2			19.2		19.2	19.2	
Actuated g/C Ratio	0.66	0.66		0.66	0.66			0.24		0.24	0.24	
v/c Ratio	0.17	0.35		0.06	0.45			0.14		0.44	0.21	
Control Delay	11.1	9.2		9.4	9.9			14.7		29.1	9.5	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	11.1	9.2		9.4	9.9			14.7		29.1	9.5	
LOS	B	A		A	A			B		C	A	
Approach Delay		9.3			9.8			14.7			21.4	
Approach LOS		A			A			B			C	
Queue Length 50th (m)	4.0	32.7		1.5	43.6			3.0		13.9	1.9	
Queue Length 95th (m)	10.8	45.1		4.9	59.5			10.2		27.7	10.9	
Internal Link Dist (m)		436.7			968.3			49.0			107.8	
Turn Bay Length (m)	46.0			34.0						22.0		
Base Capacity (vph)	316	2127		393	2088			458		369	492	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.17	0.35		0.06	0.45			0.10		0.33	0.16	

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.45

Intersection Signal Delay: 10.9	Intersection LOS: B
Intersection Capacity Utilization 70.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: Walkley & Baycrest



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	118	1049	14	24	1007	36	8	21	30	15	26	80
Future Volume (vph)	118	1049	14	24	1007	36	8	21	30	15	26	80
Satd. Flow (prot)	1658	3273	0	1658	3264	0	1658	1550	0	0	1613	1483
Flt Permitted	0.236			0.230			0.730				0.903	
Satd. Flow (perm)	410	3273	0	400	3264	0	1245	1550	0	0	1477	1430
Satd. Flow (RTOR)		2			6			30				80
Lane Group Flow (vph)	118	1063	0	24	1043	0	8	51	0	0	41	80
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		8
Detector Phase	2	2		6	6		4	4		8	8	8
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	24.3	24.3		24.3	24.3		35.1	35.1		35.1	35.1	35.1
Total Split (s)	54.9	54.9		54.9	54.9		35.1	35.1		35.1	35.1	35.1
Total Split (%)	61.0%	61.0%		61.0%	61.0%		39.0%	39.0%		39.0%	39.0%	39.0%
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	3.3
All-Red Time (s)	2.0	2.0		2.0	2.0		2.8	2.8		2.8	2.8	2.8
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Lost Time (s)	5.3	5.3		5.3	5.3		6.1	6.1			6.1	6.1
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	None
Act Effct Green (s)	61.5	61.5		61.5	61.5		21.4	21.4			21.4	21.4
Actuated g/C Ratio	0.68	0.68		0.68	0.68		0.24	0.24			0.24	0.24
v/c Ratio	0.42	0.48		0.09	0.47		0.03	0.13			0.12	0.20
Control Delay	21.1	14.6		10.5	10.8		25.5	16.2			23.7	6.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Delay	21.1	14.6		10.5	10.8		25.5	16.2			23.7	6.7
LOS	C	B		B	B		C	B			C	A
Approach Delay		15.2			10.8			17.5			12.4	
Approach LOS		B			B			B			B	
Queue Length 50th (m)	18.0	90.3		1.9	58.2		1.1	3.5			4.9	0.0
Queue Length 95th (m)	m34.9	118.5		6.0	76.2		m3.8	m11.1			12.1	9.3
Internal Link Dist (m)		289.3			348.2			329.7			132.9	
Turn Bay Length (m)	46.5			50.0			30.0					
Base Capacity (vph)	279	2236		273	2231		401	519			475	515
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	0.42	0.48		0.09	0.47		0.02	0.10			0.09	0.16

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 60 (67%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.48

Intersection Signal Delay: 13.2	Intersection LOS: B
Intersection Capacity Utilization 77.0%	ICU Level of Service D
Analysis Period (min) 15	

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

Splits and Phases: 4: Sandalwood/Briar Hill & Heron

Appendix H

MMLOS Analysis

CGH TRANSPORTATION

Multi-Modal Level of Service - Intersections Form

Consultant	CGH Transportation Inc.	**Project**	2851 Baycrest Drive
Scenario	Existing/Future	**Date**	10/12/2021
Comments			

	INTERSECTIONS	Heron Road at Baycrest Drive				Baycrest Drive at Walkley Road				Heron Road at Briar Hill Drive/ Sandalwood Drive			
	Crossing Side	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Pedestrian	Lanes	4	4	7	7	5	4	6	7	4	4	8	7
	Median	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m
	Conflicting Left Turns	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
	Conflicting Right Turns	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control
	Right Turns on Red (RToR) ?	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed
	Ped Signal Leading Interval?	No	No	No	No	No	No	No	No	No	No	No	No
	Right Turn Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel
	Corner Radius	10-15m	5-10m	5-10m	5-10m	5-10m	3-5m	5-10m	5-10m	10-15m	5-10m	5-10m	5-10m
	Crosswalk Type	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Textured/coloured pavement	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings
	PETSI Score	53	54	5	5	38	58	21	5	53	54	-11	5
	Ped. Exposure to Traffic LoS	D	D	F	F	E	D	F	F	D	D	F	F
	Cycle Length	90	90	90	90	70	70	70	70	90	90	90	90
	Effective Walk Time	20	20	30	30	8	8	19	19	7	7	39	39
	Average Pedestrian Delay	27	27	20	20	27	27	19	19	38	38	14	14
	Pedestrian Delay LoS	C	C	C	C	C	C	B	B	D	D	B	B
	Level of Service	D	D	F	F	E	D	F	F	D	D	F	F
		F				F				F			
	Approach From	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Bicycle	Bicycle Lane Arrangement on Approach	Mixed Traffic	Mixed Traffic	Mixed Traffic	Curb Bike Lane, Cycletrack or MUP	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Curb Bike Lane, Cycletrack or MUP
	Right Turn Lane Configuration												
	Right Turning Speed												
	Cyclist relative to RT motorists	#N/A	#N/A	#N/A	Not Applicable	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Not Applicable
	Separated or Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Separated	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Separated
	Left Turn Approach	One lane crossed	No lane crossed	≥ 2 lanes crossed	2-stage, LT box	One lane crossed	No lane crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	One lane crossed	≥ 2 lanes crossed	2-stage, LT box
	Operating Speed	> 50 to < 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h
	Left Turning Cyclist	E	C	F	A	E	C	F	F	F	E	F	A
	Level of Service	#N/A	#N/A	#N/A	A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	A
		#N/A				#N/A				#N/A			
Transit	Average Signal Delay		> 40 sec	≤ 20 sec	≤ 20 sec	≤ 30 sec		≤ 20 sec				≤ 20 sec	≤ 20 sec
	Level of Service	-	F	C	C	D	-	C	-	-	-	C	C
		F				D				C			
Truck	Effective Corner Radius												
	Number of Receiving Lanes on Departure from Intersection												
	Level of Service	-	-	-	-	-	-	-	-	-	-	-	-
		-				-				-			
Auto	Volume to Capacity Ratio	0.61 - 0.70				0.0 - 0.60				0.0 - 0.60			
	Level of Service	B				A				A			

Multi-Modal Level of Service - Segments Form

Consultant	**CGH Transportation Inc.**	**Project**	**2851 Baycrest Drive**
Scenario	**Existing/Future**	**Date**	**10/12/2021**
Comments			

SEGMENTS			Section Sanalwood Drive	Section Heron Road	Section 3
Pedestrian	Sidewalk Width Boulevard Width	-	1.5 m 0.5 - 2 m	1.5 m 0.5 - 2 m	
	Avg Daily Curb Lane Traffic Volume		≤ 3000	> 3000	
	Operating Speed On-Street Parking		> 50 to 60 km/h yes	> 50 to 60 km/h no	
	Exposure to Traffic PLoS		**C**	**E**	**-**
	Effective Sidewalk Width				
	Pedestrian Volume				
	Crowding PLoS		**-**	**-**	**-**
	Level of Service		**-**	**-**	**-**
Bicycle	Type of Cycling Facility	D	Mixed Traffic	Physically Separated	
	Number of Travel Lanes		≤ 2 (no centreline)		
	Operating Speed		≥ 50 to 60 km/h		
	# of Lanes & Operating Speed LoS		**D**	**-**	**-**
	Bike Lane (+ Parking Lane) Width				
	Bike Lane Width LoS		**-**	**-**	**-**
	Bike Lane Blockages				
	Blockage LoS		**-**	**-**	**-**
	Median Refuge Width (no median = < 1.8 m)		< 1.8 m refuge		
	No. of Lanes at Unsignalized Crossing		≤ 3 lanes		
	Sidestreet Operating Speed		≤ 40 km/h		
	Unsignalized Crossing - Lowest LoS		**A**	**A**	**-**
	Level of Service		**D**	**A**	**-**
Transit	Facility Type	D		Mixed Traffic	
	Friction or Ratio Transit:Posted Speed			Vt/Vp ≥ 0.8	
	Level of Service		**-**	**D**	**-**
Truck	Truck Lane Width	A		> 3.7 m	
	Travel Lanes per Direction			> 1	
	Level of Service		**-**	**A**	**-**

Appendix I

Synchro Intersection Worksheets – 2024 Future Total Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	685	178	24	1053	20	240	22	43	3	3	4
Future Volume (vph)	18	685	178	24	1053	20	240	22	43	3	3	4
Satd. Flow (prot)	1658	3112	0	1445	3210	0	0	1605	0	1658	1558	0
Flt Permitted	0.202			0.277				0.767		0.652		
Satd. Flow (perm)	351	3112	0	417	3210	0	0	1251	0	1133	1558	0
Satd. Flow (RTOR)		47			3			12			4	
Lane Group Flow (vph)	18	863	0	24	1073	0	0	305	0	3	7	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	30.7	30.7		30.7	30.7		35.0	35.0		35.0	35.0	
Total Split (s)	45.0	45.0		45.0	45.0		45.0	45.0		45.0	45.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	1.4	1.4		1.4	1.4		2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	4.7	4.7		4.7	4.7			6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	52.1	52.1		52.1	52.1			27.2		27.2	27.2	
Actuated g/C Ratio	0.58	0.58		0.58	0.58			0.30		0.30	0.30	
v/c Ratio	0.09	0.47		0.10	0.58			0.79		0.01	0.01	
Control Delay	13.1	12.7		15.5	20.8			41.8		17.7	13.4	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	13.1	12.7		15.5	20.8			41.8		17.7	13.4	
LOS	B	B		B	C			D		B	B	
Approach Delay		12.7			20.7			41.8			14.7	
Approach LOS		B			C			D			B	
Queue Length 50th (m)	1.4	41.8		2.6	86.7			44.8		0.4	0.4	
Queue Length 95th (m)	5.9	69.7		m8.1	118.4			65.0		1.9	2.8	
Internal Link Dist (m)		622.7			289.3			338.6			31.1	
Turn Bay Length (m)	35.5			42.5						24.5		
Base Capacity (vph)	203	1822		241	1860			548		490	677	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.09	0.47		0.10	0.58			0.56		0.01	0.01	

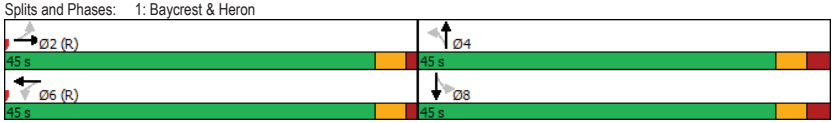
Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 51 (57%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 20.4	Intersection LOS: C
Intersection Capacity Utilization 65.1%	ICU Level of Service C
Analysis Period (min) 15	

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

Splits and Phases: 1: Baycrest & Heron



Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	3	8	55	2	21	7	164	35	19	112	4
Future Vol, veh/h	0	3	8	55	2	21	7	164	35	19	112	4
Conflicting Peds, #/hr	10	0	22	22	0	10	12	0	28	28	0	12
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	4	2	5	2	10	16	11	9	2
Mvmt Flow	0	3	8	55	2	21	7	164	35	19	112	4

Major/Minor	Minor2			Minor1				Major1			Major2	
Conflicting Flow All	381	405	148	404	390	220	128	0	0	227	0	0
Stage 1	164	164	-	224	224	-	-	-	-	-	-	-
Stage 2	217	241	-	180	166	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.14	6.52	6.25	4.12	-	-	4.21	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.14	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.14	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.536	4.018	3.345	2.218	-	-	2.299	-	-
Pot Cap-1 Maneuver	577	535	899	554	545	812	1458	-	-	1290	-	-
Stage 1	838	762	-	774	718	-	-	-	-	-	-	-
Stage 2	785	706	-	817	761	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	542	508	875	517	517	788	1444	-	-	1262	-	-
Mov Cap-2 Maneuver	542	508	-	517	517	-	-	-	-	-	-	-
Stage 1	826	743	-	753	699	-	-	-	-	-	-	-
Stage 2	752	687	-	780	742	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10	12.3	0.3	1.1
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1444	-	-	731	570	1262	-	-
HCM Lane V/C Ratio	0.005	-	-	0.015	0.137	0.015	-	-
HCM Control Delay (s)	7.5	0	-	10	12.3	7.9	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.5	0	-	-

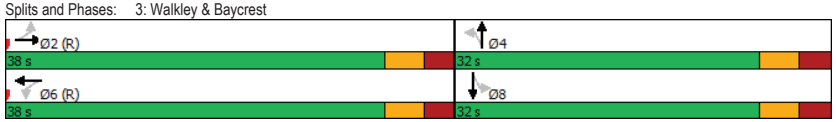
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰ ↑↱			↰ ↑↱			↕			↰ ↱	
Traffic Volume (vph)	42	562	10	8	599	118	24	19	26	126	5	51
Future Volume (vph)	42	562	10	8	599	118	24	19	26	126	5	51
Satd. Flow (prot)	1496	3181	0	1496	3122	0	0	1609	0	1551	1477	0
Flt Permitted	0.369			0.437				0.886		0.712		
Satd. Flow (perm)	578	3181	0	682	3122	0	0	1446	0	1142	1477	0
Satd. Flow (RTOR)		3			43			26			51	
Lane Group Flow (vph)	42	572	0	8	717	0	0	69	0	126	56	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	25.9	25.9		25.9	25.9		31.1	31.1		31.1	31.1	
Total Split (s)	38.0	38.0		38.0	38.0		32.0	32.0		32.0	32.0	
Total Split (%)	54.3%	54.3%		54.3%	54.3%		45.7%	45.7%		45.7%	45.7%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.6	2.6		2.6	2.6		2.8	2.8		2.8	2.8	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	5.9	5.9		5.9	5.9			6.1		6.1	6.1	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	45.7	45.7		45.7	45.7			16.7		16.7	16.7	
Actuated g/C Ratio	0.65	0.65		0.65	0.65			0.24		0.24	0.24	
v/c Ratio	0.11	0.28		0.02	0.35			0.19		0.46	0.14	
Control Delay	10.3	8.5		9.5	8.7			13.5		26.5	6.7	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	10.3	8.5		9.5	8.7			13.5		26.5	6.7	
LOS	B	A		A	A			B		C	A	
Approach Delay		8.7			8.7			13.5			20.4	
Approach LOS		A			A			B			C	
Queue Length 50th (m)	1.8	14.6		0.3	18.2			4.8		15.2	0.5	
Queue Length 95th (m)	8.5	34.7		2.6	43.1			11.2		24.0	6.9	
Internal Link Dist (m)		436.7			968.3			49.0			107.8	
Turn Bay Length (m)	46.0			34.0						22.0		
Base Capacity (vph)	377	2078		445	2053			551		422	578	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.11	0.28		0.02	0.35			0.13		0.30	0.10	

Intersection Summary
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 17 (24%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.46

Intersection Signal Delay: 10.2	Intersection LOS: B
Intersection Capacity Utilization 61.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3: Walkley & Baycrest



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	676	17	16	995	25	32	12	20	11	13	102
Future Volume (vph)	63	676	17	16	995	25	32	12	20	11	13	102
Satd. Flow (prot)	1658	3249	0	1566	3178	0	1445	1496	0	0	1707	1483
Flt Permitted	0.262			0.385			0.742				0.864	
Satd. Flow (perm)	456	3249	0	631	3178	0	1125	1496	0	0	1507	1460
Satd. Flow (RTOR)		4			4			20				96
Lane Group Flow (vph)	63	693	0	16	1020	0	32	32	0	0	24	102
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		8
Detector Phase	2	2		6	6		4	4		8	8	8
Switch Phase												
Minimum Initial (s)	1.0	1.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	24.3	24.3		24.3	24.3		35.1	35.1		35.1	35.1	35.1
Total Split (s)	54.9	54.9		54.9	54.9		35.1	35.1		35.1	35.1	35.1
Total Split (%)	61.0%	61.0%		61.0%	61.0%		39.0%	39.0%		39.0%	39.0%	39.0%
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	3.3
All-Red Time (s)	2.0	2.0		2.0	2.0		2.8	2.8		2.8	2.8	2.8
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Lost Time (s)	5.3	5.3		5.3	5.3		6.1	6.1			6.1	6.1
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	None
Act Effct Green (s)	69.1	69.1		69.1	69.1		13.8	13.8			13.8	13.8
Actuated g/C Ratio	0.77	0.77		0.77	0.77		0.15	0.15			0.15	0.15
v/c Ratio	0.18	0.28		0.03	0.42		0.19	0.13			0.10	0.33
Control Delay	8.2	6.2		6.4	6.6		33.9	18.3			30.3	10.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Delay	8.2	6.2		6.4	6.6		33.9	18.3			30.3	10.0
LOS	A	A		A	A		C	B			C	B
Approach Delay		6.3			6.6			26.1			13.9	
Approach LOS		A			A			C			B	
Queue Length 50th (m)	1.6	16.6		0.5	25.5		5.4	2.2			3.8	1.0
Queue Length 95th (m)	m21.3	72.9		4.1	75.0		m11.1	m8.4			8.3	11.1
Internal Link Dist (m)		289.3			348.2			69.8			132.9	
Turn Bay Length (m)	46.5			50.0			30.0					
Base Capacity (vph)	350	2494		484	2440		362	495			485	535
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	0.18	0.28		0.03	0.42		0.09	0.06			0.05	0.19

Intersection Summary

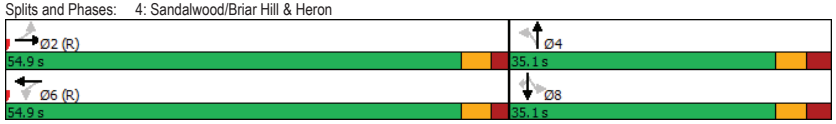
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.42

Intersection Signal Delay: 7.6	Intersection LOS: A
Intersection Capacity Utilization 64.1%	ICU Level of Service C
Analysis Period (min) 15	

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

Splits and Phases: 4: Sandalwood/Briar Hill & Heron



Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	22	9	4	53	36	10
Future Vol, veh/h	22	9	4	53	36	10
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	22	9	4	53	36	10

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	102	41	46	0	-	0
Stage 1	41	-	-	-	-	-
Stage 2	61	-	-	-	-	-
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	896	1030	1562	-	-	-
Stage 1	981	-	-	-	-	-
Stage 2	962	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	893	1030	1562	-	-	-
Mov Cap-2 Maneuver	893	-	-	-	-	-
Stage 1	978	-	-	-	-	-
Stage 2	962	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9	0.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1562	-	929	-	-
HCM Lane V/C Ratio	0.003	-	0.033	-	-
HCM Control Delay (s)	7.3	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	1085	233	25	1001	13	148	2	37	18	7	3
Future Volume (vph)	4	1085	233	25	1001	13	148	2	37	18	7	3
Satd. Flow (prot)	1658	3147	0	1626	3305	0	0	1549	0	1610	1648	0
Flt Permitted	0.243			0.157				0.764		0.688		
Satd. Flow (perm)	423	3147	0	268	3305	0	0	1206	0	1161	1648	0
Satd. Flow (RTOR)		46			2			15			3	
Lane Group Flow (vph)	4	1318	0	25	1014	0	0	187	0	18	10	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	29.7	29.7		29.7	29.7		35.0	35.0		35.0	35.0	
Total Split (s)	55.0	55.0		55.0	55.0		35.0	35.0		35.0	35.0	
Total Split (%)	61.1%	61.1%		61.1%	61.1%		38.9%	38.9%		38.9%	38.9%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	1.4	1.4		1.4	1.4		2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	4.7	4.7		4.7	4.7			6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	59.1	59.1		59.1	59.1			20.2		20.2	20.2	
Actuated g/C Ratio	0.66	0.66		0.66	0.66			0.22		0.22	0.22	
v/c Ratio	0.01	0.63		0.14	0.47			0.66		0.07	0.03	
Control Delay	8.8	12.1		11.9	13.0			39.0		23.7	19.1	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	8.8	12.1		11.9	13.0			39.0		23.7	19.1	
LOS	A	B		B	B			D		C	B	
Approach Delay		12.1			13.0			39.0			22.0	
Approach LOS		B			B			D			C	
Queue Length 50th (m)	0.2	55.5		1.1	69.5			28.0		2.6	1.0	
Queue Length 95th (m)	1.7	107.1		m7.8	109.7			43.0		6.8	4.3	
Internal Link Dist (m)		622.7			289.3			338.1			31.1	
Turn Bay Length (m)	35.5			42.5						24.5		
Base Capacity (vph)	277	2080		175	2169			398		374	533	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.01	0.63		0.14	0.47			0.47		0.05	0.02	

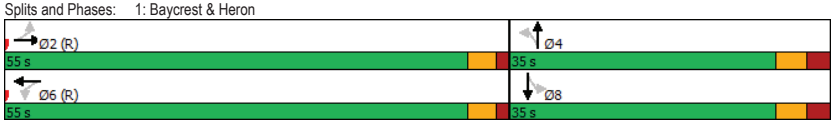
Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 14 (16%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 14.5	Intersection LOS: B
Intersection Capacity Utilization 68.0%	ICU Level of Service C
Analysis Period (min) 15	

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

Splits and Phases: 1: Baycrest & Heron



Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	2	4	35	0	22	3	165	39	21	190	2
Future Vol, veh/h	0	2	4	35	0	22	3	165	39	21	190	2
Conflicting Peds, #/hr	3	0	19	19	0	3	23	0	14	14	0	23
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	7	2	2	7	2
Mvmt Flow	0	2	4	35	0	22	3	165	39	21	190	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	461	480	233	460	462	202	215	0	0	218	0	0
Stage 1	256	256	-	205	205	-	-	-	-	-	-	-
Stage 2	205	224	-	255	257	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	511	485	806	512	497	839	1355	-	-	1352	-	-
Stage 1	749	696	-	797	732	-	-	-	-	-	-	-
Stage 2	797	718	-	749	695	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	480	461	780	487	473	828	1331	-	-	1337	-	-
Mov Cap-2 Maneuver	480	461	-	487	473	-	-	-	-	-	-	-
Stage 1	733	671	-	786	722	-	-	-	-	-	-	-
Stage 2	772	708	-	719	670	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.7	11.9	0.1	0.8
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1331	-	-	634	579	1337	-	-
HCM Lane V/C Ratio	0.002	-	-	0.009	0.098	0.016	-	-
HCM Control Delay (s)	7.7	0	-	10.7	11.9	7.7	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.3	0	-	-

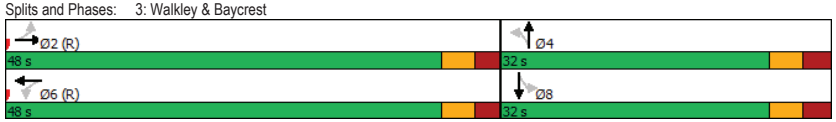
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↕			↕	
Traffic Volume (vph)	60	719	18	22	788	148	17	11	19	122	18	65
Future Volume (vph)	60	719	18	22	788	148	17	11	19	122	18	65
Satd. Flow (prot)	1658	3197	0	1610	3115	0	0	1542	0	1523	1389	0
Flt Permitted	0.275			0.356				0.888		0.726		
Satd. Flow (perm)	474	3197	0	592	3115	0	0	1375	0	1140	1389	0
Satd. Flow (RTOR)		5			41			19			65	
Lane Group Flow (vph)	60	737	0	22	936	0	0	47	0	122	83	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	25.9	25.9		25.9	25.9		31.1	31.1		31.1	31.1	
Total Split (s)	48.0	48.0		48.0	48.0		32.0	32.0		32.0	32.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.6	2.6		2.6	2.6		2.8	2.8		2.8	2.8	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	5.9	5.9		5.9	5.9			6.1		6.1	6.1	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	53.2	53.2		53.2	53.2			19.2		19.2	19.2	
Actuated g/C Ratio	0.66	0.66		0.66	0.66			0.24		0.24	0.24	
v/c Ratio	0.19	0.35		0.06	0.45			0.14		0.45	0.22	
Control Delay	11.4	9.2		9.4	9.9			14.7		29.3	9.2	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	11.4	9.2		9.4	9.9			14.7		29.3	9.2	
LOS	B	A		A	A			B		C	A	
Approach Delay		9.3			9.9			14.7			21.1	
Approach LOS		A			A			B			C	
Queue Length 50th (m)	4.5	32.7		1.5	43.6			3.0		14.1	1.9	
Queue Length 95th (m)	11.9	45.1		4.9	59.7			10.2		28.2	11.3	
Internal Link Dist (m)		436.7			968.3			49.0			107.8	
Turn Bay Length (m)	46.0			34.0						22.0		
Base Capacity (vph)	315	2126		393	2084			458		369	493	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.19	0.35		0.06	0.45			0.10		0.33	0.17	

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.45

Intersection Signal Delay: 10.9	Intersection LOS: B
Intersection Capacity Utilization 71.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: Walkley & Baycrest



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	1049	28	32	982	28	18	21	36	12	26	63
Future Volume (vph)	92	1049	28	32	982	28	18	21	36	12	26	63
Satd. Flow (prot)	1658	3263	0	1658	3268	0	1658	1538	0	0	1609	1483
Flt Permitted	0.247			0.226			0.732				0.918	
Satd. Flow (perm)	429	3263	0	393	3268	0	1248	1538	0	0	1496	1430
Satd. Flow (RTOR)		5			5			36				63
Lane Group Flow (vph)	92	1077	0	32	1010	0	18	57	0	0	38	63
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		8
Detector Phase	2	2		6	6		4	4		8	8	8
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	24.3	24.3		24.3	24.3		35.1	35.1		35.1	35.1	35.1
Total Split (s)	54.9	54.9		54.9	54.9		35.1	35.1		35.1	35.1	35.1
Total Split (%)	61.0%	61.0%		61.0%	61.0%		39.0%	39.0%		39.0%	39.0%	39.0%
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	3.3
All-Red Time (s)	2.0	2.0		2.0	2.0		2.8	2.8		2.8	2.8	2.8
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Lost Time (s)	5.3	5.3		5.3	5.3		6.1	6.1			6.1	6.1
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	None
Act Effct Green (s)	61.5	61.5		61.5	61.5		21.4	21.4			21.4	21.4
Actuated g/C Ratio	0.68	0.68		0.68	0.68		0.24	0.24			0.24	0.24
v/c Ratio	0.31	0.48		0.12	0.45		0.06	0.15			0.11	0.16
Control Delay	16.9	14.7		11.0	10.6		25.0	14.3			23.5	7.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Delay	16.9	14.7		11.0	10.6		25.0	14.3			23.5	7.0
LOS	B	B		B	B		C	B			C	A
Approach Delay		14.9			10.6			16.8			13.2	
Approach LOS		B			B			B			B	
Queue Length 50th (m)	13.0	92.8		2.5	55.6		2.4	3.3			4.5	0.0
Queue Length 95th (m)	m25.0	120.8		7.5	72.7		m6.7	m11.4			11.4	8.3
Internal Link Dist (m)		289.3			348.2			66.3			132.9	
Turn Bay Length (m)	46.5			50.0			30.0					
Base Capacity (vph)	293	2230		268	2234		402	519			482	503
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	0.31	0.48		0.12	0.45		0.04	0.11			0.08	0.13

Intersection Summary

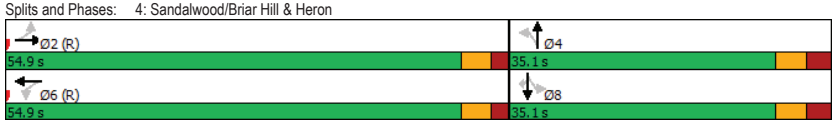
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 60 (67%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.48

Intersection Signal Delay: 13.0	Intersection LOS: B
Intersection Capacity Utilization 76.0%	ICU Level of Service D
Analysis Period (min) 15	

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

Splits and Phases: 4: Sandalwood/Briar Hill & Heron



Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	16	7	9	51	64	21
Future Vol, veh/h	16	7	9	51	64	21
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	16	7	9	51	64	21

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	144	75	85	0	-	0
Stage 1	75	-	-	-	-	-
Stage 2	69	-	-	-	-	-
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	849	986	1512	-	-	-
Stage 1	948	-	-	-	-	-
Stage 2	954	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	844	986	1512	-	-	-
Mov Cap-2 Maneuver	844	-	-	-	-	-
Stage 1	942	-	-	-	-	-
Stage 2	954	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	1.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1512	-	883	-	-
HCM Lane V/C Ratio	0.006	-	0.026	-	-
HCM Control Delay (s)	7.4	0	9.2	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Appendix J

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)	18	702	178	24	1053	20	240	22	43	3	3	4
Future Volume (vph)	18	702	178	24	1053	20	240	22	43	3	3	4
Satd. Flow (prot)	1658	3116	0	1445	3210	0	0	1605	0	1658	1558	0
Flt Permitted	0.202			0.271				0.767		0.652		
Satd. Flow (perm)	351	3116	0	408	3210	0	0	1251	0	1133	1558	0
Satd. Flow (RTOR)		45			3			12			4	
Lane Group Flow (vph)	18	880	0	24	1073	0	0	305	0	3	7	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	30.7	30.7		30.7	30.7		35.0	35.0		35.0	35.0	
Total Split (s)	45.0	45.0		45.0	45.0		45.0	45.0		45.0	45.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	1.4	1.4		1.4	1.4		2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	4.7	4.7		4.7	4.7			6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	52.1	52.1		52.1	52.1			27.2		27.2	27.2	
Actuated g/C Ratio	0.58	0.58		0.58	0.58			0.30		0.30	0.30	
v/c Ratio	0.09	0.48		0.10	0.58			0.79		0.01	0.01	
Control Delay	13.1	12.9		15.1	21.1			41.8		17.7	13.4	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	13.1	12.9		15.1	21.1			41.8		17.7	13.4	
LOS	B	B		B	C			D		B	B	
Approach Delay		12.9			20.9			41.8			14.7	
Approach LOS		B			C			D			B	
Queue Length 50th (m)	1.4	43.2		2.6	83.7			44.8		0.4	0.4	
Queue Length 95th (m)	5.9	71.7		m7.5	116.2			65.0		1.9	2.8	
Internal Link Dist (m)		622.7			289.3			338.6			31.1	
Turn Bay Length (m)	35.5			42.5						24.5		
Base Capacity (vph)	203	1824		236	1860			548		490	677	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.09	0.48		0.10	0.58			0.56		0.01	0.01	

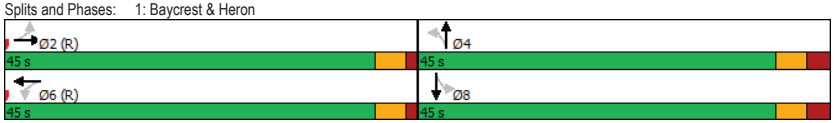
Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 51 (57%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 20.5	Intersection LOS: C
Intersection Capacity Utilization 65.1%	ICU Level of Service C
Analysis Period (min) 15	

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

Splits and Phases: 1: Baycrest & Heron



Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	3	8	55	2	21	7	164	35	19	112	4
Future Vol, veh/h	0	3	8	55	2	21	7	164	35	19	112	4
Conflicting Peds, #/hr	10	0	22	22	0	10	12	0	28	28	0	12
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	4	2	5	2	10	16	11	9	2
Mvmt Flow	0	3	8	55	2	21	7	164	35	19	112	4

Major/Minor	Minor2			Minor1				Major1			Major2	
Conflicting Flow All	381	405	148	404	390	220	128	0	0	227	0	0
Stage 1	164	164	-	224	224	-	-	-	-	-	-	-
Stage 2	217	241	-	180	166	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.14	6.52	6.25	4.12	-	-	4.21	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.14	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.14	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.536	4.018	3.345	2.218	-	-	2.299	-	-
Pot Cap-1 Maneuver	577	535	899	554	545	812	1458	-	-	1290	-	-
Stage 1	838	762	-	774	718	-	-	-	-	-	-	-
Stage 2	785	706	-	817	761	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	542	508	875	517	517	788	1444	-	-	1262	-	-
Mov Cap-2 Maneuver	542	508	-	517	517	-	-	-	-	-	-	-
Stage 1	826	743	-	753	699	-	-	-	-	-	-	-
Stage 2	752	687	-	780	742	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10	12.3	0.3	1.1
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1444	-	-	731	570	1262	-	-
HCM Lane V/C Ratio	0.005	-	-	0.015	0.137	0.015	-	-
HCM Control Delay (s)	7.5	0	-	10	12.3	7.9	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.5	0	-	-

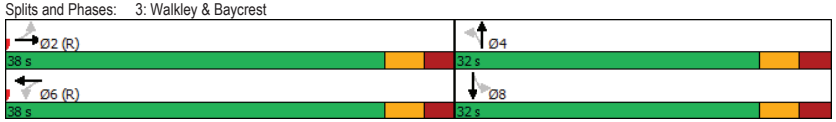
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↑↱		↰	↑↱			↕		↰	↱
Traffic Volume (vph)	42	562	10	8	599	118	24	19	26	126	5	51
Future Volume (vph)	42	562	10	8	599	118	24	19	26	126	5	51
Satd. Flow (prot)	1496	3181	0	1496	3122	0	0	1609	0	1551	1477	0
Flt Permitted	0.369			0.437				0.886		0.712		
Satd. Flow (perm)	578	3181	0	682	3122	0	0	1446	0	1142	1477	0
Satd. Flow (RTOR)		3			43			26			51	
Lane Group Flow (vph)	42	572	0	8	717	0	0	69	0	126	56	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	25.9	25.9		25.9	25.9		31.1	31.1		31.1	31.1	
Total Split (s)	38.0	38.0		38.0	38.0		32.0	32.0		32.0	32.0	
Total Split (%)	54.3%	54.3%		54.3%	54.3%		45.7%	45.7%		45.7%	45.7%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.6	2.6		2.6	2.6		2.8	2.8		2.8	2.8	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	5.9	5.9		5.9	5.9			6.1		6.1	6.1	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	45.7	45.7		45.7	45.7			16.7		16.7	16.7	
Actuated g/C Ratio	0.65	0.65		0.65	0.65			0.24		0.24	0.24	
v/c Ratio	0.11	0.28		0.02	0.35			0.19		0.46	0.14	
Control Delay	10.3	8.5		9.5	8.7			13.5		26.5	6.7	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	10.3	8.5		9.5	8.7			13.5		26.5	6.7	
LOS	B	A		A	A			B		C	A	
Approach Delay		8.7			8.7			13.5			20.4	
Approach LOS		A			A			B			C	
Queue Length 50th (m)	1.8	14.6		0.3	18.2			4.8		15.2	0.5	
Queue Length 95th (m)	8.5	34.7		2.6	43.1			11.2		24.0	6.9	
Internal Link Dist (m)		436.7			968.3			49.0			107.8	
Turn Bay Length (m)	46.0			34.0						22.0		
Base Capacity (vph)	377	2078		445	2053			551		422	578	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.11	0.28		0.02	0.35			0.13		0.30	0.10	

Intersection Summary
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 17 (24%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.46

Intersection Signal Delay: 10.2	Intersection LOS: B
Intersection Capacity Utilization 61.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3: Walkley & Baycrest



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	693	17	16	995	32	32	12	20	14	13	130
Future Volume (vph)	80	693	17	16	995	32	32	12	20	14	13	130
Satd. Flow (prot)	1658	3249	0	1566	3175	0	1445	1496	0	0	1701	1483
Flt Permitted	0.255			0.374			0.740				0.856	
Satd. Flow (perm)	444	3249	0	613	3175	0	1122	1496	0	0	1492	1460
Satd. Flow (RTOR)		4			6			20				96
Lane Group Flow (vph)	80	710	0	16	1027	0	32	32	0	0	27	130
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		8
Detector Phase	2	2		6	6		4	4		8	8	8
Switch Phase												
Minimum Initial (s)	1.0	1.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	24.3	24.3		24.3	24.3		35.1	35.1		35.1	35.1	35.1
Total Split (s)	54.9	54.9		54.9	54.9		35.1	35.1		35.1	35.1	35.1
Total Split (%)	61.0%	61.0%		61.0%	61.0%		39.0%	39.0%		39.0%	39.0%	39.0%
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	3.3
All-Red Time (s)	2.0	2.0		2.0	2.0		2.8	2.8		2.8	2.8	2.8
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Lost Time (s)	5.3	5.3		5.3	5.3		6.1	6.1			6.1	6.1
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	None
Act Effct Green (s)	64.8	64.8		64.8	64.8		13.8	13.8			13.8	13.8
Actuated g/C Ratio	0.72	0.72		0.72	0.72		0.15	0.15			0.15	0.15
v/c Ratio	0.25	0.30		0.04	0.45		0.19	0.13			0.12	0.43
Control Delay	10.0	7.3		6.4	7.2		33.8	18.1			30.7	14.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Delay	10.0	7.3		6.4	7.2		33.8	18.1			30.7	14.8
LOS	B	A		A	A		C	B			C	B
Approach Delay		7.6			7.2			25.9			17.5	
Approach LOS		A			A			C			B	
Queue Length 50th (m)	2.7	16.9		0.5	25.8		5.4	2.2			4.3	5.4
Queue Length 95th (m)	m27.7	74.4		4.1	75.8		m11.2	m8.4			8.9	16.3
Internal Link Dist (m)		289.3			348.2			69.8			132.9	
Turn Bay Length (m)	46.5			50.0			30.0					
Base Capacity (vph)	319	2340		441	2287		361	495			480	535
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	0.25	0.30		0.04	0.45		0.09	0.06			0.06	0.24

Intersection Summary

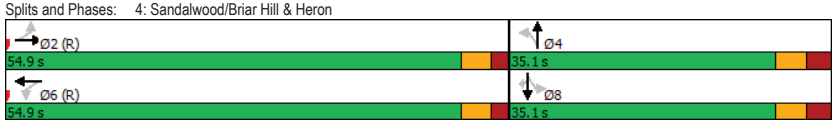
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.45

Intersection Signal Delay: 8.7	Intersection LOS: A
Intersection Capacity Utilization 64.9%	ICU Level of Service C
Analysis Period (min) 15	

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

Splits and Phases: 4: Sandalwood/Briar Hill & Heron



Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	22	9	4	53	36	10
Future Vol, veh/h	22	9	4	53	36	10
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	22	9	4	53	36	10

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	102	41	46	0	-	0
Stage 1	41	-	-	-	-	-
Stage 2	61	-	-	-	-	-
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	896	1030	1562	-	-	-
Stage 1	981	-	-	-	-	-
Stage 2	962	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	893	1030	1562	-	-	-
Mov Cap-2 Maneuver	893	-	-	-	-	-
Stage 1	978	-	-	-	-	-
Stage 2	962	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9	0.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1562	-	929	-	-
HCM Lane V/C Ratio	0.003	-	0.033	-	-
HCM Control Delay (s)	7.3	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	1085	233	25	1026	13	148	2	37	18	7	3
Future Volume (vph)	4	1085	233	25	1026	13	148	2	37	18	7	3
Satd. Flow (prot)	1658	3147	0	1626	3305	0	0	1549	0	1610	1648	0
Flt Permitted	0.235			0.157				0.764		0.688		
Satd. Flow (perm)	409	3147	0	268	3305	0	0	1206	0	1161	1648	0
Satd. Flow (RTOR)		46			2			15			3	
Lane Group Flow (vph)	4	1318	0	25	1039	0	0	187	0	18	10	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	29.7	29.7		29.7	29.7		35.0	35.0		35.0	35.0	
Total Split (s)	55.0	55.0		55.0	55.0		35.0	35.0		35.0	35.0	
Total Split (%)	61.1%	61.1%		61.1%	61.1%		38.9%	38.9%		38.9%	38.9%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	1.4	1.4		1.4	1.4		2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	4.7	4.7		4.7	4.7			6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	59.1	59.1		59.1	59.1			20.2		20.2	20.2	
Actuated g/C Ratio	0.66	0.66		0.66	0.66			0.22		0.22	0.22	
v/c Ratio	0.01	0.63		0.14	0.48			0.66		0.07	0.03	
Control Delay	8.8	12.1		11.6	13.0			39.0		23.7	19.1	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	8.8	12.1		11.6	13.0			39.0		23.7	19.1	
LOS	A	B		B	B			D		C	B	
Approach Delay		12.1			13.0			39.0			22.0	
Approach LOS		B			B			D			C	
Queue Length 50th (m)	0.2	55.5		1.1	71.4			28.0		2.6	1.0	
Queue Length 95th (m)	1.7	107.1		m7.6	112.0			43.0		6.8	4.3	
Internal Link Dist (m)		622.7			289.3			338.1			31.1	
Turn Bay Length (m)	35.5			42.5						24.5		
Base Capacity (vph)	268	2080		175	2169			398		374	533	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.01	0.63		0.14	0.48			0.47		0.05	0.02	

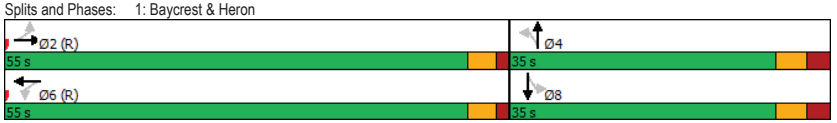
Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 14 (16%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 14.5	Intersection LOS: B
Intersection Capacity Utilization 68.0%	ICU Level of Service C
Analysis Period (min) 15	

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

Splits and Phases: 1: Baycrest & Heron



Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	2	4	35	0	22	3	165	39	21	190	2
Future Vol, veh/h	0	2	4	35	0	22	3	165	39	21	190	2
Conflicting Peds, #/hr	3	0	19	19	0	3	23	0	14	14	0	23
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	7	2	2	7	2
Mvmt Flow	0	2	4	35	0	22	3	165	39	21	190	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	461	480	233	460	462	202	215	0	0	218	0	0
Stage 1	256	256	-	205	205	-	-	-	-	-	-	-
Stage 2	205	224	-	255	257	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	511	485	806	512	497	839	1355	-	-	1352	-	-
Stage 1	749	696	-	797	732	-	-	-	-	-	-	-
Stage 2	797	718	-	749	695	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	480	461	780	487	473	828	1331	-	-	1337	-	-
Mov Cap-2 Maneuver	480	461	-	487	473	-	-	-	-	-	-	-
Stage 1	733	671	-	786	722	-	-	-	-	-	-	-
Stage 2	772	708	-	719	670	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.7	11.9	0.1	0.8
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1331	-	-	634	579	1337	-	-
HCM Lane V/C Ratio	0.002	-	-	0.009	0.098	0.016	-	-
HCM Control Delay (s)	7.7	0	-	10.7	11.9	7.7	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.3	0	-	-

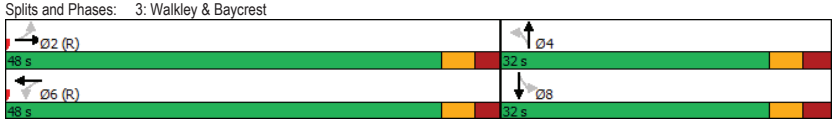
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	719	18	22	788	148	17	11	19	122	18	65
Future Volume (vph)	60	719	18	22	788	148	17	11	19	122	18	65
Satd. Flow (prot)	1658	3197	0	1610	3115	0	0	1542	0	1523	1389	0
Flt Permitted	0.275			0.356				0.888		0.726		
Satd. Flow (perm)	474	3197	0	592	3115	0	0	1375	0	1140	1389	0
Satd. Flow (RTOR)		5			41			19			65	
Lane Group Flow (vph)	60	737	0	22	936	0	0	47	0	122	83	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	25.9	25.9		25.9	25.9		31.1	31.1		31.1	31.1	
Total Split (s)	48.0	48.0		48.0	48.0		32.0	32.0		32.0	32.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.6	2.6		2.6	2.6		2.8	2.8		2.8	2.8	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	5.9	5.9		5.9	5.9			6.1		6.1	6.1	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	53.2	53.2		53.2	53.2			19.2		19.2	19.2	
Actuated g/C Ratio	0.66	0.66		0.66	0.66			0.24		0.24	0.24	
v/c Ratio	0.19	0.35		0.06	0.45			0.14		0.45	0.22	
Control Delay	11.4	9.2		9.4	9.9			14.7		29.3	9.2	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	11.4	9.2		9.4	9.9			14.7		29.3	9.2	
LOS	B	A		A	A			B		C	A	
Approach Delay		9.3			9.9			14.7			21.1	
Approach LOS		A			A			B			C	
Queue Length 50th (m)	4.5	32.7		1.5	43.6			3.0		14.1	1.9	
Queue Length 95th (m)	11.9	45.1		4.9	59.7			10.2		28.2	11.3	
Internal Link Dist (m)		436.7			968.3			49.0			107.8	
Turn Bay Length (m)	46.0			34.0						22.0		
Base Capacity (vph)	315	2126		393	2084			458		369	493	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.19	0.35		0.06	0.45			0.10		0.33	0.17	

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.45

Intersection Signal Delay: 10.9	Intersection LOS: B
Intersection Capacity Utilization 71.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: Walkley & Baycrest



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	118	1049	28	32	1007	36	18	21	36	15	26	80
Future Volume (vph)	118	1049	28	32	1007	36	18	21	36	15	26	80
Satd. Flow (prot)	1658	3263	0	1658	3264	0	1658	1538	0	0	1613	1483
Flt Permitted	0.236			0.226			0.730				0.901	
Satd. Flow (perm)	410	3263	0	393	3264	0	1245	1538	0	0	1474	1430
Satd. Flow (RTOR)		5			6			36				80
Lane Group Flow (vph)	118	1077	0	32	1043	0	18	57	0	0	41	80
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		8
Detector Phase	2	2		6	6		4	4		8	8	8
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	24.3	24.3		24.3	24.3		35.1	35.1		35.1	35.1	35.1
Total Split (s)	54.9	54.9		54.9	54.9		35.1	35.1		35.1	35.1	35.1
Total Split (%)	61.0%	61.0%		61.0%	61.0%		39.0%	39.0%		39.0%	39.0%	39.0%
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	3.3
All-Red Time (s)	2.0	2.0		2.0	2.0		2.8	2.8		2.8	2.8	2.8
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Lost Time (s)	5.3	5.3		5.3	5.3		6.1	6.1			6.1	6.1
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	None
Act Effct Green (s)	61.5	61.5		61.5	61.5		21.4	21.4			21.4	21.4
Actuated g/C Ratio	0.68	0.68		0.68	0.68		0.24	0.24			0.24	0.24
v/c Ratio	0.42	0.48		0.12	0.47		0.06	0.15			0.12	0.20
Control Delay	20.9	14.6		11.0	10.8		24.8	14.2			23.7	6.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Delay	20.9	14.6		11.0	10.8		24.8	14.2			23.7	6.7
LOS	C	B		B	B		C	B			C	A
Approach Delay		15.3			10.8			16.8			12.5	
Approach LOS		B			B			B			B	
Queue Length 50th (m)	18.0	92.1		2.5	58.2		2.4	3.3			4.9	0.0
Queue Length 95th (m)	m34.3	120.3		7.5	76.2		m6.8	m11.4			12.1	9.3
Internal Link Dist (m)		289.3			348.2			66.3			132.9	
Turn Bay Length (m)	46.5			50.0			30.0					
Base Capacity (vph)	279	2230		268	2231		401	519			474	515
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	0.42	0.48		0.12	0.47		0.04	0.11			0.09	0.16

Intersection Summary

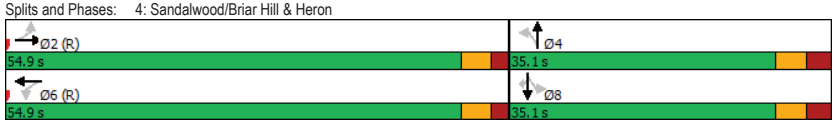
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 60 (67%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.48

Intersection Signal Delay: 13.2	Intersection LOS: B
Intersection Capacity Utilization 77.0%	ICU Level of Service D
Analysis Period (min) 15	

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

Splits and Phases: 4: Sandalwood/Briar Hill & Heron



Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	16	7	9	51	64	21
Future Vol, veh/h	16	7	9	51	64	21
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	16	7	9	51	64	21

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	144	75	85	0	-	0
Stage 1	75	-	-	-	-	-
Stage 2	69	-	-	-	-	-
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	849	986	1512	-	-	-
Stage 1	948	-	-	-	-	-
Stage 2	954	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	844	986	1512	-	-	-
Mov Cap-2 Maneuver	844	-	-	-	-	-
Stage 1	942	-	-	-	-	-
Stage 2	954	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	1.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1512	-	883	-	-
HCM Lane V/C Ratio	0.006	-	0.026	-	-
HCM Control Delay (s)	7.4	0	9.2	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Appendix K

TDM Checklist

CGH TRANSPORTATION

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 Checklist **City of Ottawa**
Version 1.0 (30 June 2017)

		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)	☐