

# 8370 Campeau Drive

## Transportation Impact Assessment

Step 1 Screening Report

Step 2 Scoping Report

Step 3 Forecasting Report

Step 4 Strategy Report

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## 1 Screening

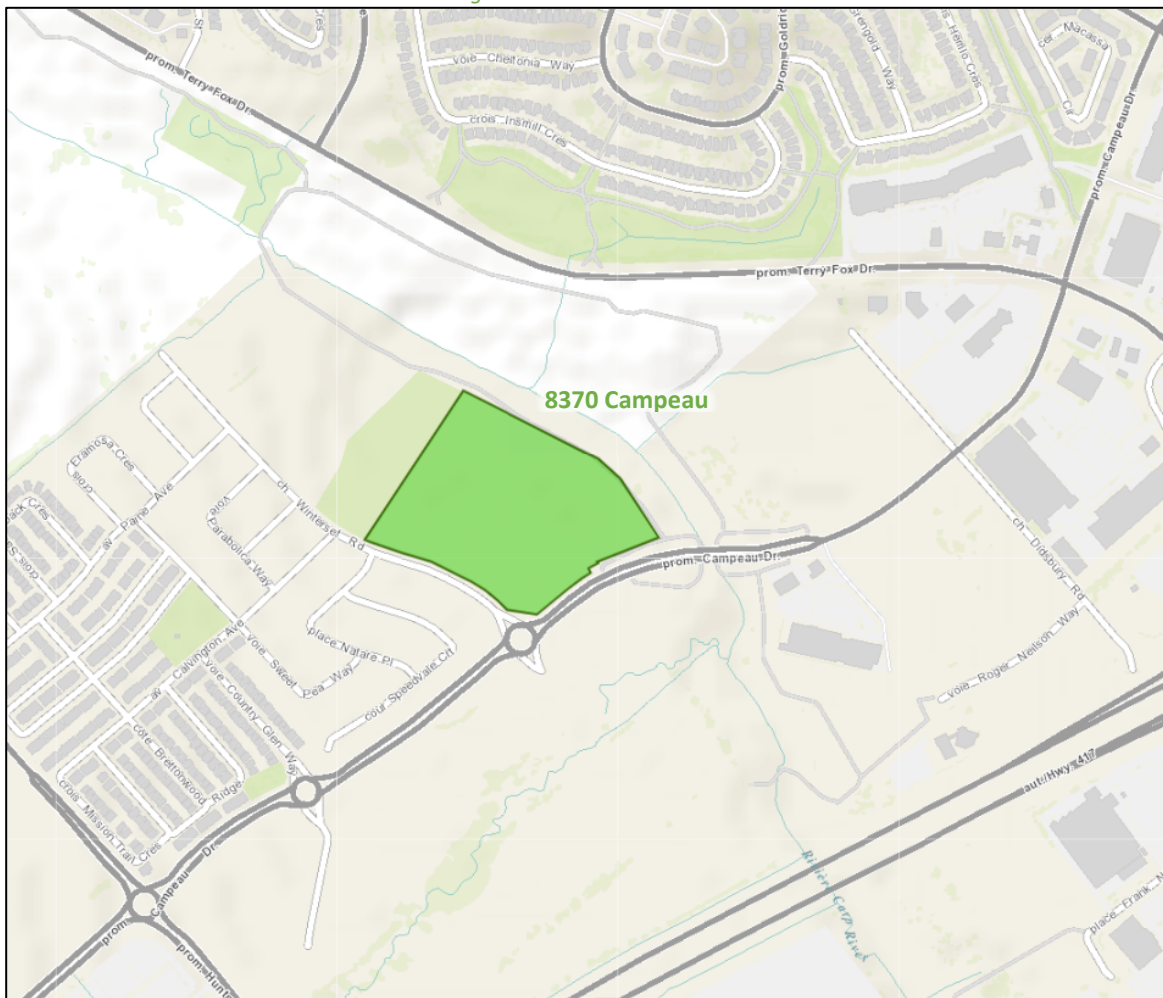
This study has been prepared according to the City of Ottawa’s 2017 Transportation Impact Assessment (TIA) Guidelines, prior to the June 2023 updates. Accordingly, a Step 1 Screening Form has been prepared and is included as Appendix A, along with the Certification Form for the TIA Study PM. As shown 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 the zoning by-law amendment and plan of subdivision application.

## 2 Existing and Planned Conditions

### 2.1 Proposed Development

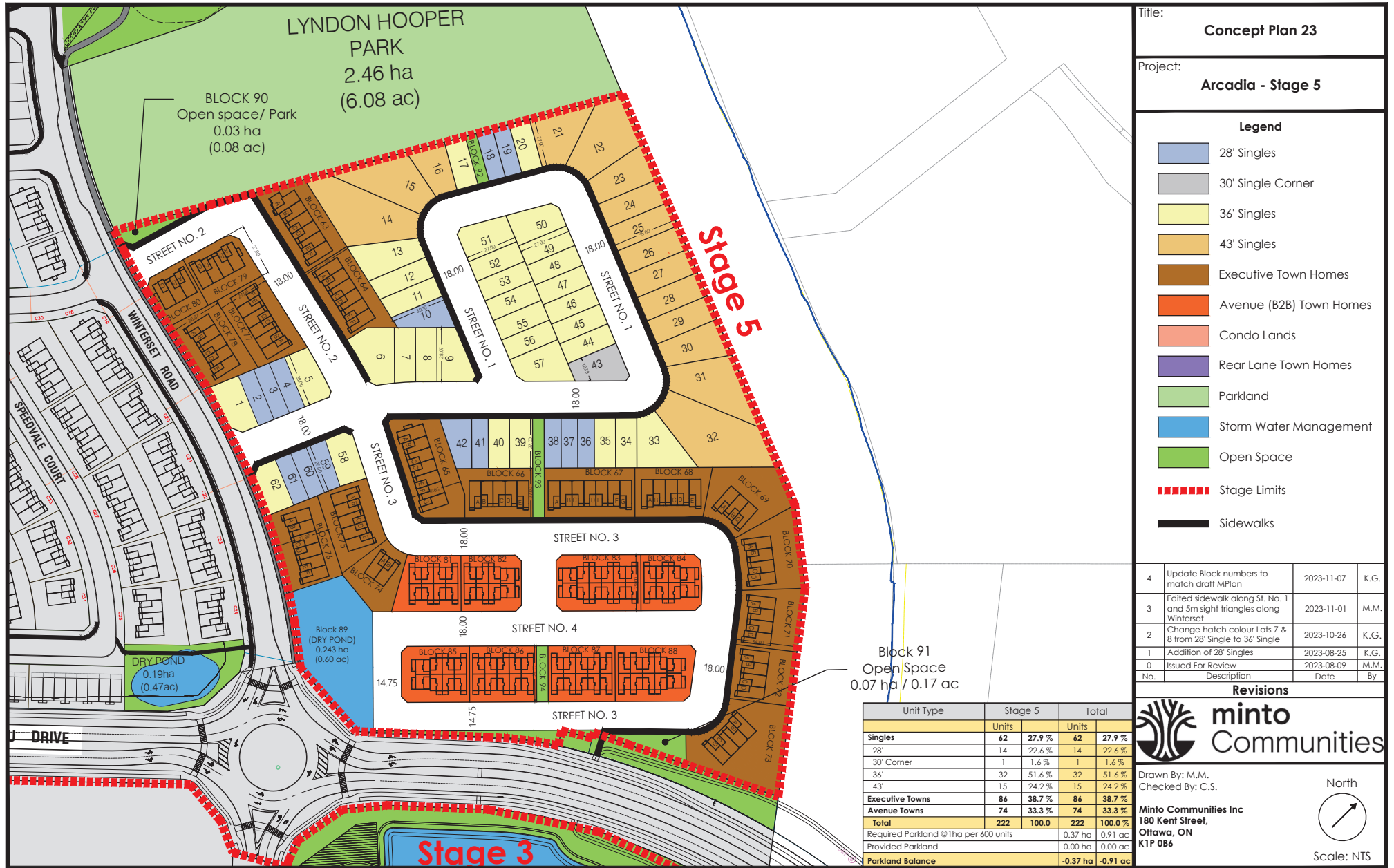
The existing site, located at 8370 Campeau Drive, is zoned as Development Reserve Zone (DR[1932]). The proposed redevelopment consists of 62 single detached units and 160 townhome units. The concept plan includes two full-movements accesses on Winterset Road. The anticipated full build-out and occupancy horizon is 2025 with construction occurring in a single phase. The site is located within the Kanata West Secondary Plan and Community Design Plan areas. Figure 1 illustrates the Study Area Context. Figure 2 illustrates the proposed concept plan.

Figure 1: Area Context Plan



Source: <http://maps.ottawa.ca/geoOttawa/> Accessed: November 2, 2023

Figure 2: Concept Plan



Title: **Concept Plan 23**

Project: **Arcadia - Stage 5**

**Revisions**

**Revisions**

Drawn By: M.M.  
Checked By: C.S.

**Minto Communities**

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North

Scale: NTS

## 2.2 Existing Conditions

### 2.2.1 Area Road Network

*Huntmar Drive:* Huntmar Drive is a City of Ottawa arterial road with a two-lane cross-section north of Cyclone Taylor Boulevard, a divided four-lane urban cross-section between Cyclone Taylor Boulevard to Palladium Drive and transitioning to a rural two-lane cross-section south of Palladium Drive. Cycletracks and sidewalks extend north of Campeau Drive on the east side of the road for 105 metres, to the south on both sides of the road for 115 metres and a sidewalk is provided on the east side of the road between Cyclone Taylor Boulevard and Palladium Drive. The posted speed limit is 70 km/h approximately north of Paine Avenue, 50 km/h to the south, and the City-protected right-of-way is 37.5 metres.

*Campeau Drive:* Campeau Drive is a City of Ottawa arterial road with a divided four-lane urban cross-section west of Didsbury Road and a two-lane urban cross-section to the east of Didsbury Road. Sidewalks and cycletracks are present on the south side between Journeyman Street and Huntmar Drive, and on both sides between Huntmar Drive and Didsbury Road. Sidewalks are present on both sides of the road east of Didsbury Road, and a cycletrack is present on the north side of the road east of Didsbury Road for 80 metres. The posted speed limit is 60 km/h. The existing right-of-way is 41.0 metres west of Huntmar Drive, 37.5 metres between Huntmar Drive and Didsbury Road, and the City-protected right-of-way is 40.0 metres east of Didsbury Road within the study area.

*Terry Fox Drive:* Terry Fox Drive is a City of Ottawa arterial road with a four-lane divided urban cross-section. Sidewalks are present on the east side of the road north of the Signature Centre signalized access, and on both sides to the south. Bike lanes are presented on both sides of the road north of Campeau Drive. The speed limit is 70km/h, and the City-protected right-of-way is 44.5 metres. Terry Fox Drive is designated as a truck route.

*Kanata Avenue:* Kanata Avenue is a City of Ottawa major collector road with a two-lane urban cross-section. Sidewalks and bike lanes are present on both sides of the road. The speed limit is 60km/h and the City-protected right-of-way is 26.0 metres.

*Country Glen Way:* Country Glen Way is a City of Ottawa local road with a two-lane urban cross-section. Sidewalks are provided on both sides of the road. The posted speed limit is 40 km/h and the existing right-of-way is 20.0 metres.

*Winterset Road:* Winterset Road is a City of Ottawa local road with a two-lane cross-section, presently serving as a construction access. The posted speed limit is 40 km/h, and the existing right-of-way is 22.0 metres.

*Didsbury Road:* Didsbury Road is a City of Ottawa local road with a two-lane urban cross-section. Sidewalks are present on the west side of the road. The unposted speed limit is assumed to be 50 km/h, and the City-protected right-of-way is 26.0 metres.

### 2.2.2 Existing Intersections

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

#### Huntmar Drive at Campeau Drive

The intersection of Huntmar Drive at Campeau Drive is a four-legged roundabout intersection. The northbound consists of a left-turn lane, a shared left-turn/through lane, and a right-turn lane, and the southbound consists of a left-turn lane, a through lane, and a right-turn lane. The eastbound consists of a shared left-turn/through lane, a through lane, and an auxiliary right-turn bypass lane, and the westbound approach consists of a shared left-turn/through lane, a through lane, and a right-turn lane. Pedestrian crossovers are

provided on each leg and a MUP circulates the roundabout. No turn restrictions were noted.

#### Country Glen Way at Campeau Drive

The intersection of Country Glen Way at Campeau Drive is a four-legged roundabout intersection. The northbound approach consists of a left-turn lane and a shared through/right-turn lane, and the southbound approach consists of a shared all-movement lane. The eastbound and westbound approaches each consists of a shared left-turn/through lane and a shared through/right-turn lane. Pedestrian crossovers are provided on each leg and a MUP circulates the roundabout. No turn restrictions were noted.

#### Winterset Road at Campeau Drive

The intersection of Winterset Road at Campeau Drive is a four-legged roundabout intersection. The northbound is currently closed until Donum Lane is constructed and will consist of a shared through/left-turn land and a right-turn lane. The southbound approach consists of a shared through/left-turn land and a right-turn lane. The eastbound and westbound approaches each consists of a shared left-turn/through lane and a shared through/right-turn lane. Pedestrian crossovers are provided on each leg and a MUP circulates the roundabout. No turn restrictions were noted.

#### Kanata Commons Road at Campeau Drive

The intersection of Kanata Commons Road at Campeau Drive is a signalized intersection. The northbound approach consists of an auxiliary left-turn lane, a through lane and an auxiliary right-turn lane, and the southbound approach consists of an auxiliary left-turn lane and a shared through/right-turn lane. The eastbound approach consists of an auxiliary left-turn lane, two through lanes, and an auxiliary right-turn lane, and the westbound approach consists of dual auxiliary left-turn lanes, two through lanes, and an auxiliary right-turn lane. No turn restrictions were noted.

#### Didsbury Road at Campeau Drive

The intersection of Didsbury Road at Campeau Drive is a signalized intersection. The northbound and southbound approaches each consist of an auxiliary left-turn lane and a shared through/right-turn lane. The eastbound and westbound approaches each consist of an auxiliary left-turn lane, a through lane, and a shared through/right lane. No turn restrictions were noted.

#### Terry Fox Drive at Campeau Drive

The intersection of Terry Fox Drive at Campeau Drive is a signalized intersection. The northbound approach consists of an auxiliary left-turn lane, two through lanes, a bike lane, and an auxiliary right-turn lane, and the southbound approach consists of an auxiliary left-turn lane, two through lanes, a bike lane, and an auxiliary channelized right-turn lane. The eastbound approach consists of an auxiliary left-turn lane, a through lane, and an auxiliary channelized right-turn lane, and the westbound approach consists of an auxiliary left-turn lane, a through lane, a bike lane, and an auxiliary channelized right-turn lane.

#### Terry Fox Drive at Signature Centre

The intersection of Terry Fox Drive at Signature Centre is a signalized intersection. The northbound and southbound approaches each

consist of an auxiliary left-turn lane, a through lane, a shared through/right-turn lane and a bike lane. The eastbound approach consists of a shared all-movement lane, and the westbound approach consists of a shared left-turn/through lane and an auxiliary right-turn lane.

#### Terry Fox Drive at Kanata Avenue

The intersection of Terry Fox Drive at Kanata Avenue is a signalized intersection. The northbound approach consists of two through lanes, a bike lane, and an auxiliary channelized right-turn lane, and the southbound approach consists of an auxiliary left-turn lane, two through lanes, and a bike lane. The westbound approach consists of an auxiliary left-turn lane, a left-turn lane, a bike lane, and an auxiliary channelized right-turn lane.

#### 2.2.3 Existing Driveways

Within 200 metres, driveways to 40 townhouse units are present on the west side of Winterset Road. None of the driveways within the area of consideration are significant traffic generators.

#### 2.2.4 Cycling and Pedestrian Facilities

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

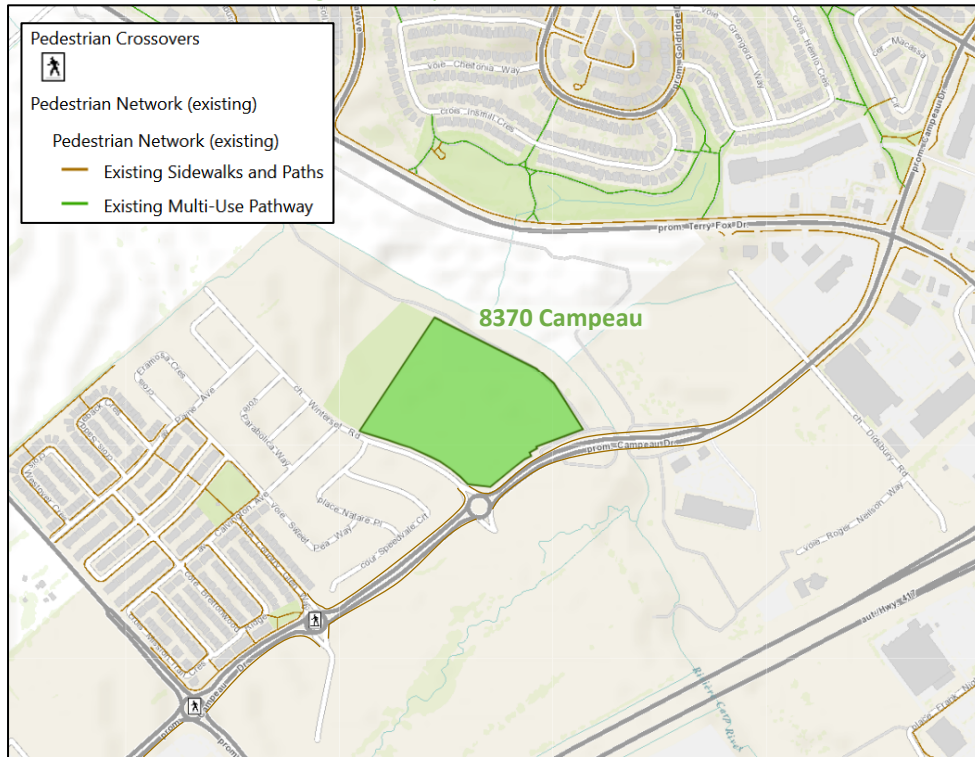
Sidewalks are provided on the east side of Terry Fox Drive north of the Signature Centre signalized access and on both sides to the south. Sidewalks are provided or planned on both sides of Country Glen Way, Kanata Avenue, Campeau Drive, and Huntmar Drive. As the area is currently developing and roadways under construction/opening, some links are currently missing, such as the north side of Campeau Drive between Journeyman Street and Huntmar Drive or across the Highway 417 overpass on Huntmar Drive.

Bike lanes are presented on both sides of Kanata Avenue and Terry Fox Drive north of Campeau Drive. Along Huntmar Drive, cycletracks are present on the east side north of Campeau Drive for 105 metres, on both sides south of Campeau Drive for 115 metres. Along Campeau Drive, cycletracks are present on the south side between Journeyman Street and Huntmar Drive, on both sides between Huntmar Drive and Didsbury Road, and on the north side east of Didsbury Road within the study area.

Huntmar Drive south of Campeau Drive, Campeau Drive east of Huntmar Drive, and Terry Fox Drive are spine routes. Huntmar Drive north of Campeau Drive is a local route. Pathways are present along Carp River north of Campeau Drive and between Terry Fox and Herlihey Way connecting to Campeau Drive. This latter pathway continuing to Campeau Drive continuing to Terry Fox Drive south of Campeau Drive forms part of a cross-town bikeway.

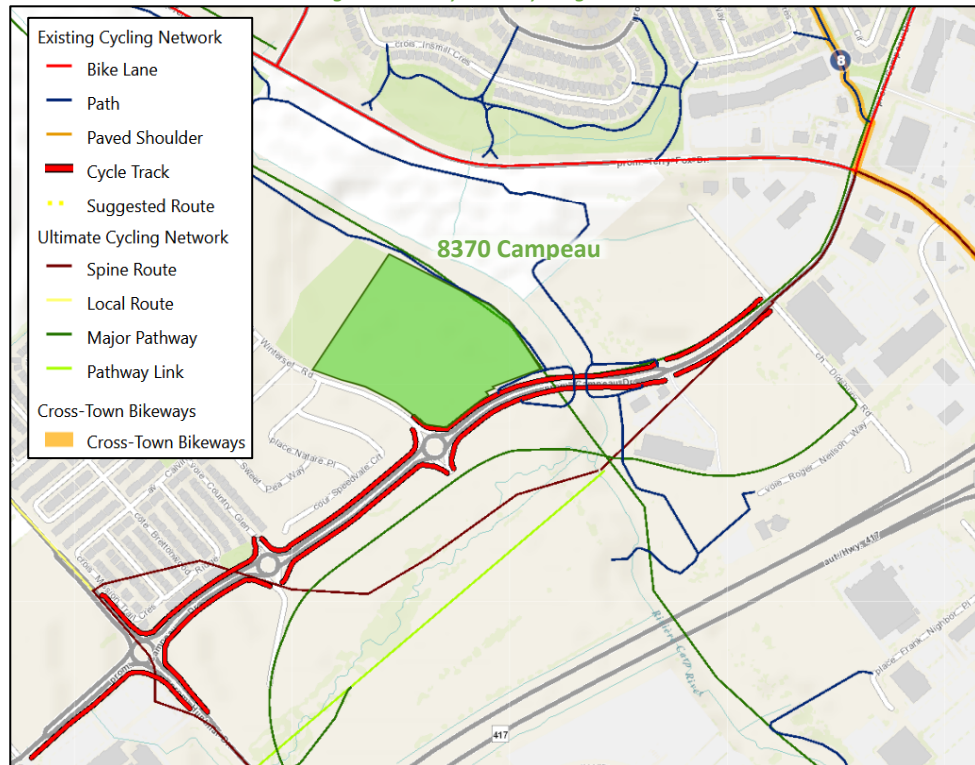


Figure 3: Study Area Pedestrian Facilities



Source: <http://maps.ottawa.ca/geoOttawa/> Accessed: November 2, 2023

Figure 4: Study Area Cycling Facilities



Source: <http://maps.ottawa.ca/geoOttawa/> Accessed: November 2, 2023

Pedestrian and cyclist volumes included in study area intersection counts, presented in Section 2.2.7, have been compiled and are illustrated in Figure 5 and Figure 6, respectively. Only the intersections of Terry Fox Drive at Campeau Drive, Terry Fox Drive at 329 N of Campeau Dr/Signature C, Terry Fox Drive at Kanata Avenue had pedestrian and cyclist volumes available.

Figure 5: Existing Pedestrian Volumes

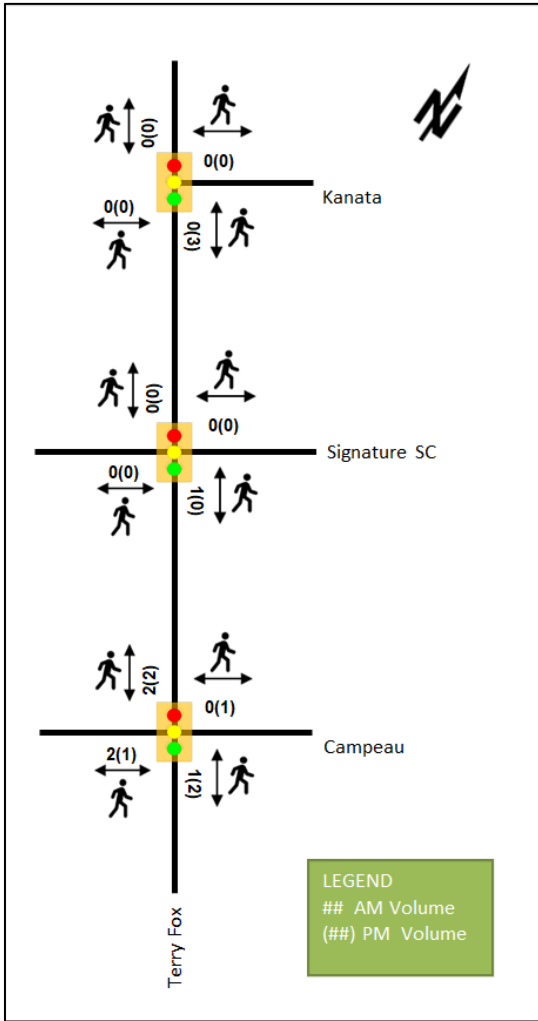
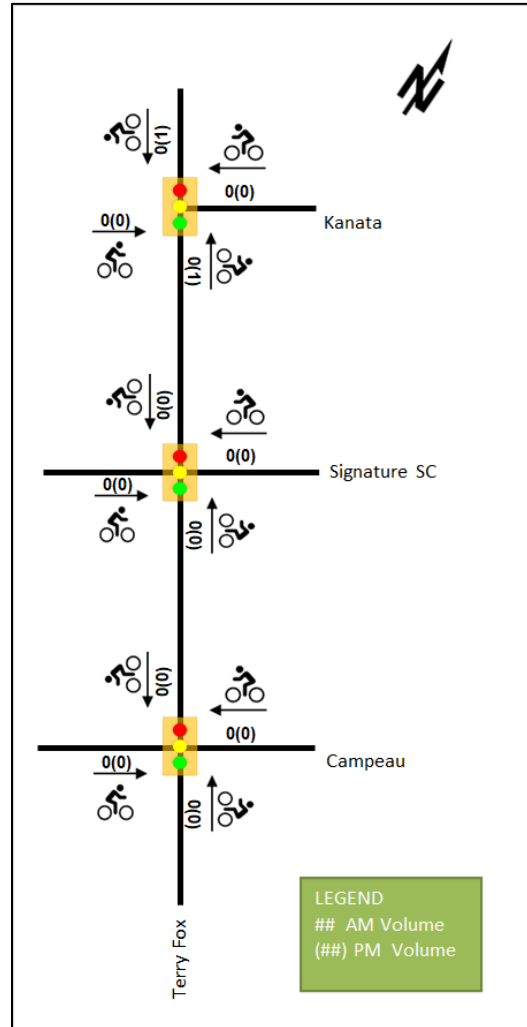


Figure 6: Existing Cyclist Volumes



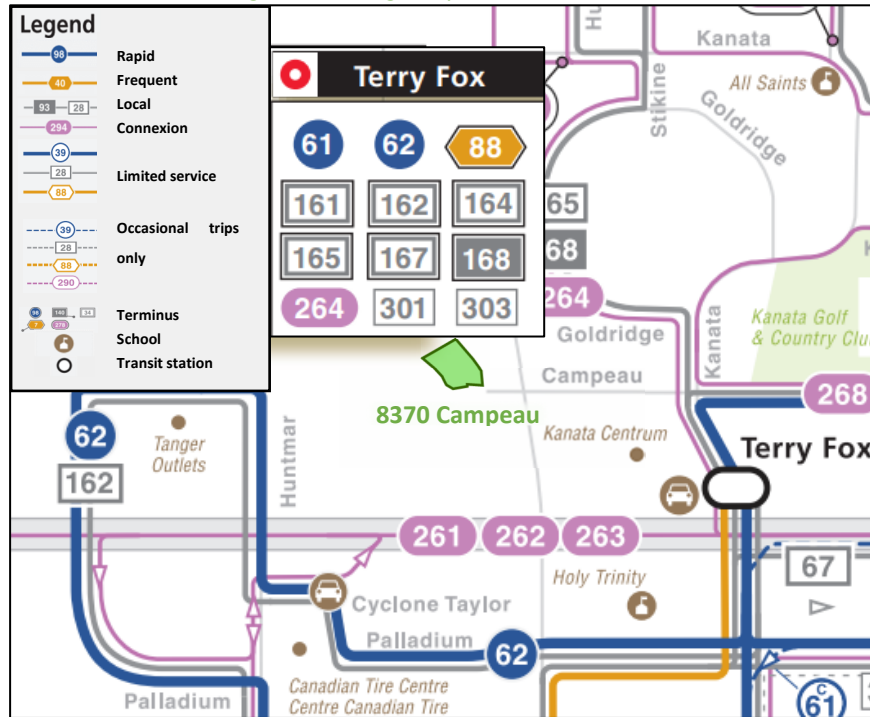
2.2.5 Existing Transit

Figure 7 illustrates the transit system map in the study area and Figure 8 illustrates nearby transit stops. All transit information is from November 2, 2023, and is included for general information purposes and context to the surrounding area.

Within the study area, routes #62 and #162 travels along Palladium Drive, Campeau Dive, and Huntmar Drive. Primary stops are located at Huntmar Drive at Campeau Dive. The frequency of these routes within proximity of the proposed site based on November 2, 2023, service levels are:

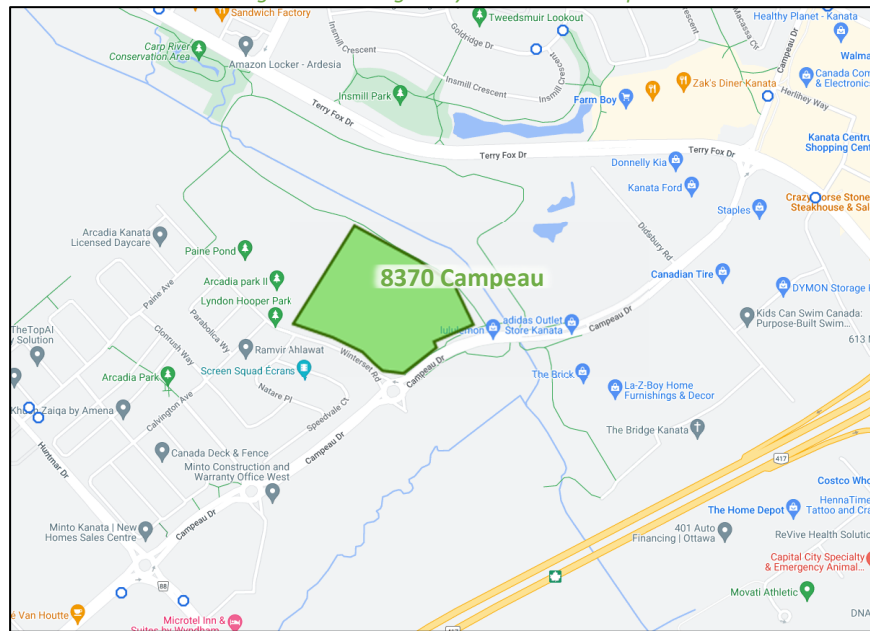
- Route #62 – 30-minute service all-day
- Route # 162 – Three afternoon buses and four late evening buses per day

Figure 7: Existing Study Area Transit Service



Source: <http://www.octranspo.com/> Accessed: November 2, 2023

Figure 8: Existing Study Area Transit Stops



Source: <http://www.octranspo.com/> Accessed: November 2, 2023

### 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 and other sources for the existing study area key intersections. As the count dates are prior to the opening of Campeau Drive across the Carp River, the existing conditions assessed consider the conditions in 2020. Therefore, the Campeau Drive and Didsbury Road intersection was not included, additional new road connections and developments were also excluded from the existing conditions review. The future and new development conditions will be assessed during the future background conditions, Table 1 summarizes the intersection count dates.

*Table 1: Intersection Count Date*

<b>Intersection</b>	<b>Count Date</b>	<b>Source</b>
<b>Huntmar Drive at Campeau Drive</b>	Tuesday, May 28, 2019	The Traffic Specialist
<b>Terry Fox Drive at Kanata Avenue</b>	Wednesday, April 11, 2018	City of Ottawa
<b>Terry Fox Drive at Signature C</b>	Wednesday, December 06, 2017	City of Ottawa
<b>Terry Fox Drive at Campeau Drive</b>	Tuesday, January 21, 2020	City of Ottawa
<b>Country Glen Way at Campeau Drive</b>	-	Transportation Brief – Addendum #2 Arcadia Subdivision – Stage 3 (J.L. Richards & Associates Limited, 2019)

Figure 9 illustrates the existing traffic counts and Table 2 summarizes the existing intersection operations. The level of service for signalized intersections is based on volume to capacity ratio (v/c) calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection. Synchro 11 has been used to model the signalized intersections and Sidra 8 to model the study area roundabouts. Detailed turning movement count data is included in Appendix B and the Synchro and Sidra worksheets are provided in Appendix C.

Figure 9: 2020 Existing Traffic Counts

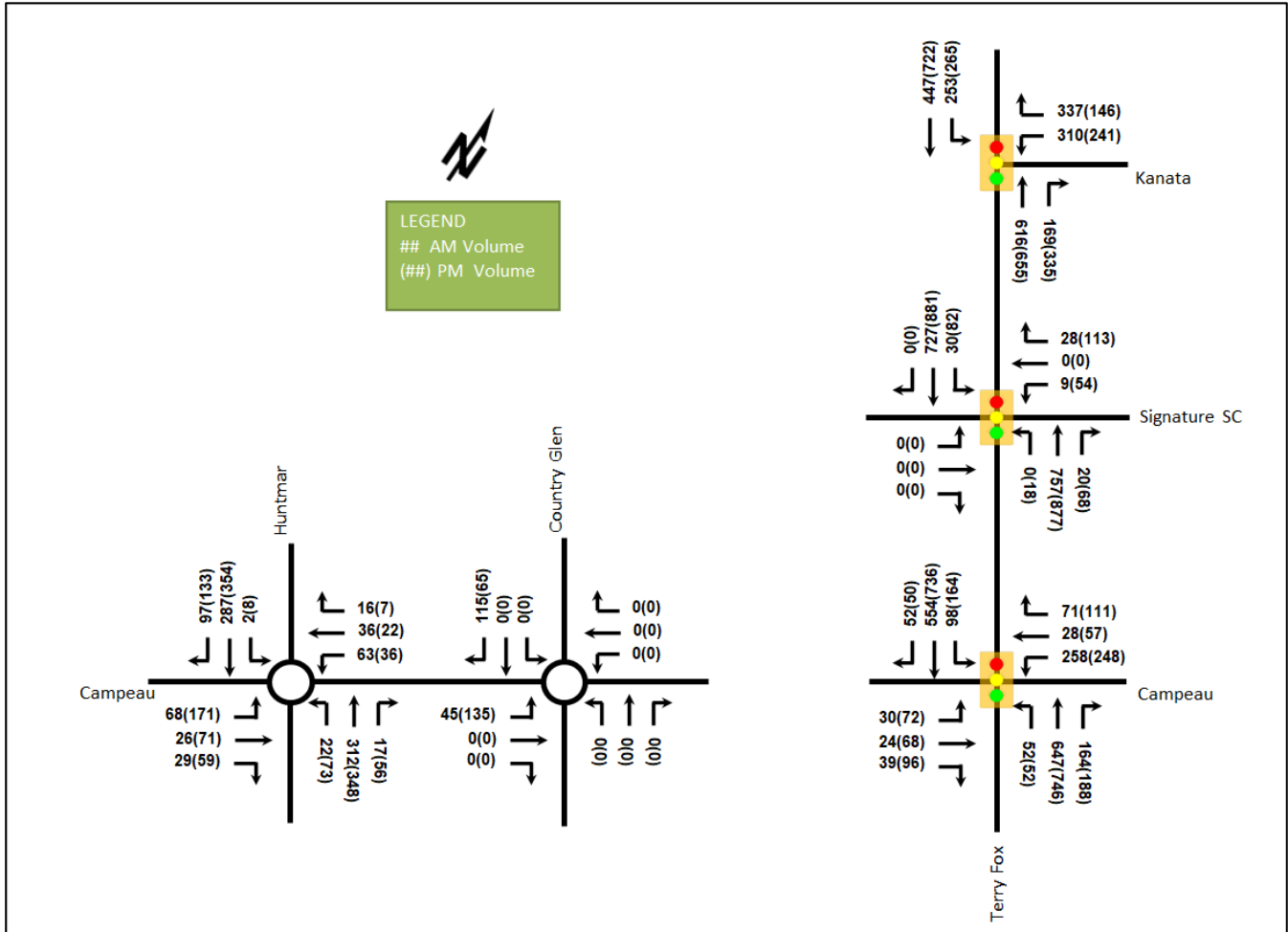


Table 2: 2020 Existing Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 <sup>th</sup> )	LOS	V/C	Delay	Q (95 <sup>th</sup> )
<b>Huntmar Drive at Campeau Drive Roundabout</b>	EB	A	0.09	7.8	1.6	A	0.23	8.2	4.8
	WB	A	0.09	8.0	1.6	A	0.06	8.7	1.0
	NB	A	0.33	2.4	8.1	A	0.42	3.7	10.9
	SB	A	0.16	2.3	3.3	A	0.20	2.5	4.4
	<b>Overall</b>	<b>A</b>	<b>0.34</b>	<b>3.7</b>	-	<b>A</b>	<b>0.42</b>	<b>4.5</b>	-
<b>Terry Fox Drive at Kanata Avenue Signalized</b>	WBL	B	0.65	44.2	49.8	B	0.61	45.4	37.2
	WBR	B	0.68	11.1	26.9	A	0.48	11.1	17.0
	NBT	A	0.51	24.7	84.7	A	0.48	20.1	69.8
	NBR	A	0.27	4.7	14.8	A	0.43	3.6	16.0
	SBL	C	0.76	49.0	81.5	D	0.83	56.8	#97.3
	SBT	A	0.21	5.5	25.3	A	0.33	5.1	35.8
	<b>Overall</b>	<b>B</b>	<b>0.61</b>	<b>22.7</b>	-	<b>A</b>	<b>0.59</b>	<b>19.3</b>	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 <sup>th</sup> )	LOS	V/C	Delay	Q (95 <sup>th</sup> )
Terry Fox Drive at Signature C Signalized	EB	A	-	-	-	A	-	-	-
	WBL/T	A	0.04	33.6	6.2	A	0.17	35.1	22.1
	WBR	A	0.09	11.0	7.0	A	0.26	7.2	14.2
	NBL	A	-	-	-	A	0.08	5.4	m1.7
	NBT/R	A	0.41	13.4	48.0	A	0.51	6.0	27.2
	SBL	A	0.10	8.1	6.3	A	0.38	16.8	22.4
	SBT/R	A	0.38	9.5	49.4	A	0.48	13.1	75.6
	<b>Overall</b>	<b>A</b>	<b>0.31</b>	<b>11.6</b>	<b>-</b>	<b>A</b>	<b>0.41</b>	<b>10.2</b>	<b>-</b>
Terry Fox Drive at Campeau Drive Signalized	EBL	A	0.09	25.5	10.7	A	0.24	34.0	25.1
	EBT	A	0.05	24.6	9.2	A	0.16	32.1	23.3
	EBR	A	0.09	0.4	0.0	A	0.23	6.5	11.8
	WBL	D	0.81	52.9	76.9	D	0.84	62.9	84.9
	WBT	A	0.06	24.9	10.1	A	0.14	31.4	20.1
	WBR	A	0.17	3.9	6.7	A	0.26	6.3	12.6
	NBL	A	0.14	13.0	13.2	A	0.16	12.4	12.5
	NBT	A	0.49	24.3	88.7	A	0.52	25.2	108.7
	NBR	A	0.24	4.5	14.5	A	0.26	4.3	15.5
	SBL	A	0.29	29.5	37.9	A	0.49	22.5	41.9
	SBT	A	0.39	43.4	93.4	A	0.46	16.1	52.7
	SBR	A	0.08	16.3	12.1	A	0.07	0.6	1.3
	<b>Overall</b>	<b>A</b>	<b>0.58</b>	<b>30.2</b>	<b>-</b>	<b>B</b>	<b>0.62</b>	<b>22.9</b>	<b>-</b>

**Notes:** Saturation flow rate of 1800 veh/h/lane  
Peak Hour Factor = 0.90  
V/C = volume-to-capacity ratio

Delay = average vehicle delay in seconds  
Queue is measured in metres  
# = volume 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.

At the intersection of Kanata Avenue and Terry Fox Drive, the southbound left-turn movement may be subject to extended queues during PM peak hours.

### 2.2.8 Collision Analysis

Collision data have been acquired from the City of Ottawa open data website ([data.ottawa.ca](http://data.ottawa.ca)) for five years prior to the commencement of this TIA for the surrounding study area road network. Figure 10 illustrates the intersections and segments analyzed. There were no collisions within the study area from 2018 to 2022 and no further review of collisions is required.

Figure 10: Study Area Collision Records – 2018-2022



## 2.3 Planned Conditions

### 2.3.1 Changes to the Area Transportation Network

The Transportation Master Plan’s Rapid Transit and Transit Priority Network identify Light Rail Transit to extend Light Rail Transit (LRT) from Moodie Drive to Kanata within the Ultimate Network Concept and this project is being studied within the Kanata LRT Planning and EA Study. The future Campeau Station along this extension is planned to be located on the southern boundary of Arcadia community Stage 6. In addition, the Transportation Master Plan’s Road Network identifies widening of Palladium Drive from HWY 417 to Campeau Drive, the extension of Kanata west to Abbott Street by phase two (2020 to 2025) and widening of Huntmar Drive from Campeau south to Maple Grove Road by phase three (2026 to 2031).

The Campeau Drive extension was completed and open in the fall of 2021, connecting Campeau Drive across the Carp River to Didsbury Road, including the roundabout at Winterset Road and signals at both Kanata Commons and Didsbury Road. While not within the study area, Palladium Drive has been realigned to the south of Highway 417 at a new roundabout intersection to form a portion of the planned Kanata North-South Arterial.

The Palladium Drive/Robert Grant Avenue at Derreen Avenue/Palladium Drive roundabout is currently under construction and is not anticipated to impact area travel patterns.

### 2.3.2 Other Study Area Developments

#### 130 Huntmar Drive

The proposed development application includes a site plan for the construction of 90 single family homes, 226 Townhomes, 426 Stacked townhomes, 30,000 ft<sup>2</sup> of retail, and a 2.409 Ha school. The development is anticipated to be built out in 2024 and is predicted to generate 435 new AM two-way peak-hour auto trips and 507 new PM two-way peak-hour auto trips. (Dillon Consulting, 2021)

*195 Huntmar Drive*

The proposed development application includes a plan of subdivision for the construction of a total of 155 single detached, 418 townhouse units, 13,747 m<sup>2</sup> of commercial spaces across three parcels, and two car dealerships (4,000 m<sup>2</sup> GFA each). The development is anticipated to be built out in 2024 and is predicted to generate 991 new AM two-way peak-hour auto trips and 1,372 new PM two-way peak-hour auto trips. (CGH Transportation, 2019)

*319 Huntmar Drive*

The proposed development application includes a site plan for the construction of four, nine-storey mid-rise apartment buildings with 424 units and an amenity building for the use of the residents. No TIA is available as part of this application.

*333 Huntmar Drive*

The proposed development application includes a site plan for the construction of 134 hotel rooms and approximately 30,000 ft<sup>2</sup> of restaurant type land uses. The development is anticipated to be built out in 2022. The development is predicted to generate 61 new AM two-way peak-hour auto trips and 309 new PM two-way peak-hour auto trips. (Parsons, 2014)

*340 Huntmar Drive*

The proposed development application includes a site plan for the construction of a hotel with approximately 108 rooms. The development has been constructed in 2021, and it will be included in the future horizons. (Parsons, 2018)

*405 Huntmar Drive*

The proposed development application includes a site plan for the construction of 44,493 m<sup>2</sup> of warehouse buildings. The anticipated build-out horizon is 2024. The development is predicted to generate new 89 AM two-way peak-hour auto trips and 92 new PM two-way peak-hour auto trips. (Novatech, 2022)

*1300 & 1360 Upper Canada Street*

The proposed development application includes a site plan for the construction of a one-storey warehouse facility, with approximately 120,500 ft<sup>2</sup> gross floor area. The anticipated build-out horizon is assumed to be 2024, and the development is predicted to generate 34 new AM two-way peak-hour auto trips and 36 new PM two-way peak-hour auto trips. (Parsons, 2021)

*1400 Upper Canada Street*

The proposed development application includes a site plan for the construction of 65,400 ft<sup>2</sup> of office space and warehouse area by phase one and expands to 76,400 ft<sup>2</sup> of office space and warehouse area by phase two. The anticipated build-out horizon is 2021 for phase one and 2026 for phase two. The development is predicted to generate new 178 AM two-way peak-hour auto trips and 122 new PM two-way peak-hour auto trips by phase one and 213 new AM two-way peak-hour auto trips and 150 new PM two-way peak-hour auto trips by phase two. (Parsons, 2020)

*8605 Campeau Drive*

*The proposed development application includes a site plan for the construction of a gas station comprising of six gasoline pumps with twelve fueling stations, a car wash, and a convenience store and eating establishment with a drive through. The anticipated build-out horizon is 2025, and the development is predicted to generate 106 new AM two-way peak-hour auto trips and 132 new PM two-way peak-hour auto trips. (NexTrans, 2023)*

*8800 Campeau Drive*

The proposed development application includes a site plan for the construction of a 66,000 ft<sup>2</sup> office/warehouse space by phase one and expands to 77,800 ft<sup>2</sup> office/warehouse space by phase two. The assumed phase one horizon year is 2021 with the facility operating at only 25% of the ultimate capacity. The assumed phase two horizon year is 2026 but could take upwards of 20 years for this level of operation to materialize depending on market conditions. The development is predicted to generate 23 new AM and PM two-way peak-hour auto trips by phase one and 26 AM two-way peak-hour auto trips and 27 new PM two-way peak-hour auto trips by phase two. (Parsons, 2021)

*800 Palladium Drive*

The proposed development application includes a site plan for the construction of approximately 11,000 ft<sup>2</sup> commercial space, 80,000 ft<sup>2</sup> office space, and 5,000 ft<sup>2</sup> of restaurant space. The development has been constructed in 2021, and it will be included in the future horizons. (Stantec, 2019)

*Arcadia community Stage 3&4*

The proposed development application includes a site plan for the construction of 30 single family homes and 192 townhouse units for a total of 222 residential units by stage 3 and 156 single family homes and 70 townhouse units for a total of 226 residential units by stage 4. The development has been constructed in 2022, and it will be included in the future horizons. (J.L. Richards & Associates Limited, 2019)

*Arcadia community Stage 6*

The proposed development application includes a site plan for the construction of 264 stacked towns and 104 townhomes. The anticipated build-out horizon is 2025, and the development is predicted to generate 100 new AM two-way peak-hour auto trips and 123 new PM two-way peak-hour auto trips. (CGH Transportation, 2022)

*8600 Campeau Drive*

The proposed development application includes a site plan for the construction of a four-storey building housing with 120 hotel units. The development has been constructed in 2021, and it will be included in the future horizons. (IBI Group, 2018)

*8700 Campeau Drive*

The proposed development application includes a site plan for the construction of a five-storey office building with a gross floor area of 150,000 ft<sup>2</sup>. The development has been constructed in 2021, and it will be included in the future horizons. (Parsons, 2019)

*471 Terry Fox Drive*

The proposed development application includes a Zoning By-law Amendment to allow the construction of 22,400 ft<sup>2</sup> of retail component. No TIA is available as part of this application.

*3075 Palladium Drive*

The proposed development application includes a site plan for approximately 82,805 sq. ft. of retail space including large and small multi-unit retail pads. The anticipated full build-out horizon is 2027. The file has been initiated and no TIA is available at this time.

*3095 Palladium Drive*

The proposed development application includes a site plan for 3,461 sq. m of retail space including large and small multi-unit retail pads on the northern portion of the site and a 454 sq. m. of car wash on the southern portion of the site. The anticipated full build-out horizon is 2027. The file has been initiated and no TIA is available at this time.

### 3 Study Area and Time Periods

#### 3.1 Study Area

The study area will include the intersections of:

- Campeau Drive at:
  - Huntmar Drive
  - Country Glen Way
  - Winterset Road (Future Conditions)
  - Terry Fox Drive
- Terry Fox Drive at:
  - Signature Centre
  - Kanata Avenue
- Winterset Road at:
  - Street NO.1 (Future Conditions)
  - Street NO.2 (Future Conditions)

The boundary road will be Campeau Drive and Winterset Road (future). Screen lines SL44 and SL53 are present within proximity to the site but will not be analyzed as part of this study.

#### 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 2025. As a result, the full build-out plus five years horizon year is 2030.

## 4 Exemption Review

Table 3 summarizes the exemptions for this TIA.

*Table 3: Exemption Review*

Module	Element	Explanation	Exempt/Required
<b>Design Review Component</b>			
<b>4.1 Development Design</b>	4.1.2 Circulation and Access	Only required for site plans	Exempt
	4.2.3 New Street Networks	Only required for plans of subdivision	Required
<b>4.2 Parking</b>	4.2.1 Parking Supply	Only required for site plans	Exempt
	4.2.2 Spillover Parking	Only required for site plans where parking supply is 15% below unconstrained demand	Exempt
<b>Network Impact Component</b>			
<b>4.5 Transportation Demand Management</b>	All Elements	Not required for site plans expected to have fewer than 60 employees and/or students on location at any given time	Required
<b>4.6 Neighbourhood Traffic Management</b>	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

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

## 5 Development-Generated Travel Demand

### 5.1 Mode Shares

Examining the mode shares recommended in the TRANS Trip Generation Manual (2020) for the subject district, derived from the most recent National Capital Region Origin-Destination survey (OD Survey), the existing average district mode shares by land use for Kanata/Stittsville have been summarized in Table 4.

Table 4: TRANS Trip Generation Manual Recommended Mode Shares – Kanata/Stittsville

Travel Mode	Single-Detached		Multi-Unit (Low-Rise)	
	AM	PM	AM	PM
Auto Driver	52%	56%	52%	58%
Auto Passenger	15%	19%	14%	17%
Transit	20%	14%	22%	17%
Cycling	1%	1%	0%	0%
Walking	12%	9%	11%	8%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

The completion of the Campeau Drive extension provides a direct connection to the Terry Fox BRT Station and would support the area transit mode shares. Depending on the service provided by OC Transpo, this may increase as the station is only 1.65 kilometres from the proposed subdivision. Once the Kanata LRT is extended to Donum Lane, beyond the study horizons of this study, the transit mode share is expected to increase above the current 14-22% currently documented in the Kanata/Stittsville area.

### 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 5 summarizes the person trip rates for the proposed residential land uses for each peak period.

Table 5: Trip Generation Person Trip Rates by Peak Period

Land Use	Land Use Code	Peak Period	Person Trip Rates
Single-Detached	210 (TRANS)	AM	2.05
		PM	2.48
Multi-Unit (Low-Rise)	220 (TRANS)	AM	1.35
		PM	1.58

Using the above person trip rates, the total person trip generation has been estimated. Table 6 summarizes the total person trip generation for the residential land uses.

Table 6: Total Residential Person Trip Generation by Peak Period

Land Use	Units	AM Peak Period			PM Peak Period		
		In	Out	Total	In	Out	Total
Single-Detached	62	38	89	127	95	59	154
Multi-Unit (Low-Rise)	160	65	151	216	142	111	253



Using the above mode share targets for the person trip rates, the person trips by mode have been projected. Trip generation by peak hour has been forecasted using the prescribed peak period conversion factors presented in the TRANS Trip Generation Manual (2020) for the residential component. Table 7 summarizes the residential trip generation by mode.

*Table 7: Residential Trip Generation by Mode*

Travel Mode		AM Peak Hour				PM Peak Hour			
		Mode Share	In	Out	Total	Mode Share	In	Out	Total
Single-Detached	Auto Driver	52%	10	22	32	56%	24	14	38
	Auto Passenger	15%	3	6	9	19%	8	5	13
	Transit	20%	4	10	14	14%	6	4	10
	Cycling	1%	0	1	1	1%	1	0	1
	Walking	12%	3	6	9	9%	4	3	7
	<b>Total</b>	<b>100%</b>	<b>20</b>	<b>45</b>	<b>65</b>	<b>100%</b>	<b>43</b>	<b>26</b>	<b>69</b>
Multi-Unit (Low-Rise)	Auto Driver	52%	16	38	54	58%	36	29	65
	Auto Passenger	14%	4	10	14	17%	11	8	19
	Transit	22%	8	18	26	17%	11	9	20
	Cycling	0%	0	0	0	0%	0	0	0
	Walking	11%	4	10	14	8%	6	5	11
	<b>Total</b>	<b>100%</b>	<b>32</b>	<b>76</b>	<b>108</b>	<b>100%</b>	<b>64</b>	<b>50</b>	<b>114</b>
Total	Auto Driver	-	26	60	86	-	60	43	103
	Auto Passenger	-	7	16	23	-	19	13	32
	Transit	-	12	28	40	-	17	13	30
	Cycling	-	0	1	1	-	1	0	1
	Walking	-	7	16	23	-	10	7	17
	<b>Total</b>	<b>-</b>	<b>52</b>	<b>121</b>	<b>173</b>	<b>-</b>	<b>107</b>	<b>76</b>	<b>183</b>

As shown above, a total of 86 new AM and 103 PM new 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 Kanata/Stittsville. Table 8 below summarizes the distributions.

*Table 8: OD Survey Distribution – Kanata/Stittsville*

To/From	Residential % of Trips
North	15%
South	30%
East	50%
West	5%
<b>Total</b>	<b>100%</b>

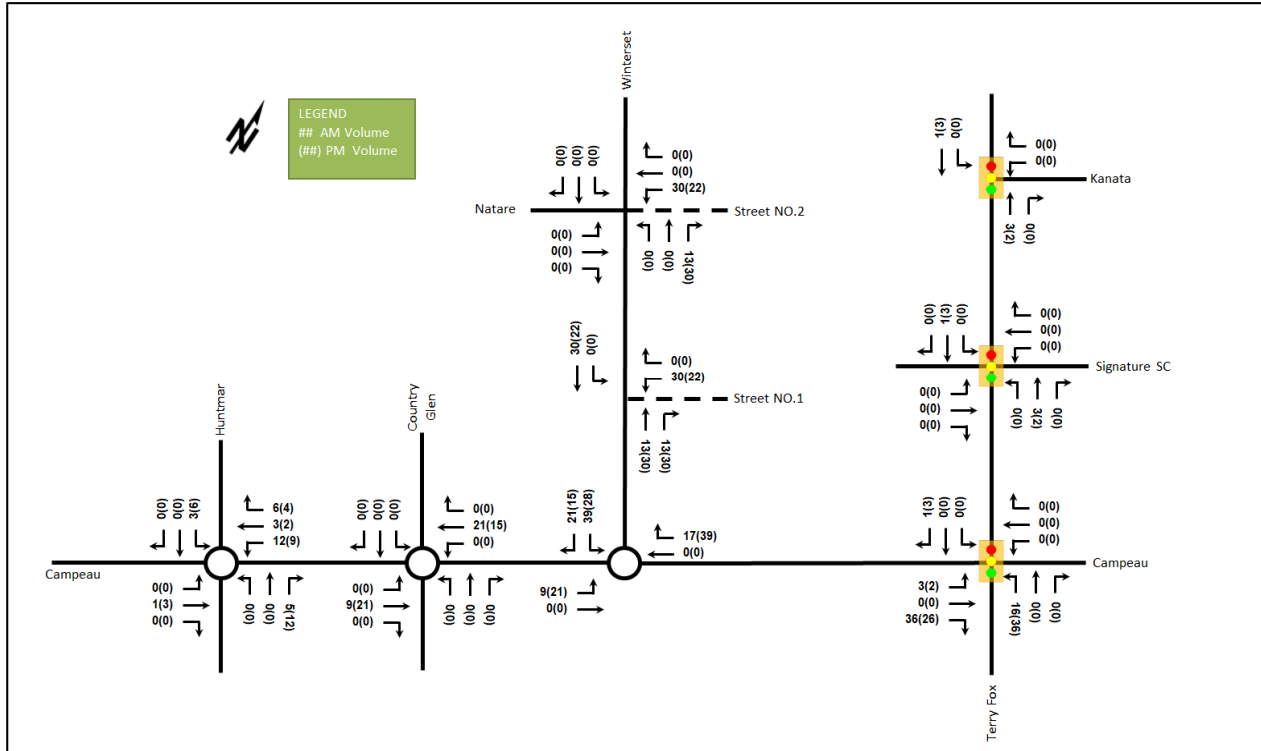
### 5.4 Trip Assignment

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

Table 9: Trip Assignment

To/From	Via
North	10% Huntmar Drive (N), 5% Terry Fox Drive(N)
South	10% Terry Fox Drive(S), 20% Huntmar Drive (S)
East	50% Terry Fox Drive(S)
West	5% Campeau Drive (W)
<b>Total</b>	<b>100%</b>

Figure 11: 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 Campeau Drive extension was completed and opened in the fall of 2021. Therefore, volumes on Campeau Drive were re-distributed in future horizons based on the existing volumes and other area developments. These are summarized in Section 6.3.

### 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 growth rates in the study area derived from the two TRANS model horizons are projected to be positive in both east-west and north-south directions. When reviewing the existing volumes compared to the 2031 model horizon, it is noted that forecasted volumes on eastbound, westbound, and northbound movement in the study area have been exceeded.

Resultantly, growth rates derived from the two TRANS model horizons rounded to the nearest 0.25% will be peak-directionally applied to the appropriate roadway’s mainline volumes and to the appropriate major turning movements at the intersections. Table 10 summarizes the growth rates applied within the study area.

*Table 10: TRANS Regional Model Projections – Study Area Growth Rates*

Street	AM Peak Hour		PM Peak Hour	
	Eastbound	Westbound	Eastbound	Westbound
Campeau Drive	2.00%	2.00%	2.00%	2.00%
	Northbound	Southbound	Northbound	Southbound
Terry Fox Drive	1.75%	2.50%	2.50%	1.75%
Huntmar Drive	2.25%	2.00%	2.00%	2.25%

### 6.3 Other Developments

The background developments explicitly considered in the background conditions (Section 6.2) include:

- 130 Huntmar Drive
- 195 Huntmar Drive
- 333 Huntmar Drive
- 405 Huntmar Drive
- 1300 & 1360 Upper Canada Street
- 1400 Upper Canada Street
- 8605 Campeau Drive
- 8800 Campeau Drive
- 340 Huntmar Drive
- 800 Palladium Drive
- Arcadia community Stage 3&4
- Arcadia community Stage 6
- 8600 Campeau Drive
- 8700 Campeau Drive
- 3075 Palladium Drive
- 3095 Palladium Drive

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

The background volumes and other study area development volumes will be re-distributed in future horizons due to the network changes associated with the Campeau Drive extension. Figure 12 illustrates the 2025 total re-assigned volumes and Figure 13 illustrates the 2030 total re-assigned volumes.

Figure 14 illustrates the 2025 total background developments volumes after re-assignment and Figure 15 illustrates the 2030 total background developments volumes after re-assignment.

Figure 12: 2025 Total Re-Assigned Volumes 2025

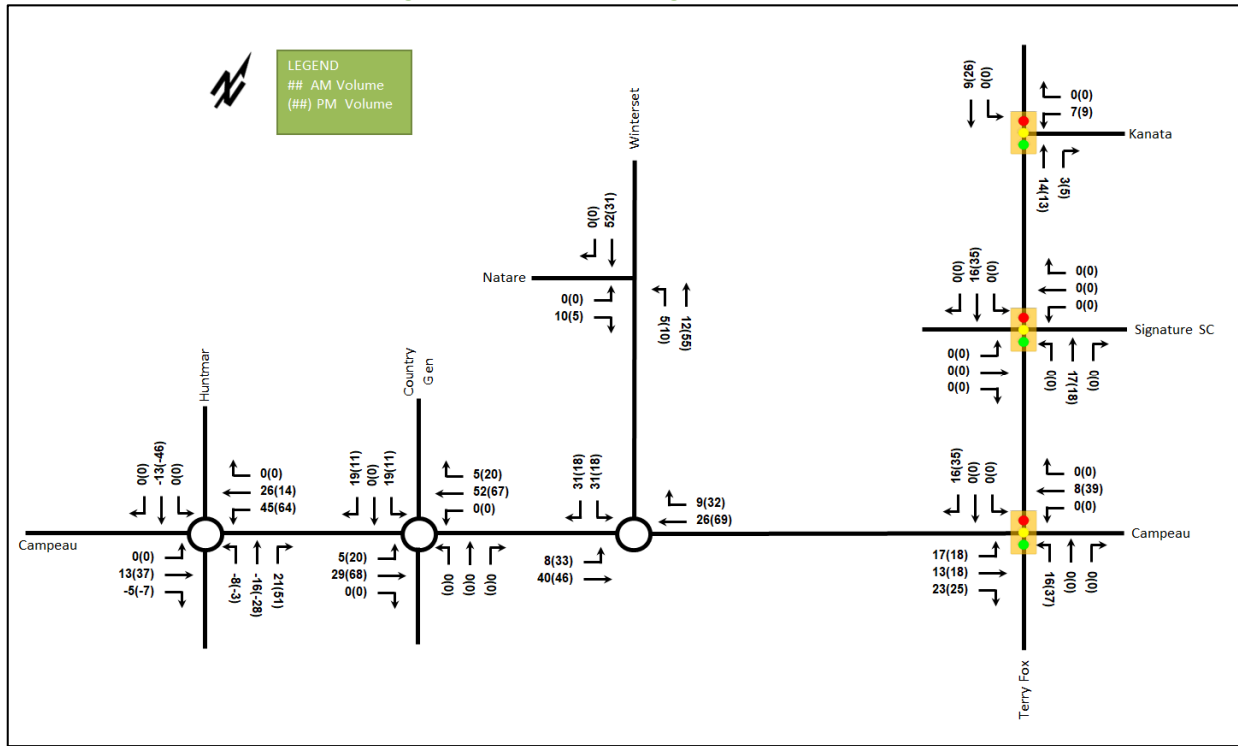


Figure 13: 2030 Total Re-Assigned Volumes 2025

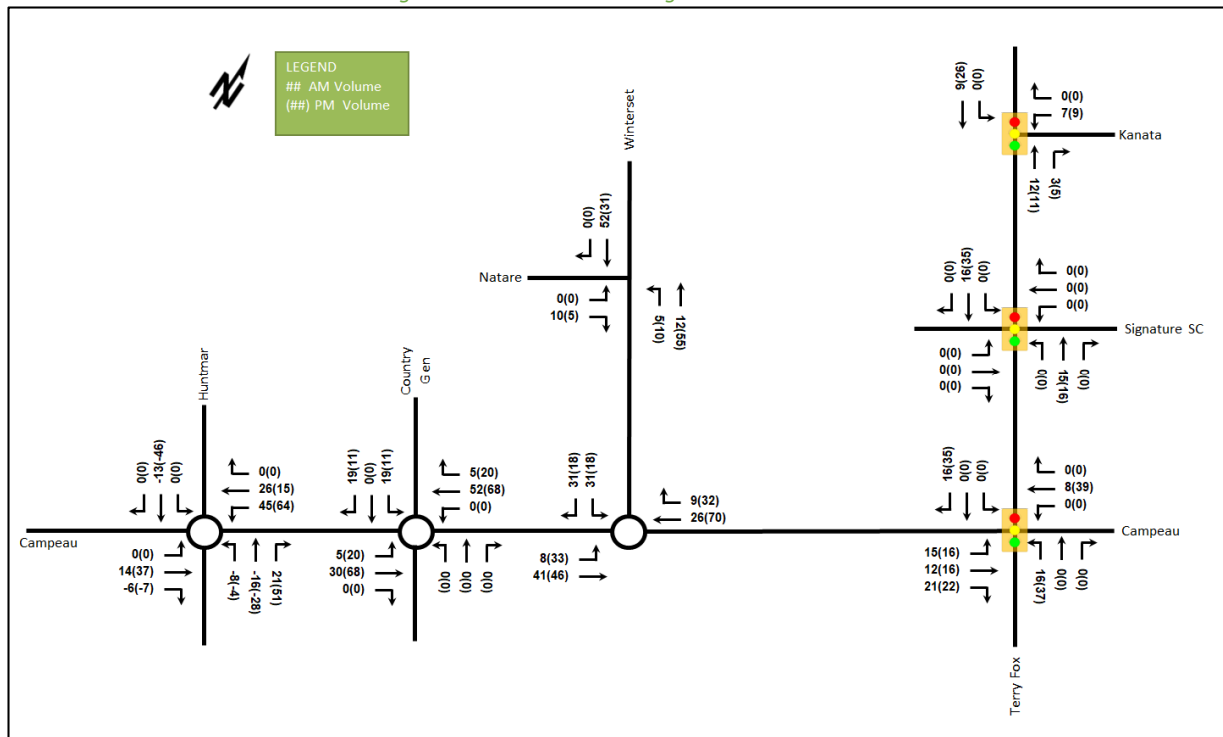


Figure 14: 2025 Total Background Developments Volumes

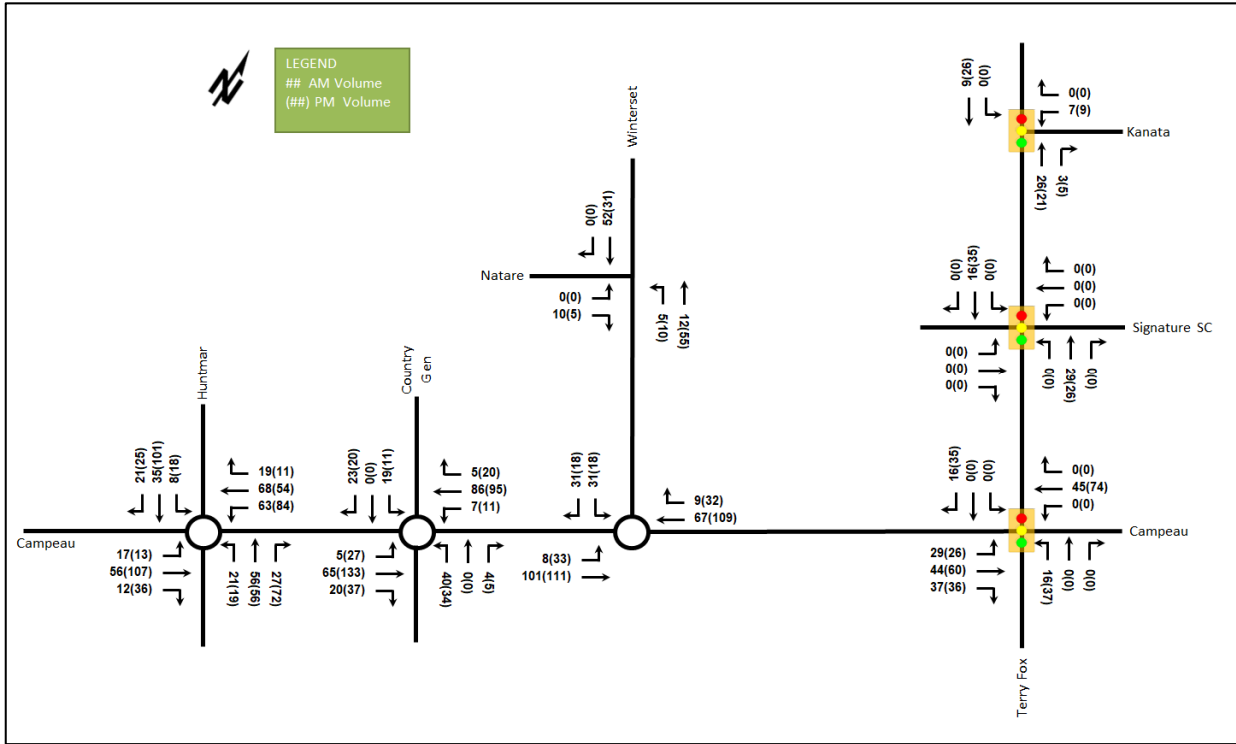
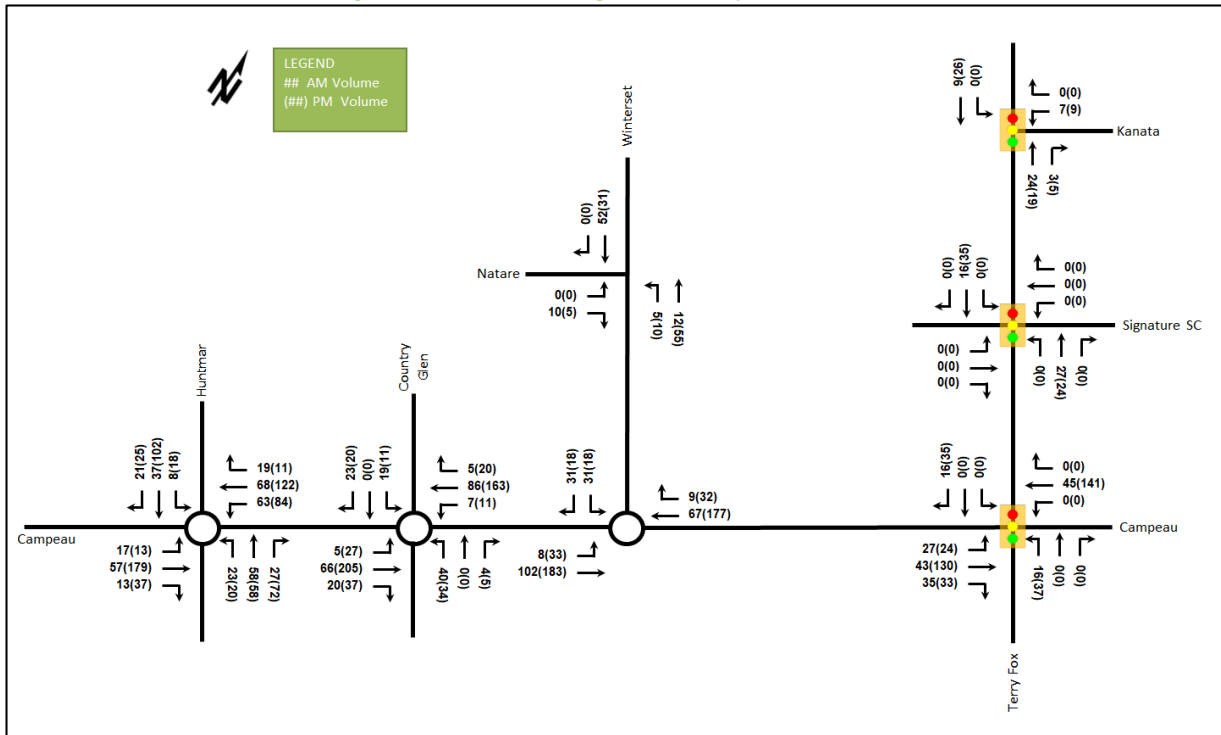


Figure 15: 2030 Total Background Developments Volumes



## 7 Demand Rationalization

### 7.1 2025 Future Background Operations

Since the Campeau Drive extension was completed in the fall of 2021, the intersections of Country Glen Way at Campeau Drive and Winterset Road at Campeau Drive are included in the future background conditions.

Figure 14 illustrates the 2025 background volumes and Table 11 summarizes the 2025 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. Synchro 11 has been used to model the signalized intersections and Sidra 8 to model the study area roundabouts. The Synchro and Sidra worksheets for the 2025 future background horizon are provided in Appendix E.

Figure 16: 2025 Future Background Volumes

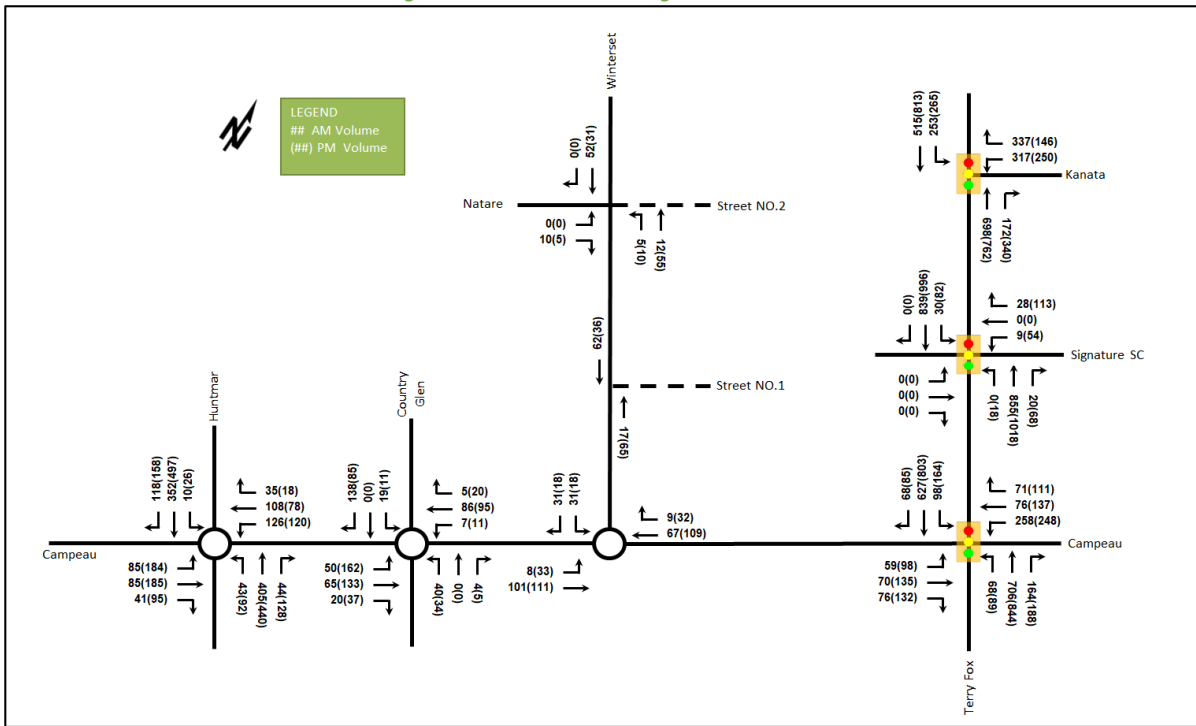


Table 11: 2025 Future Background Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 <sup>th</sup> )	LOS	V/C	Delay	Q (95 <sup>th</sup> )
Huntmar Drive at Campeau Dive Roundabout	EB	A	0.11	7.3	2.2	A	0.27	8.1	5.8
	WB	A	0.17	8.0	3.2	A	0.18	9.2	3.4
	NB	A	0.42	3.0	10.9	A	0.53	4.6	16.6
	SB	A	0.20	2.9	4.3	A	0.29	3.2	6.8
	<b>Overall</b>	<b>A</b>	<b>0.42</b>	<b>4.5</b>	<b>10.9</b>	<b>A</b>	<b>0.53</b>	<b>5.4</b>	<b>16.6</b>
Country Glen Way at Campeau Dive Roundabout	EB	A	0.06	5.8	1.6	A	0.15	6.4	4.2
	WB	A	0.05	4.0	0.9	A	0.07	4.5	1.2
	NB	A	0.02	1.7	0.4	A	0.02	2.1	0.4
	SB	A	0.16	0.6	3.0	A	0.10	0.6	1.8
	<b>Overall</b>	<b>A</b>	<b>0.16</b>	<b>3.1</b>	<b>3.0</b>	<b>A</b>	<b>0.15</b>	<b>4.8</b>	<b>4.2</b>

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 <sup>th</sup> )	LOS	V/C	Delay	Q (95 <sup>th</sup> )
<b>Winterset Road at Campeau Drive Roundabout</b>	EB	A	0.05	3.8	1.3	A	0.07	4.7	1.7
	WB	A	0.04	3.4	0.8	A	0.07	3.6	1.6
	SB	A	0.03	0.9	0.5	A	0.02	1.0	0.3
	<b>Overall</b>	<b>A</b>	<b>0.05</b>	<b>3.0</b>	<b>1.3</b>	<b>A</b>	<b>0.07</b>	<b>3.8</b>	<b>1.7</b>
<b>Terry Fox Drive at Kanata Avenue Signalized</b>	WBL	B	0.63	42.8	44.6	A	0.56	42.0	35.5
	WBR	B	0.66	11.2	24.8	A	0.44	11.1	16.5
	NBT	A	0.50	22.6	80.6	A	0.52	21.4	82.3
	NBR	A	0.24	4.4	13.5	A	0.41	4.0	17.0
	SBL	C	0.74	47.4	71.9	C	0.73	45.5	71.3
	SBT	A	0.22	5.2	24.8	A	0.34	5.1	35.8
	<b>Overall</b>	<b>A</b>	<b>0.59</b>	<b>21.2</b>	-	<b>A</b>	<b>0.59</b>	<b>17.9</b>	-
<b>Terry Fox Drive at Signature C Signalized</b>	EB	-	-	-	-	-	-	-	-
	WBL/T	A	0.04	33.4	5.6	A	0.15	34.9	20.3
	WBR	A	0.08	9.9	6.1	A	0.23	7.4	13.6
	NBL	-	-	-	-	A	0.07	4.8	m0.5
	NBT/R	A	0.42	13.8	64.5	A	0.53	15.4	130.8
	SBL	A	0.09	8.0	5.9	A	0.36	16.6	20.6
	SBT/R	A	0.39	9.7	51.8	A	0.48	13.3	77.3
<b>Overall</b>	<b>A</b>	<b>0.32</b>	<b>11.8</b>	-	<b>A</b>	<b>0.42</b>	<b>14.5</b>	-	
<b>Terry Fox Drive at Campeau Drive Signalized</b>	EBL	A	0.18	28.5	17.3	A	0.34	37.3	30.2
	EBT	A	0.15	27.9	19.2	A	0.30	35.7	37.7
	EBR	A	0.17	3.6	6.2	A	0.28	6.3	12.9
	WBL	C	0.80	54.1	70.7	D	0.85	66.5	77.6
	WBT	A	0.16	28.3	20.5	A	0.31	35.9	38.2
	WBR	A	0.16	3.0	5.2	A	0.24	6.5	11.9
	NBL	A	0.16	12.3	14.5	A	0.24	12.4	17.7
	NBT	A	0.47	23.0	86.6	A	0.52	24.2	110.8
	NBR	A	0.22	4.5	13.9	A	0.23	4.4	15.4
	SBL	A	0.25	27.3	34.3	A	0.44	27.7	52.7
	SBT	A	0.39	42.2	94.8	A	0.47	39.1	112.8
	SBR	A	0.09	18.2	15.3	A	0.11	18.0	19.1
<b>Overall</b>	<b>A</b>	<b>0.56</b>	<b>29.2</b>	-	<b>B</b>	<b>0.61</b>	<b>30.1</b>	-	

**Notes:** Saturation flow rate of 1800 veh/h/lane  
 Peak Hour Factor = 1.00  
 V/C = volume-to-capacity ratio

Delay = average vehicle delay in seconds  
 Queue is measured in metres  
 # = volume for the 95th %ile cycle exceeds capacity

During both the AM and PM peak hours at the 2025 future background horizon, the study area intersections operate similarly to the existing conditions. No capacity issues are noted.

### 7.2 2030 Future Background Operations

Figure 15 illustrates the 2030 background volumes and Table 12 summarizes the 2030 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. Synchro 11 has been used to model the signalized intersections and Sidra 8 to model the study area roundabout. The Synchro and Sidra worksheets for the 2030 future background horizon are provided in Appendix F.

Figure 17: 2030 Future Background Volumes

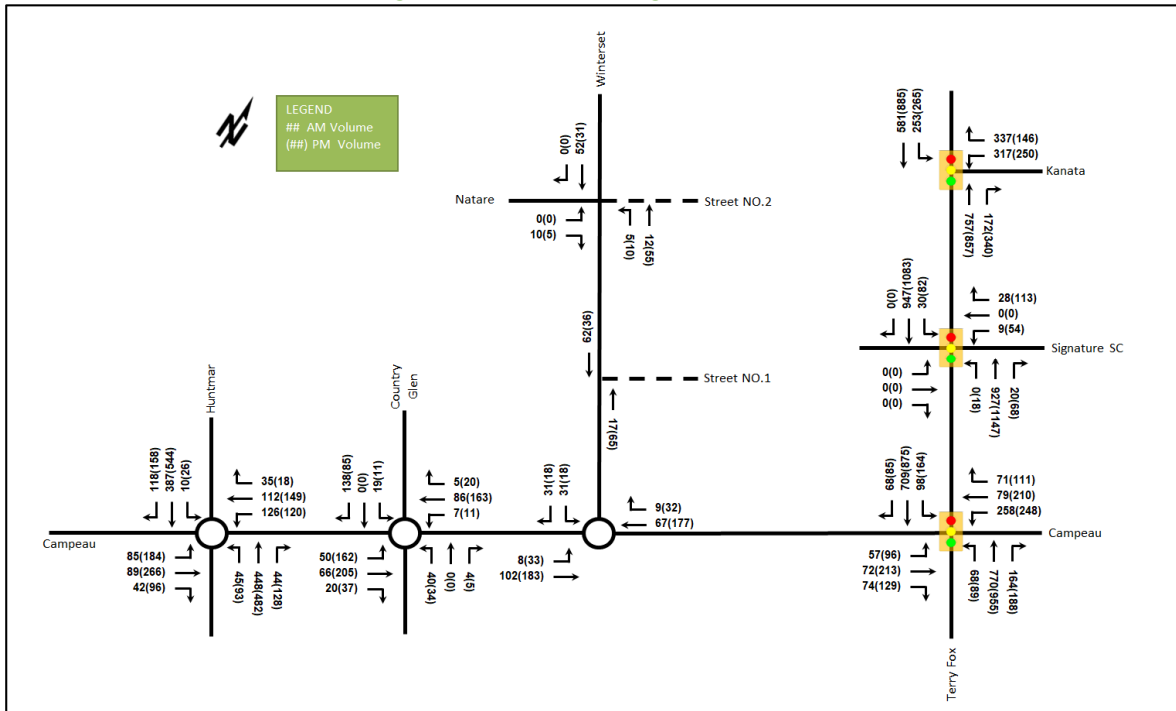


Table 12: 2030 Future Background Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 <sup>th</sup> )	LOS	V/C	Delay	Q (95 <sup>th</sup> )
<b>Huntmar Drive at Campeau Dive Roundabout</b>	EB	A	0.12	7.4	2.2	A	0.34	8.2	7.9
	WB	A	0.17	8.1	3.3	A	0.21	8.7	4.3
	NB	A	0.46	3.0	12.9	A	0.61	5.4	22.1
	SB	A	0.22	3.0	4.8	A	0.34	3.5	8.1
	<b>Overall</b>	<b>A</b>	<b>0.46</b>	<b>4.5</b>	<b>12.9</b>	<b>A</b>	<b>0.61</b>	<b>5.9</b>	<b>22.1</b>
<b>Country Glen Way at Campeau Dive Roundabout</b>	EB	A	0.06	5.7	1.6	A	0.19	5.9	5.4
	WB	A	0.05	4.0	0.9	A	0.10	4.3	2.0
	NB	A	0.02	1.7	0.4	A	0.02	2.3	0.4
	SB	A	0.16	0.6	3.0	A	0.10	0.8	1.9
	<b>Overall</b>	<b>A</b>	<b>0.16</b>	<b>3.1</b>	<b>3.0</b>	<b>A</b>	<b>0.19</b>	<b>4.6</b>	<b>5.4</b>
<b>Winterset Road at Campeau Dive Roundabout</b>	EB	A	0.05	3.8	1.3	A	0.10	4.2	2.6
	WB	A	0.04	3.4	0.8	A	0.10	3.5	2.5
	SB	A	0.03	0.9	0.5	A	0.02	1.2	0.3
	<b>Overall</b>	<b>A</b>	<b>0.05</b>	<b>3.0</b>	<b>1.3</b>	<b>A</b>	<b>0.10</b>	<b>3.7</b>	<b>2.6</b>
<b>Terry Fox Drive at Kanata Avenue Signalized</b>	WBL	B	0.63	42.8	44.6	A	0.56	42.0	35.5
	WBR	B	0.66	11.2	24.8	A	0.44	11.1	16.5
	NBT	A	0.54	23.3	88.7	A	0.59	22.5	95.2
	NBR	A	0.24	4.4	13.5	A	0.41	4.0	17.0
	SBL	C	0.74	47.4	71.9	C	0.73	45.5	71.3
	SBT	A	0.25	5.4	28.3	A	0.37	5.3	39.8
	<b>Overall</b>	<b>B</b>	<b>0.61</b>	<b>21.0</b>	-	<b>B</b>	<b>0.62</b>	<b>18.1</b>	-



Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 <sup>th</sup> )	LOS	V/C	Delay	Q (95 <sup>th</sup> )
Terry Fox Drive at Signature C Signalized	EB	-	-	-	-	-	-	-	-
	WBL/T	A	0.04	33.4	5.6	A	0.15	34.9	20.3
	WBR	A	0.08	9.9	6.1	A	0.24	10.9	17.3
	NBL	-	-	-	-	A	0.08	3.6	m0.4
	NBT/R	A	0.45	14.4	71.8	A	0.59	14.7	155.8
	SBL	A	0.10	8.2	6.0	A	0.44	20.8	24.0
	SBT/R	A	0.44	10.2	60.6	A	0.53	13.9	86.8
<b>Overall</b>	<b>A</b>	<b>0.34</b>	<b>12.3</b>	<b>-</b>	<b>-</b>	<b>A</b>	<b>0.46</b>	<b>14.7</b>	<b>-</b>
Terry Fox Drive at Campeau Drive Signalized	EBL	A	0.17	28.3	16.8	A	0.36	35.8	30.8
	EBT	A	0.15	28.0	19.7	A	0.42	36.0	57.6
	EBR	A	0.16	3.3	5.9	A	0.25	5.9	12.8
	WBL	C	0.80	54.1	70.7	E	0.93	80.0	#93.1
	WBT	A	0.17	28.4	21.2	A	0.43	36.1	57.2
	WBR	A	0.16	3.0	5.2	A	0.22	6.1	11.9
	NBL	A	0.17	12.5	14.5	A	0.28	14.4	17.7
	NBT	A	0.51	23.8	96.4	B	0.63	29.1	130.5
	NBR	A	0.22	4.5	14.0	A	0.25	6.4	19.4
	SBL	A	0.27	27.3	34.6	A	0.53	33.2	54.2
	SBT	A	0.44	43.4	105.4	A	0.55	44.2	123.1
	SBR	A	0.09	17.9	15.4	A	0.11	19.0	19.6
	<b>Overall</b>	<b>A</b>	<b>0.58</b>	<b>30.1</b>	<b>-</b>	<b>-</b>	<b>C</b>	<b>0.72</b>	<b>34.5</b>

**Notes:** Saturation flow rate of 1800 veh/h/lane  
 Peak Hour Factor = 1.00  
 V/C = volume-to-capacity ratio

Delay = average vehicle delay in seconds  
 Queue is measured in metres  
 # = volume for the 95th %ile cycle exceeds capacity

The intersections at the 2030 future background horizon are anticipated to operate similarly to the 2025 background conditions.

At the intersection of Terry Fox Drive at Campeau Drive, the westbound left-turn movement may experience extended queues during PM peak hour due to the background developments.

### 7.3 Modal Share Sensitivity and Demand Rationalization Conclusions

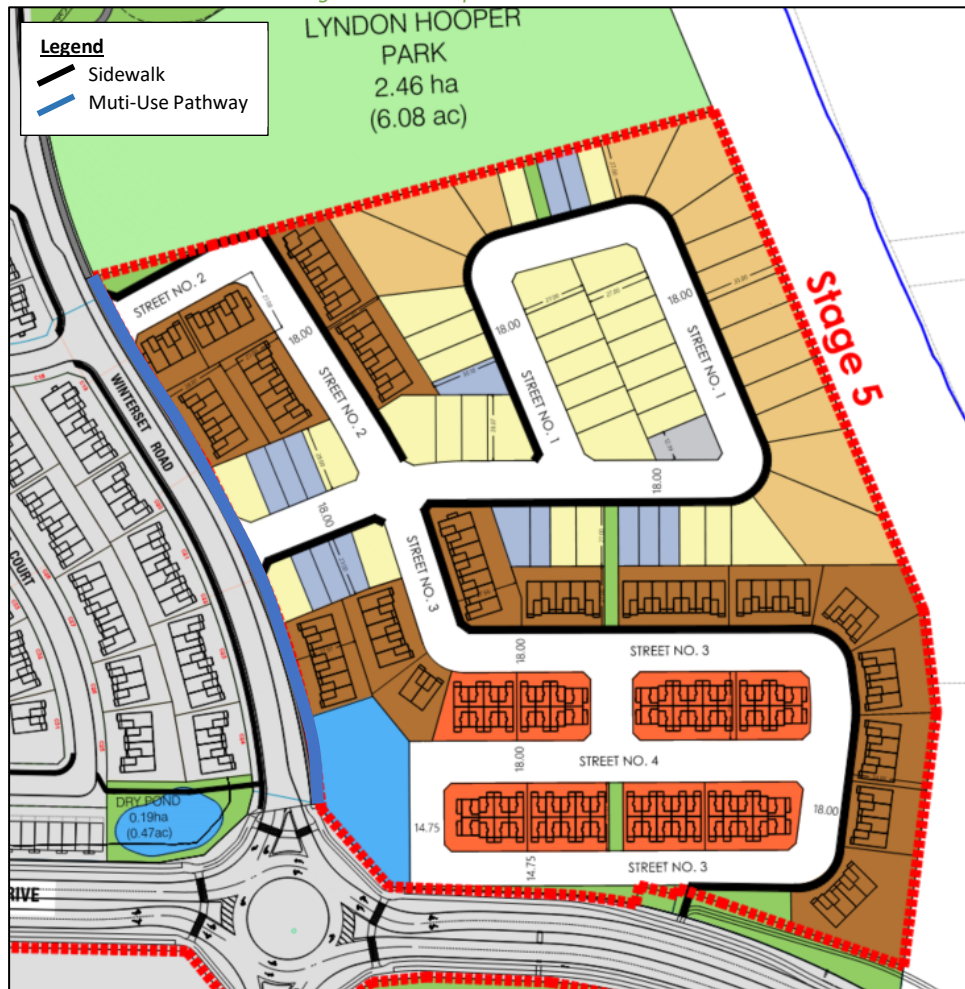
No capacity constraints are noted within the study area. The proposed trip generation rates and modal shares are consistent with the surrounding area context and do not unduly impact the surrounding road network. As such, no rationalization of the modal share and projected volumes is required.

## 8 Development Design

### 8.1 Design for Sustainable Modes

The proposed development is a residential subdivision where each dwelling will include a driveway and garage. Bicycle parking is assumed to be within the individual units. Figure 16 illustrates the pedestrian concept network with connections to adjacent pedestrian facilities.

Figure 18: Concept Pedestrian Network



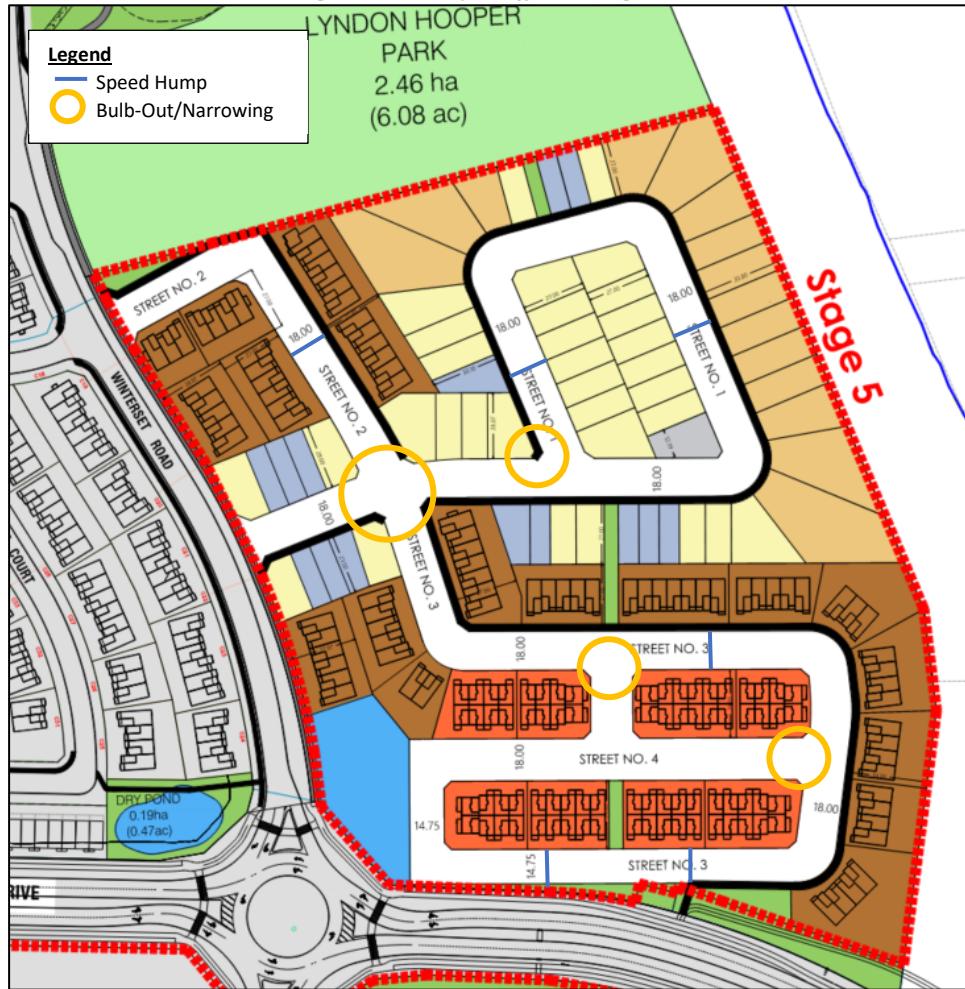
## 8.2 New Street Networks

The planned street network will include 18-metre local roadways. The local will provide parking on one side of the roadway. The local roads are proposed to be posted as 30 km/h.

To support the pedestrian and cycling connectivity within the subdivision, Figure 17 illustrates the concept traffic calming plan. Traffic calming elements are recommended at the internal intersections, including bulb-outs to narrow each approach to the intersection (e.g. reduced crossing distance). Once the road network pattern and lotting concepts are confirmed, the on-street parking can be outlined in the geometric roadway design. The location of speed humps is subject to minor changes and will need to be refined as part of the detailed engineering submission once the locations of the driveway, stormwater flows, surface ponding, and servicing elements, such as utilities and fire hydrants, have been established.

The internal road intersections are recommended to be stop-controlled on the minor approaches of all intersections.

Figure 19: Concept Traffic Calming Plan



## 9 Boundary Street Design

Table 13 summarizes the MMLOS analysis for the boundary streets of Campeau Drive and Winterset Road. The existing and future conditions for Campeau Drive will be the same and is considered in one row. The boundary Street of Campeau Drive analysis is based on the land use designation of “Mixed Use Centre” and “General Urban Area”, and Winterset Road analysis is based on the land use designation of “General Urban Area”. The MMLOS worksheets have been provided in Appendix G.

Table 13: Boundary Street MMLOS Analysis

Segment	Pedestrian LOS		Bicycle LOS		Transit LOS		Truck LOS	
	PLOS	Target	BLOS	Target	TLOS	Target	TrLOS	Target
Campeau Drive	B	C	A	D	N/A	N/A	N/A	N/A
Winterset Road (Existing)	<b>F</b>	C	B	D	N/A	N/A	N/A	N/A
Winterset Road (Future)	B	C	B	D	N/A	N/A	N/A	N/A

The boundary street of Campeau Drive meets the pedestrian and cycling MMLOS targets.

The boundary street of Winterset Road does not meet the pedestrian MMLOS target in the existing condition, but it will meet the target once the sidewalk is provided along the east side of Winterset Road. The boundary street of Winterset Road meets the cycling MMLOS target.

## 10 Access Intersections Design

### 10.1 Location and Design of Access

The residential accesses will connect to the adjacent road network via local roads connection to Winterset Road. Within the subdivision, no turn lanes are proposed for the internal intersections which will be controlled by minor stop control.

### 10.2 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.

### 10.3 Access Intersection Design

#### 10.3.1 2025 Future Total Access Intersection Operations

The 2025 future total intersection volumes are illustrated in Figure 18 and the access intersection operations are summarized below in Table 14. Synchro 11 has been used to model the unsignalized intersections and the HCM 2010 methodology was used for unsignalized intersection operations. The Synchro worksheets have been provided in Appendix H.

Figure 20: 2025 Future Total Volumes

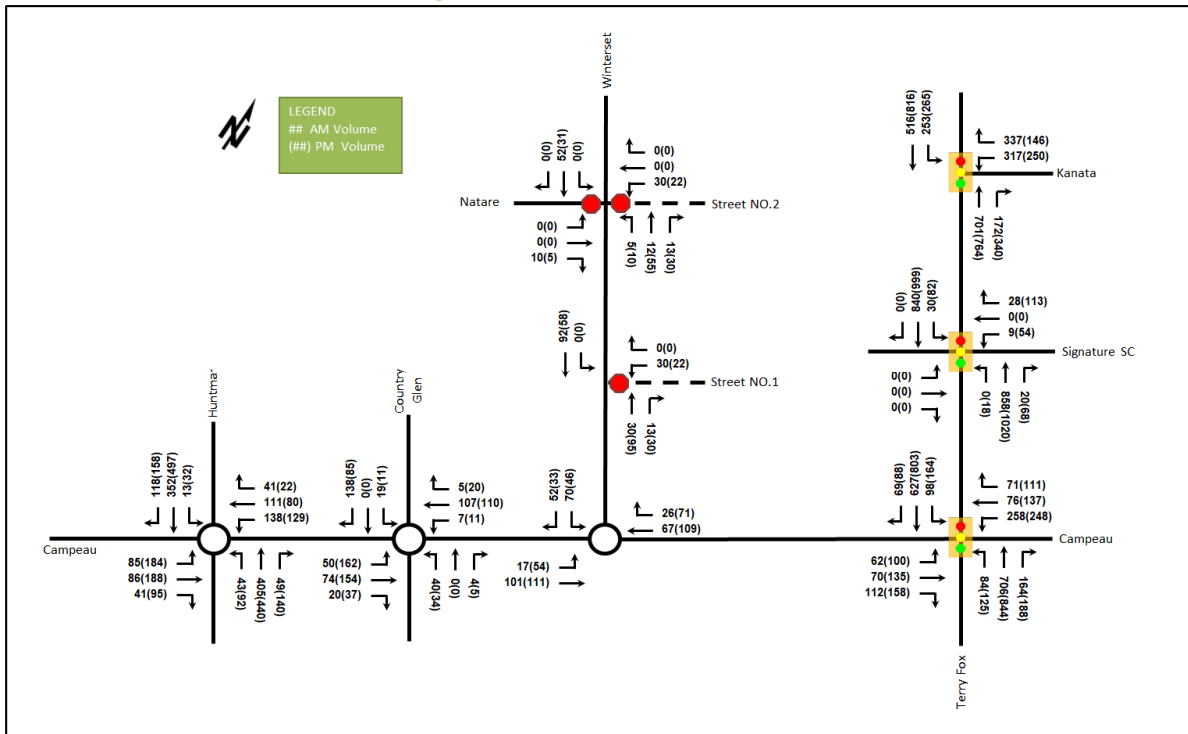


Table 14: 2025 Future Total Access Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 <sup>th</sup> )	LOS	V/C	Delay	Q (95 <sup>th</sup> )
Winterset Road at No.1 Street <i>Unsignalized</i>	WB	A	0.04	9.3	0.8	A	0.03	9.5	0.8
	NB	-	-	-	-	-	-	-	-
	SB	A	-	0.0	0.0	A	-	0.0	0.0
	<b>Overall</b>	<b>A</b>	-	<b>1.7</b>	-	<b>A</b>	-	<b>1.0</b>	-
Winterset Road at No.2 Street <i>Unsignalized</i>	EB	A	0.01	8.6	0.0	A	0.01	8.5	0.0
	WB	A	0.03	9.2	0.8	A	0.03	9.4	0.8
	NB	A	0.00	7.3	0.0	A	0.01	7.3	0.0
	SB	A	-	0.0	0.0	A	-	0.0	0.0
	<b>Overall</b>	<b>A</b>	-	<b>3.3</b>	-	<b>A</b>	-	<b>2.1</b>	-

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

The 2025 future total access intersection operates satisfactorily.

10.3.2 2030 Future Total Access Intersection Operations

The 2030 future total intersection volumes are illustrated in Figure 19 and the access intersection operations are summarized below in Table 15. Synchro 11 has been used to model the unsignalized intersections and the HCM 2010 methodology was used for unsignalized intersection operations. The Synchro worksheets have been provided in Appendix I.

Figure 21: 2030 Future Total Volumes

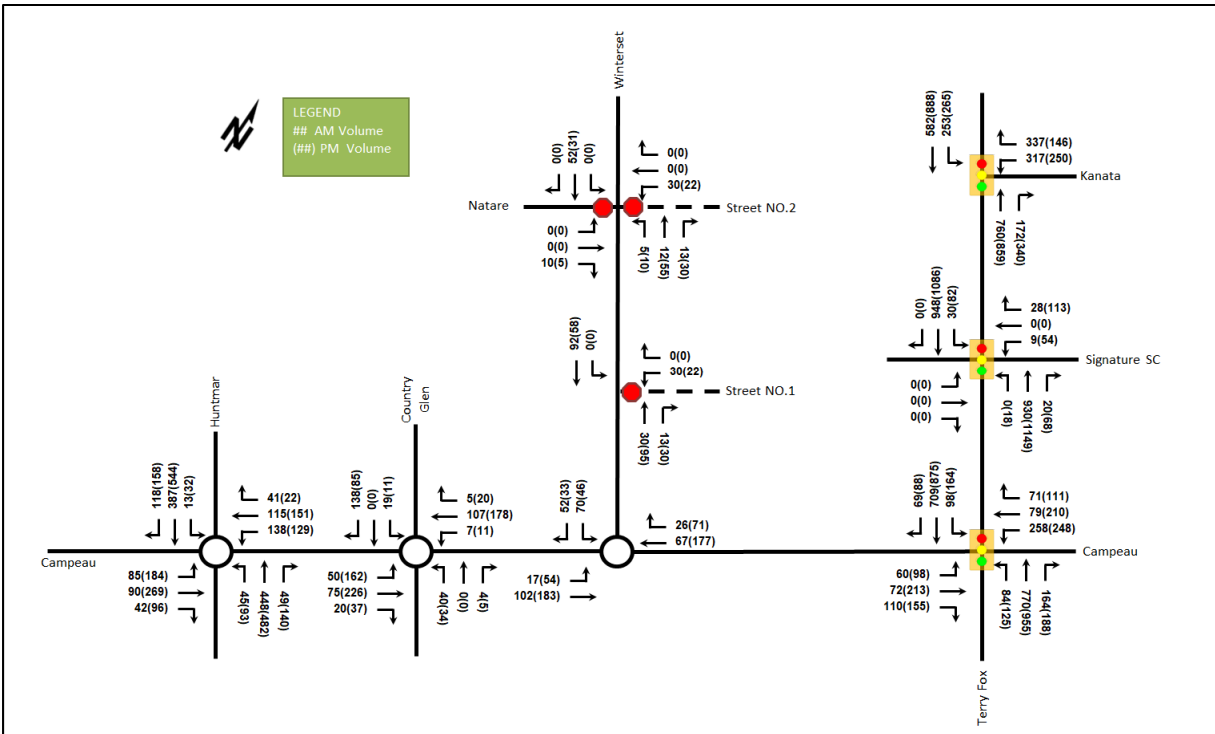


Table 15: 2030 Future Total Access Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 <sup>th</sup> )	LOS	V/C	Delay	Q (95 <sup>th</sup> )
Winterset Road at No.1 Street Unsignalized	WB	A	0.04	9.3	0.8	A	0.03	9.5	0.8
	NB	-	-	-	-	-	-	-	-
	SB	A	-	0.0	0.0	A	-	0.0	0.0
	<b>Overall</b>	<b>A</b>	-	<b>1.7</b>	-	<b>A</b>	-	<b>1.0</b>	-
Winterset Road at No.2 Street Unsignalized	EB	A	0.01	8.6	0.0	A	0.01	8.5	0.0
	WB	A	0.03	9.2	0.8	A	0.03	9.4	0.8
	NB	A	0.00	7.3	0.0	A	0.01	7.3	0.0
	SB	A	-	0.0	0.0	A	-	0.0	0.0
	<b>Overall</b>	<b>A</b>	-	<b>3.3</b>	-	<b>A</b>	-	<b>2.1</b>	-

**Notes:** Saturation flow rate of 1800 veh/h/lane  
Peak Hour Factor = 1.00  
V/C = volume-to-capacity ratio

Delay = average vehicle delay in seconds  
Queue is measured in metres  
# = volume for the 95th %ile cycle exceeds capacity

The 2030 future total access intersection operates satisfactorily.

### 10.3.3 Access Intersection MMLOS

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

### 10.3.4 Recommended Design Elements

The design elements for the site intersections are consistent with the CDP and various EA study recommendations.

## 11 Transportation Demand Management

### 11.1 Context for TDM

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

The subject site is within the Kanata West Secondary Plan and Community Design Plan areas. The total bedroom count within the development is subject to the final unit breakdown and layout selections by purchasers. No age restrictions are noted.

### 11.2 Need and Opportunity

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

### 11.3 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 J. The key TDM measures recommended include:

- Provide a multimodal travel option information package to new residents



## 12 Neighbourhood Traffic Management

Site traffic is proposed to access the arterial network via Winterset Road. 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.

2025 background volumes on Winterset Road are expected to be 79 two-way vehicles in the AM peak hour and 101 two-way vehicles in the PM peak hour. Overall, the site is anticipated to generate approximately 86 and 103 two-way vehicle trips during the AM and PM peak hours, respectively, accessing Winterset Road. While over the prescribed theoretical local road capacity, this volume increase is not considered a significant impact on Winterset Road or requires any traffic management.

## 13 Transit

### 13.1 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 16 summarizes the transit trip generation.

*Table 16: Trip Generation by Transit Mode*

Travel Mode	Mode Share	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Transit	Varies	12	28	40	17	13	30

The proposed development is anticipated to generate an additional 40AM and 30PM peak hour two-way transit trips. From the trip distribution found in section 5.3, these values can be further broken down. Table 17 summarizes forecasted site-generated transit ridership trips by direction and the equivalent bus loads.

*Table 17: Forecasted Site-Generated Transit Ridership*

Direction	AM Peak Hour		PM Peak Hour		Service Type	Approximate Equivalent Peak Hour/Direction Bus Loads
	In	Out	In	Out		
North	2	4	3	2	Bus	Negligible
South	4	8	5	4	Bus	Negligible
East	6	14	9	7	Bus	One quarter of a standard bus
West	0	2	0	0	Bus	Negligible

It is recommended that future transit service include the routing of at minimum a local route with half-hour service, and potentially include a Connexion route, along Campeau Drive connecting to Terry Fox Station. Such routes would service the many residential developments east of Huntmar Drive and provide connection to the developing retail areas west of Terry Fox Drive along Campeau Drive.

### 13.2 Transit Priority

No transit priority is required explicitly for this study.

## 14 Network Concept

The subject development is in line with the intended context set by the Development Reserve zoning for the subject parcel. No future network changes are required to support the subject development, and the subject development will be making use of the existing infrastructure of the newly extended Campeau Drive.

## 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 2025 Future Total Network Intersection Operations

The 2025 future total network intersection operations are summarized below in Table 17. 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. Synchro 11 has been used to model the signalized intersections and Sidra 8 to model the study area roundabout. The Synchro and Sidra worksheets have been provided in Appendix H.

Table 18: 2025 Future Total Network Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 <sup>th</sup> )	LOS	V/C	Delay	Q (95 <sup>th</sup> )
Huntmar Drive at Campeau Dive Roundabout	EB	A	0.11	7.3	2.2	A	0.27	8.2	5.9
	WB	A	0.18	8.0	3.5	A	0.19	9.2	3.7
	NB	A	0.42	3.0	11.0	A	0.53	4.7	16.8
	SB	A	0.20	3.0	4.4	A	0.30	3.3	7.0
	<b>Overall</b>	<b>A</b>	<b>0.42</b>	<b>4.6</b>	<b>11.0</b>	<b>A</b>	<b>0.53</b>	<b>5.5</b>	<b>16.8</b>
Country Glen Way at Campeau Dive Roundabout	EB	A	0.07	5.6	1.7	A	0.16	6.3	4.6
	WB	A	0.06	3.9	1.1	A	0.07	4.4	1.4
	NB	A	0.02	1.7	0.4	A	0.02	2.2	0.4
	SB	A	0.16	0.6	3.1	A	0.10	0.6	1.8
	<b>Overall</b>	<b>A</b>	<b>0.16</b>	<b>3.1</b>	<b>3.1</b>	<b>A</b>	<b>0.16</b>	<b>4.7</b>	<b>4.6</b>
Winterset Road at Campeau Dive Roundabout	EB	A	0.06	4.4	1.4	A	0.08	5.4	2.0
	WB	A	0.04	3.6	1.0	A	0.09	3.8	2.2
	SB	A	0.07	1.0	1.2	A	0.05	1.2	0.8
	<b>Overall</b>	<b>A</b>	<b>0.07</b>	<b>2.9</b>	<b>1.4</b>	<b>A</b>	<b>0.09</b>	<b>4.0</b>	<b>2.2</b>
Terry Fox Drive at Kanata Avenue Signalized	WBL	B	0.63	42.8	44.6	A	0.56	42.0	35.5
	WBR	B	0.66	11.2	24.8	A	0.44	11.1	16.5
	NBT	A	0.50	22.6	81.1	A	0.53	21.4	82.6
	NBR	A	0.24	4.4	13.5	A	0.41	4.0	17.0
	SBL	C	0.74	47.4	71.9	C	0.73	45.5	71.3
	SBT	A	0.22	5.2	24.9	A	0.34	5.1	35.9
	<b>Overall</b>	<b>A</b>	<b>0.59</b>	<b>21.2</b>	<b>-</b>	<b>A</b>	<b>0.59</b>	<b>17.9</b>	<b>-</b>
Terry Fox Drive at Signature C Signalized	EB	-	-	-	-	-	-	-	-
	WBL/T	A	0.04	33.4	5.6	A	0.15	34.9	20.3
	WBR	A	0.08	9.9	6.1	A	0.23	7.4	13.6
	NBL	-	-	-	-	A	0.07	4.8	m0.6
	NBT/R	A	0.42	13.7	63.9	A	0.53	15.4	130.7
	SBL	A	0.09	8.0	5.9	A	0.36	16.6	20.6
	SBT/R	A	0.39	9.7	51.9	A	0.48	13.3	77.6
	<b>Overall</b>	<b>A</b>	<b>0.32</b>	<b>11.7</b>	<b>-</b>	<b>A</b>	<b>0.42</b>	<b>14.5</b>	<b>-</b>



Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 <sup>th</sup> )	LOS	V/C	Delay	Q (95 <sup>th</sup> )
<b>Terry Fox Drive at Campeau Drive</b> <i>Signalized</i>	EBL	A	0.19	28.7	17.9	A	0.34	37.5	30.8
	EBT	A	0.15	27.9	19.2	A	0.30	35.7	37.7
	EBR	A	0.24	5.9	11.1	A	0.32	6.2	14.0
	WBL	C	0.80	54.1	70.7	D	0.85	66.5	77.6
	WBT	A	0.16	28.3	20.5	A	0.31	35.9	38.2
	WBR	A	0.16	3.0	5.2	A	0.24	6.5	11.9
	NBL	A	0.19	12.4	17.1	A	0.33	13.1	23.6
	NBT	A	0.47	23.0	86.6	A	0.52	24.2	110.8
	NBR	A	0.22	4.5	13.9	A	0.23	4.4	15.4
	SBL	A	0.25	27.4	34.2	A	0.44	27.7	52.6
	SBT	A	0.39	42.7	94.8	A	0.48	40.2	113.1
SBR	A	0.09	18.6	15.6	A	0.11	18.9	20.2	
<b>Overall</b>	<b>A</b>	<b>0.56</b>	<b>29.0</b>	<b>-</b>	<b>-</b>	<b>B</b>	<b>0.61</b>	<b>30.0</b>	<b>-</b>

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

The network intersection operations for the 2025 future total horizon are anticipated to operate similarly to the 2025 background condition.

15.2.2 2030 Future Total Network Intersection Operations

The 2030 future total network intersection operations are summarized below in Table 18. 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. Synchro 11 has been used to model the signalized intersections and Sidra 8 to model the study area roundabout. The Synchro and Sidra worksheets have been provided in Appendix I.

Table 19: 2030 Future Total Network Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 <sup>th</sup> )	LOS	V/C	Delay	Q (95 <sup>th</sup> )
<b>Huntmar Drive at Campeau Drive</b> <i>Roundabout</i>	EB	A	0.12	7.4	2.3	A	0.34	8.3	8.1
	WB	A	0.19	8.2	3.6	A	0.22	8.8	4.5
	NB	A	0.46	3.0	13.0	A	0.61	4.4	22.3
	SB	A	0.23	3.0	4.9	A	0.34	3.6	8.3
	<b>Overall</b>	<b>A</b>	<b>0.46</b>	<b>4.6</b>	<b>13.0</b>	<b>13.0</b>	<b>A</b>	<b>0.61</b>	<b>6.0</b>
<b>Country Glen Way at Campeau Drive</b> <i>Roundabout</i>	EB	A	0.07	5.6	1.7	A	0.20	5.8	5.7
	WB	A	0.06	3.9	1.1	A	0.11	4.2	2.1
	NB	A	0.02	1.7	0.4	A	0.02	2.4	0.4
	SB	A	0.16	0.6	3.1	A	0.10	0.8	1.9
	<b>Overall</b>	<b>A</b>	<b>0.16</b>	<b>3.1</b>	<b>3.1</b>	<b>3.1</b>	<b>A</b>	<b>0.20</b>	<b>4.6</b>
<b>Winterset Road at Campeau Drive</b> <i>Roundabout</i>	EB	A	0.06	4.4	1.4	A	0.11	4.9	2.9
	WB	A	0.04	3.6	1.0	A	0.12	3.8	3.1
	SB	A	0.07	1.0	1.2	A	0.05	1.4	0.8
	<b>Overall</b>	<b>A</b>	<b>0.07</b>	<b>2.9</b>	<b>1.4</b>	<b>1.4</b>	<b>A</b>	<b>0.12</b>	<b>3.9</b>

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 <sup>th</sup> )	LOS	V/C	Delay	Q (95 <sup>th</sup> )
Terry Fox Drive at Kanata Avenue <i>Signalized</i>	WBL	B	0.63	42.8	44.6	A	0.56	42.0	35.5
	WBR	B	0.66	11.2	24.8	A	0.44	11.1	16.5
	NBT	A	0.54	23.3	89.3	A	0.59	22.6	95.5
	NBR	A	0.24	4.4	13.5	A	0.41	4.0	17.0
	SBL	C	0.74	47.4	71.9	C	0.73	45.5	71.3
	SBT	A	0.25	5.4	28.3	A	0.37	5.3	40.0
	<b>Overall</b>	<b>B</b>	<b>0.61</b>	<b>21.1</b>	-	-	<b>B</b>	<b>0.62</b>	<b>18.1</b>
Terry Fox Drive at Signature C <i>Signalized</i>	EB	-	-	-	-	-	-	-	-
	WBL/T	A	0.04	33.4	5.6	A	0.15	34.9	20.3
	WBR	A	0.08	9.9	6.1	A	0.24	10.9	17.3
	NBL	-	-	-	-	A	0.08	3.6	m0.4
	NBT/R	A	0.45	14.4	71.8	A	0.59	14.7	155.8
	SBL	A	0.10	8.2	6.0	A	0.44	20.9	24.2
	SBT/R	A	0.44	10.2	60.8	A	0.53	13.9	87.2
<b>Overall</b>	<b>A</b>	<b>0.34</b>	<b>12.3</b>	-	-	<b>A</b>	<b>0.46</b>	<b>14.7</b>	-
Terry Fox Drive at Campeau Drive <i>Signalized</i>	EBL	A	0.18	28.5	17.6	A	0.36	36.1	31.3
	EBT	A	0.15	28.0	19.7	A	0.42	36.0	57.6
	EBR	A	0.23	5.8	10.9	A	0.29	5.7	13.8
	WBL	C	0.80	54.1	70.7	E	0.93	80.0	#93.1
	WBT	A	0.17	28.4	21.2	A	0.43	36.1	57.2
	WBR	A	0.16	3.0	5.2	A	0.22	6.1	11.9
	NBL	A	0.21	12.6	17.2	A	0.38	15.6	23.6
	NBT	A	0.51	23.8	96.4	B	0.63	29.1	130.5
	NBR	A	0.22	4.5	14.0	A	0.25	6.4	19.4
	SBL	A	0.27	27.3	34.6	A	0.53	33.3	54.2
	SBT	A	0.44	43.9	105.4	A	0.56	45.5	123.3
	SBR	A	0.09	18.3	15.7	A	0.12	20.1	20.7
<b>Overall</b>	<b>A</b>	<b>0.58</b>	<b>29.8</b>	-	-	<b>C</b>	<b>0.72</b>	<b>34.5</b>	-

**Notes:** Saturation flow rate of 1800 veh/h/lane  
Peak Hour Factor = 1.00  
V/C = volume-to-capacity ratio

Delay = average vehicle delay in seconds  
Queue is measured in metres  
# = volume for the 95th %ile cycle exceeds capacity

The network intersection operations for the 2030 future total horizon are anticipated to operate similarly to the 2030 background condition.

### 15.2.3 Network Intersection MMLOS

Table 19 summarizes the MMLOS analysis for the network intersections of Terry Fox Drive at Kanata Avenue, Terry Fox Drive at Signature C, and Terry Fox Drive at Campeau Drive. The existing and future conditions for both intersections will be the same and are considered in one row. The Terry Fox Drive at Campeau Drive intersection analysis is based on the land use designation of “Mixed Use Centre” and “General Urban Area”, and other intersections are based on the land use designation of “General Urban Area”. The MMLOS worksheets have been provided in Appendix G.

Table 20: 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
Terry Fox Drive at Kanata Avenue	<b>F</b>	C	<b>F</b>	B	N/A	N/A	N/A	N/A	B	D

Intersection	Pedestrian LOS		Bicycle LOS		Transit LOS		Truck LOS		Auto LOS	
	PLOS	Target	BLOS	Target	TLOS	Target	TrLOS	Target	ALOS	Target
Terry Fox Drive at Signature C	F	C	F	C	N/A	N/A	N/A	N/A	A	D
Terry Fox Drive at Campeau Drive	F	C	F	A	N/A	N/A	N/A	N/A	C	D

The pedestrian LOS will not be met at the intersections throughout the study area. To meet pedestrian LOS targets, the maximum crossing distance on all pedestrian crossings would need to be reduced to three-lane widths.

The bicycle LOS will not be met at the intersection 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 dedicated facilities would be required at the intersections.

#### 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 62 single detached units and 160 townhome units
- Accesses are proposed onto Winterset Road via two full-movements accesses
- The development is proposed to be completed as a single phase by 2025
- The trip generation and safety triggers were met for the TIA Screening

### Existing Conditions

- Huntmar Drive, Campeau Drive, and Terry Fox Drive are arterial roads, and Kanata Avenue is a major collector road in the study area
- Sidewalks are provided or planned on the east side of Terry Fox Drive, and on both sides of Country Glen Way, Campeau Drive and Huntmar Drive
- Bike lanes are presented on both sides of Kanata Avenue and Terry Fox Drive north of Campeau Drive
- Cycletracks are present on Huntmar Drive and Campeau Drive
- Huntmar Drive south of Campeau Drive, Campeau Drive east of Huntmar Drive, and Terry Fox Drive are spine routes. Huntmar Drive north of Campeau Drive is a local route. Pathways are present along Carp River north of Campeau Drive. Terry Fox Drive south of Campeau Drive is a cross-town bikeway.
- No collision is within the study area from 2018 to 2022
- During both the AM and PM peak hours, the study area intersections operate well in the 2002 existing conditions

### Development Generated Travel Demand

- The proposed development is forecasted to produce 173 two-way people trips during the AM peak hour and 183 two-way people trips during the PM peak hour
- Of the forecasted people trips, 86 two-way trips will be vehicle trips during the AM peak hour and 103 two-way trips will be vehicle trips during the PM peak

- Of the forecasted trips, 15% are anticipated to travel north, 30% to the south, 50% to the east, and 5% to the west

### **Background Conditions**

- The Campeau Drive extension was completed in the fall of 2021, and a resultant redistribution of area traffic will be applied to future horizons
- The background growth rates derived from the two TRANS model horizons and to the appropriate roadway's mainline volumes and to the appropriate major turning movements at the intersections
- The intersections in the future background conditions are anticipated to operate similarly to existing conditions

### **Development Design**

- The bike and auto parking areas are to be located at each dwelling unit
- Pedestrian connections will be made to Winterset Road
- The conceptual traffic calming elements are recommended at the future internal road intersections including bulb-outs and speed humps

### **Boundary Street Design**

- The boundary street of Campeau Drive meets the pedestrian and cycling MMLOS targets
- The boundary street of Winterset Road does not meet the pedestrian MMLOS target in the existing condition, but it will meet the target once the sidewalk is provided along the east side of Winterset Road
- The boundary street of Winterset Road meets the cycling MMLOS target

### **Access Intersections Design**

- The site will access Winterset Road via two full-movement accesses
- The site accesses will have stop-control on the minor approach
- The 2025 and 2030 future total access intersection operates satisfactorily

### **TDM**

- Supportive TDM measures to be included within the proposed development should include:
  - Provide a multimodal travel option information package to new residents

### **NTM**

- The site is anticipated to generate approximately 86 and 104 two-way vehicle trips during the AM and PM peak hours, respectively accessing Winterset Road, and this volume increase is not considered a significant impact on Winterset Road or require any traffic management

### **Transit**

- The proposed development is anticipated to generate an additional 40 AM and 30 PM peak hour two-way transit trips
- Peak hour increases in transit ridership resulting from the site equate to one quarter of a standard bus easterly of the site, and negligible impact on other directions
- It is recommended that future transit service include the routing of at minimum a local route with half-hour service, and potentially include a Connexion route, along Campeau Drive connecting to Terry Fox Station to service area residential and commercial development

- No transit priority is required explicitly for this study

#### Network Concept

- No future network changes are required to support the subject development, and the subject development will be making use of the existing infrastructure of the newly extended Campeau Drive

#### Network Intersection Design

- Generally, the network intersections operating at the future total horizons will operate similarly to the future background conditions
- No rationalization of the modal share and projected volumes is required
- The pedestrian LOS will not be met at the intersections throughout the study area, which require crossing distances to be reduced to equal or less than three-lane widths
- The bicycle transit LOS will not be met at the intersections throughout the study area, which are limited by the lack of dedicated facilities and improved left-turn configurations
- The network intersection operations for the future total horizons are anticipated to operate similarly to the background conditions

## 17 Conclusion

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

Prepared By:



Yu-Chu Chen, EIT  
Transportation Engineering-Intern

Reviewed By:



Andrew Harte, P.Eng.  
Senior Transportation Engineer

# Appendix A

TIA Screening Form and PM Certification Form

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

Date: 8-Nov-23  
Project Number: 2023-146  
Project Reference: Arcadia Stage 5

1.1 Description of Proposed Development	
Municipal Address	8370 Campeau Drive
Description of Location	Ward 4. Northeastcorner of the Winterset Road/Donum Lane and Campeau Drive roundabout
Land Use Classification	Development Reserve Zone (DR(1932))
Development Size	62 single detached units and 160 townhome units
Accesses	Two accesses onto Winterset Road
Phase of Development	Single Phase
Buildout Year	2025
TIA Requirement	Full TIA Required

1.2 Trip Generation Trigger		
Land Use Type	Single Detached	
Development Size	62	Units
Trip Generation Trigger	Yes	

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

1.4. Safety Triggers	
Are posted speed limits on a boundary street 80 km/hr or greater?	No
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?	No
Is the proposed driveway within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions)?	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



## **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<sup>1</sup> or registered<sup>2</sup> 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  
110 Laurier Avenue West, 4th fl.  
Ottawa, ON K1P 1J1  
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Ville d'Ottawa  
Services d'infrastructure et Viabilité des  
collectivités  
Urbanisme et Gestion de la croissance  
110, avenue Laurier Ouest  
Ottawa (Ontario) K1P 1J1  
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

<b>Office Contact Information (Please Print)</b>
Address: 6 Plaza Court
City / Postal Code: Ottawa / K2H 7W1
Telephone / Extension: (613) 697-3797
E-Mail Address: Andrew.Harte@CGHTransportation.com



# Appendix B

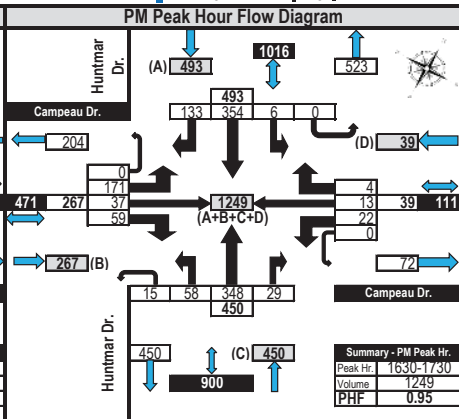
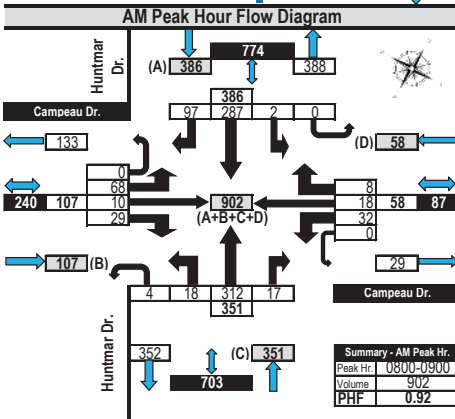
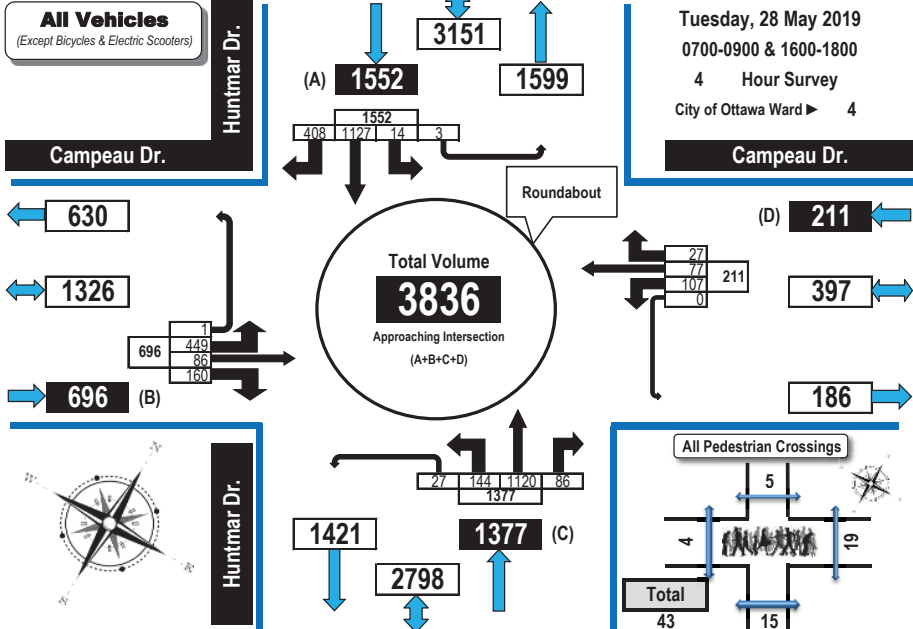
Turning Movement Counts



### Turning Movement Count Summary, AM and PM Peak Hour Flow Diagrams

Automobiles, Taxis, Light Trucks, Vans, SUV's, Motorcycles, Heavy Trucks, Buses, and School Buses

#### Campeau Drive & Huntmar Drive (ROUNDBABOUT) Kanata, ON



### Transportation Services - Traffic Services

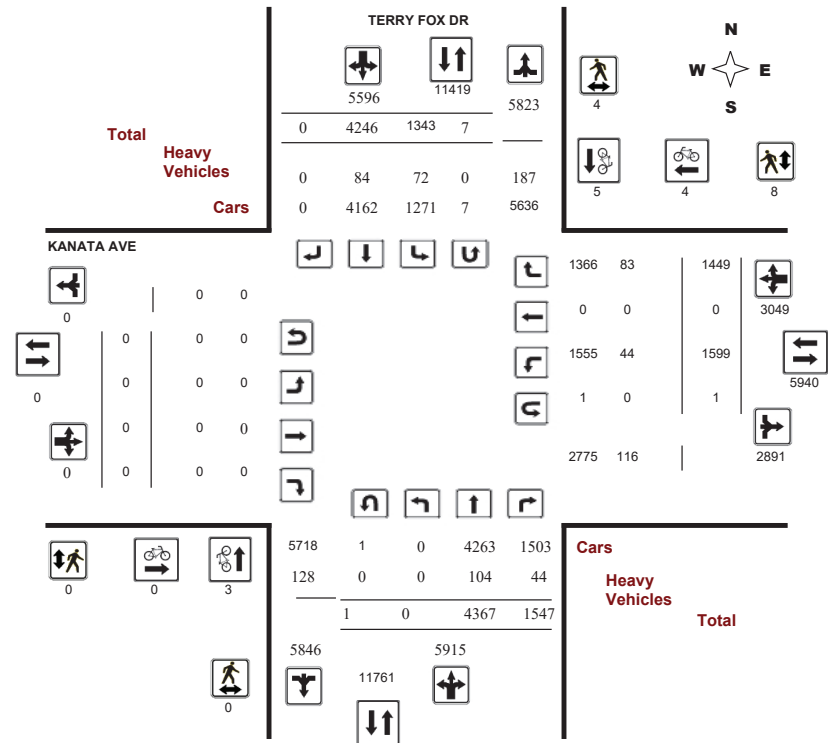
#### Turning Movement Count - Study Results

##### KANATA AVE @ TERRY FOX DR

**Survey Date:** Wednesday, April 11, 2018  
**Start Time:** 07:00

**WO No:** 37662  
**Device:** Miovision

#### Full Study Diagram







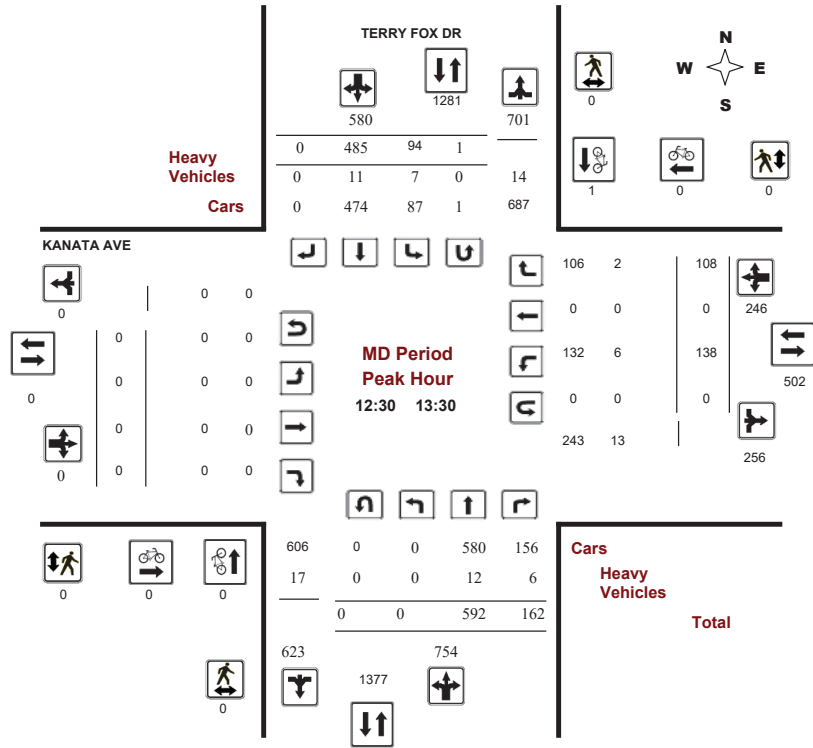
# Transportation Services - Traffic Services

## Turning Movement Count - Peak Hour Diagram

### KANATA AVE @ TERRY FOX DR

Survey Date: Wednesday, April 11, 2018  
Start Time: 07:00

WO No: 37662  
Device: Miovision



Comments



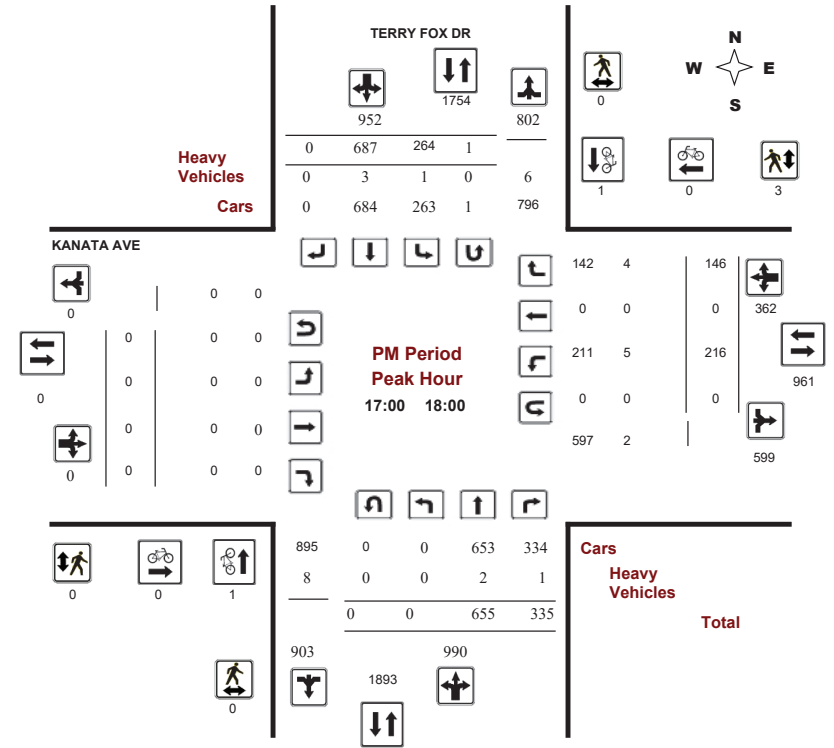
# Transportation Services - Traffic Services

## Turning Movement Count - Peak Hour Diagram

### KANATA AVE @ TERRY FOX DR

Survey Date: Wednesday, April 11, 2018  
Start Time: 07:00

WO No: 37662  
Device: Miovision



Comments



Transportation Services - Traffic Services

Turning Movement Count - Study Results

KANATA AVE @ TERRY FOX DR

Survey Date: Wednesday, April 11, 2018

WO No: 37662

Start Time: 07:00

Device: Miovision

Full Study Summary (8 HR Standard)

Survey Date: Wednesday, April 11, 2018

Total Observed U-Turns

ADT Factor

Northbound: 1 Southbound: 7
Eastbound: 0 Westbound: 1

Table with columns for Period, Northbound (LT, ST, RT, NB TOT), Southbound (LT, ST, RT, SB TOT, STR TOT), Eastbound (LT, ST, RT, EB TOT), Westbound (LT, ST, RT, WB TOT), STR TOT, Grand Total. Includes sub-totals for U Turns, EQ 12Hr, and AVG 12Hr.

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



Transportation Services - Traffic Services

Turning Movement Count - Study Results

KANATA AVE @ TERRY FOX DR

Survey Date: Wednesday, April 11, 2018

WO No: 37662

Start Time: 07:00

Device: Miovision

Full Study 15 Minute Increments

Table with columns for Time Period, Northbound (LT, ST, RT, N TOT), Southbound (LT, ST, RT, S TOT, STR TOT), Eastbound (LT, ST, RT, E TOT), Westbound (LT, ST, RT, W TOT, STR TOT), Grand Total. Shows 15-minute increments from 07:00 to 18:00.

Note: U-Turns are included in Totals.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

KANATA AVE @ TERRY FOX DR

Survey Date: Wednesday, April 11, 2018

WO No: 37662

Start Time: 07:00

Device: Miovision

Full Study Cyclist Volume

Table with columns: Time Period, Northbound, Southbound, Street Total, Eastbound, Westbound, Street Total, Grand Total. Rows show cyclist volume data for Terry Fox Dr and Kanata Ave from 07:00 to 18:00.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

KANATA AVE @ TERRY FOX DR

Survey Date: Wednesday, April 11, 2018

WO No: 37662

Start Time: 07:00

Device: Miovision

Full Study Pedestrian Volume

Table with columns: Time Period, NB Approach, SB Approach, Total, EB Approach, WB Approach, Total, Grand Total. Rows show pedestrian volume data for Terry Fox Dr and Kanata Ave from 07:00 to 18:00.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

KANATA AVE @ TERRY FOX DR

Survey Date: Wednesday, April 11, 2018

WO No: 37662

Start Time: 07:00

Device: Miovision

Full Study Heavy Vehicles

Table with columns for Time Period, Northbound (LT, ST, RT, N TOT, S TOT, STR TOT), Eastbound (LT, ST, RT, E TOT), Westbound (LT, ST, RT, W TOT, STR TOT), and Grand Total. Rows represent 15-minute intervals from 07:00 to 18:00.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

KANATA AVE @ TERRY FOX DR

Survey Date: Wednesday, April 11, 2018

WO No: 37662

Start Time: 07:00

Device: Miovision

Full Study 15 Minute U-Turn Total

Table with columns for Time Period, Northbound U-Turn Total, Southbound U-Turn Total, Eastbound U-Turn Total, Westbound U-Turn Total, and Total. Rows represent 15-minute intervals from 07:00 to 18:00.





# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### TERRY FOX DR @ 329 N OF CAMPEAU DR/SIGNATURE C

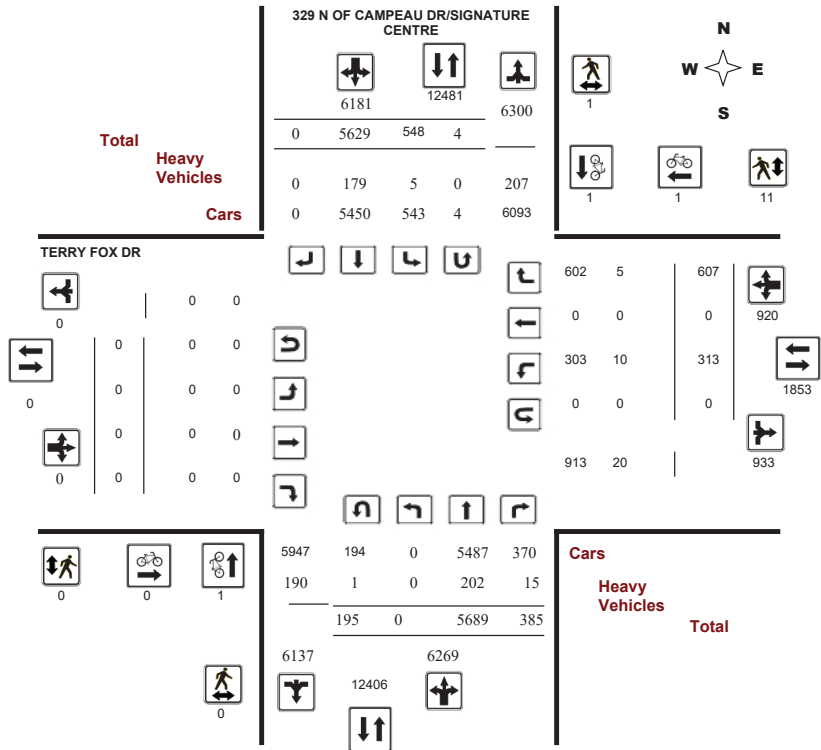
Survey Date: Wednesday, December 06, 2017

WO No: 37361

Start Time: 07:00

Device: Miovision

#### Full Study Diagram



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### TERRY FOX DR @ 329 N OF CAMPEAU DR/SIGNATURE C

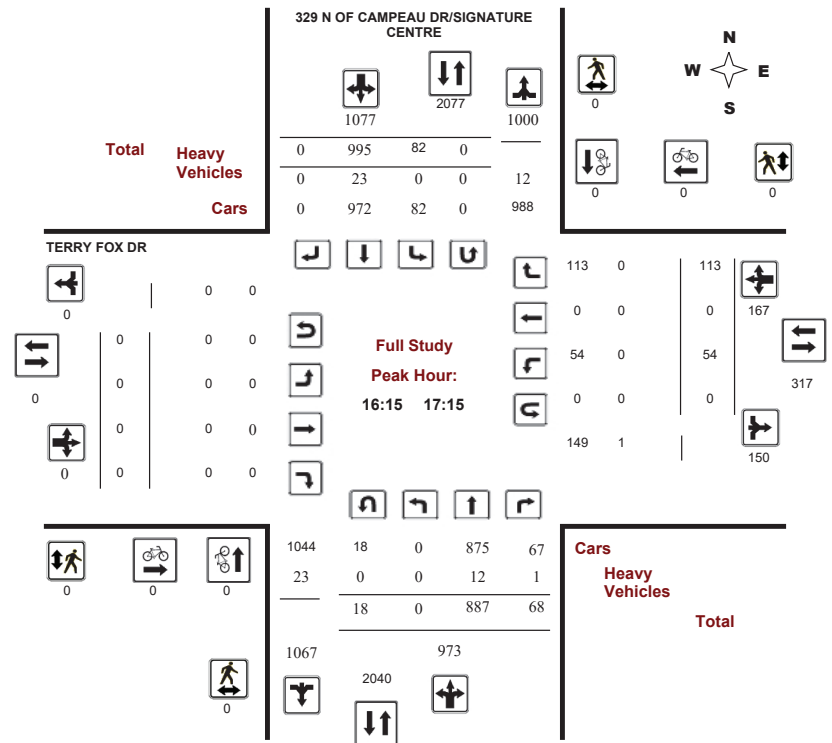
Survey Date: Wednesday, December 06, 2017

WO No: 37361

Start Time: 07:00

Device: Miovision

#### Full Study Peak Hour Diagram





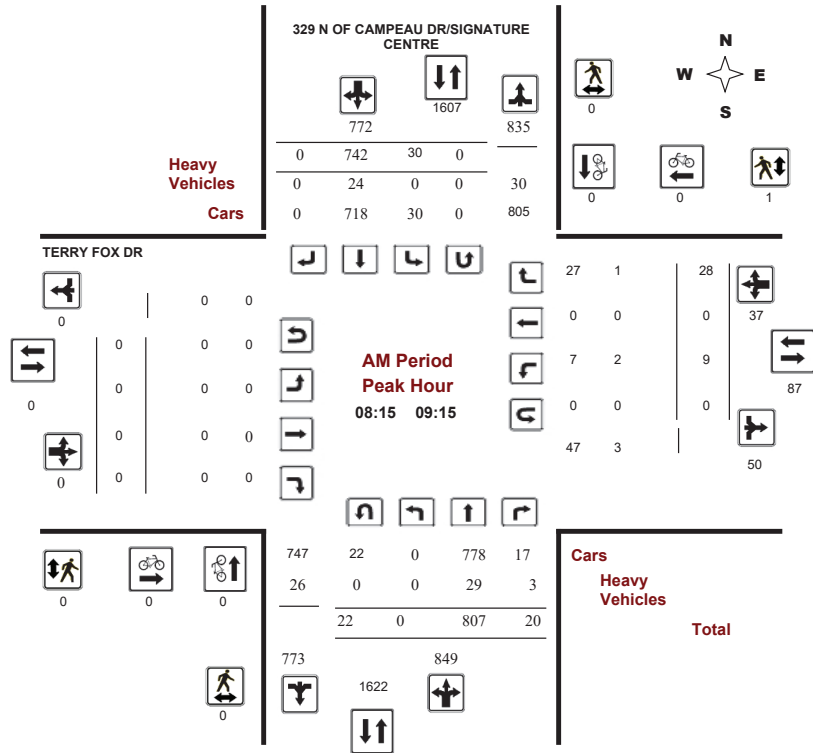
# Transportation Services - Traffic Services

## Turning Movement Count - Peak Hour Diagram

### TERRY FOX DR @ 329 N OF CAMPEAU DR/SIGNATURE C

Survey Date: Wednesday, December 06, 2017  
Start Time: 07:00

WO No: 37361  
Device: Miovision



Comments



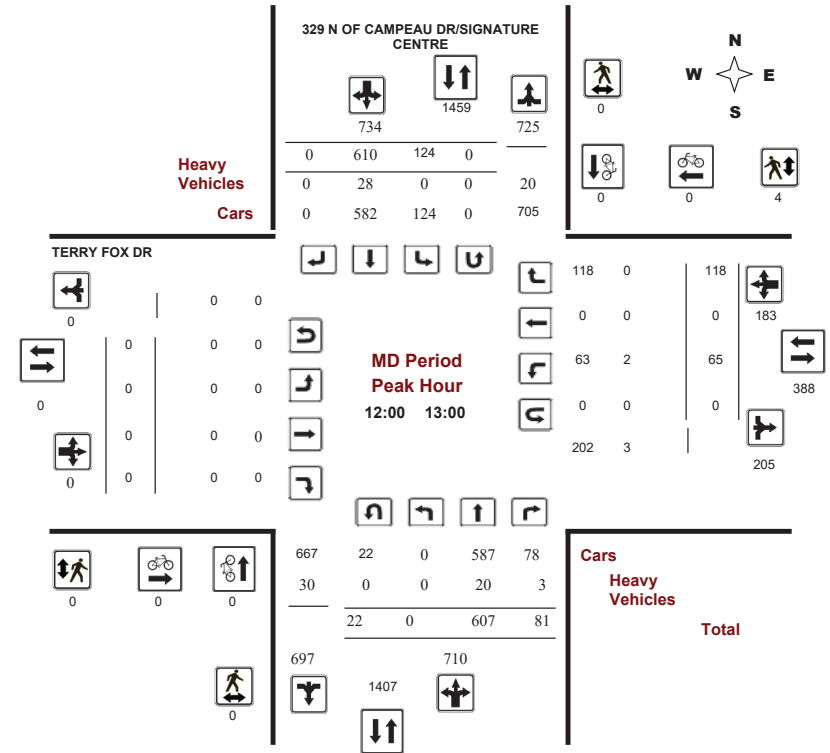
# Transportation Services - Traffic Services

## Turning Movement Count - Peak Hour Diagram

### TERRY FOX DR @ 329 N OF CAMPEAU DR/SIGNATURE C

Survey Date: Wednesday, December 06, 2017  
Start Time: 07:00

WO No: 37361  
Device: Miovision



Comments



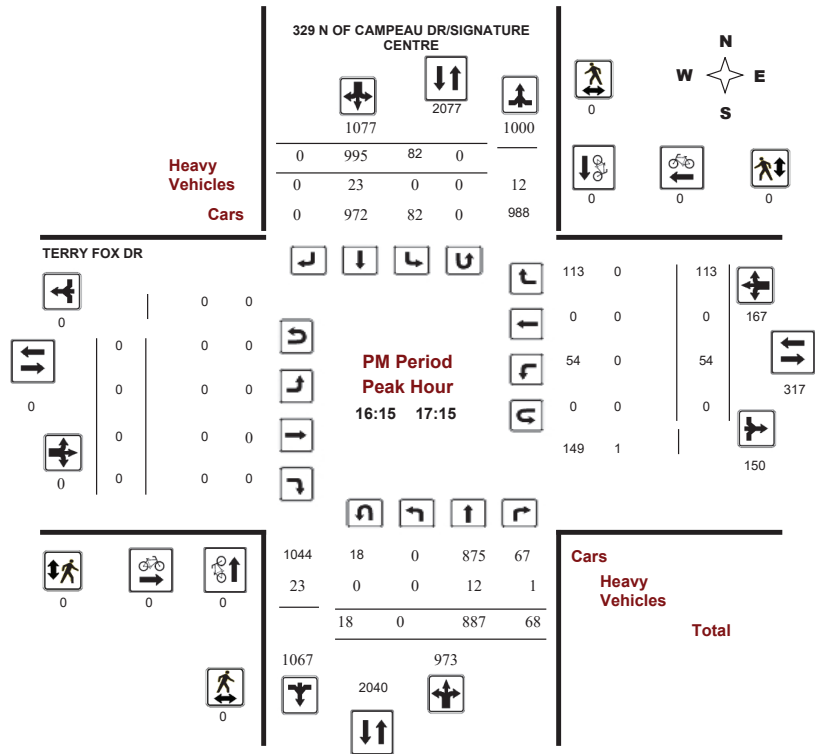
# Transportation Services - Traffic Services

## Turning Movement Count - Peak Hour Diagram

### TERRY FOX DR @ 329 N OF CAMPEAU DR/SIGNATURE C

Survey Date: Wednesday, December 06, 2017  
Start Time: 07:00

WO No: 37361  
Device: Miovision



Comments



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### TERRY FOX DR @ 329 N OF CAMPEAU DR/SIGNATURE C

Survey Date: Wednesday, December 06, 2017  
Start Time: 07:00

WO No: 37361  
Device: Miovision

### Full Study Summary (8 HR Standard)

Survey Date: Wednesday, December 06, 2017

**Total Observed U-Turns**  
Northbound: 195  
Southbound: 4  
Eastbound: 0  
Westbound: 0

**AADT Factor**  
1.00

Period	329 N OF CAMPEAU DR/SIGNATURE CENTRE										TERRY FOX DR						Grand Total		
	Northbound					Southbound					Eastbound			Westbound					
	LT	ST	RT	NB TOT	STR TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	WB TOT	STR TOT			
07:00-08:00	0	457	5	462	8	636	0	644	1106	0	0	0	0	1	0	0	1	1	1107
08:00-09:00	0	819	15	834	26	670	0	696	1530	0	0	0	0	6	0	23	29	29	1559
09:00-10:00	0	637	31	668	53	685	0	738	1406	0	0	0	0	23	0	24	47	47	1453
11:30-12:30	0	518	79	597	115	646	0	761	1358	0	0	0	0	59	0	111	170	170	1528
12:30-13:30	0	672	72	744	94	525	0	619	1363	0	0	0	0	62	0	119	181	181	1544
15:00-16:00	0	789	57	846	78	585	0	663	1509	0	0	0	0	61	0	107	168	168	1677
16:00-17:00	0	855	60	915	86	946	0	1032	1947	0	0	0	0	60	0	121	181	181	2128
17:00-18:00	0	942	66	1008	88	936	0	1024	2032	0	0	0	0	41	0	102	143	143	2175
<b>Sub Total</b>	<b>0</b>	<b>5689</b>	<b>385</b>	<b>6074</b>	<b>548</b>	<b>5629</b>	<b>0</b>	<b>6177</b>	<b>12251</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>313</b>	<b>0</b>	<b>607</b>	<b>920</b>	<b>920</b>	<b>13171</b>
<b>U Turns</b>	<b>195</b>			<b>195</b>	<b>4</b>			<b>4</b>	<b>199</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>199</b>
<b>Total</b>	<b>195</b>	<b>5689</b>	<b>385</b>	<b>6269</b>	<b>552</b>	<b>5629</b>	<b>0</b>	<b>6181</b>	<b>12450</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>313</b>	<b>0</b>	<b>607</b>	<b>920</b>	<b>920</b>	<b>13370</b>
<b>EQ 12Hr</b>	<b>271</b>	<b>7908</b>	<b>535</b>	<b>8714</b>	<b>767</b>	<b>7824</b>	<b>0</b>	<b>8591</b>	<b>17305</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>435</b>	<b>0</b>	<b>844</b>	<b>1279</b>	<b>1279</b>	<b>18584</b>
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														<b>1.39</b>					
<b>AVG 12Hr</b>	<b>271</b>	<b>7908</b>	<b>535</b>	<b>8714</b>	<b>767</b>	<b>7824</b>	<b>0</b>	<b>8591</b>	<b>17305</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>435</b>	<b>0</b>	<b>844</b>	<b>1279</b>	<b>1279</b>	<b>18584</b>
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														<b>1.00</b>					
<b>AVG 24Hr</b>	<b>355</b>	<b>10359</b>	<b>701</b>	<b>11415</b>	<b>1005</b>	<b>10249</b>	<b>0</b>	<b>11254</b>	<b>22669</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>570</b>	<b>0</b>	<b>1106</b>	<b>1676</b>	<b>1676</b>	<b>24345</b>
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														<b>1.31</b>					
Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.																			



Transportation Services - Traffic Services

Turning Movement Count - Study Results

TERRY FOX DR @ 329 N OF CAMPEAU DR/SIGNATURE C

Survey Date: Wednesday, December 06, 2017

WO No: 37361

Start Time: 07:00

Device: Miovision

Full Study 15 Minute Increments

329 N OF CAMPEAU DR/SIGNATURE CENTRE

TERRY FOX DR

Table with columns: Time Period, LT, ST, RT, N TOT, S TOT, STR TOT, Eastbound (LT, ST, RT, E TOT), Westbound (LT, ST, RT, W TOT), STR TOT, Grand Total. Rows show 15-minute intervals from 07:00 to 18:00.

Note: U-Turns are included in Totals.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

TERRY FOX DR @ 329 N OF CAMPEAU DR/SIGNATURE C

Survey Date: Wednesday, December 06, 2017

WO No: 37361

Start Time: 07:00

Device: Miovision

Full Study Cyclist Volume

329 N OF CAMPEAU DR/SIGNATURE CENTRE

TERRY FOX DR

Table with columns: Time Period, Northbound, Southbound, Street Total, Eastbound, Westbound, Street Total, Grand Total. Rows show 15-minute intervals from 07:00 to 18:00.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

TERRY FOX DR @ 329 N OF CAMPEAU DR/SIGNATURE C

Survey Date: Wednesday, December 06, 2017

WO No: 37361

Start Time: 07:00

Device: Miovision

Full Study Pedestrian Volume

329 N OF CAMPEAU DR/SIGNATURE CENTRE TERRY FOX DR

Table with columns: Time Period, NB Approach, SB Approach, Total, EB Approach, WB Approach, Grand Total. Rows show pedestrian counts from 07:00 to 17:45.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

TERRY FOX DR @ 329 N OF CAMPEAU DR/SIGNATURE C

Survey Date: Wednesday, December 06, 2017

WO No: 37361

Start Time: 07:00

Device: Miovision

Full Study Heavy Vehicles

329 N OF CAMPEAU DR/SIGNATURE CENTRE TERRY FOX DR

Table with columns: Time Period, Northbound (LT, ST, RT, N TOT), Southbound (LT, ST, RT, S TOT), Eastbound (LT, ST, RT, E TOT), Westbound (LT, ST, RT, W TOT), Grand Total. Rows show heavy vehicle counts from 07:00 to 17:45.



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### TERRY FOX DR @ 329 N OF CAMPEAU DR/SIGNATURE C

Survey Date: Wednesday, December 06, 2017

WO No: 37361

Start Time: 07:00

Device: Miovision

#### Full Study 15 Minute U-Turn Total

Time Period	329 N OF CAMPEAU		TERRY FOX DR		Total
	DR/SIGNATURE Northbound U-Turn Total	CENTRE Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	
07:00 - 07:15	3	0	0	0	3
07:15 - 07:30	7	0	0	0	7
07:30 - 07:45	2	1	0	0	3
07:45 - 08:00	8	0	0	0	8
08:00 - 08:15	0	0	0	0	0
08:15 - 08:30	4	0	0	0	4
08:30 - 08:45	4	0	0	0	4
08:45 - 09:00	10	0	0	0	10
09:00 - 09:15	4	0	0	0	4
09:15 - 09:30	11	0	0	0	11
09:30 - 09:45	11	0	0	0	11
09:45 - 10:00	6	1	0	0	7
11:30 - 11:45	5	1	0	0	6
11:45 - 12:00	10	0	0	0	10
12:00 - 12:15	6	0	0	0	6
12:15 - 12:30	8	0	0	0	8
12:30 - 12:45	4	0	0	0	4
12:45 - 13:00	4	0	0	0	4
13:00 - 13:15	7	0	0	0	7
13:15 - 13:30	12	1	0	0	13
15:00 - 15:15	9	0	0	0	9
15:15 - 15:30	8	0	0	0	8
15:30 - 15:45	8	0	0	0	8
15:45 - 16:00	6	0	0	0	6
16:00 - 16:15	7	0	0	0	7
16:15 - 16:30	2	0	0	0	2
16:30 - 16:45	6	0	0	0	6
16:45 - 17:00	5	0	0	0	5
17:00 - 17:15	5	0	0	0	5
17:15 - 17:30	5	0	0	0	5
17:30 - 17:45	2	0	0	0	2
17:45 - 18:00	6	0	0	0	6
<b>Total</b>	<b>195</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>199</b>



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### CAMPEAU DR @ TERRY FOX DR

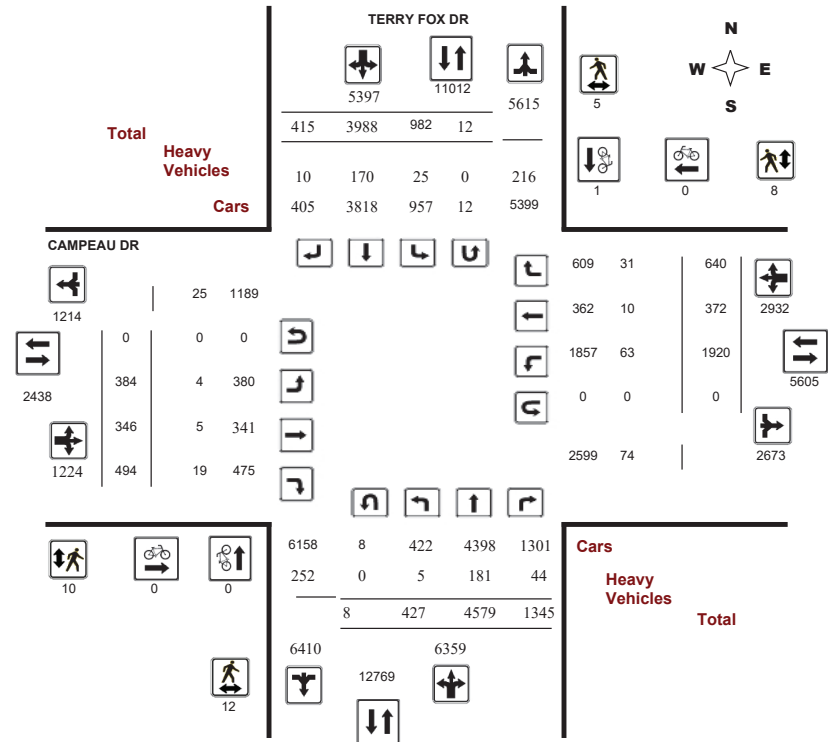
Survey Date: Tuesday, January 21, 2020

WO No: 39361

Start Time: 07:00

Device: Miovision

#### Full Study Diagram



5471861 - TUE JAN 21, 2020 - 8HRS - LORETTA



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### CAMPEAU DR @ TERRY FOX DR

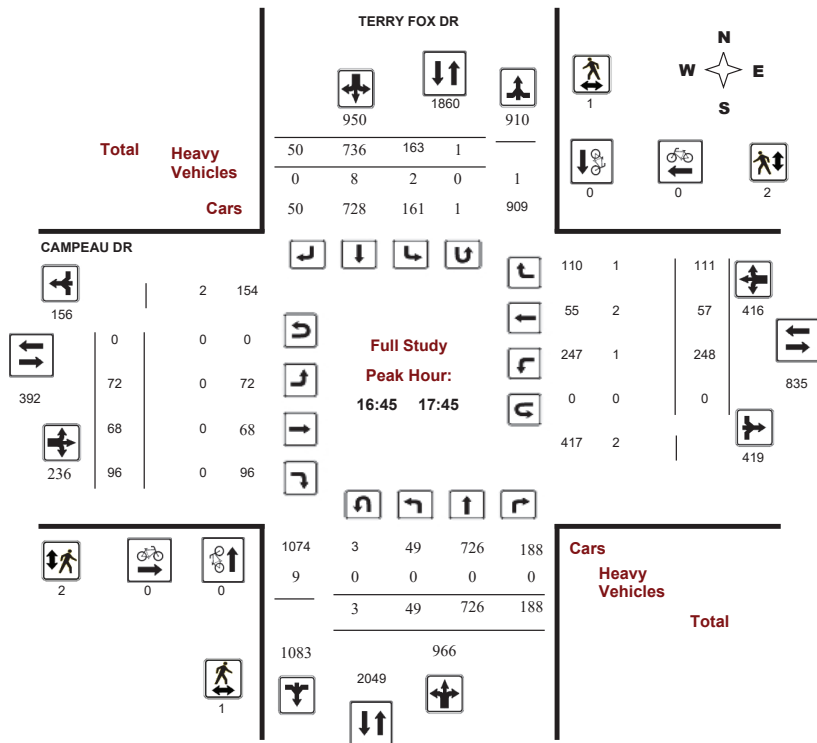
Survey Date: Tuesday, January 21, 2020

WO No: 39361

Start Time: 07:00

Device: Miovision

### Full Study Peak Hour Diagram



5471861 - TUE JAN 21, 2020 - 8HRS - LORETTA



# Transportation Services - Traffic Services

## Turning Movement Count - Peak Hour Diagram

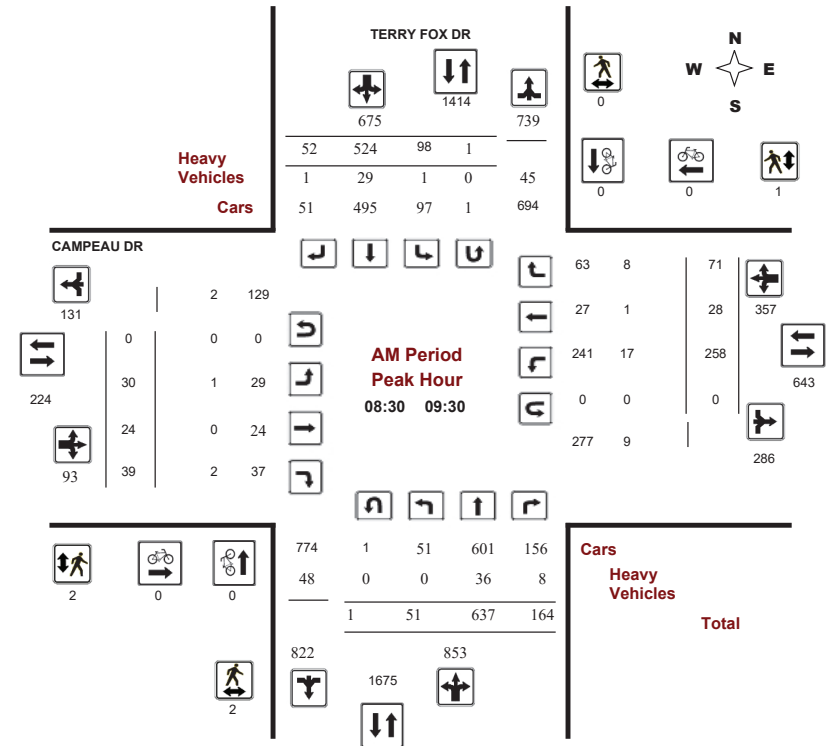
### CAMPEAU DR @ TERRY FOX DR

Survey Date: Tuesday, January 21, 2020

WO No: 39361

Start Time: 07:00

Device: Miovision



Comments 5471861 - TUE JAN 21, 2020 - 8HRS - LORETTA



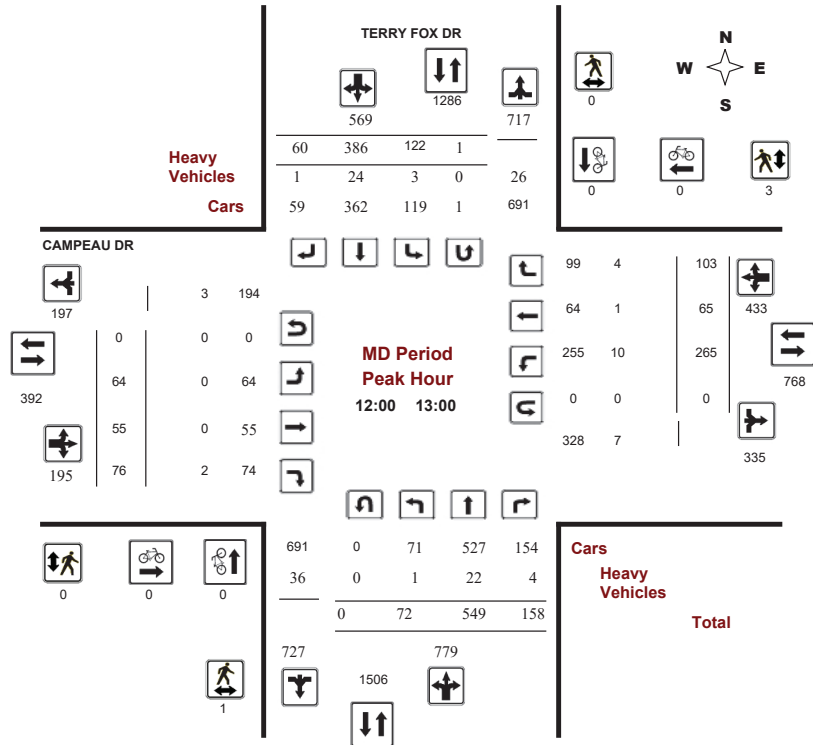
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

CAMPEAU DR @ TERRY FOX DR

Survey Date: Tuesday, January 21, 2020  
Start Time: 07:00

WO No: 39361  
Device: Miovision



Comments 5471861 - TUE JAN 21, 2020 - 8HRS - LORETTA



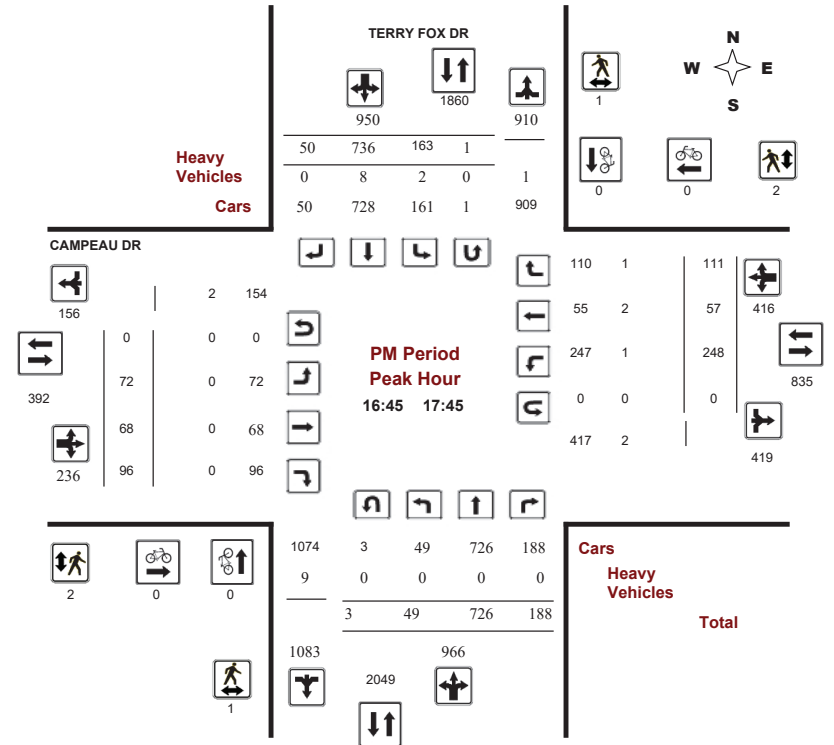
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

CAMPEAU DR @ TERRY FOX DR

Survey Date: Tuesday, January 21, 2020  
Start Time: 07:00

WO No: 39361  
Device: Miovision



Comments 5471861 - TUE JAN 21, 2020 - 8HRS - LORETTA





Transportation Services - Traffic Services

Turning Movement Count - Study Results

CAMPEAU DR @ TERRY FOX DR

Survey Date: Tuesday, January 21, 2020

WO No: 39361

Start Time: 07:00

Device: Miovision

Full Study Summary (8 HR Standard)

Survey Date: Tuesday, January 21, 2020

Total Observed U-Turns AADT Factor
Northbound: 8 Southbound: 12 Eastbound: 0 Westbound: 0 1.10

Table with columns for Period, Northbound, Southbound, Eastbound, Westbound, and Grand Total. Includes sub-totals for U-Turns, EQ 12Hr, and AVG 24Hr.

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



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CAMPEAU DR @ TERRY FOX DR

Survey Date: Tuesday, January 21, 2020

WO No: 39361

Start Time: 07:00

Device: Miovision

Full Study 15 Minute Increments

Table with columns for Time Period, Northbound, Southbound, Eastbound, Westbound, and Grand Total. Shows 15-minute increments from 07:00 to 18:00.

Note: U-Turns are included in Totals.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CAMPEAU DR @ TERRY FOX DR

Survey Date: Tuesday, January 21, 2020

WO No: 39361

Start Time: 07:00

Device: Miovision

Full Study Cyclist Volume

Time Period	TERRY FOX DR			CAMPEAU DR			Grand Total
	Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	
07:00 07:15	0	0	0	0	0	0	0
07:15 07:30	0	0	0	0	0	0	0
07:30 07:45	0	0	0	0	0	0	0
07:45 08:00	0	0	0	0	0	0	0
08:00 08:15	0	0	0	0	0	0	0
08:15 08:30	0	0	0	0	0	0	0
08:30 08:45	0	0	0	0	0	0	0
08:45 09:00	0	0	0	0	0	0	0
09:00 09:15	0	0	0	0	0	0	0
09:15 09:30	0	0	0	0	0	0	0
09:30 09:45	0	0	0	0	0	0	0
09:45 10:00	0	0	0	0	0	0	0
11:30 11:45	0	0	0	0	0	0	0
11:45 12:00	0	0	0	0	0	0	0
12:00 12:15	0	0	0	0	0	0	0
12:15 12:30	0	0	0	0	0	0	0
12:30 12:45	0	0	0	0	0	0	0
12:45 13:00	0	0	0	0	0	0	0
13:00 13:15	0	0	0	0	0	0	0
13:15 13:30	0	0	0	0	0	0	0
15:00 15:15	0	0	0	0	0	0	0
15:15 15:30	0	0	0	0	0	0	0
15:30 15:45	0	0	0	0	0	0	0
15:45 16:00	0	0	0	0	0	0	0
16:00 16:15	0	0	0	0	0	0	0
16:15 16:30	0	1	1	0	0	0	1
16:30 16:45	0	0	0	0	0	0	0
16:45 17:00	0	0	0	0	0	0	0
17:00 17:15	0	0	0	0	0	0	0
17:15 17:30	0	0	0	0	0	0	0
17:30 17:45	0	0	0	0	0	0	0
17:45 18:00	0	0	0	0	0	0	0
Total	0	1	1	0	0	0	1



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CAMPEAU DR @ TERRY FOX DR

Survey Date: Tuesday, January 21, 2020

WO No: 39361

Start Time: 07:00

Device: Miovision

Full Study Pedestrian Volume

Time Period	TERRY FOX DR			CAMPEAU DR			Grand Total
	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	
07:00 07:15	0	0	0	0	0	0	0
07:15 07:30	0	0	0	0	0	0	0
07:30 07:45	0	0	0	0	0	0	0
07:45 08:00	0	0	0	0	0	0	0
08:00 08:15	1	0	1	1	0	1	2
08:15 08:30	0	0	0	0	0	0	0
08:30 08:45	0	0	0	0	1	1	1
08:45 09:00	1	0	1	0	0	0	1
09:00 09:15	0	0	0	1	0	1	1
09:15 09:30	1	0	1	1	0	1	2
09:30 09:45	0	0	0	0	0	0	0
09:45 10:00	0	0	0	0	0	0	0
11:30 11:45	0	1	1	0	1	1	2
11:45 12:00	1	0	1	0	0	0	1
12:00 12:15	1	0	1	0	0	0	1
12:15 12:30	0	0	0	0	0	0	0
12:30 12:45	0	0	0	0	1	1	1
12:45 13:00	0	0	0	0	2	2	2
13:00 13:15	1	1	2	1	0	1	3
13:15 13:30	0	0	0	1	0	1	1
15:00 15:15	0	1	1	1	0	1	2
15:15 15:30	2	1	3	1	1	2	5
15:30 15:45	0	0	0	0	0	0	0
15:45 16:00	0	0	0	0	0	0	0
16:00 16:15	1	0	1	0	0	0	1
16:15 16:30	0	0	0	0	0	0	0
16:30 16:45	0	0	0	0	0	0	0
16:45 17:00	0	0	0	0	0	0	0
17:00 17:15	1	1	2	1	1	2	4
17:15 17:30	0	0	0	0	1	1	1
17:30 17:45	0	0	0	1	0	1	1
17:45 18:00	2	0	2	1	0	1	3
Total	12	5	17	10	8	18	35

5471861 - TUE JAN 21, 2020 - 8HRS - LORETTA



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CAMPEAU DR @ TERRY FOX DR

Survey Date: Tuesday, January 21, 2020

WO No: 39361

Start Time: 07:00

Device: Miovision

Full Study Heavy Vehicles

TERRY FOX DR CAMPEAU DR

Table with columns for Time Period, Northbound (LT, ST, RT, N TOT, STR TOT), Southbound (LT, ST, RT, S TOT, STR TOT), Eastbound (LT, ST, RT, E TOT), Westbound (LT, ST, RT, W TOT, STR TOT), and Grand Total. Rows represent 15-minute intervals from 07:00 to 18:00.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CAMPEAU DR @ TERRY FOX DR

Survey Date: Tuesday, January 21, 2020

WO No: 39361

Start Time: 07:00

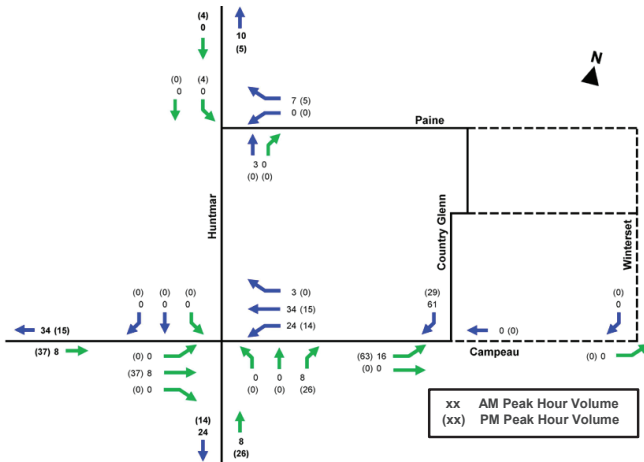
Device: Miovision

Full Study 15 Minute U-Turn Total

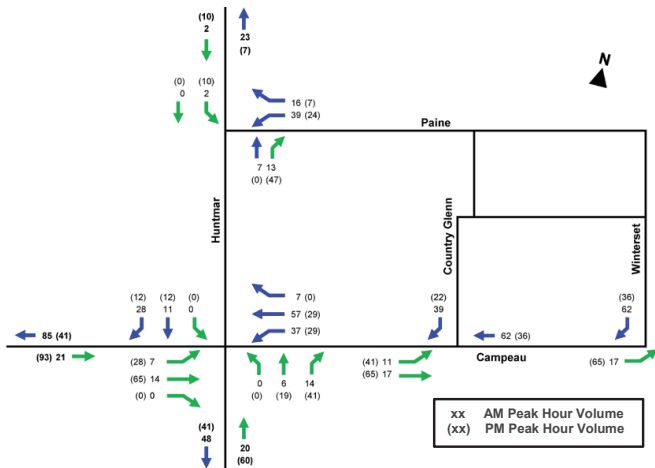
TERRY FOX DR CAMPEAU DR

Table with columns for Time Period, Northbound U-Turn Total, Southbound U-Turn Total, Eastbound U-Turn Total, Westbound U-Turn Total, and Total. Rows represent 15-minute intervals from 07:00 to 18:00.

**TRANSPORTATION BRIEF – ADDENDUM #2  
 ARCADIA SUBDIVISION – STAGE 3  
 OTTAWA, ONTARIO**



**Figure 5: Site-Generated Traffic – Stage 3 Build-Out**



**Figure 6: Site-Generated Traffic – Stage 3 and 4 Build-Out**

# Appendix C

Synchro and Sidra Intersection Worksheets – Existing Conditions

Lanes, Volumes, Timings  
4: Terry Fox & Kanata

11/02/2023

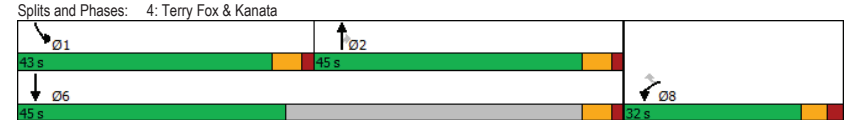
	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔	↔	↕↕	↔	↔↔	↕↕
Traffic Volume (vph)	310	337	616	169	253	447
Future Volume (vph)	310	337	616	169	253	447
Satd. Flow (prot)	3185	1414	3283	1441	1595	3283
Fit Permitted	0.950				0.950	
Satd. Flow (perm)	3185	1414	3283	1441	1595	3283
Satd. Flow (RTOR)		374		188		
Lane Group Flow (vph)	344	374	684	188	281	497
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	31.2	31.2	25.0	25.0	11.0	25.0
Total Split (s)	32.0	32.0	45.0	45.0	43.0	45.0
Total Split (%)	26.7%	26.7%	37.5%	37.5%	35.8%	37.5%
Yellow Time (s)	3.7	3.7	4.2	4.2	4.2	4.2
All-Red Time (s)	2.5	2.5	1.8	1.8	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	6.0	6.0	6.0	6.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	Max	Max	None	Max
Act Effct Green (s)	16.0	16.0	39.5	39.5	22.2	67.8
Actuated g/C Ratio	0.17	0.17	0.41	0.41	0.23	0.70
v/c Ratio	0.65	0.68	0.51	0.27	0.76	0.21
Control Delay	44.2	11.1	24.7	4.7	49.0	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.2	11.1	24.7	4.7	49.0	5.5
LOS	D	B	C	A	D	A
Approach Delay	27.0		20.4			21.2
Approach LOS	C		C			C
Queue Length 50th (m)	30.6	0.0	47.6	0.0	48.0	14.1
Queue Length 95th (m)	49.8	26.9	84.7	14.8	81.5	25.3
Internal Link Dist (m)	616.6		846.8			487.6
Turn Bay Length (m)				100.0	85.5	
Base Capacity (vph)	865	656	1348	702	621	2832
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.57	0.51	0.27	0.45	0.18

Intersection Summary	
Cycle Length:	120
Actuated Cycle Length:	96.2
Natural Cycle:	80
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.76

Lanes, Volumes, Timings  
4: Terry Fox & Kanata

11/02/2023

Intersection Signal Delay: 22.7	Intersection LOS: C
Intersection Capacity Utilization 57.3%	ICU Level of Service B
Analysis Period (min) 15	



Lanes, Volumes, Timings  
5: Terry Fox & Signature SC

11/02/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	0	0	0	9	0	28	0	757	20	30	727	0
Future Volume (vph)	0	0	0	9	0	28	0	757	20	30	727	0
Satd. Flow (prot)	0	1745	0	0	1386	1455	1745	3228	0	1658	3283	0
Fit Permitted					0.757					0.298		
Satd. Flow (perm)	0	1745	0	0	1104	1455	1745	3228	0	520	3283	0
Satd. Flow (RTOR)						34		5				
Lane Group Flow (vph)	0	0	0	0	10	31	0	863	0	33	808	0
Turn Type				Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Minimum Split (s)	31.6	31.6		31.6	31.6	31.6	31.4	31.4		32.8	32.8	
Total Split (s)	32.0	32.0		32.0	32.0	32.0	78.0	78.0		78.0	78.0	
Total Split (%)	29.1%	29.1%		29.1%	29.1%	29.1%	70.9%	70.9%		70.9%	70.9%	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	4.2	4.2		4.2	4.2	
All-Red Time (s)	3.6	3.6		3.6	3.6	3.6	2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.6			6.6	6.6	6.4	6.4		6.4	6.4	
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)					25.4	25.4		71.6		71.6	71.6	
Actuated g/C Ratio					0.23	0.23		0.65		0.65	0.65	
v/c Ratio					0.04	0.09		0.41		0.10	0.38	
Control Delay					33.6	11.0		13.4		8.1	9.5	
Queue Delay					0.0	0.0		0.0		0.0	0.0	
Total Delay					33.6	11.0		13.4		8.1	9.5	
LOS					C	B		B		A	A	
Approach Delay					16.5			13.4			9.5	
Approach LOS					B			B			A	
Queue Length 50th (m)					1.7	0.0		82.2		2.4	38.6	
Queue Length 95th (m)					6.2	7.0		48.0		6.3	49.4	
Internal Link Dist (m)		19.8			92.3			301.0			846.8	
Turn Bay Length (m)										61.0		
Base Capacity (vph)					254	362		2102		338	2136	
Starvation Cap Reductn					0	0		0		0	0	
Spillback Cap Reductn					0	0		0		0	0	
Storage Cap Reductn					0	0		0		0	0	
Reduced v/c Ratio					0.04	0.09		0.41		0.10	0.38	
<b>Intersection Summary</b>												
Cycle Length: 110												
Actuated Cycle Length: 110												
Offset: 49 (45%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green												
Natural Cycle: 65												
Control Type: Pretimed												
Maximum v/c Ratio: 0.41												
Intersection Signal Delay: 11.6      Intersection LOS: B												
Intersection Capacity Utilization 45.5%      ICU Level of Service A												
Analysis Period (min) 15												

Lanes, Volumes, Timings  
5: Terry Fox & Signature SC

11/02/2023





Lanes, Volumes, Timings  
6: Terry Fox & Campeau

11/02/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Traffic Volume (vph)	30	24	39	258	28	71	52	647	164	98	554	52
Future Volume (vph)	30	24	39	258	28	71	52	647	164	98	554	52
Satd. Flow (prot)	1642	1745	1441	1580	1712	1363	1658	3191	1441	1658	3191	1483
Fit Permitted	0.737			0.740			0.386			0.294		
Satd. Flow (perm)	1274	1745	1421	1229	1712	1363	673	3191	1410	513	3191	1449
Satd. Flow (RTOR)			97			97			182			
Lane Group Flow (vph)	33	27	43	287	31	79	58	719	182	109	616	58
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1		6
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	40.4	40.4	40.4	43.4	43.4	43.4	11.4	40.4	40.4	11.4	43.4	43.4
Total Split (s)	54.0	54.0	54.0	54.0	54.0	54.0	12.0	44.0	44.0	12.0	44.0	44.0
Total Split (%)	49.1%	49.1%	49.1%	49.1%	49.1%	49.1%	10.9%	40.0%	40.0%	10.9%	40.0%	40.0%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	2.7	2.7	2.7	2.7	2.7	2.7	2.2	2.2	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max	C-Max
Act Effct Green (s)	31.8	31.8	31.8	31.8	31.8	31.8	57.8	50.5	50.5	61.4	54.1	54.1
Actuated g/C Ratio	0.29	0.29	0.29	0.29	0.29	0.29	0.53	0.46	0.46	0.56	0.49	0.49
v/c Ratio	0.09	0.05	0.09	0.81	0.06	0.17	0.14	0.49	0.24	0.29	0.39	0.08
Control Delay	25.5	24.6	0.4	52.9	24.9	3.9	13.0	24.3	4.5	29.5	43.4	16.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.5	24.6	0.4	52.9	24.9	3.9	13.0	24.3	4.5	29.5	43.4	16.3
LOS	C	C	A	D	C	A	B	C	A	C	D	B
Approach Delay		14.8			41.0			19.9			39.5	
Approach LOS		B			D			B			D	
Queue Length 50th (m)	5.2	4.2	0.0	56.9	4.8	0.0	4.9	55.4	0.0	18.5	74.3	2.1
Queue Length 95th (m)	10.7	9.2	0.0	76.9	10.1	6.7	13.2	88.7	14.5	37.9	93.4	12.1
Internal Link Dist (m)		178.3			204.4			313.2			301.0	
Turn Bay Length (m)	62.5		64.5	70.0		63.5	45.0		62.5	97.5		50.0
Base Capacity (vph)	551	755	669	531	740	644	419	1465	745	374	1568	761
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.04	0.06	0.54	0.04	0.12	0.14	0.49	0.24	0.29	0.39	0.08

Intersection Summary

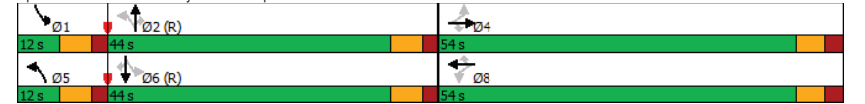
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 27 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings  
6: Terry Fox & Campeau

11/02/2023

Maximum v/c Ratio: 0.81	Intersection LOS: C
Intersection Signal Delay: 30.2	ICU Level of Service C
Intersection Capacity Utilization 72.8%	
Analysis Period (min) 15	

Splits and Phases: 6: Terry Fox & Campeau



Lanes, Volumes, Timings  
4: Terry Fox & Kanata

11/02/2023

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔	↔	↑↑	↔	↔↔	↑↑
Traffic Volume (vph)	241	146	655	335	265	722
Future Volume (vph)	241	146	655	335	265	722
Satd. Flow (prot)	3216	1469	3316	1483	1658	3316
Fit Permitted	0.950				0.950	
Satd. Flow (perm)	3216	1469	3316	1452	1652	3316
Satd. Flow (RTOR)		162		372		
Lane Group Flow (vph)	268	162	728	372	294	802
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	31.2	31.2	25.0	25.0	11.0	25.0
Total Split (s)	32.0	32.0	45.0	45.0	43.0	45.0
Total Split (%)	26.7%	26.7%	37.5%	37.5%	35.8%	37.5%
Maximum Green (s)	25.8	25.8	39.0	39.0	37.0	39.0
Yellow Time (s)	3.7	3.7	4.2	4.2	4.2	4.2
All-Red Time (s)	2.5	2.5	1.8	1.8	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	6.0	6.0	6.0	6.0
Lead/Lag			Lag	Lag	Lead	Lead
Lead-Lag Optimize?			Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Max	Max	None	Max
Walk Time (s)	7.0	7.0	7.0	7.0		7.0
Flash Dont Walk (s)	18.0	18.0	12.0	12.0		12.0
Pedestrian Calls (#/hr)	0	0	0	0		0
Act Effct Green (s)	13.2	13.2	39.4	39.4	21.6	67.0
Actuated g/C Ratio	0.14	0.14	0.43	0.43	0.23	0.72
v/c Ratio	0.59	0.47	0.52	0.45	0.76	0.33
Control Delay	43.4	11.0	22.8	4.3	46.7	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.4	11.0	22.8	4.3	46.7	5.3
LOS	D	B	C	A	D	A
Approach Delay	31.2		16.5			16.4
Approach LOS	C		B			B
Queue Length 50th (m)	23.1	0.0	48.4	0.0	48.5	22.6
Queue Length 95th (m)	39.0	17.5	83.1	18.4	80.2	36.8
Internal Link Dist (m)	616.6		846.8			487.6
Turn Bay Length (m)				100.0	85.5	
Base Capacity (vph)	905	529	1411	831	669	2951
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.31	0.52	0.45	0.44	0.27

Intersection Summary

Scenario 1 8370 Campeau Drive 11:59 pm 09/03/2021 Existing  
PM Peak Hour

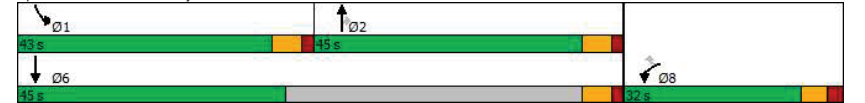
Synchro 11 Report  
Page 1

Lanes, Volumes, Timings  
4: Terry Fox & Kanata

11/02/2023

Cycle Length: 120	
Actuated Cycle Length: 92.5	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 18.9	Intersection LOS: B
Intersection Capacity Utilization 57.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 4: Terry Fox & Kanata



Scenario 1 8370 Campeau Drive 11:59 pm 09/03/2021 Existing  
PM Peak Hour

Synchro 11 Report  
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Lanes, Volumes, Timings  
5: Terry Fox & Signature SC

11/02/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↔		↔	↔	
Traffic Volume (vph)	0	0	0	54	0	113	18	877	68	82	881	0
Future Volume (vph)	0	0	0	54	0	113	18	877	68	82	881	0
Satd. Flow (prot)	0	1745	0	0	1658	1483	1658	3279	0	1658	3316	0
Fit Permitted					0.757		0.246			0.223		
Satd. Flow (perm)	0	1745	0	0	1321	1483	429	3279	0	389	3316	0
Satd. Flow (RTOR)					126		13					
Lane Group Flow (vph)	0	0	0	0	60	126	20	1050	0	91	979	0
Turn Type				Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Minimum Split (s)	31.6	31.6		31.6	31.6	31.6	31.4	31.4		32.8	32.8	
Total Split (s)	39.0	39.0		39.0	39.0	39.0	81.0	81.0		81.0	81.0	
Total Split (%)	32.5%	32.5%		32.5%	32.5%	32.5%	67.5%	67.5%		67.5%	67.5%	
Maximum Green (s)	32.4	32.4		32.4	32.4	32.4	74.6	74.6		74.6	74.6	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	4.2	4.2		4.2	4.2	
All-Red Time (s)	3.6	3.6		3.6	3.6	3.6	2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.6			6.6	6.6	6.4	6.4		6.4	6.4	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	18.0	18.0		18.0	18.0	18.0	18.0	18.0		18.0	18.0	
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0		0	0	
Act Effct Green (s)				32.4	32.4	74.6	74.6	74.6		74.6	74.6	
Actuated g/C Ratio				0.27	0.27	0.62	0.62	0.62		0.62	0.62	
v/c Ratio				0.17	0.26	0.08	0.51	0.38		0.38	0.48	
Control Delay				35.1	7.2	5.4	6.0	16.8		13.1		
Queue Delay				0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay				35.1	7.2	5.4	6.0	16.8		13.1		
LOS				D	A	A	A	B		B		
Approach Delay				16.2			6.0	13.5				
Approach LOS				B			A	B				
Queue Length 50th (m)				10.8	0.0	0.7	19.8	9.9		60.8		
Queue Length 95th (m)				22.1	14.2	m1.7	27.2	22.4		75.6		
Internal Link Dist (m)		19.8		92.3			301.0			846.8		
Turn Bay Length (m)						51.0		61.0				
Base Capacity (vph)				356	492	266	2043	241		2061		
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	0.26	0.08	0.51	0.38		0.48		

Intersection Summary	
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	83 (69%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle:	65
Control Type:	Pretimed

Lanes, Volumes, Timings  
5: Terry Fox & Signature SC

11/02/2023

Maximum v/c Ratio: 0.51	Intersection LOS: B
Intersection Signal Delay: 10.2	ICU Level of Service B
Intersection Capacity Utilization 60.7%	
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 5: Terry Fox & Signature SC



Lanes, Volumes, Timings  
6: Terry Fox & Campeau

11/02/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Traffic Volume (vph)	72	68	96	248	57	111	52	746	188	164	736	50
Future Volume (vph)	72	68	96	248	57	111	52	746	188	164	736	50
Satd. Flow (prot)	1658	1745	1483	1658	1712	1483	1658	3316	1483	1658	3316	1483
Fit Permitted	0.716			0.708			0.304			0.238		
Satd. Flow (perm)	1248	1745	1464	1234	1712	1464	530	3316	1449	415	3316	1449
Satd. Flow (RTOR)			107				123			208		
Lane Group Flow (vph)	80	76	107	276	63	123	58	829	209	182	818	56
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4		8		8	5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	40.4	40.4	40.4	43.4	43.4	43.4	11.4	40.4	40.4	11.4	43.4	43.4
Total Split (s)	48.0	48.0	48.0	48.0	48.0	48.0	22.0	50.0	50.0	22.0	50.0	50.0
Total Split (%)	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	18.3%	41.7%	41.7%	18.3%	41.7%	41.7%
Maximum Green (s)	41.6	41.6	41.6	41.6	41.6	41.6	15.6	43.6	43.6	15.6	43.6	43.6
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	2.7	2.7	2.7	2.7	2.7	2.7	2.2	2.2	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)	27.0	27.0	27.0	30.0	30.0	30.0		27.0	27.0		30.0	30.0
Pedestrian Calls (#/hr)	1	1	1	1	1	1		1	1		2	2
Act Effct Green (s)	31.9	31.9	31.9	31.9	31.9	31.9	64.9	57.6	57.6	73.8	64.0	64.0
Actuated g/C Ratio	0.27	0.27	0.27	0.27	0.27	0.27	0.54	0.48	0.48	0.62	0.53	0.53
v/c Ratio	0.24	0.16	0.23	0.84	0.14	0.26	0.16	0.52	0.26	0.49	0.46	0.07
Control Delay	34.0	32.1	6.5	62.9	31.4	6.3	12.4	25.2	4.3	22.5	16.1	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.0	32.1	6.5	62.9	31.4	6.3	12.4	25.2	4.3	22.5	16.1	0.6
LOS	C	C	A	E	C	A	B	C	A	C	B	A
Approach Delay		22.2			43.6			20.5			16.3	
Approach LOS		C			D			C			B	
Queue Length 50th (m)	14.8	13.7	0.0	61.3	11.3	0.0	5.0	69.4	0.1	16.7	43.6	0.0
Queue Length 95th (m)	25.1	23.3	11.8	84.9	20.1	12.6	12.5	108.7	15.5	41.9	52.7	1.3
Internal Link Dist (m)		178.3			204.4			313.2			301.0	
Turn Bay Length (m)	62.5		64.5	70.0		63.5	45.0		62.5	97.5		50.0
Base Capacity (vph)	432	604	577	427	593	587	468	1591	803	421	1767	813
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.13	0.19	0.65	0.11	0.21	0.12	0.52	0.26	0.43	0.46	0.07

Intersection Summary

Scenario 1 8370 Campeau Drive 11:59 pm 09/03/2021 Existing  
PM Peak Hour

Synchro 11 Report  
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Lanes, Volumes, Timings  
6: Terry Fox & Campeau

11/02/2023

Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 93 (78%), Referenced to phase 2:NBLT and 6:SBTL, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 22.9	Intersection LOS: C
Intersection Capacity Utilization 75.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 6: Terry Fox & Campeau



Scenario 1 8370 Campeau Drive 11:59 pm 09/03/2021 Existing  
PM Peak Hour

Synchro 11 Report  
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## MOVEMENT SUMMARY

 Site: 101 [Huntmar-Campeau AM Existing]

Arcadia Stage 5  
Site Category: (None)  
Roundabout

Movement Performance - Vehicles													
Mov ID	Turn	Demand Total	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h	
<b>South: Huntmar</b>													
1	L2	24	2.0	0.024	7.8	LOS A	0.1	0.4	0.16	0.57	0.16	50.5	
2	T1	347	2.0	0.336	2.1	LOS A	1.1	8.1	0.21	0.24	0.21	50.3	
3	R2	19	2.0	0.018	2.8	LOS A	0.0	0.3	0.16	0.36	0.16	51.8	
Approach		390	2.0	0.336	2.4	LOS A	1.1	8.1	0.21	0.27	0.21	50.4	
<b>East: Campeau</b>													
4	L2	70	2.0	0.086	10.6	LOS B	0.2	1.6	0.35	0.72	0.35	50.5	
5	T1	40	2.0	0.050	4.6	LOS A	0.1	0.9	0.36	0.46	0.36	57.0	
6	R2	18	2.0	0.022	5.0	LOS A	0.1	0.4	0.35	0.55	0.35	51.2	
Approach		128	2.0	0.086	8.0	LOS A	0.2	1.6	0.35	0.62	0.35	52.4	
<b>North: Huntmar</b>													
7	L2	2	2.0	0.159	7.9	LOS A	0.5	3.3	0.21	0.25	0.21	54.2	
8	T1	319	2.0	0.159	2.1	LOS A	0.5	3.3	0.20	0.25	0.20	50.3	
9	R2	108	2.0	0.107	2.9	LOS A	0.3	2.1	0.20	0.39	0.20	51.7	
Approach		429	2.0	0.159	2.3	LOS A	0.5	3.3	0.20	0.28	0.20	50.6	
<b>West: Campeau</b>													
10	L2	76	2.0	0.089	10.5	LOS B	0.2	1.6	0.33	0.71	0.33	50.5	
11	T1	29	2.0	0.035	4.4	LOS A	0.1	0.6	0.33	0.44	0.33	57.2	
12	R2	32	2.0	0.038	4.5	LOS A	0.1	0.7	0.31	0.52	0.31	51.6	
Approach		137	2.0	0.089	7.8	LOS A	0.2	1.6	0.33	0.61	0.33	52.0	
All Vehicles		1083	2.0	0.336	3.7	LOS A	1.1	8.1	0.24	0.36	0.24	50.9	

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.  
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).  
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).  
Roundabout Capacity Model: US HCM 2010.  
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.  
Gap-Acceptance Capacity: Traditional M1.  
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

## MOVEMENT SUMMARY

 Site: 101 [Huntmar-Campeau PM Existing]

Arcadia Stage 5  
Site Category: (None)  
Roundabout

Movement Performance - Vehicles													
Mov ID	Turn	Demand Total	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h	
<b>South: Huntmar</b>													
1	L2	81	2.0	0.090	8.3	LOS A	0.2	1.7	0.29	0.64	0.29	50.1	
2	T1	387	2.0	0.423	2.8	LOS A	1.5	10.9	0.39	0.33	0.39	49.5	
3	R2	62	2.0	0.069	3.3	LOS A	0.2	1.3	0.29	0.45	0.29	51.4	
Approach		530	2.0	0.423	3.7	LOS A	1.5	10.9	0.36	0.39	0.36	49.8	
<b>East: Campeau</b>													
4	L2	40	2.0	0.057	11.3	LOS B	0.1	1.0	0.41	0.77	0.41	50.3	
5	T1	24	2.0	0.036	5.4	LOS A	0.1	0.7	0.43	0.53	0.43	56.6	
6	R2	8	2.0	0.011	5.7	LOS A	0.0	0.2	0.42	0.59	0.42	50.9	
Approach		72	2.0	0.057	8.7	LOS A	0.1	1.0	0.42	0.67	0.42	52.3	
<b>North: Huntmar</b>													
7	L2	9	2.0	0.201	8.0	LOS A	0.6	4.4	0.23	0.27	0.23	54.0	
8	T1	393	2.0	0.201	2.1	LOS A	0.6	4.4	0.22	0.26	0.22	50.2	
9	R2	148	2.0	0.148	3.0	LOS A	0.4	3.0	0.22	0.40	0.22	51.6	
Approach		550	2.0	0.201	2.5	LOS A	0.6	4.4	0.22	0.30	0.22	50.6	
<b>West: Campeau</b>													
10	L2	190	2.0	0.233	10.8	LOS B	0.7	4.8	0.39	0.75	0.39	50.3	
11	T1	79	2.0	0.099	4.7	LOS A	0.3	1.9	0.37	0.46	0.37	56.9	
12	R2	66	2.0	0.080	4.7	LOS A	0.2	1.4	0.34	0.56	0.34	51.5	
Approach		334	2.0	0.233	8.2	LOS A	0.7	4.8	0.38	0.65	0.38	52.0	
All Vehicles		1487	2.0	0.423	4.5	LOS A	1.5	10.9	0.32	0.43	0.32	50.7	

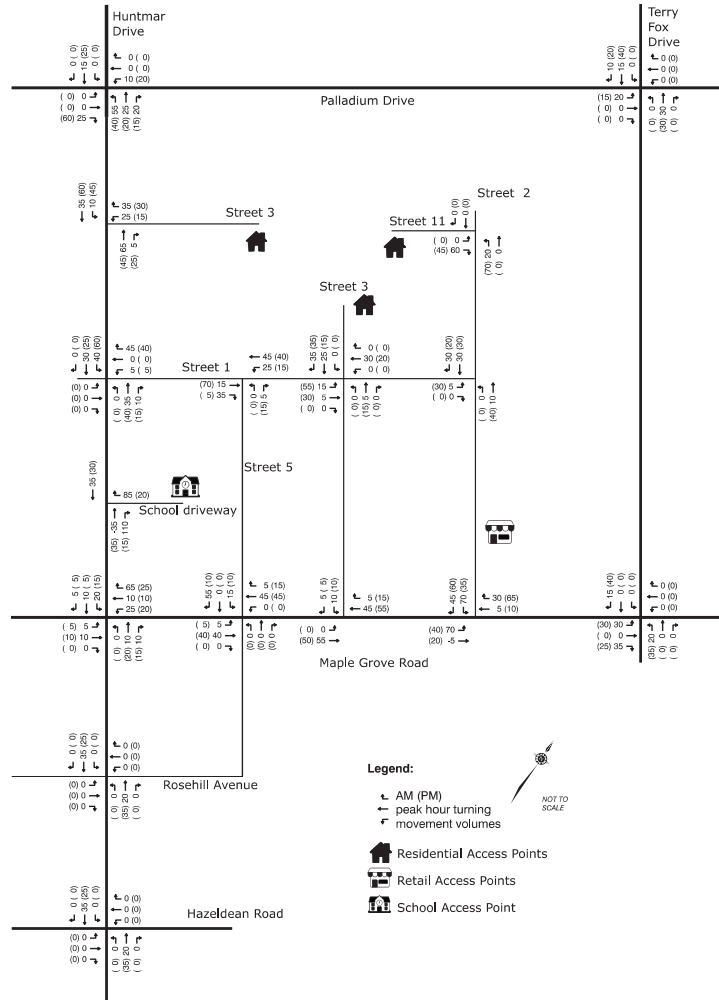
Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.  
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).  
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).  
Roundabout Capacity Model: US HCM 2010.  
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.  
Gap-Acceptance Capacity: Traditional M1.  
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# Appendix D

Background Development Volumes

Figure 20: Trip Assignment



Urbandale Construction Ltd.  
130 Huntmar Drive - Transportation Impact Assessment (TIA)  
September 2020 – 19-1698



Figure 12: 'New' and 'Pass-by' Site Generated Traffic Volumes

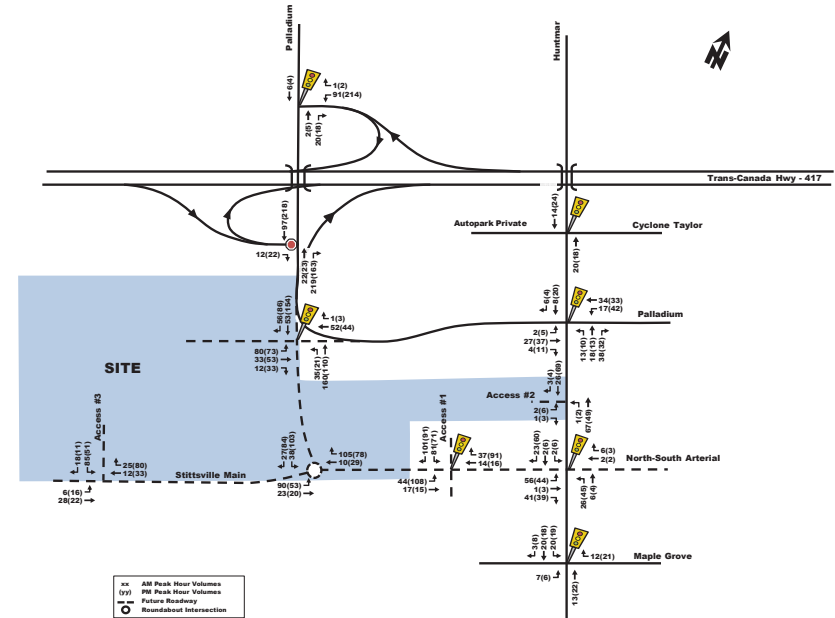
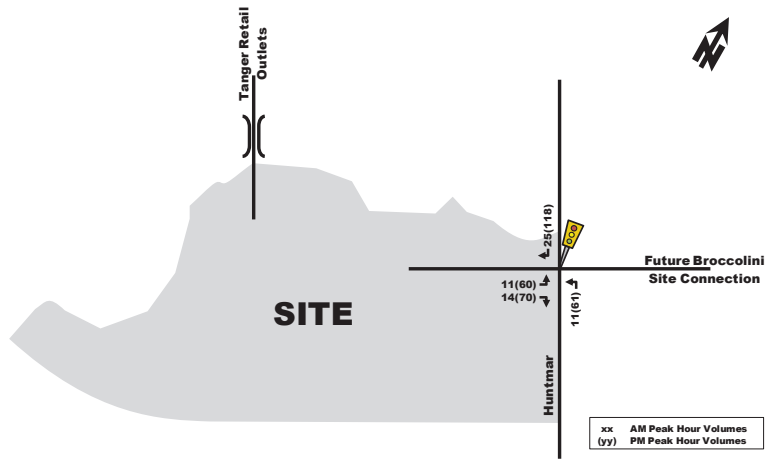


Figure 3: 'New' and 'Pass-by' Site-Generated Traffic Volumes



**PARSONS**

**3.1.3. TRIP DISTRIBUTION AND ASSIGNMENT**

Given the low projected number of vehicle trips projected to be generated by the proposed development, the future roadway network impact is considered negligible. However, a review of the number of vehicles projected to enter/exit the site at the proposed site driveways is provided as Figure 7.

Figure 7: Site-Generated Vehicle Trips

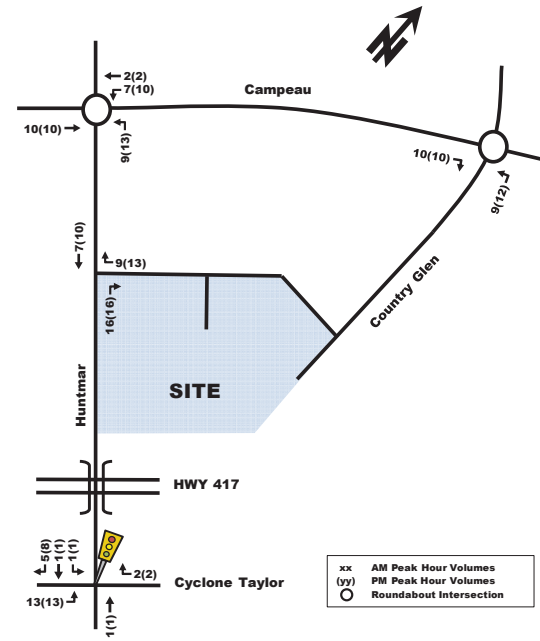
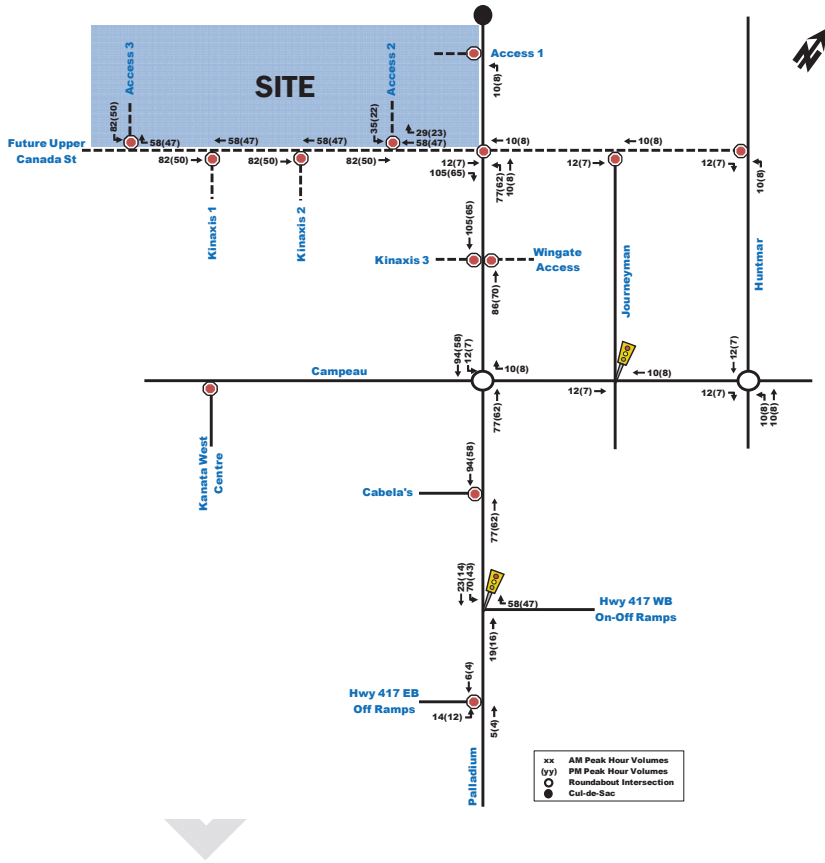






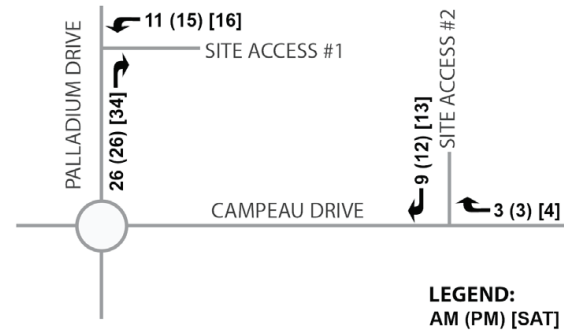
Figure 13: Purolator Facility Site-Generated Traffic (Phase 2)



### 3.1.7 Trip Assignment

Utilizing the estimated number of new auto trips and applying the above distribution, future site-generated traffic volumes at each of the proposed site access driveways have been illustrated in Figure 3 as follows:

Figure 3 - Site-Generated Traffic



➤ Based on the anticipated turning movement volumes illustrated in Figure 3 above, it is not expected that there will be any operational impacts at either of the site access driveways and therefore no further analysis is required.

3.1.2. TRIP DISTRIBUTION AND ASSIGNMENT

Based on the 2011 NCR Household Origin-Destination Survey (Kanata – Stittsville district) and the location of adjacent arterial roadways and neighbourhoods, the distribution of site-generated traffic volumes was estimated as follows:

- 25% to/from the north;
- 10% to/from the south;
- 60% to/from the east; and,
- 5% to/from the west.

The expected site-generated auto trips in Table 4 were then assigned to the road networks as shown in Figure 9 below, based on existing traffic volumes, estimated travel times and engineering judgement.

Figure 9: Kinaxis Office Development Site-Generated Traffic

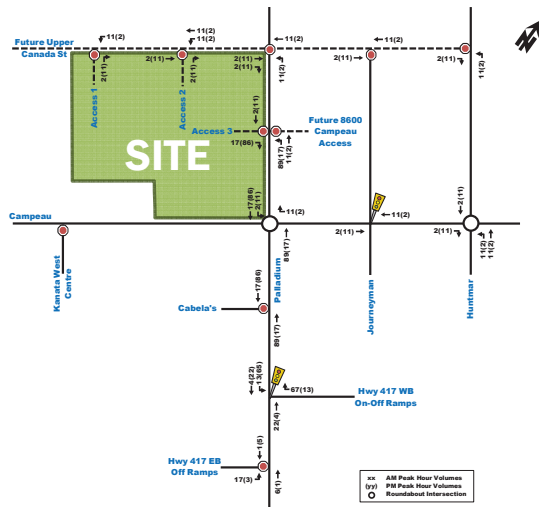


Figure 12: Maritime Ontario Facility Site-Generated Traffic (Phase 1)

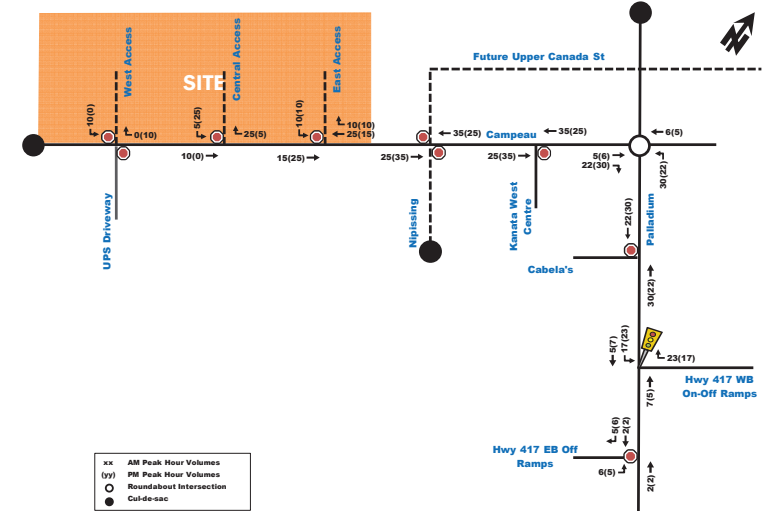
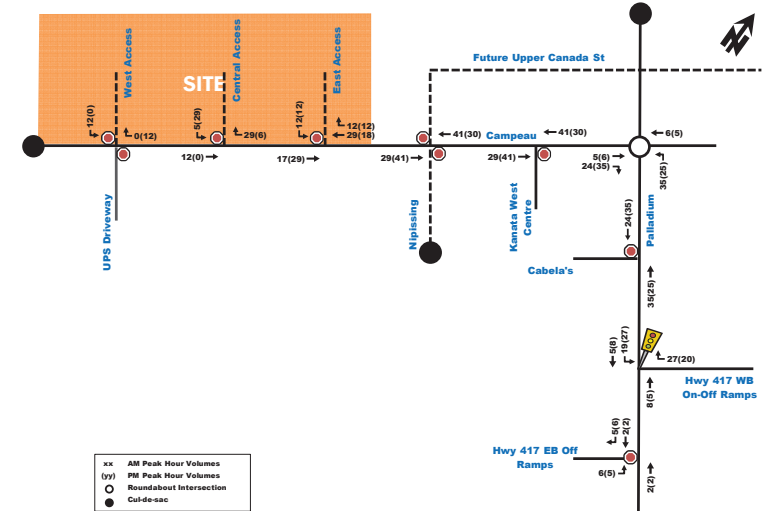


Figure 13: Maritime Ontario Facility Site-Generated Traffic (Phase 2)



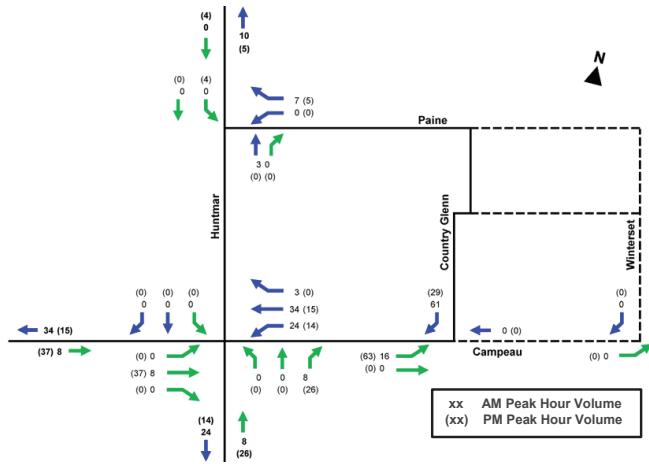


Figure 5: Site-Generated Traffic – Stage 3 Build-Out

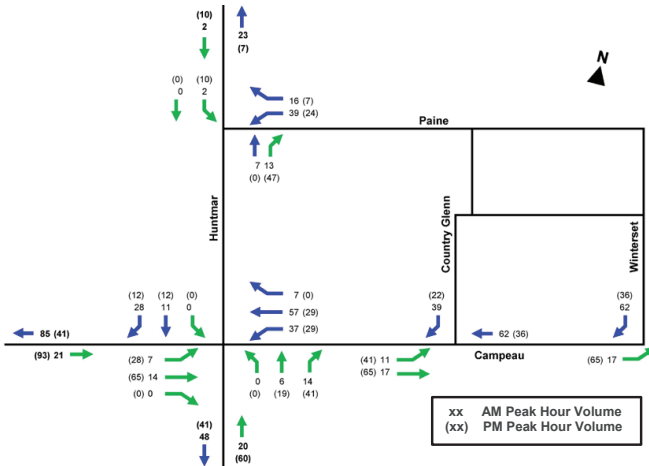
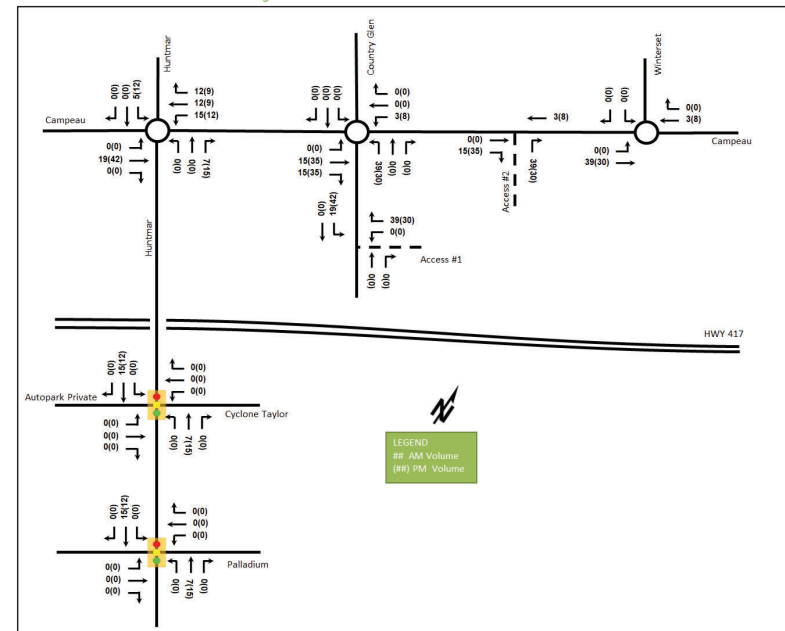


Figure 6: Site-Generated Traffic – Stage 3 and 4 Build-Out

Figure 11: New Site Generation Auto Volumes



# Appendix E

Synchro and Sidra Intersection Worksheets – 2025 Future Background Conditions

Lanes, Volumes, Timings  
4: Terry Fox & Kanata

11/02/2023

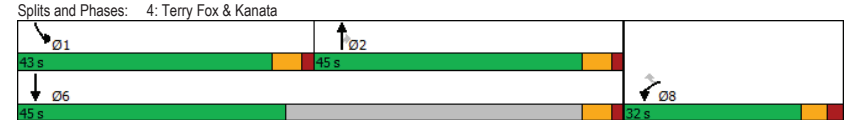
	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔	↔	↕↕	↔	↔↔	↕↕
Traffic Volume (vph)	317	337	699	172	253	515
Future Volume (vph)	317	337	699	172	253	515
Satd. Flow (prot)	3185	1414	3283	1441	1595	3283
Fit Permitted	0.950				0.950	
Satd. Flow (perm)	3185	1414	3283	1441	1595	3283
Satd. Flow (RTOR)		337		172		
Lane Group Flow (vph)	317	337	699	172	253	515
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	31.2	31.2	25.0	25.0	11.0	25.0
Total Split (s)	32.0	32.0	45.0	45.0	43.0	45.0
Total Split (%)	26.7%	26.7%	37.5%	37.5%	35.8%	37.5%
Yellow Time (s)	3.7	3.7	4.2	4.2	4.2	4.2
All-Red Time (s)	2.5	2.5	1.8	1.8	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	6.0	6.0	6.0	6.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	Max	Max	None	Max
Act Effct Green (s)	14.7	14.7	39.4	39.4	20.0	65.5
Actuated g/C Ratio	0.16	0.16	0.43	0.43	0.22	0.71
v/c Ratio	0.63	0.66	0.50	0.24	0.74	0.22
Control Delay	42.8	11.2	22.6	4.4	47.4	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.8	11.2	22.6	4.4	47.4	5.2
LOS	D	B	C	A	D	A
Approach Delay	26.6		19.0			19.1
Approach LOS	C		B			B
Queue Length 50th (m)	27.1	0.0	45.7	0.0	41.6	14.0
Queue Length 95th (m)	44.6	24.8	80.7	13.5	71.9	24.8
Internal Link Dist (m)	616.6		846.8			487.6
Turn Bay Length (m)				100.0	85.5	
Base Capacity (vph)	898	640	1399	713	644	2924
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.53	0.50	0.24	0.39	0.18

Intersection Summary	
Cycle Length:	120
Actuated Cycle Length:	92.5
Natural Cycle:	75
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.74

Lanes, Volumes, Timings  
4: Terry Fox & Kanata

11/02/2023

Intersection Signal Delay: 21.2	Intersection LOS: C
Intersection Capacity Utilization 59.9%	ICU Level of Service B
Analysis Period (min) 15	



Lanes, Volumes, Timings  
5: Terry Fox & Signature SC

11/02/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	0	0	0	9	0	28	0	856	20	30	839	0
Future Volume (vph)	0	0	0	9	0	28	0	856	20	30	839	0
Satd. Flow (prot)	0	1745	0	0	1386	1455	1745	3233	0	1658	3283	0
Fit Permitted					0.757					0.293		
Satd. Flow (perm)	0	1745	0	0	1104	1455	1745	3233	0	511	3283	0
Satd. Flow (RTOR)						34		4				
Lane Group Flow (vph)	0	0	0	0	9	28	0	876	0	30	839	0
Turn Type				Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Minimum Split (s)	31.6	31.6		31.6	31.6	31.6	31.4	31.4		32.8	32.8	
Total Split (s)	32.0	32.0		32.0	32.0	32.0	78.0	78.0		78.0	78.0	
Total Split (%)	29.1%	29.1%		29.1%	29.1%	29.1%	70.9%	70.9%		70.9%	70.9%	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	4.2	4.2		4.2	4.2	
All-Red Time (s)	3.6	3.6		3.6	3.6	3.6	2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.6			6.6	6.6	6.4	6.4		6.4	6.4	
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)					25.4	25.4		71.6		71.6	71.6	
Actuated g/C Ratio					0.23	0.23		0.65		0.65	0.65	
v/c Ratio					0.04	0.08		0.42		0.09	0.39	
Control Delay					33.4	9.9		14.0		8.0	9.7	
Queue Delay					0.0	0.0		0.0		0.0	0.0	
Total Delay					33.4	9.9		14.0		8.0	9.7	
LOS					C	A		B		A	A	
Approach Delay					15.6			14.0			9.6	
Approach LOS					B			B			A	
Queue Length 50th (m)					1.5	0.0		80.4		2.2	40.6	
Queue Length 95th (m)					5.6	6.1		100.8		5.9	51.8	
Internal Link Dist (m)		19.8			92.3			301.0			846.8	
Turn Bay Length (m)										61.0		
Base Capacity (vph)					254	362		2105		332	2136	
Starvation Cap Reductn					0	0		0		0	0	
Spillback Cap Reductn					0	0		0		0	0	
Storage Cap Reductn					0	0		0		0	0	
Reduced v/c Ratio					0.04	0.08		0.42		0.09	0.39	
<b>Intersection Summary</b>												
Cycle Length: 110												
Actuated Cycle Length: 110												
Offset: 49 (45%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green												
Natural Cycle: 65												
Control Type: Pretimed												
Maximum v/c Ratio: 0.42												
Intersection Signal Delay: 11.9												
Intersection LOS: B												
Intersection Capacity Utilization 45.5%												
ICU Level of Service A												
Analysis Period (min) 15												

Lanes, Volumes, Timings  
5: Terry Fox & Signature SC

11/02/2023



Lanes, Volumes, Timings  
6: Terry Fox & Campeau

11/02/2023

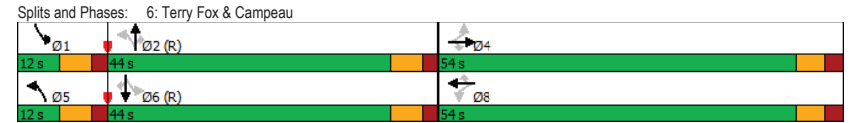
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Traffic Volume (vph)	60	49	78	258	42	71	68	706	164	98	627	68
Future Volume (vph)	60	49	78	258	42	71	68	706	164	98	627	68
Satd. Flow (prot)	1642	1745	1441	1580	1712	1363	1658	3191	1441	1658	3191	1483
Fit Permitted	0.730			0.725			0.383			0.310		
Satd. Flow (perm)	1262	1745	1421	1204	1712	1363	668	3191	1410	541	3191	1463
Satd. Flow (RTOR)			97			97			164			
Lane Group Flow (vph)	60	49	78	258	42	71	68	706	164	98	627	68
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4	4	8	8	8	5	2	2	1	6	6
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	40.4	40.4	40.4	43.4	43.4	43.4	11.4	40.4	40.4	11.4	43.4	43.4
Total Split (s)	54.0	54.0	54.0	54.0	54.0	54.0	12.0	44.0	44.0	12.0	44.0	44.0
Total Split (%)	49.1%	49.1%	49.1%	49.1%	49.1%	49.1%	10.9%	40.0%	40.0%	10.9%	40.0%	40.0%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	2.7	2.7	2.7	2.7	2.7	2.7	2.2	2.2	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max	C-Max
Act Effct Green (s)	29.7	29.7	29.7	29.7	29.7	29.7	60.2	52.7	52.7	63.2	56.0	56.0
Actuated g/C Ratio	0.27	0.27	0.27	0.27	0.27	0.27	0.55	0.48	0.48	0.57	0.51	0.51
v/c Ratio	0.18	0.10	0.17	0.79	0.09	0.16	0.16	0.46	0.22	0.25	0.39	0.09
Control Delay	28.9	27.2	4.0	54.0	26.9	3.1	12.0	22.5	4.4	26.8	41.7	18.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.9	27.2	4.0	54.0	26.9	3.1	12.0	22.5	4.4	26.8	41.7	18.0
LOS	C	C	A	D	C	A	B	C	A	C	D	B
Approach Delay	18.1				41.2			18.6			37.8	
Approach LOS	B				D			B			D	
Queue Length 50th (m)	9.9	7.9	0.0	51.5	6.8	0.0	5.5	51.4	0.0	16.0	75.0	2.8
Queue Length 95th (m)	17.7	14.8	6.7	70.9	13.1	5.2	14.3	85.6	13.8	34.0	94.8	15.2
Internal Link Dist (m)		128.0			204.4			313.2			301.0	
Turn Bay Length (m)	62.5		64.5	70.0		63.5	45.0		62.5	97.5		50.0
Base Capacity (vph)	546	755	669	521	740	644	433	1528	760	396	1623	792
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.06	0.12	0.50	0.06	0.11	0.16	0.46	0.22	0.25	0.39	0.09

**Intersection Summary**  
 Cycle Length: 110  
 Actuated Cycle Length: 110  
 Offset: 27 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated

Lanes, Volumes, Timings  
6: Terry Fox & Campeau

11/02/2023

Maximum v/c Ratio: 0.79	Intersection LOS: C
Intersection Signal Delay: 28.9	ICU Level of Service C
Intersection Capacity Utilization 72.8%	
Analysis Period (min) 15	





Lanes, Volumes, Timings  
4: Terry Fox & Kanata

11/02/2023

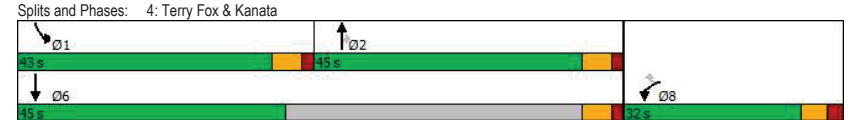
	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔	↔	↕↕	↔	↔↔	↕↕
Traffic Volume (vph)	250	146	762	340	265	813
Future Volume (vph)	250	146	762	340	265	813
Satd. Flow (prot)	3216	1469	3316	1483	1658	3316
Fit Permitted	0.950				0.950	
Satd. Flow (perm)	3216	1469	3316	1452	1652	3316
Satd. Flow (RTOR)		146		340		
Lane Group Flow (vph)	250	146	762	340	265	813
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	31.2	31.2	25.0	25.0	11.0	25.0
Total Split (s)	32.0	32.0	45.0	45.0	43.0	45.0
Total Split (%)	26.7%	26.7%	37.5%	37.5%	35.8%	37.5%
Yellow Time (s)	3.7	3.7	4.2	4.2	4.2	4.2
All-Red Time (s)	2.5	2.5	1.8	1.8	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	6.0	6.0	6.0	6.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	Max	Max	None	Max
Act Effct Green (s)	12.4	12.4	39.3	39.3	19.5	64.9
Actuated g/C Ratio	0.14	0.14	0.44	0.44	0.22	0.72
v/c Ratio	0.56	0.44	0.52	0.41	0.73	0.34
Control Delay	42.0	11.1	21.4	4.0	45.5	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.0	11.1	21.4	4.0	45.5	5.1
LOS	D	B	C	A	D	A
Approach Delay	30.6		16.0			15.0
Approach LOS	C		B			B
Queue Length 50th (m)	20.8	0.0	48.2	0.0	42.3	22.1
Queue Length 95th (m)	35.5	16.5	82.3	17.0	71.3	35.8
Internal Link Dist (m)	616.6		846.8			487.6
Turn Bay Length (m)				100.0	85.5	
Base Capacity (vph)	933	530	1455	828	690	3029
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.28	0.52	0.41	0.38	0.27

Intersection Summary	
Cycle Length:	120
Actuated Cycle Length:	89.6
Natural Cycle:	80
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.73

Lanes, Volumes, Timings  
4: Terry Fox & Kanata

11/02/2023

Intersection Signal Delay: 17.9	Intersection LOS: B
Intersection Capacity Utilization 60.4%	ICU Level of Service B
Analysis Period (min) 15	



Lanes, Volumes, Timings  
5: Terry Fox & Signature SC

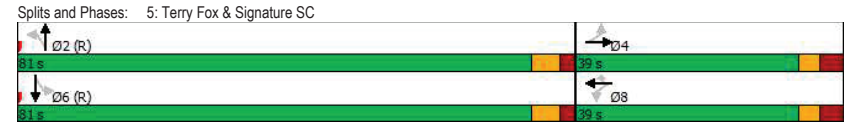
11/02/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	0	0	0	54	0	113	18	1018	68	82	996	0
Future Volume (vph)	0	0	0	54	0	113	18	1018	68	82	996	0
Satd. Flow (prot)	0	1745	0	0	1658	1483	1658	3286	0	1658	3316	0
Fit Permitted					0.757		0.240			0.211		
Satd. Flow (perm)	0	1745	0	0	1321	1483	419	3286	0	368	3316	0
Satd. Flow (RTOR)						113		11				
Lane Group Flow (vph)	0	0	0	0	54	113	18	1086	0	82	996	0
Turn Type				Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Minimum Split (s)	31.6	31.6		31.6	31.6	31.6	31.4	31.4		32.8	32.8	
Total Split (s)	39.0	39.0		39.0	39.0	39.0	81.0	81.0		81.0	81.0	
Total Split (%)	32.5%	32.5%		32.5%	32.5%	32.5%	67.5%	67.5%		67.5%	67.5%	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	4.2	4.2		4.2	4.2	
All-Red Time (s)	3.6	3.6		3.6	3.6	3.6	2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.6			6.6	6.6	6.4	6.4		6.4	6.4	
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)					32.4	32.4	74.6	74.6		74.6	74.6	
Actuated g/C Ratio					0.27	0.27	0.62	0.62		0.62	0.62	
v/c Ratio					0.15	0.23	0.07	0.53		0.36	0.48	
Control Delay					34.9	7.4	4.8	15.4		16.6	13.3	
Queue Delay					0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay					34.9	7.4	4.8	15.4		16.6	13.3	
LOS					C	A	A	B		B	B	
Approach Delay					16.3			15.3			13.5	
Approach LOS					B			B			B	
Queue Length 50th (m)					9.7	0.0	2.3	109.2		8.8	62.3	
Queue Length 95th (m)					20.3	13.6	m0.5	130.8		20.6	77.3	
Internal Link Dist (m)		19.8			92.3			301.0			846.8	
Turn Bay Length (m)							51.0			61.0		
Base Capacity (vph)					356	482	260	2046		228	2061	
Starvation Cap Reductn					0	0	0	0		0	0	
Spillback Cap Reductn					0	0	0	0		0	0	
Storage Cap Reductn					0	0	0	0		0	0	
Reduced v/c Ratio					0.15	0.23	0.07	0.53		0.36	0.48	
<b>Intersection Summary</b>												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 49 (41%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green												
Natural Cycle: 65												
Control Type: Pretimed												
Maximum v/c Ratio: 0.53												
Intersection Signal Delay: 14.5												
Intersection LOS: B												
Intersection Capacity Utilization 64.8%												
ICU Level of Service C												
Analysis Period (min) 15												

Lanes, Volumes, Timings  
5: Terry Fox & Signature SC

11/02/2023

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



Lanes, Volumes, Timings  
6: Terry Fox & Campeau

11/02/2023

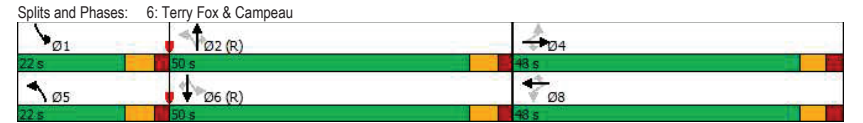
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Traffic Volume (vph)	98	135	132	248	137	111	89	844	188	164	803	85
Future Volume (vph)	98	135	132	248	137	111	89	844	188	164	803	85
Satd. Flow (prot)	1658	1745	1483	1658	1712	1483	1658	3316	1483	1658	3316	1483
Fit Permitted	0.649			0.653			0.296			0.248		
Satd. Flow (perm)	1132	1745	1464	1139	1712	1464	516	3316	1449	432	3316	1463
Satd. Flow (RTOR)			132			111			184		1	89
Lane Group Flow (vph)	98	135	132	248	137	111	89	844	188	164	803	85
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4	4	8	8	8	5	2	2	6	6	6
Permitted Phases	4	4	4	8	8	8	5	2	2	1	6	6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	40.4	40.4	40.4	43.4	43.4	43.4	11.4	40.4	40.4	11.4	43.4	43.4
Total Split (s)	48.0	48.0	48.0	48.0	48.0	48.0	22.0	50.0	50.0	22.0	50.0	50.0
Total Split (%)	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	18.3%	41.7%	41.7%	18.3%	41.7%	41.7%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	2.7	2.7	2.7	2.7	2.7	2.7	2.2	2.2	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max	C-Max
Act Effct Green (s)	30.8	30.8	30.8	30.8	30.8	30.8	67.5	59.3	59.3	72.4	61.8	61.8
Actuated g/C Ratio	0.26	0.26	0.26	0.26	0.26	0.26	0.56	0.49	0.49	0.60	0.52	0.52
v/c Ratio	0.34	0.30	0.28	0.85	0.31	0.24	0.24	0.52	0.23	0.44	0.47	0.11
Control Delay	37.3	35.7	6.3	66.5	35.9	6.5	12.4	24.2	4.4	27.7	39.1	18.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.3	35.7	6.3	66.5	35.9	6.5	12.4	24.2	4.4	27.7	39.1	18.0
LOS	D	D	A	E	D	A	B	C	A	C	D	B
Approach Delay		25.5			44.6			19.9			35.6	
Approach LOS		C			D			B			D	
Queue Length 50th (m)	18.8	25.6	0.0	55.5	26.1	0.0	7.5	68.6	0.5	27.0	87.7	3.7
Queue Length 95th (m)	30.2	37.7	12.9	77.6	38.2	11.9	17.7	110.8	15.4	52.7	112.8	19.1
Internal Link Dist (m)		128.0			204.4			313.2			301.0	
Turn Bay Length (m)	62.5		64.5	70.0		63.5	45.0		62.5	97.5		50.0
Base Capacity (vph)	392	604	593	394	593	580	468	1638	808	432	1706	796
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.22	0.22	0.63	0.23	0.19	0.19	0.52	0.23	0.38	0.47	0.11

**Intersection Summary**  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 27 (23%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated

Lanes, Volumes, Timings  
6: Terry Fox & Campeau

11/02/2023

Maximum v/c Ratio: 0.85	Intersection LOS: C
Intersection Signal Delay: 30.1	ICU Level of Service E
Intersection Capacity Utilization 82.7%	
Analysis Period (min) 15	



## MOVEMENT SUMMARY

Site: 101 [Huntmar-Campeau AM FB2025 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Arcadia Stage 5  
Site Category: (None)  
Roundabout

Vehicle Movement Performance														
Mov ID	Turn Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
		[ Total HV ]	%	[ Total HV ]	%				[ Veh. ]	Dist ]				
		veh/h	%	veh/h	%	v/c	sec			m				km/h
South: Huntmar														
1	L2	All MCs	43 2.0	43 2.0	0.045	8.0	LOS A	0.1	0.8	0.22	0.59	0.22	47.2	
2	T1	All MCs	405 2.0	405 2.0	0.416	2.4	LOS A	1.5	10.9	0.32	0.29	0.32	47.5	
3	R2	All MCs	44 2.0	44 2.0	0.046	3.0	LOS A	0.1	0.8	0.22	0.40	0.22	50.7	
Approach			492 2.0	492 2.0	0.416	3.0	LOS A	1.5	10.9	0.30	0.32	0.30	47.7	
East: Campeau														
4	L2	All MCs	126 2.0	126 2.0	0.166	11.1	LOS B	0.4	3.2	0.41	0.74	0.41	46.7	
5	T1	All MCs	108 2.0	108 2.0	0.146	5.2	LOS A	0.4	2.9	0.42	0.51	0.42	54.1	
6	R2	All MCs	35 2.0	35 2.0	0.047	5.4	LOS A	0.1	0.9	0.39	0.60	0.39	50.0	
Approach			269 2.0	269 2.0	0.166	8.0	LOS A	0.4	3.2	0.41	0.63	0.41	49.8	
North: Huntmar														
7	L2	All MCs	10 2.0	10 2.0	0.201	8.5	LOS A	0.6	4.3	0.32	0.34	0.32	49.9	
8	T1	All MCs	352 2.0	352 2.0	0.201	2.6	LOS A	0.6	4.3	0.31	0.32	0.31	47.4	
9	R2	All MCs	118 2.0	118 2.0	0.132	3.4	LOS A	0.4	2.6	0.30	0.45	0.30	50.4	
Approach			480 2.0	480 2.0	0.201	2.9	LOS A	0.6	4.3	0.31	0.35	0.31	48.2	
West: Campeau														
10	L2	All MCs	85 2.0	85 2.0	0.111	11.0	LOS B	0.3	2.2	0.39	0.73	0.39	46.7	
11	T1	All MCs	85 2.0	85 2.0	0.109	4.7	LOS A	0.3	2.0	0.37	0.47	0.37	54.4	
12	R2	All MCs	41 2.0	41 2.0	0.052	4.8	LOS A	0.1	0.9	0.35	0.57	0.35	50.4	
Approach			211 2.0	211 2.0	0.111	7.3	LOS A	0.3	2.2	0.38	0.59	0.38	50.2	
All Vehicles			1452 2.0	1452 2.0	0.416	4.5	LOS A	1.5	10.9	0.33	0.43	0.33	48.6	

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Sieglösch M1 implied by US HCM 2010 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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## MOVEMENT SUMMARY

Site: 101 [Country Glen-Campeau AM FB2025 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Arcadia Stage 5  
Site Category: (None)  
Roundabout

Vehicle Movement Performance														
Mov ID	Turn Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
		[ Total HV ]	%	[ Total HV ]	%				[ Veh. ]	Dist ]				
		veh/h	%	veh/h	%	v/c	sec			m				km/h
South: Country Glen														
1	L2	All MCs	40 2.0	40 2.0	0.022	1.8	LOS A	0.1	0.4	0.18	0.26	0.18	37.5	
2	T1	All MCs	1 2.0	1 2.0	0.022	0.3	LOS A	0.1	0.4	0.17	0.23	0.17	29.5	
3	R2	All MCs	4 2.0	4 2.0	0.022	0.3	LOS A	0.1	0.4	0.17	0.23	0.17	37.7	
Approach			45 2.0	45 2.0	0.022	1.7	LOS A	0.1	0.4	0.18	0.25	0.18	37.3	
East: Campeau														
4	L2	All MCs	7 2.0	7 2.0	0.047	9.6	LOS A	0.1	0.9	0.15	0.40	0.15	38.6	
5	T1	All MCs	86 2.0	86 2.0	0.047	3.5	LOS A	0.1	0.9	0.15	0.37	0.15	55.3	
6	R2	All MCs	5 2.0	5 2.0	0.047	4.4	LOS A	0.1	0.8	0.14	0.35	0.14	38.8	
Approach			98 2.0	98 2.0	0.047	4.0	LOS A	0.1	0.9	0.15	0.37	0.15	52.6	
North: Country Glen														
7	L2	All MCs	19 2.0	19 2.0	0.156	1.9	LOS A	0.4	3.0	0.20	0.11	0.20	38.4	
8	T1	All MCs	1 2.0	1 2.0	0.156	0.4	LOS A	0.4	3.0	0.20	0.11	0.20	29.7	
9	R2	All MCs	138 2.0	138 2.0	0.156	0.4	LOS A	0.4	3.0	0.20	0.11	0.20	38.5	
Approach			158 2.0	158 2.0	0.156	0.6	LOS A	0.4	3.0	0.20	0.11	0.20	38.4	
West: Campeau														
10	L2	All MCs	50 2.0	50 2.0	0.063	9.5	LOS A	0.2	1.6	0.10	0.57	0.10	37.7	
11	T1	All MCs	65 2.0	65 2.0	0.063	3.4	LOS A	0.2	1.6	0.10	0.41	0.10	54.8	
12	R2	All MCs	20 2.0	20 2.0	0.063	4.3	LOS A	0.2	1.6	0.10	0.35	0.10	38.8	
Approach			135 2.0	135 2.0	0.063	5.8	LOS A	0.2	1.6	0.10	0.46	0.10	44.5	
All Vehicles			436 2.0	436 2.0	0.156	3.1	LOS A	0.4	3.0	0.15	0.29	0.15	42.7	

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Sieglösch M1 implied by US HCM 2010 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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## MOVEMENT SUMMARY

**Site: 101 [Winterset-Campeau AM FB2025 (Site Folder: General)]**

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Arcadia Stage 5  
Site Category: (None)  
Roundabout

Vehicle Movement Performance														
Mov ID	Turn Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
		[ Total HV ]	%	[ Total HV ]	%				[ Veh. ]	Dist ]				
		veh/h	%	veh/h	%	v/c	sec	[ Veh. Dist ]		veh	m	Rate	Cycles	km/h
East: Campeau														
5	T1	All MCs	67 2.0	67 2.0	0.035	3.3	LOS A	0.1	0.8	0.05	0.33	0.05	56.1	
6	R2	All MCs	9 2.0	9 2.0	0.035	4.2	LOS A	0.1	0.8	0.05	0.34	0.05	39.0	
Approach			76 2.0	76 2.0	0.035	3.4	LOS A	0.1	0.8	0.05	0.33	0.05	53.4	
North: Winterset														
7	L2	All MCs	31 2.0	31 2.0	0.029	1.7	LOS A	0.1	0.5	0.12	0.25	0.12	37.5	
9	R2	All MCs	31 2.0	31 2.0	0.029	0.2	LOS A	0.1	0.5	0.12	0.03	0.12	38.8	
Approach			62 2.0	62 2.0	0.029	0.9	LOS A	0.1	0.5	0.12	0.14	0.12	38.1	
West: Campeau														
10	L2	All MCs	8 2.0	8 2.0	0.051	9.5	LOS A	0.2	1.3	0.11	0.38	0.11	38.7	
11	T1	All MCs	101 2.0	101 2.0	0.051	3.4	LOS A	0.2	1.3	0.11	0.35	0.11	55.6	
Approach			109 2.0	109 2.0	0.051	3.8	LOS A	0.2	1.3	0.11	0.35	0.11	53.8	
All Vehicles			247 2.0	247 2.0	0.051	3.0	LOS A	0.2	1.3	0.09	0.29	0.09	48.7	

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Sieglösch M1 implied by US HCM 2010 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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\2021-048 Sidra 2023-11-02.sip9

## MOVEMENT SUMMARY

**Site: 101 [Huntmar-Campeau PM FB2025 (Site Folder: General)]**

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Arcadia Stage 6  
Site Category: (None)  
Roundabout

Vehicle Movement Performance														
Mov ID	Turn Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
		[ Total HV ]	%	[ Total HV ]	%				[ Veh. ]	Dist ]				
		veh/h	%	veh/h	%	v/c	sec	[ Veh. Dist ]		veh	m	Rate	Cycles	km/h
South: Huntmar														
1	L2	All MCs	92 2.0	92 2.0	0.112	8.8	LOS A	0.3	2.2	0.36	0.66	0.36	46.8	
2	T1	All MCs	440 2.0	440 2.0	0.526	4.0	LOS A	2.3	16.6	0.51	0.50	0.58	46.7	
3	R2	All MCs	128 2.0	128 2.0	0.156	3.9	LOS A	0.4	3.2	0.37	0.51	0.37	50.2	
Approach			660 2.0	660 2.0	0.526	4.6	LOS A	2.3	16.6	0.46	0.52	0.51	47.3	
East: Campeau														
4	L2	All MCs	120 2.0	120 2.0	0.180	11.8	LOS B	0.5	3.4	0.46	0.79	0.46	46.4	
5	T1	All MCs	78 2.0	78 2.0	0.121	5.9	LOS A	0.3	2.3	0.47	0.58	0.47	53.9	
6	R2	All MCs	18 2.0	18 2.0	0.028	6.1	LOS A	0.1	0.5	0.44	0.64	0.44	49.7	
Approach			216 2.0	216 2.0	0.180	9.2	LOS A	0.5	3.4	0.46	0.70	0.46	49.1	
North: Huntmar														
7	L2	All MCs	26 2.0	26 2.0	0.293	8.6	LOS A	1.0	6.8	0.36	0.37	0.36	49.6	
8	T1	All MCs	497 2.0	497 2.0	0.293	2.8	LOS A	1.0	6.8	0.35	0.34	0.35	47.2	
9	R2	All MCs	158 2.0	158 2.0	0.178	3.5	LOS A	0.5	3.7	0.32	0.46	0.32	50.4	
Approach			681 2.0	681 2.0	0.293	3.2	LOS A	1.0	6.8	0.35	0.37	0.35	48.0	
West: Campeau														
10	L2	All MCs	184 2.0	184 2.0	0.271	12.0	LOS B	0.8	5.8	0.50	0.79	0.50	46.3	
11	T1	All MCs	185 2.0	185 2.0	0.264	5.6	LOS A	0.8	5.4	0.47	0.56	0.47	53.9	
12	R2	All MCs	95 2.0	95 2.0	0.133	5.4	LOS A	0.3	2.5	0.42	0.63	0.42	50.1	
Approach			464 2.0	464 2.0	0.271	8.1	LOS A	0.8	5.8	0.47	0.66	0.47	49.8	
All Vehicles			2021 2.0	2021 2.0	0.526	5.4	LOS A	2.3	16.6	0.43	0.52	0.44	48.3	

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Sieglösch M1 implied by US HCM 2010 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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\2021-048 Sidra 2021-09-24.sip9

## MOVEMENT SUMMARY

Site: 101 [Country Glen-Campeau PM FB2025 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Arcadia Stage 5  
Site Category: (None)  
Roundabout

Vehicle Movement Performance														
Mov ID	Turn Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
		[ Total HV ]	%	[ Total HV ]	%				[ Veh. ]	Dist ]				
		veh/h	%	veh/h	%	v/c	sec			m				km/h
South: Country Glen														
1	L2	All MCs	34 2.0	34 2.0	0.023	2.3	LOS A	0.1	0.4	0.28	0.33	0.28	37.3	
2	T1	All MCs	1 2.0	1 2.0	0.023	0.8	LOS A	0.1	0.4	0.27	0.30	0.27	29.5	
3	R2	All MCs	5 2.0	5 2.0	0.023	0.8	LOS A	0.1	0.4	0.27	0.30	0.27	37.6	
Approach			40 2.0	40 2.0	0.023	2.1	LOS A	0.1	0.4	0.28	0.32	0.28	37.1	
East: Campeau														
4	L2	All MCs	11 2.0	11 2.0	0.066	9.9	LOS A	0.2	1.2	0.24	0.44	0.24	38.4	
5	T1	All MCs	95 2.0	95 2.0	0.066	3.8	LOS A	0.2	1.2	0.23	0.43	0.23	54.7	
6	R2	All MCs	20 2.0	20 2.0	0.066	4.7	LOS A	0.2	1.2	0.22	0.41	0.22	38.5	
Approach			126 2.0	126 2.0	0.066	4.5	LOS A	0.2	1.2	0.23	0.43	0.23	49.6	
North: Country Glen														
7	L2	All MCs	11 2.0	11 2.0	0.096	1.9	LOS A	0.2	1.8	0.19	0.11	0.19	38.4	
8	T1	All MCs	1 2.0	1 2.0	0.096	0.4	LOS A	0.2	1.8	0.19	0.11	0.19	29.7	
9	R2	All MCs	85 2.0	85 2.0	0.096	0.4	LOS A	0.2	1.8	0.19	0.11	0.19	38.5	
Approach			97 2.0	97 2.0	0.096	0.6	LOS A	0.2	1.8	0.19	0.11	0.19	38.4	
West: Campeau														
10	L2	All MCs	162 2.0	162 2.0	0.154	9.5	LOS A	0.6	4.2	0.10	0.61	0.10	37.2	
11	T1	All MCs	133 2.0	133 2.0	0.154	3.4	LOS A	0.6	4.2	0.10	0.35	0.10	55.6	
12	R2	All MCs	37 2.0	37 2.0	0.154	4.3	LOS A	0.6	4.2	0.10	0.34	0.10	38.9	
Approach			332 2.0	332 2.0	0.154	6.4	LOS A	0.6	4.2	0.10	0.47	0.10	43.0	
All Vehicles			595 2.0	595 2.0	0.154	4.8	LOS A	0.6	4.2	0.15	0.39	0.15	42.9	

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Sieglösch M1 implied by US HCM 2010 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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## MOVEMENT SUMMARY

Site: 101 [Winterset-Campeau PM FB2025 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Arcadia Stage 5  
Site Category: (None)  
Roundabout

Vehicle Movement Performance														
Mov ID	Turn Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
		[ Total HV ]	%	[ Total HV ]	%				[ Veh. ]	Dist ]				
		veh/h	%	veh/h	%	v/c	sec			m				km/h
East: Campeau														
5	T1	All MCs	109 2.0	109 2.0	0.066	3.4	LOS A	0.2	1.6	0.11	0.34	0.11	55.7	
6	R2	All MCs	32 2.0	32 2.0	0.066	4.3	LOS A	0.2	1.6	0.11	0.37	0.11	38.7	
Approach			141 2.0	141 2.0	0.066	3.6	LOS A	0.2	1.6	0.11	0.35	0.11	50.7	
North: Winterset														
7	L2	All MCs	18 2.0	18 2.0	0.018	1.8	LOS A	0.0	0.3	0.16	0.26	0.16	37.4	
9	R2	All MCs	18 2.0	18 2.0	0.018	0.3	LOS A	0.0	0.3	0.15	0.05	0.15	38.7	
Approach			36 2.0	36 2.0	0.018	1.0	LOS A	0.0	0.3	0.16	0.16	0.16	38.0	
West: Campeau														
10	L2	All MCs	33 2.0	33 2.0	0.066	9.4	LOS A	0.2	1.7	0.08	0.49	0.08	38.2	
11	T1	All MCs	111 2.0	111 2.0	0.066	3.3	LOS A	0.2	1.7	0.08	0.38	0.08	55.3	
Approach			144 2.0	144 2.0	0.066	4.7	LOS A	0.2	1.7	0.08	0.40	0.08	50.1	
All Vehicles			321 2.0	321 2.0	0.066	3.8	LOS A	0.2	1.7	0.10	0.35	0.10	48.6	

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Sieglösch M1 implied by US HCM 2010 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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# Appendix F

Synchro and Sidra Intersection Worksheets – 2030 Future Background Conditions

Lanes, Volumes, Timings  
4: Terry Fox & Kanata

11/02/2023

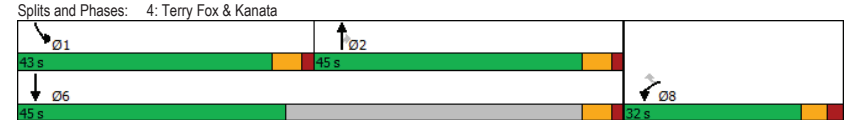
	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔	↔	↕↕	↔	↔↔	↕↕
Traffic Volume (vph)	317	337	757	172	253	581
Future Volume (vph)	317	337	757	172	253	581
Satd. Flow (prot)	3185	1414	3283	1441	1595	3283
Fit Permitted	0.950				0.950	
Satd. Flow (perm)	3185	1414	3283	1441	1595	3283
Satd. Flow (RTOR)		337		172		
Lane Group Flow (vph)	317	337	757	172	253	581
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8			2	1	6
Permitted Phases		8		2		
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	31.2	31.2	25.0	25.0	11.0	25.0
Total Split (s)	32.0	32.0	45.0	45.0	43.0	45.0
Total Split (%)	26.7%	26.7%	37.5%	37.5%	35.8%	37.5%
Yellow Time (s)	3.7	3.7	4.2	4.2	4.2	4.2
All-Red Time (s)	2.5	2.5	1.8	1.8	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	6.0	6.0	6.0	6.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	Max	Max	None	Max
Act Effct Green (s)	14.7	14.7	39.4	39.4	20.0	65.5
Actuated g/C Ratio	0.16	0.16	0.43	0.43	0.22	0.71
v/c Ratio	0.63	0.66	0.54	0.24	0.74	0.25
Control Delay	42.8	11.2	23.3	4.4	47.4	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.8	11.2	23.3	4.4	47.4	5.4
LOS	D	B	C	A	D	A
Approach Delay	26.6		19.8			18.1
Approach LOS	C		B			B
Queue Length 50th (m)	27.1	0.0	50.5	0.0	41.6	16.1
Queue Length 95th (m)	44.6	24.8	88.7	13.5	71.9	28.3
Internal Link Dist (m)	616.6		846.8			487.6
Turn Bay Length (m)				100.0	85.5	
Base Capacity (vph)	898	640	1399	713	644	2924
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.53	0.54	0.24	0.39	0.20

Intersection Summary	
Cycle Length:	120
Actuated Cycle Length:	92.5
Natural Cycle:	80
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.74

Lanes, Volumes, Timings  
4: Terry Fox & Kanata

11/02/2023

Intersection Signal Delay: 21.0	Intersection LOS: C
Intersection Capacity Utilization 61.6%	ICU Level of Service B
Analysis Period (min) 15	





HCM Signalized Intersection Capacity Analysis  
4: Terry Fox & Kanata

11/02/2023

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↕	↕	↔	↔
Traffic Volume (vph)	317	337	757	172	253	581
Future Volume (vph)	317	337	757	172	253	581
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.2	6.2	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	1.00	0.95	1.00	1.00	0.95
Fr	1.00	0.85	1.00	0.85	1.00	1.00
Fit Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3185	1414	3283	1441	1595	3283
Fit Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3185	1414	3283	1441	1595	3283
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	317	337	757	172	253	581
RTOR Reduction (vph)	0	283	0	98	0	0
Lane Group Flow (vph)	317	54	757	74	253	581
Heavy Vehicles (%)	3%	7%	3%	5%	6%	3%
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	14.7	14.7	39.5	39.5	19.9	65.4
Effective Green, g (s)	14.7	14.7	39.5	39.5	19.9	65.4
Actuated g/C Ratio	0.16	0.16	0.43	0.43	0.22	0.71
Clearance Time (s)	6.2	6.2	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	507	225	1404	616	343	2326
v/s Ratio Prot	c0.10		c0.23		c0.16	0.18
v/s Ratio Perm		0.04		0.05		
v/c Ratio	0.63	0.24	0.54	0.12	0.74	0.25
Uniform Delay, d1	36.2	33.9	19.6	15.9	33.8	4.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.4	0.6	1.5	0.4	8.0	0.3
Delay (s)	38.6	34.5	21.1	16.3	41.8	5.0
Level of Service	D	C	C	B	D	A
Approach Delay (s)	36.5		20.2		16.2	
Approach LOS	D		C		B	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			23.2		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.61			
Actuated Cycle Length (s)			92.3		Sum of lost time (s)	18.2
Intersection Capacity Utilization			61.6%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

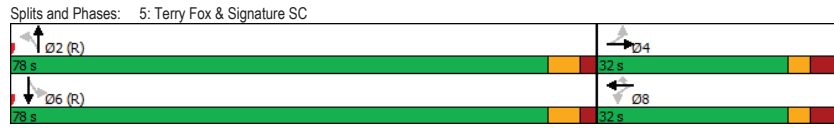
Lanes, Volumes, Timings  
5: Terry Fox & Signature SC

11/02/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	0	0	0	9	0	28	0	927	20	30	947	0
Future Volume (vph)	0	0	0	9	0	28	0	927	20	30	947	0
Satd. Flow (prot)	0	1745	0	0	1386	1455	1745	3233	0	1658	3283	0
Fit Permitted					0.757					0.267		
Satd. Flow (perm)	0	1745	0	0	1104	1455	1745	3233	0	466	3283	0
Satd. Flow (RTOR)					34			4				
Lane Group Flow (vph)	0	0	0	0	9	28	0	947	0	30	947	0
Turn Type				Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2				6
Permitted Phases	4			8		8	2			6		
Minimum Split (s)	31.6	31.6		31.6	31.6	31.6	31.4	31.4		32.8	32.8	
Total Split (s)	32.0	32.0		32.0	32.0	32.0	78.0	78.0		78.0	78.0	
Total Split (%)	29.1%	29.1%		29.1%	29.1%	29.1%	70.9%	70.9%		70.9%	70.9%	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	4.2	4.2		4.2	4.2	
All-Red Time (s)	3.6	3.6		3.6	3.6	3.6	2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.6			6.6	6.6	6.4	6.4		6.4	6.4	
<b>Lead/Lag</b>												
Lead-Lag Optimize?												
Act Effct Green (s)				25.4	25.4		71.6			71.6	71.6	
Actuated g/C Ratio				0.23	0.23		0.65			0.65	0.65	
v/c Ratio				0.04	0.08		0.45			0.10	0.44	
Control Delay				33.4	9.9		14.4			8.2	10.2	
Queue Delay				0.0	0.0		0.0			0.0	0.0	
Total Delay				33.4	9.9		14.4			8.2	10.2	
LOS				C	A		B			A	B	
Approach Delay				15.6			14.4			10.2		
Approach LOS				B			B			B		
Queue Length 50th (m)				1.5	0.0		90.3			2.2	47.9	
Queue Length 95th (m)				5.6	6.1		71.8			6.0	60.6	
Internal Link Dist (m)				19.8			301.0				846.8	
Turn Bay Length (m)										61.0		
Base Capacity (vph)				254	362		2105			303	2136	
Starvation Cap Reductn				0	0		0			0	0	
Spillback Cap Reductn				0	0		0			0	0	
Storage Cap Reductn				0	0		0			0	0	
Reduced v/c Ratio				0.04	0.08		0.45			0.10	0.44	
<b>Intersection Summary</b>												
Cycle Length: 110												
Actuated Cycle Length: 110												
Offset: 49 (45%), Referenced to phase 2:NBT and 6:SBTL, Start of Green												
Natural Cycle: 65												
Control Type: Pretimed												
Maximum v/c Ratio: 0.45												
Intersection Signal Delay: 12.3												
Intersection LOS: B												
Intersection Capacity Utilization 46.9%												
ICU Level of Service A												
Analysis Period (min) 15												

Lanes, Volumes, Timings  
5: Terry Fox & Signature SC

11/02/2023



HCM Signalized Intersection Capacity Analysis  
5: Terry Fox & Signature SC

11/02/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕		↕	↕	
Traffic Volume (vph)	0	0	0	9	0	28	0	927	20	30	947	0
Future Volume (vph)	0	0	0	9	0	28	0	927	20	30	947	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					6.6	6.6			6.4		6.4	
Lane Util. Factor					1.00	1.00			0.95		1.00	0.95
Frbp, ped/bikes					1.00	1.00			1.00		1.00	1.00
Flpb, ped/bikes					1.00	1.00			1.00		1.00	1.00
Frt					1.00	0.85			1.00		1.00	1.00
Flt Protected					0.95	1.00			1.00		0.95	1.00
Satd. Flow (prot)					1386	1455			3233		1657	3283
Flt Permitted					0.76	1.00			1.00		0.27	1.00
Satd. Flow (perm)					1105	1455			3233		466	3283
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	9	0	28	0	927	20	30	947	0
RTOR Reduction (vph)	0	0	0	0	0	22	0	1	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	9	6	0	946	0	30	947	0
Confl. Peds. (#/hr)									1		1	
Heavy Vehicles (%)	2%	2%	2%	22%	2%	4%	2%	4%	15%	2%	3%	2%
Turn Type				Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)					25.4	25.4		71.6		71.6	71.6	
Effective Green, g (s)					25.4	25.4		71.6		71.6	71.6	
Actuated g/C Ratio					0.23	0.23		0.65		0.65	0.65	
Clearance Time (s)					6.6	6.6		6.4		6.4	6.4	
Lane Grp Cap (vph)					255	335		2104		303	2136	
v/s Ratio Prot								c0.29			0.29	
v/s Ratio Perm					c0.01	0.00					0.06	
v/c Ratio					0.04	0.02		0.45		0.10	0.44	
Uniform Delay, d1					32.8	32.7		9.5		7.2	9.4	
Progression Factor					1.00	1.00		1.44		1.00	1.00	
Incremental Delay, d2					0.3	0.1		0.6		0.7	0.7	
Delay (s)					33.1	32.8		14.3		7.8	10.1	
Level of Service					C	C		B		A	B	
Approach Delay (s)		0.0			32.9			14.3			10.0	
Approach LOS		A			C			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay					12.5			HCM 2000 Level of Service		B		
HCM 2000 Volume to Capacity ratio					0.34							
Actuated Cycle Length (s)					110.0			Sum of lost time (s)		13.0		
Intersection Capacity Utilization					46.9%			ICU Level of Service		A		
Analysis Period (min)					15							
c Critical Lane Group												

Lanes, Volumes, Timings  
6: Terry Fox & Campeau

11/02/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Traffic Volume (vph)	57	72	74	258	79	71	68	770	164	98	709	68
Future Volume (vph)	57	72	74	258	79	71	68	770	164	98	709	68
Satd. Flow (prot)	1642	1745	1441	1580	1712	1363	1658	3191	1441	1658	3191	1483
Fit Permitted	0.706			0.710			0.337			0.277		
Satd. Flow (perm)	1220	1745	1421	1179	1712	1363	588	3191	1410	483	3191	1463
Satd. Flow (RTOR)			97				97			164		
Lane Group Flow (vph)	57	72	74	258	79	71	68	770	164	98	709	68
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1		6
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	40.4	40.4	40.4	43.4	43.4	43.4	11.4	40.4	40.4	11.4	43.4	43.4
Total Split (s)	54.0	54.0	54.0	54.0	54.0	54.0	12.0	44.0	44.0	12.0	44.0	44.0
Total Split (%)	49.1%	49.1%	49.1%	49.1%	49.1%	49.1%	10.9%	40.0%	40.0%	10.9%	40.0%	40.0%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	2.7	2.7	2.7	2.7	2.7	2.7	2.2	2.2	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max	C-Max
Act Effct Green (s)	30.2	30.2	30.2	30.2	30.2	30.2	59.7	52.1	52.1	62.7	55.4	55.4
Actuated g/C Ratio	0.27	0.27	0.27	0.27	0.27	0.27	0.54	0.47	0.47	0.57	0.50	0.50
v/c Ratio	0.17	0.15	0.16	0.80	0.17	0.16	0.17	0.51	0.22	0.27	0.44	0.09
Control Delay	28.3	28.0	3.3	54.1	28.4	3.0	12.5	23.8	4.5	27.3	43.4	17.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.3	28.0	3.3	54.1	28.4	3.0	12.5	23.8	4.5	27.3	43.4	17.9
LOS	C	C	A	D	C	A	B	C	A	C	D	B
Approach Delay		19.1			40.2			19.8			39.6	
Approach LOS		B			D			B			D	
Queue Length 50th (m)	9.3	11.7	0.0	51.3	12.9	0.0	5.6	58.4	0.0	16.3	86.4	3.1
Queue Length 95th (m)	16.8	19.7	5.9	70.7	21.2	5.2	14.5	96.4	14.0	34.6	105.4	15.4
Internal Link Dist (m)		128.0			204.4			313.2			301.0	
Turn Bay Length (m)	62.5		64.5	70.0		63.5	45.0		62.5	97.5		50.0
Base Capacity (vph)	527	755	669	510	740	644	392	1512	754	365	1608	785
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.10	0.11	0.51	0.11	0.11	0.17	0.51	0.22	0.27	0.44	0.09

Intersection Summary

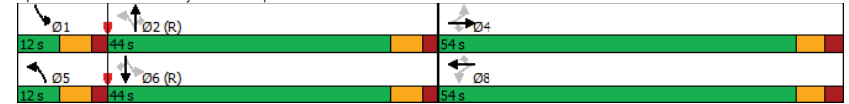
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 27 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings  
6: Terry Fox & Campeau

11/02/2023

Maximum v/c Ratio: 0.80	Intersection LOS: C
Intersection Signal Delay: 30.1	ICU Level of Service C
Intersection Capacity Utilization 72.8%	
Analysis Period (min) 15	

Splits and Phases: 6: Terry Fox & Campeau



HCM Signalized Intersection Capacity Analysis  
6: Terry Fox & Campeau

11/02/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔	↑	↘	↔	↑	↘	↔	↑	↘	↔	↑	↘	
Traffic Volume (vph)	57	72	74	258	79	71	68	770	164	98	709	68	
Future Volume (vph)	57	72	74	258	79	71	68	770	164	98	709	68	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Total Lost time (s)	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1642	1745	1421	1578	1712	1363	1658	3191	1410	1658	3191	1463	
Fit Permitted	0.71	1.00	1.00	0.71	1.00	1.00	0.34	1.00	1.00	0.28	1.00	1.00	
Satd. Flow (perm)	1219	1745	1421	1179	1712	1363	589	3191	1410	483	3191	1463	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Adj. Flow (vph)	57	72	74	258	79	71	68	770	164	98	709	68	
RTOR Reduction (vph)	0	0	54	0	0	52	0	0	86	0	0	34	
Lane Group Flow (vph)	57	72	20	258	79	19	68	770	78	98	709	34	
Confl. Peds. (#/hr)			2	2			2		1	1		2	
Heavy Vehicles (%)	3%	2%	5%	7%	4%	11%	2%	6%	5%	2%	6%	2%	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	
Protected Phases		4			8		5	2		1		6	
Permitted Phases	4		4	8		8	2		2	6		6	
Actuated Green, G (s)	30.2	30.2	30.2	30.2	30.2	30.2	58.5	52.1	52.1	62.7	54.2	54.2	
Effective Green, g (s)	30.2	30.2	30.2	30.2	30.2	30.2	58.5	52.1	52.1	62.7	54.2	54.2	
Actuated g/C Ratio	0.27	0.27	0.27	0.27	0.27	0.27	0.53	0.47	0.47	0.57	0.49	0.49	
Clearance Time (s)	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	334	479	390	323	470	374	375	1511	667	366	1572	720	
v/s Ratio Prot		0.04			0.05		0.01	c0.24		c0.02		0.22	
v/s Ratio Perm	0.05		0.01	c0.22		0.01	0.09		0.06	0.13		0.02	
v/c Ratio	0.17	0.15	0.05	0.80	0.17	0.05	0.18	0.51	0.12	0.27	0.45	0.05	
Uniform Delay, d1	30.4	30.2	29.4	37.1	30.3	29.4	12.8	20.1	16.1	11.7	18.2	14.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.27	2.08	8.36	
Incremental Delay, d2	0.2	0.1	0.1	12.9	0.2	0.1	0.2	1.2	0.4	0.4	0.9	0.1	
Delay (s)	30.6	30.3	29.4	50.0	30.5	29.4	13.0	21.3	16.5	26.9	38.6	121.3	
Level of Service	C	C	C	D	C	C	B	C	B	C	D	F	
Approach Delay (s)		30.1			42.6			20.0			43.7		
Approach LOS		C			D			B			D		
<b>Intersection Summary</b>													
HCM 2000 Control Delay		32.9			HCM 2000 Level of Service						C		
HCM 2000 Volume to Capacity ratio		0.58											
Actuated Cycle Length (s)		110.0			Sum of lost time (s)						19.2		
Intersection Capacity Utilization		72.8%			ICU Level of Service						C		
Analysis Period (min)		15											

Scenario 1 8370 Campeau Drive 11:59 pm 09/03/2021 2030 Future Background  
AM Peak Hour

Synchro 11 Report  
Page 12

Lanes, Volumes, Timings  
4: Terry Fox & Kanata

11/02/2023

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↘	↑	↘	↔	↑
Traffic Volume (vph)	250	146	857	340	265	885
Future Volume (vph)	250	146	857	340	265	885
Satd. Flow (prot)	3216	1469	3316	1483	1658	3316
Fit Permitted	0.950				0.950	
Satd. Flow (perm)	3216	1469	3316	1452	1653	3316
Satd. Flow (RTOR)		146		340		
Lane Group Flow (vph)	250	146	857	340	265	885
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Detector Phase	8	8	2	2	1	6
<b>Switch Phase</b>						
Minimum Initial (s)	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	31.2	31.2	25.0	25.0	11.0	25.0
Total Split (s)	32.0	32.0	45.0	45.0	43.0	45.0
Total Split (%)	26.7%	26.7%	37.5%	37.5%	35.8%	37.5%
Yellow Time (s)	3.7	3.7	4.2	4.2	4.2	4.2
All-Red Time (s)	2.5	2.5	1.8	1.8	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	6.0	6.0	6.0	6.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	Max	Max	None	Max
Act Effct Green (s)	12.4	12.4	39.3	39.3	19.5	64.9
Actuated g/C Ratio	0.14	0.14	0.44	0.44	0.22	0.72
v/c Ratio	0.56	0.44	0.59	0.41	0.73	0.37
Control Delay	42.0	11.1	22.5	4.0	45.5	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.0	11.1	22.5	4.0	45.5	5.3
LOS	D	B	C	A	D	A
Approach Delay	30.6		17.3			14.6
Approach LOS	C		B			B
Queue Length 50th (m)	20.8	0.0	56.3	0.0	42.3	24.8
Queue Length 95th (m)	35.5	16.5	95.2	17.0	71.3	39.8
Internal Link Dist (m)	616.6		846.8			487.6
Turn Bay Length (m)				100.0	85.5	
Base Capacity (vph)	933	530	1455	828	690	3029
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.28	0.59	0.41	0.38	0.29
<b>Intersection Summary</b>						
Cycle Length: 120						
Actuated Cycle Length: 89.6						
Natural Cycle: 80						
Control Type: Actuated-Uncoordinated						
Maximum v/c Ratio: 0.73						

Scenario 1 570 Winterset Road 11:59 pm 09/03/2021 2030 Future Background  
PM Peak Hour

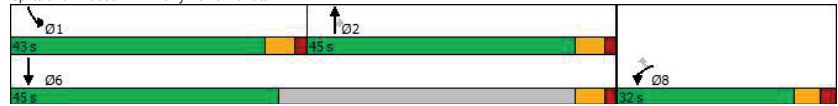
Synchro 11 Report  
Page 4

Lanes, Volumes, Timings  
4: Terry Fox & Kanata

11/02/2023

Intersection Signal Delay: 18.1 Intersection LOS: B  
Intersection Capacity Utilization 63.2% ICU Level of Service B  
Analysis Period (min) 15

Splits and Phases: 4: Terry Fox & Kanata



Lanes, Volumes, Timings  
5: Terry Fox & Signature SC

11/02/2023

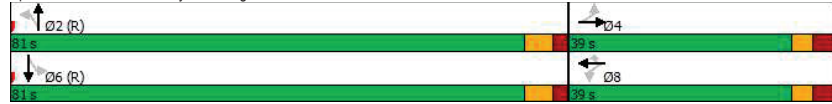
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↔		↔	↔	
Traffic Volume (vph)	0	0	0	54	0	113	18	1147	68	82	1083	0
Future Volume (vph)	0	0	0	54	0	113	18	1147	68	82	1083	0
Satd. Flow (prot)	0	1745	0	0	1658	1483	1658	3289	0	1658	3316	0
Fit Permitted					0.757		0.212			0.174		
Satd. Flow (perm)	0	1745	0	0	1321	1483	370	3289	0	304	3316	0
Satd. Flow (RTOR)						94		9				
Lane Group Flow (vph)	0	0	0	0	54	113	18	1215	0	82	1083	0
Turn Type				Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Minimum Split (s)	31.6	31.6		31.6	31.6	31.4	31.4			32.8	32.8	
Total Split (s)	39.0	39.0		39.0	39.0	39.0	81.0	81.0		81.0	81.0	
Total Split (%)	32.5%	32.5%		32.5%	32.5%	32.5%	67.5%	67.5%		67.5%	67.5%	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	4.2	4.2		4.2	4.2	
All-Red Time (s)	3.6	3.6		3.6	3.6	3.6	2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.6			6.6	6.6	6.4	6.4		6.4	6.4	
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)					32.4	32.4	74.6	74.6		74.6	74.6	
Actuated g/C Ratio					0.27	0.27	0.62	0.62		0.62	0.62	
v/c Ratio					0.15	0.24	0.08	0.59		0.44	0.53	
Control Delay					34.9	10.9	3.6	14.7		20.8	13.9	
Queue Delay					0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay					34.9	10.9	3.6	14.7		20.8	13.9	
LOS					C	B	A	B		C	B	
Approach Delay					18.7			14.5			14.4	
Approach LOS					B			B			B	
Queue Length 50th (m)					9.7	3.3	1.4	132.4		9.4	70.4	
Queue Length 95th (m)					20.3	17.3	m0.4	155.8		24.0	86.8	
Internal Link Dist (m)					19.8			301.0			846.8	
Turn Bay Length (m)							51.0			61.0		
Base Capacity (vph)					356	469	230	2048		188	2061	
Starvation Cap Reductn					0	0	0	0		0	0	
Spillback Cap Reductn					0	0	0	0		0	0	
Storage Cap Reductn					0	0	0	0		0	0	
Reduced v/c Ratio					0.15	0.24	0.08	0.59		0.44	0.53	
<b>Intersection Summary</b>												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 49 (41%), Referenced to phase 2:NBT and 6:SBTL, Start of Green												
Natural Cycle: 75												
Control Type: Pre-timed												
Maximum v/c Ratio: 0.59												
Intersection Signal Delay: 14.7 Intersection LOS: B												
Intersection Capacity Utilization 68.6% ICU Level of Service C												
Analysis Period (min) 15												

Lanes, Volumes, Timings  
5: Terry Fox & Signature SC

11/02/2023

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

Splits and Phases: 5: Terry Fox & Signature SC



Lanes, Volumes, Timings  
6: Terry Fox & Campeau

11/02/2023

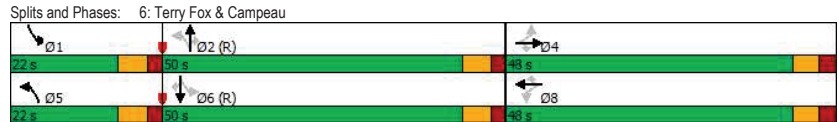
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↕	↔	↔
Traffic Volume (vph)	96	213	129	248	210	111	89	955	188	164	875	85
Future Volume (vph)	96	213	129	248	210	111	89	955	188	164	875	85
Satd. Flow (prot)	1658	1745	1483	1658	1712	1483	1658	3316	1483	1658	3316	1483
Fit Permitted	0.538			0.533			0.253			0.188		
Satd. Flow (perm)	938	1745	1464	929	1712	1464	441	3316	1449	328	3316	1463
Satd. Flow (RTOR)			129			111			162			89
Lane Group Flow (vph)	96	213	129	248	210	111	89	955	188	164	875	85
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	40.4	40.4	40.4	43.4	43.4	43.4	11.4	40.4	40.4	11.4	43.4	43.4
Total Split (s)	48.0	48.0	48.0	48.0	48.0	48.0	22.0	50.0	50.0	22.0	50.0	50.0
Total Split (%)	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	18.3%	41.7%	41.7%	18.3%	41.7%	41.7%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	2.7	2.7	2.7	2.7	2.7	2.7	2.2	2.2	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	34.6	34.6	34.6	34.6	34.6	34.6	63.4	55.0	55.0	69.0	57.8	57.8
Actuated g/C Ratio	0.29	0.29	0.29	0.29	0.29	0.29	0.53	0.46	0.46	0.58	0.48	0.48
v/c Ratio	0.36	0.42	0.25	0.93	0.43	0.22	0.28	0.63	0.25	0.53	0.55	0.11
Control Delay	35.8	36.0	5.9	80.0	36.1	6.1	14.4	29.1	6.4	33.2	44.2	19.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.8	36.0	5.9	80.0	36.1	6.1	14.4	29.1	6.4	33.2	44.2	19.0
LOS	D	D	A	E	D	A	B	C	A	C	D	B
Approach Delay		27.1			49.4			24.6			40.7	
Approach LOS		C			D			C			D	
Queue Length 50th (m)	17.6	39.8	0.0	55.5	39.3	0.0	8.6	89.9	3.4	30.3	101.7	4.2
Queue Length 95th (m)	30.8	57.6	12.8	#93.1	57.2	11.9	17.7	130.5	19.4	54.2	123.1	19.6
Internal Link Dist (m)		128.0			204.4			313.2			301.0	
Turn Bay Length (m)	62.5		64.5	70.0		63.5	45.0		62.5	97.5		50.0
Base Capacity (vph)	325	604	591	322	593	580	416	1520	752	370	1597	750
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.35	0.22	0.77	0.35	0.19	0.21	0.63	0.25	0.44	0.55	0.11

**Intersection Summary**  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 27 (23%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated

Lanes, Volumes, Timings  
6: Terry Fox & Campeau

11/02/2023

Maximum v/c Ratio: 0.93	Intersection LOS: C
Intersection Signal Delay: 34.5	ICU Level of Service E
Intersection Capacity Utilization 86.1%	
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	



**MOVEMENT SUMMARY**

Site: 101 [Huntmar-Campeau AM FB2030 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Arcadia Stage 6  
Site Category: (None)  
Roundabout

Mov ID	Turn Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
		[ Total HV ]	%	[ Total HV ]	%				[ Veh. ]	[ Dist ]				
South: Huntmar														
1	L2	All MCs	45 2.0	45 2.0	0.047	8.0	LOS A	0.1	0.9	0.22	0.59	0.22	47.2	
2	T1	All MCs	448 2.0	448 2.0	0.461	2.5	LOS A	1.8	12.9	0.34	0.29	0.34	47.4	
3	R2	All MCs	44 2.0	44 2.0	0.046	3.0	LOS A	0.1	0.8	0.22	0.40	0.22	50.7	
Approach			537 2.0	537 2.0	0.461	3.0	LOS A	1.8	12.9	0.32	0.33	0.32	47.6	
East: Campeau														
4	L2	All MCs	126 2.0	126 2.0	0.172	11.3	LOS B	0.5	3.3	0.42	0.75	0.42	46.6	
5	T1	All MCs	112 2.0	112 2.0	0.157	5.4	LOS A	0.4	3.1	0.44	0.53	0.44	54.1	
6	R2	All MCs	35 2.0	35 2.0	0.049	5.6	LOS A	0.1	0.9	0.41	0.62	0.41	49.9	
Approach			273 2.0	273 2.0	0.172	8.1	LOS A	0.5	3.3	0.43	0.64	0.43	49.8	
North: Huntmar														
7	L2	All MCs	10 2.0	10 2.0	0.221	8.5	LOS A	0.7	4.8	0.33	0.34	0.33	49.9	
8	T1	All MCs	387 2.0	387 2.0	0.221	2.7	LOS A	0.7	4.8	0.32	0.32	0.32	47.4	
9	R2	All MCs	118 2.0	118 2.0	0.132	3.5	LOS A	0.4	2.6	0.31	0.45	0.31	50.4	
Approach			515 2.0	515 2.0	0.221	3.0	LOS A	0.7	4.8	0.32	0.35	0.32	48.1	
West: Campeau														
10	L2	All MCs	85 2.0	85 2.0	0.115	11.2	LOS B	0.3	2.2	0.41	0.74	0.41	46.7	
11	T1	All MCs	89 2.0	89 2.0	0.115	4.9	LOS A	0.3	2.2	0.39	0.49	0.39	54.3	
12	R2	All MCs	42 2.0	42 2.0	0.055	4.9	LOS A	0.1	1.0	0.37	0.58	0.37	50.3	
Approach			216 2.0	216 2.0	0.115	7.4	LOS A	0.3	2.2	0.39	0.60	0.39	50.3	
All Vehicles			1541 2.0	1541 2.0	0.461	4.5	LOS A	1.8	12.9	0.35	0.43	0.35	48.5	

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Sieglösch M1 implied by US HCM 2010 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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## MOVEMENT SUMMARY

**Site: 101 [Country Glen-Campeau AM FB2030 (Site Folder: General)]**

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Arcadia Stage 5  
Site Category: (None)  
Roundabout

Vehicle Movement Performance															
Mov ID	Turn Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed	
		[ Total HV ]	%	[ Total HV ]	%				[ Veh. ]	Dist ]					
		veh/h	%	veh/h	%	v/c	sec			veh	m			km/h	
South: Country Glen															
1	L2	All MCs	40	2.0	40	2.0	0.022	1.8	LOS A	0.1	0.4	0.18	0.26	0.18	37.5
2	T1	All MCs	1	2.0	1	2.0	0.022	0.3	LOS A	0.1	0.4	0.17	0.23	0.17	29.5
3	R2	All MCs	4	2.0	4	2.0	0.022	0.3	LOS A	0.1	0.4	0.17	0.23	0.17	37.7
Approach			45	2.0	45	2.0	0.022	1.7	LOS A	0.1	0.4	0.18	0.25	0.18	37.3
East: Campeau															
4	L2	All MCs	7	2.0	7	2.0	0.047	9.6	LOS A	0.1	0.9	0.15	0.40	0.15	38.6
5	T1	All MCs	86	2.0	86	2.0	0.047	3.5	LOS A	0.1	0.9	0.15	0.37	0.15	55.3
6	R2	All MCs	5	2.0	5	2.0	0.047	4.4	LOS A	0.1	0.8	0.14	0.35	0.14	38.8
Approach			98	2.0	98	2.0	0.047	4.0	LOS A	0.1	0.9	0.15	0.37	0.15	52.6
North: Country Glen															
7	L2	All MCs	19	2.0	19	2.0	0.156	1.9	LOS A	0.4	3.0	0.20	0.11	0.20	38.4
8	T1	All MCs	1	2.0	1	2.0	0.156	0.4	LOS A	0.4	3.0	0.20	0.11	0.20	29.7
9	R2	All MCs	138	2.0	138	2.0	0.156	0.4	LOS A	0.4	3.0	0.20	0.11	0.20	38.5
Approach			158	2.0	158	2.0	0.156	0.6	LOS A	0.4	3.0	0.20	0.11	0.20	38.4
West: Campeau															
10	L2	All MCs	50	2.0	50	2.0	0.063	9.5	LOS A	0.2	1.6	0.10	0.56	0.10	37.7
11	T1	All MCs	66	2.0	66	2.0	0.063	3.4	LOS A	0.2	1.6	0.10	0.41	0.10	54.8
12	R2	All MCs	20	2.0	20	2.0	0.063	4.3	LOS A	0.2	1.6	0.10	0.35	0.10	38.8
Approach			136	2.0	136	2.0	0.063	5.7	LOS A	0.2	1.6	0.10	0.46	0.10	44.6
All Vehicles			437	2.0	437	2.0	0.156	3.1	LOS A	0.4	3.0	0.15	0.29	0.15	42.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Sieglösch M1 implied by US HCM 2010 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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## MOVEMENT SUMMARY

**Site: 101 [Winterset-Campeau AM FB2030 (Site Folder: General)]**

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Arcadia Stage 5  
Site Category: (None)  
Roundabout

Vehicle Movement Performance															
Mov ID	Turn Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed	
		[ Total HV ]	%	[ Total HV ]	%				[ Veh. ]	Dist ]					
		veh/h	%	veh/h	%	v/c	sec			veh	m			km/h	
East: Campeau															
5	T1	All MCs	67	2.0	67	2.0	0.035	3.3	LOS A	0.1	0.8	0.05	0.33	0.05	56.1
6	R2	All MCs	9	2.0	9	2.0	0.035	4.2	LOS A	0.1	0.8	0.05	0.34	0.05	39.0
Approach			76	2.0	76	2.0	0.035	3.4	LOS A	0.1	0.8	0.05	0.33	0.05	53.4
North: Winterset															
7	L2	All MCs	31	2.0	31	2.0	0.029	1.7	LOS A	0.1	0.5	0.12	0.25	0.12	37.5
9	R2	All MCs	31	2.0	31	2.0	0.029	0.2	LOS A	0.1	0.5	0.12	0.03	0.12	38.8
Approach			62	2.0	62	2.0	0.029	0.9	LOS A	0.1	0.5	0.12	0.14	0.12	38.1
West: Campeau															
10	L2	All MCs	8	2.0	8	2.0	0.051	9.5	LOS A	0.2	1.3	0.11	0.38	0.11	38.7
11	T1	All MCs	102	2.0	102	2.0	0.051	3.4	LOS A	0.2	1.3	0.11	0.35	0.11	55.6
Approach			110	2.0	110	2.0	0.051	3.8	LOS A	0.2	1.3	0.11	0.35	0.11	53.9
All Vehicles			248	2.0	248	2.0	0.051	3.0	LOS A	0.2	1.3	0.09	0.29	0.09	48.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Sieglösch M1 implied by US HCM 2010 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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## MOVEMENT SUMMARY

Site: 101 [Huntmar-Campeau PM FB2030 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Arcadia Stage 6  
Site Category: (None)  
Roundabout

Vehicle Movement Performance															
Mov ID	Turn Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed	
		[ Total HV ]	%	[ Total HV ]	%				[ Veh. ]	Dist ]					
		veh/h	%	veh/h	%	v/c	sec			m				km/h	
South: Huntmar															
1	L2	All MCs	93	2.0	93	2.0	0.121	9.1	LOS A	0.3	2.4	0.39	0.69	0.39	46.7
2	T1	All MCs	482	2.0	482	2.0	0.610	5.1	LOS A	3.1	22.1	0.60	0.64	0.74	46.4
3	R2	All MCs	128	2.0	128	2.0	0.166	4.2	LOS A	0.5	3.4	0.41	0.54	0.41	50.1
Approach			703	2.0	703	2.0	0.610	5.4	LOS A	3.1	22.1	0.54	0.63	0.63	47.0
East: Campeau															
4	L2	All MCs	120	2.0	120	2.0	0.212	12.4	LOS B	0.6	4.3	0.51	0.80	0.51	46.4
5	T1	All MCs	149	2.0	149	2.0	0.212	6.0	LOS A	0.6	4.3	0.49	0.61	0.49	53.5
6	R2	All MCs	18	2.0	18	2.0	0.029	6.3	LOS A	0.1	0.5	0.46	0.65	0.46	49.5
Approach			287	2.0	287	2.0	0.212	8.7	LOS A	0.6	4.3	0.49	0.69	0.49	50.0
North: Huntmar															
7	L2	All MCs	26	2.0	26	2.0	0.336	9.0	LOS A	1.1	8.1	0.42	0.41	0.42	49.4
8	T1	All MCs	544	2.0	544	2.0	0.336	3.1	LOS A	1.1	8.1	0.41	0.38	0.41	47.0
9	R2	All MCs	158	2.0	158	2.0	0.188	3.8	LOS A	0.6	3.9	0.36	0.50	0.36	50.2
Approach			728	2.0	728	2.0	0.336	3.5	LOS A	1.1	8.1	0.40	0.41	0.40	47.7
West: Campeau															
10	L2	All MCs	184	2.0	184	2.0	0.337	12.5	LOS B	1.1	7.9	0.54	0.81	0.58	46.5
11	T1	All MCs	266	2.0	266	2.0	0.337	6.2	LOS A	1.1	7.9	0.52	0.65	0.56	53.2
12	R2	All MCs	96	2.0	96	2.0	0.139	5.6	LOS A	0.4	2.6	0.44	0.64	0.44	50.0
Approach			546	2.0	546	2.0	0.337	8.2	LOS A	1.1	7.9	0.51	0.70	0.54	50.2
All Vehicles			2264	2.0	2264	2.0	0.610	5.9	LOS A	3.1	22.1	0.48	0.58	0.52	48.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Sieglösch M1 implied by US HCM 2010 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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## MOVEMENT SUMMARY

Site: 101 [Country Glen-Campeau PM FB2030 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Arcadia Stage 5  
Site Category: (None)  
Roundabout

Vehicle Movement Performance															
Mov ID	Turn Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed	
		[ Total HV ]	%	[ Total HV ]	%				[ Veh. ]	Dist ]					
		veh/h	%	veh/h	%	v/c	sec			m				km/h	
South: Country Glen															
1	L2	All MCs	34	2.0	34	2.0	0.024	2.6	LOS A	0.1	0.4	0.32	0.36	0.32	37.2
2	T1	All MCs	1	2.0	1	2.0	0.024	1.0	LOS A	0.1	0.4	0.31	0.33	0.31	29.4
3	R2	All MCs	5	2.0	5	2.0	0.024	1.0	LOS A	0.1	0.4	0.31	0.33	0.31	37.6
Approach			40	2.0	40	2.0	0.024	2.3	LOS A	0.1	0.4	0.32	0.36	0.32	37.0
East: Campeau															
4	L2	All MCs	11	2.0	11	2.0	0.101	10.0	LOS A	0.3	2.0	0.25	0.42	0.25	38.4
5	T1	All MCs	163	2.0	163	2.0	0.101	3.8	LOS A	0.3	2.0	0.24	0.41	0.24	54.8
6	R2	All MCs	20	2.0	20	2.0	0.101	4.7	LOS A	0.3	1.9	0.23	0.40	0.23	38.5
Approach			194	2.0	194	2.0	0.101	4.3	LOS A	0.3	2.0	0.24	0.41	0.24	51.4
North: Country Glen															
7	L2	All MCs	11	2.0	11	2.0	0.101	2.1	LOS A	0.3	1.9	0.24	0.15	0.24	38.3
8	T1	All MCs	1	2.0	1	2.0	0.101	0.6	LOS A	0.3	1.9	0.24	0.15	0.24	29.7
9	R2	All MCs	85	2.0	85	2.0	0.101	0.6	LOS A	0.3	1.9	0.24	0.15	0.24	38.4
Approach			97	2.0	97	2.0	0.101	0.8	LOS A	0.3	1.9	0.24	0.15	0.24	38.3
West: Campeau															
10	L2	All MCs	162	2.0	162	2.0	0.187	9.5	LOS A	0.8	5.4	0.10	0.58	0.10	37.5
11	T1	All MCs	205	2.0	205	2.0	0.187	3.4	LOS A	0.8	5.4	0.10	0.38	0.10	55.1
12	R2	All MCs	37	2.0	37	2.0	0.187	4.3	LOS A	0.8	5.4	0.10	0.34	0.10	38.9
Approach			404	2.0	404	2.0	0.187	5.9	LOS A	0.8	5.4	0.10	0.46	0.10	44.9
All Vehicles			735	2.0	735	2.0	0.187	4.6	LOS A	0.8	5.4	0.17	0.40	0.17	44.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Sieglösch M1 implied by US HCM 2010 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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## MOVEMENT SUMMARY

Site: 101 [Winterset-Campeau PM FB2030 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Arcadia Stage 5  
Site Category: (None)  
Roundabout

Vehicle Movement Performance															
Mov ID	Turn Class	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[ Total HV ]	%	[ Total HV ]	%				[ Veh. veh ]	[ Dist ]				
East: Campeau															
5	T1	All MCs	177	2.0	177	2.0	0.098	3.4	LOS A	0.4	2.5	0.12	0.33	0.12	55.7
6	R2	All MCs	32	2.0	32	2.0	0.098	4.3	LOS A	0.4	2.5	0.12	0.36	0.12	38.8
Approach			209	2.0	209	2.0	0.098	3.5	LOS A	0.4	2.5	0.12	0.34	0.12	52.2
North: Winterset															
7	L2	All MCs	18	2.0	18	2.0	0.019	2.0	LOS A	0.0	0.3	0.21	0.29	0.21	37.3
9	R2	All MCs	18	2.0	18	2.0	0.018	0.4	LOS A	0.0	0.3	0.20	0.09	0.20	38.6
Approach			36	2.0	36	2.0	0.019	1.2	LOS A	0.0	0.3	0.21	0.19	0.21	37.9
West: Campeau															
10	L2	All MCs	33	2.0	33	2.0	0.099	9.4	LOS A	0.4	2.6	0.08	0.44	0.08	38.5
11	T1	All MCs	183	2.0	183	2.0	0.099	3.3	LOS A	0.4	2.6	0.08	0.37	0.08	55.4
Approach			216	2.0	216	2.0	0.099	4.2	LOS A	0.4	2.6	0.08	0.38	0.08	51.9
All Vehicles			461	2.0	461	2.0	0.099	3.7	LOS A	0.4	2.6	0.11	0.34	0.11	50.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Sieglösch M1 implied by US HCM 2010 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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# Appendix G

MMLOS Analysis

# Multi-Modal Level of Service - Intersections Form

Consultant  
Scenario  
Comments

CGH Transportation Inc.
Existing/Future

Project  
Date

8370 Campeau Drive
11/2/2023

INTERSECTIONS														
Crossing Side		Kanata Avenue at Terry Fox Drive				Terry Fox Drive at Signature C				Campeau Drive at Terry Fox Drive				
		NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	
Pedestrian	Lanes	7		5		7	7	7	7	7	8	7	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		
	Conflicting Left Turns	Protected		Protected		Permissive		Permissive		Permissive		Protected/ Permissive		
	Conflicting Right Turns	Permissive or yield control		Permissive or yield control		Permissive or yield control		Permissive or yield control		Permissive or yield control		Permissive or yield control		
	Right Turns on Red (RTor) ?	RTOR allowed		RTOR allowed		RTOR allowed		RTOR allowed		RTOR allowed		RTOR allowed		
	Ped Signal Leading Interval?	No		No		No		No		No		No		
	Right Turn Channel	Conv'tl without Receiving Lane		No Channel		No Channel		No Channel		Conv'tl without Receiving Lane		Conv'tl without Receiving Lane		
	Corner Radius	>25m		>25m		10-15m		10-15m		15-25m		15-25m		
	Crosswalk Type	Std transverse markings		Std transverse markings		Std transverse markings		Std transverse markings		Std transverse markings		Std transverse markings		
	<b>PETSI Score</b>	13		42		4		4		6		-10		
	<b>Ped. Exposure to Traffic LoS</b>	F		E		F		F		F		F		
	Cycle Length													
	Effective Walk Time													
	<b>Average Pedestrian Delay</b>													
<b>Pedestrian Delay LoS</b>	-		-		-		-		-		-		-	
<b>Level of Service</b>	F		E		F		F		F		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	Pocket Bike Lane	Pocket Bike Lane	Pocket Bike Lane		Pocket Bike Lane	Pocket Bike Lane	Mixed Traffic	Mixed Traffic	Pocket Bike Lane	Pocket Bike Lane	Pocket Bike Lane	Mixed Traffic	
	Right Turn Lane Configuration		Bike lane shifts to the left of right turn	Bike lane shifts to the left of right turn				≤ 50 m		Bike lane shifts to the left of right turn	Bike lane shifts to the left of right turn	Bike lane shifts to the left of right turn	> 50 m	
	Right Turning Speed		>25 to 30 km/h	>25 to 30 km/h				≤ 25 km/h		>25 to 30 km/h	>25 to 30 km/h	>25 to 30 km/h	>25 km/h	
	<b>Cyclist relative to RT motorists</b>	#N/A	F	F	-	#N/A	#N/A	D	#N/A	F	F	F	F	
	<b>Separated or Mixed Traffic</b>	Separated	Separated	Separated	-	Separated	Separated	Mixed Traffic	Mixed Traffic	Separated	Separated	Separated	Mixed Traffic	
	Left Turn Approach	≥ 2 lanes crossed		No lane crossed		≥ 2 lanes crossed	≥ 2 lanes crossed	One lane crossed	No lane crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	1 lane crossed	≥ 2 lanes crossed	
	Operating Speed	≥ 60 km/h		≥ 60 km/h		≥ 60 km/h	≥ 60 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	≥ 60 km/h	≥ 60 km/h	≥ 60 km/h	≥ 60 km/h	
	<b>Left Turning Cyclist</b>	F	-	C	-	F	F	D	B	F	F	E	F	
<b>Level of Service</b>	#N/A	-	F	-	#N/A	#N/A	D	#N/A	F	F	F	F		
		#N/A				#N/A				F				
Transit	Average Signal Delay													
	<b>Level of Service</b>	-		-		-		-		-		-		-
Truck	Effective Corner Radius													
	Number of Receiving Lanes on Departure from Intersection	-		-		-		-		-		-		-
Auto	Volume to Capacity Ratio	0.61 - 0.70				0.0 - 0.60				0.71 - 0.80				
	<b>Level of Service</b>	B				A				C				

## Multi-Modal Level of Service - Segments Form

Consultant Scenario Comments	CGH Transportation Inc.	Project Date	8370 Campeau Drive
	Existing/Future		11/2/2023

SEGMENTS			Campeau Existing	Winterset Existing	Winterset Future
Pedestrian	Sidewalk Width	-	≥ 2 m	no sidewalk	≥ 2 m
	Boulevard Width		0.5 - 2 m	n/a	< 0.5
	Avg Daily Curb Lane Traffic Volume		≤ 3000	≤ 3000	≤ 3000
	Operating Speed		> 60 km/h	> 30 to 50 km/h	> 30 to 50 km/h
	On-Street Parking		no	no	no
	<b>Exposure to Traffic PLoS</b>		<b>B</b>	<b>F</b>	<b>B</b>
	Effective Sidewalk Width				
Pedestrian Volume					
<b>Crowding PLoS</b>	-	-	-		
<b>Level of Service</b>	-	-	-		
Bicycle	Type of Cycling Facility	B	Physically Separated	Mixed Traffic	Mixed Traffic
	Number of Travel Lanes			≤ 2 (no centreline)	≤ 2 (no centreline)
	Operating Speed			>40 to <50 km/h	>40 to <50 km/h
	<b># of Lanes &amp; Operating Speed LoS</b>		-	<b>B</b>	<b>B</b>
	Bike Lane (+ Parking Lane) Width				
	<b>Bike Lane Width LoS</b>		-	-	-
	Bike Lane Blockages				
	<b>Blockage LoS</b>		-	-	-
	Median Refuge Width (no median = < 1.8 m)			< 1.8 m refuge	< 1.8 m refuge
	No. of Lanes at Unsignalized Crossing			≤ 3 lanes	≤ 3 lanes
	Sidestreet Operating Speed			≤ 40 km/h	≤ 40 km/h
<b>Unsignalized Crossing - Lowest LoS</b>	<b>A</b>	<b>A</b>	<b>A</b>		
<b>Level of Service</b>	<b>A</b>	<b>B</b>	<b>B</b>		
Transit	Facility Type	-			
	Friction or Ratio Transit:Posted Speed				
	<b>Level of Service</b>		-	-	-
Truck	Truck Lane Width	-			
	Travel Lanes per Direction				
	<b>Level of Service</b>		-	-	-

# Appendix H

Synchro and Sidra Intersection Worksheets – 2025 Future Total Conditions

Lanes, Volumes, Timings  
4: Terry Fox & Kanata

11/02/2023

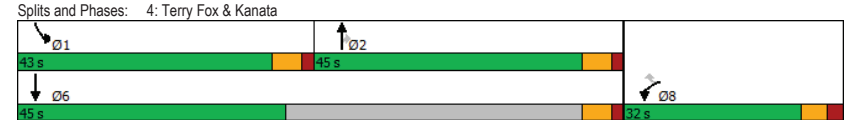
	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔	↔	↕↕	↔	↔↔	↕↕
Traffic Volume (vph)	317	337	701	172	253	516
Future Volume (vph)	317	337	701	172	253	516
Satd. Flow (prot)	3185	1414	3283	1441	1595	3283
Fit Permitted	0.950				0.950	
Satd. Flow (perm)	3185	1414	3283	1441	1595	3283
Satd. Flow (RTOR)		337		172		
Lane Group Flow (vph)	317	337	701	172	253	516
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	31.2	31.2	25.0	25.0	11.0	25.0
Total Split (s)	32.0	32.0	45.0	45.0	43.0	45.0
Total Split (%)	26.7%	26.7%	37.5%	37.5%	35.8%	37.5%
Yellow Time (s)	3.7	3.7	4.2	4.2	4.2	4.2
All-Red Time (s)	2.5	2.5	1.8	1.8	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	6.0	6.0	6.0	6.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	Max	Max	None	Max
Act Effct Green (s)	14.7	14.7	39.4	39.4	20.0	65.5
Actuated g/C Ratio	0.16	0.16	0.43	0.43	0.22	0.71
v/c Ratio	0.63	0.66	0.50	0.24	0.74	0.22
Control Delay	42.8	11.2	22.6	4.4	47.4	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.8	11.2	22.6	4.4	47.4	5.2
LOS	D	B	C	A	D	A
Approach Delay	26.6		19.0			19.1
Approach LOS	C		B			B
Queue Length 50th (m)	27.1	0.0	45.8	0.0	41.6	14.0
Queue Length 95th (m)	44.6	24.8	81.1	13.5	71.9	24.9
Internal Link Dist (m)	616.6		846.8			487.6
Turn Bay Length (m)				100.0	85.5	
Base Capacity (vph)	898	640	1399	713	644	2924
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.53	0.50	0.24	0.39	0.18

Intersection Summary	
Cycle Length:	120
Actuated Cycle Length:	92.5
Natural Cycle:	75
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.74

Lanes, Volumes, Timings  
4: Terry Fox & Kanata

11/02/2023

Intersection Signal Delay: 21.2	Intersection LOS: C
Intersection Capacity Utilization 60.0%	ICU Level of Service B
Analysis Period (min) 15	



Lanes, Volumes, Timings  
5: Terry Fox & Signature SC

11/02/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	0	0	0	9	0	28	0	858	20	30	840	0
Future Volume (vph)	0	0	0	9	0	28	0	858	20	30	840	0
Satd. Flow (prot)	0	1745	0	0	1386	1455	1745	3233	0	1658	3283	0
Fit Permitted					0.757				0.292			
Satd. Flow (perm)	0	1745	0	0	1104	1455	1745	3233	0	509	3283	0
Satd. Flow (RTOR)						34		4				
Lane Group Flow (vph)	0	0	0	0	9	28	0	878	0	30	840	0
Turn Type				Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Minimum Split (s)	31.6	31.6		31.6	31.6	31.6	31.4	31.4		32.8	32.8	
Total Split (s)	32.0	32.0		32.0	32.0	32.0	78.0	78.0		78.0	78.0	
Total Split (%)	29.1%	29.1%		29.1%	29.1%	29.1%	70.9%	70.9%		70.9%	70.9%	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	4.2	4.2		4.2	4.2	
All-Red Time (s)	3.6	3.6		3.6	3.6	3.6	2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.6			6.6	6.6	6.4	6.4		6.4	6.4	
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)					25.4	25.4		71.6		71.6	71.6	
Actuated g/C Ratio					0.23	0.23		0.65		0.65	0.65	
v/c Ratio					0.04	0.08		0.42		0.09	0.39	
Control Delay					33.4	9.9		13.7		8.0	9.7	
Queue Delay					0.0	0.0		0.0		0.0	0.0	
Total Delay					33.4	9.9		13.7		8.0	9.7	
LOS					C	A		B		A	A	
Approach Delay					15.6			13.7			9.6	
Approach LOS					B			B			A	
Queue Length 50th (m)					1.5	0.0		80.4		2.2	40.7	
Queue Length 95th (m)					5.6	6.1		63.9		5.9	51.9	
Internal Link Dist (m)		19.8			92.3			301.0			846.8	
Turn Bay Length (m)										61.0		
Base Capacity (vph)					254	362		2105		331	2136	
Starvation Cap Reductn					0	0		0		0	0	
Spillback Cap Reductn					0	0		0		0	0	
Storage Cap Reductn					0	0		0		0	0	
Reduced v/c Ratio					0.04	0.08		0.42		0.09	0.39	
<b>Intersection Summary</b>												
Cycle Length: 110												
Actuated Cycle Length: 110												
Offset: 49 (45%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green												
Natural Cycle: 65												
Control Type: Pretimed												
Maximum v/c Ratio: 0.42												
Intersection Signal Delay: 11.7												
Intersection LOS: B												
Intersection Capacity Utilization 45.5%												
ICU Level of Service A												
Analysis Period (min) 15												

Lanes, Volumes, Timings  
5: Terry Fox & Signature SC

11/02/2023





Lanes, Volumes, Timings  
6: Terry Fox & Campeau

11/02/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Traffic Volume (vph)	62	70	112	258	76	71	84	706	164	98	627	69
Future Volume (vph)	62	70	112	258	76	71	84	706	164	98	627	69
Satd. Flow (prot)	1642	1745	1441	1580	1712	1363	1658	3191	1441	1658	3191	1483
Fit Permitted	0.708			0.711			0.377			0.310		
Satd. Flow (perm)	1224	1745	1421	1181	1712	1363	657	3191	1410	541	3191	1463
Satd. Flow (RTOR)			112			97			164			
Lane Group Flow (vph)	62	70	112	258	76	71	84	706	164	98	627	69
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1		6
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	40.4	40.4	40.4	43.4	43.4	43.4	11.4	40.4	40.4	11.4	43.4	43.4
Total Split (s)	54.0	54.0	54.0	54.0	54.0	54.0	12.0	44.0	44.0	12.0	44.0	44.0
Total Split (%)	49.1%	49.1%	49.1%	49.1%	49.1%	49.1%	10.9%	40.0%	40.0%	10.9%	40.0%	40.0%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	2.7	2.7	2.7	2.7	2.7	2.7	2.2	2.2	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max	C-Max
Act Effct Green (s)	30.2	30.2	30.2	30.2	30.2	30.2	60.2	52.2	52.2	62.3	55.0	55.0
Actuated g/C Ratio	0.27	0.27	0.27	0.27	0.27	0.27	0.55	0.47	0.47	0.57	0.50	0.50
v/c Ratio	0.19	0.15	0.24	0.80	0.16	0.16	0.19	0.47	0.22	0.25	0.39	0.09
Control Delay	28.7	27.9	5.9	54.1	28.3	3.0	12.4	23.0	4.5	27.4	42.7	18.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.7	27.9	5.9	54.1	28.3	3.0	12.4	23.0	4.5	27.4	42.7	18.6
LOS	C	C	A	D	C	A	B	C	A	C	D	B
Approach Delay		18.0			40.3			18.9			38.7	
Approach LOS		B			D			B			D	
Queue Length 50th (m)	10.2	11.4	0.0	51.4	12.4	0.0	6.9	52.0	0.0	16.2	75.8	3.0
Queue Length 95th (m)	17.9	19.2	11.1	70.7	20.5	5.2	17.1	86.6	13.9	34.2	94.8	15.6
Internal Link Dist (m)		128.0			204.4			313.2			301.0	
Turn Bay Length (m)	62.5		64.5	70.0		63.5	45.0		62.5	97.5		50.0
Base Capacity (vph)	529	755	678	511	740	644	432	1513	754	392	1596	780
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.09	0.17	0.50	0.10	0.11	0.19	0.47	0.22	0.25	0.39	0.09

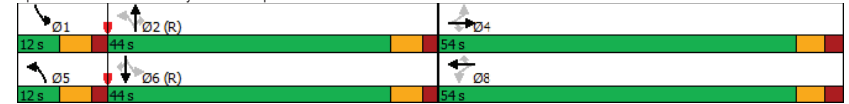
**Intersection Summary**  
 Cycle Length: 110  
 Actuated Cycle Length: 110  
 Offset: 27 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated

Lanes, Volumes, Timings  
6: Terry Fox & Campeau

11/02/2023

Maximum v/c Ratio: 0.80	Intersection Signal Delay: 29.0	Intersection LOS: C
Intersection Capacity Utilization 73.5%	ICU Level of Service D	
Analysis Period (min) 15		

Splits and Phases: 6: Terry Fox & Campeau



Intersection						
Int Delay, s/veh	1.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔			↔
Traffic Vol, veh/h	30	0	30	13	0	92
Future Vol, veh/h	30	0	30	13	0	92
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	30	0	30	13	0	92

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	129	37	0 0 43 0
Stage 1	37	-	- - - -
Stage 2	92	-	- - - -
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	865	1035	- - 1566 -
Stage 1	985	-	- - - -
Stage 2	932	-	- - - -
Platoon blocked, %	-	-	- - - -
Mov Cap-1 Maneuver	865	1035	- - 1566 -
Mov Cap-2 Maneuver	865	-	- - - -
Stage 1	985	-	- - - -
Stage 2	932	-	- - - -

Approach	WB	NB	SB
HCM Control Delay, s	9.3	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 865	1566	-
HCM Lane V/C Ratio	-	- 0.035	-	-
HCM Control Delay (s)	-	- 9.3	0	-
HCM Lane LOS	-	- A	A	-
HCM 95th %tile Q(veh)	-	- 0.1	0	-

Intersection												
Int Delay, s/veh	3.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔				↔			↔	
Traffic Vol, veh/h	0	0	10	30	0	0	5	12	13	0	52	0
Future Vol, veh/h	0	0	10	30	0	0	5	12	13	0	52	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
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	2	2	2	2	2
Mvmt Flow	0	0	10	30	0	0	5	12	13	0	52	0

Major/Minor	Minor2	Minor1	Major1	Major2
Conflicting Flow All	81	87	52 86	81 19 52 0 0 25 0 0
Stage 1	52	52	- 29 29	- - - - - - - -
Stage 2	29	35	- 57 52	- - - - - - - -
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	907	803	1016 900	809 1059 1554 - - 1589 - -
Stage 1	961	852	- 988 871	- - - - - - - -
Stage 2	988	866	- 955 852	- - - - - - - -
Platoon blocked, %	-	-	- - - -	- - - - - - - -
Mov Cap-1 Maneuver	905	801	1016 889	807 1059 1554 - - 1589 - -
Mov Cap-2 Maneuver	905	801	- 889 807	- - - - - - - -
Stage 1	958	852	- 985 868	- - - - - - - -
Stage 2	985	863	- 946 852	- - - - - - - -

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.6	9.2	1.2	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1554	-	-	1016	889	1589	-	-
HCM Lane V/C Ratio	0.003	-	-	0.01	0.034	-	-	-
HCM Control Delay (s)	7.3	0	-	8.6	9.2	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-

Lanes, Volumes, Timings  
4: Terry Fox & Kanata

11/02/2023

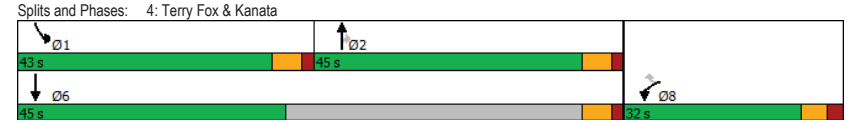
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔	↔	↑↑	↔	↔↔	↔↔
Traffic Volume (vph)	250	146	764	340	265	816
Future Volume (vph)	250	146	764	340	265	816
Satd. Flow (prot)	3216	1469	3316	1483	1658	3316
Fit Permitted	0.950				0.950	
Satd. Flow (perm)	3216	1469	3316	1452	1652	3316
Satd. Flow (RTOR)		146		340		
Lane Group Flow (vph)	250	146	764	340	265	816
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	31.2	31.2	25.0	25.0	11.0	25.0
Total Split (s)	32.0	32.0	45.0	45.0	43.0	45.0
Total Split (%)	26.7%	26.7%	37.5%	37.5%	35.8%	37.5%
Yellow Time (s)	3.7	3.7	4.2	4.2	4.2	4.2
All-Red Time (s)	2.5	2.5	1.8	1.8	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	6.0	6.0	6.0	6.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	Max	Max	None	Max
Act Effct Green (s)	12.4	12.4	39.3	39.3	19.5	64.9
Actuated g/C Ratio	0.14	0.14	0.44	0.44	0.22	0.72
v/c Ratio	0.56	0.44	0.53	0.41	0.73	0.34
Control Delay	42.0	11.1	21.4	4.0	45.5	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.0	11.1	21.4	4.0	45.5	5.1
LOS	D	B	C	A	D	A
Approach Delay	30.6		16.0			15.0
Approach LOS	C		B			B
Queue Length 50th (m)	20.8	0.0	48.4	0.0	42.3	22.2
Queue Length 95th (m)	35.5	16.5	82.6	17.0	71.3	35.9
Internal Link Dist (m)	616.6		846.8			487.6
Turn Bay Length (m)				100.0	85.5	
Base Capacity (vph)	933	530	1455	828	690	3029
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.28	0.53	0.41	0.38	0.27

Intersection Summary	
Cycle Length:	120
Actuated Cycle Length:	89.6
Natural Cycle:	80
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.73

Lanes, Volumes, Timings  
4: Terry Fox & Kanata

11/02/2023

Intersection Signal Delay: 17.9	Intersection LOS: B
Intersection Capacity Utilization 60.5%	ICU Level of Service B
Analysis Period (min) 15	



Lanes, Volumes, Timings  
5: Terry Fox & Signature SC

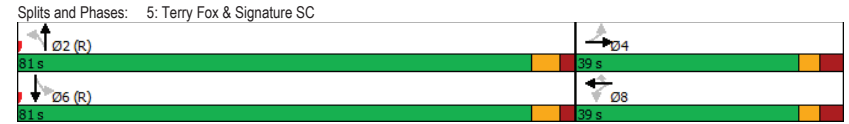
11/02/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	0	0	0	54	0	113	18	1020	68	82	999	0
Future Volume (vph)	0	0	0	54	0	113	18	1020	68	82	999	0
Satd. Flow (prot)	0	1745	0	0	1658	1483	1658	3286	0	1658	3316	0
Fit Permitted					0.757		0.239			0.211		
Satd. Flow (perm)	0	1745	0	0	1321	1483	417	3286	0	368	3316	0
Satd. Flow (RTOR)						113		11				
Lane Group Flow (vph)	0	0	0	0	54	113	18	1088	0	82	999	0
Turn Type				Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2				6
Permitted Phases	4			8		8	2			6		
Minimum Split (s)	31.6	31.6		31.6	31.6	31.6	31.4			32.8		32.8
Total Split (s)	39.0	39.0		39.0	39.0	39.0	81.0			81.0		81.0
Total Split (%)	32.5%	32.5%		32.5%	32.5%	32.5%	67.5%			67.5%		67.5%
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	4.2			4.2		4.2
All-Red Time (s)	3.6	3.6		3.6	3.6	3.6	2.2			2.2		2.2
Lost Time Adjust (s)		0.0			0.0	0.0	0.0			0.0		0.0
Total Lost Time (s)		6.6			6.6	6.6	6.4			6.4		6.4
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)					32.4	32.4	74.6	74.6		74.6	74.6	
Actuated g/C Ratio					0.27	0.27	0.62	0.62		0.62	0.62	
v/c Ratio					0.15	0.23	0.07	0.53		0.36	0.48	
Control Delay					34.9	7.4	4.8	15.4		16.6	13.3	
Queue Delay					0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay					34.9	7.4	4.8	15.4		16.6	13.3	
LOS					C	A	A	B		B	B	
Approach Delay					16.3			15.3			13.5	
Approach LOS					B			B			B	
Queue Length 50th (m)					9.7	0.0	2.3	109.2		8.8	62.6	
Queue Length 95th (m)					20.3	13.6	m0.6	130.7		20.6	77.6	
Internal Link Dist (m)		19.8			92.3			301.0			846.8	
Turn Bay Length (m)							51.0			61.0		
Base Capacity (vph)					356	482	259	2046		228	2061	
Starvation Cap Reductn					0	0	0	0		0	0	
Spillback Cap Reductn					0	0	0	0		0	0	
Storage Cap Reductn					0	0	0	0		0	0	
Reduced v/c Ratio					0.15	0.23	0.07	0.53		0.36	0.48	
<b>Intersection Summary</b>												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 49 (41%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green												
Natural Cycle: 65												
Control Type: Pretimed												
Maximum v/c Ratio: 0.53												
Intersection Signal Delay: 14.5												
Intersection LOS: B												
Intersection Capacity Utilization 64.9%												
ICU Level of Service C												
Analysis Period (min) 15												

Lanes, Volumes, Timings  
5: Terry Fox & Signature SC

11/02/2023

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



Lanes, Volumes, Timings  
6: Terry Fox & Campeau

11/02/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Traffic Volume (vph)	100	135	158	248	137	111	125	844	188	164	803	88
Future Volume (vph)	100	135	158	248	137	111	125	844	188	164	803	88
Satd. Flow (prot)	1658	1745	1483	1658	1712	1483	1658	3316	1483	1658	3316	1483
Fit Permitted	0.649			0.653			0.286			0.253		
Satd. Flow (perm)	1132	1745	1464	1139	1712	1464	499	3316	1449	441	3316	1463
Satd. Flow (RTOR)			158			111			184			89
Lane Group Flow (vph)	100	135	158	248	137	111	125	844	188	164	803	88
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4	4	8	8	8	5	2	2	1	6	6
Permitted Phases	4	4	4	8	8	8	5	2	2	1	6	6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	40.4	40.4	40.4	43.4	43.4	43.4	11.4	40.4	40.4	11.4	43.4	43.4
Total Split (s)	48.0	48.0	48.0	48.0	48.0	48.0	22.0	50.0	50.0	22.0	50.0	50.0
Total Split (%)	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	18.3%	41.7%	41.7%	18.3%	41.7%	41.7%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	2.7	2.7	2.7	2.7	2.7	2.7	2.2	2.2	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max	C-Max
Act Effct Green (s)	30.8	30.8	30.8	30.8	30.8	30.8	68.6	59.3	59.3	71.3	60.6	60.6
Actuated g/C Ratio	0.26	0.26	0.26	0.26	0.26	0.26	0.57	0.49	0.49	0.59	0.50	0.50
v/c Ratio	0.34	0.30	0.32	0.85	0.31	0.24	0.33	0.52	0.23	0.44	0.48	0.11
Control Delay	37.5	35.7	6.2	66.5	35.9	6.5	13.1	24.2	4.4	27.7	40.2	18.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.5	35.7	6.2	66.5	35.9	6.5	13.1	24.2	4.4	27.7	40.2	18.9
LOS	D	D	A	E	D	A	B	C	A	C	D	B
Approach Delay		24.3			44.6			19.8			36.5	
Approach LOS		C			D			B			D	
Queue Length 50th (m)	19.2	25.6	0.0	55.5	26.1	0.0	10.8	68.6	0.5	26.9	89.6	3.9
Queue Length 95th (m)	30.8	37.7	14.0	77.6	38.2	11.9	23.6	110.8	15.4	52.6	113.1	20.2
Internal Link Dist (m)		128.0			204.4			313.2			301.0	
Turn Bay Length (m)	62.5		64.5	70.0		63.5	45.0		62.5	97.5		50.0
Base Capacity (vph)	392	604	610	394	593	580	459	1638	808	434	1674	782
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.22	0.26	0.63	0.23	0.19	0.27	0.52	0.23	0.38	0.48	0.11

Intersection Summary

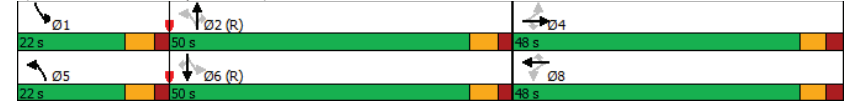
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 27 (23%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings  
6: Terry Fox & Campeau

11/02/2023

Maximum v/c Ratio: 0.85	Intersection LOS: C
Intersection Signal Delay: 30.0	ICU Level of Service E
Intersection Capacity Utilization 83.0%	
Analysis Period (min) 15	

Splits and Phases: 6: Terry Fox & Campeau



Intersection						
Int Delay, s/veh	1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔			↔
Traffic Vol, veh/h	22	0	95	30	0	58
Future Vol, veh/h	22	0	95	30	0	58
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	-	-	-	-	-
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	0	95	30	0	58

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	168	110	0 0 125 0
Stage 1	110	-	- - - -
Stage 2	58	-	- - - -
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	822	943	- - 1462 -
Stage 1	915	-	- - - -
Stage 2	965	-	- - - -
Platoon blocked, %	-	-	- - - -
Mov Cap-1 Maneuver	822	943	- - 1462 -
Mov Cap-2 Maneuver	822	-	- - - -
Stage 1	915	-	- - - -
Stage 2	965	-	- - - -

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 822	1462	-
HCM Lane V/C Ratio	-	- 0.027	-	-
HCM Control Delay (s)	-	- 9.5	0	-
HCM Lane LOS	-	- A	A	-
HCM 95th %tile Q(veh)	-	- 0.1	0	-

Intersection												
Int Delay, s/veh	2.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔				↔			↔	
Traffic Vol, veh/h	0	0	5	22	0	0	10	55	30	0	31	0
Future Vol, veh/h	0	0	5	22	0	0	10	55	30	0	31	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	-	-	-	-	-	-	-	-	-	-
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	2	2	2	2	2
Mvmt Flow	0	0	5	22	0	0	10	55	30	0	31	0

Major/Minor	Minor2	Minor1	Major1	Major2
Conflicting Flow All	121	136	31 124	121 70 31 0 0 85 0 0
Stage 1	31	31	- 90 90	- - - - - - - -
Stage 2	90	105	- 34 31	- - - - - - - -
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	854	755	1043 850	769 993 1582 - - 1512 - -
Stage 1	986	869	- 917 820	- - - - - - - -
Stage 2	917	808	- 982 869	- - - - - - - -
Platoon blocked, %	-	-	- - - -	- - - - - - - -
Mov Cap-1 Maneuver	850	750	1043 842	764 993 1582 - - 1512 - -
Mov Cap-2 Maneuver	850	750	- 842 764	- - - - - - - -
Stage 1	979	869	- 911 814	- - - - - - - -
Stage 2	911	802	- 977 869	- - - - - - - -

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.5	9.4	0.8	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1582	-	-	1043	842	1512	-	-
HCM Lane V/C Ratio	0.006	-	-	0.005	0.026	-	-	-
HCM Control Delay (s)	7.3	0	-	8.5	9.4	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-

## MOVEMENT SUMMARY

Site: 101 [Huntmar-Campeau AM FT2025 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Arcadia Stage 6  
Site Category: (None)  
Roundabout

Vehicle Movement Performance															
Mov ID	Turn Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed	
		[ Total HV ]	%	[ Total HV ]	%				[ Veh. ]	Dist ]					
		veh/h	%	veh/h	%	v/c	sec			veh	m			km/h	
South: Huntmar															
1	L2	All MCs	43	2.0	43	2.0	0.045	8.0	LOS A	0.1	0.8	0.22	0.59	0.22	47.2
2	T1	All MCs	405	2.0	405	2.0	0.417	2.5	LOS A	1.5	11.0	0.32	0.29	0.32	47.5
3	R2	All MCs	49	2.0	49	2.0	0.051	3.1	LOS A	0.1	0.9	0.23	0.40	0.23	50.7
Approach			497	2.0	497	2.0	0.417	3.0	LOS A	1.5	11.0	0.30	0.33	0.30	47.7
East: Campeau															
4	L2	All MCs	138	2.0	138	2.0	0.182	11.1	LOS B	0.5	3.5	0.41	0.74	0.41	46.7
5	T1	All MCs	111	2.0	111	2.0	0.150	5.2	LOS A	0.4	3.0	0.42	0.51	0.42	54.1
6	R2	All MCs	41	2.0	41	2.0	0.056	5.4	LOS A	0.1	1.0	0.39	0.61	0.39	50.0
Approach			290	2.0	290	2.0	0.182	8.0	LOS A	0.5	3.5	0.41	0.63	0.41	49.7
North: Huntmar															
7	L2	All MCs	13	2.0	13	2.0	0.204	8.5	LOS A	0.6	4.4	0.33	0.35	0.33	49.8
8	T1	All MCs	352	2.0	352	2.0	0.204	2.7	LOS A	0.6	4.4	0.32	0.33	0.32	47.4
9	R2	All MCs	118	2.0	118	2.0	0.133	3.5	LOS A	0.4	2.7	0.31	0.46	0.31	50.4
Approach			483	2.0	483	2.0	0.204	3.0	LOS A	0.6	4.4	0.32	0.36	0.32	48.1
West: Campeau															
10	L2	All MCs	85	2.0	85	2.0	0.113	11.1	LOS B	0.3	2.2	0.40	0.73	0.40	46.7
11	T1	All MCs	86	2.0	86	2.0	0.111	4.8	LOS A	0.3	2.0	0.38	0.48	0.38	54.4
12	R2	All MCs	41	2.0	41	2.0	0.052	4.9	LOS A	0.1	0.9	0.36	0.57	0.36	50.4
Approach			212	2.0	212	2.0	0.113	7.3	LOS A	0.3	2.2	0.38	0.60	0.38	50.2
All Vehicles			1482	2.0	1482	2.0	0.417	4.6	LOS A	1.5	11.0	0.34	0.44	0.34	48.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Sieglösch M1 implied by US HCM 2010 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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## MOVEMENT SUMMARY

Site: 101 [Country Glen-Campeau AM FT2025 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Arcadia Stage 5  
Site Category: (None)  
Roundabout

Vehicle Movement Performance															
Mov ID	Turn Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed	
		[ Total HV ]	%	[ Total HV ]	%				[ Veh. ]	Dist ]					
		veh/h	%	veh/h	%	v/c	sec			veh	m			km/h	
South: Country Glen															
1	L2	All MCs	40	2.0	40	2.0	0.023	1.9	LOS A	0.1	0.4	0.19	0.26	0.19	37.5
2	T1	All MCs	1	2.0	1	2.0	0.023	0.4	LOS A	0.1	0.4	0.18	0.23	0.18	29.5
3	R2	All MCs	4	2.0	4	2.0	0.023	0.4	LOS A	0.1	0.4	0.18	0.23	0.18	37.7
Approach			45	2.0	45	2.0	0.023	1.7	LOS A	0.1	0.4	0.18	0.26	0.18	37.3
East: Campeau															
4	L2	All MCs	7	2.0	7	2.0	0.058	9.6	LOS A	0.2	1.1	0.15	0.39	0.15	38.7
5	T1	All MCs	107	2.0	107	2.0	0.058	3.5	LOS A	0.2	1.1	0.15	0.37	0.15	55.4
6	R2	All MCs	5	2.0	5	2.0	0.058	4.4	LOS A	0.1	1.0	0.14	0.35	0.14	38.9
Approach			119	2.0	119	2.0	0.058	3.9	LOS A	0.2	1.1	0.15	0.37	0.15	53.1
North: Country Glen															
7	L2	All MCs	19	2.0	19	2.0	0.158	2.0	LOS A	0.4	3.1	0.21	0.12	0.21	38.3
8	T1	All MCs	1	2.0	1	2.0	0.158	0.5	LOS A	0.4	3.1	0.21	0.12	0.21	29.7
9	R2	All MCs	138	2.0	138	2.0	0.158	0.5	LOS A	0.4	3.1	0.21	0.12	0.21	38.4
Approach			158	2.0	158	2.0	0.158	0.6	LOS A	0.4	3.1	0.21	0.12	0.21	38.4
West: Campeau															
10	L2	All MCs	50	2.0	50	2.0	0.067	9.5	LOS A	0.2	1.7	0.10	0.56	0.10	37.7
11	T1	All MCs	74	2.0	74	2.0	0.067	3.4	LOS A	0.2	1.7	0.10	0.41	0.10	54.8
12	R2	All MCs	20	2.0	20	2.0	0.067	4.3	LOS A	0.2	1.7	0.10	0.35	0.10	38.8
Approach			144	2.0	144	2.0	0.067	5.6	LOS A	0.2	1.7	0.10	0.45	0.10	45.1
All Vehicles			466	2.0	466	2.0	0.158	3.1	LOS A	0.4	3.1	0.16	0.30	0.16	43.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Sieglösch M1 implied by US HCM 2010 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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## MOVEMENT SUMMARY

**Site: 101 [Winterset-Campeau AM FT2025 (Site Folder: General)]**

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Arcadia Stage 5  
Site Category: (None)  
Roundabout

Vehicle Movement Performance														
Mov ID	Turn Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
		[ Total HV ]	%	[ Total HV ]	%				[ Veh. ]	Dist ]				
		veh/h	%	veh/h	%	v/c	sec			veh	m	Rate	Cycles	km/h
East: Campeau														
5	T1	All MCs	67 2.0	67 2.0	0.043	3.3	LOS A	0.1	1.0	0.07	0.34	0.07	0.07	55.9
6	R2	All MCs	26 2.0	26 2.0	0.043	4.2	LOS A	0.1	1.0	0.07	0.38	0.07	0.07	38.7
Approach			93 2.0	93 2.0	0.043	3.6	LOS A	0.1	1.0	0.07	0.35	0.07	0.07	49.8
North: Winterset														
7	L2	All MCs	70 2.0	70 2.0	0.066	1.7	LOS A	0.2	1.2	0.12	0.25	0.12	0.12	37.5
9	R2	All MCs	52 2.0	52 2.0	0.049	0.2	LOS A	0.1	0.9	0.13	0.04	0.13	0.13	38.8
Approach			122 2.0	122 2.0	0.066	1.0	LOS A	0.2	1.2	0.12	0.16	0.12	0.12	38.0
West: Campeau														
10	L2	All MCs	17 2.0	17 2.0	0.057	9.6	LOS A	0.2	1.4	0.17	0.44	0.17	0.17	38.3
11	T1	All MCs	101 2.0	101 2.0	0.057	3.6	LOS A	0.2	1.4	0.17	0.38	0.17	0.17	55.0
Approach			118 2.0	118 2.0	0.057	4.4	LOS A	0.2	1.4	0.17	0.39	0.17	0.17	51.7
All Vehicles			333 2.0	333 2.0	0.066	2.9	LOS A	0.2	1.4	0.13	0.29	0.13	0.13	45.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Sieglösch M1 implied by US HCM 2010 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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## MOVEMENT SUMMARY

**Site: 101 [Huntmar-Campeau PM FT2025 (Site Folder: General)]**

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Arcadia Stage 6  
Site Category: (None)  
Roundabout

Vehicle Movement Performance														
Mov ID	Turn Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
		[ Total HV ]	%	[ Total HV ]	%				[ Veh. ]	Dist ]				
		veh/h	%	veh/h	%	v/c	sec			veh	m	Rate	Cycles	km/h
South: Huntmar														
1	L2	All MCs	92 2.0	92 2.0	0.113	8.8	LOS A	0.3	2.2	0.36	0.67	0.36	0.36	46.8
2	T1	All MCs	440 2.0	440 2.0	0.530	4.1	LOS A	2.4	16.8	0.52	0.51	0.59	0.59	46.7
3	R2	All MCs	140 2.0	140 2.0	0.172	4.0	LOS A	0.5	3.5	0.38	0.51	0.38	0.38	50.2
Approach			672 2.0	672 2.0	0.530	4.7	LOS A	2.4	16.8	0.47	0.53	0.51	0.51	47.4
East: Campeau														
4	L2	All MCs	129 2.0	129 2.0	0.194	11.9	LOS B	0.5	3.7	0.47	0.79	0.47	0.47	46.4
5	T1	All MCs	80 2.0	80 2.0	0.125	5.9	LOS A	0.3	2.4	0.47	0.58	0.47	0.47	53.9
6	R2	All MCs	22 2.0	22 2.0	0.034	6.1	LOS A	0.1	0.6	0.45	0.65	0.45	0.45	49.6
Approach			231 2.0	231 2.0	0.194	9.2	LOS A	0.5	3.7	0.47	0.71	0.47	0.47	49.0
North: Huntmar														
7	L2	All MCs	32 2.0	32 2.0	0.298	8.7	LOS A	1.0	7.0	0.37	0.39	0.37	0.37	49.5
8	T1	All MCs	497 2.0	497 2.0	0.298	2.8	LOS A	1.0	7.0	0.36	0.35	0.36	0.36	47.2
9	R2	All MCs	158 2.0	158 2.0	0.180	3.6	LOS A	0.5	3.7	0.33	0.47	0.33	0.33	50.3
Approach			687 2.0	687 2.0	0.298	3.3	LOS A	1.0	7.0	0.35	0.38	0.35	0.35	47.9
West: Campeau														
10	L2	All MCs	184 2.0	184 2.0	0.274	12.1	LOS B	0.8	5.9	0.50	0.79	0.50	0.50	46.3
11	T1	All MCs	188 2.0	188 2.0	0.271	5.7	LOS A	0.8	5.5	0.48	0.56	0.48	0.48	53.8
12	R2	All MCs	95 2.0	95 2.0	0.134	5.5	LOS A	0.3	2.5	0.42	0.63	0.42	0.42	50.1
Approach			467 2.0	467 2.0	0.274	8.2	LOS A	0.8	5.9	0.48	0.67	0.48	0.48	49.8
All Vehicles			2057 2.0	2057 2.0	0.530	5.5	LOS A	2.4	16.8	0.43	0.53	0.45	0.45	48.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Sieglösch M1 implied by US HCM 2010 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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## MOVEMENT SUMMARY

Site: 101 [Country Glen-Campeau PM FT2025 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Arcadia Stage 5  
Site Category: (None)  
Roundabout

Vehicle Movement Performance															
Mov ID	Turn Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed	
		[ Total HV ]	%	[ Total HV ]	%				[ Veh. ]	Dist ]					
		veh/h	%	veh/h	%	v/c	sec			m				km/h	
South: Country Glen															
1	L2	All MCs	34	2.0	34	2.0	0.023	2.4	LOS A	0.1	0.4	0.29	0.34	0.29	37.3
2	T1	All MCs	1	2.0	1	2.0	0.023	0.9	LOS A	0.1	0.4	0.28	0.31	0.28	29.4
3	R2	All MCs	5	2.0	5	2.0	0.023	0.9	LOS A	0.1	0.4	0.28	0.31	0.28	37.6
Approach			40	2.0	40	2.0	0.023	2.2	LOS A	0.1	0.4	0.29	0.33	0.29	37.1
East: Campeau															
4	L2	All MCs	11	2.0	11	2.0	0.074	9.9	LOS A	0.2	1.4	0.24	0.44	0.24	38.4
5	T1	All MCs	110	2.0	110	2.0	0.074	3.8	LOS A	0.2	1.4	0.23	0.42	0.23	54.8
6	R2	All MCs	20	2.0	20	2.0	0.074	4.7	LOS A	0.2	1.3	0.22	0.41	0.22	38.5
Approach			141	2.0	141	2.0	0.074	4.4	LOS A	0.2	1.4	0.23	0.42	0.23	50.1
North: Country Glen															
7	L2	All MCs	11	2.0	11	2.0	0.097	1.9	LOS A	0.3	1.8	0.20	0.11	0.20	38.3
8	T1	All MCs	1	2.0	1	2.0	0.097	0.4	LOS A	0.3	1.8	0.20	0.11	0.20	29.7
9	R2	All MCs	85	2.0	85	2.0	0.097	0.4	LOS A	0.3	1.8	0.20	0.11	0.20	38.5
Approach			97	2.0	97	2.0	0.097	0.6	LOS A	0.3	1.8	0.20	0.11	0.20	38.3
West: Campeau															
10	L2	All MCs	162	2.0	162	2.0	0.163	9.5	LOS A	0.6	4.6	0.10	0.60	0.10	37.3
11	T1	All MCs	154	2.0	154	2.0	0.163	3.4	LOS A	0.6	4.6	0.10	0.36	0.10	55.4
12	R2	All MCs	37	2.0	37	2.0	0.163	4.3	LOS A	0.6	4.6	0.10	0.34	0.10	38.9
Approach			353	2.0	353	2.0	0.163	6.3	LOS A	0.6	4.6	0.10	0.47	0.10	43.6
All Vehicles			631	2.0	631	2.0	0.163	4.7	LOS A	0.6	4.6	0.16	0.40	0.16	43.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Sieglösch M1 implied by US HCM 2010 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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## MOVEMENT SUMMARY

Site: 101 [Winterset-Campeau PM FT2025 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Arcadia Stage 5  
Site Category: (None)  
Roundabout

Vehicle Movement Performance															
Mov ID	Turn Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed	
		[ Total HV ]	%	[ Total HV ]	%				[ Veh. ]	Dist ]					
		veh/h	%	veh/h	%	v/c	sec			m				km/h	
East: Campeau															
5	T1	All MCs	109	2.0	109	2.0	0.086	3.5	LOS A	0.3	2.2	0.15	0.35	0.15	55.5
6	R2	All MCs	71	2.0	71	2.0	0.086	4.4	LOS A	0.3	2.2	0.15	0.42	0.15	38.4
Approach			180	2.0	180	2.0	0.086	3.8	LOS A	0.3	2.2	0.15	0.37	0.15	47.3
North: Winterset															
7	L2	All MCs	46	2.0	46	2.0	0.045	1.8	LOS A	0.1	0.8	0.16	0.27	0.16	37.4
9	R2	All MCs	33	2.0	33	2.0	0.032	0.3	LOS A	0.1	0.6	0.16	0.06	0.16	38.7
Approach			79	2.0	79	2.0	0.045	1.2	LOS A	0.1	0.8	0.16	0.18	0.16	37.9
West: Campeau															
10	L2	All MCs	54	2.0	54	2.0	0.078	9.5	LOS A	0.3	2.0	0.14	0.54	0.14	37.8
11	T1	All MCs	111	2.0	111	2.0	0.078	3.5	LOS A	0.3	2.0	0.14	0.38	0.14	54.9
Approach			165	2.0	165	2.0	0.078	5.4	LOS A	0.3	2.0	0.14	0.43	0.14	47.8
All Vehicles			424	2.0	424	2.0	0.086	4.0	LOS A	0.3	2.2	0.15	0.36	0.15	45.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Sieglösch M1 implied by US HCM 2010 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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# Appendix I

Synchro and Sidra Intersection Worksheets – 2030 Future Total Conditions

Lanes, Volumes, Timings  
4: Terry Fox & Kanata

11/02/2023

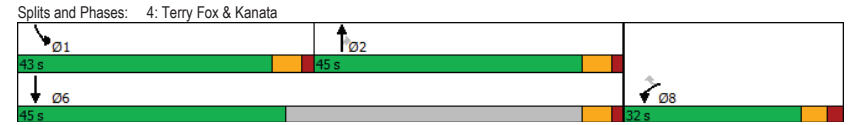
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔	↔	↕↕	↔	↔↔	↕↕
Traffic Volume (vph)	317	337	760	172	253	582
Future Volume (vph)	317	337	760	172	253	582
Satd. Flow (prot)	3185	1414	3283	1441	1595	3283
Fit Permitted	0.950				0.950	
Satd. Flow (perm)	3185	1414	3283	1441	1595	3283
Satd. Flow (RTOR)		337		172		
Lane Group Flow (vph)	317	337	760	172	253	582
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	31.2	31.2	25.0	25.0	11.0	25.0
Total Split (s)	32.0	32.0	45.0	45.0	43.0	45.0
Total Split (%)	26.7%	26.7%	37.5%	37.5%	35.8%	37.5%
Yellow Time (s)	3.7	3.7	4.2	4.2	4.2	4.2
All-Red Time (s)	2.5	2.5	1.8	1.8	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	6.0	6.0	6.0	6.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	Max	Max	None	Max
Act Effct Green (s)	14.7	14.7	39.4	39.4	20.0	65.5
Actuated g/C Ratio	0.16	0.16	0.43	0.43	0.22	0.71
v/c Ratio	0.63	0.66	0.54	0.24	0.74	0.25
Control Delay	42.8	11.2	23.3	4.4	47.4	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.8	11.2	23.3	4.4	47.4	5.4
LOS	D	B	C	A	D	A
Approach Delay	26.6		19.8			18.1
Approach LOS	C		B			B
Queue Length 50th (m)	27.1	0.0	50.8	0.0	41.6	16.2
Queue Length 95th (m)	44.6	24.8	89.3	13.5	71.9	28.3
Internal Link Dist (m)	616.6		846.8			487.6
Turn Bay Length (m)				100.0	85.5	
Base Capacity (vph)	898	640	1399	713	644	2924
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.53	0.54	0.24	0.39	0.20

Intersection Summary	
Cycle Length:	120
Actuated Cycle Length:	92.5
Natural Cycle:	80
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.74

Lanes, Volumes, Timings  
4: Terry Fox & Kanata

11/02/2023

Intersection Signal Delay: 21.1	Intersection LOS: C
Intersection Capacity Utilization 61.7%	ICU Level of Service B
Analysis Period (min) 15	



Lanes, Volumes, Timings  
5: Terry Fox & Signature SC

11/02/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	0	0	0	9	0	28	0	930	20	30	948	0
Future Volume (vph)	0	0	0	9	0	28	0	930	20	30	948	0
Satd. Flow (prot)	0	1745	0	0	1386	1455	1745	3233	0	1658	3283	0
Fit Permitted					0.757					0.266		
Satd. Flow (perm)	0	1745	0	0	1104	1455	1745	3233	0	464	3283	0
Satd. Flow (RTOR)						34		4				
Lane Group Flow (vph)	0	0	0	0	9	28	0	950	0	30	948	0
Turn Type				Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Minimum Split (s)	31.6	31.6		31.6	31.6	31.6	31.4	31.4		32.8	32.8	
Total Split (s)	32.0	32.0		32.0	32.0	32.0	78.0	78.0		78.0	78.0	
Total Split (%)	29.1%	29.1%		29.1%	29.1%	29.1%	70.9%	70.9%		70.9%	70.9%	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	4.2	4.2		4.2	4.2	
All-Red Time (s)	3.6	3.6		3.6	3.6	3.6	2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.6			6.6	6.6	6.4	6.4		6.4	6.4	
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)					25.4	25.4		71.6		71.6	71.6	
Actuated g/C Ratio					0.23	0.23		0.65		0.65	0.65	
v/c Ratio					0.04	0.08		0.45		0.10	0.44	
Control Delay					33.4	9.9		14.4		8.2	10.2	
Queue Delay					0.0	0.0		0.0		0.0	0.0	
Total Delay					33.4	9.9		14.4		8.2	10.2	
LOS					C	A		B		A	B	
Approach Delay					15.6			14.4			10.2	
Approach LOS					B			B			B	
Queue Length 50th (m)					1.5	0.0		90.3		2.2	48.0	
Queue Length 95th (m)					5.6	6.1		71.8		6.0	60.8	
Internal Link Dist (m)		19.8			92.3			301.0			846.8	
Turn Bay Length (m)										61.0		
Base Capacity (vph)					254	362		2105		302	2136	
Starvation Cap Reductn					0	0		0		0	0	
Spillback Cap Reductn					0	0		0		0	0	
Storage Cap Reductn					0	0		0		0	0	
Reduced v/c Ratio					0.04	0.08		0.45		0.10	0.44	
<b>Intersection Summary</b>												
Cycle Length: 110												
Actuated Cycle Length: 110												
Offset: 49 (45%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green												
Natural Cycle: 65												
Control Type: Pretimed												
Maximum v/c Ratio: 0.45												
Intersection Signal Delay: 12.3      Intersection LOS: B												
Intersection Capacity Utilization 47.0%      ICU Level of Service A												
Analysis Period (min) 15												

Lanes, Volumes, Timings  
5: Terry Fox & Signature SC

11/02/2023



Lanes, Volumes, Timings  
6: Terry Fox & Campeau

11/02/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Traffic Volume (vph)	60	72	110	258	79	71	84	770	164	98	709	69
Future Volume (vph)	60	72	110	258	79	71	84	770	164	98	709	69
Satd. Flow (prot)	1642	1745	1441	1580	1712	1363	1658	3191	1441	1658	3191	1483
Fit Permitted	0.706			0.710			0.333			0.279		
Satd. Flow (perm)	1220	1745	1421	1179	1712	1363	581	3191	1410	487	3191	1463
Satd. Flow (RTOR)			110			97			164			
Lane Group Flow (vph)	60	72	110	258	79	71	84	770	164	98	709	69
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4	4	8	8	8	5	2	2	1	6	6
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	40.4	40.4	40.4	43.4	43.4	43.4	11.4	40.4	40.4	11.4	43.4	43.4
Total Split (s)	54.0	54.0	54.0	54.0	54.0	54.0	12.0	44.0	44.0	12.0	44.0	44.0
Total Split (%)	49.1%	49.1%	49.1%	49.1%	49.1%	49.1%	10.9%	40.0%	40.0%	10.9%	40.0%	40.0%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	2.7	2.7	2.7	2.7	2.7	2.7	2.2	2.2	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max	C-Max
Act Effct Green (s)	30.2	30.2	30.2	30.2	30.2	30.2	60.2	52.1	52.1	62.3	55.0	55.0
Actuated g/C Ratio	0.27	0.27	0.27	0.27	0.27	0.27	0.55	0.47	0.47	0.57	0.50	0.50
v/c Ratio	0.18	0.15	0.23	0.80	0.17	0.16	0.21	0.51	0.22	0.27	0.44	0.09
Control Delay	28.5	28.0	5.8	54.1	28.4	3.0	12.6	23.8	4.5	27.3	43.9	18.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.5	28.0	5.8	54.1	28.4	3.0	12.6	23.8	4.5	27.3	43.9	18.3
LOS	C	C	A	D	C	A	B	C	A	C	D	B
Approach Delay	18.0				40.2			19.7			40.0	
Approach LOS	B				D			B			D	
Queue Length 50th (m)	9.8	11.7	0.0	51.3	12.9	0.0	7.0	58.4	0.0	16.3	86.4	3.1
Queue Length 95th (m)	17.6	19.7	10.9	70.7	21.2	5.2	17.2	96.4	14.0	34.6	105.4	15.7
Internal Link Dist (m)		128.0			204.4			313.2			301.0	
Turn Bay Length (m)	62.5		64.5	70.0		63.5	45.0		62.5	97.5		50.0
Base Capacity (vph)	527	755	677	510	740	644	396	1512	754	365	1594	779
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.10	0.16	0.51	0.11	0.11	0.21	0.51	0.22	0.27	0.44	0.09

Intersection Summary

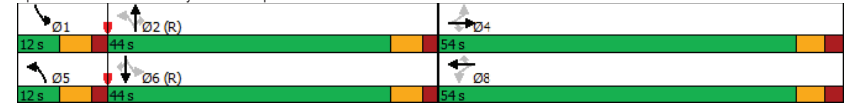
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 27 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings  
6: Terry Fox & Campeau

11/02/2023

Maximum v/c Ratio: 0.80	Intersection LOS: C
Intersection Signal Delay: 29.8	ICU Level of Service D
Intersection Capacity Utilization 73.5%	
Analysis Period (min) 15	

Splits and Phases: 6: Terry Fox & Campeau



Intersection						
Int Delay, s/veh	1.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔			↔
Traffic Vol, veh/h	30	0	30	13	0	92
Future Vol, veh/h	30	0	30	13	0	92
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	30	0	30	13	0	92

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	129	37	0 0 43 0
Stage 1	37	-	- - - -
Stage 2	92	-	- - - -
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	865	1035	- - 1566 -
Stage 1	985	-	- - - -
Stage 2	932	-	- - - -
Platoon blocked, %	-	-	- - - -
Mov Cap-1 Maneuver	865	1035	- - 1566 -
Mov Cap-2 Maneuver	865	-	- - - -
Stage 1	985	-	- - - -
Stage 2	932	-	- - - -

Approach	WB	NB	SB
HCM Control Delay, s	9.3	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 865	1566	-
HCM Lane V/C Ratio	-	- 0.035	-	-
HCM Control Delay (s)	-	- 9.3	0	-
HCM Lane LOS	-	- A	A	-
HCM 95th %tile Q(veh)	-	- 0.1	0	-

Intersection												
Int Delay, s/veh	3.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔				↔			↔	
Traffic Vol, veh/h	0	0	10	30	0	0	5	12	13	0	52	0
Future Vol, veh/h	0	0	10	30	0	0	5	12	13	0	52	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
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	2	2	2	2	2
Mvmt Flow	0	0	10	30	0	0	5	12	13	0	52	0

Major/Minor	Minor2	Minor1	Major1	Major2
Conflicting Flow All	81	87	52 86	81 19 52 0 0 25 0 0
Stage 1	52	52	- 29 29	- - - - - - - -
Stage 2	29	35	- 57 52	- - - - - - - -
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	907	803	1016 900	809 1059 1554 - - 1589 - -
Stage 1	961	852	- 988 871	- - - - - - - -
Stage 2	988	866	- 955 852	- - - - - - - -
Platoon blocked, %	-	-	- - - -	- - - - - - - -
Mov Cap-1 Maneuver	905	801	1016 889	807 1059 1554 - - 1589 - -
Mov Cap-2 Maneuver	905	801	- 889 807	- - - - - - - -
Stage 1	958	852	- 985 868	- - - - - - - -
Stage 2	985	863	- 946 852	- - - - - - - -

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.6	9.2	1.2	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1554	-	-	1016	889	1589	-	-
HCM Lane V/C Ratio	0.003	-	-	0.01	0.034	-	-	-
HCM Control Delay (s)	7.3	0	-	8.6	9.2	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-

Lanes, Volumes, Timings  
4: Terry Fox & Kanata

11/02/2023

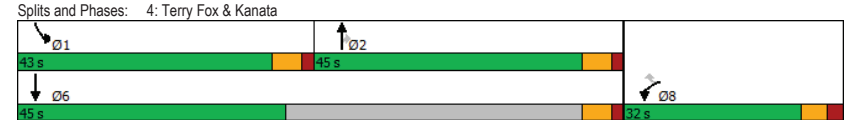
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔	↔	↑↑	↔	↔↔	↔↔
Traffic Volume (vph)	250	146	859	340	265	888
Future Volume (vph)	250	146	859	340	265	888
Satd. Flow (prot)	3216	1469	3316	1483	1658	3316
Fit Permitted	0.950				0.950	
Satd. Flow (perm)	3216	1469	3316	1452	1653	3316
Satd. Flow (RTOR)		146		340		
Lane Group Flow (vph)	250	146	859	340	265	888
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	31.2	31.2	25.0	25.0	11.0	25.0
Total Split (s)	32.0	32.0	45.0	45.0	43.0	45.0
Total Split (%)	26.7%	26.7%	37.5%	37.5%	35.8%	37.5%
Yellow Time (s)	3.7	3.7	4.2	4.2	4.2	4.2
All-Red Time (s)	2.5	2.5	1.8	1.8	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	6.0	6.0	6.0	6.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	Max	Max	None	Max
Act Effct Green (s)	12.4	12.4	39.3	39.3	19.5	64.9
Actuated g/C Ratio	0.14	0.14	0.44	0.44	0.22	0.72
v/c Ratio	0.56	0.44	0.59	0.41	0.73	0.37
Control Delay	42.0	11.1	22.6	4.0	45.5	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.0	11.1	22.6	4.0	45.5	5.3
LOS	D	B	C	A	D	A
Approach Delay	30.6		17.3			14.6
Approach LOS	C		B			B
Queue Length 50th (m)	20.8	0.0	56.5	0.0	42.3	24.9
Queue Length 95th (m)	35.5	16.5	95.5	17.0	71.3	40.0
Internal Link Dist (m)	616.6		846.8			487.6
Turn Bay Length (m)				100.0	85.5	
Base Capacity (vph)	933	530	1455	828	690	3029
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.28	0.59	0.41	0.38	0.29

Intersection Summary	
Cycle Length:	120
Actuated Cycle Length:	89.6
Natural Cycle:	80
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.73

Lanes, Volumes, Timings  
4: Terry Fox & Kanata

11/02/2023

Intersection Signal Delay: 18.1	Intersection LOS: B
Intersection Capacity Utilization 63.3%	ICU Level of Service B
Analysis Period (min) 15	



Lanes, Volumes, Timings  
5: Terry Fox & Signature SC

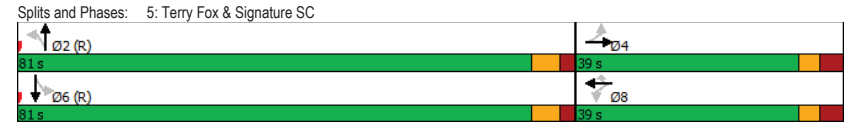
11/02/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	0	0	0	54	0	113	18	1149	68	82	1086	0
Future Volume (vph)	0	0	0	54	0	113	18	1149	68	82	1086	0
Satd. Flow (prot)	0	1745	0	0	1658	1483	1658	3289	0	1658	3316	0
Fit Permitted					0.757		0.211			0.173		
Satd. Flow (perm)	0	1745	0	0	1321	1483	368	3289	0	302	3316	0
Satd. Flow (RTOR)						94		9				
Lane Group Flow (vph)	0	0	0	0	54	113	18	1217	0	82	1086	0
Turn Type				Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Minimum Split (s)	31.6	31.6		31.6	31.6	31.6	31.4	31.4		32.8	32.8	
Total Split (s)	39.0	39.0		39.0	39.0	39.0	81.0	81.0		81.0	81.0	
Total Split (%)	32.5%	32.5%		32.5%	32.5%	32.5%	67.5%	67.5%		67.5%	67.5%	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	4.2	4.2		4.2	4.2	
All-Red Time (s)	3.6	3.6		3.6	3.6	3.6	2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.6			6.6	6.6	6.4	6.4		6.4	6.4	
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)					32.4	32.4	74.6	74.6		74.6	74.6	
Actuated g/C Ratio					0.27	0.27	0.62	0.62		0.62	0.62	
v/c Ratio					0.15	0.24	0.08	0.59		0.44	0.53	
Control Delay					34.9	10.9	3.6	14.7		20.9	13.9	
Queue Delay					0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay					34.9	10.9	3.6	14.7		20.9	13.9	
LOS					C	B	A	B		C	B	
Approach Delay					18.7			14.5			14.4	
Approach LOS					B			B			B	
Queue Length 50th (m)					9.7	3.3	1.4	132.4		9.4	70.7	
Queue Length 95th (m)					20.3	17.3	m0.4	155.8		24.2	87.2	
Internal Link Dist (m)		19.8			92.3			301.0			846.8	
Turn Bay Length (m)							51.0			61.0		
Base Capacity (vph)					356	469	228	2048		187	2061	
Starvation Cap Reductn					0	0	0	0		0	0	
Spillback Cap Reductn					0	0	0	0		0	0	
Storage Cap Reductn					0	0	0	0		0	0	
Reduced v/c Ratio					0.15	0.24	0.08	0.59		0.44	0.53	
<b>Intersection Summary</b>												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 49 (41%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green												
Natural Cycle: 75												
Control Type: Pretimed												
Maximum v/c Ratio: 0.59												
Intersection Signal Delay: 14.7												
Intersection Capacity Utilization 68.6%												
Intersection LOS: B												
ICU Level of Service C												
Analysis Period (min) 15												

Lanes, Volumes, Timings  
5: Terry Fox & Signature SC

11/02/2023

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





Lanes, Volumes, Timings  
6: Terry Fox & Campeau

11/02/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Traffic Volume (vph)	98	213	155	248	210	111	125	955	188	164	875	88
Future Volume (vph)	98	213	155	248	210	111	125	955	188	164	875	88
Satd. Flow (prot)	1658	1745	1483	1658	1712	1483	1658	3316	1483	1658	3316	1483
Fit Permitted	0.538			0.533			0.242			0.192		
Satd. Flow (perm)	938	1745	1464	929	1712	1464	422	3316	1449	335	3316	1463
Satd. Flow (RTOR)			155			111			162			89
Lane Group Flow (vph)	98	213	155	248	210	111	125	955	188	164	875	88
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1		6
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	40.4	40.4	40.4	43.4	43.4	43.4	11.4	40.4	40.4	11.4	43.4	43.4
Total Split (s)	48.0	48.0	48.0	48.0	48.0	48.0	22.0	50.0	50.0	22.0	50.0	50.0
Total Split (%)	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	18.3%	41.7%	41.7%	18.3%	41.7%	41.7%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	2.7	2.7	2.7	2.7	2.7	2.7	2.2	2.2	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max	C-Max
Act Effct Green (s)	34.6	34.6	34.6	34.6	34.6	34.6	64.7	55.0	55.0	67.7	56.6	56.6
Actuated g/C Ratio	0.29	0.29	0.29	0.29	0.29	0.29	0.54	0.46	0.46	0.56	0.47	0.47
v/c Ratio	0.36	0.42	0.29	0.93	0.43	0.22	0.38	0.63	0.25	0.53	0.56	0.12
Control Delay	36.1	36.0	5.7	80.0	36.1	6.1	15.6	29.1	6.4	33.3	45.5	20.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.1	36.0	5.7	80.0	36.1	6.1	15.6	29.1	6.4	33.3	45.5	20.1
LOS	D	D	A	E	D	A	B	C	A	C	D	C
Approach Delay		25.9			49.4			24.4			41.7	
Approach LOS		C			D			C			D	
Queue Length 50th (m)	17.9	39.8	0.0	55.5	39.3	0.0	12.3	89.9	3.4	30.2	101.8	4.5
Queue Length 95th (m)	31.3	57.6	13.8	#93.1	57.2	11.9	23.6	130.5	19.4	54.2	123.3	20.7
Internal Link Dist (m)		128.0			204.4			313.2			301.0	
Turn Bay Length (m)	62.5		64.5	70.0		63.5	45.0		62.5	97.5		50.0
Base Capacity (vph)	325	604	608	322	593	580	407	1520	752	371	1562	736
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.35	0.25	0.77	0.35	0.19	0.31	0.63	0.25	0.44	0.56	0.12

Intersection Summary

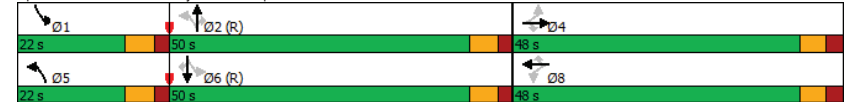
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 27 (23%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings  
6: Terry Fox & Campeau

11/02/2023

Maximum v/c Ratio: 0.93	Intersection LOS: C
Intersection Signal Delay: 34.5	ICU Level of Service E
Intersection Capacity Utilization 86.4%	
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 6: Terry Fox & Campeau



Intersection						
Int Delay, s/veh	1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔			↔
Traffic Vol, veh/h	22	0	95	30	0	58
Future Vol, veh/h	22	0	95	30	0	58
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	-	-	-	-	-
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	0	95	30	0	58

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	168	110	0 0 125 0
Stage 1	110	-	- - - -
Stage 2	58	-	- - - -
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	822	943	- - 1462 -
Stage 1	915	-	- - - -
Stage 2	965	-	- - - -
Platoon blocked, %	-	-	- - - -
Mov Cap-1 Maneuver	822	943	- - 1462 -
Mov Cap-2 Maneuver	822	-	- - - -
Stage 1	915	-	- - - -
Stage 2	965	-	- - - -

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 822	1462	-
HCM Lane V/C Ratio	-	- 0.027	-	-
HCM Control Delay (s)	-	- 9.5	0	-
HCM Lane LOS	-	- A	A	-
HCM 95th %tile Q(veh)	-	- 0.1	0	-

Intersection												
Int Delay, s/veh	2.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔				↔			↔	
Traffic Vol, veh/h	0	0	5	22	0	0	10	55	30	0	31	0
Future Vol, veh/h	0	0	5	22	0	0	10	55	30	0	31	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	-	-	-	-	-	-	-	-	-	-
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	2	2	2	2	2
Mvmt Flow	0	0	5	22	0	0	10	55	30	0	31	0

Major/Minor	Minor2	Minor1	Major1	Major2
Conflicting Flow All	121	136	31 124	121 70 31 0 0 85 0 0
Stage 1	31	31	- 90 90	- - - - - - - -
Stage 2	90	105	- 34 31	- - - - - - - -
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	854	755	1043 850	769 993 1582 - - 1512 - -
Stage 1	986	869	- 917 820	- - - - - - - -
Stage 2	917	808	- 982 869	- - - - - - - -
Platoon blocked, %	-	-	- - - -	- - - - - - - -
Mov Cap-1 Maneuver	850	750	1043 842	764 993 1582 - - 1512 - -
Mov Cap-2 Maneuver	850	750	- 842 764	- - - - - - - -
Stage 1	979	869	- 911 814	- - - - - - - -
Stage 2	911	802	- 977 869	- - - - - - - -

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.5	9.4	0.8	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1582	-	-	1043	842	1512	-	-
HCM Lane V/C Ratio	0.006	-	-	0.005	0.026	-	-	-
HCM Control Delay (s)	7.3	0	-	8.5	9.4	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-

## MOVEMENT SUMMARY

Site: 101 [Huntmar-Campeau AM FT2030 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Arcadia Stage 6  
Site Category: (None)  
Roundabout

Vehicle Movement Performance														
Mov ID	Turn Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
		[ Total HV ]	[ Total HV ]	[ Total HV ]	[ Total HV ]				[ Veh. ]	[ Dist ]				
		veh/h	%	veh/h	%	v/c	sec			m				km/h
South: Huntmar														
1	L2	All MCs	45 2.0	45 2.0	0.047	8.0	LOS A	0.1	0.9	0.23	0.59	0.23	47.2	
2	T1	All MCs	448 2.0	448 2.0	0.463	2.5	LOS A	1.8	13.0	0.34	0.30	0.34	47.4	
3	R2	All MCs	49 2.0	49 2.0	0.051	3.1	LOS A	0.1	1.0	0.23	0.40	0.23	50.7	
Approach			542 2.0	542 2.0	0.463	3.0	LOS A	1.8	13.0	0.32	0.33	0.32	47.6	
East: Campeau														
4	L2	All MCs	138 2.0	138 2.0	0.188	11.3	LOS B	0.5	3.6	0.43	0.75	0.43	46.6	
5	T1	All MCs	115 2.0	115 2.0	0.161	5.4	LOS A	0.5	3.2	0.44	0.53	0.44	54.0	
6	R2	All MCs	41 2.0	41 2.0	0.057	5.6	LOS A	0.2	1.1	0.41	0.62	0.41	49.9	
Approach			294 2.0	294 2.0	0.188	8.2	LOS A	0.5	3.6	0.43	0.65	0.43	49.7	
North: Huntmar														
7	L2	All MCs	13 2.0	13 2.0	0.225	8.6	LOS A	0.7	4.9	0.34	0.35	0.34	49.8	
8	T1	All MCs	387 2.0	387 2.0	0.225	2.7	LOS A	0.7	4.9	0.33	0.33	0.33	47.3	
9	R2	All MCs	118 2.0	118 2.0	0.134	3.5	LOS A	0.4	2.7	0.31	0.46	0.31	50.4	
Approach			518 2.0	518 2.0	0.225	3.0	LOS A	0.7	4.9	0.33	0.36	0.33	48.0	
West: Campeau														
10	L2	All MCs	85 2.0	85 2.0	0.117	11.2	LOS B	0.3	2.3	0.41	0.74	0.41	46.7	
11	T1	All MCs	90 2.0	90 2.0	0.117	4.9	LOS A	0.3	2.3	0.39	0.49	0.39	54.2	
12	R2	All MCs	42 2.0	42 2.0	0.055	5.0	LOS A	0.1	1.0	0.37	0.58	0.37	50.3	
Approach			217 2.0	217 2.0	0.117	7.4	LOS A	0.3	2.3	0.40	0.61	0.40	50.3	
All Vehicles			1571 2.0	1571 2.0	0.463	4.6	LOS A	1.8	13.0	0.36	0.44	0.36	48.5	

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Sieglösch M1 implied by US HCM 2010 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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## MOVEMENT SUMMARY

Site: 101 [Country Glen-Campeau AM FT2030 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Arcadia Stage 5  
Site Category: (None)  
Roundabout

Vehicle Movement Performance														
Mov ID	Turn Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
		[ Total HV ]	[ Total HV ]	[ Total HV ]	[ Total HV ]				[ Veh. ]	[ Dist ]				
		veh/h	%	veh/h	%	v/c	sec			m				km/h
South: Country Glen														
1	L2	All MCs	40 2.0	40 2.0	0.023	1.9	LOS A	0.1	0.4	0.19	0.26	0.19	37.5	
2	T1	All MCs	1 2.0	1 2.0	0.023	0.4	LOS A	0.1	0.4	0.18	0.24	0.18	29.5	
3	R2	All MCs	4 2.0	4 2.0	0.023	0.4	LOS A	0.1	0.4	0.18	0.24	0.18	37.7	
Approach			45 2.0	45 2.0	0.023	1.7	LOS A	0.1	0.4	0.19	0.26	0.19	37.3	
East: Campeau														
4	L2	All MCs	7 2.0	7 2.0	0.058	9.6	LOS A	0.2	1.1	0.15	0.39	0.15	38.7	
5	T1	All MCs	107 2.0	107 2.0	0.058	3.5	LOS A	0.2	1.1	0.15	0.37	0.15	55.4	
6	R2	All MCs	5 2.0	5 2.0	0.058	4.4	LOS A	0.1	1.0	0.14	0.35	0.14	38.9	
Approach			119 2.0	119 2.0	0.058	3.9	LOS A	0.2	1.1	0.15	0.37	0.15	53.1	
North: Country Glen														
7	L2	All MCs	19 2.0	19 2.0	0.158	2.0	LOS A	0.4	3.1	0.21	0.12	0.21	38.3	
8	T1	All MCs	1 2.0	1 2.0	0.158	0.5	LOS A	0.4	3.1	0.21	0.12	0.21	29.7	
9	R2	All MCs	138 2.0	138 2.0	0.158	0.5	LOS A	0.4	3.1	0.21	0.12	0.21	38.4	
Approach			158 2.0	158 2.0	0.158	0.6	LOS A	0.4	3.1	0.21	0.12	0.21	38.4	
West: Campeau														
10	L2	All MCs	50 2.0	50 2.0	0.067	9.5	LOS A	0.2	1.7	0.10	0.55	0.10	37.8	
11	T1	All MCs	75 2.0	75 2.0	0.067	3.4	LOS A	0.2	1.7	0.10	0.41	0.10	54.8	
12	R2	All MCs	20 2.0	20 2.0	0.067	4.3	LOS A	0.2	1.7	0.10	0.35	0.10	38.8	
Approach			145 2.0	145 2.0	0.067	5.6	LOS A	0.2	1.7	0.10	0.45	0.10	45.2	
All Vehicles			467 2.0	467 2.0	0.158	3.1	LOS A	0.4	3.1	0.16	0.30	0.16	43.3	

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Sieglösch M1 implied by US HCM 2010 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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## MOVEMENT SUMMARY

**Site: 101 [Winterset-Campeau AM FT2030 (Site Folder: General)]**

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Arcadia Stage 5  
Site Category: (None)  
Roundabout

Vehicle Movement Performance															
Mov ID	Turn Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed	
		[ Total HV ]	%	[ Total HV ]	%				[ Veh. ]	Dist ]					
		veh/h	%	veh/h	%	v/c	sec			veh	m			km/h	
East: Campeau															
5	T1	All MCs	67	2.0	67	2.0	0.043	3.3	LOS A	0.1	1.0	0.07	0.34	0.07	55.9
6	R2	All MCs	26	2.0	26	2.0	0.043	4.2	LOS A	0.1	1.0	0.07	0.38	0.07	38.7
Approach			93	2.0	93	2.0	0.043	3.6	LOS A	0.1	1.0	0.07	0.35	0.07	49.8
North: Winterset															
7	L2	All MCs	70	2.0	70	2.0	0.066	1.7	LOS A	0.2	1.2	0.12	0.25	0.12	37.5
9	R2	All MCs	52	2.0	52	2.0	0.049	0.2	LOS A	0.1	0.9	0.13	0.04	0.13	38.8
Approach			122	2.0	122	2.0	0.066	1.0	LOS A	0.2	1.2	0.12	0.16	0.12	38.0
West: Campeau															
10	L2	All MCs	17	2.0	17	2.0	0.058	9.6	LOS A	0.2	1.4	0.17	0.44	0.17	38.3
11	T1	All MCs	102	2.0	102	2.0	0.058	3.6	LOS A	0.2	1.4	0.17	0.38	0.17	55.0
Approach			119	2.0	119	2.0	0.058	4.4	LOS A	0.2	1.4	0.17	0.39	0.17	51.8
All Vehicles			334	2.0	334	2.0	0.066	2.9	LOS A	0.2	1.4	0.13	0.29	0.13	45.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Sieglösch M1 implied by US HCM 2010 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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## MOVEMENT SUMMARY

**Site: 101 [Huntmar-Campeau PM FT2030 (Site Folder: General)]**

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Arcadia Stage 6  
Site Category: (None)  
Roundabout

Vehicle Movement Performance															
Mov ID	Turn Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed	
		[ Total HV ]	%	[ Total HV ]	%				[ Veh. ]	Dist ]					
		veh/h	%	veh/h	%	v/c	sec			veh	m			km/h	
South: Huntmar															
1	L2	All MCs	93	2.0	93	2.0	0.122	9.2	LOS A	0.3	2.4	0.40	0.69	0.40	46.7
2	T1	All MCs	482	2.0	482	2.0	0.614	5.1	LOS A	3.1	22.3	0.61	0.65	0.75	46.3
3	R2	All MCs	140	2.0	140	2.0	0.183	4.3	LOS A	0.5	3.8	0.41	0.55	0.41	50.1
Approach			715	2.0	715	2.0	0.614	5.5	LOS A	3.1	22.3	0.54	0.64	0.64	47.1
East: Campeau															
4	L2	All MCs	129	2.0	129	2.0	0.221	12.4	LOS B	0.6	4.5	0.51	0.81	0.51	46.3
5	T1	All MCs	151	2.0	151	2.0	0.221	6.0	LOS A	0.6	4.5	0.49	0.61	0.49	53.6
6	R2	All MCs	22	2.0	22	2.0	0.035	6.3	LOS A	0.1	0.6	0.46	0.66	0.46	49.5
Approach			302	2.0	302	2.0	0.221	8.8	LOS A	0.6	4.5	0.50	0.70	0.50	49.9
North: Huntmar															
7	L2	All MCs	32	2.0	32	2.0	0.342	9.1	LOS A	1.2	8.3	0.43	0.43	0.43	49.3
8	T1	All MCs	544	2.0	544	2.0	0.342	3.2	LOS A	1.2	8.3	0.42	0.39	0.42	47.0
9	R2	All MCs	158	2.0	158	2.0	0.190	3.9	LOS A	0.6	4.0	0.37	0.50	0.37	50.2
Approach			734	2.0	734	2.0	0.342	3.6	LOS A	1.2	8.3	0.41	0.42	0.41	47.7
West: Campeau															
10	L2	All MCs	184	2.0	184	2.0	0.343	12.7	LOS B	1.1	8.1	0.54	0.81	0.59	46.5
11	T1	All MCs	269	2.0	269	2.0	0.343	6.3	LOS A	1.1	8.1	0.52	0.66	0.57	53.1
12	R2	All MCs	96	2.0	96	2.0	0.140	5.7	LOS A	0.4	2.6	0.44	0.65	0.44	50.0
Approach			549	2.0	549	2.0	0.343	8.3	LOS A	1.1	8.1	0.51	0.71	0.55	50.1
All Vehicles			2300	2.0	2300	2.0	0.614	6.0	LOS A	3.1	22.3	0.49	0.59	0.52	48.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Sieglösch M1 implied by US HCM 2010 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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\2021-048 Sidra 2021-09-24.sip9

## MOVEMENT SUMMARY

Site: 101 [Country Glen-Campeau PM FT2030 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Arcadia Stage 5  
Site Category: (None)  
Roundabout

Vehicle Movement Performance															
Mov ID	Turn Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed	
		[ Total HV ]	%	[ Total HV ]	%				[ Veh. ]	Dist ]					
		veh/h	%	veh/h	%	v/c	sec			veh	m			km/h	
South: Country Glen															
1	L2	All MCs	34	2.0	34	2.0	0.024	2.6	LOS A	0.1	0.4	0.33	0.37	0.33	37.2
2	T1	All MCs	1	2.0	1	2.0	0.024	1.1	LOS A	0.1	0.4	0.31	0.34	0.31	29.4
3	R2	All MCs	5	2.0	5	2.0	0.024	1.1	LOS A	0.1	0.4	0.31	0.34	0.31	37.6
Approach			40	2.0	40	2.0	0.024	2.4	LOS A	0.1	0.4	0.32	0.37	0.32	37.0
East: Campeau															
4	L2	All MCs	11	2.0	11	2.0	0.109	10.0	LOS A	0.3	2.1	0.25	0.42	0.25	38.4
5	T1	All MCs	178	2.0	178	2.0	0.109	3.8	LOS A	0.3	2.1	0.24	0.41	0.24	54.9
6	R2	All MCs	20	2.0	20	2.0	0.109	4.7	LOS A	0.3	2.0	0.23	0.40	0.23	38.6
Approach			209	2.0	209	2.0	0.109	4.2	LOS A	0.3	2.1	0.24	0.41	0.24	51.6
North: Country Glen															
7	L2	All MCs	11	2.0	11	2.0	0.102	2.1	LOS A	0.3	1.9	0.25	0.16	0.25	38.3
8	T1	All MCs	1	2.0	1	2.0	0.102	0.6	LOS A	0.3	1.9	0.25	0.16	0.25	29.7
9	R2	All MCs	85	2.0	85	2.0	0.102	0.6	LOS A	0.3	1.9	0.25	0.16	0.25	38.4
Approach			97	2.0	97	2.0	0.102	0.8	LOS A	0.3	1.9	0.25	0.16	0.25	38.3
West: Campeau															
10	L2	All MCs	162	2.0	162	2.0	0.197	9.5	LOS A	0.8	5.7	0.11	0.57	0.11	37.6
11	T1	All MCs	226	2.0	226	2.0	0.197	3.4	LOS A	0.8	5.7	0.11	0.39	0.11	55.0
12	R2	All MCs	37	2.0	37	2.0	0.197	4.3	LOS A	0.8	5.7	0.11	0.34	0.11	38.9
Approach			425	2.0	425	2.0	0.197	5.8	LOS A	0.8	5.7	0.11	0.45	0.11	45.3
All Vehicles			771	2.0	771	2.0	0.197	4.6	LOS A	0.8	5.7	0.17	0.40	0.17	45.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Sieglösch M1 implied by US HCM 2010 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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## MOVEMENT SUMMARY

Site: 101 [Winterset-Campeau PM FT2030 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Arcadia Stage 5  
Site Category: (None)  
Roundabout

Vehicle Movement Performance															
Mov ID	Turn Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed	
		[ Total HV ]	%	[ Total HV ]	%				[ Veh. ]	Dist ]					
		veh/h	%	veh/h	%	v/c	sec			veh	m			km/h	
East: Campeau															
5	T1	All MCs	177	2.0	177	2.0	0.118	3.5	LOS A	0.4	3.1	0.16	0.35	0.16	55.5
6	R2	All MCs	71	2.0	71	2.0	0.118	4.4	LOS A	0.4	3.1	0.16	0.39	0.16	38.5
Approach			248	2.0	248	2.0	0.118	3.8	LOS A	0.4	3.1	0.16	0.36	0.16	49.3
North: Winterset															
7	L2	All MCs	46	2.0	46	2.0	0.047	2.0	LOS A	0.1	0.8	0.21	0.30	0.21	37.3
9	R2	All MCs	33	2.0	33	2.0	0.034	0.5	LOS A	0.1	0.6	0.22	0.10	0.22	38.6
Approach			79	2.0	79	2.0	0.047	1.4	LOS A	0.1	0.8	0.21	0.22	0.21	37.8
West: Campeau															
10	L2	All MCs	54	2.0	54	2.0	0.112	9.6	LOS A	0.4	2.9	0.14	0.49	0.14	38.1
11	T1	All MCs	183	2.0	183	2.0	0.112	3.5	LOS A	0.4	2.9	0.14	0.38	0.14	55.0
Approach			237	2.0	237	2.0	0.112	4.9	LOS A	0.4	2.9	0.14	0.41	0.14	49.9
All Vehicles			564	2.0	564	2.0	0.118	3.9	LOS A	0.4	3.1	0.16	0.36	0.16	47.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Sieglösch M1 implied by US HCM 2010 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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# Appendix J

TDM Checklist

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

<b>Legend</b>	
<b>BASIC</b>	The measure is generally feasible and effective, and in most cases would benefit the development and its users
<b>BETTER</b>	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: <i>Residential developments</i>		Check if proposed & add descriptions
<b>1. TDM PROGRAM MANAGEMENT</b>		
<b>1.1 Program coordinator</b>		
<b>BASIC</b>	★ 1.1.1 Designate an internal coordinator, or contract with an external coordinator	<input type="checkbox"/>
<b>1.2 Travel surveys</b>		
<b>BETTER</b>	1.2.1 Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress	<input type="checkbox"/>
<b>2. WALKING AND CYCLING</b>		
<b>2.1 Information on walking/cycling routes &amp; destinations</b>		
<b>BASIC</b>	2.1.1 Display local area maps with walking/cycling access routes and key destinations at major entrances ( <i>multi-family, condominium</i> )	<input type="checkbox"/>
<b>2.2 Bicycle skills training</b>		
<b>BETTER</b>	2.2.1 Offer on-site cycling courses for residents, or subsidize off-site courses	<input type="checkbox"/>

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



TDM measures: <i>Residential developments</i>		Check if proposed & add descriptions
<b>6. TDM MARKETING &amp; COMMUNICATIONS</b>		
<b>6.1 Multimodal travel information</b>		
<b>BASIC</b> ★	6.1.1 Provide a multimodal travel option information package to new residents	<input checked="" type="checkbox"/>
<b>6.2 Personalized trip planning</b>		
<b>BETTER</b> ★	6.2.1 Offer personalized trip planning to new residents	<input type="checkbox"/>