

8415 Campeau Drive

Transportation Impact Assessment

Step 1 Screening Report

Step 2 Scoping Report

Step 3 Forecasting Report

Step 4 Strategy Report

Prepared for:

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July 2022

PN: 2021-048

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1 Screening

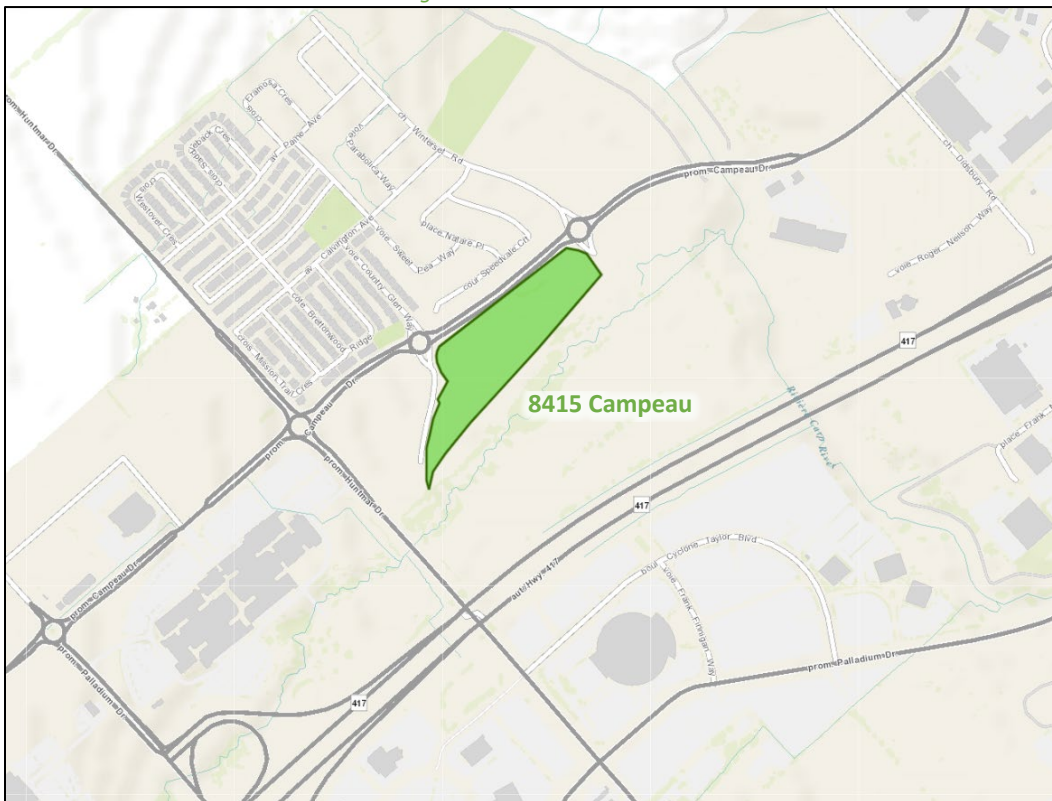
This study has been prepared according to the City of Ottawa’s 2017 Transportation Impact Assessment (TIA) Guidelines. Accordingly, a Step 1 Screening Form has been prepared and is included as Appendix A, along with the Certification Form for the TIA Study PM. As shown in the Screening Form, a TIA is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

2 Existing and Planned Conditions

2.1 Proposed Development

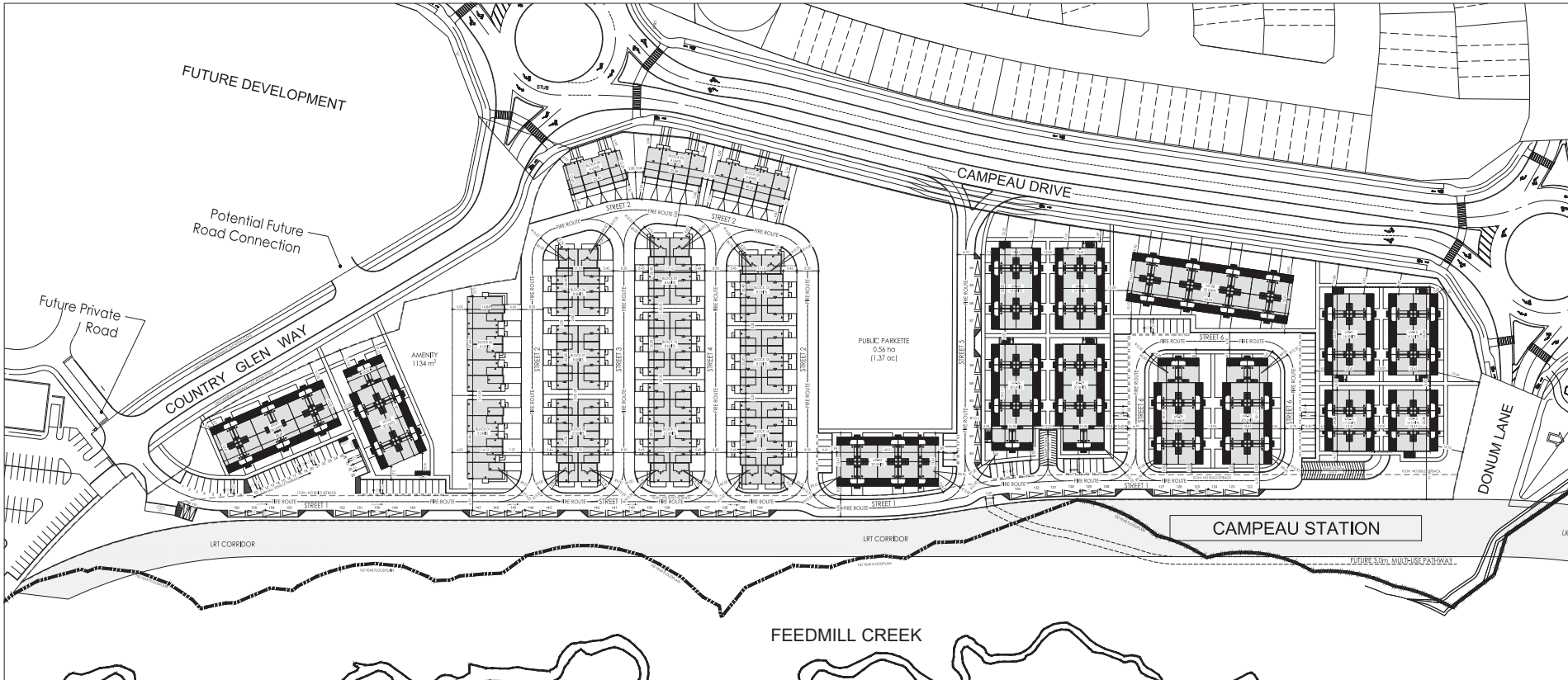
The existing site, located at 8415 Campeau Drive, is zoned as Development Reserve Zone (DR). The proposed development consists of 264 stacked towns and 104 townhomes. A total of 279 residential parking spaces, 27 visitor surface parking spaces, and 128 bicycle spaces will be provided for the stacked towns, and garages and bike storage will be provided internally for each townhome. The site plan includes one right-in-right-out access onto Campeau Drive and one full-movements access onto Country Glen Way. 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, and the Kanata West Mixed Use Centre Design Priority Area. 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: June 28, 2022

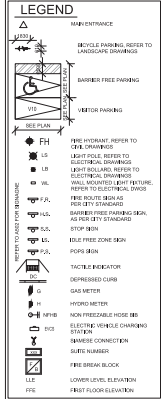
Figure 2: Concept Plan



THESE DRAWINGS ARE NOT TO BE SCALED.
ALL DIMENSIONS AND LEVELS GIVEN IN CONSTRUCTION PERSPECTIVE TO COMMENCEMENT OF WORK. ANY DISCREPANCIES MUST BE RECONCILED TO THE ARCHITECT'S INTENT.

NO.	DATE	REVISION/COMMENT
1	15-FEB-22	ISSUED FOR SPA
2	24-FEB-22	CLIENT REVIEW
3	31-MAY-22	REV PER CLIENT COMMENT
4	29-JUN-22	REV PER CLIENT COMMENT
5	20-JUN-22	REV PER CLIENT COMMENT
6	07-JUL-22	ISSUED FOR SPA

ADDITIONAL NOTES:



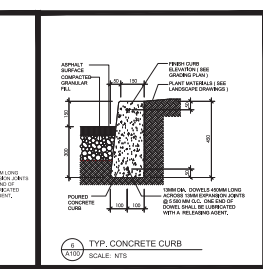
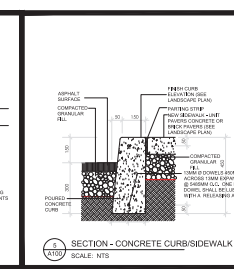
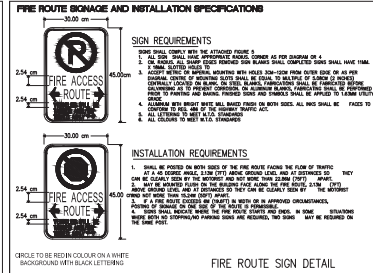
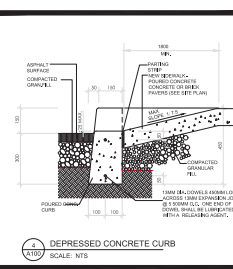
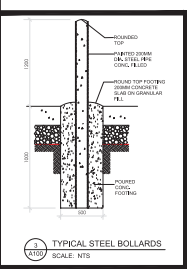
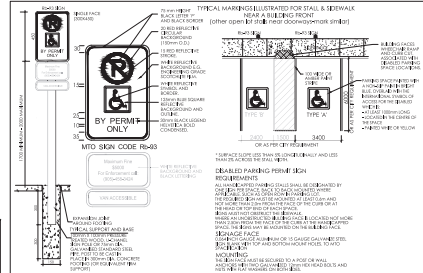
PRELIMINARY, NOT FOR CONSTRUCTION
ALL AREA CALCULATIONS ARE PRELIMINARY

NO.	DATE	REVISION/COMMENT

1 SITE PLAN
1:650



KEY PLAN



SITE STATISTICS

ITEMS	REQUIRED	PROPOSED - NORTH LOT
NET LOT AREA (includes easements)	NO RETURN	55270.99 SM (564931.96 SF)
EASEMENT AREA	NO RETURN	0.00 SM (0.00 SF)
GROSS LOT AREA (includes easements)	NO RETURN	55270.99 SM (564931.96 SF)
BUILDING AREA	NO RETURN	13401.90 SM (144257.43 SF)
LOT COVERAGE (net for area/building area)	NO RETURN	24.33 %
GROSS FLOOR AREA	NO RETURN	40205.88 SM (432772.49 SF)
NET F.S.A (gross floor area/net lot area)	NO RETURN	0.73
GROSS F.A. (gross floor area/gross lot area)	NO RETURN	0.73

SETBACKS	NO RETURN	3.01 M
MIN. FRONT YARD	NO RETURN	15.25 M
MIN. CORNER SIDE YARD	NO RETURN	9.83 M
MIN. INTERIOR SIDE YARD	NO RETURN	9.83 M
MIN. REAR YARD	NO RETURN	3.00 M

NUMBER OF TOPIGRAPHY UNITS:	284 SUITES
STACKED - 2 BED	194 SUITES
TRADITIONAL - 3 BED	90 SUITES

TOTAL NUMBER OF UNITS	374 SUITES		
TOTAL PARKING SPACES:	EPS	RATIO	
RESIDENT PARKING SPACES:	CONFR	SPACE: 16	10
	CONFR	TOTAL: 24	NA
VISITOR PARKING SPACES (as per City of Ottawa Traffic and Parking By-law (No. 2017-50), Section 111)	CONFR	SPACE: 25	0.17
	CONFR	TOTAL: 4	NA

BARRIER FREE PARKING SPACES DEDICATED FOR VISITORS:	CONFR	SPACE: 0	NA
	CONFR	TOTAL: 1	NA

BIKE SPACES:	SPACES/UNIT	%
LONG-TERM BIKE SPACES (as per City of Ottawa Traffic and Parking By-law (No. 2017-50), Section 111)	NA	194/284 (68.31% OF LOT AREA)

LANDSCAPED OPEN SPACE AREA:	AREA	PERCENT OF LANDSCAPING
SOFT LANDSCAPE AREA:	NA	17644.00 SM (185768.24 SF) (80.20% OF LANDSCAPING)
HARD LANDSCAPE AREA:	NA	2216.06 SM (23674.99 SF) (8.74% OF LANDSCAPING)

LOCKER SPACES:	NA	TBD
AMENITY AREA (TOTAL):	CONFR	TBD
AMENITY AREA (COMMUNAL):	CONFR	TBD



CLIENT: Minto Communities Canada
200-180 Markham
Ottawa, Ontario K1P 0B6

PROJECT: ARCADIA - STAGE 6
Ottawa, Ontario

DRAWING TITLE: SITE PLAN

DATE: 2024-04-14

SCALE: 1:500

DRAWN BY: AB

CHECKED BY: GB

PROJECT NUMBER: S22009SP-100

DRAWING NUMBER: S22009SP-100

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. Cycle tracks and sidewalks extend north of Campeau Drive on the east side of the roadway 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 roadway 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 to the west and a two-lane urban cross-section to the east of Didsbury Road. Sidewalks and cycle tracks 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 within the study area. The posted speed limit is 60 km/h and the protected right-of-way is 41.0 metres to the west of Huntmar Drive, the City-protected right-of-way is 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.

Palladium Drive: Palladium Drive is a City of Ottawa arterial road with a divided four-lane urban cross-section to the east of Huntmar Drive and transitions to a four-lane rural cross-section with gravel shoulders to the west. Sidewalks are present on both sides of the road east of Huntmar Drive and on the north side of the road to Autopark Private. The posted speed limit is 70 km/h west of Huntmar Drive and 60 km/h to the east. The City-protected right-of-way is 44.5 metres and Palladium Drive is a truck route south of the westbound Highway 417 ramp terminal.

Country Glen Way: Country Glen Way is a City of Ottawa local road with a two-lane urban cross-section. Sidewalks are planned on both sides of the roadway. 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 unposted speed limit is assumed to be 50 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 roadway. The unposted speed limit is assumed to be 50 km/h and the City-protected right-of-way is 26.0 metres.

Cyclone Taylor Boulevard: Cyclone Taylor Boulevard is a City of Ottawa local road with a four-lane urban cross-section. Sidewalks are provided on the south side of the road to the west and on both sides of the road to the east of the Canadian Tire Centre. The unposted speed limit is assumed to be 50km/h and the existing right-of-way is 26.0 metres.

Autopark Private: Autopark Private is a privately-owned local road with a two-lane urban cross-section. Sidewalks are present on the north side of the roadway. The posted speed limit is 30km/h.

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 lane and a right-turn lane. 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.
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 and a 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, a buffer zone, two through lanes, and an auxiliary right-turn lane. No turn restrictions were noted. The southbound and the eastbound left-turn lane are currently closed.
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.
Autopark Private/ Cyclone Taylor Boulevard at Huntmar Drive	The intersection of Autopark Private/ Cyclone Taylor Boulevard at Huntmar Drive is a signalized intersection. The northbound approach consists of an auxiliary left-turn lane, a through lane and a channelized

right-turn lane, and the southbound approach consists of an auxiliary left-turn lane, a through lane, and an auxiliary right-turn lane. The eastbound approach consists of a shared all-movement lane that will functionally operate as a shared left-turn/through lane and short auxiliary right-turn lane, given the pavement width on the approach, and the westbound approach consists of a shared left-turn/through lane and a right-turn lane. No turn restrictions were noted.

Palladium Drive at Huntmar Drive

The intersection of Palladium Drive at Huntmar 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, a through lane and a channelized right-turn lane. The westbound and eastbound approaches each consist of an auxiliary left-turn lane, a through lane and a shared through/right-turn lane. No turn restrictions were noted.

2.2.3 Existing Driveways

At the Country Glen Way access location, two additional private approaches will be located at the intersection to form a four-way intersection. While no site plans are available at this time, an additional access has been provided along Country Glen Way, approximately 75 metres south of Campeau Drive.

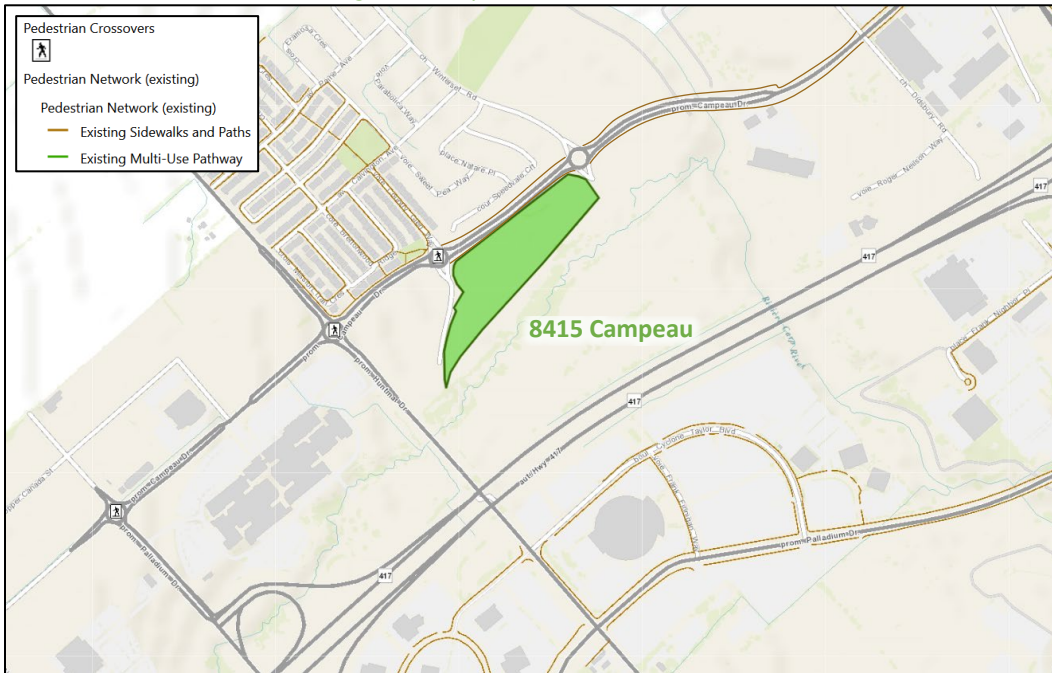
2.2.4 Cycling and Pedestrian Facilities

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

Sidewalks are provided or planned on both sides of Country Glen Way, Campeau Drive, Huntmar Drive and Palladium Drive. As the area is currently developing and roadways under construction/recently opening, some links are currently missing, such as the north side of Campeau Drive between Journeyman Street and Huntmar Drive.

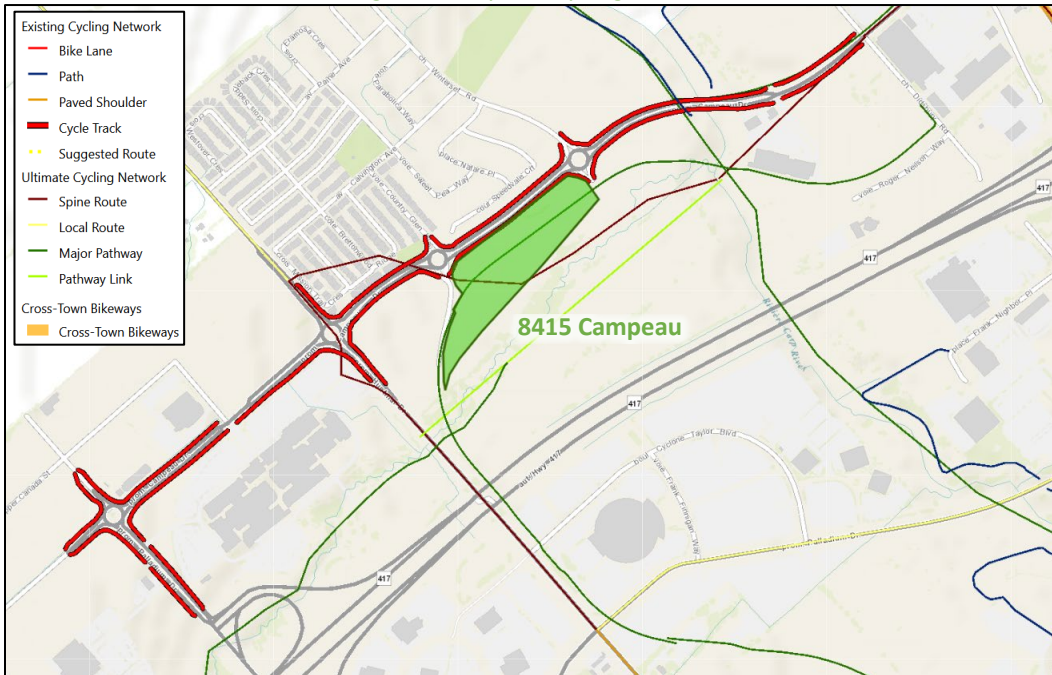
Cycletracks are present on Campeau Drive and Huntmar Drive near Campeau Drive. Similar to the sidewalks, a number of planned links, such as the north side of Campeau Drive between Journeyman Street and Huntmar Drive have not been constructed at this time. Huntmar Drive south of Campeau Drive and Campeau Drive east of Huntmar Drive are spine routes. Huntmar Drive north of Campeau Drive and Palladium Drive east of Huntmar Drive are local routes. Pathways are present along Carp River north of Campeau Drive.

Figure 3: Study Area Pedestrian Facilities



Source: <http://maps.ottawa.ca/geoOttawa/> Accessed: June 28, 2022

Figure 4: Study Area Cycling Facilities



Source: <http://maps.ottawa.ca/geoOttawa/> Accessed: June 28, 2022

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 Huntmar Drive at Autopark Private/Cyclone Taylor Boulevard and Huntmar Drive at Palladium Drive had pedestrian and cyclist volumes available.

Figure 5: Existing Pedestrian Volumes

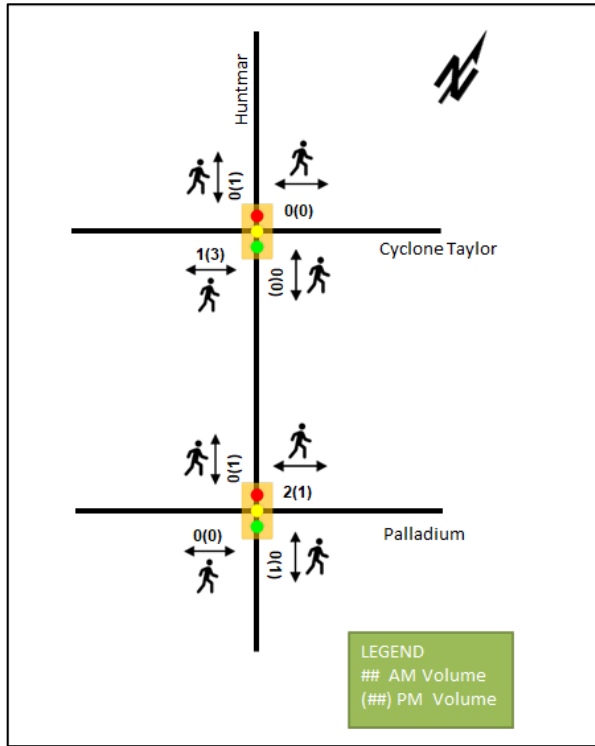
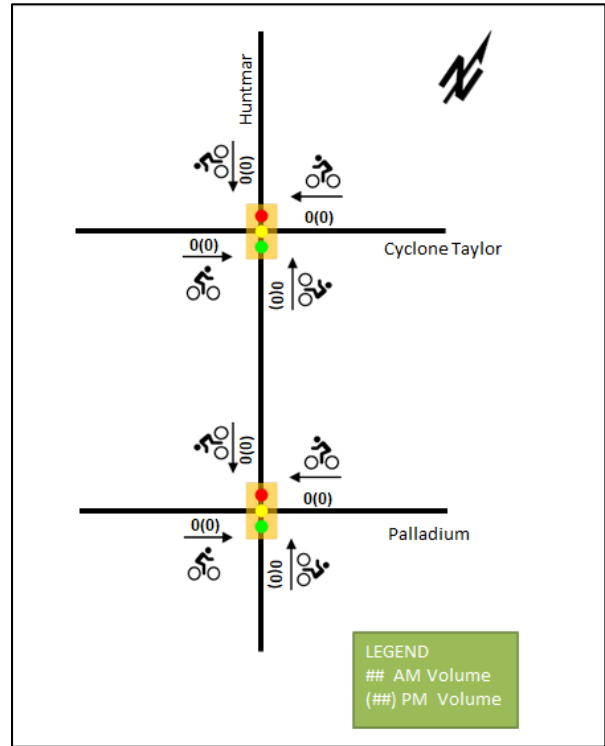


Figure 6: Existing Cyclist Volumes



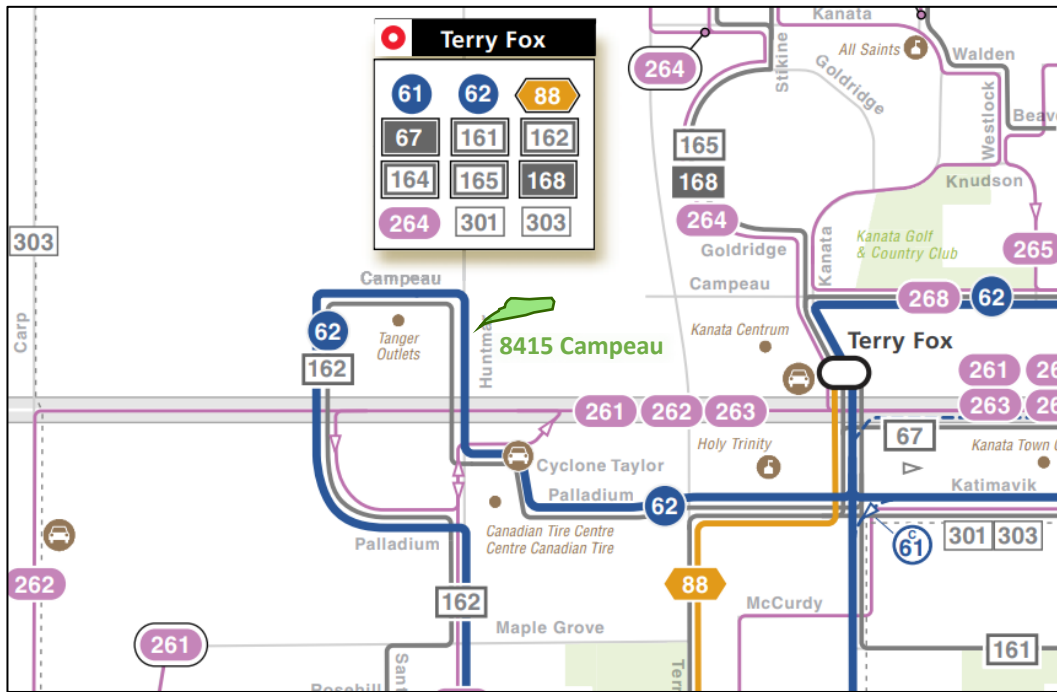
2.2.5 Existing Transit

Within the study area, routes #62 and #162 travel along Palladium Drive, Campeau Drive, and Huntmar Drive. Primary stops are located at Huntmar Drive at Campeau Drive. The frequency of these routes within proximity of the proposed site currently are:

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

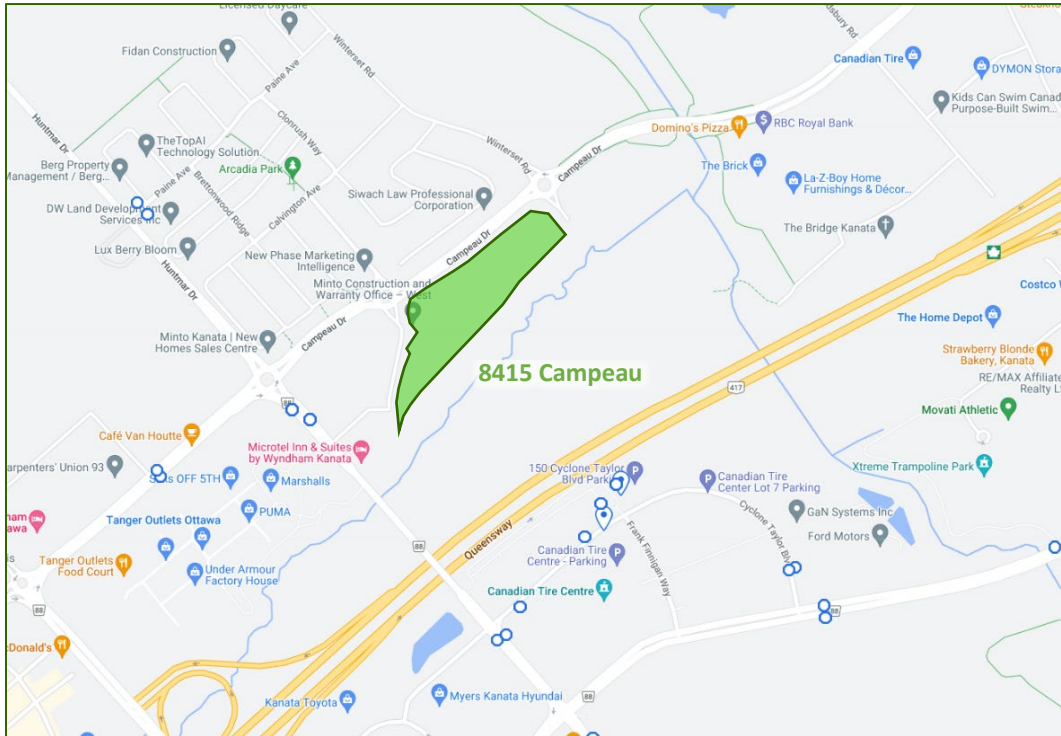
Figure 7 illustrates the transit system map in the study area and Figure 8 illustrates nearby transit stops.

Figure 7: Existing Study Area Transit Service



Source: <http://www.octranspo.com/> Accessed: June 28, 2022

Figure 8: Existing Study Area Transit Stops



Source: <http://www.octranspo.com/> Accessed: June 28, 2022

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 and will model the new roadway connection in the future background conditions. Table 1 summarizes the intersection count dates.

Table 1: Intersection Count Date

Intersection	Count Date	Source
Huntmar Dr at Campeau Dr	Tuesday, May 28, 2019	The Traffic Specialist
Huntmar Dr at Autopark Priv/ Cyclone Taylor Blvd	Tuesday, January 21, 2020	City of Ottawa
Huntmar Dr at Palladium Dr	Tuesday, July 7, 2011	City of Ottawa
Country Glen Way at Campeau Drive	-	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. Detailed turning movement count data is included in Appendix B and the Synchro worksheets are provided in Appendix C.

Figure 9: Existing Traffic Counts

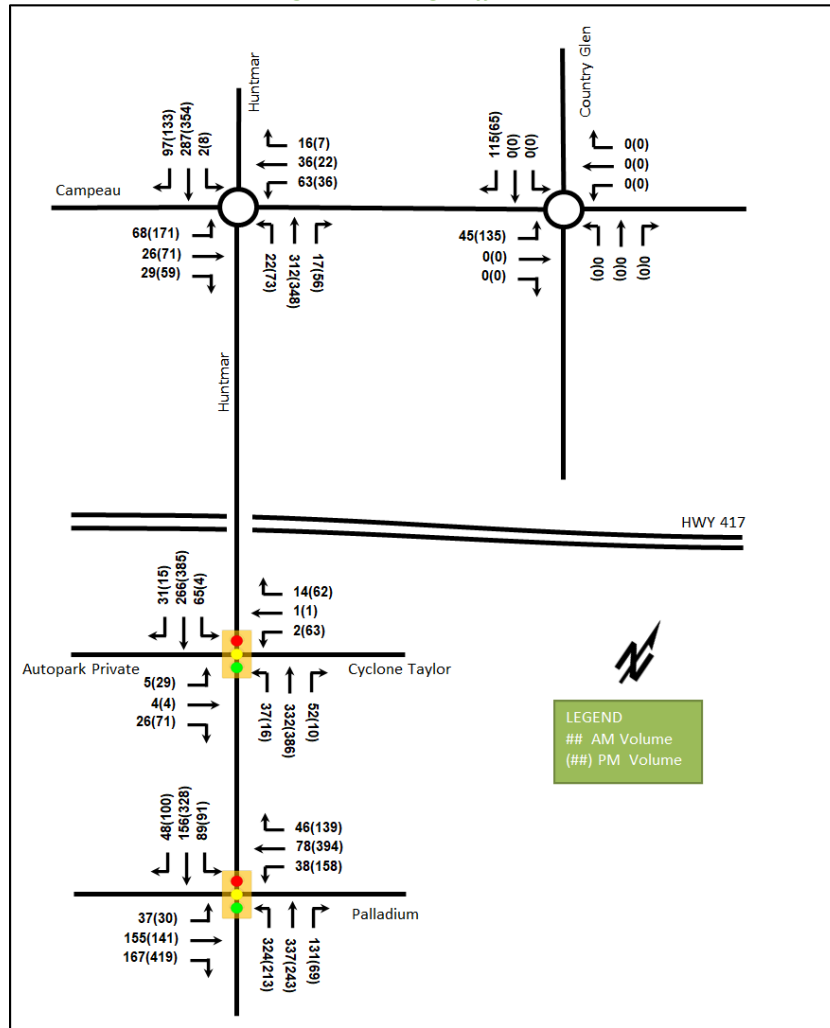


Table 2: Existing Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay(s)	Q (95 th)	LOS	V/C	Delay(s)	Q (95 th)
Huntmar Drive at Campeau Drive Roundabout	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
	Overall	A	0.34	3.7	-	A	0.42	4.5	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay(s)	Q (95 th)	LOS	V/C	Delay(s)	Q (95 th)
Huntmar Drive at Autopark / Cyclone Taylor <i>Signalized</i>	EB	A	0.09	7.0	4.9	A	0.27	7.5	10.0
	WBL	A	0.01	11.5	1.1	A	0.23	15.1	11.3
	WBL/R	A	0.04	6.6	2.9	A	0.16	4.8	5.9
	NBL	A	0.05	8.2	8.5	A	0.04	9.6	4.8
	NBT	A	0.27	7.9	55.8	A	0.42	11.5	67.0
	NBR	A	0.05	3.9	5.9	A	0.02	0.0	0.0
	SBL	A	0.10	8.2	13.4	A	0.01	9.8	1.9
	SBT	A	0.22	7.5	43.7	A	0.42	11.5	66.6
	SBR	A	0.03	2.5	2.9	A	0.02	0.1	0.4
Overall	A	0.29	7.3	-	A	0.41	10.6	-	
Huntmar Drive at Palladium Drive <i>Signalized</i>	EBL	A	0.10	22.8	13.5	A	0.17	33.3	14.5
	EBT/R	A	0.29	11.1	23.6	A	0.54	12.6	38.6
	WBL	A	0.10	13.6	10.0	A	0.57	27.1	41.9
	WBT/R	A	0.09	8.7	9.7	A	0.40	19.1	60.6
	NBL	D	0.90	52.0	#104.0	C	0.80	42.3	#58.7
	NBT	A	0.56	25.1	79.5	A	0.37	21.6	54.9
	NBR	A	0.22	4.3	11.1	A	0.11	3.0	6.0
	SBL	A	0.60	49.1	32.1	A	0.38	35.3	31.2
	SBT	A	0.57	40.1	47.6	D	0.81	50.3	100.6
	SBR	A	0.14	0.8	0.0	A	0.23	2.8	5.4
	Overall	A	0.58	26.5	-	C	0.74	24.5	-

Notes: Saturation flow rate of 1800 veh/h/lane
Queue is measured in metres
Peak Hour Factor = 0.90

m = metered queue
= 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 Huntmar Drive and Palladium Drive, the northbound left-turn movement may subject to extended queues during both peak hours.

2.2.8 Collision Analysis

Collision data have been acquired from the City of Ottawa open data website (data.ottawa.ca) for five years prior to the commencement of this TIA for the surrounding study area road network.

Table 3 summarizes the collision types and conditions in the study area, Figure 10 illustrates the intersections and segments analyzed, and Table 4 summarizes the total collisions for each of these locations. Collision data are included in Appendix D.

Table 3: Study Area Collision Summary, 2016-2020

		Number	%
Total Collisions		19	100%
Classification	Fatality	0	0%
	Non-Fatal Injury	2	11%
	Property Damage Only	17	89%
Initial Impact Type	Angle	5	26%
	Rear end	3	16%
	Sideswipe	8	42%
	Turning Movement	1	5%
	SMV Other	2	11%
Road Surface Condition	Dry	16	84%
	Wet	1	5%
	Loose Snow	1	5%
	Ice	1	5%
Pedestrian Involved		0	0%
Cyclists Involved		0	0%

Figure 10: Representation of Study Area Collision Records

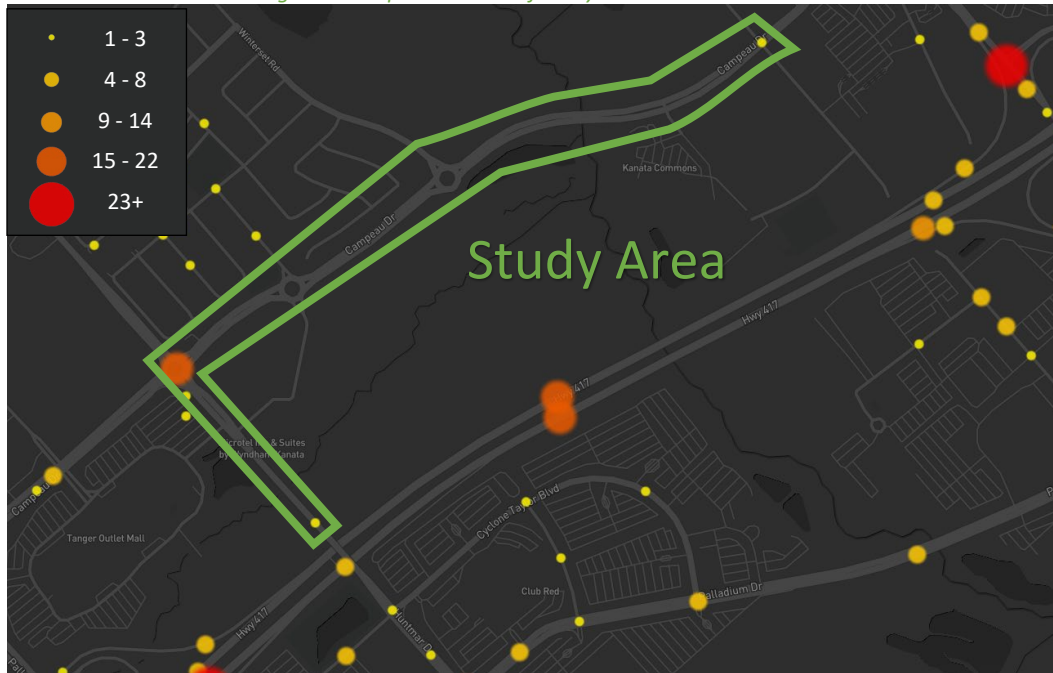


Table 4: Summary of Collision Locations, 2016-2020

Intersections / Segments	Number	%
Campeau Dr @ Huntmar Dr	16	84%
Huntmar Dr Btwn Huntmar Dr & Autopark Priv	1	5%
Campeau Dr @ Didsbury Rd	2	11%

Within the study area, the intersection of Campeau Drive at Huntmar Drive is noted to have experienced higher collisions than other locations. Table 5 summarizes the collision types and conditions for the location.

Table 5: Campeau Drive at Huntmar Drive Collision Summary

		Number	%
Total Collisions		16	100%
Classification	Fatality	0	0%
	Non-Fatal Injury	1	6%
	Property Damage Only	15	94%
Initial Impact Type	Angle	5	31%
	Rear end	1	6%
	Sideswipe	8	50%
	SMV Other	2	13%
Road Surface Condition	Dry	13	81%
	Wet	1	6%
	Loose Snow	1	6%
	Ice	1	6%
Pedestrian Involved		0	0%
Cyclists Involved		0	0%

The Campeau Drive at Huntmar Drive intersection had a total of 16 collisions during the 2016-2020 time period, with 15 involving property damage only and the remaining one having non-fatal injuries. The collision types are most represented by sideswipe with eight collisions, followed by five angle collisions, with the remaining collision types represented by SMV Other and rear end. Sideswipe collisions may be more prevalent at roundabouts. Weather conditions do not influence collisions at this location. No further collision analysis is required for this study.

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 subject site boundary. In addition, the Transportation Master Plan's Road Network identifies widening of Palladium Drive from HWY 417 to Campeau Drive, an 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 Disbury 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 79 single family homes, 162 townhomes, 512 Stacked townhomes, 30,000 ft² of retail, a 23,941 m² school, and a 10,655 m² park. The development is anticipated to be built out in 2024 and is predicted to generate 263 new AM two-way peak-hour auto trips and 209 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 square metres of commercial spaces across three parcels, and two car dealerships (4,000 square metres 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 1372 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 ft² of restaurant type land uses. The development is anticipated to be built 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)

1400 Upper Canada Street

The proposed development application includes a site plan for the construction of 65,400 ft² of office space and warehouse area by phase one and expand to 76,400 ft² 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)

8800 Campeau Drive

The proposed development application includes a site plan for the construction of 66,000 ft² of office/warehouse space by phase one and will expand to 77,800 ft² of 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 60 new AM and PM two-way peak-hour auto trips by phase one and 70 AM two-way peak-hour auto trips and 71 new PM two-way peak-hour auto trips by phase two. (Parsons, 2021)

340 Huntmar Drive

The proposed development application includes a site plan for the construction of a hotel with approximately 108 rooms. The development was built in 2021, and it is predicted to generate 44 new AM two-way peak-hour auto trips and 51 new PM two-way peak-hour auto trips. (Parsons, 2018)

800 Palladium Drive

The proposed development application includes a site plan for the construction of approximately 11,000 ft² of commercial space, 80,000 ft² of office space, and 5,000 ft² of restaurant space. The development was built in 2021, and it is predicted to generate 162 new AM two-way peak-hour auto trips and 156 new PM two-way peak-hour auto trips. (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 stage 3 is completed in 2021 and stage 4 anticipated build-out horizon is 2022. The development is predicted to generate 199 new AM two-way peak-hour auto trips and 252 new PM two-way peak-hour auto trips by stage 3&4. (J.L. Richards & Associates Limited, 2019)

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 was built in 2021, and it is predicted to generate 49 new AM two-way peak-hour auto trips, 56 new PM two-way peak-hour auto trips, and 68 new Saturday peak-hour auto trips. (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 ft². The development was built in 2021, and it is predicted to generate 129 new AM two-way peak-hour auto trips and 129 new PM two-way peak-hour auto trips. (Parsons, 2019)

8605 Campeau Drive

The proposed development application includes a site plan for the construction of a gas station comprising of five gasoline pumps with ten fueling stations, a convenience store and eating establishment with a drive through, and an oil change building. The anticipated build-out horizon is 2025, and the development is predicted to generate 110 new AM two-way peak-hour auto trips and 119 new PM two-way peak-hour auto trips. (J+B Engineering Inc, 2020)

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 ft² gross floor area. The anticipated build-out horizon is 2023, 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)

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)
 - Site Access (Future Conditions)
- Huntmar Drive at:
 - Autopark Private/Cyclone Taylor Boulevard
 - Palladium Drive
- Country Glen Way at:
 - Site Access (Future Conditions)

The boundary road will be Campeau Drive, Country Glen Way, and Donum Lane (future). Screen lines SL44 and SL53 are present within proximity to the site and will not be included within the study analysis.

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 6 summarizes the exemptions for this TIA.

Table 6: Exemption Review

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

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 7.

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

Travel Mode	Multi-Unit (Low-Rise)	
	AM	PM
Auto Driver	52%	58%
Auto Passenger	14%	17%
Transit	22%	17%
Cycling	0%	0%
Walking	11%	8%
Total	100%	100%

With the completion of the Campeau Drive extension, a connection to the Terry Fox Station BRT was created, which lies two kilometres from the site. Therefore, a ten percent shift toward the transit mode taken from the auto mode is proposed for the site mode shares. The modified mode share targets proposed for the development are summarized in Table 8.

Table 8: Proposed Development Mode Shares

Travel Mode	Multi-Unit (Low-Rise)	
	AM	PM
Auto Driver	42%	48%
Auto Passenger	14%	17%
Transit	32%	27%
Cycling	0%	0%
Walking	11%	8%
Total	100%	100%

5.2 Trip Generation

This TIA has been prepared using the vehicle and person trip rates for the residential dwellings using the TRANS Trip Generation Manual (2020). Table 9 summarizes the person trip rates for the proposed residential land uses for each peak period.

Table 9: Trip Generation Person Trip Rates by Peak Period

Land Use	Land Use Code	Peak Period	Person Trip Rates
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 10 summarizes the total person trip generation for the residential land uses.

Table 10: Total Residential Person Trip Generation by Peak Period

Land Use	Units	AM Peak Period			PM Peak Period		
		In	Out	Total	In	Out	Total
Multi-Unit (Low-Rise)	368	149	348	497	325	256	581

Using the above mode share targets for a BRT area and the person trip rates, the person trips by mode have been projected. Trip generation by peak hour has been forecasted using the prescribed peak period conversion factors presented in the TRANS Trip Generation Manual (2020) for the residential component. Table 11 summarizes the trip generation by mode.

Table 11: Residential Trip Generation by Mode

Travel Mode		AM Peak Hour				PM Peak Hour			
		Mode Share	In	Out	Total	Mode Share	In	Out	Total
Multi-Unit (Low-Rise)	Auto Driver	42%	30	70	100	48%	69	54	123
	Auto Passenger	14%	10	24	34	17%	24	19	43
	Transit	32%	26	61	87	27%	41	32	73
	Cycling	0%	0	0	0	0%	0	0	0
	Walking	11%	9	22	31	8%	14	10	24
	Total	100%	75	174	249	100%	143	113	256

As shown above, a total of 100 AM and 123 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 12 below summarizes the distributions.

Table 12: OD Survey Distribution – Kanata/ Stittsville

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

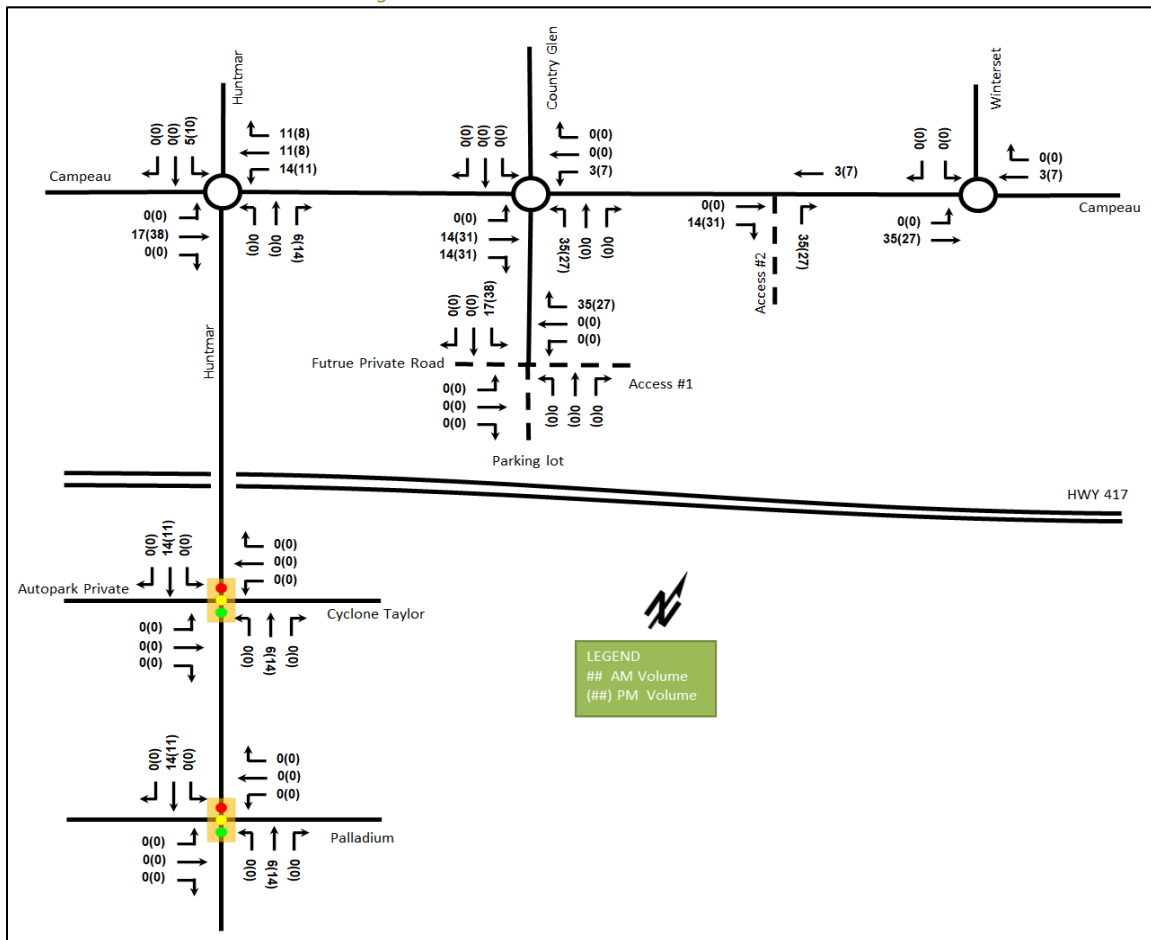
5.4 Trip Assignment

Using the distribution outlined above, turning movement splits, and access to major transportation infrastructure, the trips generated by the site have been assigned to the study area road network. Table 13 summarizes the proportional assignment to the study area roadways, and Figure 11 illustrates the new site generated volumes.

Table 13: Trip Assignment

To/From	Inbound Via	Outbound Via
North	15% Huntmar Drive(N)	15% Huntmar Drive (N)
South	10% Campeau Drive(W) 20% Huntmar Drive (S)	10% Campeau Drive(W) 20% Huntmar Drive (S)
East	40% Campeau Drive(W) 10% Campeau Drive(E)	50% Campeau Drive(E)
West	5% Campeau Drive (W)	5% Campeau Drive (W)
Total	100%	100%

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 in the fall of 2021. Given this new network link, a resultant redistribution of area traffic will be applied to future horizons which will be further discussed and illustrated in Section 6.3.

6.2 Background Growth

A review of the volume 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, however, it is noted that forecasted volumes in the study area have been exceeded. Therefore, growth on study area roadways will be accounted for explicitly through the inclusion of area development traffic, with no annual background rates applied. The projections are provided in Appendix E.

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
- 1400 Upper Canada Street
- 8800 Campeau Drive
- 340 Huntmar Drive
- 800 Palladium Drive
- Arcadia community Stage 3&4
- 8600 Campeau Drive
- 8700 Campeau Drive
- 8605 Campeau Drive
- 1300-1360 Upper Canada Street

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

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 12: 2025 Total Re-Assigned Volumes

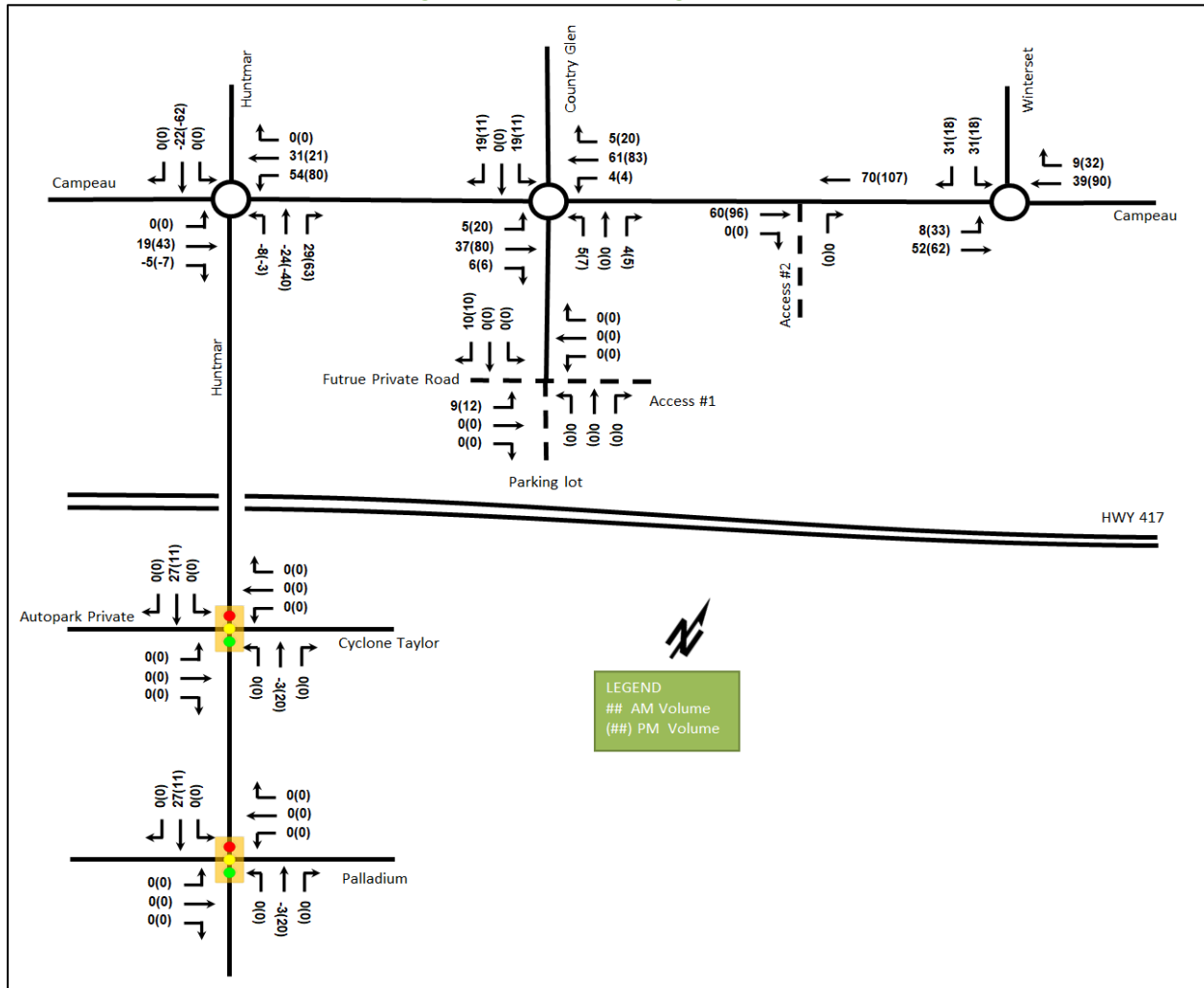
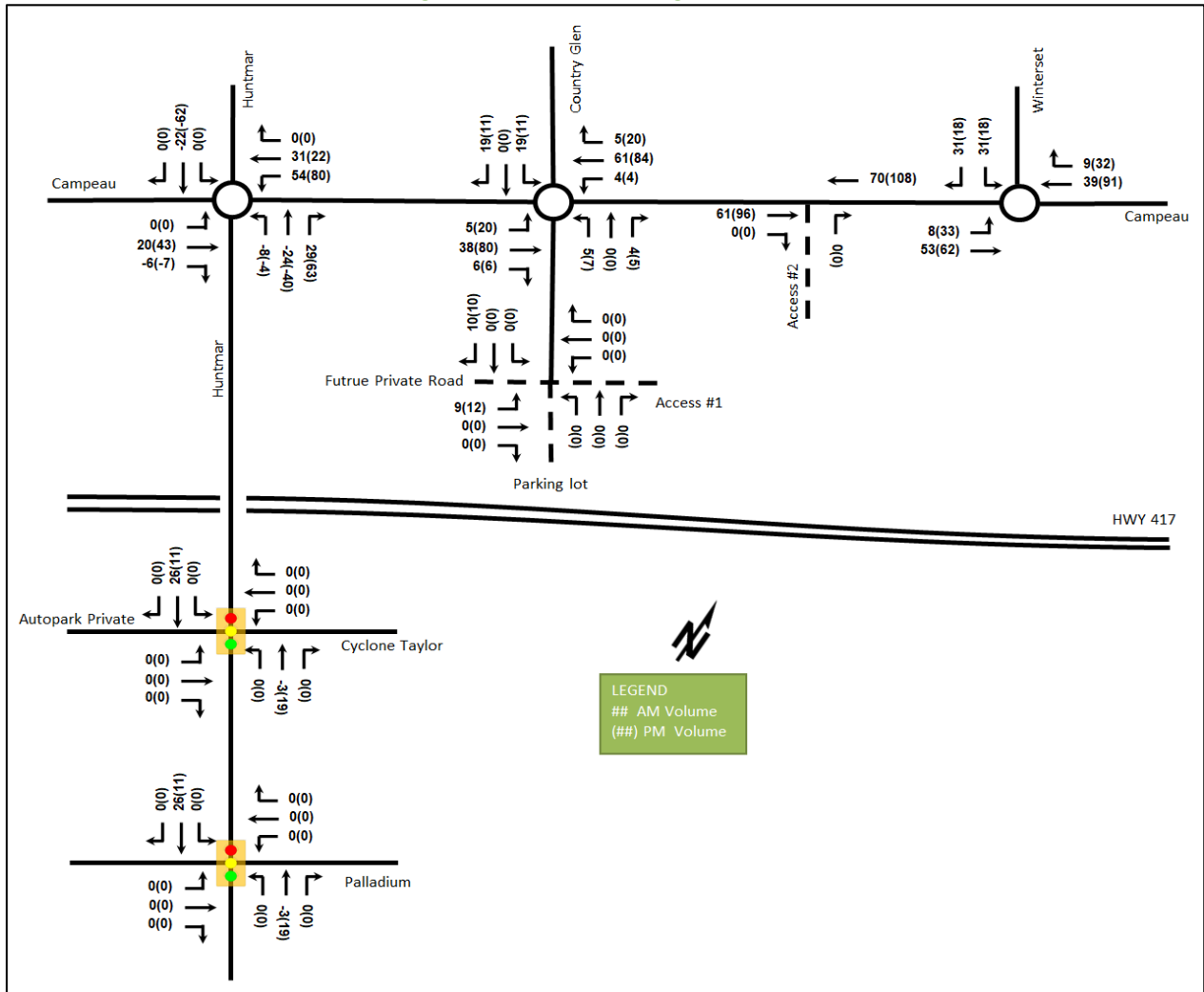


Figure 13: 2030 Total Re-Assigned Volumes



7 Demand Rationalization

7.1 2025 Future Background Operations

Since 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 14 summarizes the 2025 background intersection operations. The level of service for signalized intersections is based on v/c calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection. 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 condition are provided in Appendix G.

Figure 14: 2025 Future Background Volumes

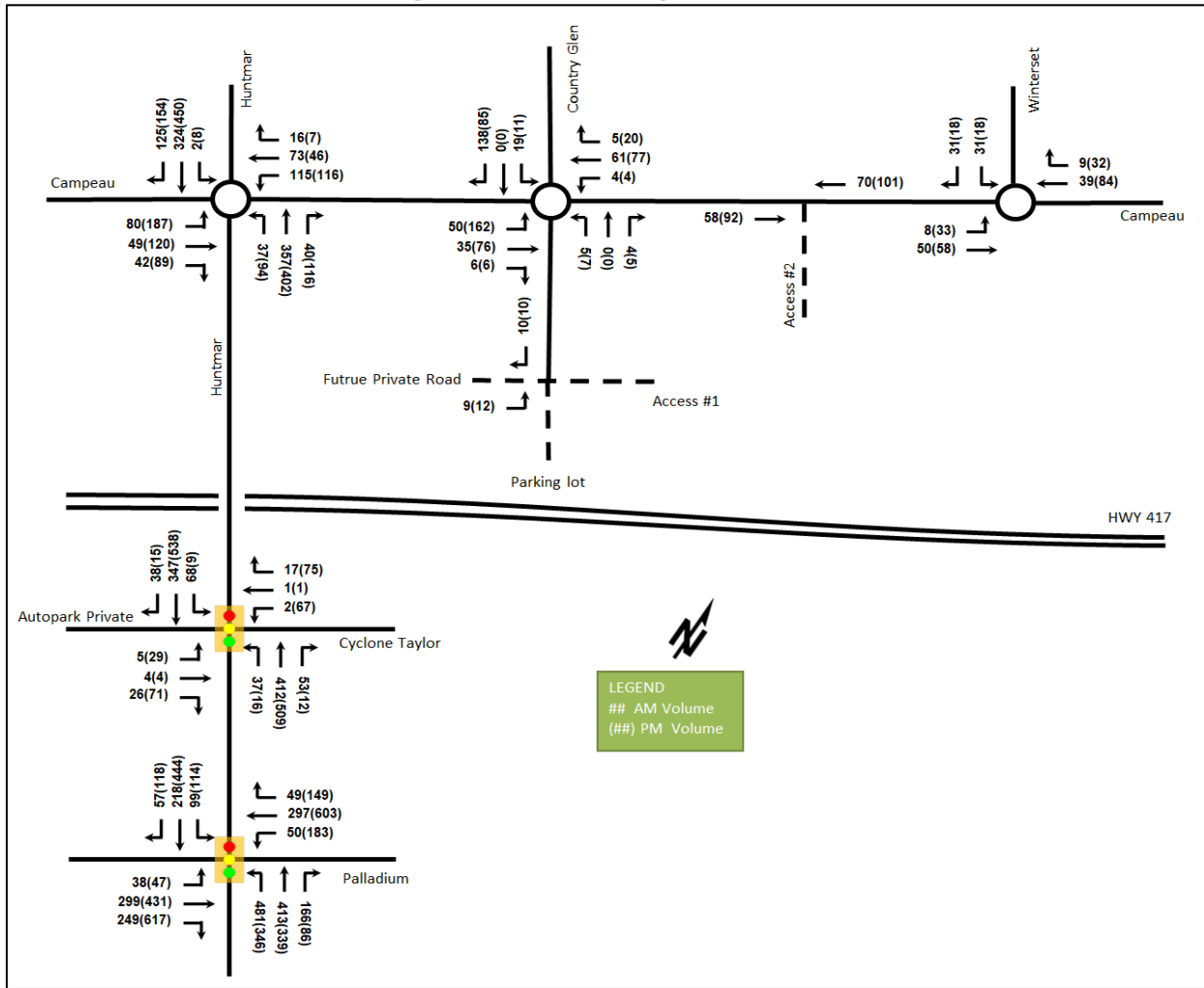


Table 14: 2025 Future Background Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay(s)	Q (95 th)	LOS	V/C	Delay(s)	Q (95 th)
Huntmar Drive at Campeau Drive Roundabout	EB	A	0.10	7.4	1.8	A	0.25	8.1	5.2
	WB	A	0.15	8.2	2.7	A	0.17	9.7	3.2
	NB	A	0.35	2.7	8.6	A	0.45	4.0	12.2
	SB	A	0.17	2.6	3.6	A	0.25	2.8	5.6
	Overall	A	0.35	4.2	-	A	0.45	5.1	-
Country Glen Way at Campeau Drive Roundabout	EB	A	0.05	6.6	1.1	A	0.15	7.3	4.1
	WB	A	0.03	3.8	0.6	A	0.05	4.1	1.0
	NB	A	0.01	5.1	0.1	A	0.01	5.7	0.1
	SB	A	0.15	2.9	2.9	A	0.09	2.9	1.7
	Overall	A	0.15	4.2	-	A	0.15	5.6	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay(s)	Q (95 th)	LOS	V/C	Delay(s)	Q (95 th)
Winterset Road at Campeau Drive Roundabout	EB	A	0.03	3.6	0.7	A	0.04	5.1	1.0
	WB	A	0.02	3.4	0.4	A	0.05	3.5	1.0
	SB	A	0.06	4.8	1.0	A	0.03	5.0	0.6
	Overall	A	0.06	4.0	-	A	0.05	4.3	-
Huntmar Drive at Autopark / Cyclone Taylor Signalized	EB	A	0.08	5.7	4.7	A	0.25	7.5	9.4
	WBL	A	0.01	9.0	1.1	A	0.22	14.9	10.9
	WBL/R	A	0.05	5.3	3.0	A	0.17	4.8	6.1
	NBL	A	0.04	6.4	8.0	A	0.04	9.8	4.5
	NBT	A	0.27	6.1	63.5	A	0.50	13.5	#95.4
	NBR	A	0.04	3.2	5.5	A	0.02	0.1	0.0
	SBL	A	0.09	6.4	13.0	A	0.03	10.0	3.2
	SBT	A	0.23	5.8	52.1	A	0.53	14.3	#103.5
	SBR	A	0.03	2.5	3.5	A	0.02	0.1	0.2
Overall	A	0.32	5.7	-	A	0.49	12.6	-	
Huntmar Drive at Palladium Drive Signalized	EBL	A	0.11	24.5	13.3	A	0.30	39.5	20.0
	EBT/R	A	0.45	17.1	46.7	E	0.99	54.6	#145.9
	WBL	A	0.15	14.9	11.7	C	0.80	50.7	#65.3
	WBT/R	A	0.23	14.0	28.1	A	0.53	24.2	83.4
	NBL	F	1.29	172.3	#181.3	F	1.30	181.1	#128.2
	NBT	A	0.60	26.1	91.1	A	0.43	22.2	70.2
	NBR	A	0.24	4.2	11.8	A	0.12	3.5	7.5
	SBL	A	0.57	46.8	32.7	A	0.40	35.0	35.5
	SBT	B	0.67	43.8	60.3	D	0.87	55.0	127.7
	SBR	A	0.14	0.7	0.0	A	0.22	2.9	6.8
Overall	D	0.89	51.5	-	F	1.17	53.4	-	

Notes: Saturation flow rate of 1800 veh/h/lane
 Queue is measured in metres
 Peak Hour Factor = 1.00

m = metered queue
 # = volume for the 95th %ile cycle exceeds capacity

During both the AM and PM peak hours, the study area intersections are subject to queuing issues generally and capacity issues at the intersection of Huntmar Drive and Palladium Drive.

The intersection of Huntmar Drive at Autopark Private/Cyclone Taylor Boulevard may exhibit extended queuing on the northbound and southbound through movements during PM peak hour at this horizon.

At the intersection of Huntmar Drive and Palladium Drive, the northbound left-turn movement is over theoretical capacity and may be subject to high delays and extended queues during peak hours. Extended queues may be exhibited on the eastbound shared through/right-turn and westbound left-turn movement, and eastbound shared through/right-turn movement is approaching its theoretical capacity during PM peak hour at this horizon.

To address the capacity constraints at Huntmar Drive at Palladium Drive, the v/c ratio may be able to be mitigated through signal timing optimization during the AM peak hour, and a network reduction of approximately 79 northbound left-turn vehicles during the PM peak hour would be required. This operational constraint can be addressed by the City and will not restrict the subject development.

7.2 2030 Future Background Operations

Figure 15 illustrates the 2030 background volumes and Table 15 summarizes the 2030 background intersection operations. The level of service for signalized intersections is based on v/c calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection. 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 2030 future background condition are provided in Appendix H.

Figure 15: 2030 Future Background Volumes

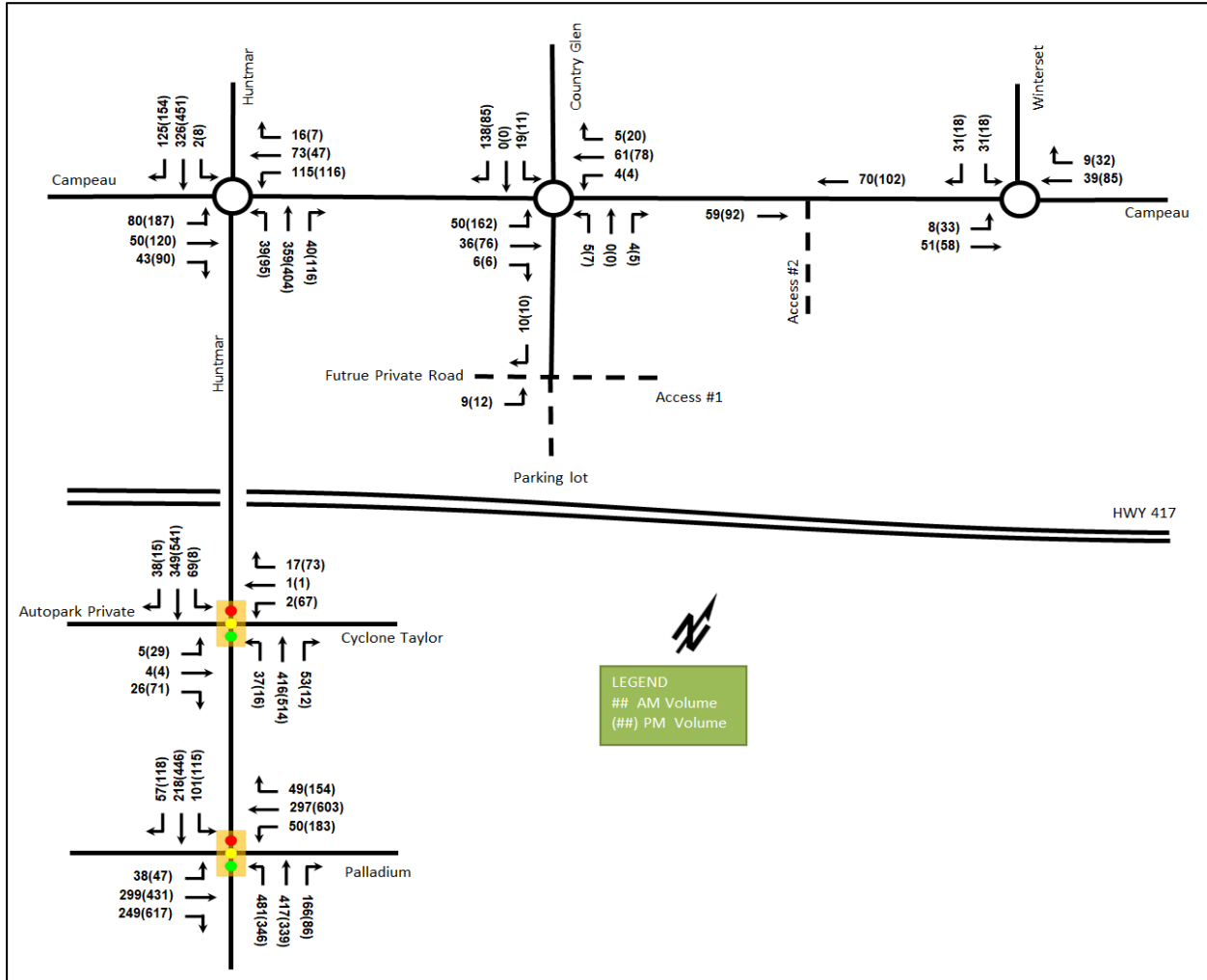


Table 15: 2030 Future Background Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay(s)	Q (95 th)	LOS	V/C	Delay(s)	Q (95 th)
Huntmar Drive at Campeau Drive Roundabout	EB	A	0.10	7.4	1.8	A	0.25	8.1	5.2
	WB	A	0.15	8.2	2.7	A	0.17	9.7	3.2
	NB	A	0.36	2.7	8.7	A	0.46	4.0	12.4
	SB	A	0.18	2.6	3.6	A	0.25	2.8	5.6
	Overall	A	0.36	4.2	-	A	0.46	5.1	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay(s)	Q (95 th)	LOS	V/C	Delay(s)	Q (95 th)
Country Glen Way at Campeau Drive Roundabout	EB	A	0.05	6.5	1.1	A	0.15	7.3	4.1
	WB	A	0.03	3.8	0.6	A	0.05	4.1	1.0
	NB	A	0.01	5.1	0.1	A	0.01	5.7	0.1
	SB	A	0.15	2.9	2.9	A	0.09	2.9	1.7
	Overall	A	0.15	4.2	-	A	0.15	5.6	-
Winterset Road at Campeau Drive Roundabout	EB	A	0.03	3.6	0.7	A	0.05	5.1	1.0
	WB	A	0.02	3.4	0.4	A	0.05	3.5	1.0
	SB	A	0.06	4.8	1.0	A	0.03	5.0	0.6
	Overall	A	0.06	4.0	-	A	0.05	4.3	-
Huntmar Drive at Autopark Private / Cyclone Taylor Boulevard Signalized	EB	A	0.08	5.7	4.7	A	0.25	7.5	9.4
	WBL	A	0.01	9.0	1.1	A	0.22	14.9	10.9
	WBL/R	A	0.05	5.3	3.0	A	0.17	4.8	6.0
	NBL	A	0.04	6.4	8.0	A	0.04	9.8	4.5
	NBT	A	0.27	6.1	64.6	A	0.51	13.6	#96.7
	NBR	A	0.04	3.2	5.5	A	0.02	0.1	0.0
	SBL	A	0.09	6.4	13.2	A	0.03	10.0	3.0
	SBT	A	0.23	5.8	52.6	A	0.53	14.3	#104.5
	SBR	A	0.03	2.5	3.5	A	0.02	0.1	0.2
	Overall	A	0.33	5.7	-	A	0.49	12.7	-
Huntmar Drive at Palladium Drive Signalized	EBL	A	0.11	24.6	13.4	A	0.30	39.6	20.0
	EBT/R	A	0.45	17.2	46.8	E	0.99	54.9	#145.9
	WBL	A	0.15	15.0	11.7	D	0.81	50.9	#65.3
	WBT/R	A	0.23	14.1	28.2	A	0.54	24.3	84.0
	NBL	F	1.28	171.4	#181.9	F	1.30	183.0	#128.6
	NBT	B	0.61	26.3	92.2	A	0.43	22.2	70.2
	NBR	A	0.24	4.2	11.8	A	0.12	3.5	7.5
	SBL	A	0.58	47.6	33.5	A	0.40	35.1	36.0
	SBT	B	0.66	43.7	60.2	D	0.87	55.1	128.4
	SBR	A	0.14	0.7	0.0	A	0.22	2.9	6.8
Overall	D	0.89	40.6	-	F	1.18	53.7	-	

Notes: Saturation flow rate of 1800 veh/h/lane
 Queue is measured in metres
 Peak Hour Factor = 1.00

m = metered queue
 # = volume for the 95th %ile cycle exceeds capacity

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

Similar to the 2025 future background condition, signal timing optimization during the AM peak hour and a network reduction of approximately 79 northbound left-turn vehicles during the PM peak hour could address the capacity constraints at Huntmar Drive at Palladium Drive. This operational constraint can be addressed by the City and will not restrict the subject development.

7.3 Modal Share Sensitivity and Demand Rationalization Conclusions

No capacity constraints have been noted in the vicinity of the development or at intersection movements that would support and be impacted by the development. The only constraint noted is the northbound left-turn movement at the intersection of Huntmar Drive and Palladium Drive and is a result of background development

traffic. As the Robert Grant Avenue and Stittsville Main extensions are currently being planned for construction, these may alleviate the capacity constraint on this movement.

8 Development Design

8.1 Design for Sustainable Modes

The proposed development includes 264 infusion terraces and 104 townhomes with two two-way accesses. Surface parking and two garage ramps with 15% slope will be provided on the south side of the development for infusion terraces underground parking. Driveways will be provided for each townhome. Bike racks will be provided for bicycle parking. A connection to the future 3.0-metre multi-use pathway along Campeau Station will be provided on the south side of the site. A 1.8-metre public sidewalk will be provided along the east side of the public parkette, and hard surface connections will be provided within the development to connect each unit and the pedestrian and cycling facilities along boundary roads.

8.2 Circulation and Access

The proposed development proposes a full-movement access onto Country Glen Way and a right-in-right-out access onto Campeau Drive. Both accesses are 6.7-meter wide, and it connects to the internal road circulating the site.

The fire truck and garbage collection vehicle turning templates were reviewed to confirm movements will be permitted on site. The garbage collection vehicle, approximated by an HSU, will require to collect on the internal aisle and from the garbage collection area east of the intersection of Country Glen Way at Access #1. The turning templates are provided in Appendix I.

9 Parking

9.1 Parking Supply

The proposed development consists of 264 stacked towns and 104 townhomes. Garages and bike storage will be provided internally for each townhome. A total of 279 residential parking spaces with 131 above ground and 148 under ground, 27 visitor surface parking spaces, and 128 bicycle spaces will be provided for stacked towns.

Being closer to the LRT station, the amount of required visitor parking has been reduced during the re-zoning exercise. The minimum vehicle parking provisions for the site are a 264 residential parking spaces, 27 visitor parking spaces, and 132 bicycle parking spaces.

The minimum residential and visitor parking requirement are satisfied, and bicycle parking is four spaces less than the requirement.

10 Boundary Street Design

Table 16 summarizes the MMLOS analysis for the boundary streets of Campeau Drive, Country Glen Way (Future), and Donum Lane (future). The existing and future conditions for both streets will be the same and are considered in one row. The boundary street analysis is based on the policy area within 600 m of a rapid transit station. The MMLOS worksheets have been provided in Appendix J.

Table 16: Boundary Street MMLOS Analysis

Segment	Pedestrian LOS		Bicycle LOS		Transit LOS		Truck LOS	
	PLOS	Target	BLOS	Target	TLOS	Target	TrLOS	Target
Campeau Drive	B	A	A	D	-	-	-	-
Country Glen Way (Existing)	F	A	B	D	-	-	-	-
Country Glen Way (Future)	A	A	A	D	-	-	-	-
Donum Lane (Future)	A	A	B	D	-	-	-	-

Campeau Drive does not meet the pedestrian MMLOS targets given the high target set by the policy area of being within 600 m of a rapid transit station and the high operating vehicle speeds. Country Glen Way does not meet the pedestrian MMLOS targets in the existing condition but will meet in the future condition.

11 Access Intersections Design

11.1 Location and Design of Access

The site will access Country Glen Way via a full-movement access and Campeau Drive via right-in-right-out access. The accesses are proposed to be 6.7 metres wide.

The suggested minimum throat length is 40 metres for arterial road (Campeau Drive) from Table 8.9.3 of the TAC Geometric Design Guidelines, and it is suggested that 7.5 metres be provided on Country Glen Way. The throat length for the access will be 12.0 metres for access on Country Glen Way and approximately 86 metres for access on Campeau Drive. It is noted that the outbound lane to Campeau Drive has parallel parking bays, this parking will not induce turning movements and is considered to satisfy the throat length requirements.

11.2 Intersection Control

Based upon the projected volumes, the site access on Campeau Drive will have stop-control on the minor approach, and the site access on Country Glen Way will have all-way stop-control. No further traffic control is necessary to address operational issues.

11.3 Access Intersection Design

11.3.1 2025 Future Total Access Intersection Operations

The 2025 future total intersection volumes are illustrated in Figure 16 and the access intersection operations are summarized below in Table 17. Synchro 11 has been used to model the unsignalized intersections and HCM 2010 methodology was used for unsignalized intersection operations. The synchro worksheets have been provided in Appendix K.

Figure 16: 2025 Future Total Volumes

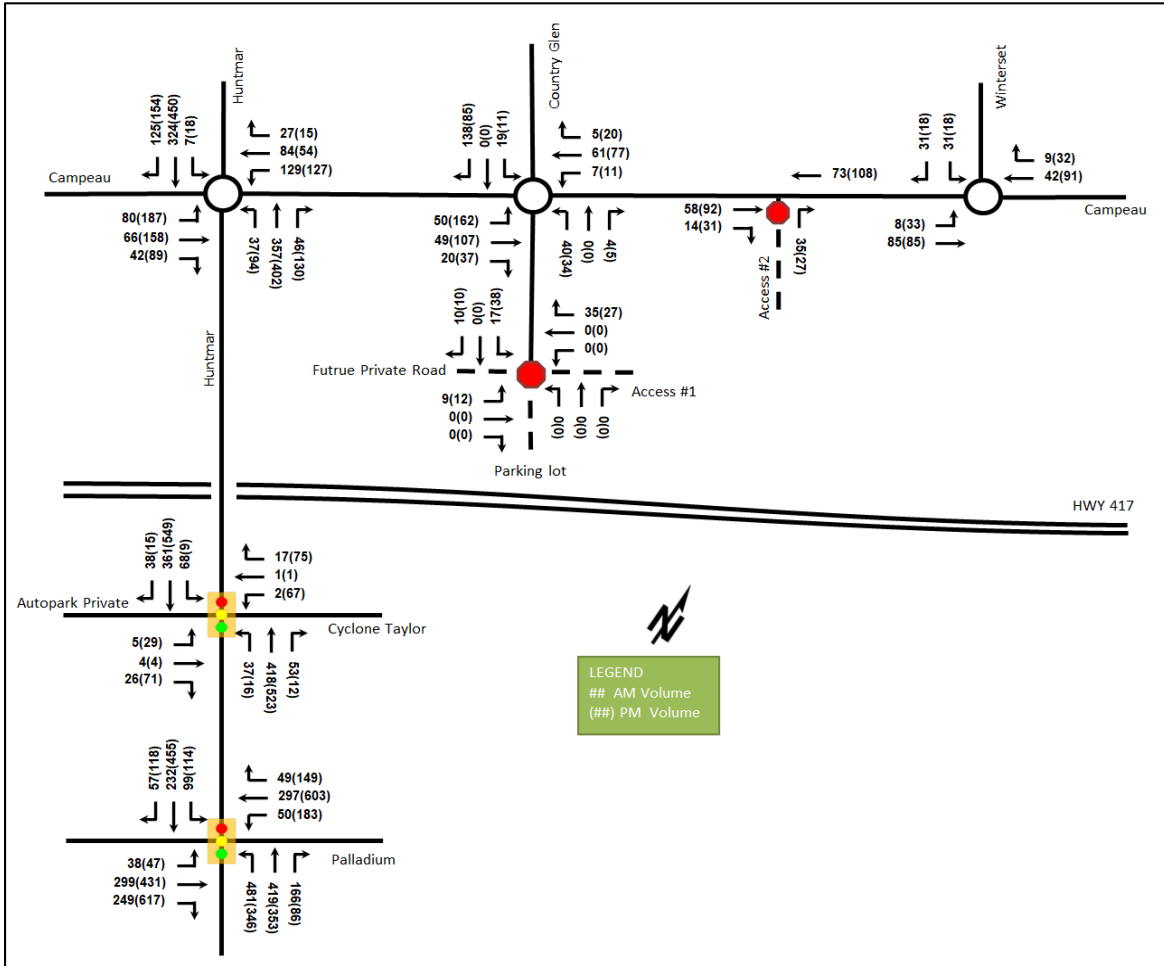


Table 17: 2025 Future Total Access Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 th)	LOS	V/C	Delay	Q (95 th)
Site Access #1 at Country Glen Way <i>Unsignalized</i>	EB	A	0.01	7.3	0.0	A	0.01	7.3	0.0
	WB	A	0.03	6.5	0.8	A	0.03	6.5	0.8
	NB	-	-	-	-	-	-	-	-
	SB	A	0.03	7.0	0.8	A	0.05	7.3	1.5
	Overall	A	-	6.8	-	-	A	-	7.1
Site Access #2 at Campeau Drive <i>Unsignalized</i>	EBT	-	-	-	-	-	-	-	-
	EBT/R	-	-	-	-	-	-	-	-
	WBT	-	-	-	-	-	-	-	-
	NBR	A	0.03	8.6	0.8	A	0.03	8.7	0.8
	Overall	A	-	1.6	-	-	A	-	0.9

Notes: Saturation flow rate of 1800 veh/h/lane
Queue is measured in metres
Peak Hour Factor = 1.00

m = metered queue
= volume for the 95th %ile cycle exceeds capacity

The 2025 future total access intersection operates satisfactorily. No mitigation is required.

11.3.2 2030 Future Total Access Intersection Operations

The 2030 future total intersection volumes are illustrated in Figure 17 and the access intersection operations are summarized below in Table 18. Synchro 11 has been used to model the unsignalized intersections and HCM 2010

methodology was used for unsignalized intersection operations. The synchro worksheets have been provided in Appendix L.

Figure 17: 2030 Future Total Volumes

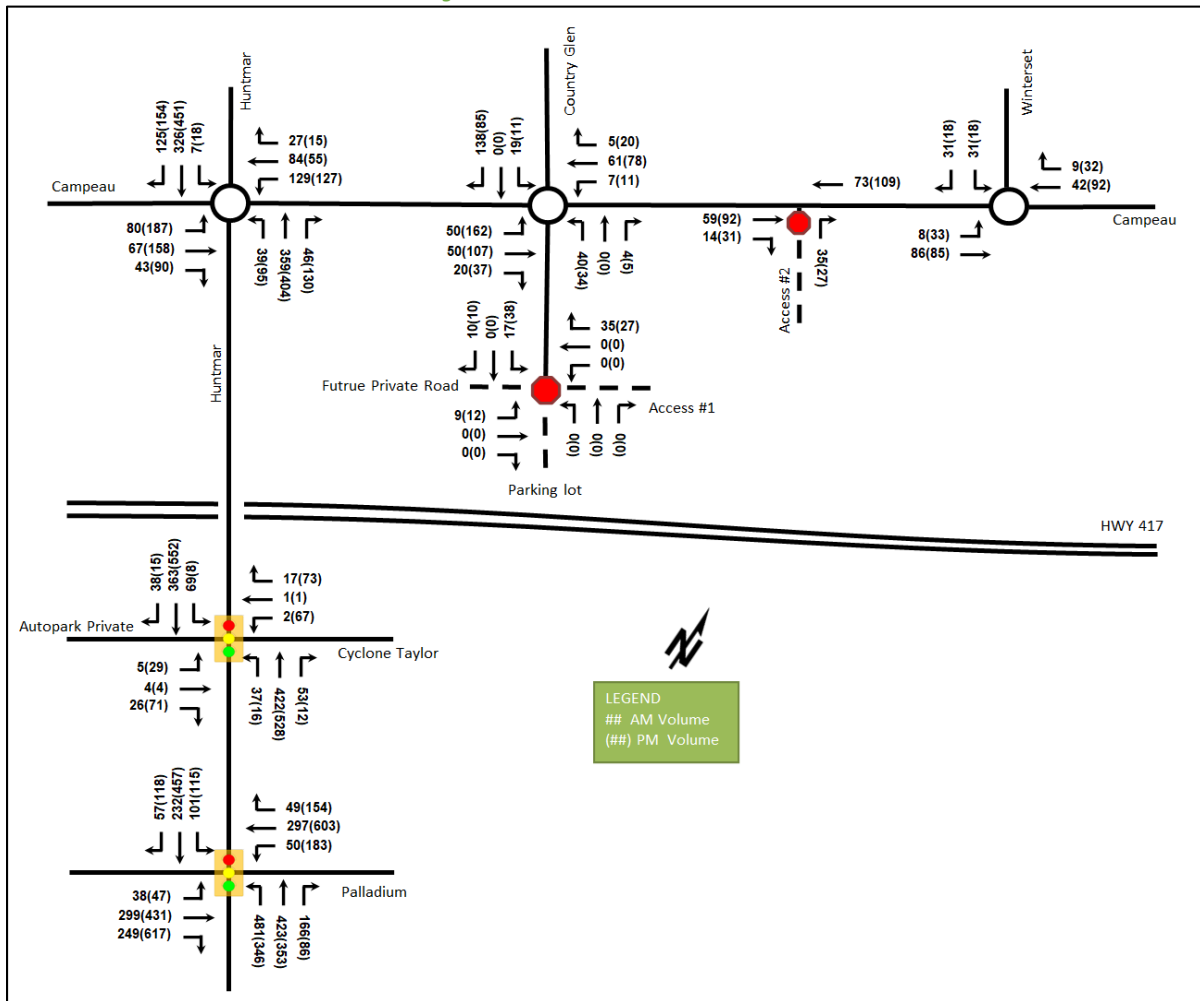


Table 18: 2030 Future Total Access Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 th)	LOS	V/C	Delay	Q (95 th)
Site Access #1 at Country Glen Way <i>Unsignalized</i>	EB	A	0.01	7.3	0.0	A	0.01	7.3	0.0
	WB	A	0.03	6.5	0.8	A	0.03	6.5	0.8
	NB	-	-	-	-	-	-	-	-
	SB	A	0.03	7.0	0.8	A	0.05	7.3	1.5
	Overall	A	-	6.8	-	-	A	-	7.1
Site Access #2 at Campeau Drive <i>Unsignalized</i>	EBT	-	-	-	-	-	-	-	-
	EBT/R	-	-	-	-	-	-	-	-
	WBT	-	-	-	-	-	-	-	-
	NBR	A	0.03	8.6	0.8	A	0.03	8.7	0.8
	Overall	A	-	1.7	-	-	A	-	0.9

Notes: Saturation flow rate of 1800 veh/h/lane
Queue is measured in metres
Peak Hour Factor = 1.00

m = metered queue
= volume for the 95th %ile cycle exceeds capacity

The 2030 future total access intersection operates satisfactorily. No mitigation is required.

11.3.3 Access Intersection MMLoS

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

11.3.4 Recommended Design Elements

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

12 Transportation Demand Management

12.1 Context for TDM

The mode shares used within the TIA represent a shift from auto modes to transit modes given the site's access to Terry Fox Station. Overall, the modal shares are likely to be achieved and supporting TDM measures should be provided.

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

12.2 Need and Opportunity

The subject site has been assumed to rely predominantly on auto travel with an increase in transit ridership with access to Terry Fox Station, and those assumptions have been carried through the analysis. The study area intersections are anticipated to have the residual capacity and the increase in transit ridership is achievable.

12.3 TDM Program

The "suite of post occupancy TDM measures" has been summarized in the TDM checklists for the residential land uses. The checklist is provided in Appendix M. The key TDM measures recommended include:

- Provide a multimodal travel option information package to new residents
- Inclusion of a 1-year Presto card for first time new townhome purchase and apartment rental, with a set time frame for this offer (e.g. 6-months) from the initial opening of the site

13 Neighbourhood Traffic Management

The proposed development will connect to the arterial road network via Country Glen Way (a local road). The TIA Guidelines propose a threshold of 120 vehicles per peak hour for the classification of local roads, which per City guidance is to be interpreted as two-way volumes. City staff have noted that these thresholds are under review and will be updated in the future. The existing volumes on the roadways of Country Glen Way is summarized below and compared to the forecasted site volumes for those links. The results of this analysis are summarized in Table 19.

Table 19: NTM Review

Segment	AM Peak				PM Peak			
	Existing Two-Way	FB2025 & 2030 Two-Way	Site Traffic	Total Two-Way	Existing Two-Way	FB2025 & 2030 Two-Way	Site Traffic	Total Two-Way
Country Glen Way	0	19	52	71	0	22	65	87

The total forecasted volumes on Country Glen Way are below the threshold from the TIA guidelines. Thus, development traffic will have no impact on the classification or function of Country Glen Way.

14 Transit

14.1 Route Capacity

In Section 5.1 the trip generation by mode was estimated, including an estimate of the number of transit trips that will be generated by the proposed development. Table 20 summarizes the transit trip generation.

Table 20: Trip Generation by Transit Mode

Travel Mode	Mode Share	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Transit	32% (27%)	26	61	87	41	32	73

The proposed development is anticipated to generate an additional 87 AM peak hour transit trips and 73 PM peak hour transit trips. Of these trips, 61 outbound AM trips and 41 inbound PM trips are anticipated. From the trip distribution found in Section 5.2, these values can be further broken down.

Site-generated outbound AM trips break down to 18 trips to the south, 40 trips to the east, and three trips to the west. Site-generated inbound PM trips break down to 12 trips from the south, 27 trips from the east, and two trips from the west. Route #62 provides up to two trips during peak hours and travels to all directions.

It is recommended that future transit service include the routing of 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.

14.2 Transit Priority

Examining delay, negligible impacts are noted on the transit priority movements of the westbound right-turn and southbound left-turn movements at the intersection of Huntmar Drive and Autopark Private/ Cyclone Taylor Boulevard.

At the intersection of Huntmar Drive and Palladium Drive, the largest impact of forecasted site traffic is a resultant increase in delay for the northbound left-turn of 6.0 seconds in peak hours. No decrease in transit level of service is noted by these impacts.

15 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.

16 Network Intersection Design

16.1 Network Intersection Control

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

16.2 Network Intersection Design

16.2.1 2025 Future Total Network Intersection Operations

The 2025 future total network intersection operations are summarized below in Table 21. The level of service for signalized intersections is based on HCM 2010 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 roundabout. The synchro and Sidra worksheets have been provided in Appendix K.

Table 21: 2025 Future Total Network Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 th)	LOS	V/C	Delay	Q (95 th)
Huntmar Drive at Campeau Drive Roundabout	EB	A	0.10	7.3	1.8	A	0.26	8.0	5.2
	WB	A	0.16	8.1	3.1	A	0.19	9.5	3.6
	NB	A	0.36	2.8	8.8	A	0.47	4.3	13.1
	SB	A	0.18	2.8	3.8	A	0.26	3.0	5.8
	Overall	A	0.36	4.4	8.8	A	0.47	5.3	13.1
Country Glen Way at Campeau Drive Roundabout	EB	A	0.06	5.8	1.4	A	0.15	6.5	4.1
	WB	A	0.04	4.2	0.6	A	0.06	4.5	1.1
	NB	A	0.04	7.2	0.7	A	0.04	7.4	0.6
	SB	A	0.15	3.0	3.0	A	0.10	3.0	1.7
	Overall	A	0.15	4.5	3.0	A	0.15	5.5	4.1
Winterset Road at Campeau Drive Roundabout	EB	A	0.04	3.3	1.1	A	0.05	4.5	1.3
	WB	A	0.02	3.4	0.4	A	0.06	3.5	1.1
	SB	A	0.06	4.9	1.0	A	0.03	5.0	0.6
	Overall	A	0.06	3.8	1.1	A	0.06	4.1	1.3
Huntmar Drive at Autopark Private / Cyclone Taylor Boulevard Signalized	EB	A	0.08	5.7	4.7	A	0.25	7.5	9.4
	WBL	A	0.01	9.0	1.1	A	0.22	14.9	10.9
	WBL/R	A	0.05	5.3	3.0	A	0.17	4.8	6.1
	NBL	A	0.04	6.4	8.0	A	0.04	9.8	4.5
	NBT	A	0.27	6.1	64.9	A	0.52	13.9	#99.4
	NBR	A	0.04	3.2	5.5	A	0.02	0.1	0.0
	SBL	A	0.09	6.4	13.0	A	0.03	10.0	3.2
	SBT	A	0.24	5.9	54.6	A	0.54	14.6	#106.7
	SBR	A	0.03	2.5	3.5	A	0.02	0.1	0.2
Overall	A	0.33	5.8	-	A	0.51	12.9	-	
Huntmar Drive at Palladium Drive Signalized	EBL	A	0.11	25.0	13.4	A	0.30	39.7	20.0
	EBT/R	A	0.46	17.5	47.4	E	1.00	56.0	#145.9
	WBL	A	0.16	15.4	11.9	D	0.81	51.6	#65.3
	WBT/R	A	0.23	14.4	28.7	A	0.54	24.5	83.4
	NBL	F	1.30	179.4	#184.4	F	1.32	189.6	#130.5
	NBT	A	0.60	26.0	92.7	A	0.45	22.4	73.6
	NBR	A	0.24	4.1	11.7	A	0.12	3.5	7.5
	SBL	A	0.55	45.4	32.6	A	0.40	34.9	35.6
	SBT	B	0.68	44.1	63.8	D	0.88	55.8	#133.4
SBR	A	0.14	0.7	0.0	A	0.22	2.9	6.8	
Overall	D	0.90	52.9	-	F	1.04	54.8	-	

Notes: Saturation flow rate of 1800 veh/h/lane
 Queue is measured in metres
 Peak Hour Factor = 1.00

m = metered queue
 # = volume for the 95th %ile cycle exceeds capacity

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

Similar to 2025 future background condition, signal timing optimization during the AM peak hour and a network reduction of approximately 82 northbound left-turn vehicles during the PM peak hour could address the capacity constraints at Huntmar Drive at Palladium Drive. Since the northbound left-turn movement constraint at the

intersection of Huntmar Drive and Palladium Drive and is a result of background development traffic, no mitigation is required.

16.2.2 2030 Future Total Network Intersection Operations

The 2030 future total network intersection operations are summarized below in Table 22. The level of service for signalized intersections is based on HCM 2010 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 roundabout. The synchro and Sidra worksheets have been provided in Appendix L.

Table 22: 2030 Future Total Network Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 th)	LOS	V/C	Delay	Q (95 th)
Huntmar Drive at Campeau Drive Roundabout	EB	A	0.10	7.2	1.8	A	0.26	8.0	5.2
	WB	A	0.16	8.1	3.1	A	0.19	9.5	3.6
	NB	A	0.36	2.8	8.8	A	0.47	4.3	13.3
	SB	A	0.18	2.8	3.8	A	0.26	3.0	5.8
	Overall	A	0.36	4.4	8.8	A	0.47	5.3	13.3
Country Glen Way at Campeau Drive Roundabout	EB	A	0.06	5.8	1.4	A	0.15	6.4	4.1
	WB	A	0.04	4.2	0.6	A	0.06	4.5	1.1
	NB	A	0.04	7.2	0.7	A	0.04	7.4	0.6
	SB	A	0.15	3.0	3.0	A	0.10	3.0	1.7
	Overall	A	0.15	4.5	3.0	A	0.15	5.5	4.1
Winterset Road at Campeau Drive Roundabout	EB	A	0.04	3.3	1.1	A	0.06	4.5	1.3
	WB	A	0.02	3.4	0.4	A	0.06	3.5	1.1
	SB	A	0.06	4.8	1.0	A	0.03	5.0	0.6
	Overall	A	0.06	3.8	1.1	A	0.06	4.1	1.3
Huntmar Drive at Autopark Private / Cyclone Taylor Boulevard Signalized	EB	A	0.08	5.7	4.7	A	0.25	7.5	9.4
	WBL	A	0.01	9.0	1.1	A	0.22	14.9	10.9
	WBL/R	A	0.05	5.3	3.0	A	0.17	4.8	6.0
	NBL	A	0.04	6.4	8.0	A	0.04	9.8	4.5
	NBT	A	0.28	6.2	65.7	A	0.52	14.0	#100.6
	NBR	A	0.04	3.2	5.5	A	0.02	0.1	0.0
	SBL	A	0.09	6.4	13.2	A	0.03	10.0	3.0
	SBT	A	0.24	5.9	55.1	A	0.55	14.6	#107.4
	SBR	A	0.03	2.5	3.5	A	0.02	0.1	0.2
Overall	A	0.33	5.8	-	A	0.50	13.0	-	
Huntmar Drive at Palladium Drive Signalized	EBL	A	0.11	25.0	13.4	A	0.30	39.9	20.0
	EBT/R	A	0.46	17.5	47.4	E	1.00	56.2	#145.9
	WBL	A	0.16	15.4	11.9	D	0.81	51.8	#65.3
	WBT/R	A	0.23	14.4	28.7	A	0.54	24.6	84.0
	NBL	F	1.30	179.4	#184.4	F	1.32	189.6	#130.5
	NBT	B	0.61	26.1	93.7	A	0.45	22.4	73.6
	NBR	A	0.24	4.1	11.7	A	0.12	3.5	7.5
	SBL	A	0.57	46.1	33.3	A	0.40	35.0	36.1
	SBT	B	0.68	44.1	63.8	D	0.88	56.0	#135.5
	SBR	A	0.14	0.7	0.0	A	0.22	2.9	6.8
Overall	D	0.90	52.9	-	F	1.19	54.9	-	

Notes: Saturation flow rate of 1800 veh/h/lane
 Queue is measured in metres
 Peak Hour Factor = 1.00

m = metered queue
 # = 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 future background condition.

Similar to the 2030 future background condition, signal timing optimization during the AM peak hour and a network reduction of approximately 82 northbound left-turn vehicles during the PM peak hour could address the capacity constraints at Huntmar Drive at Palladium Drive. Since the northbound left-turn movement constraint at the intersection of Huntmar Drive and Palladium Drive is a result of background development traffic, no mitigation is required.

16.2.3 Network Intersection MMLOS

Table 23 summarizes the MMLOS analysis for the network intersections of Huntmar Drive at Autopark Private/Cyclone Taylor Boulevard and Huntmar Drive at Palladium Drive. The existing and future conditions for both intersections will be the same and are considered in one row. The intersection analysis is based on the policy area within 600 m of a rapid transit station. The MMLOS worksheets has been provided in Appendix J.

Table 23: 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
Huntmar Dr at Autopark Priv/Cyclone Taylor Blvd	F	C	F	C	-	-	-	-	A	D
Huntmar Dr at Palladium Dr	F	C	F	B	-	-	-	-	C	D

The pedestrian LOS will not be met at the intersection of Huntmar Drive at Autopark Private/Cyclone Taylor Boulevard and of Huntmar Drive at Palladium Drive. To meet pedestrian LOS targets, the maximum crossing distance on all pedestrian crossings would need to be reduced to three lane-widths.

The bicycle transit LOS will not be met at the intersection of Huntmar Drive at Autopark Private/ Cyclone Taylor Boulevard and of Huntmar Drive at Palladium Drive. 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 along the roadways.

The transit LOS targets will not be met at the intersection of Huntmar Drive at Palladium Drive. To meet transit LOS, the delay would need to be reduced to below 10 seconds on all transit movements.

16.2.4 Recommended Design Elements

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

17 Next Steps

Following the circulation and review of the TIA, any outstanding comments will be documents within the context of the zoning bylaw amendment and site plan applications in the Step 4 Strategy Report. Once remaining TIA Steps are completed and sign-off has been received from City Transportation Project Manager, a signed and stamped final report will be provided to City staff.

18 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 264 stacked towns and 104 townhomes

- Accesses are proposed onto Campeau Drive via a right-in-right-out access and onto Country Glen Way via a full-movements access
- The development is proposed to be completed as a single phase by 2025
- The trip generation, location and safety triggers were met for the TIA Screening

Existing Conditions

- Huntmar Drive, Campeau Drive, and Palladium Drive are arterial roads in the study area
- Sidewalks are provided or planned on both sides of Country Glen Way, Campeau Drive, Huntmar Drive and Palladium Drive
- Cycletracks are present on Campeau Drive and Huntmar Drive near Campeau Drive
- Huntmar Drive south of Campeau Drive and Campeau Drive east of Huntmar Drive are spine routes, Huntmar Drive north of Campeau Drive and Palladium Drive east of Huntmar Drive are local routes, and pathways are present along Carp River north of Campeau Drive
- The collisions in the study area are few and predominantly sideswipe, which may be more prevalent at roundabouts
- The northbound left-turn movement may subject to extended queues during both peak hours at Huntmar Drive and Palladium Drive intersection, but generally the intersections operate well

Development Generated Travel Demand

- The proposed development is forecasted to produce 249 two-way people trips during the AM peak hour and 256 two-way people trips during the PM peak hour
- Of the forecasted people trips, 100 two-way trips will be vehicle trips during the AM peak hour and 123 two-way trips will be vehicle trips during the PM peak hour based on a 42%-48% auto mode share, reduced for the development's access to Terry Fox Station
- Of the forecasted trips, 15% are anticipated to travel north, 30% to travel south, 50% to travel east, and 5% to travel 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
- Growth on study area roadways will be accounted for explicitly through the inclusion of area development traffic
- The intersection of Huntmar Drive at Palladium Drive, the northbound left-turn movement during both peak hours are over theoretical capacity and may subject to high delays and extended queues
- The intersections at the 2030 future background condition are anticipated to operate similarly to the 2025 background conditions
- Signal timing optimization during the AM peak hour and a network reduction of approximately 79 northbound left-turn vehicles during the PM peak hour could address the capacity constraints at Huntmar Drive at Palladium Drive
- This operational constraint can be addressed by the City and will not restrict the subject development

Development Design

- Driveways will be provided for each townhome and both underground and surface parking will be provided for stacked towns.
- Bike racks will be provided for bicycle parking
- A 3.0 metre multi-use pathway will be provided along Campeau Station and a connection to the pathway will be provided on the south side of the site
- The fire truck and garbage collection vehicles turning templates were reviewed to confirm movements will be permitted on site

Parking

- Garages and bike storage will be provided internally for each townhome
- A total of 279 residential parking spaces and 27 visitor surface parking spaces will be provided for stacked towns and it meets the parking requirements
- A total of 128 bicycle spaces will be provided for stacked towns, and it is four spaces less than the requirement

Boundary Street Design

- Campeau Drive does not meet the pedestrian MMLoS targets given the high target set by the policy area of being within 600 m of a rapid transit station
- Country Glen Way does not meet the pedestrian MMLoS targets in the existing condition but will meet in the future condition

Access Intersections Design

- The site will access Country Glen Way via a full-movement access and Campeau Drive via right-in-right-out access
- The accesses are proposed to be 6.7 metres wide
- The throat length for the access will be 12.0 metres for access on Country Glen Way and approximately 86 metres for access on Campeau Drive
- The site access on Campeau Drive will have stop-control on the minor approach, and the site access on Country Glen Way will have all-way stop-control
- The 2025 and 2030 future total access intersection operates satisfactorily. No mitigation is required

TDM

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

NTM

- The total forecasted volumes on Country Glen Way are below the threshold from the TIA guidelines, no impact on the classification or function of Country Glen Way

Transit

- 61 outbound AM transit trips and 41 inbound PM transit trips are anticipated from the development

- 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
- At the intersection of Huntmar Drive and Palladium Drive, the largest impact of forecasted site traffic is a resultant increase in delay for the northbound left-turn of 6.0 seconds in peak hours, and no decrease in transit level of service is noted by these impacts

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 operate at the future total horizons will operate similarly to the future background conditions
- The operational constraints at the Huntmar Drive and Palladium Drive intersection can be addressed by the City and will not restrict the subject development
- The pedestrian LOS will not be met at the intersection of Huntmar Drive and Autopark Private/ Cyclone Taylor Boulevard and of Huntmar Drive and Palladium Drive, which would require crossing distances equal to or less than three lane widths to meet targets
- The bicycle transit LOS will not be met at the intersection of Huntmar Drive and Autopark Private/ Cyclone Taylor Boulevard and of Huntmar Drive and Palladium Drive, which are limited by the lack of dedicated facilities and improved left-turn configurations
- The transit LOS targets will not be met at the intersection of Huntmar Drive and Palladium Drive and the delay would need to be reduced to below 10 seconds on all transit movements

19 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 2017 TIA Guidelines
Step 1 - Screening Form

Date: 14-Jul-22
Project Number: 2021-048
Project Reference: Arcadia Stage 6

1.1 Description of Proposed Development	
Municipal Address	8415 Campeau Drive
Description of Location	Ward 4. Between Campeau Drive at Country Glen Way and Campeau Drive at Winterset Road/Donum lane
Land Use Classification	Development Reserve Zone (DR)
Development Size	264 stacked towns and 104 townhomes
Accesses	One access onto Campeau Drive and one access onto Country Glen Way
Phase of Development	Single Phase
Buildout Year	2025
TIA Requirement	Full TIA Required

1.2 Trip Generation Trigger	
Land Use Type	Townhomes or apartments
Development Size	368 Units
Trip Generation Trigger	Yes

1.3 Location Triggers	
Does the development propose a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit or Spine Bicycle Networks?	Yes
Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone?	Yes Kanata West Mixed Use Centre Design Priority Area
Location Trigger	Yes

1.4. Safety Triggers	
Are posted speed limits on a boundary street 80 km/hr or greater?	No
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?	No
Is the proposed driveway within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions)?	Yes
Is the proposed driveway within auxiliary lanes of an intersection?	No
Does the proposed driveway make use of an existing median break that serves an existing site?	No
Is there is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?	No
Does the development include a drive-thru facility?	No
Safety Trigger	Yes



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 licensed¹ or registered² 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
Tel. : 613-580-2424
Fax: 613-560-6006

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

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



Appendix B

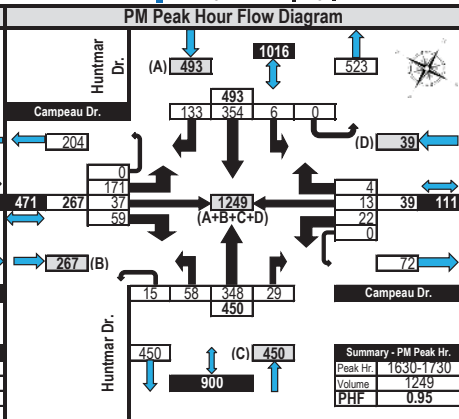
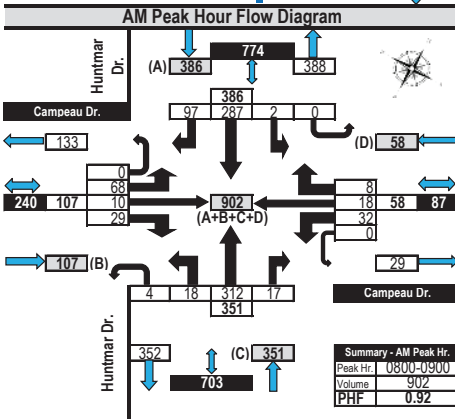
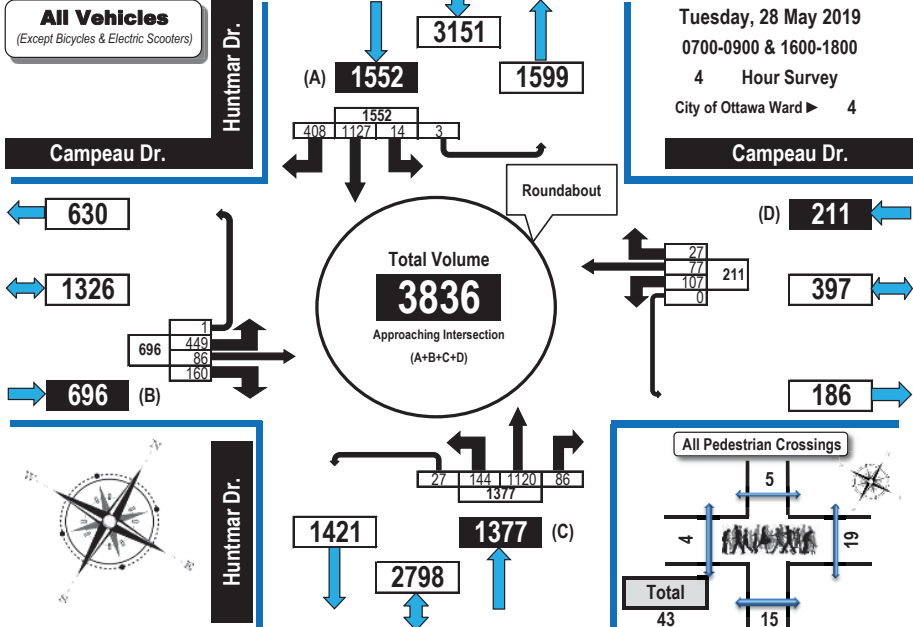
Turning Movement Counts



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



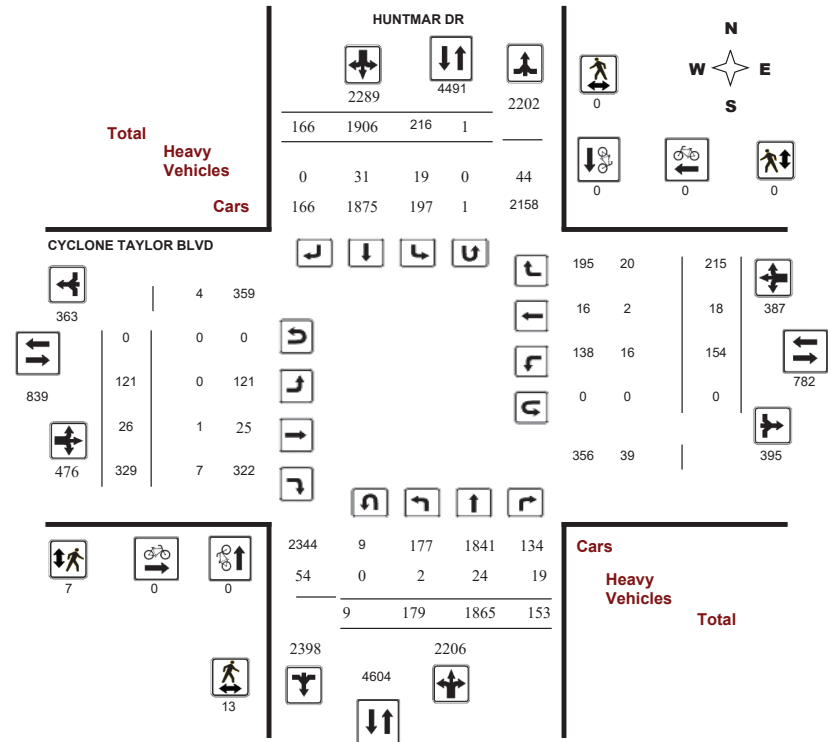
Transportation Services - Traffic Services

Turning Movement Count - Study Results CYCLONE TAYLOR BLVD @ HUNTMAR DR

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

WO No: 39365
Device: Miovision

Full Study Diagram



5471865 - TUE JAN 21, 2020 - 8HRS - LORETTA



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CYCLONE TAYLOR BLVD @ HUNTMAR DR

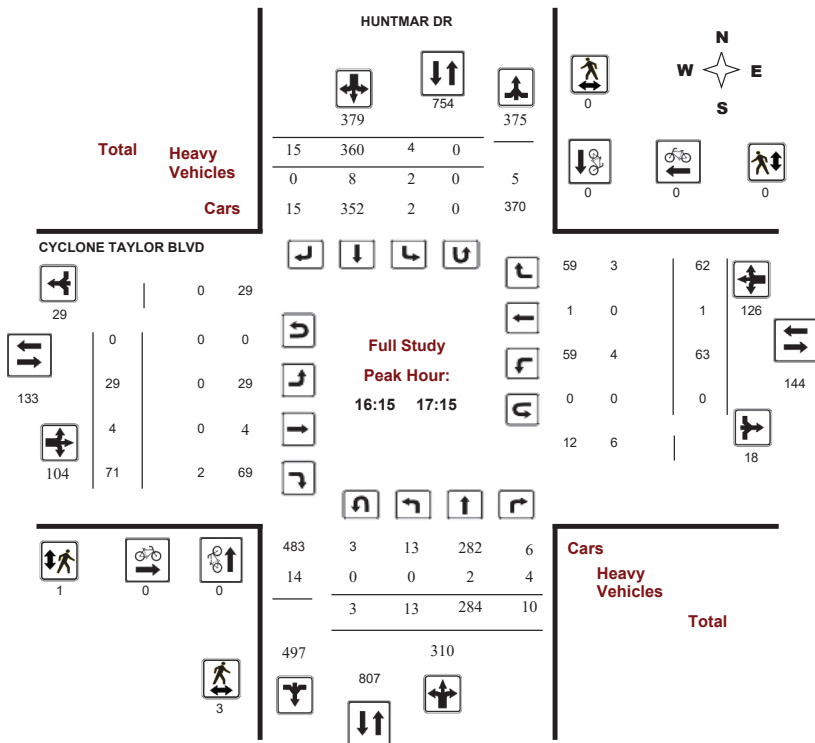
Survey Date: Tuesday, January 21, 2020

WO No: 39365

Start Time: 07:00

Device: Miovision

Full Study Peak Hour Diagram



5471865 - TUE JAN 21, 2020 - 8HRS - LORETTA



Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

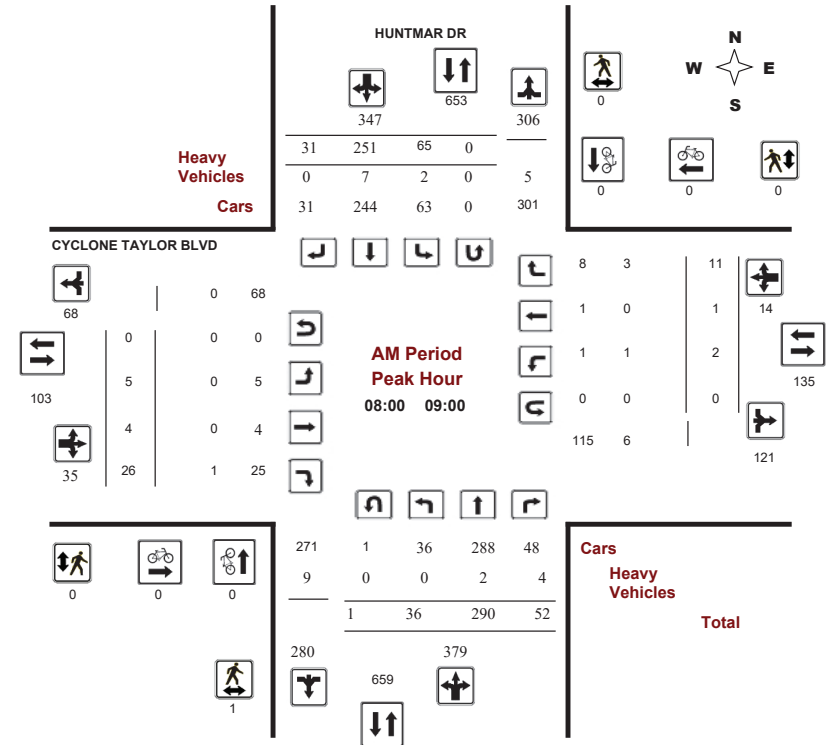
CYCLONE TAYLOR BLVD @ HUNTMAR DR

Survey Date: Tuesday, January 21, 2020

WO No: 39365

Start Time: 07:00

Device: Miovision



Comments 5471865 - TUE JAN 21, 2020 - 8HRS - LORETTA



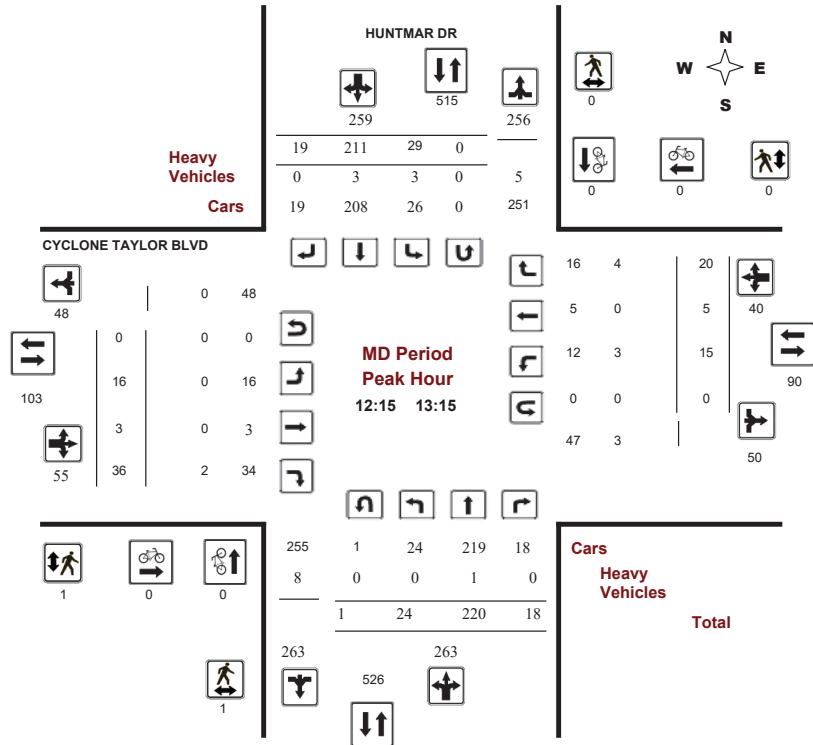
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

CYCLONE TAYLOR BLVD @ HUNTMAR DR

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

WO No: 39365
Device: Miovision



Comments 5471865 - TUE JAN 21, 2020 - 8HRS - LORETTA



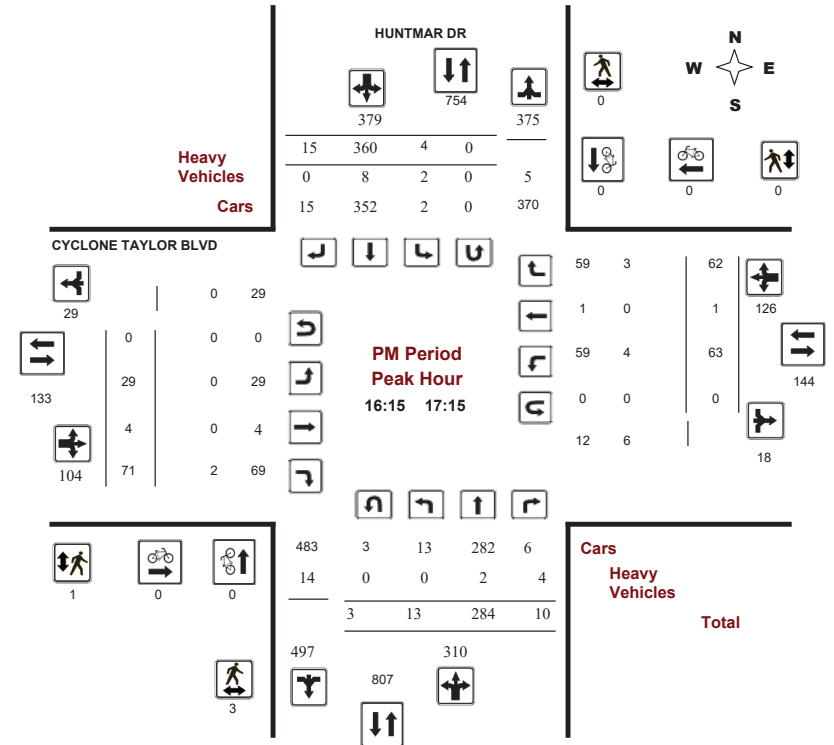
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

CYCLONE TAYLOR BLVD @ HUNTMAR DR

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

WO No: 39365
Device: Miovision



Comments 5471865 - TUE JAN 21, 2020 - 8HRS - LORETTA



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CYCLONE TAYLOR BLVD @ HUNTMAR DR

Survey Date: Tuesday, January 21, 2020

WO No: 39365

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: 9 Southbound: 1
Eastbound: 0 Westbound: 0

1.10

Table with columns for Period, HUNTMAR DR (Northbound, Southbound), CYCLONE TAYLOR BLVD (Eastbound, Westbound), and Grand Total. Rows show traffic volume data for various time periods.

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

AVG 12Hr 287 2851 234 3372 332 2914 254 3500 6872 185 40 503 728 235 28 329 592 1320 8192
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor. 1.10

AVG 24Hr 376 3735 307 4418 435 3817 333 4585 9003 242 52 659 953 308 37 431 776 1729 10732

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

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



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CYCLONE TAYLOR BLVD @ HUNTMAR DR

Survey Date: Tuesday, January 21, 2020

WO No: 39365

Start Time: 07:00

Device: Miovision

Full Study 15 Minute Increments

Table with columns for Time Period, HUNTMAR DR (Northbound, Southbound), CYCLONE TAYLOR BLVD (Eastbound, Westbound), and Grand Total. Rows show 15-minute traffic volume increments.

Note: U-Turns are included in Totals.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CYCLONE TAYLOR BLVD @ HUNTMAR DR

Survey Date: Tuesday, January 21, 2020

WO No: 39365

Start Time: 07:00

Device: Miovision

Full Study Cyclist Volume

Time Period	HUNTMAR DR			CYCLONE TAYLOR BLVD			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	0	0	0	0	0	0
16:30 16:45	0	0	0	0	0	0	0
16:45 17:00	0	0	0	0	0	0	0
17:00 17:15	0	0	0	0	0	0	0
17:15 17:30	0	0	0	0	0	0	0
17:30 17:45	0	0	0	0	0	0	0
17:45 18:00	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CYCLONE TAYLOR BLVD @ HUNTMAR DR

Survey Date: Tuesday, January 21, 2020

WO No: 39365

Start Time: 07:00

Device: Miovision

Full Study Pedestrian Volume

Time Period	HUNTMAR DR			CYCLONE TAYLOR BLVD			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	1	0	1	0	0	0	1
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	1	0	1	0	0	0	1
09:00 09:15	1	0	1	1	0	1	2
09:15 09:30	0	0	0	0	0	0	0
09:30 09:45	1	0	1	1	0	1	2
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	1	0	1	0	0	0	1
12:00 12:15	0	0	0	0	0	0	0
12:15 12:30	0	0	0	0	0	0	0
12:30 12:45	1	0	1	1	0	1	2
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	2	0	2	2	0	2	4
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	2	0	2	1	0	1	3
16:15 16:30	0	0	0	0	0	0	0
16:30 16:45	3	0	3	0	0	0	3
16:45 17:00	0	0	0	0	0	0	0
17:00 17:15	0	0	0	1	0	1	1
17:15 17:30	0	0	0	0	0	0	0
17:30 17:45	0	0	0	0	0	0	0
17:45 18:00	0	0	0	0	0	0	0
Total	13	0	13	7	0	7	20

5471865 - TUE JAN 21, 2020 - 8HRS - LORETTA



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CYCLONE TAYLOR BLVD @ HUNTMAR DR

Survey Date: Tuesday, January 21, 2020

WO No: 39365

Start Time: 07:00

Device: Miovision

Full Study Heavy Vehicles

Table with columns for 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), and Grand Total. Rows show data for various time intervals from 07:00 to 18:00.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CYCLONE TAYLOR BLVD @ HUNTMAR DR

Survey Date: Tuesday, January 21, 2020

WO No: 39365

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 show data for various time intervals from 07:00 to 18:00.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

HUNTMAR DR @ PALLADIUM DR S

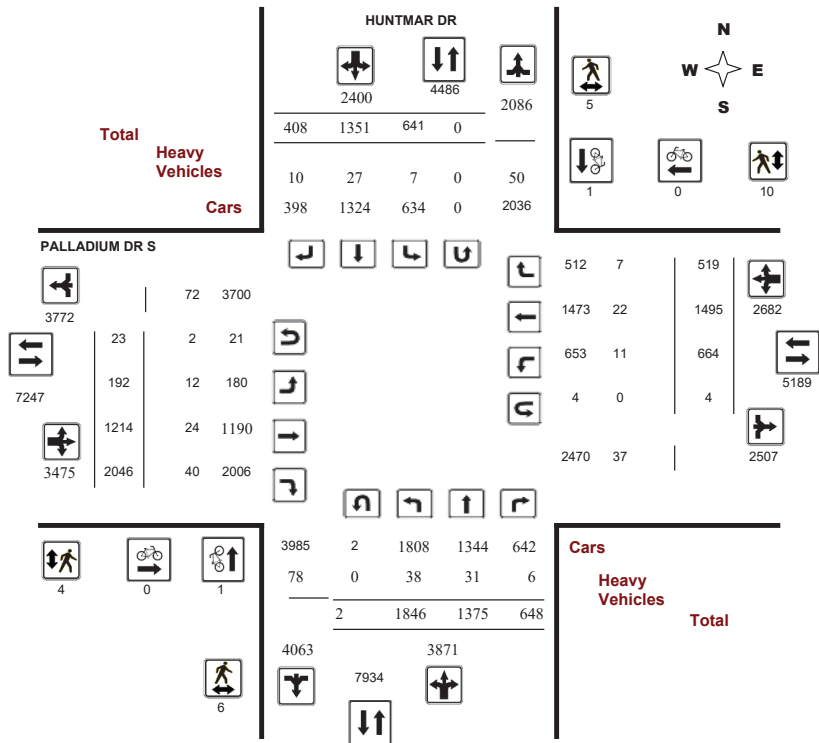
Survey Date: Wednesday, April 10, 2019

WO No: 38526

Start Time: 07:00

Device: Miovision

Full Study Diagram



Transportation Services - Traffic Services

Turning Movement Count - Study Results

HUNTMAR DR @ PALLADIUM DR S

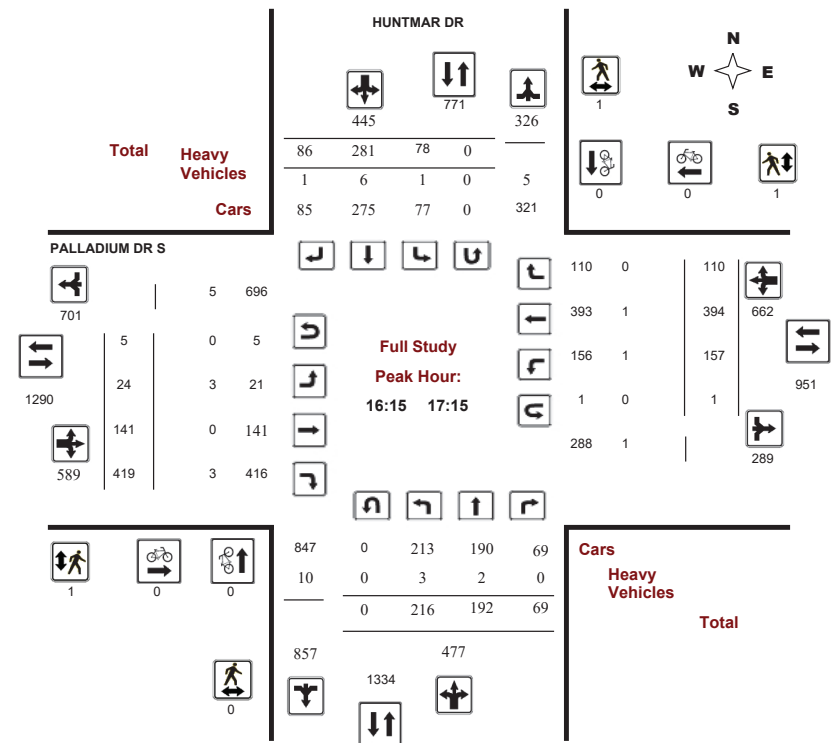
Survey Date: Wednesday, April 10, 2019

WO No: 38526

Start Time: 07:00

Device: Miovision

Full Study Peak Hour Diagram





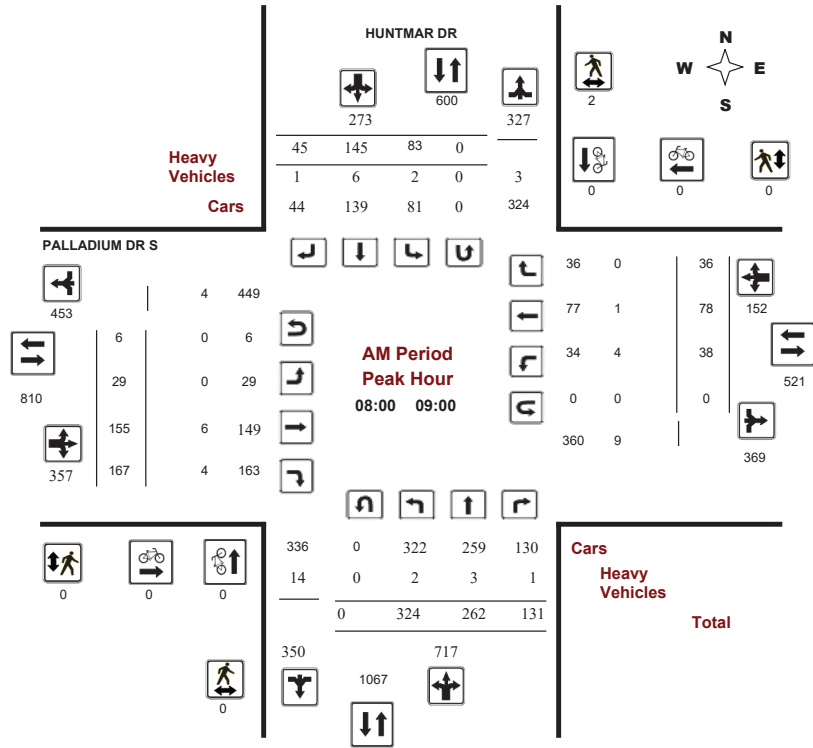
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

HUNTMAR DR @ PALLADIUM DR S

Survey Date: Wednesday, April 10, 2019
Start Time: 07:00

WO No: 38526
Device: Miovision



Comments



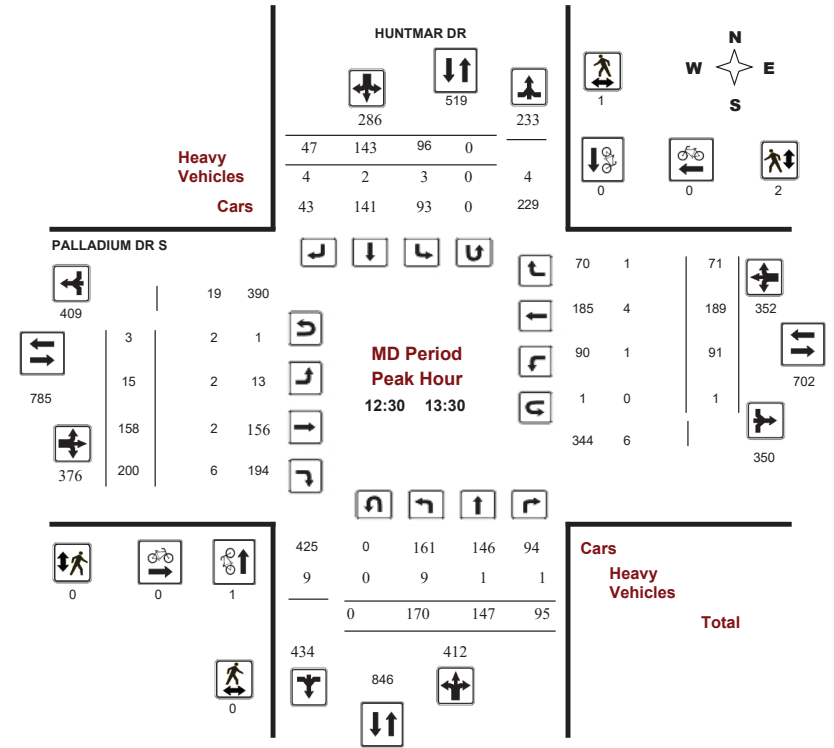
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

HUNTMAR DR @ PALLADIUM DR S

Survey Date: Wednesday, April 10, 2019
Start Time: 07:00

WO No: 38526
Device: Miovision



Comments



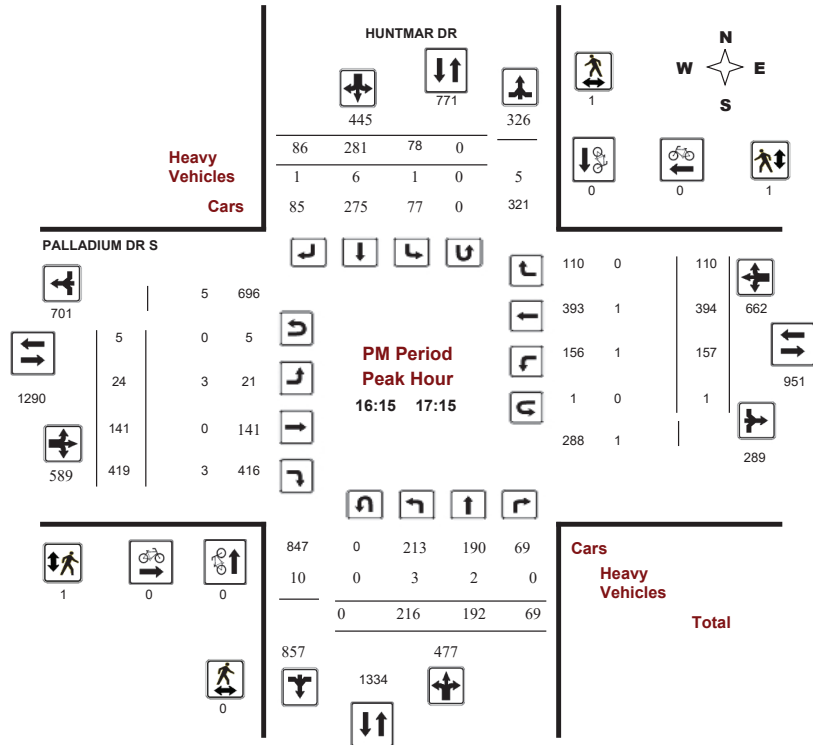
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

HUNTMAR DR @ PALLADIUM DR S

Survey Date: Wednesday, April 10, 2019
Start Time: 07:00

WO No: 38526
Device: Miovision



Comments



Transportation Services - Traffic Services

Turning Movement Count - Study Results

HUNTMAR DR @ PALLADIUM DR S

Survey Date: Wednesday, April 10, 2019
Start Time: 07:00

WO No: 38526
Device: Miovision

Full Study Summary (8 HR Standard)

Survey Date: Wednesday, April 10, 2019

Total Observed U-Turns
Northbound: 2 Southbound: 0
Eastbound: 23 Westbound: 4

AADT Factor .90

Period	HUNTMAR DR								PALLADIUM DR S								Grand Total		
	Northbound				Southbound				Eastbound				Westbound						
	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	WB TOT	STR TOT				
07:00-08:00	344	171	90	605	60	90	48	198	803	12	178	161	351	20	44	18	82	433	1236
08:00-09:00	324	262	131	717	83	145	45	273	990	29	155	167	351	38	78	36	152	503	1493
09:00-10:00	212	160	71	443	56	103	28	187	630	21	163	135	319	42	77	36	155	474	1104
11:30-12:30	159	132	69	360	87	145	39	271	631	30	149	202	381	90	194	83	367	748	1379
12:30-13:30	170	147	95	412	96	143	47	286	698	15	158	200	373	91	189	71	351	724	1422
15:00-16:00	232	146	53	431	79	190	53	322	753	31	144	357	532	114	240	74	428	960	1713
16:00-17:00	208	182	66	456	57	274	79	410	866	23	123	402	548	149	367	95	611	1159	2025
17:00-18:00	197	175	73	445	123	261	69	453	898	31	144	422	597	120	306	106	532	1129	2027
Sub Total	1846	1375	648	3869	641	1351	408	2400	6269	192	1214	2046	3452	664	1495	519	2678	6130	12399
U Turns	2			2	0			0	2	23			23	4			4	27	29
Total	1848	1375	648	3871	641	1351	408	2400	6271	215	1214	2046	3475	668	1495	519	2682	6157	12428
EQ 12Hr	2569	1911	901	5381	891	1878	567	3336	8717	299	1687	2844	4830	929	2078	721	3728	8558	17275
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.	1.39																		
AVG 12Hr	2312	1720	811	4843	802	1690	510	3002	7845	269	1518	2560	4347	836	1870	649	3355	7702	15547
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.	.90																		
AVG 24Hr	3029	2253	1062	6344	1051	2214	668	3933	10277	352	1989	3354	5695	1095	2450	850	4395	10090	20367
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.	1.31																		
Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.																			



Transportation Services - Traffic Services

Turning Movement Count - Study Results

HUNTMAR DR @ PALLADIUM DR S

Survey Date: Wednesday, April 10, 2019

WO No: 38526

Start Time: 07:00

Device: Miovision

Full Study 15 Minute Increments

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.

Note: U-Turns are included in Totals.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

HUNTMAR DR @ PALLADIUM DR S

Survey Date: Wednesday, April 10, 2019

WO No: 38526

Start Time: 07:00

Device: Miovision

Full Study Cyclist Volume

Table with columns for Time Period, HUNTMAR DR (Northbound, Southbound, Street Total), PALLADIUM DR S (Eastbound, Westbound, Street Total), and Grand Total. Rows represent 15-minute intervals from 07:00 to 18:00.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

HUNTMAR DR @ PALLADIUM DR S

Survey Date: Wednesday, April 10, 2019

WO No: 38526

Start Time: 07:00

Device: Miovision

Full Study Pedestrian Volume

HUNTMAR DR

PALLADIUM DR S

Table with columns: Time Period, NB Approach (E or W Crossing), SB Approach (E or W Crossing), Total, EB Approach (N or S Crossing), WB Approach (N or S Crossing), Total, Grand Total. Rows show pedestrian counts from 07:00 to 17:45, with a total of 11 for HUNTMAR DR and 14 for PALLADIUM DR S.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

HUNTMAR DR @ PALLADIUM DR S

Survey Date: Wednesday, April 10, 2019

WO No: 38526

Start Time: 07:00

Device: Miovision

Full Study Heavy Vehicles

HUNTMAR DR

PALLADIUM DR S

Table with columns: 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. Rows show heavy vehicle counts from 07:00 to 17:45, with a total of 38 for HUNTMAR DR and 116 for PALLADIUM DR S.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

HUNTMAR DR @ PALLADIUM DR S

Survey Date: Wednesday, April 10, 2019

WO No: 38526

Start Time: 07:00

Device: Miovision

Full Study 15 Minute U-Turn Total

HUNTMAR DR

PALLADIUM DR S

Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	1	0	1
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	0	0	0
07:45	08:00	0	0	0	0	0
08:00	08:15	0	0	2	0	2
08:15	08:30	0	0	1	0	1
08:30	08:45	0	0	1	0	1
08:45	09:00	0	0	2	0	2
09:00	09:15	0	0	0	0	0
09:15	09:30	0	0	0	0	0
09:30	09:45	0	0	0	0	0
09:45	10:00	0	0	0	0	0
11:30	11:45	0	0	1	0	1
11:45	12:00	0	0	1	0	1
12:00	12:15	0	0	0	0	0
12:15	12:30	0	0	0	0	0
12:30	12:45	0	0	0	0	0
12:45	13:00	0	0	0	1	1
13:00	13:15	0	0	1	0	1
13:15	13:30	0	0	2	0	2
15:00	15:15	0	0	0	0	0
15:15	15:30	0	0	1	2	3
15:30	15:45	0	0	2	0	2
15:45	16:00	0	0	0	0	0
16:00	16:15	2	0	0	0	2
16:15	16:30	0	0	4	1	5
16:30	16:45	0	0	1	0	1
16:45	17:00	0	0	0	0	0
17:00	17:15	0	0	0	0	0
17:15	17:30	0	0	3	0	3
17:30	17:45	0	0	0	0	0
17:45	18:00	0	0	0	0	0
Total		2	0	23	4	29

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

2.3 Existing Traffic Volumes

The existing traffic volumes in the study area were previously reported in the 2017 Transportation Brief prepared by Parsons for Stage 3 and 4 of the Arcadia development. These traffic volumes are presented in Figure 4 below.

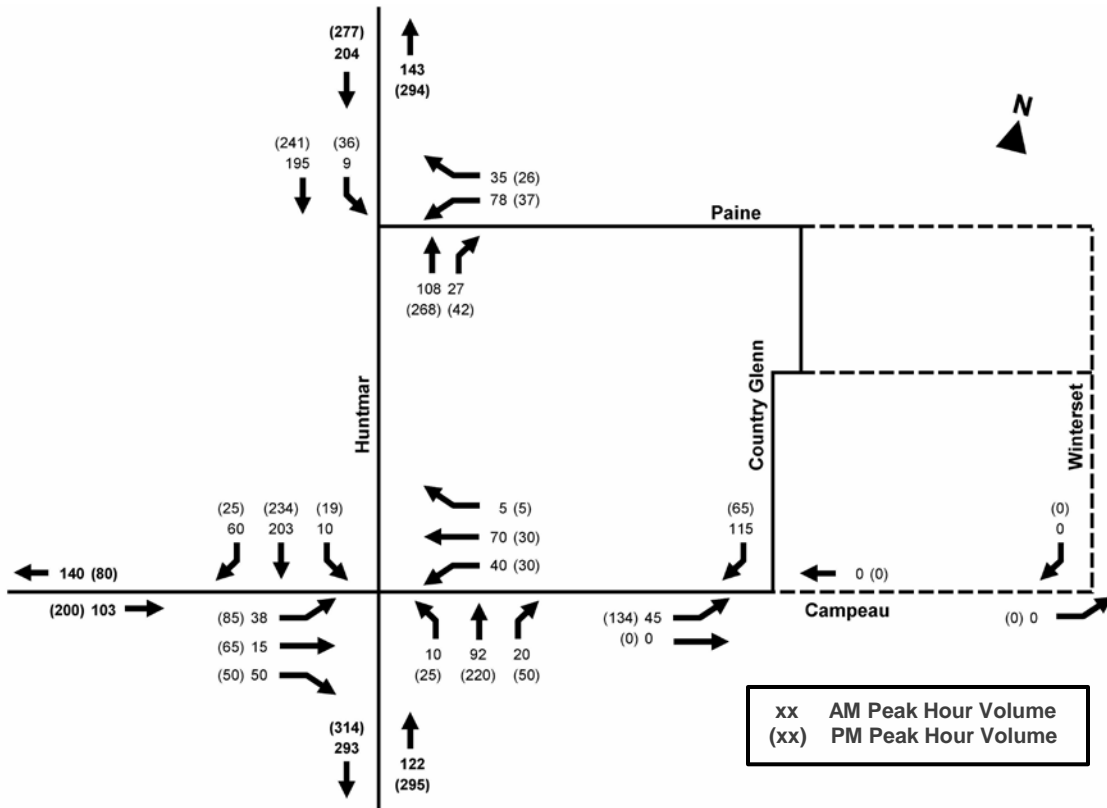


Figure 4: 2017 Background Traffic Volumes

Appendix C

Synchro Intersection Worksheets – Existing Conditions

MOVEMENT SUMMARY

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

Arcadia Stage 6
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	v/c	sec		[Veh.]	[Dist]				km/h
South: Huntmar														
1	L2	22	2.0	24	2.0	0.024	7.8	LOS A	0.1	0.4	0.16	0.57	0.16	50.5
2	T1	312	2.0	347	2.0	0.336	2.1	LOS A	1.1	8.1	0.21	0.24	0.21	50.3
3	R2	17	2.0	19	2.0	0.018	2.8	LOS A	0.0	0.3	0.16	0.36	0.16	51.8
Approach		351	2.0	390	2.0	0.336	2.4	LOS A	1.1	8.1	0.21	0.27	0.21	50.4
East: Campeau														
4	L2	63	2.0	70	2.0	0.086	10.6	LOS B	0.2	1.6	0.35	0.72	0.35	50.5
5	T1	36	2.0	40	2.0	0.050	4.6	LOS A	0.1	0.9	0.36	0.46	0.36	57.0
6	R2	16	2.0	18	2.0	0.022	5.0	LOS A	0.1	0.4	0.35	0.55	0.35	51.2
Approach		115	2.0	128	2.0	0.086	8.0	LOS A	0.2	1.6	0.35	0.62	0.35	52.4
North: Huntmar														
7	L2	2	2.0	2	2.0	0.159	7.9	LOS A	0.5	3.3	0.21	0.25	0.21	54.2
8	T1	287	2.0	319	2.0	0.159	2.1	LOS A	0.5	3.3	0.20	0.25	0.20	50.3
9	R2	97	2.0	108	2.0	0.107	2.9	LOS A	0.3	2.1	0.20	0.39	0.20	51.7
Approach		386	2.0	429	2.0	0.159	2.3	LOS A	0.5	3.3	0.20	0.28	0.20	50.6
West: Campeau														
10	L2	68	2.0	76	2.0	0.089	10.5	LOS B	0.2	1.6	0.33	0.71	0.33	50.5
11	T1	26	2.0	29	2.0	0.035	4.4	LOS A	0.1	0.6	0.33	0.44	0.33	57.2
12	R2	29	2.0	32	2.0	0.038	4.5	LOS A	0.1	0.7	0.31	0.52	0.31	51.6
Approach		123	2.0	137	2.0	0.089	7.8	LOS A	0.2	1.6	0.33	0.61	0.33	52.0
All Vehicles		975	2.0	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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: Not Saved

Lanes, Volumes, Timings

4: Huntmar & Autopark Private/Cyclone Taylor

Existing
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	5	4	26	2	1	14	37	332	52	65	266	31
Future Volume (vph)	5	4	26	2	1	14	37	332	52	65	266	31
Satd. Flow (prot)	0	1543	0	1658	1499	0	1658	1745	1483	1658	1745	1483
Fit Permitted		0.942		0.732			0.579			0.542		
Satd. Flow (perm)	0	1466	0	1277	1499	0	1010	1745	1483	946	1745	1483
Satd. Flow (RTOR)		29		16			58			58		
Lane Group Flow (vph)	0	39	0	2	17	0	41	369	58	72	296	34
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	Perm	NA	Perm	Perm
Protected Phases		4		8			2		2	6		6
Permitted Phases	4		8			2		2	6		6	
Detector Phase	4	4	8	8	2	2	2	2	6	6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
Minimum Split (s)	33.1	33.1	33.1	33.1	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9
Total Split (s)	33.1	33.1	33.1	33.1	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9
Total Split (%)	53.4%	53.4%	53.4%	53.4%	46.6%	46.6%	46.6%	46.6%	46.6%	46.6%	46.6%	46.6%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.9	2.9	2.9	2.9	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
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)	6.2	6.2	6.2	6.2	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	Min	Min	Min	Min	Min	Min	Min	Min
Act Effct Green (s)	12.8	12.8	12.8	12.8	37.1	37.1	37.1	37.1	37.1	37.1	37.1	37.1
Actuated g/C Ratio	0.27	0.27	0.27	0.27	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
v/c Ratio	0.09	0.01	0.04	0.05	0.27	0.05	0.10	0.22	0.03			
Control Delay	7.0	11.5	6.6	8.2	7.9	3.9	8.2	7.5	2.5			
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
Total Delay	7.0	11.5	6.6	8.2	7.9	3.9	8.2	7.5	2.5			
LOS	A	B	A	A	A	A	A	A	A			
Approach Delay	7.0		7.1		7.4		7.2					
Approach LOS	A		A		A		A					
Queue Length 50th (m)	0.6		0.1	0.1	0.0	0.0	0.0	0.0	0.0			
Queue Length 95th (m)	4.9		1.1	2.9	8.5	55.8	5.9	13.4	43.7	2.9		
Internal Link Dist (m)	199.6			315.6			205.7			336.7		
Turn Bay Length (m)					57.0		56.0			46.5		
Base Capacity (vph)	853		732	866	784	1354	1164	734	1354	1163		
Starvation Cap Reductn	0		0	0	0	0	0	0	0	0		
Spillback Cap Reductn	0		0	0	0	0	0	0	0	0		
Storage Cap Reductn	0		0	0	0	0	0	0	0	0		
Reduced v/c Ratio	0.05		0.00	0.02	0.05	0.27	0.05	0.10	0.22	0.03		

Intersection Summary

Cycle Length: 62
Actuated Cycle Length: 47.8
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.27

Scenario 1 8415 Campeau Drive 12:00 am 08/31/2021 Existing

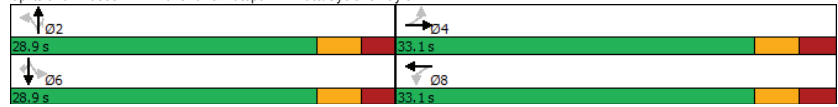
Synchro 11 Report
Page 1

Lanes, Volumes, Timings
4: Huntmar & Autopark Private/Cyclone Taylor

Existing
AM Peak Hour

Intersection Signal Delay: 7.3	Intersection LOS: A
Intersection Capacity Utilization 62.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 4: Huntmar & Autopark Private/Cyclone Taylor



Lanes, Volumes, Timings
5: Huntmar & Palladium

Existing
AM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗	↗	↖	↖↗	↗	↖	↖↗	↗	↖	↖↗	↗
Traffic Volume (vph)	37	155	167	38	78	46	324	337	131	89	156	48
Future Volume (vph)	37	155	167	38	78	46	324	337	131	89	156	48
Satd. Flow (prot)	1658	3057	0	1658	3117	0	1658	1745	1483	1658	1745	1483
Fit Permitted	0.664			0.443			0.416			0.539		
Satd. Flow (perm)	1157	3057	0	773	3117	0	726	1745	1483	941	1745	1483
Satd. Flow (RTOR)		186			51			146				152
Lane Group Flow (vph)	41	358	0	42	138	0	360	374	146	99	173	53
Turn Type	Perm	NA	pm+pt	NA	pm+pt	NA	Perm	Perm	Perm	NA	Perm	Perm
Protected Phases		6		5	2		7	4			8	
Permitted Phases	6			2			4		4	8		8
Detector Phase	6	6		5	2		7	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.3	36.3		11.3	36.3		11.4	37.4	37.4	37.4	37.4	37.4
Total Split (s)	36.3	36.3		17.0	53.3		17.0	61.7	61.7	44.7	44.7	44.7
Total Split (%)	31.6%	31.6%		14.8%	46.3%		14.8%	53.7%	53.7%	38.9%	38.9%	38.9%
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6		2.6	2.6		3.1	3.1	3.1	3.1	3.1	3.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3		6.3	6.3		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag	Lag	Lag		Lead			Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	Yes
Recall Mode	Max	Max		None	None		None	None	None	None	None	None
Act Effct Green (s)	30.6	30.6		38.6	38.6		32.0	32.0	32.0	14.7	14.7	14.7
Actuated g/C Ratio	0.37	0.37		0.46	0.46		0.38	0.38	0.38	0.18	0.18	0.18
v/c Ratio	0.10	0.29		0.10	0.09		0.90	0.56	0.22	0.60	0.57	0.14
Control Delay	22.8	11.1		13.6	8.7		52.0	25.1	4.3	49.1	40.1	0.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.8	11.1		13.6	8.7		52.0	25.1	4.3	49.1	40.1	0.8
LOS	C	B		B	A		D	C	A	D	D	A
Approach Delay		12.3			9.8			32.6			36.4	
Approach LOS		B			A			C			D	
Queue Length 50th (m)	4.7	10.5		3.5	3.7		49.1	50.8	0.0	15.8	27.3	0.0
Queue Length 95th (m)	13.5	23.6		10.0	9.7		#104.0	79.5	11.1	32.1	47.6	0.0
Internal Link Dist (m)		170.0			174.7			260.9			205.7	
Turn Bay Length (m)										51.5		
Base Capacity (vph)	423	1237		472	1809		398	1177	1048	440	815	774
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.29		0.09	0.08		0.90	0.32	0.14	0.23	0.21	0.07

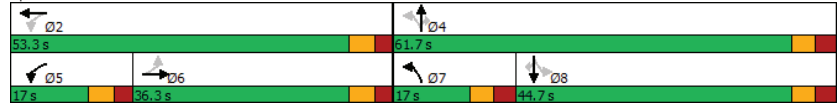
Intersection Summary												
Cycle Length: 115												
Actuated Cycle Length: 83.6												
Natural Cycle: 100												
Control Type: Actuated-Uncoordinated												
Maximum v/c Ratio: 0.90												

Lanes, Volumes, Timings
5: Huntmar & Palladium

Existing
AM Peak Hour

Intersection Signal Delay: 26.5	Intersection LOS: C
Intersection Capacity Utilization 66.5%	ICU Level of Service C
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 5: Huntmar & Palladium



MOVEMENT SUMMARY

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

Arcadia Stage 6
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist. m]				
South: Huntmar														
1	L2	73	2.0	81	2.0	0.090	8.3	LOS A	0.2	1.7	0.29	0.64	0.29	50.1
2	T1	348	2.0	387	2.0	0.423	2.8	LOS A	1.5	10.9	0.39	0.33	0.39	49.5
3	R2	56	2.0	62	2.0	0.069	3.3	LOS A	0.2	1.3	0.29	0.45	0.29	51.4
Approach		477	2.0	530	2.0	0.423	3.7	LOS A	1.5	10.9	0.36	0.39	0.36	49.8
East: Campeau														
4	L2	36	2.0	40	2.0	0.057	11.3	LOS B	0.1	1.0	0.41	0.77	0.41	50.3
5	T1	22	2.0	24	2.0	0.036	5.4	LOS A	0.1	0.7	0.43	0.53	0.43	56.6
6	R2	7	2.0	8	2.0	0.011	5.7	LOS A	0.0	0.2	0.42	0.59	0.42	50.9
Approach		65	2.0	72	2.0	0.057	8.7	LOS A	0.1	1.0	0.42	0.67	0.42	52.3
North: Huntmar														
7	L2	8	2.0	9	2.0	0.201	8.0	LOS A	0.6	4.4	0.23	0.27	0.23	54.0
8	T1	354	2.0	393	2.0	0.201	2.1	LOS A	0.6	4.4	0.22	0.26	0.22	50.2
9	R2	133	2.0	148	2.0	0.148	3.0	LOS A	0.4	3.0	0.22	0.40	0.22	51.6
Approach		495	2.0	550	2.0	0.201	2.5	LOS A	0.6	4.4	0.22	0.30	0.22	50.6
West: Campeau														
10	L2	171	2.0	190	2.0	0.233	10.8	LOS B	0.7	4.8	0.39	0.75	0.39	50.3
11	T1	71	2.0	79	2.0	0.099	4.7	LOS A	0.3	1.9	0.37	0.46	0.37	56.9
12	R2	59	2.0	66	2.0	0.080	4.7	LOS A	0.2	1.4	0.34	0.56	0.34	51.5
Approach		301	2.0	334	2.0	0.233	8.2	LOS A	0.7	4.8	0.38	0.65	0.38	52.0
All Vehicles		1338	2.0	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.
 Delay Model: SIDRA Standard (Geometric Delay is included).
 Queue Model: SIDRA Standard.
 Gap-Acceptance Capacity: Traditional M1.
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Lanes, Volumes, Timings
4: Huntmar & Autopark Private/Cyclone Taylor

Existing
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	29	4	71	63	1	62	16	386	10	4	385	15
Future Volume (vph)	29	4	71	63	1	62	16	386	10	4	385	15
Satd. Flow (prot)	0	1535	0	1595	1445	0	1658	1745	1081	1127	1745	1483
Fit Permitted		0.883		0.683			0.490			0.490		
Satd. Flow (perm)	0	1375	0	1145	1445	0	855	1745	1081	581	1745	1452
Satd. Flow (RTOR)		79		69			56			56		
Lane Group Flow (vph)	0	115	0	70	70	0	18	429	11	4	428	17
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	Perm	NA	Perm	Perm
Protected Phases		4		8			2	2	2	6		6
Permitted Phases	4		8				2	2	2	6		6
Detector Phase	4	4	8	8			2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0			23.0	23.0	23.0	23.0	23.0	23.0
Minimum Split (s)	33.1	33.1	33.1	33.1			28.9	28.9	28.9	28.9	28.9	28.9
Total Split (s)	33.1	33.1	33.1	33.1			28.9	28.9	28.9	28.9	28.9	28.9
Total Split (%)	53.4%	53.4%	53.4%	53.4%			46.6%	46.6%	46.6%	46.6%	46.6%	46.6%
Yellow Time (s)	3.3	3.3	3.3	3.3			3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.9	2.9	2.9	2.9			2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)		0.0		0.0			0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.2		6.2			5.9	5.9	5.9	5.9	5.9	5.9
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None			Min	Min	Min	Min	Min	Min
Act Effct Green (s)	12.8	12.8	12.8	12.8			28.0	28.0	28.0	28.0	28.0	28.0
Actuated g/C Ratio	0.27	0.27	0.27	0.27			0.58	0.58	0.58	0.58	0.58	0.58
v/c Ratio	0.27	0.23	0.16	0.16			0.04	0.42	0.02	0.01	0.42	0.02
Control Delay	7.5	15.1	4.8	4.8			9.6	11.5	0.0	9.8	11.5	0.1
Queue Delay	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.5	15.1	4.8	4.8			9.6	11.5	0.0	9.8	11.5	0.1
LOS	A	B	A	A			A	B	A	A	B	A
Approach Delay	7.5		10.0				11.1			11.0		
Approach LOS	A		A				B			B		
Queue Length 50th (m)	2.3	4.6	0.1	0.1			0.6	19.4	0.0	0.1	19.3	0.0
Queue Length 95th (m)	10.0	11.3	5.9	5.9			4.8	67.0	0.0	1.9	66.6	0.4
Internal Link Dist (m)	199.6		315.6				205.7			336.7		
Turn Bay Length (m)							57.0			56.0		46.5
Base Capacity (vph)	814	649	849				496	1012	650	337	1012	865
Starvation Cap Reductn	0	0	0				0	0	0	0	0	0
Spillback Cap Reductn	0	0	0				0	0	0	0	0	0
Storage Cap Reductn	0	0	0				0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.11	0.08				0.04	0.42	0.02	0.01	0.42	0.02

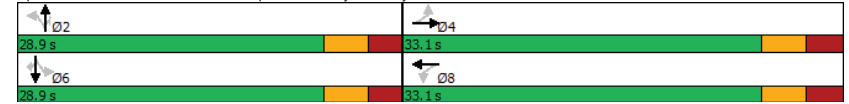
Intersection Summary												
Cycle Length: 62												
Actuated Cycle Length: 48.2												
Natural Cycle: 65												
Control Type: Actuated-Uncoordinated												
Maximum v/c Ratio: 0.42												

Lanes, Volumes, Timings
4: Huntmar & Autopark Private/Cyclone Taylor

Existing
PM Peak Hour

Intersection Signal Delay: 10.6	Intersection LOS: B
Intersection Capacity Utilization 63.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 4: Huntmar & Autopark Private/Cyclone Taylor



Lanes, Volumes, Timings
5: Huntmar & Palladium

Existing
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	30	141	419	158	394	139	213	243	69	91	328	100
Future Volume (vph)	30	141	419	158	394	139	213	243	69	91	328	100
Satd. Flow (prot)	1496	2944	0	1658	3175	0	1658	1745	1483	1658	1745	1483
Fit Permitted	0.428			0.230			0.224			0.593		
Satd. Flow (perm)	674	2944	0	401	3175	0	391	1745	1464	1034	1745	1464
Satd. Flow (RTOR)		412			52				91			152
Lane Group Flow (vph)	33	623	0	176	592	0	237	270	77	101	364	111
Turn Type	Perm	NA	pm+pt	NA	pm+pt	NA	Perm	Perm	Perm	NA	Perm	Perm
Protected Phases		6		5	2		7	4		4	8	8
Permitted Phases	6			2			4		4	8		8
Detector Phase	6	6		5	2		7	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.3	36.3		11.3	36.3		11.4	37.4	37.4	37.4	37.4	37.4
Total Split (s)	36.3	36.3		17.0	53.3		17.0	61.7	61.7	44.7	44.7	44.7
Total Split (%)	31.6%	31.6%		14.8%	46.3%		14.8%	53.7%	53.7%	38.9%	38.9%	38.9%
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6		2.6	2.6		3.1	3.1	3.1	3.1	3.1	3.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3		6.3	6.3		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag	Lag	Lag		Lead			Lead		Lag	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes		Yes	Yes	Yes	Yes
Recall Mode	Max	Max		None	None		None	None	None	None	None	None
Act Effct Green (s)	30.2	30.2		47.0	47.0		43.8	43.8	43.8	26.7	26.7	26.7
Actuated g/C Ratio	0.29	0.29		0.45	0.45		0.42	0.42	0.42	0.26	0.26	0.26
v/c Ratio	0.17	0.54		0.57	0.40		0.80	0.37	0.11	0.38	0.81	0.23
Control Delay	33.3	12.6		27.1	19.1		42.3	21.6	3.0	35.3	50.3	2.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.3	12.6		27.1	19.1		42.3	21.6	3.0	35.3	50.3	2.8
LOS	C	B		C	B		D	C	A	D	D	A
Approach Delay		13.6			21.0			27.6			38.5	
Approach LOS		B			C			C			D	
Queue Length 50th (m)	4.9	16.9		20.8	36.4		31.4	36.2	0.0	16.7	68.7	0.0
Queue Length 95th (m)	14.5	38.6		41.9	60.6		#58.7	54.9	6.0	31.2	100.6	5.4
Internal Link Dist (m)		170.0			174.7			260.9			205.7	
Turn Bay Length (m)									51.5			
Base Capacity (vph)	196	1149		312	1476		295	936	828	384	648	639
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.54		0.56	0.40		0.80	0.29	0.09	0.26	0.56	0.17

Intersection Summary

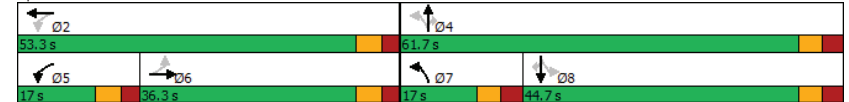
Cycle Length: 115
 Actuated Cycle Length: 103.6
 Natural Cycle: 100
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.81

Lanes, Volumes, Timings
5: Huntmar & Palladium

Existing
PM Peak Hour

Intersection Signal Delay: 24.5
 Intersection Capacity Utilization 79.7%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 5: Huntmar & Palladium



Appendix D

Collision Data

Accident Date	Accident Year	Accident Time	Location	Environment Condition	Light	Traffic Control	Traffic Control Condition	Classification Of Accident	Initial Impact Type	Road Surface Condition	# Vehicles	# Motorcycles	# Bicycles	# Pedestrians
5/24/2016	2016	17:27	CAMPEAU DR @ HUNTMAR DR (0011612)	01 - Clear	01 - Daylight	11 - Roundabout	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
9/12/2016	2016	18:14	CAMPEAU DR @ HUNTMAR DR (0011612)	01 - Clear	01 - Daylight	11 - Roundabout	01 - Functioning	03 - P.D. only	02 - Angle	01 - Dry	2	0	0	0
10/2/2017	2017	7:36	CAMPEAU DR @ HUNTMAR DR (0011612)	01 - Clear	01 - Daylight	11 - Roundabout	01 - Functioning	03 - P.D. only	02 - Angle	01 - Dry	2	0	0	0
6/14/2017	2017	9:50	CAMPEAU DR @ HUNTMAR DR (0011612)	01 - Clear	01 - Daylight	11 - Roundabout	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
7/10/2017	2017	17:47	CAMPEAU DR @ HUNTMAR DR (0011612)	01 - Clear	01 - Daylight	11 - Roundabout	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
2/8/2018	2018	22:45	CAMPEAU DR @ HUNTMAR DR (0011612)	01 - Clear	07 - Dark	11 - Roundabout	01 - Functioning	03 - P.D. only	02 - Angle	02 - Loose snow	2	0	0	0
3/19/2018	2018	14:44	CAMPEAU DR @ HUNTMAR DR (0011612)	01 - Clear	01 - Daylight	11 - Roundabout	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
5/1/2018	2018	18:30	CAMPEAU DR @ HUNTMAR DR (0011612)	01 - Clear	01 - Daylight	11 - Roundabout	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
6/25/2018	2018	23:23	CAMPEAU DR @ HUNTMAR DR (0011612)	01 - Clear	07 - Dark	11 - Roundabout	01 - Functioning	03 - P.D. only	03 - Rear end	01 - Dry	2	0	0	0
8/2/2018	2018	15:50	CAMPEAU DR @ HUNTMAR DR (0011612)	01 - Clear	01 - Daylight	11 - Roundabout	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
9/30/2019	2019	14:57	CAMPEAU DR @ HUNTMAR DR (0011612)	01 - Clear	01 - Daylight	11 - Roundabout	01 - Functioning	03 - P.D. only	02 - Angle	01 - Dry	2	0	0	0
12/18/2019	2019	15:56	CAMPEAU DR @ HUNTMAR DR (0011612)	01 - Clear	01 - Daylight	11 - Roundabout	01 - Functioning	03 - P.D. only	02 - Angle	06 - Ice	2	0	0	0
4/27/2019	2019	15:30	CAMPEAU DR @ HUNTMAR DR (0011612)	02 - Rain	01 - Daylight	11 - Roundabout	01 - Functioning	03 - P.D. only	02 - Wet	01 - Dry	1	0	0	0
7/3/2019	2019	8:44	CAMPEAU DR @ HUNTMAR DR (0011612)	01 - Clear	01 - Daylight	11 - Roundabout	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
7/22/2019	2019	18:30	CAMPEAU DR @ HUNTMAR DR (0011612)	01 - Clear	01 - Daylight	11 - Roundabout	00 - Unknown	02 - Non-fatal injury	07 - SMV other	01 - Dry	1	1	0	0
8/31/2020	2020	15:55	CAMPEAU DR @ HUNTMAR DR (0011612)	01 - Clear	01 - Daylight	11 - Roundabout	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
8/7/2019	2019	15:10	CAMPEAU DR @ DOBURY RD (0011857)	01 - Clear	01 - Daylight	02 - Stop sign	01 - Functioning	03 - P.D. only	05 - Turning movement	01 - Dry	2	0	0	0
11/17/2019	2019	22:42	HUNTMAR DR btwn HUNTMAR DR & AUTOPARK PRIV (_32AZW1)	01 - Clear	07 - Dark	10 - No control	0	02 - Non-fatal injury	03 - Rear end	01 - Dry	3	0	0	0
5/13/2016	2016	23:10	HUNTMAR DR btwn HUNTMAR DR & AUTOPARK PRIV (_32AZW1)	01 - Clear	07 - Dark	10 - No control	0	03 - P.D. only	03 - Rear end	01 - Dry	2	0	0	0

Appendix E

City TRANS Model Plots

TRANS Regional Model

Version 2.15 - Assigned June 16, 2020

AM Peak Hour Total Traffic Volume

Campeau Drive Area

2011 Model - Basecase

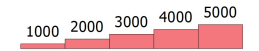
N/A

User Initials: BusterB
Plot Prepared: 24 Sept. 2021
EMME Scenario: 21711

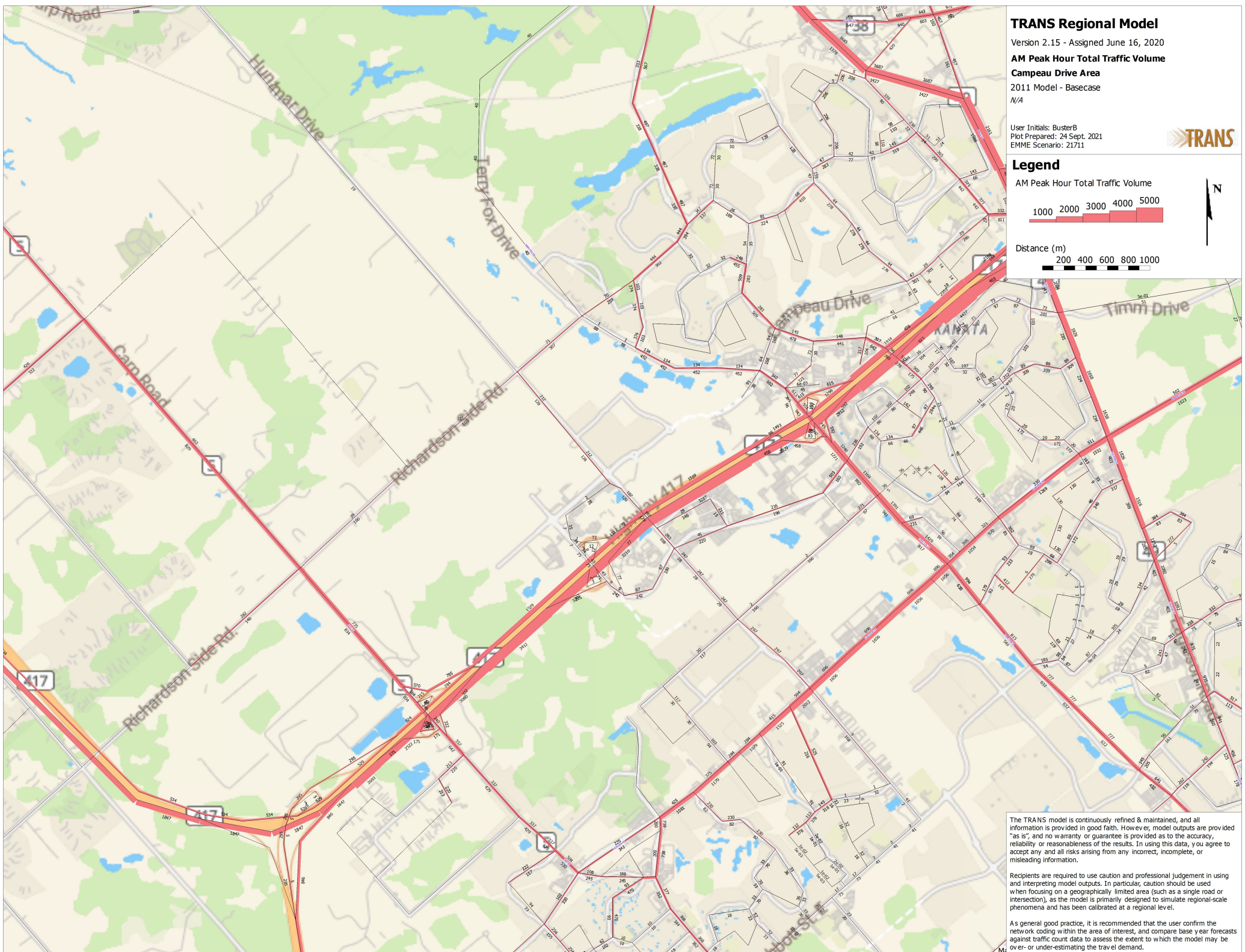
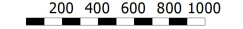


Legend

AM Peak Hour Total Traffic Volume



Distance (m)



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

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

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

TRANS Regional Model

Version 2.15 - Assigned June 16, 2020

AM Peak Hour Total Traffic Volume

Campeau Dr Area

2031 Model - Basecase

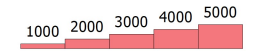
N/A

User Initials: BusterB
Plot Prepared: 24 Sep 2021
EMME Scenario: 21711

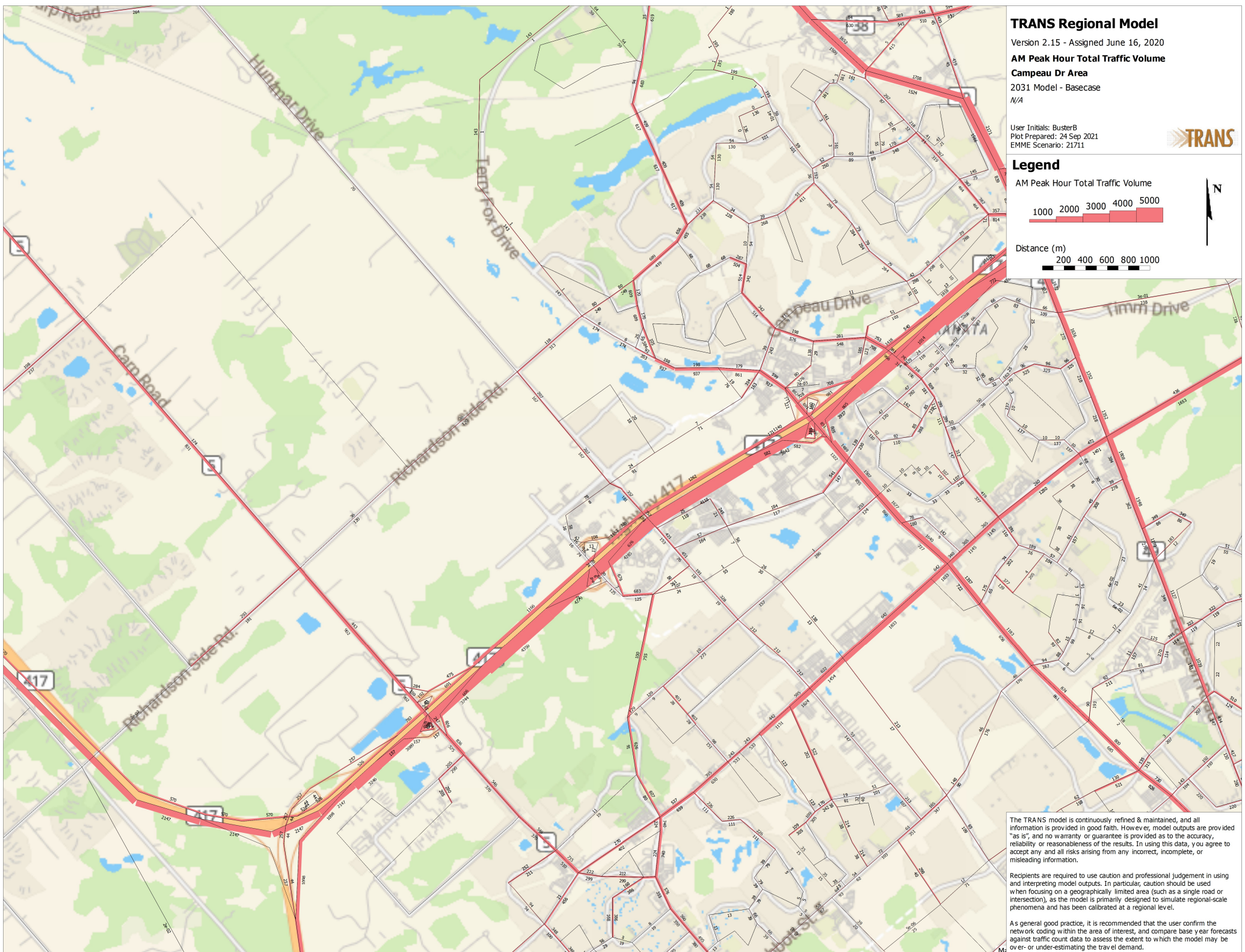
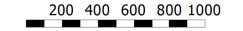


Legend

AM Peak Hour Total Traffic Volume



Distance (m)



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

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

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

Appendix F

Background Development Volumes

Figure 18: Trip Assignment

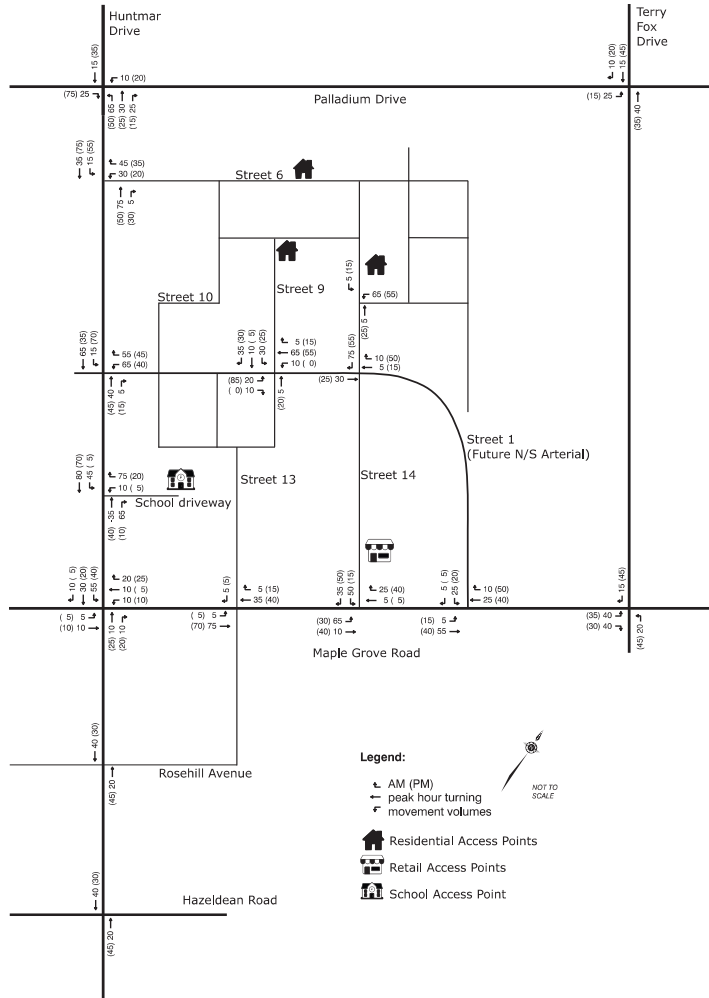
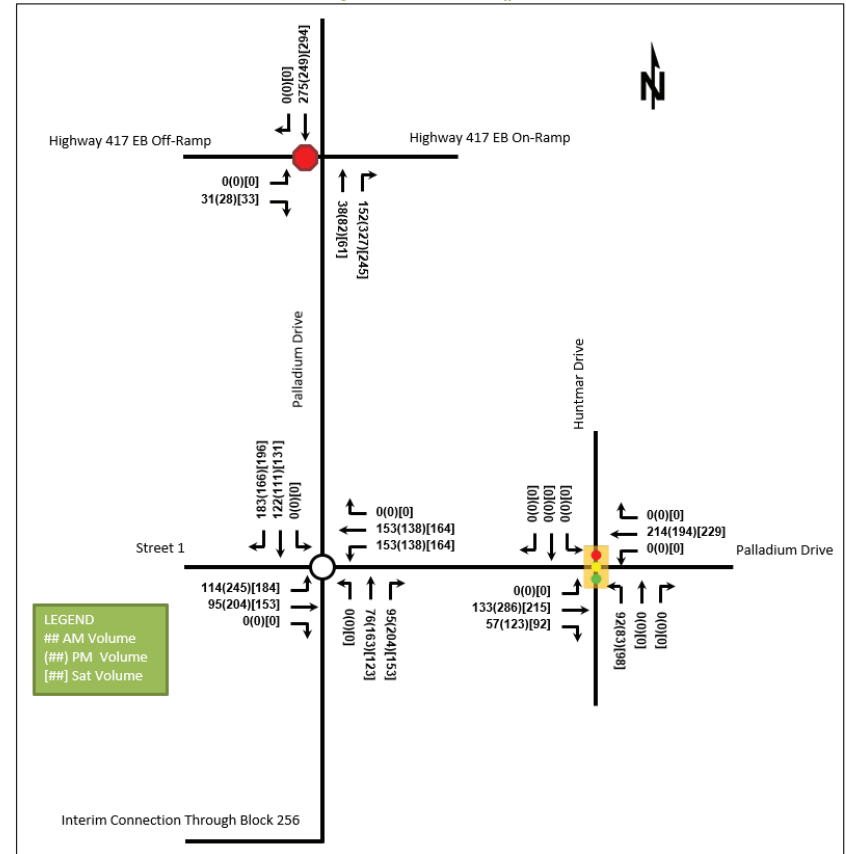


Figure 13: Site Generated Traffic



3.2 Background Network Travel Demands

The background traffic generated by nearby developments has been combined with the traffic counts. Figure 14 illustrates the 2024 future background traffic volumes. All of the background developments are anticipated to be built-out by 2024. As no background growth rate is being applied the, 2024 traffic volumes are anticipated to be similar to the 2029 traffic volumes, therefore no additional figure has been created for 2029 traffic volumes.

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

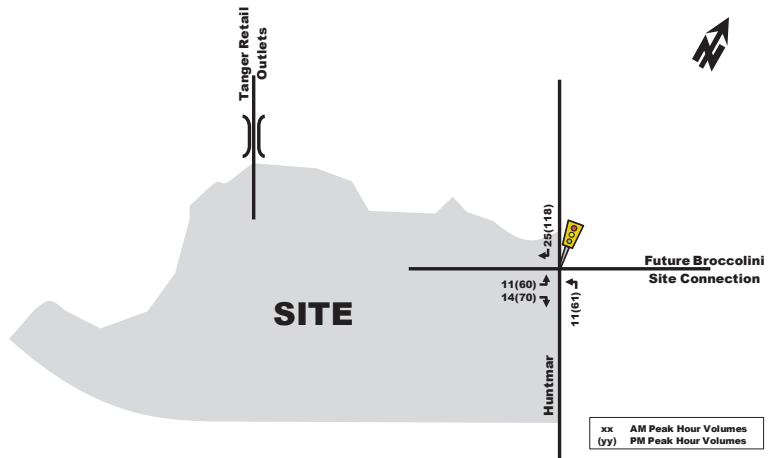


Figure 12: Purolator Facility Site-Generated Traffic (Phase 1)

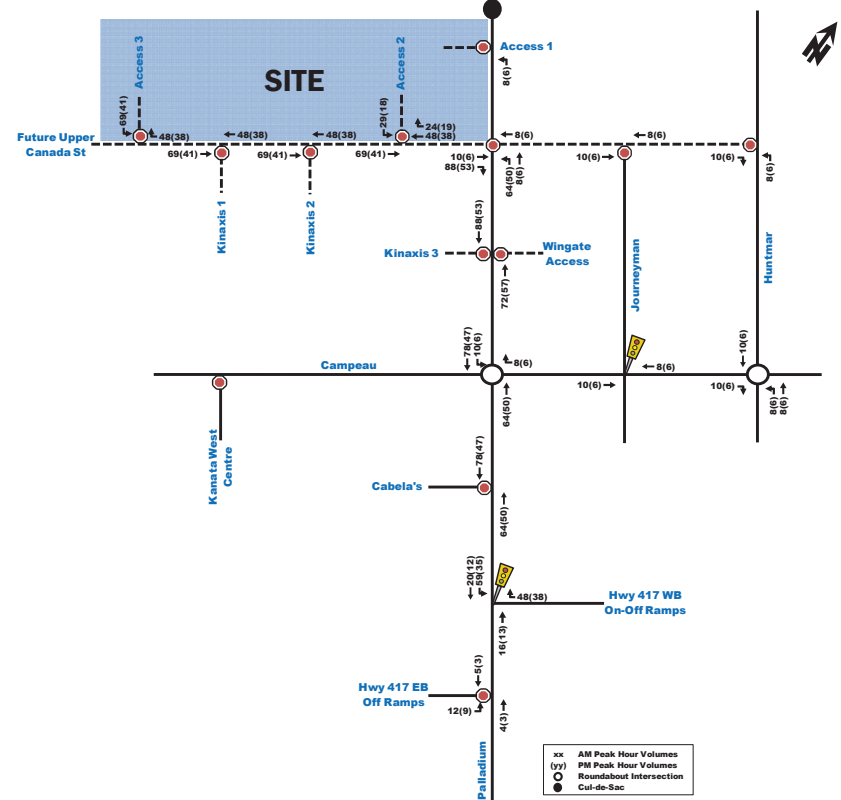


Figure 13: Purolator Facility Site-Generated Traffic (Phase 2)

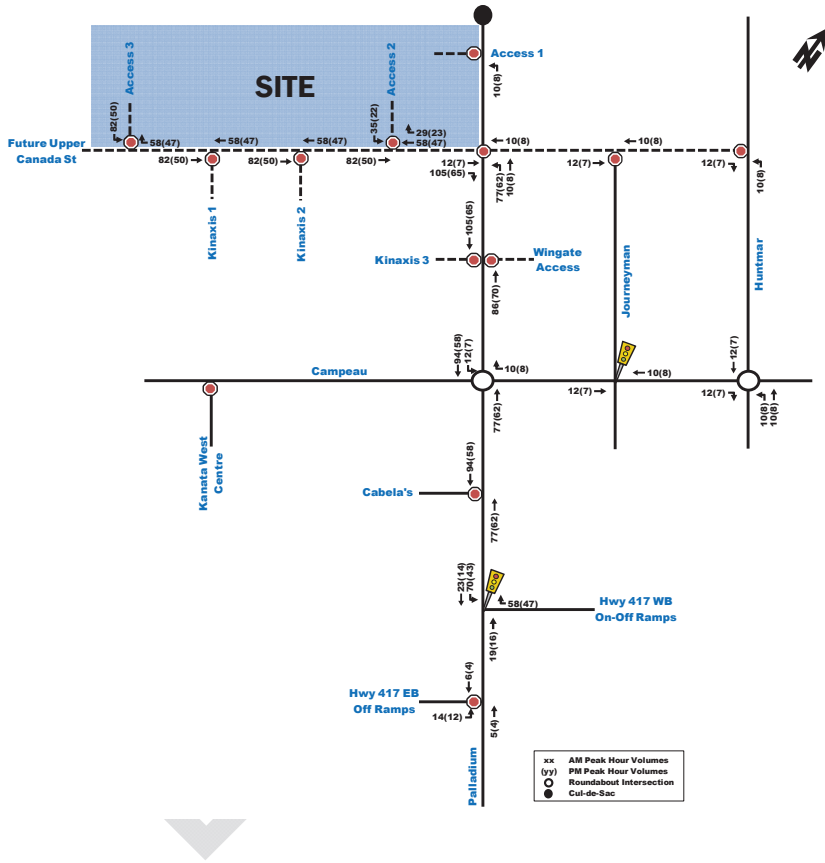


Figure 12: Maritime Ontario Facility Site-Generated Traffic (Phase 1)

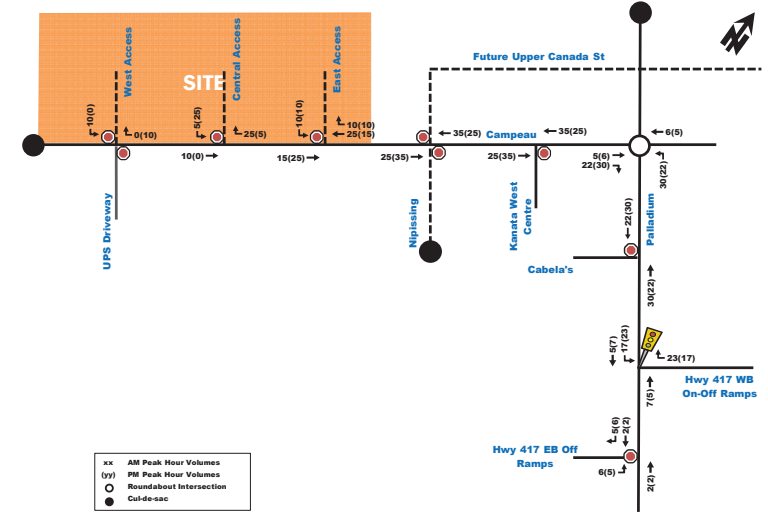
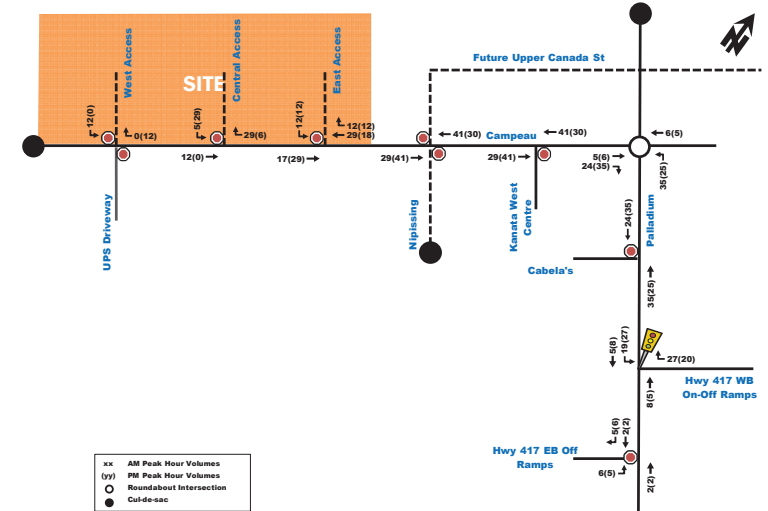


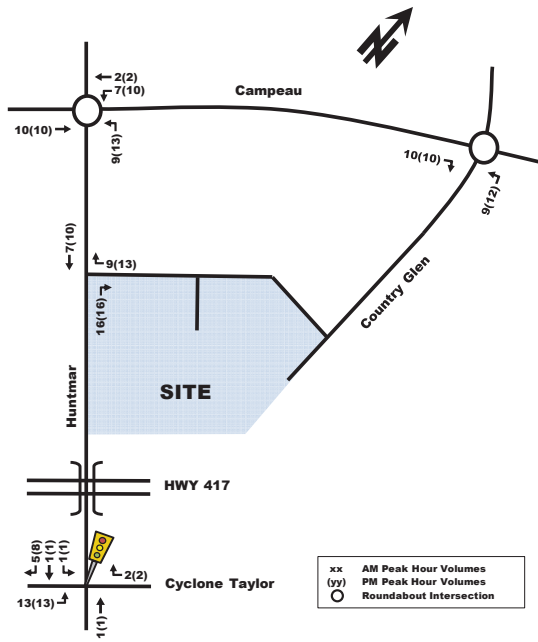
Figure 13: Maritime Ontario Facility Site-Generated Traffic (Phase 2)



3.1.3. TRIP DISTRIBUTION AND ASSIGNMENT

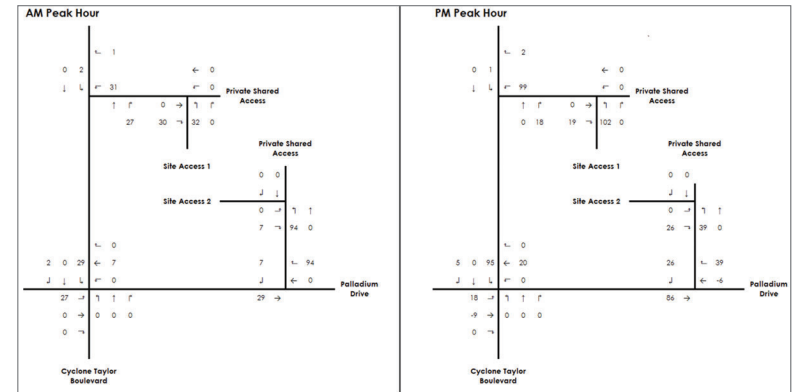
Given the low projected number of vehicle trips projected to be generated by the proposed development, the future roadway network impact is considered negligible. However, a review of the number of vehicles projected to enter/exit the site at the proposed site driveways is provided as Figure 7.

Figure 7: Site-Generated Vehicle Trips



800 Palladium Drive Transportation Impact Assessment
Forecasting
March 19, 2019

Figure 12 - Net Site Generated Traffic Volumes



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

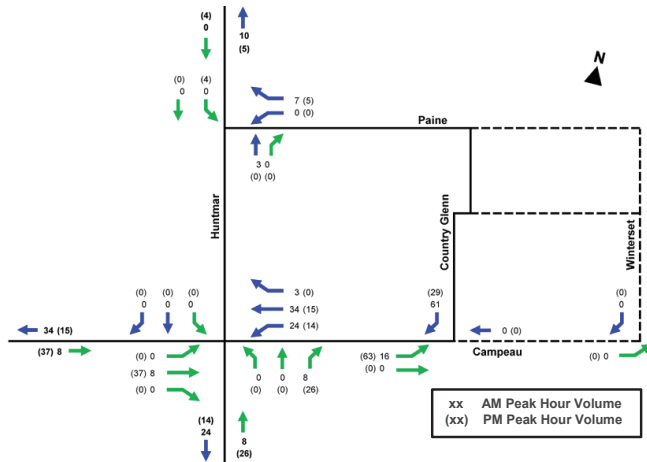


Figure 5: Site-Generated Traffic – Stage 3 Build-Out

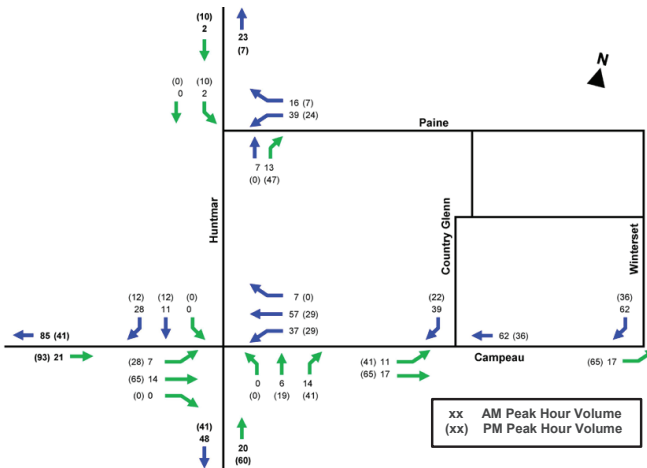
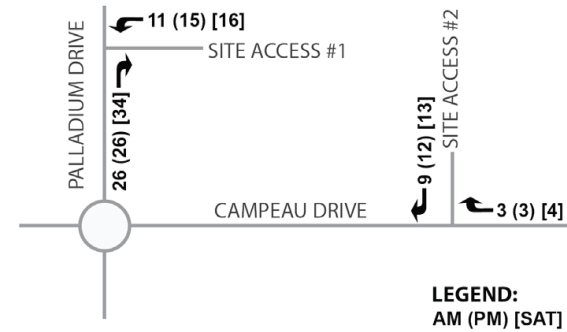


Figure 6: Site-Generated Traffic – Stage 3 and 4 Build-Out

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.

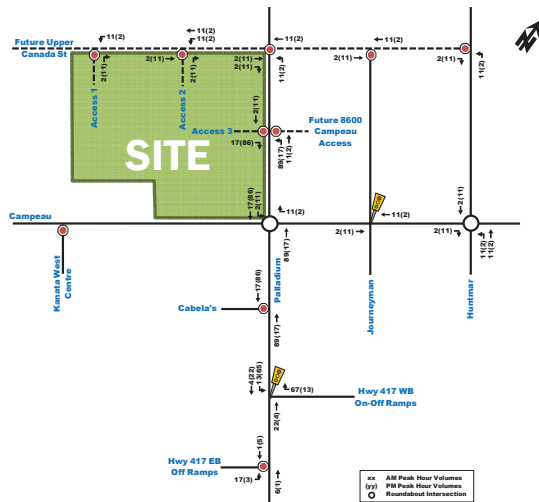
3.1.2. TRIP DISTRIBUTION AND ASSIGNMENT

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



As shown in Table 4.1, the proposed development is anticipated to generate 110 two-way trips (61 inbound and 49 outbound) during the AM peak hours and 119 two-way trips (60 inbound and 59 outbound) during the PM peak hours.

The assumptions for the trip distribution rates are based on the existing traffic patterns at the Campeau Drive and Palladium Drive intersection, and routes that drivers would likely take to access the subject site and engineering judgement based on ease of site access. As a result, site trip distribution is summarized for the inbound and outbound site traffic movements during the morning and afternoon peak hours in Table 4.2.

Table 4.2 – Site Traffic Trip Distribution

Direction	Via	AM Peak Hour		PM Peak Hour	
		Inbound	Outbound	Inbound	Outbound
North	Palladium Drive	8%	8%	2%	2%
South	Palladium Drive	42%	42%	55%	55%
East	Campeau Drive	36%	36%	32%	32%
West	Campeau Drive	14%	14%	11%	11%
Total		100%	100%	100%	100%

Figure 4-1 - Site Generated Traffic Volumes

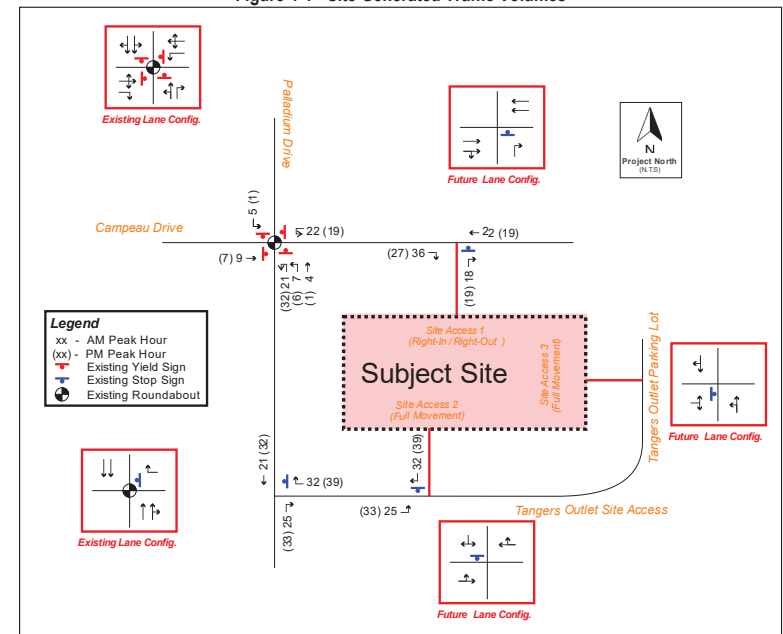


Table 6: Site-Generated Trips by Travel Mode, Horizon Year 2023

Travel Mode	Mode Share	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
		In	Out	Total	In	Out	Total
Auto Driver	65%	26	8	34	10	26	36
Auto Passenger	15%	6	2	8	2	6	8
Transit	15%	6	2	8	2	6	8
Walk	2%	0	0	0	0	1	1
Bike	3%	1	0	1	0	1	1
Total Person Trips	100%	39	12	51	14	40	54
Total Auto Trips		26	8	34	10	26	36

As shown in Table 6, the anticipated number of total auto trips generated by proposed development is approximately 34 to 36 veh/h at horizon year 2023, during the morning and afternoon peak hours.

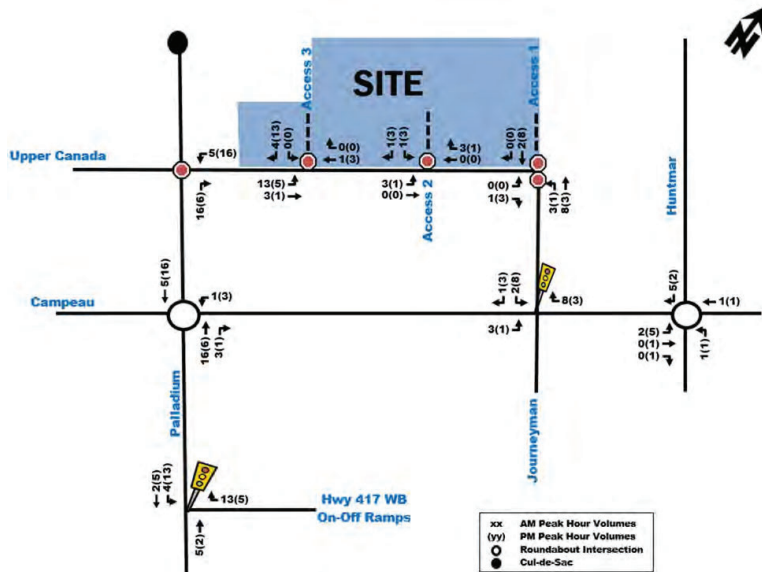
3.1.2. Trip Distribution and Assignment

Based on the 2011 OD 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;
- 5% to/from the south;
- 60% to/from the east; and,
- 10% to/from the west.

The anticipated site-generated auto trips for the proposed development from Table 6 were then assigned to the road network as shown in Figure 10.

Figure 10: Site-Generated Traffic



Appendix G

Synchro and Sidra Worksheets – 2025 Future Background

MOVEMENT SUMMARY

Site: 101 [Country Glen-Campeau AM FB25 (Site Folder: General)]

Arcadia Stage 6
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh.]	[Dist.]				
South: Country Glen														
1	L2	5	2.0	5	2.0	0.005	7.7	LOS A	0.0	0.1	0.16	0.56	0.16	50.4
2	T1	1	2.0	1	2.0	0.005	2.0	LOS A	0.0	0.1	0.15	0.31	0.15	50.3
3	R2	4	2.0	4	2.0	0.005	2.5	LOS A	0.0	0.1	0.15	0.31	0.15	52.2
Approach		10	2.0	10	2.0	0.005	5.1	LOS A	0.0	0.1	0.15	0.43	0.15	51.1
East: Campeau														
4	L2	4	2.0	4	2.0	0.033	9.5	LOS A	0.1	0.6	0.11	0.38	0.11	54.8
5	T1	61	2.0	61	2.0	0.033	3.5	LOS A	0.1	0.6	0.11	0.36	0.11	58.0
6	R2	5	2.0	5	2.0	0.033	3.7	LOS A	0.1	0.6	0.10	0.35	0.10	52.3
Approach		70	2.0	70	2.0	0.033	3.8	LOS A	0.1	0.6	0.11	0.36	0.11	57.4
North: Country Glen														
7	L2	19	2.0	19	2.0	0.149	7.7	LOS A	0.4	2.9	0.13	0.36	0.13	54.3
8	T1	1	2.0	1	2.0	0.149	1.6	LOS A	0.4	2.9	0.13	0.36	0.13	50.1
9	R2	138	2.0	138	2.0	0.149	2.2	LOS A	0.4	2.9	0.13	0.36	0.13	52.0
Approach		158	2.0	158	2.0	0.149	2.9	LOS A	0.4	2.9	0.13	0.36	0.13	52.2
West: Campeau														
10	L2	50	2.0	50	2.0	0.046	9.4	LOS A	0.2	1.1	0.09	0.61	0.09	51.3
11	T1	35	2.0	35	2.0	0.038	3.0	LOS A	0.1	0.9	0.09	0.31	0.09	58.9
12	R2	6	2.0	6	2.0	0.038	3.3	LOS A	0.1	0.9	0.09	0.31	0.09	52.7
Approach		91	2.0	91	2.0	0.046	6.6	LOS A	0.2	1.1	0.09	0.48	0.09	54.0
All Vehicles		329	2.0	329	2.0	0.149	4.2	LOS A	0.4	2.9	0.12	0.39	0.12	53.7

Site Level of Service (LOS) Method: Delay (SIDRA). 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 per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 2010.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
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 AM FB25 (Site Folder: General)]

Arcadia Stage 6
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh.]	[Dist.]				
South: Huntmar														
1	L2	37	2.0	37	2.0	0.037	7.8	LOS A	0.1	0.7	0.18	0.58	0.18	50.4
2	T1	357	2.0	357	2.0	0.354	2.2	LOS A	1.2	8.6	0.24	0.25	0.24	50.1
3	R2	40	2.0	40	2.0	0.040	2.9	LOS A	0.1	0.7	0.18	0.37	0.18	51.7
Approach		434	2.0	434	2.0	0.354	2.7	LOS A	1.2	8.6	0.23	0.29	0.23	50.3
East: Campeau														
4	L2	115	2.0	115	2.0	0.145	10.8	LOS B	0.4	2.7	0.38	0.75	0.38	50.4
5	T1	73	2.0	73	2.0	0.094	4.8	LOS A	0.3	1.8	0.38	0.47	0.38	56.9
6	R2	16	2.0	16	2.0	0.021	5.1	LOS A	0.1	0.4	0.36	0.55	0.36	51.2
Approach		204	2.0	204	2.0	0.145	8.2	LOS A	0.4	2.7	0.38	0.64	0.38	52.6
North: Huntmar														
7	L2	2	2.0	2	2.0	0.173	8.2	LOS A	0.5	3.6	0.28	0.29	0.28	53.8
8	T1	324	2.0	324	2.0	0.173	2.4	LOS A	0.5	3.6	0.27	0.28	0.27	50.0
9	R2	125	2.0	125	2.0	0.134	3.2	LOS A	0.4	2.7	0.27	0.44	0.27	51.4
Approach		451	2.0	451	2.0	0.173	2.6	LOS A	0.5	3.6	0.27	0.33	0.27	50.4
West: Campeau														
10	L2	80	2.0	80	2.0	0.098	10.6	LOS B	0.3	1.8	0.35	0.73	0.35	50.5
11	T1	49	2.0	49	2.0	0.062	4.6	LOS A	0.2	1.2	0.36	0.46	0.36	57.0
12	R2	42	2.0	42	2.0	0.052	4.7	LOS A	0.1	0.9	0.34	0.55	0.34	51.5
Approach		171	2.0	171	2.0	0.098	7.4	LOS A	0.3	1.8	0.35	0.61	0.35	52.4
All Vehicles		1260	2.0	1260	2.0	0.354	4.2	LOS A	1.2	8.6	0.29	0.40	0.29	51.0

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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Winterset-Campeau AM FB25 (Site Folder: General)]

Arcadia Stage 6
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh.]	[Dist.]				
East: Campeau														
5	T1	39	2.0	39	2.0	0.022	3.4	LOS A	0.1	0.4	0.03	0.34	0.03	58.7
6	R2	9	2.0	9	2.0	0.022	3.6	LOS A	0.1	0.4	0.03	0.36	0.03	52.5
Approach		48	2.0	48	2.0	0.022	3.4	LOS A	0.1	0.4	0.03	0.34	0.03	57.5
North: Winterset														
7	L2	31	2.0	31	2.0	0.057	7.6	LOS A	0.1	1.0	0.09	0.46	0.09	52.8
9	R2	31	2.0	31	2.0	0.057	2.1	LOS A	0.1	1.0	0.09	0.46	0.09	50.7
Approach		62	2.0	62	2.0	0.057	4.8	LOS A	0.1	1.0	0.09	0.46	0.09	51.7
West: Campeau														
10	L2	8	2.0	8	2.0	0.027	9.4	LOS A	0.1	0.7	0.10	0.41	0.10	54.5
11	T1	50	2.0	50	2.0	0.027	2.7	LOS A	0.1	0.7	0.10	0.33	0.10	58.6
Approach		58	2.0	58	2.0	0.027	3.6	LOS A	0.1	0.7	0.10	0.34	0.10	58.0
All Vehicles		168	2.0	168	2.0	0.057	4.0	LOS A	0.1	1.0	0.08	0.39	0.08	55.4

Site Level of Service (LOS) Method: Delay (SIDRA). 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 per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 2010.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: Not Saved

Lanes, Volumes, Timings

4: Huntmar & Autopark Private/Cyclone Taylor

2025 Future Background

AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	5	4	26	2	1	17	37	412	53	68	347	38
Future Volume (vph)	5	4	26	2	1	17	37	412	53	68	347	38
Satd. Flow (prot)	0	1523	0	1127	1273	0	1658	1745	1401	1642	1728	1483
Fit Permitted		0.946					0.553			0.521		
Satd. Flow (perm)	0	1451	0	1186	1273	0	965	1745	1401	900	1728	1483
Satd. Flow (RTOR)		26			17				56			56
Lane Group Flow (vph)	0	35	0	2	18	0	37	412	53	68	347	38
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2		6		6
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		23.0	23.0	23.0	23.0	23.0	23.0
Minimum Split (s)	33.1	33.1		33.1	33.1		28.9	28.9	28.9	28.9	28.9	28.9
Total Split (s)	33.1	33.1		33.1	33.1		28.9	28.9	28.9	28.9	28.9	28.9
Total Split (%)	53.4%	53.4%		53.4%	53.4%		46.6%	46.6%	46.6%	46.6%	46.6%	46.6%
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.9	2.9		2.9	2.9		2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.2		6.2	6.2		5.9	5.9	5.9	5.9	5.9	5.9
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min	Min	Min	Min	Min
Act Effct Green (s)		13.0		13.0	13.0		39.0	39.0	39.0	39.0	39.0	39.0
Actuated g/C Ratio		0.29		0.29	0.29		0.87	0.87	0.87	0.87	0.87	0.87
v/c Ratio		0.08		0.01	0.05		0.04	0.27	0.04	0.09	0.23	0.03
Control Delay		5.7		9.0	5.3		6.4	6.1	3.2	6.4	5.8	2.5
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		5.7		9.0	5.3		6.4	6.1	3.2	6.4	5.8	2.5
LOS		A		A	A		A	A	A	A	A	A
Approach Delay		5.7			5.7			5.8			5.6	
Approach LOS		A			A			A			A	
Queue Length 50th (m)		0.6		0.1	0.1		0.0	0.0	0.0	0.0	0.0	0.0
Queue Length 95th (m)		4.7		1.1	3.0		8.0	63.5	5.5	13.0	52.1	3.5
Internal Link Dist (m)		199.6			315.6			205.7			39.4	
Turn Bay Length (m)							57.0			56.5		57.5
Base Capacity (vph)		935		756	818		843	1525	1232	787	1511	1303
Starvation Cap Reductn		0		0	0		0	0	0	0	0	0
Spillback Cap Reductn		0		0	0		0	0	0	0	0	0
Storage Cap Reductn		0		0	0		0	0	0	0	0	0
Reduced v/c Ratio		0.04		0.00	0.02		0.04	0.27	0.04	0.09	0.23	0.03
Intersection Summary												
Cycle Length: 62												
Actuated Cycle Length: 44.6												
Natural Cycle: 65												
Control Type: Actuated-Uncoordinated												
Maximum v/c Ratio: 0.27												

Scenario 1 8415 Campeau Drive 12:00 am 08/31/2021 2025 Future Background

Synchro 11 Report

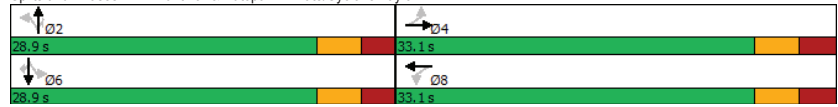
Page 4

Lanes, Volumes, Timings
4: Huntmar & Autopark Private/Cyclone Taylor

2025 Future Background
AM Peak Hour

Intersection Signal Delay: 5.7 Intersection LOS: A
Intersection Capacity Utilization 65.9% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 4: Huntmar & Autopark Private/Cyclone Taylor



Lanes, Volumes, Timings
5: Huntmar & Palladium

2025 Future Background
AM Peak Hour

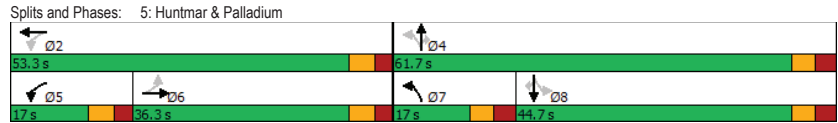
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗	↗	↖	↖↗	↗	↖	↖↗	↗	↖	↖↗	↗
Traffic Volume (vph)	38	299	249	50	297	49	481	413	166	99	218	57
Future Volume (vph)	38	299	249	50	297	49	481	413	166	99	218	57
Satd. Flow (prot)	1658	3058	0	1523	3240	0	1658	1745	1483	1658	1712	1483
Fit Permitted	0.544			0.313			0.354			0.520		
Satd. Flow (perm)	948	3058	0	502	3240	0	618	1745	1483	907	1712	1483
Satd. Flow (RTOR)		179			20				166			152
Lane Group Flow (vph)	38	548	0	50	346	0	481	413	166	99	218	57
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		6		5	2		7	4			8	
Permitted Phases	6			2			4		4	8		8
Detector Phase	6	6		5	2		7	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.3	36.3		11.3	36.3		11.4	37.4	37.4	37.4	37.4	37.4
Total Split (s)	36.3	36.3		17.0	53.3		17.0	61.7	61.7	44.7	44.7	44.7
Total Split (%)	31.6%	31.6%		14.8%	46.3%		14.8%	53.7%	53.7%	38.9%	38.9%	38.9%
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6		2.6	2.6		3.1	3.1	3.1	3.1	3.1	3.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3		6.3	6.3		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag	Lag	Lag		Lead			Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	Yes
Recall Mode	Max	Max		None	None		None	None	None	None	None	None
Act Effct Green (s)	30.6	30.6		39.1	39.1		33.8	33.8	33.8	16.5	16.5	16.5
Actuated g/C Ratio	0.36	0.36		0.46	0.46		0.39	0.39	0.39	0.19	0.19	0.19
v/c Ratio	0.11	0.45		0.15	0.23		1.29	0.60	0.24	0.57	0.67	0.14
Control Delay	24.5	17.1		14.9	14.0		172.3	26.1	4.2	46.8	43.8	0.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.5	17.1		14.9	14.0		172.3	26.1	4.2	46.8	43.8	0.7
LOS	C	B		B	B		F	C	A	D	D	A
Approach Delay		17.6			14.1			89.0			38.0	
Approach LOS		B			B			F			D	
Queue Length 50th (m)	4.6	25.9		4.4	16.2		-104.9	58.5	0.0	16.0	36.0	0.0
Queue Length 95th (m)	13.3	46.7		11.7	28.1		#181.3	91.1	11.8	32.7	60.3	0.0
Internal Link Dist (m)		170.0			174.7			260.9			205.7	
Turn Bay Length (m)										51.5		
Base Capacity (vph)	338	1205		358	1819		374	1147	1031	413	779	758
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.45		0.14	0.19		1.29	0.36	0.16	0.24	0.28	0.08

Intersection Summary
Cycle Length: 115
Actuated Cycle Length: 85.9
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.29

Lanes, Volumes, Timings
5: Huntmar & Palladium

2025 Future Background
AM Peak Hour

Intersection Signal Delay: 51.5 Intersection LOS: D
 Intersection Capacity Utilization 82.7% ICU Level of Service E
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.



HCM 2010 TWSC
6: Access#1 & Country Glen

2025 Future Background
AM Peak Hour

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

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

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

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

Intersection						
Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↑
Traffic Vol, veh/h	58	0	0	70	0	0
Future Vol, veh/h	58	0	0	70	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	58	0	0	70	0	0

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	- - - 29
Stage 1	-	-	- - -
Stage 2	-	-	- - -
Critical Hdwy	-	-	- - - 6.94
Critical Hdwy Stg 1	-	-	- - -
Critical Hdwy Stg 2	-	-	- - -
Follow-up Hdwy	-	-	- - - 3.32
Pot Cap-1 Maneuver	-	-	0 - 1039
Stage 1	-	-	0 - 0
Stage 2	-	-	0 - 0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	- - - 1039
Mov Cap-2 Maneuver	-	-	- - -
Stage 1	-	-	- - -
Stage 2	-	-	- - -

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	0	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	-	-	-	-

MOVEMENT SUMMARY

Site: 101 [Country Glen-Campeau PM FB25 (Site Folder: General)]

Arcadia Stage 6
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh.]	[Dist.]				
South: Country Glen														
1	L2	7	2.0	7	2.0	0.008	8.1	LOS A	0.0	0.1	0.24	0.58	0.24	50.1
2	T1	1	2.0	1	2.0	0.007	2.4	LOS A	0.0	0.1	0.26	0.36	0.26	49.9
3	R2	5	2.0	5	2.0	0.007	2.9	LOS A	0.0	0.1	0.26	0.36	0.26	51.8
Approach		13	2.0	13	2.0	0.008	5.7	LOS A	0.0	0.1	0.25	0.48	0.25	50.7
East: Campeau														
4	L2	4	2.0	4	2.0	0.052	9.8	LOS A	0.1	1.0	0.22	0.41	0.22	54.4
5	T1	77	2.0	77	2.0	0.052	3.8	LOS A	0.1	1.0	0.21	0.41	0.21	57.5
6	R2	20	2.0	20	2.0	0.052	4.0	LOS A	0.1	0.9	0.20	0.41	0.20	51.8
Approach		101	2.0	101	2.0	0.052	4.1	LOS A	0.1	1.0	0.21	0.41	0.21	56.2
North: Country Glen														
7	L2	11	2.0	11	2.0	0.092	7.7	LOS A	0.2	1.7	0.14	0.36	0.14	54.3
8	T1	1	2.0	1	2.0	0.092	1.6	LOS A	0.2	1.7	0.14	0.36	0.14	50.1
9	R2	85	2.0	85	2.0	0.092	2.3	LOS A	0.2	1.7	0.14	0.36	0.14	52.0
Approach		97	2.0	97	2.0	0.092	2.9	LOS A	0.2	1.7	0.14	0.36	0.14	52.2
West: Campeau														
10	L2	162	2.0	162	2.0	0.149	9.4	LOS A	0.6	4.1	0.08	0.62	0.08	51.3
11	T1	76	2.0	76	2.0	0.075	3.0	LOS A	0.3	1.9	0.07	0.30	0.07	59.0
12	R2	6	2.0	6	2.0	0.075	3.3	LOS A	0.3	1.9	0.07	0.30	0.07	52.8
Approach		244	2.0	244	2.0	0.149	7.3	LOS A	0.6	4.1	0.08	0.51	0.08	53.5
All Vehicles		455	2.0	455	2.0	0.149	5.6	LOS A	0.6	4.1	0.13	0.45	0.13	53.7

Site Level of Service (LOS) Method: Delay (SIDRA). 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 per movement.
 Intersection and Approach LOS values are based on average delay for all vehicle movements.
 Roundabout Capacity Model: US HCM 2010.
 Delay Model: SIDRA Standard (Geometric Delay is included).
 Queue Model: SIDRA Standard.
 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 FB25 (Site Folder: General)]

Arcadia Stage 6
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh.]	[Dist m]				
South: Huntmar														
1	L2	94	2.0	94	2.0	0.108	8.5	LOS A	0.3	2.1	0.32	0.65	0.32	50.0
2	T1	402	2.0	402	2.0	0.453	3.1	LOS A	1.7	12.2	0.42	0.37	0.44	49.3
3	R2	116	2.0	116	2.0	0.133	3.5	LOS A	0.4	2.7	0.32	0.48	0.32	51.3
Approach		612	2.0	612	2.0	0.453	4.0	LOS A	1.7	12.2	0.39	0.43	0.40	49.8
East: Campeau														
4	L2	116	2.0	116	2.0	0.169	11.6	LOS B	0.5	3.2	0.45	0.80	0.45	50.1
5	T1	46	2.0	46	2.0	0.069	5.6	LOS A	0.2	1.3	0.45	0.55	0.45	56.5
6	R2	7	2.0	7	2.0	0.011	5.8	LOS A	0.0	0.2	0.43	0.59	0.43	50.9
Approach		169	2.0	169	2.0	0.169	9.7	LOS A	0.5	3.2	0.45	0.73	0.45	51.7
North: Huntmar														
7	L2	8	2.0	8	2.0	0.249	8.4	LOS A	0.8	5.6	0.32	0.32	0.32	53.5
8	T1	450	2.0	450	2.0	0.249	2.6	LOS A	0.8	5.6	0.31	0.31	0.31	49.8
9	R2	154	2.0	154	2.0	0.169	3.4	LOS A	0.5	3.5	0.30	0.46	0.30	51.3
Approach		612	2.0	612	2.0	0.249	2.8	LOS A	0.8	5.6	0.31	0.35	0.31	50.2
West: Campeau														
10	L2	187	2.0	187	2.0	0.252	11.3	LOS B	0.7	5.2	0.45	0.79	0.45	50.2
11	T1	120	2.0	120	2.0	0.167	5.3	LOS A	0.5	3.4	0.44	0.53	0.44	56.5
12	R2	89	2.0	89	2.0	0.119	5.2	LOS A	0.3	2.2	0.40	0.63	0.40	51.3
Approach		396	2.0	396	2.0	0.252	8.1	LOS A	0.7	5.2	0.43	0.67	0.43	52.2
All Vehicles		1789	2.0	1789	2.0	0.453	5.1	LOS A	1.7	12.2	0.38	0.48	0.38	50.6

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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Winterset-Campeau PM FB25 (Site Folder: General)]

Arcadia Stage 6
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh.]	[Dist m]				
East: Campeau														
5	T1	84	2.0	84	2.0	0.054	3.4	LOS A	0.1	1.0	0.08	0.34	0.08	58.5
6	R2	32	2.0	32	2.0	0.054	3.7	LOS A	0.1	0.9	0.08	0.38	0.08	52.3
Approach		116	2.0	116	2.0	0.054	3.5	LOS A	0.1	1.0	0.08	0.35	0.08	56.6
North: Winterset														
7	L2	18	2.0	18	2.0	0.034	7.7	LOS A	0.1	0.6	0.13	0.47	0.13	52.7
9	R2	18	2.0	18	2.0	0.034	2.2	LOS A	0.1	0.6	0.13	0.47	0.13	50.5
Approach		36	2.0	36	2.0	0.034	5.0	LOS A	0.1	0.6	0.13	0.47	0.13	51.6
West: Campeau														
10	L2	33	2.0	33	2.0	0.042	9.4	LOS A	0.1	1.0	0.08	0.56	0.08	52.5
11	T1	58	2.0	58	2.0	0.042	2.7	LOS A	0.1	1.0	0.08	0.34	0.08	58.5
Approach		91	2.0	91	2.0	0.042	5.1	LOS A	0.1	1.0	0.08	0.42	0.08	56.1
All Vehicles		243	2.0	243	2.0	0.054	4.3	LOS A	0.1	1.0	0.09	0.40	0.09	55.6

Site Level of Service (LOS) Method: Delay (SIDRA). 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 per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 2010.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Lanes, Volumes, Timings
 4: Huntmar & Autopark Private/Cyclone Taylor 2025 Future Background
 PM Peak Hour

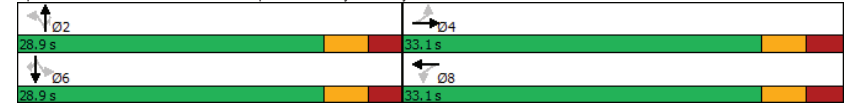
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	29	4	71	67	1	75	16	509	12	9	538	15
Future Volume (vph)	29	4	71	67	1	75	16	509	12	9	538	15
Satd. Flow (prot)	0	1537	0	1595	1445	0	1658	1745	1081	1127	1745	1483
Fit Permitted		0.883		0.690			0.398			0.422		
Satd. Flow (perm)	0	1377	0	1157	1445	0	694	1745	1081	501	1745	1452
Satd. Flow (RTOR)		71		75					56			56
Lane Group Flow (vph)	0	104	0	67	76	0	16	509	12	9	538	15
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	Perm	NA	Perm	Perm
Protected Phases		4		8			2	2	2	6	6	6
Permitted Phases	4	4		8	8		2	2	2	6	6	6
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		23.0	23.0	23.0	23.0	23.0	23.0
Minimum Split (s)	33.1	33.1		33.1	33.1		28.9	28.9	28.9	28.9	28.9	28.9
Total Split (s)	33.1	33.1		33.1	33.1		28.9	28.9	28.9	28.9	28.9	28.9
Total Split (%)	53.4%	53.4%		53.4%	53.4%		46.6%	46.6%	46.6%	46.6%	46.6%	46.6%
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.9	2.9		2.9	2.9		2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.2		6.2	6.2		5.9	5.9	5.9	5.9	5.9	5.9
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min	Min	Min	Min	Min
Act Effct Green (s)	12.8	12.8		12.8	12.8		28.0	28.0	28.0	28.0	28.0	28.0
Actuated g/C Ratio	0.27	0.27		0.27	0.27		0.58	0.58	0.58	0.58	0.58	0.58
v/c Ratio	0.25	0.22		0.17	0.17		0.04	0.50	0.02	0.03	0.53	0.02
Control Delay	7.5	14.9		4.8	4.8		9.8	13.5	0.1	10.0	14.3	0.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.5	14.9		4.8	4.8		9.8	13.5	0.1	10.0	14.3	0.1
LOS	A	B		A	A		A	B	A	A	B	A
Approach Delay	7.5			9.5			13.1			13.8		
Approach LOS	A			A			B			B		
Queue Length 50th (m)	2.1	4.4		0.1	0.1		0.6	24.6	0.0	0.3	26.5	0.0
Queue Length 95th (m)	9.4	10.9		6.1	6.1		4.5	#95.4	0.0	3.2	#103.5	0.2
Internal Link Dist (m)	199.6			315.6			205.7			39.4		
Turn Bay Length (m)							57.0			56.5		57.5
Base Capacity (vph)	811			656	852		402	1012	650	290	1012	865
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.10		0.09	0.09		0.04	0.50	0.02	0.03	0.53	0.02

Intersection Summary												
Cycle Length: 62												
Actuated Cycle Length: 48.2												
Natural Cycle: 65												
Control Type: Actuated-Uncoordinated												
Maximum v/c Ratio: 0.53												

Lanes, Volumes, Timings
 4: Huntmar & Autopark Private/Cyclone Taylor 2025 Future Background
 PM Peak Hour

Intersection Signal Delay: 12.6	Intersection LOS: B
Intersection Capacity Utilization 63.0%	ICU Level of Service B
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 4: Huntmar & Autopark Private/Cyclone Taylor



Lanes, Volumes, Timings
5: Huntmar & Palladium

2025 Future Background
PM Peak Hour

	↖	→	↗	↖	←	↖	↗	↖	↗	↖	↗	↖
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕	↗	↖	↕	↗	↖	↕	↗	↖	↕	↗
Traffic Volume (vph)	47	431	617	183	603	149	346	339	86	114	444	118
Future Volume (vph)	47	431	617	183	603	149	346	339	86	114	444	118
Satd. Flow (prot)	1496	3024	0	1658	3208	0	1658	1745	1483	1658	1745	1483
Fit Permitted	0.366			0.110			0.172			0.557		
Satd. Flow (perm)	576	3024	0	192	3208	0	300	1745	1464	971	1745	1464
Satd. Flow (RTOR)		304			32				91			152
Lane Group Flow (vph)	47	1048	0	183	752	0	346	339	86	114	444	118
Turn Type	Perm	NA	pm+pt	NA	pm+pt	NA	Perm	Perm	Perm	NA	Perm	Perm
Protected Phases		6		5	2		7	4			8	
Permitted Phases	6			2			4		4	8		8
Detector Phase	6	6		5	2		7	4	4	8		8
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.3	36.3		11.3	36.3		11.4	37.4	37.4	37.4	37.4	37.4
Total Split (s)	36.3	36.3		17.0	53.3		17.0	61.7	61.7	44.7	44.7	44.7
Total Split (%)	31.6%	31.6%		14.8%	46.3%		14.8%	53.7%	53.7%	38.9%	38.9%	38.9%
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6		2.6	2.6		3.1	3.1	3.1	3.1	3.1	3.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3		6.3	6.3		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag	Lag	Lag		Lead			Lead		Lag	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes		Yes	Yes	Yes	
Recall Mode	Max	Max		None	None		None	None	None	None	None	None
Act Effct Green (s)	30.1	30.1		47.2	47.2		48.8	48.8	48.8	31.7	31.7	31.7
Actuated g/C Ratio	0.28	0.28		0.43	0.43		0.45	0.45	0.45	0.29	0.29	0.29
v/c Ratio	0.30	0.99		0.80	0.53		1.30	0.43	0.12	0.40	0.87	0.22
Control Delay	39.5	54.6		50.7	24.2		181.1	22.2	3.5	35.0	55.0	2.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.5	54.6		50.7	24.2		181.1	22.2	3.5	35.0	55.0	2.9
LOS	D	D		D	C		F	C	A	D	D	A
Approach Delay		54.0			29.4			91.4			42.5	
Approach LOS		D			C			F			D	
Queue Length 50th (m)	8.1	~92.3		25.0	59.8		~70.5	47.7	0.0	19.3	88.9	0.0
Queue Length 95th (m)	20.0	#145.9		#65.3	83.4		#128.2	70.2	7.5	35.5	127.7	6.8
Internal Link Dist (m)		170.0			174.7			260.9			205.7	
Turn Bay Length (m)									51.5			
Base Capacity (vph)	159	1057		228	1410		267	891	792	343	617	615
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.99		0.80	0.53		1.30	0.38	0.11	0.33	0.72	0.19

Intersection Summary

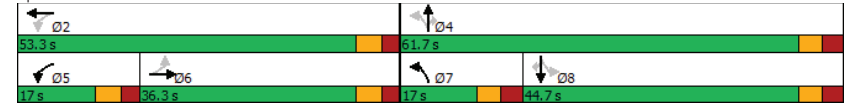
Cycle Length: 115
 Actuated Cycle Length: 108.7
 Natural Cycle: 110
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.30

Lanes, Volumes, Timings
5: Huntmar & Palladium

2025 Future Background
PM Peak Hour

Intersection Signal Delay: 53.4
 Intersection Capacity Utilization 110.3%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service H
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 5: Huntmar & Palladium



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

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

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

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

Intersection						
Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔		↔
Traffic Vol, veh/h	92	0	0	101	0	0
Future Vol, veh/h	92	0	0	101	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	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	92	0	0	101	0	0

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	46
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	6.94
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	3.32
Pot Cap-1 Maneuver	-	0	1014
Stage 1	-	0	0
Stage 2	-	0	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1014
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	0	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	-	-	-	-

Appendix H

Synchro and Sidra Worksheets – 2030 Future Background

MOVEMENT SUMMARY

Site: 101 [Country Glen-Campeau AM FB30 (Site Folder: General)]

Arcadia Stage 6
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh.]	[Dist.]				
South: Country Glen														
1	L2	5	2.0	5	2.0	0.005	7.7	LOS A	0.0	0.1	0.16	0.56	0.16	50.4
2	T1	1	2.0	1	2.0	0.005	2.0	LOS A	0.0	0.1	0.15	0.31	0.15	50.3
3	R2	4	2.0	4	2.0	0.005	2.5	LOS A	0.0	0.1	0.15	0.31	0.15	52.2
Approach		10	2.0	10	2.0	0.005	5.1	LOS A	0.0	0.1	0.15	0.43	0.15	51.1
East: Campeau														
4	L2	4	2.0	4	2.0	0.033	9.5	LOS A	0.1	0.6	0.11	0.38	0.11	54.8
5	T1	61	2.0	61	2.0	0.033	3.5	LOS A	0.1	0.6	0.11	0.36	0.11	58.0
6	R2	5	2.0	5	2.0	0.033	3.7	LOS A	0.1	0.6	0.10	0.35	0.10	52.3
Approach		70	2.0	70	2.0	0.033	3.8	LOS A	0.1	0.6	0.11	0.36	0.11	57.4
North: Country Glen														
7	L2	19	2.0	19	2.0	0.149	7.7	LOS A	0.4	2.9	0.13	0.36	0.13	54.3
8	T1	1	2.0	1	2.0	0.149	1.6	LOS A	0.4	2.9	0.13	0.36	0.13	50.1
9	R2	138	2.0	138	2.0	0.149	2.2	LOS A	0.4	2.9	0.13	0.36	0.13	52.0
Approach		158	2.0	158	2.0	0.149	2.9	LOS A	0.4	2.9	0.13	0.36	0.13	52.2
West: Campeau														
10	L2	50	2.0	50	2.0	0.047	9.4	LOS A	0.2	1.1	0.09	0.61	0.09	51.3
11	T1	36	2.0	36	2.0	0.039	3.0	LOS A	0.1	0.9	0.09	0.31	0.09	58.9
12	R2	6	2.0	6	2.0	0.039	3.3	LOS A	0.1	0.9	0.09	0.31	0.09	52.7
Approach		92	2.0	92	2.0	0.047	6.5	LOS A	0.2	1.1	0.09	0.47	0.09	54.1
All Vehicles		330	2.0	330	2.0	0.149	4.2	LOS A	0.4	2.9	0.12	0.39	0.12	53.8

Site Level of Service (LOS) Method: Delay (SIDRA). 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 per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 2010.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
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 AM FB30 (Site Folder: General)]

Arcadia Stage 6
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh.]	[Dist.]				
South: Huntmar														
1	L2	39	2.0	39	2.0	0.039	7.8	LOS A	0.1	0.7	0.18	0.58	0.18	50.4
2	T1	359	2.0	359	2.0	0.358	2.2	LOS A	1.2	8.7	0.25	0.25	0.25	50.1
3	R2	40	2.0	40	2.0	0.040	2.9	LOS A	0.1	0.7	0.19	0.37	0.19	51.7
Approach		438	2.0	438	2.0	0.358	2.7	LOS A	1.2	8.7	0.23	0.29	0.23	50.3
East: Campeau														
4	L2	115	2.0	115	2.0	0.146	10.8	LOS B	0.4	2.7	0.38	0.75	0.38	50.4
5	T1	73	2.0	73	2.0	0.095	4.8	LOS A	0.3	1.8	0.38	0.48	0.38	56.9
6	R2	16	2.0	16	2.0	0.021	5.1	LOS A	0.1	0.4	0.36	0.55	0.36	51.1
Approach		204	2.0	204	2.0	0.146	8.2	LOS A	0.4	2.7	0.38	0.64	0.38	52.6
North: Huntmar														
7	L2	2	2.0	2	2.0	0.176	8.2	LOS A	0.5	3.6	0.28	0.29	0.28	53.8
8	T1	326	2.0	326	2.0	0.176	2.4	LOS A	0.5	3.6	0.27	0.28	0.27	50.0
9	R2	125	2.0	125	2.0	0.135	3.2	LOS A	0.4	2.7	0.27	0.44	0.27	51.4
Approach		453	2.0	453	2.0	0.176	2.6	LOS A	0.5	3.6	0.27	0.33	0.27	50.4
West: Campeau														
10	L2	80	2.0	80	2.0	0.099	10.6	LOS B	0.3	1.8	0.35	0.73	0.35	50.5
11	T1	50	2.0	50	2.0	0.063	4.6	LOS A	0.2	1.2	0.36	0.46	0.36	57.0
12	R2	43	2.0	43	2.0	0.053	4.7	LOS A	0.1	0.9	0.34	0.55	0.34	51.5
Approach		173	2.0	173	2.0	0.099	7.4	LOS A	0.3	1.8	0.35	0.61	0.35	52.4
All Vehicles		1268	2.0	1268	2.0	0.358	4.2	LOS A	1.2	8.7	0.29	0.40	0.29	51.0

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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Winterset-Campeau AM FB30 (Site Folder: General)]

Arcadia Stage 6
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh.]	[Dist.]				
East: Campeau														
5	T1	39	0.0	39	0.0	0.022	3.4	LOS A	0.1	0.4	0.03	0.34	0.03	58.8
6	R2	9	0.0	9	0.0	0.022	3.6	LOS A	0.1	0.4	0.03	0.36	0.03	52.5
Approach		48	0.0	48	0.0	0.022	3.4	LOS A	0.1	0.4	0.03	0.34	0.03	57.5
North: Winterset														
7	L2	31	0.0	31	0.0	0.057	7.6	LOS A	0.1	1.0	0.09	0.46	0.09	52.9
9	R2	31	0.0	31	0.0	0.057	2.1	LOS A	0.1	1.0	0.09	0.46	0.09	50.7
Approach		62	0.0	62	0.0	0.057	4.8	LOS A	0.1	1.0	0.09	0.46	0.09	51.8
West: Campeau														
10	L2	8	0.0	8	0.0	0.027	9.4	LOS A	0.1	0.7	0.10	0.41	0.10	54.6
11	T1	51	0.0	51	0.0	0.027	2.7	LOS A	0.1	0.7	0.10	0.33	0.10	58.6
Approach		59	0.0	59	0.0	0.027	3.6	LOS A	0.1	0.7	0.10	0.34	0.10	58.0
All Vehicles		169	0.0	169	0.0	0.057	4.0	LOS A	0.1	1.0	0.08	0.39	0.08	55.4

Site Level of Service (LOS) Method: Delay (SIDRA). 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 per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 2010.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Lanes, Volumes, Timings

4: Huntmar & Autopark Private/Cyclone Taylor

2030 Future Background

AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	5	4	26	2	1	17	37	416	53	69	349	38
Future Volume (vph)	5	4	26	2	1	17	37	416	53	69	349	38
Satd. Flow (prot)	0	1523	0	1127	1273	0	1658	1745	1401	1642	1728	1483
Fit Permitted		0.946					0.552		0.519			
Satd. Flow (perm)	0	1451	0	1186	1273	0	963	1745	1401	897	1728	1483
Satd. Flow (RTOR)		26			17				56			
Lane Group Flow (vph)	0	35	0	2	18	0	37	416	53	69	349	38
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	Perm	NA	Perm	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		23.0	23.0	23.0	23.0	23.0	23.0
Minimum Split (s)	33.1	33.1		33.1	33.1		28.9	28.9	28.9	28.9	28.9	28.9
Total Split (s)	33.1	33.1		33.1	33.1		28.9	28.9	28.9	28.9	28.9	28.9
Total Split (%)	53.4%	53.4%		53.4%	53.4%		46.6%	46.6%	46.6%	46.6%	46.6%	46.6%
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.9	2.9		2.9	2.9		2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.2		6.2	6.2		5.9	5.9	5.9	5.9	5.9	5.9
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min	Min	Min	Min	Min
Act Effct Green (s)		13.0		13.0	13.0		39.0	39.0	39.0	39.0	39.0	39.0
Actuated g/C Ratio		0.29		0.29	0.29		0.87	0.87	0.87	0.87	0.87	0.87
v/c Ratio		0.08		0.01	0.05		0.04	0.27	0.04	0.09	0.23	0.03
Control Delay		5.7		9.0	5.3		6.4	6.1	3.2	6.4	5.8	2.5
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		5.7		9.0	5.3		6.4	6.1	3.2	6.4	5.8	2.5
LOS		A		A	A		A	A	A	A	A	A
Approach Delay		5.7			5.7			5.8			5.6	
Approach LOS		A			A			A			A	
Queue Length 50th (m)		0.6		0.1	0.1		0.0	0.0	0.0	0.0	0.0	0.0
Queue Length 95th (m)		4.7		1.1	3.0		8.0	64.6	5.5	13.2	52.6	3.5
Internal Link Dist (m)		199.6			315.6			205.7			39.4	
Turn Bay Length (m)							57.0			56.5		57.5
Base Capacity (vph)		935		756	818		842	1525	1232	784	1511	1303
Starvation Cap Reductn		0		0	0		0	0	0	0	0	0
Spillback Cap Reductn		0		0	0		0	0	0	0	0	0
Storage Cap Reductn		0		0	0		0	0	0	0	0	0
Reduced v/c Ratio		0.04		0.00	0.02		0.04	0.27	0.04	0.09	0.23	0.03

Intersection Summary

Cycle Length: 62
Actuated Cycle Length: 44.6
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.27

Scenario 1 8415 Campeau Drive 12:00 am 08/31/2021 2030 Future Background

Synchro 11 Report

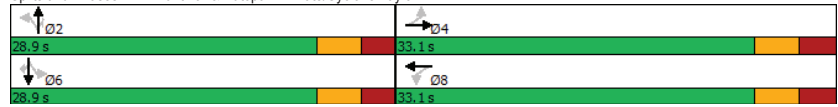
Page 4

Lanes, Volumes, Timings
4: Huntmar & Autopark Private/Cyclone Taylor

2030 Future Background
AM Peak Hour

Intersection Signal Delay: 5.7 Intersection LOS: A
Intersection Capacity Utilization 66.1% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 4: Huntmar & Autopark Private/Cyclone Taylor



Lanes, Volumes, Timings
5: Huntmar & Palladium

2030 Future Background
AM Peak Hour

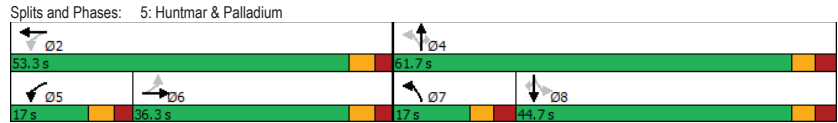
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↕	↔	↔
Traffic Volume (vph)	38	299	249	50	297	49	481	417	166	101	218	57
Future Volume (vph)	38	299	249	50	297	49	481	417	166	101	218	57
Satd. Flow (prot)	1658	3058	0	1523	3240	0	1658	1745	1483	1658	1712	1483
Fit Permitted	0.544			0.313			0.355			0.518		
Satd. Flow (perm)	948	3058	0	502	3240	0	620	1745	1483	904	1712	1483
Satd. Flow (RTOR)		179			20			166				152
Lane Group Flow (vph)	38	548	0	50	346	0	481	417	166	101	218	57
Turn Type	Perm	NA	pm+pt	NA	pm+pt	NA	Perm	Perm	Perm	NA	Perm	Perm
Protected Phases		6		5	2		7	4			8	
Permitted Phases	6			2			4		4	8		8
Detector Phase	6	6		5	2		7	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.3	36.3		11.3	36.3		11.4	37.4	37.4	37.4	37.4	37.4
Total Split (s)	36.3	36.3		17.0	53.3		17.0	61.7	61.7	44.7	44.7	44.7
Total Split (%)	31.6%	31.6%		14.8%	46.3%		14.8%	53.7%	53.7%	38.9%	38.9%	38.9%
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6		2.6	2.6		3.1	3.1	3.1	3.1	3.1	3.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3		6.3	6.3		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag	Lag	Lag		Lead			Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	Yes
Recall Mode	Max	Max		None	None		None	None	None	None	None	None
Act Effct Green (s)	30.6	30.6		39.1	39.1		33.8	33.8	33.8	16.5	16.5	16.5
Actuated g/C Ratio	0.36	0.36		0.46	0.46		0.39	0.39	0.39	0.19	0.19	0.19
v/c Ratio	0.11	0.45		0.15	0.23		1.28	0.61	0.24	0.58	0.66	0.14
Control Delay	24.6	17.2		15.0	14.1		171.4	26.3	4.2	47.6	43.7	0.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.6	17.2		15.0	14.1		171.4	26.3	4.2	47.6	43.7	0.7
LOS	C	B		B	B		F	C	A	D	D	A
Approach Delay		17.7			14.2			88.4			38.2	
Approach LOS		B			B			F			D	
Queue Length 50th (m)	4.6	25.9		4.4	16.2		~104.8	59.2	0.0	16.4	36.0	0.0
Queue Length 95th (m)	13.4	46.8		11.7	28.2		#181.9	92.2	11.8	33.5	60.2	0.0
Internal Link Dist (m)		170.0			174.7			260.9			205.7	
Turn Bay Length (m)										51.5		
Base Capacity (vph)	337	1205		358	1818		375	1146	1031	411	778	757
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.45		0.14	0.19		1.28	0.36	0.16	0.25	0.28	0.08

Intersection Summary
Cycle Length: 115
Actuated Cycle Length: 85.9
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.28

Lanes, Volumes, Timings
5: Huntmar & Palladium

2030 Future Background
AM Peak Hour

Intersection Signal Delay: 51.4 Intersection LOS: D
 Intersection Capacity Utilization 82.7% ICU Level of Service E
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.



HCM 2010 TWSC
6: Access#1 & Country Glen

2030 Future Background
AM Peak Hour

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

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

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

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

Intersection						
Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↑
Traffic Vol, veh/h	59	0	0	70	0	0
Future Vol, veh/h	59	0	0	70	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	59	0	0	70	0	0
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	-	-	-	30
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	1038
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	1038
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0	0			
HCM LOS			A			
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT		
Capacity (veh/h)	-	-	-	-		
HCM Lane V/C Ratio	-	-	-	-		
HCM Control Delay (s)	0	-	-	-		
HCM Lane LOS	A	-	-	-		
HCM 95th %tile Q(veh)	-	-	-	-		

MOVEMENT SUMMARY

Site: 101 [Country Glen-Campeau PM FB30 (Site Folder: General)]

Arcadia Stage 6
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh.]	[Dist.]				
South: Country Glen														
1	L2	7	2.0	7	2.0	0.008	8.1	LOS A	0.0	0.1	0.24	0.58	0.24	50.1
2	T1	1	2.0	1	2.0	0.007	2.4	LOS A	0.0	0.1	0.26	0.36	0.26	49.9
3	R2	5	20.0	5	20.0	0.007	3.0	LOS A	0.0	0.1	0.26	0.36	0.26	51.4
Approach		13	8.9	13	8.9	0.008	5.7	LOS A	0.0	0.1	0.25	0.48	0.25	50.6
East: Campeau														
4	L2	4	2.0	4	2.0	0.052	9.8	LOS A	0.1	1.0	0.22	0.41	0.22	54.4
5	T1	78	2.0	78	2.0	0.052	3.8	LOS A	0.1	1.0	0.21	0.41	0.21	57.5
6	R2	20	2.0	20	2.0	0.052	4.0	LOS A	0.1	0.9	0.20	0.41	0.20	51.8
Approach		102	2.0	102	2.0	0.052	4.1	LOS A	0.1	1.0	0.21	0.41	0.21	56.2
North: Country Glen														
7	L2	11	2.0	11	2.0	0.093	7.7	LOS A	0.2	1.7	0.15	0.36	0.15	54.3
8	T1	1	2.0	1	2.0	0.093	1.6	LOS A	0.2	1.7	0.15	0.36	0.15	50.1
9	R2	85	2.0	85	2.0	0.093	2.3	LOS A	0.2	1.7	0.15	0.36	0.15	52.0
Approach		97	2.0	97	2.0	0.093	2.9	LOS A	0.2	1.7	0.15	0.36	0.15	52.2
West: Campeau														
10	L2	162	2.0	162	2.0	0.150	9.4	LOS A	0.6	4.1	0.08	0.62	0.08	51.3
11	T1	76	2.0	76	2.0	0.076	3.0	LOS A	0.3	1.9	0.07	0.30	0.07	59.0
12	R2	6	2.0	6	2.0	0.076	3.3	LOS A	0.3	1.9	0.07	0.30	0.07	52.8
Approach		244	2.0	244	2.0	0.150	7.3	LOS A	0.6	4.1	0.08	0.51	0.08	53.5
All Vehicles		456	2.2	456	2.2	0.150	5.6	LOS A	0.6	4.1	0.13	0.45	0.13	53.7

Site Level of Service (LOS) Method: Delay (SIDRA). 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 per movement.
 Intersection and Approach LOS values are based on average delay for all vehicle movements.
 Roundabout Capacity Model: US HCM 2010.
 Delay Model: SIDRA Standard (Geometric Delay is included).
 Queue Model: SIDRA Standard.
 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 FB30 (Site Folder: General)]

Arcadia Stage 6
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh.]	[Dist m]				
South: Huntmar														
1	L2	95	2.0	95	2.0	0.109	8.5	LOS A	0.3	2.1	0.32	0.65	0.32	50.0
2	T1	404	2.0	404	2.0	0.457	3.1	LOS A	1.7	12.4	0.42	0.37	0.44	49.3
3	R2	116	2.0	116	2.0	0.133	3.5	LOS A	0.4	2.7	0.32	0.48	0.32	51.3
Approach		615	2.0	615	2.0	0.457	4.0	LOS A	1.7	12.4	0.39	0.44	0.40	49.8
East: Campeau														
4	L2	116	2.0	116	2.0	0.169	11.6	LOS B	0.5	3.2	0.45	0.80	0.45	50.1
5	T1	47	2.0	47	2.0	0.071	5.6	LOS A	0.2	1.3	0.45	0.55	0.45	56.5
6	R2	7	2.0	7	2.0	0.011	5.8	LOS A	0.0	0.2	0.43	0.59	0.43	50.9
Approach		170	2.0	170	2.0	0.169	9.7	LOS A	0.5	3.2	0.45	0.73	0.45	51.7
North: Huntmar														
7	L2	8	2.0	8	2.0	0.251	8.4	LOS A	0.8	5.6	0.33	0.32	0.33	53.5
8	T1	451	2.0	451	2.0	0.251	2.6	LOS A	0.8	5.6	0.32	0.31	0.32	49.8
9	R2	154	2.0	154	2.0	0.170	3.4	LOS A	0.5	3.5	0.30	0.46	0.30	51.3
Approach		613	2.0	613	2.0	0.251	2.8	LOS A	0.8	5.6	0.31	0.35	0.31	50.2
West: Campeau														
10	L2	187	2.0	187	2.0	0.253	11.3	LOS B	0.7	5.2	0.45	0.79	0.45	50.2
11	T1	120	2.0	120	2.0	0.167	5.3	LOS A	0.5	3.4	0.44	0.53	0.44	56.5
12	R2	90	2.0	90	2.0	0.121	5.2	LOS A	0.3	2.2	0.40	0.63	0.40	51.3
Approach		397	2.0	397	2.0	0.253	8.1	LOS A	0.7	5.2	0.43	0.67	0.43	52.2
All Vehicles		1795	2.0	1795	2.0	0.457	5.1	LOS A	1.7	12.4	0.38	0.49	0.38	50.6

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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Winterset-Campeau PM FB30 (Site Folder: General)]

Arcadia Stage 6
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh.]	[Dist m]				
East: Campeau														
5	T1	85	2.0	85	2.0	0.054	3.4	LOS A	0.1	1.0	0.08	0.34	0.08	58.5
6	R2	32	2.0	32	2.0	0.054	3.7	LOS A	0.1	0.9	0.08	0.38	0.08	52.3
Approach		117	2.0	117	2.0	0.054	3.5	LOS A	0.1	1.0	0.08	0.35	0.08	56.6
North: Winterset														
7	L2	18	0.0	18	0.0	0.034	7.7	LOS A	0.1	0.6	0.13	0.47	0.13	52.7
9	R2	18	2.0	18	2.0	0.034	2.2	LOS A	0.1	0.6	0.13	0.47	0.13	50.5
Approach		36	1.0	36	1.0	0.034	5.0	LOS A	0.1	0.6	0.13	0.47	0.13	51.6
West: Campeau														
10	L2	33	2.0	33	2.0	0.042	9.4	LOS A	0.1	1.0	0.08	0.56	0.08	52.5
11	T1	58	2.0	58	2.0	0.042	2.7	LOS A	0.1	1.0	0.08	0.34	0.08	58.5
Approach		91	2.0	91	2.0	0.042	5.1	LOS A	0.1	1.0	0.08	0.42	0.08	56.1
All Vehicles		244	1.9	244	1.9	0.054	4.3	LOS A	0.1	1.0	0.09	0.40	0.09	55.6

Site Level of Service (LOS) Method: Delay (SIDRA). 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 per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 2010.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Lanes, Volumes, Timings
 4: Huntmar & Autopark Private/Cyclone Taylor 2030 Future Background
 PM Peak Hour

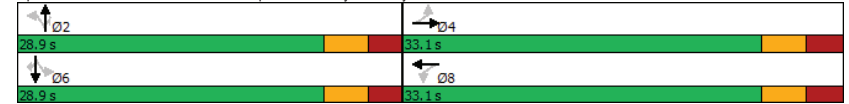
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	29	4	71	67	1	73	16	514	12	8	541	15
Future Volume (vph)	29	4	71	67	1	73	16	514	12	8	541	15
Satd. Flow (prot)	0	1537	0	1595	1445	0	1658	1745	1081	1127	1745	1483
Fit Permitted		0.884		0.690			0.396			0.418		
Satd. Flow (perm)	0	1378	0	1157	1445	0	691	1745	1081	496	1745	1452
Satd. Flow (RTOR)		71		73					56			56
Lane Group Flow (vph)	0	104	0	67	74	0	16	514	12	8	541	15
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	Perm	NA	Perm	Perm
Protected Phases		4		8			2	2	2	6	6	6
Permitted Phases	4	4	8	8	2	2	2	2	6	6	6	6
Detector Phase	4	4	8	8	2	2	2	2	6	6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
Minimum Split (s)	33.1	33.1	33.1	33.1	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9
Total Split (s)	33.1	33.1	33.1	33.1	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9
Total Split (%)	53.4%	53.4%	53.4%	53.4%	46.6%	46.6%	46.6%	46.6%	46.6%	46.6%	46.6%	46.6%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.9	2.9	2.9	2.9	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
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)	6.2	6.2	6.2	6.2	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	Min	Min	Min	Min	Min	Min	Min	Min
Act Effct Green (s)	12.8	12.8	12.8	12.8	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0
Actuated g/C Ratio	0.27	0.27	0.27	0.27	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58
v/c Ratio	0.25	0.22	0.17	0.17	0.04	0.51	0.02	0.03	0.53	0.02	0.53	0.02
Control Delay	7.5	14.9	4.8	4.8	9.8	13.6	0.1	10.0	14.3	0.1	14.3	0.1
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	7.5	14.9	4.8	4.8	9.8	13.6	0.1	10.0	14.3	0.1	14.3	0.1
LOS	A	B	A	A	A	B	A	A	B	A	B	A
Approach Delay	7.5		9.6		13.2				13.9			
Approach LOS	A		A		B				B			
Queue Length 50th (m)	2.1	4.4	0.1	0.1	0.6	24.8	0.0	0.3	26.7	0.0	26.7	0.0
Queue Length 95th (m)	9.4	10.9	6.0	6.0	4.5	#96.7	0.0	3.0	#104.5	0.2	#104.5	0.2
Internal Link Dist (m)	199.6		315.6			205.7			39.4			
Turn Bay Length (m)					57.0			56.5			57.5	
Base Capacity (vph)	812	656	851	851	401	1012	650	287	1012	865	865	865
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	0.13	0.10	0.09	0.09	0.04	0.51	0.02	0.03	0.53	0.02	0.53	0.02

Intersection Summary												
Cycle Length: 62												
Actuated Cycle Length: 48.2												
Natural Cycle: 65												
Control Type: Actuated-Uncoordinated												
Maximum v/c Ratio: 0.53												

Lanes, Volumes, Timings
 4: Huntmar & Autopark Private/Cyclone Taylor 2030 Future Background
 PM Peak Hour

Intersection Signal Delay: 12.7	Intersection LOS: B
Intersection Capacity Utilization 63.0%	ICU Level of Service B
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 4: Huntmar & Autopark Private/Cyclone Taylor



Lanes, Volumes, Timings
5: Huntmar & Palladium

2030 Future Background
PM Peak Hour

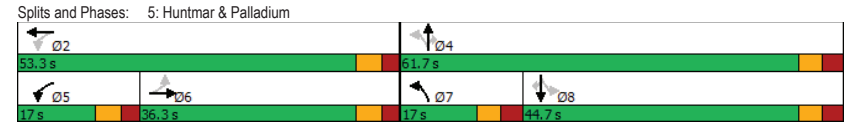
	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕	↘	↖	↕	↘	↖	↕	↘	↖	↕	↘
Traffic Volume (vph)	47	431	617	183	603	154	346	339	86	115	446	118
Future Volume (vph)	47	431	617	183	603	154	346	339	86	115	446	118
Satd. Flow (prot)	1496	3024	0	1658	3204	0	1658	1745	1483	1658	1745	1483
Fit Permitted	0.364			0.110			0.171			0.557		
Satd. Flow (perm)	573	3024	0	192	3204	0	298	1745	1464	971	1745	1464
Satd. Flow (RTOR)		304			33				91			152
Lane Group Flow (vph)	47	1048	0	183	757	0	346	339	86	115	446	118
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		6		5	2		7	4			8	
Permitted Phases	6			2			4		4	8		8
Detector Phase	6	6		5	2		7	4	4	8		8
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		5.0	10.0	10.0	10.0		10.0
Minimum Split (s)	36.3	36.3		11.3	36.3		11.4	37.4	37.4	37.4		37.4
Total Split (s)	36.3	36.3		17.0	53.3		17.0	61.7	61.7	44.7		44.7
Total Split (%)	31.6%	31.6%		14.8%	46.3%		14.8%	53.7%	53.7%	38.9%		38.9%
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3	3.3	3.3		3.3
All-Red Time (s)	2.6	2.6		2.6	2.6		3.1	3.1	3.1	3.1		3.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	6.3	6.3		6.3	6.3		6.4	6.4	6.4	6.4		6.4
Lead/Lag	Lag	Lag		Lead			Lead		Lag	Lag		Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes		Yes	Yes		Yes
Recall Mode	Max	Max		None	None		None	None	None	None		None
Act Effct Green (s)	30.1	30.1		47.2	47.2		48.9	48.9	48.9	31.8		31.8
Actuated g/C Ratio	0.28	0.28		0.43	0.43		0.45	0.45	0.45	0.29		0.29
v/c Ratio	0.30	0.99		0.81	0.54		1.30	0.43	0.12	0.40		0.87
Control Delay	39.6	54.9		50.9	24.3		183.0	22.2	3.5	35.1		55.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0		0.0
Total Delay	39.6	54.9		50.9	24.3		183.0	22.2	3.5	35.1		55.1
LOS	D	D		D	C		F	C	A	D		E
Approach Delay		54.2			29.5			92.3				42.7
Approach LOS		D			C			F				D
Queue Length 50th (m)	8.1	~92.7		25.1	60.5		~70.9	47.7	0.0	19.5		89.5
Queue Length 95th (m)	20.0	#145.9		#65.3	84.0		#128.6	70.2	7.5	36.0		128.4
Internal Link Dist (m)		170.0			174.7			260.9				205.7
Turn Bay Length (m)										51.5		
Base Capacity (vph)	158	1056		227	1407		266	889	791	342		616
Starvation Cap Reductn	0	0		0	0		0	0	0	0		0
Spillback Cap Reductn	0	0		0	0		0	0	0	0		0
Storage Cap Reductn	0	0		0	0		0	0	0	0		0
Reduced v/c Ratio	0.30	0.99		0.81	0.54		1.30	0.38	0.11	0.34		0.72

Intersection Summary	
Cycle Length:	115
Actuated Cycle Length:	108.8
Natural Cycle:	110
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	1.30

Lanes, Volumes, Timings
5: Huntmar & Palladium

2030 Future Background
PM Peak Hour

Intersection Signal Delay: 53.7	Intersection LOS: D
Intersection Capacity Utilization 110.5%	ICU Level of Service H
Analysis Period (min) 15	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	



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

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

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

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

Intersection						
Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔		↔
Traffic Vol, veh/h	92	0	0	102	0	0
Future Vol, veh/h	92	0	0	102	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	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	92	0	0	102	0	0

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	46
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	6.94
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	3.32
Pot Cap-1 Maneuver	-	0	1014
Stage 1	-	0	0
Stage 2	-	0	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1014
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

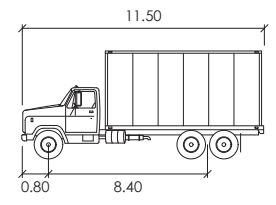
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	0	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	-	-	-	-

Appendix I

Turning Templates



Notes:



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

01	Issued for Review	AN	2022-07-15
REV:	DESCRIPTION:	BY:	DATE:
STATUS:			



CGH Transportation
628 Haines Road
Newmarket, ON
L3Y 6V5
(905) 251-4070

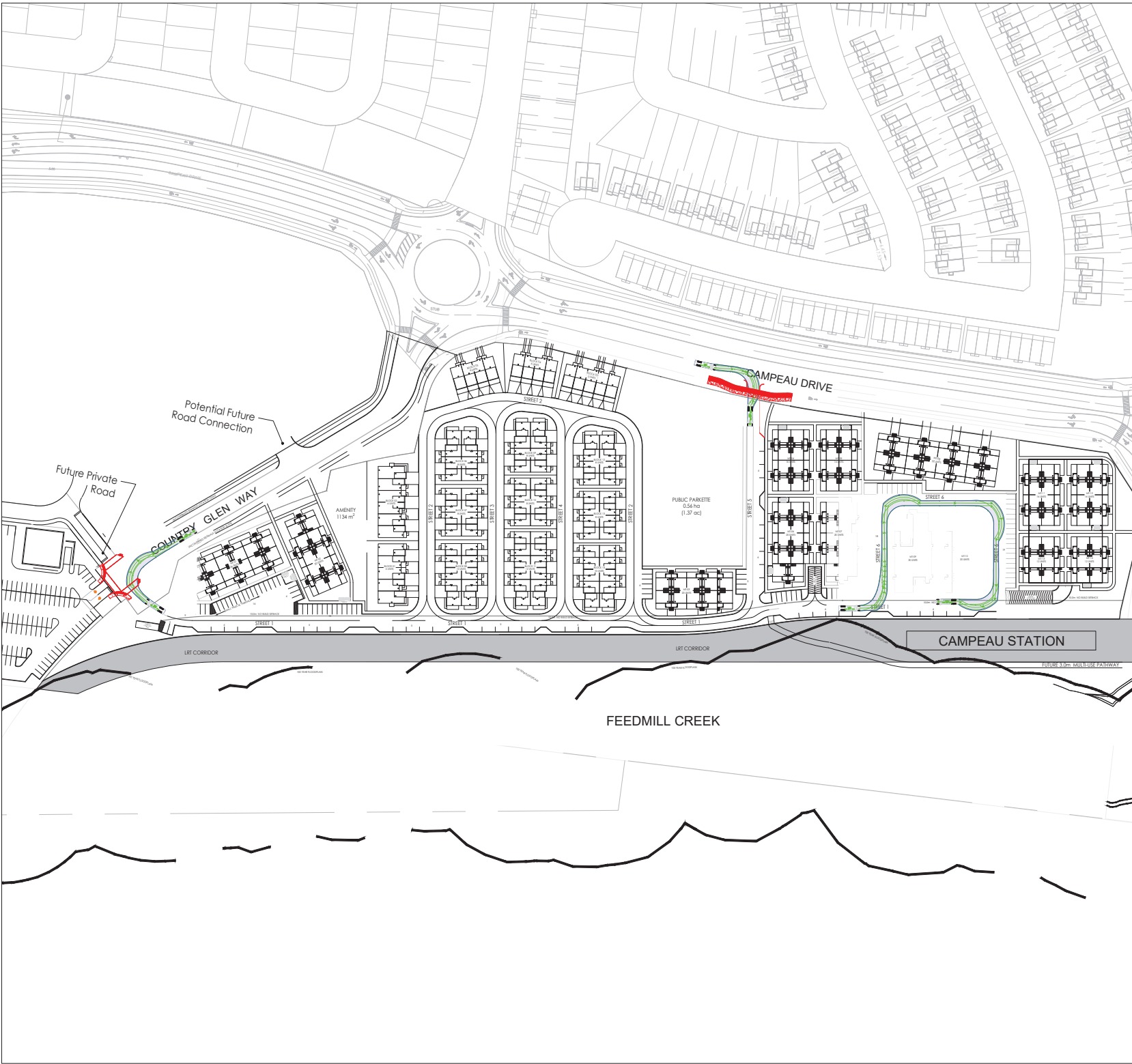
CLIENT: Minto Communities
200-180 Kent St
Ottawa, ON
K1P 0B6

ARCHITECT:

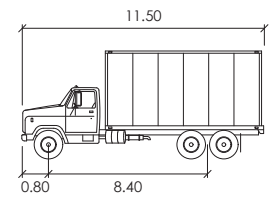
SITE: Arcadia 6

TITLE: Turning Movement Analysis
HSU Turning Movements (1)

SCALE AT A3: NTS	DATE: 2022-07-15	DRAWN: AN	CHECKED: MC
PROJECT NO: 2021-048	DRAWING NO: 001	REVISION: 01	



Notes:



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

01	Issued for Review	AN	2022-07-15
REV:	DESCRIPTION:	BY:	DATE:
STATUS:			



CGH Transportation
 628 Haines Road
 Newmarket, ON
 L3Y 6V5
 (905) 251-4070

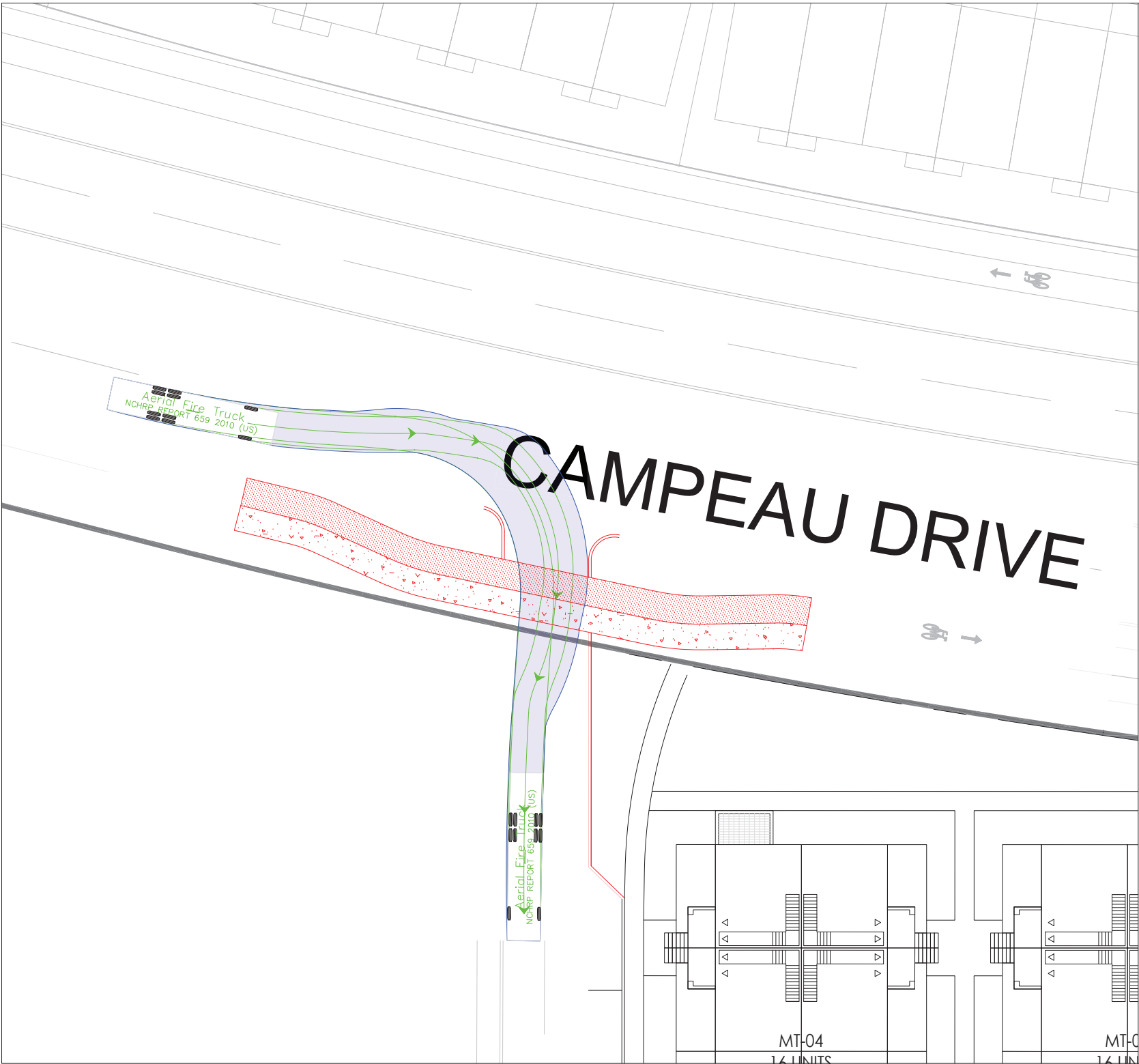
CLIENT: **Minto Communities**
 200-180 Kent St
 Ottawa, ON
 K1P 0B6

ARCHITECT:

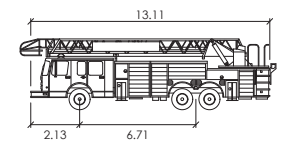
SITE: **Arcadia 6**

TITLE: **Turning Movement Analysis
 HSU Turning Movements (1)**

SCALE AT A3: NTS	DATE: 2022-07-15	DRAWN: AN	CHECKED: MC
PROJECT NO: 2021-048	DRAWING NO: 001	REVISION: 01	



Notes:



Aerial Fire Truck

	meters
Width	: 2.59
Track	: 2.59
Lock to Lock Time	: 6.0
Steering Angle	: 33.3

CAMPEAU DRIVE

Aerial Fire Truck
NCHRP REPORT 659 2010 (US)

Aerial Fire Truck
NCHRP REPORT 659 2010 (US)

01	Issued for Review	AN	2022-07-15
REV:	DESCRIPTION:	BY:	DATE:
STATUS:			



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628 Haines Road
Newmarket, ON
L3Y 6V5
(905) 251-4070

CLIENT: **Minto Communities**
200-180 Kent St
Ottawa, ON
K1P 0B6

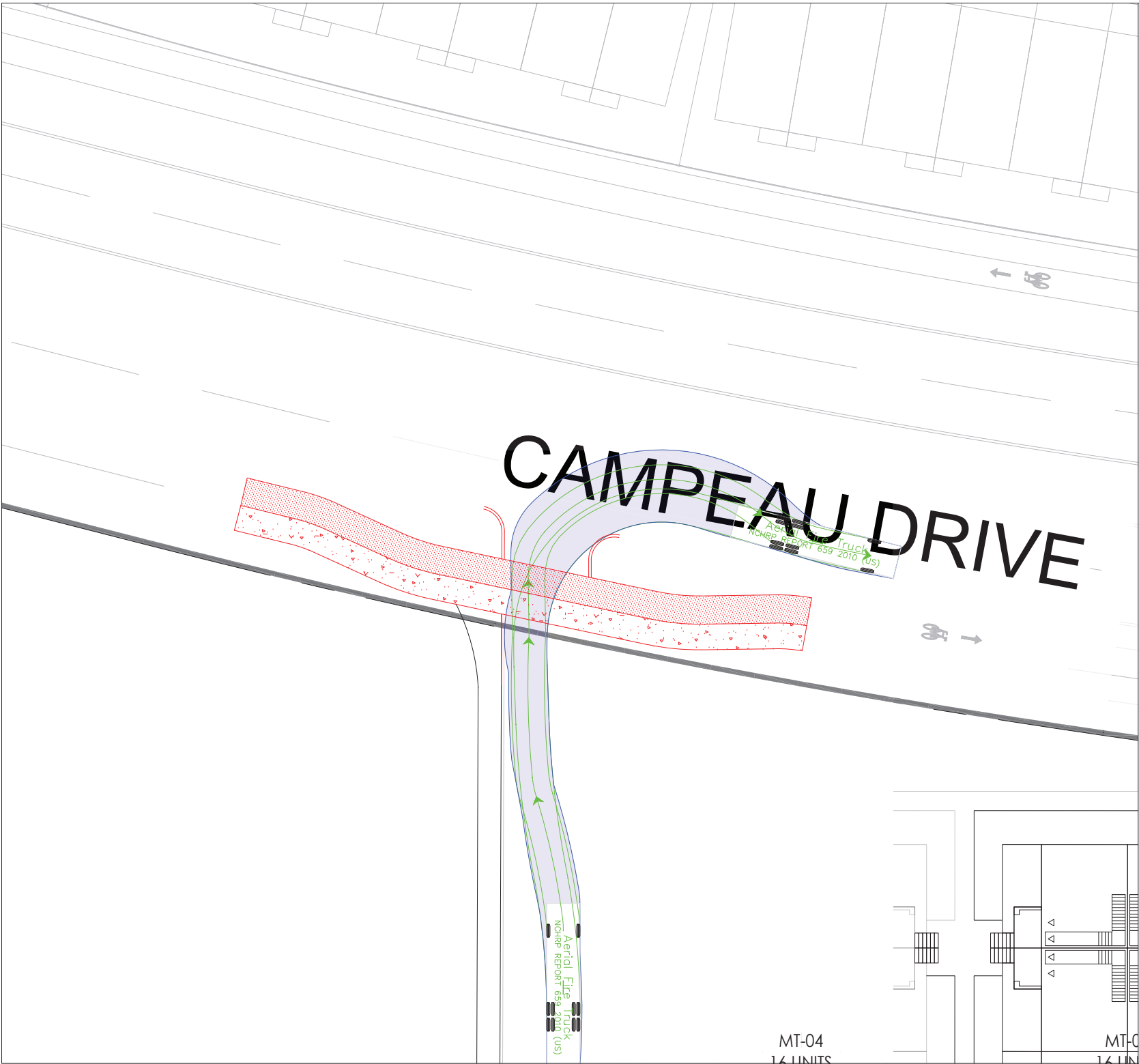
SITE: **Arcadia 6**

TITLE: **Turning Movement Analysis
Fire Truck Movements (1)**

SCALE AT A3: NTS	DATE: 2022-07-15	DRAWN: AN	CHECKED: MC
PROJECT NO: 2021-048	DRAWING NO: 003	REVISION: 01	

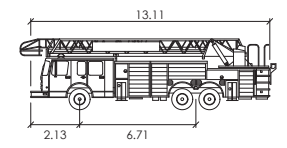
MT-04
1:4 UNITS

MT-04
1:4 UNITS



CAMPEAU DRIVE

Notes:



Aerial Fire Truck

Width	: 2.59
Track	: 2.59
Lock to Lock Time	: 6.0
Steering Angle	: 33.3

01	Issued for Review	AN	2022-07-15
REV:	DESCRIPTION:	BY:	DATE:
STATUS:			



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 L3Y 6V5
 (905) 251-4070

CLIENT: **Minto Communities**
 200-180 Kent St
 Ottawa, ON
 K1P 0B6

ARCHITECT:

SITE: **Arcadia 6**

TITLE: **Turning Movement Analysis
 Fire Truck Movements (2)**

SCALE AT A3: NTS	DATE: 2022-07-15	DRAWN: AN	CHECKED: MC
PROJECT NO: 2021-048	DRAWING NO: 004	REVISION: 01	



MT-04
1:4 UNITS

MT-04
1:4 UNITS



Notes:

LEGEND

-  CONCRETE SIDEWALK
-  TWSI

01	Issued for Review	AN	2022-07-15
REV:	DESCRIPTION:	BY:	DATE:
STATUS:			

 **CGH Transportation**
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 Newmarket, ON
 L3Y 6V5
 (905) 251-4070

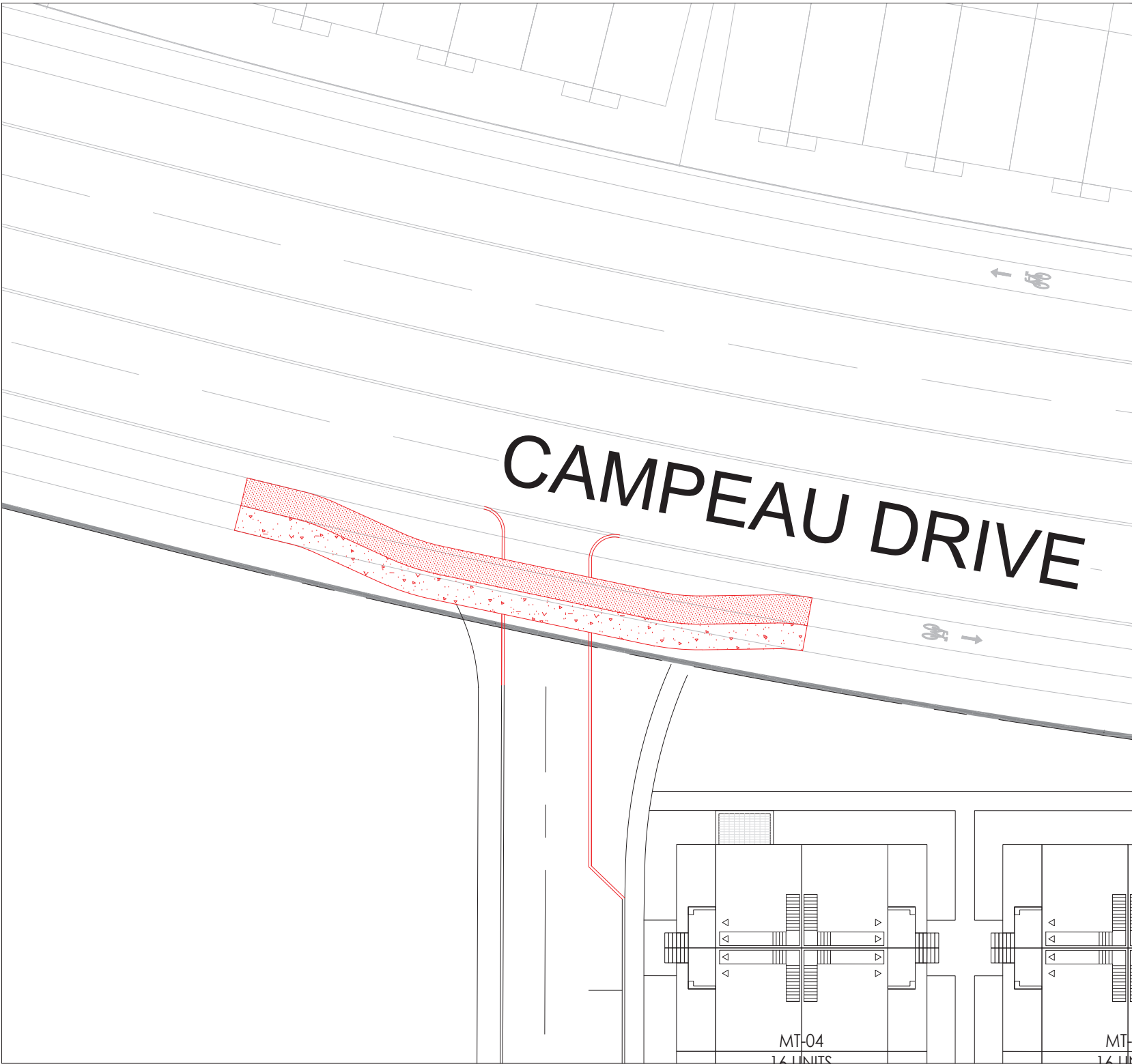
CLIENT: **Minto Communities**
 200-180 Kent St
 Ottawa, ON
 K1P 0B6

ARCHITECT:

SITE: **Arcadia 6**



TITLE: **Access 1 Geometry**

SCALE: AT A3:	DATE:	DRAWN:	CHECKED:
NTS	2022-07-15	AN	MC
PROJECT NO:	DRAWING NO:	REVISION:	
2021-048	005	01	



Notes:

LEGEND

-  CONCRETE SIDEWALK
-  ASPHALT CYCLE TRACK

01	Issued for Review	AN	2022-07-15
REV:	DESCRIPTION:	BY:	DATE:
STATUS:			



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 Newmarket, ON
 L3Y 6V5
 (905) 251-4070

CLIENT: **Minto Communities**
 200-180 Kent St
 Ottawa, ON
 K1P 0B6

ARCHITECT:

SITE: **Arcadia 6**

TITLE: **Access 2 Geometry**

SCALE: AT A3:	DATE:	DRAWN:	CHECKED:
NTS	2022-07-15	AN	MC
PROJECT NO:	DRAWING NO:	REVISION:	
2021-048	006	01	

MT-04
1:4 UNITS

MT-04
1:4 UNITS

Appendix J

MMLOS Analysis

Multi-Modal Level of Service - Intersections Form

Consultant
Scenario
Comments

CGH Transportation Inc.
Existing/Future

Project
Date

8415 Campeau Drive
7/14/2022

INTERSECTIONS		Huntmar Dr at Autopark Priv/Cyclone Taylor Blvd				Huntmar Dr at Palladium Dr				
Crossing Side		NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	
Pedestrian	Lanes		7	6	6	6	7	8	7	
	Median		No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	
	Conflicting Left Turns		Permissive	Permissive	Permissive	Permissive	Protected/ 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	Permissive or yield control	
	Right Turns on Red (RTOR) ?		RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	
	Ped Signal Leading Interval?		No	No	No	No	No	No	No	
	Right Turn Channel		No Channel	Conventional with Receiving Lane	No Channel	No Channel	No Channel	No Channel	Conv'tl without Receiving Lane	
	Corner Radius		15-25m	>25m	15-25m	15-25m	15-25m	15-25m	>25m	
	Crosswalk Type		Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	
	PETSI Score			2	18	18	18	2	-14	5
	Ped. Exposure to Traffic LoS		-	F	F	F	F	F	F	F
	Cycle Length			62	62	62	115	115	115	115
Effective Walk Time			7	7	7	7	7	15	15	
Average Pedestrian Delay			24	24	24	51	51	43	43	
Pedestrian Delay LoS		-	C	C	C	E	E	E	E	
Level of Service		-	F	F	F	F	F	F	F	
Approach From		NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	
Bicycle	Bicycle Lane Arrangement on Approach	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	
	Right Turn Lane Configuration		> 50 m			> 50 m	≤ 50 m			
	Right Turning Speed		>25 km/h			>25 km/h	>25 km/h			
	Cyclist relative to RT motorists	-	F	-	-	F	E	-	-	
	Separated or Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	
	Left Turn Approach	≥ 2 lanes crossed	≥ 2 lanes crossed	One lane crossed	No lane crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	
	Operating Speed	≥ 60 km/h	≥ 60 km/h	> 50 to < 60 km/h	≤ 40 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	≥ 60 km/h	≥ 60 km/h	
Left Turning Cyclist	F	F	E	B	F	F	F	F		
Level of Service	-	F	-	-	F	F	-	-		
Level of Service		F				F				
Transit	Average Signal Delay									
	Level of Service	-	-	-	-	-	-	-	-	
Truck	Effective Corner Radius									
	Number of Receiving Lanes on Departure from Intersection									
Auto	Volume to Capacity Ratio		0.0 - 0.60				0.71 - 0.80			
	Level of Service		A				C			

Appendix K

Synchro and Sidra Worksheets – 2025 Future Total

MOVEMENT SUMMARY

Site: 101 [Country Glen-Campeau AM FT25 (Site Folder: General)]

Arcadia Stage 6
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh.]	[Dist.]				
South: Country Glen														
1	L2	40	2.0	40	2.0	0.039	7.8	LOS A	0.1	0.7	0.16	0.58	0.16	50.4
2	T1	1	2.0	1	2.0	0.005	2.1	LOS A	0.0	0.1	0.17	0.31	0.17	50.3
3	R2	4	2.0	4	2.0	0.005	2.5	LOS A	0.0	0.1	0.17	0.31	0.17	52.1
Approach		45	2.0	45	2.0	0.039	7.2	LOS A	0.1	0.7	0.16	0.55	0.16	50.5
East: Campeau														
4	L2	7	2.0	7	2.0	0.035	9.6	LOS A	0.1	0.6	0.15	0.42	0.15	54.3
5	T1	61	2.0	61	2.0	0.035	3.6	LOS A	0.1	0.6	0.14	0.39	0.14	57.7
6	R2	5	2.0	5	2.0	0.035	3.8	LOS A	0.1	0.6	0.14	0.36	0.14	52.1
Approach		73	2.0	73	2.0	0.035	4.2	LOS A	0.1	0.6	0.14	0.39	0.14	56.9
North: Country Glen														
7	L2	19	2.0	19	2.0	0.153	7.8	LOS A	0.4	3.0	0.17	0.38	0.17	54.1
8	T1	1	2.0	1	2.0	0.153	1.7	LOS A	0.4	3.0	0.17	0.38	0.17	50.0
9	R2	138	2.0	138	2.0	0.153	2.3	LOS A	0.4	3.0	0.17	0.38	0.17	51.9
Approach		158	2.0	158	2.0	0.153	3.0	LOS A	0.4	3.0	0.17	0.38	0.17	52.1
West: Campeau														
10	L2	50	2.0	50	2.0	0.055	9.4	LOS A	0.2	1.4	0.10	0.59	0.10	51.9
11	T1	49	2.0	49	2.0	0.055	3.1	LOS A	0.2	1.4	0.10	0.38	0.10	58.0
12	R2	20	2.0	20	2.0	0.055	3.4	LOS A	0.2	1.4	0.10	0.33	0.10	52.6
Approach		119	2.0	119	2.0	0.055	5.8	LOS A	0.2	1.4	0.10	0.46	0.10	54.4
All Vehicles		395	2.0	395	2.0	0.153	4.5	LOS A	0.4	3.0	0.14	0.42	0.14	53.4

Site Level of Service (LOS) Method: Delay (SIDRA). 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 per movement.
 Intersection and Approach LOS values are based on average delay for all vehicle movements.
 Roundabout Capacity Model: US HCM 2010.
 Delay Model: SIDRA Standard (Geometric Delay is included).
 Queue Model: SIDRA Standard.
 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 AM FT25 (Site Folder: General)]

Arcadia Stage 6
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh.]	[Dist.]				
South: Huntmar														
1	L2	37	2.0	37	2.0	0.038	7.9	LOS A	0.1	0.7	0.20	0.58	0.20	50.4
2	T1	357	2.0	357	2.0	0.359	2.2	LOS A	1.2	8.8	0.27	0.26	0.27	50.0
3	R2	46	2.0	46	2.0	0.047	2.9	LOS A	0.1	0.9	0.20	0.38	0.20	51.7
Approach		440	2.0	440	2.0	0.359	2.8	LOS A	1.2	8.8	0.25	0.30	0.25	50.2
East: Campeau														
4	L2	129	2.0	129	2.0	0.162	10.8	LOS B	0.4	3.1	0.38	0.75	0.38	50.4
5	T1	84	2.0	84	2.0	0.108	4.8	LOS A	0.3	2.1	0.39	0.48	0.39	56.9
6	R2	27	2.0	27	2.0	0.035	5.1	LOS A	0.1	0.6	0.37	0.57	0.37	51.1
Approach		240	2.0	240	2.0	0.162	8.1	LOS A	0.4	3.1	0.38	0.63	0.38	52.5
North: Huntmar														
7	L2	7	2.0	7	2.0	0.179	8.3	LOS A	0.5	3.8	0.30	0.31	0.30	53.6
8	T1	324	2.0	324	2.0	0.179	2.5	LOS A	0.5	3.8	0.29	0.30	0.29	49.9
9	R2	125	2.0	125	2.0	0.136	3.3	LOS A	0.4	2.7	0.29	0.45	0.29	51.4
Approach		456	2.0	456	2.0	0.179	2.8	LOS A	0.5	3.8	0.29	0.34	0.29	50.3
West: Campeau														
10	L2	80	2.0	80	2.0	0.100	10.7	LOS B	0.3	1.8	0.36	0.73	0.36	50.4
11	T1	66	2.0	66	2.0	0.084	4.7	LOS A	0.2	1.6	0.37	0.47	0.37	56.9
12	R2	42	2.0	42	2.0	0.052	4.7	LOS A	0.1	0.9	0.34	0.56	0.34	51.5
Approach		188	2.0	188	2.0	0.100	7.3	LOS A	0.3	1.8	0.36	0.60	0.36	52.8
All Vehicles		1324	2.0	1324	2.0	0.359	4.4	LOS A	1.2	8.8	0.30	0.42	0.30	51.0

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.
 Delay Model: SIDRA Standard (Geometric Delay is included).
 Queue Model: SIDRA Standard.
 Gap-Acceptance Capacity: Traditional M1.
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Winterset-Campeau AM FT25 (Site Folder: General)]

Arcadia Stage 6
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh.]	[Dist.]				
East: Campeau														
5	T1	42	2.0	42	2.0	0.023	3.4	LOS A	0.1	0.4	0.03	0.34	0.03	58.7
6	R2	9	2.0	9	2.0	0.023	3.6	LOS A	0.1	0.4	0.03	0.36	0.03	52.5
Approach		51	2.0	51	2.0	0.023	3.4	LOS A	0.1	0.4	0.03	0.34	0.03	57.6
North: Winterset														
7	L2	31	2.0	31	2.0	0.057	7.6	LOS A	0.1	1.0	0.09	0.46	0.09	52.8
9	R2	31	2.0	31	2.0	0.057	2.1	LOS A	0.1	1.0	0.09	0.46	0.09	50.7
Approach		62	2.0	62	2.0	0.057	4.9	LOS A	0.1	1.0	0.09	0.46	0.09	51.7
West: Campeau														
10	L2	8	2.0	8	2.0	0.043	9.4	LOS A	0.1	1.1	0.11	0.36	0.11	55.0
11	T1	85	2.0	85	2.0	0.043	2.7	LOS A	0.1	1.1	0.11	0.32	0.11	58.8
Approach		93	2.0	93	2.0	0.043	3.3	LOS A	0.1	1.1	0.11	0.32	0.11	58.4
All Vehicles		206	2.0	206	2.0	0.057	3.8	LOS A	0.1	1.1	0.08	0.37	0.08	56.0

Site Level of Service (LOS) Method: Delay (SIDRA). 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 per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 2010.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: Not Saved

Lanes, Volumes, Timings

4: Huntmar & Autopark Private/Cyclone Taylor

2025 Future Total
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	5	4	26	2	1	17	37	418	53	68	361	38
Future Volume (vph)	5	4	26	2	1	17	37	418	53	68	361	38
Satd. Flow (prot)	0	1523	0	1127	1273	0	1658	1745	1401	1642	1728	1483
Fit Permitted		0.946					0.546			0.518		
Satd. Flow (perm)	0	1451	0	1186	1273	0	953	1745	1401	895	1728	1483
Satd. Flow (RTOR)		26			17				56			56
Lane Group Flow (vph)	0	35	0	2	18	0	37	418	53	68	361	38
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2		6		6
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		23.0	23.0	23.0	23.0	23.0	23.0
Minimum Split (s)	33.1	33.1		33.1	33.1		28.9	28.9	28.9	28.9	28.9	28.9
Total Split (s)	33.1	33.1		33.1	33.1		28.9	28.9	28.9	28.9	28.9	28.9
Total Split (%)	53.4%	53.4%		53.4%	53.4%		46.6%	46.6%	46.6%	46.6%	46.6%	46.6%
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.9	2.9		2.9	2.9		2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.2		6.2	6.2		5.9	5.9	5.9	5.9	5.9	5.9
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min	Min	Min	Min	Min
Act Effct Green (s)		13.0		13.0	13.0		39.0	39.0	39.0	39.0	39.0	39.0
Actuated g/C Ratio		0.29		0.29	0.29		0.87	0.87	0.87	0.87	0.87	0.87
v/c Ratio		0.08		0.01	0.05		0.04	0.27	0.04	0.09	0.24	0.03
Control Delay		5.7		9.0	5.3		6.4	6.1	3.2	6.4	5.9	2.5
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		5.7		9.0	5.3		6.4	6.1	3.2	6.4	5.9	2.5
LOS		A		A	A		A	A	A	A	A	A
Approach Delay		5.7			5.7			5.8			5.7	
Approach LOS		A			A			A			A	
Queue Length 50th (m)		0.6		0.1	0.1		0.0	0.0	0.0	0.0	0.0	0.0
Queue Length 95th (m)		4.7		1.1	3.0		8.0	64.9	5.5	13.0	54.6	3.5
Internal Link Dist (m)		199.6			315.6			205.7			39.4	
Turn Bay Length (m)							57.0			56.5		57.5
Base Capacity (vph)		935		756	818		833	1525	1232	782	1511	1303
Starvation Cap Reductn		0		0	0		0	0	0	0	0	0
Spillback Cap Reductn		0		0	0		0	0	0	0	0	0
Storage Cap Reductn		0		0	0		0	0	0	0	0	0
Reduced v/c Ratio		0.04		0.00	0.02		0.04	0.27	0.04	0.09	0.24	0.03
Intersection Summary												
Cycle Length: 62												
Actuated Cycle Length: 44.6												
Natural Cycle: 65												
Control Type: Actuated-Uncoordinated												
Maximum v/c Ratio: 0.27												

Scenario 1 8415 Campeau Drive 12:00 am 08/31/2021 2025 Future Total

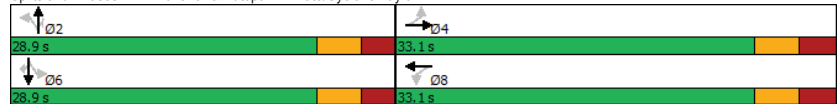
Synchro 11 Report
Page 4

Lanes, Volumes, Timings
4: Huntmar & Autopark Private/Cyclone Taylor

2025 Future Total
AM Peak Hour

Intersection Signal Delay: 5.8	Intersection LOS: A
Intersection Capacity Utilization 66.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 4: Huntmar & Autopark Private/Cyclone Taylor



Lanes, Volumes, Timings
5: Huntmar & Palladium

2025 Future Total
AM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗	↗	↖	↖↗	↗	↖	↖↗	↗	↖	↖↗	↗
Traffic Volume (vph)	38	299	249	50	297	49	481	419	166	99	232	57
Future Volume (vph)	38	299	249	50	297	49	481	419	166	99	232	57
Satd. Flow (prot)	1658	3058	0	1523	3240	0	1658	1745	1483	1658	1712	1483
Fit Permitted	0.544			0.311			0.340			0.517		
Satd. Flow (perm)	948	3058	0	499	3240	0	593	1745	1483	902	1712	1483
Satd. Flow (RTOR)		179			20				166			152
Lane Group Flow (vph)	38	548	0	50	346	0	481	419	166	99	232	57
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		6		5	2		7	4			8	
Permitted Phases	6			2			4		4	8		8
Detector Phase	6	6		5	2		7	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.3	36.3		11.3	36.3		11.4	37.4	37.4	37.4	37.4	37.4
Total Split (s)	36.3	36.3		17.0	53.3		17.0	61.7	61.7	44.7	44.7	44.7
Total Split (%)	31.6%	31.6%		14.8%	46.3%		14.8%	53.7%	53.7%	38.9%	38.9%	38.9%
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6		2.6	2.6		3.1	3.1	3.1	3.1	3.1	3.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3		6.3	6.3		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag	Lag	Lag		Lead			Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	Yes
Recall Mode	Max	Max		None	None		None	None	None	None	None	None
Act Effct Green (s)	30.7	30.7		39.1	39.1		34.6	34.6	34.6	17.2	17.2	17.2
Actuated g/C Ratio	0.35	0.35		0.45	0.45		0.40	0.40	0.40	0.20	0.20	0.20
v/c Ratio	0.11	0.46		0.16	0.23		1.30	0.60	0.24	0.55	0.68	0.14
Control Delay	25.0	17.5		15.4	14.4		179.4	26.0	4.1	45.4	44.1	0.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.0	17.5		15.4	14.4		179.4	26.0	4.1	45.4	44.1	0.7
LOS	C	B		B	B		F	C	A	D	D	A
Approach Delay		18.0			14.5			91.8			38.0	
Approach LOS		B			B			F			D	
Queue Length 50th (m)	4.7	26.3		4.5	16.5		~106.2	59.6	0.0	16.0	38.7	0.0
Queue Length 95th (m)	13.4	47.4		11.9	28.7		#184.4	92.7	11.7	32.6	63.8	0.0
Internal Link Dist (m)		170.0			174.7			260.9			205.7	
Turn Bay Length (m)										51.5		
Base Capacity (vph)	335	1196		354	1803		369	1137	1024	407	772	752
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.46		0.14	0.19		1.30	0.37	0.16	0.24	0.30	0.08

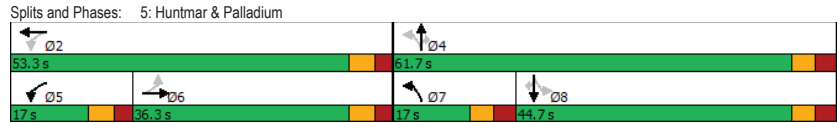
Intersection Summary

Cycle Length: 115
Actuated Cycle Length: 86.7
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.30

Lanes, Volumes, Timings
5: Huntmar & Palladium

2025 Future Total
AM Peak Hour

Intersection Signal Delay: 52.9	Intersection LOS: D
Intersection Capacity Utilization 83.5%	ICU Level of Service E
Analysis Period (min) 15	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	



HCM 2010 AWSC
6: Parking Lot/Country Glen & Private Road/Access#1

2025 Future Total
AM Peak Hour

Intersection	
Intersection Delay, s/veh	6.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	9	0	0	0	0	35	0	0	0	17	0	10
Future Vol, veh/h	9	0	0	0	0	35	0	0	0	17	0	10
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	0	0	0	0	35	0	0	0	17	0	10
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.3	6.5	0	7
HCM LOS	A	A	-	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	100%	0%	63%
Vol Thru, %	100%	0%	0%	0%
Vol Right, %	0%	0%	100%	37%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	0	9	35	27
LT Vol	0	9	0	17
Through Vol	0	0	0	0
RT Vol	0	0	35	10
Lane Flow Rate	0	9	35	27
Geometry Grp	1	1	1	1
Degree of Util (X)	0	0.011	0.033	0.029
Departure Headway (Hd)	4.031	4.208	3.388	3.914
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	0	853	1059	918
Service Time	2.045	2.219	1.4	1.923
HCM Lane V/C Ratio	0	0.011	0.033	0.029
HCM Control Delay	7	7.3	6.5	7
HCM Lane LOS	N	A	A	A
HCM 95th-tile Q	0	0	0.1	0.1

Intersection						
Int Delay, s/veh	1.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↑
Traffic Vol, veh/h	58	14	0	73	0	35
Future Vol, veh/h	58	14	0	73	0	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	58	14	0	73	0	35

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	- - 36
Stage 1	-	-	- - -
Stage 2	-	-	- - -
Critical Hdwy	-	-	- - 6.94
Critical Hdwy Stg 1	-	-	- - -
Critical Hdwy Stg 2	-	-	- - -
Follow-up Hdwy	-	-	- - 3.32
Pot Cap-1 Maneuver	-	-	0 - 1029
Stage 1	-	-	0 - 0
Stage 2	-	-	0 - 0
Platoon blocked, %	-	-	- - -
Mov Cap-1 Maneuver	-	-	- - 1029
Mov Cap-2 Maneuver	-	-	- - -
Stage 1	-	-	- - -
Stage 2	-	-	- - -

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	1029	-	-	-
HCM Lane V/C Ratio	0.034	-	-	-
HCM Control Delay (s)	8.6	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-

MOVEMENT SUMMARY

Site: 101 [Country Glen-Campeau PM FT25 (Site Folder: General)]

Arcadia Stage 6
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh.]	[Dist.]				
South: Country Glen														
1	L2	34	2.0	34	2.0	0.037	8.2	LOS A	0.1	0.6	0.26	0.62	0.26	50.1
2	T1	1	2.0	1	2.0	0.007	2.5	LOS A	0.0	0.1	0.27	0.37	0.27	49.9
3	R2	5	2.0	5	2.0	0.007	3.0	LOS A	0.0	0.1	0.27	0.37	0.27	51.7
Approach		40	2.0	40	2.0	0.037	7.4	LOS A	0.1	0.6	0.26	0.58	0.26	50.3
East: Campeau														
4	L2	11	2.0	11	2.0	0.056	9.9	LOS A	0.1	1.1	0.24	0.46	0.24	53.9
5	T1	77	2.0	77	2.0	0.056	3.9	LOS A	0.1	1.1	0.23	0.44	0.23	57.1
6	R2	20	2.0	20	2.0	0.056	4.1	LOS A	0.1	1.0	0.22	0.41	0.22	51.7
Approach		108	2.0	108	2.0	0.056	4.5	LOS A	0.1	1.1	0.23	0.44	0.23	55.7
North: Country Glen														
7	L2	11	2.0	11	2.0	0.095	7.8	LOS A	0.2	1.7	0.17	0.38	0.17	54.2
8	T1	1	2.0	1	2.0	0.095	1.7	LOS A	0.2	1.7	0.17	0.38	0.17	50.0
9	R2	85	2.0	85	2.0	0.095	2.4	LOS A	0.2	1.7	0.17	0.38	0.17	51.9
Approach		97	2.0	97	2.0	0.095	3.0	LOS A	0.2	1.7	0.17	0.38	0.17	52.1
West: Campeau														
10	L2	162	2.0	162	2.0	0.150	9.4	LOS A	0.6	4.1	0.10	0.61	0.10	51.3
11	T1	107	2.0	107	2.0	0.133	3.1	LOS A	0.5	3.6	0.10	0.32	0.10	58.9
12	R2	37	2.0	37	2.0	0.133	3.4	LOS A	0.5	3.6	0.10	0.32	0.10	52.6
Approach		306	2.0	306	2.0	0.150	6.5	LOS A	0.6	4.1	0.10	0.48	0.10	53.8
All Vehicles		551	2.0	551	2.0	0.150	5.5	LOS A	0.6	4.1	0.15	0.46	0.15	53.6

Site Level of Service (LOS) Method: Delay (SIDRA). 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 per movement.
 Intersection and Approach LOS values are based on average delay for all vehicle movements.
 Roundabout Capacity Model: US HCM 2010.
 Delay Model: SIDRA Standard (Geometric Delay is included).
 Queue Model: SIDRA Standard.
 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 FT25 (Site Folder: General)]

Arcadia Stage 6
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh.]	[Dist m]				
South: Huntmar														
1	L2	94	2.0	94	2.0	0.111	8.6	LOS A	0.3	2.2	0.34	0.67	0.34	49.9
2	T1	402	2.0	402	2.0	0.468	3.4	LOS A	1.8	13.1	0.46	0.42	0.49	49.2
3	R2	130	2.0	130	2.0	0.154	3.7	LOS A	0.4	3.1	0.35	0.51	0.35	51.2
Approach		626	2.0	626	2.0	0.468	4.3	LOS A	1.8	13.1	0.42	0.48	0.44	49.7
East: Campeau														
4	L2	127	2.0	127	2.0	0.185	11.6	LOS B	0.5	3.6	0.46	0.81	0.46	50.1
5	T1	54	2.0	54	2.0	0.081	5.6	LOS A	0.2	1.5	0.45	0.55	0.45	56.5
6	R2	15	2.0	15	2.0	0.023	5.9	LOS A	0.1	0.4	0.43	0.62	0.43	50.9
Approach		196	2.0	196	2.0	0.185	9.5	LOS A	0.5	3.6	0.45	0.72	0.45	51.8
North: Huntmar														
7	L2	18	2.0	18	2.0	0.258	8.5	LOS A	0.8	5.8	0.34	0.35	0.34	53.3
8	T1	450	2.0	450	2.0	0.258	2.6	LOS A	0.8	5.8	0.33	0.33	0.33	49.6
9	R2	154	2.0	154	2.0	0.171	3.4	LOS A	0.5	3.5	0.31	0.47	0.31	51.3
Approach		622	2.0	622	2.0	0.258	3.0	LOS A	0.8	5.8	0.32	0.36	0.32	50.1
West: Campeau														
10	L2	187	2.0	187	2.0	0.256	11.4	LOS B	0.7	5.2	0.45	0.79	0.45	50.1
11	T1	158	2.0	158	2.0	0.223	5.5	LOS A	0.7	4.7	0.47	0.55	0.47	56.4
12	R2	89	2.0	89	2.0	0.120	5.2	LOS A	0.3	2.2	0.41	0.63	0.41	51.3
Approach		434	2.0	434	2.0	0.256	8.0	LOS A	0.7	5.2	0.45	0.67	0.45	52.5
All Vehicles		1878	2.0	1878	2.0	0.468	5.3	LOS A	1.8	13.1	0.40	0.51	0.40	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.

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

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: Traditional M1.

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

MOVEMENT SUMMARY

Site: 101 [Winterset-Campeau PM FT25 (Site Folder: General)]

Arcadia Stage 6
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh.]	[Dist m]				
East: Campeau														
5	T1	91	2.0	91	2.0	0.057	3.4	LOS A	0.1	1.1	0.08	0.34	0.08	58.5
6	R2	32	2.0	32	2.0	0.057	3.7	LOS A	0.1	1.0	0.08	0.38	0.08	52.3
Approach		123	2.0	123	2.0	0.057	3.5	LOS A	0.1	1.1	0.08	0.35	0.08	56.7
North: Winterset														
7	L2	18	2.0	18	2.0	0.034	7.7	LOS A	0.1	0.6	0.14	0.47	0.14	52.6
9	R2	18	2.0	18	2.0	0.034	2.3	LOS A	0.1	0.6	0.14	0.47	0.14	50.5
Approach		36	2.0	36	2.0	0.034	5.0	LOS A	0.1	0.6	0.14	0.47	0.14	51.6
West: Campeau														
10	L2	33	2.0	33	2.0	0.054	9.4	LOS A	0.2	1.3	0.08	0.52	0.08	53.3
11	T1	85	2.0	85	2.0	0.054	2.7	LOS A	0.2	1.3	0.08	0.35	0.08	58.4
Approach		118	2.0	118	2.0	0.054	4.5	LOS A	0.2	1.3	0.08	0.40	0.08	56.8
All Vehicles		277	2.0	277	2.0	0.057	4.1	LOS A	0.2	1.3	0.09	0.39	0.09	56.0

Site Level of Service (LOS) Method: Delay (SIDRA). 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 per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: US HCM 2010.

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

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: Traditional M1.

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

Lanes, Volumes, Timings

2025 Future Total

4: Huntmar & Autopark Private/Cyclone Taylor

PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	29	4	71	67	1	75	16	523	12	9	549	15
Future Volume (vph)	29	4	71	67	1	75	16	523	12	9	549	15
Satd. Flow (prot)	0	1537	0	1595	1445	0	1658	1745	1081	1127	1745	1483
Fit Permitted		0.883		0.690			0.389			0.410		
Satd. Flow (perm)	0	1377	0	1157	1445	0	679	1745	1081	487	1745	1452
Satd. Flow (RTOR)		71		75					56			56
Lane Group Flow (vph)	0	104	0	67	76	0	16	523	12	9	549	15
Turn Type	Perm	NA	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm
Protected Phases		4		8			2	2	2	6	6	6
Permitted Phases	4	4		8	8		2	2	2	6	6	6
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		23.0	23.0	23.0	23.0	23.0	23.0
Minimum Split (s)	33.1	33.1		33.1	33.1		28.9	28.9	28.9	28.9	28.9	28.9
Total Split (s)	33.1	33.1		33.1	33.1		28.9	28.9	28.9	28.9	28.9	28.9
Total Split (%)	53.4%	53.4%		53.4%	53.4%		46.6%	46.6%	46.6%	46.6%	46.6%	46.6%
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.9	2.9		2.9	2.9		2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.2		6.2	6.2		5.9	5.9	5.9	5.9	5.9	5.9
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min	Min	Min	Min	Min
Act Effct Green (s)	12.8	12.8		12.8	12.8		28.0	28.0	28.0	28.0	28.0	28.0
Actuated g/C Ratio	0.27	0.27		0.27	0.27		0.58	0.58	0.58	0.58	0.58	0.58
v/c Ratio	0.25	0.22		0.17	0.17		0.04	0.52	0.02	0.03	0.54	0.02
Control Delay	7.5	14.9		4.8	4.8		9.8	13.9	0.1	10.0	14.6	0.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.5	14.9		4.8	4.8		9.8	13.9	0.1	10.0	14.6	0.1
LOS	A	B		A	A		A	B	A	A	B	A
Approach Delay	7.5			9.5			13.5			14.1		
Approach LOS	A			A			B			B		
Queue Length 50th (m)	2.1	4.4		0.1	0.1		0.6	25.5	0.0	0.3	27.3	0.0
Queue Length 95th (m)	9.4	10.9		6.1	6.1		4.5	#99.4	0.0	3.2	#106.7	0.2
Internal Link Dist (m)	199.6			315.6			205.7			39.4		
Turn Bay Length (m)							57.0			56.5		57.5
Base Capacity (vph)	811			656	852		394	1012	650	282	1012	865
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.10		0.09	0.09		0.04	0.52	0.02	0.03	0.54	0.02

Intersection Summary

Cycle Length: 62
 Actuated Cycle Length: 48.2
 Natural Cycle: 65
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.54

Lanes, Volumes, Timings

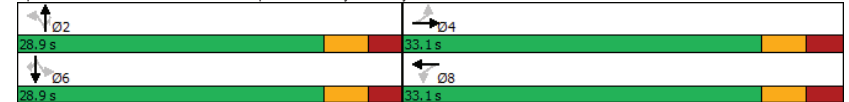
2025 Future Total

4: Huntmar & Autopark Private/Cyclone Taylor

PM Peak Hour

Intersection Signal Delay: 12.9
 Intersection LOS: B
 Intersection Capacity Utilization 63.0%
 ICU Level of Service B
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 4: Huntmar & Autopark Private/Cyclone Taylor



Lanes, Volumes, Timings
5: Huntmar & Palladium

2025 Future Total
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	47	431	617	183	603	149	346	353	86	114	455	118
Future Volume (vph)	47	431	617	183	603	149	346	353	86	114	455	118
Satd. Flow (prot)	1496	3024	0	1658	3208	0	1658	1745	1483	1658	1745	1483
Fit Permitted	0.366			0.110			0.165			0.550		
Satd. Flow (perm)	576	3024	0	192	3208	0	288	1745	1464	959	1745	1464
Satd. Flow (RTOR)		304			32				91			152
Lane Group Flow (vph)	47	1048	0	183	752	0	346	353	86	114	455	118
Turn Type	Perm	NA	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	Perm	Perm
Protected Phases		6		5	2		7	4			8	
Permitted Phases	6			2			4		4	8		8
Detector Phase	6	6		5	2		7	4	4	8		8
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.3	36.3		11.3	36.3		11.4	37.4	37.4	37.4	37.4	37.4
Total Split (s)	36.3	36.3		17.0	53.3		17.0	61.7	61.7	44.7	44.7	44.7
Total Split (%)	31.6%	31.6%		14.8%	46.3%		14.8%	53.7%	53.7%	38.9%	38.9%	38.9%
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6		2.6	2.6		3.1	3.1	3.1	3.1	3.1	3.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3		6.3	6.3		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag	Lag	Lag		Lead			Lead		Lag	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes		Yes	Yes	Yes	
Recall Mode	Max	Max		None	None		None	None	None	None	None	None
Act Effct Green (s)	30.1	30.1		47.1	47.1		49.4	49.4	49.4	32.4	32.4	32.4
Actuated g/C Ratio	0.28	0.28		0.43	0.43		0.45	0.45	0.45	0.30	0.30	0.30
v/c Ratio	0.30	1.00		0.81	0.54		1.32	0.45	0.12	0.40	0.88	0.22
Control Delay	39.7	56.0		51.6	24.5		189.6	22.4	3.5	34.9	55.8	2.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.7	56.0		51.6	24.5		189.6	22.4	3.5	34.9	55.8	2.9
LOS	D	E		D	C		F	C	A	C	E	A
Approach Delay		55.3			29.8			94.0			43.2	
Approach LOS		E			C			F			D	
Queue Length 50th (m)	8.2	~95.2		25.5	61.1		~72.9	50.2	0.0	19.3	91.9	0.0
Queue Length 95th (m)	20.0	#145.9		#65.3	83.4		#130.5	73.6	7.5	35.6	#133.4	6.8
Internal Link Dist (m)		170.0			174.7			260.9			205.7	
Turn Bay Length (m)									51.5			
Base Capacity (vph)	158	1052		226	1401		263	885	787	336	613	612
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.30	1.00		0.81	0.54		1.32	0.40	0.11	0.34	0.74	0.19

Intersection Summary

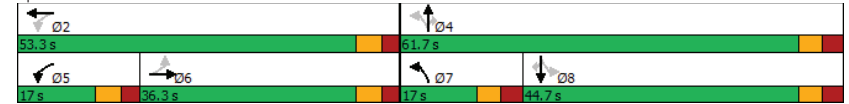
Cycle Length: 115
Actuated Cycle Length: 109.3
Natural Cycle: 110
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.32

Lanes, Volumes, Timings
5: Huntmar & Palladium

2025 Future Total
PM Peak Hour

Intersection Signal Delay: 54.8
Intersection Capacity Utilization 110.9%
Analysis Period (min) 15
Intersection LOS: D
ICU Level of Service H
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Huntmar & Palladium



HCM 2010 AWSC
6: Parking Lot/Country Glen & Private Road/Access#1

2025 Future Total
PM Peak Hour

Intersection													
Intersection Delay, s/veh	7.1												
Intersection LOS	A												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔			↔			↔			↔			
Traffic Vol, veh/h	12	0	0	0	0	27	0	0	0	38	0	10	
Future Vol, veh/h	12	0	0	0	0	27	0	0	0	38	0	10	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	12	0	0	0	0	27	0	0	0	38	0	10	
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0	
Approach	EB				WB				NB				SB
Opposing Approach	WB				EB				SB				NB
Opposing Lanes	1				1				1				1
Conflicting Approach Left	SB				NB				EB				WB
Conflicting Lanes Left	1				1				1				1
Conflicting Approach Right	NB				SB				WB				EB
Conflicting Lanes Right	1				1				1				1
HCM Control Delay	7.3				6.5				0				7.3
HCM LOS	A				A				-				A
Lane	NBLn1	EBLn1	WBLn1	SBLn1									
Vol Left, %	0%	100%	0%	79%									
Vol Thru, %	100%	0%	0%	0%									
Vol Right, %	0%	0%	100%	21%									
Sign Control	Stop	Stop	Stop	Stop									
Traffic Vol by Lane	0	12	27	48									
LT Vol	0	12	0	38									
Through Vol	0	0	0	0									
RT Vol	0	0	27	10									
Lane Flow Rate	0	12	27	48									
Geometry Grp	1	1	1	1									
Degree of Util (X)	0	0.014	0.026	0.054									
Departure Headway (Hd)	4.039	4.239	3.428	4.036									
Convergence, Y/N	Yes	Yes	Yes	Yes									
Cap	0	845	1043	891									
Service Time	2.058	2.263	1.452	2.045									
HCM Lane V/C Ratio	0	0.014	0.026	0.054									
HCM Control Delay	7.1	7.3	6.5	7.3									
HCM Lane LOS	N	A	A	A									
HCM 95th-tile Q	0	0	0.1	0.2									

HCM 2010 TWSC
7: Access#2 & Campeau

2025 Future Total
PM Peak Hour

Intersection						
Int Delay, s/veh	0.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↕			↕↕		↕
Traffic Vol, veh/h	92	31	0	108	0	27
Future Vol, veh/h	92	31	0	108	0	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	92	31	0	108	0	27
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	-	-	-	62
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	990
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	990
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0	8.7			
HCM LOS			A			
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT		
Capacity (veh/h)	990	-	-	-		
HCM Lane V/C Ratio	0.027	-	-	-		
HCM Control Delay (s)	8.7	-	-	-		
HCM Lane LOS	A	-	-	-		
HCM 95th %tile Q(veh)	0.1	-	-	-		

Appendix L

Synchro and Sidra Worksheets – 2030 Future Total

MOVEMENT SUMMARY

Site: 101 [Country Glen-Campeau AM FT30 (Site Folder: General)]

Arcadia Stage 6
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh.]	[Dist. m]				
South: Country Glen														
1	L2	40	2.0	40	2.0	0.040	7.8	LOS A	0.1	0.7	0.16	0.58	0.16	50.4
2	T1	1	2.0	1	2.0	0.005	2.1	LOS A	0.0	0.1	0.17	0.31	0.17	50.2
3	R2	4	2.0	4	2.0	0.005	2.5	LOS A	0.0	0.1	0.17	0.31	0.17	52.1
Approach		45	2.0	45	2.0	0.040	7.2	LOS A	0.1	0.7	0.16	0.55	0.16	50.5
East: Campeau														
4	L2	7	2.0	7	2.0	0.035	9.6	LOS A	0.1	0.6	0.15	0.42	0.15	54.3
5	T1	61	2.0	61	2.0	0.035	3.6	LOS A	0.1	0.6	0.14	0.39	0.14	57.7
6	R2	5	2.0	5	2.0	0.035	3.8	LOS A	0.1	0.6	0.14	0.36	0.14	52.1
Approach		73	2.0	73	2.0	0.035	4.2	LOS A	0.1	0.6	0.14	0.39	0.14	56.9
North: Country Glen														
7	L2	19	2.0	19	2.0	0.153	7.8	LOS A	0.4	3.0	0.17	0.38	0.17	54.1
8	T1	1	2.0	1	2.0	0.153	1.7	LOS A	0.4	3.0	0.17	0.38	0.17	50.0
9	R2	138	2.0	138	2.0	0.153	2.3	LOS A	0.4	3.0	0.17	0.38	0.17	51.9
Approach		158	2.0	158	2.0	0.153	3.0	LOS A	0.4	3.0	0.17	0.38	0.17	52.1
West: Campeau														
10	L2	50	2.0	50	2.0	0.056	9.4	LOS A	0.2	1.4	0.10	0.59	0.10	52.0
11	T1	50	2.0	50	2.0	0.056	3.1	LOS A	0.2	1.4	0.10	0.38	0.10	57.9
12	R2	20	2.0	20	2.0	0.056	3.4	LOS A	0.2	1.4	0.10	0.33	0.10	52.6
Approach		120	2.0	120	2.0	0.056	5.8	LOS A	0.2	1.4	0.10	0.46	0.10	54.4
All Vehicles		396	2.0	396	2.0	0.153	4.5	LOS A	0.4	3.0	0.14	0.42	0.14	53.4

Site Level of Service (LOS) Method: Delay (SIDRA). 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 per movement.
 Intersection and Approach LOS values are based on average delay for all vehicle movements.
 Roundabout Capacity Model: US HCM 2010.
 Delay Model: SIDRA Standard (Geometric Delay is included).
 Queue Model: SIDRA Standard.
 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 AM FT30 (Site Folder: General)]

Arcadia Stage 6
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh.]	[Dist. m]				
South: Huntmar														
1	L2	39	2.0	39	2.0	0.040	7.9	LOS A	0.1	0.7	0.20	0.58	0.20	50.3
2	T1	359	2.0	359	2.0	0.363	2.3	LOS A	1.2	8.8	0.27	0.26	0.27	50.0
3	R2	46	2.0	46	2.0	0.047	2.9	LOS A	0.1	0.9	0.20	0.38	0.20	51.7
Approach		444	2.0	444	2.0	0.363	2.8	LOS A	1.2	8.8	0.26	0.30	0.26	50.2
East: Campeau														
4	L2	129	2.0	129	2.0	0.163	10.8	LOS B	0.4	3.1	0.38	0.75	0.38	50.4
5	T1	84	2.0	84	2.0	0.109	4.8	LOS A	0.3	2.1	0.39	0.48	0.39	56.8
6	R2	27	2.0	27	2.0	0.035	5.1	LOS A	0.1	0.6	0.37	0.57	0.37	51.1
Approach		240	2.0	240	2.0	0.163	8.1	LOS A	0.4	3.1	0.38	0.64	0.38	52.5
North: Huntmar														
7	L2	7	2.0	7	2.0	0.181	8.3	LOS A	0.5	3.8	0.30	0.32	0.30	53.6
8	T1	326	2.0	326	2.0	0.181	2.5	LOS A	0.5	3.8	0.29	0.30	0.29	49.9
9	R2	125	2.0	125	2.0	0.137	3.3	LOS A	0.4	2.7	0.29	0.45	0.29	51.4
Approach		458	2.0	458	2.0	0.181	2.8	LOS A	0.5	3.8	0.29	0.34	0.29	50.3
West: Campeau														
10	L2	80	2.0	80	2.0	0.100	10.7	LOS B	0.3	1.8	0.36	0.73	0.36	50.4
11	T1	67	2.0	67	2.0	0.086	4.7	LOS A	0.2	1.6	0.38	0.47	0.38	56.9
12	R2	43	2.0	43	2.0	0.054	4.7	LOS A	0.1	0.9	0.34	0.56	0.34	51.5
Approach		190	2.0	190	2.0	0.100	7.2	LOS A	0.3	1.8	0.36	0.60	0.36	52.8
All Vehicles		1332	2.0	1332	2.0	0.363	4.4	LOS A	1.2	8.8	0.31	0.42	0.31	51.0

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.
 Delay Model: SIDRA Standard (Geometric Delay is included).
 Queue Model: SIDRA Standard.
 Gap-Acceptance Capacity: Traditional M1.
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Winterset-Campeau AM FT30 (Site Folder: General)]

Arcadia Stage 6
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh.]	[Dist.]				
East: Campeau														
5	T1	42	0.0	42	0.0	0.023	3.4	LOS A	0.1	0.4	0.03	0.34	0.03	58.8
6	R2	9	0.0	9	0.0	0.023	3.6	LOS A	0.1	0.4	0.03	0.36	0.03	52.5
Approach		51	0.0	51	0.0	0.023	3.4	LOS A	0.1	0.4	0.03	0.34	0.03	57.6
North: Winterset														
7	L2	31	0.0	31	0.0	0.057	7.6	LOS A	0.1	1.0	0.09	0.46	0.09	52.9
9	R2	31	0.0	31	0.0	0.057	2.1	LOS A	0.1	1.0	0.09	0.46	0.09	50.7
Approach		62	0.0	62	0.0	0.057	4.8	LOS A	0.1	1.0	0.09	0.46	0.09	51.8
West: Campeau														
10	L2	8	0.0	8	0.0	0.044	9.4	LOS A	0.2	1.1	0.11	0.36	0.11	55.1
11	T1	86	0.0	86	0.0	0.044	2.7	LOS A	0.2	1.1	0.11	0.32	0.11	58.8
Approach		94	0.0	94	0.0	0.044	3.3	LOS A	0.2	1.1	0.11	0.32	0.11	58.5
All Vehicles		207	0.0	207	0.0	0.057	3.8	LOS A	0.2	1.1	0.08	0.37	0.08	56.1

Site Level of Service (LOS) Method: Delay (SIDRA). 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 per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 2010.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: Not Saved

Lanes, Volumes, Timings

4: Huntmar & Autopark Private/Cyclone Taylor

2030 Future Total
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔		↔	↔	↔
Traffic Volume (vph)	5	4	26	2	1	17	37	422	53	69	363	38
Future Volume (vph)	5	4	26	2	1	17	37	422	53	69	363	38
Satd. Flow (prot)	0	1523	0	1127	1273	0	1658	1745	1401	1642	1728	1483
Fit Permitted		0.946					0.545			0.516		
Satd. Flow (perm)	0	1451	0	1186	1273	0	951	1745	1401	892	1728	1483
Satd. Flow (RTOR)		26			17				56			56
Lane Group Flow (vph)	0	35	0	2	18	0	37	422	53	69	363	38
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2		6		6
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		23.0	23.0	23.0	23.0	23.0	23.0
Minimum Split (s)	33.1	33.1		33.1	33.1		28.9	28.9	28.9	28.9	28.9	28.9
Total Split (s)	33.1	33.1		33.1	33.1		28.9	28.9	28.9	28.9	28.9	28.9
Total Split (%)	53.4%	53.4%		53.4%	53.4%		46.6%	46.6%	46.6%	46.6%	46.6%	46.6%
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.9	2.9		2.9	2.9		2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.2		6.2	6.2		5.9	5.9	5.9	5.9	5.9	5.9
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min	Min	Min	Min	Min
Act Effct Green (s)		13.0		13.0	13.0		39.0	39.0	39.0	39.0	39.0	39.0
Actuated g/C Ratio		0.29		0.29	0.29		0.87	0.87	0.87	0.87	0.87	0.87
v/c Ratio		0.08		0.01	0.05		0.04	0.28	0.04	0.09	0.24	0.03
Control Delay		5.7		9.0	5.3		6.4	6.2	3.2	6.4	5.9	2.5
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		5.7		9.0	5.3		6.4	6.2	3.2	6.4	5.9	2.5
LOS		A		A	A		A	A	A	A	A	A
Approach Delay		5.7			5.7			5.9			5.7	
Approach LOS		A			A			A			A	
Queue Length 50th (m)		0.6		0.1	0.1		0.0	0.0	0.0	0.0	0.0	0.0
Queue Length 95th (m)		4.7		1.1	3.0		8.0	65.7	5.5	13.2	55.1	3.5
Internal Link Dist (m)		199.6			315.6			205.7			39.4	
Turn Bay Length (m)							57.0			56.5		57.5
Base Capacity (vph)		935		756	818		831	1525	1232	780	1511	1303
Starvation Cap Reductn		0		0	0		0	0	0	0	0	0
Spillback Cap Reductn		0		0	0		0	0	0	0	0	0
Storage Cap Reductn		0		0	0		0	0	0	0	0	0
Reduced v/c Ratio		0.04		0.00	0.02		0.04	0.28	0.04	0.09	0.24	0.03
Intersection Summary												
Cycle Length: 62												
Actuated Cycle Length: 44.6												
Natural Cycle: 65												
Control Type: Actuated-Uncoordinated												
Maximum v/c Ratio: 0.28												

Scenario 1 8415 Campeau Drive 12:00 am 08/31/2021 2030 Future Total

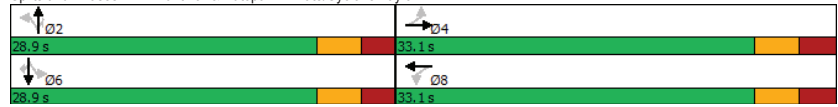
Synchro 11 Report
Page 4

Lanes, Volumes, Timings
4: Huntmar & Autopark Private/Cyclone Taylor

2030 Future Total
AM Peak Hour

Intersection Signal Delay: 5.8	Intersection LOS: A
Intersection Capacity Utilization 66.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 4: Huntmar & Autopark Private/Cyclone Taylor



Lanes, Volumes, Timings
5: Huntmar & Palladium

2030 Future Total
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	38	299	249	50	297	49	481	423	166	101	232	57
Future Volume (vph)	38	299	249	50	297	49	481	423	166	101	232	57
Satd. Flow (prot)	1658	3058	0	1523	3240	0	1658	1745	1483	1658	1712	1483
Fit Permitted	0.544			0.311			0.340			0.515		
Satd. Flow (perm)	948	3058	0	499	3240	0	593	1745	1483	899	1712	1483
Satd. Flow (RTOR)		179			20			166				152
Lane Group Flow (vph)	38	548	0	50	346	0	481	423	166	101	232	57
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		6		5	2		7	4			8	
Permitted Phases	6			2			4		4	8		8
Detector Phase	6	6		5	2		7	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.3	36.3		11.3	36.3		11.4	37.4	37.4	37.4	37.4	37.4
Total Split (s)	36.3	36.3		17.0	53.3		17.0	61.7	61.7	44.7	44.7	44.7
Total Split (%)	31.6%	31.6%		14.8%	46.3%		14.8%	53.7%	53.7%	38.9%	38.9%	38.9%
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6		2.6	2.6		3.1	3.1	3.1	3.1	3.1	3.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3		6.3	6.3		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag	Lag	Lag		Lead			Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	Yes
Recall Mode	Max	Max		None	None		None	None	None	None	None	None
Act Effct Green (s)	30.7	30.7		39.1	39.1		34.6	34.6	34.6	17.2	17.2	17.2
Actuated g/C Ratio	0.35	0.35		0.45	0.45		0.40	0.40	0.40	0.20	0.20	0.20
v/c Ratio	0.11	0.46		0.16	0.23		1.30	0.61	0.24	0.57	0.68	0.14
Control Delay	25.0	17.5		15.4	14.4		179.4	26.1	4.1	46.1	44.1	0.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.0	17.5		15.4	14.4		179.4	26.1	4.1	46.1	44.1	0.7
LOS	C	B		B	B		F	C	A	D	D	A
Approach Delay		18.0			14.5			91.6			38.3	
Approach LOS		B			B			F			D	
Queue Length 50th (m)	4.7	26.3		4.5	16.5		~106.2	60.4	0.0	16.4	38.7	0.0
Queue Length 95th (m)	13.4	47.4		11.9	28.7		#184.4	93.7	11.7	33.3	63.8	0.0
Internal Link Dist (m)		170.0			174.7			260.9			205.7	
Turn Bay Length (m)										51.5		
Base Capacity (vph)	335	1196		354	1803		369	1137	1024	405	772	752
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.46		0.14	0.19		1.30	0.37	0.16	0.25	0.30	0.08

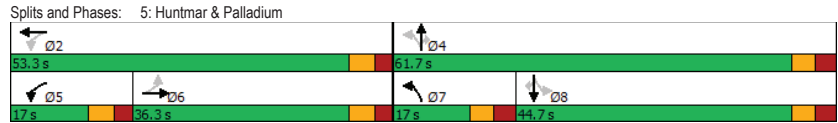
Intersection Summary

Cycle Length: 115
Actuated Cycle Length: 86.7
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.30

Lanes, Volumes, Timings
5: Huntmar & Palladium

2030 Future Total
AM Peak Hour

Intersection Signal Delay: 52.9	Intersection LOS: D
Intersection Capacity Utilization 83.5%	ICU Level of Service E
Analysis Period (min) 15	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	



HCM 2010 AWSC
6: Parking Lot/Country Glen & Private Road/Access#1

2030 Future Total
AM Peak Hour

Intersection	
Intersection Delay, s/veh	6.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	9	0	0	0	0	35	0	0	0	17	0	10
Future Vol, veh/h	9	0	0	0	0	35	0	0	0	17	0	10
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	0	0	0	0	35	0	0	0	17	0	10
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.3	6.5	0	7
HCM LOS	A	A	-	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	100%	0%	63%
Vol Thru, %	100%	0%	0%	0%
Vol Right, %	0%	0%	100%	37%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	0	9	35	27
LT Vol	0	9	0	17
Through Vol	0	0	0	0
RT Vol	0	0	35	10
Lane Flow Rate	0	9	35	27
Geometry Grp	1	1	1	1
Degree of Util (X)	0	0.011	0.033	0.029
Departure Headway (Hd)	4.031	4.208	3.388	3.914
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	0	853	1059	918
Service Time	2.045	2.219	1.4	1.923
HCM Lane V/C Ratio	0	0.011	0.033	0.029
HCM Control Delay	7	7.3	6.5	7
HCM Lane LOS	N	A	A	A
HCM 95th-tile Q	0	0	0.1	0.1

Intersection						
Int Delay, s/veh	1.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↑
Traffic Vol, veh/h	59	14	0	73	0	35
Future Vol, veh/h	59	14	0	73	0	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	59	14	0	73	0	35

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	- - 37
Stage 1	-	-	- - -
Stage 2	-	-	- - -
Critical Hdwy	-	-	- - 6.94
Critical Hdwy Stg 1	-	-	- - -
Critical Hdwy Stg 2	-	-	- - -
Follow-up Hdwy	-	-	- - 3.32
Pot Cap-1 Maneuver	-	0	- 0 1027
Stage 1	-	0	- 0 -
Stage 2	-	0	- 0 -
Platoon blocked, %	-	-	- - -
Mov Cap-1 Maneuver	-	-	- - 1027
Mov Cap-2 Maneuver	-	-	- - -
Stage 1	-	-	- - -
Stage 2	-	-	- - -

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	1027	-	-	-
HCM Lane V/C Ratio	0.034	-	-	-
HCM Control Delay (s)	8.6	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-

MOVEMENT SUMMARY

Site: 101 [Country Glen-Campeau PM FT30 (Site Folder: General)]

Arcadia Stage 6
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh.]	[Dist.]				
South: Country Glen														
1	L2	34	2.0	34	2.0	0.038	8.2	LOS A	0.1	0.6	0.26	0.62	0.26	50.1
2	T1	1	2.0	1	2.0	0.007	2.5	LOS A	0.0	0.1	0.27	0.37	0.27	49.9
3	R2	5	20.0	5	20.0	0.007	3.1	LOS A	0.0	0.1	0.27	0.37	0.27	51.4
Approach		40	4.3	40	4.3	0.038	7.4	LOS A	0.1	0.6	0.26	0.58	0.26	50.2
East: Campeau														
4	L2	11	2.0	11	2.0	0.057	9.9	LOS A	0.1	1.1	0.24	0.46	0.24	53.9
5	T1	78	2.0	78	2.0	0.057	3.9	LOS A	0.1	1.1	0.23	0.44	0.23	57.1
6	R2	20	2.0	20	2.0	0.057	4.1	LOS A	0.1	1.0	0.22	0.41	0.22	51.7
Approach		109	2.0	109	2.0	0.057	4.5	LOS A	0.1	1.1	0.23	0.44	0.23	55.7
North: Country Glen														
7	L2	11	2.0	11	2.0	0.095	7.8	LOS A	0.2	1.7	0.18	0.38	0.18	54.2
8	T1	1	2.0	1	2.0	0.095	1.7	LOS A	0.2	1.7	0.18	0.38	0.18	50.0
9	R2	85	2.0	85	2.0	0.095	2.4	LOS A	0.2	1.7	0.18	0.38	0.18	51.9
Approach		97	2.0	97	2.0	0.095	3.0	LOS A	0.2	1.7	0.18	0.38	0.18	52.1
West: Campeau														
10	L2	162	2.0	162	2.0	0.151	9.4	LOS A	0.6	4.1	0.10	0.61	0.10	51.3
11	T1	107	2.0	107	2.0	0.134	3.1	LOS A	0.5	3.6	0.10	0.32	0.10	58.9
12	R2	37	2.0	37	2.0	0.134	3.4	LOS A	0.5	3.6	0.10	0.32	0.10	52.6
Approach		306	2.0	306	2.0	0.151	6.5	LOS A	0.6	4.1	0.10	0.48	0.10	53.8
All Vehicles		552	2.2	552	2.2	0.151	5.5	LOS A	0.6	4.1	0.15	0.46	0.15	53.6

Site Level of Service (LOS) Method: Delay (SIDRA). 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 per movement.
 Intersection and Approach LOS values are based on average delay for all vehicle movements.
 Roundabout Capacity Model: US HCM 2010.
 Delay Model: SIDRA Standard (Geometric Delay is included).
 Queue Model: SIDRA Standard.
 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 FT30 (Site Folder: General)]

Arcadia Stage 6
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh.]	[Dist m]				
South: Huntmar														
1	L2	95	2.0	95	2.0	0.113	8.6	LOS A	0.3	2.2	0.34	0.67	0.34	49.9
2	T1	404	2.0	404	2.0	0.472	3.5	LOS A	1.9	13.3	0.46	0.42	0.49	49.2
3	R2	130	2.0	130	2.0	0.155	3.7	LOS A	0.4	3.1	0.35	0.51	0.35	51.2
Approach		629	2.0	629	2.0	0.472	4.3	LOS A	1.9	13.3	0.42	0.48	0.44	49.7
East: Campeau														
4	L2	127	2.0	127	2.0	0.185	11.6	LOS B	0.5	3.6	0.46	0.81	0.46	50.1
5	T1	55	2.0	55	2.0	0.083	5.6	LOS A	0.2	1.6	0.45	0.55	0.45	56.5
6	R2	15	2.0	15	2.0	0.023	5.9	LOS A	0.1	0.4	0.43	0.62	0.43	50.8
Approach		197	2.0	197	2.0	0.185	9.5	LOS A	0.5	3.6	0.45	0.72	0.45	51.8
North: Huntmar														
7	L2	18	2.0	18	2.0	0.260	8.5	LOS A	0.8	5.8	0.34	0.35	0.34	53.3
8	T1	451	2.0	451	2.0	0.260	2.6	LOS A	0.8	5.8	0.33	0.33	0.33	49.6
9	R2	154	2.0	154	2.0	0.172	3.5	LOS A	0.5	3.6	0.31	0.47	0.31	51.3
Approach		623	2.0	623	2.0	0.260	3.0	LOS A	0.8	5.8	0.33	0.36	0.33	50.1
West: Campeau														
10	L2	187	2.0	187	2.0	0.257	11.4	LOS B	0.7	5.2	0.45	0.79	0.45	50.1
11	T1	158	2.0	158	2.0	0.224	5.5	LOS A	0.7	4.7	0.47	0.55	0.47	56.4
12	R2	90	2.0	90	2.0	0.122	5.2	LOS A	0.3	2.3	0.41	0.63	0.41	51.3
Approach		435	2.0	435	2.0	0.257	8.0	LOS A	0.7	5.2	0.45	0.67	0.45	52.5
All Vehicles		1884	2.0	1884	2.0	0.472	5.3	LOS A	1.9	13.3	0.40	0.51	0.41	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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Winterset-Campeau PM FT30 (Site Folder: General)]

Arcadia Stage 6
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh.]	[Dist m]				
East: Campeau														
5	T1	92	2.0	92	2.0	0.058	3.4	LOS A	0.2	1.1	0.08	0.34	0.08	58.5
6	R2	32	2.0	32	2.0	0.058	3.7	LOS A	0.1	1.0	0.08	0.38	0.08	52.3
Approach		124	2.0	124	2.0	0.058	3.5	LOS A	0.2	1.1	0.08	0.35	0.08	56.7
North: Winterset														
7	L2	18	0.0	18	0.0	0.034	7.7	LOS A	0.1	0.6	0.14	0.47	0.14	52.7
9	R2	18	2.0	18	2.0	0.034	2.3	LOS A	0.1	0.6	0.14	0.47	0.14	50.5
Approach		36	1.0	36	1.0	0.034	5.0	LOS A	0.1	0.6	0.14	0.47	0.14	51.6
West: Campeau														
10	L2	33	2.0	33	2.0	0.055	9.4	LOS A	0.2	1.3	0.08	0.52	0.08	53.3
11	T1	85	2.0	85	2.0	0.055	2.7	LOS A	0.2	1.3	0.08	0.35	0.08	58.4
Approach		118	2.0	118	2.0	0.055	4.5	LOS A	0.2	1.3	0.08	0.40	0.08	56.8
All Vehicles		278	1.9	278	1.9	0.058	4.1	LOS A	0.2	1.3	0.09	0.39	0.09	56.1

Site Level of Service (LOS) Method: Delay (SIDRA). 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 per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 2010.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Lanes, Volumes, Timings

2030 Future Total

4: Huntmar & Autopark Private/Cyclone Taylor

PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	29	4	71	67	1	73	16	528	12	8	552	15
Future Volume (vph)	29	4	71	67	1	73	16	528	12	8	552	15
Satd. Flow (prot)	0	1537	0	1595	1445	0	1658	1745	1081	1127	1745	1483
Fit Permitted		0.884		0.690			0.387			0.406		
Satd. Flow (perm)	0	1378	0	1157	1445	0	675	1745	1081	482	1745	1452
Satd. Flow (RTOR)		71		73					56			56
Lane Group Flow (vph)	0	104	0	67	74	0	16	528	12	8	552	15
Turn Type	Perm	NA	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm
Protected Phases		4		8			2	2	2	6	6	6
Permitted Phases	4		8			2		2	6			6
Detector Phase	4	4	8	8	2	2	2	2	6	6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
Minimum Split (s)	33.1	33.1	33.1	33.1	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9
Total Split (s)	33.1	33.1	33.1	33.1	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9
Total Split (%)	53.4%	53.4%	53.4%	53.4%	46.6%	46.6%	46.6%	46.6%	46.6%	46.6%	46.6%	46.6%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.9	2.9	2.9	2.9	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)		0.0		0.0			0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.2		6.2			5.9	5.9	5.9	5.9	5.9	5.9
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	Min	Min	Min	Min	Min	Min	Min	Min
Act Effct Green (s)	12.8	12.8	12.8	12.8	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0
Actuated g/C Ratio	0.27	0.27	0.27	0.27	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58
v/c Ratio	0.25	0.22	0.17	0.04	0.52	0.02	0.03	0.55	0.02	0.55	0.02	0.02
Control Delay	7.5	14.9	4.8	9.8	14.0	0.1	10.0	14.6	0.1	10.0	14.6	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.5	14.9	4.8	9.8	14.0	0.1	10.0	14.6	0.1	10.0	14.6	0.1
LOS	A	B	A	A	B	A	A	B	A	B	A	A
Approach Delay	7.5		9.6	13.6		14.2						
Approach LOS	A		A	B		B						
Queue Length 50th (m)	2.1	4.4	0.1	0.6	25.7	0.0	0.3	27.6	0.0	27.6	0.0	0.0
Queue Length 95th (m)	9.4	10.9	6.0	4.5	#100.6	0.0	3.0	#107.4	0.2	3.0	#107.4	0.2
Internal Link Dist (m)	199.6		315.6		205.7			39.4				
Turn Bay Length (m)				57.0		56.5		57.5				
Base Capacity (vph)	812	656	851	391	1012	650	279	1012	865			
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	0.13	0.10	0.09	0.04	0.52	0.02	0.03	0.55	0.02	0.55	0.02	0.02

Intersection Summary

Cycle Length: 62
 Actuated Cycle Length: 48.2
 Natural Cycle: 65
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.55

Lanes, Volumes, Timings

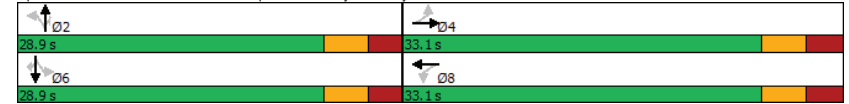
2030 Future Total

4: Huntmar & Autopark Private/Cyclone Taylor

PM Peak Hour

Intersection Signal Delay: 13.0
 Intersection Capacity Utilization 63.0%
 Intersection LOS: B
 ICU Level of Service B
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 4: Huntmar & Autopark Private/Cyclone Taylor



Lanes, Volumes, Timings
5: Huntmar & Palladium

2030 Future Total
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	47	431	617	183	603	154	346	353	86	115	457	118
Future Volume (vph)	47	431	617	183	603	154	346	353	86	115	457	118
Satd. Flow (prot)	1496	3024	0	1658	3204	0	1658	1745	1483	1658	1745	1483
Fit Permitted	0.364			0.110			0.165			0.550		
Satd. Flow (perm)	573	3024	0	192	3204	0	288	1745	1464	959	1745	1464
Satd. Flow (RTOR)		304			33				91			152
Lane Group Flow (vph)	47	1048	0	183	757	0	346	353	86	115	457	118
Turn Type	Perm	NA	pm+pt	NA	pm+pt	NA	Perm	Perm	Perm	NA	Perm	Perm
Protected Phases		6		5	2		7	4			8	
Permitted Phases	6			2			4		4	8		8
Detector Phase	6	6		5	2		7	4	4	8		8
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.3	36.3		11.3	36.3		11.4	37.4	37.4	37.4	37.4	37.4
Total Split (s)	36.3	36.3		17.0	53.3		17.0	61.7	61.7	44.7	44.7	44.7
Total Split (%)	31.6%	31.6%		14.8%	46.3%		14.8%	53.7%	53.7%	38.9%	38.9%	38.9%
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6		2.6	2.6		3.1	3.1	3.1	3.1	3.1	3.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3		6.3	6.3		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag	Lag	Lag		Lead			Lead		Lag	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes		Yes	Yes	Yes	
Recall Mode	Max	Max		None	None		None	None	None	None	None	None
Act Effct Green (s)	30.1	30.1		47.1	47.1		49.5	49.5	49.5	32.5	32.5	32.5
Actuated g/C Ratio	0.28	0.28		0.43	0.43		0.45	0.45	0.45	0.30	0.30	0.30
v/c Ratio	0.30	1.00		0.81	0.54		1.32	0.45	0.12	0.40	0.88	0.22
Control Delay	39.9	56.2		51.8	24.6		189.6	22.4	3.5	35.0	56.0	2.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.9	56.2		51.8	24.6		189.6	22.4	3.5	35.0	56.0	2.9
LOS	D	E		D	C		F	C	A	C	E	A
Approach Delay		55.5			29.9			94.0			43.4	
Approach LOS		E			C			F			D	
Queue Length 50th (m)	8.2	~95.7		25.6	61.8		~72.9	50.2	0.0	19.5	92.5	0.0
Queue Length 95th (m)	20.0	#145.9		#65.3	84.0		#130.5	73.6	7.5	36.1	#135.5	6.8
Internal Link Dist (m)		170.0			174.7			260.9			205.7	
Turn Bay Length (m)									51.5			
Base Capacity (vph)	157	1051		226	1398		263	884	786	336	612	612
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.30	1.00		0.81	0.54		1.32	0.40	0.11	0.34	0.75	0.19

Intersection Summary

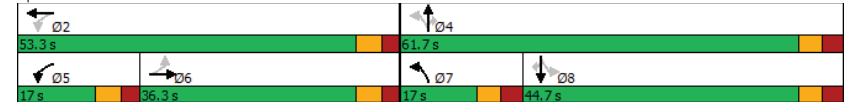
Cycle Length: 115
 Actuated Cycle Length: 109.4
 Natural Cycle: 110
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.32

Lanes, Volumes, Timings
5: Huntmar & Palladium

2030 Future Total
PM Peak Hour

Intersection Signal Delay: 54.9
 Intersection Capacity Utilization 111.0%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service H
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 5: Huntmar & Palladium



HCM 2010 AWSC
6: Parking Lot/Country Glen & Private Road/Access#1

2030 Future Total
PM Peak Hour

Intersection												
Intersection Delay, s/veh	7.1											
Intersection LOS	A											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔				↔			↔	
Traffic Vol, veh/h	12	0	0	0	0	27	0	0	0	38	0	10
Future Vol, veh/h	12	0	0	0	0	27	0	0	0	38	0	10
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	0	0	0	0	27	0	0	0	38	0	10
Number of Lanes	0	1	0	1	0	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	7.3			6.5			0			7.3		
HCM LOS	A			A			-			A		
Lane	NBLn1	EBLn1	WBLn1	SBLn1								
Vol Left, %	0%	100%	0%	79%								
Vol Thru, %	100%	0%	0%	0%								
Vol Right, %	0%	0%	100%	21%								
Sign Control	Stop	Stop	Stop	Stop								
Traffic Vol by Lane	0	12	27	48								
LT Vol	0	12	0	38								
Through Vol	0	0	0	0								
RT Vol	0	0	27	10								
Lane Flow Rate	0	12	27	48								
Geometry Grp	1	1	1	1								
Degree of Util (X)	0	0.014	0.026	0.054								
Departure Headway (Hd)	4.039	4.239	3.428	4.036								
Convergence, Y/N	Yes	Yes	Yes	Yes								
Cap	0	845	1043	891								
Service Time	2.058	2.263	1.452	2.045								
HCM Lane V/C Ratio	0	0.014	0.026	0.054								
HCM Control Delay	7.1	7.3	6.5	7.3								
HCM Lane LOS	N	A	A	A								
HCM 95th-tile Q	0	0	0.1	0.2								

HCM 2010 TWSC
7: Access#2 & Campeau

2030 Future Total
PM Peak Hour

Intersection						
Int Delay, s/veh	0.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↔			↕↔		↕
Traffic Vol, veh/h	92	31	0	109	0	27
Future Vol, veh/h	92	31	0	109	0	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	92	31	0	109	0	27
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	-	-	-	62
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	990
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	990
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0	8.7			
HCM LOS			A			
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT		
Capacity (veh/h)	990	-	-	-		
HCM Lane V/C Ratio	0.027	-	-	-		
HCM Control Delay (s)	8.7	-	-	-		
HCM Lane LOS	A	-	-	-		
HCM 95th %tile Q(veh)	0.1	-	-	-		

Appendix M

TDM Checklist

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

Legend	
BASIC	The measure is generally feasible and effective, and in most cases would benefit the development and its users
BETTER	The measure could maximize support for users of sustainable modes, and optimize development performance
★	The measure is one of the most dependably effective tools to encourage the use of sustainable modes

TDM measures: Residential developments		Check if proposed & add descriptions
1. TDM PROGRAM MANAGEMENT		
1.1 Program coordinator		
BASIC	★ 1.1.1	Designate an internal coordinator, or contract with an external coordinator <input type="checkbox"/>
1.2 Travel surveys		
BETTER	1.2.1	Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress <input type="checkbox"/>
2. WALKING AND CYCLING		
2.1 Information on walking/cycling routes & destinations		
BASIC	2.1.1	Display local area maps with walking/cycling access routes and key destinations at major entrances (<i>multi-family, condominium</i>) <input type="checkbox"/>
2.2 Bicycle skills training		
BETTER	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
3. TRANSIT		
3.1 Transit information		
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"/>
3.2 Transit fare incentives		
BASIC ★	3.2.1 Offer PRESTO cards preloaded with one monthly transit pass on residence purchase/move-in, to encourage residents to use transit	<input checked="" type="checkbox"/>
BETTER	3.2.2 Offer at least one year of free monthly transit passes on residence purchase/move-in	<input checked="" type="checkbox"/>
3.3 Enhanced public transit service		
BETTER ★	3.3.1 Contract with OC Transpo to provide early transit services until regular services are warranted by occupancy levels (<i>subdivision</i>)	<input type="checkbox"/>
3.4 Private transit service		
BETTER	3.4.1 Provide shuttle service for seniors homes or lifestyle communities (e.g. scheduled mall or supermarket runs)	<input type="checkbox"/>
4. CARSHARING & BIKESHARING		
4.1 Bikeshare stations & memberships		
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"/>
4.2 Carshare vehicles & memberships		
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"/>
5. PARKING		
5.1 Priced parking		
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
6. TDM MARKETING & COMMUNICATIONS		
6.1 Multimodal travel information		
BASIC ★	6.1.1 Provide a multimodal travel option information package to new residents	<input checked="" type="checkbox"/>
6.2 Personalized trip planning		
BETTER ★	6.2.1 Offer personalized trip planning to new residents	<input type="checkbox"/>