DILLON CONSULTING

URBANDALE CONSTRUCTION LTD.

130 Huntmar Drive

Transportation Impact Assessment (TIA)

March 2020 – 19-1698

Certification

I have reviewed and have a sound understanding of the objectives, needs, and requirements of the City of Ottawa's Official Plan and the Transportation Impact Assessment (2017) Guidelines;

I have a sound knowledge of industry standard practice with respect to the presentation of transportation impact assessment reports, including multimodal level of service review;

I have substantial experience (more than 5 years) in undertaking and delivering transportation impact studies (analysis, reporting and geometric design) with strong background knowledge in transportation planning, engineering, or traffic operations; and,

I am either a licensed or registered professional in good standing, whose field of expertise is either transportation engineering or transportation planning.

Signature of individual certifier that s/he meets the above four criteria.

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1.0 Screening

1.1 Description of Proposed Development

Municipal Address	130 Huntmar Drive, located in the NorthEast quadrant of the Huntmar Drive / Maple Grove Road intersection in Kanata West.
Description of Location	The proposed development will be a mixed-use concept, consistent with the Official Plan and the Kanata West Concept Plan. The site will include commercial lands adjacent to the planned Maple Grove Rapid Transit Station with low and medium density residential along the Rapid Transit corridor. There is a school planned at the corner of Huntmar Drive and Maple Grove Road.
Ward	Ward 6 - Stittsville
Land Use Classification	Residential (low and medium density) Commercial School
Development Size	235,568 m2 ~100 Single family homes ~200 Townhomes ~270 Stacked townhomes 30 000 ft2 of retail (2 790 m2) School - 2.409 Ha.
Number of accesses and locations	Huntmar Drive - 3 accesses Maple Grove Road - 3 accesses
Phases of development	One phase
Build-out year	2024

1.2 Trip Generation Trigger

Land Use Type	Minimum Development Size	Yes	No
Single-family homes	40 units	x	
Townhomes or apartments	90 units	x	
Office	3,500 sq.m.		x
Industrial	5,000 sq.m.		x
Fast-food restaurant or coffee shop	100 sq.m.		x
Destination retail	1,000 sq.m.		x
Gas station or convenience market	75 sq.m.		x
Other	60 person trips or more during weekday peak hours	x	

1.3 Location Triggers

	Yes	No
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?	x	
Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone?*	x	

1.4 Safety Triggers

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

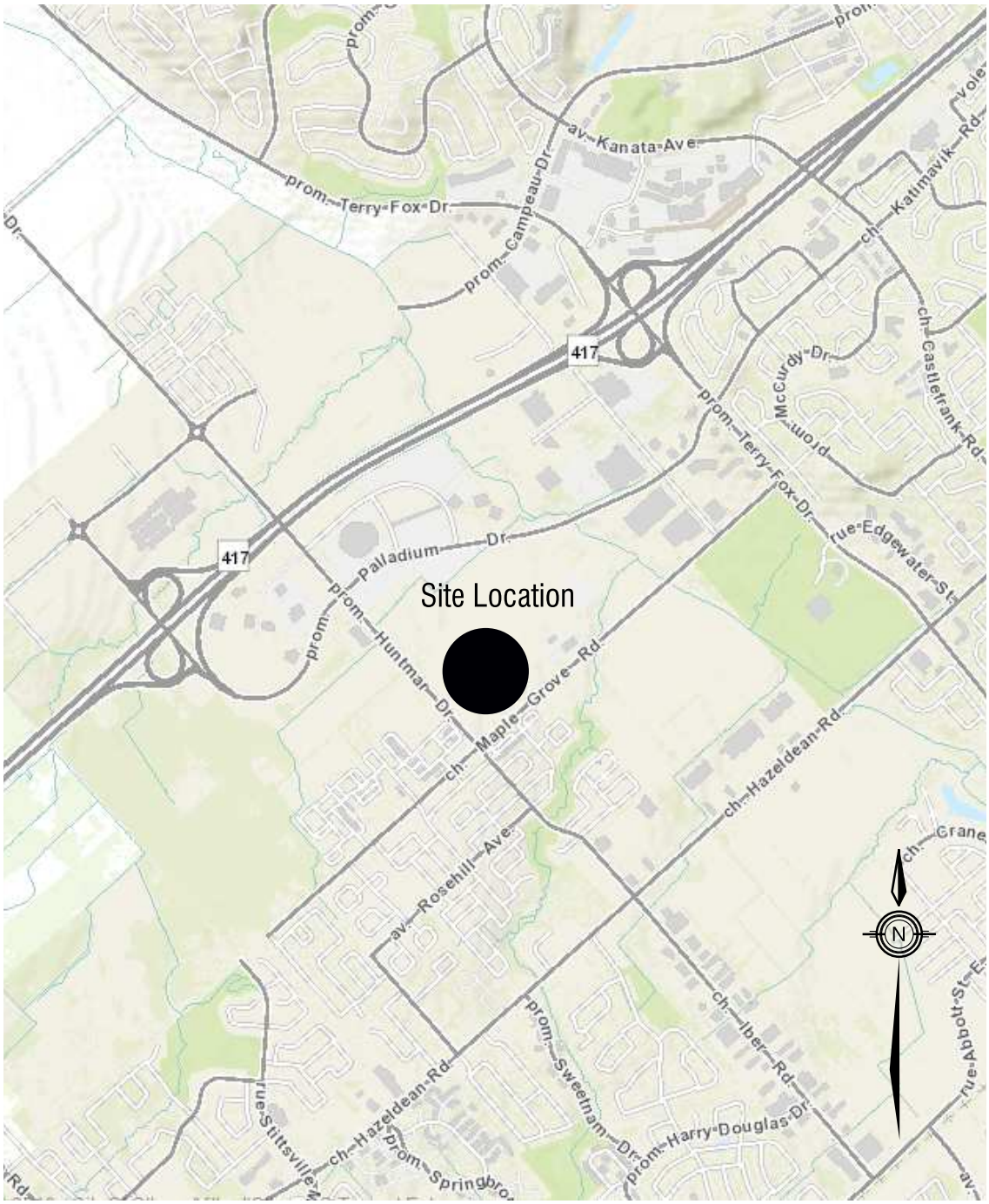
Note that it is unknown at this time where institutional land-use driveways will be located. The site is located in close proximity to the signalized intersection of Maple Grove Road and Huntmar Drive.

1.5 Summary

	Yes	No
Does the development satisfy the Trip Generation Trigger?	x	
Does the development satisfy the Location Trigger?	x	
Does the development satisfy the Safety Trigger?		x

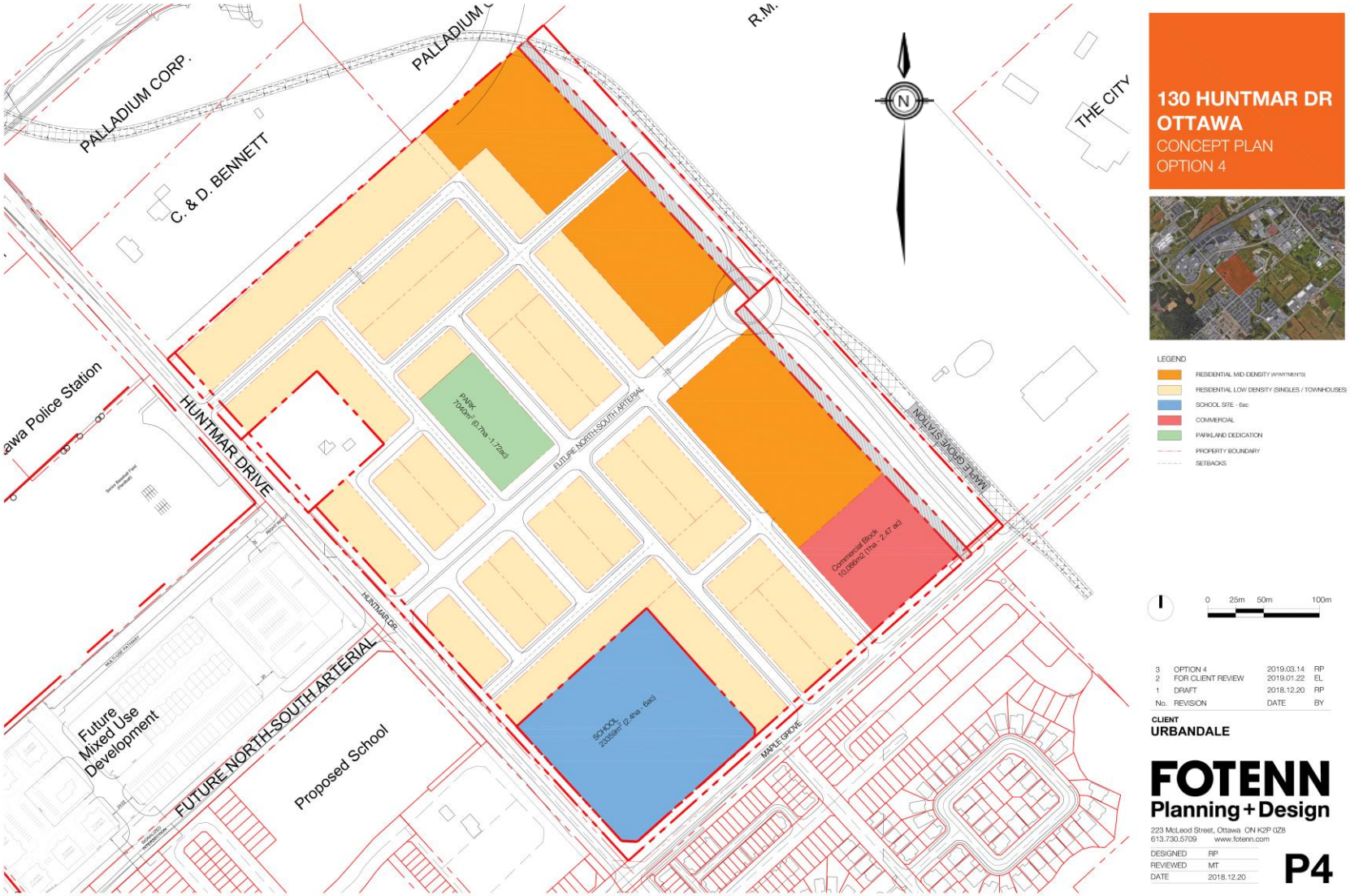
Since the development satisfies the Trip Generation and Location Triggers, the network impact component will be addressed in the TIA. **Figure 1** illustrates the site location, **Figure 2** shows the various land uses, and **Figure 3** illustrates the site plan.

Figure 1: Site Location



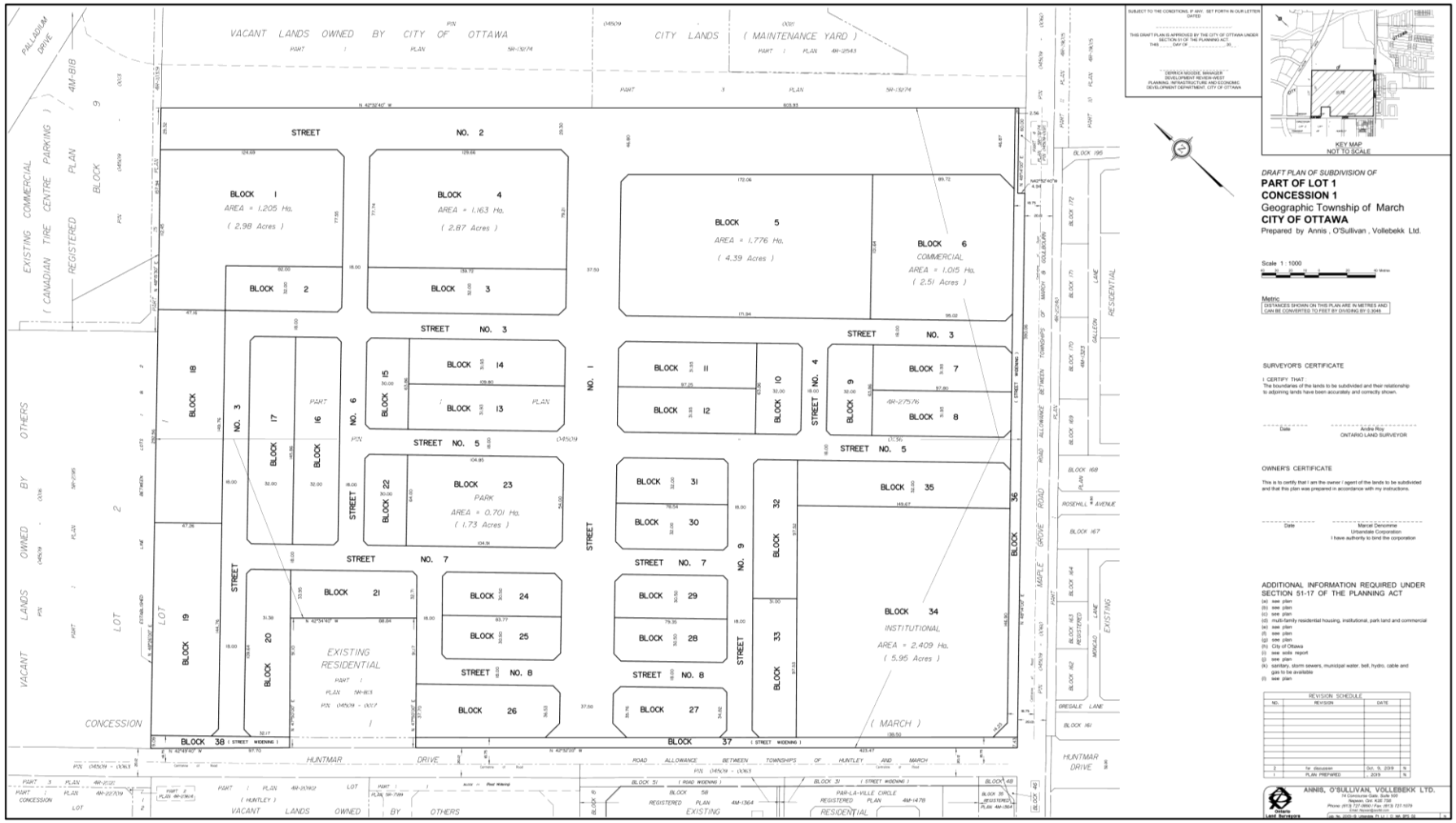
Background image source: geoOttawa, accessed October 25, 2019

Figure 2: Land Use Plan



Background image source: provided by Urbandale, accessed October 25, 2019

Figure 3: Site Plan



Background image source: provided by Urbandale, accessed October 25, 2019

2.0 Scoping

2.1 Existing and Planned Conditions

2.1.1 Proposed Development

The proposed development is within the Kanata West Secondary Plan area. 130 Huntmar Drive, a Western suburb of Ottawa, is located approximately one kilometre South of Highway 417. The site is bound by Palladium Drive to the North, Terry Fox Drive to the East, Maple Grove Road to the South, and Huntmar Drive to the West.

The right-of-way (ROW) protection for Huntmar Drive, Maple Grove Road, and EW Road 3 is 37.5 metres. All other internal roadways will consist of local roads with a ROW protection of approximately 20 metres as per ROW protection requirements for the City of Ottawa. The North-South arterial (NS Road 2) roadway, South of the roundabout will have ROW protection of approximately 47 metres in order to accommodate the future roundabout turning requirements.

Figure 4 illustrates the proposed new intersections that will be assessed as part of the transportation analysis. **Figure 5** illustrates the proposed lane configuration of the development. The following list corresponds to both of these figures:

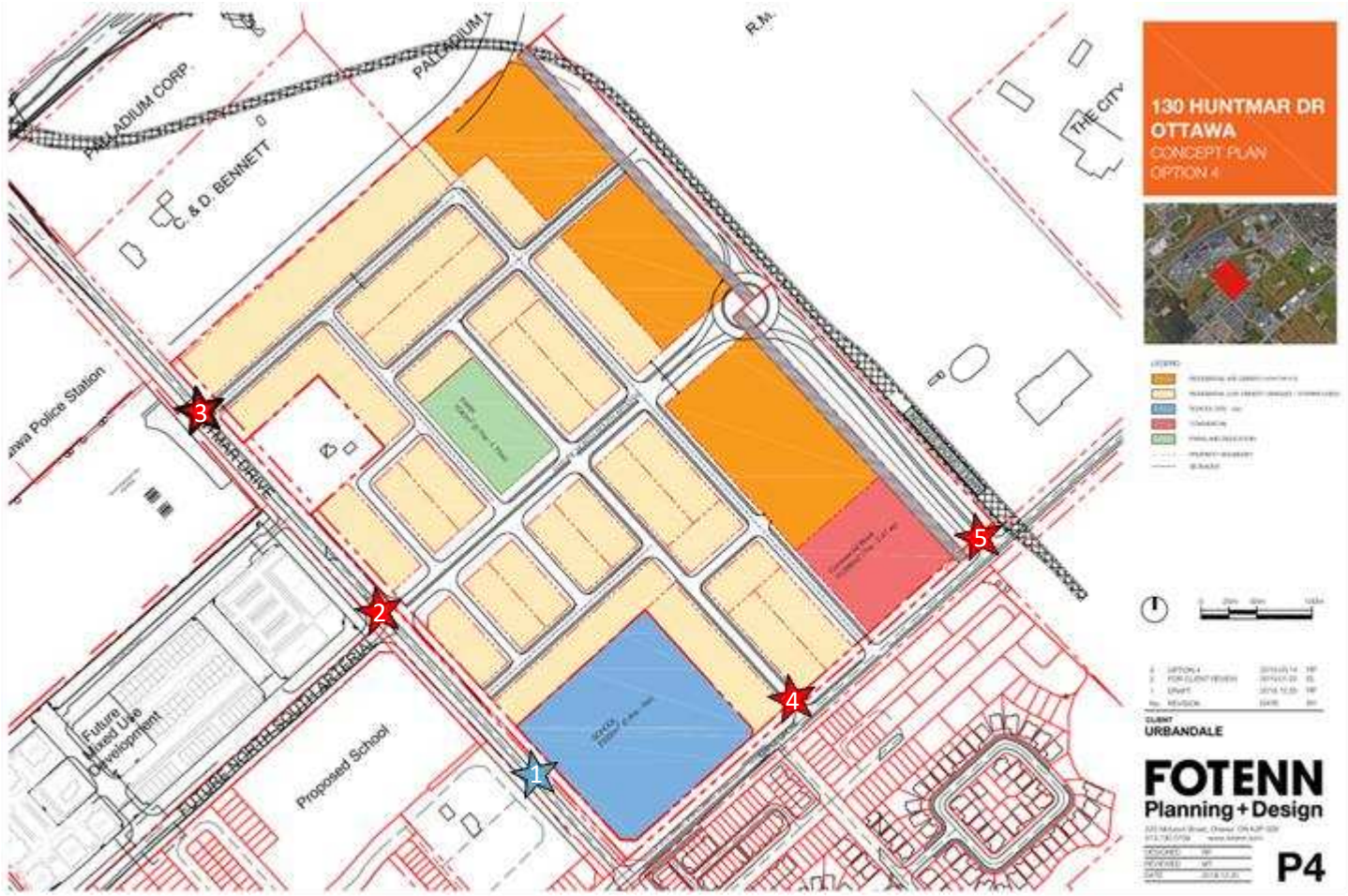
1. Huntmar Drive and School Access
2. Huntmar Drive and EW Road 3
3. Huntmar Drive and EW Road 1
4. Maple Grove Road and NS Road 1
5. Maple Grove Road and NS Road 2

Note that there are two other access intersections that will be part of the proposed development. Both of these access points will have right-in right-out movements and are expected to have minimal traffic impacts on the development; they have not been analyzed in this study. To ensure the analysis appropriately captures potential traffic impacts, all site generated trips have been assigned to the five full access intersections and the school driveway, shown in **Figure 4** and **Figure 5**.

Figure 6 illustrates the network intersections that will be assessed as part of the transportation analysis:

1. Huntmar Drive & Hazeldean Road
2. Huntmar Drive & Rosehill Avenue
3. Huntmar Drive & Maple Grove Road
4. Palladium Drive & Huntmar Drive
5. Palladium Drive & Terry Fox Drive
6. Terry Fox Drive & Maple Grove Road

Figure 4: Proposed New Full Access Intersections for Assessment



Background image source: provided by Urbandale, accessed October 25, 2019

Figure 5: Proposed Lane Configuration

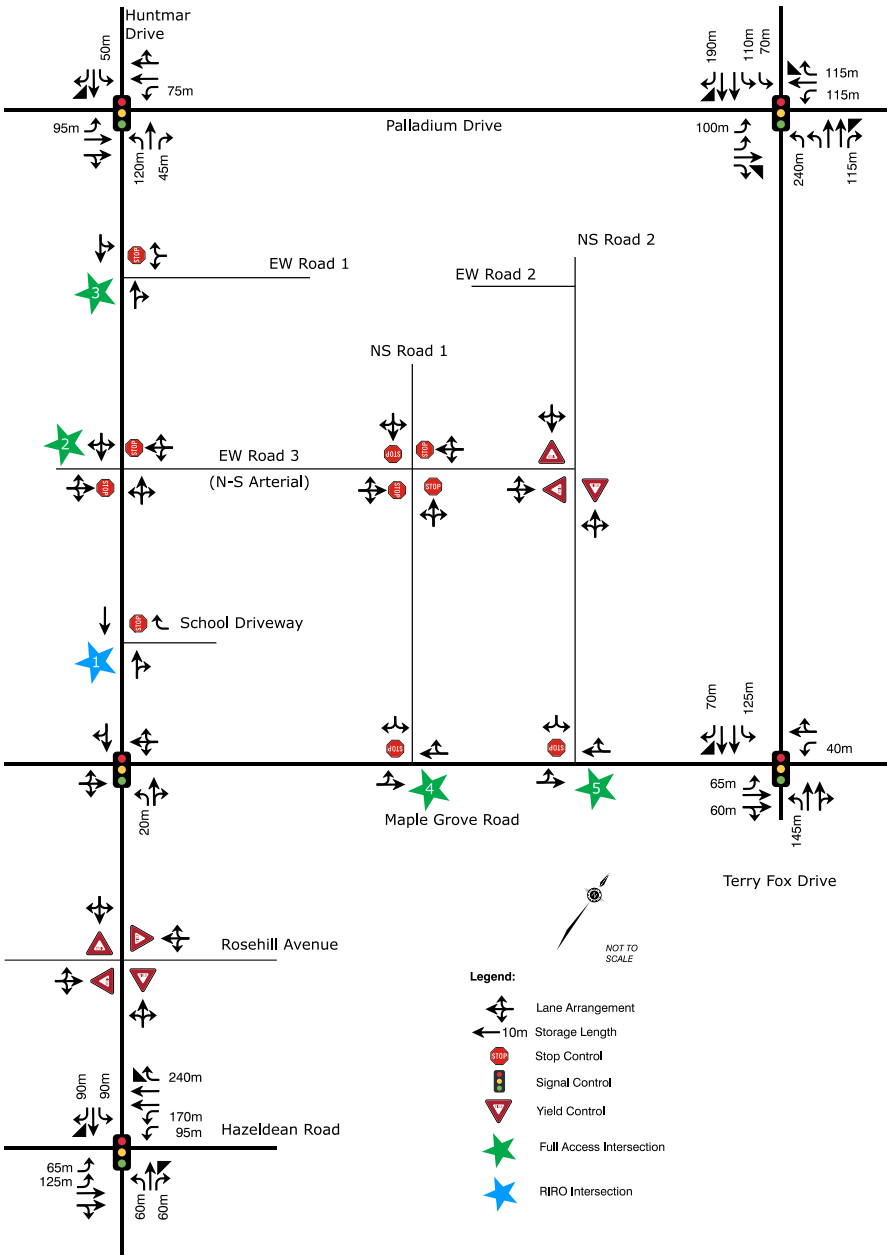
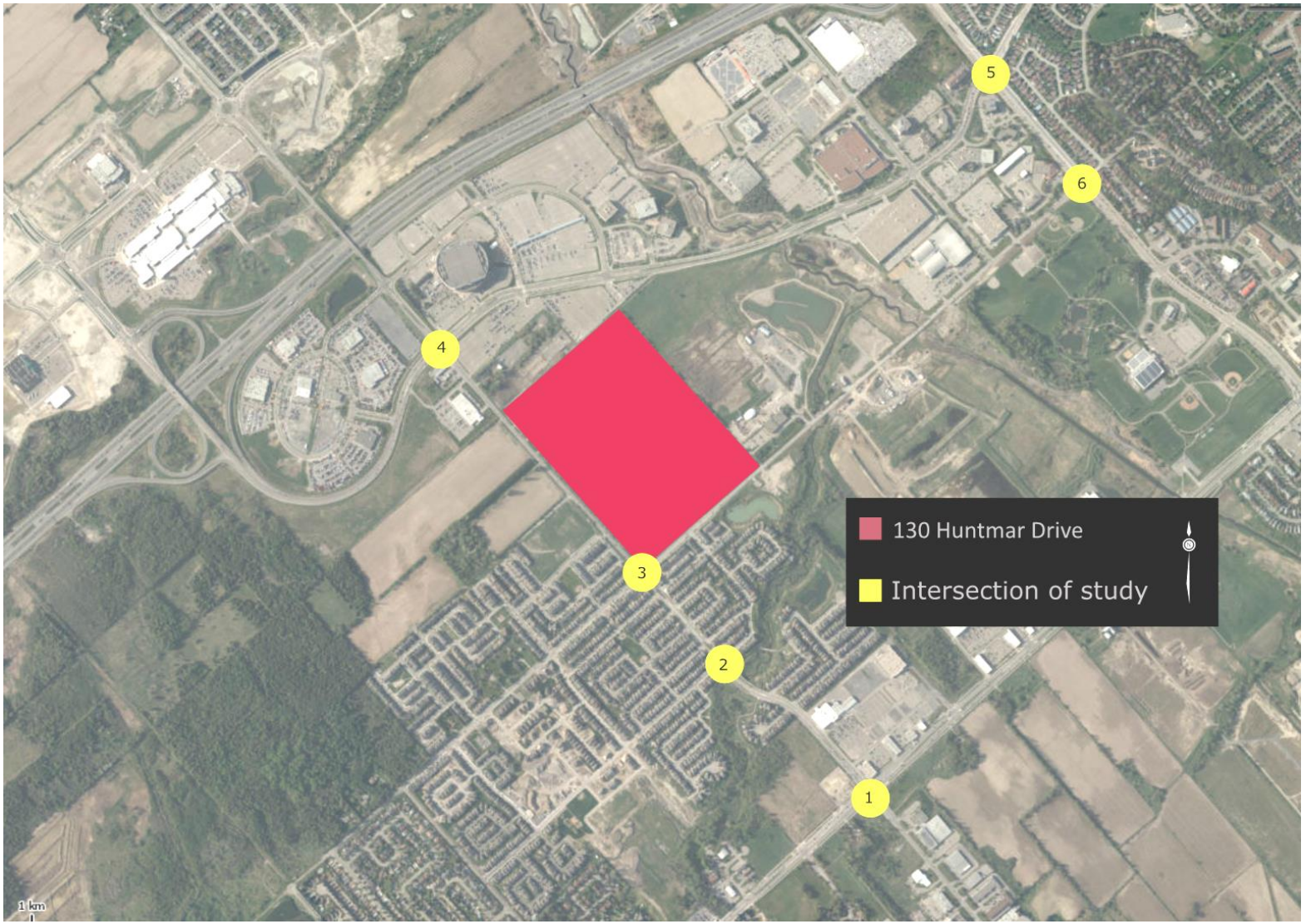


Figure 6: Existing Intersections for Assessment



Background image source: geoOttawa, accessed October 25, 2019

2.1.2 Existing Conditions

2.1.2.1 Roads and Traffic Control

The roadways under consideration in the vicinity of the study area are described as follows:

Table 1: Existing Area Roads

Road	Description	Posted Speed
Huntmar Drive	Huntmar Drive Road is two-lane municipally-owned Arterial road running North-South, bordering the proposed development on the West side. Huntmar Drive connects to the Highway 417 via Palladium Drive.	50 km/h
Maple Grove Road	Maple Grove Road is a two-lane municipally-owned Arterial road running East-West from Alon Street in Stittsville to Young's Farm Way with connections to Highway 417 and Terry Fox Drive.	50 km/h
Terry Fox Drive	Terry Fox Drive is a four-lane, divided, municipally-owned road running North-South from Herzberg Road to Eagleson Road, where it becomes Hope Side Road. It is classified as a Major Collector East of March Road and as an Arterial West to Hope Side Road.	70 km/h
Palladium Drive	Palladium Drive is a four-lane, divided, municipally-owned Arterial road running East-West from Campeau Drive to Terry Fox Drive.	70 km/h
Hazeldean Road	Hazeldean Road is a is a four-lane, divided, municipally-owned Arterial road running West to East from Spruce Ridge Road (West of Highway 417) Market to Eagleson Road. It is located South of the proposed development.	60 km/h

Figure 7 shows the road classification in the study area.

2.1.2.2 Walking and Cycling

Figure 8 illustrates the pedestrian and cycling facilities in the study area. Sidewalks exist along both sides of Palladium Drive, Huntmar Drive (South of Maple Grove Road), and Hazeldean Road. There are sidewalks on the South side of Maple Grove Road from Huntmar Drive to 90 metres east of Rosehill Avenue.

The City's 2013 Transportation Master Plan (TMP) identifies Terry Fox Drive, Hazeldean Road and Huntmar Drive as part of the Cycling Network as Spine Routes. Existing cycling facilities include a bike lane along the East side of Huntmar Drive between Maple Grove Road and Palladium Drive. The north side of Maple Grove Road and the west side of Huntmar Drive consists of paved shoulders. Other major pathways exist in the area connecting various roadways.

Figure 7: Urban Road Network

Background image source: geoOttawa, accessed October 25, 2019

Figure 8: Existing Walking and Cycling Facilities

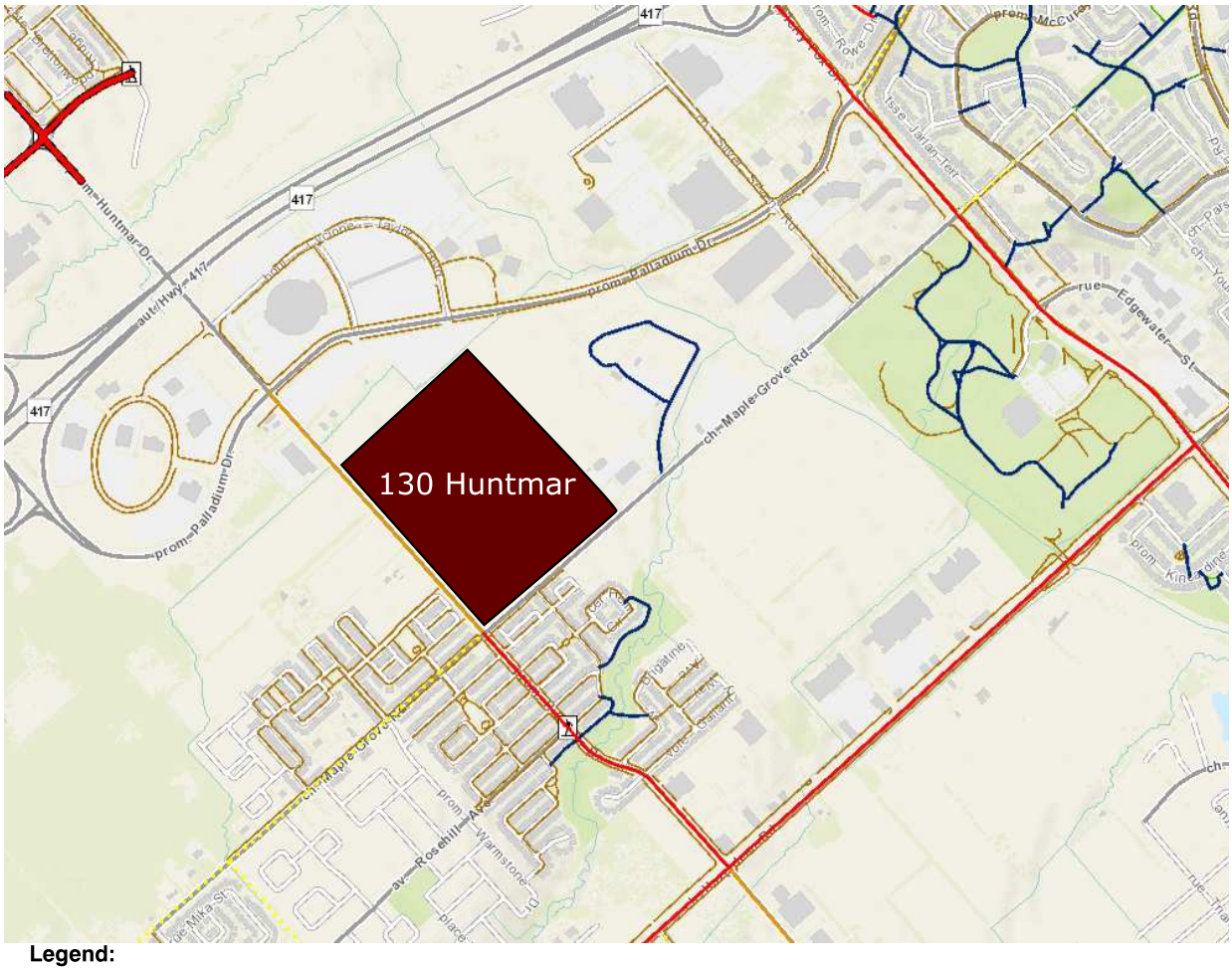


Image source: geoOttawa, accessed November 27, 2019

2.1.2.3 Transit

Figure 9 shows the existing transit service near the proposed development. Existing transit services operate 7 days / week in all time periods along Huntmar Drive and Palladium Drive with convenient access to the O-Train. Transit services operate at headways between 15 minutes and 60 minutes near the site location. Route numbers along with respective transit operation information can be found in **Table 2.**

The TRANS Committee's 2011 *NCR Household Origin-Destination Survey* (O-D Survey) indicates that within the Kanata/ Stittsville district, approximately 46% of residents make trips destined outside of the area during the AM peak period and 34% of trips originating elsewhere conclude within the Kanata / Stittsville district.

Furthermore, approximately 24% of residents originating from the Kanata / Stittsville district during the AM Peak Hour use transit as their primary mode of transportation, compared to 59% using a personal vehicle. Approximately 21% of residents destined to the Kanata / Stittsville district during the PM peak hour use transit, compared to 61% that use a personal vehicle. Roughly 4% of residents travelling within the Kanata / Stittsville district (internal trips) use transit as their primary travel mode during the AM peak period, compared to 2% during the PM peak period.

Table 2: Existing Transit Routes

Route	Stop Location	Destination	Service Hours	Headway (Minutes)
62	Huntmar / Maple Grove	Tunney's Pasture (O-Train Confederation Line)	07:00 - 23:59	30
261	Huntmar / Maple Grove	Tunney's Pasture (O-Train Confederation Line)	06:00 - 08:00	20
263	Huntmar / Maple Grove	Tunney's Pasture (O-Train Confederation Line)	06:00 - 08:00	20
162	Huntmar / Maple Grove	Tanger Outlets and Kanata Centrum	14:00 - 00:00	60
88	Terry Fox / Maple Grove	Hurdman Station	05:00 - 13:00	15

Figure 9: Existing Transit Service

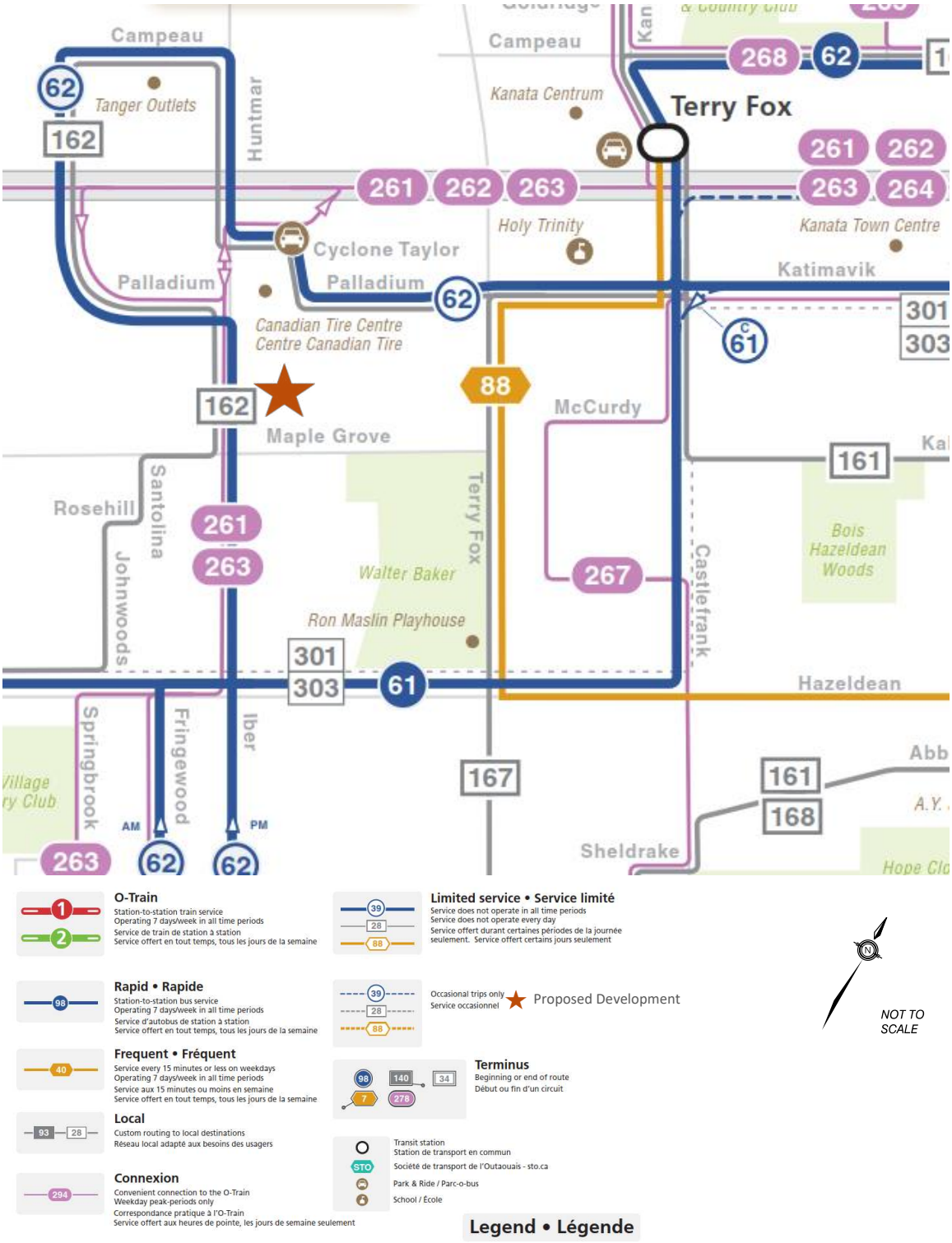


Image source: Except from OC Transpo, accessed November 27, 2019

2.1.2.4 Traffic Management Measures

There are no traffic management measures in the study area.

2.1.2.5 Traffic Volumes

Table 3 summarizes the traffic counts used for this study.

Table 3: Traffic Counts

Intersection	Date	Source
Huntmar Drive & Hazeldean Road	July 2019	City of Ottawa
Huntmar Drive & Rosehill Avenue	December 2016	City of Ottawa
Palladium Drive & Huntmar Drive	April 2019	City of Ottawa
Palladium Drive & Terry Fox Drive	November 2017	City of Ottawa
Terry Fox Drive & Maple Grove Road	March 2016	City of Ottawa
Huntmar Drive & Maple Grove Road	November 2017	City of Ottawa

A separate field investigation was also undertaken by Dillon at the intersection of Maple Grove Road and Huntmar Drive in October 2019. This intersection was chosen due to new development in the area and in order to confirm the general distribution of traffic through the intersection. This location also allowed confirmation of annual growth rates between 2017 traffic count and the 2019 existing conditions. The analysis confirmed that a 3% annual growth rate is reasonable for this location. This growth rate was applied to all intersections in the area to obtain a baseline 2019 network.

Figure 10 illustrates the existing 2019 study area traffic volumes and **Figure 11** illustrates the existing lane geometry and traffic control. For the purpose of this analysis, only two full access intersections were assumed on Maple Grove Road. A third RIRO is provided but to ensure the results of the traffic analysis capture potential impacts, all site traffic was assigned to the full access intersections. For the purpose of this analysis, only two full access intersections were assumed on Huntmar Drive. A third RIRO is provided but to ensure the results of the traffic analysis capture potential impacts, all site traffic was assigned to the full access intersections.

The 2016 and 2017 traffic volumes were grown by 3% per year to simulate existing 2019 conditions. This growth rate was derived from population growth in the surrounding area and by comparing 2016 and 2019 traffic volumes at Huntmar Drive and Rosehill Avenue.

Figure 10: Existing Traffic Volumes

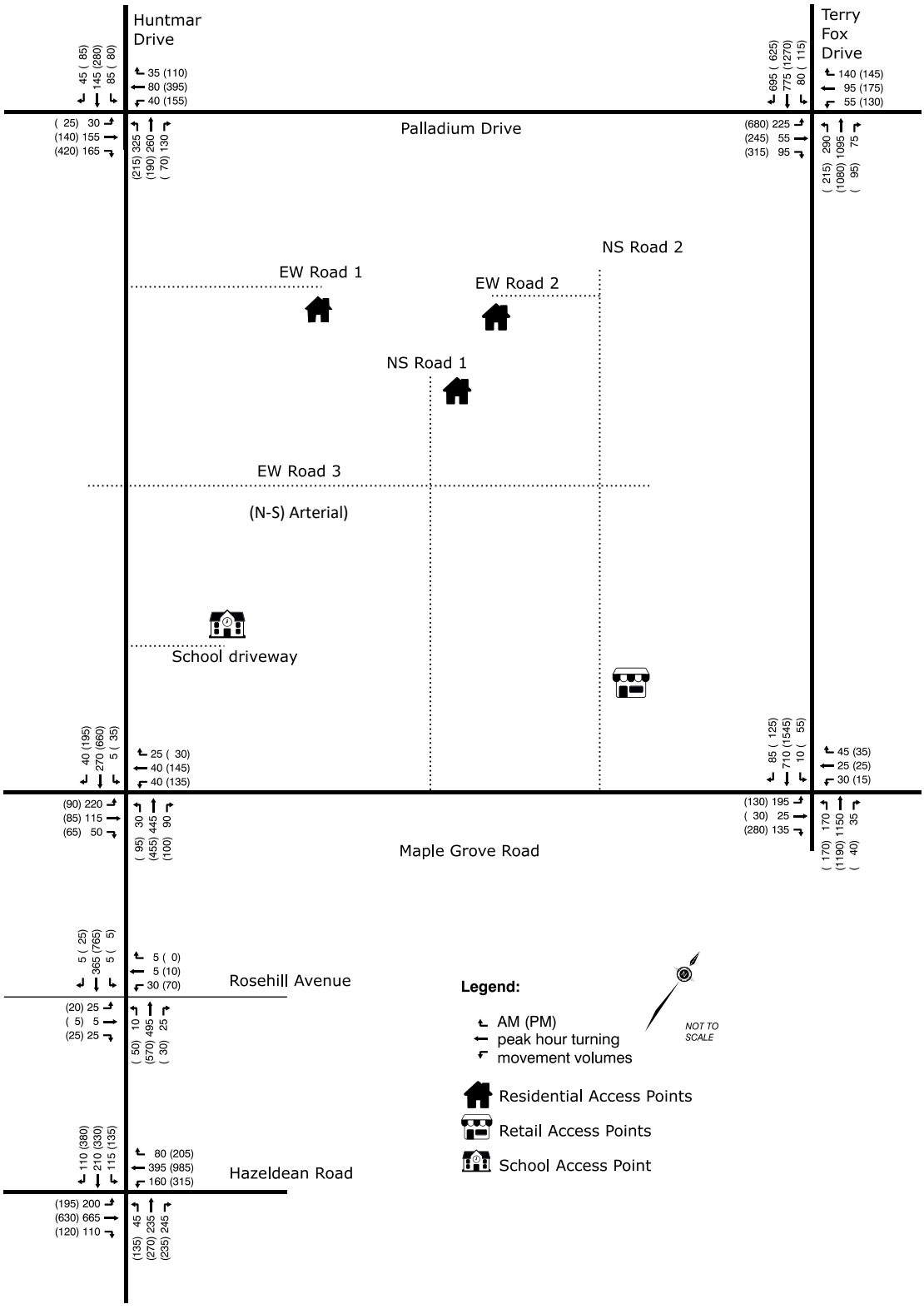
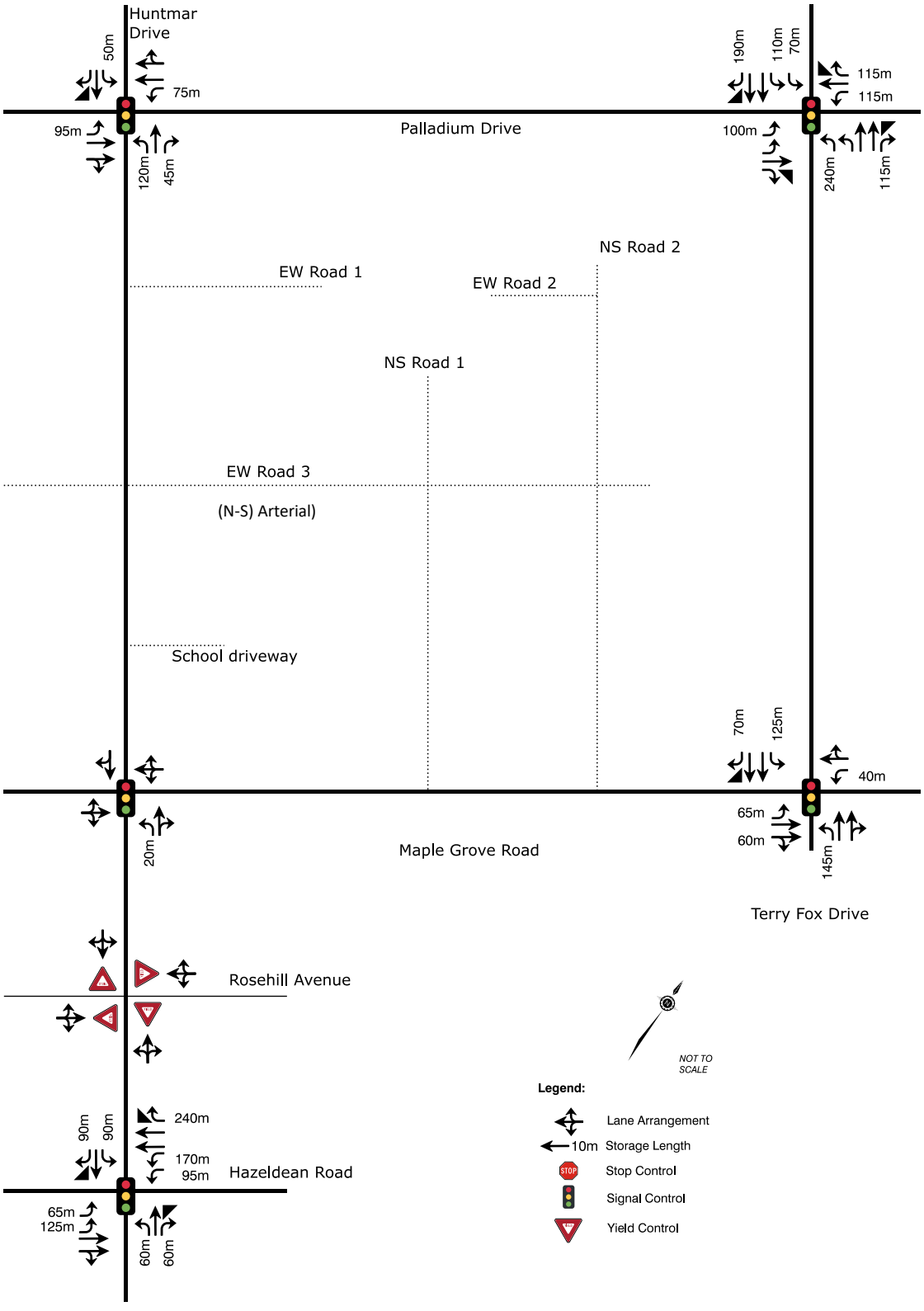


Figure 11: Existing Lane Geometry and Traffic Control



2.1.2.6 Collision History

Figure 12 illustrates the location and number of collisions in the study area between 2014 and 2018. The white number in the red circle indicates the number of total collisions at the location specified within this timeframe.

There are between five (5) and 30 collisions per year at major intersections. **Table 4** provides a breakdowns of collision types at three intersections from 2014 to 2018. The intersection of Huntmar Drive at Maple Grove Road was chosen based on its proximity to the proposed development, while Terry Fox Drive at Pallium Drive and Terry Fox Drive at Maple Grove Road were chosen based on having the highest collision rates of all the study intersections.

The majority of these collisions were rear-end and most resulted in property damage only. The accident rate for the intersection of Huntmar Drive and Maple Grove Road, including the North leg, is 2.9 accidents per million vehicle KMs, indicating low collision numbers in proximity to the development. None of the study area intersections are within the top 10 intersection collision areas within Ottawa based on the data from the 2016 City of Ottawa Road Safety Report.

Table 4: Collision Table

Intersection	Year	Rear End	Turning	Sideswipe	Angle	SMV	Approaching	Total
Huntmar Drive and Maple Grove Road	2014	1	-	-	1	1	-	3
	2015	7	-	-	2	2	-	11
	2016	5	2	1	-	3	-	11
	2017	-	-	1	-	-	1	2
	2018	5	-	-	-	2	-	7
	Total	**18**	**2**	**2**	**3**	**8**	**1**	**34**
Terry Fox Drive and Palladium Drive	2014	29	2	3	1	-	-	35
	2015	20	-	1	2	-	-	23
	2016	18	-	1	-	-	-	19
	2017	9	-	3	-	-	-	12
	2018	12	-	-	-	-	-	12
	Total	**88**	**2**	**8**	**3**	**0**	**0**	**101**
Terry Fox Drive and Maple Grove Road	2014	11	2	1	2	1	-	17
	2015	15	3	3	2	-	-	23
	2016	10	3	1	2	-	-	16
	2017	6	2	1	-	-	-	9
	2018	7	1	-	1	1	-	10
	Total	**49**	**11**	**6**	**7**	**2**	**0**	**75**

Figure 12: Collision Map (2013 to 2018)

Image source: City of Ottawa Open Data Portal, accessed November 28, 2019

2.1.3 Planned Conditions

Road Network

The 2013 TMP identified several road network improvements in the study area:

1. Huntmar Drive to be widened between Maple Grove Road and Campeau Drive;
2. A new E/W Arterial road is to be constructed connecting with E/W Road 3 (Robert Grant Expansion); and,
3. A new N/S Arterial road is to be constructed.

Figure 13 shows the 2031 Affordable Network from the TMP. We understand that discussions are underway regarding the alignment of the new NS Arterial and it may shift further east as a result.

At the time of the 2013 TMP, these projects were all planned for completion prior to the 2031 horizon. However, as of late 2019, City staff indicated that these projects are unlikely to be completed prior to the 2031 horizon.

This analysis has not included the impacts of these road projects and therefore the analysis within this report represents a "worst case" scenario (most constrained transportation scenario). The inclusion of the identified road projects would increase area roadway capacity, alleviating potential vehicle impacts.

Transit

Figure 14 shows the 2031 Affordable Transit Network in the study area. This included isolated transit measures on Hazeldean Road and isolated transit measures on the new NS Arterial roadway.

Figure 15 shows the Ultimate Transit Network in the study area. This included LRT service to the Canadian Tire Centre and then BRT with grade-separated crossings to Robertson Road and then LRT with at-grade crossings further south to Fernbank Road. The Ultimate Transit Network was amended following the *Kanata Light Rail Transit (LRT) Planning and Environmental Assessment Study (2017).*

Figure 16 shows the amended Ultimate Transit Network. This included LRT service to the intersection of Hazeldean Road and the new NS Arterial with a park and ride lot located at said intersection. LRT to Hazeldean Road is part of LRT Stage 3 and at this time is anticipated to occur until sometime after 2031, following completion of LRT Stage 2 in 2025.

Summary

City staff indicated that new road construction, road widening, BRT, and LRT projects will **not** be completed by the 2024 or 2029 horizon years and therefore they will **not** be included in the analysis. The resulting analysis will be conservative since it assumes a constrained transportation scenario.

The Affordable and Ultimate networks will have additional road and transit capacity. The transit service will also be greatly improved, particularly for the proposed development for the Ultimate transit

network. With improved transit, the auto mode share will likely be reduced and the new Arterial roadways will provide additional capacity for the remaining auto vehicles.

Figure 13: 2031 Affordable Road Network

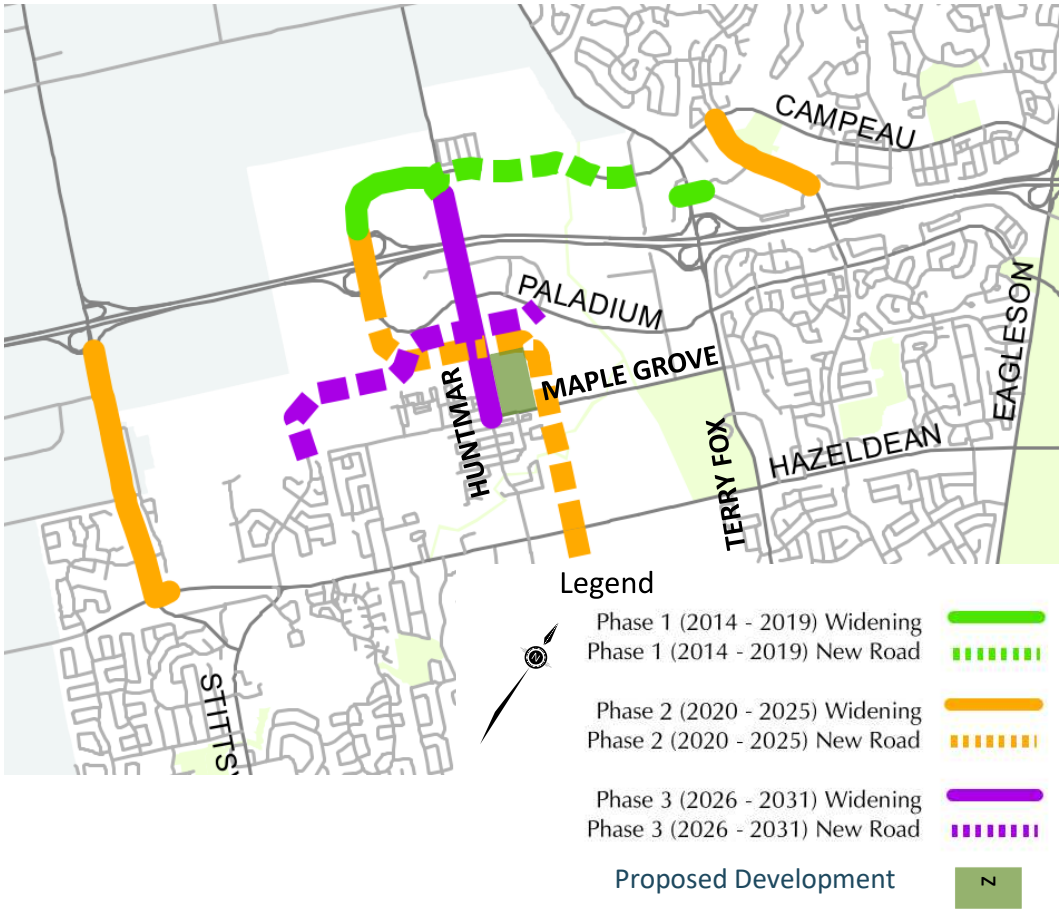


Image source: City of Ottawa 2013 TMP, 2031 Affordable Network, accessed November 28, 2019

Figure 14: 2031 Affordable Transit Network

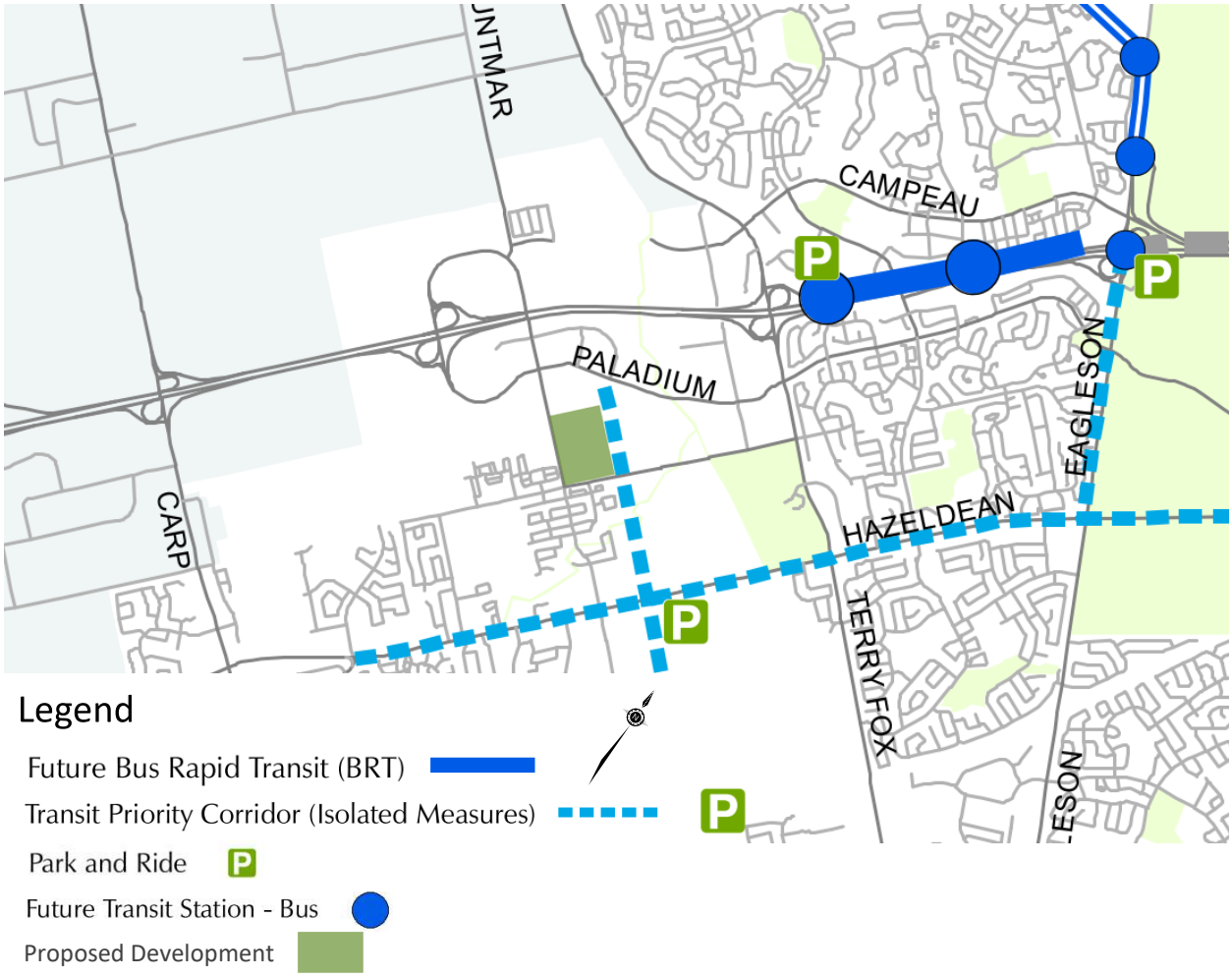


Image source: City of Ottawa 2013 TMP, 2031 Affordable Transit Network, accessed November 28, 2019

Figure 15: Ultimate Transit Network (2013 TMP)

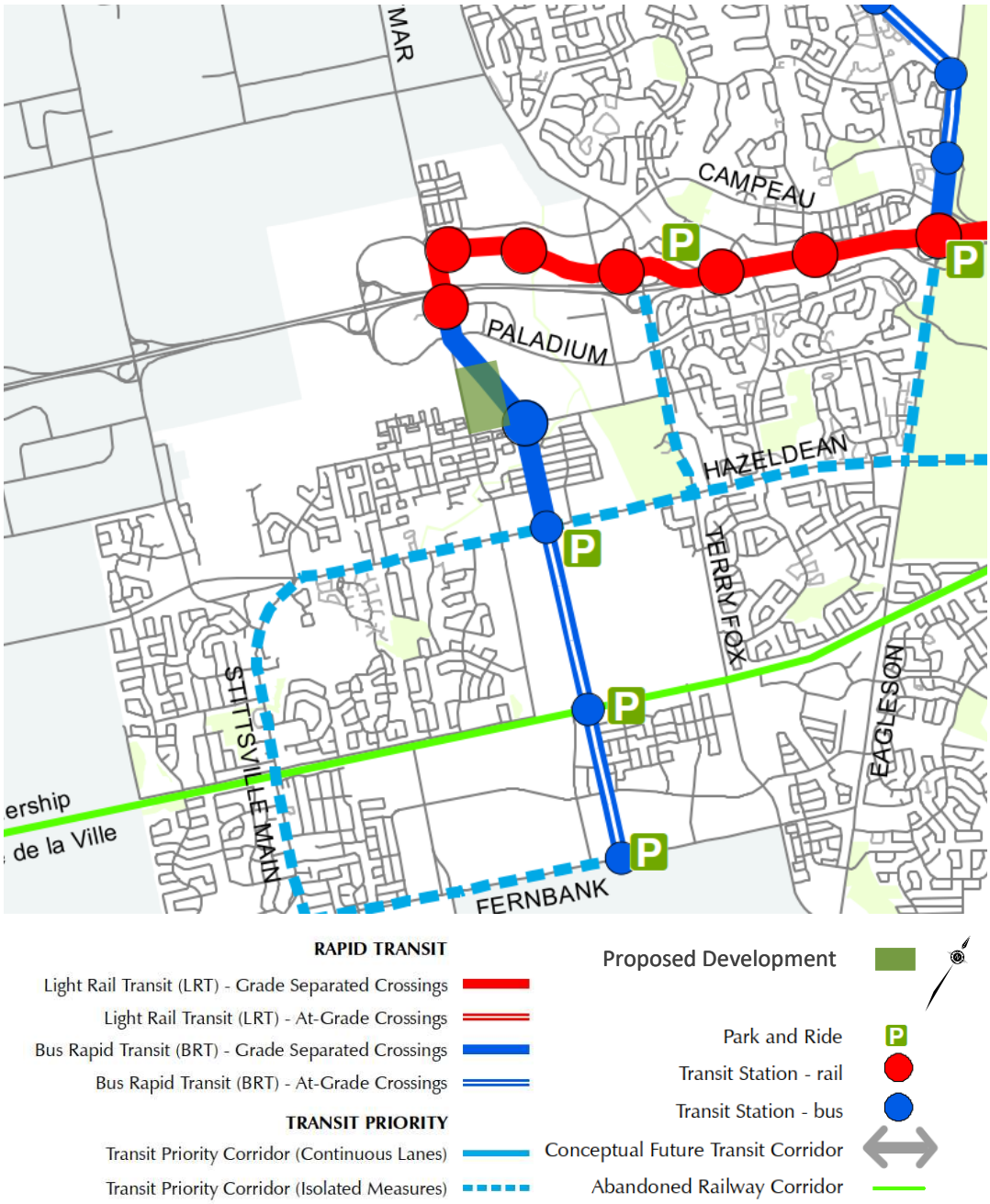


Image source: City of Ottawa 2013 TMP, Ultimate Network, accessed January 16, 2020

Figure 16: Ultimate Transit Network (2017 Kanata LRT EA)

Image source: City of Ottawa Kanata Light Rail Transit Planning and Environmental Assessment Study website, accessed January 16, 2020

2.1.3.1 Walking and Cycling

The current plan in the 2031 Ottawa TMP includes a road expansion along Huntmar Drive between Maple Grove Road and Campeau Drive to increase the number of driving lanes from two to four by 2031, with sidewalks and facilities for pedestrians and cyclists. These lanes would be added following the completion of an EA, pending funding. In advance of this, a multi-use pathway will be implemented along Huntmar Drive.

Maple Grove Road will also see improvements by 2031 through infrastructure such as sidewalks and bike lanes.

2.1.3.2 Future Background Developments

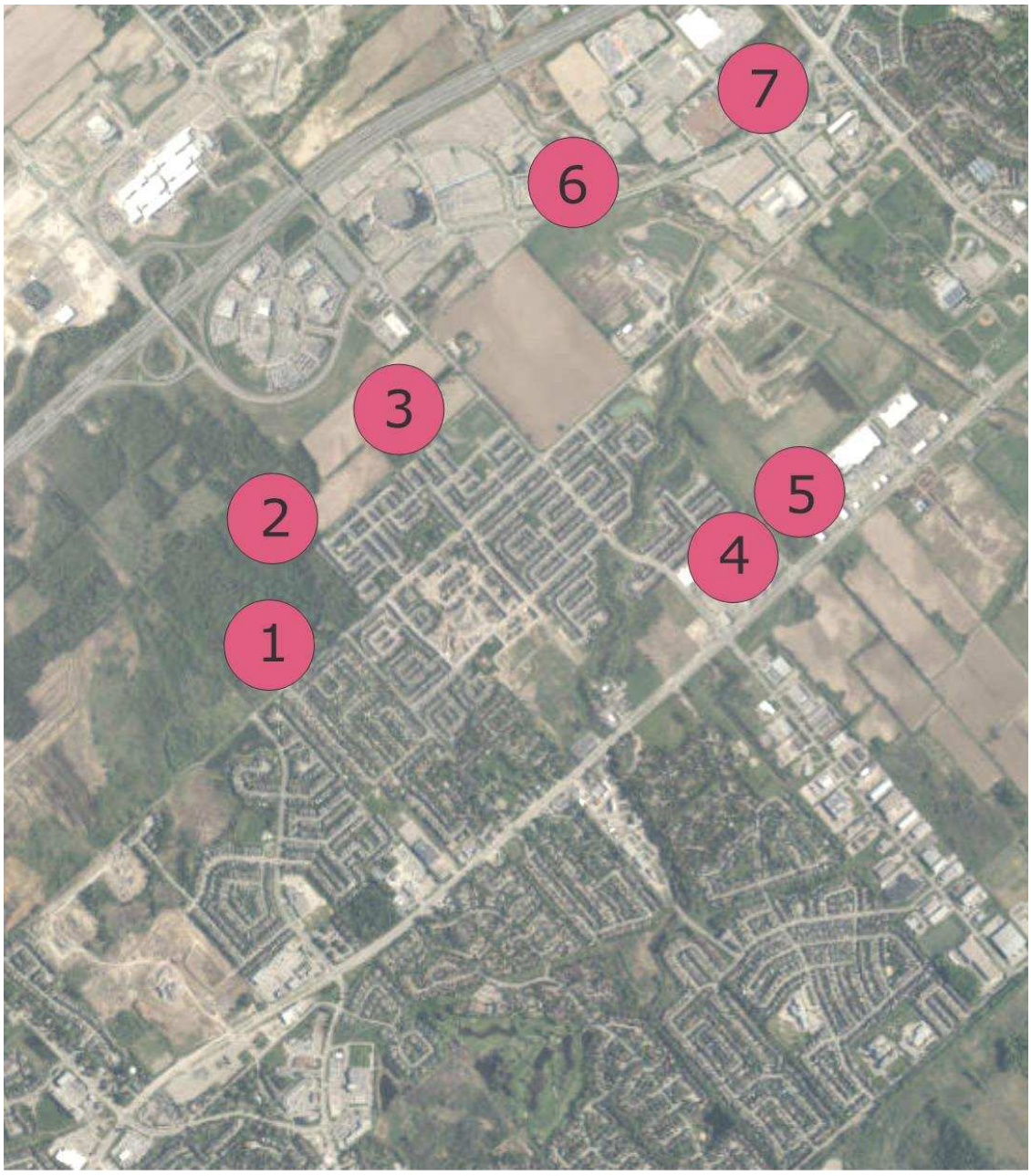
The City of Ottawa's development applications search tool was used to identify other developments within the study area that could impact study area intersections.

Table 5 contains further detail regarding these developments. The application type is mostly Plan of Subdivision and Site Plan Control. Additional developments are also underway along Palladium Drive to the West of Huntmar Drive. **Figure 17** illustrates the surrounding developments.

Table 5: Background Development Information

Development Number	Application Type	Land Use	Address	Size
D07-16-14-0016	Plan of Subdivision	Mixed-use Development	173 Huntmar Drive	206 residential units 65 000 ft^2 of office / retail
D07-16-16-0011	Plan of Subdivision	Mixed-use Development	195 Huntmar Drive	691 residential units, a commercial block, and 5.98 ha district park
D07-16-18-0010	Plan of Subdivision	Residential Subdivision	1981 Maple Grove Road	196 residential units
D07-12-19-0168	Site Plan Control	Community Retail Development	5707 Hazeldean Road	47 710 ft^2 GFA retail
D07-12-16-0032	Site Plan Control	Commercial Retail Development	5649/5705 Hazeldean Road	15 750 ft^2 GFA retail
D07-12-19-0045	Site Plan Control	Mixed-use Development	800 Palladium Drive	11 000 ft^2 GFA commercial 7 400 ft^2 GFA office 5 000 ft^2 GFA restaurant
D07-12-14-0147	Site Plan Control	Silver Seven Corporate Centre	777/737 Seven Silver Road	130 000 ft^2 GFA commercial

Figure 17: Background Developments



Legend

Development Area

1: D07-16-18-0010 - 1981 Maple Grove Road - Residential Subdivision
2: D07-16-14-0016 - 173 Huntmar Drive - Mixed Use Development
3: D07-16-16-0011 - 195 Huntmar Drive - Mixed Use Development
4: D07-12-19-0168 - 5707 Hazeldean Road - Community Retail Development
5: D07-12-16-0032 - 5649/5705 Hazeldean Road - Residential and Commercial
6: D07-12-19-0045 - 800 Palladium Drive - Mixed Use Development
7: D07-12-14-0147 - 777/737 Silver Seven Road - Silver Seven Corporate Centre

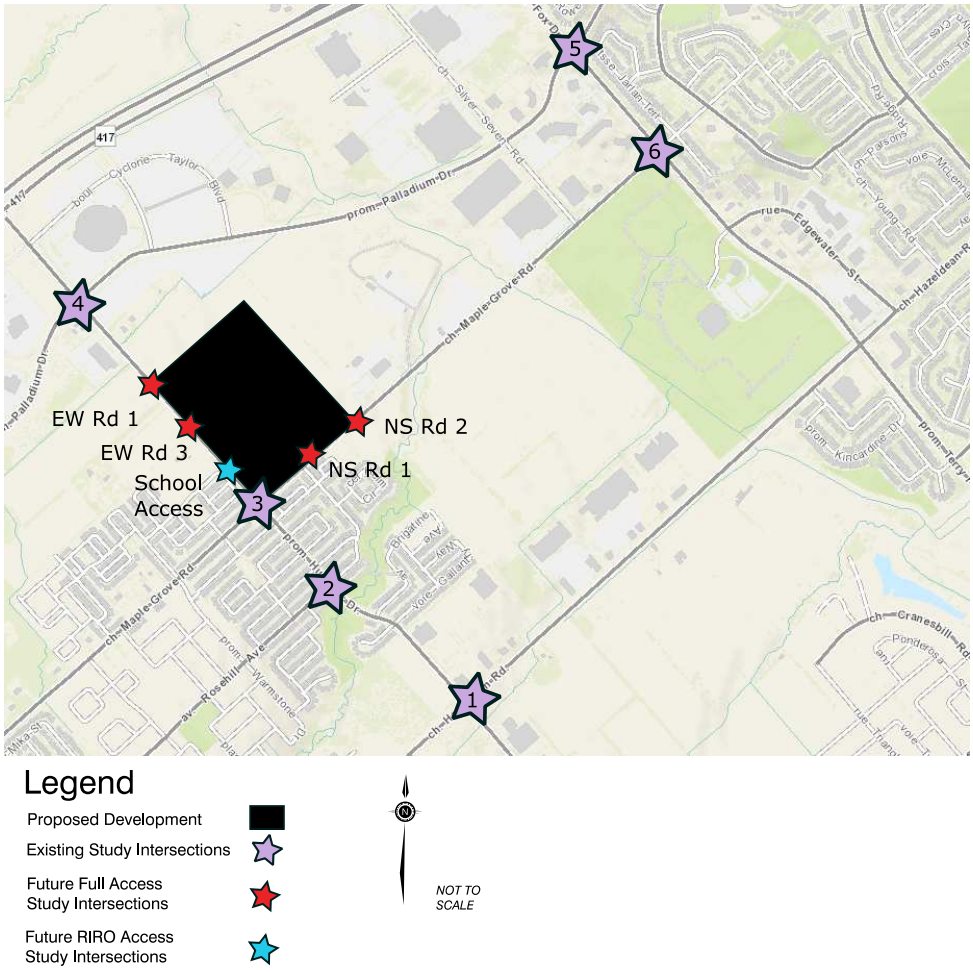
Background image source: geoOttawa, accessed December 4, 2019

2.2 Study Parameters

2.2.1 Study Area

Figure 18 illustrates the proposed study area intersections.

Figure 18: Study Area Intersections



Background image source: geoOttawa, accessed November 28, 2019

2.2.2 Time Periods

The development is primarily residential and therefore the weekday AM and PM peak hours will govern the analysis.

2.2.3 Horizon Years

Construction will commence in 2022 and is planned to be completed in 2024. The analysis will assess transportation for the 2024 horizon year, and in 2029, five years after build-out.

2.3 Exemptions Review

Table 6 presents the exemptions review table from the City of Ottawa's 2017 *Transportation Impact Assessment Guidelines*. The exemptions were rationalized as follows:

1. the TIA is not being submitted for a site plan and therefore elements 4.1.2, 4.2.1, 4.2.2, and 4.5 are exempt; and,
2. the proposed development generates less than 200 person trips in excess of the equivalent volume permitted by established zoning.

Table 6: Exemptions Review

Module	Element	Exemption Consideration	Status
Design Review Component			
4.1 Development Design	4.1.2 Circulation and Access	Only required for site plans	Exempt
	4.1.3 New Street Networks	Only required for plans of subdivision	Included
4.2 Parking	4.2.1 Parking Supply	Only required for site plans	Exempt
	4.2.2 Spillover Parking	Only required for site plans where parking supply is 15% below unconstrained demand	Exempt
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	Included
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	Exempt
4.8 Network Concept		Only required when proposed development generates more than 200 person trips during the peak hour in excess of the equivalent volume permitted by established zoning	Exempt
4.9 Intersection Design	All Elements	Not required if site generation trigger is not met	Included

3.0 Forecasting

3.1 Development-Generated Travel Demand

3.1.1 Trip Generation and Mode Shares

The proposed development includes residential, retail, recreation, and an elementary school. Several data sources were referenced to estimate the trip generation for the proposed development.

For residential and retail developments, the data sources are for vehicle trip generation. As per the TIA Guidelines, these vehicle trip rates were converted to person trip rates so that custom mode shares could be applied for the Kanata/Stittsville development context. The mode share for each land use was estimated using a combination of TRANS OD survey data, field observations, and professional judgement.

Residential Trips: The TRANS Trip Generation Study Report (2009) was used to estimate residential trip generation. The person trip rates were obtained by dividing the vehicle trip generation rates[1] by the auto vehicle mode share[2].

Retail Trips: The Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th edition, was used to estimate the retail trip generation. ITE rates often correspond with data collected in the United States as far back as 1980; ITE rates typically represent a high auto driver mode share (assumed 90%).

Recreation Trips: The planned park was not included in the trip generation calculation as it was assumed it will generate few trips during the peak hours and many of those trips would be local trips via walking or cycling and therefore there is minimal impact on the transportation network.

Elementary School Trips: The elementary school trip generation was estimated based on a trip generation study conducted in 2018 at the French catholic elementary school Bernard-Grandmaître, located in Riverside South. Bernard-Grandmaître has ~449 sq.m. of daycare, 765 students, 59 staff, and 11 school buses; this is more students, staff, and school buses than another French catholic elementary school in the area despite having a smaller footprint.The catchment areas of French catholic schools can be larger than English catholic or public schools, however, the vehicle trip generation is similar to the ITE rates (for the lower end of the spectrum).Overall, the trip generation for Bernard-Grandmaître is a reasonable proxy for estimating trip generation for the proposed school in Stittsville.

Table 7 and **Table 8** trip generation rates and total trips generated by the residential and retail land uses. **Table 9** summarizes the forecasted elementary school trip generation which is the same as the observed trip generation at Bernard-Grandmaître.

[1] TRANS Trip Generation Study Report (2009) Table 6.3
[2] TRANS Trip Generation Study Report (2009) Table 3.13

Table 7: Person Trip Generation Rates – Residential and Commercial

Land Use Code / Land Use	Source	Auto Trip Gen Rate				Auto Mode Share		Units	Person Trip Generation Rate	
		AM		PM						
		Rate	In %	Rate	In %	AM	PM		AM	PM
210: Single-detached homes	TRANS	0.7	29%	0.9	62%	55%	64%	Dwellings	1.27	1.41
224: Semi-detached, townhomes	TRANS	0.54	37%	0.71	53%	52%	62%	Dwellings	1.04	1.15
223: Mid-rise apartment 3-10 floors	TRANS	0.29	24%	0.37	62%	44%	44%	Dwellings	0.66	0.84
816: Hardware/Paint Store	ITE	1.08	54%	2.68	47%	90%	90%	1000 sq. ft. GFA	1.20	2.98
851: Convenience Market	ITE	62.5	50%	49.1	51%	90%	90%	1000 sq. ft. GFA	69.49	54.57
890: Furniture Store	ITE	0.26	71%	0.52	47%	90%	90%	1000 sq. ft. GFA	0.29	0.58
912: Drive-In Bank	ITE	9.5	58%	20.5	50%	90%	90%	1000 sq. ft. GFA	10.56	22.72
933: Fast-Food Restaurant w/o Drive-Thru	ITE	25.1	60%	28.3	50%	90%	90%	1000 sq. ft. GFA	27.89	31.49
936: Coffee/Donut Shop w/o Drive-Thru	ITE	101.1	51%	36.3	50%	90%	90%	1000 sq. ft. GFA	112.38	40.34

Table 8: Person Trips – Residential and Commercial

Land Use	Size	AM Peak Hour			PM Peak Hour		
		Total	In	Out	Total	In	Out
210: Single-detached homes	100 D.U.	127	37	90	141	87	54
224: Semi-detached, townhomes	200 D.U.	208	77	131	229	121	108
223: Mid-rise apartment 3-10 floors	270 D.U.	178	43	135	227	141	86
816: Hardware/Paint Store	2.9 k sq.ft.	3	2	1	8	4	4
851: Convenience Market	1.4 k sq.ft.	97	49	48	76	39	37
890: Furniture Store	1.7 k sq.ft.	0	0	0	1	0	1
912: Drive-In Bank	1.0 k sq.ft.	11	6	5	23	12	11
933: Fast-Food Restaurant w/o drive-thru	1.2 k sq.ft.	32	19	13	37	19	18
936: Coffee/Donut Shop w/o drive-thru	1.0 k sq.ft.	110	56	54	1	1	0
Total		**766**	**289**	**477**	**318**	**187**	**131**

Table 9: Elementary School Trip Generation

Location	Weekday AM Peak Hour of Roadway			Weekday PM Peak Hour of Roadway[3]		
	Total	In	Out	Total	In	Out
Staff parking lot vehicles	25	25	0	5	0	5
Student drop-offs / pick-up vehicles	94	47	47	0	0	0
Daycare drop-off / pick-up vehicles	74	37	37	30	15	15
School buses	22	11	11	0	0	0
Cycling (10% of students)	77	77	0	0	0	0
Walking (10% of students)	77	77	0	0	0	0
Total vehicle trips	193	109	84	35	15	20
Pass-by trips (student and daycare drop off)	94 + 74 / 193 = 87%			30 / 35 = 86%		
New trips (staff)	13%			14%		

For the retail and commercial land uses, the mode shares for the proposed development were determined using the TRANS O-D survey for the Kanata/Stittsville district:

- For residential mode shares, a blend of the 'from' and 'within' the district was used for the AM peak hour, and 'to' and 'within' the district was used for the PM peak hour.
- For retail mode shares, a blend of the 'to' and 'within' district was used for the AM peak hour and 'from' and 'within' the district was used for the PM peak hour.

Table 10 summarizes the trip generation by mode for the proposed residential and retail land uses. This 'other' category includes walking, cycling, school bus, paratransit, motorcycle / scooter, taxi, ferry, VIA rail, intercity chartered bus, and airplane.

Table 10: Trip Generation by Mode – Retail and Residential

Land Use	Travel Mode	Mode Share		AM Peak Hour			PM Peak Hour		
		AM	PM	Total	In	Out	Total	In	Out
Residential	Auto Driver	52%	59%	267	82	185	352	206	146
	Auto Pass.	13%	19%	67	20	46	113	66	47
	Transit	14%	12%	72	22	50	69	40	29
	Other	21%	11%	108	33	75	63	37	26
	Total	100%	100%	513	157	356	597	349	248
Retail	Auto Driver	60%	65%	151	79	72	120	61	59
	Auto Pass.	12%	20%	30	16	15	37	19	18
	Transit	6%	5%	15	8	7	8	4	4
	Other	23%	11%	57	30	27	19	10	9
	Total	100%	100%	253	132	121	184	94	90

[3] The Weekday PM pk hr was not observed at the French catholic elementary school Bernard-Grandmaître. The total vehicle trips were assumed to be 1/7th the AM pk hr trip generation. This assumption was based on the difference between the AM and PM pk hr average vehicle trip generation rates for an elementary school (LUC 520), ITE Trip Generation Manual, 10th edition.

There are a total of 57 outbound and 44 inbound transit trips forecast for the AM and PM peak hours respectively. (Peak Direction)

3.1.1.1 Internal Capture

This analysis includes the assignment and evaluation of internal roadways for the proposed development and therefore it is not appropriate to apply the principle of internal capture reduction for trips **between** residential, retail, and school land uses. Instead, trips between these land uses will be assigned explicitly.

The retail is concentrated in one area and therefore the principle of internal capture can be applied for retail-retail trips; it may reduce the impact of the proposed development on the study area road network, since some trips may visit multiple retail properties.

The magnitude of internal capture depends on the land uses and the likelihood of users to visit multiple properties. For this proposed development, the major retail trip generators were assumed to be a convenience market, fast-food restaurant (without drive through), and coffee/donut shop (without drive through). These are relatively similar land uses and therefore the internal capture rate is anticipated to be low (assumed to be 5%).

Table 11 summarizes the trip generation by mode after internal capture reductions.

Table 11: Trip Generation by Mode After Internal Capture

Land Use	Travel Mode	Internal Capture Rate		AM Peak Hour			PM Peak Hour		
		AM	PM	Total	In	Out	Total	In	Out
Retail	Auto Driver	5%	5%	143	75	68	114	58	56
	Auto Pass.	5%	5%	29	15	14	35	18	17
	Transit	5%	5%	14	8	7	8	4	4
	Other	5%	5%	54	28	26	18	9	9
	Total	5%	5%	240	125	115	175	89	86

3.1.1.2 Pass-By and Diverted Traffic

Fast-food restaurants, convenience markets, and elementary schools are rarely the primary trip purpose; they are usually the mid-point of a trip, called a ‘pass-by’ or ‘diverted’ trip.

Table 12 summarizes the breakdown of new trips, pass-by trips, and diverted trips. The assumed rates are based on professional judgement, since there is limited ITE data for these land uses or the ITE data was collected in the United States in 1987.

Overall it is anticipated that there will be 603 vehicle trips generated during the AM peak hour and 501 vehicle trips generated during the PM peak hour. Of these vehicle trips, there will be 311 new vehicle

trips during the AM peak hour and 371 new vehicle trips during the PM peak hour. These values can be seen in **Table 12**. The remainder of the vehicle trips are anticipated to be pass-by or diverted trips.

Table 12: Pass-By and Diverted Traffic (Auto Driver Trips)

Land Use	Trip Type	Percent		Auto Driver Trips					
		AM	PM	AM			PM		
				Total	In	Out	Total	In	Out
School	Total trips	100%		193	109	84	35	15	20
	New staff trips	from **Table 9**		25	25	0	5	0	5
	Drop-off / Pick-up	remainder		168	84	84	30	15	15
	from new residential	*33%*		*56*	*28*	*28*	*10*	*5*	*5*
	from existing residential	*67%*		*112*	*56*	*56*	*20*	*10*	*10*
Retail	Total trips	100%		143	75	68	114	58	56
	Pass-by trips	90%		124	62	62	100	50	50
	New trips	10%		19	13	6	14	8	6
Residential (new trips)	Total trips	100%		267	82	185	352	206	146
	Home-School-Work Trips	33% of drop-off/pick-up		56	28	28	10	5	5
	Home-Work Trips	Remainder		211	54	157	342	201	141
Total	Pass-by / diverted trips			292	146	146	130	65	65
	New trips			311	119	192	371	214	157
	Total			603	265	338	501	279	222

3.1.2 Trip Distribution

The trip distribution for new residential trips, pass-by school trips, and pass-by retail trips was specified separately than new retail trips and new school trips, since the former are likely home-work based and the latter are likely local only and therefore the distributions are different.

The TRANS O-D Survey indicated that 69% of all AM peak hour trips originating in the Kanata / Stittsville district are trips to work. Using this information it was determined that the majority of the origins (during PM peak period) and destinations (during AM peak period) are office and industry sectors located north and east of the study area. Traffic was assigned using three main points of destination to and from the area:

1. Ottawa Center (Destination for large majority of residents during peak hours);
2. Kanata North (Destination for residents during peak hours due to density of office spaces); and,
3. Nearby retail/schools (Destination within the district for smaller portion of residents during peak hours).

Table 13 summarizes the trip distribution used for this analysis.

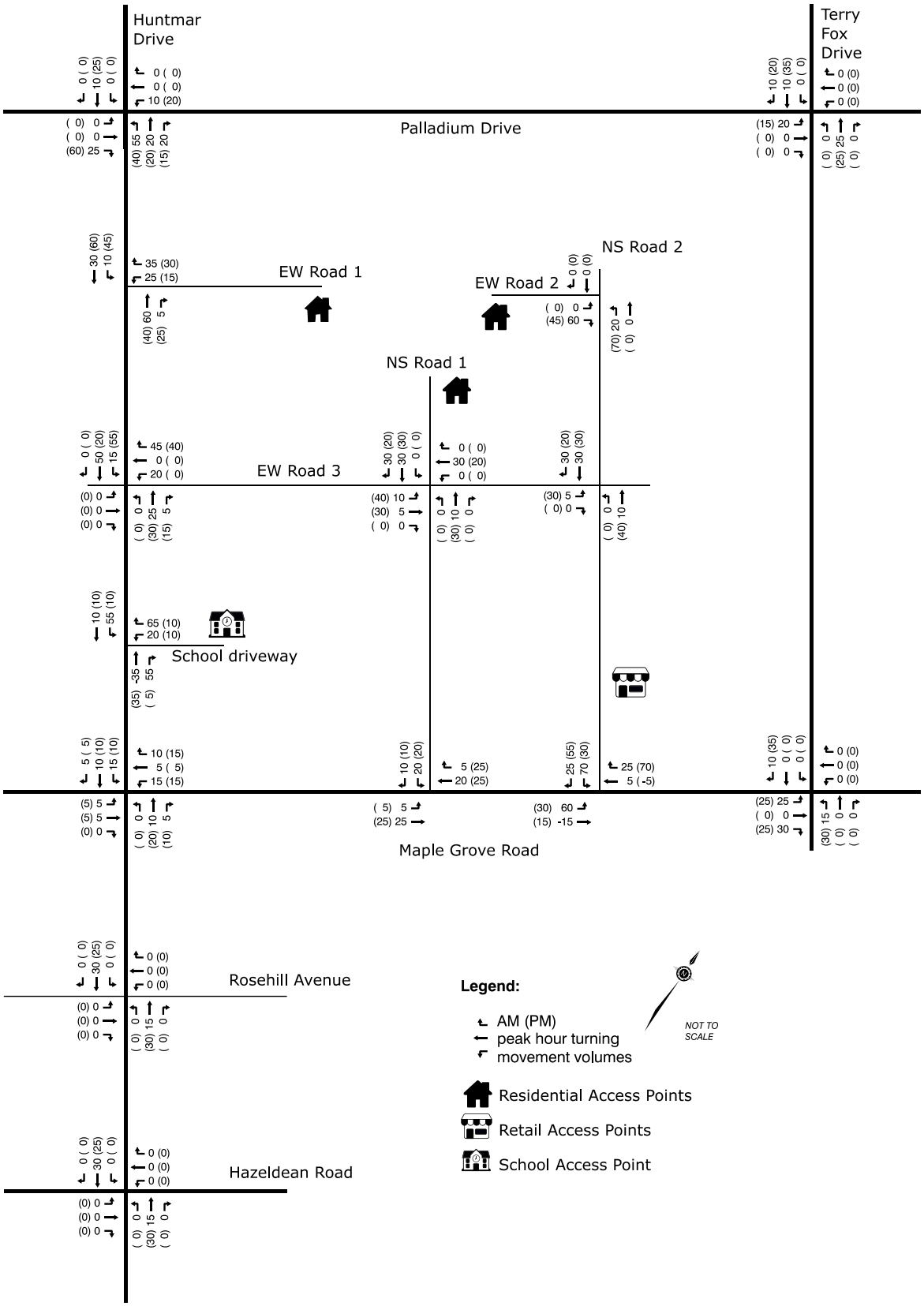
Table 13: Trip Distribution

Cardinal Direction	New Residential New School (staff) Pass-by School Pass-by Retail	New Retail Trips New School (Home-School-Home drop-offs)
North	12%	25%
East	50%	25%
South	30%	25%
West	8%	25%
Total	**100%**	**100%**

3.1.3 Trip Assignment

Figure 19 illustrates the trip assignment to the study area road network. The trip assignment for new retail trips and new school trips was a simple assignment to the local road network surrounding the proposed development.

Figure 19: Trip Assignment



3.2 Background Network Travel Demand

3.2.1 Transportation Network Plans

There are several road network projects identified in the Transportation Master Plan, however, City staff indicated that these projects are unlikely to be completed prior to 2031 and therefore the impact of these road network projects has not been included in this analysis.

The Affordable and Ultimate networks will have additional road and transit capacity. The transit service will also be greatly improved, particularly for the proposed development for the Ultimate transit network. With improved transit, the auto mode share will likely be reduced and the new Arterial roadways will provide additional capacity for the remaining auto vehicles. In other words, issues identified as part of this analysis may be short-term and remedied by already-planned improvements.

3.2.2 Background Growth

Table 14 summarizes the predicted growth rate for the Kanata / Stittsville district based on data from the TRANS O-D Surveys. The 2019 traffic counts were grown at a rate of 2.43% annually, non-compounding, to represent 2024 and 2029 background traffic volumes.

Table 14: TRANS O-D Survey Annual Growth Prediction for Kanata / Stittsville

Measurement	2011 Actual	2031 Predicted	Annual Growth
Population	105,215	156,396	2.43%
Auto trips	157,040	233,431	2.43%

A review of historic intersection volumes (3%) confirms that this level of growth is appropriate for reflecting background growth.

3.2.3 Other Developments

There are seven planned developments near the proposed development which will impact study area intersections. Details for each planned development were listed on the City of Ottawa's development applications tool and were outlined in **Section 2.1.3.2**.

These development volumes have been included as part of the background traffic analysis and applied to the future road networks separately.

Figure 20 and **Figure 21** illustrate the forecasted 2024 and 2029 background traffic volumes, respectively.

Figure 20: Background Traffic Volumes - 2024

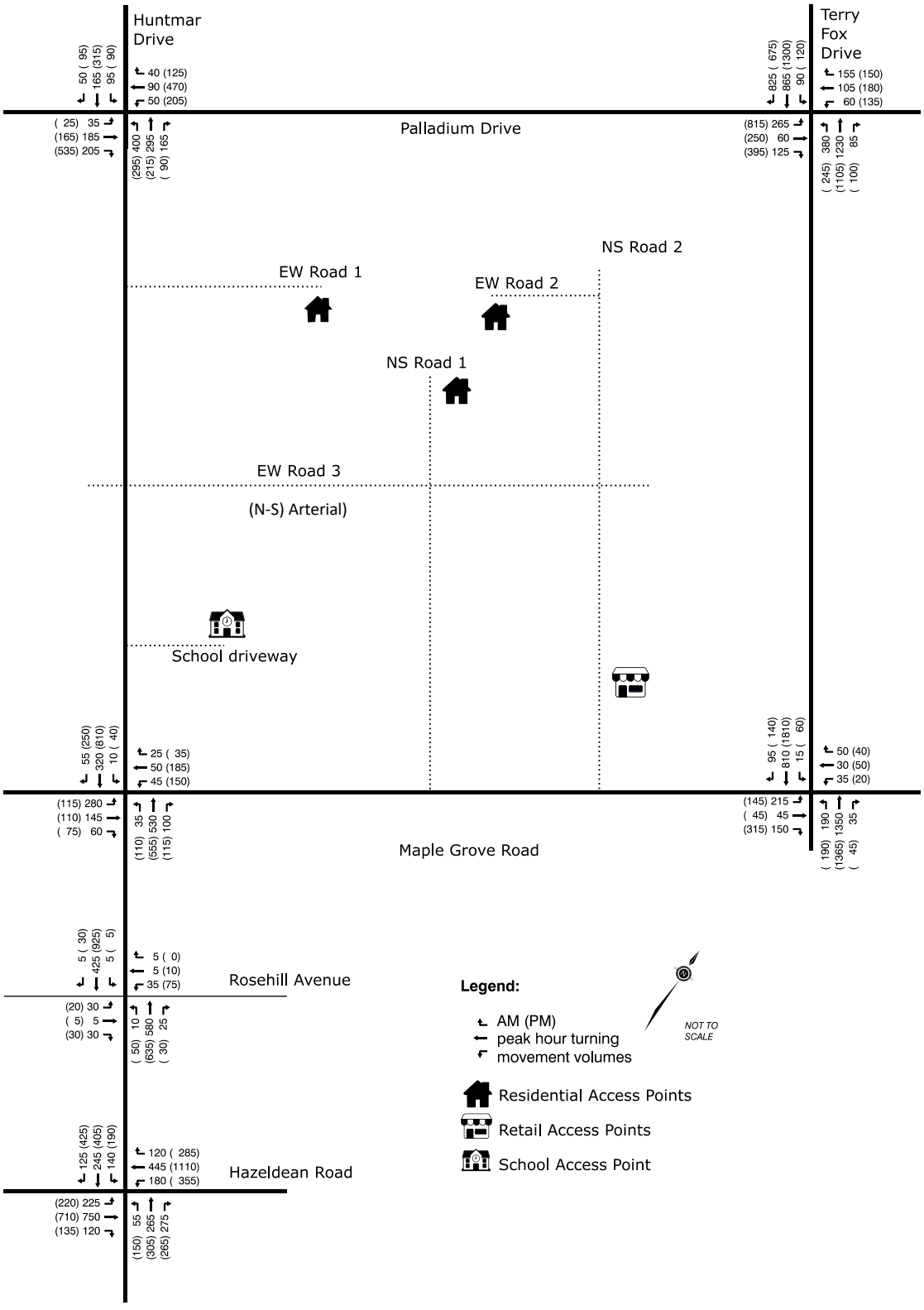
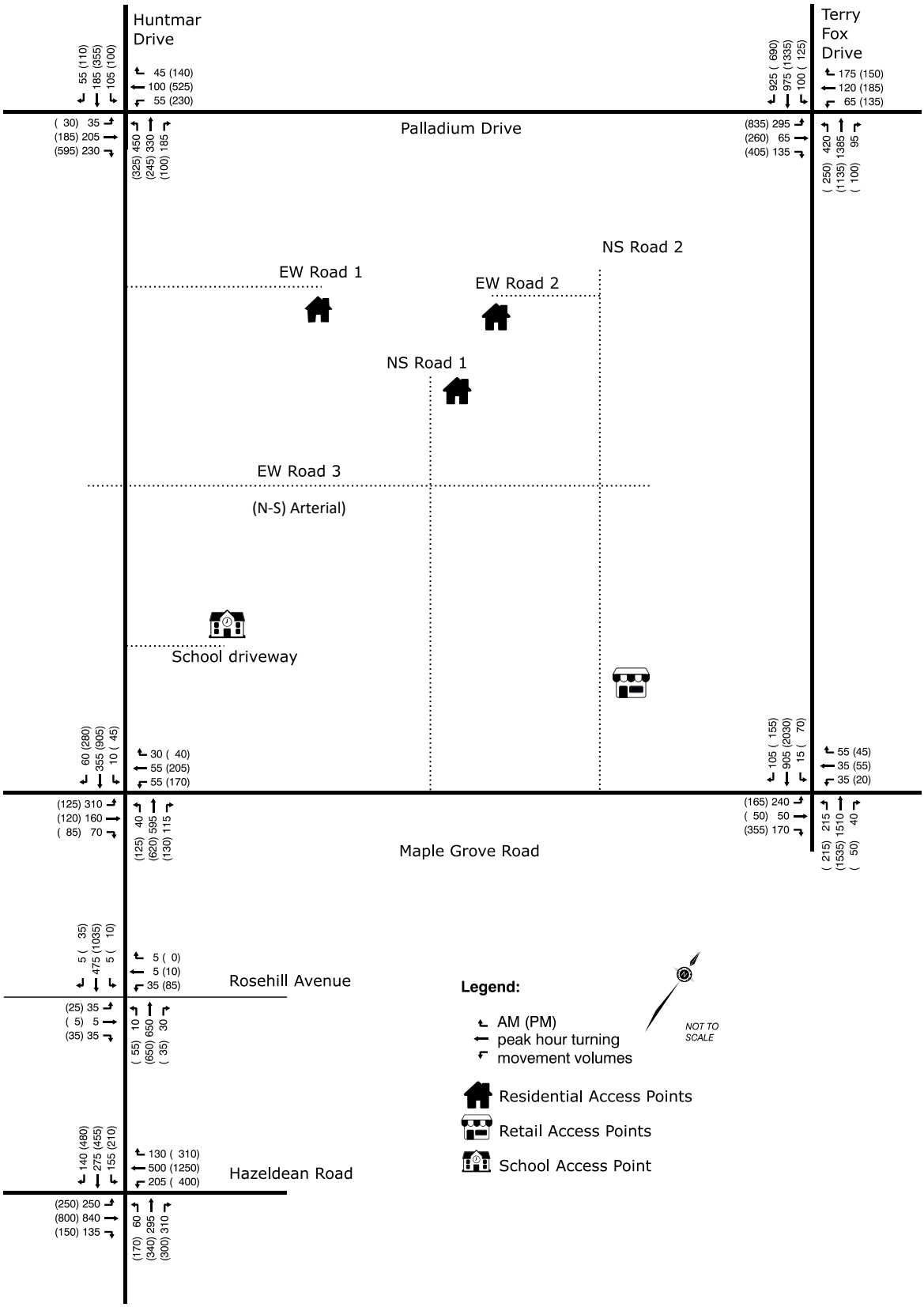


Figure 21: Background Traffic Volumes – 2029



3.3 Demand Rationalization

The proposed development is expected to generate additional vehicle trips that are to be accommodated by the roadway network. The analysis is based on application of transit mode shares representative of typical suburban areas. Future rapid transit would encourage increased shares of transit usage and would minimize the proposed vehicle network impacts. Without a full commitment that the widening of Huntmar Drive and/or construction of the new North-South Arterial would be complete by the 2029 planning horizon, the analysis is based on accommodating the forecast vehicle volumes via the existing road network. The analysis is therefore a conservative estimate of potential vehicle impacts.

3.3.1 Peak Period Ratio Analysis

Table 15 illustrates the distribution of vehicles across the peak period. A peak period ratio of 1.0 would indicate that peak hour volumes are maintained across the entire peak period. The table shows that with peak period ratios of between 0.81 and 0.91 in the AM and between 0.89 and 0.95 in the PM, there is the ability to accommodate further spreading of peak vehicles. This will likely be achieved in advance of widening Huntmar Drive or construction of the North-South Arterial.

Table 15: Peak Period Ratios

Intersection	Peak Period Volume* AM (PM)	Peak Hour Volume* AM (PM)	Peak Period Ratio
1. Huntmar & Hazeldean	444 (767)	542 (830)	0.82 (0.92)
2. Huntmar & Rosehill	161 (270)	186 (298)	0.86 (0.91)
3. Huntmar & Maple Grove	249 (374)	274 (416)	0.91 (0.9)
4. Huntmar & Palladium	260 (405)	315 (457)	0.83 (0.89)
5. Terry Fox & Palladium	589 (963)	728 (1012)	0.81 (0.95)
6. Terry Fox & Maple Grove	437 (649)	504 (704)	0.87 (0.92)

*Based of average of all movements

3.3.2 2024 and 2029 Vehicle Volumes

Figure 22 and **Figure 23** show the 2024 and 2029 AM and PM peak hour traffic volumes used in the analysis.

Figure 22: Total Traffic Volumes - 2024

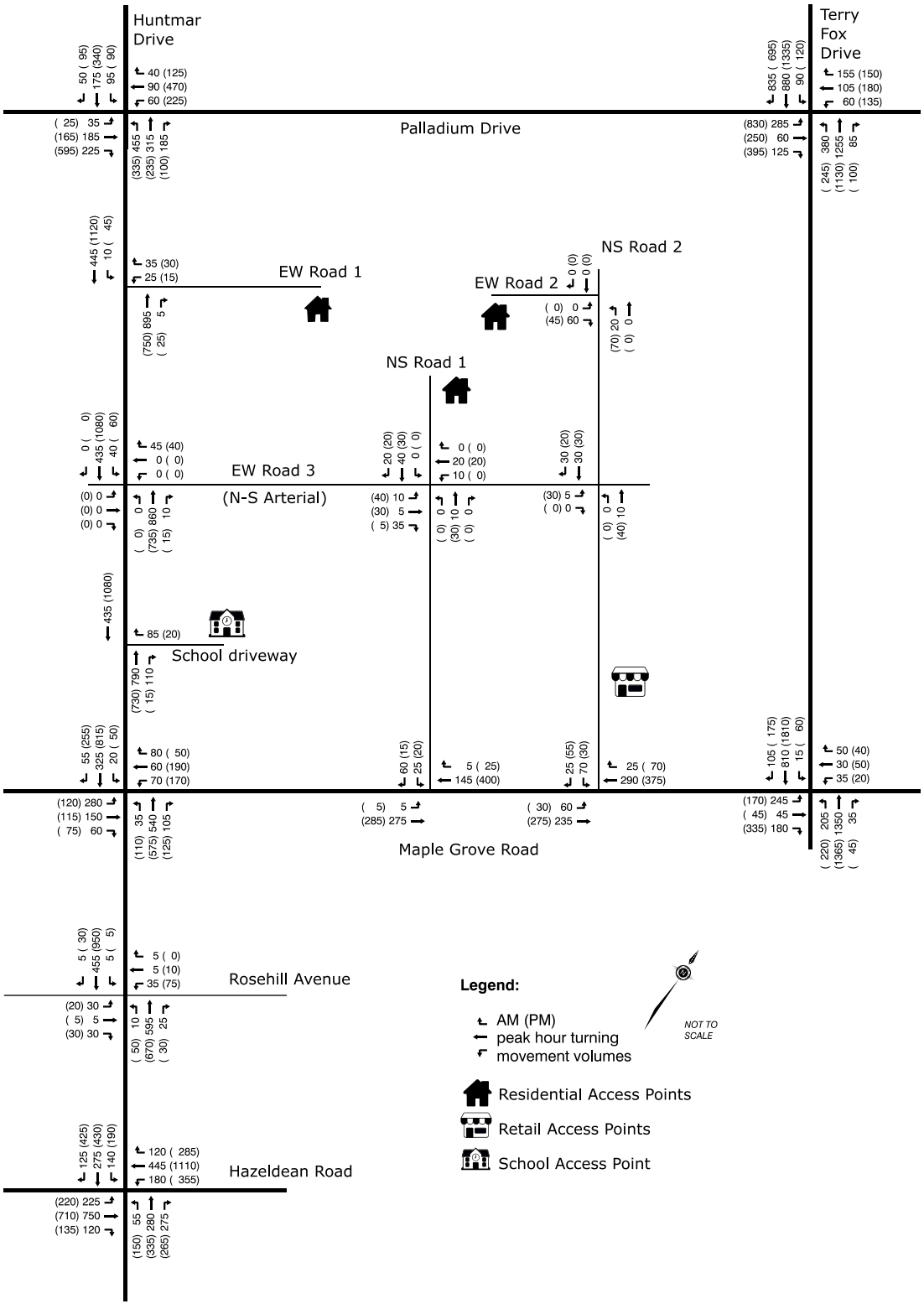
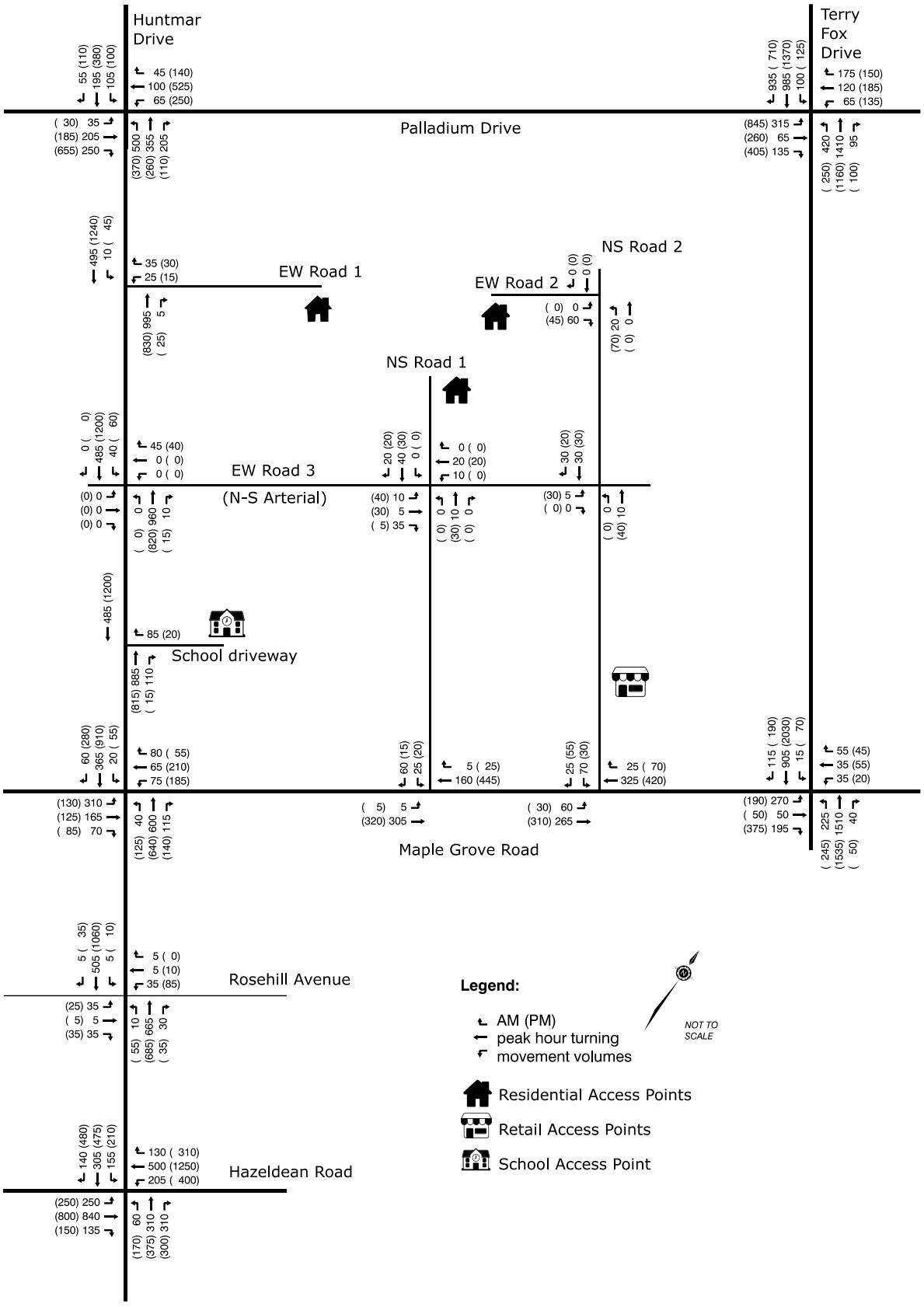


Figure 23: Total Traffic Volumes - 2029



4.0 Analysis

Operational level of service (LOS) analysis was completed using Trafficware's Synchro software version 10.0. This software package, which uses the methodologies of the Highway Capacity Manual (HCM), produces results in terms of level-of-service (LOS), volume to capacity ratio (V/C), vehicle delay, 50th percentile queues, and 95th percentile queues,.

The volume-to-capacity ratio (V/C) is a measure of the utilization of the capacity of the intersection using the intersection's critical movements and approaches. **Appendix A** contains the Synchro performance worksheets.

4.1 Development Design

4.1.1 Design for Sustainable Modes

The community will be designed to match neighbourhood roadway designs. Facilities of the surrounding area and the local streets of the proposed development can be found in **Table 16**. On-street parking will be limited to collector roadways.

Table 16: Roadway Design for Sustainable Modes

Roadway	Cycling	Pedestrian	Parking
Palladium Drive	Mixed Traffic	Sidewalk on both sides	None
Maple Grove Road	Mixed Traffic	Sidewalk on both sides	On-street parking on one side
Huntmar Drive	Mixed Traffic	Sidewalk on both sides	None
Terry Fox Road	Mixed Traffic	Sidewalk on both sides	None
Local Streets	Mixed Traffic	Sidewalk on both sides	On-street parking on one side

Transit service is currently provided along Huntmar Drive. As service expands in the area, additional stops will be situated along Huntmar Drive and Maple Grove Road to ensure residents are within 400m of a stop. There will be direct and convenient sidewalks and paved surfaces between the residential developments and the transit stops.

4.1.2 Circulation and Access

Not applicable; exempted during screening and scoping.

4.1.3 New Street Networks

Planned cross-sections for the study area roadways were obtained from the Designing Neigbourhood Collector Streets provided by the City of Ottawa to obtain cross section design standards for major collectors. **Table 17** lists the cross section details for individual local roads.

The proposed development will have a total of five (5) accesses: three on Huntmar Drive and two on Maple Grove Road. Internal roadways will be designed to accommodate transit vehicles, delivery trucks, and garbage trucks.

Table 17: Proposed Development Cross Section Design

Road	ROW (m)	Rows of trees in ROW	Transit Service Frequency	Driveway Parking	Pavement Width (m)
EW Road 1	26	0	None	2.3	9.4
EW Road 2	26	2	2	0	9.4
EW Road 3	26	2	2	0	9.4
School Access	26	0	None	2.3	9.4
NS Road 1	26	2	2	0	9.4
NS Road 2	26	2	2	0	9.4

The proposed development will have three interior intersections. These intersections are EW Road 3 at NS Road 1, EW Road 3 at NS Road 2, and EW Road 2 at NS Road 2. The three new intersections are anticipated to operate at a LOS 'A' under the site generated traffic conditions for both the AM and the PM peak hours.

The roadway network for 130 Huntmar includes the construction of EW Road 2 as a future Major Collector and NS Road 3 as a future Arterial.

4.2 Parking

Not applicable; exempted during screening and scoping.

4.3 Boundary Street Design

4.3.1 Design Concept

The Multi-Modal Level of Service (MMLOS) was evaluated for the intersection at Huntmar Drive and Maple Grove Road to assist with developing a design concept that maximizes the achievement of the MMLOS objectives.

Palladium Drive, Huntmar Drive, and Maple Grove Road are subject to MMLOS targets of school policy areas as the development will be within 300 metres of a school in the future.

Table 18 presents the minimum desirable LOS targets for each mode considering the policy area and road classification for each of the roads under review.

Table 18: Minimum Desirable MMLOS Targets

Policy Area	Road Segment	Road Class	Pedestrian LOS (PLOS)	Bicycle LOS (BLOS)	Transit LOS (TLOS)	Truck LOS (TkLOS)	Vehicle LOS (VLOS)
Within 300m of a School	Huntmar Drive	Arterial	A	C	C	No Target	E
	Maple Grove Road	Arterial	A	C	C	No Target	E

Notes on the MMLOS analysis are as follows:

- The City's TMP identifies both Huntmar Drive as a cycling Spine Route therefore it has a BLOS target of "C".
- The transit LOS target for both Huntmar Drive and Maple Grove Road is a "C" as they are planned transit priority corridor with continuous lanes.
- Neither Huntmar Drive nor Maple Grove Road are designated truck routes therefore there is no Truck LOS target.

Table 19 provides the MMLOS conditions for the roadway intersection. The posted speeds were assumed to be 50 km/h on Huntmar Drive and Maple Grove Road.

The intersection does not achieve the PLOS target 'A' because the cycle length of the intersection and the effective walk time of the pedestrian provides a level of service 'E'. This may be remedied by reducing the cycle length of the intersection or by increasing the effective walk time available to pedestrians.

The intersection does not achieve the BLOS target 'C' because the intersection bikeway type is mixed traffic. This may be remedied through installing bike lanes along Maple Grove Road, which would increase overall safety for bikers and increase the intersection LOS to 'B'. A future MUP will be constructed along Huntmar Drive connecting to the area active transportation network.

The intersection does not achieve the TLOS target 'C' because of the average signal delay on the eastbound movement. This may be remedied by installing a left turn lane on the eastbound movement, which would reduce the overall delay of the intersection. Note that the primary transit movement is via the North-South approaches. Also, the future Rapid Transit facility will significantly improve transit service with a station planned to accommodate the planned development.

Table 19: MMLOS Conditions - Intersections

	Approach	Northbound	Southbound	Eastbound	Westbound
Pedestrian	Lanes to cross	2	3	2	2
	Median	No	No	No	No
	Island refuge	No	No	No	No
	Conflicting left turns	Perm	Perm	Perm	Perm
	Conflicting right turns	Prot	Perm / yield	Perm / yield	Perm / yield
	RTOR?	Certain times	Always	Always	Always
	Pedestrian leading interval?	Yes	No	No	No
	Corner radius (largest)	10-15m	5-10m	5-10m	10-15m
	Crosswalk type	Std. transverse	Std. transverse	Std. transverse	Std. transverse
	PETSI points	93	71	86	85
	Cycle length	130	130	130	130
	Effective walk time	22	22	27	27
	Calculated pedestrian delay	45	45	41	41
	Level of service (PETSI points)	A	C	B	B
	Level of service (ped. delay)	E	E	E	E
	Level of Service	**E**	**E**	**E**	**E**
	Level of Service (Select worst)	**E**			
Bicycle	Type of bikeway	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic
	Bike lane shift	N/A	N/A	N/A	N/A
	Length of right-turn lane	N/A	N/A	N/A	N/A
	Right-turn vehicle turning speed (from int. geom.)	<=25 km/h	<=25 km/h	<=25 km/h	<=25 km/h
	Dual right-turn lane (shared or exclusive)	No	No	No	No
	Left-turn type / lanes crossed and turn speed	1 lane, 50km/h	None, <=50km/h	None, <=50km/h	None, <=50km/h
	Level of Service	**D**	**B**	**B**	**B**
	Level of Service (Select worst)	**D**			
Transit	Average signal delay	20	20	50	40
	Level of Service	**C**	**C**	**F**	**E**
	Level of Service (Select worst)	**F**			
Truck	Effective turning radius (smallest)	10 to 15m	10 to 15m	10 to 15m	10 to 15m
	Number of Receiving Lanes	1	1	1	1
	Level of Service	**E**	**E**	**E**	**E**
	Level of Service (Select worst)	**E**			
Auto	Volume to capacity ratio	0.53 (0.51)	0.32 (0.84)	0.87 (0.65)	0.23 (0.87)
	Level of Service	**A (A)**	**A (D)**	**D (A)**	**A (D)**
	Level of Service (Select worst)	**D**			

4.4 Access Intersection Design

4.4.1 Location and Design of Driveway

It is anticipated that there will be six access points to the residential area. The roads that provide entry and the distance to boundary roads are presented in **Table 20**. Four full movement accesses were analyzed. It is not anticipated that they will be impacted by tapers. It is noted that there are two other access roads in close proximity to the intersection of Huntmar Drive and Maple Grove Road, these would likely be configured as RIRO movements only and were not included in the analysis. Currently these access roads are offset with existing local roadways. NS Road 2, connecting with EW Road 3, is to be an arterial road in the future past the horizon year 2029, and therefore will require signalization at its intersection with Maple Grove Road and Huntmar Drive.

To accommodate the school access, a driveway will be required within 100 metres of the intersection of Huntmar Drive and Maple Grove Road. School accesses are typically provided via the arterial and collector road network and do not rely on local roadways. School access is also controlled (particularly for elementary schools) limiting the number of locations for pedestrian site access. For the purposes of traffic analysis, this driveway was determined to be a RIRO configuration. There is limited ability to accommodate on-street school bus loading/ unloading and parent drop off. On-site facilities would be required with appropriate sidewalks and accessible connections to the building.

Table 20: Proximity to Adjacent Driveways

Proposed Access Road	Access Intersection	Boundary Road 1	Boundary Road 1 Distance (m)	Boundary Road 2	Boundary Road 2 Distance (m)
1. School Access	Huntmar Drive	Palladium Drive	700	Maple Grove Road	160
2. EW Road 3	Huntmar Drive	Palladium Drive	560	Maple Grove Road	300
3. EW Road 1	Huntmar Drive	Palladium Drive	350	Maple Grove Road	510
4. NS Road 1	Maple Grove Road	Huntmar Drive	160	Terry Fox Drive	1530
5. NS Road 2	Maple Grove Road	Huntmar Drive	310	Terry Fox Drive	1380

4.4.2 Intersection Control

The four full access intersections that were analyzed along Huntmar Drive and Maple Grove Road will be two-way stop controlled maintaining a LOS A. NS Road 2, connecting with EW Road 3, is to be an arterial road in the future beyond the 2029 horizon year, and will require signalization at its intersections with Maple Grove Road and Huntmar Drive in the future. Two other access intersections part of the proposed

development are for right-in right-out movements; vehicles have not been assigned to these access to demonstrate the full impact of accommodating site vehicles via the other unsignalized accesses.

4.4.3 Intersection Design

The sections that follow present the analysis of access and internal intersection operations during the AM and PM peak hour for existing and future conditions.

4.4.3.1 Existing Access Intersection Operations

The proposed development is in a greenfield area and there are no existing access intersections.

4.4.3.2 Future Access Intersection Operations

The analysis confirms that vehicles will operate with satisfactory conditions at all access intersections with each movement operating at LOS A based on the volume to capacity ratio. It is noted that some intersections experience minor delays. **Table 21** and **Table 22** summarizes the Synchro results for the access intersections during the weekday AM and PM peak hours for the 2024 and 2029 horizon years.

Table 21: Access Intersections – 2024 Total Traffic

Intersection	AM (PM)					
	Mvmt.	Delay LOS	V/C LOS	Delay (s/veh)	V/C	Q95%
Huntmar & EW RD 1	WB	D (E)	A (A)	26 (44)	0.26 (0.33)	7 m (7 m)
	NB	A (A)	A (A)	0 (0)	0.00 (0.00)	0 m (0 m)
	SB	A (A)	A (A)	10 (10)	0.01 (0.05)	0 m (0 m)
Huntmar & EW RD 3	WB	C (B)	A (A)	17 (15)	0.13 (0.10)	0 m (0 m)
	NB	A (A)	A (A)	0 (0)	0.00 (0.00)	0 m (0 m)
	SB	A (A)	A (A)	10 (2)	0.05 (0.07)	0 m (1.8 m)
School Access	WB	C (B)	A (A)	18 (14)	0.24 (0.05)	7 m (0 m)
	NB	A (A)	A (A)	0 (0)	0.00 (0.00)	0 m (0 m)
	SB	A (A)	A (A)	0 (0)	0.00 (0.00)	0 m (0 m)
Maple Grove & NS RD 1	EB	A (A)	A (A)	7.5 (8)	0.00 (0.00)	0 m (0 m)
	WB	A (A)	A (A)	7.5 (8)	0.00 (0.00)	0 m (0 m)
	SB	B (B)	A (A)	10 (13)	0.11 (0.08)	0 m (0 m)
Maple Grove & NS RD 2	EB	A (A)	A (A)	8 (8)	0.03 (0.03)	0 m (0 m)
	WB	A (A)	A (A)	8 (8)	0.05 (0.03)	0 m (0 m)
	SB	C (B)	A (A)	15 (14)	0.21 (0.17)	7 m (7 m)

Table 22: Access Intersections – 2029 Total Traffic

Intersection	AM (PM)					
	Mvmt.	Delay LOS	V/C LOS	Delay (s/veh)	V/C	Q95%
Huntmar & EW RD 1	WB	D (F)	A (A)	32 (68)	0.32 (0.45)	7 m (14 m)
	NB	A (A)	A (A)	0 (0)	0.00 (0.00)	0 m (0 m)
	SB	B (A)	A (A)	10 (10)	0.01 (0.06)	0 m (0 m)
Huntmar & EW RD 3	WB	C (B)	A (A)	17 (15)	0.13 (0.10)	0 m (0 m)
	NB	A (A)	A (A)	0 (0)	0.00 (0.00)	0 m (0 m)
	SB	A (A)	A (A)	10 (2)	0.05 (0.07)	0 m (1.8 m)
School Access	WB	C (C)	A (A)	21 (15)	0.27 (0.05)	7 m (0 m)
	NB	A (A)	A (A)	0 (0)	0.00 (0.00)	0 m (0 m)
	SB	A (A)	A (A)	0 (0)	0.00 (0.00)	0 m (0 m)
Maple Grove & NS RD 1	EB	A (A)	A (A)	7.5 (8)	0.00 (0.00)	0 m (0 m)
	WB	A (A)	A (A)	7.5 (8)	0.00 (0.00)	0 m (0 m)
	SB	B (B)	A (A)	10 (14)	0.12 (0.08)	0 m (0 m)
Maple Grove & NS RD 2	EB	A (A)	A (A)	8 (8)	0.03 (0.03)	0 m (0 m)
	WB	A (A)	A (A)	8 (8)	0.05 (0.03)	0 m (0 m)
	SB	C (B)	A (A)	15 (14)	0.21 (0.17)	7 m (7 m)

A signal warrant analysis (based on OTM Book 12) was performed on the intersection of Huntmar Drive and EW Road 1. Total forecasted traffic for the horizon year 2029 was used for this analysis, shown in **Table 23**. If both conditions A and B for Justification 1, or both conditions A and B for Justification 2 were met, a signal would be warranted. It can be seen that signalization was not justified at this time for the intersection of Huntmar Drive and EW Road 1. **Appendix B** provides the full signal warrant analysis.

Table 23: Signal Warrant Analysis

			Huntmar Drive & EW RD 1	
Justification			Compliance	Signal Justified?
1. Minimum Vehicular Volume	A	Total Volume (all approaches)	100%	No
	B	Crossing Volume (minor streets)	10%	
2. Delay to Cross Traffic	A	Total Volume (major streets)	100%	No
	B	Crossing Volume (minor streets vehicle volume)	13%	

4.4.3.3 Internal Intersections

The internal intersections are forecast to operate well with LOS A at all movements, operating well below capacity and having no queue.

Figure 24: Internal Intersections

Intersection	AM					PM				
	Mvmt.	LOS	Delay (s/veh)	V/C	Q95%	Mvmt.	LOS	Delay (s/veh)	V/C	Q95%
NS Road 1 & EW Road 3	NB	A	7	0.01	0 m	NB	A	7	0.04	0 m
	EB	A	7	0.05	0 m	EB	A	8	0.09	0 m
	WB	A	7	0.04	0 m	WB	A	7	0.02	0 m
	SB	A	7	0.07	0 m	SB	A	7	0.05	0 m
NS Road 2 & EW Road 3	EB	A	2.7	0	0 m	EB	A	2.9	0.2	0 m
	NB	A	2.7	0.01	0 m	NB	A	2.9	0.03	0 m
	SB	A	2.9	0.04	0 m	SB	A	2.9	0.04	0 m

4.5 Transportation Demand Management

TDM program measures can be adopted to complement the development's proposed design. These measure encourage sustainable transportation choices, benefit occupants and visitors, and increase marketability.

Appendix C contains the complete TDM checklists which help identify relevant TDM measures to be adopted in the future.

From the TDM checklists, some recommendations are:

- Display local area maps with walking/cycling access routes and key destinations at major
- entrances;
- Display relevant transit schedules and route maps at residential building entrances;
- Contract with provider to install on-site bike share station;
- Contract with provider to install on-site car share vehicles and promote their use by residents;
- Unbundle parking costs - condominium purchase price / monthly rent;
- Provide a multimodal travel option information package to new residents.

TDM-supportive design & infrastructure measures:

- Locate buildings close to the street, and do not locate parking areas between the street and building entrances

- Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations
- Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort
- Provide shower and lockers for retail employees.

4.6 Neighbourhood Traffic Management

Not applicable; exempted during screening and scoping.

4.7 Transit

In order to achieve target transit shares, transit facilities will need to be provided along Maple Grove road in advance of the new development. Transit stops are recommended to be built at the access intersections EW road 3 at Huntmar Drive and NS road 2 at Maple Grove road. Once these stops are built all residents will be within 400 metres of transit, therefore there is no need for transit to travel through the development.

The existing transit services that run along Huntmar Drive will need to be improved in the future to accommodate the increased transit demand. Standard and articulated buses have seated capacities of 40 and 55 people respectively. In order to be conservative, the average seated capacity was approximated to be 45. To serve the additional passengers related to the 130 Huntmar Drive development, an additional 1-2 bus trips would be required during the peak hours (to serve the peak 60 passengers per hour in the peak direction).

4.8 Review of Network Concept

Not applicable; exempted during screening and scoping.

4.9 Intersection Design

This section addresses the potential impacts to area intersections beyond the immediate access intersections presented in **Section 4.4**. Six existing intersections were identified during the project Scoping that are to be assessed for impacts due to the additional site-generated vehicles as follows:

1. Huntmar Drive and Hazeldean Road
2. Huntmar Drive and Rosehill Avenue
3. Huntmar Drive and Maple Grove Road
4. Huntmar Drive and Palladium Drive
5. Terry Fox Road and Palladium Drive
6. Terry Fox Road and Maple Grove Road

Refer to **Figure 11** for lane configurations of the study area. **Appendix B** contains the intersection performance worksheets.

4.9.1.1 Existing Signalized Network Intersection Operations

It is noted that lost time reduction was included in the PM peak hour for the following intersection approaches:

- Huntmar Drive and Palladium Drive: WBL (2.0 seconds)
- Terry Fox Drive and Palladium Drive: EBL, WBL, NBL (2.0 seconds)

This lost time reduction is included to ensure that observed vehicles are being processed by the modelled network. It reflects vehicles using a portion of the amber phase for traversing the intersection. The same lost time reduction is applied to both future forecasts as it is expected that drivers' behavior will not change.

Huntmar Drive at Hazeldean Road

Table 24 summarizes the Synchro results for the existing network intersection during the AM and PM peak hours. The overall intersection is operating acceptably with each movement at LOS C or better and below capacity.

Table 24: 2019 Existing Huntmar Drive at Hazeldean Road Traffic Operations

Movement	Volume	Delay (s)	LOS	V/C	Q50th	Q95th
EBL	200 (195)	63.5 (63.3)	B (A)	0.61 (0.59)	27 (26.3)	39 (38.2)
EBTR	775 (750)	23.2 (38)	A (B)	0.48 (0.64)	67.8 (84.7)	104.8 (118.6)
WBL	160 (315)	63 (52.3)	A (A)	0.54 (0.52)	21.5 (40.7)	32.6 (57.3)
WBT	395 (985)	21 (33.4)	A (B)	0.24 (0.66)	31 (109)	51.6 (#160.3)
WBR	80 (205)	4 (4.7)	A (A)	0.1 (0.26)	0 (0)	8.4 (17.4)
NBL	45 (135)	32.4 (40)	A (B)	0.17 (0.6)	8.9 (25.6)	16.7 (37)
NBT	235 (270)	63.1 (50.8)	C (B)	0.73 (0.64)	60.9 (65.8)	82.1 (86.6)
NBR	245 (235)	9.4 (6.8)	A (A)	0.54 (0.44)	0 (0)	21.5 (18.9)
SBL	115 (135)	41.2 (33.9)	A (A)	0.5 (0.47)	23.7 (25.4)	35.7 (36.7)
SBT	210 (330)	54 (59.2)	A (C)	0.59 (0.79)	53 (83.7)	73.8 (107.3)
SBR	110 (380)	8.9 (21.3)	A (C)	0.28 (0.7)	0 (31.8)	15.1 (62.6)
OVERALL	**2570 (3935)**	**33.1 (36.6)**		**0.47 (0.61)**		
WORST MOVEMENT		**NBT (SBT)**		**0.73 (0.79)**		

Notes:

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

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

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

Huntmar Drive at Maple Grove Road

Table 25 summarizes the Synchro results for the existing network intersection during the AM and PM peak hours. The overall intersection is operating acceptably with each movement at LOS D or better and below capacity.

Table 25: 2019 Existing Huntmar Drive at Palladium Drive Traffic Operations

Movement	Volume	Delay (s)	LOS	V/C	Q50th	Q95th
EBTLR	385 (240)	58.6 (44.7)	D (B)	0.87 (0.65)	94.8 (52.7)	121.7 (72.3)
WBTLR	105 (310)	25 (64.4)	A (D)	0.23 (0.87)	15.9 (61)	26.5 (82.5)
NBL	30 (95)	15.3 (16.4)	A (A)	0.07 (0.3)	3.4 (10.9)	10 (28.2)
NBTR	535 (555)	20.2 (16.2)	A (A)	0.53 (0.51)	82.2 (74.2)	140.6 (132.4)
SBTLR	315 (890)	13.5 (25.9)	A (D)	0.32 (0.84)	24.5 (102.7)	63.2 (m#322.0)
OVERALL	**1370 (2090)**	**29.7 (30.8)**		**0.54 (0.71)**		
WORST MOVEMENT		**EBTLR (WBTLR)**		**0.87 (0.87)**		

Notes:

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

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

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

Huntmar Drive at Palladium Drive

Table 26 summarizes the Synchro results for the existing network intersection during the AM and PM peak hours. The overall intersection is operating acceptably with each movement at LOS E or better and below capacity.

Table 26: 2019 Existing Huntmar Drive at Palladium Drive Traffic Operations

Movement	Volume	Delay (s)	LOS	V/C	Q50th	Q95th
EBL	30 (25)	35.2 (31.7)	A (A)	0.12 (0.15)	6.6 (4.9)	11.5 (10.2)
EBTR	320 (560)	28.7 (15.6)	B (B)	0.6 (0.67)	21.3 (17.4)	29.8 (31.8)
WBL	40 (155)	38.2 (95.3)	A (E)	0.24 (0.95)	8.9 (32.8)	14.6 (#57.8)
WBTR	115 (505)	32.2 (49.8)	A (C)	0.22 (0.7)	10.6 (65.5)	16.1 (75.3)
NBL	325 (215)	18 (21.4)	A (A)	0.4 (0.34)	35.2 (24.2)	104.1 (73.1)
NBT	260 (190)	14.4 (17.6)	A (A)	0.21 (0.17)	25.4 (19.3)	72 (57.7)
NBR	130 (70)	6.7 (8.8)	A (A)	0.12 (0.07)	2.5 (0)	m18.5 (m14.8)
SBL	85 (80)	10.4 (12.5)	A (A)	0.12 (0.11)	6.6 (8.2)	22.2 (20.5)
SBT	145 (280)	9.6 (12.9)	A (A)	0.12 (0.25)	11.3 (31.8)	32.8 (62.3)
SBR	45 (85)	1 (3.2)	A (A)	0.04 (0.09)	0 (0)	2.2 (8.5)
OVERALL	**1495 (2165)**	**18.9 (29.0)**		**0.31 (0.5)**		
WORST MOVEMENT		**EBTR (WBL)**		**0.6 (0.95)**		

Notes:

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

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

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

Terry Fox Drive at Palladium Drive

Table 27 summarizes the Synchro results for the existing network intersection during the AM and PM peak hours. The overall intersection is operating acceptably with each movement at LOS E or better and below capacity.

Table 27: 2019 Existing Terry Fox Drive at Palladium Drive Traffic Operations

Movement	Volume	Delay (s)	LOS	V/C	Q50th	Q95th
EBL	225 (680)	68.3 (90.5)	A (E)	0.59 (0.99)	34.8 (110.6)	48.1 (#152.9)
EBT	55 (245)	54.8 (60.1)	A (B)	0.2 (0.62)	15.7 (70.5)	26.3 (97.1)
EBR	95 (315)	2.5 (16.1)	A (B)	0.26 (0.6)	0 (15.8)	2.2 (47.1)
WBL	55 (130)	74.1 (74.4)	A (B)	0.43 (0.62)	16.7 (39.2)	32.6 (59.9)
WBT	95 (175)	70 (75.7)	A (C)	0.5 (0.71)	29.1 (53.5)	43.1 (73.9)
WBR	140 (145)	11.7 (11)	A (A)	0.48 (0.43)	0 (0)	16.1 (18.3)
NBL	290 (215)	72.3 (73.3)	C (B)	0.7 (0.63)	45.5 (33.5)	60.2 (#52.2)
NBT	1095 (1080)	25 (39.4)	A (C)	0.58 (0.73)	107.6 (143.1)	183.8 (#213.6)
NBR	75 (95)	0.2 (1.1)	A (A)	0.09 (0.13)	0 (0)	0 (2.5)
SBL	80 (115)	73.6 (74)	A (A)	0.41 (0.49)	12.6 (18.1)	21.7 (28.6)
SBT	775 (1270)	28.2 (53.3)	A (E)	0.47 (0.92)	78.4 (197)	133.7 (#274.2)
SBR	695 (625)	6.9 (7.5)	B (B)	0.65 (0.65)	7.8 (8)	59 (48.6)
OVERALL	**3675 (5090)**	**30.4 (48.2)**		**0.54 (0.76)**		
WORST MOVEMENT		**NBL (EBL)**		**0.7 (0.99)**		

Notes:

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

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

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

Terry Fox Drive at Maple Grove Road

Table 28 summarizes the Synchro results for the existing network intersection during the AM and PM peak hours. The overall intersection is operating acceptably with each movement at LOS C or better and below capacity.

Table 28: 2019 Existing Terry Fox Drive at Maple Grove Traffic Operations

Movement	Volume	Delay (s)	LOS	V/C	Q50th	Q95th
EBL	195 (130)	73.3 (63.5)	D (B)	0.81 (0.65)	52.7 (34.4)	76 (m47.3)
EBT	25 (30)	39.8 (42.5)	A (A)	0.07 (0.1)	5.9 (7.2)	m10.1 (m12.6)
EBR	135 (280)	11.7 (22.4)	A (B)	0.35 (0.68)	5.4 (20.6)	m16.6 (m42.9)
WBL	30 (15)	39.2 (41.5)	A (A)	0.12 (0.07)	6.6 (3.5)	32.6 (8.8)
WBTR	70 (60)	17.7 (22.3)	A (A)	0.19 (0.21)	5.5 (5.9)	16.9 (16.1)
NBL	170 (170)	9.9 (28.7)	A (B)	0.37 (0.66)	13.7 (15.1)	28.5 (45.5)
NBTR	1185 (1230)	13.1 (14.5)	A (A)	0.53 (0.55)	70.6 (82.5)	144.4 (155.6)

Movement	Volume	Delay (s)	LOS	V/C	Q50th	Q95th
SBL	10 (55)	8.8 (8.4)	A (A)	0.03 (0.18)	0.7 (3)	3.2 (10.7)
SBT	710 (1545)	17.3 (23.8)	A (C)	0.39 (0.75)	51.9 (140.3)	85.1 (#288.0)
SBR	85 (125)	1.6 (4.2)	A (A)	0.11 (0.14)	0 (0.8)	4.6 (13.5)
OVERALL	**2615 (3640)**	**18.7 (21.5)**		**0.46 (0.62)**		
WORST MOVEMENT		**EBL (SBT)**		**0.81 (0.75)**		

Notes:

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

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

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

4.9.1.2 Existing Unsignalized Network Intersection Operations

Huntmar Drive at Rosehill Avenue

Table 29 summarizes the Synchro results for the existing roundabout intersection during the AM and PM peak hours. The overall intersection performs well with each movement at LOS B or better and below capacity.

Table 29: 2019 Existing Huntmar Drive at Rosehill Avenue Roundabout Traffic Operations

	AM					PM					
Mvmt.	Delay LOS	V/C LOS	Delay (s/veh)	V/C	Q95%	Mvmt.	Delay LOS	V/C LOS	Delay (s/veh)	V/C	Q95%
EB	A	A	5.1	0.07	0 m	EB	A	A	7.8	0.09	0 m
WB	A	A	5.5	0.06	0 m	WB	A	A	6.3	0.11	0 m
NB	A	A	7.0	0.42	2 m	NB	A	A	7.8	0.49	3 m
SB	A	A	5.6	0.30	1 m	SB	B	B	12.2	0.67	5 m

4.9.1.3 2024 Network Intersection Operations

Huntmar Drive at Hazeldean Road

Table 30 summarizes the Synchro results for the 2024 forecast network intersection during the AM and PM peak hours. The overall intersection is operating acceptably with each movement at LOS E or better and below capacity.

Table 30: 2024 Future Huntmar Drive at Hazeldean Road Traffic Operations

Movement	Volume	Delay (s)	LOS	V/C	Q50th	Q95th
EBL	225 (220)	63.2 (64)	B (B)	0.63 (0.63)	30.3 (29.7)	43 (42.5)
EBTR	870 (845)	27.3 (51.1)	A (D)	0.56 (0.85)	85.3 (110.6)	124.9 (137.7)
WBL	180 (355)	62.3 (55.5)	A (B)	0.56 (0.61)	24.2 (46)	35.8 (#87.5)
WBT	445 (1110)	23.7 (47.8)	A (D)	0.29 (0.87)	38.2 (146.2)	60.1 (#234.2)
WBR	120 (285)	4.9 (5.6)	A (A)	0.16 (0.38)	0 (0)	13.1 (22.2)

Movement	Volume	Delay (s)	LOS	V/C	Q50th	Q95th
NBL	55 (150)	31.8 (38.7)	A (B)	0.23 (0.67)	10.5 (25.9)	19.1 (36)
NBT	280 (335)	63.7 (44.6)	C (B)	0.78 (0.64)	72.2 (78.4)	97.1 (99.1)
NBR	275 (265)	9.6 (5.6)	A (A)	0.55 (0.42)	1.8 (0.4)	25 (18.3)
SBL	140 (190)	45 (33.7)	B (B)	0.62 (0.61)	28.2 (33.5)	41.8 (44.7)
SBT	275 (430)	56.3 (55.1)	C (D)	0.7 (0.82)	70.3 (107.7)	95.6 (133.1)
SBR	125 (425)	8.1 (23.3)	A (C)	0.29 (0.7)	0 (46.8)	15.7 (76.9)
OVERALL	**2990 (4610)**	**35.2 (42.0)**		**0.53 (0.72)**		
WORST MOVEMENT		**EBTR (NBL)**		**0.78 (0.87)**		

Notes:

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

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

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

Huntmar Drive at Maple Grove Road

Table 31 summarizes the Synchro results for the 2024 forecast network intersection during the AM and PM peak hours. The intersection is operating at unsatisfactory levels of service during the afternoon peak hours of travel demand. The intersection maintains LOS F, a v/c ratio of 1.38, and an expected delay of over 200 seconds corresponding to the southbound through / left / right movement during PM peak hours.

It is recommended that intersection modifications are implemented to mitigate traffic congestion. Intersection modifications should include auxiliary left-turn lanes on all approaches. Traffic congestion at this intersection may also be mitigated through higher transit mode shares from implementing isolated transit measures or bus rapid transit in the area, or from the Huntmar Drive road widening from two lanes to four lanes. It is also noted that peak spreading may occur throughout the peak period as shown in **Table 15**.

Table 31: 2024 Future Huntmar Drive at Maple Grove Road Traffic Operations

Movement	Volume	Delay (s)	LOS	V/C	Q50th	Q95th
EBTLR	490 (310)	81.5 (41.7)	**F (C)**	1.01 (0.71)	124.7 (66.1)	#200.1 (93.4)
WBTLR	210 (410)	24.5 (54)	A (E)	0.4 (0.91)	32.2 (61.8)	49.2 (97.6)
NBL	35 (110)	18.7 (37.2)	A (A)	0.1 (0.58)	5 (19.2)	11.6 (#54.2)
NBTR	645 (700)	31.1 (28.5)	C (C)	0.73 (0.73)	136.2 (137.4)	188.7 (213.8)
SBTLR	400 (1120)	18.3 (288.1)	**A (F)**	0.49 (1.38)	40.7 (~428.8)	89 (m#513.1)
OVERALL	**1780 (2650)**	**41.1 (144.1)**		**0.7 (1.11)**		
WORST MOVEMENT		**EBTLR (SBTLR)**		**1.01 (1.38)**		

Notes:

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

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

Huntmar Drive at Palladium Drive

Table 32 summarizes the Synchro results for the 2024 forecast network intersection during the AM and PM peak hours. The intersection is operating at unsatisfactory levels of service during the afternoon peak hours of travel demand. The intersection maintains LOS 'F', a v/c ratio of 1.17, and an expected delay of 150 seconds corresponding to the westbound left movement during PM peak hours. Traffic congestion at this intersection may be mitigated through higher transit mode shares from implementing isolated transit measures or bus rapid transit through the area. The Huntmar Drive road widening would also reduce congestion at this intersection. It is also noted that peak spreading may occur throughout the peak period as shown in **Table 15**.

Table 32: 2024 Future Huntmar Drive at Palladium Drive Traffic Operations

Movement	Volume	Delay (s)	LOS	V/C	Q50th	Q95th
EBL	35 (25)	33.8 (28.6)	A (A)	0.14 (0.14)	7.5 (4.6)	12.5 (9.9)
EBTR	410 (760)	28.1 (34.5)	B (E)	0.68 (0.99dr)	25.7 (54.4)	35.2 (71.2)
WBL	60 (225)	31.6 (150.1)	**A (F)**	0.36 (1.17)	12.9 (~58.5)	m10.0 (#102.7)
WBTR	130 (595)	24 (45.2)	A (B)	0.23 (0.67)	11.3 (76.7)	m13.0 (88.2)
NBL	455 (335)	23.7 (37.4)	A (B)	0.58 (0.64)	79.5 (75.5)	m148.6 (m#128.4)
NBT	315 (235)	15.4 (23)	A (A)	0.26 (0.22)	45.6 (43)	m78.2 (m73.4)
NBR	185 (100)	5.5 (10.1)	A (A)	0.17 (0.11)	8.1 (5.6)	m16.4 (m16.4)
SBL	95 (90)	11.8 (14.9)	A (A)	0.15 (0.15)	8.2 (10.4)	25.5 (24)
SBT	175 (340)	10.7 (16.2)	A (A)	0.15 (0.33)	15 (44.4)	40.5 (79.7)
SBR	50 (95)	1.6 (3.3)	A (A)	0.05 (0.1)	0 (0)	3.2 (9.1)
OVERALL	**1910 (2800)**	**19.6 (40.6)**		**0.4 (0.38)**		
WORST MOVEMENT		**EBTR (WBL)**		**0.68 (1.17)**		

Notes:

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

Terry Fox Drive at Palladium Drive

Table 33 summarizes the Synchro results for the 2024 forecast network intersection during the AM and PM peak hours. The intersection is operating at unsatisfactory levels of service during the afternoon peak hours of travel demand. The intersection maintains LOS F, a v/c ratio of 1.42, and an expected delay of 244 seconds corresponding to the eastbound left movement during PM peak hours. The failure LOS is clearly a pre-existing condition and the proposed development is anticipated to generate 2.4% of the traffic of this movement during forecast (2024) conditions. The total 2024 forecast traffic traveling along this movement is 830 veh/h and the total site generated traffic is 20 veh/h. Hence, the new

development is estimated to produce 2.4% (20/830) of total peak hour trips along the eastbound left movement.

The failure LOS is a pre-existing condition and traffic congestion at this intersection may be mitigated through higher transit mode shares from implementing isolated transit measures or bus rapid transit in the area. It is also noted that peak spreading may occur throughout the peak period as shown in **Table 15**.

Table 33: 2024 Future Terry Fox Drive at Palladium Drive Traffic Operations

Movement	Volume	Delay (s)	LOS	V/C	Q50th	Q95th
EBL	285 (830)	252.7 (243.5)	**F (F)**	1.4 (1.42)	~54.0 (~180.0)	#84.5 (#222.2)
EBT	60 (250)	53.9 (66.4)	A (C)	0.28 (0.71)	13.6 (74.7)	22.4 (94)
EBR	125 (395)	7.9 (47.9)	A (D)	0.38 (0.88)	0 (64.8)	9.6 (97.8)
WBL	60 (135)	110.4 (78.1)	C (B)	0.76 (0.66)	16.3 (41.2)	35.8 (#74.9)
WBT	105 (180)	58.2 (68.1)	A (B)	0.48 (0.64)	27.5 (54.4)	39.7 (73.5)
WBR	155 (150)	8.9 (10.2)	A (A)	0.46 (0.41)	0 (0)	13.7 (18.9)
NBL	380 (245)	70.8 (76)	C (C)	0.71 (0.71)	54.7 (38)	#78.9 (#71.0)
NBT	1255 (1130)	15.5 (39.2)	B (C)	0.65 (0.74)	54.2 (147.8)	144.6 (#225.3)
NBR	85 (100)	0.4 (0.4)	A (A)	0.1 (0.13)	0 (0)	m0.8 (0)
SBL	90 (120)	62.7 (74)	A (A)	0.4 (0.5)	12.2 (19)	20.9 (29.5)
SBT	880 (1335)	26.5 (54.9)	A (E)	0.56 (0.94)	83.1 (210.5)	128.4 (#282.2)
SBR	835 (695)	20.3 (10.9)	D (C)	0.84 (0.72)	78 (22.8)	#205.0 (81.2)
OVERALL	**4315 (5565)**	**42.3 (74.5)**		**0.68 (0.86)**		
WORST MOVEMENT		**NBT (NBT)**		**1.4 (1.42)**		

Notes:

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

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

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

Terry Fox Drive at Maple Grove Road

Table 34 summarizes the Synchro results for the 2024 forecast network intersection during the AM and PM peak hours. The overall intersection is operating acceptably with each movement at LOS E or better and below capacity.

Table 34: 2024 Future Huntmar Drive at Maple Grove Road Traffic Operations

Movement	Volume	Delay (s)	LOS	V/C	Q50th	Q95th
EBL	245 (170)	71.1 (66.6)	D (C)	0.25 (0.19)	64.8 (44.7)	m82.2 (m56.1)
EBT	45 (45)	35.2 (39.6)	A (A)	0.25 (0.19)	9.6 (10)	m15.0 (m15.1)
EBR	180 (335)	7.8 (28.2)	A (C)	0.25 (0.19)	2.8 (34.6)	m12.5 (m53.3)
WBL	35 (20)	35.8 (39.8)	A (A)	0.25 (0.19)	7.3 (4.5)	35.8 (10.7)

Movement	Volume	Delay (s)	LOS	V/C	Q50th	Q95th
WBTR	80 (90)	16.3 (28.7)	A (A)	0.25 (0.19)	6.2 (13.4)	17.8 (25.8)
NBL	205 (220)	14.1 (61)	A (D)	0.67 (0.73)	19.7 (42.3)	37.2 (72.8)
NBTR	1385 (1410)	20 (18.5)	B (B)	0.63 (0.65)	105.8 (117.4)	196 (194.7)
SBL	15 (60)	13.5 (11.1)	A (A)	0.57 (0.61)	1 (4)	m4.0 (11.4)
SBT	810 (1810)	18.6 (43)	A (E)	0.53 (0.55)	36.2 (235.3)	77 (#370.5)
SBR	105 (175)	5.5 (7.8)	A (A)	0.53 (0.55)	0 (7)	m13.3 (25.5)
OVERALL	**3105 (4335)**	**22.3 (33.6)**		**0.53 (0.54)**		
WORST MOVEMENT		**NBL (NBL)**		**0.67 (0.73)**		

Notes:

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

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

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

4.9.1.4 2024 Unsignalized Network Intersection Operations - Huntmar Drive at Rosehill Avenue

Table 35 summarizes the Synchro results for the 2024 forecast roundabout intersection during the AM and PM peak hours. The overall intersection continues to perform well with each movement at LOS C or better and below capacity.

Table 35: 2024 Future Huntmar Drive at Rosehill Avenue Roundabout M (PM) Peak Hour

Mvmt.	LOS (Delay)	LOS (V/C)	Delay (s/veh)	V/C	Q95%
EB	A (A)	A (A)	5.7 (9.7)	0.09 (0.12)	0 m (0 m)
WB	A (A)	A (A)	6.2 (7.2)	0.07 (0.13)	0 m (0 m)
NB	A (A)	A (A)	8.1 (9.0)	0.50 (0.56)	3 m (4 m)
SB	A (B)	A (B)	6.4 (19.9)	0.37 (0.83)	2 m (10 m)

4.9.1.5 2029 Network Intersection Operations

Huntmar Drive at Hazeldean Road

Table 36 summarizes the Synchro results for the 2029 forecast network intersection during the AM and PM peak hours. The intersection is operating at unsatisfactory levels of service during the afternoon peak hours of travel demand. The intersection maintains LOS F, a v/c ratio of 1.07, and an expected delay of 88 seconds corresponding to the westbound through movement during PM peak hours. Traffic congestion at this intersection may be mitigated through higher transit mode shares from implementing isolated transit measures or bus rapid transit through the area. It is also noted that peak spreading may occur throughout the peak period as shown in **Table 15**.

Table 36: 2029 Future Huntmar Drive at Hazeldean Road Traffic Operations

Movement	Volume	Delay (s)	LOS	V/C	Q50th	Q95th
EBL	250 (250)	62.3 (66.6)	B (C)	0.64 (0.7)	33.6 (33.6)	46.7 (#52.6)
EBTR	975 (950)	33 (62)	B (E)	0.68 (0.95)	106.7 (130)	154.4 (#173.4)
WBL	205 (400)	60.7 (66.3)	A (D)	0.57 (0.8)	27.3 (54.7)	39.8 (#114.7)
WBT	500 (1250)	27 (87.5)	**A (F)**	0.35 (1.07)	46.3 (~203.8)	72.2 (#276.1)
WBR	130 (310)	5.3 (5.9)	A (A)	0.18 (0.43)	0 (0)	14.3 (23.1)
NBL	60 (170)	30.3 (44.3)	A (C)	0.25 (0.76)	11.2 (28.1)	19.5 (#39.9)
NBT	310 (375)	61.2 (42.6)	C (B)	0.78 (0.65)	79.6 (85.9)	103.9 (107.4)
NBR	310 (300)	14.4 (8.9)	B (A)	0.6 (0.47)	13.3 (10.5)	40.1 (30.8)
SBL	155 (210)	46.9 (34.7)	B (B)	0.68 (0.68)	30.7 (35.5)	44 (46.5)
SBT	305 (475)	54.7 (53.4)	C (D)	0.71 (0.83)	77.8 (117.4)	102.5 (143.9)
SBR	140 (480)	7.3 (28.1)	A (C)	0.3 (0.76)	0 (64.8)	15.8 (97.3)
OVERALL	**3340 (5170)**	**37.3 (55.2)**		**0.58 (0.83)**		
WORST MOVEMENT		**NBT (WBT)**		**0.78 (1.07)**		

Notes:

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

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

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

Huntmar Drive at Maple Grove Road

Table 37 summarizes the Synchro results for the 2029 forecast network intersection during the AM and PM peak hours. The intersection is operating at unsatisfactory levels of service during the afternoon peak hours of travel demand. The intersection maintains LOS F, a v/c ratio of 1.41, and an expected delay of over 200 seconds corresponding to the southbound through / left / right movement during PM peak hour. Eastbound and westbound movements are also operating at unsatisfactory levels of service during the PM peak period.

It is recommended that intersection modifications are implemented to mitigate traffic congestion. Intersection modifications should include auxiliary left-turn lanes on all approaches. Traffic congestion at this intersection may also be mitigated through higher transit mode shares from implementing isolated transit measures or bus rapid transit in the area, or from the Huntmar Drive road widening from two lanes to four lanes. It is also noted that peak spreading may occur throughout the peak period as shown in **Table 15**.

Table 37: 2029 Future Huntmar Drive at Maple Grove Road Traffic Operations

Movement	Volume	Delay (s)	LOS	V/C	Q50th	Q95th
EBTLR	545 (340)	93.8 (108.2)	**F (F)**	1.06 (1.05)	~160.8 (~97.3)	#233.1 (#159.9)
WBTLR	220 (450)	24.5 (223.3)	**A (F)**	0.4 (1.39)	31.6 (~155.4)	52.6 (#223.4)
NBL	40 (125)	19.6 (24.4)	A (A)	0.13 (0.56)	5.7 (17.4)	13.4 (41.7)

Movement	Volume	Delay (s)	LOS	V/C	Q50th	Q95th
NBTR	715 (780)	39.2 (18.8)	D (C)	0.84 (0.7)	161.3 (124.4)	#223.1 (173)
SBTLR	445 (1245)	23.9 (208.7)	**B (F)**	0.67 (1.41)	47.2 (~456.2)	146.4 (m#489.5)
OVERALL	**1965 (2940)**	**48.8 (141.1)**		**0.8 (1.14)**		
WORST MOVEMENT		**EBTLR (SBTLR)**		**1.06 (1.41)**		

Notes:

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

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

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

Huntmar Drive at Palladium Drive

Table 38 summarizes the Synchro results for the 2029 forecast network intersection during the AM and PM peak hours. The intersection is operating at unsatisfactory levels of service during the afternoon peak hours of travel demand. The intersection maintains LOS F, a v/c ratio of 1.3, and an expected delay of 196 seconds corresponding to the westbound left movement during PM peak hours. Traffic congestion at this intersection may be mitigated through higher transit mode shares from implementing isolated transit measures or bus rapid transit through the area. The Huntmar Drive road widening would also reduce congestion at this intersection. It is also noted that peak spreading may occur throughout the peak period as shown in **Table 15**.

Table 38: 2029 Future Huntmar Drive at Palladium Drive Traffic Operations

Movement	Volume	Delay (s)	LOS	V/C	Q50th	Q95th
EBL	35 (30)	35.6 (26.9)	A (A)	0.14 (0.16)	7.6 (5.2)	13.3 (11.2)
EBTR	455 (840)	30.4 (39.8)	**C (F)**	0.71 (1.07dr)	30.7 (71.7)	40.7 (93.2)
WBL	65 (250)	49.5 (196.3)	**A (F)**	0.5 (1.3)	14.6 (~71.8)	m12.1 (m#115.0)
WBTR	145 (665)	31.6 (42.5)	A (B)	0.26 (0.67)	13.1 (87.4)	m12.8 (99.4)
NBL	500 (370)	23.7 (48.6)	B (D)	0.64 (0.84)	86.6 (90.5)	m152.6 (m#144.6)
NBT	355 (260)	14.3 (23.9)	A (A)	0.29 (0.26)	51.9 (47.4)	m77.3 (m67.7)
NBR	205 (110)	4.2 (8.5)	A (A)	0.19 (0.12)	7.2 (5.4)	m12.5 (m11.5)
SBL	105 (100)	10.8 (17.2)	A (A)	0.17 (0.18)	8.8 (13.1)	26.5 (26.7)
SBT	195 (380)	9.7 (19.2)	A (A)	0.16 (0.39)	16.4 (57.1)	41.4 (90.4)
SBR	55 (110)	1.6 (3.3)	A (A)	0.05 (0.13)	0 (0)	3.9 (9.8)
OVERALL	**2115 (3115)**	**20.7 (46.9)**		**0.43 (0.43)**		
WORST MOVEMENT		**EBTR (WBL)**		**0.71 (1.3)**		

Notes:

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

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

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

Terry Fox Drive at Palladium Drive

Table 39 summarizes the Synchro results for the 2029 forecast network intersection during the AM and PM peak hours. The intersection is operating at unsatisfactory levels of service during both the morning and the afternoon peak hours of travel demand. The intersection maintains LOS F, a v/c ratio of 1.51, and an expected delay of over 200 seconds corresponding to the eastbound left movement during PM peak hours. The failure LOS is clearly a pre-existing condition and the proposed development is anticipated to generate 2.4% of the traffic of this movement during forecast (2029) conditions. The total 2024 forecast traffic traveling along this movement is 845 veh/h and the total site generated traffic is 20 veh/h. Hence, the new development is estimated to produce 2.4% (20/845) of total peak hour trips along the westbound left movement.

The failure LOS is a pre-existing condition and traffic congestion at this intersection may be mitigated through higher transit mode shares from implementing isolated transit measures or bus rapid transit in the area. It is also noted that peak spreading may occur throughout the peak period as shown in **Table 15**.

Table 39: 2029 Future Terry Fox Drive at Palladium Drive Traffic Operations

Movement	Volume	Delay (s)	LOS	V/C	Q50th	Q95th
EBL	315 (845)	178.8 (277.8)	**F (F)**	1.21 (1.51)	~61.7 (~188.7)	#94.1 (#230.9)
EBT	65 (260)	59.4 (63.2)	A (B)	0.29 (0.68)	19 (77.4)	30.8 (99.2)
EBR	135 (405)	12.1 (46.5)	A (D)	0.43 (0.86)	0 (68.8)	18.3 (104.1)
WBL	65 (135)	112.5 (97.7)	C (D)	0.75 (0.8)	20.4 (41.7)	39.8 (#74.9)
WBT	120 (185)	72.5 (69.3)	A (B)	0.59 (0.66)	36.7 (55.6)	52.3 (75.9)
WBR	175 (150)	13.1 (5.1)	A (A)	0.53 (0.38)	0 (0)	21 (8.9)
NBL	420 (250)	66.3 (73.9)	C (B)	0.72 (0.69)	64.2 (38.7)	#98.6 (#72.7)
NBT	1410 (1160)	25.9 (39)	C (C)	0.71 (0.75)	151.4 (153.6)	241 (#232.5)
NBR	95 (100)	3.3 (0.4)	A (A)	0.11 (0.13)	0 (0)	9.4 (0)
SBL	100 (125)	73.9 (74.1)	A (A)	0.46 (0.51)	15.8 (19.7)	25.7 (30.6)
SBT	985 (1370)	31.6 (57.9)	B (E)	0.62 (0.96)	115.9 (220.5)	158.3 (#290.3)
SBR	935 (710)	44.1 (16.4)	E (C)	0.98 (0.76)	184.7 (55.7)	#313.0 (123)
OVERALL	**4820 (5695)**	**46.6 (80.9)**		**0.74 (0.89)**		
WORST MOVEMENT		**EBL (EBL)**		**1.21 (1.51)**		

Notes:

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

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

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

Terry Fox Drive at Maple Grove Road

Table 40 summarizes the Synchro results for the 2029 forecast network intersection during the AM and PM peak hours. The intersection is operating at unsatisfactory levels of service during the afternoon peak hours of travel demand. The intersection maintains LOS F, a v/c ratio of 1.15, and an expected delay of over 100 seconds corresponding to the southbound through movement during PM peak hours. The proposed site is not expected to produce traffic along southbound through movement at this intersection hence the failure LOS is a byproduct of emergent developments in the area. It is also noted that peak spreading may occur throughout the peak period as shown in **Table 15**.

Table 40: 2029 Future Terry Fox Drive at Maple Grove Road Traffic Operations

Movement	Volume	Delay (s)	LOS	V/C	Q50th	Q95th
EBL	270 (190)	71.8 (69)	D (D)	0.88 (0.81)	70.6 (49.6)	m86.2 (m60.5)
EBT	50 (50)	34.7 (38.2)	A (A)	0.11 (0.14)	10.2 (11)	m15.4 (m16.0)
EBR	195 (375)	7.6 (33.2)	A (D)	0.39 (0.82)	2.7 (47.6)	m10.1 (m63.6)
WBL	35 (20)	34.4 (38.5)	A (A)	0.11 (0.08)	7.1 (4.4)	39.8 (10.6)
WBTR	90 (100)	16 (28.6)	A (A)	0.2 (0.28)	7 (15.2)	19.7 (28.4)
NBL	225 (245)	18.4 (58.7)	B (D)	0.63 (0.83)	23.6 (48.1)	40.9 (#88.4)
NBTR	1550 (1585)	24.3 (22.9)	C (C)	0.77 (0.76)	139.6 (155.2)	#256.7 (#262.1)
SBL	15 (70)	12.3 (15.4)	A (A)	0.09 (0.36)	1.4 (5)	4.6 (13)
SBT	905 (2030)	25.9 (103.4)	**A (F)**	0.56 (1.15)	88.2 (~342.8)	127.8 (#434.8)
SBR	115 (190)	4.4 (9.3)	A (A)	0.16 (0.23)	0 (9.8)	11.5 (29.1)
OVERALL	**3450 (4855)**	**26.4 (60.7)**		**0.64 (0.89)**		
WORST MOVEMENT		**EBL (SBT)**		**0.88 (1.15)**		

Notes:

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

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

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

4.9.1.6 2029 Unsignalized Network Intersection Operations - Huntmar Drive at Rosehill Avenue

Table 41 summarizes the Synchro results for the 2029 forecast roundabout intersection during the AM and PM peak hours. Although the southbound movement fails in the PM peak hour in terms of volume capacity, it can be seen that the intersection performs acceptably in terms of delay.

Table 41: 2029 Future Huntmar Drive at Rosehill Avenue Roundabout AM (PM) Peak Hour

Mvmt.	LOS (Delay)	LOS (V/C)	Delay (s/veh)	V/C	Q95%
EB	A (B)	A (A)	6.2 (11.5)	0.11 (0.16)	0 m (1 m)
WB	A (A)	C (A)	6.6 (7.6)	0.72 (0.15)	0 m (1 m)
NB	A (A)	A (A)	9.1 (9.6)	0.55 (0.59)	4 m (4 m)
SB	A (D)	A (E)	6.8 (33.7)	0.40 (0.94)	2 m (17 m)

5.0 Conclusions

This Transportation Impact Assessment for 130 Huntmar Drive was undertaken to identify potential pressures on the transportation network once the site is developed. The analysis addressed all modes of travel in and around the site with a MMLOS assessment of boundary roads and detailed intersection analysis at access intersections, network intersections beyond the immediate study area, as well as internal circulation on new streets within the site.

While many of these intersections operate at unsatisfactory levels, congestion may be mitigated through peak spreading, implementation of the N-S arterial, the Huntmar Drive widening, and increasing transit mode share in the surrounding development. Study intersections which are forecasted to experience deficiencies by 2024 are listed below:

- Huntmar Drive and Maple Grove Road:
- Huntmar Drive and Palladium Drive:
- Terry Fox Drive and Palladium Drive:

By 2029 additional intersections are expected to operate at or exceed the capacity. Planned capacity improvements will be required such as the widening of Huntmar Drive and construction of the new North-South Arterial. Study intersections which are forecasted to experience deficiencies by 2029 are listed below:

- **Huntmar Drive and Hazeldean Road**: This intersection operates at an unsatisfactory LOS along the westbound left movement for the PM peak period. Traffic congestion at this intersection may be mitigated through higher transit mode shares from implementing isolated transit measures or bus rapid transit through the area.

- **Huntmar Drive and Maple Grove Road**: This intersection operates at an unsatisfactory LOS along the southbound through / left / right movement, the westbound through / left / right movement, and the southbound through / left / right movement for the PM peak period. Traffic congestion at this intersection may also be mitigated through higher transit mode shares from implementing isolated transit measures or bus rapid transit in the area, or from the Huntmar Drive road widening from two lanes to four lanes.

- **Huntmar Drive and Palladium Drive**: This intersection operates at an unsatisfactory LOS along the westbound left movement for the PM peak period. Traffic congestion at this intersection may be mitigated through higher transit mode shares from implementing isolated transit measures or bus rapid transit through the area. The Huntmar Drive road widening would also reduce congestion at this intersection.

- **Terry Fox Drive and Palladium Drive**: This intersection operates at an unsatisfactory LOS along the eastbound left and westbound left movements for all conditions. This is a pre-existing condition of the intersection and the site generated traffic of the proposed development is anticipated to be only 2.4% of the total traffic travelling along the movements that fail. The failure LOS is a pre-existing condition and traffic congestion at this intersection may be mitigated through higher transit mode shares from implementing isolated transit measures or bus rapid transit in the area.

- **Terry Fox Drive and Maple Grove Road**: This intersection operates at an unsatisfactory LOS along the southbound through movement for the PM peak period. The proposed site is not expected to produce traffic along southbound through movement at this intersection hence the failure LOS is a byproduct of emergent developments in the area.
    - The westbound movements at the access intersections along Huntmar Drive are projected to operate at LOS E or worse in 2024 and 2029. A signal warrant analysis was performed to determine if signalized intersections are warranted, and it was deemed unwarranted.

Appendix A

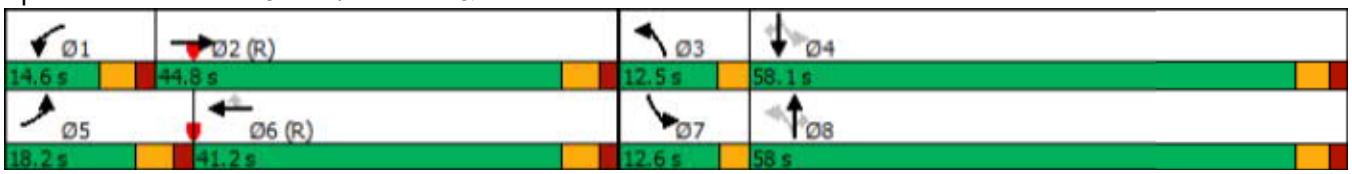
Synchro Performance Worksheets

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	200	665	110	160	395	80	45	235	245	115	210	110
Future Volume (vph)	200	665	110	160	395	80	45	235	245	115	210	110
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	14%	4%	5%	2%	4%	0%	5%	3%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	200	775	0	160	395	80	45	235	245	115	210	110
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6	8		8	4		4
Detector Phase	5	2		1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	12.5	38.6		12.5	38.6	38.6	12.5	58.0	58.0	12.5	41.3	41.3
Total Split (s)	18.2	44.8		14.6	41.2	41.2	12.5	58.0	58.0	12.6	58.1	58.1
Total Split (%)	14.0%	34.5%		11.2%	31.7%	31.7%	9.6%	44.6%	44.6%	9.7%	44.7%	44.7%
Yellow Time (s)	3.6	3.6		3.6	3.6	3.6	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0
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
Total Lost Time (s)	5.6	5.6		5.6	5.6	5.6	3.0	5.3	5.3	3.0	5.3	5.3
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	13.3	65.9		12.0	64.6	64.6	33.5	23.2	23.2	36.4	26.4	26.4
Actuated g/C Ratio	0.10	0.51		0.09	0.50	0.50	0.26	0.18	0.18	0.28	0.20	0.20
v/c Ratio	0.61	0.48		0.54	0.24	0.10	0.17	0.73	0.54	0.50	0.59	0.28
Control Delay	63.5	23.2		63.0	21.0	4.0	32.4	63.1	9.4	41.2	54.0	8.9
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.5	23.2		63.0	21.0	4.0	32.4	63.1	9.4	41.2	54.0	8.9
LOS	E	C		E	C	A	C	E	A	D	D	A
Approach Delay		31.5			29.4			35.4			39.2	
Approach LOS		C			C			D			D	
Queue Length 50th (m)	27.0	67.8		21.5	31.0	0.0	8.9	60.9	0.0	23.7	53.0	0.0
Queue Length 95th (m)	39.0	104.8		32.6	51.6	8.4	16.7	82.1	21.5	35.7	73.8	15.1
Internal Link Dist (m)		871.0			1427.4			1305.6			301.9	
Turn Bay Length (m)	50.0			90.0		225.0	30.0		60.0	50.0		275.0
Base Capacity (vph)	349	1625		296	1617	777	280	729	725	232	709	675
Starvation Cap Reductn	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
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.48		0.54	0.24	0.10	0.16	0.32	0.34	0.50	0.30	0.16

Intersection Summary

Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 125	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 33.1	Intersection LOS: C
Intersection Capacity Utilization 70.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: Iber/Huntmar & Hazeldean

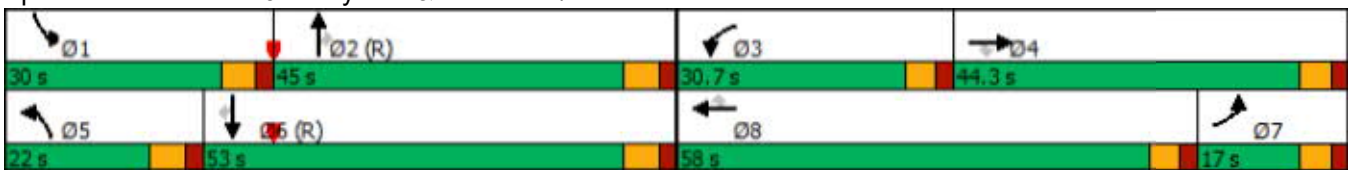


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	55	95	55	95	140	290	1095	75	80	775	695
Future Volume (vph)	225	55	95	55	95	140	290	1095	75	80	775	695
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	6%	6%	3%	12%	6%	4%	0%	3%	13%	3%	5%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	225	55	95	55	95	140	290	1095	75	80	775	695
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	12.0	40.6	40.6	12.0	40.3	40.3	12.0	42.5	42.5	30.0	41.0	41.0
Total Split (s)	17.0	44.3	44.3	30.7	58.0	58.0	22.0	45.0	45.0	30.0	53.0	53.0
Total Split (%)	11.3%	29.5%	29.5%	20.5%	38.7%	38.7%	14.7%	30.0%	30.0%	20.0%	35.3%	35.3%
Yellow Time (s)	3.6	3.6	3.6	3.3	3.3	3.3	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	0.0	0.0	-2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.6	5.6	5.6	3.3	5.3	5.3	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	18.4	24.6	24.6	12.8	16.7	16.7	18.7	84.9	84.9	9.1	75.4	75.4
Actuated g/C Ratio	0.12	0.16	0.16	0.09	0.11	0.11	0.12	0.57	0.57	0.06	0.50	0.50
v/c Ratio	0.59	0.20	0.26	0.43	0.50	0.48	0.70	0.58	0.09	0.41	0.47	0.65
Control Delay	68.3	54.8	2.5	74.1	70.0	11.7	72.3	25.0	0.2	73.6	28.2	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.3	54.8	2.5	74.1	70.0	11.7	72.3	25.0	0.2	73.6	28.2	6.9
LOS	E	D	A	E	E	B	E	C	A	E	C	A
Approach Delay		49.6			42.6			33.1			21.0	
Approach LOS		D			D			C			C	
Queue Length 50th (m)	34.8	15.7	0.0	16.7	29.1	0.0	45.5	107.6	0.0	12.6	78.4	7.8
Queue Length 95th (m)	48.1	26.3	2.2	31.4	43.1	16.1	60.2	183.8	0.0	21.7	133.7	59.0
Internal Link Dist (m)		1802.0			304.5			406.9			280.2	
Turn Bay Length (m)	100.0			115.0		115.0	240.0		115.0	70.0		190.0
Base Capacity (vph)	383	438	485	278	596	604	420	1879	830	515	1636	1067
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	0.59	0.13	0.20	0.20	0.16	0.23	0.69	0.58	0.09	0.16	0.47	0.65

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 30.4 Intersection LOS: C
Intersection Capacity Utilization 80.3% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 6: Terry Fox & Palladium/Katimavik



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	155	165	40	80	35	325	260	130	85	145	45
Future Volume (vph)	30	155	165	40	80	35	325	260	130	85	145	45
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	4%	2%	11%	1%	0%	1%	1%	1%	2%	4%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	320	0	40	115	0	325	260	130	85	145	45
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	12.5	43.0		12.5	43.0		42.3	42.3	42.3	42.3	42.3	42.3
Total Split (s)	14.9	43.0		15.0	43.1		72.0	72.0	72.0	72.0	72.0	72.0
Total Split (%)	11.5%	33.1%		11.5%	33.2%		55.4%	55.4%	55.4%	55.4%	55.4%	55.4%
Yellow Time (s)	4.0	4.0		4.0	4.0		3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
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)	6.0	6.0		6.0	6.0		5.3	5.3	5.3	5.3	5.3	5.3
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	23.0	16.9		25.2	19.9		90.4	90.4	90.4	90.4	90.4	90.4
Actuated g/C Ratio	0.18	0.13		0.19	0.15		0.70	0.70	0.70	0.70	0.70	0.70
v/c Ratio	0.12	0.60		0.24	0.22		0.40	0.21	0.12	0.12	0.12	0.04
Control Delay	35.2	28.7		38.2	32.2		18.0	14.4	6.7	10.4	9.6	1.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.2	28.7		38.2	32.2		18.0	14.4	6.7	10.4	9.6	1.0
LOS	D	C		D	C		B	B	A	B	A	A
Approach Delay		29.2			33.7			14.7			8.5	
Approach LOS		C			C			B			A	
Queue Length 50th (m)	6.6	21.3		8.9	10.6		35.2	25.4	2.5	6.6	11.3	0.0
Queue Length 95th (m)	11.5	29.8		14.6	16.1		104.1	72.0	m18.5	22.2	32.8	2.2
Internal Link Dist (m)		535.2			1802.0			357.2			231.7	
Turn Bay Length (m)	95.0			75.0			120.0		45.0	50.0		
Base Capacity (vph)	258	977		177	946		820	1238	1074	716	1203	1047
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	0.12	0.33		0.23	0.12		0.40	0.21	0.12	0.12	0.12	0.04

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.60
Intersection Signal Delay: 18.9 Intersection LOS: B
Intersection Capacity Utilization 86.4% ICU Level of Service E
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

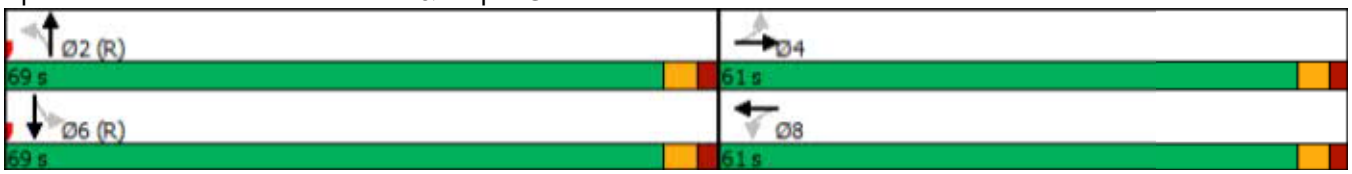
Splits and Phases: 8: Huntmar & Palladium

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	220	115	50	40	40	25	30	445	90	5	270	40
Future Volume (vph)	220	115	50	40	40	25	30	445	90	5	270	40
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	2%	6%	0%	10%	5%	23%	2%	4%	14%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	385	0	0	105	0	30	535	0	0	315	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	33.0	33.0		33.0	33.0		29.0	29.0		49.0	49.0	
Total Split (s)	61.0	61.0		61.0	61.0		69.0	69.0		69.0	69.0	
Total Split (%)	46.9%	46.9%		46.9%	46.9%		53.1%	53.1%		53.1%	53.1%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0			0.0	
Total Lost Time (s)		5.0			5.0		5.3	5.3			5.3	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)		43.6			43.6		76.1	76.1			76.1	
Actuated g/C Ratio		0.34			0.34		0.59	0.59			0.59	
v/c Ratio		0.87			0.23		0.07	0.53			0.32	
Control Delay		58.6			25.0		15.3	20.2			13.5	
Queue Delay		0.0			0.0		0.0	0.0			0.0	
Total Delay		58.6			25.0		15.3	20.2			13.5	
LOS		E			C		B	C			B	
Approach Delay		58.6			25.0			19.9			13.5	
Approach LOS		E			C			B			B	
Queue Length 50th (m)		94.8			15.9		3.4	82.2			24.5	
Queue Length 95th (m)		121.7			26.5		10.0	140.6			63.2	
Internal Link Dist (m)		630.5			86.3			293.1			175.1	
Turn Bay Length (m)							20.0					
Base Capacity (vph)		568			569		461	1002			998	
Starvation Cap Reductn		0			0		0	0			0	
Spillback Cap Reductn		0			0		0	0			0	
Storage Cap Reductn		0			0		0	0			0	
Reduced v/c Ratio		0.68			0.18		0.07	0.53			0.32	

Intersection Summary

Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 85	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 29.7	Intersection LOS: C
Intersection Capacity Utilization 68.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 21: Huntmar & Maple Grove



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	195	25	135	30	25	45	170	1150	35	10	710	85
Future Volume (vph)	195	25	135	30	25	45	170	1150	35	10	710	85
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	10%	9%	12%	11%	9%	0%	8%	5%	7%	0%	8%	19%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	195	25	135	30	70	0	170	1185	0	10	710	85
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0		5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	42.0	42.0	42.0	42.0	42.0		12.0	43.0		12.0	43.0	43.0
Total Split (s)	46.0	46.0	46.0	46.0	46.0		24.0	72.0		12.0	60.0	60.0
Total Split (%)	35.4%	35.4%	35.4%	35.4%	35.4%		18.5%	55.4%		9.2%	46.2%	46.2%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		6.0	6.0		6.0	6.0	6.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	27.2	27.2	27.2	27.2	27.2		91.8	89.3		81.1	75.3	75.3
Actuated g/C Ratio	0.21	0.21	0.21	0.21	0.21		0.71	0.69		0.62	0.58	0.58
v/c Ratio	0.81	0.07	0.35	0.12	0.19		0.37	0.53		0.03	0.39	0.11
Control Delay	73.3	39.8	11.7	39.2	17.7		9.9	13.1		8.8	17.3	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	73.3	39.8	11.7	39.2	17.7		9.9	13.1		8.8	17.3	1.6
LOS	E	D	B	D	B		A	B		A	B	A
Approach Delay		47.5			24.2			12.7			15.5	
Approach LOS		D			C			B			B	
Queue Length 50th (m)	52.7	5.9	5.4	6.6	5.5		13.7	70.6		0.7	51.9	0.0
Queue Length 95th (m)	76.0	m10.1	m16.6	14.1	16.9		28.5	144.4		3.2	85.1	4.6
Internal Link Dist (m)		1246.0			796.0			547.8			406.9	
Turn Bay Length (m)	65.0		60.0	40.0			145.0			125.0		70.0
Base Capacity (vph)	365	520	515	377	522		515	2226		297	1834	772
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	0.53	0.05	0.26	0.08	0.13		0.33	0.53		0.03	0.39	0.11

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 112 (86%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 18.7 Intersection LOS: B
Intersection Capacity Utilization 75.0% ICU Level of Service D
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 31: Terry Fox & Maple Grove

Intersection	
Intersection Delay, s/veh	6.3
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	55	40	530	375
Demand Flow Rate, veh/h	61	43	557	393
Vehicles Circulating, veh/h	419	557	37	48
Vehicles Exiting, veh/h	22	37	443	552
Ped Vol Crossing Leg, #/h	5	5	5	5
Ped Cap Adj	0.999	0.999	0.999	0.999
Approach Delay, s/veh	5.1	5.5	7.0	5.6
Approach LOS	A	A	A	A

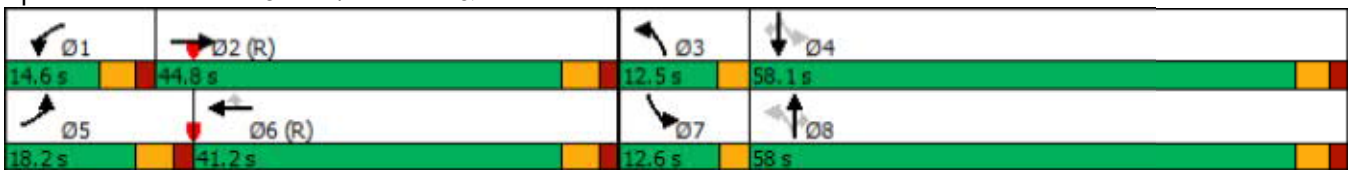
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	61	43	557	393
Cap Entry Lane, veh/h	900	782	1329	1314
Entry HV Adj Factor	0.902	0.936	0.952	0.954
Flow Entry, veh/h	55	40	530	375
Cap Entry, veh/h	811	732	1264	1252
V/C Ratio	0.068	0.055	0.419	0.299
Control Delay, s/veh	5.1	5.5	7.0	5.6
LOS	A	A	A	A
95th %tile Queue, veh	0	0	2	1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	195	630	120	315	985	205	135	270	235	135	330	380
Future Volume (vph)	195	630	120	315	985	205	135	270	235	135	330	380
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	2%	3%	1%	1%	0%	7%	2%	1%	1%	2%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	195	750	0	315	985	205	135	270	235	135	330	380
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6	8		8	4		4
Detector Phase	5	2		1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	12.5	38.6		12.5	38.6	38.6	12.5	58.0	58.0	12.5	41.3	41.3
Total Split (s)	18.2	44.8		14.6	41.2	41.2	12.5	58.0	58.0	12.6	58.1	58.1
Total Split (%)	14.0%	34.5%		11.2%	31.7%	31.7%	9.6%	44.6%	44.6%	9.7%	44.7%	44.7%
Yellow Time (s)	3.6	3.6		3.6	3.6	3.6	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0
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
Total Lost Time (s)	5.6	5.6		5.6	5.6	5.6	3.0	5.3	5.3	3.0	5.3	5.3
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	12.9	46.1		24.0	57.2	57.2	42.7	31.0	31.0	42.7	31.0	31.0
Actuated g/C Ratio	0.10	0.35		0.18	0.44	0.44	0.33	0.24	0.24	0.33	0.24	0.24
v/c Ratio	0.59	0.64		0.52	0.66	0.26	0.60	0.64	0.44	0.47	0.79	0.70
Control Delay	63.3	38.0		52.3	33.4	4.7	40.0	50.8	6.8	33.9	59.2	21.3
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.3	38.0		52.3	33.4	4.7	40.0	50.8	6.8	33.9	59.2	21.3
LOS	E	D		D	C	A	D	D	A	C	E	C
Approach Delay		43.2			33.4			32.4			38.1	
Approach LOS		D			C			C			D	
Queue Length 50th (m)	26.3	84.7		40.7	109.0	0.0	25.6	65.8	0.0	25.4	83.7	31.8
Queue Length 95th (m)	38.2	118.6		57.3	#160.3	17.4	37.0	86.6	18.9	36.7	107.3	62.6
Internal Link Dist (m)		871.0			1427.4			1305.6			301.9	
Turn Bay Length (m)	50.0			90.0		225.0	30.0		60.0	50.0		275.0
Base Capacity (vph)	352	1166		605	1489	775	226	715	742	288	716	752
Starvation Cap Reductn	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
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.64		0.52	0.66	0.26	0.60	0.38	0.32	0.47	0.46	0.51

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 125
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 36.6 Intersection LOS: D
Intersection Capacity Utilization 80.0% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Iber/Huntmar & Hazeldean

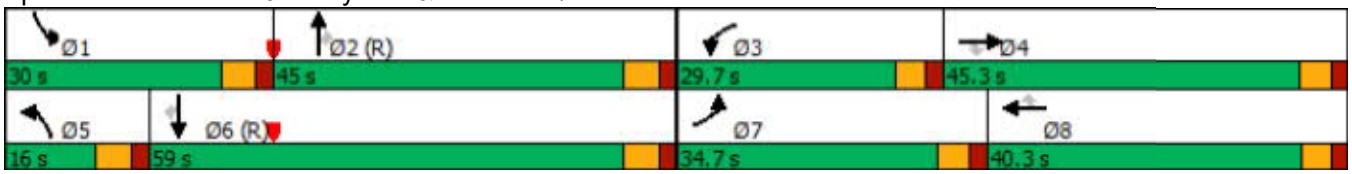


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	680	245	315	130	175	145	215	1080	95	115	1270	625
Future Volume (vph)	680	245	315	130	175	145	215	1080	95	115	1270	625
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	1%	5%	2%	0%	0%	2%	4%	0%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	680	245	315	130	175	145	215	1080	95	115	1270	625
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	12.0	40.6	40.6	12.0	40.3	40.3	12.0	42.5	42.5	30.0	41.0	41.0
Total Split (s)	34.7	45.3	45.3	29.7	40.3	40.3	16.0	45.0	45.0	30.0	59.0	59.0
Total Split (%)	23.1%	30.2%	30.2%	19.8%	26.9%	26.9%	10.7%	30.0%	30.0%	20.0%	39.3%	39.3%
Yellow Time (s)	3.6	3.6	3.6	3.3	3.3	3.3	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	0.0	0.0	-2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.6	5.6	5.6	3.3	5.3	5.3	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	31.1	33.0	33.0	19.2	21.2	21.2	15.4	66.3	66.3	10.6	61.4	61.4
Actuated g/C Ratio	0.21	0.22	0.22	0.13	0.14	0.14	0.10	0.44	0.44	0.07	0.41	0.41
v/c Ratio	0.99	0.62	0.60	0.62	0.71	0.43	0.63	0.73	0.13	0.49	0.92	0.65
Control Delay	90.5	60.1	16.1	74.4	75.7	11.0	73.3	39.4	1.1	74.0	53.3	7.5
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	90.5	60.1	16.1	74.4	75.7	11.0	73.3	39.4	1.1	74.0	53.3	7.5
LOS	F	E	B	E	E	B	E	D	A	E	D	A
Approach Delay		65.6			54.5			42.0			40.2	
Approach LOS		E			D			D			D	
Queue Length 50th (m)	110.6	70.5	15.8	39.2	53.5	0.0	33.5	143.1	0.0	18.1	197.0	8.0
Queue Length 95th (m)	#152.9	97.1	47.1	59.9	73.9	18.3	#52.2	#213.6	2.5	28.6	#274.2	48.6
Internal Link Dist (m)		1802.0			304.5			406.9			280.2	
Turn Bay Length (m)	100.0			115.0		115.0	240.0		115.0	70.0		190.0
Base Capacity (vph)	687	476	580	286	411	463	341	1481	718	530	1386	958
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	0.99	0.51	0.54	0.45	0.43	0.31	0.63	0.73	0.13	0.22	0.92	0.65

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 48.2 Intersection LOS: D
Intersection Capacity Utilization 94.1% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: Terry Fox & Palladium/Katimavik



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	140	420	155	395	110	215	190	70	80	280	85
Future Volume (vph)	25	140	420	155	395	110	215	190	70	80	280	85
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	12%	0%	1%	1%	0%	0%	1%	1%	0%	1%	2%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	25	560	0	155	505	0	215	190	70	80	280	85
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	12.5	43.0		12.5	43.0		42.3	42.3	42.3	42.3	42.3	42.3
Total Split (s)	14.9	43.0		15.0	43.1		72.0	72.0	72.0	72.0	72.0	72.0
Total Split (%)	11.5%	33.1%		11.5%	33.2%		55.4%	55.4%	55.4%	55.4%	55.4%	55.4%
Yellow Time (s)	4.0	4.0		4.0	4.0		3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
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)	6.0	6.0		6.0	6.0		5.3	5.3	5.3	5.3	5.3	5.3
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	28.2	21.1		33.1	27.7		82.6	82.6	82.6	82.6	82.6	82.6
Actuated g/C Ratio	0.22	0.16		0.25	0.21		0.64	0.64	0.64	0.64	0.64	0.64
v/c Ratio	0.15	0.67		0.95	0.70		0.34	0.17	0.07	0.11	0.25	0.09
Control Delay	31.7	15.6		95.3	49.8		21.4	17.6	8.8	12.5	12.9	3.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.7	15.6		95.3	49.8		21.4	17.6	8.8	12.5	12.9	3.2
LOS	C	B		F	D		C	B	A	B	B	A
Approach Delay		16.3			60.5			18.0			11.0	
Approach LOS		B			E			B			B	
Queue Length 50th (m)	4.9	17.4		32.8	65.5		24.2	19.3	0.0	8.2	31.8	0.0
Queue Length 95th (m)	10.2	31.8		#57.8	75.3		73.1	57.7	m14.8	20.5	62.3	8.5
Internal Link Dist (m)		535.2			1802.0			357.2			231.7	
Turn Bay Length (m)	95.0			75.0			120.0		45.0	50.0		
Base Capacity (vph)	187	1138		164	961		630	1132	983	714	1121	976
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	0.49		0.95	0.53		0.34	0.17	0.07	0.11	0.25	0.09

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 29.0 Intersection LOS: C
Intersection Capacity Utilization 92.0% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

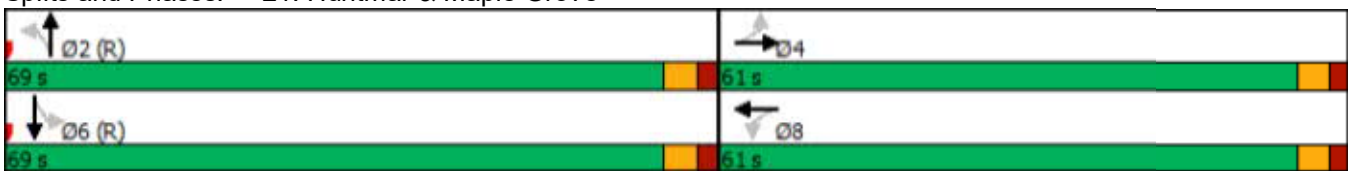
Splits and Phases: 8: Huntmar & Palladium

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	85	65	135	145	30	95	455	100	35	660	195
Future Volume (vph)	90	85	65	135	145	30	95	455	100	35	660	195
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	2%	1%	0%	0%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	240	0	0	310	0	95	555	0	0	890	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	33.0	33.0		33.0	33.0		29.0	29.0		49.0	49.0	
Total Split (s)	61.0	61.0		61.0	61.0		69.0	69.0		69.0	69.0	
Total Split (%)	46.9%	46.9%		46.9%	46.9%		53.1%	53.1%		53.1%	53.1%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0			0.0	
Total Lost Time (s)		5.0			5.0		5.3	5.3			5.3	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)		37.3			37.3		82.4	82.4			82.4	
Actuated g/C Ratio		0.29			0.29		0.63	0.63			0.63	
v/c Ratio		0.65			0.87		0.30	0.51			0.84	
Control Delay		44.7			64.4		16.4	16.2			25.9	
Queue Delay		0.0			0.0		0.0	0.0			0.0	
Total Delay		44.7			64.4		16.4	16.2			25.9	
LOS		D			E		B	B			C	
Approach Delay		44.7			64.4			16.2			25.9	
Approach LOS		D			E			B			C	
Queue Length 50th (m)		52.7			61.0		10.9	74.2			102.7	
Queue Length 95th (m)		72.3			82.5		28.2	132.4			m#322.0	
Internal Link Dist (m)		630.5			86.3			293.1			175.1	
Turn Bay Length (m)							20.0					
Base Capacity (vph)		544			532		320	1098			1055	
Starvation Cap Reductn		0			0		0	0			0	
Spillback Cap Reductn		0			0		0	0			0	
Storage Cap Reductn		0			0		0	0			0	
Reduced v/c Ratio		0.44			0.58		0.30	0.51			0.84	

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 30.8 Intersection LOS: C
Intersection Capacity Utilization 113.5% ICU Level of Service H
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 21: Huntmar & Maple Grove

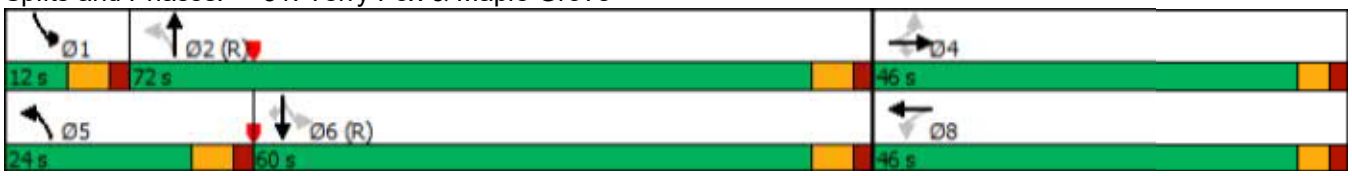


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	30	280	15	25	35	170	1190	40	55	1545	125
Future Volume (vph)	130	30	280	15	25	35	170	1190	40	55	1545	125
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour 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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	0%	1%	0%	0%	0%	3%	2%	0%	0%	1%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	130	30	280	15	60	0	170	1230	0	55	1545	125
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0		5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	42.0	42.0	42.0	42.0	42.0		12.0	43.0		12.0	43.0	43.0
Total Split (s)	46.0	46.0	46.0	46.0	46.0		24.0	72.0		12.0	60.0	60.0
Total Split (%)	35.4%	35.4%	35.4%	35.4%	35.4%		18.5%	55.4%		9.2%	46.2%	46.2%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		6.0	6.0		6.0	6.0	6.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	21.0	21.0	21.0	21.0	21.0		97.4	87.6		86.0	79.3	79.3
Actuated g/C Ratio	0.16	0.16	0.16	0.16	0.16		0.75	0.67		0.66	0.61	0.61
v/c Ratio	0.65	0.10	0.68	0.07	0.21		0.66	0.55		0.18	0.75	0.14
Control Delay	63.5	42.5	22.4	41.5	22.3		28.7	14.5		8.4	23.8	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	63.5	42.5	22.4	41.5	22.3		28.7	14.5		8.4	23.8	4.2
LOS	E	D	C	D	C		C	B		A	C	A
Approach Delay		35.9			26.1			16.2			21.9	
Approach LOS		D			C			B			C	
Queue Length 50th (m)	34.4	7.2	20.6	3.5	5.9		15.1	82.5		3.0	140.3	0.8
Queue Length 95th (m)	m47.3	m12.6	m42.9	8.8	16.1		45.5	155.6		10.7	#288.0	13.5
Internal Link Dist (m)		1246.0			796.0			547.8			406.9	
Turn Bay Length (m)	65.0		60.0	40.0			145.0			125.0		70.0
Base Capacity (vph)	393	567	608	416	536		326	2249		303	2064	916
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	0.33	0.05	0.46	0.04	0.11		0.52	0.55		0.18	0.75	0.14

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 112 (86%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 21.5 Intersection LOS: C
Intersection Capacity Utilization 87.4% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 31: Terry Fox & Maple Grove



Intersection	
Intersection Delay, s/veh	9.9
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	50	80	650	795
Demand Flow Rate, veh/h	54	81	656	804
Vehicles Circulating, veh/h	849	646	32	131
Vehicles Exiting, veh/h	86	42	870	596
Ped Vol Crossing Leg, #/h	5	5	5	5
Ped Cap Adj	0.999	0.999	0.999	0.999
Approach Delay, s/veh	7.8	6.3	7.8	12.2
Approach LOS	A	A	A	B

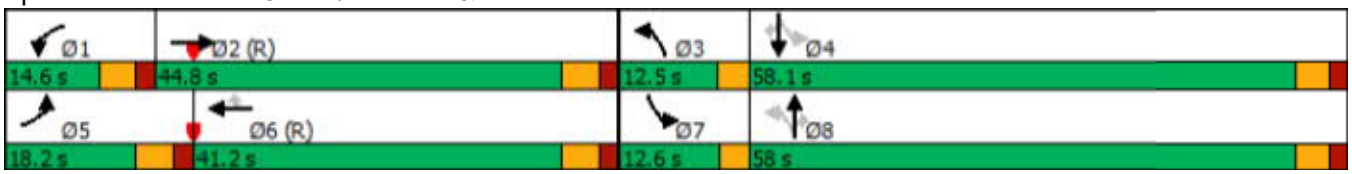
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	54	81	656	804
Cap Entry Lane, veh/h	580	714	1336	1207
Entry HV Adj Factor	0.932	0.988	0.991	0.989
Flow Entry, veh/h	50	80	650	795
Cap Entry, veh/h	541	705	1323	1193
V/C Ratio	0.093	0.114	0.492	0.666
Control Delay, s/veh	7.8	6.3	7.8	12.2
LOS	A	A	A	B
95th %tile Queue, veh	0	0	3	5

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	750	120	180	445	120	55	280	275	140	275	125
Future Volume (vph)	225	750	120	180	445	120	55	280	275	140	275	125
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	13%	3%	4%	2%	4%	0%	5%	3%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	225	870	0	180	445	120	55	280	275	140	275	125
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6	8		8	4		4
Detector Phase	5	2		1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	12.5	38.6		12.5	38.6	38.6	12.5	58.0	58.0	12.5	41.3	41.3
Total Split (s)	18.2	44.8		14.6	41.2	41.2	12.5	58.0	58.0	12.6	58.1	58.1
Total Split (%)	14.0%	34.5%		11.2%	31.7%	31.7%	9.6%	44.6%	44.6%	9.7%	44.7%	44.7%
Yellow Time (s)	3.6	3.6		3.6	3.6	3.6	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0
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
Total Lost Time (s)	5.6	5.6		5.6	5.6	5.6	3.0	5.3	5.3	3.0	5.3	5.3
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	14.3	61.9		13.0	60.6	60.6	36.5	26.0	26.0	39.1	29.2	29.2
Actuated g/C Ratio	0.11	0.48		0.10	0.47	0.47	0.28	0.20	0.20	0.30	0.22	0.22
v/c Ratio	0.63	0.56		0.56	0.29	0.16	0.23	0.78	0.55	0.62	0.70	0.29
Control Delay	63.2	27.3		62.3	23.7	4.9	31.8	63.7	9.6	45.0	56.3	8.1
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.2	27.3		62.3	23.7	4.9	31.8	63.7	9.6	45.0	56.3	8.1
LOS	E	C		E	C	A	C	E	A	D	E	A
Approach Delay		34.6			30.0			36.4			42.2	
Approach LOS		C			C			D			D	
Queue Length 50th (m)	30.3	85.3		24.2	38.2	0.0	10.5	72.2	1.8	28.2	70.3	0.0
Queue Length 95th (m)	43.0	124.9		35.8	60.1	13.1	19.1	97.1	25.0	41.8	95.6	15.7
Internal Link Dist (m)		871.0			1427.4			1305.6			301.9	
Turn Bay Length (m)	50.0			90.0		225.0	30.0		60.0	50.0		275.0
Base Capacity (vph)	368	1542		321	1532	750	256	729	738	225	716	684
Starvation Cap Reductn	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
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.56		0.56	0.29	0.16	0.21	0.38	0.37	0.62	0.38	0.18

Intersection Summary

Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 125	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 35.2	Intersection LOS: D
Intersection Capacity Utilization 75.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 3: Iber/Huntmar & Hazeldean

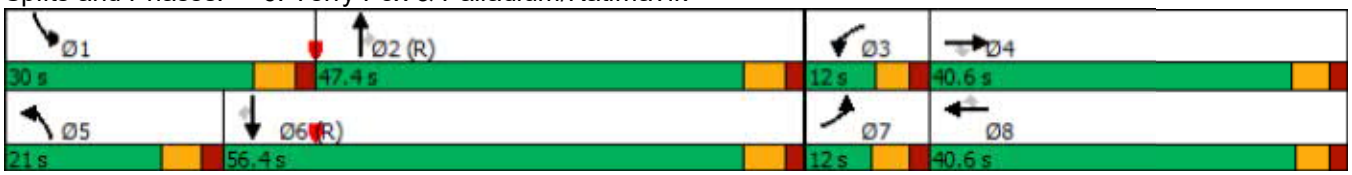


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	285	60	125	60	105	155	380	1255	85	90	880	835
Future Volume (vph)	285	60	125	60	105	155	380	1255	85	90	880	835
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour 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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	3%	11%	5%	3%	0%	2%	12%	2%	5%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	285	60	125	60	105	155	380	1255	85	90	880	835
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	12.0	40.6	40.6	12.0	40.3	40.3	12.0	42.5	42.5	30.0	41.0	41.0
Total Split (s)	12.0	40.6	40.6	12.0	40.6	40.6	21.0	47.4	47.4	30.0	56.4	56.4
Total Split (%)	9.2%	31.2%	31.2%	9.2%	31.2%	31.2%	16.2%	36.5%	36.5%	23.1%	43.4%	43.4%
Yellow Time (s)	3.6	3.6	3.6	3.3	3.3	3.3	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	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)	3.6	5.6	5.6	5.3	5.3	5.3	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	8.4	16.2	16.2	6.7	16.5	16.5	20.9	75.2	75.2	9.0	63.2	63.2
Actuated g/C Ratio	0.06	0.12	0.12	0.05	0.13	0.13	0.16	0.58	0.58	0.07	0.49	0.49
v/c Ratio	1.40	0.28	0.38	0.76	0.48	0.46	0.71	0.65	0.10	0.40	0.56	0.84
Control Delay	252.5	53.2	7.7	110.4	58.2	8.9	70.9	15.5	0.4	62.7	26.5	20.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	252.5	53.2	7.7	110.4	58.2	8.9	70.9	15.5	0.4	62.7	26.5	20.3
LOS	F	D	A	F	E	A	E	B	A	E	C	C
Approach Delay		162.0			44.1			27.0			25.4	
Approach LOS		F			D			C			C	
Queue Length 50th (m)	~53.9	13.5	0.0	16.3	27.5	0.0	54.6	54.2	0.0	12.2	83.1	78.0
Queue Length 95th (m)	#84.5	22.3	9.0	#41.6	39.7	13.7	#78.8	144.6	m0.8	20.9	128.4	#205.0
Internal Link Dist (m)		1802.0			304.5			406.9			280.2	
Turn Bay Length (m)	100.0			115.0		115.0	240.0		115.0	70.0		190.0
Base Capacity (vph)	204	461	519	79	465	522	534	1939	847	600	1584	991
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	1.40	0.13	0.24	0.76	0.23	0.30	0.71	0.65	0.10	0.15	0.56	0.84

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.40
Intersection Signal Delay: 42.3 Intersection LOS: D
Intersection Capacity Utilization 92.1% ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Terry Fox & Palladium/Katimavik



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	185	225	60	90	40	455	315	185	95	175	50
Future Volume (vph)	35	185	225	60	90	40	455	315	185	95	175	50
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	3%	2%	7%	1%	0%	0%	1%	1%	2%	4%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	35	410	0	60	130	0	455	315	185	95	175	50
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	12.5	43.0		12.5	43.0		42.3	42.3	42.3	42.3	42.3	42.3
Total Split (s)	16.9	43.0		17.0	43.1		70.0	70.0	70.0	70.0	70.0	70.0
Total Split (%)	13.0%	33.1%		13.1%	33.2%		53.8%	53.8%	53.8%	53.8%	53.8%	53.8%
Yellow Time (s)	4.0	4.0		4.0	4.0		3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
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)	6.0	6.0		6.0	6.0		5.3	5.3	5.3	5.3	5.3	5.3
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	24.1	17.8		28.2	21.9		88.2	88.2	88.2	88.2	88.2	88.2
Actuated g/C Ratio	0.19	0.14		0.22	0.17		0.68	0.68	0.68	0.68	0.68	0.68
v/c Ratio	0.14	0.68		0.36	0.23		0.58	0.26	0.17	0.15	0.15	0.05
Control Delay	33.8	28.1		31.6	24.0		22.6	14.6	4.8	11.8	10.7	1.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.8	28.1		31.6	24.0		22.6	14.6	4.8	11.8	10.7	1.6
LOS	C	C		C	C		C	B	A	B	B	A
Approach Delay		28.5			26.4			16.5			9.6	
Approach LOS		C			C			B			A	
Queue Length 50th (m)	7.5	25.7		12.9	11.3		75.5	43.3	6.9	8.2	15.0	0.0
Queue Length 95th (m)	12.5	35.2		m10.0	m13.0		m144.7	m74.6	m14.4	25.5	40.5	3.2
Internal Link Dist (m)		535.2			1802.0			357.2			231.7	
Turn Bay Length (m)	95.0			75.0			120.0		45.0	50.0		
Base Capacity (vph)	289	1019		187	958		787	1209	1069	647	1174	1024
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	0.12	0.40		0.32	0.14		0.58	0.26	0.17	0.15	0.15	0.05

Intersection Summary

Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 19.1	Intersection LOS: B
Intersection Capacity Utilization 96.5%	ICU Level of Service F
Analysis Period (min) 15	

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

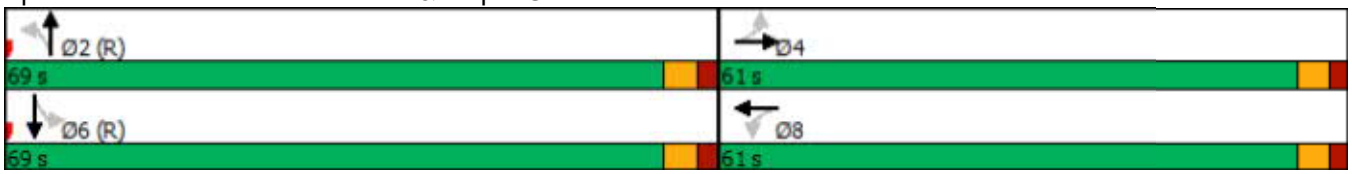
Splits and Phases: 8: Huntmar & Palladium

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	280	150	60	70	60	80	35	540	105	20	325	55
Future Volume (vph)	280	150	60	70	60	80	35	540	105	20	325	55
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	1%	5%	0%	7%	1%	21%	2%	3%	5%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	490	0	0	210	0	35	645	0	0	400	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	33.0	33.0		33.0	33.0		29.0	29.0		49.0	49.0	
Total Split (s)	61.0	61.0		61.0	61.0		69.0	69.0		69.0	69.0	
Total Split (%)	46.9%	46.9%		46.9%	46.9%		53.1%	53.1%		53.1%	53.1%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0			0.0	
Total Lost Time (s)		5.0			5.0		5.3	5.3			5.3	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)		52.9			52.9		66.8	66.8			66.8	
Actuated g/C Ratio		0.41			0.41		0.51	0.51			0.51	
v/c Ratio		1.01			0.40		0.10	0.73			0.49	
Control Delay		81.5			24.5		18.7	31.1			18.3	
Queue Delay		0.0			0.0		0.0	0.0			0.0	
Total Delay		81.5			24.5		18.7	31.1			18.3	
LOS		F			C		B	C			B	
Approach Delay		81.5			24.5			30.5			18.3	
Approach LOS		F			C			C			B	
Queue Length 50th (m)		124.7			32.2		5.0	136.2			40.7	
Queue Length 95th (m)		#200.1			49.2		11.6	188.7			89.0	
Internal Link Dist (m)		630.5			86.3			293.1			175.1	
Turn Bay Length (m)							20.0					
Base Capacity (vph)		512			558		352	884			818	
Starvation Cap Reductn		0			0		0	0			0	
Spillback Cap Reductn		0			0		0	0			0	
Storage Cap Reductn		0			0		0	0			0	
Reduced v/c Ratio		0.96			0.38		0.10	0.73			0.49	

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.01
Intersection Signal Delay: 41.1 Intersection LOS: D
Intersection Capacity Utilization 94.5% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 21: Huntmar & Maple Grove



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	245	45	180	35	30	50	205	1350	35	15	810	105
Future Volume (vph)	245	45	180	35	30	50	205	1350	35	15	810	105
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	8%	5%	9%	10%	7%	0%	7%	4%	6%	0%	7%	16%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	245	45	180	35	80	0	205	1385	0	15	810	105
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0		5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	42.0	42.0	42.0	42.0	42.0		12.0	43.0		12.0	43.0	43.0
Total Split (s)	46.0	46.0	46.0	46.0	46.0		24.0	72.0		12.0	60.0	60.0
Total Split (%)	35.4%	35.4%	35.4%	35.4%	35.4%		18.5%	55.4%		9.2%	46.2%	46.2%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		6.0	6.0		6.0	6.0	6.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	32.0	32.0	32.0	32.0	32.0		87.0	82.2		74.6	68.8	68.8
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.25		0.67	0.63		0.57	0.53	0.53
v/c Ratio	0.85	0.11	0.38	0.12	0.19		0.51	0.67		0.07	0.48	0.14
Control Delay	71.1	35.2	7.8	35.8	16.3		14.1	20.0		13.5	18.6	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	71.1	35.2	7.8	35.8	16.3		14.1	20.0		13.5	18.6	5.5
LOS	E	D	A	D	B		B	B		B	B	A
Approach Delay		43.4			22.2			19.2			17.0	
Approach LOS		D			C			B			B	
Queue Length 50th (m)	64.8	9.6	2.8	7.3	6.2		19.7	105.8		1.0	36.2	0.0
Queue Length 95th (m)	m82.2	m15.0	m12.5	15.2	17.8		37.2	196.0		m4.0	77.0	m13.3
Internal Link Dist (m)		1246.0			796.0			547.8			406.9	
Turn Bay Length (m)	65.0		60.0	40.0			145.0			125.0		70.0
Base Capacity (vph)	368	540	558	373	530		451	2069		213	1690	732
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	0.67	0.08	0.32	0.09	0.15		0.45	0.67		0.07	0.48	0.14

Intersection Summary

Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 112 (86%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 22.3	Intersection LOS: C
Intersection Capacity Utilization 81.4%	ICU Level of Service D
Analysis Period (min) 15	

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

Splits and Phases: 31: Terry Fox & Maple Grove

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	45	860	10	40	435
Future Vol, veh/h	0	45	860	10	40	435
Conflicting Peds, #/hr	5	5	0	5	5	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, %	0	0	1	0	0	3
Mvmt Flow	0	45	860	10	40	435

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1390	875	0	0	875	0
Stage 1	870	-	-	-	-	-
Stage 2	520	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	158	351	-	-	780	-
Stage 1	413	-	-	-	-	-
Stage 2	601	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	146	348	-	-	777	-
Mov Cap-2 Maneuver	146	-	-	-	-	-
Stage 1	411	-	-	-	-	-
Stage 2	558	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.9	0	0.8
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	348	777	-
HCM Lane V/C Ratio	-	-	0.129	0.051	-
HCM Control Delay (s)	-	-	16.9	9.9	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0.2	-

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	25	35	895	5	10	445
Future Vol, veh/h	25	35	895	5	10	445
Conflicting Peds, #/hr	5	5	0	5	5	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, %	0	0	1	0	0	3
Mvmt Flow	25	35	895	5	10	445

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1373	908	0	0	905	0
Stage 1	903	-	-	-	-	-
Stage 2	470	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	162	336	-	-	760	-
Stage 1	399	-	-	-	-	-
Stage 2	633	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	158	333	-	-	757	-
Mov Cap-2 Maneuver	158	-	-	-	-	-
Stage 1	397	-	-	-	-	-
Stage 2	619	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	26.3	0	0.2
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	228	757	-
HCM Lane V/C Ratio	-	-	0.263	0.013	-
HCM Control Delay (s)	-	-	26.3	9.8	0
HCM Lane LOS	-	-	D	A	A
HCM 95th %tile Q(veh)	-	-	1	0	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	60	235	290	25	70	25
Future Vol, veh/h	60	235	290	25	70	25
Conflicting Peds, #/hr	5	0	0	5	5	5
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, %	0	3	2	0	0	0
Mvmt Flow	60	235	290	25	70	25

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	320	0	-	0	668	313
Stage 1	-	-	-	-	308	-
Stage 2	-	-	-	-	360	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1251	-	-	-	426	732
Stage 1	-	-	-	-	750	-
Stage 2	-	-	-	-	710	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1246	-	-	-	399	726
Mov Cap-2 Maneuver	-	-	-	-	399	-
Stage 1	-	-	-	-	706	-
Stage 2	-	-	-	-	707	-

Approach	EB	WB	SB
HCM Control Delay, s	1.6	0	15
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1246	-	-	-	453
HCM Lane V/C Ratio	0.048	-	-	-	0.21
HCM Control Delay (s)	8	0	-	-	15
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	0.8

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	275	145	5	25	60
Future Vol, veh/h	5	275	145	5	25	60
Conflicting Peds, #/hr	5	0	0	5	5	5
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, %	0	2	4	0	0	0
Mvmt Flow	5	275	145	5	25	60

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	155	0	-	0	443	158
Stage 1	-	-	-	-	153	-
Stage 2	-	-	-	-	290	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1438	-	-	-	576	893
Stage 1	-	-	-	-	880	-
Stage 2	-	-	-	-	764	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1432	-	-	-	569	885
Mov Cap-2 Maneuver	-	-	-	-	569	-
Stage 1	-	-	-	-	873	-
Stage 2	-	-	-	-	761	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	10.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1432	-	-	-	761
HCM Lane V/C Ratio	0.003	-	-	-	0.112
HCM Control Delay (s)	7.5	0	-	-	10.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.4

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	300	315	0	0	0
Future Vol, veh/h	0	300	315	0	0	0
Conflicting Peds, #/hr	5	0	0	5	5	5
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, %	0	2	2	0	0	0
Mvmt Flow	0	300	315	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	320	0	-	0	625	325
Stage 1	-	-	-	-	320	-
Stage 2	-	-	-	-	305	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1251	-	-	-	452	721
Stage 1	-	-	-	-	741	-
Stage 2	-	-	-	-	752	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1246	-	-	-	448	715
Mov Cap-2 Maneuver	-	-	-	-	448	-
Stage 1	-	-	-	-	738	-
Stage 2	-	-	-	-	749	-

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

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1246	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	85	790	110	0	435
Future Vol, veh/h	0	85	790	110	0	435
Conflicting Peds, #/hr	5	5	0	5	5	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, %	0	0	2	0	0	3
Mvmt Flow	0	85	790	110	0	435

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	855	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	361	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	358	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.2	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	358	-
HCM Lane V/C Ratio	-	-	0.237	-
HCM Control Delay (s)	-	-	18.2	-
HCM Lane LOS	-	-	C	-
HCM 95th %tile Q(veh)	-	-	0.9	-

Intersection	
Intersection Delay, s/veh	2.9
Intersection LOS	A

Approach	EB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	5	10	60
Demand Flow Rate, veh/h	5	10	60
Vehicles Circulating, veh/h	30	5	0
Vehicles Exiting, veh/h	30	30	15
Ped Vol Crossing Leg, #/h	5	5	5
Ped Cap Adj	0.999	0.999	0.999
Approach Delay, s/veh	2.7	2.7	2.9
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	LR	LT	TR
Assumed Moves	LR	LT	TR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	5	10	60
Cap Entry Lane, veh/h	1338	1373	1380
Entry HV Adj Factor	1.000	1.000	1.000
Flow Entry, veh/h	5	10	60
Cap Entry, veh/h	1337	1372	1379
V/C Ratio	0.004	0.007	0.044
Control Delay, s/veh	2.7	2.7	2.9
LOS	A	A	A
95th %tile Queue, veh	0	0	0

Intersection	
Intersection Delay, s/veh	7.2
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	65	45	630	465
Demand Flow Rate, veh/h	71	48	656	483
Vehicles Circulating, veh/h	514	661	42	53
Vehicles Exiting, veh/h	22	37	544	656
Ped Vol Crossing Leg, #/h	5	5	5	5
Ped Cap Adj	0.999	0.999	0.999	0.999
Approach Delay, s/veh	5.7	6.2	8.1	6.4
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	71	48	656	483
Cap Entry Lane, veh/h	817	703	1322	1307
Entry HV Adj Factor	0.915	0.945	0.961	0.962
Flow Entry, veh/h	65	45	630	465
Cap Entry, veh/h	747	664	1269	1257
V/C Ratio	0.087	0.068	0.497	0.370
Control Delay, s/veh	5.7	6.2	8.1	6.4
LOS	A	A	A	A
95th %tile Queue, veh	0	0	3	2

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	10	5	35	10	20	0	0	10	0	0	40	20
Future Vol, veh/h	10	5	35	10	20	0	0	10	0	0	40	20
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, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	10	5	35	10	20	0	0	10	0	0	40	20
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	6.9	7.3	7.2	7.1
HCM LOS	A	A	A	A

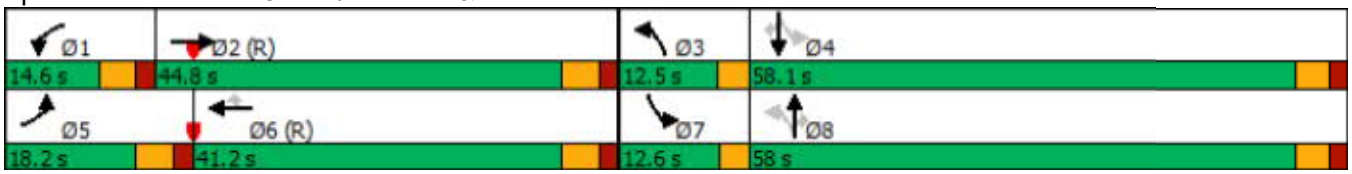
Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	20%	33%	0%
Vol Thru, %	100%	10%	67%	67%
Vol Right, %	0%	70%	0%	33%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	10	50	30	60
LT Vol	0	10	10	0
Through Vol	10	5	20	40
RT Vol	0	35	0	20
Lane Flow Rate	10	50	30	60
Geometry Grp	1	1	1	1
Degree of Util (X)	0.011	0.051	0.034	0.064
Departure Headway (Hd)	4.084	3.664	4.126	3.846
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	874	975	866	930
Service Time	2.121	1.695	2.157	1.875
HCM Lane V/C Ratio	0.011	0.051	0.035	0.065
HCM Control Delay	7.2	6.9	7.3	7.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.2	0.1	0.2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	220	710	135	355	1110	285	150	335	265	190	430	425
Future Volume (vph)	220	710	135	355	1110	285	150	335	265	190	430	425
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	2%	2%	1%	1%	0%	6%	2%	1%	1%	2%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	220	845	0	355	1110	285	150	335	265	190	430	425
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6	8		8	4		4
Detector Phase	5	2		1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	12.5	38.6		12.5	38.6	38.6	12.5	58.0	58.0	12.5	41.3	41.3
Total Split (s)	18.2	44.8		14.6	41.2	41.2	12.5	58.0	58.0	12.6	58.1	58.1
Total Split (%)	14.0%	34.5%		11.2%	31.7%	31.7%	9.6%	44.6%	44.6%	9.7%	44.7%	44.7%
Yellow Time (s)	3.6	3.6		3.6	3.6	3.6	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0
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
Total Lost Time (s)	5.6	5.6		5.6	5.6	5.6	3.0	5.3	5.3	3.0	5.3	5.3
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	13.6	39.2		23.2	48.8	48.8	50.3	38.5	38.5	50.5	38.6	38.6
Actuated g/C Ratio	0.10	0.30		0.18	0.38	0.38	0.39	0.30	0.30	0.39	0.30	0.30
v/c Ratio	0.63	0.85		0.61	0.87	0.38	0.67	0.64	0.42	0.61	0.82	0.70
Control Delay	64.0	51.1		55.5	47.8	5.6	38.7	44.6	5.6	33.7	55.1	23.3
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.0	51.1		55.5	47.8	5.6	38.7	44.6	5.6	33.7	55.1	23.3
LOS	E	D		E	D	A	D	D	A	C	E	C
Approach Delay		53.8			42.5			29.6			38.3	
Approach LOS		D			D			C			D	
Queue Length 50th (m)	29.7	110.6		46.0	146.2	0.0	25.9	78.4	0.4	33.5	107.7	46.8
Queue Length 95th (m)	42.5	137.7		#87.5	#234.2	22.2	36.0	99.1	18.3	44.7	133.1	76.9
Internal Link Dist (m)		871.0			1427.4			1305.6			301.9	
Turn Bay Length (m)	50.0			90.0		225.0	30.0		60.0	50.0		275.0
Base Capacity (vph)	362	995		585	1270	741	225	715	759	310	716	742
Starvation Cap Reductn	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
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.85		0.61	0.87	0.38	0.67	0.47	0.35	0.61	0.60	0.57

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 135
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 42.0 Intersection LOS: D
Intersection Capacity Utilization 89.3% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Iber/Huntmar & Hazeldean

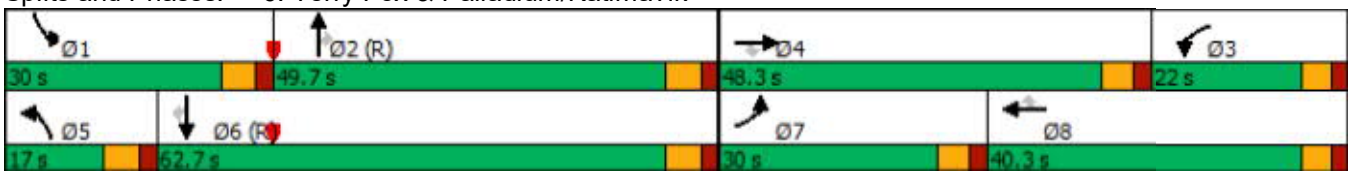


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	830	250	395	135	180	150	245	1130	100	120	1335	695
Future Volume (vph)	830	250	395	135	180	150	245	1130	100	120	1335	695
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	1%	5%	2%	0%	0%	2%	4%	0%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	830	250	395	135	180	150	245	1130	100	120	1335	695
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	12.0	40.6	40.6	12.0	40.3	40.3	12.0	42.5	42.5	30.0	41.0	41.0
Total Split (s)	30.0	48.3	48.3	22.0	40.3	40.3	17.0	49.7	49.7	30.0	62.7	62.7
Total Split (%)	20.0%	32.2%	32.2%	14.7%	26.9%	26.9%	11.3%	33.1%	33.1%	20.0%	41.8%	41.8%
Yellow Time (s)	3.6	3.6	3.6	3.3	3.3	3.3	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	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)	3.6	5.6	5.6	5.3	5.3	5.3	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	26.4	29.3	29.3	19.0	23.9	23.9	15.7	68.0	68.0	10.8	63.1	63.1
Actuated g/C Ratio	0.18	0.20	0.20	0.13	0.16	0.16	0.10	0.45	0.45	0.07	0.42	0.42
v/c Ratio	1.42	0.71	0.88	0.66	0.64	0.41	0.71	0.74	0.13	0.50	0.94	0.72
Control Delay	243.5	66.4	47.9	78.1	68.1	10.2	76.0	39.2	0.4	74.0	54.9	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	243.5	66.4	47.9	78.1	68.1	10.2	76.0	39.2	0.4	74.0	54.9	10.9
LOS	F	E	D	E	E	B	E	D	A	E	D	B
Approach Delay		161.1			52.3			42.7			41.7	
Approach LOS		F			D			D			D	
Queue Length 50th (m)	~180.0	74.7	64.8	41.2	54.4	0.0	38.0	147.8	0.0	19.0	210.5	22.8
Queue Length 95th (m)	#222.2	94.0	97.8	#74.9	73.5	18.9	#71.0	#225.3	0.0	29.5	#282.2	81.2
Internal Link Dist (m)		1802.0			304.5			406.9			280.2	
Turn Bay Length (m)	100.0			115.0		115.0	240.0		115.0	70.0		190.0
Base Capacity (vph)	583	512	566	206	411	465	347	1519	755	530	1423	970
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	1.42	0.49	0.70	0.66	0.44	0.32	0.71	0.74	0.13	0.23	0.94	0.72

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.42
Intersection Signal Delay: 74.5 Intersection LOS: E
Intersection Capacity Utilization 101.6% ICU Level of Service G
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: Terry Fox & Palladium/Katimavik



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	165	595	225	470	125	335	235	100	90	340	95
Future Volume (vph)	25	165	595	225	470	125	335	235	100	90	340	95
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	11%	0%	1%	0%	0%	0%	1%	1%	0%	1%	2%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	25	760	0	225	595	0	335	235	100	90	340	95
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	12.5	43.0		12.5	43.0		42.3	42.3	42.3	42.3	42.3	42.3
Total Split (s)	16.9	43.0		17.0	43.1		70.0	70.0	70.0	70.0	70.0	70.0
Total Split (%)	13.0%	33.1%		13.1%	33.2%		53.8%	53.8%	53.8%	53.8%	53.8%	53.8%
Yellow Time (s)	4.0	4.0		4.0	4.0		3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
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)	6.0	6.0		6.0	6.0		5.3	5.3	5.3	5.3	5.3	5.3
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	32.1	25.2		40.6	34.0		76.5	76.5	76.5	76.5	76.5	76.5
Actuated g/C Ratio	0.25	0.19		0.31	0.26		0.59	0.59	0.59	0.59	0.59	0.59
v/c Ratio	0.14	0.99dr		1.17	0.67		0.64	0.22	0.11	0.15	0.33	0.10
Control Delay	28.6	34.5		150.1	45.2		37.4	23.0	10.1	14.9	16.2	3.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.6	34.5		150.1	45.2		37.4	23.0	10.1	14.9	16.2	3.3
LOS	C	C		F	D		D	C	B	B	B	A
Approach Delay		34.3			74.0			28.3			13.7	
Approach LOS		C			E			C			B	
Queue Length 50th (m)	4.6	54.4		~58.5	76.7		76.3	43.4	5.7	10.4	44.4	0.0
Queue Length 95th (m)	9.9	71.2		#102.7	88.2		m#128.0	m72.6	m16.1	24.0	79.7	9.1
Internal Link Dist (m)		535.2			1802.0			357.2			231.7	
Turn Bay Length (m)	95.0			75.0			120.0		45.0	50.0		
Base Capacity (vph)	225	1111		193	973		520	1048	926	612	1038	914
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	0.68		1.17	0.61		0.64	0.22	0.11	0.15	0.33	0.10

Intersection Summary

Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.17	
Intersection Signal Delay: 40.6	Intersection LOS: D
Intersection Capacity Utilization 108.8%	ICU Level of Service G
Analysis Period (min) 15	

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

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

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

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 8: Huntmar & Palladium

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	120	115	75	170	190	50	110	575	125	50	815	255
Future Volume (vph)	120	115	75	170	190	50	110	575	125	50	815	255
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	2%	1%	0%	0%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	310	0	0	410	0	110	700	0	0	1120	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	33.0	33.0		33.0	33.0		29.0	29.0		49.0	49.0	
Total Split (s)	61.0	61.0		61.0	61.0		69.0	69.0		69.0	69.0	
Total Split (%)	46.9%	46.9%		46.9%	46.9%		53.1%	53.1%		53.1%	53.1%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0			0.0	
Total Lost Time (s)		5.0			5.0		5.3	5.3			5.3	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)		47.5			47.5		72.2	72.2			72.2	
Actuated g/C Ratio		0.37			0.37		0.56	0.56			0.56	
v/c Ratio		0.71			0.91		0.58	0.73			1.58	
Control Delay		41.7			54.0		37.2	28.5			288.1	
Queue Delay		0.0			0.0		0.0	0.0			0.0	
Total Delay		41.7			54.0		37.2	28.5			288.1	
LOS		D			D		D	C			F	
Approach Delay		41.7			54.0			29.7			288.1	
Approach LOS		D			D			C			F	
Queue Length 50th (m)		66.1			61.8		19.2	137.4			~428.8	
Queue Length 95th (m)		93.4			97.6		#54.2	213.8			m#513.1	
Internal Link Dist (m)		630.5			86.3			293.1			175.1	
Turn Bay Length (m)							20.0					
Base Capacity (vph)		514			529		190	963			708	
Starvation Cap Reductn		0			0		0	0			0	
Spillback Cap Reductn		0			0		0	0			0	
Storage Cap Reductn		0			0		0	0			0	
Reduced v/c Ratio		0.60			0.78		0.58	0.73			1.58	

Intersection Summary

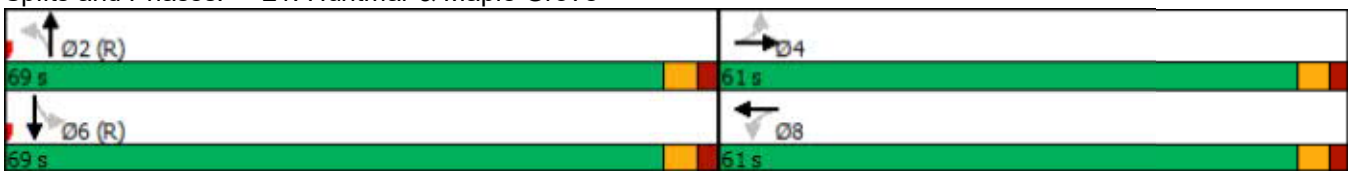
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.58	
Intersection Signal Delay: 144.1	Intersection LOS: F
Intersection Capacity Utilization 146.3%	ICU Level of Service H
Analysis Period (min) 15	

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

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

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

Splits and Phases: 21: Huntmar & Maple Grove

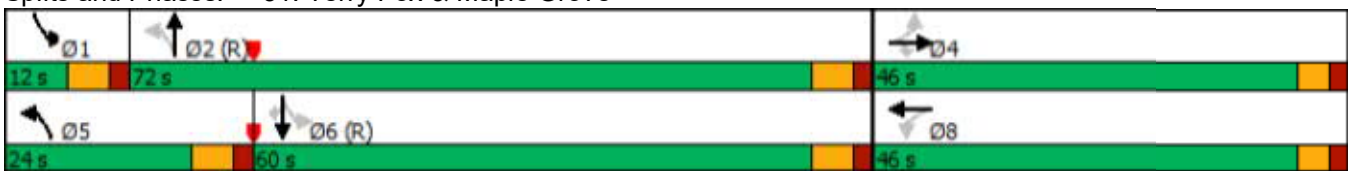


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	45	335	20	50	40	220	1365	45	60	1810	175
Future Volume (vph)	170	45	335	20	50	40	220	1365	45	60	1810	175
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour 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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	0%	1%	0%	0%	0%	3%	2%	0%	0%	1%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	170	45	335	20	90	0	220	1410	0	60	1810	175
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0		5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	42.0	42.0	42.0	42.0	42.0		12.0	43.0		12.0	43.0	43.0
Total Split (s)	46.0	46.0	46.0	46.0	46.0		24.0	72.0		12.0	60.0	60.0
Total Split (%)	35.4%	35.4%	35.4%	35.4%	35.4%		18.5%	55.4%		9.2%	46.2%	46.2%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		6.0	6.0		6.0	6.0	6.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	24.5	24.5	24.5	24.5	24.5		94.5	83.9		79.1	72.1	72.1
Actuated g/C Ratio	0.19	0.19	0.19	0.19	0.19		0.73	0.65		0.61	0.55	0.55
v/c Ratio	0.76	0.13	0.76	0.08	0.27		0.84	0.65		0.25	0.96	0.21
Control Delay	66.6	39.6	28.2	39.8	28.7		61.0	18.5		11.1	43.0	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	66.6	39.6	28.2	39.8	28.7		61.0	18.5		11.1	43.0	7.8
LOS	E	D	C	D	C		E	B		B	D	A
Approach Delay		41.0			30.7			24.3			39.1	
Approach LOS		D			C			C			D	
Queue Length 50th (m)	44.7	10.0	34.6	4.5	13.4		42.3	117.4		4.0	235.3	7.0
Queue Length 95th (m)	m56.1	m15.1	m53.3	10.7	25.8		72.8	194.7		11.4	#370.5	25.5
Internal Link Dist (m)		1246.0			796.0			547.8			406.9	
Turn Bay Length (m)	65.0		60.0	40.0			145.0			125.0		70.0
Base Capacity (vph)	378	567	606	411	547		298	2154		238	1878	852
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	0.45	0.08	0.55	0.05	0.16		0.74	0.65		0.25	0.96	0.21

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 112 (86%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 33.6 Intersection LOS: C
Intersection Capacity Utilization 98.6% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 31: Terry Fox & Maple Grove



Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	40	735	15	60	1080
Future Vol, veh/h	0	40	735	15	60	1080
Conflicting Peds, #/hr	5	5	0	5	5	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, %	0	0	0	0	0	1
Mvmt Flow	0	40	735	15	60	1080

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1953	753	0	0	755	0
Stage 1	748	-	-	-	-	-
Stage 2	1205	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	71	413	-	-	865	-
Stage 1	471	-	-	-	-	-
Stage 2	286	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	58	410	-	-	861	-
Mov Cap-2 Maneuver	58	-	-	-	-	-
Stage 1	469	-	-	-	-	-
Stage 2	235	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.7	0	0.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	410	861	-
HCM Lane V/C Ratio	-	-	0.098	0.07	-
HCM Control Delay (s)	-	-	14.7	9.5	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.2	-

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	30	750	25	45	1120
Future Vol, veh/h	15	30	750	25	45	1120
Conflicting Peds, #/hr	5	5	0	5	5	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, %	0	0	0	0	0	1
Mvmt Flow	15	30	750	25	45	1120

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1983	773	0	0	780	0
Stage 1	768	-	-	-	-	-
Stage 2	1215	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	68	402	-	-	846	-
Stage 1	461	-	-	-	-	-
Stage 2	283	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	58	399	-	-	842	-
Mov Cap-2 Maneuver	58	-	-	-	-	-
Stage 1	459	-	-	-	-	-
Stage 2	242	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	44.5	0	0.4
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	135	842	-
HCM Lane V/C Ratio	-	-	0.333	0.053	-
HCM Control Delay (s)	-	-	44.5	9.5	0
HCM Lane LOS	-	-	E	A	A
HCM 95th %tile Q(veh)	-	-	1.3	0.2	-

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	30	275	375	70	30	55
Future Vol, veh/h	30	275	375	70	30	55
Conflicting Peds, #/hr	5	0	0	5	5	5
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, %	0	0	3	0	0	0
Mvmt Flow	30	275	375	70	30	55

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	450	0	-	0	755	420
Stage 1	-	-	-	-	415	-
Stage 2	-	-	-	-	340	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1121	-	-	-	379	638
Stage 1	-	-	-	-	671	-
Stage 2	-	-	-	-	725	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1116	-	-	-	364	633
Mov Cap-2 Maneuver	-	-	-	-	364	-
Stage 1	-	-	-	-	647	-
Stage 2	-	-	-	-	722	-

Approach	EB	WB	SB
HCM Control Delay, s	8.8	0	13.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1116	-	-	-	502
HCM Lane V/C Ratio	0.027	-	-	-	0.169
HCM Control Delay (s)	8.3	0	-	-	13.6
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.6

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	285	400	25	20	15
Future Vol, veh/h	5	285	400	25	20	15
Conflicting Peds, #/hr	5	0	0	5	5	5
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, %	0	0	3	0	0	0
Mvmt Flow	5	285	400	25	20	15

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	430	0	-	0	718	423
Stage 1	-	-	-	-	418	-
Stage 2	-	-	-	-	300	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1140	-	-	-	399	635
Stage 1	-	-	-	-	669	-
Stage 2	-	-	-	-	756	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1135	-	-	-	394	630
Mov Cap-2 Maneuver	-	-	-	-	394	-
Stage 1	-	-	-	-	663	-
Stage 2	-	-	-	-	753	-

Approach	EB	WB	SB
HCM Control Delay, s	8.1	0	13.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1135	-	-	-	469
HCM Lane V/C Ratio	0.004	-	-	-	0.075
HCM Control Delay (s)	8.2	0	-	-	13.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	305	430	0	0	0
Future Vol, veh/h	0	305	430	0	0	0
Conflicting Peds, #/hr	5	0	0	5	5	5
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, %	0	0	3	0	0	0
Mvmt Flow	0	305	430	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	435	0	-	0	745	440
Stage 1	-	-	-	-	435	-
Stage 2	-	-	-	-	310	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1135	-	-	-	384	621
Stage 1	-	-	-	-	657	-
Stage 2	-	-	-	-	748	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1130	-	-	-	381	616
Mov Cap-2 Maneuver	-	-	-	-	381	-
Stage 1	-	-	-	-	654	-
Stage 2	-	-	-	-	745	-

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

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1130	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	20	730	15	0	1080
Future Vol, veh/h	0	20	730	15	0	1080
Conflicting Peds, #/hr	5	5	0	5	5	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, %	0	0	0	0	0	1
Mvmt Flow	0	20	730	15	0	1080

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	748	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	416	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	412	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.2	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	412	-
HCM Lane V/C Ratio	-	-	0.049	-
HCM Control Delay (s)	-	-	14.2	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.2	-

Intersection	
Intersection Delay, s/veh	2.9
Intersection LOS	A

Approach	EB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	30	40	50
Demand Flow Rate, veh/h	30	40	50
Vehicles Circulating, veh/h	30	30	0
Vehicles Exiting, veh/h	20	30	70
Ped Vol Crossing Leg, #/h	5	5	5
Ped Cap Adj	0.999	0.999	0.999
Approach Delay, s/veh	2.9	2.9	2.9
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	LR	LT	TR
Assumed Moves	LR	LT	TR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	30	40	50
Cap Entry Lane, veh/h	1338	1338	1380
Entry HV Adj Factor	1.000	1.000	1.000
Flow Entry, veh/h	30	40	50
Cap Entry, veh/h	1337	1337	1379
V/C Ratio	0.022	0.030	0.036
Control Delay, s/veh	2.9	2.9	2.9
LOS	A	A	A
95th %tile Queue, veh	0	0	0

Intersection	
Intersection Delay, s/veh	14.7
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	55	85	750	985
Demand Flow Rate, veh/h	58	86	757	996
Vehicles Circulating, veh/h	1040	747	32	136
Vehicles Exiting, veh/h	91	42	1066	697
Ped Vol Crossing Leg, #/h	5	5	5	5
Ped Cap Adj	1.000	0.999	0.999	0.999
Approach Delay, s/veh	9.7	7.2	9.1	19.9
Approach LOS	A	A	A	C

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	58	86	757	996
Cap Entry Lane, veh/h	478	644	1336	1201
Entry HV Adj Factor	0.944	0.988	0.991	0.989
Flow Entry, veh/h	55	85	750	985
Cap Entry, veh/h	451	636	1323	1188
V/C Ratio	0.121	0.134	0.567	0.830
Control Delay, s/veh	9.7	7.2	9.1	19.9
LOS	A	A	A	C
95th %tile Queue, veh	0	0	4	10

Intersection	
Intersection Delay, s/veh	7.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	30	5	0	20	0	0	30	0	0	30	20
Future Vol, veh/h	40	30	5	0	20	0	0	30	0	0	30	20
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, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	40	30	5	0	20	0	0	30	0	0	30	20
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	7.5	7.2	7.3	7.1
HCM LOS	A	A	A	A

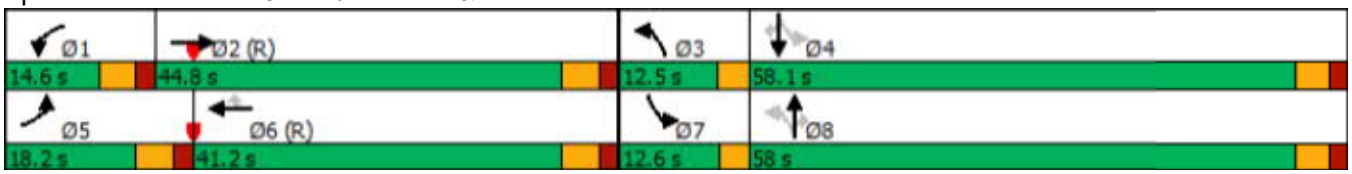
Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	53%	0%	0%
Vol Thru, %	100%	40%	100%	60%
Vol Right, %	0%	7%	0%	40%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	30	75	20	50
LT Vol	0	40	0	0
Through Vol	30	30	20	30
RT Vol	0	5	0	20
Lane Flow Rate	30	75	20	50
Geometry Grp	1	1	1	1
Degree of Util (X)	0.034	0.086	0.023	0.053
Departure Headway (Hd)	4.104	4.121	4.096	3.849
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	866	867	869	924
Service Time	2.159	2.156	2.144	1.902
HCM Lane V/C Ratio	0.035	0.087	0.023	0.054
HCM Control Delay	7.3	7.5	7.2	7.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.3	0.1	0.2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	250	840	135	205	500	130	60	310	310	155	305	140
Future Volume (vph)	250	840	135	205	500	130	60	310	310	155	305	140
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	12%	3%	4%	2%	4%	0%	4%	3%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	250	975	0	205	500	130	60	310	310	155	305	140
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6	8		8	4		4
Detector Phase	5	2		1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	12.5	38.6		12.5	38.6	38.6	12.5	58.0	58.0	12.5	41.3	41.3
Total Split (s)	18.2	44.8		14.6	41.2	41.2	12.5	58.0	58.0	12.6	58.1	58.1
Total Split (%)	14.0%	34.5%		11.2%	31.7%	31.7%	9.6%	44.6%	44.6%	9.7%	44.7%	44.7%
Yellow Time (s)	3.6	3.6		3.6	3.6	3.6	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0
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
Total Lost Time (s)	5.6	5.6		5.6	5.6	5.6	3.0	5.3	5.3	3.0	5.3	5.3
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	15.5	57.7		14.6	56.8	56.8	39.2	28.6	28.6	41.6	31.6	31.6
Actuated g/C Ratio	0.12	0.44		0.11	0.44	0.44	0.30	0.22	0.22	0.32	0.24	0.24
v/c Ratio	0.64	0.68		0.57	0.35	0.18	0.25	0.78	0.60	0.68	0.71	0.30
Control Delay	62.3	33.0		60.7	27.0	5.3	30.3	61.2	14.4	46.9	54.7	7.3
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.3	33.0		60.7	27.0	5.3	30.3	61.2	14.4	46.9	54.7	7.3
LOS	E	C		E	C	A	C	E	B	D	D	A
Approach Delay		39.0			31.9			37.2			41.6	
Approach LOS		D			C			D			D	
Queue Length 50th (m)	33.6	106.7		27.3	46.3	0.0	11.2	79.6	13.3	30.7	77.8	0.0
Queue Length 95th (m)	46.7	154.4		39.8	72.2	14.3	19.5	103.9	40.1	44.0	102.5	15.8
Internal Link Dist (m)		871.0			1427.4			1305.6			301.9	
Turn Bay Length (m)	50.0			90.0		225.0	30.0		60.0	50.0		275.0
Base Capacity (vph)	393	1440		362	1436	716	255	729	734	227	716	693
Starvation Cap Reductn	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
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.68		0.57	0.35	0.18	0.24	0.43	0.42	0.68	0.43	0.20

Intersection Summary

Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 125	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 37.3	Intersection LOS: D
Intersection Capacity Utilization 80.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 3: Iber/Huntmar & Hazeldean

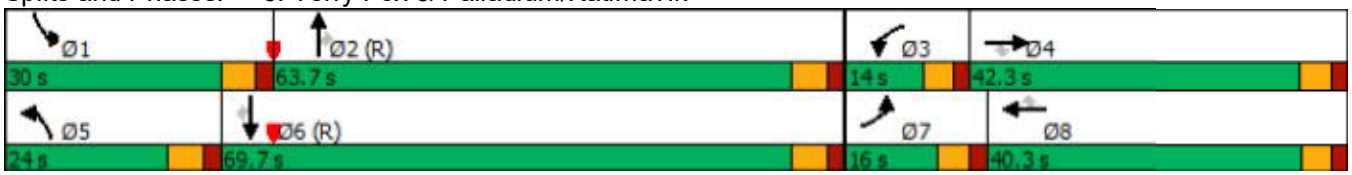


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	315	65	135	65	120	175	420	1410	95	100	985	935
Future Volume (vph)	315	65	135	65	120	175	420	1410	95	100	985	935
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak 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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	2%	10%	5%	3%	0%	2%	11%	2%	4%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	315	65	135	65	120	175	420	1410	95	100	985	935
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	12.0	40.6	40.6	12.0	40.3	40.3	12.0	42.5	42.5	30.0	41.0	41.0
Total Split (s)	16.0	42.3	42.3	14.0	40.3	40.3	24.0	63.7	63.7	30.0	69.7	69.7
Total Split (%)	10.7%	28.2%	28.2%	9.3%	26.9%	26.9%	16.0%	42.5%	42.5%	20.0%	46.5%	46.5%
Yellow Time (s)	3.6	3.6	3.6	3.3	3.3	3.3	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	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)	3.6	5.6	5.6	5.3	5.3	5.3	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	12.4	19.9	19.9	8.5	17.9	17.9	26.3	88.8	88.8	10.0	72.5	72.5
Actuated g/C Ratio	0.08	0.13	0.13	0.06	0.12	0.12	0.18	0.59	0.59	0.07	0.48	0.48
v/c Ratio	1.21	0.29	0.43	0.75	0.59	0.53	0.72	0.71	0.11	0.46	0.62	0.98
Control Delay	178.8	59.4	12.1	112.5	72.5	13.1	66.3	25.9	3.3	73.9	31.6	44.1
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	178.8	59.4	12.1	112.5	72.5	13.1	66.3	25.9	3.3	73.9	31.6	44.1
LOS	F	E	B	F	E	B	E	C	A	E	C	D
Approach Delay		120.0			50.9			33.6			39.5	
Approach LOS		F			D			C			D	
Queue Length 50th (m)	~61.7	19.0	0.0	20.4	36.7	0.0	64.2	151.4	0.0	15.8	115.9	184.7
Queue Length 95th (m)	#94.1	30.8	18.3	#46.7	52.3	21.0	#98.6	241.0	9.4	25.7	158.3	#313.0
Internal Link Dist (m)		1802.0			304.5			406.9			280.2	
Turn Bay Length (m)	100.0			115.0		115.0	240.0		115.0	70.0		190.0
Base Capacity (vph)	261	419	462	90	399	474	581	1984	841	520	1589	955
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	1.21	0.16	0.29	0.72	0.30	0.37	0.72	0.71	0.11	0.19	0.62	0.98

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.21
Intersection Signal Delay: 46.6 Intersection LOS: D
Intersection Capacity Utilization 99.9% ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: Terry Fox & Palladium/Katimavik

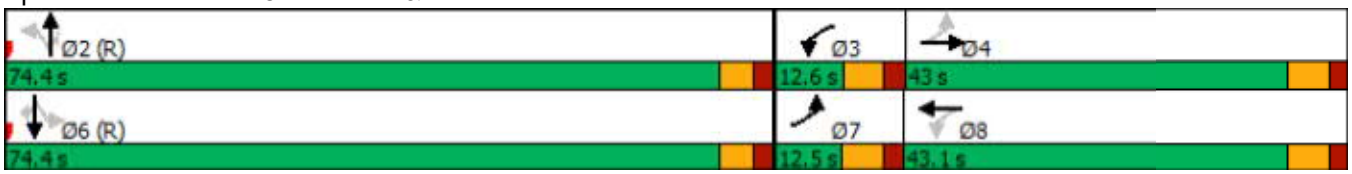


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	205	250	65	100	45	500	355	205	105	195	55
Future Volume (vph)	35	205	250	65	100	45	500	355	205	105	195	55
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour 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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	3%	2%	7%	1%	0%	0%	1%	1%	2%	3%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	35	455	0	65	145	0	500	355	205	105	195	55
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	12.5	43.0		12.5	43.0		42.3	42.3	42.3	42.3	42.3	42.3
Total Split (s)	12.5	43.0		12.6	43.1		74.4	74.4	74.4	74.4	74.4	74.4
Total Split (%)	9.6%	33.1%		9.7%	33.2%		57.2%	57.2%	57.2%	57.2%	57.2%	57.2%
Yellow Time (s)	4.0	4.0		4.0	4.0		3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
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)	6.0	6.0		6.0	6.0		5.3	5.3	5.3	5.3	5.3	5.3
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	24.0	18.8		25.3	21.4		89.8	89.8	89.8	89.8	89.8	89.8
Actuated g/C Ratio	0.18	0.14		0.19	0.16		0.69	0.69	0.69	0.69	0.69	0.69
v/c Ratio	0.14	0.71		0.50	0.26		0.64	0.29	0.19	0.17	0.16	0.05
Control Delay	35.6	30.4		49.5	31.6		23.7	14.3	4.2	10.8	9.7	1.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.6	30.4		49.5	31.6		23.7	14.3	4.2	10.8	9.7	1.6
LOS	D	C		D	C		C	B	A	B	A	A
Approach Delay		30.8			37.1			16.8			8.8	
Approach LOS		C			D			B			A	
Queue Length 50th (m)	7.6	30.7		14.5	13.1		83.4	49.7	6.3	8.8	16.4	0.0
Queue Length 95th (m)	13.3	40.7		21.9	19.2		m150.4	m74.8	m11.0	26.5	41.4	3.9
Internal Link Dist (m)		535.2			1802.0			357.2			231.7	
Turn Bay Length (m)	95.0			75.0			120.0		45.0	50.0		
Base Capacity (vph)	244	1027		131	951		787	1231	1092	627	1208	1042
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	0.14	0.44		0.50	0.15		0.64	0.29	0.19	0.17	0.16	0.05

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 20.7 Intersection LOS: C
Intersection Capacity Utilization 100.3% ICU Level of Service G
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: Huntmar & Palladium

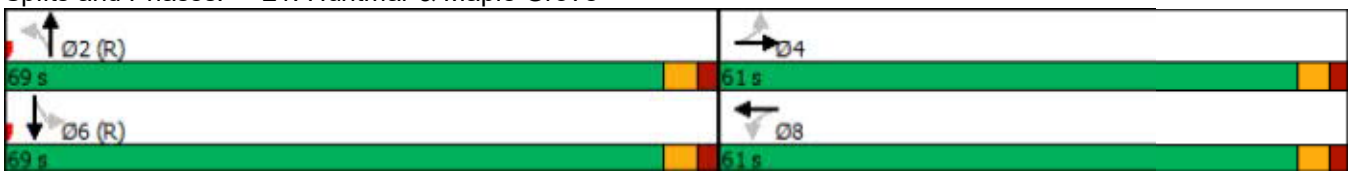


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	310	165	70	75	65	80	40	600	115	20	365	60
Future Volume (vph)	310	165	70	75	65	80	40	600	115	20	365	60
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	1%	5%	0%	7%	1%	20%	1%	3%	5%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	545	0	0	220	0	40	715	0	0	445	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	33.0	33.0		33.0	33.0		29.0	29.0		49.0	49.0	
Total Split (s)	61.0	61.0		61.0	61.0		69.0	69.0		69.0	69.0	
Total Split (%)	46.9%	46.9%		46.9%	46.9%		53.1%	53.1%		53.1%	53.1%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0			0.0	
Total Lost Time (s)		5.0			5.0		5.3	5.3			5.3	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)		56.0			56.0		63.7	63.7			63.7	
Actuated g/C Ratio		0.43			0.43		0.49	0.49			0.49	
v/c Ratio		1.06			0.40		0.13	0.84			0.67	
Control Delay		93.8			24.5		19.6	39.2			23.9	
Queue Delay		0.0			0.0		0.0	0.0			0.0	
Total Delay		93.8			24.5		19.6	39.2			23.9	
LOS		F			C		B	D			C	
Approach Delay		93.8			24.5			38.1			23.9	
Approach LOS		F			C			D			C	
Queue Length 50th (m)		~160.8			31.6		5.7	161.3			47.2	
Queue Length 95th (m)		#233.1			52.6		13.4	#223.1			146.4	
Internal Link Dist (m)		630.5			86.3			293.1			175.1	
Turn Bay Length (m)							20.0					
Base Capacity (vph)		512			544		310	849			664	
Starvation Cap Reductn		0			0		0	0			0	
Spillback Cap Reductn		0			0		0	0			0	
Storage Cap Reductn		0			0		0	0			0	
Reduced v/c Ratio		1.06			0.40		0.13	0.84			0.67	

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.06
Intersection Signal Delay: 48.8 Intersection LOS: D
Intersection Capacity Utilization 100.7% ICU Level of Service G
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 21: Huntmar & Maple Grove

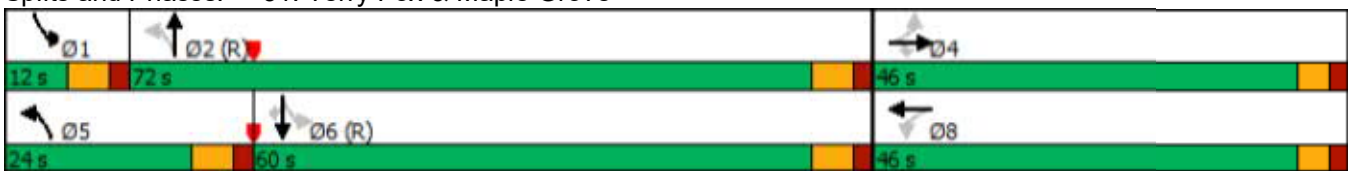


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	270	50	195	35	35	55	225	1510	40	15	905	115
Future Volume (vph)	270	50	195	35	35	55	225	1510	40	15	905	115
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	7%	5%	9%	9%	7%	0%	7%	4%	6%	0%	7%	15%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	270	50	195	35	90	0	225	1550	0	15	905	115
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0		5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	42.0	42.0	42.0	42.0	42.0		12.0	43.0		12.0	43.0	43.0
Total Split (s)	46.0	46.0	46.0	46.0	46.0		24.0	72.0		12.0	60.0	60.0
Total Split (%)	35.4%	35.4%	35.4%	35.4%	35.4%		18.5%	55.4%		9.2%	46.2%	46.2%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		6.0	6.0		6.0	6.0	6.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	34.2	34.2	34.2	34.2	34.2		84.8	80.0		71.4	65.6	65.6
Actuated g/C Ratio	0.26	0.26	0.26	0.26	0.26		0.65	0.62		0.55	0.50	0.50
v/c Ratio	0.88	0.11	0.39	0.11	0.20		0.63	0.77		0.09	0.56	0.16
Control Delay	71.8	34.7	7.6	34.4	16.0		18.4	24.3		12.3	25.9	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	71.8	34.7	7.6	34.4	16.0		18.4	24.3		12.3	25.9	4.4
LOS	E	C	A	C	B		B	C		B	C	A
Approach Delay		43.9			21.2			23.5			23.3	
Approach LOS		D			C			C			C	
Queue Length 50th (m)	70.6	10.2	2.7	7.1	7.0		23.6	139.6		1.4	88.2	0.0
Queue Length 95th (m)	m86.2	m15.4	m10.1	15.2	19.7		40.9	#256.7		4.6	127.8	11.5
Internal Link Dist (m)		1246.0			796.0			547.8			406.9	
Turn Bay Length (m)	65.0		60.0	40.0			145.0			125.0		70.0
Base Capacity (vph)	368	540	568	375	534		405	2013		165	1612	710
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	0.73	0.09	0.34	0.09	0.17		0.56	0.77		0.09	0.56	0.16

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 112 (86%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 26.4 Intersection LOS: C
Intersection Capacity Utilization 87.5% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 31: Terry Fox & Maple Grove



Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	45	960	10	40	485
Future Vol, veh/h	0	45	960	10	40	485
Conflicting Peds, #/hr	5	5	0	5	5	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, %	0	0	1	0	0	3
Mvmt Flow	0	45	960	10	40	485

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1540	975	0	0	975	0
Stage 1	970	-	-	-	-	-
Stage 2	570	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	128	308	-	-	716	-
Stage 1	371	-	-	-	-	-
Stage 2	570	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	117	305	-	-	713	-
Mov Cap-2 Maneuver	117	-	-	-	-	-
Stage 1	370	-	-	-	-	-
Stage 2	524	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.8	0	0.8
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	305	713	-
HCM Lane V/C Ratio	-	-	0.148	0.056	-
HCM Control Delay (s)	-	-	18.8	10.3	0
HCM Lane LOS	-	-	C	B	A
HCM 95th %tile Q(veh)	-	-	0.5	0.2	-

Intersection	
Int Delay, s/veh	1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	25	35	995	5	10	495
Future Vol, veh/h	25	35	995	5	10	495
Conflicting Peds, #/hr	5	5	0	5	5	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, %	0	0	1	0	0	3
Mvmt Flow	25	35	995	5	10	495

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1523	1008	0	0	1005	0
Stage 1	1003	-	-	-	-	-
Stage 2	520	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	131	295	-	-	697	-
Stage 1	358	-	-	-	-	-
Stage 2	601	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	127	293	-	-	694	-
Mov Cap-2 Maneuver	127	-	-	-	-	-
Stage 1	357	-	-	-	-	-
Stage 2	587	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	32.5	0	0.2
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	190	694	-
HCM Lane V/C Ratio	-	-	0.316	0.014	-
HCM Control Delay (s)	-	-	32.5	10.3	0
HCM Lane LOS	-	-	D	B	A
HCM 95th %tile Q(veh)	-	-	1.3	0	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	60	265	325	25	70	25
Future Vol, veh/h	60	265	325	25	70	25
Conflicting Peds, #/hr	5	0	0	5	5	5
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, %	0	3	2	0	0	0
Mvmt Flow	60	265	325	25	70	25

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	355	0	-	0	733	348
Stage 1	-	-	-	-	343	-
Stage 2	-	-	-	-	390	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1215	-	-	-	391	700
Stage 1	-	-	-	-	723	-
Stage 2	-	-	-	-	689	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1210	-	-	-	365	694
Mov Cap-2 Maneuver	-	-	-	-	365	-
Stage 1	-	-	-	-	678	-
Stage 2	-	-	-	-	686	-

Approach	EB	WB	SB
HCM Control Delay, s	1.5	0	16.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1210	-	-	-	417
HCM Lane V/C Ratio	0.05	-	-	-	0.228
HCM Control Delay (s)	8.1	0	-	-	16.2
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	0.9

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	305	160	5	25	60
Future Vol, veh/h	5	305	160	5	25	60
Conflicting Peds, #/hr	5	0	0	5	5	5
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, %	0	2	3	0	0	0
Mvmt Flow	5	305	160	5	25	60

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	170	0	-	0	488	173
Stage 1	-	-	-	-	168	-
Stage 2	-	-	-	-	320	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1420	-	-	-	543	876
Stage 1	-	-	-	-	867	-
Stage 2	-	-	-	-	741	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1414	-	-	-	536	869
Mov Cap-2 Maneuver	-	-	-	-	536	-
Stage 1	-	-	-	-	860	-
Stage 2	-	-	-	-	738	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	10.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1414	-	-	-	735
HCM Lane V/C Ratio	0.004	-	-	-	0.116
HCM Control Delay (s)	7.6	0	-	-	10.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.4

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	330	350	0	0	0
Future Vol, veh/h	0	330	350	0	0	0
Conflicting Peds, #/hr	5	0	0	5	5	5
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, %	0	2	2	0	0	0
Mvmt Flow	0	330	350	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	355	0	-	0	690	360
Stage 1	-	-	-	-	355	-
Stage 2	-	-	-	-	335	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1215	-	-	-	414	689
Stage 1	-	-	-	-	714	-
Stage 2	-	-	-	-	729	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1210	-	-	-	411	683
Mov Cap-2 Maneuver	-	-	-	-	411	-
Stage 1	-	-	-	-	711	-
Stage 2	-	-	-	-	726	-

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

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1210	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	85	885	110	0	485
Future Vol, veh/h	0	85	885	110	0	485
Conflicting Peds, #/hr	5	5	0	5	5	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, %	0	0	1	0	0	3
Mvmt Flow	0	85	885	110	0	485

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	950	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	318	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	315	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.6	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	315	-
HCM Lane V/C Ratio	-	-	0.27	-
HCM Control Delay (s)	-	-	20.6	-
HCM Lane LOS	-	-	C	-
HCM 95th %tile Q(veh)	-	-	1.1	-

Intersection	
Intersection Delay, s/veh	2.9
Intersection LOS	A

Approach	EB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	5	10	60
Demand Flow Rate, veh/h	5	10	60
Vehicles Circulating, veh/h	30	5	0
Vehicles Exiting, veh/h	30	30	15
Ped Vol Crossing Leg, #/h	5	5	5
Ped Cap Adj	0.999	0.999	0.999
Approach Delay, s/veh	2.7	2.7	2.9
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	LR	LT	TR
Assumed Moves	LR	LT	TR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	5	10	60
Cap Entry Lane, veh/h	1338	1373	1380
Entry HV Adj Factor	1.000	1.000	1.000
Flow Entry, veh/h	5	10	60
Cap Entry, veh/h	1337	1372	1379
V/C Ratio	0.004	0.007	0.044
Control Delay, s/veh	2.7	2.7	2.9
LOS	A	A	A
95th %tile Queue, veh	0	0	0

Intersection	
Intersection Delay, s/veh	8.0
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	75	45	705	515
Demand Flow Rate, veh/h	82	47	734	530
Vehicles Circulating, veh/h	561	739	47	52
Vehicles Exiting, veh/h	21	42	596	734
Ped Vol Crossing Leg, #/h	5	5	5	5
Ped Cap Adj	0.999	0.999	0.999	0.999
Approach Delay, s/veh	6.2	6.7	9.2	6.8
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	82	47	734	530
Cap Entry Lane, veh/h	779	649	1315	1309
Entry HV Adj Factor	0.915	0.950	0.961	0.971
Flow Entry, veh/h	75	45	705	515
Cap Entry, veh/h	712	617	1263	1270
V/C Ratio	0.105	0.072	0.558	0.405
Control Delay, s/veh	6.2	6.7	9.2	6.8
LOS	A	A	A	A
95th %tile Queue, veh	0	0	4	2

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	10	5	35	10	20	0	0	10	0	0	40	20
Future Vol, veh/h	10	5	35	10	20	0	0	10	0	0	40	20
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, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	10	5	35	10	20	0	0	10	0	0	40	20
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	6.9	7.3	7.2	7.1
HCM LOS	A	A	A	A

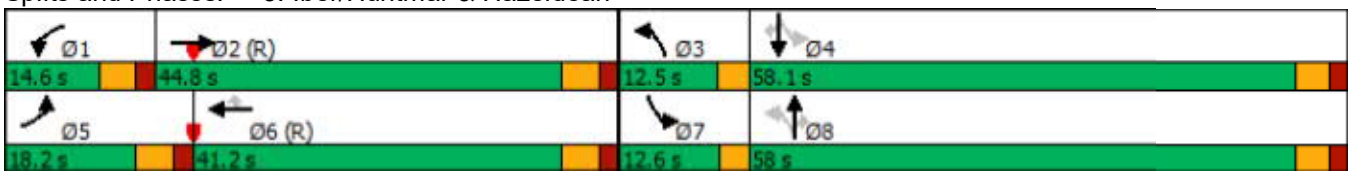
Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	20%	33%	0%
Vol Thru, %	100%	10%	67%	67%
Vol Right, %	0%	70%	0%	33%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	10	50	30	60
LT Vol	0	10	10	0
Through Vol	10	5	20	40
RT Vol	0	35	0	20
Lane Flow Rate	10	50	30	60
Geometry Grp	1	1	1	1
Degree of Util (X)	0.011	0.051	0.034	0.064
Departure Headway (Hd)	4.084	3.664	4.126	3.846
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	874	975	866	930
Service Time	2.121	1.695	2.157	1.875
HCM Lane V/C Ratio	0.011	0.051	0.035	0.065
HCM Control Delay	7.2	6.9	7.3	7.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.2	0.1	0.2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	250	800	150	400	1250	310	170	375	300	210	475	480
Future Volume (vph)	250	800	150	400	1250	310	170	375	300	210	475	480
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	1%	2%	1%	1%	0%	6%	1%	1%	1%	2%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	250	950	0	400	1250	310	170	375	300	210	475	480
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6	8		8	4		4
Detector Phase	5	2		1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	12.5	38.6		12.5	38.6	38.6	12.5	58.0	58.0	12.5	41.3	41.3
Total Split (s)	18.2	44.8		14.6	41.2	41.2	12.5	58.0	58.0	12.6	58.1	58.1
Total Split (%)	14.0%	34.5%		11.2%	31.7%	31.7%	9.6%	44.6%	44.6%	9.7%	44.7%	44.7%
Yellow Time (s)	3.6	3.6		3.6	3.6	3.6	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0
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
Total Lost Time (s)	5.6	5.6		5.6	5.6	5.6	3.0	5.3	5.3	3.0	5.3	5.3
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	14.1	39.2		19.8	44.9	44.9	53.7	41.9	41.9	53.9	42.0	42.0
Actuated g/C Ratio	0.11	0.30		0.15	0.35	0.35	0.41	0.32	0.32	0.41	0.32	0.32
v/c Ratio	0.70	0.95		0.80	1.07	0.43	0.76	0.65	0.47	0.68	0.83	0.76
Control Delay	66.6	62.0		66.3	87.5	5.9	44.3	42.6	8.9	34.7	53.4	28.1
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.6	62.0		66.3	87.5	5.9	44.3	42.6	8.9	34.7	53.4	28.1
LOS	E	E		E	F	A	D	D	A	C	D	C
Approach Delay		62.9			70.2			31.0			39.6	
Approach LOS		E			E			C			D	
Queue Length 50th (m)	33.6	130.0		54.7	~203.8	0.0	28.1	85.9	10.5	35.5	117.4	64.8
Queue Length 95th (m)	#52.6	#173.4		#114.7	#276.1	23.1	#39.9	107.4	30.8	46.5	143.9	97.3
Internal Link Dist (m)		871.0			1427.4			1305.6			301.9	
Turn Bay Length (m)	50.0			90.0		225.0	30.0		60.0	50.0		275.0
Base Capacity (vph)	365	1003		500	1170	722	224	722	748	311	716	735
Starvation Cap Reductn	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
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.95		0.80	1.07	0.43	0.76	0.52	0.40	0.68	0.66	0.65

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.07
Intersection Signal Delay: 55.2 Intersection LOS: E
Intersection Capacity Utilization 97.6% ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Iber/Huntmar & Hazeldean

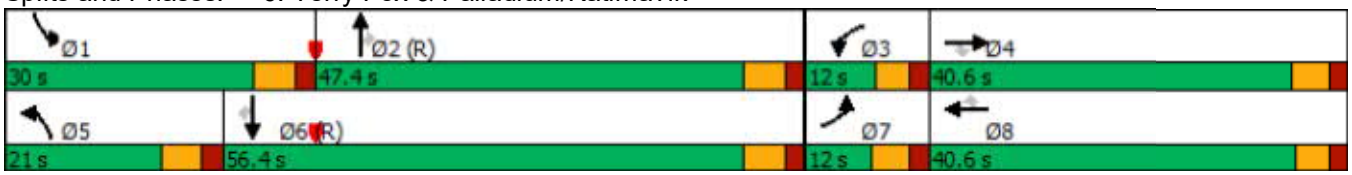


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	845	260	405	135	185	150	250	1165	100	125	1375	710
Future Volume (vph)	845	260	405	135	185	150	250	1165	100	125	1375	710
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	1%	5%	2%	0%	0%	2%	4%	0%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	845	260	405	135	185	150	250	1165	100	125	1375	710
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	12.0	40.6	40.6	12.0	40.3	40.3	12.0	42.5	42.5	30.0	41.0	41.0
Total Split (s)	12.0	40.6	40.6	12.0	40.6	40.6	21.0	47.4	47.4	30.0	56.4	56.4
Total Split (%)	9.2%	31.2%	31.2%	9.2%	31.2%	31.2%	16.2%	36.5%	36.5%	23.1%	43.4%	43.4%
Yellow Time (s)	3.6	3.6	3.6	3.3	3.3	3.3	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	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)	3.6	5.6	5.6	5.3	5.3	5.3	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	8.4	24.9	24.9	6.7	25.2	25.2	14.2	65.2	65.2	10.3	61.3	61.3
Actuated g/C Ratio	0.06	0.19	0.19	0.05	0.19	0.19	0.11	0.50	0.50	0.08	0.47	0.47
v/c Ratio	3.95	0.76	0.82	1.63	0.54	0.35	0.69	0.69	0.12	0.48	0.86	0.77
Control Delay	1353.4	63.1	32.0	367.4	52.0	5.7	79.9	19.0	0.7	62.9	38.5	19.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1353.4	63.1	32.0	367.4	52.0	5.7	79.9	19.0	0.7	62.9	38.5	19.3
LOS	F	E	C	F	D	A	E	B	A	E	D	B
Approach Delay		776.8			127.8			27.8			33.7	
Approach LOS		F			F			C			C	
Queue Length 50th (m)	~216.6	65.1	36.2	~52.1	45.7	0.0	37.2	54.9	0.0	16.9	169.7	70.2
Queue Length 95th (m)	#258.6	m86.1	71.1	#95.3	63.7	11.7	m49.3	142.8	m1.6	27.0	#256.4	#170.0
Internal Link Dist (m)		1802.0			304.5			406.9			280.2	
Turn Bay Length (m)	100.0			115.0		115.0	240.0		115.0	70.0		190.0
Base Capacity (vph)	214	484	587	83	479	534	391	1682	809	612	1597	923
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	3.95	0.54	0.69	1.63	0.39	0.28	0.64	0.69	0.12	0.20	0.86	0.77

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 3.95
Intersection Signal Delay: 236.6 Intersection LOS: F
Intersection Capacity Utilization 103.6% ICU Level of Service G
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Terry Fox & Palladium/Katimavik



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	185	650	245	525	140	370	250	110	100	365	110
Future Volume (vph)	30	185	650	245	525	140	370	250	110	100	365	110
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	11%	0%	0%	0%	0%	0%	1%	1%	0%	1%	2%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	835	0	245	665	0	370	250	110	100	365	110
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	12.5	43.0		12.5	43.0		42.3	42.3	42.3	42.3	42.3	42.3
Total Split (s)	12.5	43.0		12.6	43.1		74.4	74.4	74.4	74.4	74.4	74.4
Total Split (%)	9.6%	33.1%		9.7%	33.2%		57.2%	57.2%	57.2%	57.2%	57.2%	57.2%
Yellow Time (s)	4.0	4.0		4.0	4.0		3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
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)	6.0	6.0		6.0	6.0		5.3	5.3	5.3	5.3	5.3	5.3
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	34.9	28.6		37.7	33.7		77.5	77.5	77.5	77.5	77.5	77.5
Actuated g/C Ratio	0.27	0.22		0.29	0.26		0.60	0.60	0.60	0.60	0.60	0.60
v/c Ratio	0.20	1.01dr		1.79	0.76		0.73	0.24	0.12	0.16	0.35	0.12
Control Delay	31.0	34.4		397.2	42.4		38.6	21.8	8.2	14.4	15.8	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	31.0	34.4		397.2	42.4		38.6	21.8	8.2	14.4	15.8	2.9
LOS	C	C		F	D		D	C	A	B	B	A
Approach Delay		34.2			137.9			28.3			13.1	
Approach LOS		C			F			C			B	
Queue Length 50th (m)	5.5	61.8		~84.6	92.0		83.3	43.9	5.2	12.0	49.6	0.0
Queue Length 95th (m)	11.9	83.1		m#127.0	100.8		m125.4	m62.8	m11.2	24.5	79.8	9.1
Internal Link Dist (m)		535.2			1802.0			357.2			231.7	
Turn Bay Length (m)	95.0			75.0			120.0		45.0	50.0		
Base Capacity (vph)	152	1128		137	960		509	1061	940	608	1051	931
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	0.20	0.74		1.79	0.69		0.73	0.24	0.12	0.16	0.35	0.12

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.79
Intersection Signal Delay: 59.5 Intersection LOS: E
Intersection Capacity Utilization 114.1% 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.
m Volume for 95th percentile queue is metered by upstream signal.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 8: Huntmar & Palladium

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	125	85	185	210	55	125	630	150	60	915	280
Future Volume (vph)	130	125	85	185	210	55	125	630	150	60	915	280
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	2%	1%	0%	0%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	340	0	0	450	0	125	780	0	0	1255	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	33.0	33.0		33.0	33.0		29.0	29.0		49.0	49.0	
Total Split (s)	41.0	41.0		41.0	41.0		89.0	89.0		89.0	89.0	
Total Split (%)	31.5%	31.5%		31.5%	31.5%		68.5%	68.5%		68.5%	68.5%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0			0.0	
Total Lost Time (s)		5.0			5.0		5.3	5.3			5.3	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)		36.0			36.0		83.7	83.7			83.7	
Actuated g/C Ratio		0.28			0.28		0.64	0.64			0.64	
v/c Ratio		1.05			1.39		0.56	0.70			1.46	
Control Delay		108.2			224.0		24.6	18.8			232.8	
Queue Delay		0.0			0.0		0.0	0.0			0.0	
Total Delay		108.2			224.0		24.6	18.8			232.8	
LOS		F			F		C	B			F	
Approach Delay		108.2			224.0			19.6			232.8	
Approach LOS		F			F			B			F	
Queue Length 50th (m)		~97.3			~160.8		17.5	124.3			~470.6	
Queue Length 95th (m)		#159.9			#222.8		42.2	172.7			m#476.6	
Internal Link Dist (m)		630.5			86.3			293.1			175.1	
Turn Bay Length (m)							20.0					
Base Capacity (vph)		323			324		224	1115			857	
Starvation Cap Reductn		0			0		0	0			0	
Spillback Cap Reductn		0			0		0	0			0	
Storage Cap Reductn		0			0		0	0			0	
Reduced v/c Ratio		1.05			1.39		0.56	0.70			1.46	

Intersection Summary

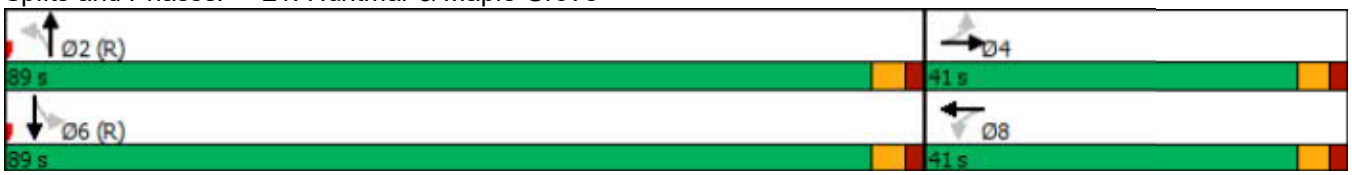
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 125	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.46	
Intersection Signal Delay: 151.7	Intersection LOS: F
Intersection Capacity Utilization 164.9%	ICU Level 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.

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

Splits and Phases: 21: Huntmar & Maple Grove

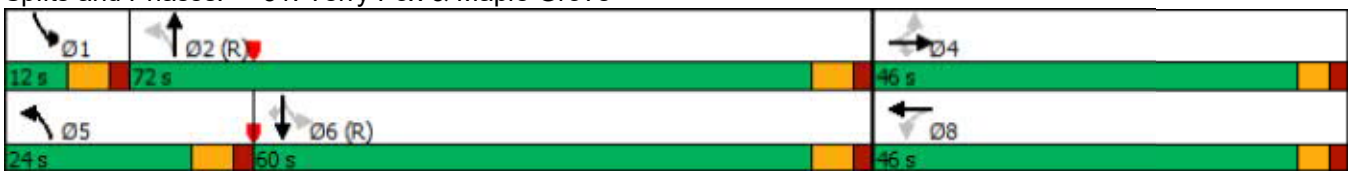


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	195	50	355	20	55	45	215	1535	50	70	2030	195
Future Volume (vph)	195	50	355	20	55	45	215	1535	50	70	2030	195
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour 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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	0%	1%	0%	0%	0%	3%	2%	0%	0%	1%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	195	50	355	20	100	0	215	1585	0	70	2030	195
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0		5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	42.0	42.0	42.0	42.0	42.0		12.0	43.0		12.0	43.0	43.0
Total Split (s)	46.0	46.0	46.0	46.0	46.0		24.0	72.0		12.0	60.0	60.0
Total Split (%)	35.4%	35.4%	35.4%	35.4%	35.4%		18.5%	55.4%		9.2%	46.2%	46.2%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		6.0	6.0		6.0	6.0	6.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	26.7	26.7	26.7	26.7	26.7		92.3	81.2		77.5	70.1	70.1
Actuated g/C Ratio	0.21	0.21	0.21	0.21	0.21		0.71	0.62		0.60	0.54	0.54
v/c Ratio	0.82	0.14	0.77	0.08	0.27		0.82	0.76		0.36	1.11	0.23
Control Delay	69.1	37.7	27.9	38.3	28.4		58.3	23.2		17.0	84.8	12.9
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	69.1	37.7	27.9	38.3	28.4		58.3	23.2		17.0	84.8	12.9
LOS	E	D	C	D	C		E	C		B	F	B
Approach Delay		42.1			30.0			27.4			76.6	
Approach LOS		D			C			C			E	
Queue Length 50th (m)	50.7	10.7	40.1	4.4	15.1		40.8	157.2		5.8	~326.4	7.9
Queue Length 95th (m)	m61.4	m15.6	m55.3	10.7	28.5		70.5	#262.1		m12.5	m#415.3	m23.9
Internal Link Dist (m)		1246.0			796.0			547.8			406.9	
Turn Bay Length (m)	65.0		60.0	40.0			145.0			125.0		70.0
Base Capacity (vph)	367	567	605	409	547		299	2083		193	1824	831
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	0.53	0.09	0.59	0.05	0.18		0.72	0.76		0.36	1.11	0.23

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 112 (86%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.11
Intersection Signal Delay: 52.8 Intersection LOS: D
Intersection Capacity Utilization 106.0% ICU Level of Service G
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 31: Terry Fox & Maple Grove



Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	40	820	15	60	1200
Future Vol, veh/h	0	40	820	15	60	1200
Conflicting Peds, #/hr	5	5	0	5	5	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, %	0	0	0	0	0	1
Mvmt Flow	0	40	820	15	60	1200

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2158	838	0	0	840	0
Stage 1	833	-	-	-	-	-
Stage 2	1325	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	53	369	-	-	804	-
Stage 1	430	-	-	-	-	-
Stage 2	251	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	41	366	-	-	801	-
Mov Cap-2 Maneuver	41	-	-	-	-	-
Stage 1	428	-	-	-	-	-
Stage 2	194	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16	0	0.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	366	801	-
HCM Lane V/C Ratio	-	-	0.109	0.075	-
HCM Control Delay (s)	-	-	16	9.9	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0.2	-

Intersection	
Int Delay, s/veh	1.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	30	830	25	45	1240
Future Vol, veh/h	15	30	830	25	45	1240
Conflicting Peds, #/hr	5	5	0	5	5	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, %	0	0	0	0	0	1
Mvmt Flow	15	30	830	25	45	1240

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2183	853	0	0	860	0
Stage 1	848	-	-	-	-	-
Stage 2	1335	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	51	362	-	-	790	-
Stage 1	423	-	-	-	-	-
Stage 2	248	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	41	359	-	-	787	-
Mov Cap-2 Maneuver	41	-	-	-	-	-
Stage 1	421	-	-	-	-	-
Stage 2	202	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	63.6	0	0.3
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	100	787	-
HCM Lane V/C Ratio	-	-	0.45	0.057	-
HCM Control Delay (s)	-	-	67.6	9.9	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	1.9	0.2	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	30	310	420	70	30	55
Future Vol, veh/h	30	310	420	70	30	55
Conflicting Peds, #/hr	5	0	0	5	5	5
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, %	0	0	3	0	0	0
Mvmt Flow	30	310	420	70	30	55

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	495	0	-	0	835	465
Stage 1	-	-	-	-	460	-
Stage 2	-	-	-	-	375	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1079	-	-	-	340	602
Stage 1	-	-	-	-	640	-
Stage 2	-	-	-	-	699	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1074	-	-	-	326	597
Mov Cap-2 Maneuver	-	-	-	-	326	-
Stage 1	-	-	-	-	616	-
Stage 2	-	-	-	-	696	-

Approach	EB	WB	SB
HCM Control Delay, s	8.7	0	14.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1074	-	-	-	462
HCM Lane V/C Ratio	0.028	-	-	-	0.184
HCM Control Delay (s)	8.4	0	-	-	14.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.7

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	320	445	25	20	15
Future Vol, veh/h	5	320	445	25	20	15
Conflicting Peds, #/hr	5	0	0	5	5	5
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, %	0	0	3	0	0	0
Mvmt Flow	5	320	445	25	20	15

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	475	0	-	0	798	468
Stage 1	-	-	-	-	463	-
Stage 2	-	-	-	-	335	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1098	-	-	-	358	599
Stage 1	-	-	-	-	638	-
Stage 2	-	-	-	-	729	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1093	-	-	-	353	594
Mov Cap-2 Maneuver	-	-	-	-	353	-
Stage 1	-	-	-	-	632	-
Stage 2	-	-	-	-	726	-

Approach	EB	WB	SB
HCM Control Delay, s	8.1	0	14.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1093	-	-	-	427
HCM Lane V/C Ratio	0.005	-	-	-	0.082
HCM Control Delay (s)	8.3	0	-	-	14.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	335	475	0	0	0
Future Vol, veh/h	0	335	475	0	0	0
Conflicting Peds, #/hr	5	0	0	5	5	5
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, %	0	0	2	0	0	0
Mvmt Flow	0	335	475	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	480	0	-	0	820	485
Stage 1	-	-	-	-	480	-
Stage 2	-	-	-	-	340	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1093	-	-	-	347	586
Stage 1	-	-	-	-	627	-
Stage 2	-	-	-	-	725	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1088	-	-	-	344	581
Mov Cap-2 Maneuver	-	-	-	-	344	-
Stage 1	-	-	-	-	624	-
Stage 2	-	-	-	-	722	-

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

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1088	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	20	815	15	0	1200
Future Vol, veh/h	0	20	815	15	0	1200
Conflicting Peds, #/hr	5	5	0	5	5	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, %	0	0	0	0	0	1
Mvmt Flow	0	20	815	15	0	1200

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	833	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	372	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	369	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.3	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	369	-
HCM Lane V/C Ratio	-	-	0.054	-
HCM Control Delay (s)	-	-	15.3	-
HCM Lane LOS	-	-	C	-
HCM 95th %tile Q(veh)	-	-	0.2	-

Intersection	
Intersection Delay, s/veh	2.9
Intersection LOS	A

Approach	EB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	30	40	50
Demand Flow Rate, veh/h	30	40	50
Vehicles Circulating, veh/h	30	30	0
Vehicles Exiting, veh/h	20	30	70
Ped Vol Crossing Leg, #/h	5	5	5
Ped Cap Adj	0.999	0.999	0.999
Approach Delay, s/veh	2.9	2.9	2.9
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	LR	LT	TR
Assumed Moves	LR	LT	TR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	30	40	50
Cap Entry Lane, veh/h	1338	1338	1380
Entry HV Adj Factor	1.000	1.000	1.000
Flow Entry, veh/h	30	40	50
Cap Entry, veh/h	1337	1337	1379
V/C Ratio	0.022	0.030	0.036
Control Delay, s/veh	2.9	2.9	2.9
LOS	A	A	A
95th %tile Queue, veh	0	0	0

Intersection	
Intersection Delay, s/veh	14.7
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	55	85	750	985
Demand Flow Rate, veh/h	58	86	757	996
Vehicles Circulating, veh/h	1040	747	32	136
Vehicles Exiting, veh/h	91	42	1066	697
Ped Vol Crossing Leg, #/h	5	5	5	5
Ped Cap Adj	1.000	0.999	0.999	0.999
Approach Delay, s/veh	9.7	7.2	9.1	19.9
Approach LOS	A	A	A	C

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	58	86	757	996
Cap Entry Lane, veh/h	478	644	1336	1201
Entry HV Adj Factor	0.944	0.988	0.991	0.989
Flow Entry, veh/h	55	85	750	985
Cap Entry, veh/h	451	636	1323	1188
V/C Ratio	0.121	0.134	0.567	0.830
Control Delay, s/veh	9.7	7.2	9.1	19.9
LOS	A	A	A	C
95th %tile Queue, veh	0	0	4	10

Intersection	
Intersection Delay, s/veh	7.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	30	5	0	20	0	0	30	0	0	30	20
Future Vol, veh/h	40	30	5	0	20	0	0	30	0	0	30	20
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, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	40	30	5	0	20	0	0	30	0	0	30	20
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	7.5	7.2	7.3	7.1
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	53%	0%	0%
Vol Thru, %	100%	40%	100%	60%
Vol Right, %	0%	7%	0%	40%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	30	75	20	50
LT Vol	0	40	0	0
Through Vol	30	30	20	30
RT Vol	0	5	0	20
Lane Flow Rate	30	75	20	50
Geometry Grp	1	1	1	1
Degree of Util (X)	0.034	0.086	0.023	0.053
Departure Headway (Hd)	4.104	4.121	4.096	3.849
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	866	867	869	924
Service Time	2.159	2.156	2.144	1.902
HCM Lane V/C Ratio	0.035	0.087	0.023	0.054
HCM Control Delay	7.3	7.5	7.2	7.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.3	0.1	0.2

Appendix B

Signal Warrant Analysis

Input Data Sheet

Analysis Sheet | Results Sheet | Proposed Collision

GO TO Justification:

What are the intersecting roadways? Huntmar Drive and EW Road 1

What is the direction of the Main Road street? North-South

When was the data collected? 2029 Total Traffic

Justification 1 - 4: Volume Warrants

a.- Number of lanes on the Main Road? 1

b.- Number of lanes on the Minor Road? 1

c.- How many approaches? 3

d.- What is the operating environment? Urban **Population >= 10,000 AND Speed < 70 km/hr**

e.- What is the eight hour vehicle volume at the intersection? (Please fill in table below)

Hour Ending	Main Northbound Approach			Minor Eastbound Approach			Main Southbound Approach			Minor Westbound Approach			Pedestrians Crossing Main Road
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
7:00		456	8				14	434		10		16	
8:00		456	8				14	434		10		16	
9:00		456	8				14	434		10		16	
10:00		456	8				14	434		10		16	
15:00		456	8				14	434		10		16	
16:00		456	8				14	434		10		16	
17:00		456	8				14	434		10		16	
18:00		456	8				14	434		10		16	
Total	**0**	**3,648**	**61**	**0**	**0**	**0**	**112**	**3,472**	**0**	**80**	**0**	**128**	**0**

Justification 5: Collision Experience

Preceding Months	Number of Collisions*
1-12	0
13-24	0
25-36	0

* Include only collisions that are susceptable to correction through the installation of traffic signal control

Justification 6: Pedestrian Volume

a.- Please fill in table below summarizing total pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
Total 8 hour pedestrian volume	0	0	0	0	0	0	0	0	
Factored 8 hour pedestrian volume	0		0		0		0		
% Assigned to crossing rate	100%		50%		0%		0%		
Net 8 Hour Pedestrian Volume at Crossing									0
Net 8 Hour Vehicular Volume on Street Being Crossed									6,411

b.- Please fill in table below summarizing delay to pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
Total 8 hour pedestrian volume	0	0	0	0	0	0	0	0	
Total 8 hour pedestrians delayed greater than 10 seconds	0	0	0	0	0	0	0	0	
Factored volume of total pedestrians	0		0		0		0		
Factored volume of delayed pedestrians	0		0		0		0		
% Assigned to Crossing Rate	100%		50%		0%		0%		
Net 8 Hour Volume of Total Pedestrians									0
Net 8 Hour Volume of Delayed Pedestrians									0

Analysis Sheet

Input Sheet | Results Sheet | Proposed Collision

GO TO Justification:

Intersection: Huntmar Drive and EW Road 1 Count Date: 2029 Total Traffic

Justification 1: Minimum Vehicle Volumes

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 Lanes		2 or More Lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☑	FREE FLOW ☐	RESTR. FLOW ☐	7:00	8:00	9:00	10:00	15:00	16:00	17:00	18:00		
1A	480	720	600	900	938	938	938	938	938	938	938	938		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100
1B	180	255	180	255	26	26	26	26	26	26	26	26		
	COMPLIANCE %				10	10	10	10	10	10	10	10	82	10
Restricted Flow Signal Justification 1:					Both 1A and 1B 100% Fulfilled each of 8 hours ☐ Yes ☑ No Lesser of 1A or 1B at least 80% fulfilled each of 8 hours ☐ Yes ☑ No									

Justification 2: Delay to Cross Traffic

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 lanes		2 or More lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☑	FREE FLOW ☐	RESTR. FLOW ☐	7:00	8:00	9:00	10:00	15:00	16:00	17:00	18:00		
2A	480	720	600	900	912	912	912	912	912	912	912	912		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100
2B	50	75	50	75	10	10	10	10	10	10	10	10		
	COMPLIANCE %				13	13	13	13	13	13	13	13	107	13
Restricted Flow Signal Justification 2:					Both 2A and 2B 100% fulfilled each of 8 hours ☐ Yes ☑ No Lesser of 2A or 2B at least 80% fulfilled each of 8 hours ☐ Yes ☑ No									

Justification 3: Combination

Combination Justification 1 and 2

	Justification Satisfied 80% or More			Two Justifications Satisfied 80% or More	
Justification 1	Minimum Vehicle Volume	YES ☐	NO ☑	YES ☐	NO ☑
Justification 2	Delay Cross Traffic	YES ☐	NO ☑		NOT JUSTIFIED

Justification 4: Four Hour Volume

Justification	Time Period	Total Volume of Both Approaches (Main)	Heaviest Minor Approach	Required Value	Average % Compliance	Overall % Compliance
		X	Y (actual)	Y (warrant threshold)		
Justification 4	7:00	912	26	121	21 %	21 %
	8:00	912	26	122	21 %	
	9:00	912	26	122	21 %	
	10:00	912	26	122	21 %	

Analysis Sheet

Input Sheet | Results Sheet | Proposed Collision

GO TO Justification:

Intersection: Huntmar Drive and EW Road 1 Count Date: 2029 Total Traffic

Justification 5: Collision Experience

Justification	Preceding Months	% Fulfillment	Overall % Compliance
Justification 5	1-12	0 %	0 %
	13-24	0 %	
	25-36	0 %	

Justification 6: Pedestrian Volume

Pedestrian Volume Analysis

8 Hour Vehicular Volume V_8		Net 8 Hour Pedestrian Volume				
		< 200	200 - 275	276 - 475	476 - 1000	>1000
Justification 6A	< 1440	Not Justified				
	1440 - 2600					
	2601 - 7000					
	> 7000					

Pedestrian Delay Analysis

Net Total 8 Hour Volume of Total Pedestrians		Net Total 8 Hour Volume of Delayed Pedestrians		
		< 75	75 - 130	> 130
Justification 6B	< 200	Not Justified		
	200 - 300			
	> 300			

Results Sheet

Input Sheet | Analysis Sheet | Proposed Collision

GO TO Justification:

Intersection: Huntmar Drive and EW Road 1

Count Date: 2029 Total Traffic

Summary Results

Justification			Compliance		Signal Justified? YES	Signal Justified? NO
1. Minimum Vehicular Volume	A	Total Volume	100	%	☐	☑
	B	Crossing Volume	10	%		
2. Delay to Cross Traffic	A	Main Road	100	%	☐	☑
	B	Crossing Road	13	%		
3. Combination	A	Justificaton 1	10	%	☐	☑
	B	Justification 2	13	%		
4. 4-Hr Volume			21	%	☐	☑
5. Collision Experience			0	%	☐	☑
6. Pedestrians	A	Volume	Justification not met		☐	☑
	B	Delay	Justification not met			

Appendix C

TDM Checklists

Introduction

The City of Ottawa's *Transportation Impact Assessment (TIA) Guidelines* (specifically Module 4.3—Transportation Demand Management) requires proponents of qualifying developments to assess the context, need and opportunity for transportation demand management (TDM) measures at their development. The guidelines require that proponents complete the City's **TDM Measures Checklist**, at a minimum, to identify any TDM measures being proposed.

The remaining sections of this document are:

- Using the Checklist
- Glossary
- TDM Measures Checklist: Non-Residential Developments
- TDM Measures Checklist: Residential developments

Readers are encouraged to contact the City of Ottawa's TDM Officer for any guidance and assistance they require to complete this checklist.

Using the Checklist

The City's *TIA Guidelines* are designed so that *Module 3.1—Development-Generated Travel Demand*, *Module 4.1—Development Design*, and *Module 4.2—Parking* are complete before a proponent begins *Module 4.3—Transportation Demand Management*.

Within Module 4.3, *Element 4.3.1—Context for TDM* and *Element 4.3.2—Need and Opportunity* are intended to create an understanding of the need for any TDM measures, and of the results they are expected to achieve or support. Once those two elements are complete, proponents begin *Element 4.3.3—TDM Program* that requires proponents to identify proposed TDM measures using the **TDM Measures Checklist**, at a minimum. The *TIA Guidelines* note that the City may require additional analysis for large or complex development proposals, or those that represent a higher degree of performance risk; as well, proponents proposing TDM measures for a new development must also propose an implementation plan that addresses planning and coordination, funding and human resources, timelines for action, performance targets and monitoring requirements.

This **TDM Measures Checklist** document includes two actual checklists, one for non-residential developments (office, institutional, retail or industrial) and one for residential developments (multi-family, condominium or subdivision). Readers may download the applicable checklist in electronic format and complete it electronically, or print it out and complete it by hand. As an alternative, they may create a freestanding document that lists the TDM measures being proposed and provides additional detail on them, including an implementation plan as required by the City's *TIA Guidelines*.

Each measure in the checklist is numbered for easy reference. Each measure is also flagged as:

- 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.

Glossary

This glossary defines and describes the following measures that are identified in the **TDM Measures Checklist**:

TDM program management
- Program coordinator
- Travel surveys

Parking
- Priced parking

Walking & cycling
- Information on walking/cycling routes & destinations
- Bicycle skills training
- Valet bike parking

Transit
- Transit information
- Transit fare incentives
- Enhanced public transit service
- Private transit service

Ridesharing
- Ridematching service
- Carpool parking price incentives
- Vanpool service

Carsharing & bikesharing
- Bikeshare stations & memberships
- Carshare vehicles & memberships

TDM marketing & communications
- Multimodal travel information
- Personalized trip planning
- Promotions

Other incentives & amenities
- Emergency ride home
- Alternative work arrangements
- Local business travel options
- Commuter incentives
- On-site amenities

For further information on selecting and implementing TDM measures (particularly as they apply to non-residential developments, with a focus on workplaces), readers may find it helpful to consult Transport Canada's *Workplace Travel Plans: Guidance for Canadian Employers*, which can be downloaded in English and French from the ACT Canada website at www.actcanada.com/resources/act-resources.

▶ *TDM program management*

While some TDM measures can be implemented with a minimum of effort through routine channels (e.g. parking or human resources), more complex measures or a larger development site may warrant assigning responsibility for TDM program coordination to a designated person either inside or outside the implementing organization. Similarly, some TDM measures are more effective if they are targeted or customized for specific audiences, and would benefit from the collection of related information.

Program coordinator. This person is charged with day-to-day TDM program development and implementation. Only in very large employers with thousands of workers is this likely to be a full-time, dedicated position. Usually, it is added to an existing role in parking, real estate, human resources or environmental management. In practice, this role may be called TDM coordinator, commute trip reduction coordinator or employee transportation coordinator. The City of Ottawa can identify external resources (e.g. non-profit organizations or consultants) that could provide these services.

Travel surveys. Travel surveys are most commonly conducted at workplaces, but can be helpful in other settings. They identify how and why people travel the way they do, and what barriers and opportunities exist for different behaviours. They usually capture the following information:

- *Personal data* including home address or postal code, destination, job type or function, employment status (full-time, part-time and/or teleworker), gender, age and hours of work
- *Commute information* including distance or time for the trip between home and work, usual methods of commuting, and reasons for choosing them
- *Barriers and opportunities* including why other commuting methods are unattractive, willingness to consider other options, and what improvements to other options could make them more attractive

▶ *Parking*

Priced parking. Charging for parking is typically among the most effective ways of getting drivers to consider other travel options. While drivers may not support parking fees, they can be more accepting if the revenues are used to improve other travel options (e.g. new showers and change rooms, improved bicycle parking or subsidized transit passes). At workplaces or daytime destinations, parking discounts (e.g. early bird specials, daily passes that cost significantly less than the equivalent hourly charge, monthly passes that cost significantly less than the equivalent daily charge) encourage long-term parking and discourage the use of other travel options. For residential uses, unbundling parking costs from dwelling purchase, lease or rental costs provides an incentive for residents to own fewer cars, and can reduce car use and the costs of parking provision.

▶ *Walking & cycling*

Active transportation options like cycling and walking are particularly attractive for short trips (typically up to 5 km and 2 km, respectively). Other supportive factors include an active, health-conscious audience, and development proximity to high-quality walking and cycling networks. Common challenges to active transportation include rain, darkness, snowy or icy conditions, personal safety concerns, the potential for bicycle theft, and a lack of shower and change facilities for those making longer trips.

Information on walking/cycling routes & destinations. Ottawa, Gatineau and the National Capital Commission all publish maps to help people identify the most convenient and comfortable walking or cycling routes.

Bicycle skills training. Potential cyclists can be intimidated by the need to ride on roads shared with motor vehicles. This barrier can be reduced or eliminated by offering cycling skills training to interested cyclists (e.g. CAN-BIKE certification courses).

Valet bike parking. For large events, temporary “valet parking” areas can be easily set up to maximize convenience and security for cyclists. Experienced local non-profit groups can help.

▶ *Transit*

Transit information. Difficulty in finding or understanding basic information on transit fares, routes and schedules can prevent people from trying transit. Employers can help by providing online links to OC Transpo and STO websites. Transit users also appreciate visible maps and schedules of transit routes that serve the site; even better, a screen that shows real-time transit arrival information is particularly useful at sites with many transit users and an adjacent transit stop or station.

Transit fare incentives. Free or subsidized transit fares are an attractive incentive for non-transit riders to try transit. Many non-users are unsure of how to pay a fare, and providing tickets or a preloaded PRESTO card (or, for special events, pre-arranging with OC Transpo that transit fares are included with event tickets) overcome that barrier.

Enhanced public transit service. OC Transpo may adjust transit routes, stop locations, service hours or frequencies for an agreed fee under contract, or at no cost where warranted by the potential ridership increase. Information provided by a survey of people who travel to a given development can support these decisions.

Private transit service. At remote suburban or rural workplaces, a poor transit connection to the nearest rapid transit station can be an obstacle for potential transit users, and an employer in this situation could initiate a private shuttle service to make transit use more feasible or attractive. Other circumstances where a shuttle makes sense include large special events, or a residential development for people with limited independent mobility who still require regular access to shops and services.

▶ *Ridesharing*

Ridesharing's potential is greatest in situations where transit ridership is low, where parking costs are high, and/or where large numbers of car commuters (e.g. employees or full-time students) live reasonably far from the workplace.

Ridematching service. Potential carpoolers in Ottawa are served by www.OttawaRideMatch.com, an online service to help people find carpool partners. Employers can arrange for a dedicated portal where their employees can search for potential carpool partners only among their colleagues, if they desire. Some very large employers may establish internal ridematching services, to maximize employee uptake and corporate control. Ridematching service providers typically include a waiver to relieve employers of liability when their employees start carpooling through a ridematching service. Ridesharing with co-workers also tends to eliminate security concerns.

Carpool parking price incentives. Discounted parking fees for carpools can be an extra incentive to rideshare.

Vanpool service. Vanpools operate in the Toronto and Vancouver metropolitan areas, where vans that carry up to about ten occupants are driven by one of the vanpool members. Vanpools tend to operate on a cost-recovery basis, and are most practical for long-distance commutes where transit is not an option. Current legislation in Ontario does not permit third-party (i.e. private or non-profit) vanpool services, but does permit employers to operate internal vanpools.

▶ *Carsharing & bikesharing*

Bikeshare station & memberships. VeloGO Bike Share and Right Bike both operate bikesharing services in Ottawa. Developments that would benefit from having a bikeshare station installed at or near their development may negotiate directly with either service provider.

Carshare vehicles & memberships. VRTUCAR and Zipcar both operate carsharing services in Ottawa, for use by the general public or by businesses as an alternative to corporate fleets. Carsharing services offer 24-hour access, self-serve reservation systems, itemized monthly billings, and outsourcing of all financing, insurance, maintenance and administrative responsibilities.

▶ *TDM marketing & communications*

Multimodal travel information. Aside from mode-specific information discussed elsewhere in this document, multimodal information that identifies and explains the full range of travel options available to people can be very influential—especially when provided at times and locations where individuals are actively choosing among those options. Examples include: employees when their employer is relocating, or when they are joining a new employer; students when they are starting a program at a new institution; visitors or customers travelling to an unfamiliar destination, or when faced with new options (e.g. shuttle services or parking restrictions); and residents when they purchase or occupy a residence that is new to them.

Personalized trip planning. As an extension to the simple provision of information, this technique (also known as *individualized marketing*) is effective in helping people make more sustainable travel choices. The approach involves identifying who is most likely to change their travel choices (notably relocating employees, students or residents) giving them customized information, training and incentives to support them in making that change. It may be conducted with assistance from an external service provider with the necessary skills, and delivered in a variety of settings including workplaces and homes.

Promotions. Special events and incentives can raise awareness and encourage individuals to examine and try new travel options.

- *Special events* can help attract attention, build participation and celebrate successes. Events that have been held in Ottawa include Earth Day (in April) Bike to Work Month (in May), Environment Week (early June), International Car Free Day (September 22), and Canadian Ridesharing Week (October). At workplaces or educational institutions, similarly effective internal events could include workshops, lunch-and-learns, inter-departmental challenges, pancake breakfasts, and so on.
- *Incentives* can encourage trial of sustainable modes, and might include loyalty rewards for duration or consistency of activity (e.g. 1,000 km commuted by bicycle), participation prizes (e.g. for completing a survey or joining a special event), or personal recognition that highlights individual accomplishments.

▶ *Other incentives & amenities*

Emergency ride home. This measure assures non-driving commuters that they will be able to get home quickly and conveniently in case of family emergency (or in some workplaces, in case of unexpected overtime, severe weather conditions, or the early departure of a carpool driver) by offering a chit or reimbursement for taxi, carshare or rental car usage. Limits on annual usage or cost per employee may be set, although across North America the actual rates of usage are typically very low.

Alternative work arrangements. A number of alternatives to the standard 9-to-5, Monday-to-Friday workweek can support sustainable commuting (and work-life balance) at workplaces:

- *Flexible working hours* allow transit commuters to take advantage of the fastest and most convenient transit services, and allow potential carpoolers to include people who work slightly different schedules in their search for carpool partners. They also allow active commuters to travel at least one direction in daylight, either in the morning or the afternoon, during the winter.
- *Compressed workweeks* allow employees to work their required hours over fewer days (e.g. five days in four, or ten days in nine), eliminating the need to commute on certain days. For employees, this can promote work-life balance and gives flexibility for appointments. For employers, this can permit extended service hours as well as reduced parking demands if employees stagger their days off.
- *Telework* is a normal part of many workplaces. It helps reduce commuting activity, and can lead to significant cost savings through workspace sharing. Telework initiatives involve many stakeholders, and may face as much resistance as support within an organization. Consultation, education and training are helpful.

Local business travel options. A common obstacle for people who might prefer to not drive to work is that their employer requires them to bring a car to work so they can make business trips during the day. Giving employees convenient alternatives to private cars for local business travel during the workday makes walking, cycling, transit or carpooling in someone else's car more practical.

- *Walking and cycling*—Active transportation can be a convenient and enjoyable way to make short business trips. They can also reduce employer expenses, although they may require extra travel time. Providing a fleet of shared bikes, or reimbursing cyclists for the kilometres they ride, are inexpensive ways to validate their choice.
- *Public transit*—Transit can be convenient and inexpensive compared to driving. OC Transpo's PRESTO cards are transferable among employees and automatically reloadable, making them the perfect tool for enabling transit use during the day.
- *Ridesharin*g—When multiple employees attend the same off-site meeting or event, they can be reminded to carpool whenever possible.
- *Taxis or ride-hailing*—Taxis and ride-hailing can eliminate parking costs, save time and eliminate collision liability concerns. Taxi chits eliminate cash transactions and minimize paperwork.
    - *Fleet vehicles or carsharing*—Fleet vehicles can be cost-effective for high travel volumes, while carsharing is a great option for less frequent trips.
    - *Interoffice shuttles*—Employers with multiple worksites in the region could use a shuttle service to move people as well as mail or supplies.
    - *Videoconferencing*—New technologies mean that staying in the office to hold meetings electronically is more viable, affordable and productive than ever.

Commuter incentives. Financial incentives can help create a level playing field and support commuting by sustainable modes. A "commuting allowance" given to all employees as a taxable benefit is one such incentive; employees who choose to drive could then be charged for parking, while other employees could use the allowance for transit fares or cycling equipment, or for spending or saving. (Note that in the United States this practice is known as "parking cash-out," and is popular because commuting allowances are not taxable up to a certain limit). Alternatively, a monthly commuting allowance for non-driving employees would give drivers an incentive to choose a different commuting mode. Another practical incentive for active commuters or transit users is to offer them discounted "rainy day" parking passes for a small number of days each month.

On-site amenities. Developments that offer services to limit employees' need for a car during their commute (e.g. to drop off clothing at the dry cleaners) or during their workday (e.g. to buy lunch) can free employees to make the commuting decision that otherwise works best for them.

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

		TDM measures: *Residential developments*	Check if proposed & add descriptions
	1.	**TDM PROGRAM MANAGEMENT**	
	1.1	**Program coordinator**	
BASIC ★	1.1.1	Designate an internal coordinator, or contract with an external coordinator	☐
	1.2	**Travel surveys**	
BETTER	1.2.1	Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress	☐
	2.	**WALKING AND CYCLING**	
	2.1	**Information on walking/cycling routes & destinations**	
BASIC	2.1.1	Display local area maps with walking/cycling access routes and key destinations at major entrances *(multi-family, condominium)*	☒ Routes and maps will be displayed inside apartment buildings.
	2.2	**Bicycle skills training**	
BETTER	2.2.1	Offer on-site cycling courses for residents, or subsidize off-site courses	☐
	3.	**TRANSIT**	
	3.1	**Transit information**	
BASIC	3.1.1	Display relevant transit schedules and route maps at entrances *(multi-family, condominium)*	☒ Routes and maps will be displayed inside apartment buildings.
BETTER	3.1.2	Provide real-time arrival information display at entrances *(multi-family, condominium)*	☐
	3.2	**Transit fare incentives**	
BASIC ★	3.2.1	Offer PRESTO cards preloaded with one monthly transit pass on residence purchase/move-in, to encourage residents to use transit	☐
BETTER	3.2.2	Offer at least one year of free monthly transit passes on residence purchase/move-in	☐
	3.3	**Enhanced public transit service**	
BETTER ★	3.3.1	Contract with OC Transpo to provide early transit services until regular services are warranted by occupancy levels *(subdivision)*	☒ OC Transpo already has plans to run a route through the subdivision.
	3.4	**Private transit service**	
BETTER	3.4.1	Provide shuttle service for seniors homes or lifestyle communities (e.g. scheduled mall or supermarket runs)	☐

	4.	**CARSHARING & BIKESHARING**	
	4.1	**Bikeshare stations & memberships**	
BETTER	4.1.1	Contract with provider to install on-site bikeshare station (*multi-family)*	☒ Client will contract with provider to install on-site bike share vehicles.
BETTER	4.1.2	Provide residents with bikeshare memberships, either free or subsidized *(multi-family)*	☐
	4.2	**Carshare vehicles & memberships**	
BETTER	4.2.1	Contract with provider to install on-site carshare vehicles and promote their use by residents	☒ Client will contract with provider to install on-site car share vehicles.
BETTER	4.2.2	Provide residents with carshare memberships, either free or subsidized	☐
	5.	**PARKING**	
	5.1	**Priced parking**	
BASIC ★	5.1.1	Unbundle parking cost from purchase price *(condominium)*	☒ Parking cost will not be bundled.
BASIC ★	5.1.2	Unbundle parking cost from monthly rent *(multi-family)*	☒ Parking cost will not be bundled.
	6.	**TDM MARKETING & COMMUNICATIONS**	
	6.1	**Multimodal travel information**	
BASIC ★	6.1.1	Provide a multimodal travel option information package to new residents	☒ Information package will be provided to new residents.
	6.2	**Personalized trip planning**	
BETTER ★	6.2.1	Offer personalized trip planning to new residents	☐