1 Canfield Road
St. Mary Coptic Orthodox Church Expansion

Transportation Impact Assessment

Strategy Report

December 17, 2019

Prepared for:

St. Mary Coptic Orthodox Church

Prepared by:

Stantec Consulting Ltd.

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1.0 SCREENING

1.1 SUMMARY OF DEVELOPMENT

Municipal Address	**1 Canfield Road**
Description of Location	Northwest quadrant of Greenbank Road / Canfield Road / Craig Henry Drive
Land Use Classification	Institutional – Place of Worship (Church)
Development Size (units)	Existing: 1 building Proposed Expansion: 1 additional building
Development Size (ft^2)	Existing: 12,920 ft^2 Proposed Expansion: 31,710 ft^2 Total: 44,630 ft^2
Number of Accesses and Locations	1 existing access on Canfield Road (location will be shifted further west as part of this development application)
Phase of Development	1 of 1 total
Buildout Year	2021

If available, please attach a sketch of the development or site plan to this form.

1.2 TRIP GENERATION TRIGGER

Considering the development's land use type and size (as filled out in the previous section), please refer to the Trip Generation Trigger checks below.

Land Use Type	Minimum Development Size	Triggered
Single-family homes	40 units	✗
Townhomes or apartments	90 units	✗
Office	3,500 m^2	✗
Industrial	5,000 m^2	✗
Fast-food restaurant or coffee shop	100 m^2	✗
Destination retail	1,000 m^2	✗
Gas station or convenience market	75 m^2	✗
Development will generate more than 60 person trips		✓

** If the development has a land use type other than what is presented in the table above, estimates of person-trip generation may be made based on average trip generation characteristics represented in the current edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual.*

If the proposed development size is greater than the sizes identified above, the Trip Generation Trigger is satisfied.

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?		✘
Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone? *		✘

**DPA and TOD are identified in the City of Ottawa Official Plan (DPA in Section 2.5.1 and Schedules A and B; TOD in Annex 6). See Chapter 4 for a list of City of Ottawa Planning and Engineering documents that support the completion of TIA).*

If any of the above questions were answered with 'Yes,' the Location Trigger is satisfied.

1.4 SAFETY TRIGGERS

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

If any of the above questions were answered with 'Yes,' the Safety Trigger is satisfied.

1.5 SUMMARY

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

If none of the triggers are satisfied, the TIA Study is complete. If one or more of the triggers is satisfied, the TIA Study must continue into the next stage (Screening and Scoping).

2.0 SCOPING

2.1 EXISTING AND PLANNED CONDITIONS

2.1.1 Proposed Development

The subject site is located in the Trend-Arlington neighbourhood of Ottawa, in the former City of Nepean. The site is located at the northwest quadrant of the intersection of Greenbank Road and Canfield Road / Craig Henry Drive and is bound by residential land uses to the north and to the west, Greenbank Road to the east, and Canfield Road to the south. The existing site includes the St. Mary Coptic Orthodox Church with a gross floor area of 12,920 ft^2.

Figure 1 illustrates the location of the proposed site.

The subject site is currently zoned as Minor Institutional Zone (I1 B[428]) Zone; the purpose of the I1 – Minor Institutional Zone, according to the City of Ottawa Official Plan, is to:

- *"Permit a range of community uses, institutional accommodation and emergency service uses to locate in areas designated as General Urban Area or Central Area in the official plan; and*
- *Minimize the impact of these minor institutional uses located in close proximity to residential uses by ensuring that the such uses are of a scale and intensity that is compatible with neighbourhood character."*

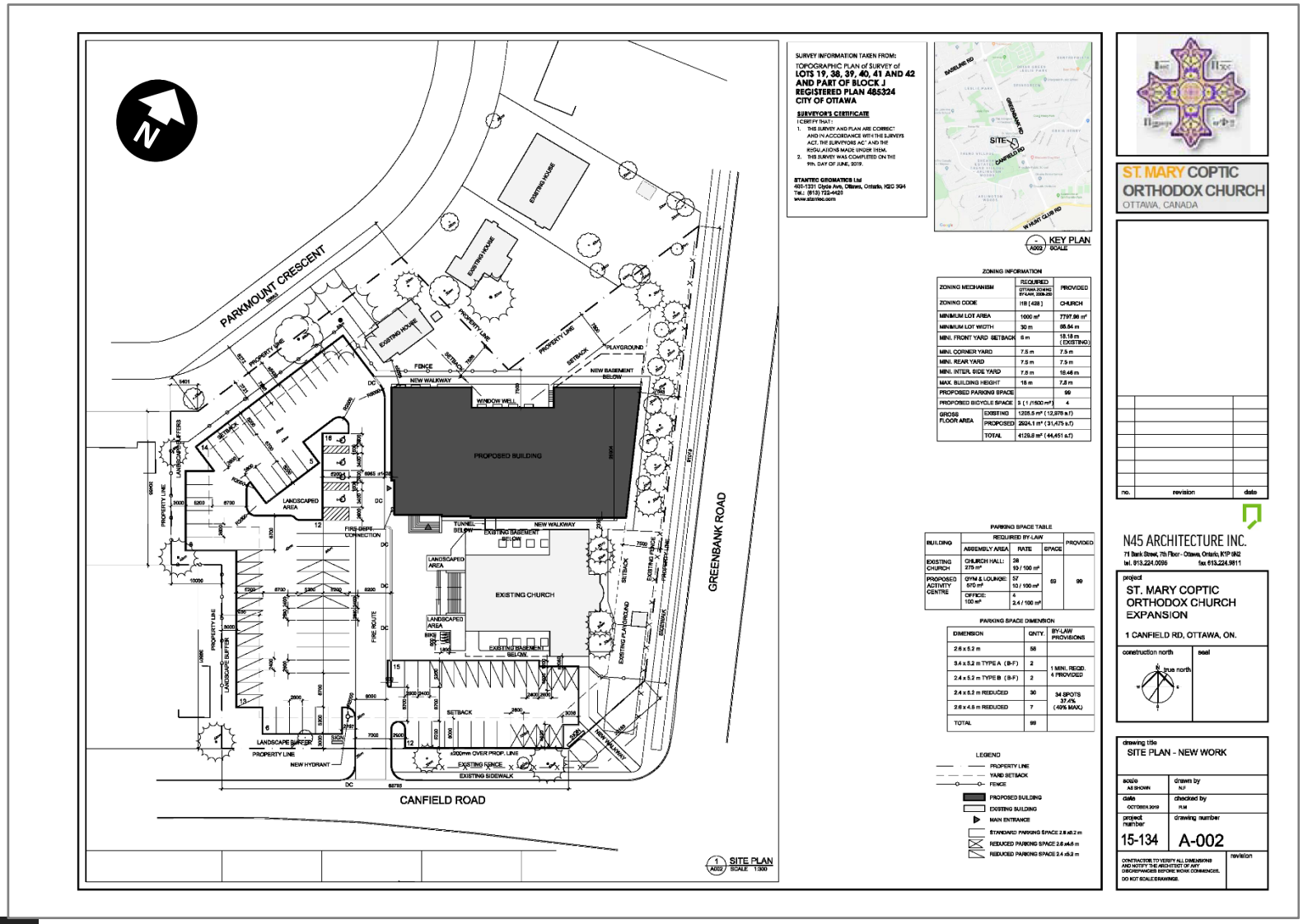
Figure 2 illustrates the proposed site plan. The existing site access is located on Canfield Road, approximately 60m west of Greenbank Road, and is a full-movements access. As part of the development application, this site access will be shifted approximately 2.5m west of the existing access. A total of 99 parking spaces are planned as part of the proposed expansion. The completion of the church expansion building is anticipated to occur by 2021.

The subject church expansion building is proposed to be a multi-purpose, two-storey building with subgrade basement as per the plans prepared by N45 Architecture Inc, dated October 10, 2019. The main floor will consist of a gym / hall that will be able to accommodate 672 people, a multimedia room, lounge, kitchen, as well as showers and change rooms. The second floor includes a study, lounges, a studio, as well as storage space. The basement includes 15 classrooms that will predominately be used on Sundays, a chapel that can seat 81 people, as well as meeting and office space. Within the site plan, there is one existing residential dwelling. This residential dwelling will be owned by the church, however, the function and use of this house will not change from existing.

Due to the nature of the existing land use, the existing church building currently generates the most amount of traffic on Sundays. The proposed expansion building will generally be used by the congregation before / after the Sunday service, therefore, the proposed expansion building is not anticipated to generate any additional traffic above what is already being generated by the existing church on a typical Sunday.

Figure 1 - Site Location

Figure 2 - Proposed Site Plan



2.1.2 Existing Conditions

2.1.2.1 Roads and Traffic Control

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

Greenbank Road — Greenbank Road is a municipally owned, four-lane divided arterial roadway with a posted speed limit of 60 km/hr across the frontage of the proposed site. Sidewalks are provided along both sides of Greenbank Road.

Canfield Road — Canfield Road is a municipally owned, two-lane undivided collector roadway with a posted speed limit of 40 km/hr across the frontage of the proposed site. Sidewalks are provided along both sides of Canfield Road, east of the existing St. Mary Church entrance. The intersection with Greenbank Road is signalized with left turn auxiliary lanes on all approaching legs.

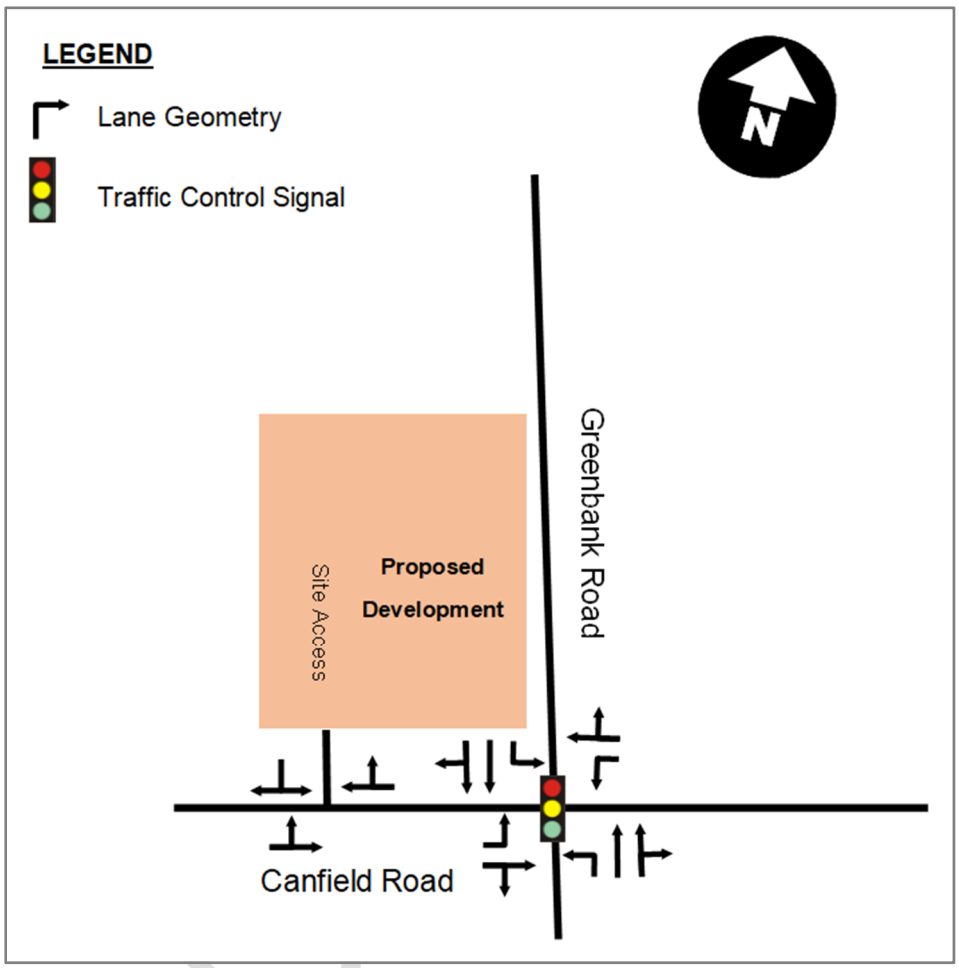
Access to the site is achieved via the existing access on Canfield Road, approximately 60m west of Greenbank Road. Within 200m of the proposed access, there are numerous existing residential buildings and driveways along both sides of Canfield Road. In addition, Elvaston Avenue (local road) is located approximately 170m east of the existing site access.

The St. Mary Coptic Church community also operates a daycare on the southwest quadrant of the Greenbank Road at Canfield Road intersection. This daycare centre is not part of the subject development application, however, it will be taken into consideration when determining the internal circulation within the subject site.

In addition, access driveways are present on Greenbank Road, approximately 110m south of Canfield Road, to Knoxdale Public School on the west side of Greenbank Road, as well as a low-rise office building and Weefolk daycare facility on the east side of Greenbank Road.

Figure 3 illustrates the existing lane configuration and traffic control.

Figure 3 - Existing Lane Configuration and Traffic Control



2.1.2.2 Walking and Cycling

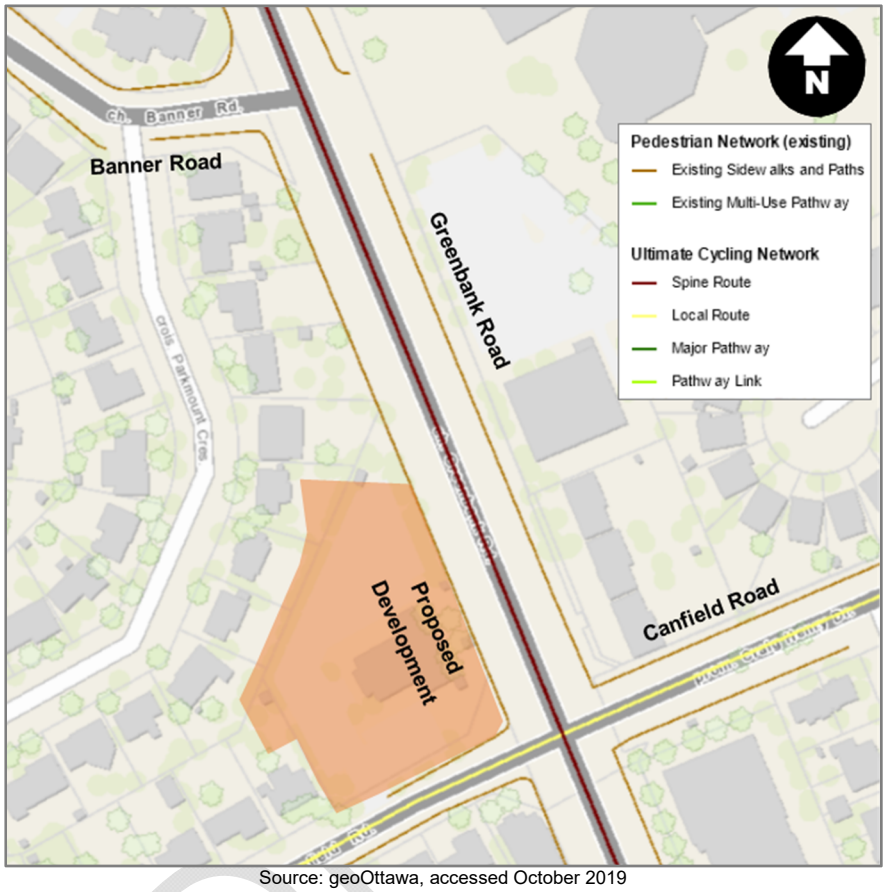
There are currently sidewalks along both sides of Greenbank Road and along both sides of Canfield Road, east of the subject site access. There are no multi-use pathways or community trails in the vicinity of the subject site that can be accessed by pedestrians and cyclists.

In general, cycling facilities in the Trend-Arlington community are developing but limited at present. Greenbank Road and Canfield Road have no cycling facilities as of October 2019. As per the City of Ottawa's Cycling Plan, Canfield Road Drive is designated as a suggested cycling route. The City of Ottawa's Ultimate Cycling Network designates Greenbank Road as a spine cycling route and Canfield Road as a local route.

Figure 4 illustrates the existing and planned pedestrian and cycling facilities within the vicinity of the subject site.

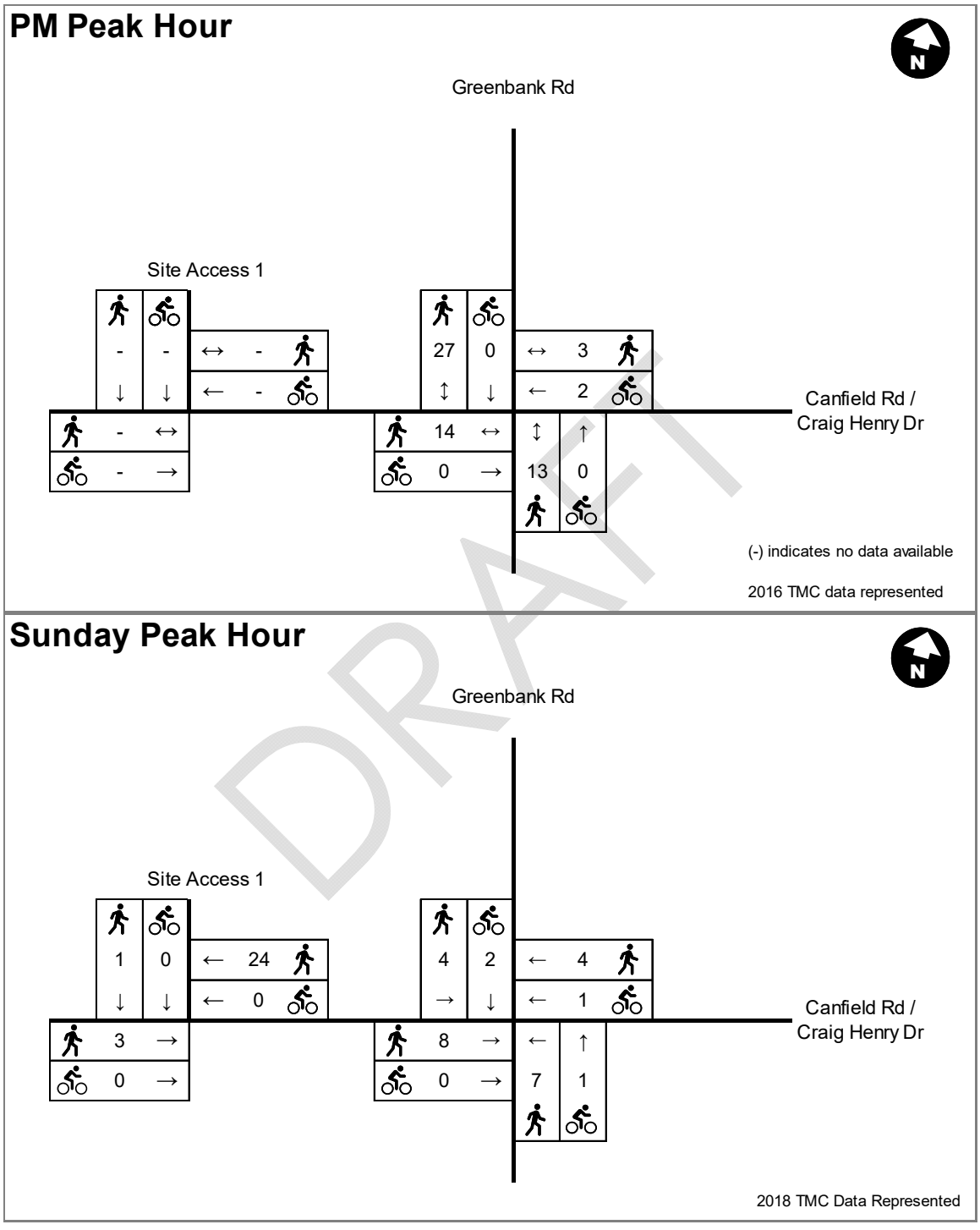
Figure 5 illustrates the pedestrian and cyclist traffic identified in the City of Ottawa's traffic movement counts at the subject intersections during the PM and Sunday peak hours.

Figure 4 - Existing and Planned Active Modes Facilities



Source: geoOttawa, accessed October 2019

Figure 5 - Pedestrian and Cyclist Traffic at Subject Intersections during PM and Sunday Peak Hours



2.1.2.3 Transit

The subject site is currently serviced by transit through the following routes:

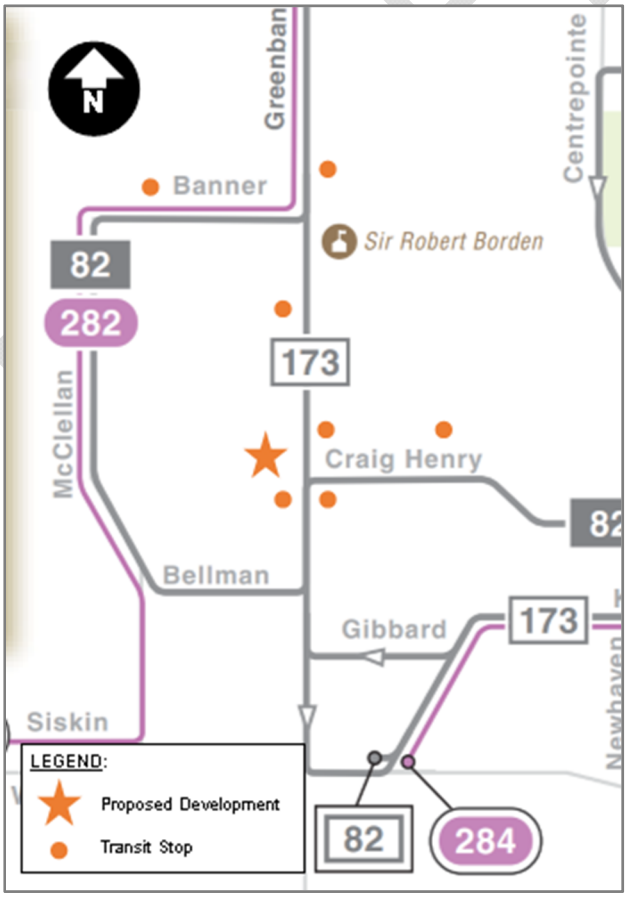
Route 82 — Route 82 is a local bus route that provides service from Lincoln Fields / Tunney's Pasture to Bayshore / Craig Henry and operates throughout the day, 7 days per week. Service between Lincoln Fields and Tunney's Pasture operates during weekday peak-periods only.

Route 173 — Route 173 is a local bus route that provides service between Barrhaven Centre and Bayshore Station and operates during the day from Monday to Friday.

Route 282 — Route 282 is a Connexion route providing bus service during peak hours (i.e. 6:00 – 9:00 AM and 3:00 -6:00 PM) from Monday to Friday. This route provides service between Tunney's Pasture and Trend-Arlington via Pinecrest Station.

Figure 6 illustrates nearby transit routes and stops in proximity to the subject site.

Figure 6 - Study Area Transit



Source: OC Transpo System Map, accessed October 11th, 2019

2.1.2.4 Traffic Management Measures

No existing traffic management measures were identified near the subject site.

2.1.2.5 Traffic Volumes

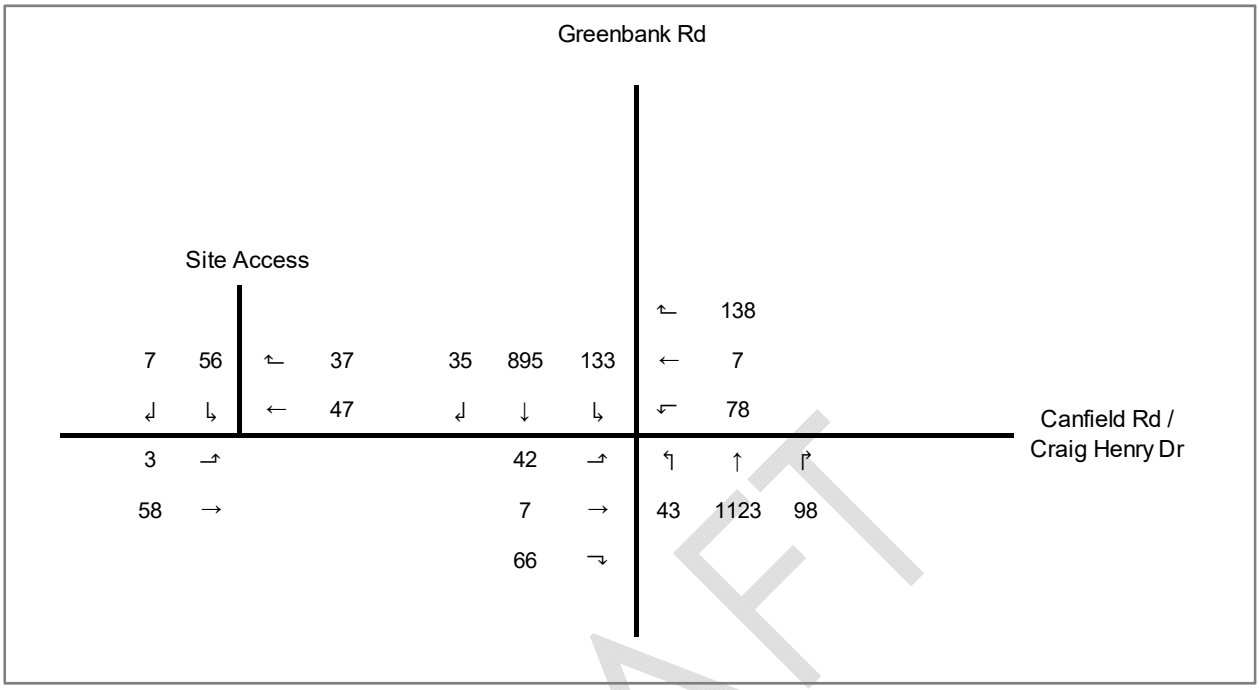
Turning movement counts at the Greenbank Road at Canfield Road intersection were collected by the City of Ottawa for the PM peak hour (2016) and the Sunday peak hour (2018). Turning movement counts at the Canfield Road at Site Access intersection were collected by Stantec for the PM peak hour (2019) and by the City for the Sunday peak hour (2018).

Figure 7 and Figure 8 below illustrates the traffic counts during the PM and Sunday peak hours adjusted for 2019 using a growth rate of 2%.

Appendix A contains the turning movement count data and is provided for reference.

Figure 7 - 2019 Existing Traffic Volumes (PM Peak)

Figure 8 - 2019 Existing Traffic Volumes (Sunday Peak Hour)



2.1.2.6 Collision History

Collision data was provided by the City of Ottawa for the period January 2014 to December 2018 in the vicinity of the subject site. The data was reviewed to determine if any intersections or road segments exhibited an identifiable collision pattern during the five (5) year period.

Table 1 summarizes the collision class and impact types for each road segment and intersection in the study area.

Table 1 - Collision Summary

LOCATION	CLASS	IMPACT TYPE				
		Sideswipe	Angle / Turning	Rear End	Single Vehicle	Other
Greenbank Road between Banner Road and Canfield	Property Damage	2		1		
	Non-Fatal Injury				1	
Greenbank Road at Canfield Road / Craig Henry Drive	Property Damage	2	9	11		
	Non-Fatal Injury		8	5	3	
Greenbank Road between Canfield and Bellman Drive	Property Damage	2	5	2		
	Non-Fatal Injury		2	1		
Total	**Property Damage**	**4**	**29**	**26**	**2**	**0**
	Non-Fatal Injury	**0**	**13**	**8**	**5**	**1**

Based on the collision data summarized in **Table 1** above it was found that the majority of the collisions resulted in property damage only (69%), which suggests that the collisions occurred at low enough speeds to not cause serious injury to people. The Greenbank Road at Canfield Road / Craig Henry Drive intersections experienced 38 collisions. These collisions were further reviewed to determine if there are any discernable patters and can be seen in **Table 2** below.

Table 2 - Collision Summary at Study Intersections

		Greenbank Road at Canfield Road / Craig Henry Drive
Time of Day	Unknown	0
	Daylight	28
	Dusk	0
	Dark	9
	Dawn	1
Environment	Clear	31
	Rain	5
	Snow	1
	Strong wind	0
	Fog, mist, smoke, dust	1
Surface Condition	Dry	28
	Wet	6
	Packed snow	0
	Ice	1
	Slush	1
	Loose snow	2

Most collisions occurred during clear environmental conditions (82%) on dry surface conditions (65%) during daylight hours (74%). Only two collisions in 2014 involved a pedestrian although, it should be noted that the City of Ottawa's OpenData database does not report pedestrian involvement in collisions for the year 2017 and as such, is not reflected.

2.1.3 Planned Conditions

2.1.3.1 Road Network Modifications

There are no planned transportation improvements in the vicinity of the subject development as per the City of Ottawa's 2013 Transportation Master Plan (TMP). The closest improvement to the subject site is the Baseline Road Bus Rapid Transit (BRT). As part of this transit priority project, transit signal priority and queue jump lanes and new bus stations will be introduced on Baseline Road between Baseline Station and Richmond Road, including a new station near the intersection of Baseline Road at Greenbank Road, which is approximately 1.5km north of the subject development. This transit project is scheduled to occur by 2023, as per direction from the City of Ottawa.

2.1.3.2 Future Background Developments

There are no planned developments outlined on the City of Ottawa's development applications website within the vicinity of the subject site that would affect the study area intersections.

2.2 STUDY AREA AND TIME PERIODS

2.2.1 Study Area

The proposed study area includes the following intersections:

1. Greenbank Road at Canfield Road / Craig Henry Drive; and
2. Canfield Road at Site Access.

2.2.2 Time Periods

The proposed scope of the transportation assessment includes the following analysis time periods:

- Weekday PM peak hour of roadway; and
- Sunday peak hour generator.

It should be noted that the subject development is most active on Sundays, and as such, the Canfield Road at Site Access intersection will only be assessed during the Sunday peak hour.

2.2.3 Horizon Years

The scope of the transportation assessment proposes the following horizon years:

- 2019 existing conditions;
- 2021 future background conditions;
- 2021 total future conditions (site build-out); and
- 2026 total future conditions (5 years beyond build-out).

2.3 EXEMPTIONS REVIEW

Table 3 summarizes the Exemptions Review table from the City of Ottawa's *2017 Transportation Impact Assessment Guidelines*.

Table 3 - Exemptions Review

Module	Element	Exemption Considerations	Exempted?
Design Review Component			
4.1 Development Design	4.1.2 Circulation and Access	Only required for site plans	No
	4.1.3 New Street Networks	Only required for plans of subdivision	Yes
4.2 Parking	4.2.1 Parking Supply	Only required for site plans	No
	4.2.2 Spillover Parking	Only required for site plans where parking supply is 15% below unconstrained demand	No
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	No
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	No
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	Yes
4.9 Intersection Design	All Elements	Not required if site generation trigger is not met.	No

3.0 FORECASTING

The Step 3.0 – Forecasting section has been reviewed by the City of Ottawa and was subject to revision as per the comments prepared by the City, dated November 27th, 2019. The comment responses reflected are herein. Further detail can be found in **Appendix B**.

3.1 DEVELOPMENT GENERATED TRAVEL DEMAND

3.1.1 Trip Generation and Mode Shares

On a typical Sunday, there will be no activity occurring in the expansion building during service in the existing church. Based on this, the trips generated by the entire site (i.e. existing church + proposed expansion building) on a Sunday will be based on the existing church only. As the church is currently operating at capacity during Sunday service, there will not be an increase in the number of people who attend Sunday service once the expansion building is complete. As such, a trip generation for the expansion building during the Sunday peak hour was not included in the subject TIA.

During the PM peak hour, the proposed expansion building may contain events that generate traffic. As outlined in the *Institute of Transportation Engineers (10th Edition) Trip Generation Manual,* Land-Use Code 560 – Church includes meeting rooms, classrooms, and dining, catering, or party rooms. As such, this land use is the most representative of the proposed expansion building. The aforementioned rationale was confirmed with the City of Ottawa as part of the Step 1, 2, and 3 TIAs.

Given the relatively negligible traffic that the proposed expansion building is anticipated to generate during the PM peak hour, it was conservatively assumed that all site trips will be auto trips (i.e. 100% auto mode share).

Table 4 outlines the projected site trips generated by the proposed expansion building during the PM peak hour.

Table 4 – Site Generated Traffic

LUC	Land Use	Size	Weekday PM Peak Hour		
			In	Out	Rate
Rates					
560	Church	31,475 sq. ft.	45%	55%	0.49
Conversion to Person Trips					
560	Church	Auto Trip Gen	7	9	16
		Person Trip Conversion	1.28	1.28	1.28
		Person Trips	9	12	21
Auto Trips					
560	Church	31,475 sq. ft.	9	12	21

3.1.2 Trip Assignment

Site generated trips were assigned to the study area road network based on the existing traffic distribution, as seen in **Figure 9**. It should be noted that the values in red represent 'outbound' trips and the values in black represent 'inbound' trips.

Figure 10 illustrates the site generated trips for the proposed development during the PM peak hour.

Figure 9 - Site Traffic Assignment

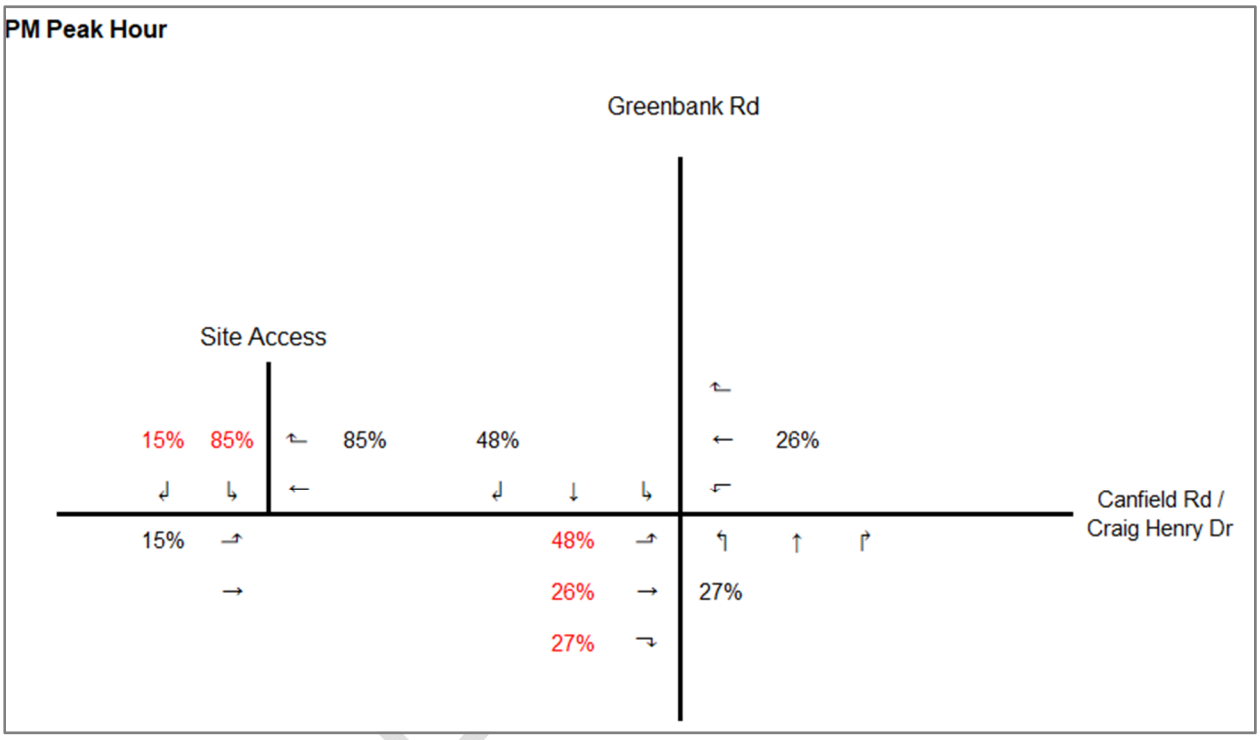
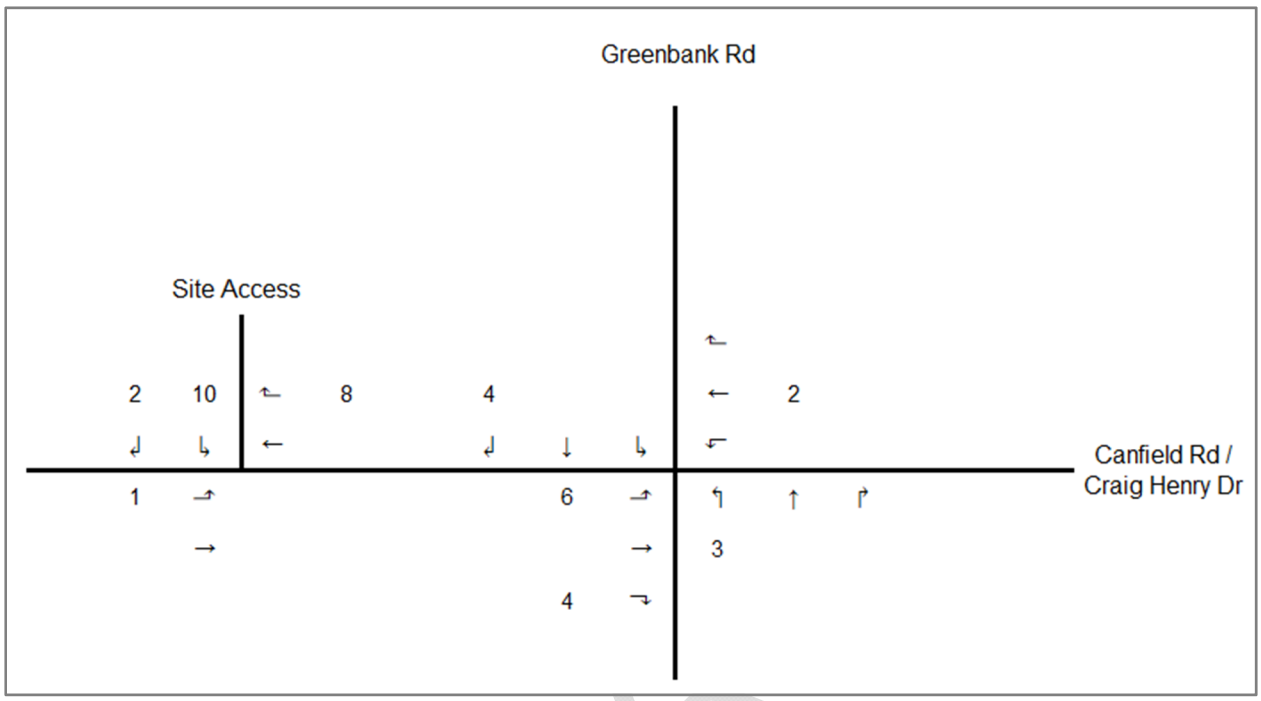


Figure 10 - Site Trips (PM Peak Hour)



3.2 BACKGROUND NETWORK TRAVEL DEMAND

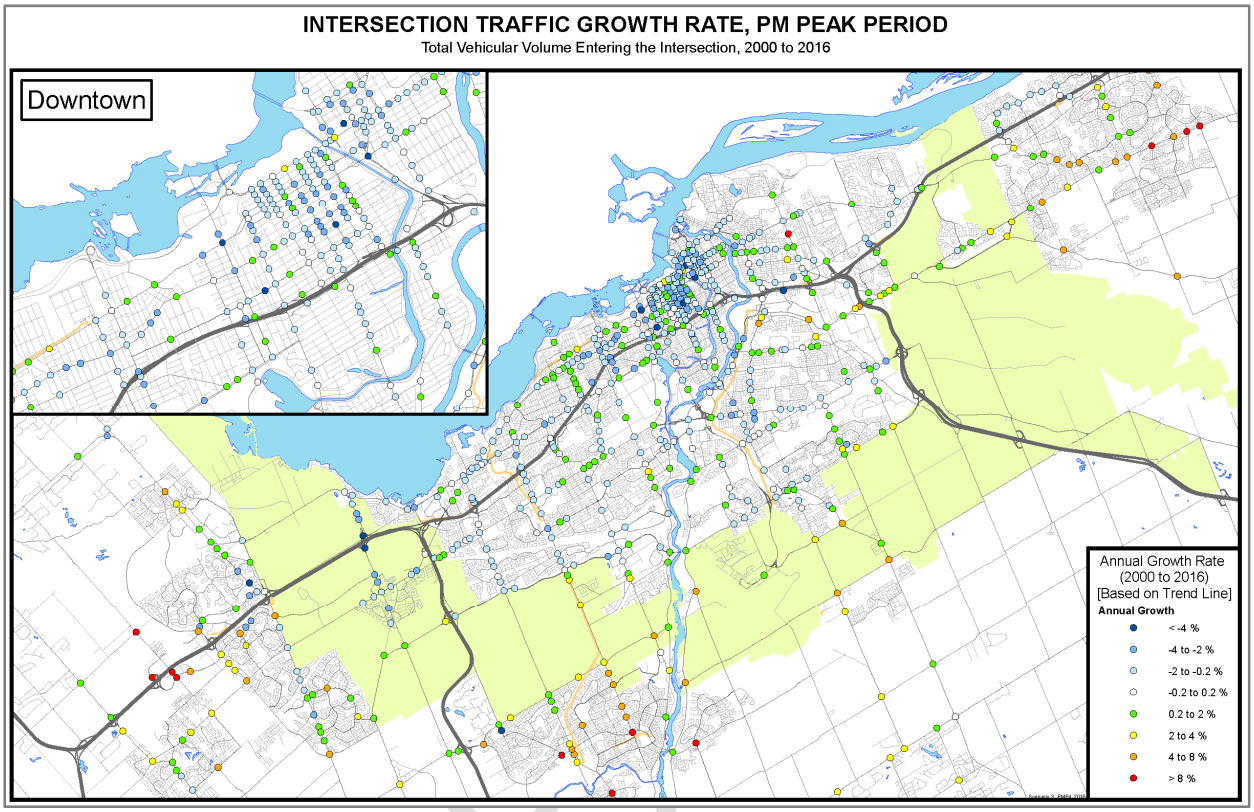
3.2.1 Transportation Network Plans

There are no transit projects scheduled to occur within the time horizons of the subject study that will affect the study area intersections. As outlined in **Section 2.1.2.2**, Greenbank Road is included in the City of Ottawa's Ultimate Cycling Plan as a spine cycling route and Canfield Road is included as a local cycling route.

3.2.2 Background Growth

The City of Ottawa provided **Figure 11** below, which outlines the average annual growth rates based on trend lines. The average annual growth in the Trend-Arlington neighbourhood is in the range of -4.0% to 2.0%. To be conservative, a 2% annual background growth rate was used in the subject analysis.

Figure 11 - Annual Growth Rates



3.2.3 Other Developments

As outlined in **Section 2.1.3.2**, there are no background developments scheduled to occur within the time horizons of the subject study that will affect the study area intersections.

3.3 DEMAND RATIONALIZATION

The proposed site is not anticipated to encounter any capacity restrictions that cannot be resolved through roadway improvements and therefore no demand rationalization is required.

4.0 STRATEGY REPORT

4.1 DEVELOPMENT DESIGN

4.1.1 Design for Sustainable Modes

To facilitate walking in the vicinity of the subject site, there are existing sidewalks along both sides of Greenbank Road as well as along both sides of Canfield Road, along the frontage of the subject site. West of the subject site, the sidewalk on Canfield Road is only on the south side of the road.

There are no existing cycling facilities within the vicinity of the subject site, as vehicles operate in mixed traffic on both Greenbank Road and Canfield Road. A bicycle rack will be provided next to the existing church building that will serve both the existing church as well as the proposed expansion building.

The subject site is currently well serviced by transit along Greenbank Road. There are existing transit stops at the intersection of Greenbank Road at Canfield Road, approximately 100m from the front door of the existing church. These transit stops are serviced by routes 82 and 173, as described in **Section 2.1.2.3**.

4.1.2 Circulation and Access

The existing church is currently operational with one site access located on Canfield Road, approximately 50m west of Greenbank Road. The proposed site plan includes shifting this site access approximately 2.5m further west to maximize the circulation on-site. This site access will be stop-controlled along the site access approach and no turning restrictions will be included.

The existing sidewalk on the north side of Canfield Road is proposed to be extended until the proposed site access location. In addition, a new walkway is being proposed at the southwest quadrant of the site plan which will provide a more direct connection from Greenbank Road to the subject site.

4.1.3 New Street Networks

Not applicable; exempted during screening and scoping.

4.2 PARKING

4.2.1 Parking Supply

Auto Parking – The subject development is located within 'Area C: Suburban' as outlined in the City of Ottawa's Zoning By-Law Schedule 1A. Based on this classification, as per City of Ottawa Zoning By-law 2008-250 (Section 101 and 102), the minimum parking space requirement for a place of worship is 10 auto parking spaces per 100m^2 of gross floor area of assembly area and 2.4 parking spaces per 100m^2 of office space. The place of worship, gym, and office spaces are the only uses within the proposed site plan that requires dedicated auto parking spaces.

The existing church has approximately 275m^2, which equates to a parking requirement of 28 spaces. The proposed gym / hall has approximately 570m^2, which equates to a parking requirement of 57 parking spaces. The proposed office has approximately 100m^2, which equates to approximately 4 parking spaces. The total required number of auto parking spaces is therefore 89. The proposed site plan includes 99 parking spaces, which meets the minimum requirements.

Bicycle Parking – As per City of Ottawa Zoning By-law 2008-250 (Section 111), the minimum bicycle parking rate of 1 bicycle parking space per 1500m^2 of gross floor area is required. The existing church and the entire expansion building contribute to the bicycle parking for the proposed site. The total area for both buildings is approximately 4,100m^2, which equates to roughly 3 bicycle parking spaces. The proposed site plan includes 4 bicycle parking spaces which meets the minimum requirement.

4.2.2 Spillover Parking

Stantec conducted parking surveys on Sunday, April 29th, 2018 between 8:30 AM and 2:00 PM. **Table 5** outlines the findings from this parking survey.

Table 5 - Parking Survey Results

Location	Number of Parking Spaces		% Utilized
	Capacity	Maximum Occupied	
St. Mary Coptic Church (existing)	75	85	113%
Canfield Road	34	17	50%
Knoxdale Public School	78	4	5%
Parkmount Crescent	119	9	8%
Banner Road	20	15	75%
Keppler Crescent	67	4	6%

The existing church was found to have a maximum of 85 vehicles parked on site. Information was provided to Stantec by the church that there are approximately an additional 10 vehicles who currently park on-street on Sundays, for a total demand of 95 parking spaces. The proposed site plan includes 99 parking spaces, which exceeds the demand of 95 parking spaces.

Despite the proposed parking supply exceeding the anticipated demand, the Church is pro-actively putting an agreement in place with the nearby Knoxdale Public School whereby members of the church can park in the school parking lot on Sundays as an alternative to parking on-street. This school is located approximately 160m from the church, or approximately a two-minute walk. There will be a sign on the church property indicating that once the church parking lot is full, motorists are to park in the Knoxdale parking lot and walk over. This should eliminate any neighbourhood concerns regarding parking along Canfield Road. As there will not be a pathway connecting the church to Parkmount Crescent, members of the church will likely not park along Parkmount Crescent as it would involve walking

greater than 400m from their car to church, which is more than double the distance from the church to Knoxdale Public School.

During the parking survey, it was found that the number of parked vehicles along Keppler Crescent, Banner Road, and Parkmount Crescent were consistent between 8:30 AM – 2:00 PM. This suggests that the parked cars along these three roads are attributed to the residents and not members of the St. Mary Coptic Church.

4.3 BOUNDARY STREET DESIGN

4.3.1 Multi Modal Level of Service

The multi-modal level of service (MMLOS) was evaluated for Greenbank Road and Canfield Road to assist with developing a design concept that maximizes the achievement of the MMLOS objectives. Based on the proximity of these two roads to Knoxdale Public School, it was determined that both subject roads, across the frontages of the subject site, fall under the 'within 300m of a school' Policy Area designation. This policy area dictates the following MMLOS targets that will be applied to the two roadways.

As Greenbank Road (arterial) and Canfield Road (collector) are within 300m of a school, these roadway segments are subject to a pedestrian level of service (PLOS) target of A.

The 2013 Ottawa Transportation Master Plan designates Greenbank Road as a spine route and Canfield Road as a local cycling route. As such, Greenbank Road has a Bicycle Level of Service (BLOS) target of C and Canfield Road has a BLOS target of B.

For Transit Level of Service (TLOS), both Greenbank Road has a TLOS target of D. As Canfield Road, across the frontage of the subject site, does not currently have any transit routes, the TLOS does not apply for this roadway segment.

Greenbank Road is a truck route and is therefore subject to a Truck Level of Service (TkLOS) target of D. As Canfield Road is a collector road and is not a truck route, TkLOS does not apply.

Table 6 presents the MMLOS for the two roadway segments.

Greenbank Road

Greenbank Road, fronting the proposed development, achieves a PLOS of E, which fails to meet the PLOS target of A. To meet the PLOS target along Greenbank Road, the sidewalk on the west side would need to be widened to 1.8m while maintaining a boulevard of greater than 2.0m coupled with a reduction in the speed limit to 40 km/hr and a reduction in the curb lane AADT to less than 3000. Although the pedestrian facilities are well-developed along Greenbank Road (i.e., sidewalks and boulevards along both sides), proximity to Knoxdale Elementary School results in an unattainably high PLOS target given the nature of Greenbank Road being an arterial roadway with high speeds and high volumes.

As cyclists operate in mixed traffic along Greenbank Road, it operates with a BLOS of F, which does not meet the target of C. Keeping the mixed-use lanes, the speed limit would need to be reduced to 40km/hr in order to meet the BLOS target. An alternative to achieving the BLOS target of D would be to implement curbside bicycle lanes along both sides

of Greenbank Road, however, this could have spatial and financial constraints. A second alternative to achieving the BLOS target would be to implement physically separated cycling facilities (i.e. a cycle track) along both sides of Greenbank Road. Similar to implementing on-street bicycle lanes, this could also have a spatial and financial constraints.

Greenbank Road, across the frontage of the subject site, meets both the TLOS and TkLOS targets.

Canfield Road

While Canfield Road, across the frontage of the subject site, includes sidewalks along both sides, it currently does not meet the PLOS target of A. Implementing a 0.5m boulevard would allow the PLOS target of A to be met. Another alternative to meet the PLOS target would be to reduce the posted speed limit.

Canfield Road, across the frontage of the subject site, meets the BLOS target of B.

As Canfield Road is not a transit route nor truck route, the TLOS and TkLOS targets do not apply.

Table 6 - Roadway Segment MMLOS

Roadway Segment	PLOS		BLOS		TLOS		TkLOS	
	Target	Actual	Target	Actual	Target	Actual	Target	Actual
Greenbank Road along property line	A	E	C	F	D	D	D	A
Canfield Road along property line	A	B	B	A	N/A		N/A	

Appendix C contains the detailed roadway segment MMLOS analysis.

4.4 ACCESS INTERSECTION DESIGN

4.4.1 Access Location

There is an existing site access to the church, located on Canfield Road approximately 50m west of Greenbank Road. The proposed site plan includes shifting this site access approximately 2.5m west. The access will be stop-controlled on the site access approach without any turning restrictions. No secondary accesses are proposed.

4.4.2 Intersection Control

Greenbank Road at Canfield Road

The existing intersection of Greenbank Road at Canfield Road is signalized with auxiliary left turn lanes in all directions.

Canfield Road at Site Access

The existing intersection of Canfield Road at Site Access does not currently have a traffic control device; however, it operates as a stop-controlled intersection along the Site Access approach.

4.5 TRANSPORTATION DEMAND MANAGEMENT

City of Ottawa TDM Checklists were used to determine what TDM measures could be implemented based on the available information. Based on the checklists, the following TDM measures have been incorporated into the site plan:

- Building entrances are located in order to minimize walking distances to sidewalks and transit stops;
- Safe, direct, and attractive pedestrian access between the public sidewalks and building entrances have been provided;
- Sidewalks will be smooth, well-drained surfaces and will be easily accessible;
- Links to the existing sidewalk network will be included;
- Safe, direct, and attractive walking routes will be provided between building entrances and nearby transit stops;
- Bicycle parking will be provided in highly visible areas;
- The number of bicycle parking meets the requirements per the Zoning By-Law;
- The bicycle parking racks will be securely anchored; and
- The number of vehicle parking spaces meets the requirements per the Zoning By-Law.

The TDM checklists are contained in **Appendix D**.

4.6 NEIGHBHOURHOOD TRAFFIC MANAGEMENT

4.6.1 Adjacent Neighbourhoods

As only one site access is proposed, all subject development traffic will use Canfield Road to access Greenbank Road. **Table 7** summarizes the PM and Sunday peak two-way traffic volume forecasts for Canfield Road at the build-out of the subject site.

Table 7 - AM & PM 2021 Traffic Volume Forecasts for Canfield Road

Road	2021 Total Traffic Volume PM Peak	2021 Total Traffic Volume SUN Peak
Canfield Road	160 veh/hr	225 veh/hr

The traffic volumes along Canfield Road at the build-out of the subject development are not projected to exceed the threshold of 300 vehicles/hour (veh/hr) for collector roadways.

4.7 TRANSIT

4.7.1 Route Capacity

As the proposed development is anticipated to generate a negligible number of trips during the PM peak hour (and the Sunday peak hour will be the same as existing), a conservative 100% auto modal share was applied. As such, the proposed development is anticipated to generate a negligible amount of new transit trips.

Section 2.1.2.3 outlines the three existing transit routes within the vicinity of the subject site.

4.8 REVIEW OF NETWORK CONCEPT

Not applicable; exempted during screening and scoping.

4.9 INTERSECTION DESIGN

4.9.1 Intersection Control

The intersection controls for the three study area intersections were discussed in **Section 4.4.2** and the analysis of the intersections can be seen in **Section 4.9.2**.

4.9.2 Intersection Design

An assessment of the study area intersections was undertaken to determine the operational characteristics under the various horizons identified in the Screening and Scoping report. Intersection operational analysis was facilitated with Synchro 10.0™ software package and the MMLOS analysis was completed for all modes and compared against the City of Ottawa's MMLOS targets.

4.9.2.1 2019 Existing Conditions

Figure 7 and **Figure 8** illustrate 2019 existing PM and Sunday peak hour traffic volumes at the study area intersection.

Intersection Capacity Analysis

Table 8 summarizes the results of the Synchro analysis for 2019 existing intersection operations.

Both study area intersections are currently operating satisfactorily, and as such, no improvements are required to supplement existing conditions.

Figure 3 illustrates the existing intersection control and lane configurations at the two study area intersections.

Appendix E contains detailed intersection performance worksheets.

Table 8 - 2019 Existing Intersection Operations

Intersection	Intersection Control	Approach / Movement		LOS	V/C	Delay (s)	Queue 95th (m)
Greenbank Road at Canfield Road	Signalized	EB	Left	A (A)	0.15 (0.24)	52.1 (33.8)	6.3 (11.9)
			Through / Right	A (A)	0.15 (0.30)	42.2 (27.5)	11.2 (18.2)
		WB	Left	A (A)	0.32 (0.33)	46.0 (31.1)	25.9 (21.0)
			Through / Right	C (A)	0.74 (0.60)	50.8 (30.6)	58.1 (39.9)
		NB	Left	A (A)	0.09 (0.13)	11.3 (10.5)	4.9 (6.3)
			Through / Right	A (B)	0.43 (0.61)	6.1 (9.7)	64.4 (80.5)
		SB	Left	A (A)	0.52 (0.55)	17.2 (27.1)	46.9 (37.8)
			Through / Right	A (A)	0.55 (0.46)	7.5 (7.6)	89.6 (56.7)
		Overall Intersection		**-**	**-**	**11.4 (12.5)**	**-**
Canfield Road at Site Access	Minor Stop-Control	EB	Left / Through	A (A)	0.00 (0.00)	0.0 (0.4)	0.0 (0.0)
		WB	Through / Right	A (A)	0.00 (0.00)	0.0 (0.0)	0.0 (0.0)
		SB	Left / Right	A (A)	0.02 (0.08)	9.1 (9.5)	0.6 (1.8)
		Overall Intersection		**A (A)**	**-**	**0.9 (3.0)**	**-**

Notes:
1. Table format: PM (SUN)
2. v/c – represents the anticipated volume divided by the predicted capacity

Multi-Modal Level of Service Assessment

Based on the proximity of this intersection to the nearby Knoxdale Elementary School, it was determined that the intersection of Greenbank Road at Canfield Road falls under the 'within 300m of a school' Policy Area designation. As such, the intersection is subject to a Pedestrian Level of Service (PLOS) target of A.

The 2013 Ottawa Transportation Master Plan designates Greenbank Road as a spine cycling route and Canfield Road as a local cycling route in the Ultimate Cycling Network. As such, the Churchill Avenue at Richmond Road intersection has a bicycle level of service (BLOS) target of B.

Greenbank Road has transit routes along it, and therefore, the Transit Level of Service (TLOS) target for the intersection is D.

Greenbank Road is also designated as a truck route; however, Canfield Road is not. As such, trucks will not be turning at the intersection of Greenbank Road and Canfield Road, thus, the Truck Level of Service (TkLOS) does not apply to this intersection.

Table 9 summarizes the MMLOS at the intersection of Greenbank Road at Canfield Road under 2019 existing conditions.

Appendix C contains the detailed MMLOS analysis.

Table 9 - Existing Signalized Intersection MMLOS

Signalized Intersection	PLOS		BLOS		TLOS		TkLOS	
	Target	Actual	Target	Actual	Target	Actual	Target	Actual
Greenbank Road at Canfield Road	A	E	B	F	D	F	N/A	

The Pedestrian Level of Service at the intersection of Greenbank Road at Canfield Road currently operates with a PLOS of E, which is below the desired target. The number of lanes required to cross Greenbank Road results in the PLOS operating below the target. Measures to improve the PLOS at this intersection include reducing the number of lanes on Greenbank Road, allocating more green time to the east / west movements for vehicles (and thus, pedestrians), implementing medians along Greenbank Road that are more than 2.4m wide, protecting the left turn phases, prohibiting the right turns on red, and raising the crosswalks.

The Bicycle Level of Service at the intersection of Greenbank Road at Canfield Road currently operates with a BLOS of F, which is below the desired target. Based on the MMLOS guidelines, intersection BLOS is influenced by the availability of dedicated cycling amenities, number of lanes cyclists must cross to negotiate a turn at intersections, and roadway operating speeds. Due to the nature of arterial roads, the posted speed limit is typically 60 km/hr or greater, which limits the potential BLOS at intersections. Reducing the posted speed limit is not a feasible option for Greenbank Road. Implementing a higher order bicycle facility (i.e. curbside bicycle lanes with two-stage left turn bike boxes) would allow the BLOS to meet the target.

The Transit Level of Service at the intersection of Greenbank Road at Canfield Road currently operates with a TLOS of F, which is below the desired target. Based on the MMLOS guidelines, intersection transit level of service is governed by the delay at the intersection. The westbound approach experiences the highest delay, which governs the TLOS at the intersection. Allocating more green time to the east / west movements for vehicles would improve the delay on the westbound approach, however, it would be to the detriment of the northbound and southbound vehicles.

4.9.2.2 2021 Future Background Conditions

Figure 12 illustrates 2021 future background PM and Sunday peak hour traffic volumes at the study area intersections.

Table 10 summarizes the results of the Synchro analysis under 2021 future background conditions. Both study area intersections are anticipated to operate acceptably under 2021 future background conditions.

Appendix E contains detailed intersection performance worksheets.

Table 10 – 2021 Future Background Intersection Operations

Intersection	Intersection Control	Approach / Movement		LOS	V/C	Delay (s)	Queue 95th (m)
Greenbank Road at Canfield Road	Signalized	EB	Left	A (A)	0.14 (0.23)	52.1 (33.9)	6.3 (11.2)
			Through / Right	A (A)	0.15 (0.30)	42.8 (28.0)	10.5 (17.5)
		WB	Left	A (A)	0.31 (0.31)	46.4 (31.4)	25.2 (19.6)
			Through / Right	A (A)	0.73 (0.60)	51.2 (31.1)	55.3 (37.1)
		NB	Left	A (A)	0.08 (0.11)	9.6 (9.3)	4.2 (5.6)
			Through / Right	A (B)	0.40 (0.56)	5.6 (8.6)	58.1 (71.4)
		SB	Left	A (B)	0.44 (0.46)	13.5 (20.4)	37.8 (29.4)
			Through / Right	A (A)	0.51 (0.42)	6.7 (6.9)	79.8 (51.1)
		Overall Intersection		**-**	**-**	**10.7 (11.4)**	**-**
Canfield Road at Site Access	Minor Stop-Control	EB	Left / Through	A (A)	0.00 (0.00)	0.0 (0.4)	0.0 (0.0)
		WB	Through / Right	A (A)	0.00 (0.00)	0.0 (0.0)	0.0 (0.0)
		SB	Left / Right	A (A)	0.02 (0.07)	9.1 (9.5)	0.0 (1.4)
		Overall Intersection		**A (A)**	**-**	**0.9 (2.9)**	**-**

Notes:
1. Table format: PM (SUN)
2. v/c – represents the anticipated volume divided by the predicted capacity

Multi-Modal Level of Service Assessment

Based on the proximity of this intersection to the nearby Knoxdale Elementary School, it was determined that the intersection of Greenbank Road at Canfield Road falls under the 'within 300m of a school' Policy Area designation. As such, the intersection is subject to a Pedestrian Level of Service (PLOS) target of A.

The 2013 Ottawa Transportation Master Plan designates Greenbank Road as a spine cycling route and Canfield Road as a local cycling route in the Ultimate Cycling Network. As such, the Churchill Avenue at Richmond Road intersection has a bicycle level of service (BLOS) target of B.

Greenbank Road has transit routes along it, and therefore, the Transit Level of Service (TLOS) target for the intersection is D.

Greenbank Road is also designated as a truck route; however, Canfield Road is not. As such, trucks will not be turning at the intersection of Greenbank Road and Canfield Road, thus, the Truck Level of Service (TkLOS) does not apply to this intersection.

Table 12 summarizes the MMLOS at the intersection of Greenbank Road at Canfield Road under 2021 future background conditions.

Appendix C contains the detailed MMLOS analysis.

Table 11 – 2021 Future Background Signalized Intersection MMLOS

Signalized Intersection	PLOS		BLOS		TLOS		TkLOS	
	Target	Actual	Target	Actual	Target	Actual	Target	Actual
Greenbank Road at Canfield Road	A	E	B	F	D	F	N/A	

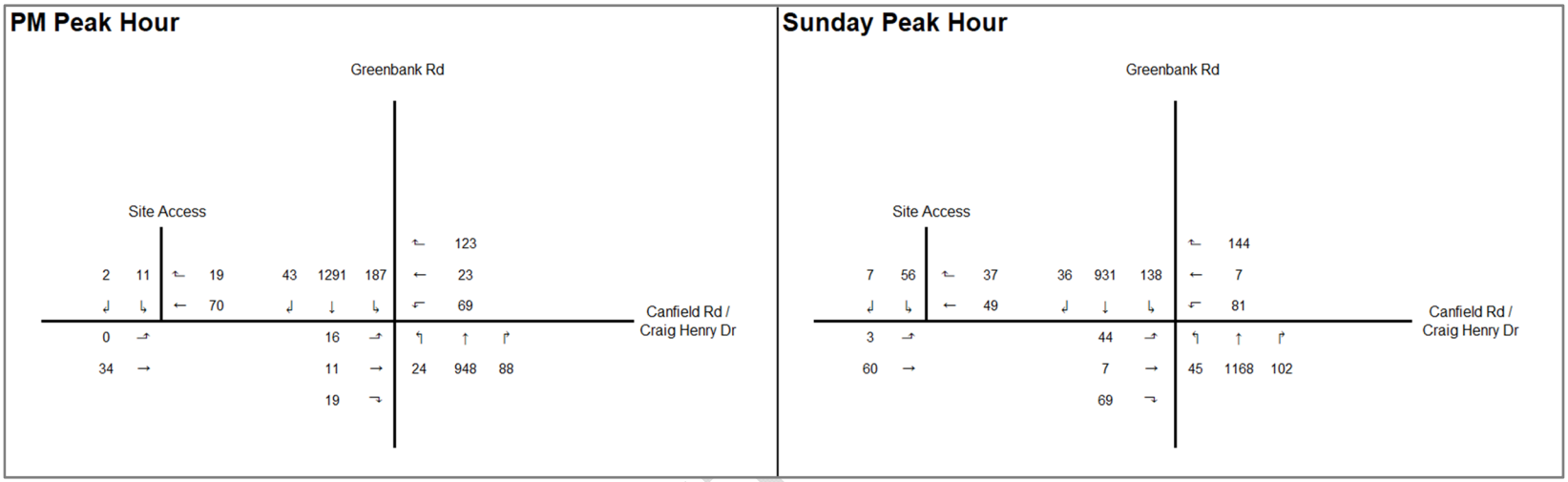
The Pedestrian Level of Service at the intersection of Greenbank Road at Canfield Road is projected to operate with a PLOS of E, which is below the desired target. The number of lanes required to cross Greenbank Road results in the PLOS operating below the target. Measures to improve the PLOS at this intersection include reducing the number of lanes on Greenbank Road, allocating more green time to the east / west movements for vehicles (and thus, pedestrians), implementing medians along Greenbank Road that are more than 2.4m wide, protecting the left turn phases, prohibiting the right turns on red, and raising the crosswalks.

The Bicycle Level of Service at the intersection of Greenbank Road at Canfield Road is projected to operate with a BLOS of F, which is below the desired target. Based on the MMLOS guidelines, intersection BLOS is influenced by the availability of dedicated cycling amenities, number of lanes cyclists must cross to negotiate a turn at intersections, and roadway operating speeds. Due to the nature of arterial roads, the posted speed limit is typically 60 km/hr or greater, which limits the potential BLOS at intersections. Reducing the posted speed limit is not a feasible option for Greenbank Road. Implementing a higher order bicycle facility (i.e. curbside bicycle lanes with two-stage left turn bike boxes) would allow the BLOS to meet the target.

The Transit Level of Service at the intersection of Greenbank Road at Canfield Road is projected to operate with a TLOS of F, which is below the desired target. Based on the MMLOS guidelines, intersection transit level of service is

governed by the delay at the intersection. The westbound approach experiences the highest delay, which governs the TLOS at the intersection. Allocating more green time to the east / west movements for vehicles would improve the delay on the westbound approach, however, it would be to the detriment of the northbound and southbound vehicles.

Figure 12 - 2021 Future Background Volumes



4.9.2.3 2021 Total Future Conditions

Figure 13 illustrates 2021 total future PM and Sunday peak hour traffic volumes at the study area intersections.

Table 12 summarizes the results of the Synchro analysis for 2021 total future intersection operations.

Both study area intersections are projected to operate acceptably under 2021 total future conditions.

Appendix E contains detailed intersection performance worksheets.

Table 12 – 2021 Total Future Intersection Operations

Intersection	Intersection Control	Approach / Movement		LOS	V/C	Delay (s)	Queue 95th (m)
Greenbank Road at Canfield Road	Signalized	EB	Left	A (A)	0.20 (0.24)	52.6 (33.8)	9.1 (11.9)
			Through / Right	A (A)	0.17 (0.32)	42.9 (28.0)	11.9 (18.9)
		WB	Left	A (A)	0.32 (0.31)	46.6 (31.4)	25.2 (19.6)
			Through / Right	A (A)	0.73 (0.59)	50.9 (30.8)	55.3 (37.1)
		NB	Left	A (A)	0.09 (0.12)	10.0 (9.6)	4.9 (6.3)
			Through / Right	A (B)	0.40 (0.56)	5.6 (8.8)	58.1 (72.1)
		SB	Left	A (B)	0.45 (0.46)	13.6 (20.8)	37.8 (29.4)
			Through / Right	A (A)	0.52 (0.43)	6.8 (7.1)	80.5 (51.8)
		Overall Intersection		**-**	**-**	**10.9 (11.6)**	**-**
Canfield Road at Site Access	Minor Stop-Control	EB	Left / Through	A (A)	0.00 (0.00)	0.2 (0.5)	0.0 (0.0)
		WB	Through / Right	A (A)	0.00 (0.00)	0.0 (0.0)	0.0 (0.0)
		SB	Left / Right	A (A)	0.03 (0.10)	9.2 (9.6)	0.7 (2.1)
		Overall Intersection		**A (A)**	**-**	**1.7 (3.4)**	**-**

Notes:
1. Table format: PM (SUN)
2. v/c – represents the anticipated volume divided by the predicted capacity

Multi-Modal Level of Service Assessment

Based on the proximity of this intersection to the nearby Knoxdale Elementary School, it was determined that the intersection of Greenbank Road at Canfield Road falls under the 'within 300m of a school' Policy Area designation. As such, the intersection is subject to a Pedestrian Level of Service (PLOS) target of A.

The 2013 Ottawa Transportation Master Plan designates Greenbank Road as a spine cycling route and Canfield Road as a local cycling route in the Ultimate Cycling Network. As such, the Churchill Avenue at Richmond Road intersection has a bicycle level of service (BLOS) target of B.

Greenbank Road has transit routes along it, and therefore, the Transit Level of Service (TLOS) target for the intersection is D.

Greenbank Road is also designated as a truck route; however, Canfield Road is not. As such, trucks will not be turning at the intersection of Greenbank Road and Canfield Road, thus, the Truck Level of Service (TkLOS) does not apply to this intersection.

Table 13 summarizes the MMLOS at the intersection of Greenbank Road at Canfield Road under 2021 total future conditions.

Appendix C contains the detailed MMLOS analysis.

Table 13 – 2021 Total Future Signalized Intersection MMLOS

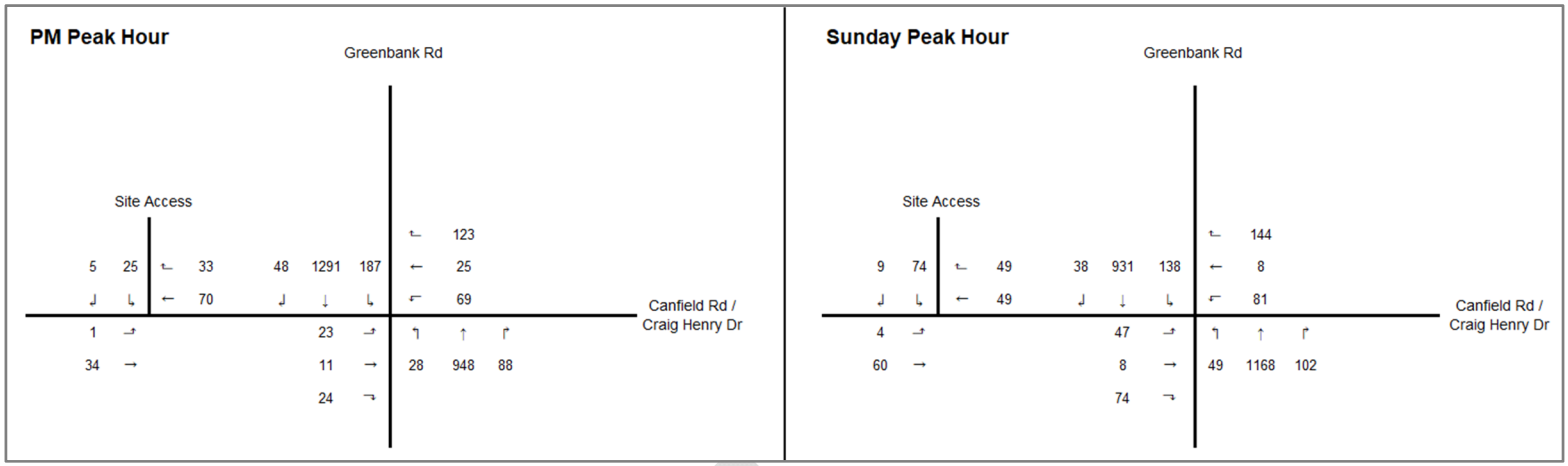
Signalized Intersection	PLOS		BLOS		TLOS		TkLOS	
	Target	Actual	Target	Actual	Target	Actual	Target	Actual
Greenbank Road at Canfield Road	A	E	B	F	D	F	N/A	

The Pedestrian Level of Service at the intersection of Greenbank Road at Canfield Road is projected to operate with a PLOS of E, which is below the desired target. The number of lanes required to cross Greenbank Road results in the PLOS operating below the target. Measures to improve the PLOS at this intersection include reducing the number of lanes on Greenbank Road, allocating more green time to the east / west movements for vehicles (and thus, pedestrians), implementing medians along Greenbank Road that are more than 2.4m wide, protecting the left turn phases, prohibiting the right turns on red, and raising the crosswalks.

The Bicycle Level of Service at the intersection of Greenbank Road at Canfield Road is projected to operate with a BLOS of F, which is below the desired target. Based on the MMLOS guidelines, intersection BLOS is influenced by the availability of dedicated cycling amenities, number of lanes cyclists must cross to negotiate a turn at intersections, and roadway operating speeds. Due to the nature of arterial roads, the posted speed limit is typically 60 km/hr or greater, which limits the potential BLOS at intersections. Reducing the posted speed limit is not a feasible option for Greenbank Road. Implementing a higher order bicycle facility (i.e. curbside bicycle lanes with two-stage left turn bike boxes) would allow the BLOS to meet the target.

The Transit Level of Service at the intersection of Greenbank Road at Canfield Road is projected to operate with a TLOS of F, which is below the desired target. Based on the MMLOS guidelines, intersection transit level of service is governed by the delay at the intersection. The westbound approach experiences the highest delay, which governs the TLOS at the intersection. Allocating more green time to the east / west movements for vehicles would improve the delay on the westbound approach, however, it would be to the detriment of the northbound and southbound vehicles.

Figure 13 - 2021 Total Future Volumes



4.9.2.4 2026 Ultimate Conditions

Figure 14 illustrates 2026 ultimate PM and Sunday peak hour traffic volumes at the study area intersections.

Intersection Capacity Analysis

Table 14 summarizes the results of the Synchro analysis for 2026 ultimate intersection operations.

Both study area intersections are projected to operate acceptably under 2026 ultimate conditions.

Appendix E contains detailed intersection performance worksheets.

Table 14 – 2026 Ultimate Intersection Operations

Intersection	Intersection Control	Approach / Movement		LOS	V/C	Delay (s)	Queue 95th (m)
Greenbank Road at Canfield Road	Signalized	EB	Left	A (A)	0.20 (0.25)	52.5 (33.7)	9.1 (12.6)
			Through / Right	A (A)	0.18 (0.31)	42.0 (27.3)	13.3 (19.6)
		WB	Left	A (A)	0.33 (0.33)	46.0 (31.0)	27.3 (21.7)
			Through / Right	A (A)	0.75 (0.60)	50.5 (30.3)	60.2 (40.6)
		NB	Left	A (A)	0.11 (0.14)	12.5 (11.3)	5.6 (7.7)
			Through / Right	A (C)	0.45 (0.63)	6.5 (10.3)	67.9 (84.7)
		SB	Left	C (D)	0.55 (0.59)	19.4 (31.0)	51.8 (42.0)
			Through / Right	B (A)	0.57 (0.47)	8.0 (7.9)	95.2 (59.5)
		Overall Intersection		-	-	**12.1 (13.1)**	-
Canfield Road at Site Access	Minor Stop-Control	EB	Left / Through	A (A)	0.00 (0.00)	0.2 (0.4)	0.0 (0.0)
		WB	Through / Right	A (A)	0.00 (0.00)	0.0 (0.0)	0.0 (0.0)
		SB	Left / Right	A (A)	0.03 (0.10)	9.3 (9.7)	0.7 (2.1)
		Overall Intersection		**A (A)**	-	**1.6 (3.3)**	-

Notes:
1. Table format: PM (SUN)
2. v/c – represents the anticipated volume divided by the predicted capacity

Multi-Modal Level of Service Assessment

Based on the proximity of this intersection to the nearby Knoxdale Elementary School, it was determined that the intersection of Greenbank Road at Canfield Road falls under the 'within 300m of a school' Policy Area designation. As such, the intersection is subject to a Pedestrian Level of Service (PLOS) target of A.

The 2013 Ottawa Transportation Master Plan designates Greenbank Road as a spine cycling route and Canfield Road as a local cycling route in the Ultimate Cycling Network. As such, the Churchill Avenue at Richmond Road intersection has a bicycle level of service (BLOS) target of B.

Greenbank Road has transit routes along it, and therefore, the Transit Level of Service (TLOS) target for the intersection is D.

Greenbank Road is also designated as a truck route; however, Canfield Road is not. As such, trucks will not be turning at the intersection of Greenbank Road and Canfield Road, thus, the Truck Level of Service (TkLOS) does not apply to this intersection.

Table 15 summarizes the MMLOS at the intersection of Greenbank Road at Canfield Road under 2021 total future conditions.

Appendix C contains the detailed MMLOS analysis.

Table 15 – 2026 Ultimate Signalized Intersection MMLOS

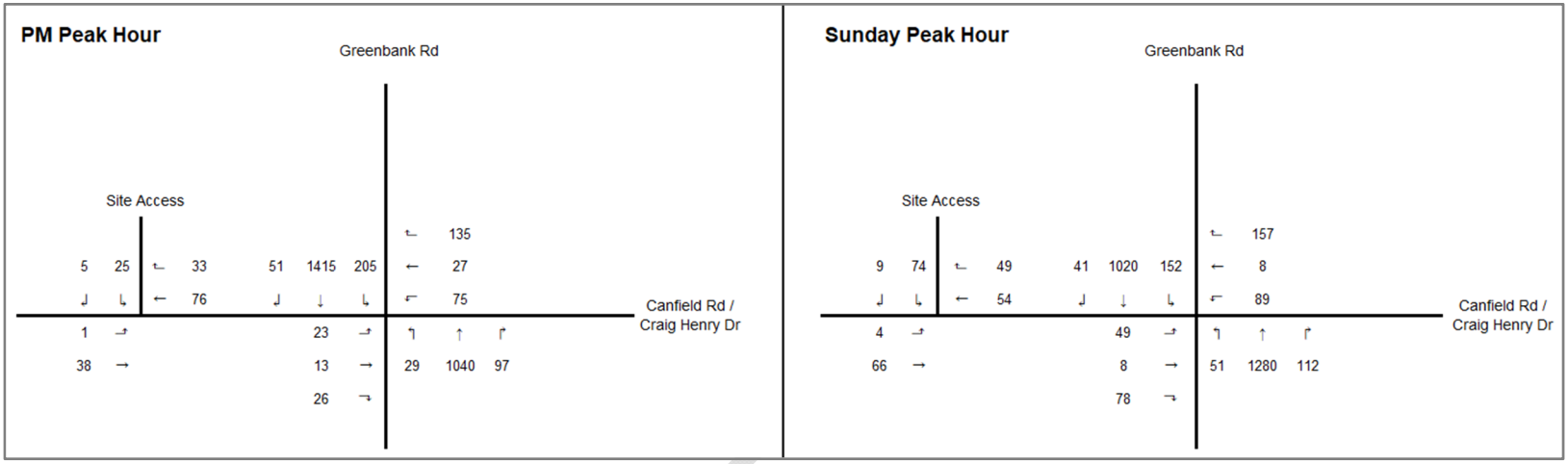
Signalized Intersection	PLOS		BLOS		TLOS		TkLOS	
	Target	Actual	Target	Actual	Target	Actual	Target	Actual
Greenbank Road at Canfield Road	A	E	B	F	D	F	N/A	

The Pedestrian Level of Service at the intersection of Greenbank Road at Canfield Road is projected to operate with a PLOS of E, which is below the desired target. The number of lanes required to cross Greenbank Road results in the PLOS operating below the target. Measures to improve the PLOS at this intersection include reducing the number of lanes on Greenbank Road, allocating more green time to the east / west movements for vehicles (and thus, pedestrians), implementing medians along Greenbank Road that are more than 2.4m wide, protecting the left turn phases, prohibiting the right turns on red, and raising the crosswalks.

The Bicycle Level of Service at the intersection of Greenbank Road at Canfield Road is projected to operate with a BLOS of F, which is below the desired target. Based on the MMLOS guidelines, intersection BLOS is influenced by the availability of dedicated cycling amenities, number of lanes cyclists must cross to negotiate a turn at intersections, and roadway operating speeds. Due to the nature of arterial roads, the posted speed limit is typically 60 km/hr or greater, which limits the potential BLOS at intersections. Reducing the posted speed limit is not a feasible option for Greenbank Road. Implementing a higher order bicycle facility (i.e. curbside bicycle lanes with two-stage left turn bike boxes) would allow the BLOS to meet the target.

The Transit Level of Service at the intersection of Greenbank Road at Canfield Road is projected to operate with a TLOS of F, which is below the desired target. Based on the MMLOS guidelines, intersection transit level of service is governed by the delay at the intersection. The westbound approach experiences the highest delay, which governs the TLOS at the intersection. Allocating more green time to the east / west movements for vehicles would improve the delay on the westbound approach, however, it would be to the detriment of the northbound and southbound vehicles

Figure 14 - 2026 Ultimate Traffic Volumes



5.0 SUMMARY AND CONCLUSIONS

This Transportation Impact Assessment (TIA) was prepared in support of a Zoning By-Law Amendment and Site Plan Control application for the proposed church expansion building on the St. Mary Coptic Church property, located at 1 Canfield Road. The site is located at the northwest quadrant of the Greenbank Road at Canfield Road intersection and is bound by Greenbank Road to the east, Canfield Road to the south, and existing residential houses to the west and north.

The subject site currently includes one access to Canfield Road, approximately 60m west of Greenbank Road. The proposed site plan includes shifting this access approximately 2.5m west to allow for improved on-site circulation. The proposed expansion building includes a gym / hall, a multimedia room, lounge, kitchen, study, studio, classrooms for Sunday school, a small chapel, as well as meeting / office space.

Due to the nature of the existing land use, the existing church currently generates the most amount of traffic on Sundays. The proposed expansion building will generally be used by the congregation before / after the Sunday service and it will be prohibited to have activities in this building during Sunday service; therefore, the proposed expansion building is not anticipated to generate any additional traffic above what is already being generated by the existing church on a typical Sunday. The proposed site (i.e. existing church plus expansion building) is anticipated to generate 21 two-way auto trips during the PM peak hour.

Both study area intersections are projected to operate acceptably under all study horizons.

The multi-modal level of service (MMLOS) assessment for segments found the following:

- Greenbank Road, fronting the proposed development, achieves a PLOS of E, which fails to meet the PLOS target of A. To meet the PLOS target along Greenbank Road, the sidewalk on the west side would need to be widened to 1.8m while maintaining a boulevard of greater than 2.0m coupled with a reduction in the speed limit to 40 km/hr and a reduction in the curb lane AADT to less than 3000. Although the pedestrian facilities are well-developed along Greenbank Road (i.e., sidewalks and boulevards along both sides), proximity to Knoxdale Elementary School results in an unattainably high PLOS target given the nature of Greenbank Road being an arterial roadway with high speeds and high volumes.

- Greenbank Road, fronting the subject site, currently achieves a Bicycle Level of service (BLOS) of F. To achieve the BLOS target of C, the speed limit would need to be reduced to 40km/hr while maintaining the existing mixed-use lanes. An alternative to achieving the BLOS target of D would be to implement curbside bicycle lanes along both sides of Greenbank Road, however, this could have spatial and financial constraints. A second alternative to achieving the BLOS target would be to implement physically separated cycling facilities (i.e. a cycle track) along both sides of Greenbank Road. Similar to implementing on-street bicycle lanes, this could also have a spatial and financial constraints.

- Greenbank Road, across the frontage of the subject site, currently meets both the Transit and Truck Level of Service (TLOS and TkLOS) targets.

- While Canfield Road, across the frontage of the subject site, includes sidewalks along both sides, it currently does not meet the PLOS target of A. Implementing a 0.5m boulevard would allow the PLOS target of A to be met. Another alternative to meet the PLOS target would be to reduce the posted speed limit.
- Canfield Road, across the frontage of the subject site, currently meets the BLOS target.
- As Canfield Road is not a transit nor truck route, the TLOS and TkLOS targets do not apply.

The MMLOS assessment for the signalized intersection of Greenbank Road at Canfield Road found the following:

- The PLOS currently operates with a PLOS of E, which is below the desired target. Measures to improve the PLOS at this intersection include reducing the number of lanes on Greenbank Road, allocating more green time to the east / west movements for vehicles (and thus, pedestrians), implementing medians along Greenbank Road that are more than 2.4m wide, protecting the left turn phases, prohibiting the right turns on red, and raising the crosswalks. This PLOS is anticipated to remain consistent throughout all study horizons.
- The BLOS currently operates with a BLOS of F, which is also below target. Due to the nature of arterial roads, the posted speed limit is typically 60 km/hr or greater, which limits the potential BLOS at intersections. Reducing the posted speed limit is not a feasible option for Greenbank Road. Implementing a higher order bicycle facility (i.e. curbside bicycle lanes with two-stage left turn bike boxes) would allow the BLOS to meet the target. This BLOS is anticipated to remain consistent throughout all study horizons.
- The TLOS currently operates with a TLOS of F, which is also below the desired target. Based on the MMLOS guidelines, intersection transit level of service is governed by the delay at the intersection. The westbound approach experiences the highest delay, which governs the TLOS at the intersection. Allocating more green time to the east / west movements for vehicles would improve the delay on the westbound approach, however, it would be to the detriment of the northbound and southbound vehicles. This TLOS is anticipated to remain consistent throughout all study horizons.

Stantec conducted parking surveys on Sunday, April 29th, 2018 between 8:30 AM and 2:00 PM. The existing church was found to have a maximum of 85 vehicles parked on site. Information was provided to Stantec by the church that there are approximately an additional 10 vehicles who currently park on-street on Sundays, for a total demand of 95 parking spaces. The proposed site plan includes 99 parking spaces, which exceeds the demand of 95 parking spaces.

Despite the proposed parking supply exceeding the anticipated demand, the Church is pro-actively putting an agreement in place with the nearby Knoxdale Public School whereby members of the church can park in the school parking lot on Sundays as an alternative to parking on-street. This school is located approximately 160m from the church, or approximately a two-minute walk. There will be a sign on the church property indicating that once the church parking lot is full, motorists are to park in the Knoxdale parking lot and walk over. This should eliminate any neighbourhood concerns regarding parking along Canfield Road. As there will not be a pathway connecting the church to Parkmount Crescent, members of the church will likely not park along Parkmount Crescent as it would involve walking greater than 400m from their car to church, which is more than double the distance from the church to Knoxdale Public School.

During the parking survey, it was found that the number of parked vehicles along Keppler Crescent, Banner Road, and Parkmount Crescent were consistent between 8:30 AM – 2:00 PM. This suggests that the parked cars along these three roads are attributed to the residents and not members of the St. Mary Coptic Church.

Based on the transportation evaluation presented in this study, the proposed site located at 1 Canfield Road can be supported and should be permitted to proceed from a transportation perspective.

Appendix A TRAFFIC COUNT DATA

5363811 - Canfield and St.Mary's Orthodox Church - Apr 29th - TMC

Sun Apr 29, 2018
Full Length (7AM-2PM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 517824, Location: 45.329734, -75.782399, Site Code: 37731103

Provided by: City of Ottawa
100 Constellation Dr,
Nepean, ON, K2G 5J9, CA

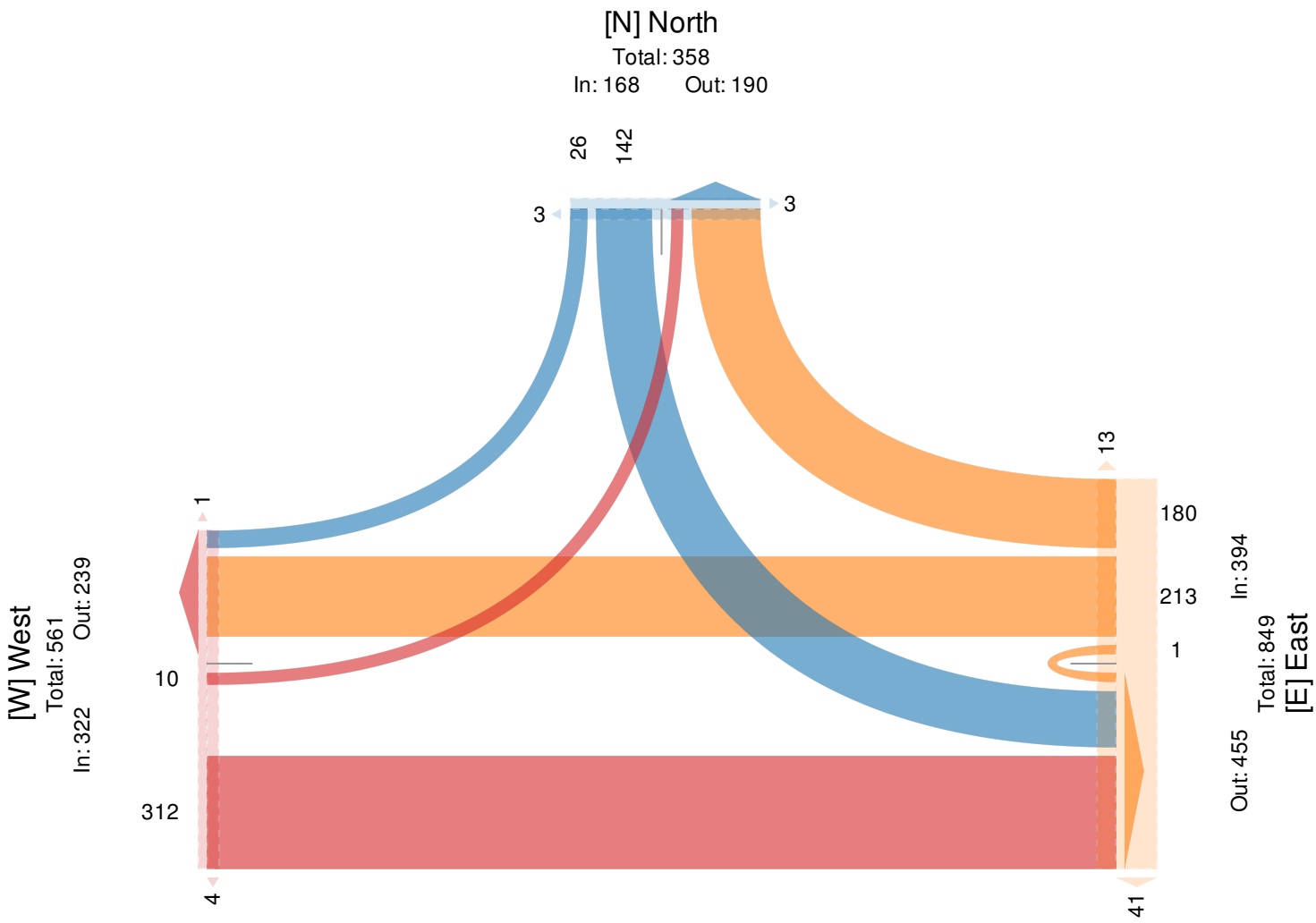
Leg / Direction	West Eastbound					East Westbound					North Southbound					
Time	L	T	U	App	Ped*	T	R	U	App	Ped*	L	R	U	App	Ped*	Int
2018-04-29 7:00AM	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	**0**
7:15AM	0	1	0	**1**	0	0	0	0	**0**	0	0	0	0	**0**	0	**1**
7:30AM	0	3	0	**3**	0	0	1	0	**1**	0	0	0	0	**0**	0	**4**
7:45AM	0	7	0	**7**	0	1	7	0	**8**	0	1	0	0	**1**	0	**16**
Hourly Total	0	11	0	**11**	0	1	8	0	**9**	0	1	0	0	**1**	0	**21**
8:00AM	0	7	0	**7**	0	2	7	0	**9**	0	1	0	0	**1**	0	**17**
8:15AM	0	6	0	**6**	0	4	7	0	**11**	0	0	0	0	**0**	0	**17**
8:30AM	0	8	0	**8**	0	6	11	0	**17**	0	2	0	0	**2**	0	**27**
8:45AM	1	9	0	**10**	0	3	11	0	**14**	1	3	0	0	**3**	1	**27**
Hourly Total	1	30	0	**31**	0	15	36	0	**51**	1	6	0	0	**6**	1	**88**
9:00AM	1	7	0	**8**	0	8	21	0	**29**	0	2	1	0	**3**	0	**40**
9:15AM	0	16	0	**16**	0	2	18	0	**20**	0	0	0	0	**0**	0	**36**
9:30AM	0	11	0	**11**	0	8	11	0	**19**	0	0	1	0	**1**	0	**31**
9:45AM	0	11	0	**11**	0	13	8	0	**21**	3	1	4	0	**5**	0	**37**
Hourly Total	1	45	0	**46**	0	31	58	0	**89**	3	3	6	0	**9**	0	**144**
10:00AM	0	16	0	**16**	0	9	8	0	**17**	0	4	1	0	**5**	3	**38**
10:15AM	1	9	0	**10**	0	7	2	0	**9**	0	1	3	0	**4**	0	**23**
10:30AM	0	16	0	**16**	0	10	2	0	**12**	0	0	0	0	**0**	0	**28**
10:45AM	1	13	0	**14**	0	13	3	0	**16**	0	1	2	0	**3**	0	**33**
Hourly Total	2	54	0	**56**	0	39	15	0	**54**	0	6	6	0	**12**	3	**122**
11:00AM	0	14	0	**14**	0	8	3	0	**11**	0	0	3	0	**3**	0	**28**
11:15AM	1	11	0	**12**	1	8	2	1	**11**	16	18	0	0	**18**	0	**41**
11:30AM	2	14	0	**16**	0	15	7	0	**22**	0	22	2	0	**24**	0	**62**
11:45AM	0	16	0	**16**	0	7	6	0	**13**	4	13	1	0	**14**	0	**43**
Hourly Total	3	55	0	**58**	1	38	18	1	**57**	20	53	6	0	**59**	0	**174**
12:00PM	1	12	0	**13**	1	15	11	0	**26**	9	9	3	0	**12**	1	**51**
12:15PM	0	15	0	**15**	2	9	13	0	**22**	11	12	1	0	**13**	0	**50**
12:30PM	0	16	0	**16**	0	8	0	0	**8**	2	7	0	0	**7**	0	**31**
12:45PM	1	13	0	**14**	1	15	5	0	**20**	0	5	1	0	**6**	1	**40**
Hourly Total	2	56	0	**58**	4	47	29	0	**76**	22	33	5	0	**38**	2	**172**
1:00PM	0	16	0	**16**	0	10	6	0	**16**	3	4	0	0	**4**	0	**36**
1:15PM	1	21	0	**22**	0	11	4	0	**15**	2	13	2	0	**15**	0	**52**
1:30PM	0	21	0	**21**	0	14	3	0	**17**	3	12	0	0	**12**	0	**50**
1:45PM	0	3	0	**3**	0	7	3	0	**10**	0	11	1	0	**12**	0	**25**
Hourly Total	1	61	0	**62**	0	42	16	0	**58**	8	40	3	0	**43**	0	**163**
Total	10	312	0	**322**	5	213	180	1	**394**	54	142	26	0	**168**	6	**884**
% Approach	3.1%	96.9%	0%	**-**	-	54.1%	45.7%	0.3%	**-**	-	84.5%	15.5%	0%	**-**	-	-
% Total	1.1%	35.3%	0%	**36.4%**	-	24.1%	20.4%	0.1%	**44.6%**	-	16.1%	2.9%	0%	**19.0%**	-	-
Lights and Motorcycles	10	306	0	**316**	-	209	179	1	**389**	-	141	26	0	**167**	-	872
% Lights and Motorcycles	100%	98.1%	0%	**98.1%**	-	98.1%	99.4%	100%	**98.7%**	-	99.3%	100%	0%	**99.4%**	-	98.6%
Heavy	0	0	0	**0**	-	0	1	0	**1**	-	1	0	0	**1**	-	2
% Heavy	0%	0%	0%	**0%**	-	0%	0.6%	0%	**0.3%**	-	0.7%	0%	0%	**0.6%**	-	0.2%
Bicycles on Road	0	6	0	**6**	-	4	0	0	**4**	-	0	0	0	**0**	-	10
% Bicycles on Road	0%	1.9%	0%	**1.9%**	-	1.9%	0%	0%	**1.0%**	-	0%	0%	0%	**0%**	-	1.1%
Pedestrians	-	-	-	-	5	-	-	-	-	54	-	-	-	-	6	
% Pedestrians	-	-	-	-	100%	-	-	-	-	100%	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

5363811 - Canfield and St.Mary's Orthodox Church - Apr 29th - TMC

Sun Apr 29, 2018
Full Length (7AM-2PM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 517824, Location: 45.329734, -75.782399, Site Code: 37731103

Provided by: City of Ottawa
100 Constellation Dr,
Nepean, ON, K2G 5J9, CA



5363811 - Canfield and St.Mary's Orthodox Church - Apr 29th - TMC

Sun Apr 29, 2018
AM Peak (WKND) (10:45AM - 11:45AM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 517824, Location: 45.329734, -75.782399, Site Code: 37731103

Provided by: City of Ottawa
100 Constellation Dr,
Nepean, ON, K2G 5J9, CA

Leg Direction	West Eastbound					East Westbound					North Southbound					
Time	L	T	U	**App**	Ped*	T	R	U	**App**	Ped*	L	R	U	**App**	Ped*	**Int**
2018-04-29 10:45AM	1	13	0	**14**	0	13	3	0	**16**	0	1	2	0	**3**	0	**33**
11:00AM	0	14	0	**14**	0	8	3	0	**11**	0	0	3	0	**3**	0	**28**
11:15AM	1	11	0	**12**	1	8	2	1	**11**	16	18	0	0	**18**	0	**41**
11:30AM	2	14	0	**16**	0	15	7	0	**22**	0	22	2	0	**24**	0	**62**
Total	4	52	0	**56**	1	44	15	1	**60**	16	41	7	0	**48**	0	**164**
% Approach	7.1%	92.9%	0%	**-**	-	73.3%	25.0%	1.7%	**-**	-	85.4%	14.6%	0%	**-**	-	-
% Total	2.4%	31.7%	0%	**34.1%**	-	26.8%	9.1%	0.6%	**36.6%**	-	25.0%	4.3%	0%	**29.3%**	-	-
PHF	0.500	0.929	-	**0.875**	-	0.733	0.536	0.250	**0.682**	-	0.466	0.583	-	**0.500**	-	0.661
Lights and Motorcycles	4	50	0	**54**	-	43	15	1	**59**	-	41	7	0	**48**	-	161
% Lights and Motorcycles	100%	96.2%	0%	**96.4%**	-	97.7%	100%	100%	**98.3%**	-	100%	100%	0%	**100%**	-	98.2%
Heavy	0	0	0	**0**	-	0	0	0	**0**	-	0	0	0	**0**	-	0
% Heavy	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0%
Bicycles on Road	0	2	0	**2**	-	1	0	0	**1**	-	0	0	0	**0**	-	3
% Bicycles on Road	0%	3.8%	0%	**3.6%**	-	2.3%	0%	0%	**1.7%**	-	0%	0%	0%	**0%**	-	1.8%
Pedestrians	-	-	-	-	1	-	-	-	-	16	-	-	-	-	0	
% Pedestrians	-	-	-	-	100%	-	-	-	-	100%	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

5363811 - Canfield and St.Mary's Orthodox Church - Apr 29th - TMC

Sun Apr 29, 2018

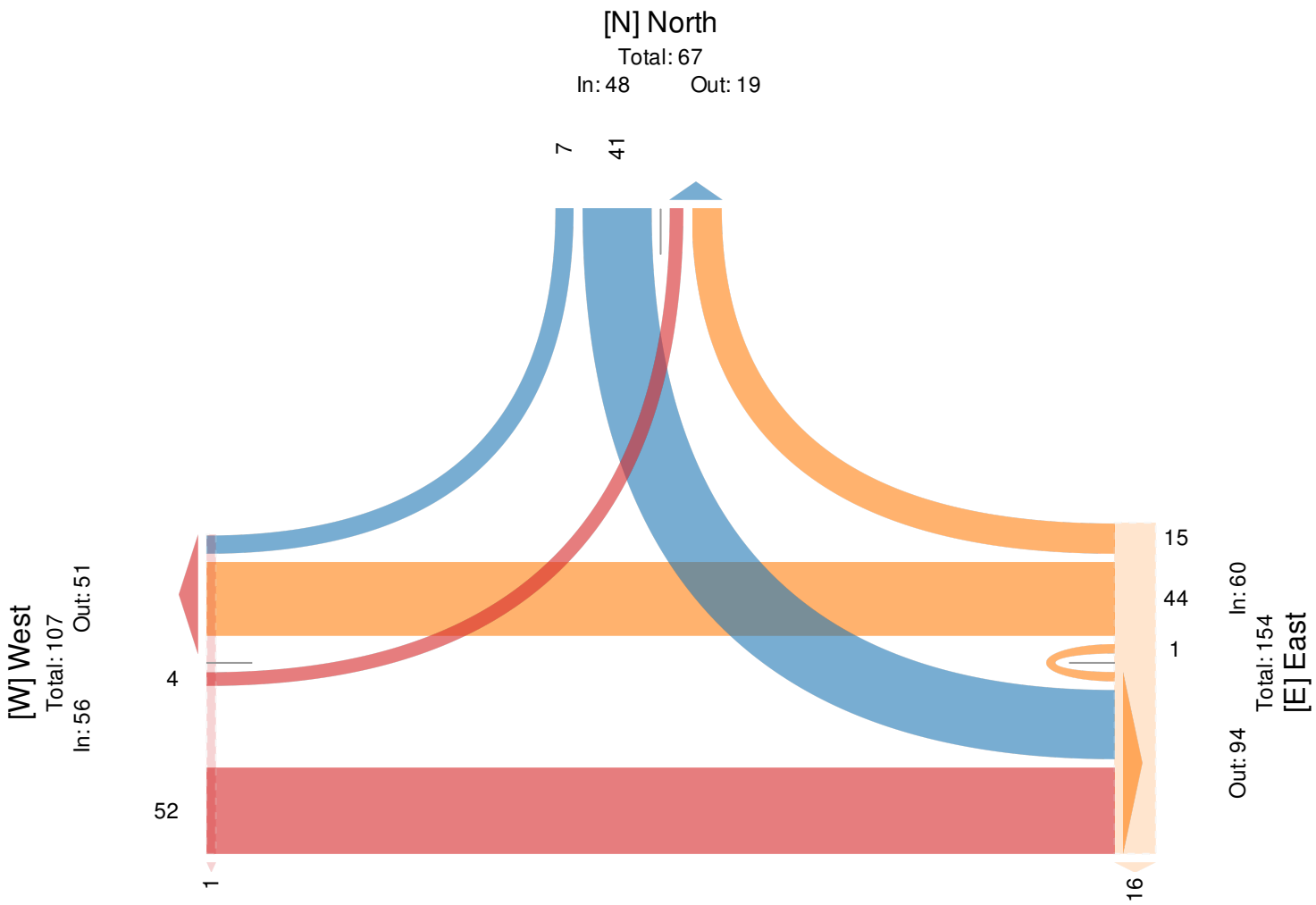
AM Peak (WKND) (10:45AM - 11:45AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 517824, Location: 45.329734, -75.782399, Site Code: 37731103

Provided by: City of Ottawa
100 Constellation Dr,
Nepean, ON, K2G 5J9, CA



5363811 - Canfield and St.Mary's Orthodox Church - Apr 29th - TMC

Sun Apr 29, 2018
Midday Peak (WKND) (11:30AM - 12:30PM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 517824, Location: 45.329734, -75.782399, Site Code: 37731103

Provided by: City of Ottawa
100 Constellation Dr,
Nepean, ON, K2G 5J9, CA

Leg Direction	West Eastbound					East Westbound					North Southbound					
Time	L	T	U	**App**	Ped*	T	R	U	**App**	Ped*	L	R	U	**App**	Ped*	**Int**
2018-04-29 11:30AM	2	14	0	**16**	0	15	7	0	**22**	0	22	2	0	**24**	0	**62**
11:45AM	0	16	0	**16**	0	7	6	0	**13**	4	13	1	0	**14**	0	**43**
12:00PM	1	12	0	**13**	1	15	11	0	**26**	9	9	3	0	**12**	1	**51**
12:15PM	0	15	0	**15**	2	9	13	0	**22**	11	12	1	0	**13**	0	**50**
Total	3	57	0	**60**	3	46	37	0	**83**	24	56	7	0	**63**	1	**206**
% Approach	5.0%	95.0%	0%	**-**	-	55.4%	44.6%	0%	**-**	-	88.9%	11.1%	0%	**-**	-	-
% Total	1.5%	27.7%	0%	**29.1%**	-	22.3%	18.0%	0%	**40.3%**	-	27.2%	3.4%	0%	**30.6%**	-	-
PHF	0.375	0.891	-	**0.938**	-	0.767	0.712	-	**0.798**	-	0.636	0.583	-	**0.656**	-	0.831
Lights and Motorcycles	3	57	0	**60**	-	44	37	0	**81**	-	56	7	0	**63**	-	204
% Lights and Motorcycles	100%	100%	0%	**100%**	-	95.7%	100%	0%	**97.6%**	-	100%	100%	0%	**100%**	-	99.0%
Heavy	0	0	0	**0**	-	0	0	0	**0**	-	0	0	0	**0**	-	0
% Heavy	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0%
Bicycles on Road	0	0	0	**0**	-	2	0	0	**2**	-	0	0	0	**0**	-	2
% Bicycles on Road	0%	0%	0%	**0%**	-	4.3%	0%	0%	**2.4%**	-	0%	0%	0%	**0%**	-	1.0%
Pedestrians	-	-	-	-	3	-	-	-	-	24	-	-	-	-	1	
% Pedestrians	-	-	-	-	100%	-	-	-	-	100%	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

5363811 - Canfield and St.Mary's Orthodox Church - Apr 29th - TMC

Sun Apr 29, 2018

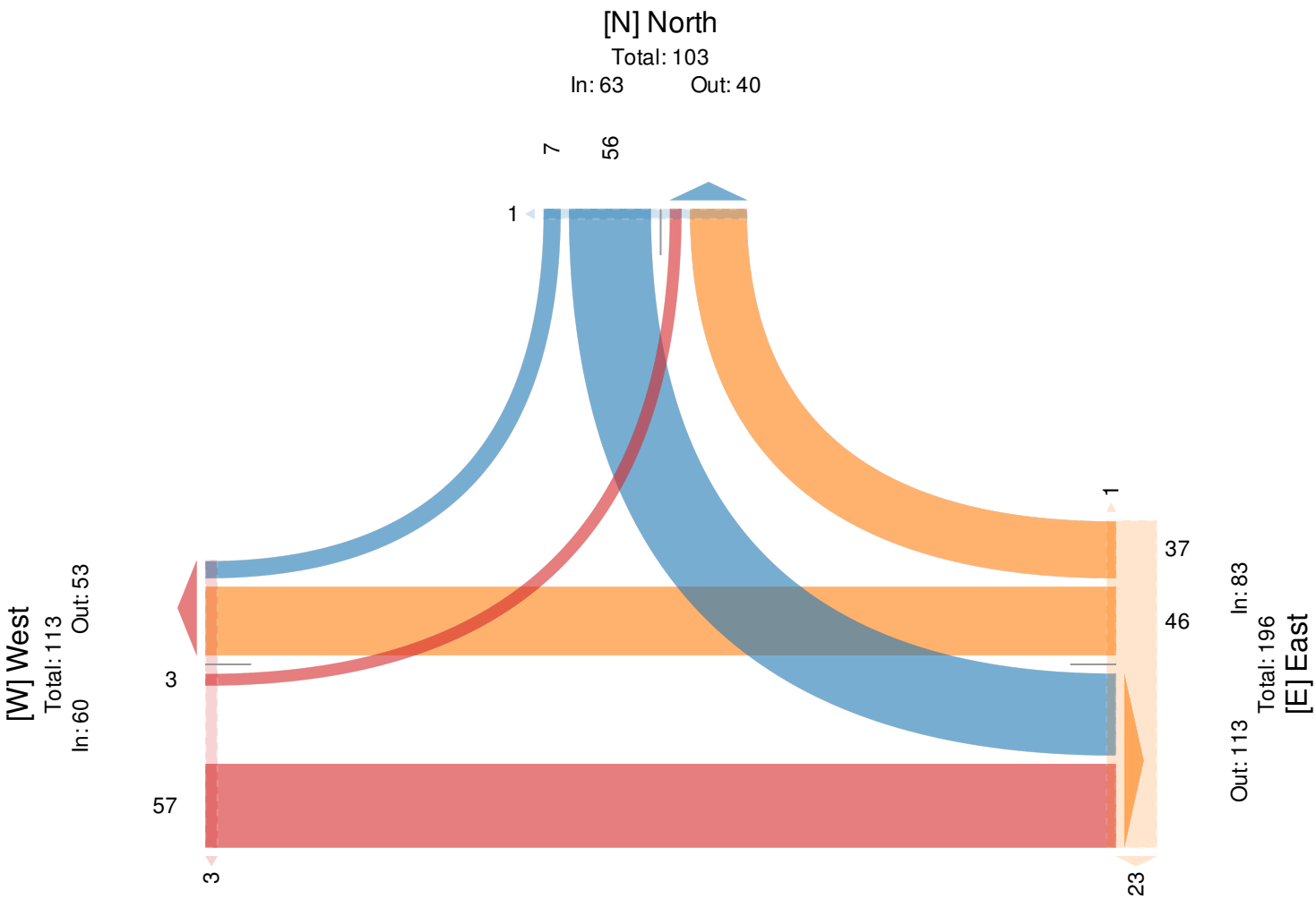
Midday Peak (WKND) (11:30AM - 12:30PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 517824, Location: 45.329734, -75.782399, Site Code: 37731103

Provided by: City of Ottawa
100 Constellation Dr,
Nepean, ON, K2G 5J9, CA



5363811 - Greenbank and Canfield/Craig Henry - Apr 29th - TMC
Sun Apr 29, 2018
Full Length (7AM-2PM)
All Classes (Lights and Motorcycles, Lights on Crosswalk and Motorcycles on Crosswalk, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 517820, Location: 45.329982, -75.781649, Site Code: 37729103

Provided by: City of Ottawa
100 Constellation Dr,
Nepean, ON, K2G 5J9, CA

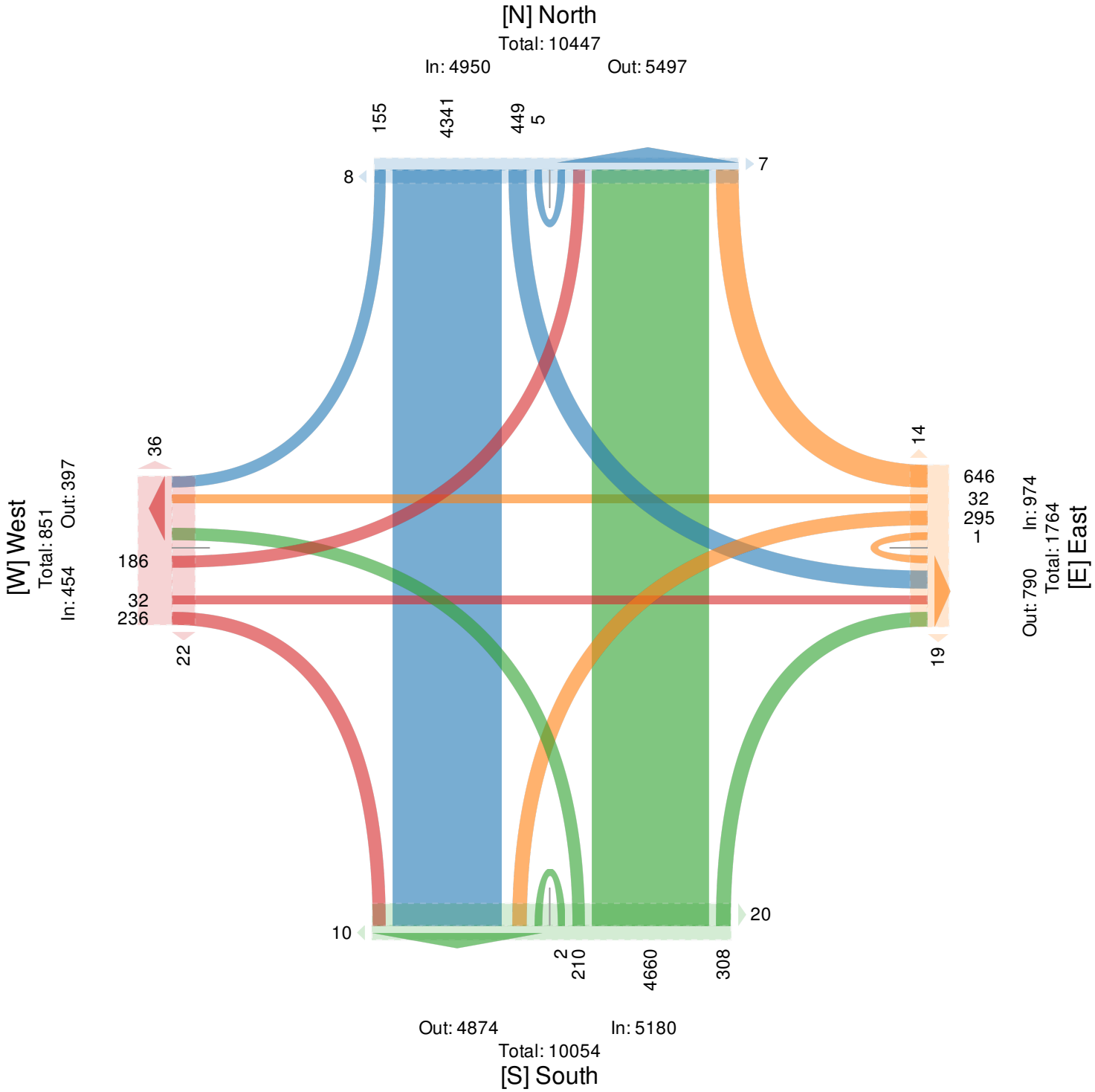
Leg	West						East						South						North						
Direction	Eastbound						Westbound						Northbound						Southbound						
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2018-04-29 7:00AM	0	0	0	0	**0**	0	1	0	0	0	**1**	2	0	34	1	0	**35**	0	1	31	0	0	**32**	1	**68**
7:15AM	0	0	0	0	**0**	2	2	0	8	0	**10**	0	0	39	0	0	**39**	0	3	31	0	0	**34**	0	**83**
7:30AM	2	0	1	0	**3**	0	2	0	9	0	**11**	0	1	60	3	0	**64**	0	3	42	0	0	**45**	0	**123**
7:45AM	4	0	3	0	**7**	0	4	0	19	1	**24**	1	1	59	6	0	**66**	2	5	64	3	0	**72**	0	**169**
Hourly Total	6	0	4	0	**10**	2	9	0	36	1	**46**	3	2	192	10	0	**204**	2	12	168	3	0	**183**	1	**443**
8:00AM	2	2	1	0	**5**	0	3	1	3	0	**7**	0	3	51	3	0	**57**	0	3	58	4	0	**65**	0	**134**
8:15AM	2	1	4	0	**7**	2	6	1	9	0	**16**	0	6	44	1	0	**51**	0	5	88	3	0	**96**	0	**170**
8:30AM	2	2	3	0	**7**	1	10	0	20	0	**30**	1	9	84	3	0	**96**	0	1	108	6	0	**115**	0	**248**
8:45AM	7	1	6	0	**14**	5	10	1	14	0	**25**	2	8	91	8	0	**107**	2	9	140	7	0	**156**	2	**302**
Hourly Total	13	6	14	0	**33**	8	29	3	46	0	**78**	3	26	270	15	0	**311**	2	18	394	20	0	**432**	2	**854**
9:00AM	1	3	2	0	**6**	4	10	2	22	0	**34**	2	13	116	3	0	**132**	1	9	111	10	0	**130**	0	**302**
9:15AM	12	1	3	0	**16**	8	9	2	21	0	**32**	1	16	116	8	0	**140**	0	10	106	5	1	**122**	1	**310**
9:30AM	9	1	5	0	**15**	4	12	2	29	0	**43**	2	14	152	9	0	**175**	2	8	119	8	0	**135**	1	**368**
9:45AM	3	1	5	0	**9**	2	8	2	30	0	**40**	1	14	171	9	0	**194**	1	10	161	5	0	**176**	2	**419**
Hourly Total	25	6	15	0	**46**	18	39	8	102	0	**149**	6	57	555	29	0	**641**	4	37	497	28	1	**563**	4	**1399**
10:00AM	14	1	8	0	**23**	3	9	0	30	0	**39**	0	9	153	10	0	**172**	3	16	146	4	0	**166**	0	**400**
10:15AM	6	0	6	0	**12**	1	10	3	32	0	**45**	2	7	189	5	0	**201**	1	13	153	4	0	**170**	1	**428**
10:30AM	7	1	5	0	**13**	1	16	1	25	0	**42**	1	7	238	10	0	**255**	0	10	180	4	1	**195**	0	**505**
10:45AM	4	2	7	0	**13**	2	16	1	34	0	**51**	1	3	258	14	1	**276**	4	21	192	12	0	**225**	0	**565**
Hourly Total	31	4	26	0	**61**	7	51	5	121	0	**177**	4	26	838	39	1	**904**	8	60	671	24	1	**756**	1	**1898**
11:00AM	4	1	8	0	**13**	1	9	1	23	0	**33**	0	6	194	11	0	**211**	3	21	204	4	1	**230**	0	**487**
11:15AM	7	0	11	0	**18**	4	10	3	34	0	**47**	0	4	192	9	0	**205**	1	26	211	5	0	**242**	0	**512**
11:30AM	14	2	32	0	**48**	2	10	2	24	0	**36**	1	8	178	12	0	**198**	0	15	200	6	0	**221**	0	**503**
11:45AM	8	2	18	0	**28**	1	12	1	25	0	**38**	0	10	224	14	0	**248**	0	24	234	10	1	**269**	0	**583**
Hourly Total	33	5	69	0	**107**	8	41	7	106	0	**154**	1	28	788	46	0	**862**	4	86	849	25	2	**962**	0	**2085**
12:00PM	11	1	14	0	**26**	1	12	1	26	0	**39**	3	10	211	11	0	**232**	2	30	211	9	0	**250**	1	**547**
12:15PM	11	3	10	0	**24**	1	10	0	30	0	**40**	1	16	214	21	0	**251**	0	25	219	6	0	**250**	0	**565**
12:30PM	13	1	13	0	**27**	1	11	1	22	0	**34**	2	9	247	18	0	**274**	0	25	248	4	0	**277**	0	**612**
12:45PM	8	2	11	0	**21**	5	17	1	24	0	**42**	3	7	312	25	1	**345**	4	28	260	6	0	**294**	2	**702**
Hourly Total	43	7	48	0	**98**	8	50	3	102	0	**155**	9	42	984	75	1	**1102**	6	108	938	25	0	**1071**	3	**2426**
1:00PM	10	0	8	0	**18**	2	27	0	42	0	**69**	0	8	280	30	0	**318**	0	31	203	11	0	**245**	2	**650**
1:15PM	11	1	17	0	**29**	0	15	3	37	0	**55**	1	10	251	23	0	**284**	2	32	197	8	0	**237**	0	**605**
1:30PM	9	3	26	0	**38**	1	17	2	32	0	**51**	1	7	258	18	0	**283**	2	39	217	1	0	**257**	2	**629**
1:45PM	5	0	9	0	**14**	4	17	1	22	0	**40**	5	4	244	23	0	**271**	0	26	207	10	1	**244**	0	**569**
Hourly Total	35	4	60	0	**99**	7	76	6	133	0	**215**	7	29	1033	94	0	**1156**	4	128	824	30	1	**983**	4	**2453**
Total	186	32	236	0	**454**	58	295	32	646	1	**974**	33	210	4660	308	2	**5180**	30	449	4341	155	5	**4950**	15	**11558**
% Approach	41.0%	7.0%	52.0%	0%	**-**	-	30.3%	3.3%	66.3%	0.1%	**-**	-	4.1%	90.0%	5.9%	0%	**-**	-	9.1%	87.7%	3.1%	0.1%	**-**	-	-
% Total	1.6%	0.3%	2.0%	0%	**3.9%**	-	2.6%	0.3%	5.6%	0%	**8.4%**	-	1.8%	40.3%	2.7%	0%	**44.8%**	-	3.9%	37.6%	1.3%	0%	**42.8%**	-	-
Lights and Motorcycles	183	31	236	0	**450**	-	287	31	640	1	**959**	-	209	4647	297	2	**5155**	-	447	4323	154	5	**4929**	-	11493
% Lights and Motorcycles	98.4%	96.9%	100%	0%	**99.1%**	-	97.3%	96.9%	99.1%	100%	**98.5%**	-	99.5%	99.7%	96.4%	100%	**99.5%**	-	99.6%	99.6%	99.4%	100%	**99.6%**	-	99.4%
Heavy	1	0	0	0	**1**	-	8	0	6	0	**14**	-	0	13	11	0	**24**	-	2	18	1	0	**21**	-	60
% Heavy	0.5%	0%	0%	0%	**0.2%**	-	2.7%	0%	0.9%	0%	**1.4%**	-	0%	0.3%	3.6%	0%	**0.5%**	-	0.4%	0.4%	0.6%	0%	**0.4%**	-	0.5%
Bicycles on Road	2	1	0	0	**3**	-	0	1	0	0	**1**	-	1	0	0	0	**1**	-	0	0	0	0	**0**	-	5
% Bicycles on Road	1.1%	3.1%	0%	0%	**0.7%**	-	0%	3.1%	0%	0%	**0.1%**	-	0.5%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%
Lights on Crosswalk and Motorcycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	
% Lights on Crosswalk and Motorcycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	3.0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-
Pedestrians	-	-	-	-	-	54	-	-	-	-	-	29	-	-	-	-	-	23	-	-	-	-	-	13	
% Pedestrians	-	-	-	-	-	93.1%	-	-	-	-	-	87.9%	-	-	-	-	-	76.7%	-	-	-	-	-	86.7%	-
Bicycles on Crosswalk	-	-	-	-	-	4	-	-	-	-	-	3	-	-	-	-	-	7	-	-	-	-	-	2	
% Bicycles on Crosswalk	-	-	-	-	-	6.9%	-	-	-	-	-	9.1%	-	-	-	-	-	23.3%	-	-	-	-	-	13.3%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

5363811 - Greenbank and Canfield/Craig Henry - Apr 29th - TMC

Sun Apr 29, 2018
Full Length (7AM-2PM)
All Classes (Lights and Motorcycles, Lights on Crosswalk and Motorcycles on Crosswalk, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 517820, Location: 45.329982, -75.781649, Site Code: 37729103

Provided by: City of Ottawa
100 Constellation Dr,
Nepean, ON, K2G 5J9, CA



5363811 - Greenbank and Canfield/Craig Henry - Apr 29th - TMC
Sun Apr 29, 2018
AM Peak (WKND) (10:30AM - 11:30AM)
All Classes (Lights and Motorcycles, Lights on Crosswalk and Motorcycles on Crosswalk, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 517820, Location: 45.329982, -75.781649, Site Code: 37729103

Provided by: City of Ottawa
100 Constellation Dr,
Nepean, ON, K2G 5J9, CA

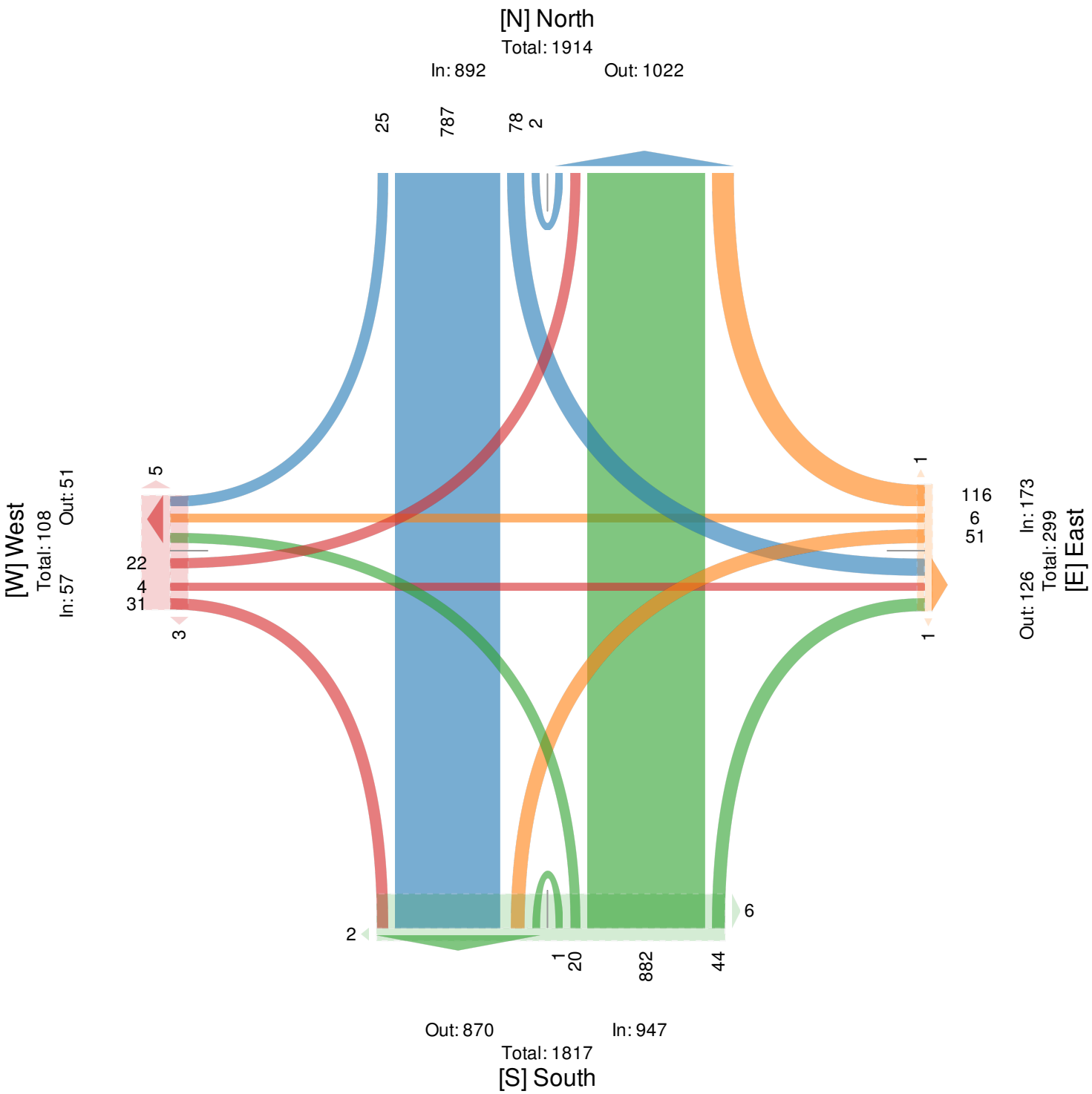
Leg	West						East						South						North						
Direction	Eastbound						Westbound						Northbound						Southbound						
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2018-04-29 10:30AM	7	1	5	0	**13**	1	16	1	25	0	**42**	1	7	238	10	0	**255**	0	10	180	4	1	**195**	0	**505**
10:45AM	4	2	7	0	**13**	2	16	1	34	0	**51**	1	3	258	14	1	**276**	4	21	192	12	0	**225**	0	**565**
11:00AM	4	1	8	0	**13**	1	9	1	23	0	**33**	0	6	194	11	0	**211**	3	21	204	4	1	**230**	0	**487**
11:15AM	7	0	11	0	**18**	4	10	3	34	0	**47**	0	4	192	9	0	**205**	1	26	211	5	0	**242**	0	**512**
Total	22	4	31	0	**57**	8	51	6	116	0	**173**	2	20	882	44	1	**947**	8	78	787	25	2	**892**	0	**2069**
% Approach	38.6%	7.0%	54.4%	0%	-	-	29.5%	3.5%	67.1%	0%	-	-	2.1%	93.1%	4.6%	0.1%	-	-	8.7%	88.2%	2.8%	0.2%	-	-	-
% Total	1.1%	0.2%	1.5%	0%	**2.8%**	-	2.5%	0.3%	5.6%	0%	**8.4%**	-	1.0%	42.6%	2.1%	0%	**45.8%**	-	3.8%	38.0%	1.2%	0.1%	**43.1%**	-	-
PHF	0.786	0.500	0.705	-	**0.792**	-	0.797	0.500	0.853	-	**0.848**	-	0.714	0.855	0.786	0.250	**0.858**	-	0.750	0.932	0.521	0.500	**0.921**	-	0.915
Lights and Motorcycles	20	4	31	0	**55**	-	50	6	116	0	**172**	-	20	881	42	1	**944**	-	77	785	25	2	**889**	-	2060
% Lights and Motorcycles	90.9%	100%	100%	0%	**96.5%**	-	98.0%	100%	100%	0%	**99.4%**	-	100%	99.9%	95.5%	100%	**99.7%**	-	98.7%	99.7%	100%	100%	**99.7%**	-	99.6%
Heavy	0	0	0	0	**0**	-	1	0	0	0	**1**	-	0	1	2	0	**3**	-	1	2	0	0	**3**	-	7
% Heavy	0%	0%	0%	0%	**0%**	-	2.0%	0%	0%	0%	**0.6%**	-	0%	0.1%	4.5%	0%	**0.3%**	-	1.3%	0.3%	0%	0%	**0.3%**	-	0.3%
Bicycles on Road	2	0	0	0	**2**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	2
% Bicycles on Road	9.1%	0%	0%	0%	**3.5%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0.1%
Lights on Crosswalk and Motorcycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Lights on Crosswalk and Motorcycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	-	6	-	-	-	-	-	2	-	-	-	-	-	8	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	75.0%	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	25.0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

5363811 - Greenbank and Canfield/Craig Henry - Apr 29th - TMC

Sun Apr 29, 2018
AM Peak (WKND) (10:30AM - 11:30AM)
All Classes (Lights and Motorcycles, Lights on Crosswalk and Motorcycles on Crosswalk, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 517820, Location: 45.329982, -75.781649, Site Code: 37729103

Provided by: City of Ottawa
100 Constellation Dr,
Nepean, ON, K2G 5J9, CA



5363811 - Greenbank and Canfield/Craig Henry - Apr 29th - TMC

Sun Apr 29, 2018

Midday Peak (WKND) (12:45PM - 1:45PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Lights on Crosswalk and Motorcycles on Crosswalk, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 517820, Location: 45.329982, -75.781649, Site Code: 37729103

Provided by: City of Ottawa
100 Constellation Dr,
Nepean, ON, K2G 5J9, CA

Leg / Direction	West Eastbound						East Westbound						South Northbound						North Southbound						
Time	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	**Int**
2018-04-29 12:45PM	8	2	11	0	**21**	5	17	1	24	0	**42**	3	7	312	25	1	**345**	4	28	260	6	0	**294**	2	**702**
1:00PM	10	0	8	0	**18**	2	27	0	42	0	**69**	0	8	280	30	0	**318**	0	31	203	11	0	**245**	2	**650**
1:15PM	11	1	17	0	**29**	0	15	3	37	0	**55**	1	10	251	23	0	**284**	2	32	197	8	0	**237**	0	**605**
1:30PM	9	3	26	0	**38**	1	17	2	32	0	**51**	1	7	258	18	0	**283**	2	39	217	1	0	**257**	2	**629**
Total	38	6	62	0	**106**	8	76	6	135	0	**217**	5	32	1101	96	1	**1230**	8	130	877	26	0	**1033**	6	**2586**
% Approach	35.8%	5.7%	58.5%	0%	**-**	-	35.0%	2.8%	62.2%	0%	**-**	-	2.6%	89.5%	7.8%	0.1%	**-**	-	12.6%	84.9%	2.5%	0%	**-**	-	-
% Total	1.5%	0.2%	2.4%	0%	**4.1%**	-	2.9%	0.2%	5.2%	0%	**8.4%**	-	1.2%	42.6%	3.7%	0%	**47.6%**	-	5.0%	33.9%	1.0%	0%	**39.9%**	-	-
PHF	0.864	0.500	0.596		**-0.697**	-	0.704	0.500	0.804		**-0.786**	-	0.800	0.882	0.800	0.250	**0.891**	-	0.833	0.843	0.591		**-0.878**	-	0.921
Lights and Motorcycles	38	6	62	0	**106**	-	74	6	134	0	**214**	-	32	1096	94	1	**1223**	-	130	872	26	0	**1028**	-	2571
% Lights and Motorcycles	100%	100%	100%	0%	**100%**	-	97.4%	100%	99.3%	0%	**98.6%**	-	100%	99.5%	97.9%	100%	**99.4%**	-	100%	99.4%	100%	0%	**99.5%**	-	99.4%
Heavy	0	0	0	0	**0**	-	2	0	1	0	**3**	-	0	5	2	0	**7**	-	0	5	0	0	**5**	-	15
% Heavy	0%	0%	0%	0%	**0%**	-	2.6%	0%	0.7%	0%	**1.4%**	-	0%	0.5%	2.1%	0%	**0.6%**	-	0%	0.6%	0%	0%	**0.5%**	-	0.6%
Bicycles on Road	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Bicycles on Road	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%
Lights on Crosswalk and Motorcycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Lights on Crosswalk and Motorcycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-
Pedestrians	-	-	-	-	-	8	-	-	-	-	-	4	-	-	-	-	-	7	-	-	-	-	-	4	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	80.0%	-	-	-	-	-	87.5%	-	-	-	-	-	66.7%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	2	
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	20.0%	-	-	-	-	-	12.5%	-	-	-	-	-	33.3%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

5363811 - Greenbank and Canfield/Craig Henry - Apr 29th - TMC

Sun Apr 29, 2018

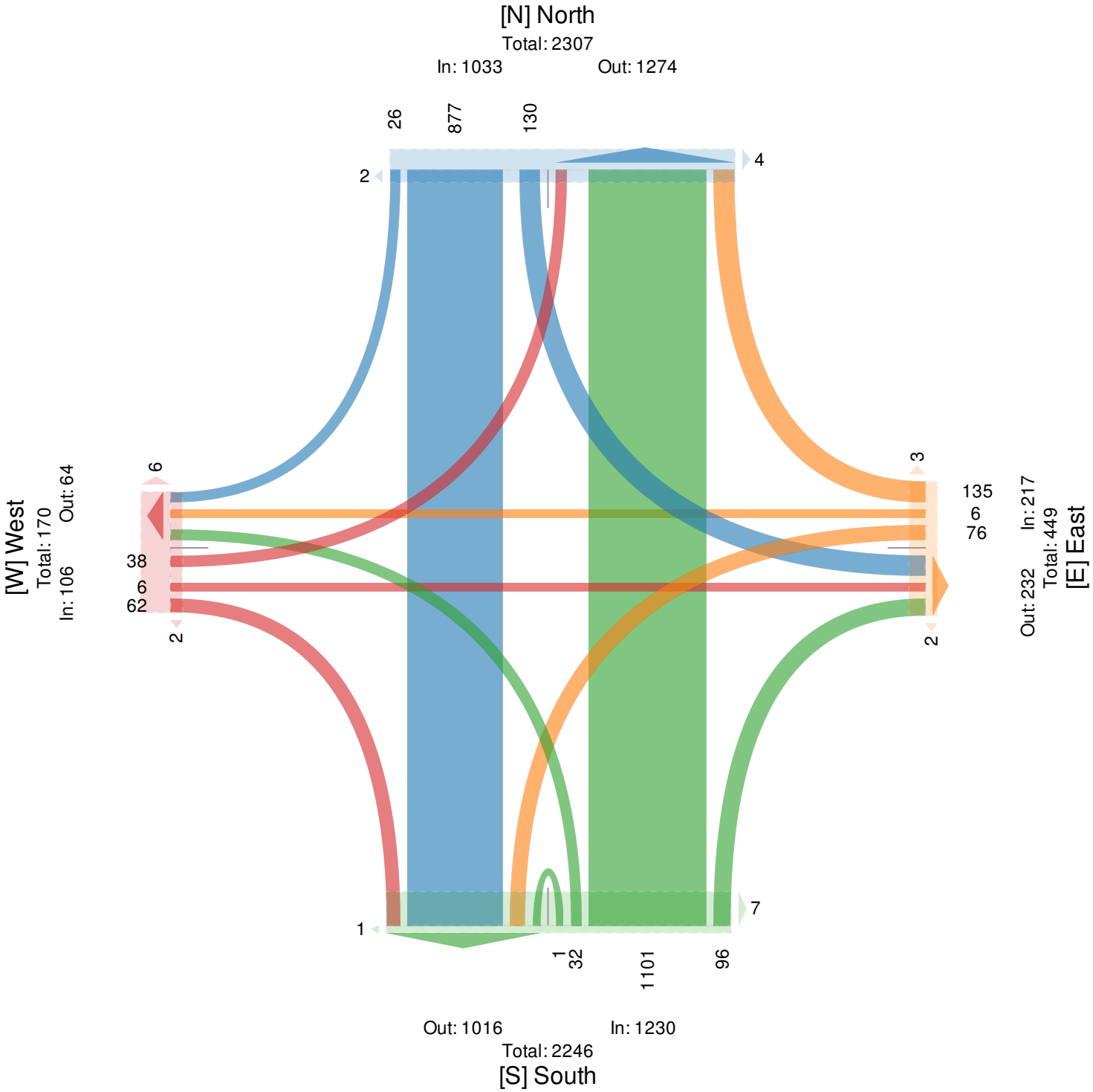
Midday Peak (WKND) (12:45PM - 1:45PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Lights on Crosswalk and Motorcycles on Crosswalk, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 517820, Location: 45.329982, -75.781649, Site Code: 37729103

Provided by: City of Ottawa
100 Constellation Dr,
Nepean, ON, K2G 5J9, CA



Transportation Services - Traffic Services

W.O. 35823

Turning Movement Count - 15 Minute Summary Report

GREENBANK RD @ CANFIELD RD/CRAIG HENRY DR

Survey Date: Wednesday, March 30, 2016

Total Observed U-Turns

Northbound: 2 Southbound: 9

Eastbound: 0 Westbound: 0

		GREENBANK RD									CANFIELD RD/CRAIG HENRY DR									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	3	219	3	**225**	10	129	3	**142**	**367**	4	0	6	**10**	8	0	27	**35**	**45**	**412**
07:15	07:30	2	295	3	**300**	7	148	2	**157**	**457**	10	2	12	**24**	10	2	31	**43**	**67**	**524**
07:30	07:45	2	325	7	**334**	12	176	3	**191**	**525**	8	3	6	**17**	11	1	55	**67**	**84**	**609**
07:45	08:00	1	340	17	**358**	16	220	5	**241**	**599**	20	1	11	**32**	29	2	44	**75**	**107**	**706**
08:00	08:15	4	360	12	**376**	18	178	0	**196**	**572**	17	5	10	**32**	12	1	46	**59**	**91**	**663**
08:15	08:30	4	344	14	**362**	21	155	1	**178**	**540**	11	3	8	**22**	8	2	54	**64**	**86**	**626**
08:30	08:45	2	290	13	**305**	22	158	4	**184**	**489**	15	4	7	**26**	21	2	37	**60**	**86**	**575**
08:45	09:00	3	253	15	**271**	18	183	4	**206**	**477**	12	2	7	**21**	8	0	45	**53**	**74**	**551**
09:00	09:15	1	210	15	**227**	23	143	2	**168**	**395**	12	0	4	**16**	11	1	32	**44**	**60**	**455**
09:15	09:30	1	202	6	**209**	19	150	4	**173**	**382**	7	2	7	**16**	11	0	34	**45**	**61**	**443**
09:30	09:45	3	190	6	**199**	16	130	1	**147**	**346**	10	0	5	**15**	6	1	42	**49**	**64**	**410**
09:45	10:00	4	175	9	**188**	10	161	2	**174**	**362**	4	1	5	**10**	15	0	31	**46**	**56**	**418**
11:30	11:45	6	171	4	**181**	22	158	7	**188**	**369**	8	1	3	**12**	4	1	29	**34**	**46**	**415**
11:45	12:00	7	186	11	**204**	25	201	7	**234**	**438**	4	0	1	**5**	9	1	17	**27**	**32**	**470**
12:00	12:15	7	192	20	**219**	29	206	5	**240**	**459**	4	0	5	**9**	12	1	27	**40**	**49**	**508**
12:15	12:30	5	208	18	**231**	22	206	7	**235**	**466**	6	1	6	**13**	11	1	19	**31**	**44**	**510**
12:30	12:45	3	227	7	**237**	17	181	9	**207**	**444**	5	2	4	**11**	5	1	29	**35**	**46**	**490**
12:45	13:00	8	213	12	**234**	14	184	4	**203**	**437**	4	1	3	**8**	18	2	32	**52**	**60**	**497**
13:00	13:15	4	177	11	**192**	23	182	1	**206**	**398**	13	3	12	**28**	10	1	25	**36**	**64**	**462**
13:15	13:30	1	180	21	**202**	23	173	7	**203**	**405**	4	2	3	**9**	12	1	20	**33**	**42**	**447**
15:00	15:15	1	221	16	**238**	30	274	6	**310**	**548**	8	1	4	**13**	17	0	29	**46**	**59**	**607**
15:15	15:30	9	205	18	**232**	42	329	8	**379**	**611**	5	3	4	**12**	12	2	24	**38**	**50**	**661**
15:30	15:45	5	197	19	**221**	37	245	9	**293**	**514**	6	2	5	**13**	10	3	33	**46**	**59**	**573**
15:45	16:00	3	229	13	**245**	34	300	12	**346**	**591**	3	3	6	**12**	13	5	26	**44**	**56**	**647**
16:00	16:15	7	222	26	**255**	38	300	7	**346**	**601**	6	1	6	**13**	18	1	31	**50**	**63**	**664**
16:15	16:30	4	204	25	**233**	55	285	7	**347**	**580**	2	2	0	**4**	16	2	29	**47**	**51**	**631**
16:30	16:45	6	205	18	**229**	43	286	9	**338**	**567**	1	3	3	**7**	17	11	31	**59**	**66**	**633**
16:45	17:00	6	191	24	**221**	40	293	13	**346**	**567**	5	4	5	**14**	12	2	38	**52**	**66**	**633**
17:00	17:15	8	205	27	**240**	59	283	15	**357**	**597**	10	2	5	**17**	18	2	30	**50**	**67**	**664**
17:15	17:30	4	188	25	**217**	58	262	5	**325**	**542**	1	1	8	**10**	22	5	43	**70**	**80**	**622**
17:30	17:45	9	187	20	**216**	47	283	10	**340**	**556**	8	2	7	**17**	19	3	35	**57**	**74**	**630**
17:45	18:00	4	210	16	**230**	53	284	9	**346**	**576**	5	0	4	**9**	12	3	34	**49**	**58**	**634**
TOTAL:		137	7221	471	**7831**	903	6846	188	**7946**	**15777**	238	57	182	**477**	417	60	1059	**1536**	**2013**	**17790**

Note: U-Turns are included in Totals.

Comment:

Transportation Services - Traffic Services

Turning Movement Count - Cyclist Volume Report

Work Order
35823

GREENBANK RD @ CANFIELD RD/CRAIG HENRY DR

Count Date: Wednesday, March 30, 2016 **Start Time:** 07:00

	GREENBANK RD			CANFIELD RD/CRAIG HENRY DR			
Time Period	Northbound	Southbound	**Street Total**	Eastbound	Westbound	**Street Total**	**Grand Total**
07:00 08:00	0	0	**0**	2	0	**2**	**2**
08:00 09:00	0	0	**0**	2	0	**2**	**2**
09:00 10:00	0	0	**0**	0	0	**0**	**0**
11:30 12:30	0	0	**0**	0	0	**0**	**0**
12:30 13:30	0	0	**0**	0	0	**0**	**0**
15:00 16:00	1	0	**1**	0	1	**1**	**2**
16:00 17:00	0	0	**0**	0	1	**1**	**1**
17:00 18:00	1	1	**2**	0	1	**1**	**3**
Total	2	1	**3**	4	3	**7**	**10**

Comment:

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

Transportation Services - Traffic Services

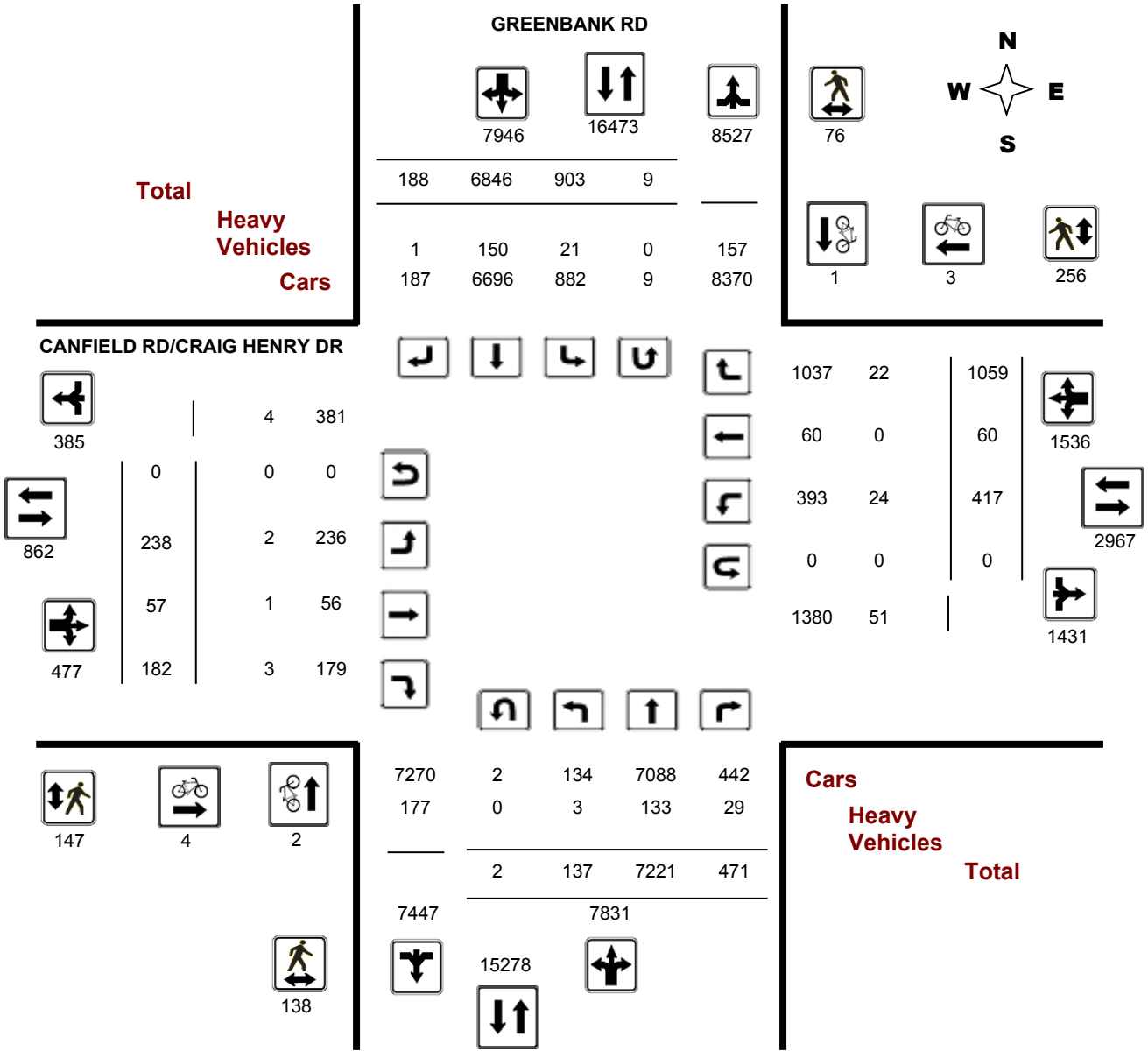
Turning Movement Count - Full Study Diagram

GREENBANK RD @ CANFIELD RD/CRAIG HENRY DR

Survey Date: Wednesday, March 30, 2016

WO#: 35823

Device: Miovision



Comments

Transportation Services - Traffic Services

W.O. 35823

Turning Movement Count - Heavy Vehicle Report

GREENBANK RD @ CANFIELD RD/CRAIG HENRY DR

Survey Date: Wednesday, March 30, 2016

		GREENBANK RD									CANFIELD RD/CRAIG HENRY DR									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	**N TOT**	LT	ST	RT	**S TOT**	**STR TOT**	LT	ST	RT	**E TOT**	LT	ST	RT	**W TOT**	**STR TOT**	**Grand Total**
07:00	08:00	1	21	6	**28**	7	23	0	**30**	**58**	0	0	0	**0**	4	0	1	**5**	**5**	**63**
08:00	09:00	1	20	5	**26**	5	22	0	**27**	**53**	1	0	1	**2**	2	0	2	**4**	**6**	**59**
09:00	10:00	0	15	2	**17**	4	30	0	**34**	**51**	1	0	0	**1**	4	0	3	**7**	**8**	**59**
11:30	12:30	1	16	4	**21**	1	16	1	**18**	**39**	0	0	0	**0**	2	0	0	**2**	**2**	**41**
12:30	13:30	0	22	4	**26**	1	22	0	**23**	**49**	0	0	0	**0**	3	0	2	**5**	**5**	**54**
15:00	16:00	0	13	4	**17**	0	16	0	**16**	**33**	0	1	1	**2**	3	0	2	**5**	**7**	**40**
16:00	17:00	0	10	2	**12**	1	15	0	**16**	**28**	0	0	1	**1**	2	0	6	**8**	**9**	**37**
17:00	18:00	0	16	2	**18**	2	6	0	**8**	**26**	0	0	0	**0**	4	0	6	**10**	**10**	**36**
Sub Total		3	133	29	**165**	21	150	1	**172**	**337**	2	1	3	**6**	24	0	22	**46**	**52**	**389**
U-Turns (Heavy Vehicles)					**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total		3	133	29	**0**	21	150	1	**172**	**337**	2	1	3	**6**	24	0	22	**46**	**52**	**389**

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

Transportation Services - Traffic Services

Work Order
35823

Turning Movement Count - Pedestrian Volume Report

GREENBANK RD @ CANFIELD RD/CRAIG HENRY DR

Count Date: Wednesday, March 30, 2016 **Start Time:** 07:00

Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	1	5	**6**	0	1	**1**	**7**
07:15 07:30	0	0	**0**	2	4	**6**	**6**
07:30 07:45	3	2	**5**	4	1	**5**	**10**
07:45 08:00	24	6	**30**	16	5	**21**	**51**
07:00 08:00	28	13	**41**	22	11	**33**	**74**
08:00 08:15	6	1	**7**	3	2	**5**	**12**
08:15 08:30	2	2	**4**	5	3	**8**	**12**
08:30 08:45	5	11	**16**	7	5	**12**	**28**
08:45 09:00	0	12	**12**	7	6	**13**	**25**
08:00 09:00	13	26	**39**	22	16	**38**	**77**
09:00 09:15	2	0	**2**	0	2	**2**	**4**
09:15 09:30	0	0	**0**	0	1	**1**	**1**
09:30 09:45	1	1	**2**	2	3	**5**	**7**
09:45 10:00	1	1	**2**	0	3	**3**	**5**
09:00 10:00	4	2	**6**	2	9	**11**	**17**
11:30 11:45	2	1	**3**	1	5	**6**	**9**
11:45 12:00	8	4	**12**	8	30	**38**	**50**
12:00 12:15	3	0	**3**	3	21	**24**	**27**
12:15 12:30	3	8	**11**	6	21	**27**	**38**
11:30 12:30	16	13	**29**	18	77	**95**	**124**
12:30 12:45	0	1	**1**	2	5	**7**	**8**
12:45 13:00	2	0	**2**	2	7	**9**	**11**
13:00 13:15	3	0	**3**	6	4	**10**	**13**
13:15 13:30	1	1	**2**	1	3	**4**	**6**
12:30 13:30	6	2	**8**	11	19	**30**	**38**
15:00 15:15	2	5	**7**	3	5	**8**	**15**
15:15 15:30	29	4	**33**	6	67	**73**	**106**
15:30 15:45	10	1	**11**	6	13	**19**	**30**
15:45 16:00	4	1	**5**	8	4	**12**	**17**
15:00 16:00	45	11	**56**	23	89	**112**	**168**
16:00 16:15	3	0	**3**	12	2	**14**	**17**
16:15 16:30	1	1	**2**	5	2	**7**	**9**
16:30 16:45	6	1	**7**	2	5	**7**	**14**
16:45 17:00	3	2	**5**	12	4	**16**	**21**
16:00 17:00	13	4	**17**	31	13	**44**	**61**
17:00 17:15	5	3	**8**	4	6	**10**	**18**
17:15 17:30	5	0	**5**	4	6	**10**	**15**
17:30 17:45	3	2	**5**	7	5	**12**	**17**
17:45 18:00	0	0	**0**	3	5	**8**	**8**
17:00 18:00	13	5	**18**	18	22	**40**	**58**
Total	138	76	**214**	147	256	**403**	**617**

Comment:

Transportation Services - Traffic Services

Work Order
35823

Turning Movement Count - Full Study Summary Report

GREENBANK RD @ CANFIELD RD/CRAIG HENRY DR

Survey Date: Wednesday, March 30, 2016

Total Observed U-Turns

Northbound: 2 Southbound: 9
Eastbound: 0 Westbound: 0

AADT Factor
1.00

Full Study

	GREENBANK RD									CANFIELD RD/CRAIG HENRY DR									
	Northbound				Southbound					Eastbound				Westbound					
Period	LT	ST	RT	**NB TOT**	LT	ST	RT	**SB TOT**	**STR TOT**	LT	ST	RT	**EB TOT**	LT	ST	RT	**WB TOT**	**STR TOT**	**Grand Total**
07:00 08:00	8	1179	30	**1217**	45	673	13	**731**	**1948**	42	6	35	**83**	58	5	157	**220**	**303**	**2251**
08:00 09:00	13	1247	54	**1314**	79	674	9	**762**	**2076**	55	14	32	**101**	49	5	182	**236**	**337**	**2413**
09:00 10:00	9	777	36	**822**	68	584	9	**661**	**1483**	33	3	21	**57**	43	2	139	**184**	**241**	**1724**
11:30 12:30	25	757	53	**835**	98	771	26	**895**	**1730**	22	2	15	**39**	36	4	92	**132**	**171**	**1901**
12:30 13:30	16	797	51	**864**	77	720	21	**818**	**1682**	26	8	22	**56**	45	5	106	**156**	**212**	**1894**
15:00 16:00	18	852	66	**936**	143	1148	35	**1326**	**2262**	22	9	19	**50**	52	10	112	**174**	**224**	**2486**
16:00 17:00	23	822	93	**938**	176	1164	36	**1376**	**2314**	14	10	14	**38**	63	16	129	**208**	**246**	**2560**
17:00 18:00	25	790	88	**903**	217	1112	39	**1368**	**2271**	24	5	24	**53**	71	13	142	**226**	**279**	**2550**
Sub Total	137	7221	471	**7829**	903	6846	188	**7937**	**15766**	238	57	182	**477**	417	60	1059	**1536**	**2013**	**17779**
U Turns				**2**				**9**	**11**				**0**				**0**	**0**	**11**
Total	137	7221	471	**7831**	903	6846	188	**7946**	**15777**	238	57	182	**477**	417	60	1059	**1536**	**2013**	**17790**
EQ 12Hr	190	10037	655	**10885**	1255	9516	261	**11045**	**21930**	331	79	253	**663**	580	83	1472	**2135**	**2798**	**24728**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.													**1.39**						
AVG 12Hr	190	10037	655	**10885**	1255	9516	261	**11045**	**21930**	331	79	253	**663**	580	83	1472	**2135**	**2798**	**24728**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.													**1.00**						
AVG 24Hr	249	13149	858	**14259**	1644	12466	342	**14469**	**28728**	433	104	331	**869**	759	109	1928	**2797**	**3666**	**32394**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.													**1.31**						

Comments:

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

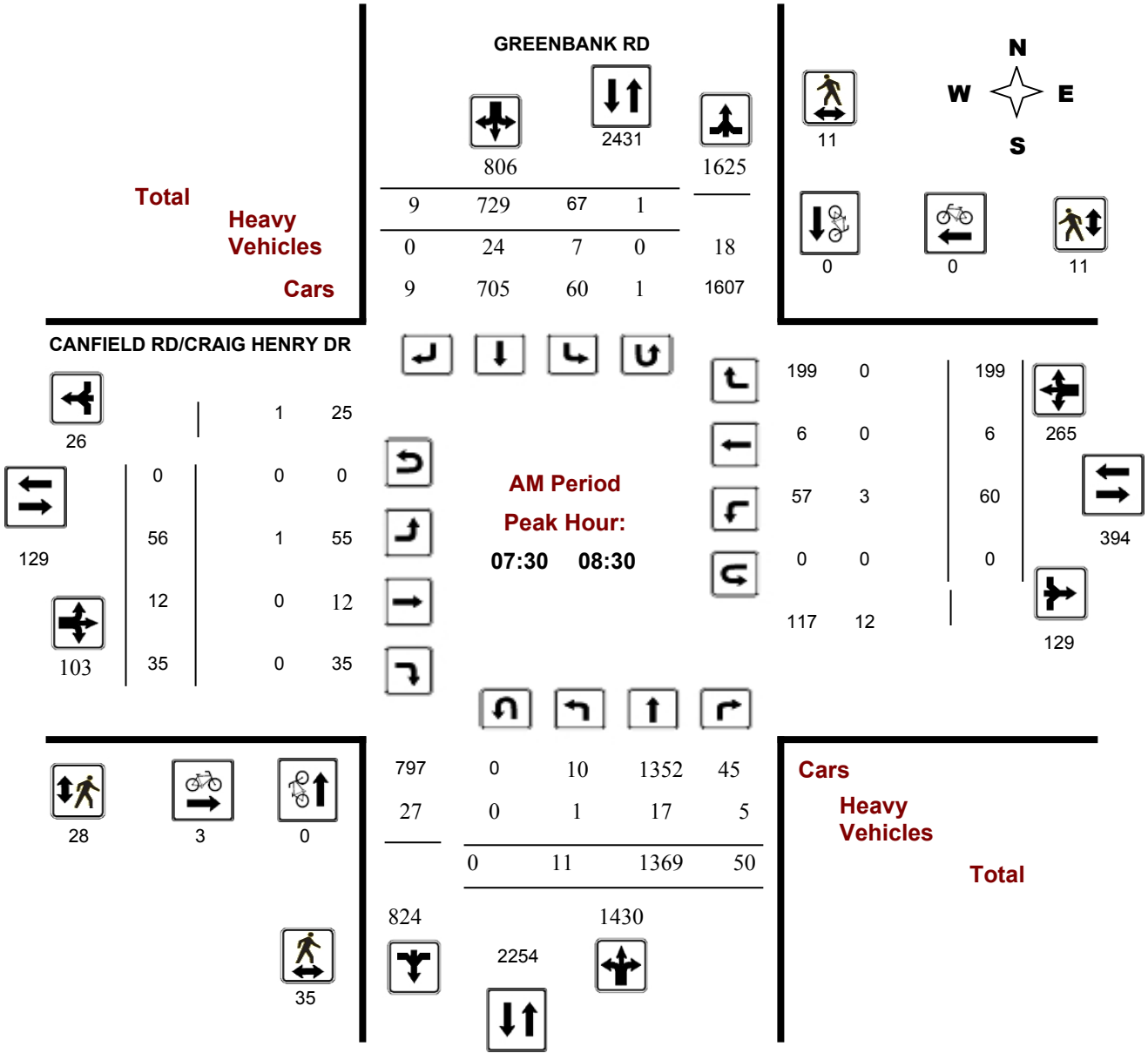
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

GREENBANK RD @ CANFIELD RD/CRAIG HENRY DR

Survey Date: Wednesday, March 30, 2016 **WO No:** 35823

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



Comments

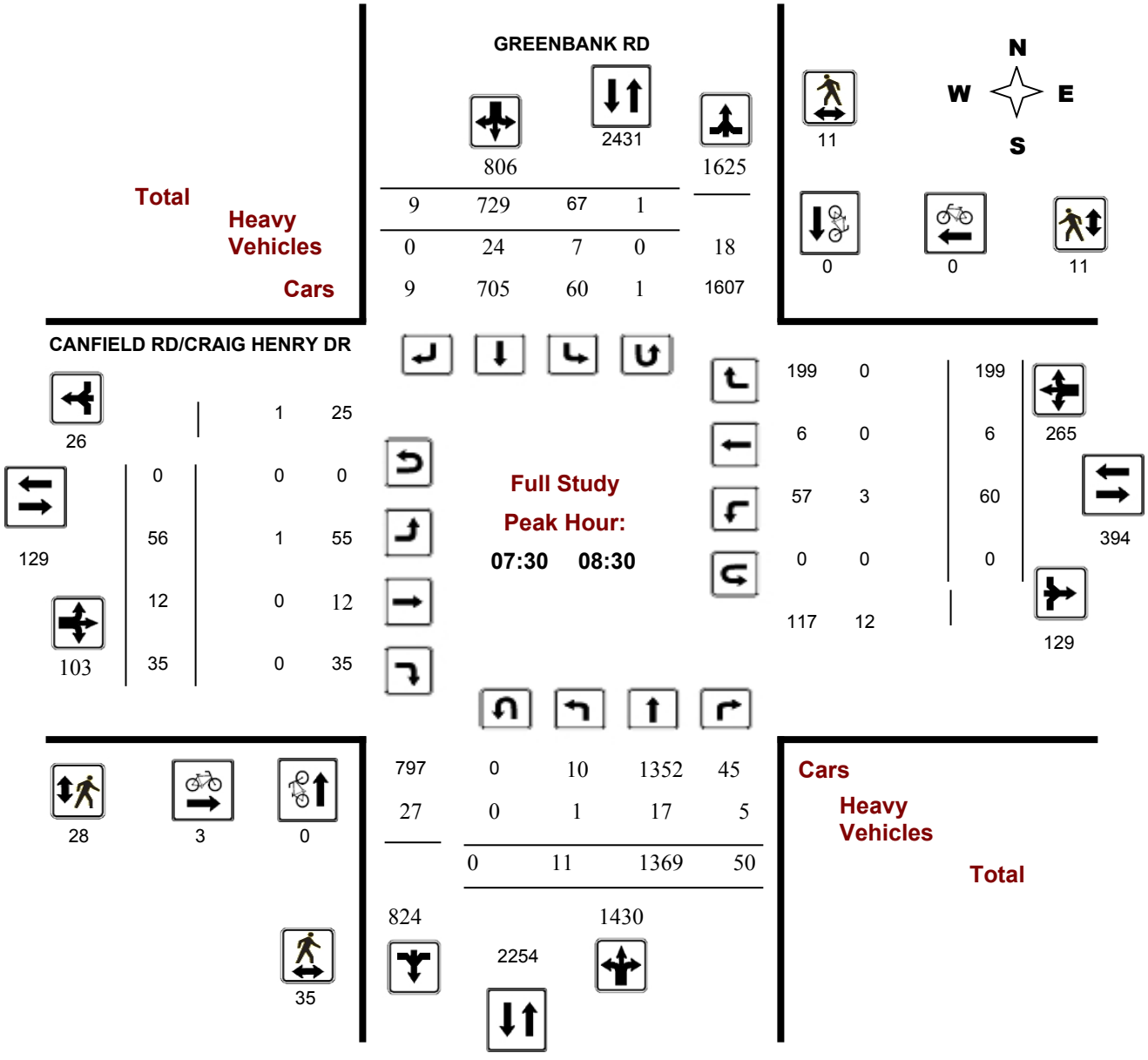
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

GREENBANK RD @ CANFIELD RD/CRAIG HENRY DR

Survey Date: Wednesday, March 30, 2016 **WO No:** 35823

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



Comments

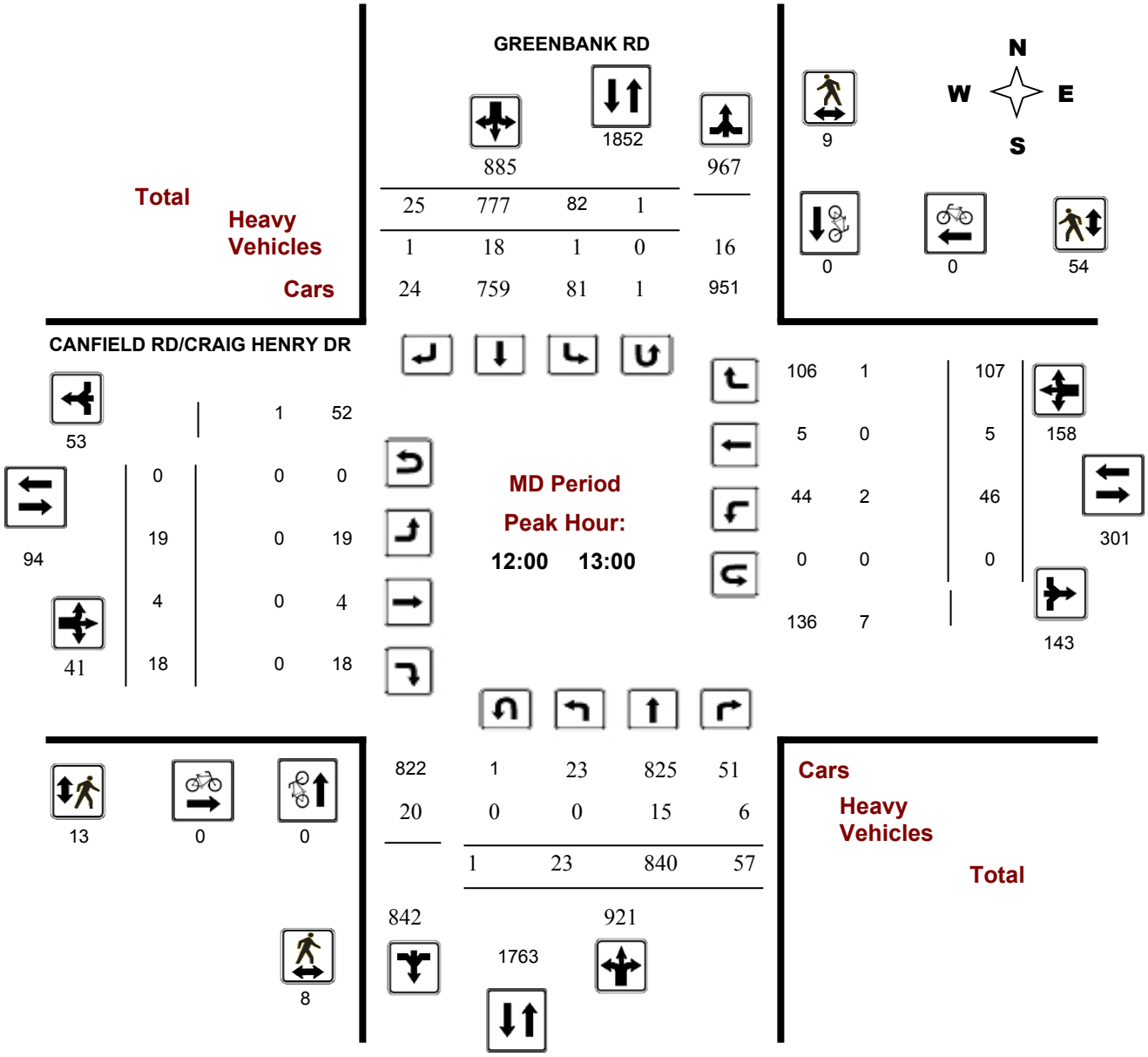
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

GREENBANK RD @ CANFIELD RD/CRAIG HENRY DR

Survey Date: Wednesday, March 30, 2016 **WO No:** 35823

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



Comments

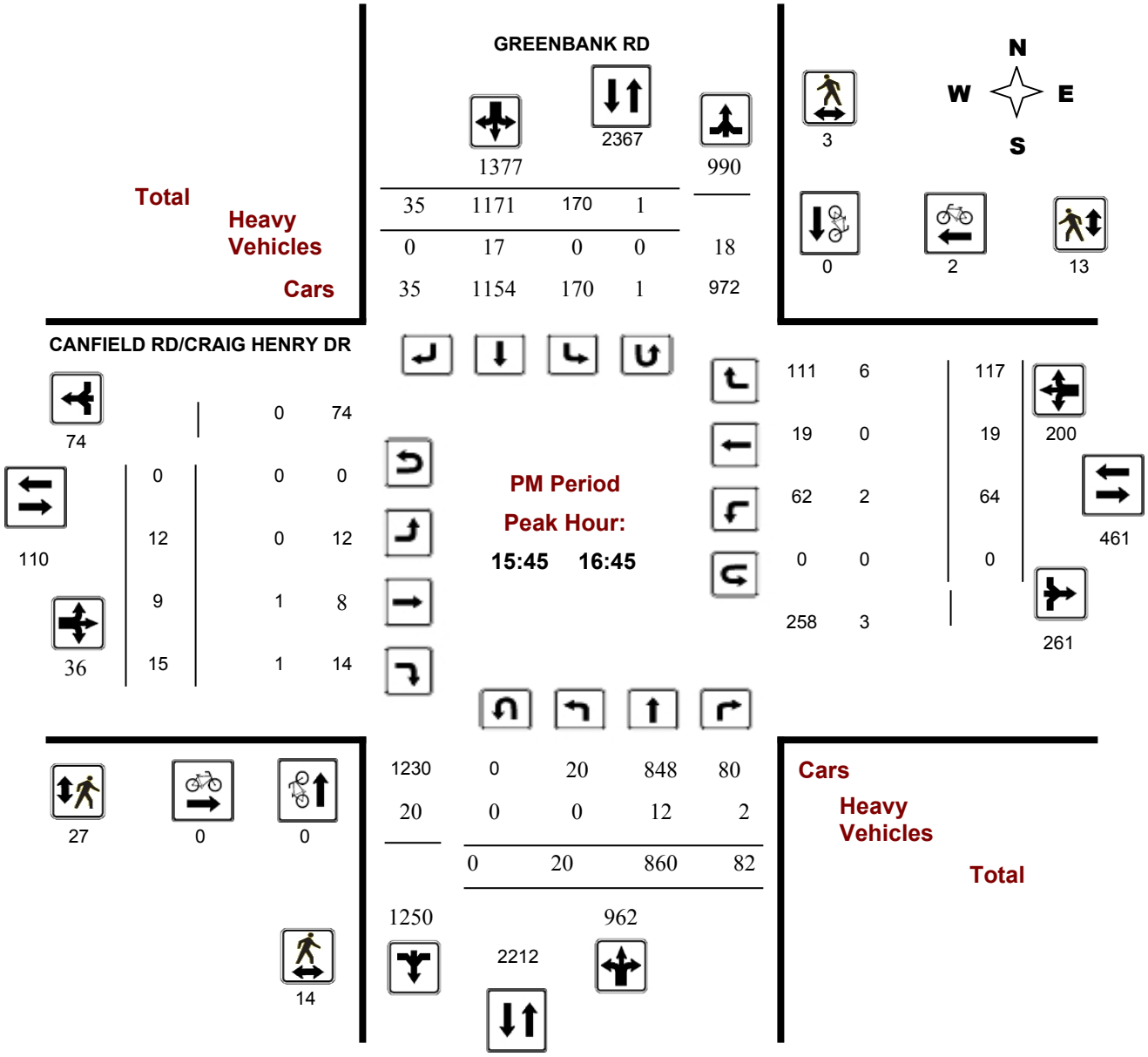
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

GREENBANK RD @ CANFIELD RD/CRAIG HENRY DR

Survey Date: Wednesday, March 30, 2016 **WO No:** 35823

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



Comments

Transportation Services - Traffic Services

Work Order
35823

Turning Movement Count - 15 Min U-Turn Total Report

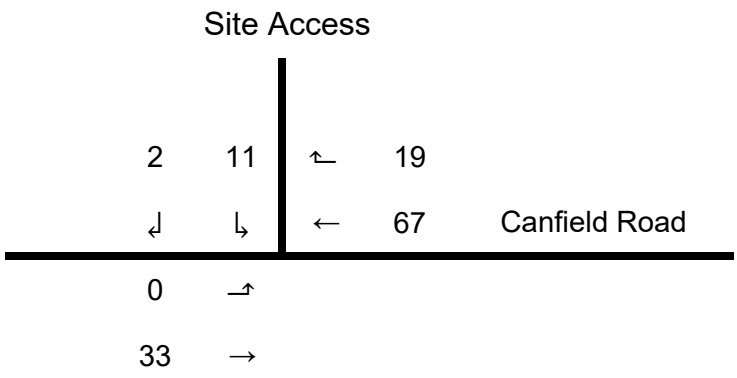
GREENBANK RD @ CANFIELD RD/CRAIG HENRY DR

Survey Date: Wednesday, March 30, 2016

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

Date: November 7, 2019

PM peak hour



Appendix B STEP 3.0 – FORECASTING COMMENT RESPONSE

From:	Gervais, Josiane
To:	O"Grady, Lauren
Cc:	Meloshe, Nancy; Smith, Molly; Dickinson, Mary
Subject:	RE: 1 Canfield - Step 3 TIA - TPM Comments
Date:	Friday, November 29, 2019 12:00:59 PM

Hi Lauren,

The responses below are adequate. Please incorporate the comments/responses below within your report, and proceed to Step 4.

Regards,

Josiane Gervais, P.Eng.
Project Manager, Infrastructure Approvals | GPRJ Approbation des demandes d'infrastructure
Development Review Branch | Dir Examen des projets d'aménagement
City of Ottawa | Ville d'Ottawa
Tel |Tél. : 613-580- 2424 ext. | poste 21765
web | Site Web : www.ottawa.ca

From: O'Grady, Lauren <Lauren.OGrady@stantec.com>
Sent: November 28, 2019 3:19 PM
To: Gervais, Josiane <josiane.gervais@ottawa.ca>
Cc: Meloshe, Nancy <Nancy.Meloshe@stantec.com>; Smith, Molly <Molly.Smith@stantec.com>; Dickinson, Mary <mary.dickinson@ottawa.ca>
Subject: RE: 1 Canfield - Step 3 TIA - TPM Comments

Good morning Josiane,

Please see below my comment responses in green. If these comments are acceptable, I recommend proceeding with the Step 4 TIA as there is very little that needs to be changed in the Step 3 TIA that adds value to the overall study.

Please let me know if you and TES concur and if I can proceed with the Step 4 TIA.

Feel free to give me a call to discuss.

Have a great day

Lauren O'Grady P.Eng.
Transportation Engineer

Direct: 613-784-2264

lauren.o'grady@stantec.com

Stantec
400 - 1331 Clyde Avenue
Ottawa ON K2C 3G4

From: Gervais, Josiane <josiane.gervais@ottawa.ca>
Sent: Wednesday, November 27, 2019 1:07 PM
To: O'Grady, Lauren <Lauren.OGrady@stantec.com>
Subject: RE: 1 Canfield - Step 3 TIA - TPM Comments

Hi Lauren,

Please find comments below regarding the Forecasting Report:

Transportation Engineering Services

- Confirm whether there is a planned church expansion and/or phase 2. In the report, only one phase is indicated, but the site plan shows otherwise. The site plan is also inconsistent regarding the size of the office. The proposed site includes one phase.
- Clarify the use/ownership of the existing houses that remain within the Subject Site. There is one house that is within the subject site that will be owned by the church. The function and use of this house will not change from existing.
- Provide further justification that the expansion building will not increase trip generation during the Sunday peak hour. It seems likely that the size of the church's congregation may increase with people attracted to the church by the additional facilities in the expansion building (gym, kitchen, classrooms, chapel, etc…). As the size of the church is not anticipating to increase, the number of people who attend Sunday service will not increase (the current church is currently at capacity for Sunday service). The way the operations will work on a Sunday is that the attendees will go to the service on Sunday and then people will typically head over to the expansion building for socialization / refreshments / Sunday school. There will be no activities happening in the expansion building during Sunday service, therefore, the number of trips the site will generate will not be more than what is there currently on a Sunday. This information was provided to us by the client.
- Consider contacting The Met (Prince of Wales/Hunt Club) to obtain their weekday PM trip generation for similar functions. Using the Church land use code for weekday PM peak is likely to underestimate person-trips to the multi-purpose facility. Using the church land use for the expansion building was agreed upon by the City during the preparation of the Step 3 TIA. This land use includes auxiliary uses such as classrooms, dining facilities, party rooms, etc. In addition, the majority of the events (i.e. birthday parties, community meetings) that will occur in the expansion building will not overlap with the roadway peak. It will likely occur once the PM peak hour has slowed down.

- Provide at least the minimum number of parking spaces required by the by-law. Providing fewer than required will require an exemption through the Committee of Adjustment. With a gym/stage capably of accommodating 672 people, 96 parking spaces will be insufficient. Attention will need to be paid to the parking spillover module in step 4, particularly with the potential for spillover parking on Parkmount Crescent (which the expanded Site is now directly adjacent to). There will be an agreement in place between the church and an adjacent school that will allow spillover parking to use the school parking lot on Sundays. The Step 4 TIA will address parking and provide more details.
- Correct the number of parking spaces shown in section 3.3.2. the number of parking spaces will be confirmed as part of the Step 4 TIA.
- Include the traffic counts referenced in 2.1.2.5 in an appendix. The appendices will be provided as part of the Step 4 TIA.
- The proponent must re-submit Step 3 to address the issues noted above. See response to the second Development Review comment below.

Traffic Signal Operations

- No comments. Noted.

Development Review - TPM

- Revise Table 4 (and subsequent figures). According to the site plan, the Gross Floor Area of Phase 1 is +/- 2,948 m^2 (31,710 s.f.). As agreed upon by the City during the preparation of the Step 3 TIA, the GFA of the 'gym / hall' area was used to calculate the number of trips. The rationale being that the gym / hall is the main reason people will use the expansion building. The auxiliary uses (office, etc.) will be used by people who are already attending the functions / events in the gym / hall. Despite this, the trip generation was rerun with the entire expansion building area (31,710 GFA) and it was found that the number of trips during the PM peak hour is 20 two-way trips, which is a negligible increase compared to using the 6000 GFA of the gym. The 31,710 GFA will be used to be conservative in the trip generation and can be reflected in the Step 4 TIA.
- Section 3.2.1 should comment on network plans for all travel modes. Based on the above comment responses, Stantec recommends proceeding with the Step 4 TIA as there is very little to change in the Step 3 TIA that will add value.

As requested by TES, please update and re-submit the forecasting report.

Regards,

Josiane Gervais, P.Eng.
Project Manager, Infrastructure Approvals | GPRJ Approbation des demandes d'infrastructure
Development Review Branch | Dir Examen des projets d'aménagement
City of Ottawa | Ville d'Ottawa
Tel |Tél. : 613-580- 2424 ext. | poste 21765

web | Site Web : www.ottawa.ca

From: O'Grady, Lauren <Lauren.OGrady@stantec.com>
Sent: November 08, 2019 2:38 PM
To: Gervais, Josiane <josiane.gervais@ottawa.ca>
Cc: Meloshe, Nancy <Nancy.Meloshe@stantec.com>; bishoy samy <bishoy_samy@hotmail.com>
Subject: 1 Canfield - Step 3 TIA

Hi Josiane,

Please see attached the Step 3 TIA for the proposed development located at 1 Canfield. Please let me know if you have any questions or comments.

Have a great weekend,

Lauren O'Grady P.Eng.
Transportation Engineer

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Appendix C MULTI-MODAL LEVEL OF SERVICE ANALYSIS

Multi-Modal Level of Service - Intersections Form

Consultant	**Stantec**	**Project**	**1 Canfield Road**
Scenario	**2019 Existing**	**Date**	**December 5th, 2019**

INTERSECTIONS		**Greenbank Road at Canfield Road**			
	Crossing Side	**NORTH**	**SOUTH**	**EAST**	**WEST**
Pedestrian	Lanes	5	5	3	3
	Median	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m
	Conflicting Left Turns	Permissive	Permissive	Permissive	Permissive
	Conflicting Right Turns	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control
	Right Turns on Red (RToR) ?	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed
	Ped Signal Leading Interval?	No	No	No	No
	Right Turn Channel	No Channel	No Channel	No Channel	No Channel
	Corner Radius	10-15m	10-15m	10-15m	10-15m
	Crosswalk Type	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings
	PETSI Score	**37**	**37**	**70**	**70**
	Ped. Exposure to Traffic LoS	**E**	**E**	**C**	**C**
	Cycle Length	110	110	110	110
	Effective Walk Time	9	9	57	57
	Average Pedestrian Delay	**46**	**46**	**13**	**13**
	Pedestrian Delay LoS	**E**	**E**	**B**	**B**
	Level of Service	**E**	**E**	**C**	**C**
		E			
	Approach From	**NORTH**	**SOUTH**	**EAST**	**WEST**
Bicycle	Bicycle Lane Arrangement on Approach	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic
	IF Dedicated Right Turn Lane, THEN Right Turn Configuration, ELSE <blank>				
	Dedicated Right Turning Speed				
	Cyclist Through Movement				
	Separated or Mixed Traffic	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**
	Left Turn Approach	One lane crossed	One lane crossed	No lane crossed	No lane crossed
	Operating Speed	≥ 60 km/h	≥ 60 km/h	≤ 40 km/h	≤ 40 km/h
	Left Turning Cyclist	**F**	**F**	**B**	**B**
	Level of Service	**F**	**F**	**B**	**B**
		F			
Transit	Average Signal Delay	≤ 30 sec	≤ 20 sec	> 40 sec	
	Level of Service	**D**	**C**	**F**	**-**
		F			
Truck	Effective Corner Radius				
	Number of Receiving Lanes on Departure from Intersection				
	Level of Service	**-**	**-**	**-**	**-**
		-			

Multi-Modal Level of Service - Intersections Form

Consultant	**Stantec**	**Project**	**1 Canfield Road**
Scenario	**2021 Future Background**	**Date**	**December 5th, 2019**

INTERSECTIONS		**Greenbank Road at Canfield Road**			
	Crossing Side	**NORTH**	**SOUTH**	**EAST**	**WEST**
Pedestrian	Lanes	5	5	3	3
	Median	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m
	Conflicting Left Turns	Permissive	Permissive	Permissive	Permissive
	Conflicting Right Turns	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control
	Right Turns on Red (RToR) ?	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed
	Ped Signal Leading Interval?	No	No	No	No
	Right Turn Channel	No Channel	No Channel	No Channel	No Channel
	Corner Radius	10-15m	10-15m	10-15m	10-15m
	Crosswalk Type	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings
	PETSI Score	**37**	**37**	**70**	**70**
	Ped. Exposure to Traffic LoS	**E**	**E**	**C**	**C**
	Cycle Length	110	110	110	110
	Effective Walk Time	9	9	57	57
	Average Pedestrian Delay	**46**	**46**	**13**	**13**
	Pedestrian Delay LoS	**E**	**E**	**B**	**B**
	Level of Service	**E**	**E**	**C**	**C**
		E			
	Approach From	**NORTH**	**SOUTH**	**EAST**	**WEST**
Bicycle	Bicycle Lane Arrangement on Approach	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic
	IF Dedicated Right Turn Lane, THEN Right Turn Configuration, ELSE <blank>				
	Dedicated Right Turning Speed				
	Cyclist Through Movement				
	Separated or Mixed Traffic	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**
	Left Turn Approach	One lane crossed	One lane crossed	No lane crossed	No lane crossed
	Operating Speed	≥ 60 km/h	≥ 60 km/h	≤ 40 km/h	≤ 40 km/h
	Left Turning Cyclist	**F**	**F**	**B**	**B**
	Level of Service	**F**	**F**	**B**	**B**
		F			
Transit	Average Signal Delay	≤ 40 sec	≤ 20 sec	> 40 sec	
	Level of Service	**E**	**C**	**F**	**-**
		F			
Truck	Effective Corner Radius				
	Number of Receiving Lanes on Departure from Intersection				
	Level of Service	**-**	**-**	**-**	**-**
		-			

Multi-Modal Level of Service - Intersections Form

Consultant	**Stantec**	**Project**	**1 Canfield Road**
Scenario	**2021 Total Future**	**Date**	**December 5th, 2019**

INTERSECTIONS		**Greenbank Road at Canfield Road**			
	Crossing Side	**NORTH**	**SOUTH**	**EAST**	**WEST**
Pedestrian	Lanes	5	5	3	3
	Median	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m
	Conflicting Left Turns	Permissive	Permissive	Permissive	Permissive
	Conflicting Right Turns	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control
	Right Turns on Red (RToR) ?	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed
	Ped Signal Leading Interval?	No	No	No	No
	Right Turn Channel	No Channel	No Channel	No Channel	No Channel
	Corner Radius	10-15m	10-15m	10-15m	10-15m
	Crosswalk Type	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings
	PETSI Score	**37**	**37**	**70**	**70**
	Ped. Exposure to Traffic LoS	**E**	**E**	**C**	**C**
	Cycle Length	110	110	110	110
	Effective Walk Time	9	9	57	57
	Average Pedestrian Delay	**46**	**46**	**13**	**13**
	Pedestrian Delay LoS	**E**	**E**	**B**	**B**
	Level of Service	**E**	**E**	**C**	**C**
		E			
	Approach From	**NORTH**	**SOUTH**	**EAST**	**WEST**
Bicycle	Bicycle Lane Arrangement on Approach	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic
	IF Dedicated Right Turn Lane, THEN Right Turn Configuration, ELSE <blank>				
	Dedicated Right Turning Speed				
	Cyclist Through Movement				
	Separated or Mixed Traffic	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**
	Left Turn Approach	One lane crossed	One lane crossed	No lane crossed	No lane crossed
	Operating Speed	≥ 60 km/h	≥ 60 km/h	≤ 40 km/h	≤ 40 km/h
	Left Turning Cyclist	**F**	**F**	**B**	**B**
	Level of Service	**F**	**F**	**B**	**B**
		F			
Transit	Average Signal Delay	≤ 40 sec	≤ 20 sec	> 40 sec	
	Level of Service	**E**	**C**	**F**	**-**
		F			
Truck	Effective Corner Radius				
	Number of Receiving Lanes on Departure from Intersection				
	Level of Service	**-**	**-**	**-**	**-**
		-			

Multi-Modal Level of Service - Intersections Form

Consultant	**Stantec**	**Project**	**1 Canfield Road**
Scenario	**2026 Ultimate**	**Date**	**December 5th, 2019**

INTERSECTIONS		**Greenbank Road at Canfield Road**			
	Crossing Side	**NORTH**	**SOUTH**	**EAST**	**WEST**
Pedestrian	Lanes	5	5	3	3
	Median	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m
	Conflicting Left Turns	Permissive	Permissive	Permissive	Permissive
	Conflicting Right Turns	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control
	Right Turns on Red (RToR) ?	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed
	Ped Signal Leading Interval?	No	No	No	No
	Right Turn Channel	No Channel	No Channel	No Channel	No Channel
	Corner Radius	10-15m	10-15m	10-15m	10-15m
	Crosswalk Type	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings
	PETSI Score	**37**	**37**	**70**	**70**
	Ped. Exposure to Traffic LoS	**E**	**E**	**C**	**C**
	Cycle Length	110	110	110	110
	Effective Walk Time	9	9	57	57
	Average Pedestrian Delay	**46**	**46**	**13**	**13**
	Pedestrian Delay LoS	**E**	**E**	**B**	**B**
	Level of Service	**E**	**E**	**C**	**C**
		E			
	Approach From	**NORTH**	**SOUTH**	**EAST**	**WEST**
Bicycle	Bicycle Lane Arrangement on Approach	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic
	IF Dedicated Right Turn Lane, THEN Right Turn Configuration, ELSE <blank>				
	Dedicated Right Turning Speed				
	Cyclist Through Movement				
	Separated or Mixed Traffic	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**
	Left Turn Approach	One lane crossed	One lane crossed	No lane crossed	No lane crossed
	Operating Speed	≥ 60 km/h	≥ 60 km/h	≤ 40 km/h	≤ 40 km/h
	Left Turning Cyclist	**F**	**F**	**B**	**B**
	Level of Service	**F**	**F**	**B**	**B**
		F			
Transit	Average Signal Delay	> 40 sec	≤ 20 sec	> 40 sec	
	Level of Service	**F**	**C**	**F**	**-**
		F			
Truck	Effective Corner Radius				
	Number of Receiving Lanes on Departure from Intersection				
	Level of Service	**-**	**-**	**-**	**-**
		-			

Multi-Modal Level of Service - Segments Form

Consultant	**Stantec**	**Project**	**1 Canfield Road**
Scenario	**2019 Existing**	**Date**	**December 5th, 2019**

SEGMENTS		Greenbank along PL	Canfield along PL
Pedestrian	Sidewalk Width Boulevard Width	1.5 m > 2 m	1.8 m < 0.5 m
	Avg Daily Curb Lane Traffic Volume	> 3000	≤ 3000
	Operating Speed On-Street Parking	> 60 km/h no	> 30 to 50 km/h yes
	Exposure to Traffic PLoS	**E**	**B**
	Level of Service	**E**	**B**
Bicycle	Type of Cycling Facility	Mixed Traffic	Mixed Traffic
	Number of Travel Lanes	2-3 lanes total	≤ 2 (no centreline)
	Operating Speed	≥ 60 km/h	≤ 40 km/h
	# of Lanes & Operating Speed LoS	**F**	**A**
	Bike Lane (+ Parking Lane) Width		
	Bike Lane Width LoS	-	-
	Bike Lane Blockages		
	Blockage LoS	-	-
	Level of Service	**F**	**A**
Transit	Facility Type	Mixed Traffic	
	Friction or Ratio Transit:Posted Speed	Vt/Vp ≥ 0.8	
	Level of Service	**D**	**-**
Truck	Truck Lane Width	≤ 3.5 m	
	Travel Lanes per Direction	> 1	
	Level of Service	**A**	**-**

Appendix D TRANSPORTATION DEMAND MANAGEMENT

TDM-Supportive Development Design and Infrastructure Checklist:
Non-Residential Developments (office, institutional, retail or industrial)

Legend

REQUIRED	The Official Plan or Zoning By-law provides related guidance that must be followed
BASIC	The measure is generally feasible and effective, and in most cases would benefit the development and its users
BETTER	The measure could maximize support for users of sustainable modes, and optimize development performance

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	1.	**WALKING & CYCLING: ROUTES**	
	1.1	**Building location & access points**	
BASIC	1.1.1	Locate building close to the street, and do not locate parking areas between the street and building entrances	☐
BASIC	1.1.2	Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	☑
BASIC	1.1.3	Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	☐
	1.2	**Facilities for walking & cycling**	
REQUIRED	1.2.1	Provide convenient, direct access to stations or major stops along rapid transit routes within 600 metres; minimize walking distances from buildings to rapid transit; provide pedestrian-friendly, weather-protected (where possible) environment between rapid transit accesses and building entrances; ensure quality linkages from sidewalks through building entrances to integrated stops/stations *(see Official Plan policy 4.3.3)*	☐
REQUIRED	1.2.2	Provide safe, direct and attractive pedestrian access from public sidewalks to building entrances through such measures as: reducing distances between public sidewalks and major building entrances; providing walkways from public streets to major building entrances; within a site, providing walkways along the front of adjoining buildings, between adjacent buildings, and connecting areas where people may congregate, such as courtyards and transit stops; and providing weather protection through canopies, colonnades, and other design elements wherever possible *(see Official Plan policy 4.3.12)*	☑

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
REQUIRED	1.2.3	Provide sidewalks of smooth, well-drained walking surfaces of contrasting materials or treatments to differentiate pedestrian areas from vehicle areas, and provide marked pedestrian crosswalks at intersection sidewalks *(see Official Plan policy 4.3.10)*	☑
REQUIRED	1.2.4	Make sidewalks and open space areas easily accessible through features such as gradual grade transition, depressed curbs at street corners and convenient access to extra-wide parking spaces and ramps *(see Official Plan policy 4.3.10)*	☑
REQUIRED	1.2.5	Include adequately spaced inter-block/street cycling and pedestrian connections to facilitate travel by active transportation. Provide links to the existing or planned network of public sidewalks, multi-use pathways and on-road cycle routes. Where public sidewalks and multi-use pathways intersect with roads, consider providing traffic control devices to give priority to cyclists and pedestrians *(see Official Plan policy 4.3.11)*	☑
BASIC	1.2.6	Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	☑
BASIC	1.2.7	Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	☐
BASIC	1.2.8	Design roads used for access or circulation by cyclists using a target operating speed of no more than 30 km/h, or provide a separated cycling facility	☐
	1.3	**Amenities for walking & cycling**	
BASIC	1.3.1	Provide lighting, landscaping and benches along walking and cycling routes between building entrances and streets, sidewalks and trails	☐
BASIC	1.3.2	Provide wayfinding signage for site access (where required, e.g. when multiple buildings or entrances exist) and egress (where warranted, such as when directions to reach transit stops/stations, trails or other common destinations are not obvious)	☐

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	2.	**WALKING & CYCLING: END-OF-TRIP FACILITIES**	
	2.1	**Bicycle parking**	
REQUIRED	2.1.1	Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible *(see Official Plan policy 4.3.6)*	☑
REQUIRED	2.1.2	Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas *(see Zoning By-law Section 111)*	☑
REQUIRED	2.1.3	Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored *(see Zoning By-law Section 111)*	☑
BASIC	2.1.4	Provide bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met), plus the expected peak number of customer/visitor cyclists	☐
BETTER	2.1.5	Provide bicycle parking spaces equivalent to the expected number of commuter and customer/visitor cyclists, plus an additional buffer (e.g. 25 percent extra) to encourage other cyclists and ensure adequate capacity in peak cycling season	☐
	2.2	**Secure bicycle parking**	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single office building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers *(see Zoning By-law Section 111)*	☐ Not Applicable. Site Plan does not provide more than 50 bicycle spaces
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met)	☐
	2.3	**Shower & change facilities**	
BASIC	2.3.1	Provide shower and change facilities for the use of active commuters	☐
BETTER	2.3.2	In addition to shower and change facilities, provide dedicated lockers, grooming stations, drying racks and laundry facilities for the use of active commuters	☐
	2.4	**Bicycle repair station**	
BETTER	2.4.1	Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	☐

	TDM-supportive design & infrastructure measures: *Non-residential developments*		Check if completed & add descriptions, explanations or plan/drawing references
	3.	**TRANSIT**	
	3.1	**Customer amenities**	
BASIC	3.1.1	Provide shelters, lighting and benches at any on-site transit stops	☐
BASIC	3.1.2	Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	☐
BETTER	3.1.3	Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	☐
	4.	**RIDESHARING**	
	4.1	**Pick-up & drop-off facilities**	
BASIC	4.1.1	Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	☐
	4.2	**Carpool parking**	
BASIC	4.2.1	Provide signed parking spaces for carpools in a priority location close to a major building entrance, sufficient in number to accommodate the mode share target for carpools	☐
BETTER	4.2.2	At large developments, provide spaces for carpools in a separate, access-controlled parking area to simplify enforcement	☐
	5.	**CARSHARING & BIKESHARING**	
	5.1	**Carshare parking spaces**	
BETTER	5.1.1	Provide carshare parking spaces in permitted non-residential zones, occupying either required or provided parking spaces *(see Zoning By-law Section 94)*	☐
	5.2	**Bikeshare station location**	
BETTER	5.2.1	Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	☐

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	6.	**PARKING**	
	6.1	**Number of parking spaces**	
REQUIRED	6.1.1	Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	☑
BASIC	6.1.2	Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking	☐
BASIC	6.1.3	Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly *(see Zoning By-law Section 104)*	☐
BETTER	6.1.4	Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking *(see Zoning By-law Section 111)*	☐
	6.2	**Separate long-term & short-term parking areas**	
BETTER	6.2.1	Separate short-term and long-term parking areas using signage or physical barriers, to permit access controls and simplify enforcement (i.e. to discourage employees from parking in visitor spaces, and vice versa)	☐
	7.	**OTHER**	
	7.1	**On-site amenities to minimize off-site trips**	
BETTER	7.1.1	Provide on-site amenities to minimize mid-day or mid-commute errands	☐

TDM Measures Checklist:
Non-Residential Developments (office, institutional, retail or industrial)

Legend

BASIC — The measure is generally feasible and effective, and in most cases would benefit the development and its users

BETTER — The measure could maximize support for users of sustainable modes, and optimize development performance

★ — The measure is one of the most dependably effective tools to encourage the use of sustainable modes

		TDM measures: *Non-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	☐
		2.2 Bicycle skills training	
		Commuter travel	
BETTER	★	2.2.1 Offer on-site cycling courses for commuters, or subsidize off-site courses	☐
		2.3 Valet bike parking	
		Visitor travel	
BETTER		2.3.1 Offer secure valet bike parking during public events when demand exceeds fixed supply (e.g. for festivals, concerts, games)	☐

			TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		3.	**TRANSIT**	
		3.1	**Transit information**	
BASIC		3.1.1	Display relevant transit schedules and route maps at entrances	☐
BASIC		3.1.2	Provide online links to OC Transpo and STO information	☐
BETTER		3.1.3	Provide real-time arrival information display at entrances	☐
		3.2	**Transit fare incentives**	
			Commuter travel	
BETTER		3.2.1	Offer preloaded PRESTO cards to encourage commuters to use transit	☐
BETTER	★	3.2.2	Subsidize or reimburse monthly transit pass purchases by employees	☐
			Visitor travel	
BETTER		3.2.3	Arrange inclusion of same-day transit fare in price of tickets (e.g. for festivals, concerts, games)	☐
		3.3	**Enhanced public transit service**	
			Commuter travel	
BETTER		3.3.1	Contract with OC Transpo to provide enhanced transit services (e.g. for shift changes, weekends)	☐
			Visitor travel	
BETTER		3.3.2	Contract with OC Transpo to provide enhanced transit services (e.g. for festivals, concerts, games)	☐
		3.4	**Private transit service**	
			Commuter travel	
BETTER		3.4.1	Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for shift changes, weekends)	☐
			Visitor travel	
BETTER		3.4.2	Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for festivals, concerts, games)	☐

			TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		4.	**RIDESHARING**	
		4.1	**Ridematching service**	
			Commuter travel	
BASIC	★	4.1.1	Provide a dedicated ridematching portal at OttawaRideMatch.com	☐
		4.2	**Carpool parking price incentives**	
			Commuter travel	
BETTER		4.2.1	Provide discounts on parking costs for registered carpools	☐
		4.3	**Vanpool service**	
			Commuter travel	
BETTER		4.3.1	Provide a vanpooling service for long-distance commuters	☐
		5.	**CARSHARING & BIKESHARING**	
		5.1	**Bikeshare stations & memberships**	
BETTER		5.1.1	Contract with provider to install on-site bikeshare station for use by commuters and visitors	☐
			Commuter travel	
BETTER		5.1.2	Provide employees with bikeshare memberships for local business travel	☐
		5.2	**Carshare vehicles & memberships**	
			Commuter travel	
BETTER		5.2.1	Contract with provider to install on-site carshare vehicles and promote their use by tenants	☐
BETTER		5.2.2	Provide employees with carshare memberships for local business travel	☐
		6.	**PARKING**	
		6.1	**Priced parking**	
			Commuter travel	
BASIC	★	6.1.1	Charge for long-term parking (daily, weekly, monthly)	☐
BASIC		6.1.2	Unbundle parking cost from lease rates at multi-tenant sites	☐
			Visitor travel	
BETTER		6.1.3	Charge for short-term parking (hourly)	☐

			TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		7.	**TDM MARKETING & COMMUNICATIONS**	
		7.1	**Multimodal travel information**	
			Commuter travel	
BASIC	★	7.1.1	Provide a multimodal travel option information package to new/relocating employees and students	☐
			Visitor travel	
BETTER	★	7.1.2	Include multimodal travel option information in invitations or advertising that attract visitors or customers (e.g. for festivals, concerts, games)	☐
		7.2	**Personalized trip planning**	
			Commuter travel	
BETTER	★	7.2.1	Offer personalized trip planning to new/relocating employees	☐
		7.3	**Promotions**	
			Commuter travel	
BETTER		7.3.1	Deliver promotions and incentives to maintain awareness, build understanding, and encourage trial of sustainable modes	☐
		8.	**OTHER INCENTIVES & AMENITIES**	
		8.1	**Emergency ride home**	
			Commuter travel	
BETTER	★	8.1.1	Provide emergency ride home service to non-driving commuters	☐
		8.2	**Alternative work arrangements**	
			Commuter travel	
BASIC	★	8.2.1	Encourage flexible work hours	☐
BETTER		8.2.2	Encourage compressed workweeks	☐
BETTER	★	8.2.3	Encourage telework	☐
		8.3	**Local business travel options**	
			Commuter travel	
BASIC	★	8.3.1	Provide local business travel options that minimize the need for employees to bring a personal car to work	☐
		8.4	**Commuter incentives**	
			Commuter travel	
BETTER		8.4.1	Offer employees a taxable, mode-neutral commuting allowance	☐
		8.5	**On-site amenities**	
			Commuter travel	
BETTER		8.5.1	Provide on-site amenities/services to minimize mid-day or mid-commute errands	☐

Appendix E INTERSECTION PERFORMANCE WORKSHEETS

E.1 2019 EXISTING CONDITIONS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	11	18	66	22	118	23	912	85	180	1241	41
Future Volume (veh/h)	15	11	18	66	22	118	23	912	85	180	1241	41
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	17	12	20	73	24	131	26	1013	94	200	1379	46
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	114	81	135	228	32	177	282	2340	217	387	2498	83
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.75	0.75	0.75	0.75	0.75	0.75
Sat Flow, veh/h	1232	597	995	1377	238	1300	376	3114	289	509	3325	111
Grp Volume(v), veh/h	17	0	32	73	0	155	26	547	560	200	697	728
Grp Sat Flow(s),veh/h/ln	1232	0	1593	1377	0	1538	376	1683	1720	509	1683	1752
Q Serve(g_s), s	1.5	0.0	1.9	5.4	0.0	10.7	3.5	13.2	13.2	26.2	19.3	19.4
Cycle Q Clear(g_c), s	12.1	0.0	1.9	7.4	0.0	10.7	22.9	13.2	13.2	39.4	19.3	19.4
Prop In Lane	1.00		0.63	1.00		0.85	1.00		0.17	1.00		0.06
Lane Grp Cap(c), veh/h	114	0	216	228	0	209	282	1265	1292	387	1265	1316
V/C Ratio(X)	0.15	0.00	0.15	0.32	0.00	0.74	0.09	0.43	0.43	0.52	0.55	0.55
Avail Cap(c_a), veh/h	252	0	395	383	0	382	282	1265	1292	387	1265	1316
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.5	0.0	41.9	45.2	0.0	45.7	10.7	5.0	5.0	12.3	5.8	5.8
Incr Delay (d2), s/veh	0.6	0.0	0.3	0.8	0.0	5.1	0.6	1.1	1.1	4.9	1.7	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.9	0.0	1.6	3.7	0.0	8.3	0.7	9.1	9.2	6.7	12.4	12.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.1	0.0	42.2	46.0	0.0	50.8	11.3	6.1	6.1	17.2	7.5	7.5
LnGrp LOS	D	A	D	D	A	D	B	A	A	B	A	A
Approach Vol, veh/h		49			228			1133			1625	
Approach Delay, s/veh		45.7			49.2			6.2			8.7	
Approach LOS		D			D			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		88.4		21.6		88.4		21.6				
Change Period (Y+Rc), s		* 5.7		* 6.7		* 5.7		* 6.7				
Max Green Setting (Gmax), s		* 70		* 27		* 70		* 27				
Max Q Clear Time (g_c+I1), s		24.9		14.1		41.4		12.7				
Green Ext Time (p_c), s		27.4		0.3		25.6		2.3				

Intersection Summary												
HCM 6th Ctrl Delay			11.4									
HCM 6th LOS			B									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

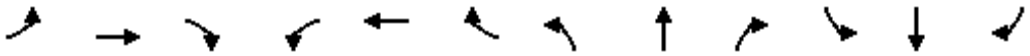
Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	33	67	19	11	2
Future Vol, veh/h	0	33	67	19	11	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	37	74	21	12	2

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	95	0	-	0	122	85
Stage 1	-	-	-	-	85	-
Stage 2	-	-	-	-	37	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1499	-	-	-	873	974
Stage 1	-	-	-	-	938	-
Stage 2	-	-	-	-	985	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1499	-	-	-	873	974
Mov Cap-2 Maneuver	-	-	-	-	873	-
Stage 1	-	-	-	-	938	-
Stage 2	-	-	-	-	985	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.1
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1499	-	-	-	887
HCM Lane V/C Ratio	-	-	-	-	0.016
HCM Control Delay (s)	0	-	-	-	9.1
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	7	66	78	7	138	43	1123	98	133	895	35
Future Volume (veh/h)	42	7	66	78	7	138	43	1123	98	133	895	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	47	8	73	87	8	153	48	1248	109	148	994	39
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	192	27	242	268	13	254	375	2062	180	269	2174	85
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.66	0.66	0.66	0.66	0.66	0.66
Sat Flow, veh/h	1225	151	1374	1317	75	1438	546	3133	273	401	3302	130
Grp Volume(v), veh/h	47	0	81	87	0	161	48	669	688	148	507	526
Grp Sat Flow(s),veh/h/ln	1225	0	1525	1317	0	1513	546	1683	1723	401	1683	1749
Q Serve(g_s), s	2.8	0.0	3.5	4.6	0.0	7.4	3.5	16.9	17.0	24.9	11.0	11.0
Cycle Q Clear(g_c), s	10.1	0.0	3.5	8.1	0.0	7.4	14.6	16.9	17.0	42.0	11.0	11.0
Prop In Lane	1.00		0.90	1.00		0.95	1.00		0.16	1.00		0.07
Lane Grp Cap(c), veh/h	192	0	269	268	0	267	375	1108	1134	269	1108	1151
V/C Ratio(X)	0.24	0.00	0.30	0.33	0.00	0.60	0.13	0.60	0.61	0.55	0.46	0.46
Avail Cap(c_a), veh/h	422	0	555	515	0	551	375	1108	1134	269	1108	1151
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.1	0.0	26.9	30.4	0.0	28.5	9.8	7.3	7.3	19.2	6.3	6.3
Incr Delay (d2), s/veh	0.7	0.0	0.6	0.7	0.0	2.2	0.7	2.4	2.4	7.9	1.4	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.7	0.0	2.6	3.0	0.0	5.7	0.9	11.3	11.5	5.4	7.9	8.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.8	0.0	27.5	31.1	0.0	30.6	10.5	9.7	9.7	27.1	7.6	7.6
LnGrp LOS	C	A	C	C	A	C	B	A	A	C	A	A
Approach Vol, veh/h		128			248			1405			1181	
Approach Delay, s/veh		29.8			30.8			9.7			10.0	
Approach LOS		C			C			A			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		55.1		19.9		55.1		19.9				
Change Period (Y+Rc), s		* 5.7		* 6.7		* 5.7		* 6.7				
Max Green Setting (Gmax), s		* 35		* 27		* 35		* 27				
Max Q Clear Time (g_c+I1), s		19.0		12.1		44.0		10.1				
Green Ext Time (p_c), s		14.3		1.1		0.0		2.7				

Intersection Summary												
HCM 6th Ctrl Delay			12.5									
HCM 6th LOS			B									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	3

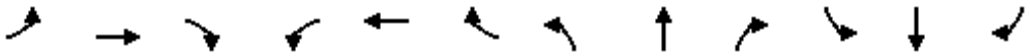
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	58	47	37	56	7
Future Vol, veh/h	3	58	47	37	56	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	64	52	41	62	8

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	93	0	-	0	143	73
Stage 1	-	-	-	-	73	-
Stage 2	-	-	-	-	70	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1501	-	-	-	850	989
Stage 1	-	-	-	-	950	-
Stage 2	-	-	-	-	953	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1501	-	-	-	848	989
Mov Cap-2 Maneuver	-	-	-	-	848	-
Stage 1	-	-	-	-	948	-
Stage 2	-	-	-	-	953	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1501	-	-	-	862
HCM Lane V/C Ratio	0.002	-	-	-	0.081
HCM Control Delay (s)	7.4	0	-	-	9.5
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.3

E.2 2021 FUTURE BACKGROUND CONDITIONS



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	11	19	69	23	123	24	948	88	187	1291	43
Future Volume (veh/h)	16	11	19	69	23	123	24	948	88	187	1291	43
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	16	11	19	69	23	123	24	948	88	187	1291	43
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	113	75	130	221	31	168	313	2360	219	420	2520	84
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.76	0.76	0.76	0.76	0.76	0.76
Sat Flow, veh/h	1242	583	1007	1380	242	1296	410	3114	289	545	3325	111
Grp Volume(v), veh/h	16	0	30	69	0	146	24	512	524	187	653	681
Grp Sat Flow(s),veh/h/ln	1242	0	1591	1380	0	1539	410	1683	1720	545	1683	1752
Q Serve(g_s), s	1.4	0.0	1.8	5.1	0.0	10.0	2.7	11.7	11.7	20.0	16.9	16.9
Cycle Q Clear(g_c), s	11.4	0.0	1.8	7.0	0.0	10.0	19.6	11.7	11.7	31.7	16.9	16.9
Prop In Lane	1.00		0.63	1.00		0.84	1.00		0.17	1.00		0.06
Lane Grp Cap(c), veh/h	113	0	206	221	0	199	313	1276	1304	420	1276	1328
V/C Ratio(X)	0.14	0.00	0.15	0.31	0.00	0.73	0.08	0.40	0.40	0.44	0.51	0.51
Avail Cap(c_a), veh/h	260	0	395	385	0	382	313	1276	1304	420	1276	1328
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.6	0.0	42.5	45.6	0.0	46.1	9.2	4.6	4.6	10.1	5.3	5.3
Incr Delay (d2), s/veh	0.6	0.0	0.3	0.8	0.0	5.2	0.5	0.9	0.9	3.4	1.5	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.9	0.0	1.5	3.6	0.0	7.9	0.6	8.2	8.3	5.4	11.0	11.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.1	0.0	42.8	46.4	0.0	51.2	9.6	5.6	5.6	13.5	6.7	6.7
LnGrp LOS	D	A	D	D	A	D	A	A	A	B	A	A
Approach Vol, veh/h		46			215			1060			1521	
Approach Delay, s/veh		46.1			49.7			5.7			7.6	
Approach LOS		D			D			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		89.1		20.9		89.1		20.9				
Change Period (Y+Rc), s		* 5.7		* 6.7		* 5.7		* 6.7				
Max Green Setting (Gmax), s		* 70		* 27		* 70		* 27				
Max Q Clear Time (g_c+I1), s		21.6		13.4		33.7		12.0				
Green Ext Time (p_c), s		26.2		0.3		30.1		2.2				

Intersection Summary												
HCM 6th Ctrl Delay			10.7									
HCM 6th LOS			B									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

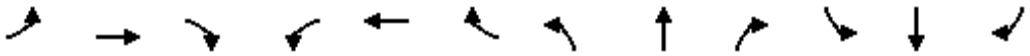
Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	34	70	19	11	2
Future Vol, veh/h	0	34	70	19	11	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	34	70	19	11	2

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	89	0	-	0	114	80
Stage 1	-	-	-	-	80	-
Stage 2	-	-	-	-	34	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1506	-	-	-	882	980
Stage 1	-	-	-	-	943	-
Stage 2	-	-	-	-	988	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1506	-	-	-	882	980
Mov Cap-2 Maneuver	-	-	-	-	882	-
Stage 1	-	-	-	-	943	-
Stage 2	-	-	-	-	988	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.1
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1506	-	-	-	896
HCM Lane V/C Ratio	-	-	-	-	0.015
HCM Control Delay (s)	0	-	-	-	9.1
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	44	7	69	81	7	144	45	1168	102	138	931	36
Future Volume (veh/h)	44	7	69	81	7	144	45	1168	102	138	931	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	44	7	69	81	7	144	45	1168	102	138	931	36
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	189	23	231	259	12	241	408	2091	182	301	2205	85
Arrive On Green	0.17	0.17	0.17	0.17	0.17	0.17	0.67	0.67	0.67	0.67	0.67	0.67
Sat Flow, veh/h	1236	140	1383	1323	70	1442	581	3133	273	436	3304	128
Grp Volume(v), veh/h	44	0	76	81	0	151	45	627	643	138	474	493
Grp Sat Flow(s),veh/h/ln	1236	0	1523	1323	0	1512	581	1683	1723	436	1683	1749
Q Serve(g_s), s	2.6	0.0	3.3	4.3	0.0	6.9	2.9	14.8	14.9	18.4	9.8	9.8
Cycle Q Clear(g_c), s	9.5	0.0	3.3	7.6	0.0	6.9	12.7	14.8	14.9	33.3	9.8	9.8
Prop In Lane	1.00		0.91	1.00		0.95	1.00		0.16	1.00		0.07
Lane Grp Cap(c), veh/h	189	0	255	259	0	253	408	1123	1150	301	1123	1167
V/C Ratio(X)	0.23	0.00	0.30	0.31	0.00	0.60	0.11	0.56	0.56	0.46	0.42	0.42
Avail Cap(c_a), veh/h	432	0	554	520	0	550	408	1123	1150	301	1123	1167
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.3	0.0	27.4	30.7	0.0	28.9	8.7	6.6	6.6	15.5	5.8	5.8
Incr Delay (d2), s/veh	0.6	0.0	0.6	0.7	0.0	2.2	0.5	2.0	2.0	5.0	1.2	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.6	0.0	2.5	2.8	0.0	5.3	0.8	10.0	10.2	4.2	7.1	7.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.9	0.0	28.0	31.4	0.0	31.1	9.3	8.6	8.6	20.4	6.9	6.9
LnGrp LOS	C	A	C	C	A	C	A	A	A	C	A	A
Approach Vol, veh/h		120			232			1315			1105	
Approach Delay, s/veh		30.2			31.2			8.6			8.6	
Approach LOS		C			C			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		55.8		19.2		55.8		19.2				
Change Period (Y+Rc), s		* 5.7		* 6.7		* 5.7		* 6.7				
Max Green Setting (Gmax), s		* 35		* 27		* 35		* 27				
Max Q Clear Time (g_c+I1), s		16.9		11.5		35.3		9.6				
Green Ext Time (p_c), s		15.4		1.1		0.0		2.6				

Intersection Summary												
HCM 6th Ctrl Delay			11.4									
HCM 6th LOS			B									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	2.9

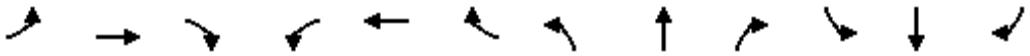
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	60	49	37	56	7
Future Vol, veh/h	3	60	49	37	56	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	60	49	37	56	7

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	86	0	-	0	134	68
Stage 1	-	-	-	-	68	-
Stage 2	-	-	-	-	66	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1510	-	-	-	860	995
Stage 1	-	-	-	-	955	-
Stage 2	-	-	-	-	957	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1510	-	-	-	858	995
Mov Cap-2 Maneuver	-	-	-	-	858	-
Stage 1	-	-	-	-	953	-
Stage 2	-	-	-	-	957	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1510	-	-	-	871
HCM Lane V/C Ratio	0.002	-	-	-	0.072
HCM Control Delay (s)	7.4	0	-	-	9.5
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.2

E.3 2021 TOTAL FUTURE CONDITIONS



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	11	24	69	23	123	28	948	88	187	1291	48
Future Volume (veh/h)	23	11	24	69	23	123	28	948	88	187	1291	48
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	23	11	24	69	23	123	28	948	88	187	1291	48
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	114	65	141	218	32	169	311	2357	219	420	2505	93
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.76	0.76	0.76	0.76	0.76	0.76
Sat Flow, veh/h	1242	496	1082	1373	242	1296	408	3114	289	545	3310	123
Grp Volume(v), veh/h	23	0	35	69	0	146	28	512	524	187	656	683
Grp Sat Flow(s),veh/h/ln	1242	0	1577	1373	0	1539	408	1683	1720	545	1683	1750
Q Serve(g_s), s	2.0	0.0	2.2	5.2	0.0	10.0	3.2	11.7	11.7	20.1	17.1	17.1
Cycle Q Clear(g_c), s	12.0	0.0	2.2	7.3	0.0	10.0	20.4	11.7	11.7	31.8	17.1	17.1
Prop In Lane	1.00		0.69	1.00		0.84	1.00		0.17	1.00		0.07
Lane Grp Cap(c), veh/h	114	0	206	218	0	201	311	1274	1302	420	1274	1324
V/C Ratio(X)	0.20	0.00	0.17	0.32	0.00	0.73	0.09	0.40	0.40	0.45	0.51	0.52
Avail Cap(c_a), veh/h	260	0	391	379	0	382	311	1274	1302	420	1274	1324
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.7	0.0	42.5	45.8	0.0	45.9	9.4	4.7	4.7	10.2	5.3	5.3
Incr Delay (d2), s/veh	0.9	0.0	0.4	0.8	0.0	5.0	0.6	0.9	0.9	3.4	1.5	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.3	0.0	1.7	3.6	0.0	7.9	0.7	8.2	8.3	5.4	11.1	11.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.6	0.0	42.9	46.6	0.0	50.9	10.0	5.6	5.6	13.6	6.8	6.8
LnGrp LOS	D	A	D	D	A	D	A	A	A	B	A	A
Approach Vol, veh/h		58			215			1064			1526	
Approach Delay, s/veh		46.7			49.5			5.7			7.6	
Approach LOS		D			D			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		89.0		21.0		89.0		21.0				
Change Period (Y+Rc), s		* 5.7		* 6.7		* 5.7		* 6.7				
Max Green Setting (Gmax), s		* 70		* 27		* 70		* 27				
Max Q Clear Time (g_c+I1), s		22.4		14.0		33.8		12.0				
Green Ext Time (p_c), s		26.1		0.3		30.0		2.2				

Intersection Summary		
HCM 6th Ctrl Delay	10.9	
HCM 6th LOS	B	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

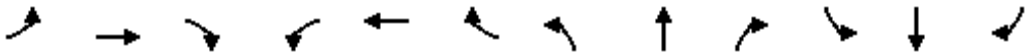
Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	34	70	33	25	5
Future Vol, veh/h	1	34	70	33	25	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	34	70	33	25	5

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	103	0	-	0	123	87
Stage 1	-	-	-	-	87	-
Stage 2	-	-	-	-	36	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1489	-	-	-	872	971
Stage 1	-	-	-	-	936	-
Stage 2	-	-	-	-	986	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1489	-	-	-	871	971
Mov Cap-2 Maneuver	-	-	-	-	871	-
Stage 1	-	-	-	-	935	-
Stage 2	-	-	-	-	986	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1489	-	-	-	886
HCM Lane V/C Ratio	0.001	-	-	-	0.034
HCM Control Delay (s)	7.4	0	-	-	9.2
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	47	8	74	81	7	144	49	1168	102	138	931	39
Future Volume (veh/h)	47	8	74	81	7	144	49	1168	102	138	931	39
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	47	8	74	81	7	144	49	1168	102	138	931	39
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	192	25	234	258	12	245	405	2082	182	299	2188	92
Arrive On Green	0.17	0.17	0.17	0.17	0.17	0.17	0.66	0.66	0.66	0.66	0.66	0.66
Sat Flow, veh/h	1236	149	1376	1316	70	1442	579	3133	273	436	3292	138
Grp Volume(v), veh/h	47	0	82	81	0	151	49	627	643	138	476	494
Grp Sat Flow(s),veh/h/ln	1236	0	1524	1316	0	1512	579	1683	1723	436	1683	1747
Q Serve(g_s), s	2.7	0.0	3.5	4.3	0.0	6.9	3.2	14.9	15.0	18.6	9.9	9.9
Cycle Q Clear(g_c), s	9.6	0.0	3.5	7.9	0.0	6.9	13.2	14.9	15.0	33.6	9.9	9.9
Prop In Lane	1.00		0.90	1.00		0.95	1.00		0.16	1.00		0.08
Lane Grp Cap(c), veh/h	192	0	259	258	0	257	405	1119	1145	299	1119	1161
V/C Ratio(X)	0.24	0.00	0.32	0.31	0.00	0.59	0.12	0.56	0.56	0.46	0.43	0.43
Avail Cap(c_a), veh/h	432	0	555	513	0	550	405	1119	1145	299	1119	1161
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.1	0.0	27.3	30.7	0.0	28.7	9.0	6.7	6.7	15.7	5.9	5.9
Incr Delay (d2), s/veh	0.7	0.0	0.7	0.7	0.0	2.1	0.6	2.0	2.0	5.1	1.2	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.7	0.0	2.7	2.8	0.0	5.3	0.9	10.1	10.3	4.2	7.2	7.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.8	0.0	28.0	31.4	0.0	30.8	9.6	8.8	8.7	20.8	7.1	7.0
LnGrp LOS	C	A	C	C	A	C	A	A	A	C	A	A
Approach Vol, veh/h		129			232			1319			1108	
Approach Delay, s/veh		30.1			31.0			8.8			8.8	
Approach LOS		C			C			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		55.5		19.5		55.5		19.5				
Change Period (Y+Rc), s		* 5.7		* 6.7		* 5.7		* 6.7				
Max Green Setting (Gmax), s		* 35		* 27		* 35		* 27				
Max Q Clear Time (g_c+I1), s		17.0		11.6		35.6		9.9				
Green Ext Time (p_c), s		15.1		1.1		0.0		2.5				

Intersection Summary	
HCM 6th Ctrl Delay	11.6
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	3.4

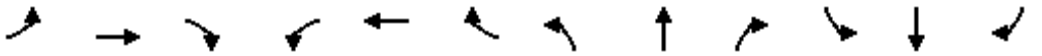
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	4	60	49	49	74	9
Future Vol, veh/h	4	60	49	49	74	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	60	49	49	74	9

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	98	0	-	0	142	74
Stage 1	-	-	-	-	74	-
Stage 2	-	-	-	-	68	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1495	-	-	-	851	988
Stage 1	-	-	-	-	949	-
Stage 2	-	-	-	-	955	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1495	-	-	-	848	988
Mov Cap-2 Maneuver	-	-	-	-	848	-
Stage 1	-	-	-	-	946	-
Stage 2	-	-	-	-	955	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	9.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1495	-	-	-	861
HCM Lane V/C Ratio	0.003	-	-	-	0.096
HCM Control Delay (s)	7.4	0	-	-	9.6
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.3

E.4 2026 ULTIMATE CONDITIONS



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	13	26	75	27	135	29	1040	97	205	1415	51
Future Volume (veh/h)	23	13	26	75	27	135	29	1040	97	205	1415	51
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	23	13	26	75	27	135	29	1040	97	205	1415	51
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	114	74	148	228	36	181	267	2324	217	372	2475	89
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.75	0.75	0.75	0.75	0.75	0.75
Sat Flow, veh/h	1224	527	1055	1368	257	1284	362	3113	290	495	3315	119
Grp Volume(v), veh/h	23	0	39	75	0	162	29	562	575	205	718	748
Grp Sat Flow(s),veh/h/ln	1224	0	1582	1368	0	1541	362	1683	1720	495	1683	1750
Q Serve(g_s), s	2.0	0.0	2.4	5.6	0.0	11.1	4.2	14.0	14.0	29.6	20.7	20.8
Cycle Q Clear(g_c), s	13.1	0.0	2.4	8.0	0.0	11.1	25.1	14.0	14.0	43.6	20.7	20.8
Prop In Lane	1.00		0.67	1.00		0.83	1.00		0.17	1.00		0.07
Lane Grp Cap(c), veh/h	114	0	223	228	0	217	267	1257	1284	372	1257	1307
V/C Ratio(X)	0.20	0.00	0.18	0.33	0.00	0.75	0.11	0.45	0.45	0.55	0.57	0.57
Avail Cap(c_a), veh/h	246	0	393	375	0	382	267	1257	1284	372	1257	1307
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.7	0.0	41.6	45.2	0.0	45.4	11.7	5.3	5.3	13.6	6.2	6.2
Incr Delay (d2), s/veh	0.9	0.0	0.4	0.8	0.0	5.1	0.8	1.2	1.1	5.8	1.9	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.3	0.0	1.9	3.9	0.0	8.6	0.8	9.5	9.7	7.4	13.1	13.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.5	0.0	42.0	46.0	0.0	50.5	12.5	6.5	6.4	19.4	8.0	8.0
LnGrp LOS	D	A	D	D	A	D	B	A	A	B	A	A
Approach Vol, veh/h		62			237			1166			1671	
Approach Delay, s/veh		45.9			49.0			6.6			9.4	
Approach LOS		D			D			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		87.8		22.2		87.8		22.2				
Change Period (Y+Rc), s		* 5.7		* 6.7		* 5.7		* 6.7				
Max Green Setting (Gmax), s		* 70		* 27		* 70		* 27				
Max Q Clear Time (g_c+I1), s		27.1		15.1		45.6		13.1				
Green Ext Time (p_c), s		27.5		0.3		22.5		2.4				

Intersection Summary												
HCM 6th Ctrl Delay			12.1									
HCM 6th LOS			B									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

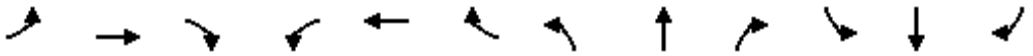
Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	38	76	33	25	5
Future Vol, veh/h	1	38	76	33	25	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	38	76	33	25	5

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	109	0	-	0	133	93
Stage 1	-	-	-	-	93	-
Stage 2	-	-	-	-	40	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1481	-	-	-	861	964
Stage 1	-	-	-	-	931	-
Stage 2	-	-	-	-	982	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1481	-	-	-	860	964
Mov Cap-2 Maneuver	-	-	-	-	860	-
Stage 1	-	-	-	-	930	-
Stage 2	-	-	-	-	982	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	9.3
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1481	-	-	-	876
HCM Lane V/C Ratio	0.001	-	-	-	0.034
HCM Control Delay (s)	7.4	0	-	-	9.3
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	8	78	89	8	157	51	1280	112	152	1020	41
Future Volume (veh/h)	49	8	78	89	8	157	51	1280	112	152	1020	41
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	49	8	78	89	8	157	51	1280	112	152	1020	41
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	195	26	250	269	13	261	361	2047	179	256	2155	87
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.65	0.65	0.65	0.65	0.65	0.65
Sat Flow, veh/h	1221	142	1382	1311	73	1439	532	3133	273	388	3299	133
Grp Volume(v), veh/h	49	0	86	89	0	165	51	686	706	152	520	541
Grp Sat Flow(s),veh/h/ln	1221	0	1523	1311	0	1513	532	1683	1723	388	1683	1748
Q Serve(g_s), s	2.9	0.0	3.7	4.7	0.0	7.5	4.0	17.9	18.0	28.3	11.6	11.6
Cycle Q Clear(g_c), s	10.4	0.0	3.7	8.4	0.0	7.5	15.6	17.9	18.0	46.4	11.6	11.6
Prop In Lane	1.00		0.91	1.00		0.95	1.00		0.16	1.00		0.08
Lane Grp Cap(c), veh/h	195	0	276	269	0	274	361	1100	1126	256	1100	1142
V/C Ratio(X)	0.25	0.00	0.31	0.33	0.00	0.60	0.14	0.62	0.63	0.59	0.47	0.47
Avail Cap(c_a), veh/h	418	0	554	509	0	551	361	1100	1126	256	1100	1142
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.0	0.0	26.6	30.3	0.0	28.2	10.4	7.6	7.6	21.3	6.5	6.5
Incr Delay (d2), s/veh	0.7	0.0	0.6	0.7	0.0	2.1	0.8	2.7	2.6	9.7	1.5	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.8	0.0	2.8	3.1	0.0	5.8	1.1	11.8	12.1	6.0	8.3	8.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.7	0.0	27.3	31.0	0.0	30.3	11.3	10.3	10.3	31.0	8.0	7.9
LnGrp LOS	C	A	C	C	A	C	B	B	B	C	A	A
Approach Vol, veh/h		135			254			1443			1213	
Approach Delay, s/veh		29.6			30.6			10.3			10.8	
Approach LOS		C			C			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		54.7		20.3		54.7		20.3				
Change Period (Y+Rc), s		* 5.7		* 6.7		* 5.7		* 6.7				
Max Green Setting (Gmax), s		* 35		* 27		* 35		* 27				
Max Q Clear Time (g_c+I1), s		20.0		12.4		48.4		10.4				
Green Ext Time (p_c), s		13.6		1.2		0.0		2.8				

Intersection Summary		
HCM 6th Ctrl Delay		13.1
HCM 6th LOS		B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	4	66	54	49	74	9
Future Vol, veh/h	4	66	54	49	74	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	66	54	49	74	9

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	103	0	-	0	153	79
Stage 1	-	-	-	-	79	-
Stage 2	-	-	-	-	74	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1489	-	-	-	839	981
Stage 1	-	-	-	-	944	-
Stage 2	-	-	-	-	949	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1489	-	-	-	836	981
Mov Cap-2 Maneuver	-	-	-	-	836	-
Stage 1	-	-	-	-	941	-
Stage 2	-	-	-	-	949	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	9.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1489	-	-	-	850
HCM Lane V/C Ratio	0.003	-	-	-	0.098
HCM Control Delay (s)	7.4	0	-	-	9.7
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.3