BLUE SEA VILLAGE MER BLEUE
2159 MER BLEUE ROAD
OTTAWA, ONTARIO

TRANSPORTATION IMPACT ASSESSMENT

Prepared for:

2534189 Ontario Limited

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TIA Report_2.doc

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TRANSPORTATION IMPACT ASSESSMENT

STEP 1 - SCREENING

A Screening Form has been prepared which is included as Exhibit 1 in the Appendix. The Trip Generation Trigger and Location Trigger have been triggered in the Screening Form, with the City of Ottawa staff review recommending that the assessment study proceed to the Scoping Document. The following will address the requirements of the Scoping section of the report.

STEP 2 - SCOPING

MODULE 2.1 – Existing and Planned Conditions

Element 2.1.1 – Proposed Development

A Site Plan has been prepared for the Blue Sea Village Mer Bleue development which comprises of seven blocks of property located along the east side of Mer Bleue Road and north of Brian Coburn Boulevard. The Transportation Impact Assessment report is being prepared in support of an Official Plan Amendment, Zoning Bylaw Amendment, and Plan of Subdivision Application for the lands. Subsequent applications for Site Plan Control on the various development blocks will be subject to traffic study updates as more details are known on size and use of lands under the development application. The location of the development is shown in Figure 2.1.

The development is proposed to be located on 4.768 hectares of vacant land with the site constructed in two phases. The land uses of the development would consist of an athletic centre, commercial use, office use, residential apartments, and a senior residential apartment building. The residential apartment use is an apartment style building to house athletes for the sports facilities. The completion date of each phase and blocks which will be included in each phase are not established, however the total development is expected to be completed by the year 2024. The TIA study will therefore examine the site at build-out of the entire site in 2024. Table 2.1 provides an inventory of the land uses for the total development of the site.

Lands to the north and east of the site comprise of commercial/light industrial uses, lands to the south is a hydro corridor adjacent to the site with residential further south, and vacant lands to the west. The Blue Sea Village Mer Bleue site is currently zoned IG7 H(21) “General Industrial Zone”. Amendments to the Zoning Bylaw will be required for the development.

FIGURE 2.1
SITE LOCATION PLAN

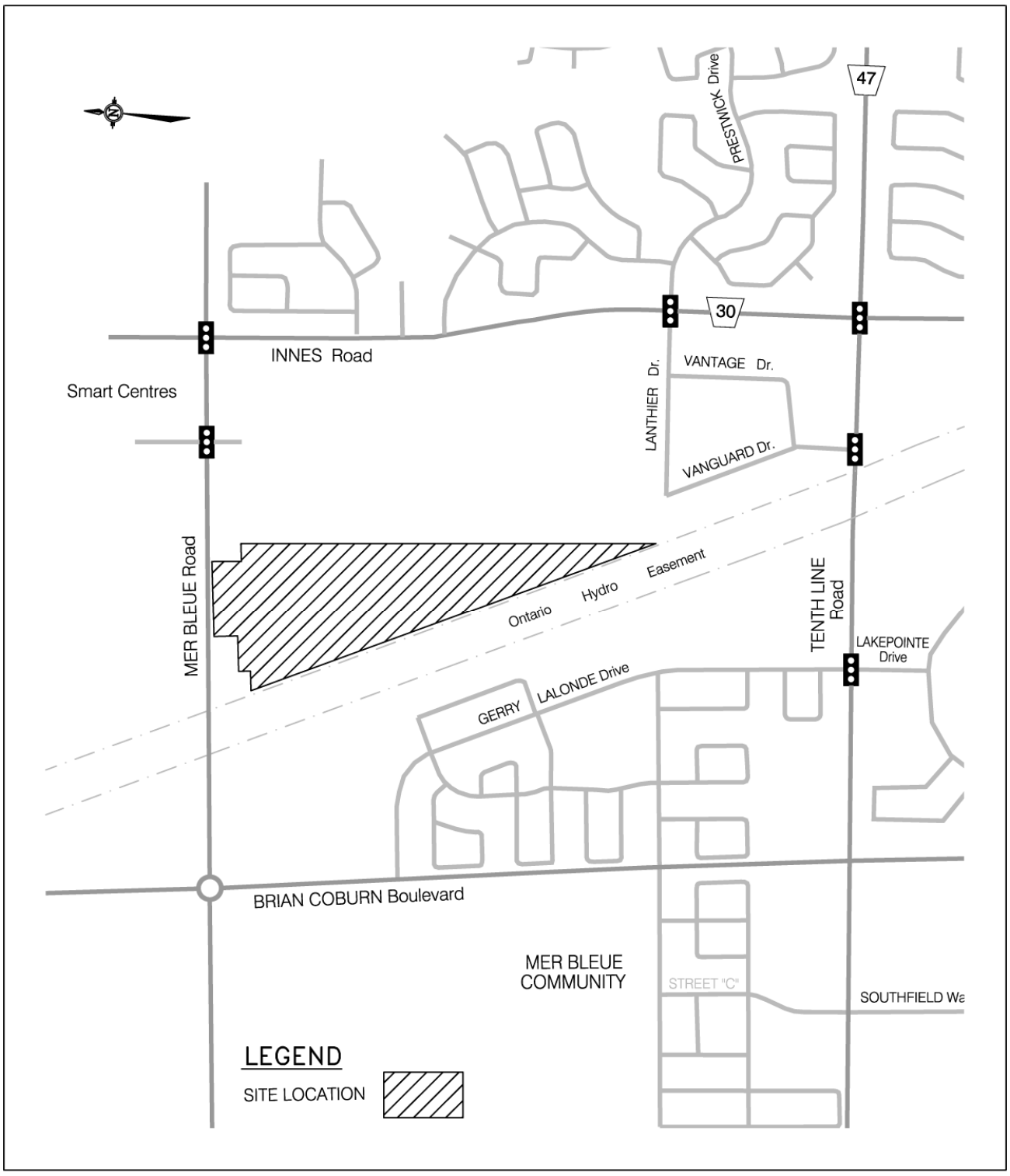

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TABLE 2.1
SITE INVENTORY

Land Use Blocks	Land Use
Block 1	Physio/Commercial Offices
Block 2	Commercial Offices
Block 3	Retirement Residence
Block 4	Residential Apartments
Block 5	Commercial Offices
Block 6	Gymnastics Centre with Ancillary Uses
Block 7	Tennis/Athletic Academy

The Blue Sea Village Mer Bleue development will comprise of seven blocks which provide a mixture of uses. Each block will have a separate access to the development's road (Street 1). The development will have one access point onto Mer Bleue Road by full build-out of the development. Once the Vanguard Drive Extension is completed through to Mer Bleue Road, the development will connect to it by way of Street 2 which will provide a link between Vanguard Drive and Mer Bleue Road. The Transportation Impact Assessment study will assume the Vanguard Drive Extension has been completed at five years beyond build-out (2029).

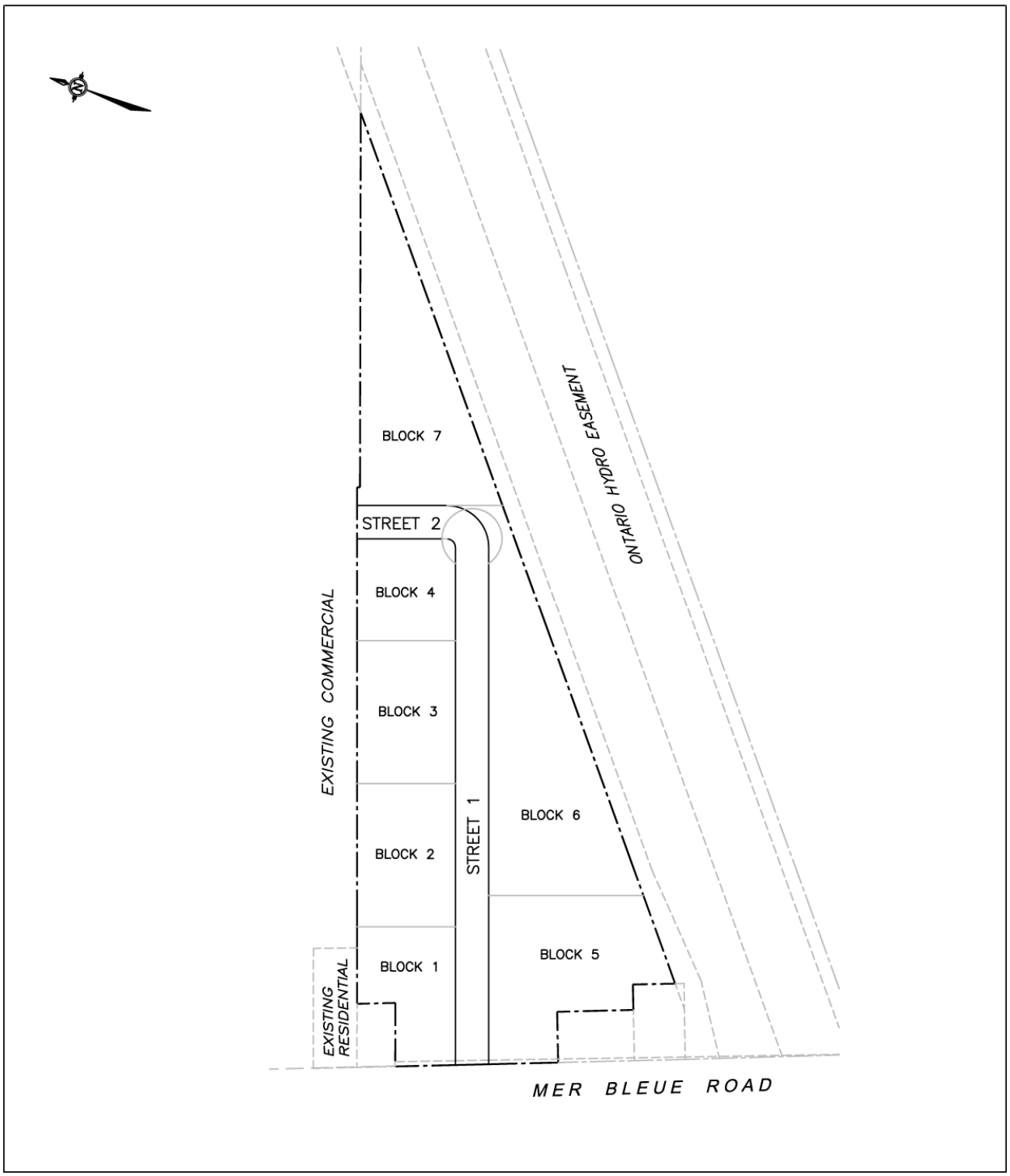
Figure 2.2 provides a concept plan of the development showing the blocks which will be developed and the proposed access points onto Mer Bleue Road and future connection to Vanguard Drive.

Element 2.1.2 – Existing Conditions

The Blue Sea Village Mer Bleue development is located on the east side of Mer Bleue Road approximately 500 m north of Brian Coburn Boulevard. Mer Bleue Road is a north-south arterial road which was widened in 2010 to a four lane divided road from the existing Smart Centres shopping centre and car dealership at Mer Bleue Road and Innes Road, to the hydro easement at the south border of the Blue Sea Village Mer Bleue development. In 2015 the four lane divided cross section was extended further south to a point approximately 450 m south of Brian Coburn Boulevard. Mer Bleue Road has sidewalks along both sides of the road with a 2.0 m cycling lane. The speed limit is posted at 60 km./h. The City of Ottawa *Transportation Master Plan* (TMP) has identified Mer Bleue Road as a "Spine Route" in the Cycling Network - Primary Urban plan.

Brian Coburn Boulevard is a two lane east-west arterial road located approximately 500 m south of the site. Brian Coburn Boulevard connects Mer Bleue Road with Trim Road, and currently terminates approximately 1,000 m west of Mer Bleue Road. A sidewalk exists along the north side of the road. The posted speed limit is 60 km./h.

FIGURE 2.2
CONCEPTUAL SITE PLAN



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Vanguard Drive is an east-west collector road which connects to Tenth Line Road and extends approximately 500 m west. The City of Ottawa is currently preparing an Environmental Assessment report which would establish the alignment of Vanguard Drive and extend the road further west of the current point of termination. Vanguard Drive has sidewalks along both sides of the street and has an unposted speed limit of 50 km./h.

The intersection of Mer Bleue Road and Brian Coburn Boulevard is located 500 m south of the site and was reconstructed in 2015 along with the Mer Bleue Road widening. The intersection was constructed as a two lane roundabout with four intersection approaches.

The closest signalized intersection to the north is the intersection at the access to the Smart Centres shopping centre located 500 m north of the site.

Traffic counts obtained from the City of Ottawa at the Smart Centres intersection 500 m north of the site determined the weekday peak AM hour to occur between 8:45 and 9:45 and peak PM hour between 4:15 and 5:15. The time period for the peak volume of traffic was applicable to vehicular, cycling and pedestrian traffic. Figure 2.2 shows the peak AM and PM hour traffic counts for the signalized intersection, with the City of Ottawa data sheets provided in the Appendix as Exhibit 2 for the peak AM hour and Exhibit 3 for the peak PM hour. The traffic signal timing plan is provided as Exhibit 4.

Element 2.1.3 – Planned Conditions

On the north side of the site is a proposed development at 2025 Mer Bleue Road. The development will contain a mixture of retail/commercial, residential apartments, and accommodations for senior living. A *Community Transportation Study* (CTS) report was prepared by Stantec Consulting Ltd. The development is expected to have full build-out by the year 2026.

The City of Ottawa has initiated an EA study for the extension of Vanguard Drive from Lanthier Drive to Mer Bleue Road. The study will include traffic volumes based on the 2025 Mer Bleue Road CTS report, which would account for future development south and west of the site.

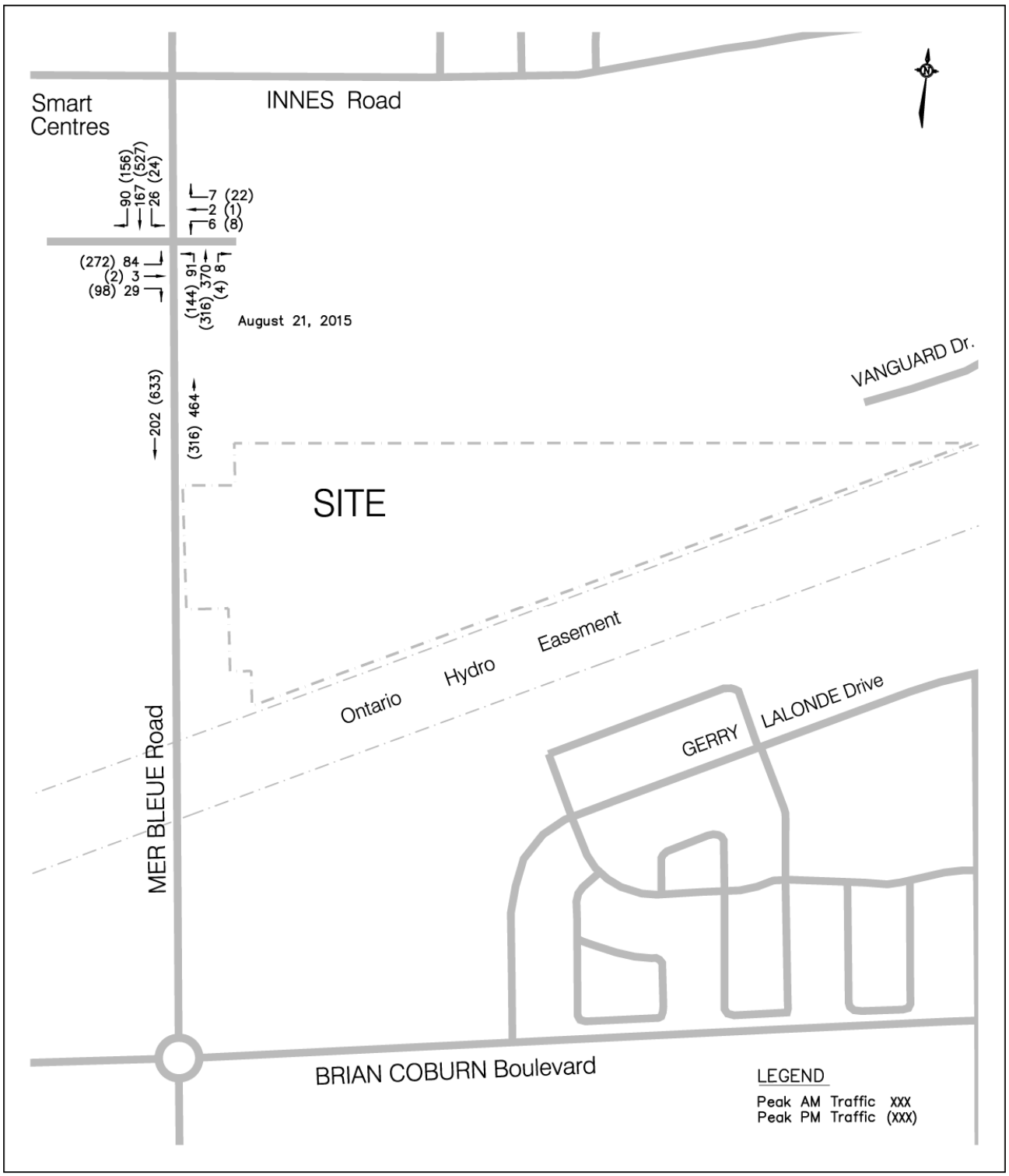
Further widening of Mer Bleue Road south to Renaud Road and the extension of Brian Coburn Boulevard between Mer Bleue Road and Navan Road are identified in the affordable road network of the *Transportation Master Plan 2013*.

MODULE 2.2 – Study Area and Time Periods

Element 2.2.1 – Study Area

The study area was determined during a pre-consultation meeting with City staff, and the examination of the impact of site trips from the proposed development on the surrounding roads. It was determined that the traffic analysis should address the operation of the site access onto Mer Bleue Road for the total development of the site. The analysis will also address the operation of the site access onto Mer Bleue Road and the Vanguard/Mer Bleue intersection following the future extension of Vanguard Drive.

FIGURE 2.3
EXISTING 2015 PEAK AM AND PM HOUR TRAFFIC COUNTS



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Element 2.2.2 – Time Periods

The proposed athletic and associated land uses would support a high level of training for professional, semi-professional, and committed athletes. A major component of the physio/commercial and commercial offices will be associated with the athletic facilities and would produce trips during the weekday AM and PM hours as athletes travel to/from the facilities for training. The residential apartments will also house some of the athletes who are training and will be available as a short term residence for people attending athletic tournaments.

The adjacent land uses to the development comprise mainly of industrial along Vanguard Drive and residential and future residential to the south and west of the site. These land uses generate peak hour trips during the weekday AM and PM hours as people are travelling to/from work.

With the operation of the athletic development generating peak hour trips on a weekday, the peak time periods for the analysis would be the weekday peak AM and PM hours of the adjacent roads which would be determined from traffic counts obtained from the City of Ottawa.

Element 2.2.3 – Horizon Years

The total Blue Sea Village Mer Bleue development is expected to be completed by the year 2024. The TIA study will examine the operation of the roads and intersections at build-out in 2024 and at five years beyond build-out in 2029. The 2024 analysis will assume one access point onto Mer Bleue Road, and the 2029 analysis would assume that Vanguard Drive has been extended and the development at 2025 Mer Bleue Road has been completed. The 2029 analysis will assume two accesses to the development at both Mer Bleue Road and Vanguard Drive.

MODULE 2.3 – Exemptions Review

The exemptions, which provide possible reductions to the scope of work of the TIA Study, were examined using Table 4: Possible Exemptions which is provided in the City's *Transportation Impact Assessment Guidelines (2017).* Utilizing the table in the TIA Guidelines, the possible exemptions proposed for the Blue Sea Village TIA Study report are shown in Table 2.2.

STEP 3 - FORECASTING

MODULE 3.1 – Development-Generated Travel Demand

Element 3.1.1 – Trip Generation and Mode Shares

The proposed development consists of a mixture of land uses mainly related to the gymnastics and athletic centre with the exception of the senior retirement residence. The land uses comprise of a gymnasium centre, tennis academy, physiotherapy/commercial, commercial offices which are mainly associated with the athletic uses, and a residential apartment building which will house athletes, friends and family members during sport training and athletic events. A block is also designated to a senior retirement residence. Table 3.1 provides an inventory of the proposed land uses and gross floor area or number of rooms for each use.

TABLE 2.2
EXEMPTIONS TO THE TIA STUDY REPORT

MODULE	ELEMENT	EXEMPTION CONSIDERATIONS
Design Review Component		
4.1 Development Design	4.1.2 Circulation and Access	No - Access to the development and will be examined.
	4.1.3 New Street Networks	Yes - Only required for subdivisions.
4.2 Parking	4.2.1 Parking Supply	No - the supply of parking will be discussed.
	4.2.2 Spillover Parking	Yes - No spillover expected.
Network Impact Component		
4.5 Transportation Demand Management	All Elements	No - TDM measures will be addressed.
4.6 Neighbourhood Traffic Management	4.6.1 Adjacent Neighbourhoods	Yes – The site will have access onto an arterial road. Trips to the future Vanguard Drive extension would not exceed ATM capacity.
4.8 Network Concept		Yes - The site would not generate more than 200 person-trips per peak hour in excess of the volume permitted by established zoning.

TABLE 3.1
LAND USE AND DEVELOPMENT AREA

Land Use Blocks	Land Use	Development Area
Block 1	Physio/Commercial Offices	10,000 ft^2
Block 2	Commercial Offices	15,000 ft^2
Block 3	Retirement Residence	100 rooms
Block 4	Residential Apartments	100 units
Block 5	Commercial Offices	20,000 ft^2
Block 6	Gymnastics Centre with Ancillary Uses	100,000 ft^2
Block 7	Tennis/Athletic Academy	90,000 ft^2

The number of expected site generated trips for the "Gymnastic Centre with Ancillary Uses" was determined from existing trips at the Tumblers Facility on Vantage Drive. The number of expected trips for the new gymnastic facility was determined by discussions with staff of the existing facility as to the number of vehicles and participants at the facility during peak hours, and the number of drop-off vehicles during the same time period. The following is the trip rate calculation:

	Entering	Exiting
3 to 4 dozen vehicles = 4 x 12 =	48	48
2 dozen drop-offs = 2 x 12 x 2 (drop-off & pickup) =	48	48
	96 Trips	96 Trips
Increase of 35% for new facility	34	34
	130 Trips	130 Trips

For the 25,000 ft^2 facility, the trip generation rate for both the peak AM and PM hours would be (2 x 130 T)/25 = 10.40 T/1000 ft^2

The trips for the remaining uses listed in Table 3.1 excluding the gymnastic centre and ancillary uses were determined from the statistical trip data documented in the Institute of Transportation Engineers (ITE) publication, *Trip Generation Manual*. The analysis used the average trip rate for each ITE Land Use. The trip rates for all uses are shown in Table 3.2.

TABLE 3.2
TRIP GENERATION RATES

BUILDING USE	ITE LAND USE	TRIP GENERATION RATE	
		Peak AM Hr.	Peak PM Hr.
Physio/Commercial Offices	Medical-Dental Office Building – ITE 720	2.39 T/1000/ft^2	3.57 T/1000/ft^2
Commercial Offices	Single Tenant Office Building – ITE 715	1.80 T/1000/ft^2	1.74 T/1000/ft^2
Retirement Residence	Senior Adult Housing - Attached – ITE 252	0.20 T/DU	0.25 T/DU
Residential Apartments	All Suites Hotel – ITE 311	0.38 T/room	0.40 T/room
Commercial Offices	Single Tenant Office Building – ITE 715	1.80 T/1000/ft^2	1.74 T/1000/ft^2
Gymnastic Centre with Ancillary Uses	Trip Rate from Data at the Existing Facility	10.40 T/1000/ft^2	10.40 T/1000/ft^2
Tennis/Athletic Academy	Health/Fitness Club – ITE 492	1.41 T/1000/ft^2	3.53 T/1000/ft^2

The trip generation rates of Table 3.2 were applied to the gross floor area or number of rooms for each building use identified in Table 3.1. The product is the weekday peak AM and PM hour site generated vehicle-trips which are shown in Table 3.3.

TABLE 3.3
PEAK HOUR SITE TRIPS GENERATED VEHICLE-TRIPS

PEAK HOUR TRIPS / BUILDING USE	WEEKDAY PEAK AM HR.			WEEKDAY PEAK PM HR.		
	TOTAL	ENTER	EXIT	TOTAL	ENTER	EXIT
Physio/Commercial Office	24	19 (79%)	5 (21%)	36	10 (.28%)	26 (72%)
Commercial Offices	27	24 (89%)	3 (11%)	26	4 (15%)	22 (85%)
Residential Apartments	38	21 (55%)	17 (45%)	40	18 (45%)	22 (55%)
Commercial Offices	36	32 (89%)	4 (11%)	35	5 (15%)	30 (85%)
Gymnastics Centre	1040	520 (50%)	520 (50%)	1040	520 (57%)	520 (43%)
Tennis/Athletic Academy	126	63 (50%)	63 (50%)	318	181 (57%)	137 (43%)
Shared Trip Reduction *	-126	-80	-46	-362	-196	-166
Subtotal Site Trips	1165	599	566	1133	542	591
Retirement Residence	20	7 (34%)	13 (66%)	25	14 (54%)	11 (46%)
Total New Trips	1185	**606**	**579**	1158	**556**	**602**

* A shared trip reduction was applied to account for shared trips between the Gymnastic Centre use and all other uses with the exception of the Retirement Residence. The reduction assumed that 50% of the trips from the athletic related uses (not including trips from the Gymnastic Centre) would be internal and/or related to the Gymnastic Centre

The peak AM and PM hour person-trips were determined using the total new vehicle-trips shown in Table 3.3 and a conversion rate of 1.28 as provided in Element 3.1.1 of the City's TIA Guidelines. The peak AM and PM hour vehicle-trips and person-trips are shown below:

	Peak AM Hour	Peak PM Hour
Vehicle-Trips	1,185	1,158
Person-Trips	1,517	1,482

The future transit mode share was determined from reviewing the *National Capital Region Travel Trends* document prepared by IBI Group which provides the mode share trends to/from Orléans during the 2011 peak AM hour, and the Transit Priority Projects listed in the City's TMP. Table 3.4 presents the modal shared summary which will be used in the TIA Submission.

TABLE 3.4
FUTURE MODE SHARE SUMMARY

Future Mode Share Targets for the Development		
Travel Mode	**Mode Share Target**	**Rationale**
Transit	24%	Consistent with the TMP Transit Priority Network 2031 Affordable Network
Walking	7%	Due to the close proximity to the surrounding residential areas
Cycling	6%	Consistent with young patrons of the athletic facilities
Auto Passenger	10%	Consistent with modal share targets and travel trends to athletic related land uses
Auto Driver	53%	

The peak hour person-trips for the various travel modes were determined by the product of the total peak hour person-trips previously determined (1,517 Peak AM & 1,482 Peak PM Hour) and the future mode share from Table 3.4. The results are shown in Table 3.5.

TABLE 3.5
FUTURE DEVELOPMENT GENERATED PERSON-TRIPS

TRAVEL MODE	**DEVELOPMENT GENERATED PERSON-TRIPS**	
	PEAK AM HOUR	**PEAK PM HOUR**
Transit	364 person-trips	356 person-trips
Walking	106 person-trips	104 person-trips
Cycling	91 person-trips	89 person-trips
Auto Passenger	152 person-trips	148 person-trips
Auto Driver	804 person-trips	785 person-trips
Total Person-Trips	**1,517 person-trips**	**1,482 person-trips**

The TIA Guidelines allow for three Trip Reduction Factors that may be applied to the expected development trips. Below discusses the three factors, with the third factor being the only factor which would provide a trip reduction for the development:

1. The proposed site is currently vacant with no existing uses or site trips which would be replaced by proposed trips from the Blue Sea Village Mer Bleue development. The reduction for existing development trips would not apply.

2. All of the trips to/from the site are assumed to be primary trips with no pass-by vehicle trips. The pass-by trip reduction factor would not apply.

3. With the exception of the retirement residence, all of the uses within the Blue Sea Village Mer Bleue development are related to the athletic activities of the individual uses. A shared trip reduction or internalization of trips within the development was applied. The study has applied a 50 percent trip reduction factor which was applied to the athletic, office and residential apartment uses which would be shared with the Gymnastic Centre. Trips generated by the Gymnastic Centre use were not reduced as these trips would be considered primary trips. The trip reduction is illustrated further in Table 3.3.

Element 3.1.2 – Trip Distribution

The distribution of site generated trips for the proposed Blue Sea Village Mer Bleue development was determined from the *National Capital Region Travel Trends* (NCR) document. The document showed the population and employment statistics for various districts within the region. With the trips to the site considered as primary trips, the study has examined the population of the surrounding districts and proportioned the trips to the shortest and most convenient routes. The trip distribution utilized in the study for both the weekday peak AM hour and PM hour time periods was as follows:

To/From the north/east	along Mer Bleue	20%
To/From the south/east	along Mer Bleue	15%
To/From the east	along Mer Bleue/Vanguard ext.	10%
To/From the north/west	along Mer Bleue and Innes	55%

Element 3.1.3 – Trip Assignment

The trip assignment has utilized the above trip distribution and assigned the expected trips for the total development of the Mer Bleue site at the year 2024. The trip assignment has assumed that the Vanguard Drive Extension has not been completed by full development of the site in 2024, but will be completed by 2029 which represents five years beyond completion. Figure 3.1 shows the trip assignment for the total development in 2024, and Figure 3.2 the trip assignment at the year 2029.

MODULE 3.2 – Background Network Travel Demands

Element 3.2.1 – Transportation Network Plans

The City of Ottawa has initiated an EA study for the extension of Vanguard Drive from Lanthier Drive to Mer Bleue Road. The study will examine various alignment options for the road extension to Mer Bleue Road. The EA study will include traffic volumes for future development

FIGURE 3.1
2024 PEAK AM AND PM HOUR SITE GENERATED TRIPS

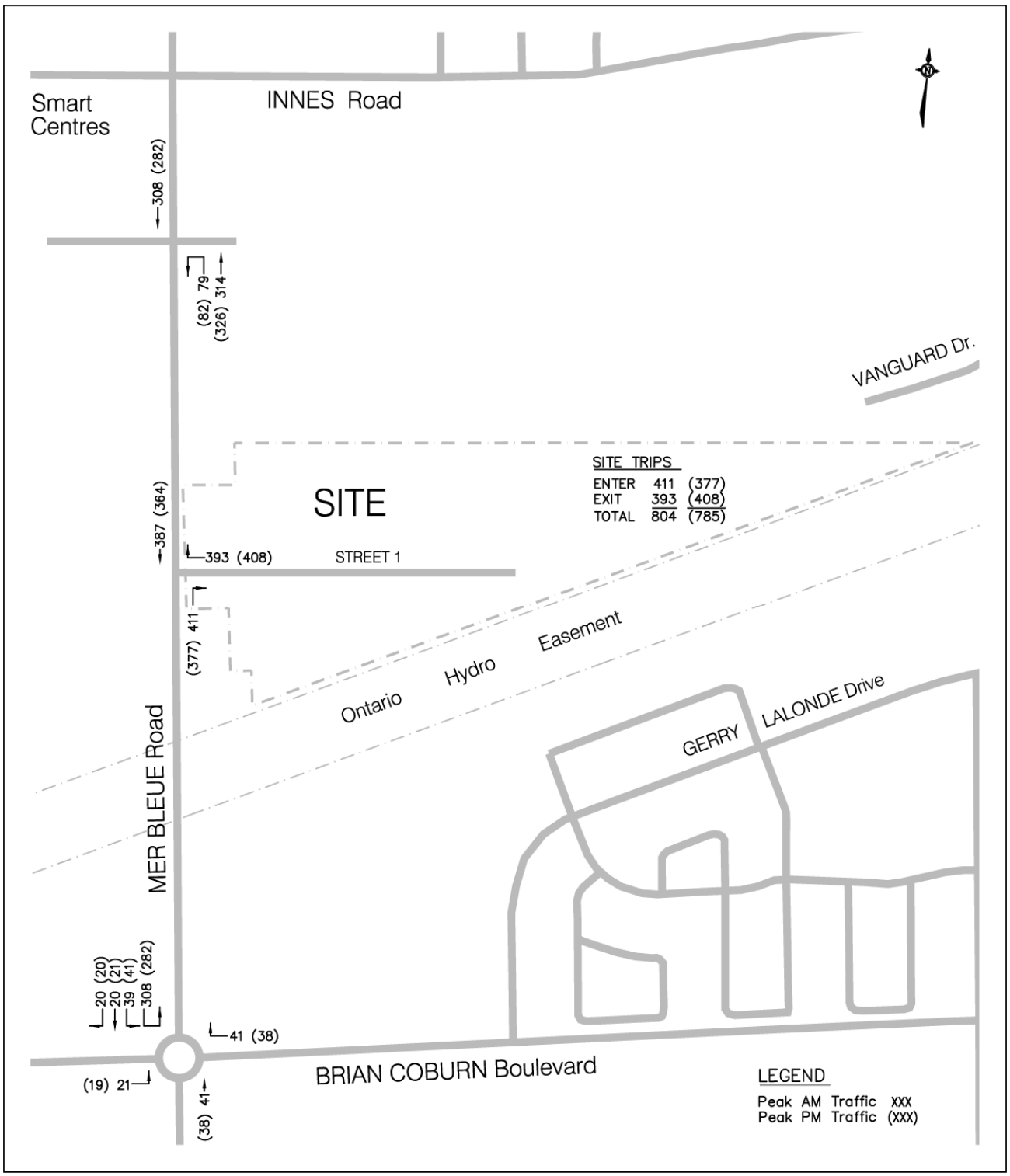

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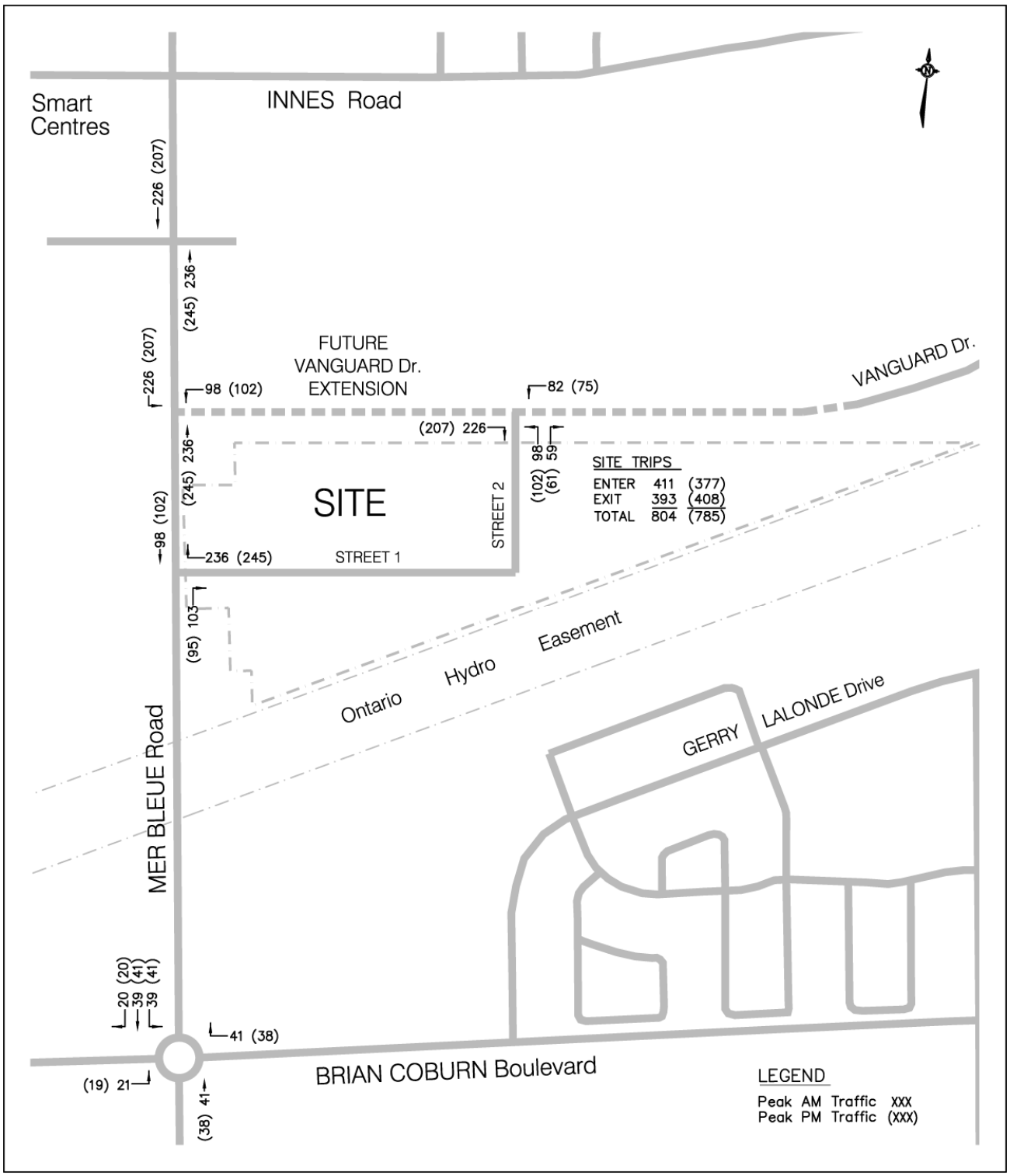
FIGURE 3.2
2029 PEAK AM AND PM HOUR SITE GENERATED TRIPS



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which are based on the 2025 Mer Bleue Road CTS report which would account for future development south and west of the site.

Further widening of Mer Bleue Road south to Renaud Road, and the extension of Brian Coburn Boulevard between Mer Bleue Road and Navan Road, are identified in Phase 1: 2014 to 2019 in the affordable road network of the *Transportation Master Plan 2013*.

Element 3.2.2 – Background Growth

To determine the growth in background traffic, the study has utilized the background traffic information as documented in the 2025 Mer Bleue Road CTS report. The 2026 future traffic without the Vanguard Drive Extension (Figure 9 of the CTS) with adjustments to the northbound and southbound Mer Bleue Road through movements was used to determine the 2024 background traffic for the TIA report. Figure 3.3 shows the expected 2024 background traffic volumes along Mer Bleue Road.

The 2029 background traffic utilized Figure 10 of the CTS report and adjusted the northbound and southbound Mer Bleue Road through movements to determine the 2029 future traffic with the Vanguard Drive Extension. Figure 3.4 shows the 2029 background traffic which was assigned the expected 2025 Mer Bleue Road development trips to Vanguard Drive.

Element 3.2.3 – Other Developments

Other development which may take place in the surrounding area is the additional development of residential areas south of the site and along the extension of Brian Coburn Boulevard south and west of the site. The 2024 and 2029 background traffic takes into account the future residential development along with the retail/commercial/residential development at 2025 Mer Bleue Road which is located on the north side of the site as previously discussed.

MODULE 3.3 – Demand Rationalization

The site is located between Mer Bleue Road and Tenth Line Road which are both four lane divided arterial roads. Existing traffic counts and background traffic calculations show that the high volume of traffic during the peak AM and PM hours is attributed to the existing and proposed residential development south of the site. The proposed Blue Sea Village Mer Bleue development would generate a small number of site generated trips when compared to the volume of background traffic resulting is a minor impact on the adjacent roads.

The development contains a number of uses which would share trips and reduce the impact on the surrounding roadway network. The development also includes a residential apartment building which would house participants training for events at the various athletic facilities within the development. The shared trips would reduce trips onto the adjacent roads.

Transit Priority Projects by the City of Ottawa which includes peak period bus lanes along with transit signal priority and queue jump lanes proposed along Brian Coburn Boulevard would encourage the use of transit to the development.

FIGURE 3.3
2024 PEAK AM AND PM HOUR BACKGOUND TRAFFIC

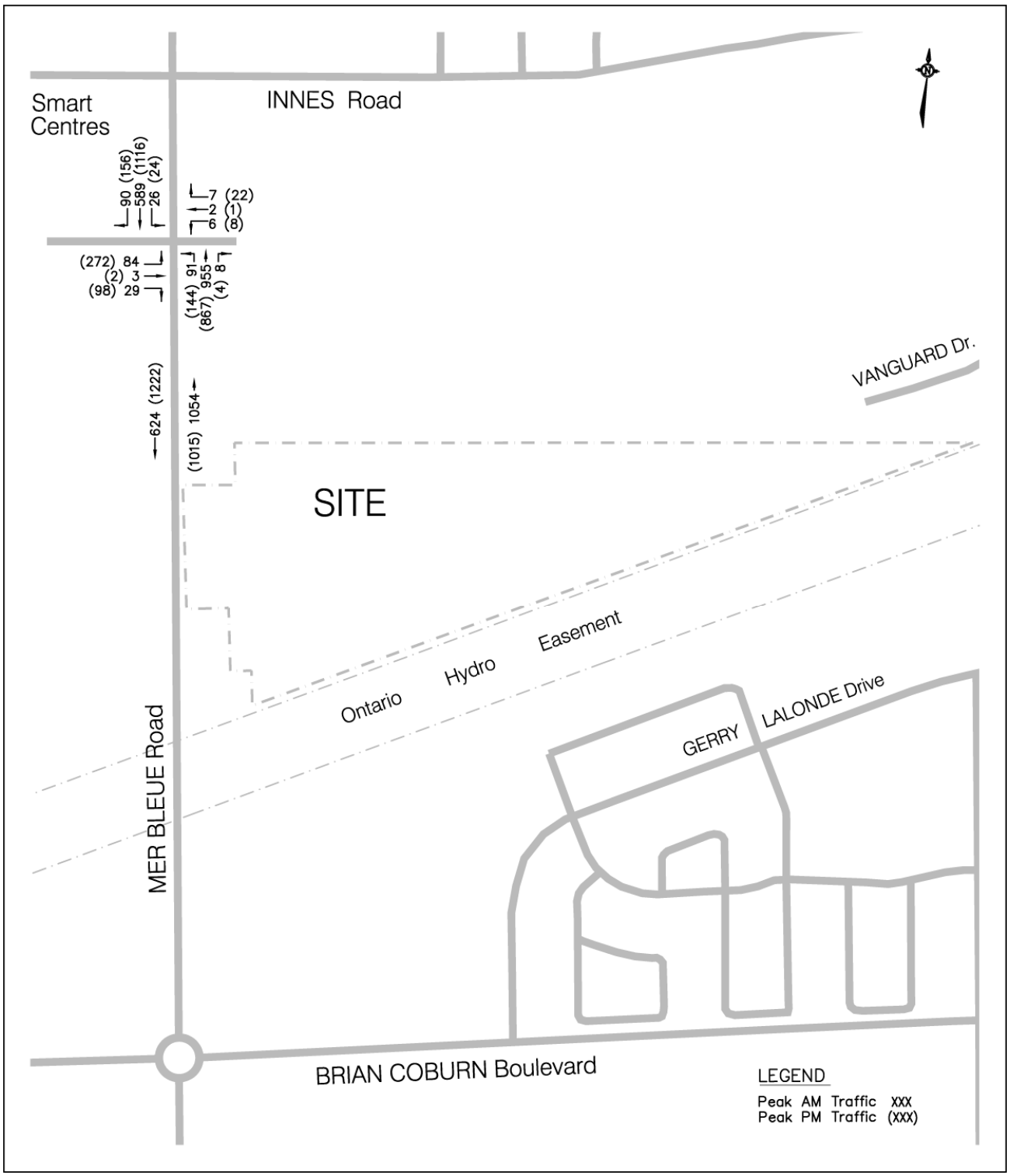

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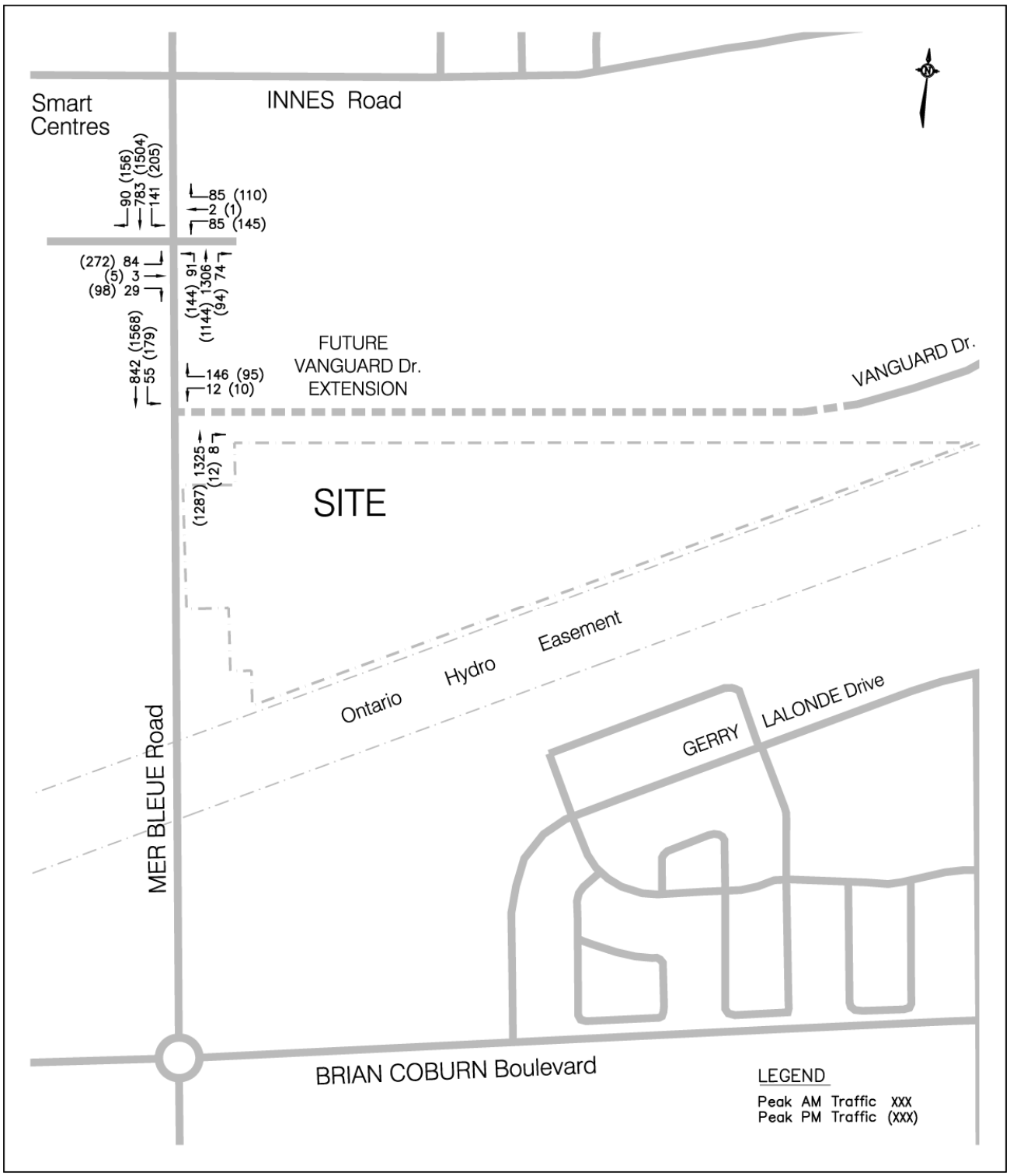
FIGURE 3.4
2029 PEAK AM AND PM HOUR BACKGOUND TRAFFIC



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STEP 4 - ANALYSIS

MODULE 4.1 – Development Design

Element 4.1.1 – Design for Sustainable Modes

The site will be designed to provide adequate on-site parking for both vehicles and bicycles. The development would provide sidewalks along both sides of the road which would allow easy and safe movement of pedestrians between various athletic facilities and accommodations. The sidewalks would also provide safe passage to transit stops along Mer Bleue Road, and Tenth Line Road following the extension of Vanguard Drive.

Element 4.1.2 – Circulation and Access

During the Site Plan Application stage, all developments would be designed to provide easy and safe access to each facility, and an efficient movement of vehicles and service vehicles within the site.

Element 4.1.3 – New Street Networks

Exempt as determined in the Scoping module.

MODULE 4.2 – Parking

Element 4.2.1 – Parking Supply

During the design phase for each building, on-site parking will be examined to ensure the parking supply is adequate and meets the zoning and parking by-laws.

Element 4.2.2 – Spillover Parking

Exempt as determined in the Scoping module.

MODULE 4.3 – Boundary Street Design

With the rapid growth in the surrounding area, the City of Ottawa has made substantial improvements to the existing roadway infrastructure. Mer Bleue Road was widened in 2010 to a four lane divided road from the existing shopping centre at Mer Bleue Road and Innes Road, to the hydro easement at the south border of the Blue Sea Village Mer Bleue development. In 2015 the four lane divided cross section was extended further south to a point approximately 450 m south of Brian Coburn Boulevard. As part of the Mer Bleue Road widening, the intersection of Mer Bleue Road and Brian Coburn Boulevard was reconstructed as a two lane roundabout.

The City is in the process of completing an Environmental Assessment study for the extension of Vanguard Drive. As part of the study, the preferred option would be capable of accommodating future traffic from development in the surrounding area. All roadway improvements completed recently would have included trips from the Blue Sea Village Mer Bleue site.

MODULE 4.4 – Access Intersection Design

Element 4.4.1 – Location and Design of Access

The location and design of the accesses to each development would be completed during the Site Plan Application stage.

Element 4.4.2 – Intersection Control

Access into the development would be from the intersection of Mer Bleue Road and the proposed road (Street 1) into the development. The intersection would be a "T" intersection with Street 1 forming the westbound approach and Mer Bleue Road the northbound and southbound approaches. The intersection would be controlled by a stop sign at the westbound Street 1 approach. Street 1 would be restricted to right-in/right-out turning movements which would be controlled by a median along Mer Bleue Road.

At the 2029 horizon year, it is assumed that the Vanguard Drive Extension would be completed linking Mer Bleue Road with Tenth Line Road. The site road (Street 2) would connect to Vanguard Drive at a "T" intersection where Vanguard Drive would form the eastbound and westbound approaches and Street 2 the northbound stop controlled approach.

The Vanguard Drive Extension would connect to Mer Bleue Road at a "T" intersection where Vanguard Drive would form the westbound approach and Mer Bleue Road the northbound and southbound approaches. The intersection would be a full movement intersection controlled by traffic signals.

Element 4.4.3 – Intersection Design

The intersection analysis will use the *Highway Capacity Software, Version 7.4,* which utilizes the intersection capacity analysis procedure as documented in the *Highway Capacity Manual 2010 and 6th Edition*. For unsignalized intersections the level of service of each lane movement and approach is determined as a function of the delay of vehicles at the approach. The following relates the level of service of each lane movement with the expected control delay at the approach.

LEVEL OF SERVICE	CONTROL DELAY	
Level of Service A	0-10 sec./vehicle	Little or No Delay
Level of Service B	>10-15 sec./vehicle	Short Traffic Delays
Level of Service C	>15-25 sec./vehicle	Average Traffic Delays
Level of Service D	>25-35 sec./vehicle	Long Traffic Delays
Level of Service E	>35-50 sec./vehicle	Very Long Traffic Delays
Level of Service F	>50 sec./vehicle	Extreme Delays – Demand Exceeds Capacity

The expected length of queue at the critical lane movements for an unsignalized intersection was determined by the calculation of the 95th percentile queue at the lane approach. The 95th percentile queue length is the calculated 95th greatest queue length out of 100 occurrences at a movement during a 15-minute peak period. The 95th percentile queue length is a function of the

capacity of a movement and the total expected traffic, with the calculated value determining the magnitude of the queue by representing the queue length as fractions of vehicles.

For a signalized intersection, the operation or level of service of an intersection is determined from the volume to capacity ratio (v/c) for each lane movement as documented by the City of Ottawa in the *Transportation Impact Assessment Guidelines (2017)*. The following relates the level of service with the volume to capacity ratio at each lane movement.

LEVEL OF SERVICE	VOLUME TO CAPACITY RATIO
Level of Service A	0 to 0.60
Level of Service B	0.61 to 0.70
Level of Service C	0.71 to 0.80
Level of Service D	0.81 to 0.90
Level of Service E	0.91 to 1.00
Level of Service F	> 1.00

The number of new site generated auto-trips was determined utilizing the Peak Hour Future Development Generated Person-Trips (Table 3.5) which were discussed in Element 3.1.1. One auto-trip was assumed to be the same as one auto driver trip from Table 3.5. The distribution of trips entering the site and trips exiting the site was determined from the distribution for all land uses as shown in Table 3.3. The number of auto-trips generated by the total development is presented in Table 4.1, and shown in Figure 3.1 (2024) and Figure 3.2 (2029).

TABLE 4.1
PEAK AM AND PM HOUR SITE GENERATED AUTO-TRIPS

LAND USE	PEAK AM HOUR			PEAK PM HOUR		
	TOTAL	ENTER	EXIT	TOTAL	ENTER	EXIT
Blue Sea Village	804	411 (51%)	393 (49%)	785	377 (48%)	408 (52%)

The total traffic is the sum of the peak hour site generated trips (Figure 3.1 for the year 2024 and Figure 3.2 for the year 2029), and the peak hour background traffic (Figure 3.3 for the year 2024 and Figure 3.4 for the year 2029). Figure 4.1 presents the total 2024 peak hour vehicular traffic and Figure 4.2 the total 2029 peak hour vehicular traffic.

VEHICULAR LEVEL OF SERVICE (LOS) - Intersection Capacity Analysis

Street 1 (Site Access) and Mer Bleue Road Intersection

The intersection is a “T” intersection with Street 1 forming the westbound stop controlled approach. Street 1 is restricted to right-in/right-out turning movements which are controlled by a median along Mer Bleue Road. For the year 2024 analysis, all development within the site is assumed to be completed but without the Vanguard Drive Extension. With only one point of

FIGURE 4.1
2024 PEAK AM AND PM HOUR TOTAL TRAFFIC

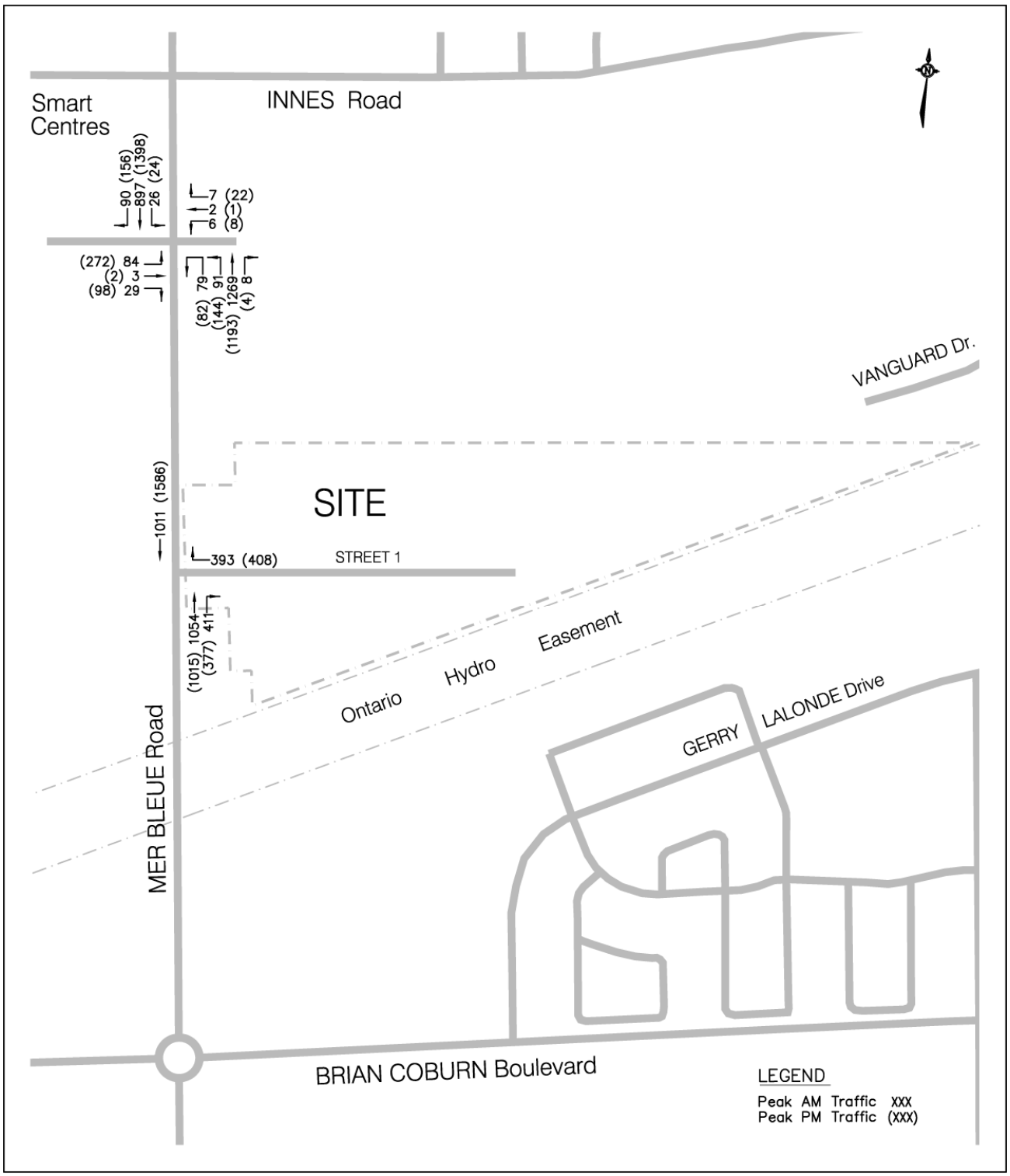

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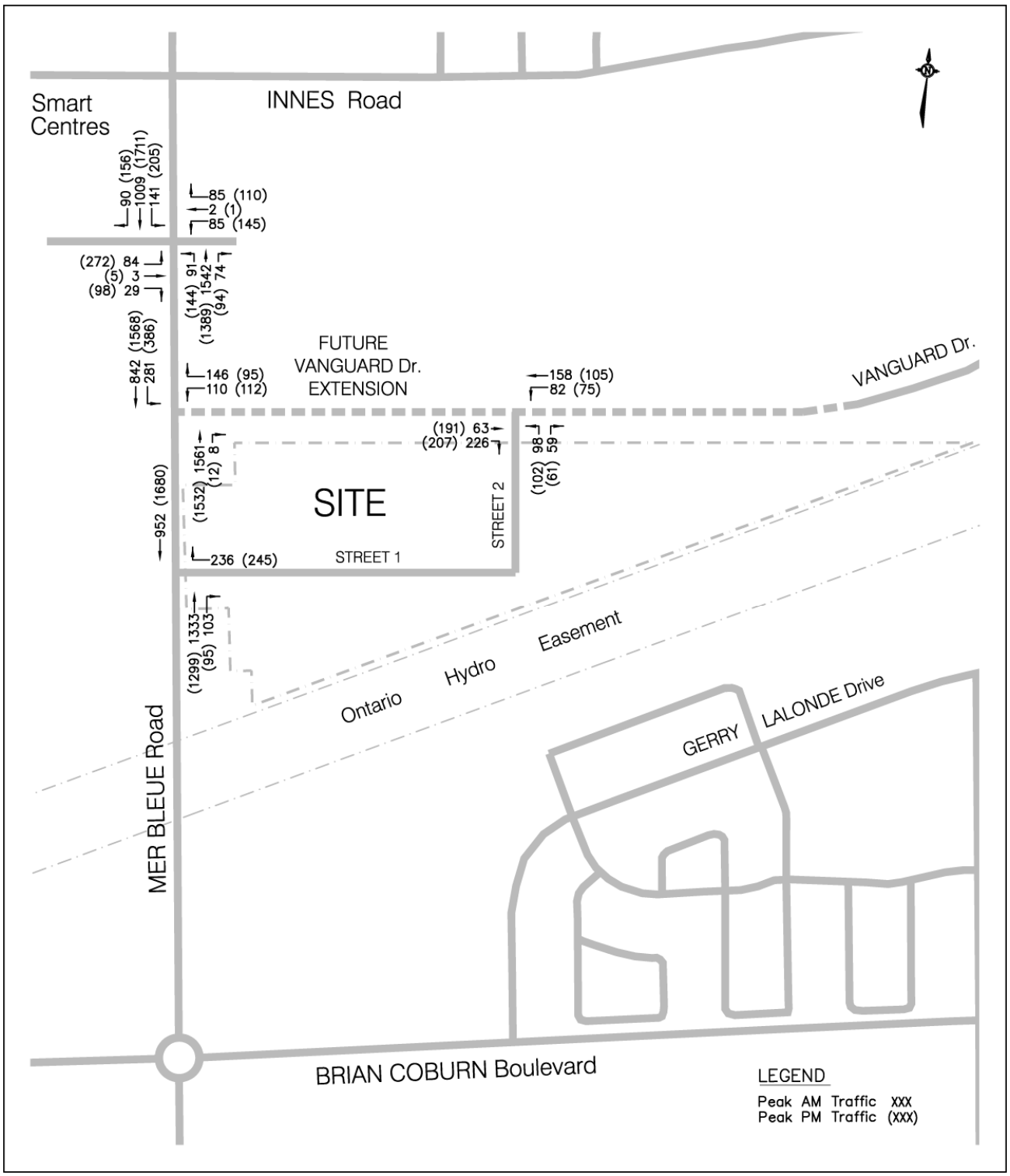
FIGURE 4.2
2029 PEAK AM AND PM HOUR TOTAL TRAFFIC



NOT TO SCALE

access/egress, the westbound Street 1 approach would function at a Level of Service (LoS) "F" with an approach delay of approximately three minutes. Table 4.2 summarizes the operation of the intersection with the analysis sheets provided in the Appendix as Exhibit 5 and Exhibit 6.

TABLE 4.2
STREET 1 AND MER BLEUE ROAD INTERSECTION – LoS & Control Delay

Intersection Approach	WEEKDAY PEAK AM HOUR YEAR 2024 (2029)		WEEKDAY PEAK PM HOUR YEAR 2024 (2029)	
	LoS	Delay (sec/veh)	LoS	Delay (sec/veh)
WB Right – Street 1	F (E)	185.8 (42.5)	F (E)	172.4 (41.7)

At the year 2029 the Vanguard Drive Extension is expected to be completed and the site will have access to Mer Bleue Road from Street 1, and access to Mer Bleue Road and Tenth Line Road from Street 2 to Vanguard Drive. For the year 2029 time period, the intersection functioned at an acceptable level of service. The intersection did experience an improved LoS at the year 2029 with the additional access point from Street 2 to Vanguard Drive. The westbound Street 1 approach would function at a LoS "E" and experience a 95th percentile queue of 6.1 vehicles during the 2029 peak PM hour. Table 4.2 summarizes the 2029 operation of the intersection the analysis provided as Exhibits 7 and 8. The intersection would require a new private approach with no modifications to Mer Bleue Road.

Street 2 (Site Access) and Vanguard Drive Intersection

The intersection of Street 2 and Vanguard Drive Extension is a "T" intersection with Street 2 forming the stop controlled northbound approach. The intersection is a full movement intersection with all approaches comprising of a single lane with shared turning movements. Table 4.3 summarizes the operation of the intersection with the analysis sheets provided as Exhibits 9 for the peak AM hour and Exhibit 10 for the peak PM hour.

TABLE 4.3
STREET 2 AND VANGUARD DRIVE INTERSECTION – LoS & Control Delay

Intersection Approach	WEEKDAY PEAK AM HOUR YEAR (2029)		WEEKDAY PEAK PM HOUR YEAR (2029)	
	LoS	Delay (sec/veh)	LoS	Delay (sec/veh)
WB Left/Through – Vanguard	(A)	(8.1)	(A)	(8.5)
NB Left/Right – Street 2	(B)	(14.2)	(C)	(15.9)

The westbound Vanguard Drive left/through movement functioned at a LoS "A" during both the 2029 peak AM and PM hours, and the northbound Street 2 left/right turn movement functioned at a LoS "B" during the peak AM hour and LoS "C" during the peak PM hour. The northbound Street 2 approach would experience a 95th percentile queue of 1.6 vehicles during the 2029 peak PM hour.

Mer Bleue Road and Vanguard Drive Extension Intersection

The intersection of Mer Bleue Road and Vanguard Drive Extension is expected to be constructed by the year 2029 along with the 2025 Mer Bleue Road development on the north side of the road. The intersection would be a full movement "T" intersection which would be controlled by traffic signals. The analysis has assumed the following lane configuration:

Northbound Mer Bleue Road Approach -	Two through lanes
	One right turn lane
Southbound Mer Bleue Road Approach -	Two through lanes
	One left turn lane
Westbound Vanguard Drive Approach -	One left turn lane
	One right turn lane

The operational analysis for the year 2029 determined that the intersection would operate at an acceptable level of service. Table 4.4 summarizes the operation of the intersection with the analysis sheets provided as Exhibit 11 for the peak AM hour and Exhibit 12 for the peak PM hour. The final design would be confirmed during the functional design stage for the Vanguard Drive Extension.

TABLE 4.4
MER BLEUE AND VANGUARD DRIVE INTERSECTION – LoS & v/c Ratio

Intersection Approach	WEEKDAY PEAK AM HOUR YEAR (2029)		WEEKDAY PEAK PM HOUR YEAR (2029)	
	LoS	v/c Ratio	LoS	v/c Ratio
WB Left – Vanguard	(A)	(0.533)	(C)	(0.782)
WB Right – Vanguard	(C)	(0.788)	(C)	(0.729)
NB Through – Mer Bleue	(D)	(0.860)	(D)	(0.893)
NB Right – Mer Bleue	(A)	(0.002)	(A)	(0.008)
SB Left – Mer Bleue	(D)	(0.835)	(D)	(0.880)
SB Through – Mer Bleue	(A)	(0.330)	(A)	(0.587)

Mer Bleue Road and 210m South of Innes Road Intersection

The closest signalized intersection would be the intersection to the Smart Centres shopping centre located 500 m north of the site and 210 m south of Innes Road. Using the existing traffic counts taken on August 21, 2015 (Exhibit 2 and 3) and the traffic signal timing plan (Exhibit 4) which were both obtained from the City of Ottawa, the intersection operated at an acceptable LoS. Table 4.5 summarizes the operation of the intersection with the analysis sheets provided as Exhibit 13 for the 2015 peak AM hour and Exhibit 14 for the peak PM hour.

TABLE 4.5
MER BLEUE AND 210m S OF INNES ROAD INTERSECTION – LoS & v/c Ratio

Intersection Approach	WEEKDAY PEAK AM HOUR YEAR *2015* 2024 (2029)		WEEKDAY PEAK PM HOUR YEAR *2015* 2024 (2029)	
	LoS	v/c Ratio	LoS	v/c Ratio
EB Left – Smart Centres	*A* A (A)	*0.381* 0.397 (0.508)	*B* C (F)	*0.681* 0.781 (1.050)
EB Through/Right – Smart Centres	*A* A (A)	*0.102* 0.141 (0.118)	*A* A (A)	*0.206* 0.289 (0.301)
WB Left – Private Road	*A* A (A)	*0.029* 0.030 (0.388)	*A* A (A)	*0.023* 0.029 (0.543)
WB Through/Right – Private Road	*A* A (A)	*0.035* 0.044 (0.418)	*A* A (A)	*0.054* 0.067 (0.325)
NB Left – Mer Bleue	*A* B (A)	*0.097* 0.570 (0.448)	*A* B (A)	*0.282* 0.643 (0.592)
NB Through – Mer Bleue	*A* A (C)	*0.154* 0.590 (0.761)	*A* B (C)	*0.160* 0.663 (0.791)
NB Right – Mer Bleue	*A* A (A)	*0.002* 0.004 (0.027)	*A* A (A)	*0.000* 0.000 (0.056)
SB Left – Mer Bleue	*A* A (A)	*0.034* 0.327 (0.551)	*A* A (D)	*0.037* 0.312 (0.837)
SB Through – Mer Bleue	*A* A (A)	*0.070* 0.448 (0.486)	*A* D (E)	*0.267* 0.878 (0.974)
SB Right – Mer Bleue	*A* A (A)	*0.063* 0.045 (0.043)	*A* A (A)	*0.002* 0.150 (0.136)

At full development of the site in 2024 the intersection continued to operate at an acceptable LoS, but with the increasing background traffic the northbound left turn movement into the Smart Centres shopping centre would require a double left turn movement and a protected left turn phase. The additional left turn lane can be accommodated within the existing pavement markings. Table 4.5 summarizes the operation of the intersection with the analysis sheets provided as Exhibit 15 for the 2024 peak AM hour and Exhibit 16 for the peak PM hour.

At the year 2029 the Vanguard Drive Extension is expected to be completed, and background traffic will further increase due to the additional residential development south of the site and the completion of the development at 2025 Mer Bleue Road. The operational analysis determined that the intersection functioned at an acceptable LoS with the exception of the eastbound left turn movement which would experience a moderate delay during the peak PM hour. Both the

northbound and southbound Mer Bleue Road approaches would be modified to include double left turn lanes (the intersection can accommodate double left turn lanes with one left turn lane currently hatched out in each direction). The current two phase traffic signals would be modified to include a protected left turn phase at the northbound and southbound approaches. These modifications would improve the operation of the intersection which can be further evaluated at a future date. Table 4.5 summarizes the operation of the intersection with the analysis sheets provided as Exhibit 17 for the 2029 peak AM hour and Exhibit 18 for the peak PM hour.

PEDESTRIAN LEVEL OF SERVICE (PLOS)

The pedestrian level of service (PLOS) was determined utilizing the City of Ottawa publication, *Multi-Modal Level of Service (MMLOS) Guidelines*. Table 4.6 presents the level of service for street segments and signalized intersections within the study area, with the analysis for the 2029 PLOS street segment evaluation provided in the Appendix as Exhibit 19 and Exhibit 20.

The level of service for the two signalized intersections is provided as Exhibit 21 for the Mer Bleue/Vanguard intersection and Exhibit 22 for the Mer Bleue/Smart Centres access.

TABLE 4.6
PEDESTRIAN LEVEL OF SERVICE (PLOS) – Street Segments & Intersections

Street	**Segment**	**Level of Service**	**Analysis**
Street 1 and 2	Mer Bleue to Vanguard	C	Exhibit 19
Mer Bleue Road	210m S of Innes to Brian Coburn	E	Exhibit 20
Intersection		**Level of Service**	**Analysis**
Mer Bleue Road and Vanguard Drive		D	Exhibit 21
Mer Bleue Road and Smart Centres Access		D	Exhibit 22

BICYCLE LEVEL OF SERVICE (BLOS) - Street Segments & Intersections

The bicycle level of service (BLOS) was determined utilizing the City of Ottawa publication, *Multi-Modal Level of Service (MMLOS) Guidelines*. Streets 1 and 2 are classified as local streets with no cycling facilities, and Mer Bleue Road is an arterial road which is identified as a “Spine Route” in the Cycling Network - Primary Urban plan. Mer Bleue Road does contain cycling lanes along both sides of the road. Table 4.7 presents the level of service for street segments within the study area, with the analysis for the 2029 traffic provided as Exhibit 23 and 24.

The BLOS was examined for the proposed signalized intersection of Mer Bleue Road and Vanguard Drive which assumed exclusive left and right turn lanes and cycling pockets, and the existing intersection of Mer Bleue Road and the Smart Centres Access. Table 4.7 presents the level of service for intersections, with the analysis for the 2029 traffic provided as Exhibit 25 and Exhibit 26.

TABLE 4.7
BICYCLE LEVEL OF SERVICE (BLOS) – Street Segments & Intersections

Street	Segment	Level of Service	Analysis
Street 1 and 2	Mer Bleue to Vanguard	B	Exhibit 23
Mer Bleue Road	210m S of Innes to Brian Coburn	F	Exhibit 24
Intersection		**Level of Service**	**Analysis**
Mer Bleue Road and Vanguard Drive		E	Exhibit 25
Mer Bleue Road and Smart Centres Access		E	Exhibit 26

TRANSIT LEVEL OF SERVICE (TLOS) - Street Segment

OC Transpo Regular Route 302 travels along Mer Bleue Road providing access to the St. Laurent Transit Station and Place d'Orléans shopping centre. A transitway corridor exists along the south side of the hydro easement south of the site. The corridor will be eventually used for a bus rapid transit route or possible light rail in the future. Bus service is not expected within the Blue Sea Village Mer Bleue site or along Vanguard Drive.

The transit level of service (TLOS) evaluation methodology and table in the MMLOS Guidelines are intended primarily to be applied along corridors with existing or planned rapid transit or transit priority measures, or along mixed traffic areas which experience parked vehicles, congestion and private driveways. A TLOS road segment evaluation was conducted for Mer Bleue Road between the Smart Centres intersection and Brian Coburn intersection. The evaluation determined that the Mer Bleue Road segment operated at a LoS "D". The evaluation form is provided as Exhibit 27.

TABLE 4.8
TRANSIT LEVEL OF SERVICE (TLOS) – Street Segment

Street	Segment	Level of Service	Analysis
Mer Bleue Road	210m S of Innes to Brian Coburn	D	Exhibit 27

TRUCK LEVEL OF SERVICE (TkLOS) - Street Segments & Intersections

The truck level of service (TkLOS) was determined utilizing the City of Ottawa publication, *Multi-Modal Level of Service (MMLOS) Guidelines*. The truck LoS was determined for the street segment between the Smart Centre access intersection (210 m S of Innes Road) to Brian Coburn Boulevard, and the intersections along Mer Bleue Road which comprises of the Mer Bleue/Vanguard and Mer Bleue/Smart Centres Access. Table 4.8 presents the truck level of

service for street segments and intersections within the study area, with the analysis for the 2029 traffic provided as Exhibit 28.

TABLE 4.9
TRUCK LEVEL OF SERVICE (TkLOS) – Street Segments & Intersections

Street	Segment & Intersection	Level of Service	Analysis
Mer Bleue Road	Mer Bleue Road Intersections	A	Exhibit 28
Mer Bleue Road	210m S of Innes to Brian Coburn	A	Exhibit 28

MODULE 4.5 – Transportation Demand Management

Element 4.5.1 – Context for TDM

The proposed Blue Sea Village Mer Bleue site is not in a Transit Oriented Development area or Design Priority Area. The area has transit service along Mer Bleue Road with more service expected in the future as residential development south of the site is completed.

The trips generated by the athletic facilities may be reduced by the implementation of carpooling or ride sharing between participants of gymnastic and athletic facilities.

Element 4.5.2 – Need and Opportunity

If the mode share targets assumed for the site were not met, the result would be only a minor impact on other land uses in the study area.

Element 4.5.3 –TDM Program

In order to reduce auto-trips, the athletic related facilities can promote a ride sharing program between participants and team members.

MODULE 4.6 – Neighbourhood Traffic Management

Element 4.6.1 – Adjacent Neighbourhoods

Exempt as determined in the Scoping module.

MODULE 4.7 – Transit

Element 4.7.1 – Route Capacity

OC Transpo routes exist along Mer Bleue Road, Brian Coburn Boulevard and Innes Road. The City's TMP identifies future improvements to Brian Coburn Boulevard by the implementation of

Transit Priority Projects comprising of bus lanes, transit signal priority and queue jump lanes. Any transit demand by the development would not exceed the capacity of the surrounding transit network.

Element 4.7.2 – Transit Priority

There would be no impact on the travel time of transit due to the accesses to the development and addition of trips by participants of the athletic facilities.

MODULE 4.8 – Review of Network Concept

Exempt as determined in the Scoping module.

MODULE 4.9 – Intersection Design

Element 4.9.1 – Intersection Control

The proposed development would have two new access points and intersections. The first would be the intersection of Street 1 and Mer Bleue Road. This intersection would be a "T" intersection controlled by a stop sign at the westbound Street 1 approach. The second access would be the intersection of Street 2 and the Vanguard Drive Extension. The intersection would be controlled by a stop sign at the northbound Street 2 approach.

Element 4.9.2 – Intersection Design

The intersections and road segments within the study area were analyzed to determine the level of service and operation at the horizon years of the study. The intersection of Mer Bleue Road and the Smart Centres access was examined utilizing the existing 2015 traffic counts, and for the expected traffic at the years of 2024 and 2029. The proposed intersection of Street 1 and Mer Bleue Road was analyzed for the expected traffic at the years of 2024 following the completion of the development, and at the year 2029. The Street 2/Vanguard and Mer Bleue/Vanguard intersections were analyzed at the year 2029 following the extension of Vanguard Drive to Mer Bleue Road. A summary of the level of service for the various modes of transportation are summarized in Table 4.10, with the results detailed in the analysis sheets provided as Exhibits in the Appendix. The proposed Street 1 and 2 within the development would meet the minimum desirable MMLOS targets by the Official Plan Policy/Designation & Road Class.

The analysis determined that the Street 1 and Street 2 within the proposed Blue Sea Village Mer Bleue development would conform to the minimum desirable MMLOS Targets as set out in the Official Plan Policy/Designation & Road Class.

TIA STRATEGY REPORT

The study determined that the full development of the site would not trigger the requirement for roadway modifications to Mer Bleue Road. The Street 1/Mer Bleue Road intersection would be restricted to right-in/right-out turning movements which would be controlled by a median along

Mer Bleue Road. If full development of the site is achieved before the Vanguard Drive Extension to Mer Bleue Road is completed, the westbound right turn movement on Street 1 may function at a LoS "F" during both the peak AM ad PM hours with an approach delay of approximately three minutes.

TABLE 4.10
MULTI-MODAL (MMLOS) SUMMARY TABLE

INTERSECTIONS	**Level of Service (LoS) – *2015* 2024 (2029)**				
	Pedestrian	**Cyclist**	**Transit**	**Auto**	**Truck**
Street 1/Mer Bleue	-	-	-	F (E)	-
Street 2/Vanguard	-	-	-	(B)	-
Mer Bleue/Vanguard	(D)	(E)	-	(B)	(A)
Mer Bleue/Smart Ctr.	(D)	(E)	-	*A* A (A)	(A)
SEGMENTS	**Level of Service (LoS) – *2015* 2024 (2029)**				
	Pedestrian	**Cyclist**	**Transit**	**Auto**	**Truck**
Street 1 and Street 2	(C)	(B)	-	-	-
Mer Bleue Road	(E)	(F)	(D)	-	(A)

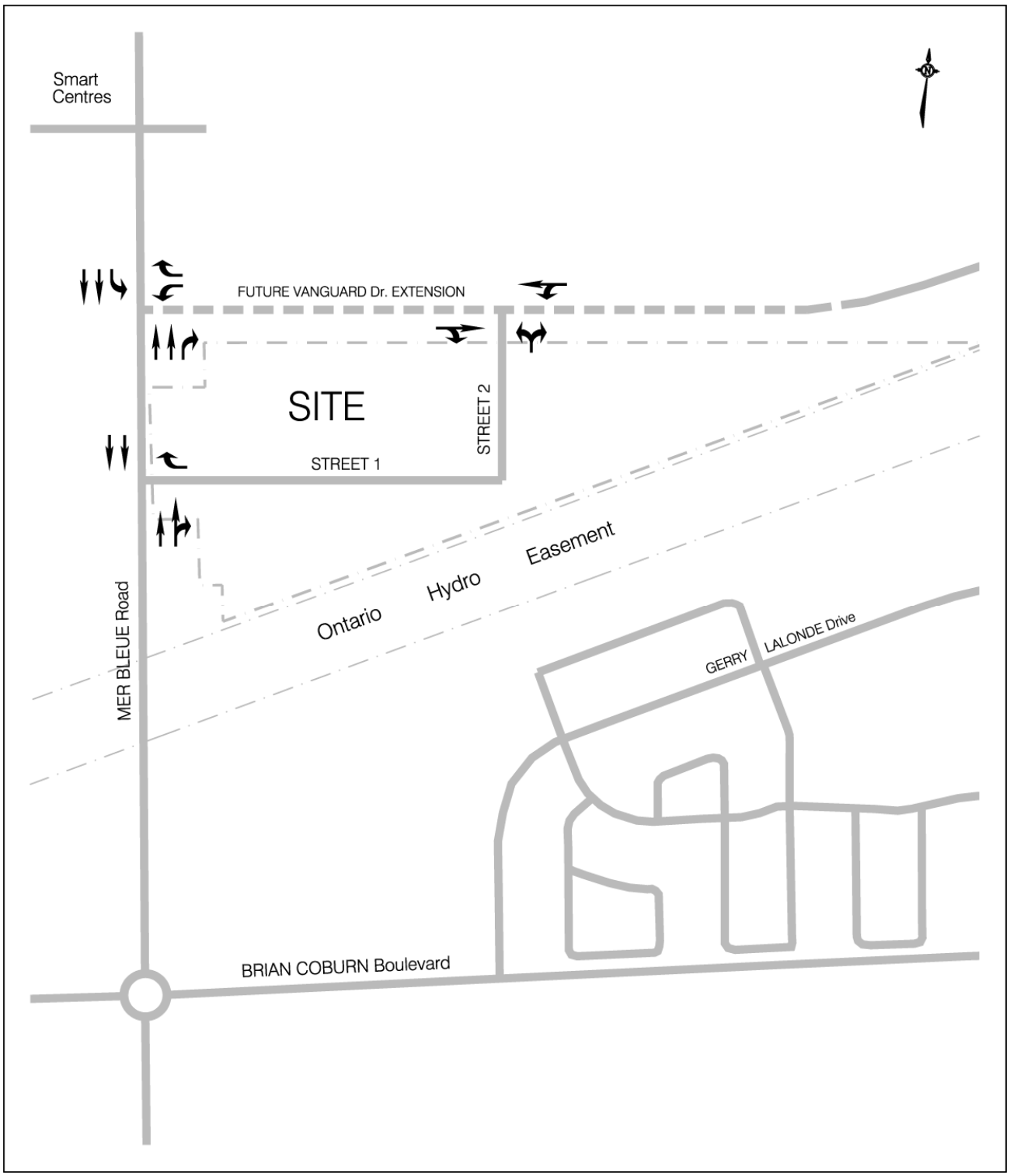
Both Street 1 and Street 2 would be designated as local streets with a pavement width of 11 metres. Sidewalks would be provided on both sides of the roadway.

Figure 4.3 shows the recommended lane configuration for the intersection of Street 1/Mer Bleue which would constructed by 2024. The operation of the intersections would be further evaluated as detailed TIA studies would be completed at the Site Plan Application stage. The Mer Bleue/Vanguard and Street 2/Vanguard intersections would be designed and constructed as part of the Vanguard Drive Extension. The Vanguard Drive Extension is expected to be completed by the year 2029.

Prepared by:

David J. Halpenny, M. Eng., P. Eng.

FIGURE 4.3
RECOMMENDED LANE CONFIGURATION



NOT TO SCALE

APPENDIX

SCREENING FORM

TRAFFIC COUNTS

TRAFFIC SIGNAL TIMING PLAN

VEHICULAR TRAFFIC ANALYSIS

PLOS, BLOS, TLOS and TkLOS SEGMENT EVALUATIONS

EXHIBIT 1
SCREENING FORM

TIA SCREENING FORM

1. Description of Proposed Development	
Municipal Address	2159 Mer Bleue Road, Ottawa
Description of Location	Blue Sea Village Mer Bleue Development. East side of Mer Bleue Road approximately 500m north of Brian Coburn Boulevard.
Land Use Classification	IG7 H(21) "General Industrial Zone"
Development Size (units)	
Development Size (m^2)	Total Land = 47,675.4m^2 (4.768 ha)
Number of Accesses and Locations	One access onto Mer Bleue Road approximately 500m north of Brian Coburn Boulevard.
Phase of Development	Two Phases
Build out Year	2024

2. Trip Generation Trigger	
Land Use Type	Athletic centre, commercial, office and senior residential.
Development Size	Gross Floor Area = 45,500m^2
Trip Generation Trigger Satisfied?	Yes

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

4. Safety Triggers	
	Yes/No
Are posted speed limits on a boundary road 80 km/h or greater?	No

Are there any horizontal/vertical curvatures on a boundary street which limits sight lines at a proposed driveway?	No
Is the proposed driveway within the area of influence of an adjacent traffic signal or roundabout (300 m rural conditions or 150 m urban/suburban conditions)? **100 m (centreline of driveway to centreline of Merivale Road)**	No
Is the proposed driveway within the auxiliary lanes of an intersection? **Within the westbound left turn taper to Merivale Road**	No
Does the proposed driveway make use of an existing median break that serves an existing site?	No
Is there a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?	No
Does the development include a drive-thru facility?	No
Safety Trigger Satisfied?	No

5. Summary	
	Yes/No
Does the development satisfy the Trip Generation Trigger?	Yes
Does the development satisfy the Location Trigger?	Yes
Does the development satisfy the Safety Trigger?	No

EXHIBIT 2
2015 PEAK AM HOUR TRAFFIC COUNTS – Mer Bleue/210 S of Innes

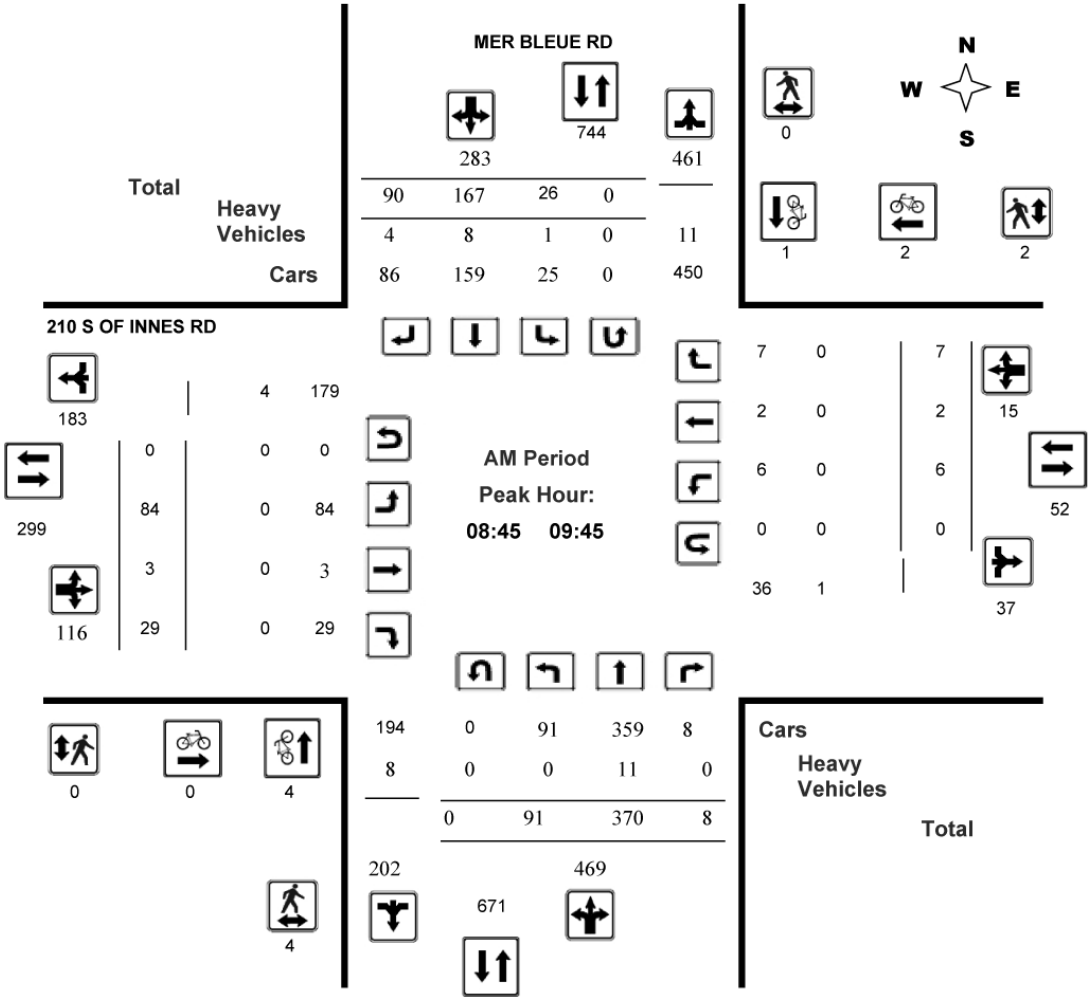
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

MER BLEUE RD @ 210 S OF INNES RD

Survey Date: Friday, August 21, 2015
Start Time: 07:00

WO No: 35282
Device: Jamar Technologies, Inc



Comments

EXHIBIT 3
2015 PEAK PM HOUR TRAFFIC COUNTS – Mer Bleue/210 S of Innes

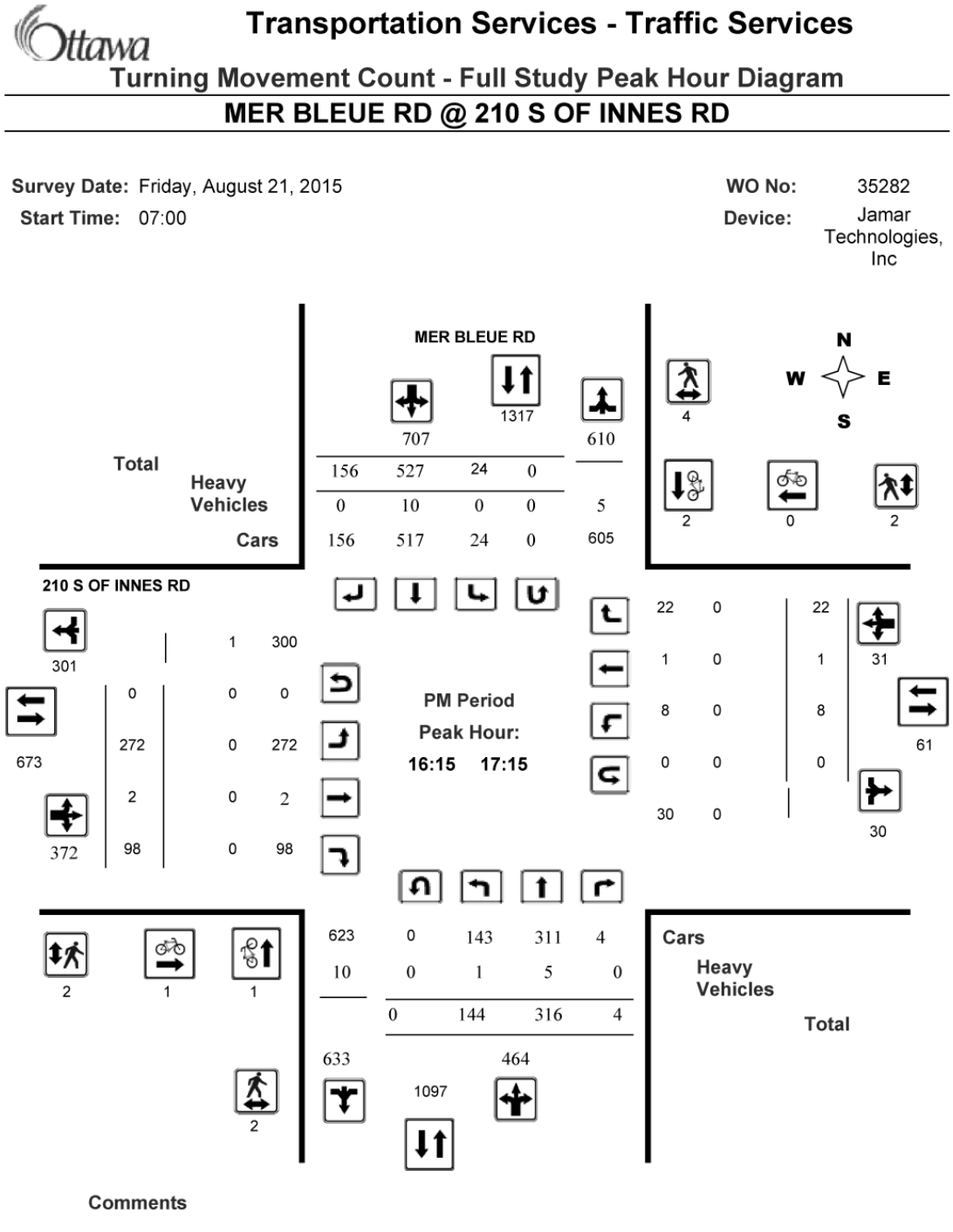


EXHIBIT 4
2015 PEAK AM HOUR TRAFFIC COUNTS – Mer Bleue/210 S of Innes

Traffic Signal Timing

City of Ottawa, Transportation Services Department

Traffic Signal Operations Unit

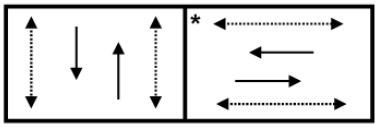
Intersection:	**Main:**	Mer Bleue	**Side:**	210m S of Innes	
Controller:	**MS-3200**			**TSD:**	**6698**
Author:	Spencer Willows			**Date:**	16-Feb-2018

Existing Timing Plans†

	Plan					Ped Minimum Time		
	AM Peak 1	Off Peak 2	PM Peak 3	Night 4	Weekend 5	*Walk*	*DW*	*A+R*
Cycle	90	80	90	75	80			
Offset	X	X	X	X	X			
NB Thru	49	39	49	34	39	7	18	3.7+2.7
SB Thru	49	39	49	34	39	7	18	3.7+2.7
EB Thru	41	41	41	41	41	7	27	3.3+3.5
WB Thru	41	41	41	41	41	7	27	3.3+3.5

Phasing Sequence‡

Plan: All



Schedule

Weekday

Time	Plan
0:10	4
6:00	1
9:30	2
15:00	3
18:30	2
22:00	4

Saturday

Time	Plan
0:10	4
7:00	2
9:00	5
20:00	2
22:00	4

Sunday

Time	Plan
0:10	4
7:00	2
10:00	5
19:00	2
22:00	4

Notes

†: Time for each direction includes amber and all red intervals

‡: Start of first phase should be used as reference point for offset

Asterisk (*) Indicates actuated phase

(fp): Fully Protected Left Turn

◄·····► Pedestrian signal

Cost is $56.50 ($50 + HST)

EXHIBIT 5
2024 PEAK AM HOUR TRAFFIC ANALYSIS – Street 1/Mer Bleue

HCS7 Two-Way Stop-Control Report

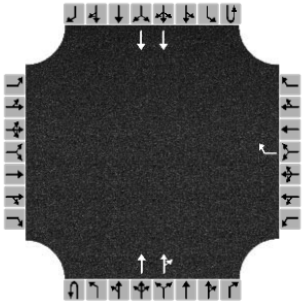
General Information

Analyst	
Agency/Co.	
Date Performed	4/9/2018
Analysis Year	2024
Time Analyzed	Peak AM Hour
Intersection Orientation	North-South
Project Description	2159 Mer Bleue Road

Site Information

Intersection	Site Access/Mer Bleue
Jurisdiction	Ottawa
East/West Street	Blue Sea Village Access
North/South Street	Mer Bleue Road
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	1	0	0	2	0	0	0	2	0
Configuration								R			T	TR			T	
Volume, V (veh/h)								393			1054	411			1011	
Percent Heavy Vehicles (%)								2								
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)								6.9								
Critical Headway (sec)								6.94								
Base Follow-Up Headway (sec)								3.3								
Follow-Up Headway (sec)								3.32								

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)								427								
Capacity, c (veh/h)								330								
v/c Ratio								1.29								
95% Queue Length, Q_{95} (veh)								20.1								
Control Delay (s/veh)								185.8								
Level of Service, LOS								F								
Approach Delay (s/veh)						185.8										
Approach LOS						F										

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EXHIBIT 6
2024 PEAK PM HOUR TRAFFIC ANALYSIS – Street 1/Mer Bleue

HCS7 Two-Way Stop-Control Report

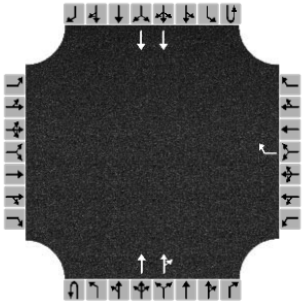
General Information

Analyst	
Agency/Co.	
Date Performed	4/9/2018
Analysis Year	2024
Time Analyzed	Peak PM Hour
Intersection Orientation	North-South
Project Description	2159 Mer Bleue Road

Site Information

Intersection	Site Access/Mer Bleue
Jurisdiction	Ottawa
East/West Street	Blue Sea Village Access
North/South Street	Mer Bleue Road
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	1	0	0	2	0	0	0	2	0
Configuration								R			T	TR			T	
Volume, V (veh/h)								408			1015	377			1586	
Percent Heavy Vehicles (%)								2								
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)								6.9								
Critical Headway (sec)								6.94								
Base Follow-Up Headway (sec)								3.3								
Follow-Up Headway (sec)								3.32								

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)								443								
Capacity, c (veh/h)								350								
v/c Ratio								1.27								
95% Queue Length, Q_{95} (veh)								20.0								
Control Delay (s/veh)								172.4								
Level of Service, LOS								F								
Approach Delay (s/veh)						172.4										
Approach LOS						F										

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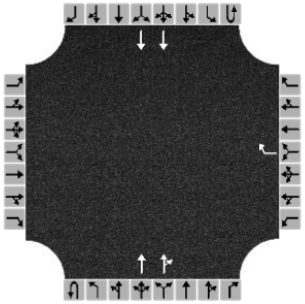
EXHIBIT 7
2029 PEAK AM HOUR TRAFFIC ANALYSIS – Street 1/Mer Bleue

HCS7 Two-Way Stop-Control Report

General Information / Site Information

Analyst		Intersection	Site Access/Mer Bleue
Agency/Co.		Jurisdiction	Ottawa
Date Performed	4/9/2018	East/West Street	Blue Sea Village Access
Analysis Year	2029	North/South Street	Mer Bleue Road
Time Analyzed	Peak AM Hour	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	2159 Mer Bleue Road		

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	1	0	0	2	0	0	0	2	0
Configuration								R			T	TR			T	
Volume, V (veh/h)								236			1333	103			952	
Percent Heavy Vehicles (%)								2								
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)								6.9								
Critical Headway (sec)								6.94								
Base Follow-Up Headway (sec)								3.3								
Follow-Up Headway (sec)								3.32								

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)								257								
Capacity, c (veh/h)								338								
v/c Ratio								0.76								
95% Queue Length, Q_{95} (veh)								6.0								
Control Delay (s/veh)								42.5								
Level of Service, LOS								E								
Approach Delay (s/veh)						42.5										
Approach LOS						E										

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EXHIBIT 8
2029 PEAK PM HOUR TRAFFIC ANALYSIS – Street 1/Mer Bleue

HCS7 Two-Way Stop-Control Report

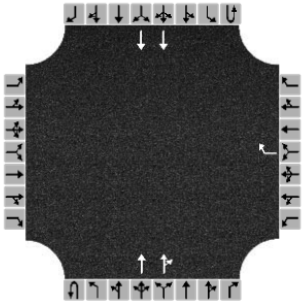
General Information

Analyst	
Agency/Co.	
Date Performed	4/9/2018
Analysis Year	2029
Time Analyzed	Peak PM Hour
Intersection Orientation	North-South
Project Description	2159 Mer Bleue Road

Site Information

Intersection	Site Access/Mer Bleue
Jurisdiction	Ottawa
East/West Street	Blue Sea Village Access
North/South Street	Mer Bleue Road
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	1	0	0	2	0	0	0	2	0
Configuration								R			T	TR			T	
Volume, V (veh/h)								245			1299	95			1680	
Percent Heavy Vehicles (%)								2								
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)								6.9								
Critical Headway (sec)								6.94								
Base Follow-Up Headway (sec)								3.3								
Follow-Up Headway (sec)								3.32								

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)								266								
Capacity, c (veh/h)								350								
v/c Ratio								0.76								
95% Queue Length, Q_{95} (veh)								6.1								
Control Delay (s/veh)								41.7								
Level of Service, LOS								E								
Approach Delay (s/veh)						41.7										
Approach LOS						E										

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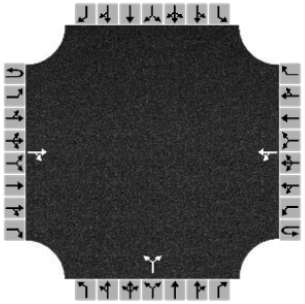
EXHIBIT 9
2029 PEAK AM HOUR TRAFFIC ANALYSIS – Street 2/Vanguard

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst		Intersection	Site Access/Vanguard
Agency/Co.		Jurisdiction	Ottawa
Date Performed	4/9/2018	East/West Street	Vanguard Drive
Analysis Year	2029	North/South Street	Blue Sea Village Access
Time Analyzed	Peak AM Hour	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	2159 Mer Bleue Road		

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	0	0
Configuration				TR		LT					LR					
Volume, V (veh/h)			63	226		82	158			98		59				
Percent Heavy Vehicles (%)						3				3		3				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2				
Critical Headway (sec)						4.13				6.43		6.23				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.23				3.53		3.33				

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						89					171					
Capacity, c (veh/h)						1239					559					
v/c Ratio						0.07					0.31					
95% Queue Length, Q_{95} (veh)						0.2					1.3					
Control Delay (s/veh)						8.1					14.2					
Level of Service, LOS						A					B					
Approach Delay (s/veh)						3.2				14.2						
Approach LOS										B						

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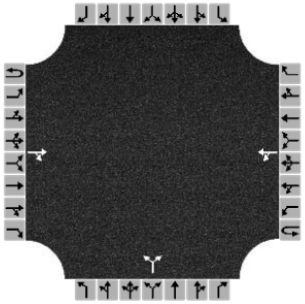
EXHIBIT 10
2029 PEAK PM HOUR TRAFFIC ANALYSIS – Street 2/Vanguard

HCS7 Two-Way Stop-Control Report

General Information / Site Information

Analyst		Intersection	Site Access/Vanguard
Agency/Co.		Jurisdiction	Ottawa
Date Performed	4/9/2018	East/West Street	Vanguard Drive
Analysis Year	2029	North/South Street	Blue Sea Village Access
Time Analyzed	Peak PM Hour	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	2159 Mer Bleue Road		

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	0	0
Configuration				TR		LT					LR					
Volume, V (veh/h)			191	207		75	105			102		61				
Percent Heavy Vehicles (%)						3				3		3				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2				
Critical Headway (sec)						4.13				6.43		6.23				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.23				3.53		3.33				

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						82					177					
Capacity, c (veh/h)						1120					506					
v/c Ratio						0.07					0.35					
95% Queue Length, Q_{95} (veh)						0.2					1.6					
Control Delay (s/veh)						8.5					15.9					
Level of Service, LOS						A					C					
Approach Delay (s/veh)						3.9				15.9						
Approach LOS										C						

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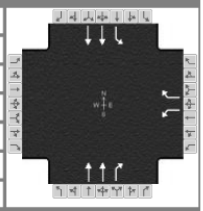
EXHIBIT 11
2029 PEAK AM HOUR TRAFFIC ANALYSIS – Mer Bleue/Vanguard

HCS7 Signalized Intersection Results Summary

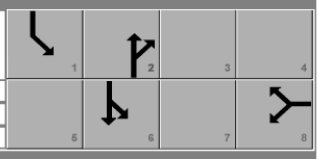
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	3/8/2018	Area Type	Other
Jurisdiction	Ottawa	Time Period	:Peak AM Hour	PHF	0.92
Urban Street	2159 Mer Bleue Road	Analysis Year	Year 2029	Analysis Period	1> 7:00
Intersection	Mer Blueue/Vanguard E…	File Name	2029_tot_am.xus		
Project Description	Blue Sea Village Mer Bleue				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h				110		146		1561	8	281	842	

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Float	Simult. Gap N/S	On

Green	12.3	56.9	11.2	0.0	0.0	0.0
Yellow	3.7	3.7	3.3	0.0	0.0	0.0
Red	2.7	2.7	3.5	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase				8		2	1	6
Case Number				9.0		7.3	1.0	4.0
Phase Duration, s				18.0		63.3	18.7	82.0
Change Period, (*Y+R c*), s				6.8		6.4	6.4	6.4
Max Allow Headway (*MAH*), s				3.3		0.0	3.1	0.0
Queue Clearance Time (*g s*), s				12.1			12.0	
Green Extension Time (*g e*), s				0.0		0.0	0.3	0.0
Phase Call Probability				1.00			1.00	
Max Out Probability				1.00			0.28	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement				3		18		2	12	1	6	
Adjusted Flow Rate (*v*), veh/h				120		155		1697	2	305	915	
Adjusted Saturation Flow Rate (*s*), veh/h/ln				1699		1495		1674	1478	1714	1660	
Queue Service Time (*g s*), s				6.6		10.1		42.2	0.1	10.0	6.3	
Cycle Queue Clearance Time (*g c*), s				6.6		10.1		42.2	0.1	10.0	6.3	
Green Ratio (*g/C*)				0.13		0.13		0.59	0.59	0.75	0.84	
Capacity (*c*), veh/h				224		197		1973	871	366	2772	
Volume-to-Capacity Ratio (*X*)				0.533		0.788		0.860	0.002	0.835	0.330	
Back of Queue (*Q*), ft/ln (50 th percentile)				68.7		113.9		392.3	0.5	196.8	23.5	
Back of Queue (*Q*), veh/ln (50 th percentile)				2.7		4.6		15.3	0.0	7.9	0.9	
Queue Storage Ratio (*RQ*) (50 th percentile)				0.42		0.57		0.28	0.00	0.86	0.04	
Uniform Delay (*d 1*), s/veh				40.5		42.0		17.1	8.4	27.9	2.6	
Incremental Delay (*d 2*), s/veh				1.3		17.4		5.2	0.0	9.7	0.3	
Initial Queue Delay (*d 3*), s/veh				0.0		0.0		0.0	0.0	0.0	0.0	
Control Delay (*d*), s/veh				41.8		59.5		22.3	8.4	37.6	2.9	
Level of Service (LOS)				D		E		C	A	D	A	
Approach Delay, s/veh / LOS	0.0			51.8		D	22.3		C	11.6		B
Intersection Delay, s/veh / LOS	20.7						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.33	B	2.35	B	1.89	B	0.66	A
Bicycle LOS Score / LOS		A		F	1.89	B	1.47	A

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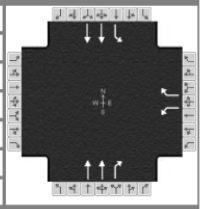
EXHIBIT 12
2029 PEAK PM HOUR TRAFFIC ANALYSIS – Mer Bleue/Vanguard

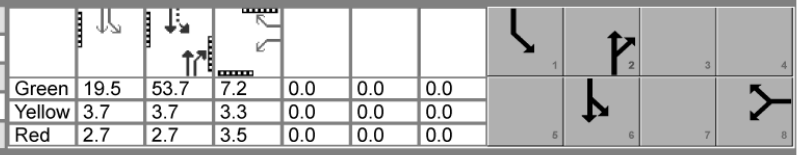
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	3/8/2018	Area Type	Other
Jurisdiction	Ottawa	Time Period	:Peak PM Hour	PHF	0.92
Urban Street	2159 Mer Bleue Road	Analysis Year	Year 2029	Analysis Period	1> 7:00
Intersection	Mer Blueue/Vanguard E…	File Name	2029_tot_pm.xus		
Project Description	Blue Sea Village Mer Bleue				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h				112		95		1532	12	386	1568	

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Float	Simult. Gap N/S	On



Green	19.5	53.7	7.2	0.0	0.0	0.0
Yellow	3.7	3.7	3.3	0.0	0.0	0.0
Red	2.7	2.7	3.5	0.0	0.0	0.0

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase				8		2	1	6
Case Number				9.0		7.3	1.0	4.0
Phase Duration, s				14.0		60.1	25.9	86.0
Change Period, (*Y+R c*), s				6.8		6.4	6.4	6.4
Max Allow Headway (*MAH*), s				3.2		0.0	3.1	0.0
Queue Clearance Time (*g s*), s				9.0			19.1	
Green Extension Time (*g e*), s				0.0		0.0	0.4	0.0
Phase Call Probability				1.00			1.00	
Max Out Probability				1.00			0.38	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement				3		18		2	12	1	6	
Adjusted Flow Rate (*v*), veh/h				122		100		1665	7	420	1704	
Adjusted Saturation Flow Rate (*s*), veh/h/ln				1692		1490		1674	1477	1714	1660	
Queue Service Time (*g s*), s				7.0		6.5		43.9	0.2	17.1	13.2	
Cycle Queue Clearance Time (*g c*), s				7.0		6.5		43.9	0.2	17.1	13.2	
Green Ratio (*g/C*)				0.09		0.09		0.56	0.56	0.79	0.88	
Capacity (*c*), veh/h				156		137		1864	823	477	2905	
Volume-to-Capacity Ratio (*X*)				0.782		0.729		0.893	0.008	0.880	0.587	
Back of Queue (*Q*), ft/ln (50 th percentile)				94		73.5		427.4	1.6	274.4	14.6	
Back of Queue (*Q*), veh/ln (50 th percentile)				3.8		2.9		16.7	0.1	11.0	0.6	
Queue Storage Ratio (*RQ*) (50 th percentile)				0.57		0.37		0.31	0.01	1.19	0.03	
Uniform Delay (*d 1*), s/veh				44.4		44.2		19.5	9.9	29.5	2.2	
Incremental Delay (*d 2*), s/veh				20.6		15.7		7.1	0.0	12.8	0.9	
Initial Queue Delay (*d 3*), s/veh				0.0		0.0		0.0	0.0	0.0	0.0	
Control Delay (*d*), s/veh				65.0		59.9		26.6	9.9	42.3	3.1	
Level of Service (LOS)				E		E		C	A	D	A	
Approach Delay, s/veh / LOS	0.0			62.7		E	26.5		C	10.8		B
Intersection Delay, s/veh / LOS	20.2						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.33	B	2.35	B	1.90	B	0.65	A
Bicycle LOS Score / LOS		A		F	1.87	B	2.22	B

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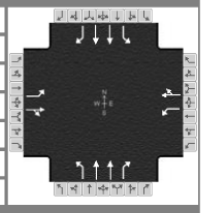
EXHIBIT 13
EXISTING 2015 PEAK AM HOUR TRAFFIC ANALYSIS – Mer Bleue/210 S of Innes

HCS7 Signalized Intersection Results Summary

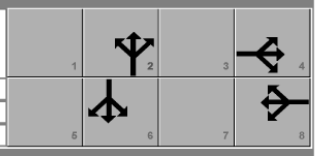
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	3/8/2018	Area Type	Other
Jurisdiction	Ottawa	Time Period	:Peak AM Hour	PHF	0.92
Urban Street	2159 Mer Bleue Road	Analysis Year	Existing 2015	Analysis Period	1> 7:00
Intersection	Mer Blueue/210m S	File Name	2015_ex_am.xus		
Project Description	Blue Sea Village Mer Bleue				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	84	3	29	6	2	7	91	370	8	26	167	90

Signal Information			
Cycle, s	90.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Float	Simult. Gap N/S	On

Green	68.3	8.5	0.0	0.0	0.0	0.0	
Yellow	3.7	3.3	0.0	0.0	0.0	0.0	
Red	2.7	3.5	0.0	0.0	0.0	0.0	



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		6.0		6.0		5.0		5.0
Phase Duration, s		15.3		15.3		74.7		74.7
Change Period, (*Y+R c*), s		6.8		6.8		6.4		6.4
Max Allow Headway (*MAH*), s		3.1		3.1		0.0		0.0
Queue Clearance Time (*g s*), s		7.8		3.4				
Green Extension Time (*g e*), s		0.2		0.2		0.0		0.0
Phase Call Probability		0.95		0.95				
Max Out Probability		0.00		0.00				

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	91	18		7	7		99	402	2	28	182	72
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1424	1554		1403	1583		1220	1674	1492	998	1660	1457
Queue Service Time (*g s*), s	5.5	1.0		0.4	0.3		1.8	2.7	0.0	0.7	1.1	1.0
Cycle Queue Clearance Time (*g c*), s	5.8	1.0		1.4	0.3		2.9	2.7	0.0	3.3	1.1	1.0
Green Ratio (*g/C*)	0.12	0.12		0.12	0.12		0.78	0.78	0.78	0.78	0.78	0.78
Capacity (*c*), veh/h	240	181		228	184		1019	2615	1166	831	2595	1139
Volume-to-Capacity Ratio (*X*)	0.381	0.102		0.029	0.035		0.097	0.154	0.002	0.034	0.070	0.063
Back of Queue (*Q*), ft/ln (50 th percentile)	46.6	8.9		3.1	3.1		7.8	13.6	0.1	2.5	5.7	4.9
Back of Queue (*Q*), veh/ln (50 th percentile)	1.9	0.4		0.1	0.1		0.3	0.5	0.0	0.1	0.2	0.2
Queue Storage Ratio (*RQ*) (50 th percentile)	0.23	0.04		0.02	0.02		0.03	0.01	0.00	0.01	0.01	0.02
Uniform Delay (*d 1*), s/veh	37.9	35.6		36.2	35.3		2.6	2.4	2.2	2.8	2.3	2.3
Incremental Delay (*d 2*), s/veh	0.4	0.1		0.0	0.0		0.2	0.1	0.0	0.1	0.1	0.1
Initial Queue Delay (*d 3*), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	38.3	35.7		36.2	35.3		2.8	2.6	2.2	2.9	2.3	2.4
Level of Service (LOS)	D	D		D	D		A	A	A	A	A	A
Approach Delay, s/veh / LOS	37.8	D		35.8	D		2.6	A		2.4	A	
Intersection Delay, s/veh / LOS	7.3						A					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.46	B	2.49	B	1.84	B	1.86	B
Bicycle LOS Score / LOS	0.67	A	0.51	A	0.90	A	0.72	A

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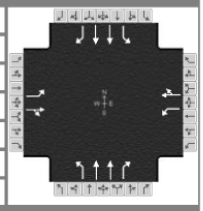
EXHIBIT 14
EXISTING 2015 PEAK PM HOUR TRAFFIC ANALYSIS – Mer Bleue/210 S of Innes

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	3/8/2018	Area Type	Other
Jurisdiction	Ottawa	Time Period	:Peak PM Hour	PHF	0.92
Urban Street	2159 Mer Bleue Road	Analysis Year	Existing 2015	Analysis Period	1> 7:00
Intersection	Mer Blueue/210m S	File Name	2015_ex_pm.xus		
Project Description	Blue Sea Village Mer Bleue				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	272	2	98	8	1	22	144	316	4	24	527	24

Signal Information												
Cycle, s	90.0	Reference Phase	2									
Offset, s	0	Reference Point	End	Green	55.2	21.6	0.0	0.0	0.0	0.0		
Uncoordinated	No	Simult. Gap E/W	On	Yellow	3.7	3.3	0.0	0.0	0.0	0.0		
Force Mode	Float	Simult. Gap N/S	On	Red	2.7	3.5	0.0	0.0	0.0	0.0		

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		6.0		6.0		5.0		5.0
Phase Duration, s		28.4		28.4		61.6		61.6
Change Period, (*Y+R c*), s		6.8		6.8		6.4		6.4
Max Allow Headway (*MAH*), s		3.1		3.1		0.0		0.0
Queue Clearance Time (*g s*), s		20.9		6.2				
Green Extension Time (*g e*), s		0.7		0.8		0.0		0.0
Phase Call Probability		1.00		1.00				
Max Out Probability		0.00		0.00				

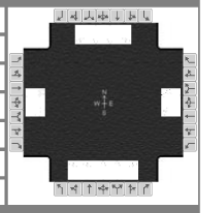
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	296	82		9	22		157	343	0	26	573	2
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1406	1509		1335	1530		846	1687	1525	1053	1687	1491
Queue Service Time (*g s*), s	17.9	3.8		0.5	1.0		9.0	3.7	0.0	0.9	6.7	0.0
Cycle Queue Clearance Time (*g c*), s	18.9	3.8		4.2	1.0		15.7	3.7	0.0	4.7	6.7	0.0
Green Ratio (*g/C*)	0.26	0.26		0.26	0.26		0.64	0.64	0.64	0.64	0.64	0.64
Capacity (*c*), veh/h	434	395		374	401		554	2145	970	705	2145	948
Volume-to-Capacity Ratio (*X*)	0.681	0.206		0.023	0.054		0.282	0.160	0.000	0.037	0.267	0.002
Back of Queue (*Q*), ft/ln (50 th percentile)	146.1	32.9		3.6	8.4		42	29.1	0	5	52.6	0.3
Back of Queue (*Q*), veh/ln (50 th percentile)	5.8	1.3		0.1	0.3		1.7	1.1	0.0	0.2	2.1	0.0
Queue Storage Ratio (*RQ*) (50 th percentile)	0.73	0.16		0.02	0.04		0.18	0.02	0.00	0.02	0.09	0.00
Uniform Delay (*d 1*), s/veh	31.9	25.9		27.5	24.9		10.6	6.6	0.0	7.6	7.2	6.0
Incremental Delay (*d 2*), s/veh	0.7	0.1		0.0	0.0		1.3	0.2	0.0	0.1	0.3	0.0
Initial Queue Delay (*d 3*), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	32.6	26.0		27.6	24.9		11.9	6.8	0.0	7.7	7.5	6.0
Level of Service (LOS)	C	C		C	C		B	A		A	A	A
Approach Delay, s/veh / LOS	31.2	C		25.6	C		8.4	A		7.5	A	
Intersection Delay, s/veh / LOS	14.1						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.45	B	2.47	B	1.88	B	1.91	B
Bicycle LOS Score / LOS	1.11	A	0.54	A	0.90	A	0.98	A

EXHIBIT 15
2024 PEAK AM HOUR TRAFFIC ANALYSIS – Mer Bleue/210 S of Innes

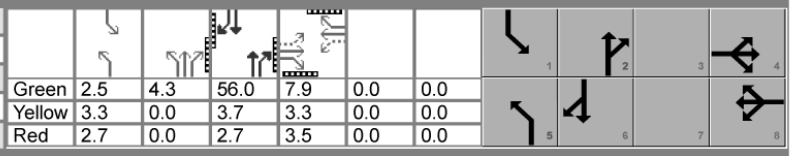
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	3/8/2018	Area Type	Other
Jurisdiction	Ottawa	Time Period	:Peak AM Hour	PHF	0.92
Urban Street	2159 Mer Bleue Road	Analysis Year	Year 2024	Analysis Period	1> 7:00
Intersection	Mer Blueue/210m S	File Name	2024_tot_am_Mod.xus		
Project Description	Blue Sea Village Mer Bleue				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	84	3	29	6	2	7	170	1269	8	26	897	90

Signal Information			
Cycle, s	90.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Float	Simult. Gap N/S	On



Green	2.5	4.3	56.0	7.9	0.0	0.0		
Yellow	3.3	0.0	3.7	3.3	0.0	0.0		
Red	2.7	0.0	2.7	3.5	0.0	0.0		

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		6.0		6.0	2.0	3.0	2.0	3.0
Phase Duration, s		14.7		14.7	12.8	66.7	8.5	62.4
Change Period, ($Y+R_c$), s		6.8		6.8	6.0	6.4	6.0	6.4
Max Allow Headway (*MAH*), s		3.1		3.1	3.1	0.0	3.1	0.0
Queue Clearance Time (g_s), s		8.0		3.7	6.8		3.4	
Green Extension Time (g_e), s		0.1		0.2	0.1	0.0	0.0	0.0
Phase Call Probability		0.94		0.96	0.99		0.51	
Max Out Probability		0.00		0.00	1.00		0.01	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	91	24		7	8		185	1379	4	28	975	43
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1415	1531		1402	1582		1652	1687	1485	1714	1687	1500
Queue Service Time (g_s), s	5.6	1.3		0.4	0.4		4.8	19.1	0.1	1.4	13.0	1.0
Cycle Queue Clearance Time (g_c), s	6.0	1.3		1.7	0.4		4.8	19.1	0.1	1.4	13.0	1.0
Green Ratio (*g/C*)	0.11	0.11		0.11	0.11		0.10	0.69	0.69	0.05	0.64	0.64
Capacity (*c*), veh/h	230	169		215	175		324	2337	1028	86	2176	968
Volume-to-Capacity Ratio (*X*)	0.397	0.141		0.030	0.044		0.570	0.590	0.004	0.327	0.448	0.045
Back of Queue (*Q*), ft/ln (50 th percentile)	47.1	11.6		3.2	3.7		48	137.6	0.5	15.1	101.8	6.8
Back of Queue (*Q*), veh/ln (50 th percentile)	1.9	0.5		0.1	0.1		1.9	5.4	0.0	0.6	4.0	0.3
Queue Storage Ratio (*RQ*) (50 th percentile)	0.24	0.06		0.02	0.02		0.21	0.10	0.00	0.07	0.18	0.03
Uniform Delay (d_1), s/veh	38.5	36.2		36.9	35.8		38.8	7.6	4.3	41.3	8.4	5.8
Incremental Delay (d_2), s/veh	0.4	0.1		0.0	0.0		0.6	1.1	0.0	0.8	0.7	0.1
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	38.9	36.3		37.0	35.8		39.4	8.7	4.3	42.1	9.0	5.9
Level of Service (LOS)	D	D		D	D		D	A	A	D	A	A
Approach Delay, s/veh / LOS	38.3	D		36.3	D		12.3	B		9.8	A	
Intersection Delay, s/veh / LOS	12.6						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.60	C	2.53	C	1.86	B	2.08	B
Bicycle LOS Score / LOS	0.68	A	0.51	A	1.78	B	1.35	A

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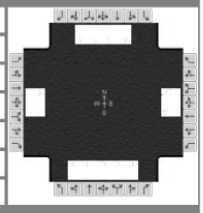
EXHIBIT 16
2024 PEAK PM HOUR TRAFFIC ANALYSIS – Mer Bleue/210 S of Innes

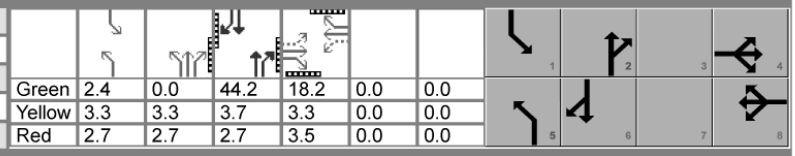
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	3/8/2018	Area Type	Other
Jurisdiction	Ottawa	Time Period	:Peak PM Hour	PHF	0.92
Urban Street	2159 Mer Bleue Road	Analysis Year	Year 2024	Analysis Period	1> 7:00
Intersection	Mer Blueue/210m S	File Name	2024_tot_pm_Mod.xus		
Project Description	Blue Sea Village Mer Bleue				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	272	2	98	8	1	22	226	1193	4	24	1398	156

Signal Information			
Cycle, s	90.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Float	Simult. Gap N/S	On



Green	2.4	0.0	44.2	18.2	0.0	0.0
Yellow	3.3	3.3	3.7	3.3	0.0	0.0
Red	2.7	2.7	2.7	3.5	0.0	0.0

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		6.0		6.0	2.0	3.0	2.0	3.0
Phase Duration, s		25.0		25.0	14.4	56.6	8.4	50.6
Change Period, ($Y+R_c$), s		6.8		6.8	6.0	6.4	6.0	6.4
Max Allow Headway (*MAH*), s		3.1		3.1	3.1	0.0	3.1	0.0
Queue Clearance Time (g_s), s		22.0		7.3	8.4		3.3	
Green Extension Time (g_e), s		0.0		0.7	0.0	0.0	0.0	0.0
Phase Call Probability		1.00		1.00	1.00		0.48	
Max Out Probability		1.00		0.01	1.00		0.01	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	296	98		9	23		246	1297	0	26	1520	115
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1404	1507		1315	1529		1652	1687	1525	1714	1687	1499
Queue Service Time (g_s), s	18.9	4.8		0.5	1.1		6.4	23.6	0.0	1.3	35.9	3.6
Cycle Queue Clearance Time (g_c), s	20.0	4.8		5.3	1.1		6.4	23.6	0.0	1.3	35.9	3.6
Green Ratio (*g/C*)	0.22	0.22		0.22	0.22		0.12	0.58	0.58	0.05	0.51	0.51
Capacity (*c*), veh/h	379	338		304	343		382	1957	885	84	1731	769
Volume-to-Capacity Ratio (*X*)	0.781	0.289		0.029	0.067		0.643	0.663	0.000	0.312	0.878	0.150
Back of Queue (*Q*), ft/ln (50 th percentile)	177.5	42.4		3.8	9.3		65.8	203.5	0	14	351.6	29.7
Back of Queue (*Q*), veh/ln (50 th percentile)	7.1	1.7		0.2	0.4		2.6	8.0	0.0	0.6	13.8	1.2
Queue Storage Ratio (*RQ*) (50 th percentile)	0.89	0.21		0.02	0.05		0.29	0.15	0.00	0.06	0.61	0.13
Uniform Delay (d_1), s/veh	35.3	28.9		31.2	27.5		38.0	13.4	0.0	41.3	20.2	11.6
Incremental Delay (d_2), s/veh	9.3	0.2		0.0	0.0		2.3	1.8	0.0	0.8	6.7	0.4
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	44.6	29.1		31.2	27.5		40.4	15.2	0.0	42.1	26.9	12.0
Level of Service (LOS)	D	C		C	C		D	B		D	C	B
Approach Delay, s/veh / LOS	40.8	D		28.5	C		19.2	B		26.1	C	
Intersection Delay, s/veh / LOS	24.8						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.59	C	2.52	C	1.89	B	2.10	B
Bicycle LOS Score / LOS	1.14	A	0.54	A	1.76	B	1.86	B

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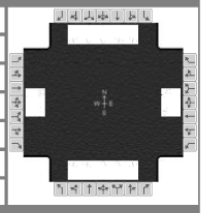
EXHIBIT 17
2029 PEAK AM HOUR TRAFFIC ANALYSIS – Mer Bleue/210 S of Innes

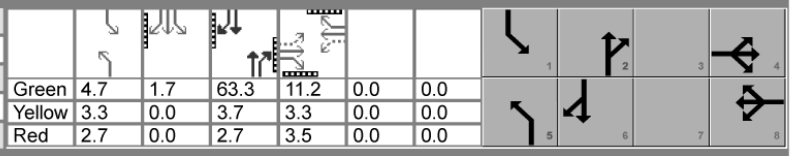
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	3/8/2018	Area Type	Other
Jurisdiction	Ottawa	Time Period	:Peak AM Hour	PHF	0.92
Urban Street	2159 Mer Bleue Road	Analysis Year	Year 2029	Analysis Period	1> 7:00
Intersection	Mer Blueue/210m S	File Name	2029_tot_am_Mod.xus		
Project Description	Blue Sea Village Mer Bleue				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	84	3	29	85	2	85	91	1542	74	141	1009	90

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Float	Simult. Gap N/S	On



Green	4.7	1.7	63.3	11.2	0.0	0.0		
Yellow	3.3	0.0	3.7	3.3	0.0	0.0		
Red	2.7	0.0	2.7	3.5	0.0	0.0		

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		6.0		6.0	2.0	3.0	2.0	3.0
Phase Duration, s		18.0		18.0	10.7	69.7	12.3	71.3
Change Period, ($Y+R_c$), s		6.8		6.8	6.0	6.4	6.0	6.4
Max Allow Headway (*MAH*), s		3.2		3.2	3.1	0.0	3.1	0.0
Queue Clearance Time (g_s), s		13.9		9.6	4.9		6.4	
Green Extension Time (g_e), s		0.0		0.1	0.0	0.0	0.0	0.0
Phase Call Probability		0.96		1.00	0.94		0.99	
Max Out Probability		1.00		1.00	1.00		1.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	91	24		92	84		99	1676	26	153	1097	43
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1326	1533		1403	1518		1652	1687	1501	1665	1687	1501
Queue Service Time (g_s), s	6.8	1.4		6.2	5.1		2.9	34.3	0.6	4.4	15.9	1.0
Cycle Queue Clearance Time (g_c), s	11.9	1.4		7.6	5.1		2.9	34.3	0.6	4.4	15.9	1.0
Green Ratio (*g/C*)	0.13	0.13		0.13	0.13		0.07	0.65	0.65	0.08	0.67	0.67
Capacity (*c*), veh/h	180	202		238	200		221	2201	979	278	2258	1004
Volume-to-Capacity Ratio (*X*)	0.508	0.118		0.388	0.418		0.448	0.761	0.027	0.551	0.486	0.043
Back of Queue (*Q*), ft/ln (50 th percentile)	55.5	12.7		52.9	46.6		29.5	287.6	4.5	45.2	126.7	7.1
Back of Queue (*Q*), veh/ln (50 th percentile)	2.2	0.5		2.1	1.9		1.2	11.3	0.2	1.8	5.0	0.3
Queue Storage Ratio (*RQ*) (50 th percentile)	0.28	0.06		0.32	0.23		0.13	0.21	0.02	0.20	0.22	0.03
Uniform Delay (d_1), s/veh	45.3	38.3		41.6	39.9		44.9	12.5	6.1	44.0	8.5	5.6
Incremental Delay (d_2), s/veh	1.0	0.1		0.4	0.5		0.5	2.5	0.1	0.8	0.8	0.1
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	46.3	38.4		42.0	40.4		45.4	15.1	6.2	44.8	9.2	5.7
Level of Service (LOS)	D	D		D	D		D	B	A	D	A	A
Approach Delay, s/veh / LOS	44.6	D		41.2	D		16.6	B		13.3	B	
Intersection Delay, s/veh / LOS	17.6						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.67	C	2.67	C	2.08	B	2.08	B
Bicycle LOS Score / LOS	0.68	A	0.78	A	1.97	B	1.55	B

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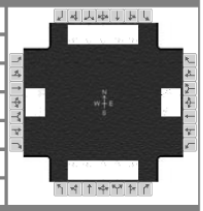
EXHIBIT 18
2029 PEAK PM HOUR TRAFFIC ANALYSIS – Mer Bleue/210 S of Innes

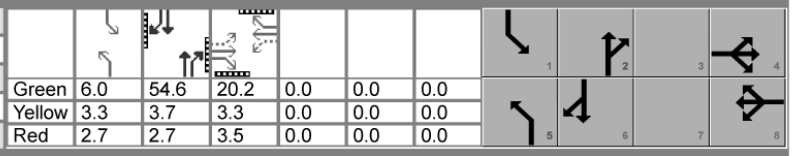
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	3/8/2018	Area Type	Other
Jurisdiction	Ottawa	Time Period	:Peak PM Hour	PHF	0.92
Urban Street	2159 Mer Bleue Road	Analysis Year	Year 2029	Analysis Period	1> 7:00
Intersection	Mer Blueue/210m S	File Name	2029_tot_pm_Mod.xus		
Project Description	Blue Sea Village Mer Bleue				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	272	5	98	145	1	110	144	1389	94	205	1711	156

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Float	Simult. Gap N/S	On



Green	6.0	54.6	20.2	0.0	0.0	0.0						
Yellow	3.3	3.7	3.3	0.0	0.0	0.0						
Red	2.7	2.7	3.5	0.0	0.0	0.0						

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		6.0		6.0	2.0	3.0	2.0	3.0
Phase Duration, s		27.0		27.0	12.0	61.0	12.0	61.0
Change Period, ($Y+R_c$), s		6.8		6.8	6.0	6.4	6.0	6.4
Max Allow Headway (*MAH*), s		3.3		3.3	3.1	0.0	3.1	0.0
Queue Clearance Time (g_s), s		24.2		18.9	6.6		8.6	
Green Extension Time (g_e), s		0.0		0.3	0.0	0.0	0.0	0.0
Phase Call Probability		1.00		1.00	0.99		1.00	
Max Out Probability		1.00		1.00	1.00		1.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	296	101		158	110		157	1510	48	223	1860	115
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1299	1515		1312	1520		1652	1687	1500	1665	1687	1500
Queue Service Time (g_s), s	16.1	5.6		11.4	6.1		4.6	35.2	1.4	6.6	53.3	3.6
Cycle Queue Clearance Time (g_c), s	22.2	5.6		16.9	6.1		4.6	35.2	1.4	6.6	53.3	3.6
Green Ratio (*g/C*)	0.22	0.22		0.22	0.22		0.08	0.57	0.57	0.08	0.57	0.57
Capacity (*c*), veh/h	282	336		290	337		264	1910	849	266	1910	849
Volume-to-Capacity Ratio (*X*)	1.050	0.301		0.543	0.325		0.592	0.791	0.056	0.837	0.974	0.136
Back of Queue (*Q*), ft/ln (50 th percentile)	303.4	49.9		91.1	54.5		48.2	325.7	11.5	84	561	29.2
Back of Queue (*Q*), veh/ln (50 th percentile)	12.1	2.0		3.6	2.2		1.9	12.8	0.5	3.4	22.1	1.2
Queue Storage Ratio (*RQ*) (50 th percentile)	1.52	0.25		0.55	0.27		0.21	0.23	0.05	0.37	0.98	0.13
Uniform Delay (d_1), s/veh	44.0	32.4		39.5	32.6		44.4	17.7	9.7	45.4	21.7	10.2
Incremental Delay (d_2), s/veh	67.2	0.2		1.2	0.2		2.4	3.4	0.1	19.2	15.3	0.3
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	111.2	32.6		40.7	32.8		46.9	21.1	9.9	64.6	37.0	10.5
Level of Service (LOS)	F	C		D	C		D	C	A	E	D	B
Approach Delay, s/veh / LOS	91.2	F		37.4	D		23.2	C		38.4	D	
Intersection Delay, s/veh / LOS	37.2						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.66	C	2.66	C	2.10	B	2.10	B
Bicycle LOS Score / LOS	1.14	A	0.93	A	1.90	B	2.30	B

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EXHIBIT 19
STREET 1 AND 2 – PLOS Segment Evaluation

STREET Street 1 and 2
FROM Mer Bleue Road
TO Vanguard Drive
YEAR 2029
DIRECTION Eastbound–Westbound / Northbound–Southbound
MMLOS MODE PLOS

SEGMENT SCORE **C**

Sidewalk Width (m)	Boulevard Width (m)	Motor Vehicle Traffic Volume (AADT)	Presence of On-street Parking	Segment PLOS			
				Operating Speed (km/h)			
				≤30	>30 or 50	>50 or 60	>60 [1]
2.0 or more	> 2	≤ 3000	N/A	A	A	A	B
		> 3000	Yes	A	B	B	N/A
			No	A	B	C	D
	0.5 to 2	≤ 3000	N/A	A	A	A	B
		> 3000	Yes	A	B	C	N/A
			No	A	C	D	E
	0	≤ 3000	NA	A	B	C	D
		> 3000	Yes	B	B	D	N/A
			No	B	C	E	F
1.8	> 2	≤ 3000	N/A	A	A	A	B
		> 3000	Yes	A	B	C	N/A
			No	A	C	D	E
	0.5 to 2	≤ 3000	N/A	A	B	B	D
		> 3000	Yes	A	C	C	N/A
			No	B	C	E	E
	0	≤ 3000	N/A	A	B	C	D
		> 3000	Yes	B	C	D	N/A
			No	C	D	F	F
1.5	> 2	≤ 3000	N/A	C	C	C	C
		> 3000	Yes	C	C	D	N/A
			No	C	D	E	E
	0.5 to 2	≤ 3000	N/A	C	C	C	D
		> 3000	Yes	C	C	D	N/A
			No	D	E	E	E
	0	N/A		D	E	F [2]	F [2]
<1.5	N/A			F [3]	F [3]	F [3]	F [3]
No sidewalk	N/A			C [4]	F [3]	F [3]	F [3]

EXHIBIT 20
MER BLEUE ROAD – PLOS Segment Evaluation

STREET	Mer Bleue Road
FROM	210m S of Innes Road
TO	Brian Coburn Boulevard
YEAR	2029
DIRECTION	Northbound–Southbound
MMLOS MODE	PLOS

SEGMENT SCORE **E**

Sidewalk Width (m)	Boulevard Width (m)	Motor Vehicle Traffic Volume (AADT)	Presence of On-street Parking	Segment PLOS			
				Operating Speed (km/h)			
				≤30	>30 or 50	>50 or 60	>60 [1]
2.0 or more	> 2	≤ 3000	N/A	A	A	A	B
		> 3000	Yes	A	B	B	N/A
			No	A	B	C	D
	0.5 to 2	≤ 3000	N/A	A	A	A	B
		> 3000	Yes	A	B	C	N/A
			No	A	C	D	E
	0	≤ 3000	NA	A	B	C	D
		> 3000	Yes	B	B	D	N/A
			No	B	C	E	F
1.8	> 2	≤ 3000	N/A	A	A	A	B
		> 3000	Yes	A	B	C	N/A
			No	A	C	D	E
	0.5 to 2	≤ 3000	N/A	A	B	B	D
		> 3000	Yes	A	C	C	N/A
			No	B	C	E	E
	0	≤ 3000	N/A	A	B	C	D
		> 3000	Yes	B	C	D	N/A
			No	C	D	F	F
1.5	> 2	≤ 3000	N/A	C	C	C	C
		> 3000	Yes	C	C	D	N/A
			No	C	D	E	E
	0.5 to 2	≤ 3000	N/A	C	C	C	D
		> 3000	Yes	C	C	D	N/A
			No	D	E	E	E
	0	N/A		D	E	F [2]	F [2]
<1.5	N/A			F [3]	F [3]	F [3]	F [3]
No sidewalk	N/A			C [4]	F [3]	F [3]	F [3]

EXHIBIT 21
MER BLEUE/VANGUARD – PLOS Signalized Intersection Evaluation

MAIN STREET	Mer Bleue Road
MINOR STREET	Vanguard Drive
APPROACHES	All
YEAR	2029
DIRECTION	All
MMLOS MODE	PLOS

	North Approach		South Approach		West Approach	
	Comment	Points	Comment	Points	Comment	Points
5.1 Crossing Distance & Conditions						
Median?	Yes		Yes		No	
Total Travel Lanes Crossed	5	75	5	75	3	105
Island Refuge	No	−4	No	−4	No	−4
5.2 Signal Phasing & Timing Features						
Left Turn Conflict	No Left Turn	0	Protected	0	Permissive	−8
Right Turn Conflict	Permissive or Yield Control	−5	No Right Turn	0	Permissive or Yield Control	−5
Right Turns on Red	RTOR Allowed	−3	RTOR No Right Turn	0	RTOR Allowed	−3
Leading Ped Interval	No	−2	No	−2	No	−2
5.3 Corner Radius						
Radius	> 15m to 25m	−8	> 15m to 25m	−8	> 15m to 25m	−8
Right Turn	No Channelization	0	No Channelization	0	No Channelization	0
5.4 Crosswalk Treatment	Standard Transverse Markings	−7	Standard Transverse Markings	−7	Standard Transverse Markings	−7
TOTAL PETSI SCORE		46		54		68
DELAY SCORE	27		27		18	
From Signal Timing Plan Mer Bleue/210m S of Innes						
PETSI SCORE		**D**		**D**		**C**
DELAY SCORE		**C**		**C**		**B**
OVERALL APPROACH SCORE		**D**		**D**		**C**

OVERALL INTERSECTION SCORE **D**

EXHIBIT 22
MER BLEUE/SMART CENTRES ACCESS – PLOS Signalized Intersection Evaluation

MAIN STREET	Mer Bleue Road
MINOR STREET	Smart Centre Access (210m S of Innes Road)
APPROACHES	All
YEAR	2029
DIRECTION	All
MMLOS MODE	PLOS

	North Approach		South Approach		East Approach		West Approach	
	Comment	Points	Comment	Points	Comment	Points	Comment	Points
5.1 Crossing Distance & Conditions								
Median?	Yes		Yes		No		No	
Total Travel Lanes Crossed	5	75	5	75	3	105	3	105
Island Refuge	No	−4	No	−4	No	−4	No	−4
5.2 Signal Phasing & Timing Features								
Left Turn Conflict	Protected	0	Protected	0	Permissive	−8	Permissive	−8
Right Turn Conflict	Permissive/ or Yield Control	−5	Permissive/ or Yield Control	−5	Permissive/ or Yield Control	−5	Permissive/ or Yield Control	−5
Right Turns on Red	RTOR Allowed	−3	RTOR Allowed	−3	RTOR Allowed	−3	RTOR Allowed	−3
Leading Ped Interval	No	−2	No	−2	No	−2	No	−2
5.3 Corner Radius								
Radius	> 15m to 25m	−8	> 15m to 25m	−8	> 15m to 25m	−8	> 15m to 25m	−8
Right Turn	No Channelization	0	No Channelization	0	No Channelization	0	No Channelization	0
5.4 Crosswalk Treatment	Standard Transverse Markings	−7	Standard Transverse Markings	−7	Standard Transverse Markings	−7	Standard Transverse Markings	−7
TOTAL PETSI SCORE		46		46		68		68
DELAY SCORE	27		27		18		18	
From Signal Timing Plan Mer Bleue/210m S of Innes								
PETSI SCORE		**D**		**D**		**C**		**C**
DELAY SCORE		**C**		**C**		**B**		**B**
OVERALL APPROACH SCORE		**D**		**D**		**C**		**C**

OVERALL INTERSECTION SCORE **D**

EXHIBIT 23
STREET 1 AND 2 – BLOS Segment Evaluation

STREET	Street 1 and 2
FROM	Mer Bleue Road
TO	Vanguard Drive
YEAR	2029
DIRECTION	Eastbound–Westbound / Northbound–Southbound
MMLOS MODE	BLOS

SEGMENT SCORE **B**

Type of Bikeway		LOS
Physically Separated Bikeway (cycle tracks, protected bike lanes and multi-use paths). Physical separation refers to, but is not limited to, curbs, raised medians, bollards and parking lanes (adjacent to the bike lane along the travelled way i.e. not curbside).		A
Bike Lanes Not Adjacent Parking Lane - Select Worst Scoring Criteria		
No. of Travel Lanes	1 travel lane in each direction	A
	2 travel lanes in each direction separated by a raised median	B
	2 travel lanes in each direction without a separating median	C
	More than 2 travel lanes in each direction	D
Bike Lane Width	≥ 1.8 m wide bike lane (includes marked buffer and paved gutter width)	A
	≥1.5 m to <1.8 m wide bike lane (includes marked buffer and paved gutter width)	B
	≥1.2 m to <1.5 m wide bike lane (includes marked buffer and paved gutter width)	C
Operating Speed	≤ 50 km/h operating speed	A
	60 km/h operating speed	C
	≥ 70 km/h operating speed	E
Bike lane blockage (commercial areas)	Rare	A
	Frequent	C
Bike Lanes Adjacent to curbside Parking Lane - Select Worst Scoring Criteria		
No. of Travel Lanes	1 travel lane in each direction	A
	2 or more travel lanes in each direction	C
Bike Lane and Parking Lane Width	4.5 m wide bike lane plus parking lane (includes marked buffer and paved gutter width)	A
	4.25 m wide bike lane plus parking lane (includes marked buffer and paved gutter width)	B
	≤ 4.0 m wide bike lane plus parking lane (includes marked buffer and paved gutter width)	C
Operating Speed	≤ 40 km/h operating speed	A
	50 km/h operating speed	B
	60 km/h operating speed	D
	≥ 70 km/h operating speed	F
Bike lane blockage (commercial areas)	Rare	A
	Frequent	C
Mixed Traffic		
No. of Travel Lanes and Operating Speed	2 travel lanes; ≤ 40 km/h; no marked centerline or classified as residential	A
	2 to 3 travel lanes; ≤ 40 km/h	B
	2 travel lanes; 50 km/h; no marked centerline or classified as residential	B
	2 to 3 travel lanes; 50 km/h	D
	4 to 5 travel lanes; ≤ 40 km/h	D
	4 to 5 travel lanes; ≥ 50 km/h	E
	6 or more travel lanes; ≤ 40 km/h	E
	≥ 60 km/h	F
Unsignalized Crossing along Route: no median refuge		
No. of Travel Lanes on Side Street and Operating Speed	3 or less lanes being crossed; ≤ 40 km/h	A
	4 to 5 lanes being crossed; ≤ 40 km/h	B
	3 or less lanes being crossed; 50 km/h	B
	4 to 5 lanes being crossed; 50 km/h	C
	3 or less lanes being crossed; 60 km/h	C
	4 to 5 lanes being crossed; 60 km/h	D
	6 or more lanes being crossed; ≤ 40 km/h	E
	3 or less lanes being crossed; ≥ 65 km/h	E
	6 or more lanes being crossed; ≥ 50 km/h	F
	4 to 5 lanes being crossed; ≥ 65 km/h	F
Unsignalized Crossing along Route: with median refuge (≥ 1.8 m wide)		
No. of Travel Lanes on Side Street and Operating Speed	5 or less lanes being crossed; ≤ 40 km/h	A
	3 or less lanes being crossed; 50 km/h	A
	6 or more lanes being crossed; ≤ 40 km/h	B
	4 to 5 lanes being crossed; 50 km/h	B
	3 or less lanes being crossed; 60 km/h	B
	6 or more lanes being crossed; 50 km/h	C
	4 to 5 lanes being crossed; 60 km/h	C
	3 or less lanes being crossed; ≥ 65 km/h	D
	6 or more lanes being crossed; 60 km/h	E
	4 to 5 lanes being crossed; ≥ 65 km/h	E
	6 or more lanes being crossed; ≥ 65 km/h	F

NOT APPLICABLE

NOT APPLICABLE

NOT APPLICABLE

EXHIBIT 24
MER BLEUE ROAD – BLOS Segment Evaluation

STREET	Mer Bleue Road
FROM	210m S of Innes Road
TO	Brian Coburn Boulevard
YEAR	2029
DIRECTION	Northbound–Southbound
MMLOS MODE	BLOS

SEGMENT SCORE **F**

Type of Bikeway		LOS
Physically Separated Bikeway (cycle tracks, protected bike lanes and multi-use paths). Physical separation refers to, but is not limited to, curbs, raised medians, bollards and parking lanes (adjacent to the bike lane along the travelled way i.e. not curbside).		A
Bike Lanes Not Adjacent Parking Lane - Select Worst Scoring Criteria		
No. of Travel Lanes	1 travel lane in each direction	A
	2 travel lanes in each direction separated by a raised median	B
	2 travel lanes in each direction without a separating median	C
	More than 2 travel lanes in each direction	D
Bike Lane Width	≥ 1.8 m wide bike lane (includes marked buffer and paved gutter width)	A
	≥1.5 m to <1.8 m wide bike lane (includes marked buffer and paved gutter width)	B
	≥1.2 m to <1.5 m wide bike lane (includes marked buffer and paved gutter width)	C
Operating Speed	≤ 50 km/h operating speed	A
	60 km/h operating speed	C
	≥ 70 km/h operating speed	E
Bike lane blockage (commercial areas)	Rare	A
	Frequent	C
Bike Lanes Adjacent to curbside Parking Lane - Select Worst Scoring Criteria		
No. of Travel Lanes	1 travel lane in each direction	A
	2 or more travel lanes in each direction	C
Bike Lane and Parking Lane Width	4.5 m wide bike lane plus parking lane (includes marked buffer and paved gutter width)	A
	4.25 m wide bike lane plus parking lane (includes marked buffer and paved gutter width)	B
	≤ 4.0 m wide bike lane plus parking lane (includes marked buffer and paved gutter width)	C
Operating Speed	< 40 km/h operating speed	A
	50 km/h operating speed	B
	60 km/h operating speed	D
	≥ 70 km/h operating speed	F
Bike lane blockage (commercial areas)	Rare	A
	Frequent	C
Mixed Traffic		
No. of Travel Lanes and Operating Speed	2 travel lanes; ≤ 40 km/h; no marked centerline or classified as residential	A
	2 to 3 travel lanes; ≤ 40 km/h	B
	2 travel lanes; 50 km/h; no marked centerline or classified as residential	B
	2 to 3 travel lanes; 50 km/h	D
	4 to 5 travel lanes; ≤ 40 km/h	D
	4 to 5 travel lanes; ≥ 50 km/h	E
	6 or more travel lanes; ≤ 40 km/h	E
	≥ 60 km/h	F
Unsignalized Crossing along Route: no median refuge		
No. of Travel Lanes on Side Street and Operating Speed	3 or less lanes being crossed; ≤ 40 km/h	A
	4 to 5 lanes being crossed; ≤ 40 km/h	B
	3 or less lanes being crossed; 50 km/h	B
	4 to 5 lanes being crossed; 50 km/h	C
	3 or less lanes being crossed; 60 km/h	C
	4 to 5 lanes being crossed; 60 km/h	D
	6 or more lanes being crossed; ≤ 40 km/h	E
	3 or less lanes being crossed; ≥ 65 km/h	E
	6 or more lanes being crossed; ≥ 50 km/h	F
	4 to 5 lanes being crossed; ≥ 65 km/h	F
Unsignalized Crossing along Route: with median refuge (≥ 1.8 m wide)		
No. of Travel Lanes on Side Street and Operating Speed	5 or less lanes being crossed; ≤ 40 km/h	A
	3 or less lanes being crossed; 50 km/h	A
	6 or more lanes being crossed; ≤ 40 km/h	B
	4 to 5 lanes being crossed; 50 km/h	B
	3 or less lanes being crossed; 60 km/h	B
	6 or more lanes being crossed; 50 km/h	C
	4 to 5 lanes being crossed; 60 km/h	C
	3 or less lanes being crossed; ≥ 65 km/h	D
	6 or more lanes being crossed; 60 km/h	E
	4 to 5 lanes being crossed; ≥ 65 km/h	E
	6 or more lanes being crossed; ≥ 65 km/h	F

NOT APPLICABLE

NOT APPLICABLE

NOT APPLICABLE

EXHIBIT 25
MER BLEUE/VANGUARD – BLOS Signalized Intersection Evaluation

MAIN STREET	Mer Bleue Road
MINOR STREET	Vanguard Drive
APPROACHES	Northbound/Southbound
YEAR	2029
DIRECTION	North/South
MMLOS MODE	BLOS

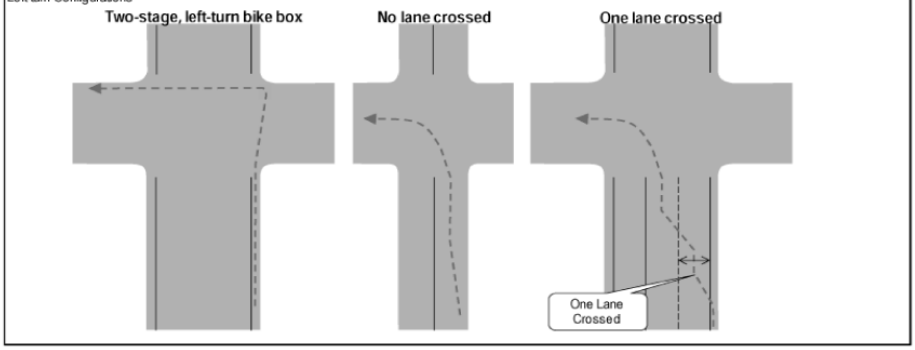
SEGMENT SCORE **E**

Bikeway and Intersection Type		LOS
Bike Lanes or higher order facility on a Signalized Intersection Approach		
Right-turn Lane and Turning Speed of Motorists	No impact on LTS (as long as cycling facility remains to the right of any turn lane - otherwise see pocket bike lanes below)	
Cyclist Making a Left-turn and Operating Speed of Motorists (refer to figure)	Two-stage, left-turn bike box; ≤ 50 km/h	A
	No lane crossed, ≤ 50 km/h	B
	1 lane crossed, ≤ 40 km/h	B
	No lane crossed, ≥ 60 km/h	C
	1 lane crossed, 50 km/h	C
	2 or more lanes crossed, ≤ 40 km/h	D
	1 lane crossed, ≥ 60 km/h	E
	2 or more lanes crossed, ≥ 50 km/h	F
	All other single left-turn lane configurations	F
	Dual left-turn lanes (shared or exclusive)	F
Pocket Bike Lanes on a Signalized Intersection Approach		
Right-turn Lane and Turning Speed of Motorists	Right-turn lane introduced to the right of the bike lane and ≤ 50 m long, turning speed ≤ 25 km/h (based on curb radii and angle of intersection)	B
	Right-turn lane introduced to the right of the bike lane and > 50 m long, turning speed ≤ 30 km/h (based on curb radii and angle of intersection)	D
	Bike lane shifts to the left of the right-turn lane, turning speed ≤ 25 km/h (based on curb radii and angle of intersection)	D
	Right-turn lane with any other configurations	F
	Dual right-turn lanes (shared or exclusive)	F
Cyclist Making a Left-turn and Operating Speed of Motorists (refer to figure)	Two-stage, left-turn bike box; ≤ 50 km/h	A
	No lane crossed, ≤ 50 km/h	B
	1 lane crossed, ≤ 40 km/h	B
	No lane crossed, ≥ 60 km/h	C
	1 lane crossed, 50 km/h	C
	2 or more lanes crossed, ≤ 40 km/h	D
	1 lane crossed, ≥ 60 km/h	E
	2 or more lanes crossed, ≥ 50 km/h	F
	All other single left-turn lane configurations	F
	Dual left-turn lanes (shared or exclusive)	F
Mixed Traffic on a Signalized Intersection Approach		
Right-turn Lane and Turning Speed of Motorists	Right-turn lane 25 to 50 m long, turning speed ≤ 25 km/h (based on curb radii and angle of intersection)	D
	Right-turn lane 25 to 50 m long, turning speed > 25 km/h (based on curb radii and angle of intersection)	E
	Right-turn lane longer than 50 m	F
	Dual right-turn lanes (shared or exclusive)	F
Cyclist Making a Left-turn and Operating Speed of Motorists (refer to figure)	Two-stage, left-turn bike box; ≤ 50 km/h	A
	No lane crossed, ≤ 50 km/h	B
	1 lane crossed, ≤ 40 km/h	B
	No lane crossed, ≥ 60 km/h	D
	1 lane crossed, 50 km/h	D
	2 or more lanes crossed, ≤ 40 km/h	D
	1 lane crossed, ≥ 60 km/h	F
	2 or more lanes crossed, ≥ 50 km/h	F
	All other single left-turn lane configurations	F
	Dual left-turn lanes (shared or exclusive)	F

NOT APPLICABLE

NOT APPLICABLE

Left-turn Configurations



Notes:
1. Pocket bike lanes are defined as bike lanes that develop near intersections between vehicular right turn lanes on the right side and vehicular through or left lanes on the left side. All other configurations of bike lanes or separated facility that remain against the edge of the curb/parking lane and require right turning vehicles to yield to through cyclists will not impact the level of traffic stress (i.e. are considered to be LOS A).

EXHIBIT 26
MER BLEUE/SMART CENTRES ACCESS – BLOS Signalized Intersection Evaluation

MAIN STREET	Mer Bleue Road
MINOR STREET	Smart Centre Access (210m S of Innes Road)
APPROACHES	Northbound/Southbound
YEAR	2029
DIRECTION	North/South
MMLOS MODE	BLOS

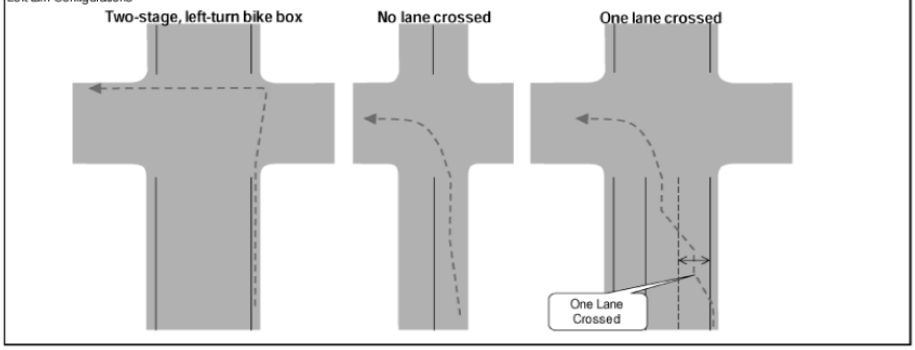
SEGMENT SCORE **E**

Bikeway and Intersection Type		LOS
Bike Lanes or higher order facility on a Signalized Intersection Approach		
Right-turn Lane and Turning Speed of Motorists	No impact on LTS (as long as cycling facility remains to the right of any turn lane - otherwise see pocket bike lanes below)	
Cyclist Making a Left-turn and Operating Speed of Motorists (refer to figure)	Two-stage, left-turn bike box; ≤ 50 km/h	A
	No lane crossed, ≤ 50 km/h	B
	1 lane crossed, ≤ 40 km/h	B
	No lane crossed, ≥ 60 km/h	C
	1 lane crossed, 50 km/h	C
	2 or more lanes crossed, ≤ 40 km/h	D
	1 lane crossed, ≥ 60 km/h	E
	2 or more lanes crossed, ≥ 50 km/h	F
	All other single left-turn lane configurations	F
	Dual left-turn lanes (shared or exclusive)	F
Pocket Bike Lanes on a Signalized Intersection Approach		
Right-turn Lane and Turning Speed of Motorists	Right-turn lane introduced to the right of the bike lane and ≤ 50 m long, turning speed ≤ 25 km/h (based on curb radii and angle of intersection)	B
	Right-turn lane introduced to the right of the bike lane and > 50 m long, turning speed ≤ 30 km/h (based on curb radii and angle of intersection)	D
	Bike lane shifts to the left of the right-turn lane, turning speed ≤ 25 km/h (based on curb radii and angle of intersection)	D
	Right-turn lane with any other configurations	F
	Dual right-turn lanes (shared or exclusive)	F
Cyclist Making a Left-turn and Operating Speed of Motorists (refer to figure)	Two-stage, left-turn bike box; ≤ 50 km/h	A
	No lane crossed, ≤ 50 km/h	B
	1 lane crossed, ≤ 40 km/h	B
	No lane crossed, ≥ 60 km/h	C
	1 lane crossed, 50 km/h	C
	2 or more lanes crossed, ≤ 40 km/h	D
	1 lane crossed, ≥ 60 km/h	E
	2 or more lanes crossed, ≥ 50 km/h	F
	All other single left-turn lane configurations	F
	Dual left-turn lanes (shared or exclusive)	F
Mixed Traffic on a Signalized Intersection Approach		
Right-turn Lane and Turning Speed of Motorists	Right-turn lane 25 to 50 m long, turning speed ≤ 25 km/h (based on curb radii and angle of intersection)	D
	Right-turn lane 25 to 50 m long, turning speed > 25 km/h (based on curb radii and angle of intersection)	E
	Right-turn lane longer than 50 m	F
	Dual right-turn lanes (shared or exclusive)	F
Cyclist Making a Left-turn and Operating Speed of Motorists (refer to figure)	Two-stage, left-turn bike box; ≤ 50 km/h	A
	No lane crossed, ≤ 50 km/h	B
	1 lane crossed, ≤ 40 km/h	B
	No lane crossed, ≥ 60 km/h	D
	1 lane crossed, 50 km/h	D
	2 or more lanes crossed, ≤ 40 km/h	D
	1 lane crossed, ≥ 60 km/h	F
	2 or more lanes crossed, ≥ 50 km/h	F
	All other single left-turn lane configurations	F
	Dual left-turn lanes (shared or exclusive)	F

NOT APPLICABLE

NOT APPLICABLE

Left-turn Configurations



Notes:
1. Pocket bike lanes are defined as bike lanes that develop near intersections between vehicular right turn lanes on the right side and vehicular through or left lanes on the left side. All other configurations of bike lanes or separated facility that remain against the edge of the curb/parking lane and require right turning vehicles to yield to through cyclists will not impact the level of traffic stress (i.e. are considered to be LOS A).

EXHIBIT 27
MER BLEUE ROAD – TLOS Segment Evaluation

STREET	Mer Bleue Road
FROM	210m S of Innes Road
TO	Brian Coburn Boulevard
YEAR	2029
DIRECTION	Northbound–Southbound
MMLOS MODE	TLOS

SEGMENT SCORE **D**

Facility Type		Level/exposure to congestion delay, friction and incidents			Quantitative Measurement	LOS
		Congestion	Friction	Incident Potential		
Segregated ROW		No	No	No	N/A	A
Bus lane	No/limited parking/driveway friction	No	Low	Low	$C_f \leq 60$	B
	Frequent parking/driveway friction	No	Medium	Medium	$C_f > 60$	C
Mixed Traffic	Limited parking/driveway friction	Yes	Low	Medium	$Vt/Vp \geq 0.8$	D
	Moderate parking/driveway friction	Yes	Medium	Medium	$Vt/Vp \leq 0.6$	E
	Frequent parking/driveway friction	Yes	High	High	$Vt/Vp < 0.4$	F

Notes:

Cf, Conflict Factor = = (Number of driveways x crossing volume) / 1 km

Vt/Vp is the ratio of average transit travel speed to posted speed limit

EXHIBIT 28
MER BLEUE ROAD – TkLOS Segment & Intersection Evaluation

STREET	Mer Bleue Road
FROM	210m S of Innes Road
TO	Brian Coburn Boulevard
YEAR	2029
DIRECTION	Northbound–Southbound
MMLOS MODE	TkLOS

SEGMENT SCORE **A**

INTERSECTION SCORE **A**

Exhibit 20 – TkLOS Segment Evaluation Table

Curb Lane Width (m)	Only two travel lanes (one in each direction)	More than two travel lanes
>3.7	B	[A]
≤3.5	C	A
≤3.3	D	C
≤3.2	E	D
≤3	F	E

Exhibit 21 – TkLOS Signalized Intersection Evaluation Table

Effective Corner Radius	One receiving lane on departure from intersection	More than one receiving lane on departure from intersection
< 10m	F	D
10 to 15m	E	B
> 15m	C	[A]