Caivan Communities

2275 Mer Bleue

Transportation Impact Assessment

CGH TRANSPORTATION

2275 Mer-Bleue Road

Transportation Impact Assessment

Step 1 Screening Report

Step 2 Scoping Report

Step 3 Forecasting Report

Step 4 Strategy Report

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PN: 2020-82

Table of Contents

List of Figures

Table of Tables

List of Appendices

1 Screening

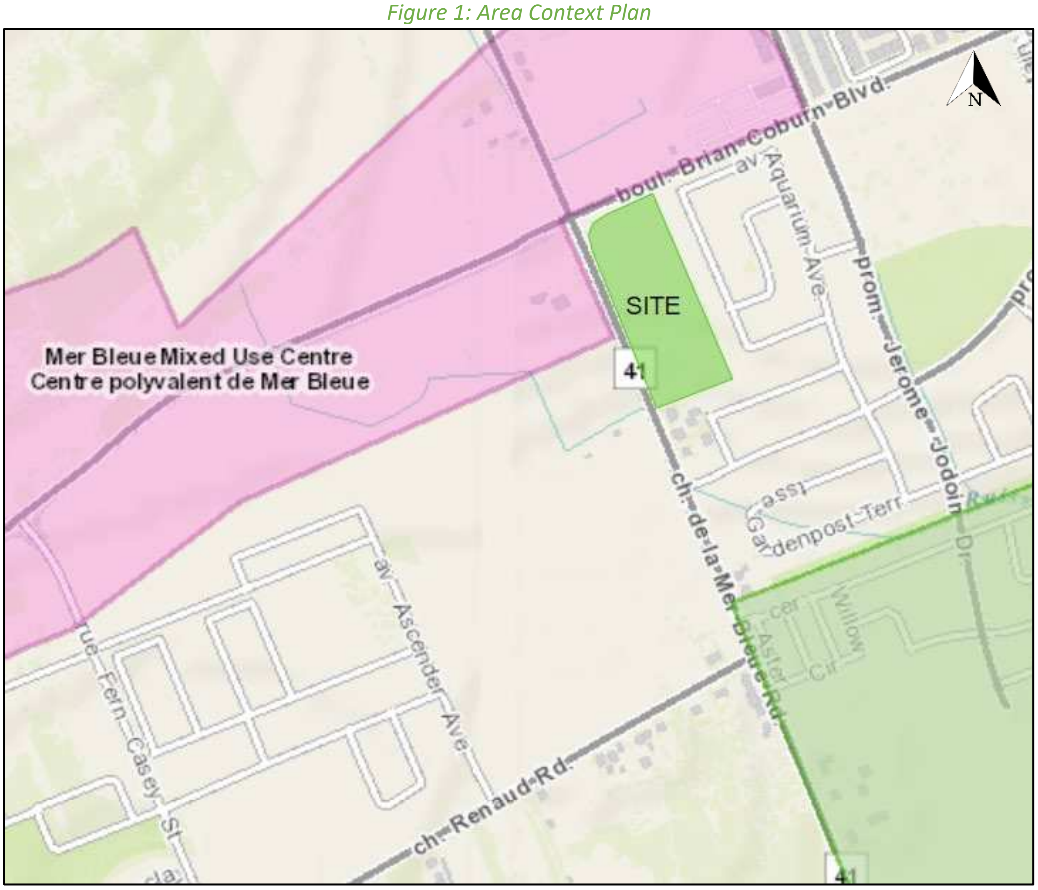
This study has been prepared according to the City of Ottawa's 2017 Transportation Impact Assessment (TIA) Guidelines. Accordingly, a Step 1 Screening Form has been prepared and is included as Appendix A, along with the Certification Form for TIA Study PM. As shown in the Screening Form, a TIA is required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

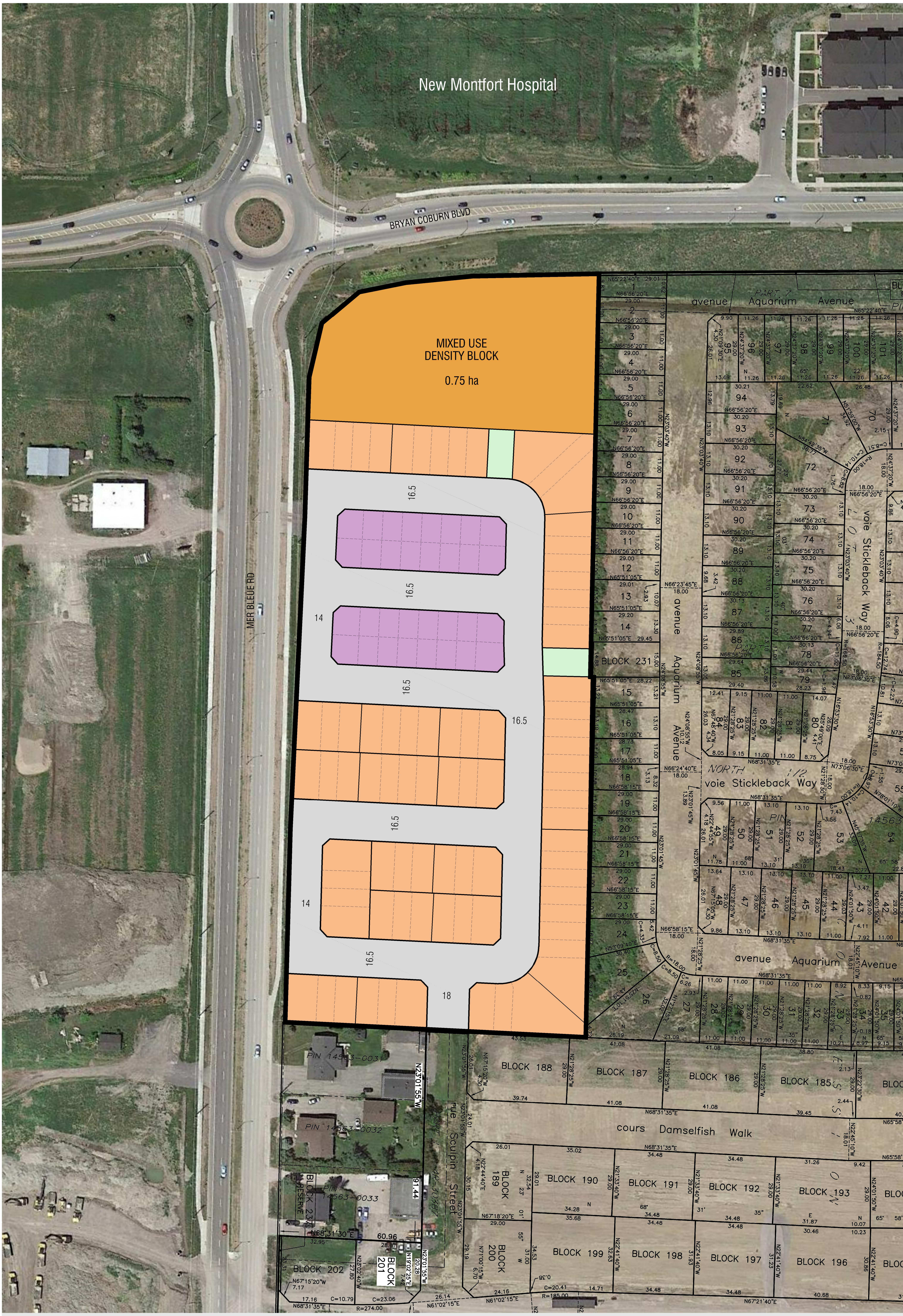
2 Existing and Planned Conditions

2.1 Proposed Development

The proposed development, located at 2275 Mer-Bleue Road, is currently zoned General Mixed Use (GM15[2156] S330-H). The existing land is currently undeveloped. The proposed development consists of 32 back-to-back townhouse units, 80 standard townhouse units, and a 0.75 hectare mid-rise mixed-use development block. The site is proposed to have two accesses. The first (Site Access #1) will serve the townhouses only and will be provided through the residential development to the south and out to Mer-Bleue Road at Decoeur Drive. Decoeur Drive is a full-movement intersection and is approximately 430 metres south of Brian Coburn Boulevard and 310 metres north of Renaud Road. The second (Site Access #2) will be a right-in / right-out access on Brian Coburn Boulevard, and will serve the mid-rise mixed-use development block only. The access configuration and location will be discussed in further steps of the TIA. The anticipated full build-out and occupancy horizon is 2024. Figure 1 illustrates the Study Area Context. Figure 2 illustrates the proposed concept plan.

Figure 1: Area Context Plan





DRAFT

- All Units In Metric Unless Otherwise Noted.
- Base Information Obtained From Various Sources And Is Approximate.
- Schedule / Plan Information Is Conceptual And Requires Verification by Appropriate Agency.
- Aerial Photo: Google Earth, Approx. Spring 2018

GERRARD DESIGN

CAIVAN 2075 MER BLEUE | Ottawa, Ontario

PRELIMINARY LOTTED CONCEPT

NOV 25, 2020
PROJECT 2063
SCALE 1:1500

SK-08

2.2 Existing Conditions

2.2.1 Area Road Network

Mer-Bleue Road

Mer-Bleue is a City of Ottawa arterial road with a four-lane cross-section within the majority of the Study Area and a two-lane cross-section extending south at approximately 200 metres north of Renaud Road. The posted speed limit is 60 km/h north of Renaud Road and 50 km/h south of Renaud Road. Mer-Bleue Road has asphalt and gravel shoulders in conjunction with the two-lane cross section and switches to curbs and gutters where it widens to four lanes. Bike lanes and sidewalks are present where Mer-Bleue is four lanes. No cycling or pedestrian infrastructure is provided for the section of Mer-Bleue that is two lanes. The Ottawa Official Plan reserves a 37.5 metre right of way. Mer-Bleue is designated as a partial trucking route to the north of Brian Coburn Boulevard.

Brian Coburn Boulevard

Brian Coburn Boulevard is a City of Ottawa arterial road that has a two-lane cross-section with intermittent left-turn lanes east of Mer-Bleue Road and a posted speed-limit of 60 km/h to the east of Mer-Bleue Road and 70 km/h to the west of Mer-Bleue Road. Brian Coburn Boulevard has curbs and gutters within the Study Area. To the west of Mer-Bleue Road, a bike lane is provided on the north side and a multi-use pathway is provided on the south side. To the east Mer-Bleue Road, a sidewalk is provided on the north side and a bike plan is also provided on the north side between Mer-Bleue Road and Gerry Lalonde Drive / Jerome Jodoin Drive. The City Official Plan reserves a 40.0 metre right-of-way. Brian Coburn Boulevard is designated as a partial trucking route.

Gerry Lalonde Drive / Jerome Jodoin Drive

Gerry Lalonde Drive is a City of Ottawa collector road with a two-lane cross section to the north of Brian Coburn Boulevard and posted speed limit of 50 km/h. Information on Jerome Jodoin Drive is unknown as it is being constructed and is currently a gravel road used by construction vehicles only. Gerry Lalonde Drive has curbs and gutters and sidewalks on both sides of the road. Room for on-street parking is provided on both sides of the street. The measured right-of-way is 24.0 metres.

Renaud Road

Renaud Road is a City of Ottawa collector road with a two-lane cross-section and a posted speed limit of 50 km/h. Gravel shoulders are present on both sides of the road and no pedestrian or cycling facilities are provided. The City of Ottawa Official Plan reserves a 24.0 metre right-of-way.

2.2.2 Existing Intersections

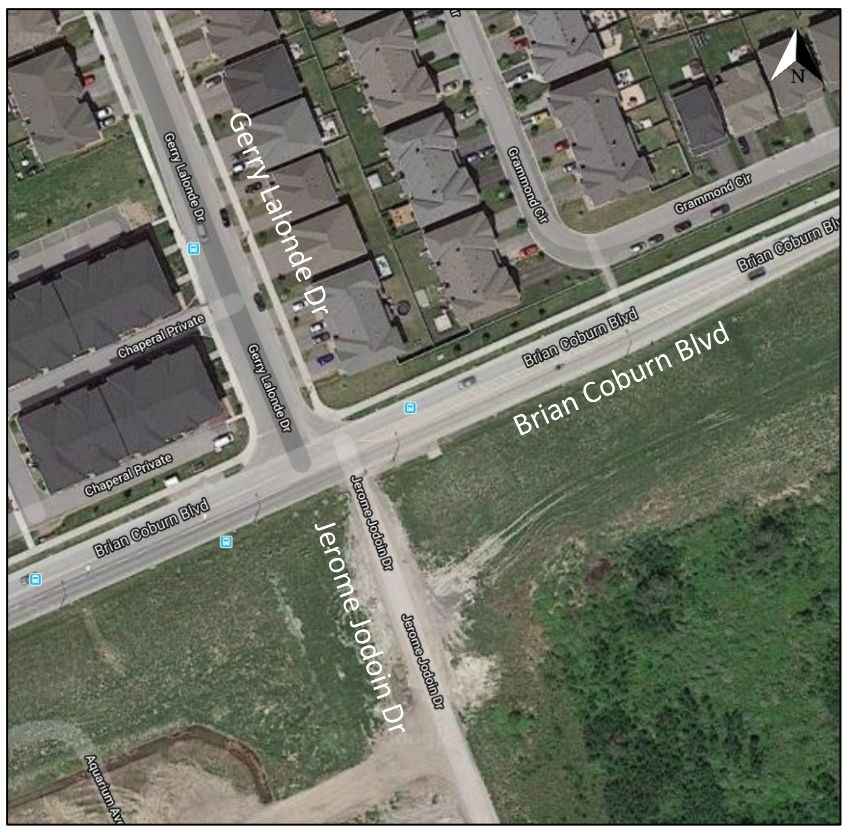
A description and accompanying aerial photograph of the existing intersections within the Study Area can be found below.

Mer-Bleue Road at Brian Coburn Boulevard

The intersection of Mer-Bleue Road and Brian Coburn Boulevard is an unsignalized, two-lane, four-leg roundabout. The north and south approaches are both two lanes and consist of a shared left-turn through lane and a shared through / right-turn lane. The east and west approaches are single lanes and are both shared left-turn / through / right-turn movements. All approaches must yield to traffic within the roundabout. The speed limit within the roundabout is 30 km/h. No turn restrictions were noted.

Brian Coburn Boulevard at Gerry Lalonde Drive / Jerome Jodoin Drive

The intersection of Brian Coburn Boulevard and Gerry Lalonde Dive / Jerome Jodoin Drive is an unsignalized intersection with stop-control on the north and south approaches. The south leg is currently used as a construction access only and is assumed to be a single lane consisting of a shared left-turn /through / right-turn movement. The north and east approach consist of a shared left-turn / through / right-turn lane. The west approach has an auxiliary left-turn lane and a shared through / right-turn lane. No turn restrictions were noted.



Renaud Road at Mer-Bleue Road

The intersection of Renaud Road and Mer-Bleue Road is an unsignalized T-intersection with stop-control for all three legs. The south approach consists of a shared left-turn / through lanes, the north approach has a shared through / right-turn lane and the west approach has a shared left-turn / right-turn lane. No turn restrictions were noted.

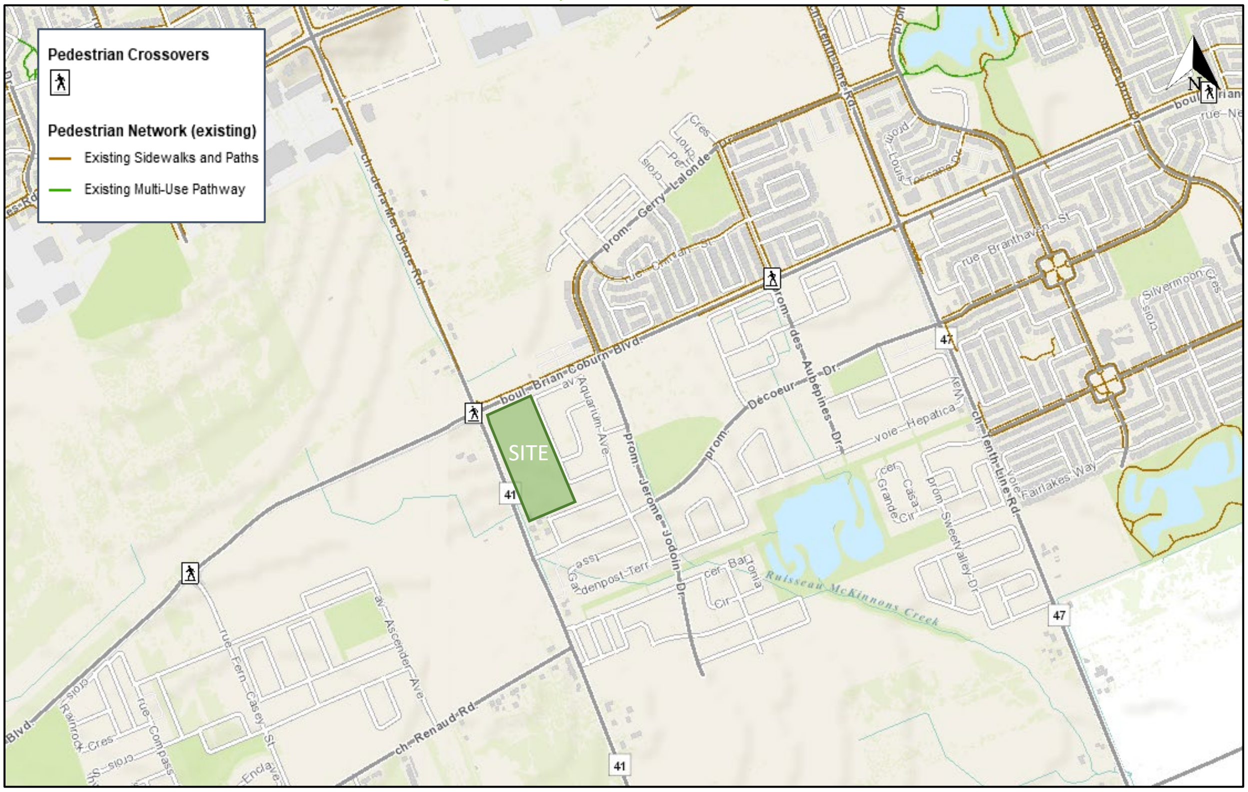
2.2.3 Existing Driveways

Existing driveways are located along Brian Coburn Boulevard and Mer-Bleue Road within 200 metres of the proposed site accesses. All existing driveways are residential accesses and driveways to existing and future residential developments. Any significant traffic generation from these driveways and accesses will be considered in the background traffic of future scenarios and explored further in Section 2.3.2.

2.2.4 Cycling and Pedestrian Facilities

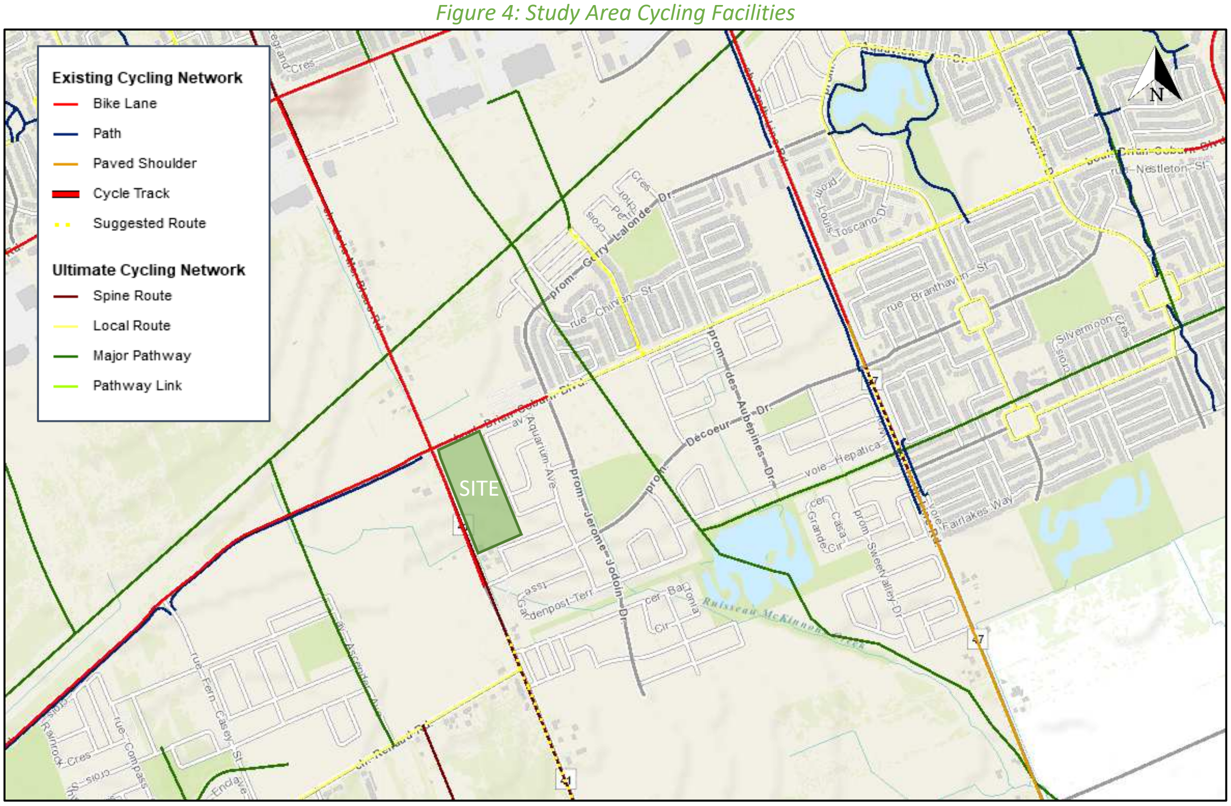
Sidewalks are provided along Mer-Bleue Road to the north and south of Brian Coburn Boulevard and stop approximately 200 metres north of Renaud Road (not shown below). Sidewalks are provided on the north side of Brian Coburn Boulevard to the east of Mer-Bleue Road as well as on both sides of Gerry Lalonde Drive. The cycling network consists of bike lanes to the north and south of Brian Coburn Boulevard which stop approximately 200 metres north of Renaud Road. Brian Coburn Boulevard has bike lanes on the north side to the west of Mer-Bleue Road and to the east it has bike lanes which stop at Gerry Lalonde Drive. A multi-use pathway on the south side of Brian Coburn Boulevard is present west of Mer-Bleue Road and Renaud Road is considered a local route. Figure 3 illustrates the pedestrian facilities in the Study Area and Figure 4 illustrates the cycling facilities.

Figure 3: Study Area Pedestrian Facilities



Source: http://maps.ottawa.ca/geoOttawa/ Accessed: January 7, 2021

Figure 4: Study Area Cycling Facilities



Source: http://maps.ottawa.ca/geoOttawa/ Accessed: January 7, 2021

2.2.5 Existing Transit

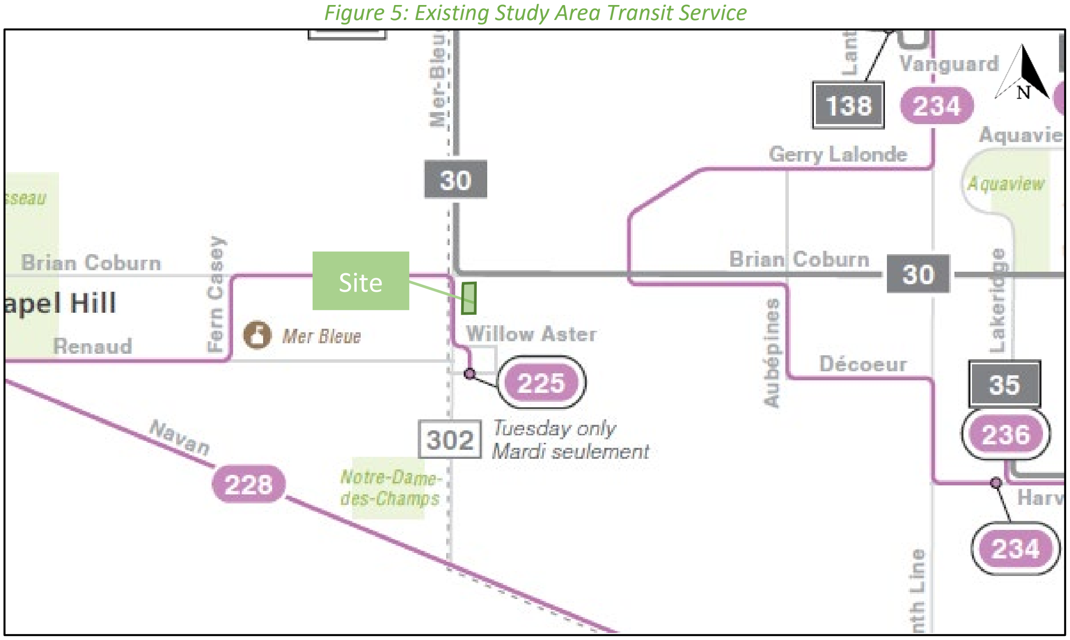
Within the Study Area, route #30 has four stops on Brian Colburn Boulevard between Mer-Bleue Road and Gerry Lalonde Drive with two of those stops almost directly beside the development site. Route #30 has four stops on Brian Colburn Boulevard to the east of Gerry Lalonde Drive with three of these stops also shared by route #234. Routes #30 and #302 share two stops on Mer-Bleue Road, north of Brian Coburn Boulevard. Additionally, Route #225 has one stop in the vicinity of the subject site, at the intersection of Mer-Bleue Road and Renaud Road.

The frequencies of these routes within the proximity of the proposed site currently are:

- Route #30— every 10-15 minutes in the peak directions, and every 30 minutes in the off-peak direction, off peak times and on weekends.
- Route #234— every 15 in the peak directions on weekdays. No weekend service.
- Route #302— Tuesdays at approximately 9:30 in the AM peak and 3:00 in the PM peak
- Route #225 – every 20 minutes between 5:30 and 8:10 AM, and 5:30 and 7:50 PM

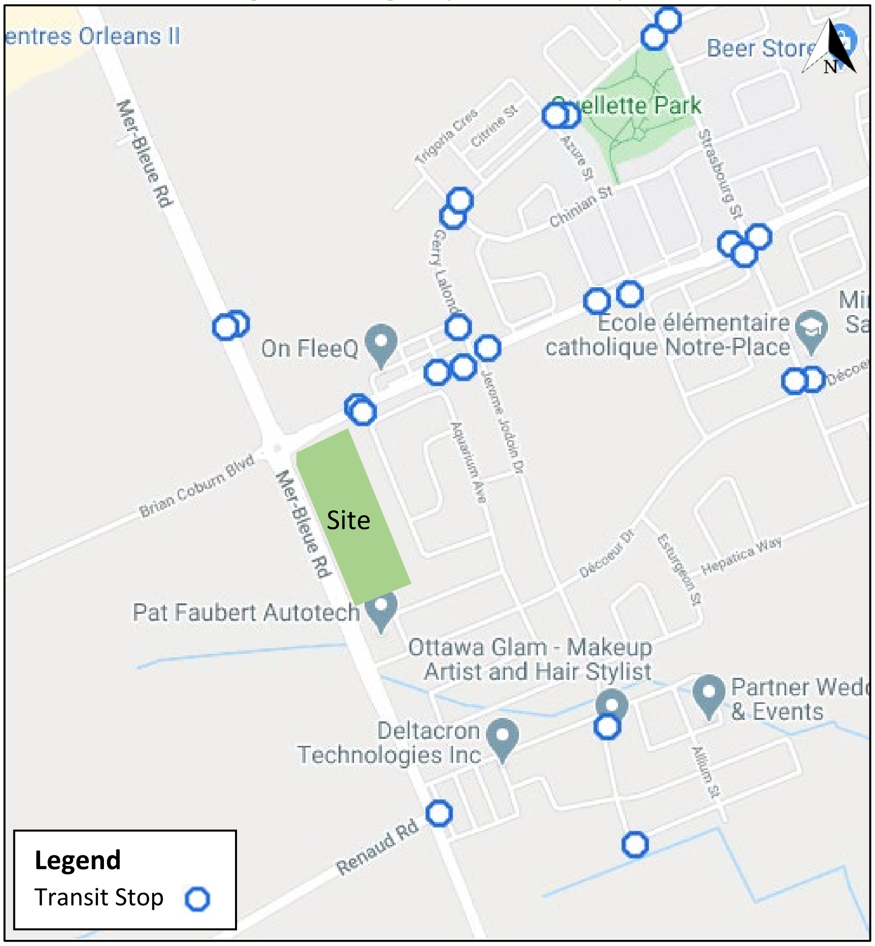
Figure 5 illustrates the transit system map and Figure 6 illustrates the transit stops in the Study Area.

Figure 5: Existing Study Area Transit Service



Source: http://maps.ottawa.ca/geoOttawa/ Accessed: March 30, 2020

Figure 6: Existing Study Area Transit Stops



Source: http://plan.octranspo.com/plan Accessed: March 30, 2020

2.2.6 Existing Area Traffic Management Measures

There are no existing area traffic management measures within the Study Area with the exception of a radar speed sign on Gerry Lalonde Drive facing northbound vehicles.

2.2.7 Existing Peak Hour Travel Demand

Existing turning movement counts were acquired for the existing Study Area intersections for both the AM and PM peak hours. Table 1 summarizes the intersection count dates and data sources.

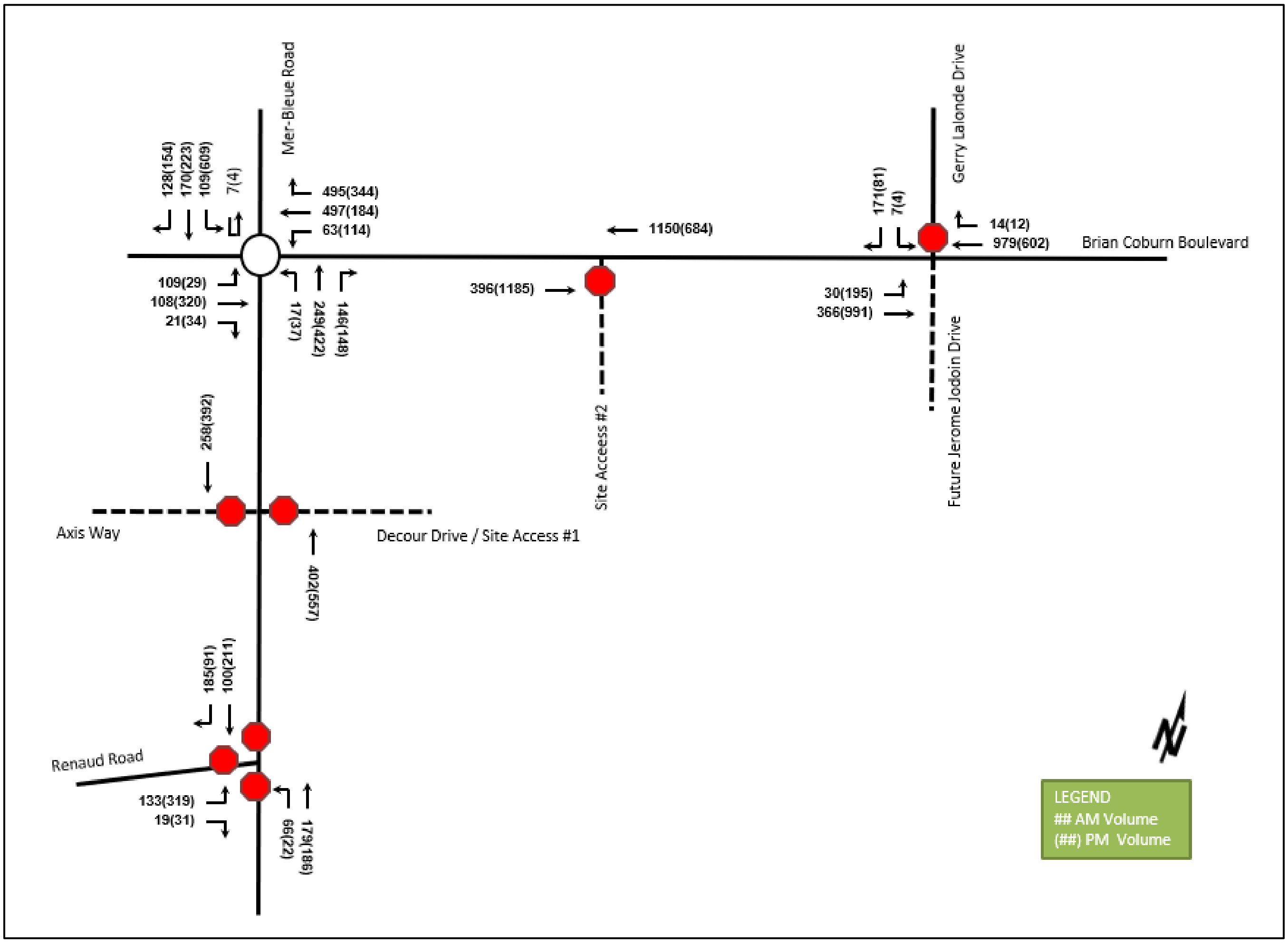
Table 1: Intersection Count Dates and Data Sources

Intersection	Count Date	Data Source
Mer-Bleue Road at Brian Coburn Boulevard	December 2017	2225 Mer-Bleue Road TIS (HDR, 2018)
Brian Coburn Boulevard at Gerry Lalonde Drive / Jerome Jodoin Drive	Wednesday October 17, 2018	City of Ottawa
Renaud Road at Mer-Bleue Road	Thursday November 15, 2018	City of Ottawa

Figure 7 illustrates the 2020 existing horizon traffic volumes and Table 17 summarizes the existing intersection operations. As shown above, the turning movement count data has been collected over different years. A background growth rate has been applied to the Study Area intersections to reflect a 2020 horizon and was determined based on adjacent transportation studies. A 1% annual growth rate was used in the following studies;

2025 Mer-Bleue Road Community Transportation Study (Stantec, 2017), Proposed TrailsEdge East Development Community Transportation Study (Castleglenn Consultants, 2016), and the Proposed Avalon West Community Development Phase 3 and 4 Addendum No. 2 Letter Report (Castleglenn Consultants, 2015). A 2% annual growth rate was used in the 2225 Mer-Bleue Road Transportation Impact Study (HDR, 2018). In order to reflect a conservative estimate of growth, a 2% background growth rate has been applied to the Study Area intersections. Detailed turning movement count data is included in Appendix B

Figure 7: 2020 Existing Horizon Traffic Volumes and Traffic Controls



Additionally, the collected intersection counts also provided existing pedestrian and cyclist demands at the two of the Study Area intersections for both AM and PM peak periods. Both pedestrian and cyclist volumes were not available at the intersection of Brian Coburn Road and Mer-Bleue Road and as such, an assumed conservative pedestrian volume of 10 pedestrians / hour and 10 cyclists / hour has been entered for each leg of the roundabout. Figure 8 illustrates the existing pedestrian volumes and Figure 9 illustrates the existing cyclist volumes at the Study Area intersections

Figure 8: Existing Pedestrian Volumes

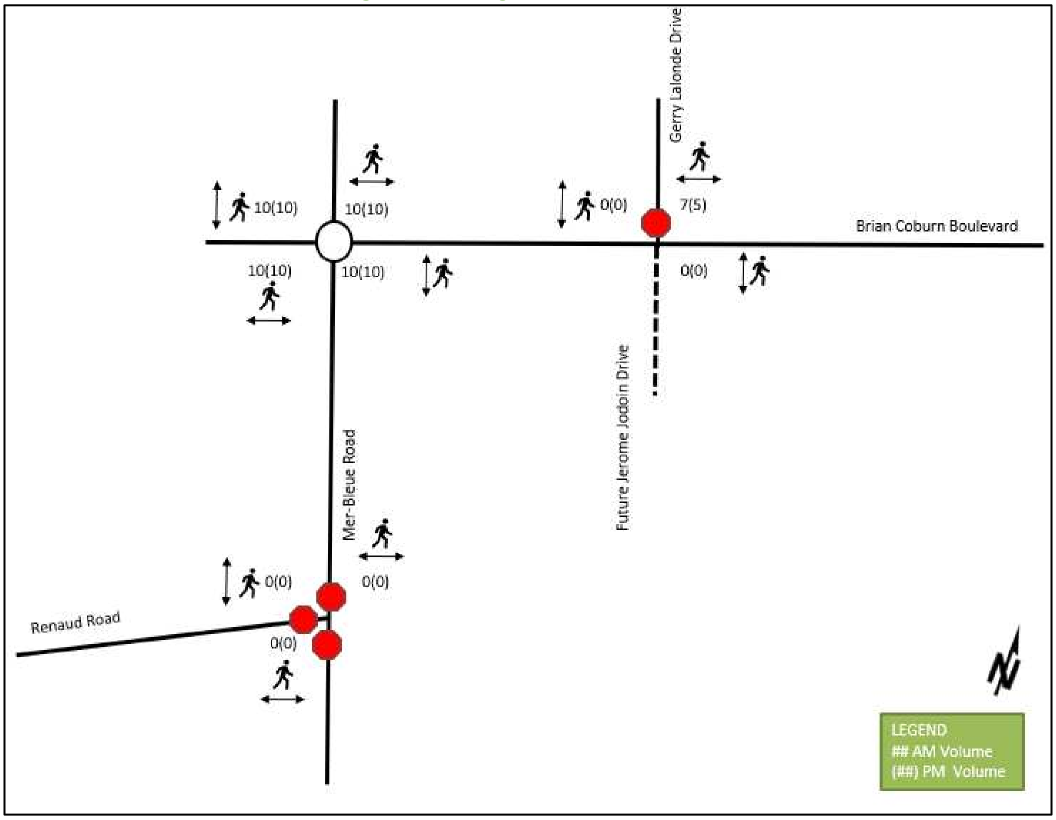
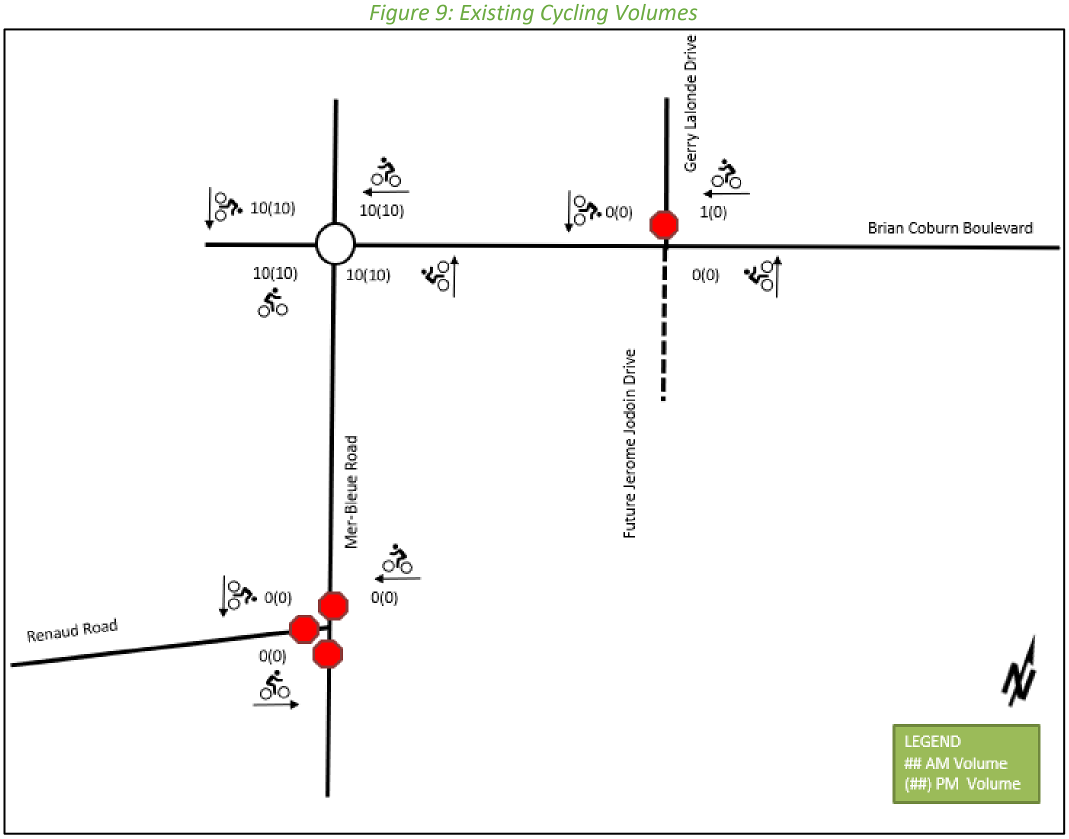


Figure 9: Existing Cycling Volumes



2.2.8 Collision Analysis

Collision data has been acquired from the City of Ottawa for five years (2014-2018) prior to the commencement of this TIA for the surrounding Study Area road network. Figure 10 illustrates the collisions at the intersections and road segments within the Study Area and Table 2 summarizes the collisions at the intersections and road segments within the Study Area. Table 3 summarizes the collision types and conditions of the 38 collisions recorded in the Study Area. Collision data is included in Appendix C.

Figure 10: Study Area Representation of Collision Locations

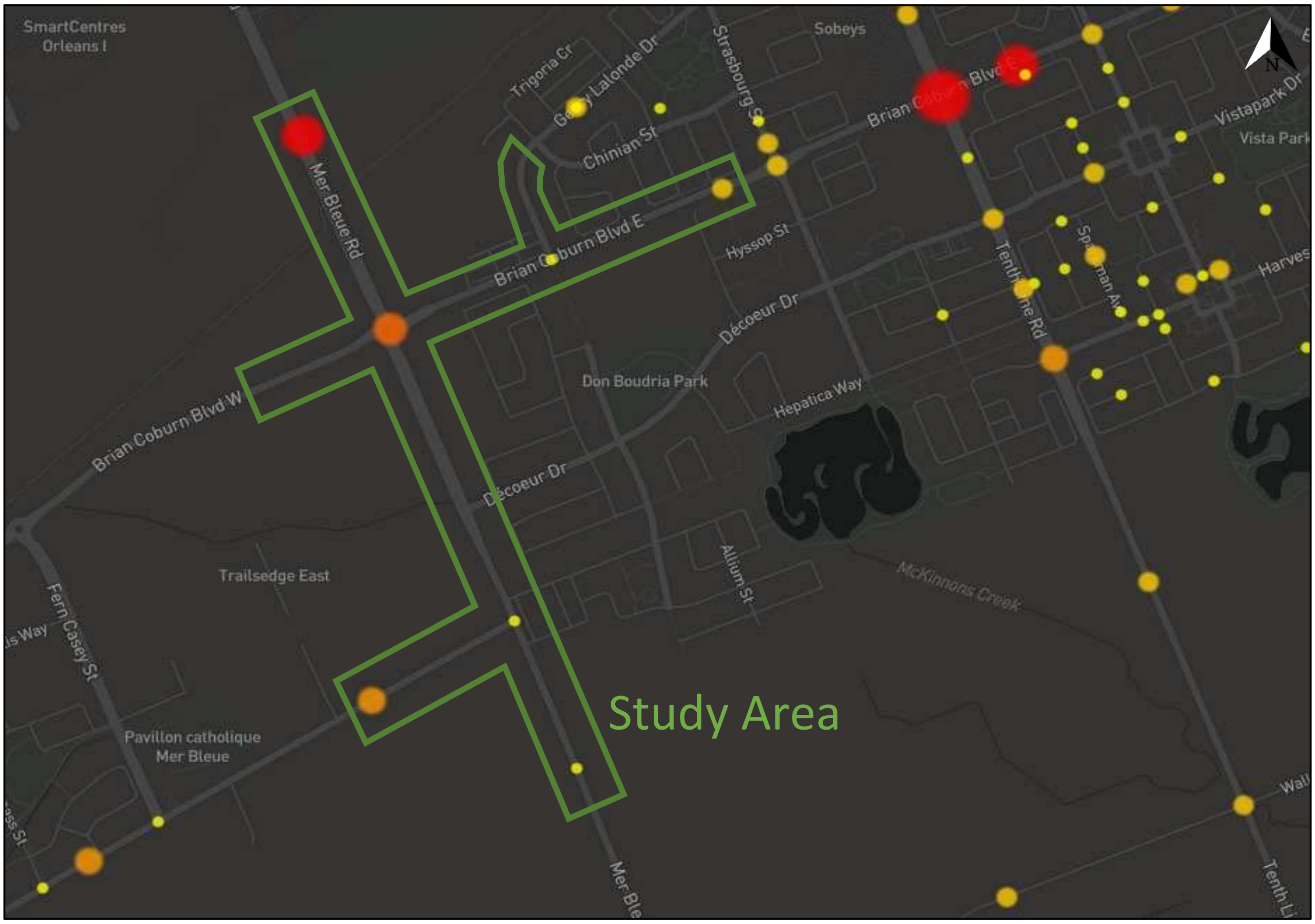


Table 2: Summary of Collision Locations

Intersection / Segment	Number	%
	38	100%
Brian Coburn Boulevard @ Mer-Bleue Road	9	23%
Brian Coburn Boulevard @ Gerry Lalonde Drive	3	8%
Renaud Road @ Mer-Bleue Road	3	8%
Brian Coburn Boulevard btwn Chaperal Private & Mer-Bleue Road	2	5%
Brian Coburn Boulevard btwn Fern Casey Street & Mer-Bleue Road	3	8%
Brian Coburn Boulevard btwn Gerry Lalonde Drive & Strasbourg Street	5	13%
Gerry Lalonde Drive btwn Brian Coburn Boulevard & Trigoria Crescent	3	8%
Mer-Bleue btwn 210 S of Innes Road & Renaud Road	6	16%
Mer-Bleue Road btwn Renaud Road & Du Palais Street	1	3%
Renaud Road btwn White Street & Mer-Bleue Road	3	8%

Table 3: Collision Summary

		Number	%
Total Collisions		**38**	**100%**
Classification	Fatality	0	0%
	Non-Fatal Injury	5	13%
	Property Damage Only	33	87%
Initial Impact Type	Approaching	2	5%
	Angle	5	13%
	Rear end	13	34%
	Sideswipe	4	11%
	Turning Movement	3	8%
	SMV Unattended Vehicle	1	3%
	SMV Other	8	21%
	Other	2	5%
Road Surface Condition	Dry	26	68%
	Wet	6	16%
	Loose Snow	5	13%
	Slush	0	0%
	Packed Snow	0	0%
	Ice	1	3%
	Loose sand or gravel	0	0%
Pedestrian Involved		**0**	**0%**
Cyclists Involved		**0**	**0%**

Overall, no fatal collisions were documented in the Study Area and no collisions involving pedestrians or cyclists have been documented either. Of the 38 collisions recorded in the Study Area, 13% resulted in a non-fatal injury and the remaining 87% resulted in property damage only. The impact types are distributed throughout the various categories with the largest number of collisions, at 34%, found in the rear end impact type category. Weather/road conditions are considered a contributing factor for 32% of the collisions in the Study Area.

2.3 Planned Conditions

2.3.1 Changes to the Area Transportation Network

The subject development is within the Mer-Bleue Community Design Plan. As this design plan was published in 2006, many of the plans and recommendations have already been implemented or are no longer feasible. As such, applicable elements of the Ottawa Official Plan, Ottawa Transportation Master Plan, Ottawa Pedestrian Plan, and the Ottawa Cycling Plan have been used to identify changes to the area transportation network. The resulting changes to the road, pedestrian, and cycling network in the Study Area due to these plans are outlined below:

- As part of the 2031 Affordable Network, Brian Coburn Boulevard between Tenth Line Road and Blackburn Hamlet Bypass will be considered a Transit Priority Corridor (Isolated Measures). As a result, transit signal priority and queue jump lanes will be implemented. The exact timing of this is not clear.
- As part of the City of Ottawa Urban Road Network, Jerome Jodoin Drive has been designated as a future collector road. The exact timing of this is not clear.
- As part of the 2031 Ultimate Cycling Network, within the Study Area Mer-Bleue Road will be considered a spine route, Brian Coburn and Renaud Road will be considered a local route and a major pathway

travelling north-south will intersect Brian Coburn Boulevard to the east of Gerry Lalonde Drive / Jerome Jodoin Drive. The exact timing of these have not been made clear.

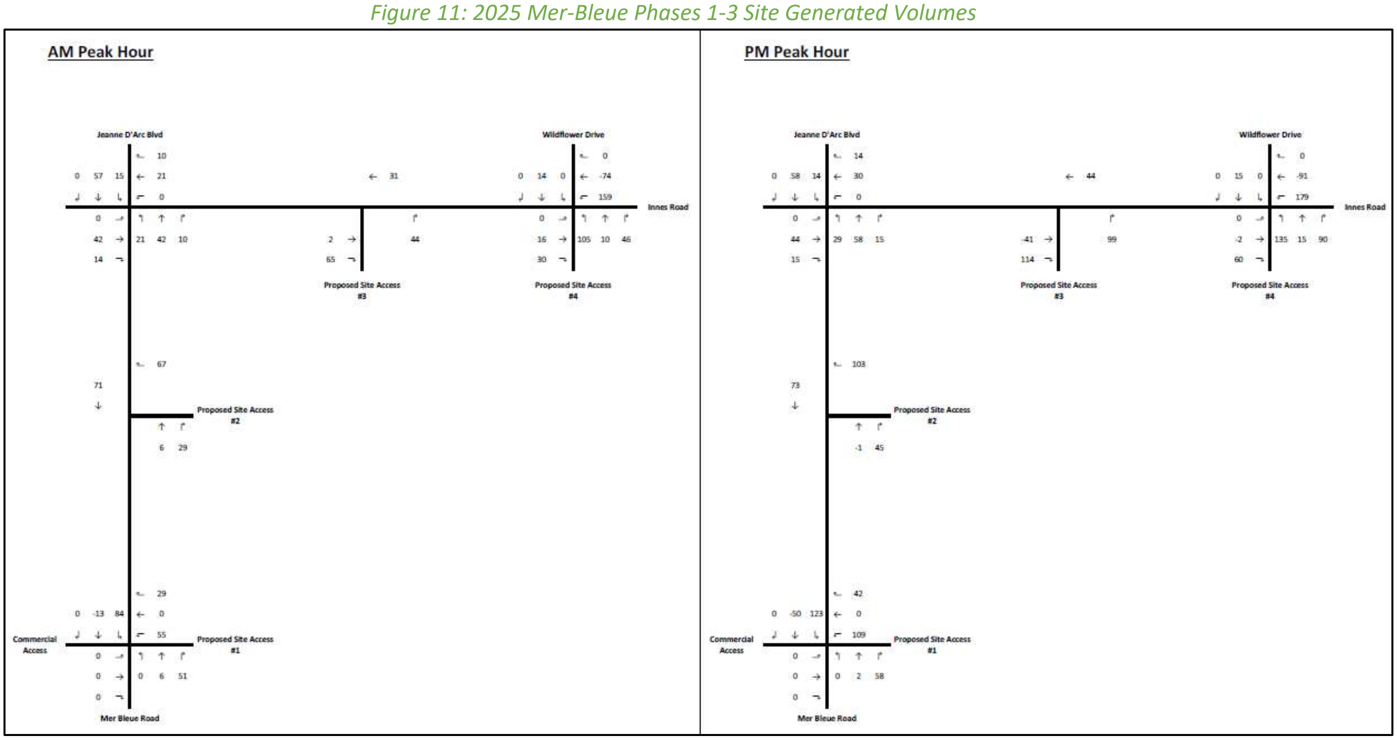
While reviewing TrailsEdge East Development Community Transportation Study, it was noted that the signal warrants at Mer-Bleue Road and Axis Way / Decoeur Drive will be met in 2021 as a result of traffic generated by TrailEdge East and Avalon West developments. An excerpt from the Proposed TrailsEdge East Development Community Transportation Study can be seen in Appendix D. Further, the Planning, Infrastructure, and Economic Development Department Report (March 2019) to City of Ottawa's Planning Committee and Council indicates that intersection of Brian Coburn Boulevard at Gerry Lalonde Drive / Jerome Jodoin Drive will be upgraded to a single-lane roundabout and can be found in Appendix E. Thus, these intersections will be coded as a signalized intersection and a roundabout, respectively, for future horizon operational analysis purposes only and are required to be designed by others.

2.3.2 Other Study Area Developments

A few development applications were available for the adjacent properties as listed on the City's Development Application Search tool:

- 2025 Mer-Bleue Road Phases 1-3 – The SmartREIT Orleans commercial development Phases 1 to 3 will have approximately 183,000 ft^2 GFA of retail space, 30,000 ft^2 GFA of restaurant space and 10,000 ft^2 GFA of bank developments. Full-build-out is expected by 2019. The anticipated trip generation from this site can be seen in Figure 11 and is an excerpt from the Orleans Commercial Development Transportation Impact Study prepared by Stantec Consulting Ltd.

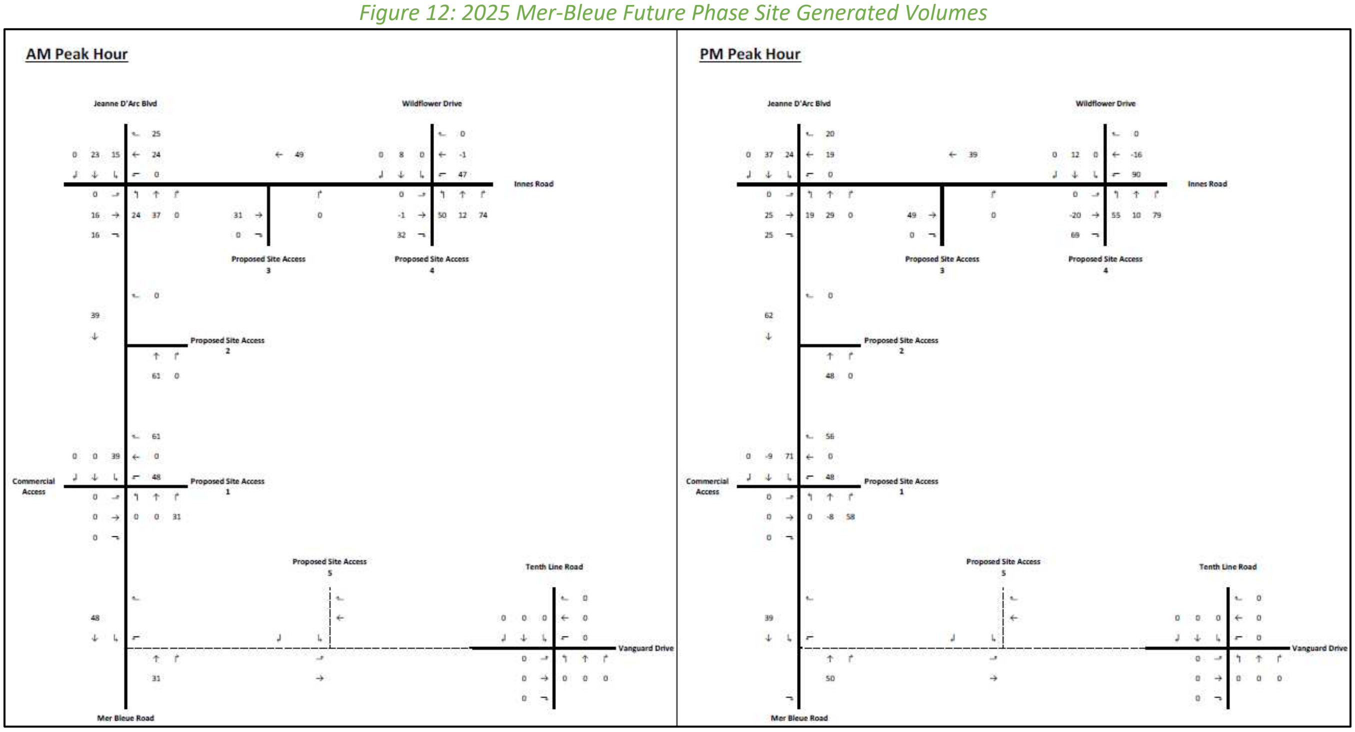
Figure 11: 2025 Mer-Bleue Phases 1-3 Site Generated Volumes



Source: Orleans Commercial Development Transportation Impact Study (Stantec Consulting, 2016)

- 2025 Mer-Bleue Road Future Phase – The SmartREIT Orleans commercial development future phase will have approximately 42,000 ft^2 GFA of retail space, 14,000 ft^2 GFA of restaurant space and 118,000 ft^2 GFA of industrial space, 1200 apartment units, 350 senior housing units and a 256-bed assisted living building. Full-build-out is expected by 2026. The anticipated trip generation from this site can be seen in Figure 12 and is an excerpt from the 2025 Mer-Bleue Road Community Transportation Study prepared by Stantec Consulting Ltd.

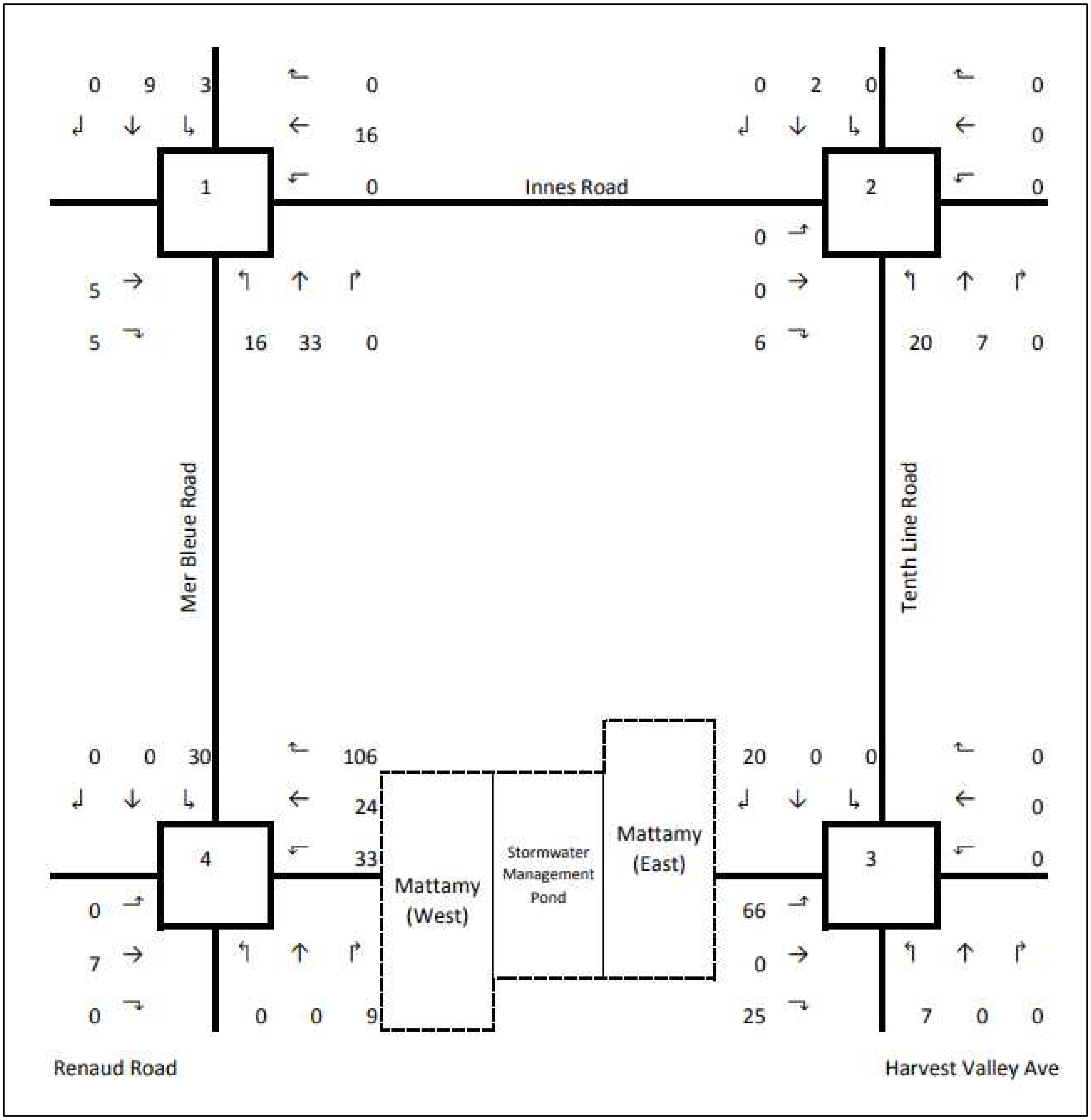
Figure 12: 2025 Mer-Bleue Future Phase Site Generated Volumes



Source: 2025 Mer-Bleue Road Community Transportation Study (Stantec Consulting, 2017)

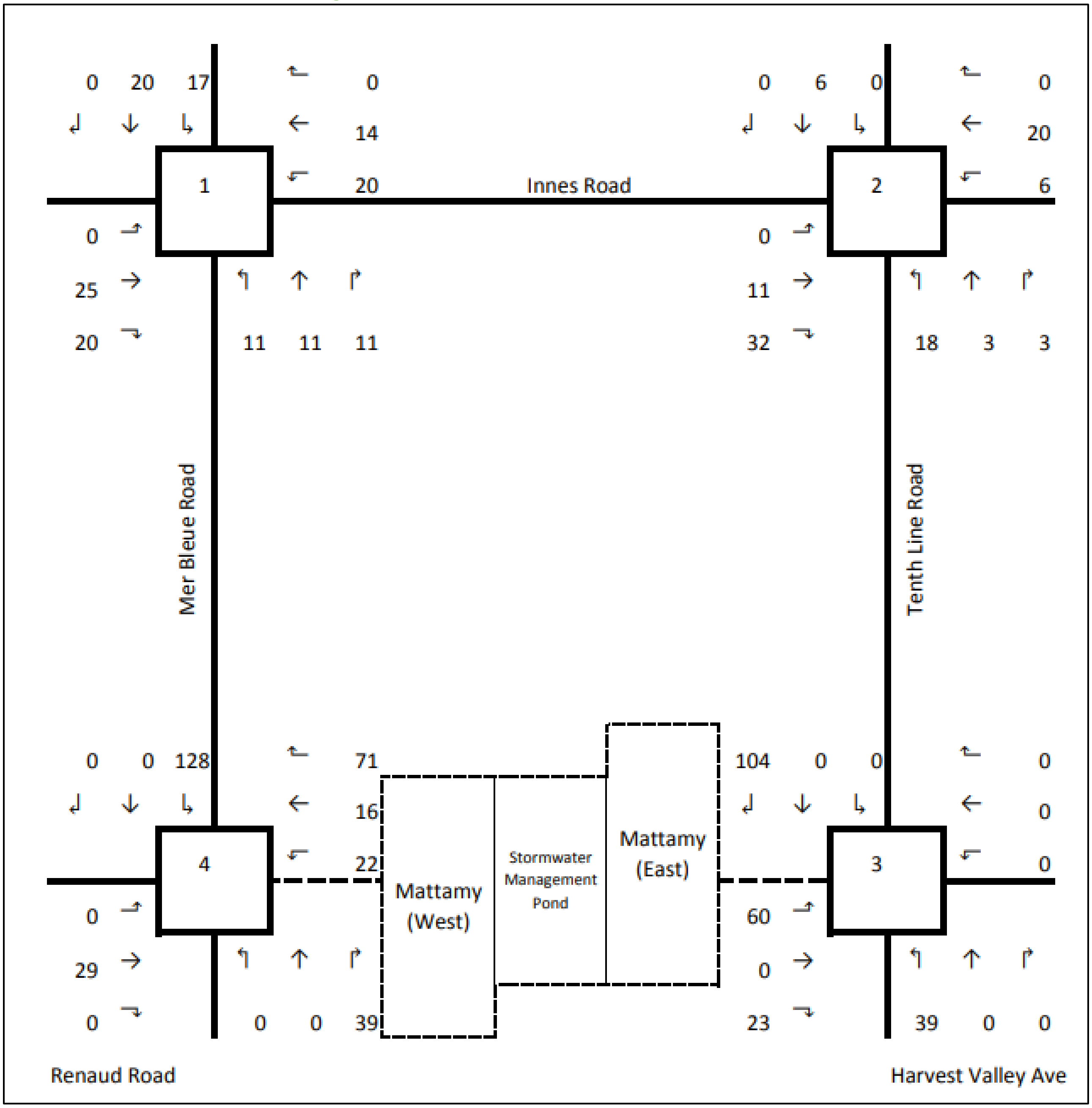
- 2405 Mer-Bleue Road / 2496 Tenth Line Road – The Summerside Phases 1 to 3 will have approximately 810 residential units consisting of 430 single family detached dwellings, 260 townhouse units and 210 apartment units. Full-build out is expected by 2020. The anticipated trip generation from this site can be seen in Figure 13 and Figure 14, and is an excerpt from the 2405 Mer-Bleue Transportation Impact Study prepared by Stantec Consulting Ltd.

Figure 13: 2405 Mer-Bleue Site Generated Volumes-AM



Source: 2405 Mer-Bleue Road Transportation Impact Study (Stantec Consulting, 2014)

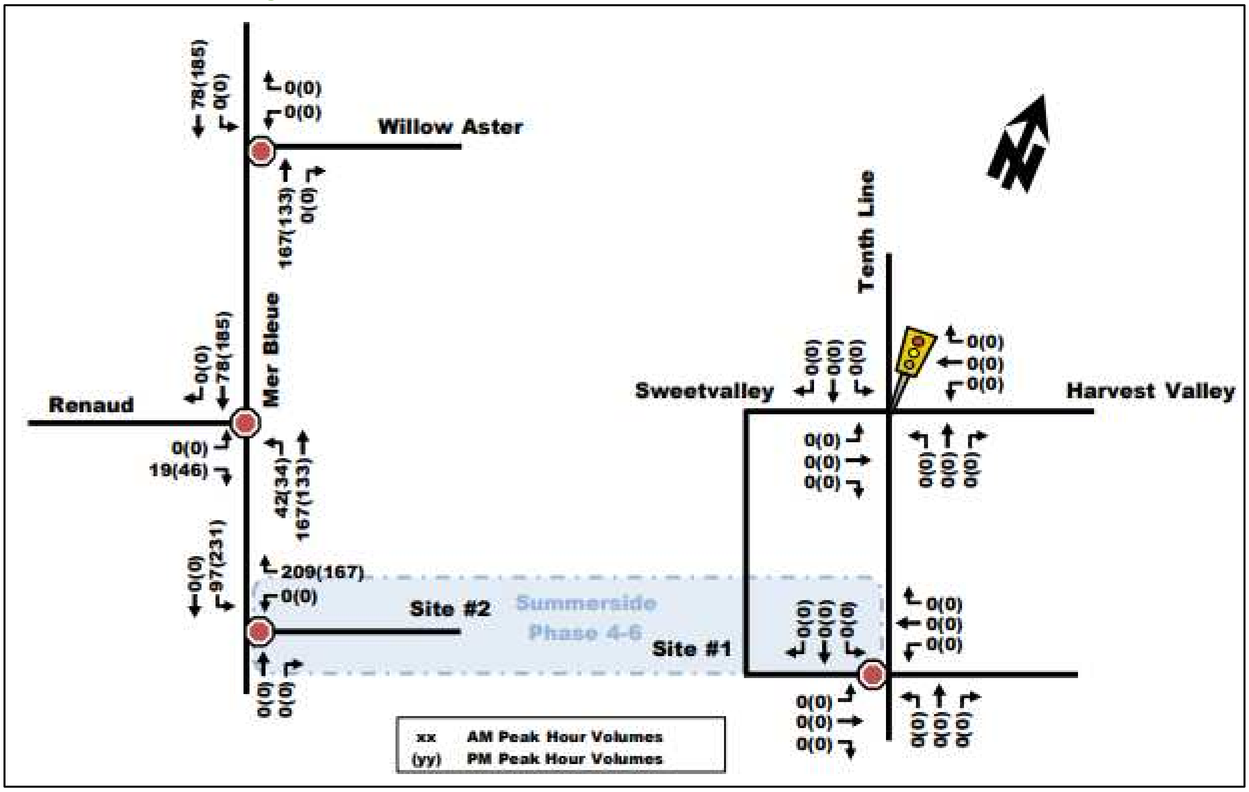
Figure 14: 2405 Mer-Bleue Site Generated Volumes-PM



Source: 2405 Mer-Bleue Road Transportation Impact Study (Stantec Consulting, 2014)

- 2564 Tenth Line Road – The Summerside West Phases 5 to 6 will consist of 257 single family homes (Phase 5), and 236 townhomes (Phase 6). Full build out is expected to be 2024 for both Phase 5 and Phase 6. The anticipated trip generation from this site for Phase 5 and Phase 6 can be seen in Figure 15, and is an excerpt from the Summerside West Phase 4-6 Transportation Impact Assessment Strategy Report prepared by Parsons. The Phase 4 of the Summerside West development will not impact Study Area intersections and therefore has not been included in this study as one of the background developments.

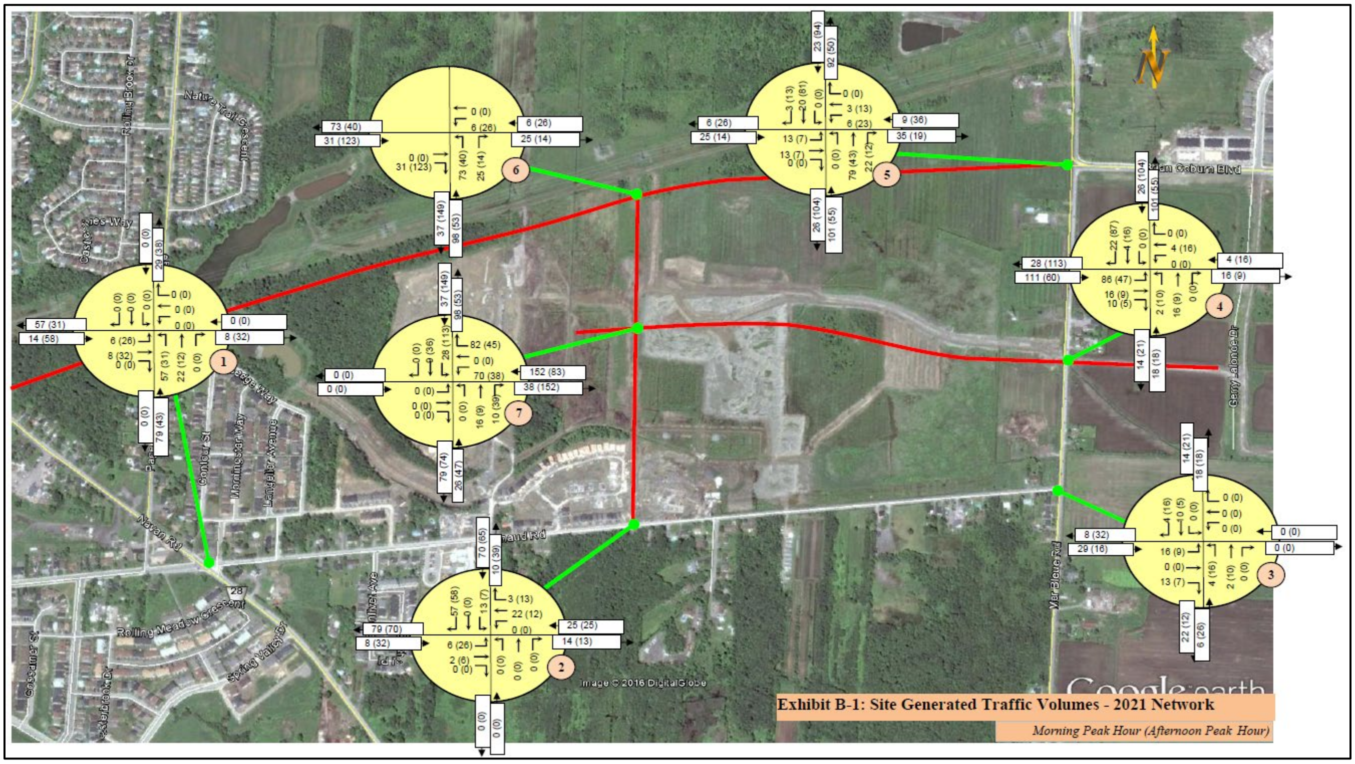
Figure 15: Summerside West Phase 4-6 Site Generated Volumes - Phase 5 & 6



Source: Summerside West Phase 4-6 TIA Strategy Report (Parsons, 2018)

- TrailsEdge East Development – approximately 900 residential units consisting of a mix of single, townhomes, and back-to-backs are to be completed by 2021. The anticipated trip generation from this site can be seen in Figure 16, and is an excerpt from the Proposed TrailsEdge East Development Community Transportation Study prepared by Castleglenn Consultants.

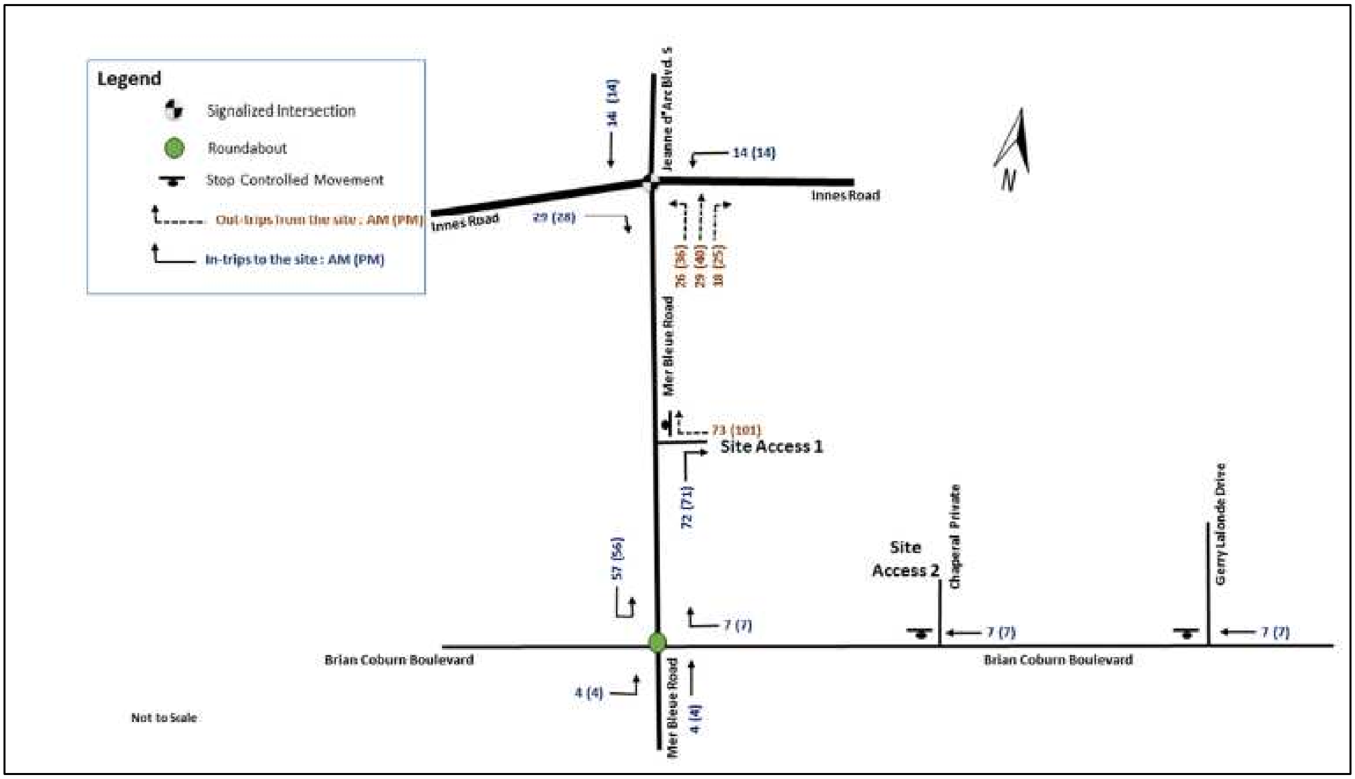
Figure 16: TrailsEdge East Development Generated Volumes



Source: Proposed TrailsEdge East Development Community Transportation Study (Castleglenn Consultants, 2016)

- 2225 Mer-Bleue Road – the proposed Orleans Health Hub will be a 6040 square feet health services building with approximately 242 parking stalls and two site accesses. It is estimated that full-build out of this development will occur in 2021. The anticipated trip generation from this site can be seen in Figure 17 and is an excerpt from 2225 Mer-Bleue Road – Orleans Health Hub Transportation Impact Study prepared by HDR.

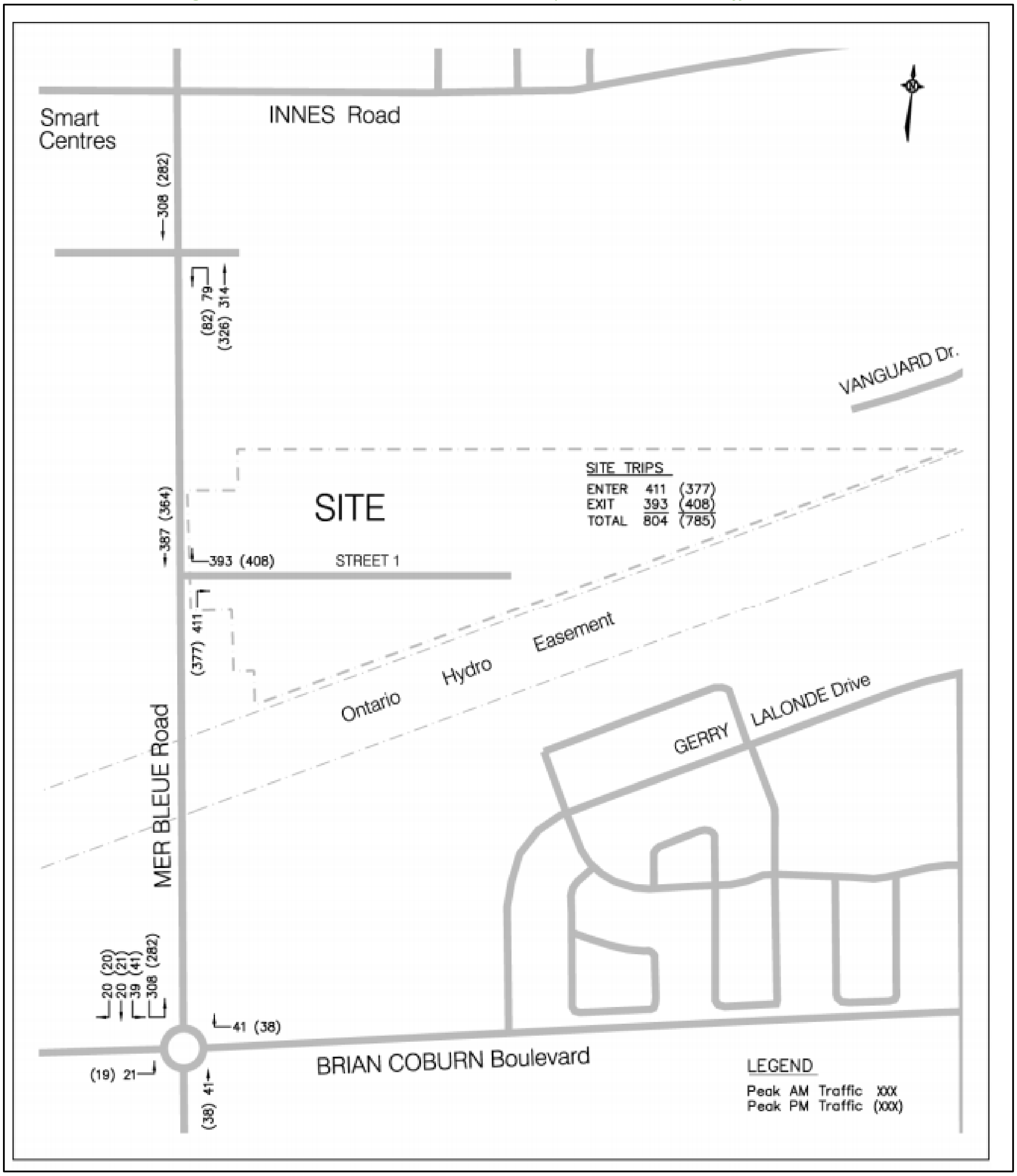
Figure 17: 2225 Mer-Bleue Road Development Generated Traffic Volumes



Source: 2225 Mer-Bleue Road Transportation Impact Study (HDR, 2018)

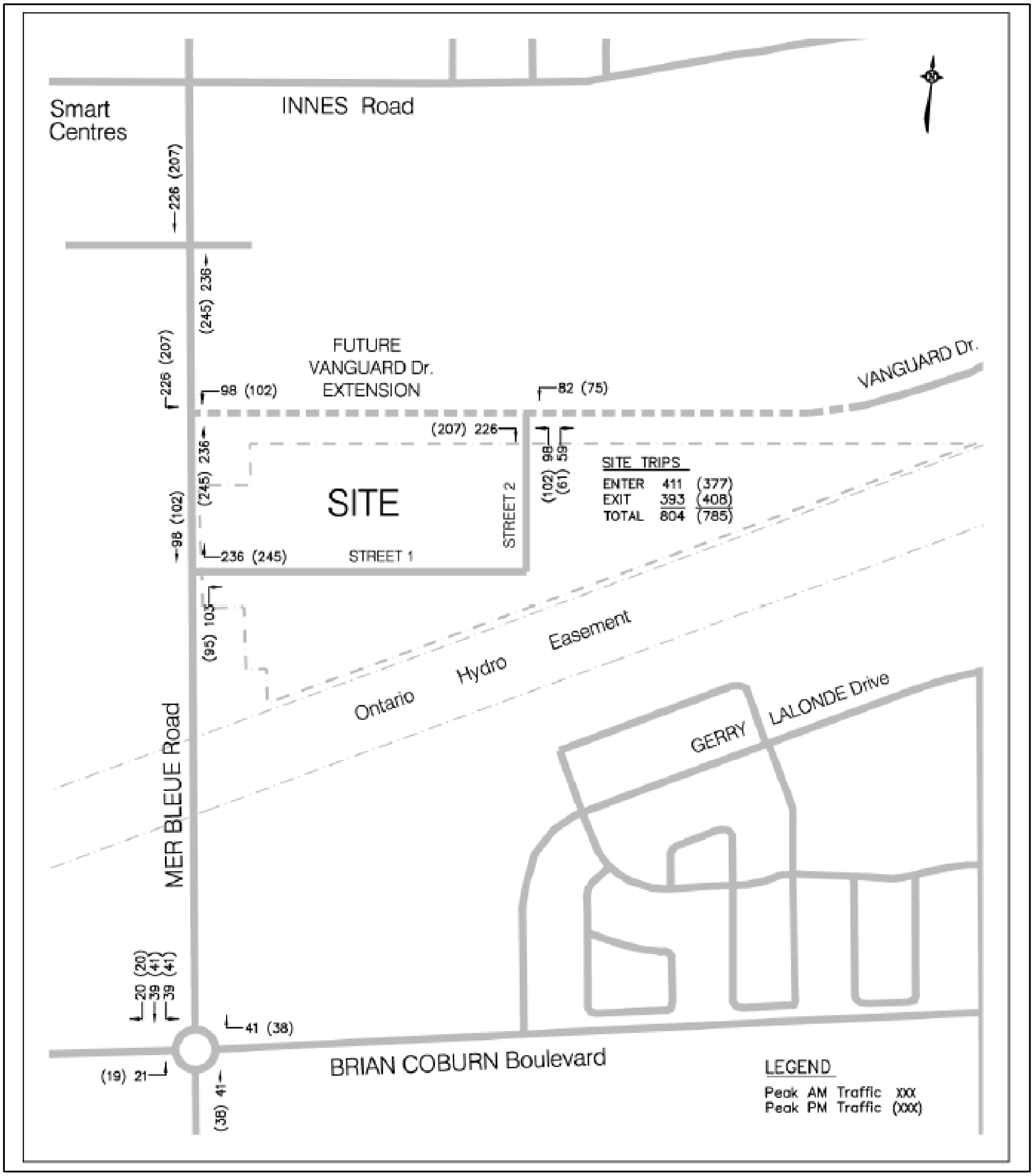
- 2159 Mer-Bleue Road – Blue Sea Village is a seven-block mixed use development with 45,000 square feet of office space, 190,000 square feet of recreational space, 100 retirement residence units and 100 residential apartment units. One site access will be provided and full-build out is expected to occur in 2024. Trip distribution of this development will change once future Vaughan Drive extension is built in 2029, allowing southbound left turns into the site. The anticipated 2024 and 2029 trip distribution from this site can be seen in Figure 18 and Figure 19, respectively and are excepts from the 2159 Mer-Bleue Road Blue Sea Village Transportation Impact Assessment prepared by D.J. Halpenny & Associates Ltd.

Figure 18: 2159 Mer-Bleue Road 2024 Development Generated Traffic Volumes



Source: 2159 Mer-Bleue Road Transportation Impact Assessment (D.J. Halpenny & Associates Ltd., 2018)

Figure 19: 2159 Mer-Bleue Road 2029 Development Generated Traffic Volumes



Source: 2159 Mer-Bleue Road Transportation Impact Assessment (D.J. Halpenny & Associates Ltd., 2018)

- 2167 Tenth Line Road – a mixed-use development with 231 proposed apartment units and 500 square metres of retail. This property is expected to be built-out in 2021. Trip generation of this development can be seen in Figure 20 and is excerpt from the 2167 Tenth Line Road Traffic Impact Assessment prepared by Castleglenn Consultants in 2020.

Figure 20: 2167 Tenth Line Development Generated Traffic Volumes

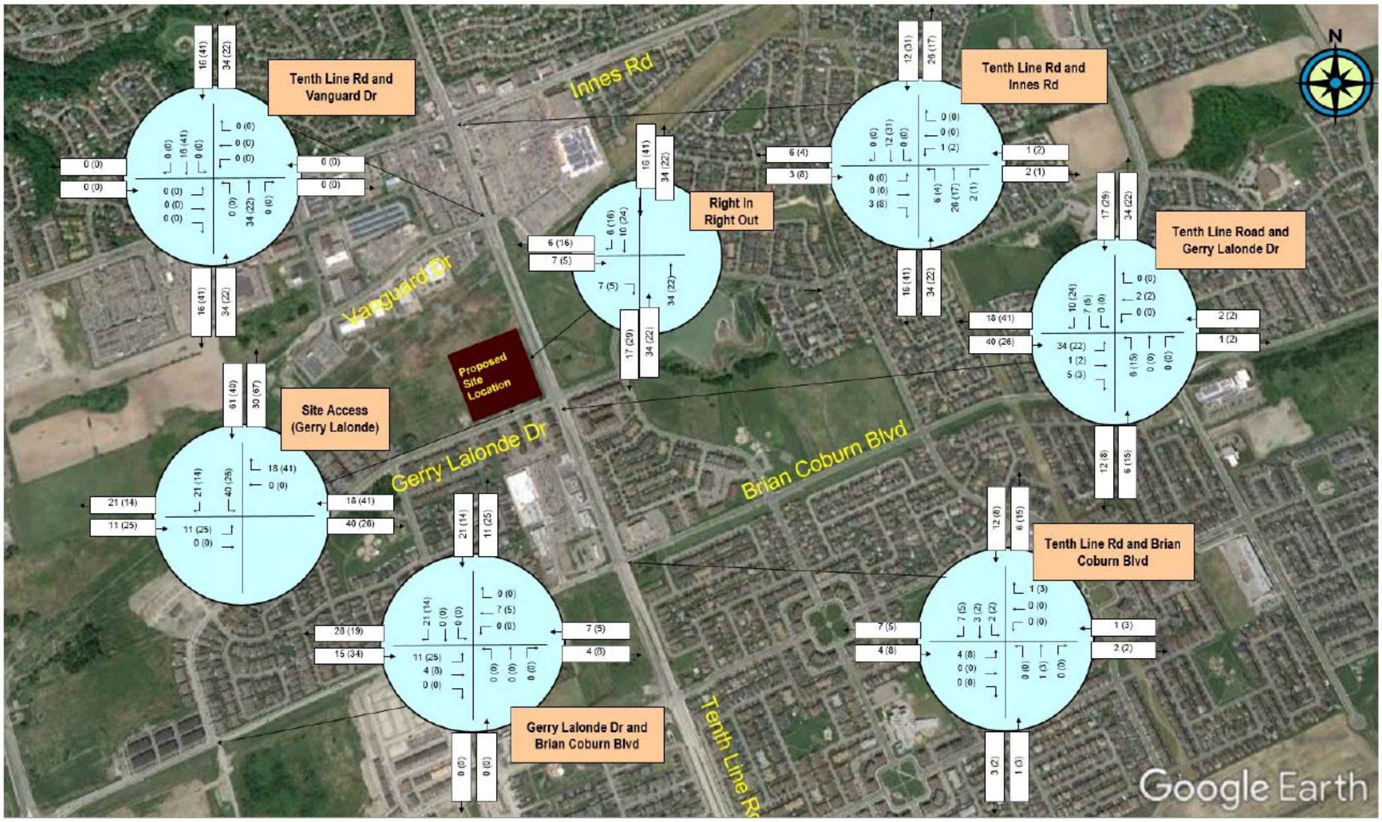


Exhibit 4-4: Net Site Auto Generated Travel Demand – Full Build Out [AM (PM)]

Source: 2167 Tenth Line Road Traffic Impact Assessment Final Draft (Castleglenn, 2020)

- 2605 Tenth Line Road – a proposed 125 Ha residential subdivision with approximately 200 single family homes, 200 townhomes, and 200 stacked townhomes. Since the 2605 Tenth Line Community Transportation Study has been prepared by Delcan in 2014, changes were proposed to the east portion of the subdivision. Therefore, for this study a combination of the west-side site generated volumes outlined in the 2014 Delcan Study and the east-side site generated volumes prepared by CGH in 2020 was used to determine the background traffic volumes.
- Avalon West Community Phase 5 – Phase 5 of the Avalon West community is proposed to include approximately 1,120 residential units, and a secondary school. Full-build out is expected to occur in 2021. As no Transportation Impact Study for this development is currently available, the anticipated movements In and Out of the Avalon West development through the intersection of Mer-Bleue Road at Decoeur Drive, and the intersection of Gerry Lalonde Drive at Brian Coburn Boulevard were determined using the background traffic volumes illustrated in TrailsEdge East Development Community Transportation Study, and 2167 Tenth Line Road TIA, respectively.

3 Study Area and Time Periods

3.1 Study Area

The Study Area will include the intersections of Brian Coburn Boulevard and Mer-Bleue Road, Brian Coburn Boulevard and Gerry Lalonde Drive / Jerome Jodoin Drive, and Mer-Bleue Road and Renaud Road. Brian Coburn Boulevard and Mer-Bleue Road will be examined as Boundary Roads.

3.2 Time Periods

As the proposed development is composed primarily of residential units the AM and PM peak hours will be examined.

3.3 Horizon Years

The anticipated build-out year is 2024. As a result, the full build-out plus five years horizon year is 2029.

4 Exemption Review

Table 4 summarizes the exemptions for this TIA.

Table 4: Exemption Review

Module	Element	Explanation	Exempt/Required
Design Review Component			
4.1 Development Design	4.1.2 Circulation and Access	Only required for site plans	Exempt
4.2 Parking	4.2.3 New Street Networks	Only required for plans of subdivision	Required
	4.2.1 Parking Supply	Only required for site plans	Exempt
	4.2.2 Spillover Parking	Only required for site plans where parking supply is 15% below unconstrained demand	Exempt
Network Impact Component			
4.5 Transportation Demand Management	All Elements	Not required for site plans expected to have fewer than 60 employees and/or students on location at any given time	Required
4.6 Neighbourhood Traffic Management	4.6.1 Adjacent Neighbourhoods	Only required when the development relies on local or collector streets for access and total volumes exceed ATM capacity thresholds	Required
4.8 Network Concept		Only required when proposed development generates more than 200 person-trips during the peak hour in excess of equivalent volume permitted by established zoning	Required

5 Development-Generated Travel Demand

5.1 Trip Generation and Mode Shares

This TIA has been prepared using the TRANS Trip Generation Study Report (2009) vehicle and person trip rates for the residential components, and the ITE Trip Generation Manual (10th Edition) average vehicle trip rates for the commercial components of the proposed development. To estimate commercial land use person trip generation, a factor of 1.28 has been applied to the ITE rates. Table 5 summarizes the vehicle and person trip rates for the proposed land uses.

Table 5: Trip Generation Person Trip Rates

Land Use	Land Use Code	Peak Hour	Vehicle Trip Rate	Person Trip Rates
Townhouses	224 (TRANS)	AM	0.54	0.98
		PM	0.71	1.16
Mid-Rise Apartments	223 (TRANS)	AM	0.29	0.66
		PM	0.34	0.84
Shopping Centre	820 (ITE)	AM	0.94	1.20
		PM	3.81	4.88

Using the above Person Trip rates, the total person trip generation has been estimated. Table 6 below illustrates the total person trip generation by land use.

Table 6: Total Person Trip Rates

Land Use	Units/GFA (s.f.)	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Townhouses	112	41	69	110	69	61	130
Mid-Rise Apartments	170	27	85	112	89	54	143
Shopping Centre	15,000	11	7	18	35	38	73
	Total Person Trips	79	161	240	193	153	346

To account for trips that are made within the proposed Mid-Rise Building (i.e. a building resident using retail portion of the mid-rise before coming home from work), an internal capture rate has been applied to the total person trip generation of the Retail land use. The ITE Trip Generation Handbook (3d Edition) provides the internal trip capture rates for trip origins and destinations within a mixed-use development and can be found in Appendix F.

The Residential portion is the largest use of the Mid-Rise Apartment Building. Therefore, this land use is treated as the anchor for this part of the development and is not reduced based on the multi-use capture rate. The commercial portion of the development, which generates a lower number of trips, has been reduced to reflect building residents utilizing the on-site retail stores. The internal capture rates for the Residential and Retail uses are summarized in Table 7. The total net person trip generation can be seen in Table 8.

Table 7: Internal Capture Rates

Land Use	AM Peak Hour		PM Peak Hour	
	In	Out	In	Out
Residential to/from Retail	17%	14%	10%	26%

Table 8: Total Net Person Trip Generation

Land Use	Units/GFA (s.f.)	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Townhouses	112	41	69	110	69	61	130
Mid-Rise Apartments	170	27	85	112	89	54	143
Shopping Centre	15,000	9	6	15	31	28	59
	Total Person Trips	77	160	237	189	143	332

Using the most recent National Capital Region Origin-Destination (OD Survey), the existing mode shares for Orleans have been summarized in Table 9. As a result of the Forecasting and Strategy Report comments, shown in Appendix G, the existing transit mode share has been rounded up to nearest 5%. This accounts for the fact that the mixed-use component of the proposed development is located in close proximity to a transit stop served by a high-frequency route, making the mixed-use block a more transit accessible location when compared to an average residential dwelling in Orleans. Further, as the Study Area is expected to be predominantly built out by the time the proposed development is complete, it is also anticipated that OC Transpo will increase service frequencies and/or provide larger variety of routes along the boundary arterial roads to meet future demands. The active mode share has also been increased from the existing total of 7% to 10% (split evenly between walking and cycling) as the surrounding area is expected to become more urbanized in the future. The existing pedestrian and cyclist infrastructure surrounding the proposed development, as well as the proposed TDM measures, discussed in detail in Sections 8 and 12, also provide favourable conditions for the increase in active mode shares.

Table 9: Mode Share

Travel Mode	Orleans
Auto Driver	55%
Auto Passenger	15%
Transit	20%
Cyclist	5%
Pedestrian	5%
Total	100%

Using the above mode shares and the person trip rates, the person trips by mode have been projected. Table 10 summarizes the trip generation by mode.

Table 10: Trip Generation by Mode

Travel Mode	Mode Share	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Townhouses							
Auto Driver	55%	23	38	61	38	34	72
Auto Passenger	15%	7	10	17	11	9	20
Transit	20%	8	14	22	14	12	26
Cyclist	5%	3	3	6	4	3	7
Pedestrian	5%	3	3	6	4	3	7
Total	100%	41	69	110	69	61	130
Mid-Rise Apartments and Shopping Centre (Mixed-Use)							
Auto Driver	55%	20	50	70	66	45	111
Auto Passenger	15%	5	14	19	18	12	30
Transit	20%	7	18	25	24	17	41
Cyclist	5%	3	4	7	6	4	10
Pedestrian	5%	3	4	7	6	4	10
Total	100%	36	91	127	120	82	202
	Grand Total	77	160	237	189	143	332

As shown above, 237 AM and 332 PM new peak hour two-way vehicle trips are projected as a result of the proposed development. Out of these trips, 61 AM and 72 PM peak hour two-way vehicle trips are generated by the Townhouse portion of the development and will utilize Mer-Bleue Road at Decoeur Drive intersection to access the site, where 70 AM and 111 PM peak hour two-way vehicle trips will be generated by the mixed-use portion of the development and enter/exit the site via Site Access #2 at Brian Coburn Boulevard.

5.2 Trip Distribution

To understand the travel patterns of the subject development, the OD survey has been reviewed to determine the existing travel patterns that will be applied to the new vehicle trips. Table 11 below summarizes the distribution for Orleans.

Table 11: OD Survey Existing Directional Split Orleans

To/From	% of Trips
North	20%
South	0%
East	20%
West	60%
Total	100%

Site-generated trips have been distributed separately for the townhouses and the mid-rise building, as the two components are not connected via internal road network, and have different access locations and turning restrictions. Figure X illustrates the trip distribution for the Townhouse component of the proposed development and Figure Y illustrates the trip distribution for the Mixed-Use component.

Figure 21: Trip Distribution - Townhouse Component

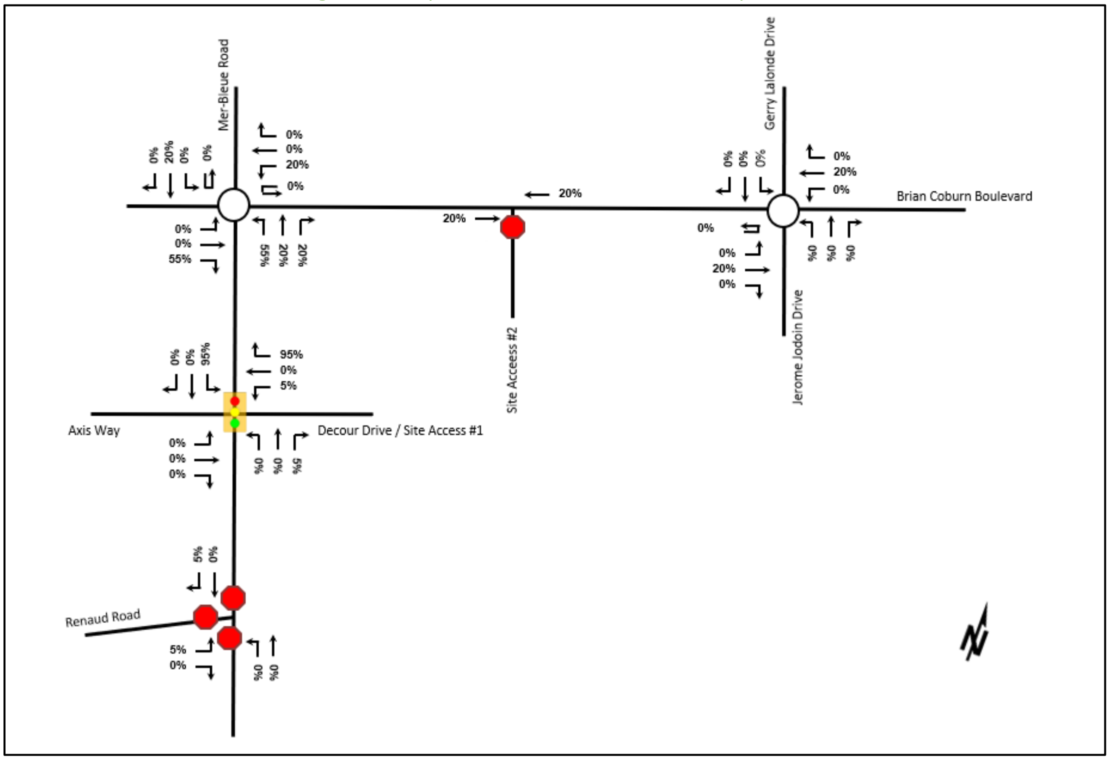
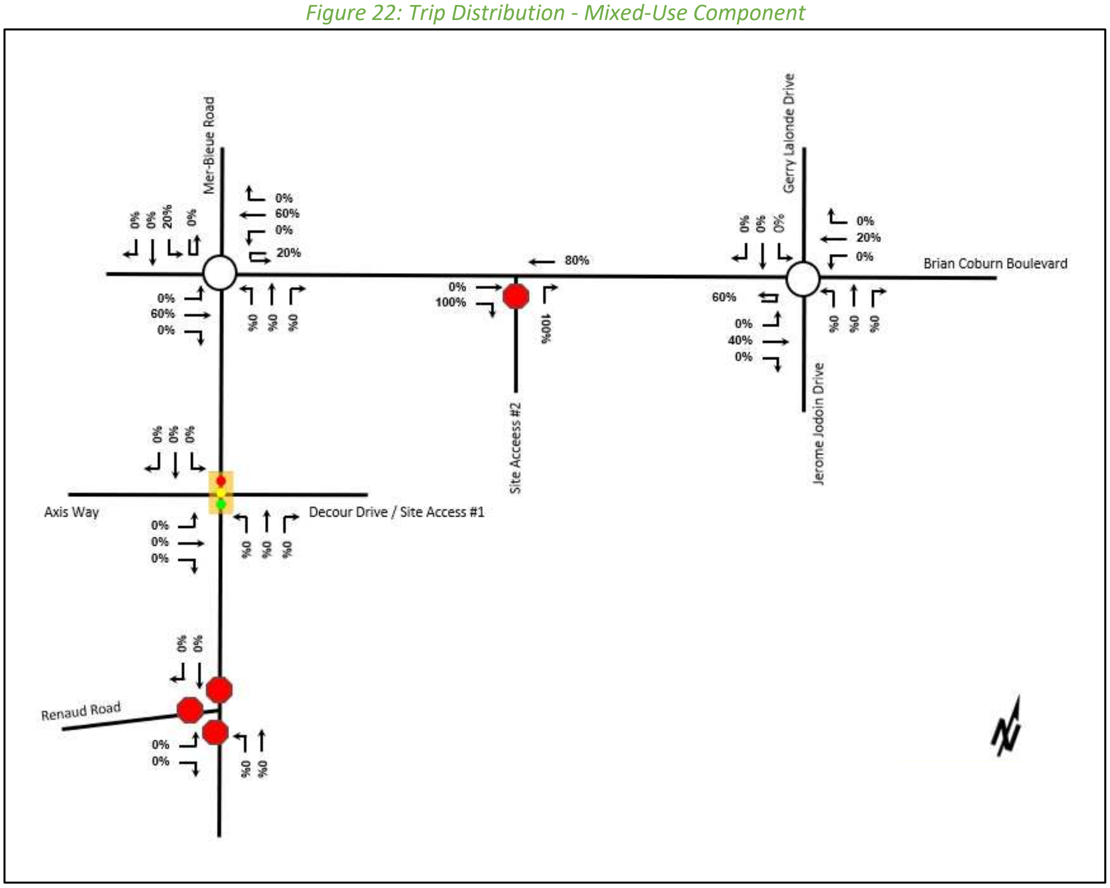


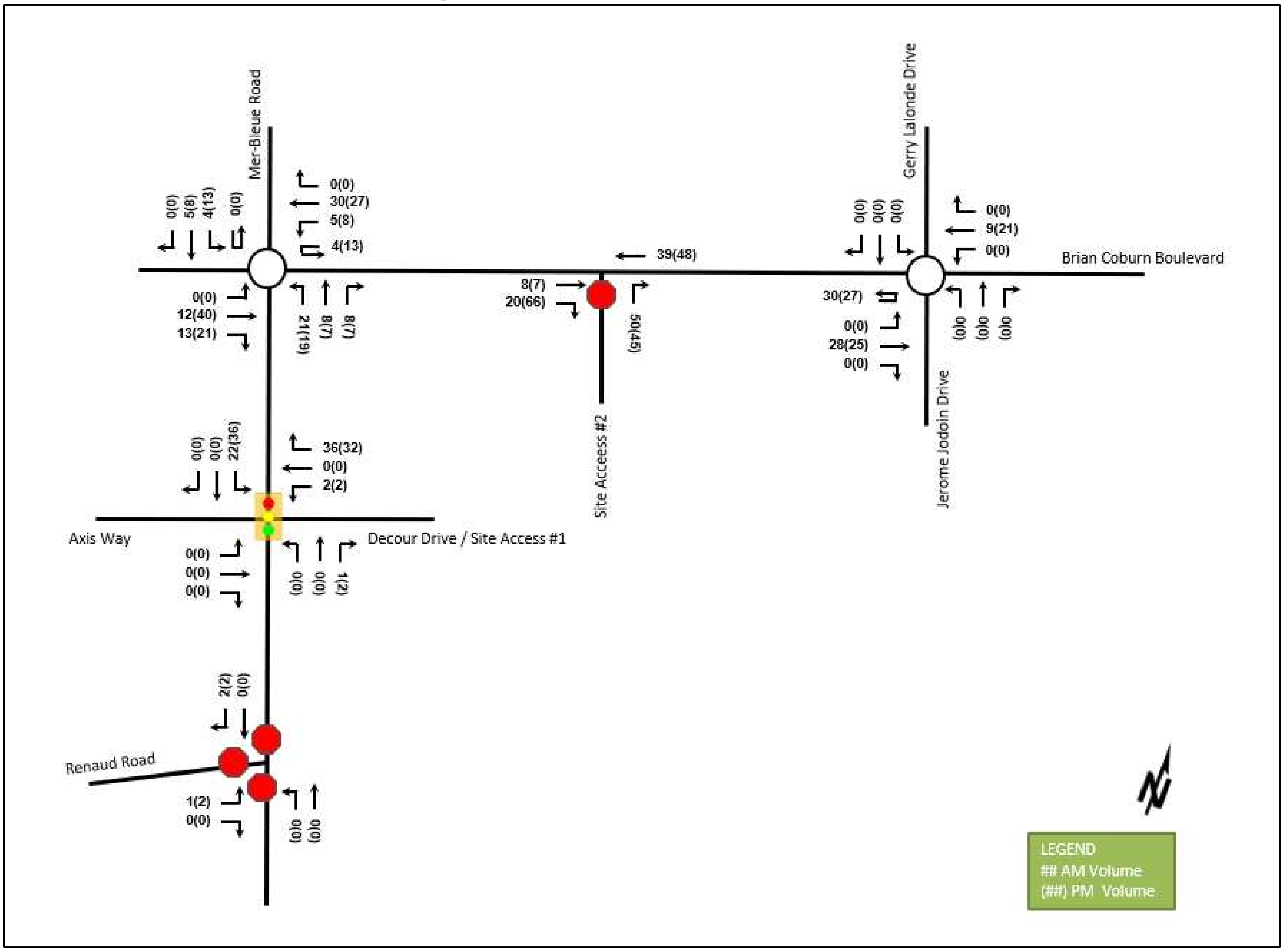
Figure 22: Trip Distribution - Mixed-Use Component



5.3 Trip Assignment

Using the distribution outlined above, turning movement splits, and access to major transportation infrastructure, the trips generated by the site have been assigned to the Study Area road network. Figure 23 illustrates the new site generated volumes.

Figure 23: New Site Generated Auto Volumes



6 Background Network Travel Demands

6.1 Transportation Network Plans

The transportation network plans were discussed in Section 2.3.1. As a result of background developments, the intersection of Mer-Bleue Road and Axis Way / Decoeur Drive will be signalised, and the intersection of Brian Coburn Boulevard at Gerry Lalonde Drive / Jerome Jodoin Drive will be a one-lane roundabout. These changes will be coded in Synchro and Sidra in all Future Background and Future Total scenarios for operational analysis purposes only and the intersections ae required to be designed by others.

6.2 Background Growth and Other Developments

Surrounding development Traffic Impact Assessments have used a 2% traffic growth within the Study Area of this report. As such, an annual background growth of 2% will be used in order to remain consistent with these studies.

The background developments explicitly considered in the 2024 and 2029 background conditions include:

- 2025 Mer-Bleue Road
- 2405 Mer-Bleue Road / 2496 Tenth Line Road
- 2564 Tenth Line Road
- TrailsEdge East Development
- 2225 Mer-Bleue Road
- 2159 Mer-Bleue Road
- 2168 Tenth Line Road
- 2605 Tenth Line Road
- Avalon West Community Phase 5

All of these developments are discussed in Section 2.3.2. Figure 24 illustrates the 2024 future background volumes and Figure 25 illustrates the 2029 future background volumes.

Figure 24: Future Background 2024 Volumes

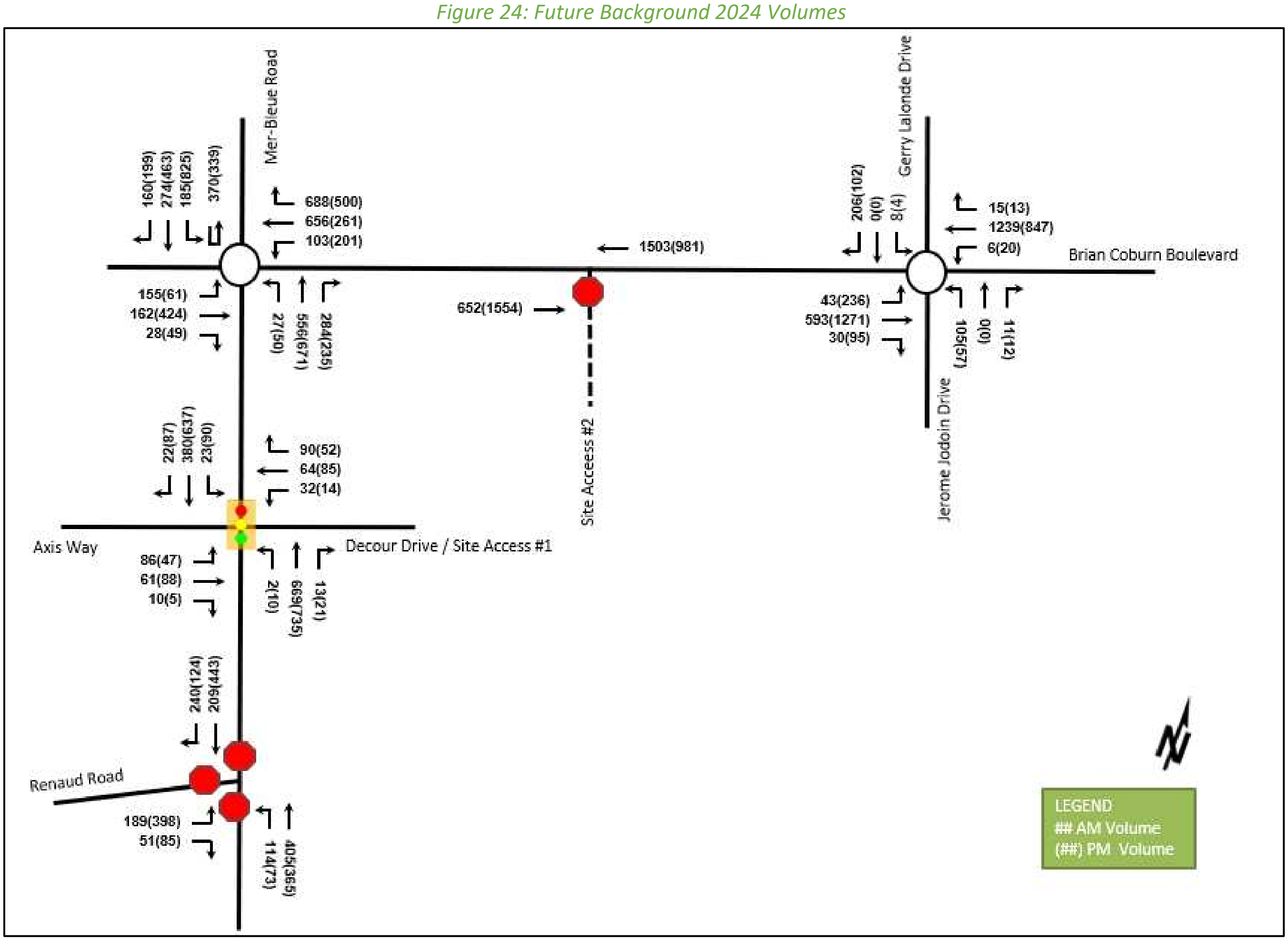
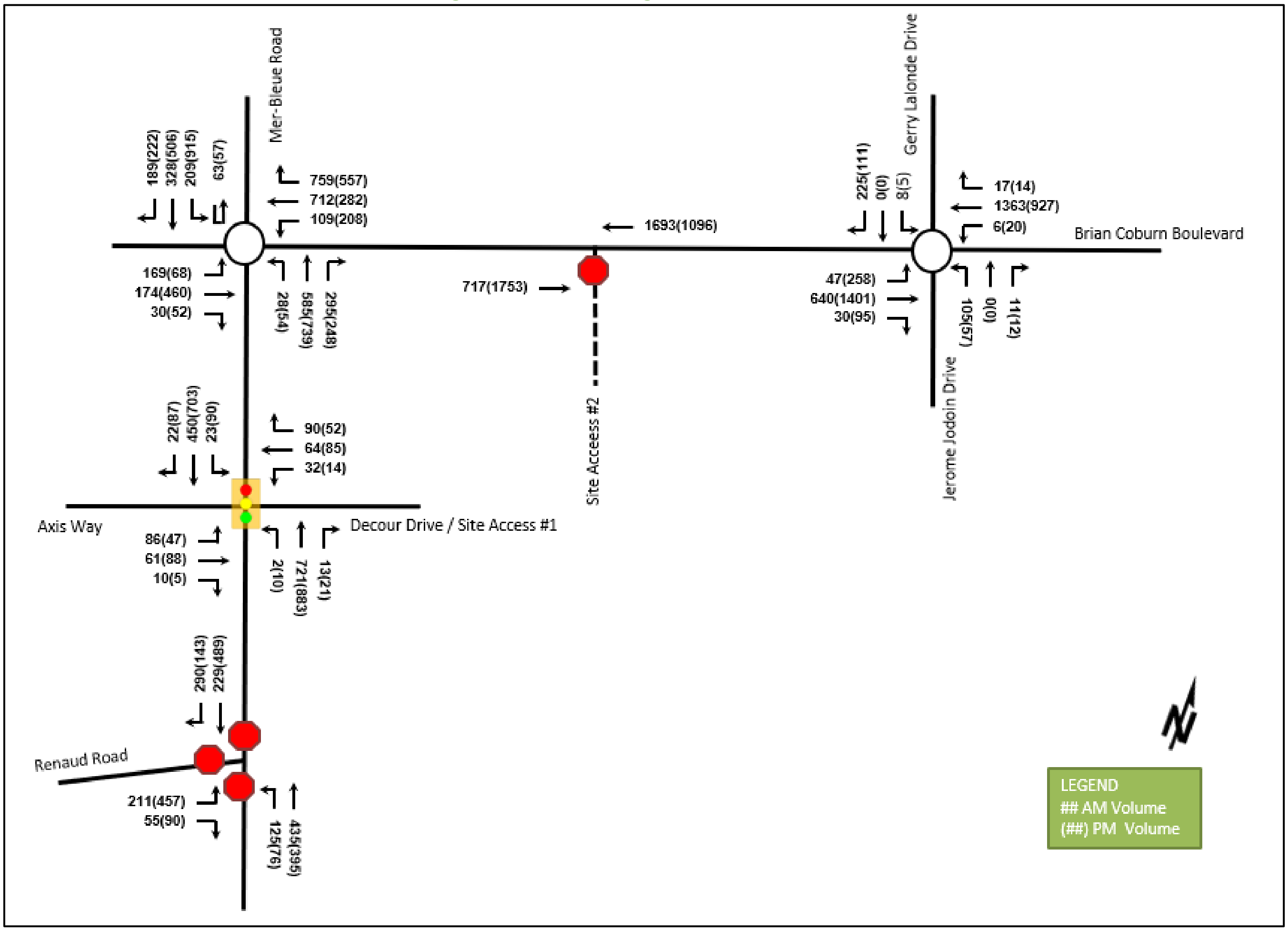


Figure 25: Future Background 2029 Volumes



7 Demand Rationalization

Based on background growth and the intersection upgrades required to support TrailsEdge East development, and Avalon West Community Phase 5 development, it is expected that the Study Area will experience capacity constraints in the next 4-9 years. As the timelines of Brian Coburn Boulevard transit improvements and widening are unknown, it is assumed that these changes to the network will be implemented beyond this study's horizons. Although the combination of background growth and delay of infrastructure projects will likely result in poor operational performance of the Study Area intersections, the Future Background volumes illustrated in Figure 24 and Figure 25 should be carried forward in the analysis to emphasise the need for infrastructure upgrades outlined in the City's 2031 Affordable Network.

As part of the Forecasting Report comments, shown in Appendix G, the City of Ottawa has requested that additional analysis to "quantify the amount of demand that requires rationalization" is undertaken. As such, a sensitivity analysis will be conducted in Section 16.2.6. The sensitivity analysis will identify the volume required to be diverted from the over-capacity movements in order to maintain a V/C ratio below 1.0.

The 2024 and 2029 future total volumes are illustrated in Figure 26 and Figure 27, respectively.

Figure 26: Future Total 2024 Volumes

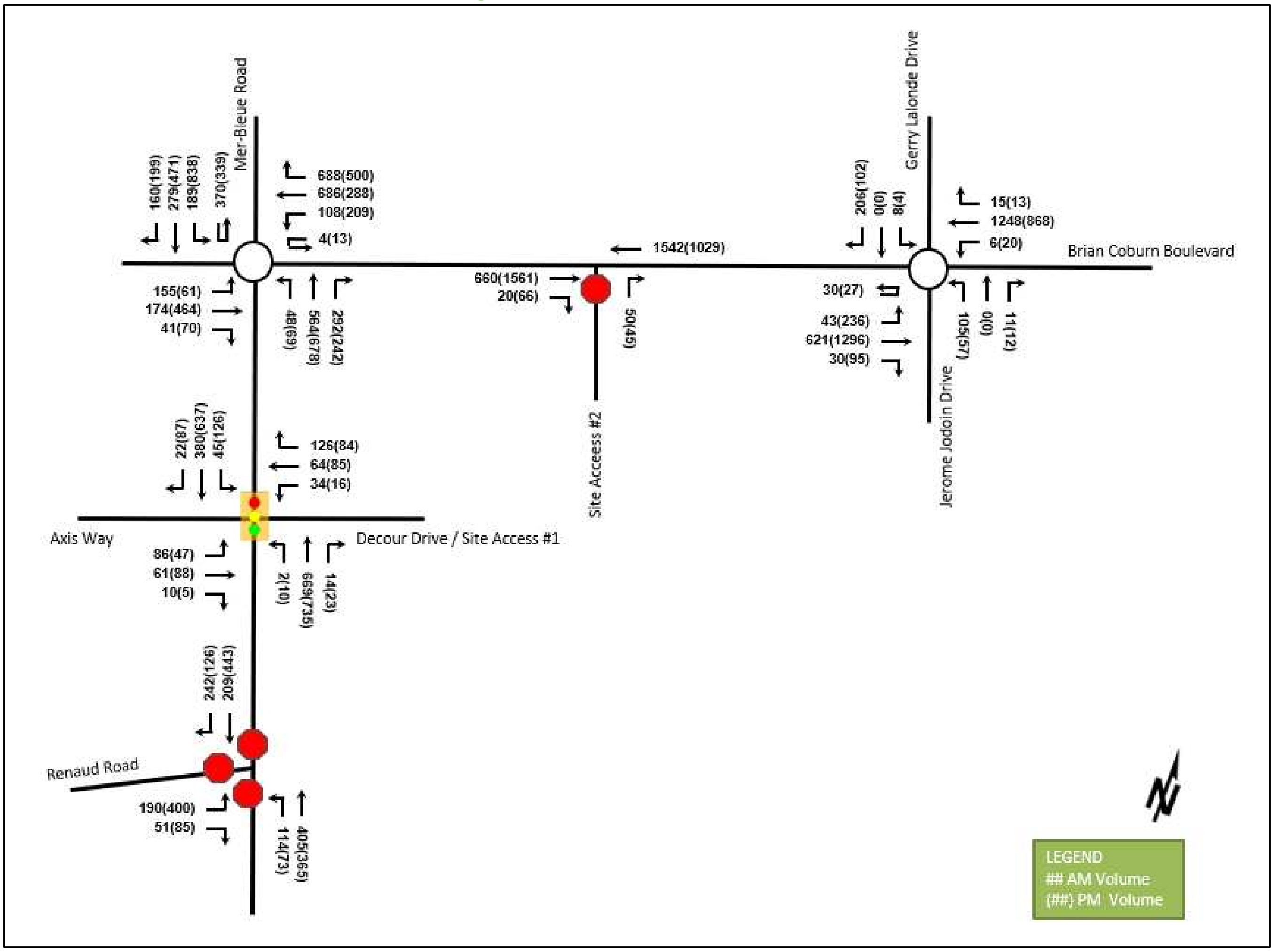
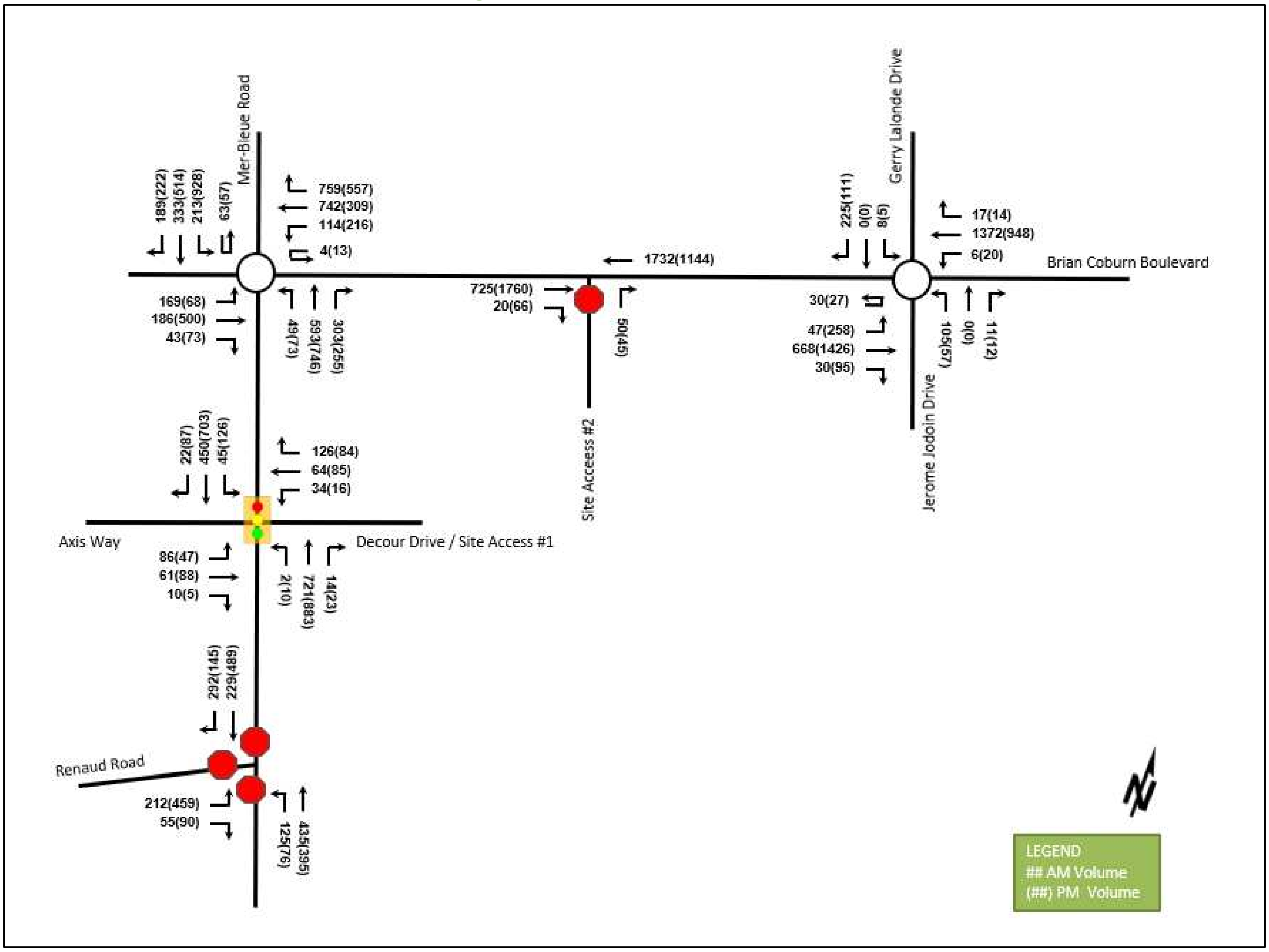


Figure 27: Future Total 2029 Volumes

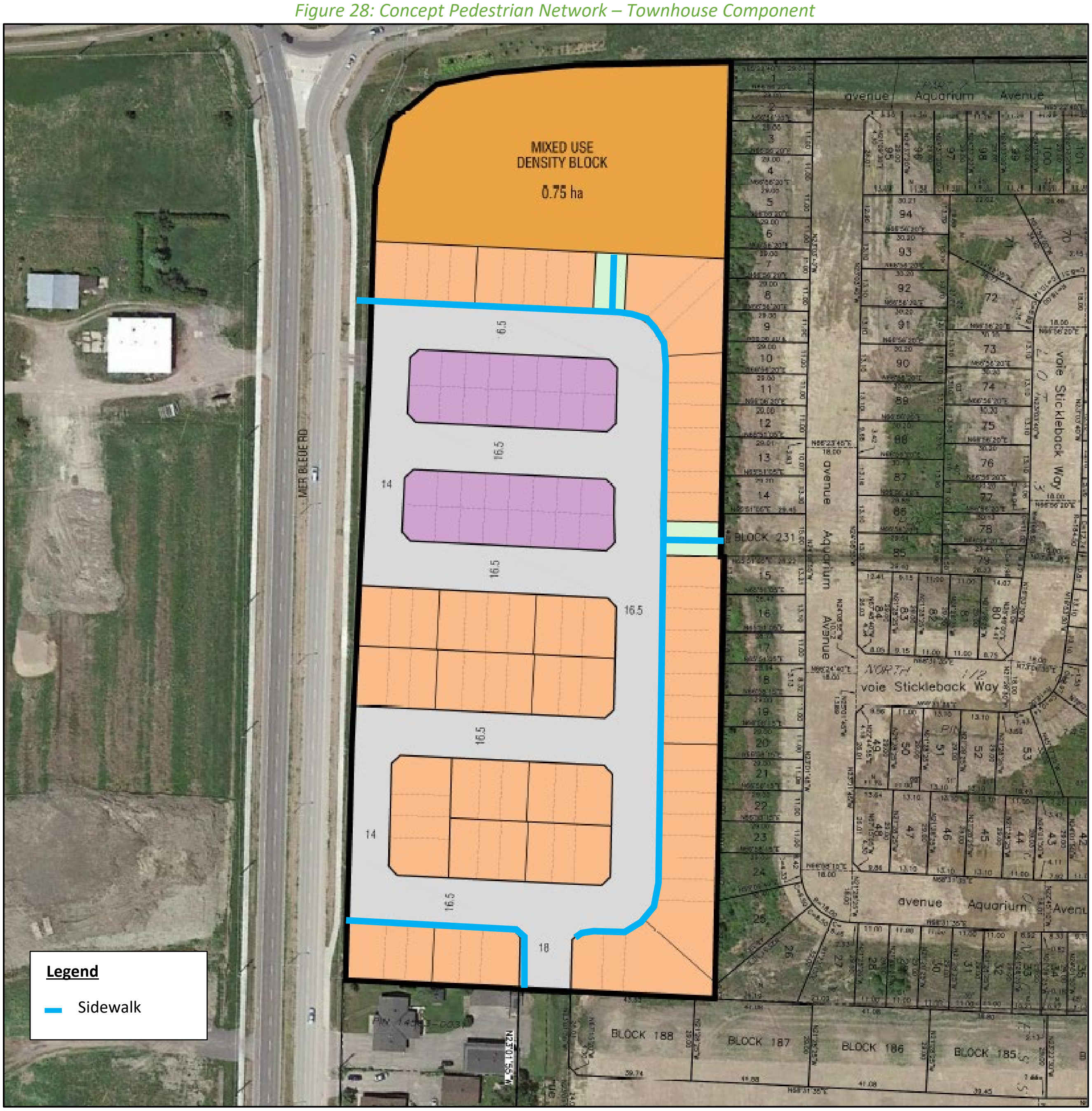


8 Development Design

8.1 Design for Sustainable Modes

Within the Townhouse component of the proposed development, sidewalks will be provided along units with the longest associated walking distances. Further, pedestrian connections will be provided between the residential subdivision and the Mixed-Use block as well as the adjacent development to the east. Figure 28 illustrates the concept pedestrian network. The cyclists will use the roadway within the subdivision as no cycling infrastructure is planned along local roads in the vicinity of the subject development.

Figure 28: Concept Pedestrian Network – Townhouse Component



Pedestrian facilities in the Mixed-Use component are proposed to connect the building users to Brian Coburn Boulevard, Mer-Bleue Road, and the residential subdivision to the south. Further, the MUP along the south side of Brian Coburn Boulevard will be extended past the Mer-Bleue Road along the subject site frontage. Active Transportation design elements of the Mixed-Use block will be further refined at the time of the Site Plan Application for this component.

Facilities that are supportive of sustainable modes in the City of Ottawa's TDM-supportive Development Design and Infrastructure Checklist, which are applicable to the Mixed-Use component of the proposed development and required for standard site design are recommended and should be considered during the Site Plan Application for the mid-rise building. The following additional measures are also recommended:

- Locate building close to the street, and do not locate parking between the street and building entrances
- Locate building entrances in order to minimize walking distances to sidewalks and transit facilities
- Locate building doors and windows to ensure visibility of pedestrians from the building
- Design roads used for access or circulation by cyclists using a target operating speed of 30 km/h
- Provide safe, direct and attractive walking routes from building entrances to nearby transit stops
- Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible
- Provide up to three carshare parking spaces occupying either required or provided parking spaces
- Provide a designated bikeshare station area near major building entrance

TDM Checklists can be found in Appendix H.

8.2 Circulation and Access

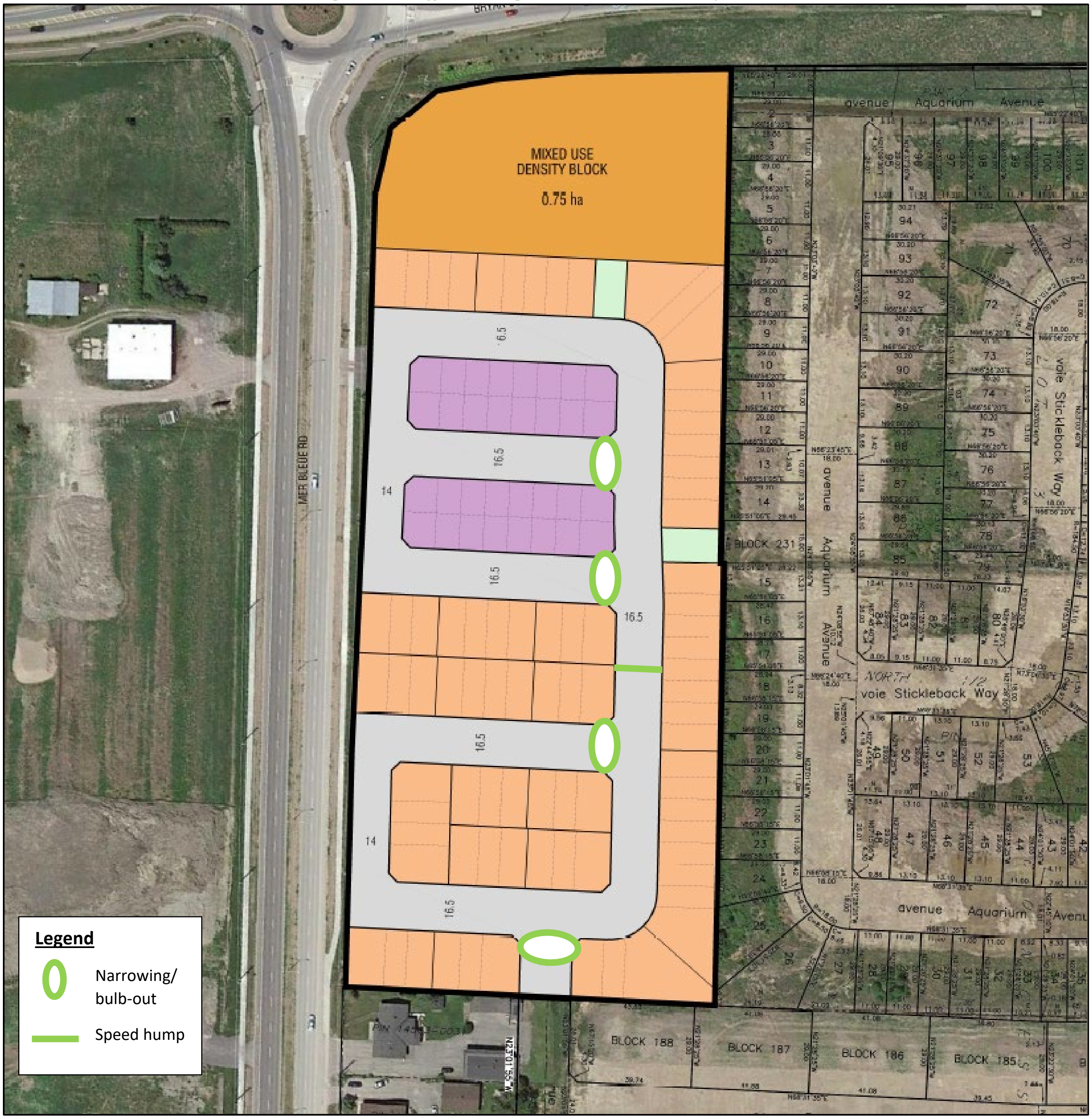
Turning Templates for the Mixed-Use component of the proposed development are not required as part of the Zoning ByLaw Amendment and will be developed in later stages as part of the Site Plan Application.

8.3 New Street Networks

The residential subdivision planned street network will include 14.0 metre window roads, and 16.5 metre local roadways. The local roads will provide parking on one side of the roadway, and the proposed posted speed limit will be 30 km/h. The internal road intersections are recommended to be stop-controlled on the minor approaches. The active transportation network is discussed in Section 8.1.

To support the pedestrian and cyclist connectivity within the subdivision, Figure 29 illustrates the concept traffic calming plan. The plan reduces crossing distances for pedestrians and cyclists, as well as limits the speeds of vehicles entering and exiting local roads from the collector road. The on-street parking will further limit the driving speeds within the subdivision, creating a safer space for active mode users.

Figure 29: Traffic Calming Plan – Townhouse Component



9 Parking

9.1 Parking Supply

The Townhouse component of the proposed development is a residential subdivision and therefore auto and bicycle parking areas will be within each resident's home. Additional on-street parking will be provided along one side of all roads within the subdivision.

The Mixed-Use component of the development will predominantly include underground parking for both automobiles and bicycles, and some surface vehicular parking. The parking requirements and recommended provisions for the Mixed-Use component of the proposed development are summarized in Table 12.

Table 12: Parking Provisions – Mixed Use Component

Land Use	Units / GFA (s.m.)	Parking Rate	Parking Required	Parking Provided
Mid-Rise Apartments	170	1.2 spaces / dwelling unit + 0.2 visitor spaces / dwelling unit	238	289
Retail	1,500	3.4 spaces / 100 m^2 GFA	51	
		Total	289	
Mid-Rise Apartments (Bicycle)	170	0.5 spaces / dwelling unit	85	91
Retail (Bicycle)	1,500	1 spaces / 250 m^2 GFA	6	
Total			91	

Based on the City of Ottawa Zoning By-laws, a minimum of 289 automobile and 91 bicycle parking spaces are required. As can be seen in Table 12, the proposed parking provisions meet the Zoning requirements. The Mixed-Use component parking supply will be further refined in later stages as part of the Site Plan Application.

9.2 Spillover Parking

This TIA is exempt from this Module (see Section 4).

10 Boundary Street Design

Mer-Bleue Road, and Brian Coburn Boulevard are noted as boundary roads for the proposed development. Decoeur Drive will also be a future boundary road to the proposed development however as no detailed design is available, the segment MMLOS analysis along this road cannot be completed at this point in time.

The Segment Multi-Modal Level of Service (MMLOS) is broken down into the Pedestrian Level of Service (PLOS), Bicycle Level of Service (BLOS), Transit Level of Service (TLOS), and Truck Level of Service (TkLOS) and are all recorded in Table 13. As the Existing, Future Background, and Future Total scenarios are all different, they have been evaluated in their own MMLOS worksheets. The results however are the same across majority of horizons. Mer-Bleue Road, and Brian Coburn Boulevard have been evaluated against the target for a general urban area. The MMLOS Worksheets for each horizon can be found in Appendix I.

Table 13: Boundary Street MMLOS

<table>
<tr><th rowspan="3">Road Segment</th><th rowspan="3">Horizon</th><th colspan="8">MMLOS</th></tr>
<tr><th colspan="2">PLOS</th><th colspan="2">BLOS</th><th colspan="2">TLOS</th><th colspan="2">TkLOS</th></tr>
<tr><th>Actual</th><th>Target</th><th>Actual</th><th>Target</th><th>Actual</th><th>Target</th><th>Actual</th><th>Target</th></tr>
<tr><td rowspan="5">Mer-Bleue Road - Brian Coburn Boulevard to Decoeur Drive</td><td>Existing</td><td rowspan="5">D</td><td rowspan="5">C</td><td rowspan="5">C</td><td rowspan="5">C</td><td rowspan="5">D</td><td rowspan="5">D</td><td rowspan="5">A</td><td rowspan="5">D</td></tr>
<tr><td>2024 FB</td></tr>
<tr><td>2024 FT</td></tr>
<tr><td>2029 FB</td></tr>
<tr><td>2029 FT</td></tr>
<tr><td rowspan="5">Brian Coburn Boulevard – Mer-Bleue Road to Jerome Jodoin Drive</td><td>Existing</td><td rowspan="2">F</td><td rowspan="5">C</td><td rowspan="2">F</td><td rowspan="5">B</td><td rowspan="5">D</td><td rowspan="5">D</td><td>B</td><td rowspan="5">D</td></tr>
<tr><td>2024 FB</td><td rowspan="4">A</td></tr>
<tr><td>2024 FT</td><td rowspan="3">E</td><td rowspan="3">A</td></tr>
<tr><td>2029 FB</td></tr>
<tr><td>2029 FT</td></tr>
</table>

Once the proposed MUP along the south side of Brian Coburn Boulevard is constructed as part of the proposed development, the Pedestrian LOS along Brian Coburn Boulevard will improve. However, due to high vehicular volumes and speeds, the Pedestrian LOS before and after the planned MUP implementation is below the general urban area target. The PLOS is also below the target LOS along Mer-Bleue Road as a result of vehicular volumes and speeds.

The Bicycle LOS along Brian Coburn Boulevard will be improved as a result of the proposed MUP along the frontage of the subject site. The Bicycle LOS for a physically separated cycling facility is A.

Along Mer-Bleue Road, the Bicycle LOS target is met in existing and future horizons. Further, Transit and Truck LOS is met along all study segments and horizons.

11 Access Intersections Design

11.1 Location and Design of Access

Access to the development lands will be accommodated via Mer-Bleue Road and Brian Coburn Boulevard. Although the Mixed-Use and the Townhouse portion of the development are adjacent to one another, no infrastructure will be provided to support vehicular movement between the two components of the development.

Access to the Townhouses will be accommodated via the future intersection of Mer-Bleue Road and Decoeur Drive / Axis Way (Site Access #1). No turn restrictions are planned at this intersection. After making a northbound right turn or a southbound left turn movement at this intersection, the subdivision residents will travel eastbound along future Decoeur Drive and then northbound along future Sculpin Street to reach their destination.

Access to the Mixed-Use component of the development will be accommodated via a right-in / right-out access at Brian Coburn Boulevard, located as close to the eastern edge of the property as possible (approximately 100 metres east of the eastern edge of Mer-Bleue Road). Using TAC Geometric Guide for Canadian Roads (TAC), Figure 8.8.2, the spacing between Site Access #2 and Mer-Bleue Road has been checked for suggested minimum corner clearances. It has been found that the suggested minimum clearance is 70 metres for an arterial road, and thus, Site Access #2 meets this guideline.

According to TAC Table 9.9.6, clear stopping sight distance for a 70 km/h design speed is 105 metres. The planned location of Site Access #2 meets this requirement, as the distance between the eastbound exit point of Mer-Bleue Road and Brian Coburn Boulevard roundabout and Site Access #2 is 105 metres. It is also expected as the approaching vehicles are exiting the roundabout, that their speeds will be lower than 70 km/h, which allows for a longer reaction time. The clear sight distance triangle between Site Access #2 and Mer-Bleue Road at Brian Coburn Boulevard roundabout should be maintained clear of obstruction by the City and the 2275 Mer-Bleue Road property owner when planning for and implementing any modifications to this road segment. Further clear sight distance analysis would be required once a more detailed site concept is available.

11.2 Access Intersection Control

Using OTM Book 12 Justification 7, and the volume projections herein the traffic control signal warrant for Site Access #1 at Mer-Bleue Road has been examined for 2024 and 2029 Future Background and Future Total horizons, and for Site Access #2 at Brian Coburn Boulevard for 2024 and 2029 Future Total horizons. It has been found that signals are warranted at Site Access #1 and Mer-Bleue Road in 2024 Future Background horizon using rural conditions (roads with operating speeds greater or equal to 70 km/h). This is in line with the TrailsEdge Community Transportation Study prepared by Castleglenn Consultants in 2016. As signalization at this intersection is required as part of a Background scenario, traffic signals were modeled for operational purposes only and the intersection is required to be designed by others. The signalization warrants for site accesses can be found in Appendix J.

As a result, Site Access #1 will be a signalized intersection, and Site Access #2 will have a stop-control on the minor approach.

11.3 Access Intersection Design

Based on the eastbound right-turning volumes at Site Access #2, an eastbound right-turn lane is not warranted. This access will be further reviewed as part of 2024 and 2029 Future Total horizons to ensure that access to the Mixed-Use component of the development functions within the City of Ottawa’s operational thresholds. Further, design components of the Mixed-Use block, including throat length, will be reviewed and refined as part of the future Site Plan Application.

12 Transportation Demand Management

12.1 Context for TDM

The mode shares used within the TIA are mostly representative of the existing Study Area travel behaviour. Both the transit mode share, and the sum of active mode shares have been rounded up to the nearest 5%. This is consistent with the City’s staff comments provided for the Forecasting and Strategy Reports, shown in Appendix G. The minor increase in these mode shares accounts for future urbanization of the Study Area, which encompasses a more complete cyclist and pedestrian network, higher variety of destinations within a walking distance, and an increase in transit frequencies and route variety, as demand for transit services in the Study Area grows. Considering this as well as the TDM measures recommended as part of this report, it is likely that the sustainable mode share of the subject site will be above the estimated total of 45%, including transit, auto passenger, walking, and biking. However, the sustainable mode shares used in this analysis have not been increased by more than 5% to ensure that the proposed development can function within acceptable thresholds if the mode shift is not realized within the studied timeframe.

12.2 Need and Opportunity

Seventy percent of the development generated trips have been assumed to rely on auto travel mode, including 15% of auto passengers, and those assumptions have been carried through the analysis. The 20 % transit mode share is a conservative estimate of the future 2024 and 2029 transit trips, as it is expected that transit services will improve in the vicinity of the subject site as the Study Area builds out. Further, the proposed development is located along an Isolated Measures Transit Priority Corridor outlined in the City's 2031 Affordable Transit Network. Therefore, it is unlikely that the transit mode share will decrease. It is also expected that the pedestrian and cyclist mode shares grow to a total of 10% (split evenly between cycling and walking) as the Study Area builds out, resulting in larger number of short-distance destinations, better connected pedestrian network, and enhanced cycling facilities, including a proposed MUP along the south side of Brian Coburn Boulevard.

12.3 TDM Program

Transportation Demand Management measures are implemented to encourage the use of non-auto modes of travel. This is aimed at reducing the reliance on single occupant auto trips in the City of Ottawa.

Listed below are the recommended TDM measures for the Mixed-Use component of the proposed development. These measures should be considered at the time of Site Plan Application when details pertinent to the mid-rise residential building are further refined:

- Display local area maps with walking/cycling access routes and key destinations at major entrances
- Display relevant transit schedules and route maps at entrances
- Provide a multimodal travel option package to new/relocating employees and residents
- Contract with provider to install on-site bikeshare station for use by commuters and visitors
- Contract with provider to install on-site carshare vehicles and promote their use by tenants
- Unbundle parking cost from unit purchase price

Further, a multimodal travel option package to new residents will be provided to new townhome owners at first occupancy.

13 Neighbourhood Traffic Management

In this section, the Neighborhood Traffic Management along Decoeur Drive and Sculpin Street leading to the Townhouse component of the proposed development will be discussed. The TIA Guidelines outline a collector road threshold of 2,500 vehicles per day (AADT), or 300 vehicles in a given peak hour for Neighbourhood Traffic Management review. The threshold for local roads is 1,000 vehicles per day (AADT), or 120 vehicles for a given peak hour. This will give an indication of whether Decoeur Drive and Sculpin Street meet or exceed the theoretical thresholds. The implications of the anticipated traffic within the context of the existing/planned road network and any required mitigation measures are discussed in the following subsections.

13.1 Decoeur Drive

Table 14 summarizes the AADT in both directions on the collector road of Decoeur Drive in the PM peak period.

Table 14: Decoeur Drive Volumes - NTM Review

East of Mer-Bleue Road				
Development	PM Peak			
	Eastbound	% Theoretical Threshold	Westbound	% Theoretical Threshold
2275 Mer-Bleue Road – Townhouse Component	38 (380 AADT)	13%	34	11%
2029 Future Background Volumes	199 (1990 AADT)	78%	151	60%
Total	**237 (2370 AADT)**	**95%**	**185**	**74%**

Note: 1. AADT approximated using 10:1 ratio of PM peak hour traffic
AADT calculated as one-way peak direction volumes

As shown above, the proposed site trip generation is expected to use 13% of the theoretical AADT threshold of Decoeur Drive. When combined with traffic from the background developments, the eastbound AADT along Decoeur Drive east of Mer-Bleue Road is 2370, which is 95% of the daily theoretical threshold for a collector road. Thus, the daily AADT thresholds along Decoeur Drive will not be exceeded. No mitigation measures are proposed along this road.

13.2 Sculpin Street

Table 15 summarizes the AADT in both directions on the local road of Sculpin Street in the PM peak period. As no dwellings are currently fronting this street, it is assumed that 100% of the volume along Sculpin Street is generated by the subject development.

Table 15: Sculpin Street Volumes - NTM Review

North of Decoeur Drive				
Development	PM Peak			
	Northbound	% Theoretical Threshold	Southbound	% Theoretical Threshold
2275 Mer-Bleue Road – Townhouse Component	38 (380 AADT)	38%	34	34%
Total	**38 (380 AADT)**	**38%**	**34**	**34%**

Note: 1. AADT approximated using 10:1 ratio of PM peak hour development-generated traffic
AADT calculated as one-way peak direction volumes

The proposed development generates 34 PM peak hour trips in the peak direction of Sculpin Street. As illustrated above, this does not exceed the City's ADDT threshold. No mitigation measures are proposed along this road.

14 Transit

14.1 Route Capacity

In Section 5.1, the trip generation by mode was estimated, including the number of transit trips that will be generated by the proposed development. Table 16 summarizes the site transit trip generation.

Table 16: Trip Generation by Transit Mode

Travel Mode	Mode Share	AM			PM		
		In	Out	Total	In	Out	Total
Transit	25%	15	32	47	38	29	67

Overall, the forecasted new transit trips would result in lower than one bus capacity equivalent (single bus, 55-person capacity) in the peak direction to accommodate the transit trips generated from the subject site. As these trips are distributed to different directions and throughout the peak hour, the existing routes are expected to have sufficient residual capacity to accommodate the site-generated transit trips. Further, once the Study Area builds out, it is anticipated that OC Transpo will re-evaluate demand and ensure that adequate capacity is provided.

14.2 Transit Priority

No transit priority is required/considered for the study area.

15 Review of Network Concept

Brian Coburn Boulevard may potentially approach or exceed a single lane capacity in the peak direction by 2024 Background and Future conditions. For example, in the PM peak period the west approach volume in the shared through / left-turn lane at Brian Coburn Boulevard and Gerry Lalonde Drive intersection is 1186 during Existing horizon, and 1602 in the 2024 Future Background horizon. These volume projections are dependent on surrounding development growth being realized, and on background growth proceeding at the same rate. The likely impact of the interim condition is extended queues along Brian Coburn Boulevard. The operations of the Study Area intersections along Brian Coburn Boulevard will be further examined in Section 16.

The network concept, as identified within the City of Ottawa's Transportation Master Plan, includes a widening of Brian Coburn Boulevard to a four-lane arterial between Navan Road and Mer-Bleue Road as well as between Trim Road and Frank Kenny Road. Sufficient ROW has been reserved for future Brian Coburn Boulevard widening including along the frontage of the proposed development.

16 Network Intersection Design

16.1 Network Intersection Control

As stated in Section 2.3.1, the network intersection of Brian Coburn Boulevard at Gerry Lalonde Drive / Jerome Jodoin Drive is expected to be a single lane roundabout.

A signal warrant analysis was performed for the intersection of Mer-Bleue Road at Renaud Road for the Future Background, and Future Total horizons using the OTM Book 12 Justification 7 criteria. Using this criterion, it was found that signals are warranted at this intersection in 2024 Future Background horizon using rural conditions (roads with operating speeds greater or equal to 70 km/h). The signalization warrants for intersection of Mer-Bleue Road at Renaud Road can be found in Appendix J.

The intersection methods of control for Mer-Bleue Road at Brian Coburn Boulevard will remain consistent with existing methods of control at both future horizons.

16.2 Network Intersection Design

To understand the intersection design, an MMLOS analysis of existing, 2024 future horizon, and 2029 future horizon demands is required. The existing and future segment MMLOS has been discussed in Section 10. The following sections will discuss the vehicle LOS at Study Area intersections which is based on the HCM criteria for average delay at unsignalized intersections and roundabouts. At signalized intersections, the level of service is based on the V/C ratio as required by the City of Ottawa. This will be followed by a discussion of the intersection MMLOS for other modes.

Synchro (Version 11) and Sidra (Version 8.0) were used to model the Study Area intersections. The Heavy Vehicle percentage (HV %) has been calculated for each turning movement at the Study Area intersection. All Heavy Vehicle percentages calculated to be less than 2% were entered into the Synchro model as 2% in order to produce a conservative analysis. These calculations are shown in Appendix K. All parameters have been coded using the City of Ottawa's TIA Guidelines and default parameters.

16.2.1 Existing Conditions

The existing intersection volumes have been analyzed to establish a baseline condition and determine the impact of the subject development as well as the surrounding background developments on the Study Area road network. Table 17 summarizes the operational analysis of the 2020 existing conditions. Appendix L contains the 2020 Existing Conditions Synchro and Sidra sheets.

Table 17: Existing Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
Mer-Bleue Road at Brian Coburn Boulevard *Roundabout*	EBL/T/R	A	0.26	6	8	D	0.75	26	43
	WBL/T/R	**F**	**1.20**	**118**	**662**	C	0.81	23	94
	NBL/T/R	A	0.23	6	7	C	0.64	21	30
	SBL/T/R	A	0.27	7	8	B	0.69	12	65
	Overall	***F***	***1.20***	***62***	***662***	*C*	*0.81*	*19*	*94*
Brian Coburn Boulevard at Gerry Lalonde Drive / Jerome Jodoin Drive *Unsignalized*	EBL	B	0.05	11	2	B	0.24	10	7
	EBT	-	-	-	-	-	-	-	-
	WBT/R	-	-	-	-	-	-	-	-
	SBL/R	**F**	**0.81**	**63**	**47**	D	0.40	30	14
Mer-Bleue Road at Renaud Road *Unsignalized*	EBL/R	B	0.26	11	8	C	0.60	17	30
	NBL/T	B	0.37	11	13	B	0.37	12	13
	SBT/R	B	0.40	11	14	B	0.50	14	21

Notes: Saturation flow rate of 1800 veh/h/lane
PHF = 0.90

In the AM peak period, the westbound approach of Mer-Bleue Road at Brian Coburn Boulevard intersection is shown to operate with V/C > 1.0, high delays, and long queues. Other approaches of this intersection are within the City of Ottawa's operational thresholds.

As a result of high eastbound and westbound volumes along Brian Coburn Boulevard, the southbound approach of Brian Coburn Boulevard at Gerry Lalonde Drive / Jerome Jodoin Drive experiences high delays during the AM peak hour. As plans are in place for this intersection to be upgraded to a roundabout, no mitigation measures were proposed as part of the Existing scenario analysis.

Renaud Road at Mer-Bleue Road intersection operates satisfactorily during the peak hours.

16.2.2 2024 Future Background Operations

The 2024 future background intersection volumes and other development traffic have been analyzed to allow a comparison between the future volumes with and without the proposed development. As previously mentioned, signal warrants were met at Mer-Bleue Road and Renaud Road intersection, as well as Mer-Bleue Road and Decoeur Drive (Site Access #1) intersection. The intersection of Brian Coburn Boulevard at Gerry Lalonde Drive / Jerome Jodoin Drive is planned to be upgraded to a roundabout as a result of Avalon West Community Phase 5 development. These as well as additional improvements resulting from the operational analysis on the Study Area network were applied to the Synchro and Sidra models in the 2024 Future Background horizon and are discussed below. Table 18 summarizes the operational analysis of 2024 Future Background conditions. Appendix M contains the 2024 Future Background Synchro and Sidra sheets.

Table 18: 2024 Future Background Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
Mer-Bleue Road at Brian Coburn Boulevard ***Roundabout***	EBL/T/R	B	0.52	14	22	**F**	**1.49**	**263**	**451**
	WBL/T/R	**F**	**2.66**	**771**	**2121**	**F**	**1.56**	**274**	**854**
	NBL/T/R	C	0.69	21	40	**F**	**1.15**	**121**	**214**
	SBL/T/R	A	0.53	9	29	**F**	**1.16**	**68**	**623**
	Overall	***F***	***2.66***	***315***	***2121***	***F***	***1.55***	***150***	***854***
	Mitigation Measure: Widening to Two EB and Two WB Lanes								
	EBL/T/R	A	0.28	10	8	E	0.80	46	37
	WBL/T/R	**F**	**1.42**	**222**	**587**	D	0.79	28	57
	NBL/T/R	C	0.69	21	40	**F**	**1.22**	**148**	**272**
	SBL/T/R	B	0.65	14	44	**F**	**1.28**	**106**	**758**
	Overall	***F***	***1.42***	***98***	**587**	***F***	***1.28***	***90***	***758***
Brian Coburn Boulevard at Gerry Lalonde Drive / Jerome Jodoin Drive ***Roundabout***	EBL/T/R	A	0.51	8	29	**F**	**1.21**	**114**	**2861**
	WBL/T/R	**F**	**1.08**	**69**	**737**	C	0.84	22	24
	NBL/T/R	A	0.17	7	5	B	0.19	13	5
	SBL/T/R	D	0.58	25	22	A	0.21	10	6
	Overall	***E***	***1.08***	***43***	***737***	***F***	***1.21***	***77***	***2861***
	Mitigation Measure: Widening to Two EB and Two WB Lanes								
	EBL/T/R	A	0.25	5	9	A	0.59	9	36
	WBL/T/R	A	0.52	9	25	A	0.41	8	16
	NBL/T/R	A	0.15	6	4	B	0.18	12	4
	SBL/T/R	C	0.49	18	16	A	0.17	8	4
	Overall	***A***	***0.52***	***8***	***25***	***A***	***0.59***	***9***	***36***
Mer-Bleue Road at Renaud Road ***Signalized***	EBL	A	0.39	13	23	B	0.68	21	62
	EBR	A	0.11	5	5	A	0.16	5	7
	NBL	A	0.27	9	13	A	0.33	14	12
	NBT	A	0.45	9	38	A	0.47	12	41
	SBT/R	A	0.52	8	35	C	0.76	18	73
	Overall	***A***	***0.51***	***9***	-	***C***	***0.71***	***16***	-
Mer-Bleue Road at Decoeur Drive / Axis Way (Site Access #1) ***Signalized***	EBL	A	0.25	13	12	A	0.14	13	9
	EBT/R	A	0.14	10	9	A	0.19	12	13
	WBL	A	0.09	11	6	A	0.04	12	4
	WBT/R	A	0.29	7	13	A	0.27	10	15
	NBL	A	0.00	7	1	A	0.03	7	2
	NBT/R	A	0.43	9	28	A	0.46	9	30
	SBL	A	0.07	8	4	A	0.27	10	12
	SBT/R	A	0.27	8	16	A	0.46	9	29
	Overall	***A***	***0.43***	***9***	-	***A***	***0.44***	***9***	-

Notes: Saturation flow rate of 1800 veh/h/lane
PHF = 1.0

With the addition of background growth to reflect the 2024 horizon as well as traffic generated from surrounding developments, multiple movements fail at Mer-Bleue Road and Brian Coburn Boulevard and Brian Coburn Boulevard at Gerry Lalonde Drive / Jerome Jodoin Drive during the 2024 Future Background horizon.

At the intersection of Mer-Bleue Road and Brian Coburn Boulevard, the westbound approach fails during the AM peak period and all approaches fail during the PM peak period. At Brian Coburn Boulevard and Gerry Lalonde

Drive / Jerome Jodoin Drive, the westbound approach fails during the AM peak hour, and northbound and southbound approaches fail during the PM peak hour. As anticipated, with the addition of background growth and approved/proposed developments in the Study Area, the capacity constraints along Brian Coburn Boulevard are clear.

As a mitigation measure, widening of Brian Coburn Boulevard from two to four lanes has been coded in Sidra and can be seen in Table 19. As a result, the operational performance of eastbound and westbound approaches at Mer-Bleue Road and Brian Coburn Boulevard has significantly improved. The westbound approach, however, is still failing at this intersection during the AM peak period. Th proposed mitigation measure has resulted in V/C ratio of 1.42 (previously 2.66) at this approach. The operational performance of northbound and southbound approaches remains at a LOS F. As such, this indicates that the capacity issues cannot be solved based on localized improvements and instead require regional network improvements throughout Orleans by the City of Ottawa.

At the intersection of Brian Coburn Boulevard and Gerry Lalonde Drive / Jerome Jodoin Drive, the widening of Brian Coburn Boulevard to four lanes improves the LOS at all approaches and the intersection operates well.

The signalized intersections of Mer-Bleue Road at Renaud Road, and Mer-Bleue Road at Decoeur Drive / Axis Way operate well.

16.2.3 2024 Total Future Operations

The 2024 Total Future intersection volumes, including the site generated traffic and other development traffic, have been analyzed to understand the impact of the subject development on the Study Area intersections. The mitigation measures outlined in 2024 Future Background Scenario Analysis were carried over to this scenario. Table 19 summarizes the operational analysis of the 2024 Total Future conditions. Appendix N contains the 2024 Future Total Synchro and Sidra Sheets.

Table 19: 2024 Future Total Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
Mer-Bleue Road at Brian Coburn Boulevard ***Roundabout***	EBL/T/R	B	0.31	10	9	**F**	**0.88**	**57**	**51**
	WBL/T/R	**F**	**1.50**	**255**	**663**	D	0.82	31	65
	NBL/T/R	C	0.73	24	46	**F**	**1.27**	**168**	**316**
	SBL/T/R	B	0.66	15	46	**F**	**1.37**	**131**	**860**
	Overall	***F***	***1.50***	***111***	***663***	***F***	***1.37***	***106***	***860***
Brian Coburn Boulevard at Gerry Lalonde Drive / Jerome Jodoin Drive ***Roundabout***	EBL/T/R	A	0.27	5	10	A	0.61	10	39
	WBL/T/R	A	0.54	9	26	A	0.44	8	17
	NBL/T/R	A	0.15	6	4	B	0.19	13	4
	SBL/T/R	C	0.51	19	17	A	0.18	8	5
	Overall	***A***	***0.54***	***9***	***26***	***A***	***0.61***	***10***	***6***
Mer-Bleue Road at Renaud Road ***Signalized***	EBL	A	0.39	13	25	B	0.68	21	63
	EBR	A	0.11	5	5	A	0.16	5	7
	NBL	A	0.27	9	14	A	0.33	14	13
	NBT	A	0.44	9	39	A	0.47	12	41
	SBT/R	A	0.52	8	36	C	0.76	18	73
	Overall	***A***	***0.51***	***8***	-	***C***	***0.71***	***13***	-
Mer-Bleue Road at Decoeur Drive / Axis Way (Site Access #1) ***Signalized***	EBL	A	0.28	13	13	A	0.15	15	11
	EBT/R	A	0.15	10	9	A	0.20	14	17
	WBL	A	0.10	11	6	A	0.05	14	5
	WBT/R	A	0.36	7	14	A	0.34	11	20
	NBL	A	0.01	7	1	A	0.03	6	2
	NBT/R	A	0.52	10	28	A	0.43	8	31
	SBL	A	0.16	9	6	A	0.36	11	16
	SBT/R	A	0.33	8	16	A	0.44	8	29
	Overall	***A***	***0.42***	***9***	-	***A***	***0.43***	***8***	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
Brian Coburn Boulevard at Site Access #2 ***Unsignalized***	EBT	-	-	-	-	-	-	-	-
	EBR	-	-	-	-	-	-	-	-
	WBT	-	-	-	-	-	-	-	-
	NBR	B	0.08	11	2	C	0.14	18	4

Notes: Saturation flow rate of 1800 veh/h/lane
PHF = 1.0

With the addition of the site generated traffic, the Study Area is expected to operate with similar operational characteristics as the 2024 Future Background conditions at most intersection movements.

The operational performance of eastbound approach at Mer-Bleue Road and Brian Coburn Boulevard decreases from LOS E in 2024 Future Background horizon to LOS F in 2024 Future Total horizon during the PM peak period. A lower LOS is expected at this intersection with any additional traffic as many approaches fail or are approaching failure in the Background scenario.

The signalized intersections of Mer-Bleue Road at Renaud Road, and Mer-Bleue Road at Decoeur Drive / Axis Way, as well as the unsignalized intersection of Brian Coburn Boulevard and Site Access #2 operate well.

16.2.4 2029 Future Background Operations

The 2029 Future Background intersection volumes and other development traffic have been analyzed to allow a comparison between the future volumes with and without the proposed development. The mitigation measures outlined in 2024 Future Background Scenario Analysis were carried over to this scenario. Table 20 summarizes the operational analysis of the 2029 Future Background conditions. Appendix O contains the 2029 Future Background Synchro and Sidra sheets.

Table 20: 2029 Future Background Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
Mer-Bleue Road at Brian Coburn Boulevard ***Roundabout***	EBL/T/R	A	0.25	8	7	**F**	**0.88**	**60**	**51**
	WBL/T/R	**F**	**1.23**	**137**	**456**	C	0.74	21	55
	NBL/T/R	B	0.57	14	32	**F**	**1.34**	**199**	**385**
	SBL/T/R	B	0.54	13	26	**F**	**1.10**	**61**	**398**
	Overall	***F***	***1.23***	***66***	***456***	***F***	***1.34***	***84***	***398***
Brian Coburn Boulevard at Gerry Lalonde Drive / Jerome Jodoin Drive ***Roundabout***	EBL/T/R	A	0.27	5	10	B	0.65	11	45
	WBL/T/R	A	0.58	10	30	A	0.46	9	18
	NBL/T/R	A	0.15	6	4	B	0.21	15	5
	SBL/T/R	C	0.59	24	21	A	0.20	9	5
	Overall	**A**	**0.59**	**10**	**30**	**A**	**0.65**	**10**	**45**
Mer-Bleue Road at Renaud Road ***Signalized***	EBL	EBL	A	0.43	14	C	0.77	27	#84
	EBR	EBR	A	0.12	5	A	0.17	5	7
	NBL	NBL	A	0.34	11	A	0.40	17	15
	NBT	NBT	A	0.47	10	A	0.49	12	45
	SBT/R	SBT	A	0.58	9	D	0.81	22	#92
	Overall	***A***	***0.57***	***10***	-	***C***	***0.78***	***20***	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
Mer-Bleue Road at Decoeur Drive / Axis Way (Site Access #1) ***Signalized***	EBL	A	0.26	13	13	A	0.15	16	11
	EBT/R	A	0.14	10	10	A	0.20	15	17
	WBL	A	0.09	12	6	A	0.04	15	5
	WBT/R	A	0.29	8	13	A	0.29	12	19
	NBL	A	0.00	7	1	A	0.03	6	2
	NBT/R	A	0.45	9	31	A	0.50	9	37
	SBL	A	0.07	8	4	A	0.31	11	12
	SBT/R	A	0.30	8	19	A	0.47	8	32
	Overall	***A***	***0.45***	***9***	-	***A***	***0.49***	***9***	-

Notes: Saturation flow rate of 1800 veh/h/lane
PHF = 1.0
# - 95% percentile exceeds capacity; queue may be longer

The operational performance of the Study Area intersections remains relatively consistent with the 2024 Future Background horizon.

The operational performance of eastbound approach at Mer-Bleue Road and Brian Coburn Boulevard decreases from LOS E to LOS F during the PM peak period. As previously discussed in Section 16.2.3, a lower LOS is expected at this intersection with any additional traffic as many approaches fail or are approaching failure in the Background scenario.

The level of service of eastbound left, and southbound through/right movements at the intersection of Mer-Bleue Road and Renaud Road decrease from LOS B, and LOS C to LOS C, and LOS D, respectively. It was also noted that the volume for the 95th percentile cycle exceeds capacity at these movements. However, as V/C ratio of these approaches is less than one, it can be assumed that the 95th percentile queue will be rarely exceeded.

The signalized intersection of Mer-Bleue Road at Decoeur Drive / Axis Way operates well.

16.2.5 2029 Total Future Operations

The 2029 Total Future intersection volumes, including the site generated traffic and other development traffic, have been analyzed to understand the impact of the subject development on the Study Area intersections. Table 21 summarizes the operational analysis of the 2029 Future Total conditions. Appendix P contains the 2029 Future Total Synchro and Sidra Sheets.

Table 21: 2029 Future Total Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
Mer-Bleue Road at Brian Coburn Boulevard ***Roundabout***	EBL/T/R	A	0.27	8	8	**F**	**0.97**	**77**	**77**
	WBL/T/R	**F**	**1.29**	**163**	**532**	C	0.75	22	60
	NBL/T/R	B	0.61	15	36	**F**	**1.40**	**221**	**430**
	SBL/T/R	B	0.56	14	27	**F**	**1.17**	**82**	**487**
	Overall	***F***	***1.29***	***78***	***532***	***F***	***1.40***	***100***	***487***
Brian Coburn Boulevard at Gerry Lalonde Drive / Jerome Jodoin Drive ***Roundabout***	EBL/T/R	A	0.29	5	11	B	0.67	11	49
	WBL/T/R	B	0.60	11	31	A	0.48	9	22
	NBL/T/R	A	0.16	7	4	C	0.22	15	5
	SBL/T/R	D	0.61	26	22	A	0.21	9	5
	Overall	***B***	***0.61***	***10***	***31***	***B***	***0.67***	***11***	***49***

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
Mer-Bleue Road at Renaud Road ***Signalized***	EBL	A	0.44	15	33	C	0.78	27	#85
	EBR	A	0.12	5	6	A	0.17	5	7
	NBL	A	0.33	11	17	A	0.40	17	15
	NBT	A	0.46	10	46	A	0.49	12	45
	SBT/R	A	0.58	9	48	D	0.81	22	#94
	Overall	***A***	***0.57***	***8***	-	***C***	***0.79***	***16***	-
Mer-Bleue Road at Decoeur Drive / Axis Way (Site Access #1) ***Signalized***	EBL	A	0.28	14	13	A	0.17	19	11
	EBT/R	A	0.15	11	10	A	0.22	18	18
	WBL	A	0.10	12	6	A	0.05	18	5
	WBT/R	A	0.37	8	15	A	0.37	14	22
	NBL	A	0.01	7	1	A	0.03	6	2
	NBT/R	A	0.54	10	31	A	0.47	8	39
	SBL	A	0.16	9	6	A	0.39	12	19
	SBT/R	A	0.37	9	19	A	0.43	7	33
	Overall	***A***	***0.44***	***9***	-	***A***	***0.48***	***8***	-
Brian Coburn Boulevard at Site Access #2 ***Unsignalized***	EBT	-	-	-	-	-	-	-	-
	EBR	-	-	-	-	-	-	-	-
	WBT	-	-	-	-	-	-	-	-
	NBR	B	0.08	11	2	C	0.16	21	5

Notes: Saturation flow rate of 1800 veh/h/lane
PHF = 1.0
# - 95% percentile exceeds capacity; queue may be longer

With the addition of the site generated traffic, the Study Area is expected to operate with similar operational characteristics as the 2029 Future Background conditions.

The signalized intersections of Mer-Bleue Road at Renaud Road, and Mer-Bleue Road at Decoeur Drive / Axis Way, as well as the unsignalized intersection of Brian Coburn Boulevard and Site Access #2 operate well.

16.2.6 Sensitivity Analysis

As discussed in Section 7, as a result of a comment received from the City of Ottawa requesting analysis to "quantify the amount of demand that requires rationalization", a sensitivity analysis has been undertaken. The volumes at Mer-Bleue Road and Brian Coburn Boulevard have been evaluated. The sensitivity analysis performed identified the volume required to be diverted from over-capacity approaches in order to maintain a V/C ratio <1.0. This was done by reducing volume for each movement of a failing approach proportionally to the amount of volume on the movement relative to the total approach volume. Table 22 summarizes the results of the sensitivity analysis.

Table 22: Sensitivity Analysis Summary

Analysis Period	Intersection	Approach with V/C <1	Volume			
			Original	New	Reduction (%)	Reduction
AM Peak Hour	**Mer-Bleue Road at Brian Coburn Boulevard**	WBL/T/R	1619	1247	23%	372
PM Peak Hour	**Mer-Bleue Road at Brian Coburn Boulevard**	NBL/T/R	1074	773	28%	301
		SBL/T/R	1721	1446	16%	275

As this analysis shows, the failing approaches require a reduction ranging between 275 and 372 peak hour vehicles to function within the City of Ottawa's operational thresholds. Looking at Figure 23 it can be seen that the proposed development adds 39 AM peak hour trips to the westbound approach, 33 PM peak hour trips to the northbound approach, and 21 PM peak hour trips to the southbound approach volume. When divided by the 2029

Future Total approach volume, the site-generated trips make up a maximum of 3% of the total approach volume. Therefore, as stated in the previous sections, the impact of the proposed development on Mer-Bleue Road at Brian Coburn Boulevard intersection is minimal, and the poor operational performance is predominantly caused by existing traffic, background growth, and nearby developments.

16.2.7 Network Intersection MMLOS

Intersection MMLOS is only undertaken at signalized intersections. The two signalized intersections considered in this study are Mer-Bleue Road at Renaud Road, and Mer-Bleue Road at Decoeur Drive / Axis Way. These intersections are currently stop-controlled and have been signalized in Synchro analysis as an improvement measure. As such, several conservative assumptions about the intersection configuration were made to evaluate the intersection MMLOS and can be seen in MMLOS worksheets in Appendix I. Table 23 summarizes the MMLOS analysis for these intersections in the Study Area for the existing and future horizons. The analysis is based on the general urban area targets.

Table 23: Study Area Intersection MMLOS Analysis—All Horizons

<table>
<tr><th rowspan="2">Intersection</th><th rowspan="2">Horizon</th><th colspan="2">Pedestrian LOS</th><th colspan="2">Bicycle LOS</th><th colspan="2">Transit LOS</th><th colspan="2">Truck LOS</th><th colspan="2">Auto LOS</th></tr>
<tr><th>PLOS</th><th>Target</th><th>BLOS</th><th>Target</th><th>TLOS</th><th>Target</th><th>TrLOS</th><th>Target</th><th>ALOS</th><th>Target</th></tr>
<tr><td rowspan="4">Mer-Bleue Road & Renaud Road</td><td>2024 FB</td><td rowspan="4">C</td><td rowspan="8">C</td><td rowspan="4">D</td><td rowspan="8">D</td><td rowspan="4">-</td><td rowspan="8">D</td><td rowspan="4">-</td><td rowspan="8">E</td><td>A(C)</td><td rowspan="8">D</td></tr>
<tr><td>2029 FB</td><td>A(C)</td></tr>
<tr><td>2024 FT</td><td>A(C)</td></tr>
<tr><td>2029 FT</td><td>A(C)</td></tr>
<tr><td rowspan="4">Mer-Bleue Road & Decoeur Drive / Axis Way</td><td>2024 FB</td><td rowspan="4">F</td><td rowspan="4">F</td><td rowspan="4">B</td><td rowspan="4">-</td><td>A(A)</td></tr>
<tr><td>2029 FB</td><td>A(A)</td></tr>
<tr><td>2024 FT</td><td>A(A)</td></tr>
<tr><td>2029 FT</td><td>A(A)</td></tr>
<tr><td>Notes:</td><td colspan="11">AM(PM)</td></tr>
</table>

Based on the new intersection configuration assumptions, the pedestrian LOS target is not met at Mer-Bleue Road and Decoeur Drive / Axis Way as a result of east-west crossing distances. The bicycle LOS is also not met at this intersection as a result of number of lanes and the operating speeds.

Transit LOS is only evaluated where there is an existing or a known future transit route, and Truck LOS is only evaluated along truck routes. Where applicable, these targets are met.

The Auto LOS is also met at both signalized Study Area intersections at all future horizons.

17 Recommendations

As can be seen in Sections 16.2.1 to 16.2.5, the need for modifications to the City's Road Network Concept is evident. During the 2024 Future Background horizon most of movements fail at Brian Coburn Boulevard and Mer-Bleue Road, and Brian Coburn Boulevard and Gerry Lalonde Drive / Jerome Jodoin Drive.

The volumes used in the model for the 2024 Future Background scenario consist of raw traffic counts, background growth, and developments found on the City's Development Application Search Tool. The Turning Movement Counts along at Brian Coburn Boulevard intersections were collected by the City for Brian Coburn Boulevard at Mer-Bleue Road in 2018 and by HDR for Brian Coburn Boulevard at Gerry Lalonde Drive in 2017. A 2% annual growth rate was applied to the traffic counts and is consistent with 2225 Mer-Bleue Road Transportation Impact Study (HDR, 2018). All background developments within one kilometre of the subject site, or those which impact the Study Area intersections and were available through the City's Development Application Search Tool were added to the 2024 Future Background traffic volumes. These volumes were carried through the Study Area and distributed at major (arterial to arterial) road intersections using the existing turning movement splits.

The widening of Brian Coburn Boulevard from two to four lanes has been recommended as a mitigation measure. Sufficient ROW has been reserved by the City of Ottawa for this widening, including the segment along the subject site frontage. The widening alleviates congestion at both Study Area roundabouts, bringing the operational performance at Brian Coburn Boulevard and Gerry Lalonde Drive / Jerome Jodoin Drive to a satisfactory LOS. However, this is not sufficient to support growth at Mer-Bleue Road and Brian Coburn Boulevard intersection. As previously mentioned, this indicates that the capacity issues cannot be solved based on localized intersection improvements and instead require regional network improvements throughout Orleans by the City of Ottawa. These may include investments in transit infrastructure, incentivising businesses to provide work-from-home options for their employees and constructing alternative routes for vehicles to reach their destination. These potential regional road network modifications are outside of scope of this TIA.

18 Conclusions

A. The proposed development, located at 2275 Mer-Bleue Road, is a two-part development consisting of a Residential subdivision and a Mixed-Use block. One hundred and twelve townhouses are proposed as part of the Residential subdivision, and the Mixed-Use component consists of 170 apartment units and 15,000 square feet of retail space.
B. Approximately 290 vehicle parking spaces and 90 bicycle parking spaces will be provided as part of the Mixed-Use building.
C. Access to the Townhouses will be accommodated via the future intersection of Mer-Bleue Road and Decoeur Drive / Axis Way (Site Access #1), and access to the Mixed-Use component of the development will be accommodated via a right-in / right-out access at Brian Coburn Boulevard (Site Access #2). Site Access #2 is adjacent to the eastern property line and is approximately 130 metres east from Mer-Bleue Road, measured from centreline to centreline.
D. The existing Study Area is currently served by bus routes #30, #234, #302, and #225.
E. The previous five years of collision history at the existing Study Area intersections has been reviewed. No patterns emerged that indicated that mitigation measures or further monitoring was required.
F. The residential trip generation rates were identified using TRANS Trip Generation Report (2009) and the retail trip rates were identified using the ITE Trip Generation Manual. The Orleans mode shares were used to determine the trip generation by mode, with sustainable mode shares rounded to the nearest 5% to address the Forecasting and Strategy Report comments provided by the City staff. Internal capture trips were accounted for in the Mixed-Use component trip generation.
G. It was found that the proposed development can be anticipated to generate 131 AM, and 183 PM net new peak hour two-way vehicle trips. Minimum vehicle and bicycle parking space requirements are met.
H. It was found that the Pedestrian LOS is not met along Mer-Bleue Road and Brian Coburn Boulevard segments adjacent to the subject site as a result of high vehicular volumes and speeds. Bicycle LOS is not met along Brian Coburn Boulevard due to a lack of cycling infrastructure. In future horizons, bicycle and pedestrian LOS improve along Brian Coburn Boulevard as a result of the proposed MUP. Further, Transit and Truck LOS is met along all study segments and horizons.
I. Signal warrants were evaluated at Mer-Bleue Road and Decoeur Drive / Axis Way (Site Access #1), and Mer-Bleue Road at Renaud Road. Signalization was warranted at both intersections in 2024 Future Background horizon. Auxiliary left-turn lanes were added to each approach of signalized intersections.

J. In the existing conditions operational analysis, westbound approach fails at Mer-Bleue Road at Brian Coburn Boulevard intersection, and southbound approach fails at Brian Coburn Boulevard and Gerry Lalonde Drive.

K. In the 2024 Future Background horizon, both Mer-Bleue Road at Brian Coburn Boulevard, and Brian Coburn Boulevard at Jerome Jodoin Drive operate poorly with an overall LOS F. As a mitigation measure, widening of Brian Coburn Boulevard from two to four lanes throughout the Study Area was proposed. As a result, traffic operations within the Study Area improved significantly. However, the LOS at westbound, southbound, and northbound approaches at Mer-Bleue Road and Brian Coburn Boulevard remained poor. This indicates that the capacity issues cannot be solved based on localized intersection improvements and instead require regional network improvements throughout Orleans by the City of Ottawa.

L. The Study Area intersections are expected to operate with similar operational characteristics as the 2024 Future Background conditions during the 2024 Future Total horizon. The operational performance of eastbound approach at Mer-Bleue Road and Brian Coburn Boulevard decreases from LOS E to LOS F during the PM peak period. A lower LOS is expected at this intersection with any additional traffic as many approaches fail or are approaching failure in the Background scenario. Site Access #2 at Brian Coburn Boulevard is shown to operate at a satisfactory LOS.

M. In the 2029 Future Background horizon the operational performance of the Study Area intersections remains relatively consistent with the 2024 Future Background horizon. The operations of Mer-Bleue Road at Brian Coburn Boulevard remain poor. The operational performance of the eastbound approach at Mer-Bleue Road and Brian Coburn Boulevard decreases from LOS E to LOS F during the PM peak period. A lower LOS is expected at this intersection with any additional traffic as many approaches fail or are approaching failure in the Background scenario. The level of service of eastbound left, and southbound through/right movements at the intersection of Mer-Bleue Road and Renaud Road decrease from LOS B, and LOS C to LOS C, and LOS D, respectively.

N. With the addition of the site generated traffic, the Study Area is expected to operate with similar operational characteristics to the 2029 Future Background conditions in the 2029 Future Total horizon. The operations of Mer-Bleue Road at Brian Coburn Boulevard remain poor.

O. Based on the new intersection configuration assumptions, the pedestrian LOS target is not met at Mer-Bleue Road and Decoeur Drive / Axis Way as a result of east-west crossing distances. The bicycle LOS is also not met at this intersection as a result of number of lanes and the operating speeds. Other MMLOS targets are met at all horizons.

P. As can be seen in Sections 16.2.1 to 16.2.7, the need for Network Concept modifications as a result of Background traffic is evident. The widening of Brian Coburn Boulevard from two to four lanes has been recommended as a mitigation measure. The widening improved operational performance; however, this was not sufficient to bring the LOS at Mer-Bleue Road and Brian Coburn Boulevard above LOS F. This indicates that the capacity issues cannot be solved based on localized intersection improvements and instead require regional network improvements throughout Orleans by the City of Ottawa.

It has been noted that the proposed development accesses operate well and can be accommodated within the road network without negatively impacting the existing intersections. It is recommended that, from a transportation perspective, the proposed development application process proceeds.

Prepared By:	Reviewed By:
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LICENSED PROFESSIONAL ENGINEER
M. B. CROCKFORD
100152912
March 26, 2021
PROVINCE OF ONTARIO

Appendix A

TIA Screening Form and PM Certification Form

CGH TRANSPORTATION

13 Markham Avenue
Ottawa ON K2G 3Z1

City of Ottawa 2017 TIA Guidelines
Step 1 - Screening Form

Date:	04-Dec-20
Project Number:	2020-82
Project Reference:	Caivan 2275 Mer-Bleue

1.1 Description of Proposed Development	
Municipal Address	2275 Mer-Bleue Road
Description of Location	CON 11 LOT 3
Land Use Classification	General Mixed Use Zone - GM15[2156] S330-h
Development Size	32 back-to-back townhouse units, 80 standard townhouse units, and a 0.75 ha. Mid-rise mixed-use development block
Accesses	Two: One on Mer-Bleue via the connection to the residential development to the south. One access on Brian Coburn Boulevard.
Phase of Development	Single Phase
Buildout Year	2024
TIA Requirement	Full TIA Required

1.2 Trip Generation Trigger		
Land Use Type	Townhomes or apartments	
Development Size	112	Units
Trip Generation Trigger	Yes	

1.3 Location Triggers	
Does the development propose a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit or Spine Bicycle Networks?	No
Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone?	No
Location Trigger	No

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

TIA Plan Reports

On 14 June 2017, the Council of the City of Ottawa adopted new Transportation Impact Assessment (TIA) Guidelines. In adopting the guidelines, Council established a requirement for those preparing and delivering transportation impact assessments and reports to sign a letter of certification.

Individuals submitting TIA reports will be responsible for all aspects of development-related transportation assessment and reporting, and undertaking such work, in accordance and compliance with the City of Ottawa's Official Plan, the Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines.

By submitting the attached TIA report (and any associated documents) and signing this document, the individual acknowledges that s/he meets the four criteria listed below.

CERTIFICATION

1. I have reviewed and have a sound understanding of the objectives, needs and requirements of the City of Ottawa's Official Plan, Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines;
2. I have a sound knowledge of industry standard practice with respect to the preparation of transportation impact assessment reports, including multi modal level of service review;
3. I have substantial experience (more than 5 years) in undertaking and delivering transportation impact studies (analysis, reporting and geometric design) with strong background knowledge in transportation planning, engineering or traffic operations; and
4. I am either a licensed[1] or registered[2] professional in good standing, whose field of expertise [check √ appropriate field(s)] is either transportation engineering √ or transportation planning ☐.

[1,2] **License of registration body that oversees the profession is required to have a code of conduct and ethics guidelines that will ensure appropriate conduct and representation for transportation planning and/or transportation engineering works.**

Dated at ___Newmarket__________ this __28__ day of ________June________, 2019.
(City)

Name: ____________Mark Crockford________________________________
(Please Print)

Professional Title: __________Professional Engineer____________________________

____
Signature of Individual certifier that s/he meets the above four criteria

Office Contact Information (Please Print)
Address: 628 Haines Road
City / Postal Code: Newmarket / L3Y 6V5
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LICENSED PROFESSIONAL ENGINEER
M. B. CROCKFORD
100152912
June 28, 2019
PROVINCE OF ONTARIO

Appendix B

Turning Movement Count Data

Transportation Services - Traffic Services

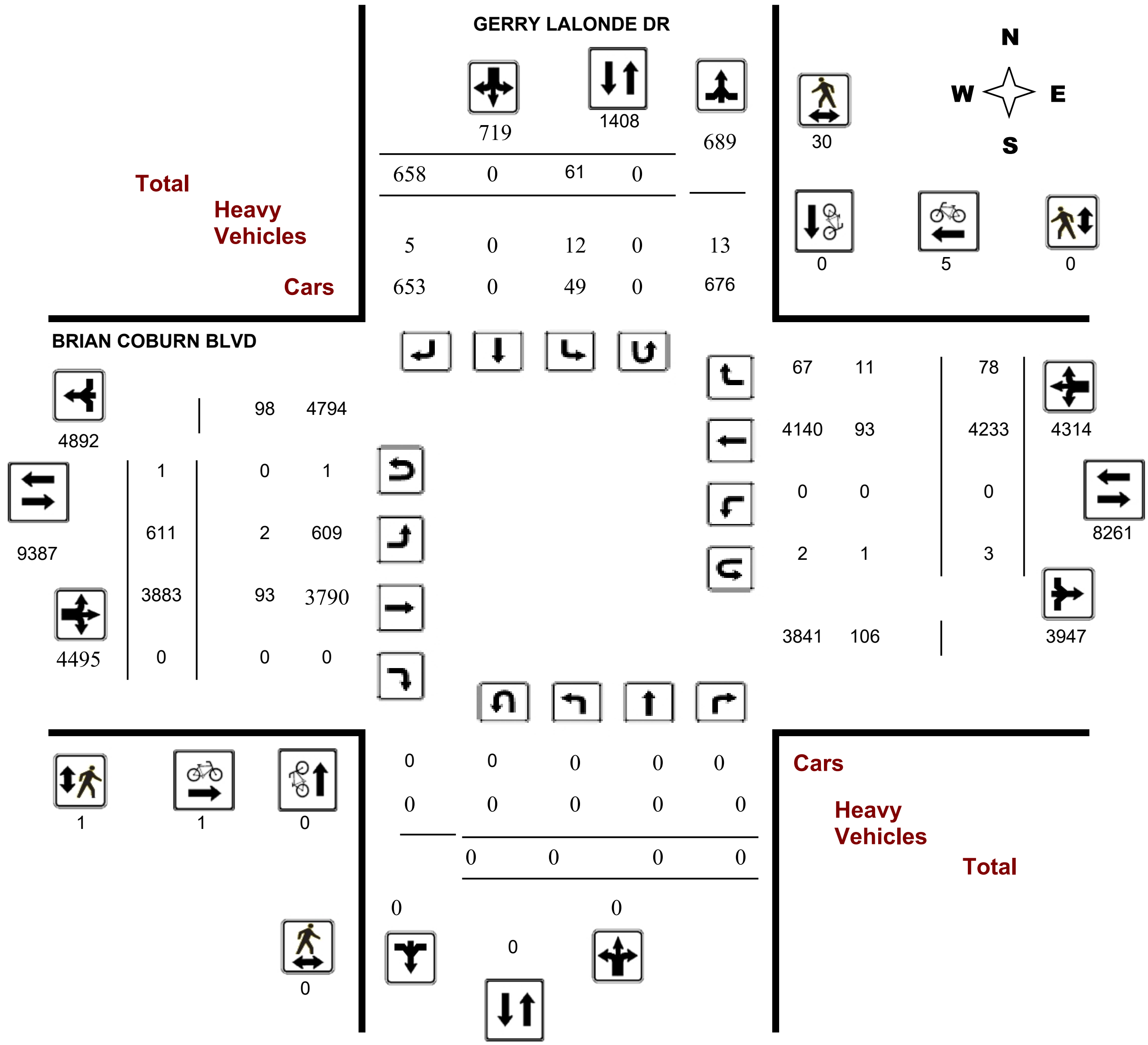
Turning Movement Count - Study Results

BRIAN COBURN BLVD @ GERRY LALONDE DR

Survey Date: Wednesday, October 17, 2018 **WO No:** 38062

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

Full Study Diagram



Transportation Services - Traffic Services

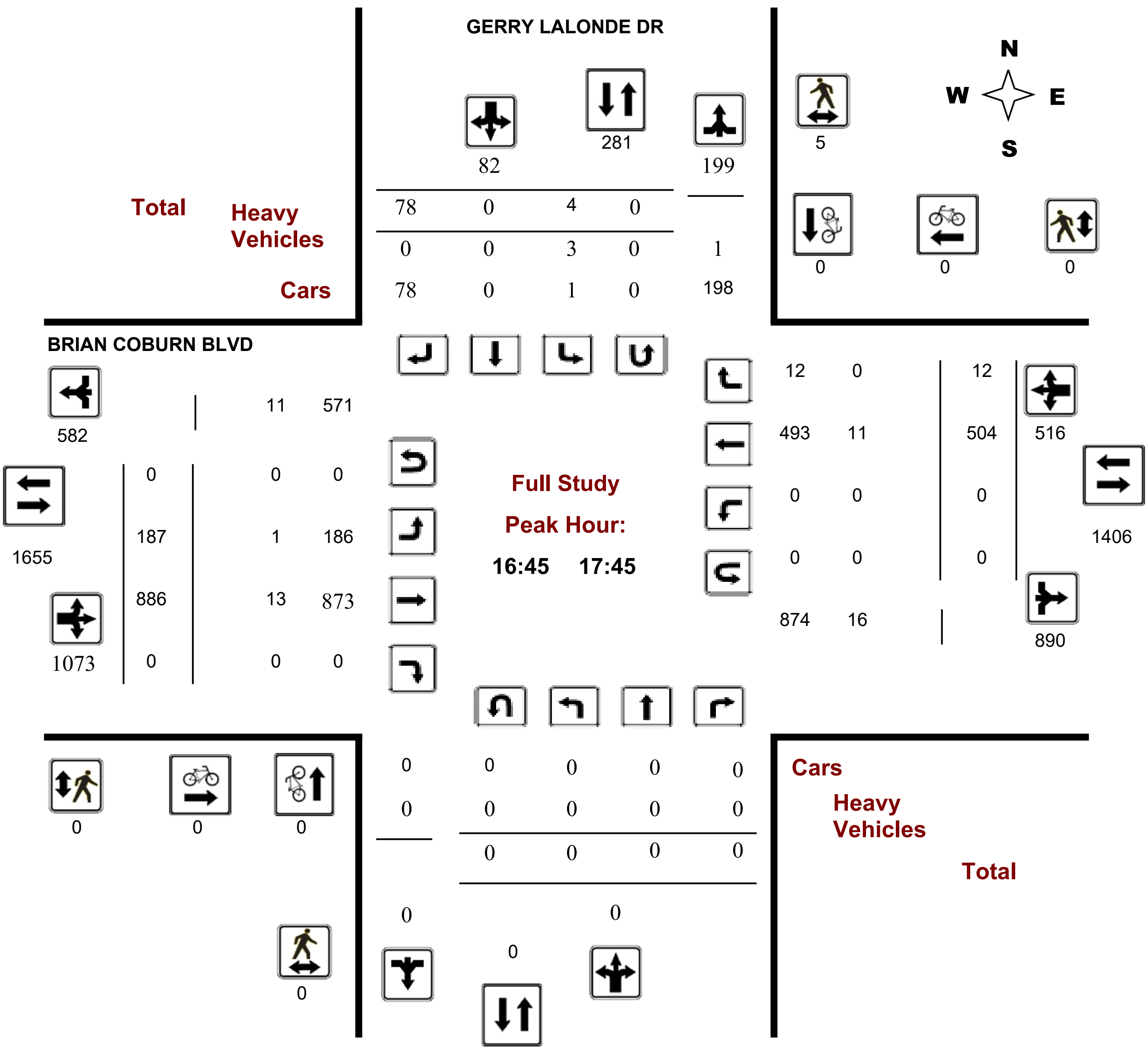
Turning Movement Count - Study Results

BRIAN COBURN BLVD @ GERRY LALONDE DR

Survey Date: Wednesday, October 17, 2018 **WO No:** 38062

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

Full Study Peak Hour Diagram



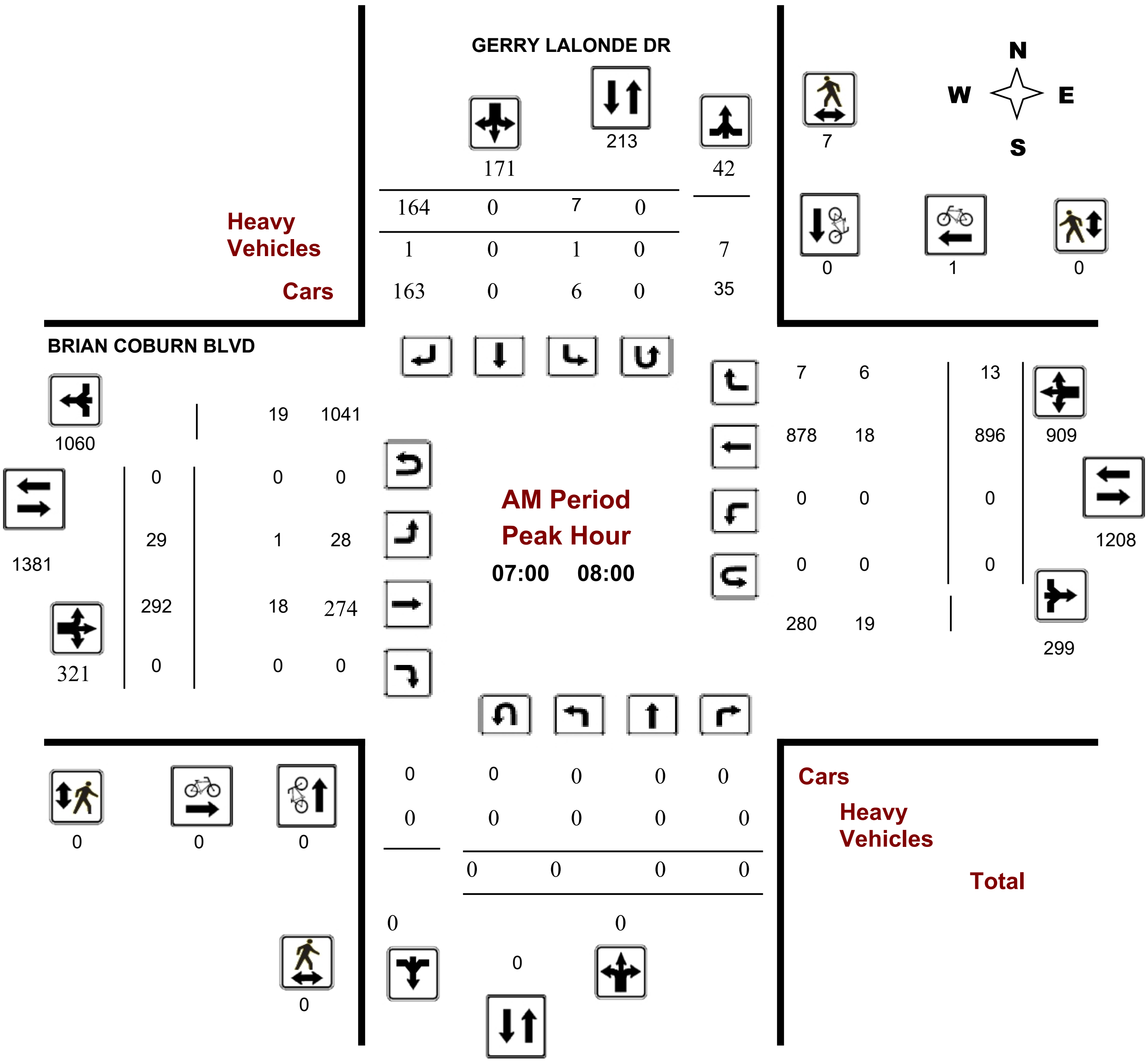
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BRIAN COBURN BLVD @ GERRY LALONDE DR

Survey Date: Wednesday, October 17, 2018 **WO No:** 38062

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



Comments

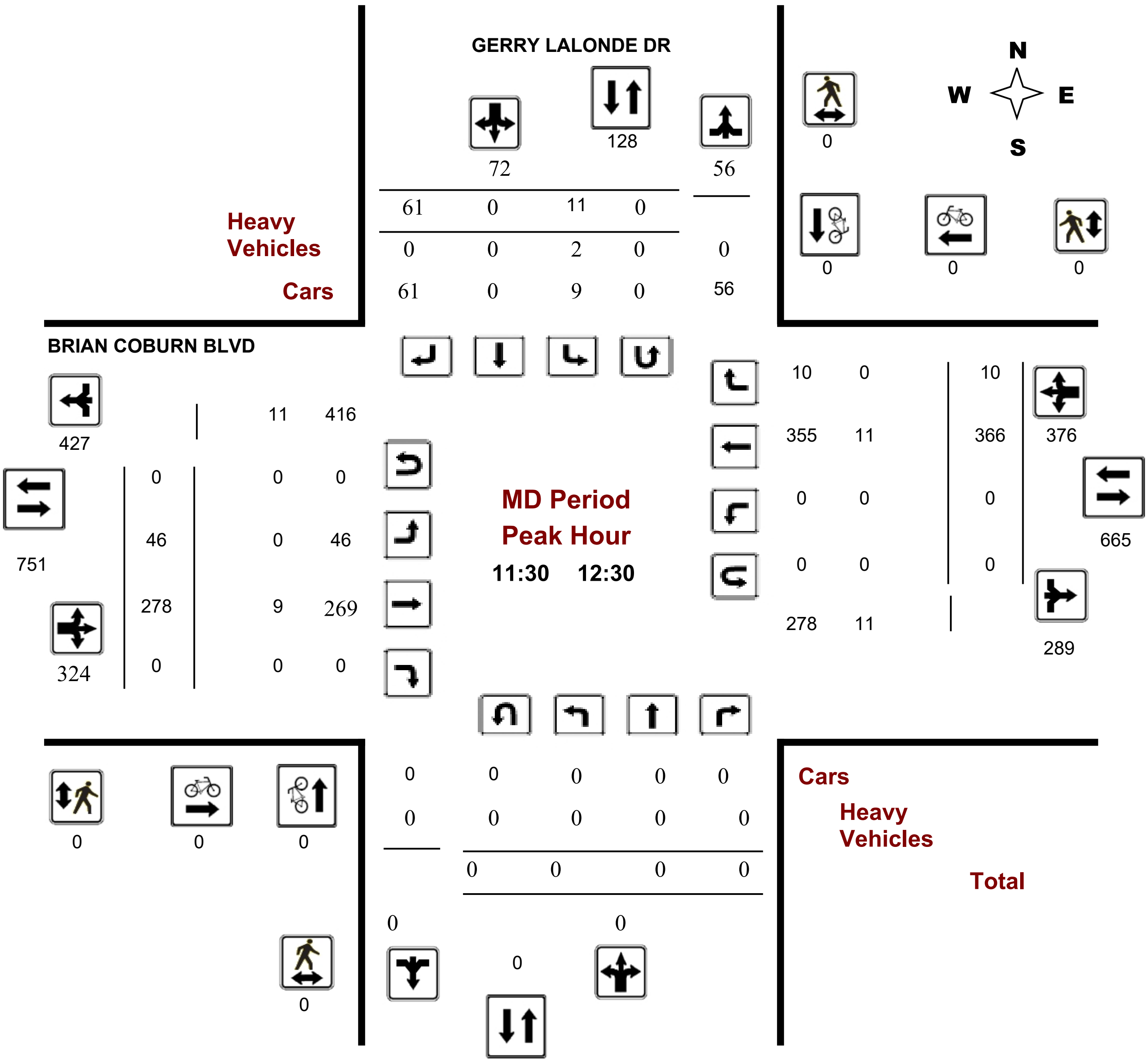
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BRIAN COBURN BLVD @ GERRY LALONDE DR

Survey Date: Wednesday, October 17, 2018 **WO No:** 38062

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



Comments

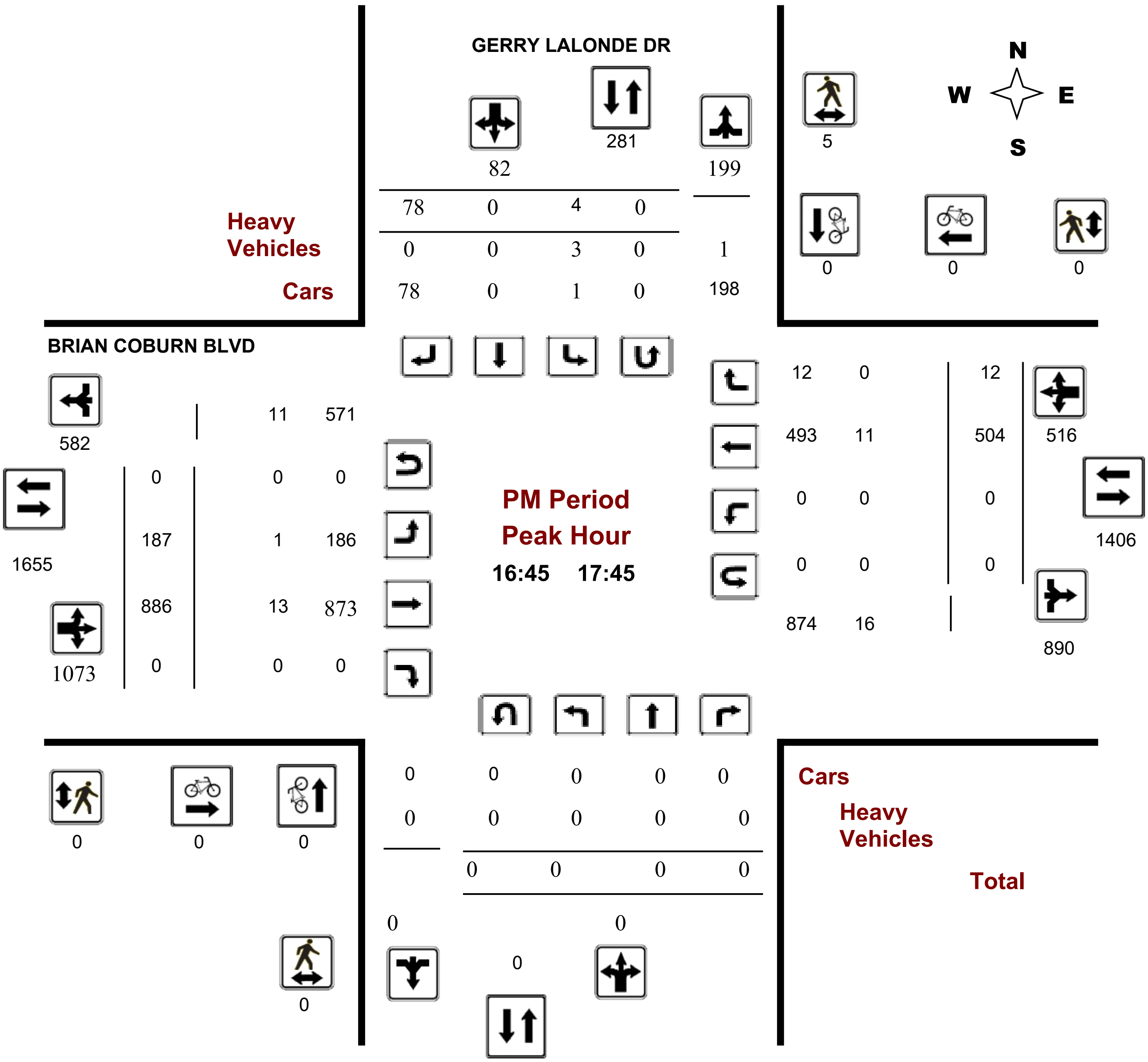
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BRIAN COBURN BLVD @ GERRY LALONDE DR

Survey Date: Wednesday, October 17, 2018 **WO No:** 38062

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



Comments

Ottawa

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BRIAN COBURN BLVD @ GERRY LALONDE DR

Survey Date: Wednesday, October 17, 2018 **WO No:** 38062

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

Full Study Summary (8 HR Standard)

Survey Date: Wednesday, October 17, 201

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 1 Westbound: 3

AADT Factor

.90

	GERRY LALONDE DR									BRIAN COBURN BLVD									
	Northbound				Southbound					Eastbound				Westbound					
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	0	0	0	**0**	7	0	164	**171**	**171**	29	292	0	**321**	0	896	13	**909**	**1230**	**1401**
08:00 09:00	0	0	0	**0**	9	0	109	**118**	**118**	28	260	0	**288**	0	747	6	**753**	**1041**	**1159**
09:00 10:00	0	0	0	**0**	4	0	71	**75**	**75**	24	244	0	**268**	0	517	9	**526**	**794**	**869**
11:30 12:30	0	0	0	**0**	11	0	61	**72**	**72**	46	278	0	**324**	0	366	10	**376**	**700**	**772**
12:30 13:30	0	0	0	**0**	9	0	57	**66**	**66**	38	327	0	**365**	0	324	6	**330**	**695**	**761**
15:00 16:00	0	0	0	**0**	11	0	55	**66**	**66**	103	750	0	**853**	0	417	13	**430**	**1283**	**1349**
16:00 17:00	0	0	0	**0**	4	0	63	**67**	**67**	173	890	0	**1063**	0	420	10	**430**	**1493**	**1560**
17:00 18:00	0	0	0	**0**	6	0	78	**84**	**84**	170	842	0	**1012**	0	546	11	**557**	**1569**	**1653**
Sub Total	0	0	0	**0**	61	0	658	**719**	**719**	611	3883	0	**4494**	0	4233	78	**4311**	**8805**	**9524**
U Turns				**0**				**0**	**0**				**1**				**3**	**4**	**4**
Total	0	0	0	**0**	61	0	658	**719**	**719**	611	3883	0	**4495**	0	4233	78	**4314**	**8809**	**9528**
EQ 12Hr	0	0	0	**0**	85	0	915	**999**	**999**	849	5397	0	**6248**	0	5884	108	**5996**	**12245**	**13244**
AVG 12Hr	0	0	0	**0**	72	0	776	**848**	**899**	720	4578	0	**5300**	0	4991	92	**5086**	**11020**	**11920**
AVG 24Hr	0	0	0	**0**	94	0	1016	**1110**	**1110**	944	5997	0	**6942**	0	6538	120	**6663**	**13605**	**14715**

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

Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor. **0.9**

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

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

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BRIAN COBURN BLVD @ GERRY LALONDE DR

Survey Date: Wednesday, October 17, 2018 **WO No:** 38062

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

Full Study 15 Minute Increments

Time Period		GERRY LALONDE DR Northbound				Southbound					BRIAN COBURN BLVD Eastbound				Westbound					
		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	0	0	0	0	0	0	41	41	0	2	48	0	50	0	239	5	244	0	335
07:15	07:30	0	0	0	0	3	0	37	40	1	9	52	0	61	0	225	3	228	1	329
07:30	07:45	0	0	0	0	2	0	47	49	1	6	92	0	98	0	236	3	239	1	386
07:45	08:00	0	0	0	0	2	0	39	41	0	12	100	0	112	0	196	2	198	0	351
08:00	08:15	0	0	0	0	1	0	36	37	0	5	68	0	73	0	182	1	183	0	293
08:15	08:30	0	0	0	0	5	0	35	40	0	9	61	0	70	0	226	2	228	0	338
08:30	08:45	0	0	0	0	3	0	20	23	1	8	61	0	69	0	203	2	205	1	297
08:45	09:00	0	0	0	0	0	0	18	18	0	6	70	0	76	0	136	1	137	0	231
09:00	09:15	0	0	0	0	1	0	18	19	1	8	70	0	78	0	178	2	180	1	277
09:15	09:30	0	0	0	0	1	0	20	21	0	4	54	0	58	0	132	4	136	0	215
09:30	09:45	0	0	0	0	2	0	22	24	2	11	66	0	77	0	109	1	112	2	213
09:45	10:00	0	0	0	0	0	0	11	11	0	1	54	0	55	0	98	2	100	0	166
11:30	11:45	0	0	0	0	5	0	15	20	2	11	71	0	82	0	107	3	110	2	212
11:45	12:00	0	0	0	0	4	0	15	19	0	8	70	0	78	0	76	3	79	0	176
12:00	12:15	0	0	0	0	0	0	12	12	0	16	71	0	87	0	91	2	93	0	192
12:15	12:30	0	0	0	0	2	0	19	21	0	11	66	0	77	0	92	2	94	0	192
12:30	12:45	0	0	0	0	1	0	23	24	0	9	89	0	98	0	71	1	73	0	195
12:45	13:00	0	0	0	0	3	0	10	13	0	6	73	0	79	0	95	2	97	0	189
13:00	13:15	0	0	0	0	1	0	13	14	0	13	86	0	99	0	79	2	81	0	194
13:15	13:30	0	0	0	0	4	0	11	15	0	10	79	0	89	0	79	1	80	0	184
15:00	15:15	0	0	0	0	2	0	13	15	1	19	139	0	158	0	101	1	102	1	275
15:15	15:30	0	0	0	0	5	0	15	20	0	22	175	0	197	0	104	6	110	0	327
15:30	15:45	0	0	0	0	0	0	13	13	0	24	235	0	259	0	103	3	106	0	378
15:45	16:00	0	0	0	0	4	0	14	18	1	38	201	0	239	0	109	3	112	1	369
16:00	16:15	0	0	0	0	1	0	11	12	1	51	205	0	256	0	113	1	114	1	382
16:15	16:30	0	0	0	0	2	0	15	17	2	36	218	0	255	0	107	2	109	2	381
16:30	16:45	0	0	0	0	1	0	19	20	1	37	227	0	264	0	103	4	107	1	391
16:45	17:00	0	0	0	0	0	0	18	18	0	49	240	0	289	0	97	3	100	0	407
17:00	17:15	0	0	0	0	3	0	18	21	2	42	199	0	241	0	144	2	146	2	408
17:15	17:30	0	0	0	0	0	0	21	21	0	57	238	0	295	0	132	6	138	0	454
17:30	17:45	0	0	0	0	1	0	21	22	1	39	209	0	248	0	131	1	132	1	402
17:45	18:00	0	0	0	0	2	0	18	20	0	32	196	0	228	0	139	2	141	0	389
Total:		0	0	0	0	61	0	658	719	17	611	3883	0	4495	0	4233	78	4314	17	9,528

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BRIAN COBURN BLVD @ GERRY LALONDE DR

Survey Date: Wednesday, October 17, 2018 **WO No:** 38062

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

Full Study Cyclist Volume

Time Period		GERRY LALONDE DR Northbound	Southbound	Street Total	BRIAN COBURN BLVD Eastbound	Westbound	Street Total	Grand Total
07:00	07:15	0	0	0	0	0	0	0
07:15	07:30	0	0	0	0	0	0	0
07:30	07:45	0	0	0	0	0	0	0
07:45	08:00	0	0	0	0	1	1	1
08:00	08:15	0	0	0	0	1	1	1
08:15	08:30	0	0	0	0	0	0	0
08:30	08:45	0	0	0	0	1	1	1
08:45	09:00	0	0	0	0	0	0	0
09:00	09:15	0	0	0	0	0	0	0
09:15	09:30	0	0	0	0	0	0	0
09:30	09:45	0	0	0	0	1	1	1
09:45	10:00	0	0	0	0	0	0	0
11:30	11:45	0	0	0	0	0	0	0
11:45	12:00	0	0	0	0	0	0	0
12:00	12:15	0	0	0	0	0	0	0
12:15	12:30	0	0	0	0	0	0	0
12:30	12:45	0	0	0	0	0	0	0
12:45	13:00	0	0	0	0	0	0	0
13:00	13:15	0	0	0	0	0	0	0
13:15	13:30	0	0	0	0	0	0	0
15:00	15:15	0	0	0	0	0	0	0
15:15	15:30	0	0	0	1	0	1	1
15:30	15:45	0	0	0	0	0	0	0
15:45	16:00	0	0	0	0	0	0	0
16:00	16:15	0	0	0	0	0	0	0
16:15	16:30	0	0	0	0	1	1	1
16:30	16:45	0	0	0	0	0	0	0
16:45	17:00	0	0	0	0	0	0	0
17:00	17:15	0	0	0	0	0	0	0
17:15	17:30	0	0	0	0	0	0	0
17:30	17:45	0	0	0	0	0	0	0
17:45	18:00	0	0	0	0	0	0	0
Total		0	0	**0**	1	5	6	6

Turning Movement Count - Study Results

BRIAN COBURN BLVD @ GERRY LALONDE DR

Survey Date: Wednesday, October 17, 2018 **WO No:** 38062

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

Full Study Pedestrian Volume

Time Period	GERRY LALONDE DR NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	BRIAN COBURN BLVD EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	0	1	**1**	0	0	**0**	**1**
07:15 07:30	0	2	**2**	0	0	**0**	**2**
07:30 07:45	0	3	**3**	0	0	**0**	**3**
07:45 08:00	0	1	**1**	0	0	**0**	**1**
08:00 08:15	0	5	**5**	0	0	**0**	**5**
08:15 08:30	0	0	**0**	0	0	**0**	**0**
08:30 08:45	0	0	**0**	1	0	**1**	**1**
08:45 09:00	0	0	**0**	0	0	**0**	**0**
09:00 09:15	0	2	**2**	0	0	**0**	**2**
09:15 09:30	0	0	**0**	0	0	**0**	**0**
09:30 09:45	0	0	**0**	0	0	**0**	**0**
09:45 10:00	0	0	**0**	0	0	**0**	**0**
11:30 11:45	0	0	**0**	0	0	**0**	**0**
11:45 12:00	0	0	**0**	0	0	**0**	**0**
12:00 12:15	0	0	**0**	0	0	**0**	**0**
12:15 12:30	0	0	**0**	0	0	**0**	**0**
12:30 12:45	0	0	**0**	0	0	**0**	**0**
12:45 13:00	0	1	**1**	0	0	**0**	**1**
13:00 13:15	0	0	**0**	0	0	**0**	**0**
13:15 13:30	0	0	**0**	0	0	**0**	**0**
15:00 15:15	0	0	**0**	0	0	**0**	**0**
15:15 15:30	0	0	**0**	0	0	**0**	**0**
15:30 15:45	0	1	**1**	0	0	**0**	**1**
15:45 16:00	0	0	**0**	0	0	**0**	**0**
16:00 16:15	0	2	**2**	0	0	**0**	**2**
16:15 16:30	0	0	**0**	0	0	**0**	**0**
16:30 16:45	0	5	**5**	0	0	**0**	**5**
16:45 17:00	0	2	**2**	0	0	**0**	**2**
17:00 17:15	0	1	**1**	0	0	**0**	**1**
17:15 17:30	0	1	**1**	0	0	**0**	**1**
17:30 17:45	0	1	**1**	0	0	**0**	**1**
17:45 18:00	0	2	**2**	0	0	**0**	**2**
Total	0	30	**30**	1	0	**1**	**31**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BRIAN COBURN BLVD @ GERRY LALONDE DR

Survey Date: Wednesday, October 17, 2018 **WO No:** 38062

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

Full Study Heavy Vehicles

Time Period		GERRY LALONDE DR Northbound LT	ST	RT	N TOT	Southbound LT	ST	RT	S TOT	STR TOT	BRIAN COBURN BLVD Eastbound LT	ST	RT	E TOT	Westbound LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**2**	0	3	3	**6**	**8**	**8**
07:15	07:30	0	0	0	**0**	1	0	0	**1**	**1**	0	6	0	**6**	0	3	2	**5**	**11**	**12**
07:30	07:45	0	0	0	**0**	0	0	1	**1**	**1**	1	5	0	**6**	0	9	1	**10**	**16**	**17**
07:45	08:00	0	0	0	**0**	0	0	0	**0**	**0**	0	5	0	**5**	0	3	0	**3**	**8**	**8**
08:00	08:15	0	0	0	**0**	0	0	0	**0**	**0**	0	4	0	**4**	0	4	1	**5**	**9**	**9**
08:15	08:30	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	5	1	**6**	**7**	**7**
08:30	08:45	0	0	0	**0**	1	0	0	**1**	**1**	0	7	0	**7**	0	1	0	**1**	**8**	**9**
08:45	09:00	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**2**	0	1	1	**2**	**4**	**4**
09:00	09:15	0	0	0	**0**	0	0	1	**1**	**1**	0	2	0	**2**	0	4	0	**4**	**6**	**7**
09:15	09:30	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**2**	0	3	2	**5**	**7**	**7**
09:30	09:45	0	0	0	**0**	1	0	1	**2**	**2**	0	3	0	**3**	0	4	0	**5**	**8**	**10**
09:45	10:00	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	1	0	**1**	**1**	**1**
11:30	11:45	0	0	0	**0**	2	0	0	**2**	**2**	0	4	0	**4**	0	4	0	**4**	**8**	**10**
11:45	12:00	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	2	0	**2**	**3**	**3**
12:00	12:15	0	0	0	**0**	0	0	0	**0**	**0**	0	3	0	**3**	0	1	0	**1**	**4**	**4**
12:15	12:30	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	4	0	**4**	**5**	**5**
12:30	12:45	0	0	0	**0**	0	0	0	**0**	**0**	0	6	0	**6**	0	3	0	**3**	**9**	**9**
12:45	13:00	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	1	0	**1**	**2**	**2**
13:00	13:15	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**2**	0	2	0	**2**	**4**	**4**
13:15	13:30	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**2**	0	2	0	**2**	**4**	**4**
15:00	15:15	0	0	0	**0**	0	0	1	**1**	**1**	0	3	0	**3**	0	3	0	**3**	**6**	**7**
15:15	15:30	0	0	0	**0**	0	0	0	**0**	**0**	0	3	0	**3**	0	4	0	**4**	**7**	**7**
15:30	15:45	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**2**	0	2	0	**2**	**4**	**4**
15:45	16:00	0	0	0	**0**	1	0	0	**1**	**1**	0	3	0	**3**	0	5	0	**5**	**8**	**9**
16:00	16:15	0	0	0	**0**	1	0	0	**1**	**1**	0	5	0	**5**	0	4	0	**4**	**9**	**10**
16:15	16:30	0	0	0	**0**	1	0	1	**2**	**2**	0	1	0	**1**	0	1	0	**1**	**2**	**4**
16:30	16:45	0	0	0	**0**	1	0	0	**1**	**1**	0	1	0	**1**	0	2	0	**2**	**3**	**4**
16:45	17:00	0	0	0	**0**	0	0	0	**0**	**0**	0	4	0	**4**	0	0	0	**0**	**4**	**4**
17:00	17:15	0	0	0	**0**	2	0	0	**2**	**2**	0	2	0	**2**	0	3	0	**3**	**5**	**7**
17:15	17:30	0	0	0	**0**	0	0	0	**0**	**0**	1	4	0	**5**	0	5	0	**5**	**10**	**10**
17:30	17:45	0	0	0	**0**	1	0	0	**1**	**1**	0	3	0	**3**	0	3	0	**3**	**6**	**7**
17:45	18:00	0	0	0	**0**	0	0	0	**0**	**0**	0	3	0	**3**	0	1	0	**1**	**4**	**4**
Total:	None	0	0	0	**0**	12	0	5	**17**	**17**	2	93	0	**95**	0	93	11	**105**	**200**	**217**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BRIAN COBURN BLVD @ GERRY LALONDE DR

Survey Date: Wednesday, October 17, 2018 **WO No:** 38062

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

Full Study 15 Minute U-Turn Total

Time Period		GERRY LALONDE DR Northbound U-Turn Total	GERRY LALONDE DR Southbound U-Turn Total	BRIAN COBURN BLVD Eastbound U-Turn Total	BRIAN COBURN BLVD Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	0
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	0	0	0
07:45	08:00	0	0	0	0	0
08:00	08:15	0	0	0	0	0
08:15	08:30	0	0	0	0	0
08:30	08:45	0	0	0	0	0
08:45	09:00	0	0	0	0	0
09:00	09:15	0	0	0	0	0
09:15	09:30	0	0	0	0	0
09:30	09:45	0	0	0	2	2
09:45	10:00	0	0	0	0	0
11:30	11:45	0	0	0	0	0
11:45	12:00	0	0	0	0	0
12:00	12:15	0	0	0	0	0
12:15	12:30	0	0	0	0	0
12:30	12:45	0	0	0	1	1
12:45	13:00	0	0	0	0	0
13:00	13:15	0	0	0	0	0
13:15	13:30	0	0	0	0	0
15:00	15:15	0	0	0	0	0
15:15	15:30	0	0	0	0	0
15:30	15:45	0	0	0	0	0
15:45	16:00	0	0	0	0	0
16:00	16:15	0	0	0	0	0
16:15	16:30	0	0	1	0	1
16:30	16:45	0	0	0	0	0
16:45	17:00	0	0	0	0	0
17:00	17:15	0	0	0	0	0
17:15	17:30	0	0	0	0	0
17:30	17:45	0	0	0	0	0
17:45	18:00	0	0	0	0	0
Total		0	0	1	3	4

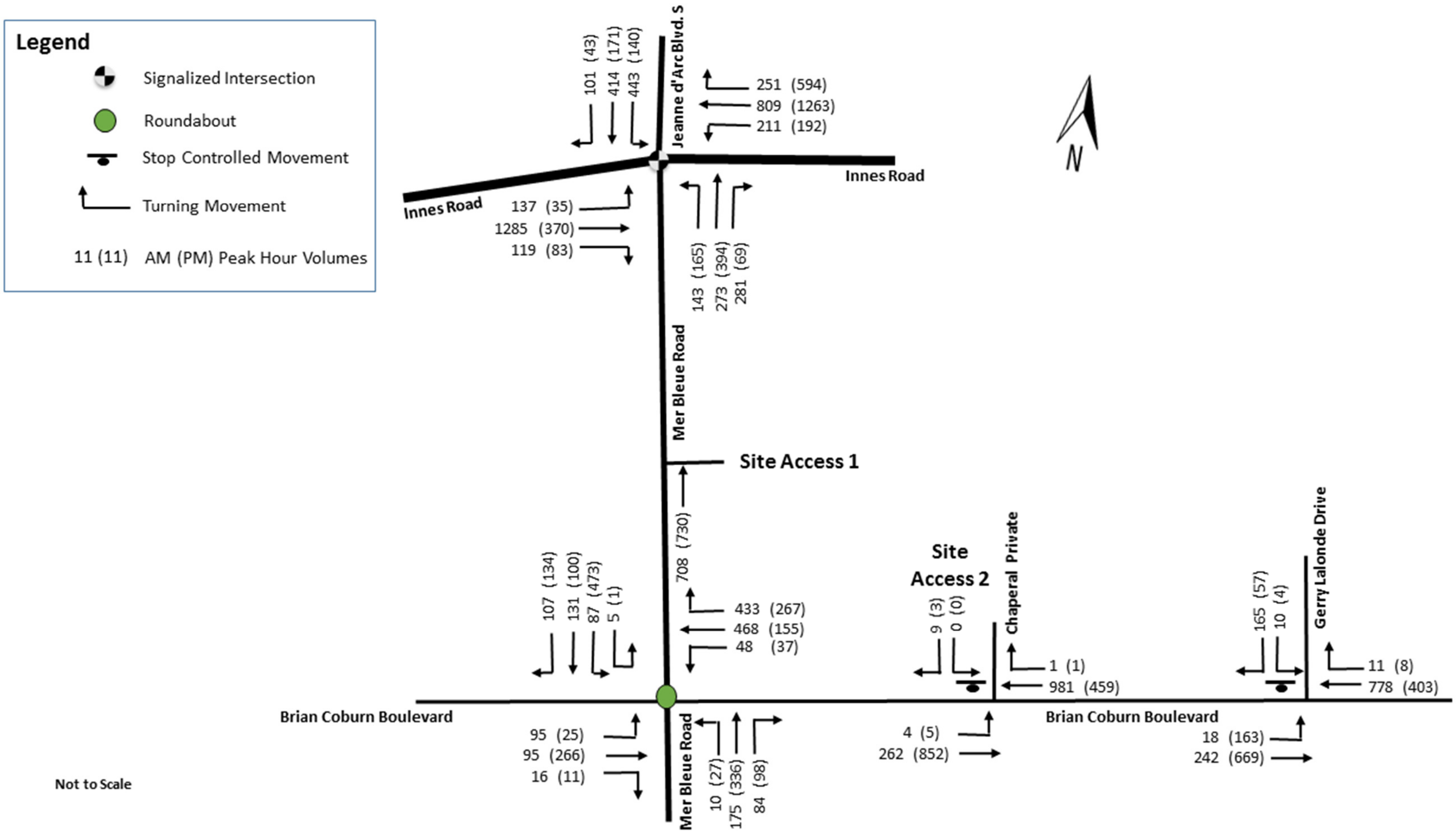


Exhibit 6: Existing 2017 Traffic Volumes

Transportation Services - Traffic Services

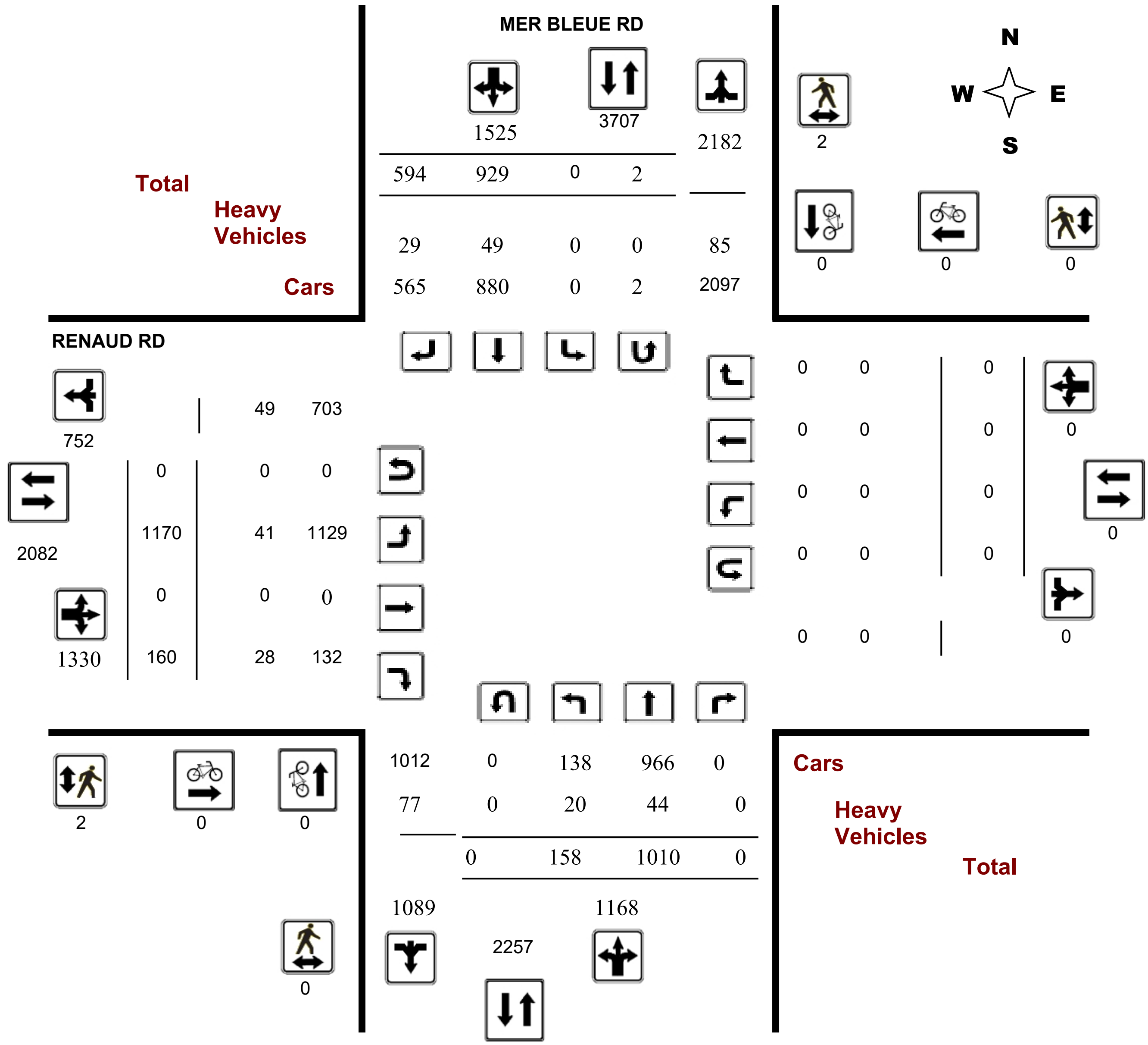
Turning Movement Count - Study Results

RENAUD RD @ MER BLEUE RD

Survey Date: Thursday, November 15, 2018 **WO No:** 38121

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

Full Study Diagram



Transportation Services - Traffic Services

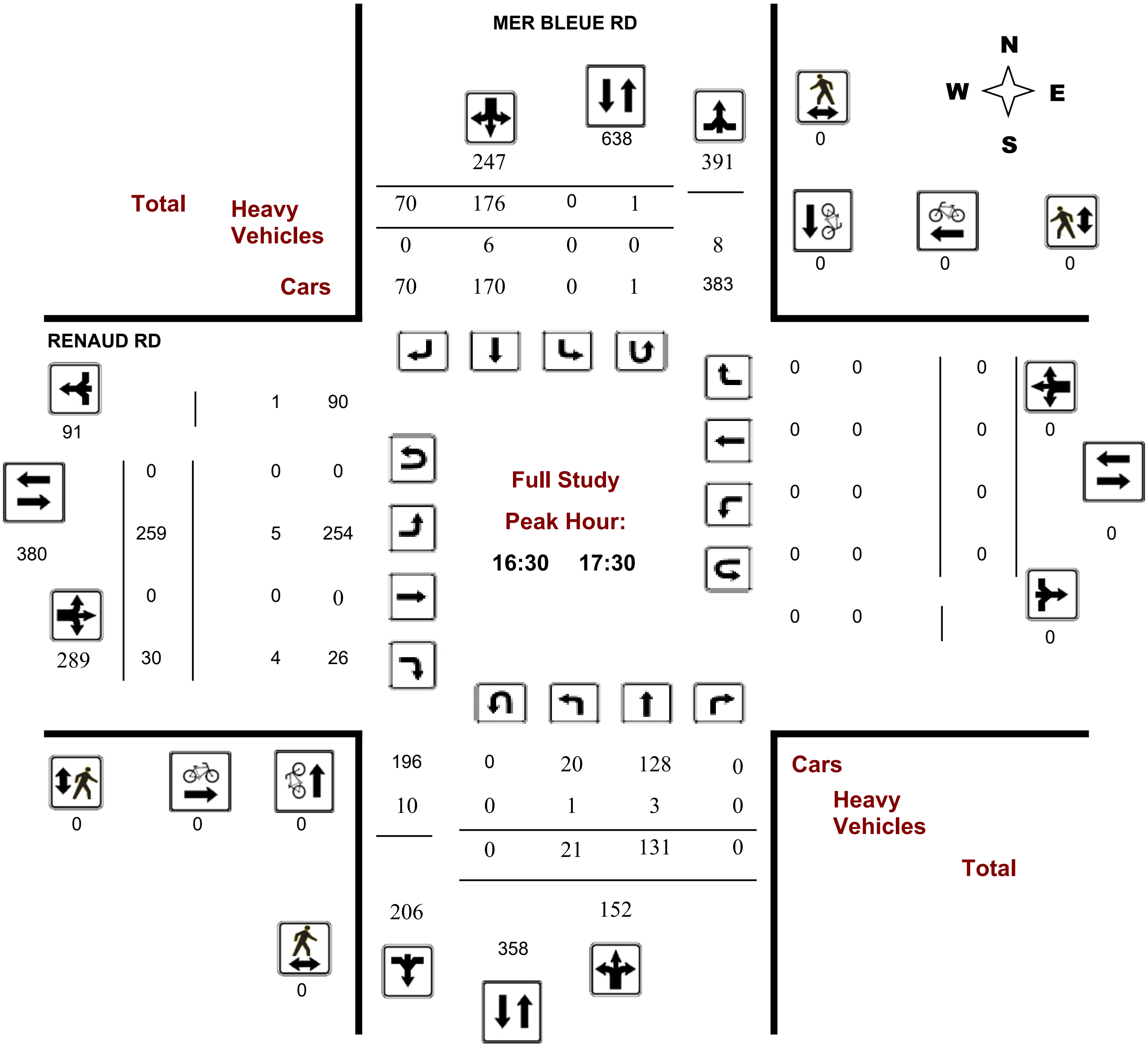
Turning Movement Count - Study Results

RENAUD RD @ MER BLEUE RD

Survey Date: Thursday, November 15, 2018 **WO No:** 38121

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

Full Study Peak Hour Diagram



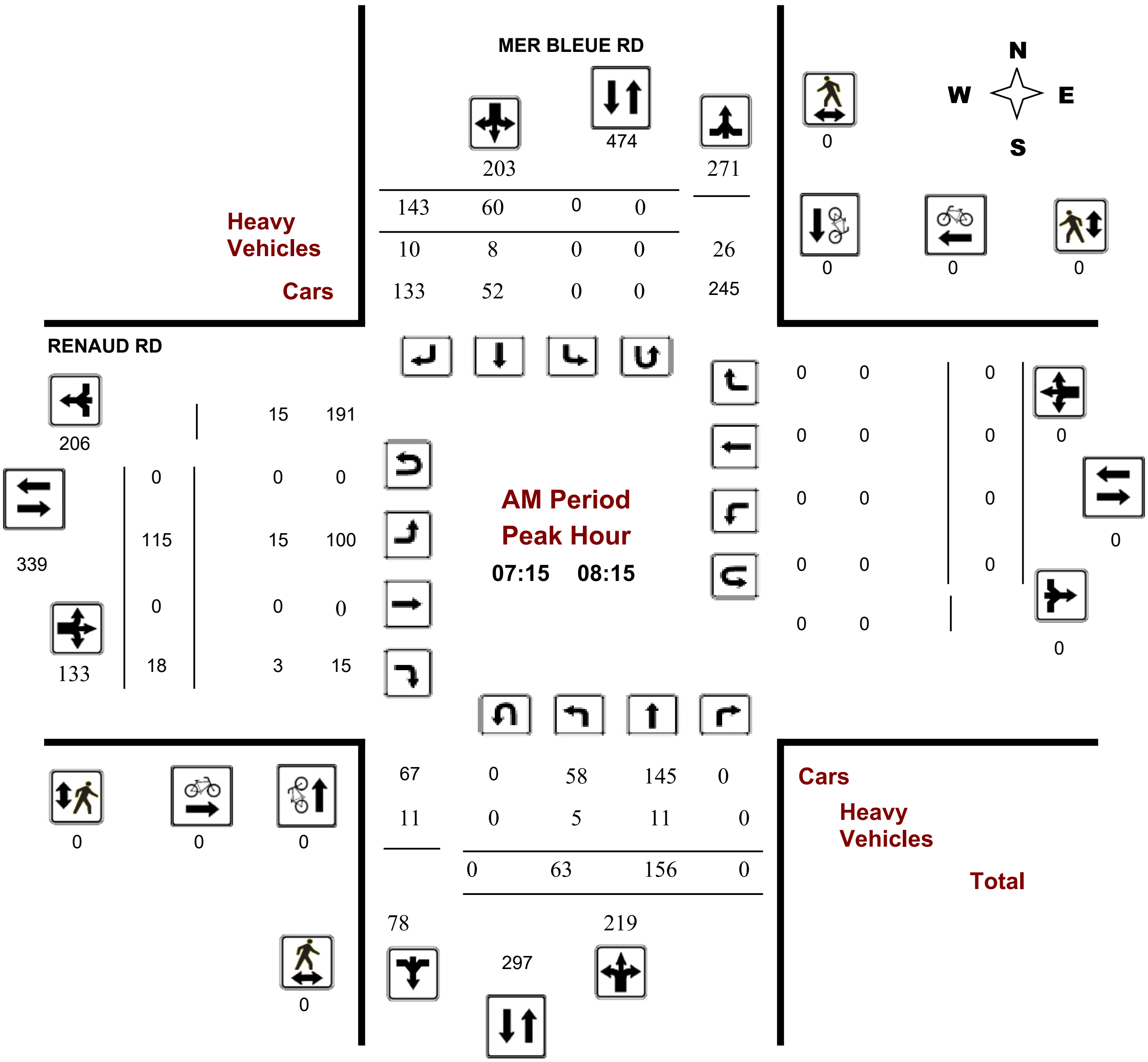
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

RENAUD RD @ MER BLEUE RD

Survey Date: Thursday, November 15, 2018 **WO No:** 38121

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



Comments

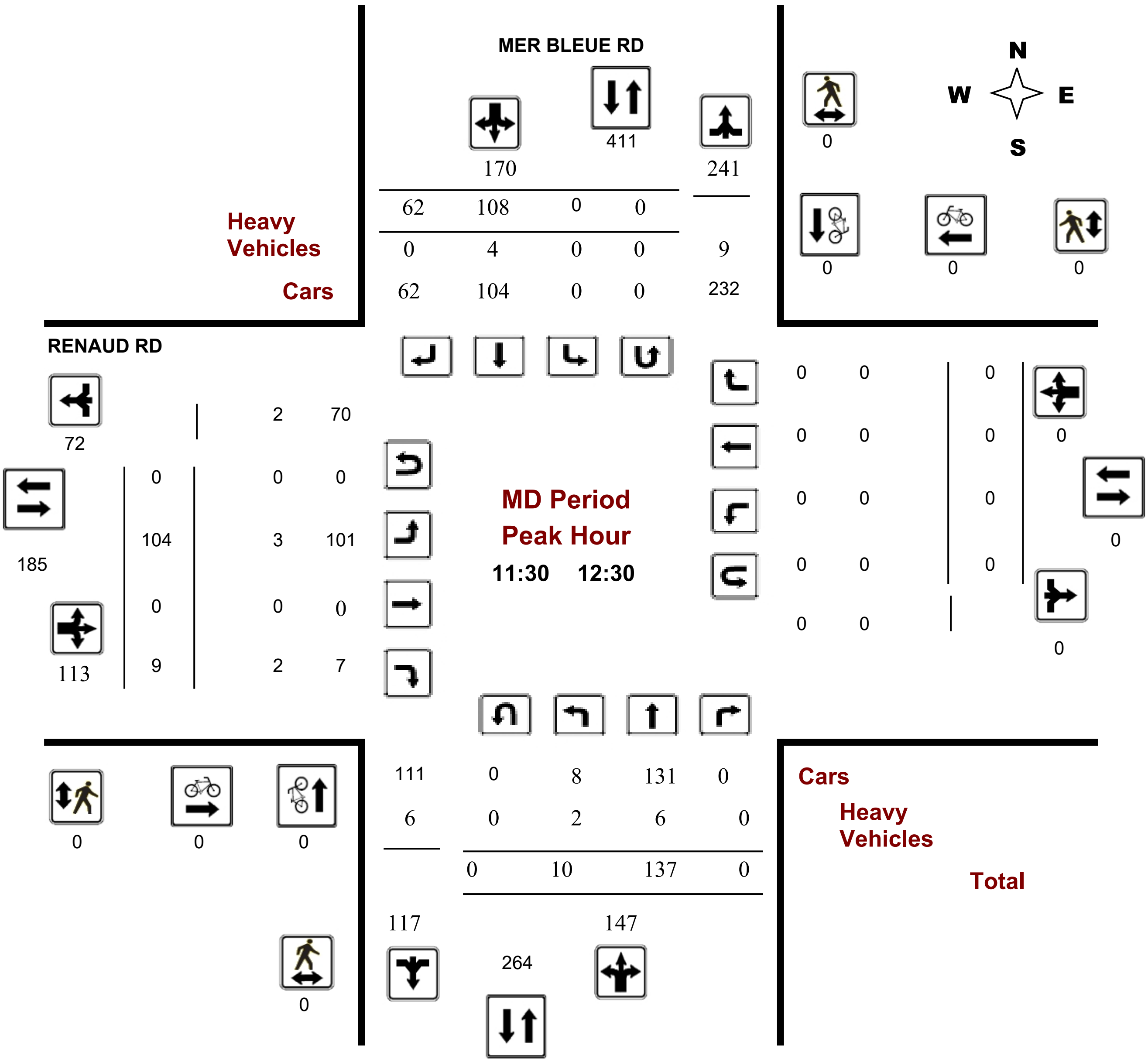
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

RENAUD RD @ MER BLEUE RD

Survey Date: Thursday, November 15, 2018 **WO No:** 38121

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



Comments

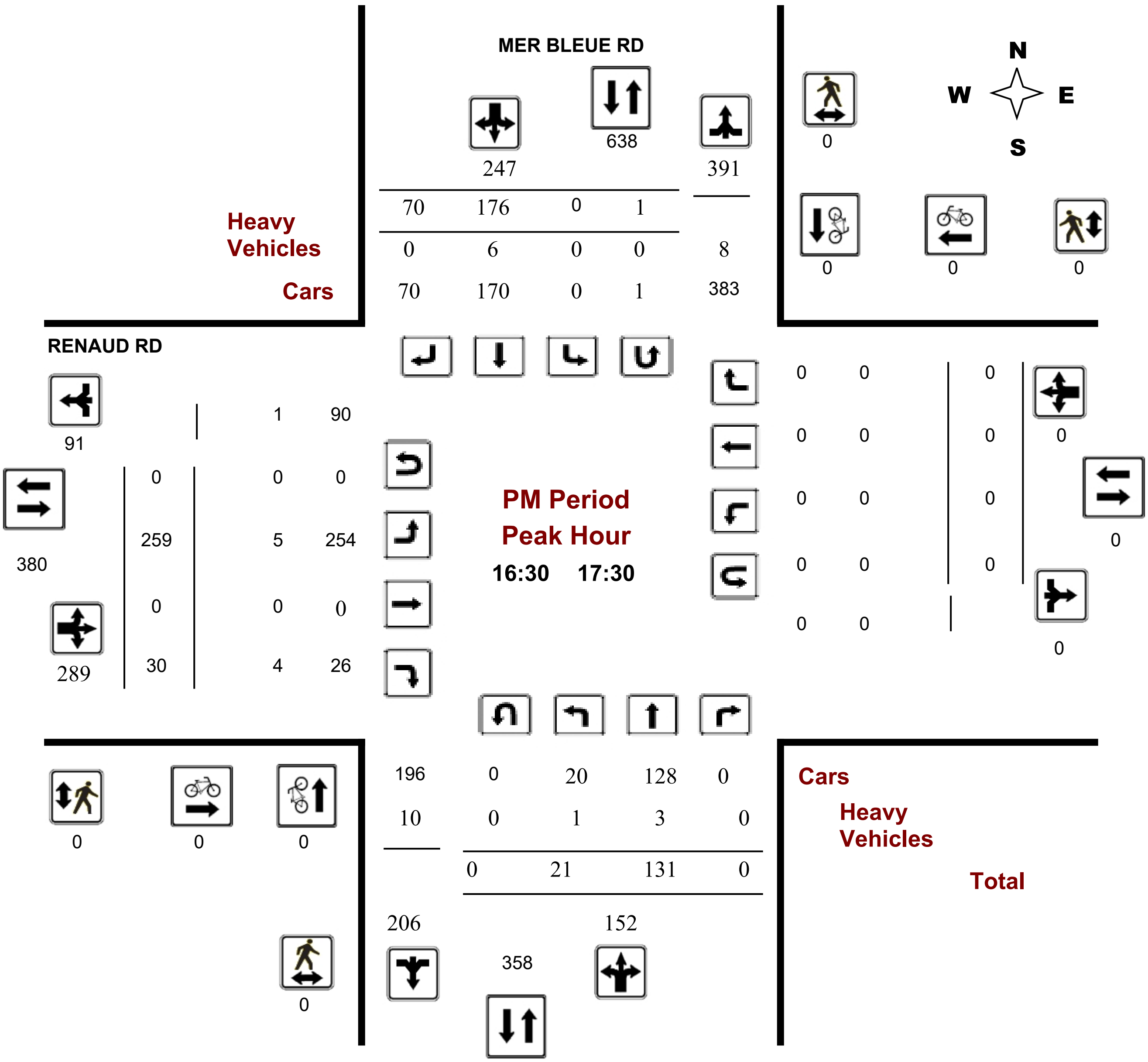
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

RENAUD RD @ MER BLEUE RD

Survey Date: Thursday, November 15, 2018 **WO No:** 38121

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



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

RENAUD RD @ MER BLEUE RD

Survey Date: Thursday, November 15, 2018 **WO No:** 38121

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

Full Study Summary (8 HR Standard)

Survey Date: Thursday, November 15, 2018

Total Observed U-Turns

Northbound: 0 Southbound: 2

Eastbound: 0 Westbound: 0

AADT Factor

.90

	MER BLEUE RD									RENAUD RD									
	Northbound				Southbound					Eastbound				Westbound					
Period	LT	ST	RT	**NB TOT**	LT	ST	RT	**SB TOT**	**STR TOT**	LT	ST	RT	**EB TOT**	LT	ST	RT	**WB TOT**	**STR TOT**	**Grand Total**
07:00 08:00	67	148	0	**215**	0	42	147	**189**	**404**	103	0	17	**120**	0	0	0	**0**	**120**	**524**
08:00 09:00	21	131	0	**152**	0	68	86	**154**	**306**	128	0	14	**142**	0	0	0	**0**	**142**	**448**
09:00 10:00	10	128	0	**138**	0	76	50	**126**	**264**	84	0	12	**96**	0	0	0	**0**	**96**	**360**
11:30 12:30	10	137	0	**147**	0	108	62	**170**	**317**	104	0	9	**113**	0	0	0	**0**	**113**	**430**
12:30 13:30	5	96	0	**101**	0	127	47	**174**	**275**	90	0	10	**100**	0	0	0	**0**	**100**	**375**
15:00 16:00	11	123	0	**134**	0	151	62	**213**	**347**	183	0	31	**214**	0	0	0	**0**	**214**	**561**
16:00 17:00	21	121	0	**142**	0	178	62	**240**	**382**	235	0	42	**277**	0	0	0	**0**	**277**	**659**
17:00 18:00	13	126	0	**139**	0	179	78	**257**	**396**	243	0	25	**268**	0	0	0	**0**	**268**	**664**
Sub Total	158	1010	0	**1168**	0	929	594	**1523**	**2691**	1170	0	160	**1330**	0	0	0	**0**	**1330**	**4021**
U Turns				**0**				**2**	**2**				**0**				**0**	**0**	**2**
Total	158	1010	0	**1168**	0	929	594	**1525**	**2693**	1170	0	160	**1330**	0	0	0	**0**	**1330**	**4023**
EQ 12Hr	220	1404	0	**1624**	0	1291	826	**2120**	**3743**	1626	0	222	**1849**	0	0	0	**0**	**1849**	**5592**

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

AVG 12Hr	186	1191	0	**1377**	0	1095	700	**1798**	**3369**	1379	0	189	**1568**	0	0	0	**0**	**1664**	**5033**

Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor. **0.9**

AVG 24Hr	244	1560	0	**1804**	0	1435	917	**2355**	**4159**	1807	0	247	**2054**	0	0	0	**0**	**2054**	**6213**

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

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

Transportation Services - Traffic Services

Turning Movement Count - Study Results

RENAUD RD @ MER BLEUE RD

Survey Date: Thursday, November 15, 2018 **WO No:** 38121

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

Full Study 15 Minute Increments

		MER BLEUE RD									RENAUD RD									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	11	20	0	31	0	4	29	33	7	14	0	3	17	0	0	0	0	7	81
07:15	07:30	22	37	0	59	0	14	44	58	6	23	0	5	28	0	0	0	0	6	145
07:30	07:45	20	52	0	72	0	12	38	50	9	24	0	0	24	0	0	0	0	9	146
07:45	08:00	14	39	0	53	0	12	36	48	11	42	0	9	51	0	0	0	0	11	152
08:00	08:15	7	28	0	35	0	22	25	47	8	26	0	4	30	0	0	0	0	8	112
08:15	08:30	8	29	0	37	0	15	20	35	5	30	0	2	32	0	0	0	0	5	104
08:30	08:45	2	33	0	35	0	13	25	38	10	31	0	5	36	0	0	0	0	10	109
08:45	09:00	4	41	0	45	0	18	16	34	4	41	0	3	44	0	0	0	0	4	123
09:00	09:15	5	35	0	40	0	18	12	30	3	19	0	1	20	0	0	0	0	3	90
09:15	09:30	0	27	0	27	0	15	10	25	6	19	0	4	23	0	0	0	0	6	75
09:30	09:45	4	40	0	44	0	25	15	40	5	23	0	3	26	0	0	0	0	5	110
09:45	10:00	1	26	0	27	0	18	13	31	4	23	0	4	27	0	0	0	0	4	85
11:30	11:45	2	39	0	41	0	30	15	45	2	20	0	1	21	0	0	0	0	2	107
11:45	12:00	3	31	0	34	0	26	18	44	4	24	0	1	25	0	0	0	0	4	103
12:00	12:15	2	29	0	31	0	22	18	40	1	31	0	4	35	0	0	0	0	1	106
12:15	12:30	3	38	0	41	0	30	11	41	5	29	0	3	32	0	0	0	0	5	114
12:30	12:45	3	22	0	25	0	33	16	49	2	16	0	1	17	0	0	0	0	2	91
12:45	13:00	1	27	0	28	0	37	10	47	1	22	0	1	23	0	0	0	0	1	98
13:00	13:15	0	26	0	26	0	29	11	40	1	27	0	3	30	0	0	0	0	1	96
13:15	13:30	1	21	0	22	0	28	10	38	2	25	0	5	30	0	0	0	0	2	90
15:00	15:15	1	28	0	29	0	34	20	54	3	40	0	3	43	0	0	0	0	3	126
15:15	15:30	5	31	0	36	0	45	14	59	3	45	0	6	51	0	0	0	0	3	146
15:30	15:45	3	29	0	32	0	34	11	45	2	52	0	13	65	0	0	0	0	2	142
15:45	16:00	2	35	0	37	0	38	17	55	7	46	0	9	55	0	0	0	0	7	147
16:00	16:15	5	29	0	34	0	52	22	74	9	48	0	10	58	0	0	0	0	9	166
16:15	16:30	5	28	0	33	0	43	13	56	6	66	0	14	80	0	0	0	0	6	169
16:30	16:45	7	34	0	41	0	43	12	56	3	67	0	9	76	0	0	0	0	3	173
16:45	17:00	4	30	0	34	0	40	15	55	5	54	0	9	63	0	0	0	0	5	152
17:00	17:15	5	36	0	41	0	53	26	79	2	64	0	3	67	0	0	0	0	2	187
17:15	17:30	5	31	0	36	0	40	17	57	0	74	0	9	83	0	0	0	0	0	176
17:30	17:45	2	26	0	28	0	54	12	66	4	62	0	8	70	0	0	0	0	4	164
17:45	18:00	1	33	0	34	0	32	23	56	2	43	0	5	48	0	0	0	0	2	138
Total:		158	1010	0	1168	0	929	594	1525	142	1170	0	160	1330	0	0	0	0	142	4,023

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

RENAUD RD @ MER BLEUE RD

Survey Date: Thursday, November 15, 2018 **WO No:** 38121

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

Full Study Cyclist Volume

Time Period		MER BLEUE RD Northbound	Southbound	Street Total	RENAUD RD Eastbound	Westbound	Street Total	Grand Total
07:00	07:15	0	0	0	0	0	0	0
07:15	07:30	0	0	0	0	0	0	0
07:30	07:45	0	0	0	0	0	0	0
07:45	08:00	0	0	0	0	0	0	0
08:00	08:15	0	0	0	0	0	0	0
08:15	08:30	0	0	0	0	0	0	0
08:30	08:45	0	0	0	0	0	0	0
08:45	09:00	0	0	0	0	0	0	0
09:00	09:15	0	0	0	0	0	0	0
09:15	09:30	0	0	0	0	0	0	0
09:30	09:45	0	0	0	0	0	0	0
09:45	10:00	0	0	0	0	0	0	0
11:30	11:45	0	0	0	0	0	0	0
11:45	12:00	0	0	0	0	0	0	0
12:00	12:15	0	0	0	0	0	0	0
12:15	12:30	0	0	0	0	0	0	0
12:30	12:45	0	0	0	0	0	0	0
12:45	13:00	0	0	0	0	0	0	0
13:00	13:15	0	0	0	0	0	0	0
13:15	13:30	0	0	0	0	0	0	0
15:00	15:15	0	0	0	0	0	0	0
15:15	15:30	0	0	0	0	0	0	0
15:30	15:45	0	0	0	0	0	0	0
15:45	16:00	0	0	0	0	0	0	0
16:00	16:15	0	0	0	0	0	0	0
16:15	16:30	0	0	0	0	0	0	0
16:30	16:45	0	0	0	0	0	0	0
16:45	17:00	0	0	0	0	0	0	0
17:00	17:15	0	0	0	0	0	0	0
17:15	17:30	0	0	0	0	0	0	0
17:30	17:45	0	0	0	0	0	0	0
17:45	18:00	0	0	0	0	0	0	0
Total		0	0	**0**	0	0	0	0

Transportation Services - Traffic Services

Turning Movement Count - Study Results

RENAUD RD @ MER BLEUE RD

Survey Date: Thursday, November 15, 2018 **WO No:** 38121

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

Full Study Pedestrian Volume

Time Period	MER BLEUE RD NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	RENAUD RD EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	0	0	**0**	0	0	**0**	**0**
07:15 07:30	0	0	**0**	0	0	**0**	**0**
07:30 07:45	0	0	**0**	0	0	**0**	**0**
07:45 08:00	0	0	**0**	0	0	**0**	**0**
08:00 08:15	0	0	**0**	0	0	**0**	**0**
08:15 08:30	0	0	**0**	0	0	**0**	**0**
08:30 08:45	0	0	**0**	0	0	**0**	**0**
08:45 09:00	0	0	**0**	1	0	**1**	**1**
09:00 09:15	0	1	**1**	0	0	**0**	**1**
09:15 09:30	0	0	**0**	0	0	**0**	**0**
09:30 09:45	0	0	**0**	0	0	**0**	**0**
09:45 10:00	0	0	**0**	0	0	**0**	**0**
11:30 11:45	0	0	**0**	0	0	**0**	**0**
11:45 12:00	0	0	**0**	0	0	**0**	**0**
12:00 12:15	0	0	**0**	0	0	**0**	**0**
12:15 12:30	0	0	**0**	0	0	**0**	**0**
12:30 12:45	0	0	**0**	0	0	**0**	**0**
12:45 13:00	0	0	**0**	0	0	**0**	**0**
13:00 13:15	0	0	**0**	0	0	**0**	**0**
13:15 13:30	0	0	**0**	0	0	**0**	**0**
15:00 15:15	0	1	**1**	0	0	**0**	**1**
15:15 15:30	0	0	**0**	0	0	**0**	**0**
15:30 15:45	0	0	**0**	0	0	**0**	**0**
15:45 16:00	0	0	**0**	0	0	**0**	**0**
16:00 16:15	0	0	**0**	0	0	**0**	**0**
16:15 16:30	0	0	**0**	1	0	**1**	**1**
16:30 16:45	0	0	**0**	0	0	**0**	**0**
16:45 17:00	0	0	**0**	0	0	**0**	**0**
17:00 17:15	0	0	**0**	0	0	**0**	**0**
17:15 17:30	0	0	**0**	0	0	**0**	**0**
17:30 17:45	0	0	**0**	0	0	**0**	**0**
17:45 18:00	0	0	**0**	0	0	**0**	**0**
Total	0	2	**2**	2	0	**2**	**4**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

RENAUD RD @ MER BLEUE RD

Survey Date: Thursday, November 15, 2018 **WO No:** 38121

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

Full Study Heavy Vehicles

		MER BLEUE RD									RENAUD RD								
		Northbound				Southbound					Eastbound				Westbound				
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	1	5	0	**6**	0	0	1	**1**	**7**	2	0	1	**3**	0	0	0	**0**	**3**	**10**
07:15	07:30	1	3	0	**4**	0	1	1	**2**	**6**	2	0	0	**2**	0	0	0	**0**	**2**	**8**
07:30	07:45	3	2	0	**5**	0	1	3	**4**	**9**	2	0	0	**2**	0	0	0	**0**	**2**	**11**
07:45	08:00	1	4	0	**5**	0	1	5	**6**	**11**	9	0	2	**11**	0	0	0	**0**	**11**	**22**
08:00	08:15	0	2	0	**2**	0	5	1	**6**	**8**	2	0	1	**3**	0	0	0	**0**	**3**	**11**
08:15	08:30	1	2	0	**3**	0	1	1	**2**	**5**	2	0	1	**3**	0	0	0	**0**	**3**	**8**
08:30	08:45	1	2	0	**3**	0	3	4	**7**	**10**	1	0	0	**1**	0	0	0	**0**	**1**	**11**
08:45	09:00	1	1	0	**2**	0	2	0	**2**	**4**	0	0	1	**1**	0	0	0	**0**	**1**	**5**
09:00	09:15	0	2	0	**2**	0	1	0	**1**	**3**	1	0	1	**2**	0	0	0	**0**	**2**	**5**
09:15	09:30	0	1	0	**1**	0	4	1	**5**	**6**	0	0	0	**0**	0	0	0	**0**	**0**	**6**
09:30	09:45	1	2	0	**3**	0	1	1	**2**	**5**	2	0	2	**4**	0	0	0	**0**	**4**	**9**
09:45	10:00	0	1	0	**1**	0	1	2	**3**	**4**	0	0	1	**1**	0	0	0	**0**	**1**	**5**
11:30	11:45	0	2	0	**2**	0	0	0	**0**	**2**	0	0	1	**1**	0	0	0	**0**	**1**	**3**
11:45	12:00	0	3	0	**3**	0	1	0	**1**	**4**	0	0	0	**0**	0	0	0	**0**	**0**	**4**
12:00	12:15	1	0	0	**1**	0	0	0	**0**	**1**	1	0	0	**1**	0	0	0	**0**	**1**	**2**
12:15	12:30	1	1	0	**2**	0	3	0	**3**	**5**	2	0	1	**3**	0	0	0	**0**	**3**	**8**
12:30	12:45	1	0	0	**1**	0	1	0	**1**	**2**	2	0	1	**3**	0	0	0	**0**	**3**	**5**
12:45	13:00	0	0	0	**0**	0	1	0	**1**	**1**	2	0	0	**2**	0	0	0	**0**	**2**	**3**
13:00	13:15	0	0	0	**0**	0	1	0	**1**	**1**	1	0	2	**3**	0	0	0	**0**	**3**	**4**
13:15	13:30	1	0	0	**1**	0	0	1	**1**	**2**	0	0	1	**1**	0	0	0	**0**	**1**	**3**
15:00	15:15	0	2	0	**2**	0	1	0	**1**	**3**	0	0	0	**0**	0	0	0	**0**	**0**	**3**
15:15	15:30	0	1	0	**1**	0	0	2	**2**	**3**	0	0	0	**0**	0	0	0	**0**	**0**	**3**
15:30	15:45	1	1	0	**2**	0	0	0	**0**	**2**	0	0	2	**2**	0	0	0	**0**	**2**	**4**
15:45	16:00	1	2	0	**3**	0	3	1	**4**	**7**	0	0	1	**1**	0	0	0	**0**	**1**	**8**
16:00	16:15	1	0	0	**1**	0	6	2	**8**	**9**	1	0	1	**2**	0	0	0	**0**	**2**	**11**
16:15	16:30	1	1	0	**2**	0	4	0	**4**	**6**	2	0	3	**5**	0	0	0	**0**	**5**	**11**
16:30	16:45	0	0	0	**0**	0	3	0	**3**	**3**	0	0	2	**2**	0	0	0	**0**	**2**	**5**
16:45	17:00	0	3	0	**3**	0	2	0	**2**	**5**	1	0	1	**2**	0	0	0	**0**	**2**	**7**
17:00	17:15	1	0	0	**1**	0	1	0	**1**	**2**	1	0	0	**1**	0	0	0	**0**	**1**	**3**
17:15	17:30	0	0	0	**0**	0	0	0	**0**	**0**	3	0	1	**4**	0	0	0	**0**	**4**	**4**
17:30	17:45	1	0	0	**1**	0	1	2	**3**	**4**	1	0	1	**2**	0	0	0	**0**	**2**	**6**
17:45	18:00	0	1	0	**1**	0	0	1	**1**	**2**	1	0	0	**1**	0	0	0	**0**	**1**	**3**
Total:	None	20	44	0	**64**	0	49	29	**78**	**142**	41	0	28	**69**	0	0	0	**0**	**69**	**211**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

RENAUD RD @ MER BLEUE RD

Survey Date: Thursday, November 15, 2018 **WO No:** 38121

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

Full Study 15 Minute U-Turn Total

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

Appendix C

Collision Data

Accident Date	Accident Year	Accident Time	Location	Environment Condition	Light	Traffic Control	Classification Of Accident	Initial Impact Type	Road Surface Condition
2015-09-24	2015	17:33	BRIAN COBURN BLVD @ MER BLEUE RD	01 - Clear	01 - Daylight	02 - Stop sign	03 - P.D. only	03 - Rear end	01 - Dry
2015-04-14	2015	15:51	BRIAN COBURN BLVD @ MER BLEUE RD	01 - Clear	01 - Daylight	02 - Stop sign	03 - P.D. only	02 - Angle	01 - Dry
2016-01-04	2016	19:37	BRIAN COBURN BLVD @ MER BLEUE RD	01 - Clear	07 - Dark	01 - Traffic signal	03 - P.D. only	03 - Rear end	01 - Dry
2016-10-04	2016	7:15	BRIAN COBURN BLVD @ MER BLEUE RD	01 - Clear	01 - Daylight	11 - Roundabout	03 - P.D. only	03 - Rear end	01 - Dry
2017-09-27	2017	18:30	BRIAN COBURN BLVD @ MER BLEUE RD	01 - Clear	05 - Dusk	11 - Roundabout	03 - P.D. only	03 - Rear end	01 - Dry
2017-02-07	2017	22:38	BRIAN COBURN BLVD @ MER BLEUE RD	03 - Snow	07 - Dark	11 - Roundabout	03 - P.D. only	07 - SMV other	03 - Loose snow
2017-03-08	2017	7:20	BRIAN COBURN BLVD @ MER BLEUE RD	04 - Freezing Rain	01 - Daylight	11 - Roundabout	03 - P.D. only	07 - SMV other	06 - Ice
2017-03-30	2017	20:52	BRIAN COBURN BLVD @ MER BLEUE RD	01 - Clear	07 - Dark	11 - Roundabout	03 - P.D. only	02 - Angle	01 - Dry
2018-06-22	2018	10:17	BRIAN COBURN BLVD @ MER BLEUE RD (0014363)	01 - Clear	01 - Daylight	11 - Roundabout	03 - P.D. only	03 - Rear end	01 - Dry

Accident Date	Accident Year	Accident Time	Location	Environment Condition	Light	Traffic Control	Classification Of Accident	Initial Impact Type	Road Surface Condition
2015-02-20	2015	10:37	BRIAN COBURN BLVD @ GERRY LALONDE DR	01 - Clear	01 - Daylight	02 - Stop sign	03 - P.D. only	05 - Turning movement	01 - Dry
2017-05-08	2017	23:21	BRIAN COBURN BLVD @ GERRY LALONDE DR	01 - Clear	07 - Dark	02 - Stop sign	03 - P.D. only	07 - SMV other	01 - Dry
2018-10-10	2018	6:30	BRIAN COBURN BLVD @ GERRY LALONDE DR (0014327)	07 - Fog, mist, smoke, du	03 - Dawn	02 - Stop sign	03 - P.D. only	03 - Rear end	02 - Wet

Accident Date	Accident Year	Accident Time	Location	Environment Condition	Light	Traffic Control	Classification Of Accident	Initial Impact Type	Road Surface Condition
2016-08-14	2016	8:47	RENAUD RD @ MER BLEUE RD	01 - Clear	01 - Daylight	02 - Stop sign	03 - P.D. only	07 - SMV other	01 - Dry
2017-02-03	2017	16:33	RENAUD RD @ MER BLEUE RD	01 - Clear	01 - Daylight	02 - Stop sign	03 - P.D. only	02 - Angle	01 - Dry
2017-03-02	2017	16:06	RENAUD RD @ MER BLEUE RD	01 - Clear	01 - Daylight	02 - Stop sign	03 - P.D. only	03 - Rear end	01 - Dry

Accident Date	Accident Year	Accident Time	Location	Environment Condition	Light	Traffic Control	Classification Of Accident	Initial Impact Type	Road Surface Condition
2017-10-18	2017	7:55	BRIAN COBURN BLVD btwn CHAPERAL PRIV & MER BLEUE RD	01 - Clear	01 - Daylight	10 - No control	02 - Non-fatal injury	03 - Rear end	01 - Dry
2018-09-05	2018	8:09	BRIAN COBURN BLVD btwn CHAPERAL PRIV & MER BLEUE RD (e___2HGI)	01 - Clear	01 - Daylight	10 - No control	02 - Non-fatal injury	03 - Rear end	01 - Dry

Accident Date	Accident Year	Accident Time	Location	Environment Condition	Light	Traffic Control	Classification Of Accident	Initial Impact Type	Road Surface Condition
2018-03-19	2018	15:34	BRIAN COBURN BLVD btwn FERN CASEY ST & MER BLEUE RD (e___2IA9)	01 - Clear	01 - Daylight	10 - No control	03 - P.D. only	01 - Approaching	01 - Dry
2018-05-16	2018	18:00	BRIAN COBURN BLVD btwn FERN CASEY ST & MER BLEUE RD (e___2IA9)	01 - Clear	01 - Daylight	10 - No control	03 - P.D. only	04 - Sideswipe	01 - Dry
2018-12-02	2018	15:33	BRIAN COBURN BLVD btwn FERN CASEY ST & MER BLEUE RD (e___2IA9)	02 - Rain	01 - Daylight	10 - No control	03 - P.D. only	05 - Turning movement	02 - Wet

Accident Date	Accident Year	Accident Time	Location	Environment Condition	Light	Traffic Control	Classification Of Accident	Initial Impact Type	Road Surface Condition
2014-02-12	2014	7:54	BRIAN COBURN BLVD btwn GERRY LALONDE DR & STRASBOURG ST	01 - Clear	01 - Daylight	10 - No control	03 - P.D. only	99 - Other	01 - Dry
2016-04-29	2016	10:41	BRIAN COBURN BLVD btwn GERRY LALONDE DR & STRASBOURG ST	01 - Clear	01 - Daylight	10 - No control	03 - P.D. only	03 - Rear end	01 - Dry
2017-06-05	2017	14:09	BRIAN COBURN BLVD btwn GERRY LALONDE DR & STRASBOURG ST	02 - Rain	01 - Daylight	10 - No control	02 - Non-fatal injury	01 - Approaching	02 - Wet
2018-01-08	2018	9:20	BRIAN COBURN BLVD btwn GERRY LALONDE DR & STRASBOURG ST (__6ZT4Q	03 - Snow	01 - Daylight	10 - No control	03 - P.D. only	03 - Rear end	03 - Loose snow
2018-12-10	2018	0:43	BRIAN COBURN BLVD btwn GERRY LALONDE DR & STRASBOURG ST (__6ZT4Q	01 - Clear	07 - Dark	10 - No control	02 - Non-fatal injury	07 - SMV other	02 - Wet

Accident Date	Accident Year	Accident Time	Location	Environment Condition	Light	Traffic Control	Classification Of Accident	Initial Impact Type	Road Surface Condition
2014-03-16	2014	16:29	Gerry Lalonde Dr btwn Brian Coburn Blvd and Trigoria Cres	01 - Clear	01 - Daylight	01 - Traffic signal	03 - P.D. only	02 - Angle	01 - Dry
2014-03-26	2014	17:00	Gerry Lalonde Dr btwn Brian Coburn Blvd and Trigoria Cres	01 - Clear	01 - Daylight	10 - No control	03 - P.D. only	03 - Rear end	01 - Dry
2014-05-21	2014	12:07	Gerry Lalonde Dr btwn Brian Coburn Blvd and Trigoria Cres	01 - Clear	01 - Daylight	10 - No control	03 - P.D. only	06 - SMV unattended vehicle	01 - Dry

Accident Date	Accident Year	Accident Time	Location	Environment Condition	Light	Traffic Control	Classification Of Accident	Initial Impact Type	Road Surface Condition
2014-09-23	2014	20:57	MER BLEUE RD btwn 210 S OF INNES RD & RENAUD RD	07 - Fog, mist, smoke, du	07 - Dark	10 - No control	03 - P.D. only	07 - SMV other	01 - Dry
2014-11-04	2014	2:18	MER BLEUE RD btwn 210 S OF INNES RD & RENAUD RD	01 - Clear	07 - Dark	10 - No control	03 - P.D. only	07 - SMV other	01 - Dry
2015-02-26	2015	17:06	MER BLEUE RD btwn 210 S OF INNES RD & RENAUD RD	01 - Clear	01 - Daylight	10 - No control	03 - P.D. only	04 - Sideswipe	01 - Dry
2015-02-08	2015	10:53	MER BLEUE RD btwn 210 S OF INNES RD & RENAUD RD	03 - Snow	01 - Daylight	10 - No control	03 - P.D. only	99 - Other	03 - Loose snow
2016-05-31	2016	12:02	MER BLEUE RD btwn 210 S OF INNES RD & RENAUD RD	01 - Clear	01 - Daylight	10 - No control	03 - P.D. only	04 - Sideswipe	01 - Dry
2016-11-03	2016	7:19	MER BLEUE RD btwn 210 S OF INNES RD & RENAUD RD	02 - Rain	03 - Dawn	10 - No control	03 - P.D. only	04 - Sideswipe	02 - Wet

Accident Date	Accident Year	Accident Time	Location	Environment Condition	Light	Traffic Control	Classification Of Accident	Initial Impact Type	Road Surface Condition
2014-10-15	2014	16:34	MER BLEUE RD btwn RENAUD RD & DU PALAIS ST	02 - Rain	01 - Daylight	10 - No control	03 - P.D. only	03 - Rear end	02 - Wet

Accident Date	Accident Year	Accident Time	Location	Environment Condition	Light	Traffic Control	Classification Of Accident	Initial Impact Type	Road Surface Condition
2015-02-14	2015	14:40	RENAUD RD btwn WHITE ST & MER BLEUE RD	01 - Clear	01 - Daylight	10 - No control	02 - Non-fatal injury	02 - Angle	03 - Loose snow
2015-02-21	2015	10:42	RENAUD RD btwn WHITE ST & MER BLEUE RD	03 - Snow	01 - Daylight	10 - No control	03 - P.D. only	07 - SMV other	03 - Loose snow
2016-06-30	2016	7:01	RENAUD RD btwn WHITE ST & MER BLEUE RD	01 - Clear	01 - Daylight	10 - No control	03 - P.D. only	05 - Turning movement	01 - Dry

LOCATION & GEOID	TOTAL_COLLISIONS	TOTAL_CYCLIST_COLLISIONS	TOTAL_PEDESTRIAN_COLLISIONS
BRIAN COBURN BLVD @ MER BLEUE RD (0014363)	9	0	0
BRIAN COBURN BLVD @ GERRY LALONDE DR (0014327)	3	0	0
RENAUD RD @ MER BLEUE RD (0012893)	3	0	0
BRIAN COBURN BLVD btwn CHAPERAL PRIV & MER BLEUE RD (e___2HGI)	2	0	0
BRIAN COBURN BLVD btwn FERN CASEY ST & MER BLEUE RD (e___2IA9)	3	0	0
BRIAN COBURN BLVD btwn GERRY LALONDE DR & STRASBOURG ST (__6ZT4QS)	5	0	0
GERRY LALONDE DR btwn BRIAN COBURN BLVD & CHINIAN ST/TRIGORIA CRES (__86L66A)	3	0	0
MER BLEUE RD btwn 210 S OF INNES RD & RENAUD RD (__3ZA2S1B)	6	0	0
MER BLEUE RD btwn RENAUD RD & DU PALAIS ST (__3ZBO5M)	1	0	0
RENAUD RD btwn WHITE ST & MER BLEUE RD (__3ZA6P1)	3	0	0

Appendix D

Mer-Bleue Rd. at Decoeur Dr. Proposed Intersection Improvements - TrailsEdge East CTS

- ***Mer Bleue Road / Axis Way / Decoeur***: This intersection would be the main access to the TrailsEdge East lands and Avalon West community to the east. It is anticipated that this intersection would initially operate as a two-way STOP-Controlled intersection until development progresses east and west of Mer Bleue Road and the need for a traffic control signal is met. For the purpose of this study, it is assumed that TrailsEdge East and Avalon West lands be fully developed by 2021 horizon year and therefore traffic signals were assumed to be in place by 2021. However, the intersection should be monitored at time closer to 2021 to ensure that development on either side is progressing as anticipated and traffic signals are warranted.
- ***Mer Bleue Road / Renaud Road***: The existing All-Way STOP Controlled T-intersection would be converted to a 4-Way intersection by 2020 to serve the proposed Mattamy development east of Mer Bleue Road. The 4-Way STOP-Controlled intersection would operate at satisfactory overall LOS "D" during the afternoon peak hour of travel demand. The SB movement operates at a congested level of service during the afternoon peak hour. It should be noted that the 2405 Mer Bleue Road[6] TIS assumed that traffic signals be in place by 2021 once the residential community (Mattamy) east of Mer Bleue Road is developed. It is recommended that the intersection be monitored at a time closer to 2021 as developments progress in the area to determine if signals are warranted. For the purpose of this study, the intersection was also simulated as a traffic signal with auxiliary lanes, which results in satisfactory level of service.
- All remaining study area intersections operate at satisfactory level of service during both peak hours of travel demand.

6.4 2026 Forecast Analysis

The 2026 forecast analysis indicates that:

- ***Mer Bleue Road / Brian Coburn Boulevard***: The WB and EB movements continue to exhibit unsatisfactory level of service during the peak hour of travel demand as background traffic grows. Once again, this study assumed an aggressive build-out of adjacent developments, which assume a worst-case scenario on the adjacent roadway network.
- ***Navan Road / Renaud Road***: The intersection exhibits satisfactory level of service on all approaches once the east leg of Renaud Road is closed. Traffic using Renaud Road is expected to divert to Brian Coburn Boulevard and head south on Navan Road to reach west of Navan Road (i.e. Anderson Road). This would alleviate pressure at the NB-LT movement and divert traffic to the SB-RT movement.
- All remaining study area intersections operate at satisfactory level of service during both peak hours of travel demand.

6 2405 Mer Bleue Road Transportation Impact Study, Stantec April 2014

Appendix E

Brian Coburn Blvd. at Jerome Jodoin Dr. Proposed Intersection Improvements – PIED Report

Report to
Rapport au:

Planning Committee / Comité de l'urbanisme
April 11, 2019 / 11 avril 2019

and Council / et au Conseil
April 24, 2019 / 24 avril 2019

Submitted on March 28, 2019
Soumis le 28 mars 2019

Submitted by
Soumis par:
Lee Ann Snedden
Director / Directrice
Planning Services / Services de la planification
Planning, Infrastructure and Economic Development Department / Direction générale de la planification, de l'infrastructure et du développement économique

Contact Person
Personne ressource:
Jeff McEwen
Manager/Gestionnaire, Development Review-Suburban Services/Examen des projets d'aménagement-Services suburbains
613-580-2424, 16597, Jeff.McEwen@ottawa.ca

Ward: CUMBERLAND (19) **File Number**: ACS2019-PIE-PS-0030

SUBJECT: **Front-Ending Report – Roundabout (Brian Coburn Boulevard at Gerry Lalonde Drive/Jerome Jodoin Drive)**

OBJET: **Rapport d'entente préalable – Carrefour giratoire (promenade Brian Coburn, à l'angle des promenades Gerry Lalonde et Jerome Jodoin)**

REPORT RECOMMENDATIONS

That Planning Committee recommend that Council:

1. **Delegate authority to the General Manager, Planning, Infrastructure and**

Economic Development Department, to enter into a Front-Ending Agreement with Minto Communities - Canada for the design and construction of a roundabout at the intersection of Brian Coburn Boulevard and Gerry Lalonde Drive/Jerome Jodoin Drive as outlined in this report, to an upset limit of $1,800,000 including applicable taxes and indexing, in accordance with the Front-Ending Agreement Principles and Policy set forth in Documents 1 and 2 and with the final form and content being to the satisfaction of the City Clerk and Solicitor;

2. **Authorize the financial disbursement to reimburse the design and construction costs incurred by Minto Communities - Canada pursuant to the execution of the Front-Ending Agreement;**

3. **Authorize the pre-committal of $1,800,000 including applicable taxes (the upset limit of the Front-Ending Agreement) from the 2019 and 2020 Capital Budget/Development Charges Forecast subject to execution of the Front- Ending Agreement;**

4. **Authorize the expenditure of $1,800,000 including applicable taxes (upset limit) in accordance with the reimbursement schedule set out in the Front-Ending Agreement.**

RECOMMANDATIONS DU RAPPORT

Que le Comité de l'urbanisme recommande ce qui suit au Conseil :

1. **Déléguer au directeur général de Planification, Infrastructure et Développement économique le pouvoir de conclure une entente préalable avec Minto Communities - Canada, en vue de procéder à la conception et à l'installation d'un carrefour giratoire à l'angle du boulevard Brian-Coburn et des promenades Gerry-Lalonde et Jerome-Jodoin, comme le décrit le présent rapport, jusqu'à concurrence de 1 800 000 $, taxes applicables et indexation en sus, conformément aux principes et à la politique de l'entente préalable énoncés dans les documents 1 et 2, et dont la forme et le contenu définitifs seront à la satisfaction du greffier municipal et de l'avocat général;**

2. **Autoriser la sortie des fonds nécessaires au remboursement des coûts de conception et de construction engagés par Minto Communities - Canada, dans le cadre de l'exécution de l'entente préalable;**

3. **Autoriser l’engagement préalable d’une somme de 1 800 000 $, taxes applicables en sus, (la limite maximale de l’entente préalable) provenant du budget d’immobilisations de 2019 et 2020 et des prévisions de redevances d’aménagement, sous réserve de l’exécution de l’entente préalable;**

4. **Autoriser la dépense de 1 800 000 $, taxes applicables en sus, (la limite maximale de l’entente préalable), conformément au calendrier de remboursement fixé dans l’entente préalable.**

BACKGROUND

Minto Communities – Canada received draft plan of subdivision approval on January 9, 2007 and an extension and revision of that draft approval on October 2, 2014 for the lands at 2233 Mer-Bleue Road, which is located in Avalon West, between Mer-Bleue Road and Tenth Line Road in Orléans.

The intersection was originally to be a signalized intersection. An “Intersection Control and Roundabout Feasibility Study” prepared for the City of Ottawa by Robinson Consultants Inc. in January 2016 looked at roundabouts versus signals at Brian Coburn Boulevard for the intersections at Gerry Lalonde Drive, Strasbourg Street, Aquaview Drive, Esprit Drive and signals at Tenth Line Road. The study determined that mixed corridor with single-lane roundabouts at the intersections of Brian Coburn Boulevard at Gerry Lalonde Drive and Brian Coburn Boulevard at Strasbourg Street/Des Aubépines Drive and signals at Tenth Line Road, Aquaview Drive and Esprit Drive would operate at an acceptable level of service in both the 2021 and 2031 periods and is anticipated to have the lowest capital cost.

The proposed works include the design and construction of a single-lane roundabout at the intersection of Brian Coburn Boulevard and Gerry Lalonde Drive/Jerome Jodoin Drive in Orléans (Cumberland Ward 19). The roundabout is identified in the City of Ottawa 2014 Development Charge By-law as an intersection construction project.

The upset limit provided for the works is $1,800,000 including applicable taxes for design and construction. Reimbursement for the roundabout is identified for 2020 if constructed in 2019. Minto Communities - Canada shall be required to enter into an agreement with the City for the design and construction of the roundabout as identified in the subdivision agreement. The construction of the roundabout will coincide with the opening of the intersection of Jerome Jodoin Drive at Brian Coburn Boulevard in 2019.

DISCUSSION

The intersection of Brian Coburn Boulevard and Gerry Lalonde Drive was originally to be a signalized intersection. An “Intersection Control and Roundabout Feasibility Study” prepared for the City of Ottawa by Robinson Consultants Inc. in January 2016 looked at roundabouts versus signals on Brian Coburn Boulevard. The study determined that a single-lane roundabout at this intersection would operate at an acceptable level of service in both the 2021 and 2031 periods and is anticipated to have the lowest capital cost.

The continuous, steady growth of the Minto Communities development south of Brian Coburn Boulevard requires a controlled intersection at Gerry Lalonde Drive/Jerome Jodoin Drive for access and egress. A roundabout is preferred to a traffic signal as it will provide the most efficient method for travelling along Brian Coburn Boulevard, without causing any additional delay to this road. The benefits of the roundabout are fewer conflict points, reductions in number and severity of collisions, slower speeds and therefore reduced pollution and fuel usages.

RURAL IMPLICATIONS

There are no rural implications associated with the proposed Front-Ending Agreement.

CONSULTATION

All development approvals were conducted according to the requirements of the *Planning Act* and the City’s Public Notification and Consultation Policy. The front-ending entities agree to the process outlined herein.

COMMENTS BY THE WARD COUNCILLOR

Councillor Blais fully supports the installation of the roundabout.

LEGAL IMPLICATIONS

There are no legal impediments to the implementation of this report’s recommendation. Subject to Council approval, the City will be entering into a standard Front-Ending agreement with the developer to front end the cost of the roundabout at Brian Coburn Boulevard at Gerry Lalonde/Jerome Jodoin Drive, in accordance with the Council approved Front-Ending policy.

RISK MANAGEMENT IMPLICATIONS

There are no risk implications associated with the front-ending of the intersection.

ASSET MANAGEMENT IMPLICATIONS

The recommendations documented in this report are consistent with the City's Comprehensive Asset Management (CAM) Program objectives. The implementation of the CAM program results in timely decisions that minimize lifecycle costs and ensure the long-term affordability of assets. To fulfill its obligation to deliver quality services to the community, the City must ensure that assets supporting City services are managed in a way that balances service levels, risk and affordability.

Entering into Front-Ending Agreements with the Developers associated with the adjacent plan of subdivision for the design and construction of a roundabout at Brian Coburn Boulevard at Gerry Lalonde Drive/Jerome Jodoin Drive supports a level of service expectation and what needs to be done to achieve those levels.

FINANCIAL IMPLICATIONS

The front-ending report and subsequent agreement are in accordance with the Council approved Development Charges Background Study. The intersection of Coburn Boulevard at Gerry Lalonde Drive/Jerome Jodoin Drive is item number 1.XXX36 as listed in the 2014 Development Charges Background Study.

The project has an upset limit of $1,800,000 including applicable taxes for reimbursement in 2020.

Development Charge Item	Up-Set Limit (including applicable taxes)	Criteria for Repayment
A. Construction – Intersection roundabout	$1,285,720	Repayment based on the actual value **to** upset limit.
B. 15% Engineering	$192,855 (15% of construction)	Repayment based on the actual value **to** upset limit.
C.10% Project Management	$128,570 (10% of Civil works for the intersection)	Repayment based on the actual value **to** upset limit.

D. 15% Contingency	$ 192,855 (15% contingency)	Repayment based on the actual value **to** upset limit. All contingencies must be justified and supported by invoices and payment

Repayment shall be based on the actual value to an upset limit of $1,800,000 including applicable taxes. Should the actual costs exceed the upset limit, the additional costs shall be borne by the developer and the City shall not be obligated to compensate for additional costs.

Repayment is subject to fulfilment of the Front-Ending Agreement conditions, and will be based on the actual value of the costs incurred.

Pending Council approval for the City to enter into the Front-Ending Agreement, a capital account will be established with budget authority of $1,800,000, 100 percent Roads and Related Services Development Charge funded.

Once the works are accepted, the City shall assume maintenance of the intersection roundabout. With this intersection currently in operation with stop control, the proposed geometric modifications will not have any additional operating impacts.

ACCESSIBILITY IMPACTS

All infrastructure will be designed in accordance with all relevant legislation and regulations.

ENVIRONMENTAL IMPLICATIONS

There are no environmental implications with the front ending of this intersection.

TERM OF COUNCIL PRIORITIES

This project addresses the following Term of Council Priority:

- TM4 – Improve safety for all road users.

SUPPORTING DOCUMENTATION

Document 1 Front-Ending Agreement Principles

Document 2 Council Approved Front-Ending Policy

Document 3 Location Map

DISPOSITION

Staff are recommending this report be considered at the April 24, 2019 Council meeting.

Legal Services to prepare the final form of the agreements in consultation with the Planning, Infrastructure and Economic Development Department.

The Treasurer to earmark funds for repayment as noted in this report.

Document 1 – Front-Ending Agreement Principles

1. Minto Communities - Canada are required to post 100 per cent securities for the full cost of the design and construction of traffic signals for the intersection of Brian Coburn Boulevard and Gerry Lalonde Drive/Jerome Jodoin Drive, including all associated works, estimated at $1,800,000 including engineering, land remuneration, project management and contingences, and applicable taxes.

2. The cost of the roundabout of the intersection of Brian Coburn Boulevard and Gerry Lalonde Drive/Jerome Jodoin Drive, including all associated works, is set at an upset limit of $1,800,000 including engineering, land remuneration, project management and contingencies, and applicable taxes. All costs incurred shall be justified and include supporting invoices and payment certificates.

3. The City will reimburse Minto Communities - Canada after the works have been accepted by the City. Reimbursement will take place following acceptance in 2020, provided the applicant satisfies all requirements in accordance with the Council approved Front-Ending Policies in Document 2.

4. The repayment of construction costs for the roundabout of the Brian Coburn Boulevard and Gerry Lalonde Drive/Jerome Jodoin Drive intersection shall be pursuant to Council-approved Front-Ending Agreement Policy as referenced under Document 2.

Document 2 – Council Approved Front-Ending Policy

Front-Ending Agreements are requested by developers who wish to have specific growth-related capital works in place in advance of the City's capital project plans for emplacement of these same works: developers agree to finance the works at the "front-end" and recover their costs from the City at a later date. The following conditions must be met in order for the City to enter into a Front-Ending Agreement:

1. All Front-Ending Agreements with the City will be for growth-related capital works that have been included in a development charge study.

2. The contract for front-ended works shall be awarded by the front-ender in accordance with the City's Purchasing Policy of a competitive procurement process and subject to the review and satisfaction of the General Manager, Planning, Infrastructure and Economic Development Department. Where the front-ender does not award the work in accordance with the City's purchasing policy, they must demonstrate that competitive pricing has been obtained, through independent analysis of their engineer, to the satisfaction of the General Manager, Planning, Infrastructure and Economic Development Department. The contract for the work must be made available to the City to provide to the public.

3. Stormwater ponds and related sewer works that are 100 per cent development charge funded in the recommended by-laws will be paid back to the developer based on revenues as they are collected from the designated area. This means that at no time are the repayments to exceed the revenues received. Each Front-Ending Agreement will define the geographic area involved and a separate and specific deferred revenue account may be set up to keep track of the revenues collected and payments made. Crediting will also be allowed for the Front-Ending Agreements related to storm water ponds. Indexing shall apply to the outstanding balance in accordance with the rate of indexation pursuant to the Development Charge By-laws.

4. For all other capital projects, a lump sum payment, both the development charge portion and the City portion, will be made to the developer in the year the project is identified in the City's 10-year capital plan at the time the Front-Ending Agreement is approved. Should growth occur earlier than forecasted, then repayment would be accelerated to reflect the revised timing the City would have budgeted for the project. If growth occurs more slowly than forecasted, then the City will have an additional one to three years (one to three years from the year the project was identified in the 10-year plan) to make repayments. Only in this latter case will the City's portion of the payment be indexed beginning with the

year the project was identified in the 10-year plan.

5. Given that the City will be assuming operating costs earlier than anticipated through the Front-Ending Agreement process; the City is not to pay any carrying costs to the developer.

6. All development charges payable by developers must be paid up front in accordance with the City's by-law. With the exception of the stormwater ponds and related sewer works, there will not be any crediting allowed as a result of entering into a Front-Ending Agreement. On December 8, 2004, City Council approved, "That staff be directed to work with the industry to develop the details of a credit policy to be incorporated into the Front-Ending Policy".

7. In the case where multiple Front-Ending Agreements are in force in the same area-specific Development Charge By-law, and the City has approved the front-ended works for development charge reimbursements, the front-enders will share in the distribution of development charge revenues on a pro-rata basis with other storm water drainage projects. The pro-rated works shall be based on the balance of the outstanding amount owing on the date the repayment is due. Existing front-enders will be advised of new Front-Ending Agreements for stormwater works within the same benefiting area and area-specific development charge By-law.

8. The capital project upset limits for engineering, project management, and contingency shall be the established rates set in accordance with the City's Development Charge By-laws and accompanying background studies, as amended.

9. Land remuneration shall be subject to an appraisal by a professional land appraiser and the appraisal shall be conducted in accordance with the terms of reference as established in the City's Development Charge By-laws and accompanying background studies, as amended. The upset limit for land remuneration shall be the lesser of the appraised value and the upset limit in accordance with the City's Development Charge By-laws and accompanying background studies.

10. Indexing shall apply to the total project costs if the front-ended works have been delayed over a period of time; the front-ender provides justification for the delay, and with the written concurrence of the City.

11. Where a front-ender is eligible for development charge reimbursement, documentation is required to support the reimbursement in accordance with the

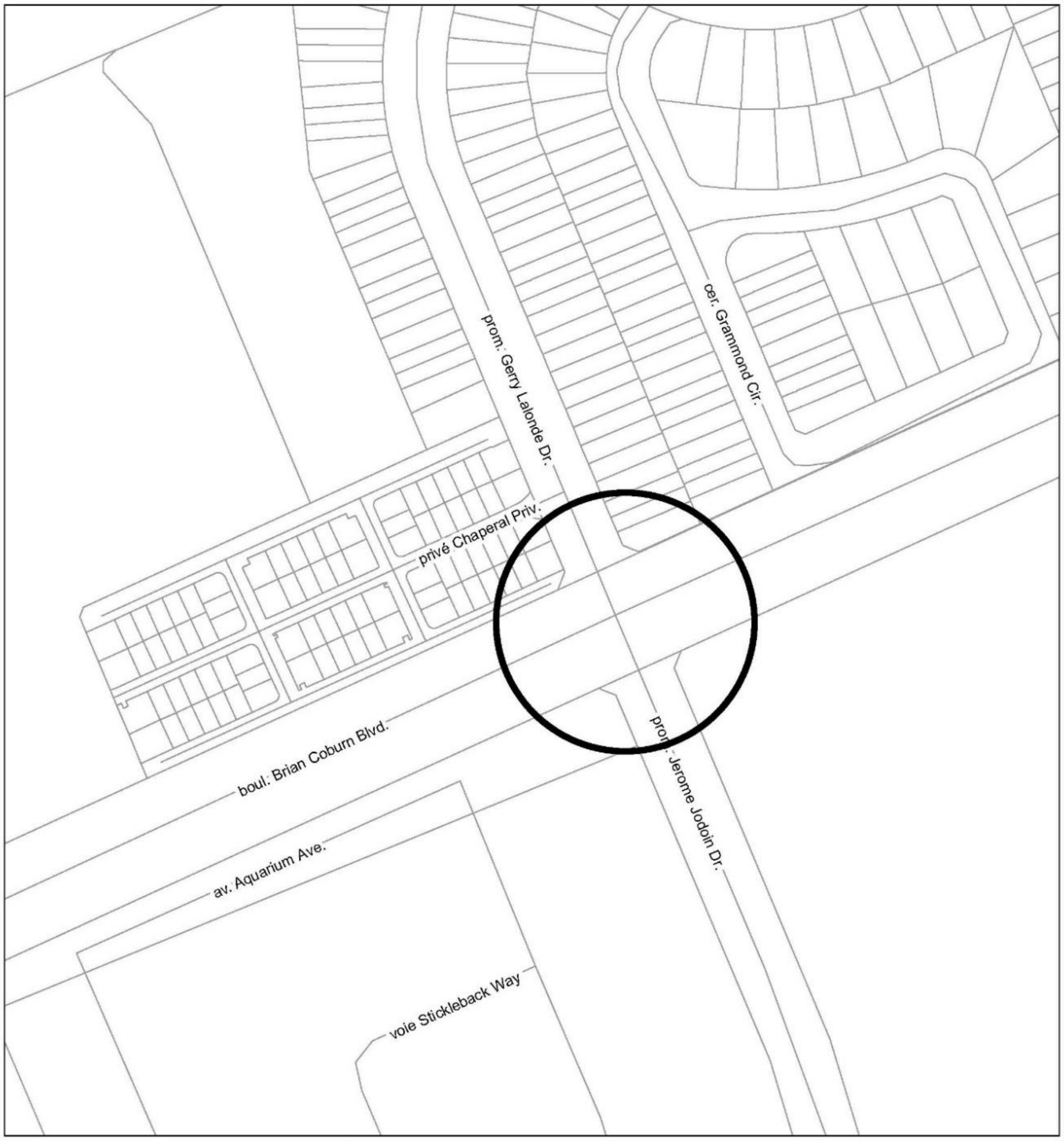
City's Purchasing Policy. The Front-Ending Agreement shall identify at which stage the documentation shall be required. The following documentation shall be forwarded to the City before payment is issued:

- An invoice summarizing the front-ended works, and separate cost items, if applicable, for land, construction costs, engineering fees, project management fees, contingency fees, and applicable taxes.
- Payment Certificates, including the final certificate, signed by the developer's civil engineer.
- All invoices supporting re-payment for the front-ended works.
- Statutory Declaration.
- Certificate of Substantial Performance.
- Workplace Safety and Insurance Board Clearance Certificate (WSIB).
- Certificate of Publication.

12. A report to Council is required to authorize staff to enter into a Front-Ending Agreement. The recommendation will include the financial commitment of the City, specify the funding source(s), the project timeline and where necessary, request that a specific deferred revenue account be established. The financial comment in the report will specify the timelines for the repayment, an operating budget impact and an estimate of the year in which the operating budget impact will begin. It should also indicate the year in which the project was originally identified in the City's 10- year capital plan. A capital project will be established upon Council approval to enter into a Front-Ending Agreement. The status of these projects will be provided to Council on a yearly basis.

13. No capital project identified outside of the Council approved 10- year long range capital plan, shown in the Development Charge Background Study is eligible to be front-ended unless another item(s) of comparable value, funding allocation, and timing is delayed. A capital project identified with a post-period deduction applied to the gross cost will only have the development charge portion reimbursed if front-ended over the term of the by-law. Indexing would not be applicable to the repayment of the post-period component of the project cost. If growth occurs more slowly than forecasted, then the City Treasurer will have the authority to add an additional three years, without interest, to the repayment of the post-period component of the front-ended project from development charges.

Document 3 – Location Map



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REVISION / RÉVISION - 2018 / 12 / 10

LOCATION MAP / PLAN DE LOCALISATION
FRONT ENDING AGREEMENT / ACCORD DE FINANCEMENT INITIAL

boul. Brian Coburn Boulevard and/et
prom. Gerry Lalonde Drive/prom. Jerome Jodoin Drive
D07-16-09-0018 Stage 6 (Phase 12)

Appendix F

ITE Internal Capture Rates

Table 6.2 Unconstrained Internal Person Trip Capture Rates for Trip Destinations within a Mixed-Use Development

		Weekday	
		AM Peak Hour	PM Peak Hour
To OFFICE	From Retail	4%	31%
	From Restaurant	14%	30%
	From Cinema/Entertainment	0%	6%
	From Residential	3%	57%
	From Hotel	3%	0%
To RETAIL	From Office	32%	8%
	From Restaurant	8%	50%
	From Cinema/Entertainment	0%	4%
	From Residential	17%	10%
	From Hotel	4%	2%
To RESTAURANT	From Office	23%	2%
	From Retail	50%	29%
	From Cinema/Entertainment	0%	3%
	From Residential	20%	14%
	From Hotel	6%	5%
To CINEMA/ENTERTAINMENT	From Office	0%	1%
	From Retail	0%	26%
	From Restaurant	0%	32%
	From Residential	0%	0%
	From Hotel	0%	0%
To RESIDENTIAL	From Office	0%	4%
	From Retail	2%	46%
	From Restaurant	5%	16%
	From Cinema/Entertainment	0%	4%
	From Hotel	0%	0%
To HOTEL	From Office	0%	0%
	From Retail	0%	17%
	From Restaurant	4%	71%
	From Cinema/Entertainment	0%	1%
	From Residential	0%	12%

Source: Bochner, B., K. Hooper, B. Sperry, and R. Dunphy. NCHRP Report 684: *Enhancing Internal Trip Capture Estimation for Mixed-Use Developments.* Washington, DC: Transportation Research Board, Tables 101 and 102, 2011.

Table 6.1 Unconstrained Internal Person Trip Capture Rates for Trip Origins within a Mixed-Use Development

		WEEKDAY	
		AM Peak Hour	PM Peak Hour
From OFFICE	To Retail	28%	20%
	To Restaurant	63%	4%
	To Cinema/Entertainment	0%	0%
	To Residential	1%	2%
	To Hotel	0%	0%
From RETAIL	To Office	29%	2%
	To Restaurant	13%	29%
	To Cinema/Entertainment	0%	4%
	To Residential	14%	26%
	To Hotel	0%	5%
From RESTAURANT	To Office	31%	3%
	To Retail	14%	41%
	To Cinema/Entertainment	0%	8%
	To Residential	4%	18%
	To Hotel	3%	7%
From CINEMA/ENTERTAINMENT	To Office	0%	2%
	To Retail	0%	21%
	To Restaurant	0%	31%
	To Residential	0%	8%
	To Hotel	0%	2%
From RESIDENTIAL	To Office	2%	4%
	To Retail	1%	42%
	To Restaurant	20%	21%
	To Cinema/Entertainment	0%	0%
	To Hotel	0%	3%
From HOTEL	To Office	75%	0%
	To Retail	14%	16%
	To Restaurant	9%	68%
	To Cinema/Entertainment	0%	0%
	To Residential	0%	2%

Source: Bochner, B., K. Hooper, B. Sperry, and R. Dunphy. NCHRP Report 684: *Enhancing Internal Trip Capture Estimation for Mixed-Use Developments*. Washington, DC: Transportation Research Board, Tables 99 and 100, 2011.

Appendix G

Forecasting and Strategy Report Comments

From: Giampa, Mike <Mike.Giampa@ottawa.ca>
Sent: Wednesday, January 20, 2021 7:39:36 AM
To: Mark Crockford <mark.crockford@cghtransportation.com>
Subject: RE: 2275 Mer Bleue Road

Hi Mark, see below for forecasting comments:

Transportation Engineering Services

Section 2.2.5 Existing Transit

Include a description of route 225.

Section 5.1 Trip Generation and Mode Shares

Correct the directional assignment of trips in Table 7 for the townhouses and mid-rise apartments. Revise all associated tables and figures.

Consider a higher transit mode share target given that it is served by a frequent transit route, particularly for the apartment/retail portion.

Consider the amount of parking envisioned for the retail portion and whether a higher active mode share is appropriate.

Section 5.2 Trip Distribution

Describe how the vehicles are routed to/from north. Less than 20% of volumes are traveling to/from north via Mer Bleue according to Figure 21.

Section 7.0 Demand Rationalization

Quantify the amount of demand that requires rationalization as part of this section of the report.

Consider this development's impact on the surrounding network and ensure that TDM Measures are implemented in order to maximize the sustainable mode shares, and whether more aggressive sustainable mode shares for the development are required.

From: Giampa, Mike <Mike.Giampa@ottawa.ca>
Sent: March 17, 2021 10:26 AM
To: Mark Crockford <mark.crockford@cghtransportation.com>
Cc: Belan, Steve <Steve.Belan@ottawa.ca>
Subject: 2275 Mer Bleue TIA Strategy comments

Hi Mark,
Sorry about the late TIA comments, see below:

Transportation Engineering Services

Section 2.3.1 Planned Conditions:

The 2031 Affordable Network includes the construction of Brian Coburn Boulevard between Navan Road and Mer Bleue Road as a two-lane road only. Brian Coburn Boulevard is ultimately envisioned as a four-lane road, but this is not included in the 2031 Affordable Network. That said, the need to widen Brian Coburn Boulevard in the near-term (per the findings of Section 16 and Section 17 of this report) is acknowledged.

Section 5.1 Trip Generation and Mode Shares

Unaddressed forecasting comment: “Correct the directional assignment of trips in Table 6 for the townhouses and mid-rise apartments. Revise all associated tables and figures.”

Section 8.1 Design for Sustainable Modes:

Update Section 8.1 and Figure 26 to be consistent with Figure 14 and Figure 15 of the January 2021 Planning Rationale by Fotenn. Figure 14/15 show a sidewalk on the west side of Sculpin Street (not the east), and also show a sidewalk on the south side southernmost east-west road (Street ‘A’) that connects Mer Bleue Road to Sculpin Street.

Note that Section 4.1.2 of the draft new Official Plan requires all new local roads in the urban area to have a sidewalk on at least one side of the road. It is also noted that Section 5.1.6 of the Mer Bleue Community Design Plan of the East Urban Community CDP recommends that “all local roads should have a sidewalk on at least one side”.

Confirm whether the pedestrian facility proposed for the south side of Brian Coburn Boulevard along the site frontage should be a sidewalk, or whether it should be a MUP to be consistent with the facility west of Mer Bleue Road. Clarify if the developer will be covering this cost.

1.2.5 of the TDM-Supportive Design and Infrastructure Checklist for residential developments may be “checked”.

Section 8.3 New Street Networks:

Update Section 8.3 and Figure 27 to be consistent with the January 2021 Planning Rationale by Fotenn and the draft subdivision plan dated 2020-12-23.

Section 11 Access Intersection Design:

Clarification of how Site Access #2 will be restricted to right-in / right-out will be required during the site plan application and RMA for the mixed-use component of the development.

Section 12.3 TDM Program:

Consider additional TDM Measures to maximize sustainable mode shares and minimize the development’s impact on the congested road network.

Certain TDM measures can be applied to townhouse developments. For example, multi-modal travel option packages can be given to new townhome owners at first occupancy.

Traffic Signal Design

No comments to this TIA for this circulation. Traffic Signal Design and Specification reserves the right to make future comments based on subsequent submissions.

Future considerations:

If there are any future proposed changes in the existing roadway geometry for the purpose of constructing a new TCS(s) or modifications to existing TCS(s) the City of Ottawa Traffic Signal Design and Specification Unit is required to complete a review for traffic signal plant re-design and provide the actual re-design to the proponent or consultant.

If the proposed traffic signals are warranted/approved for installation or modifications to existing TCS are approved, and RMA approved, please forward an approved geometry detail design drawings (dwg digital format in NAD 83 coordinates) including following: base mapping, existing and new underground utilities/sewers, new/existing catch basins locations, AutoTurn-Radius Modeling for approved vehicles and approved pavement markings drawings in separate files , no Xref files attached in master file(s), for detail traffic plant design lay out.

Please send all digital (CADD) design files to Peter.Grajcar@ottawa.ca 613-580-2424 x23035. If not sure as per above request and more detail info needed as per input files, (i.e. format, etc.) please ask for our Dispatch checklist document and it will be gladly provided.

Street Lighting

If the proposed TIA is approved, please contact Barrie Forrester at 613-580-2424 ext 23332 (Barrie.Forrester@ottawa.ca) to setup cost recovery for Street Lighting review/coordination.

Full roadway lighting as per City of Ottawa policy is required. Send streetlight design including point by point light calculations for review and approval to the assigned Street Lighting Coordinator.
The developer will be 100% responsible for all associated street light costs. PO or payment must be setup with the City of Ottawa Street Light Group prior to any sub-division review/approval will be completed.
City Street Lighting will require commencement of work notification so that we can inspect construction at all stages.
Upon completion we require as-builts in both e-format (Microstation & dwg). Once received, we advise Hydro that the City will accept the energy charges. With that authorization (plus an

ESA certificate obtained by the developer or his electrical contractor) Hydro will then energize.

Any queries such as required light levels or approved materials can be directed to the assigned Street Lighting Project Coordinator.

Mike Giampa, P.Eng.
Senior Transportation Engineer, Infrastructure Applications
Development Review East Unit | Planning, Infrastructure and Economic Development
City of Ottawa
110 Laurier Avenue West, Ottawa, ON K1P 1J1
✉ **mike.giampa@ottawa.ca**
☎ **(613.580.2424) x. 23657**

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Appendix H

TDM Checklists

Introduction

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

The remaining sections of this document are:

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

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

Using the Checklist

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

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

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

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

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

Glossary

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

TDM program management
- Program coordinator
- Travel surveys

Parking
- Priced parking

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

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

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

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

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

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

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

▶ *TDM program management*

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

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

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

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

▶ *Parking*

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

▶ *Walking & cycling*

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

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

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

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

▶ *Transit*

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

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

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

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

▶ *Ridesharing*

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

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

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

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

▶ *Carsharing & bikesharing*

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

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

▶ *TDM marketing & communications*

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

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

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

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

▶ *Other incentives & amenities*

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

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

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

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

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

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

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

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

(Applicable to the non-residential component of the Mixed-Use Building only, to be considered at time of site plan application when details pertinent to the mid-rise residential building are refined)

Legend

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

			TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		1.	**TDM PROGRAM MANAGEMENT**	
		1.1	**Program coordinator**	
BASIC	★	1.1.1	Designate an internal coordinator, or contract with an external coordinator	☐
		1.2	**Travel surveys**	
BETTER		1.2.1	Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress	☐
		2.	**WALKING AND CYCLING**	
		2.1	**Information on walking/cycling routes & destinations**	
BASIC		2.1.1	Display local area maps with walking/cycling access routes and key destinations at major entrances	☐
		2.2	**Bicycle skills training**	
			Commuter travel	
BETTER	★	2.2.1	Offer on-site cycling courses for commuters, or subsidize off-site courses	☐
		2.3	**Valet bike parking**	
			Visitor travel	
BETTER		2.3.1	Offer secure valet bike parking during public events when demand exceeds fixed supply (e.g. for festivals, concerts, games)	☐

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

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

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

TDM Measures Checklist:

Residential Developments (multi-family, condominium or subdivision)

(Applicable to the residential component of the Mixed-Use Building only, to be considered at time of site plan application when details pertinent to the mid-rise residential building are refined)

Legend

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

			TDM measures: *Residential developments*	Check if proposed & add descriptions
		1.	**TDM PROGRAM MANAGEMENT**	
		1.1	**Program coordinator**	
BASIC	★	1.1.1	Designate an internal coordinator, or contract with an external coordinator	☐
		1.2	**Travel surveys**	
BETTER		1.2.1	Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress	☐
		2.	**WALKING AND CYCLING**	
		2.1	**Information on walking/cycling routes & destinations**	
BASIC		2.1.1	Display local area maps with walking/cycling access routes and key destinations at major entrances *(multi-family, condominium)*	☑
		2.2	**Bicycle skills training**	
BETTER		2.2.1	Offer on-site cycling courses for residents, or subsidize off-site courses	☐

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

			TDM measures: *Residential developments*	Check if proposed & add descriptions
		6.	**TDM MARKETING & COMMUNICATIONS**	
		6.1	**Multimodal travel information**	
BASIC	★	6.1.1	Provide a multimodal travel option information package to new residents	☑ Note: applies to both residential components of the proposed development
		6.2	**Personalized trip planning**	
BETTER	★	6.2.1	Offer personalized trip planning to new residents	☐

Introduction

The City of Ottawa's *Transportation Impact Assessment (TIA) Guidelines* (specifically Module 4.1—Development Design) requires proponents of qualifying developments to use the City's **TDM-Supportive Development Design and Infrastructure Checklist** to assess the opportunity to implement design elements that are supportive of sustainable modes. The goal of this assessment is to ensure that the development provides safe and efficient access for all users, while creating an environment that encourages walking, cycling and transit use.

The remaining sections of this document are:

- Using the Checklist
- Glossary
- TDM-Supportive Development Design and Infrastructure Checklist: Non-Residential Developments
- TDM-Supportive Development Design and Infrastructure Checklist: Residential Developments

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

Using the Checklist

This **TDM-Supportive Development Design and Infrastructure Checklist** document includes two actual checklists, one for non-residential developments (office, institutional, retail or industrial) and one for residential developments (multi-family or condominium only; subdivisions are exempt). Readers may download the applicable checklist in electronic format and complete it electronically, or print it out and complete it by hand. As an alternative, they may create a freestanding document that lists the design and infrastructure measures being proposed and provides additional detail on them.

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

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

Glossary

This glossary defines and describes the following measures that are identified in the **TDM-Supportive Development Design and Infrastructure Checklist**:

Walking & cycling: Routes
- Building location & access points
- Facilities for walking & cycling
- Amenities for walking & cycling

Walking & cycling: End-of-trip facilities
- Bicycle parking
- Secure bicycle parking
- Shower & change facilities
- Bicycle repair station

Transit
- Walking routes to transit
- Customer amenities

Ridesharing
- Pick-up & drop-off facilities
- Carpool parking

Carsharing & bikesharing
- Carshare parking spaces
- Bikeshare station location

Parking
- Number of parking spaces
- Separate long-term & short-term parking areas

Other
- On-site amenities to minimize off-site trips

In addition to specific references made in this glossary, readers should consult the City of Ottawa's design and planning guidelines for a variety of different land uses and contexts, available on the City's website at www.ottawa.ca. Readers may also find the following resources to be helpful:

- *Promoting Sustainable Transportation through Site Design*, Institute of Transportation Engineers, 2004 (www.cite7.org/wpdm-package/iterp-promoting-sustainable-transportation)
- *Bicycle End-of-Trip Facilities: A Guide for Canadian Municipalities and Employers*, Transport Canada, 2010 (www.fcm.ca/Documents/tools/GMF/Transport_Canada/BikeEndofTrip_EN.pdf)

▶ *Walking & cycling: Routes*

Building location & access points*.* Correctly positioning buildings and their entrances can help make walking convenient, comfortable and safe. Minimizing travel distances and maximizing visibility are key.

Facilities for walking & cycling. The Official Plan gives clear direction on the provision and design of walking and cycling facilities for both access and circulation. On larger, busier sites (e.g. multi-building campuses) the inclusion of sidewalks, pathways, marked crossings, stop signs and traffic calming features can create a safer and more supportive environment for active transportation.

Amenities for walking & cycling. Lighting, landscaping, benches and wayfinding can make walking and cycling safer and more secure, comfortable and accessible.

▶ *Walking & cycling: End-of-trip facilities*

Bicycle parking. The Official Plan and Zoning By-law both address the need for adequate bicycle parking at developments. Weather protection and theft prevention are major concerns for commuters who spend hundreds or thousands of dollars on a quality bicycle. Bicycle racks should have a design that enables secure locking while preventing damage to wheels. They should be located within sight of busy areas such as main building entrances or staffed parking kiosks.

Secure bicycle parking. Ottawa's Zoning By-law requires a secure area for bicycles at office or residential developments having more than 50 bicycle parking spaces. Lockable outdoor bike cages or indoor storage rooms that limit access to registered users are ideal.

Shower & change facilities. Longer-distance cyclists, joggers and even pedestrians can need a place to shower and change at work; the lack of such facilities is a major barrier to active commuting. Lockers and drying racks provide a place to store gear away from workspaces, and showers and grooming stations allow commuters to make themselves presentable for the office.

Bicycle repair station. Cycling commuters can experience maintenance issues that make the homeward trip difficult or impossible. A small supply of tools (e.g. air pump, Allen keys, wrenches) and supplies (e.g. inner tube patches, chain lubricant) in the workplace can help.

▶ *Transit*

Customer amenities. Larger developments that feature an on-site transit stop can make transit use more attractive by providing shelters, lighting and benches. Even better, they could integrate the passenger waiting area into a building entrance.

▶ *Ridesharing*

Pick-up & drop-off facilities. Having a safe place to load or unload passengers (for carpools as well as taxis and ride-hailing services) without obstructing pedestrians, cyclists or other vehicles can help make carpooling work.

Carpool parking. At destinations with large parking lots (or lots that regularly fill to capacity), signed priority carpool parking spaces can be an effective ridesharing incentive. Priority spaces are frequently abused by non-carpoolers, so a system to provide registered users with vehicle identification tags is recommended.

▶ *Carsharing & bikesharing*

Carshare parking spaces. For developments where carsharing could be an attractive option for employees, visitors or residents, ensuring an attractive location for future carshare parking spaces can avoid challenges associated with future retrofits.

Bikeshare station location. For developments where bikesharing could be an attractive option for employees, visitor or residents, ensuring an attractive location for a future bikeshare station can avoid challenges associated with future retrofits.

▶ *Parking*

Number of parking spaces. Parking capacity is an important variable in development design, as it can either support or subvert the mode share targets set during the transportation impact analysis (TIA). While the Zoning By-law establishes any minimum and/or maximum requirements for parking capacity, it also allows a reduction in any minimum to reflect the existence of on-site shower, change and locker rooms provided for cyclists.

Separate long-term & short-term parking areas. Because access to unused parking spaces can be a powerful incentive to drive, developments can better manage their parking supply and travel behaviours by separating long-term from short-term parking through the use of landscaping, gated controls or signs. Doing so makes it difficult for long-term parkers (e.g. commuters) to park in short-term areas (e.g. for visitors) as long as enforcement occurs; it also protects long-term parking capacity for its intended users.

▶ *Other*

On-site amenities to minimize off-site trips. Developments that offer facilities to limit employees' need for a car during their commute (e.g. to drop off children at daycare) or during their workday (e.g. to hit the gym) can free employees to make the commuting decision that otherwise works best for them.

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

(Applicable to the non-residential component of the Mixed-Use Building only, to be considered at time of site plan application when details pertinent to the mid-rise residential building are refined)

Legend

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

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

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

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	2.	**WALKING & CYCLING: END-OF-TRIP FACILITIES**	
	2.1	**Bicycle parking**	
REQUIRED	2.1.1	Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible *(see Official Plan policy 4.3.6)*	☑
REQUIRED	2.1.2	Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas *(see Zoning By-law Section 111)*	☑
REQUIRED	2.1.3	Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored *(see Zoning By-law Section 111)*	☑
BASIC	2.1.4	Provide bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met), plus the expected peak number of customer/visitor cyclists	☐
BETTER	2.1.5	Provide bicycle parking spaces equivalent to the expected number of commuter and customer/visitor cyclists, plus an additional buffer (e.g. 25 percent extra) to encourage other cyclists and ensure adequate capacity in peak cycling season	☐
	2.2	**Secure bicycle parking**	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single office building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers *(see Zoning By-law Section 111)*	☐
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met)	☐
	2.3	**Shower & change facilities**	
BASIC	2.3.1	Provide shower and change facilities for the use of active commuters	☐
BETTER	2.3.2	In addition to shower and change facilities, provide dedicated lockers, grooming stations, drying racks and laundry facilities for the use of active commuters	☐
	2.4	**Bicycle repair station**	
BETTER	2.4.1	Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	☐

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

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

TDM-Supportive Development Design and Infrastructure Checklist: *Residential Developments (multi-family or condominium)*

(Applicable to the residential component of the Mixed-Use Building only, to be considered at time of site plan application when details pertinent to the mid-rise residential building are refined)

Legend

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

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

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

	TDM-supportive design & infrastructure measures: *Residential developments*		Check if completed & add descriptions, explanations or plan/drawing references
	2.	**WALKING & CYCLING: END-OF-TRIP FACILITIES**	
	2.1	**Bicycle parking**	
REQUIRED	2.1.1	Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible *(see Official Plan policy 4.3.6)*	☑
REQUIRED	2.1.2	Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas *(see Zoning By-law Section 111)*	☑
REQUIRED	2.1.3	Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored *(see Zoning By-law Section 111)*	☑
BASIC	2.1.4	Provide bicycle parking spaces equivalent to the expected number of resident-owned bicycles, plus the expected peak number of visitor cyclists	☐
	2.2	**Secure bicycle parking**	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single residential building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers *(see Zoning By-law Section 111)*	☑
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to at least the number of units at condominiums or multi-family residential developments	☐
	2.3	**Bicycle repair station**	
BETTER	2.3.1	Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	☐
	3.	**TRANSIT**	
	3.1	**Customer amenities**	
BASIC	3.1.1	Provide shelters, lighting and benches at any on-site transit stops	☐
BASIC	3.1.2	Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	☐
BETTER	3.1.3	Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	☐

	TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	4. RIDESHARING	
	4.1 Pick-up & drop-off facilities	
BASIC	4.1.1 Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	☐
	5. CARSHARING & BIKESHARING	
	5.1 Carshare parking spaces	
BETTER	5.1.1 Provide up to three carshare parking spaces in an R3, R4 or R5 Zone for specified residential uses *(see Zoning By-law Section 94)*	☑
	5.2 Bikeshare station location	
BETTER	5.2.1 Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	☑
	6. PARKING	
	6.1 Number of parking spaces	
REQUIRED	6.1.1 Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	☐
BASIC	6.1.2 Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking	☐
BASIC	6.1.3 Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly *(see Zoning By-law Section 104)*	☐
BETTER	6.1.4 Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking *(see Zoning By-law Section 111)*	☐
	6.2 Separate long-term & short-term parking areas	
BETTER	6.2.1 Provide separate areas for short-term and long-term parking (using signage or physical barriers) to permit access controls and simplify enforcement (i.e. to discourage residents from parking in visitor spaces, and vice versa)	☐

Appendix I

MMLOS Worksheets

Multi-Modal Level of Service - Intersections Form

Consultant	CGH Transportation	**Project**	2020-82
Scenario	2024 Future Background AM	**Date**	05-Jan-21
Comments			

INTERSECTIONS		Mer-Bleue Road @ Decoeur Drive / Axis Way				Mer-Bleue Road @ Renaud Road							
	Crossing Side	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Pedestrian	Lanes	7	7	3	3	3	3		3				
	Median	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m		No Median - 2.4 m				
	Conflicting Left Turns	Permissive	Permissive	Permissive	Permissive	Permissive	No left turn / Prohib.		Permissive				
	Conflicting Right Turns	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	No right turn	Permissive or yield control		Permissive or yield control				
	Right Turns on Red (RToR) ?	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed		RTOR allowed				
	Ped Signal Leading Interval?	No	No	No	No	No	No		No				
	Right Turn Channel	No Channel	No Channel	No Channel	No Channel	No Right Turn	No Channel		No Channel				
	Corner Radius	5-10m	5-10m	5-10m	5-10m	No Right Turn	5-10m		5-10m				
	Crosswalk Type	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings		Std transverse markings				
	PETSI Score	5	5	71	71	85	79		71				
	Ped. Exposure to Traffic LoS	F	F	C	C	B	B	-	C	-	-	-	-
	Cycle Length												
	Effective Walk Time												
	Average Pedestrian Delay												
	Pedestrian Delay LoS	-	-	-	-	-	-	-	-	-	-	-	-
	Level of Service	F	F	C	C	B	B	-	C	-	-	-	-
		F				C				-			
	Approach From	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Bicycle	Bicycle Lane Arrangement on Approach	Pocket Bike Lane	Pocket Bike Lane	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic		Mixed Traffic				
	Right Turn Lane Configuration	≤ 50 m Introduced right turn lane	≤ 50 m Introduced right turn lane	≤ 50 m	≤ 50 m	≤ 50 m	≤ 50 m		≤ 50 m				
	Right Turning Speed	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h		≤ 25 km/h				
	Cyclist relative to RT motorists	B	B	D	D	D	D	-	D	-	-	-	-
	Separated or Mixed Traffic	Separated	Separated	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	-	Mixed Traffic	-	-	-	-
	Left Turn Approach	≥ 2 lanes crossed	≥ 2 lanes crossed	No lane crossed	No lane crossed	No lane crossed	No lane crossed		No lane crossed				
	Operating Speed	≥ 60 km/h	≥ 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h		> 50 to < 60 km/h				
	Left Turning Cyclist	F	F	C	C	C	C	-	C	-	-	-	-
	Level of Service	F	F	D	D	D	D	-	D	-	-	-	-
		F				D				-			
Transit	Average Signal Delay	≤ 10 sec	≤ 10 sec										
	Level of Service	B	B	-	-	-	-	-	-	-	-	-	-
		B				-				-			
Truck	Effective Corner Radius												
	Number of Receiving Lanes on Departure from Intersection												
	Level of Service	-	-	-	-	-	-	-	-	-	-	-	-
		-				-				-			
Auto	Volume to Capacity Ratio	0.0 - 0.60				0.0 - 0.60							
	Level of Service	A				A				-			

Multi-Modal Level of Service - Intersections Form

Consultant	CGH Transportation	**Project**	2020-82
Scenario	2024 Future Background PM	**Date**	05-Jan-21
Comments			

	INTERSECTIONS	Mer-Bleue Road @ Decoeur Drive / Axis Way				Mer-Bleue Road @ Renaud Road							
	Crossing Side	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Pedestrian	Lanes	7	7	3	3	3	3		3				
	Median	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m		No Median - 2.4 m				
	Conflicting Left Turns	Permissive	Permissive	Permissive	Permissive	Permissive	No left turn / Prohib.		Permissive				
	Conflicting Right Turns	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	No right turn	Permissive or yield control		Permissive or yield control				
	Right Turns on Red (RToR) ?	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed		RTOR allowed				
	Ped Signal Leading Interval?	No	No	No	No	No	No		No				
	Right Turn Channel	No Channel	No Channel	No Channel	No Channel	No Right Turn	No Channel		No Channel				
	Corner Radius	5-10m	5-10m	5-10m	5-10m	No Right Turn	5-10m		5-10m				
	Crosswalk Type	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings		Std transverse markings				
	PETSI Score	5	5	71	71	85	79		71				
	Ped. Exposure to Traffic LoS	F	F	C	C	B	B	-	C	-	-	-	-
	Cycle Length												
	Effective Walk Time												
	Average Pedestrian Delay												
	Pedestrian Delay LoS	-	-	-	-	-	-	-	-	-	-	-	-
	Level of Service	F	F	C	C	B	B	-	C	-	-	-	-
		F				C				-			
	Approach From	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Bicycle	Bicycle Lane Arrangement on Approach	Pocket Bike Lane	Pocket Bike Lane	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic		Mixed Traffic				
	Right Turn Lane Configuration	≤ 50 m Introduced right turn lane	≤ 50 m Introduced right turn lane	≤ 50 m	≤ 50 m	≤ 50 m	≤ 50 m		≤ 50 m				
	Right Turning Speed	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h		≤ 25 km/h				
	Cyclist relative to RT motorists	B	B	D	D	D	D	-	D	-	-	-	-
	Separated or Mixed Traffic	Separated	Separated	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	-	Mixed Traffic	-	-	-	-
	Left Turn Approach	≥ 2 lanes crossed	≥ 2 lanes crossed	No lane crossed	No lane crossed	No lane crossed	No lane crossed		No lane crossed				
	Operating Speed	≥ 60 km/h	≥ 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h		> 50 to < 60 km/h				
	Left Turning Cyclist	F	F	C	C	C	C	-	C	-	-	-	-
	Level of Service	F	F	D	D	D	D	-	D	-	-	-	-
		F				D				-			
Transit	Average Signal Delay	≤ 10 sec	≤ 10 sec										
	Level of Service	B	B	-	-	-	-	-	-	-	-	-	-
		B				-				-			
Truck	Effective Corner Radius												
	Number of Receiving Lanes on Departure from Intersection												
	Level of Service	-	-	-	-	-	-	-	-	-	-	-	-
		-				-				-			
Auto	Volume to Capacity Ratio	0.0 - 0.60				0.71 - 0.80							
	Level of Service	A				C				-			

Multi-Modal Level of Service - Intersections Form

Consultant	CGH Transportation	**Project**	2020-82
Scenario	2024 Future Total AM	**Date**	05-Jan-21
Comments			

	INTERSECTIONS	Mer-Bleue Road @ Decoeur Drive / Axis Way				Mer-Bleue Road @ Renaud Road							
	Crossing Side	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Pedestrian	Lanes	7	7	3	3	3	3		3				
	Median	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m		No Median - 2.4 m				
	Conflicting Left Turns	Permissive	Permissive	Permissive	Permissive	Permissive	No left turn / Prohib.		Permissive				
	Conflicting Right Turns	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	No right turn	Permissive or yield control		Permissive or yield control				
	Right Turns on Red (RToR) ?	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed		RTOR allowed				
	Ped Signal Leading Interval?	No	No	No	No	No	No		No				
	Right Turn Channel	No Channel	No Channel	No Channel	No Channel	No Right Turn	No Channel		No Channel				
	Corner Radius	5-10m	5-10m	5-10m	5-10m	No Right Turn	5-10m		5-10m				
	Crosswalk Type	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings		Std transverse markings				
	PETSI Score	5	5	71	71	85	79		71				
	Ped. Exposure to Traffic LoS	F	F	C	C	B	B	-	C	-	-	-	-
	Cycle Length												
	Effective Walk Time												
	Average Pedestrian Delay												
	Pedestrian Delay LoS	-	-	-	-	-	-	-	-	-	-	-	-
	Level of Service	F	F	C	C	B	B	-	C	-	-	-	-
		F				C				-			
	Approach From	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Bicycle	Bicycle Lane Arrangement on Approach	Pocket Bike Lane	Pocket Bike Lane	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic		Mixed Traffic				
	Right Turn Lane Configuration	≤ 50 m Introduced right turn lane	≤ 50 m Introduced right turn lane	≤ 50 m	≤ 50 m	≤ 50 m	≤ 50 m		≤ 50 m				
	Right Turning Speed	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h		≤ 25 km/h				
	Cyclist relative to RT motorists	B	B	D	D	D	D	-	D	-	-	-	-
	Separated or Mixed Traffic	Separated	Separated	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	-	Mixed Traffic	-	-	-	-
	Left Turn Approach	≥ 2 lanes crossed	≥ 2 lanes crossed	No lane crossed	No lane crossed	No lane crossed	No lane crossed		No lane crossed				
	Operating Speed	≥ 60 km/h	≥ 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h		> 50 to < 60 km/h				
	Left Turning Cyclist	F	F	C	C	C	C	-	C	-	-	-	-
	Level of Service	F	F	D	D	D	D	-	D	-	-	-	-
		F				D				-			
Transit	Average Signal Delay	≤ 10 sec	≤ 10 sec										
	Level of Service	B	B	-	-	-	-	-	-	-	-	-	-
		B				-				-			
Truck	Effective Corner Radius												
	Number of Receiving Lanes on Departure from Intersection												
	Level of Service	-	-	-	-	-	-	-	-	-	-	-	-
		-				-				-			
Auto	Volume to Capacity Ratio	0.0 - 0.60				0.0 - 0.60							
	Level of Service	A				A				-			

Multi-Modal Level of Service - Intersections Form

Consultant	CGH Transportation	**Project**	2020-82
Scenario	2024 Future Total PM	**Date**	05-Jan-21
Comments			

	INTERSECTIONS	Mer-Bleue Road @ Decoeur Drive / Axis Way				Mer-Bleue Road @ Renaud Road							
	Crossing Side	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Pedestrian	Lanes	7	7	3	3	3	3		3				
	Median	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m		No Median - 2.4 m				
	Conflicting Left Turns	Permissive	Permissive	Permissive	Permissive	Permissive	No left turn / Prohib.		Permissive				
	Conflicting Right Turns	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	No right turn	Permissive or yield control		Permissive or yield control				
	Right Turns on Red (RToR) ?	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed		RTOR allowed				
	Ped Signal Leading Interval?	No	No	No	No	No	No		No				
	Right Turn Channel	No Channel	No Channel	No Channel	No Channel	No Right Turn	No Channel		No Channel				
	Corner Radius	5-10m	5-10m	5-10m	5-10m	No Right Turn	5-10m		5-10m				
	Crosswalk Type	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings		Std transverse markings				
	PETSI Score	5	5	71	71	85	79		71				
	Ped. Exposure to Traffic LoS	F	F	C	C	B	B	-	C	-	-	-	-
	Cycle Length												
	Effective Walk Time												
	Average Pedestrian Delay												
	Pedestrian Delay LoS	-	-	-	-	-	-	-	-	-	-	-	-
	Level of Service	F	F	C	C	B	B	-	C	-	-	-	-
		F				C				-			
	Approach From	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Bicycle	Bicycle Lane Arrangement on Approach	Pocket Bike Lane	Pocket Bike Lane	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic		Mixed Traffic				
	Right Turn Lane Configuration	≤ 50 m Introduced right turn lane	≤ 50 m Introduced right turn lane	≤ 50 m	≤ 50 m	≤ 50 m	≤ 50 m		≤ 50 m				
	Right Turning Speed	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h		≤ 25 km/h				
	Cyclist relative to RT motorists	B	B	D	D	D	D	-	D	-	-	-	-
	Separated or Mixed Traffic	Separated	Separated	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	-	Mixed Traffic	-	-	-	-
	Left Turn Approach	≥ 2 lanes crossed	≥ 2 lanes crossed	No lane crossed	No lane crossed	No lane crossed	No lane crossed		No lane crossed				
	Operating Speed	≥ 60 km/h	≥ 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h		> 50 to < 60 km/h				
	Left Turning Cyclist	F	F	C	C	C	C	-	C	-	-	-	-
	Level of Service	F	F	D	D	D	D	-	D	-	-	-	-
		F				D				-			
Transit	Average Signal Delay	≤ 10 sec	≤ 10 sec										
	Level of Service	B	B	-	-	-	-	-	-	-	-	-	-
		B				-				-			
Truck	Effective Corner Radius												
	Number of Receiving Lanes on Departure from Intersection												
	Level of Service	-	-	-	-	-	-	-	-	-	-	-	-
		-				-				-			
Auto	Volume to Capacity Ratio	0.0 - 0.60				0.71 - 0.80							
	Level of Service	A				C				-			

Multi-Modal Level of Service - Intersections Form

Consultant	CGH Transportation	**Project**	2020-82
Scenario	2029 Future Background AM	**Date**	05-Jan-21
Comments			

INTERSECTIONS		Mer-Bleue Road @ Decoeur Drive / Axis Way				Mer-Bleue Road @ Renaud Road							
	Crossing Side	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Pedestrian	Lanes	7	7	3	3	3	3		3				
	Median	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m		No Median - 2.4 m				
	Conflicting Left Turns	Permissive	Permissive	Permissive	Permissive	Permissive	No left turn / Prohib.		Permissive				
	Conflicting Right Turns	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	No right turn	Permissive or yield control		Permissive or yield control				
	Right Turns on Red (RToR) ?	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed		RTOR allowed				
	Ped Signal Leading Interval?	No	No	No	No	No	No		No				
	Right Turn Channel	No Channel	No Channel	No Channel	No Channel	No Right Turn	No Channel		No Channel				
	Corner Radius	5-10m	5-10m	5-10m	5-10m	No Right Turn	5-10m		5-10m				
	Crosswalk Type	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings		Std transverse markings				
	PETSI Score	5	5	71	71	85	79		71				
	Ped. Exposure to Traffic LoS	F	F	C	C	B	B	-	C	-	-	-	-
	Cycle Length												
	Effective Walk Time												
	Average Pedestrian Delay												
	Pedestrian Delay LoS	-	-	-	-	-	-	-	-	-	-	-	-
	Level of Service	F	F	C	C	B	B	-	C	-	-	-	-
		F				C				-			
	Approach From	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Bicycle	Bicycle Lane Arrangement on Approach	Pocket Bike Lane	Pocket Bike Lane	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic		Mixed Traffic				
	Right Turn Lane Configuration	≤ 50 m Introduced right turn lane	≤ 50 m Introduced right turn lane	≤ 50 m	≤ 50 m	≤ 50 m	≤ 50 m		≤ 50 m				
	Right Turning Speed	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h		≤ 25 km/h				
	Cyclist relative to RT motorists	B	B	D	D	D	D	-	D	-	-	-	-
	Separated or Mixed Traffic	Separated	Separated	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	-	Mixed Traffic	-	-	-	-
	Left Turn Approach	≥ 2 lanes crossed	≥ 2 lanes crossed	No lane crossed	No lane crossed	No lane crossed	No lane crossed		No lane crossed				
	Operating Speed	≥ 60 km/h	≥ 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h		> 50 to < 60 km/h				
	Left Turning Cyclist	F	F	C	C	C	C	-	C	-	-	-	-
	Level of Service	F	F	D	D	D	D	-	D	-	-	-	-
		F				D				-			
Transit	Average Signal Delay	≤ 10 sec	≤ 10 sec										
	Level of Service	B	B	-	-	-	-	-	-	-	-	-	-
		B				-				-			
Truck	Effective Corner Radius												
	Number of Receiving Lanes on Departure from Intersection												
	Level of Service	-	-	-	-	-	-	-	-	-	-	-	-
		-				-				-			
Auto	Volume to Capacity Ratio	0.0 - 0.60				0.0 - 0.60							
	Level of Service	A				A				-			

Multi-Modal Level of Service - Intersections Form

Consultant	CGH Transportation	**Project**	2020-82
Scenario	2029 Future Background PM	**Date**	05-Jan-21
Comments			

	INTERSECTIONS	Mer-Bleue Road @ Decoeur Drive / Axis Way				Mer-Bleue Road @ Renaud Road							
	Crossing Side	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Pedestrian	Lanes	7	7	3	3	3	3		3				
	Median	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m		No Median - 2.4 m				
	Conflicting Left Turns	Permissive	Permissive	Permissive	Permissive	Permissive	No left turn / Prohib.		Permissive				
	Conflicting Right Turns	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	No right turn	Permissive or yield control		Permissive or yield control				
	Right Turns on Red (RToR) ?	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed		RTOR allowed				
	Ped Signal Leading Interval?	No	No	No	No	No	No		No				
	Right Turn Channel	No Channel	No Channel	No Channel	No Channel	No Right Turn	No Channel		No Channel				
	Corner Radius	5-10m	5-10m	5-10m	5-10m	No Right Turn	5-10m		5-10m				
	Crosswalk Type	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings		Std transverse markings				
	PETSI Score	5	5	71	71	85	79		71				
	Ped. Exposure to Traffic LoS	F	F	C	C	B	B	-	C	-	-	-	-
	Cycle Length												
	Effective Walk Time												
	Average Pedestrian Delay												
	Pedestrian Delay LoS	-	-	-	-	-	-	-	-	-	-	-	-
	Level of Service	F	F	C	C	B	B	-	C	-	-	-	-
		F				C				-			
	Approach From	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Bicycle	Bicycle Lane Arrangement on Approach	Pocket Bike Lane	Pocket Bike Lane	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic		Mixed Traffic				
	Right Turn Lane Configuration	≤ 50 m Introduced right turn lane	≤ 50 m Introduced right turn lane	≤ 50 m	≤ 50 m	≤ 50 m	≤ 50 m		≤ 50 m				
	Right Turning Speed	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h		≤ 25 km/h				
	Cyclist relative to RT motorists	B	B	D	D	D	D	-	D	-	-	-	-
	Separated or Mixed Traffic	Separated	Separated	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	-	Mixed Traffic	-	-	-	-
	Left Turn Approach	≥ 2 lanes crossed	≥ 2 lanes crossed	No lane crossed	No lane crossed	No lane crossed	No lane crossed		No lane crossed				
	Operating Speed	≥ 60 km/h	≥ 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h		> 50 to < 60 km/h				
	Left Turning Cyclist	F	F	C	C	C	C	-	C	-	-	-	-
	Level of Service	F	F	D	D	D	D	-	D	-	-	-	-
		F				D				-			
Transit	Average Signal Delay	≤ 10 sec	≤ 10 sec										
	Level of Service	B	B	-	-	-	-	-	-	-	-	-	-
		B				-				-			
Truck	Effective Corner Radius												
	Number of Receiving Lanes on Departure from Intersection												
	Level of Service	-	-	-	-	-	-	-	-	-	-	-	-
		-				-				-			
Auto	Volume to Capacity Ratio	0.0 - 0.60				0.71 - 0.80							
	Level of Service	A				C				-			

Multi-Modal Level of Service - Intersections Form

Consultant	CGH Transportation	**Project**	2020-82
Scenario	2029 Future Total AM	**Date**	05-Jan-21
Comments			

	INTERSECTIONS	Mer-Bleue Road @ Decoeur Drive / Axis Way				Mer-Bleue Road @ Renaud Road							
	Crossing Side	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Pedestrian	Lanes	7	7	3	3	3	3		3				
	Median	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m		No Median - 2.4 m				
	Conflicting Left Turns	Permissive	Permissive	Permissive	Permissive	Permissive	No left turn / Prohib.		Permissive				
	Conflicting Right Turns	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	No right turn	Permissive or yield control		Permissive or yield control				
	Right Turns on Red (RToR) ?	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed		RTOR allowed				
	Ped Signal Leading Interval?	No	No	No	No	No	No		No				
	Right Turn Channel	No Channel	No Channel	No Channel	No Channel	No Right Turn	No Channel		No Channel				
	Corner Radius	5-10m	5-10m	5-10m	5-10m	No Right Turn	5-10m		5-10m				
	Crosswalk Type	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings		Std transverse markings				
	PETSI Score	5	5	71	71	85	79		71				
	Ped. Exposure to Traffic LoS	F	F	C	C	B	B	-	C	-	-	-	-
	Cycle Length												
	Effective Walk Time												
	Average Pedestrian Delay												
	Pedestrian Delay LoS	-	-	-	-	-	-	-	-	-	-	-	-
	Level of Service	F	F	C	C	B	B	-	C	-	-	-	-
		F				C				-			
	Approach From	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Bicycle	Bicycle Lane Arrangement on Approach	Pocket Bike Lane	Pocket Bike Lane	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic		Mixed Traffic				
	Right Turn Lane Configuration	≤ 50 m Introduced right turn lane	≤ 50 m Introduced right turn lane	≤ 50 m	≤ 50 m	≤ 50 m	≤ 50 m		≤ 50 m				
	Right Turning Speed	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h		≤ 25 km/h				
	Cyclist relative to RT motorists	B	B	D	D	D	D	-	D	-	-	-	-
	Separated or Mixed Traffic	Separated	Separated	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	-	Mixed Traffic	-	-	-	-
	Left Turn Approach	≥ 2 lanes crossed	≥ 2 lanes crossed	No lane crossed	No lane crossed	No lane crossed	No lane crossed		No lane crossed				
	Operating Speed	≥ 60 km/h	≥ 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	≥ 60 km/h	> 50 to < 60 km/h		> 50 to < 60 km/h				
	Left Turning Cyclist	F	F	C	C	C	C	-	C	-	-	-	-
	Level of Service	F	F	D	D	D	D	-	D	-	-	-	-
		F				D				-			
Transit	Average Signal Delay	≤ 10 sec	≤ 10 sec										
	Level of Service	B	B	-	-	-	-	-	-	-	-	-	-
		B				-				-			
Truck	Effective Corner Radius												
	Number of Receiving Lanes on Departure from Intersection												
	Level of Service	-	-	-	-	-	-	-	-	-	-	-	-
		-				-				-			
Auto	Volume to Capacity Ratio	0.0 - 0.60				0.0 - 0.60							
	Level of Service	A				A				-			

Multi-Modal Level of Service - Intersections Form

Consultant	CGH Transportation	**Project**	2020-82
Scenario	2029 Future Total PM	**Date**	05-Jan-21
Comments			

	INTERSECTIONS	Mer-Bleue Road @ Decoeur Drive / Axis Way				Mer-Bleue Road @ Renaud Road							
	Crossing Side	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Pedestrian	Lanes	7	7	3	3	3	3		3				
	Median	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m		No Median - 2.4 m				
	Conflicting Left Turns	Permissive	Permissive	Permissive	Permissive	Permissive	No left turn / Prohib.		Permissive				
	Conflicting Right Turns	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	No right turn	Permissive or yield control		Permissive or yield control				
	Right Turns on Red (RToR) ?	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed		RTOR allowed				
	Ped Signal Leading Interval?	No	No	No	No	No	No		No				
	Right Turn Channel	No Channel	No Channel	No Channel	No Channel	No Right Turn	No Channel		No Channel				
	Corner Radius	5-10m	5-10m	5-10m	5-10m	No Right Turn	5-10m		5-10m				
	Crosswalk Type	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings		Std transverse markings				
	PETSI Score	5	5	71	71	85	79		71				
	Ped. Exposure to Traffic LoS	F	F	C	C	B	B	-	C	-	-	-	-
	Cycle Length												
	Effective Walk Time												
	Average Pedestrian Delay												
	Pedestrian Delay LoS	-	-	-	-	-	-	-	-	-	-	-	-
	Level of Service	F	F	C	C	B	B	-	C	-	-	-	-
		F				C				-			
	Approach From	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Bicycle	Bicycle Lane Arrangement on Approach	Pocket Bike Lane	Pocket Bike Lane	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic		Mixed Traffic				
	Right Turn Lane Configuration	≤ 50 m Introduced right turn lane	≤ 50 m Introduced right turn lane	≤ 50 m	≤ 50 m	≤ 50 m	≤ 50 m		≤ 50 m				
	Right Turning Speed	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h		≤ 25 km/h				
	Cyclist relative to RT motorists	B	B	D	D	D	D	-	D	-	-	-	-
	Separated or Mixed Traffic	Separated	Separated	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	-	Mixed Traffic	-	-	-	-
	Left Turn Approach	≥ 2 lanes crossed	≥ 2 lanes crossed	No lane crossed	No lane crossed	No lane crossed	No lane crossed		No lane crossed				
	Operating Speed	≥ 60 km/h	≥ 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h		> 50 to < 60 km/h				
	Left Turning Cyclist	F	F	C	C	C	C	-	C	-	-	-	-
	Level of Service	F	F	D	D	D	D	-	D	-	-	-	-
		F				D				-			
Transit	Average Signal Delay	≤ 10 sec	≤ 10 sec										
	Level of Service	B	B	-	-	-	-	-	-	-	-	-	-
		B				-				-			
Truck	Effective Corner Radius												
	Number of Receiving Lanes on Departure from Intersection												
	Level of Service	-	-	-	-	-	-	-	-	-	-	-	-
		-				-				-			
Auto	Volume to Capacity Ratio	0.0 - 0.60				0.71 - 0.80							
	Level of Service	A				C				-			

Multi-Modal Level of Service - Segments Form

Consultant	CGH Transportation	**Project**	2020-82
Scenario	2020 Existing	**Date**	23-Mar-21
Comments			

SEGMENTS		Street A	Mer-Bleue Road - Brian Coburn Boulevard to Decoeur Drive	Brian Coburn Boulevard – Mer-Bleue Road to Jerome Jodoin Drive	Section	Section	Section	Section	Section	Section	Section
			1	2	3	4	5	6	7	8	9
Pedestrian	Sidewalk Width Boulevard Width	F	≥ 2 m > 2 m	no sidewalk n/a							
	Avg Daily Curb Lane Traffic Volume		> 3000	> 3000							
	Operating Speed On-Street Parking		> 60 km/h no	> 60 km/h no							
	Exposure to Traffic PLoS		D	F	-	-	-	-	-	-	-
	Effective Sidewalk Width		2.0 m								
	Pedestrian Volume		250 ped/hr								
	Crowding PLoS		B	-	-	-	-	-	-	-	-
	Level of Service		D	F	-	-	-	-	-	-	-
Bicycle	Type of Cycling Facility	F	Curbside Bike Lane	Mixed Traffic							
	Number of Travel Lanes		2 ea. dir. (w median)	≤ 2 (no centreline)							
	Operating Speed		>50 to 70 km/h	≥ 60 km/h							
	# of Lanes & Operating Speed LoS		C	F	-	-	-	-	-	-	-
	Bike Lane (+ Parking Lane) Width		≥ 1.8 m								
	Bike Lane Width LoS		A	-	-	-	-	-	-	-	-
	Bike Lane Blockages		Rare								
	Blockage LoS		A	-	-	-	-	-	-	-	-
	Median Refuge Width (no median = < 1.8 m)		< 1.8 m refuge	< 1.8 m refuge							
	No. of Lanes at Unsignalized Crossing		≤ 3 lanes	≤ 3 lanes							
	Sidestreet Operating Speed		≤ 40 km/h	≤ 40 km/h							
	Unsignalized Crossing - Lowest LoS		A	A	-	-	-	-	-	-	-
	Level of Service		C	F	-	-	-	-	-	-	-
Transit	Facility Type	D	Mixed Traffic	Mixed Traffic							
	Friction or Ratio Transit:Posted Speed		Vt/Vp ≥ 0.8	Vt/Vp ≥ 0.8							
	Level of Service		D	D	-	-	-	-	-	-	-
Truck	Truck Lane Width	B	≤ 3.5 m	> 3.7 m							
	Travel Lanes per Direction		> 1	1							
	Level of Service		A	B	-	-	-	-	-	-	-

Multi-Modal Level of Service - Segments Form

Consultant	CGH Transportation	**Project**	2020-82
Scenario	2024 Future Background	**Date**	23-Mar-21
Comments			

SEGMENTS		Street A	Mer-Bleue Road - Brian Coburn Boulevard to Decoeur Drive	Brian Coburn Boulevard – Mer-Bleue Road to Jerome Jodoin Drive	Section	Section	Section	Section	Section	Section	Section
			1	2	3	4	5	6	7	8	9
Pedestrian	Sidewalk Width Boulevard Width	F	≥ 2 m > 2 m	no sidewalk n/a							
	Avg Daily Curb Lane Traffic Volume		> 3000	> 3000							
	Operating Speed On-Street Parking		> 60 km/h no	> 60 km/h no							
	Exposure to Traffic PLoS		D	F	-	-	-	-	-	-	-
	Effective Sidewalk Width		2.0 m								
	Pedestrian Volume		250 ped/hr								
	Crowding PLoS		B	-	-	-	-	-	-	-	-
	Level of Service		D	F	-	-	-	-	-	-	-
Bicycle	Type of Cycling Facility	F	Curbside Bike Lane	Mixed Traffic							
	Number of Travel Lanes		2 ea. dir. (w median)	4-5 lanes total							
	Operating Speed		>50 to 70 km/h	≥ 60 km/h							
	# of Lanes & Operating Speed LoS		C	F	-	-	-	-	-	-	-
	Bike Lane (+ Parking Lane) Width		≥ 1.8 m								
	Bike Lane Width LoS		A	-	-	-	-	-	-	-	-
	Bike Lane Blockages		Rare								
	Blockage LoS		A	-	-	-	-	-	-	-	-
	Median Refuge Width (no median = < 1.8 m)		< 1.8 m refuge	< 1.8 m refuge							
	No. of Lanes at Unsignalized Crossing		≤ 3 lanes	≤ 3 lanes							
	Sidestreet Operating Speed		≤ 40 km/h	≤ 40 km/h							
	Unsignalized Crossing - Lowest LoS		A	A	-	-	-	-	-	-	-
	Level of Service		C	F	-	-	-	-	-	-	-
Transit	Facility Type	D	Mixed Traffic	Mixed Traffic							
	Friction or Ratio Transit:Posted Speed		Vt/Vp ≥ 0.8	Vt/Vp ≥ 0.8							
	Level of Service		D	D	-	-	-	-	-	-	-
Truck	Truck Lane Width	A	≤ 3.5 m	> 3.7 m							
	Travel Lanes per Direction		> 1	> 1							
	Level of Service		A	A	-	-	-	-	-	-	-

Multi-Modal Level of Service - Segments Form

Consultant	CGH Transportation	**Project**	2020-82
Scenario	2024 Future Total	**Date**	23-Mar-21
Comments			

SEGMENTS		Street A	Mer-Bleue Road - Brian Coburn Boulevard to Decoeur Drive	Brian Coburn Boulevard – Mer-Bleue Road to Jerome Jodoin Drive	Section	Section	Section	Section	Section	Section	Section
			1	2	3	4	5	6	7	8	9
Pedestrian	Sidewalk Width Boulevard Width	**E**	≥ 2 m > 2 m	≥ 2 m 0.5 - 2 m							
	Avg Daily Curb Lane Traffic Volume		> 3000	> 3000							
	Operating Speed On-Street Parking		> 60 km/h no	> 60 km/h no							
	Exposure to Traffic PLoS		**D**	**E**	-	-	-	-	-	-	-
	Effective Sidewalk Width		2.0 m	3.0 m							
	Pedestrian Volume		250 ped/hr	250 ped/hr							
	Crowding PLoS		**B**	**A**	-	-	-	-	-	-	-
	Level of Service		**D**	**E**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Bicycle	Type of Cycling Facility	**C**	Curbside Bike Lane	Physically Separated							
	Number of Travel Lanes		2 ea. dir. (w median)								
	Operating Speed		>50 to 70 km/h								
	# of Lanes & Operating Speed LoS		**C**	-	-	-	-	-	-	-	-
	Bike Lane (+ Parking Lane) Width		≥ 1.8 m								
	Bike Lane Width LoS		**A**	-	-	-	-	-	-	-	-
	Bike Lane Blockages		Rare								
	Blockage LoS		**A**	-	-	-	-	-	-	-	-
	Median Refuge Width (no median = < 1.8 m)		< 1.8 m refuge								
	No. of Lanes at Unsignalized Crossing		≤ 3 lanes								
	Sidestreet Operating Speed		≤ 40 km/h								
	Unsignalized Crossing - Lowest LoS		**A**	**A**	-	-	-	-	-	-	-
	Level of Service		**C**	**A**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Transit	Facility Type	**D**	Mixed Traffic	Mixed Traffic							
	Friction or Ratio Transit:Posted Speed		Vt/Vp ≥ 0.8	Vt/Vp ≥ 0.8							
	Level of Service		**D**	**D**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Truck	Truck Lane Width	**A**	≤ 3.5 m	> 3.7 m							
	Travel Lanes per Direction		> 1	> 1							
	Level of Service		**A**	**A**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Multi-Modal Level of Service - Segments Form

Consultant	CGH Transportation	**Project**	2020-82
Scenario	2029 Future Background	**Date**	23-Mar-21
Comments			

SEGMENTS		**Street A**	Mer-Bleue Road - Brian Coburn Boulevard to Decoeur Drive	Brian Coburn Boulevard – Mer-Bleue Road to Jerome Jodoin Drive	Section	Section	Section	Section	Section	Section	Section
			1	2	3	4	5	6	7	8	9
Pedestrian	Sidewalk Width Boulevard Width	**E**	≥ 2 m > 2 m	≥ 2 m 0.5 - 2 m							
	Avg Daily Curb Lane Traffic Volume		> 3000	> 3000							
	Operating Speed On-Street Parking		> 60 km/h no	> 60 km/h no							
	Exposure to Traffic PLoS		**D**	**E**	-	-	-	-	-	-	-
	Effective Sidewalk Width		2.0 m	3.0 m							
	Pedestrian Volume		250 ped/hr	250 ped/hr							
	Crowding PLoS		**B**	**A**	-	-	-	-	-	-	-
	Level of Service		**D**	**E**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Bicycle	Type of Cycling Facility	**C**	Curbside Bike Lane	Physically Separated							
	Number of Travel Lanes		2 ea. dir. (w median)								
	Operating Speed		>50 to 70 km/h								
	# of Lanes & Operating Speed LoS		**C**	-	-	-	-	-	-	-	-
	Bike Lane (+ Parking Lane) Width		≥ 1.8 m								
	Bike Lane Width LoS		**A**	-	-	-	-	-	-	-	-
	Bike Lane Blockages		Rare								
	Blockage LoS		**A**	-	-	-	-	-	-	-	-
	Median Refuge Width (no median = < 1.8 m)		< 1.8 m refuge								
	No. of Lanes at Unsignalized Crossing		≤ 3 lanes								
	Sidestreet Operating Speed		≤ 40 km/h								
	Unsignalized Crossing - Lowest LoS		**A**	**A**	-	-	-	-	-	-	-
	Level of Service		**C**	**A**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Transit	Facility Type	**D**	Mixed Traffic	Mixed Traffic							
	Friction or Ratio Transit:Posted Speed		Vt/Vp ≥ 0.8	Vt/Vp ≥ 0.8							
	Level of Service		**D**	**D**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Truck	Truck Lane Width	**A**	≤ 3.5 m	> 3.7 m							
	Travel Lanes per Direction		> 1	> 1							
	Level of Service		**A**	**A**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Multi-Modal Level of Service - Segments Form

Consultant	CGH Transportation	**Project**	2020-82
Scenario	2029 Future Total	**Date**	23-Mar-21
Comments			

SEGMENTS		**Street A**	Mer-Bleue Road - Brian Coburn Boulevard to Decoeur Drive	Brian Coburn Boulevard – Mer-Bleue Road to Jerome Jodoin Drive	Section	Section	Section	Section	Section	Section	Section
			1	2	3	4	5	6	7	8	9
Pedestrian	Sidewalk Width Boulevard Width	**E**	≥ 2 m > 2 m	≥ 2 m 0.5 - 2 m							
	Avg Daily Curb Lane Traffic Volume		> 3000	> 3000							
	Operating Speed On-Street Parking		> 60 km/h no	> 60 km/h no							
	Exposure to Traffic PLoS		**D**	**E**	-	-	-	-	-	-	-
	Effective Sidewalk Width		2.0 m	3.0 m							
	Pedestrian Volume		250 ped/hr	250 ped/hr							
	Crowding PLoS		**B**	**A**	-	-	-	-	-	-	-
	Level of Service		**D**	**E**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Bicycle	Type of Cycling Facility	**C**	Curbside Bike Lane	Physically Separated							
	Number of Travel Lanes		2 ea. dir. (w median)								
	Operating Speed		>50 to 70 km/h								
	# of Lanes & Operating Speed LoS		**C**	-	-	-	-	-	-	-	-
	Bike Lane (+ Parking Lane) Width		≥ 1.8 m								
	Bike Lane Width LoS		**A**	-	-	-	-	-	-	-	-
	Bike Lane Blockages		Rare								
	Blockage LoS		**A**	-	-	-	-	-	-	-	-
	Median Refuge Width (no median = < 1.8 m)		< 1.8 m refuge								
	No. of Lanes at Unsignalized Crossing		≤ 3 lanes								
	Sidestreet Operating Speed		≤ 40 km/h								
	Unsignalized Crossing - Lowest LoS		**A**	**A**	-	-	-	-	-	-	-
	Level of Service		**C**	**A**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Transit	Facility Type	**D**	Mixed Traffic	Mixed Traffic							
	Friction or Ratio Transit:Posted Speed		Vt/Vp ≥ 0.8	Vt/Vp ≥ 0.8							
	Level of Service		**D**	**D**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Truck	Truck Lane Width	**A**	≤ 3.5 m	> 3.7 m							
	Travel Lanes per Direction		> 1	> 1							
	Level of Service		**A**	**A**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Appendix J

Signal Warrants

Mer-Bleue Road at Site Access #1
Future Total 2029

Justification #7

Justification	Description	Minimum Requirement 1 Lane Highway		Minimum Requirement 2 or More Lanes		Compliance			Signal
						Sectional		Entire %	
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%		
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	948	158%	147%	Yes
	B. Vehicle volume, along minor streets (average hour)	120	170	120	170	177	147%		
2. Delay to Cross Traffic	A. Vehicle volumes, major street (average hour)	480	720	600	900	772	129%	129%	Yes
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75	83	166%		

Notes
1. Refer to OTM Book 12, pg 88, Nov 2007
2. Lowest section percentage governs justification
3. Average hourly volumes estimated from peak hour volumes, AHV = PM/2 or (AM + PM) / 4
4. T-intersection factor corrected, applies only to 1B

Mer-Bleue Road at Site Access #1
Future Background 2024

Justification #7

<table>
<tr><th rowspan="3">Justification</th><th rowspan="3">Description</th><th colspan="2">Minimum Requirement</th><th colspan="2">Minimum Requirement</th><th colspan="3">Compliance</th><th rowspan="3">Signal</th></tr>
<tr><th colspan="2">1 Lane Highway</th><th colspan="2">2 or More Lanes</th><th colspan="2">Sectional</th><th rowspan="2">Entire %</th></tr>
<tr><th>Free Flow</th><th>Restr. Flow</th><th>Free Flow</th><th>Restr. Flow</th><th>Numerical</th><th>%</th></tr>
<tr><td rowspan="2">1. Minimum Vehicular Volume</td><td>A. Vehicle volume, all approaches (average hour)</td><td>480</td><td>720</td><td>600</td><td>900</td><td>831</td><td>138%</td><td rowspan="2">132%</td><td rowspan="2">Yes</td></tr>
<tr><td>B. Vehicle volume, along minor streets (average hour)</td><td>120</td><td>170</td><td>120</td><td>170</td><td>159</td><td>132%</td></tr>
<tr><td rowspan="2">2. Delay to Cross Traffic</td><td>A. Vehicle volumes, major street (average hour)</td><td>480</td><td>720</td><td>600</td><td>900</td><td>672</td><td>112%</td><td rowspan="2">112%</td><td rowspan="2">No</td></tr>
<tr><td>B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)</td><td>50</td><td>75</td><td>50</td><td>75</td><td>82</td><td>164%</td></tr>
</table>

Notes
1. Refer to OTM Book 12, pg 88, Nov 2007
2. Lowest section percentage governs justification
3. Average hourly volumes estimated from peak hour volumes, AHV = PM/2 or (AM + PM) / 4
4. T-intersection factor corrected, applies only to 1B

Mer-Bleue Road at Site Access #1
Future Background 2029

Justification #7

Justification	Description	Minimum Requirement 1 Lane Highway		Minimum Requirement 2 or More Lanes		Compliance			Signal
						Sectional		Entire %	
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%		
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	915	152%	132%	Yes
	B. Vehicle volume, along minor streets (average hour)	120	170	120	170	159	132%		
2. Delay to Cross Traffic	A. Vehicle volumes, major street (average hour)	480	720	600	900	756	126%	126%	Yes
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75	82	164%		

Notes
1. Refer to OTM Book 12, pg 88, Nov 2007
2. Lowest section percentage governs justification
3. Average hourly volumes estimated from peak hour volumes, AHV = PM/2 or (AM + PM) / 4
4. T-intersection factor corrected, applies only to 1B

Mer-Bleue Road at Site Access #1
Future Total 2024

Justification #7

Justification	Description	Minimum Requirement 1 Lane Highway		Minimum Requirement 2 or More Lanes		Compliance			Signal
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Sectional Numerical	Sectional %	Entire %	
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	864	144%	144%	Yes
	B. Vehicle volume, along minor streets (average hour)	120	170	120	170	177	147%		
2. Delay to Cross Traffic	A. Vehicle volumes, major street (average hour)	480	720	600	900	688	115%	115%	No
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75	83	166%		

Notes
1. Refer to OTM Book 12, pg 88, Nov 2007
2. Lowest section percentage governs justification
3. Average hourly volumes estimated from peak hour volumes, AHV = PM/2 or (AM + PM) / 4
4. T-intersection factor corrected, applies only to 1B

Brian Coburn Boulevard at site access #2
Future Total 2029

Justification #7

Justification	Description	Minimum Requirement 1 Lane Highway		Minimum Requirement 2 or More Lanes		Compliance			Signal
						Sectional		Entire %	
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%		
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	1386	289%	30%	No
	B. Vehicle volume, along minor streets (average hour)	120	170	120	170	36	30%		
2. Delay to Cross Traffic	A. Vehicle volumes, major street (average hour)	480	720	600	900	1362	284%	0%	No
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75	0	0%		

Notes
1. Refer to OTM Book 12, pg 88, Nov 2007
2. Lowest section percentage governs justification
3. Average hourly volumes estimated from peak hour volumes, AHV = PM/2 or (AM + PM) / 4
4. T-intersection factor corrected, applies only to 1B

Brian Coburn Boulevard at site access #2
Future Total 2024

Justification #7

Justification	Description	Minimum Requirement 1 Lane Highway		Minimum Requirement 2 or More Lanes		Compliance			Signal
						Sectional		Entire %	
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%		
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	1243	259%	30%	No
	B. Vehicle volume, along minor streets (average hour)	120	170	120	170	36	30%		
2. Delay to Cross Traffic	A. Vehicle volumes, major street (average hour)	480	720	600	900	1220	254%	0%	No
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75	0	0%		

Notes
1. Refer to OTM Book 12, pg 88, Nov 2007
2. Lowest section percentage governs justification
3. Average hourly volumes estimated from peak hour volumes, AHV = PM/2 or (AM + PM) / 4
4. T-intersection factor corrected, applies only to 1B

Mer-Bleue Road at Renaud Road
Future Background 2024

Justification #7

Justification	Description	Minimum Requirement 1 Lane Highway		Minimum Requirement 2 or More Lanes		Compliance			Signal
						Sectional		Entire %	
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%		
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	674	140%	140%	Yes
	B. Vehicle volume, along minor streets (average hour)	120	170	120	170	271	226%		
2. Delay to Cross Traffic	A. Vehicle volumes, major street (average hour)	480	720	600	900	493	103%	103%	No
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75	147	294%		

Notes
1. Refer to OTM Book 12, pg 88, Nov 2007
2. Lowest section percentage governs justification
3. Average hourly volumes estimated from peak hour volumes, AHV = PM/2 or (AM + PM) / 4
4. T-intersection factor corrected, applies only to 1B

Mer-Bleue Road at Renaud Road
Future Background 2029

Justification #7

Justification	Description	Minimum Requirement 1 Lane Highway		Minimum Requirement 2 or More Lanes		Compliance			Signal
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Sectional Numerical	Sectional %	Entire %	
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	749	156%	156%	Yes
	B. Vehicle volume, along minor streets (average hour)	120	170	120	170	305	254%		
2. Delay to Cross Traffic	A. Vehicle volumes, major street (average hour)	480	720	600	900	546	114%	114%	No
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75	167	334%		

Notes
1. Refer to OTM Book 12, pg 88, Nov 2007
2. Lowest section percentage governs justification
3. Average hourly volumes estimated from peak hour volumes, AHV = PM/2 or (AM + PM) / 4
4. T-intersection factor corrected, applies only to 1B

Mer-Bleue Road at Renaud Road
Future Total 2024

Justification #7

Justification	Description	Minimum Requirement 1 Lane Highway		Minimum Requirement 2 or More Lanes		Compliance			Signal
						Sectional		Entire %	
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%		
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	676	141%	141%	Yes
	B. Vehicle volume, along minor streets (average hour)	120	170	120	170	272	227%		
2. Delay to Cross Traffic	A. Vehicle volumes, major street (average hour)	480	720	600	900	494	103%	103%	No
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75	148	295%		

Notes
1. Refer to OTM Book 12, pg 88, Nov 2007
2. Lowest section percentage governs justification
3. Average hourly volumes estimated from peak hour volumes, AHV = PM/2 or (AM + PM) / 4
4. T-intersection factor corrected, applies only to 1B

Mer-Bleue Road at Renaud Road
Future Total 2029

Justification #7

Justification	Description	Minimum Requirement 1 Lane Highway		Minimum Requirement 2 or More Lanes		Compliance			Signal
						Sectional		Entire %	
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%		
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	751	156%	156%	Yes
	B. Vehicle volume, along minor streets (average hour)	120	170	120	170	306	255%		
2. Delay to Cross Traffic	A. Vehicle volumes, major street (average hour)	480	720	600	900	547	114%	114%	No
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75	168	336%		

Notes
1. Refer to OTM Book 12, pg 88, Nov 2007
2. Lowest section percentage governs justification
3. Average hourly volumes estimated from peak hour volumes, AHV = PM/2 or (AM + PM) / 4
4. T-intersection factor corrected, applies only to 1B

Appendix K

HV% Calculations

[1] Mer-Bleue Road & Brian Coburn Boulevard												
AM												
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
HV Volume												
Total Volume												
HV%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
PM												
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
HV Volume												
Total Volume												
HV%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%

[2] Brian Coburn Boulevard & Gerry Lalonde Drive / Jerome Jodoin Drive												
AM												
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
HV Volume	0	0	0	1	0	1	1	18	0	0	18	6
Total Volume	0	0	0	7	0	164	29	292	0	0	896	13
HV%				14%		1%	3%	6%			2%	46%
PM												
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
HV Volume	0	0	0	3	0	0	1	13	0	0	11	0
Total Volume	0	0	0	4	0	78	187	886	0	0	504	12
HV%				75%		0%	1%	1%			2%	0%

[3] Renaud Road & Mer-Bleue Road												
AM												
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
HV Volume	5	11	0	0	8	10	15	0	3	0	0	0
Total Volume	63	156	0	0	60	143	115	0	18	0	0	0
HV%	8%	7%			13%	7%	13%		17%			
PM												
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
HV Volume	1	3	0	0	6	0	5	0	4	0	0	0
Total Volume	21	131	0	0	176	70	259	0	30	0	0	0
HV%	5%	2%			3%	2%	2%		13%			

Appendix L

Synchro and Sidra 2020 Existing Worksheets

Intersection	
Int Delay, s/veh	7.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	30	366	979	14	7	171
Future Vol, veh/h	30	366	979	14	7	171
Conflicting Peds, #/hr	7	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	1050	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	3	6	2	46	14	1
Mvmt Flow	33	407	1088	16	8	190

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1111	0	-	0	1576	1103
Stage 1	-	-	-	-	1103	-
Stage 2	-	-	-	-	473	-
Critical Hdwy	4.13	-	-	-	6.54	6.21
Critical Hdwy Stg 1	-	-	-	-	5.54	-
Critical Hdwy Stg 2	-	-	-	-	5.54	-
Follow-up Hdwy	2.227	-	-	-	3.626	3.309
Pot Cap-1 Maneuver	625	-	-	-	113	258
Stage 1	-	-	-	-	301	-
Stage 2	-	-	-	-	603	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	621	-	-	-	106	256
Mov Cap-2 Maneuver	-	-	-	-	106	-
Stage 1	-	-	-	-	283	-
Stage 2	-	-	-	-	599	-

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	62.7
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	621	-	-	-	243
HCM Lane V/C Ratio	0.054	-	-	-	0.814
HCM Control Delay (s)	11.1	-	-	-	62.7
HCM Lane LOS	B	-	-	-	F
HCM 95th %tile Q(veh)	0.2	-	-	-	6.2

Intersection	
Intersection Delay, s/veh	10.7
Intersection LOS	B

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	133	19	66	179	100	185
Future Vol, veh/h	133	19	66	179	100	185
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	13	17	8	7	13	7
Mvmt Flow	148	21	73	199	111	206
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	10.6	10.9	10.6
HCM LOS	B	B	B

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	27%	88%	0%
Vol Thru, %	73%	0%	35%
Vol Right, %	0%	12%	65%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	245	152	285
LT Vol	66	133	0
Through Vol	179	0	100
RT Vol	0	19	185
Lane Flow Rate	272	169	317
Geometry Grp	1	1	1
Degree of Util (X)	0.372	0.26	0.399
Departure Headway (Hd)	4.922	5.549	4.54
Convergence, Y/N	Yes	Yes	Yes
Cap	727	642	788
Service Time	2.981	3.629	2.594
HCM Lane V/C Ratio	0.374	0.263	0.402
HCM Control Delay	10.9	10.6	10.6
HCM Lane LOS	B	B	B
HCM 95th-tile Q	1.7	1	1.9

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	195	991	602	12	4	81
Future Vol, veh/h	195	991	602	12	4	81
Conflicting Peds, #/hr	5	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	1050	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	75	2
Mvmt Flow	217	1101	669	13	4	90

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	687	0	-	0	2216	681
Stage 1	-	-	-	-	681	-
Stage 2	-	-	-	-	1535	-
Critical Hdwy	4.12	-	-	-	7.15	6.22
Critical Hdwy Stg 1	-	-	-	-	6.15	-
Critical Hdwy Stg 2	-	-	-	-	6.15	-
Follow-up Hdwy	2.218	-	-	-	4.175	3.318
Pot Cap-1 Maneuver	907	-	-	-	29	450
Stage 1	-	-	-	-	390	-
Stage 2	-	-	-	-	134	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	903	-	-	-	22	448
Mov Cap-2 Maneuver	-	-	-	-	22	-
Stage 1	-	-	-	-	295	-
Stage 2	-	-	-	-	133	-

Approach	EB		WB		SB
HCM Control Delay, s	1.7		0		30.4
HCM LOS					D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	903	-	-	-	234
HCM Lane V/C Ratio	0.24	-	-	-	0.404
HCM Control Delay (s)	10.2	-	-	-	30.4
HCM Lane LOS	B	-	-	-	D
HCM 95th %tile Q(veh)	0.9	-	-	-	1.8

Intersection	
Intersection Delay, s/veh	14.5
Intersection LOS	B

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	319	31	22	186	211	91
Future Vol, veh/h	319	31	22	186	211	91
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	13	5	2	3	2
Mvmt Flow	354	34	24	207	234	101
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	16.8	12	13.5
HCM LOS	C	B	B

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	11%	91%	0%
Vol Thru, %	89%	0%	70%
Vol Right, %	0%	9%	30%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	208	350	302
LT Vol	22	319	0
Through Vol	186	0	211
RT Vol	0	31	91
Lane Flow Rate	231	389	336
Geometry Grp	1	1	1
Degree of Util (X)	0.365	0.603	0.495
Departure Headway (Hd)	5.69	5.583	5.313
Convergence, Y/N	Yes	Yes	Yes
Cap	631	646	678
Service Time	3.737	3.621	3.355
HCM Lane V/C Ratio	0.366	0.602	0.496
HCM Control Delay	12	16.8	13.5
HCM Lane LOS	B	C	B
HCM 95th-tile Q	1.7	4	2.8

DEGREE OF SATURATION

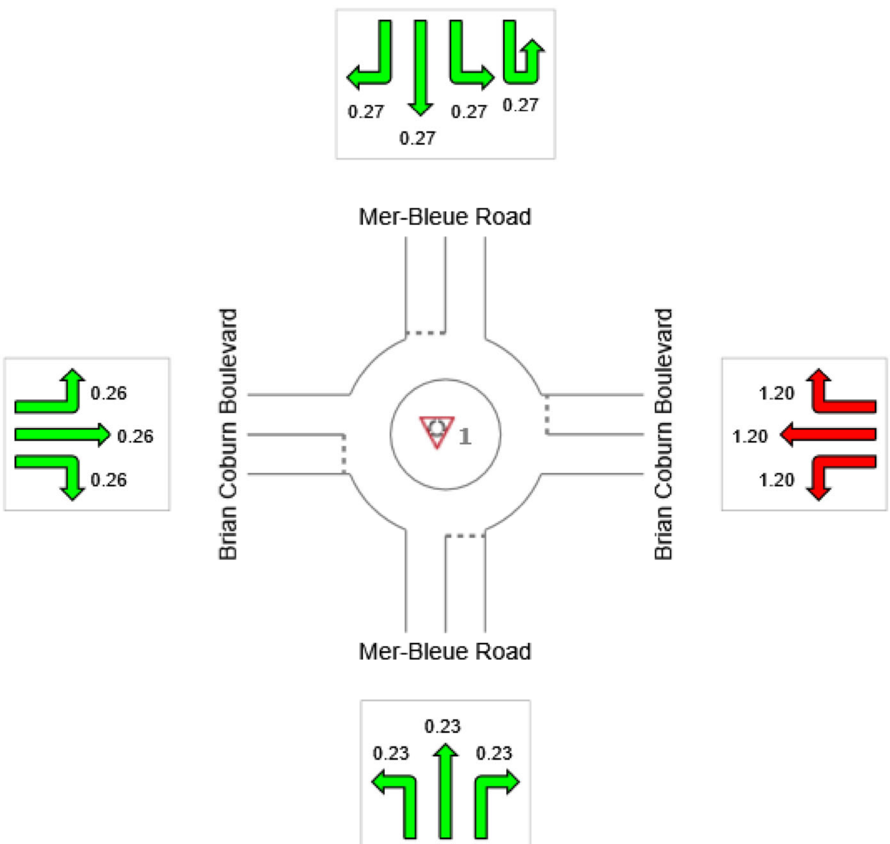
Ratio of Demand Volume to Capacity, v/c ratio per movement

Site: 1 [Mer-Bleue & Brian Coburn Existing 2020 AM]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Degree of Saturation	0.23	1.20	0.27	0.26	1.20



Colour code based on Degree of Saturation

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

DELAY (CONTROL)

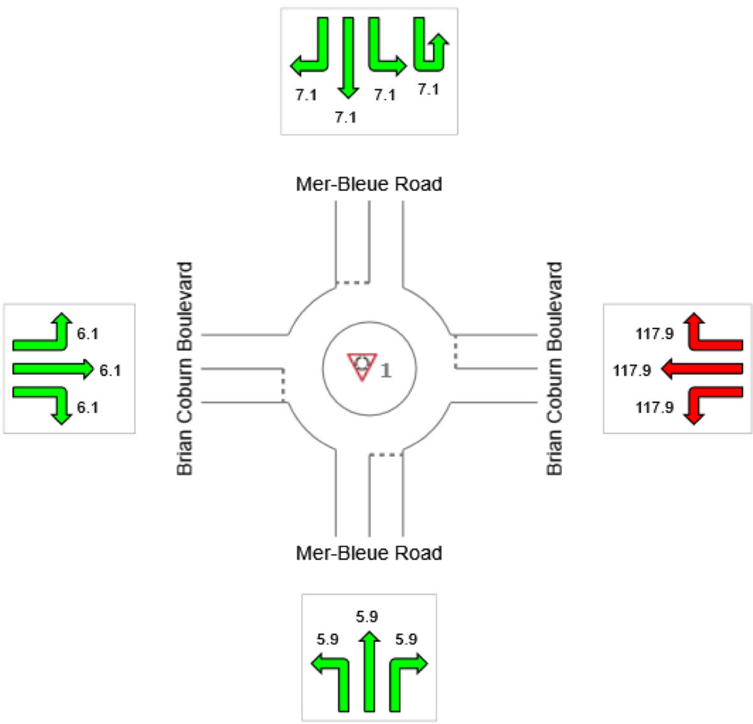
Average control delay per vehicle, or average pedestrian delay (seconds)

Site: 1 [Mer-Bleue & Brian Coburn Existing 2020 AM]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Delay (Control)	5.9	117.9	7.1	6.1	61.9
LOS	A	F	A	A	F



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

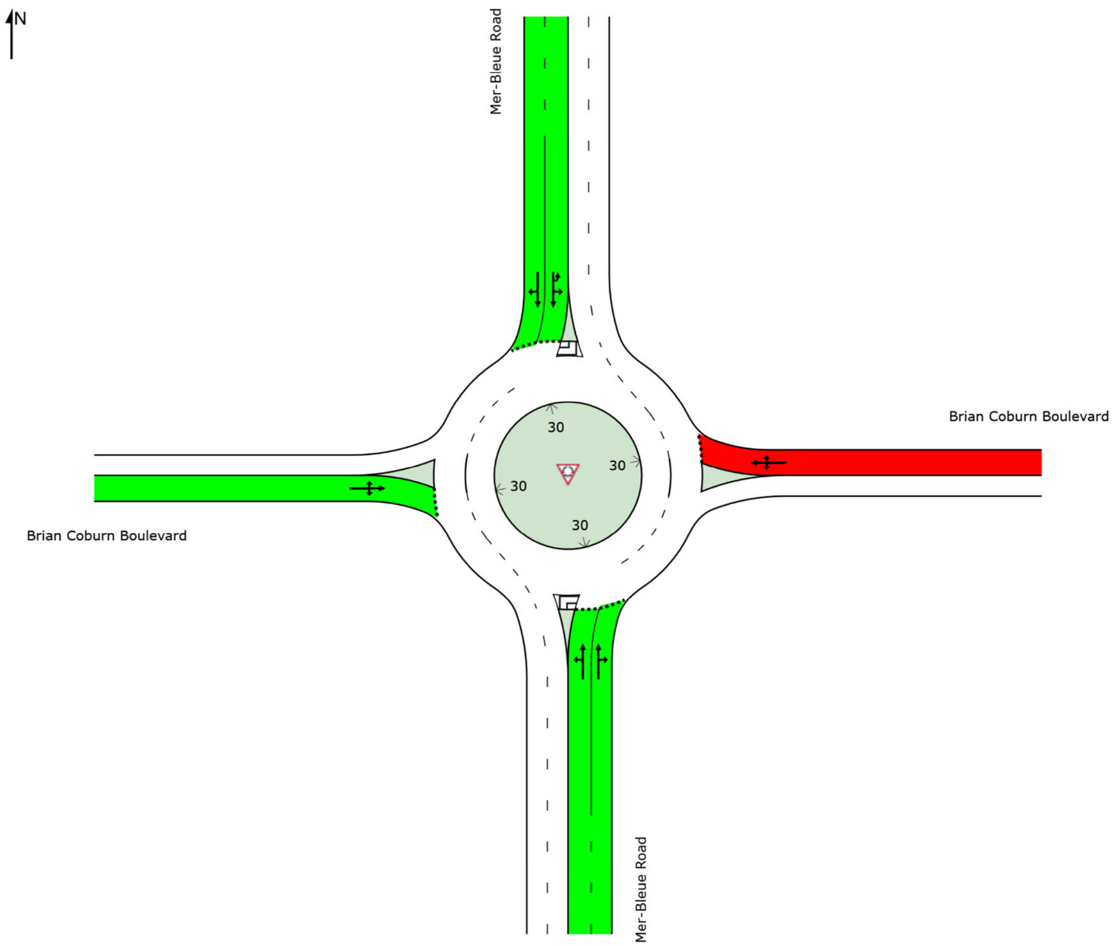
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 1 [Mer-Bleue & Brian Coburn Existing 2020 AM]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	F	A	A	F



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

MOVEMENT SUMMARY

Site: 1 [Mer-Bleue & Brian Coburn Existing 2020 AM]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Mer-Bleue Road												
1	L2	19	2.0	0.231	5.9	LOS A	1.0	7.1	0.48	0.40	0.48	52.8
2	T1	277	2.0	0.231	5.9	LOS A	1.0	7.1	0.48	0.40	0.48	52.6
3	R2	162	2.0	0.231	5.9	LOS A	1.0	7.1	0.48	0.40	0.48	46.8
Approach		458	2.0	0.231	5.9	LOS A	1.0	7.1	0.48	0.40	0.48	51.0
East: Brian Coburn Boulevard												
4	L2	70	2.0	1.202	117.9	LOS F	93.0	662.4	1.00	3.76	7.75	14.1
5	T1	552	2.0	1.202	117.9	LOS F	93.0	662.4	1.00	3.76	7.75	15.8
6	R2	550	2.0	1.202	117.9	LOS F	93.0	662.4	1.00	3.76	7.75	15.6
Approach		1172	2.0	1.202	117.9	LOS F	93.0	662.4	1.00	3.76	7.75	15.6
North: Mer-Bleue Road												
7u	U	8	2.0	0.271	7.1	LOS A	1.1	8.2	0.57	0.55	0.57	51.8
7	L2	121	2.0	0.271	7.1	LOS A	1.1	8.2	0.57	0.55	0.57	47.3
8	T1	189	2.0	0.271	7.1	LOS A	1.1	8.2	0.57	0.55	0.57	50.5
9	R2	142	2.0	0.271	7.1	LOS A	1.1	8.2	0.57	0.55	0.57	50.7
Approach		460	2.0	0.271	7.1	LOS A	1.1	8.2	0.57	0.55	0.57	49.9
West: Brian Coburn Boulevard												
10	L2	121	2.0	0.260	6.1	LOS A	1.1	7.8	0.47	0.40	0.47	51.8
11	T1	120	2.0	0.260	6.1	LOS A	1.1	7.8	0.47	0.40	0.47	48.4
12	R2	23	2.0	0.260	6.1	LOS A	1.1	7.8	0.47	0.40	0.47	49.4
Approach		264	2.0	0.260	6.1	LOS A	1.1	7.8	0.47	0.40	0.47	50.3
All Vehicles		2354	2.0	1.202	61.9	LOS F	93.0	662.4	0.76	2.10	4.12	25.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

DEGREE OF SATURATION

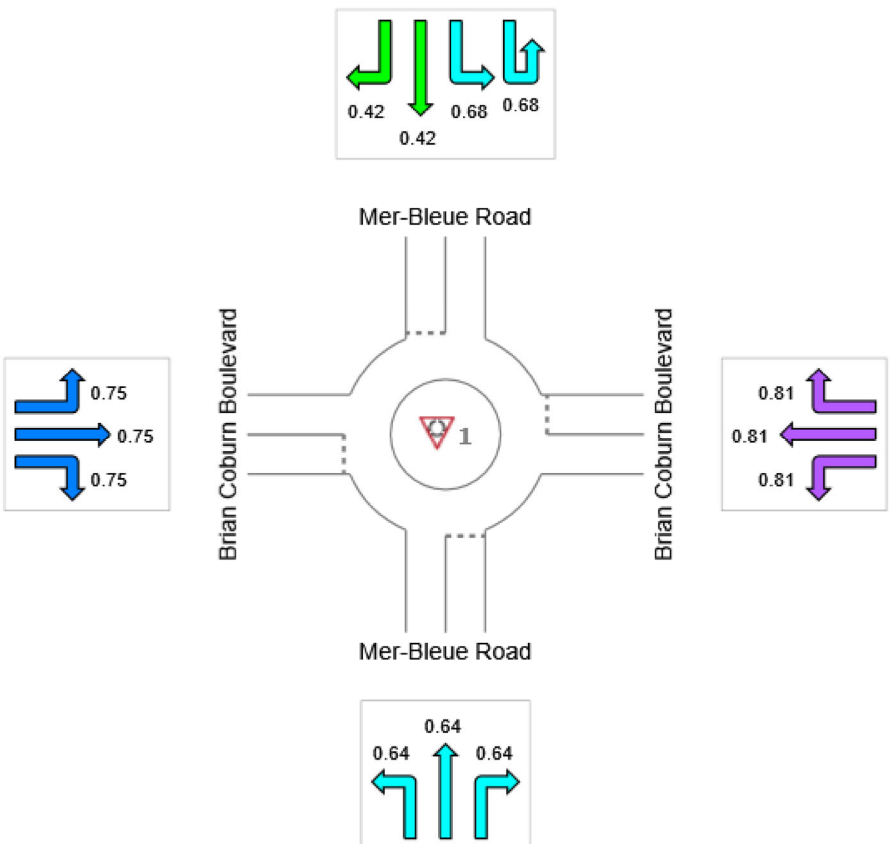
Ratio of Demand Volume to Capacity, v/c ratio per movement

Site: 1 [Mer-Bleue & Brian Coburn Existing 2020 PM]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Degree of Saturation	0.64	0.81	0.68	0.75	0.81



Colour code based on Degree of Saturation

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

DELAY (CONTROL)

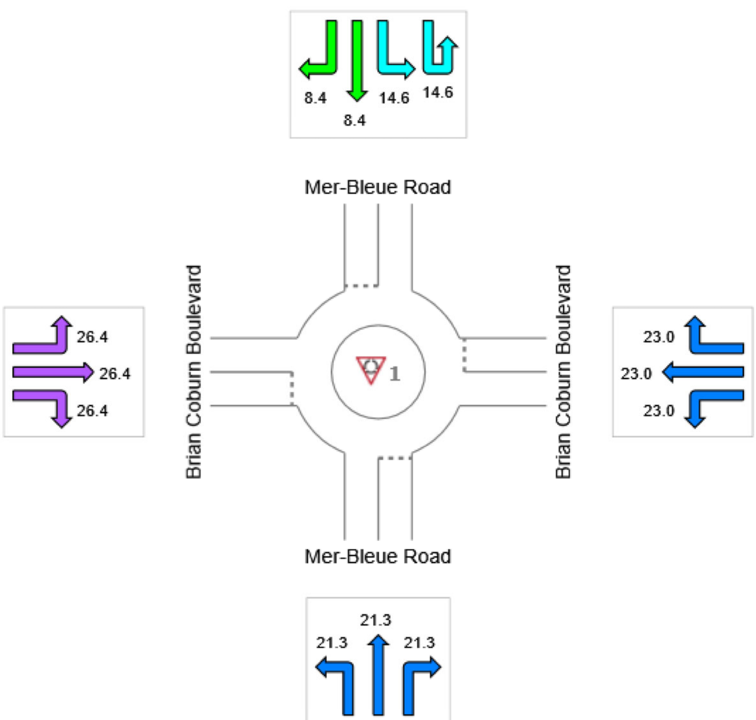
Average control delay per vehicle, or average pedestrian delay (seconds)

Site: 1 [Mer-Bleue & Brian Coburn Existing 2020 PM]

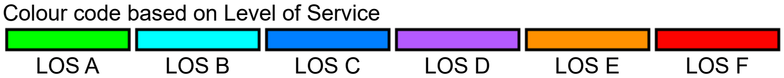
Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Delay (Control)	21.3	23.0	12.2	26.4	19.0
LOS	C	C	B	D	C



Colour code based on Level of Service



Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

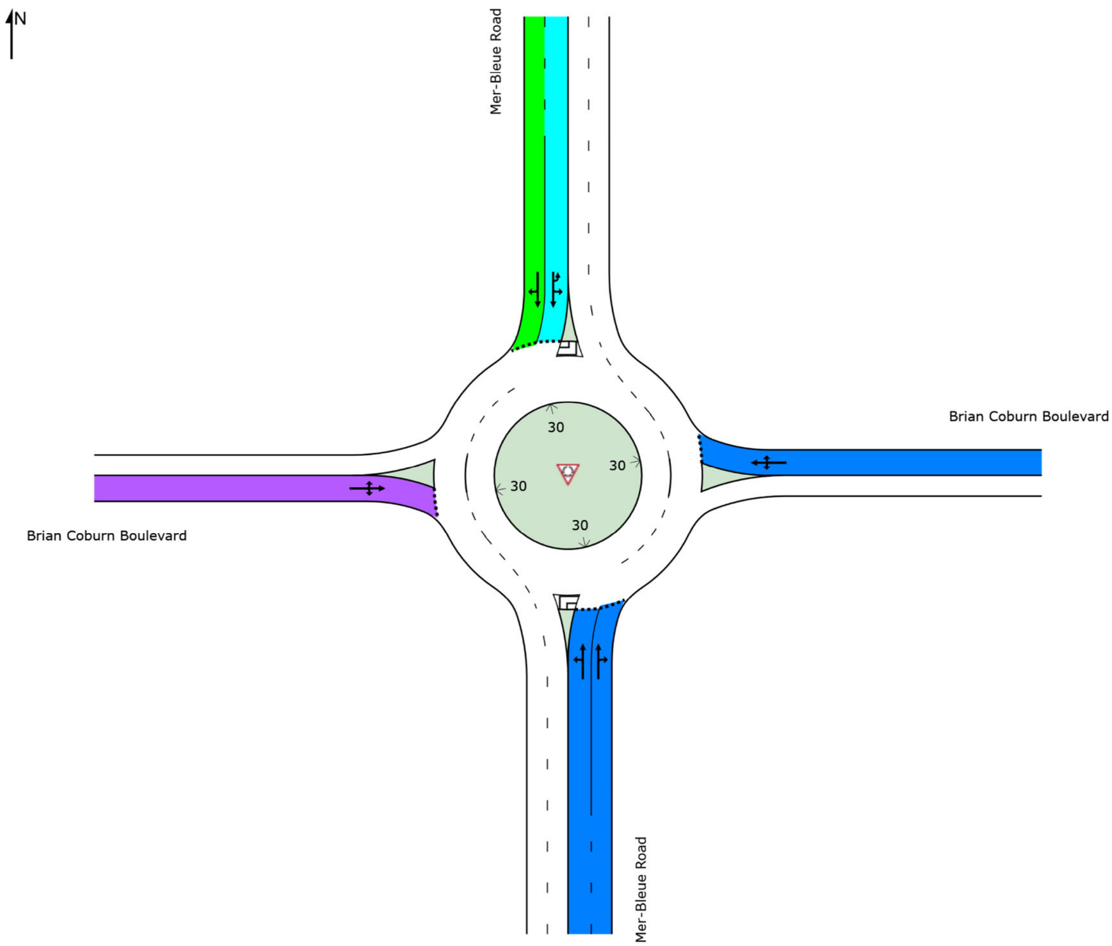
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 1 [Mer-Bleue & Brian Coburn Existing 2020 PM]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	C	C	B	D	C



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

MOVEMENT SUMMARY

Site: 1 [Mer-Bleue & Brian Coburn Existing 2020 PM]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
Movement Performance - Vehicles												
South: Mer-Bleue Road												
1	L2	41	2.0	0.639	21.3	LOS C	4.1	29.5	0.82	1.03	1.52	42.5
2	T1	469	2.0	0.639	21.3	LOS C	4.1	29.5	0.82	1.03	1.52	42.4
3	R2	164	2.0	0.639	21.3	LOS C	4.1	29.5	0.82	1.03	1.52	35.3
Approach		674	2.0	0.639	21.3	LOS C	4.1	29.5	0.82	1.03	1.52	41.0
East: Brian Coburn Boulevard												
4	L2	127	2.0	0.810	23.0	LOS C	13.2	93.9	0.92	1.38	2.16	35.6
5	T1	204	2.0	0.810	23.0	LOS C	13.2	93.9	0.92	1.38	2.16	37.5
6	R2	382	2.0	0.810	23.0	LOS C	13.2	93.9	0.92	1.38	2.16	36.5
Approach		713	2.0	0.810	23.0	LOS C	13.2	93.9	0.92	1.38	2.16	36.7
North: Mer-Bleue Road												
7u	U	1	2.0	0.685	14.6	LOS B	9.1	64.9	0.77	0.96	1.35	45.8
7	L2	677	2.0	0.685	14.6	LOS B	9.1	64.9	0.77	0.96	1.35	40.4
8	T1	248	2.0	0.423	8.4	LOS A	2.2	15.5	0.57	0.51	0.57	50.8
9	R2	171	2.0	0.423	8.4	LOS A	2.2	15.5	0.57	0.51	0.57	49.9
Approach		1097	2.0	0.685	12.2	LOS B	9.1	64.9	0.70	0.79	1.05	44.3
West: Brian Coburn Boulevard												
10	L2	32	2.0	0.747	26.4	LOS D	6.1	43.1	0.85	1.16	1.91	41.4
11	T1	356	2.0	0.747	26.4	LOS D	6.1	43.1	0.85	1.16	1.91	36.1
12	R2	38	2.0	0.747	26.4	LOS D	6.1	43.1	0.85	1.16	1.91	39.0
Approach		426	2.0	0.747	26.4	LOS D	6.1	43.1	0.85	1.16	1.91	36.9
All Vehicles		2910	2.0	0.810	19.0	LOS C	13.2	93.9	0.80	1.04	1.56	40.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Appendix M

2024 Future Background Synchro and Sidra Worksheets

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	155	162	28	103	656	688	27	556	284	370	185	274
Future Volume (vph)	155	162	28	103	656	688	27	556	284	370	185	274
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Frt		0.988			0.929			0.951				0.976
Flt Protected		0.978			0.996			0.998				0.973
Satd. Flow (prot)	0	3204	0	0	3068	0	0	3147	0	0	0	3149
Flt Permitted		0.978			0.996			0.998				0.973
Satd. Flow (perm)	0	3204	0	0	3068	0	0	3147	0	0	0	3149
Link Speed (k/h)		70			60			60				60
Link Distance (m)		647.3			419.1			463.6				481.8
Travel Time (s)		33.3			25.1			27.8				28.9
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	155	162	28	103	656	688	27	556	284	370	185	274
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	345	0	0	1447	0	0	867	0	0	0	989
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	R NA	Left	Left
Median Width(m)		0.0			0.0			3.5				3.5
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		3.0			3.0			3.0				3.0
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	25		15	25		15	25		15	15	25	
Sign Control		Yield			Yield			Yield				Yield

Intersection Summary	
Area Type:	Other
Control Type: Roundabout	
Intersection Capacity Utilization 126.5%	ICU Level of Service H
Analysis Period (min) 15	

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	160
Future Volume (vph)	160
Ideal Flow (vphpl)	1800
Lane Util. Factor	0.95
Frt	
Flt Protected	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Peak Hour Factor	1.00
Adj. Flow (vph)	160
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	1.09
Turning Speed (k/h)	15
Sign Control	

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	593	30	6	1239	15	105	0	11	8	0	206
Future Volume (vph)	43	593	30	6	1239	15	105	0	11	8	0	206
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	105.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	45.0			15.0			15.0			15.0		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.993			0.998			0.987			0.870	
Flt Protected		0.997						0.957			0.998	
Satd. Flow (prot)	0	3170	0	0	3292	0	0	1648	0	0	1523	0
Flt Permitted		0.997						0.957			0.998	
Satd. Flow (perm)	0	3170	0	0	3292	0	0	1648	0	0	1523	0
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		419.1			443.7			148.0			244.6	
Travel Time (s)		25.1			26.6			10.7			17.6	
Confl. Peds. (#/hr)	7											
Confl. Bikes (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	6%	2%	2%	2%	46%	2%	2%	2%	14%	2%	1%
Adj. Flow (vph)	43	593	30	6	1239	15	105	0	11	8	0	206
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	666	0	0	1260	0	0	116	0	0	214	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		3.0			3.0			3.0			3.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary	
Area Type: Other	
Control Type: Roundabout	
Intersection Capacity Utilization 83.6%	ICU Level of Service E
Analysis Period (min) 15	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	189	51	114	405	209	240
Future Volume (vph)	189	51	114	405	209	240
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	95.0	0.0	30.0			0.0
Storage Lanes	1	1	1			0
Taper Length (m)	15.0		75.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.928	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1496	1293	1566	1664	1505	0
Flt Permitted	0.950		0.468			
Satd. Flow (perm)	1496	1293	771	1664	1505	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		51			139	
Link Speed (k/h)	50			50	60	
Link Distance (m)	691.8			356.1	136.7	
Travel Time (s)	49.8			25.6	8.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	13%	17%	8%	7%	13%	7%
Adj. Flow (vph)	189	51	114	405	209	240
Shared Lane Traffic (%)						
Lane Group Flow (vph)	189	51	114	405	449	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	3.0			3.0	3.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	25	15	25			15
Number of Detectors	1	1	1	2	2	
Detector Template	Left	Right	Left	Thru	Thru	
Leading Detector (m)	2.0	2.0	2.0	10.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	2.0	2.0	0.6	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	6	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		4	2			
Detector Phase	4	4	2	2	6	
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	25.0	25.0	24.0	24.0	25.2	
Total Split (s)	25.0	25.0	24.0	24.0	25.2	
Total Split (%)	49.8%	49.8%	47.8%	47.8%	50.2%	
Maximum Green (s)	20.7	20.7	19.7	19.7	20.5	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.3	4.3	4.3	4.3	4.7	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	Min	Min	Min	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	13.5	13.5	12.5	12.5	13.5	
Pedestrian Calls (#/hr)	0	0	0	0	0	
Act Effct Green (s)	11.3	11.3	18.7	18.7	18.4	
Actuated g/C Ratio	0.33	0.33	0.54	0.54	0.53	
v/c Ratio	0.39	0.11	0.27	0.45	0.52	
Control Delay	12.6	4.6	9.3	9.3	8.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	12.6	4.6	9.3	9.3	8.1	
LOS	B	A	A	A	A	
Approach Delay	10.9			9.3	8.1	
Approach LOS	B			A	A	
Queue Length 50th (m)	6.8	0.0	3.6	14.3	10.8	
Queue Length 95th (m)	23.1	4.8	13.2	37.6	34.7	
Internal Link Dist (m)	667.8			332.1	112.7	
Turn Bay Length (m)	95.0		30.0			
Base Capacity (vph)	918	813	523	1130	1054	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.21	0.06	0.22	0.36	0.43	

Intersection Summary

Area Type: Other

Cycle Length: 50.2

Actuated Cycle Length: 34.4

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

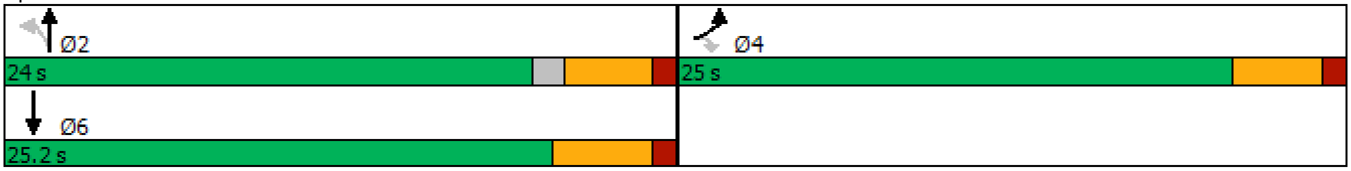
Maximum v/c Ratio: 0.52

Intersection Signal Delay: 9.2 Intersection LOS: A

Intersection Capacity Utilization 57.6% ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 3: Mer-Bleue Road & Renaud Road



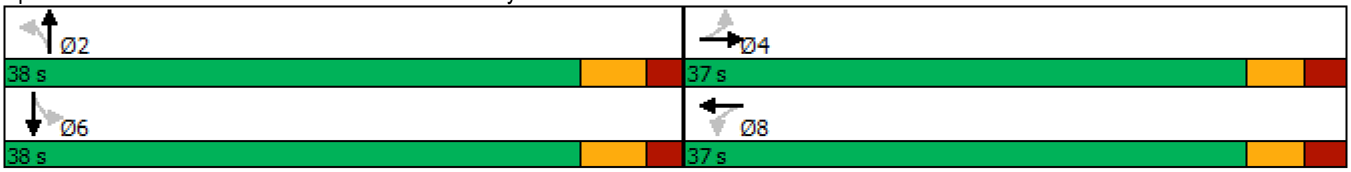
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	86	61	10	32	64	90	2	669	13	23	380	22
Future Volume (vph)	86	61	10	32	64	90	2	669	13	23	380	22
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	30.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	15.0			15.0			75.0			75.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.979			0.912			0.997			0.992	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1658	1708	0	1658	1592	0	1658	3154	0	1658	2985	0
Flt Permitted	0.659			0.711			0.515			0.392		
Satd. Flow (perm)	1150	1708	0	1241	1592	0	899	3154	0	684	2985	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			90			3			10	
Link Speed (k/h)		50			50			60			60	
Link Distance (m)		221.2			188.0			167.0			463.6	
Travel Time (s)		15.9			13.5			10.0			27.8	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	7%	2%	2%	13%	2%
Adj. Flow (vph)	86	61	10	32	64	90	2	669	13	23	380	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	86	71	0	32	154	0	2	682	0	23	402	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		3.0			3.0			3.0			3.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	36.1	36.1		36.1	36.1		35.9	35.9		35.9	35.9	
Total Split (s)	37.0	37.0		37.0	37.0		38.0	38.0		38.0	38.0	
Total Split (%)	49.3%	49.3%		49.3%	49.3%		50.7%	50.7%		50.7%	50.7%	
Maximum Green (s)	31.3	31.3		31.3	31.3		32.1	32.1		32.1	32.1	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.7	3.7		3.7	3.7	
All-Red Time (s)	2.4	2.4		2.4	2.4		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.7	5.7		5.7	5.7		5.9	5.9		5.9	5.9	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	23.0	23.0		23.0	23.0		10.5	10.5		10.5	10.5	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	10.5	10.5		10.5	10.5		17.6	17.6		17.6	17.6	
Actuated g/C Ratio	0.30	0.30		0.30	0.30		0.50	0.50		0.50	0.50	
v/c Ratio	0.25	0.14		0.09	0.29		0.00	0.43		0.07	0.27	
Control Delay	12.6	9.8		10.8	7.1		7.0	8.9		7.7	7.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	12.6	9.8		10.8	7.1		7.0	8.9		7.7	7.7	
LOS	B	A		B	A		A	A		A	A	
Approach Delay		11.3			7.7			8.9			7.7	
Approach LOS		B			A			A			A	
Queue Length 50th (m)	3.5	2.4		1.2	2.5		0.1	15.0		0.8	7.8	
Queue Length 95th (m)	12.2	9.2		5.7	12.6		0.8	27.5		3.7	15.6	
Internal Link Dist (m)		197.2			164.0			143.0			439.6	
Turn Bay Length (m)	30.0			30.0			30.0			35.0		
Base Capacity (vph)	1038	1543		1120	1446		827	2904		629	2749	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.08	0.05		0.03	0.11		0.00	0.23		0.04	0.15	

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 34.9
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.43
Intersection Signal Delay: 8.7 Intersection LOS: A
Intersection Capacity Utilization 52.3% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 5: Mer-Bleue Road & Axis Way/Decoeur Drive



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	61	424	49	201	261	500	50	671	235	339	825	463
Future Volume (vph)	61	424	49	201	261	500	50	671	235	339	825	463
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Frt		0.986			0.922			0.963				0.984
Flt Protected		0.994			0.990			0.997				0.969
Satd. Flow (prot)	0	3250	0	0	3026	0	0	3183	0	0	0	3161
Flt Permitted		0.994			0.990			0.997				0.969
Satd. Flow (perm)	0	3250	0	0	3026	0	0	3183	0	0	0	3161
Link Speed (k/h)		70			60			60				60
Link Distance (m)		647.3			419.1			458.1				481.8
Travel Time (s)		33.3			25.1			27.5				28.9
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	61	424	49	201	261	500	50	671	235	339	825	463
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	534	0	0	962	0	0	956	0	0	0	1826
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	R NA	Left	Left
Median Width(m)		0.0			0.0			3.5				3.5
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		3.0			3.0			3.0				3.0
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	25		15	25		15	25		15	15	25	
Sign Control		Yield			Yield			Yield				Yield

Intersection Summary	
Area Type: Other	
Control Type: Roundabout	
Intersection Capacity Utilization 145.0%	ICU Level of Service H
Analysis Period (min) 15	

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	199
Future Volume (vph)	199
Ideal Flow (vphpl)	1800
Lane Util. Factor	0.95
Frt	
Flt Protected	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Peak Hour Factor	1.00
Adj. Flow (vph)	199
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	1.09
Turning Speed (k/h)	15
Sign Control	

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	236	1271	95	20	847	13	57	0	12	4	0	102
Future Volume (vph)	236	1271	95	20	847	13	57	0	12	4	0	102
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	105.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	45.0			15.0			15.0			15.0		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.991			0.998			0.977			0.870	
Flt Protected		0.993			0.999			0.960			0.998	
Satd. Flow (prot)	0	3263	0	0	3306	0	0	1637	0	0	1475	0
Flt Permitted		0.993			0.999			0.960			0.998	
Satd. Flow (perm)	0	3263	0	0	3306	0	0	1637	0	0	1475	0
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		419.1			443.7			213.2			244.6	
Travel Time (s)		25.1			26.6			15.4			17.6	
Confl. Peds. (#/hr)	5											
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	75%	2%	2%
Adj. Flow (vph)	236	1271	95	20	847	13	57	0	12	4	0	102
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1602	0	0	880	0	0	69	0	0	106	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		3.0			3.0			3.0			3.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary	
Area Type:	Other
Control Type: Roundabout	
Intersection Capacity Utilization 94.0%	ICU Level of Service F
Analysis Period (min) 15	

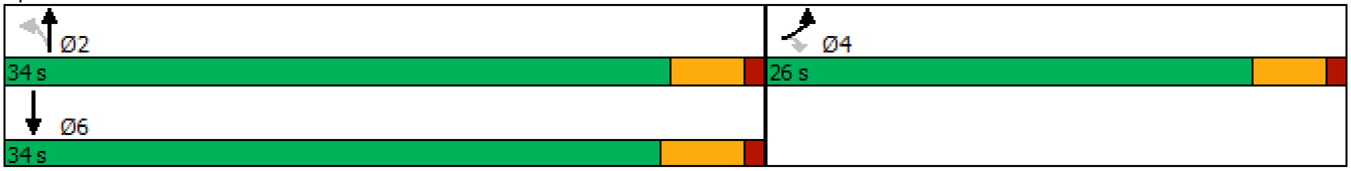
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	398	85	73	365	443	124
Future Volume (vph)	398	85	73	365	443	124
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	95.0	0.0	30.0			0.0
Storage Lanes	1	1	1			0
Taper Length (m)	15.0		75.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.970	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1658	1339	1610	1745	1680	0
Flt Permitted	0.950		0.298			
Satd. Flow (perm)	1658	1339	505	1745	1680	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		85			33	
Link Speed (k/h)	50			50	60	
Link Distance (m)	691.8			356.1	129.9	
Travel Time (s)	49.8			25.6	7.8	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	13%	5%	2%	3%	2%
Adj. Flow (vph)	398	85	73	365	443	124
Shared Lane Traffic (%)						
Lane Group Flow (vph)	398	85	73	365	567	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	3.0			3.0	3.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	25	15	25			15
Number of Detectors	1	1	1	2	2	
Detector Template	Left	Right	Left	Thru	Thru	
Leading Detector (m)	2.0	2.0	2.0	10.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	2.0	2.0	0.6	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	6	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		4	2			
Detector Phase	4	4	2	2	6	
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	24.8	24.8	23.8	23.8	25.2	
Total Split (s)	26.0	26.0	34.0	34.0	34.0	
Total Split (%)	43.3%	43.3%	56.7%	56.7%	56.7%	
Maximum Green (s)	21.7	21.7	29.7	29.7	29.3	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.3	4.3	4.3	4.3	4.7	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	Min	Min	Min	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	13.5	13.5	12.5	12.5	13.5	
Pedestrian Calls (#/hr)	0	0	0	0	0	
Act Effct Green (s)	16.0	16.0	20.0	20.0	19.6	
Actuated g/C Ratio	0.35	0.35	0.44	0.44	0.43	
v/c Ratio	0.68	0.16	0.33	0.47	0.76	
Control Delay	20.6	4.6	13.5	11.5	18.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	20.6	4.6	13.5	11.5	18.0	
LOS	C	A	B	B	B	
Approach Delay	17.8			11.8	18.0	
Approach LOS	B			B	B	
Queue Length 50th (m)	25.1	0.0	3.3	17.9	31.4	
Queue Length 95th (m)	62.0	7.2	12.4	40.9	72.5	
Internal Link Dist (m)	667.8			332.1	105.9	
Turn Bay Length (m)	95.0		30.0			
Base Capacity (vph)	852	730	354	1225	1177	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.47	0.12	0.21	0.30	0.48	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 45.2
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 16.1 Intersection LOS: B
Intersection Capacity Utilization 75.3% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 3: Mer-Bleue Road & Renaud Road

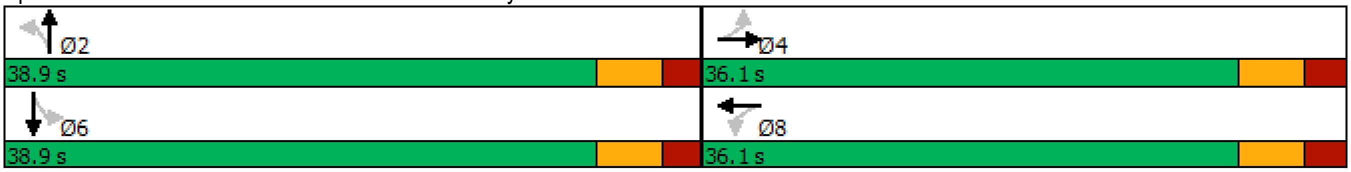


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱		↰	↑↱		↰	↑↱	
Traffic Volume (vph)	47	88	5	14	85	52	10	735	21	90	637	87
Future Volume (vph)	47	88	5	14	85	52	10	735	21	90	637	87
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	30.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	15.0			15.0			75.0			75.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.992			0.943			0.996			0.982	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1658	1731	0	1658	1646	0	1658	3152	0	1658	2974	0
Flt Permitted	0.669			0.697			0.376			0.365		
Satd. Flow (perm)	1167	1731	0	1216	1646	0	656	3152	0	637	2974	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			49			5			25	
Link Speed (k/h)		50			50			60			60	
Link Distance (m)		269.4			286.1			179.4			458.1	
Travel Time (s)		19.4			20.6			10.8			27.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	7%	2%	2%	13%	2%
Adj. Flow (vph)	47	88	5	14	85	52	10	735	21	90	637	87
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	93	0	14	137	0	10	756	0	90	724	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		3.0			3.0			3.0			3.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	36.1	36.1		36.1	36.1		35.9	35.9		35.9	35.9	
Total Split (s)	36.1	36.1		36.1	36.1		38.9	38.9		38.9	38.9	
Total Split (%)	48.1%	48.1%		48.1%	48.1%		51.9%	51.9%		51.9%	51.9%	
Maximum Green (s)	30.0	30.0		30.0	30.0		33.0	33.0		33.0	33.0	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.7	3.7		3.7	3.7	
All-Red Time (s)	2.4	2.4		2.4	2.4		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1		5.9	5.9		5.9	5.9	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	23.0	23.0		23.0	23.0		10.5	10.5		10.5	10.5	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	10.4	10.4		10.4	10.4		19.1	19.1		19.1	19.1	
Actuated g/C Ratio	0.28	0.28		0.28	0.28		0.52	0.52		0.52	0.52	
v/c Ratio	0.14	0.19		0.04	0.27		0.03	0.46		0.27	0.46	
Control Delay	12.7	12.1		11.7	9.9		6.9	8.9		10.4	8.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	12.7	12.1		11.7	9.9		6.9	8.9		10.4	8.8	
LOS	B	B		B	A		A	A		B	A	
Approach Delay		12.3			10.1			8.9			9.0	
Approach LOS		B			B			A			A	
Queue Length 50th (m)	2.1	4.0		0.6	3.9		0.3	17.4		3.6	16.2	
Queue Length 95th (m)	8.5	13.3		3.8	15.2		2.1	30.4		11.5	28.9	
Internal Link Dist (m)		245.4			262.1			155.4			434.1	
Turn Bay Length (m)	30.0			30.0			30.0			35.0		
Base Capacity (vph)	1012	1502		1054	1434		592	2848		575	2689	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.05	0.06		0.01	0.10		0.02	0.27		0.16	0.27	

Intersection Summary	
Area Type: Other	
Cycle Length: 75	
Actuated Cycle Length: 36.5	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.46	
Intersection Signal Delay: 9.3	Intersection LOS: A
Intersection Capacity Utilization 67.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 5: Mer-Bleue Road & Axis Way/Decoeur Drive



DEGREE OF SATURATION

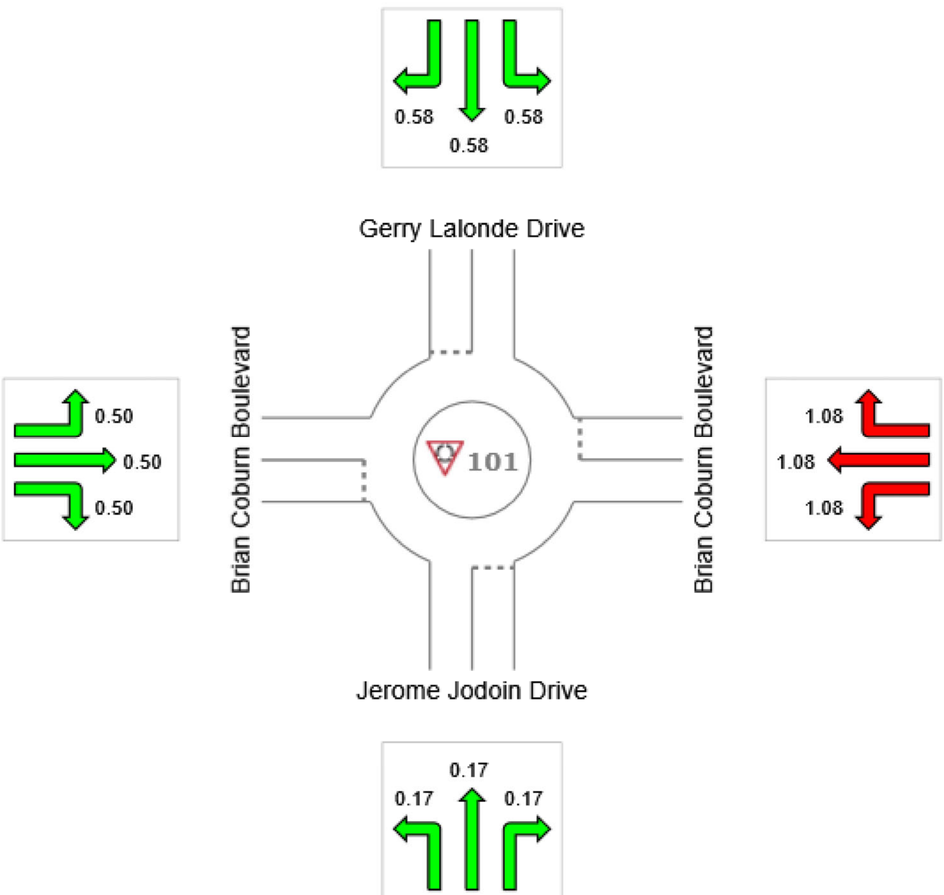
Ratio of Demand Volume to Capacity, v/c ratio per movement

Site: 101 [Brian Coburn & Gerry Lalonde 2024 FB AM]

New Site
Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Degree of Saturation	0.17	1.08	0.58	0.50	1.08



Colour code based on Degree of Saturation

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Organisation: CGH TRANSPORTATION | Processed: January 6, 2021 1:46:56 PM
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DELAY (CONTROL)

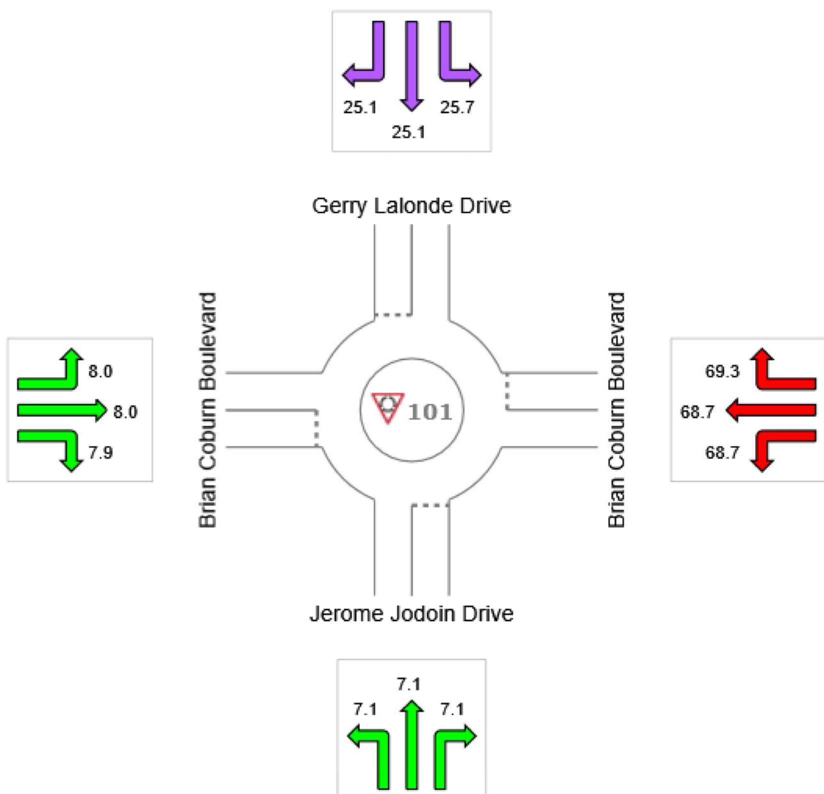
Average control delay per vehicle, or average pedestrian delay (seconds)

Site: 101 [Brian Coburn & Gerry Lalonde 2024 FB AM]

New Site
Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Delay (Control)	7.1	68.7	25.1	8.0	43.4
LOS	A	F	D	A	E



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

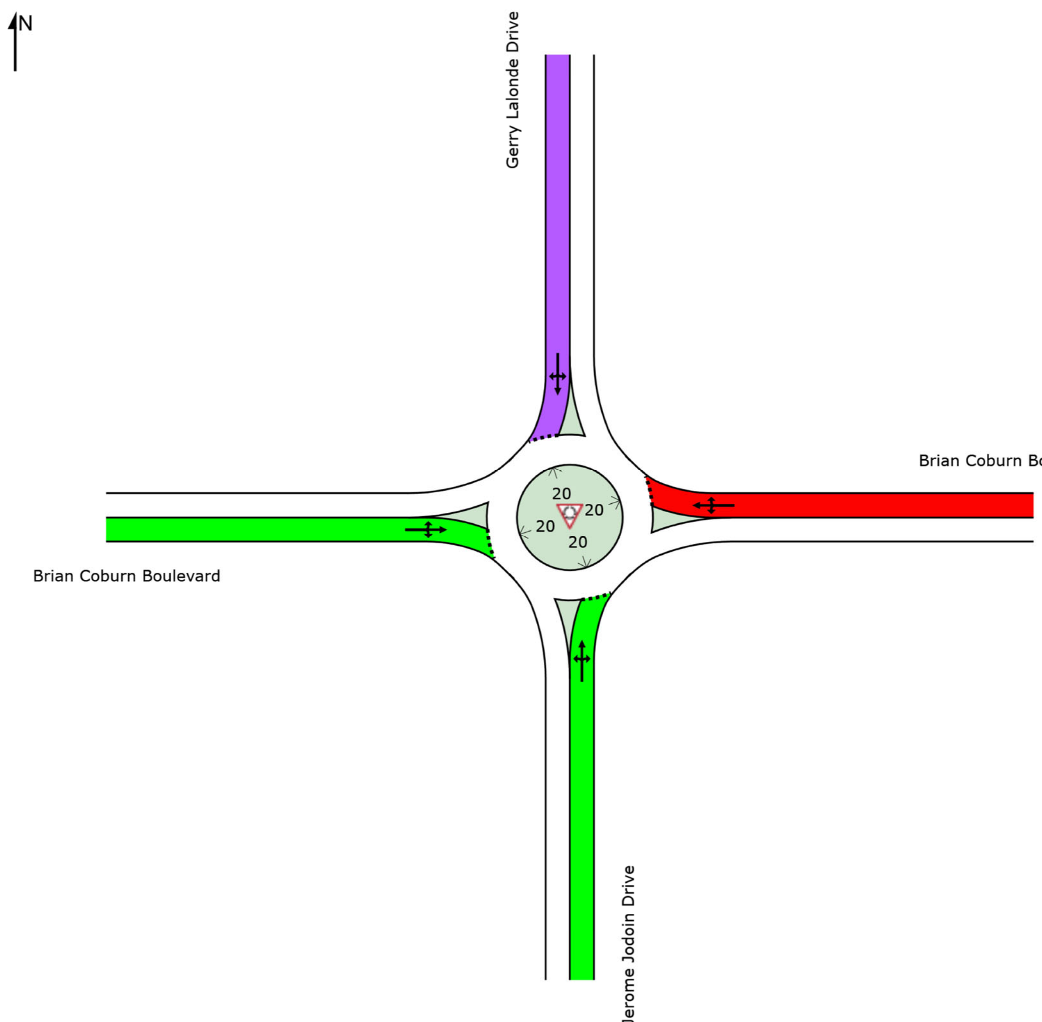
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [Brian Coburn & Gerry Lalonde 2024 FB AM]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	F	D	A	E



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

MOVEMENT SUMMARY

Site: 101 [Brian Coburn & Gerry Lalonde 2024 FB AM]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Jerome Jodoin Drive												
1	L2	105	2.0	0.169	7.1	LOS A	0.7	4.9	0.61	0.60	0.61	48.4
2	T1	1	2.0	0.169	7.1	LOS A	0.7	4.9	0.61	0.60	0.61	48.5
3	R2	11	2.0	0.169	7.1	LOS A	0.7	4.9	0.61	0.60	0.61	47.6
Approach		117	2.0	0.169	7.1	LOS A	0.7	4.9	0.61	0.60	0.61	48.4
East: Brian Coburn Boulevard												
4	L2	6	2.0	1.080	68.7	LOS F	103.0	736.6	1.00	2.11	3.34	27.6
5	T1	1239	2.0	1.080	68.7	LOS F	103.0	736.6	1.00	2.11	3.34	27.7
6	R2	15	46.0	1.080	69.3	LOS F	103.0	736.6	1.00	2.11	3.34	27.0
Approach		1260	2.5	1.080	68.7	LOS F	103.0	736.6	1.00	2.11	3.34	27.6
North: Gerry Lalonde Drive												
7	L2	8	14.0	0.580	25.7	LOS D	3.0	21.7	0.86	1.03	1.45	40.4
8	T1	1	2.0	0.580	25.1	LOS D	3.0	21.7	0.86	1.03	1.45	40.7
9	R2	206	2.0	0.580	25.1	LOS D	3.0	21.7	0.86	1.03	1.45	40.0
Approach		215	2.4	0.580	25.1	LOS D	3.0	21.7	0.86	1.03	1.45	40.1
West: Brian Coburn Boulevard												
10	L2	43	3.0	0.505	8.0	LOS A	4.0	29.1	0.14	0.04	0.14	50.2
11	T1	593	6.0	0.505	8.0	LOS A	4.0	29.1	0.14	0.04	0.14	50.3
12	R2	30	2.0	0.505	7.9	LOS A	4.0	29.1	0.14	0.04	0.14	49.3
Approach		666	5.6	0.505	8.0	LOS A	4.0	29.1	0.14	0.04	0.14	50.2
All Vehicles		2258	3.4	1.080	43.4	LOS E	103.0	736.6	0.71	1.32	2.08	33.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

DEGREE OF SATURATION

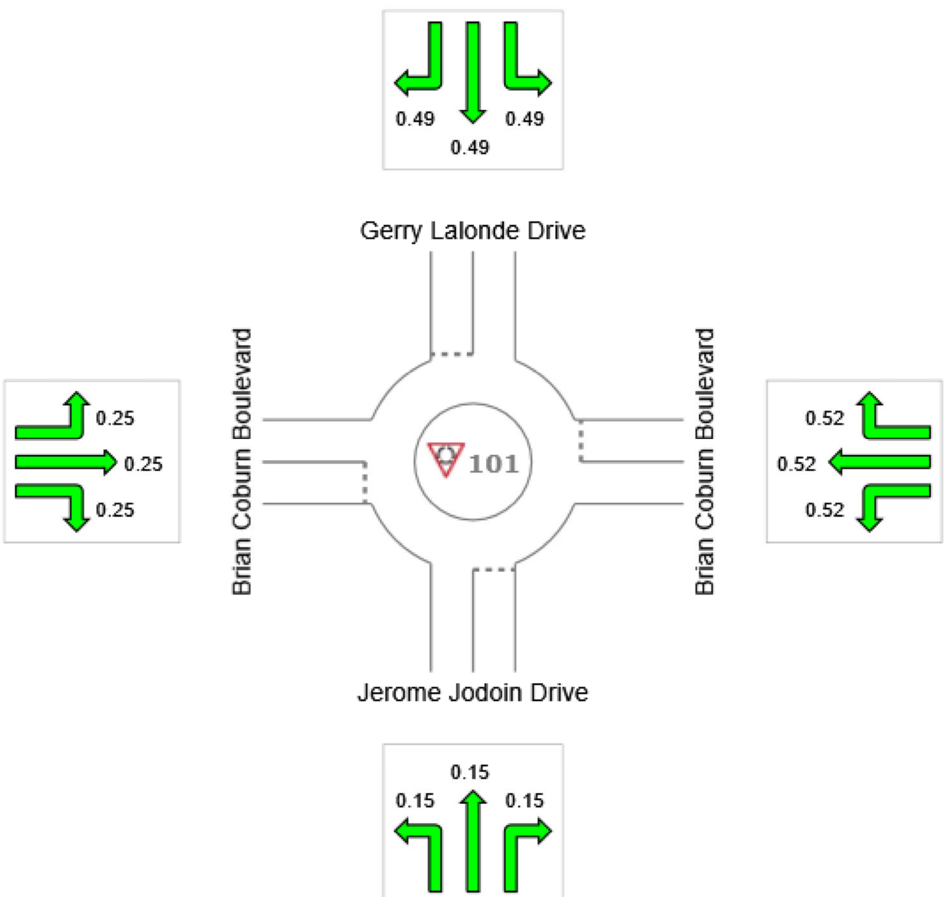
Ratio of Demand Volume to Capacity, v/c ratio per movement

Site: 101 [Brian Coburn & Gerry Lalonde 2024 FB AM - Widened]

New Site
Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Degree of Saturation	0.15	0.52	0.49	0.25	0.52



Colour code based on Degree of Saturation

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Organisation: CGH TRANSPORTATION | Processed: January 6, 2021 12:41:04 PM
Project: C:\Users\RobinMarinac\CGH TRANSPORTATION\CGH Working - Documents\Projects\2020-82 Caivan 2275 Mer Bleue\DATA\Sidra

DELAY (CONTROL)

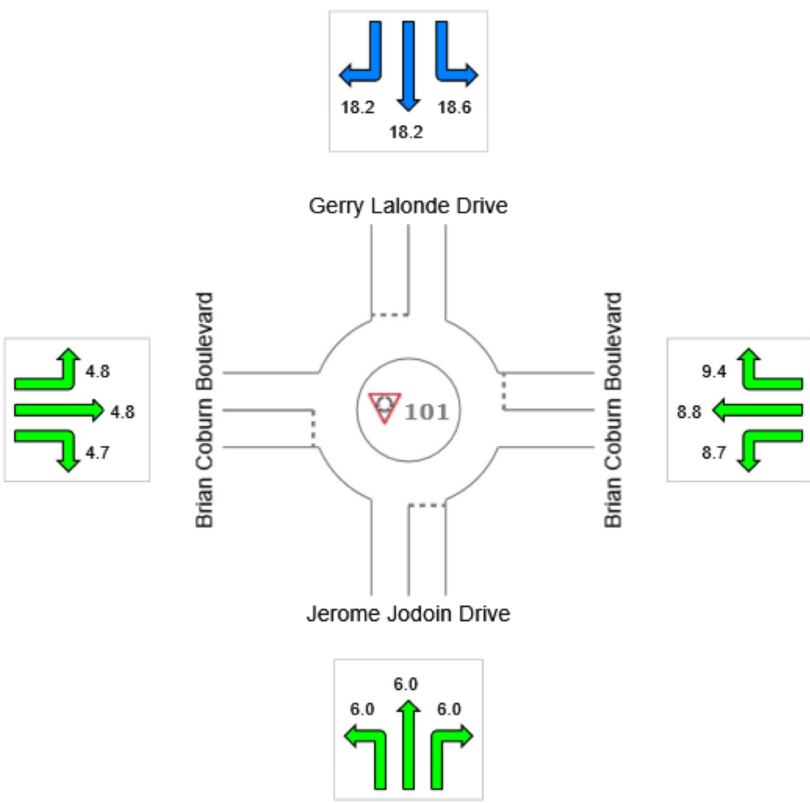
Average control delay per vehicle, or average pedestrian delay (seconds)

Site: 101 [Brian Coburn & Gerry Lalonde 2024 FB AM - Widened]

New Site
Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Delay (Control)	6.0	8.8	18.2	4.8	8.3
LOS	A	A	C	A	A



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

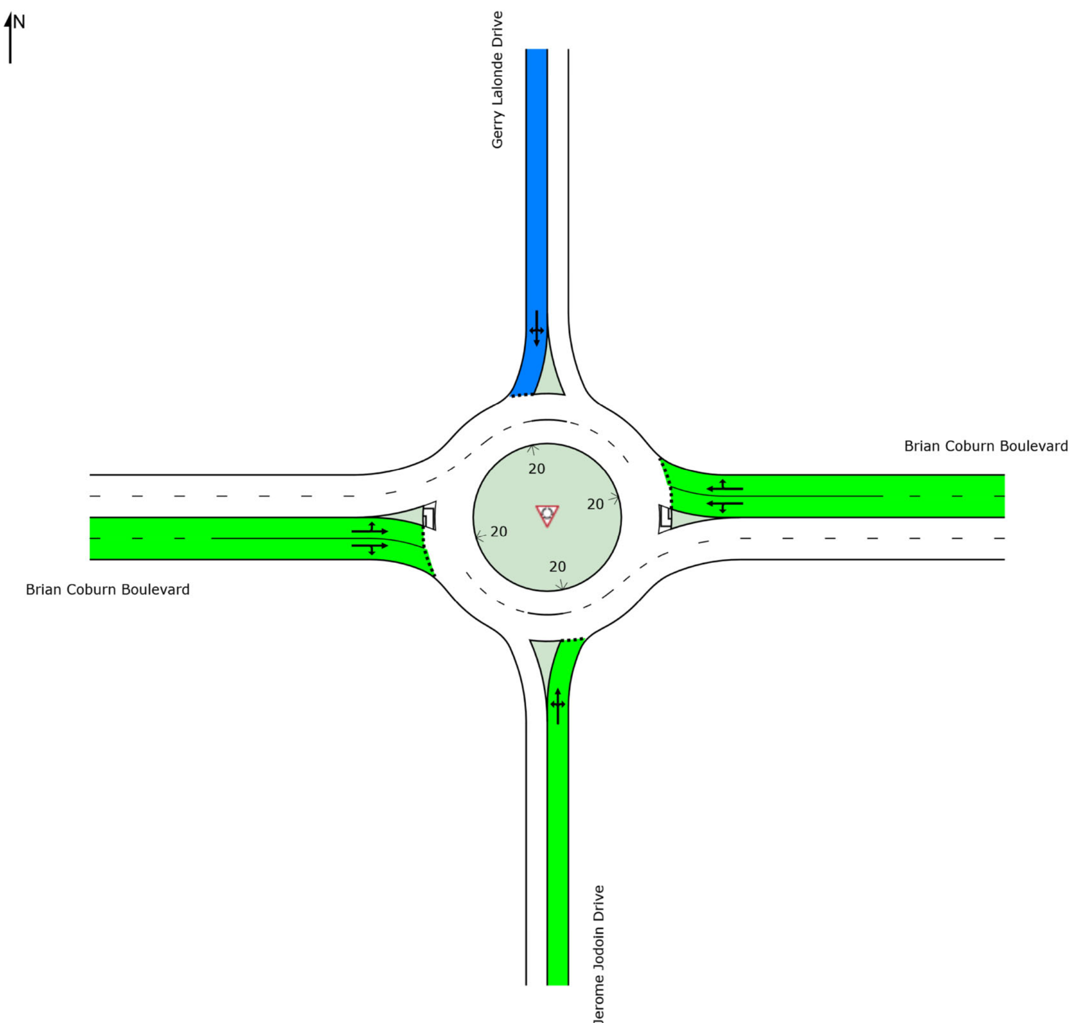
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [Brian Coburn & Gerry Lalonde 2024 FB AM - Widened]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	A	C	A	A



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

MOVEMENT SUMMARY

Site: 101 [Brian Coburn & Gerry Lalonde 2024 FB AM - Widened]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Jerome Jodoin Drive												
1	L2	105	2.0	0.146	6.0	LOS A	0.5	3.8	0.54	0.52	0.54	49.3
2	T1	1	2.0	0.146	6.0	LOS A	0.5	3.8	0.54	0.52	0.54	49.3
3	R2	11	2.0	0.146	6.0	LOS A	0.5	3.8	0.54	0.52	0.54	48.4
Approach		117	2.0	0.146	6.0	LOS A	0.5	3.8	0.54	0.52	0.54	49.3
East: Brian Coburn Boulevard												
4	L2	6	2.0	0.521	8.7	LOS A	3.5	24.8	0.45	0.29	0.45	50.0
5	T1	1239	2.0	0.521	8.8	LOS A	3.5	24.8	0.45	0.29	0.45	50.1
6	R2	15	46.0	0.521	9.4	LOS A	3.5	24.8	0.45	0.29	0.45	47.6
Approach		1260	2.5	0.521	8.8	LOS A	3.5	24.8	0.45	0.29	0.45	50.1
North: Gerry Lalonde Drive												
7	L2	8	14.0	0.488	18.6	LOS C	2.2	15.9	0.81	0.93	1.24	44.0
8	T1	1	2.0	0.488	18.2	LOS C	2.2	15.9	0.81	0.93	1.24	44.3
9	R2	206	2.0	0.488	18.2	LOS C	2.2	15.9	0.81	0.93	1.24	43.6
Approach		215	2.4	0.488	18.2	LOS C	2.2	15.9	0.81	0.93	1.24	43.6
West: Brian Coburn Boulevard												
10	L2	43	3.0	0.247	4.8	LOS A	1.2	8.8	0.09	0.02	0.09	52.4
11	T1	593	6.0	0.247	4.8	LOS A	1.2	8.8	0.09	0.02	0.09	52.7
12	R2	30	2.0	0.247	4.7	LOS A	1.2	8.8	0.09	0.02	0.09	51.5
Approach		666	5.6	0.247	4.8	LOS A	1.2	8.8	0.09	0.02	0.09	52.6
All Vehicles		2258	3.4	0.521	8.3	LOS A	3.5	24.8	0.38	0.28	0.42	50.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

DEGREE OF SATURATION

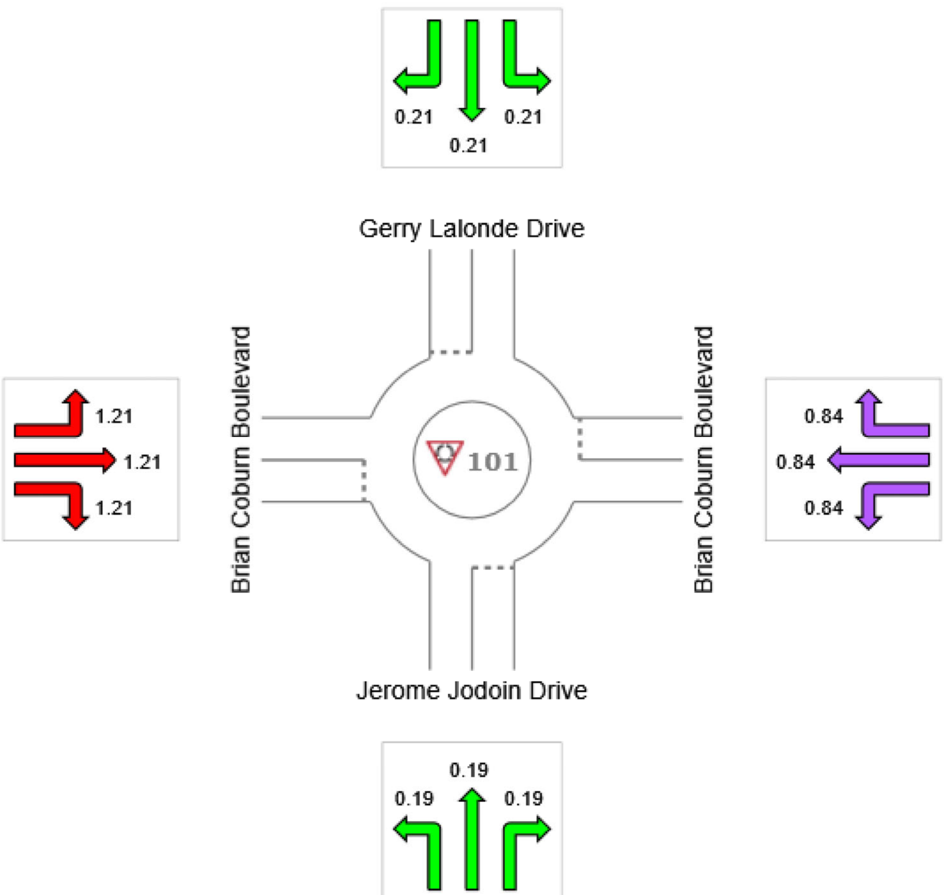
Ratio of Demand Volume to Capacity, v/c ratio per movement

Site: 101 [Brian Coburn & Gerry Lalonde 2024 FB PM]

New Site
Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Degree of Saturation	0.19	0.84	0.21	1.21	1.21



Colour code based on Degree of Saturation

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Organisation: CGH TRANSPORTATION | Processed: January 6, 2021 1:47:50 PM
Project: C:\Users\RobinMarinac\CGH TRANSPORTATION\CGH Working - Documents\Projects\2020-82 Caivan 2275 Mer Bleue\DATA\Sidra

DELAY (CONTROL)

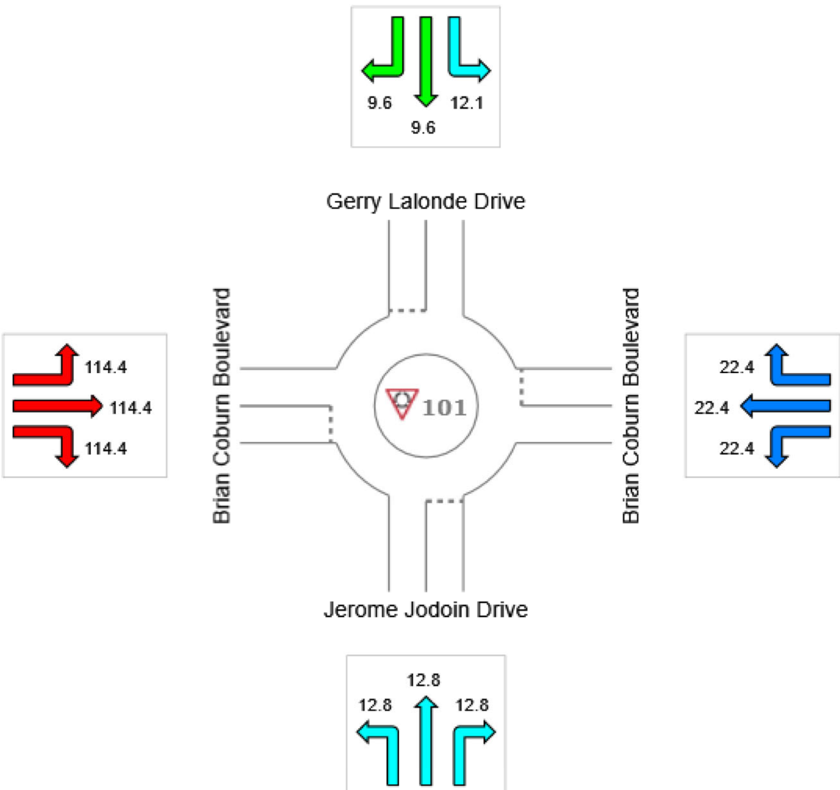
Average control delay per vehicle, or average pedestrian delay (seconds)

Site: 101 [Brian Coburn & Gerry Lalonde 2024 FB PM]

New Site
Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Delay (Control)	12.8	22.4	9.7	114.4	77.1
LOS	B	C	A	F	F



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

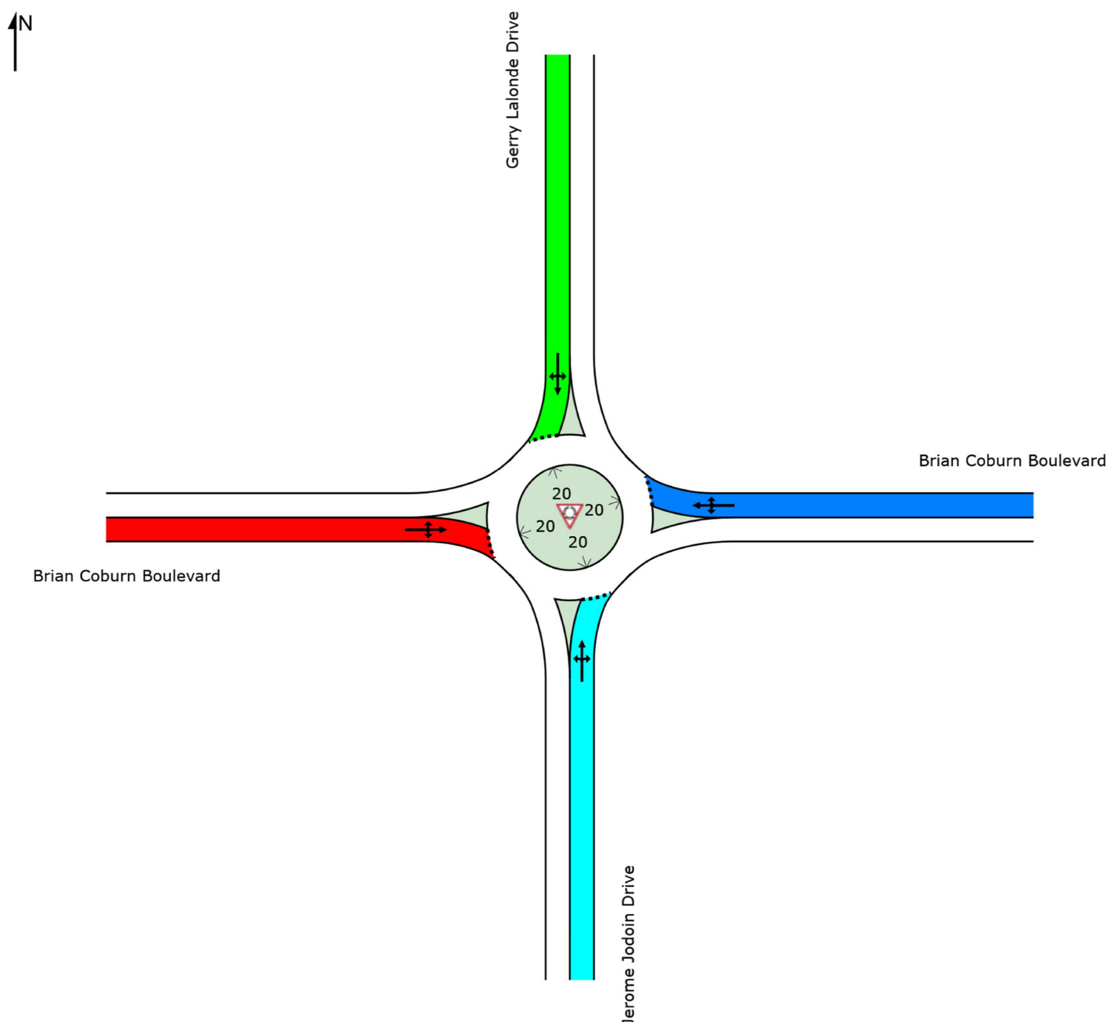
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [Brian Coburn & Gerry Lalonde 2024 FB PM]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	B	C	A	F	F



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

MOVEMENT SUMMARY

Site: 101 [Brian Coburn & Gerry Lalonde 2024 FB PM]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Jerome Jodoin Drive												
1	L2	57	2.0	0.188	12.8	LOS B	0.7	4.8	0.76	0.76	0.76	45.3
2	T1	1	2.0	0.188	12.8	LOS B	0.7	4.8	0.76	0.76	0.76	45.4
3	R2	12	2.0	0.188	12.8	LOS B	0.7	4.8	0.76	0.76	0.76	44.6
Approach		70	2.0	0.188	12.8	LOS B	0.7	4.8	0.76	0.76	0.76	45.2
East: Brian Coburn Boulevard												
4	L2	20	2.0	0.839	22.4	LOS C	24.4	173.5	1.00	1.32	2.00	42.1
5	T1	847	2.0	0.839	22.4	LOS C	24.4	173.5	1.00	1.32	2.00	42.2
6	R2	13	2.0	0.839	22.4	LOS C	24.4	173.5	1.00	1.32	2.00	41.5
Approach		880	2.0	0.839	22.4	LOS C	24.4	173.5	1.00	1.32	2.00	42.2
North: Gerry Lalonde Drive												
7	L2	4	75.0	0.206	12.1	LOS B	0.8	5.7	0.68	0.68	0.68	46.7
8	T1	1	2.0	0.206	9.6	LOS A	0.8	5.7	0.68	0.68	0.68	49.3
9	R2	102	2.0	0.206	9.6	LOS A	0.8	5.7	0.68	0.68	0.68	48.2
Approach		107	4.7	0.206	9.7	LOS A	0.8	5.7	0.68	0.68	0.68	48.2
West: Brian Coburn Boulevard												
10	L2	236	2.0	1.207	114.4	LOS F	401.8	2860.9	1.00	0.94	1.98	20.5
11	T1	1271	2.0	1.207	114.4	LOS F	401.8	2860.9	1.00	0.94	1.98	20.6
12	R2	95	2.0	1.207	114.4	LOS F	401.8	2860.9	1.00	0.94	1.98	20.4
Approach		1602	2.0	1.207	114.4	LOS F	401.8	2860.9	1.00	0.94	1.98	20.5
All Vehicles		2659	2.1	1.207	77.1	LOS F	401.8	2860.9	0.98	1.05	1.90	25.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

DEGREE OF SATURATION

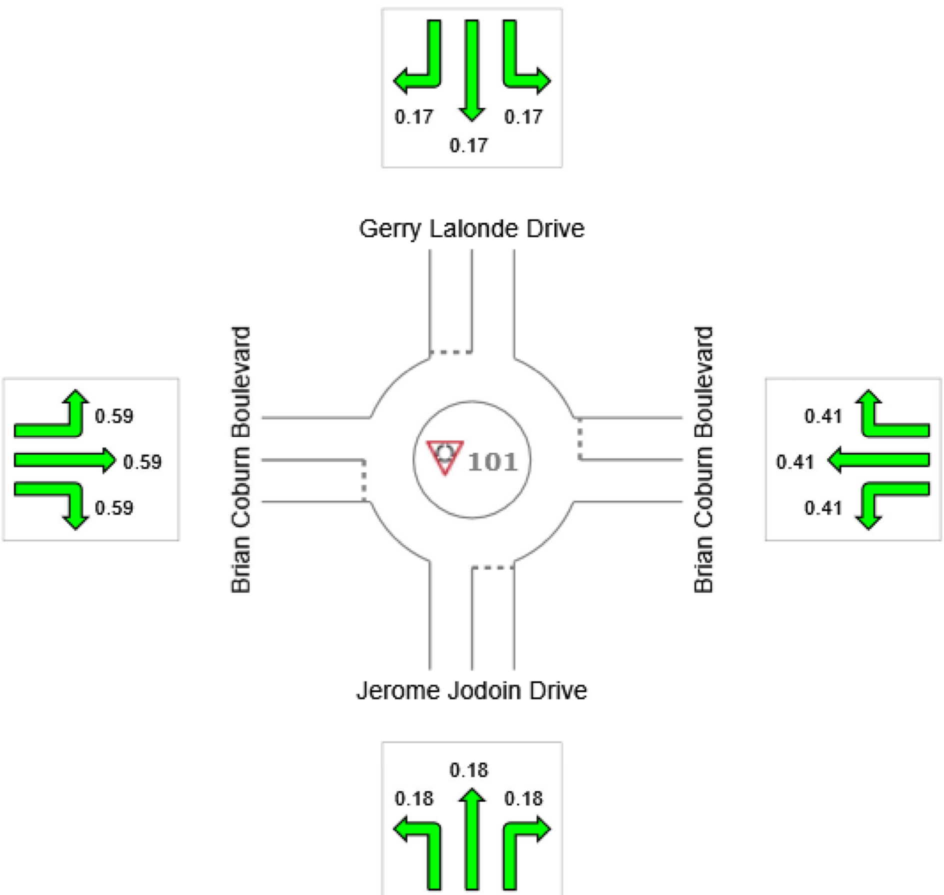
Ratio of Demand Volume to Capacity, v/c ratio per movement

Site: 101 [Brian Coburn & Gerry Lalonde 2024 FB PM - Widened]

New Site
Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Degree of Saturation	0.18	0.41	0.17	0.59	0.59



Colour code based on Degree of Saturation

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

Organisation: CGH TRANSPORTATION | Processed: January 6, 2021 12:42:23 PM
Project: C:\Users\RobinMarinac\CGH TRANSPORTATION\CGH Working - Documents\Projects\2020-82 Caivan 2275 Mer Bleue\DATA\Sidra

DELAY (CONTROL)

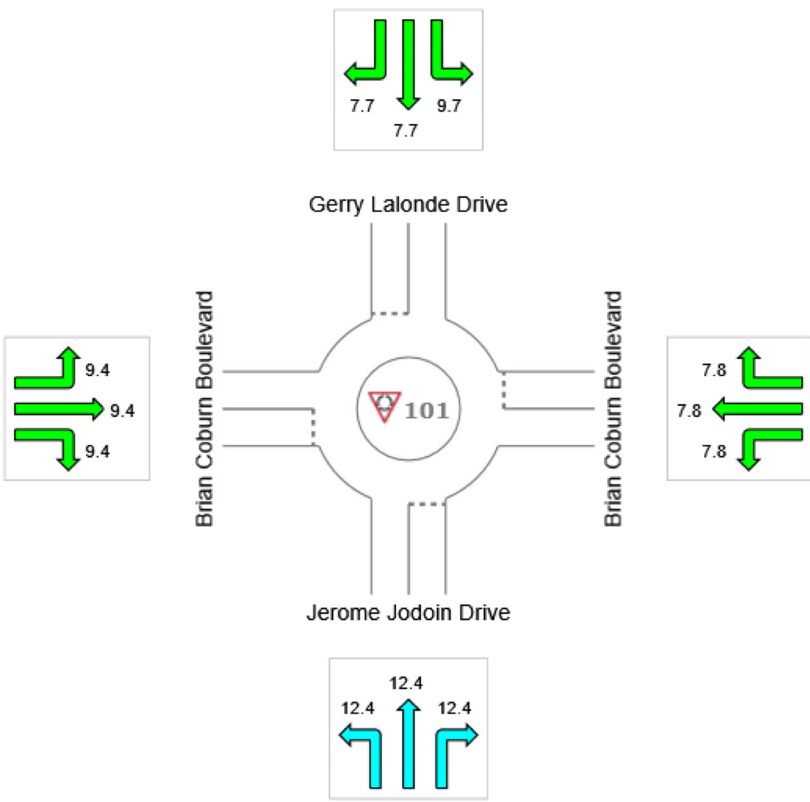
Average control delay per vehicle, or average pedestrian delay (seconds)

Site: 101 [Brian Coburn & Gerry Lalonde 2024 FB PM - Widened]

New Site
Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Delay (Control)	12.4	7.8	7.8	9.4	8.9
LOS	B	A	A	A	A



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

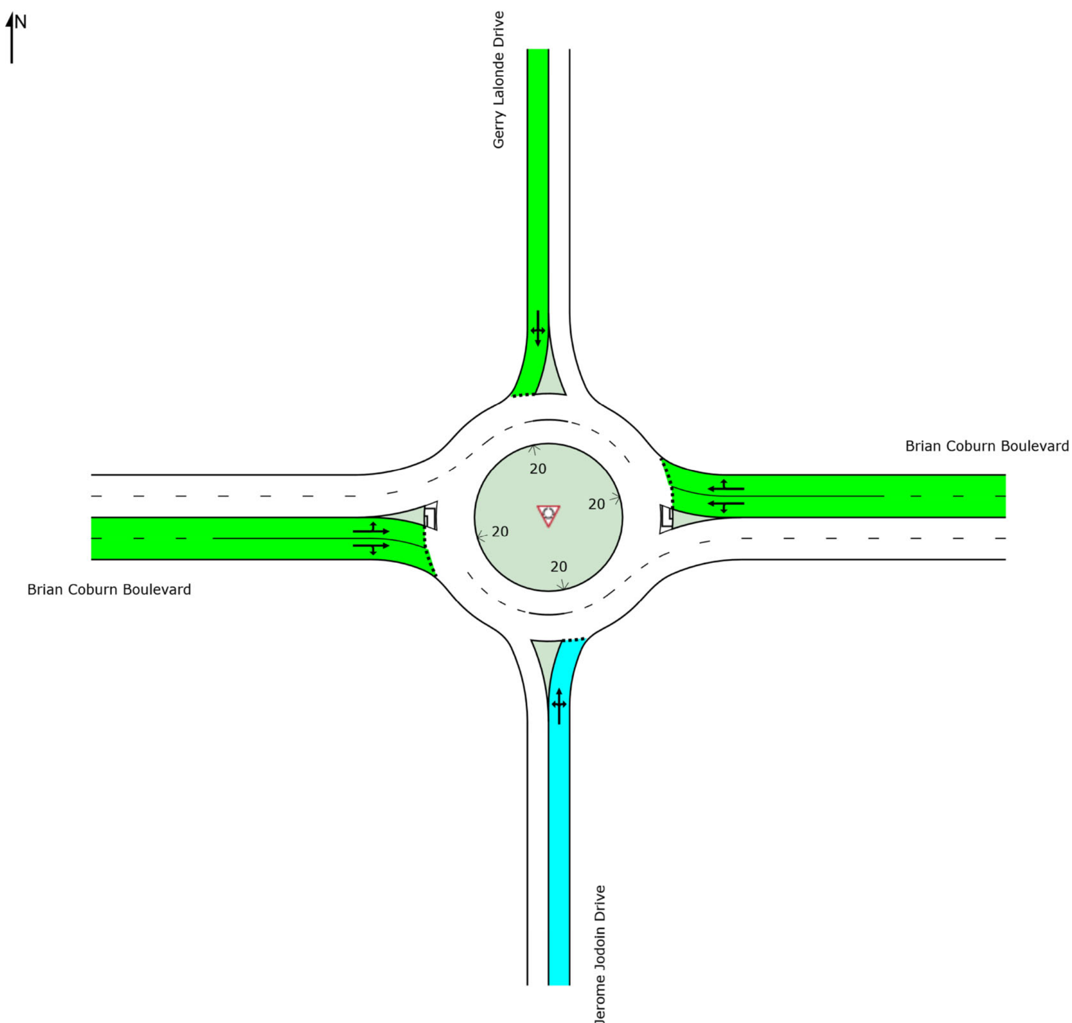
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [Brian Coburn & Gerry Lalonde 2024 FB PM - Widened]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	B	A	A	A	A



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

MOVEMENT SUMMARY

Site: 101 [Brian Coburn & Gerry Lalonde 2024 FB PM - Widened]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Jerome Jodoin Drive												
1	L2	57	2.0	0.182	12.4	LOS B	0.6	4.2	0.76	0.76	0.76	45.8
2	T1	1	2.0	0.182	12.4	LOS B	0.6	4.2	0.76	0.76	0.76	45.8
3	R2	12	2.0	0.182	12.4	LOS B	0.6	4.2	0.76	0.76	0.76	45.0
Approach		70	2.0	0.182	12.4	LOS B	0.6	4.2	0.76	0.76	0.76	45.7
East: Brian Coburn Boulevard												
4	L2	20	2.0	0.414	7.8	LOS A	2.2	15.6	0.52	0.42	0.52	50.7
5	T1	847	2.0	0.414	7.8	LOS A	2.2	15.6	0.52	0.42	0.52	50.8
6	R2	13	2.0	0.414	7.8	LOS A	2.2	15.6	0.52	0.42	0.52	49.6
Approach		880	2.0	0.414	7.8	LOS A	2.2	15.6	0.52	0.42	0.52	50.8
North: Gerry Lalonde Drive												
7	L2	4	75.0	0.171	9.7	LOS A	0.6	4.3	0.61	0.61	0.61	48.4
8	T1	1	2.0	0.171	7.7	LOS A	0.6	4.3	0.61	0.61	0.61	50.9
9	R2	102	2.0	0.171	7.7	LOS A	0.6	4.3	0.61	0.61	0.61	49.8
Approach		107	4.7	0.171	7.8	LOS A	0.6	4.3	0.61	0.61	0.61	49.8
West: Brian Coburn Boulevard												
10	L2	236	2.0	0.590	9.4	LOS A	5.1	36.3	0.21	0.07	0.21	48.9
11	T1	1271	2.0	0.590	9.4	LOS A	5.1	36.3	0.21	0.07	0.21	49.5
12	R2	95	2.0	0.590	9.4	LOS A	5.1	36.3	0.21	0.07	0.21	48.5
Approach		1602	2.0	0.590	9.4	LOS A	5.1	36.3	0.21	0.07	0.21	49.3
All Vehicles		2659	2.1	0.590	8.9	LOS A	5.1	36.3	0.34	0.23	0.34	49.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

DEGREE OF SATURATION

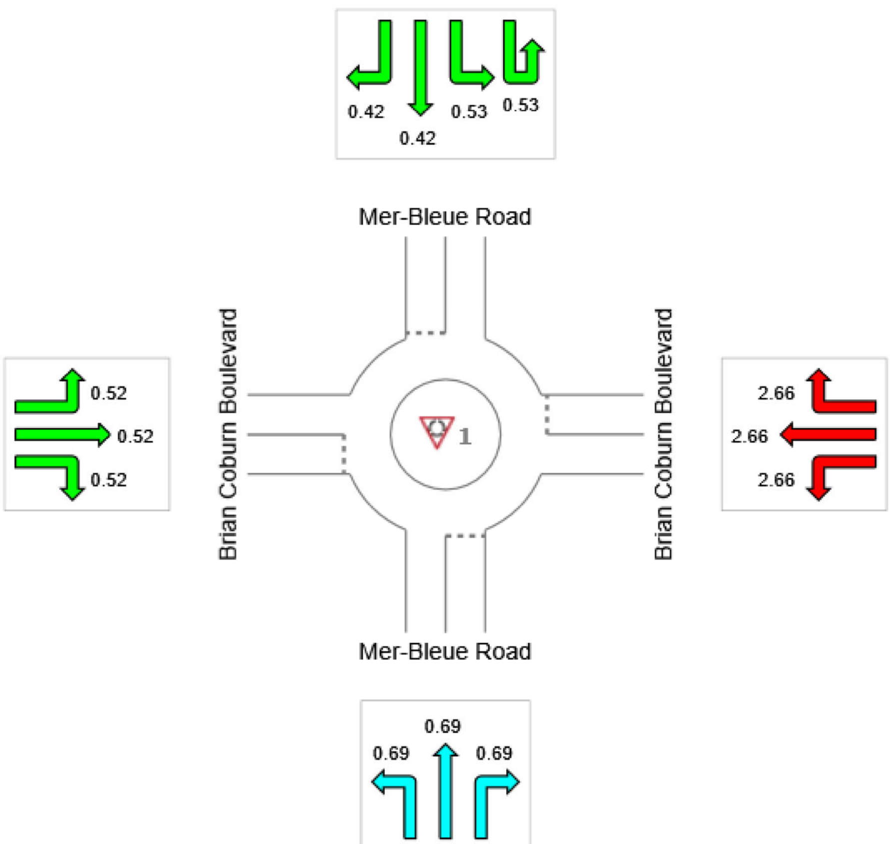
Ratio of Demand Volume to Capacity, v/c ratio per movement

Site: 1 [Mer-Bleue & Brian Coburn 2024 FB AM]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Degree of Saturation	0.69	2.66	0.53	0.52	2.66



Colour code based on Degree of Saturation

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

DELAY (CONTROL)

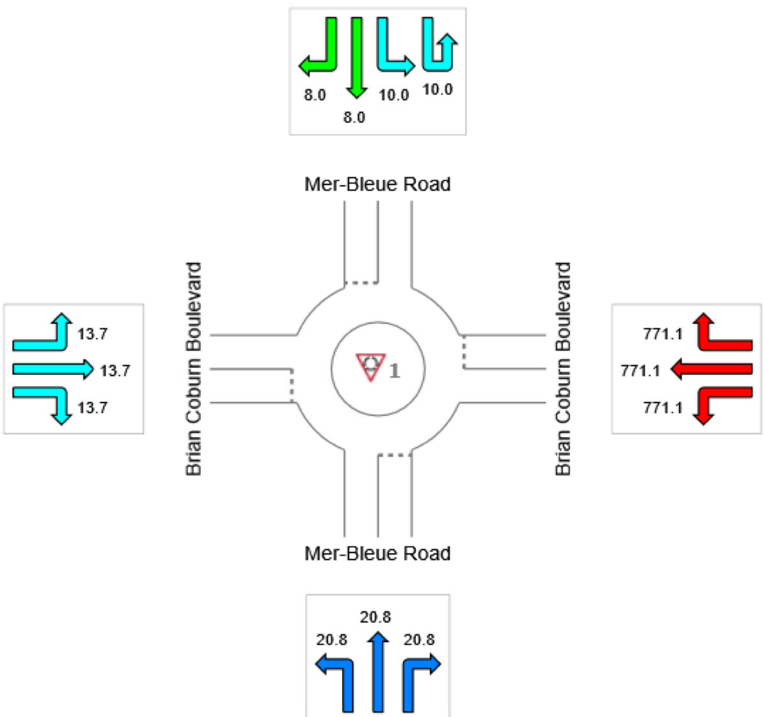
Average control delay per vehicle, or average pedestrian delay (seconds)

Site: 1 [Mer-Bleue & Brian Coburn 2024 FB AM]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Delay (Control)	20.8	771.1	9.1	13.7	314.6
LOS	C	F	A	B	F



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

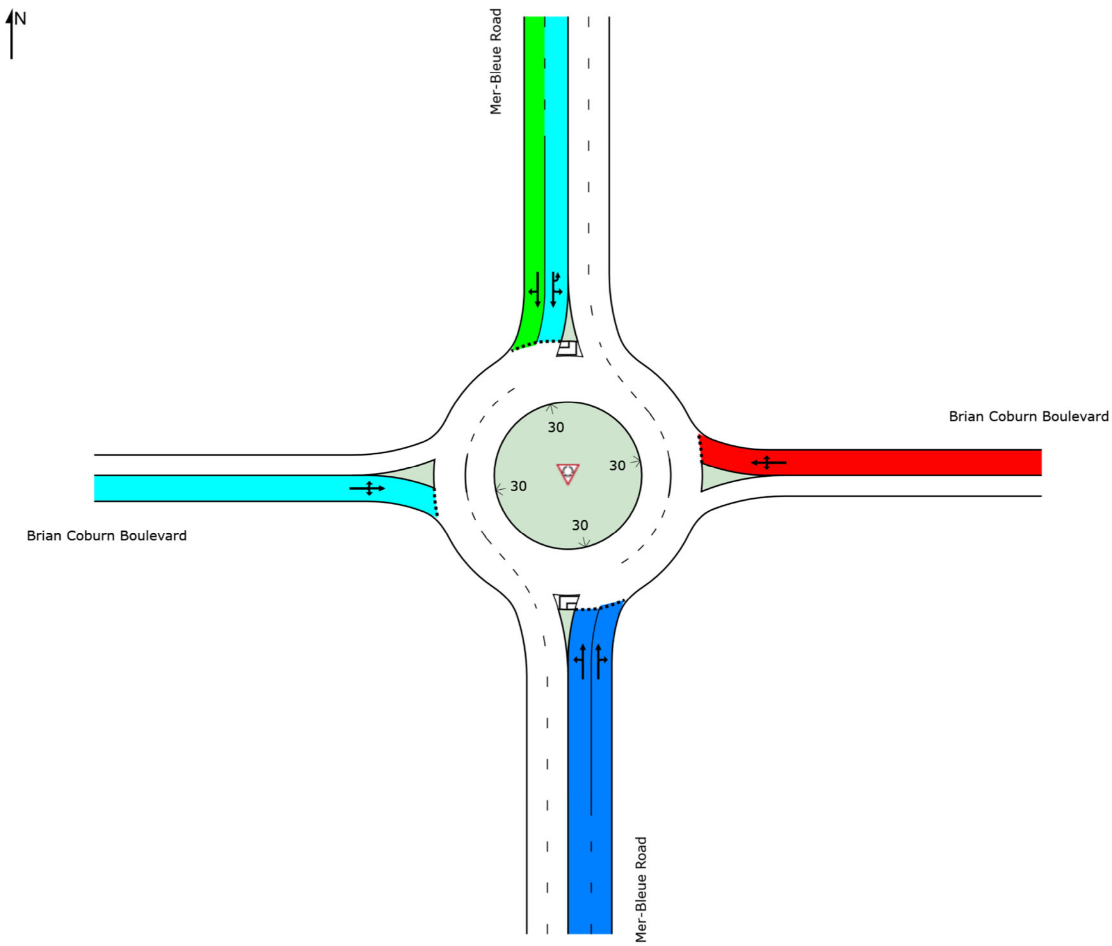
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 1 [Mer-Bleue & Brian Coburn 2024 FB AM]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	C	F	A	B	F



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

MOVEMENT SUMMARY

Site: 1 [Mer-Bleue & Brian Coburn 2024 FB AM]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Mer-Bleue Road												
1	L2	27	2.0	0.688	20.8	LOS C	5.6	40.0	0.83	1.09	1.65	42.9
2	T1	556	2.0	0.688	20.8	LOS C	5.6	40.0	0.83	1.09	1.65	42.7
3	R2	284	2.0	0.688	20.8	LOS C	5.6	40.0	0.83	1.09	1.65	35.5
Approach		867	2.0	0.688	20.8	LOS C	5.6	40.0	0.83	1.09	1.65	40.8
East: Brian Coburn Boulevard												
4	L2	103	2.0	2.664	771.1	LOS F	297.9	2121.2	1.00	8.18	25.45	2.7
5	T1	656	2.0	2.664	771.1	LOS F	297.9	2121.2	1.00	8.18	25.45	3.1
6	R2	688	2.0	2.664	771.1	LOS F	297.9	2121.2	1.00	8.18	25.45	3.1
Approach		1447	2.0	2.664	771.1	LOS F	297.9	2121.2	1.00	8.18	25.45	3.1
North: Mer-Bleue Road												
7u	U	370	2.0	0.534	10.0	LOS B	4.0	28.6	0.61	0.57	0.73	47.7
7	L2	185	2.0	0.534	10.0	LOS B	4.0	28.6	0.61	0.57	0.73	42.6
8	T1	274	2.0	0.417	8.0	LOS A	2.2	15.5	0.53	0.44	0.53	51.1
9	R2	160	2.0	0.417	8.0	LOS A	2.2	15.5	0.53	0.44	0.53	50.2
Approach		989	2.0	0.534	9.1	LOS A	4.0	28.6	0.58	0.51	0.65	48.1
West: Brian Coburn Boulevard												
10	L2	155	2.0	0.518	13.7	LOS B	3.0	21.6	0.73	0.87	1.15	47.0
11	T1	162	2.0	0.518	13.7	LOS B	3.0	21.6	0.73	0.87	1.15	42.6
12	R2	28	2.0	0.518	13.7	LOS B	3.0	21.6	0.73	0.87	1.15	44.6
Approach		345	2.0	0.518	13.7	LOS B	3.0	21.6	0.73	0.87	1.15	45.0
All Vehicles		3648	2.0	2.664	314.6	LOS F	297.9	2121.2	0.82	3.73	10.77	8.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

DEGREE OF SATURATION

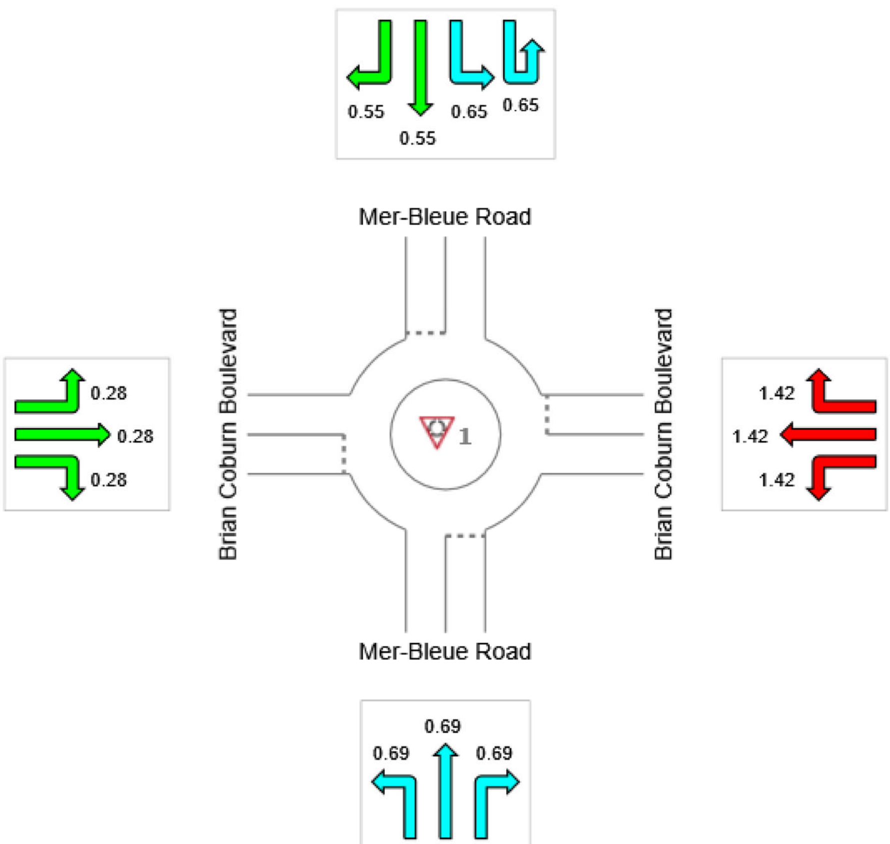
Ratio of Demand Volume to Capacity, v/c ratio per movement

Site: 1 [Mer-Bleue & Brian Coburn 2024 FB AM - Widened]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Degree of Saturation	0.69	1.42	0.65	0.28	1.42



Colour code based on Degree of Saturation

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

DELAY (CONTROL)

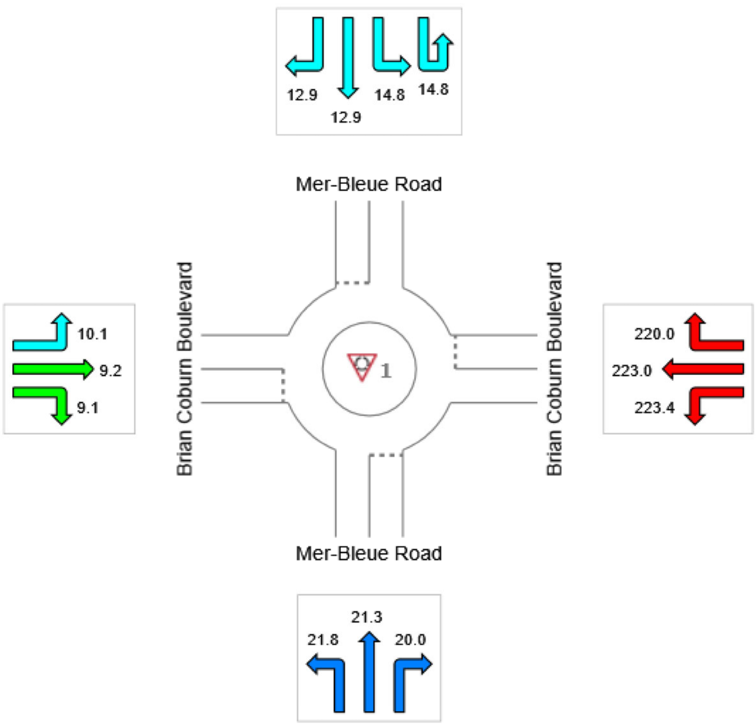
Average control delay per vehicle, or average pedestrian delay (seconds)

Site: 1 [Mer-Bleue & Brian Coburn 2024 FB AM - Widened]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Delay (Control)	20.9	221.6	13.9	9.6	97.5
LOS	C	F	B	A	F



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

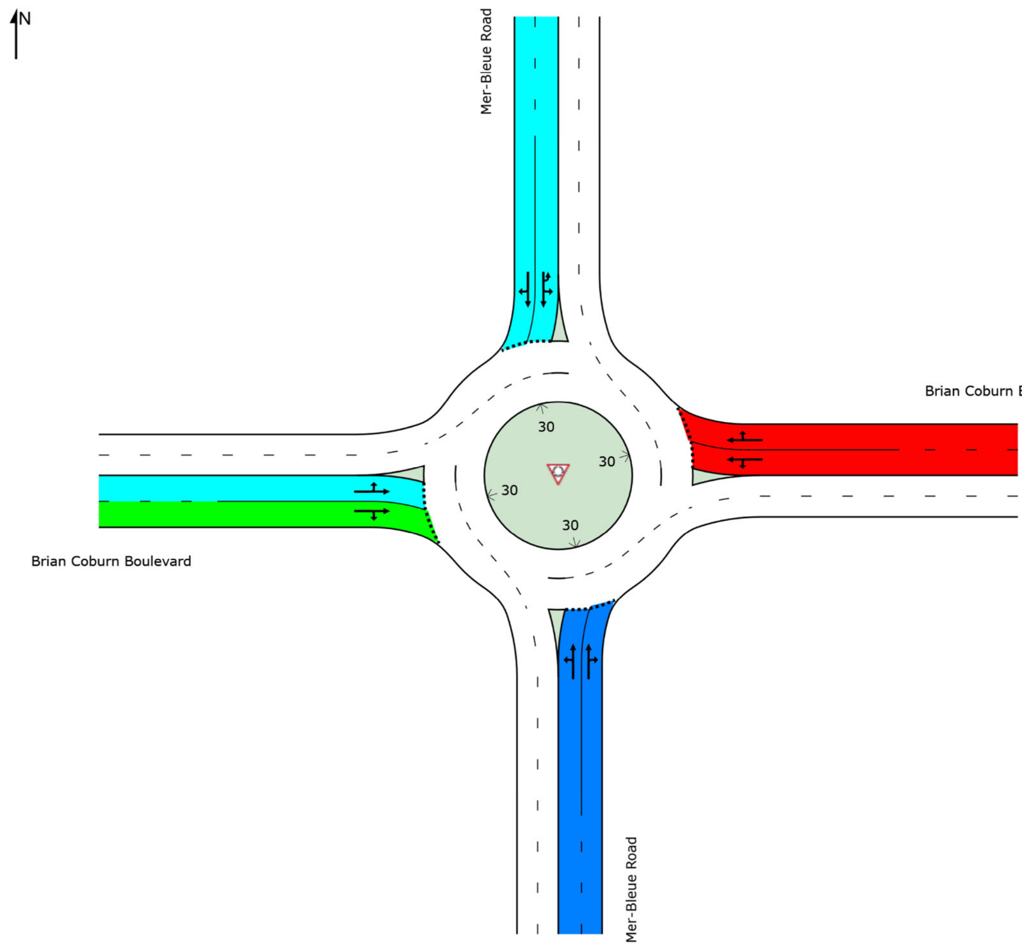
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 1 [Mer-Bleue & Brian Coburn 2024 FB AM - Widened]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	C	F	B	A	F



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

MOVEMENT SUMMARY

Site: 1 [Mer-Bleue & Brian Coburn 2024 FB AM - Widened]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Mer-Bleue Road												
1	L2	27	2.0	0.689	21.8	LOS C	5.4	38.6	0.83	1.08	1.65	42.5
2	T1	556	2.0	0.689	21.3	LOS C	5.6	40.0	0.82	1.08	1.65	42.6
3	R2	284	2.0	0.689	20.0	LOS C	5.6	40.0	0.82	1.08	1.64	36.2
Approach		867	2.0	0.689	20.9	LOS C	5.6	40.0	0.82	1.08	1.65	40.9
East: Brian Coburn Boulevard												
4	L2	103	2.0	1.418	223.4	LOS F	73.3	522.0	1.00	4.24	12.21	8.6
5	T1	656	2.0	1.418	223.0	LOS F	82.5	587.1	1.00	4.29	12.34	9.7
6	R2	688	2.0	1.418	220.0	LOS F	82.5	587.1	1.00	4.59	13.23	9.5
Approach		1447	2.0	1.418	221.6	LOS F	82.5	587.1	1.00	4.43	12.76	9.5
North: Mer-Bleue Road												
7u	U	370	2.0	0.647	14.8	LOS B	6.2	43.9	0.76	0.99	1.37	45.3
7	L2	185	2.0	0.647	14.8	LOS B	6.2	43.9	0.76	0.99	1.37	40.0
8	T1	274	2.0	0.554	12.9	LOS B	4.1	29.2	0.71	0.86	1.12	47.7
9	R2	160	2.0	0.554	12.9	LOS B	4.1	29.2	0.71	0.86	1.12	47.3
Approach		989	2.0	0.647	13.9	LOS B	6.2	43.9	0.74	0.93	1.26	45.3
West: Brian Coburn Boulevard												
10	L2	155	2.0	0.282	10.1	LOS B	1.1	7.7	0.66	0.67	0.68	47.7
11	T1	162	2.0	0.282	9.2	LOS A	1.1	7.7	0.64	0.65	0.65	47.7
12	R2	28	2.0	0.282	9.1	LOS A	1.1	7.6	0.64	0.65	0.65	48.8
Approach		345	2.0	0.282	9.6	LOS A	1.1	7.7	0.65	0.66	0.67	47.8
All Vehicles		3648	2.0	1.418	97.5	LOS F	82.5	587.1	0.85	2.33	5.86	19.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

DEGREE OF SATURATION

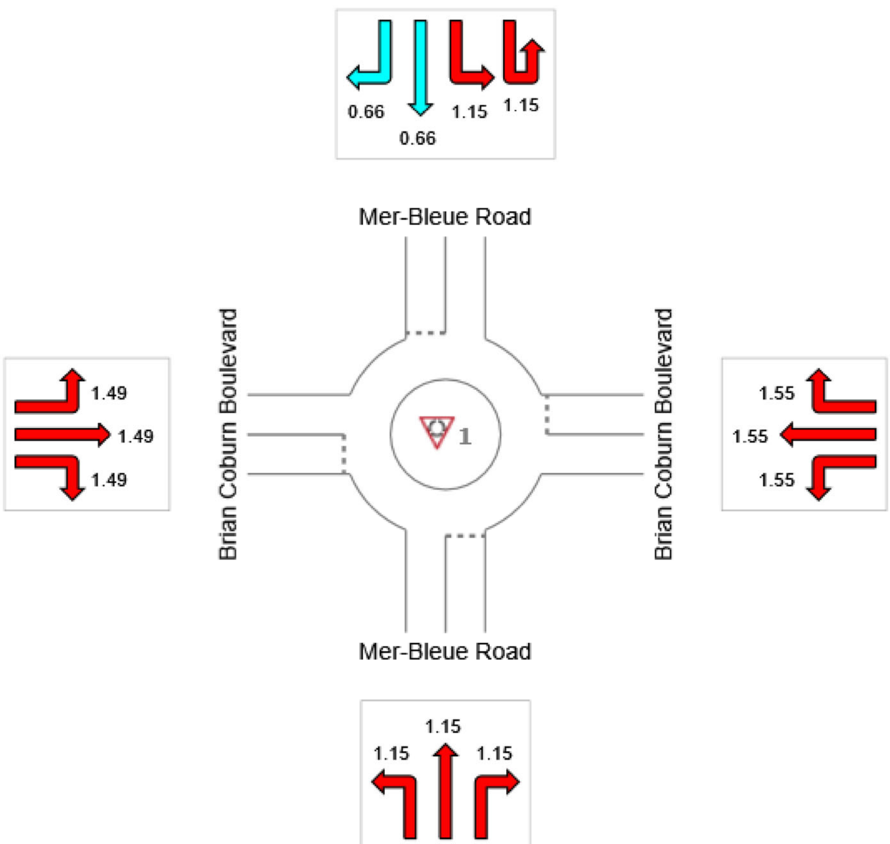
Ratio of Demand Volume to Capacity, v/c ratio per movement

Site: 1 [Mer-Bleue & Brian Coburn 2024 FB PM]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Degree of Saturation	1.15	1.55	1.15	1.49	1.55



Colour code based on Degree of Saturation

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

DELAY (CONTROL)

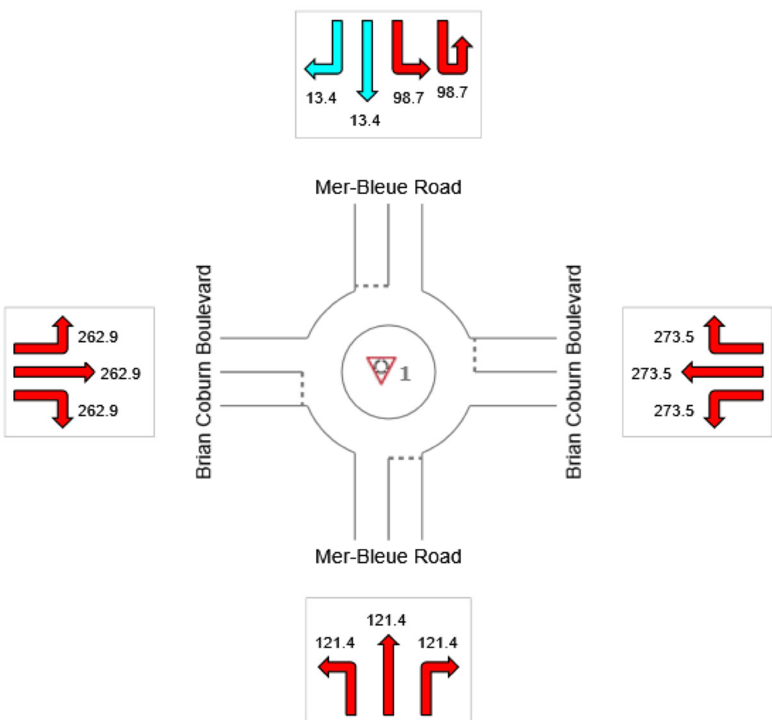
Average control delay per vehicle, or average pedestrian delay (seconds)

Site: 1 [Mer-Bleue & Brian Coburn 2024 FB PM]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Delay (Control)	121.4	273.5	67.8	262.9	150.4
LOS	F	F	F	F	F



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

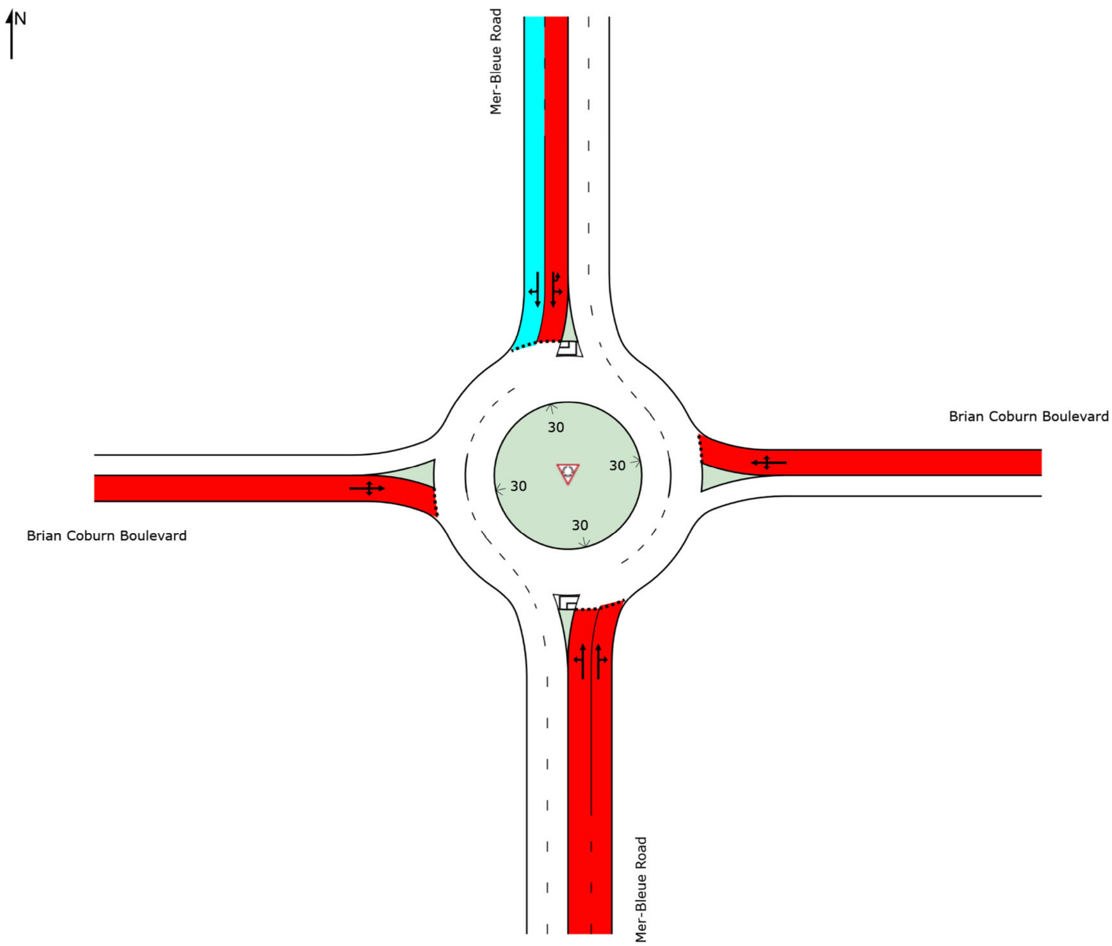
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 1 [Mer-Bleue & Brian Coburn 2024 FB PM]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	F	F	F	F	F



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

MOVEMENT SUMMARY

Site: 1 [Mer-Bleue & Brian Coburn 2024 FB PM]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Mer-Bleue Road												
1	L2	50	2.0	1.148	121.4	LOS F	30.1	214.2	1.00	2.66	6.99	18.9
2	T1	671	2.0	1.148	121.4	LOS F	30.1	214.2	1.00	2.66	6.99	18.8
3	R2	235	2.0	1.148	121.4	LOS F	30.1	214.2	1.00	2.66	6.99	13.5
Approach		956	2.0	1.148	121.4	LOS F	30.1	214.2	1.00	2.66	6.99	17.6
East: Brian Coburn Boulevard												
4	L2	201	2.0	1.549	273.5	LOS F	119.9	853.8	1.00	5.51	15.69	7.1
5	T1	261	2.0	1.549	273.5	LOS F	119.9	853.8	1.00	5.51	15.69	8.1
6	R2	500	2.0	1.549	273.5	LOS F	119.9	853.8	1.00	5.51	15.69	8.0
Approach		962	2.0	1.549	273.5	LOS F	119.9	853.8	1.00	5.51	15.69	7.9
North: Mer-Bleue Road												
7u	U	339	2.0	1.155	98.7	LOS F	87.4	622.6	1.00	3.27	6.25	22.9
7	L2	825	2.0	1.155	98.7	LOS F	87.4	622.6	1.00	3.27	6.25	17.9
8	T1	463	2.0	0.657	13.4	LOS B	8.1	57.3	0.73	0.86	1.19	47.2
9	R2	199	2.0	0.657	13.4	LOS B	8.1	57.3	0.73	0.86	1.19	46.8
Approach		1826	2.0	1.155	67.8	LOS F	87.4	622.6	0.90	2.39	4.41	25.3
West: Brian Coburn Boulevard												
10	L2	61	2.0	1.490	262.9	LOS F	63.3	450.6	1.00	4.02	12.44	11.5
11	T1	424	2.0	1.490	262.9	LOS F	63.3	450.6	1.00	4.02	12.44	8.4
12	R2	49	2.0	1.490	262.9	LOS F	63.3	450.6	1.00	4.02	12.44	10.5
Approach		534	2.0	1.490	262.9	LOS F	63.3	450.6	1.00	4.02	12.44	9.0
All Vehicles		4278	2.0	1.549	150.4	LOS F	119.9	853.8	0.96	3.36	8.53	14.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

DEGREE OF SATURATION

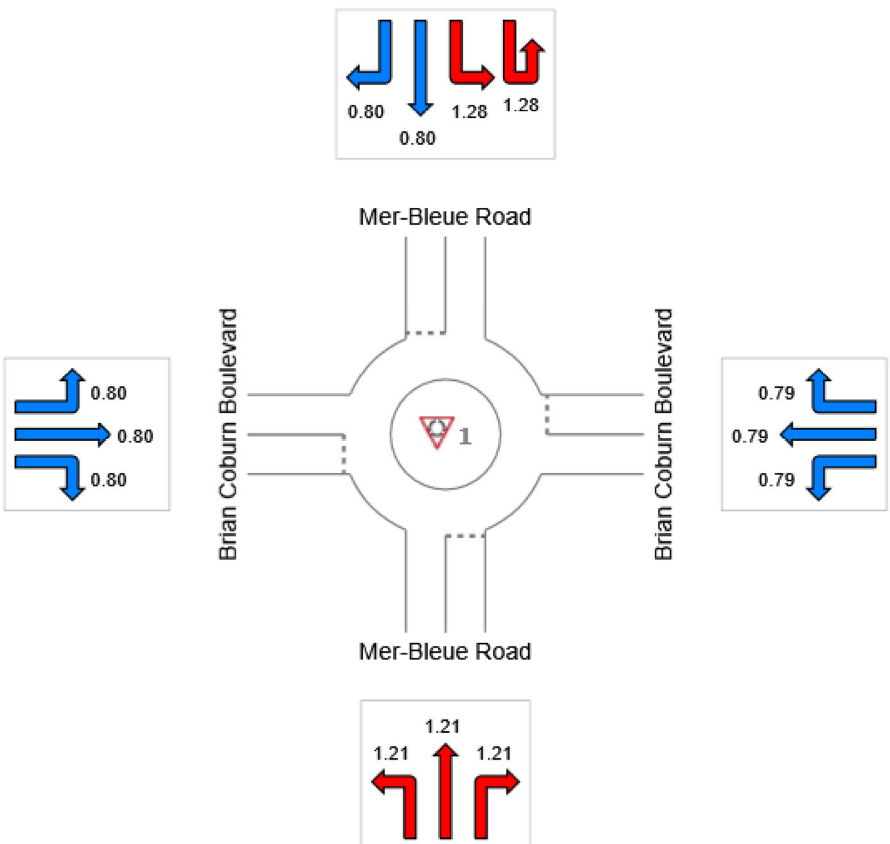
Ratio of Demand Volume to Capacity, v/c ratio per movement

Site: 1 [Mer-Bleue & Brian Coburn 2024 FB PM - Widened]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Degree of Saturation	1.21	0.79	1.28	0.80	1.28



Colour code based on Degree of Saturation

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Organisation: CGH TRANSPORTATION | Processed: January 6, 2021 11:30:41 AM
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DELAY (CONTROL)

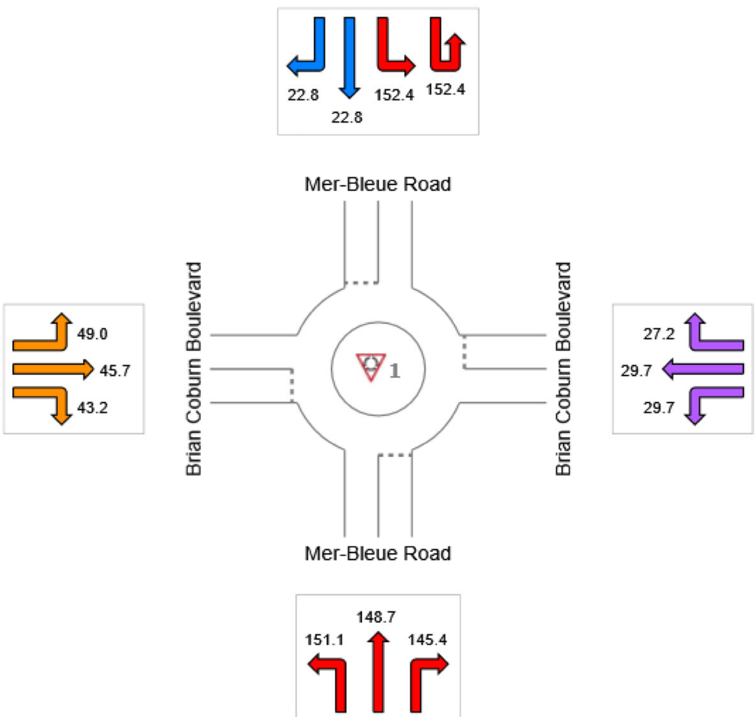
Average control delay per vehicle, or average pedestrian delay (seconds)

Site: 1 [Mer-Bleue & Brian Coburn 2024 FB PM - Widened]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Delay (Control)	148.0	28.4	105.5	45.8	90.2
LOS	F	D	F	E	F



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

INTERSECTION SUMMARY

Site: 1 [Mer-Bleue & Brian Coburn 2024 FB PM - Widened]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

Intersection Performance - Hourly Values

Performance Measure	Vehicles		Persons	
Travel Speed (Average)	20.8	km/h	20.8	km/h
Travel Distance (Total)	3553.5	veh-km/h	4264.1	pers-km/h
Travel Time (Total)	171.2	veh-h/h	205.4	pers-h/h
Demand Flows (Total)	4278	veh/h	5134	pers/h
Percent Heavy Vehicles (Demand)	2.0	%		
Degree of Saturation	1.283			
Practical Spare Capacity	-33.8	%		
Effective Intersection Capacity	3333	veh/h		
Control Delay (Total)	107.19	veh-h/h	128.63	pers-h/h
Control Delay (Average)	90.2	sec	90.2	sec
Control Delay (Worst Lane)	152.4	sec		
Control Delay (Worst Movement)	152.4	sec	152.4	sec
Geometric Delay (Average)	0.0	sec		
Stop-Line Delay (Average)	90.2	sec		
Idling Time (Average)	58.4	sec		
Intersection Level of Service (LOS)	LOS F			
95% Back of Queue - Vehicles (Worst Lane)	105.7	veh		
95% Back of Queue - Distance (Worst Lane)	752.7	m		
Queue Storage Ratio (Worst Lane)	0.61			
Total Effective Stops	10731	veh/h	12877	pers/h
Effective Stop Rate	2.51		2.51	
Proportion Queued	0.95		0.95	
Performance Index	533.7		533.7	
Cost (Total)	6144.99	$/h	6144.99	$/h
Fuel Consumption (Total)	528.3	L/h		
Carbon Dioxide (Total)	1246.5	kg/h		
Hydrocarbons (Total)	0.126	kg/h		
Carbon Monoxide (Total)	1.209	kg/h		
NOx (Total)	1.315	kg/h		

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Site Model Variability Index (Iterations 3 to N): 5.3 %
Number of Iterations: 7 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 2.5% 1.2% 0.6%

Intersection Performance - Annual Values

Performance Measure	Vehicles		Persons	
Demand Flows (Total)	2,053,440	veh/y	2,464,128	pers/y
Delay	51,451	veh-h/y	61,741	pers-h/y
Effective Stops	5,150,652	veh/y	6,180,782	pers/y
Travel Distance	1,705,658	veh-km/y	2,046,790	pers-km/y
Travel Time	82,174	veh-h/y	98,609	pers-h/y

Cost	2,949,594	$/y	2,949,594	$/y
Fuel Consumption	253,577	L/y		
Carbon Dioxide	598,325	kg/y		
Hydrocarbons	60	kg/y		
Carbon Monoxide	580	kg/y		
NOx	631	kg/y		

Organisation: CGH TRANSPORTATION | Processed: January 6, 2021 11:30:41 AM
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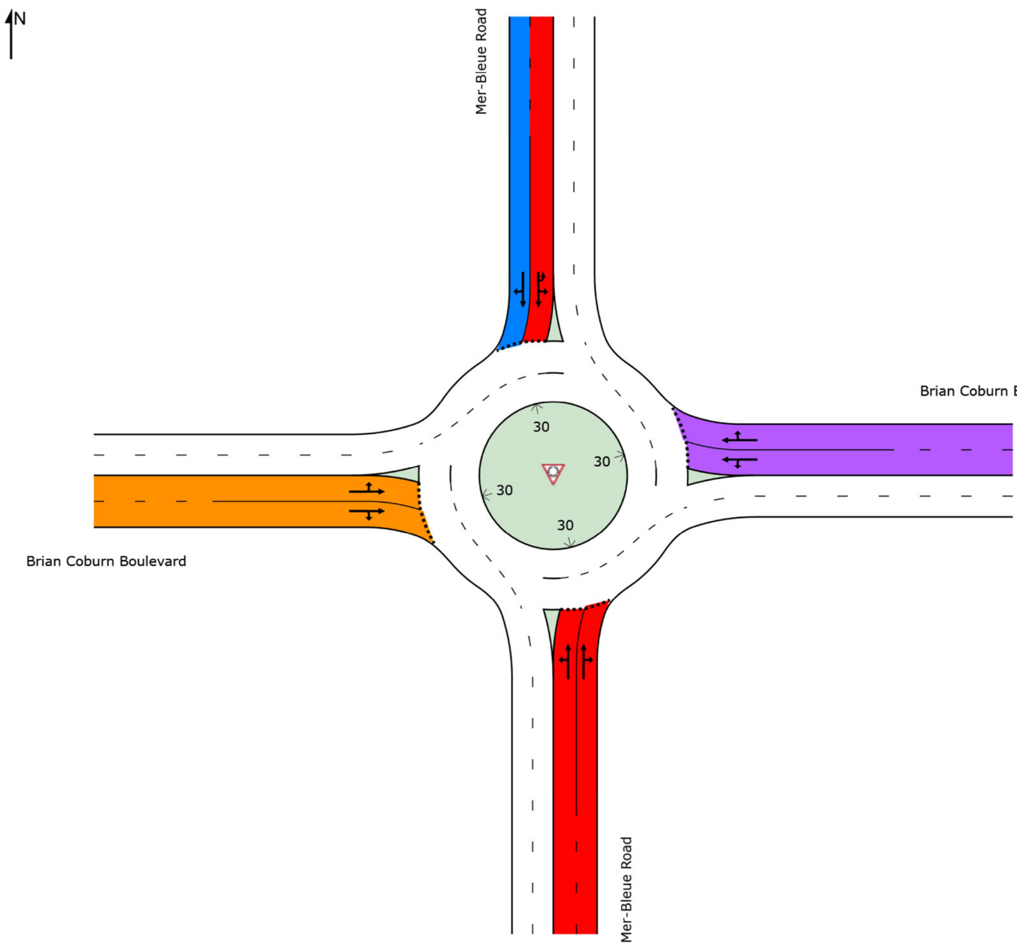
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 1 [Mer-Bleue & Brian Coburn 2024 FB PM - Widened]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	F	D	F	E	F



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

MOVEMENT SUMMARY

Site: 1 [Mer-Bleue & Brian Coburn 2024 FB PM - Widened]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Mer-Bleue Road												
1	L2	50	2.0	1.215	151.1	LOS F	33.7	240.0	1.00	2.87	7.92	16.3
2	T1	671	2.0	1.215	148.7	LOS F	38.2	272.0	1.00	2.96	8.21	16.4
3	R2	235	2.0	1.215	145.4	LOS F	38.2	272.0	1.00	3.09	8.63	11.9
Approach		956	2.0	1.215	148.0	LOS F	38.2	272.0	1.00	2.99	8.30	15.4
East: Brian Coburn Boulevard												
4	L2	201	2.0	0.790	29.7	LOS D	7.7	54.6	0.88	1.26	2.12	32.1
5	T1	261	2.0	0.790	29.7	LOS D	8.0	57.1	0.88	1.26	2.12	34.1
6	R2	500	2.0	0.790	27.2	LOS D	8.0	57.1	0.88	1.27	2.12	34.4
Approach		962	2.0	0.790	28.4	LOS D	8.0	57.1	0.88	1.26	2.12	33.8
North: Mer-Bleue Road												
7u	U	339	2.0	1.283	152.4	LOS F	105.7	752.7	1.00	4.38	9.80	17.5
7	L2	825	2.0	1.283	152.4	LOS F	105.7	752.7	1.00	4.38	9.80	13.3
8	T1	463	2.0	0.795	22.8	LOS C	12.4	88.6	0.91	1.34	2.05	41.8
9	R2	199	2.0	0.795	22.8	LOS C	12.4	88.6	0.91	1.34	2.05	42.0
Approach		1826	2.0	1.283	105.5	LOS F	105.7	752.7	0.97	3.27	6.99	19.6
West: Brian Coburn Boulevard												
10	L2	61	2.0	0.796	49.0	LOS E	4.9	35.1	0.94	1.27	2.23	33.1
11	T1	424	2.0	0.796	45.7	LOS E	5.2	36.9	0.93	1.27	2.23	28.6
12	R2	49	2.0	0.796	43.2	LOS E	5.2	36.9	0.93	1.27	2.23	32.7
Approach		534	2.0	0.796	45.8	LOS E	5.2	36.9	0.93	1.27	2.23	29.6
All Vehicles		4278	2.0	1.283	90.2	LOS F	105.7	752.7	0.95	2.51	5.59	20.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Appendix N

2024 Future Total Synchro and Sidra Worksheets

Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	155	174	41	4	108	686	688	48	564	292	370	189
Future Volume (vph)	155	174	41	4	108	686	688	48	564	292	370	189
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Frt		0.983				0.931			0.952			
Flt Protected		0.979				0.996			0.997			
Satd. Flow (prot)	0	3191	0	0	0	3075	0	0	3147	0	0	0
Flt Permitted		0.979				0.996			0.997			
Satd. Flow (perm)	0	3191	0	0	0	3075	0	0	3147	0	0	0
Link Speed (k/h)		70				60			60			
Link Distance (m)		647.3				110.9			463.6			
Travel Time (s)		33.3				6.7			27.8			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	155	174	41	4	108	686	688	48	564	292	370	189
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	370	0	0	0	1486	0	0	904	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	R NA	Left
Median Width(m)		0.0				0.0			3.5			
Link Offset(m)		0.0				0.0			0.0			
Crosswalk Width(m)		3.0				3.0			3.0			
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	25		15	15	25		15	25		15	15	25
Sign Control		Yield				Yield			Yield			

Intersection Summary	
Area Type: Other	
Control Type: Roundabout	
Intersection Capacity Utilization 129.8%	ICU Level of Service H
Analysis Period (min) 15	

Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	279	160
Future Volume (vph)	279	160
Ideal Flow (vphpl)	1800	1800
Lane Util. Factor	0.95	0.95
Frt	0.976	
Flt Protected	0.973	
Satd. Flow (prot)	3149	0
Flt Permitted	0.973	
Satd. Flow (perm)	3149	0
Link Speed (k/h)	60	
Link Distance (m)	481.8	
Travel Time (s)	28.9	
Peak Hour Factor	1.00	1.00
Adj. Flow (vph)	279	160
Shared Lane Traffic (%)		
Lane Group Flow (vph)	998	0
Enter Blocked Intersection	No	No
Lane Alignment	Left	Right
Median Width(m)	3.5	
Link Offset(m)	0.0	
Crosswalk Width(m)	3.0	
Two way Left Turn Lane		
Headway Factor	1.09	1.09
Turning Speed (k/h)		15
Sign Control	Yield	

Intersection Summary

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	30	43	621	30	6	1248	15	105	0	11	8	0
Future Volume (vph)	30	43	621	30	6	1248	15	105	0	11	8	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		105.0		0.0	0.0		0.0	0.0		0.0	0.0	
Storage Lanes		0		0	0		0	0		0	0	
Taper Length (m)		45.0			15.0			15.0			15.0	
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.994			0.998			0.987			0.870
Flt Protected			0.995						0.957			0.998
Satd. Flow (prot)	0	0	3171	0	0	3292	0	0	1648	0	0	1523
Flt Permitted			0.995						0.957			0.998
Satd. Flow (perm)	0	0	3171	0	0	3292	0	0	1648	0	0	1523
Link Speed (k/h)			60			60			50			50
Link Distance (m)			308.2			443.7			148.0			244.6
Travel Time (s)			18.5			26.6			10.7			17.6
Confl. Peds. (#/hr)		7										
Confl. Bikes (#/hr)							1					
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	3%	6%	2%	2%	2%	46%	2%	2%	2%	14%	2%
Adj. Flow (vph)	30	43	621	30	6	1248	15	105	0	11	8	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	724	0	0	1269	0	0	116	0	0	214
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left
Median Width(m)			0.0			0.0			0.0			0.0
Link Offset(m)			0.0			0.0			0.0			0.0
Crosswalk Width(m)			3.0			3.0			3.0			3.0
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	15	25		15	25		15	25		15	25	
Sign Control			Yield			Yield			Yield			Yield

Intersection Summary	
Area Type:	Other
Control Type: Roundabout	
Intersection Capacity Utilization 92.6%	ICU Level of Service F
Analysis Period (min) 15	

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	206
Future Volume (vph)	206
Ideal Flow (vphpl)	1800
Storage Length (m)	0.0
Storage Lanes	0
Taper Length (m)	
Lane Util. Factor	1.00
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	1.00
Heavy Vehicles (%)	1%
Adj. Flow (vph)	206
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	1.09
Turning Speed (k/h)	15
Sign Control	

Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	190	51	114	405	209	242
Future Volume (vph)	190	51	114	405	209	242
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	95.0	0.0	30.0			0.0
Storage Lanes	1	1	1			0
Taper Length (m)	15.0		75.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.928	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1496	1293	1566	1664	1505	0
Flt Permitted	0.950		0.465			
Satd. Flow (perm)	1496	1293	766	1664	1505	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		51			140	
Link Speed (k/h)	50			50	60	
Link Distance (m)	691.8			356.1	136.7	
Travel Time (s)	49.8			25.6	8.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	13%	17%	8%	7%	13%	7%
Adj. Flow (vph)	190	51	114	405	209	242
Shared Lane Traffic (%)						
Lane Group Flow (vph)	190	51	114	405	451	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	3.0			3.0	3.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	25	15	25			15
Number of Detectors	1	1	1	2	2	
Detector Template	Left	Right	Left	Thru	Thru	
Leading Detector (m)	2.0	2.0	2.0	10.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	2.0	2.0	0.6	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	6	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		4	2			
Detector Phase	4	4	2	2	6	
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	25.0	25.0	24.0	24.0	25.2	
Total Split (s)	25.0	25.0	35.0	35.0	35.0	
Total Split (%)	41.7%	41.7%	58.3%	58.3%	58.3%	
Maximum Green (s)	20.7	20.7	30.7	30.7	30.3	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.3	4.3	4.3	4.3	4.7	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	Min	Min	Min	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	13.5	13.5	12.5	12.5	13.5	
Pedestrian Calls (#/hr)	0	0	0	0	0	
Act Effct Green (s)	11.5	11.5	19.3	19.3	19.0	
Actuated g/C Ratio	0.33	0.33	0.55	0.55	0.54	
v/c Ratio	0.39	0.11	0.27	0.44	0.52	
Control Delay	13.1	4.8	9.2	9.2	8.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	13.1	4.8	9.2	9.2	8.0	
LOS	B	A	A	A	A	
Approach Delay	11.4			9.2	8.0	
Approach LOS	B			A	A	
Queue Length 50th (m)	7.0	0.0	3.6	14.3	10.8	
Queue Length 95th (m)	25.0	5.2	13.5	38.9	35.9	
Internal Link Dist (m)	667.8			332.1	112.7	
Turn Bay Length (m)	95.0		30.0			
Base Capacity (vph)	909	805	684	1487	1348	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.21	0.06	0.17	0.27	0.33	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 35.2

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

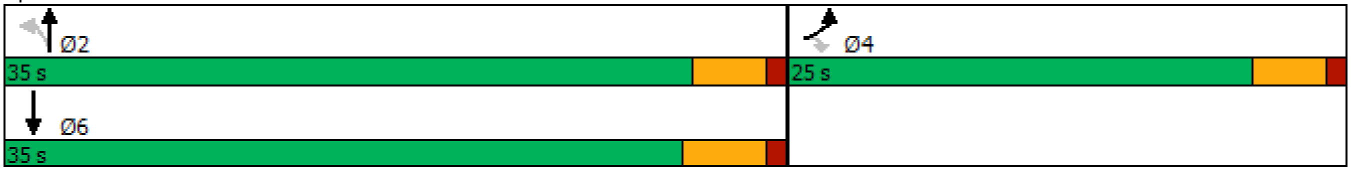
Maximum v/c Ratio: 0.52

Intersection Signal Delay: 9.2 Intersection LOS: A

Intersection Capacity Utilization 57.8% ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 3: Mer-Bleue Road & Renaud Road



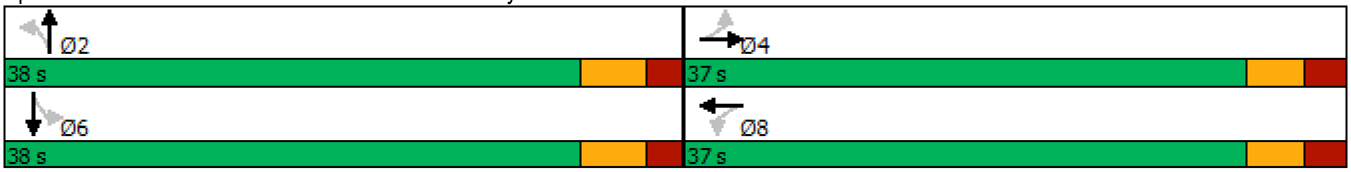
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	86	61	10	34	64	126	2	669	14	45	380	22
Future Volume (vph)	86	61	10	34	64	126	2	669	14	45	380	22
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	30.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	15.0			15.0			75.0			75.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.979			0.901			0.997			0.992	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1658	1708	0	1658	1572	0	1658	3154	0	1658	2985	0
Flt Permitted	0.638			0.711			0.515			0.392		
Satd. Flow (perm)	1113	1708	0	1241	1572	0	899	3154	0	684	2985	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			126			3			10	
Link Speed (k/h)		50			50			60			60	
Link Distance (m)		221.2			188.0			167.0			463.6	
Travel Time (s)		15.9			13.5			10.0			27.8	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	7%	2%	2%	13%	2%
Adj. Flow (vph)	86	61	10	34	64	126	2	669	14	45	380	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	86	71	0	34	190	0	2	683	0	45	402	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		3.0			3.0			3.0			3.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	36.1	36.1		36.1	36.1		35.9	35.9		35.9	35.9	
Total Split (s)	37.0	37.0		37.0	37.0		38.0	38.0		38.0	38.0	
Total Split (%)	49.3%	49.3%		49.3%	49.3%		50.7%	50.7%		50.7%	50.7%	
Maximum Green (s)	31.3	31.3		31.3	31.3		32.1	32.1		32.1	32.1	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.7	3.7		3.7	3.7	
All-Red Time (s)	2.4	2.4		2.4	2.4		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.7	5.7		5.7	5.7		5.9	5.9		5.9	5.9	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	23.0	23.0		23.0	23.0		10.5	10.5		10.5	10.5	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	10.6	10.6		10.6	10.6		15.7	15.7		15.7	15.7	
Actuated g/C Ratio	0.28	0.28		0.28	0.28		0.41	0.41		0.41	0.41	
v/c Ratio	0.28	0.15		0.10	0.36		0.01	0.52		0.16	0.33	
Control Delay	13.2	9.9		10.9	6.8		7.0	10.2		9.0	8.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	13.2	9.9		10.9	6.8		7.0	10.2		9.0	8.4	
LOS	B	A		B	A		A	B		A	A	
Approach Delay		11.7			7.5			10.2			8.5	
Approach LOS		B			A			B			A	
Queue Length 50th (m)	3.5	2.4		1.3	2.5		0.1	15.0		1.6	7.8	
Queue Length 95th (m)	12.5	9.3		6.0	13.6		0.9	28.1		6.2	15.9	
Internal Link Dist (m)		197.2			164.0			143.0			439.6	
Turn Bay Length (m)	30.0			30.0			30.0			35.0		
Base Capacity (vph)	929	1428		1036	1334		770	2702		586	2558	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.09	0.05		0.03	0.14		0.00	0.25		0.08	0.16	

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 38.2
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.52
Intersection Signal Delay: 9.5 Intersection LOS: A
Intersection Capacity Utilization 67.7% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 5: Mer-Bleue Road & Axis Way/Decoeur Drive



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	660	20	0	1542	0	50
Future Volume (vph)	660	20	0	1542	0	50
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)		25.0	0.0		0.0	0.0
Storage Lanes		0	0		0	1
Taper Length (m)			15.0		15.0	
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.996					0.865
Flt Protected						
Satd. Flow (prot)	3302	0	0	3316	0	1510
Flt Permitted						
Satd. Flow (perm)	3302	0	0	3316	0	1510
Link Speed (k/h)	60			60	50	
Link Distance (m)	110.9			308.2	141.0	
Travel Time (s)	6.7			18.5	10.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	660	20	0	1542	0	50
Shared Lane Traffic (%)						
Lane Group Flow (vph)	680	0	0	1542	0	50
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	3.0			3.0	3.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 48.3% ICU Level of Service A

Analysis Period (min) 15

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	660	20	0	1542	0	50
Future Vol, veh/h	660	20	0	1542	0	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	660	20	0	1542	0	50

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	340
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	656
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	656
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	656	-	-	-
HCM Lane V/C Ratio	0.076	-	-	-
HCM Control Delay (s)	10.9	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.2	-	-	-

Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	61	464	70	13	209	288	500	69	678	242	339	838
Future Volume (vph)	61	464	70	13	209	288	500	69	678	242	339	838
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Frt		0.982				0.926			0.963			
Flt Protected		0.995				0.989			0.997			
Satd. Flow (prot)	0	3240	0	0	0	3037	0	0	3183	0	0	0
Flt Permitted		0.995				0.989			0.997			
Satd. Flow (perm)	0	3240	0	0	0	3037	0	0	3183	0	0	0
Link Speed (k/h)		70				60			60			
Link Distance (m)		647.3				109.9			458.1			
Travel Time (s)		33.3				6.6			27.5			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	61	464	70	13	209	288	500	69	678	242	339	838
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	595	0	0	0	1010	0	0	989	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	R NA	Left
Median Width(m)		0.0				0.0			3.5			
Link Offset(m)		0.0				0.0			0.0			
Crosswalk Width(m)		3.0				3.0			3.0			
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	25		15	15	25		15	25		15	15	25
Sign Control		Yield				Yield			Yield			

Intersection Summary	
Area Type:	Other
Control Type: Roundabout	
Intersection Capacity Utilization 149.9%	ICU Level of Service H
Analysis Period (min) 15	

Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	471	199
Future Volume (vph)	471	199
Ideal Flow (vphpl)	1800	1800
Lane Util. Factor	0.95	0.95
Frt	0.984	
Flt Protected	0.969	
Satd. Flow (prot)	3161	0
Flt Permitted	0.969	
Satd. Flow (perm)	3161	0
Link Speed (k/h)	60	
Link Distance (m)	481.8	
Travel Time (s)	28.9	
Peak Hour Factor	1.00	1.00
Adj. Flow (vph)	471	199
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1847	0
Enter Blocked Intersection	No	No
Lane Alignment	Left	Right
Median Width(m)	3.5	
Link Offset(m)	0.0	
Crosswalk Width(m)	3.0	
Two way Left Turn Lane		
Headway Factor	1.09	1.09
Turning Speed (k/h)		15
Sign Control	Yield	

Intersection Summary

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	27	236	1296	95	20	868	13	57	0	12	4	0
Future Volume (vph)	27	236	1296	95	20	868	13	57	0	12	4	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		105.0		0.0	0.0		0.0	0.0		0.0	0.0	
Storage Lanes		0		0	0		0	0		0	0	
Taper Length (m)		45.0			15.0			15.0			15.0	
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.991			0.998			0.977			0.870
Flt Protected			0.992			0.999			0.960			0.998
Satd. Flow (prot)	0	0	3260	0	0	3306	0	0	1637	0	0	1475
Flt Permitted			0.992			0.999			0.960			0.998
Satd. Flow (perm)	0	0	3260	0	0	3306	0	0	1637	0	0	1475
Link Speed (k/h)			60			60			50			50
Link Distance (m)			309.2			443.7			213.2			244.6
Travel Time (s)			18.6			26.6			15.4			17.6
Confl. Peds. (#/hr)		5										
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	75%	2%
Adj. Flow (vph)	27	236	1296	95	20	868	13	57	0	12	4	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	1654	0	0	901	0	0	69	0	0	106
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left
Median Width(m)			0.0			0.0			0.0			0.0
Link Offset(m)			0.0			0.0			0.0			0.0
Crosswalk Width(m)			3.0			3.0			3.0			3.0
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	15	25		15	25		15	25		15	25	
Sign Control			Yield			Yield			Yield			Yield

Intersection Summary

Area Type: Other

Control Type: Roundabout

Intersection Capacity Utilization 96.2% ICU Level of Service F

Analysis Period (min) 15

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	102
Future Volume (vph)	102
Ideal Flow (vphpl)	1800
Storage Length (m)	0.0
Storage Lanes	0
Taper Length (m)	
Lane Util. Factor	1.00
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	1.00
Heavy Vehicles (%)	2%
Adj. Flow (vph)	102
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	1.09
Turning Speed (k/h)	15
Sign Control	

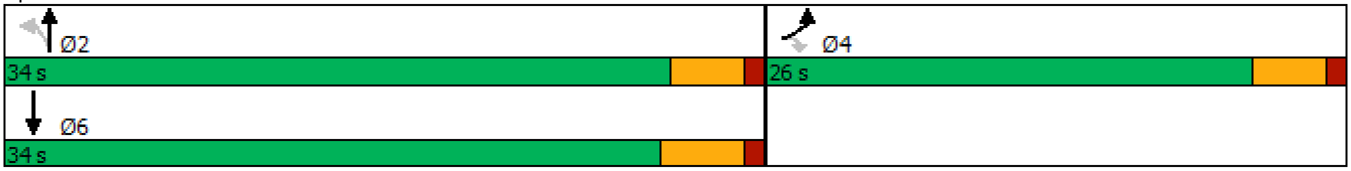
Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	400	85	73	365	443	126
Future Volume (vph)	400	85	73	365	443	126
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	95.0	0.0	30.0			0.0
Storage Lanes	1	1	1			0
Taper Length (m)	15.0		75.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.970	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1658	1339	1610	1745	1680	0
Flt Permitted	0.950		0.297			
Satd. Flow (perm)	1658	1339	503	1745	1680	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		85			33	
Link Speed (k/h)	50			50	60	
Link Distance (m)	691.8			356.1	129.9	
Travel Time (s)	49.8			25.6	7.8	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	13%	5%	2%	3%	2%
Adj. Flow (vph)	400	85	73	365	443	126
Shared Lane Traffic (%)						
Lane Group Flow (vph)	400	85	73	365	569	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	3.0			3.0	3.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	25	15	25			15
Number of Detectors	1	1	1	2	2	
Detector Template	Left	Right	Left	Thru	Thru	
Leading Detector (m)	2.0	2.0	2.0	10.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	2.0	2.0	0.6	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	6	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		4	2			
Detector Phase	4	4	2	2	6	
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	24.8	24.8	23.8	23.8	25.2	
Total Split (s)	26.0	26.0	34.0	34.0	34.0	
Total Split (%)	43.3%	43.3%	56.7%	56.7%	56.7%	
Maximum Green (s)	21.7	21.7	29.7	29.7	29.3	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.3	4.3	4.3	4.3	4.7	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	Min	Min	Min	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	13.5	13.5	12.5	12.5	13.5	
Pedestrian Calls (#/hr)	0	0	0	0	0	
Act Effct Green (s)	16.0	16.0	20.1	20.1	19.7	
Actuated g/C Ratio	0.35	0.35	0.44	0.44	0.43	
v/c Ratio	0.68	0.16	0.33	0.47	0.76	
Control Delay	20.8	4.6	13.6	11.5	18.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	20.8	4.6	13.6	11.5	18.2	
LOS	C	A	B	B	B	
Approach Delay	17.9			11.9	18.2	
Approach LOS	B			B	B	
Queue Length 50th (m)	25.5	0.0	3.4	18.0	31.8	
Queue Length 95th (m)	62.5	7.2	12.5	40.9	73.1	
Internal Link Dist (m)	667.8			332.1	105.9	
Turn Bay Length (m)	95.0		30.0			
Base Capacity (vph)	849	727	352	1221	1172	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.47	0.12	0.21	0.30	0.49	

Intersection Summary	
Area Type: Other	
Cycle Length: 60	
Actuated Cycle Length: 45.4	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 16.2	Intersection LOS: B
Intersection Capacity Utilization 75.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 3: Mer-Bleue Road & Renaud Road

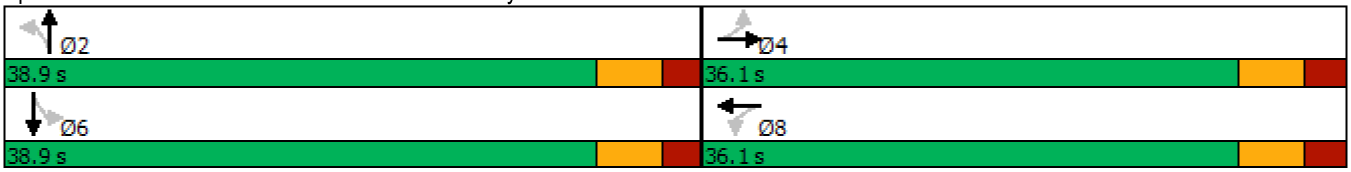


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	88	5	16	85	84	10	735	23	126	637	87
Future Volume (vph)	47	88	5	16	85	84	10	735	23	126	637	87
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	30.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	15.0			15.0			75.0			75.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.992			0.925			0.995			0.982	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1658	1731	0	1658	1614	0	1658	3149	0	1658	2974	0
Flt Permitted	0.650			0.697			0.376			0.364		
Satd. Flow (perm)	1134	1731	0	1216	1614	0	656	3149	0	635	2974	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			79			5			25	
Link Speed (k/h)		50			50			60			60	
Link Distance (m)		269.4			286.1			179.4			458.1	
Travel Time (s)		19.4			20.6			10.8			27.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	7%	2%	2%	13%	2%
Adj. Flow (vph)	47	88	5	16	85	84	10	735	23	126	637	87
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	93	0	16	169	0	10	758	0	126	724	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		3.0			3.0			3.0			3.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	36.1	36.1		36.1	36.1		35.9	35.9		35.9	35.9	
Total Split (s)	36.1	36.1		36.1	36.1		38.9	38.9		38.9	38.9	
Total Split (%)	48.1%	48.1%		48.1%	48.1%		51.9%	51.9%		51.9%	51.9%	
Maximum Green (s)	30.0	30.0		30.0	30.0		33.0	33.0		33.0	33.0	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.7	3.7		3.7	3.7	
All-Red Time (s)	2.4	2.4		2.4	2.4		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1		5.9	5.9		5.9	5.9	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	23.0	23.0		23.0	23.0		10.5	10.5		10.5	10.5	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	10.8	10.8		10.8	10.8		21.9	21.9		21.9	21.9	
Actuated g/C Ratio	0.27	0.27		0.27	0.27		0.55	0.55		0.55	0.55	
v/c Ratio	0.15	0.20		0.05	0.34		0.03	0.43		0.36	0.44	
Control Delay	15.3	14.4		14.4	10.8		6.3	8.3		11.4	8.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	15.3	14.4		14.4	10.8		6.3	8.3		11.4	8.1	
LOS	B	B		B	B		A	A		B	A	
Approach Delay		14.7			11.1			8.2			8.6	
Approach LOS		B			B			A			A	
Queue Length 50th (m)	2.1	4.0		0.7	4.1		0.3	17.6		5.3	16.2	
Queue Length 95th (m)	10.6	16.5		5.0	20.2		2.0	31.1		16.2	29.4	
Internal Link Dist (m)		245.4			262.1			155.4			434.1	
Turn Bay Length (m)	30.0			30.0			30.0			35.0		
Base Capacity (vph)	893	1365		958	1289		559	2688		542	2542	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.05	0.07		0.02	0.13		0.02	0.28		0.23	0.28	

Intersection Summary	
Area Type: Other	
Cycle Length: 75	
Actuated Cycle Length: 39.5	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.44	
Intersection Signal Delay: 9.1	Intersection LOS: A
Intersection Capacity Utilization 69.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 5: Mer-Bleue Road & Axis Way/Decoeur Drive



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1561	66	0	1029	0	45
Future Volume (vph)	1561	66	0	1029	0	45
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)		25.0	0.0		0.0	0.0
Storage Lanes		0	0		0	1
Taper Length (m)			15.0		15.0	
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.994					0.865
Flt Protected						
Satd. Flow (prot)	3296	0	0	3316	0	1510
Flt Permitted						
Satd. Flow (perm)	3296	0	0	3316	0	1510
Link Speed (k/h)	60			60	50	
Link Distance (m)	109.9			309.2	208.6	
Travel Time (s)	6.6			18.6	15.0	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1561	66	0	1029	0	45
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1627	0	0	1029	0	45
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	3.0			3.0	3.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 57.8%	ICU Level of Service B
Analysis Period (min) 15	

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1561	66	0	1029	0	45
Future Vol, veh/h	1561	66	0	1029	0	45
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1561	66	0	1029	0	45

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	814
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	321
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	321
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	18
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	321	-	-	-
HCM Lane V/C Ratio	0.14	-	-	-
HCM Control Delay (s)	18	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	0.5	-	-	-

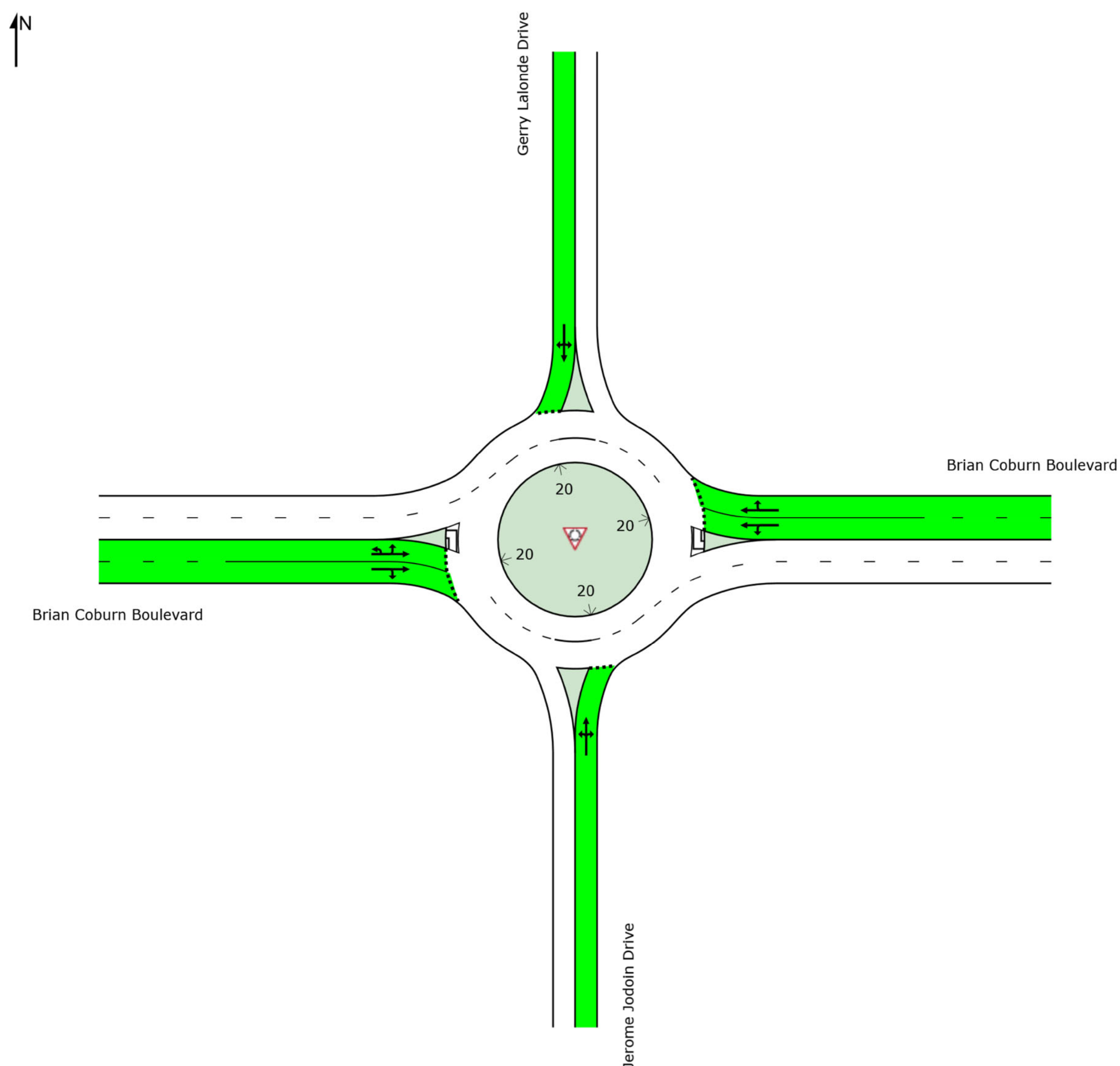
DEGREE OF SATURATION

Ratio of Demand Volume to Capacity, v/c ratio per lane

Site: 101 [Brian Coburn & Gerry Lalonde 2024 FT AM - Widened]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
Degree of Saturation	0.15	0.54	0.51	0.27	0.54



Colour code based on Degree of Saturation

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Organisation: CGH TRANSPORTATION | Processed: March 23, 2021 12:10:33 PM
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DELAY (CONTROL)

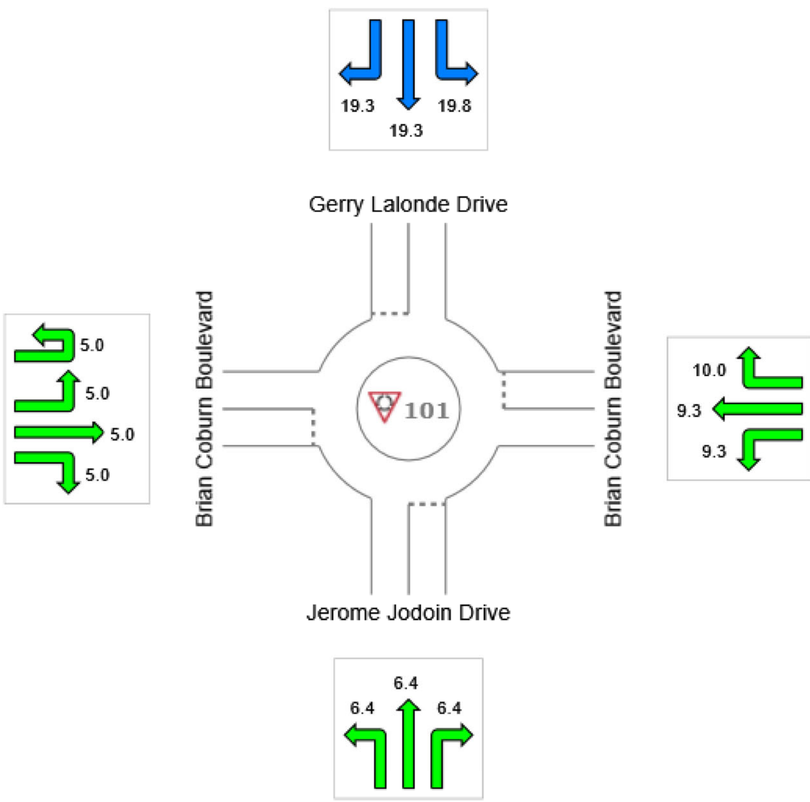
Average control delay per vehicle, or average pedestrian delay (seconds)

Site: 101 [Brian Coburn & Gerry Lalonde 2024 FT AM - Widened]

New Site
Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Delay (Control)	6.4	9.3	19.3	5.0	8.7
LOS	A	A	C	A	A



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

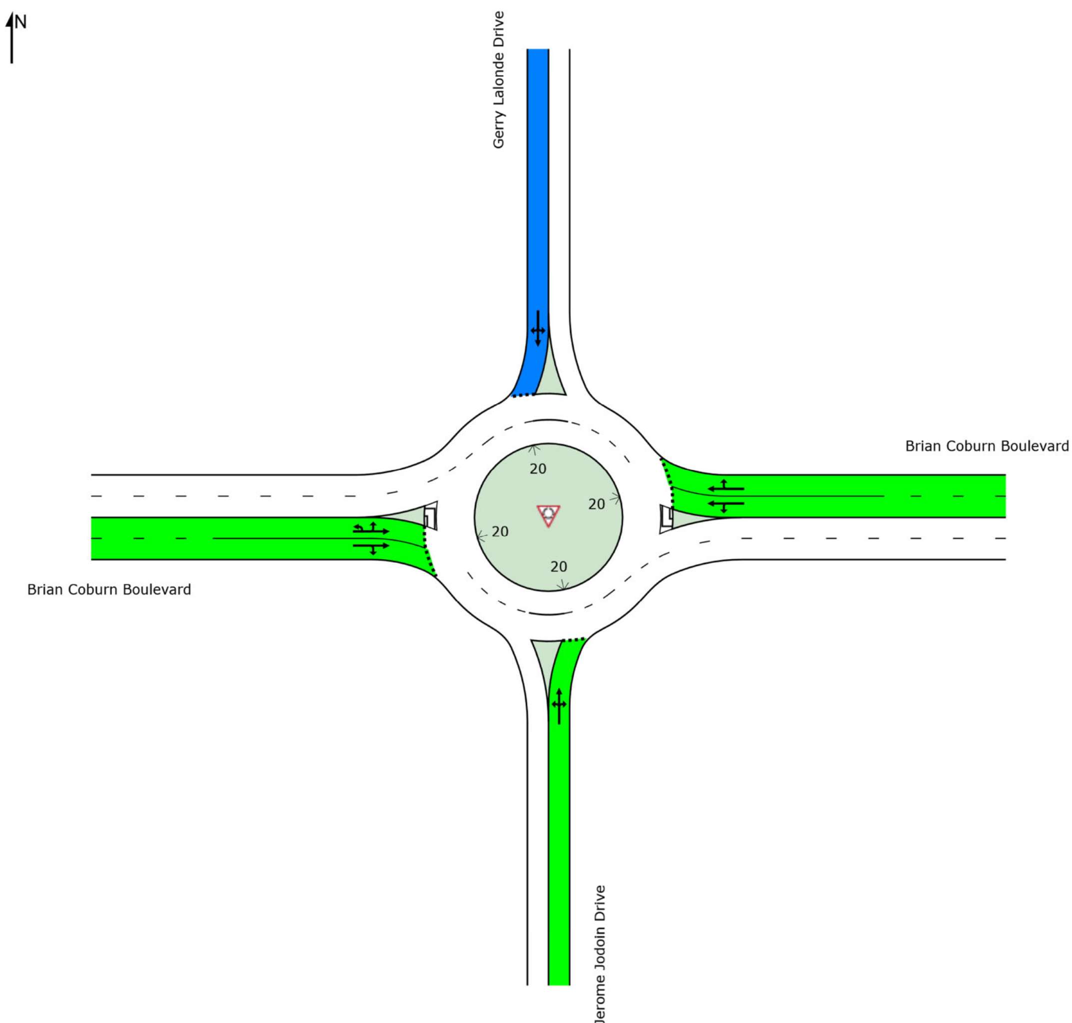
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [Brian Coburn & Gerry Lalonde 2024 FT AM - Widened]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	A	C	A	A



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

MOVEMENT SUMMARY

Site: 101 [Brian Coburn & Gerry Lalonde 2024 FT AM - Widened]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Jerome Jodoin Drive												
1	L2	105	2.0	0.154	6.4	LOS A	0.6	4.0	0.56	0.56	0.56	49.1
2	T1	1	2.0	0.154	6.4	LOS A	0.6	4.0	0.56	0.56	0.56	49.1
3	R2	11	2.0	0.154	6.4	LOS A	0.6	4.0	0.56	0.56	0.56	48.2
Approach		117	2.0	0.154	6.4	LOS A	0.6	4.0	0.56	0.56	0.56	49.0
East: Brian Coburn Boulevard												
4	L2	6	2.0	0.540	9.3	LOS A	3.6	25.8	0.50	0.35	0.50	49.6
5	T1	1248	2.0	0.540	9.3	LOS A	3.6	25.8	0.50	0.35	0.50	49.8
6	R2	15	46.0	0.540	10.0	LOS A	3.6	25.8	0.50	0.35	0.50	47.2
Approach		1269	2.5	0.540	9.3	LOS A	3.6	25.8	0.50	0.35	0.50	49.7
North: Gerry Lalonde Drive												
7	L2	8	14.0	0.506	19.8	LOS C	2.3	16.5	0.82	0.95	1.29	43.4
8	T1	1	2.0	0.506	19.3	LOS C	2.3	16.5	0.82	0.95	1.29	43.7
9	R2	206	2.0	0.506	19.3	LOS C	2.3	16.5	0.82	0.95	1.29	43.0
Approach		215	2.4	0.506	19.3	LOS C	2.3	16.5	0.82	0.95	1.29	43.0
West: Brian Coburn Boulevard												
10u	U	32	2.0	0.269	5.0	LOS A	1.3	9.8	0.09	0.02	0.09	52.8
10	L2	43	3.0	0.269	5.0	LOS A	1.3	9.8	0.09	0.02	0.09	51.8
11	T1	621	6.0	0.269	5.0	LOS A	1.3	9.8	0.09	0.02	0.09	52.3
12	R2	30	2.0	0.269	5.0	LOS A	1.3	9.8	0.09	0.02	0.09	51.3
Approach		726	5.5	0.269	5.0	LOS A	1.3	9.8	0.09	0.02	0.09	52.3
All Vehicles		2327	3.4	0.540	8.7	LOS A	3.6	25.8	0.41	0.31	0.45	49.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

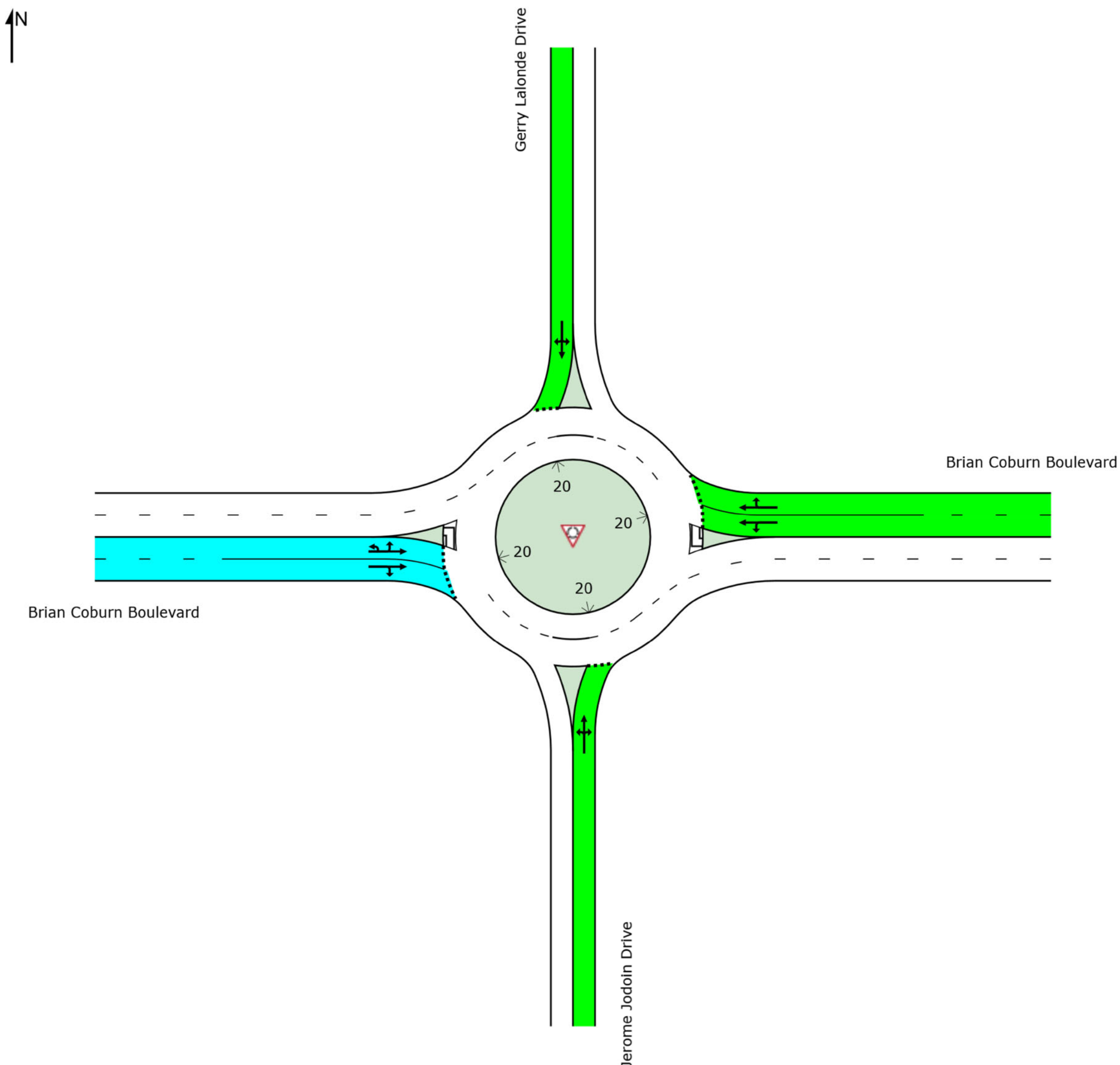
DEGREE OF SATURATION

Ratio of Demand Volume to Capacity, v/c ratio per lane

Site: 101 [Brian Coburn & Gerry Lalonde 2024 FT PM - Widened]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
Degree of Saturation	0.19	0.43	0.18	0.61	0.61



Colour code based on Degree of Saturation

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Organisation: CGH TRANSPORTATION | Processed: March 23, 2021 12:09:25 PM
Project: C:\Users\RobinMarinac\CGH TRANSPORTATION\CGH Working - Documents\Projects\2020-82 Caivan 2275 Mer Bleue\DATA\Sidra

DELAY (CONTROL)

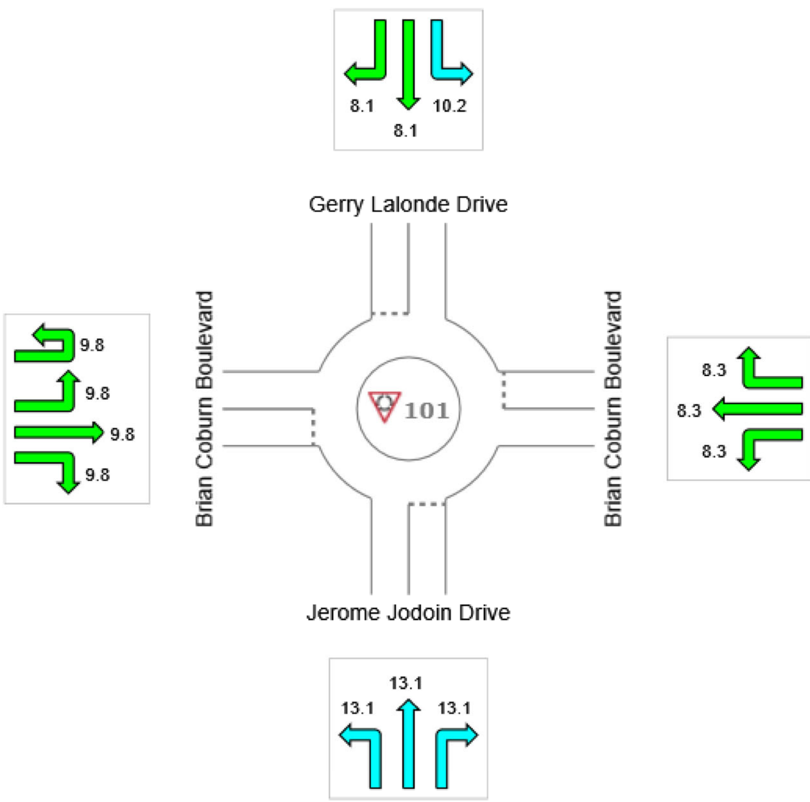
Average control delay per vehicle, or average pedestrian delay (seconds)

Site: 101 [Brian Coburn & Gerry Lalonde 2024 FT PM - Widened]

New Site
Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Delay (Control)	13.1	8.3	8.2	9.8	9.3
LOS	B	A	A	A	A



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

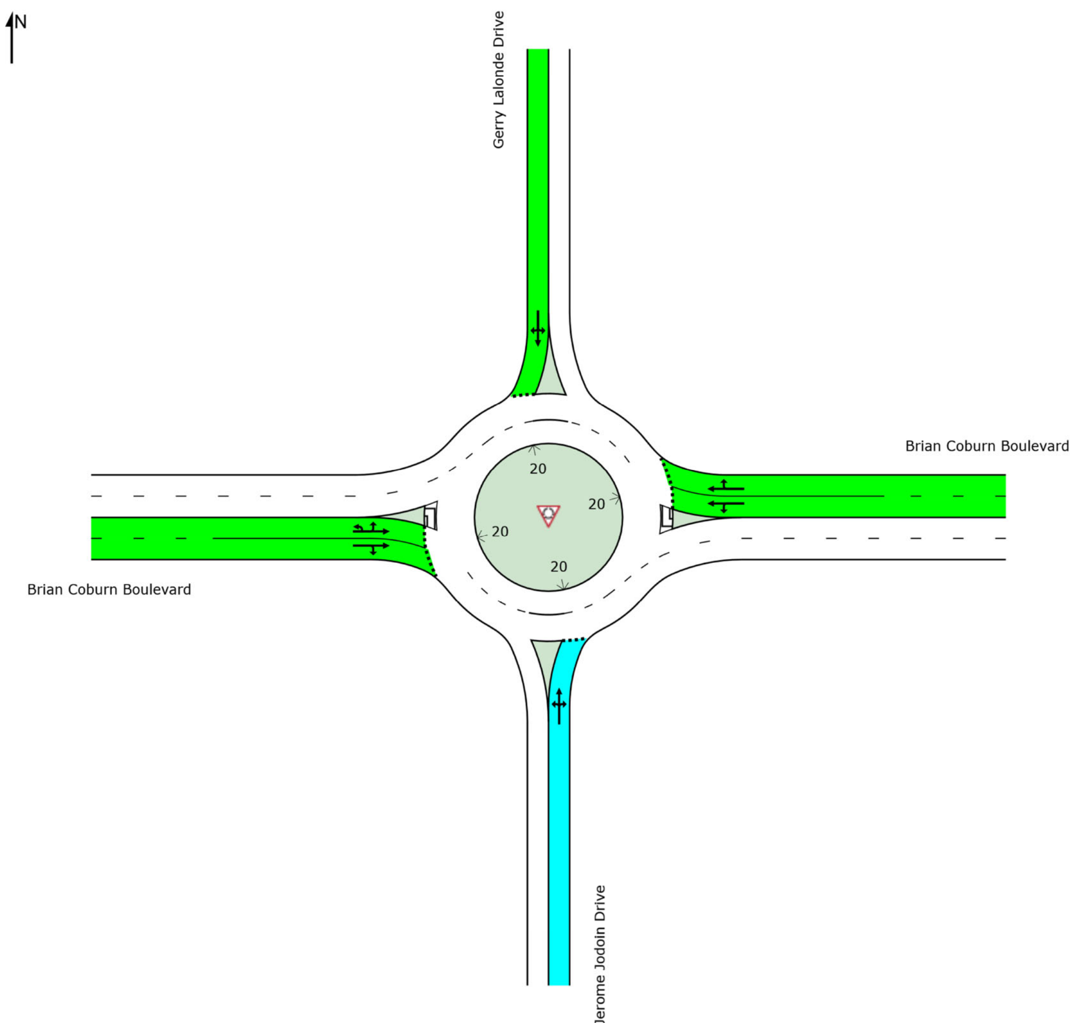
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [Brian Coburn & Gerry Lalonde 2024 FT PM - Widened]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	B	A	A	A	A



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

MOVEMENT SUMMARY

Site: 101 [Brian Coburn & Gerry Lalonde 2024 FT PM - Widened]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles													
Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Jerome Jodoin Drive												
1	L2	57	2.0	0.191	13.1	LOS B	0.6	4.4	0.78	0.78	0.78	45.4
2	T1	1	2.0	0.191	13.1	LOS B	0.6	4.4	0.78	0.78	0.78	45.4
3	R2	12	2.0	0.191	13.1	LOS B	0.6	4.4	0.78	0.78	0.78	44.6
Approach		70	2.0	0.191	13.1	LOS B	0.6	4.4	0.78	0.78	0.78	45.3
East: Brian Coburn Boulevard												
4	L2	20	2.0	0.435	8.3	LOS A	2.3	16.5	0.55	0.46	0.55	50.3
5	T1	868	2.0	0.435	8.3	LOS A	2.3	16.5	0.55	0.46	0.55	50.5
6	R2	13	2.0	0.435	8.3	LOS A	2.3	16.5	0.55	0.46	0.55	49.2
Approach		901	2.0	0.435	8.3	LOS A	2.3	16.5	0.55	0.46	0.55	50.5
North: Gerry Lalonde Drive												
7	L2	4	75.0	0.178	10.2	LOS B	0.6	4.5	0.62	0.62	0.62	48.1
8	T1	1	2.0	0.178	8.1	LOS A	0.6	4.5	0.62	0.62	0.62	50.6
9	R2	102	2.0	0.178	8.1	LOS A	0.6	4.5	0.62	0.62	0.62	49.5
Approach		107	4.7	0.178	8.2	LOS A	0.6	4.5	0.62	0.62	0.62	49.5
West: Brian Coburn Boulevard												
10u	U	28	2.0	0.610	9.8	LOS A	5.5	39.2	0.22	0.07	0.22	49.4
10	L2	236	2.0	0.610	9.8	LOS A	5.5	39.2	0.22	0.07	0.22	48.6
11	T1	1296	2.0	0.610	9.8	LOS A	5.5	39.2	0.22	0.07	0.22	49.1
12	R2	95	2.0	0.610	9.8	LOS A	5.5	39.2	0.22	0.07	0.22	48.3
Approach		1655	2.0	0.610	9.8	LOS A	5.5	39.2	0.22	0.07	0.22	49.0
All Vehicles		2733	2.1	0.610	9.3	LOS A	5.5	39.2	0.36	0.24	0.36	49.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

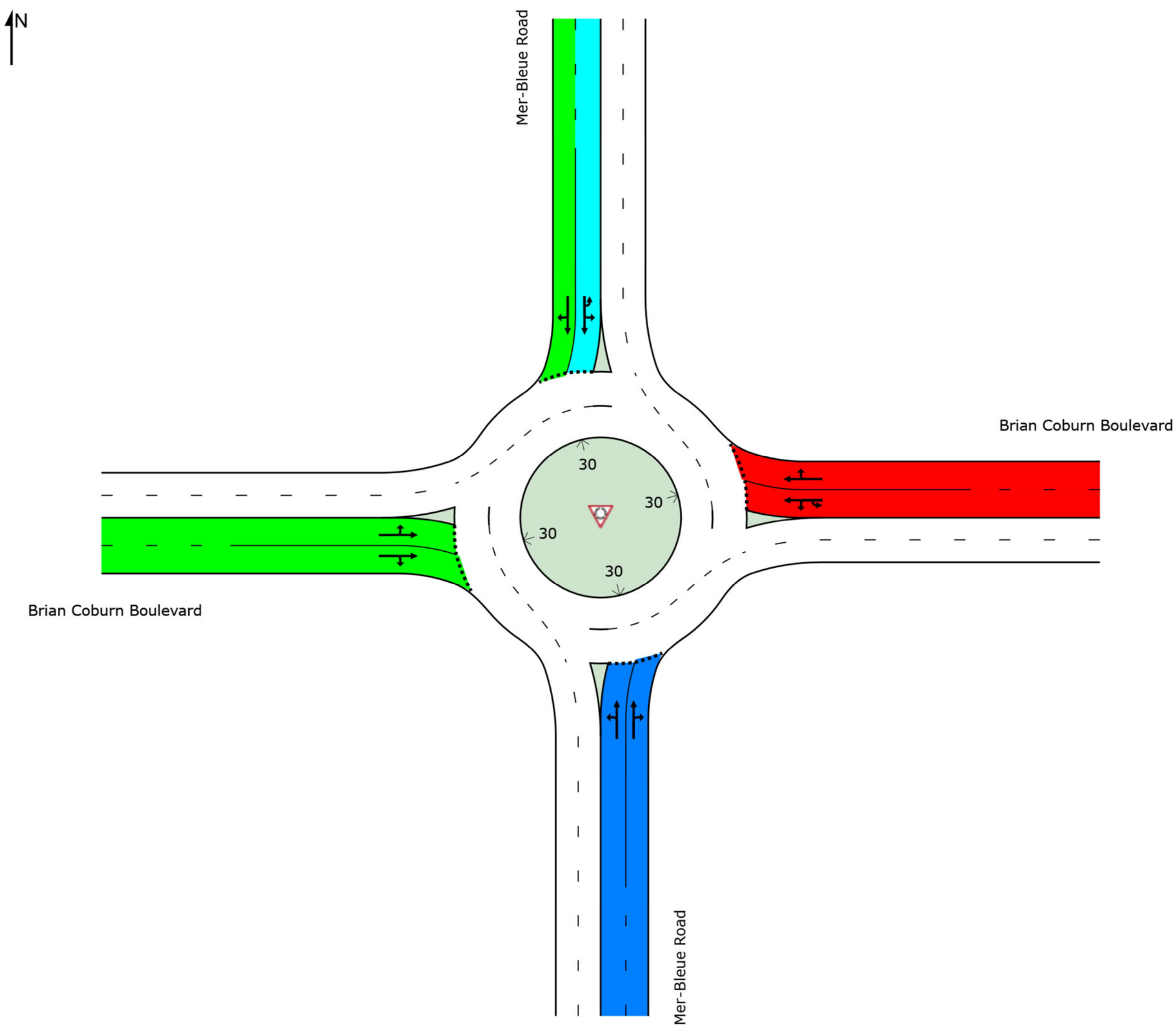
DEGREE OF SATURATION

Ratio of Demand Volume to Capacity, v/c ratio per lane

Site: 1 [Mer-Bleue & Brian Coburn 2024 FT AM - Widened]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
Degree of Saturation	0.73	1.49	0.66	0.31	1.49



Colour code based on Degree of Saturation

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

DELAY (CONTROL)

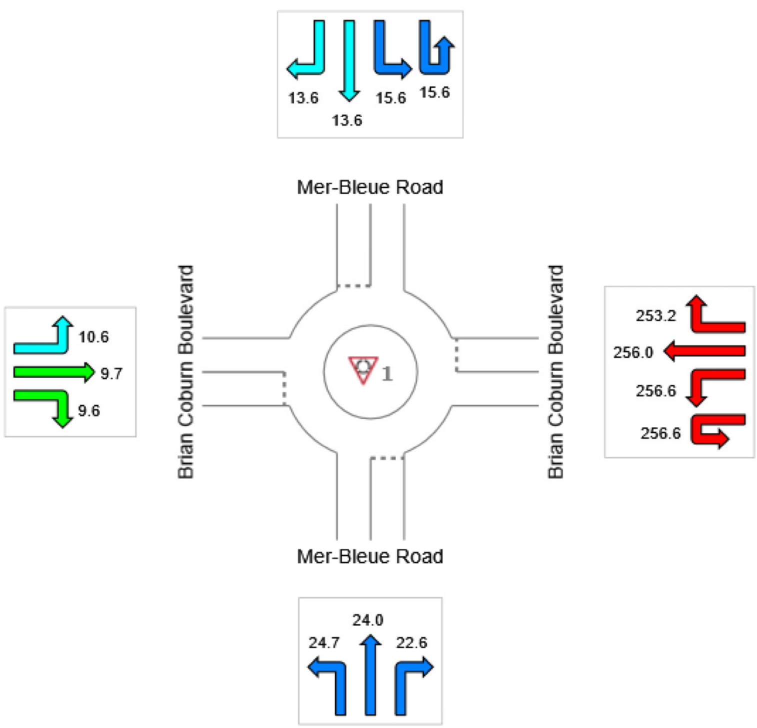
Average control delay per vehicle, or average pedestrian delay (seconds)

Site: 1 [Mer-Bleue & Brian Coburn 2024 FT AM - Widened]

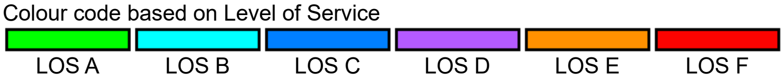
Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Delay (Control)	23.6	254.8	14.7	10.0	111.3
LOS	C	F	B	B	F



Colour code based on Level of Service



Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

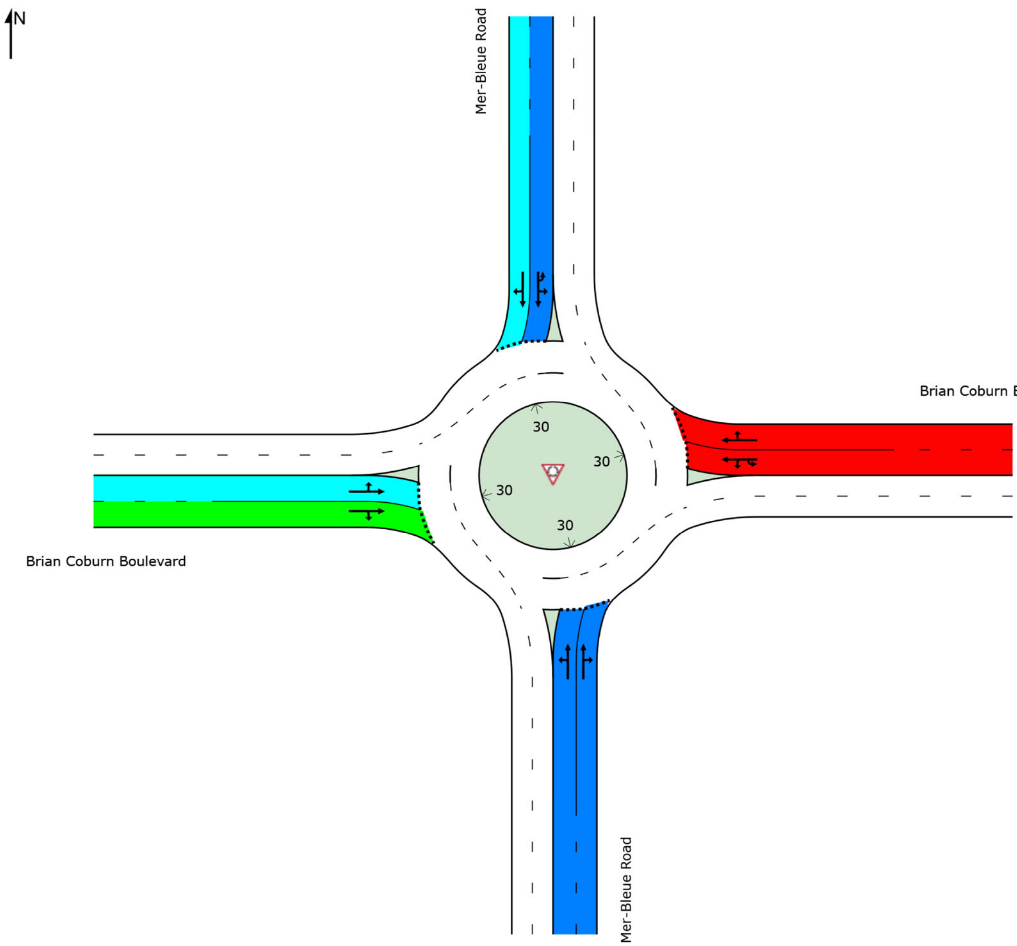
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 1 [Mer-Bleue & Brian Coburn 2024 FT AM - Widened]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	C	F	B	B	F



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

MOVEMENT SUMMARY

Site: 1 [Mer-Bleue & Brian Coburn 2024 FT AM - Widened]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Mer-Bleue Road												
1	L2	48	2.0	0.730	24.7	LOS C	6.2	44.2	0.85	1.15	1.82	41.0
2	T1	564	2.0	0.730	24.0	LOS C	6.5	45.9	0.85	1.15	1.82	41.1
3	R2	292	2.0	0.730	22.6	LOS C	6.5	45.9	0.84	1.15	1.81	34.8
Approach		904	2.0	0.730	23.6	LOS C	6.5	45.9	0.84	1.15	1.81	39.4
East: Brian Coburn Boulevard												
4u	U	4	2.0	1.494	256.6	LOS F	82.5	587.6	1.00	4.52	13.28	5.1
4	L2	108	2.0	1.494	256.6	LOS F	82.5	587.6	1.00	4.52	13.28	7.7
5	T1	686	2.0	1.494	256.0	LOS F	93.1	662.8	1.00	4.58	13.45	8.7
6	R2	688	2.0	1.494	253.2	LOS F	93.1	662.8	1.00	4.91	14.44	8.5
Approach		1486	2.0	1.494	254.8	LOS F	93.1	662.8	1.00	4.73	13.90	8.5
North: Mer-Bleue Road												
7u	U	370	2.0	0.663	15.6	LOS C	6.5	46.1	0.78	1.02	1.44	44.9
7	L2	189	2.0	0.663	15.6	LOS C	6.5	46.1	0.78	1.02	1.44	39.5
8	T1	279	2.0	0.571	13.6	LOS B	4.3	30.9	0.73	0.89	1.18	47.3
9	R2	160	2.0	0.571	13.6	LOS B	4.3	30.9	0.73	0.89	1.18	46.9
Approach		998	2.0	0.663	14.7	LOS B	6.5	46.1	0.76	0.96	1.33	44.9
West: Brian Coburn Boulevard												
10	L2	155	2.0	0.305	10.6	LOS B	1.2	8.7	0.67	0.69	0.74	47.6
11	T1	174	2.0	0.305	9.7	LOS A	1.2	8.7	0.66	0.68	0.72	47.0
12	R2	41	2.0	0.305	9.6	LOS A	1.2	8.6	0.65	0.67	0.71	48.4
Approach		370	2.0	0.305	10.0	LOS B	1.2	8.7	0.66	0.68	0.73	47.5
All Vehicles		3758	2.0	1.494	111.3	LOS F	93.1	662.8	0.86	2.47	6.36	18.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

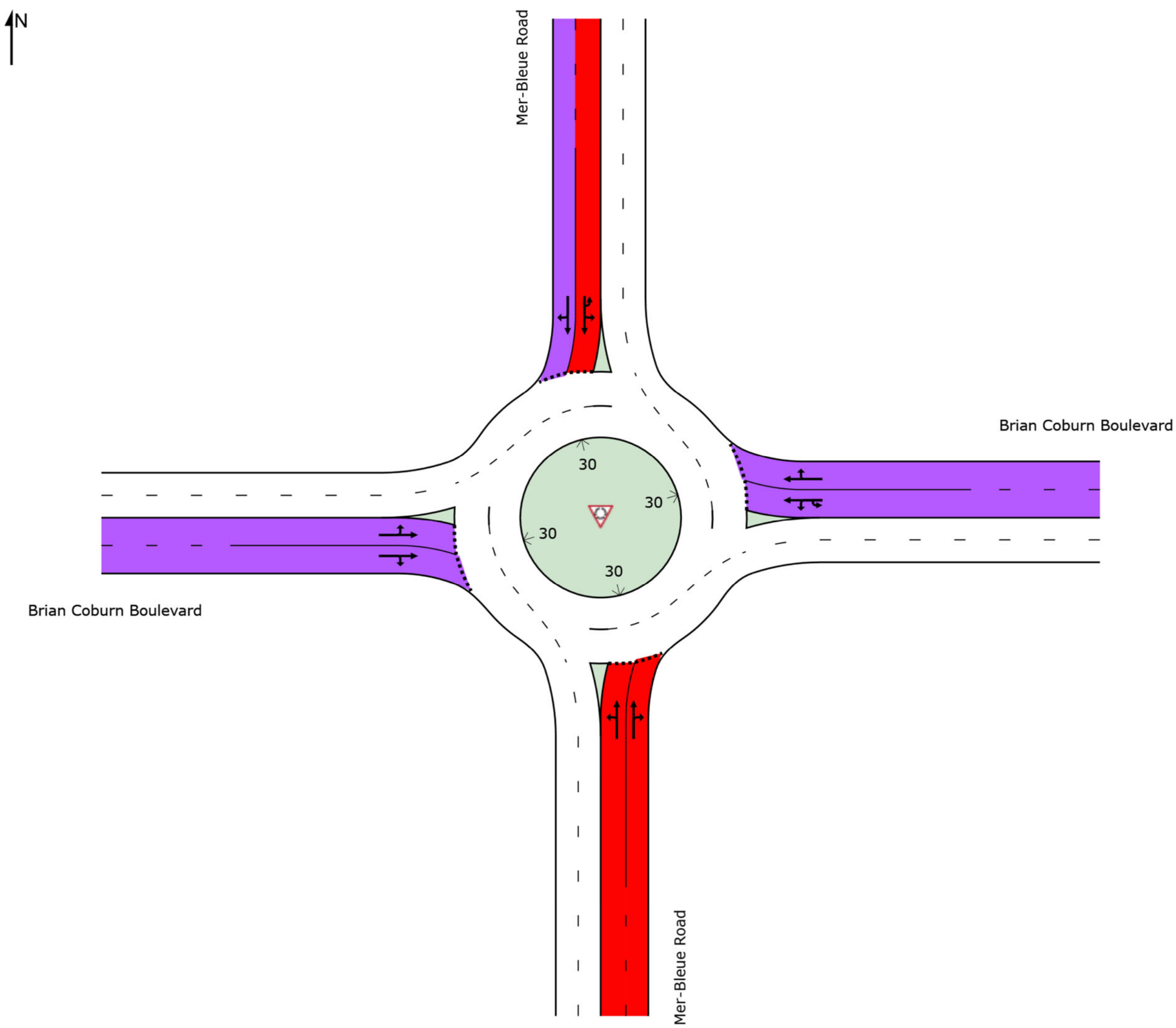
DEGREE OF SATURATION

Ratio of Demand Volume to Capacity, v/c ratio per lane

Site: 1 [Mer-Bleue & Brian Coburn 2024 FT PM - Widened]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
Degree of Saturation	1.27	0.82	1.37	0.88	1.37



Colour code based on Degree of Saturation

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

Organisation: CGH TRANSPORTATION | Processed: March 23, 2021 12:03:07 PM
Project: C:\Users\RobinMarinac\CGH TRANSPORTATION\CGH Working - Documents\Projects\2020-82 Caivan 2275 Mer Bleue\DATA\Sidra

DELAY (CONTROL)

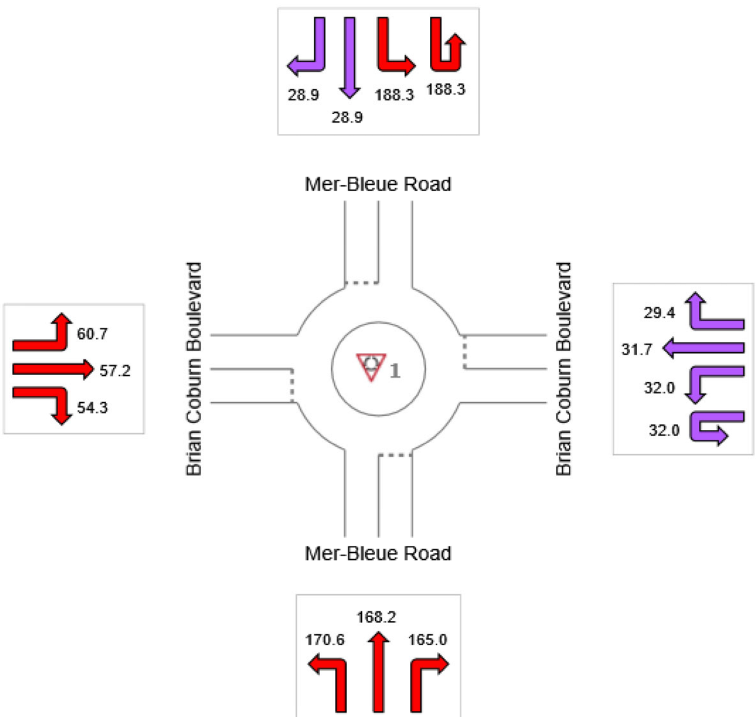
Average control delay per vehicle, or average pedestrian delay (seconds)

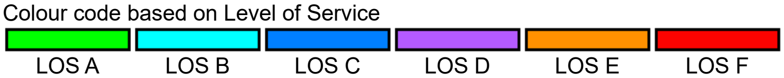
Site: 1 [Mer-Bleue & Brian Coburn 2024 FT PM - Widened]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Delay (Control)	167.6	30.6	130.5	57.2	106.2
LOS	F	D	F	F	F





Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

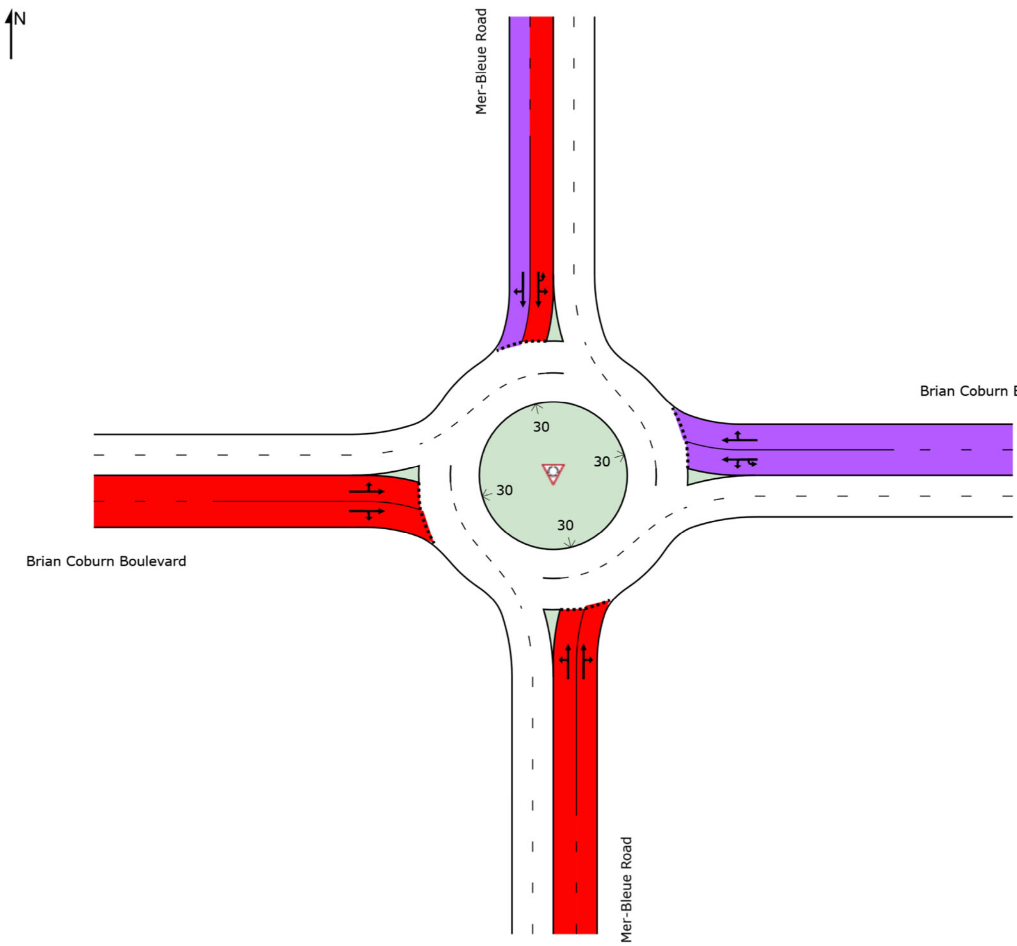
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 1 [Mer-Bleue & Brian Coburn 2024 FT PM - Widened]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	F	D	F	F	F



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

MOVEMENT SUMMARY

Site: 1 [Mer-Bleue & Brian Coburn 2024 FT PM - Widened]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Mer-Bleue Road												
1	L2	69	2.0	1.265	170.6	LOS F	39.0	277.3	1.00	3.09	8.75	14.9
2	T1	678	2.0	1.265	168.2	LOS F	44.3	315.5	1.00	3.20	9.10	15.0
3	R2	242	2.0	1.265	165.0	LOS F	44.3	315.5	1.00	3.35	9.58	10.7
Approach		989	2.0	1.265	167.6	LOS F	44.3	315.5	1.00	3.23	9.20	14.0
East: Brian Coburn Boulevard												
4u	U	13	2.0	0.817	32.0	LOS D	8.7	61.9	0.90	1.33	2.28	22.3
4	L2	209	2.0	0.817	32.0	LOS D	8.7	61.9	0.90	1.33	2.28	31.0
5	T1	288	2.0	0.817	31.7	LOS D	9.1	65.0	0.90	1.33	2.29	33.2
6	R2	500	2.0	0.817	29.4	LOS D	9.1	65.0	0.90	1.34	2.29	33.4
Approach		1010	2.0	0.817	30.6	LOS D	9.1	65.0	0.90	1.33	2.29	32.8
North: Mer-Bleue Road												
7u	U	339	2.0	1.366	188.3	LOS F	120.7	859.6	1.00	4.94	11.69	15.1
7	L2	838	2.0	1.366	188.3	LOS F	120.7	859.6	1.00	4.94	11.69	11.4
8	T1	471	2.0	0.851	28.9	LOS D	14.9	105.9	0.96	1.52	2.50	38.9
9	R2	199	2.0	0.851	28.9	LOS D	14.9	105.9	0.96	1.52	2.50	39.3
Approach		1847	2.0	1.366	130.5	LOS F	120.7	859.6	0.99	3.70	8.36	17.0
West: Brian Coburn Boulevard												
10	L2	61	2.0	0.875	60.7	LOS F	6.7	47.5	0.96	1.43	2.75	30.0
11	T1	464	2.0	0.875	57.2	LOS F	7.1	50.5	0.96	1.43	2.77	25.4
12	R2	70	2.0	0.875	54.3	LOS F	7.1	50.5	0.95	1.44	2.79	29.6
Approach		595	2.0	0.875	57.2	LOS F	7.1	50.5	0.96	1.43	2.77	26.5
All Vehicles		4441	2.0	1.366	106.2	LOS F	120.7	859.6	0.97	2.75	6.41	18.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Appendix O

2029 Future Background Synchro and Sidra Worksheets

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	169	174	30	109	712	759	28	585	295	63	209	328
Future Volume (vph)	169	174	30	109	712	759	28	585	295	63	209	328
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Frt		0.988			0.928			0.951				0.964
Flt Protected		0.978			0.997			0.998				0.983
Satd. Flow (prot)	0	3204	0	0	3068	0	0	3147	0	0	0	3142
Flt Permitted		0.978			0.997			0.998				0.983
Satd. Flow (perm)	0	3204	0	0	3068	0	0	3147	0	0	0	3142
Link Speed (k/h)		70			60			60				60
Link Distance (m)		647.3			419.1			463.6				481.8
Travel Time (s)		33.3			25.1			27.8				28.9
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	169	174	30	109	712	759	28	585	295	63	209	328
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	373	0	0	1580	0	0	908	0	0	0	789
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	R NA	Left	Left
Median Width(m)		0.0			0.0			3.5				3.5
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		3.0			3.0			3.0				3.0
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	25		15	25		15	25		15	15	25	
Sign Control		Yield			Yield			Yield				Yield

Intersection Summary

Area Type: Other

Control Type: Roundabout

Intersection Capacity Utilization 126.7% ICU Level of Service H

Analysis Period (min) 15

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	189
Future Volume (vph)	189
Ideal Flow (vphpl)	1800
Lane Util. Factor	0.95
Frt	
Flt Protected	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Peak Hour Factor	1.00
Adj. Flow (vph)	189
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	1.09
Turning Speed (k/h)	15
Sign Control	

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	640	30	6	1363	17	105	0	11	8	0	225
Future Volume (vph)	47	640	30	6	1363	17	105	0	11	8	0	225
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	105.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	45.0			15.0			15.0			15.0		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.994			0.998			0.987			0.870	
Flt Protected		0.997						0.957			0.998	
Satd. Flow (prot)	0	3173	0	0	3292	0	0	1648	0	0	1523	0
Flt Permitted		0.997						0.957			0.998	
Satd. Flow (perm)	0	3173	0	0	3292	0	0	1648	0	0	1523	0
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		419.1			443.7			148.0			244.6	
Travel Time (s)		25.1			26.6			10.7			17.6	
Confl. Peds. (#/hr)	7											
Confl. Bikes (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	6%	2%	2%	2%	46%	2%	2%	2%	14%	2%	1%
Adj. Flow (vph)	47	640	30	6	1363	17	105	0	11	8	0	225
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	717	0	0	1386	0	0	116	0	0	233	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		3.0			3.0			3.0			3.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary

Area Type: Other

Control Type: Roundabout

Intersection Capacity Utilization 89.5% ICU Level of Service E

Analysis Period (min) 15

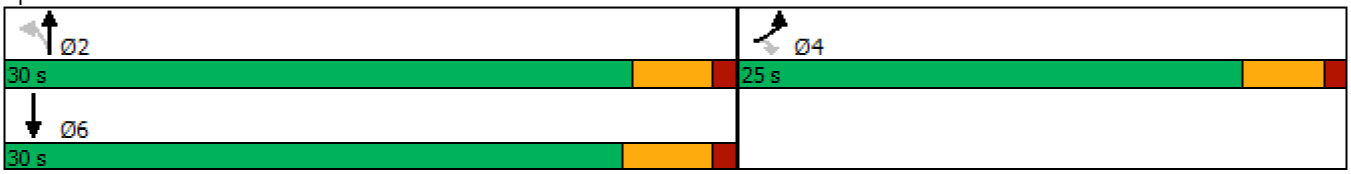
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	211	55	125	435	229	290
Future Volume (vph)	211	55	125	435	229	290
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	95.0	0.0	30.0			0.0
Storage Lanes	1	1	1			0
Taper Length (m)	15.0		75.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.925	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1496	1293	1566	1664	1502	0
Flt Permitted	0.950		0.403			
Satd. Flow (perm)	1496	1293	664	1664	1502	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		55			154	
Link Speed (k/h)	50			50	60	
Link Distance (m)	691.8			356.1	136.7	
Travel Time (s)	49.8			25.6	8.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	13%	17%	8%	7%	13%	7%
Adj. Flow (vph)	211	55	125	435	229	290
Shared Lane Traffic (%)						
Lane Group Flow (vph)	211	55	125	435	519	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	3.0			3.0	3.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	25	15	25			15
Number of Detectors	1	1	1	2	2	
Detector Template	Left	Right	Left	Thru	Thru	
Leading Detector (m)	2.0	2.0	2.0	10.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	2.0	2.0	0.6	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	6	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		4	2			
Detector Phase	4	4	2	2	6	
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	25.0	25.0	24.0	24.0	25.2	
Total Split (s)	25.0	25.0	30.0	30.0	30.0	
Total Split (%)	45.5%	45.5%	54.5%	54.5%	54.5%	
Maximum Green (s)	20.7	20.7	25.7	25.7	25.3	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.3	4.3	4.3	4.3	4.7	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	Min	Min	Min	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	13.5	13.5	12.5	12.5	13.5	
Pedestrian Calls (#/hr)	0	0	0	0	0	
Act Effct Green (s)	12.1	12.1	20.5	20.5	20.2	
Actuated g/C Ratio	0.33	0.33	0.55	0.55	0.55	
v/c Ratio	0.43	0.12	0.34	0.47	0.58	
Control Delay	14.4	4.9	10.9	9.7	9.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	14.4	4.9	10.9	9.7	9.2	
LOS	B	A	B	A	A	
Approach Delay	12.4			10.0	9.2	
Approach LOS	B			A	A	
Queue Length 50th (m)	8.8	0.0	4.2	15.9	13.5	
Queue Length 95th (m)	29.4	5.5	16.9	44.7	46.9	
Internal Link Dist (m)	667.8			332.1	112.7	
Turn Bay Length (m)	95.0		30.0			
Base Capacity (vph)	875	779	482	1209	1118	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.24	0.07	0.26	0.36	0.46	

Intersection Summary

Area Type: Other
Cycle Length: 55
Actuated Cycle Length: 37
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.58
Intersection Signal Delay: 10.2 — Intersection LOS: B
Intersection Capacity Utilization 63.2% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: Mer-Bleue Road & Renaud Road



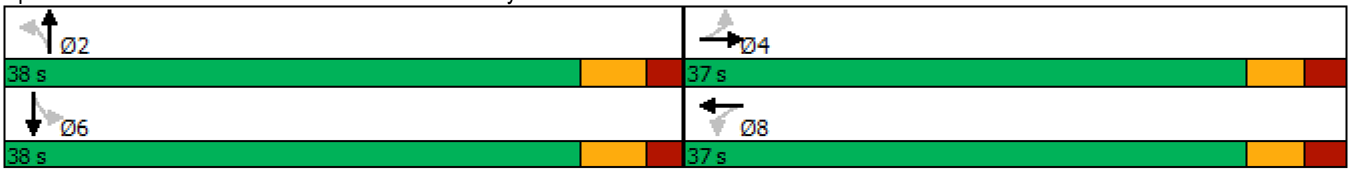
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	86	61	10	32	64	90	2	721	13	23	450	22
Future Volume (vph)	86	61	10	32	64	90	2	721	13	23	450	22
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	30.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	15.0			15.0			75.0			75.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.979			0.912			0.997			0.993	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1658	1708	0	1658	1592	0	1658	3154	0	1658	2986	0
Flt Permitted	0.659			0.711			0.482			0.373		
Satd. Flow (perm)	1150	1708	0	1241	1592	0	841	3154	0	651	2986	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			90			3			8	
Link Speed (k/h)		50			50			60			60	
Link Distance (m)		221.2			188.0			167.0			463.6	
Travel Time (s)		15.9			13.5			10.0			27.8	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	7%	2%	2%	13%	2%
Adj. Flow (vph)	86	61	10	32	64	90	2	721	13	23	450	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	86	71	0	32	154	0	2	734	0	23	472	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		3.0			3.0			3.0			3.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	36.1	36.1		36.1	36.1		35.9	35.9		35.9	35.9	
Total Split (s)	37.0	37.0		37.0	37.0		38.0	38.0		38.0	38.0	
Total Split (%)	49.3%	49.3%		49.3%	49.3%		50.7%	50.7%		50.7%	50.7%	
Maximum Green (s)	31.3	31.3		31.3	31.3		32.1	32.1		32.1	32.1	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.7	3.7		3.7	3.7	
All-Red Time (s)	2.4	2.4		2.4	2.4		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.7	5.7		5.7	5.7		5.9	5.9		5.9	5.9	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	23.0	23.0		23.0	23.0		10.5	10.5		10.5	10.5	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	10.6	10.6		10.6	10.6		18.7	18.7		18.7	18.7	
Actuated g/C Ratio	0.29	0.29		0.29	0.29		0.52	0.52		0.52	0.52	
v/c Ratio	0.26	0.14		0.09	0.29		0.00	0.45		0.07	0.30	
Control Delay	13.4	10.4		11.5	7.5		6.5	8.9		7.6	7.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	13.4	10.4		11.5	7.5		6.5	8.9		7.6	7.8	
LOS	B	B		B	A		A	A		A	A	
Approach Delay		12.1			8.2			8.9			7.8	
Approach LOS		B			A			A			A	
Queue Length 50th (m)	3.8	2.6		1.3	2.7		0.1	16.5		0.8	9.5	
Queue Length 95th (m)	13.1	9.9		6.1	13.3		0.8	30.5		3.8	18.7	
Internal Link Dist (m)		197.2			164.0			143.0			439.6	
Turn Bay Length (m)	30.0			30.0			30.0			35.0		
Base Capacity (vph)	1045	1553		1128	1455		753	2825		583	2675	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.08	0.05		0.03	0.11		0.00	0.26		0.04	0.18	

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 36
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.45
Intersection Signal Delay: 8.8 Intersection LOS: A
Intersection Capacity Utilization 53.6% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 5: Mer-Bleue Road & Axis Way/Decoeur Drive



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	68	460	52	208	282	557	54	739	248	57	915	506
Future Volume (vph)	68	460	52	208	282	557	54	739	248	57	915	506
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Frt		0.987			0.920			0.964				0.980
Flt Protected		0.994			0.990			0.997				0.972
Satd. Flow (prot)	0	3253	0	0	3020	0	0	3187	0	0	0	3158
Flt Permitted		0.994			0.990			0.997				0.972
Satd. Flow (perm)	0	3253	0	0	3020	0	0	3187	0	0	0	3158
Link Speed (k/h)		70			60			60				60
Link Distance (m)		647.3			419.1			458.1				481.8
Travel Time (s)		33.3			25.1			27.5				28.9
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	68	460	52	208	282	557	54	739	248	57	915	506
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	580	0	0	1047	0	0	1041	0	0	0	1700
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	R NA	Left	Left
Median Width(m)		0.0			0.0			3.5				3.5
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		3.0			3.0			3.0				3.0
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	25		15	25		15	25		15	15	25	
Sign Control		Yield			Yield			Yield				Yield

Intersection Summary	
Area Type: Other	
Control Type: Roundabout	
Intersection Capacity Utilization 149.2%	ICU Level of Service H
Analysis Period (min) 15	

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	222
Future Volume (vph)	222
Ideal Flow (vphpl)	1800
Lane Util. Factor	0.95
Frt	
Flt Protected	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Peak Hour Factor	1.00
Adj. Flow (vph)	222
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	1.09
Turning Speed (k/h)	15
Sign Control	

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	258	1401	95	20	927	14	57	0	12	5	0	111
Future Volume (vph)	258	1401	95	20	927	14	57	0	12	5	0	111
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	105.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	45.0			15.0			15.0			15.0		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.992			0.998			0.977			0.871	
Flt Protected		0.993			0.999			0.960			0.998	
Satd. Flow (prot)	0	3266	0	0	3306	0	0	1637	0	0	1472	0
Flt Permitted		0.993			0.999			0.960			0.998	
Satd. Flow (perm)	0	3266	0	0	3306	0	0	1637	0	0	1472	0
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		419.1			443.7			213.2			244.6	
Travel Time (s)		25.1			26.6			15.4			17.6	
Confl. Peds. (#/hr)	5											
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	75%	2%	2%
Adj. Flow (vph)	258	1401	95	20	927	14	57	0	12	5	0	111
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1754	0	0	961	0	0	69	0	0	116	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		3.0			3.0			3.0			3.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary

Area Type: Other

Control Type: Roundabout

Intersection Capacity Utilization 100.9% ICU Level of Service G

Analysis Period (min) 15

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	457	90	76	395	489	143
Future Volume (vph)	457	90	76	395	489	143
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	95.0	0.0	30.0			0.0
Storage Lanes	1	1	1			0
Taper Length (m)	15.0		75.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.969	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1658	1339	1610	1745	1678	0
Flt Permitted	0.950		0.243			
Satd. Flow (perm)	1658	1339	412	1745	1678	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		90			34	
Link Speed (k/h)	50			50	60	
Link Distance (m)	691.8			356.1	129.9	
Travel Time (s)	49.8			25.6	7.8	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	13%	5%	2%	3%	2%
Adj. Flow (vph)	457	90	76	395	489	143
Shared Lane Traffic (%)						
Lane Group Flow (vph)	457	90	76	395	632	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	3.0			3.0	3.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	25	15	25			15
Number of Detectors	1	1	1	2	2	
Detector Template	Left	Right	Left	Thru	Thru	
Leading Detector (m)	2.0	2.0	2.0	10.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	2.0	2.0	0.6	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	6	

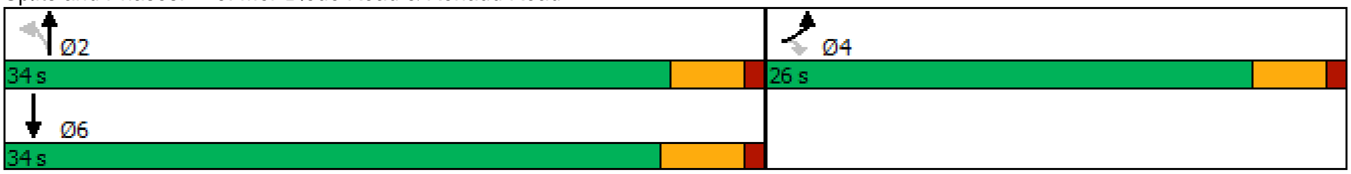
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		4	2			
Detector Phase	4	4	2	2	6	
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	24.8	24.8	23.8	23.8	25.2	
Total Split (s)	26.0	26.0	34.0	34.0	34.0	
Total Split (%)	43.3%	43.3%	56.7%	56.7%	56.7%	
Maximum Green (s)	21.7	21.7	29.7	29.7	29.3	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.3	4.3	4.3	4.3	4.7	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	Min	Min	Min	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	13.5	13.5	12.5	12.5	13.5	
Pedestrian Calls (#/hr)	0	0	0	0	0	
Act Effct Green (s)	17.9	17.9	23.0	23.0	22.6	
Actuated g/C Ratio	0.36	0.36	0.46	0.46	0.45	
v/c Ratio	0.77	0.17	0.40	0.49	0.81	
Control Delay	26.5	4.5	17.1	12.1	21.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	26.5	4.5	17.1	12.1	21.7	
LOS	C	A	B	B	C	
Approach Delay	22.9			12.9	21.7	
Approach LOS	C			B	C	
Queue Length 50th (m)	37.4	0.0	4.5	24.7	46.5	
Queue Length 95th (m)	#84.3	7.4	14.6	45.0	#92.4	
Internal Link Dist (m)	667.8			332.1	105.9	
Turn Bay Length (m)	95.0		30.0			
Base Capacity (vph)	760	663	258	1095	1052	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.60	0.14	0.29	0.36	0.60	

Intersection Summary	
Area Type: Other	
Cycle Length: 60	
Actuated Cycle Length: 50	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 19.6	Intersection LOS: B
Intersection Capacity Utilization 82.5%	ICU Level of Service E
Analysis Period (min) 15	

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 3: Mer-Bleue Road & Renaud Road

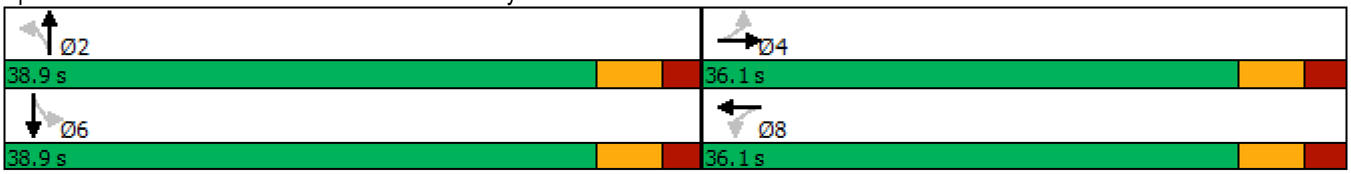


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	88	5	14	85	52	10	883	21	90	703	87
Future Volume (vph)	47	88	5	14	85	52	10	883	21	90	703	87
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	30.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	15.0			15.0			75.0			75.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.992			0.943			0.997			0.983	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1658	1731	0	1658	1646	0	1658	3155	0	1658	2974	0
Flt Permitted	0.669			0.697			0.351			0.296		
Satd. Flow (perm)	1167	1731	0	1216	1646	0	613	3155	0	517	2974	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			49			4			23	
Link Speed (k/h)		50			50			60			60	
Link Distance (m)		269.4			286.1			179.4			458.1	
Travel Time (s)		19.4			20.6			10.8			27.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	7%	2%	2%	13%	2%
Adj. Flow (vph)	47	88	5	14	85	52	10	883	21	90	703	87
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	93	0	14	137	0	10	904	0	90	790	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		3.0			3.0			3.0			3.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	36.1	36.1		36.1	36.1		35.9	35.9		35.9	35.9	
Total Split (s)	36.1	36.1		36.1	36.1		38.9	38.9		38.9	38.9	
Total Split (%)	48.1%	48.1%		48.1%	48.1%		51.9%	51.9%		51.9%	51.9%	
Maximum Green (s)	30.0	30.0		30.0	30.0		33.0	33.0		33.0	33.0	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.7	3.7		3.7	3.7	
All-Red Time (s)	2.4	2.4		2.4	2.4		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1		5.9	5.9		5.9	5.9	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	23.0	23.0		23.0	23.0		10.5	10.5		10.5	10.5	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	10.6	10.6		10.6	10.6		22.7	22.7		22.7	22.7	
Actuated g/C Ratio	0.26	0.26		0.26	0.26		0.57	0.57		0.57	0.57	
v/c Ratio	0.15	0.20		0.04	0.29		0.03	0.50		0.31	0.47	
Control Delay	15.5	14.7		14.6	12.0		6.1	8.7		10.8	8.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	15.5	14.7		14.6	12.0		6.1	8.7		10.8	8.2	
LOS	B	B		B	B		A	A		B	A	
Approach Delay		15.0			12.3			8.7			8.5	
Approach LOS		B			B			A			A	
Queue Length 50th (m)	2.3	4.4		0.7	4.4		0.3	22.3		3.7	18.4	
Queue Length 95th (m)	10.5	16.5		4.6	18.5		2.0	37.4		12.0	31.6	
Internal Link Dist (m)		245.4			262.1			155.4			434.1	
Turn Bay Length (m)	30.0			30.0			30.0			35.0		
Base Capacity (vph)	903	1341		941	1285		513	2645		433	2496	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.05	0.07		0.01	0.11		0.02	0.34		0.21	0.32	

Intersection Summary	
Area Type: Other	
Cycle Length: 75	
Actuated Cycle Length: 40	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.50	
Intersection Signal Delay: 9.3	Intersection LOS: A
Intersection Capacity Utilization 71.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 5: Mer-Bleue Road & Axis Way/Decoeur Drive



DEGREE OF SATURATION

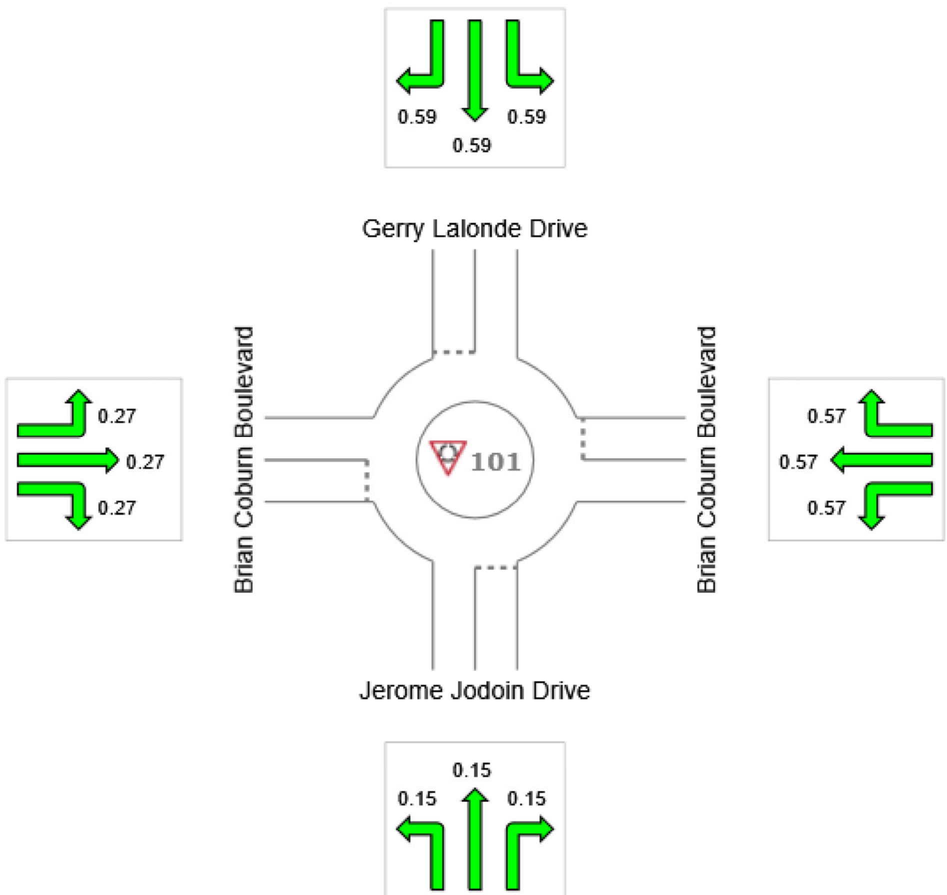
Ratio of Demand Volume to Capacity, v/c ratio per movement

Site: 101 [Brian Coburn & Gerry Lalonde 2029 FB AM - Widened]

New Site
Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Degree of Saturation	0.15	0.57	0.59	0.27	0.59



Colour code based on Degree of Saturation

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

DELAY (CONTROL)

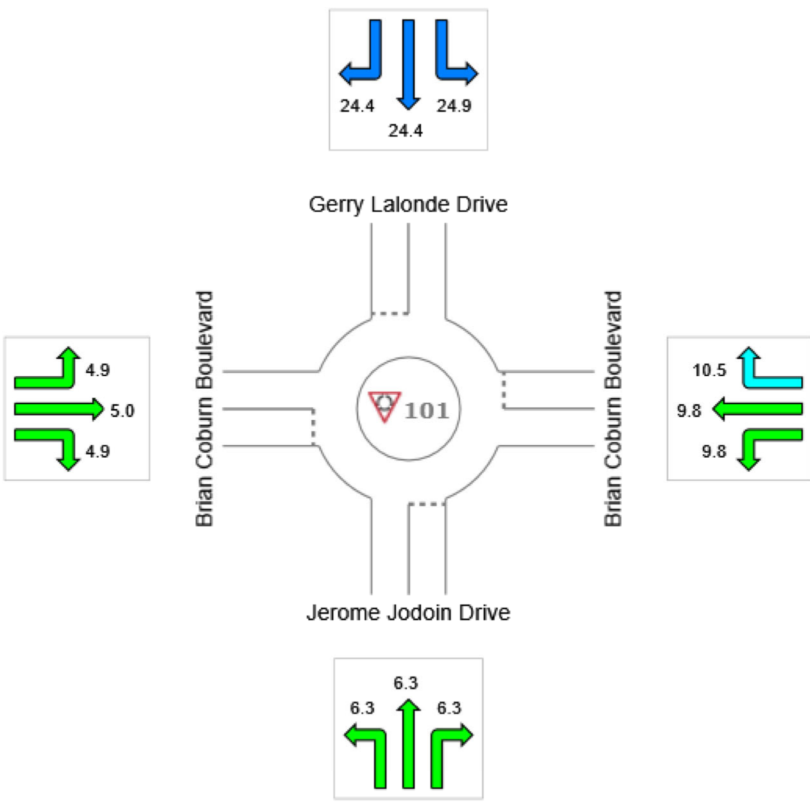
Average control delay per vehicle, or average pedestrian delay (seconds)

Site: 101 [Brian Coburn & Gerry Lalonde 2029 FB AM - Widened]

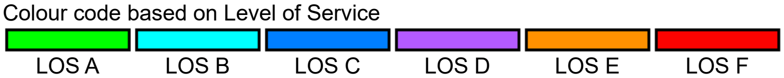
New Site
Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Delay (Control)	6.3	9.8	24.4	5.0	9.6
LOS	A	A	C	A	A



Colour code based on Level of Service



Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

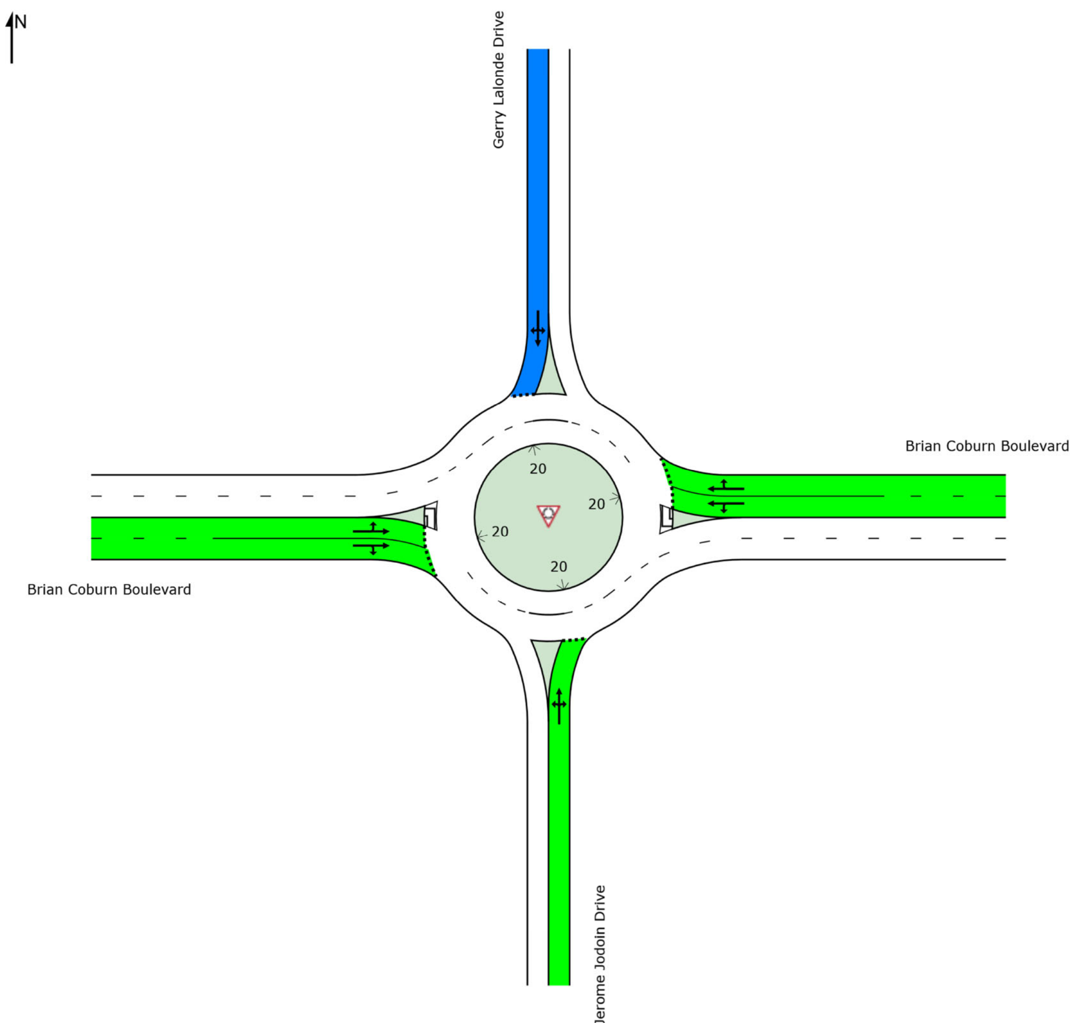
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [Brian Coburn & Gerry Lalonde 2029 FB AM - Widened]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	A	C	A	A



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

MOVEMENT SUMMARY

Site: 101 [Brian Coburn & Gerry Lalonde 2029 FB AM - Widened]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Jerome Jodoin Drive												
1	L2	105	2.0	0.153	6.3	LOS A	0.6	4.0	0.56	0.55	0.56	49.1
2	T1	1	2.0	0.153	6.3	LOS A	0.6	4.0	0.56	0.55	0.56	49.1
3	R2	11	2.0	0.153	6.3	LOS A	0.6	4.0	0.56	0.55	0.56	48.2
Approach		117	2.0	0.153	6.3	LOS A	0.6	4.0	0.56	0.55	0.56	49.1
East: Brian Coburn Boulevard												
4	L2	6	2.0	0.575	9.8	LOS A	4.2	29.8	0.50	0.33	0.50	49.3
5	T1	1363	2.0	0.575	9.8	LOS A	4.2	29.8	0.50	0.33	0.50	49.4
6	R2	17	46.0	0.575	10.5	LOS B	4.1	29.7	0.49	0.32	0.49	46.9
Approach		1386	2.5	0.575	9.8	LOS A	4.2	29.8	0.50	0.33	0.50	49.4
North: Gerry Lalonde Drive												
7	L2	8	14.0	0.591	24.9	LOS C	2.9	20.7	0.86	1.03	1.49	41.0
8	T1	1	2.0	0.591	24.4	LOS C	2.9	20.7	0.86	1.03	1.49	41.2
9	R2	225	2.0	0.591	24.4	LOS C	2.9	20.7	0.86	1.03	1.49	40.6
Approach		234	2.4	0.591	24.4	LOS C	2.9	20.7	0.86	1.03	1.49	40.6
West: Brian Coburn Boulevard												
10	L2	47	3.0	0.266	4.9	LOS A	1.3	9.7	0.09	0.02	0.09	52.2
11	T1	640	6.0	0.266	5.0	LOS A	1.3	9.7	0.09	0.02	0.09	52.5
12	R2	30	2.0	0.266	4.9	LOS A	1.3	9.7	0.09	0.02	0.09	51.3
Approach		717	5.6	0.266	5.0	LOS A	1.3	9.7	0.09	0.02	0.09	52.5
All Vehicles		2454	3.4	0.591	9.6	LOS A	4.2	29.8	0.41	0.31	0.48	49.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

DEGREE OF SATURATION

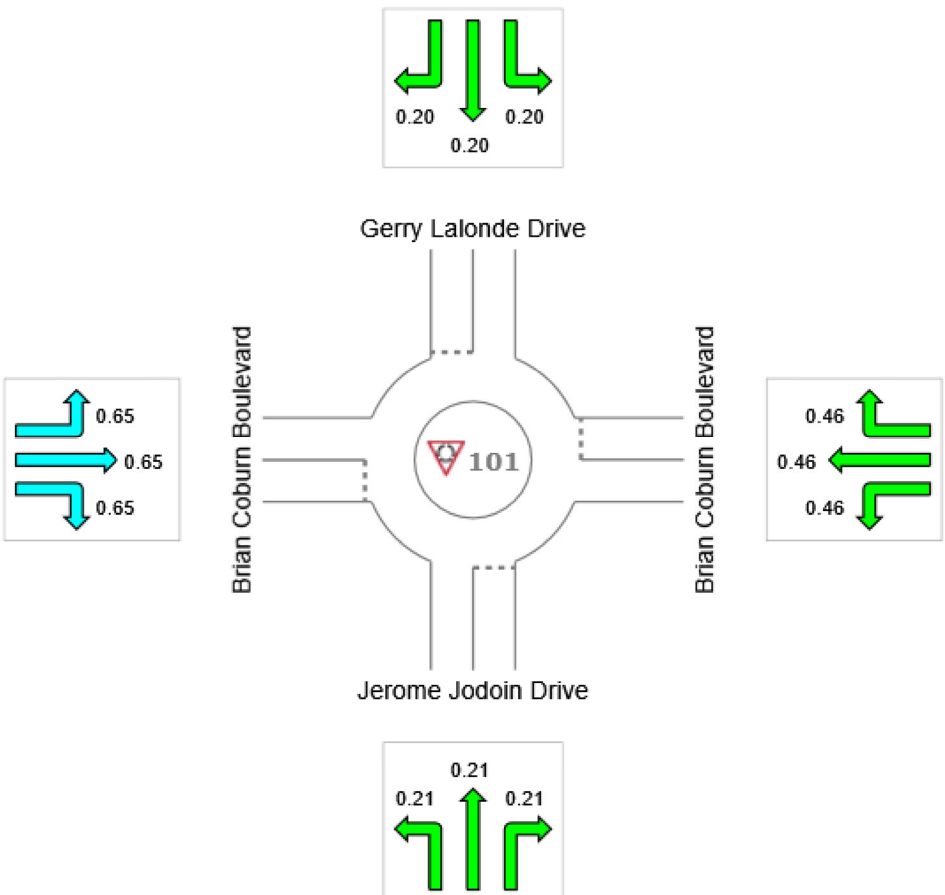
Ratio of Demand Volume to Capacity, v/c ratio per movement

Site: 101 [Brian Coburn & Gerry Lalonde 2029 FB PM - Widened]

New Site
Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Degree of Saturation	0.21	0.46	0.20	0.65	0.65



Colour code based on Degree of Saturation

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

DELAY (CONTROL)

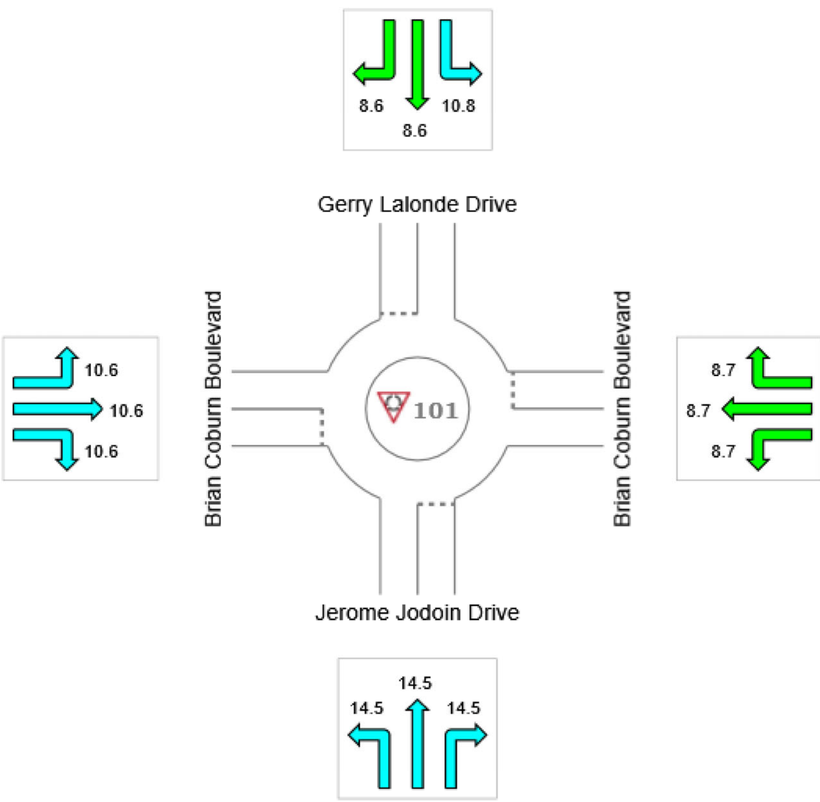
Average control delay per vehicle, or average pedestrian delay (seconds)

Site: 101 [Brian Coburn & Gerry Lalonde 2029 FB PM - Widened]

New Site
Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Delay (Control)	14.5	8.7	8.7	10.6	10.0
LOS	B	A	A	B	A



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

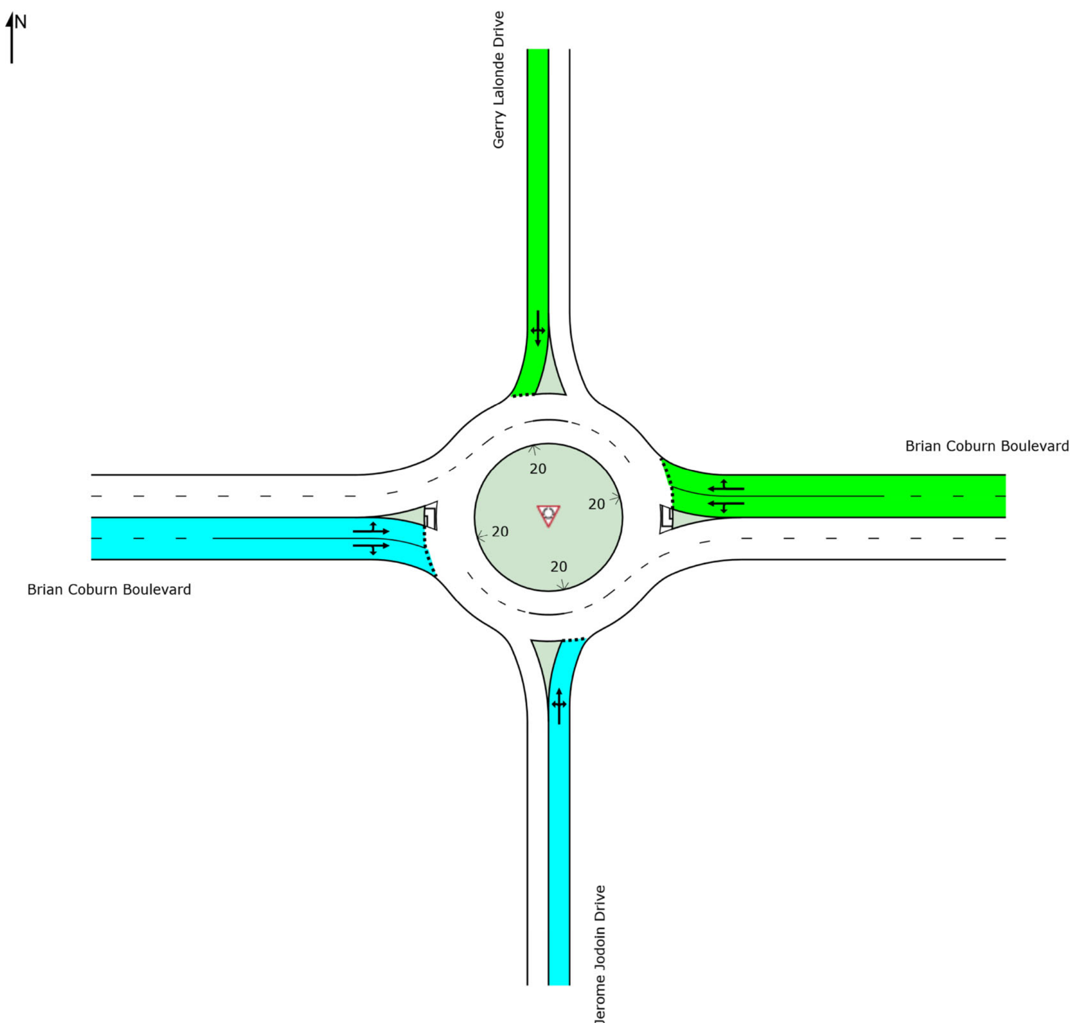
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [Brian Coburn & Gerry Lalonde 2029 FB PM - Widened]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	B	A	A	B	A



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

MOVEMENT SUMMARY

Site: 101 [Brian Coburn & Gerry Lalonde 2029 FB PM - Widened]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Jerome Jodoin Drive												
1	L2	57	2.0	0.208	14.5	LOS B	0.7	4.7	0.80	0.80	0.80	44.6
2	T1	1	2.0	0.208	14.5	LOS B	0.7	4.7	0.80	0.80	0.80	44.7
3	R2	12	2.0	0.208	14.5	LOS B	0.7	4.7	0.80	0.80	0.80	43.8
Approach		70	2.0	0.208	14.5	LOS B	0.7	4.7	0.80	0.80	0.80	44.5
East: Brian Coburn Boulevard												
4	L2	20	2.0	0.461	8.7	LOS A	2.5	18.1	0.56	0.47	0.56	50.1
5	T1	927	2.0	0.461	8.7	LOS A	2.5	18.1	0.56	0.47	0.56	50.2
6	R2	14	2.0	0.461	8.7	LOS A	2.5	18.1	0.56	0.47	0.56	49.0
Approach		961	2.0	0.461	8.7	LOS A	2.5	18.1	0.56	0.47	0.56	50.2
North: Gerry Lalonde Drive												
7	L2	5	75.0	0.200	10.8	LOS B	0.7	5.1	0.63	0.63	0.63	47.8
8	T1	1	2.0	0.200	8.6	LOS A	0.7	5.1	0.63	0.63	0.63	50.3
9	R2	111	2.0	0.200	8.6	LOS A	0.7	5.1	0.63	0.63	0.63	49.2
Approach		117	5.1	0.200	8.7	LOS A	0.7	5.1	0.63	0.63	0.63	49.1
West: Brian Coburn Boulevard												
10	L2	258	2.0	0.647	10.6	LOS B	6.4	45.3	0.25	0.08	0.25	48.1
11	T1	1401	2.0	0.647	10.6	LOS B	6.4	45.3	0.25	0.08	0.25	48.6
12	R2	95	2.0	0.647	10.6	LOS B	6.4	45.3	0.25	0.08	0.25	47.8
Approach		1754	2.0	0.647	10.6	LOS B	6.4	45.3	0.25	0.08	0.25	48.5
All Vehicles		2902	2.1	0.647	10.0	LOS A	6.4	45.3	0.38	0.25	0.38	49.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

DEGREE OF SATURATION

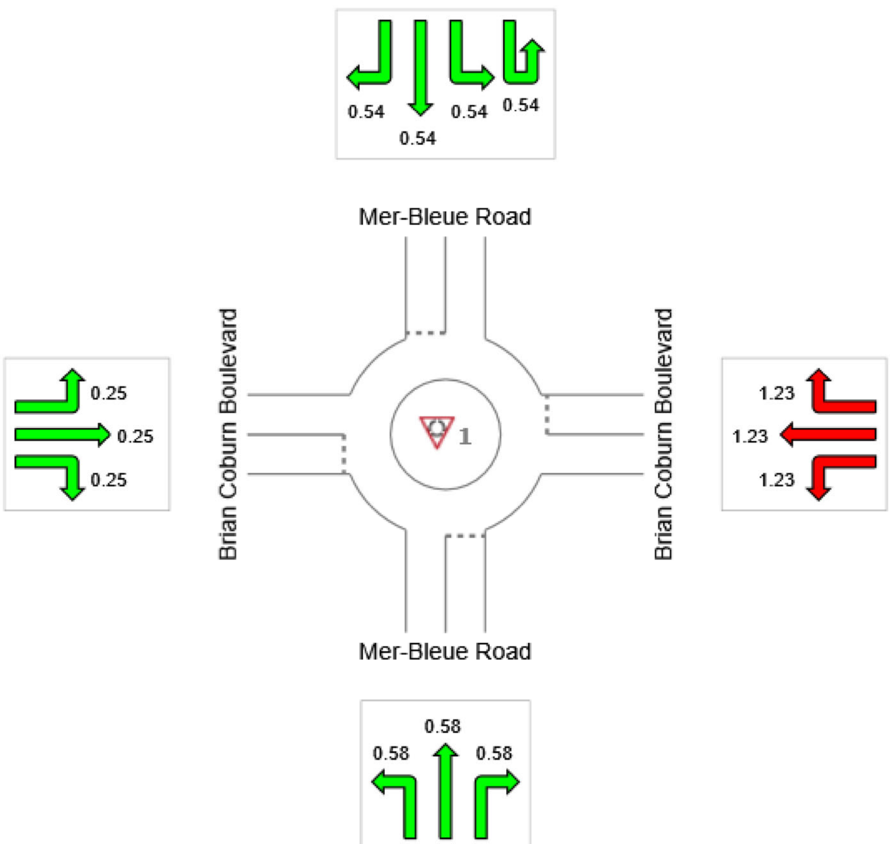
Ratio of Demand Volume to Capacity, v/c ratio per movement

Site: 1 [Mer-Bleue & Brian Coburn 2029 FB AM - Widened]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Degree of Saturation	0.58	1.23	0.54	0.25	1.23



Colour code based on Degree of Saturation

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

Organisation: CGH TRANSPORTATION | Processed: January 6, 2021 11:42:45 AM
Project: C:\Users\RobinMarinac\CGH TRANSPORTATION\CGH Working - Documents\Projects\2020-82 Caivan 2275 Mer Bleue\DATA\Sidra

DELAY (CONTROL)

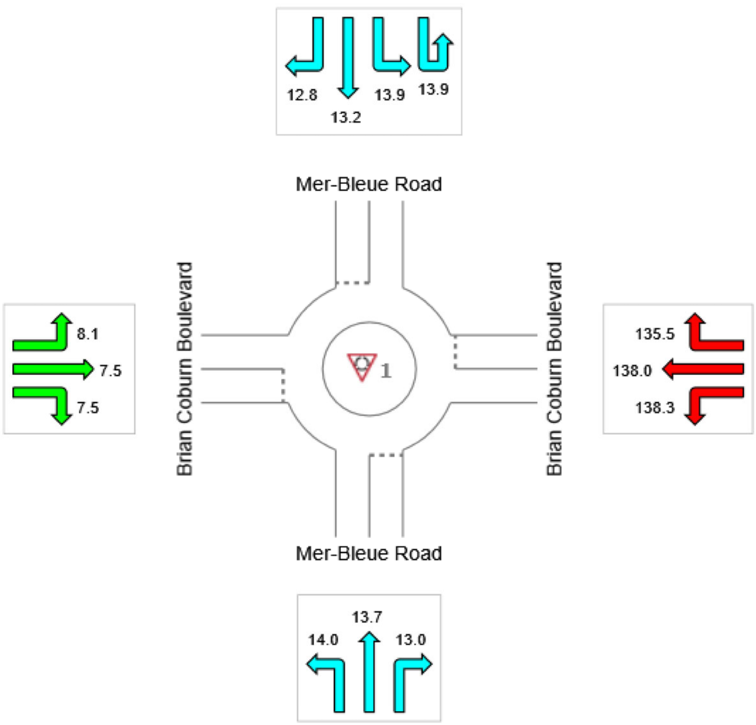
Average control delay per vehicle, or average pedestrian delay (seconds)

Site: 1 [Mer-Bleue & Brian Coburn 2029 FB AM - Widened]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Delay (Control)	13.5	136.8	13.3	7.8	66.3
LOS	B	F	B	A	F



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

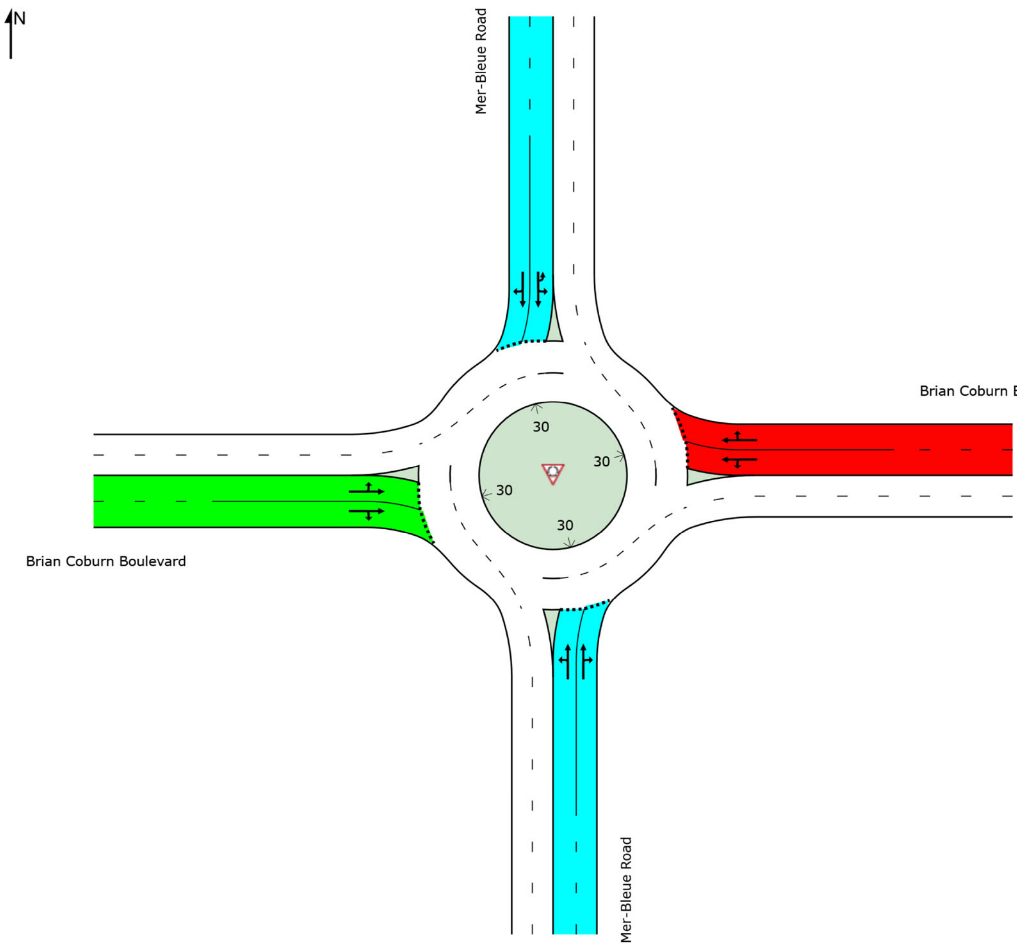
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 1 [Mer-Bleue & Brian Coburn 2029 FB AM - Widened]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	B	F	B	A	F



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

MOVEMENT SUMMARY

Site: 1 [Mer-Bleue & Brian Coburn 2029 FB AM - Widened]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Mer-Bleue Road												
1	L2	28	2.0	0.576	14.0	LOS B	4.4	31.0	0.74	0.91	1.22	47.2
2	T1	585	2.0	0.576	13.7	LOS B	4.4	31.6	0.74	0.90	1.21	47.1
3	R2	295	2.0	0.576	13.0	LOS B	4.4	31.6	0.72	0.89	1.19	41.0
Approach		908	2.0	0.576	13.5	LOS B	4.4	31.6	0.73	0.90	1.20	45.5
East: Brian Coburn Boulevard												
4	L2	109	2.0	1.226	138.3	LOS F	58.1	413.5	1.00	3.56	9.12	12.8
5	T1	712	2.0	1.226	138.0	LOS F	64.0	455.5	1.00	3.58	9.17	14.2
6	R2	759	2.0	1.226	135.5	LOS F	64.0	455.5	1.00	3.77	9.63	13.9
Approach		1580	2.0	1.226	136.8	LOS F	64.0	455.5	1.00	3.67	9.39	14.0
North: Mer-Bleue Road												
7u	U	63	2.0	0.543	13.9	LOS B	3.6	25.4	0.73	0.88	1.17	47.0
7	L2	209	2.0	0.543	13.9	LOS B	3.6	25.4	0.73	0.88	1.17	41.8
8	T1	328	2.0	0.543	13.2	LOS B	3.6	25.8	0.72	0.87	1.15	46.7
9	R2	189	2.0	0.543	12.8	LOS B	3.6	25.8	0.72	0.86	1.14	47.3
Approach		789	2.0	0.543	13.3	LOS B	3.6	25.8	0.72	0.87	1.16	45.7
West: Brian Coburn Boulevard												
10	L2	169	2.0	0.253	8.1	LOS A	1.0	7.0	0.61	0.61	0.61	48.9
11	T1	174	2.0	0.253	7.5	LOS A	1.0	7.0	0.59	0.59	0.59	49.2
12	R2	30	2.0	0.253	7.5	LOS A	1.0	7.0	0.59	0.59	0.59	50.0
Approach		373	2.0	0.253	7.8	LOS A	1.0	7.0	0.60	0.60	0.60	49.1
All Vehicles		3650	2.0	1.226	66.3	LOS F	64.0	455.5	0.83	2.06	4.67	24.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

DEGREE OF SATURATION

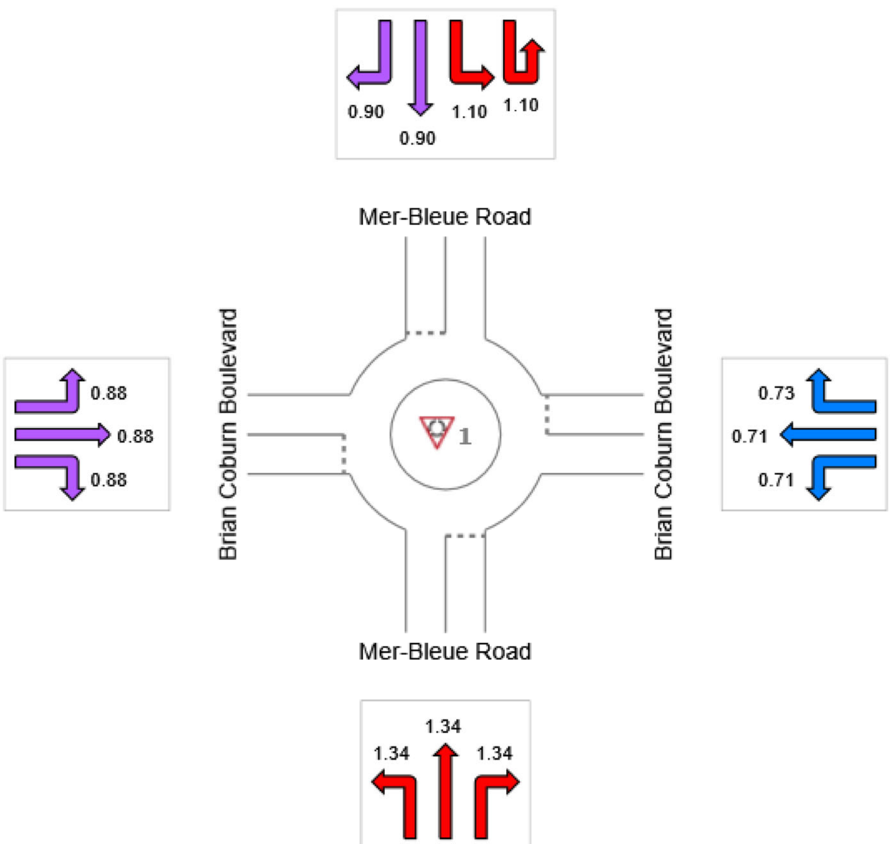
Ratio of Demand Volume to Capacity, v/c ratio per movement

Site: 1 [Mer-Bleue & Brian Coburn 2029 FB PM - Widened]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Degree of Saturation	1.34	0.73	1.10	0.88	1.34



Colour code based on Degree of Saturation

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

DELAY (CONTROL)

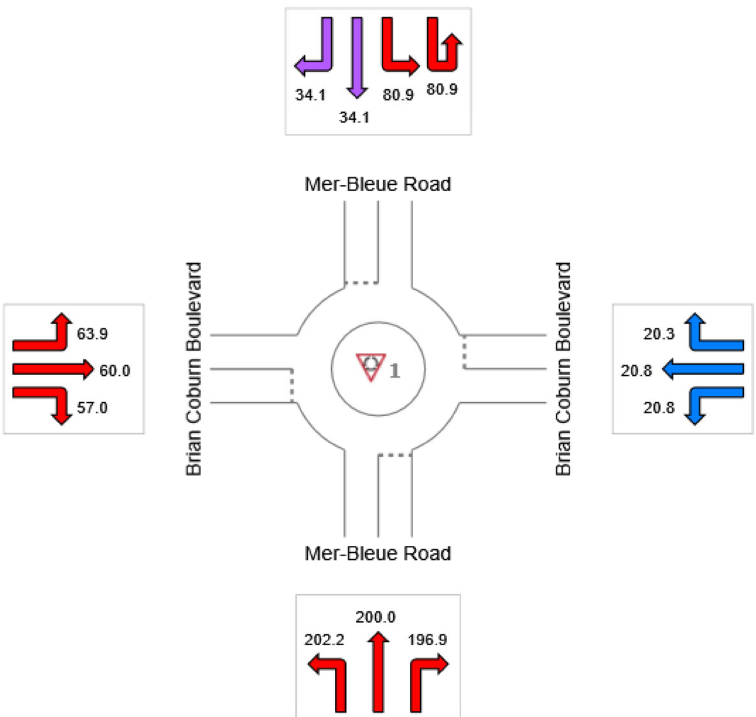
Average control delay per vehicle, or average pedestrian delay (seconds)

Site: 1 [Mer-Bleue & Brian Coburn 2029 FB PM - Widened]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Delay (Control)	199.4	20.5	60.8	60.2	84.1
LOS	F	C	F	F	F



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

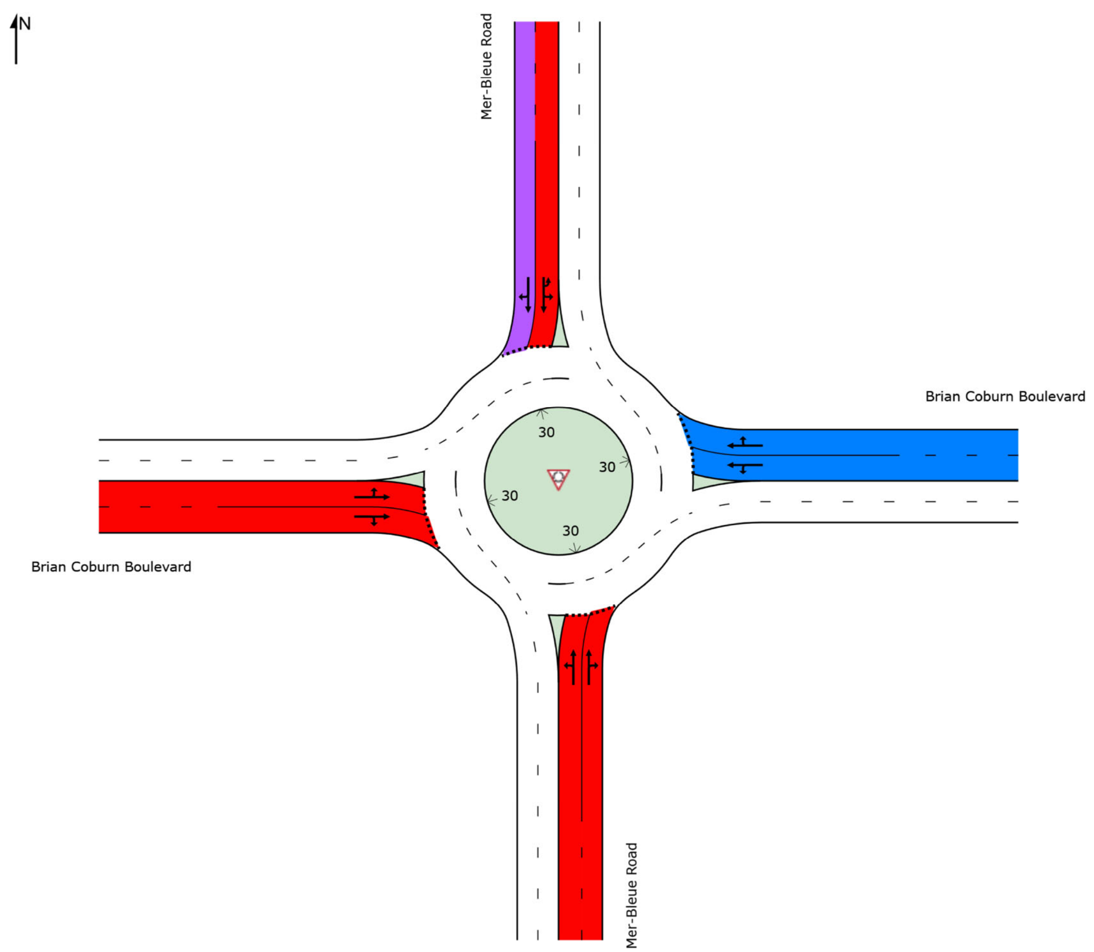
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 1 [Mer-Bleue & Brian Coburn 2029 FB PM - Widened]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	F	C	F	F	F



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

MOVEMENT SUMMARY

Site: 1 [Mer-Bleue & Brian Coburn 2029 FB PM - Widened]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Mer-Bleue Road												
1	L2	54	2.0	1.344	202.2	LOS F	47.3	336.6	1.00	3.41	9.96	13.1
2	T1	739	2.0	1.344	200.0	LOS F	54.0	384.5	1.00	3.54	10.39	13.1
3	R2	248	2.0	1.344	196.9	LOS F	54.0	384.5	1.00	3.72	10.97	9.3
Approach		1041	2.0	1.344	199.4	LOS F	54.0	384.5	1.00	3.58	10.50	12.3
East: Brian Coburn Boulevard												
4	L2	208	2.0	0.714	20.8	LOS C	6.8	48.6	0.84	1.13	1.71	36.7
5	T1	282	2.0	0.714	20.8	LOS C	6.8	48.6	0.84	1.13	1.71	38.5
6	R2	557	2.0	0.734	20.3	LOS C	7.6	54.5	0.84	1.16	1.78	38.0
Approach		1047	2.0	0.734	20.5	LOS C	7.6	54.5	0.84	1.15	1.75	37.9
North: Mer-Bleue Road												
7u	U	57	2.0	1.097	80.9	LOS F	55.9	397.9	1.00	2.96	6.20	25.7
7	L2	915	2.0	1.097	80.9	LOS F	55.9	397.9	1.00	2.96	6.20	20.4
8	T1	506	2.0	0.898	34.1	LOS D	19.7	140.3	1.00	1.71	2.92	36.7
9	R2	222	2.0	0.898	34.1	LOS D	19.7	140.3	1.00	1.71	2.92	37.3
Approach		1700	2.0	1.097	60.8	LOS F	55.9	397.9	1.00	2.42	4.80	26.3
West: Brian Coburn Boulevard												
10	L2	68	2.0	0.884	63.9	LOS F	6.8	48.1	0.96	1.44	2.81	29.3
11	T1	460	2.0	0.884	60.0	LOS F	7.2	51.2	0.96	1.45	2.84	24.7
12	R2	52	2.0	0.884	57.0	LOS F	7.2	51.2	0.96	1.46	2.86	28.9
Approach		580	2.0	0.884	60.2	LOS F	7.2	51.2	0.96	1.45	2.84	25.7
All Vehicles		4368	2.0	1.344	84.1	LOS F	55.9	397.9	0.96	2.26	5.17	21.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Appendix P

2029 Future Total Synchro Worksheets

Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	169	186	43	4	114	742	759	49	593	303	63	213
Future Volume (vph)	169	186	43	4	114	742	759	49	593	303	63	213
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Frt		0.984				0.930			0.952			
Flt Protected		0.979				0.996			0.997			
Satd. Flow (prot)	0	3194	0	0	0	3071	0	0	3147	0	0	0
Flt Permitted		0.979				0.996			0.997			
Satd. Flow (perm)	0	3194	0	0	0	3071	0	0	3147	0	0	0
Link Speed (k/h)		70				60			60			
Link Distance (m)		647.3				110.9			463.6			
Travel Time (s)		33.3				6.7			27.8			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	169	186	43	4	114	742	759	49	593	303	63	213
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	398	0	0	0	1619	0	0	945	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	R NA	Left
Median Width(m)		0.0				0.0			3.5			
Link Offset(m)		0.0				0.0			0.0			
Crosswalk Width(m)		3.0				3.0			3.0			
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	25		15	15	25		15	25		15	15	25
Sign Control		Yield				Yield			Yield			

Intersection Summary	
Area Type:	Other
Control Type: Roundabout	
Intersection Capacity Utilization 130.0%	ICU Level of Service H
Analysis Period (min) 15	

Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	333	189
Future Volume (vph)	333	189
Ideal Flow (vphpl)	1800	1800
Lane Util. Factor	0.95	0.95
Frt	0.964	
Flt Protected	0.983	
Satd. Flow (prot)	3142	0
Flt Permitted	0.983	
Satd. Flow (perm)	3142	0
Link Speed (k/h)	60	
Link Distance (m)	481.8	
Travel Time (s)	28.9	
Peak Hour Factor	1.00	1.00
Adj. Flow (vph)	333	189
Shared Lane Traffic (%)		
Lane Group Flow (vph)	798	0
Enter Blocked Intersection	No	No
Lane Alignment	Left	Right
Median Width(m)	3.5	
Link Offset(m)	0.0	
Crosswalk Width(m)	3.0	
Two way Left Turn Lane		
Headway Factor	1.09	1.09
Turning Speed (k/h)		15
Sign Control	Yield	

Intersection Summary

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	30	47	668	30	6	1372	17	105	0	11	8	0
Future Volume (vph)	30	47	668	30	6	1372	17	105	0	11	8	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		105.0		0.0	0.0		0.0	0.0		0.0	0.0	
Storage Lanes		0		0	0		0	0		0	0	
Taper Length (m)		45.0			15.0			15.0			15.0	
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.994			0.998			0.987			0.870
Flt Protected			0.995						0.957			0.998
Satd. Flow (prot)	0	0	3170	0	0	3292	0	0	1648	0	0	1523
Flt Permitted			0.995						0.957			0.998
Satd. Flow (perm)	0	0	3170	0	0	3292	0	0	1648	0	0	1523
Link Speed (k/h)			60			60			50			50
Link Distance (m)			308.2			443.7			148.0			244.6
Travel Time (s)			18.5			26.6			10.7			17.6
Confl. Peds. (#/hr)		7										
Confl. Bikes (#/hr)							1					
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	3%	6%	2%	2%	2%	46%	2%	2%	2%	14%	2%
Adj. Flow (vph)	30	47	668	30	6	1372	17	105	0	11	8	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	775	0	0	1395	0	0	116	0	0	233
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left
Median Width(m)			0.0			0.0			0.0			0.0
Link Offset(m)			0.0			0.0			0.0			0.0
Crosswalk Width(m)			3.0			3.0			3.0			3.0
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	15	25		15	25		15	25		15	25	
Sign Control			Yield			Yield			Yield			Yield

Intersection Summary

Area Type: Other

Control Type: Roundabout

Intersection Capacity Utilization 99.0% ICU Level of Service F

Analysis Period (min) 15

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	225
Future Volume (vph)	225
Ideal Flow (vphpl)	1800
Storage Length (m)	0.0
Storage Lanes	0
Taper Length (m)	
Lane Util. Factor	1.00
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	1.00
Heavy Vehicles (%)	1%
Adj. Flow (vph)	225
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	1.09
Turning Speed (k/h)	15
Sign Control	

Intersection Summary

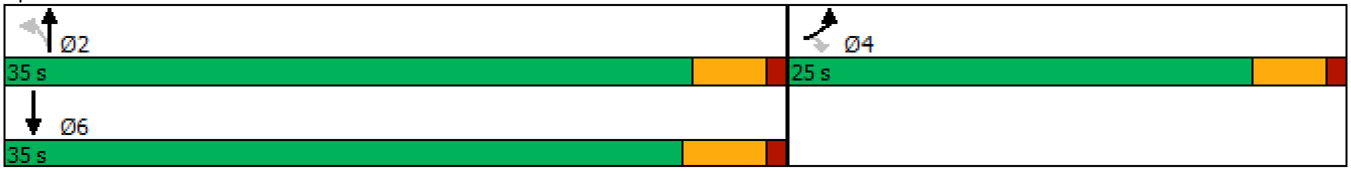
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	212	55	125	435	229	292
Future Volume (vph)	212	55	125	435	229	292
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	95.0	0.0	30.0			0.0
Storage Lanes	1	1	1			0
Taper Length (m)	15.0		75.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.924	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1496	1293	1566	1664	1500	0
Flt Permitted	0.950		0.403			
Satd. Flow (perm)	1496	1293	664	1664	1500	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		55			155	
Link Speed (k/h)	50			50	60	
Link Distance (m)	691.8			356.1	136.7	
Travel Time (s)	49.8			25.6	8.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	13%	17%	8%	7%	13%	7%
Adj. Flow (vph)	212	55	125	435	229	292
Shared Lane Traffic (%)						
Lane Group Flow (vph)	212	55	125	435	521	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	3.0			3.0	3.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	25	15	25			15
Number of Detectors	1	1	1	2	2	
Detector Template	Left	Right	Left	Thru	Thru	
Leading Detector (m)	2.0	2.0	2.0	10.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	2.0	2.0	0.6	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	6	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		4	2			
Detector Phase	4	4	2	2	6	
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	25.0	25.0	24.0	24.0	25.2	
Total Split (s)	25.0	25.0	35.0	35.0	35.0	
Total Split (%)	41.7%	41.7%	58.3%	58.3%	58.3%	
Maximum Green (s)	20.7	20.7	30.7	30.7	30.3	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.3	4.3	4.3	4.3	4.7	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	Min	Min	Min	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	13.5	13.5	12.5	12.5	13.5	
Pedestrian Calls (#/hr)	0	0	0	0	0	
Act Effct Green (s)	12.4	12.4	21.7	21.7	21.4	
Actuated g/C Ratio	0.32	0.32	0.57	0.57	0.56	
v/c Ratio	0.44	0.12	0.33	0.46	0.58	
Control Delay	15.4	5.4	10.6	9.5	8.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	15.4	5.4	10.6	9.5	8.9	
LOS	B	A	B	A	A	
Approach Delay	13.4			9.7	8.9	
Approach LOS	B			A	A	
Queue Length 50th (m)	9.1	0.0	4.2	15.9	13.5	
Queue Length 95th (m)	33.3	6.1	17.2	45.9	48.2	
Internal Link Dist (m)	667.8			332.1	112.7	
Turn Bay Length (m)	95.0		30.0			
Base Capacity (vph)	857	764	557	1396	1276	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.25	0.07	0.22	0.31	0.41	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 38.4
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.58
Intersection Signal Delay: 10.1 Intersection LOS: B
Intersection Capacity Utilization 63.4% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: Mer-Bleue Road & Renaud Road

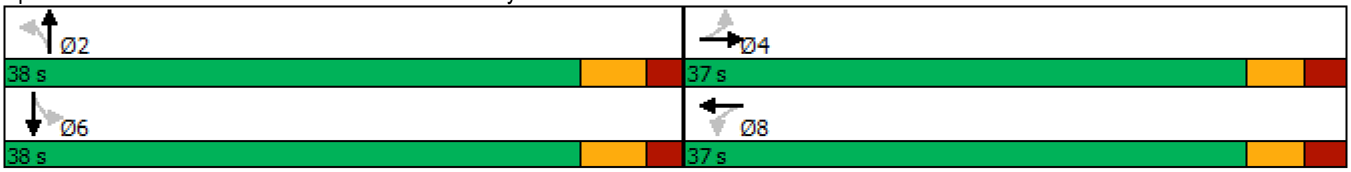


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	86	61	10	34	64	126	2	721	14	45	450	22
Future Volume (vph)	86	61	10	34	64	126	2	721	14	45	450	22
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	30.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	15.0			15.0			75.0			75.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.979			0.901			0.997			0.993	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1658	1708	0	1658	1572	0	1658	3154	0	1658	2986	0
Flt Permitted	0.638			0.711			0.482			0.368		
Satd. Flow (perm)	1113	1708	0	1241	1572	0	841	3154	0	642	2986	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			117			3			8	
Link Speed (k/h)		50			50			60			60	
Link Distance (m)		221.2			188.0			167.0			463.6	
Travel Time (s)		15.9			13.5			10.0			27.8	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	7%	2%	2%	13%	2%
Adj. Flow (vph)	86	61	10	34	64	126	2	721	14	45	450	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	86	71	0	34	190	0	2	735	0	45	472	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		3.0			3.0			3.0			3.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	36.1	36.1		36.1	36.1		35.9	35.9		35.9	35.9	
Total Split (s)	37.0	37.0		37.0	37.0		38.0	38.0		38.0	38.0	
Total Split (%)	49.3%	49.3%		49.3%	49.3%		50.7%	50.7%		50.7%	50.7%	
Maximum Green (s)	31.3	31.3		31.3	31.3		32.1	32.1		32.1	32.1	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.7	3.7		3.7	3.7	
All-Red Time (s)	2.4	2.4		2.4	2.4		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.7	5.7		5.7	5.7		5.9	5.9		5.9	5.9	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	23.0	23.0		23.0	23.0		10.5	10.5		10.5	10.5	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	10.7	10.7		10.7	10.7		16.8	16.8		16.8	16.8	
Actuated g/C Ratio	0.27	0.27		0.27	0.27		0.43	0.43		0.43	0.43	
v/c Ratio	0.28	0.15		0.10	0.37		0.01	0.54		0.16	0.37	
Control Delay	14.0	10.5		11.6	7.7		6.5	10.3		9.0	8.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	14.0	10.5		11.6	7.7		6.5	10.3		9.0	8.6	
LOS	B	B		B	A		A	B		A	A	
Approach Delay		12.4			8.3			10.3			8.7	
Approach LOS		B			A			B			A	
Queue Length 50th (m)	3.8	2.6		1.4	3.1		0.1	16.5		1.6	9.5	
Queue Length 95th (m)	13.2	9.9		6.4	15.1		0.9	31.1		6.4	19.0	
Internal Link Dist (m)		197.2			164.0			143.0			439.6	
Turn Bay Length (m)	30.0			30.0			30.0			35.0		
Base Capacity (vph)	936	1439		1044	1341		699	2623		533	2485	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.09	0.05		0.03	0.14		0.00	0.28		0.08	0.19	

Intersection Summary	
Area Type: Other	
Cycle Length: 75	
Actuated Cycle Length: 39.3	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 9.7	Intersection LOS: A
Intersection Capacity Utilization 69.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 5: Mer-Bleue Road & Axis Way/Decoeur Drive



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	725	20	0	1732	0	50
Future Volume (vph)	725	20	0	1732	0	50
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)		25.0	0.0		0.0	0.0
Storage Lanes		0	0		0	1
Taper Length (m)			15.0		15.0	
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.996					0.865
Flt Protected						
Satd. Flow (prot)	3302	0	0	3316	0	1510
Flt Permitted						
Satd. Flow (perm)	3302	0	0	3316	0	1510
Link Speed (k/h)	60			60	50	
Link Distance (m)	110.9			308.2	141.0	
Travel Time (s)	6.7			18.5	10.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	725	20	0	1732	0	50
Shared Lane Traffic (%)						
Lane Group Flow (vph)	745	0	0	1732	0	50
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	3.0			3.0	3.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 53.9%	ICU Level of Service A
Analysis Period (min) 15	

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↱			↑↑		↱
Traffic Vol, veh/h	725	20	0	1732	0	50
Future Vol, veh/h	725	20	0	1732	0	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	725	20	0	1732	0	50

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	373
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	624
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	624
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	11.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	624	-	-	-
HCM Lane V/C Ratio	0.08	-	-	-
HCM Control Delay (s)	11.3	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.3	-	-	-

Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	68	500	73	13	216	309	557	73	746	255	57	928
Future Volume (vph)	68	500	73	13	216	309	557	73	746	255	57	928
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Frt		0.983				0.924			0.964			
Flt Protected		0.995				0.990			0.997			
Satd. Flow (prot)	0	3243	0	0	0	3033	0	0	3187	0	0	0
Flt Permitted		0.995				0.990			0.997			
Satd. Flow (perm)	0	3243	0	0	0	3033	0	0	3187	0	0	0
Link Speed (k/h)		70				60			60			
Link Distance (m)		647.3				109.9			458.1			
Travel Time (s)		33.3				6.6			27.5			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	68	500	73	13	216	309	557	73	746	255	57	928
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	641	0	0	0	1095	0	0	1074	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	R NA	Left
Median Width(m)		0.0				0.0			3.5			
Link Offset(m)		0.0				0.0			0.0			
Crosswalk Width(m)		3.0				3.0			3.0			
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	25		15	15	25		15	25		15	15	25
Sign Control		Yield				Yield			Yield			

Intersection Summary

Area Type: Other

Control Type: Roundabout

Intersection Capacity Utilization 154.3% ICU Level of Service H

Analysis Period (min) 15

Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	514	222
Future Volume (vph)	514	222
Ideal Flow (vphpl)	1800	1800
Lane Util. Factor	0.95	0.95
Frt	0.981	
Flt Protected	0.972	
Satd. Flow (prot)	3162	0
Flt Permitted	0.972	
Satd. Flow (perm)	3162	0
Link Speed (k/h)	60	
Link Distance (m)	481.8	
Travel Time (s)	28.9	
Peak Hour Factor	1.00	1.00
Adj. Flow (vph)	514	222
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1721	0
Enter Blocked Intersection	No	No
Lane Alignment	Left	Right
Median Width(m)	3.5	
Link Offset(m)	0.0	
Crosswalk Width(m)	3.0	
Two way Left Turn Lane		
Headway Factor	1.09	1.09
Turning Speed (k/h)		15
Sign Control	Yield	

Intersection Summary

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	27	258	1426	95	20	948	14	57	0	12	5	0
Future Volume (vph)	27	258	1426	95	20	948	14	57	0	12	5	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		105.0		0.0	0.0		0.0	0.0		0.0	0.0	
Storage Lanes		0		0	0		0	0		0	0	
Taper Length (m)		45.0			15.0			15.0			15.0	
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.992			0.998			0.977			0.871
Flt Protected			0.992			0.999			0.960			0.998
Satd. Flow (prot)	0	0	3263	0	0	3306	0	0	1637	0	0	1472
Flt Permitted			0.992			0.999			0.960			0.998
Satd. Flow (perm)	0	0	3263	0	0	3306	0	0	1637	0	0	1472
Link Speed (k/h)			60			60			50			50
Link Distance (m)			309.2			443.7			213.2			244.6
Travel Time (s)			18.6			26.6			15.4			17.6
Confl. Peds. (#/hr)		5										
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	75%	2%
Adj. Flow (vph)	27	258	1426	95	20	948	14	57	0	12	5	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	1806	0	0	982	0	0	69	0	0	116
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left
Median Width(m)			0.0			0.0			0.0			0.0
Link Offset(m)			0.0			0.0			0.0			0.0
Crosswalk Width(m)			3.0			3.0			3.0			3.0
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	15	25		15	25		15	25		15	25	
Sign Control			Yield			Yield			Yield			Yield

Intersection Summary

Area Type: Other

Control Type: Roundabout

Intersection Capacity Utilization 103.1% ICU Level of Service G

Analysis Period (min) 15

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	111
Future Volume (vph)	111
Ideal Flow (vphpl)	1800
Storage Length (m)	0.0
Storage Lanes	0
Taper Length (m)	
Lane Util. Factor	1.00
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	1.00
Heavy Vehicles (%)	2%
Adj. Flow (vph)	111
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	1.09
Turning Speed (k/h)	15
Sign Control	

Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	459	90	76	395	489	145
Future Volume (vph)	459	90	76	395	489	145
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	95.0	0.0	30.0			0.0
Storage Lanes	1	1	1			0
Taper Length (m)	15.0		75.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.969	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1658	1339	1610	1745	1678	0
Flt Permitted	0.950		0.242			
Satd. Flow (perm)	1658	1339	410	1745	1678	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		90			35	
Link Speed (k/h)	50			50	60	
Link Distance (m)	691.8			356.1	129.9	
Travel Time (s)	49.8			25.6	7.8	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	13%	5%	2%	3%	2%
Adj. Flow (vph)	459	90	76	395	489	145
Shared Lane Traffic (%)						
Lane Group Flow (vph)	459	90	76	395	634	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	3.0			3.0	3.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	25	15	25			15
Number of Detectors	1	1	1	2	2	
Detector Template	Left	Right	Left	Thru	Thru	
Leading Detector (m)	2.0	2.0	2.0	10.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	2.0	2.0	0.6	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	6	

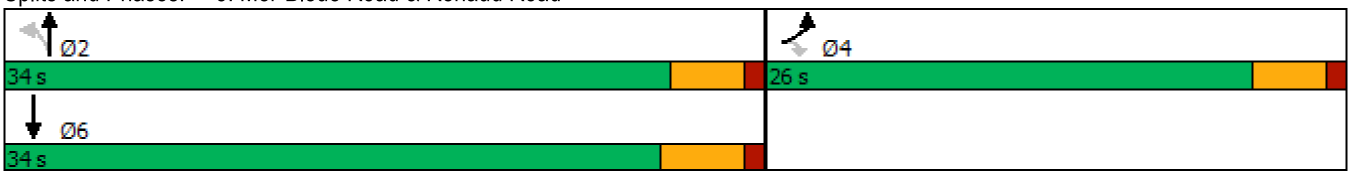
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		4	2			
Detector Phase	4	4	2	2	6	
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	24.8	24.8	23.8	23.8	25.2	
Total Split (s)	26.0	26.0	34.0	34.0	34.0	
Total Split (%)	43.3%	43.3%	56.7%	56.7%	56.7%	
Maximum Green (s)	21.7	21.7	29.7	29.7	29.3	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.3	4.3	4.3	4.3	4.7	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	Min	Min	Min	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	13.5	13.5	12.5	12.5	13.5	
Pedestrian Calls (#/hr)	0	0	0	0	0	
Act Effct Green (s)	17.9	17.9	23.1	23.1	22.7	
Actuated g/C Ratio	0.36	0.36	0.46	0.46	0.45	
v/c Ratio	0.78	0.17	0.40	0.49	0.81	
Control Delay	26.7	4.5	17.2	12.1	21.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	26.7	4.5	17.2	12.1	21.7	
LOS	C	A	B	B	C	
Approach Delay	23.1			13.0	21.7	
Approach LOS	C			B	C	
Queue Length 50th (m)	37.8	0.0	4.5	24.8	46.9	
Queue Length 95th (m)	#85.0	7.4	14.6	45.0	#93.5	
Internal Link Dist (m)	667.8			332.1	105.9	
Turn Bay Length (m)	95.0		30.0			
Base Capacity (vph)	758	661	256	1092	1049	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.61	0.14	0.30	0.36	0.60	

Intersection Summary	
Area Type: Other	
Cycle Length: 60	
Actuated Cycle Length: 50.1	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 19.7	Intersection LOS: B
Intersection Capacity Utilization 82.7%	ICU Level of Service E
Analysis Period (min) 15	

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 3: Mer-Bleue Road & Renaud Road

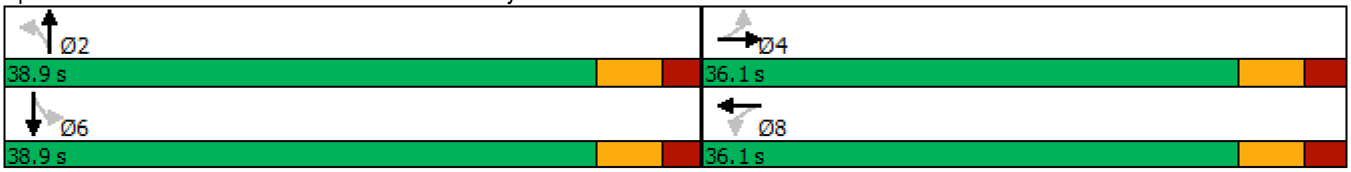


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	88	5	16	85	84	10	883	23	126	703	87
Future Volume (vph)	47	88	5	16	85	84	10	883	23	126	703	87
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	30.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	15.0			15.0			75.0			75.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.992			0.925			0.996			0.983	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1658	1731	0	1658	1614	0	1658	3152	0	1658	2974	0
Flt Permitted	0.650			0.697			0.351			0.298		
Satd. Flow (perm)	1134	1731	0	1216	1614	0	613	3152	0	520	2974	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			75			4			23	
Link Speed (k/h)		50			50			60			60	
Link Distance (m)		269.4			286.1			179.4			458.1	
Travel Time (s)		19.4			20.6			10.8			27.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	7%	2%	2%	13%	2%
Adj. Flow (vph)	47	88	5	16	85	84	10	883	23	126	703	87
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	93	0	16	169	0	10	906	0	126	790	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		3.0			3.0			3.0			3.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	36.1	36.1		36.1	36.1		35.9	35.9		35.9	35.9	
Total Split (s)	36.1	36.1		36.1	36.1		38.9	38.9		38.9	38.9	
Total Split (%)	48.1%	48.1%		48.1%	48.1%		51.9%	51.9%		51.9%	51.9%	
Maximum Green (s)	30.0	30.0		30.0	30.0		33.0	33.0		33.0	33.0	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.7	3.7		3.7	3.7	
All-Red Time (s)	2.4	2.4		2.4	2.4		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1		5.9	5.9		5.9	5.9	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	23.0	23.0		23.0	23.0		10.5	10.5		10.5	10.5	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	11.0	11.0		11.0	11.0		27.5	27.5		27.5	27.5	
Actuated g/C Ratio	0.25	0.25		0.25	0.25		0.62	0.62		0.62	0.62	
v/c Ratio	0.17	0.22		0.05	0.37		0.03	0.47		0.39	0.43	
Control Delay	18.8	17.6		17.6	13.5		5.6	7.7		11.9	7.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	18.8	17.6		17.6	13.5		5.6	7.7		11.9	7.3	
LOS	B	B		B	B		A	A		B	A	
Approach Delay		18.0			13.9			7.7			7.9	
Approach LOS		B			B			A			A	
Queue Length 50th (m)	2.9	5.5		1.0	5.9		0.3	22.5		5.6	18.4	
Queue Length 95th (m)	11.3	17.7		5.3	22.1		2.0	38.6		18.5	32.5	
Internal Link Dist (m)		245.4			262.1			155.4			434.1	
Turn Bay Length (m)	30.0			30.0			30.0			35.0		
Base Capacity (vph)	798	1220		856	1158		466	2399		395	2268	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.06	0.08		0.02	0.15		0.02	0.38		0.32	0.35	

Intersection Summary	
Area Type: Other	
Cycle Length: 75	
Actuated Cycle Length: 44.7	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.47	
Intersection Signal Delay: 9.0	Intersection LOS: A
Intersection Capacity Utilization 73.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 5: Mer-Bleue Road & Axis Way/Decoeur Drive



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1760	66	0	1144	0	45
Future Volume (vph)	1760	66	0	1144	0	45
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)		25.0	0.0		0.0	0.0
Storage Lanes		0	0		0	1
Taper Length (m)			15.0		15.0	
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.995					0.865
Flt Protected						
Satd. Flow (prot)	3299	0	0	3316	0	1510
Flt Permitted						
Satd. Flow (perm)	3299	0	0	3316	0	1510
Link Speed (k/h)	60			60	50	
Link Distance (m)	109.9			309.2	208.6	
Travel Time (s)	6.6			18.6	15.0	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1760	66	0	1144	0	45
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1826	0	0	1144	0	45
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	3.0			3.0	3.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 63.6%	ICU Level of Service B
Analysis Period (min) 15	

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↱			↑↑		↱
Traffic Vol, veh/h	1760	66	0	1144	0	45
Future Vol, veh/h	1760	66	0	1144	0	45
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1760	66	0	1144	0	45

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	913
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	276
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	276
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	276	-	-	-
HCM Lane V/C Ratio	0.163	-	-	-
HCM Control Delay (s)	20.6	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	0.6	-	-	-

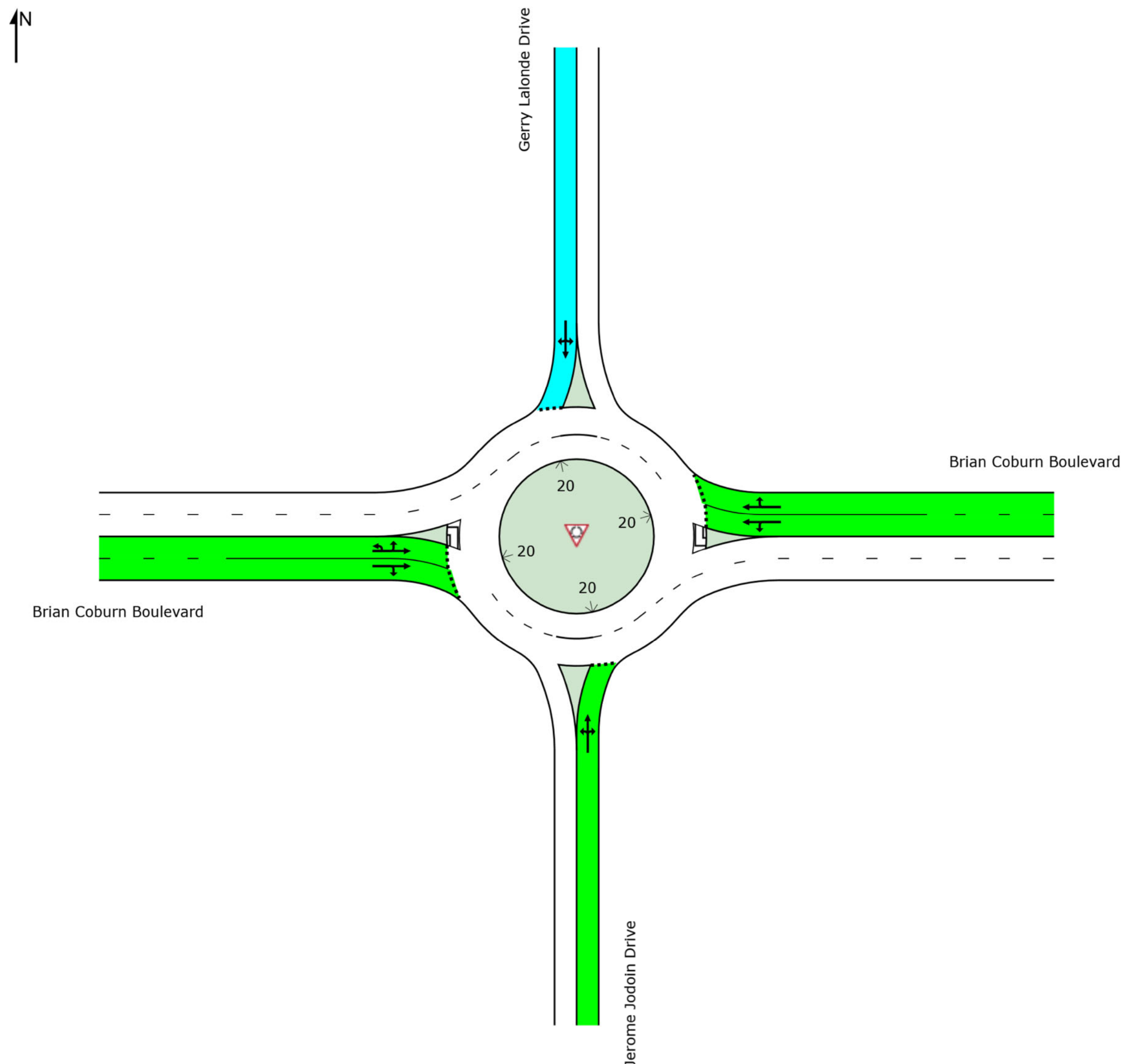
DEGREE OF SATURATION

Ratio of Demand Volume to Capacity, v/c ratio per lane

Site: 101 [Brian Coburn & Gerry Lalonde 2029 FT AM - Widened]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
Degree of Saturation	0.16	0.60	0.61	0.29	0.61



Colour code based on Degree of Saturation

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

Organisation: CGH TRANSPORTATION | Processed: March 23, 2021 1:35:53 PM
Project: C:\Users\RobinMarinac\CGH TRANSPORTATION\CGH Working - Documents\Projects\2020-82 Caivan 2275 Mer Bleue\DATA\Sidra

DELAY (CONTROL)

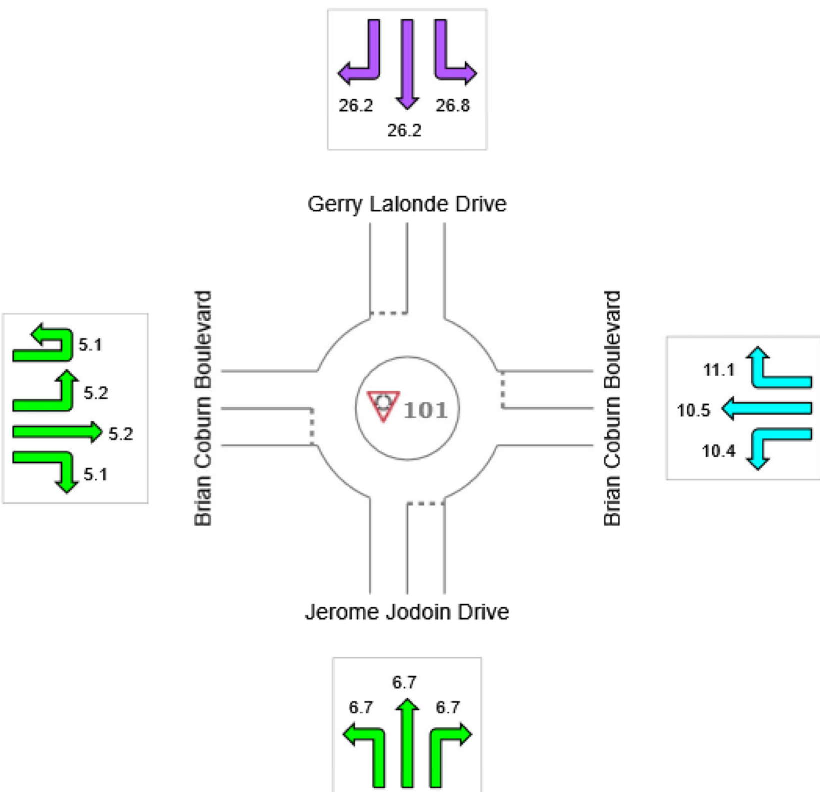
Average control delay per vehicle, or average pedestrian delay (seconds)

Site: 101 [Brian Coburn & Gerry Lalonde 2029 FT AM - Widened]

New Site
Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Delay (Control)	6.7	10.5	26.3	5.2	10.1
LOS	A	B	D	A	B



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

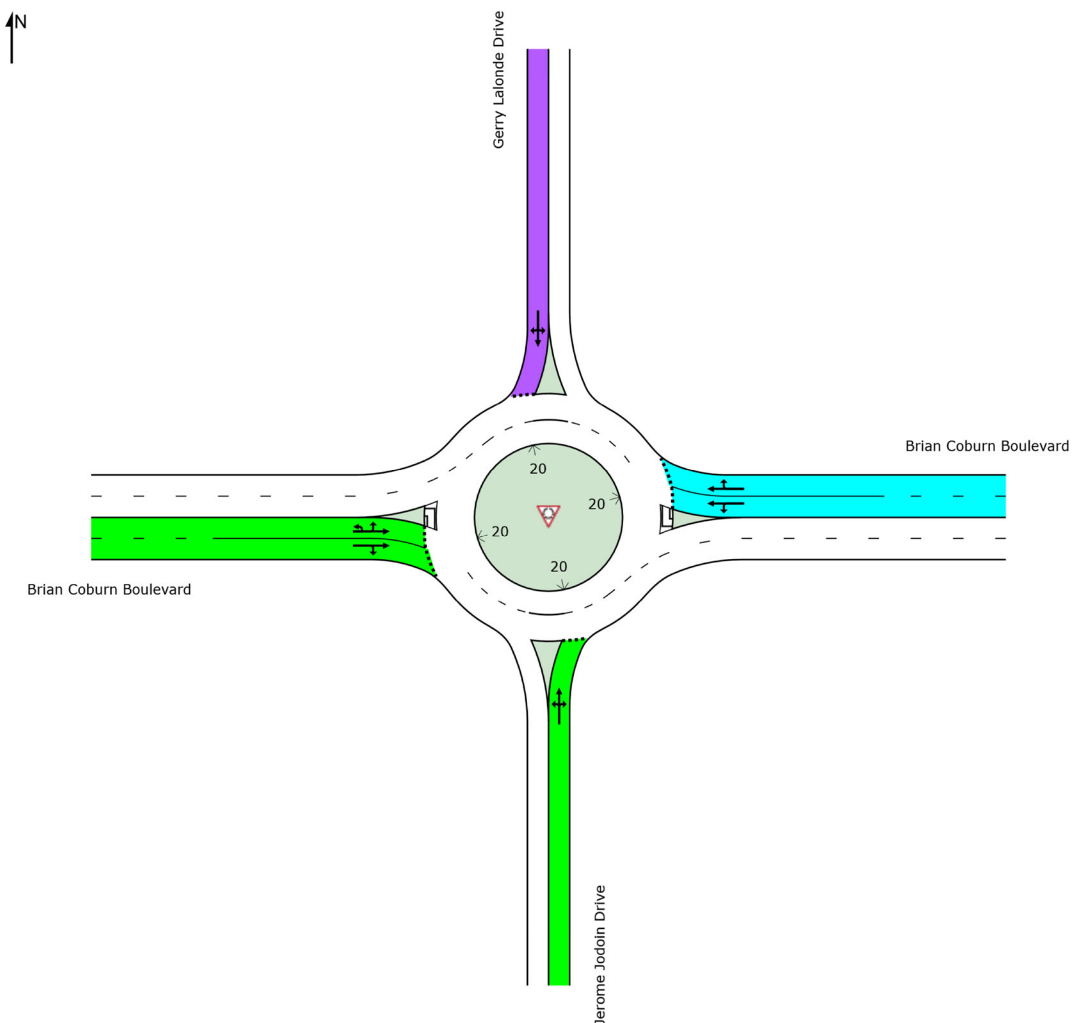
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [Brian Coburn & Gerry Lalonde 2029 FT AM - Widened]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	B	D	A	B



Colour code based on Level of Service

LOS A   LOS B   LOS C   LOS D   LOS E   LOS F

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

MOVEMENT SUMMARY

Site: 101 [Brian Coburn & Gerry Lalonde 2029 FT AM - Widened]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles													
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Jerome Jodoin Drive												
1	L2	105	2.0	0.161	6.7	LOS A	0.6	4.1	0.58	0.58	0.58	48.9
2	T1	1	2.0	0.161	6.7	LOS A	0.6	4.1	0.58	0.58	0.58	48.9
3	R2	11	2.0	0.161	6.7	LOS A	0.6	4.1	0.58	0.58	0.58	48.0
Approach		117	2.0	0.161	6.7	LOS A	0.6	4.1	0.58	0.58	0.58	48.8
East: Brian Coburn Boulevard												
4	L2	6	2.0	0.595	10.4	LOS B	4.3	30.9	0.55	0.39	0.55	48.9
5	T1	1372	2.0	0.595	10.5	LOS B	4.3	30.9	0.55	0.39	0.55	49.0
6	R2	17	46.0	0.595	11.1	LOS B	4.3	30.9	0.55	0.39	0.55	46.5
Approach		1395	2.5	0.595	10.5	LOS B	4.3	30.9	0.55	0.39	0.55	49.0
North: Gerry Lalonde Drive												
7	L2	8	14.0	0.612	26.8	LOS D	3.0	21.6	0.87	1.05	1.55	40.1
8	T1	1	2.0	0.612	26.2	LOS D	3.0	21.6	0.87	1.05	1.55	40.4
9	R2	225	2.0	0.612	26.2	LOS D	3.0	21.6	0.87	1.05	1.55	39.8
Approach		234	2.4	0.612	26.3	LOS D	3.0	21.6	0.87	1.05	1.55	39.8
West: Brian Coburn Boulevard												
10u	U	32	2.0	0.288	5.1	LOS A	1.5	10.8	0.09	0.02	0.09	52.7
10	L2	47	3.0	0.288	5.2	LOS A	1.5	10.8	0.09	0.02	0.09	51.7
11	T1	668	6.0	0.288	5.2	LOS A	1.5	10.8	0.09	0.02	0.09	52.2
12	R2	30	2.0	0.288	5.1	LOS A	1.5	10.8	0.09	0.02	0.09	51.2
Approach		777	5.5	0.288	5.2	LOS A	1.5	10.8	0.09	0.02	0.09	52.2
All Vehicles		2523	3.4	0.612	10.1	LOS B	4.3	30.9	0.44	0.35	0.50	48.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

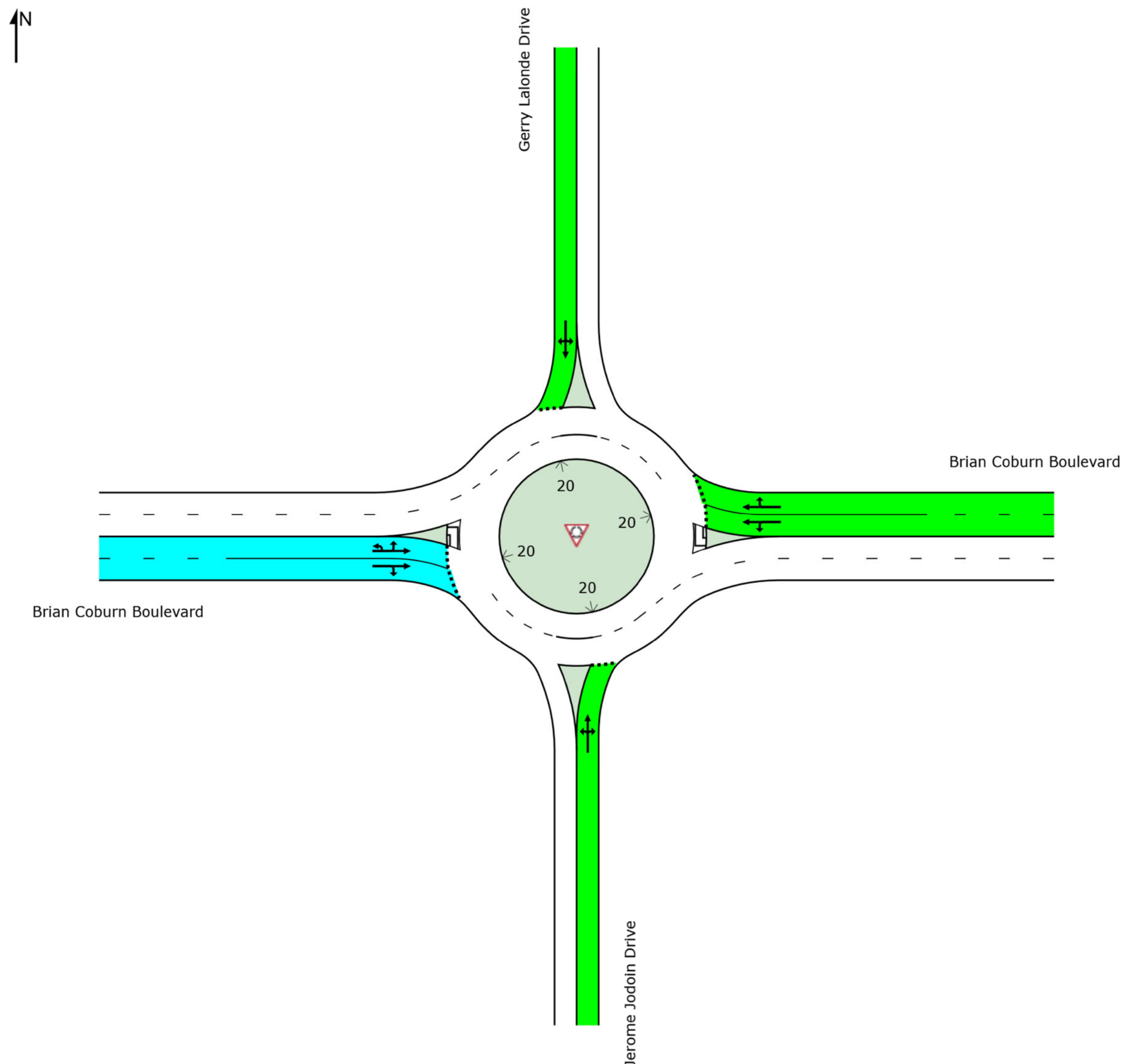
DEGREE OF SATURATION

Ratio of Demand Volume to Capacity, v/c ratio per lane

Site: 101 [Brian Coburn & Gerry Lalonde 2029 FT PM - Widened]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
Degree of Saturation	0.22	0.48	0.21	0.67	0.67



Colour code based on Degree of Saturation

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Organisation: CGH TRANSPORTATION | Processed: March 23, 2021 1:33:38 PM
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DELAY (CONTROL)

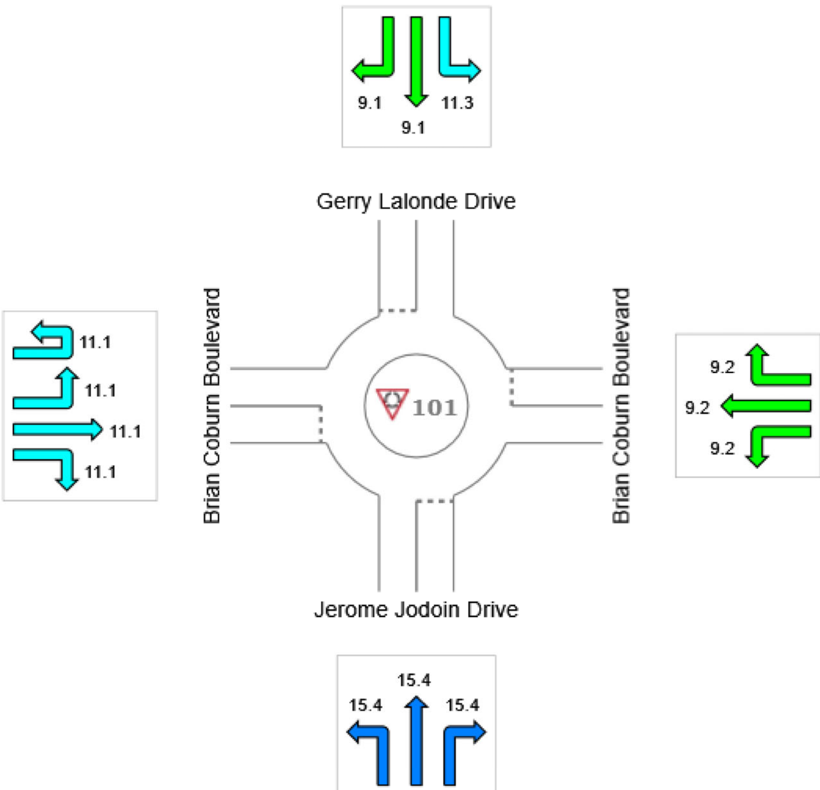
Average control delay per vehicle, or average pedestrian delay (seconds)

Site: 101 [Brian Coburn & Gerry Lalonde 2029 FT PM - Widened]

New Site
Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Delay (Control)	15.4	9.2	9.2	11.1	10.5
LOS	C	A	A	B	B



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

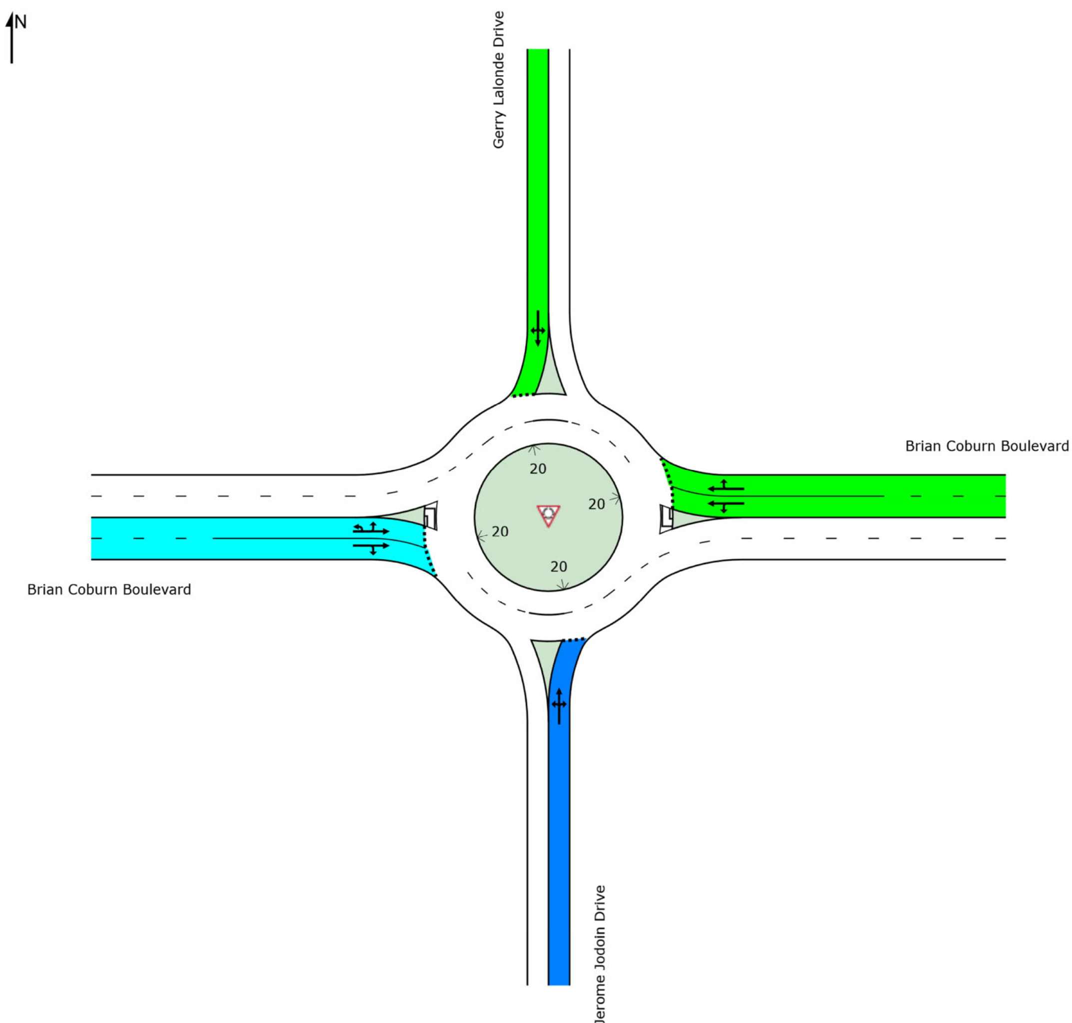
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [Brian Coburn & Gerry Lalonde 2029 FT PM - Widened]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	C	A	A	B	B



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

MOVEMENT SUMMARY

Site: 101 [Brian Coburn & Gerry Lalonde 2029 FT PM - Widened]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Jerome Jodoin Drive												
1	L2	57	2.0	0.218	15.4	LOS C	0.7	4.9	0.81	0.81	0.82	44.2
2	T1	1	2.0	0.218	15.4	LOS C	0.7	4.9	0.81	0.81	0.82	44.2
3	R2	12	2.0	0.218	15.4	LOS C	0.7	4.9	0.81	0.81	0.82	43.4
Approach		70	2.0	0.218	15.4	LOS C	0.7	4.9	0.81	0.81	0.82	44.1
East: Brian Coburn Boulevard												
4	L2	20	2.0	0.483	9.2	LOS A	3.1	21.8	0.59	0.55	0.67	49.7
5	T1	948	2.0	0.483	9.2	LOS A	3.1	21.8	0.59	0.55	0.67	49.9
6	R2	14	2.0	0.483	9.2	LOS A	3.1	21.8	0.59	0.55	0.67	48.6
Approach		982	2.0	0.483	9.2	LOS A	3.1	21.8	0.59	0.55	0.67	49.8
North: Gerry Lalonde Drive												
7	L2	5	75.0	0.209	11.3	LOS B	0.7	5.3	0.65	0.65	0.65	47.5
8	T1	1	2.0	0.209	9.1	LOS A	0.7	5.3	0.65	0.65	0.65	50.0
9	R2	111	2.0	0.209	9.1	LOS A	0.7	5.3	0.65	0.65	0.65	48.9
Approach		117	5.1	0.209	9.2	LOS A	0.7	5.3	0.65	0.65	0.65	48.8
West: Brian Coburn Boulevard												
10u	U	28	2.0	0.667	11.1	LOS B	6.9	49.1	0.26	0.09	0.26	48.5
10	L2	258	2.0	0.667	11.1	LOS B	6.9	49.1	0.26	0.09	0.26	47.7
11	T1	1426	2.0	0.667	11.1	LOS B	6.9	49.1	0.26	0.09	0.26	48.3
12	R2	95	2.0	0.667	11.1	LOS B	6.9	49.1	0.26	0.09	0.26	47.4
Approach		1807	2.0	0.667	11.1	LOS B	6.9	49.1	0.26	0.09	0.26	48.2
All Vehicles		2976	2.1	0.667	10.5	LOS B	6.9	49.1	0.40	0.28	0.42	48.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

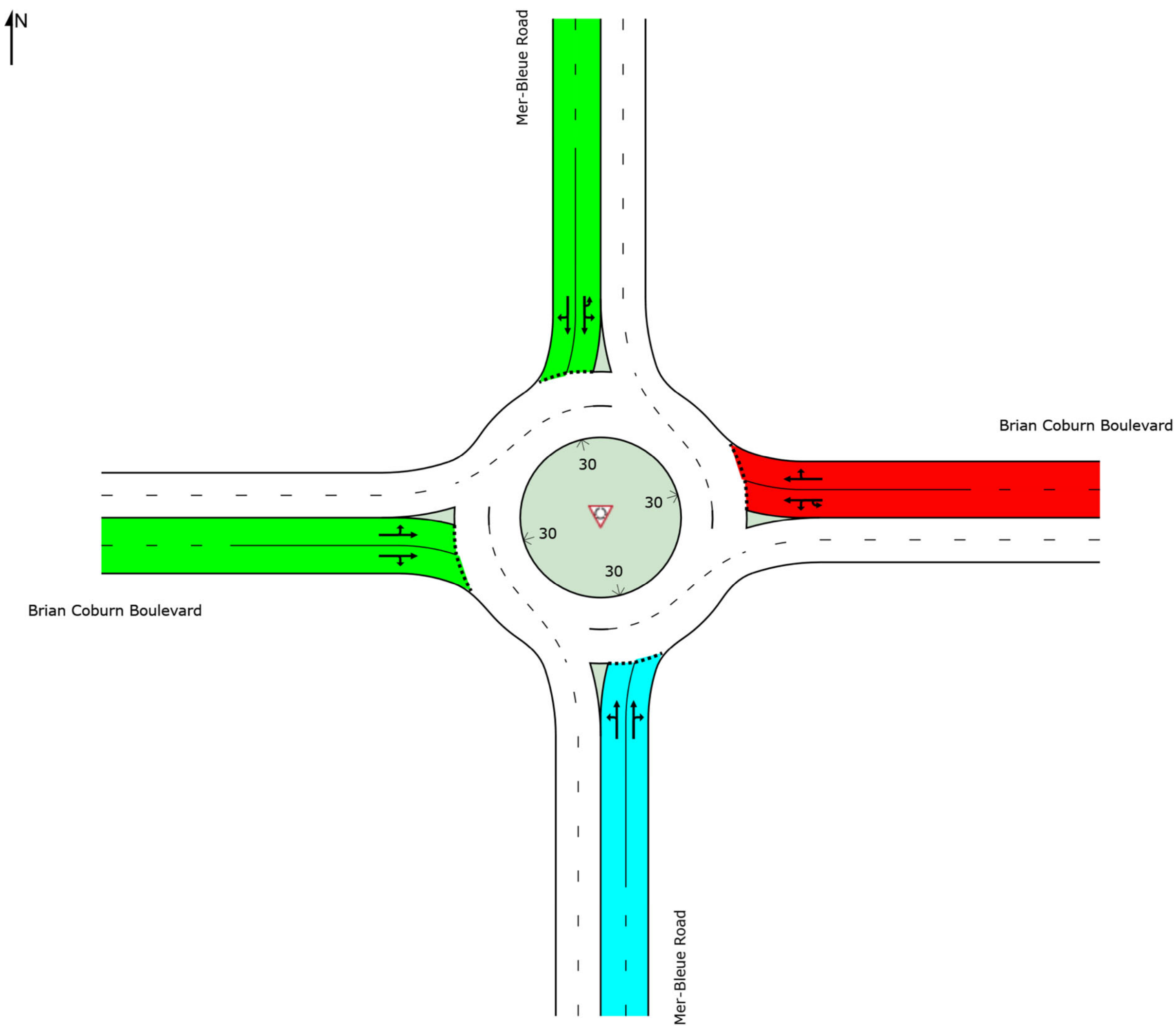
DEGREE OF SATURATION

Ratio of Demand Volume to Capacity, v/c ratio per lane

Site: 1 [Mer-Bleue & Brian Coburn 2029 FT AM - Widened]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
Degree of Saturation	0.61	1.29	0.56	0.27	1.29



Colour code based on Degree of Saturation

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Organisation: CGH TRANSPORTATION | Processed: March 23, 2021 12:14:02 PM
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DELAY (CONTROL)

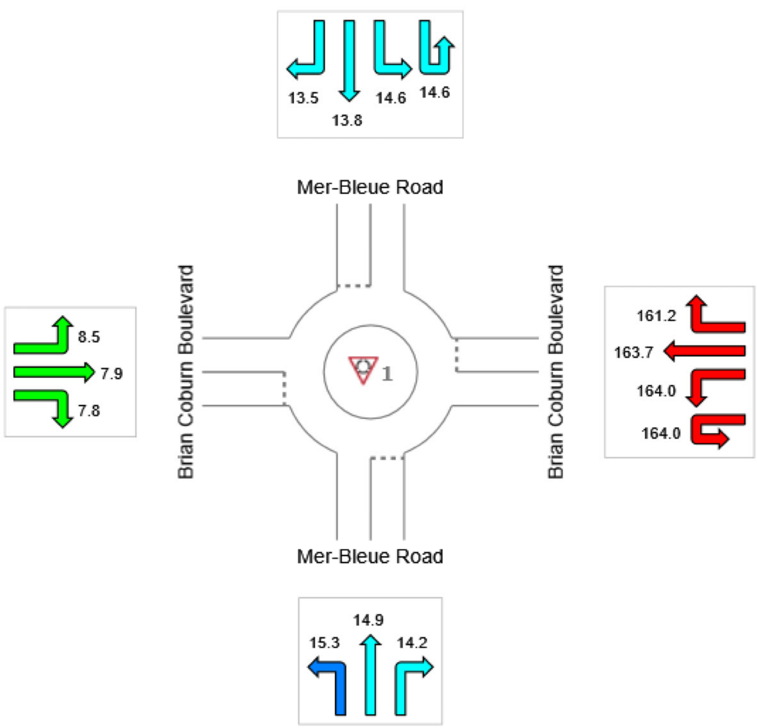
Average control delay per vehicle, or average pedestrian delay (seconds)

Site: 1 [Mer-Bleue & Brian Coburn 2029 FT AM - Widened]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Delay (Control)	14.7	162.5	14.0	8.1	77.5
LOS	B	F	B	A	F



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

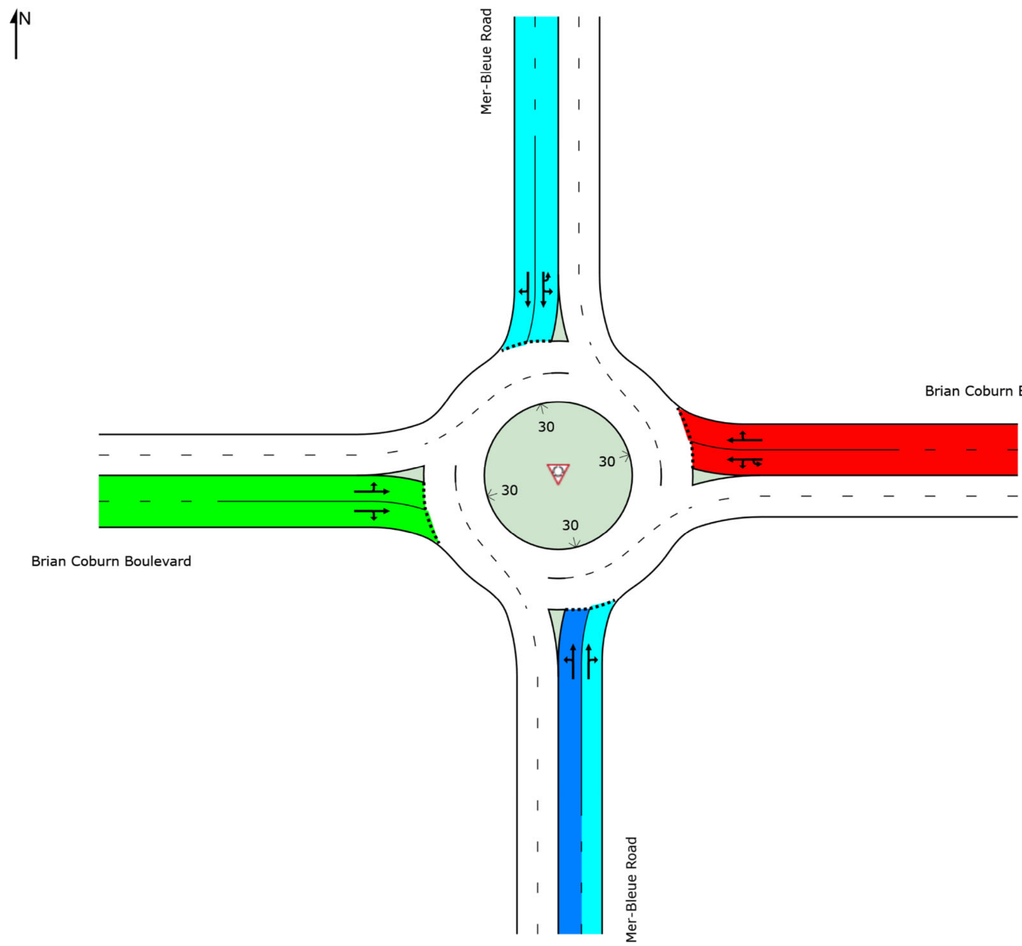
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 1 [Mer-Bleue & Brian Coburn 2029 FT AM - Widened]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	B	F	B	A	F



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

MOVEMENT SUMMARY

Site: 1 [Mer-Bleue & Brian Coburn 2029 FT AM - Widened]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Mer-Bleue Road												
1	L2	49	2.0	0.610	15.3	LOS C	4.9	34.9	0.76	0.96	1.32	46.2
2	T1	593	2.0	0.610	14.9	LOS B	5.0	35.7	0.76	0.95	1.31	46.2
3	R2	303	2.0	0.610	14.2	LOS B	5.0	35.7	0.75	0.94	1.30	40.1
Approach		945	2.0	0.610	14.7	LOS B	5.0	35.7	0.76	0.95	1.31	44.6
East: Brian Coburn Boulevard												
4u	U	4	2.0	1.289	164.0	LOS F	67.6	481.0	1.00	3.91	10.35	7.5
4	L2	114	2.0	1.289	164.0	LOS F	67.6	481.0	1.00	3.91	10.35	11.1
5	T1	742	2.0	1.289	163.7	LOS F	74.7	531.9	1.00	3.95	10.44	12.5
6	R2	759	2.0	1.289	161.2	LOS F	74.7	531.9	1.00	4.17	11.00	12.2
Approach		1619	2.0	1.289	162.5	LOS F	74.7	531.9	1.00	4.05	10.69	12.2
North: Mer-Bleue Road												
7u	U	63	2.0	0.559	14.6	LOS B	3.7	26.6	0.74	0.90	1.22	46.6
7	L2	213	2.0	0.559	14.6	LOS B	3.7	26.6	0.74	0.90	1.22	41.3
8	T1	333	2.0	0.559	13.8	LOS B	3.8	27.1	0.73	0.89	1.20	46.3
9	R2	189	2.0	0.559	13.5	LOS B	3.8	27.1	0.73	0.89	1.19	46.9
Approach		798	2.0	0.559	14.0	LOS B	3.8	27.1	0.74	0.89	1.20	45.3
West: Brian Coburn Boulevard												
10	L2	169	2.0	0.273	8.5	LOS A	1.1	7.6	0.62	0.62	0.62	48.8
11	T1	186	2.0	0.273	7.9	LOS A	1.1	7.6	0.60	0.60	0.60	48.6
12	R2	43	2.0	0.273	7.8	LOS A	1.1	7.6	0.60	0.60	0.60	49.7
Approach		398	2.0	0.273	8.1	LOS A	1.1	7.6	0.61	0.61	0.61	48.9
All Vehicles		3760	2.0	1.289	77.5	LOS F	74.7	531.9	0.84	2.24	5.25	22.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

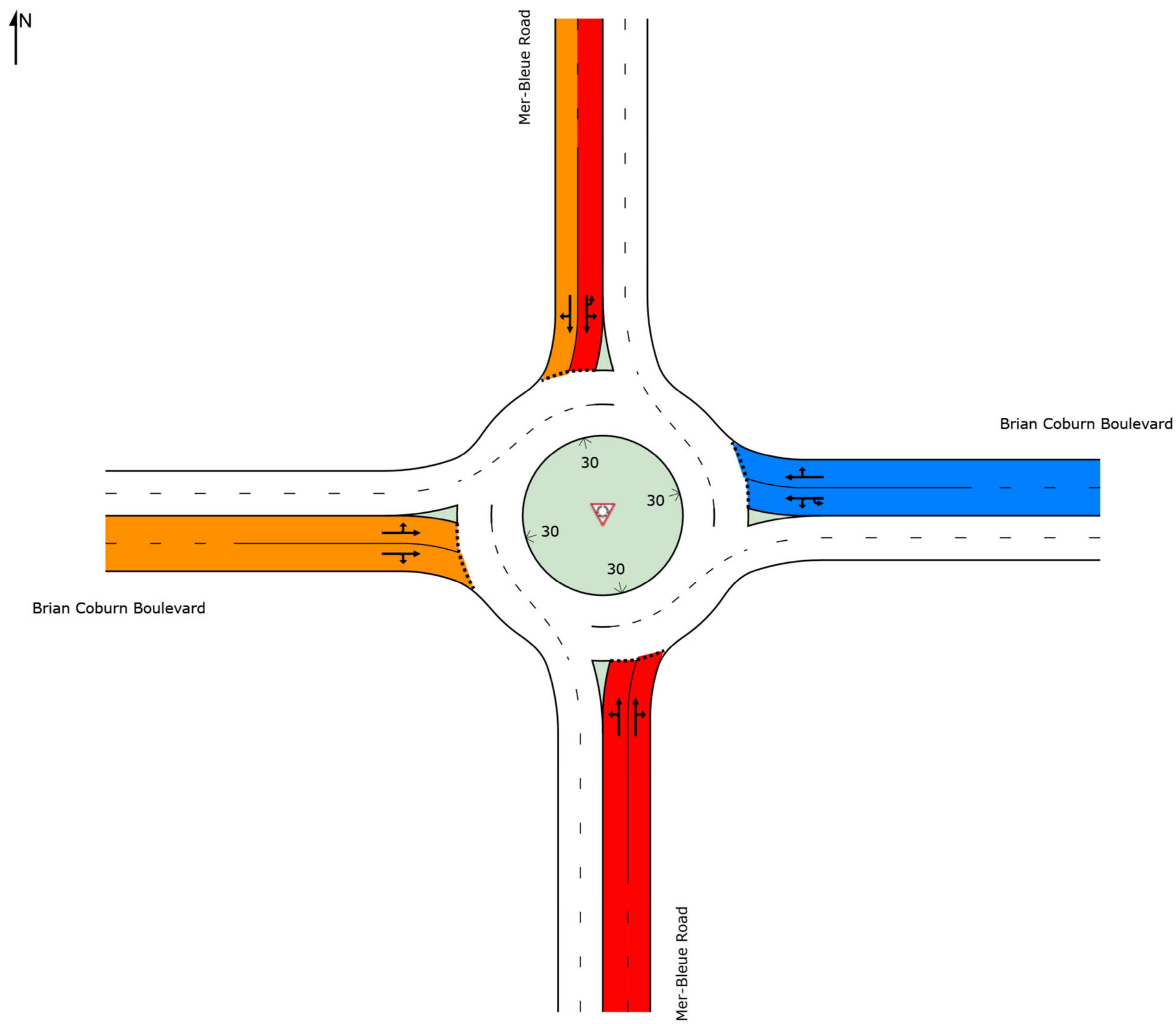
DEGREE OF SATURATION

Ratio of Demand Volume to Capacity, v/c ratio per lane

Site: 1 [Mer-Bleue & Brian Coburn 2029 FT PM - Widened]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
Degree of Saturation	1.40	0.75	1.17	0.97	1.40



Colour code based on Degree of Saturation

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DELAY (CONTROL)

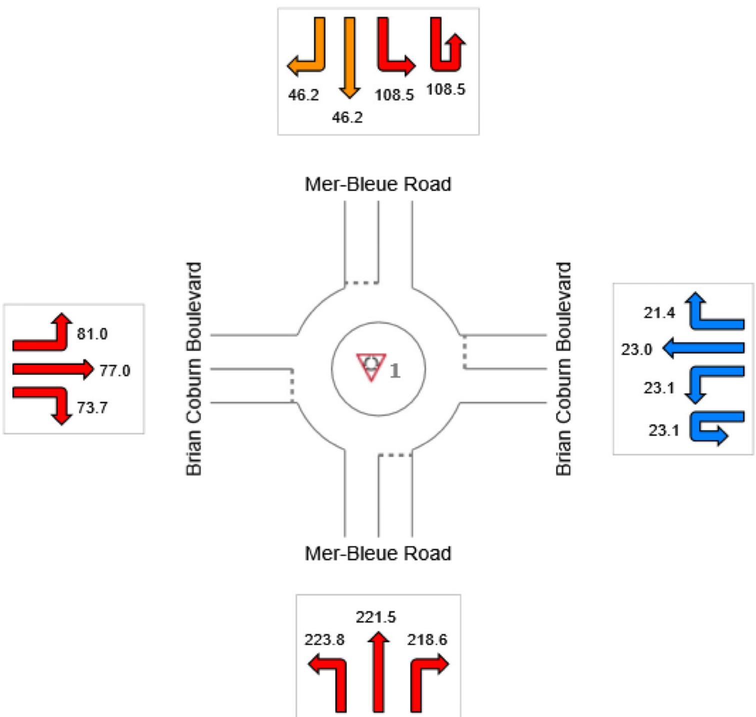
Average control delay per vehicle, or average pedestrian delay (seconds)

Site: 1 [Mer-Bleue & Brian Coburn 2029 FT PM - Widened]

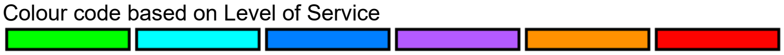
Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Delay (Control)	221.0	22.2	81.9	77.0	99.7
LOS	F	C	F	F	F



Colour code based on Level of Service



LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

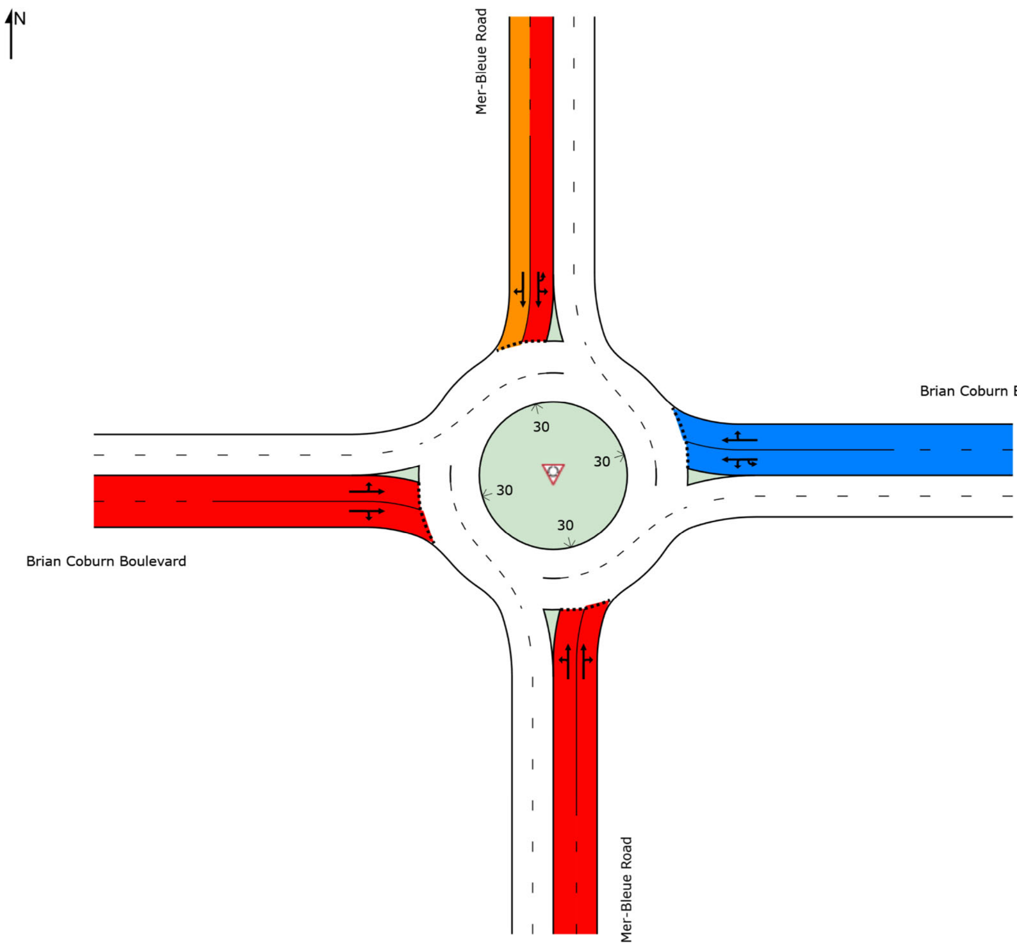
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 1 [Mer-Bleue & Brian Coburn 2029 FT PM - Widened]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	F	C	F	F	F



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

MOVEMENT SUMMARY

Site: 1 [Mer-Bleue & Brian Coburn 2029 FT PM - Widened]

Roundabout with 1 & 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-4
Roundabout Guide (TRB 2010) example number: A-3
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Mer-Bleue Road												
1	L2	73	2.0	1.396	223.8	LOS F	52.7	375.5	1.00	3.60	10.69	12.1
2	T1	746	2.0	1.396	221.5	LOS F	60.4	429.8	1.00	3.75	11.18	12.1
3	R2	255	2.0	1.396	218.6	LOS F	60.4	429.8	1.00	3.94	11.81	8.5
Approach		1074	2.0	1.396	221.0	LOS F	60.4	429.8	1.00	3.79	11.29	11.3
East: Brian Coburn Boulevard												
4u	U	13	2.0	0.754	23.1	LOS C	8.0	57.2	0.86	1.21	1.89	25.7
4	L2	216	2.0	0.754	23.1	LOS C	8.0	57.2	0.86	1.21	1.89	35.3
5	T1	309	2.0	0.754	23.0	LOS C	8.4	59.5	0.86	1.21	1.89	37.3
6	R2	557	2.0	0.754	21.4	LOS C	8.4	59.5	0.86	1.21	1.88	37.4
Approach		1095	2.0	0.754	22.2	LOS C	8.4	59.5	0.86	1.21	1.88	36.8
North: Mer-Bleue Road												
7u	U	57	2.0	1.170	108.5	LOS F	68.4	487.1	1.00	3.52	7.94	21.7
7	L2	928	2.0	1.170	108.5	LOS F	68.4	487.1	1.00	3.52	7.94	16.9
8	T1	514	2.0	0.959	46.2	LOS E	24.9	177.0	1.00	1.96	3.70	32.5
9	R2	222	2.0	0.959	46.2	LOS E	24.9	177.0	1.00	1.96	3.70	33.3
Approach		1721	2.0	1.170	81.9	LOS F	68.4	487.1	1.00	2.85	6.13	22.3
West: Brian Coburn Boulevard												
10	L2	68	2.0	0.966	81.0	LOS F	9.9	70.6	0.99	1.68	3.65	25.9
11	T1	500	2.0	0.966	77.0	LOS F	10.8	76.8	0.98	1.70	3.73	21.3
12	R2	73	2.0	0.966	73.7	LOS F	10.8	76.8	0.98	1.73	3.80	25.3
Approach		641	2.0	0.966	77.0	LOS F	10.8	76.8	0.98	1.70	3.73	22.3
All Vehicles		4531	2.0	1.396	99.7	LOS F	68.4	487.1	0.96	2.51	5.99	19.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.