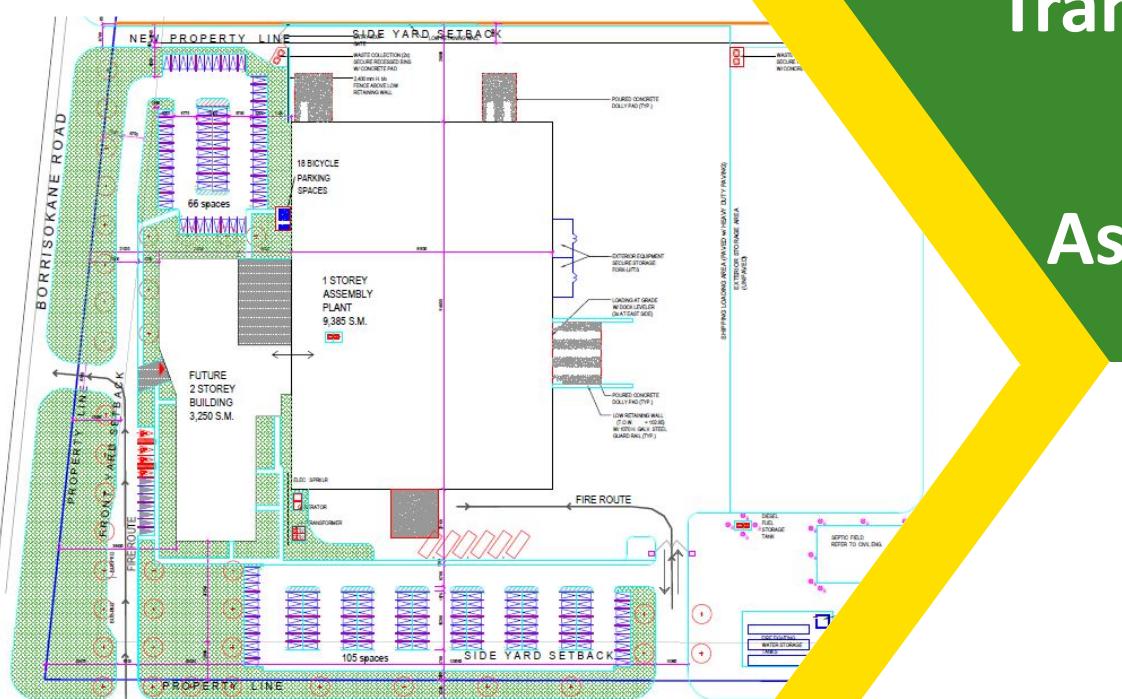


Caivan Communities

3713 Borrisokane Road: ABIC Facility

Transportation Impact Assessment



3713 Borrisokane Road- ABIC Manufacturing Facility

Transportation Impact Assessment

Step 1 Screening Report

Step 2 Scoping Report

Step 3 Forecasting Report

Step 4 Strategy Report

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1 Screening

This study has been prepared according to the City of Ottawa's 2017 Transportation Impact Assessment (TIA) Guidelines. Accordingly, a Step 1 Screening Form has been prepared and is included as Appendix A, along with the Certification Form for 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 3713 Borrisokane Road, is currently an old quarry property, partially within the Barrhaven South Urban Expansion Area (UEA). The site is in an area that is currently zoned as a Mineral Extraction Operation Zone (ME2). The current development application would modify the zoning to allow for industrial uses on the western portion of the property. The eastern portion of the land which is within the Urban Expansion Boundary will not be included in this TIA but is the subject of an ongoing TIA for a residential development. The proposed industrial development will consist of approximately 3,250 square metres of general office space and 9,385 square metres of industrial buildings, approximately 171 regular parking spaces, seven visitor parking spaces and eighteen bicycle parking spots. Four site accesses are planned for the proposed development. Two accesses to the development lands will be provided to the west of the proposed development onto Borrisokane Road approximately 630 metres (Site Access #1) and 735 metres (Site Access #2) south of Cambrian Road. The other two site accesses will be provided to the south of the proposed development onto a future roadway. These accesses will be located approximately 30 metres (Access #3) and 200 metres (Site Access #4) east of Borrisokane Road. Site Access #1 is designated for truck use only and is expected to operate as a on-way, right-in only access. Site Access #2 is expected to operate as a right-in right-out access. Both Site Access #3 and #4 are expected to operate as full-movement accesses. The anticipated full build-out and occupancy horizon is 2022. Figure 1 illustrates the Study Area Context. Figure 2 illustrates the proposed concept plan.

Figure 1: Area Context Plan

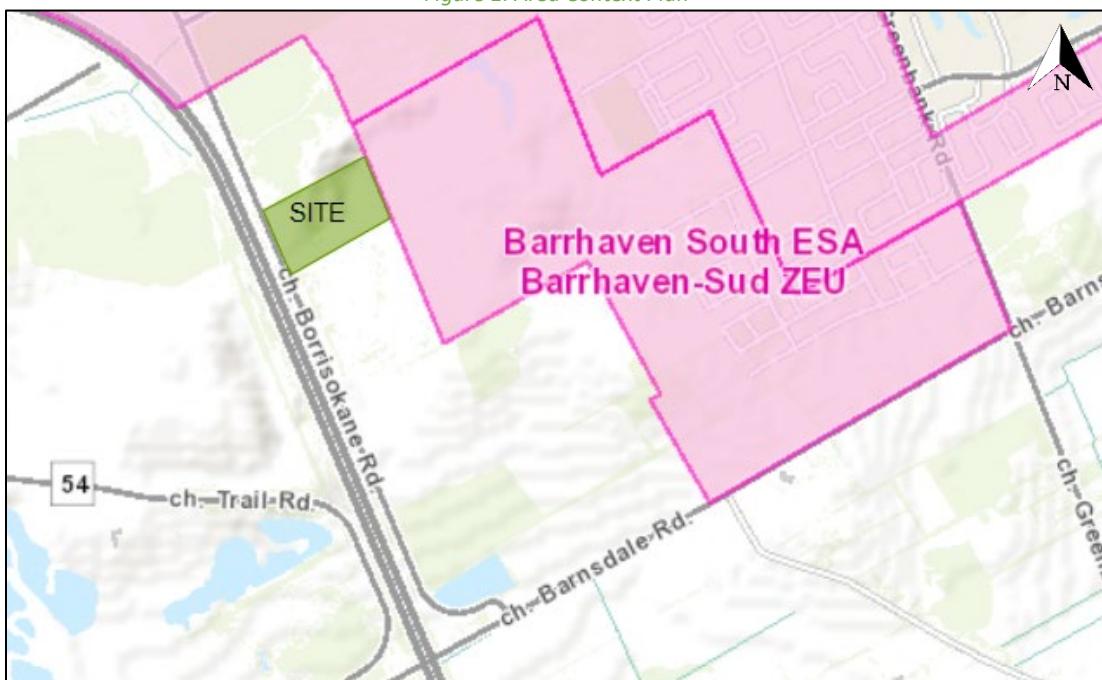
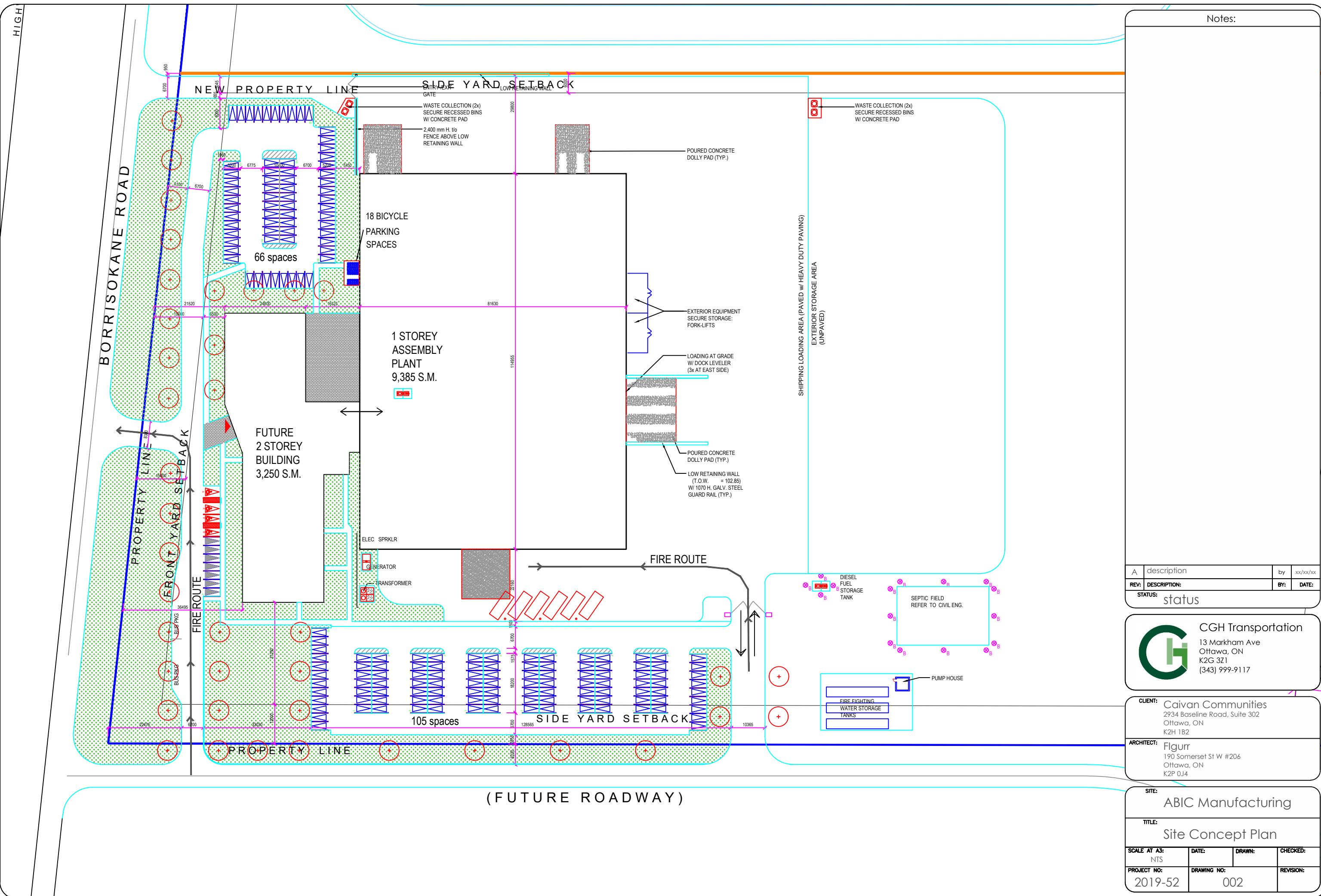


Figure 2: Concept Plan



2.2 Existing Conditions

2.2.1 Area Road Network

Borrisokane Road

Borrisokane Road is a Ministry of Ontario road with a two-lane cross-section and a posted speed limit of 80 km/h along the frontage of the site. Gravel shoulders are present on both sides of the road. No sidewalks are provided. North of Cambrian Road, Borrisokane Road is an Arterial Road, and south of Cambrian Road it is a Collector Road. Borrisokane is part of the Veterans Memorial Highway (Highway 416) corridor to the south of Cambrian Road and has a measured 37.5 metre right of way to the north of Cambrian Road.

Cambrian Road

Cambrian Road is a City of Ottawa collector road with a two-lane cross-section and a posted speed limit of 70 km/h for approximately 700 metres east of Borrisokane Road and 50 km/h in the remaining Study Area. To the west of Seeley's Bay Street, Cambrian Road has gravel shoulders and no sidewalks. To the east of Seeley's Bay Street, Cambrian Road has curbs and gutters as well as sidewalks. The Ottawa Official Plan reserves a 37.5 metre right-of-way from Cedarview (now Borrisokane Road) to Jockvale Road.

Barnsdale Road

Barnsdale Road is a City of Ottawa arterial road with a two-lane cross-section and a posted speed limit of 80 km/h. Gravel shoulders are present on both sides of the road and no sidewalks are provided. The City of Ottawa Official Plan reserves a 40-metre right-of-way within the Study Area.

Veterans Memorial Highway (Highway 416)

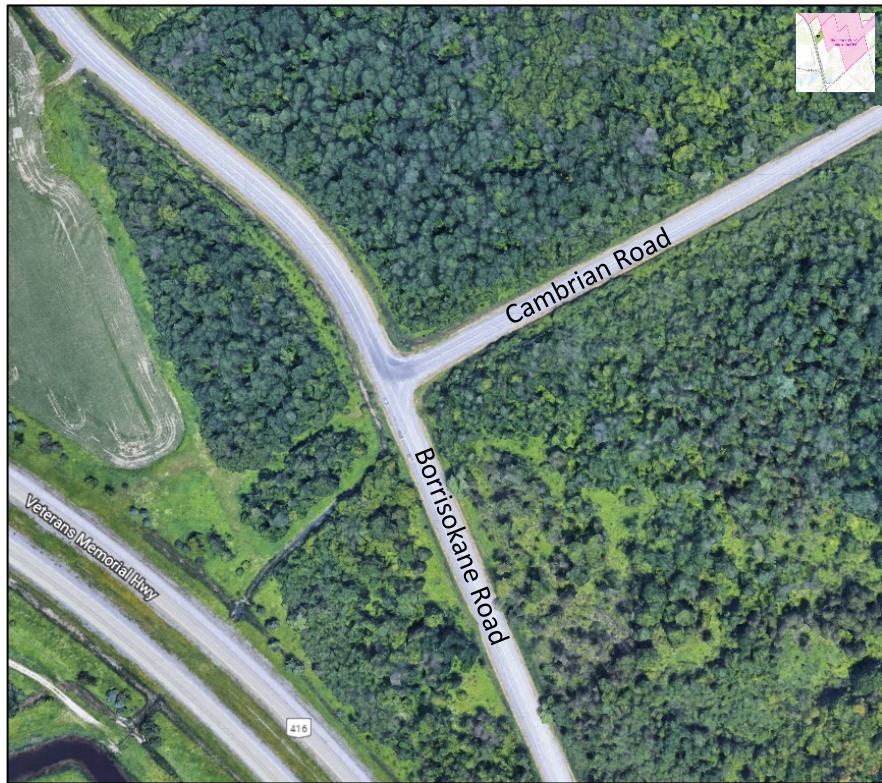
Highway 416 is a Ministry of Ontario freeway with a four-lane separated cross-section and a posted speed limit of 100 km/h. Paved shoulders are present on both sides of the road. The measured right-of-way is 130 metres.

2.2.2 Existing Intersections

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

Borrisokane Road / Cambrian Road

Borrisokane Road and Cambrian Road is an unsignalized t-intersection. The westbound approach is stop-controlled and consists of a shared left-turn/right-turn lane. The northbound approach consists of a shared through/right-turn lane and the southbound approach consists of a shared left-turn/through lane. No turn restrictions are noted.



Borrisokane Road / Barnsdale Road

Borrisokane Road and Barnsdale Road is an unsignalized t-intersection. The southbound approach is stop-controlled and consists of a shared left-turn/right-turn lane. The eastbound approach consists of a shared left-turn / through lane and the westbound approach consists of a shared right-turn/through lane. No turn restrictions are noted.



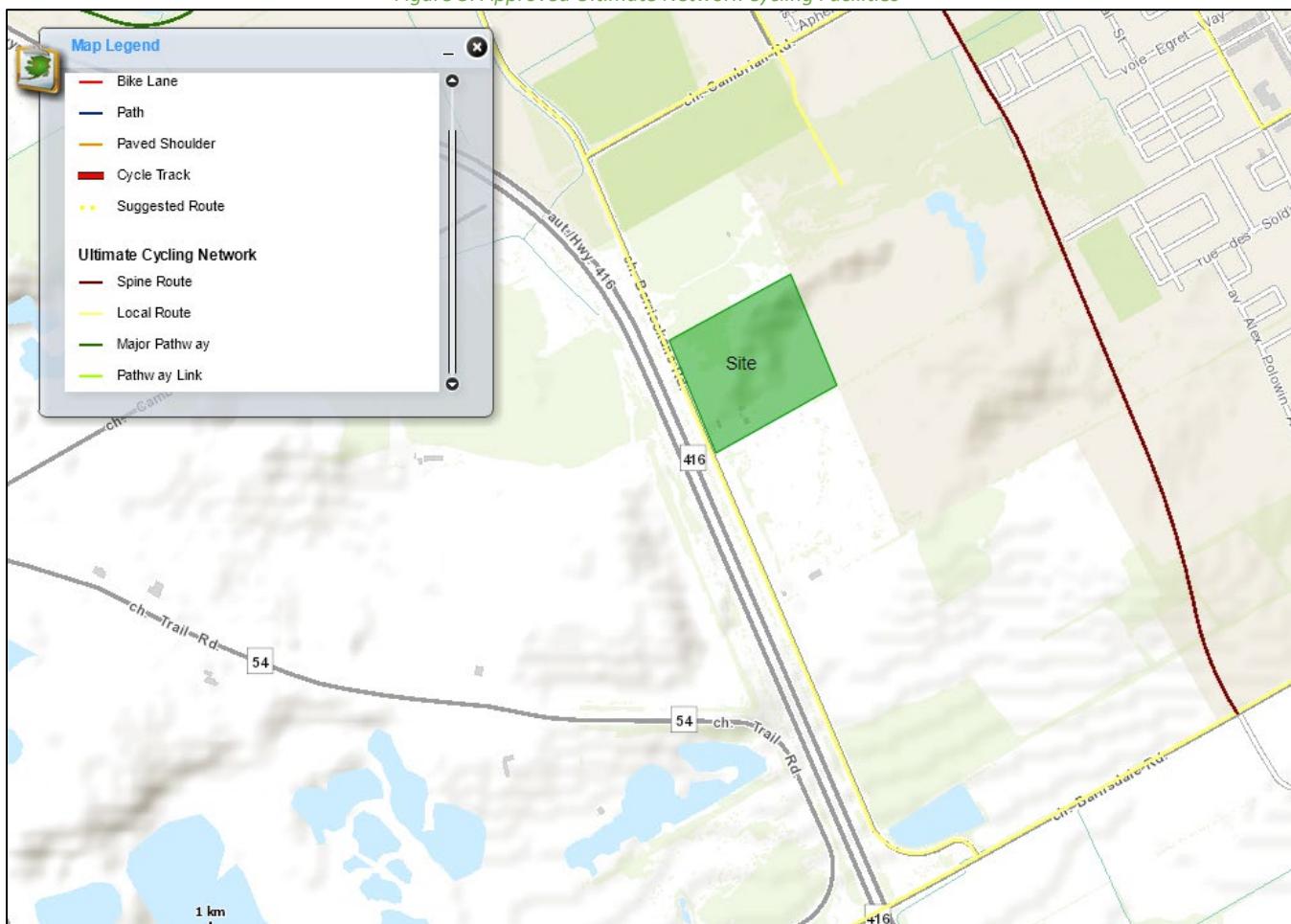
2.2.3 Existing Driveways

There are no existing driveways within 200 metres of the proposed site accesses.

2.2.4 Cycling and Pedestrian Facilities

No cycling facilities or pedestrian facilities currently exist along Borrisokane Road, Barnsdale Road, or Cambrian Road. Approved cycling infrastructure as part of The City of Ottawa's Ultimate Cycling Network includes plans for local cycling routes along Cambrian Road, Borrisokane Road and Barnsdale Road as seen in Figure 3.

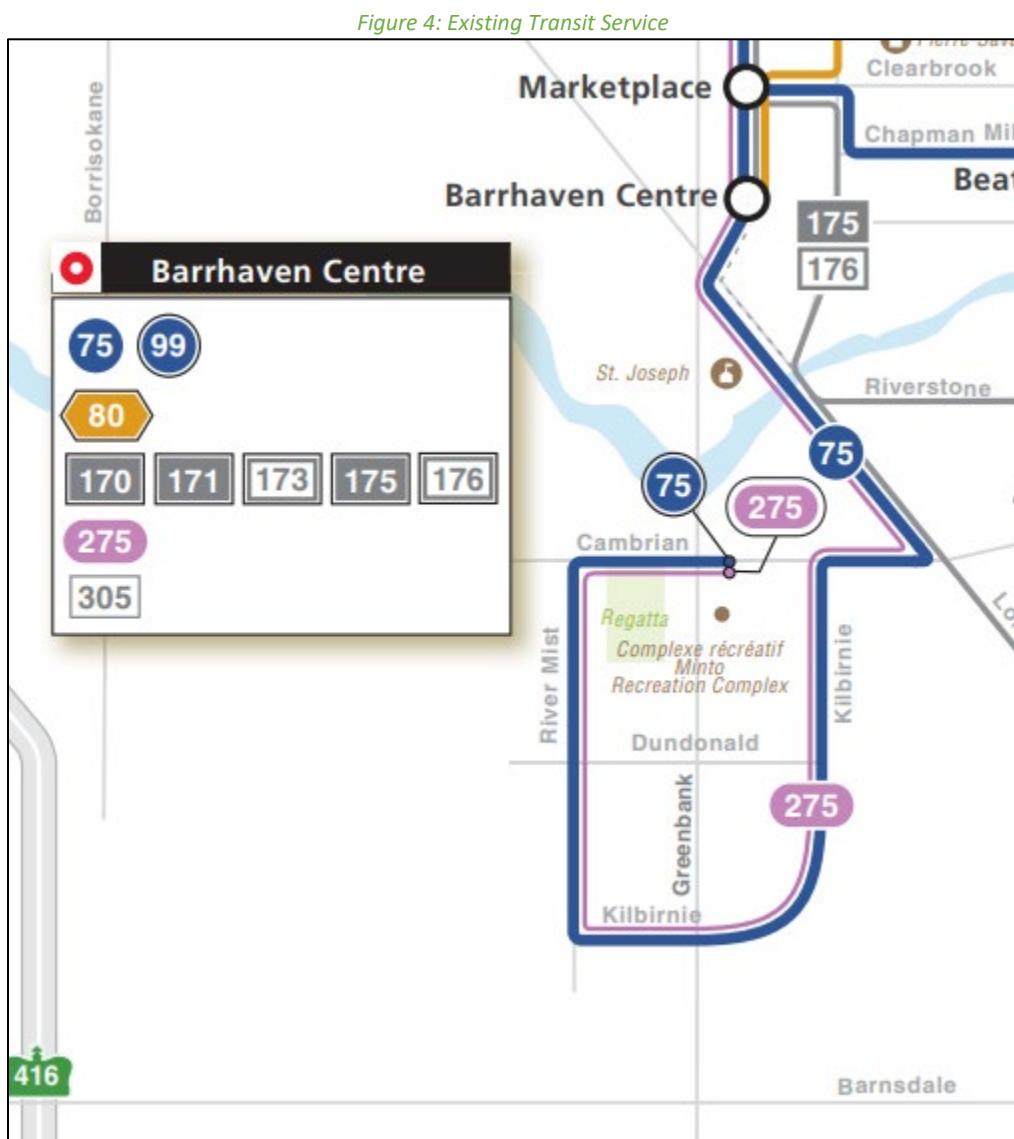
Figure 3: Approved Ultimate Network Cycling Facilities



Source: <http://maps.ottawa.ca/geoOttawa/> Accessed: October 9, 2019

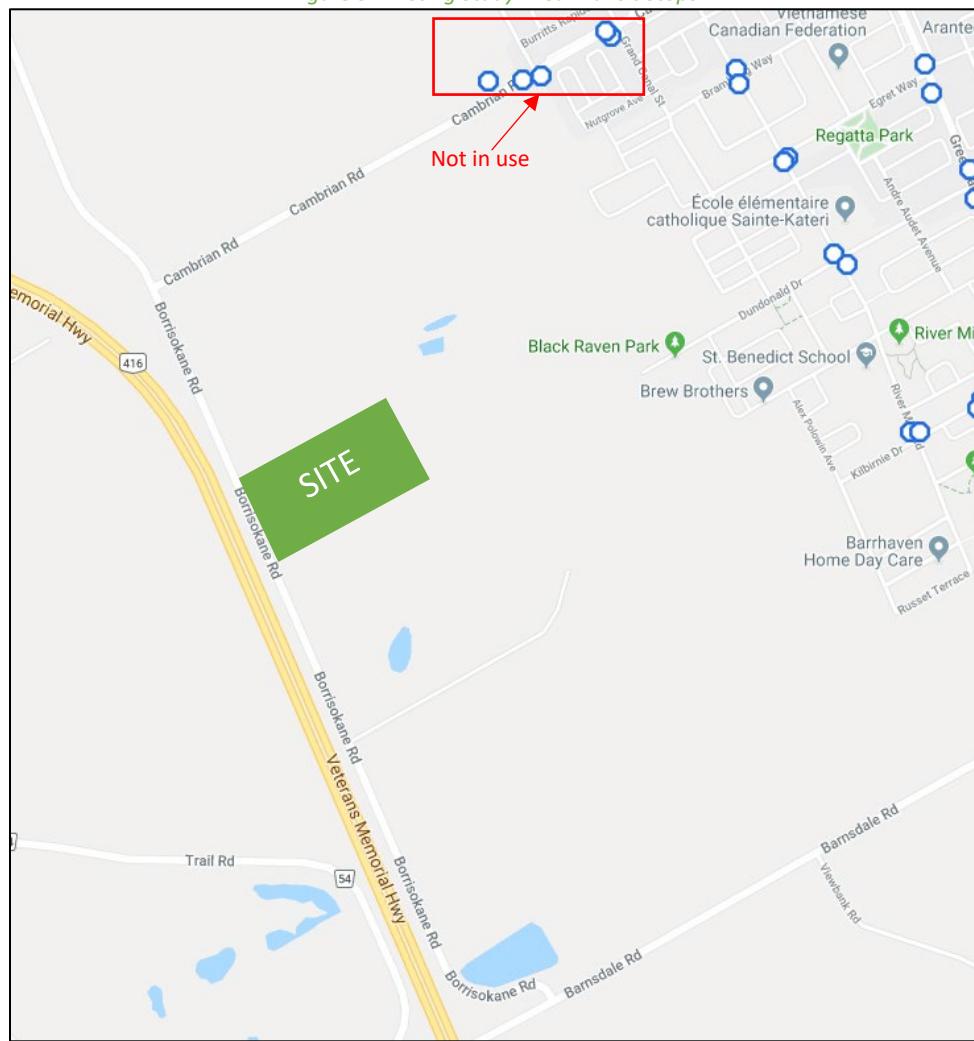
2.2.5 Existing Transit

There is no existing transit service along the boundary roads. East of the subject development, Route 75 and Route 275 run along River Mist Road and Cambrian Road. Figure 4 illustrates the existing transit service and Figure 5 illustrates the existing transit stops.



Source: <http://www.octranspo.com/> Accessed: October 10, 2019

Figure 5: Existing Study Area Transit Stops



Source: <http://plan.octranspo.com/plan> Accessed: October 10, 2019

2.2.6 Existing Area Traffic Management Measures

There are no existing area traffic management measures within the Study Area.

2.2.7 Existing Peak Hour Travel Demand

Turning movement counts for the existing Study Area intersections were acquired from the City of Ottawa as well as from an excerpt from the Meadows Phase 5 TIA by others. Table 1 summarizes the intersection count dates and sources.

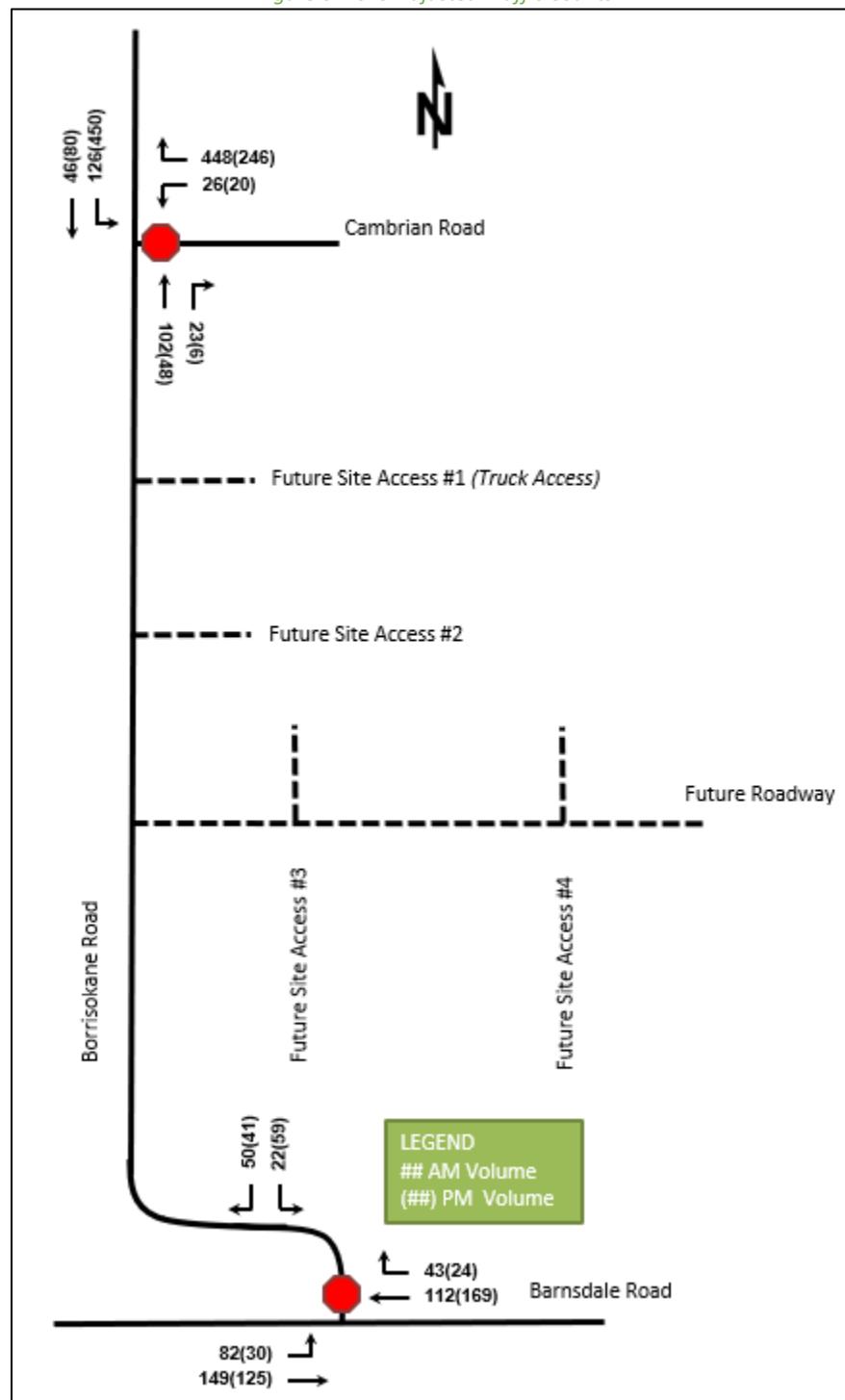
Table 1: Intersection Count Date

Intersection	Count Date	Data Source
Borrisokane Road / Cambrian Road	Tuesday, February 15, 2018	Meadows Phase 5 TIA
Borrisokane Road / Barnsdale Road	Thursday, January 10, 2019	City of Ottawa

Figure 6 illustrates the 2019 existing horizon traffic volumes. As shown above, the turning movement count data has been collected over different years. To reflect a constant horizon, a 2% background growth rate has been used which is consistent with surrounding development Traffic Impact Assessments such as 3285 Borrisokane Road Commercial Development Transportation Impact Study (Parsons, 2018), 3640 Greenbank Road Transportation

Impact Assessment (CGH Transportation, 2018), Half Moon Bay North Apartment Block Transportation Impact Assessment (Stantec, 2018), The Meadows Phase 5 Transportation Impact Assessment Report (IBI Group 2018), and Quinn's Pointe 2 Transportation Impact Assessment (Stantec, 2018). Additionally, volume balancing has been applied within the Study Area and site-traffic generated by adjacent developments built-out during 2019 have been considered. Detailed turning movement count data is included in Appendix B.

Figure 6: 2019 Adjusted Traffic Counts



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. Specific attention has been directed towards the Study Area intersections and road segments. Table 2 summarizes the total collisions for the intersections of interest. Collision data is included in Appendix C. As the segment of Borrisokane Road between Strandherd Drive and Barnsdale Road was named Cedarview Road prior to September 2016, all references in Appendix C to Cedarview Road should be taken to mean Borrisokane Road. For consistency within the body of this document, all references within this section to Cedarview Road have been changed to Borrisokane Road.

Table 2: Summary of Collision Locations

Intersections / Segments	Number	%
	42	100%
Barnsdale Rd btwn Trail Rd & Borrisokane Rd	1	2.38%
Borrisokane Rd btwn Cambrian Rd & Strandherd Dr	20	47.62%
Cambrian Rd btwn Borrisokane Rd & Grand Canal St	3	7.15%
Borrisokane Rd btwn Cambrian Rd & Barnsdale Rd	3	7.15%
Barnsdale Rd at Borrisokane Rd	5	11.90%
Cambrian Rd at Borrisokane Rd	10	23.80

Overall, no fatal collisions were documented in the Study Area and no collisions were noted involving pedestrians or cyclists.

The road segment of Barnsdale Road between Trail Road and Borrisokane Road experienced one collision between 2014-2018. The collision resulted in a non-fatal injury. The collision's initial impact type was recorded as SMV Other. Weather/road conditions are unknown for this collision. Table 3 summarizes the collisions at the road segment of Barnsdale Road between Trail Road and Borrisokane Road.

Table 3: Barnsdale Rd btwn Trail Rd and Borrisokane Rd Collision Summary

	Number	%
Total Collisions	1	100%
Classification	Fatality	0.00%
	Non-Fatal Injury	100.00%
	Property Damage Only	0.00%
Initial Impact Type	Angle	0.00%
	Rear end	0.00%
	Sideswipe	0.00%
	Turning Movement	0.00%
	SMV Other	100.00%
	Other	0.00%
Road Surface Condition	Dry	0.00%
	Wet	0.00%
	Loose Snow	0.00%
	Slush	0.00%
	Packed Snow	0.00%
	Ice	0.00%
Pedestrians Involved	0	0.00%
Cyclists Involved	0	0.00%

The road segment of Borrisokane Road between Cambrian Road and Strandherd Drive experienced 20 collisions between 2014-2018. Of these collisions, five resulted in non-fatal injuries and 15 resulted in property damage

only. The initial impact types are varied between the rear end, other and SMV other initial impact categories with 5%, 5% and 90% of all collisions respectively. Weather/road conditions are considered a contributing factor for 45% of collisions on this road segment. Table 4 summarizes the collisions at the road segment of Borrisokane Road between Cambrian Road and Strandherd Drive.

Table 4: Borrisokane Rd btwn Cambrian Rd & Strandherd Dr

		Number	%
Total Collisions		20	100%
Classification	Fatality	0	0.00%
	Non-Fatal Injury	5	25.00%
	Property Damage Only	15	75.00%
Initial Impact Type	Angle	0	0.00%
	Rear end	1	5.00%
	Sideswipe	0	0.00%
	Turning Movement	0	0.00%
	SMV Other	18	90.00%
	Other	1	5.00%
Road Surface Condition	Dry	11	55.00%
	Wet	2	10.00%
	Loose Snow	3	15.00%
	Slush	0	0.00%
	Packed Snow	1	5.00%
	Ice	3	15.00%
Pedestrians Involved		0	0.00%
Cyclists Involved		0	0.00%

The road segment of Cambrian Road between Borrisokane Road and Grand Canal Street experienced three collisions between 2014-2018. Two of these collisions resulted in non-fatal injuries and one resulted in property damage only. The collisions have been classified as approaching, SMV unattended vehicle and SMV other initial impact types. Weather/road conditions were considered a contributing factor for 33.33% of collisions on this road segment. Table 5 summarizes the collisions at the road segment of Cambrian Road between Borrisokane Road and Grand Canal Street.

Table 5: Cambrian Rd btwn Borrisokane Rd & Grand Canal St

		Number	%
Total Collisions		3	100%
Classification	Fatality	0	0.00%
	Non-Fatal Injury	2	66.67%
	Property Damage Only	1	33.33%
Initial Impact Type	Approaching	1	33.33%
	Angle	0	0.00%
	Rear end	0	0.00%
	Sideswipe	0	0.00%
	Turning Movement	0	0.00%
	SMV Unattended Vehicle	1	33.33%
	SMV Other	1	33.33%
	Other	0	0.00%
Road Surface Condition	Dry	2	66.67%

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	Wet	0	0.00%
	Loose Snow	1	33.33%
	Slush	0	0.00%
	Packed Snow	0	0.00%
	Ice	0	0.00%
Pedestrians Involved		0	0.00%
Cyclists Involved		0	0.00%

The road segment of Borrisokane Road between Cambrian Road and Barnsdale Road experienced three collision between 2014-2018. All three of these collisions resulted in property damage only. The collisions have all been classified as SMV other initial impact types. Weather/road conditions were considered a contributing factor for 66.67% of collisions on this road segment. Table 6 summarizes the collisions at the road segment of Borrisokane Road between Cambrian Road and Barnsdale Road.

Table 6:Borrisokane Rd btwn Cambrian Rd & Barnsdale Rd Collision Summary

		Number	%
	Total Collisions	3	100%
Classification	Fatality	0	0.00%
	Non-Fatal Injury	0	0.00%
	Property Damage Only	3	100.00%
Initial Impact Type	Approaching	0	33.33%
	Angle	0	0.00%
	Rear end	0	0.00%
	Sideswipe	0	0.00%
	Turning Movement	0	0.00%
	SMV Unattended Vehicle	0	0.00%
	SMV Other	3	100.00%
	Other	0	0.00%
Road Surface Condition	Dry	2	66.67%
	Wet	1	33.33%
	Loose Snow	0	0.00%
	Slush	0	0.00%
	Packed Snow	0	0.00%
	Ice	0	0.00%
Pedestrians Involved		0	0.00%
Cyclists Involved		0	0.00%

The intersection of Borrisokane Road and Barnsdale Road experienced four collisions between 2014-2018. Two collisions resulted in non-fatal injuries while the other two collisions resulted in property damage only. The initial impact types are varied between angle and rear end categories with 75% and 25% of all collisions respectively. Weather/road conditions were considered a contributing factor for 50% of collisions at this intersection. Table 7 summarizes the collisions at the intersection of Borrisokane Road and Barnsdale Road.

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Table 7: Borrisokane Rd and Barnsdale Rd Collision Summary

		Number	%
Total Collisions		4	100%
Classification	Fatality	0	0.00%
	Non-Fatal Injury	2	50.00%
	Property Damage Only	2	50.00%
Initial Impact Type	Approaching	0	0.00%
	Angle	3	75.00%
	Rear end	1	25.00%
	Sideswipe	0	0.00%
	Turning Movement	0	20.00%
	SMV Unattended Vehicle	0	0.00%
	SMV Other	0	0.00%
	Other	0	0.00%
Road Surface Condition	Dry	3	50.00%
	Wet	1	25.00%
	Loose Snow	1	25.00%
	Slush	0	0.00%
	Packed Snow	0	0.00%
	Ice	0	0.00%
Pedestrians Involved		0	0.00%
Cyclists Involved		0	0.00%

The intersection of Cambrian Road and Borrisokane Road experienced ten collisions between 2014-2018. Three of these collisions resulted in non-fatal injuries and the other 7 resulted in property damage only. The collisions have all been classified as rear end and SMV other initial impact types with 40% and 60% of all collisions respectively. Weather/road conditions were considered a contributing factor for 40% of collisions at this intersection. Table 8 summarizes the collisions at the intersection of Cambrian Road and Borrisokane Road.

Table 8: Cambrian Rd and Borrisokane Rd Collision Summary

		Number	%
Total Collisions		10	100%
Classification	Fatality	0	0.00%
	Non-Fatal Injury	3	30.00%
	Property Damage Only	7	70.00%
Initial Impact Type	Approaching	0	0.00%
	Angle	0	0.00%
	Rear end	4	40.00%
	Sideswipe	0	0.00%
	Turning Movement	0	0.00%
	SMV Unattended Vehicle	0	0.00%
	SMV Other	6	60.00%
	Other	0	0.00%
Road Surface Condition	Dry	6	60.00%
	Wet	1	10.00%
	Loose Snow	0	0.00%
	Slush	0	0.00%
	Packed Snow	0	0.00%
	Ice	2	20.00%
	Loose sand or gravel	1	10.00%
Pedestrians Involved		0	0.00%
Cyclists Involved		0	0.00%

2.3 Planned Conditions

2.3.1 Changes to the Area Transportation Network

The planned development is subject to policies outlined in the City of Ottawa's Master Plan and City of Ottawa's Official Plan. Additionally, Development Charges (DC) outlined in the 2019 City of Ottawa Intersection Control Measures By-Law will impact the planned development.

Expected changes to the subject development as outlined in the City of Ottawa's Master Plan and City of Ottawa's Official Plan are:

- The widening of Barnsdale Road from two to four lanes between Highway 416 and Prince of Wales Drive. This widening is shown in the 2031 Network Concept Plan Map, however it is not shown on the 2031 Affordable Network Map.
- A new interchange on Barnsdale Road east of Highway 416 is also shown in the 2031 Network Concept Plan Map, however it is not shown on the 2031 Affordable Network Map.
- Local cycling routes along Cambrian Road, Borrisokane Road and Barnsdale Road within the Study Area as part of the City of Ottawa's Ultimate Cycling Network.

Intersection Control Measures outlined in the 2019 Ottawa Development Charges By-Law are expected to be implemented at the following intersections:

- Cambrian Road and Borrisokane Road at a gross project cost of \$1,300,000 (2020-2031)
- Cambrian Road and Apolune Way at a gross project cost of \$1,300,000 (2020-2031)

2.3.2 Other Study Area Developments

The Meadows Phase 4

Northeast of the proposed development is Phase 4 of the Meadows Tamarack Development and is expected to be built out during 2019. Phase 4 will have 136 townhouse units and 50 single family units. This development is anticipated to produce 142 two-way AM peak period auto trips and 171 two-way PM peak period auto trips. (IBI 2018)

The Meadows Phase 5

North of the proposed development is Phase 5 of the Tamarack Development of the Meadows and is expected to be built-out during 2022. Phase 5 will have 221 townhouse units and 125 single family units. This development is anticipated to produce 294 two-way AM peak period auto trips and 334 two-way PM peak period auto trips. (IBI 2018)

3387 Borrisokane Road

North of Cambrian Road is the Glenview Development of 3387 Borrisokane Road which is expected to be built-out during 2022. The development is expected to have 179 single family units and 109 townhouses. The development is anticipated to produce 137 two-way AM peak period auto trips and 174 two-way PM peak period auto trips. (Stantec 2016)

3809 Borrisokane Road

South of the proposed development is the 3809 Borrisokane Road development which is expected to be built-out during 2025. This development will include 590 residential units, split between townhouse units and detached home units. The eastern parcel of 3713 Borrisokane Road will include a connection to 3809 Borrisokane Road and both developments will share an access to Borrisokane Road as part of an interim phase only. Approximately 300 units will use this connection prior to the full build-out in 2025 at which time the connection to Borrisokane Road will be closed. This development is expected to produce 401 two-way AM peak period auto trips and 457 two-way PM peak period auto trips. (CGH 2019).

Half Moon Bay West

North of the proposed development is the Mattamy Development of Half Moon Bay West which is expected to be built-out during 2024. This development will include 552 single family homes and 464 townhomes. Construction has not yet commenced on this subdivision. This development is expected to produce 786 two-way AM peak period auto trips and 1193 two-way PM peak period auto trips. (Stantec 2016).

Citi Gate's Highway 416 Employment Lands

North of the proposed development is the Citi Gate Corporate Campus. This development will include 32,516 square metres allocated towards a shopping centre, 165,600 square metres allocated towards business parks and 105,000 square metres allocated towards car dealerships. The full build-out year is 2029 with an interim development year of 2019. This development is expected to produce 4267 two-way AM peak period auto trips and 4848 two-way PM peak period auto trips. (Novatech 2012).

Mattamy's Half Moon Bay North Phase 9 (Apartment Block)

North of the proposed development is the Half Moon Bay North Phase 9 development which is expected to be built-out during 2019. This development will consist of 60 stacked townhouses. This development is expected to produce 74 two-way AM peak period auto trips and 80 two-way PM peak period auto trips. (Stantec 2018).

3285 Borrisokane Road

North of the proposed development is 3285 Borrisokane Road which is expected to be built-out during 2020. This development will include 125 single family homes and 75 townhouses. This development is expected to produce 129 two-way AM peak period auto trips and 146 two-way PM peak period auto trips. (Parsons 2018).

3713 Borrisokane Road-Residential Component

Directly east of the proposed development is the residential component of 3713 Borrisokane Road. The development will include approximately 123 detached homes and 439 townhouses and is expected to be built-out during 2024. This development is expected to produce 349 two-way AM peak period auto trips and 407 two-way PM peak period auto trips. (CGH 2020)

Barrhaven South Expansion Lands (Quinn's Pointe 2)

To the southeast of the proposed development is the Minto Development of Quinn's Pointe 2. This development will include 536 single-family dwelling units, 493 townhomes, 100 apartment units, and two elementary schools, anticipated over 2 phases of construction for the horizon years of 2022 and 2025. A total of 749 two-way AM peak period auto trips and 813 two-way PM peak period auto trips are expected from this development (Stantec 2018).

Half Moon Bay South Phase 5

Southeast of the proposed development is the Mattamy Development of Half Moon Bay South which is expected to be built-out during 2020. The development will consist of 164 single detached home units and 97 townhouse units. This development is expected to produce 180 two-way AM peak period auto trips and 207 two-way PM peak period auto trips. (CGH 2019)

Mattamy's Half Moon Bay North Phases 7,8

North of the proposed development is the Half Moon Bay North Phase 7 and 8 development and is expected to be built-out during 2019. The development will consist of 471 residential units. No TIA is currently available for this development.

4041 Moodie Drive

Southwest of the proposed development is 4041 Moodie Drive. This development is planned to be a temporary two-year training facility for the Ottawa Fire Services. No TIA is currently available for this development.

3 Study Area and Time Periods

3.1 Study Area

The Study Area will include the intersection of Cambrian Road and Borrisokane Road, and Borrisokane Road and Barnsdale Road, and will include examining Borrisokane Road as a Boundary Road.

3.2 Time Periods

As a result of the shift work schedule of the workers at the proposed development, peak site traffic generation will occur slightly outside of the AM and PM peak periods. However, to produce a conservative analysis, AM and PM peak hours will be examined.

3.3 Horizon Years

The anticipated build-out year is 2022. As a result, the full build-out plus five years horizon year is 2027.

4 Exemption Review

Table 9 summarizes the exemptions for this TIA.

Table 9: Exemption Review

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

As a result of the expected unique trip generation of the proposed development, three trip generation methods have been considered. The first method is using the ITE Trip Generation Manual (10th Edition). The second trip generation method considered is using a first principles analysis based on project statistics provided by ABIC, and the third method is evaluating and applying the trip generation of a proxy site.

5.1.1 Method 1-ITE

Vehicle trip rates and rate equations for the industrial and office development components were taken from ITE Trip Generation Manual (10th Edition). The fitted curve equation was used along with the office building land use statistics to develop vehicle trip rates. As no fitted curve equations were available for the industrial-manufacturing land use, the average vehicle trip rate was used. To estimate the person trip generation for each development component, a factor of 1.28 has been applied to the vehicle trip rates. Table 10 summarizes the person trip rates for the proposed land uses for the ITE trip generation method.

Table 10: Trip Generation Person Trip Rates-Trip Generation Method

Land Uses	Land Use Code	Peak Hour	Vehicle Trip Rate	Person Trip Rates
General Office Building	710	AM	1.16	1.48
		PM	1.15	1.47
Industrial-Manufacturing	140	AM	0.62	0.79
		PM	0.67	0.86

Using the above Person Trip rates, the total person trip generation has been estimated. Table 11 below illustrates the total person trip generation by land use for the ITE trip generation method.

Table 11: Total Person Trip Generation-ITE Trip Generation Method

Land Use	GFA (1000 sq. ft.)	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
General Office Building	34.98	45	7	52	8	43	51
Industrial-Manufacturing	101.02	62	18	80	27	60	87
Total Person Trips		107	25	132	35	103	138

Using the most recent National Capital Region Origin-Destination (OD Survey), the existing mode shares for South Nepean have been summarized in Table 12. Adjustments to these mode shares have been made in order to more accurately represent the expected mode choices within the Study Area. As a result of the rural context and limited pedestrian and cyclist facilities within the Study Area, the non-auto mode share was reduced to 0%. In the event that pedestrian or cyclists do access the proposed site, these numbers will be very low. While there is potential for transit, this will occur beyond the study horizons and as a result, the transit mode share was reduced to 0%. Overall, the auto driver mode share was increased to 85% in order to ensure a conservative analysis is performed. The adjusted South Nepean Mode Share can also be seen in Table 12 and will be used to generate the site trips for the proposed development.

Table 12: Mode Share

Travel Mode	South Nepean Mode Share	Adjusted South Nepean Mode Share
Auto Driver	60%	85%
Auto Passenger	15%	15%
Transit	15%	0%
Cycling	9%	0%
Walking	1%	0%
Total	100%	100%

Using the above adjusted mode shares and the ITE person trip rates, the person trips by mode have been projected. Table 13 summarizes the trip generation by mode for the ITE trip generation method.

Table 13: Trip Generation Mode-ITE Trip Generation Method

Travel Mode	Mode Share	In	Out	Total	In	Out	Total
Auto Driver	85%	91	21	112	30	88	117
Auto Passenger	15%	16	4	20	5	15	20
Transit	0%	0	0	0	0	0	0
Cycling	0%	0	0	0	0	0	0
Walking	0%	0	0	0	0	0	0
Total	100%	107	25	132	35	103	138

As shown above, 112 AM and 117 PM new peak hour two-way vehicle trips are projected as a result of the proposed development.

5.1.2 Method 2-First Principles

Using employee counts provided by ABIC, the person trips for the proposed development were determined. In order to produce a conservative analysis, it was assumed that all office workers (80) will arrive within the AM peak period and depart in the PM peak period. It was assumed that a shift change will occur during both the AM and PM peak periods producing in and out volumes of 40 industrial workers. In the PM peak period, it was assumed that all customers (30) will arrive and depart within the hour. This represents a conservative estimate of the site traffic. The site statistics with the expected employee counts can be found in Appendix D and the resulting person trips are summarized in Table 14.

Table 14: ABIC Facility Person Trips-First Principles Method

Peak Period	In/Out	Land Use Type	Person Trips
AM	In	Office Building	80
		Industrial	40
	Out	Industrial	40
PM	In	Industrial	40
		Customer	30
	Out	Industrial	40
		Customer	30
		Office Building	80

Using the adjusted mode shares summarized in Table 12 above, and the person trips from Table 14, the person trips by mode have been projected. Table 15 summarizes the trip generation by mode.

Table 15: Trip Generation by Mode-First Principles Method

Travel Mode	Mode Share	In	Out	Total	In	Out	Total
Auto Driver	85%	102	34	136	60	128	188
Auto Passenger	15%	18	6	24	10	22	32
Transit	0%	0	0	0	0	0	0
Cycling	0%	0	0	0	0	0	0
Walking	0%	0	0	0	0	0	0
Total	100%	120	40	160	70	150	220

As shown above, 136 AM and 188 PM new peak hour two-way vehicle trips are projected as a result of the proposed development.

5.1.3 Method 3-Proxy Study GFA Rate

Site statistics and traffic data for the AM and PM peak periods were collected and analyzed at the Canopy Growth Corporation in Smiths Falls. This information was used to determine the person trip generation rates at this proxy site based on the Gross Floor Area (GFA) of the development. As no land use distinction was provided between office space and industrial space, the resulting person trip rates can only be described by peak period and not by land use. Given the lack of transit, cycling and pedestrian facilities in the area surrounding the Canopy Growth development, the counted vehicle trips were considered person trips. The calculated person trip rates can be seen in Table 16. Canopy Growth Corporation site information can be found in Appendix E and traffic data collected at this proxy site can be found in Appendix F.

Table 16: Person Trip Generation Rates-Proxy Site Method

	In	Out	Total
AM	73.42%	26.58%	0.79
PM	15.29%	84.71%	0.85

Using the proxy study rates, the person trips for the proposed development were calculated using the GFA of the ABIC development. The person trip rates of this method can be seen in Table 17.

Table 17: Total Person Trip Generation-Proxy Study Method

GFA (1000 sq. ft.)	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
136.0	79	29	108	18	98	116
Total Person Trips	79	29	108	18	98	116

Using the adjusted mode shares summarized in Table 12 above, and the person trips from Table 17, the person trips by mode have been projected. Table 18 summarizes the trip generation by mode.

Table 18:Trip Generation by Mode-Proxy Study Method

Travel Mode	Mode Share	In	Out	Total	In	Out	Total
Auto Driver	85%	67	25	92	15	83	98
Auto Passenger	15%	12	4	16	3	15	18
Transit	0%	0	0	0	0	0	0
Cycling	0%	0	0	0	0	0	0
Walking	0%	0	0	0	0	0	0
Total	100%	79	29	108	18	98	116

As shown above, 92 AM and 98 PM new peak hour two-way vehicle trips are projected as a result of the proposed development.

5.1.4 Trip Generation Method Comparison

In order to determine the trip generation method that will be used, the person trip rates and the total person trips from each method were compared in Table 19 and Table 20 respectively.

Table 19: Trip Generation Methods Person Trip Rates Comparison

Land Uses	Land Use Code	Peak Hour	Person Trip Rates		
			ITE	First Principles	GFA Proxy Study
General Office Building	710	AM	1.48	2.15	0.79
		PM	1.47	2.15	0.85
Industrial-Manufacturing	140	AM	0.79	0.80	0.79
		PM	0.86	1.40	0.85

Table 20: Trip Generation Methods Total Person Trips Comparison

Trip Generation Methods	In	Out	Total	In	Out	Total
ITE	107	25	132	35	103	138
First Principles	120	40	160	70	150	220
Proxy Study	79	29	108	18	98	116

Based on these two comparison charts, the first principles method will be used. While the City of Ottawa's TIA guidelines indicate that this is not generally the preferred method, in this situation it provides the most accurate and conservative person trip estimates. This method also reflects the customer trips to the sales office and showroom which are not otherwise considered in the other two methods.

5.2 Trip Distribution

To understand the travel patterns of the subject development, the OD survey has been reviewed to determine the existing travel pattern that will be applied to the new vehicle trips. Table 21 below summarizes the distribution for South Nepean.

Table 21: OD Survey Existing Mode Share-South Nepean

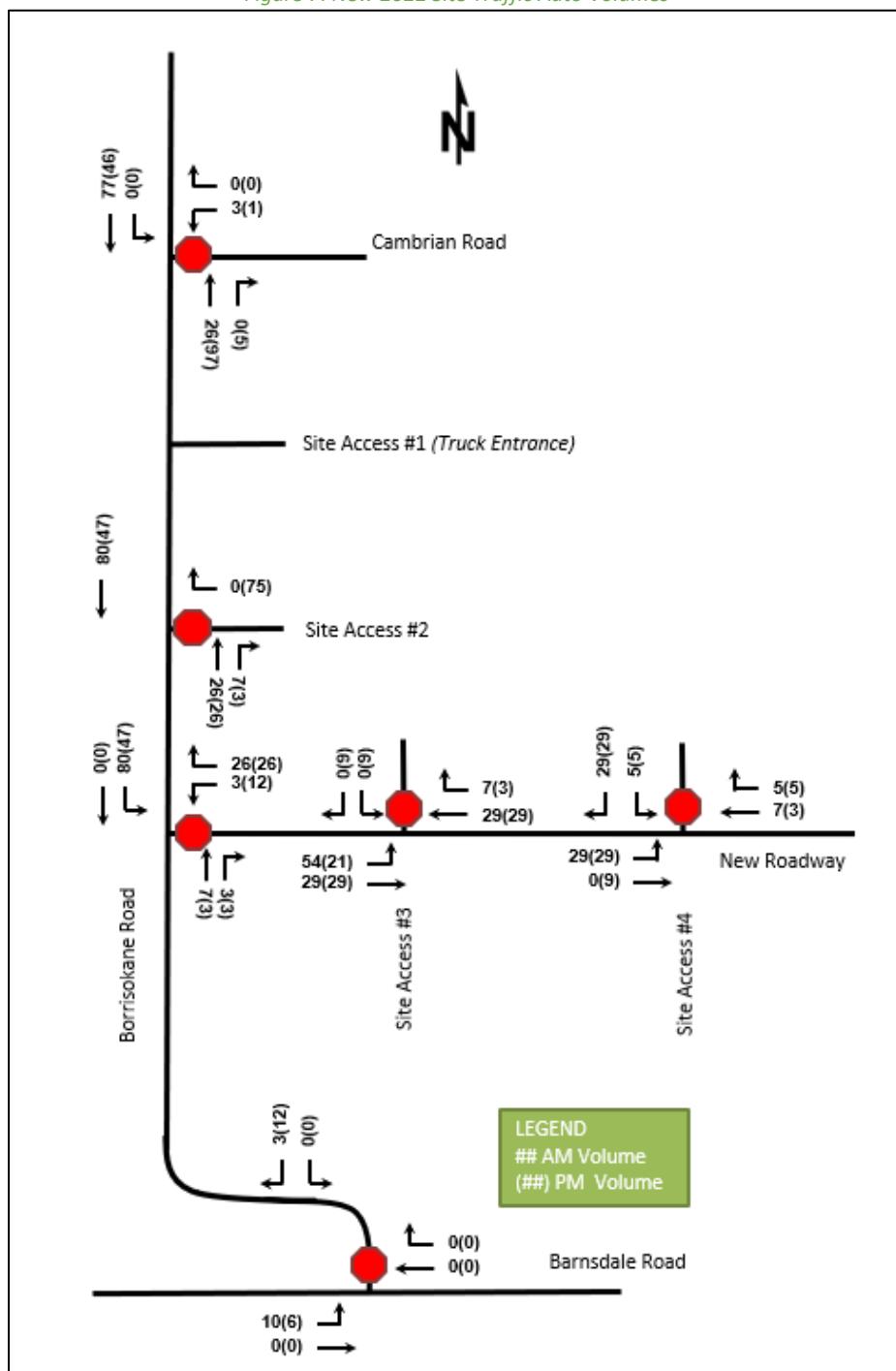
To/From	% of Trips
North	80%
South	5%
East	10%
West	5%
Total	100%

5.3 Trip Assignment

Using the distribution outlined above, turning movement splits, and access to major transportation infrastructure, the trips generated by the site using the first principles method have been assigned to the Study Area road network for both the 2022 and 2027 future horizons. In the 2022 future horizon, the New Roadway will be considered a through road and connect to 3809 Borrisokane Road. In the 2027 future horizon, the New Roadway will not be considered a through road and will end at Site Access #4. Within both future horizons, Site Access #2 and Site Access #3 will provide access to the office parking spaces and customer/visitor parking spaces and Site Access #4 will provide access to the industrial parking spaces. Site Access #1 is not considered as it will only be used by trucks.

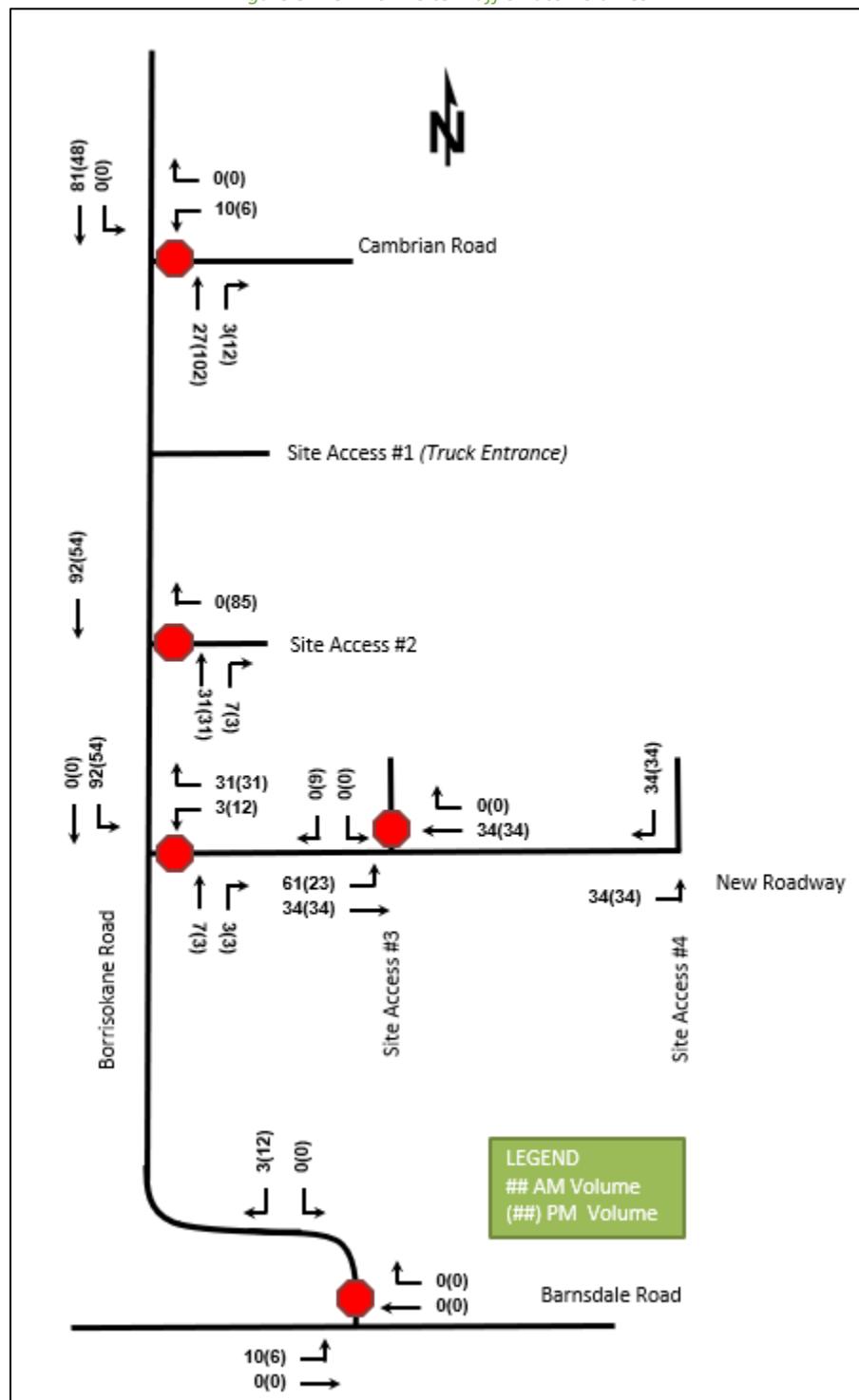
Approximately three inbound and 12-15 outbound trucks are anticipated per day and will be spread-out over the course of the day. As most of these trips will occur during off peak hours, truck volumes are anticipated to have a negligible impact during peak periods. While Borrisokane Road is not identified as a truck route by the City of Ottawa, it is a Ministry of Ontario road and would not have been considered by the City when identifying the truck route network. Therefore, trucks will be directed to take truck routes outside of the Study Area and to travel on Borrisokane Road within the Study Area. Figure 7 illustrates the new site generated volumes for the 2022 future horizon and Figure 8 illustrates the new site generated volumes for the 2027 future horizon.

Figure 7: New 2022 Site Traffic Auto Volumes



3713 Borrisokane Road Transportation Impact Assessment- Manufacturing Facility

Figure 8: New 2027 Site Traffic Auto Volumes



6 Background Network Travel Demands

6.1 Transportation Network Plans

The transportation network plans were discussed in Section 2.3.1. The additional connectivity provided by these plans has the potential to improve the active mode network but is not anticipated to significantly impact the modal shares used in the future trip generation.

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 both the 2022 and 2027 background conditions include the Meadows Phase 5, 3387 Borrisokane Road, 3809 Borrisokane Road and 3285 Borrisokane Road developments. The Half Moon Bay West, and the residential portion of 3713 Borrisokane Road developments are only considered in the 2027 background conditions. All background developments are discussed in Section 2.3.2.

Figure 9 illustrates the 2022 background volumes and Figure 10 illustrates the 2027 background volumes.

3713 Borrisokane Road Transportation Impact Assessment- Manufacturing Facility

Figure 9: Background 2022 Volumes

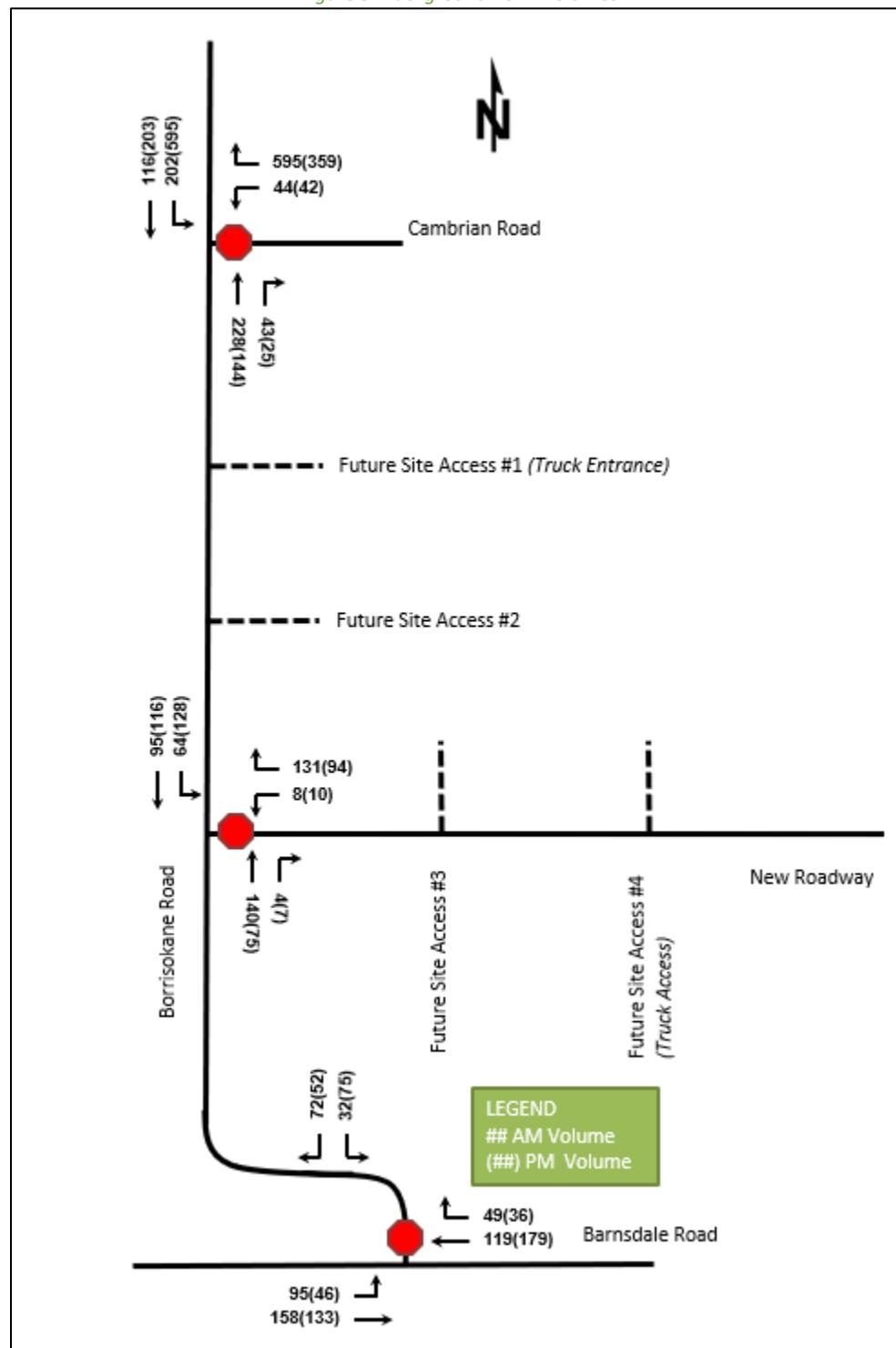
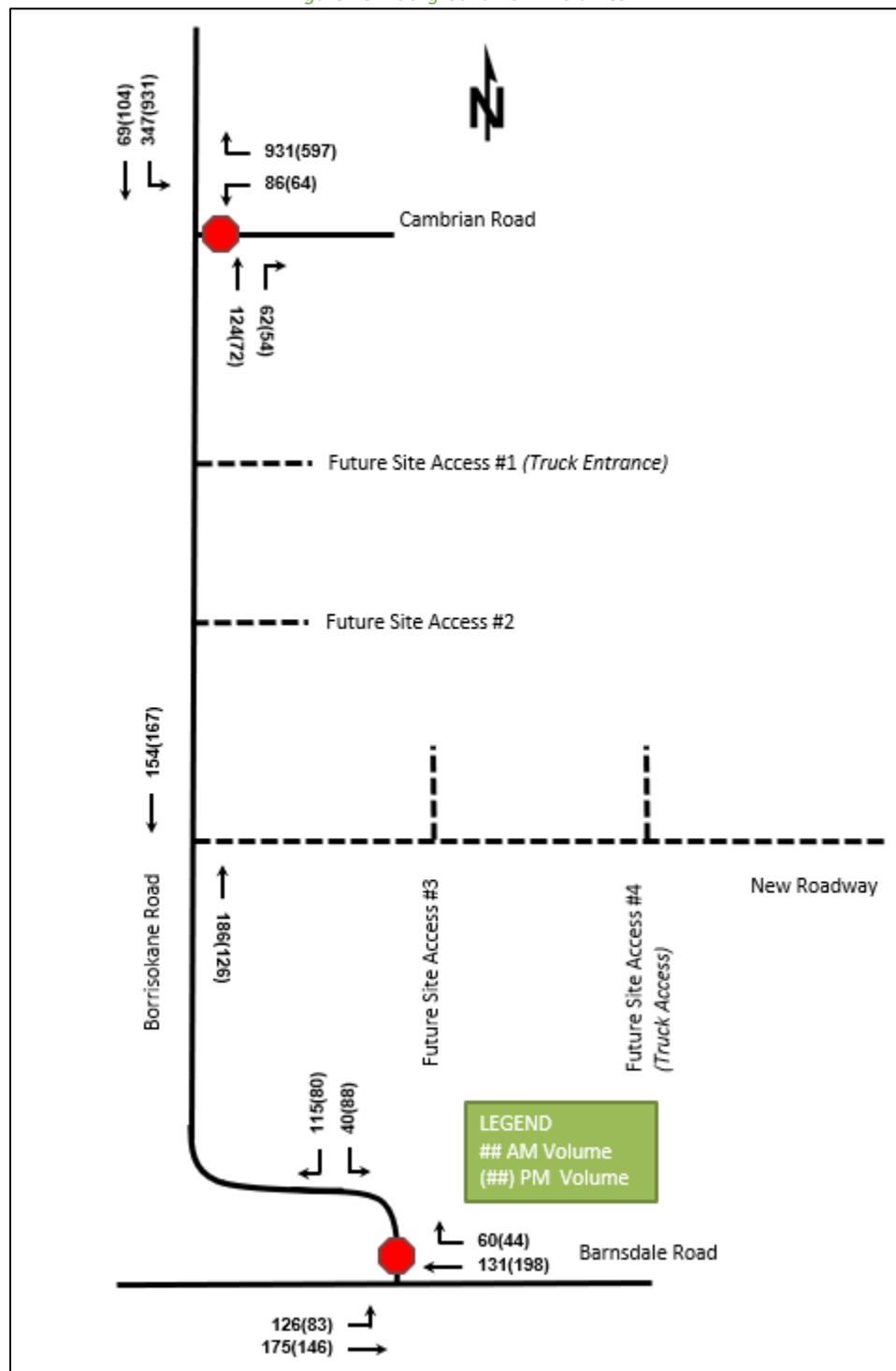


Figure 10: Background 2027 Volumes



7 Demand Rationalization

As documented in Section 16.2.1, the existing intersections within the Study Area are operating well and have additional capacity. The changes in volume between existing and future conditions will come from growth within the Study Area, the developments mentioned in Section 2.3.2, and the proposed development within this report.

The trip generation of this development is the most conservative and accurate prediction, as can be seen in Section 5.1.4, and no adjustments are required.

Within this TIA, the New Roadway has been assigned volumes from 3809 Borrisokane Road based on the assumption within that TIA that the New Roadway will be used as the residential development's only access during the 2022 future horizons. The New Roadway will not connect Borrisokane Road to 3809 Borrisokane Road in the 2027 future horizons. As such, the volumes assigned to the Study Area network from the residential development of 3809 Borrisokane Road will be distributed differently between the 2022 and 2027 future horizons.

The future total 2022 volumes are illustrated in Figure 11 and the future total 2027 volumes are illustrated in Figure 12.

Figure 11: Future Total 2022 Volumes

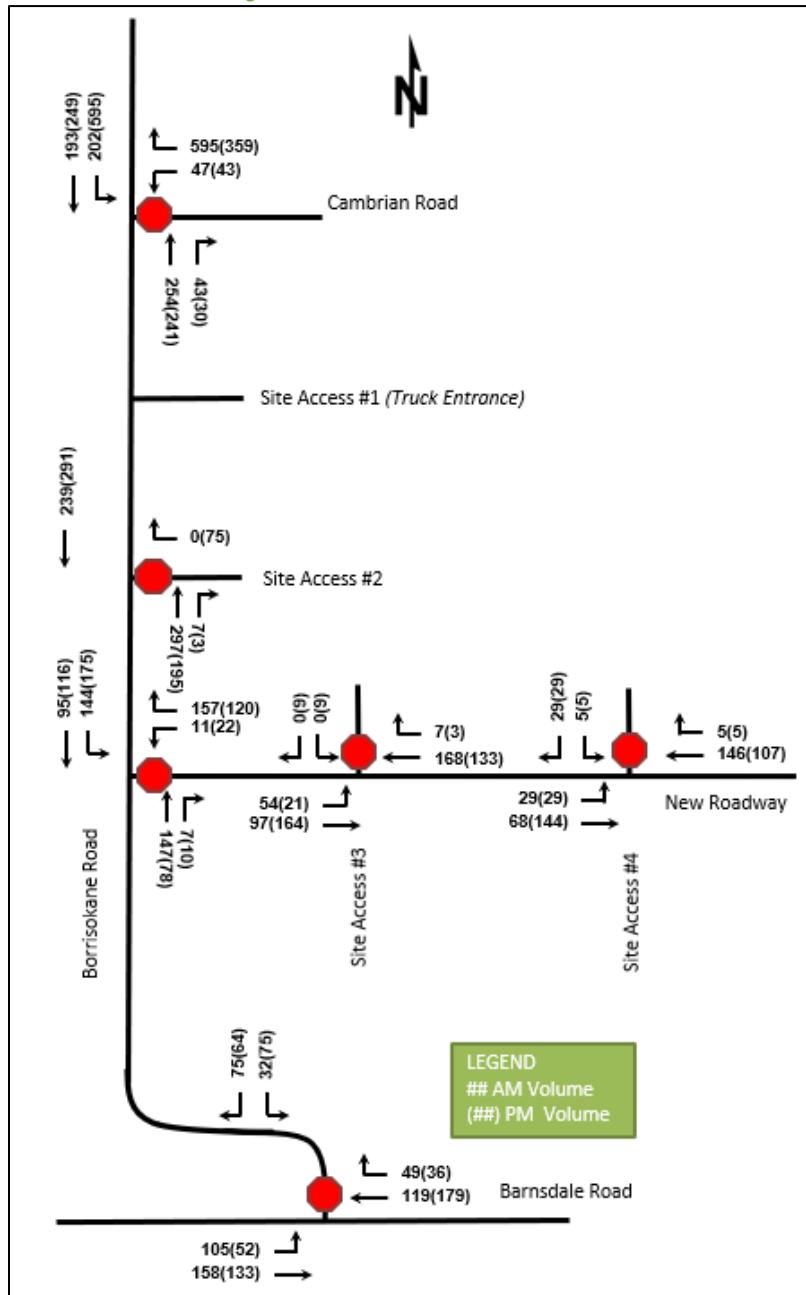
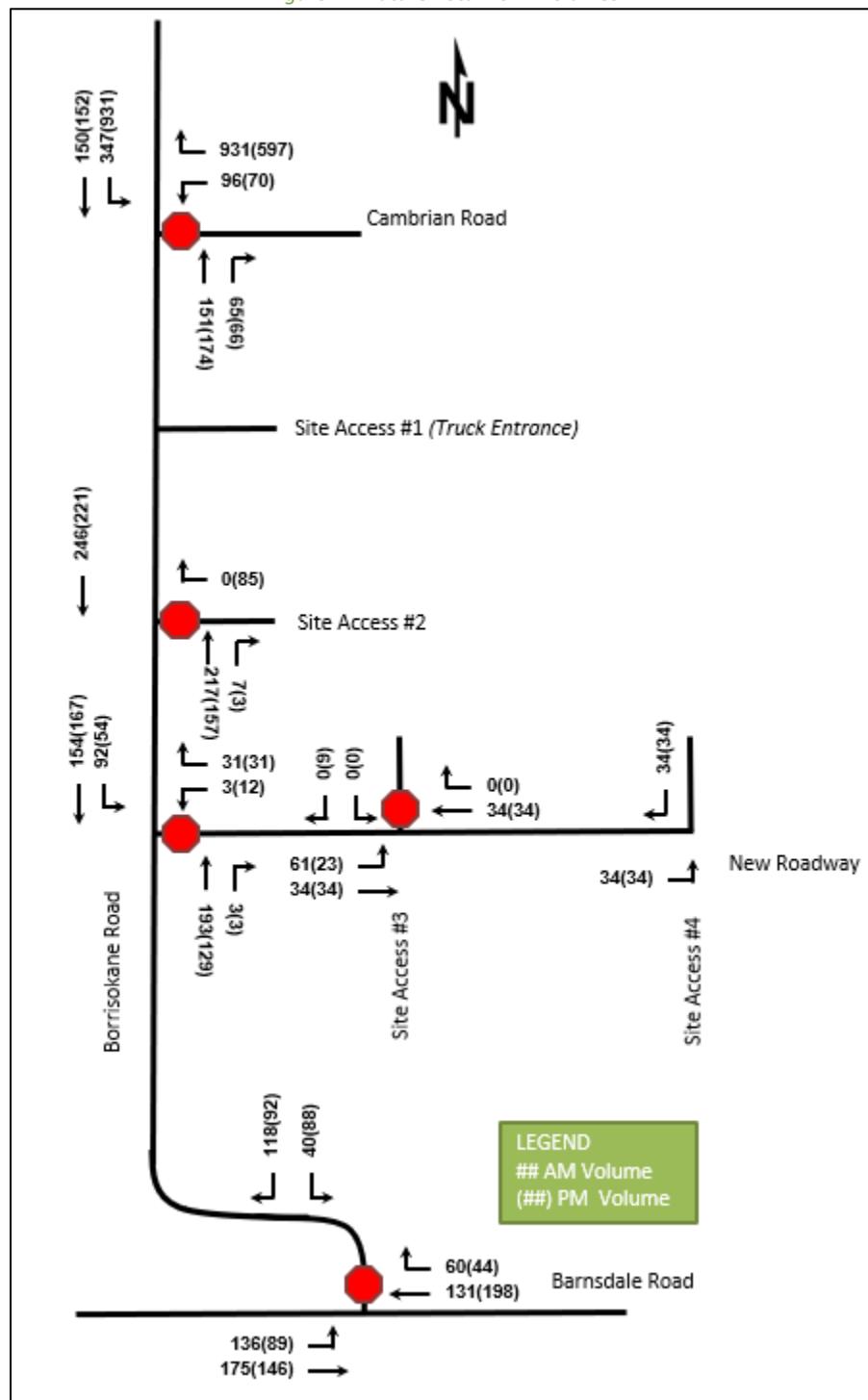


Figure 12: Future Total 2027 Volumes



8 Development Design

8.1 Design for Sustainable Modes

The proposed development is an industrial development with surface parking for both automobiles and bicycles. Pedestrian facilities have been proposed within the development site plan and will connect pedestrians to internal surface parking. No cycling facilities or connections within the development have been proposed at this time due to the lack of cycling facilities in the surrounding area road network. However, future local cycling routes along Cambrian Road, Borrisokane Road, and Barnsdale Road, as shown in Figure 3, have been approved as part of the City of Ottawa's Ultimate Cycling Network. These local cycling routes will provide cycling access to the development.

It is recommended that transit service to the development be improved by means of developing a contract with OC Transpo to provide early transit services until regular services are warranted.

Additionally, development facilities supportive of sustainable modes in the City of Ottawa's TDM-supportive Development Design and Infrastructure Checklist which are required for zoning and standard site design are recommended. The following additional measures are also recommended:

- Locate building entrances in order to minimize walking distances to sidewalks and transit facilities
- Locate building doors and entrances to ensure visibility of pedestrians from the building
- Provide wayfinding signage for site access and egress
- Provide a permanent bike repair station
- Provide signed parking spaces for carpools in a priority location close to a major building entrance

TDM Checklists can be found in Appendix G.

8.2 Circulation and Access

Access #2, Access #3, and Access #4 will accommodate passenger vehicles accessing the surface automobile parking. Access #1 is considered the primary entrance to the shipping and loading area and as such will be used exclusively by trucks. Site Access #2 will also serve as an entrance for buses to access the bus parking spaces within the proposed development. Site Access #3 will serve as the exit for these buses. Bus volumes entering and exiting the site are expected to be minimal and during off-peak periods. Additionally, trucks will also use Access #4 as an exit however this is considered a secondary access and will accommodate minimal truck volumes. Access #1 and Access #4 are also expected to be used by garbage trucks to access the development.

Turning templates for delivery trucks and garbage trucks can be found in Appendix H.

8.3 New Street Networks

This TIA is exempt from this Module (see Table 9).

9 Parking

9.1 Parking Supply

The parking requirements and provisions for the proposed development are summarized in Table 22.

Table 22: Parking Provisions

Land Use	Parking Rate	Parking Required	Parking Provided	Surplus/(Deficit)
Light Industrial (auto)	0.8 spaces/100m ² GFA	76	105	29
Office (auto)	2.4 spaces/100m ² GFA	78	66	-12
Light Industrial/Office (visitor)	N/A	0	7	7
Total (auto)	-	154	178	24
Light Industrial (bicycle)	N/A	0	18	18
Office (bicycle)	N/A	0		

As shown above, vehicle parking requirements for light industrial land use has been exceeded by 29 spaces and office land uses have not been met by a deficit of 12 spots. Overall parking within the proposed development is provided at a surplus of 24 spots. Therefore, the parking spaces provided are considered sufficient to serve the site.

Bicycle parking and auto visitor parking is not required in the proposed development area and as such the seven spots and 18 spots respectively have been provided to improve the functionality of the site.

9.2 Spillover Parking

This TIA is exempt from this Module (see Table 9).

10 Boundary Street Design

For the purposes of this TIA, Borrisokane Road will be considered a boundary street for the existing, future 2022 and future 2027 horizons. The future roadway to the south of the development will be considered a boundary road in the 2022 future horizon and the 2027 future horizon. Segment 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)

Borrisokane Road is not currently a Complete Street and no plans currently exist to upgrade it to a Complete Street. The segment MMLOS for Borrisokane Road can be found in Table 23.

Table 23: Borrisokane Road Segment MMLOS

Road Segment	Horizon	MMLOS							
		PLOS		BLOS		TLOS		TkLOS	
		Actual	Target	Actual	Target	Actual	Target	Actual	Target
Borrisokane Road	Existing	F	None	F	None	-	-	C	E
	2022	F	None	F	None	-	-	C	E
	2027	F	None	F	None	-	-	C	E

The road segment of Borrisokane Road will meet the TkLOS target level in all horizons, however no targets exist for PLOS, BLOS or TLOS as the Study Area is considered a general rural area.

As the design of the future roadway is currently unclear, its MMLOS cannot be determined at this time..

11 Access Intersections Design

11.1 Location and Design of Access

Four unsignalized site accesses are planned for the proposed development. Four site accesses are planned for the proposed development. Two accesses to the development lands will be provided to the west of the proposed development onto Borrisokane Road approximately 630 metres (Site Access #1) and 735 metres (Site Access #2) south of Cambrian Road. The other two site accesses will be provided to the south of the proposed development onto a future roadway. These accesses will be located approximately 30 metres (Access #3) and 200 metres (Site Access #4) east of Borrisokane Road. Site Access #1 is designated for truck use only and is expected to operate as a one-way, right-in only access. Site Access #2 is expected to operate as a right-in right-out access. Both Site Access #3 and #4 are expected to operate as full-movement accesses.

11.2 Intersection Control

Based on the projected volumes, the four site accesses will have stop-control on the minor approach for both future total horizons. No further traffic control is warranted to address operational issues.

11.3 Intersection Design

Left-turn lane warrants for unsignalized intersections were examined at Site Access #3 and Site Access #4 for both 2022 and 2027 total future horizons. To determine if a left-turn lane is warranted, the MTO Geometric Design Standards for Ontario Highways, Section E, left-turn lane warrant nomographs were examined.

Southbound left-turn lanes were not found to be warranted at either access during the 2022 or 2027 future horizons. Left-turn lane warrants have been provided in Appendix I.

12 Transportation Demand Management

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.

The following measures, consistent with the TDM Checklist included in Appendix G, could be implemented to ensure that the travel mode shares meet the TOD targets.

- Designate an internal TDM coordinator, or contract with an external TDM coordinator.
- Display local area maps with walking/cycling access routes and key destinations at major entrances.
- Contract with OC Transpo to provide enhanced transit services.
- Provide discounts on parking costs for registered carpools.
- Charge for long-term parking.
- Encourage flexible work hours (office workers).
- Encourage telework (office workers).

13 Neighbourhood Traffic Management

13.1 Adjacent Neighbourhoods

This TIA is exempt from this Module (see Table 9).

14 Transit

In section 5.1.2 the trip generation by mode was estimated. The assumed transit mode share for the future horizons is 0%. Future transit facilities are anticipated to service the proposed development however this will occur beyond the study horizons.

Bus parking is provided within the proposed development for private shuttles and tour buses. As these are unlikely to service the site right away, a transit mode share of 0% provides a conservative estimate of auto trips.

Additionally, a contract with OC Transpo to provide enhanced transit service as discussed in Section 12 is encouraged.

15 Review of Network Concept

The background and forecasted site trips do not exceed the anticipated lane capacities on the boundary road network. Beyond the TIA horizons, additional road and transit service via Re-Aligned Greenbank Road, will add additional capacity and promote higher transit use south of Jock River.

16 Intersection Design

16.1 Intersection Control

The intersection of the New Roadway and Borrisokane Road will be an unsignalized intersection with stop-control on the minor approach in all future horizons.

A signal warrant analysis was performed for the intersection of Cambrian Road and Borrisokane Road for the 2022 and 2027 horizons using the OTM Book 12 Justification 7 criteria. Using these criteria, it was found that a signal is warranted at this intersection during the 2027 total future horizon. Appendix J includes the signal warrant calculation sheets.

The intersection method of control for Barnsdale Road and Borrisokane Road will remain consistent with existing methods of control in both future horizons.

16.2 Intersection Design

To understand the intersection design, an MMLOS analysis of existing, 2022 future horizon, and 2027 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. 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.

Additionally, left-turn lane warrants for unsignalized intersections were examined at both Cambrian Road and Borrisokane Road, and the New Roadway and Borrisokane Road at both 2022 and 2027 future background and total future horizons To determine if a left-turn lane is warranted, the MTO Geometric Design Standards for Ontario Highways, Section E, left-turn lane warrant nomographs were examined.

Southbound left-turn lanes were found to be warranted at the intersection of Cambrian Road and Borrisokane Road for all future horizons. Southbound left-turn lanes were warranted at the intersection of the New Roadway and Borrisokane Road for the 2022 and 2027 future total horizons only. Left-turn lane warrants have been provided in Appendix H.

The southbound left-turn lane at the intersection of Cambrian Road and Borrisokane Road is warranted as a result of the significant volumes generated by future surrounding developments. As such, the left-turn lane has been developed for operational analysis purposes only as the intersection is required to be designed by others.

Preliminary storage and taper lengths for the proposed left-turn lane at Borrisokane Road and the New Roadway are summarized in Table 24.

Table 24: 2022 and 2027 New Roadway Left-turn Lane - Preliminary Design Criteria

Design Standard	Design Speed	Storage	Parallel Lane	Taper Ratio	Taper	Total Lane Length
TAC	100 km/h	15 m (min.)	115 m	30:1	105 m	235 m

Using Transportation Association of Canada's Geometric Design Guide for Canadian Roads (TAC) the storage, parallel lane, and taper lengths were determined for a 100 km/h design speed. For the purposes of determining the taper length it was assumed that this left-turn lane would be constructed as a left-turn on the left side of the centreline with a 3.5 metre turning lane width. The parallel lane length was calculated based on the following formula (TAC Formula 2.5.1):

$$d_b = 0.039 \frac{V^2}{a}$$

Where:

d_b = Braking Distance (m)

V = Design Speed (km/h)

a = Deceleration rate (m/s^2) = 3.4 m/s^2

The distance between the New Roadway and Access #2 is approximately 95 metres. As such, Site Access #2 will be located within the parallel lane portion and Site Access #1 will be located within the taper portion of the southbound left-turn for the New Roadway. As Site Access #1 is a right-in only access and serves only trucks, and Site Access #2 is a right-in right-out access, this will have no traffic impact on the two accesses on Borrisokane Road to the north of the New Roadway.

Using Transportation Association of Canada's Geometric Design Guide for Canadian Roads (TAC) the runout lane is calculated to be 135 metres (30 metres + departure taper of 105 metres) with a design speed of 100 km/h. No intersections or driveways are located within 135 metres south of the New Roadway on Borrisokane Road. Additionally, an RMA will be required at this intersection at which time the design of both the auxiliary and runout lane will be refined.

As such, the southbound left-turn lane at the New Roadway should be 235 metres long with a storage lane of 15 metres, a parallel lane of 115 metres and a taper of 105 metres.

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 on the Study Area road network. Table 25 summarizes the operational analysis of the 2019 existing conditions. Appendix K contains the 2019 Existing Conditions Synchro sheets.

Table 25: Existing Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	Delay	V/C	Q (95 th)	LOS	Delay	V/C	Q (95 th)
Cambrian Road & Borrisokane Road Unsignalized	WBL/R	B	15	0.60	31	B	14	0.42	16
	NBT/R	-	-	-	-	-	-	-	-
	SBL/T	A	8	0.10	2	A	8	0.32	11
Barnsdale Road & Borrisokane Road Unsignalized	EBL/T	A	8	0.07	2	A	8	0.03	1
	WBT/R	-	-	-	-	-	-	-	-
	SBL/R	B	11	0.11	3	B	12	0.17	6
Notes:	Saturation flow rate of 1800 veh/h/lane								
	PHF = 0.90								

Both existing intersections within the Study Area operate satisfactorily during the peak hours. No mitigation measures are required or recommended.

16.2.2 2022 Future Background

The 2022 future background intersection volumes and other development traffic has been analyzed to allow a comparison between the future volumes with and without the proposed development. Table 26 summarizes the operational analysis of 2022 future background conditions. Appendix L contains the 2022 Future Background Synchro sheets.

Table 26: 2022 Future Background Conditions Operational Analysis

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	Delay	V/C	Q (95 th)	LOS	Delay	V/C	Q (95 th)
Cambrian Road & Borrisokane Road Unsignalized	WBL/R	E	38	0.90	87	F	74	0.99	90
	NBT/R	-	-	-	-	-	-	-	-
	SBL	A	8	0.16	4	A	9	0.42	16
	SBT	-	-	-	-	-	-	-	-
<i>Mitigation - WBL Turn Lane</i>									
Cambrian Road & Borrisokane Road Unsignalized	WBL	C	19	0.14	3	F	109	0.58	19
	WBR	C	22	0.75	54	B	12	0.40	15
	NBT/R	-	-	-	-	-	-	-	-
	SBL	A	8	0.16	4	A	9	0.42	16
	SBT	-	-	-	-	-	-	-	-
Barnsdale Road & Borrisokane Road Unsignalized	EBL/T	A	8	0.07	2	A	8	0.03	1
	WBT/R	-	-	-	-	-	-	-	-
	SBL/R	B	11	0.14	4	B	12	0.19	5
New Roadway & Borrisokane Road Unsignalized	WBL/R	A	10	0.16	4	A	10	0.12	3
	NBT/R	-	-	-	-	-	-	-	-
	SBL/T	A	8	0.05	1	A	8	0.08	2
Notes:	Saturation flow rate of 1800 veh/h/lane								
	PHF = 1.00								

With the addition of background growth to reflect the 2022 horizon as well as traffic generated from surrounding developments, the Study Area intersections are anticipated to operate within the City of Ottawa operational thresholds with the exception of the shared westbound left-turn / right-turn at the intersection of Cambrian Road and Borrisokane Road during the PM peak period. As a result of traffic generated from surrounding developments, the westbound shared left-turn / right-turn operates significantly worse than the existing conditions operations of this movement with a LOS F and V/C ratio of 0.99.

A westbound left-turn at Cambrian Road and Borrisokane Road is recommended as a mitigation measure for this horizon. With the implementation of this turn lane, the V/C ratio has been improved however, the westbound left-turn still operates with a high delay and LOS F as a result of the traffic generated from surrounding developments.

The result of the left-turn lane warrant for the 2022 future background scenario at the intersection of the New Roadway and Borrisokane Road was ambiguous. As such, the operational analysis of the intersection was used to determine if a southbound left-turn lane was warranted at this location. As this intersection operates with low V/C ratios and low delays, no left-turn lane is warranted for this horizon.

16.2.3 2027 Future Background

The 2027 future background intersection volumes and other development traffic has been analyzed to allow a comparison between the future volumes with and without the proposed development. Table 27 summarizes the operational analysis of the 2027 future background conditions. Appendix M contains the 2027 Future Background Synchro sheets.

Table 27: 2027 Future Background Conditions Operational Analysis

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	Delay	V/C	Q (95 th)	LOS	Delay	V/C	Q (95 th)
Cambrian Road & Borrisokane Road Unsignalized	WBL/R	F	217	1.42	351	F	1191	3.54	480
	NBT/R	-	-	-	-	-	-	-	-
	SBL	A	9	0.25	8	B	12	0.64	37
	SBT	-	-	-	-	-	-	-	-
<i>Mitigation - Signalization & WBL Turn Lane</i>									
Cambrian Road & Borrisokane Road Signalized	WBL	A	15	0.15	16	A	36	0.30	20
	WBR	E	23	0.94	#138	D	15	0.84	31
	NBT/R	A	14	0.22	32	A	21	0.26	29
	SBL	B	26	0.64	#97	E	26	0.93	#273
	SBT	A	16	0.08	16	A	5	0.08	13
	<i>Overall</i>	<i>C</i>	<i>22</i>	-	-	<i>C</i>	<i>21</i>	-	-
Barnsdale Road & Borrisokane Road Unsignalized	EBL/T	A	8	0.09	2	A	8	0.06	2
	WBT/R	-	-	-	-	-	-	-	-
	SBL/R	B	12	0.23	7	B	14	0.28	9
Notes:	Saturation flow rate of 1800 veh/h/lane								
	PHF = 1.00								
	# indicates the volume for the 95 th percentile cycle exceeds capacity								

The 2027 future background conditions are forecast to operate acceptably during the peak hours with no volume-to capacity issues noted with the exception of the shared westbound left-turn / right-turn at the intersection of Cambrian Road and Borrisokane Road in both the AM and PM peak periods.

Mitigation measures at the intersection of Cambrian Road and Borrisokane Road are recommended for the 2027 future background horizon to eliminate potential volume-to-capacity issues. In addition to signalization and appropriate optimization of the intersection a westbound left-turn has been implemented. In the PM peak period, the southbound left-turn movement will operate as a protected and permissive turn. As shown in Table 27, these mitigation measures allow for the intersection of Cambrian Road and Borrisokane Road to operate satisfactorily. The volume for the 95th percentile cycle exceeds capacity for the westbound right turn and the southbound left turn movements in the AM peak and the southbound left-turn movements in the PM peak. The V/C ratio for these

movements is less than one and can therefore be assumed that in practice the 95th percentile queues will rarely be exceeded.

While the signalization warrants do not indicate that the signalization of Cambrian Road and Borrisokane Road is warranted at this time, it is important to recognize that the threshold for signalization was only just missed. Signalization of an existing intersection is required if the justification is met to 120%. In the 2027 future background scenario for Cambrian Road and Borrisokane Road, the justification was met to 119%. This is consistent with the findings of the operational analysis shown in Table 27 and proves signalizing the intersection to be an appropriate mitigation measure.

16.2.4 2022 Total Future

The 2022 total future intersection volumes, including the site generated traffic and other development traffic, has been analyzed to understand the impact of the subject development on the Study Area intersections. Table 28 summarizes the operational analysis of the 2022 total future conditions. Appendix N contains the 2022 Future Total Synchro Sheets.

Table 28: 2022 Total Future Conditions Operational Analysis

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	Delay	V/C	Q (95 th)	LOS	Delay	V/C	Q (95 th)
Cambrian Road & Borrisokane Road Unsignalized	WBL/R	E	49	0.95	104	F	166	1.24	137
	NBT/R	-	-	-	-	-	-	-	-
	SBL	A	8	0.16	4	B	10	0.46	19
	SBT	-	-	-	-	-	-	-	-
<i>Mitigation - Signalization</i>									
Cambrian Road & Borrisokane Road Signalized	WBL/R	D	19	0.87	52	C	17	0.79	31
	NBT/R	A	10	0.30	47	A	5	0.22	28
	SBL	A	12	0.34	39	D	21	0.81	153
	SBT	A	10	0.19	31	A	5	0.20	26
	Overall	B	15	-	-	B	15	-	-
Barnsdale Road & Borrisokane Road Unsignalized	EBL/T	A	8	0.07	2	A	8	0.04	1
	WBT/R	-	-	-	-	-	-	-	-
	SBL/R	B	11	0.15	4	B	12	0.21	6
New Roadway & Borrisokane Road Unsignalized	WBL/R	B	10	0.20	6	B	10	0.17	5
	NBT/R	-	-	-	-	-	-	-	-
	SBL	A	8	0.10	3	A	8	0.12	3
	SBT	-	-	-	-	-	-	-	-
Access#2 & Borrisokane Road Unsignalized	WBR	A	0	-	-	A	10	0.09	2
	NBT/R	-	-	-	-	-	-	-	-
	SBT	-	-	-	-	-	-	-	-
Access#3 & New Roadway Unsignalized	EBL/T	A	8	0.04	1	A	8	0.02	<1
	WBT/R	-	-	-	-	-	-	-	-
	SBL/R	A	0	-	-	A	0	-	1
Access#4 & New Roadway Unsignalized	EBL/T	A	8	0.02	1	A	8	0.02	1
	WBT/R	-	-	-	-	-	-	-	-
	SBL/R	A	9	0.04	1	A	9	0.04	1
Notes:	Saturation flow rate of 1800 veh/h/lane								
	PHF = 1.00								

With the addition of the site generated traffic, the Study Area is expected to operate with similar operational characteristics as the 2022 future background conditions.

Mitigation measures at the intersection of Cambrian Road and Borrisokane Road are recommended for the 2022 future total horizon to eliminate projected volume-to-capacity issues. Signalization and appropriate optimization of the intersection have been implemented. As shown in Table 28, this mitigation measures allows for the intersection of Cambrian Road and Borrisokane Road to operate satisfactorily.

While the signalization warrants do not indicate that the signalization of Cambrian Road and Borrisokane Road is warranted at this time, it is important to recognize that it is recommended to construct the necessary underground provisions as part of road works where justification of a signal is met to 100%. In the 2022 future total scenario for Cambrian Road and Borrisokane Road, the justification was met to 99%. This demonstrates signalizing the intersection to be an appropriate mitigation measure.

16.2.5 2027 Total Future

The 2027 total future intersection volumes, including the site generated traffic and other development traffic, has been analyzed to understand the impact of the subject development on the Study Area intersections. As a result

of the significant volumes expected to be generated by surrounding developments, signalization of the intersection of Cambrian Road and Borrisokane Road is warranted and has been optimized accordingly. In both the AM and PM peak periods, a westbound left-turn lane was required at the intersection of Cambrian Road and Borrisokane Road to eliminate potential volume-to-capacity issues. In the PM peak period, the southbound left-turn movement will operate as a protected and permissive turn. Access #4 has not been included in the operational analysis as the New Roadway will be shut to through traffic just east of Access #4. Table 29 summarizes the operational analysis of the 2027 future total conditions. Appendix O contains the 2027 Future Total Synchro Sheets.

Table 29: 2027 Total Future Conditions Operational Analysis

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	Delay	V/C	Q (95 th)	LOS	Delay	V/C	Q (95 th)
Cambrian Road & Borrisokane Road Signalized	WBL	A	15	0.16	18	A	43	0.35	24
	WBR	E	27	0.95	#149	D	16	0.85	34
	NBT/R	A	15	0.27	38	A	37	0.55	70
	SBL	B	29	0.67	#97	E	41	0.98	#264
	SBT	A	16	0.18	29	A	4	0.12	18
	Overall	C	24	-	-	C	30	-	-
Barnsdale Road & Borrisokane Road Unsignalized	EBL/T	A	8	0.10	3	A	8	0.07	2
	WBT/R	-	-	-	-	-	-	-	-
	SBL/R	B	12	0.23	7	B	14	0.30	10
New Roadway & Borrisokane Road Unsignalized	WBL/R	A	10	0.04	1	A	10	0.05	1
	NBT/R	-	-	-	-	-	-	-	-
	SBL	A	8	0.07	2	A	8	0.04	1
	SBT	-	-	-	-	-	-	-	-
Access#2 & Borrisokane Road Unsignalized	WBR	A	0	-	-	A	10	0.10	2
	NBT/R	-	-	-	-	-	-	-	-
	SBT	-	-	-	-	-	-	-	-
Access#3 & New Roadway Unsignalized	EBL/T	A	7	0.04	1	A	7	0.02	<1
	WBT/R	-	-	-	-	-	-	-	-
	SBL/R	A	0	-	-	A	9	0.01	<1
Notes:	Saturation flow rate of 1800 veh/h/lane								
	PHF = 1.00								

With the addition of site generated traffic, the Study Area intersections are anticipated to operate with similar operational characteristics as the 2027 future background conditions, and well within the City of Ottawa operational thresholds. The volume for the 95th percentile cycle exceeds capacity for the westbound right and southbound left movements in the AM peak and the northbound through and southbound left-turn movements in the PM peak. The V/C ratio for these movements is less than one and can therefore be assumed that in practice the 95th percentile queues will rarely be exceeded

16.2.6 Intersection MMLOS

As intersection MMLOS is only undertaken at signalized intersections, only the intersection of Cambrian Road and Borrisokane Road in the 2027 future horizons can be analyzed. As the design of this intersection is currently unclear, its MMLOS cannot be determined at this time, however it is assumed that the design will include transit and active mode supportive elements in order to achieve MMLOS targets.

17 Conclusions

This Transportation Impact Assessment has documented the existing and future transportation conditions, for all travel modes, in the Study Area. The following conclusions can be offered based on the foregoing:

- A. The proposed development, located on the western portion of 3713 Borrisokane Road, is an industrial development which will consist of approximately 3,250 square metres of general office space and 9,385 square metres of industrial buildings, approximately 171 regular parking spaces, seven visitor parking spaces and eighteen bicycle parking spots.
- B. Two accesses to the development lands will be provided to the west of the proposed development onto Borrisokane Road approximately 630 metres (Site Access #1) and 735 metres (Site Access #2) south of Cambrian Road. The other two site accesses will be provided to the south of the proposed development onto a future roadway. These accesses will be located approximately 30 metres (Access #3) and 200 metres (Site Access #4) east of Borrisokane Road. Site Access #1 is designated for truck use only and is expected to operate as a one-way, right-in only access. Site Access #2 is expected to operate as a right-in right-out access. Both Site Access #3 and #4 are expected to operate as full-movement accesses.
- C. The existing Study Area is not currently served by any bus routes, however Route #75 and Route #275 serve the area east of the subject development.
- D. 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.
- E. Three trip generation methods were considered as a result of the expected unique trip generation of the proposed development:
 - i. Method 1: ITE
 - ii. Method 2: First Principles
 - iii. Method 3: Proxy Study GFA Rates
- F. The first principles approach was selected to determine the total person trip generation and the adjusted South Nepean mode shares were used to determine the trip generation by mode. An estimated 136 AM and 188 PM new peak hour two-way vehicle trips are projected.
- G. Approximately three inbound and 12-15 outbound trucks are anticipated per day and will be spread-out over the course of the day. These trips are expected to have a negligible impact during peak periods.
- H. Approximately 171 regular parking spaces, seven visitor parking spaces and eighteen bicycle parking spots will be provided. No parking requirements exist for visitor or bicycle parking spaces, however the minimum parking requirements for regular vehicle parking spaces are exceeded.
- I. Turning templates indicate the proposed accesses and circulation route within the development can accommodate the expected delivery trucks and garbage trucks.
- J. It was found that the road segment of Borrisokane Road will meet the TkLOS target level in all horizons, however no targets exist for PLOS, BLOS or TLOS as the Study Area is considered a general rural area.
- K. Left-turn lane warrants have been examined at the intersections of Cambrian Road and Borrisokane Road, and Borrisokane Road and the New Roadway for the 2022 and 2027 future background and total future horizons.
 - i. A southbound left-turn lane is warranted at the intersection of Cambrian Road and Borrisokane Road for all future horizons. Design details will be provided by others outside of this TIA.
- L. A southbound left-turn lane is warranted at the intersection of the New Roadway for the 2022 future total and 2027 future total horizons. A 15-metre storage lane with a 115-metre parallel lane and a 105-metre taper should be provided.

- M. Left-turn lane warrants have been examined at the access intersection of Access #3 and the New Roadway, and Access #4 and the New Roadway for the 2022 and 2027 total future horizons. No left-turns are warranted
- N. An RMA is required for the proposed southbound left turn lane at the New Roadway. This will be prepared upon approval of the findings of this TIA and will be submitted separately.
- O. Signal warrants have been examined at the intersection of Cambrian Road and Borrisokane Road.
 - i. The signal warrant for the 2027 future background horizon is met to 119%. Even though the threshold is 120%, given the failing operational analysis of Cambrian Road and Borrisokane Road as an unsignalized intersection, signalization is warranted at this horizon.
- P. The Study Area intersections operate satisfactorily during the peak hours in the existing conditions operational analysis.
- Q. The Study Area intersections operate satisfactorily overall during the peak hours in the 2022 future background operational analysis following the implementation of mitigation measures.
- R. The Study Area intersections operate satisfactorily during the peak hours in the 2022 future total operational analysis, following the implementation of mitigation measures, with similar operational characteristics as the 2022 future background conditions.
- S. The Study Area intersections operate satisfactorily during the peak hours in the 2027 future background operational analysis following the implementation of mitigation measures.
- T. The Study Area intersections operate satisfactorily during the peak hours in the 2027 future total operational analysis with similar operational characteristics as the 2027 future background conditions.
- U. As the design of the future signalized intersection of Borrisokane and Cambrian Road is currently unclear, its MMLOS cannot be determined at this time, however it is assumed that the design will include transit and active mode supportive elements in order to achieve its MMLOS targets.

The proposed development will function within the Study Area Road Network. It is recommended that, from a transportation perspective, the proposed development application process proceed.

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Appendix A

TIA Screening Form and PM Certification Form

City of Ottawa 2017 TIA Guidelines
 Step 1 - Screening Form

Date: 19-Mar-20
 Project Number: 2019-52
 Project Reference: Caivan ABIC Manufacturing Facility

1.1 Description of Proposed Development	
Municipal Address	3713 Borrisokane Road
Description of Location	CON 3RF PT LOT 9 RP 5R-6254; PART 2 LESS RP 5R-13374 PTS;9 & 10 RD WIDENING
Land Use Classification	ME2-Mineral Extraction Operation-Pit Only and Urban Expansion Area (Residential Use)
Development Size	Approximately 9,385 sq. metres industrial, 3,250 sq. metres general office space & approximately 185 regular parking spaces, 7 visitor spaces & 18 bicycle parking spots
Accesses	Four total. Two accesses onto Borrisokane Road approx 630 metres & 735 metres south of Cambrian Road. Two access onto the future roadway approx 30 metres & 200 metres east of Borrisokane
Phase of Development	Single Phase
Buildout Year	2022
TIA Requirement	Full TIA Required

1.2 Trip Generation Trigger	
Land Use Type	Industrial
Development Size	9385 G.F.A.
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?	Yes
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)?	No
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 a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?	No
Does the development include a drive-thru facility?	No
Safety Trigger	Yes



TIA Plan Reports

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

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

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

CERTIFICATION

1. I have reviewed and have a sound understanding of the objectives, needs and requirements of the City of Ottawa's Official Plan, Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines;
2. I have a sound knowledge of industry standard practice with respect to the preparation of transportation impact assessment reports, including multi modal level of service review;
3. I have substantial experience (more than 5 years) in undertaking and delivering transportation impact studies (analysis, reporting and geometric design) with strong background knowledge in transportation planning, engineering or traffic operations; and
4. I am either a licensed¹ or registered² professional in good standing, whose field of expertise [check appropriate field(s)] is either transportation engineering or transportation planning .

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

Dated at Newmarket this 16 day of October, 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)
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Appendix B

Turning Movement Counts

Survey Date: Tuesday February 15 2018
 Weather: Cloudy

AM Peak Hour: 7:30 AM to 8:30 AM
 MD Peak Hour: 11:30 AM to 12:30 PM
 PM Peak Hour: 4:45 PM to 5:45 PM

TURNING MOVEMENT COUNT SUMMARY - ALL MODES

AADT FACTOR: 1.0



Turning Movement Count - Full Study Summary Report (Vehicles)

Time Period	Borrisokane Road					Borrisokane Road					N/S STREET TOTAL	0					Cambrian Road					E/W STREET TOTAL	Grand TOTAL			
	Northbound					Southbound						Eastbound					Westbound									
	LT	ST	RT	U-Turns	NB TOTAL	LT	ST	RT	U-Turns	SB TOTAL		LT	ST	RT	U-Turns	EB TOTAL	LT	ST	RT	U-Turns	WB TOTAL					
7:00 8:00	0	28	10	0	38	72	15	0	0	87	125	0	0	0	0	0	8	0	350	0	358	358	483			
8:00 9:00	0	48	13	0	61	123	22	0	0	145	206	0	0	0	0	0	5	0	346	0	351	351	557			
9:00 10:00	0	24	1	0	25	60	22	0	0	82	107	0	0	0	0	0	1	0	209	0	210	210	317			
AVG AM Pk HR	0	33	8	0	41	85	20	0	0	105	146	0	0	0	0	0	5	0	302	0	306	306	452			
11:30 12:30	0	54	9	0	63	105	26	0	0	131	194	0	0	0	0	0	4	0	139	0	143	143	337			
12:30 13:30	0	48	6	0	54	87	23	0	0	110	164	0	0	0	0	0	2	0	117	0	119	119	283			
AVG MD Pk HR	0	51	8	0	59	96	25	0	0	121	179	0	0	0	0	0	3	0	128	0	131	131	310			
15:00 16:00	0	40	1	0	41	58	51	0	0	109	150	0	0	0	0	0	13	0	159	0	172	172	322			
16:00 17:00	0	25	0	0	25	344	43	0	0	387	412	0	0	0	0	0	11	0	162	0	173	173	585			
17:00 18:00	0	22	0	0	22	352	36	0	0	388	410	0	0	0	0	0	14	0	198	0	212	212	622			
AVG PM Pk HR	0	29	0	0	29	251	43	0	0	295	324	0	0	0	0	0	13	0	173	0	186	186	510			
TOTAL	0	373	56	0	429	1,382	282	0	0	1,664	2,093	0	0	0	0	0	66	0	2,110	0	2,175	2,175	4,268			
EQ 12Hr	0	519	77	0	596	1921	392	0	0	2313	2909	0	0	0	0	0	91	0	2932	0	3024	3024	5933			
Note: These volumes are calculated by multiplying the totals by the appropriate expansion factor.																										
AVG 12Hr	0	519	77	0	596	1921	392	0	0	2313	2909	0	0	0	0	0	91	0	2932	0	3024	3024	5933			
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.																										
AVG 24Hr	0	680	101	0	781	2516	514	0	0	3030	3811	0	0	0	0	0	120	0	3841	0	3961	3961	7772			
Note: These volumes are calculated by multiplying the Average Daily 12hr. totals by the 12 to 24 expansion factor.																										

Turning Movement Count - Full Study Summary Report (Pedestrians)

Time Period	Borrisokane Road					Borrisokane Road					N/S STREET TOTAL	0					Cambrian Road					E/W STREET TOTAL	Grand TOTAL			
	NB Approach (East or West Crossing)					SB Approach (East or West Crossing)						EB Approach (North or South Crossing)					WB Approach (North or South Crossing)									
	LT	ST	RT	U-Turns	NB TOTAL	LT	ST	RT	U-Turns	SB TOTAL		LT	ST	RT	U-Turns	EB TOTAL	LT	ST	RT	U-Turns	WB TOTAL					
7:00 8:00	0				0	0				0	0	0			0	0				0	0	0	0			
8:00 9:00	0				0	0				0	0	0			0	0				0	0	0	0			
9:00 10:00	0				0	0				0	0	0			0	0				1	0	1	1			
11:30 12:30	0				0	0				0	0	0			0	0				0	0	0	0			
12:30 13:30	0				0	0				0	0	0			0	0				0	0	0	0			
15:00 16:00	0				0	0				0	0	0			0	0				0	0	0	0			
16:00 17:00	0				0	228				228	228	0			0	0				0	0	0	228			
17:00 18:00	0				0	0				0	0	0			0	0				0	0	0	0			
TOTAL:	0				0	228				228	0	0			0	0				1	0	1	229			

Turning Movement Count - Full Study Summary Report (Cyclists)																					
Time Period	Borrisokane Road					Borrisokane Road					N/S STREET TOTAL	0				Cambrian Road				E/W STREET TOTAL	Grand TOTAL
	Northbound					Southbound						Eastbound				Westbound					
7:00 - 8:00					0				0		0					0		0	0	0	0
8:00 - 9:00					0				0		0					0		0	0	0	0
9:00 - 10:00					0				0		0					0		0	0	0	0
11:30 - 12:30					0				0		0					0		0	0	0	0
12:30 - 13:30					0				0		0					0		0	0	0	0
15:00 - 16:00					0				0		0					0		0	0	0	0
16:00 - 17:00					0				0		0					0		0	0	0	0
17:00 - 18:00					0				0		0					0		0	0	0	0
TOTAL:					0				0		0					0		0	0	0	0

Turning Movement Count - Full Study Summary Report (Heavy Vehicles)																								
Time Period	Borrisokane Road						Borrisokane Road						N/S STREET TOTAL	0				Cambrian Road				E/W STREET TOTAL	Grand TOTAL	
	Northbound						Southbound							Eastbound				Westbound						
	LT	ST	RT	U-Turns	NB TOTAL		LT	ST	RT	U-Turns	SB TOTAL			LT	ST	RT	U-Turns	EB TOTAL	LT	ST	RT	U-Turns	WB TOTAL	
7:00 - 8:00	0	9	0	0	9		16	8	0	0	24	33		0	0	0	0	0	0	0	5	0	5	38
8:00 - 9:00	0	10	2	0	12		4	10	0	0	14	26		0	0	0	0	0	2	0	16	0	18	44
9:00 - 10:00	0	12	0	0	12		7	13	0	0	20	32		0	0	0	0	0	0	0	10	0	10	42
11:30 - 12:30	0	11	1	0	12		2	11	0	0	13	25		0	0	0	0	0	1	0	5	0	6	31
12:30 - 13:30	0	10	3	0	13		2	11	0	0	13	26		0	0	0	0	0	0	0	5	0	5	31
15:00 - 16:00	0	2	0	0	2		10	2	0	0	12	14		0	0	0	0	0	1	0	11	0	12	26
16:00 - 17:00	0	1	5	0	6		6	2	0	0	8	14		0	0	0	0	0	4	0	17	0	21	35
17:00 - 18:00	0	2	1	0	3		1	1	0	0	2	5		0	0	0	0	0	2	0	5	0	7	12
TOTAL:	0	57	12	0	69		48	58	0	0	106	175		0	0	0	0	0	10	0	74	0	84	259



Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

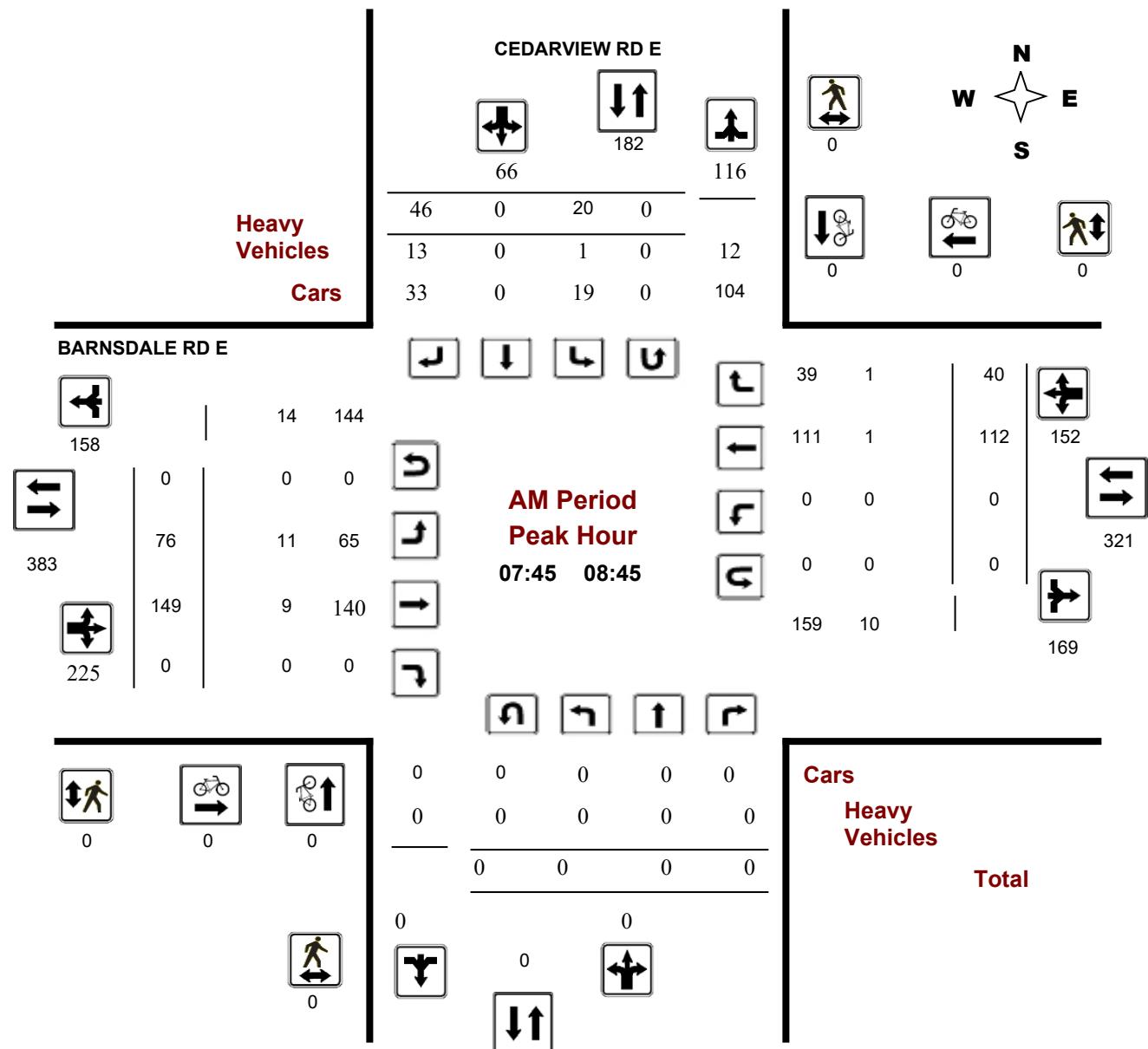
BARNSDALE RD E @ CEDARVIEW RD E

Survey Date: Thursday, January 10, 2019

Start Time: 07:00

WO No: 38246

Device: Miovision



Turning Movement Count - Peak Hour Diagram

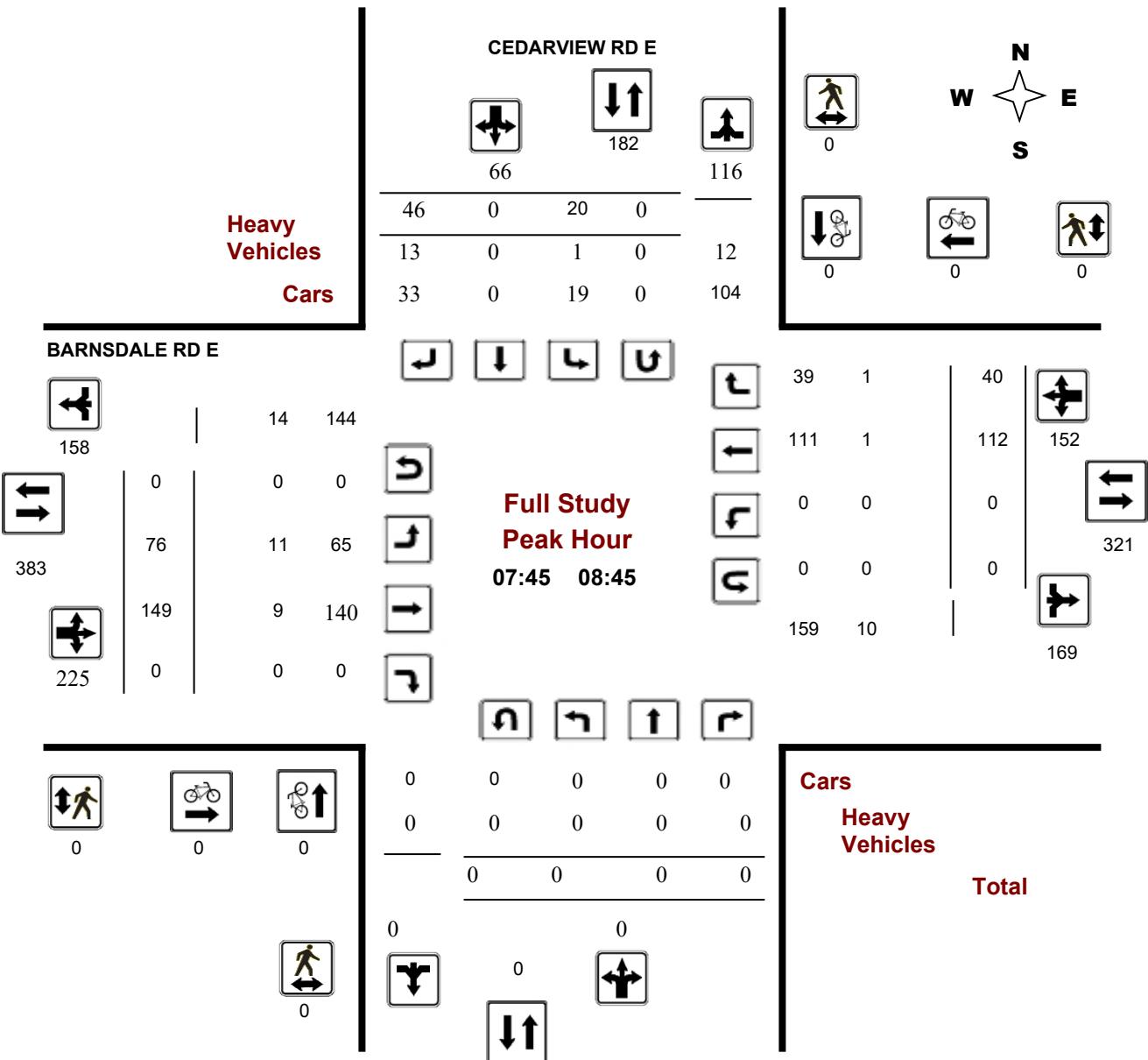
BARNSDALE RD E @ CEDARVIEW RD E

Survey Date: Thursday, January 10, 2019

Start Time: 07:00

WO No: 38246

Device: Miovision



Comments



Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

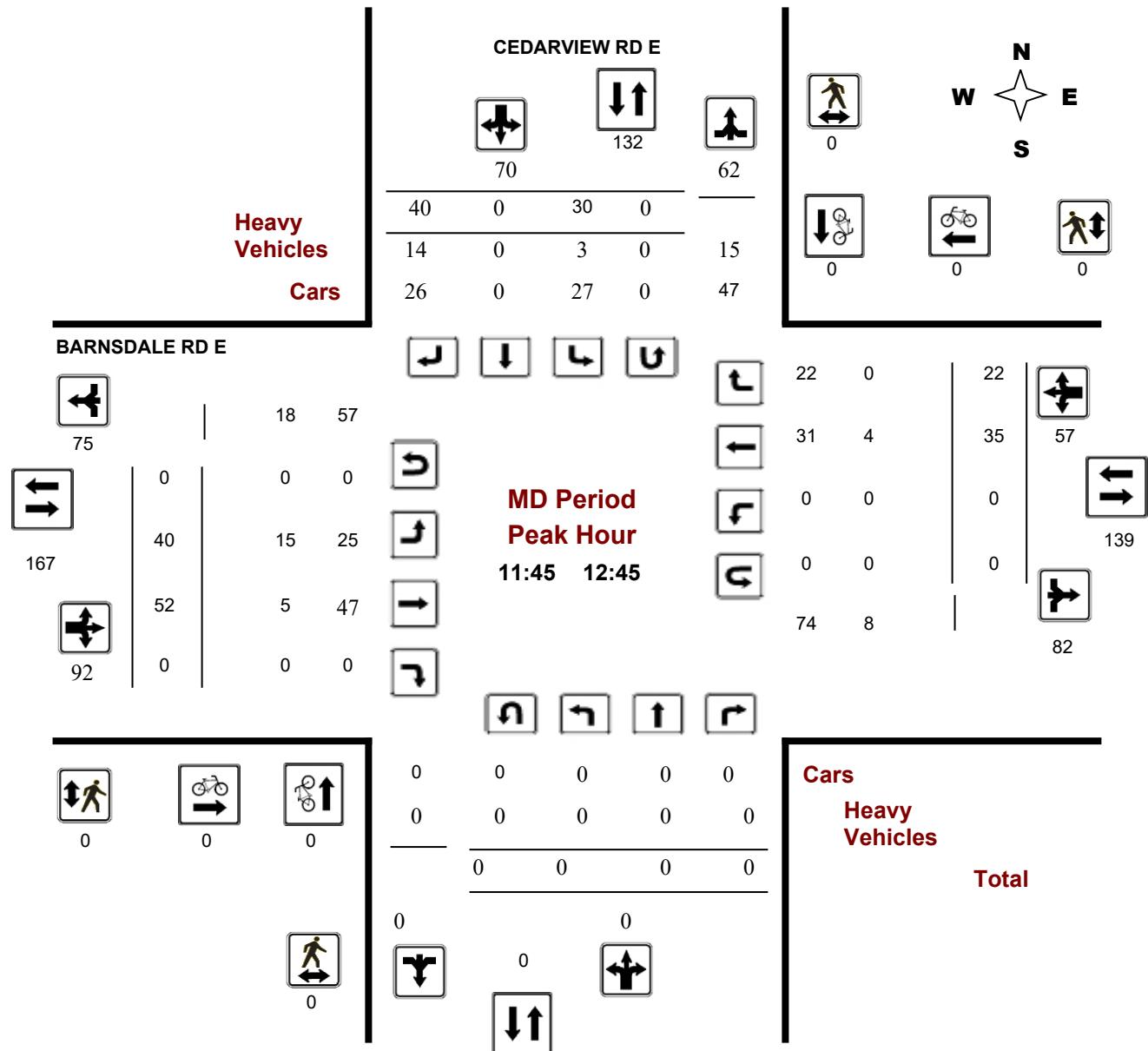
BARNSDALE RD E @ CEDARVIEW RD E

Survey Date: Thursday, January 10, 2019

Start Time: 07:00

WO No: 38246

Device: Miovision





Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

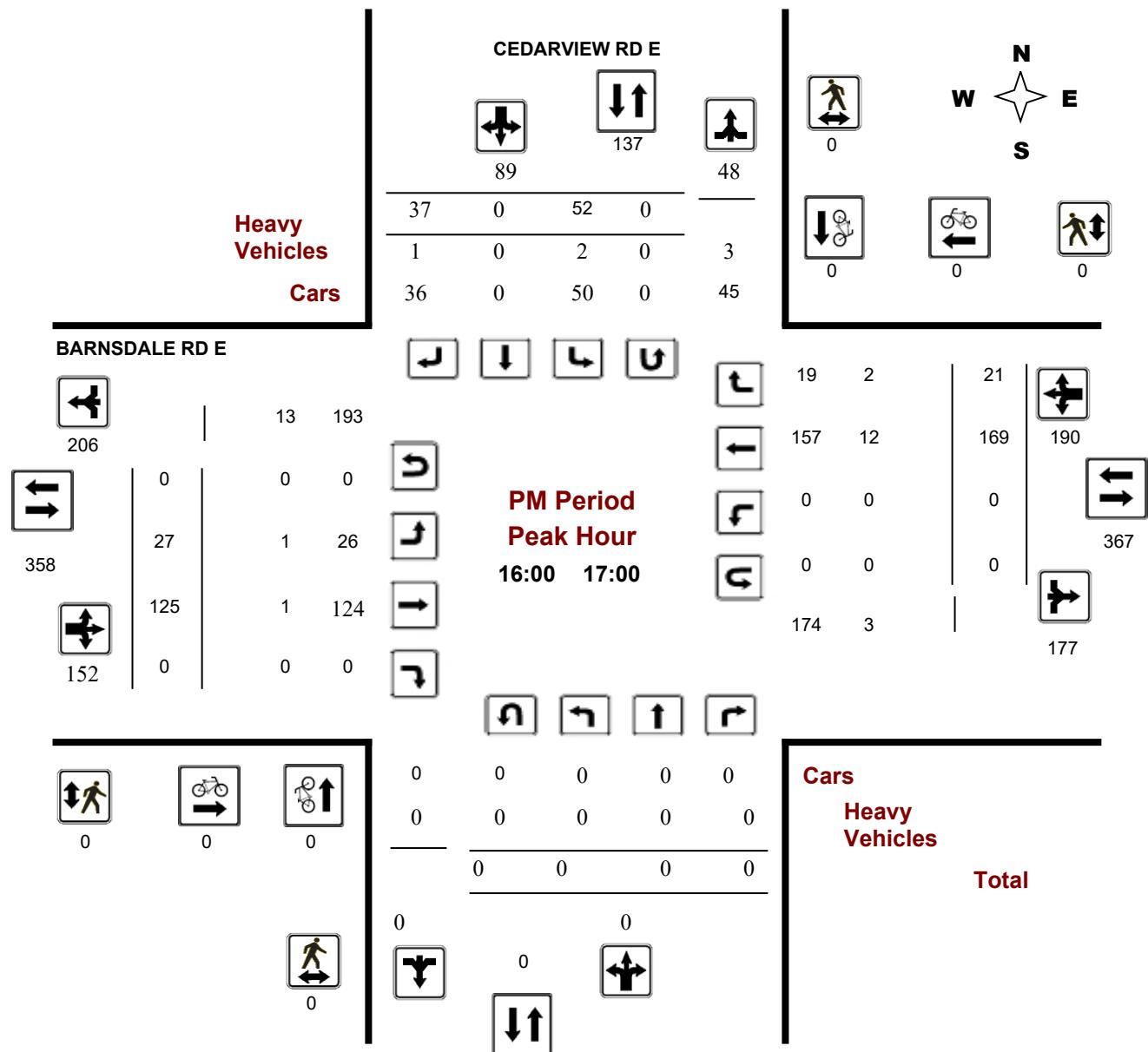
BARNSDALE RD E @ CEDARVIEW RD E

Survey Date: Thursday, January 10, 2019

Start Time: 07:00

WO No: 38246

Device: Miovision





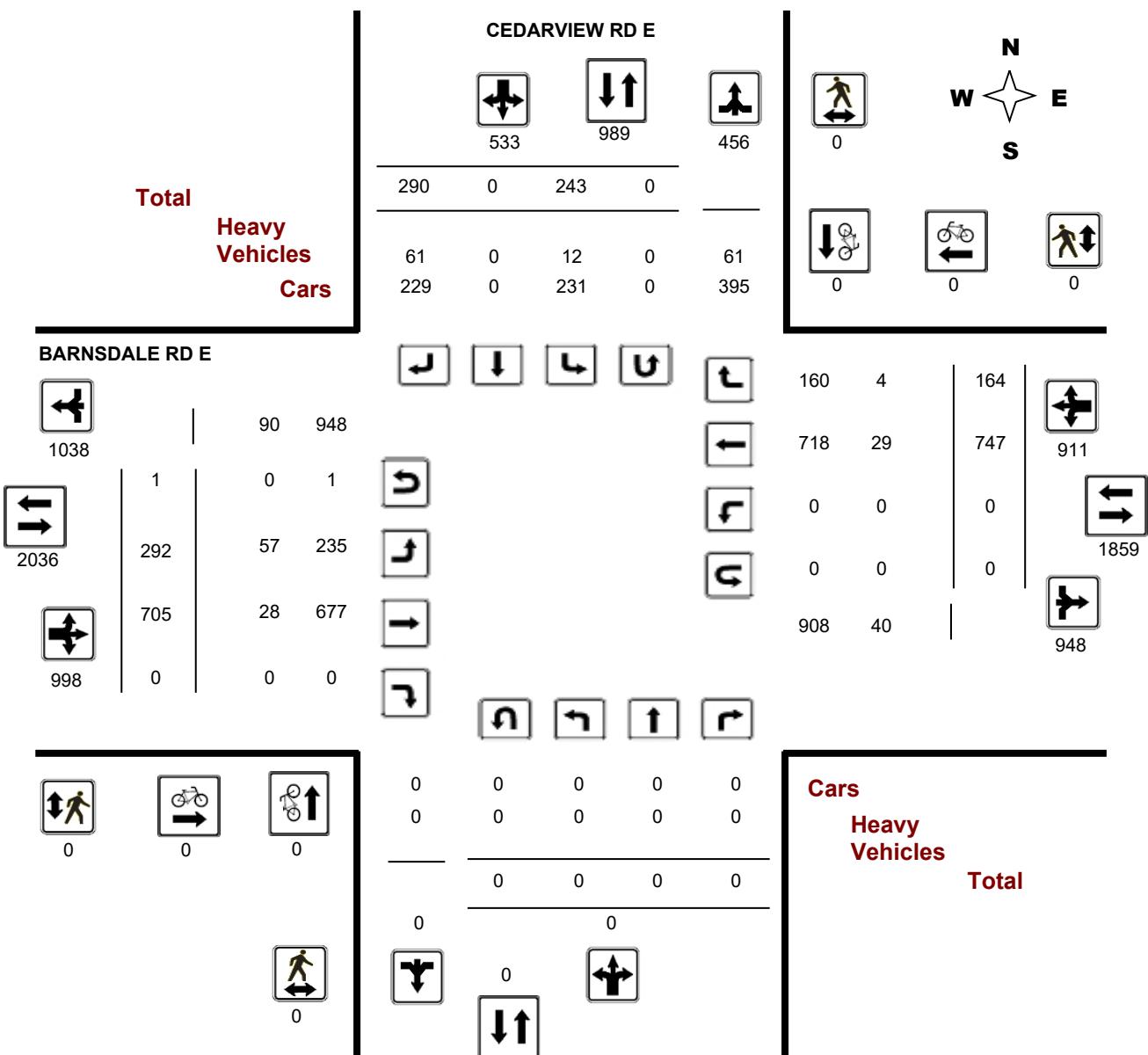
Transportation Services - Traffic Services

Turning Movement Count - Full Study Diagram

BARNSDALE RD E @ CEDARVIEW RD E

Survey Date: Thursday, January 10, 2019

WO#: 38246
Device: Miovision



Comments



Transportation Services - Traffic Services

Work Order

38246

Turning Movement Count - Full Study Summary Report

BARNSDALE RD E @ CEDARVIEW RD E

Survey Date: Thursday, January 10, 2019

Total Observed U-Turns

AADT Factor

Northbound:	0	Southbound:	0
Eastbound:	1	Westbound:	0

1.00

Full Study

CEDARVIEW RD E

BARNSDALE RD E

Period	Northbound			Southbound			SB TOT	STR TOT	Eastbound			Westbound			WB TOT	STR TOT	Grand Total		
	LT	ST	RT	NB TOT	LT	ST	RT		LT	ST	RT	EB TOT	LT	ST	RT				
07:00 08:00	0	0	0	0	11	0	19	30	30	26	124	0	150	0	85	14	99	249	279
08:00 09:00	0	0	0	0	20	0	51	71	71	77	149	0	226	0	105	37	142	368	439
09:00 10:00	0	0	0	0	19	0	25	44	44	34	58	0	92	0	53	18	71	163	207
11:30 12:30	0	0	0	0	31	0	42	73	73	38	49	0	87	0	38	15	53	140	213
12:30 13:30	0	0	0	0	27	0	37	64	64	37	41	0	78	0	29	21	50	128	192
15:00 16:00	0	0	0	0	53	0	47	100	100	33	57	0	90	0	133	26	159	249	349
16:00 17:00	0	0	0	0	52	0	37	89	89	27	125	0	152	0	169	21	190	342	431
17:00 18:00	0	0	0	0	30	0	32	62	62	20	102	0	122	0	135	12	147	269	331
Sub Total	0	0	0	0	243	0	290	533	533	292	705	0	997	0	747	164	911	1908	2441
U Turns					0			0	0				1			0	1	1	
Total	0	0	0	0	243	0	290	533	533	292	705	0	998	0	747	164	911	1909	2442
EQ 12Hr	0	0	0	0	338	0	403	741	741	406	980	0	1387	0	1038	228	1266	2653	3394

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.

1.00

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

1.31

Comments:

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



Transportation Services - Traffic Services

W.O.

38246

Turning Movement Count - 15 Minute Summary Report

BARNSDALE RD E @ CEDARVIEW RD E

Survey Date: Thursday, January 10, 2019

Total Observed U-Turns

Northbound:	0	Southbound:	0
Eastbound:	1	Westbound:	0

CEDARVIEW RD E

BARNSDALE RD E

Time Period	Northbound			Southbound			Eastbound			Westbound			W TOT	STR TOT	Grand Total	
	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT			
07:00 - 07:15	0	0	0	0	3	0	5	8	8	8	17	0	26	0	9	44
07:15 - 07:30	0	0	0	0	4	0	4	8	8	2	39	0	41	0	27	78
07:30 - 07:45	0	0	0	0	1	0	4	5	5	4	35	0	39	0	20	68
07:45 - 08:00	0	0	0	0	3	0	6	9	9	12	33	0	45	0	29	90
08:00 - 08:15	0	0	0	0	6	0	6	12	12	27	46	0	73	0	26	122
08:15 - 08:30	0	0	0	0	5	0	13	18	18	24	41	0	65	0	27	125
08:30 - 08:45	0	0	0	0	6	0	21	27	27	13	29	0	42	0	30	106
08:45 - 09:00	0	0	0	0	3	0	11	14	14	13	33	0	46	0	22	86
09:00 - 09:15	0	0	0	0	6	0	9	15	15	10	14	0	24	0	16	59
09:15 - 09:30	0	0	0	0	7	0	8	15	15	11	23	0	34	0	12	65
09:30 - 09:45	0	0	0	0	2	0	6	8	8	8	8	0	16	0	16	46
09:45 - 10:00	0	0	0	0	4	0	2	6	6	5	13	0	18	0	9	37
11:30 - 11:45	0	0	0	0	9	0	13	22	22	8	10	0	18	0	9	49
11:45 - 12:00	0	0	0	0	6	0	8	14	14	12	13	0	25	0	10	53
12:00 - 12:15	0	0	0	0	6	0	14	20	20	8	11	0	19	0	10	57
12:15 - 12:30	0	0	0	0	10	0	7	17	17	10	15	0	25	0	9	54
12:30 - 12:45	0	0	0	0	8	0	11	19	19	10	13	0	23	0	6	55
12:45 - 13:00	0	0	0	0	7	0	5	12	12	13	10	0	23	0	7	46
13:00 - 13:15	0	0	0	0	8	0	9	17	17	8	11	0	19	0	6	47
13:15 - 13:30	0	0	0	0	4	0	12	16	16	6	7	0	13	0	5	44
15:00 - 15:15	0	0	0	0	9	0	10	19	19	12	11	0	23	0	8	58
15:15 - 15:30	0	0	0	0	14	0	12	26	26	9	15	0	24	0	31	84
15:30 - 15:45	0	0	0	0	11	0	15	26	26	6	16	0	22	0	43	99
15:45 - 16:00	0	0	0	0	19	0	10	29	29	6	15	0	21	0	32	89
16:00 - 16:15	0	0	0	0	12	0	9	21	21	8	33	0	41	0	42	109
16:15 - 16:30	0	0	0	0	17	0	6	23	23	8	23	0	31	0	44	103
16:30 - 16:45	0	0	0	0	12	0	8	20	20	4	39	0	43	0	39	105
16:45 - 17:00	0	0	0	0	11	0	14	25	25	7	30	0	37	0	44	114
17:00 - 17:15	0	0	0	0	8	0	9	17	17	6	25	0	31	0	44	95
17:15 - 17:30	0	0	0	0	3	0	10	13	13	8	39	0	47	0	28	93
17:30 - 17:45	0	0	0	0	11	0	8	19	19	4	21	0	25	0	37	83
17:45 - 18:00	0	0	0	0	8	0	5	13	13	2	17	0	19	0	26	60

TOTAL: 0 0 0 0 243 0 290 533 533 292 705 0 998 0 747 164 911 1909 2442

Note: U-Turns are included in Totals.

Comment:



Transportation Services - Traffic Services

Turning Movement Count - Cyclist Volume Report

Work Order
38246

BARNSDALE RD E @ CEDARVIEW RD E

Count Date: Thursday, January 10, 2019

Start Time: 07:00

Time Period	CEDARVIEW RD E			BARNSDALE RD E			Grand Total
	Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	
07:00 08:00	0	0	0	0	0	0	0
08:00 09:00	0	0	0	0	0	0	0
09:00 10:00	0	0	0	0	0	0	0
11:30 12:30	0	0	0	0	0	0	0
12:30 13:30	0	0	0	0	0	0	0
15:00 16:00	0	0	0	0	0	0	0
16:00 17:00	0	0	0	0	0	0	0
17:00 18:00	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0

Comment:

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



Transportation Services - Traffic Services

W.O.
38246

Turning Movement Count - Heavy Vehicle Report

BARNSDALE RD E @ CEDARVIEW RD E

Survey Date: Thursday, January 10, 2019

CEDARVIEW RD E				BARNSDALE RD E																
Time Period	Northbound			Southbound			S TOT	STR TOT	Eastbound			Westbound			W TOT	STR TOT	Grand Total			
	LT	ST	RT	LT	ST	RT			LT	ST	RT	E TOT	LT	ST	RT					
07:00	08:00	0	0	0	0	0	3	3	2	9	0	11	0	1	0	1	12	15		
08:00	09:00	0	0	0	0	1	0	16	17	17	13	6	0	19	0	0	1	1	20	37
09:00	10:00	0	0	0	0	3	0	10	13	13	10	0	0	10	0	2	1	3	13	26
11:30	12:30	0	0	0	0	3	0	16	19	19	16	6	0	22	0	5	0	5	27	46
12:30	13:30	0	0	0	0	0	9	9	9	13	3	0	16	0	3	0	3	19	28	
15:00	16:00	0	0	0	0	3	0	5	8	8	2	2	0	4	0	4	0	4	8	16
16:00	17:00	0	0	0	0	2	0	1	3	3	1	1	0	2	0	12	2	14	16	19
17:00	18:00	0	0	0	0	0	1	1	1	0	1	0	1	0	2	0	2	3	4	
Sub Total		0	0	0	0	12	0	61	73	73	57	28	0	85	0	29	4	33	118	191
U-Turns (Heavy Vehicles)				0			0			0			0			0			0	
Total		0	0	0	0	12	0	61	73	73	57	28	0	85	0	29	4	33	118	191

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



Transportation Services - Traffic Services

Work Order

38246

Turning Movement Count - Pedestrian Volume Report

BARNSDALE RD E @ CEDARVIEW RD E

Count Date: Thursday, January 10, 2019

Start Time: 07:00

Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	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
07:00 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
08:00 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
09:00 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
11:30 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
12:30 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
15:00 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
16:00 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
17:00 18:00	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0

Comment:

Turning Movement Count - 15 Min U-Turn Total Report

BARNSDALE RD E @ CEDARVIEW RD E

Survey Date: Thursday, January 10, 2019

Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	1	0	1
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	0	0	0
07:45	08:00	0	0	0	0	0
08:00	08:15	0	0	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	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	0	1

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
2014-07-23	2014	:00 A	BARNSDALE RD btwn TRAIL RD & CEDAR IEW RD	01 - Clear	01 - Daylight	10 - No control	02 - Non-fatal injury	07 - Scatterer	07 - Scatterer

Accident Date	Accident Year	Accident Time	Location	Environment Condition	Light	Traffic Control	Classification Of Accident	Initial Impact Type	Road Surface Condition
2014-03-22	2014	11:40:00 A	CEDAR IEW RD btwn CA BRIAN RD & STRANDHERD DR	03 - Snow	01 - Daylight	10 - No control	03 - Pedestrian	07 - Scatterer	03 - Loose snow
2014-04-03	2014	:00:00 P	CEDAR IEW RD btwn CA BRIAN RD & STRANDHERD DR	01 - Clear	07 - Dark	10 - No control	02 - Non-fatal injury	07 - Scatterer	01 - Dry
2014-01-0	2014	7:21:00 A	CEDAR IEW RD btwn CA BRIAN RD & STRANDHERD DR	01 - Clear	03 - Dawn	10 - No control	03 - Pedestrian	07 - Scatterer	0 - Ice
2014-01-0	2014	7:14:00 A	CEDAR IEW RD btwn CA BRIAN RD & STRANDHERD DR	03 - Snow	03 - Dawn	10 - No control	03 - Pedestrian	07 - Scatterer	0 - Packed snow
2014-01-2	2014	1:17:00 P	CEDAR IEW RD btwn CA BRIAN RD & STRANDHERD DR	01 - Clear	01 - Daylight	10 - No control	02 - Non-fatal injury	07 - Scatterer	01 - Dry
2017-02-23	2017	2:40:00 P	BORRISOKANE RD btwn CA BRIAN RD & STRANDHERD DR	01 - Clear	01 - Daylight	10 - No control	03 - Pedestrian	-	01 - Dry
2017-10-07	2017	10:20:00 A	BORRISOKANE RD btwn CA BRIAN RD & STRANDHERD DR	02 - Rain	01 - Daylight	10 - No control	03 - Pedestrian	07 - Scatterer	02 - Wet
2017-10-23	2017	:27:00 P	BORRISOKANE RD btwn CA BRIAN RD & STRANDHERD DR	01 - Clear	07 - Dark	10 - No control	03 - Pedestrian	07 - Scatterer	01 - Dry
2017-12-0	2017	:10:00 A	BORRISOKANE RD btwn CA BRIAN RD & STRANDHERD DR	01 - Clear	01 - Daylight	10 - No control	02 - Non-fatal injury	07 - Scatterer	01 - Dry
2017-02-10	2017	10:30:00 P	BORRISOKANE RD btwn CA BRIAN RD & STRANDHERD DR	04 - Freezing rain	07 - Dark	10 - No control	03 - Pedestrian	07 - Scatterer	0 - Ice
2017-02-0	2017	:11:00 P	BORRISOKANE RD btwn CA BRIAN RD & STRANDHERD DR	03 - Snow	07 - Dark	10 - No control	03 - Pedestrian	07 - Scatterer	03 - Loose snow
2014-03-07	2014	:37:00 A	BORRISOKANE RD btwn CA BRIAN RD & STRANDHERD DR (3 A1CC)	03 - Snow	01 - Daylight	10 - No control	03 - Pedestrian	07 - Scatterer	03 - Loose snow
2014-01-1	2014	:20:00 A	BORRISOKANE RD btwn CA BRIAN RD & STRANDHERD DR (3 A1CC)	01 - Clear	01 - Daylight	10 - No control	02 - Non-fatal injury	07 - Scatterer	01 - Dry
2014-01-02	2014	4:30:00 P	BORRISOKANE RD btwn CA BRIAN RD & STRANDHERD DR (3 A1CC)	01 - Clear	01 - Daylight	10 - No control	03 - Pedestrian	07 - Scatterer	01 - Dry
2014-01-1	2014	11:11:00 A	BORRISOKANE RD btwn CA BRIAN RD & STRANDHERD DR (3 A1CC)	01 - Clear	01 - Daylight	10 - No control	03 - Pedestrian	07 - Scatterer	01 - Dry
2014-01-24	2014	:17:00 P	BORRISOKANE RD btwn CA BRIAN RD & STRANDHERD DR (3 A1CC)	01 - Clear	01 - Daylight	10 - No control	02 - Non-fatal injury	07 - Scatterer	01 - Dry
2014-01-1	2014	:30:00 P	BORRISOKANE RD btwn CA BRIAN RD & STRANDHERD DR (3 A1CC)	01 - Clear	01 - Daylight	10 - No control	03 - Pedestrian	07 - Scatterer	01 - Dry
2014-10-0	2014	1:40:00 P	BORRISOKANE RD btwn CA BRIAN RD & STRANDHERD DR (3 A1CC)	02 - Rain	01 - Daylight	10 - No control	03 - Pedestrian	07 - Scatterer	02 - Wet
2014-12-01	2014	10:40:00 P	BORRISOKANE RD btwn CA BRIAN RD & STRANDHERD DR (3 A1CC)	01 - Clear	07 - Dark	10 - No control	03 - Pedestrian	07 - Scatterer	01 - Dry
2014-12-27	2014	12:27:00 P	BORRISOKANE RD btwn CA BRIAN RD & STRANDHERD DR (3 A1CC)	01 - Clear	01 - Daylight	10 - No control	03 - Pedestrian	03 - Rear end	0 - Ice

Accident Date	Accident Year	Accident Time	Location	Environment Condition	Light	Traffic Control	Classification Of Accident	Initial Impact Type	Road Surface Condition
2014-03-1	2014	4:00:00 P	CA BRIAN RD btwn BORRISOKANE RD & GRAND CANAL ST	01 - Clear	01 - Daylight	10 - No control	02 - Non-fatal injury	01 - Approach	01 - Dry
2014-10-0	2014	12:00:00 A	CA BRIAN RD btwn BORRISOKANE RD & GRAND CANAL ST	01 - Clear	00 - unknown	10 - No control	03 - Pedestrian	0 - Unattended vehicle	01 - Dry
2014-01-30	2014	4:40:00 A	CA BRIAN RD btwn BORRISOKANE RD & GRAND CANAL ST	03 - Snow	07 - Dark	10 - No control	02 - Non-fatal injury	07 - Scatterer	03 - Loose snow

Accident Date	Accident Year	Accident Time	Location	Environment Condition	Light	Traffic Control	Classification Of Accident	Initial Impact Type	Road Surface Condition
2014-01-04	2014	3:22:00 P	CEDAR IEW RD btwn CA BRIAN RD & BARNSDALE RD	01 - Clear	01 - Daylight	10 - No control	03 - Pedestrian	07 - Scatterer	01 - Dry
2014-04-04	2014	7:00 P	CEDAR IEW RD btwn CA BRIAN RD & BARNSDALE RD	01 - Clear	07 - Dark	10 - No control	03 - Pedestrian	07 - Scatterer	01 - Dry
2014-01-0	2014	:10:00 A	CEDAR IEW RD btwn CA BRIAN RD & BARNSDALE RD (3 A1T)	0 - Strong wind	01 - Daylight	10 - No control	03 - Pedestrian	07 - Scatterer	02 - Wet

Accident Date	Accident Year	Accident Time	Location	Environment Condition	Light	Traffic Control	Classification Of Accident	Initial Impact Type	Road Surface Condition
2014-02-0	2014	12:20:00 P	BARNSDALE RD W CEDAR IEW RD W	01 - Clear	01 - Daylight	02 - Stop sign	03 - Pedestrian	03 - Rear end	03 - Loose snow
2017-12-14	2017	:30:00 A	BARNSDALE RD E CEDAR IEW RD E	01 - Clear	01 - Daylight	02 - Stop sign	03 - Pedestrian	02 - Lane	02 - Wet
2014-01-10	2014	12:13:00 P	BARNSDALE RD E CEDAR IEW RD E (0001077)	01 - Clear	01 - Daylight	02 - Stop sign	02 - Non-fatal injury	02 - Lane	01 - Dry
2014-04-0	2014	12:20:00 A	BARNSDALE RD E CEDAR IEW RD E (0001077)	01 - Clear	07 - Dark	02 - Stop sign	02 - Non-fatal injury	02 - Lane	01 - Dry

Accident Date	Accident Year	Accident Time	Location	Environment Condition	Light	Traffic Control	Classification Of Accident	Initial Impact Type	Road Surface Condition
2014-01-0	2014	3:30:00 P	CA BRIAN RD CEDAR IEW RD	01 - Clear	01 - Daylight	02 - Stop sign	02 - Non-fatal injury	07 - Scatterer	01 - Dry
2014-07-10	2014	:00 A	CA BRIAN RD CEDAR IEW RD	01 - Clear	01 - Daylight	02 - Stop sign	03 - Pedestrian	03 - Rear end	01 - Dry
2014-01-2	2014	4:43:00 P	CA BRIAN RD CEDAR IEW RD	01 - Clear	0 - Dusk	02 - Stop sign	03 - Pedestrian	07 - Scatterer	0 - Ice
2014-01-23	2014	:10:00 P	CA BRIAN RD CEDAR IEW RD	01 - Clear	01 - Daylight	02 - Stop sign	02 - Non-fatal injury	03 - Rear end	01 - Dry
2014-07-2	2014	3:27:00 A	CA BRIAN RD CEDAR IEW RD	07 - Fog mist smoke	07 - Dark	02 - Stop sign	03 - Pedestrian	03 - Rear end	01 - Dry
2014-07-22	2014	:00 P	CA BRIAN RD CEDAR IEW RD	02 - Rain	0 - Dusk	02 - Stop sign	03 - Pedestrian	07 - Scatterer	02 - Wet
2014-12-11	2014	:30:00 A	CA BRIAN RD CEDAR IEW RD	01 - Clear	01 - Daylight	02 - Stop sign	03 - Pedestrian	07 - Scatterer	0 - Ice
2017-01-2	2017	1:7:00 P	CA BRIAN RD CEDAR IEW RD	01 - Clear	01 - Daylight	02 - Stop sign	03 - Pedestrian	03 - Rear end	01 - Dry
2017-12-17	2017	:33:00 A	CA BRIAN RD CEDAR IEW RD	01 - Clear	01 - Daylight	02 - Stop sign	03 - Pedestrian	07 - Scatterer	01 - Dry
2014-01-2	2014	11:10:00 A	CA BRIAN RD CEDAR IEW RD (000171)	01 - Clear	01 - Daylight	02 - Stop sign	02 - Non-fatal injury	07 - Scatterer	0 - Loose sand or rime

LOCATION & GEOID	TOTAL_COLLISIONS	TOTAL_CYCLIST_COLLISIONS	TOTAL_PEDESTRIAN_COLLISIONS
BARNSDALE RD btwn TRAIL RD & CEDAR IEW RD	1	0	0
BORRISOKANE RD btwn CA BRIAN RD & STRANDHERD DR	20	0	0
CA BRIAN RD btwn BORRISOKANE RD & GRAND CANAL ST	3	0	0
CEDAR IEW RD btwn CA BRIAN RD & BARNSDALE RD	3	0	0
BARNSDALE RD E CEDAR IEW RD E	5	0	0
CA BRIAN RD CEDAR IEW RD	10	0	0

Appendix D

ABIC Site Statistics

1944 ABIC Admin Offices & Assembly Plant

Site / Building Design Review

October 30, 2019

Occupant Load:

Offices / admin: 78 employees
Daycare: 15 children + 2 adults
Visitors : assume 30 visitors at any given time
Plant: 40 employees per shift

Plumbing

3.7.4.3i group A2 child care:
(10 children per water closet, 15 children require 2 WC) **Provided: 2 children WC + 1 adult WC**

3.7.4.7 group D Office:
(5 per sex = 10 water closets total required) **Provided: 8 women WC + 8 men WC**

3.7.4.9 group F2 Industrial Plant:
(3 per sex = 6 water closets total required) **Provided: 3 women WC + 3 men WC**

1 Universal washroom: **Provided: 1 Barrier-Free water closet**

Total Water Closet count:
(including urinals which account for 50% of men's water closets) **26 water closets**

Other plumbing:

22 lavatories
2 kitchen sinks
4 showers (2 / sex)
1 mop sink

Drinking fountains: 2 or more, 1 being barrier-free

Areas: Building Area (greatest horizontal area above grade) at level 1: **2,917 m²**

Admin Building 3.2.2.54. Group D, up to 3 Storeys, Sprinklered (+ Group A2 Child Care minor occupancy)

L1, Offices:	1,410 m ²
L1, Lobby:	622 m ²
L1, Design / Visitor's center:	674 m ²
L1, Daycare:	135 m ²
L2, Atrium / offices:	624 m ²

Total: **3,465 m² / 37,283 sq.ft.**

Assembly Plant 3.2.2.70. Group F, Division 2, up to 4 Storeys

Shop floor: **9,341 m² / 100,509 sq.ft.**
(Mezzanine office: 80 m²)

3.2.5.7. Water Supply

(2) Hydrants shall be located within 90 m horizontally of any portion of a building perimeter that is required to face a street in Subsection 3.2.2.

3.2.5.16. Fire Department Connections

(1) The fire department connection for a standpipe system shall be located so that the distance from the fire department connection to a hydrant is not more than 45 m and is unobstructed.
(2) The fire department connection for an automatic sprinkler system shall be located so that the distance from the fire department connection to a hydrant is not more than 45 m and is unobstructed.

Appendix E

Proxy Site Information

Canopy Growth Information Call

Source: Aaron.king@canopygrowth.com

- 1500 employees in/out per day
- 24/5 7am to 7am (24 hours/day Monday- Friday)
 - 8.5 hour shifts
 - 3 shifts
- 60%-70% of employees work day shifts
- 1 million sq ft-3 buildings
- New bottling plant
- Visitor centre
- Future parking garage and 5 storey office tower and will need 1800 spots
- 800 parking spots (existing)
- 7:30 for parking accommodations

Appendix F

Proxy Site Traffic Data

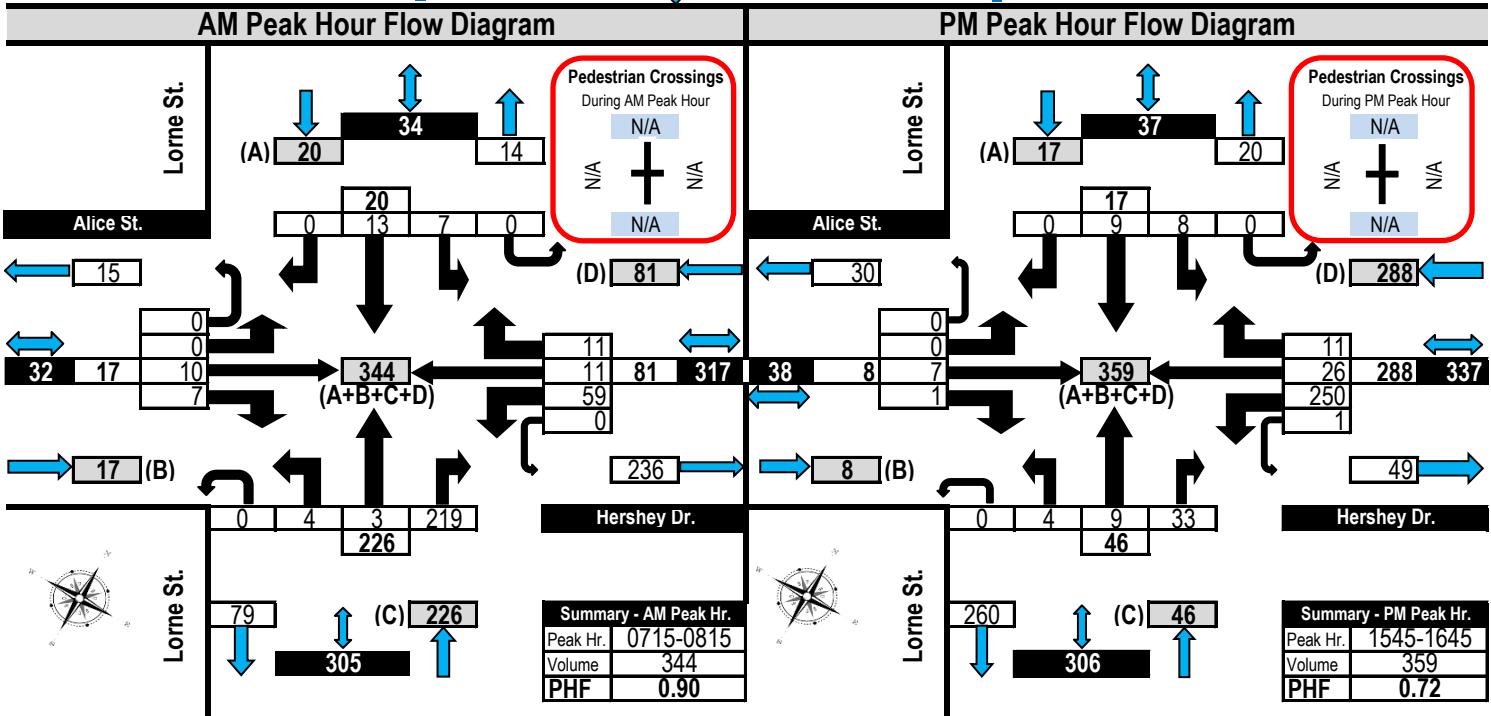
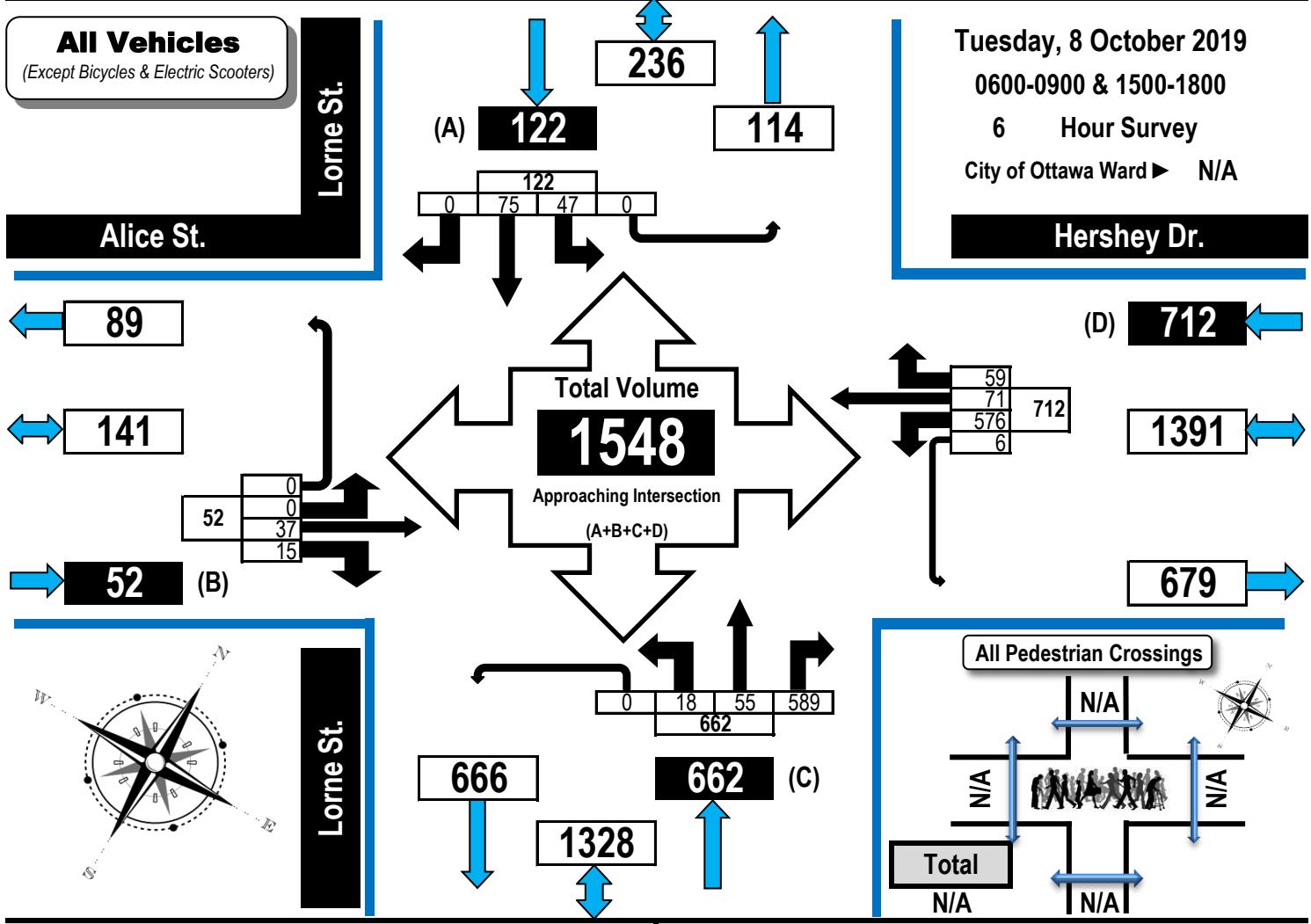


Turning Movement Count Summary, AM and PM Peak Hour Flow Diagrams

Automobiles, Taxis, Light
Trucks, Vans, SUV's,
Motorcycles, Heavy Trucks,
Buses, and School Buses

Alice Street/Hershey Drive & Lorne Street

Smiths Falls, ON



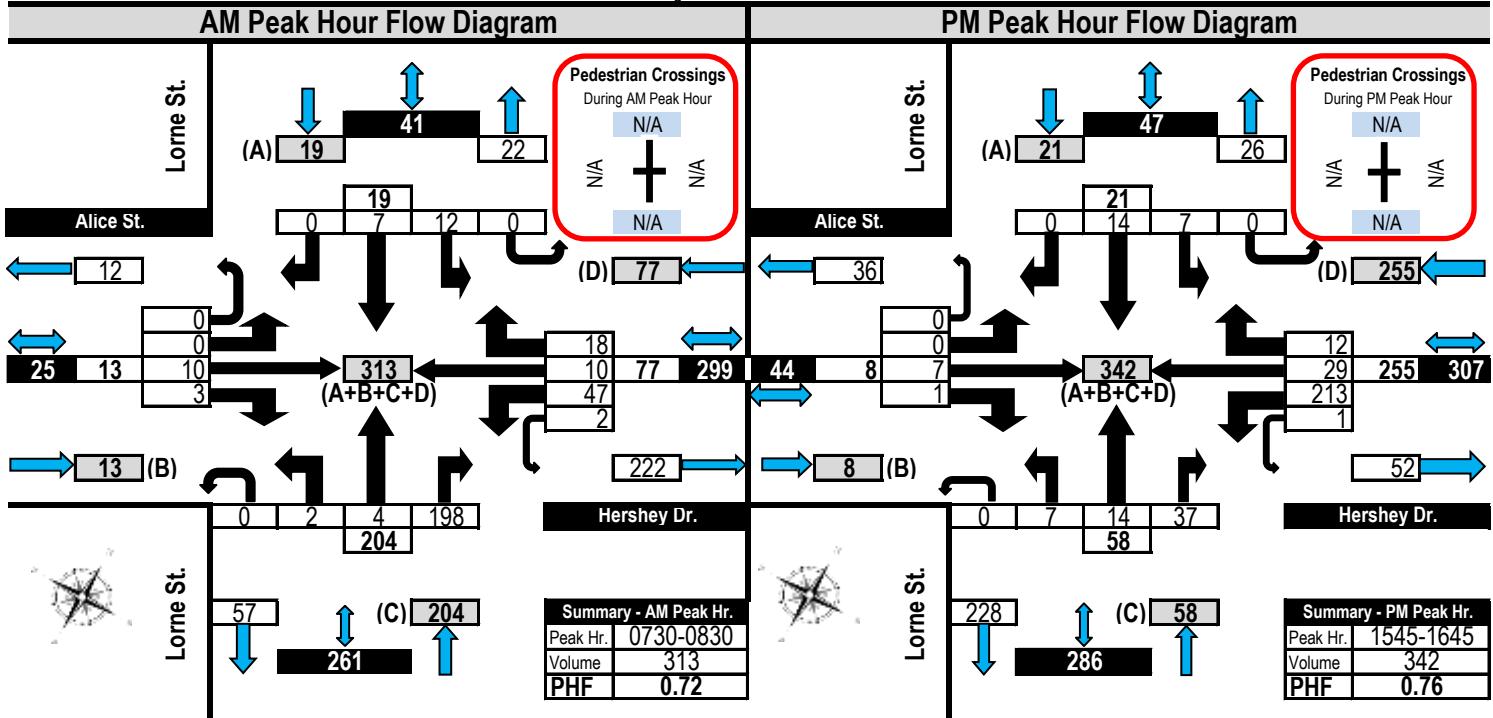
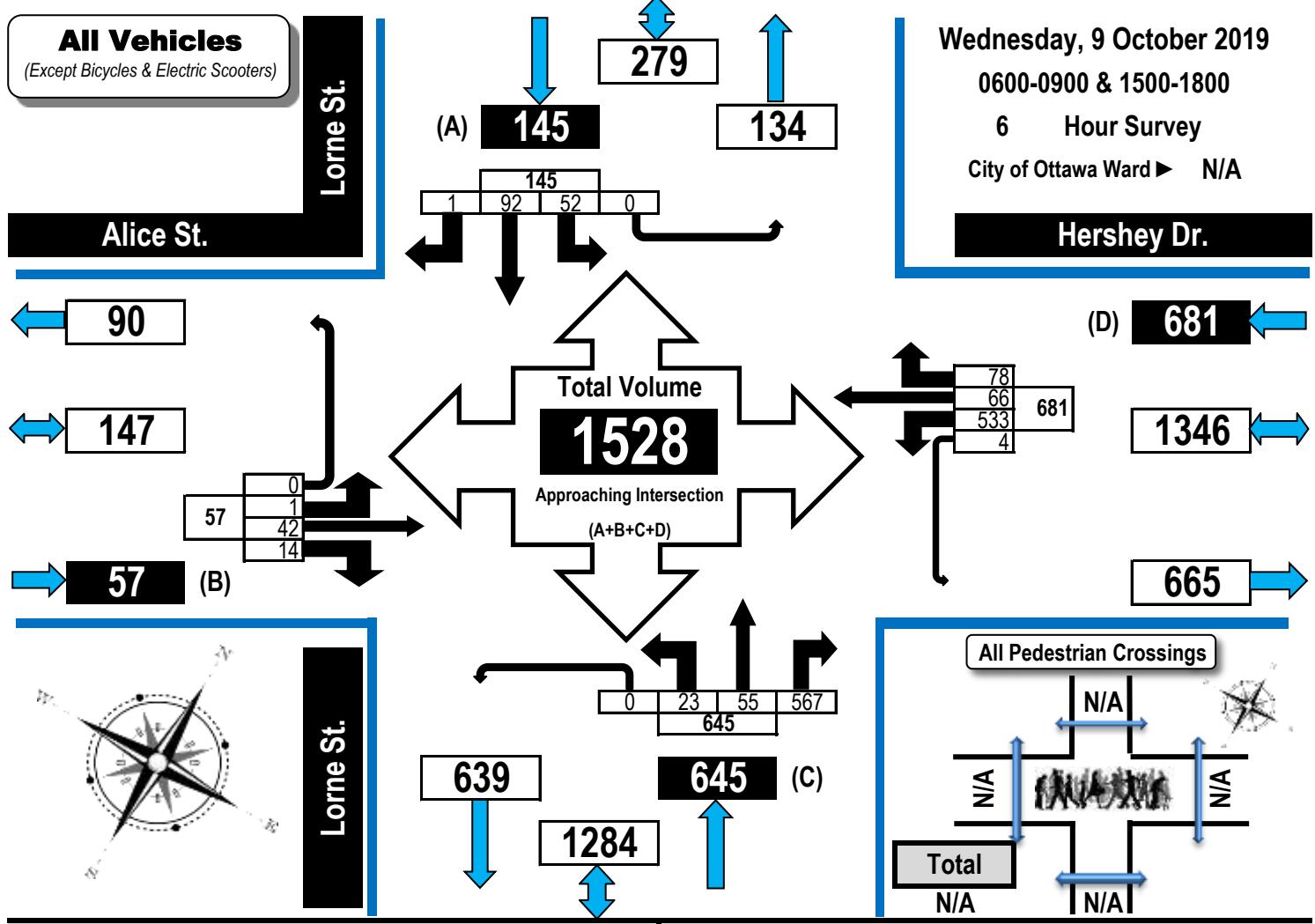


Turning Movement Count Summary, AM and PM Peak Hour Flow Diagrams

Automobiles, Taxis, Light
Trucks, Vans, SUV's,
Motorcycles, Heavy Trucks,
Buses, and School Buses

Alice Street/Hershey Drive & Lorne Street

Smiths Falls, ON



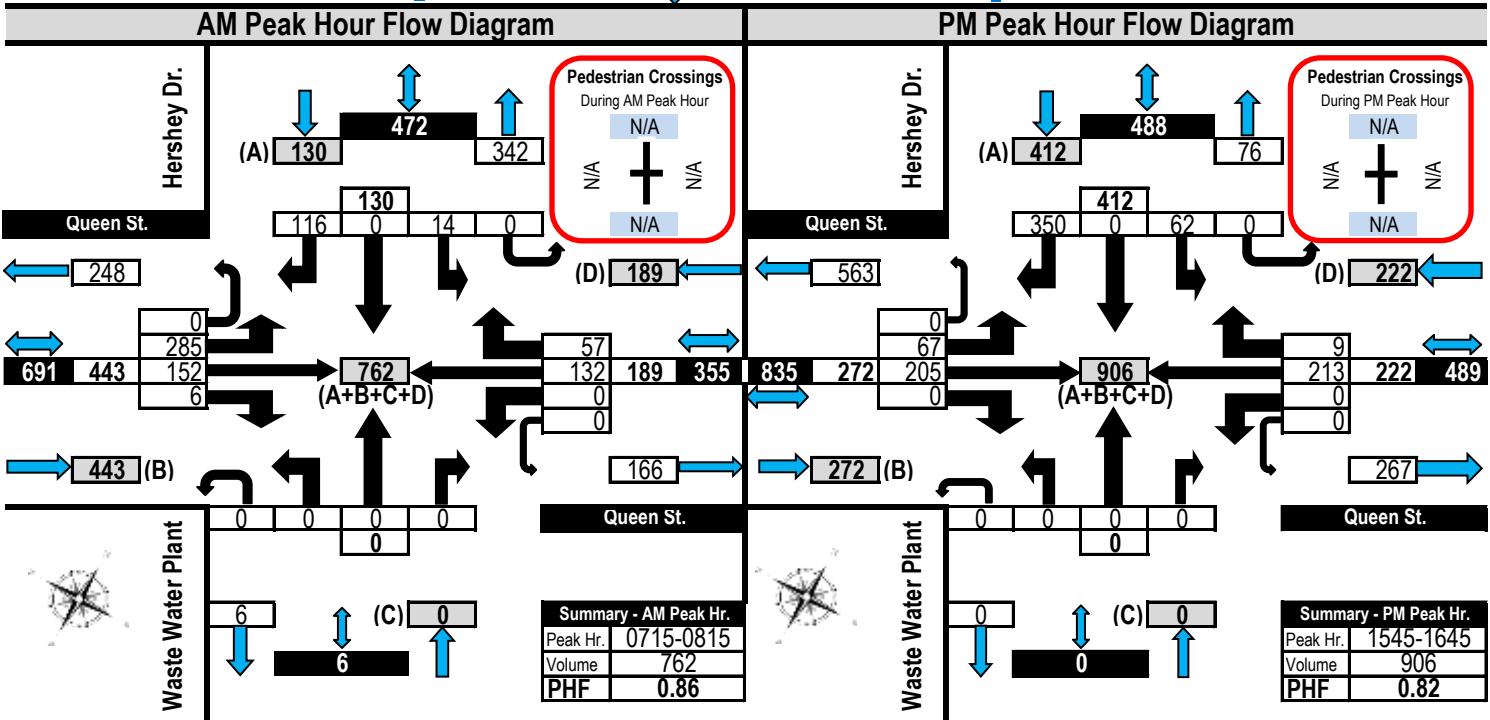
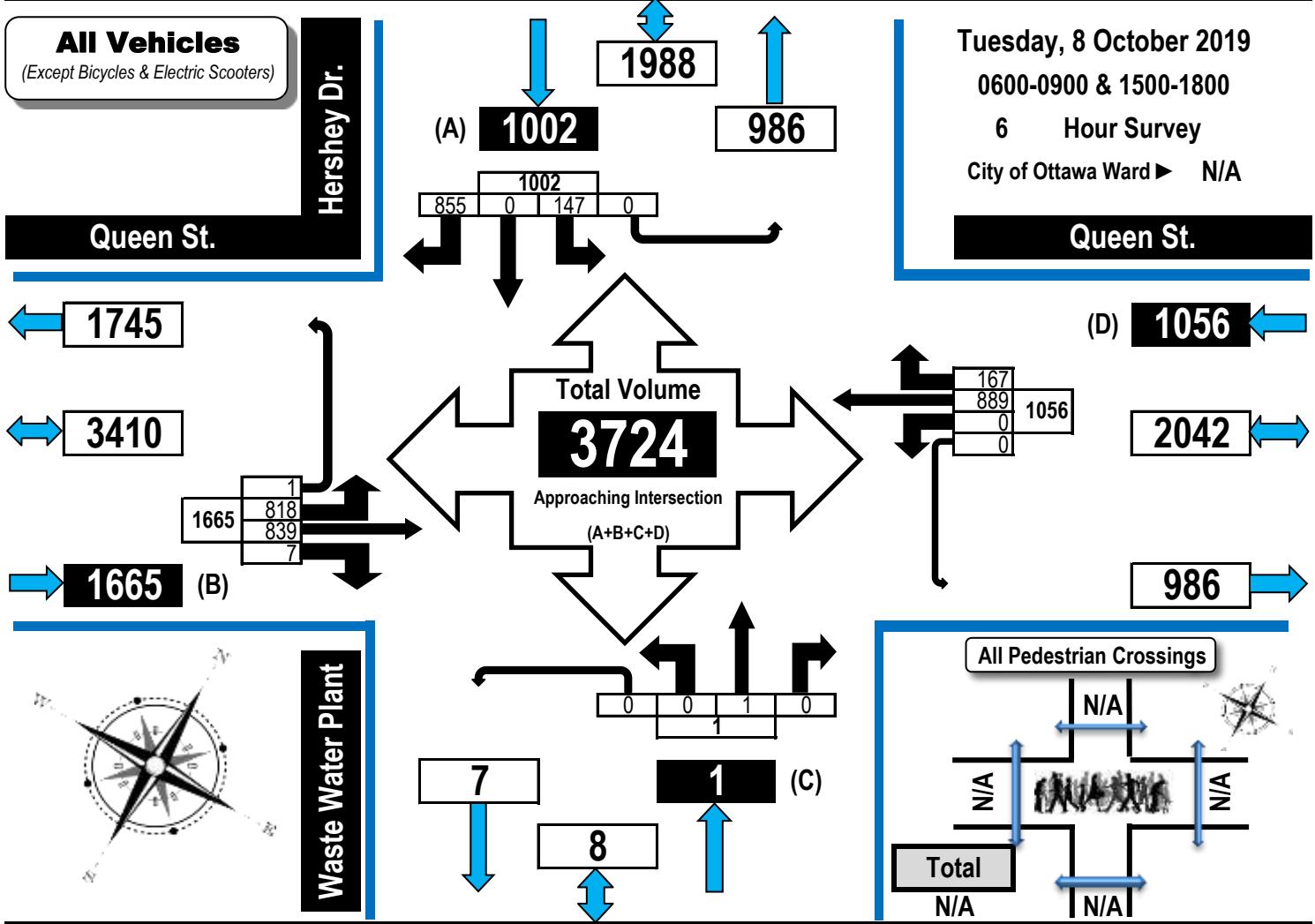


Turning Movement Count Summary, AM and PM Peak Hour Flow Diagrams

Automobiles, Taxis, Light
Trucks, Vans, SUV's,
Motorcycles, Heavy Trucks,
Buses, and School Buses

Hershey Drive & Queen Street

Smiths Falls, ON



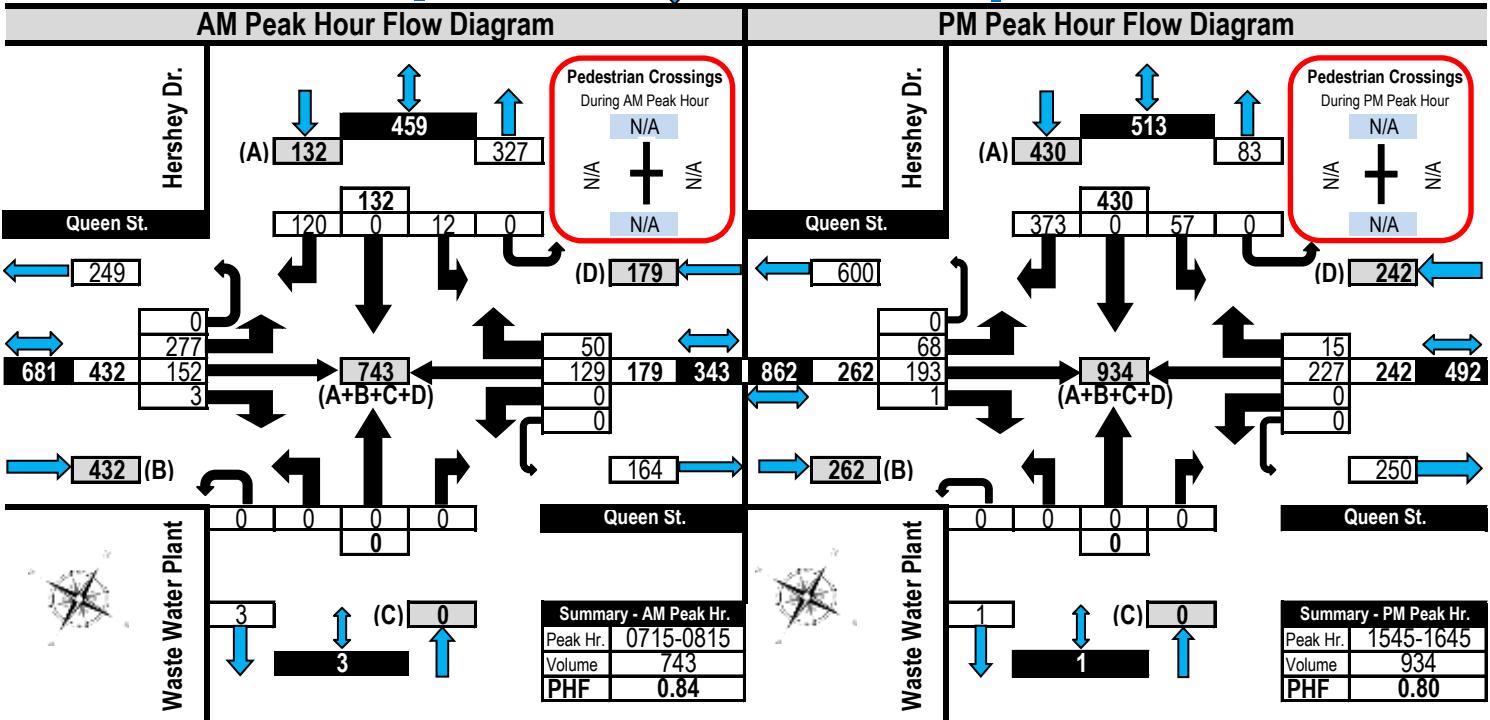
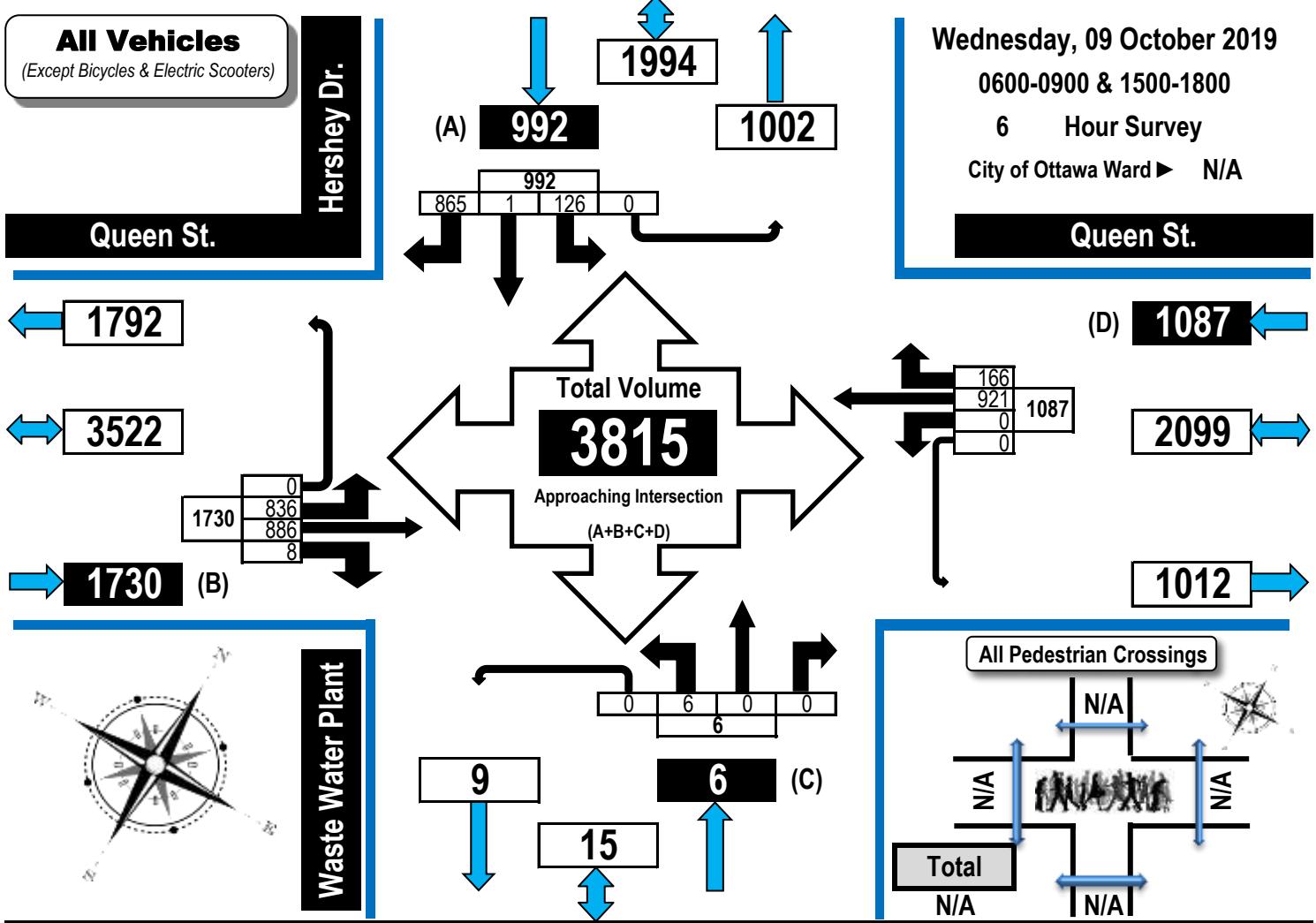


Turning Movement Count Summary, AM and PM Peak Hour Flow Diagrams

Automobiles, Taxis, Light
Trucks, Vans, SUV's,
Motorcycles, Heavy Trucks,
Buses, and School Buses

Hershey Drive & Queen Street

Smiths Falls, ON



Appendix G

TDM Checklists

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

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

TDM-supportive design & infrastructure measures: <i>Non-residential developments</i>		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	<input type="checkbox"/>
BASIC	1.1.2 Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	<input checked="" type="checkbox"/>
BASIC	1.1.3 Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	<input checked="" type="checkbox"/>
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 <i>Official Plan policy 4.3.3</i>)	<input type="checkbox"/>
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 <i>Official Plan policy 4.3.12</i>)	<input checked="" type="checkbox"/>

TDM-supportive design & infrastructure measures: <i>Non-residential developments</i>		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 <i>Official Plan policy 4.3.10</i>)	<input checked="" type="checkbox"/>
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 <i>Official Plan policy 4.3.10</i>)	<input checked="" type="checkbox"/>
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 <i>Official Plan policy 4.3.11</i>)	<input checked="" type="checkbox"/>
BASIC	1.2.6 Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	<input type="checkbox"/>
BASIC	1.2.7 Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	<input type="checkbox"/>
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	<input type="checkbox"/>
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	<input type="checkbox"/>
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)	<input checked="" type="checkbox"/>

TDM-supportive design & infrastructure measures: <i>Non-residential developments</i>		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 <i>Official Plan policy 4.3.6</i>)	<input checked="" type="checkbox"/>
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 <i>Zoning By-law Section 111</i>)	<input checked="" type="checkbox"/>
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 <i>Zoning By-law Section 111</i>)	<input checked="" type="checkbox"/>
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	<input type="checkbox"/>
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	<input type="checkbox"/>
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 <i>Zoning By-law Section 111</i>)	<input type="checkbox"/>
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)	<input type="checkbox"/>
2.3 Shower & change facilities		
BASIC	2.3.1 Provide shower and change facilities for the use of active commuters	<input type="checkbox"/>
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	<input type="checkbox"/>
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)	<input checked="" type="checkbox"/>

TDM-supportive design & infrastructure measures: <i>Non-residential developments</i>		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	<input type="checkbox"/>
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	<input type="checkbox"/>
BETTER	3.1.3 Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	<input type="checkbox"/>
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	<input type="checkbox"/>
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	<input checked="" type="checkbox"/>
BETTER	4.2.2 At large developments, provide spaces for carpools in a separate, access-controlled parking area to simplify enforcement	<input type="checkbox"/>
5. CARSHARING & BIKE SHARING		
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 <i>Zoning By-law Section 94</i>)	<input type="checkbox"/>
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	<input type="checkbox"/>

TDM-supportive design & infrastructure measures: <i>Non-residential developments</i>		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	<input checked="" type="checkbox"/>
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	<input type="checkbox"/>
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 <i>Zoning By-law Section 104</i>)	<input type="checkbox"/>
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 <i>Zoning By-law Section 111</i>)	<input type="checkbox"/>
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)	<input type="checkbox"/>
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	<input type="checkbox"/>

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

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

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

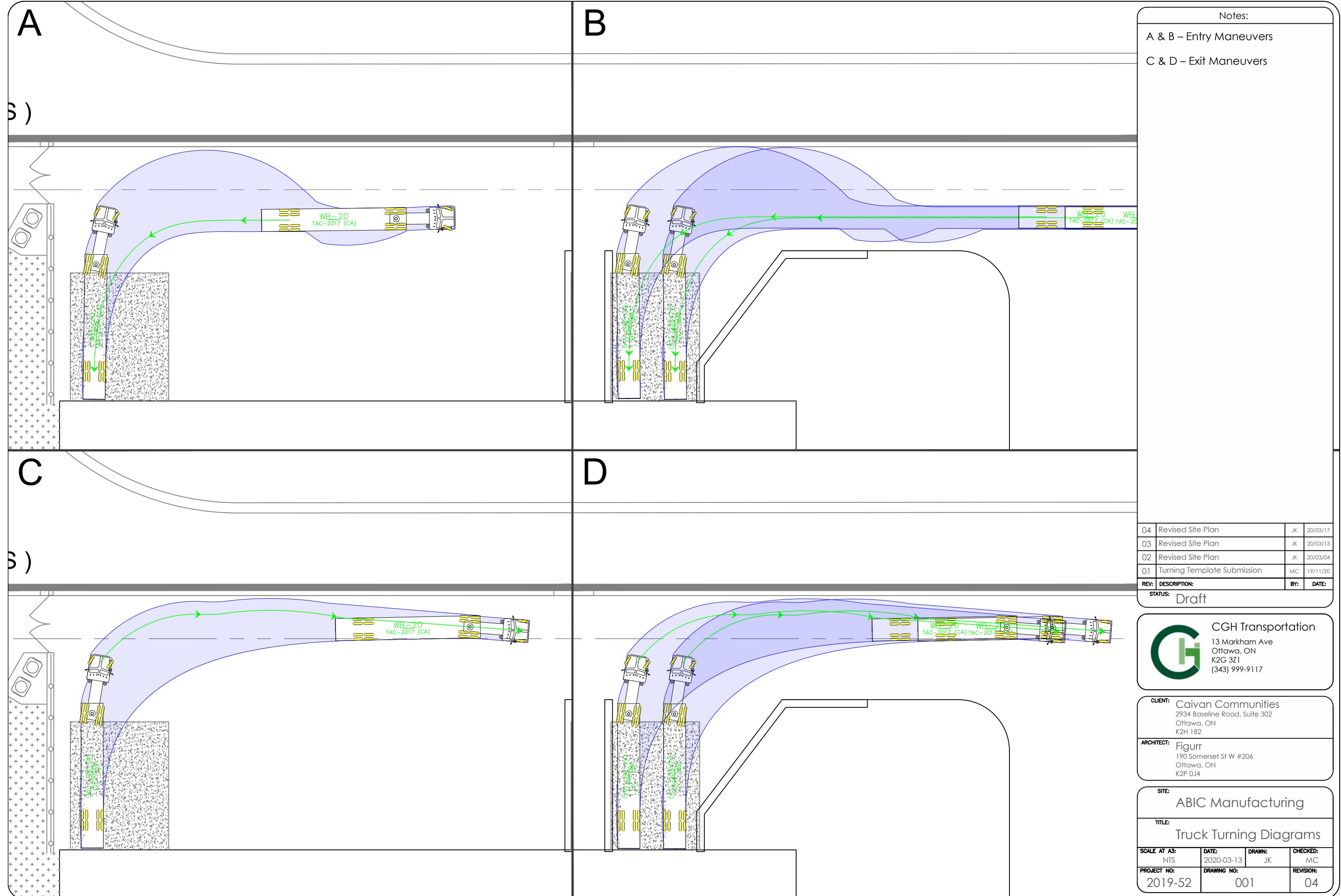
TDM measures: <i>Non-residential developments</i>		Check if proposed & add descriptions
3. TRANSIT		
3.1 Transit information		
BASIC	3.1.1 Display relevant transit schedules and route maps at entrances	<input type="checkbox"/>
BASIC	3.1.2 Provide online links to OC Transpo and STO information	<input type="checkbox"/>
BETTER	3.1.3 Provide real-time arrival information display at entrances	<input type="checkbox"/>
3.2 Transit fare incentives		
<i>Commuter travel</i>		
BETTER	3.2.1 Offer preloaded PRESTO cards to encourage commuters to use transit	<input type="checkbox"/>
BETTER ★	3.2.2 Subsidize or reimburse monthly transit pass purchases by employees	<input type="checkbox"/>
<i>Visitor travel</i>		
BETTER	3.2.3 Arrange inclusion of same-day transit fare in price of tickets (e.g. for festivals, concerts, games)	<input type="checkbox"/>
3.3 Enhanced public transit service		
<i>Commuter travel</i>		
BETTER	3.3.1 Contract with OC Transpo to provide enhanced transit services (e.g. for shift changes, weekends)	<input checked="" type="checkbox"/>
<i>Visitor travel</i>		
BETTER	3.3.2 Contract with OC Transpo to provide enhanced transit services (e.g. for festivals, concerts, games)	<input type="checkbox"/>
3.4 Private transit service		
<i>Commuter travel</i>		
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)	<input type="checkbox"/>
<i>Visitor travel</i>		
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)	<input type="checkbox"/>

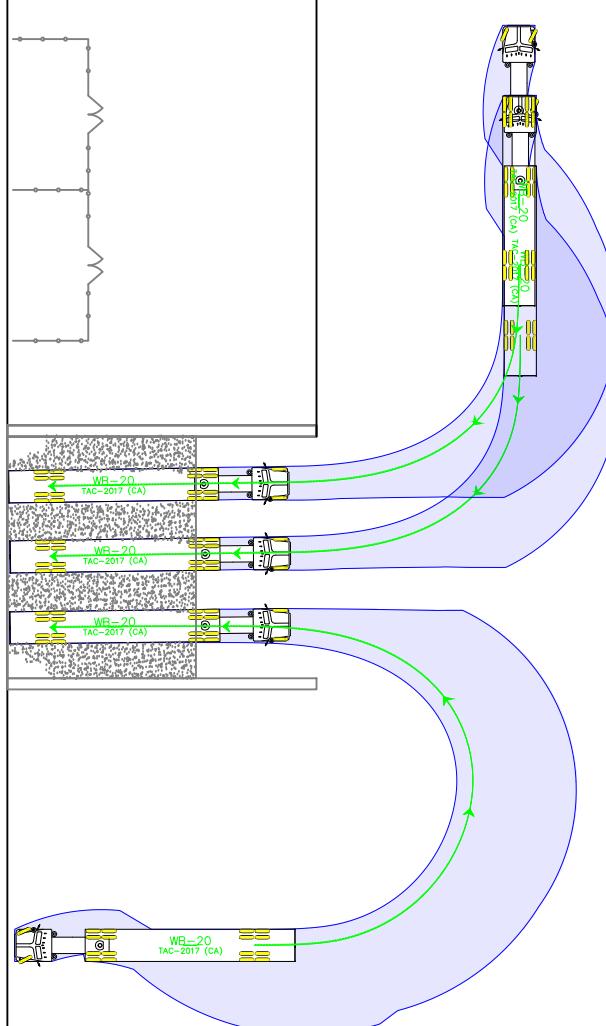
TDM measures: <i>Non-residential developments</i>			Check if proposed & add descriptions
4. RIDESHARING			
4.1 Ridematching service			
<i>Commuter travel</i>			
BASIC	★	4.1.1 Provide a dedicated ridematching portal at OttawaRideMatch.com	<input type="checkbox"/>
4.2 Carpool parking price incentives	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

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

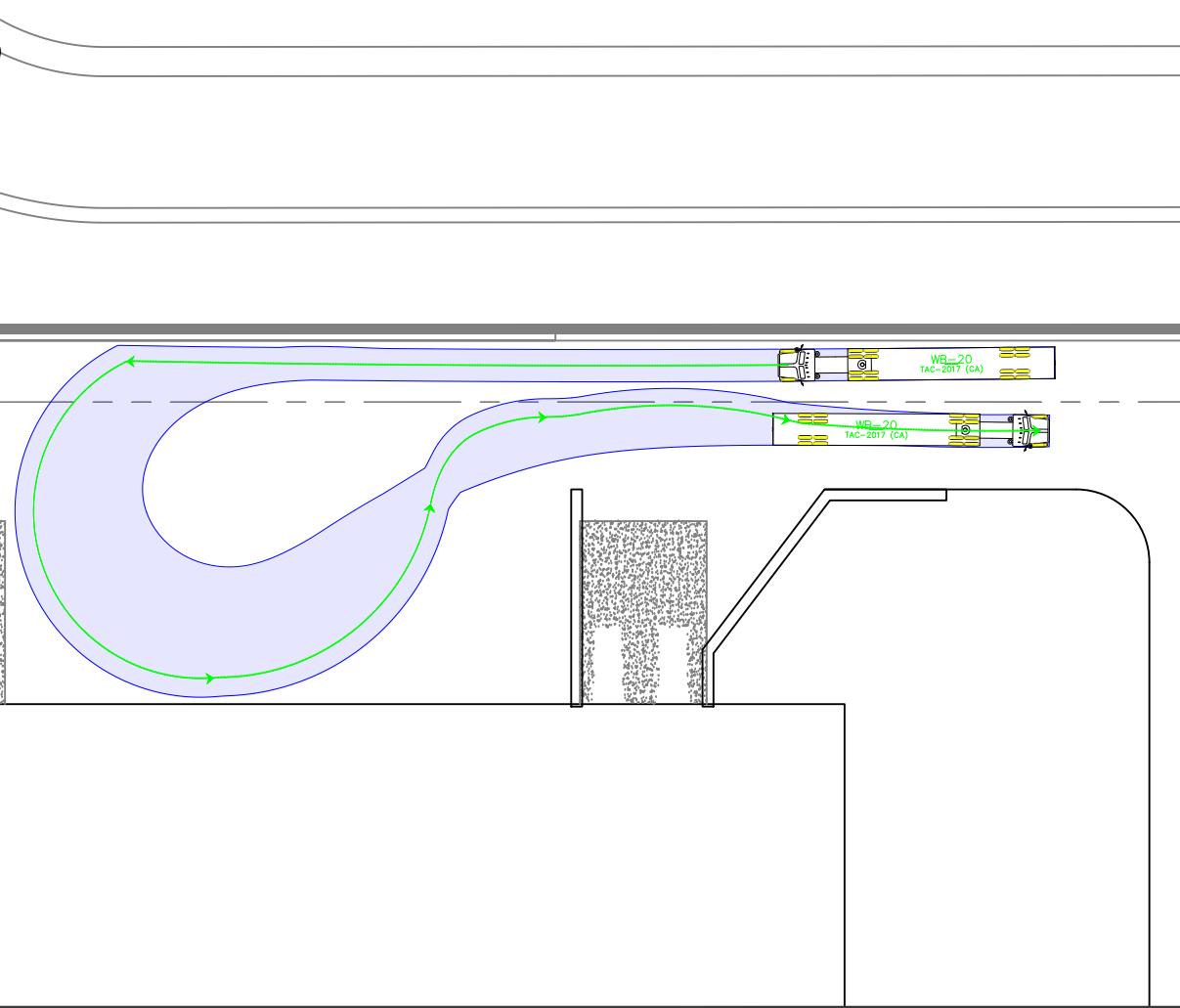
Appendix H

Turning Templates



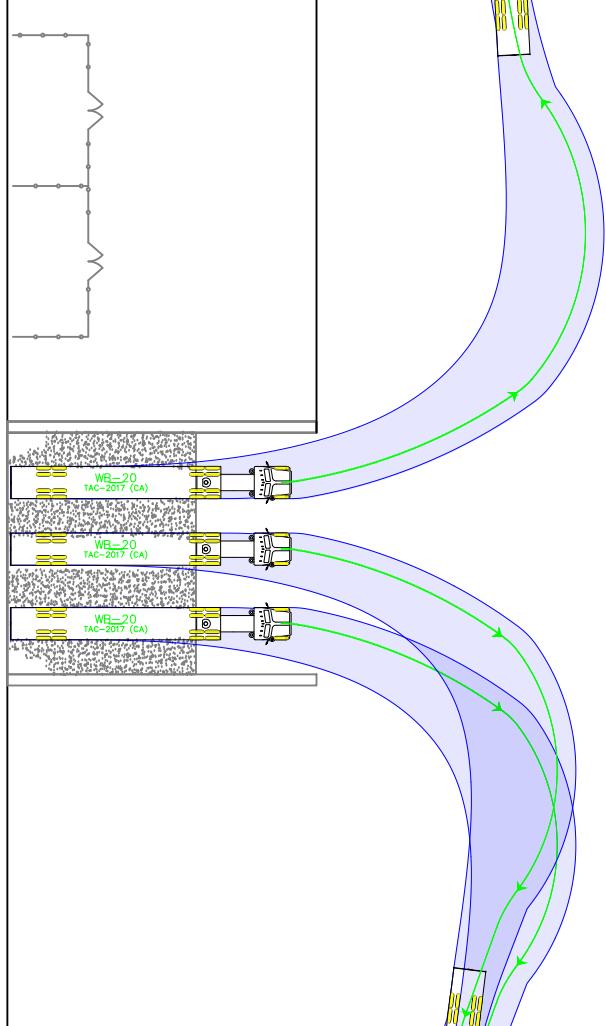
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SHIPPING LOADING AREA (PAVED w/ HEAVY EXTERIOR STORAGE AREA (UNPAVED))

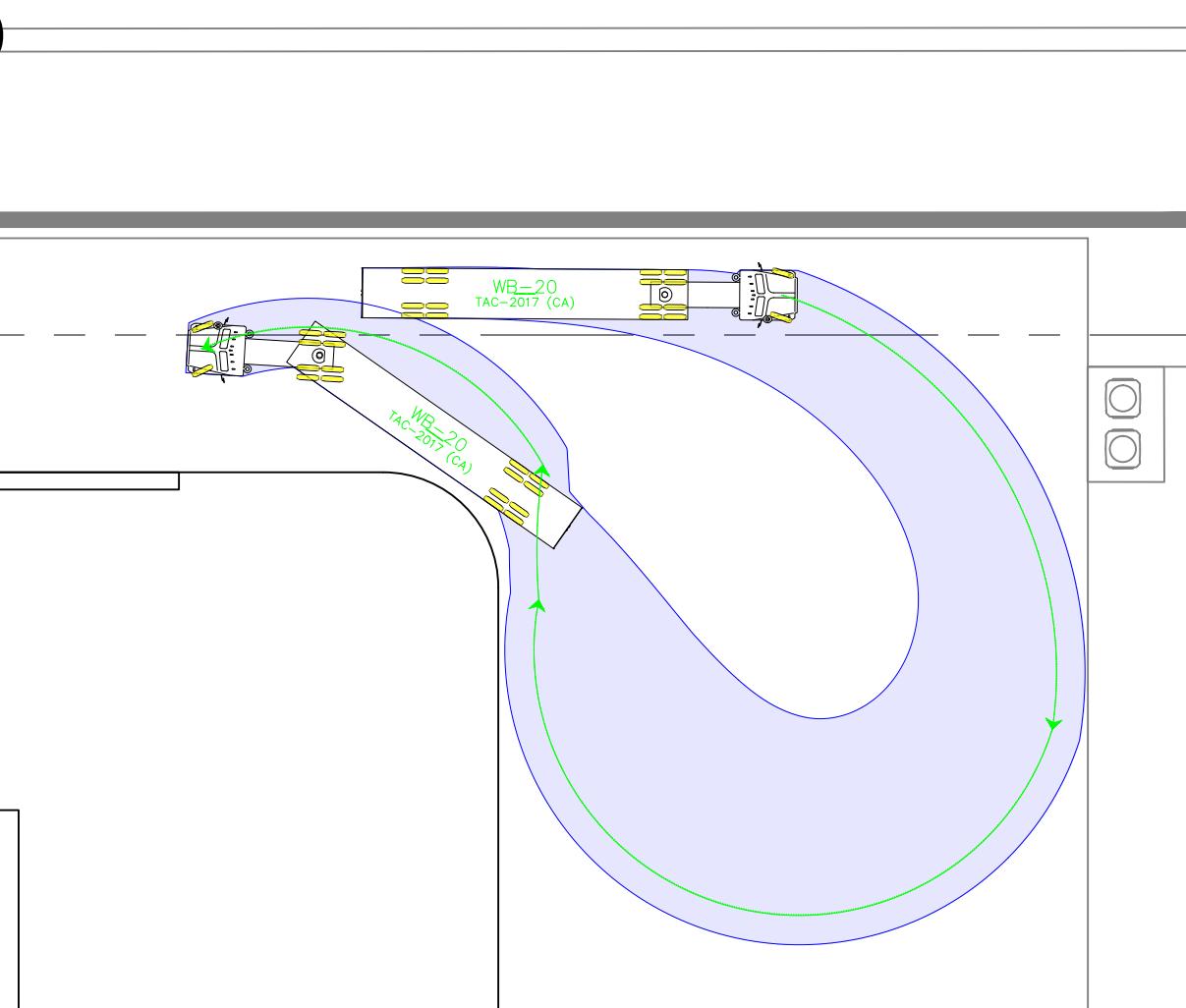
B

Notes:

- A – Entry Maneuvers
- B – Northern U-Turn
- C – Exit Maneuvers
- D – Eastern U-Turn

C

SHIPPING LOADING AREA (PAVED w/ HEAVY EXTERIOR STORAGE AREA (UNPAVED))

D

04	Revised Site Plan	JK	20/03/17
03	Revised Site Plan	JK	20/03/13
02	Revised Site Plan	JK	20/03/04
01	Turning Template Submission	MC	19/11/20
REV:	DESCRIPTION:	BY:	DATE:
STATUS: Draft			

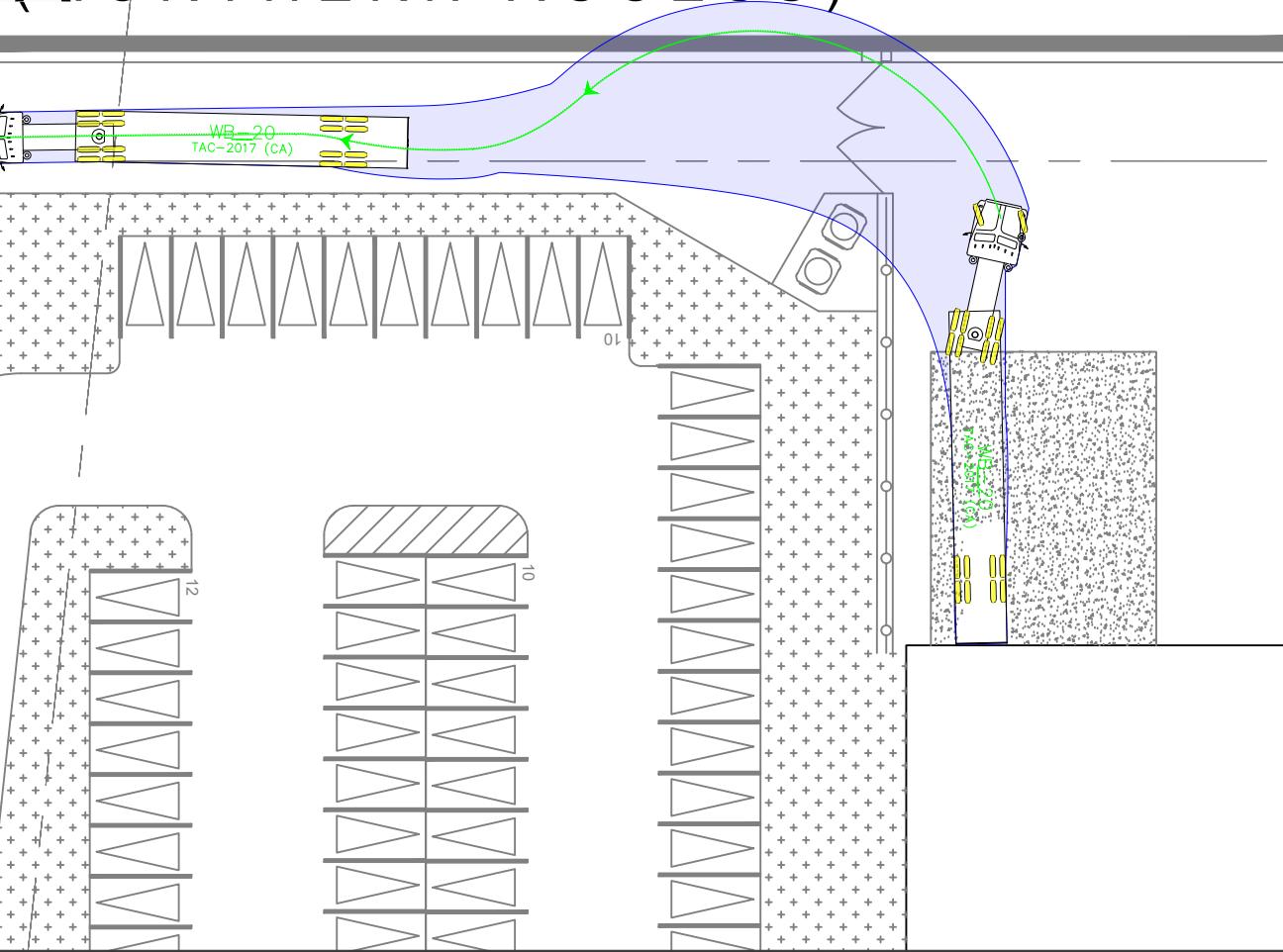


CLIENT: Caivan Communities
2934 Baseline Road, Suite 302
Ottawa, ON
K2H 3Z2

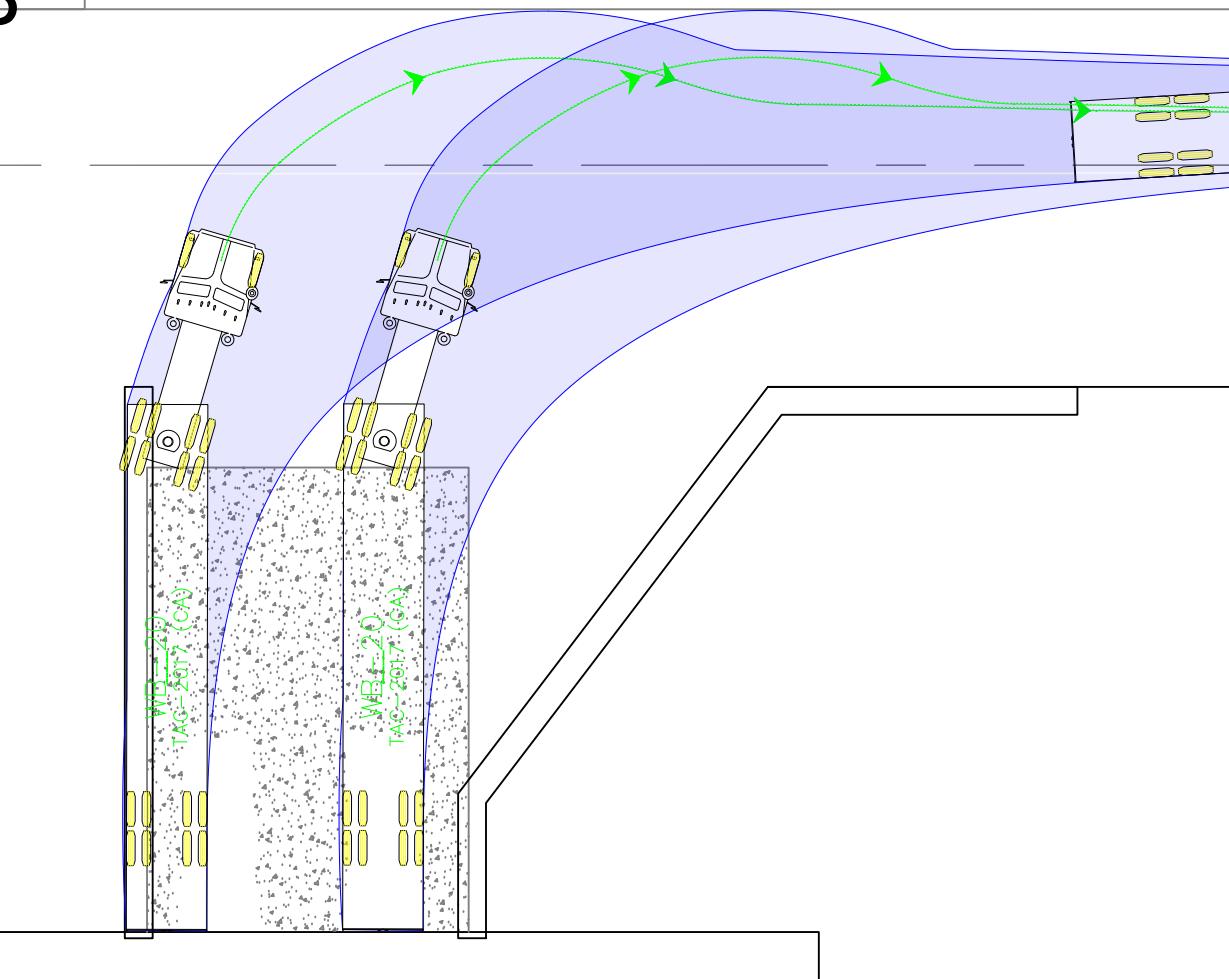
ARCHITECT: Figurr
190 Somerset St W #206
Ottawa, ON
K2P 0J4

SITE: ABIC Manufacturing
TITLE: Truck Turning Diagrams
SCALE AT A3: NTS DATE: 2020-03-13 DRAWN: JK CHECKED: MC
PROJECT NO: 2019-52 DRAWING NO: 002 REVISION: 04

NORTHERN ACCESS)



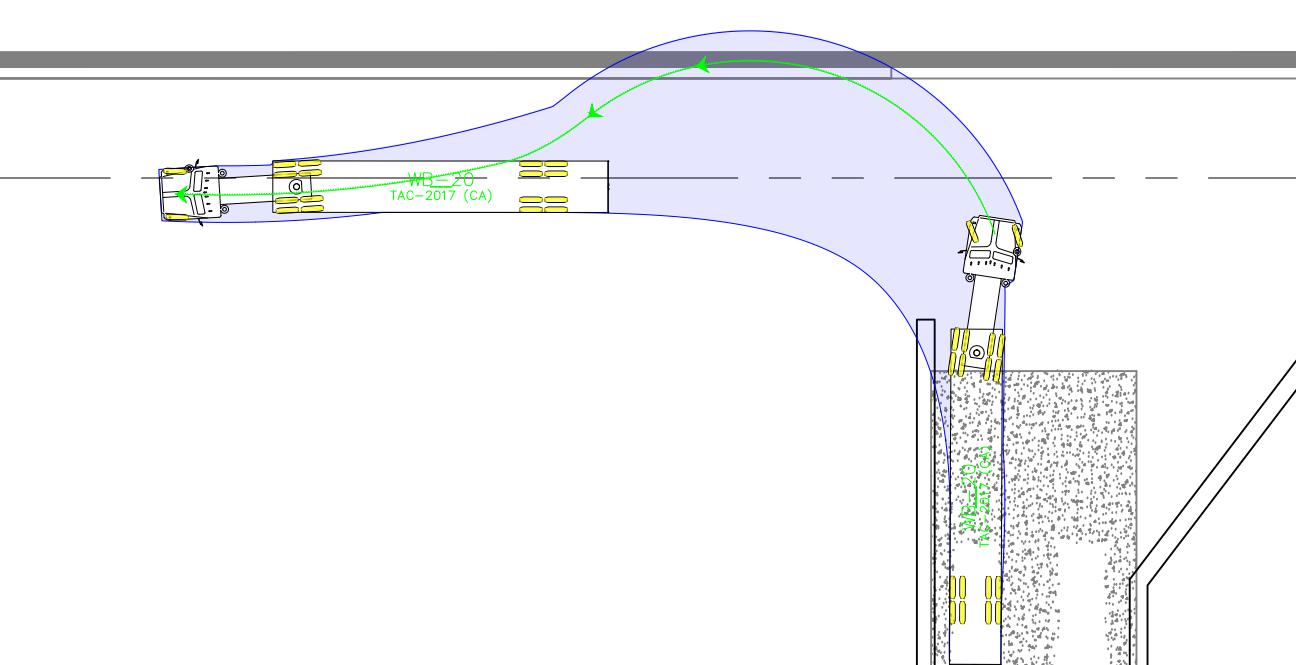
B



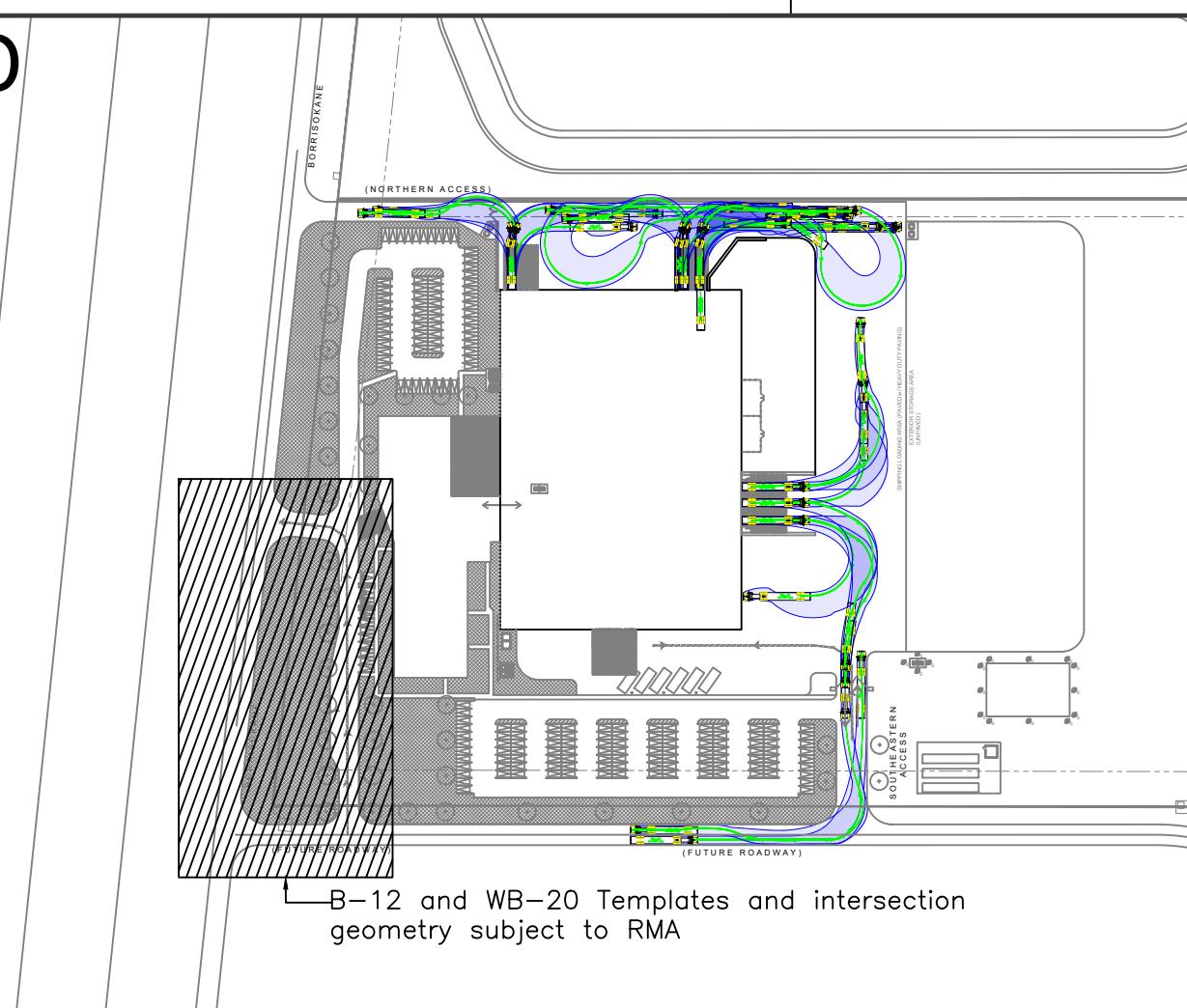
Notes:

- A - Western Bay Exiting Westbound
- B - Minimum Truck Spacing
- C - Eastern Bay Exiting Westbound
- D - Key Plan

C



D



04	Revised Site Plan	JK	20/03/17
03	Revised Site Plan	JK	20/03/13
02	Revised Site Plan	JK	20/03/04
01	Turning Template Submission	MC	19/11/20
REV:	DESCRIPTION:	BY:	DATE:
STATUS: Draft			



CLIENT: Caivan Communities
2934 Baseline Road, Suite 302
Ottawa, ON
K2H 3Z1

ARCHITECT: Figurr
190 Somerset St W #206
Ottawa, ON
K2P 0J4

SITE: ABIC Manufacturing

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
NTS	2020-03-17	JK	MC
PROJECT NO:	DRAWING NO:		
2019-52	003		04

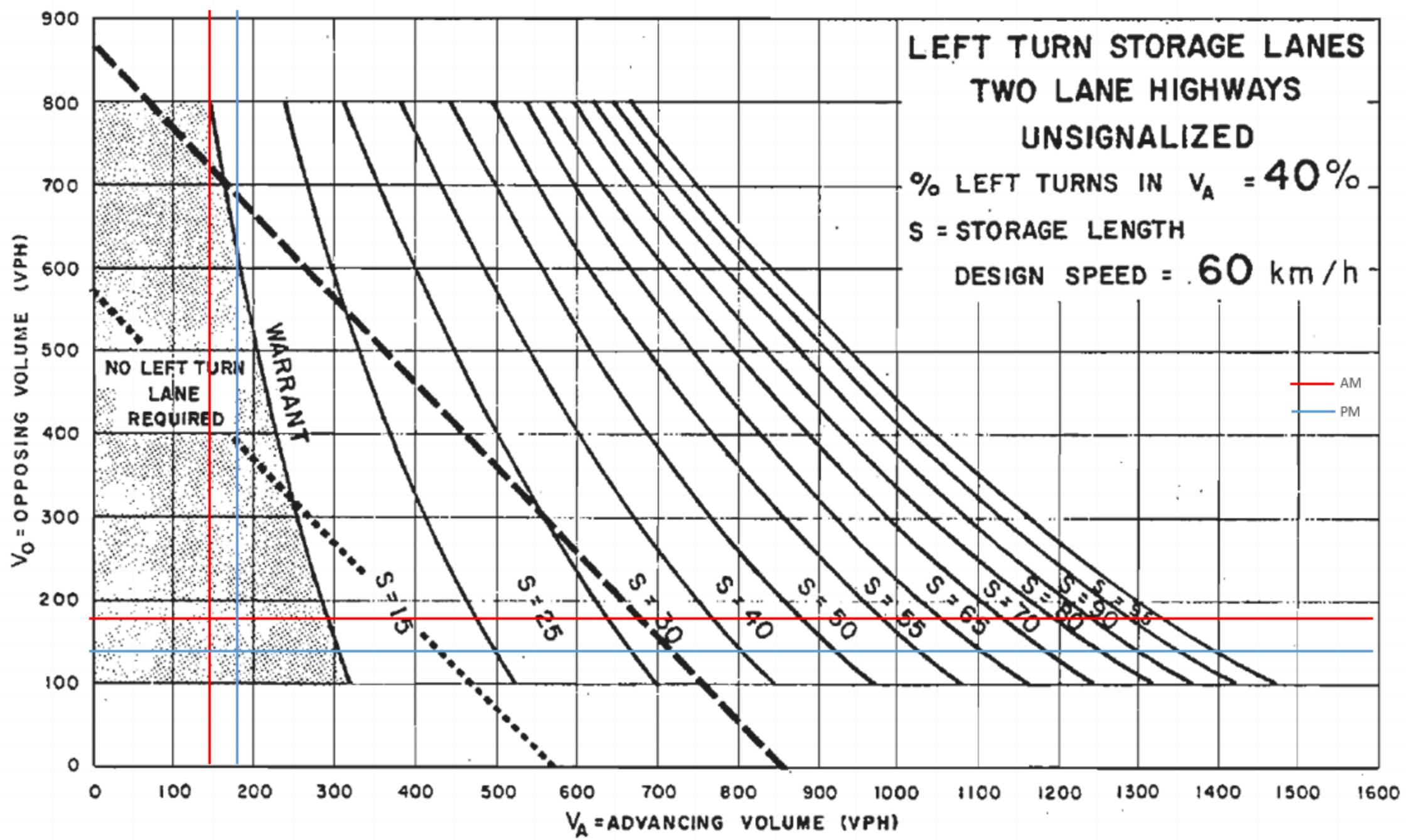
Appendix I

Left-turn Lane Warrants

Appendix I(1)

Left-turn Lane Warrants:
Access #3 2022 FT

Design Speed 60 km/h	Eastbound Left Yes	Traffic Data Summary												Intersection Metrics			
		Left Turn Volumes			Throughput Volumes			Right Turn Volumes			Total Volumes			%Left Turn	Volume Advancing	Volume Opposing	
		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	0	35.8%	151	175
	AM	54	97	0	0	168	7	0	0	0	0	0	0	0	35.8%	151	175
	PM	21	164	0	0	133	3	0	0	0	9	0	9	9	11.4%	185	136



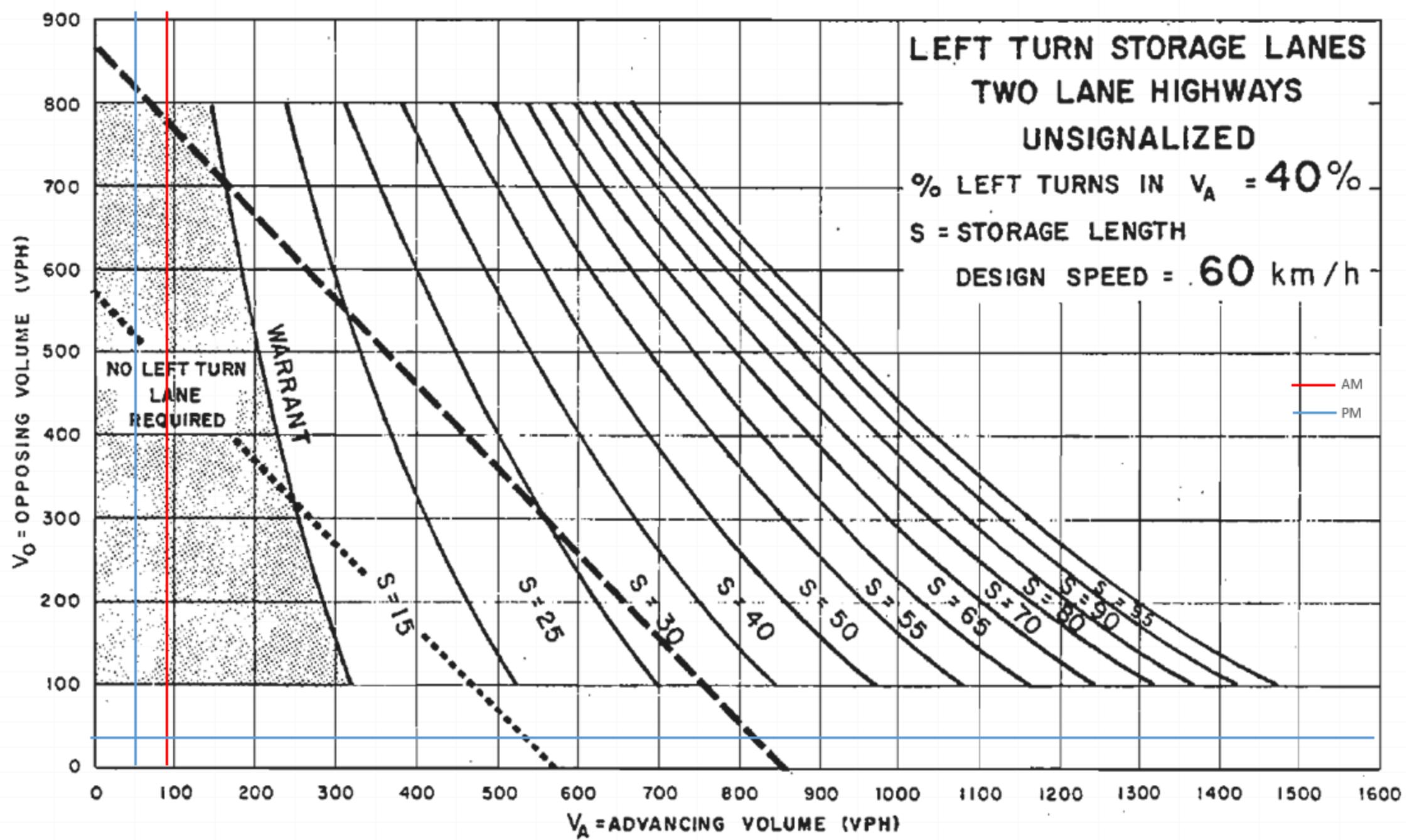
Appendix I(2)

Left-turn Lane Warrants:
Access #3 2027 FT

Design Speed 60 km/h	Eastbound Left Yes												
		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
		AM	61	34	0	0	34	0	0	0	0	0	0
		PM	23	34	0	0	34	0	0	0	0	0	9

%Left Turn Volume Advancing Volume Opposing
 64.2% 95 34

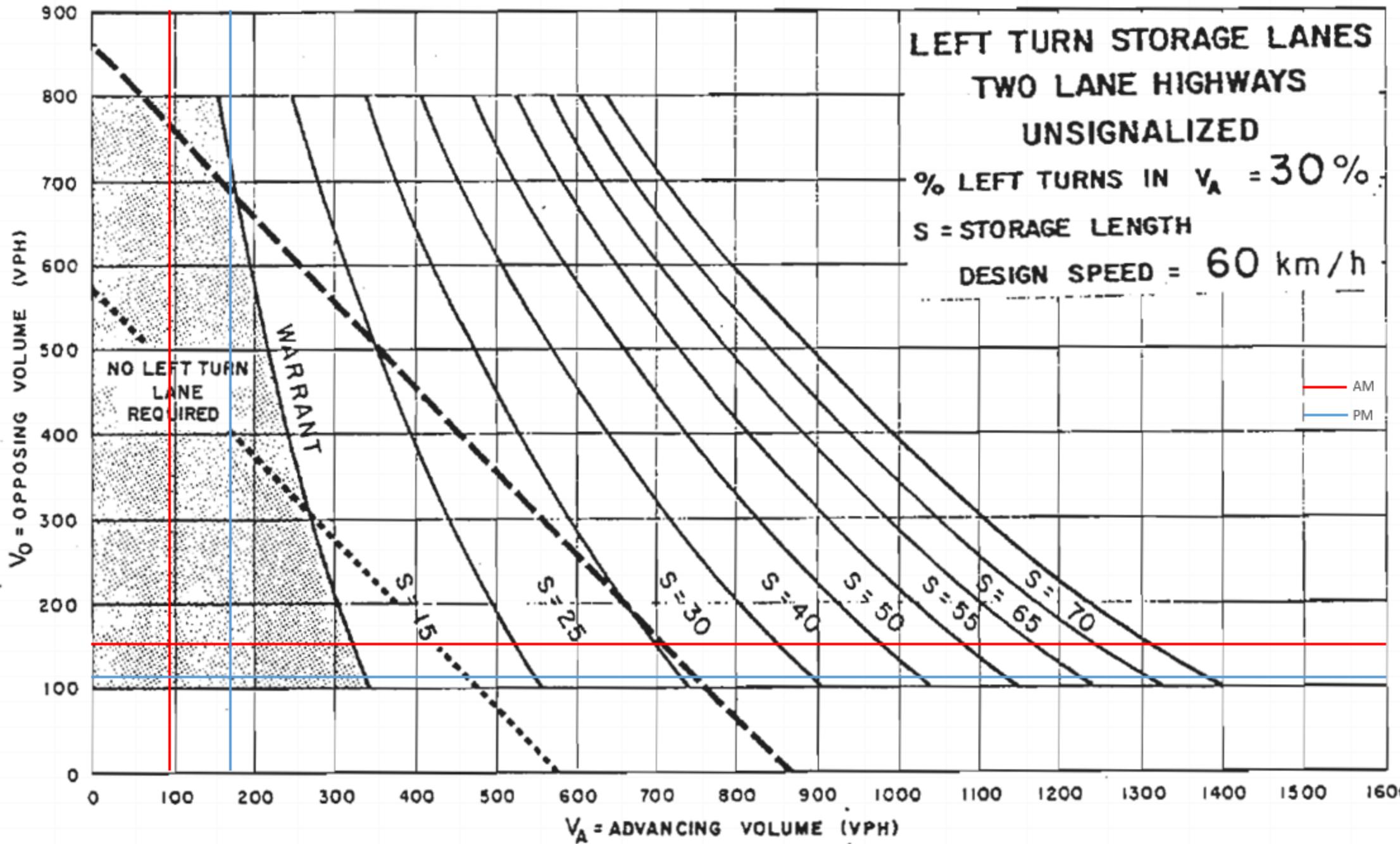
57 9 40.4%



Appendix I(3)

Left-turn Lane Warrants:
Access #4 2022 FT

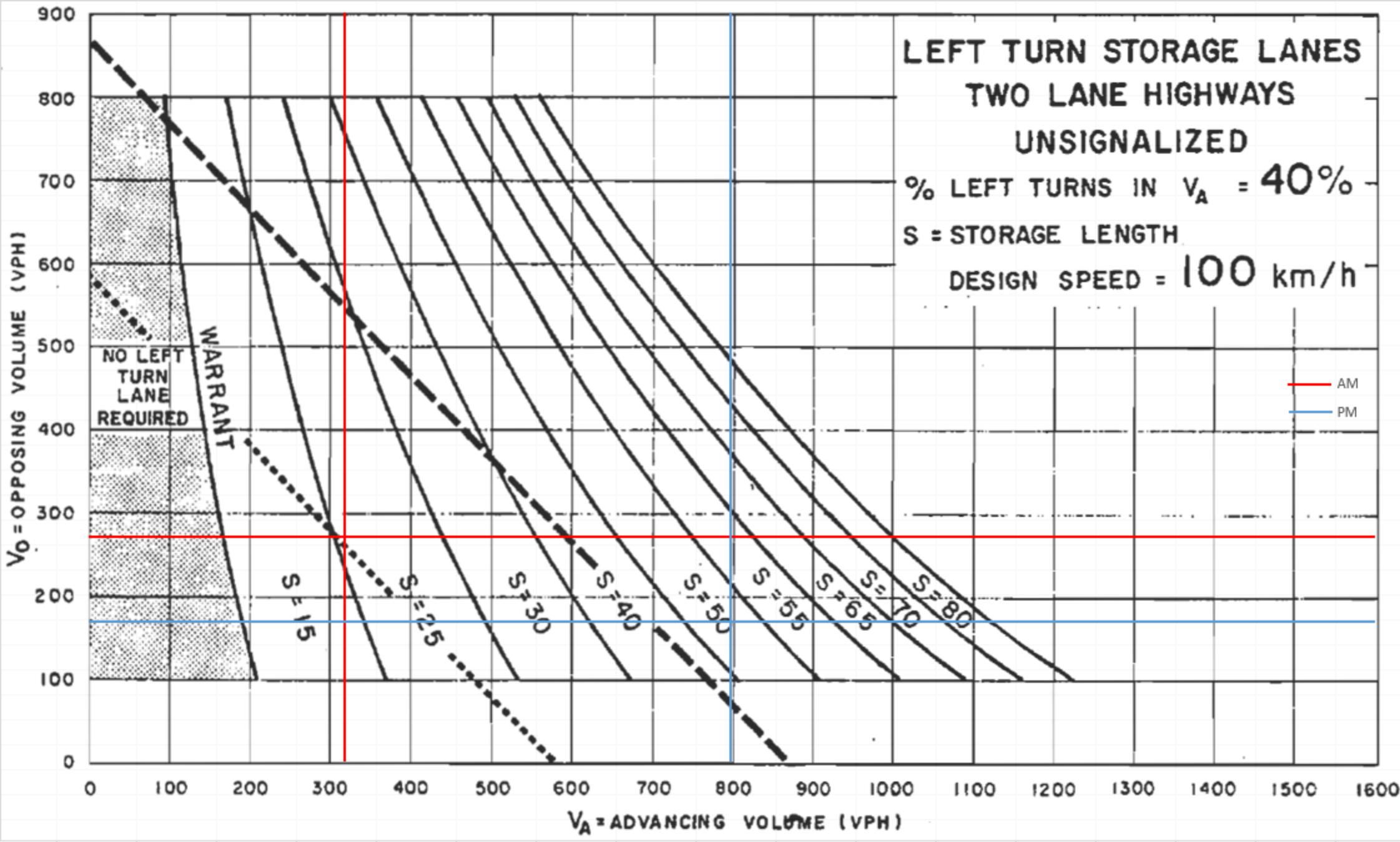
Design Speed 60 km/h	Eastbound Left Yes	Traffic Data Summary												%Left Turn 29.9%	Volume Advancing 97	Volume Opposing 151
		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR			
		AM	29	68	0	0	146	5	0	0	0	5	0	29		
PM		29	144	0	0	107	5	0	0	0	5	0	29	16.8%	173	112



Appendix I(4)

**Left-turn Lane Warrants:
Cambrian Rd & Borrisokane Rd 2022 FB**

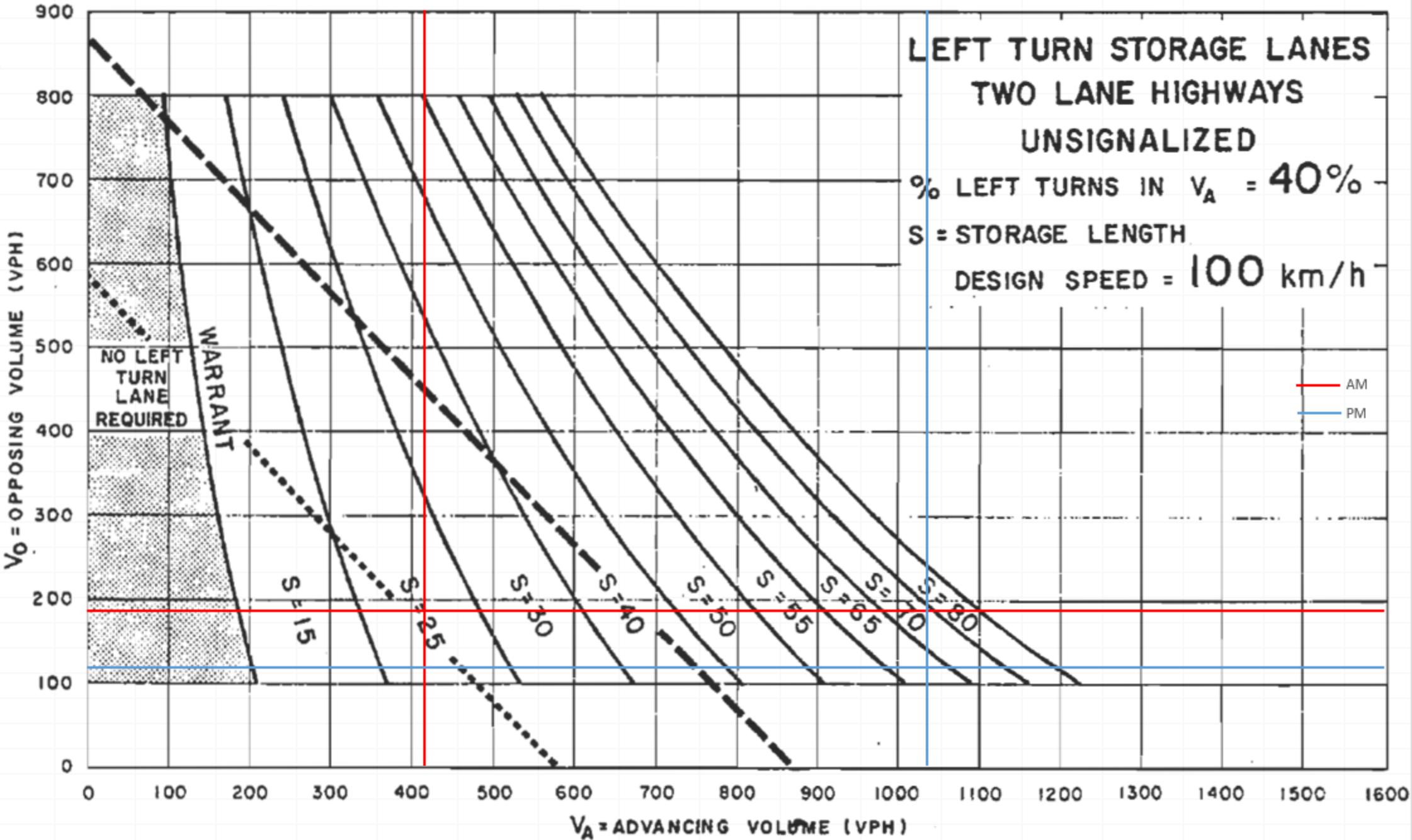
Design Speed 100 km/h	Southbound Left										Yes					
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	%Left Turn	Volume Advancing	Volume Opposing	
	AM	0	0	0	44	0	595	0	228	43	202	116	0	63.5%	318	271
	PM	0	0	0	42	0	359	0	144	25	595	203	0	74.6%	798	169



Appendix I(5)

Left-turn Lane Warrants:
Cambrian Rd & Borrisokane Rd 2027 FB

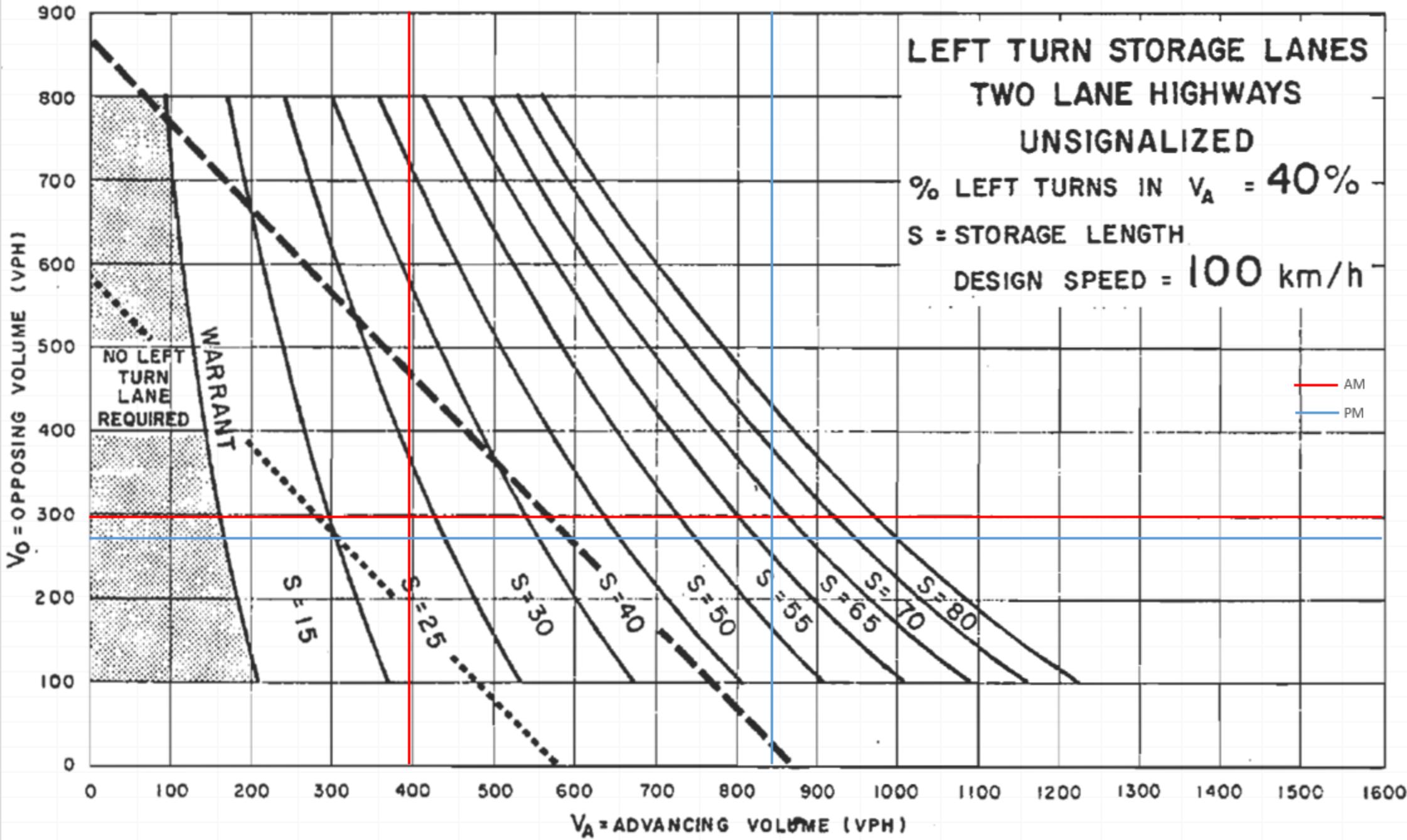
Design Speed 100 km/h	Southbound Left											%Left Turn 0	Volume Advancing 416	Volume Opposing 186
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	Yes				
										SBL	SBT	SBR		
	AM	0	0	0	86	0	931	0	124	62	347	69	0	83.4%
	PM	0	0	0	64	0	597	0	72	46	931	104	0	90.0%
													1035	118



Appendix I(6)

Left-turn Lane Warrants:
Cambrian Rd & Borrisokane Rd 2022 FT

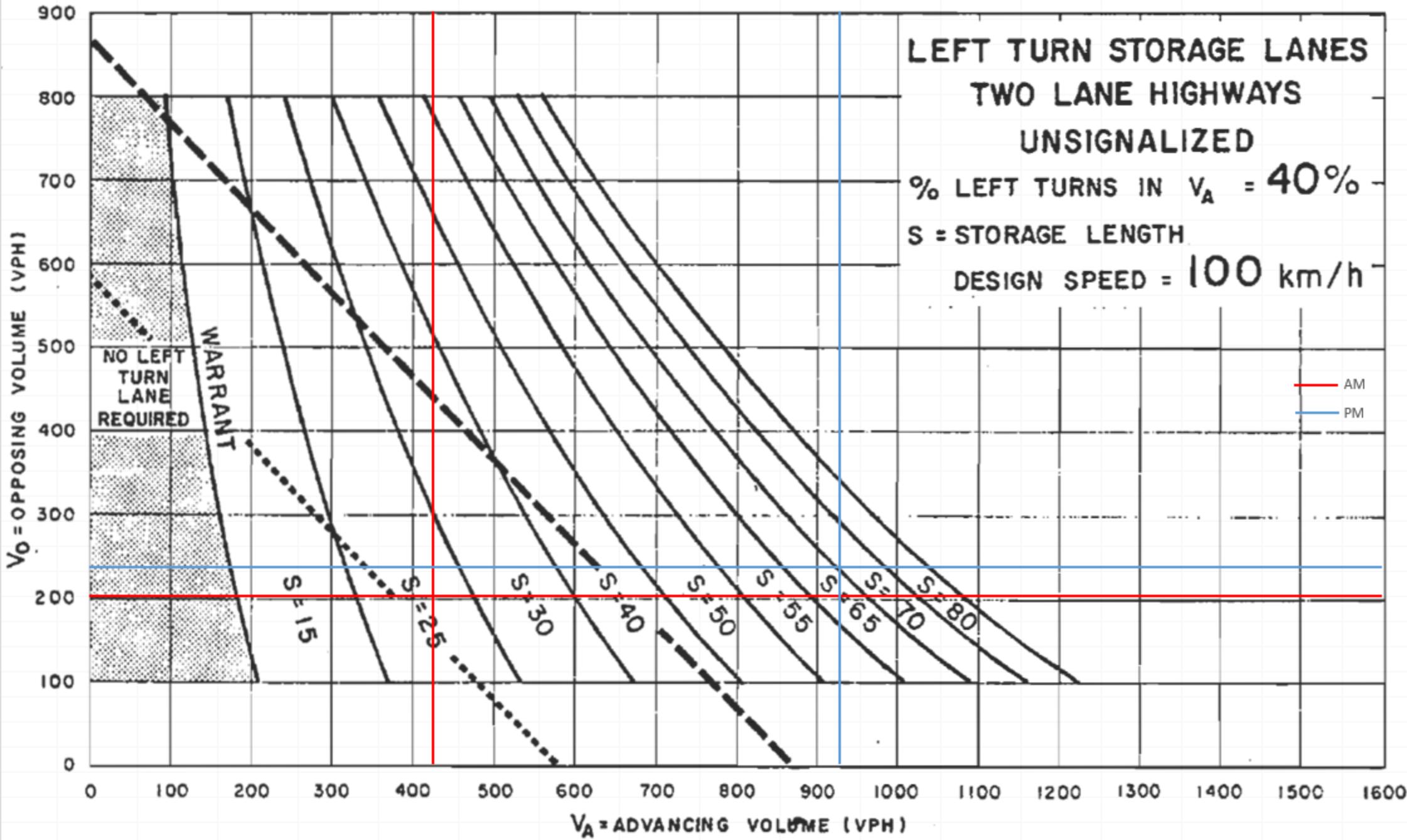
Design Speed 100 km/h	Southbound Left											Yes	%Left Turn	Volume Advancing	Volume Opposing
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR				
	AM	0	0	0	47	0	595	0	254	43	202	193			
	PM	0	0	0	43	0	359	0	241	30	595	249			



Appendix I(7)

Left-turn Lane Warrants:
Cambrian Rd & Borrisokane Rd 2027 FT

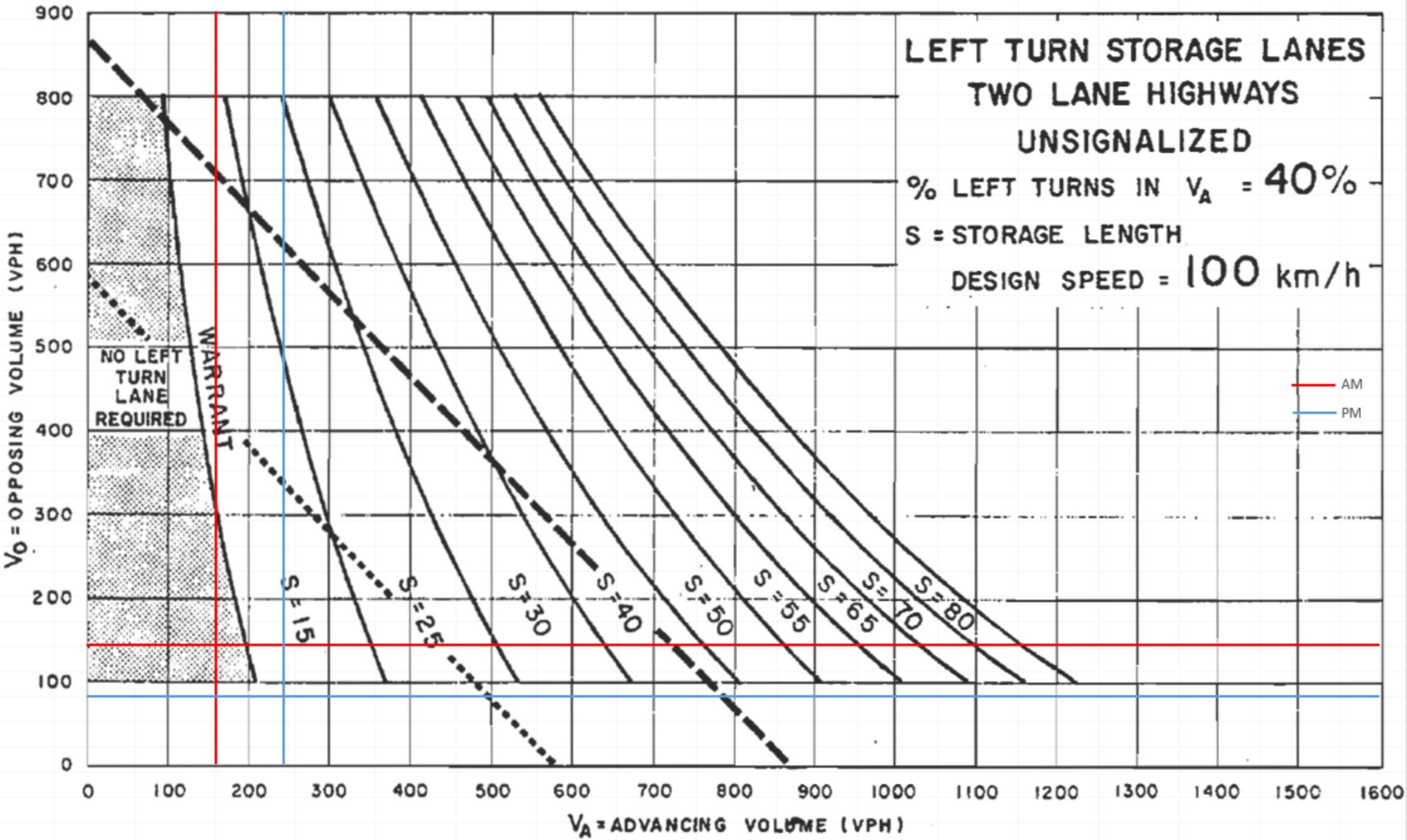
Design Speed 100 km/h	Southbound Left											%Left Turn 0	Volume Advancing 64.8%	Volume Opposing 426	Volume Opposing 202
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	Yes	SBL	SBT	SBR		
										SBL	SBT	150	152		
AM	0	0	0	87	0	780	0	151	51	276	150	0	64.8%	426	202
PM	0	0	0	60	0	479	0	174	63	777	152	0	83.6%	929	237



Appendix I(8)

**Left-turn Lane Warrants:
Borrisokane Rd & New Roadway 2022 FB**

Design Speed 100 km/h	Southbound Left												Yes		
													%Left Turn	Volume Advancing	Volume Opposing
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	0	40.3%	159
AM	0	0	0	8	0	131	0	140	4	64	95	0	40.3%	159	144
PM	0	0	0	10	0	94	0	75	7	128	116	0	52.5%	244	82

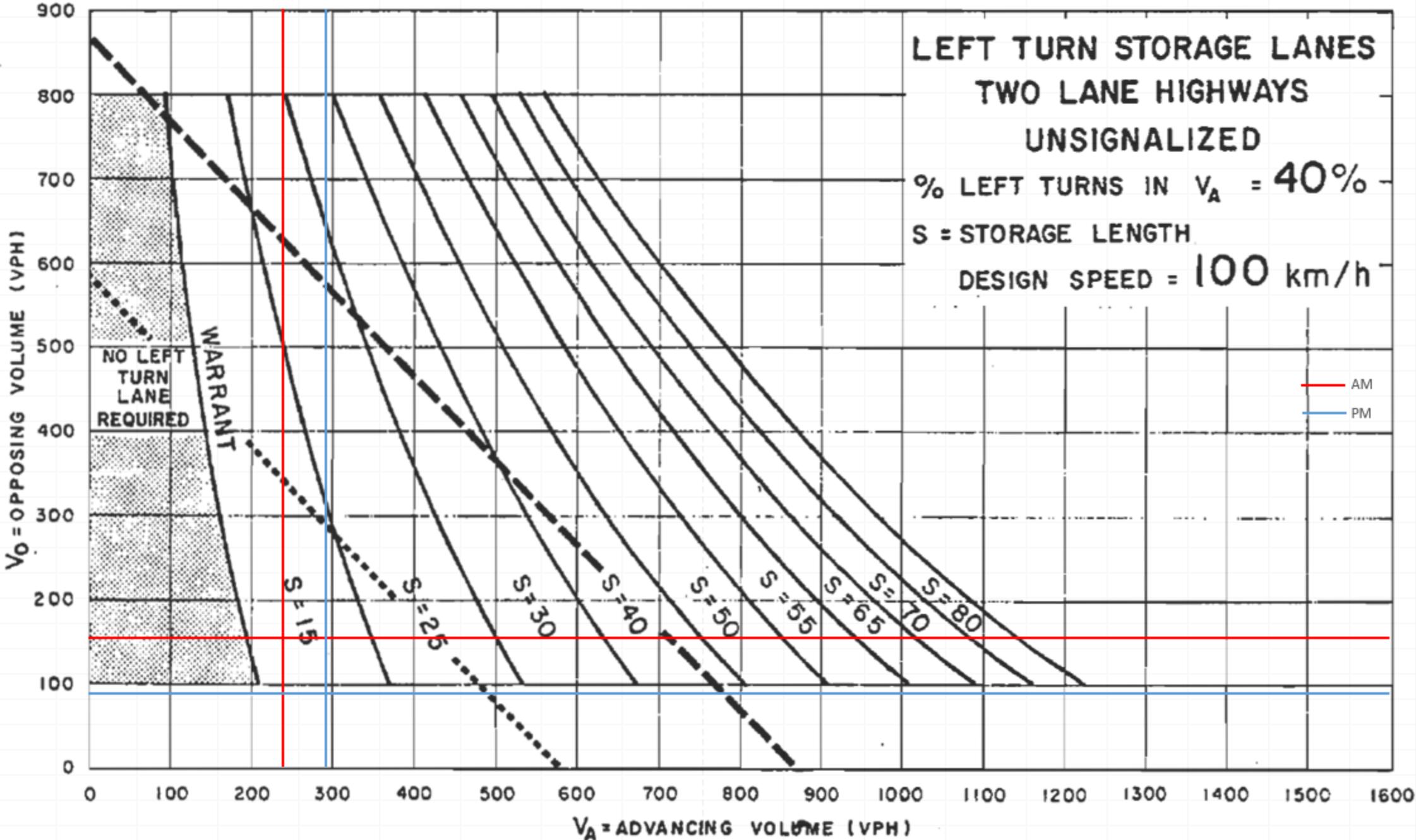


Appendix I(9)

Left-turn Lane Warrants:

Borrisokane Rd & New Roadway 2022 FT

Design Speed 100 km/h	Southbound Left												%Left Turn	Volume Advancing	Volume Opposing			
	Yes																	
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR						
AM	0	0	0	11	0	157	0	147	7	144	95	0	60.3%	239	154			
PM	0	0	0	22	0	120	0	78	10	175	116	0	60.1%	291	88			

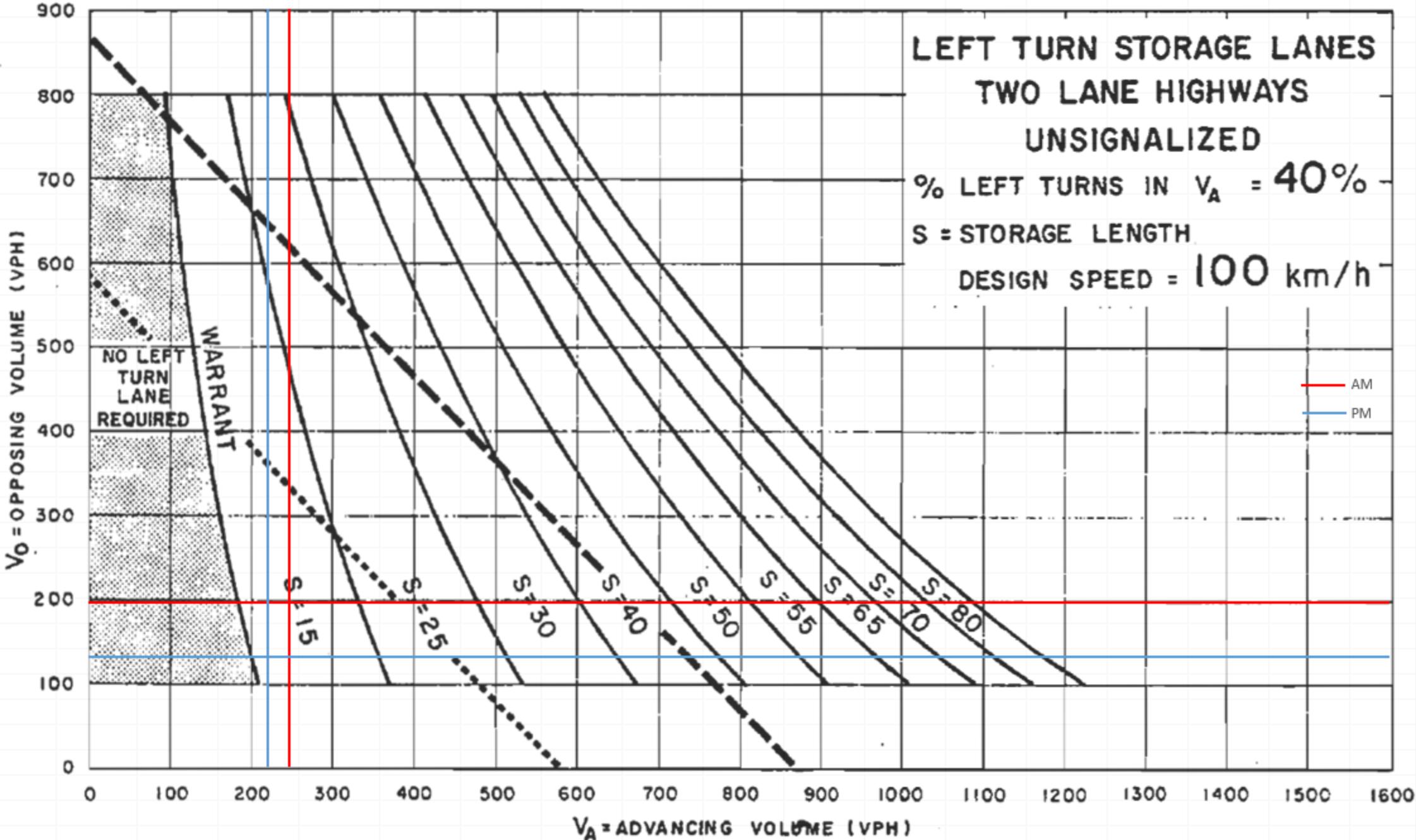


Appendix I(10)

Left-turn Lane Warrants:

Borrisokane Rd & New Roadway 2027 FT

Design Speed 100 km/h	Southbound Left									Yes			%Left Turn	Volume Advancing	Volume Opposing	
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR				
	AM	0	0	0	3	0	31	0	193	3	92	154	0	37.4%	246	196
	PM	0	0	0	12	0	31	0	129	3	54	167	0	24.4%	221	132



Appendix J

Signal Warrants

Cambrian Rd & Borrisokane Rd
2022 FB

Justification #7

Justification	Description	Minimum Requirement		Minimum Requirement		Compliance		Signal	
		1 Lane Highway		2 or More Lanes		Sectional			
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%		
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	649	90%	90% No	
	B. Vehicle volume, along minor streets (average hour)	120	170	120	170	390	229%		
2. Delay to Cross Traffic	A. Vehicle volumes, major street (average hour)	480	720	600	900	389	54%	54% No	
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75	121	162%		

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

Cambrian Rd & Borrisokane Rd
2022 FT

Justification #7

Justification	Description	Minimum Requirement		Minimum Requirement		Compliance		Signal	
		1 Lane Highway		2 or More Lanes		Sectional			
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%		
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	713	99%	99% No	
	B. Vehicle volume, along minor streets (average hour)	120	170	120	170	392	230%		
2. Delay to Cross Traffic	A. Vehicle volumes, major street (average hour)	480	720	600	900	452	63%	63% No	
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75	122	163%		

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

Cambrian Rd & Borrisokane Rd
2027 FB

Justification #7

Justification	Description	Minimum Requirement		Minimum Requirement		Compliance		Signal	
		1 Lane Highway		2 or More Lanes		Sectional			
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%		
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	860	119%	119%	
	B. Vehicle volume, along minor streets (average hour)	120	170	120	170	629	370%		
2. Delay to Cross Traffic	A. Vehicle volumes, major street (average hour)	480	720	600	900	441	61%	61%	
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75	197	263%		

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

Cambrian Rd & Borrisokane Rd
2027 FT

Justification #7

Justification	Description	Minimum Requirement		Minimum Requirement		Compliance		Signal	
		1 Lane Highway		2 or More Lanes		Sectional			
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%		
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	933	130%	130%	
	B. Vehicle volume, along minor streets (average hour)	120	170	120	170	635	374%		
2. Delay to Cross Traffic	A. Vehicle volumes, major street (average hour)	480	720	600	900	509	71%	71%	
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75	201	268%		

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

Existing 2019 Synchro Worksheets

Lanes, Volumes, Timings
1: Borrisokane Road & Cambrian Road

2019 Existing AM
2019-52 Caivan ABIC Manufacturing Facility

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	26	448	102	23	126	46
Future Volume (vph)	26	448	102	23	126	46
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.872		0.975			
Flt Protected	0.997				0.965	
Satd. Flow (prot)	1517	0	1701	0	0	1684
Flt Permitted	0.997				0.965	
Satd. Flow (perm)	1517	0	1701	0	0	1684
Link Speed (k/h)	70		80		80	
Link Distance (m)	602.9		2165.3		321.8	
Travel Time (s)	31.0		97.4		14.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	29	498	113	26	140	51
Shared Lane Traffic (%)						
Lane Group Flow (vph)	527	0	139	0	0	191
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.5		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)	25	15		15	25	
Sign Control	Stop		Free		Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 57.8%

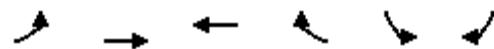
ICU Level of Service B

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	10.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	B		A		
Traffic Vol, veh/h	26	448	102	23	126	46
Future Vol, veh/h	26	448	102	23	126	46
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	29	498	113	26	140	51
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	457	126	0	0	139	0
Stage 1	126	-	-	-	-	-
Stage 2	331	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	562	924	-	-	1445	-
Stage 1	900	-	-	-	-	-
Stage 2	728	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	506	924	-	-	1445	-
Mov Cap-2 Maneuver	506	-	-	-	-	-
Stage 1	900	-	-	-	-	-
Stage 2	655	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	14.9	0	5.7			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	884	1445	-	
HCM Lane V/C Ratio	-	-	0.596	0.097	-	
HCM Control Delay (s)	-	-	14.9	7.8	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	4.1	0.3	-	

Lanes, Volumes, Timings
2: Barnsdale Road & Borrisokane Road

2019 Existing AM
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	82	149	112	43	22	50
Future Volume (vph)	82	149	112	43	22	50
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.962			0.905	
Flt Protected		0.983			0.985	
Satd. Flow (prot)	0	1715	1679	0	1556	0
Flt Permitted		0.983			0.985	
Satd. Flow (perm)	0	1715	1679	0	1556	0
Link Speed (k/h)		80	80		80	
Link Distance (m)	324.2	761.4		2165.3		
Travel Time (s)		14.6	34.3		97.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	91	166	124	48	24	56
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	257	172	0	80	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
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
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 36.6%

ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	82	149	112	43	22	50
Future Vol, veh/h	82	149	112	43	22	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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	91	166	124	48	24	56
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	172	0	-	0	496	148
Stage 1	-	-	-	-	148	-
Stage 2	-	-	-	-	348	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1405	-	-	-	533	899
Stage 1	-	-	-	-	880	-
Stage 2	-	-	-	-	715	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1405	-	-	-	495	899
Mov Cap-2 Maneuver	-	-	-	-	495	-
Stage 1	-	-	-	-	818	-
Stage 2	-	-	-	-	715	-
Approach	EB	WB	SB			
HCM Control Delay, s	2.7	0	10.6			
HCM LOS			B			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1405	-	-	-	720	
HCM Lane V/C Ratio	0.065	-	-	-	0.111	
HCM Control Delay (s)	7.7	0	-	-	10.6	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0.2	-	-	-	0.4	

Lanes, Volumes, Timings
1: Borrisokane Road & Cambrian Road

2019 Existing PM
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	20	246	48	6	450	80
Future Volume (vph)	20	246	48	6	450	80
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.875		0.984			
Flt Protected	0.996				0.959	
Satd. Flow (prot)	1521	0	1717	0	0	1674
Flt Permitted	0.996				0.959	
Satd. Flow (perm)	1521	0	1717	0	0	1674
Link Speed (k/h)	70		80		80	
Link Distance (m)	602.9		2165.3		321.8	
Travel Time (s)	31.0		97.4		14.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	22	273	53	7	500	89
Shared Lane Traffic (%)						
Lane Group Flow (vph)	295	0	60	0	0	589
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.5		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)	25	15		15	25	
Sign Control	Stop		Free		Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 61.3%

ICU Level of Service B

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	8.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	B			A	
Traffic Vol, veh/h	20	246	48	6	450	80
Future Vol, veh/h	20	246	48	6	450	80
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	273	53	7	500	89
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1146	57	0	0	60	0
Stage 1	57	-	-	-	-	-
Stage 2	1089	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	220	1009	-	-	1544	-
Stage 1	966	-	-	-	-	-
Stage 2	323	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	145	1009	-	-	1544	-
Mov Cap-2 Maneuver	145	-	-	-	-	-
Stage 1	966	-	-	-	-	-
Stage 2	213	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	13.9	0		7.2		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	697	1544	-	
HCM Lane V/C Ratio	-	-	0.424	0.324	-	
HCM Control Delay (s)	-	-	13.9	8.4	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	2.1	1.4	-	

Lanes, Volumes, Timings
2: Barnsdale Road & Borrisokane Road

2019 Existing PM
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	30	125	169	24	59	41
Future Volume (vph)	30	125	169	24	59	41
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.983			0.945	
Flt Protected		0.990			0.971	
Satd. Flow (prot)	0	1728	1715	0	1601	0
Flt Permitted		0.990			0.971	
Satd. Flow (perm)	0	1728	1715	0	1601	0
Link Speed (k/h)		80	80		80	
Link Distance (m)	324.2	761.4		2165.3		
Travel Time (s)		14.6	34.3		97.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	33	139	188	27	66	46
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	172	215	0	112	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
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
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 35.7%

ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	3.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	30	125	169	24	59	41
Future Vol, veh/h	30	125	169	24	59	41
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	139	188	27	66	46
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	215	0	-	0	407	202
Stage 1	-	-	-	-	202	-
Stage 2	-	-	-	-	205	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1355	-	-	-	600	839
Stage 1	-	-	-	-	832	-
Stage 2	-	-	-	-	829	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1355	-	-	-	584	839
Mov Cap-2 Maneuver	-	-	-	-	584	-
Stage 1	-	-	-	-	810	-
Stage 2	-	-	-	-	829	-
Approach	EB	WB	SB			
HCM Control Delay, s	1.5	0	11.5			
HCM LOS			B			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1355	-	-	-	667	
HCM Lane V/C Ratio	0.025	-	-	-	0.167	
HCM Control Delay (s)	7.7	0	-	-	11.5	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.6	

Appendix L

2022 Future Background Synchro Worksheets

Lanes, Volumes, Timings

1: Borrisokane Road & Cambrian Road

2022 FB AM
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	44	595	228	43	202	116
Future Volume (vph)	44	595	228	43	202	116
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0		0.0	130.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	15.0				100.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.874		0.979			
Flt Protected	0.997				0.950	
Satd. Flow (prot)	1521	0	1708	0	1658	1745
Flt Permitted	0.997				0.950	
Satd. Flow (perm)	1521	0	1708	0	1658	1745
Link Speed (k/h)	70		80		80	
Link Distance (m)	602.9		828.5		321.8	
Travel Time (s)	31.0		37.3		14.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	44	595	228	43	202	116
Shared Lane Traffic (%)						
Lane Group Flow (vph)	639	0	271	0	202	116
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
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		15	25	
Sign Control	Stop		Free		Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	78.6%				ICU Level of Service D	
Analysis Period (min)	15					

Intersection

Int Delay, s/veh 20.9

Movement WBL WBR NBT NBR SBL SBT

Lane Configurations						
Traffic Vol, veh/h	44	595	228	43	202	116
Future Vol, veh/h	44	595	228	43	202	116
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	1300	-
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	44	595	228	43	202	116

Major/Minor Minor1 Major1 Major2

Conflicting Flow All	770	250	0	0	271	0
Stage 1	250	-	-	-	-	-
Stage 2	520	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	369	789	-	-	1292	-
Stage 1	792	-	-	-	-	-
Stage 2	597	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	311	789	-	-	1292	-
Mov Cap-2 Maneuver	311	-	-	-	-	-
Stage 1	792	-	-	-	-	-
Stage 2	504	-	-	-	-	-

Approach WB NB SB

HCM Control Delay, s	37.5	0	5.3
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WB Ln1	SBL	SBT
Capacity (veh/h)	-	-	713	1292	-
HCM Lane V/C Ratio	-	-	0.896	0.156	-
HCM Control Delay (s)	-	-	37.5	8.3	-
HCM Lane LOS	-	-	E	A	-
HCM 95th %tile Q(veh)	-	-	11.5	0.6	-

Lanes, Volumes, Timings
2: Barnsdale Road & Borrisokane Road

2022 FB AM
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	95	158	119	49	32	72
Future Volume (vph)	95	158	119	49	32	72
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.961			0.907	
Flt Protected		0.982			0.985	
Satd. Flow (prot)	0	1714	1677	0	1559	0
Flt Permitted		0.982			0.985	
Satd. Flow (perm)	0	1714	1677	0	1559	0
Link Speed (k/h)		80	80		80	
Link Distance (m)	324.2	761.4		1316.9		
Travel Time (s)		14.6	34.3		59.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	95	158	119	49	32	72
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	253	168	0	104	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
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
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 40.6%

ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	3.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	95	158	119	49	32	72
Future Vol, veh/h	95	158	119	49	32	72
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	95	158	119	49	32	72
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	168	0	-	0	492	144
Stage 1	-	-	-	-	144	-
Stage 2	-	-	-	-	348	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1410	-	-	-	536	903
Stage 1	-	-	-	-	883	-
Stage 2	-	-	-	-	715	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1410	-	-	-	496	903
Mov Cap-2 Maneuver	-	-	-	-	496	-
Stage 1	-	-	-	-	818	-
Stage 2	-	-	-	-	715	-
Approach	EB	WB	SB			
HCM Control Delay, s	2.9	0	10.8			
HCM LOS			B			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1410	-	-	-	721	
HCM Lane V/C Ratio	0.067	-	-	-	0.144	
HCM Control Delay (s)	7.7	0	-	-	10.8	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0.2	-	-	-	0.5	

Lanes, Volumes, Timings
3: Borrisokane Road & New Roadway

2022 FB AM
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	8	131	140	4	64	95
Future Volume (vph)	8	131	140	4	64	95
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.873		0.996			
Flt Protected	0.997				0.980	
Satd. Flow (prot)	1519	0	1738	0	0	1710
Flt Permitted	0.997				0.980	
Satd. Flow (perm)	1519	0	1738	0	0	1710
Link Speed (k/h)	50		80		80	
Link Distance (m)	858.3		1316.9		828.5	
Travel Time (s)	61.8		59.3		37.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	8	131	140	4	64	95
Shared Lane Traffic (%)						
Lane Group Flow (vph)	139	0	144	0	0	159
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.5		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)	25	15		15	25	
Sign Control	Stop		Free		Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 36.1%

ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	4.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	B	N			
Traffic Vol, veh/h	8	131	140	4	64	95
Future Vol, veh/h	8	131	140	4	64	95
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	131	140	4	64	95
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	365	142	0	0	144	0
Stage 1	142	-	-	-	-	-
Stage 2	223	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	635	906	-	-	1438	-
Stage 1	885	-	-	-	-	-
Stage 2	814	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	605	906	-	-	1438	-
Mov Cap-2 Maneuver	605	-	-	-	-	-
Stage 1	885	-	-	-	-	-
Stage 2	776	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	9.9	0	3.1			
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	881	1438	-	
HCM Lane V/C Ratio	-	-	0.158	0.045	-	
HCM Control Delay (s)	-	-	9.9	7.6	0	
HCM Lane LOS	-	-	A	A	A	
HCM 95th %tile Q(veh)	-	-	0.6	0.1	-	

Lanes, Volumes, Timings
1: Borrisokane Road & Cambrian Road

2022 FB AM-Mitigation
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	44	595	228	43	202	116
Future Volume (vph)	44	595	228	43	202	116
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	100.0	0.0		0.0	130.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	50.0				100.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.979			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1658	1483	1708	0	1658	1745
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1658	1483	1708	0	1658	1745
Link Speed (k/h)	70		80			80
Link Distance (m)	602.9		828.5			321.8
Travel Time (s)	31.0		37.3			14.5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	44	595	228	43	202	116
Shared Lane Traffic (%)						
Lane Group Flow (vph)	44	595	271	0	202	116
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
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		15	25	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	61.0%				ICU Level of Service B	
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	12.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖ ↗ ↘ ↙ ↗ ↘					
Traffic Vol, veh/h	44	595	228	43	202	116
Future Vol, veh/h	44	595	228	43	202	116
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	1000	0	-	-	1300	-
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	44	595	228	43	202	116
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	770	250	0	0	271	0
Stage 1	250	-	-	-	-	-
Stage 2	520	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	369	789	-	-	1292	-
Stage 1	792	-	-	-	-	-
Stage 2	597	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	311	789	-	-	1292	-
Mov Cap-2 Maneuver	311	-	-	-	-	-
Stage 1	792	-	-	-	-	-
Stage 2	504	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	21.9	0		5.3		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	311	789	1292	-
HCM Lane V/C Ratio	-	-	0.141	0.754	0.156	-
HCM Control Delay (s)	-	-	18.5	22.1	8.3	-
HCM Lane LOS	-	-	C	C	A	-
HCM 95th %tile Q(veh)	-	-	0.5	7.1	0.6	-

Lanes, Volumes, Timings
2: Barnsdale Road & Borrisokane Road

2022 FB AM-Mitigation
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	95	158	119	49	32	72
Future Volume (vph)	95	158	119	49	32	72
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.961			0.907	
Flt Protected		0.982			0.985	
Satd. Flow (prot)	0	1714	1677	0	1559	0
Flt Permitted		0.982			0.985	
Satd. Flow (perm)	0	1714	1677	0	1559	0
Link Speed (k/h)		80	80		80	
Link Distance (m)	324.2	761.4		1316.9		
Travel Time (s)		14.6	34.3		59.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	95	158	119	49	32	72
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	253	168	0	104	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
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
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 40.6%

ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	3.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	95	158	119	49	32	72
Future Vol, veh/h	95	158	119	49	32	72
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	95	158	119	49	32	72
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	168	0	-	0	492	144
Stage 1	-	-	-	-	144	-
Stage 2	-	-	-	-	348	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1410	-	-	-	536	903
Stage 1	-	-	-	-	883	-
Stage 2	-	-	-	-	715	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1410	-	-	-	496	903
Mov Cap-2 Maneuver	-	-	-	-	496	-
Stage 1	-	-	-	-	818	-
Stage 2	-	-	-	-	715	-
Approach	EB	WB	SB			
HCM Control Delay, s	2.9	0	10.8			
HCM LOS			B			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1410	-	-	-	721	
HCM Lane V/C Ratio	0.067	-	-	-	0.144	
HCM Control Delay (s)	7.7	0	-	-	10.8	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0.2	-	-	-	0.5	

Lanes, Volumes, Timings
3: Borrisokane Road & New Roadway

2022 FB AM-Mitigation
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	8	131	140	4	64	95
Future Volume (vph)	8	131	140	4	64	95
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.873		0.996			
Flt Protected	0.997				0.980	
Satd. Flow (prot)	1519	0	1738	0	0	1710
Flt Permitted	0.997				0.980	
Satd. Flow (perm)	1519	0	1738	0	0	1710
Link Speed (k/h)	50		80		80	
Link Distance (m)	858.3		1316.9		828.5	
Travel Time (s)	61.8		59.3		37.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	8	131	140	4	64	95
Shared Lane Traffic (%)						
Lane Group Flow (vph)	139	0	144	0	0	159
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.5		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)	25	15		15	25	
Sign Control	Stop		Free		Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 36.1%

ICU Level of Service A

Analysis Period (min) 15

Intersection

Int Delay, s/veh 4.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	B	A			
Traffic Vol, veh/h	8	131	140	4	64	95
Future Vol, veh/h	8	131	140	4	64	95
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	131	140	4	64	95

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	365	142	0	0	144
Stage 1	142	-	-	-	-
Stage 2	223	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	635	906	-	-	1438
Stage 1	885	-	-	-	-
Stage 2	814	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	605	906	-	-	1438
Mov Cap-2 Maneuver	605	-	-	-	-
Stage 1	885	-	-	-	-
Stage 2	776	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.9	0	3.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	881	1438	-
HCM Lane V/C Ratio	-	-	0.158	0.045	-
HCM Control Delay (s)	-	-	9.9	7.6	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.6	0.1	-

Lanes, Volumes, Timings
1: Borrisokane Road & Cambrian Road

2022 FB PM
2019-52 Caivan ABIC Manufacturing Facility

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	42	359	144	25	595	203
Future Volume (vph)	42	359	144	25	595	203
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0		0.0	130.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	15.0				100.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.879		0.980			
Flt Protected	0.995				0.950	
Satd. Flow (prot)	1526	0	1710	0	1658	1745
Flt Permitted	0.995				0.950	
Satd. Flow (perm)	1526	0	1710	0	1658	1745
Link Speed (k/h)	70		80		80	
Link Distance (m)	602.9		828.5		321.8	
Travel Time (s)	31.0		37.3		14.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	42	359	144	25	595	203
Shared Lane Traffic (%)						
Lane Group Flow (vph)	401	0	169	0	595	203
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
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		15	25	
Sign Control	Stop		Free		Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	80.3%				ICU Level of Service D	
Analysis Period (min)	15					

Intersection

Int Delay, s/veh 25.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
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Lane Configurations						
Traffic Vol, veh/h	42	359	144	25	595	203
Future Vol, veh/h	42	359	144	25	595	203
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	1300	-
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	42	359	144	25	595	203

Major/Minor	Minor1	Major1	Major2
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Conflicting Flow All	1550	157	0	0	169	0
Stage 1	157	-	-	-	-	-
Stage 2	1393	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	125	889	-	-	1409	-
Stage 1	871	-	-	-	-	-
Stage 2	230	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	72	889	-	-	1409	-
Mov Cap-2 Maneuver	72	-	-	-	-	-
Stage 1	871	-	-	-	-	-
Stage 2	133	-	-	-	-	-

Approach	WB	NB	SB
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HCM Control Delay, s	73.9	0	7
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
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Capacity (veh/h)	-	-	406	1409	-
HCM Lane V/C Ratio	-	-	0.988	0.422	-
HCM Control Delay (s)	-	-	73.9	9.4	-
HCM Lane LOS	-	-	F	A	-
HCM 95th %tile Q(veh)	-	-	12	2.1	-

Lanes, Volumes, Timings
2: Barnsdale Road & Borrisokane Road

2022 FB PM
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	46	133	179	36	75	52
Future Volume (vph)	46	133	179	36	75	52
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.977			0.945	
Flt Protected		0.987			0.971	
Satd. Flow (prot)	0	1722	1705	0	1601	0
Flt Permitted		0.987			0.971	
Satd. Flow (perm)	0	1722	1705	0	1601	0
Link Speed (k/h)		80	80		80	
Link Distance (m)		324.2	761.4		1316.9	
Travel Time (s)		14.6	34.3		59.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	46	133	179	36	75	52
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	179	215	0	127	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
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
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 40.1%

ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	3.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	46	133	179	36	75	52
Future Vol, veh/h	46	133	179	36	75	52
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	46	133	179	36	75	52
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	215	0	-	0	422	197
Stage 1	-	-	-	-	197	-
Stage 2	-	-	-	-	225	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1355	-	-	-	588	844
Stage 1	-	-	-	-	836	-
Stage 2	-	-	-	-	812	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1355	-	-	-	566	844
Mov Cap-2 Maneuver	-	-	-	-	566	-
Stage 1	-	-	-	-	805	-
Stage 2	-	-	-	-	812	-
Approach	EB	WB	SB			
HCM Control Delay, s	2	0	11.8			
HCM LOS			B			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1355	-	-	-	654	
HCM Lane V/C Ratio	0.034	-	-	-	0.194	
HCM Control Delay (s)	7.8	0	-	-	11.8	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.7	

Lanes, Volumes, Timings
3: Borrisokane Road & New Roadway

2022 FB PM
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	10	94	75	7	128	116
Future Volume (vph)	10	94	75	7	128	116
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.878		0.988			
Flt Protected	0.995				0.974	
Satd. Flow (prot)	1525	0	1724	0	0	1700
Flt Permitted	0.995				0.974	
Satd. Flow (perm)	1525	0	1724	0	0	1700
Link Speed (k/h)	50		80		80	
Link Distance (m)	858.3		1316.9		828.5	
Travel Time (s)	61.8		59.3		37.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	94	75	7	128	116
Shared Lane Traffic (%)						
Lane Group Flow (vph)	104	0	82	0	0	244
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.5		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)	25	15		15	25	
Sign Control	Stop		Free		Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 34.0%

ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	4.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	B	B		A	
Traffic Vol, veh/h	10	94	75	7	128	116
Future Vol, veh/h	10	94	75	7	128	116
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	94	75	7	128	116
Major/Minor						
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	451	79	0	0	82	0
Stage 1	79	-	-	-	-	-
Stage 2	372	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	566	981	-	-	1515	-
Stage 1	944	-	-	-	-	-
Stage 2	697	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	515	981	-	-	1515	-
Mov Cap-2 Maneuver	515	-	-	-	-	-
Stage 1	944	-	-	-	-	-
Stage 2	634	-	-	-	-	-
Approach						
Approach	WB	NB	SB			
HCM Control Delay, s	9.5	0	4			
HCM LOS	A					
Minor Lane/Major Mvmt		NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	902	1515	-	-
HCM Lane V/C Ratio	-	-	0.115	0.084	-	-
HCM Control Delay (s)	-	-	9.5	7.6	0	-
HCM Lane LOS	-	-	A	A	A	-
HCM 95th %tile Q(veh)	-	-	0.4	0.3	-	-

Lanes, Volumes, Timings
1: Borrisokane Road & Cambrian Road

2022 FB PM-Mitigation
2019-52 Caivan ABIC Manufacturing Facility

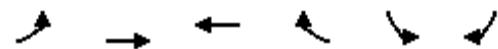


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑ ↗	↗ ↑	↑ ↘	↗ ↘	↖ ↗	↖ ↑
Traffic Volume (vph)	42	359	144	25	595	203
Future Volume (vph)	42	359	144	25	595	203
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	100.0	0.0		0.0	130.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	50.0				100.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.980			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1658	1483	1710	0	1658	1745
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1658	1483	1710	0	1658	1745
Link Speed (k/h)	70		80			80
Link Distance (m)	602.9		828.5			321.8
Travel Time (s)	31.0		37.3			14.5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	42	359	144	25	595	203
Shared Lane Traffic (%)						
Lane Group Flow (vph)	42	359	169	0	595	203
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
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		15	25	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	57.7%				ICU Level of Service B	
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	10.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖ ↗ ↘ ↖ ↙ ↘					
Traffic Vol, veh/h	42	359	144	25	595	203
Future Vol, veh/h	42	359	144	25	595	203
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	1000	0	-	-	1300	-
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	42	359	144	25	595	203
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1550	157	0	0	169	0
Stage 1	157	-	-	-	-	-
Stage 2	1393	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	125	889	-	-	1409	-
Stage 1	871	-	-	-	-	-
Stage 2	230	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	72	889	-	-	1409	-
Mov Cap-2 Maneuver	72	-	-	-	-	-
Stage 1	871	-	-	-	-	-
Stage 2	133	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	22	0	7			
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	72	889	1409	-
HCM Lane V/C Ratio	-	-	0.583	0.404	0.422	-
HCM Control Delay (s)	-	-	109.3	11.8	9.4	-
HCM Lane LOS	-	-	F	B	A	-
HCM 95th %tile Q(veh)	-	-	2.5	2	2.1	-

Lanes, Volumes, Timings
2: Barnsdale Road & Borrisokane Road

2022 FB PM-Mitigation
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	46	133	179	36	75	52
Future Volume (vph)	46	133	179	36	75	52
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.977			0.945	
Flt Protected		0.987			0.971	
Satd. Flow (prot)	0	1722	1705	0	1601	0
Flt Permitted		0.987			0.971	
Satd. Flow (perm)	0	1722	1705	0	1601	0
Link Speed (k/h)		80	80		80	
Link Distance (m)	324.2	761.4		1316.9		
Travel Time (s)		14.6	34.3		59.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	46	133	179	36	75	52
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	179	215	0	127	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
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
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 40.1%

ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	3.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	46	133	179	36	75	52
Future Vol, veh/h	46	133	179	36	75	52
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	46	133	179	36	75	52
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	215	0	-	0	422	197
Stage 1	-	-	-	-	197	-
Stage 2	-	-	-	-	225	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1355	-	-	-	588	844
Stage 1	-	-	-	-	836	-
Stage 2	-	-	-	-	812	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1355	-	-	-	566	844
Mov Cap-2 Maneuver	-	-	-	-	566	-
Stage 1	-	-	-	-	805	-
Stage 2	-	-	-	-	812	-
Approach	EB	WB	SB			
HCM Control Delay, s	2	0	11.8			
HCM LOS			B			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1355	-	-	-	654	
HCM Lane V/C Ratio	0.034	-	-	-	0.194	
HCM Control Delay (s)	7.8	0	-	-	11.8	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.7	

Lanes, Volumes, Timings
3: Borrisokane Road & New Roadway

2022 FB PM-Mitigation
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	10	94	75	7	128	116
Future Volume (vph)	10	94	75	7	128	116
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.878		0.988			
Flt Protected	0.995				0.974	
Satd. Flow (prot)	1525	0	1724	0	0	1700
Flt Permitted	0.995				0.974	
Satd. Flow (perm)	1525	0	1724	0	0	1700
Link Speed (k/h)	50		80		80	
Link Distance (m)	858.3		1316.9		828.5	
Travel Time (s)	61.8		59.3		37.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	94	75	7	128	116
Shared Lane Traffic (%)						
Lane Group Flow (vph)	104	0	82	0	0	244
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.5		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)	25	15		15	25	
Sign Control	Stop		Free		Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 34.0%

ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	4.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	B	B		A	
Traffic Vol, veh/h	10	94	75	7	128	116
Future Vol, veh/h	10	94	75	7	128	116
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	94	75	7	128	116
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	451	79	0	0	82	0
Stage 1	79	-	-	-	-	-
Stage 2	372	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	566	981	-	-	1515	-
Stage 1	944	-	-	-	-	-
Stage 2	697	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	515	981	-	-	1515	-
Mov Cap-2 Maneuver	515	-	-	-	-	-
Stage 1	944	-	-	-	-	-
Stage 2	634	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	9.5	0		4		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	902	1515	-	
HCM Lane V/C Ratio	-	-	0.115	0.084	-	
HCM Control Delay (s)	-	-	9.5	7.6	0	
HCM Lane LOS	-	-	A	A	A	
HCM 95th %tile Q(veh)	-	-	0.4	0.3	-	

Appendix M

2027 Future Background Synchro Worksheets

Lanes, Volumes, Timings

1: Borrisokane Road & Cambrian Road

2027 FB AM
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	86	931	124	62	347	69
Future Volume (vph)	86	931	124	62	347	69
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0		0.0	130.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	50.0				100.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.876		0.955			
Flt Protected	0.996				0.950	
Satd. Flow (prot)	1523	0	1667	0	1658	1745
Flt Permitted	0.996				0.950	
Satd. Flow (perm)	1523	0	1667	0	1658	1745
Link Speed (k/h)	70		80		80	
Link Distance (m)	602.9		828.5		321.8	
Travel Time (s)	31.0		37.3		14.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	86	931	124	62	347	69
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1017	0	186	0	347	69
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
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		15	25	
Sign Control	Stop		Free		Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	106.9%				ICU Level of Service G	
Analysis Period (min)	15					

Intersection

Int Delay, s/veh 137.9

Movement WBL WBR NBT NBR SBL SBT

Lane Configurations						
Traffic Vol, veh/h	86	931	124	62	347	69
Future Vol, veh/h	86	931	124	62	347	69
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	1300	-
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	86	931	124	62	347	69

Major/Minor Minor1 Major1 Major2

Conflicting Flow All	918	155	0	0	186	0
Stage 1	155	-	-	-	-	-
Stage 2	763	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	302	~ 891	-	-	1388	-
Stage 1	873	-	-	-	-	-
Stage 2	460	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	227	~ 891	-	-	1388	-
Mov Cap-2 Maneuver	227	-	-	-	-	-
Stage 1	873	-	-	-	-	-
Stage 2	345	-	-	-	-	-

Approach WB NB SB

HCM Control Delay, s 216.7 0 7.1

HCM LOS F

Minor Lane/Major Mvmt	NBT	NBR	WB Ln1	SBL	SBT
Capacity (veh/h)	-	-	714	1388	-
HCM Lane V/C Ratio	-	-	1.424	0.25	-
HCM Control Delay (s)	-	-	216.7	8.5	-
HCM Lane LOS	-	-	F	A	-
HCM 95th %tile Q(veh)	-	-	46.1	1	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lanes, Volumes, Timings
2: Barnsdale Road & Borrisokane Road

2027 FB AM
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	126	175	131	60	40	115
Future Volume (vph)	126	175	131	60	40	115
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.958			0.900	
Flt Protected		0.979			0.987	
Satd. Flow (prot)	0	1708	1672	0	1550	0
Flt Permitted		0.979			0.987	
Satd. Flow (perm)	0	1708	1672	0	1550	0
Link Speed (k/h)		80	80		80	
Link Distance (m)	324.2	761.4		1316.9		
Travel Time (s)		14.6	34.3		59.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	126	175	131	60	40	115
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	301	191	0	155	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
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
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 48.0%

ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	4.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	126	175	131	60	40	115
Future Vol, veh/h	126	175	131	60	40	115
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	126	175	131	60	40	115
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	191	0	-	0	588	161
Stage 1	-	-	-	-	161	-
Stage 2	-	-	-	-	427	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1383	-	-	-	471	884
Stage 1	-	-	-	-	868	-
Stage 2	-	-	-	-	658	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1383	-	-	-	423	884
Mov Cap-2 Maneuver	-	-	-	-	423	-
Stage 1	-	-	-	-	780	-
Stage 2	-	-	-	-	658	-
Approach	EB	WB	SB			
HCM Control Delay, s	3.3	0	11.7			
HCM LOS			B			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1383	-	-	-	690	
HCM Lane V/C Ratio	0.091	-	-	-	0.225	
HCM Control Delay (s)	7.9	0	-	-	11.7	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0.3	-	-	-	0.9	

Lanes, Volumes, Timings
1: Borrisokane Road & Cambrian Road

2027 FB AM-Mitigation
2019-52 Caivan ABIC Manufacturing Facility

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	86	931	124	62	347	69
Future Volume (vph)	86	931	124	62	347	69
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	100.0	0.0		0.0	130.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	50.0				100.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.955			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1658	1483	1667	0	1658	1745
Flt Permitted	0.950				0.640	
Satd. Flow (perm)	1658	1483	1667	0	1117	1745
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		728	33			
Link Speed (k/h)	70		80			80
Link Distance (m)	602.9		828.5			321.8
Travel Time (s)	31.0		37.3			14.5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	86	931	124	62	347	69
Shared Lane Traffic (%)						
Lane Group Flow (vph)	86	931	186	0	347	69
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
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		15	25	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	2.0	2.0	10.0		2.0	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	0.6		2.0	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	NA	Perm	NA	
Protected Phases	8		2		6	
Permitted Phases		8		6		

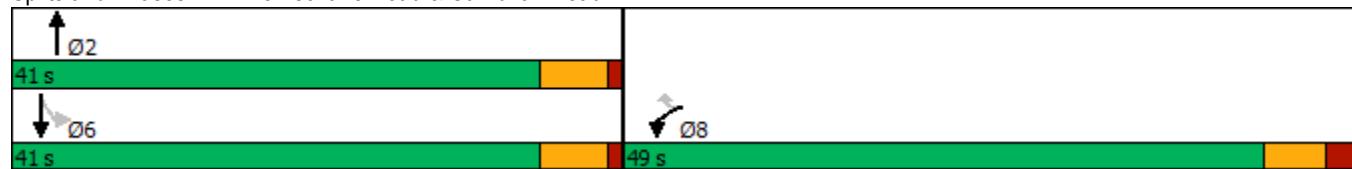
Lanes, Volumes, Timings
1: Borrisokane Road & Cambrian Road

2027 FB AM-Mitigation
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	8	8	2		6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0		10.0	10.0
Minimum Split (s)	30.2	30.2	29.7		29.7	29.7
Total Split (s)	49.0	49.0	41.0		41.0	41.0
Total Split (%)	54.4%	54.4%	45.6%		45.6%	45.6%
Maximum Green (s)	42.8	42.8	35.3		35.3	35.3
Yellow Time (s)	4.2	4.2	4.6		4.6	4.6
All-Red Time (s)	2.0	2.0	1.1		1.1	1.1
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.2	6.2	5.7		5.7	5.7
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	Max		Max	Max
Walk Time (s)	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)	17.0	17.0	17.0		17.0	17.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effect Green (s)	26.1	26.1	36.6		36.6	36.6
Actuated g/C Ratio	0.35	0.35	0.49		0.49	0.49
v/c Ratio	0.15	0.94	0.22		0.64	0.08
Control Delay	15.0	23.0	13.6		26.3	15.5
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	15.0	23.0	13.6		26.3	15.5
LOS	B	C	B		C	B
Approach Delay	22.3		13.6		24.5	
Approach LOS	C		B		C	
Queue Length 50th (m)	7.9	22.9	12.2		36.4	5.2
Queue Length 95th (m)	15.8	#138.3	32.2		#97.4	15.7
Internal Link Dist (m)	578.9		804.5		297.8	
Turn Bay Length (m)	100.0				130.0	
Base Capacity (vph)	980	1174	829		544	850
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	0.09	0.79	0.22		0.64	0.08
Intersection Summary						
Area Type:	Other					
Cycle Length: 90						
Actuated Cycle Length: 75.1						
Natural Cycle: 60						
Control Type: Semi Act-Uncoord						
Maximum v/c Ratio: 0.94						
Intersection Signal Delay: 21.9				Intersection LOS: C		
Intersection Capacity Utilization 81.6%				ICU Level of Service D		
Analysis Period (min) 15						
# 95th percentile volume exceeds capacity, queue may be longer.						
Queue shown is maximum after two cycles.						

Splits and Phases: 1: Borrisokane Road & Cambrian Road



Lanes, Volumes, Timings
2: Barnsdale Road & Borrisokane Road

2027 FB AM-Mitigation
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	126	175	131	60	40	115
Future Volume (vph)	126	175	131	60	40	115
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.958			0.900	
Flt Protected		0.979			0.987	
Satd. Flow (prot)	0	1708	1672	0	1550	0
Flt Permitted		0.979			0.987	
Satd. Flow (perm)	0	1708	1672	0	1550	0
Link Speed (k/h)		80	80		80	
Link Distance (m)	324.2	761.4		1316.9		
Travel Time (s)		14.6	34.3		59.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	126	175	131	60	40	115
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	301	191	0	155	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
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
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 48.0%

ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	4.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	126	175	131	60	40	115
Future Vol, veh/h	126	175	131	60	40	115
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	126	175	131	60	40	115
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	191	0	-	0	588	161
Stage 1	-	-	-	-	161	-
Stage 2	-	-	-	-	427	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1383	-	-	-	471	884
Stage 1	-	-	-	-	868	-
Stage 2	-	-	-	-	658	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1383	-	-	-	423	884
Mov Cap-2 Maneuver	-	-	-	-	423	-
Stage 1	-	-	-	-	780	-
Stage 2	-	-	-	-	658	-
Approach	EB	WB	SB			
HCM Control Delay, s	3.3	0	11.7			
HCM LOS			B			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1383	-	-	-	690	
HCM Lane V/C Ratio	0.091	-	-	-	0.225	
HCM Control Delay (s)	7.9	0	-	-	11.7	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0.3	-	-	-	0.9	

Lanes, Volumes, Timings
1: Borrisokane Road & Cambrian Road

2027 FB PM
2019-52 Caivan ABIC Manufacturing Facility

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	64	597	72	54	931	104
Future Volume (vph)	64	597	72	54	931	104
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0		0.0	130.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	50.0				100.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.878		0.942			
Flt Protected	0.995				0.950	
Satd. Flow (prot)	1525	0	1644	0	1658	1745
Flt Permitted	0.995				0.950	
Satd. Flow (perm)	1525	0	1644	0	1658	1745
Link Speed (k/h)	70		80		80	
Link Distance (m)	602.9		828.5		321.8	
Travel Time (s)	31.0		37.3		14.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	64	597	72	54	931	104
Shared Lane Traffic (%)						
Lane Group Flow (vph)	661	0	126	0	931	104
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
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		15	25	
Sign Control	Stop		Free		Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	114.6%				ICU Level of Service H	
Analysis Period (min)	15					

Intersection

Int Delay, s/veh 438.1

Movement WBL WBR NBT NBR SBL SBT

Lane Configurations						
Traffic Vol, veh/h	64	597	72	54	931	104
Future Vol, veh/h	64	597	72	54	931	104
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	1300	-
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	64	597	72	54	931	104

Major/Minor Minor1 Major1 Major2

Conflicting Flow All	2065	99	0	0	126	0
Stage 1	99	-	-	-	-	-
Stage 2	1966	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	~ 60	957	-	-	1460	-
Stage 1	925	-	-	-	-	-
Stage 2	119	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	~ 22	957	-	-	1460	-
Mov Cap-2 Maneuver	~ 22	-	-	-	-	-
Stage 1	925	-	-	-	-	-
Stage 2	~ 43	-	-	-	-	-

Approach WB NB SB

HCM Control Delay, \$ 1191.1 0 10.5

HCM LOS F

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	187	1460	-
HCM Lane V/C Ratio	-	-	3.535	0.638	-
HCM Control Delay (s)	-	\$ 1191.1	11.7	-	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q(veh)	-	-	63.2	4.9	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lanes, Volumes, Timings
2: Barnsdale Road & Borrisokane Road

2027 FB PM
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	83	146	198	44	88	80
Future Volume (vph)	83	146	198	44	88	80
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.975			0.936	
Flt Protected		0.982			0.974	
Satd. Flow (prot)	0	1714	1701	0	1591	0
Flt Permitted		0.982			0.974	
Satd. Flow (perm)	0	1714	1701	0	1591	0
Link Speed (k/h)		80	80		80	
Link Distance (m)	324.2	761.4		1316.9		
Travel Time (s)		14.6	34.3		59.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	83	146	198	44	88	80
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	229	242	0	168	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
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
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 47.1%

ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	4.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	83	146	198	44	88	80
Future Vol, veh/h	83	146	198	44	88	80
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	83	146	198	44	88	80
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	242	0	-	0	532	220
Stage 1	-	-	-	-	220	-
Stage 2	-	-	-	-	312	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1324	-	-	-	508	820
Stage 1	-	-	-	-	817	-
Stage 2	-	-	-	-	742	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1324	-	-	-	473	820
Mov Cap-2 Maneuver	-	-	-	-	473	-
Stage 1	-	-	-	-	761	-
Stage 2	-	-	-	-	742	-
Approach	EB	WB	SB			
HCM Control Delay, s	2.9	0	13.5			
HCM LOS			B			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1324	-	-	-	592	
HCM Lane V/C Ratio	0.063	-	-	-	0.284	
HCM Control Delay (s)	7.9	0	-	-	13.5	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0.2	-	-	-	1.2	

Lanes, Volumes, Timings
1: Borrisokane Road & Cambrian Road

2027 FB PM-Mitigation
2019-52 Caivan ABIC Manufacturing Facility

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	64	597	72	54	931	104
Future Volume (vph)	64	597	72	54	931	104
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	100.0	0.0		0.0	130.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	50.0				100.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.942			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1658	1483	1644	0	1658	1745
Flt Permitted	0.950				0.571	
Satd. Flow (perm)	1658	1483	1644	0	996	1745
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		597	36			
Link Speed (k/h)	70		80			80
Link Distance (m)	978.3		828.5			321.8
Travel Time (s)	50.3		37.3			14.5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	64	597	72	54	931	104
Shared Lane Traffic (%)						
Lane Group Flow (vph)	64	597	126	0	931	104
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
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		15	25	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	2.0	2.0	10.0		2.0	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	0.6		2.0	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	NA	pm+pt	NA	
Protected Phases	8		2		1	6
Permitted Phases		8			6	

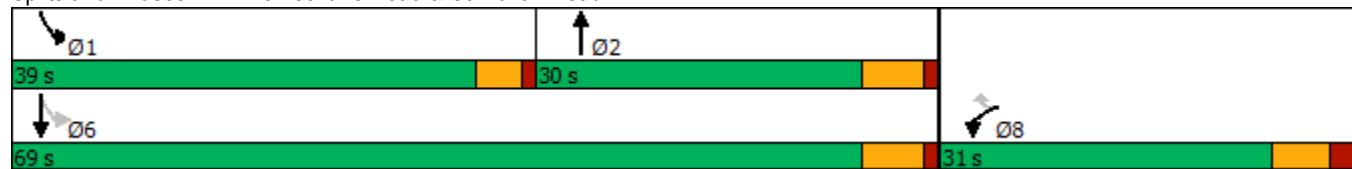
Lanes, Volumes, Timings
1: Borrisokane Road & Cambrian Road

2027 FB PM-Mitigation
2019-52 Caivan ABIC Manufacturing Facility



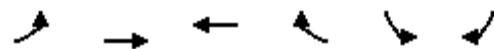
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	8	8	2		1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0		5.0	10.0
Minimum Split (s)	30.2	30.2	29.7		10.6	29.7
Total Split (s)	31.0	31.0	30.0		39.0	69.0
Total Split (%)	31.0%	31.0%	30.0%		39.0%	69.0%
Maximum Green (s)	24.8	24.8	24.3		34.5	63.3
Yellow Time (s)	4.2	4.2	4.6		3.5	4.6
All-Red Time (s)	2.0	2.0	1.1		1.0	1.1
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.2	6.2	5.7		4.5	5.7
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	Max		None	Max
Walk Time (s)	7.0	7.0	7.0			7.0
Flash Dont Walk (s)	17.0	17.0	17.0			17.0
Pedestrian Calls (#/hr)	0	0	0			0
Act Effect Green (s)	11.4	11.4	24.4		64.9	63.7
Actuated g/C Ratio	0.13	0.13	0.28		0.75	0.73
v/c Ratio	0.30	0.84	0.26		0.93	0.08
Control Delay	36.4	14.6	20.6		26.0	4.7
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	36.4	14.6	20.6		26.0	4.7
LOS	D	B	C		C	A
Approach Delay	16.7		20.6			23.9
Approach LOS	B		C			C
Queue Length 50th (m)	9.7	0.0	10.8		59.9	3.4
Queue Length 95th (m)	20.4	31.4	29.4		#273.2	13.4
Internal Link Dist (m)	954.3		804.5			297.8
Turn Bay Length (m)	100.0				130.0	
Base Capacity (vph)	475	851	487		1006	1277
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	0.13	0.70	0.26		0.93	0.08
Intersection Summary						
Area Type:	Other					
Cycle Length: 100						
Actuated Cycle Length: 87						
Natural Cycle: 100						
Control Type: Semi Act-Uncoord						
Maximum v/c Ratio: 0.93						
Intersection Signal Delay: 21.0	Intersection LOS: C					
Intersection Capacity Utilization 80.6%	ICU Level of Service D					
Analysis Period (min) 15						
# 95th percentile volume exceeds capacity, queue may be longer.						
Queue shown is maximum after two cycles.						

Splits and Phases: 1: Borrisokane Road & Cambrian Road



Lanes, Volumes, Timings
2: Barnsdale Road & Borrisokane Road

2027 FB PM-Mitigation
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	83	146	198	44	88	80
Future Volume (vph)	83	146	198	44	88	80
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.975			0.936	
Flt Protected		0.982			0.974	
Satd. Flow (prot)	0	1714	1701	0	1591	0
Flt Permitted		0.982			0.974	
Satd. Flow (perm)	0	1714	1701	0	1591	0
Link Speed (k/h)		80	80		80	
Link Distance (m)	324.2	761.4		1316.9		
Travel Time (s)		14.6	34.3		59.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	83	146	198	44	88	80
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	229	242	0	168	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
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
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 47.1%

ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	4.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	83	146	198	44	88	80
Future Vol, veh/h	83	146	198	44	88	80
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	83	146	198	44	88	80
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	242	0	-	0	532	220
Stage 1	-	-	-	-	220	-
Stage 2	-	-	-	-	312	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1324	-	-	-	508	820
Stage 1	-	-	-	-	817	-
Stage 2	-	-	-	-	742	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1324	-	-	-	473	820
Mov Cap-2 Maneuver	-	-	-	-	473	-
Stage 1	-	-	-	-	761	-
Stage 2	-	-	-	-	742	-
Approach	EB	WB	SB			
HCM Control Delay, s	2.9	0	13.5			
HCM LOS			B			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1324	-	-	-	592	
HCM Lane V/C Ratio	0.063	-	-	-	0.284	
HCM Control Delay (s)	7.9	0	-	-	13.5	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0.2	-	-	-	1.2	

Appendix N

2022 Future Total Synchro Worksheets

Lanes, Volumes, Timings
1: Borrisokane Road & Cambrian Road

2022 FT AM
2019-52 Caivan ABIC Manufacturing Facility

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	47	595	254	43	202	193
Future Volume (vph)	47	595	254	43	202	193
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0		0.0	130.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	15.0				100.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.875		0.980			
Flt Protected	0.996				0.950	
Satd. Flow (prot)	1521	0	1710	0	1658	1745
Flt Permitted	0.996				0.950	
Satd. Flow (perm)	1521	0	1710	0	1658	1745
Link Speed (k/h)	70		80		80	
Link Distance (m)	602.9		728.6		321.8	
Travel Time (s)	31.0		32.8		14.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	47	595	254	43	202	193
Shared Lane Traffic (%)						
Lane Group Flow (vph)	642	0	297	0	202	193
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
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		15	25	
Sign Control	Stop		Free		Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	80.3%				ICU Level of Service D	
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	24.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	B	T	R	T	U
Traffic Vol, veh/h	47	595	254	43	202	193
Future Vol, veh/h	47	595	254	43	202	193
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	1300	-
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	47	595	254	43	202	193
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	873	276	0	0	297	0
Stage 1	276	-	-	-	-	-
Stage 2	597	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	321	763	-	-	1264	-
Stage 1	771	-	-	-	-	-
Stage 2	550	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	270	763	-	-	1264	-
Mov Cap-2 Maneuver	270	-	-	-	-	-
Stage 1	771	-	-	-	-	-
Stage 2	462	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	49	0	4.3			
HCM LOS	E					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	673	1264	-	
HCM Lane V/C Ratio	-	-	0.954	0.16	-	
HCM Control Delay (s)	-	-	49	8.4	-	
HCM Lane LOS	-	-	E	A	-	
HCM 95th %tile Q(veh)	-	-	13.7	0.6	-	

Lanes, Volumes, Timings
2: Barnsdale Road & Borrisokane Road

2022 FT AM
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	105	158	119	49	32	75
Future Volume (vph)	105	158	119	49	32	75
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.961			0.905	
Flt Protected		0.980			0.985	
Satd. Flow (prot)	0	1710	1677	0	1556	0
Flt Permitted		0.980			0.985	
Satd. Flow (perm)	0	1710	1677	0	1556	0
Link Speed (k/h)		80	80		80	
Link Distance (m)	324.2	761.4		1316.9		
Travel Time (s)		14.6	34.3		59.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	105	158	119	49	32	75
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	263	168	0	107	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
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
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 41.4%

ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	3.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	105	158	119	49	32	75
Future Vol, veh/h	105	158	119	49	32	75
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	105	158	119	49	32	75
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	168	0	-	0	512	144
Stage 1	-	-	-	-	144	-
Stage 2	-	-	-	-	368	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1410	-	-	-	522	903
Stage 1	-	-	-	-	883	-
Stage 2	-	-	-	-	700	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1410	-	-	-	479	903
Mov Cap-2 Maneuver	-	-	-	-	479	-
Stage 1	-	-	-	-	811	-
Stage 2	-	-	-	-	700	-
Approach	EB	WB	SB			
HCM Control Delay, s	3.1	0	10.9			
HCM LOS			B			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1410	-	-	-	714	
HCM Lane V/C Ratio	0.074	-	-	-	0.15	
HCM Control Delay (s)	7.8	0	-	-	10.9	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0.2	-	-	-	0.5	

Lanes, Volumes, Timings
3: Borrisokane Road & New Roadway

2022 FT AM
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	11	157	147	7	144	95
Future Volume (vph)	11	157	147	7	144	95
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0		0.0	130.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	15.0				100.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.874		0.994			
Flt Protected	0.997				0.950	
Satd. Flow (prot)	1521	0	1735	0	1658	1745
Flt Permitted	0.997				0.950	
Satd. Flow (perm)	1521	0	1735	0	1658	1745
Link Speed (k/h)	50		80		80	
Link Distance (m)	37.5		1316.9		99.9	
Travel Time (s)	2.7		59.3		4.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	11	157	147	7	144	95
Shared Lane Traffic (%)						
Lane Group Flow (vph)	168	0	154	0	144	95
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
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		15	25	
Sign Control	Stop		Free		Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	37.9%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	5.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	B	T	R	U	↑
Traffic Vol, veh/h	11	157	147	7	144	95
Future Vol, veh/h	11	157	147	7	144	95
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	1300	-
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	11	157	147	7	144	95
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	534	151	0	0	154	0
Stage 1	151	-	-	-	-	-
Stage 2	383	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	507	895	-	-	1426	-
Stage 1	877	-	-	-	-	-
Stage 2	689	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	456	895	-	-	1426	-
Mov Cap-2 Maneuver	456	-	-	-	-	-
Stage 1	877	-	-	-	-	-
Stage 2	619	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	10.3	0	4.7			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	842	1426	-	
HCM Lane V/C Ratio	-	-	0.2	0.101	-	
HCM Control Delay (s)	-	-	10.3	7.8	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	0.7	0.3	-	

Lanes, Volumes, Timings
5: Borrisokane Road & Access #2

2022 FT AM
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↑	↑		↑
Traffic Volume (vph)	0	0	297	7	0	239
Future Volume (vph)	0	0	297	7	0	239
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t			0.997			
Flt Protected						
Satd. Flow (prot)	0	1745	1740	0	0	1745
Flt Permitted						
Satd. Flow (perm)	0	1745	1740	0	0	1745
Link Speed (k/h)	50		80			80
Link Distance (m)	102.1		99.9			728.6
Travel Time (s)	7.4		4.5			32.8
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	297	7	0	239
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	304	0	0	239
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		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		15	25	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 20.3%

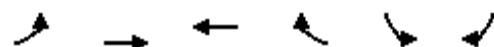
ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↑	↑		↑	
Traffic Vol, veh/h	0	0	297	7	0	239
Future Vol, veh/h	0	0	297	7	0	239
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	297	7	0	239
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	-	301	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	739	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	739	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	0	0	0			
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT		
Capacity (veh/h)	-	-	-	-		
HCM Lane V/C Ratio	-	-	-	-		
HCM Control Delay (s)	-	-	0	-		
HCM Lane LOS	-	-	A	-		
HCM 95th %tile Q(veh)	-	-	-	-		

Lanes, Volumes, Timings
6: New Roadway & Access #3

2022 FT AM
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	54	97	168	7	0	0
Future Volume (vph)	54	97	168	7	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.995			
Flt Protected			0.982			
Satd. Flow (prot)	0	1714	1736	0	1745	0
Flt Permitted			0.982			
Satd. Flow (perm)	0	1714	1736	0	1745	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		37.5	165.2		81.3	
Travel Time (s)		2.7	11.9		5.9	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	54	97	168	7	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	151	175	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
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
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 25.0%

ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	1.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	54	97	168	7	0	0
Future Vol, veh/h	54	97	168	7	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	54	97	168	7	0	0
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	175	0	-	0	377	172
Stage 1	-	-	-	-	172	-
Stage 2	-	-	-	-	205	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1401	-	-	-	625	872
Stage 1	-	-	-	-	858	-
Stage 2	-	-	-	-	829	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1401	-	-	-	599	872
Mov Cap-2 Maneuver	-	-	-	-	599	-
Stage 1	-	-	-	-	823	-
Stage 2	-	-	-	-	829	-
Approach	EB	WB	SB			
HCM Control Delay, s	2.7	0	0			
HCM LOS			A			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1401	-	-	-	-	-
HCM Lane V/C Ratio	0.039	-	-	-	-	-
HCM Control Delay (s)	7.7	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	-	-	-



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	29	68	146	5	5	29
Future Volume (vph)	29	68	146	5	5	29
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996			0.885	
Flt Protected		0.985			0.993	
Satd. Flow (prot)	0	1719	1738	0	1534	0
Flt Permitted		0.985			0.993	
Satd. Flow (perm)	0	1719	1738	0	1534	0
Link Speed (k/h)		50	50		50	
Link Distance (m)	165.2	556.5			78.2	
Travel Time (s)		11.9	40.1		5.6	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	29	68	146	5	5	29
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	97	151	0	34	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
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
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 27.2%

ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	1.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	29	68	146	5	5	29
Future Vol, veh/h	29	68	146	5	5	29
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	29	68	146	5	5	29
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	151	0	-	0	275	149
Stage 1	-	-	-	-	149	-
Stage 2	-	-	-	-	126	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1430	-	-	-	715	898
Stage 1	-	-	-	-	879	-
Stage 2	-	-	-	-	900	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1430	-	-	-	700	898
Mov Cap-2 Maneuver	-	-	-	-	700	-
Stage 1	-	-	-	-	861	-
Stage 2	-	-	-	-	900	-
Approach	EB	WB	SB			
HCM Control Delay, s	2.3	0	9.3			
HCM LOS			A			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1430	-	-	-	862	
HCM Lane V/C Ratio	0.02	-	-	-	0.039	
HCM Control Delay (s)	7.6	0	-	-	9.3	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1	

Lanes, Volumes, Timings
1: Borrisokane Road & Cambrian Road

2022 FT AM-Mitigation
2019-52 Caivan ABIC Manufacturing Facility

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	47	595	254	43	202	193
Future Volume (vph)	47	595	254	43	202	193
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0		0.0	130.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	15.0				100.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.875		0.980			
Flt Protected	0.996				0.950	
Satd. Flow (prot)	1521	0	1710	0	1658	1745
Flt Permitted	0.996				0.579	
Satd. Flow (perm)	1521	0	1710	0	1010	1745
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	496		12			
Link Speed (k/h)	70		80			80
Link Distance (m)	602.9		728.6			321.8
Travel Time (s)	31.0		32.8			14.5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	47	595	254	43	202	193
Shared Lane Traffic (%)						
Lane Group Flow (vph)	642	0	297	0	202	193
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
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		15	25	
Number of Detectors	1		2		1	2
Detector Template	Left		Thru		Left	Thru
Leading Detector (m)	2.0		10.0		2.0	10.0
Trailing Detector (m)	0.0		0.0		0.0	0.0
Detector 1 Position(m)	0.0		0.0		0.0	0.0
Detector 1 Size(m)	2.0		0.6		2.0	0.6
Detector 1 Type	Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0		0.0	0.0
Detector 1 Queue (s)	0.0		0.0		0.0	0.0
Detector 1 Delay (s)	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		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases				6		

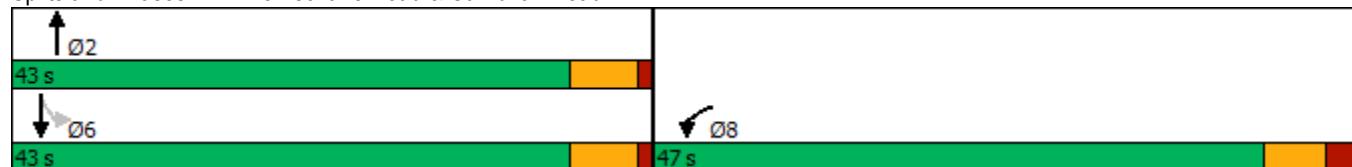
Lanes, Volumes, Timings
1: Borrisokane Road & Cambrian Road

2022 FT AM-Mitigation
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	8		2		6	6
Switch Phase						
Minimum Initial (s)	5.0		10.0		10.0	
Minimum Split (s)	30.2		29.7		29.7	
Total Split (s)	47.0		43.0		43.0	
Total Split (%)	52.2%		47.8%		47.8%	47.8%
Maximum Green (s)	40.8		37.3		37.3	
Yellow Time (s)	4.2		4.6		4.6	
All-Red Time (s)	2.0		1.1		1.1	
Lost Time Adjust (s)	0.0		0.0		0.0	
Total Lost Time (s)	6.2		5.7		5.7	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0		3.0	
Recall Mode	None		Max		Max	
Walk Time (s)	7.0		7.0		7.0	
Flash Dont Walk (s)	17.0		17.0		17.0	
Pedestrian Calls (#/hr)	0		0		0	
Act Effect Green (s)	15.4		38.1		38.1	
Actuated g/C Ratio	0.23		0.58		0.58	
v/c Ratio	0.87		0.30		0.34	0.19
Control Delay	19.2		10.1		12.4	9.7
Queue Delay	0.0		0.0		0.0	0.0
Total Delay	19.2		10.1		12.4	9.7
LOS	B		B		B	A
Approach Delay	19.2		10.1			11.1
Approach LOS	B		B			B
Queue Length 50th (m)	14.8		14.4		10.6	9.2
Queue Length 95th (m)	52.0		47.1		38.9	31.3
Internal Link Dist (m)	578.9		704.6			297.8
Turn Bay Length (m)					130.0	
Base Capacity (vph)	1146		997		586	1012
Starvation Cap Reductn	0		0		0	0
Spillback Cap Reductn	0		0		0	0
Storage Cap Reductn	0		0		0	0
Reduced v/c Ratio	0.56		0.30		0.34	0.19
Intersection Summary						
Area Type:	Other					
Cycle Length: 90						
Actuated Cycle Length: 65.6						
Natural Cycle: 60						
Control Type: Semi Act-Uncoord						
Maximum v/c Ratio: 0.87						
Intersection Signal Delay: 14.8					Intersection LOS: B	
Intersection Capacity Utilization 84.9%						ICU Level of Service E
Analysis Period (min) 15						

Splits and Phases: 1: Borrisokane Road & Cambrian Road



Lanes, Volumes, Timings
2: Barnsdale Road & Borrisokane Road

2022 FT AM-Mitigation
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	105	158	119	49	32	75
Future Volume (vph)	105	158	119	49	32	75
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.961			0.905	
Flt Protected		0.980			0.985	
Satd. Flow (prot)	0	1710	1677	0	1556	0
Flt Permitted		0.980			0.985	
Satd. Flow (perm)	0	1710	1677	0	1556	0
Link Speed (k/h)		80	80		80	
Link Distance (m)	324.2	761.4		1316.9		
Travel Time (s)		14.6	34.3		59.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	105	158	119	49	32	75
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	263	168	0	107	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
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
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 41.4%

ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	3.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	105	158	119	49	32	75
Future Vol, veh/h	105	158	119	49	32	75
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	105	158	119	49	32	75
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	168	0	-	0	512	144
Stage 1	-	-	-	-	144	-
Stage 2	-	-	-	-	368	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1410	-	-	-	522	903
Stage 1	-	-	-	-	883	-
Stage 2	-	-	-	-	700	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1410	-	-	-	479	903
Mov Cap-2 Maneuver	-	-	-	-	479	-
Stage 1	-	-	-	-	811	-
Stage 2	-	-	-	-	700	-
Approach	EB	WB	SB			
HCM Control Delay, s	3.1	0	10.9			
HCM LOS			B			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1410	-	-	-	714	
HCM Lane V/C Ratio	0.074	-	-	-	0.15	
HCM Control Delay (s)	7.8	0	-	-	10.9	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0.2	-	-	-	0.5	

Lanes, Volumes, Timings
3: Borrisokane Road & New Roadway

2022 FT AM-Mitigation
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	11	157	147	7	144	95
Future Volume (vph)	11	157	147	7	144	95
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0		0.0	130.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	15.0				100.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.874		0.994			
Flt Protected	0.997				0.950	
Satd. Flow (prot)	1521	0	1735	0	1658	1745
Flt Permitted	0.997				0.950	
Satd. Flow (perm)	1521	0	1735	0	1658	1745
Link Speed (k/h)	50		80		80	
Link Distance (m)	37.5		1316.9		99.9	
Travel Time (s)	2.7		59.3		4.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	11	157	147	7	144	95
Shared Lane Traffic (%)						
Lane Group Flow (vph)	168	0	154	0	144	95
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
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		15	25	
Sign Control	Stop		Free		Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	37.9%				ICU Level of Service A	
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	5.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	B	T	R	T	U
Traffic Vol, veh/h	11	157	147	7	144	95
Future Vol, veh/h	11	157	147	7	144	95
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	1300	-
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	11	157	147	7	144	95
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	534	151	0	0	154	0
Stage 1	151	-	-	-	-	-
Stage 2	383	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	507	895	-	-	1426	-
Stage 1	877	-	-	-	-	-
Stage 2	689	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	456	895	-	-	1426	-
Mov Cap-2 Maneuver	456	-	-	-	-	-
Stage 1	877	-	-	-	-	-
Stage 2	619	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	10.3	0	4.7			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	842	1426	-	
HCM Lane V/C Ratio	-	-	0.2	0.101	-	
HCM Control Delay (s)	-	-	10.3	7.8	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	0.7	0.3	-	

Lanes, Volumes, Timings
5: Borrisokane Road & Access #2

2022 FT AM-Mitigation
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↑	↑		↑
Traffic Volume (vph)	0	0	297	7	0	239
Future Volume (vph)	0	0	297	7	0	239
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t			0.997			
Flt Protected						
Satd. Flow (prot)	0	1745	1740	0	0	1745
Flt Permitted						
Satd. Flow (perm)	0	1745	1740	0	0	1745
Link Speed (k/h)	50		80			80
Link Distance (m)	102.1		99.9			728.6
Travel Time (s)	7.4		4.5			32.8
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	297	7	0	239
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	304	0	0	239
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		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		15	25	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 20.3%

ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	297	7	0	239
Future Vol, veh/h	0	0	297	7	0	239
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	297	7	0	239
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	-	301	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	739	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	739	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	0	0	0			
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT		
Capacity (veh/h)	-	-	-	-		
HCM Lane V/C Ratio	-	-	-	-		
HCM Control Delay (s)	-	-	0	-		
HCM Lane LOS	-	-	A	-		
HCM 95th %tile Q(veh)	-	-	-	-		



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	54	97	168	7	0	0
Future Volume (vph)	54	97	168	7	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.995			
Flt Protected			0.982			
Satd. Flow (prot)	0	1714	1736	0	1745	0
Flt Permitted			0.982			
Satd. Flow (perm)	0	1714	1736	0	1745	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		37.5	165.2		81.3	
Travel Time (s)		2.7	11.9		5.9	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	54	97	168	7	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	151	175	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
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
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 25.0%

ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	1.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	54	97	168	7	0	0
Future Vol, veh/h	54	97	168	7	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	54	97	168	7	0	0
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	175	0	-	0	377	172
Stage 1	-	-	-	-	172	-
Stage 2	-	-	-	-	205	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1401	-	-	-	625	872
Stage 1	-	-	-	-	858	-
Stage 2	-	-	-	-	829	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1401	-	-	-	599	872
Mov Cap-2 Maneuver	-	-	-	-	599	-
Stage 1	-	-	-	-	823	-
Stage 2	-	-	-	-	829	-
Approach	EB	WB	SB			
HCM Control Delay, s	2.7	0	0			
HCM LOS			A			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1401	-	-	-	-	-
HCM Lane V/C Ratio	0.039	-	-	-	-	-
HCM Control Delay (s)	7.7	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	-	-	-



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	29	68	146	5	5	29
Future Volume (vph)	29	68	146	5	5	29
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996			0.885	
Flt Protected		0.985			0.993	
Satd. Flow (prot)	0	1719	1738	0	1534	0
Flt Permitted		0.985			0.993	
Satd. Flow (perm)	0	1719	1738	0	1534	0
Link Speed (k/h)		50	50		50	
Link Distance (m)	165.2	556.5			78.2	
Travel Time (s)		11.9	40.1		5.6	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	29	68	146	5	5	29
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	97	151	0	34	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
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
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 27.2%

ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	1.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	29	68	146	5	5	29
Future Vol, veh/h	29	68	146	5	5	29
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	29	68	146	5	5	29
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	151	0	-	0	275	149
Stage 1	-	-	-	-	149	-
Stage 2	-	-	-	-	126	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1430	-	-	-	715	898
Stage 1	-	-	-	-	879	-
Stage 2	-	-	-	-	900	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1430	-	-	-	700	898
Mov Cap-2 Maneuver	-	-	-	-	700	-
Stage 1	-	-	-	-	861	-
Stage 2	-	-	-	-	900	-
Approach	EB	WB	SB			
HCM Control Delay, s	2.3	0	9.3			
HCM LOS			A			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1430	-	-	-	862	
HCM Lane V/C Ratio	0.02	-	-	-	0.039	
HCM Control Delay (s)	7.6	0	-	-	9.3	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1	

Lanes, Volumes, Timings
1: Borrisokane Road & Cambrian Road

2022 FT PM
2019-52 Caivan ABIC Manufacturing Facility

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	43	359	241	30	595	249
Future Volume (vph)	43	359	241	30	595	249
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0		0.0	130.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	15.0				100.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.879		0.985			
Flt Protected	0.995				0.950	
Satd. Flow (prot)	1526	0	1719	0	1658	1745
Flt Permitted	0.995				0.950	
Satd. Flow (perm)	1526	0	1719	0	1658	1745
Link Speed (k/h)	70		80		80	
Link Distance (m)	602.9		728.6		321.8	
Travel Time (s)	31.0		32.8		14.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	43	359	241	30	595	249
Shared Lane Traffic (%)						
Lane Group Flow (vph)	402	0	271	0	595	249
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
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		15	25	
Sign Control	Stop		Free		Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	86.0%				ICU Level of Service E	
Analysis Period (min)	15					

Intersection

Int Delay, s/veh 47.9

Movement WBL WBR NBT NBR SBL SBT

Lane Configurations	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	43	359	241	30	595	249
Future Vol, veh/h	43	359	241	30	595	249
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	1300	-
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	43	359	241	30	595	249

Major/Minor Minor1 Major1 Major2

Conflicting Flow All	1695	256	0	0	271	0
Stage 1	256	-	-	-	-	-
Stage 2	1439	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	102	783	-	-	1292	-
Stage 1	787	-	-	-	-	-
Stage 2	218	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	55	783	-	-	1292	-
Mov Cap-2 Maneuver	55	-	-	-	-	-
Stage 1	787	-	-	-	-	-
Stage 2	118	-	-	-	-	-

Approach WB NB SB

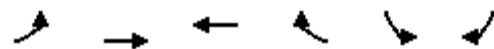
HCM Control Delay, s 165.9 0 7.1

HCM LOS F

Minor Lane/Major Mvmt	NBT	NBR	WB Ln1	SBL	SBT
Capacity (veh/h)	-	-	324	1292	-
HCM Lane V/C Ratio	-	-	1.241	0.461	-
HCM Control Delay (s)	-	-	165.9	10.1	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q(veh)	-	-	18.1	2.5	-

Lanes, Volumes, Timings
2: Barnsdale Road & Borrisokane Road

2022 FT PM
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	52	133	179	36	75	64
Future Volume (vph)	52	133	179	36	75	64
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.977			0.938	
Flt Protected		0.986			0.974	
Satd. Flow (prot)	0	1721	1705	0	1594	0
Flt Permitted		0.986			0.974	
Satd. Flow (perm)	0	1721	1705	0	1594	0
Link Speed (k/h)		80	80		80	
Link Distance (m)	324.2	761.4		1316.9		
Travel Time (s)		14.6	34.3		59.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	52	133	179	36	75	64
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	185	215	0	139	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
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
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 41.2%

ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	3.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	52	133	179	36	75	64
Future Vol, veh/h	52	133	179	36	75	64
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	52	133	179	36	75	64
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	215	0	-	0	434	197
Stage 1	-	-	-	-	197	-
Stage 2	-	-	-	-	237	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1355	-	-	-	579	844
Stage 1	-	-	-	-	836	-
Stage 2	-	-	-	-	802	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1355	-	-	-	555	844
Mov Cap-2 Maneuver	-	-	-	-	555	-
Stage 1	-	-	-	-	802	-
Stage 2	-	-	-	-	802	-
Approach	EB	WB	SB			
HCM Control Delay, s	2.2	0	11.9			
HCM LOS			B			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1355	-	-	-	659	
HCM Lane V/C Ratio	0.038	-	-	-	0.211	
HCM Control Delay (s)	7.8	0	-	-	11.9	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.8	

Lanes, Volumes, Timings
3: Borrisokane Road & New Roadway

2022 FT PM
2019-52 Caivan ABIC Manufacturing Facility

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	22	120	78	10	175	116
Future Volume (vph)	22	120	78	10	175	116
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0		0.0	130.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	15.0				100.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.886		0.985			
Flt Protected	0.992				0.950	
Satd. Flow (prot)	1534	0	1719	0	1658	1745
Flt Permitted	0.992				0.950	
Satd. Flow (perm)	1534	0	1719	0	1658	1745
Link Speed (k/h)	50		80		80	
Link Distance (m)	37.5		1316.9		99.9	
Travel Time (s)	2.7		59.3		4.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	22	120	78	10	175	116
Shared Lane Traffic (%)						
Lane Group Flow (vph)	142	0	88	0	175	116
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
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		15	25	
Sign Control	Stop		Free		Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	32.7%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	5.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	B	T	T	U	U
Traffic Vol, veh/h	22	120	78	10	175	116
Future Vol, veh/h	22	120	78	10	175	116
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	1300	-
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	22	120	78	10	175	116
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	549	83	0	0	88	0
Stage 1	83	-	-	-	-	-
Stage 2	466	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	497	976	-	-	1508	-
Stage 1	940	-	-	-	-	-
Stage 2	632	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	439	976	-	-	1508	-
Mov Cap-2 Maneuver	439	-	-	-	-	-
Stage 1	940	-	-	-	-	-
Stage 2	559	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	10.3	0		4.6		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	821	1508	-	
HCM Lane V/C Ratio	-	-	0.173	0.116	-	
HCM Control Delay (s)	-	-	10.3	7.7	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	0.6	0.4	-	

Lanes, Volumes, Timings
5: Borrisokane Road & Access #2

2022 FT PM
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↑	↑			↑
Traffic Volume (vph)	0	75	195	3	0	291
Future Volume (vph)	0	75	195	3	0	291
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.865	0.998			
Flt Protected						
Satd. Flow (prot)	0	1510	1742	0	0	1745
Flt Permitted						
Satd. Flow (perm)	0	1510	1742	0	0	1745
Link Speed (k/h)	50		80			80
Link Distance (m)	102.1		99.9			728.6
Travel Time (s)	7.4		4.5			32.8
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	75	195	3	0	291
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	75	198	0	0	291
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		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		15	25	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 22.6%

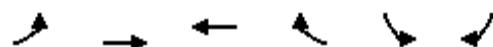
ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	1.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	75	195	3	0	291
Future Vol, veh/h	0	75	195	3	0	291
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	75	195	3	0	291
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	-	197	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	844	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	844	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	9.7	0	0			
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBT			
Capacity (veh/h)	-	-	844	-		
HCM Lane V/C Ratio	-	-	0.089	-		
HCM Control Delay (s)	-	-	9.7	-		
HCM Lane LOS	-	-	A	-		
HCM 95th %tile Q(veh)	-	-	0.3	-		

Lanes, Volumes, Timings
6: New Roadway & Access #3

2022 FT PM
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	21	164	133	3	9	9
Future Volume (vph)	21	164	133	3	9	9
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.932	
Flt Protected		0.994			0.976	
Satd. Flow (prot)	0	1735	1740	0	1587	0
Flt Permitted		0.994			0.976	
Satd. Flow (perm)	0	1735	1740	0	1587	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		37.5	165.2		81.3	
Travel Time (s)		2.7	11.9		5.9	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	21	164	133	3	9	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	185	136	0	18	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
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
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

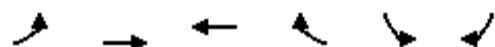
Control Type: Unsignalized

Intersection Capacity Utilization 31.3%

ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	21	164	133	3	9	9
Future Vol, veh/h	21	164	133	3	9	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	164	133	3	9	9
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	136	0	-	0	341	135
Stage 1	-	-	-	-	135	-
Stage 2	-	-	-	-	206	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1448	-	-	-	655	914
Stage 1	-	-	-	-	891	-
Stage 2	-	-	-	-	829	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1448	-	-	-	645	914
Mov Cap-2 Maneuver	-	-	-	-	645	-
Stage 1	-	-	-	-	877	-
Stage 2	-	-	-	-	829	-
Approach	EB	WB	SB			
HCM Control Delay, s	0.9	0	9.9			
HCM LOS			A			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1448	-	-	-	756	
HCM Lane V/C Ratio	0.015	-	-	-	0.024	
HCM Control Delay (s)	7.5	0	-	-	9.9	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	0.1	



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	29	144	107	5	5	29
Future Volume (vph)	29	144	107	5	5	29
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.994			0.885	
Flt Protected		0.992			0.993	
Satd. Flow (prot)	0	1731	1735	0	1534	0
Flt Permitted		0.992			0.993	
Satd. Flow (perm)	0	1731	1735	0	1534	0
Link Speed (k/h)		50	50		50	
Link Distance (m)	165.2	556.5			78.2	
Travel Time (s)		11.9	40.1		5.6	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	29	144	107	5	5	29
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	173	112	0	34	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
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
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 26.4%

ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	1.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	29	144	107	5	5	29
Future Vol, veh/h	29	144	107	5	5	29
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	29	144	107	5	5	29
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	112	0	-	0	312	110
Stage 1	-	-	-	-	110	-
Stage 2	-	-	-	-	202	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1478	-	-	-	681	943
Stage 1	-	-	-	-	915	-
Stage 2	-	-	-	-	832	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1478	-	-	-	667	943
Mov Cap-2 Maneuver	-	-	-	-	667	-
Stage 1	-	-	-	-	896	-
Stage 2	-	-	-	-	832	-
Approach	EB	WB	SB			
HCM Control Delay, s	1.3	0	9.2			
HCM LOS			A			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1478	-	-	-	889	
HCM Lane V/C Ratio	0.02	-	-	-	0.038	
HCM Control Delay (s)	7.5	0	-	-	9.2	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1	

Lanes, Volumes, Timings
1: Borrisokane Road & Cambrian Road

2022 FT PM-Mitigation
2019-52 Caivan ABIC Manufacturing Facility

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	43	359	241	30	595	249
Future Volume (vph)	43	359	241	30	595	249
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0		0.0	130.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	15.0				100.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.879		0.985			
Flt Protected	0.995				0.950	
Satd. Flow (prot)	1526	0	1719	0	1658	1745
Flt Permitted	0.995				0.593	
Satd. Flow (perm)	1526	0	1719	0	1035	1745
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	359		12			
Link Speed (k/h)	70		80			80
Link Distance (m)	602.9		728.6			321.8
Travel Time (s)	31.0		32.8			14.5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	43	359	241	30	595	249
Shared Lane Traffic (%)						
Lane Group Flow (vph)	402	0	271	0	595	249
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
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		15	25	
Number of Detectors	1		2		1	2
Detector Template	Left		Thru		Left	Thru
Leading Detector (m)	2.0		10.0		2.0	10.0
Trailing Detector (m)	0.0		0.0		0.0	0.0
Detector 1 Position(m)	0.0		0.0		0.0	0.0
Detector 1 Size(m)	2.0		0.6		2.0	0.6
Detector 1 Type	Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0		0.0	0.0
Detector 1 Queue (s)	0.0		0.0		0.0	0.0
Detector 1 Delay (s)	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		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases				6		

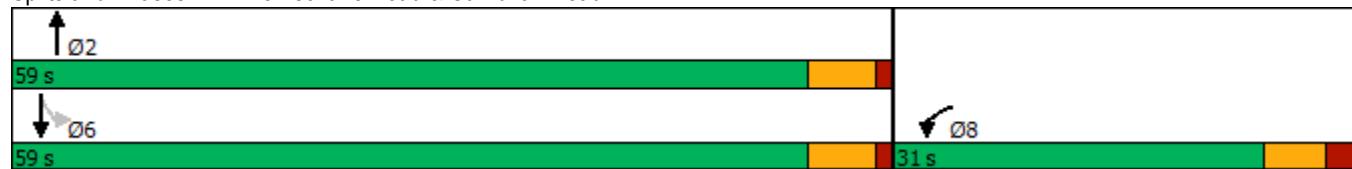
Lanes, Volumes, Timings
1: Borrisokane Road & Cambrian Road

2022 FT PM-Mitigation
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	8		2		6	6
Switch Phase						
Minimum Initial (s)	5.0		10.0		10.0	
Minimum Split (s)	30.2		29.7		29.7	
Total Split (s)	31.0		59.0		59.0	
Total Split (%)	34.4%		65.6%		65.6%	65.6%
Maximum Green (s)	24.8		53.3		53.3	
Yellow Time (s)	4.2		4.6		4.6	
All-Red Time (s)	2.0		1.1		1.1	
Lost Time Adjust (s)	0.0		0.0		0.0	
Total Lost Time (s)	6.2		5.7		5.7	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0		3.0	
Recall Mode	None		Max		Max	
Walk Time (s)	7.0		7.0		7.0	
Flash Dont Walk (s)	17.0		17.0		17.0	
Pedestrian Calls (#/hr)	0		0		0	
Act Effect Green (s)	10.0		53.6		53.6	
Actuated g/C Ratio	0.13		0.71		0.71	
v/c Ratio	0.79		0.22		0.81	0.20
Control Delay	17.1		5.0		21.0	5.1
Queue Delay	0.0		0.0		0.0	
Total Delay	17.1		5.0		21.0	5.1
LOS	B		A		C	A
Approach Delay	17.1		5.0			16.3
Approach LOS	B		A			B
Queue Length 50th (m)	5.5		9.0		41.3	8.5
Queue Length 95th (m)	31.1		27.7		#153.1	26.3
Internal Link Dist (m)	578.9		704.6			297.8
Turn Bay Length (m)					130.0	
Base Capacity (vph)	744		1222		734	1238
Starvation Cap Reductn	0		0		0	0
Spillback Cap Reductn	0		0		0	0
Storage Cap Reductn	0		0		0	0
Reduced v/c Ratio	0.54		0.22		0.81	0.20
Intersection Summary						
Area Type:	Other					
Cycle Length: 90						
Actuated Cycle Length: 75.5						
Natural Cycle: 90						
Control Type: Semi Act-Uncoord						
Maximum v/c Ratio: 0.81						
Intersection Signal Delay: 14.5				Intersection LOS: B		
Intersection Capacity Utilization 90.7%				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: 1: Borrisokane Road & Cambrian Road



Lanes, Volumes, Timings
2: Barnsdale Road & Borrisokane Road

2022 FT PM-Mitigation
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	52	133	179	36	75	64
Future Volume (vph)	52	133	179	36	75	64
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.977			0.938	
Flt Protected		0.986			0.974	
Satd. Flow (prot)	0	1721	1705	0	1594	0
Flt Permitted		0.986			0.974	
Satd. Flow (perm)	0	1721	1705	0	1594	0
Link Speed (k/h)		80	80		80	
Link Distance (m)	324.2	761.4		1316.9		
Travel Time (s)		14.6	34.3		59.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	52	133	179	36	75	64
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	185	215	0	139	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
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
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 41.2%

ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	3.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	52	133	179	36	75	64
Future Vol, veh/h	52	133	179	36	75	64
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	52	133	179	36	75	64
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	215	0	-	0	434	197
Stage 1	-	-	-	-	197	-
Stage 2	-	-	-	-	237	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1355	-	-	-	579	844
Stage 1	-	-	-	-	836	-
Stage 2	-	-	-	-	802	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1355	-	-	-	555	844
Mov Cap-2 Maneuver	-	-	-	-	555	-
Stage 1	-	-	-	-	802	-
Stage 2	-	-	-	-	802	-
Approach	EB	WB	SB			
HCM Control Delay, s	2.2	0	11.9			
HCM LOS			B			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1355	-	-	-	659	
HCM Lane V/C Ratio	0.038	-	-	-	0.211	
HCM Control Delay (s)	7.8	0	-	-	11.9	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.8	

Lanes, Volumes, Timings
3: Borrisokane Road & New Roadway

2022 FT PM-Mitigation
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	22	120	78	10	175	116
Future Volume (vph)	22	120	78	10	175	116
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0		0.0	130.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	15.0				100.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.886		0.985			
Flt Protected	0.992				0.950	
Satd. Flow (prot)	1534	0	1719	0	1658	1745
Flt Permitted	0.992				0.950	
Satd. Flow (perm)	1534	0	1719	0	1658	1745
Link Speed (k/h)	50		80		80	
Link Distance (m)	37.5		1316.9		99.9	
Travel Time (s)	2.7		59.3		4.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	22	120	78	10	175	116
Shared Lane Traffic (%)						
Lane Group Flow (vph)	142	0	88	0	175	116
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
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		15	25	
Sign Control	Stop		Free		Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	32.7%				ICU Level of Service A	
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	5.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	B	T	R	U	↑
Traffic Vol, veh/h	22	120	78	10	175	116
Future Vol, veh/h	22	120	78	10	175	116
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	1300	-
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	22	120	78	10	175	116
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	549	83	0	0	88	0
Stage 1	83	-	-	-	-	-
Stage 2	466	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	497	976	-	-	1508	-
Stage 1	940	-	-	-	-	-
Stage 2	632	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	439	976	-	-	1508	-
Mov Cap-2 Maneuver	439	-	-	-	-	-
Stage 1	940	-	-	-	-	-
Stage 2	559	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	10.3	0		4.6		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	821	1508	-	
HCM Lane V/C Ratio	-	-	0.173	0.116	-	
HCM Control Delay (s)	-	-	10.3	7.7	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	0.6	0.4	-	

Lanes, Volumes, Timings
5: Borrisokane Road & Access #2

2022 FT PM-Mitigation
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↑	↑			↑
Traffic Volume (vph)	0	75	195	3	0	291
Future Volume (vph)	0	75	195	3	0	291
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.865	0.998			
Flt Protected						
Satd. Flow (prot)	0	1510	1742	0	0	1745
Flt Permitted						
Satd. Flow (perm)	0	1510	1742	0	0	1745
Link Speed (k/h)	50		80			80
Link Distance (m)	102.1		99.9			728.6
Travel Time (s)	7.4		4.5			32.8
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	75	195	3	0	291
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	75	198	0	0	291
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		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		15	25	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 22.6%

ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	1.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	75	195	3	0	291
Future Vol, veh/h	0	75	195	3	0	291
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	75	195	3	0	291
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	-	197	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	844	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	844	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	9.7	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT		
Capacity (veh/h)	-	-	844	-		
HCM Lane V/C Ratio	-	-	0.089	-		
HCM Control Delay (s)	-	-	9.7	-		
HCM Lane LOS	-	-	A	-		
HCM 95th %tile Q(veh)	-	-	0.3	-		



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	21	164	133	3	9	9
Future Volume (vph)	21	164	133	3	9	9
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.932	
Flt Protected		0.994			0.976	
Satd. Flow (prot)	0	1735	1740	0	1587	0
Flt Permitted		0.994			0.976	
Satd. Flow (perm)	0	1735	1740	0	1587	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		37.5	165.2		81.3	
Travel Time (s)		2.7	11.9		5.9	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	21	164	133	3	9	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	185	136	0	18	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
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
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 31.3%

ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	21	164	133	3	9	9
Future Vol, veh/h	21	164	133	3	9	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	164	133	3	9	9
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	136	0	-	0	341	135
Stage 1	-	-	-	-	135	-
Stage 2	-	-	-	-	206	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1448	-	-	-	655	914
Stage 1	-	-	-	-	891	-
Stage 2	-	-	-	-	829	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1448	-	-	-	645	914
Mov Cap-2 Maneuver	-	-	-	-	645	-
Stage 1	-	-	-	-	877	-
Stage 2	-	-	-	-	829	-
Approach	EB	WB	SB			
HCM Control Delay, s	0.9	0	9.9			
HCM LOS			A			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1448	-	-	-	756	
HCM Lane V/C Ratio	0.015	-	-	-	0.024	
HCM Control Delay (s)	7.5	0	-	-	9.9	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	0.1	

Lanes, Volumes, Timings
7: New Roadway & Access #4

2022 FT PM-Mitigation
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	29	144	107	5	5	29
Future Volume (vph)	29	144	107	5	5	29
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.994			0.885	
Flt Protected		0.992			0.993	
Satd. Flow (prot)	0	1731	1735	0	1534	0
Flt Permitted		0.992			0.993	
Satd. Flow (perm)	0	1731	1735	0	1534	0
Link Speed (k/h)		50	50		50	
Link Distance (m)	165.2	556.5			78.2	
Travel Time (s)		11.9	40.1		5.6	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	29	144	107	5	5	29
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	173	112	0	34	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
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
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 26.4%

ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	1.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	29	144	107	5	5	29
Future Vol, veh/h	29	144	107	5	5	29
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	29	144	107	5	5	29
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	112	0	-	0	312	110
Stage 1	-	-	-	-	110	-
Stage 2	-	-	-	-	202	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1478	-	-	-	681	943
Stage 1	-	-	-	-	915	-
Stage 2	-	-	-	-	832	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1478	-	-	-	667	943
Mov Cap-2 Maneuver	-	-	-	-	667	-
Stage 1	-	-	-	-	896	-
Stage 2	-	-	-	-	832	-
Approach	EB	WB	SB			
HCM Control Delay, s	1.3	0	9.2			
HCM LOS			A			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1478	-	-	-	889	
HCM Lane V/C Ratio	0.02	-	-	-	0.038	
HCM Control Delay (s)	7.5	0	-	-	9.2	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1	

Appendix O

2027 Future Total Synchro Worksheets

Lanes, Volumes, Timings
1: Borrisokane Road & Cambrian Road

2027 FT AM
2019-52 Caivan ABIC Manufacturing Facility

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	96	931	151	65	347	150
Future Volume (vph)	96	931	151	65	347	150
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	100.0	0.0		0.0	130.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	50.0				100.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.959			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1658	1483	1674	0	1658	1745
Flt Permitted	0.950				0.623	
Satd. Flow (perm)	1658	1483	1674	0	1087	1745
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		677	29			
Link Speed (k/h)	70		80			80
Link Distance (m)	602.9		728.6			321.8
Travel Time (s)	31.0		32.8			14.5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	96	931	151	65	347	150
Shared Lane Traffic (%)						
Lane Group Flow (vph)	96	931	216	0	347	150
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
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		15	25	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	2.0	2.0	10.0		2.0	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	0.6		2.0	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	NA	Perm	NA	
Protected Phases	8		2		6	
Permitted Phases		8		6		

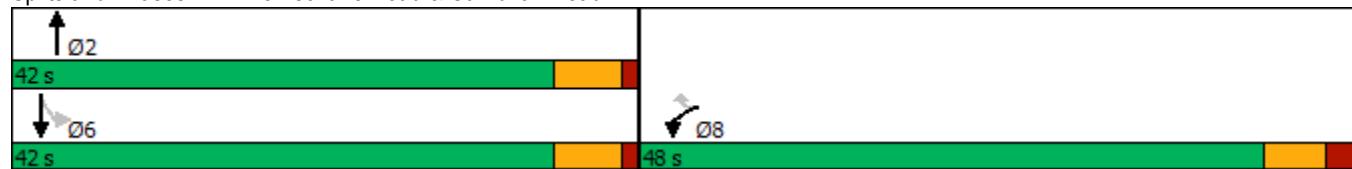
Lanes, Volumes, Timings
1: Borrisokane Road & Cambrian Road

2027 FT AM
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	8	8	2		6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0		10.0	10.0
Minimum Split (s)	30.2	30.2	29.7		29.7	29.7
Total Split (s)	48.0	48.0	42.0		42.0	42.0
Total Split (%)	53.3%	53.3%	46.7%		46.7%	46.7%
Maximum Green (s)	41.8	41.8	36.3		36.3	36.3
Yellow Time (s)	4.2	4.2	4.6		4.6	4.6
All-Red Time (s)	2.0	2.0	1.1		1.1	1.1
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.2	6.2	5.7		5.7	5.7
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	Max		Max	Max
Walk Time (s)	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)	17.0	17.0	17.0		17.0	17.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effect Green (s)	29.1	29.1	37.3		37.3	37.3
Actuated g/C Ratio	0.37	0.37	0.47		0.47	0.47
v/c Ratio	0.16	0.95	0.27		0.67	0.18
Control Delay	15.2	27.0	14.8		28.6	16.3
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	15.2	27.0	14.8		28.6	16.3
LOS	B	C	B		C	B
Approach Delay	25.9		14.8		24.9	
Approach LOS	C		B		C	
Queue Length 50th (m)	9.1	38.0	18.4		44.7	14.4
Queue Length 95th (m)	17.8	#148.7	37.6		#97.3	29.3
Internal Link Dist (m)	578.9		704.6		297.8	
Turn Bay Length (m)	100.0				130.0	
Base Capacity (vph)	906	1117	809		515	827
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	0.11	0.83	0.27		0.67	0.18
Intersection Summary						
Area Type:	Other					
Cycle Length: 90						
Actuated Cycle Length: 78.7						
Natural Cycle: 90						
Control Type: Semi Act-Uncoord						
Maximum v/c Ratio: 0.95						
Intersection Signal Delay: 24.2				Intersection LOS: C		
Intersection Capacity Utilization 83.3%				ICU Level of Service E		
Analysis Period (min) 15						
# 95th percentile volume exceeds capacity, queue may be longer.						
Queue shown is maximum after two cycles.						

Splits and Phases: 1: Borrisokane Road & Cambrian Road



Lanes, Volumes, Timings
2: Barnsdale Road & Borrisokane Road

2027 FT AM
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	136	175	131	60	40	118
Future Volume (vph)	136	175	131	60	40	118
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.958			0.899	
Flt Protected		0.979			0.988	
Satd. Flow (prot)	0	1708	1672	0	1550	0
Flt Permitted		0.979			0.988	
Satd. Flow (perm)	0	1708	1672	0	1550	0
Link Speed (k/h)		80	80		80	
Link Distance (m)	324.2	761.4		1316.9		
Travel Time (s)		14.6	34.3		59.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	136	175	131	60	40	118
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	311	191	0	158	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
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
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 48.8%

ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	4.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	136	175	131	60	40	118
Future Vol, veh/h	136	175	131	60	40	118
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	136	175	131	60	40	118
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	191	0	-	0	608	161
Stage 1	-	-	-	-	161	-
Stage 2	-	-	-	-	447	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1383	-	-	-	459	884
Stage 1	-	-	-	-	868	-
Stage 2	-	-	-	-	644	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1383	-	-	-	409	884
Mov Cap-2 Maneuver	-	-	-	-	409	-
Stage 1	-	-	-	-	773	-
Stage 2	-	-	-	-	644	-
Approach	EB	WB	SB			
HCM Control Delay, s	3.4	0	11.9			
HCM LOS			B			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1383	-	-	-	683	
HCM Lane V/C Ratio	0.098	-	-	-	0.231	
HCM Control Delay (s)	7.9	0	-	-	11.9	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0.3	-	-	-	0.9	

Lanes, Volumes, Timings
3: Borrisokane Road & New Roadway

2027 FT AM
2019-52 Caivan ABIC Manufacturing Facility

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	3	31	193	3	92	154
Future Volume (vph)	3	31	193	3	92	154
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0		0.0	130.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	15.0				100.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.877		0.998			
Flt Protected	0.996				0.950	
Satd. Flow (prot)	1524	0	1742	0	1658	1745
Flt Permitted	0.996				0.950	
Satd. Flow (perm)	1524	0	1742	0	1658	1745
Link Speed (k/h)	50		80		80	
Link Distance (m)	37.5		1316.9		99.9	
Travel Time (s)	2.7		59.3		4.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	3	31	193	3	92	154
Shared Lane Traffic (%)						
Lane Group Flow (vph)	34	0	196	0	92	154
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
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		15	25	
Sign Control	Stop		Free		Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	29.6%				ICU Level of Service A	
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	2.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	B	T	R	U	↑
Traffic Vol, veh/h	3	31	193	3	92	154
Future Vol, veh/h	3	31	193	3	92	154
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	1300	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	31	193	3	92	154
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	533	195	0	0	196	0
Stage 1	195	-	-	-	-	-
Stage 2	338	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	507	846	-	-	1377	-
Stage 1	838	-	-	-	-	-
Stage 2	722	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	473	846	-	-	1377	-
Mov Cap-2 Maneuver	473	-	-	-	-	-
Stage 1	838	-	-	-	-	-
Stage 2	674	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	9.8	0		2.9		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	791	1377	-	
HCM Lane V/C Ratio	-	-	0.043	0.067	-	
HCM Control Delay (s)	-	-	9.8	7.8	-	
HCM Lane LOS	-	-	A	A	-	
HCM 95th %tile Q(veh)	-	-	0.1	0.2	-	

Lanes, Volumes, Timings
5: Borrisokane Road & Access #2

2027 FT AM
2019-52 Caivan ABIC Manufacturing Facility

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	217	7	0	246
Future Volume (vph)	0	0	217	7	0	246
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t			0.996			
Flt Protected						
Satd. Flow (prot)	0	1745	1738	0	0	1745
Flt Permitted						
Satd. Flow (perm)	0	1745	1738	0	0	1745
Link Speed (k/h)	50		80			80
Link Distance (m)	102.1		99.9			728.6
Travel Time (s)	7.4		4.5			32.8
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	217	7	0	246
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	224	0	0	246
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		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		15	25	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 17.0%

ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	217	7	0	246
Future Vol, veh/h	0	0	217	7	0	246
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	217	7	0	246
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	-	221	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	819	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	819	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	0	0	0			
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT		
Capacity (veh/h)	-	-	-	-		
HCM Lane V/C Ratio	-	-	-	-		
HCM Control Delay (s)	-	-	0	-		
HCM Lane LOS	-	-	A	-		
HCM 95th %tile Q(veh)	-	-	-	-		

Lanes, Volumes, Timings
6: New Roadway & Access #3

2027 FT AM
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	61	34	34	0	0	0
Future Volume (vph)	61	34	34	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected		0.969				
Satd. Flow (prot)	0	1691	1745	0	1745	0
Flt Permitted		0.969				
Satd. Flow (perm)	0	1691	1745	0	1745	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		37.5	141.5		81.3	
Travel Time (s)		2.7	10.2		5.9	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	61	34	34	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	95	34	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
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
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 15.5%

ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	3.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	61	34	34	0	0	0
Future Vol, veh/h	61	34	34	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	61	34	34	0	0	0
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	34	0	-	0	190	34
Stage 1	-	-	-	-	34	-
Stage 2	-	-	-	-	156	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1578	-	-	-	799	1039
Stage 1	-	-	-	-	988	-
Stage 2	-	-	-	-	872	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1578	-	-	-	768	1039
Mov Cap-2 Maneuver	-	-	-	-	768	-
Stage 1	-	-	-	-	949	-
Stage 2	-	-	-	-	872	-
Approach	EB	WB	SB			
HCM Control Delay, s	4.7	0	0			
HCM LOS			A			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1578	-	-	-	-	-
HCM Lane V/C Ratio	0.039	-	-	-	-	-
HCM Control Delay (s)	7.4	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	-	-	-

Lanes, Volumes, Timings

1: Borrisokane Road & Cambrian Road

2027 FT PM

2019-52 Caivan ABIC Manufacturing Facility



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑	↑	↑		↑	↑
Traffic Volume (vph)	70	597	174	66	931	152
Future Volume (vph)	70	597	174	66	931	152
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	100.0	0.0		0.0	130.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	50.0				100.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.963			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1658	1483	1681	0	1658	1745
Flt Permitted	0.950				0.382	
Satd. Flow (perm)	1658	1483	1681	0	667	1745
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		597	16			
Link Speed (k/h)	70		80			80
Link Distance (m)	602.9		728.6			321.8
Travel Time (s)	31.0		32.8			14.5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	70	597	174	66	931	152
Shared Lane Traffic (%)						
Lane Group Flow (vph)	70	597	240	0	931	152
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
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		15	25	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	2.0	2.0	10.0		2.0	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	0.6		2.0	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	NA	pm+pt	NA	
Protected Phases	8		2		1	6
Permitted Phases		8			6	

Lanes, Volumes, Timings
1: Borrisokane Road & Cambrian Road

2027 FT PM
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	8	8	2		1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0		5.0	10.0
Minimum Split (s)	30.2	30.2	29.7		10.7	29.7
Total Split (s)	31.0	31.0	30.0		49.0	79.0
Total Split (%)	28.2%	28.2%	27.3%		44.5%	71.8%
Maximum Green (s)	24.8	24.8	24.3		43.3	73.3
Yellow Time (s)	4.2	4.2	4.6		4.6	4.6
All-Red Time (s)	2.0	2.0	1.1		1.1	1.1
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.2	6.2	5.7		5.7	5.7
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	Max		None	Max
Walk Time (s)	7.0	7.0	7.0			7.0
Flash Dont Walk (s)	17.0	17.0	17.0			17.0
Pedestrian Calls (#/hr)	0	0	0			0
Act Effect Green (s)	11.9	11.9	24.4		73.6	73.6
Actuated g/C Ratio	0.12	0.12	0.25		0.76	0.76
v/c Ratio	0.35	0.85	0.55		0.98	0.12
Control Delay	42.9	15.6	36.6		41.3	4.4
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	42.9	15.6	36.6		41.3	4.4
LOS	D	B	D		D	A
Approach Delay	18.5		36.6			36.2
Approach LOS	B		D			D
Queue Length 50th (m)	12.2	0.0	35.2		106.5	5.4
Queue Length 95th (m)	24.4	34.2	70.0	#263.9		18.1
Internal Link Dist (m)	578.9		704.6			297.8
Turn Bay Length (m)	100.0			130.0		
Base Capacity (vph)	423	823	433	946	1318	
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	0.17	0.73	0.55	0.98	0.12	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 97.4

Natural Cycle: 120

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.98

Intersection Signal Delay: 30.3 Intersection LOS: C

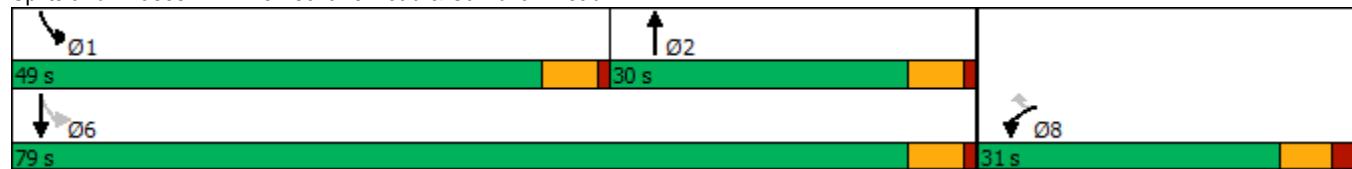
Intersection Capacity Utilization 87.2% ICU Level of Service E

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Borrisokane Road & Cambrian Road



Lanes, Volumes, Timings
2: Barnsdale Road & Borrisokane Road

2027 FT PM
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	89	146	198	44	88	92
Future Volume (vph)	89	146	198	44	88	92
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.975			0.931	
Flt Protected		0.981			0.976	
Satd. Flow (prot)	0	1712	1701	0	1586	0
Flt Permitted		0.981			0.976	
Satd. Flow (perm)	0	1712	1701	0	1586	0
Link Speed (k/h)		80	80		80	
Link Distance (m)	324.2	761.4		1316.9		
Travel Time (s)		14.6	34.3		59.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	89	146	198	44	88	92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	235	242	0	180	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
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
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 48.2%

ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	4.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	89	146	198	44	88	92
Future Vol, veh/h	89	146	198	44	88	92
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	89	146	198	44	88	92
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	242	0	-	0	544	220
Stage 1	-	-	-	-	220	-
Stage 2	-	-	-	-	324	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1324	-	-	-	500	820
Stage 1	-	-	-	-	817	-
Stage 2	-	-	-	-	733	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1324	-	-	-	464	820
Mov Cap-2 Maneuver	-	-	-	-	464	-
Stage 1	-	-	-	-	757	-
Stage 2	-	-	-	-	733	-
Approach	EB	WB	SB			
HCM Control Delay, s	3	0	13.6			
HCM LOS			B			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1324	-	-	-	596	
HCM Lane V/C Ratio	0.067	-	-	-	0.302	
HCM Control Delay (s)	7.9	0	-	-	13.6	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0.2	-	-	-	1.3	

Lanes, Volumes, Timings
3: Borrisokane Road & New Roadway

2027 FT PM
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↑	↗	↙	↑
Traffic Volume (vph)	12	31	129	3	54	167
Future Volume (vph)	12	31	129	3	54	167
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0		0.0	130.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	15.0				100.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.903		0.997			
Flt Protected	0.986				0.950	
Satd. Flow (prot)	1554	0	1740	0	1658	1745
Flt Permitted	0.986				0.950	
Satd. Flow (perm)	1554	0	1740	0	1658	1745
Link Speed (k/h)	50		80		80	
Link Distance (m)	37.5		1316.9		99.9	
Travel Time (s)	2.7		59.3		4.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	12	31	129	3	54	167
Shared Lane Traffic (%)						
Lane Group Flow (vph)	43	0	132	0	54	167
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
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		15	25	
Sign Control	Stop		Free		Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	24.0%				ICU Level of Service A	
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	2.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	B	T	R	U	↑
Traffic Vol, veh/h	12	31	129	3	54	167
Future Vol, veh/h	12	31	129	3	54	167
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	1300	-
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	12	31	129	3	54	167
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	406	131	0	0	132	0
Stage 1	131	-	-	-	-	-
Stage 2	275	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	601	919	-	-	1453	-
Stage 1	895	-	-	-	-	-
Stage 2	771	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	579	919	-	-	1453	-
Mov Cap-2 Maneuver	579	-	-	-	-	-
Stage 1	895	-	-	-	-	-
Stage 2	742	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	9.8	0	1.9			
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	790	1453	-	
HCM Lane V/C Ratio	-	-	0.054	0.037	-	
HCM Control Delay (s)	-	-	9.8	7.6	-	
HCM Lane LOS	-	-	A	A	-	
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-	

Lanes, Volumes, Timings
5: Borrisokane Road & Access #2

2027 FT PM
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↑	↑			↑
Traffic Volume (vph)	0	85	157	3	0	221
Future Volume (vph)	0	85	157	3	0	221
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.865	0.997			
Flt Protected						
Satd. Flow (prot)	0	1510	1740	0	0	1745
Flt Permitted						
Satd. Flow (perm)	0	1510	1740	0	0	1745
Link Speed (k/h)	50		80			80
Link Distance (m)	102.1		99.9			728.6
Travel Time (s)	7.4		4.5			32.8
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	85	157	3	0	221
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	85	160	0	0	221
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		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		15	25	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 21.1%

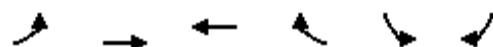
ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	1.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	85	157	3	0	221
Future Vol, veh/h	0	85	157	3	0	221
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	85	157	3	0	221
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	-	159	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	886	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	886	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	9.5	0	0			
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT		
Capacity (veh/h)	-	-	886	-		
HCM Lane V/C Ratio	-	-	0.096	-		
HCM Control Delay (s)	-	-	9.5	-		
HCM Lane LOS	-	-	A	-		
HCM 95th %tile Q(veh)	-	-	0.3	-		

Lanes, Volumes, Timings
6: New Roadway & Access #3

2027 FT PM
2019-52 Caivan ABIC Manufacturing Facility



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	23	34	34	0	0	9
Future Volume (vph)	23	34	34	0	0	9
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.865	
Flt Protected		0.980				
Satd. Flow (prot)	0	1710	1745	0	1510	0
Flt Permitted		0.980				
Satd. Flow (perm)	0	1710	1745	0	1510	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		37.5	127.1		81.3	
Travel Time (s)		2.7	9.2		5.9	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	23	34	34	0	0	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	57	34	0	9	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
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
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 19.9%

ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	2.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	23	34	34	0	0	9
Future Vol, veh/h	23	34	34	0	0	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	34	34	0	0	9
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	34	0	-	0	114	34
Stage 1	-	-	-	-	34	-
Stage 2	-	-	-	-	80	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1578	-	-	-	882	1039
Stage 1	-	-	-	-	988	-
Stage 2	-	-	-	-	943	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1578	-	-	-	869	1039
Mov Cap-2 Maneuver	-	-	-	-	869	-
Stage 1	-	-	-	-	973	-
Stage 2	-	-	-	-	943	-
Approach	EB	WB	SB			
HCM Control Delay, s	3	0	8.5			
HCM LOS			A			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1578	-	-	-	1039	-
HCM Lane V/C Ratio	0.015	-	-	-	0.009	-
HCM Control Delay (s)	7.3	0	-	-	8.5	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0	-