

6295, 6363, 6409 Perth Street, 6305 Ottawa Street West Transportation Impact Assessment

Step 1 Screening Report

Step 2 Scoping Report

Step 3 Forecasting Report

Step 4 Strategy Report

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July 2020

PN: 2019-64

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1 Screening

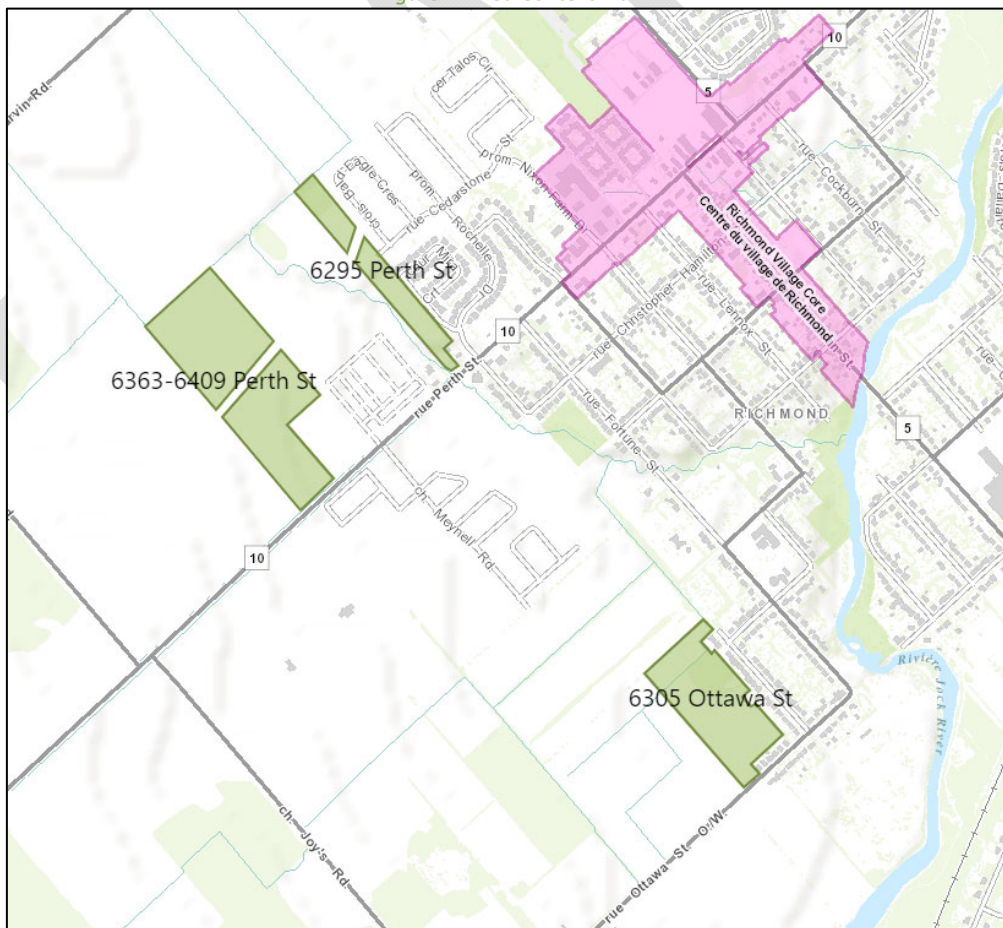
This study has been prepared according to the City of Ottawa’s 2017 Transportation Impact Assessment (TIA) Guidelines. Accordingly, a Step 1 Screening Form has been prepared and is included as Appendix A, along with the Certification Form for TIA Study PM. As shown in the Screening Form, a TIA is required through the trip generation and safety triggers, and will include both the Design Review and the Network Impact Components.

2 Existing and Planned Conditions

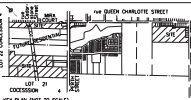
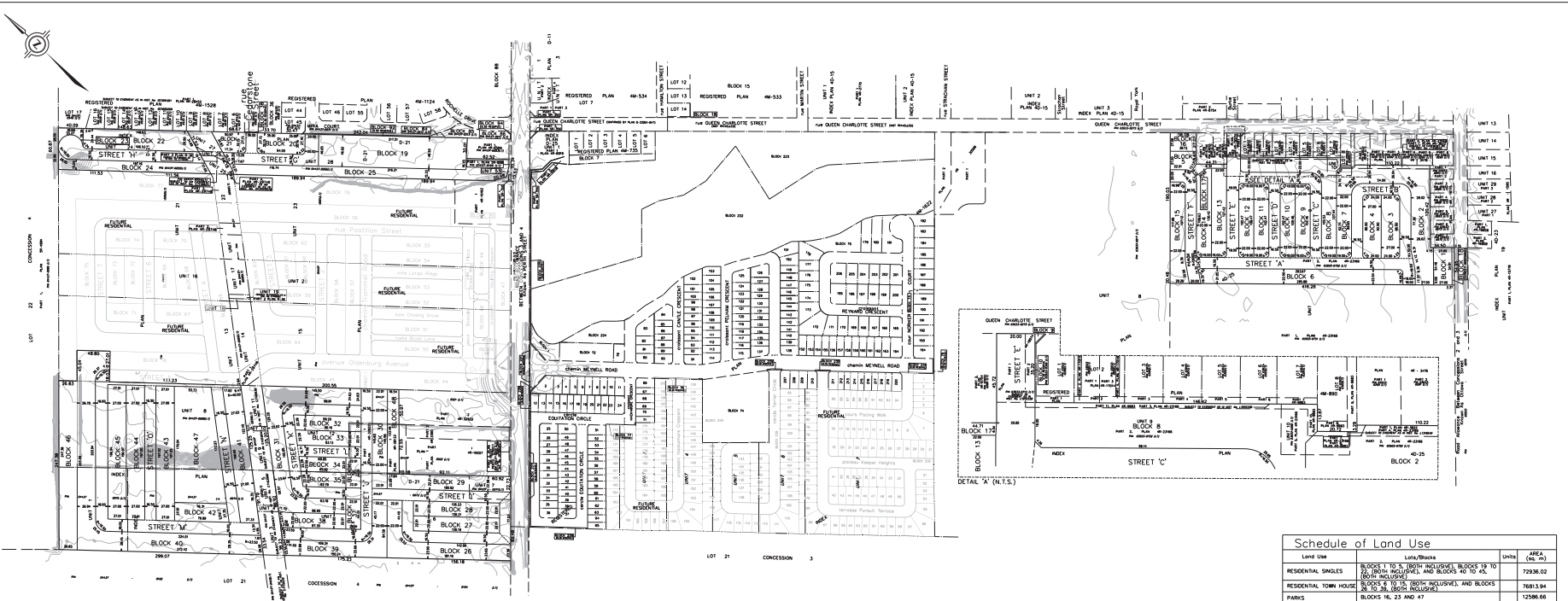
2.1 Proposed Development

The proposed development, located at 6295, 6363 and 6409 Perth Street and 6305 Ottawa Street, is currently greenfield property designated as Development Reserve (DR1) and is included within the Richmond CDP. The proposed development would include a total of 577 residential units, with 119 detached homes and 205 townhomes at 6363-6409 Perth Street, 42 detached homes at 6295 Perth Street, and 42 detached homes and 169 townhomes at 6305 Ottawa Street. Access will be provided through Oldenburg Street, and local connections to Cedarstone Street, Mira Court, and Burke Street, with future connections to future development lands on the north side of Ottawa Street. This study will support the zoning bylaw amendment and draft plan of subdivision applications. Figure 1 illustrates the Study Area Context, and Figure 2 illustrates the proposed draft plan for the north and south development lands.

Figure 1: Area Context Plan



Source: <http://maps.ottawa.ca/geoOttawabeta/> Accessed: May 28, 2020



DRAFT PLAN OF SUBDIVISION OF
 PART OF UNITS 6, 12 AND 28
 INDEX PLAN D-21
 AND
 PART OF UNITS 2, 8 AND 24
 INDEX PLAN D-21
 AND
 PART OF UNITS 9 AND 10
 INDEX PLAN 40-25
 (GEOGRAPHIC TOWNSHIP OF GOLDBOURN)
 CITY OF OTTAWA
 J. D. BARNES LIMITED
 1000
 METRIC UNITS AND/OR COORDINATE SYSTEM ON THIS PLAN ARE IN
 EQUIPMENT 2000
 SCALE 1:2000

ELEVATION NOTE
 1. ELEVATIONS SHOWN ON THIS PLAN ARE RELATED TO GROUND LEVEL.
 2. THE RESPONSIBILITY OF THE SURVEYOR IS TO VERIFY
 THAT THE GROUND LEVEL DATA IS ACCURATE AND TO REPORT
 ANY DISCREPANCIES TO THE CLIENT.

NOTES
 DISTANCES ARE GIVEN.
 ALL DISTANCES ON CURVES ARE ARC DISTANCES UNLESS OTHERWISE SPECIFIED.

ADDITIONAL INFORMATION
 As required under section 51(17) of the
 Planning Act R.S.O. 2000

(REFERRED TO AND TO) - As shown on this Plan.
 (L) - As shown on this Draft and Key Plan.
 (M) - Lines shown used in accordance with the Schedule of Land Use.
 (N) - All boundary corners.
 (O) - Other Markers Dependent on city, city and city, Ontario
 (Other Particulars)

SUBJECT TO THE CONDITIONS, IF ANY, SET FORTH IN OUR LETTERS
 OF TRANSMITTAL AND THIS DRAFT PLAN IS APPROVED BY THE CITY OF
 OTTAWA UNDER SECTION 51 OF THE PLANNING ACT AND THE CITY OF
 OTTAWA, ON 2020

I, J. D. BARNES, being
 PLANNING, INFRASTRUCTURE AND DEVELOPMENT DEPARTMENT,
 CITY OF OTTAWA

OWNER'S CERTIFICATE
 RICHMOND VILLAGE DEVELOPMENT CORPORATION, being the REGISTERED OWNER
 OF THE LAND SHOWN HEREON, HEREBY CERTIFIES THAT THE INFORMATION SET FORTH
 AND SUBMIT THIS DRAFT PLAN OF SUBDIVISION OF APPROVED.

I, J. D. BARNES, being
 RICHMOND VILLAGE DEVELOPMENT CORPORATION

SURVEYOR'S CERTIFICATE
 I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LAND TO BE SUBDIVIDED ARE
 CORRECTLY SHOWN.
 PRELIMINARY
 J. D. BARNES
 LAND INFORMATION SPECIALISTS
 1000
 1000

DRAWN BY: [Name] OF [Firm]
 DATE: [Date]

Land Use	Lots/Blocks	Units	AREA Line (m ²)
RESIDENTIAL SINGLES	BLOCKS 1 TO 5, (BOTH INCLUSIVE), BLOCKS 19 TO 20 (BOTH INCLUSIVE), AND BLOCKS 40 TO 45, (BOTH INCLUSIVE)		7236.02
RESIDENTIAL TOWN HOUSES	BLOCKS 6 TO 15, (BOTH INCLUSIVE), AND BLOCKS 16 TO 23, (BOTH INCLUSIVE)		7683.94
PARKS	BLOCKS 16, 23 AND 47		12586.66
WALKWAY	BLOCK 17		419.05
OPEN SPACE	BLOCKS 24, 25, 46 AND 48		19180.17
STREETS	STREETS 16 TO 22, (BOTH INCLUSIVE), AND 7th Catherine Street		64783.39
STREET WIDENING	BLOCK 18		184.49
0.30 RESERVES			
Total			246903.71

2.2 Existing Conditions

2.2.1 Area Road Network

Perth Street: Perth Street is a City of Ottawa arterial road with a divided four-lane urban cross-section east of Rochelle Drive/Queen Charlotte Street and transitions to a two-lane rural cross-section to the west. Sidewalks are provided on both sides of the road and the posted speed limit is 50 km/h within the Village Boundary and 80 km/h to the west. The Ottawa Official Plan reserves a 30.0 metre right of way within the Village Boundary. Perth Street is a truck route.

Ottawa Street: Ottawa Street is a City of Ottawa collector road between Joys Road and Fortune Street with a two-lane rural cross-section with gravel shoulders. The posted speed limit changes between 50 km/h and 70 km/h approximately 400 metres west of Queen Charlotte Street. The existing right-of-way is 20.0 metres.

Fortune Street: Fortune Street is a City of Ottawa collector road with a semi-urban cross-section with no curbs on the west side and a sidewalk on the east side. The posted speed limit is 50 km/h, and a school zone is located from north of Royal York Street to south of Burke Street. The existing right-of-way is 20.0 metres.

Meynell Road: Meynell Road, while currently classified as a local road, is to be a City of Ottawa collector road with a two-lane urban cross-section. Sidewalks are provided on both sides of the road and on-street parking is permitted. The unposted speed limit is 50 km/h and the existing right-of-way is 22.0 metres.

Rochelle Drive: Rochelle Drive is a City of Ottawa local road with a two-lane urban cross-section including a sidewalk on the east side. The unposted speed limit is 50 km/h and the existing right-of-way is 20 metres.

Queen Charlotte Street: Queen Charlotte Street is a City of Ottawa local road with a cross-section that is urbanized on the west side on the section north of Christopher Hamilton Street, and fully rural south of Burke Street. The unposted speed limit is 50 km/h, no sidewalks are provided, and the existing right-of-way is 20.0 metres.

Nixon Farm Drive: Nixon Farm Drive is a City of Ottawa local road with a two-lane urban cross-section. The unposted speed limit is 50 km/h, no sidewalks are provided, and the existing right-of-way is 20.0 metres.

Fowler Street: Fowler Avenue is a City of Ottawa local road with a two-lane rural cross-section. The unposted speed limit is 50 km/h, no sidewalks are provided, and the existing right-of-way is 20.0 metres.

Mira Court: Mira Court is a City of Ottawa local road with a two-lane urban cross-section. The unposted speed limit is 50 km/h, no sidewalks are provided, and the existing right-of-way is 20.0 metres.

Cedarstone Street: Cedarstone Street is a City of Ottawa local road with a two-lane urban cross-section. The unposted speed limit is 50 km/h, a sidewalk is provided on the south side of the roadway, and the existing right-of-way is 20.0 metres.

Burke Street: Burke Street is a City of Ottawa local road with a two-lane rural cross-section. The unposted speed limit is 50 km/h, no sidewalks are provided, and the existing right-of-way is 16.0 metres.

2.2.2 Existing Intersections

The existing signalized area intersections within one kilometre of the site have been summarized below:

Perth Street & Meynell Street

The intersection of Perth Street and Meynell Street is an unsignalized intersection with stop-control located on the minor approach of Meynell Street. All approaches currently consist of single lane shared movements. No turn restrictions are noted.

Perth Street & Rochelle Drive/Queen Charlotte Street

The intersection of Perth Street and Rochelle Drive/Queen Charlotte Street is an unsignalized intersection with stop-control located on the minor approaches. The north and south bound approaches consist of a shared all movement lane, the westbound approach consists of a left-turn lane and shared through/right-turn lane, and the eastbound approach consists of a shared left-turn/through lane and shared through/right-turn lane. No turn restrictions are noted.

Perth Street & Fortune Street

The intersection of Perth Street and Fortune Street is an unsignalized intersection with stop-control located on the minor approaches of Fortune Street. The northbound approach consists of a shared all movement lane, the eastbound approach consists of a through lane and a shared through/right-turn lane, and the westbound approach consists of a shared left-turn/through lane and a through lane. No turn restrictions are noted.

Perth Street & Nixon Farm Drive/Fowler Street

The intersection of Perth Street and Nixon Farm Drive/Fowler Street is a signalized intersection. The northbound approach consists of a shared all movement lane, and the southbound approach consists of a left-turn lane and shared through/right-turn lane. The westbound and eastbound approaches each consist of a shared left-turn/through lane and shared through/right-turn lane. No turn restrictions are noted.

Cedarstone Street & Rochelle Drive

The intersection of Cedarstone Street and Rochelle Drive is an unsignalized intersection with stop-control located on the minor approaches of Cedarstone Street. All approaches currently consist of single lane shared movements. No turn restrictions are noted.

Mira Court & Rochelle Drive

The intersection of Mira Court and Rochelle Drive is an unsignalized intersection with stop-control located on the minor approach of Mira Court. All approaches currently consist of single lane shared movements. No turn restrictions are noted.

Burke Street & Fortune Street

The intersection of Burke Street and Fortune Street is an unsignalized intersection with stop-control located on the minor approaches of Burke Street. All approaches currently consist of single lane shared movements. No turn restrictions are noted.

Ottawa Street & Queen Charlotte Street

The intersection of Ottawa Street and Queen Charlotte Street is an unsignalized intersection with all-way stop-control. All approaches currently consist of single lane shared movements. No turn restrictions are noted.

2.2.3 Existing Driveways

Driveways exist along Perth Street, Mira Court, Cedarstone Street and Burke Street within 200 metres of proposed site accesses, including both private residences and field accesses.

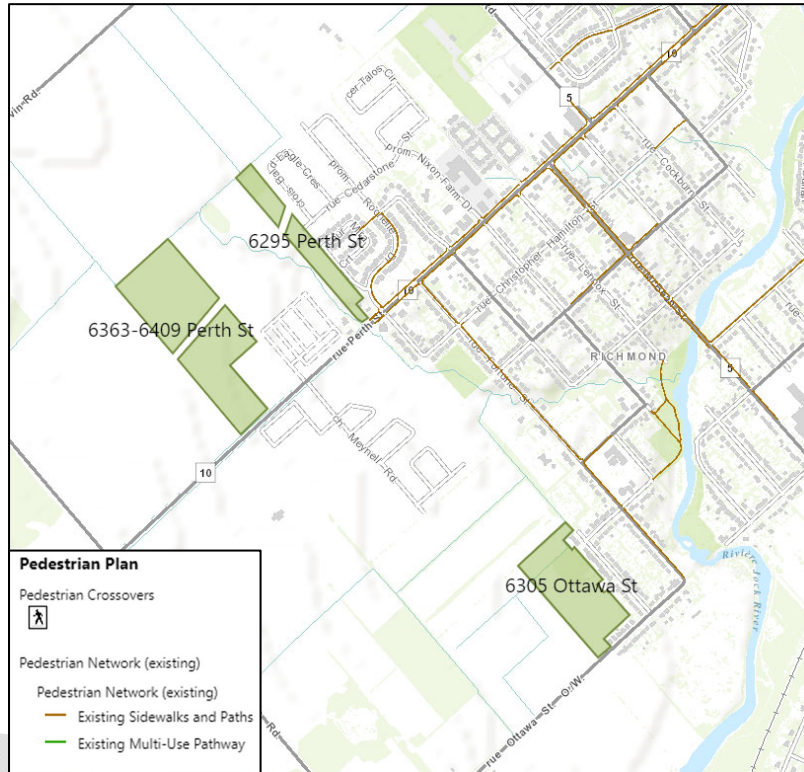
2.2.4 Cycling and Pedestrian Facilities

Figure 3 illustrates the pedestrian facilities in the study area and Figure 4 illustrates the cycling facilities.

Sidewalks are provided along both sides of Perth Street to the east of Rochelle Drive/Queen Charlotte Drive and a sidewalk is provided on Fortune Street. While not illustrated below, Queen Charlotte Drive also has a sidewalk

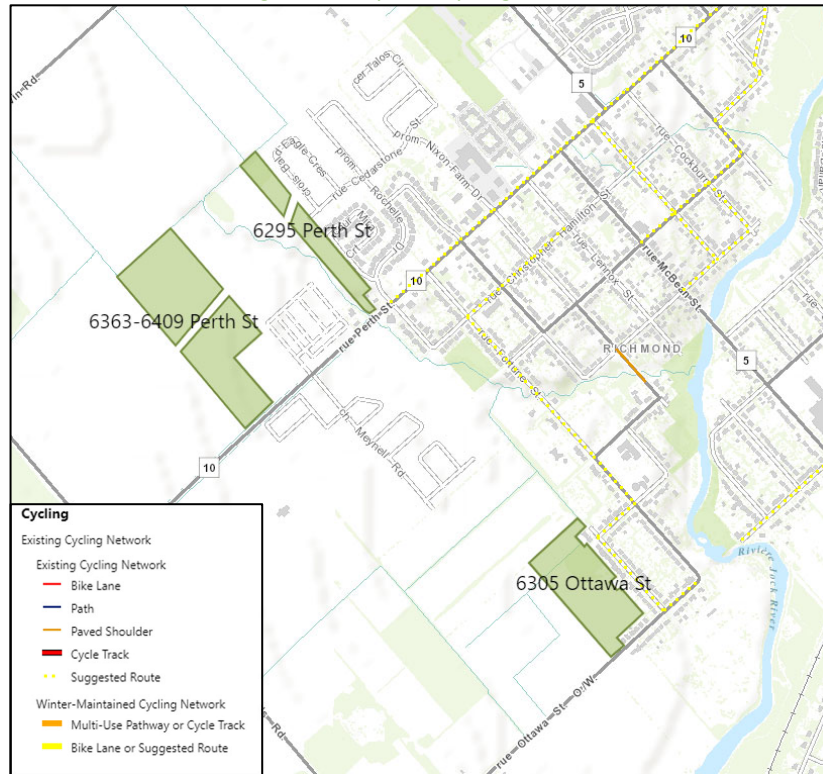
on the west side between Perth Street and Christopher Hamilton Street, and Cedarstone Street has a sidewalk west of Rochelle Drive. No dedicated cycling facilities are provided in the study area. Perth Street is designated as a cycling spine route to the east of Rochelle Drive/Queen Charlotte Street, and Ottawa Street, Queen Charlotte Street (between Ottawa Street and Burke Street), Burke Street (between Queen Charlotte Street and Fortune Street), Fortune Street (between Burke Street to Christopher Hamilton Street), and Christopher Hamilton Street (east of Fortune Street) are designated as local routes.

Figure 3: Study Area Pedestrian Facilities



Source: <http://maps.ottawa.ca/geoOttawabeta/> Accessed: May 28, 2020

Figure 4: Study Area Cycling Facilities



Source: <http://maps.ottawa.ca/geoOttawabeta/> Accessed: May 28, 2020

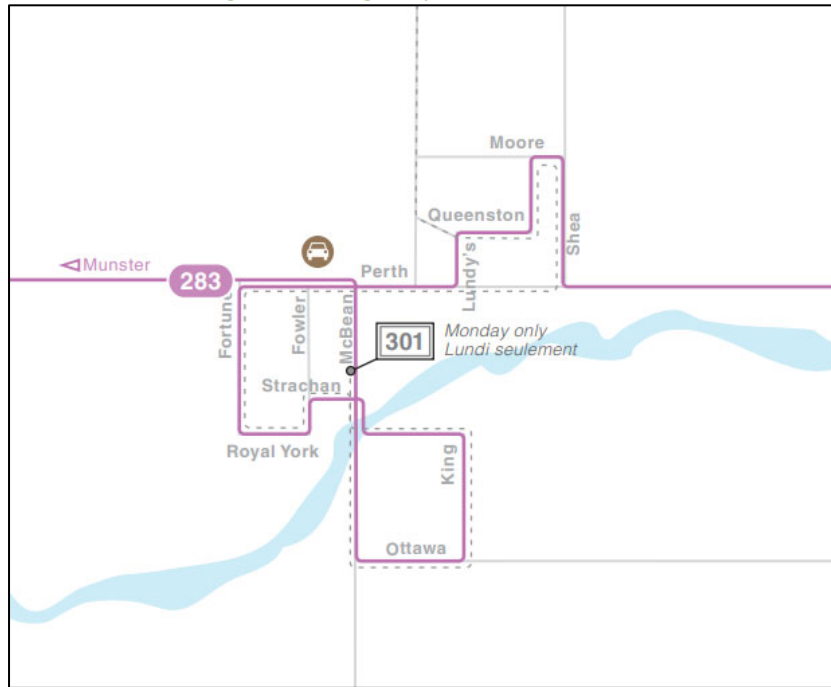
2.2.5 Existing Transit

Within the study area, the routes #283 and 301 provide service to Richmond Village. In the vicinity of the proposed site, stops are located on Fortune Street at Royal York Street, Martin Street, and Christopher Hamilton Street and at Perth Street at Joys Road. The frequency of these routes within proximity of the proposed site currently are (prior to pandemic reduced service changes):

- Route #283 – 30-minute service during the peak hours, with a total of four trips during each peak, and three AM trips traveling from Munster and two PM trips ending in Munster
- Route #301 – Monday only service, with a single AM trip departing at 8:50 AM, and a single trip returning at 3:40 PM

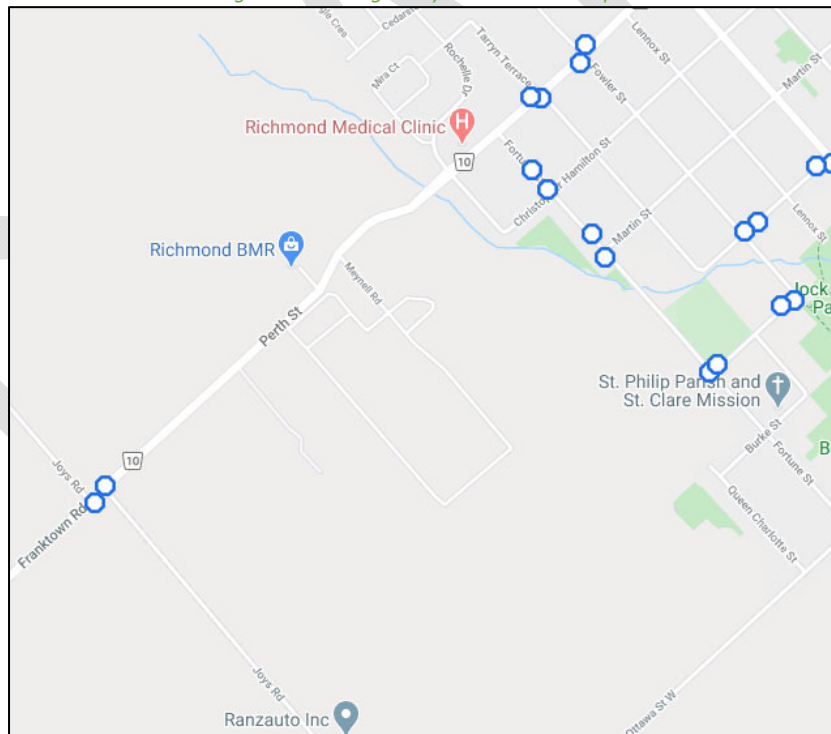
Figure 5 illustrates the transit system map in the study area and Figure 6 illustrates nearby transit stops.

Figure 5: Existing Study Area Transit Service



Source: <http://www.octranspo.com/> Accessed: May 28, 2020

Figure 6: Existing Study Area Transit Stops



Source: <http://www.octranspo.com/> Accessed: May 28, 2020

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

Existing turning movement counts were acquired from adjacent development studies for the existing study area intersections. Table 1 summarizes the intersection count dates.

Table 1: Intersection Count Date

Intersection	Count Date	Source
Perth Street & Meynell Road	-	Trip Generation of Phase 1
Perth Street & Rochelle Drive/Queen Charlotte Street	May 18, 2016	Transportation Brief, Richmond Oaks Health Centre (6265 Perth Street), June 2016, D.J. Halpenny & Associates Ltd.
Perth Street & Nixon Farm Drive/Fowler Street	August 12, 2015	Transportation Brief, Samara Square (6143 Perth Street), June 2017, D.J. Halpenny & Associates Ltd.

Figure 7 illustrates the existing traffic volumes and Table 2 summarizes the existing intersection operations. The level of service for signalized intersections is based on the TIA Guidelines for the lane movements and HCM average delay for the overall intersection. Detailed turning movement count data is included in Appendix B and the synchro worksheets are provided in Appendix C.

Figure 7: Existing Intersection Volumes

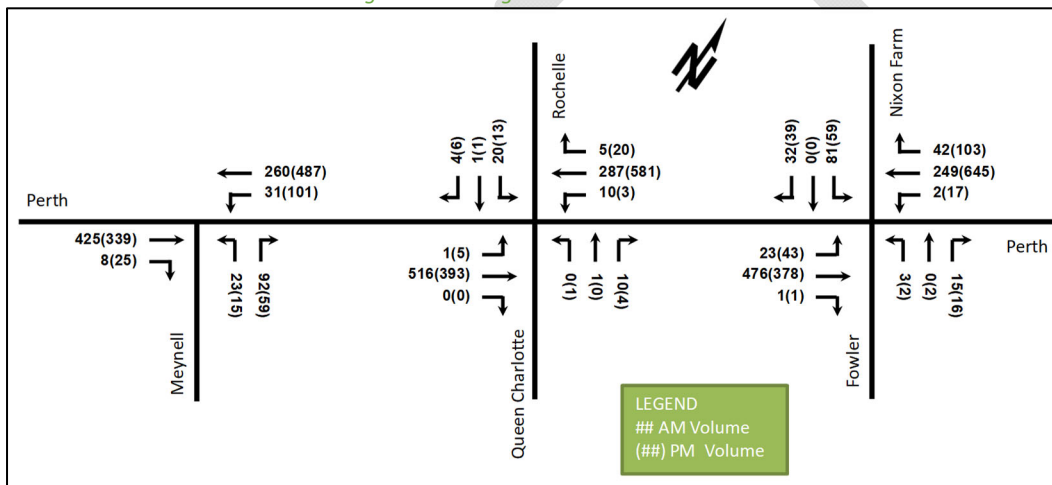


Table 2: Existing Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 th)	LOS	V/C	Delay	Q (95 th)
Perth Street & Meynell Road <i>Unsignalized</i>	EBT/R	-	-	-	-	-	-	-	-
	WBL/T	A	0.03	8.4	0.8	A	0.10	8.5	2.3
	NB	B	0.25	14.5	7.5	C	0.19	15.2	5.3
	Overall	A	-	2.3	-	A	-	2.0	-
Perth Street & Rochelle Drive/Queen Charlotte Street <i>Unsignalized</i>	EBL/T	A	0.00	7.9	0.0	A	0.01	8.9	0.0
	EBT/R	-	-	-	-	-	-	-	-
	WBL	A	0.01	8.6	0.0	A	0.00	8.2	0.0
	WBT/R	-	-	-	-	-	-	-	-
	NB	B	0.02	11.0	0.8	B	0.01	13.0	0.0
	SB	B	0.07	14.9	1.5	C	0.08	18.8	2.3
Overall	A	0.30	0.7	-	A	-	0.5	-	

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 th)	LOS	V/C	Delay	Q (95 th)
Perth Street & Nixon Farm Drive/Fowler Street Signalized	EB	A	0.24	4.5	22.5	A	0.23	4.1	17.6
	WB	A	0.14	3.7	12.1	A	0.37	4.6	33.0
	NB	A	0.08	6.6	3.8	A	0.09	14.2	6.0
	SBL	A	0.44	34.0	23.7	A	0.34	31.9	18.6
	SBT/R	A	0.05	0.2	0.0	A	0.12	0.7	0.0
	Overall	A	-	6.7	-	A	0.39	5.7	-

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

During both the AM and PM peak hours, the study area intersections operate well. No capacity issues are noted.

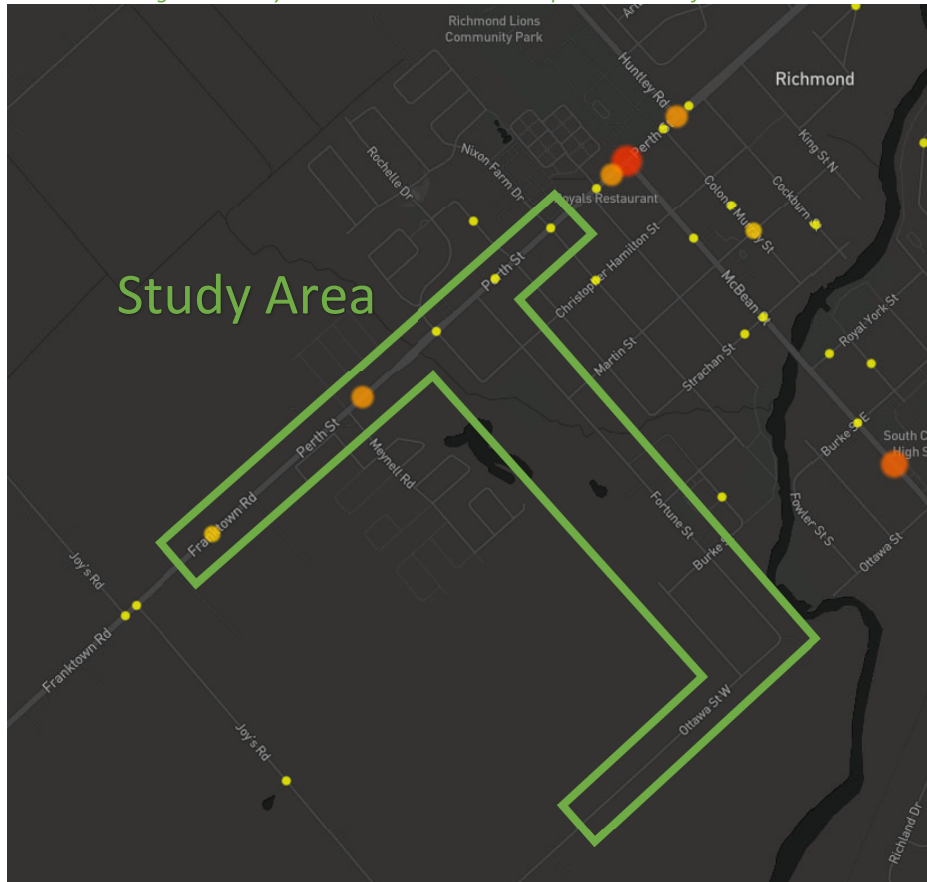
2.2.8 Collision Analysis

Collision data have been acquired from the City of Ottawa open data website (data.ottawa.ca) for five years prior to the commencement of this TIA for the surrounding study area road network. Table 3 summarizes the collisions types and conditions in the study area, Figure 8 illustrates the intersections and segments analyzed, and Table 4 summarizes the total collisions for each of these locations. Collision data are included in Appendix D.

Table 3: Study Area Collision Summary, 2014-2018

		Number	%
Total Collisions		16	100%
Classification	Fatality	0	0%
	Non-Fatal Injury	4	25%
	Property Damage Only	12	75%
Initial Impact Type	Angle	1	6%
	Rear end	2	13%
	Sideswipe	1	6%
	Turning Movement	3	19%
	SMV Other	9	56%
Road Surface Condition	Dry	11	69%
	Wet	2	13%
	Ice	3	19%
Pedestrian Involved		2	13%
Cyclists Involved		0	0%

Figure 8: Study Area Collision Records – Representation of 2014-2016



Source: <https://maps.bikeottawa.ca/collisions/> Accessed: May 28, 2020

Table 4: Summary of Collision Locations, 2014-2018

Intersections / Segments	Number	%
		100%
Perth St @ Queen Charlotte St/Rochelle Dr	4	25%
Fowler St/Nixon Farm Dr @ Perth St	1	6%
Fortune St @ Martin St	1	6%
Franktown Rd btwn Joy's Rd & Perth St	2	13%
Perth St btwn Franktown Rd & Rochelle Dr	4	25%
Perth St btwn Fortune St & Tarryn Ter	1	6%
Perth St btwn Tarryn Ter & Nixon Farm Dr	1	6%
Perth St btwn Nixon Farm Dr & Lennox St	1	6%
Fortune St btwn Perth St & Hamilton St	1	6%

Within the study area, no specific localities are noted to have collisions frequencies of concern. Generally, the trend of the study area is having high representation of single motor vehicle (other) collisions, which are typical of rural roads with higher speed limits than their urban counterparts. Specifically, this collision type is the highest represented at both locations with four collisions.

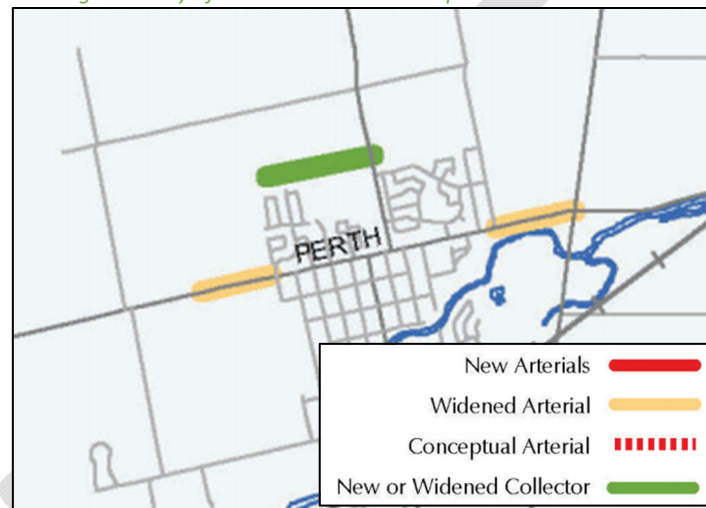
2.3 Planned Conditions

2.3.1 Changes to the Area Transportation Network

The subject development is within the Richmond Village Secondary Plan/Community Design Plan. No improvements are included within the 2031 Affordable Network of the Ottawa TMP. The following projects are currently identified beyond the 2031 horizon in the Network Concept and are illustrated in Figure 9:

- Richmond Village By-Pass: Construct a new two-lane road between Huntley Road and Eagleson Road
- Perth Street Widening: Widen Perth Street to four lanes between Village Boundary and Rochelle Drive/Queen Charlotte Street
- Perth Street Widening: Widen Perth Street to four lanes between Shea Road and Eagleson Road

Figure 9: City of Ottawa Network Concept – Richmond Context



The RMA and detailed design for the new intersection at Perth Street and Meynell Road and the urbanization of Perth Street between Meynell Road and Rochelle Drive/Queen Charlotte Street are included within DC funded project list and are expected to be constructed by 2024/25. The new intersection's ultimate condition will include a roundabout and cycle track that continues to the intersection of Perth Street and Rochelle Drive/Queen Charlotte Street, and the intersection's interim condition will be stop-controlled on the minor approaches.

2.3.2 Other Study Area Developments

Fox Run Phase 1 - Caivan

The first Phase of the Fox Run development is currently under construction. In total, the subdivision will include a total of 214 single family homes. A new intersection on Perth Street will be provided at Meynell Road.

Fox Run Phase 2/3 - Caivan

The second Phases of Fox Run have been termed Phase 2 North and South and include 386 residential units split on the north side of Perth Street and on the west side of the Phase 1 lands. Servicing is underway and it is expected that this phase will be completed by 2024.

Fox Run Phase 4/5 - Caivan

The final two phases of the Fox Run development are currently planned to begin in 2025. It is envisioned that a total of 205 single family homes is planned to be constructed during 2025-2026.

6240-6431 Ottawa Street – Mattamy Richmond Subdivision

A plan of subdivision application has been submitted for a new residential subdivision along Ottawa Street with 848 single family homes and 252 townhomes estimated to be built-out by 2029 with approximately 100-150 units per year. The proposed site will extend Meynell Road, connect to Ottawa Street, and include additional future connections to Royal York Street and Burke Street.

6265 Perth street – Richmond Oaks Health Centre

The proposed medical centre will be developed in two phases, with Phase 1 completed including a medical clinic and pharmacy, and Phase 2 will include 31 senior apartment units and 10,182 sq. ft. of commercial/retail space. Phase 2 is anticipated to be completed by 2022.

Samara Square

Phase 2 of the Hyde Park Senior Development will include two buildings with 35 rental apartments, 124 senior retirement apartments, and supporting commercial/retail. While not currently included in the development planning, Phase 3 will include an additional 122 apartment units in eight buildings.

471 Sangeet Place

An extension of the existing Jock River Estates development includes an additional 10 homes.

3 Study Area and Time Periods

3.1 Study Area

The TIA guidelines recommend a study area that includes all signalized and roundabout intersections within 1.0 km of the subject lands. Due to the current pandemic conditions, and past construction/closures along Eagleson Road and McBean Street in the last three years, limited data is available and verifiable in the area. It is therefore recommended that the following intersections be included in this study, based on available counts and adjacent area studies:

- Perth Street at Meynell Road/Oldenburg Street
- Perth Street at Rochelle Drive/Queen Charlotte Street
- Perth Street at Nixon Farm Drive/Fowler Street

The many local road intersections will not be able to have data collection completed at this time, as the rate at which to scale these volumes is unknown. A review of the generated volumes can be completed with the inclusion of the Neighbourhood Traffic Management module to the scope of work to gauge the relative impact the specific developments would have on the area road thresholds.

No TRANS screenlines are present in the area, therefore no screenlines will be reviewed as part of this study.

3.2 Time Periods

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

3.3 Horizon Years

The anticipated build-out year of 2025 is assumed for the subject site. As a result, the full build-out plus five years horizon year is 2030.

4 Exemption Review

Table 5 summarizes the exemptions for this TIA.

Table 5: Exemption Review

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

5 Development-Generated Travel Demand

5.1 Trip Generation and Mode Shares

This TIA has been prepared using the vehicle and person trip rates for the residential components using the TRANS Trip Generation Study Report (2009) for rural areas. Table 6 summarizes the person trip rates for the proposed land uses.

Table 6: Trip Generation Person Trip Rates

Dwelling Type	Land Use Code	Peak Hour	Vehicle Trip Rate	Person Trip Rates
Single-Detached Dwelling	221	AM	0.62	1.03
		PM	0.92	1.23
Townhomes/Rowhouses	223	AM	0.62	0.85
		PM	0.67	0.91

Using the above Person Trip rates, the total person trip generation has been estimated. Table 7 summarizes the total person trip generation by phase and dwelling type.

Table 7: Total Person Trip Generation

Site	Land Use	Units	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
6363-6409 Perth St.	Single-Detached	119	36	87	123	89	57	146
	Townhomes	205	64	110	174	99	88	187
6295 Perth St.	Single-Detached	42	12	31	43	32	20	52
6305 Ottawa St.	Single-Detached	42	12	31	43	32	20	52
	Townhomes	169	53	91	144	82	72	154
Total Person Trips			177	350	527	334	257	591

Using the most recent National Capital Region Origin-Destination survey (OD Survey), the existing mode shares for Rural Southwest have been determined and compared to various modes share breakdowns identified by City Staff as potential interpretations of the data. Table 8 summarizes these modal shares.

Table 8: Rural Southwest Mode Share

Travel Mode	Rural Southwest	AM From/Within	PM To/Within
Auto Driver	75%	85%	75%
Auto Passenger	15%	10%	15%
Transit	5%	5%	5%
Bicycle	1%	0%	0%
Walk	4%	0%	5%
Total	100%	100%	100%

Per City of Ottawa staff, the AM and PM mode shares and person trip rates have been projected and summarized in Table 9.

Table 9: Trip Generation by Mode

Phase	Travel Mode	Mode Share	In	Out	Total	Mode Share	In	Out	Total
6363-6409 Perth Street	Auto Driver	85%	75	148	223	75%	141	109	250
	Auto Passenger	10%	15	30	44	15%	28	22	50
	Transit	5%	5	10	15	5%	9	7	16
	Bicycle	0%	1	2	3	0%	0	0	0
	Walk	0%	4	7	12	5%	9	7	16
	Total	100%	100	197	297	100%	188	145	333
6295 Perth Street	Auto Driver	85%	9	23	32	75%	24	15	39
	Auto Passenger	10%	2	5	6	15%	5	3	8
	Transit	5%	1	2	3	5%	2	1	3
	Bicycle	0%	0	0	0	0%	0	0	0
	Walk	0%	0	1	2	5%	2	1	3
	Total	100%	12	31	43	100%	32	20	52
6305 Ottawa Street	Auto Driver	85%	55	103	159	75%	86	69	155
	Auto Passenger	10%	6	12	18	15%	17	14	31
	Transit	5%	4	7	11	5%	6	5	11
	Bicycle	0%	0	0	0	0%	0	0	0
	Walk	0%	0	0	0	5%	6	5	11
	Total	100%	65	122	187	100%	114	92	206

As shown above, 527 AM and 591 PM peak hour two-way vehicle trips are projected as a result of the proposed development.

No trip reductions factors (i.e. synergy, pass-by, etc.) have been applied as the subject development is residential.

5.2 Trip Distribution

To understand the travel patterns of the subject development the OD Survey has been reviewed to determine the existing travel patterns. Table 10 below summarizes the distribution.

Table 10: OD Survey Existing Distribution – Rural Southwest

To/From	Percent of Trips	Via
North	55%	Perth St - 45% east, 10% west
South	5%	Perth St/Martin St - 5% east
East	25%	Perth St east
West	15%	Perth St west
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 have been assigned to the Study Area road network. The new site volumes for 6363-6409 Perth Street, 6295 Perth Street, and 6305 Ottawa Street are illustrated in Figure 10, Figure 11, and Figure 12.

Figure 10: New Site Generation Auto Volumes – 6363-6409 Perth Street

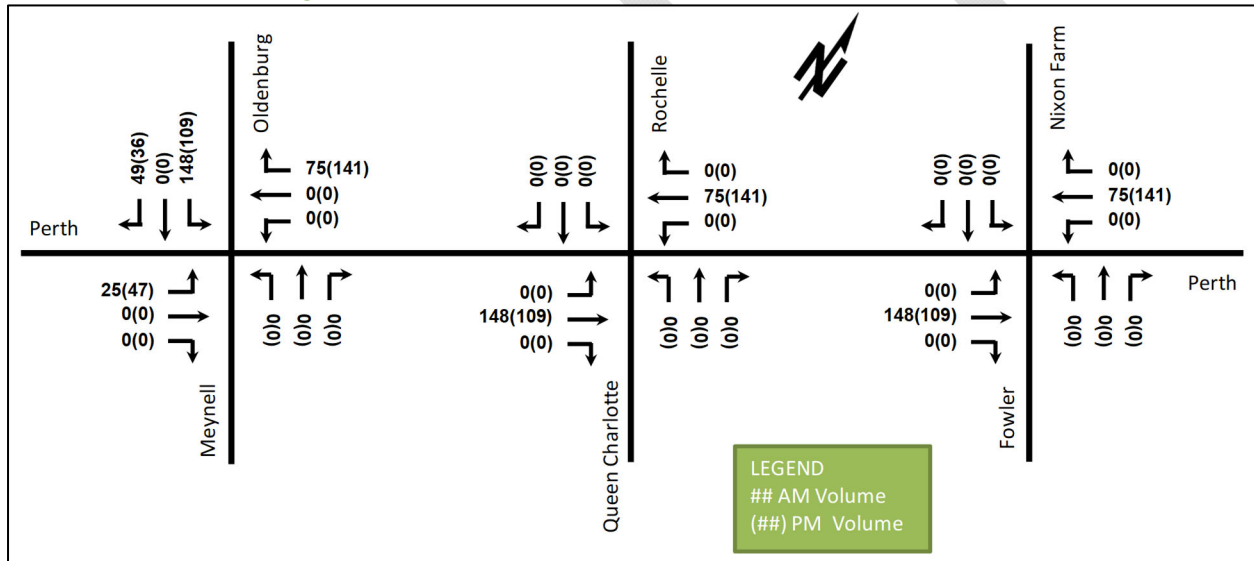


Figure 11: New Site Generation Auto Volumes – 6295 Perth Street

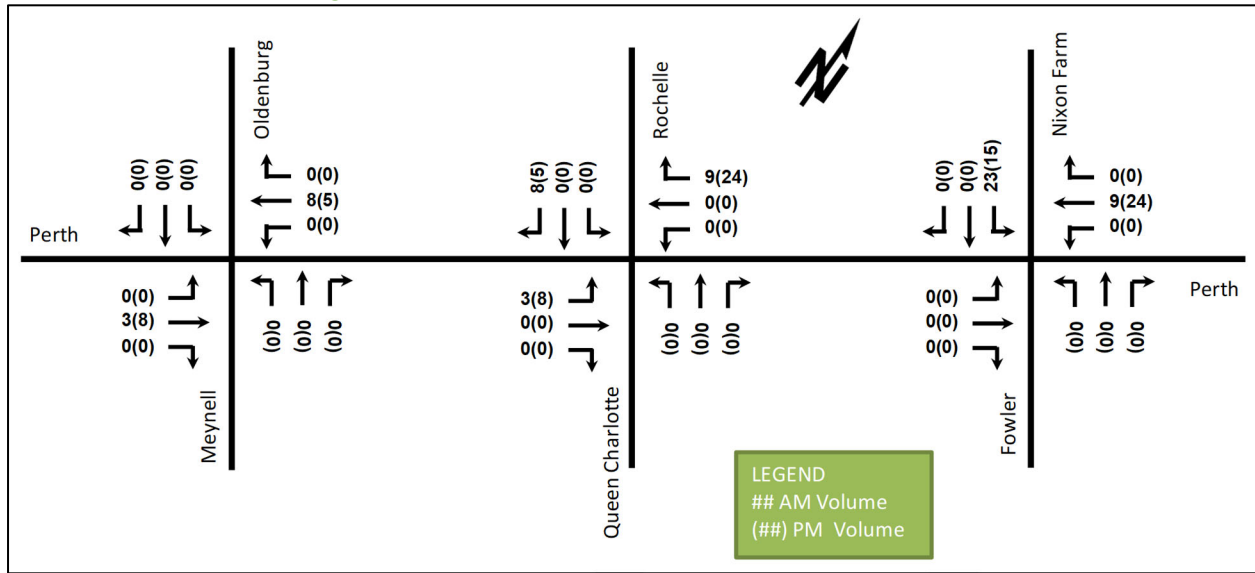
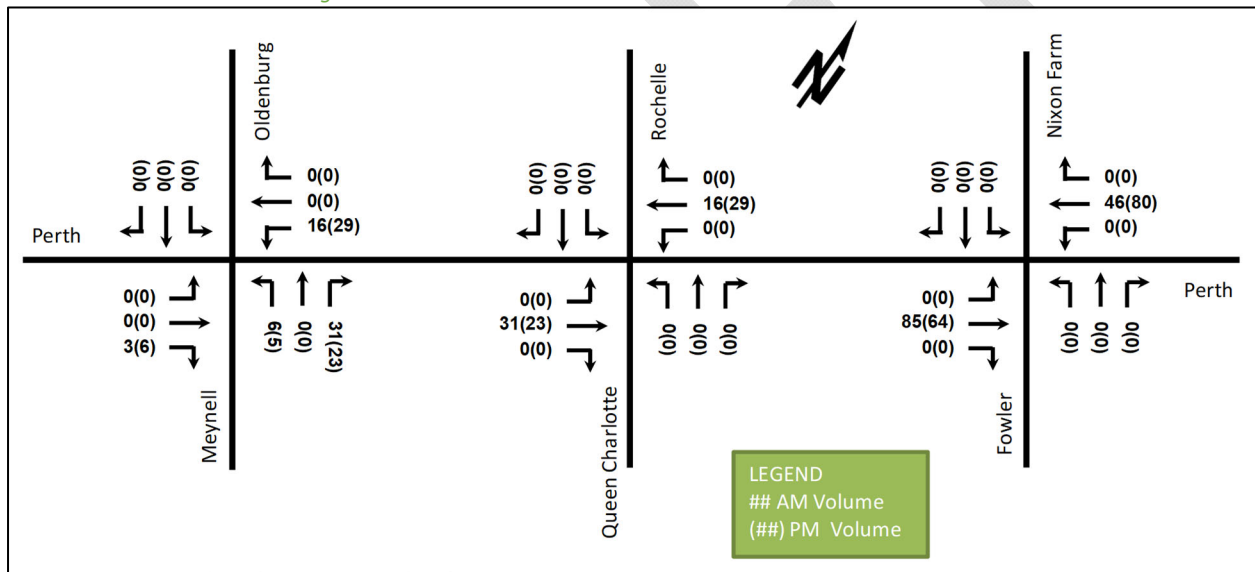


Figure 12: New Site Generation Auto Volumes – 6305 Ottawa Street



6 Background Network Travel Demand

6.1 Transportation Network Plans

The transportation network plans were discussed in Section 2.3.

6.2 Background Growth

The background growth identified in adjacent developments ranges from 1.5% to 2.0% along Perth Street. A significant amount of the development within the Village of Richmond has been explicitly accounted for in Section 6.3. Therefore, a background growth rate along Perth Street has been assumed as 1.5% for development beyond the Village of Richmond. The TRANS background projection plots are provided in Appendix E.

6.3 Other Developments

The background developments explicitly considered in the background conditions (Section 2.3) include:

- Fox Run Phase 1 - Caivan
- Fox Run Phase 2/3 - Caivan
- Fox Run Phase 4/5 - Caivan
- 6240-6431 Ottawa Street – Mattamy Richmond Subdivision
- 6265 Perth street – Richmond Oaks Health Centre
- Samara Square
- 471 Sangeet Place

Based on the assumed build-out rates of the adjacent developments, the total background development volumes for the 2025 and 2030 horizons are illustrated in Figure 13 and Figure 14.

Figure 13: 2025 Background Development Total Volumes

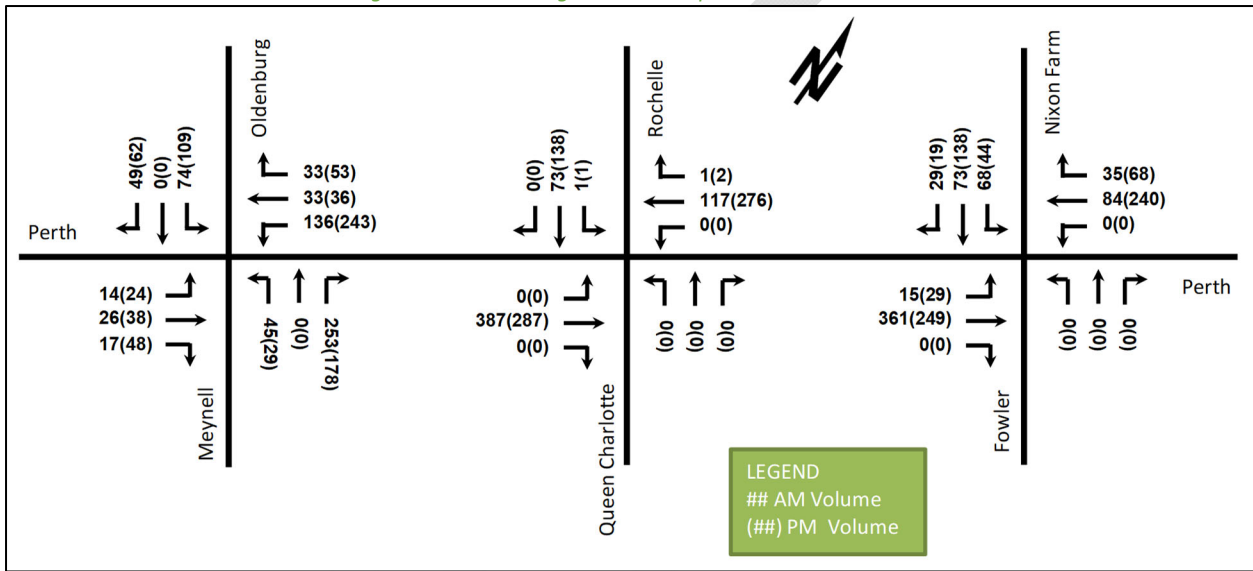
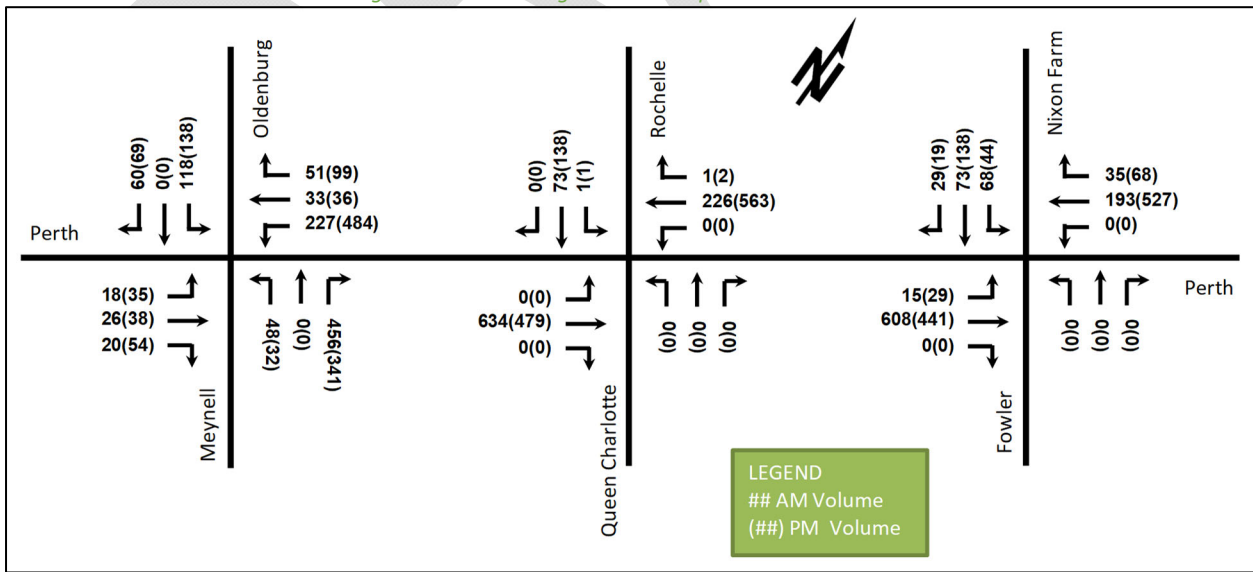


Figure 14: 2030 Background Development Total Volumes



7 Demand Rationalization

7.1 2025 Future Background Conditions

Figure 15 illustrates the 2025 future background volumes and Table 11 summarizes the intersection operations. The level of service for signalized intersections is based on the TIA Guidelines for volume to capacity ratio of the lane movements and HCM average delay for the overall intersection, and HCM average delay for unsignalized intersections. The synchro and sidra worksheets are provided in Appendix F.

Figure 15: 2025 Future Background Traffic Volumes

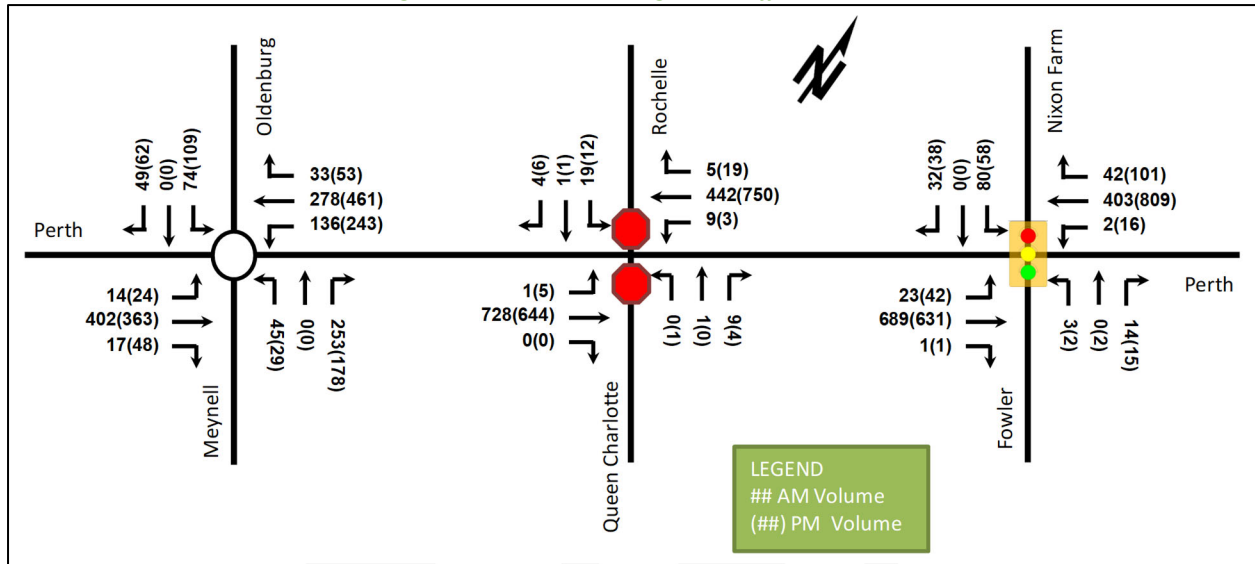


Table 11: 2025 Future Background Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 th)	LOS	V/C	Delay	Q (95 th)
Perth Street & Meynell Road Roundabout	EB	A	0.39	5.7	18.1	A	0.44	7.0	21.5
	WB	A	0.33	5.8	16.7	A	0.53	5.9	33.8
	NB	A	0.35	7.9	16.4	A	0.25	7.6	11.1
	SB	A	0.14	9.3	5.4	B	0.25	12.2	11.2
	Overall	A	0.39	6.6	-	A	0.53	7.1	-
Perth Street & Rochelle Drive/Queen Charlotte Street Unsignalized	EBL/T	A	0.00	8.2	0.0	A	0.01	9.3	0.0
	EBT/R	-	-	-	-	-	-	-	-
	WBL	A	0.01	9.2	0.0	A	0.003	8.8	0.0
	WBT/R	-	-	-	-	-	-	-	-
	NB	B	0.02	12.2	0.8	B	0.02	16.5	0.0
	SB	C	0.08	18.5	2.3	C	0.09	23.9	2.3
Overall	A	-	0.5	-	A	-	0.4	-	
Perth Street & Nixon Farm Drive/Fowler Street Signalized	EB	A	0.31	4.6	26.9	A	0.31	4.4	23.7
	WB	A	0.19	3.9	15.4	A	0.40	4.7	33.7
	NB	A	0.07	5.2	2.8	A	0.08	15.2	5.3
	SBL	A	0.40	33.4	20.1	A	0.31	31.6	15.7
	SBT/R	A	0.06	0.2	0.0	A	0.12	0.8	0.0
	Overall	A	0.35	6.0	-	A	0.41	5.5	-

Notes: Saturation flow rate of 1800 veh/h/lane
PHF = 1.00

Overall, the study area intersections will operate like the existing conditions during the 2025 future background horizon. No improvements or mitigation is required.

7.2 2030 Future Background Conditions

Figure 16 illustrates the 2030 future background volumes and Table 12 summarizes the intersection operations. The level of service for signalized intersections is based on the TIA Guidelines for volume to capacity ratio of the lane movements and HCM average delay for the overall intersection, and HCM average delay for unsignalized intersections. The synchro and sidra worksheets are provided in Appendix H.

Figure 16: 2030 Future Background Traffic Volumes

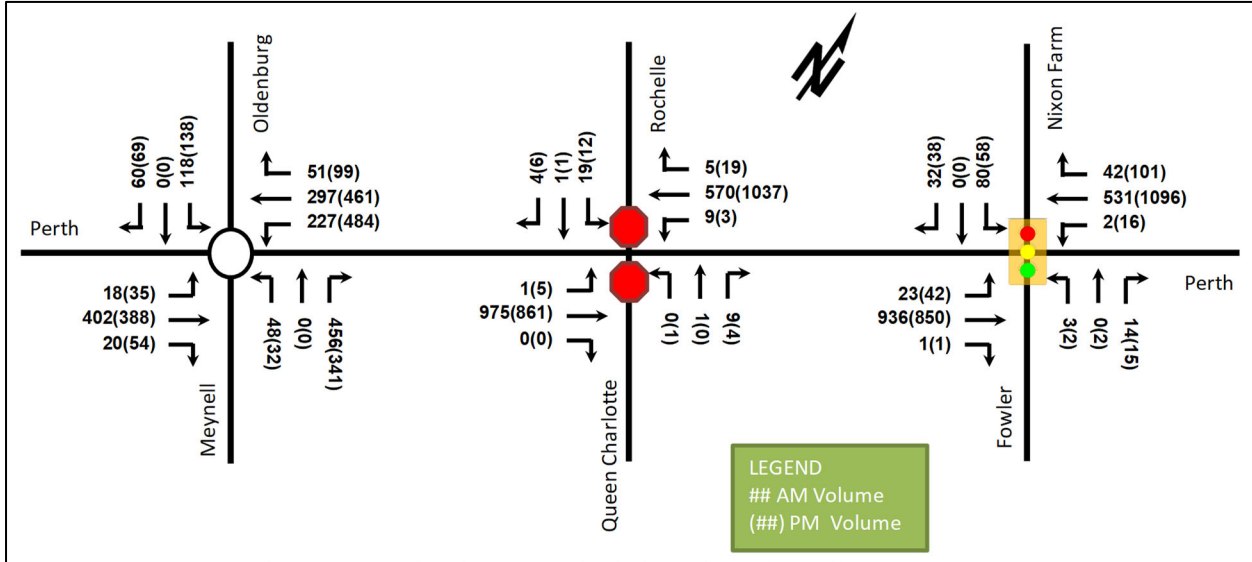


Table 12: 2030 Future Background Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 th)	LOS	V/C	Delay	Q (95 th)
Perth Street & Meynell Road Roundabout	EB	A	0.45	6.8	22.0	B	0.64	13.2	47.8
	WB	A	0.42	6.3	24.7	A	0.74	7.1	72.6
	NB	B	0.63	11.4	46.1	A	0.50	9.4	29.1
	SB	B	0.22	10.7	9.5	B	0.44	18.4	25.1
	Overall	A	0.63	6.8	-	A	0.74	10.0	-
Perth Street & Rochelle Drive/Queen Charlotte Street Unsignalized	EBL/T	A	0.00	8.6	0.0	B	0.01	10.5	0.0
	EBT/R	-	-	-	-	-	-	-	-
	WBL	B	0.01	10.2	0.0	A	0.00	9.6	0.0
	WBT/R	-	-	-	-	-	-	-	-
	NB	B	0.03	14.8	0.8	D	0.03	27.5	0.8
	SB	C	0.12	26.3	3.0	E	0.17	43.6	4.5
Overall	A	-	0.6	-	A	-	0.6	-	
Perth Street & Nixon Farm Drive/Fowler Street Signalized	EB	A	0.41	5.3	39.7	A	0.42	5.1	34.6
	WB	A	0.24	4.2	20.5	A	0.52	5.8	51.0
	NB	A	0.07	5.2	2.8	A	0.08	15.2	5.3
	SBL	A	0.40	33.4	20.1	A	0.31	31.6	15.7
	SBT/R	A	0.07	0.3	0.0	A	0.15	6.6	5.0
	Overall	A	0.44	6.2	-	A	0.52	6.3	-

Notes: Saturation flow rate of 1800 veh/h/lane
PHF = 1.00

Overall, the study area intersections at the 2030 future background horizon will operate similarly to the existing and 2025 future background conditions. No improvements or mitigation is required.

7.3 Modal Share Sensitivity

Capacity constraints have been noted at the Rochelle Drive/Queen Charlotte Street intersection for the northbound and southbound movements. As this is a function of the left-turns, the left-turns will likely move to the Nixon Farm Drive/Fowler Street signalized intersection. This will be modified in the future total conditions.

No additional capacity constraints are noted in the background horizons.

8 Development Design

8.1 Design for Sustainable Modes

The proposed development is a residential subdivision where each dwelling will include a driveway and garage. Bicycle parking is assumed to be within the individual units. Figure 17 and Figure 18 illustrates the pedestrian concept network with connections to adjacent pedestrian facilities and both collector and arterial roadways.

Figure 17: Concept Pedestrian and Cycling Network – 6295, 6363, 6409 Perth Street

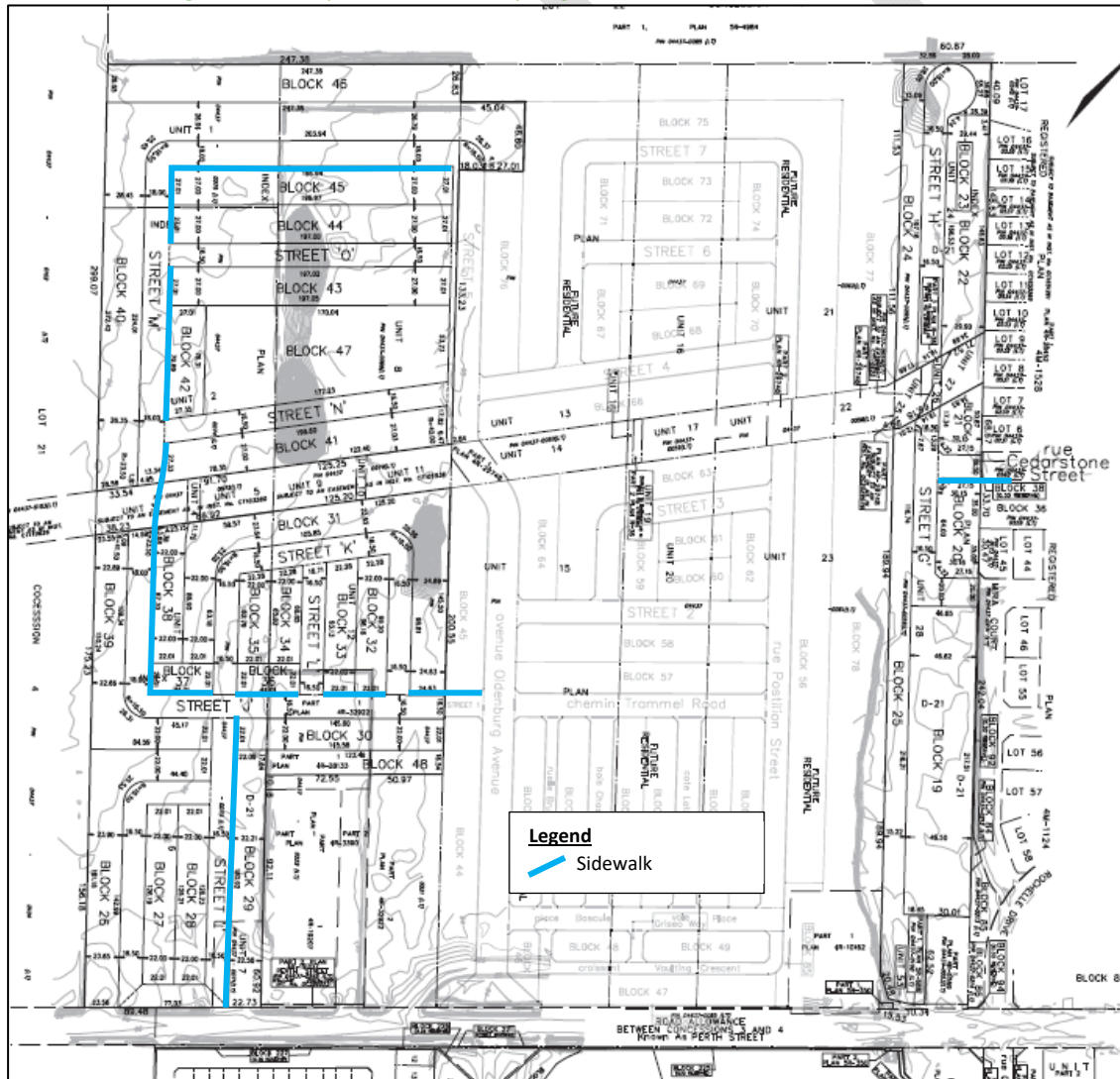
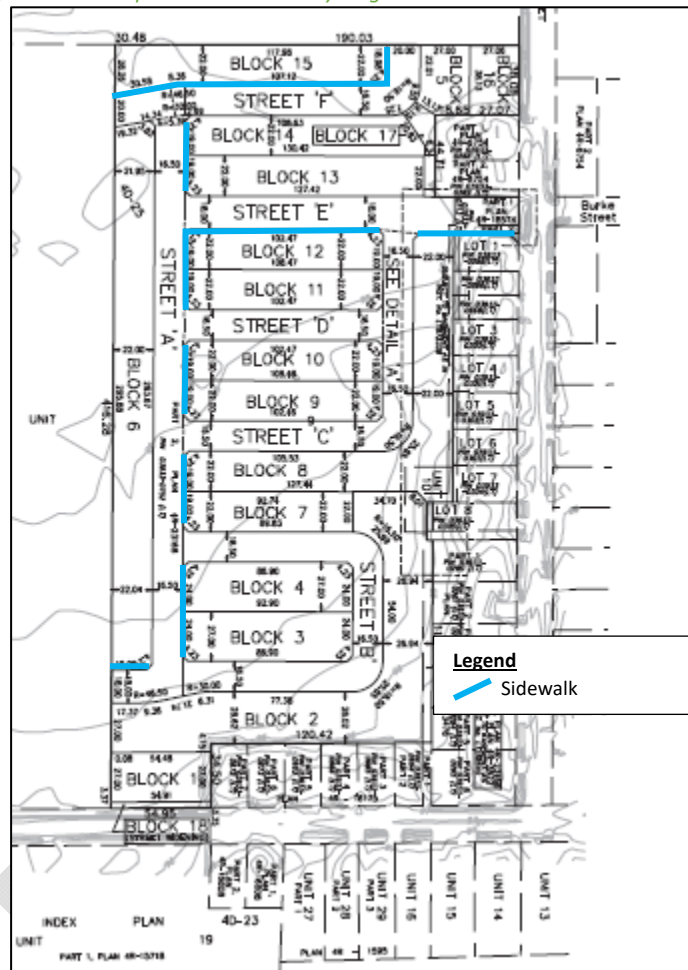


Figure 18: Concept Pedestrian and Cycling Network – 6305 Ottawa Street West



8.2 New Street Networks

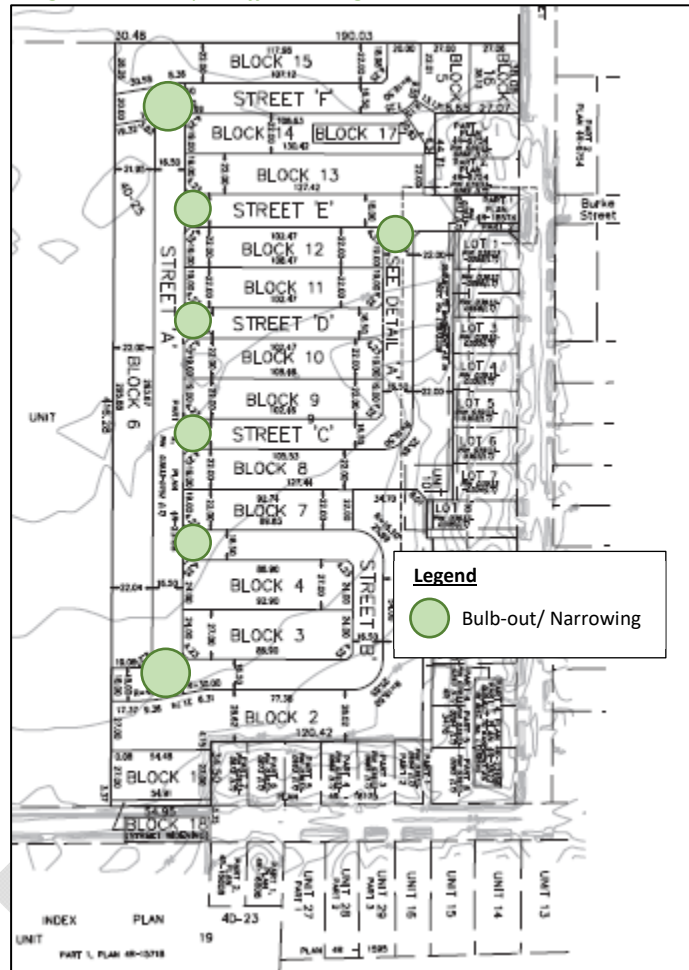
The planned street network will include a mix of 16.5 and 18.0 metre local roadways, and 20.0 metre local road connections to adjacent local roadways. The local roads will provide the opportunity for parking on one side of the roadway. The subdivision is considered to be designed for 30 km/h roadways.

Traffic calming elements are recommended at the internal intersections, including bulb-outs to narrow each approach to the intersection (e.g. reduced crossing distance). On-street parking is undefined within these concepts. Once the road network pattern and lotting concepts are confirmed, the on-street parking can be outlined in the geometric roadway design. Figure 19 illustrates the proposed locations.

Figure 19: Concept Traffic Calming Plan – 6295, 6363, 6409 Perth Street



Figure 20: Concept Traffic Calming Plan – 6305 Ottawa Street West



9 Boundary Street Design

Table 13 summarizes the MMLOS analysis for the boundary street network. Perth Street and Ottawa Street are noted for future improvement and thus the existing and future conditions have been assessed in separate rows where the remaining roadways' existing and future conditions are considered in the same row. The analysis is based on the policy area of Village. The MMLOS worksheets has been provided in Appendix H.

Table 13: Boundary Street MMLOS Analysis

Segment	Pedestrian LOS		Bicycle LOS		Transit LOS		Truck LOS	
	PLOS	Target	BLOS	Target	TLOS	Target	TrLOS	Target
Perth	F	C	F	C	D	N/A	C	D
Ottawa (existing)	F	C	F	B	D	N/A	N/A	N/A
Ottawa (future)	E	C	D	B	D	N/A	N/A	N/A
Meynell	C	C	A	D	D	N/A	N/A	N/A
Oldenburg	C	C	A	D	N/A	N/A	N/A	N/A
Mira	-	C	A	D	N/A	N/A	N/A	N/A
Cedarstone	E	C	A	D	N/A	N/A	N/A	N/A
Burke	-	C	A	B	N/A	N/A	N/A	N/A

Cedarstone Street, Perth Street and Ottawa Street do not meet the pedestrian LOS targets for Richmond Village. The existing Perth Street and Ottawa Street do not have any pedestrian facilities. Cedarstone Street would require a wider sidewalk (1.8 metres) or a boulevard of 0.5 metres or greater to meet the area targets. In the future, Ottawa Street is assumed to include a sidewalk and is limited by the traffic volumes and speeds anticipated along the roadway. No mitigation is recommended for: Perth Street as it is a rural arterial roadway and connections can be provided through the subdivision; for Ottawa Street as the road design is subject to the subdivision work included in 6240-6431 Ottawa Street or; on Cedarstone Street due to limited space for shifting the existing sidewalks.

Similar to the pedestrian conditions, existing Perth Street and Ottawa Street do not have any dedicated cycling facilities and fail to meet the bicycle LOS. The future Ottawa Street remains undefined, but the assumption of mixed traffic will not meet the area targets. Along Ottawa Street, it is recommended that the City investigate the ability to place separated facilities for cyclists during the approvals of 6240-6431 Ottawa Street. This is the direction the MMLOS analysis dictates for the roadway, even if it is not ultimately required given the location at the limits of the Village.

10 Access Intersections Design

10.1 Location and Design of Access

The residential accesses will connect to the adjacent road network via local roads and adjacent collector roads of Oldenburg Avenue, Fortune Street and Ottawa Street. Within the subdivision, no turn lanes are proposed for the internal intersections which will be controlled by minor stop control.

10.2 Intersection Control

No intersections are located on the boundary of the site and access is provided through local roadways.

10.3 Access Intersection Design

All intersection analysis is provided in Section 16.

11 Transportation Demand Management

11.1 Context for TDM

The mode shares used within the TIA are representative of the area and no major improvements are anticipated to shift these modes.

The subject site is not within a design priority area.

Total bedrooms within the development is subject to the final unit count and layout selections by purchasers. No age restrictions are noted.

11.2 Need and Opportunity

The subject site has been assumed to rely predominantly on auto travel. The study area intersections are anticipated to have residual capacity and if transit service is increased in the area, there may be a shift from auto that is possible.

11.3 TDM Program

The “suite of post occupancy TDM measures” has been summarized in the TDM checklists for the residential land uses. The checklist is provided in Appendix I. The key TDM measures recommended include:

- Contract with OC Transpo to provide early transit services until regular services are warranted by occupancy levels (subdivision)
- Provide the option to include a 1-month Presto card for first time new home purchase, with a set time frame for this offer (e.g. 6-months) from the initial offering of units for each phase/registration
- Provide a multimodal travel option information package to new residents
- Offer personalized trip planning to new residents

12 Neighbourhood Traffic Management

The proposed development will connect to the arterial road network through the adjacent local and collector road network which requires a review of the traffic thresholds for the roadways, as stipulated within the TIA guidelines. In general, the TIA thresholds are too low for local and collector roadways when considered as two-way volumes. The thresholds may be more applicable as one-way volumes, although they will still be too low for application when considering areas with limited collector road connectivity to arterial roads or where a single collector is accessed by multiple local roadways.

Given the two-way volume definitions, Oldenburg Avenue will be approaching capacity in 2025 background conditions and is forecasted to exceed the TIA threshold prior to 2030 background conditions. Once 6363-6409 Perth Street is built-out, Oldenburg Avenue will increase to over double the threshold by 2030. Operationally, see Section 15.2, the roundabout may experience some constraints on the Oldenburg Avenue leg given the increase of volumes along Perth Street. This is quirk of the roundabout capacity more than an indication that Oldenburg Avenue is suffering due to exceeding the TIA thresholds for a collector road.

For 6295 Perth Street, Rochelle Drive will be under the local road thresholds. Nixon Farm Drive is currently over the local road thresholds and operates more closely as a collector roadway for all the residential area north of Perth Street west of Huntley Road. Nixon Farm Drive is below the collector road thresholds.

For 6305 Ottawa Street, the forecasted trips would theoretically exceed a single local road threshold. Given the access configuration (Street B, Street E to Burke Street and Street F) these impacts are distributed across multiple roads. Due to the recent pandemic, data collection was limited, and the City has not been able to provide Streetlight data to approximate the area volumes and validate the impact of 6305 Ottawa Street on Burke Street, Fortune Street and Ottawa Street.

Stepping back from the specific roadway thresholds and volumes, the rural nature within Richmond Village limits the ability to feasibly provide solutions beyond the proposed subdivision and boundary roads. Additionally, the under classification of roadways (e.g. Nixon Farm Street) or convoluted routing of the available collector (e.g. Fortune-Royal York-Fowler) will increase the perceived impacts of the volumes on adjacent roadways and contribute to the thresholds being met, either currently or in the future. Overall, the development of the Richmond Village West Development Lands is going to have a relative impact on the local and collector road volumes. The increase in traffic from the subject lands at 6295, 6363, 6409 Perth Street and 6305 Ottawa Street West, while exceeding the TIA two-way volume thresholds, is not anticipated to have undue impacts on the roads and can be supported.

13 Transit

13.1 Route Capacity

In Section 5.1 the trip generation by mode was estimated, including an estimate of the number of transit trips that will be generated by the proposed development. Table 14 summarizes the transit trip generation.

Table 14: Trip Generation by Transit Mode

Travel Mode	Mode Share	AM Peak Period			PM Peak Period		
		In	Out	Total	In	Out	Total
Transit	5%	10	19	29	17	13	30

The proposed development is anticipated to generate an additional 29 AM peak hour transit trips and 30 PM peak hour transit trips. Of these trips, 19 outbound AM trips and 17 inbound PM trips are anticipated. Given the routes along Perth Street, it is likely majority of these trips will be to the east. It is unlikely any trips will be west to Munster.

Overall, the forecasted new transit trips would result in the need for approximately half of a single bus (55-person capacity) during the AM and PM peak hours for local service.

13.2 Transit Priority

No transit priority is required explicitly for this study.

14 Network Concept

The background and forecasted site trips do not exceed the anticipated lane capacities on the boundary road network. The development aligns with the development concepts contemplated in the Richmond CDP and planned infrastructure noted therein.

15 Network Intersection Design

15.1 Network Intersection Control

No change to the existing signalized control is recommended for the network intersections.

15.2 Network Intersection Design

15.2.1 2025 Future Total Network Intersection Operations

The 2025 future total intersection volumes are illustrated above in Figure 21 and intersection operations are summarized below in Table 15. The level of service for signalized intersections is based on the TIA Guidelines for volume to capacity ratio of the lane movements and HCM average delay for the overall intersection, and HCM average delay for unsignalized intersections. The synchro and sidra worksheets have been provided in Appendix J.

Figure 21: 2025 Future Total Volumes

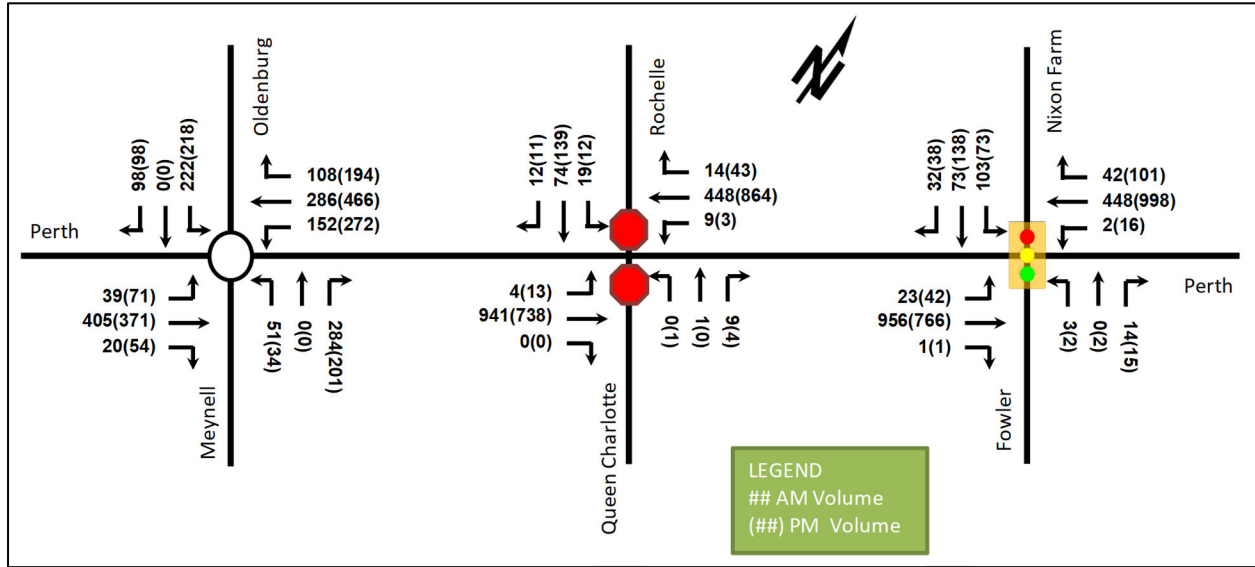


Table 15: 2025 Future Total Network Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 th)	LOS	V/C	Delay	Q (95 th)
Perth Street & Meynell Road Roundabout	EB	A	0.49	7.4	26.2	A	0.58	10.2	38.0
	WB	A	0.42	5.9	22.8	B	0.70	6.5	60.1
	NB	A	0.47	10.8	26.9	A	0.34	9.3	16.5
	SB	A	0.37	10.6	17.3	A	0.52	16.0	32.7
	Overall	A	0.49	8.2	-	B	0.70	9.3	-
Perth Street & Rochelle Drive/Queen Charlotte Street Unsignalized	EBL/T	A	0.00	8.5	0.0	A	0.02	10.1	0.8
	EBT/R	-	-	-	-	-	-	-	-
	WBL	A	0.01	9.9	0.0	A	0.00	9.3	0.0
	WBT/R	-	-	-	-	-	-	-	-
	NB	B	0.02	14.0	0.1	C	0.02	23.0	0.8
	SB	C	0.13	21.5	3.0	D	0.15	32.2	3.8
Overall	A	-	0.6	-	A	-	0.7	-	
Perth Street & Nixon Farm Drive/Fowler Street Signalized	EB	A	0.41	5.7	42.8	A	0.40	5.2	34.5
	WB	A	0.25	4.6	22.6	A	0.50	5.9	51.6
	NB	A	0.06	4.9	2.8	A	0.08	14.7	5.3
	SBL	A	0.48	34.9	24.6	A	0.37	32.6	18.8
	SBT/R	A	0.07	0.3	0.0	A	0.14	4.7	4.1
	Overall	A	0.46	7.0	-	A	0.52	6.6	-

Notes: Saturation flow rate of 1800 veh/h/lane
PHF = 1.00

§: Delay exceeds 300s

The network intersection operations for the 2025 future total horizon operate similar to the 2025 future background conditions. No improvements or mitigation is required.

15.2.2 2030 Future Total Network Intersection Operations

The 2030 future total intersection volumes are illustrated above in Figure 22 and intersection operations are summarized below in Table 16. The level of service for signalized intersections is based on the TIA Guidelines for volume to capacity ratio of the lane movements and HCM average delay for the overall intersection, and HCM average delay for unsignalized intersections. The synchro and sidra worksheets have been provided in Appendix K.

Figure 22: 2030 Future Total Volumes

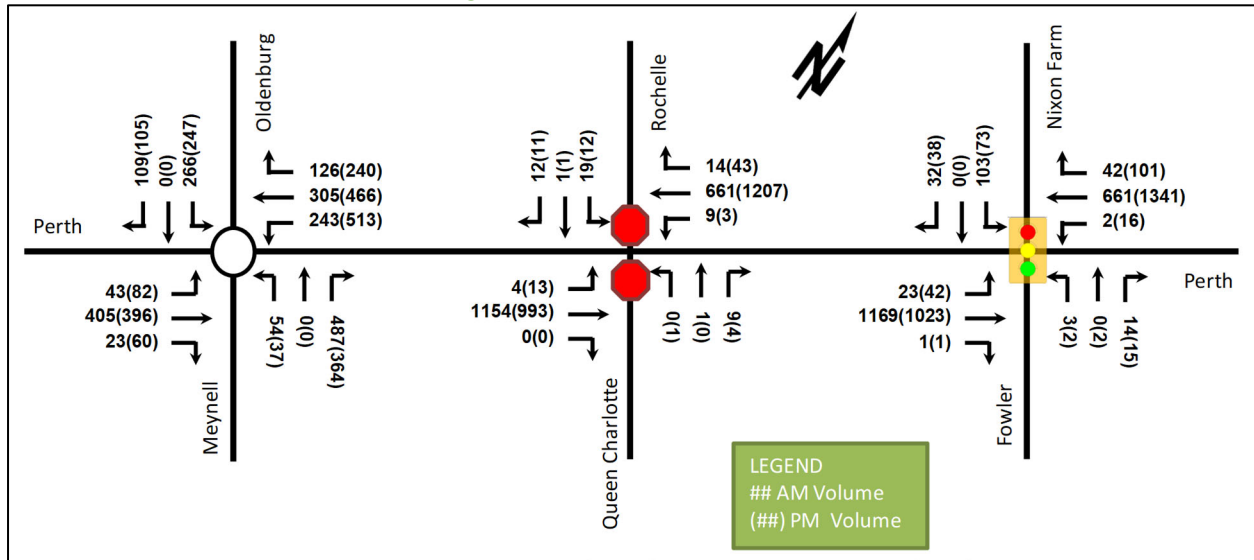


Table 16: 2030 Future Total Network Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 th)	LOS	V/C	Delay	Q (95 th)
Perth Street & Meynell Road Roundabout	EB	A	0.57	10.1	36.8	E	0.91	37.9	136.9
	WB	A	0.52	6.5	32.5	E	0.94	10.4	187.6
	NB	D	0.82	23.7	93.1	A	0.64	15.1	48.5
	SB	A	0.49	12.9	27.6	F	1.03	119.8	217.0
	Overall	D	0.82	13.0	-	F	1.03	32.4	-
Perth Street & Rochelle Drive/Queen Charlotte Street Unsignalized	EBL/T	A	0.00	9.0	0.0	B	0.02	11.6	0.8
	EBT/R	-	-	-	-	-	-	-	-
	WBL	B	0.02	11.1	0.0	B	0.00	10.2	0.0
	WBT/R	-	-	-	-	-	-	-	-
	NB	C	0.03	17.5	0.8	E	0.05	45.4	1.5
	SB	D	0.19	31.2	0.8	F	0.29	64.2	8.3
Overall	A	-	0.7	-	A	-	0.9	-	
Perth Street & Nixon Farm Drive/Fowler Street Signalized	EB	A	0.52	6.8	60.3	A	0.51	6.2	49.4
	WB	A	0.30	4.9	28.8	B	0.63	7.5	76.7
	NB	A	0.06	4.9	2.8	A	0.08	14.7	5.3
	SBL	A	0.48	34.9	24.6	A	0.37	32.6	18.8
	SBT/R	A	0.08	0.4	0.0	A	0.15	12.3	7.4
	Overall	A	0.55	7.4	-	B	0.63	7.8	-

Notes: Saturation flow rate of 1800 veh/h/lane
PHF = 1.00

The network intersection operations for the 2030 future total horizon will see a degradation of the southbound approaches along Perth Street at Oldenburg Avenue and at Rochelle Drive. Perth Street at Rochelle Drive/Queen Charlotte Street does not meet signal warrants and the warrant is provided in Appendix L.

The decrease in the PM peak operations on Oldenburg Avenue to a LOS F is due to the increase in traffic along Perth Street in the westbound direction. The continued build-out of 6240-6431 Ottawa Street is the primary reason for the increase in westbound left-turn volumes which reduce potential gaps for the southbound traffic to access the roundabout. The traffic projections assumed within this TIA did not alter the 2019 TIA (Stantec) for 6240-6431 Ottawa Street which applied over 75% of all development traffic to Meynell Road. A greater

utilization of Ottawa Street is anticipated and will need to be reassessed by those development lands once they proceed. As an example, if the westbound through and left-turn volumes were decreased by 50 vehicles, the v/c ratio for the southbound approach would improve to 0.94, and at 75 vehicles would improve to 0.88. Therefore, the development traffic associated with 6295, 6363, 6409 Perth Street and 6305 Ottawa Street West is can be accommodated by the road network in the 2030 horizon and no mitigation is recommended as part of this study.

The southbound approach at the Perth Street and Rochelle Drive/Queen Charlotte Street intersection is also subject to the increased volumes along Perth Street, limiting the ability for southbound left-turns to be completed. The Nixon Farm Drive/Fowler Street signalized intersection has residual capacity and can accommodate these additional left-turns. The City may investigate the need to implement signage limiting southbound left-turns during the PM peak hours to encourage the use of Nixon Farm Drive and act as an enforcement tool to avoid this constrained movement.

As a sensitivity, Table 17 summarizes the intersection operations if 75 westbound left-turns and 12 southbound left-turns are shifted to the Perth Street and Nixon Farm Drive/Fowler Street intersection to illustrate that the road network has residual capacity to accommodate all the development lands in west Richmond Village. The westbound queuing is not anticipated to reach the previous intersection at Lennox Street. The synchro and sidra worksheets are provided in Appendix M.

Table 17: 2030 Future Total Network Intersection Operations – PM Peak Diverted Volumes

Intersection	Lane	PM Peak Hour			
		LOS	V/C	Delay	Q (95 th)
Perth Street & Meynell Road Roundabout	EB	D	0.81	22.6	90.0
	WB	D	0.88	8.1	123.4
	NB	B	0.64	15.3	49.0
	SB	D	0.88	49.1	103.8
	Overall	D	0.88	18.4	-
Perth Street & Rochelle Drive/Queen Charlotte Street Unsignalized	EBL/T	B	0.02	11.1	0.8
	EBT/R	-	-	-	-
	WBL	B	0.00	10.2	-
	WBT/R	-	-	-	-
	NB	E	0.05	38.6	0.8
	SB	D	0.07	26.2	1.5
Overall	A	-	0.4	-	
Perth Street & Nixon Farm Drive/Fowler Street Signalized	EB	A	0.52	6.6	52.3
	WB	C	0.79	12.8	#139.7
	NB	A	0.08	14.5	5.2
	SBL	A	0.42	33.6	21.3
	SBT/R	A	0.15	12.1	7.4
	Overall	C	0.78	11.0	-

Notes: Saturation flow rate of 1800 veh/h/lane
PHF = 1.00

15.2.3 Network Intersection MMLoS

Table 18 summarizes the MMLoS analysis for the network intersections of Perth Street at Nixon Farm Drive/Fowler Street. The existing and future conditions will be the same and are considered in one row. The intersection analysis is based on the policy area of village arterial. The MMLoS worksheets has been provided in Appendix G.

Table 18: Study Area Intersection MMLoS Analysis

Intersection	Pedestrian LOS		Bicycle LOS		Transit LOS		Truck LOS		Auto LOS	
	PLOS	Target	BLOS	Target	TLOS	Target	TrLOS	Target	ALOS	Target
Perth Street & Nixon Farm Drive/Fowler Street	D	C	D	C	N/A	N/A	F	D	B	D

The MMLoS targets will not be met for the pedestrian, bicycle and truck LOS. The pedestrian level of service would require a maximum of three lanes at a crossing to meet a LOS C. The mixed traffic approaches for cyclists govern the bicycle LOS and require improvements on the approach geometry to meet the target LOS. The truck LOS is not met due to turning radii off of Perth Street and the single receiving lanes to the north and south.

No mitigation is recommended as part of this study. The City may investigate the complete reconstruction of the intersection to improve BLOS and TrLOS and the feasibility of lane reductions along Perth Street to improve the PLOS.

While no target is designated for transit in the Village setting, a transit route does travel along Perth Street and would receive a TLOS B.

15.2.4 Recommended Design Elements

No study area intersection design elements are proposed as part of this study.

16 Next Steps

Following the circulation and review of the TIA, any outstanding comments will be documents within the context of the plan of subdivision and zoning bylaw amendment applications, and if required, a revised Step 4 Strategy Report. Once remaining TIA Steps are completed and sign-off has been received from City Transportation Project Manager, a signed and stamped final report will be provided to City staff.

Appendix A

TIA Screening Form and PM Certification Form

DRAFT

City of Ottawa 2017 TIA Guidelines
Step 1 - Screening Form

Date: 04-Jun-20
Project Number: 2019-64
Project Reference: Green & Laffin Lands

1.1 Description of Proposed Development	
Municipal Address	6409, 6363, 6295 Perth Street, 6305 Ottawa Street West
Description of Location	Existing farm land within the Village of Richmond
Land Use Classification	Development Reserve (DR1)
<u>Approximate</u> Development Size	6406 & 6363 Perth St: 116 singles, 204 townhomes 6295 Perth St: 41 singles 6305 Ottawa St W: 200 singles
Accesses	6406 & 6363 Perth St: Connectivity through Fox Run North 6295 Perth St: New connection to Mira Court 6305 Ottawa St W: New connection to Queen Charlotte Street at Burke Street
Phase of Development	6406 & 6363 Perth St: One or two phases 6295 Perth St: Single phase 6305 Ottawa St W: Single phase
Buildout Year	2027
TIA Requirement	Full TIA Required

1.2 Trip Generation Trigger		
Land Use Type	Single-family homes	
Development Size	577	Units
Trip Generation Trigger	Yes	(Approx. 204 townhomes, 357 singles)

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)?	Yes
Is the proposed driveway within auxiliary lanes of an intersection?	No
Does the proposed driveway make use of an existing median break that serves an existing site?	No
Is there 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.


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Ottawa (Ontario) K1P 1J1
Tél. : 613-580-2424
Télécopieur: 613-560-6006

Dated at Ottawa this 20 day of September, 2018.
(City)

Name: Andrew Harte
(Please Print)

Professional Title: Professional Engineer



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

Office Contact Information (Please Print)
Address: 13 Markham Avenue
City / Postal Code: Ottawa / K2G 3Z1
Telephone / Extension: (613) 697-3797
E-Mail Address: Andrew.Harte@CGHTransportation.com

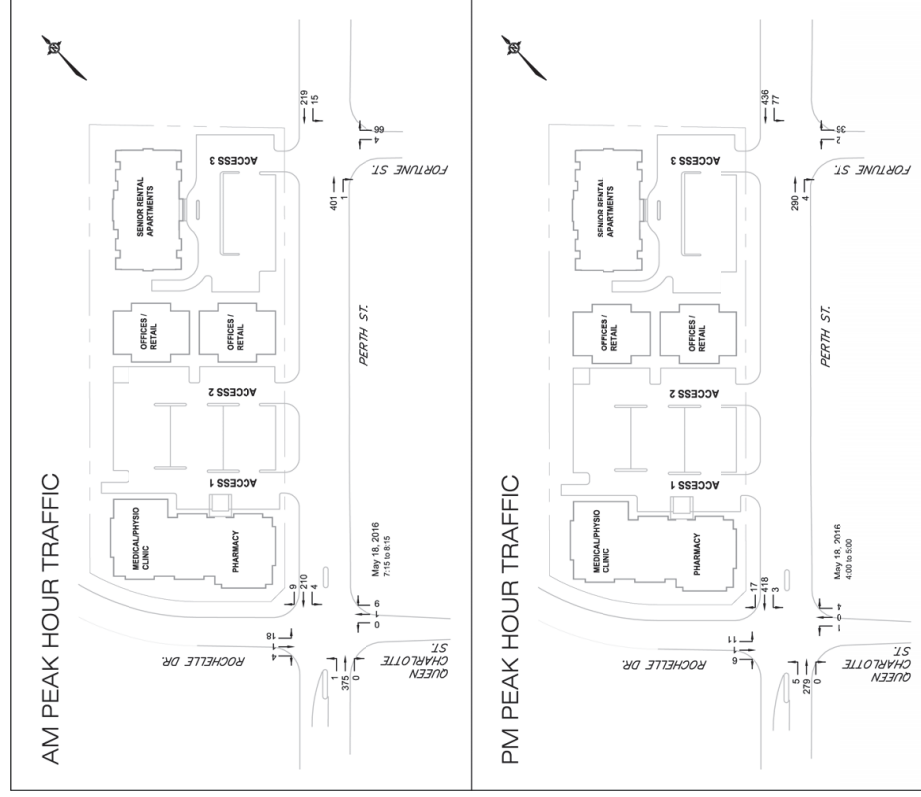


Appendix B

Turning Movement Counts

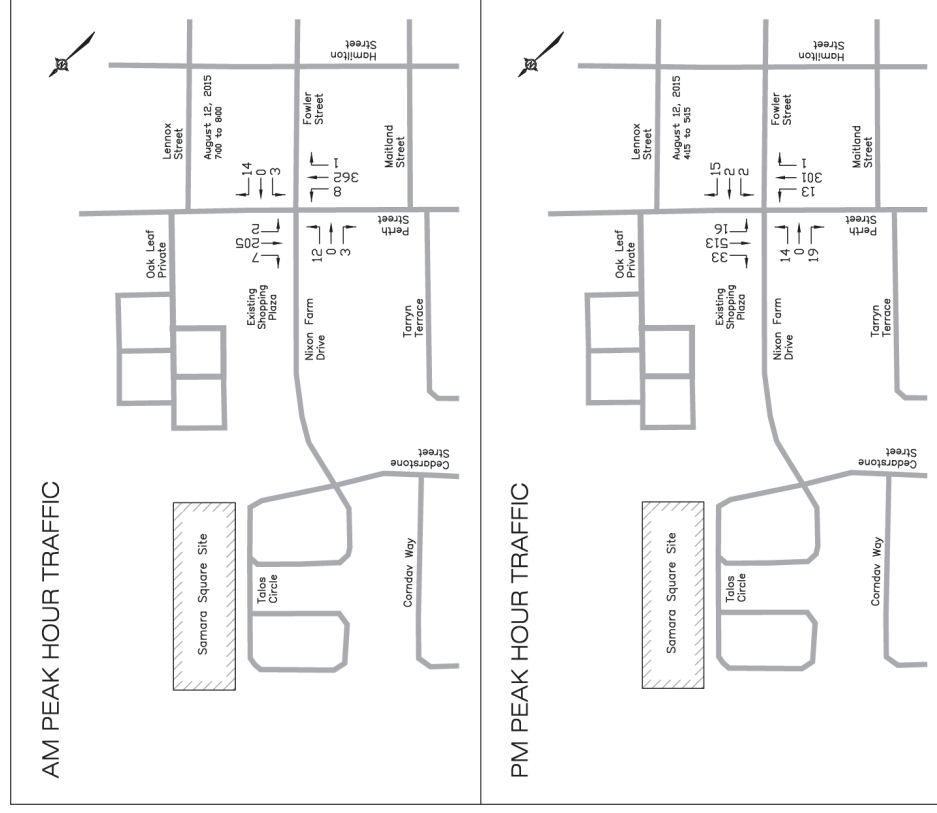
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FIGURE 2.1
 EXISTING 2016 WEEKDAY PEAK AM AND PM HOUR TRAFFIC COUNTS



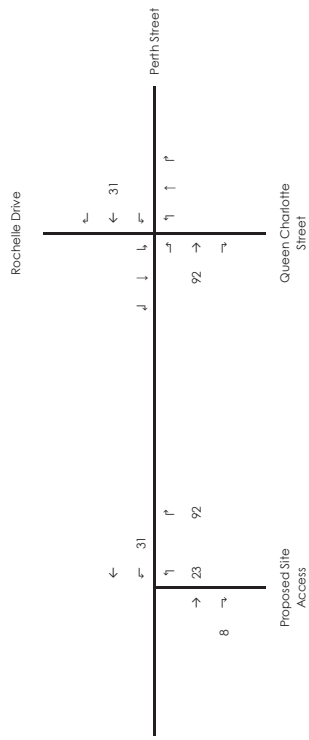
NOT TO SCALE

FIGURE 2.1
 YEAR 2015 WEEKDAY PEAK AM AND PM HOUR TRAFFIC COUNTS

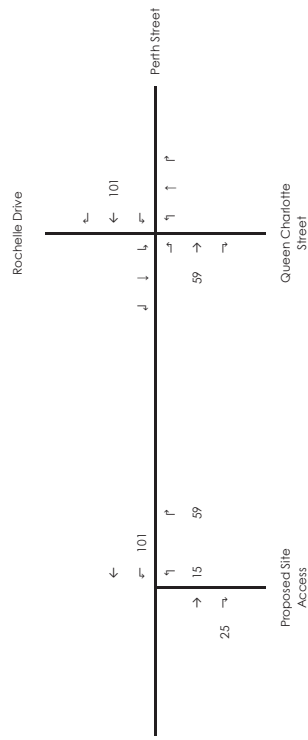


NOT TO SCALE

AM Peak Hour



PM Peak Hour



Richmond Village Development Corporation
 Richmond Village - Phase 1
 Figure 7
 Site Traffic



Appendix C

Synchro Intersection Worksheets – Existing Conditions

DRAFT

Lanes, Volumes, Timings
1: Queen Charlotte/Rochelle & Perth

05-30-2020

Lane Group	EBL	EBT	EBR	EBL	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	1	516	0	10	287	5	0	1	10	20	1	4	
Future Volume (vph)	1	516	0	10	287	5	0	1	10	20	1	4	
Satd. Flow (prot)	0	3316	0	1658	1740	0	0	1529	0	0	1643	0	
Flt Permitted				0.950								0.961	
Satd. Flow (perm)	0	3316	0	1658	1740	0	0	1529	0	0	1643	0	
Lane Group Flow (vph)	0	574	0	11	325	0	0	12	0	0	27	0	
Sign Control		Free		Free				Stop		Stop		Stop	
Intersection Summary													
Control Type: Unsignalized													
Intersection Capacity Utilization 31.1%													
Analysis Period (min) 15													

HCM 2010 TWSC
1: Queen Charlotte/Rochelle & Perth

06-30-2020

Intersection	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
In/Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	516	0	10	287	5	0	1	10	20	1	4
Future Vol, veh/h	1	516	0	10	287	5	0	1	10	20	1	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	350	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	0
Grade, %	-	0	-	-	0	-	-	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	573	0	11	319	6	0	1	11	22	1	4
Major/Minor												
	Major1	Major2	Minor1	Minor2								
Conflicting Flow All	325	0	0	573	0	0	922	922	287	633	919	322
Stage 1	-	-	-	-	-	-	575	575	-	344	344	-
Stage 2	-	-	-	-	-	-	347	347	-	289	289	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.53	6.93	7.33	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	4.019	3.319	3.519	4.019	3.319
Pot Cap-1 Maneuver	1233	-	-	998	-	-	238	269	710	378	270	718
Stage 1	-	-	-	-	-	-	471	502	-	671	636	-
Stage 2	-	-	-	-	-	-	668	634	-	695	502	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1233	-	-	998	-	-	234	266	710	367	267	718
Mov Cap-2 Maneuver	-	-	-	-	-	-	234	266	-	367	267	-
Stage 1	-	-	-	-	-	-	471	501	-	670	629	-
Stage 2	-	-	-	-	-	-	655	627	-	682	501	-
Approach												
	EB	WB	NB	SB								
HCM Control Delay, s	0	0.3	11	14.9								
HCM LOS		B	B	B								
Minor Lane/Major Mvmt												
	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	616	1233	-	-	998	-	-	392				
HCM Lane V/C Ratio	0.02	0.001	-	-	0.011	-	-	0.071				
HCM Control Delay (s)	11	7.9	0	-	8.6	-	-	14.9				
HCM Lane LOS	B	A	A	-	A	-	-	B				
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.2				

Lanes, Volumes, Timings
2: Meynell & Perth

05-30-2020

→	↖	↗	←	→	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	425	8	31	260	23	92
Future Volume (vph)	425	8	31	260	23	92
Satd. Flow (prot)	1740	0	0	1736	1541	0
Flt Permitted				0.995	0.990	
Satd. Flow (perm)	1740	0	0	1736	1541	0
Lane Group Flow (vph)	481	0	0	323	128	0
Sign Control	Free			Free	Stop	
Intersection Summary						
Control Type: Unsignalized						
Intersection Capacity Utilization 55.8%						
Analysis Period (min) 15						
ICU Level of Service B						

HCM 2010 TWSC
2: Meynell & Perth

05-30-2020

Intersection	EBT	EBR	WBL	WBT	NBL	NBR
In/Delay, s/veh	2.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖	↗	↖	↗	↖	↗
Traffic Vol, veh/h	425	8	31	260	23	92
Future Vol, veh/h	425	8	31	260	23	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	-	-	-	-	-	-
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	472	9	34	289	26	102
Major/Minor						
Conflicting Flow All	0	0	481	0	834	477
Stage 1	-	-	-	-	477	-
Stage 2	-	-	-	-	-	357
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	-	-	1082	-	388	588
Stage 1	-	-	-	-	624	-
Stage 2	-	-	-	-	-	708
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1082	-	325	588
Mov Cap-2 Maneuver	-	-	-	-	325	-
Stage 1	-	-	-	-	624	-
Stage 2	-	-	-	-	-	682
Approach						
EB	WB	NB				
HCM Control Delay, s	0	0.9	14.5			
HCM LOS	B					
Minor Lane/Major Mvmt						
NBLn1	EBT	EBR	WBL	WBT		
Capacity (veh/h)	506	-	-	1082		
HCM Lane V/C Ratio	0.253	-	-	0.032		
HCM Control Delay (s)	14.5	-	-	8.4		
HCM Lane LOS	B	-	-	A		
HCM 95th %tile Q(veh)	1	-	-	0.1		

Lanes, Volumes, Timings
3: Fowler/Nixon Farm & Perth

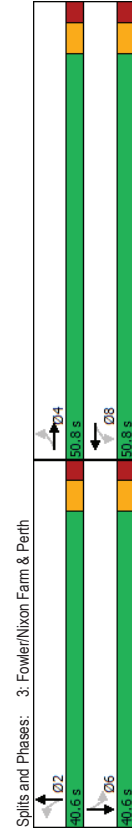
05-30-2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	23	476	1	2	249	42	3	0	15	81	0	32
Traffic Volume (vph)	23	476	1	2	249	42	3	0	15	81	0	32
Future Volume (vph)	0	3309	0	0	3243	0	0	1534	0	1658	1483	0
Satd. Flow (prot)	0.930			0.953			0.955		0.744			
Flt Permitted	0	3084	0	0	3090	0	0	1475	0	1298	1483	0
Satd. Flow (perm)	0	556	0	0	326	0	0	20	0	90	36	0
Lane Group Flow (vph)	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Turn Type	4	4	8	8	2	2	6	6	6	6	6	6
Protected Phases	4	4	8	8	2	2	6	6	6	6	6	6
Permitted Phases	4	4	8	8	2	2	6	6	6	6	6	6
Detector Phase	4	4	8	8	2	2	6	6	6	6	6	6
Switch Phase	4	4	8	8	2	2	6	6	6	6	6	6
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	50.8	50.8	50.8	50.8	50.8	50.8	25.6	25.6	25.6	25.6	25.6	25.6
Total Split (s)	50.8	50.8	50.8	50.8	50.8	40.6	40.6	40.6	40.6	40.6	40.6	40.6
Total Split (%)	55.6%	55.6%	55.6%	55.6%	55.6%	44.4%	44.4%	44.4%	44.4%	44.4%	44.4%	44.4%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	5.8	5.8	5.6	5.6	5.6	5.6	5.6	5.6	5.6
Lead/Lag Optimize?												
Recall Mode	Max	Max	Max	Max	Max	None	None	None	None	None	None	None
Act Effct Green (s)	53.2	53.2	0.75	0.75	0.75	11.2	11.2	11.2	11.2	11.2	11.2	11.2
Actuated G/C Ratio	0.75	0.75	0.24	0.24	0.24	0.16	0.16	0.16	0.16	0.16	0.16	0.16
v/c Ratio	0.24	0.24	0.14	0.14	0.14	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Control Delay	4.5	4.5	3.7	3.7	3.7	6.6	6.6	6.6	6.6	6.6	6.6	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.5	4.5	3.7	3.7	3.7	6.6	6.6	6.6	6.6	6.6	6.6	6.6
LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Delay	4.5	4.5	3.7	3.7	3.7	6.6	6.6	6.6	6.6	6.6	6.6	6.6
Approach LOS	A	A	A	A	A	A	A	A	A	A	A	A
Queue Length 50th (m)	12.3	12.3	5.9	5.9	5.9	0.0	0.0	0.0	0.0	11.7	0.0	0.0
Queue Length 95th (m)	22.5	22.5	12.1	12.1	12.1	3.8	3.8	3.8	3.8	23.7	0.0	0.0
Internal Link Dist (m)	414.4	414.4	185.4	185.4	185.4	258.4	258.4	258.4	258.4	148.6	148.6	148.6
Turn Bay Length (m)										15.0	15.0	15.0
Base Capacity (vph)	2302	2302	2314	2314	2314	745	745	745	745	641	1000	1000
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.24	0.14	0.14	0.14	0.03	0.03	0.03	0.03	0.14	0.04	0.04
Intersection Summary												
Cycle Length: 91.4												
Actuated Cycle Length: 71.2												
Natural Cycle: 80												
Control Type: Semi Act-Uncoord												
Maximum v/c Ratio: 0.44												

Lanes, Volumes, Timings
3: Fowler/Nixon Farm & Perth

05-30-2020

Intersection Signal Delay: 6.7	Intersection LOS: A
Intersection Capacity Utilization 49.1%	ICU Level of Service A
Analysis Period (min) 15	



Lanes, Volumes, Timings
1: Queen Charlotte/Rochelle & Perth

06-30-2020

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	393	0	3	581	20	1	0	4	13	1	6
Future Volume (vph)	5	393	0	3	581	20	1	0	4	13	1	6
Satd. Flow (prot)	0	3312	0	1658	1736	0	0	1541	0	0	1618	0
Flt P/Permitted		0.999		0.950			0.990				0.969	
Satd. Flow (perm)	0	3312	0	1658	1736	0	0	1541	0	0	1618	0
Lane Group Flow (vph)	0	443	0	3	668	0	0	5	0	0	22	0
Sign Control		Free		Free			Stop				Stop	
Intersection Summary												
Control Type:	Unsignalized											
Intersection Capacity Utilization	43.6%											
Analysis Period (min)	15											
	ICU Level of Service A											

Intersection	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4P	4P	4P	4P	4P	4P	4P	4P	4P	4P	4P	4P
Traffic Vol, veh/h	5	333	0	3	581	20	1	0	4	13	1	6
Future Vol, veh/h	5	333	0	3	581	20	1	0	4	13	1	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	None	-	-	None	-	-	None	-
Storage Length	350	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	0
Grade, %	-	0	-	-	0	-	-	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	437	0	3	646	22	1	0	4	14	1	7
Major/Minor	Major1	Major2	Minor1	Minor2	Minor1	Minor2	Minor1	Minor2	Minor1	Minor2	Minor1	Minor2
Conflicting Flow All	668	0	0	437	0	0	1116	1123	219	894	1112	657
Stage 1	-	-	-	-	-	-	449	449	-	663	663	-
Stage 2	-	-	-	-	-	-	667	674	-	231	449	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.53	6.93	7.33	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	4.019	3.319	3.519	4.019	3.319
Pot Cap-1 Maneuver	920	-	-	1121	-	-	173	206	786	249	208	464
Stage 1	-	-	-	-	-	-	650	571	-	450	458	-
Stage 2	-	-	-	-	-	-	447	453	-	752	571	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	920	-	-	1121	-	-	168	203	786	246	206	464
Mov Cap-2 Maneuver	-	-	-	-	-	-	168	203	-	246	206	-
Stage 1	-	-	-	-	-	-	555	566	-	446	457	-
Stage 2	-	-	-	-	-	-	438	452	-	741	566	-
Approach	EB	WB	NB	SB	EB	WB	NB	SB	EB	WB	NB	SB
HCM Control Delay, s	0.1	0	13	18.8	0.1	0	13	18.8	0.1	0	13	18.8
HCM LOS	B	B	B	C	B	B	B	C	B	B	B	C
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBT	SBR	SBLn1	SBT
Capacity (veh/h)	453	920	-	-	1121	-	-	-	-	283	-	-
HCM Lane V/C Ratio	0.012	0.006	-	-	0.003	-	-	-	-	0.079	-	-
HCM Control Delay (s)	13	8.9	0	-	8.2	-	-	-	-	18.8	-	-
HCM Lane LOS	B	A	A	-	A	-	-	-	-	C	-	-
HCM 95th %ile Q(veh)	0	0	-	-	0	-	-	-	-	0.3	-	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	4P	4P	4P	4P	4P	4P
Traffic Volume (vph)	339	25	101	487	15	59
Future Volume (vph)	339	25	101	487	15	59
Satd. Flow (prot)	1729	0	0	1729	1543	0
Flt P Permitted	0.991	0.991	0.991	0.991	0.990	0.990
Satd. Flow (perm)	1729	0	0	1729	1543	0
Lane Group Flow (vph)	405	0	0	653	83	0
Sign Control	Free	Free	Free	Free	Stop	Stop
Intersection Summary						
Control Type: Unsignalized	ICU Level of Service C					
Intersection Capacity Utilization 68.1%						
Analysis Period (min) 15						

05-30-2020
 HCM 2010 TWSC
 2: Meynell & Perth

Intersection	Major1		Major2		Minor1	
Int Delay, s/veh	EBT	EBR	WBL	WBT	NBL	NBR
2						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	339	25	101	487	15	59
Traffic Vol, veh/h	339	25	101	487	15	59
Future Vol, veh/h	0	0	0	0	0	0
Conflicting Peds, #/hr	Free	Free	Free	Free	Stop	Stop
Sign Control	-	None	-	None	-	None
RT Channelized	-	-	-	-	-	-
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	0	0	0	-
Grade, %	0	-	0	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	377	28	112	541	17	66
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	405	0	1156	391
Stage 1	-	-	-	-	391	-
Stage 2	-	-	-	-	765	-
Critical Hwy	-	-	4.12	-	6.42	6.22
Critical Hwy Stg 1	-	-	-	-	5.42	-
Critical Hwy Stg 2	-	-	-	-	5.42	-
Follow-up Hwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1154	-	217	658
Stage 1	-	-	-	-	683	-
Stage 2	-	-	-	-	459	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1154	-	187	658
Mov Cap-2 Maneuver	-	-	-	-	187	-
Stage 1	-	-	-	-	683	-
Stage 2	-	-	-	-	395	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	1.5	15.2			
HCM LOS			C			
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	436	-	-	1154	-	
HCM Lane V/C Ratio	0.189	-	-	0.097	-	
HCM Control Delay (s)	15.2	-	-	8.5	0	
HCM Lane LOS	C	-	-	A	A	
HCM 95th %ile Q(veh)	0.7	-	-	0.3	-	

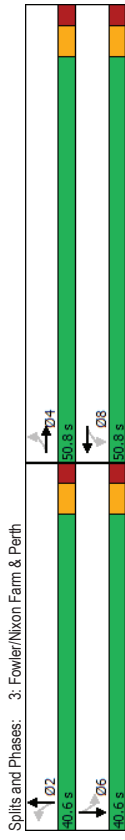
06-30-2020
 Lanes, Volumes, Timings
 3: Fowler/Nixon Farm & Perth

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	378	1	17	645	103	2	2	16	59	0	39
Future Volume (vph)	43	378	1	17	645	103	2	2	16	59	0	39
Satd. Flow (prot)	0	3299	0	0	3246	0	0	1545	0	1658	1483	0
Flt Permitted	0.820			0.941			0.970			0.743		
Satd. Flow (perm)	0	2719	0	0	3058	0	0	1507	0	1297	1483	0
Satd. Flow (RTOR)				27			18					161
Lane Group Flow (vph)	0	469	0	0	850	0	0	22	0	66	43	0
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	4	4	4	8	8	8	2	2	2	6	6	6
Permitted Phases	4	4	4	8	8	8	2	2	2	6	6	6
Detector Phase	4	4	4	8	8	8	2	2	2	6	6	6
Switch Phase	4	4	4	8	8	8	2	2	2	6	6	6
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	24.8	24.8	24.8	24.8	24.8	24.8	40.6	40.6	40.6	40.6	40.6	40.6
Total Split (s)	50.8	50.8	50.8	50.8	50.8	50.8	40.6	40.6	40.6	40.6	40.6	40.6
Total Split (%)	55.6%	55.6%	55.6%	55.6%	55.6%	55.6%	44.4%	44.4%	44.4%	44.4%	44.4%	44.4%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.3	2.3	2.3	2.3	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	5.8	5.8	5.8	5.6	5.6	5.6	5.6	5.6	5.6
Lead/Lag												
Lead/Lag Optimize?												
Recall Mode	Max	Max	Max	Max	Max	Max	None	None	None	None	None	None
Act Effct Green (s)	53.5	53.5	53.5	53.5	53.5	53.5	10.5	10.5	10.5	10.5	10.5	10.5
Actuated g/C Ratio	0.75	0.75	0.75	0.75	0.75	0.75	0.15	0.15	0.15	0.15	0.15	0.15
v/c Ratio	0.23	0.23	0.37	0.37	0.37	0.37	0.09	0.09	0.34	0.12	0.12	0.12
Control Delay	4.1	4.1	4.6	4.6	4.6	4.6	14.2	14.2	31.9	0.7	0.7	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.1	4.1	4.6	4.6	4.6	4.6	14.2	14.2	31.9	0.7	0.7	0.7
LOS	A	A	A	A	A	A	B	B	C	C	A	A
Approach Delay	4.1	4.1	4.6	4.6	4.6	4.6	14.2	14.2	19.6	19.6	19.6	19.6
Approach LOS	A	A	A	A	A	A	B	B	B	B	B	B
Queue Length 50th (m)	10.2	10.2	20.2	20.2	20.2	20.2	0.5	0.5	8.7	0.0	0.0	0.0
Queue Length 95th (m)	17.6	17.6	33.0	33.0	33.0	33.0	6.0	6.0	18.6	0.0	0.0	0.0
Internal Link Dist (m)	414.4	414.4	185.4	185.4	185.4	258.4	258.4	258.4	148.6	148.6	148.6	148.6
Turn Bay Length (m)												
Base Capacity (vph)	2053	2053	2316	2316	2316	2316	757	757	644	817	817	817
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.23	0.37	0.37	0.37	0.37	0.03	0.03	0.10	0.05	0.05	0.05
Intersection Summary												
Cycle Length: 91.4												
Actuated Cycle Length: 70.9												
Natural Cycle: 70												
Control Type: Semi Act-Uncoord												
Maximum v/c Ratio: 0.37												

Lanes, Volumes, Timings
 3: Fowler/Nixon Farm & Perth

05-30-2020

Intersection Signal Delay: 5.7 Intersection LOS: A
 Intersection Capacity Utilization 59.6% ICU Level of Service B
 Analysis Period (min) 15



Appendix D

Collision Data

DRAFT

Accident Date	Accident Year	Accident Time	Location	Environment Condition	Light	Traffic Control	Traffic Control Condition	Classification Of Accident	Initial Impact Type	Road Surface Condition
2018-03-04	2018	11:49	FORTUNE ST @ MARTIN ST (0000443)	01 - Clear	01 - Daylight	02 - Stop sign		03 - P.D. only	02 - Angle	01 - Dry
2018-04-06	2018	9:15	FORTUNE ST btwn PERTH ST & HAMILTON ST (__3ZBNC5)	01 - Clear	01 - Daylight	10 - No control		02 - Non-fatal injury	07 - SMV other	01 - Dry
2015-06-30	2015	12:28	FOWLER ST/NIXON FARM DR @ PERTH ST	01 - Clear	01 - Daylight	01 - Traffic signal		02 - Non-fatal injury	07 - SMV other	01 - Dry
2014-09-18	2014	7:59	FRANKTOWN RD btwn JOY'S RD & PERTH ST	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	03 - Rear end	01 - Dry
2016-09-28	2016	3:00	FRANKTOWN RD btwn JOY'S RD & PERTH ST	01 - Clear	07 - Dark	10 - No control		03 - P.D. only	07 - SMV other	01 - Dry
2017-12-11	2017	8:49	PERTH ST @ QUEEN CHARLOTTE ST/ROCHELLE DR	01 - Clear	01 - Daylight	02 - Stop sign		03 - P.D. only	04 - Sideswipe	01 - Dry
2015-02-07	2015	4:38	PERTH ST @ QUEEN CHARLOTTE ST/ROCHELLE DR	01 - Clear	07 - Dark	02 - Stop sign		03 - P.D. only	07 - SMV other	02 - Wet
2017-02-20	2017	1:58	PERTH ST @ QUEEN CHARLOTTE ST/ROCHELLE DR	01 - Clear	07 - Dark	02 - Stop sign		02 - Non-fatal injury	07 - SMV other	06 - Ice
2018-10-09	2018	17:20	PERTH ST @ QUEEN CHARLOTTE ST/ROCHELLE DR (0009772)	01 - Clear	01 - Daylight	02 - Stop sign		03 - P.D. only	05 - Turning movement	01 - Dry
2015-08-23	2015	5:05	PERTH ST btwn FORTUNE ST & TARRYN TER	01 - Clear	07 - Dark	10 - No control		03 - P.D. only	07 - SMV other	01 - Dry
2014-10-13	2014	19:27	PERTH ST btwn FRANKTOWN RD & ROCHELLE DR	02 - Rain	07 - Dark	10 - No control		03 - P.D. only	05 - Turning movement	02 - Wet
2015-03-02	2015	19:05	PERTH ST btwn FRANKTOWN RD & ROCHELLE DR	03 - Snow	07 - Dark	10 - No control		03 - P.D. only	07 - SMV other	06 - Ice
2015-12-20	2015	5:41	PERTH ST btwn FRANKTOWN RD & ROCHELLE DR	03 - Snow	07 - Dark	10 - No control		02 - Non-fatal injury	07 - SMV other	06 - Ice
2017-06-17	2017	4:28	PERTH ST btwn FRANKTOWN RD & ROCHELLE DR	01 - Clear	07 - Dark	10 - No control		03 - P.D. only	07 - SMV other	01 - Dry
2018-03-31	2018	13:31	PERTH ST btwn NIXONFARM DR & LENNOX ST (__3ZA4Z2)	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	05 - Turning movement	01 - Dry
2018-04-19	2018	16:01	PERTH ST btwn TARRYN TER & NIXONFARM DR (__3ZA4Z2)	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	03 - Rear end	01 - Dry

Appendix E

TRANS Background Projection Plots

DRAFT

TRANS Regional Model

Version 2.13 - Assigned December 11, 2019

AM Peak Hour Total Traffic Volume

Richmond Area

2011 Model - Base Scenario

No Modifications from Base Version

User Initials: MM

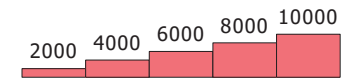
Plot Prepared: April 21, 2020

EMME Scenario: 21311



Legend

AM Peak Hour Total Traffic Volume



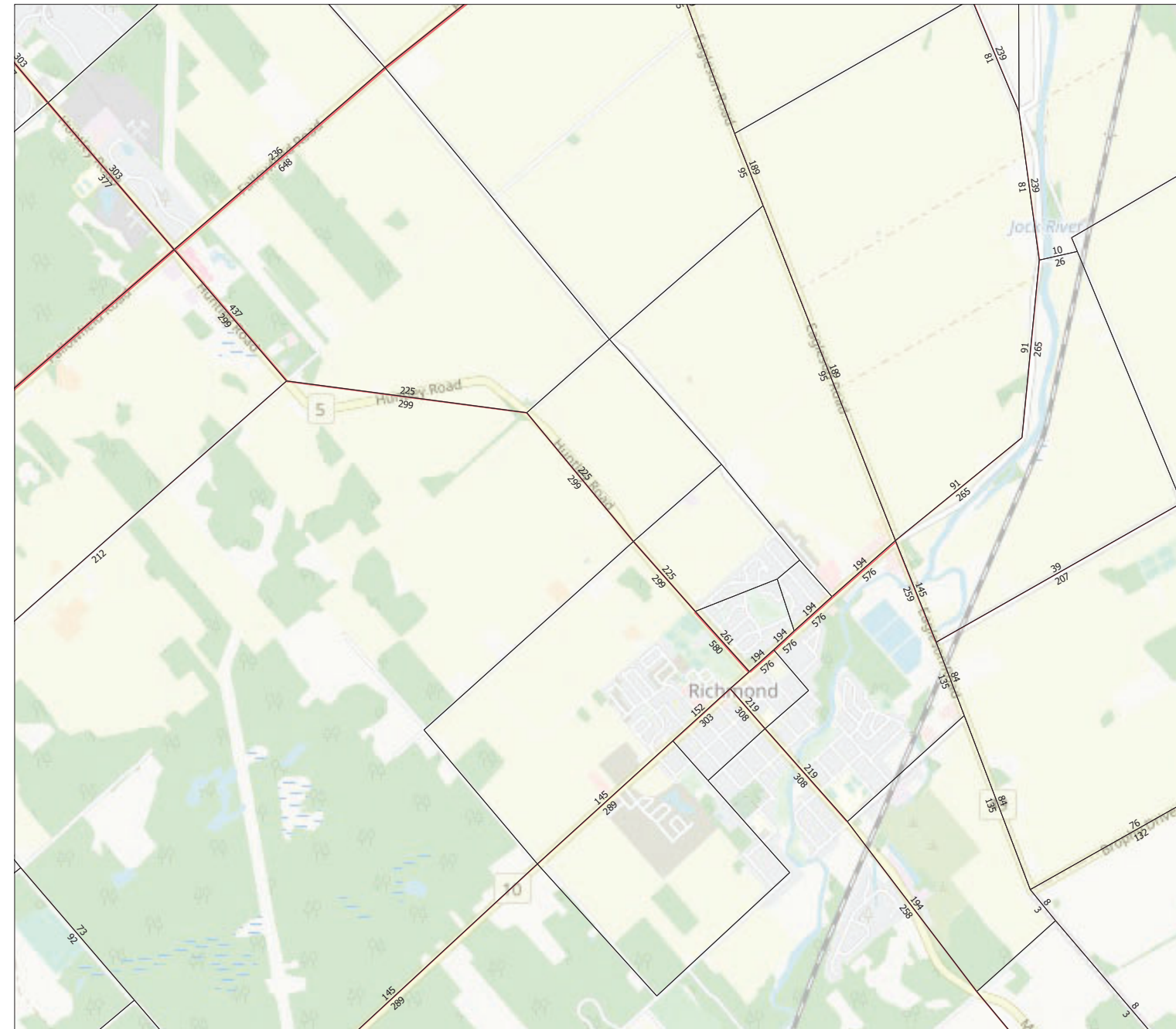
Distance (m)



The TRANS model is continuously refined & maintained, and all information is provided in good faith. However, model outputs are provided "as is", and no warranty or guarantee is provided as to the accuracy, reliability or reasonableness of the results. In using this data, you agree to accept any and all risks arising from any incorrect, incomplete, or misleading information.

Recipients are required to use caution and professional judgement in using and interpreting model outputs. In particular, caution should be used when focusing on a geographically limited area (such as a single road or intersection), as the model is primarily designed to simulate regional-scale phenomena and has been calibrated at a regional level.

As general good practice, it is recommended that the user confirm the network coding within the area of interest, and compare base year forecasts against traffic count data to assess the extent to which the model may be over- or under-estimating the travel demand.



TRANS Regional Model

Version 2.11 - Assigned February 19, 2020

AM Peak Hour Total Traffic Volume

Richmond Area

2031 Model - Affordable Road & Transit Network

No Modifications from Base Version

User Initials: MM

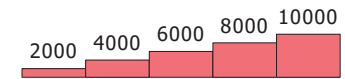
Plot Prepared: April 21, 2020

EMME Scenario: 21131



Legend

AM Peak Hour Total Traffic Volume



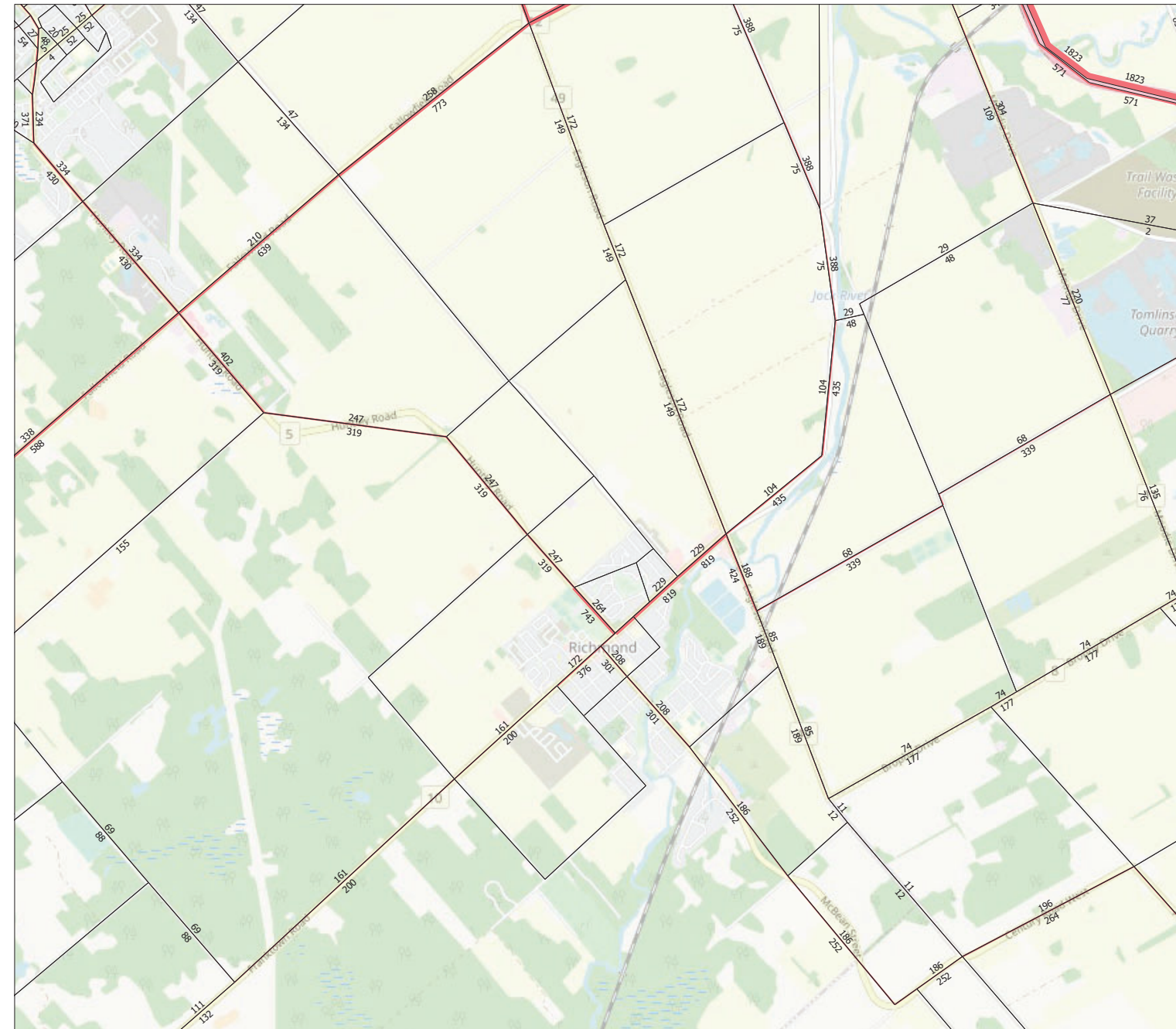
Distance (m)



The TRANS model is continuously refined & maintained, and all information is provided in good faith. However, model outputs are provided "as is", and no warranty or guarantee is provided as to the accuracy, reliability or reasonableness of the results. In using this data, you agree to accept any and all risks arising from any incorrect, incomplete, or misleading information.

Recipients are required to use caution and professional judgement in using and interpreting model outputs. In particular, caution should be used when focusing on a geographically limited area (such as a single road or intersection), as the model is primarily designed to simulate regional-scale phenomena and has been calibrated at a regional level.

As general good practice, it is recommended that the user confirm the network coding within the area of interest, and compare base year forecasts against traffic count data to assess the extent to which the model may be over- or under-estimating the travel demand.



Appendix F

Synchro Intersection Worksheets – 2025 Future Background Conditions

DRAFT

Intersection	2.8											
Int'l Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4T	4T	4T	4T	4T	4T	4T	4T	4T	4T	4T	4T
Traffic Vol, veh/h	1762	0	9	357	5	0	1	9	19	74	4	4
Future Vol, veh/h	1762	0	9	357	5	0	1	9	19	74	4	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	350	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	-	-	0	-	0	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1762	0	9	357	5	0	1	9	19	74	4	4
Major/Minor	Major1	Major2	Minor1	Minor2	Minor1	Minor2	Minor1	Minor2	Minor1	Minor2	Minor1	Minor2
Conflicting Flow All	362	0	0	762	0	0	1181	1144	381	762	1142	360
Stage 1	-	-	-	-	-	-	764	764	-	378	378	-
Stage 2	-	-	-	-	-	-	417	380	-	384	764	-
Critical Hdwy	413	-	-	4.13	-	-	7.33	6.53	6.93	7.33	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-
Follow-up Hdwy	2219	-	-	2219	-	-	3519	4019	3319	3519	4019	3319
Pot Cap-1 Maneuver	1195	-	-	848	-	-	156	199	618	307	200	684
Stage 1	-	-	-	-	-	-	363	412	-	643	614	-
Stage 2	-	-	-	-	-	-	612	613	-	611	412	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1195	-	-	848	-	-	109	197	618	299	198	684
Mov Cap-2 Maneuver	-	-	-	-	-	-	109	197	-	299	198	-
Stage 1	-	-	-	-	-	-	363	412	-	642	607	-
Stage 2	-	-	-	-	-	-	529	606	-	600	412	-
Approach	EB	WB	WB	EB	WB	WB	NB	NB	SB	SB	SB	SB
HCM Control Delay, s	0	0.2	0.2	12.2	33.9	33.9	B	B	D	D	D	D
HCM LOS												
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	509	1195	-	-	848	-	-	219				
HCM Lane V/C Ratio	0.02	0.001	-	-	0.011	-	-	0.443				
HCM Control Delay (s)	12.2	8	0	-	9.3	-	-	33.9				
HCM Lane LOS	B	A	A	A	A	A	A	D				
HCM 95th %ile Q(veh)	0.1	0	-	-	0	-	-	2.1				

MOVEMENT SUMMARY

Site: 101 [Perth-Meynell AM 2025]

Fox Run Phase 2
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Sat	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance Queued m	Prop. Queued	Effective Stop Rate Cycles	Aver. No. Cycles	Average Speed km/h
South: Meynell												
1	L2	47	1.0	0.350	12.0	LOS B	2.3	16.4	0.70	0.76	0.70	53.6
2	T1	1	1.0	0.350	7.4	LOS A	2.3	16.4	0.70	0.76	0.70	53.7
3	R2	266	1.0	0.350	7.2	LOS A	2.3	16.4	0.70	0.76	0.70	52.4
Approach												
		315	1.0	0.350	7.9	LOS A	2.3	16.4	0.70	0.76	0.70	52.6
East: Perth												
4	L2	143	1.0	0.327	9.1	LOS A	2.3	16.7	0.26	0.49	0.26	54.6
5	T1	293	2.0	0.327	4.5	LOS A	2.3	16.7	0.26	0.49	0.26	54.7
6	R2	35	1.0	0.327	4.2	LOS A	2.3	16.7	0.26	0.49	0.26	53.4
Approach												
		471	1.6	0.327	5.8	LOS A	2.3	16.7	0.26	0.49	0.26	54.6
North: Meynell												
7	L2	78	1.0	0.138	11.3	LOS B	0.8	5.4	0.58	0.70	0.58	52.7
8	T1	1	1.0	0.138	6.7	LOS A	0.8	5.4	0.58	0.70	0.58	52.7
9	R2	52	1.0	0.138	6.4	LOS A	0.8	5.4	0.58	0.70	0.58	51.5
Approach												
		131	1.0	0.138	9.3	LOS A	0.8	5.4	0.58	0.70	0.58	52.2
West: Perth												
10	L2	15	1.0	0.385	10.1	LOS B	2.5	18.1	0.49	0.55	0.49	54.4
11	T1	423	2.0	0.385	5.5	LOS A	2.5	18.1	0.49	0.55	0.49	54.4
12	R2	18	1.0	0.385	5.3	LOS A	2.5	18.1	0.49	0.55	0.49	53.2
Approach												
		456	1.9	0.385	5.7	LOS A	2.5	18.1	0.49	0.55	0.49	54.4
All Vehicles												
		1372	1.5	0.385	6.6	LOS A	2.5	18.1	0.47	0.59	0.47	53.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akeglik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Modal Designation.

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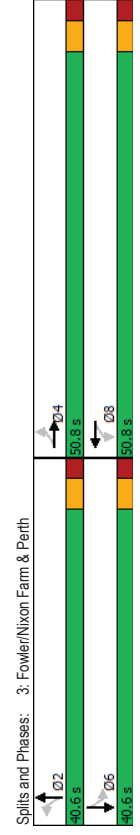
Lanes, Volumes, Timings
3: Fowler/Nixon Farm & Perth

Lanes, Volumes, Timings
3: Fowler/Nixon Farm & Perth

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations											
Traffic Volume (vph)	23	723	1	2	318	42	3	0	14	80	73
Future Volume (vph)	23	723	1	2	318	42	3	0	14	80	73
Satd. Flow (prot)	0	3309	0	0	3259	0	0	1537	0	1658	1665
Flt Permitted	0.938			0.953			0.933			0.746	
Satd. Flow (perm)	0	3110	0	0	3106	0	0	1447	0	1302	1665
Satd. Flow (RTOR)				22			33			28	
Lane Group Flow (vph)	0	747	0	0	362	0	0	17	0	80	105
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	
Protected Phases	4	4		8	8		2	2	6		6
Permitted Phases	4	4		8	8		2	2	6		6
Detector Phase	4	4		8	8		2	2	6		6
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8
Total Split (s)	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8
Total Split (%)	55.6%	55.6%	55.6%	55.6%	55.6%	55.6%	55.6%	55.6%	55.6%	55.6%	55.6%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.3	2.3	2.3	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	5.8	5.8	5.8	5.6	5.6	5.6	5.6	5.6
Lead/Lag Optimize?											
Recall Mode	Max	Max	Max	Max	Max	Max	None	None	None	None	None
Act Effct Green (s)	50.6	50.6	50.6	50.6	50.6	50.6	10.8	10.8	10.8	10.8	10.8
Actuated G/C Ratio	0.74	0.74	0.74	0.74	0.74	0.74	0.16	0.16	0.16	0.16	0.16
v/c Ratio	0.32	0.32	0.32	0.32	0.32	0.32	0.07	0.07	0.07	0.07	0.07
Control Delay	4.8	4.8	4.8	4.8	4.8	4.8	5.3	5.3	5.3	5.3	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.8	4.8	4.8	4.8	4.8	4.8	5.3	5.3	5.3	5.3	5.3
LOS	A	A	A	A	A	A	A	A	A	A	A
Approach Delay	4.8	4.8	4.8	4.8	4.8	4.8	5.3	5.3	5.3	5.3	5.3
Approach LOS	A	A	A	A	A	A	A	A	A	A	A
Queue Length 50th (m)	16.5	16.5	16.5	16.5	16.5	16.5	0.0	0.0	0.0	0.0	0.0
Queue Length 95th (m)	28.5	28.5	28.5	28.5	28.5	28.5	2.8	2.8	2.8	2.8	2.8
Internal Link Dist (m)	414.4	414.4	414.4	414.4	414.4	414.4	258.4	258.4	258.4	258.4	258.4
Turn Bay Length (m)											
Base Capacity (vph)	2302	2302	2302	2302	2302	2302	757	757	757	757	757
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.32	0.32	0.32	0.32	0.32	0.16	0.16	0.16	0.16	0.16
Intersection Summary											
Cycle Length: 91.4											
Actuated Cycle Length: 68.4											
Natural Cycle: 80											
Control Type: Semi Act-Uncoord											
Maximum v/c Ratio: 0.39											

Intersection Signal Delay: 7.7
Intersection Capacity Utilization 58.3%
Analysis Period (min) 15

Intersection LOS: A
ICU Level of Service B



Intersection	Int Delay, s/veh	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Int Delay, s/veh	13.2												
Lane Configurations		4T			4T			4T			4T		4T
Traffic Vol, veh/h		5	606	0	3	694	19	1	0	4	12	139	6
Future Vol, veh/h		5	606	0	3	694	19	1	0	4	12	139	6
Conflicting Peds, #/hr		0	0	0	0	0	0	0	0	0	0	0	0
Sign Control		Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized		-	-	None	-	-	None	-	-	None	-	-	None
Storage Length		350											
Veh in Median Storage, #		0			0			0			0		0
Grade, %		-			-			-			-		0
Peak Hour Factor		100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %		2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow		5	606	0	3	694	19	1	0	4	12	139	6
Major/Minor		Major1	Major2	Minor1	Minor2	Minor1	Minor2	Minor1	Minor2	Minor1	Minor2	Minor1	Minor2
Conflicting Flow All		713	0	0	606	0	0	1398	1335	303	1023	1326	704
Stage 1		-	-	-	-	-	-	616	616	-	710	710	-
Stage 2		-	-	-	-	-	-	782	719	-	313	616	-
Critical Hwy		413	-	-	413	-	-	733	653	693	733	653	623
Critical Hwy Stg 1		-	-	-	-	-	-	653	553	-	613	553	-
Critical Hwy Stg 2		-	-	-	-	-	-	613	553	-	653	553	-
Follow-up Hwy		2219	-	-	2219	-	-	3519	4019	3319	3519	4019	3319
Pot Cap-1 Maneuver		885	-	-	970	-	-	109	153	694	202	155	436
Stage 1		-	-	-	-	-	-	445	481	-	424	436	-
Stage 2		-	-	-	-	-	-	386	432	-	673	481	-
Platoon blocked, %		-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver		885	-	-	970	-	-	23	151	694	199	153	436
Mov Cap-2 Maneuver		-	-	-	-	-	-	23	151	-	199	153	-
Stage 1		-	-	-	-	-	-	441	477	-	420	435	-
Stage 2		-	-	-	-	-	-	258	431	-	663	477	-
Approach		EB	WB	WB	EB	WB	WB	NB	NB	SB	SB	SB	SB
HCM Control Delay, s		0.1	0	0	0	0	0	42.1	42.1	123	123	123	123
HCM LOS		E	F	F	F	F	F	E	E	F	F	F	F
Minor Lane/Major Mvmt Capacity (veh/h)		NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	WBR	SBLn1	SBLn1	SBLn1	SBLn1
HCM Lane V/C Ratio		102	885	-	-	970	-	-	-	160	-	-	-
HCM Control Delay (s)		0.049	0.006	-	-	0.003	-	-	-	0.981	-	-	-
HCM Lane LOS		E	A	A	A	A	A	A	A	F	F	F	F
HCM 95th %ile Q(veh)		0.2	0	-	-	0	-	-	-	7.5	-	-	-

MOVEMENT SUMMARY

Site: 101 [Perth-Meynell PM 2025]

Fox Run Phase 2
Site Category: (None)
Roundabout

Mov ID	Turn	Demand Flows Total	HV %	Deg. Sat	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
Movement Performance - Vehicles												
		veh/h	%	v/c	sec		veh	m				km/h
South: Meynell												
1	L2	31	1.0	0.249	11.8	LOS B	1.6	11.1	0.68	0.73	0.68	54.0
2	T1	1	1.0	0.249	7.1	LOS A	1.6	11.1	0.68	0.73	0.68	54.0
3	R2	187	1.0	0.249	7.0	LOS A	1.6	11.1	0.68	0.73	0.68	52.7
Approach		219	1.0	0.249	7.6	LOS A	1.6	11.1	0.68	0.73	0.68	52.8
East: Perth												
4	L2	256	1.0	0.528	9.2	LOS A	4.8	33.8	0.30	0.49	0.30	54.5
5	T1	485	2.0	0.528	4.4	LOS A	4.8	33.8	0.30	0.49	0.30	54.6
6	R2	56	1.0	0.528	4.2	LOS A	4.8	33.8	0.30	0.49	0.30	53.3
Approach		797	1.6	0.528	5.9	LOS A	4.8	33.8	0.30	0.49	0.30	54.5
North: Meynell												
7	L2	115	1.0	0.248	14.0	LOS B	1.6	11.2	0.77	0.84	0.77	50.6
8	T1	1	1.0	0.248	9.5	LOS A	1.6	11.2	0.77	0.84	0.77	50.7
9	R2	65	1.0	0.248	9.1	LOS A	1.6	11.2	0.77	0.84	0.77	49.6
Approach		181	1.0	0.248	12.2	LOS B	1.6	11.2	0.77	0.84	0.77	50.2
West: Perth												
10	L2	25	1.0	0.441	11.3	LOS B	3.0	21.5	0.64	0.67	0.64	53.7
11	T1	382	2.0	0.441	6.8	LOS A	3.0	21.5	0.64	0.67	0.64	53.7
12	R2	51	1.0	0.441	6.5	LOS A	3.0	21.5	0.64	0.67	0.64	52.4
Approach		458	1.8	0.441	7.0	LOS A	3.0	21.5	0.64	0.67	0.64	53.5
All Vehicles		1655	1.5	0.528	7.1	LOS A	4.8	33.8	0.50	0.61	0.50	53.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akeglik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Modal Designation.

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations	42	593	1	16	753	101	2	2	15	58	138
Traffic Volume (vph)	42	593	1	16	753	101	2	2	15	58	138
Future Volume (vph)	0	306	0	0	3256	0	0	1551	0	1658	1889
Satd. Flow (prot)	0.857	0.940						0.964		0.745	
FI Permitted											
Satd. Flow (perm)	0	2842	0	0	3064	0	0	1502	0	1300	1889
Satd. Flow (RTOR)								15		18	
Lane Group Flow (vph)	0	636	0	0	870	0	0	19	0	58	176
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	
Protected Phases	4	4		8	8		2	2		6	6
Permitted Phases	4	4		8	8		2	2		6	6
Detector Phase	4	4		8	8		2	2		6	6
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	24.8	24.8	24.8	24.8	24.8	40.6	40.6	40.6	40.6	40.6	40.6
Total Split (s)	50.8	50.8	50.8	50.8	50.8	40.6	40.6	40.6	40.6	40.6	40.6
Total Split (%)	55.6%	55.6%	55.6%	55.6%	55.6%	44.4%	44.4%	44.4%	44.4%	44.4%	44.4%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.3	2.3	2.3	2.3	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8		5.8	5.8		5.6	5.6		5.6	5.6

Lead-Lag Optimize?

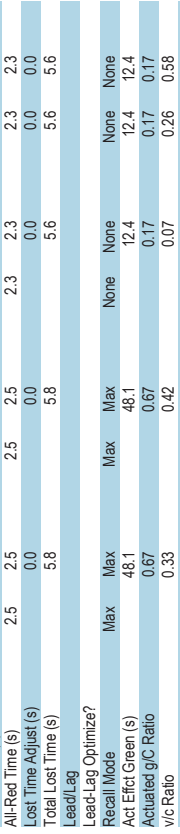
Recall Mode	Max	Max	Max	None	None	None
Act Effct Green (s)	48.1	48.1	12.4	12.4	12.4	12.4
Actuated G/C Ratio	0.67	0.67	0.17	0.17	0.17	0.17
v/c Ratio	0.33	0.42	0.07	0.07	0.26	0.58
Control Delay	6.1	6.5	13.8	13.8	27.2	31.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.1	6.5	13.8	13.8	27.2	31.4
LOS	A	A	B	B	C	C
Approach Delay	6.1	6.5	13.8	13.8	30.4	30.4
Approach LOS	A	A	B	B	C	C
Queue Length 50th (m)	15.3	21.8	0.4	0.4	6.4	18.3
Queue Length 95th (m)	28.4	39.7	5.1	5.1	15.3	35.1
Internal Link Dist (m)	414.4	185.4	258.4	258.4	148.6	148.6
Turn Bay Length (m)					15.0	
Base Capacity (vph)	1900	2056	740	740	634	833
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.42	0.03	0.03	0.09	0.21

Intersection Summary

Cycle Length: 91.4
Actuated Cycle Length: 72
Natural Cycle: 70
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.58

6295, 6363, 6409 Perth St PM Peak Hour

6295, 6363, 6409 Perth St PM Peak Hour



Appendix G

Signal Warrants – Justification 7

DRAFT

1: Queen Charlotte/Rochelle & Perth

Intersection	Init Delay, s/veh												
	5.2												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	4T			4T					4T			4T	
Traffic Vol, veh/h	1 1009	0	9	485	5	0	1	9	19	74	4		
Future Vol, veh/h	1 1009	0	9	485	5	0	1	9	19	74	4		
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	
Storage Length	350			0			0			0		0	
Veh in Median Storage, #	0			0			0			0		0	
Grade, %													
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	1 1009	0	9	485	5	0	1	9	19	74	4		
Major/Minor	Major1	Major2					Minor1						Minor2
Conflicting Flow All	490	0	0	1009	0	0	1556	1519	505	1013	1517	488	
Stage 1	-	-	-	-	-	-	1011	1011	-	506	506	-	
Stage 2	-	-	-	-	-	-	545	508	-	507	1011	-	
Critical Hwy	4.13	-	-	4.13	-	-	7.33	6.53	6.93	7.33	6.53	6.23	
Critical Hwy Stg 1	-	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-	
Critical Hwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-	
Follow-up Hwy	2.219	-	-	2.219	-	-	3.519	4.019	3.319	3.519	4.019	3.319	
Pot Cap-1 Maneuver	1071	-	-	685	-	-	84	118	513	205	119	579	
Stage 1	-	-	-	-	-	-	257	316	-	548	539	-	
Stage 2	-	-	-	-	-	-	522	538	-	517	316	-	
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-	
Mov Cap-1 Maneuver	1071	-	-	685	-	-	41	116	513	198	117	579	
Mov Cap-2 Maneuver	-	-	-	-	-	-	41	116	-	198	117	-	
Stage 1	-	-	-	-	-	-	256	315	-	547	532	-	
Stage 2	-	-	-	-	-	-	440	531	-	505	315	-	
Approach	EB	WB	WB	EB	WB	WB	NB	NB	SB	SB	SB	SB	
HCM Control Delay, s	0	0.2	0.2	14.7	14.7	14.7	84.8	84.8	84.8	84.8	84.8	84.8	
HCM LOS	B												
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1					
Capacity (veh/h)	382	1071	-	-	685	-	-	132					
HCM Lane V/C Ratio	0.026	0.001	-	-	0.013	-	-	0.735					
HCM Control Delay (s)	14.7	8.4	0	-	10.3	-	-	84.8					
HCM Lane LOS	B	A	A	A	B	-	-	F					
HCM 95th %ile Q(veh)	0.1	0	-	-	0	-	-	4.2					

MOVEMENT SUMMARY

Site: 101 [Perth-Meynell AM 2030]

Fox Run Phase 2
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total	HV %	Deg. Sat	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	v/c	sec		veh	m				km/h
South: Meynell												
1	L2	51	1.0	0.629	15.8	LOS B	6.5	46.1	0.89	0.98	1.11	51.0
2	T1	1	1.0	0.629	11.2	LOS B	6.5	46.1	0.89	0.98	1.11	51.1
3	R2	480	1.0	0.629	11.0	LOS B	6.5	46.1	0.89	0.98	1.11	49.9
Approach		532	1.0	0.629	11.4	LOS B	6.5	46.1	0.89	0.98	1.11	50.0
East: Perth												
4	L2	239	1.0	0.422	9.2	LOS A	3.5	24.7	0.32	0.51	0.32	54.2
5	T1	313	2.0	0.422	4.5	LOS A	3.5	24.7	0.32	0.51	0.32	54.2
6	R2	54	1.0	0.422	4.3	LOS A	3.5	24.7	0.32	0.51	0.32	52.9
Approach		605	1.5	0.422	6.3	LOS A	3.5	24.7	0.32	0.51	0.32	54.1
North: Meynell												
7	L2	124	1.0	0.222	12.3	LOS B	1.3	9.5	0.68	0.77	0.68	51.7
8	T1	1	1.0	0.222	7.7	LOS A	1.3	9.5	0.68	0.77	0.68	51.7
9	R2	63	1.0	0.222	7.5	LOS A	1.3	9.5	0.68	0.77	0.68	50.6
Approach		188	1.0	0.222	10.7	LOS B	1.3	9.5	0.68	0.77	0.68	51.3
West: Perth												
10	L2	19	1.0	0.449	11.3	LOS B	3.1	22.0	0.64	0.67	0.64	53.7
11	T1	423	2.0	0.449	6.7	LOS A	3.1	22.0	0.64	0.67	0.64	53.7
12	R2	21	1.0	0.449	6.4	LOS A	3.1	22.0	0.64	0.67	0.64	52.5
Approach		463	1.9	0.449	6.8	LOS A	3.1	22.0	0.64	0.67	0.64	53.6
All Vehicles		1788	1.4	0.629	8.4	LOS A	6.5	46.1	0.61	0.72	0.68	52.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akeglik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Modal Designation.

SIDRA INTERSECTION 8.0 | Copyright © 2000-2019 Akcelik and Associates Pty Ltd | sifrasolutions.com
 Organisation: CGH TRANSPORTATION | Processed: June 30, 2020 10:38:38 AM
 Project: C:\Users\Andrew.Harte\CGH TRANSPORTATION\CGH Working - Documents\Projects\2019-64 Calvan 6295, 6363, 6409 Perth St.DAT
 sidra\2019-64 GreenLaffin.sip8

2030 Future Background
06-30-2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations	23	970	1	2	446	42	3	0	14	80	73
Traffic Volume (vph)	23	970	1	2	446	42	3	0	14	80	73
Future Volume (vph)	0	3812	0	0	3273	0	0	1537	0	1658	1665
Satd. Flow (prot)	0.938			0.953			0.933		0.746		
Flt Permitted	0	3110	0	0	3119	0	0	1447	0	1302	1665
Satd. Flow (RTOR)		15		33			33		28		
Lane Group Flow (vph)	0	994	0	0	490	0	0	17	0	80	105
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	NA
Protected Phases	4	4		8	8		2	2		6	6
Permitted Phases	4	4		8	8		2	2		6	6
Detector Phase	4	4		8	8		2	2		6	6
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	50.8	50.8	50.8	50.8	50.8	50.8	40.6	40.6	40.6	40.6	40.6
Total Split (s)	50.8	50.8	50.8	50.8	50.8	50.8	44.4%	44.4%	44.4%	44.4%	44.4%
Total Split (%)	55.6%	55.6%	55.6%	55.6%	55.6%	55.6%	44.4%	44.4%	44.4%	44.4%	44.4%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.3	2.3	2.3	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	5.8	5.8	5.8	5.6	5.6	5.6	5.6	5.6

Lead/Lag Optimize?

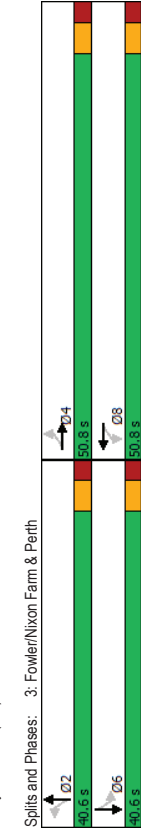
Recall Mode	Max	Max	Max	None	None	None
Act Effct Green (s)	50.6	50.6	10.8	10.8	10.8	10.8
Actuated G/C Ratio	0.74	0.74	0.16	0.16	0.16	0.16
v/c Ratio	0.43	0.21	0.07	0.39	0.37	0.37
Control Delay	5.6	4.1	5.3	31.7	23.4	23.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.6	4.1	5.3	31.7	23.4	23.4
LOS	A	A	A	C	C	C
Approach Delay	5.6	4.1	5.3	27.0	27.0	27.0
Approach LOS	A	A	A	C	C	C
Queue Length 50th (m)	24.6	9.4	0.0	9.0	8.5	8.5
Queue Length 95th (m)	41.6	17.1	2.8	20.1	20.6	20.6
Internal Link Dist (m)	414.4	185.4	258.4	148.6	148.6	148.6
Turn Bay Length (m)				15.0		
Base Capacity (vph)	2302	2312	757	666	666	666
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.21	0.02	0.12	0.12	0.12

Intersection Summary

Cycle Length: 91.4
Actuated Cycle Length: 68.4
Natural Cycle: 80
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.43

Intersection Signal Delay: 7.5
Intersection Capacity Utilization 66.6%
Analysis Period (min) 15

Intersection LOS: A
ICU Level of Service C



Intersection	45.2											
Int'l Delay, s/veh	45.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4T	4T	4T	4T	4T	4T	4T	4T	4T	4T	4T	4T
Traffic Vol, veh/h	5 823	0	3 981	19	1	0	4	12	139	6		
Future Vol, veh/h	5 823	0	3 981	19	1	0	4	12	139	6		
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	None	-	None	-	None	-	None	-
Storage Length	350	-	0	-	0	-	0	-	0	-	0	-
Veh in Median Storage, #	0	-	0	-	0	-	0	-	0	-	0	-
Grade, %	-	-	0	-	0	-	0	-	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5 823	0	3 981	19	1	0	4	12	139	6		
Major/Minor	Major1	Major2	Minor1	Minor2	Minor1	Minor2	Minor1	Minor2	Minor1	Minor2	Minor1	Minor2
Conflicting Flow All	1000	0	823	0	1902	1839	412	1419	1830	981		
Stage 1	-	-	-	-	-	833	833	-	997	997	-	-
Stage 2	-	-	-	-	-	1069	1006	-	422	833	-	-
Critical Hwy	4.13	-	4.13	-	-	7.33	6.53	6.93	7.33	6.53	6.23	-
Critical Hwy Stg 1	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-	-
Critical Hwy Stg 2	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-	-
Follow-up Hwy	2.219	-	2.219	-	-	3.519	4.019	3.319	3.519	4.019	3.319	-
Pot Cap-1 Maneuver	690	-	805	-	-	47	76	590	105	~76	298	-
Stage 1	-	-	-	-	-	330	383	-	293	321	-	-
Stage 2	-	-	-	-	-	267	318	-	581	383	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	690	-	805	-	-	74	590	103	~75	298	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	326	378	-	289	320	-	-
Stage 1	-	-	-	-	-	147	317	-	570	378	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Approach	EB	WB	NB	NB	SB	SB						
HCM Control Delay, s	0.2	0			\$ 572.9	F						
HCM LOS												
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	690	-	-	-	805	-	-	79				
HCM Lane V/C Ratio	0.007	-	-	-	0.004	-	-	1.987				
HCM Control Delay (s)	10.3	0.1	-	-	9.5	-	-	\$ 572.9				
HCM Lane LOS	B	A	-	-	A	-	-	F				
HCM 95th %ile Q(veh)	0	-	-	-	0	-	-	14				
Notes												
- Volume exceeds capacity	\$ Delay exceeds 300s + Computation Not Defined *											
- All major volume in platoon												

MOVEMENT SUMMARY

Site: 101 [Perth-Meynell PM 2030]

Fox Run Phase 2
Site Category: (None)
Roundabout

Movement Performance - Vehicles													
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Sat	Average Delay sec	Level of Service	95% Back of Queue Vehicles	Distance Queued m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h	
South: Meynell													
1	L2	34	1.0	0.495	13.8	LOS B	4.1	29.1	0.85	0.89	0.93	52.5	
2	T1	1	1.0	0.495	9.2	LOS A	4.1	29.1	0.85	0.89	0.93	52.6	
3	R2	359	1.0	0.495	8.9	LOS A	4.1	29.1	0.85	0.89	0.93	51.4	
Approach													
		394	1.0	0.495	9.4	LOS A	4.1	29.1	0.85	0.89	0.93	51.5	
East: Perth													
4	L2	509	1.0	0.741	9.6	LOS A	10.2	72.6	0.52	0.51	0.52	53.3	
5	T1	485	2.0	0.741	4.9	LOS A	10.2	72.6	0.52	0.51	0.52	53.3	
6	R2	104	1.0	0.741	4.7	LOS A	10.2	72.6	0.52	0.51	0.52	52.1	
Approach													
		1099	1.4	0.741	7.1	LOS A	10.2	72.6	0.52	0.51	0.52	53.2	
North: Meynell													
7	L2	145	1.0	0.435	20.0	LOS C	3.6	25.1	0.97	1.04	1.10	46.7	
8	T1	1	1.0	0.435	15.4	LOS B	3.6	25.1	0.97	1.04	1.10	46.8	
9	R2	73	1.0	0.435	15.2	LOS B	3.6	25.1	0.97	1.04	1.10	45.8	
Approach													
		219	1.0	0.435	18.4	LOS B	3.6	25.1	0.97	1.04	1.10	46.4	
West: Perth													
10	L2	37	1.0	0.637	17.5	LOS B	6.7	47.8	0.91	1.04	1.21	49.9	
11	T1	408	2.0	0.637	12.9	LOS B	6.7	47.8	0.91	1.04	1.21	49.9	
12	R2	57	1.0	0.637	12.6	LOS B	6.7	47.8	0.91	1.04	1.21	48.9	
Approach													
		502	1.8	0.637	13.2	LOS B	6.7	47.8	0.91	1.04	1.21	49.8	
All Vehicles		2214	1.4	0.741	10.0	LOS A	10.2	72.6	0.71	0.75	0.81	51.3	

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

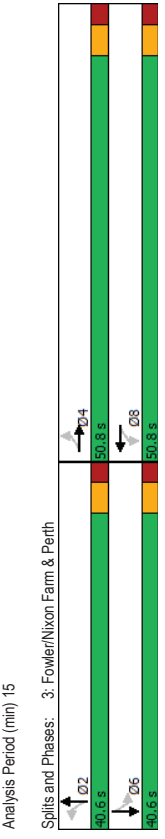
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akeglik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Modal Designation.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations	42	812	1	16	1040	101	2	2	15	58	138
Traffic Volume (vph)	42	812	1	16	1040	101	2	2	15	58	138
Future Volume (vph)	0	3309	0	0	3269	0	0	1551	0	1658	1889
Satd. Flow (prot)	0.847	0.939					0.964		0.745		
FI Permitted											
Satd. Flow (perm)	0	2808	0	0	3073	0	0	1502	0	1300	1689
Satd. Flow (RTOR)				15			15				18
Lane Group Flow (vph)	0	855	0	0	1157	0	0	19	0	58	176
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	
Protected Phases	4	4		8	8		2	2	6	6	
Permitted Phases	4	4		8	8		2	2	6	6	
Detector Phase	4	4		8	8		2	2	6	6	
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	24.8	24.8	24.8	24.8	24.8	24.8	40.6	40.6	40.6	40.6	40.6
Total Split (s)	50.8	50.8	50.8	50.8	50.8	50.8	40.6	40.6	40.6	40.6	40.6
Total Split (%)	55.6%	55.6%	55.6%	55.6%	55.6%	55.6%	44.4%	44.4%	44.4%	44.4%	44.4%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.3	2.3	2.3	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8		5.8			5.6		5.6		5.6
Lead/Lag Optimize?											
Recall Mode	Max	Max	Max	Max	Max	Max	None	None	None	None	None
Act Effct Green (s)	48.1	48.1		48.1			12.4		12.4		12.4
Actuated G/C Ratio	0.67	0.67		0.67			0.17		0.17		0.17
v/c Ratio	0.46	0.46		0.56			0.07		0.26		0.58
Control Delay	7.1	8.0		8.0			13.8		27.2		31.4
Queue Delay	0.0	0.0		0.0			0.0		0.0		0.0
Total Delay	7.1	8.0		8.0			13.8		27.2		31.4
LOS	A	A		A			B		C		C
Approach Delay	7.1	8.0		8.0			13.8		30.4		30.4
Approach LOS	A	A		A			B		C		C
Queue Length 50th (m)	22.9	34.0		34.0			0.4		6.4		18.3
Queue Length 95th (m)	42.0	60.9		60.9			5.1		15.3		35.1
Internal Link Dist (m)	414.4	185.4		185.4			258.4		148.6		148.6
Turn Bay Length (m)									15.0		
Base Capacity (vph)	1877	2059		2059			740		634		833
Starvation Cap Reductn	0	0		0			0		0		0
Spillback Cap Reductn	0	0		0			0		0		0
Storage Cap Reductn	0	0		0			0		0		0
Reduced v/c Ratio	0.46	0.56		0.56			0.03		0.09		0.21

Intersection Summary	
Cycle Length:	91.4
Actuated Cycle Length:	72
Natural Cycle:	80
Control Type:	Sem Act-Uncoord
Maximum v/c Ratio:	0.58



Appendix H

Synchro Intersection Worksheets – 2030 Future Background Conditions

DRAFT

Multi-Modal Level of Service - Intersections Form

Consultant	CGH Transportation	Project	2019-64 - 6295, 6363, 6409
Scenario	Existing and Future	Date	Perth, 6305 Ottawa
Comments			07-Jul-20

INTERSECTIONS		Perth & Nixon Farm/Fowler			
Crossing Side		NORTH	SOUTH	EAST	WEST
Pedestrian	Lanes	3	0 - 2	4	4
	Median	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m
	Conflicting Left Turns	Permissive	Permissive	Permissive	Permissive
	Conflicting Right Turns	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control
	Right Turns on Red (RTOR) ?	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed
	Ped Signal Leading Interval?	No	No	No	No
	Right Turn Channel	No Channel	No Channel	No Channel	No Channel
	Corner Radius	5-10m	5-10m	5-10m	5-10m
	Crosswalk Type	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings
	PETSI Score	71	86	54	54
	Ped. Exposure to Traffic LoS	C	B	D	D
	Cycle Length				
	Effective Walk Time				
	Average Pedestrian Delay				
Pedestrian Delay LoS	-	-	-	-	
Level of Service	C	B	D	D	
D					
Approach From		NORTH	SOUTH	EAST	WEST
Bicycle	Bicycle Lane Arrangement on Approach	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic
	Right Turn Lane Configuration	≤ 50 m	≤ 50 m	≤ 50 m	≤ 50 m
	Right Turning Speed	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h
	Cyclist relative to RT motorists	D	D	D	D
	Separated or Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic
	Left Turn Approach	No lane crossed	No lane crossed	No lane crossed	No lane crossed
	Operating Speed	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h
	Left Turning Cyclist	B	B	C	C
Level of Service	D	D	D	D	
D					
Transit	Average Signal Delay			≤ 10 sec	≤ 10 sec
	Level of Service	-	-	B	B
B					
Truck	Effective Corner Radius			< 10 m	< 10 m
	Number of Receiving Lanes on Departure from Intersection			1	1
	Level of Service	-	-	F	F
F					
Auto	Volume to Capacity Ratio	0.61 - 0.70			
	Level of Service	B			

Multi-Modal Level of Service - Segments Form

Consultant	CGH Transportation	Project	2019-64 - 6295, 6363, 6409
Scenario	Existing and Future		Perth, 6305 Ottawa
Comments		Date	07-Jul-20

SEGMENTS		Street A	Meynell 1	Oldenburg 2	Ex. Perth 3	Mira 4	Cedarstone 5	Burke 6	Ex. Ottawa 7	Fut. Ottawa 9
Pedestrian	Sidewalk Width Boulevard Width	E	1.8 m 0.5 - 2 m	1.8 m < 0.5 m	no sidewalk n/a	no sidewalk n/a	1.5 m < 0.5 m	no sidewalk n/a	no sidewalk n/a	≥ 2 m < 0.5
	Avg Daily Curb Lane Traffic Volume		> 3000	> 3000	> 3000	≤ 3000	≤ 3000	≤ 3000	≤ 3000	> 3000
	Operating Speed On-Street Parking		> 30 to 50 km/h yes	> 30 to 50 km/h yes	> 60 km/h no	> 30 to 50 km/h yes	> 30 to 50 km/h yes	≤ 30 km/h yes	> 60 km/h no	> 50 to 60 km/h no
	Exposure to Traffic PLoS		C	C	F	F	E	C	F	E
	Effective Sidewalk Width		2.0 m	1.5 m			1.5 m			2.0 m
	Pedestrian Volume		250 ped/hr	250 ped/hr			250 ped/hr			250 ped/hr
	Crowding PLoS		B	B	-	-	B	-	-	B
Level of Service	C	C	-	-	E	-	-	E		
Bicycle	Type of Cycling Facility	F	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic
	Number of Travel Lanes		≤ 2 (no centreline)	≤ 2 (no centreline)	2-3 lanes total	≤ 2 (no centreline)	≤ 2 (no centreline)	≤ 2 (no centreline)	≤ 2 (no centreline)	≤ 2 (no centreline)
	Operating Speed		≤ 40 km/h	≤ 40 km/h	≥ 60 km/h	≤ 40 km/h	≤ 40 km/h	≤ 40 km/h	≥ 60 km/h	≥ 50 to 60 km/h
	# of Lanes & Operating Speed LoS		A	A	F	A	A	A	F	D
	Bike Lane (+ Parking Lane) Width									
	Bike Lane Width LoS		-	-	-	-	-	-	-	-
	Bike Lane Blockages									
	Blockage LoS		-	-	-	-	-	-	-	-
	Median Refuge Width (no median = < 1.8 m) No. of Lanes at Unsignalized Crossing		< 1.8 m refuge ≤ 3 lanes	< 1.8 m refuge ≤ 3 lanes	< 1.8 m refuge ≤ 3 lanes	< 1.8 m refuge ≤ 3 lanes	< 1.8 m refuge ≤ 3 lanes	< 1.8 m refuge ≤ 3 lanes	< 1.8 m refuge ≤ 3 lanes	< 1.8 m refuge ≤ 3 lanes
Sidestreet Operating Speed Unsignalized Crossing - Lowest LoS	≤ 40 km/h A	≤ 40 km/h A	>40 to 50 km/h A	≤ 40 km/h A	≤ 40 km/h A	≤ 40 km/h A	≤ 40 km/h A	≥ 65 km/h D	>50 to 60 km/h B	
Level of Service	A	A	F	A	A	A	A	F	D	
Transit	Facility Type	D	Mixed Traffic		Mixed Traffic					Mixed Traffic
	Friction or Ratio Transit:Posted Speed		Vt/Vp ≥ 0.8		Vt/Vp ≥ 0.8					Vt/Vp ≥ 0.8
	Level of Service		D	-	D	-	-	-	-	D
Truck	Truck Lane Width	C			≤ 3.5 m					
	Travel Lanes per Direction				1					
Level of Service	-	-	C	-	-	-	-	-	-	
Auto	Level of Service	Not Applicable								

Appendix I

MMLOS Analysis

DRAFT

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

Legend

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

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

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

TDM measures: Residential developments		Check if proposed & add descriptions
1. TDM PROGRAM MANAGEMENT		
1.1 Program coordinator		
BASIC ★	1.1.1 Designate an internal coordinator, or contract with an external coordinator	<input 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 (<i>multi-family, condominium</i>)	<input type="checkbox"/>
2.2 Bicycle skills training		
BETTER	2.2.1 Offer on-site cycling courses for residents, or subsidize off-site courses	<input type="checkbox"/>

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

TDM measures: Residential developments		Check if proposed & add descriptions
6. TDM MARKETING & COMMUNICATIONS		
6.1 Multimodal travel information		
BASIC ★	6.1.1 Provide a multimodal travel option information package to new residents	<input checked="" type="checkbox"/>
6.2 Personalized trip planning		
BETTER ★	6.2.1 Offer personalized trip planning to new residents	<input checked="" type="checkbox"/>

Appendix J

Synchro Intersection Worksheets – 2025 Future Total Conditions

DRAFT

2025 Future Total
07-10-2020

1: Queen Charlotte/Rochelle & Perth

Intersection	Int Delay, s/veh	0.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	4	907	0	9	533	14	0	1	9	19	1	12	
Traffic Vol, veh/h	4	907	0	9	533	14	0	1	9	19	1	12	
Future Vol, veh/h	4	907	0	9	533	14	0	1	9	19	1	12	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	
Storage Length	350	-	-	0	-	-	-	-	-	-	-	-	
Veh in Median Storage, #	0	-	-	0	-	-	-	-	0	-	-	0	
Grade, %	-	0	-	-	0	-	-	-	0	-	-	0	
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	4	907	0	9	533	14	0	1	9	19	1	12	
Major/Minor	Major1	Major2	Minor1	Minor2	Minor2	Minor2	Minor2	Minor2	Minor2	Minor2	Minor2	Minor2	
Conflicting Flow All	547	0	0	907	0	0	1480	1480	454	1020	1473	540	
Stage 1	-	-	-	-	-	-	915	915	-	558	558	-	
Stage 2	-	-	-	-	-	-	565	565	-	462	462	-	
Critical Hwy	4.13	-	-	4.13	-	-	7.33	6.53	6.83	7.33	6.53	6.23	
Critical Hwy Stg 1	-	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-	
Critical Hwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-	
Follow-up Hwy	2.219	-	-	2.219	-	-	3.519	4.019	3.319	3.519	4.019	3.319	
Pot Cap-1 Maneuver	1020	-	-	748	-	-	95	126	554	203	126	541	
Stage 1	-	-	-	-	-	-	294	351	-	513	511	-	
Stage 2	-	-	-	-	-	-	509	507	-	550	351	-	
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-	
Mov Cap-1 Maneuver	1020	-	-	748	-	-	91	123	554	195	123	541	
Mov Cap-2 Maneuver	-	-	-	-	-	-	91	123	-	195	123	-	
Stage 1	-	-	-	-	-	-	292	348	-	509	505	-	
Stage 2	-	-	-	-	-	-	491	501	-	535	348	-	
Approach	EB	WB	WB	EB	WB	WB	NB	NB	SB	SB	SB	SB	
HCM Control Delay, s	0	0.2	0.2	0.2	0.2	0.2	14	14	21.5	21.5	21.5	21.5	
HCM LOS	B	B	B	B	B	B	B	B	C	C	C	C	
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT	WBR	NBLn1	NBLn1	WBR	WBR	WBR	WBR	
Capacity (veh/h)	410	1020	-	-	748	-	-	-	250	-	-	-	
HCM Lane V/C Ratio	0.024	0.004	-	-	0.012	-	-	-	0.128	-	-	-	
HCM Control Delay (s)	14	8.5	0	-	9.9	-	-	-	21.5	-	-	-	
HCM Lane LOS	B	A	A	A	A	A	A	A	C	C	C	C	
HCM 95th %ile Q(veh)	0.1	0	-	-	0	-	-	-	0.4	-	-	-	

MOVEMENT SUMMARY

Site: 101 [Perth-Meynell AM FT2025]

Fox Run Phase 2
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total	HV %	Deg. Sat	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	v/c	sec		veh	m				km/h
South: Meynell												
1	L2	54	1.0	0.473	14.9	LOS B	3.8	26.9	0.86	0.92	0.96	51.5
2	T1	1	1.0	0.473	10.3	LOS B	3.8	26.9	0.86	0.92	0.96	51.5
3	R2	299	1.0	0.473	10.1	LOS B	3.8	26.9	0.86	0.92	0.96	50.4
Approach		354	1.0	0.473	10.8	LOS B	3.8	26.9	0.86	0.92	0.96	50.5
East: Perth												
4	L2	160	1.0	0.417	9.3	LOS A	3.2	22.8	0.36	0.51	0.36	54.4
5	T1	301	2.0	0.417	4.7	LOS A	3.2	22.8	0.36	0.51	0.36	54.4
6	R2	114	1.0	0.417	4.5	LOS A	3.2	22.8	0.36	0.51	0.36	53.2
Approach		575	1.5	0.417	5.9	LOS A	3.2	22.8	0.36	0.51	0.36	54.2
North: Meynell												
7	L2	234	1.0	0.372	12.1	LOS B	2.4	17.3	0.70	0.79	0.70	51.8
8	T1	1	1.0	0.372	7.5	LOS A	2.4	17.3	0.70	0.79	0.70	51.8
9	R2	103	1.0	0.372	7.3	LOS A	2.4	17.3	0.70	0.79	0.70	50.7
Approach		338	1.0	0.372	10.6	LOS B	2.4	17.3	0.70	0.79	0.70	51.4
West: Perth												
10	L2	41	1.0	0.494	11.7	LOS B	3.7	26.2	0.70	0.71	0.71	53.3
11	T1	426	2.0	0.494	7.1	LOS A	3.7	26.2	0.70	0.71	0.71	53.3
12	R2	21	1.0	0.494	6.8	LOS A	3.7	26.2	0.70	0.71	0.71	52.1
Approach		488	1.9	0.494	7.4	LOS A	3.7	26.2	0.70	0.71	0.71	53.2
All Vehicles		1755	1.4	0.494	8.2	LOS A	3.8	26.9	0.62	0.70	0.64	52.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Aqelik, M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Modal Designation.

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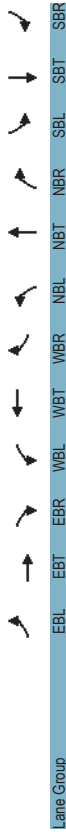
Lanes, Volumes, Timings
3: Fowler/Nixon Farm & Perth

Lanes, Volumes, Timings
3: Fowler/Nixon Farm & Perth

2025 Future Total
07-10-2020

2025 Future Total
07-10-2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations	23	922	1	2	533	42	3	0	14	103	0
Traffic Volume (vph)	23	922	1	2	533	42	3	0	14	103	0
Future Volume (vph)	0	3812	0	0	3279	0	0	1537	0	1658	1483
Satd. Flow (prot)	0.935			0.953			0.950		0.746		
Flt Permitted	0	3100	0	0	3125	0	0	1474	0	1302	1483
Satd. Flow (perm)	0	946	0	0	577	0	0	17	0	103	32
Lane Group Flow (vph)	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	
Turn Type	4	4	4	8	8	8	2	2	6	6	6
Protected Phases	4	4	4	8	8	8	2	2	6	6	6
Permitted Phases	4	4	4	8	8	8	2	2	6	6	6
Detector Phase	4	4	4	8	8	8	2	2	6	6	6
Switch Phase	4	4	4	8	8	8	2	2	6	6	6
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	50.8	50.8	50.8	50.8	50.8	50.8	40.6	40.6	40.6	40.6	40.6
Total Split (s)	50.8	50.8	50.8	50.8	50.8	50.8	44.4%	44.4%	44.4%	44.4%	44.4%
Total Split (%)	55.6%	55.6%	55.6%	55.6%	55.6%	55.6%	44.4%	44.4%	44.4%	44.4%	44.4%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.3	2.3	2.3	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	5.8	5.8	5.8	5.6	5.6	5.6	5.6	5.6
Lead/Lag Optimize?											
Recall Mode	Max	Max	Max	Max	Max	Max	None	None	None	None	None
Act Effct Green (s)	53.1	53.1	53.1	53.1	53.1	53.1	11.7	11.7	11.7	11.7	11.7
Actuated G/C Ratio	0.74	0.74	0.74	0.74	0.74	0.74	0.16	0.16	0.16	0.16	0.16
v/c Ratio	0.41	0.41	0.41	0.25	0.25	0.25	0.06	0.06	0.06	0.06	0.07
Control Delay	5.7	5.7	5.7	4.6	4.6	4.6	34.9	34.9	34.9	34.9	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.7	5.7	5.7	4.6	4.6	4.6	4.9	4.9	4.9	4.9	0.3
LOS	A	A	A	A	A	A	A	A	A	C	A
Approach Delay	5.7	5.7	5.7	4.6	4.6	4.6	4.9	4.9	4.9	26.7	0.3
Approach LOS	A	A	A	A	A	A	A	A	A	C	A
Queue Length 50th (m)	24.2	24.2	24.2	12.3	12.3	12.3	0.0	0.0	0.0	12.6	0.0
Queue Length 95th (m)	42.8	42.8	42.8	22.6	22.6	22.6	2.8	2.8	2.8	24.6	0.0
Internal Link Dist (m)	414.4	414.4	414.4	185.4	185.4	185.4	258.4	258.4	258.4	148.6	0.0
Turn Bay Length (m)										15.0	0.0
Base Capacity (vph)	2298	2298	2298	2319	2319	2319	740	740	740	639	863
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.41	0.41	0.25	0.25	0.25	0.02	0.02	0.02	0.16	0.04



Intersection Signal Delay: 7.0
Intersection Capacity Utilization 66.5%
Analysis Period (min) 15
Intersection LOS: A
ICU Level of Service C

Splits and Phases: 3: Fowler/Nixon Farm & Perth
49.6 s
50.8 s
50.8 s

2025 Future Total

1: Queen Charlotte/Rochelle & Perth

Intersection	2025 Future Total												
Int Delay, s/veh	0.7												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
EBL	41								41				
EBT		41											
EBR			41										
WBL				41									
WBT					41								
WBR						41							
NBL							41						
NBT								41					
NBR									41				
SBL										41			
SBT											41		
SBR												41	
Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	None
Storage Length	350												
Veh in Median Storage, #	0	0	0	0	0	0	0	0	0	0	0	0	0
Grade, %													
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Movmt Flow	13	776	0	3	920	43	1	0	4	12	1	11	

MOVEMENT SUMMARY

Site: 101 [Perth-Meynell PM FT2025]

Fox Run Phase 2
Site Category: (None)
Roundabout

Movement Performance - Vehicles													
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Sat	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h	
South: Meynell													
1	L2	36	1.0	0.338	13.5	LOS B	2.3	16.5	0.81	0.84	0.81	52.7	
2	T1	1	1.0	0.338	8.7	LOS A	2.3	16.5	0.81	0.84	0.81	52.7	
3	R2	212	1.0	0.338	8.6	LOS A	2.3	16.5	0.81	0.84	0.81	51.4	
Approach													
		248	1.0	0.338	9.3	LOS A	2.3	16.5	0.81	0.84	0.81	51.6	
East: Perth													
4	L2	286	1.0	0.703	9.9	LOS A	8.5	60.1	0.59	0.54	0.59	53.6	
5	T1	491	2.0	0.703	5.2	LOS A	8.5	60.1	0.59	0.54	0.59	53.7	
6	R2	204	1.0	0.703	4.9	LOS A	8.5	60.1	0.59	0.54	0.59	52.5	
Approach													
		981	1.5	0.703	6.5	LOS A	8.5	60.1	0.59	0.54	0.59	53.4	
North: Meynell													
7	L2	229	1.0	0.519	17.5	LOS B	4.6	32.7	0.94	1.03	1.13	48.2	
8	T1	1	1.0	0.519	13.0	LOS B	4.6	32.7	0.94	1.03	1.13	48.2	
9	R2	103	1.0	0.519	12.7	LOS B	4.6	32.7	0.94	1.03	1.13	47.2	
Approach													
		334	1.0	0.519	16.0	LOS B	4.6	32.7	0.94	1.03	1.13	47.9	
West: Perth													
10	L2	75	1.0	0.578	14.1	LOS B	5.3	38.0	0.82	0.88	0.96	52.1	
11	T1	391	2.0	0.578	9.6	LOS A	5.3	38.0	0.82	0.88	0.96	52.0	
12	R2	57	1.0	0.578	9.4	LOS A	5.3	38.0	0.82	0.88	0.96	50.9	
Approach													
		522	1.7	0.578	10.2	LOS B	5.3	38.0	0.82	0.88	0.96	51.9	
All Vehicles		2085	1.4	0.703	9.3	LOS A	8.5	60.1	0.73	0.74	0.79	51.9	

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Agevik, M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Modal Designation.

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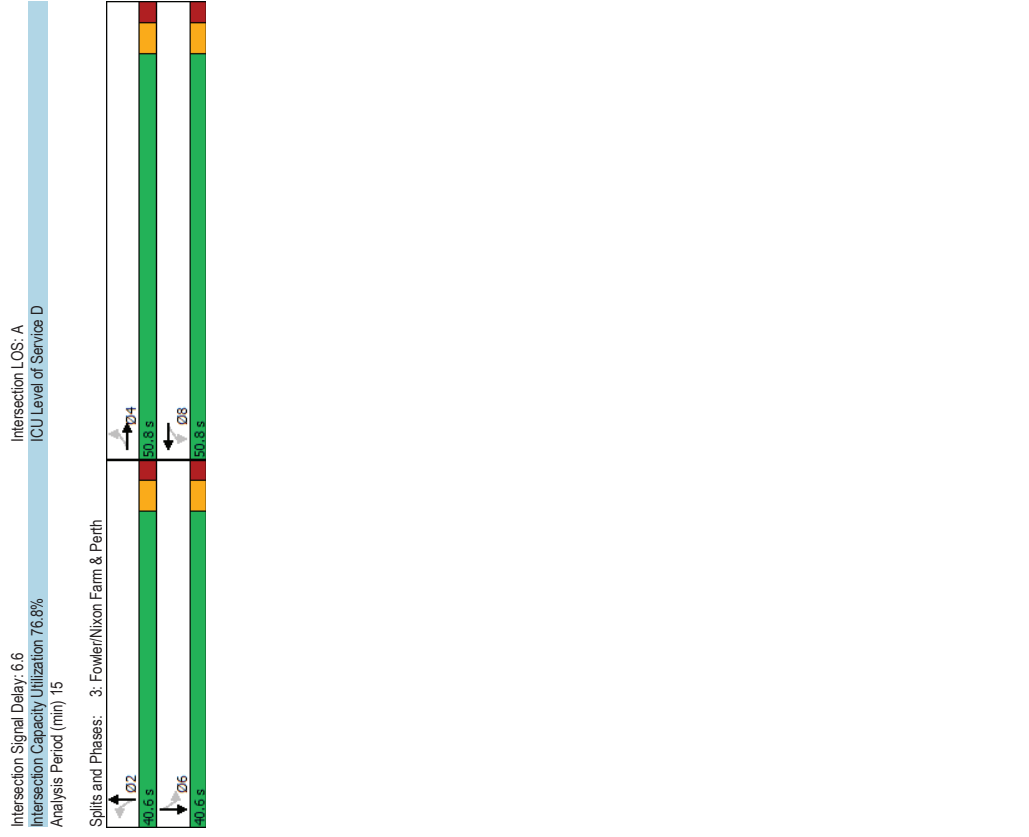
Lanes, Volumes, Timings
3: Fowler/Nixon Farm & Perth

2025 Future Total
07-10-2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR	SBR
Lane Configurations	42	804	1	16	1054	101	2	2	15	73	0	38
Traffic Volume (vph)	42	804	1	16	1054	101	2	2	15	73	0	38
Future Volume (vph)	0	3809	0	0	3269	0	0	1551	0	1658	1483	0
Satd. Flow (prot)	0.846			0.940			0.967		0.745			
Flt Permitted	0	2805	0	0	3076	0	0	1507	0	1300	1483	0
Satd. Flow (perm)	0	847	0	0	1171	0	0	19	0	73	38	0
Lane Group Flow (vph)	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA		
Turn Type	4	4	8	8	2	2	6	6				
Protected Phases	4	4	8	8	2	2	6	6				
Permitted Phases	4	4	8	8	2	2	6	6				
Detector Phase	4	4	8	8	2	2	6	6				
Switch Phase	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Initial (s)	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8
Minimum Split (s)	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8
Total Split (%)	55.6%	55.6%	55.6%	55.6%	55.6%	55.6%	55.6%	55.6%	55.6%	55.6%	55.6%	55.6%
Total Split (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
Yellow Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.3	2.3	2.3	2.3	2.3	2.3
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	5.8	5.8	5.8	5.8	5.8	5.8	5.6	5.6	5.6	5.6	5.6	5.6
Total Lost Time (s)												
Lead/Lag Optimize?												
Recall Mode	Max	Max	Max	Max	Max	Max	None	None	None	None	None	None
Act Effct Green (s)	53.6	53.6	53.6	53.6	53.6	53.6	10.7	10.7	10.7	10.7	10.7	10.7
Actuated G/C Ratio	0.75	0.75	0.75	0.75	0.75	0.75	0.15	0.15	0.15	0.15	0.15	0.15
v/c Ratio	0.40	0.50	0.50	0.50	0.50	0.50	0.08	0.08	0.37	0.14	0.14	0.14
Control Delay	5.2	5.9	5.9	5.9	5.9	5.9	14.7	14.7	32.6	4.7	4.7	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.2	5.9	5.9	5.9	5.9	5.9	14.7	14.7	32.6	4.7	4.7	4.7
LOS	A	A	A	A	A	A	B	B	C	C	A	A
Approach Delay	5.2	5.9	5.9	5.9	5.9	5.9	14.7	14.7	32.6	4.7	4.7	4.7
Approach LOS	A	A	A	A	A	A	B	B	C	C	A	A
Queue Length 50th (m)	20.4	31.4	31.4	31.4	31.4	31.4	0.5	0.5	9.1	0.0	0.0	0.0
Queue Length 95th (m)	34.5	51.6	51.6	51.6	51.6	51.6	5.3	5.3	18.8	4.1	4.1	4.1
Internal Link Dist (m)	414.4	185.4	185.4	185.4	185.4	185.4	258.4	258.4	148.6	148.6	148.6	148.6
Turn Bay Length (m)	2113	2321	2321	2321	2321	2321	753	753	643	765	765	765
Base Capacity (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.50	0.50	0.50	0.50	0.50	0.03	0.03	0.11	0.05	0.05	0.05
Intersection Summary												
Cycle Length: 91.4												
Actuated Cycle Length: 71.1												
Natural Cycle: 80												
Control Type: Semi Act-Uncoord												
Maximum v/c Ratio: 0.50												

Lanes, Volumes, Timings
3: Fowler/Nixon Farm & Perth

2025 Future Total
07-10-2020



Appendix K

Synchro Intersection Worksheets – 2030 Future Total Conditions

DRAFT

2030 Future Total

1: Queen Charlotte/Rochelle & Perth

Intersection	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Int'l Delay, s/veh	0.7											
Lane Configurations												
Traffic Vol, veh/h	4	1154	0	9	661	14	0	1	9	19	1	12
Future Vol, veh/h	4	1154	0	9	661	14	0	1	9	19	1	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	350	-	-	0	-	0	-	-	0	-	-	0
Veh In Median Storage, #	0	-	-	0	-	0	-	-	0	-	-	0
Grade, %	-	-	-	-	-	-	-	-	-	-	-	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	1154	0	9	661	14	0	1	9	19	1	12
Major/Minor												
	Major1	Major2	Minor1	Minor2								
Conflicting Flow All	675	0	0	1154	0	0	1855	1855	577	1272	1848	668
Stage 1	-	-	-	-	-	-	1162	1162	-	686	686	-
Stage 2	-	-	-	-	-	-	693	693	-	586	1162	-
Critical Hwy	413	-	-	4.13	-	-	7.33	6.53	6.93	7.33	6.53	6.23
Critical Hwy Stg 1	-	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-
Critical Hwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-
Follow-up Hwy	2219	-	-	2219	-	-	3519	4019	3319	3519	4019	3319
Platoon blocked, %	914	-	-	603	-	-	51	73	461	134	74	457
Stage 1	-	-	-	-	-	-	208	268	-	437	447	-
Stage 2	-	-	-	-	-	-	433	444	-	464	268	-
Mov Cap-1 Maneuver	914	-	-	603	-	-	48	71	461	127	72	457
Mov Cap-2 Maneuver	-	-	-	-	-	-	48	71	-	127	72	-
Stage 1	-	-	-	-	-	-	206	265	-	432	440	-
Stage 2	-	-	-	-	-	-	414	437	-	448	265	-
Approach												
	EB	WB	NB	SB								
HCM Control Delay, s	0.1	0.1	0.1	17.5			17.5		31.2			
HCM LOS			C	D								
Minor Lane/Major Mvmt												
	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	288	914	-	-	603	-	-	169				
HCM Lane V/C Ratio	0.034	0.004	-	-	0.015	-	-	0.189				
HCM Control Delay (s)	17.5	9	0.1	11.1	-	-	-	31.2				
HCM Lane LOS	C	A	A	B	-	-	-	D				
HCM 95th %ile Q(veh)	0.1	0	-	-	0	-	-	0.7				

MOVEMENT SUMMARY

Site: 101 [Perth-Meynell AM FT2030]

Fox Run Phase 2
Site Category: (None)
Roundabout

Movement Performance - Vehicles													
Mov ID	Turn	Demanded Flows Total veh/h	HV %	Deg Sat	Average Delay sec	Level of Service	95% Back of Queue Vehs	Distance Queued m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h	
South: Meynell													
1	L2	57	1.0	0.818	28.1	LOS C	13.2	93.1	1.00	1.34	1.86	43.6	
2	T1	1	1.0	0.818	23.4	LOS C	13.2	93.1	1.00	1.34	1.86	43.6	
3	R2	513	1.0	0.818	23.2	LOS C	13.2	93.1	1.00	1.34	1.86	42.8	
Approach													
571	1.0	0.818	23.7	LOS C	13.2	93.1	1.00	1.34	1.86	1.86	42.9		
East: Perth													
4	L2	256	1.0	0.516	9.5	LOS A	4.6	32.5	0.43	0.53	0.43	53.9	
5	T1	321	2.0	0.516	4.9	LOS A	4.6	32.5	0.43	0.53	0.43	53.9	
6	R2	133	1.0	0.516	4.6	LOS A	4.6	32.5	0.43	0.53	0.43	52.7	
Approach													
709	1.5	0.516	6.5	LOS A	4.6	32.5	0.43	0.53	0.43	0.53	0.43	53.7	
North: Meynell													
7	L2	280	1.0	0.489	14.3	LOS B	3.9	27.6	0.82	0.91	0.92	50.2	
8	T1	1	1.0	0.489	9.7	LOS A	3.9	27.6	0.82	0.91	0.92	50.2	
9	R2	115	1.0	0.489	9.5	LOS A	3.9	27.6	0.82	0.91	0.92	49.2	
Approach													
396	1.0	0.489	12.9	LOS B	3.9	27.6	0.82	0.91	0.92	0.92	49.9		
West: Perth													
10	L2	45	1.0	0.569	14.3	LOS B	5.2	36.8	0.83	0.89	0.97	52.1	
11	T1	426	2.0	0.569	9.7	LOS A	5.2	36.8	0.83	0.89	0.97	52.1	
12	R2	24	1.0	0.569	9.4	LOS A	5.2	36.8	0.83	0.89	0.97	51.0	
Approach													
496	1.9	0.569	10.1	LOS B	5.2	36.8	0.83	0.89	0.89	0.97	52.0		
All Vehicles													
2172	1.3	0.818	13.0	LOS B	13.2	93.1	1.00	1.34	0.90	1.02	1.02	49.4	

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akcelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Modal Designation.

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 Organisation: CGH TRANSPORTATION | Processed: July 10, 2020, 11:11:17 AM
 Project: c:\Users\Andrew.Harte\CGH TRANSPORTATION\CGH Working - Documents\Projects\2019-64 Calvan 6295, 6363, 6409 Perth SINDATA\sidra\2019-64 GreenLafin.sip8

Lanes, Volumes, Timings
3: Fowler/Nixon Farm & Perth

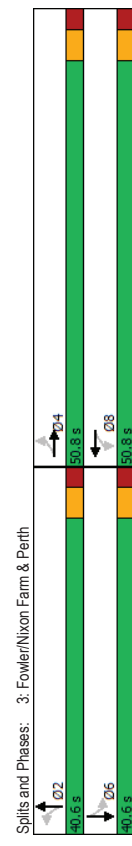
2030 Future Total
07-13-2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations	23	1169	1	2	661	42	3	0	14	103	0
Traffic Volume (vph)	23	1169	1	2	661	42	3	0	14	103	0
Future Volume (vph)	0	3812	0	0	3286	0	0	1537	0	1658	1483
Satd. Flow (prot)	0.935			0.953			0.950		0.746		
Flt Permitted	0	3100	0	0	3131	0	0	1474	0	1302	1483
Satd. Flow (perm)	0	1193	0	0	705	0	0	17	0	103	32
Lane Group Flow (vph)	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	
Turn Type	4	4	4	8	8	8	2	2	6	6	6
Protected Phases	4	4	4	8	8	8	2	2	6	6	6
Permitted Phases	4	4	4	8	8	8	2	2	6	6	6
Detector Phase	4	4	4	8	8	8	2	2	6	6	6
Switch Phase	4	4	4	8	8	8	2	2	6	6	6
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	50.8	50.8	50.8	50.8	50.8	50.8	40.6	40.6	40.6	40.6	25.6
Total Split (s)	50.8	50.8	50.8	50.8	50.8	50.8	40.6	40.6	40.6	40.6	40.6
Total Split (%)	55.6%	55.6%	55.6%	55.6%	55.6%	55.6%	44.4%	44.4%	44.4%	44.4%	44.4%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.3	2.3	2.3	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	5.8	5.8	5.8	5.6	5.6	5.6	5.6	5.6
Lead/Lag Optimize?											
Recall Mode	Max	Max	Max	Max	Max	Max	None	None	None	None	None
Act Effct Green (s)	53.1	53.1	53.1	53.1	53.1	53.1	11.7	11.7	11.7	11.7	11.7
Actuated G/C Ratio	0.74	0.74	0.74	0.74	0.74	0.74	0.16	0.16	0.16	0.16	0.16
v/c Ratio	0.52	0.52	0.52	0.30	0.30	0.30	0.06	0.06	0.06	0.06	0.08
Control Delay	6.8	6.8	6.8	4.9	4.9	4.9	34.9	34.9	34.9	34.9	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.8	6.8	6.8	4.9	4.9	4.9	34.9	34.9	34.9	34.9	0.4
LOS	A	A	A	A	A	A	A	A	A	C	A
Approach Delay	6.8	6.8	6.8	4.9	4.9	4.9	26.7	26.7	26.7	26.7	0.4
Approach LOS	A	A	A	A	A	A	A	A	A	C	A
Queue Length 50th (m)	34.4	34.4	34.4	15.8	15.8	15.8	0.0	0.0	0.0	12.6	0.0
Queue Length 95th (m)	60.3	60.3	60.3	28.8	28.8	28.8	2.8	2.8	2.8	24.6	0.0
Internal Link Dist (m)	414.4	414.4	414.4	185.4	185.4	185.4	258.4	258.4	258.4	148.6	148.6
Turn Bay Length (m)										15.0	15.0
Base Capacity (vph)	2298	2298	2298	2323	2323	2323	740	740	740	639	823
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.52	0.52	0.30	0.30	0.30	0.02	0.02	0.02	0.16	0.04
Intersection Summary											
Cycle Length: 91.4											
Actuated Cycle Length: 71.6											
Natural Cycle: 80											
Control Type: Semi Act-Uncoord											
Maximum v/c Ratio: 0.52											

Lanes, Volumes, Timings
3: Fowler/Nixon Farm & Perth

2030 Future Total
07-13-2020

Intersection Signal Delay: 7.4	Intersection LOS: A
Intersection Capacity Utilization 73.6%	ICU Level of Service D
Analysis Period (min) 15	



HCM Signalized Intersection Capacity Analysis
 3: Fowler/Nixon Farm & Perth
 2030 Future Total
 07-13-2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4T		4T			4T		4T			
Traffic Volume (vph)	23	1169	1	2	661	42	3	0	14	103	0	32
Future Volume (vph)	23	1169	1	2	661	42	3	0	14	103	0	32
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		5.8		5.8			5.6		5.6			5.6
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ft	1.00	0.99		0.99		0.89		0.89		1.00	0.85	
Flt Protected	1.00			1.00		0.99		0.99		0.95	1.00	
Satd. Flow (prot)	3312	3286		3286		1538		1538		1658	1483	
Flt Permitted	0.93	0.95		0.95		0.95		0.95		0.75	1.00	
Satd. Flow (perm)	3099	3131		3131		1473		1473		1302	1483	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	23	1169	1	2	661	42	3	0	14	103	0	32
RTOR Reduction (vph)	0	0	0	3	0	0	0	15	0	0	28	0
Lane Group Flow (vph)	0	1193	0	0	702	0	0	2	0	103	4	0
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	4			8			2				6	
Permitted Phases	4			8			2				6	
Actuated Green, G (s)	51.8			51.8			9.6		9.6		9.6	
Effective Green, g (s)	51.8			51.8			9.6		9.6		9.6	
Actuated G/C Ratio	0.71			0.71			0.13		0.13		0.13	
Clearance Time (s)	5.8			5.8			5.6		5.6		5.6	
Vehicle Extension (s)	3.0			3.0			3.0		3.0		3.0	
Lane Grp Cap (vph)	2205			2227			194		171		195	
v/s Ratio Prot												
v/s Ratio Perm	c0.38			0.22			0.00		0.00		c0.08	
v/s Ratio	0.54			0.32			0.01		0.60		0.02	
Uniform Delay, d1	4.9			3.9			27.5		29.8		27.5	
Progression Factor	1.00			1.00			1.00		1.00		1.00	
Incremental Delay, d2	1.0			0.4			0.0		5.9		0.0	
Delay (s)	5.9			4.3			27.5		35.7		27.6	
Level of Service	A			A			C		D		C	
Approach Delay (s)	5.9			4.3			27.5		33.7		27.6	
Approach LOS	A			A			C		C		C	
Intersection Summary												
HCM 2000 Control Delay				7.3			HCM 2000 Level of Service		A			
HCM 2000 Volume to Capacity ratio				0.55								
Actuated Cycle Length (s)				72.8			Sum of lost time (s)		11.4			
Intersection Capacity Utilization				73.6%			ICU Level of Service		D			
Analysis Period (min)				15								
c Critical Lane Group												

MOVEMENT SUMMARY

Site: 101 [Perth-Meynell PM FT2030]

Fox Run Phase 2
 Site Category: (None)
 Roundabout

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Sat v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
Movement Performance - Vehicles												
South: Meynell												
1	L2	39	1.0	0.642	19.5	LOS B	6.9	48.5	0.98	1.11	1.32	48.5
2	T1	1	1.0	0.642	14.9	LOS B	6.9	48.5	0.98	1.11	1.32	48.6
3	R2	383	1.0	0.642	14.6	LOS B	6.9	48.5	0.98	1.11	1.32	47.5
Approach												
		423	1.0	0.642	15.1	LOS B	6.9	48.5	0.98	1.11	1.32	47.6
East: Perth												
4	L2	540	1.0	0.937	13.1	LOS B	26.5	187.6	1.00	0.63	1.06	51.5
5	T1	491	2.0	0.937	8.5	LOS A	26.5	187.6	1.00	0.63	1.06	51.5
6	R2	253	1.0	0.937	8.3	LOS A	26.5	187.6	1.00	0.63	1.06	50.4
Approach												
		1283	1.4	0.937	10.4	LOS B	26.5	187.6	1.00	0.63	1.06	51.2
North: Meynell												
7	L2	260	1.0	1.033	121.2	LOS F	30.7	217.0	1.00	2.12	3.99	20.6
8	T1	1	1.0	1.033	116.6	LOS F	30.7	217.0	1.00	2.12	3.99	20.6
9	R2	111	1.0	1.033	116.4	LOS F	30.7	217.0	1.00	2.12	3.99	20.4
Approach												
		372	1.0	1.033	119.8	LOS F	30.7	217.0	1.00	2.12	3.99	20.5
West: Perth												
10	L2	86	1.0	0.906	41.8	LOS D	19.3	136.9	1.00	1.58	2.48	37.5
11	T1	417	2.0	0.906	37.2	LOS D	19.3	136.9	1.00	1.58	2.48	37.5
12	R2	63	1.0	0.906	36.9	LOS D	19.3	136.9	1.00	1.58	2.48	36.9
Approach												
		566	1.7	0.906	37.9	LOS D	19.3	136.9	1.00	1.58	2.48	37.5
All Vehicles												
		2644	1.3	1.033	32.4	LOS C	30.7	217.0	1.00	1.12	1.82	39.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akeplik M3D).

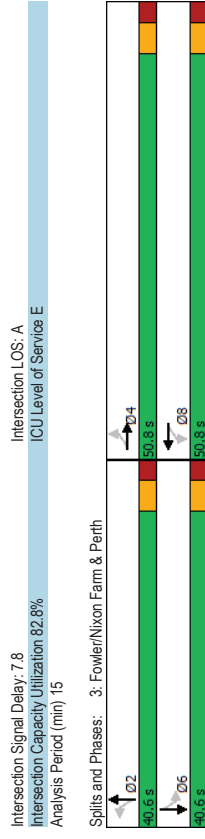
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Modal Designation.

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 sidra\2019-64 GreenLafin.sip8

Lanes, Volumes, Timings
3: Fowler/Nixon Farm & Perth

Lanes, Volumes, Timings
3: Fowler/Nixon Farm & Perth

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations	4L	4L	4R	4L	4L	4R	4L	4R	4L	4R	4R
Traffic Volume (vph)	42	1023	1	16	1341	101	2	2	15	73	0
Future Volume (vph)	42	1023	1	16	1341	101	2	2	15	73	0
Satd. Flow (prot)	0	3309	0	0	3279	0	0	1551	0	1658	1483
Flt Permitted	0.834			0.939			0.967		0.745		
Satd. Flow (perm)	0	2765	0	0	3082	0	0	1507	0	1300	1483
Satd. Flow (RTOR)				12			15		33		
Lane Group Flow (vph)	0	1066	0	0	1458	0	0	19	0	73	38
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	
Protected Phases	4	4		8	8		2	2	6		6
Permitted Phases	4	4		8	8		2	2	6		6
Detector Phase	4	4		8	8		2	2	6		6
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	24.8	24.8	24.8	24.8	24.8	40.6	40.6	40.6	40.6	40.6	40.6
Total Split (s)	50.8	50.8	50.8	50.8	50.8	40.6	40.6	40.6	40.6	40.6	40.6
Total Split (%)	55.6%	55.6%	55.6%	55.6%	55.6%	44.4%	44.4%	44.4%	44.4%	44.4%	44.4%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.3	2.3	2.3	2.3	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	5.8	5.8	5.6	5.6	5.6	5.6	5.6	5.6
Lead/Lag Optimize?											
Recall Mode	Max	Max	Max	Max	Max	None	None	None	None	None	None
Act Effct Green (s)	53.6	53.6	53.6	53.6	53.6	10.7	10.7	10.7	10.7	10.7	10.7
Actuated G/C Ratio	0.75	0.75	0.75	0.75	0.75	0.15	0.15	0.15	0.15	0.15	0.15
v/c Ratio	0.51	0.51	0.51	0.51	0.51	0.08	0.08	0.08	0.08	0.08	0.08
Control Delay	6.2	6.2	6.2	6.2	6.2	14.7	14.7	14.7	14.7	32.6	12.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.2	6.2	6.2	6.2	6.2	14.7	14.7	14.7	14.7	32.6	12.3
LOS	A	A	A	A	A	B	B	B	B	C	B
Approach Delay	6.2	6.2	6.2	6.2	6.2	14.7	14.7	14.7	14.7	25.7	12.3
Approach LOS	A	A	A	A	A	B	B	B	B	C	B
Queue Length 50th (m)	29.4	29.4	29.4	29.4	29.4	0.5	0.5	0.5	0.5	9.1	0.6
Queue Length 95th (m)	49.4	49.4	49.4	49.4	49.4	5.3	5.3	5.3	5.3	18.8	7.4
Internal Link Dist (m)	414.4	414.4	414.4	414.4	414.4	258.4	258.4	258.4	258.4	148.6	148.6
Turn Bay Length (m)										15.0	
Base Capacity (vph)	2083	2083	2083	2083	2083	753	753	753	753	643	750
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.51	0.51	0.51	0.51	0.63	0.63	0.63	0.63	0.11	0.05



Appendix L

TDM Checklist

DRAFT

Perth St @ Rochelle Dr/Queen Charlotte St
2030 FT - w/SBL

Justification #7

Justification	Description	Minimum Requirement		Minimum Requirement		Compliance		Signal	
		1 Lane Highway		2 or More Lanes		Sectional			Entire %
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%		
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	1043	116%	10%	No
	B. Vehicle volume, along minor streets (average hour)	120	170	120	170	18	10%		
2. Delay to Cross Traffic	A. Vehicle volumes, major street (average hour)	480	720	600	900	1025	114%	11%	No
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75	9	11%		

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
5. Correction to 2B, as per MTO and City of Ottawa, for '2 or More Lanes' has been applied

Appendix M

Synchro/Sidra Intersection Worksheets – 2030 Future Total Conditions PM Diverted Volumes

DRAFT

Intersection	Int Delay, s/veh	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Int Delay, s/veh	0.4												
Movement		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4T	4T	4T	4T	4T	4T	4T	4T	4T	4T	4T	4T
Traffic Vol, veh/h	13	933	0	3	1103	43	1	0	4	0	1	11	
Future Vol, veh/h	13	933	0	3	1103	43	1	0	4	0	1	11	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control		Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized		-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	350	-	-	0	-	-	0	-	-	0	-	-	0
Veh in Median Storage, #	0	-	-	0	-	-	0	-	-	0	-	-	0
Grade, %	-	-	-	0	-	-	0	-	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	933	0	3	1103	43	1	0	4	0	1	11	
Major/Minor		Major1	Major2	Minor1	Minor2	Minor2	Minor2	Minor2	Minor2	Minor2	Minor2	Minor2	Minor2
Conflicting Flow All	1146	0	0	993	0	2156	2171	497	-	2150	1125	-	-
Stage 1	-	-	-	-	-	1019	1019	-	-	1131	-	-	-
Stage 2	-	-	-	-	-	1137	1152	-	-	1019	-	-	-
Critical Hwy	413	-	-	413	-	733	653	693	-	653	623	-	-
Critical Hwy Stg 1	-	-	-	-	-	653	553	-	-	553	-	-	-
Critical Hwy Stg 2	-	-	-	-	-	613	553	-	-	553	-	-	-
Follow-up Hwy	2219	-	-	2219	-	3519	4019	3319	-	4019	3319	-	-
Pot Cap-1 Maneuver	608	-	-	694	-	30	46	519	0	48	249	-	-
Stage 1	-	-	-	-	-	254	314	-	-	278	-	-	-
Stage 2	-	-	-	-	-	244	271	-	-	314	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	608	-	-	694	-	27	44	519	-	46	249	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	27	44	-	-	46	-	-	-
Stage 1	-	-	-	-	-	242	299	-	-	277	-	-	-
Stage 2	-	-	-	-	-	231	270	-	-	299	-	-	-
Approach		EB	WB	NB	EB	WB	NB	SB	EB	WB	NB	SB	EB
HCM Control Delay, s	0.4								38.6				26.2
HCM LOS									E				D
Minor Lane/Major Mvmt Capacity (veh/h)	112	608	-	-	694	-	-	182	-	-	-	-	-
HCM Lane V/C Ratio	0.045	0.021	-	-	0.004	-	-	0.066	-	-	-	-	-
HCM Control Delay (s)	38.6	11.1	0.3	-	10.2	-	-	26.2	-	-	-	-	-
HCM Lane LOS	E	B	A	-	B	-	-	D	-	-	-	-	-
HCM 95th %ile Q(veh)	0.1	0.1	-	-	0	-	-	0.2	-	-	-	-	-

MOVEMENT SUMMARY

Site: 101 [Perth-Meynell PM FT2030 - Diverted Volumes]

Fox Run Phase 2
 Site Category: (None)
 Roundabout

Movement Performance - Vehicles													
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Sat	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance Queued m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h	
South: Meynell													
1	L2	39	1.0	0.643	19.7	LOS B	6.9	49.0	0.98	1.12	1.34	48.4	
2	T1	1	1.0	0.643	15.1	LOS B	6.9	49.0	0.98	1.12	1.34	48.5	
3	R2	383	1.0	0.643	14.9	LOS B	6.9	49.0	0.98	1.12	1.34	47.4	
Approach													
		423	1.0	0.643	15.3	LOS B	6.9	49.0	0.98	1.12	1.34	47.5	
East: Perth													
4	L2	461	1.0	0.882	11.0	LOS B	17.4	123.4	0.96	0.59	0.97	52.0	
5	T1	491	2.0	0.882	6.4	LOS A	17.4	123.4	0.96	0.59	0.97	52.1	
6	R2	253	1.0	0.882	6.1	LOS A	17.4	123.4	0.96	0.59	0.97	50.9	
Approach													
		1204	1.4	0.882	8.1	LOS A	17.4	123.4	0.96	0.59	0.97	51.8	
North: Meynell													
7	L2	260	1.0	0.875	50.6	LOS E	14.7	103.8	1.00	1.47	2.24	33.8	
8	T1	1	1.0	0.875	45.9	LOS D	14.7	103.8	1.00	1.47	2.24	33.8	
9	R2	111	1.0	0.875	45.7	LOS D	14.7	103.8	1.00	1.47	2.24	33.3	
Approach													
		372	1.0	0.875	49.1	LOS D	14.7	103.8	1.00	1.47	2.24	33.7	
West: Perth													
10	L2	86	1.0	0.812	26.5	LOS C	12.7	90.0	1.00	1.31	1.78	44.3	
11	T1	417	2.0	0.812	21.9	LOS C	12.7	90.0	1.00	1.31	1.78	44.4	
12	R2	63	1.0	0.812	21.6	LOS C	12.7	90.0	1.00	1.31	1.78	43.5	
Approach													
		566	1.7	0.812	22.6	LOS C	12.7	90.0	1.00	1.31	1.78	44.3	
All Vehicles													
		2565	1.4	0.882	18.4	LOS B	17.4	123.4	0.98	0.97	1.39	45.8	

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akeplik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Modal Designation.

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Lanes, Volumes, Timings
3: Fowler/Nixon Farm & Perth

2030 Future Total - Diverted Volumes
07-13-2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	1023	1	91	1341	101	2	2	15	85	0	38
Future Volume (vph)	42	1023	1	91	1341	101	2	2	15	85	0	38
Satd. Flow (prot)	0	3309	0	0	3273	0	0	1551	0	1658	1483	0
Flt Permitted	0.826			0.790			0.968			0.745		
Satd. Flow (perm)	0	2739	0	0	2593	0	0	1509	0	1300	1483	0
Satd. Flow (RTOR)				11			15			33		
Lane Group Flow (vph)	0	1066	0	0	1533	0	0	19	0	85	38	0
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Permitted Phases	4	4	4	8	8	8	2	2	2	6	6	6
Detector Phase	4	4	4	8	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	24.8	24.8	24.8	24.8	24.8	24.8	40.6	40.6	40.6	40.6	40.6	40.6
Total Split (s)	50.8	50.8	50.8	50.8	50.8	50.8	40.6	40.6	40.6	40.6	40.6	40.6
Total Split (%)	55.6%	55.6%	55.6%	55.6%	55.6%	55.6%	44.4%	44.4%	44.4%	44.4%	44.4%	44.4%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.3	2.3	2.3	2.3	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	5.8	5.8	5.8	5.6	5.6	5.6	5.6	5.6	5.6
Lead/Lag Optimize?												
Recall Mode	Max	Max	Max	Max	Max	Max	None	None	None	None	None	None
Act Effct Green (s)	53.3	53.3	53.3	53.3	53.3	53.3	11.1	11.1	11.1	11.1	11.1	11.1
Actuated G/C Ratio	0.75	0.75	0.75	0.75	0.75	0.75	0.16	0.16	0.16	0.16	0.16	0.16
v/c Ratio	0.52	0.52	0.52	0.79	0.79	0.79	0.08	0.08	0.42	0.42	0.15	0.15
Control Delay	6.6	6.6	6.6	12.8	12.8	12.8	14.5	14.5	33.6	33.6	12.1	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.6	6.6	6.6	12.8	12.8	12.8	14.5	14.5	33.6	33.6	12.1	12.1
LOS	A	A	A	B	B	B	B	B	C	C	B	B
Approach Delay	6.6	6.6	6.6	12.8	12.8	12.8	14.5	14.5	26.9	26.9	11.1	11.1
Approach LOS	A	A	A	B	B	B	B	B	C	C	B	B
Queue Length 50th (m)	29.5	29.5	29.5	62.8	62.8	62.8	0.5	0.5	10.4	10.4	0.6	0.6
Queue Length 95th (m)	52.3	52.3	52.3	#139.7	#139.7	#139.7	5.2	5.2	21.3	21.3	7.4	7.4
Internal Link Dist (m)	414.4	414.4	414.4	185.4	185.4	185.4	258.4	258.4	148.6	148.6	148.6	148.6
Turn Bay Length (m)												
Base Capacity (vph)	2050	2050	2050	1943	1943	1943	753	753	642	642	749	749
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.52	0.52	0.79	0.79	0.79	0.03	0.03	0.13	0.13	0.05	0.05
Intersection Summary												
Cycle Length: 91.4												
Actuated Cycle Length: 71.2												
Natural Cycle: 130												
Control Type: Semi Act-Uncoord												
Maximum v/c Ratio: 0.79												

Lanes, Volumes, Timings
3: Fowler/Nixon Farm & Perth

2030 Future Total - Diverted Volumes
07-13-2020

Intersection Signal Delay: 11.0	Intersection LOS: B
Intersection Capacity Utilization 102.5%	ICU Level of Service G
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

