50 Leikin Drive

Transportation Impact Assessment

Step 1 Screening Report

Step 2 Scoping Report

Step 3 Forecasting Report

Step 4 Strategy Report

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Table of Contents

List of Figures

Table of Tables

List of Appendices

1 Screening

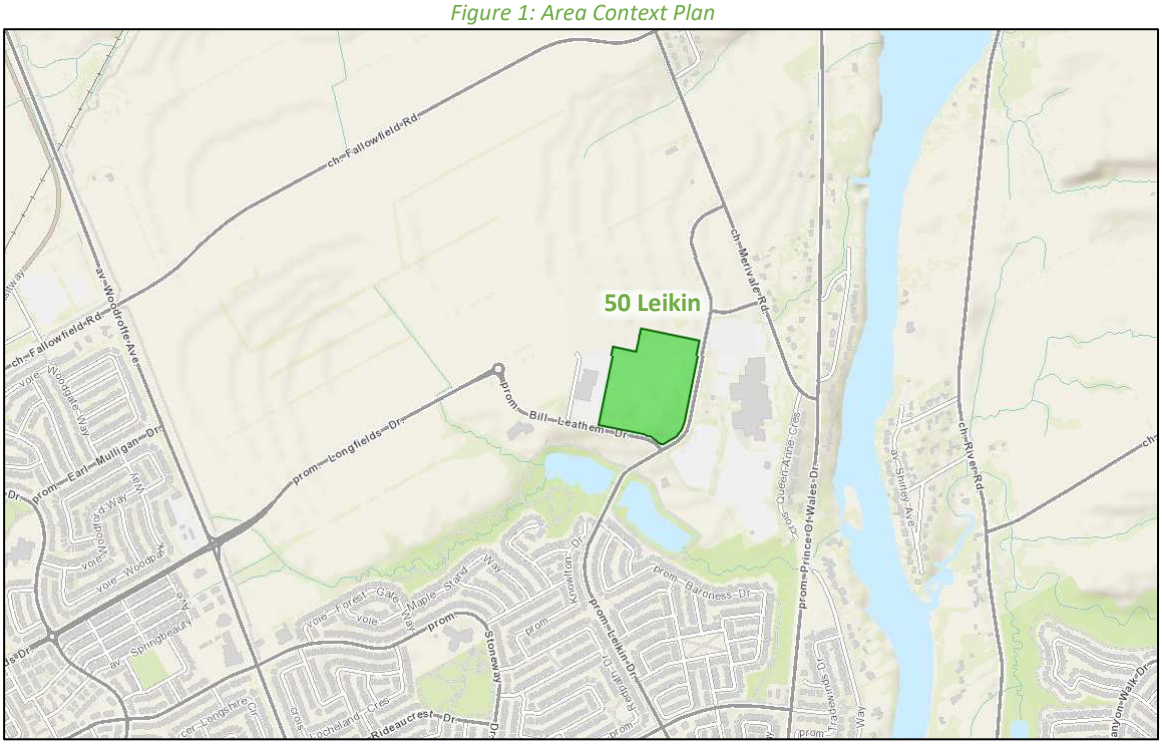
This study has been prepared according to the City of Ottawa's 2017 Transportation Impact Assessment (TIA) Guidelines. Accordingly, a Step 1 Screening Form has been prepared and is included as Appendix A, along with the Certification Form for the TIA Study PM. As shown in the Screening Form, a TIA is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

2 Existing and Planned Conditions

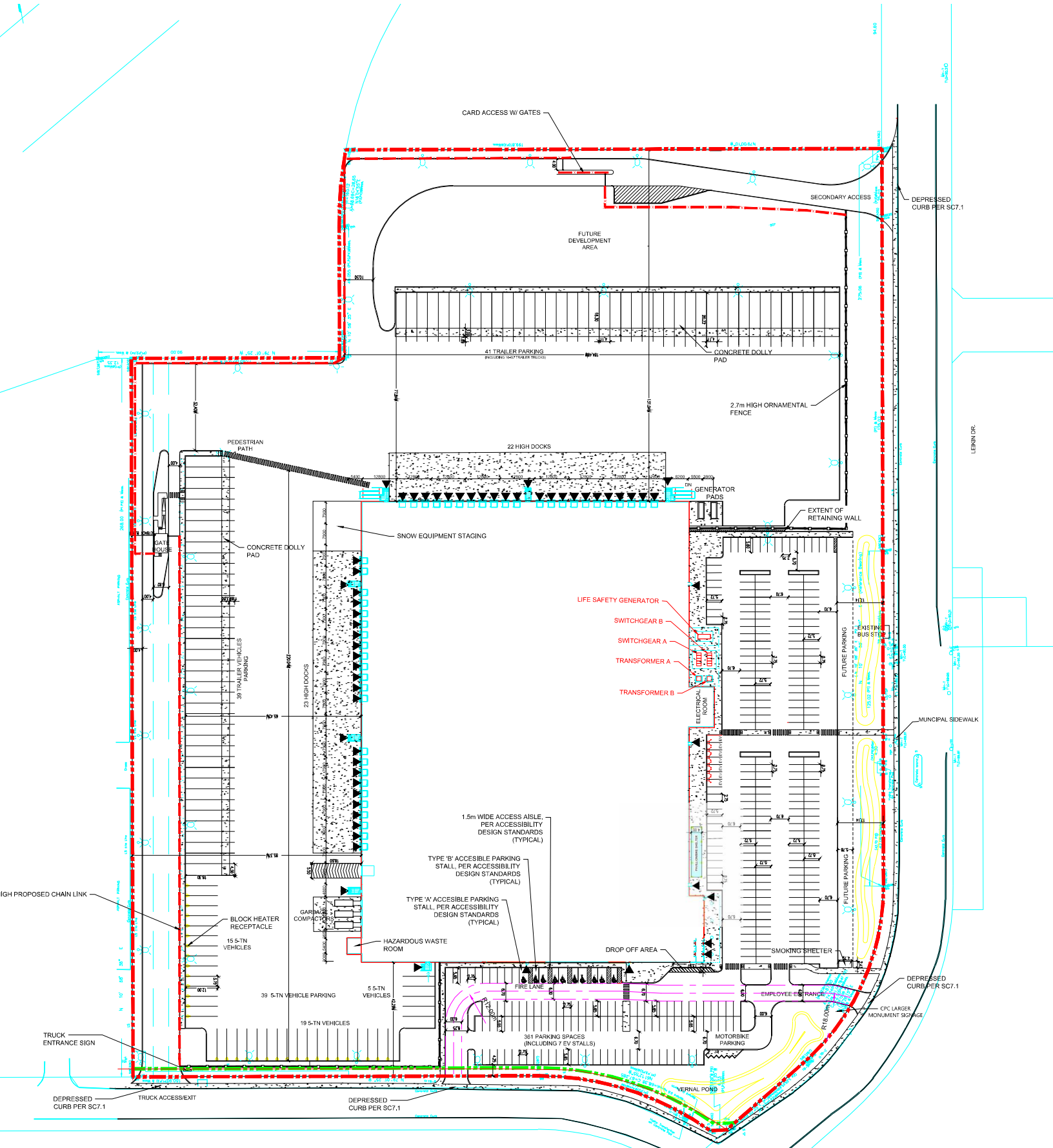
2.1 Proposed Development

The existing greenfield site is located at 50 Leikin Drive and is zoned as light industrial (IL9). The proposed development concept is for the construction of a 218,000 square foot light industrial building centrally located in the parcel with surrounding surface parking lots comprising 361 employee parking spaces, 39 five-tonne truck parking spaces, and 80 trailer parking spaces. The site will facilitate a total of 55 docking doors along the exterior of the building. The proposed access configuration includes a two-way truck access on each Leikin Drive and Bill Leathem Drive and an employee parking access on both roadways. The development will be constructed in a single phase anticipated to be built out by 2026. Figure 1 illustrates the study area context. Figure 2 illustrates the proposed site plan.

Figure 1: Area Context Plan



Source: http://maps.ottawa.ca/geoOttawa/ Accessed: January 27, 2023


CARD ACCESS W/ GATES
SECONDARY ACCESS
DEPRESSED CURB PER SC7.1
FUTURE DEVELOPMENT AREA
41 TRAILER PARKING
CONCRETE DOLLY PAD
2.7m HIGH ORNAMENTAL FENCE
PEDESTRIAN PATH
22 HIGH DOCKS
GENERATOR PADS
EXTENT OF RETAINING WALL
GATE HOUSE
CONCRETE DOLLY PAD
SNOW EQUIPMENT STAGING
LIFE SAFETY GENERATOR
SWITCHGEAR B
SWITCHGEAR A
TRANSFORMER A
TRANSFORMER B
ELECTRICAL ROOM
EXISTING BUS STOP
FUTURE PARKING
MUNCIPAL SIDEWALK
39 TRAILER VEHICLES PARKING
23 HIGH DOCKS
1.5m WIDE ACCESS AISLE, PER ACCESSIBILITY DESIGN STANDARDS (TYPICAL)
TYPE 'B' ACCESIBLE PARKING STALL, PER ACCESSIBILITY DESIGN STANDARDS (TYPICAL)
TYPE 'A' ACCESIBLE PARKING STALL, PER ACCESSIBILITY DESIGN STANDARDS (TYPICAL)
IGH PROPOSED CHAIN LINK
BLOCK HEATER RECEPTACLE
15 5-TN VEHICLES
GARBAGE COMPACTORS
HAZARDOUS WASTE ROOM
DROP OFF AREA
SMOKING SHELTER
FIRE LANE
EMPLOYEE ENTRANCE
DEPRESSED CURB PER SC7.1
CPC LARGER MONUMENT SIGNAGE
39 5-TN VEHICLE PARKING
5 5-TN VEHICLES
19 5-TN VEHICLES
361 PARKING SPACES (INCLUDING 7 EV STALLS)
MOTORBIKE PARKING
TRUCK ENTRANCE SIGN
VERNAL POND
DEPRESSED CURB PER SC7.1
TRUCK ACCESS/EXIT
DEPRESSED CURB PER SC7.1
BILL LEATHEM DR.
LEIKIN DR.

2.2 Existing Conditions

2.2.1 Area Road Network

Prince of Wales Drive: Prince of Wales Drive is a City of Ottawa arterial road with a two-lane rural cross-section with paved shoulders on both sides of the road. The posted speed limit is 80 km/h, and the Ottawa Official Plan reserves a right-of-way that varies between 40 metres and 65 metres within the study area. Prince of Wales Drive is a truck route.

Merivale Road: Merivale Road is a City of Ottawa arterial road with a two-lane rural cross-section with paved shoulders on both sides of the road. The posted speed limit is 80 km/h, and the Ottawa Official Plan reserves a 37.5 metre right-of-way within the study area. Merivale Road is a truck route.

Longfields Drive: Longfields Drive is a City of Ottawa major collector road with a two-lane rural cross-section with paved shoulders on both sides of the road. The posted speed limit is 70 km/h, and the measured right-of-way is 26.0 metres within the study area.

Leikin Drive: Leikin Drive is a City of Ottawa major collector road with a two-lane urban cross-section with bike lanes on both sides of the road. South of Beckstead Road, a sidewalk is on the east side of the road, and south of Holitzner Way, a MUP is on the west side of the road. The posted speed limit is 60 km/h, and the Ottawa Official Plan reserves a 26.0 metre right-of-way.

Bill Leathem Drive: Bill Leathem Drive is a City of Ottawa major collector road with a two-lane urban cross-section with a sidewalk on the west side of the road. The unposted speed limit is assumed to be 50 km/h and the Ottawa Official Plan reserves a 26.0 metre right-of-way.

Beckstead Road: Beckstead Road is a City of Ottawa collector road with a two-lane urban cross-section with a sidewalk on the south side of the road. The unposted speed limit is assumed to be 50 km/h and the measured right-of-way is 26.0 metres.

2.2.2 Existing Intersections

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

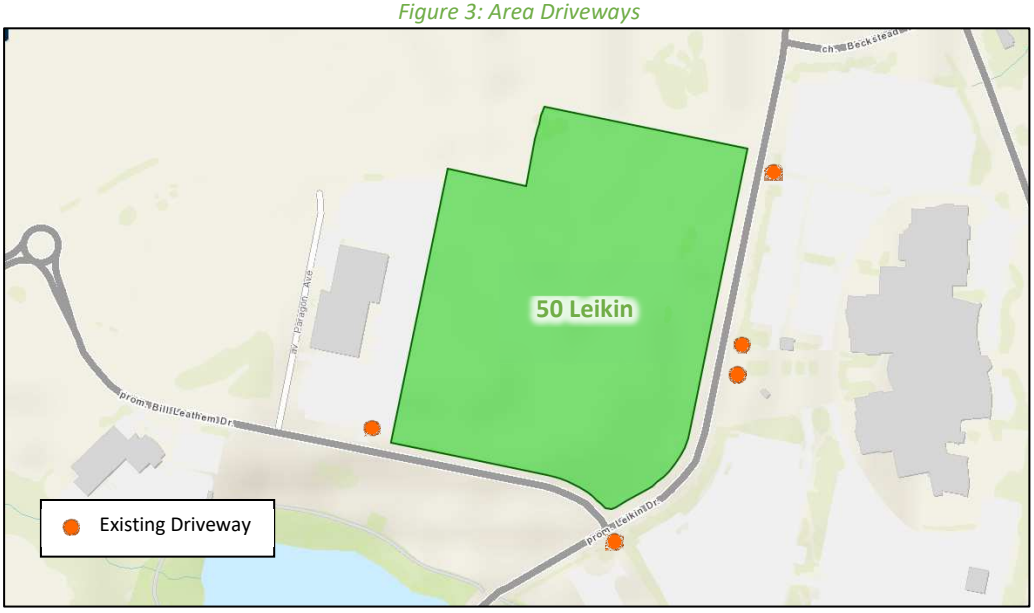
Merivale Road at Leikin Drive	The intersection of Merivale Road at Leikin Drive is a signalized T-intersection. The northbound approach consists of an auxiliary left-turn lane and a through lane, and the southbound approach consists of a through lane and an auxiliary right-turn lane. The eastbound approach consists of a left-turn lane and an auxiliary right-turn lane. No turn restrictions were noted.
Bill Leathem Drive at Longfields Drive	The intersection of Bill Leathem Drive at Longfields Drive is a three-legged roundabout intersection. The northbound and eastbound approaches each consists of a shared all-movements lane. The east leg is unconstructed. No turn restrictions were noted.
Leikin Drive at Beckstead Road	The intersection of Leikin Drive at Beckstead Road is an unsignalized T-intersection with stop control on the minor approach of Beckstead Road. The northbound approach consists of a shared through/right-turn lane, and the southbound approach consists of an auxiliary left-turn lane and a through lane. The westbound approach consists of a shared left/right-turn lane that operates as a left-turn lane and a short auxiliary right-turn lane. No turn restrictions were noted.

Merivale Road at Beckstead Road	The intersection of Merivale Road at Beckstead Road is an unsignalized T-intersection with stop control on the minor approach of Beckstead Road. The northbound approach consists of an auxiliary left-turn lane and a through lane, and the southbound approach consists of a shared through/right-turn lane. The eastbound approach consists of a shared left/right-turn lane that operates as a left-turn lane and a short auxiliary right-turn lane. No turn restrictions were noted.
Leikin Drive at RCMP Campus Access	The intersection of Leikin Drive at the RCMP Campus access is a signalized intersection. The northbound approach consists of a through lane, a bike lane, and an auxiliary right-turn lane, and the southbound approach consists of an auxiliary left-turn lane, a through lane, and a bike lane. The westbound approach consists of a left-turn lane and a right-turn lane. The east leg inbound and outbound lanes are separated by an approximately 12-metre-wide median. No turn restrictions were noted.
Bill Leathem Drive at Leikin Drive	The intersection of Bill Leathem Drive at Leikin Drive is an unsignalized intersection with stop control on the minor approaches of Bill Leathem Drive. The private northbound and the southbound approaches each consist of a shared all-movements lane. The eastbound and westbound approaches each consist of an auxiliary left-turn lane and a shared through/right-turn lane. No turn restrictions were noted.
Prince of Wales Drive at Merivale Road	The intersection of Prince of Wales Drive at Merivale Road is a signalized T-intersection. The northbound approach consists of an auxiliary left-turn lane, a through lane, and a cycletrack, and the southbound approach consists of a through lane, an auxiliary shared through/channelized right-turn lane, and a pocket bike lane. The eastbound approach consists of an auxiliary left-turn lane, a right-turn lane, and a bike lane. No turn restrictions were noted.

2.2.3 Existing Driveways

Within 200 metres of the proposed site accesses, one driveway to the RCMP complex is on the east side of Leikin Drive, and one driveway to an office building is located on the north side of Bill Leathem Drive. Additionally, a one-way couplet to the RCMP complex is located at the signalized intersection at Leikin, and the south leg of the intersection of Bill Leathem Drive at Leikin Drive is a driveway to the RCMP complex. Figure 3 illustrates area driveways.

Figure 3: Area Driveways



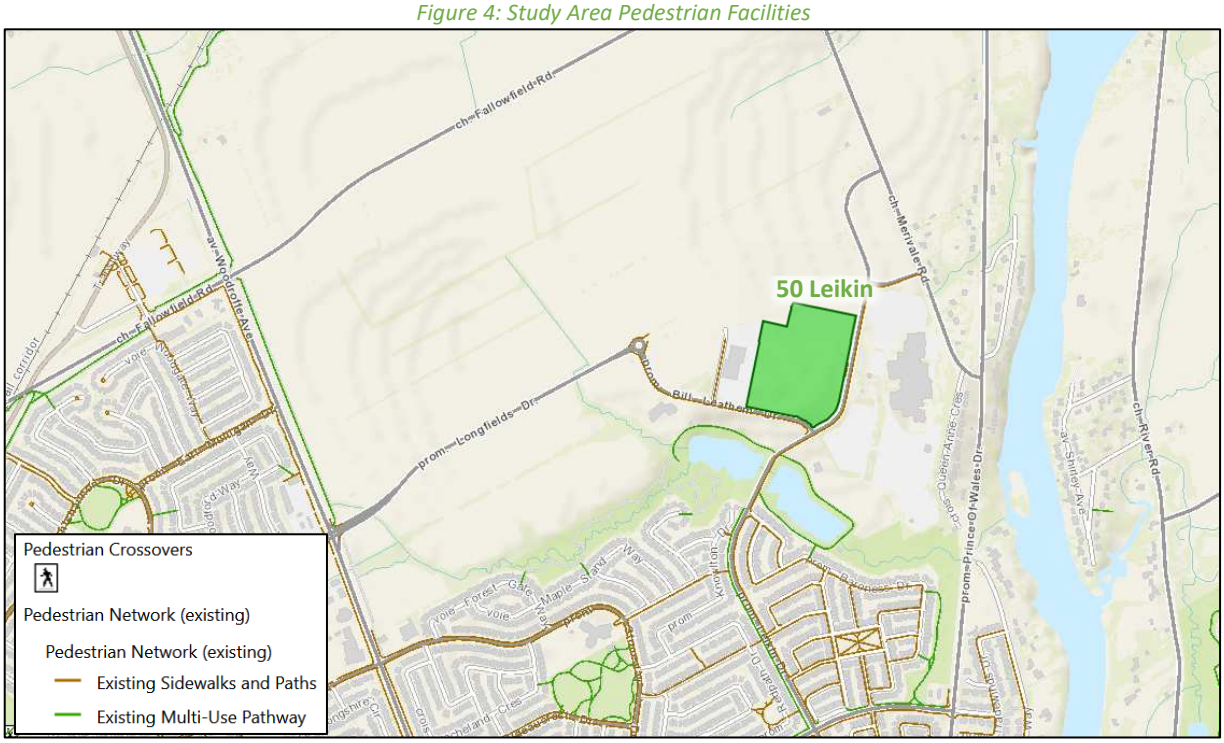
Source: http://maps.ottawa.ca/geoOttawa/ Accessed: January 27, 2023

2.2.4 Cycling and Pedestrian Facilities

Sidewalks are provided along one side of Bill Leathem Drive, Leikin Drive, and Beckstead Road. A MUP is provided along one side of Leikin Drive south of Holitzner Way and pathways circulate the Clarke Bellinger Stormwater Facility with local neighbourhood connections. Cycling facilities include bike lanes along both sides of Leikin Drive, paved shoulders along Longfields Drive, Merivale Road, and Prince of Wales Drive. Prince of Wales Drive north of Merivale Road is a cross-town bikeway, Prince of Wales Drive and Merivale Road are spine routes, and Longfields Drive, Bill Leathem Drive, and Leikin Drive are local routes.

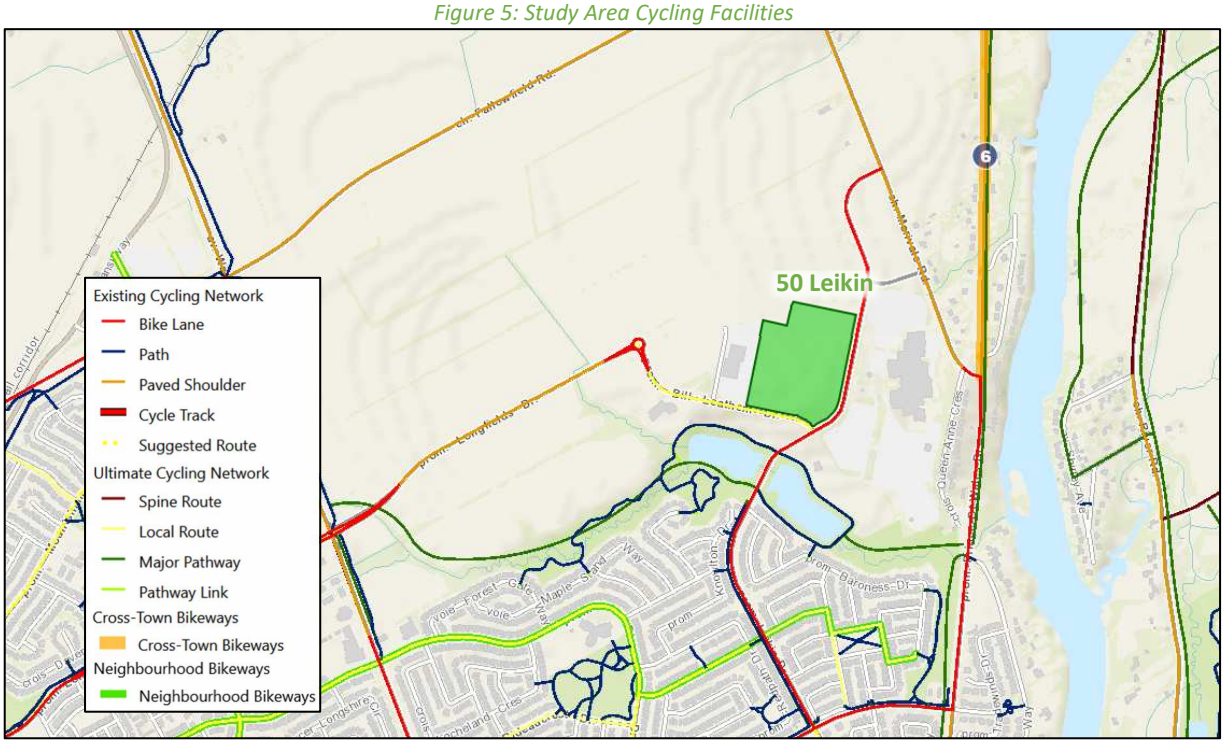
Figure 4 illustrates the pedestrian facilities in the study area and Figure 5 illustrates the cycling facilities. Pedestrian and cyclist volumes included in study area intersection counts, presented in Section 2.2.7, have been compiled and are illustrated in Figure 6 and Figure 7, respectively.

Figure 4: Study Area Pedestrian Facilities



Source: http://maps.ottawa.ca/geoOttawa/ Accessed: January 27, 2023

Figure 5: Study Area Cycling Facilities



Source: http://maps.ottawa.ca/geoOttawa/ Accessed: January 27, 2023

Figure 6: Existing Pedestrian Volumes

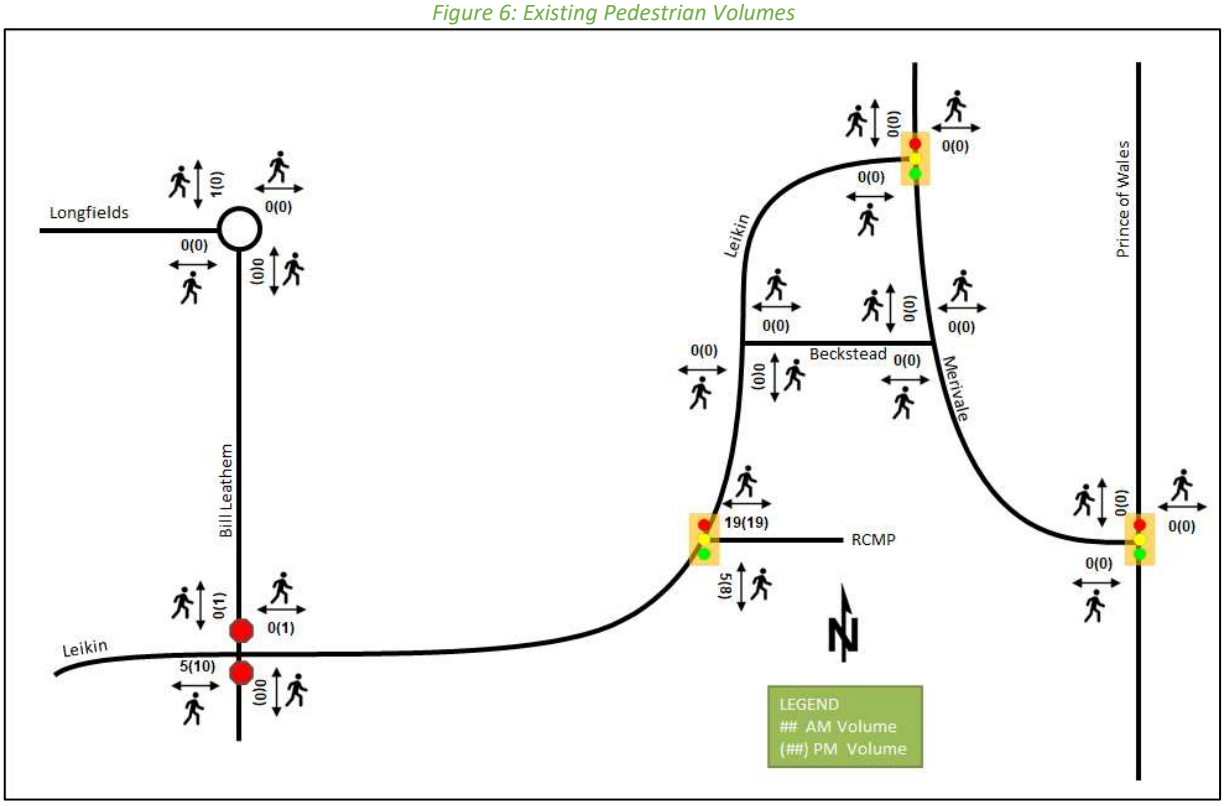
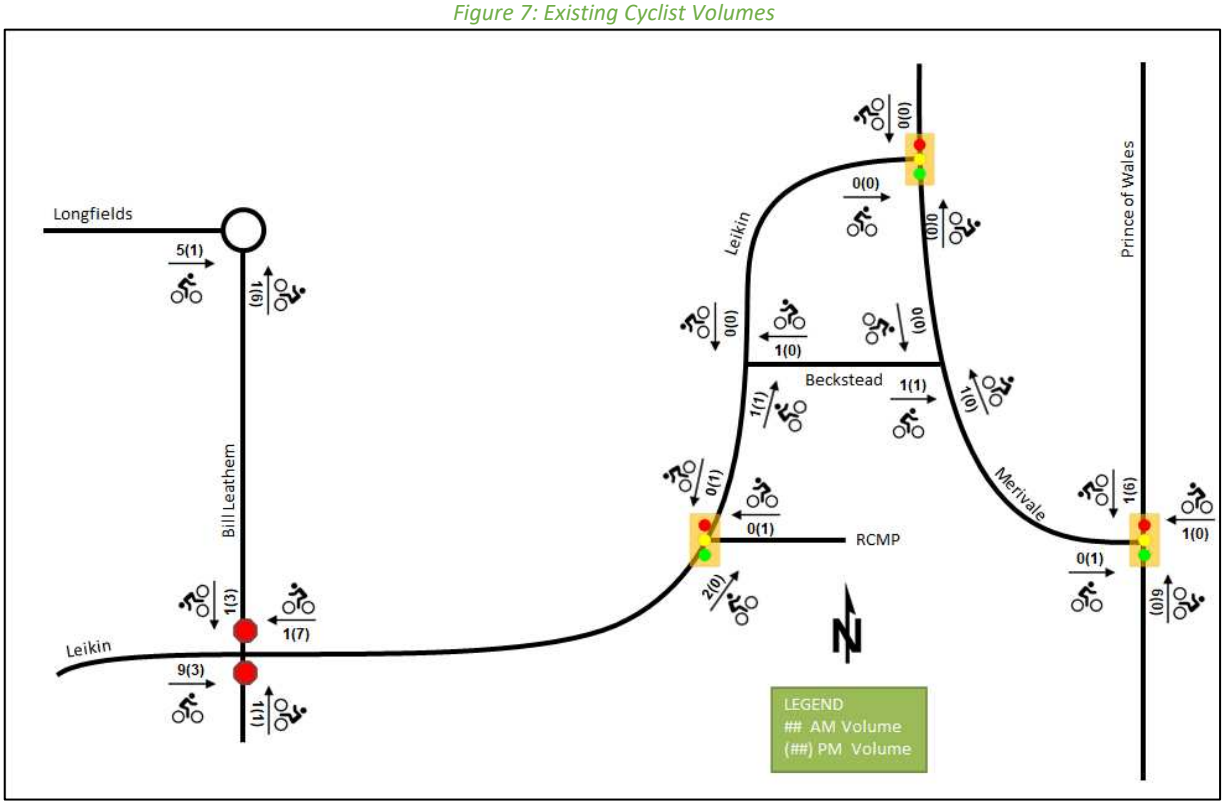


Figure 7: Existing Cyclist Volumes



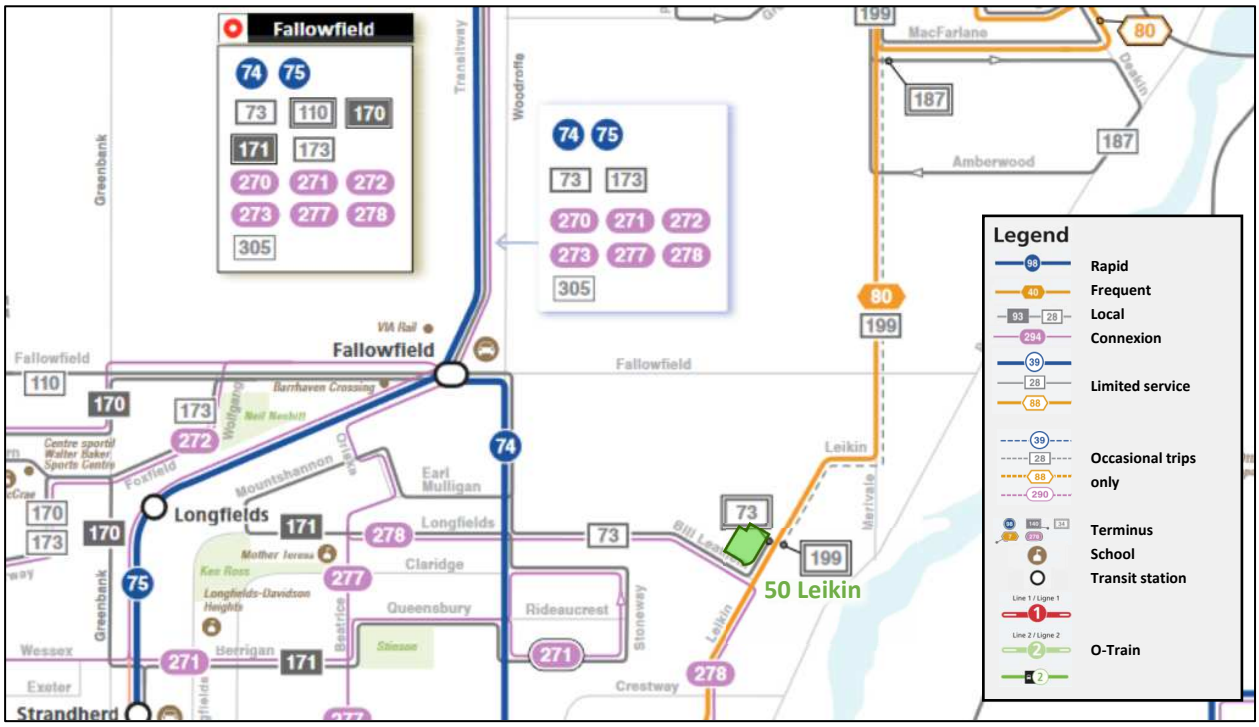
2.2.5 Existing Transit

Figure 8 illustrates the transit system map in the study area and Figure 9 illustrates nearby transit stops. All transit information is from January 30, 2023, and is included for general information purposes and context to the surrounding area.

Within the study area, the routes #80 and #199 travel along Leikin Drive and Merivale Road, with route #80 connecting to Marketplace and Barrhaven Centre Stations, and the routes #73 and #278 travel along Bill Leathem Drive connecting to Fallowfield Station. The frequency of these routes within proximity of the proposed site based on January 30, 2023 service levels are:

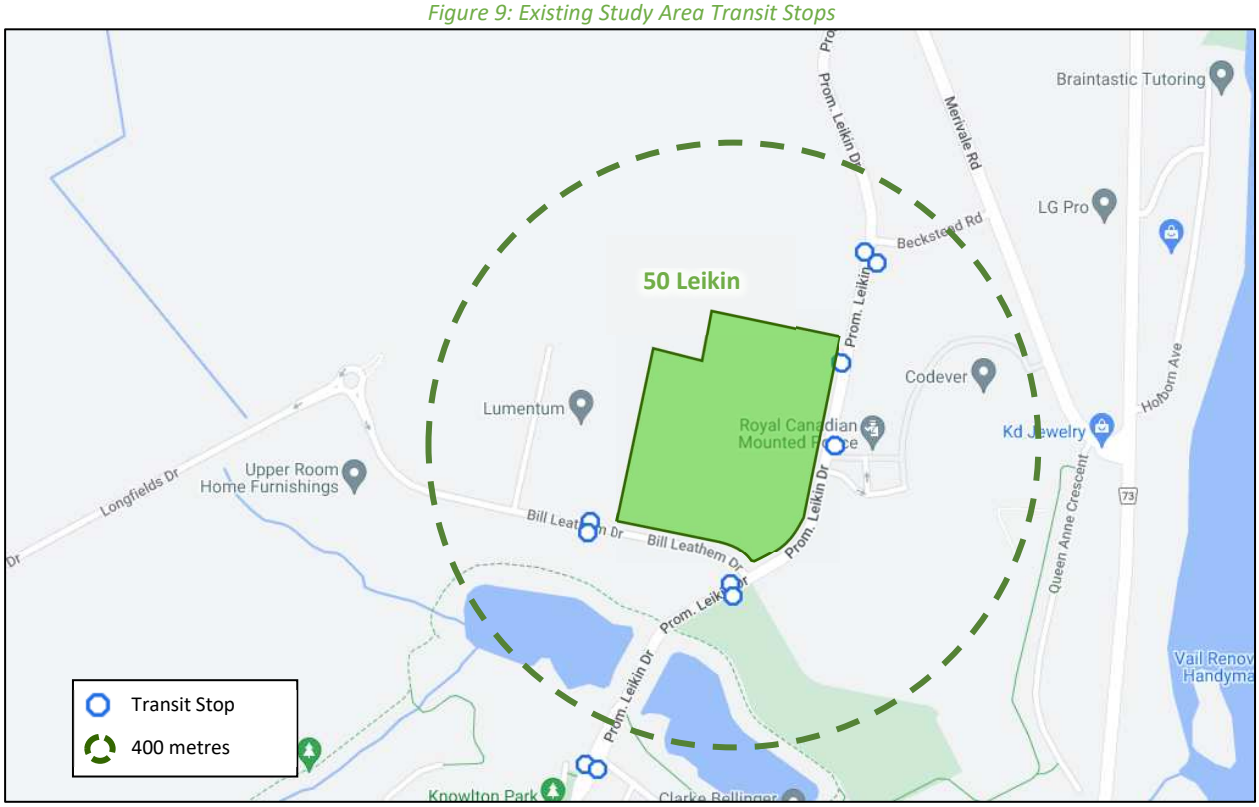
- Route # 73 – 30-minute service to the RCMP campus in the AM and from the RCMP campus in the PM, operating in the peak period/direction only
- Route # 80 – 30-minute service all day
- Route # 199 – Two buses to the RCMP campus in the AM peak period and two buses from the RCMP campus in the PM peak period
- Route # 278 – 30-minute service operating in the peak period/direction only

Figure 8: Existing Study Area Transit Service



Source: http://www.octranspo.com/ Accessed: January 27, 2023

Figure 9: Existing Study Area Transit Stops



Source: http://www.octranspo.com/ Accessed: January 27, 2023

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 various sources for the existing study area intersections. A 2022 count for the intersection of Bill Leathem Drive at Leikin Drive was reviewed and had a decreased volume when compared to the 2019 count. Therefore, the 2019 count will be used for the intersection of Bill Leathem Drive at Leikin Drive. Table 1 summarizes the intersection count dates and sources.

Table 1: Intersection Count Date

Intersection	Count Date	Source
Merivale Road at Leikin Drive	Wednesday, November 21, 2018	City of Ottawa
Bill Leathem Drive at Longfields Drive	Tuesday, June 10, 2015	99 Bill Leathem Dr, 2-20 Leikin Dr TIA
RCMP Campus at Leikin Drive	Tuesday, January 14, 2020	City of Ottawa
Merivale Road at Beckstead Road	Wednesday, February 8, 2023	The Traffic Specialist
Bill Leathem Drive at Leikin Drive	Wednesday, June 12, 2019	City of Ottawa
Prince of Wales Drive at Merivale Road	Wednesday, June 13, 2018	City of Ottawa

Figure 10 illustrates the existing traffic counts and Table 2 summarizes the existing intersection operations. The level of service for signalized intersections is based on volume to capacity ratio (v/c) calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection, and average delay for unsignalized intersections. Given the intersection of Bill Leathem Drive at Longfields Drive effectively constitutes a 90-degree bend, it will not be analyzed in the existing conditions. The roundabout will be analyzed in the future conditions using the volumes from the 99 Bill Leathem Drive, 2-20 Leikin Drive TIA which is proposed to add two legs to the

intersection for site access. Detailed turning movement count data is included in Appendix B and the Synchro worksheets are provided in Appendix C.

Figure 10: Existing Traffic Counts

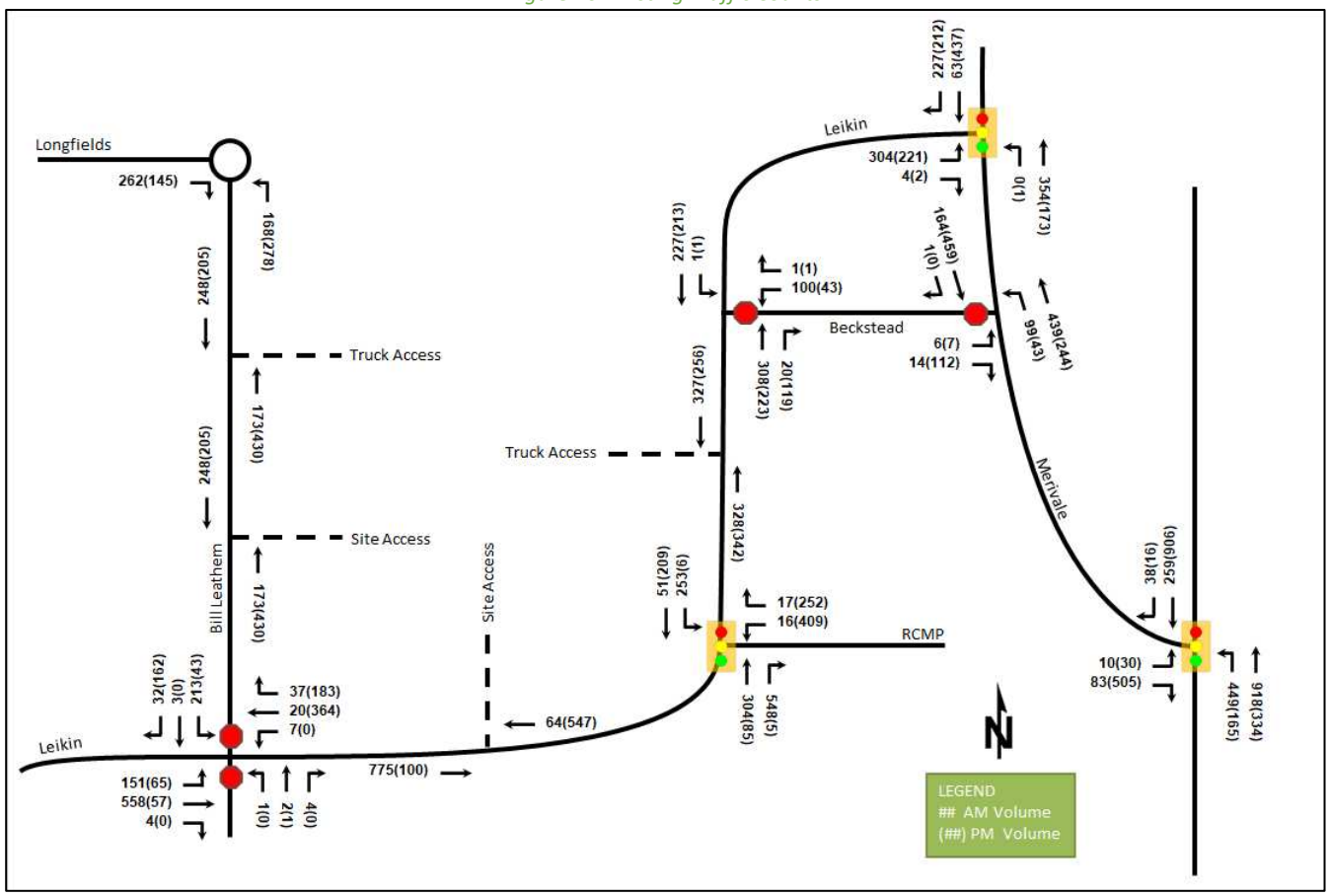


Table 2: Existing Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Merivale Rd & Leikin Dr ***Signalized***	EBL	D	0.86	56.8	**#113.0**	B	0.67	34.1	55.0
	EBR	A	0.01	18.8	2.7	A	0.01	15.5	1.5
	NBL	-	-	-	-	A	0.00	9.0	0.9
	NBT	A	0.36	10.7	61.7	A	0.20	9.2	30.1
	SBT	A	0.08	8.6	12.3	A	0.48	12.0	83.1
	SBR	A	0.25	1.9	10.0	A	0.24	2.3	11.0
	Overall	**A**	**0.50**	**23.2**	**-**	**A**	**0.53**	**14.2**	**-**
Leikin Dr & Beckstead Rd ***Unsignalized***	WBL	C	0.24	15.3	6.8	B	0.10	13.1	2.3
	WBR	B	0.00	10.2	0.0	B	0.00	10.0	0.0
	NBT/R	-	-	-	-	-	-	-	-
	SBL	A	0.00	8.0	0.0	A	0.00	8.1	0.0
	SBT	-	-	-	-	-	-	-	-
	Overall	**A**	**-**	**2.3**	**-**	**A**	**-**	**1.0**	**-**

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Merivale Rd & Beckstead Rd *Unsignalized*	EBL	C	0.02	17.8	0.8	C	0.03	17.1	0.8
	EBR	A	0.02	9.3	0.8	B	0.22	13.2	6.0
	NBL	A	0.08	7.8	2.3	A	0.05	8.6	0.8
	NBT	-	-	-	-	-	-	-	-
	SBT/R	-	-	-	-	-	-	-	-
	Overall	**A**	**-**	**1.4**	**-**	**A**	**-**	**2.3**	**-**
Leikin Dr & RCMP *Signalized*	WBL	A	0.06	27.1	7.5	D	0.90	57.3	**#147.3**
	WBR	A	0.07	13.4	5.2	A	0.46	6.0	18.4
	NBT	A	0.40	16.7	67.2	A	0.10	13.8	21.5
	NBR	A	0.60	4.7	22.5	A	0.01	8.8	2.4
	SBL	A	0.40	6.4	29.5	A	0.01	10.7	2.6
	SBT	A	0.05	4.7	7.3	A	0.24	12.6	37.4
	Overall	**A**	**0.42**	**8.5**	**-**	**A**	**0.49**	**29.9**	**-**
Bill Leathem Dr & Leikin Dr *Unsignalized*	EBL	A	0.11	7.6	3.0	A	0.08	9.0	1.5
	EBT/R	-	-	-	-	-	-	-	-
	WBL	A	0.01	9.4	0.0	A	-	0.0	0.0
	WBT/R	-	-	-	-	-	-	-	-
	NB	C	0.03	17.9	0.8	C	0.00	17.8	0.0
	SB	**F**	**1.29**	**204.6**	**110.3**	C	0.47	18.6	18.0
	Overall	**F**	**-**	**50.5**	**-**	**A**	**-**	**5.0**	**-**
Prince of Wales Dr & Merivale Rd *Signalized*	EBL	A	0.07	41.9	7.3	A	0.24	55.9	17.6
	EBR	A	0.38	10.6	9.3	**F**	**1.05**	**84.6**	**#194.5**
	NBL	A	0.58	4.3	38.7	A	0.32	3.6	12.6
	NBT	B	0.61	4.2	141.2	A	0.24	2.6	26.0
	SBT/R	A	0.14	5.8	26.2	A	0.54	17.3	92.9
	Overall	**C**	**0.75**	**5.0**	**-**	**C**	**0.75**	**31.6**	**-**

Notes: Saturation flow rate of 1800 veh/h/lane
Queue is measured in metres
Peak Hour Factor = 0.90
Delay = average vehicle delay in seconds
m = metered queue
# = volume for the 95th %ile cycle exceeds capacity

During the AM peak hour, at the intersection of Merivale Road at Leikin Drive, extended queueing may be present on the eastbound left movement. Also during the AM peak hour, at the intersection of Bill Leathem Drive at Leikin Drive, the southbound movement is over theoretical capacity and this movement, and the overall intersection may be subject to high delays. While stating that warrants are not met (confirmed in warrants provided in Appendix D), the 99 Bill Leathem Drive & 2-20 Leikin Drive TIA proposed signalization of this intersection as a means to mitigate existing and forecasted capacity issues at this intersection. This will be reviewed through the subsequent TIA modules to confirm any improvements.

During the PM peak hour, at the intersection of Prince of Wales Drive at Merivale Road, the eastbound right movement may be operating over theoretical capacity and may be subject to high delays and extended, but as the remaining movements have residual capacity, shifting three seconds of split from the north-south phases to the east phase would alleviate this capacity issue. At the intersection of Leikin Drive at the RCMP campus access, the westbound left movement may exhibit extended queues.

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 are road network. Table 3 summarizes the collision

types and conditions in the study area, Figure 11 illustrates the intersections and segments analyzed, and Table 4 summarizes the total collisions for each of these locations. Collision data are included in Appendix E.

Table 3: Study Area Collision Summary, 2016-2020

		Number	%
Total Collisions		**50**	**100%**
Classification	**Fatality**	0	0%
	Non-Fatal Injury	15	30%
	Property Damage Only	35	70%
Initial Impact Type	**Approaching**	3	6%
	Angle	7	14%
	Rear end	20	40%
	Sideswipe	2	4%
	Turning Movement	6	12%
	SMV Other	10	20%
	Other	2	4%
Road Surface Condition	**Dry**	23	46%
	Wet	18	36%
	Loose Snow	2	4%
	Slush	1	2%
	Ice	6	12%
Pedestrian Involved		0	0%
Cyclists Involved		0	0%

Figure 11: Study Area Collision Records

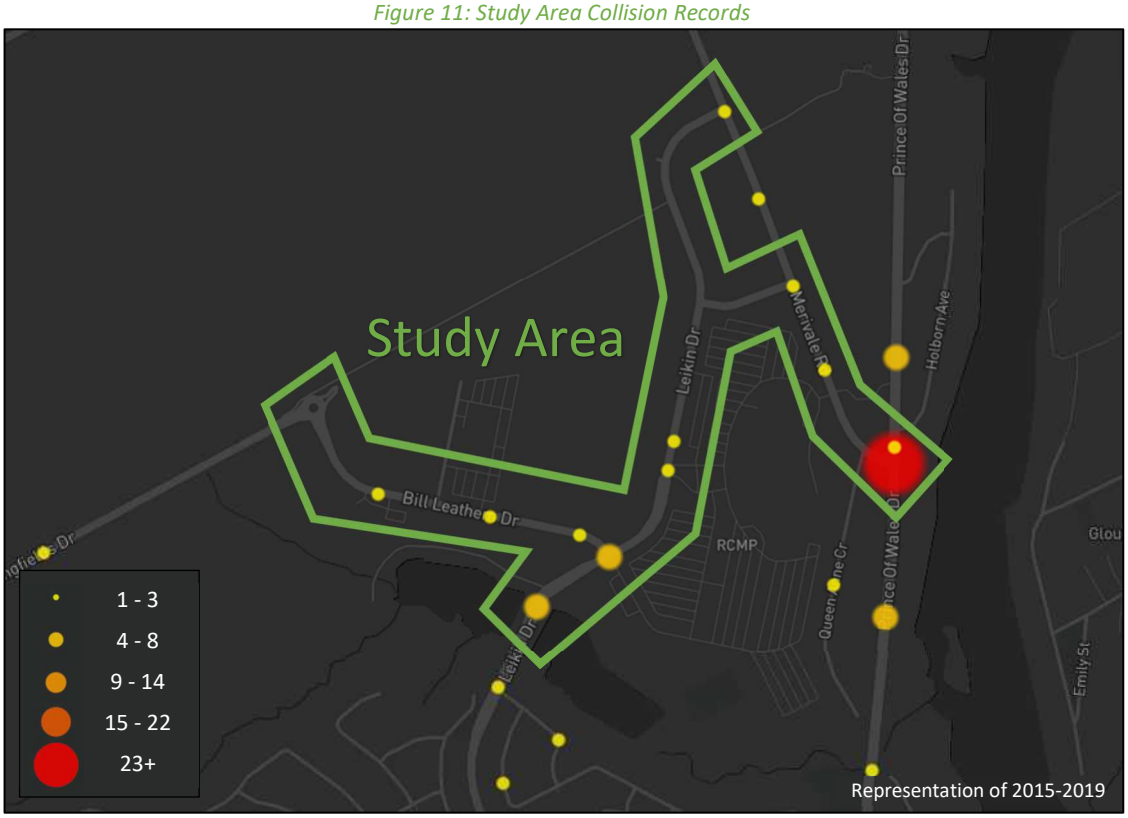


Table 4: Summary of Collision Locations, 2016-2020

	Number	%
Intersections / Segments	**50**	**100%**
Prince Of Wales Drive @ Merivale Road	30	60%
Bill Leathem Drive @ Leikin Drive	6	12%
Leikin Drive between Beckstead Road & Bill Leathem Drive	3	6%
Beckstead Road @ Merivale Road	2	4%
Leikin Drive @ Merivale Road	2	4%
Leikin Drive @ RCMP Access/150 N Of Bill Leathem Drive	2	4%
Bill Leathem Drive between the continuation of Bill Leathem Drive & Paragon Avenue	2	4%
Bill Leathem Drive between Paragon Avenue & the continuation of Bill Leathem Drive	2	4%
Leikin Drive between Holitzner Way & Crestway Drive	2	4%
Bill Leathem Drive between the continuation of Bill Leathem Drive & Leikin Drive	1	2%

Within the study area, the Prince of Wales Drive at Merivale Road intersection is noted to have experienced higher collisions than other locations. Table 5 summarizes the collision types at this location.

Table 5: Intersection of Prince of Wales at Merivale Road – 2016-2020 Collisions

		Number	%
Total Collisions		**30**	**100%**
Classification	**Fatality**	0	0%
	Non-Fatal Injury	9	30%
	Property Damage Only	21	70%
Initial Impact Type	**Approaching**	2	7%
	Angle	2	7%
	Rear end	16	53%
	Sideswipe	2	7%
	Turning Movement	4	13%
	SMV Other	4	13%
Road Surface Condition	**Dry**	18	60%
	Wet	9	30%
	Slush	1	3%
	Ice	2	7%
Pedestrian Involved		0	0%
Cyclists Involved		0	0%

The Prince of Wales at Merivale Road intersection had a total of 30 collisions during the 2016-2020 time period, with 21 involving property damage only and the remaining nine having non-fatal injuries. The collision types are most represented by rear end with 16 collisions, followed by four collisions each as turning movement and SMV other, and the remaining collisions split between approaching, angle, and sideswipe. Rear end collisions are typically associated with congestion, and no other trends are noted. Weather conditions may affect collisions at this location. No further review of collisions at this location are required as part of this study.

2.3 Planned Conditions

2.3.1 Changes to the Area Transportation Network

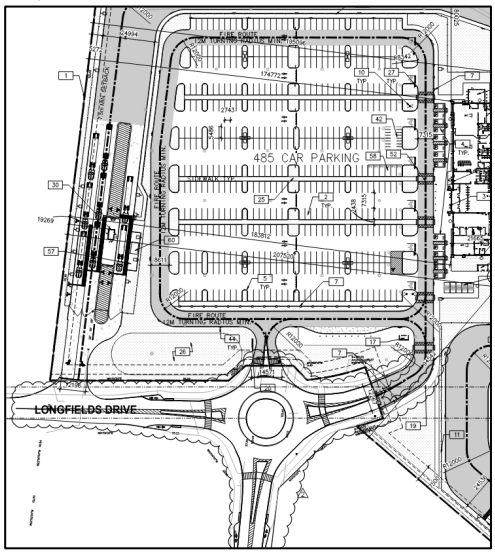
Within the Transportation Master Plan, the Road Network's Network Concept diagram shows the widening of Prince of Wales Drive from Woodroffe Avenue to Fisher Avenue, and the widening of the section between Merivale Road and Fisher Avenue is included as a Phase 3 project (2026-2031) in the Affordable Network. It is assumed that this project will not be completed within the study horizons.

2.3.2 Other Study Area Developments

99 Bill Leathem Drive, 2-20 Leikin Drive

The proposed development application includes a site plan for the construction of an approximately 26,000 square metre light industrial sortation facility. The development is anticipated to be built out by 2026 and to generate 250 AM and 255 PM peak hour auto trips. As part of this development, the north and east legs of the roundabout intersection of Bill Leathem Drive at Longfields Drive will be constructed as site accesses for an employee parking lot with no changes to the remaining approaches. This modification is illustrated in Figure 12. (Novatech, 2021)

Figure 12: 99 Bill Leathem Drive, 2-20 Leikin Drive TIA - Bill Leathem Drive at Longfields Drive Modifications



2 Leikin Drive

The proposed development application includes a site plan for the construction of a building comprising 117 square metres of office space and 3,036 square metres of warehouse space. Part of the development was constructed in 2021 and was anticipated to generate 36 AM and 38 PM peak hour auto trips, and the remaining development is assumed to be built out by 2025 and to generate an additional 2 AM and 5 PM peak hour auto trips. (McIntosh Perry, 2022)

3 Study Area and Time Periods

3.1 Study Area

The study area will include the intersections of:

- Bill Leathem Drive at:
  - Longfields Drive
  - Leikin Drive
  - Site Employee Access (future conditions)
  - Site Truck Access (future conditions)
- Leikin Drive at:
  - Site Employee Access (future conditions)
  - RCMP Visitor Access/Site Truck Access (future conditions/design review only)
  - RCMP Campus
  - Merivale Road

    - Beckstead Road
- Merivale Road at:
    - Prince of Wales Drive
    - Beckstead Road

The boundary roads will be Bill Leathem Drive and Leikin Drive. TRANS Screenline 9 is across the Greenbelt north of the site and will not be analyzed as part of this study.

3.2 Time Periods

As the proposed development is for an industrial land use, the weekday AM and PM peak hours will be examined.

3.3 Horizon Years

The anticipated build-out year is 2026. As a result, the full build-out plus five years horizon year is 2031.

4 Exemption Review

Table 6 summarizes the exemptions for this TIA.

Table 6: Exemption Review

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

5 Development-Generated Travel Demand

5.1 Mode Shares

To understand the travel for the site employees as they arrive for and depart from their shifts, the mode shares recommended in the TRANS Trip Generation Manual (2020) for the subject district, derived from the most recent National Capital Region Origin-Destination survey (OD Survey), will be examined. The existing average district

mode shares for the employment land uses for South Nepean have been summarized in Table 7. Site trucking traffic will comprise only vehicle trips, thus a 100% Auto Driver modal share will apply to that component.

Table 7: TRANS Trip Generation Manual Recommended Mode Shares – South Nepean

Travel Mode	Employment Generator	Site Trucks
	AM and PM	AM and PM
Auto Driver	80%	100%
Auto Passenger	10%	-
Transit	5%	-
Cycling	1%	-
Walking	4%	-
Total	**100%**	**100%**

5.2 Trip Generation

This TIA has been prepared with information provided by the proponent to estimate the site operations, including total employees, shifts, hours of operation, and truck arrivals/departures. Facility operational information and assumptions are provided in Appendix F. Table 8 summarizes the person trip rates for the facility employees and site trucks for each peak hour.

Table 8: Facility Trip Generation Person Trips

Facility Trip Component	Peak Hour	Vehicle Trips	Person Trips
Employees	AM	-	180
	PM	-	143
5-Tonne Trucks	AM	15	-
	PM	32	-
Line Haul Trucks	AM	7	-
	PM	8	-

Using the above person trip rates, the directional person trip generation has been estimated. Table 9 summarizes the person trip generation for each operational component.

Table 9: Total Person Trip Generation

Trip Component	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
Employees	108	72	180	24	120	144
5-Tonne Trucks	8	7	15	16	16	32
Line Haul Trucks	4	3	7	6	2	8

Using the above mode share targets and the person trips, total trips by mode have been projected. Table 10 summarizes the site trip generation by mode and peak hour.

Table 10: Trip Generation by Mode

Travel Mode		AM Peak Hour				PM Peak Hour			
		Mode Share	In	Out	Total	Mode Share	In	Out	Total
Employees	Auto Driver	**80%**	86	58	144	**80%**	19	96	115
	Auto Passenger	**10%**	11	7	18	**10%**	2	12	14
	Transit	**5%**	5	4	9	**5%**	1	6	7
	Cycling	**1%**	1	1	2	**1%**	0	1	1
	Walking	**4%**	4	3	7	**4%**	1	5	6
	Total	**100%**	**107**	**73**	**180**	**100%**	**23**	**120**	**143**

Travel Mode		AM Peak Hour				PM Peak Hour			
		Mode Share	In	Out	Total	Mode Share	In	Out	Total
Trucks	Auto Driver	**100%**	12	10	22	**100%**	22	18	40
	Auto Passenger	-	-	-	-	-	-	-	-
	Transit	-	-	-	-	-	-	-	-
	Cycling	-	-	-	-	-	-	-	-
	Walking	-	-	-	-	-	-	-	-
	Total	**100%**	**12**	**10**	**22**	**100%**	**22**	**18**	**40**
Total	Auto Driver	-	98	68	166	-	41	114	155
	Auto Passenger	-	11	7	18	-	2	12	14
	Transit	-	5	4	9	-	1	6	7
	Cycling	-	1	1	2	-	0	1	1
	Walking	-	4	3	7	-	1	5	6
	Total	-	**119**	**83**	**202**	-	**45**	**138**	**183**

As shown above, a total of 166 AM and 155 PM new peak hour two-way vehicle trips are projected as a result of the proposed development.

5.3 Trip Distribution

To understand the travel patterns of the subject development, the OD Survey has been reviewed to determine the travel for the development employees, and these patterns were applied based on the build-out of South Nepean. Table 11 below summarizes the distributions for the employees. Truck traffic will be distributed regionally and via truck routes.

Table 11: OD Survey Distribution – South Nepean

To/From	Employees		Trucks	
	% of Trips	% of Trips	% of Trips	Via
North	30%	25% Merivale Rd, 5% Longfields Dr	10%	10% Merivale Rd
South	30%	20% Leikin Dr, 10% Prince of Wales Dr	10%	10% Prince of Wales Dr
East	5%	5% Prince of Wales Dr	40%	30% Merivale Rd, 10% Prince of Wales Dr
West	35%	10% Leikin Dr, 25% Longfields Dr	40%	30% Longfields Dr, 10% Prince of Wales Dr
Total	**100%**	**100%**	**100%**	**100%**

5.4 Trip Assignment

Using the distribution outlined above, turning movement splits, and access to major transportation infrastructure, the trips generated by the site have been assigned to the study area road network. Figure 13 illustrates the new site-generated employee auto volumes, and Figure 14 illustrates the new site-generated truck volumes.

Figure 13: New Site Generation Employee Auto Volumes

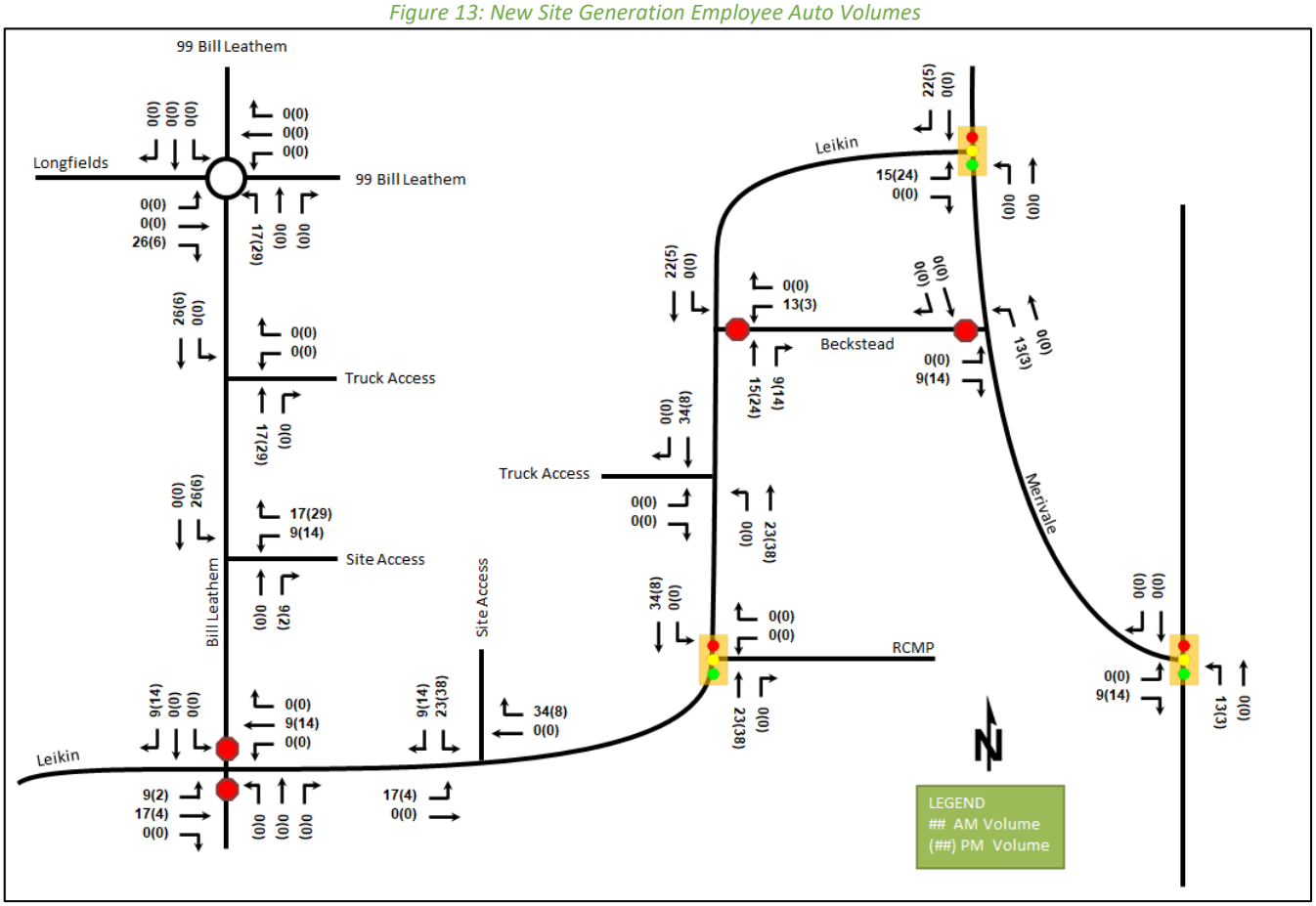
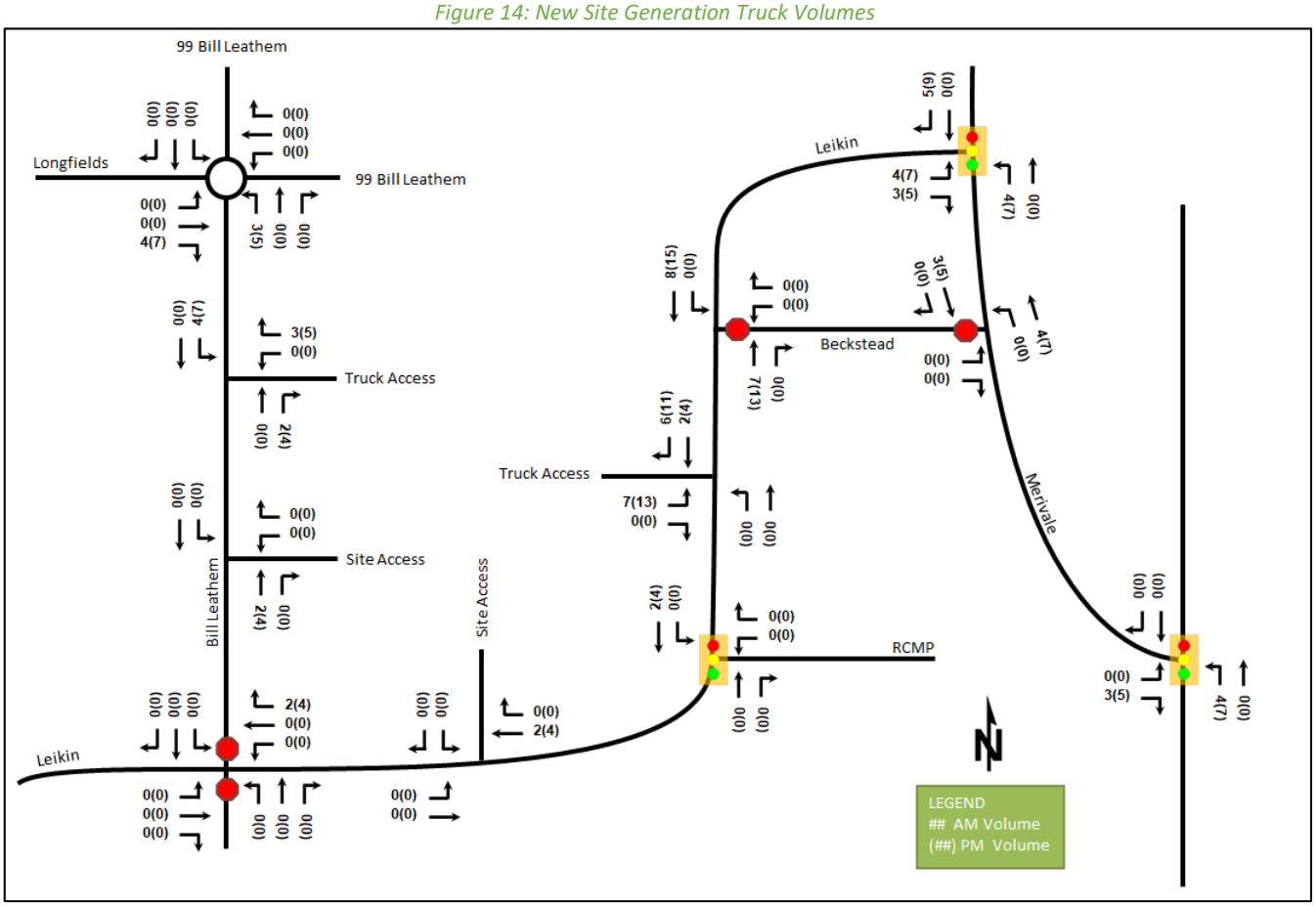


Figure 14: New Site Generation Truck Volumes



6 Background Network Travel Demands

6.1 Transportation Network Plans

The transportation network plans were discussed in Section 2.3. As previously noted, the north and east legs of the roundabout intersection of Bill Leathem Drive at Leikin Drive will be constructed and serve as site accesses for the proposed 99 Bill Leathem Drive, 2-20 Leikin Drive development. These approaches are understood to consist of a single shared all-movements lane, and no changes to area traffic beyond the volumes introduced at the site accesses are anticipated.

6.2 Background Growth

A review of the background projections from the City's TRANS Regional Model for the 2011 and 2031 horizons was completed to determine the background growth for the study area roads.

All growth on Longfields Drive, Bill Leathem Drive, and Leikin Drive is assumed to be associated with future development within this area which can explicitly be accounted for by incorporated forecasted volumes from area traffic studies.

The background TRANS model growth rates for Merivale Road and Prince of Wales Drive are summarized in Table 12 and the TRANS model plots are provided in Appendix G.

Table 12: TRANS Regional Model Projections – Study Area Growth Rates

Street	TRANS Rate		2011 to Existing		Existing to 2031	
	Northbound	Northbound	Southbound	Southbound	Northbound	Southbound
Merivale Rd	0.02%	1.00%	0.81%	2.08%	-0.50%	0.29%
Prince of Wales Dr	0.99%	-1.78%	0.73%	-6.54%	1.16%	1.52%

A comparison of the TRANS volumes and the existing volumes reveal that the historical growth has progressed more rapidly than anticipated along Merivale Road and slightly less rapidly than anticipated along Prince of Wales Drive. As these trends appear to have been roughly validated, the TRANS rates, rounded to the nearest 0.25% will be applied to mainline arterial movements and major turning movements between the arterials within the study area during the AM peak hour and reversed in the PM peak hour. The resultant growth rates by peak hour to be applied to the study area arterial roads are summarized in Table 13.

Table 13: Applied Growth Rates

Street	AM Peak Hour		PM Peak Hour	
	Northbound	Southbound	Northbound	Southbound
Merivale Rd	-	1.00%	1.00%	-
Prince of Wales Dr	1.00%	-	-	1.00%

6.3 Other Developments

The background development explicitly considered in the background conditions (Section 6.2) is 99 Bill Leathem Drive, 2-20 Leikin Drive. The background development volumes within the study area have been provided in Appendix H.

7 Demand Rationalization

7.1 2026 Future Background Operations

Figure 15 illustrates the 2026 background volumes and Table 14 summarizes the 2026 background intersection operations. The level of service for signalized intersections is based on v/c calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection, and average delay for unsignalized intersections. Synchro 11 has been used to model the signalized and stop-controlled intersections and Sidra 9 to model the study area roundabouts. Signal and stop control warrants for the intersection of Bill Leathem Drive at Leikin Drive are provided in Appendix D. The Synchro and Sidra worksheets for the 2026 future background horizon are provided in Appendix I.

Figure 15: 2026 Future Background Volumes

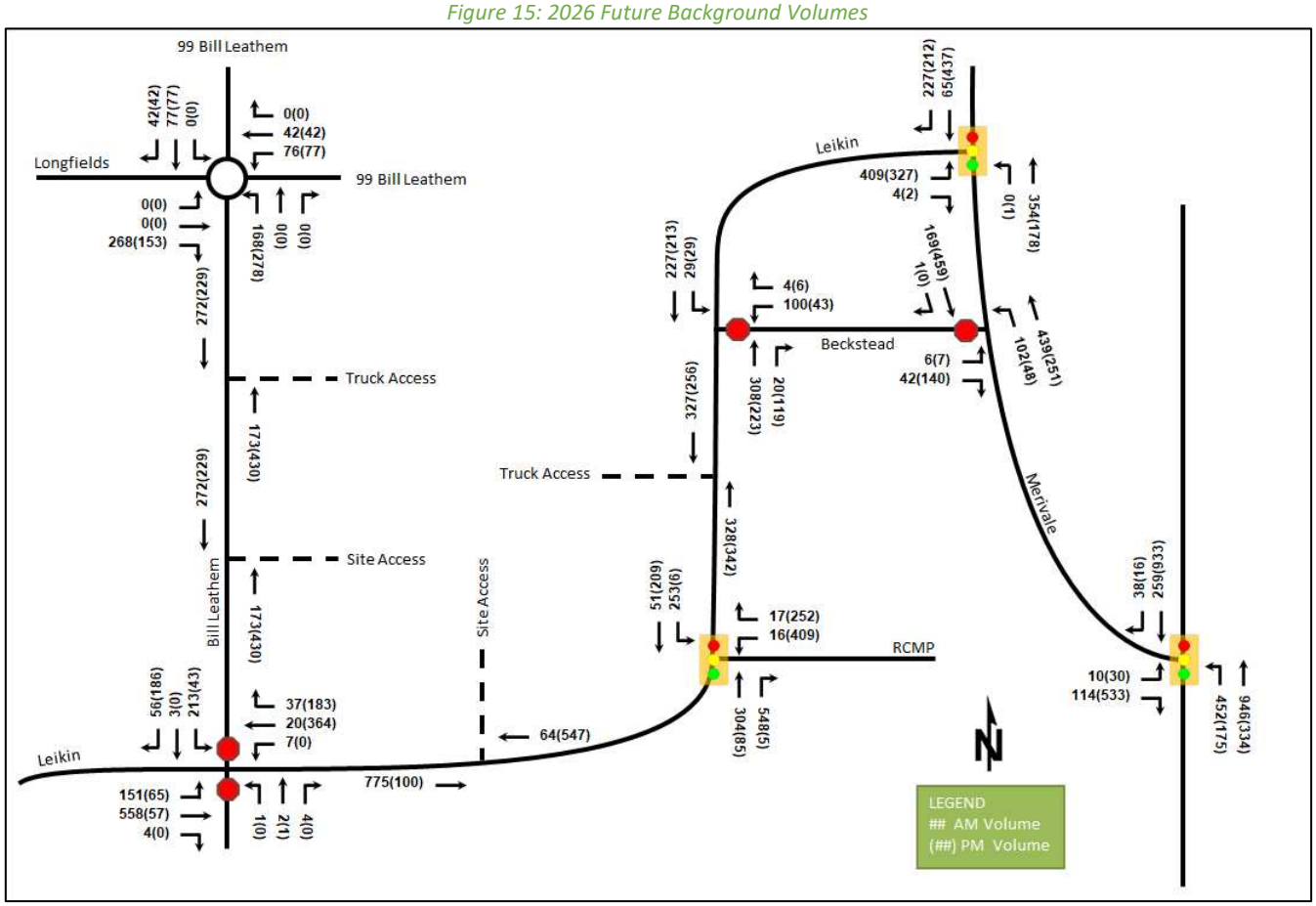


Table 14: 2026 Future Background Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Bill Leathem Dr & Longfields Dr ***Roundabout***	EB	A	0.22	5.4	9.0	A	0.13	5.5	5.2
	WB	A	0.10	0.8	3.3	A	0.10	1.3	3.7
	NB	A	0.10	7.4	3.9	A	0.16	7.4	6.5
	SB	A	0.11	1.3	3.9	A	0.11	1.9	4.3
	Overall	**A**	**0.22**	**4.4**	**9.0**	**A**	**0.16**	**4.9**	**6.5**
Merivale Rd & Leikin Dr ***Signalized***	EBL	E	0.97	74.5	**#147.0**	C	0.78	38.6	74.6
	EBR	A	0.01	18.8	2.7	A	0.01	15.0	1.5
	NBL	-	-	-	-	A	0.00	10.0	0.9
	NBT	A	0.33	10.8	54.5	A	0.19	10.3	28.6
	SBT	A	0.07	8.7	11.6	A	0.45	12.8	73.6
	SBR	A	0.23	1.9	9.5	A	0.23	2.5	10.6
	Overall	**A**	**0.52**	**33.4**	**-**	**A**	**0.55**	**17.8**	**-**
Leikin Dr & Beckstead Rd ***Unsignalized***	WBL	C	0.22	15.2	6.0	B	0.09	13.2	2.3
	WBR	B	0.01	10.0	0.0	A	0.01	9.8	0.0
	NBT/R	-	-	-	-	-	-	-	-
	SBL	A	0.02	8.0	0.8	A	0.02	8.0	0.8
	SBT	-	-	-	-	-	-	-	-
	Overall	**A**	**-**	**2.6**	**-**	**A**	**-**	**1.4**	**-**

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Merivale Rd & Beckstead Rd *Unsignalized*	EBL	C	0.02	16.4	0.8	C	0.02	15.9	0.8
	EBR	A	0.05	9.3	1.5	B	0.23	12.8	6.8
	NBL	A	0.07	7.8	1.5	A	0.04	8.4	0.8
	NBT	-	-	-	-	-	-	-	-
	SBT/R	-	-	-	-	-	-	-	-
	Overall	**A**	**-**	**1.7**	**-**	**A**	**-**	**2.6**	**-**
Leikin Dr & RCMP *Signalized*	WBL	A	0.05	26.5	6.8	D	0.86	53.9	**#124.8**
	WBR	A	0.07	13.4	4.9	A	0.44	6.2	17.5
	NBT	A	0.36	15.8	58.5	A	0.09	13.3	19.6
	NBR	A	0.56	4.3	20.4	A	0.01	9.0	2.1
	SBL	A	0.35	6.0	26.4	A	0.01	10.5	2.4
	SBT	A	0.04	4.8	6.7	A	0.21	11.6	33.7
	Overall	**A**	**0.36**	**8.1**	**-**	**A**	**0.45**	**28.2**	**-**
Bill Leathem Dr & Leikin Dr *Unsignalized*	EBL	A	0.10	7.6	2.3	A	0.06	8.8	1.5
	EBT/R	-	-	-	-	-	-	-	-
	WBL	A	0.01	9.1	0.0	A	-	0.0	0.0
	WBT/R	-	-	-	-	-	-	-	-
	NB	C	0.02	16.4	0.8	C	0.00	16.4	0.0
	SB	**F**	**1.00**	**96.6**	**76.5**	C	0.43	16.6	15.8
	Overall	**D**	**-**	**26.1**	**-**	**A**	**-**	**4.9**	**-**
Prince of Wales Dr & Merivale Rd *Signalized*	EBL	A	0.06	41.8	6.7	A	0.22	55.5	16.2
	EBR	A	0.45	11.2	10.7	E	0.97	61.9	**#172.4**
	NBL	A	0.51	3.5	34.0	A	0.30	3.3	11.8
	NBT	A	0.57	3.5	115.8	A	0.22	2.4	22.5
	SBT/R	A	0.13	5.4	22.4	A	0.50	16.6	83.6
	Overall	**B**	**0.70**	**4.5**	**-**	**B**	**0.69**	**25.7**	**-**

Notes: Saturation flow rate of 1800 veh/h/lane
Queue is measured in metres
Peak Hour Factor = 1.00
Delay = average vehicle delay in seconds
m = metered queue
# = volume for the 95th %ile cycle exceeds capacity

During both the AM and PM peak hours, the study area intersections at the 2026 future background horizon operate similarly to the existing conditions. At the intersection of Merivale Road at Leikin Drive during the AM peak hour, the eastbound left movement is approaching theoretical capacity with an increase in delay. At the intersection of Prince of Wales Drive at Merivale Road, the eastbound right movement is near capacity, which is an operational improvement from the existing conditions due to the peak hour factor of 1.00 for forecasted conditions.

7.2 2031 Future Background Operations

Figure 16 illustrates the 2031 background volumes and Table 15 summarizes the 2031 background intersection operations. The level of service for signalized intersections is based on v/c calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection, and average delay for unsignalized intersections. Synchro 11 has been used to model the signalized and stop-controlled intersections and Sidra 9 to model the study area roundabouts. Signal and stop control warrants for the intersection of Bill Leathem Drive at Leikin Drive are provided in Appendix D. The Synchro and Sidra worksheets for the 2031 future background horizon are provided in Appendix J.

Figure 16: 2031 Future Background Volumes

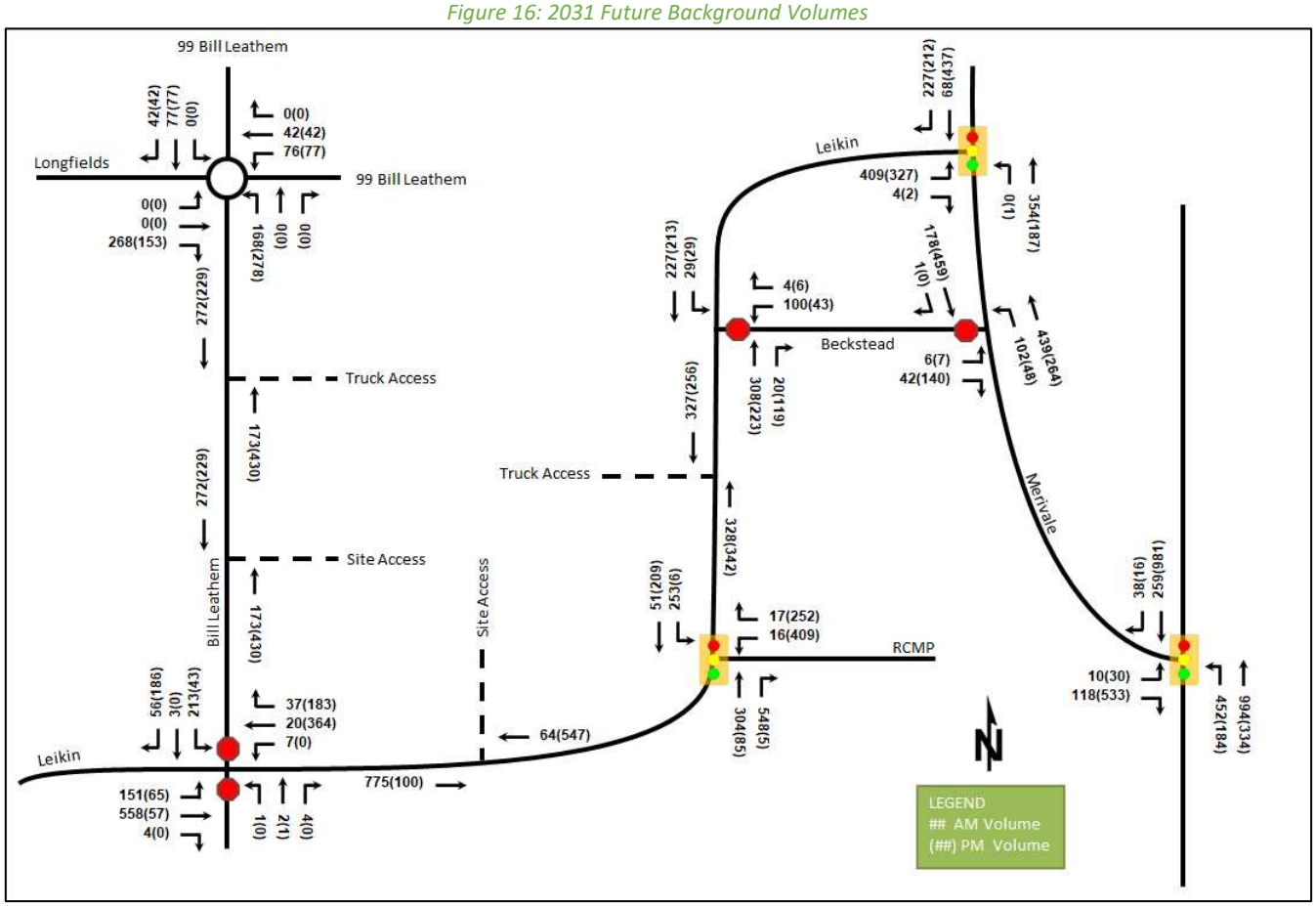


Table 15: 2031 Future Background Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Bill Leathem Dr & Longfields Dr ***Roundabout***	EB	A	0.22	5.4	9.0	A	0.13	5.5	5.2
	WB	A	0.10	0.8	3.3	A	0.10	1.3	3.7
	NB	A	0.10	7.4	3.9	A	0.16	7.4	6.5
	SB	A	0.11	1.3	3.9	A	0.11	1.9	4.3
	Overall	**A**	**0.22**	**4.4**	**9.0**	**A**	**0.16**	**4.9**	**6.5**
Merivale Rd & Leikin Dr ***Signalized***	EBL	E	0.97	74.5	**#147.0**	C	0.78	38.6	74.6
	EBR	A	0.01	18.8	2.7	A	0.01	15.0	1.5
	NBL	-	-	-	-	A	0.00	10.0	0.9
	NBT	A	0.33	10.8	54.5	A	0.20	10.3	30.0
	SBT	A	0.08	8.7	11.9	A	0.45	12.8	73.6
	SBR	A	0.23	1.9	9.5	A	0.23	2.5	10.6
	Overall	**A**	**0.52**	**33.3**	**-**	**A**	**0.55**	**17.8**	**-**
Leikin Dr & Beckstead Rd ***Unsignalized***	WBL	C	0.22	15.2	6.0	B	0.09	13.2	2.3
	WBR	B	0.01	10.0	0.0	A	0.01	9.8	0.0
	NBT/R	-	-	-	-	-	-	-	-
	SBL	A	0.02	8.0	0.8	A	0.02	8.0	0.8
	SBT	-	-	-	-	-	-	-	-
	Overall	**A**	**-**	**2.6**	**-**	**A**	**-**	**1.4**	**-**

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Merivale Rd & Beckstead Rd ***Unsignalized***	EBL	C	0.02	16.5	0.8	C	0.02	16.1	0.8
	EBR	A	0.05	9.4	1.5	B	0.23	12.8	6.8
	NBL	A	0.07	7.8	1.5	A	0.04	8.4	0.8
	NBT	-	-	-	-	-	-	-	-
	SBT/R	-	-	-	-	-	-	-	-
	Overall	**A**	**-**	**1.7**	**-**	**A**	**-**	**2.5**	**-**
Leikin Dr & RCMP ***Signalized***	WBL	A	0.05	26.5	6.8	D	0.86	53.9	**#124.8**
	WBR	A	0.07	13.4	4.9	A	0.44	6.2	17.5
	NBT	A	0.36	15.8	58.5	A	0.09	13.3	19.6
	NBR	A	0.56	4.3	20.4	A	0.01	9.0	2.1
	SBL	A	0.35	6.0	26.4	A	0.01	10.5	2.4
	SBT	A	0.04	4.8	6.7	A	0.21	11.6	33.7
	Overall	**A**	**0.36**	**8.1**	**-**	**A**	**0.45**	**28.2**	**-**
Bill Leathem Dr & Leikin Dr ***Unsignalized***	EBL	A	0.10	7.6	2.3	A	0.06	8.8	1.5
	EBT/R	-	-	-	-	-	-	-	-
	WBL	A	0.01	9.1	0.0	A	-	0.0	0.0
	WBT/R	-	-	-	-	-	-	-	-
	NB	C	0.02	16.4	0.8	C	0.00	16.4	0.0
	SB	**F**	**1.00**	**96.6**	**76.5**	C	0.43	16.6	15.8
	Overall	**D**	**-**	**26.1**	**-**	**A**	**-**	**4.9**	**-**
Prince of Wales Dr & Merivale Rd ***Signalized***	EBL	A	0.06	41.8	6.7	A	0.22	55.5	16.2
	EBR	A	0.46	11.2	10.9	E	0.99	67.7	**#177.4**
	NBL	A	0.51	3.5	34.0	A	0.32	3.5	12.3
	NBT	A	0.60	3.9	131.6	A	0.22	2.4	22.5
	SBT/R	A	0.13	5.4	22.4	A	0.53	17.1	89.3
	Overall	**C**	**0.74**	**4.7**	**-**	**C**	**0.72**	**27.0**	**-**

Notes: Saturation flow rate of 1800 veh/h/lane
Queue is measured in metres
Peak Hour Factor = 1.00
Delay = average vehicle delay in seconds
m = metered queue
# = volume for the 95th %ile cycle exceeds capacity

During both the AM and PM peak hours, the study area intersections at the 2031 future background horizon operate similarly to the 2026 future background conditions. No new capacity issues are noted.

7.3 2026 Future Total Operations

Figure 17 illustrates the 2026 total volumes and Table 16 summarizes the 2026 total intersection operations. The level of service for signalized intersections is based on v/c calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection, and average delay for unsignalized intersections. Synchro 11 has been used to model the signalized and stop-controlled intersections and Sidra 9 to model the study area roundabouts. Signal and stop control warrants for the intersection of Bill Leathem Drive at Leikin Drive are provided in Appendix D. The Synchro and Sidra worksheets for the 2026 total horizon are provided in Appendix K.

Figure 17: 2026 Future Total Volumes

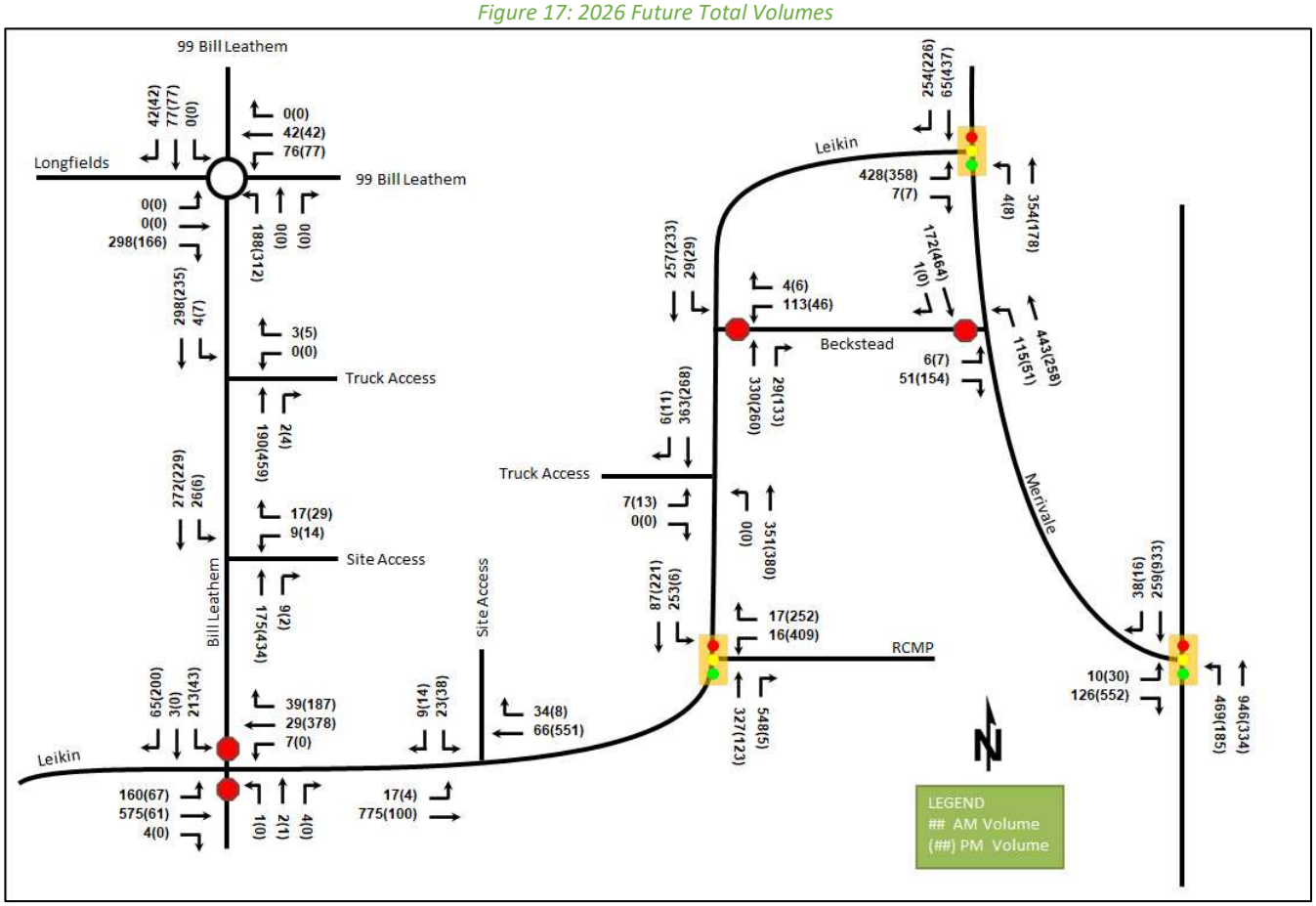


Table 16: 2026 Future Total Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Bill Leathem Dr & Longfields Dr *Roundabout*	EB	A	0.24	5.5	10.2	A	0.14	5.5	5.7
	WB	A	0.10	0.9	3.4	A	0.11	1.5	3.8
	NB	A	0.11	7.4	4.4	A	0.18	7.4	7.5
	SB	A	0.11	1.5	3.9	A	0.12	2.1	4.4
	Overall	**A**	**0.24**	**4.6**	**10.2**	**A**	**0.18**	**5.1**	**7.5**
Merivale Rd & Leikin Dr *Signalized*	EBL	**F**	**1.01**	**85.2**	**#155.9**	C	0.80	39.6	**#90.2**
	EBR	A	0.03	17.1	3.7	A	0.03	12.6	2.9
	NBL	A	0.01	8.8	1.8	A	0.03	11.1	3.0
	NBT	A	0.33	10.8	54.5	A	0.20	10.8	28.6
	SBT	A	0.07	8.7	11.6	A	0.46	13.6	73.6
	SBR	A	0.26	1.9	10.0	A	0.25	2.6	10.9
	Overall	**A**	**0.54**	**37.3**	**-**	**A**	**0.57**	**18.8**	**-**
Leikin Dr & Beckstead Rd *Unsignalized*	WBL	C	0.27	16.8	8.3	B	0.10	14.1	2.3
	WBR	B	0.01	10.2	0.0	B	0.01	10.1	0.0
	NBT/R	-	-	-	-	-	-	-	-
	SBL	A	0.02	8.1	0.8	A	0.03	8.2	0.8
	SBT	-	-	-	-	-	-	-	-
	Overall	**A**	**-**	**2.8**	**-**	**A**	**-**	**1.3**	**-**

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Merivale Rd & Beckstead Rd ***Unsignalized***	EBL	C	0.02	17.0	0.8	C	0.02	16.3	0.8
	EBR	A	0.06	9.4	1.5	B	0.26	13.1	7.5
	NBL	A	0.08	7.8	2.3	A	0.05	8.4	0.8
	NBT	-	-	-	-	-	-	-	-
	SBT/R	-	-	-	-	-	-	-	-
	Overall	**A**	**-**	**1.9**	**-**	**A**	**-**	**2.7**	**-**
Leikin Dr & RCMP ***Signalized***	WBL	A	0.05	26.5	6.8	D	0.86	53.9	**#124.8**
	WBR	A	0.07	13.4	4.9	A	0.44	6.2	17.5
	NBT	A	0.38	16.0	63.2	A	0.13	13.3	26.8
	NBR	A	0.56	4.3	20.4	A	0.01	9.0	2.1
	SBL	A	0.36	6.1	26.4	A	0.01	10.5	2.4
	SBT	A	0.07	4.7	10.1	A	0.22	11.7	35.6
	Overall	**A**	**0.37**	**8.2**	**-**	**A**	**0.46**	**27.5**	**-**
Bill Leathem Dr & Leikin Dr ***Unsignalized***	EBL	A	0.11	7.6	2.3	A	0.07	8.8	1.5
	EBT/R	-	-	-	-	-	-	-	-
	WBL	A	0.01	9.2	0.0	A	-	0.0	0.0
	WBT/R	-	-	-	-	-	-	-	-
	NB	C	0.02	17.1	0.8	C	0.00	16.8	0.0
	SB	**F**	**1.09**	**122.6**	**87.8**	C	0.46	17.6	18.0
	Overall	**D**	**-**	**32.6**	**-**	**A**	**-**	**5.2**	**-**
Prince of Wales Dr & Merivale Rd ***Signalized***	EBL	A	0.06	41.8	6.7	A	0.22	55.5	16.2
	EBR	A	0.46	10.8	11.1	**F**	**1.02**	**72.8**	**#183.8**
	NBL	A	0.53	3.7	35.8	A	0.32	3.5	12.6
	NBT	A	0.57	3.5	115.8	A	0.22	2.4	22.5
	SBT/R	A	0.13	5.6	22.8	A	0.50	16.6	83.6
	Overall	**B**	**0.70**	**4.6**	**-**	**C**	**0.71**	**28.2**	**-**
Bill Leathem Dr & Site Trucks ***Unsignalized***	WBL/R	B	0.01	10.5	0.0	B	0.01	13.3	0.0
	NBT/R	-	-	-	-	-	-	-	-
	SBL/T	A	0.00	8.8	0.0	A	0.01	10.0	0.0
	Overall	**A**	**-**	**0.1**	**-**	**A**	**-**	**0.2**	**-**
Bill Leathem Dr & Site Employees ***Unsignalized***	WBL/R	B	0.04	10.3	0.8	B	0.08	12.3	2.3
	NBT/R	-	-	-	-	-	-	-	-
	SBL/T	A	0.02	7.6	0.8	A	0.01	8.2	0.0
	Overall	**A**	**-**	**0.9**	**-**	**A**	**-**	**0.8**	**-**
Leikin Dr & Site Trucks ***Unsignalized***	EBL/R	C	0.03	18.1	0.8	C	0.04	17.1	0.8
	NBL/T	-	-	-	-	-	-	-	-
	SBT/R	-	-	-	-	-	-	-	-
	Overall	**A**	**-**	**0.2**	**-**	**A**	**-**	**0.3**	**-**
Leikin Dr & Site Employees ***Unsignalized***	EBL/T	A	0.01	7.4	0.0	A	0.00	8.6	0.0
	WBT/R	-	-	-	-	-	-	-	-
	SBL/R	B	0.06	11.6	1.5	B	0.11	13.8	3.0
	Overall	**A**	**-**	**0.7**	**-**	**A**	**-**	**1.0**	**-**

Notes: Saturation flow rate of 1800 veh/h/lane
Queue is measured in metres
Peak Hour Factor = 1.00
Delay = average vehicle delay in seconds
m = metered queue
# = volume for the 95th %ile cycle exceeds capacity

During both the AM and PM peak hours, the study area intersections at the 2026 future total horizon operate similarly to the 2026 future background conditions.

At the intersection of Merivale Road at Leikin Drive, the eastbound left movement is forecast to be over theoretical capacity with high delays during the AM peak hour, with an increase in v/c of 0.04 (pushing the former LOS E to F) and delay of 10.7 seconds from the background conditions. This movement may also exhibit extended queues during the PM peak hour, with an increase of 15.6 metres, or approximately two car-lengths. Shifting one second of split from the north-south phases to the eastbound phase during the AM peak hour would reduce v/c of all movements to 1.00 or below at the intersection.

Delays and v/c ratio have increased on the southbound movement at the intersection of Bill Leathem Drive at Leikin Drive during the AM peak hour from the background conditions, although they are forecast to operate better than the existing conditions. While the increase in delay is 26.0 seconds on this movement, limited impact on operations is forecast with the resultant increase in 95th percentile queue due to site traffic being 11.3 metres, or less than two car-lengths.

7.4 2031 Future Total Operations

Figure 18 illustrates the 2031 total volumes and Table 17 summarizes the 2031 total intersection operations. The level of service for signalized intersections is based on v/c calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection, and average delay for unsignalized intersections. Synchro 11 has been used to model the signalized and stop-controlled intersections and Sidra 9 to model the study area roundabouts. Signal and stop control warrants for the intersection of Bill Leathem Drive at Leikin Drive are provided in Appendix D. The Synchro and Sidra worksheets for the 2031 future total horizon are provided in Appendix L.

Figure 18: 2031 Future Total Volumes

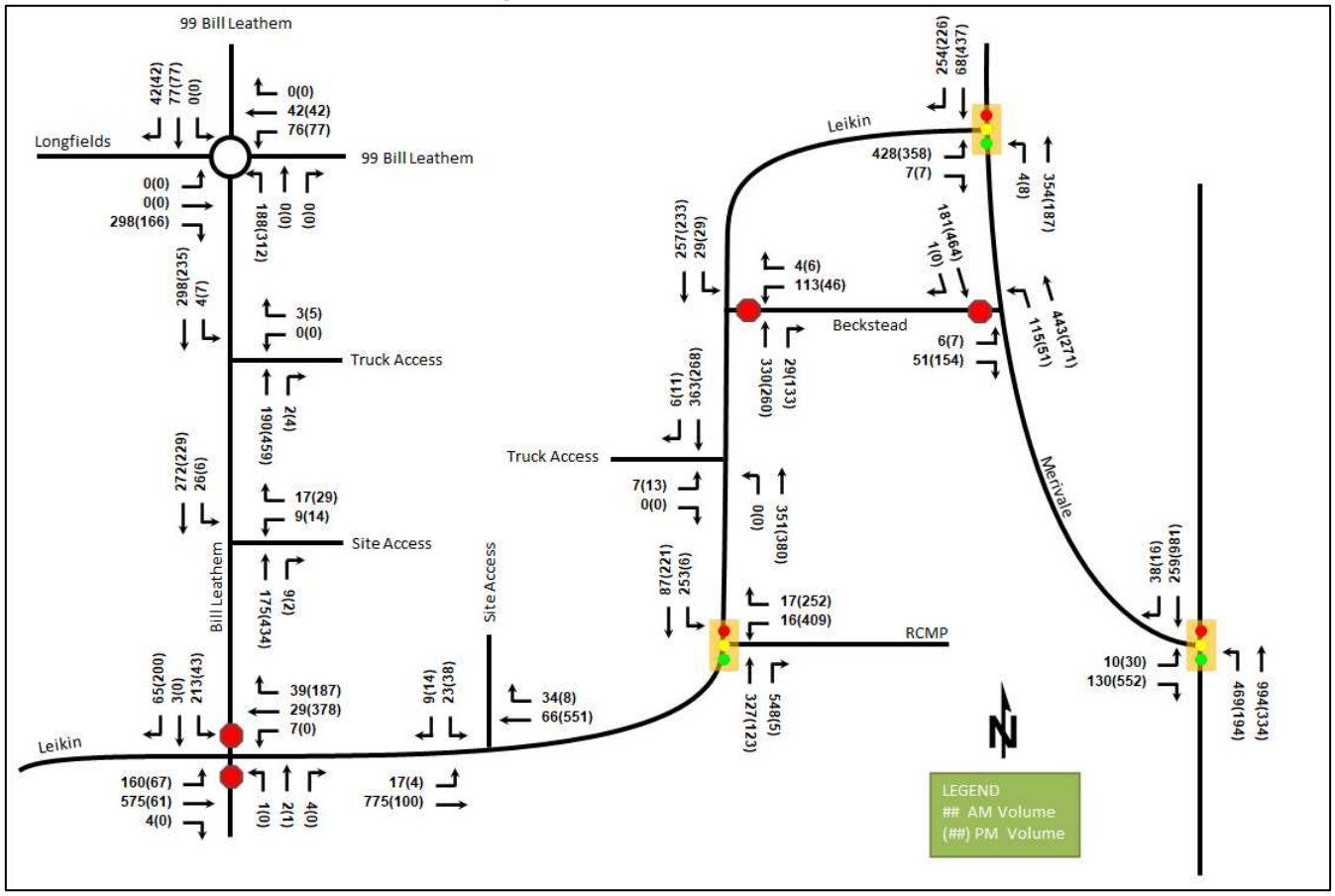


Table 17: 2031 Future Total Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Bill Leathem Dr & Longfields Dr ***Roundabout***	EB	A	0.24	5.5	10.2	A	0.14	5.5	5.7
	WB	A	0.10	0.9	3.4	A	0.11	1.5	3.8
	NB	A	0.11	7.4	4.4	A	0.18	7.4	7.5
	SB	A	0.11	1.5	3.9	A	0.12	2.1	4.4
	Overall	**A**	**0.24**	**4.6**	**10.2**	**A**	**0.18**	**5.1**	**7.5**
Merivale Rd & Leikin Dr ***Signalized***	EBL	**F**	**1.01**	**85.2**	**#155.9**	C	0.80	39.6	**#90.2**
	EBR	A	0.03	17.1	3.7	A	0.03	12.6	2.9
	NBL	A	0.01	8.8	1.8	A	0.03	11.1	3.0
	NBT	A	0.33	10.8	54.5	A	0.21	10.9	30.0
	SBT	A	0.08	8.7	11.9	A	0.46	13.6	73.6
	SBR	A	0.26	1.9	10.0	A	0.25	2.6	10.9
	Overall	**A**	**0.54**	**37.2**	**-**	**A**	**0.57**	**18.7**	**-**
Leikin Dr & Beckstead Rd ***Unsignalized***	WBL	C	0.27	16.8	8.3	B	0.10	14.1	2.3
	WBR	B	0.01	10.2	0.0	B	0.01	10.1	0.0
	NBT/R	-	-	-	-	-	-	-	-
	SBL	A	0.02	8.1	0.8	A	0.03	8.2	0.8
	SBT	-	-	-	-	-	-	-	-
	Overall	**A**	**-**	**2.8**	**-**	**A**	**-**	**1.3**	**-**
Merivale Rd & Beckstead Rd ***Unsignalized***	EBL	C	0.02	17.2	0.8	C	0.02	16.5	0.8
	EBR	A	0.06	9.4	1.5	B	0.26	13.1	7.5
	NBL	A	0.08	7.8	2.3	A	0.05	8.4	0.8
	NBT	-	-	-	-	-	-	-	-
	SBT/R	-	-	-	-	-	-	-	-
	Overall	**A**	**-**	**1.8**	**-**	**A**	**-**	**2.7**	**-**
Leikin Dr & RCMP ***Signalized***	WBL	A	0.05	26.5	6.8	D	0.86	53.9	**#124.8**
	WBR	A	0.07	13.4	4.9	A	0.44	6.2	17.5
	NBT	A	0.38	16.0	63.2	A	0.13	13.3	26.8
	NBR	A	0.56	4.3	20.4	A	0.01	9.0	2.1
	SBL	A	0.36	6.1	26.4	A	0.01	10.5	2.4
	SBT	A	0.07	4.7	10.1	A	0.22	11.7	35.6
	Overall	**A**	**0.37**	**8.2**	**-**	**A**	**0.46**	**27.5**	**-**
Bill Leathem Dr & Leikin Dr ***Unsignalized***	EBL	A	0.11	7.6	2.3	A	0.07	8.8	1.5
	EBT/R	-	-	-	-	-	-	-	-
	WBL	A	0.01	9.2	0.0	A	-	0.0	0.0
	WBT/R	-	-	-	-	-	-	-	-
	NB	C	0.02	17.1	0.8	C	0.00	16.8	0.0
	SB	**F**	**1.09**	**122.6**	**87.8**	C	0.46	17.6	18.0
	Overall	**D**	**-**	**32.6**	**-**	**A**	**-**	**5.2**	**-**
Prince of Wales Dr & Merivale Rd ***Signalized***	EBL	A	0.06	41.8	6.7	A	0.22	55.5	16.2
	EBR	A	0.47	10.8	11.3	**F**	**1.04**	**79.0**	**#188.8**
	NBL	A	0.53	3.7	35.8	A	0.35	3.7	13.1
	NBT	A	0.60	3.9	131.6	A	0.22	2.4	22.5
	SBT/R	A	0.13	5.6	22.8	A	0.53	17.1	89.3
	Overall	**C**	**0.74**	**4.8**	**-**	**C**	**0.74**	**30.3**	**-**

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Bill Leathem Dr & Site Trucks ***Unsignalized***	WBL/R	B	0.01	10.5	0.0	B	0.01	13.3	0.0
	NBT/R	-	-	-	-	-	-	-	-
	SBL/T	A	0.00	8.8	0.0	A	0.01	10.0	0.0
	Overall	**A**	**-**	**0.1**	**-**	**A**	**-**	**0.2**	**-**
Bill Leathem Dr & Site Employees ***Unsignalized***	WBL/R	B	0.04	10.3	0.8	B	0.08	12.3	2.3
	NBT/R	-	-	-	-	-	-	-	-
	SBL/T	A	0.02	7.6	0.8	A	0.01	8.2	0.0
	Overall	**A**	**-**	**0.9**	**-**	**A**	**-**	**0.8**	**-**
Leikin Dr & Site Employees ***Unsignalized***	EBL/T	A	0.01	7.4	0.0	A	0.00	8.6	0.0
	WBT/R	-	-	-	-	-	-	-	-
	SBL/R	B	0.06	11.6	1.5	B	0.11	13.8	3.0
	Overall	**A**	**-**	**0.7**	**-**	**A**	**-**	**1.0**	**-**
Leikin Dr & Site Trucks ***Unsignalized***	EBL/R	C	0.03	18.1	0.8	C	0.04	17.1	0.8
	NBL/T	-	-	-	-	-	-	-	-
	SBT/R	-	-	-	-	-	-	-	-
	Overall	**A**	**-**	**0.2**	**-**	**A**	**-**	**0.3**	**-**

Notes: Saturation flow rate of 1800 veh/h/lane
Queue is measured in metres
Peak Hour Factor = 1.00
Delay = average vehicle delay in seconds
m = metered queue
# = volume for the 95th %ile cycle exceeds capacity

During both the AM and PM peak hours, the study area intersections at the 2031 future total horizon operate similarly to the 2026 future total conditions.

As with the 2026 future total horizon, at the intersection of Merivale Road at Leikin Drive, shifting one second of split from the north-south phases to the eastbound phase during the AM peak hour would ensure all movements operate with a v/c of 1.00 or below at the intersection and improve delays on the eastbound left-turn movement.

At the intersection of Prince of Wales Drive at Merivale Road, the eastbound right movement is forecast to be over theoretical capacity during the PM peak hour, as in the existing conditions. Shifting two seconds of split from the north-south phases to the eastbound phase during the PM peak hour would ensure all movements operate with a v/c of 1.00 or below at the intersection.

7.5 Modal Share Sensitivity and Demand Rationalization Conclusions

7.5.1 Rationalization of Network Travel Demand

Overall, the road network operates well with a few movements exhibiting capacity issues. These include:

- the eastbound left-turn movement at the intersection of Merivale Road at Leikin Drive during the AM peak hour at the future background and future total horizons
- the eastbound right-turn movement at the intersection of Prince of Wales Drive at Merivale Road during the PM peak hour at all study horizons
- the southbound approach at the intersection of Bill Leathem Drive at Leikin Drive during the AM peak at all study horizons

The nature of the capacity or delay constraints on these turning movements do not warrant geometric changes or intersection control changes. For the signalized intersections of Merivale Road at Leikin Drive and Prince of Wales Drive at Merivale Road can be accommodated slight timing changes and are assumed to be part of the City's normal monitoring and adjustment for their signal network.

The unsignalized intersection of Bill Leathem Drive at Leikin Drive does not meet signalization warrants and the volumes and directional splits do not meet the Ontario Traffic Manual Book 5 – Regulatory Signs criteria for an all-way stop-control, each of which are provided in Appendix D. While unwarranted, the all-way stop-control would alleviate the southbound operational issues during the AM peak. Table 18 summarizes the operations at this intersection with the all-way stop-control treatment at the 2031 future total horizon.

The level of service is based on average delay for unsignalized intersections, and the Synchro worksheets are provided in Appendix L.

Table 18: 2031 Future Total Intersection Operations – Bill Leathem Drive at Leikin Drive with AWSC

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Bill Leathem Dr & Leikin Dr *Unsignalized*	EBL	B	0.27	11.1	8.3	A	0.12	10.0	3.0
	EBT/R	E	0.89	37.5	82.5	A	0.10	9.5	2.3
	WBL	B	0.01	10.2	0.0	-	-	-	-
	WBT/R	A	0.12	10.0	3.0	D	0.81	26.4	63.8
	NB	A	0.01	9.3	0.0	A	0.00	9.3	0.0
	SB	B	0.46	13.8	18.0	B	0.36	11.3	12.0
	Overall	D	-	25.6	-	C	-	20.2	-

Notes: Saturation flow rate of 1800 veh/h/lane; Queue is measured in metres; Peak Hour Factor = 1.00; Delay = average vehicle delay in seconds; m = metered queue; # = volume for the 95th %ile cycle exceeds capacity

7.5.2 Emerging Trends

Approximately 70% traffic on Leikin Drive between Bill Leathem Drive and Beckstead Road has historically been associated with the RCMP campus, and thus it is unknown what impacts new work models will have on area traffic. The potential exists for the hybrid work modal to be incorporated into ongoing RCMP operations and this would reduce the volumes expected on the road network when compared to pre-pandemic levels. These decreases would result in improvements to the constrained movements noted above and no changes to the signal timing adjustments or control change at the Bill Leathem Drive at Leikin Drive intersection would be required.

Given this trend, and the mitigations proposed in Section 5.7.1, no further rationalization of network travel demand is required.

7.5.3 Rationalization of Development-Generated Travel Demand

The proposed site logistical operations generate a minor peak hour demand on the network, with 31 vehicles added to the eastbound left-turn for the Merivale Road at Leikin Drive intersection, 19 vehicles added to the eastbound right-turn for the Prince of Wales Drive at Merivale Road intersection and 14 vehicles added to the southbound right-turn for the Bill Leathem Drive at Leikin Drive intersection. The modal shares applied to the employee trips matches the area mode share for autos at 80%. This mode share is very high for Ottawa and no further sensitivity to this mode is required. The City improvements to the local transit and active mode connectivity could reduce this auto mode in the future.

Given the minor mitigation measures noted in Section 7.5.1, no further rationalization for site-generated travel demand is required.

8 Development Design

8.1 Design for Sustainable Modes

The proposed development is a light industrial facility. The auto parking areas for employees will be provided in continuous lots on the east and south sides of the site, and truck parking will be provided in continuous lots on the west and north sides of the site. The lots for these respective purposes are separated from each other and each use has an access on each Bill Leathem Drive and Leikin Drive. Sidewalks are proposed along the boundary roads of Leikin Drive and Bill Leathem Drive.

Transit stops are provided on both sides of Leikin Drive at the RCMP campus access intersection, and on both sides of Bill Leathem drive at the site access for the 61 Bill Leathem Drive parcel. All transit stops are within 400 metres' walking distance of the proposed building entrance.

8.2 Circulation and Access

The site is proposed as having a two-way full-movement truck access on Bill Leathem Drive on the west side of the parcel and a two-way full-movement truck access on Leikin Drive opposite the RCMP campus visitor parking access. Each access connects to the truck parking lots and facility docks.

For site employees, a two-way full-movement access is proposed each on Bill Leathem Drive roughly in the centre of the parcel, and on Leikin Drive between Bill Leathem Drive and the RCMP campus access.

Emergency services are anticipated to access the site via the employee access. Waste collection is to occur within the western vehicle parking yard and the truck yards, drive aisles, and accesses have been designed to accommodate line haul trucks.

9 Parking

9.1 Parking Supply

Based upon the maximum forecast need given the planned logistics of the employee shift changeovers and site operations, the development is proposed as providing 361 vehicle parking spaces. Bicycle parking spaces are provided within a sheltered area.

Parking for 80 line-haul truck trailers, and parking for 39 five-tonne trucks are proposed on site connecting to the truck accesses on Leikin Drive and Bill Leathem Drive.

The zoning by-law requires 114 vehicle spaces and 24 bicycle spaces for light industrial or warehouse land uses of this size. Thus, the minimum vehicle and bicycle parking requirements are satisfied.

10 Boundary Street Design

Table 19 summarizes the MMLOS analysis for the boundary streets of Leikin Drive and Bill Leathem Drive. The boundary street analysis is based on the land-use of "Employment Area". The MMLOS worksheets have been provided in Appendix M.

Table 19: Boundary Street MMLOS Analysis

Segment	Pedestrian LOS		Bicycle LOS		Transit LOS		Truck LOS	
	PLOS	Target	BLOS	Target	TLOS	Target	TrLOS	Target
Leikin Drive (Existing)	**F**	C	C	C	-	-	B	B
Leikin Drive (Future)	**D**	C	C	C	-	-	B	B
Bill Leathem Drive (Existing)	**F**	C	**D**	C	-	-	B	B

Segment	Pedestrian LOS		Bicycle LOS		Transit LOS		Truck LOS	
	PLOS	Target	BLOS	Target	TLOS	Target	TrLOS	Target
Bill Leathem Drive (Future)	**E**	C	**D**	C	-	-	B	B

Pedestrian LOS targets will not be met in the existing and future conditions on Leikin Drive and Bill Leathem Drive. Typically, pedestrian LOS targets are not met by most urban conditions when the adjacent travel lane conveys more than 3,000 vehicles per day, as is the case on both boundary streets. To meet the theoretical pedestrian LOS targets, a 2.0-metre-wide boulevard or separation from vehicular traffic would be required on Bill Leathem Drive and a 0.2-metre-wide boulevard would be required on Leikin Drive, or a reduction in operating speeds to 50 km/h would be required for both boundary streets.

The bicycle LOS targets will not be met on Bill Leathem Drive. To meet the theoretical bicycle LOS targets along Bill Leathem Drive, a curbside bike lane would be required at a minimum.

While the vehicle travel lanes are 5.5 metres in width on Bill Leathem Drive and thus an effective separation for pedestrians from vehicular traffic will be achieved, the City may wish to study the inclusion of bike lanes along the corridor to improve both bicycle and pedestrian conditions. Cycling infrastructure is best implemented on a corridor-wide basis, and no local improvements for the development site are recommended. A deficit of 0.2 metres separation from traffic to meet PLOS targets is considered to be negligible. The City could also examine reducing the operating speeds on both roadways, where the proposed sidewalk configurations would meet PLOS targets with operating speeds of 50 km/h on the boundary streets.

11 Access Intersections Design

11.1 Location and Design of Access

The two-way full-movement truck access on Bill Leathem Drive is proposed to be located approximately 3.5 metres from the adjacent property line, to be 13.85 metres wide including two inbound lanes and one outbound lane with 10.0-metre curb radii. The throat length is approximately 200 metres and includes two inbound travel lanes, therefore nearly doubling the effective throat length.

The two-way full-movement employee access on Bill Leathem Drive is proposed to be located approximately 99 metres to the east of the truck access and approximately 102 metres from Leikin Drive, to be 8.25 metres-wide with 5.0-metre curb radii, and with a throat length of approximately 10.5 metres (13.5 metres from the back of the sidewalk to the first point of conflict). The proposed throat length is noted to be lower than the suggested minimum value of 15 metres for light industrial developments of this proposed size fronting collector roads from the Geometric Design Guide for Canadian Roads (TAC, 2017).

The two-way full-movement truck access on Leikin Drive is proposed to be located approximately 3.6 metres from the adjacent property line along the section parallel to it, and interest Leikin Drive at the location of the existing intersection of Leikin Drive the RCMP visitor parking access through a skew of approximately 81.5 degrees. The truck access is proposed to be 8.0-metres-wide with a 25.0-metre inbound radius and a 15.0-metre outbound radius, and a throat length of approximately 100 metres.

The two-way full-movement employee access on Leikin Drive is located approximately 75 metres from Bill Leathem Drive and approximately 89 metres from the RCMP campus access. The skew of the intersection from the roadway on the south side is 70.0 degrees. The access is proposed to be 6.0 metres in width, to have 5.0-metre curb radii with a throat length of approximately 26 metres.

The site frontage on Bill Leathem Drive is approximately 220 metres and on Leikin Drive is approximately 385 metres. Each frontage is permitted at least two two-way accesses from Section 25(1) of the private approach by-law, and the site complies with this provision.

The site accesses have been located to be compliant with private approach by-law provisions and TAC guidance.

Accesses are proposed to be provided via a depressed curb through the sidewalk at the roadway edge, and to comply with City standard SC7.1.

11.2 Intersection Control

The site accesses will have stop-control on the minor site driveway approaches.

11.3 Access Intersection Design

11.3.1 Future Access Intersection Operations

The operations are noted in Section 7.3 and 7.4. The site access intersections are anticipated to operate well during both peak hours at both future horizons.

11.3.2 Access Intersection MMLOS

As the access intersections will not be signalized, no access intersection MMLOS analysis is possible or required.

11.3.3 Recommended Design Elements

The site accesses are recommended to comply with City Standard SC7.1 with continuous sidewalks through the driveways via a depressed curb.

12 Transportation Demand Management

12.1 Context for TDM

The mode shares used within the TIA represent the unmodified district mode shares. Overall, the modal shares are likely to be achieved and supporting TDM measures should be provided.

Most of the trips generated by the development are anticipated to occur outside of the adjacent road peak hours. It is understood that approximately 600 employees will be working on-site in a workday. A shift change is anticipated at midnight, and TDM measures will be focused on the daytime shift changes.

12.2 Need and Opportunity

The subject site has been assumed to rely predominantly on auto travel, and this assumption has been carried through the analysis. Negligible impacts from failure to meet the typical district mode shares are anticipated for peak hour traffic operations.

12.3 TDM Program

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

- Display local area maps with walking/cycling access routes and key destinations, and transit routes and schedules at major entrances
- Provide online links to OC Transpo information
- Provide a dedicated ridematching portal at OttawaRideMatch.com
- Provide a multimodal travel option information package to new/relocating employees

13 Neighbourhood Traffic Management

The TIA guidelines thresholds are typically too low for employment areas and have been acknowledged to be generally too low for the purposes of the NTM analysis by City Staff who have noted that these thresholds are under review and will be updated in the future.

The proposed development proposes access to Bill Leathem Drive and Leikin Drive, which are each major collector roads. The forecasted volumes along Bill Leathem Drive are in the range of 490 AM-to-698 PM peak hour two-way vehicles, The highest forecasted volumes along Leikin Drive are 830 AM peak hour two-way vehicles northeast of Bill Leathem Drive, and 706 PM peak hour two-way vehicles southwest of Bill Leathem Drive. Overall, the site is forecast to contribute 50 AM and 47 PM peak hour two-way vehicles to Bill Leathem Drive and 72 AM and 74 PM peak two-way vehicles to Leikin Drive.

The PM peak hour volumes on Bill Leathem Drive and both peak hour volumes on Leikin Drive are forecast to exceed the TIA Guidelines threshold of 600 vehicles during the peak hour, equivalent to 10 cars per minute in both directions total. It is anticipated that as hybrid work models are fully established, peak hour volumes associated with the RCMP campus, which constitute the majority of volumes on Leikin Drive to the northeast of Bill Leathem Drive, the volumes on both roads are anticipated to reduce beyond those captured in 2019.

Overall, if the City desires to seed volume reductions along Leikin Drive or Bill Leathem Drive, this will require traffic calming and possible traffic diversion measures to reduce possible flow through traffic to/from the east and west. This would require an area traffic management study and would be the responsibility of the City to pursue.

14 Transit

14.1 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 20 summarizes the transit trip generation.

Table 20: Trip Generation by Transit Mode

Travel Mode	Employees Mode Share	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Transit	5%	5	4	9	1	6	7

The proposed development is anticipated to generate an additional nine AM and seven PM peak hour two-way transit trips. These trips represent a negligible level of transit ridership. As the employment area builds out further, it is anticipated that transit service in the area will further improve and opportunities for further shifts to transit will be enabled.

14.2 Transit Priority

No transit priority is required explicitly for this study.

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 Future Total Network Intersection Operations

The future operations are noted in Sections 7.3 and 7.4. Minor shifts in split may be required to rebalance signal timing given the arterial priority, and no additional mitigations are required for the addition of site traffic to the network.

15.2.2 Network Intersection MMLOS

Table 21 summarizes the MMLOS analysis for the network intersections of Merivale Road at Leikin Drive and Prince of Wales Drive at Merivale Road. The existing and future conditions for both intersections will be the same and are considered in one row. The intersection analysis is based on the land-use of "Employment Area". The MMLOS worksheets has been provided in Appendix M.

Table 21: 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
Merivale Rd & Leikin Dr	F	C	F	B	N/A	N/A	C	D	A	D
Prince of Wales Dr & Merivale Rd	F	C	B	B	N/A	N/A	C	D	C	D

Typical of arterial intersections, the pedestrian LOS targets will not be met at the study area intersections. To meet pedestrian LOS targets, the maximum crossing distance on all pedestrian crossings would need to be reduced to three lane-widths.

The bicycle LOS targets will not be met at the Merivale Road and Leikin Drive intersection. To meet bicycle LOS targets, the left-turn configurations would need to be two-stage or include left-turn boxes.

The City of Ottawa will be responsible for exploring options to address any deficiencies in its desired MMLOS trade-offs. No improvements are recommended as part of this study to address MMLOS.

15.2.3 Recommended Design Elements

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

16 Summary of Improvements Indicated and Modifications Options

The following summarizes the analysis and results presented in this TIA report:

Proposed Site and Screening

- The proposed development concept is for the construction of a 218,000 square foot light industrial building with surface parking lots comprising 361 employee parking spaces, 39 five-tonne truck parking spaces, and 80 trailer parking spaces
- The site will facilitate a total of 55 docking doors along the exterior of the building
- The proposed access configuration includes a two-way truck access on each Leikin Drive and Bill Leathem Drive and the employee parking lot connects to accesses on both roadways
- The development will be constructed in a single phase anticipated to be built out by 2026
- The trip generation and safety triggers were met for the TIA Screening

Existing Conditions

- Prince of Wales Drive and Merivale Road are arterial roads, and Longfields Drive, Leikin Drive, Bill Leathem Drive, and Beckstead Road are collector road in the study area

- Sidewalks are provided along one side of Bill Leathem Drive, Leikin Drive, and Beckstead Road, a MUP is provided along one side of Leikin Drive south of Holitzner Way, and pathways circulate the Clarke Bellinger Stormwater Facility with local neighbourhood connections
- Bike lanes are provided along both sides of Leikin Drive, paved shoulders along Longfields Drive, Merivale Road, and Prince of Wales Drive
- Prince of Wales Drive north of Merivale Road is a cross-town bikeway, Prince of Wales Drive and Merivale Road are spine routes, and Longfields Drive, Bill Leathem Drive, and Leikin Drive are local routes
- Within the study area, the intersection of Prince of Wales at Merivale is noted to have higher collisions than other locations, but the collision types are mostly represented by rear end indicating they are lower speed and associated with congestion
- During the AM peak hour, the southbound movement at the intersection of Bill Leathem Drive at Leikin Drive is over theoretical capacity, and signal warrants are not met
- During the PM peak hour, the eastbound right movement at the intersection of Prince of Wales Drive at Merivale Road is over theoretical capacity, and shifting three seconds of split from the north-south phases to the east phase would alleviate this capacity issue

Development Generated Travel Demand

- A total of 166 AM and 155 PM new peak hour two-way vehicle trips are projected as a result of the proposed development
- Of the forecasted employees' trips, 30% are anticipated to travel north and south, 5% to the east, and 35% to both the west
- Of the forecasted trucks' trips, 10% are anticipated to travel north and south, and 40% to the east and west

Background Conditions

- The north and east legs of the roundabout intersection of Bill Leathem Drive at Leikin Drive will be constructed and serve as site accesses for the proposed 99 Bill Leathem Drive, 2-20 Leikin Drive development
- All growth on Longfields Drive, Bill Leathem Drive, and Leikin Drive is assumed to be associated with future development within this area which can explicitly be accounted for by incorporated forecasted volumes from area traffic studies
- Growth rates of 1.00% have been applied to mainline movements and major turning movements along Merivale Road and Prince of Wales Drive during the AM peak hour and reversed in the PM peak hour
- Capacity issues have been noted on the eastbound left-turn movement at the intersection of Merivale Road at Leikin Drive during the AM peak hour, on the eastbound right-turn movement at the intersection of Prince of Wales Drive at Merivale Road during the PM peak hour, and on the southbound approach at the intersection of Bill Leathem Drive at Leikin Drive during the AM peak hour
- The nature of the capacity or delay issues on these turning movements do not warrant geometric changes or intersection control changes
- The unsignalized intersection of Bill Leathem Drive at Leikin Drive does not meet signalization warrants and the volumes and directional splits do not meet the Ontario Traffic Manual Book 5 warrants for all-way stop control
- All-way stop-control would alleviate the southbound operational issues at Bill Leathem Drive at Leikin Drive during the AM peak

Development Design

- The auto parking areas for employees will be provided in continuous lots on the east and south sides of the site, and truck parking will be provided in continuous lots on the west and north sides of the site
- Sidewalks are proposed along the boundary roads of Leikin Drive and Bill Leathem Drive
- Transit stops are provided on both sides of Leikin Drive at the RCMP campus access intersection, and on both sides of Bill Leathem drive at the site access for the 61 Bill Leathem Drive parcel
- The site is proposed as having a two-way full-movement truck access on Bill Leathem Drive on the west side of the parcel and a two-way full-movement truck access on Leikin Drive opposite the RCMP campus visitor parking access
- A two-way full-movement access for employees is proposed each on Bill Leathem Drive roughly in the centre of the parcel, and on Leikin Drive between Bill Leathem Drive and the RCMP campus access for site employees
- Emergency services are anticipated to access the site via the employee access
- Waste collection is to occur within the western vehicle parking yard and the truck yards, drive aisles, and accesses have been designed to accommodate line haul trucks

Parking

- The development is proposed as providing 361 vehicle parking spaces
- Bicycle parking spaces are provided within a sheltered area Parking for 80 line haul truck trailers, and parking for 39 five-tonne trucks are proposed on site connecting to the truck accesses on Leikin Drive and Bill Leathem Drive
- The minimum vehicle and bicycle parking requirements are satisfied

Boundary Street Design

- The pedestrian LOS targets will not be met along both boundary roads with existing operating speeds
- Bicycle LOS targets will not be met on Bill Leathem Drive and at minimum, an on-street bike lane would be required to meet targets
- Pedestrian LOS is effectively being met in the future conditions on Leikin Drive and may be close to being met functionally on Bill Leathem Drive, but the provision of a bike lane on Bill Leathem Drive would improve PLOS, or a reduction of operating speeds to 50 km/h would meet PLOS targets
- Cycling infrastructure is best implemented on a corridor-wide basis, whose design and implementation is the responsibility of the City

Access Intersections Design

- The two-way full-movement truck access on Bill Leathem Drive is proposed to be located approximately 3.5 metres from the adjacent property line, to be 13.85 metres wide including two inbound lanes and one outbound lane with 10.0-metre curb radii and a throat length of approximately 200 metres
- The two-way full-movement employee access on Bill Leathem Drive is proposed to be located approximately 104 metres to the east of the truck access and approximately 102 metres from Leikin Drive, is 8.25-metres-wide with 5.0-metre curb radii, and with a throat length of 10.5 metres and with 13.5 metres between the back of sidewalk and first point of conflict, where the suggested minimum throat length per TAC is 15 metres
- The two-way full-movement truck access on Leikin Drive is proposed to be located approximately 3.6 metres from the adjacent property line at its closest point, skewing at 81.5 degrees to meet Leikin Drive

at the intersection of with the RCMP visitor parking access, is 8.0-metres-wide with a 25.0-metre inbound radius and a 15.0-metre outbound radius, and a throat length is approximately 100 metres
- The two-way full-movement employee access on Leikin Drive is located approximately 75 metres from Bill Leathem Drive and approximately 89 metres from the RCMP campus access, the skew of the intersection from the south side is 70.0 degrees, the access is 6.0 metres wide with 5.0-metre radii, and a throat length of approximately 26 metres
- The private approach by-law permits more than two two-way access per frontage, with which the site is in compliance
- Access is to be provided via a depressed curb through the sidewalk at the roadway edge, and to comply with City standard SC7.1

TDM

- Supportive TDM measures to be included within the proposed development should include:
    - Display local area maps with walking/cycling access routes and key destinations, and transit routes and schedules at major entrances
    - Provide online links to OC Transpo information
    - Provide a dedicated ridematching portal at OttawaRideMatch.com
    - Provide a multimodal travel option information package to new/relocating employees

NTM

- The development proposes access to Bill Leathem Drive and Leikin Drive, which are each major collector roads
- NTM thresholds, which have been acknowledged to be too low for the analysis by the City, are anticipated to be exceeded on both boundary roads
- It is anticipated that as hybrid work models are fully established, peak hour volumes associated with the RCMP campus, which constitute the majority of volumes on Leikin Drive to the northeast of Bill Leathem Drive, volumes on both roads will reduce from those captured in the traffic counts
- If the City desires a reduction on these roads, traffic calming or diversion measures to reduce cut-through from the adjacent neighbourhoods would be required, which would be the responsibility of the City

Transit

- The proposed development is anticipated to generate an additional nine AM and seven PM peak hour two-way transit trips, and it represents a negligible level of transit ridership
- As the employment area builds out further, it is anticipated that transit service in the area will further improve and opportunities for further shifts to transit will be enabled

Network Intersection Design

- During both the AM and PM peak hours, the study area intersections at the future total horizons operate similarly to the 2026 future background conditions
- The proposed site operations generate a minor peak hour demand on the network
- The pedestrian LOS targets will not be met at the study area intersections, and maximum crossing distance on all pedestrian crossings would need to be reduced to three lane-widths
- The bicycle LOS targets will not be met at the Merivale Road and Leikin Drive intersection, and the left-turn configurations would need to be two-stage or include left-turn boxes

- No improvements are recommended as part of this study to address MMLOS

17 Conclusion

It is recommended that, from a transportation perspective, the proposed development applications proceed.

Prepared By:

John Kingsley, EIT
Transportation Engineering-Intern

Reviewed By:

Andrew Harte, P.Eng.
Senior Transportation Engineer

Appendix A

TIA Screening Form and PM Certification Form

6 Plaza Court
Ottawa, ON K2H 7W1

City of Ottawa 2017 TIA Guidelines
Step 1 - Screening Form

Date: 16-Jan-23
Project Number: 2022-162
Project Reference: 50 Leikin

1.1 Description of Proposed Development	
Municipal Address	50 Leikin Drive
Description of Location	Northeast corner of Bill Leathem Dr and Leikin Dr
Land Use Classification	Light Industrial (IL9)
Development Size	218,000 sq. ft. Light Industrial Facility
Accesses	One full-moves on Leikin Dr, one full-moves on Bill Leathem Dr, one outlet on Bill Leathem Dr
Phase of Development	Single
Buildout Year	2026
TIA Requirement	Full TIA Required

1.2 Trip Generation Trigger		
Land Use Type	Industrial	
Development Size	218,000	G.F.A.
Trip Generation Trigger	Yes	

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

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

TIA Plan Reports

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

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

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

CERTIFICATION

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

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

City Of Ottawa
Infrastructure Services and Community Sustainability
Planning and Growth Management
110 Laurier Avenue West, 4th fl.
Ottawa, ON K1P 1J1
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Services d 'infrastructure et Viabilité des collectivités
Urbanisme et Gestion de la croissance
110, avenue Laurier Ouest
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: 6 Plaza Court
City / Postal Code: Ottawa / K2H 7W1
Telephone / Extension: (613) 697-3797
E-Mail Address: Andrew.Harte@CGHTransportation.com

Appendix B

Turning Movement Counts

Transportation Services - Traffic Services

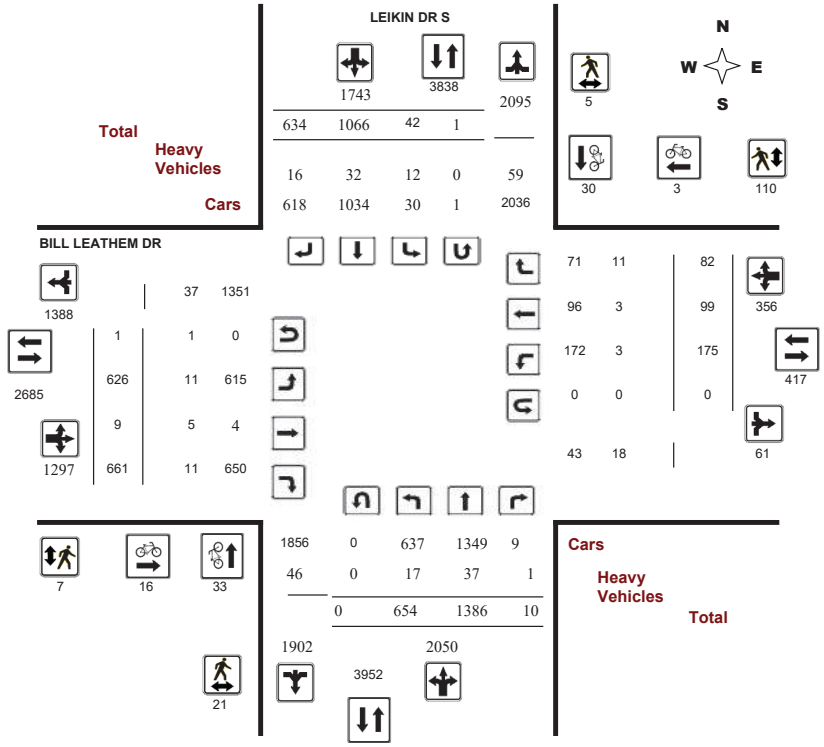
Turning Movement Count - Study Results

BILL LEATHEM DR @ LEIKIN DR S

Survey Date: Wednesday, June 12, 2019 **WO No:** 38659

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

Full Study Diagram



Transportation Services - Traffic Services

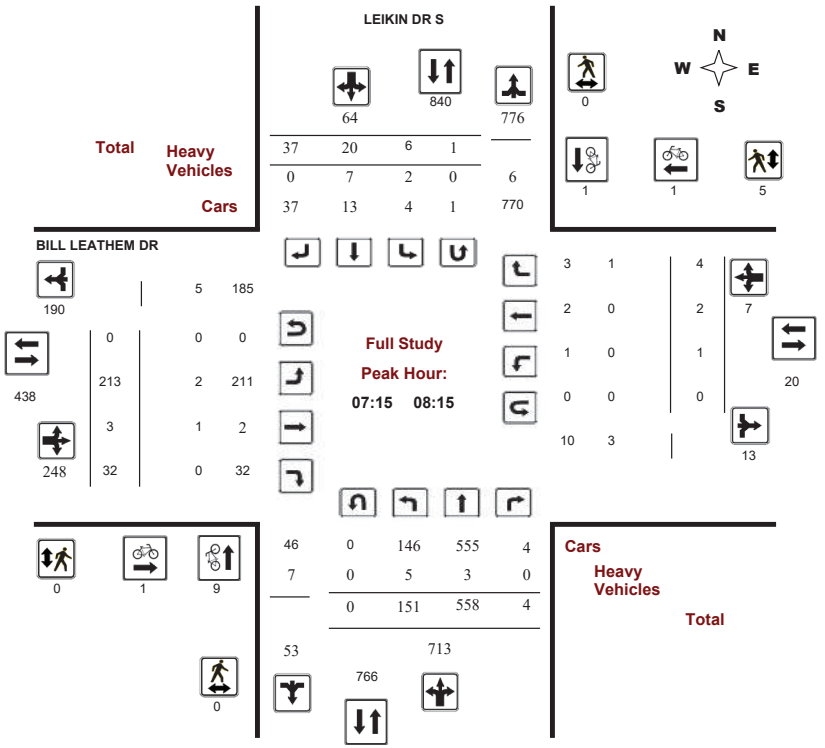
Turning Movement Count - Study Results

BILL LEATHEM DR @ LEIKIN DR S

Survey Date: Wednesday, June 12, 2019 **WO No:** 38659

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

Full Study Peak Hour Diagram



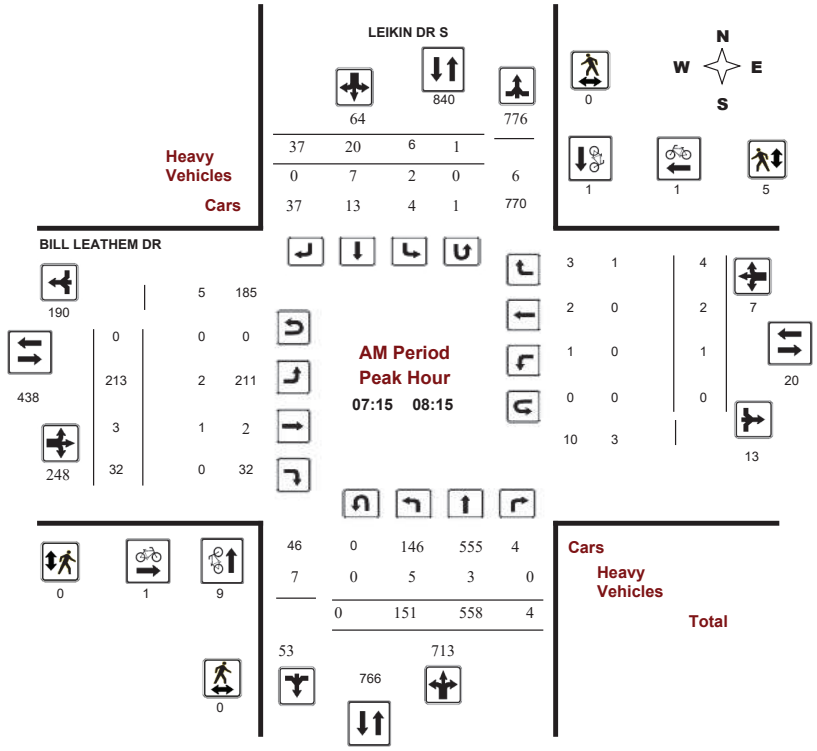
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BILL LEATHEM DR @ LEIKIN DR S

Survey Date: Wednesday, June 12, 2019 **WO No:** 38659

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



Comments

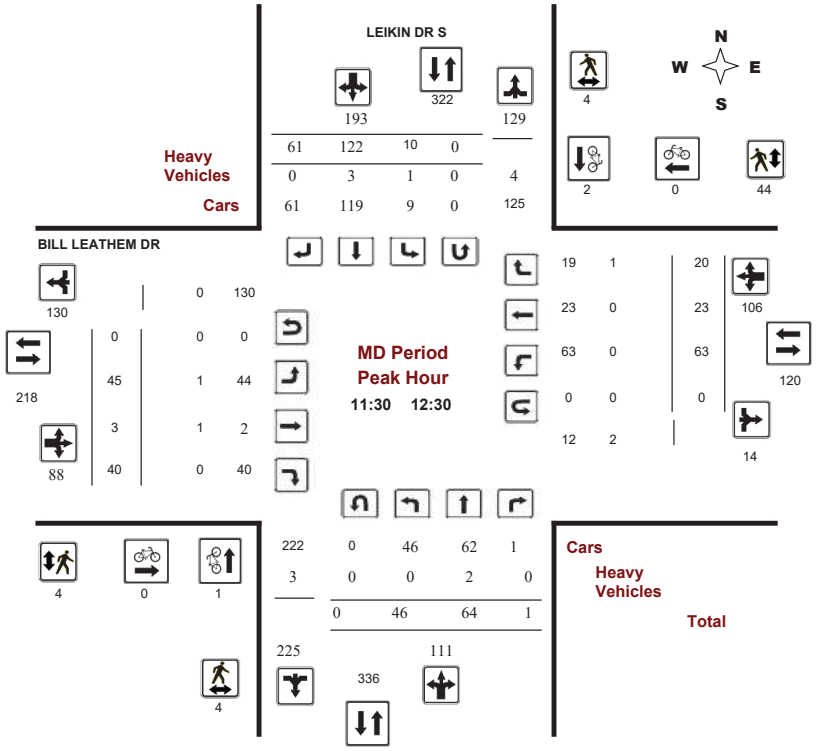
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BILL LEATHEM DR @ LEIKIN DR S

Survey Date: Wednesday, June 12, 2019 **WO No:** 38659

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



Comments

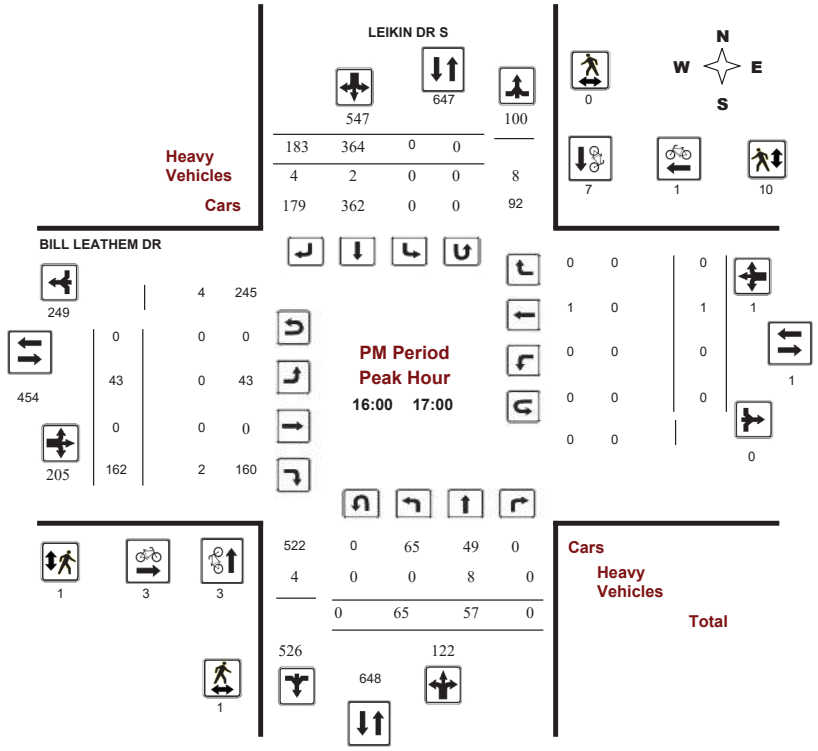
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BILL LEATHEM DR @ LEIKIN DR S

Survey Date: Wednesday, June 12, 2019 **WO No:** 38659

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



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BILL LEATHEM DR @ LEIKIN DR S

Survey Date: Wednesday, June 12, 2019 **WO No:** 38659

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

Full Study Summary (8 HR Standard)

Survey Date: Wednesday, June 12, 2019

Total Observed U-Turns

Northbound: 0 Southbound: 1

Eastbound: 1 Westbound: 0

AADT Factor 1.25

	LEIKIN DR S								BILL LEATHEM DR									
	Northbound				Southbound				Eastbound				Westbound					
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	141	553	4	**698**	7	17	24	**48**	**746**	178	3	28	**209**	0	0	2	**2**	**211**	**957**
08:00 09:00	156	372	2	**530**	9	32	56	**97**	**627**	165	2	54	**221**	2	6	7	**15**	**236**	**863**
09:00 10:00	82	129	3	**214**	6	38	45	**89**	**303**	61	0	35	**96**	6	5	14	**25**	**121**	**424**
11:30 12:30	46	64	1	**111**	10	122	61	**193**	**304**	45	3	40	**88**	63	23	20	**106**	**194**	**498**
12:30 13:30	32	111	0	**143**	9	64	34	**107**	**250**	64	0	48	**112**	10	9	11	**30**	**142**	**392**
15:00 16:00	55	44	0	**99**	1	187	141	**329**	**428**	32	1	107	**140**	94	55	28	**177**	**317**	**745**
16:00 17:00	65	57	0	**122**	0	364	183	**547**	**669**	43	0	162	**205**	0	1	0	**1**	**206**	**875**
17:00 18:00	77	56	0	**133**	0	242	90	**332**	**465**	38	0	187	**225**	0	0	0	**0**	**225**	**690**
Sub Total	654	1386	10	**2050**	42	1066	634	**1742**	**3792**	626	9	661	**1296**	175	99	82	**356**	**1652**	**5444**
U Turns				**0**				**1**	**1**				**1**				**0**	**1**	**2**
Total	654	1386	10	**2050**	42	1066	634	**1743**	**3793**	626	9	661	**1297**	175	99	82	**356**	**1653**	**5446**
EQ 12Hr	909	1927	14	**2850**	58	1482	881	**2423**	**5272**	870	13	919	**1803**	243	138	114	**495**	**2298**	**7570**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	818	1734	13	**2565**	53	1334	793	**2180**	**4745**	783	11	827	**1623**	219	124	103	**445**	**2068**	**6813**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**0.9**					
AVG 24Hr	1072	2271	16	**3360**	69	1747	1039	**2856**	**6216**	1026	15	1083	**2126**	287	162	134	**583**	**2709**	**8925**

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

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

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BILL LEATHEM DR @ LEIKIN DR S

Survey Date: Wednesday, June 12, 2019 **WO No:** 38659

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

Full Study 15 Minute Increments

		LEIKIN DR S									BILL LEATHEM DR									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	34	121	1	156	3	5	3	11	329	32	0	4	36	0	0	0	0	329	203
07:15	07:30	33	143	0	176	2	3	4	9	376	41	1	3	45	0	0	1	1	376	231
07:30	07:45	37	158	0	195	2	4	10	17	426	42	1	9	52	0	0	0	0	426	264
07:45	08:00	37	131	3	171	0	5	7	12	395	63	1	12	76	0	0	1	1	395	260
08:00	08:15	44	126	1	171	2	8	16	26	409	67	0	8	75	1	2	2	5	409	277
08:15	08:30	44	102	0	146	1	6	9	16	324	40	2	13	55	0	2	1	3	324	220
08:30	08:45	41	81	0	122	5	6	9	20	279	30	0	16	46	1	1	3	5	279	193
08:45	09:00	27	63	1	91	1	12	22	35	247	28	0	17	46	0	1	1	2	247	174
09:00	09:15	29	74	2	105	0	10	13	23	253	22	0	11	33	2	1	6	9	253	170
09:15	09:30	24	27	0	51	2	8	19	29	147	16	0	11	27	2	0	3	5	147	112
09:30	09:45	14	15	1	30	3	12	8	23	101	10	0	6	16	2	1	3	6	101	75
09:45	10:00	15	13	0	28	1	8	5	14	85	13	0	7	20	0	3	2	5	85	67
11:30	11:45	12	7	0	19	0	28	20	48	136	6	0	13	19	11	4	4	19	136	105
11:45	12:00	10	20	0	30	2	35	14	51	189	13	2	6	21	28	5	6	39	189	141
12:00	12:15	13	18	0	31	5	34	15	54	184	15	0	10	25	17	9	5	31	184	141
12:15	12:30	11	19	1	31	3	25	12	40	149	11	1	11	23	7	5	5	17	149	111
12:30	12:45	9	23	0	32	1	10	7	18	121	22	0	11	33	4	4	1	9	121	92
12:45	13:00	7	31	0	38	3	17	13	33	151	13	0	14	27	1	2	4	7	151	105
13:00	13:15	8	38	0	46	2	26	7	35	176	15	0	11	26	2	2	3	7	176	114
13:15	13:30	8	19	0	27	3	11	7	21	110	14	0	12	26	3	1	3	7	110	81
15:00	15:15	19	12	0	31	0	35	50	85	240	7	1	25	33	34	18	11	63	240	212
15:15	15:30	11	9	0	20	0	41	21	62	204	8	0	29	37	25	13	10	48	204	167
15:30	15:45	11	11	0	22	0	49	33	82	225	9	0	26	35	21	10	5	36	225	175
15:45	16:00	14	12	0	26	1	62	37	100	251	8	0	27	35	14	14	2	30	251	191
16:00	16:15	17	11	0	28	0	90	59	149	331	15	0	38	53	0	1	0	1	331	231
16:15	16:30	12	16	0	28	0	78	44	122	293	10	0	39	49	0	0	0	0	293	199
16:30	16:45	17	14	0	31	0	98	40	138	332	11	0	40	51	0	0	0	0	332	220
16:45	17:00	19	16	0	35	0	98	40	138	339	7	0	45	52	0	0	0	0	339	225
17:00	17:15	14	11	0	25	0	70	27	97	275	18	0	54	72	0	0	0	0	275	194
17:15	17:30	21	12	0	33	0	75	24	99	280	9	0	52	61	0	0	0	0	280	193
17:30	17:45	26	17	0	43	0	57	18	75	246	8	0	46	54	0	0	0	0	246	172
17:45	18:00	16	16	0	32	0	40	21	61	187	3	0	35	38	0	0	0	0	187	131
Total:		654	1386	10	2050	42	1066	634	1743	7790	626	9	661	1297	175	99	82	356	7790	5,446

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BILL LEATHEM DR @ LEIKIN DR S

Survey Date: Wednesday, June 12, 2019 **WO No:** 38659

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

Full Study Cyclist Volume

		LEIKIN DR S			BILL LEATHEM DR			
Time Period		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00	07:15	5	0	5	0	0	0	5
07:15	07:30	1	0	1	0	0	0	1
07:30	07:45	3	0	3	1	1	2	5
07:45	08:00	4	1	5	0	0	0	5
08:00	08:15	1	0	1	0	0	0	1
08:15	08:30	4	0	4	0	0	0	4
08:30	08:45	2	3	5	0	0	0	5
08:45	09:00	0	1	1	0	0	0	1
09:00	09:15	0	1	1	0	1	1	2
09:15	09:30	0	0	0	0	0	0	0
09:30	09:45	0	0	0	0	0	0	0
09:45	10:00	1	2	3	0	0	0	3
11:30	11:45	0	1	1	0	0	0	1
11:45	12:00	0	1	1	0	0	0	1
12:00	12:15	0	0	0	0	0	0	0
12:15	12:30	1	0	1	0	0	0	1
12:30	12:45	1	0	1	2	0	2	3
12:45	13:00	0	1	1	2	0	2	3
13:00	13:15	2	0	2	0	0	0	2
13:15	13:30	0	0	0	1	0	1	1
15:00	15:15	1	0	1	0	0	0	1
15:15	15:30	0	0	0	0	0	0	0
15:30	15:45	0	2	2	0	0	0	2
15:45	16:00	1	3	4	0	0	0	4
16:00	16:15	1	3	4	2	0	2	6
16:15	16:30	0	2	2	0	1	1	3
16:30	16:45	0	1	1	1	0	1	2
16:45	17:00	2	1	3	0	0	0	3
17:00	17:15	0	0	0	0	0	0	0
17:15	17:30	2	2	4	3	0	3	7
17:30	17:45	0	4	4	1	0	1	5
17:45	18:00	1	1	2	3	0	3	5
Total		33	30	**63**	16	3	19	82

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BILL LEATHEM DR @ LEIKIN DR S

Survey Date: Wednesday, June 12, 2019 **WO No:** 38659

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

Full Study Pedestrian Volume

	LEIKIN DR S			BILL LEATHEM DR			
Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	0	0	**0**	0	1	**1**	**1**
07:15 07:30	0	0	**0**	0	1	**1**	**1**
07:30 07:45	0	0	**0**	0	1	**1**	**1**
07:45 08:00	0	0	**0**	0	1	**1**	**1**
08:00 08:15	0	0	**0**	0	2	**2**	**2**
08:15 08:30	0	0	**0**	0	0	**0**	**0**
08:30 08:45	0	0	**0**	0	2	**2**	**2**
08:45 09:00	0	0	**0**	0	1	**1**	**1**
09:00 09:15	0	0	**0**	0	0	**0**	**0**
09:15 09:30	0	0	**0**	0	1	**1**	**1**
09:30 09:45	0	0	**0**	0	0	**0**	**0**
09:45 10:00	0	0	**0**	0	0	**0**	**0**
11:30 11:45	1	2	**3**	2	5	**7**	**10**
11:45 12:00	0	0	**0**	0	4	**4**	**4**
12:00 12:15	1	0	**1**	0	14	**14**	**15**
12:15 12:30	2	2	**4**	2	21	**23**	**27**
12:30 12:45	6	0	**6**	2	15	**17**	**23**
12:45 13:00	5	0	**5**	0	11	**11**	**16**
13:00 13:15	5	0	**5**	0	7	**7**	**12**
13:15 13:30	0	0	**0**	0	6	**6**	**6**
15:00 15:15	0	0	**0**	0	2	**2**	**2**
15:15 15:30	0	0	**0**	0	1	**1**	**1**
15:30 15:45	0	0	**0**	0	1	**1**	**1**
15:45 16:00	0	0	**0**	0	0	**0**	**0**
16:00 16:15	1	0	**1**	0	4	**4**	**5**
16:15 16:30	0	0	**0**	1	1	**2**	**2**
16:30 16:45	0	0	**0**	0	2	**2**	**2**
16:45 17:00	0	0	**0**	0	3	**3**	**3**
17:00 17:15	0	0	**0**	0	1	**1**	**1**
17:15 17:30	0	0	**0**	0	2	**2**	**2**
17:30 17:45	0	1	**1**	0	0	**0**	**1**
17:45 18:00	0	0	**0**	0	0	**0**	**0**
Total	21	5	**26**	7	110	**117**	**143**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BILL LEATHEM DR @ LEIKIN DR S

Survey Date: Wednesday, June 12, 2019 **WO No:** 38659

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

Full Study Heavy Vehicles

		LEIKIN DR S									BILL LEATHEM DR									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	1	0	0	**2**	0	1	0	**1**	**3**	0	0	0	**1**	0	0	0	**0**	**1**	**2**
07:15	07:30	1	2	0	**3**	1	0	0	**4**	**7**	0	1	0	**2**	0	0	1	**3**	**5**	**6**
07:30	07:45	1	0	0	**3**	0	2	0	**3**	**6**	1	0	0	**2**	0	0	0	**0**	**2**	**4**
07:45	08:00	1	1	0	**4**	0	2	0	**3**	**7**	0	0	0	**1**	0	0	0	**0**	**1**	**4**
08:00	08:15	2	0	0	**5**	1	3	0	**5**	**10**	1	0	0	**3**	0	0	0	**1**	**4**	**7**
08:15	08:30	2	1	0	**7**	1	4	0	**8**	**15**	1	2	0	**6**	0	1	1	**5**	**11**	**13**
08:30	08:45	1	0	0	**3**	2	1	1	**8**	**11**	2	0	1	**6**	0	1	2	**5**	**11**	**11**
08:45	09:00	1	1	0	**4**	1	2	1	**8**	**12**	2	0	0	**6**	0	0	1	**2**	**8**	**10**
09:00	09:15	0	1	1	**4**	0	1	0	**4**	**8**	0	0	0	**0**	1	0	2	**4**	**4**	**6**
09:15	09:30	0	1	0	**2**	1	0	0	**4**	**6**	1	0	0	**1**	1	0	1	**3**	**4**	**5**
09:30	09:45	0	1	0	**2**	1	1	0	**4**	**6**	1	0	0	**1**	0	0	0	**1**	**2**	**4**
09:45	10:00	0	1	0	**3**	0	2	0	**4**	**7**	1	0	0	**2**	0	1	0	**1**	**3**	**5**
11:30	11:45	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	0	0	**0**	**0**	**0**
11:45	12:00	0	1	0	**2**	0	1	0	**3**	**5**	1	1	0	**2**	0	0	0	**1**	**3**	**4**
12:00	12:15	0	0	0	**1**	0	1	0	**1**	**2**	0	0	0	**0**	0	0	0	**0**	**0**	**1**
12:15	12:30	0	1	0	**2**	1	1	0	**4**	**6**	0	0	0	**0**	0	0	1	**2**	**2**	**4**
12:30	12:45	1	0	0	**2**	1	0	0	**1**	**3**	0	0	1	**2**	0	0	0	**1**	**3**	**3**
12:45	13:00	0	2	0	**4**	2	1	0	**6**	**10**	0	0	1	**1**	0	0	1	**3**	**4**	**7**
13:00	13:15	0	0	0	**2**	0	2	0	**2**	**4**	0	0	0	**0**	0	0	0	**0**	**0**	**2**
13:15	13:30	0	1	0	**1**	0	0	0	**2**	**3**	0	0	0	**0**	0	0	1	**1**	**1**	**2**
15:00	15:15	3	2	0	**9**	0	1	1	**4**	**13**	0	1	2	**7**	1	0	0	**2**	**9**	**11**
15:15	15:30	1	1	0	**3**	0	1	2	**4**	**7**	0	0	0	**3**	0	0	0	**0**	**3**	**5**
15:30	15:45	0	2	0	**2**	0	0	1	**3**	**5**	0	0	0	**1**	0	0	0	**0**	**1**	**3**
15:45	16:00	1	4	0	**7**	0	1	1	**6**	**13**	0	0	1	**3**	0	0	0	**0**	**3**	**8**
16:00	16:15	0	3	0	**4**	0	0	1	**4**	**8**	0	0	1	**2**	0	0	0	**0**	**2**	**5**
16:15	16:30	0	1	0	**1**	0	0	2	**3**	**4**	0	0	0	**2**	0	0	0	**0**	**2**	**3**
16:30	16:45	0	2	0	**4**	0	1	1	**4**	**8**	0	0	1	**2**	0	0	0	**0**	**2**	**5**
16:45	17:00	0	2	0	**3**	0	1	0	**3**	**6**	0	0	0	**0**	0	0	0	**0**	**0**	**3**
17:00	17:15	1	1	0	**2**	0	0	2	**3**	**5**	0	0	0	**3**	0	0	0	**0**	**3**	**4**
17:15	17:30	0	2	0	**3**	0	0	1	**3**	**6**	0	0	1	**2**	0	0	0	**0**	**2**	**4**
17:30	17:45	0	2	0	**5**	0	1	2	**5**	**10**	0	0	2	**4**	0	0	0	**0**	**4**	**7**
17:45	18:00	0	1	0	**2**	0	1	0	**2**	**4**	0	0	0	**0**	0	0	0	**0**	**0**	**2**
Total:	None	17	37	1	**101**	12	32	16	**119**	**220**	11	5	11	**65**	3	3	11	**35**	**100**	**160**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BILL LEATHEM DR @ LEIKIN DR S

Survey Date: Wednesday, June 12, 2019 **WO No:** 38659

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

Full Study 15 Minute U-Turn Total

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

Transportation Services - Traffic Services

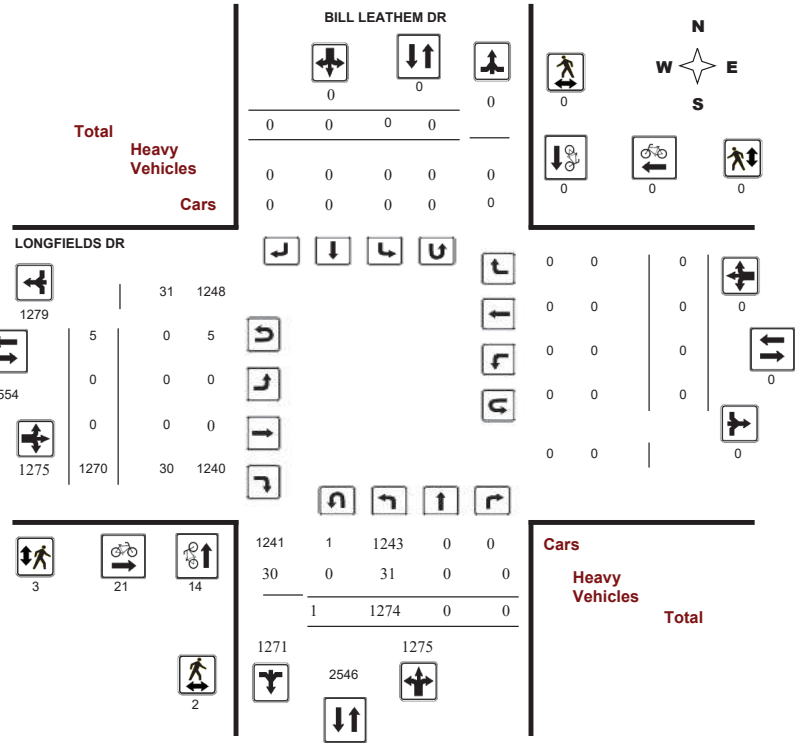
Turning Movement Count - Study Results

BILL LEATHEM DR @ LONGFIELDS DR

Survey Date: Wednesday, June 10, 2015 **WO No:** 35082

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

Full Study Diagram



Transportation Services - Traffic Services

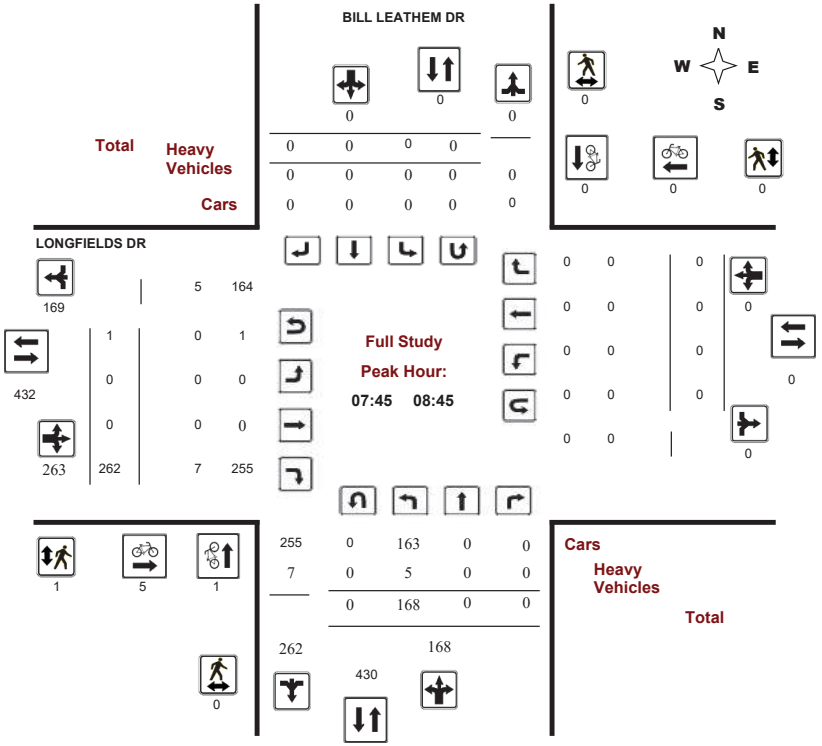
Turning Movement Count - Study Results

BILL LEATHEM DR @ LONGFIELDS DR

Survey Date: Wednesday, June 10, 2015 **WO No:** 35082

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

Full Study Peak Hour Diagram



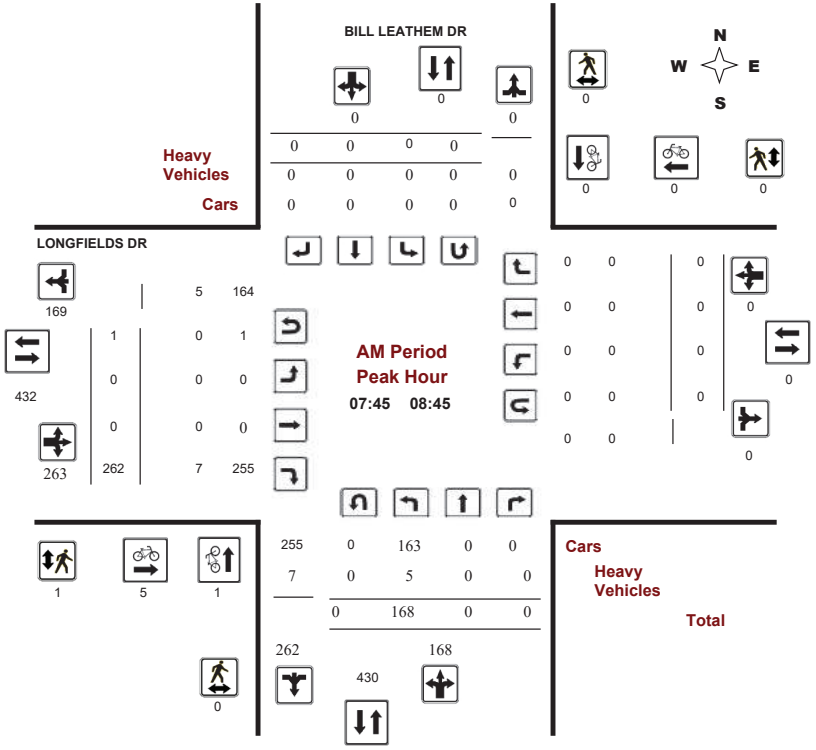
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BILL LEATHEM DR @ LONGFIELDS DR

Survey Date: Wednesday, June 10, 2015 **WO No:** 35082

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



Comments

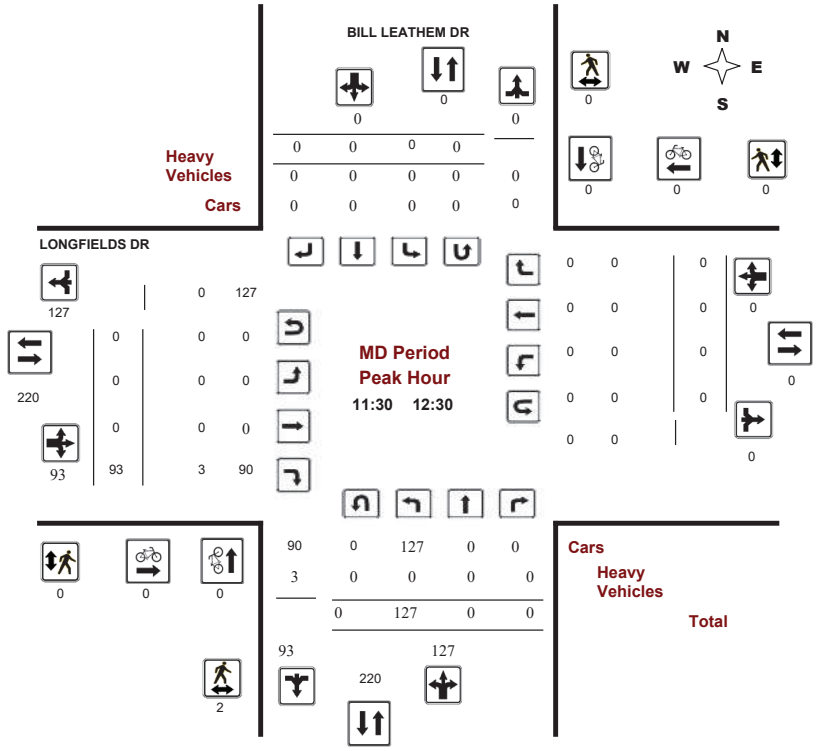
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BILL LEATHEM DR @ LONGFIELDS DR

Survey Date: Wednesday, June 10, 2015 **WO No:** 35082

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



Comments

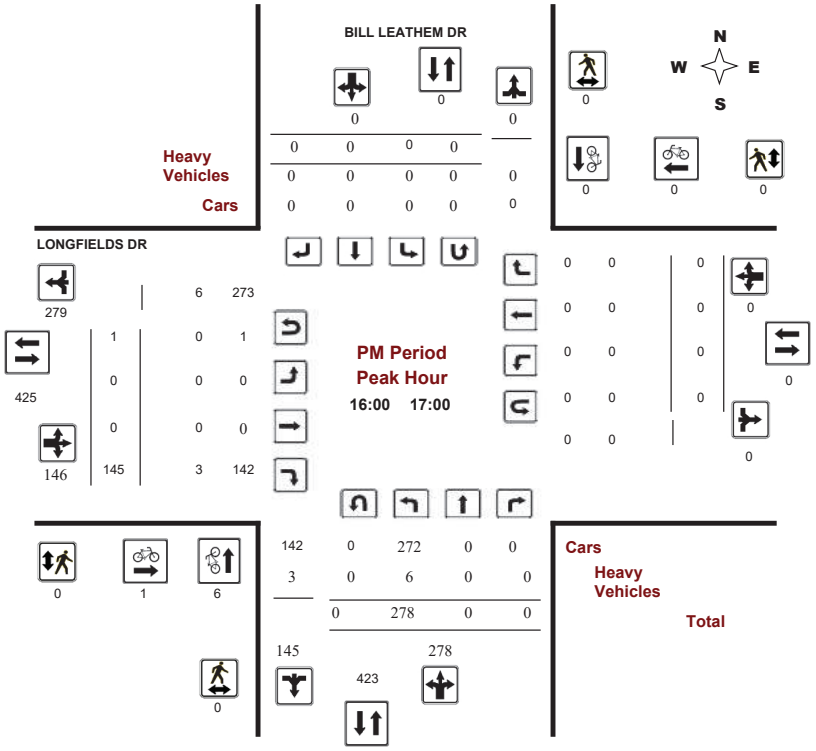
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BILL LEATHEM DR @ LONGFIELDS DR

Survey Date: Wednesday, June 10, 2015 **WO No:** 35082

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



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BILL LEATHEM DR @ LONGFIELDS DR

Survey Date: Wednesday, June 10, 2015 **WO No:** 35082

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

Full Study Summary (8 HR Standard)

Survey Date: Wednesday, June 10, 2015

Total Observed U-Turns

Northbound: 1 Southbound: 0

Eastbound: 5 Westbound: 0

AADT Factor .90

	BILL LEATHEM DR								LONGFIELDS DR									
	Northbound				Southbound				Eastbound				Westbound					
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	123	0	0	**123**	0	0	0	**0**	**123**	0	0	231	**231**	0	0	0	**0**	**231**	**354**
08:00 09:00	159	0	0	**159**	0	0	0	**0**	**159**	0	0	255	**255**	0	0	0	**0**	**255**	**414**
09:00 10:00	89	0	0	**89**	0	0	0	**0**	**89**	0	0	141	**141**	0	0	0	**0**	**141**	**230**
11:30 12:30	127	0	0	**127**	0	0	0	**0**	**127**	0	0	93	**93**	0	0	0	**0**	**93**	**220**
12:30 13:30	66	0	0	**66**	0	0	0	**0**	**66**	0	0	117	**117**	0	0	0	**0**	**117**	**183**
15:00 16:00	210	0	0	**210**	0	0	0	**0**	**210**	0	0	128	**128**	0	0	0	**0**	**128**	**338**
16:00 17:00	278	0	0	**278**	0	0	0	**0**	**278**	0	0	145	**145**	0	0	0	**0**	**145**	**423**
17:00 18:00	222	0	0	**222**	0	0	0	**0**	**222**	0	0	160	**160**	0	0	0	**0**	**160**	**382**
Sub Total	1274	0	0	**1274**	0	0	0	**0**	**1274**	0	0	1270	**1270**	0	0	0	**0**	**1270**	**2544**
U Turns				**1**				**0**	**1**				**5**				**0**	**5**	**6**
Total	1274	0	0	**1275**	0	0	0	**0**	**1275**	0	0	1270	**1275**	0	0	0	**0**	**1275**	**2550**
EQ 12Hr	1771	0	0	**1772**	0	0	0	**0**	**1772**	0	0	1765	**1772**	0	0	0	**0**	**1772**	**3544**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	1502	0	0	**1503**	0	0	0	**0**	**1595**	0	0	1497	**1503**	0	0	0	**0**	**1595**	**3190**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**0.9**					
AVG 24Hr	1968	0	0	**1969**	0	0	0	**0**	**1969**	0	0	1962	**1969**	0	0	0	**0**	**1969**	**3938**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														**1.31**					

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

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BILL LEATHEM DR @ LONGFIELDS DR

Survey Date: Wednesday, June 10, 2015 **WO No:** 35082

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

Full Study 15 Minute Increments

		BILL LEATHEM DR									LONGFIELDS DR									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	24	0	0	24	0	0	0	0	0	0	0	45	45	0	0	0	0	0	69
07:15	07:30	28	0	0	28	0	0	0	0	0	0	0	58	58	0	0	0	0	0	86
07:30	07:45	32	0	0	32	0	0	0	0	1	0	0	57	57	0	0	0	0	1	89
07:45	08:00	39	0	0	39	0	0	0	0	0	0	0	71	72	0	0	0	0	0	111
08:00	08:15	44	0	0	44	0	0	0	0	4	0	0	57	57	0	0	0	0	4	101
08:15	08:30	45	0	0	45	0	0	0	0	1	0	0	66	66	0	0	0	0	1	111
08:30	08:45	40	0	0	40	0	0	0	0	0	0	0	68	68	0	0	0	0	0	108
08:45	09:00	30	0	0	30	0	0	0	0	2	0	0	64	64	0	0	0	0	2	94
09:00	09:15	31	0	0	31	0	0	0	0	1	0	0	55	55	0	0	0	0	1	86
09:15	09:30	16	0	0	16	0	0	0	0	1	0	0	40	41	0	0	0	0	1	57
09:30	09:45	31	0	0	31	0	0	0	0	2	0	0	29	29	0	0	0	0	2	60
09:45	10:00	11	0	0	11	0	0	0	0	1	0	0	17	17	0	0	0	0	1	28
11:30	11:45	38	0	0	38	0	0	0	0	0	0	0	20	20	0	0	0	0	0	58
11:45	12:00	33	0	0	33	0	0	0	0	0	0	0	23	23	0	0	0	0	0	56
12:00	12:15	35	0	0	35	0	0	0	0	0	0	0	26	26	0	0	0	0	0	61
12:15	12:30	21	0	0	21	0	0	0	0	0	0	0	24	24	0	0	0	0	0	45
12:30	12:45	17	0	0	17	0	0	0	0	0	0	0	39	39	0	0	0	0	0	56
12:45	13:00	17	0	0	17	0	0	0	0	1	0	0	35	35	0	0	0	0	1	52
13:00	13:15	14	0	0	14	0	0	0	0	0	0	0	23	24	0	0	0	0	0	38
13:15	13:30	18	0	0	18	0	0	0	0	0	0	0	20	20	0	0	0	0	0	38
15:00	15:15	50	0	0	50	0	0	0	0	2	0	0	27	27	0	0	0	0	2	77
15:15	15:30	41	0	0	41	0	0	0	0	2	0	0	30	31	0	0	0	0	2	72
15:30	15:45	55	0	0	55	0	0	0	0	3	0	0	42	42	0	0	0	0	3	97
15:45	16:00	64	0	0	64	0	0	0	0	1	0	0	29	29	0	0	0	0	1	93
16:00	16:15	87	0	0	87	0	0	0	0	2	0	0	35	35	0	0	0	0	2	122
16:15	16:30	59	0	0	59	0	0	0	0	0	0	0	38	39	0	0	0	0	0	98
16:30	16:45	64	0	0	64	0	0	0	0	3	0	0	31	31	0	0	0	0	3	95
16:45	17:00	68	0	0	68	0	0	0	0	1	0	0	41	41	0	0	0	0	1	109
17:00	17:15	70	0	0	70	0	0	0	0	0	0	0	37	37	0	0	0	0	0	107
17:15	17:30	57	0	0	58	0	0	0	0	1	0	0	44	44	0	0	0	0	1	102
17:30	17:45	52	0	0	52	0	0	0	0	0	0	0	35	35	0	0	0	0	0	87
17:45	18:00	43	0	0	43	0	0	0	0	2	0	0	44	44	0	0	0	0	2	87
Total:		1274	0	0	1275	0	0	0	0	31	0	0	1270	1275	0	0	0	0	31	2,550

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BILL LEATHEM DR @ LONGFIELDS DR

Survey Date: Wednesday, June 10, 2015 **WO No:** 35082

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

Full Study Cyclist Volume

Time Period		BILL LEATHEM DR Northbound	BILL LEATHEM DR Southbound	BILL LEATHEM DR Street Total	LONGFIELDS DR Eastbound	LONGFIELDS DR Westbound	LONGFIELDS DR Street Total	Grand Total
07:00	07:15	0	0	0	3	0	3	3
07:15	07:30	0	0	0	0	0	0	0
07:30	07:45	0	0	0	2	0	2	2
07:45	08:00	1	0	1	0	0	0	1
08:00	08:15	0	0	0	2	0	2	2
08:15	08:30	0	0	0	1	0	1	1
08:30	08:45	0	0	0	2	0	2	2
08:45	09:00	1	0	1	3	0	3	4
09:00	09:15	0	0	0	2	0	2	2
09:15	09:30	0	0	0	1	0	1	1
09:30	09:45	2	0	2	2	0	2	4
09:45	10:00	0	0	0	0	0	0	0
11:30	11:45	0	0	0	0	0	0	0
11:45	12:00	0	0	0	0	0	0	0
12:00	12:15	0	0	0	0	0	0	0
12:15	12:30	0	0	0	0	0	0	0
12:30	12:45	0	0	0	0	0	0	0
12:45	13:00	0	0	0	0	0	0	0
13:00	13:15	0	0	0	0	0	0	0
13:15	13:30	0	0	0	0	0	0	0
15:00	15:15	0	0	0	0	0	0	0
15:15	15:30	0	0	0	1	0	1	1
15:30	15:45	1	0	1	0	0	0	1
15:45	16:00	0	0	0	0	0	0	0
16:00	16:15	1	0	1	0	0	0	1
16:15	16:30	2	0	2	0	0	0	2
16:30	16:45	1	0	1	0	0	0	1
16:45	17:00	2	0	2	1	0	1	3
17:00	17:15	0	0	0	0	0	0	0
17:15	17:30	1	0	1	1	0	1	2
17:30	17:45	1	0	1	0	0	0	1
17:45	18:00	1	0	1	0	0	0	1
Total		14	0	**14**	21	0	21	35

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BILL LEATHEM DR @ LONGFIELDS DR

Survey Date: Wednesday, June 10, 2015 **WO No:** 35082

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

Full Study Pedestrian Volume

Time Period		BILL LEATHEM DR NB Approach (E or W Crossing)	BILL LEATHEM DR SB Approach (E or W Crossing)	BILL LEATHEM DR Total	LONGFIELDS DR EB Approach (N or S Crossing)	LONGFIELDS DR WB Approach (N or S Crossing)	LONGFIELDS DR Total	Grand Total
07:00	07:15	0	0	**0**	0	0	**0**	**0**
07:15	07:30	0	0	**0**	0	0	**0**	**0**
07:30	07:45	0	0	**0**	0	0	**0**	**0**
07:45	08:00	0	0	**0**	0	0	**0**	**0**
08:00	08:15	0	0	**0**	0	0	**0**	**0**
08:15	08:30	0	0	**0**	0	0	**0**	**0**
08:30	08:45	0	0	**0**	1	0	**1**	**1**
08:45	09:00	0	0	**0**	0	0	**0**	**0**
09:00	09:15	0	0	**0**	0	0	**0**	**0**
09:15	09:30	0	0	**0**	0	0	**0**	**0**
09:30	09:45	0	0	**0**	0	0	**0**	**0**
09:45	10:00	0	0	**0**	0	0	**0**	**0**
11:30	11:45	0	0	**0**	0	0	**0**	**0**
11:45	12:00	0	0	**0**	0	0	**0**	**0**
12:00	12:15	1	0	**1**	0	0	**0**	**1**
12:15	12:30	1	0	**1**	0	0	**0**	**1**
12:30	12:45	0	0	**0**	0	0	**0**	**0**
12:45	13:00	0	0	**0**	1	0	**1**	**1**
13:00	13:15	0	0	**0**	1	0	**1**	**1**
13:15	13:30	0	0	**0**	0	0	**0**	**0**
15:00	15:15	0	0	**0**	0	0	**0**	**0**
15:15	15:30	0	0	**0**	0	0	**0**	**0**
15:30	15:45	0	0	**0**	0	0	**0**	**0**
15:45	16:00	0	0	**0**	0	0	**0**	**0**
16:00	16:15	0	0	**0**	0	0	**0**	**0**
16:15	16:30	0	0	**0**	0	0	**0**	**0**
16:30	16:45	0	0	**0**	0	0	**0**	**0**
16:45	17:00	0	0	**0**	0	0	**0**	**0**
17:00	17:15	0	0	**0**	0	0	**0**	**0**
17:15	17:30	0	0	**0**	0	0	**0**	**0**
17:30	17:45	0	0	**0**	0	0	**0**	**0**
17:45	18:00	0	0	**0**	0	0	**0**	**0**
Total	.....	2	0	**2**	3	0	**3**	**5**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BILL LEATHEM DR @ LONGFIELDS DR

Survey Date: Wednesday, June 10, 2015 **WO No:** 35082

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

Full Study Heavy Vehicles

		BILL LEATHEM DR									LONGFIELDS DR									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	0	0	0	**0**	0	0	0	**0**	**0**	0	0	1	**1**	0	0	0	**0**	**1**	**1**
07:15	07:30	0	0	0	**0**	0	0	0	**0**	**0**	0	0	4	**4**	0	0	0	**0**	**4**	**4**
07:30	07:45	1	0	0	**1**	0	0	0	**0**	**1**	0	0	1	**1**	0	0	0	**0**	**1**	**2**
07:45	08:00	0	0	0	**0**	0	0	0	**0**	**0**	0	0	1	**1**	0	0	0	**0**	**1**	**1**
08:00	08:15	4	0	0	**4**	0	0	0	**0**	**4**	0	0	2	**2**	0	0	0	**0**	**2**	**6**
08:15	08:30	1	0	0	**1**	0	0	0	**0**	**1**	0	0	2	**2**	0	0	0	**0**	**2**	**3**
08:30	08:45	0	0	0	**0**	0	0	0	**0**	**0**	0	0	2	**2**	0	0	0	**0**	**2**	**2**
08:45	09:00	2	0	0	**2**	0	0	0	**0**	**2**	0	0	2	**2**	0	0	0	**0**	**2**	**4**
09:00	09:15	1	0	0	**1**	0	0	0	**0**	**1**	0	0	0	**0**	0	0	0	**0**	**0**	**1**
09:15	09:30	1	0	0	**1**	0	0	0	**0**	**1**	0	0	1	**1**	0	0	0	**0**	**1**	**2**
09:30	09:45	2	0	0	**2**	0	0	0	**0**	**2**	0	0	0	**0**	0	0	0	**0**	**0**	**2**
09:45	10:00	1	0	0	**1**	0	0	0	**0**	**1**	0	0	0	**0**	0	0	0	**0**	**0**	**1**
11:30	11:45	0	0	0	**0**	0	0	0	**0**	**0**	0	0	1	**1**	0	0	0	**0**	**1**	**1**
11:45	12:00	0	0	0	**0**	0	0	0	**0**	**0**	0	0	1	**1**	0	0	0	**0**	**1**	**1**
12:00	12:15	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	0	0	**0**	**0**	**0**
12:15	12:30	0	0	0	**0**	0	0	0	**0**	**0**	0	0	1	**1**	0	0	0	**0**	**1**	**1**
12:30	12:45	0	0	0	**0**	0	0	0	**0**	**0**	0	0	1	**1**	0	0	0	**0**	**1**	**1**
12:45	13:00	1	0	0	**1**	0	0	0	**0**	**1**	0	0	0	**0**	0	0	0	**0**	**0**	**1**
13:00	13:15	0	0	0	**0**	0	0	0	**0**	**0**	0	0	1	**1**	0	0	0	**0**	**1**	**1**
13:15	13:30	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	0	0	**0**	**0**	**0**
15:00	15:15	2	0	0	**2**	0	0	0	**0**	**2**	0	0	4	**4**	0	0	0	**0**	**4**	**6**
15:15	15:30	2	0	0	**2**	0	0	0	**0**	**2**	0	0	0	**0**	0	0	0	**0**	**0**	**2**
15:30	15:45	3	0	0	**3**	0	0	0	**0**	**3**	0	0	0	**0**	0	0	0	**0**	**0**	**3**
15:45	16:00	1	0	0	**1**	0	0	0	**0**	**1**	0	0	0	**0**	0	0	0	**0**	**0**	**1**
16:00	16:15	2	0	0	**2**	0	0	0	**0**	**2**	0	0	1	**1**	0	0	0	**0**	**1**	**3**
16:15	16:30	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	0	0	**0**	**0**	**0**
16:30	16:45	3	0	0	**3**	0	0	0	**0**	**3**	0	0	1	**1**	0	0	0	**0**	**1**	**4**
16:45	17:00	1	0	0	**1**	0	0	0	**0**	**1**	0	0	1	**1**	0	0	0	**0**	**1**	**2**
17:00	17:15	0	0	0	**0**	0	0	0	**0**	**0**	0	0	1	**1**	0	0	0	**0**	**1**	**1**
17:15	17:30	1	0	0	**1**	0	0	0	**0**	**1**	0	0	1	**1**	0	0	0	**0**	**1**	**2**
17:30	17:45	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	0	0	**0**	**0**	**0**
17:45	18:00	2	0	0	**2**	0	0	0	**0**	**2**	0	0	0	**0**	0	0	0	**0**	**0**	**2**
Total:	None	31	0	0	**31**	0	0	0	**0**	**31**	0	0	30	**30**	0	0	0	**0**	**30**	**61**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BILL LEATHEM DR @ LONGFIELDS DR

Survey Date: Wednesday, June 10, 2015 **WO No:** 35082

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

Full Study 15 Minute U-Turn Total

		BILL LEATHEM DR		LONGFIELDS DR		
Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	0
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	0	0	0
07:45	08:00	0	0	1	0	1
08:00	08:15	0	0	0	0	0
08:15	08:30	0	0	0	0	0
08:30	08:45	0	0	0	0	0
08:45	09:00	0	0	0	0	0
09:00	09:15	0	0	0	0	0
09:15	09:30	0	0	1	0	1
09:30	09:45	0	0	0	0	0
09:45	10:00	0	0	0	0	0
11:30	11:45	0	0	0	0	0
11:45	12:00	0	0	0	0	0
12:00	12:15	0	0	0	0	0
12:15	12:30	0	0	0	0	0
12:30	12:45	0	0	0	0	0
12:45	13:00	0	0	0	0	0
13:00	13:15	0	0	1	0	1
13:15	13:30	0	0	0	0	0
15:00	15:15	0	0	0	0	0
15:15	15:30	0	0	1	0	1
15:30	15:45	0	0	0	0	0
15:45	16:00	0	0	0	0	0
16:00	16:15	0	0	0	0	0
16:15	16:30	0	0	1	0	1
16:30	16:45	0	0	0	0	0
16:45	17:00	0	0	0	0	0
17:00	17:15	0	0	0	0	0
17:15	17:30	1	0	0	0	1
17:30	17:45	0	0	0	0	0
17:45	18:00	0	0	0	0	0
Total		1	0	5	0	6

Transportation Services - Traffic Services

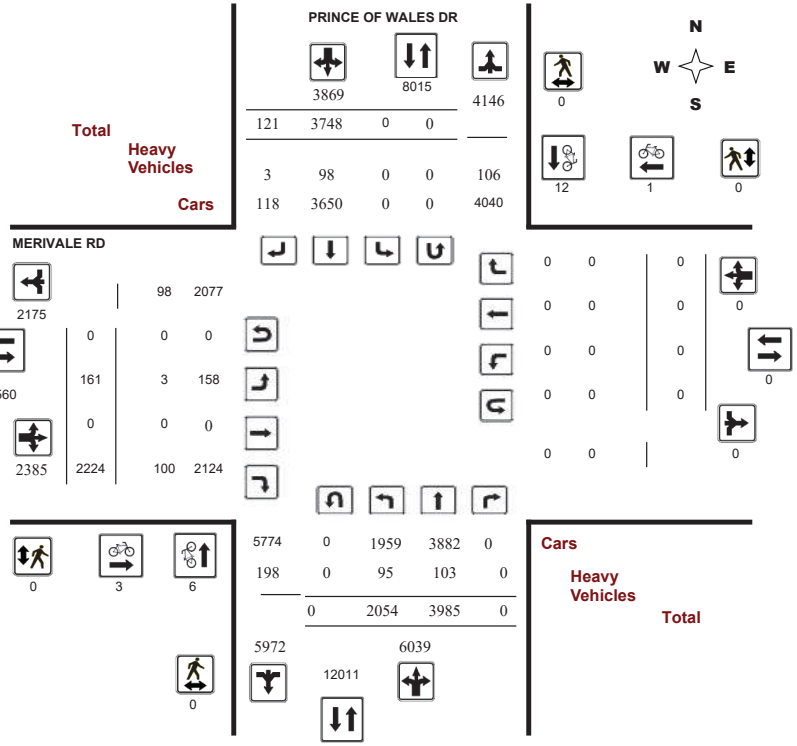
Turning Movement Count - Study Results

PRINCE OF WALES DR @ MERIVALE RD

Survey Date: Wednesday, June 13, 2018 **WO No:** 37904

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

Full Study Diagram



Transportation Services - Traffic Services

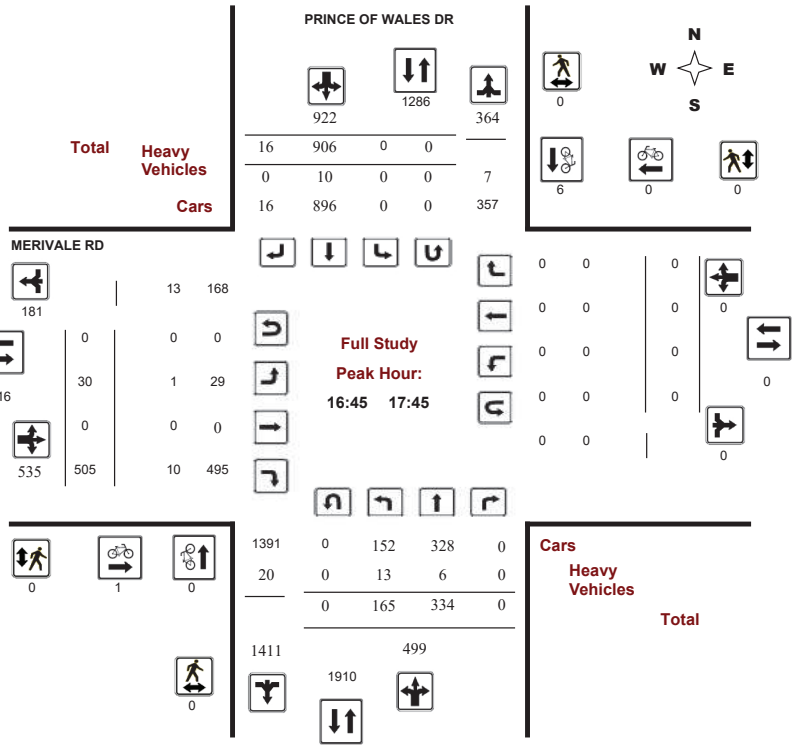
Turning Movement Count - Study Results

PRINCE OF WALES DR @ MERIVALE RD

Survey Date: Wednesday, June 13, 2018 **WO No:** 37904

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

Full Study Peak Hour Diagram



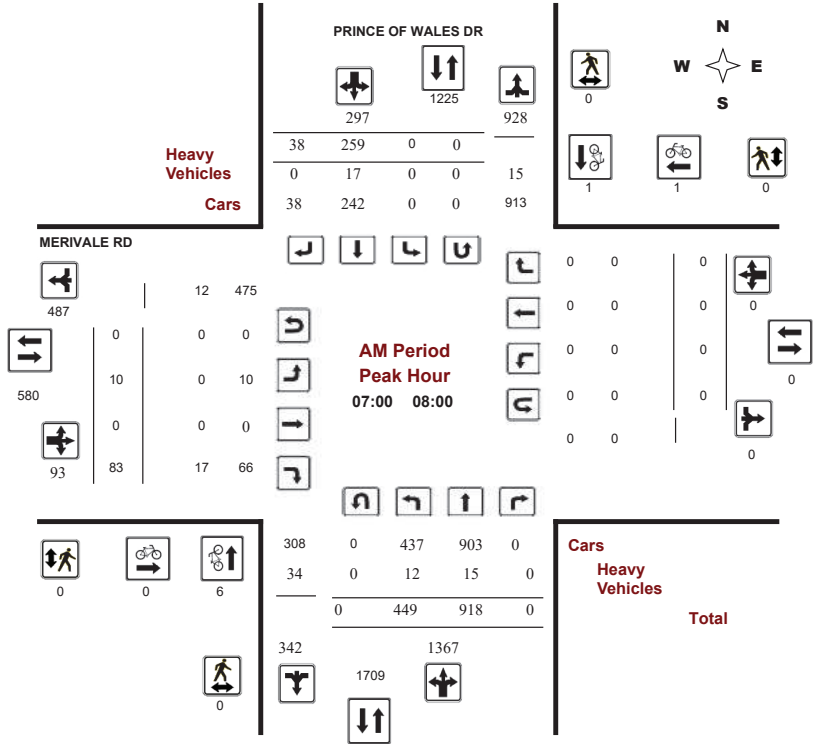
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

PRINCE OF WALES DR @ MERIVALE RD

Survey Date: Wednesday, June 13, 2018 **WO No:** 37904

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



Comments

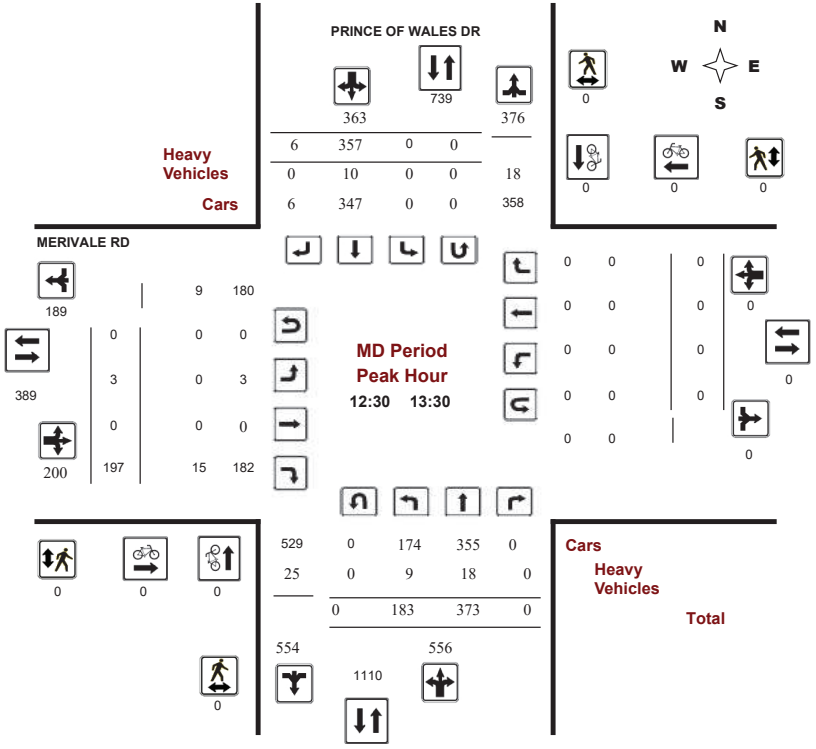
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

PRINCE OF WALES DR @ MERIVALE RD

Survey Date: Wednesday, June 13, 2018 **WO No:** 37904

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



Comments

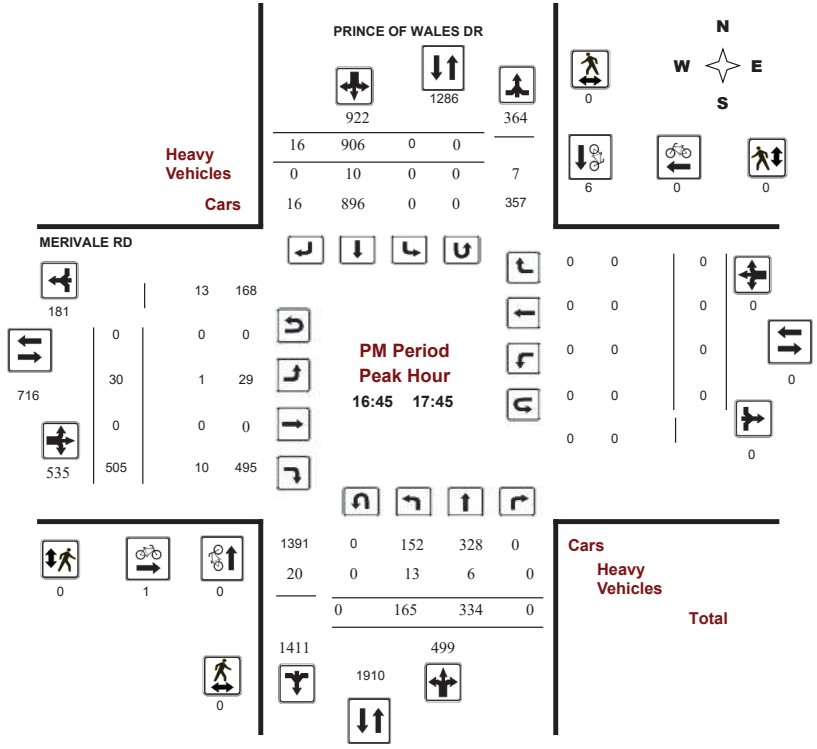
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

PRINCE OF WALES DR @ MERIVALE RD

Survey Date: Wednesday, June 13, 2018 **WO No:** 37904

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



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

PRINCE OF WALES DR @ MERIVALE RD

Survey Date: Wednesday, June 13, 2018 **WO No:** 37904

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

Full Study Summary (8 HR Standard)

Survey Date: Wednesday, June 13, 2018

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 0 Westbound: 0

AADT Factor .90

	PRINCE OF WALES DR								MERIVALE RD									
	Northbound				Southbound				Eastbound				Westbound					
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	449	918	0	**1367**	0	259	38	**297**	**1664**	10	0	83	**93**	0	0	0	**0**	**93**	**1757**
08:00 09:00	418	718	0	**1136**	0	229	16	**245**	**1381**	10	0	93	**103**	0	0	0	**0**	**103**	**1484**
09:00 10:00	295	651	0	**946**	0	256	11	**267**	**1213**	8	0	130	**138**	0	0	0	**0**	**138**	**1351**
11:30 12:30	202	344	0	**546**	0	341	8	**349**	**895**	11	0	202	**213**	0	0	0	**0**	**213**	**1108**
12:30 13:30	183	373	0	**556**	0	357	6	**363**	**919**	3	0	197	**200**	0	0	0	**0**	**200**	**1119**
15:00 16:00	164	337	0	**501**	0	704	6	**710**	**1211**	58	0	446	**504**	0	0	0	**0**	**504**	**1715**
16:00 17:00	183	312	0	**495**	0	759	22	**781**	**1276**	38	0	577	**615**	0	0	0	**0**	**615**	**1891**
17:00 18:00	160	332	0	**492**	0	843	14	**857**	**1349**	23	0	496	**519**	0	0	0	**0**	**519**	**1868**
Sub Total	2054	3985	0	**6039**	0	3748	121	**3869**	**9908**	161	0	2224	**2385**	0	0	0	**0**	**2385**	**12293**
U Turns				**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total	2054	3985	0	**6039**	0	3748	121	**3869**	**9908**	161	0	2224	**2385**	0	0	0	**0**	**2385**	**12293**
EQ 12Hr	2855	5539	0	**8394**	0	5210	168	**5378**	**13772**	224	0	3091	**3315**	0	0	0	**0**	**3315**	**17087**

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

AVG 12Hr	2570	4985	0	**7555**	0	6142	198	**4840**	**12395**	202	0	2782	**2984**	0	0	0	**0**	**2984**	**15378**

Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor. **.90**

AVG 24Hr	3367	6530	0	**9897**	0	8046	259	**6340**	**16237**	265	0	3644	**3909**	0	0	0	**0**	**3909**	**20145**

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

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

Transportation Services - Traffic Services

Turning Movement Count - Study Results

PRINCE OF WALES DR @ MERIVALE RD

Survey Date: Wednesday, June 13, 2018 **WO No:** 37904

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

Full Study 15 Minute Increments

		PRINCE OF WALES DR									MERIVALE RD									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	123	228	0	351	0	53	13	66	417	0	0	28	28	0	0	0	0	28	445
07:15	07:30	117	226	0	343	0	70	6	76	419	2	0	21	23	0	0	0	0	23	442
07:30	07:45	94	246	0	340	0	69	10	79	419	4	0	16	20	0	0	0	0	20	439
07:45	08:00	115	218	0	333	0	67	9	76	409	4	0	18	22	0	0	0	0	22	431
08:00	08:15	114	183	0	297	0	64	3	67	364	4	0	18	22	0	0	0	0	22	386
08:15	08:30	99	193	0	292	0	52	5	57	349	0	0	21	21	0	0	0	0	21	370
08:30	08:45	97	175	0	272	0	53	5	58	330	2	0	32	34	0	0	0	0	34	364
08:45	09:00	108	167	0	275	0	60	3	63	338	4	0	22	26	0	0	0	0	26	364
09:00	09:15	89	202	0	291	0	71	5	76	367	2	0	32	34	0	0	0	0	34	401
09:15	09:30	86	178	0	264	0	64	5	69	333	0	0	29	29	0	0	0	0	29	362
09:30	09:45	60	140	0	200	0	62	1	63	263	0	0	39	39	0	0	0	0	39	302
09:45	10:00	60	131	0	191	0	59	0	59	250	6	0	30	36	0	0	0	0	36	286
11:30	11:45	61	94	0	155	0	91	1	92	247	4	0	45	49	0	0	0	0	49	296
11:45	12:00	56	93	0	149	0	76	2	78	227	1	0	51	52	0	0	0	0	52	279
12:00	12:15	41	83	0	124	0	93	2	95	219	1	0	42	43	0	0	0	0	43	262
12:15	12:30	44	74	0	118	0	81	3	84	202	5	0	64	69	0	0	0	0	69	271
12:30	12:45	49	86	0	135	0	91	2	93	228	1	0	41	42	0	0	0	0	42	270
12:45	13:00	45	101	0	146	0	96	1	97	243	1	0	56	57	0	0	0	0	57	300
13:00	13:15	52	89	0	141	0	80	1	81	222	0	0	44	44	0	0	0	0	44	266
13:15	13:30	37	97	0	134	0	90	2	92	226	1	0	56	57	0	0	0	0	57	283
15:00	15:15	43	87	0	130	0	150	1	151	281	20	0	100	120	0	0	0	0	120	401
15:15	15:30	37	83	0	120	0	163	1	164	284	18	0	97	115	0	0	0	0	115	399
15:30	15:45	43	93	0	136	0	203	2	205	341	12	0	133	145	0	0	0	0	145	486
15:45	16:00	41	74	0	115	0	188	2	190	305	8	0	116	124	0	0	0	0	124	429
16:00	16:15	63	77	0	140	0	192	2	194	334	11	0	150	161	0	0	0	0	161	495
16:15	16:30	36	81	0	117	0	168	8	176	293	11	0	132	143	0	0	0	0	143	436
16:30	16:45	44	74	0	118	0	178	8	186	304	8	0	170	178	0	0	0	0	178	482
16:45	17:00	40	80	0	120	0	221	4	225	345	8	0	125	133	0	0	0	0	133	478
17:00	17:15	45	86	0	131	0	213	6	219	350	14	0	136	150	0	0	0	0	150	500
17:15	17:30	43	93	0	136	0	248	3	251	387	7	0	102	109	0	0	0	0	109	496
17:30	17:45	37	75	0	112	0	224	3	227	339	1	0	142	143	0	0	0	0	143	482
17:45	18:00	35	78	0	113	0	158	2	160	273	1	0	116	117	0	0	0	0	117	390
Total:		2054	3985	0	6039	0	3748	121	3869	9908	161	0	2224	2385	0	0	0	0	2385	12,293

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

PRINCE OF WALES DR @ MERIVALE RD

Survey Date: Wednesday, June 13, 2018 **WO No:** 37904

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

Full Study Cyclist Volume

		PRINCE OF WALES DR			MERIVALE RD			
Time Period		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00	07:15	1	0	1	0	1	1	2
07:15	07:30	2	0	2	0	0	0	2
07:30	07:45	0	0	0	0	0	0	0
07:45	08:00	3	1	4	0	0	0	4
08:00	08:15	0	0	0	0	0	0	0
08:15	08:30	0	0	0	1	0	1	1
08:30	08:45	0	1	1	0	0	0	1
08:45	09:00	0	0	0	0	0	0	0
09:00	09:15	0	0	0	0	0	0	0
09:15	09:30	0	0	0	0	0	0	0
09:30	09:45	0	0	0	0	0	0	0
09:45	10:00	0	0	0	0	0	0	0
11:30	11:45	0	0	0	0	0	0	0
11:45	12:00	0	0	0	0	0	0	0
12:00	12:15	0	0	0	0	0	0	0
12:15	12:30	0	0	0	0	0	0	0
12:30	12:45	0	0	0	0	0	0	0
12:45	13:00	0	0	0	0	0	0	0
13:00	13:15	0	0	0	0	0	0	0
13:15	13:30	0	0	0	0	0	0	0
15:00	15:15	0	0	0	0	0	0	0
15:15	15:30	0	0	0	0	0	0	0
15:30	15:45	0	2	2	0	0	0	2
15:45	16:00	0	0	0	0	0	0	0
16:00	16:15	0	2	2	0	0	0	2
16:15	16:30	0	0	0	1	0	1	1
16:30	16:45	0	0	0	0	0	0	0
16:45	17:00	0	1	1	1	0	1	2
17:00	17:15	0	2	2	0	0	0	2
17:15	17:30	0	3	3	0	0	0	3
17:30	17:45	0	0	0	0	0	0	0
17:45	18:00	0	0	0	0	0	0	0
Total		6	12	**18**	3	1	4	22

Transportation Services - Traffic Services

Turning Movement Count - Study Results

PRINCE OF WALES DR @ MERIVALE RD

Survey Date: Wednesday, June 13, 2018 **WO No:** 37904

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

Full Study Pedestrian Volume

		PRINCE OF WALES DR			MERIVALE RD			
Time Period		NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00	07:15	0	0	**0**	0	0	**0**	**0**
07:15	07:30	0	0	**0**	0	0	**0**	**0**
07:30	07:45	0	0	**0**	0	0	**0**	**0**
07:45	08:00	0	0	**0**	0	0	**0**	**0**
08:00	08:15	0	0	**0**	0	0	**0**	**0**
08:15	08:30	0	0	**0**	0	0	**0**	**0**
08:30	08:45	0	0	**0**	0	0	**0**	**0**
08:45	09:00	0	0	**0**	0	0	**0**	**0**
09:00	09:15	0	0	**0**	0	0	**0**	**0**
09:15	09:30	0	0	**0**	0	0	**0**	**0**
09:30	09:45	0	0	**0**	0	0	**0**	**0**
09:45	10:00	0	0	**0**	0	0	**0**	**0**
11:30	11:45	0	0	**0**	0	0	**0**	**0**
11:45	12:00	0	0	**0**	0	0	**0**	**0**
12:00	12:15	0	0	**0**	0	0	**0**	**0**
12:15	12:30	0	0	**0**	0	0	**0**	**0**
12:30	12:45	0	0	**0**	0	0	**0**	**0**
12:45	13:00	0	0	**0**	0	0	**0**	**0**
13:00	13:15	0	0	**0**	0	0	**0**	**0**
13:15	13:30	0	0	**0**	0	0	**0**	**0**
15:00	15:15	0	0	**0**	0	0	**0**	**0**
15:15	15:30	0	0	**0**	0	0	**0**	**0**
15:30	15:45	0	0	**0**	0	0	**0**	**0**
15:45	16:00	0	0	**0**	0	0	**0**	**0**
16:00	16:15	0	0	**0**	0	0	**0**	**0**
16:15	16:30	0	0	**0**	0	0	**0**	**0**
16:30	16:45	0	0	**0**	0	0	**0**	**0**
16:45	17:00	0	0	**0**	0	0	**0**	**0**
17:00	17:15	0	0	**0**	0	0	**0**	**0**
17:15	17:30	0	0	**0**	0	0	**0**	**0**
17:30	17:45	0	0	**0**	0	0	**0**	**0**
17:45	18:00	0	0	**0**	0	0	**0**	**0**
Total	.....	0	0	**0**	0	0	**0**	**0**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

PRINCE OF WALES DR @ MERIVALE RD

Survey Date: Wednesday, June 13, 2018 **WO No:** 37904

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

Full Study Heavy Vehicles

		PRINCE OF WALES DR									MERIVALE RD									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	2	4	0	**17**	0	5	0	**9**	**26**	0	0	6	**8**	0	0	0	**0**	**8**	**17**
07:15	07:30	7	4	0	**19**	0	5	0	**9**	**28**	0	0	3	**10**	0	0	0	**0**	**10**	**19**
07:30	07:45	2	4	0	**15**	0	4	0	**8**	**23**	0	0	5	**7**	0	0	0	**0**	**7**	**15**
07:45	08:00	1	3	0	**10**	0	3	0	**6**	**16**	0	0	3	**4**	0	0	0	**0**	**4**	**10**
08:00	08:15	3	3	0	**13**	0	5	0	**8**	**21**	0	0	2	**5**	0	0	0	**0**	**5**	**13**
08:15	08:30	5	3	0	**16**	0	4	0	**7**	**23**	0	0	4	**9**	0	0	0	**0**	**9**	**16**
08:30	08:45	1	0	0	**8**	0	2	0	**2**	**10**	0	0	5	**6**	0	0	0	**0**	**6**	**8**
08:45	09:00	4	0	0	**11**	0	6	0	**6**	**17**	0	0	1	**5**	0	0	0	**0**	**5**	**11**
09:00	09:15	3	3	0	**10**	0	2	0	**5**	**15**	0	0	2	**5**	0	0	0	**0**	**5**	**10**
09:15	09:30	2	6	0	**18**	0	6	0	**12**	**30**	0	0	4	**6**	0	0	0	**0**	**6**	**18**
09:30	09:45	0	5	0	**10**	0	2	0	**7**	**17**	0	0	3	**3**	0	0	0	**0**	**3**	**10**
09:45	10:00	1	2	0	**7**	0	3	0	**7**	**14**	2	0	1	**4**	0	0	0	**0**	**4**	**9**
11:30	11:45	1	4	0	**9**	0	2	0	**6**	**15**	0	0	2	**3**	0	0	0	**0**	**3**	**9**
11:45	12:00	4	4	0	**17**	0	3	0	**7**	**24**	0	0	6	**10**	0	0	0	**0**	**10**	**17**
12:00	12:15	2	3	0	**12**	0	4	1	**8**	**20**	0	0	3	**6**	0	0	0	**0**	**6**	**13**
12:15	12:30	3	2	0	**12**	0	3	0	**5**	**17**	0	0	4	**7**	0	0	0	**0**	**7**	**12**
12:30	12:45	2	2	0	**13**	0	3	0	**5**	**18**	0	0	6	**8**	0	0	0	**0**	**8**	**13**
12:45	13:00	2	3	0	**9**	0	1	0	**4**	**13**	0	0	3	**5**	0	0	0	**0**	**5**	**9**
13:00	13:15	1	7	0	**11**	0	2	0	**9**	**20**	0	0	1	**2**	0	0	0	**0**	**2**	**11**
13:15	13:30	4	6	0	**19**	0	4	0	**10**	**29**	0	0	5	**9**	0	0	0	**0**	**9**	**19**
15:00	15:15	2	2	0	**12**	0	5	1	**8**	**20**	0	0	3	**6**	0	0	0	**0**	**6**	**13**
15:15	15:30	5	3	0	**13**	0	3	1	**7**	**20**	0	0	2	**8**	0	0	0	**0**	**8**	**14**
15:30	15:45	2	4	0	**12**	0	4	0	**8**	**20**	0	0	2	**4**	0	0	0	**0**	**4**	**12**
15:45	16:00	3	5	0	**13**	0	2	0	**7**	**20**	0	0	3	**6**	0	0	0	**0**	**6**	**13**
16:00	16:15	10	5	0	**20**	0	2	0	**7**	**27**	0	0	3	**13**	0	0	0	**0**	**13**	**20**
16:15	16:30	4	3	0	**13**	0	2	0	**5**	**18**	0	0	4	**8**	0	0	0	**0**	**8**	**13**
16:30	16:45	5	5	0	**13**	0	1	0	**6**	**19**	0	0	2	**7**	0	0	0	**0**	**7**	**13**
16:45	17:00	6	2	0	**17**	0	5	0	**8**	**25**	1	0	4	**11**	0	0	0	**0**	**11**	**18**
17:00	17:15	4	1	0	**10**	0	2	0	**3**	**13**	0	0	3	**7**	0	0	0	**0**	**7**	**10**
17:15	17:30	1	1	0	**4**	0	0	0	**1**	**5**	0	0	2	**3**	0	0	0	**0**	**3**	**4**
17:30	17:45	2	2	0	**8**	0	3	0	**5**	**13**	0	0	1	**3**	0	0	0	**0**	**3**	**8**
17:45	18:00	1	2	0	**5**	0	0	0	**2**	**7**	0	0	2	**3**	0	0	0	**0**	**3**	**5**
Total:	None	95	103	0	**396**	0	98	3	**207**	**603**	3	0	100	**201**	0	0	0	**0**	**201**	**402**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

PRINCE OF WALES DR @ MERIVALE RD

Survey Date: Wednesday, June 13, 2018 **WO No:** 37904

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

Full Study 15 Minute U-Turn Total

Time Period		PRINCE OF WALES DR Northbound U-Turn Total	PRINCE OF WALES DR Southbound U-Turn Total	MERIVALE RD Eastbound U-Turn Total	MERIVALE RD Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	0
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	0	0	0
07:45	08:00	0	0	0	0	0
08:00	08:15	0	0	0	0	0
08:15	08:30	0	0	0	0	0
08:30	08:45	0	0	0	0	0
08:45	09:00	0	0	0	0	0
09:00	09:15	0	0	0	0	0
09:15	09:30	0	0	0	0	0
09:30	09:45	0	0	0	0	0
09:45	10:00	0	0	0	0	0
11:30	11:45	0	0	0	0	0
11:45	12:00	0	0	0	0	0
12:00	12:15	0	0	0	0	0
12:15	12:30	0	0	0	0	0
12:30	12:45	0	0	0	0	0
12:45	13:00	0	0	0	0	0
13:00	13:15	0	0	0	0	0
13:15	13:30	0	0	0	0	0
15:00	15:15	0	0	0	0	0
15:15	15:30	0	0	0	0	0
15:30	15:45	0	0	0	0	0
15:45	16:00	0	0	0	0	0
16:00	16:15	0	0	0	0	0
16:15	16:30	0	0	0	0	0
16:30	16:45	0	0	0	0	0
16:45	17:00	0	0	0	0	0
17:00	17:15	0	0	0	0	0
17:15	17:30	0	0	0	0	0
17:30	17:45	0	0	0	0	0
17:45	18:00	0	0	0	0	0
Total		0	0	0	0	0

Appendix C

Synchro and Sidra Intersection Worksheets – Existing Conditions

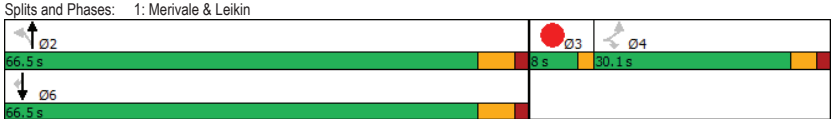
Lane Group	EBL	EBR	NBT	SBT	SBR	Ø3
Lane Configurations						
Traffic Volume (vph)	304	4	354	63	227	
Future Volume (vph)	304	4	354	63	227	
Lane Group Flow (vph)	338	4	393	70	252	
Turn Type	Perm	Perm	NA	NA	Perm	
Protected Phases			2	6		3
Permitted Phases	4	4			6	
Detector Phase	4	4	2	6	6	
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	6.0
Minimum Split (s)	22.1	22.1	16.5	34.5	34.5	8.0
Total Split (s)	30.1	30.1	66.5	66.5	66.5	8.0
Total Split (%)	28.8%	28.8%	63.6%	63.6%	63.6%	8%
Maximum Green (s)	25.0	25.0	60.0	60.0	60.0	6.0
Yellow Time (s)	3.3	3.3	4.6	4.6	4.6	2.0
All-Red Time (s)	1.8	1.8	1.9	1.9	1.9	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.1	5.1	6.5	6.5	6.5	
Lead/Lag	Lag	Lag				Lead
Lead-Lag Optimize?	Yes	Yes				Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Max	Max	Max	None
Walk Time (s)	7.0	7.0		7.0	7.0	3.0
Flash Dont Walk (s)	10.0	10.0		21.0	21.0	0.0
Pedestrian Calls (#/hr)	0	0		0	0	4
Act Effct Green (s)	23.0	23.0	60.1	60.1	60.1	
Actuated g/C Ratio	0.24	0.24	0.62	0.62	0.62	
v/c Ratio	0.86	0.01	0.36	0.08	0.25	
Control Delay	56.8	18.8	10.7	8.6	1.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	56.8	18.8	10.7	8.6	1.9	
LOS	E	B	B	A	A	
Approach Delay	56.3		10.7	3.3		
Approach LOS	E		B	A		
Queue Length 50th (m)	58.8	0.0	32.9	4.8	0.0	
Queue Length 95th (m)	#113.0	2.7	61.7	12.3	10.0	
Internal Link Dist (m)	391.2		325.6	181.8		
Turn Bay Length (m)		240.0			115.0	
Base Capacity (vph)	432	389	1080	890	1012	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.78	0.01	0.36	0.08	0.25	

Intersection Summary

Cycle Length: 104.6
Actuated Cycle Length: 96.2
Natural Cycle: 65
Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.86
Intersection Signal Delay: 23.2 — Intersection LOS: C
Intersection Capacity Utilization 47.1% — ICU Level of Service A
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Merivale & Leikin



Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	14	99	439	164	1
Future Vol, veh/h	6	14	99	439	164	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	8	40	-	-	-
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	4	7	100
Mvmt Flow	7	16	110	488	182	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	891	183	183	0	-	0
Stage 1	183	-	-	-	-	-
Stage 2	708	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	313	859	1392	-	-	-
Stage 1	848	-	-	-	-	-
Stage 2	488	-	-	-	-	-
Platoon blocked, %					-	-
Mov Cap-1 Maneuver	288	859	1392	-	-	-
Mov Cap-2 Maneuver	288	-	-	-	-	-
Stage 1	781	-	-	-	-	-
Stage 2	488	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.9	1.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1392	-	288	859	-	-
HCM Lane V/C Ratio	0.079	-	0.023	0.018	-	-
HCM Control Delay (s)	7.8	-	17.8	9.3	-	-
HCM Lane LOS	A	-	C	A	-	-
HCM 95th %tile Q(veh)	0.3	-	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	50.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	151	558	4	7	20	37	1	2	4	213	3	32
Future Vol, veh/h	151	558	4	7	20	37	1	2	4	213	3	32
Conflicting Peds, #/hr	0	0	5	5	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	30	-	-	-	-	-	-	-	-	-	-	-
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, %	3	2	2	29	35	2	2	2	25	2	33	2
Mvmt Flow	168	620	4	8	22	41	1	2	4	237	3	36

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	63	0	0	629	0	0	1041	1042	627	1020	1024	43
Stage 1	-	-	-	-	-	-	963	963	-	59	59	-
Stage 2	-	-	-	-	-	-	78	79	-	961	965	-
Critical Hdwy	4.13	-	-	4.39	-	-	7.12	6.52	6.45	7.12	6.83	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.83	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.83	-
Follow-up Hdwy	2.227	-	-	2.461	-	-	3.518	4.018	3.525	3.518	4.297	3.318
Pot Cap-1 Maneuver	1533	-	-	836	-	-	208	230	444	~ 215	208	1027
Stage 1	-	-	-	-	-	-	307	334	-	953	789	-
Stage 2	-	-	-	-	-	-	931	829	-	308	296	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1533	-	-	833	-	-	180	202	442	~ 192	183	1027
Mov Cap-2 Maneuver	-	-	-	-	-	-	180	202	-	~ 192	183	-
Stage 1	-	-	-	-	-	-	272	296	-	848	781	-
Stage 2	-	-	-	-	-	-	886	821	-	269	262	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.6	1	17.9	204.6
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	286	1533	-	-	833	-	-	214
HCM Lane V/C Ratio	0.027	0.109	-	-	0.009	-	-	1.288
HCM Control Delay (s)	17.9	7.6	-	-	9.4	-	-	204.6
HCM Lane LOS	C	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	0.1	0.4	-	-	0	-	-	14.7

Notes

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

Lane Group	EBL	EBR	NBL	NBT	SBT	Ø3
Lane Configurations						
Traffic Volume (vph)	10	83	449	918	259	
Future Volume (vph)	10	83	449	918	259	
Lane Group Flow (vph)	11	92	499	1020	330	
Turn Type	Perm	pm+ov	pm+pt	NA	NA	
Protected Phases		5	5	2	6	3
Permitted Phases	4	4	2			
Detector Phase	4	5	5	2	6	
Switch Phase						
Minimum Initial (s)	10.0	5.0	5.0	10.0	10.0	1.0
Minimum Split (s)	22.8	11.4	11.4	16.5	32.5	5.0
Total Split (s)	23.0	22.0	22.0	72.0	50.0	5.0
Total Split (%)	23.0%	22.0%	22.0%	72.0%	50.0%	5%
Maximum Green (s)	16.2	15.6	15.6	65.5	43.5	3.0
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	2.0
All-Red Time (s)	2.2	1.8	1.8	1.9	1.9	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.8	6.4	6.4	6.5	6.5	
Lead/Lag	Lag	Lead	Lead		Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Max	C-Max	None
Walk Time (s)	2.0				7.0	3.0
Flash Dont Walk (s)	14.0				19.0	0.0
Pedestrian Calls (#/hr)	0				0	0
Act Effct Green (s)	10.0	12.7	90.2	95.3	74.4	
Actuated g/C Ratio	0.10	0.13	0.90	0.95	0.74	
v/c Ratio	0.07	0.38	0.58	0.61	0.14	
Control Delay	41.9	10.6	4.3	4.2	5.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	41.9	10.6	4.3	4.2	5.8	
LOS	D	B	A	A	A	
Approach Delay	13.9			4.2	5.8	
Approach LOS	B			A	A	
Queue Length 50th (m)	2.0	0.0	0.7	0.0	4.7	
Queue Length 95th (m)	7.3	9.3	38.7	141.2	26.2	
Internal Link Dist (m)	355.3			333.0	741.3	
Turn Bay Length (m)	135.0		120.0			
Base Capacity (vph)	268	329	918	1664	2318	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.04	0.28	0.54	0.61	0.14	

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 15 (15%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 90

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.61
Intersection Signal Delay: 5.0 Intersection LOS: A
Intersection Capacity Utilization 70.4% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 5: Prince of Wales & Merivale

Intersection	
Int Delay, s/veh	2.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	100	1	308	20	1	227
Future Vol, veh/h	100	1	308	20	1	227
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	8	-	-	30	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	4	2	2	4
Mvmt Flow	111	1	342	22	1	252

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	607	353	0	0	364	0
Stage 1	353	-	-	-	-	-
Stage 2	254	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	460	691	-	-	1195	-
Stage 1	711	-	-	-	-	-
Stage 2	788	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	460	691	-	-	1195	-
Mov Cap-2 Maneuver	460	-	-	-	-	-
Stage 1	711	-	-	-	-	-
Stage 2	787	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.2	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	460	691	1195	-
HCM Lane V/C Ratio	-	-	0.242	0.002	0.001	-
HCM Control Delay (s)	-	-	15.3	10.2	8	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	0.9	0	0	-

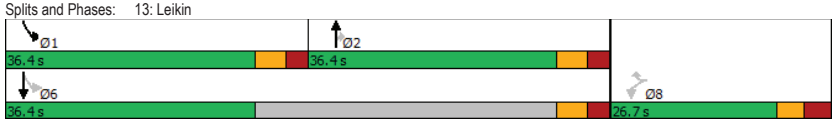
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	16	17	304	548	253	51
Future Volume (vph)	16	17	304	548	253	51
Lane Group Flow (vph)	18	19	338	609	281	57
Turn Type	Perm	Perm	NA	Perm	pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	8	8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0
Minimum Split (s)	24.7	24.7	31.4	31.4	11.4	16.4
Total Split (s)	26.7	26.7	36.4	36.4	36.4	36.4
Total Split (%)	26.8%	26.8%	36.6%	36.6%	36.6%	36.6%
Maximum Green (s)	20.0	20.0	30.0	30.0	30.0	30.0
Yellow Time (s)	3.3	3.3	3.7	3.7	3.7	3.7
All-Red Time (s)	3.4	3.4	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.7	6.7	6.4	6.4	6.4	6.4
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Max	Max	None	Max
Walk Time (s)	7.0	7.0	18.0	18.0		
Flash Dont Walk (s)	11.0	11.0	7.0	7.0		
Pedestrian Calls (#/hr)	19	19	5	5		
Act Effct Green (s)	11.8	11.8	31.5	31.5	47.9	51.3
Actuated g/C Ratio	0.18	0.18	0.49	0.49	0.74	0.80
v/c Ratio	0.06	0.07	0.40	0.60	0.40	0.05
Control Delay	27.1	13.4	16.7	4.7	6.4	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.1	13.4	16.7	4.7	6.4	4.7
LOS	C	B	B	A	A	A
Approach Delay	20.1		9.0			6.1
Approach LOS	C		A			A
Queue Length 50th (m)	2.1	0.0	29.9	0.0	12.3	2.1
Queue Length 95th (m)	7.5	5.2	67.2	22.5	29.5	7.3
Internal Link Dist (m)	73.5		75.1			162.3
Turn Bay Length (m)				130.0	150.0	
Base Capacity (vph)	540	444	837	1013	1003	1433
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	0.03	0.04	0.40	0.60	0.28	0.04

Intersection Summary
Cycle Length: 99.5
Actuated Cycle Length: 64.5
Natural Cycle: 70
Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 8.5	Intersection LOS: A
Intersection Capacity Utilization 63.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 13: Leikin



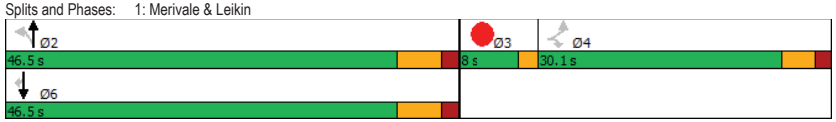
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø3
Lane Configurations							
Traffic Volume (vph)	221	2	1	173	437	212	
Future Volume (vph)	221	2	1	173	437	212	
Lane Group Flow (vph)	246	2	1	192	486	236	
Turn Type	Perm	Perm	Perm	NA	NA	Perm	
Protected Phases				2	6		3
Permitted Phases	4	4	2			6	
Detector Phase	4	4	2	2	6	6	
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	6.0
Minimum Split (s)	22.1	22.1	16.5	16.5	34.5	34.5	8.0
Total Split (s)	30.1	30.1	46.5	46.5	46.5	46.5	8.0
Total Split (%)	35.6%	35.6%	55.0%	55.0%	55.0%	55.0%	9%
Maximum Green (s)	25.0	25.0	40.0	40.0	40.0	40.0	6.0
Yellow Time (s)	3.3	3.3	4.6	4.6	4.6	4.6	2.0
All-Red Time (s)	1.8	1.8	1.9	1.9	1.9	1.9	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.1	5.1	6.5	6.5	6.5	6.5	
Lead/Lag	Lag	Lag					Lead
Lead-Lag Optimize?	Yes	Yes					Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Max	Max	Max	Max	None
Walk Time (s)	7.0	7.0			7.0	7.0	3.0
Flash Dont Walk (s)	10.0	10.0			21.0	21.0	0.0
Pedestrian Calls (#/hr)	0	0			0	0	8
Act Effct Green (s)	15.6	15.6	40.4	40.4	40.4	40.4	
Actuated g/C Ratio	0.23	0.23	0.58	0.58	0.58	0.58	
v/c Ratio	0.67	0.01	0.00	0.20	0.48	0.24	
Control Delay	34.1	15.5	9.0	9.2	12.0	2.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	34.1	15.5	9.0	9.2	12.0	2.3	
LOS	C	B	A	A	B	A	
Approach Delay	33.9			9.2	8.8		
Approach LOS	C			A	A		
Queue Length 50th (m)	27.9	0.0	0.1	9.5	29.5	0.0	
Queue Length 95th (m)	55.0	1.5	0.9	30.1	83.1	11.0	
Internal Link Dist (m)	391.2			325.6	181.8		
Turn Bay Length (m)		240.0	120.0			115.0	
Base Capacity (vph)	594	277	438	964	1021	965	
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	0.41	0.01	0.00	0.20	0.48	0.24	

Intersection Summary
Cycle Length: 84.6
Actuated Cycle Length: 69.1
Natural Cycle: 65
Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 14.2	Intersection LOS: B
Intersection Capacity Utilization 46.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Merivale & Leikin



Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	112	43	244	459	0
Future Vol, veh/h	7	112	43	244	459	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	8	40	-	-	-
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	5	2	2
Mvmt Flow	8	124	48	271	510	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	877	510	510	0	-	0
Stage 1	510	-	-	-	-	-
Stage 2	367	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	319	563	1055	-	-	-
Stage 1	603	-	-	-	-	-
Stage 2	701	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	305	563	1055	-	-	-
Mov Cap-2 Maneuver	305	-	-	-	-	-
Stage 1	576	-	-	-	-	-
Stage 2	701	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.4	1.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1055	-	305	563	-	-
HCM Lane V/C Ratio	0.045	-	0.026	0.221	-	-
HCM Control Delay (s)	8.6	-	17.1	13.2	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	0.8	-	-

Intersection	
Int Delay, s/veh	5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	65	57	0	0	364	183	0	1	0	43	0	162
Future Vol, veh/h	65	57	0	0	364	183	0	1	0	43	0	162
Conflicting Peds, #/hr	1	0	10	10	0	1	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	30	-	-	-	-	-	-	-	-	-	-	-
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	14	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	72	63	0	0	404	203	0	1	0	48	0	180

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	608	0	0	73	0	0	814	825	73	715	724	508
Stage 1	-	-	-	-	-	-	217	217	-	507	507	-
Stage 2	-	-	-	-	-	-	597	608	-	208	217	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	970	-	-	1527	-	-	297	308	989	346	352	565
Stage 1	-	-	-	-	-	-	785	723	-	548	539	-
Stage 2	-	-	-	-	-	-	490	486	-	794	723	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	969	-	-	1515	-	-	189	283	981	325	323	564
Mov Cap-2 Maneuver	-	-	-	-	-	-	189	283	-	325	323	-
Stage 1	-	-	-	-	-	-	721	664	-	507	538	-
Stage 2	-	-	-	-	-	-	333	486	-	734	664	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	4.8	0	17.8	18.6
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	283	969	-	-	1515	-	-	489
HCM Lane V/C Ratio	0.004	0.075	-	-	-	-	-	0.466
HCM Control Delay (s)	17.8	9	-	-	0	-	-	18.6
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0	0.2	-	-	0	-	-	2.4

Lane Group	EBL	EBR	NBL	NBT	SBT	Ø3
Lane Configurations						
Traffic Volume (vph)	30	505	165	334	906	
Future Volume (vph)	30	505	165	334	906	
Lane Group Flow (vph)	33	561	183	371	1025	
Turn Type	Perm	pm+ov	pm+pt	NA	NA	
Protected Phases		5	5	2	6	3
Permitted Phases	4	4	2			
Detector Phase	4	5	5	2	6	
Switch Phase						
Minimum Initial (s)	10.0	5.0	5.0	10.0	10.0	1.0
Minimum Split (s)	22.8	11.4	11.4	16.5	32.5	5.0
Total Split (s)	26.0	14.0	14.0	89.0	75.0	5.0
Total Split (%)	21.7%	11.7%	11.7%	74.2%	62.5%	4%
Maximum Green (s)	19.2	7.6	7.6	82.5	68.5	3.0
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	2.0
All-Red Time (s)	2.2	1.8	1.8	1.9	1.9	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.8	6.4	6.4	6.5	6.5	
Lead/Lag	Lag	Lead	Lead		Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Max	C-Max	None
Walk Time (s)	2.0				7.0	3.0
Flash Dont Walk (s)	14.0				19.0	0.0
Pedestrian Calls (#/hr)	0				0	0
Act Effct Green (s)	10.1	34.8	103.4	105.9	68.5	
Actuated g/C Ratio	0.08	0.29	0.86	0.88	0.57	
v/c Ratio	0.24	1.05	0.32	0.24	0.54	
Control Delay	55.9	84.6	3.6	2.6	17.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	55.9	84.6	3.6	2.6	17.3	
LOS	E	F	A	A	B	
Approach Delay	83.0			2.9	17.3	
Approach LOS	F			A	B	
Queue Length 50th (m)	7.4	~126.7	7.5	17.2	75.0	
Queue Length 95th (m)	17.6	#194.5	12.6	26.0	92.9	
Internal Link Dist (m)	354.7			333.0	741.3	
Turn Bay Length (m)	135.0		120.0			
Base Capacity (vph)	262	532	566	1540	1886	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.13	1.05	0.32	0.24	0.54	

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 112 (93%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 90

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.05
Intersection Signal Delay: 31.6 Intersection LOS: C
Intersection Capacity Utilization 70.7% ICU Level of Service C
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Prince of Wales & Merivale

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	43	1	223	119	1	213
Future Vol, veh/h	43	1	223	119	1	213
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	8	-	-	30	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	3	2	2	3
Mvmt Flow	48	1	248	132	1	237

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	553	314	0	0	380	0
Stage 1	314	-	-	-	-	-
Stage 2	239	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	494	726	-	-	1178	-
Stage 1	741	-	-	-	-	-
Stage 2	801	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	494	726	-	-	1178	-
Mov Cap-2 Maneuver	494	-	-	-	-	-
Stage 1	741	-	-	-	-	-
Stage 2	800	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	494	726	1178	-
HCM Lane V/C Ratio	-	-	0.097	0.002	0.001	-
HCM Control Delay (s)	-	-	13.1	10	8.1	-
HCM Lane LOS	-	-	B	B	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0	0	-

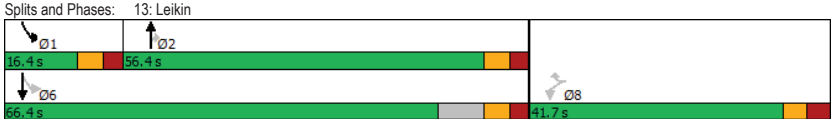
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	409	252	85	5	6	209
Future Volume (vph)	409	252	85	5	6	209
Lane Group Flow (vph)	454	280	94	6	7	232
Turn Type	Perm	Perm	NA	Perm	pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	8	8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0
Minimum Split (s)	24.7	24.7	31.4	31.4	11.4	16.4
Total Split (s)	41.7	41.7	56.4	56.4	16.4	66.4
Total Split (%)	36.4%	36.4%	49.3%	49.3%	14.3%	58.0%
Maximum Green (s)	35.0	35.0	50.0	50.0	10.0	60.0
Yellow Time (s)	3.3	3.3	3.7	3.7	3.7	3.7
All-Red Time (s)	3.4	3.4	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.7	6.7	6.4	6.4	6.4	6.4
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Max	Max	None	Max
Walk Time (s)	7.0	7.0	18.0	18.0		
Flash Dont Walk (s)	11.0	11.0	7.0	7.0		
Pedestrian Calls (#/hr)	19	19	8	8		
Act Effct Green (s)	32.4	32.4	58.2	58.2	60.6	60.6
Actuated g/C Ratio	0.31	0.31	0.55	0.55	0.57	0.57
v/c Ratio	0.90	0.46	0.10	0.01	0.01	0.24
Control Delay	57.3	6.0	13.8	8.8	10.7	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.3	6.0	13.8	8.8	10.7	12.6
LOS	E	A	B	A	B	B
Approach Delay	37.7		13.5			12.5
Approach LOS	D		B			B
Queue Length 50th (m)	88.6	0.0	8.9	0.0	0.6	23.8
Queue Length 95th (m)	#147.3	18.4	21.5	2.4	2.6	37.4
Internal Link Dist (m)	73.5		75.0			162.3
Turn Bay Length (m)						
Base Capacity (vph)	547	637	903	784	670	1082
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	0.83	0.44	0.10	0.01	0.01	0.21

Intersection Summary

Cycle Length: 114.5
Actuated Cycle Length: 106.1
Natural Cycle: 70
Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.90
Intersection Signal Delay: 29.9 — Intersection LOS: C
Intersection Capacity Utilization 55.7% — ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 13: Leikin



Appendix D

Bill Leathem Drive at Leikin Drive Signalization Warrants

CGH TRANSPORTATION

Bill Leathem Dr @ Leikin Dr
Existing

Justification #7

Justification	Description	Minimum Requirement 1 Lane Highway		Minimum Requirement 2 or More Lanes		Compliance Sectional		Compliance Entire %	Signal
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%		
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	477	66%	66%	No
	B. Vehicle volume, along minor streets (average hour)	120	170	120	170	115	68%		
2. Delay to Cross Traffic	A. Vehicle volumes, major street (average hour)	480	720	600	900	362	50%	50%	No
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75	65	87%		

Notes
1. Refer to OTM Book 12, pg 92, Mar 2012
2. Lowest section percentage governs justification
3. Average hourly volumes estimated from peak hour volumes, AHV = PM/2 or (AM + PM) / 4, including amplifcation factors
4. T-intersection factor corrected, applies only to 1B

Bill Leathem Dr @ Leikin Dr
FB2026

Justification #7

Justification	Description	Minimum Requirement 1 Lane Highway		Minimum Requirement 2 or More Lanes		Compliance Sectional		Compliance Entire %	Signal
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%		
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	489	68%	68%	No
	B. Vehicle volume, along minor streets (average hour)	120	170	120	170	127	75%		
2. Delay to Cross Traffic	A. Vehicle volumes, major street (average hour)	480	720	600	900	362	50%	50%	No
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75	65	87%		

Notes
1. Refer to OTM Book 12, pg 92, Mar 2012
2. Lowest section percentage governs justification
3. Average hourly volumes estimated from peak hour volumes, AHV = PM/2 or (AM + PM) / 4, including amplifcation factors
4. T-intersection factor corrected, applies only to 1B

Bill Leathem Dr @ Leikin Dr
FB2031

Justification #7

Justification	Description	Minimum Requirement 1 Lane Highway		Minimum Requirement 2 or More Lanes		Compliance Sectional		Compliance Entire %	Signal
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%		
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	489	68%	68%	No
	B. Vehicle volume, along minor streets (average hour)	120	170	120	170	127	75%		
2. Delay to Cross Traffic	A. Vehicle volumes, major street (average hour)	480	720	600	900	362	50%	50%	No
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75	65	87%		

Notes
1. Refer to OTM Book 12, pg 92, Mar 2012
2. Lowest section percentage governs justification
3. Average hourly volumes estimated from peak hour volumes, AHV = PM/2 or (AM + PM) / 4, including amplifcation factors
4. T-intersection factor corrected, applies only to 1B

Bill Leathem Dr @ Leikin Dr
FT2026

Justification #7

Justification	Description	Minimum Requirement 1 Lane Highway		Minimum Requirement 2 or More Lanes		Compliance Sectional		Compliance Entire %	Signal
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%		
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	511	71%	71%	No
	B. Vehicle volume, along minor streets (average hour)	120	170	120	170	135	80%		
2. Delay to Cross Traffic	A. Vehicle volumes, major street (average hour)	480	720	600	900	375	52%	52%	No
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75	67	90%		

Notes
1. Refer to OTM Book 12, pg 92, Mar 2012
2. Lowest section percentage governs justification
3. Average hourly volumes estimated from peak hour volumes, AHV = PM/2 or (AM + PM) / 4, including amplifcation factors
4. T-intersection factor corrected, applies only to 1B

Bill Leathem Dr @ Leikin Dr
FT2031

Justification #7

Justification	Description	Minimum Requirement 1 Lane Highway		Minimum Requirement 2 or More Lanes		Compliance Sectional		Compliance Entire %	Signal
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%		
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	511	71%	71%	No
	B. Vehicle volume, along minor streets (average hour)	120	170	120	170	135	80%		
2. Delay to Cross Traffic	A. Vehicle volumes, major street (average hour)	480	720	600	900	375	52%	52%	No
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75	67	90%		

Notes
1. Refer to OTM Book 12, pg 92, Mar 2012
2. Lowest section percentage governs justification
3. Average hourly volumes estimated from peak hour volumes, AHV = PM/2 or (AM + PM) / 4, including amplifcation factors
4. T-intersection factor corrected, applies only to 1B

OTM Book 5 - Regulatory Signs (Page 26)

All-Way Stop Minimum Volume Warrant (Collector Roads and Rural Arterial Roads)

All-way stop control may be considered on collector roads, or rural arterial roads where the following conditions are met:

A • The total vehicle volume on all intersection approaches exceeds 375 vehicles per hour for each of the highest eight hours of the day; and,

B • The combined vehicle and pedestrian volume on the minor street exceeds 150 units per hour (all vehicles plus pedestrians wishing to enter the intersection) for each of the same eight hours as the total volume; OR the combined vehicle and pedestrian volume on the minor street exceeds 120 units per our (all vehicles plus pedestrians wishing to enter the intersection) for each of the same eight hours as the total volume, with an average delay to all minor street traffic (vehicles and pedestrians) of greater than 30 seconds for the entire eight hour period; and,

C • The volume split does not exceed 70/30 (that is the minor street must not be less than 30% of the total volume entering the intersection) as measured over the entire eight-hour count period. Volume on the major street is defined as vehicles only. Volume on the minor street includes all vehicles plus any pedestrians wishing to cross the major roadway. For three-legged intersections a volume split of 75/25 is permissible.

AWSC Warrants - Bill Leathem Drive at Leikin Drive
Existing

Timeframe	Total Vehicles	Criteria A (>375)	Minor Vehicles	Pedestrians	Minor Vehs + Peds	Criteria B (>150)	Minor Proportion	Criteria C (>=30%)	Warranted?
7:00-8:00	957		211	4	215		22%		
8:00-9:00	863		236	5	241		27%		
9:00-10:00	424		121	1	122	**Yes** if	29%		
11:30-12:30	498	**Yes**	194	48	242	delay > 30s	39%	**No**	**No**
12:30-13:30	392		142	41	183	for each	36%		
15:00-16:00	745		317	4	321	hour	43%		
16:00-17:00	875		206	11	217		24%		
17:00-18:00	690		225	3	228		33%		

AWSC Warrants - Bill Leathem Drive at Leikin Drive
FB 2026 & 2031

Timeframe	Total Vehicles	Criteria A (>375)	Minor Vehicles	Pedestrians	Minor Vehs + Peds	Criteria B (>150)	Minor Proportion	Criteria C (>=30%)	Warranted?
7:00-8:00	977		231	4	235		24%		
8:00-9:00	885		258	5	263		29%		
9:00-10:00	435		132	1	133	**Yes** if	30%		
11:30-12:30	616	**Yes**	263	48	311	delay > 30s	43%	**No**	**No**
12:30-13:30	482		192	41	233	for each	40%		
15:00-16:00	926		429	4	433	hour	46%		
16:00-17:00	1056		279	11	290		26%		
17:00-18:00	845		305	3	308		36%		

AWSC Warrants - Bill Leathem Drive at Leikin Drive
FT 2026 & 2031

Timeframe	Total Vehicles	Criteria A (>375)	Minor Vehicles	Pedestrians	Minor Vehs + Peds	Criteria B (>150)	Minor Proportion	Criteria C (>=30%)	Warranted?
7:00-8:00	1022		242	4	246		24%		
8:00-9:00	926		271	5	276		29%		
9:00-10:00	456		139	1	140	**Yes** if	30%		
11:30-12:30	645	**Yes**	276	48	324	delay > 30s	43%	**No**	**No**
12:30-13:30	505		202	41	243	for each	40%		
15:00-16:00	970		451	4	455	hour	46%		
16:00-17:00	1105		293	11	304		27%		
17:00-18:00	884		320	3	323		36%		

Appendix E

Collision Data

CGH TRANSPORTATION

Accident Date	Accident Year	Accident Time	Location	Environment Condition	Light	Traffic Control	Traffic Control Condition	Classification Of Accident	Initial Impact Type	Road Surface Condition	# Vehicles	# Motorcycles	# Bicycles	# Pedestrians
2017-08-17	2017	13:32	BECKSTEAD RD @ MERIVALE RD (0001556)	01 - Clear	01 - Daylight	02 - Stop sign	00 - Unknown	02 - Non-fatal injury	03 - Rear end	02 - Wet	1	0	0	0
2016-02-14	2016	11:12	BILL LEATHEM DR @ LEIKIN DR S (0005135)	05 - Drifting Snow	01 - Daylight	02 - Stop sign	01 - Functioning	03 - P.D. only	07 - SMV other	06 - Ice	2	0	0	0
2016-03-28	2016	15:59	BILL LEATHEM DR @ LEIKIN DR S (0005135)	01 - Clear	01 - Daylight	02 - Stop sign	01 - Functioning	03 - P.D. only	03 - Rear end	02 - Wet	2	0	0	0
2017-09-29	2017	22:50	BILL LEATHEM DR @ LEIKIN DR S (0005135)	02 - Rain	07 - Dark	02 - Stop sign	01 - Functioning	03 - P.D. only	02 - Angle	02 - Wet	1	0	0	0
2018-12-06	2018	14:10	BILL LEATHEM DR @ LEIKIN DR S (0005135)	01 - Clear	01 - Daylight	02 - Stop sign	01 - Functioning	02 - Non-fatal injury	02 - Angle	01 - Dry	2	0	0	0
2019-09-23	2019	7:42	BILL LEATHEM DR @ LEIKIN DR S (0005135)	02 - Rain	01 - Daylight	02 - Stop sign	01 - Functioning	03 - P.D. only	99 - Other	02 - Wet	2	0	0	0
2019-10-31	2019	7:25	BILL LEATHEM DR @ LEIKIN DR S (0005135)	02 - Rain	03 - Dawn	02 - Stop sign	01 - Functioning	03 - P.D. only	02 - Angle	02 - Wet	2	0	0	0
2016-08-12	2016	9:23	BILL LEATHEM DR btwn Continuation of BILL LEATHEM DR & LEIKIN DR (__3ZA10X)	02 - Rain	01 - Daylight	10 - No control	0	03 - P.D. only	07 - SMV other	02 - Wet	2	0	0	0
2019-02-25	2019	11:18	BILL LEATHEM DR btwn Continuation of BILL LEATHEM DR & PARAGON AVE (__3ZA10Z)	05 - Drifting Snow	01 - Daylight	10 - No control	0	03 - P.D. only	07 - SMV other	06 - Ice	2	0	0	0
2016-01-03	2016	9:29	BILL LEATHEM DR btwn PARAGON AVE & Continuation of BILL LEATHEM DR (__3ZA10Y)	03 - Snow	01 - Daylight	10 - No control	0	03 - P.D. only	01 - Approaching	03 - Loose snow	2	0	0	0
2017-11-02	2017	9:04	LEIKIN DR @ MERIVALE RD (0005133)	02 - Rain	01 - Daylight	01 - Traffic signal	01 - Functioning	02 - Non-fatal injury	07 - SMV other	02 - Wet	2	0	0	0
2017-10-31	2017	14:34	LEIKIN DR @ MERIVALE RD (0005133)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	02 - Non-fatal injury	02 - Angle	01 - Dry	1	0	0	0
2018-12-19	2018	14:55	LEIKIN DR @ RCMP ACCESS/150 N OF BILL LEATHEM DR (0013517)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	02 - Angle	01 - Dry	2	0	0	0
2020-01-15	2020	7:57	LEIKIN DR @ RCMP ACCESS/150 N OF BILL LEATHEM DR (0013517)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	05 - Turning movement	01 - Dry	2	0	0	0
2016-08-19	2016	8:45	LEIKIN DR btwn BECKSTEAD RD & BILL LEATHEM DR (__3ZA105)	01 - Clear	01 - Daylight	10 - No control	0	02 - Non-fatal injury	05 - Turning movement	01 - Dry	1	0	0	0
2017-01-05	2017	13:50	LEIKIN DR btwn BECKSTEAD RD & BILL LEATHEM DR (__3ZA105)	04 - Freezing Rain	01 - Daylight	10 - No control	0	03 - P.D. only	03 - Rear end	06 - Ice	2	0	0	0
2020-06-02	2020	13:41	LEIKIN DR btwn BECKSTEAD RD & BILL LEATHEM DR (__3ZA105)	02 - Rain	01 - Daylight	10 - No control	0	03 - P.D. only	99 - Other	02 - Wet	1	0	0	0
2017-12-13	2017	16:35	LEIKIN DR btwn HOLITZNER WAY & CRESTWAY DR (__3ZA40I)	03 - Snow	05 - Dusk	10 - No control	0	03 - P.D. only	07 - SMV other	03 - Loose snow	1	0	0	0
2018-01-14	2018	0:43	LEIKIN DR btwn HOLITZNER WAY & CRESTWAY DR (__3ZA40I)	01 - Clear	07 - Dark	10 - No control	0	03 - P.D. only	07 - SMV other	06 - Ice	2	0	0	0

Appendix F

Facility Information and Assumptions

CGH TRANSPORTATION

The general study area AM peak hour is 7:00-8:00, and PM peak hour is 4:00PM to 5:00PM

Information Provided by Future Facility Owner

Employees

Site operates 24 hours per day

Three shifts of employees

Most employees are onsite 4:00PM – 8:00AM, with a changeover at 12:00AM

600 employees total

Truck Trips

Truck Type	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
5-Tonne Trucks	8	7	15	16	16	32
Line Haul Trucks	4	3	7	6	2	8

Assumptions Based on the Above Information

Employees

The three shifts are assumed to be 12:00AM-8:00AM, 8:00AM-4:00PM, and 4:00PM-12:00AM with an employee distribution of 40%, 20%, and 40% split for these shifts, respectively

In the AM peak hour, 90% of employees arriving for their shifts and 30% of employees departing from their shifts are assumed to be captured

*Sample: 600 employees * 20% on 12:00AM shift = 120 trips * 80% auto mode * 90% arriving = 86 inbound autos*

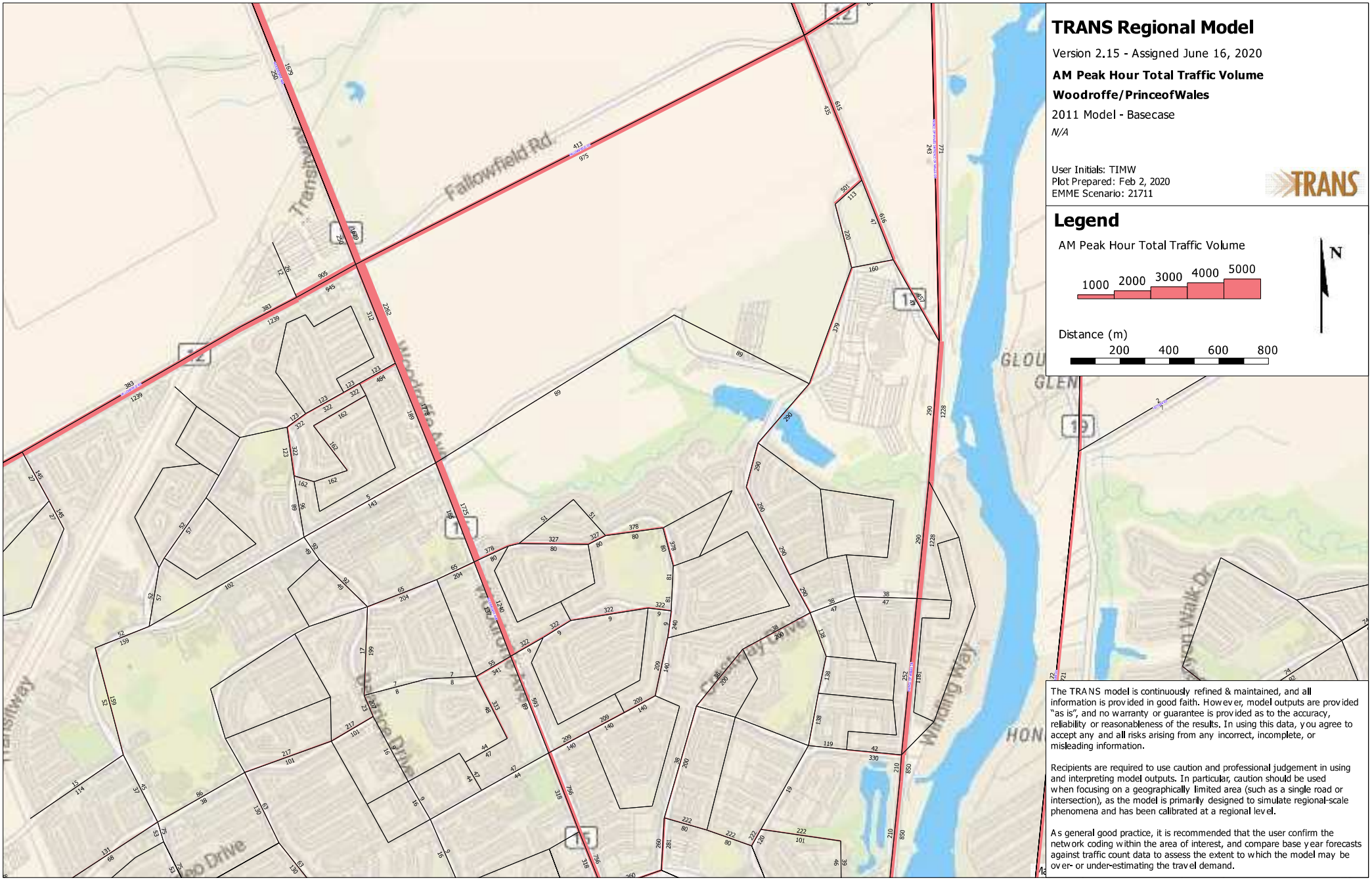
*600 employees * 40% on 8:00AM shift = 240 trips * 80% auto mode * 30% departing = 58 outbound autos*

In the PM peak hour, 10% of employees arriving for their shifts and 100% of employees departing from their shifts are assumed to be captured

Appendix G

Background Development Volumes

CGH TRANSPORTATION



TRANS Regional Model

Version 2.15 - Assigned June 16, 2020

AM Peak Hour Total Traffic Volume

Woodroffe/PrinceofWales

2011 Model - Basecase

N/A

User Initials: TIMW
Plot Prepared: Feb 2, 2020
EMME Scenario: 21711

TRANS

Legend

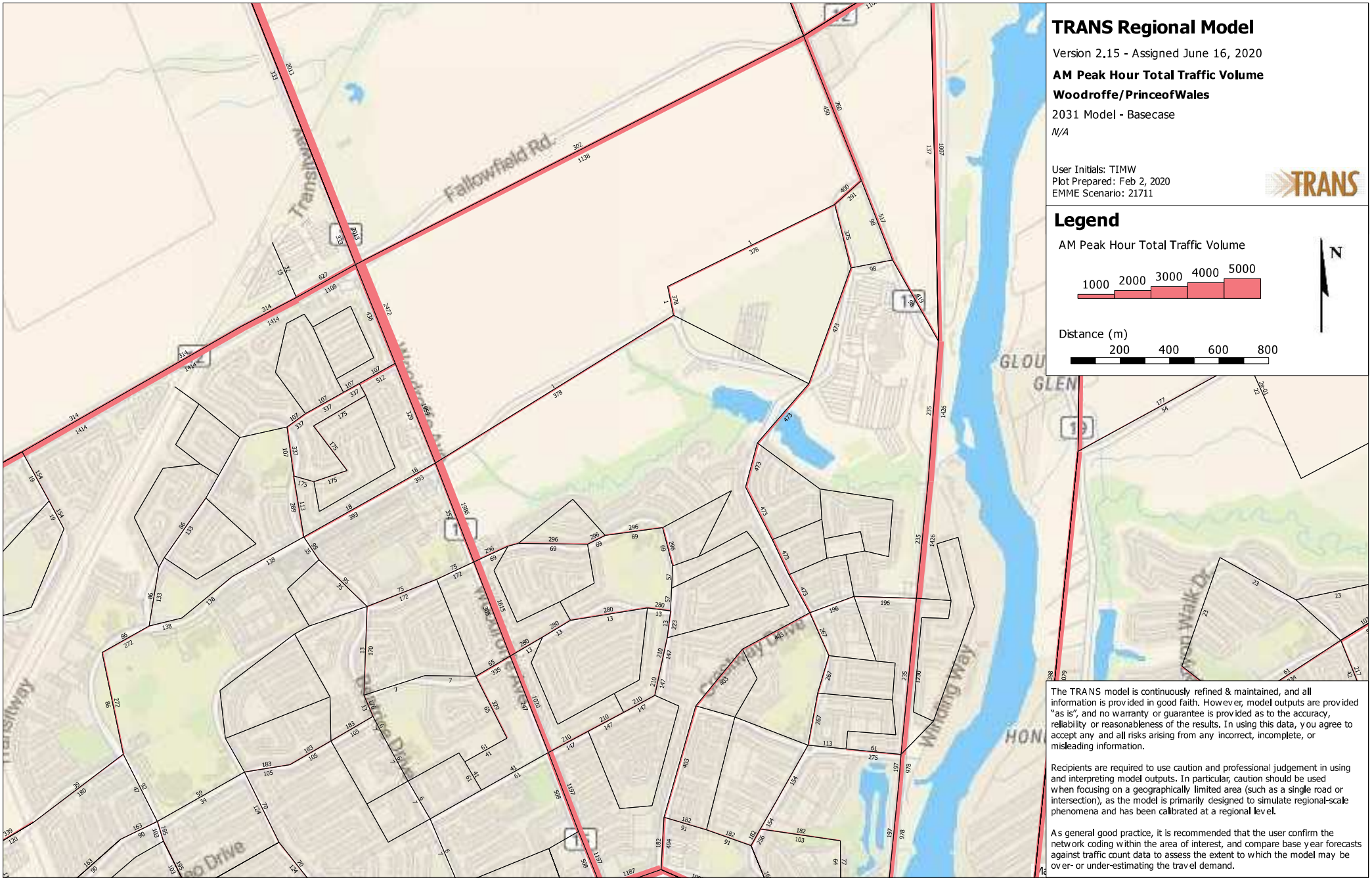
AM Peak Hour Total Traffic Volume

1000 2000 3000 4000 5000

Distance (m)

200 400 600 800

N



TRANS Regional Model

Version 2.15 - Assigned June 16, 2020

AM Peak Hour Total Traffic Volume

Woodroffe/PrinceofWales

2031 Model - Basecase

N/A

User Initials: TIMW
Plot Prepared: Feb 2, 2020
EMME Scenario: 21711

TRANS

Legend

AM Peak Hour Total Traffic Volume

1000 2000 3000 4000 5000

N

Distance (m)

200 400 600 800

Appendix H

Growth Data

CGH TRANSPORTATION

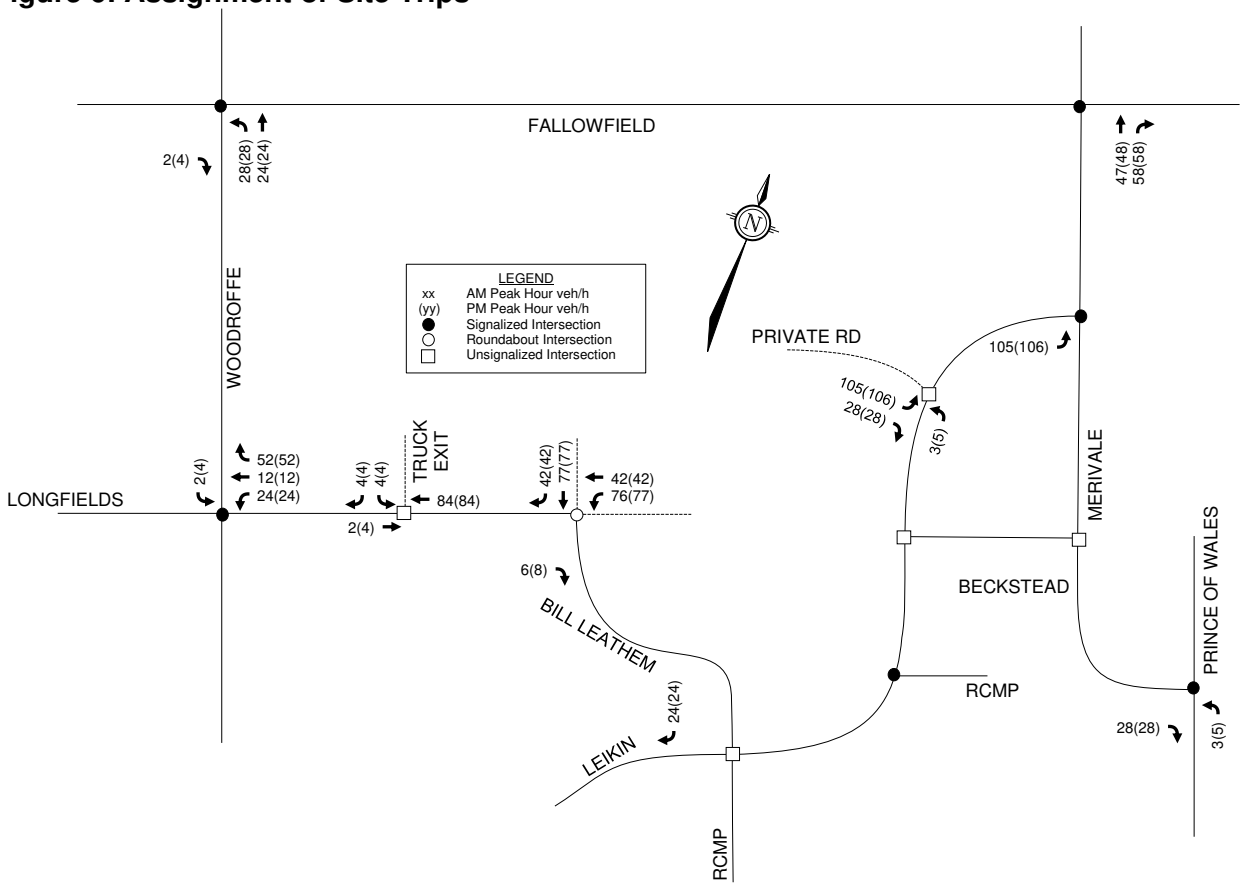
The distribution of heavy vehicle trips generated by the development has been estimated (see below).

- 50% to/from the south along Merivale Road and Prince of Wales Drive; and,
- 50% to/from the west along Fallowfield Road.

It is assumed that the site trips will use the private road connecting Paragon Avenue and Leikin Drive to travel east-west. Traffic to / from the south via Merivale Road and Prince of Wales Drive has been assigned to the Beckstead Road connection.

Site generated traffic volumes have been assigned to the study area intersections and are shown in **Figure 6**.

Figure 6: Assignment of Site Trips



5.2 Background Traffic

5.2.1 Future Background Growth

A rate of background growth has been established through a review of the City of Ottawa's 2013 TMP and Strategic Long-Range Model (comparing snapshots of 2011 and 2031 AM peak volumes). The snapshots (See **Appendix D**) suggest a growth rate of -0.8% to 1.5% per year in the peak direction on arterial roadways within the study area. For the 'Barrhaven' area of Ottawa,

Appendix I

Synchro and Sidra Intersection Worksheets – 2026 Future Background Conditions

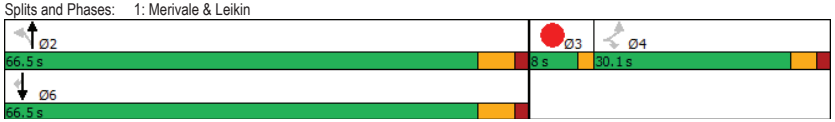
Lane Group	EBL	EBR	NBT	SBT	SBR	Ø3
Lane Configurations						
Traffic Volume (vph)	409	4	354	65	227	
Future Volume (vph)	409	4	354	65	227	
Lane Group Flow (vph)	409	4	354	65	227	
Turn Type	Perm	Perm	NA	NA	Perm	
Protected Phases			2	6		3
Permitted Phases	4	4			6	
Detector Phase	4	4	2	6	6	
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	6.0
Minimum Split (s)	22.1	22.1	16.5	34.5	34.5	8.0
Total Split (s)	30.1	30.1	66.5	66.5	66.5	8.0
Total Split (%)	28.8%	28.8%	63.6%	63.6%	63.6%	8%
Maximum Green (s)	25.0	25.0	60.0	60.0	60.0	6.0
Yellow Time (s)	3.3	3.3	4.6	4.6	4.6	2.0
All-Red Time (s)	1.8	1.8	1.9	1.9	1.9	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.1	5.1	6.5	6.5	6.5	
Lead/Lag	Lag	Lag				Lead
Lead-Lag Optimize?	Yes	Yes				Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Max	Max	Max	None
Walk Time (s)	7.0	7.0		7.0	7.0	3.0
Flash Dont Walk (s)	10.0	10.0		21.0	21.0	0.0
Pedestrian Calls (#/hr)	0	0		0	0	4
Act Effct Green (s)	25.0	25.0	60.1	60.1	60.1	
Actuated g/C Ratio	0.25	0.25	0.61	0.61	0.61	
v/c Ratio	0.97	0.01	0.33	0.07	0.23	
Control Delay	74.5	18.8	10.8	8.7	1.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	74.5	18.8	10.8	8.7	1.9	
LOS	E	B	B	A	A	
Approach Delay	74.0		10.8	3.4		
Approach LOS	E		B	A		
Queue Length 50th (m)	75.2	0.0	28.8	4.4	0.0	
Queue Length 95th (m)	#147.0	2.7	54.5	11.6	9.5	
Internal Link Dist (m)	391.2		325.6	181.8		
Turn Bay Length (m)		240.0			115.0	
Base Capacity (vph)	422	380	1057	870	986	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.97	0.01	0.33	0.07	0.23	

Intersection Summary

Cycle Length: 104.6
Actuated Cycle Length: 98.2
Natural Cycle: 65
Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.97
Intersection Signal Delay: 33.4 — Intersection LOS: C
Intersection Capacity Utilization 53.3% — ICU Level of Service A
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Merivale & Leikin



Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	42	102	439	169	1
Future Vol, veh/h	6	42	102	439	169	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	8	40	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	4	7	100
Mvmt Flow	6	42	102	439	169	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	813	170	170	0	-	0
Stage 1	170	-	-	-	-	-
Stage 2	643	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	348	874	1407	-	-	-
Stage 1	860	-	-	-	-	-
Stage 2	523	-	-	-	-	-
Platoon blocked, %					-	-
Mov Cap-1 Maneuver	323	874	1407	-	-	-
Mov Cap-2 Maneuver	323	-	-	-	-	-
Stage 1	798	-	-	-	-	-
Stage 2	523	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.2	1.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1407	-	323	874	-	-
HCM Lane V/C Ratio	0.072	-	0.019	0.048	-	-
HCM Control Delay (s)	7.8	-	16.4	9.3	-	-
HCM Lane LOS	A	-	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	0.1	0.2	-	-

Intersection	
Int Delay, s/veh	26.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	151	558	4	7	20	37	1	2	4	213	3	56
Future Vol, veh/h	151	558	4	7	20	37	1	2	4	213	3	56
Conflicting Peds, #/hr	0	0	5	5	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	30	-	-	-	-	-	-	-	-	-	-	-
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, %	3	2	2	29	35	2	2	2	25	2	33	2
Mvmt Flow	151	558	4	7	20	37	1	2	4	213	3	56

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	57	0	0	567	0	0	949	938	565	918	922	39
Stage 1	-	-	-	-	-	-	867	867	-	53	53	-
Stage 2	-	-	-	-	-	-	82	71	-	865	869	-
Critical Hdwy	4.13	-	-	4.39	-	-	7.12	6.52	6.45	7.12	6.83	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.83	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.83	-
Follow-up Hdwy	2.227	-	-	2.461	-	-	3.518	4.018	3.525	3.518	4.297	3.318
Pot Cap-1 Maneuver	1541	-	-	884	-	-	240	264	483	252	240	1033
Stage 1	-	-	-	-	-	-	348	370	-	960	793	-
Stage 2	-	-	-	-	-	-	926	836	-	348	330	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1541	-	-	881	-	-	206	235	481	228	214	1033
Mov Cap-2 Maneuver	-	-	-	-	-	-	206	235	-	228	214	-
Stage 1	-	-	-	-	-	-	313	332	-	866	787	-
Stage 2	-	-	-	-	-	-	866	829	-	309	296	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.6	1	16.4	96.6
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	323	1541	-	-	881	-	-	271
HCM Lane V/C Ratio	0.022	0.098	-	-	0.008	-	-	1.004
HCM Control Delay (s)	16.4	7.6	-	-	9.1	-	-	96.6
HCM Lane LOS	C	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	0.1	0.3	-	-	0	-	-	10.2

Lane Group	EBL	EBR	NBL	NBT	SBT	Ø3
Lane Configurations						
Traffic Volume (vph)	10	114	452	946	259	
Future Volume (vph)	10	114	452	946	259	
Lane Group Flow (vph)	10	114	452	946	297	
Turn Type	Perm	pm+ov	pm+pt	NA	NA	
Protected Phases		5	5	2	6	3
Permitted Phases	4	4	2			
Detector Phase	4	5	5	2	6	
Switch Phase						
Minimum Initial (s)	10.0	5.0	5.0	10.0	10.0	1.0
Minimum Split (s)	22.8	11.4	11.4	16.5	32.5	5.0
Total Split (s)	23.0	22.0	22.0	72.0	50.0	5.0
Total Split (%)	23.0%	22.0%	22.0%	72.0%	50.0%	5%
Maximum Green (s)	16.2	15.6	15.6	65.5	43.5	3.0
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	2.0
All-Red Time (s)	2.2	1.8	1.8	1.9	1.9	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.8	6.4	6.4	6.5	6.5	
Lead/Lag	Lag	Lead	Lead		Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Max	C-Max	None
Walk Time (s)	2.0				7.0	3.0
Flash Dont Walk (s)	14.0				19.0	0.0
Pedestrian Calls (#/hr)	0				0	0
Act Effct Green (s)	10.0	12.4	90.2	95.3	74.7	
Actuated g/C Ratio	0.10	0.12	0.90	0.95	0.75	
v/c Ratio	0.06	0.45	0.51	0.57	0.13	
Control Delay	41.8	11.2	3.5	3.5	5.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	41.8	11.2	3.5	3.5	5.4	
LOS	D	B	A	A	A	
Approach Delay	13.6			3.5	5.4	
Approach LOS	B			A	A	
Queue Length 50th (m)	1.8	0.0	0.6	0.0	4.2	
Queue Length 95th (m)	6.7	10.7	34.0	115.8	22.4	
Internal Link Dist (m)	355.3			333.0	741.3	
Turn Bay Length (m)	135.0		120.0			
Base Capacity (vph)	268	342	936	1664	2329	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.04	0.33	0.48	0.57	0.13	

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 15 (15%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 90

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.57
Intersection Signal Delay: 4.5 — Intersection LOS: A
Intersection Capacity Utilization 72.0% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 5: Prince of Wales & Merivale

Intersection	
Int Delay, s/veh	2.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	100	4	308	20	29	227
Future Vol, veh/h	100	4	308	20	29	227
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	8	-	-	30	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	4	2	2	4
Mvmt Flow	100	4	308	20	29	227

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	603	318	0	0	328	0
Stage 1	318	-	-	-	-	-
Stage 2	285	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	462	723	-	-	1232	-
Stage 1	738	-	-	-	-	-
Stage 2	763	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	451	723	-	-	1232	-
Mov Cap-2 Maneuver	451	-	-	-	-	-
Stage 1	738	-	-	-	-	-
Stage 2	745	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15	0	0.9
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	451	723	1232	-
HCM Lane V/C Ratio	-	-	0.222	0.006	0.024	-
HCM Control Delay (s)	-	-	15.2	10	8	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	0.8	0	0.1	-

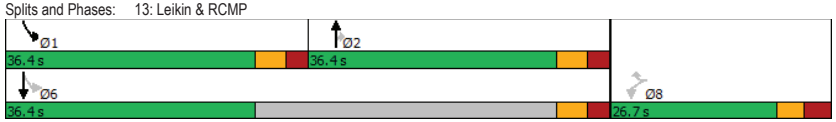
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	16	17	304	548	253	51
Future Volume (vph)	16	17	304	548	253	51
Lane Group Flow (vph)	16	17	304	548	253	51
Turn Type	Perm	Perm	NA	Perm	pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	8	8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0
Minimum Split (s)	24.7	24.7	31.4	31.4	11.4	16.4
Total Split (s)	26.7	26.7	36.4	36.4	36.4	36.4
Total Split (%)	26.8%	26.8%	36.6%	36.6%	36.6%	36.6%
Maximum Green (s)	20.0	20.0	30.0	30.0	30.0	30.0
Yellow Time (s)	3.3	3.3	3.7	3.7	3.7	3.7
All-Red Time (s)	3.4	3.4	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.7	6.7	6.4	6.4	6.4	6.4
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Max	Max	None	Max
Walk Time (s)	7.0	7.0	18.0	18.0		
Flash Dont Walk (s)	11.0	11.0	7.0	7.0		
Pedestrian Calls (#/hr)	19	19	5	5		
Act Effct Green (s)	11.7	11.7	31.4	31.4	47.3	50.7
Actuated g/C Ratio	0.18	0.18	0.49	0.49	0.74	0.79
v/c Ratio	0.05	0.07	0.36	0.56	0.35	0.04
Control Delay	26.5	13.4	15.8	4.3	6.0	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.5	13.4	15.8	4.3	6.0	4.8
LOS	C	B	B	A	A	A
Approach Delay	19.8		8.4			5.8
Approach LOS	B		A			A
Queue Length 50th (m)	1.8	0.0	25.8	0.0	10.8	1.9
Queue Length 95th (m)	6.8	4.9	58.5	20.4	26.4	6.7
Internal Link Dist (m)	73.5		75.1			162.3
Turn Bay Length (m)				130.0	150.0	
Base Capacity (vph)	543	445	842	984	1016	1415
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	0.03	0.04	0.36	0.56	0.25	0.04

Intersection Summary
Cycle Length: 99.5
Actuated Cycle Length: 63.9
Natural Cycle: 70
Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.56

Intersection Signal Delay: 8.1	Intersection LOS: A
Intersection Capacity Utilization 63.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 13: Leikin & RCMP



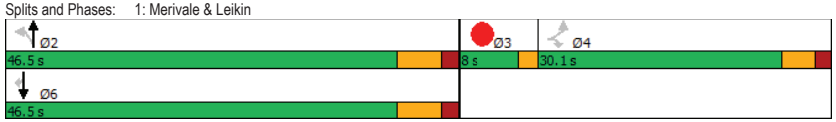
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø3
Lane Configurations							
Traffic Volume (vph)	327	2	1	178	437	212	
Future Volume (vph)	327	2	1	178	437	212	
Lane Group Flow (vph)	327	2	1	178	437	212	
Turn Type	Perm	Perm	Perm	NA	NA	Perm	
Protected Phases				2	6		3
Permitted Phases	4	4	2			6	
Detector Phase	4	4	2	2	6	6	
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	6.0
Minimum Split (s)	22.1	22.1	16.5	16.5	34.5	34.5	8.0
Total Split (s)	30.1	30.1	46.5	46.5	46.5	46.5	8.0
Total Split (%)	35.6%	35.6%	55.0%	55.0%	55.0%	55.0%	9%
Maximum Green (s)	25.0	25.0	40.0	40.0	40.0	40.0	6.0
Yellow Time (s)	3.3	3.3	4.6	4.6	4.6	4.6	2.0
All-Red Time (s)	1.8	1.8	1.9	1.9	1.9	1.9	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.1	5.1	6.5	6.5	6.5	6.5	
Lead/Lag	Lag	Lag					Lead
Lead-Lag Optimize?	Yes	Yes					Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Max	Max	Max	Max	None
Walk Time (s)	7.0	7.0			7.0	7.0	3.0
Flash Dont Walk (s)	10.0	10.0			21.0	21.0	0.0
Pedestrian Calls (#/hr)	0	0			0	0	8
Act Effct Green (s)	18.7	18.7	40.4	40.4	40.4	40.4	
Actuated g/C Ratio	0.26	0.26	0.56	0.56	0.56	0.56	
v/c Ratio	0.78	0.01	0.00	0.19	0.45	0.23	
Control Delay	38.6	15.0	10.0	10.3	12.8	2.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	38.6	15.0	10.0	10.3	12.8	2.5	
LOS	D	B	A	B	B	A	
Approach Delay	38.4			10.3	9.4		
Approach LOS	D			B	A		
Queue Length 50th (m)	39.4	0.0	0.1	10.4	30.4	0.0	
Queue Length 95th (m)	74.6	1.5	0.9	28.6	73.6	10.6	
Internal Link Dist (m)	391.2			325.6	181.8		
Turn Bay Length (m)		240.0	120.0			115.0	
Base Capacity (vph)	568	265	445	922	976	923	
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	0.58	0.01	0.00	0.19	0.45	0.23	

Intersection Summary
Cycle Length: 84.6
Actuated Cycle Length: 72.1
Natural Cycle: 65
Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 17.8	Intersection LOS: B
Intersection Capacity Utilization 53.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Merivale & Leikin



Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	140	48	251	459	0
Future Vol, veh/h	7	140	48	251	459	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	8	40	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	5	2	2
Mvmt Flow	7	140	48	251	459	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	806	459	459	0	-	0
Stage 1	459	-	-	-	-	-
Stage 2	347	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	351	602	1102	-	-	-
Stage 1	636	-	-	-	-	-
Stage 2	716	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	336	602	1102	-	-	-
Mov Cap-2 Maneuver	336	-	-	-	-	-
Stage 1	608	-	-	-	-	-
Stage 2	716	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.9	1.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1102	-	336	602	-	-
HCM Lane V/C Ratio	0.044	-	0.021	0.233	-	-
HCM Control Delay (s)	8.4	-	15.9	12.8	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	0.9	-	-

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	65	57	0	0	364	183	0	1	0	43	0	186
Future Vol, veh/h	65	57	0	0	364	183	0	1	0	43	0	186
Conflicting Peds, #/hr	1	0	10	10	0	1	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	30	-	-	-	-	-	-	-	-	-	-	-
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	14	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	65	57	0	0	364	183	0	1	0	43	0	186

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	548	0	0	67	0	0	747	745	67	645	654	458
Stage 1	-	-	-	-	-	-	197	197	-	457	457	-
Stage 2	-	-	-	-	-	-	550	548	-	188	197	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1021	-	-	1535	-	-	329	342	997	385	386	603
Stage 1	-	-	-	-	-	-	805	738	-	583	568	-
Stage 2	-	-	-	-	-	-	519	517	-	814	738	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1020	-	-	1523	-	-	215	317	989	365	358	602
Mov Cap-2 Maneuver	-	-	-	-	-	-	215	317	-	365	358	-
Stage 1	-	-	-	-	-	-	748	686	-	546	567	-
Stage 2	-	-	-	-	-	-	358	516	-	761	686	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	4.7	0	16.4	16.6
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	317	1020	-	-	1523	-	-	537
HCM Lane V/C Ratio	0.003	0.064	-	-	-	-	-	0.426
HCM Control Delay (s)	16.4	8.8	-	-	0	-	-	16.6
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0	0.2	-	-	0	-	-	2.1

Lane Group	EBL	EBR	NBL	NBT	SBT	Ø3
Lane Configurations						
Traffic Volume (vph)	30	533	175	334	933	
Future Volume (vph)	30	533	175	334	933	
Lane Group Flow (vph)	30	533	175	334	949	
Turn Type	Perm	pm+ov	pm+pt	NA	NA	
Protected Phases		5	5	2	6	3
Permitted Phases	4	4	2			
Detector Phase	4	5	5	2	6	
Switch Phase						
Minimum Initial (s)	10.0	5.0	5.0	10.0	10.0	1.0
Minimum Split (s)	22.8	11.4	11.4	16.5	32.5	5.0
Total Split (s)	26.0	14.0	14.0	89.0	75.0	5.0
Total Split (%)	21.7%	11.7%	11.7%	74.2%	62.5%	4%
Maximum Green (s)	19.2	7.6	7.6	82.5	68.5	3.0
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	2.0
All-Red Time (s)	2.2	1.8	1.8	1.9	1.9	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.8	6.4	6.4	6.5	6.5	
Lead/Lag	Lag	Lead	Lead		Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Max	C-Max	None
Walk Time (s)	2.0				7.0	3.0
Flash Dont Walk (s)	14.0				19.0	0.0
Pedestrian Calls (#/hr)	0				0	0
Act Effct Green (s)	10.1	34.8	103.5	106.0	68.5	
Actuated g/C Ratio	0.08	0.29	0.86	0.88	0.57	
v/c Ratio	0.22	0.97	0.30	0.22	0.50	
Control Delay	55.5	61.9	3.3	2.4	16.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	55.5	61.9	3.3	2.4	16.6	
LOS	E	E	A	A	B	
Approach Delay	61.6			2.7	16.6	
Approach LOS	E			A	B	
Queue Length 50th (m)	6.7	~93.4	7.2	15.1	67.2	
Queue Length 95th (m)	16.2	#172.4	11.8	22.5	83.6	
Internal Link Dist (m)	354.7			333.0	741.3	
Turn Bay Length (m)	135.0		120.0			
Base Capacity (vph)	262	547	592	1541	1886	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.11	0.97	0.30	0.22	0.50	

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 112 (93%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 80

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.97
Intersection Signal Delay: 25.7 Intersection LOS: C
Intersection Capacity Utilization 73.3% ICU Level of Service D
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Prince of Wales & Merivale

Intersection	
Int Delay, s/veh	1.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	43	6	223	119	29	213
Future Vol, veh/h	43	6	223	119	29	213
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	8	-	-	30	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	3	2	2	3
Mvmt Flow	43	6	223	119	29	213

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	554	283	0	0	342	0
Stage 1	283	-	-	-	-	-
Stage 2	271	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	493	756	-	-	1217	-
Stage 1	765	-	-	-	-	-
Stage 2	775	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	481	756	-	-	1217	-
Mov Cap-2 Maneuver	481	-	-	-	-	-
Stage 1	765	-	-	-	-	-
Stage 2	756	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.8	0	1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	481	756	1217	-
HCM Lane V/C Ratio	-	-	0.089	0.008	0.024	-
HCM Control Delay (s)	-	-	13.2	9.8	8	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0	0.1	-

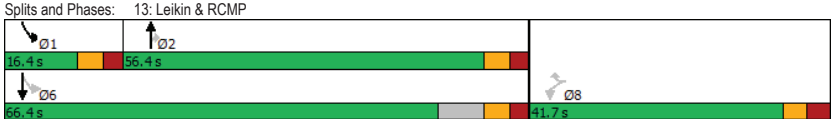
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	409	252	85	5	6	209
Future Volume (vph)	409	252	85	5	6	209
Lane Group Flow (vph)	409	252	85	5	6	209
Turn Type	Perm	Perm	NA	Perm	pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	8	8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0
Minimum Split (s)	24.7	24.7	31.4	31.4	11.4	16.4
Total Split (s)	41.7	41.7	56.4	56.4	16.4	66.4
Total Split (%)	36.4%	36.4%	49.3%	49.3%	14.3%	58.0%
Maximum Green (s)	35.0	35.0	50.0	50.0	10.0	60.0
Yellow Time (s)	3.3	3.3	3.7	3.7	3.7	3.7
All-Red Time (s)	3.4	3.4	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.7	6.7	6.4	6.4	6.4	6.4
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Max	Max	None	Max
Walk Time (s)	7.0	7.0	18.0	18.0		
Flash Dont Walk (s)	11.0	11.0	7.0	7.0		
Pedestrian Calls (#/hr)	19	19	8	8		
Act Effct Green (s)	29.5	29.5	58.4	58.4	60.7	60.7
Actuated g/C Ratio	0.29	0.29	0.56	0.56	0.59	0.59
v/c Ratio	0.86	0.44	0.09	0.01	0.01	0.21
Control Delay	53.9	6.2	13.3	9.0	10.5	11.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.9	6.2	13.3	9.0	10.5	11.6
LOS	D	A	B	A	B	B
Approach Delay	35.7		13.0			11.5
Approach LOS	D		B			B
Queue Length 50th (m)	76.9	0.0	7.3	0.0	0.5	19.3
Queue Length 95th (m)	#124.8	17.5	19.6	2.1	2.4	33.7
Internal Link Dist (m)	73.5		75.0			162.3
Turn Bay Length (m)						
Base Capacity (vph)	563	629	930	807	693	1113
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	0.73	0.40	0.09	0.01	0.01	0.19

Intersection Summary

Cycle Length: 114.5
Actuated Cycle Length: 103.4
Natural Cycle: 70
Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.86
Intersection Signal Delay: 28.2 — Intersection LOS: C
Intersection Capacity Utilization 55.7% — ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 13: Leikin & RCMP



MOVEMENT SUMMARY

Site: 101 [Longfields-Bill Leathem BG 2026 & 2031 AM Peak (Site Folder: General)]

50 Leikin Dr
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bill Leathem														
1	L2	168	5.0	168	5.0	0.102	7.4	LOS A	0.5	3.9	0.03	0.59	0.03	51.1
2	T1	1	2.0	1	2.0	0.102	7.2	LOS A	0.5	3.9	0.03	0.59	0.03	39.9
3	R2	1	2.0	1	2.0	0.102	4.6	LOS A	0.5	3.9	0.03	0.59	0.03	36.1
Approach		170	5.0	170	5.0	0.102	7.4	LOS A	0.5	3.9	0.03	0.59	0.03	50.9
East: Site Access E														
4	L2	76	2.0	76	2.0	0.096	0.8	LOS A	0.5	3.3	0.32	0.17	0.32	37.7
5	T1	42	2.0	42	2.0	0.096	0.8	LOS A	0.5	3.3	0.32	0.17	0.32	41.4
6	R2	1	2.0	1	2.0	0.096	0.8	LOS A	0.5	3.3	0.32	0.17	0.32	19.2
Approach		119	2.0	119	2.0	0.096	0.8	LOS A	0.5	3.3	0.32	0.17	0.32	38.9
North: Site Access N														
7	L2	1	2.0	1	2.0	0.106	1.3	LOS A	0.5	3.9	0.43	0.28	0.43	18.9
8	T1	77	2.0	77	2.0	0.106	1.3	LOS A	0.5	3.9	0.43	0.28	0.43	42.2
9	R2	42	2.0	42	2.0	0.106	1.3	LOS A	0.5	3.9	0.43	0.28	0.43	48.4
Approach		120	2.0	120	2.0	0.106	1.3	LOS A	0.5	3.9	0.43	0.28	0.43	44.1
West: Longfields														
10	L2	1	2.0	1	2.0	0.215	13.3	LOS B	1.2	9.0	0.35	0.53	0.35	51.7
11	T1	1	2.0	1	2.0	0.215	10.2	LOS B	1.2	9.0	0.35	0.53	0.35	43.8
12	R2	268	6.0	268	6.0	0.215	5.4	LOS A	1.2	9.0	0.35	0.53	0.35	53.6
Approach		270	6.0	270	6.0	0.215	5.4	LOS A	1.2	9.0	0.35	0.53	0.35	53.5
All Vehicles		679	4.3	679	4.3	0.215	4.4	LOS A	1.2	9.0	0.28	0.44	0.28	49.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: 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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Longfields-Bill Leathem BG 2026 & 2031 PM Peak (Site Folder: General)]

50 Leikin Dr
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bill Leathem														
1	L2	278	3.0	278	3.0	0.164	7.4	LOS A	0.9	6.5	0.03	0.59	0.03	51.5
2	T1	1	2.0	1	2.0	0.164	7.2	LOS A	0.9	6.5	0.03	0.59	0.03	39.9
3	R2	1	2.0	1	2.0	0.164	4.6	LOS A	0.9	6.5	0.03	0.59	0.03	36.1
Approach		280	3.0	280	3.0	0.164	7.4	LOS A	0.9	6.5	0.03	0.59	0.03	51.4
East: Site Access E														
4	L2	77	2.0	77	2.0	0.104	1.3	LOS A	0.5	3.7	0.41	0.26	0.41	37.5
5	T1	42	2.0	42	2.0	0.104	1.3	LOS A	0.5	3.7	0.41	0.26	0.41	41.1
6	R2	1	2.0	1	2.0	0.104	1.3	LOS A	0.5	3.7	0.41	0.26	0.41	19.0
Approach		120	2.0	120	2.0	0.104	1.3	LOS A	0.5	3.7	0.41	0.26	0.41	38.6
North: Site Access N														
7	L2	1	2.0	1	2.0	0.114	1.9	LOS A	0.6	4.3	0.50	0.36	0.50	18.7
8	T1	77	2.0	77	2.0	0.114	1.9	LOS A	0.6	4.3	0.50	0.36	0.50	41.9
9	R2	42	2.0	42	2.0	0.114	1.9	LOS A	0.6	4.3	0.50	0.36	0.50	48.1
Approach		120	2.0	120	2.0	0.114	1.9	LOS A	0.6	4.3	0.50	0.36	0.50	43.8
West: Longfields														
10	L2	1	2.0	1	2.0	0.129	13.3	LOS B	0.7	5.2	0.34	0.53	0.34	51.7
11	T1	1	2.0	1	2.0	0.129	10.2	LOS B	0.7	5.2	0.34	0.53	0.34	43.8
12	R2	153	10.0	153	10.0	0.129	5.4	LOS A	0.7	5.2	0.34	0.53	0.34	53.6
Approach		155	9.9	155	9.9	0.129	5.5	LOS A	0.7	5.2	0.34	0.53	0.34	53.5
All Vehicles		675	4.2	675	4.2	0.164	4.9	LOS A	0.9	6.5	0.25	0.48	0.25	48.8

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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Appendix J

Synchro and Sidra Intersection Worksheets – 2031 Future Background Conditions

Lane Group	EBL	EBR	NBT	SBT	SBR	Ø3
Lane Configurations						
Traffic Volume (vph)	409	4	354	68	227	
Future Volume (vph)	409	4	354	68	227	
Lane Group Flow (vph)	409	4	354	68	227	
Turn Type	Perm	Perm	NA	NA	Perm	
Protected Phases			2	6		3
Permitted Phases	4	4			6	
Detector Phase	4	4	2	6	6	
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	6.0
Minimum Split (s)	22.1	22.1	16.5	34.5	34.5	8.0
Total Split (s)	30.1	30.1	66.5	66.5	66.5	8.0
Total Split (%)	28.8%	28.8%	63.6%	63.6%	63.6%	8%
Maximum Green (s)	25.0	25.0	60.0	60.0	60.0	6.0
Yellow Time (s)	3.3	3.3	4.6	4.6	4.6	2.0
All-Red Time (s)	1.8	1.8	1.9	1.9	1.9	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.1	5.1	6.5	6.5	6.5	
Lead/Lag	Lag	Lag				Lead
Lead-Lag Optimize?	Yes	Yes				Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Max	Max	Max	None
Walk Time (s)	7.0	7.0		7.0	7.0	3.0
Flash Dont Walk (s)	10.0	10.0		21.0	21.0	0.0
Pedestrian Calls (#/hr)	0	0		0	0	4
Act Effct Green (s)	25.0	25.0	60.1	60.1	60.1	
Actuated g/C Ratio	0.25	0.25	0.61	0.61	0.61	
v/c Ratio	0.97	0.01	0.33	0.08	0.23	
Control Delay	74.5	18.8	10.8	8.7	1.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	74.5	18.8	10.8	8.7	1.9	
LOS	E	B	B	A	A	
Approach Delay	74.0		10.8	3.5		
Approach LOS	E		B	A		
Queue Length 50th (m)	75.2	0.0	28.8	4.6	0.0	
Queue Length 95th (m)	#147.0	2.7	54.5	11.9	9.5	
Internal Link Dist (m)	391.2		325.6	181.8		
Turn Bay Length (m)		240.0			115.0	
Base Capacity (vph)	422	380	1057	870	986	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.97	0.01	0.33	0.08	0.23	

Intersection Summary

Cycle Length: 104.6
Actuated Cycle Length: 98.2
Natural Cycle: 65
Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.97

Intersection Signal Delay: 33.3	Intersection LOS: C
Intersection Capacity Utilization 53.3%	ICU Level of Service A
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Merivale & Leikin

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	42	102	439	178	1
Future Vol, veh/h	6	42	102	439	178	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	8	40	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	4	7	100
Mvmt Flow	6	42	102	439	178	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	822	179	179	0	-	0
Stage 1	179	-	-	-	-	-
Stage 2	643	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	344	864	1397	-	-	-
Stage 1	852	-	-	-	-	-
Stage 2	523	-	-	-	-	-
Platoon blocked, %					-	-
Mov Cap-1 Maneuver	319	864	1397	-	-	-
Mov Cap-2 Maneuver	319	-	-	-	-	-
Stage 1	790	-	-	-	-	-
Stage 2	523	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.3	1.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1397	-	319	864	-	-
HCM Lane V/C Ratio	0.073	-	0.019	0.049	-	-
HCM Control Delay (s)	7.8	-	16.5	9.4	-	-
HCM Lane LOS	A	-	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	0.1	0.2	-	-

Intersection	
Int Delay, s/veh	26.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	151	558	4	7	20	37	1	2	4	213	3	56
Future Vol, veh/h	151	558	4	7	20	37	1	2	4	213	3	56
Conflicting Peds, #/hr	0	0	5	5	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	30	-	-	-	-	-	-	-	-	-	-	-
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, %	3	2	2	29	35	2	2	2	25	2	33	2
Mvmt Flow	151	558	4	7	20	37	1	2	4	213	3	56

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	57	0	0	567	0	0	949	938	565	918	922	39
Stage 1	-	-	-	-	-	-	867	867	-	53	53	-
Stage 2	-	-	-	-	-	-	82	71	-	865	869	-
Critical Hdwy	4.13	-	-	4.39	-	-	7.12	6.52	6.45	7.12	6.83	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.83	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.83	-
Follow-up Hdwy	2.227	-	-	2.461	-	-	3.518	4.018	3.525	3.518	4.297	3.318
Pot Cap-1 Maneuver	1541	-	-	884	-	-	240	264	483	252	240	1033
Stage 1	-	-	-	-	-	-	348	370	-	960	793	-
Stage 2	-	-	-	-	-	-	926	836	-	348	330	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1541	-	-	881	-	-	206	235	481	228	214	1033
Mov Cap-2 Maneuver	-	-	-	-	-	-	206	235	-	228	214	-
Stage 1	-	-	-	-	-	-	313	332	-	866	787	-
Stage 2	-	-	-	-	-	-	866	829	-	309	296	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.6	1	16.4	96.6
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	323	1541	-	-	881	-	-	271
HCM Lane V/C Ratio	0.022	0.098	-	-	0.008	-	-	1.004
HCM Control Delay (s)	16.4	7.6	-	-	9.1	-	-	96.6
HCM Lane LOS	C	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	0.1	0.3	-	-	0	-	-	10.2

Lane Group	EBL	EBR	NBL	NBT	SBT	Ø3
Lane Configurations						
Traffic Volume (vph)	10	118	452	994	259	
Future Volume (vph)	10	118	452	994	259	
Lane Group Flow (vph)	10	118	452	994	297	
Turn Type	Perm	pm+ov	pm+pt	NA	NA	
Protected Phases		5	5	2	6	3
Permitted Phases	4	4	2			
Detector Phase	4	5	5	2	6	
Switch Phase						
Minimum Initial (s)	10.0	5.0	5.0	10.0	10.0	1.0
Minimum Split (s)	22.8	11.4	11.4	16.5	32.5	5.0
Total Split (s)	23.0	22.0	22.0	72.0	50.0	5.0
Total Split (%)	23.0%	22.0%	22.0%	72.0%	50.0%	5%
Maximum Green (s)	16.2	15.6	15.6	65.5	43.5	3.0
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	2.0
All-Red Time (s)	2.2	1.8	1.8	1.9	1.9	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.8	6.4	6.4	6.5	6.5	
Lead/Lag	Lag	Lead	Lead		Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Max	C-Max	None
Walk Time (s)	2.0				7.0	3.0
Flash Dont Walk (s)	14.0				19.0	0.0
Pedestrian Calls (#/hr)	0				0	0
Act Effct Green (s)	10.0	12.4	90.2	95.3	74.7	
Actuated g/C Ratio	0.10	0.12	0.90	0.95	0.75	
v/c Ratio	0.06	0.46	0.51	0.60	0.13	
Control Delay	41.8	11.2	3.5	3.9	5.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	41.8	11.2	3.5	3.9	5.4	
LOS	D	B	A	A	A	
Approach Delay	13.6			3.8	5.4	
Approach LOS	B			A	A	
Queue Length 50th (m)	1.8	0.0	0.6	0.0	4.2	
Queue Length 95th (m)	6.7	10.9	34.0	131.6	22.4	
Internal Link Dist (m)	355.3			333.0	741.3	
Turn Bay Length (m)	135.0		120.0			
Base Capacity (vph)	268	345	936	1664	2329	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.04	0.34	0.48	0.60	0.13	

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 15 (15%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 90

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.60
Intersection Signal Delay: 4.7 — Intersection LOS: A
Intersection Capacity Utilization 74.6% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 5: Prince of Wales & Merivale

Intersection	
Int Delay, s/veh	2.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	100	4	308	20	29	227
Future Vol, veh/h	100	4	308	20	29	227
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	8	-	-	30	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	4	2	2	4
Mvmt Flow	100	4	308	20	29	227

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	603	318	0	0	328	0
Stage 1	318	-	-	-	-	-
Stage 2	285	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	462	723	-	-	1232	-
Stage 1	738	-	-	-	-	-
Stage 2	763	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	451	723	-	-	1232	-
Mov Cap-2 Maneuver	451	-	-	-	-	-
Stage 1	738	-	-	-	-	-
Stage 2	745	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15	0	0.9
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	451	723	1232	-
HCM Lane V/C Ratio	-	-	0.222	0.006	0.024	-
HCM Control Delay (s)	-	-	15.2	10	8	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	0.8	0	0.1	-

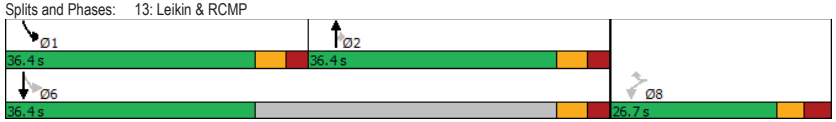
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	16	17	304	548	253	51
Future Volume (vph)	16	17	304	548	253	51
Lane Group Flow (vph)	16	17	304	548	253	51
Turn Type	Perm	Perm	NA	Perm	pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	8	8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0
Minimum Split (s)	24.7	24.7	31.4	31.4	11.4	16.4
Total Split (s)	26.7	26.7	36.4	36.4	36.4	36.4
Total Split (%)	26.8%	26.8%	36.6%	36.6%	36.6%	36.6%
Maximum Green (s)	20.0	20.0	30.0	30.0	30.0	30.0
Yellow Time (s)	3.3	3.3	3.7	3.7	3.7	3.7
All-Red Time (s)	3.4	3.4	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.7	6.7	6.4	6.4	6.4	6.4
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Max	Max	None	Max
Walk Time (s)	7.0	7.0	18.0	18.0		
Flash Dont Walk (s)	11.0	11.0	7.0	7.0		
Pedestrian Calls (#/hr)	19	19	5	5		
Act Effct Green (s)	11.7	11.7	31.4	31.4	47.3	50.7
Actuated g/C Ratio	0.18	0.18	0.49	0.49	0.74	0.79
v/c Ratio	0.05	0.07	0.36	0.56	0.35	0.04
Control Delay	26.5	13.4	15.8	4.3	6.0	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.5	13.4	15.8	4.3	6.0	4.8
LOS	C	B	B	A	A	A
Approach Delay	19.8		8.4			5.8
Approach LOS	B		A			A
Queue Length 50th (m)	1.8	0.0	25.8	0.0	10.8	1.9
Queue Length 95th (m)	6.8	4.9	58.5	20.4	26.4	6.7
Internal Link Dist (m)	73.5		75.1			162.3
Turn Bay Length (m)				130.0	150.0	
Base Capacity (vph)	543	445	842	984	1016	1415
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	0.03	0.04	0.36	0.56	0.25	0.04

Intersection Summary
Cycle Length: 99.5
Actuated Cycle Length: 63.9
Natural Cycle: 70
Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.56

Intersection Signal Delay: 8.1	Intersection LOS: A
Intersection Capacity Utilization 63.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 13: Leikin & RCMP



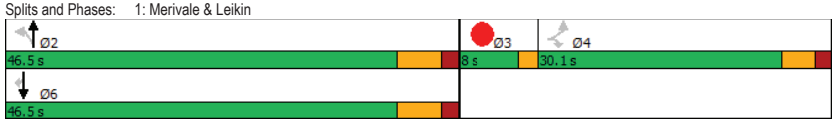
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø3
Lane Configurations							
Traffic Volume (vph)	327	2	1	187	437	212	
Future Volume (vph)	327	2	1	187	437	212	
Lane Group Flow (vph)	327	2	1	187	437	212	
Turn Type	Perm	Perm	Perm	NA	NA	Perm	
Protected Phases				2	6		3
Permitted Phases	4	4	2			6	
Detector Phase	4	4	2	2	6	6	
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	6.0
Minimum Split (s)	22.1	22.1	16.5	16.5	34.5	34.5	8.0
Total Split (s)	30.1	30.1	46.5	46.5	46.5	46.5	8.0
Total Split (%)	35.6%	35.6%	55.0%	55.0%	55.0%	55.0%	9%
Maximum Green (s)	25.0	25.0	40.0	40.0	40.0	40.0	6.0
Yellow Time (s)	3.3	3.3	4.6	4.6	4.6	4.6	2.0
All-Red Time (s)	1.8	1.8	1.9	1.9	1.9	1.9	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.1	5.1	6.5	6.5	6.5	6.5	
Lead/Lag	Lag	Lag					Lead
Lead-Lag Optimize?	Yes	Yes					Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Max	Max	Max	Max	None
Walk Time (s)	7.0	7.0			7.0	7.0	3.0
Flash Dont Walk (s)	10.0	10.0			21.0	21.0	0.0
Pedestrian Calls (#/hr)	0	0			0	0	8
Act Effct Green (s)	18.7	18.7	40.4	40.4	40.4	40.4	
Actuated g/C Ratio	0.26	0.26	0.56	0.56	0.56	0.56	
v/c Ratio	0.78	0.01	0.00	0.20	0.45	0.23	
Control Delay	38.6	15.0	10.0	10.3	12.8	2.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	38.6	15.0	10.0	10.3	12.8	2.5	
LOS	D	B	A	B	B	A	
Approach Delay	38.4			10.3	9.4		
Approach LOS	D			B	A		
Queue Length 50th (m)	39.4	0.0	0.1	11.0	30.4	0.0	
Queue Length 95th (m)	74.6	1.5	0.9	30.0	73.6	10.6	
Internal Link Dist (m)	391.2			325.6	181.8		
Turn Bay Length (m)		240.0	120.0			115.0	
Base Capacity (vph)	568	265	445	922	976	923	
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	0.58	0.01	0.00	0.20	0.45	0.23	

Intersection Summary
Cycle Length: 84.6
Actuated Cycle Length: 72.1
Natural Cycle: 65
Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 17.8	Intersection LOS: B
Intersection Capacity Utilization 53.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Merivale & Leikin



Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	140	48	264	459	0
Future Vol, veh/h	7	140	48	264	459	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	8	40	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	5	2	2
Mvmt Flow	7	140	48	264	459	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	819	459	459	0	-	0
Stage 1	459	-	-	-	-	-
Stage 2	360	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	345	602	1102	-	-	-
Stage 1	636	-	-	-	-	-
Stage 2	706	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	330	602	1102	-	-	-
Mov Cap-2 Maneuver	330	-	-	-	-	-
Stage 1	608	-	-	-	-	-
Stage 2	706	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13	1.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1102	-	330	602	-	-
HCM Lane V/C Ratio	0.044	-	0.021	0.233	-	-
HCM Control Delay (s)	8.4	-	16.1	12.8	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	0.9	-	-

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	65	57	0	0	364	183	0	1	0	43	0	186
Future Vol, veh/h	65	57	0	0	364	183	0	1	0	43	0	186
Conflicting Peds, #/hr	1	0	10	10	0	1	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	30	-	-	-	-	-	-	-	-	-	-	-
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	14	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	65	57	0	0	364	183	0	1	0	43	0	186

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	548	0	0	67	0	0	747	745	67	645	654	458
Stage 1	-	-	-	-	-	-	197	197	-	457	457	-
Stage 2	-	-	-	-	-	-	550	548	-	188	197	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1021	-	-	1535	-	-	329	342	997	385	386	603
Stage 1	-	-	-	-	-	-	805	738	-	583	568	-
Stage 2	-	-	-	-	-	-	519	517	-	814	738	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1020	-	-	1523	-	-	215	317	989	365	358	602
Mov Cap-2 Maneuver	-	-	-	-	-	-	215	317	-	365	358	-
Stage 1	-	-	-	-	-	-	748	686	-	546	567	-
Stage 2	-	-	-	-	-	-	358	516	-	761	686	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	4.7	0	16.4	16.6
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	317	1020	-	-	1523	-	-	537
HCM Lane V/C Ratio	0.003	0.064	-	-	-	-	-	0.426
HCM Control Delay (s)	16.4	8.8	-	-	0	-	-	16.6
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0	0.2	-	-	0	-	-	2.1

Lane Group	EBL	EBR	NBL	NBT	SBT	Ø3
Lane Configurations						
Traffic Volume (vph)	30	533	184	334	981	
Future Volume (vph)	30	533	184	334	981	
Lane Group Flow (vph)	30	533	184	334	997	
Turn Type	Perm	pm+ov	pm+pt	NA	NA	
Protected Phases		5	5	2	6	3
Permitted Phases	4	4	2			
Detector Phase	4	5	5	2	6	
Switch Phase						
Minimum Initial (s)	10.0	5.0	5.0	10.0	10.0	1.0
Minimum Split (s)	22.8	11.4	11.4	16.5	32.5	5.0
Total Split (s)	26.0	14.0	14.0	89.0	75.0	5.0
Total Split (%)	21.7%	11.7%	11.7%	74.2%	62.5%	4%
Maximum Green (s)	19.2	7.6	7.6	82.5	68.5	3.0
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	2.0
All-Red Time (s)	2.2	1.8	1.8	1.9	1.9	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.8	6.4	6.4	6.5	6.5	
Lead/Lag	Lag	Lead	Lead		Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Max	C-Max	None
Walk Time (s)	2.0				7.0	3.0
Flash Dont Walk (s)	14.0				19.0	0.0
Pedestrian Calls (#/hr)	0				0	0
Act Effct Green (s)	10.1	34.8	103.5	106.0	68.5	
Actuated g/C Ratio	0.08	0.29	0.86	0.88	0.57	
v/c Ratio	0.22	0.99	0.32	0.22	0.53	
Control Delay	55.5	67.7	3.5	2.4	17.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	55.5	67.7	3.5	2.4	17.1	
LOS	E	E	A	A	B	
Approach Delay	67.0			2.8	17.1	
Approach LOS	E			A	B	
Queue Length 50th (m)	6.7	~101.2	7.6	15.1	72.0	
Queue Length 95th (m)	16.2	#177.4	12.3	22.5	89.3	
Internal Link Dist (m)	354.7			333.0	741.3	
Turn Bay Length (m)	135.0		120.0			
Base Capacity (vph)	262	537	576	1541	1889	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.11	0.99	0.32	0.22	0.53	

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 112 (93%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 90

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 27.0 Intersection LOS: C
Intersection Capacity Utilization 74.7% ICU Level of Service D
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Prince of Wales & Merivale

Intersection	
Int Delay, s/veh	1.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	43	6	223	119	29	213
Future Vol, veh/h	43	6	223	119	29	213
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	8	-	-	30	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	3	2	2	3
Mvmt Flow	43	6	223	119	29	213

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	554	283	0	0	342	0
Stage 1	283	-	-	-	-	-
Stage 2	271	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	493	756	-	-	1217	-
Stage 1	765	-	-	-	-	-
Stage 2	775	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	481	756	-	-	1217	-
Mov Cap-2 Maneuver	481	-	-	-	-	-
Stage 1	765	-	-	-	-	-
Stage 2	756	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.8	0	1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	481	756	1217	-
HCM Lane V/C Ratio	-	-	0.089	0.008	0.024	-
HCM Control Delay (s)	-	-	13.2	9.8	8	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0	0.1	-

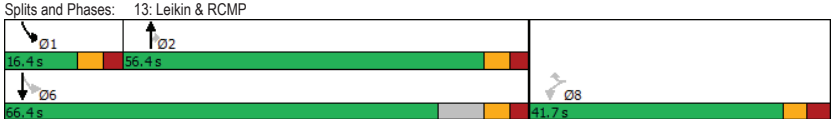
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	409	252	85	5	6	209
Future Volume (vph)	409	252	85	5	6	209
Lane Group Flow (vph)	409	252	85	5	6	209
Turn Type	Perm	Perm	NA	Perm	pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	8	8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0
Minimum Split (s)	24.7	24.7	31.4	31.4	11.4	16.4
Total Split (s)	41.7	41.7	56.4	56.4	16.4	66.4
Total Split (%)	36.4%	36.4%	49.3%	49.3%	14.3%	58.0%
Maximum Green (s)	35.0	35.0	50.0	50.0	10.0	60.0
Yellow Time (s)	3.3	3.3	3.7	3.7	3.7	3.7
All-Red Time (s)	3.4	3.4	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.7	6.7	6.4	6.4	6.4	6.4
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Max	Max	None	Max
Walk Time (s)	7.0	7.0	18.0	18.0		
Flash Dont Walk (s)	11.0	11.0	7.0	7.0		
Pedestrian Calls (#/hr)	19	19	8	8		
Act Effct Green (s)	29.5	29.5	58.4	58.4	60.7	60.7
Actuated g/C Ratio	0.29	0.29	0.56	0.56	0.59	0.59
v/c Ratio	0.86	0.44	0.09	0.01	0.01	0.21
Control Delay	53.9	6.2	13.3	9.0	10.5	11.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.9	6.2	13.3	9.0	10.5	11.6
LOS	D	A	B	A	B	B
Approach Delay	35.7		13.0			11.5
Approach LOS	D		B			B
Queue Length 50th (m)	76.9	0.0	7.3	0.0	0.5	19.3
Queue Length 95th (m)	#124.8	17.5	19.6	2.1	2.4	33.7
Internal Link Dist (m)	73.5		75.0			162.3
Turn Bay Length (m)						
Base Capacity (vph)	563	629	930	807	693	1113
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	0.73	0.40	0.09	0.01	0.01	0.19

Intersection Summary

Cycle Length: 114.5
Actuated Cycle Length: 103.4
Natural Cycle: 70
Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.86
Intersection Signal Delay: 28.2 — Intersection LOS: C
Intersection Capacity Utilization 55.7% — ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 13: Leikin & RCMP



MOVEMENT SUMMARY

Site: 101 [Longfields-Bill Leathem BG 2026 & 2031 AM Peak (Site Folder: General)]

50 Leikin Dr
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bill Leathem														
1	L2	168	5.0	168	5.0	0.102	7.4	LOS A	0.5	3.9	0.03	0.59	0.03	51.1
2	T1	1	2.0	1	2.0	0.102	7.2	LOS A	0.5	3.9	0.03	0.59	0.03	39.9
3	R2	1	2.0	1	2.0	0.102	4.6	LOS A	0.5	3.9	0.03	0.59	0.03	36.1
Approach		170	5.0	170	5.0	0.102	7.4	LOS A	0.5	3.9	0.03	0.59	0.03	50.9
East: Site Access E														
4	L2	76	2.0	76	2.0	0.096	0.8	LOS A	0.5	3.3	0.32	0.17	0.32	37.7
5	T1	42	2.0	42	2.0	0.096	0.8	LOS A	0.5	3.3	0.32	0.17	0.32	41.4
6	R2	1	2.0	1	2.0	0.096	0.8	LOS A	0.5	3.3	0.32	0.17	0.32	19.2
Approach		119	2.0	119	2.0	0.096	0.8	LOS A	0.5	3.3	0.32	0.17	0.32	38.9
North: Site Access N														
7	L2	1	2.0	1	2.0	0.106	1.3	LOS A	0.5	3.9	0.43	0.28	0.43	18.9
8	T1	77	2.0	77	2.0	0.106	1.3	LOS A	0.5	3.9	0.43	0.28	0.43	42.2
9	R2	42	2.0	42	2.0	0.106	1.3	LOS A	0.5	3.9	0.43	0.28	0.43	48.4
Approach		120	2.0	120	2.0	0.106	1.3	LOS A	0.5	3.9	0.43	0.28	0.43	44.1
West: Longfields														
10	L2	1	2.0	1	2.0	0.215	13.3	LOS B	1.2	9.0	0.35	0.53	0.35	51.7
11	T1	1	2.0	1	2.0	0.215	10.2	LOS B	1.2	9.0	0.35	0.53	0.35	43.8
12	R2	268	6.0	268	6.0	0.215	5.4	LOS A	1.2	9.0	0.35	0.53	0.35	53.6
Approach		270	6.0	270	6.0	0.215	5.4	LOS A	1.2	9.0	0.35	0.53	0.35	53.5
All Vehicles		679	4.3	679	4.3	0.215	4.4	LOS A	1.2	9.0	0.28	0.44	0.28	49.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: 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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Longfields-Bill Leathem BG 2026 & 2031 PM Peak (Site Folder: General)]

50 Leikin Dr
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bill Leathem														
1	L2	278	3.0	278	3.0	0.164	7.4	LOS A	0.9	6.5	0.03	0.59	0.03	51.5
2	T1	1	2.0	1	2.0	0.164	7.2	LOS A	0.9	6.5	0.03	0.59	0.03	39.9
3	R2	1	2.0	1	2.0	0.164	4.6	LOS A	0.9	6.5	0.03	0.59	0.03	36.1
Approach		280	3.0	280	3.0	0.164	7.4	LOS A	0.9	6.5	0.03	0.59	0.03	51.4
East: Site Access E														
4	L2	77	2.0	77	2.0	0.104	1.3	LOS A	0.5	3.7	0.41	0.26	0.41	37.5
5	T1	42	2.0	42	2.0	0.104	1.3	LOS A	0.5	3.7	0.41	0.26	0.41	41.1
6	R2	1	2.0	1	2.0	0.104	1.3	LOS A	0.5	3.7	0.41	0.26	0.41	19.0
Approach		120	2.0	120	2.0	0.104	1.3	LOS A	0.5	3.7	0.41	0.26	0.41	38.6
North: Site Access N														
7	L2	1	2.0	1	2.0	0.114	1.9	LOS A	0.6	4.3	0.50	0.36	0.50	18.7
8	T1	77	2.0	77	2.0	0.114	1.9	LOS A	0.6	4.3	0.50	0.36	0.50	41.9
9	R2	42	2.0	42	2.0	0.114	1.9	LOS A	0.6	4.3	0.50	0.36	0.50	48.1
Approach		120	2.0	120	2.0	0.114	1.9	LOS A	0.6	4.3	0.50	0.36	0.50	43.8
West: Longfields														
10	L2	1	2.0	1	2.0	0.129	13.3	LOS B	0.7	5.2	0.34	0.53	0.34	51.7
11	T1	1	2.0	1	2.0	0.129	10.2	LOS B	0.7	5.2	0.34	0.53	0.34	43.8
12	R2	153	10.0	153	10.0	0.129	5.4	LOS A	0.7	5.2	0.34	0.53	0.34	53.6
Approach		155	9.9	155	9.9	0.129	5.5	LOS A	0.7	5.2	0.34	0.53	0.34	53.5
All Vehicles		675	4.2	675	4.2	0.164	4.9	LOS A	0.9	6.5	0.25	0.48	0.25	48.8

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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Appendix K

Synchro and Sidra Intersection Worksheets – 2026 Future Total Conditions

CGH TRANSPORTATION

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø3
Lane Configurations							
Traffic Volume (vph)	428	7	4	354	65	254	
Future Volume (vph)	428	7	4	354	65	254	
Lane Group Flow (vph)	428	7	4	354	65	254	
Turn Type	Perm	Perm	Perm	NA	NA	Perm	
Protected Phases				2	6		3
Permitted Phases	4	4	2			6	
Detector Phase	4	4	2	2	6	6	
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	6.0
Minimum Split (s)	22.1	22.1	16.5	16.5	34.5	34.5	8.0
Total Split (s)	30.1	30.1	66.5	66.5	66.5	66.5	8.0
Total Split (%)	28.8%	28.8%	63.6%	63.6%	63.6%	63.6%	8%
Maximum Green (s)	25.0	25.0	60.0	60.0	60.0	60.0	6.0
Yellow Time (s)	3.3	3.3	4.6	4.6	4.6	4.6	2.0
All-Red Time (s)	1.8	1.8	1.9	1.9	1.9	1.9	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.1	5.1	6.5	6.5	6.5	6.5	
Lead/Lag	Lag	Lag					Lead
Lead-Lag Optimize?	Yes	Yes					Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Max	Max	Max	Max	None
Walk Time (s)	7.0	7.0			7.0	7.0	3.0
Flash Dont Walk (s)	10.0	10.0			21.0	21.0	0.0
Pedestrian Calls (#/hr)	0	0			0	0	4
Act Effct Green (s)	25.0	25.0	60.1	60.1	60.1	60.1	
Actuated g/C Ratio	0.25	0.25	0.61	0.61	0.61	0.61	
v/c Ratio	1.01	0.03	0.01	0.33	0.07	0.26	
Control Delay	85.2	17.1	8.8	10.8	8.7	1.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	85.2	17.1	8.8	10.8	8.7	1.9	
LOS	F	B	A	B	A	A	
Approach Delay	84.1			10.8	3.3		
Approach LOS	F			B	A		
Queue Length 50th (m)	79.9	0.0	0.3	28.8	4.4	0.0	
Queue Length 95th (m)	#155.9	3.7	1.8	54.5	11.6	10.0	
Internal Link Dist (m)	391.2			325.6	181.8		
Turn Bay Length (m)		240.0	120.0			115.0	
Base Capacity (vph)	422	274	389	1057	870	988	
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	1.01	0.03	0.01	0.33	0.07	0.26	

Intersection Summary

Cycle Length: 104.6
Actuated Cycle Length: 98.2
Natural Cycle: 70
Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.01
Intersection Signal Delay: 37.3 — Intersection LOS: D
Intersection Capacity Utilization 54.4% — ICU Level of Service A
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Merivale & Leikin

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	51	115	443	172	1
Future Vol, veh/h	6	51	115	443	172	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	8	40	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	5	9	100
Mvmt Flow	6	51	115	443	172	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	846	173	173	0	-	0
Stage 1	173	-	-	-	-	-
Stage 2	673	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	333	871	1404	-	-	-
Stage 1	857	-	-	-	-	-
Stage 2	507	-	-	-	-	-
Platoon blocked, %					-	-
Mov Cap-1 Maneuver	306	871	1404	-	-	-
Mov Cap-2 Maneuver	306	-	-	-	-	-
Stage 1	787	-	-	-	-	-
Stage 2	507	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.2	1.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1404	-	306	871	-	-
HCM Lane V/C Ratio	0.082	-	0.02	0.059	-	-
HCM Control Delay (s)	7.8	-	17	9.4	-	-
HCM Lane LOS	A	-	C	A	-	-
HCM 95th %tile Q(veh)	0.3	-	0.1	0.2	-	-

Intersection	
Int Delay, s/veh	32.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	160	575	4	7	29	39	1	2	4	213	3	65
Future Vol, veh/h	160	575	4	7	29	39	1	2	4	213	3	65
Conflicting Peds, #/hr	0	0	5	5	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	30	-	-	-	-	-	-	-	-	-	-	-
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, %	3	2	2	29	24	5	2	2	25	2	33	2
Mvmt Flow	160	575	4	7	29	39	1	2	4	213	3	65

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	68	0	0	584	0	0	999	984	582	963	967	49
Stage 1	-	-	-	-	-	-	902	902	-	63	63	-
Stage 2	-	-	-	-	-	-	97	82	-	900	904	-
Critical Hdwy	4.13	-	-	4.39	-	-	7.12	6.52	6.45	7.12	6.83	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.83	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.83	-
Follow-up Hdwy	2.227	-	-	2.461	-	-	3.518	4.018	3.525	3.518	4.297	3.318
Pot Cap-1 Maneuver	1527	-	-	870	-	-	222	248	472	235	226	1020
Stage 1	-	-	-	-	-	-	332	356	-	948	785	-
Stage 2	-	-	-	-	-	-	910	827	-	333	317	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1527	-	-	867	-	-	187	219	470	~ 212	200	1020
Mov Cap-2 Maneuver	-	-	-	-	-	-	187	219	-	~ 212	200	-
Stage 1	-	-	-	-	-	-	296	317	-	848	779	-
Stage 2	-	-	-	-	-	-	842	820	-	294	282	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.7	0.9	17.1	122.6
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	304	1527	-	-	867	-	-	259
HCM Lane V/C Ratio	0.023	0.105	-	-	0.008	-	-	1.085
HCM Control Delay (s)	17.1	7.6	-	-	9.2	-	-	122.6
HCM Lane LOS	C	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	0.1	0.3	-	-	0	-	-	11.7

Notes

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

Lane Group	EBL	EBR	NBL	NBT	SBT	Ø3
Lane Configurations						
Traffic Volume (vph)	10	126	469	946	259	
Future Volume (vph)	10	126	469	946	259	
Lane Group Flow (vph)	10	126	469	946	297	
Turn Type	Perm	pm+ov	pm+pt	NA	NA	
Protected Phases		5	5	2	6	3
Permitted Phases	4	4	2			
Detector Phase	4	5	5	2	6	
Switch Phase						
Minimum Initial (s)	10.0	5.0	5.0	10.0	10.0	1.0
Minimum Split (s)	22.8	11.4	11.4	16.5	32.5	5.0
Total Split (s)	23.0	22.0	22.0	72.0	50.0	5.0
Total Split (%)	23.0%	22.0%	22.0%	72.0%	50.0%	5%
Maximum Green (s)	16.2	15.6	15.6	65.5	43.5	3.0
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	2.0
All-Red Time (s)	2.2	1.8	1.8	1.9	1.9	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.8	6.4	6.4	6.5	6.5	
Lead/Lag	Lag	Lead	Lead		Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Max	C-Max	None
Walk Time (s)	2.0				7.0	3.0
Flash Dont Walk (s)	14.0				19.0	0.0
Pedestrian Calls (#/hr)	0				0	0
Act Effct Green (s)	10.0	12.5	90.2	95.3	74.6	
Actuated g/C Ratio	0.10	0.12	0.90	0.95	0.75	
v/c Ratio	0.06	0.46	0.53	0.57	0.13	
Control Delay	41.8	10.8	3.7	3.5	5.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	41.8	10.8	3.7	3.5	5.6	
LOS	D	B	A	A	A	
Approach Delay	13.1			3.6	5.6	
Approach LOS	B			A	A	
Queue Length 50th (m)	1.8	0.0	0.7	0.0	4.2	
Queue Length 95th (m)	6.7	11.1	35.8	115.8	22.8	
Internal Link Dist (m)	355.3			333.0	741.3	
Turn Bay Length (m)	135.0		120.0			
Base Capacity (vph)	268	362	937	1664	2324	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.04	0.35	0.50	0.57	0.13	

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 15 (15%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 90

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.57
Intersection Signal Delay: 4.6 — Intersection LOS: A
Intersection Capacity Utilization 72.0% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 5: Prince of Wales & Merivale

Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	9	17	175	9	26	272
Future Vol, veh/h	9	17	175	9	26	272
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	8	2	2	2
Mvmt Flow	9	17	175	9	26	272

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	504	180	0	0	184	0
Stage 1	180	-	-	-	-	-
Stage 2	324	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	528	863	-	-	1391	-
Stage 1	851	-	-	-	-	-
Stage 2	733	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	516	863	-	-	1391	-
Mov Cap-2 Maneuver	516	-	-	-	-	-
Stage 1	851	-	-	-	-	-
Stage 2	717	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.3	0	0.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	700	1391	-
HCM Lane V/C Ratio	-	-	0.037	0.019	-
HCM Control Delay (s)	-	-	10.3	7.6	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	17	775	66	34	23	9
Future Vol, veh/h	17	775	66	34	23	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	14	2	2	2
Mvmt Flow	17	775	66	34	23	9

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	100	0	-	0	505	83
Stage 1	-	-	-	-	83	-
Stage 2	-	-	-	-	422	-
Critical Hdwy	4.13	-	-	-	6.63	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	2.219	-	-	-	3.519	3.319
Pot Cap-1 Maneuver	1492	-	-	-	511	976
Stage 1	-	-	-	-	940	-
Stage 2	-	-	-	-	630	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1492	-	-	-	501	976
Mov Cap-2 Maneuver	-	-	-	-	501	-
Stage 1	-	-	-	-	921	-
Stage 2	-	-	-	-	630	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	11.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1492	-	-	-	580
HCM Lane V/C Ratio	0.011	-	-	-	0.055
HCM Control Delay (s)	7.4	0.1	-	-	11.6
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection	
Int Delay, s/veh	2.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	113	4	330	29	29	257
Future Vol, veh/h	113	4	330	29	29	257
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	8	-	-	30	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	6	2	2	6
Mvmt Flow	113	4	330	29	29	257

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	660	345	0	0	359	0
Stage 1	345	-	-	-	-	-
Stage 2	315	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	428	698	-	-	1200	-
Stage 1	717	-	-	-	-	-
Stage 2	740	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	418	698	-	-	1200	-
Mov Cap-2 Maneuver	418	-	-	-	-	-
Stage 1	717	-	-	-	-	-
Stage 2	722	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.6	0	0.8
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	418	698	1200	-
HCM Lane V/C Ratio	-	-	0.27	0.006	0.024	-
HCM Control Delay (s)	-	-	16.8	10.2	8.1	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	1.1	0	0.1	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	3	190	2	4	298
Future Vol, veh/h	0	3	190	2	4	298
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	100	6	100	100	2
Mvmt Flow	0	3	190	2	4	298

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	497	191	0	0	192	0
Stage 1	191	-	-	-	-	-
Stage 2	306	-	-	-	-	-
Critical Hdwy	6.42	7.2	-	-	5.1	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	4.2	-	-	3.1	-
Pot Cap-1 Maneuver	532	653	-	-	960	-
Stage 1	841	-	-	-	-	-
Stage 2	747	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	529	653	-	-	960	-
Mov Cap-2 Maneuver	529	-	-	-	-	-
Stage 1	841	-	-	-	-	-
Stage 2	743	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.5	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	653	960	-
HCM Lane V/C Ratio	-	-	0.005	0.004	-
HCM Control Delay (s)	-	-	10.5	8.8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	0	0	351	363	6
Future Vol, veh/h	7	0	0	351	363	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	100	2	2	3	3	100
Mvmt Flow	7	0	0	351	363	6

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	717	366	369	0	-	0
Stage 1	366	-	-	-	-	-
Stage 2	351	-	-	-	-	-
Critical Hdwy	7.4	6.22	4.12	-	-	-
Critical Hdwy Stg 1	6.4	-	-	-	-	-
Critical Hdwy Stg 2	6.4	-	-	-	-	-
Follow-up Hdwy	4.4	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	281	679	1190	-	-	-
Stage 1	529	-	-	-	-	-
Stage 2	539	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	281	679	1190	-	-	-
Mov Cap-2 Maneuver	281	-	-	-	-	-
Stage 1	529	-	-	-	-	-
Stage 2	539	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.1	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1190	-	281	-	-
HCM Lane V/C Ratio	-	-	0.025	-	-
HCM Control Delay (s)	0	-	18.1	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

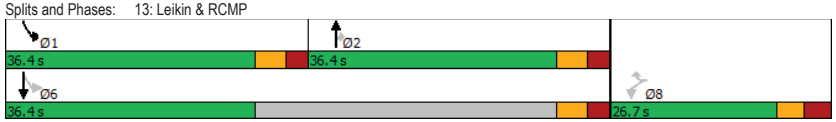
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	16	17	327	548	253	87
Future Volume (vph)	16	17	327	548	253	87
Lane Group Flow (vph)	16	17	327	548	253	87
Turn Type	Perm	Perm	NA	Perm	pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	8	8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0
Minimum Split (s)	24.7	24.7	31.4	31.4	11.4	16.4
Total Split (s)	26.7	26.7	36.4	36.4	36.4	36.4
Total Split (%)	26.8%	26.8%	36.6%	36.6%	36.6%	36.6%
Maximum Green (s)	20.0	20.0	30.0	30.0	30.0	30.0
Yellow Time (s)	3.3	3.3	3.7	3.7	3.7	3.7
All-Red Time (s)	3.4	3.4	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.7	6.7	6.4	6.4	6.4	6.4
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Max	Max	None	Max
Walk Time (s)	7.0	7.0	18.0	18.0		
Flash Dont Walk (s)	11.0	11.0	7.0	7.0		
Pedestrian Calls (#/hr)	19	19	5	5		
Act Effct Green (s)	11.7	11.7	31.4	31.4	47.3	50.7
Actuated g/C Ratio	0.18	0.18	0.49	0.49	0.74	0.79
v/c Ratio	0.05	0.07	0.38	0.56	0.36	0.07
Control Delay	26.5	13.4	16.0	4.3	6.1	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.5	13.4	16.0	4.3	6.1	4.7
LOS	C	B	B	A	A	A
Approach Delay	19.8		8.7			5.8
Approach LOS	B		A			A
Queue Length 50th (m)	1.8	0.0	28.2	0.0	10.8	3.3
Queue Length 95th (m)	6.8	4.9	63.2	20.4	26.4	10.1
Internal Link Dist (m)	73.5		75.1			162.3
Turn Bay Length (m)				130.0	150.0	
Base Capacity (vph)	543	445	850	984	1008	1478
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	0.03	0.04	0.38	0.56	0.25	0.06

Intersection Summary
Cycle Length: 99.5
Actuated Cycle Length: 63.9
Natural Cycle: 70
Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.56

Intersection Signal Delay: 8.2	Intersection LOS: A
Intersection Capacity Utilization 63.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 13: Leikin & RCMP



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø3
Lane Configurations							
Traffic Volume (vph)	358	7	8	178	437	226	
Future Volume (vph)	358	7	8	178	437	226	
Lane Group Flow (vph)	358	7	8	178	437	226	
Turn Type	Perm	Perm	Perm	NA	NA	Perm	
Protected Phases				2	6		3
Permitted Phases	4	4	2			6	
Detector Phase	4	4	2	2	6	6	
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	6.0
Minimum Split (s)	22.1	22.1	16.5	16.5	34.5	34.5	8.0
Total Split (s)	30.1	30.1	46.5	46.5	46.5	46.5	8.0
Total Split (%)	35.6%	35.6%	55.0%	55.0%	55.0%	55.0%	9%
Maximum Green (s)	25.0	25.0	40.0	40.0	40.0	40.0	6.0
Yellow Time (s)	3.3	3.3	4.6	4.6	4.6	4.6	2.0
All-Red Time (s)	1.8	1.8	1.9	1.9	1.9	1.9	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.1	5.1	6.5	6.5	6.5	6.5	
Lead/Lag	Lag	Lag					Lead
Lead-Lag Optimize?	Yes	Yes					Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Max	Max	Max	Max	None
Walk Time (s)	7.0	7.0			7.0	7.0	3.0
Flash Dont Walk (s)	10.0	10.0			21.0	21.0	0.0
Pedestrian Calls (#/hr)	0	0			0	0	8
Act Effct Green (s)	20.4	20.4	40.3	40.3	40.3	40.3	
Actuated g/C Ratio	0.28	0.28	0.55	0.55	0.55	0.55	
v/c Ratio	0.80	0.03	0.03	0.20	0.46	0.25	
Control Delay	39.6	12.6	11.1	10.8	13.6	2.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	39.6	12.6	11.1	10.8	13.6	2.6	
LOS	D	B	B	B	B	A	
Approach Delay	39.1			10.8	9.8		
Approach LOS	D			B	A		
Queue Length 50th (m)	44.2	0.0	0.5	11.3	33.1	0.0	
Queue Length 95th (m)	#90.2	2.9	3.0	28.6	73.6	10.9	
Internal Link Dist (m)	391.2			325.6	181.8		
Turn Bay Length (m)		240.0	120.0			115.0	
Base Capacity (vph)	555	262	232	900	953	890	
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	0.65	0.03	0.03	0.20	0.46	0.25	

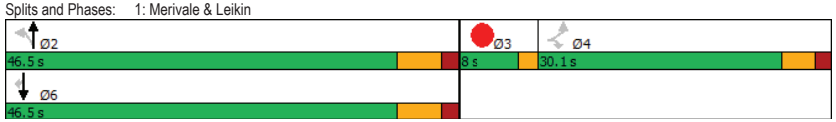
Intersection Summary
Cycle Length: 84.6
Actuated Cycle Length: 73.8
Natural Cycle: 65
Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 18.8	Intersection LOS: B
Intersection Capacity Utilization 54.9%	ICU Level of Service A
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Merivale & Leikin



Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	154	51	258	464	0
Future Vol, veh/h	7	154	51	258	464	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	8	40	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	7	2	2
Mvmt Flow	7	154	51	258	464	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	824	464	464	0	-	0
Stage 1	464	-	-	-	-	-
Stage 2	360	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	343	598	1097	-	-	-
Stage 1	633	-	-	-	-	-
Stage 2	706	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	327	598	1097	-	-	-
Mov Cap-2 Maneuver	327	-	-	-	-	-
Stage 1	604	-	-	-	-	-
Stage 2	706	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.2	1.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1097	-	327	598	-	-
HCM Lane V/C Ratio	0.046	-	0.021	0.258	-	-
HCM Control Delay (s)	8.4	-	16.3	13.1	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	1	-	-

Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	67	61	0	0	378	187	0	1	0	43	0	200
Future Vol, veh/h	67	61	0	0	378	187	0	1	0	43	0	200
Conflicting Peds, #/hr	1	0	10	10	0	1	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	30	-	-	-	-	-	-	-	-	-	-	-
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	13	2	2	2	4	2	2	2	2	2	2
Mvmt Flow	67	61	0	0	378	187	0	1	0	43	0	200

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	566	0	0	71	0	0	778	771	71	669	678	474
Stage 1	-	-	-	-	-	-	205	205	-	473	473	-
Stage 2	-	-	-	-	-	-	573	566	-	196	205	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1006	-	-	1529	-	-	314	331	991	371	374	590
Stage 1	-	-	-	-	-	-	797	732	-	572	558	-
Stage 2	-	-	-	-	-	-	505	507	-	806	732	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1005	-	-	1517	-	-	195	306	983	351	346	589
Mov Cap-2 Maneuver	-	-	-	-	-	-	195	306	-	351	346	-
Stage 1	-	-	-	-	-	-	738	678	-	534	557	-
Stage 2	-	-	-	-	-	-	333	506	-	751	678	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	4.6	0	16.8	17.6
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	306	1005	-	-	1517	-	-	526
HCM Lane V/C Ratio	0.003	0.067	-	-	-	-	-	0.462
HCM Control Delay (s)	16.8	8.8	-	-	0	-	-	17.6
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0	0.2	-	-	0	-	-	2.4

Lane Group	EBL	EBR	NBL	NBT	SBT	Ø3
Lane Configurations						
Traffic Volume (vph)	30	552	185	334	933	
Future Volume (vph)	30	552	185	334	933	
Lane Group Flow (vph)	30	552	185	334	949	
Turn Type	Perm	pm+ov	pm+pt	NA	NA	
Protected Phases		5	5	2	6	3
Permitted Phases	4	4	2			
Detector Phase	4	5	5	2	6	
Switch Phase						
Minimum Initial (s)	10.0	5.0	5.0	10.0	10.0	1.0
Minimum Split (s)	22.8	11.4	11.4	16.5	32.5	5.0
Total Split (s)	26.0	14.0	14.0	89.0	75.0	5.0
Total Split (%)	21.7%	11.7%	11.7%	74.2%	62.5%	4%
Maximum Green (s)	19.2	7.6	7.6	82.5	68.5	3.0
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	2.0
All-Red Time (s)	2.2	1.8	1.8	1.9	1.9	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.8	6.4	6.4	6.5	6.5	
Lead/Lag	Lag	Lead	Lead		Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Max	C-Max	None
Walk Time (s)	2.0				7.0	3.0
Flash Dont Walk (s)	14.0				19.0	0.0
Pedestrian Calls (#/hr)	0				0	0
Act Effct Green (s)	10.1	34.8	103.5	106.0	68.5	
Actuated g/C Ratio	0.08	0.29	0.86	0.88	0.57	
v/c Ratio	0.22	1.02	0.32	0.22	0.50	
Control Delay	55.5	72.8	3.5	2.4	16.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	55.5	72.8	3.5	2.4	16.6	
LOS	E	E	A	A	B	
Approach Delay	71.9			2.8	16.6	
Approach LOS	E			A	B	
Queue Length 50th (m)	6.7	~110.0	7.7	15.1	67.2	
Queue Length 95th (m)	16.2	#183.8	12.6	22.5	83.6	
Internal Link Dist (m)	354.7			333.0	741.3	
Turn Bay Length (m)	135.0		120.0			
Base Capacity (vph)	262	542	576	1541	1886	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.11	1.02	0.32	0.22	0.50	

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 112 (93%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 90

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.02
Intersection Signal Delay: 28.8 Intersection LOS: C
Intersection Capacity Utilization 74.6% ICU Level of Service D
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Prince of Wales & Merivale

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	29	434	2	6	229
Future Vol, veh/h	14	29	434	2	6	229
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	29	434	2	6	229

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	676	435	0	0	436	0
Stage 1	435	-	-	-	-	-
Stage 2	241	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	419	621	-	-	1124	-
Stage 1	653	-	-	-	-	-
Stage 2	799	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	416	621	-	-	1124	-
Mov Cap-2 Maneuver	416	-	-	-	-	-
Stage 1	653	-	-	-	-	-
Stage 2	794	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.3	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	535	1124	-
HCM Lane V/C Ratio	-	-	0.08	0.005	-
HCM Control Delay (s)	-	-	12.3	8.2	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	4	100	551	8	38	14
Future Vol, veh/h	4	100	551	8	38	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	8	2	2	2	2
Mvmt Flow	4	100	551	8	38	14

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	559	0	-	0	613	555
Stage 1	-	-	-	-	555	-
Stage 2	-	-	-	-	58	-
Critical Hdwy	4.13	-	-	-	6.63	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	2.219	-	-	-	3.519	3.319
Pot Cap-1 Maneuver	1010	-	-	-	440	530
Stage 1	-	-	-	-	574	-
Stage 2	-	-	-	-	958	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1010	-	-	-	438	530
Mov Cap-2 Maneuver	-	-	-	-	438	-
Stage 1	-	-	-	-	572	-
Stage 2	-	-	-	-	958	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	13.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1010	-	-	-	459
HCM Lane V/C Ratio	0.004	-	-	-	0.113
HCM Control Delay (s)	8.6	0	-	-	13.8
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.4

Intersection	
Int Delay, s/veh	1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	46	6	260	133	29	233
Future Vol, veh/h	46	6	260	133	29	233
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	8	-	-	30	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	8	2	2	9
Mvmt Flow	46	6	260	133	29	233

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	618	327	0	0	393	0
Stage 1	327	-	-	-	-	-
Stage 2	291	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	453	714	-	-	1166	-
Stage 1	731	-	-	-	-	-
Stage 2	759	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	442	714	-	-	1166	-
Mov Cap-2 Maneuver	442	-	-	-	-	-
Stage 1	731	-	-	-	-	-
Stage 2	740	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.6	0	0.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	442	714	1166	-
HCM Lane V/C Ratio	-	-	0.104	0.008	0.025	-
HCM Control Delay (s)	-	-	14.1	10.1	8.2	-
HCM Lane LOS	-	-	B	B	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0	0.1	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	5	459	4	7	235
Future Vol, veh/h	0	5	459	4	7	235
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	100	2	100	100	2
Mvmt Flow	0	5	459	4	7	235

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	710	461	0	0	463	0
Stage 1	461	-	-	-	-	-
Stage 2	249	-	-	-	-	-
Critical Hdwy	6.42	7.2	-	-	5.1	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	4.2	-	-	3.1	-
Pot Cap-1 Maneuver	400	441	-	-	731	-
Stage 1	635	-	-	-	-	-
Stage 2	792	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	396	441	-	-	731	-
Mov Cap-2 Maneuver	396	-	-	-	-	-
Stage 1	635	-	-	-	-	-
Stage 2	783	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.3	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	441	731	-
HCM Lane V/C Ratio	-	-	0.011	0.01	-
HCM Control Delay (s)	-	-	13.3	10	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	13	0	0	380	268	11
Future Vol, veh/h	13	0	0	380	268	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	100	2	2	2	4	100
Mvmt Flow	13	0	0	380	268	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	654	274	279	0	-	0
Stage 1	274	-	-	-	-	-
Stage 2	380	-	-	-	-	-
Critical Hdwy	7.4	6.22	4.12	-	-	-
Critical Hdwy Stg 1	6.4	-	-	-	-	-
Critical Hdwy Stg 2	6.4	-	-	-	-	-
Follow-up Hdwy	4.4	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	310	765	1284	-	-	-
Stage 1	592	-	-	-	-	-
Stage 2	520	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	310	765	1284	-	-	-
Mov Cap-2 Maneuver	310	-	-	-	-	-
Stage 1	592	-	-	-	-	-
Stage 2	520	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.1	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1284	-	310	-	-
HCM Lane V/C Ratio	-	-	0.042	-	-
HCM Control Delay (s)	0	-	17.1	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

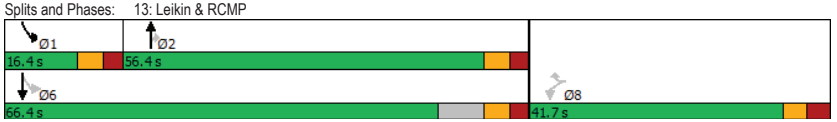
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	409	252	123	5	6	221
Future Volume (vph)	409	252	123	5	6	221
Lane Group Flow (vph)	409	252	123	5	6	221
Turn Type	Perm	Perm	NA	Perm	pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	8	8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0
Minimum Split (s)	24.7	24.7	31.4	31.4	11.4	16.4
Total Split (s)	41.7	41.7	56.4	56.4	16.4	66.4
Total Split (%)	36.4%	36.4%	49.3%	49.3%	14.3%	58.0%
Maximum Green (s)	35.0	35.0	50.0	50.0	10.0	60.0
Yellow Time (s)	3.3	3.3	3.7	3.7	3.7	3.7
All-Red Time (s)	3.4	3.4	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.7	6.7	6.4	6.4	6.4	6.4
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Max	Max	None	Max
Walk Time (s)	7.0	7.0	18.0	18.0		
Flash Dont Walk (s)	11.0	11.0	7.0	7.0		
Pedestrian Calls (#/hr)	19	19	8	8		
Act Effct Green (s)	29.5	29.5	58.4	58.4	60.7	60.7
Actuated g/C Ratio	0.29	0.29	0.56	0.56	0.59	0.59
v/c Ratio	0.86	0.44	0.13	0.01	0.01	0.22
Control Delay	53.9	6.2	13.3	9.0	10.5	11.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.9	6.2	13.3	9.0	10.5	11.7
LOS	D	A	B	A	B	B
Approach Delay	35.7		13.2			11.7
Approach LOS	D		B			B
Queue Length 50th (m)	76.9	0.0	10.8	0.0	0.5	20.6
Queue Length 95th (m)	#124.8	17.5	26.8	2.1	2.4	35.6
Internal Link Dist (m)	73.5		75.0			162.3
Turn Bay Length (m)						
Base Capacity (vph)	563	629	947	807	676	1092
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	0.73	0.40	0.13	0.01	0.01	0.20

Intersection Summary

Cycle Length: 114.5
Actuated Cycle Length: 103.4
Natural Cycle: 70
Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.86
Intersection Signal Delay: 27.5 — Intersection LOS: C
Intersection Capacity Utilization 55.7% — ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 13: Leikin & RCMP



MOVEMENT SUMMARY

Site: 101 [Longfields-Bill Leathem FT 2026 & 2031 AM Peak (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

50 Leikin Dr
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bill Leathem															
1	L2	All MCs	188	5.0	188	5.0	0.113	7.4	LOS A	0.6	4.4	0.03	0.59	0.03	48.9
2	T1	All MCs	1	2.0	1	2.0	0.113	7.2	LOS A	0.6	4.4	0.03	0.59	0.03	39.9
3	R2	All MCs	1	2.0	1	2.0	0.113	4.6	LOS A	0.6	4.4	0.03	0.59	0.03	36.1
Approach			190	5.0	190	5.0	0.113	7.4	LOS A	0.6	4.4	0.03	0.59	0.03	48.8
East: Site Access E															
4	L2	All MCs	76	2.0	76	2.0	0.097	0.9	LOS A	0.5	3.4	0.34	0.18	0.34	35.1
5	T1	All MCs	42	2.0	42	2.0	0.097	0.9	LOS A	0.5	3.4	0.34	0.18	0.34	39.9
6	R2	All MCs	1	2.0	1	2.0	0.097	0.9	LOS A	0.5	3.4	0.34	0.18	0.34	19.2
Approach			119	2.0	119	2.0	0.097	0.9	LOS A	0.5	3.4	0.34	0.18	0.34	36.6
North: Site Access N															
7	L2	All MCs	1	2.0	1	2.0	0.107	1.5	LOS A	0.6	3.9	0.44	0.28	0.44	18.8
8	T1	All MCs	77	2.0	77	2.0	0.107	1.5	LOS A	0.6	3.9	0.44	0.28	0.44	39.8
9	R2	All MCs	42	2.0	42	2.0	0.107	1.5	LOS A	0.6	3.9	0.44	0.28	0.44	47.4
Approach			120	2.0	120	2.0	0.107	1.5	LOS A	0.6	3.9	0.44	0.28	0.44	42.1
West: Longfields															
10	L2	All MCs	1	2.0	1	2.0	0.239	13.3	LOS B	1.4	10.2	0.36	0.51	0.36	51.6
11	T1	All MCs	1	2.0	1	2.0	0.239	10.2	LOS B	1.4	10.2	0.36	0.51	0.36	43.8
12	R2	All MCs	298	6.0	298	6.0	0.239	5.4	LOS A	1.4	10.2	0.36	0.51	0.36	52.6
Approach			300	6.0	300	6.0	0.239	5.5	LOS A	1.4	10.2	0.36	0.51	0.36	52.6
All Vehicles			729	4.4	729	4.4	0.239	4.6	LOS A	1.4	10.2	0.28	0.44	0.28	47.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Longfields-Bill Leathem FT 2026 & 2031 PM Peak (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

50 Leikin Dr
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bill Leathem															
1	L2	All MCs	312	3.0	312	3.0	0.183	7.4	LOS A	1.0	7.5	0.03	0.59	0.03	49.3
2	T1	All MCs	1	2.0	1	2.0	0.183	7.2	LOS A	1.0	7.5	0.03	0.59	0.03	39.9
3	R2	All MCs	1	2.0	1	2.0	0.183	4.6	LOS A	1.0	7.5	0.03	0.59	0.03	36.1
Approach			314	3.0	314	3.0	0.183	7.4	LOS A	1.0	7.5	0.03	0.59	0.03	49.2
East: Site Access E															
4	L2	All MCs	77	2.0	77	2.0	0.107	1.5	LOS A	0.5	3.8	0.44	0.27	0.44	34.9
5	T1	All MCs	42	2.0	42	2.0	0.107	1.5	LOS A	0.5	3.8	0.44	0.27	0.44	39.7
6	R2	All MCs	1	2.0	1	2.0	0.107	1.5	LOS A	0.5	3.8	0.44	0.27	0.44	19.0
Approach			120	2.0	120	2.0	0.107	1.5	LOS A	0.5	3.8	0.44	0.27	0.44	36.4
North: Site Access N															
7	L2	All MCs	1	2.0	1	2.0	0.117	2.1	LOS A	0.6	4.4	0.53	0.36	0.53	18.6
8	T1	All MCs	77	2.0	77	2.0	0.117	2.1	LOS A	0.6	4.4	0.53	0.36	0.53	39.6
9	R2	All MCs	42	2.0	42	2.0	0.117	2.1	LOS A	0.6	4.4	0.53	0.36	0.53	47.1
Approach			120	2.0	120	2.0	0.117	2.1	LOS A	0.6	4.4	0.53	0.36	0.53	41.8
West: Longfields															
10	L2	All MCs	1	2.0	1	2.0	0.140	13.3	LOS B	0.7	5.7	0.34	0.51	0.34	51.7
11	T1	All MCs	1	2.0	1	2.0	0.140	10.2	LOS B	0.7	5.7	0.34	0.51	0.34	43.8
12	R2	All MCs	166	10.0	166	10.0	0.140	5.4	LOS A	0.7	5.7	0.34	0.51	0.34	52.7
Approach			168	9.9	168	9.9	0.140	5.5	LOS A	0.7	5.7	0.34	0.51	0.34	52.6
All Vehicles			722	4.3	722	4.3	0.183	5.1	LOS A	1.0	7.5	0.25	0.48	0.25	47.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Appendix L

Synchro and Sidra Intersection Worksheets – 2031 Future Total Conditions

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø3
Lane Configurations							
Traffic Volume (vph)	428	7	4	354	68	254	
Future Volume (vph)	428	7	4	354	68	254	
Lane Group Flow (vph)	428	7	4	354	68	254	
Turn Type	Perm	Perm	Perm	NA	NA	Perm	
Protected Phases				2	6		3
Permitted Phases	4	4	2			6	
Detector Phase	4	4	2	2	6	6	
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	6.0
Minimum Split (s)	22.1	22.1	16.5	16.5	34.5	34.5	8.0
Total Split (s)	30.1	30.1	66.5	66.5	66.5	66.5	8.0
Total Split (%)	28.8%	28.8%	63.6%	63.6%	63.6%	63.6%	8%
Maximum Green (s)	25.0	25.0	60.0	60.0	60.0	60.0	6.0
Yellow Time (s)	3.3	3.3	4.6	4.6	4.6	4.6	2.0
All-Red Time (s)	1.8	1.8	1.9	1.9	1.9	1.9	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.1	5.1	6.5	6.5	6.5	6.5	
Lead/Lag	Lag	Lag					Lead
Lead-Lag Optimize?	Yes	Yes					Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Max	Max	Max	Max	None
Walk Time (s)	7.0	7.0			7.0	7.0	3.0
Flash Dont Walk (s)	10.0	10.0			21.0	21.0	0.0
Pedestrian Calls (#/hr)	0	0			0	0	4
Act Effct Green (s)	25.0	25.0	60.1	60.1	60.1	60.1	
Actuated g/C Ratio	0.25	0.25	0.61	0.61	0.61	0.61	
v/c Ratio	1.01	0.03	0.01	0.33	0.08	0.26	
Control Delay	85.2	17.1	8.8	10.8	8.7	1.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	85.2	17.1	8.8	10.8	8.7	1.9	
LOS	F	B	A	B	A	A	
Approach Delay	84.1			10.8	3.4		
Approach LOS	F			B	A		
Queue Length 50th (m)	79.9	0.0	0.3	28.8	4.6	0.0	
Queue Length 95th (m)	#155.9	3.7	1.8	54.5	11.9	10.0	
Internal Link Dist (m)	391.2			325.6	181.8		
Turn Bay Length (m)		240.0	120.0			115.0	
Base Capacity (vph)	422	274	388	1057	870	988	
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	1.01	0.03	0.01	0.33	0.08	0.26	

Intersection Summary

Cycle Length: 104.6
Actuated Cycle Length: 98.2
Natural Cycle: 70
Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.01
Intersection Signal Delay: 37.2 — Intersection LOS: D
Intersection Capacity Utilization 54.4% — ICU Level of Service A
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Merivale & Leikin

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	51	115	443	181	1
Future Vol, veh/h	6	51	115	443	181	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	8	40	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	5	9	100
Mvmt Flow	6	51	115	443	181	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	855	182	182	0	-	0
Stage 1	182	-	-	-	-	-
Stage 2	673	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	329	861	1393	-	-	-
Stage 1	849	-	-	-	-	-
Stage 2	507	-	-	-	-	-
Platoon blocked, %					-	-
Mov Cap-1 Maneuver	302	861	1393	-	-	-
Mov Cap-2 Maneuver	302	-	-	-	-	-
Stage 1	779	-	-	-	-	-
Stage 2	507	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.2	1.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1393	-	302	861	-	-
HCM Lane V/C Ratio	0.083	-	0.02	0.059	-	-
HCM Control Delay (s)	7.8	-	17.2	9.4	-	-
HCM Lane LOS	A	-	C	A	-	-
HCM 95th %tile Q(veh)	0.3	-	0.1	0.2	-	-

Intersection	
Int Delay, s/veh	32.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	160	575	4	7	29	39	1	2	4	213	3	65
Future Vol, veh/h	160	575	4	7	29	39	1	2	4	213	3	65
Conflicting Peds, #/hr	0	0	5	5	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	30	-	-	-	-	-	-	-	-	-	-	-
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, %	3	2	2	29	24	5	2	2	25	2	33	2
Mvmt Flow	160	575	4	7	29	39	1	2	4	213	3	65

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	68	0	0	584	0	0	999	984	582	963	967	49
Stage 1	-	-	-	-	-	-	902	902	-	63	63	-
Stage 2	-	-	-	-	-	-	97	82	-	900	904	-
Critical Hdwy	4.13	-	-	4.39	-	-	7.12	6.52	6.45	7.12	6.83	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.83	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.83	-
Follow-up Hdwy	2.227	-	-	2.461	-	-	3.518	4.018	3.525	3.518	4.297	3.318
Pot Cap-1 Maneuver	1527	-	-	870	-	-	222	248	472	235	226	1020
Stage 1	-	-	-	-	-	-	332	356	-	948	785	-
Stage 2	-	-	-	-	-	-	910	827	-	333	317	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1527	-	-	867	-	-	187	219	470	~ 212	200	1020
Mov Cap-2 Maneuver	-	-	-	-	-	-	187	219	-	~ 212	200	-
Stage 1	-	-	-	-	-	-	296	317	-	848	779	-
Stage 2	-	-	-	-	-	-	842	820	-	294	282	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.7	0.9	17.1	122.6
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	304	1527	-	-	867	-	-	259
HCM Lane V/C Ratio	0.023	0.105	-	-	0.008	-	-	1.085
HCM Control Delay (s)	17.1	7.6	-	-	9.2	-	-	122.6
HCM Lane LOS	C	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	0.1	0.3	-	-	0	-	-	11.7

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

Lane Group	EBL	EBR	NBL	NBT	SBT	Ø3
Lane Configurations						
Traffic Volume (vph)	10	130	469	994	259	
Future Volume (vph)	10	130	469	994	259	
Lane Group Flow (vph)	10	130	469	994	297	
Turn Type	Perm	pm+ov	pm+pt	NA	NA	
Protected Phases		5	5	2	6	3
Permitted Phases	4	4	2			
Detector Phase	4	5	5	2	6	
Switch Phase						
Minimum Initial (s)	10.0	5.0	5.0	10.0	10.0	1.0
Minimum Split (s)	22.8	11.4	11.4	16.5	32.5	5.0
Total Split (s)	23.0	22.0	22.0	72.0	50.0	5.0
Total Split (%)	23.0%	22.0%	22.0%	72.0%	50.0%	5%
Maximum Green (s)	16.2	15.6	15.6	65.5	43.5	3.0
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	2.0
All-Red Time (s)	2.2	1.8	1.8	1.9	1.9	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.8	6.4	6.4	6.5	6.5	
Lead/Lag	Lag	Lead	Lead		Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Max	C-Max	None
Walk Time (s)	2.0				7.0	3.0
Flash Dont Walk (s)	14.0				19.0	0.0
Pedestrian Calls (#/hr)	0				0	0
Act Effct Green (s)	10.0	12.6	90.2	95.3	74.5	
Actuated g/C Ratio	0.10	0.13	0.90	0.95	0.74	
v/c Ratio	0.06	0.47	0.53	0.60	0.13	
Control Delay	41.8	10.8	3.7	3.9	5.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	41.8	10.8	3.7	3.9	5.6	
LOS	D	B	A	A	A	
Approach Delay	13.1			3.8	5.6	
Approach LOS	B			A	A	
Queue Length 50th (m)	1.8	0.0	0.7	0.0	4.2	
Queue Length 95th (m)	6.7	11.3	35.8	131.6	22.8	
Internal Link Dist (m)	355.3			333.0	741.3	
Turn Bay Length (m)	135.0		120.0			
Base Capacity (vph)	268	365	937	1664	2324	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.04	0.36	0.50	0.60	0.13	

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 15 (15%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 90

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.60
Intersection Signal Delay: 4.8 — Intersection LOS: A
Intersection Capacity Utilization 74.6% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 5: Prince of Wales & Merivale

Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	9	17	175	9	26	272
Future Vol, veh/h	9	17	175	9	26	272
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	8	2	2	2
Mvmt Flow	9	17	175	9	26	272

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	504	180	0	0	184	0
Stage 1	180	-	-	-	-	-
Stage 2	324	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	528	863	-	-	1391	-
Stage 1	851	-	-	-	-	-
Stage 2	733	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	516	863	-	-	1391	-
Mov Cap-2 Maneuver	516	-	-	-	-	-
Stage 1	851	-	-	-	-	-
Stage 2	717	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.3	0	0.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	700	1391	-
HCM Lane V/C Ratio	-	-	0.037	0.019	-
HCM Control Delay (s)	-	-	10.3	7.6	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	17	775	66	34	23	9
Future Vol, veh/h	17	775	66	34	23	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	14	2	2	2
Mvmt Flow	17	775	66	34	23	9

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	100	0	-	0	505	83
Stage 1	-	-	-	-	83	-
Stage 2	-	-	-	-	422	-
Critical Hdwy	4.13	-	-	-	6.63	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	2.219	-	-	-	3.519	3.319
Pot Cap-1 Maneuver	1492	-	-	-	511	976
Stage 1	-	-	-	-	940	-
Stage 2	-	-	-	-	630	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1492	-	-	-	501	976
Mov Cap-2 Maneuver	-	-	-	-	501	-
Stage 1	-	-	-	-	921	-
Stage 2	-	-	-	-	630	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	11.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1492	-	-	-	580
HCM Lane V/C Ratio	0.011	-	-	-	0.055
HCM Control Delay (s)	7.4	0.1	-	-	11.6
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection	
Int Delay, s/veh	2.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	113	4	330	29	29	257
Future Vol, veh/h	113	4	330	29	29	257
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	8	-	-	30	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	6	2	2	6
Mvmt Flow	113	4	330	29	29	257

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	660	345	0	0	359	0
Stage 1	345	-	-	-	-	-
Stage 2	315	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	428	698	-	-	1200	-
Stage 1	717	-	-	-	-	-
Stage 2	740	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	418	698	-	-	1200	-
Mov Cap-2 Maneuver	418	-	-	-	-	-
Stage 1	717	-	-	-	-	-
Stage 2	722	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.6	0	0.8
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	418	698	1200	-
HCM Lane V/C Ratio	-	-	0.27	0.006	0.024	-
HCM Control Delay (s)	-	-	16.8	10.2	8.1	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	1.1	0	0.1	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	3	190	2	4	298
Future Vol, veh/h	0	3	190	2	4	298
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	100	6	100	100	2
Mvmt Flow	0	3	190	2	4	298

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	497	191	0	0	192	0
Stage 1	191	-	-	-	-	-
Stage 2	306	-	-	-	-	-
Critical Hdwy	6.42	7.2	-	-	5.1	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	4.2	-	-	3.1	-
Pot Cap-1 Maneuver	532	653	-	-	960	-
Stage 1	841	-	-	-	-	-
Stage 2	747	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	529	653	-	-	960	-
Mov Cap-2 Maneuver	529	-	-	-	-	-
Stage 1	841	-	-	-	-	-
Stage 2	743	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.5	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	653	960	-
HCM Lane V/C Ratio	-	-	0.005	0.004	-
HCM Control Delay (s)	-	-	10.5	8.8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	0	0	351	363	6
Future Vol, veh/h	7	0	0	351	363	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	100	2	2	3	3	100
Mvmt Flow	7	0	0	351	363	6

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	717	366	369	0	-	0
Stage 1	366	-	-	-	-	-
Stage 2	351	-	-	-	-	-
Critical Hdwy	7.4	6.22	4.12	-	-	-
Critical Hdwy Stg 1	6.4	-	-	-	-	-
Critical Hdwy Stg 2	6.4	-	-	-	-	-
Follow-up Hdwy	4.4	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	281	679	1190	-	-	-
Stage 1	529	-	-	-	-	-
Stage 2	539	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	281	679	1190	-	-	-
Mov Cap-2 Maneuver	281	-	-	-	-	-
Stage 1	529	-	-	-	-	-
Stage 2	539	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.1	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1190	-	281	-	-
HCM Lane V/C Ratio	-	-	0.025	-	-
HCM Control Delay (s)	0	-	18.1	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

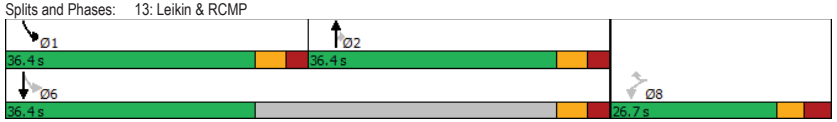
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	16	17	327	548	253	87
Future Volume (vph)	16	17	327	548	253	87
Lane Group Flow (vph)	16	17	327	548	253	87
Turn Type	Perm	Perm	NA	Perm	pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	8	8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0
Minimum Split (s)	24.7	24.7	31.4	31.4	11.4	16.4
Total Split (s)	26.7	26.7	36.4	36.4	36.4	36.4
Total Split (%)	26.8%	26.8%	36.6%	36.6%	36.6%	36.6%
Maximum Green (s)	20.0	20.0	30.0	30.0	30.0	30.0
Yellow Time (s)	3.3	3.3	3.7	3.7	3.7	3.7
All-Red Time (s)	3.4	3.4	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.7	6.7	6.4	6.4	6.4	6.4
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Max	Max	None	Max
Walk Time (s)	7.0	7.0	18.0	18.0		
Flash Dont Walk (s)	11.0	11.0	7.0	7.0		
Pedestrian Calls (#/hr)	19	19	5	5		
Act Effct Green (s)	11.7	11.7	31.4	31.4	47.3	50.7
Actuated g/C Ratio	0.18	0.18	0.49	0.49	0.74	0.79
v/c Ratio	0.05	0.07	0.38	0.56	0.36	0.07
Control Delay	26.5	13.4	16.0	4.3	6.1	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.5	13.4	16.0	4.3	6.1	4.7
LOS	C	B	B	A	A	A
Approach Delay	19.8		8.7			5.8
Approach LOS	B		A			A
Queue Length 50th (m)	1.8	0.0	28.2	0.0	10.8	3.3
Queue Length 95th (m)	6.8	4.9	63.2	20.4	26.4	10.1
Internal Link Dist (m)	73.5		75.1			162.3
Turn Bay Length (m)				130.0	150.0	
Base Capacity (vph)	543	445	850	984	1008	1478
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	0.03	0.04	0.38	0.56	0.25	0.06

Intersection Summary
Cycle Length: 99.5
Actuated Cycle Length: 63.9
Natural Cycle: 70
Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.56

Intersection Signal Delay: 8.2	Intersection LOS: A
Intersection Capacity Utilization 63.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 13: Leikin & RCMP



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø3
Lane Configurations							
Traffic Volume (vph)	358	7	8	187	437	226	
Future Volume (vph)	358	7	8	187	437	226	
Lane Group Flow (vph)	358	7	8	187	437	226	
Turn Type	Perm	Perm	Perm	NA	NA	Perm	
Protected Phases				2	6		3
Permitted Phases	4	4	2			6	
Detector Phase	4	4	2	2	6	6	
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	6.0
Minimum Split (s)	22.1	22.1	16.5	16.5	34.5	34.5	8.0
Total Split (s)	30.1	30.1	46.5	46.5	46.5	46.5	8.0
Total Split (%)	35.6%	35.6%	55.0%	55.0%	55.0%	55.0%	9%
Maximum Green (s)	25.0	25.0	40.0	40.0	40.0	40.0	6.0
Yellow Time (s)	3.3	3.3	4.6	4.6	4.6	4.6	2.0
All-Red Time (s)	1.8	1.8	1.9	1.9	1.9	1.9	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.1	5.1	6.5	6.5	6.5	6.5	
Lead/Lag	Lag	Lag					Lead
Lead-Lag Optimize?	Yes	Yes					Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Max	Max	Max	Max	None
Walk Time (s)	7.0	7.0			7.0	7.0	3.0
Flash Dont Walk (s)	10.0	10.0			21.0	21.0	0.0
Pedestrian Calls (#/hr)	0	0			0	0	8
Act Effct Green (s)	20.4	20.4	40.3	40.3	40.3	40.3	
Actuated g/C Ratio	0.28	0.28	0.55	0.55	0.55	0.55	
v/c Ratio	0.80	0.03	0.03	0.21	0.46	0.25	
Control Delay	39.6	12.6	11.1	10.9	13.6	2.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	39.6	12.6	11.1	10.9	13.6	2.6	
LOS	D	B	B	B	B	A	
Approach Delay	39.1			10.9	9.8		
Approach LOS	D			B	A		
Queue Length 50th (m)	44.2	0.0	0.5	12.0	33.1	0.0	
Queue Length 95th (m)	#90.2	2.9	3.0	30.0	73.6	10.9	
Internal Link Dist (m)	391.2			325.6	181.8		
Turn Bay Length (m)		240.0	120.0			115.0	
Base Capacity (vph)	555	262	232	900	953	890	
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	0.65	0.03	0.03	0.21	0.46	0.25	

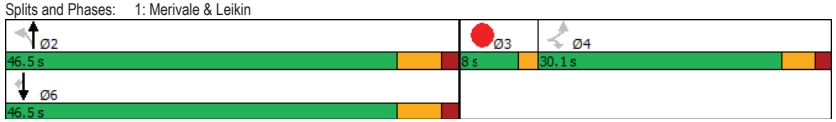
Intersection Summary
Cycle Length: 84.6
Actuated Cycle Length: 73.8
Natural Cycle: 65
Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 18.7	Intersection LOS: B
Intersection Capacity Utilization 54.9%	ICU Level of Service A
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Merivale & Leikin



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.0			3.5	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	3.0			3.0	3.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	25	15	25			15
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (m)	2.0	2.0	2.0	10.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	2.0	2.0	0.6	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Intersection Summary						

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	154	51	271	464	0
Future Vol, veh/h	7	154	51	271	464	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	8	40	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	7	2	2
Mvmt Flow	7	154	51	271	464	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	837	464	464	0	-	0
Stage 1	464	-	-	-	-	-
Stage 2	373	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	337	598	1097	-	-	-
Stage 1	633	-	-	-	-	-
Stage 2	696	-	-	-	-	-
Platoon blocked, %					-	-
Mov Cap-1 Maneuver	321	598	1097	-	-	-
Mov Cap-2 Maneuver	321	-	-	-	-	-
Stage 1	604	-	-	-	-	-
Stage 2	696	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.2	1.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1097	-	321	598	-	-
HCM Lane V/C Ratio	0.046	-	0.022	0.258	-	-
HCM Control Delay (s)	8.4	-	16.5	13.1	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	1	-	-

Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	67	61	0	0	378	187	0	1	0	43	0	200
Future Vol, veh/h	67	61	0	0	378	187	0	1	0	43	0	200
Conflicting Peds, #/hr	1	0	10	10	0	1	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	30	-	-	-	-	-	-	-	-	-	-	-
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	13	2	2	2	4	2	2	2	2	2	2
Mvmt Flow	67	61	0	0	378	187	0	1	0	43	0	200

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	566	0	0	71	0	0	778	771	71	669	678	474
Stage 1	-	-	-	-	-	-	205	205	-	473	473	-
Stage 2	-	-	-	-	-	-	573	566	-	196	205	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1006	-	-	1529	-	-	314	331	991	371	374	590
Stage 1	-	-	-	-	-	-	797	732	-	572	558	-
Stage 2	-	-	-	-	-	-	505	507	-	806	732	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1005	-	-	1517	-	-	195	306	983	351	346	589
Mov Cap-2 Maneuver	-	-	-	-	-	-	195	306	-	351	346	-
Stage 1	-	-	-	-	-	-	738	678	-	534	557	-
Stage 2	-	-	-	-	-	-	333	506	-	751	678	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	4.6	0	16.8	17.6
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	306	1005	-	-	1517	-	-	526
HCM Lane V/C Ratio	0.003	0.067	-	-	-	-	-	0.462
HCM Control Delay (s)	16.8	8.8	-	-	0	-	-	17.6
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0	0.2	-	-	0	-	-	2.4

Lane Group	EBL	EBR	NBL	NBT	SBT	Ø3
Lane Configurations						
Traffic Volume (vph)	30	552	194	334	981	
Future Volume (vph)	30	552	194	334	981	
Lane Group Flow (vph)	30	552	194	334	997	
Turn Type	Perm	pm+ov	pm+pt	NA	NA	
Protected Phases		5	5	2	6	3
Permitted Phases	4	4	2			
Detector Phase	4	5	5	2	6	
Switch Phase						
Minimum Initial (s)	10.0	5.0	5.0	10.0	10.0	1.0
Minimum Split (s)	22.8	11.4	11.4	16.5	32.5	5.0
Total Split (s)	26.0	14.0	14.0	89.0	75.0	5.0
Total Split (%)	21.7%	11.7%	11.7%	74.2%	62.5%	4%
Maximum Green (s)	19.2	7.6	7.6	82.5	68.5	3.0
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	2.0
All-Red Time (s)	2.2	1.8	1.8	1.9	1.9	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.8	6.4	6.4	6.5	6.5	
Lead/Lag	Lag	Lead	Lead		Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Max	C-Max	None
Walk Time (s)	2.0				7.0	3.0
Flash Dont Walk (s)	14.0				19.0	0.0
Pedestrian Calls (#/hr)	0				0	0
Act Effct Green (s)	10.1	34.8	103.5	106.0	68.5	
Actuated g/C Ratio	0.08	0.29	0.86	0.88	0.57	
v/c Ratio	0.22	1.04	0.35	0.22	0.53	
Control Delay	55.5	79.0	3.7	2.4	17.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	55.5	79.0	3.7	2.4	17.1	
LOS	E	E	A	A	B	
Approach Delay	77.7			2.9	17.1	
Approach LOS	E			A	B	
Queue Length 50th (m)	6.7	~121.0	8.1	15.1	72.0	
Queue Length 95th (m)	16.2	#188.8	13.1	22.5	89.3	
Internal Link Dist (m)	354.7			333.0	741.3	
Turn Bay Length (m)	135.0		120.0			
Base Capacity (vph)	262	533	560	1541	1889	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.11	1.04	0.35	0.22	0.53	

Intersection Summary

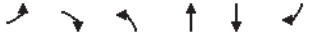
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 112 (93%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 90

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.04
Intersection Signal Delay: 30.3 — Intersection LOS: C
Intersection Capacity Utilization 76.0% — ICU Level of Service D
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Prince of Wales & Merivale



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	3.0			3.0	3.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	25	15	25			15
Number of Detectors	1	1	1	2	2	
Detector Template	Left	Right	Left	Thru	Thru	
Leading Detector (m)	2.0	2.0	2.0	10.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	2.0	2.0	0.6	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	

Intersection Summary

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	29	434	2	6	229
Future Vol, veh/h	14	29	434	2	6	229
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	29	434	2	6	229

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	676	435	0	0	436	0
Stage 1	435	-	-	-	-	-
Stage 2	241	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	419	621	-	-	1124	-
Stage 1	653	-	-	-	-	-
Stage 2	799	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	416	621	-	-	1124	-
Mov Cap-2 Maneuver	416	-	-	-	-	-
Stage 1	653	-	-	-	-	-
Stage 2	794	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.3	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	535	1124	-
HCM Lane V/C Ratio	-	-	0.08	0.005	-
HCM Control Delay (s)	-	-	12.3	8.2	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	4	100	551	8	38	14
Future Vol, veh/h	4	100	551	8	38	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	8	2	2	2	2
Mvmt Flow	4	100	551	8	38	14

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	559	0	-	0	613	555
Stage 1	-	-	-	-	555	-
Stage 2	-	-	-	-	58	-
Critical Hdwy	4.13	-	-	-	6.63	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	2.219	-	-	-	3.519	3.319
Pot Cap-1 Maneuver	1010	-	-	-	440	530
Stage 1	-	-	-	-	574	-
Stage 2	-	-	-	-	958	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1010	-	-	-	438	530
Mov Cap-2 Maneuver	-	-	-	-	438	-
Stage 1	-	-	-	-	572	-
Stage 2	-	-	-	-	958	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	13.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1010	-	-	-	459
HCM Lane V/C Ratio	0.004	-	-	-	0.113
HCM Control Delay (s)	8.6	0	-	-	13.8
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.4

Intersection	
Int Delay, s/veh	1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	46	6	260	133	29	233
Future Vol, veh/h	46	6	260	133	29	233
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	8	-	-	30	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	8	2	2	9
Mvmt Flow	46	6	260	133	29	233

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	618	327	0	0	393	0
Stage 1	327	-	-	-	-	-
Stage 2	291	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	453	714	-	-	1166	-
Stage 1	731	-	-	-	-	-
Stage 2	759	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	442	714	-	-	1166	-
Mov Cap-2 Maneuver	442	-	-	-	-	-
Stage 1	731	-	-	-	-	-
Stage 2	740	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.6	0	0.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	442	714	1166	-
HCM Lane V/C Ratio	-	-	0.104	0.008	0.025	-
HCM Control Delay (s)	-	-	14.1	10.1	8.2	-
HCM Lane LOS	-	-	B	B	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0	0.1	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	5	459	4	7	235
Future Vol, veh/h	0	5	459	4	7	235
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	100	2	100	100	2
Mvmt Flow	0	5	459	4	7	235

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	710	461	0	0	463	0
Stage 1	461	-	-	-	-	-
Stage 2	249	-	-	-	-	-
Critical Hdwy	6.42	7.2	-	-	5.1	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	4.2	-	-	3.1	-
Pot Cap-1 Maneuver	400	441	-	-	731	-
Stage 1	635	-	-	-	-	-
Stage 2	792	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	396	441	-	-	731	-
Mov Cap-2 Maneuver	396	-	-	-	-	-
Stage 1	635	-	-	-	-	-
Stage 2	783	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.3	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	441	731	-
HCM Lane V/C Ratio	-	-	0.011	0.01	-
HCM Control Delay (s)	-	-	13.3	10	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	13	0	0	380	268	11
Future Vol, veh/h	13	0	0	380	268	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	100	2	2	2	4	100
Mvmt Flow	13	0	0	380	268	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	654	274	279	0	-	0
Stage 1	274	-	-	-	-	-
Stage 2	380	-	-	-	-	-
Critical Hdwy	7.4	6.22	4.12	-	-	-
Critical Hdwy Stg 1	6.4	-	-	-	-	-
Critical Hdwy Stg 2	6.4	-	-	-	-	-
Follow-up Hdwy	4.4	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	310	765	1284	-	-	-
Stage 1	592	-	-	-	-	-
Stage 2	520	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	310	765	1284	-	-	-
Mov Cap-2 Maneuver	310	-	-	-	-	-
Stage 1	592	-	-	-	-	-
Stage 2	520	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.1	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1284	-	310	-	-
HCM Lane V/C Ratio	-	-	0.042	-	-
HCM Control Delay (s)	0	-	17.1	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

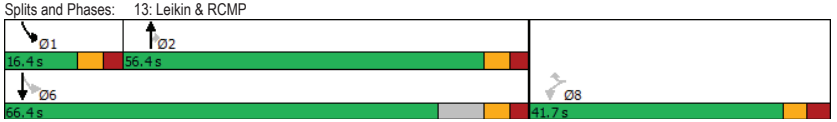
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	409	252	123	5	6	221
Future Volume (vph)	409	252	123	5	6	221
Lane Group Flow (vph)	409	252	123	5	6	221
Turn Type	Perm	Perm	NA	Perm	pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	8	8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0
Minimum Split (s)	24.7	24.7	31.4	31.4	11.4	16.4
Total Split (s)	41.7	41.7	56.4	56.4	16.4	66.4
Total Split (%)	36.4%	36.4%	49.3%	49.3%	14.3%	58.0%
Maximum Green (s)	35.0	35.0	50.0	50.0	10.0	60.0
Yellow Time (s)	3.3	3.3	3.7	3.7	3.7	3.7
All-Red Time (s)	3.4	3.4	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.7	6.7	6.4	6.4	6.4	6.4
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Max	Max	None	Max
Walk Time (s)	7.0	7.0	18.0	18.0		
Flash Dont Walk (s)	11.0	11.0	7.0	7.0		
Pedestrian Calls (#/hr)	19	19	8	8		
Act Effct Green (s)	29.5	29.5	58.4	58.4	60.7	60.7
Actuated g/C Ratio	0.29	0.29	0.56	0.56	0.59	0.59
v/c Ratio	0.86	0.44	0.13	0.01	0.01	0.22
Control Delay	53.9	6.2	13.3	9.0	10.5	11.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.9	6.2	13.3	9.0	10.5	11.7
LOS	D	A	B	A	B	B
Approach Delay	35.7		13.2			11.7
Approach LOS	D		B			B
Queue Length 50th (m)	76.9	0.0	10.8	0.0	0.5	20.6
Queue Length 95th (m)	#124.8	17.5	26.8	2.1	2.4	35.6
Internal Link Dist (m)	73.5		75.0			162.3
Turn Bay Length (m)						
Base Capacity (vph)	563	629	947	807	676	1092
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	0.73	0.40	0.13	0.01	0.01	0.20

Intersection Summary

Cycle Length: 114.5
Actuated Cycle Length: 103.4
Natural Cycle: 70
Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.86
Intersection Signal Delay: 27.5 — Intersection LOS: C
Intersection Capacity Utilization 55.7% — ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 13: Leikin & RCMP



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	12.0		3.5			3.5
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	3.0		3.0			3.0
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (m)	2.0	2.0	10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	2.0	0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

Intersection Summary

MOVEMENT SUMMARY

Site: 101 [Longfields-Bill Leathem FT 2026 & 2031 AM Peak (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

50 Leikin Dr
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bill Leathem															
1	L2	All MCs	188	5.0	188	5.0	0.113	7.4	LOS A	0.6	4.4	0.03	0.59	0.03	48.9
2	T1	All MCs	1	2.0	1	2.0	0.113	7.2	LOS A	0.6	4.4	0.03	0.59	0.03	39.9
3	R2	All MCs	1	2.0	1	2.0	0.113	4.6	LOS A	0.6	4.4	0.03	0.59	0.03	36.1
Approach			190	5.0	190	5.0	0.113	7.4	LOS A	0.6	4.4	0.03	0.59	0.03	48.8
East: Site Access E															
4	L2	All MCs	76	2.0	76	2.0	0.097	0.9	LOS A	0.5	3.4	0.34	0.18	0.34	35.1
5	T1	All MCs	42	2.0	42	2.0	0.097	0.9	LOS A	0.5	3.4	0.34	0.18	0.34	39.9
6	R2	All MCs	1	2.0	1	2.0	0.097	0.9	LOS A	0.5	3.4	0.34	0.18	0.34	19.2
Approach			119	2.0	119	2.0	0.097	0.9	LOS A	0.5	3.4	0.34	0.18	0.34	36.6
North: Site Access N															
7	L2	All MCs	1	2.0	1	2.0	0.107	1.5	LOS A	0.6	3.9	0.44	0.28	0.44	18.8
8	T1	All MCs	77	2.0	77	2.0	0.107	1.5	LOS A	0.6	3.9	0.44	0.28	0.44	39.8
9	R2	All MCs	42	2.0	42	2.0	0.107	1.5	LOS A	0.6	3.9	0.44	0.28	0.44	47.4
Approach			120	2.0	120	2.0	0.107	1.5	LOS A	0.6	3.9	0.44	0.28	0.44	42.1
West: Longfields															
10	L2	All MCs	1	2.0	1	2.0	0.239	13.3	LOS B	1.4	10.2	0.36	0.51	0.36	51.6
11	T1	All MCs	1	2.0	1	2.0	0.239	10.2	LOS B	1.4	10.2	0.36	0.51	0.36	43.8
12	R2	All MCs	298	6.0	298	6.0	0.239	5.4	LOS A	1.4	10.2	0.36	0.51	0.36	52.6
Approach			300	6.0	300	6.0	0.239	5.5	LOS A	1.4	10.2	0.36	0.51	0.36	52.6
All Vehicles			729	4.4	729	4.4	0.239	4.6	LOS A	1.4	10.2	0.28	0.44	0.28	47.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Longfields-Bill Leathem FT 2026 & 2031 PM Peak (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

50 Leikin Dr
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bill Leathem															
1	L2	All MCs	312	3.0	312	3.0	0.183	7.4	LOS A	1.0	7.5	0.03	0.59	0.03	49.3
2	T1	All MCs	1	2.0	1	2.0	0.183	7.2	LOS A	1.0	7.5	0.03	0.59	0.03	39.9
3	R2	All MCs	1	2.0	1	2.0	0.183	4.6	LOS A	1.0	7.5	0.03	0.59	0.03	36.1
Approach			314	3.0	314	3.0	0.183	7.4	LOS A	1.0	7.5	0.03	0.59	0.03	49.2
East: Site Access E															
4	L2	All MCs	77	2.0	77	2.0	0.107	1.5	LOS A	0.5	3.8	0.44	0.27	0.44	34.9
5	T1	All MCs	42	2.0	42	2.0	0.107	1.5	LOS A	0.5	3.8	0.44	0.27	0.44	39.7
6	R2	All MCs	1	2.0	1	2.0	0.107	1.5	LOS A	0.5	3.8	0.44	0.27	0.44	19.0
Approach			120	2.0	120	2.0	0.107	1.5	LOS A	0.5	3.8	0.44	0.27	0.44	36.4
North: Site Access N															
7	L2	All MCs	1	2.0	1	2.0	0.117	2.1	LOS A	0.6	4.4	0.53	0.36	0.53	18.6
8	T1	All MCs	77	2.0	77	2.0	0.117	2.1	LOS A	0.6	4.4	0.53	0.36	0.53	39.6
9	R2	All MCs	42	2.0	42	2.0	0.117	2.1	LOS A	0.6	4.4	0.53	0.36	0.53	47.1
Approach			120	2.0	120	2.0	0.117	2.1	LOS A	0.6	4.4	0.53	0.36	0.53	41.8
West: Longfields															
10	L2	All MCs	1	2.0	1	2.0	0.140	13.3	LOS B	0.7	5.7	0.34	0.51	0.34	51.7
11	T1	All MCs	1	2.0	1	2.0	0.140	10.2	LOS B	0.7	5.7	0.34	0.51	0.34	43.8
12	R2	All MCs	166	10.0	166	10.0	0.140	5.4	LOS A	0.7	5.7	0.34	0.51	0.34	52.7
Approach			168	9.9	168	9.9	0.140	5.5	LOS A	0.7	5.7	0.34	0.51	0.34	52.6
All Vehicles			722	4.3	722	4.3	0.183	5.1	LOS A	1.0	7.5	0.25	0.48	0.25	47.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Intersection	
Intersection Delay, s/veh	25.6
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	160	575	4	7	29	39	1	2	4	213	3	65
Future Vol, veh/h	160	575	4	7	29	39	1	2	4	213	3	65
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	3	2	2	29	24	5	2	2	25	2	33	2
Mvmt Flow	160	575	4	7	29	39	1	2	4	213	3	65
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	31.8	10	9.3	13.8
HCM LOS	D	A	A	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	14%	100%	0%	100%	0%	76%
Vol Thru, %	29%	0%	99%	0%	43%	1%
Vol Right, %	57%	0%	1%	0%	57%	23%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	7	160	579	7	68	281
LT Vol	1	160	0	7	0	213
Through Vol	2	0	575	0	29	3
RT Vol	4	0	4	0	39	65
Lane Flow Rate	7	160	579	7	68	281
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.012	0.27	0.894	0.014	0.121	0.459
Departure Headway (Hd)	6.169	6.085	5.557	7.393	6.387	5.876
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	579	592	654	484	561	613
Service Time	4.218	3.807	3.28	5.134	4.128	3.907
HCM Lane V/C Ratio	0.012	0.27	0.885	0.014	0.121	0.458
HCM Control Delay	9.3	11.1	37.5	10.2	10	13.8
HCM Lane LOS	A	B	E	B	A	B
HCM 95th-tile Q	0	1.1	11	0	0.4	2.4

Intersection	
Intersection Delay, s/veh	20.2
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	67	61	0	0	378	187	0	1	0	43	0	200
Future Vol, veh/h	67	61	0	0	378	187	0	1	0	43	0	200
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	13	2	2	2	4	2	2	2	2	2	2
Mvmt Flow	67	61	0	0	378	187	0	1	0	43	0	200
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	9.8	26.4	9.3	11.3
HCM LOS	A	D	A	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	100%	0%	0%	0%	18%
Vol Thru, %	100%	0%	100%	100%	67%	0%
Vol Right, %	0%	0%	0%	0%	33%	82%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	1	67	61	0	565	243
LT Vol	0	67	0	0	0	43
Through Vol	1	0	61	0	378	0
RT Vol	0	0	0	0	187	200
Lane Flow Rate	1	67	61	0	565	243
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.002	0.119	0.103	0	0.813	0.359
Departure Headway (Hd)	6.276	6.377	6.059	5.413	5.179	5.313
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	569	563	592	0	701	678
Service Time	4.328	4.108	3.79	3.128	2.894	3.342
HCM Lane V/C Ratio	0.002	0.119	0.103	0	0.806	0.358
HCM Control Delay	9.3	10	9.5	8.1	26.4	11.3
HCM Lane LOS	A	A	A	N	D	B
HCM 95th-tile Q	0	0.4	0.3	0	8.5	1.6

Appendix M

MMLOS Analysis

CGH TRANSPORTATION

Multi-Modal Level of Service - Segments Form

Consultant	**CGH Transportation Inc.**	**Project**	**50 Leikin Dr**
Scenario	**Existing/Future**	**Date**	**2023-06-23**
Comments			

SEGMENTS			Leikin Dr Ex	Bill Leathem Dr Ex	Leikin Dr Fut	Bill Leathem Dr Fut
Pedestrian	Sidewalk Width Boulevard Width	**F**	no sidewalk n/a	no sidewalk n/a	≥ 2 m 0.5 - 2 m	≥ 2 m < 0.5
	Avg Daily Curb Lane Traffic Volume		> 3000	> 3000	> 3000	> 3000
	Operating Speed On-Street Parking		> 50 to 60 km/h no	> 50 to 60 km/h no	> 50 to 60 km/h no	> 50 to 60 km/h no
	Exposure to Traffic PLoS		**F**	**F**	**D**	**E**
	Effective Sidewalk Width					
	Pedestrian Volume					
	Crowding PLoS		**-**	**-**	**-**	**-**
	Level of Service		**F**	**F**	**-**	**-**
Bicycle	Type of Cycling Facility	**D**	Curbside Bike Lane	Mixed Traffic	Curbside Bike Lane	Mixed Traffic
	Number of Travel Lanes		≤ 1 each direction	≤ 2 (no centreline)	≤ 1 each direction	≤ 2 (no centreline)
	Operating Speed		>50 to 70 km/h	≥ 50 to 60 km/h	>50 to 70 km/h	≥ 50 to 60 km/h
	# of Lanes & Operating Speed LoS		**C**	**D**	**C**	**D**
	Bike Lane (+ Parking Lane) Width		≥1.5 to <1.8 m		≥1.5 to <1.8 m	
	Bike Lane Width LoS		**B**	**-**	**B**	**-**
	Bike Lane Blockages		Rare		Rare	
	Blockage LoS		**A**	**-**	**A**	**-**
	Median Refuge Width (no median = < 1.8 m)		< 1.8 m refuge	< 1.8 m refuge	< 1.8 m refuge	< 1.8 m refuge
	No. of Lanes at Unsignalized Crossing		≤ 3 lanes	≤ 3 lanes	≤ 3 lanes	≤ 3 lanes
	Sidestreet Operating Speed		≤ 40 km/h	≤ 40 km/h	≤ 40 km/h	≤ 40 km/h
	Unsignalized Crossing - Lowest LoS		**A**	**A**	**A**	**A**
	Level of Service		**C**	**D**	**C**	**D**
Transit	Facility Type	**-**				
	Friction or Ratio Transit:Posted Speed					
	Level of Service		**-**	**-**	**-**	**-**
Truck	Truck Lane Width	**B**	> 3.7 m	> 3.7 m		
	Travel Lanes per Direction		1	1		
	Level of Service		**B**	**B**	**-**	**-**

Multi-Modal Level of Service - Intersections Form

Consultant	**CGH Transportation Inc.**	**Project**	**50 Leikin Dr**
Scenario	**Existing/Future**	**Date**	**2023-02-23**
Comments			

INTERSECTIONS		Merivale Rd & Leikin Dr				Prince of Wales Dr & Merivale Rd			
	Crossing Side	**NORTH**	**SOUTH**	**EAST**	**WEST**	**NORTH**	**SOUTH**	**EAST**	**WEST**
Pedestrian	Lanes	4	3		8	5	6		7
	Median	No Median - 2.4 m	No Median - 2.4 m		No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m		No Median - 2.4 m
	Conflicting Left Turns	Permissive	No left turn / Prohib.		Permissive	Permissive	No left turn / Prohib.		Protected/ Permissive
	Conflicting Right Turns	No right turn	Permissive or yield control		Permissive or yield control	No right turn	Protected/ Permissive		Permissive or yield control
	Right Turns on Red (RToR) ?	RTOR allowed	RTOR prohibited		RTOR allowed	RTOR allowed	RTOR prohibited		RTOR allowed
	Ped Signal Leading Interval?	No	No		No	No	No		No
	Right Turn Channel	No Right Turn	No Channel		No Channel	No Right Turn	No Channel		Smart Channel
	Corner Radius	No Right Turn	5-10m		10-15m	No Right Turn	10-15m		15-25m
	Crosswalk Type	Std transverse markings	Std transverse markings		Std transverse markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings		Std transverse markings
	PETSI Score	**68**	**82**		**-12**	**55**	**34**		**8**
	Ped. Exposure to Traffic LoS	**C**	**B**	**-**	**F**	**D**	**E**	**-**	**F**
	Cycle Length	67	67		67	100	100		100
	Effective Walk Time	10	10		14	7	7		25
	Average Pedestrian Delay	**24**	**24**		**21**	**43**	**43**		**28**
	Pedestrian Delay LoS	**C**	**C**	**-**	**C**	**E**	**E**	**-**	**C**
	Level of Service	**C**	**C**	**-**	**F**	**E**	**E**	**-**	**F**
		F				**F**			
	Approach From	**NORTH**	**SOUTH**	**EAST**	**WEST**	**NORTH**	**SOUTH**	**EAST**	**WEST**
Bicycle	Bicycle Lane Arrangement on Approach	Mixed Traffic			Curb Bike Lane, Cycletrack or MUP	Pocket Bike Lane			Curb Bike Lane, Cycletrack or MUP
	Right Turn Lane Configuration	> 50 m			Not Applicable	≤ 50 m Introduced right turn lane			Not Applicable
	Right Turning Speed	>25 km/h			Not Applicable	≤ 25 km/h			Not Applicable
	Cyclist relative to RT motorists	**F**	**-**	**-**	**Not Applicable**	**B**	**-**	**-**	**Not Applicable**
	Separated or Mixed Traffic	**Mixed Traffic**	**-**	**-**	**Separated**	**Separated**	**Separated**	**-**	**Separated**
	Left Turn Approach		No lane crossed		2-stage, LT box		2-stage, LT box		2-stage, LT box
	Operating Speed		≥ 60 km/h		> 50 to < 60 km/h		≤ 40 km/h		≤ 40 km/h
	Left Turning Cyclist	**-**	**C**	**-**	**A**	**-**	**A**	**-**	**A**
	Level of Service	**F**	**C**	**-**	**A**	**B**	**A**	**-**	**A**
		F				**B**			
Transit	Average Signal Delay								
	Level of Service	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
		-				**-**			
Truck	Effective Corner Radius	> 15 m			> 15 m	> 15 m			10 - 15 m
	Number of Receiving Lanes on Departure from Intersection	≥ 2			1	1			≥ 2
	Level of Service	**A**	**-**	**-**	**C**	**C**	**-**	**-**	**B**
		C				**C**			
Auto	Volume to Capacity Ratio		0.0 - 0.60				0.71 - 0.80		
	Level of Service	**A**				**C**			

Appendix N

TDM Checklist

CGH TRANSPORTATION

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

Legend

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

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

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

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

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

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

TDM Measures Checklist **City of Ottawa**
Version 1.0 (30 June 2017)

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

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

Legend

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

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

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

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

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

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