

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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PN: 2022-162

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1 Screening

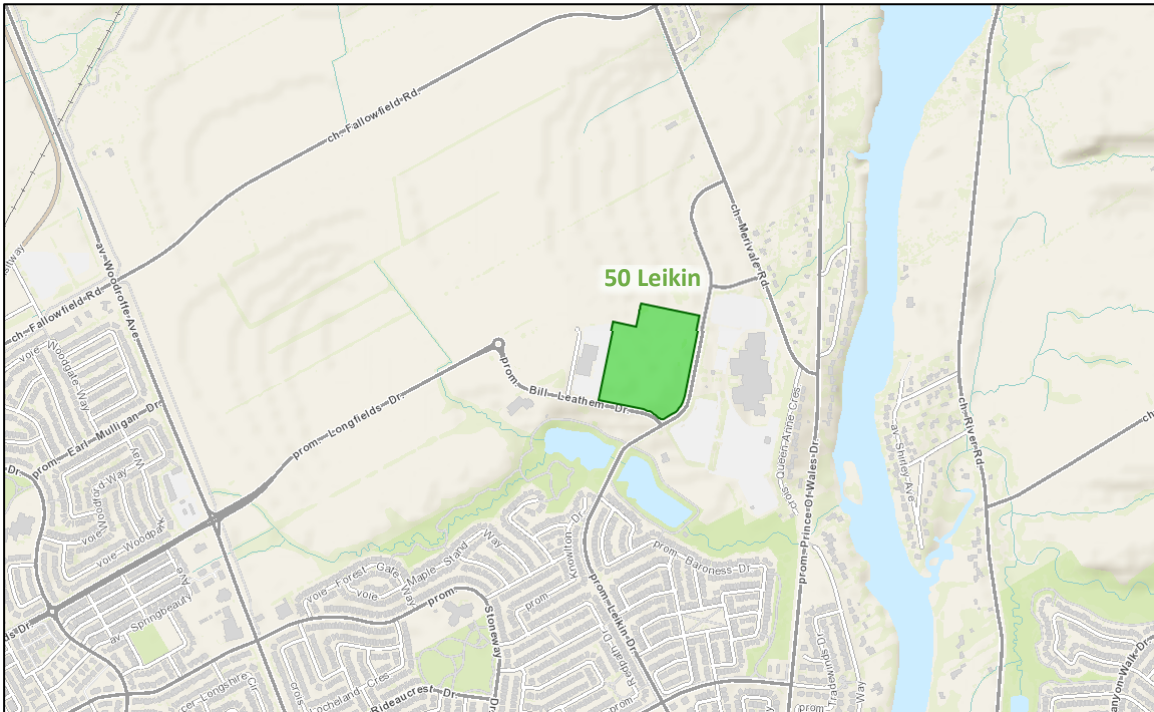
This study has been prepared according to the City of Ottawa’s 2017 Transportation Impact Assessment (TIA) Guidelines. Accordingly, a Step 1 Screening Form has been prepared and is included as Appendix A, along with the Certification Form for the TIA Study PM. As shown in the Screening Form, a TIA is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

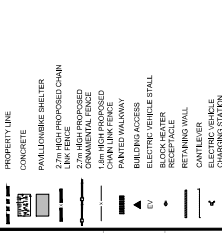
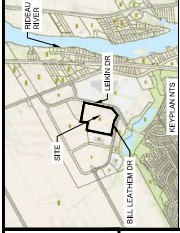
2.1 Proposed Development

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 362 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



PRELIMINARY DESIGN
 THESE DOCUMENTS ARE NOT COMPLETE AND SHOULD BE USED ONLY FOR REFERENCE. ANY CHANGES TO THE DESIGN DEVELOPMENT AND CONSTRUCTION SHALL BE ADVISED.

NO.	REVISION FOR CLIENT REVIEW	DATE	BY
1	ISSUED FOR CLIENT REVIEW		

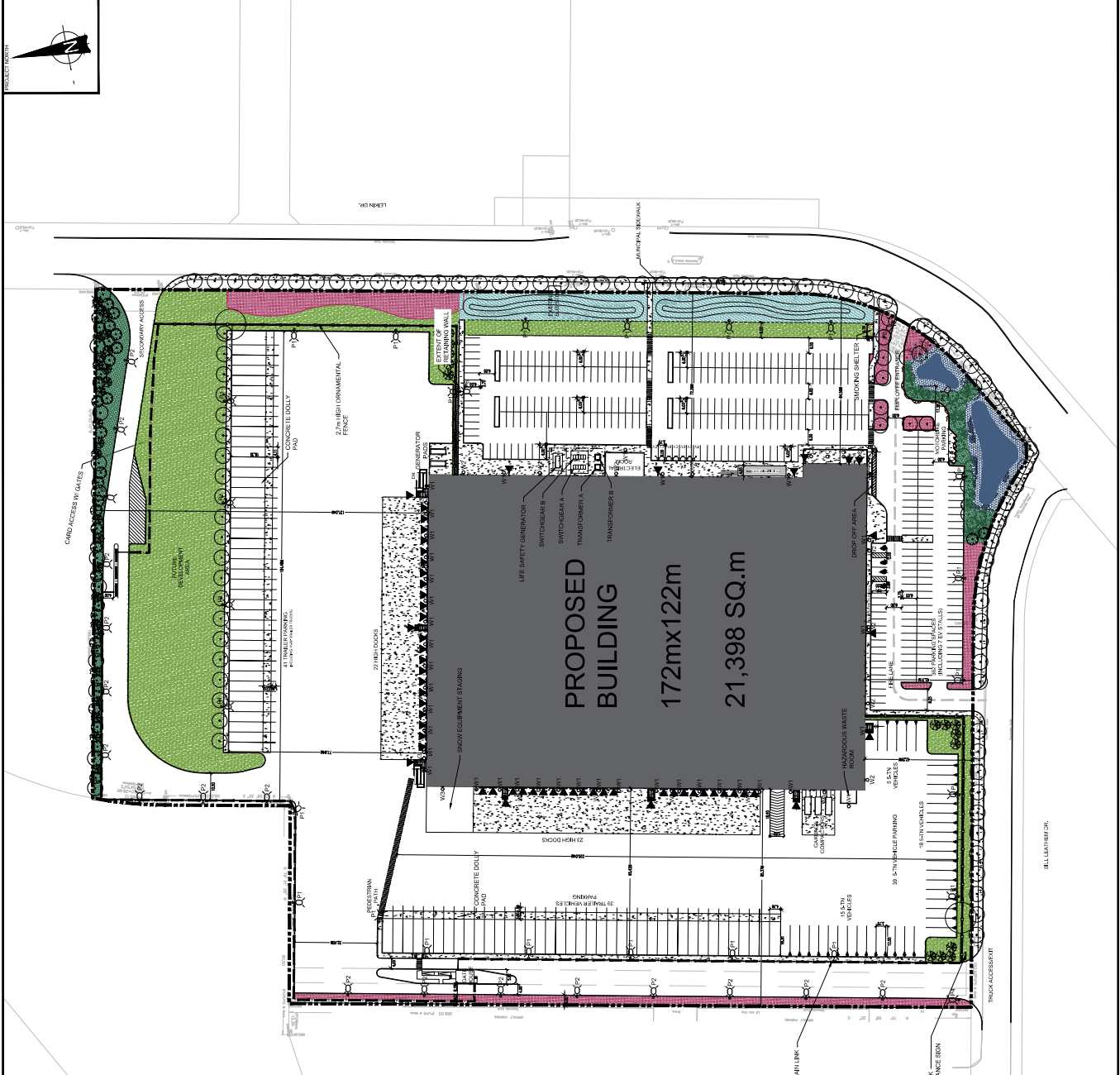
SCALE: 1/250
 DATE: 1/25/2024



PROJECT: CANADA POST CORPORATION
 OTTAWA PROCESSING CENTRE
 90 LEBLANC DRIVE
 OTTAWA, ONTARIO

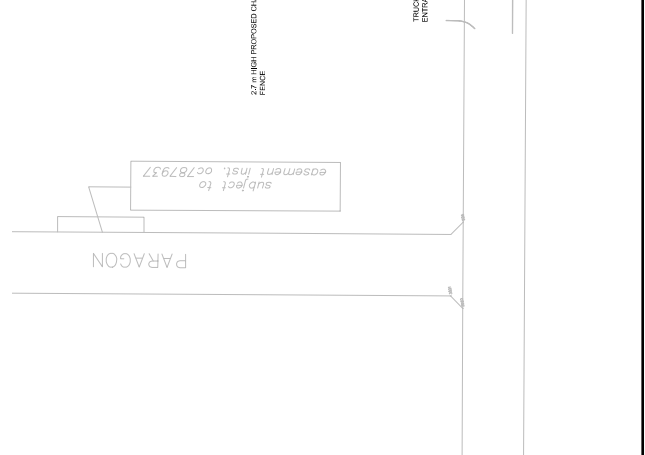
DESIGN: AMY	DATE: 1/25/2024
DRAWN: NAD	
CHECKED: LJ	
DATE: 3/28/2024	

SITE PLAN
 SP1



Zoning Provisions	Standards	Provided
Minimum Lot Area	3,000 sq. m.	90,720 sq. m.
Minimum Lot Width	50 m.	219 m.
Minimum Front Corner Side and Rear Yard Setback	6 m.	42.4 m (12.93 m) / 121.82 m.
Maximum Lot Coverage	60%	25.9%
Maximum Building Heights	22 m.	13.3 m.
Maximum Floor Space Index	2	.259
Minimum Width of Landscaped Area Abutting a Street	3 m.	3 m.
Minimum Landscaped Area in Parking Lots	15%	15%
Industrial Parking: per 100m of gfa - up to 5000 m2	8 (40 spaces)	40 Spaces
Industrial Parking: per 100m of gfa - over 5000 m2	4 (52 spaces)	52 Spaces
Office Parking: per 100m of gfa	2.4 (138 spaces)	138 Spaces

Type	Number
Regular Employee (inc. 11 Future EV)	355
EV	7
Sum of Total Employee Trailer	362
5-Ton Vehicle	80
	39



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.

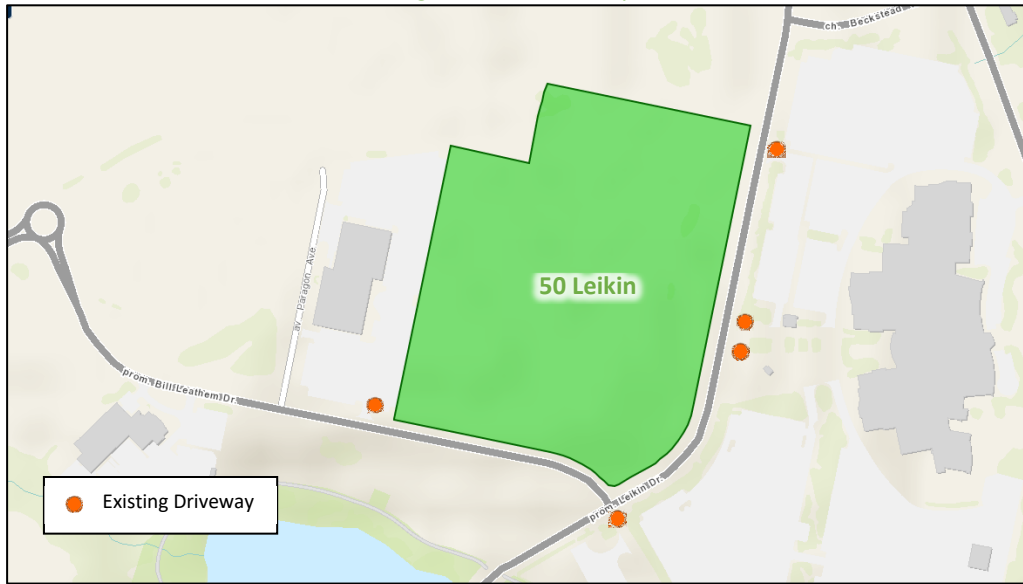
Prince of Wales Drive at Merivale Road

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



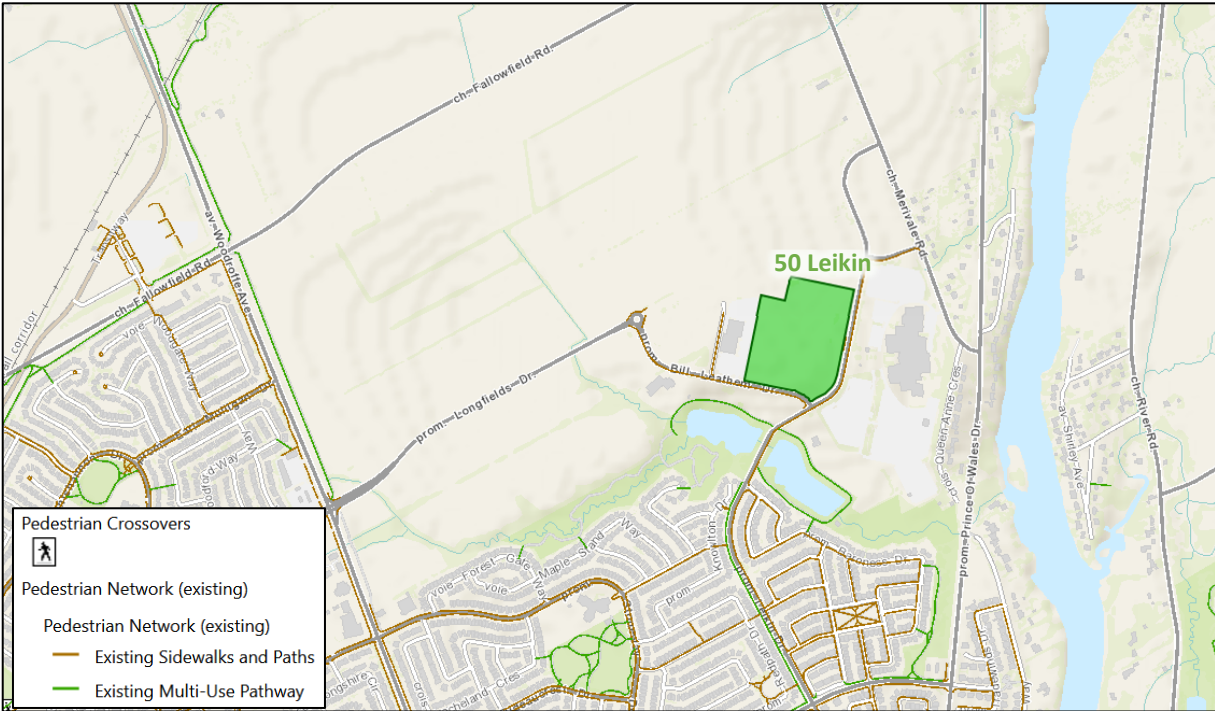
Source: <http://maps.ottawa.ca/geoOttawa/> Accessed: January 27, 2023

2.2.4 Cycling and Pedestrian Facilities

Sidewalks are provided along one side of Bill Leatham 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 Leatham Drive, and Leikin Drive are local routes.

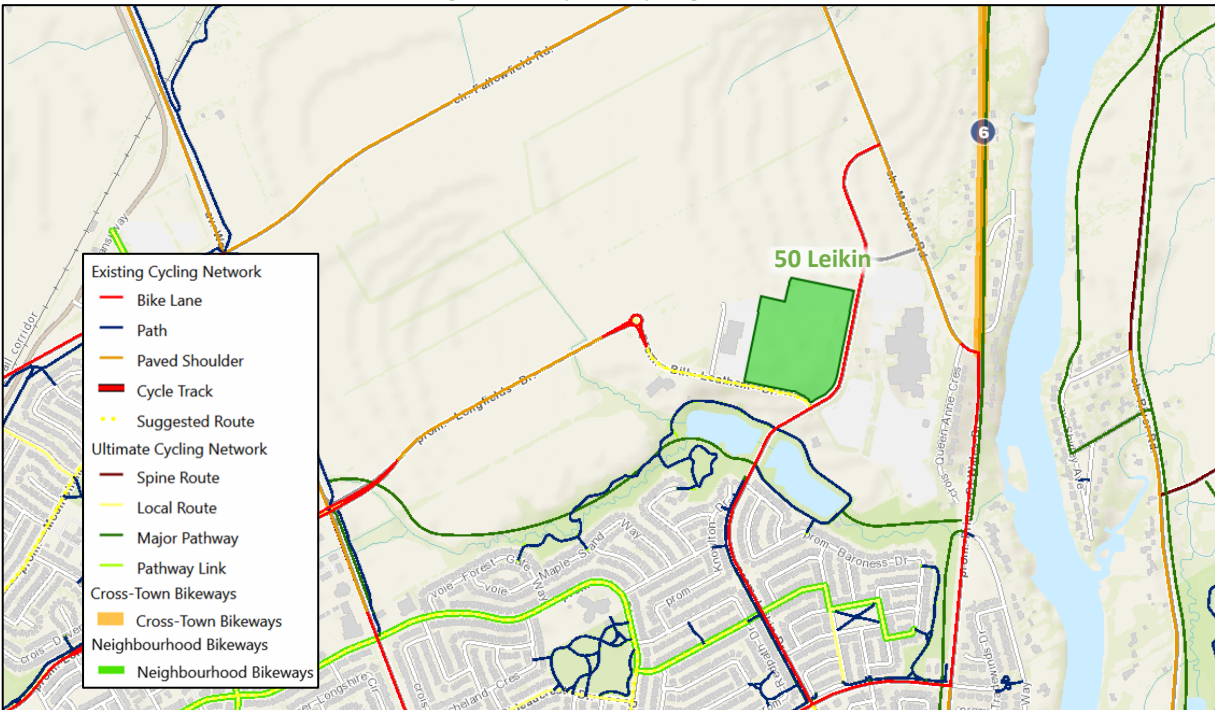
Figure 4 illustrates the pedestrian facilities in the study area and Figure 5 illustrates the cycling facilities. Pedestrian and cyclist volumes included in study area intersection counts, presented in Section 2.2.7, have been compiled and are illustrated in Figure 6 and Figure 7, respectively.

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

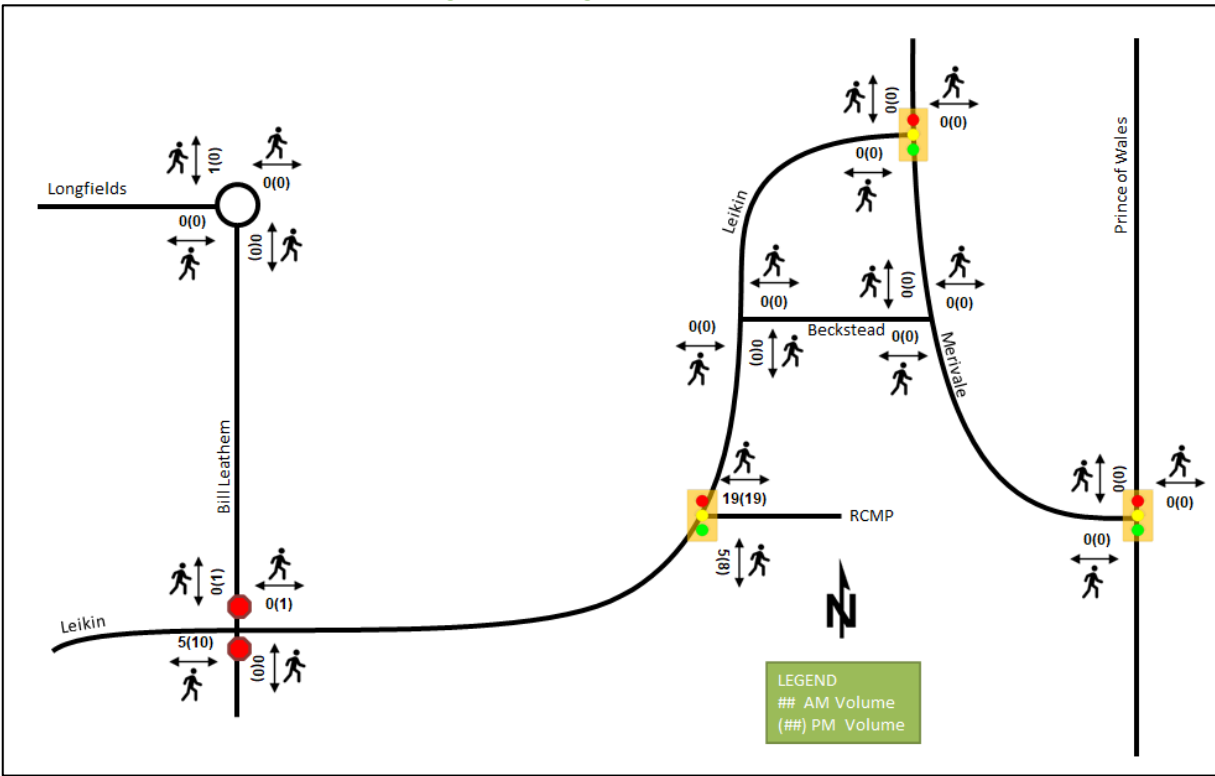
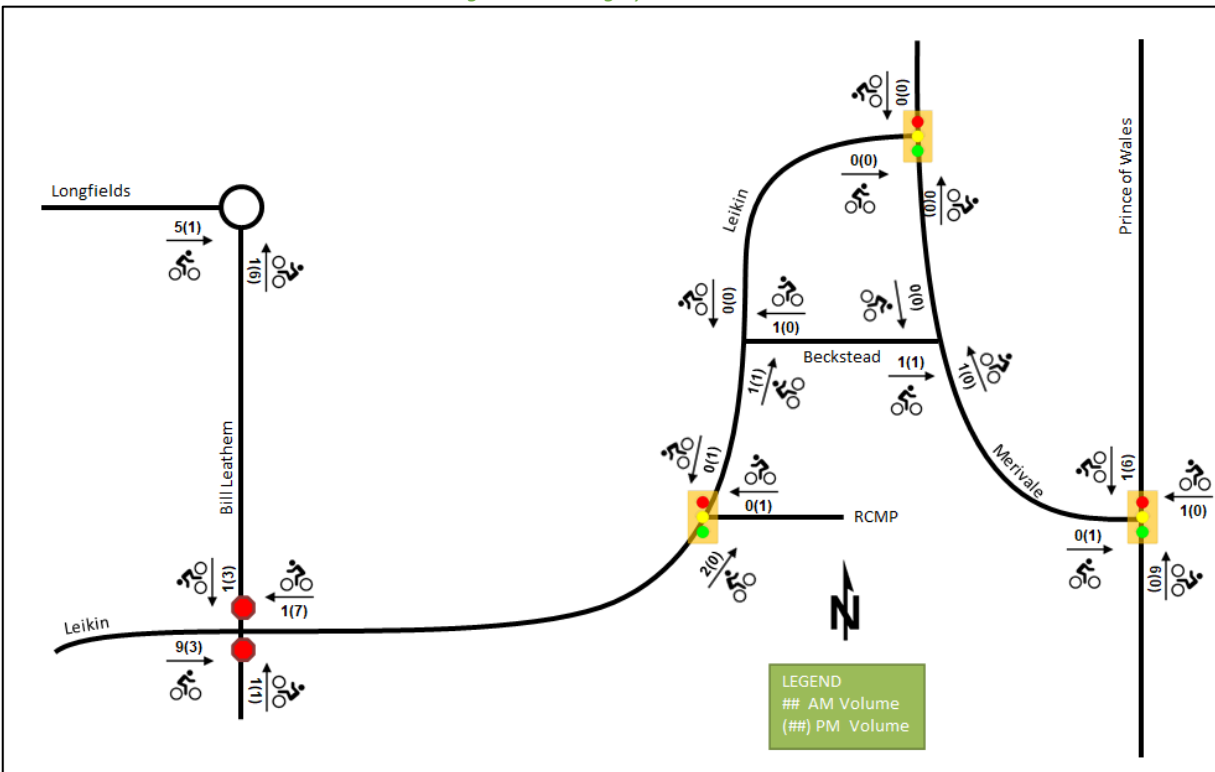


Figure 7: Existing Cyclist Volumes



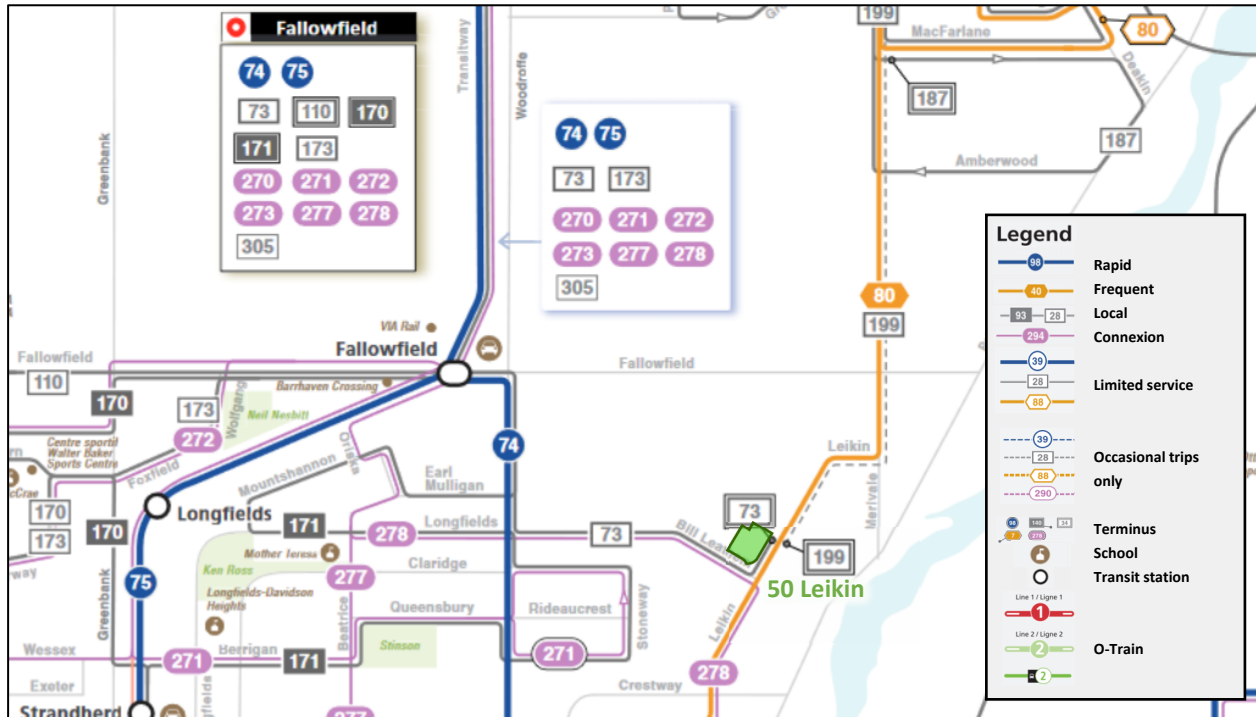
2.2.5 Existing Transit

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 Leatham Drive connecting to Fallowfield Station. The frequency of these routes within proximity of the proposed site based on January 30, 2023 service levels are:

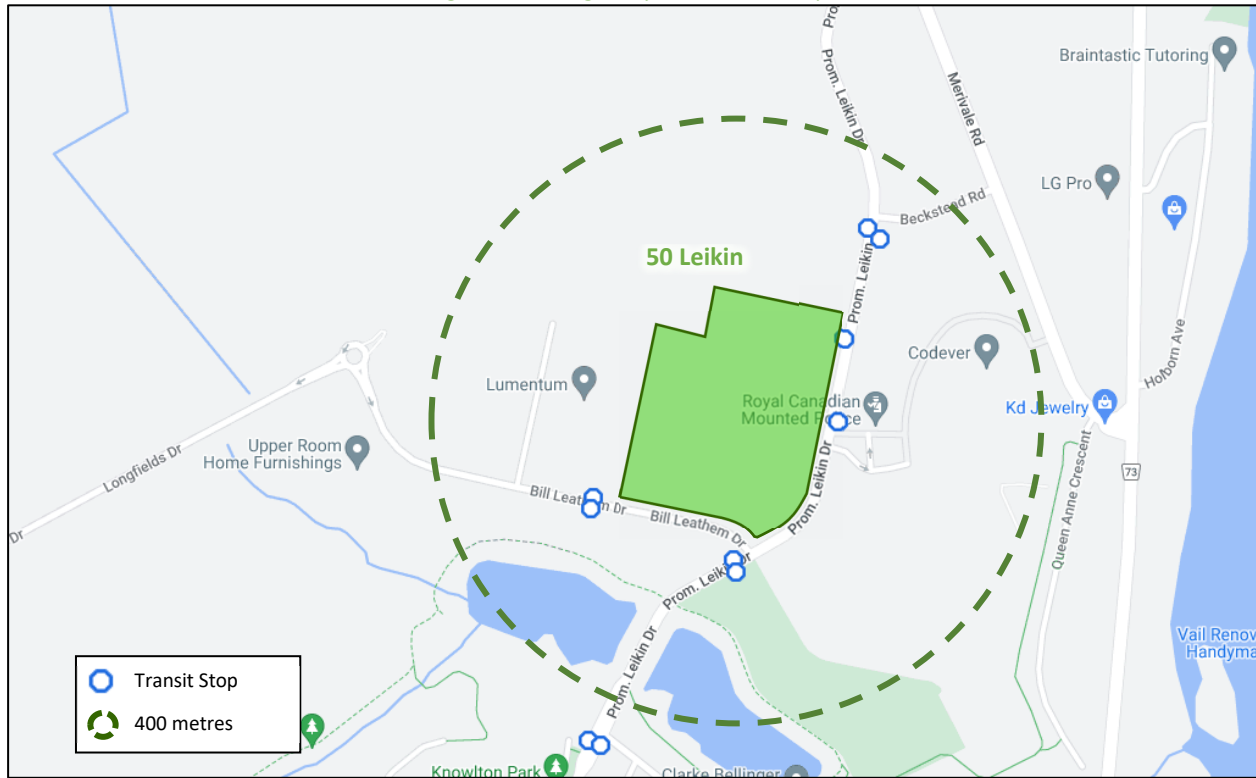
- Route # 73 – 30-minute service to the RCMP campus in the AM and from the RCMP campus in the PM, operating in the peak period/direction only
- Route # 80 – 30-minute service all day
- Route # 199 – Two buses to the RCMP campus in the AM peak period and two buses from the RCMP campus in the PM peak period
- 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 Leatham 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 Leatham 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 Leatham Drive at Longfields Drive	Tuesday, June 10, 2015	99 Bill Leatham 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 Leatham 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 Leatham 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 Leatham 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

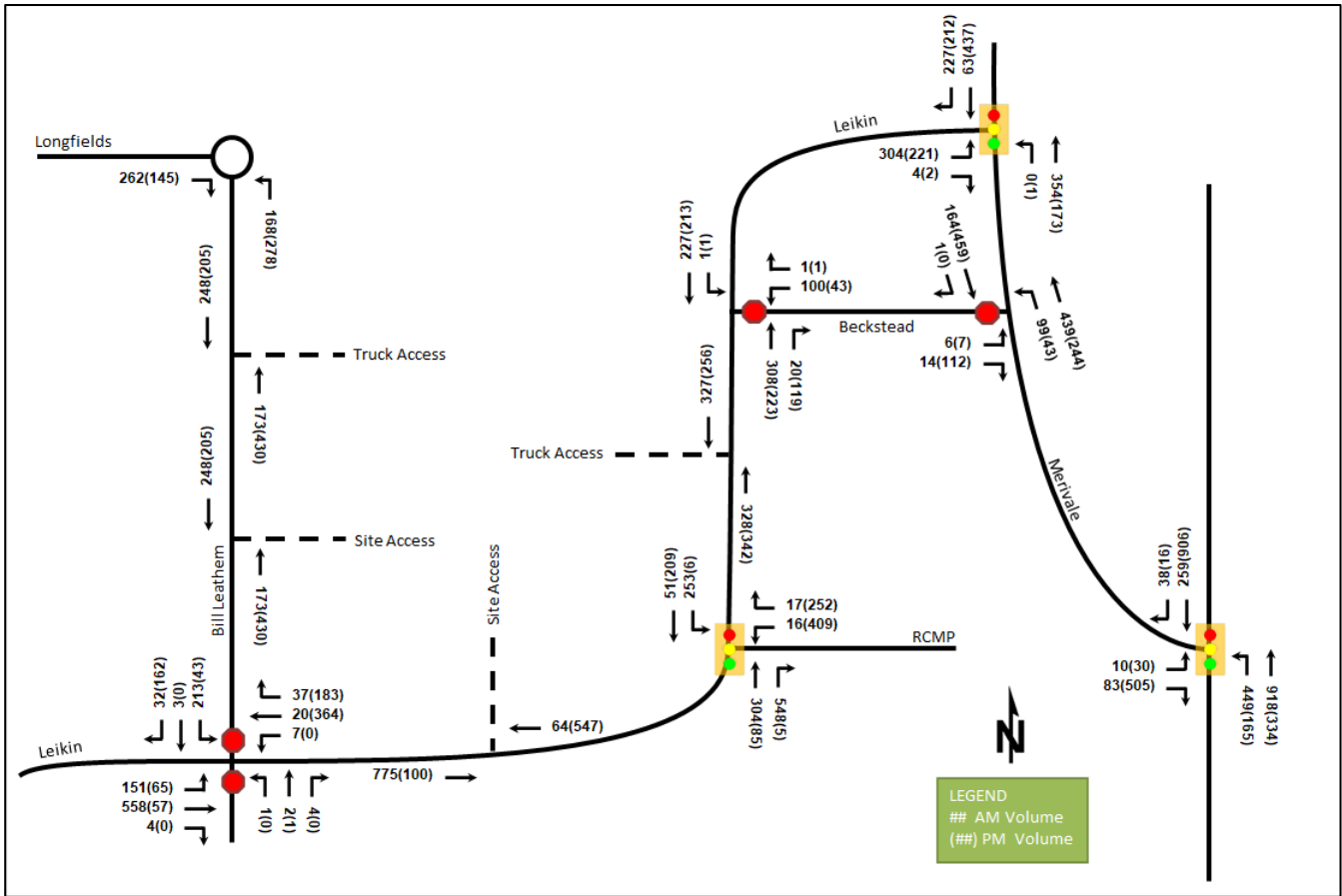


Table 2: Existing Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95 th)	LOS	V/C	Delay (s)	Q (95 th)
Merivale Rd & Leikin Dr <i>Signalized</i>	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 <i>Unsignalized</i>	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	-
Merivale Rd & Beckstead Rd	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

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95 th)	LOS	V/C	Delay (s)	Q (95 th)
Unsignalized	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 area 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		19	100%
Classification	Fatality	0	0%
	Non-Fatal Injury	5	26%
	Property Damage Only	14	74%
Initial Impact Type	Approaching	1	5%
	Angle	5	26%
	Rear end	3	16%
	Turning Movement	2	11%
	SMV Other	6	32%
	Other	2	11%
Road Surface Condition	Dry	5	26%
	Wet	8	42%
	Loose Snow	2	11%
	Ice	4	21%
Pedestrian Involved		0	0%
Cyclists Involved		0	0%

Figure 11: Study Area Collision Records

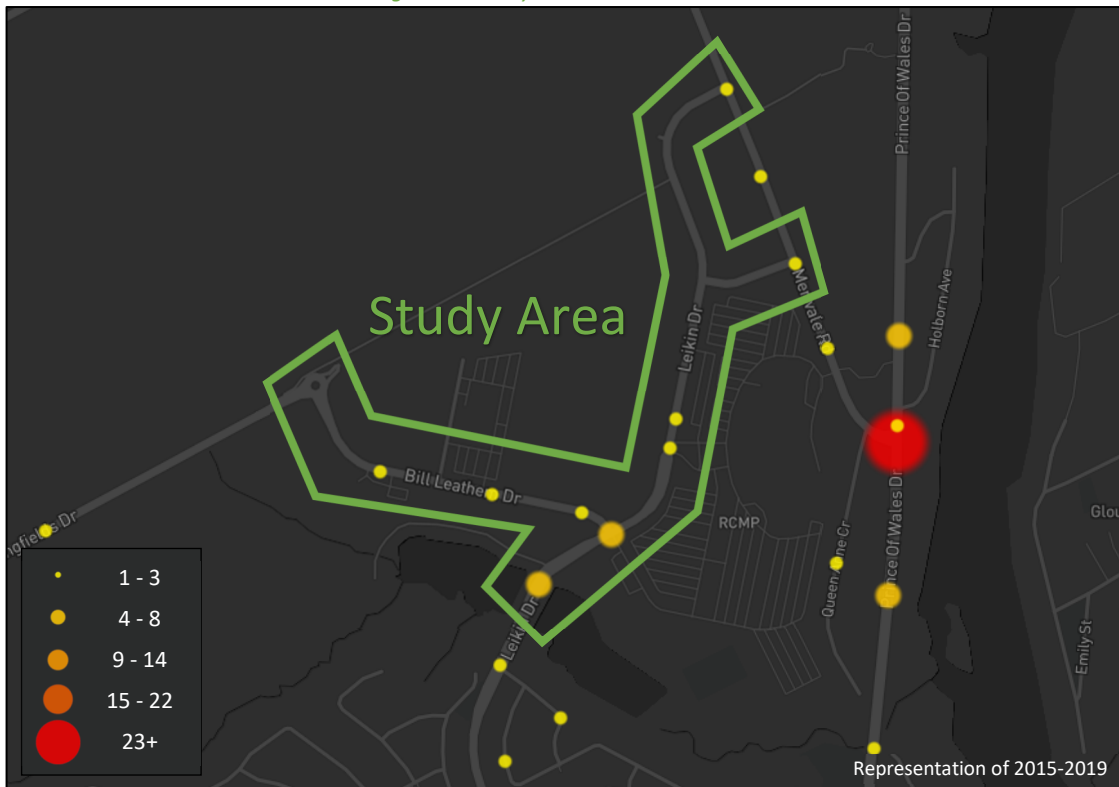


Table 4: Summary of Collision Locations, 2016-2020

Intersections / Segments	Number	%
Total Collisions	19	100%
Bill Leathem Drive @ Leikin Drive	6	32%
Leikin Drive between Beckstead Road & Bill Leathem Drive	3	16%
Bill Leathem Drive between the continuation of Bill Leathem Drive & Paragon Avenue	2	11%
Bill Leathem Drive between Paragon Avenue & the continuation of Bill Leathem Drive	2	11%

Intersections / Segments	Number	%
	19	100%
Leikin Drive @ Merivale Road	2	11%
Leikin Drive @ RCMP Access/150 N Of Bill Leathem Drive	2	11%
Leikin Drive between Holitzner Way & Crestway Drive	2	11%
Beckstead Road @ Merivale Road	1	5%
Bill Leathem Drive between the continuation of Bill Leathem Drive & Leikin Drive	1	5%

Within the study area, no locations are associated with high collisions. Study area collisions are most represented by SMV (other) with six collisions followed by angle with five collisions. Three of the angle collisions took place at the intersection of Bill Leathem Drive at Leikin Drive. No patterns are noted, no further review is required as part of this study, and no mitigation is required to address collisions within the study area.

2.3 Planned Conditions

2.3.1 Changes to the Area Transportation Network

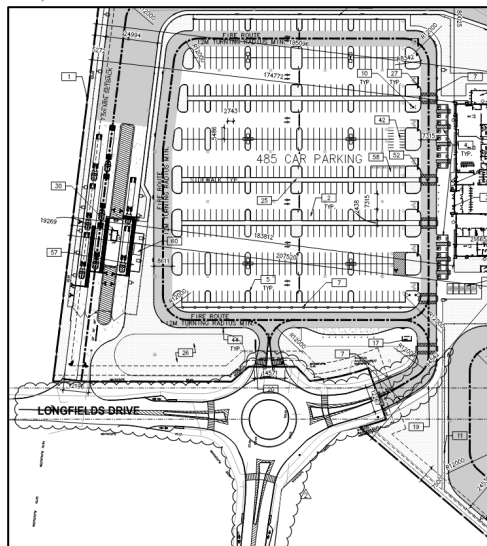
Within the Transportation Master Plan, the Road Network’s Network Concept diagram shows the widening of Prince of Wales Drive from Woodroffe Avenue to Fisher Avenue, and the widening of the section between Merivale Road and Fisher Avenue is included as a Phase 3 project (2026-2031) in the Affordable 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 5 summarizes the exemptions for this TIA.

Table 5: Exemption Review

Module	Element	Explanation	Exempt/Required
Design Review Component			
4.1 Development Design	4.1.2 Circulation and Access	Only required for site plans	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

Module	Element	Explanation	Exempt/Required
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 6. Site trucking traffic will comprise only vehicle trips, thus a 100% Auto Driver modal share will apply to that component.

Table 6: 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 7 summarizes the person trip rates for the facility employees and site trucks for each peak hour.

Table 7: 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 8 summarizes the person trip generation for each operational component.

Table 8: 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 9 summarizes the site trip generation by mode and peak hour.

Table 9: 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
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 10 below summarizes the distributions for the employees. Truck traffic will be distributed regionally and via truck routes.

Table 10: 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

To/From	Employees		Trucks	
	% of Trips	% of Trips	% of Trips	Via
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

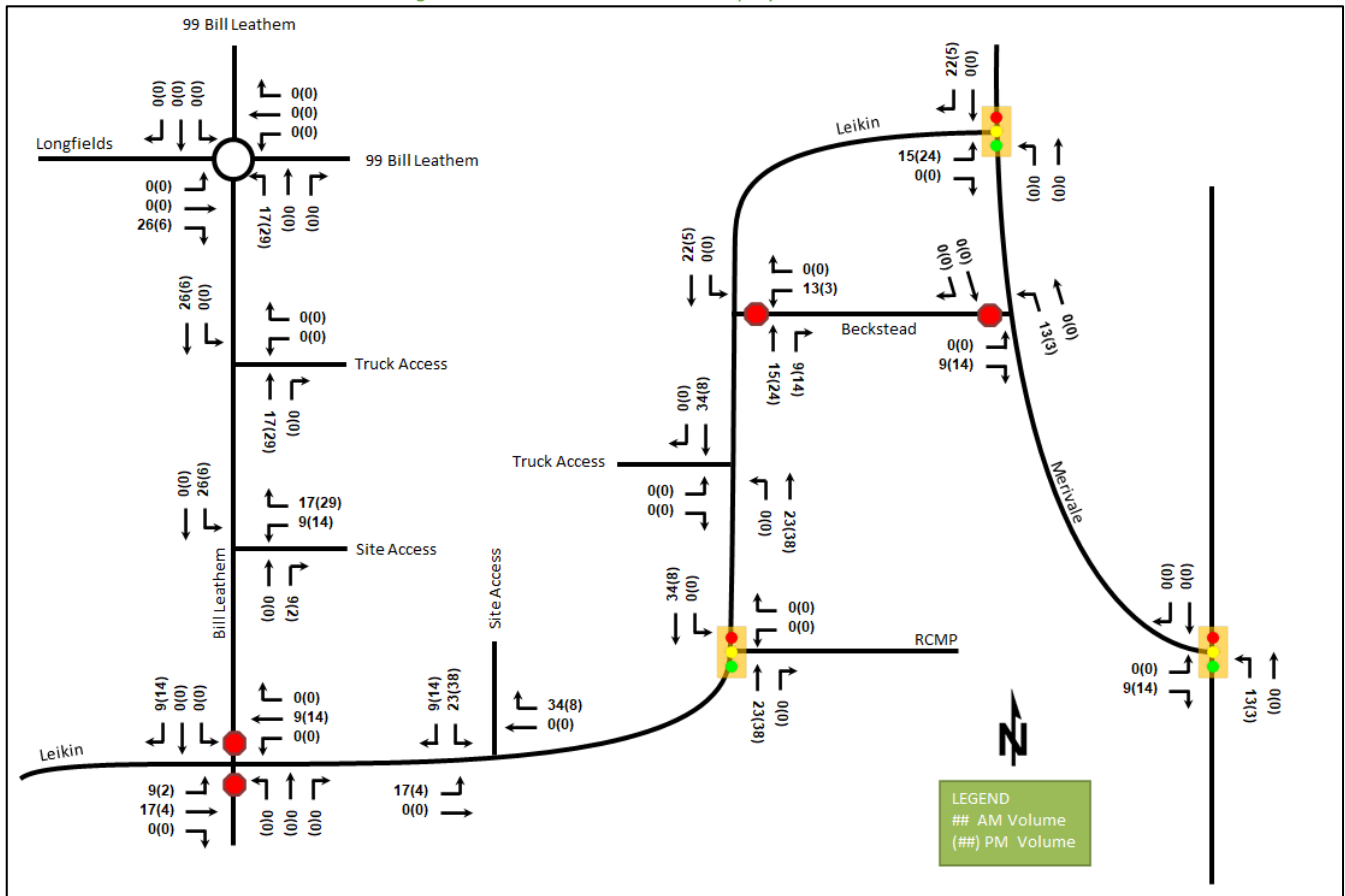
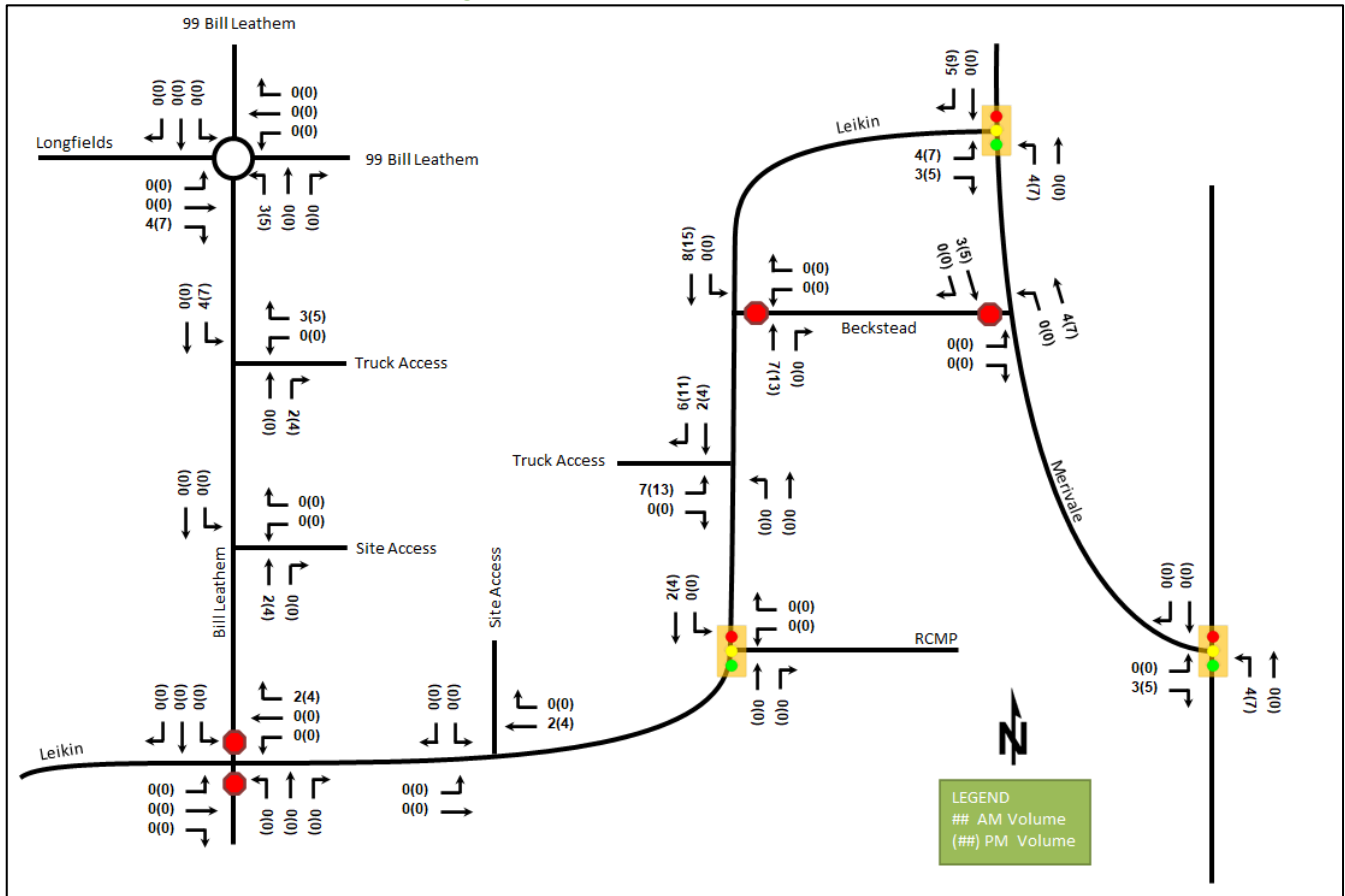


Figure 14: New Site Generation Truck Volumes



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 11 and the TRANS model plots are provided in Appendix G.

Table 11: 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 12.

Table 12: 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 13 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

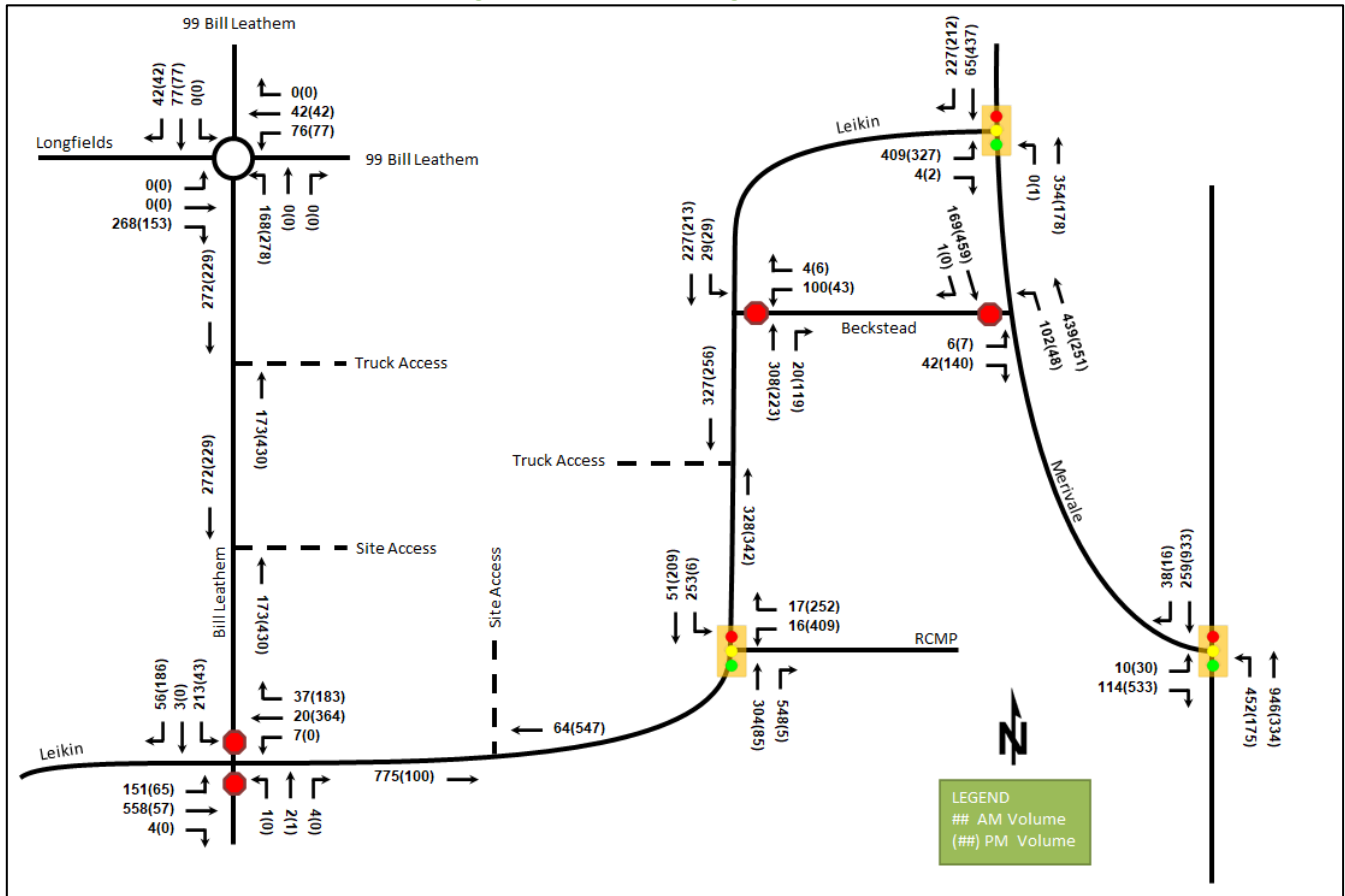


Table 13: 2026 Future Background Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95 th)	LOS	V/C	Delay (s)	Q (95 th)
Bill Leatham 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 (95 th)	LOS	V/C	Delay (s)	Q (95 th)
Merivale Rd & Beckstead Rd <i>Unsignalized</i>	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 <i>Signalized</i>	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 Leatham Dr & Leikin Dr <i>Unsignalized</i>	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 <i>Signalized</i>	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 14 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 Leatham 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

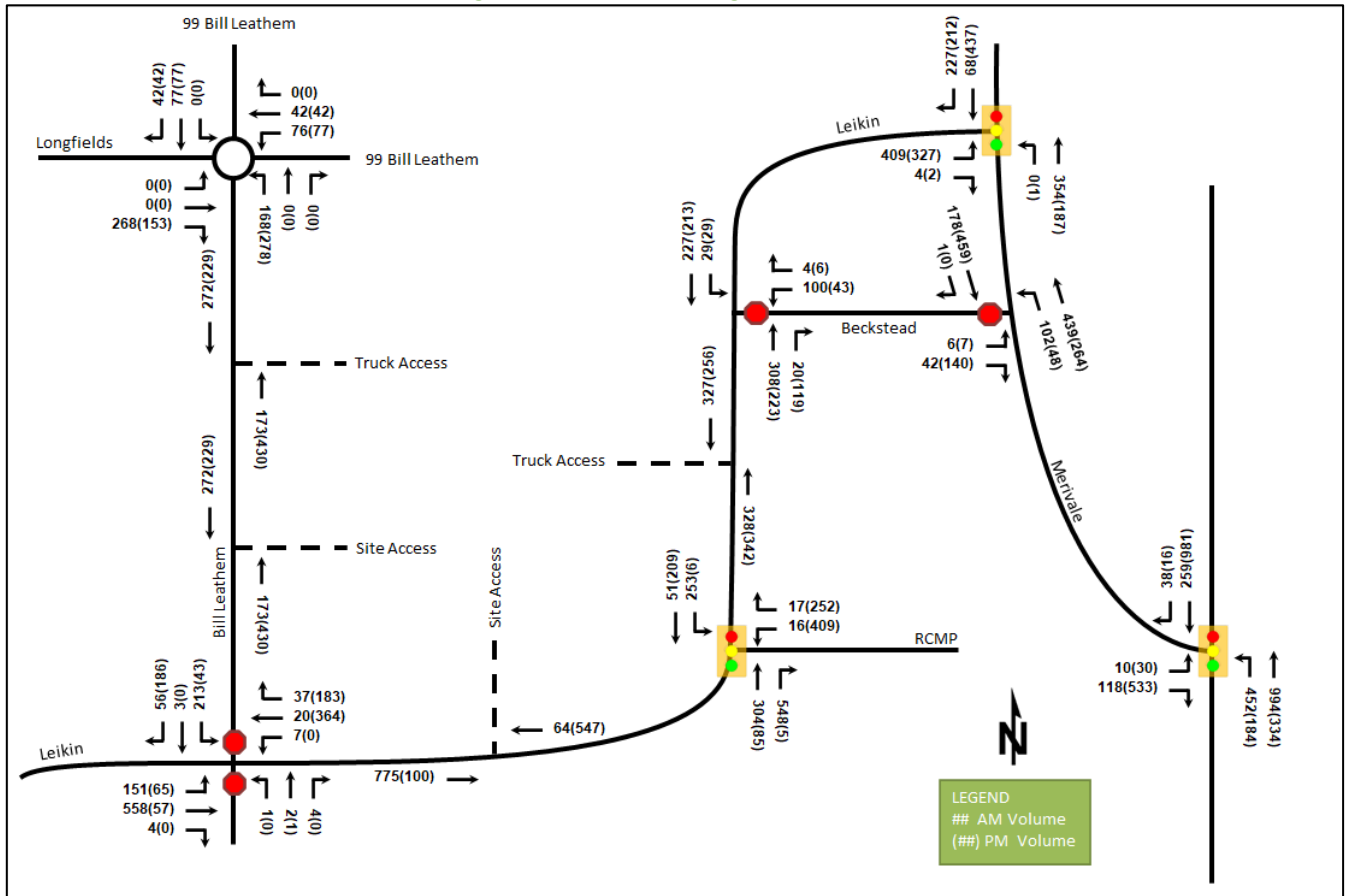


Table 14: 2031 Future Background Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95 th)	LOS	V/C	Delay (s)	Q (95 th)
Bill Leatham 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 (95 th)	LOS	V/C	Delay (s)	Q (95 th)
Merivale Rd & Beckstead Rd <i>Unsignalized</i>	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 <i>Signalized</i>	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 Leatham Dr & Leikin Dr <i>Unsignalized</i>	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 <i>Signalized</i>	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 15 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 Leatham 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

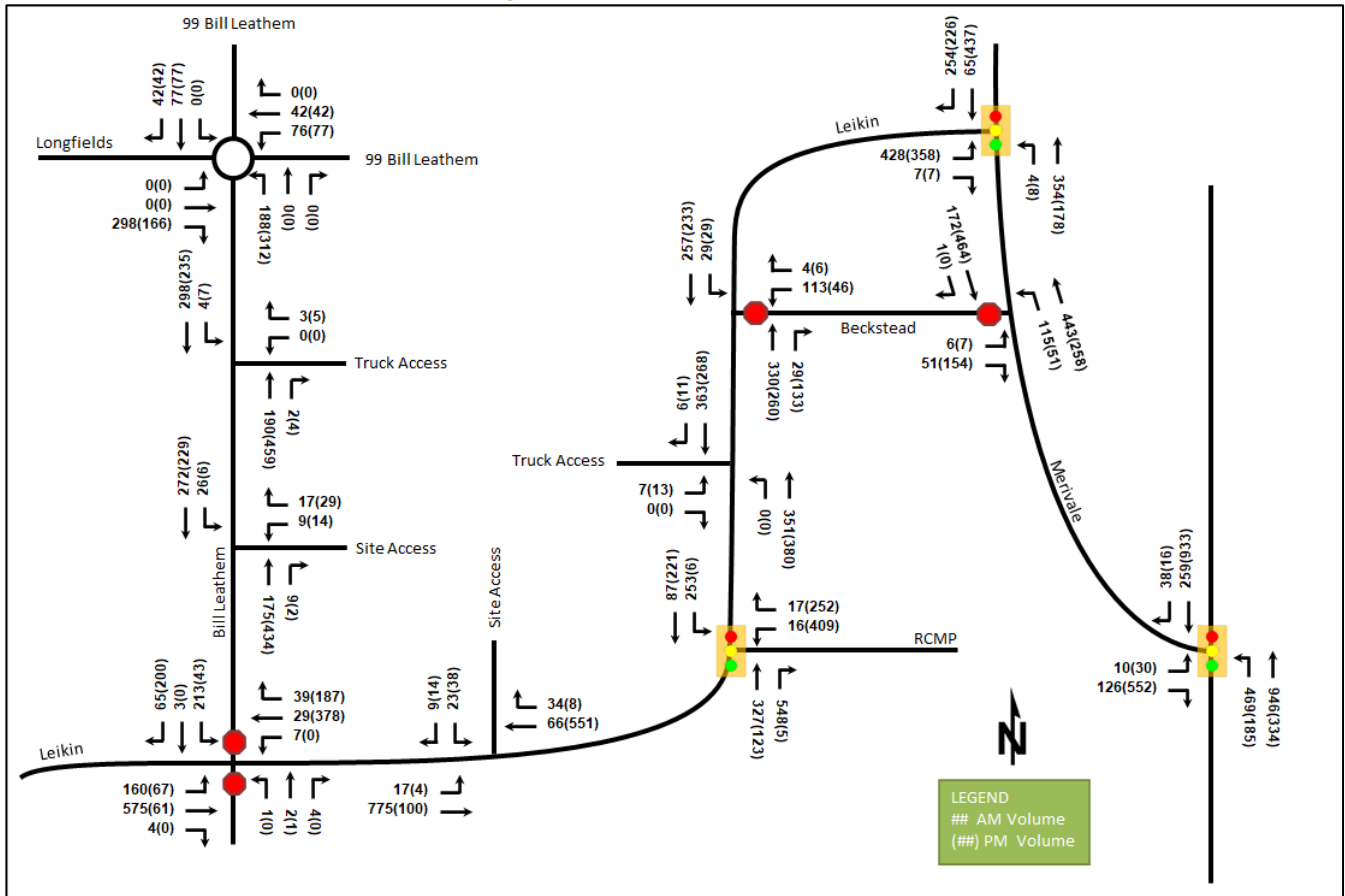


Table 15: 2026 Future Total Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95 th)	LOS	V/C	Delay (s)	Q (95 th)
Bill Leatham 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 (95 th)	LOS	V/C	Delay (s)	Q (95 th)
Merivale Rd & Beckstead Rd <i>Unsignalized</i>	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 <i>Signalized</i>	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 Leatham Dr & Leikin Dr <i>Unsignalized</i>	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 <i>Signalized</i>	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 Leatham Dr & Site Trucks <i>Unsignalized</i>	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 Leatham Dr & Site Employees <i>Unsignalized</i>	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 <i>Unsignalized</i>	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 <i>Unsignalized</i>	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 16 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

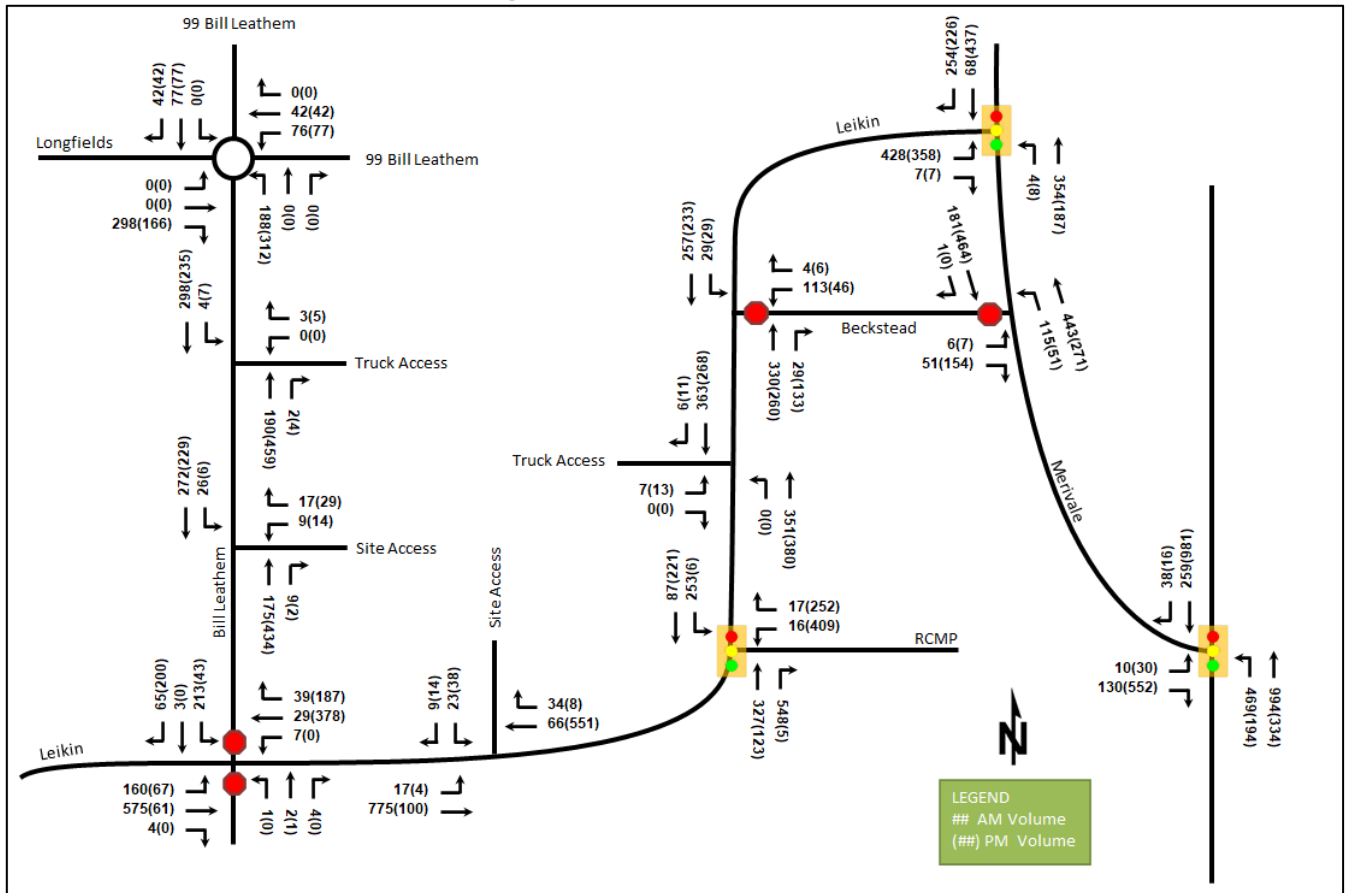


Table 16: 2031 Future Total Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95 th)	LOS	V/C	Delay (s)	Q (95 th)
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 (95 th)	LOS	V/C	Delay (s)	Q (95 th)
Bill Leatham Dr & Site Trucks <i>Unsignalized</i>	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 Leatham Dr & Site Employees <i>Unsignalized</i>	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 <i>Unsignalized</i>	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 <i>Unsignalized</i>	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 Leatham 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 17 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 17: 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 (95 th)	LOS	V/C	Delay (s)	Q (95 th)
Bill Leathem Dr & Leikin Dr <i>Unsignalized</i>	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 362 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 18 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 18: 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 intersect 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.

Access is 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 19 summarizes the transit trip generation.

Table 19: 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 20 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 20: 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 362 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, no locations are associated with high collisions
- During the AM peak hour, the southbound movement at the intersection of Bill Leathem Drive at Leikin Drive is over theoretical capacity, and the 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 362 vehicle parking space
- 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

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 licensed¹ or registered² professional in good standing, whose field of expertise [check appropriate field(s)] is either transportation engineering or transportation planning .

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


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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Fax: 613-560-6006

Ville d'Ottawa
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

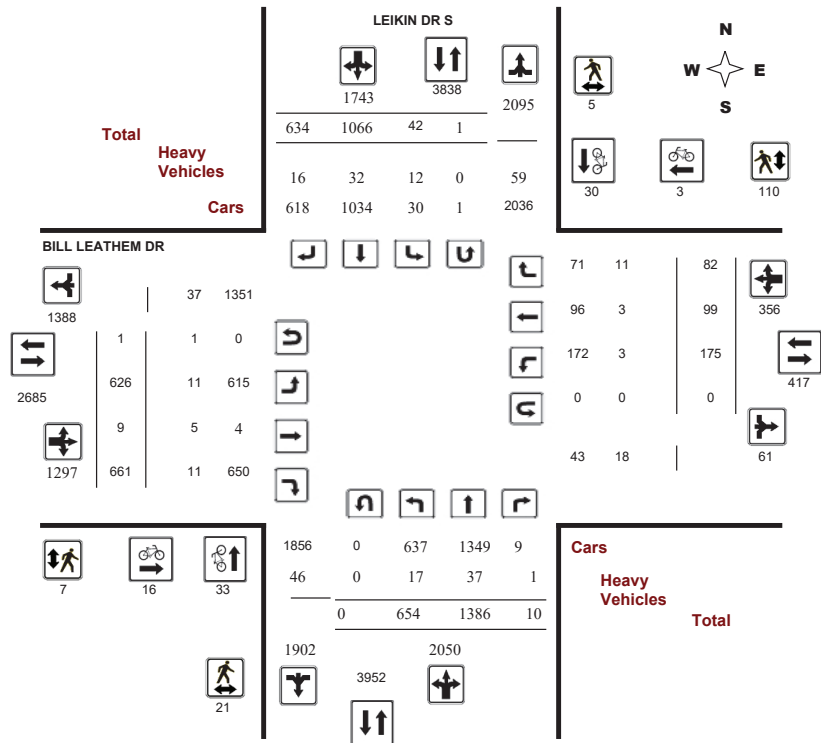
Survey Date: Wednesday, June 12, 2019

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

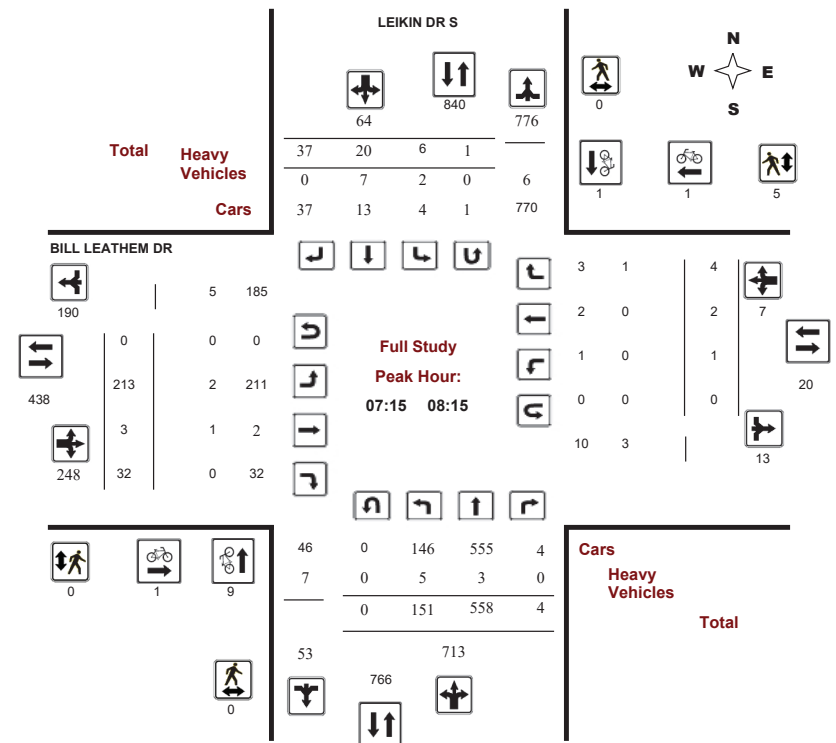
Survey Date: Wednesday, June 12, 2019

WO No: 38659

Start Time: 07:00

Device: Miovision

Full Study Peak Hour Diagram





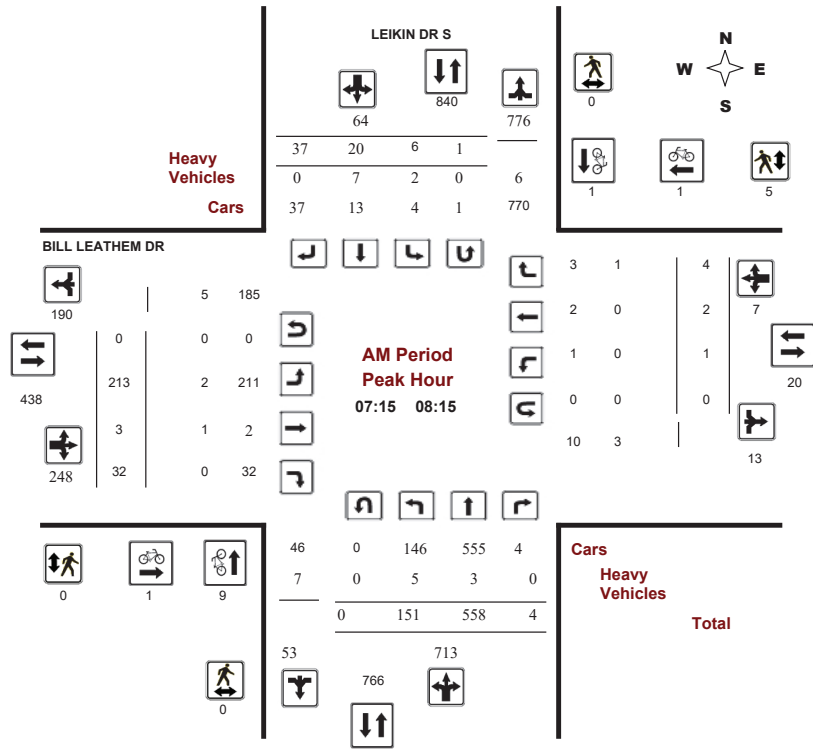
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BILL LEATHEM DR @ LEIKIN DR S

Survey Date: Wednesday, June 12, 2019
Start Time: 07:00

WO No: 38659
Device: Miovision



Comments



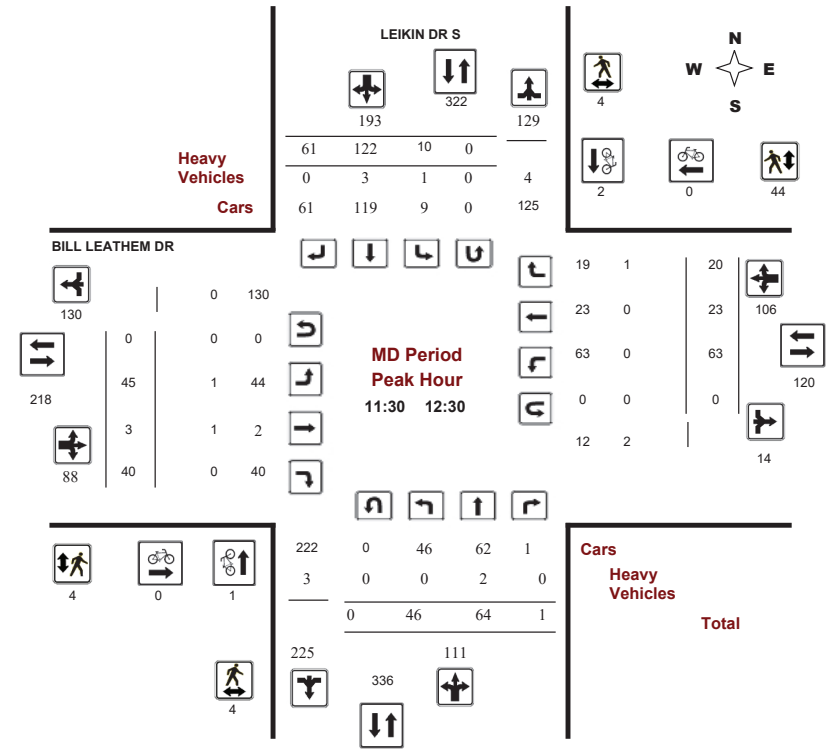
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BILL LEATHEM DR @ LEIKIN DR S

Survey Date: Wednesday, June 12, 2019
Start Time: 07:00

WO No: 38659
Device: Miovision



Comments



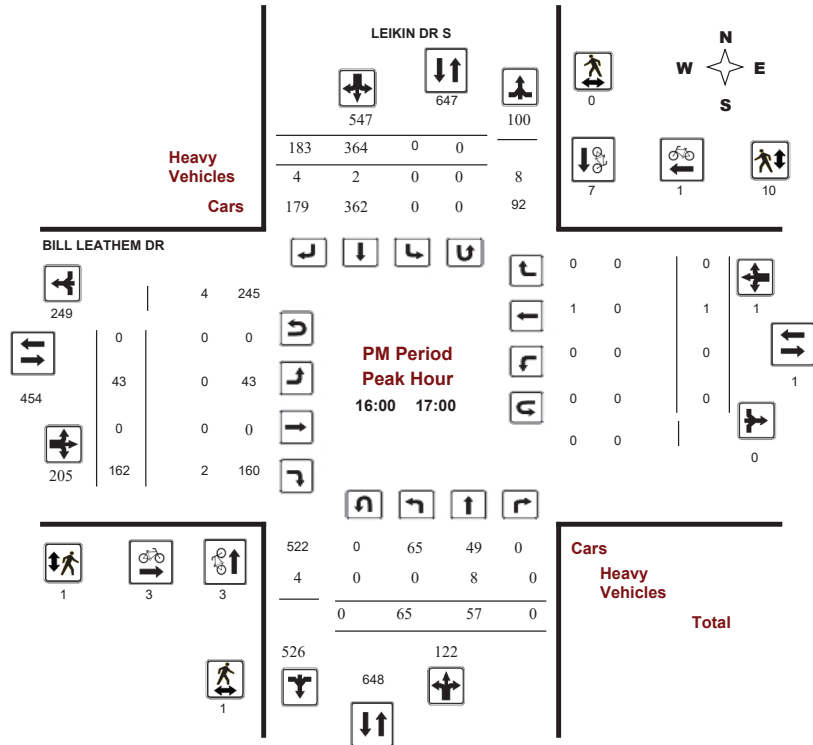
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BILL LEATHEM DR @ LEIKIN DR S

Survey Date: Wednesday, June 12, 2019
Start Time: 07:00

WO No: 38659
Device: Miovision



Comments



Transportation Services - Traffic Services

Turning Movement Count - Study Results

BILL LEATHEM DR @ LEIKIN DR S

Survey Date: Wednesday, June 12, 2019
Start Time: 07:00

WO No: 38659
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

Period	LEIKIN DR S								BILL LEATHEM DR								WB TOT	STR TOT	Grand Total
	Northbound				Southbound				Eastbound				Westbound						
	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT			
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

Table with columns for Time Period, Northbound, Southbound, Eastbound, Westbound, and Grand Total. Rows show 15-minute intervals from 07:00 to 18:00.

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

Table with columns for Time Period, Northbound, Southbound, Street Total, Eastbound, Westbound, Street Total, and Grand Total. Rows show 15-minute intervals from 07:00 to 18:00.



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

Table with columns: 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. Rows show pedestrian counts from 07:00 to 18:00.



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

Table with columns: Time Period, Northbound (LT, ST, RT, N TOT), Southbound (LT, ST, RT, S TOT, STR TOT), Eastbound (LT, ST, RT, E TOT), Westbound (LT, ST, RT, W TOT, STR TOT), Grand Total. Rows show heavy vehicle counts from 07:00 to 18:00.



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

LEIKIN DR S

BILL LEATHEM 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	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

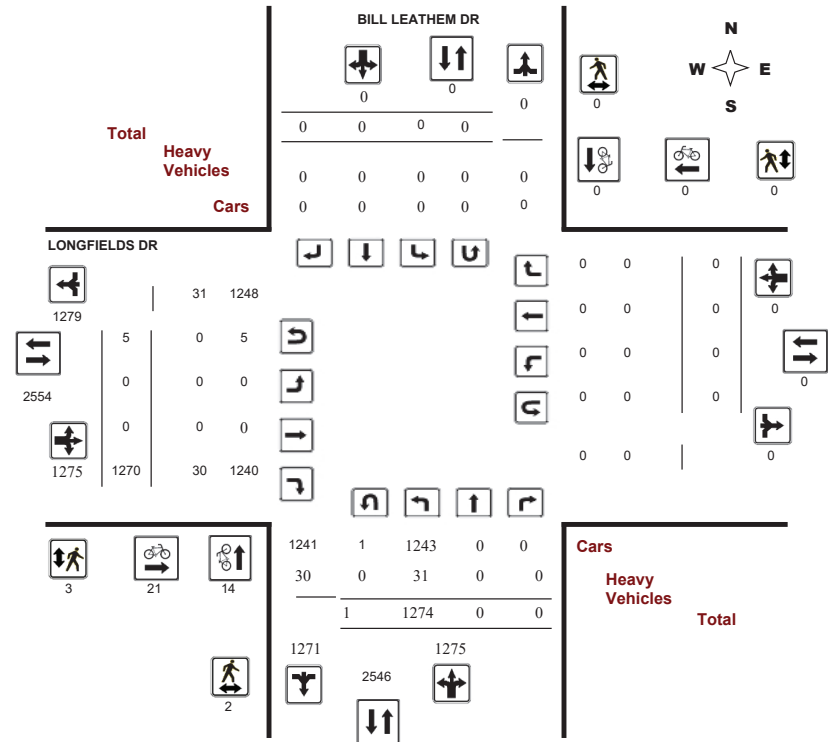
Survey Date: Wednesday, June 10, 2015

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

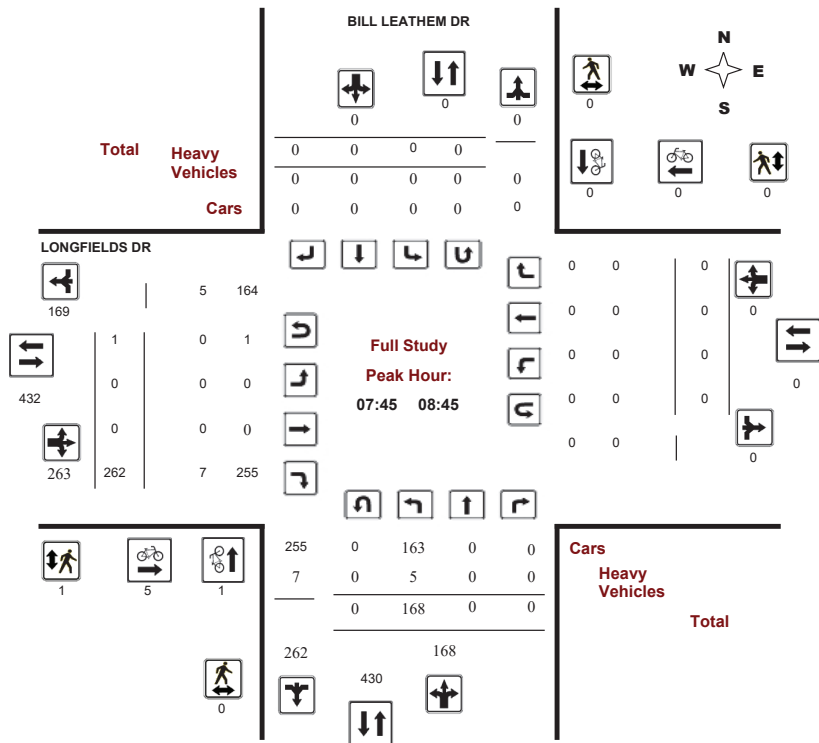
Survey Date: Wednesday, June 10, 2015

WO No: 35082

Start Time: 07:00

Device: Miovision

Full Study Peak Hour Diagram



Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

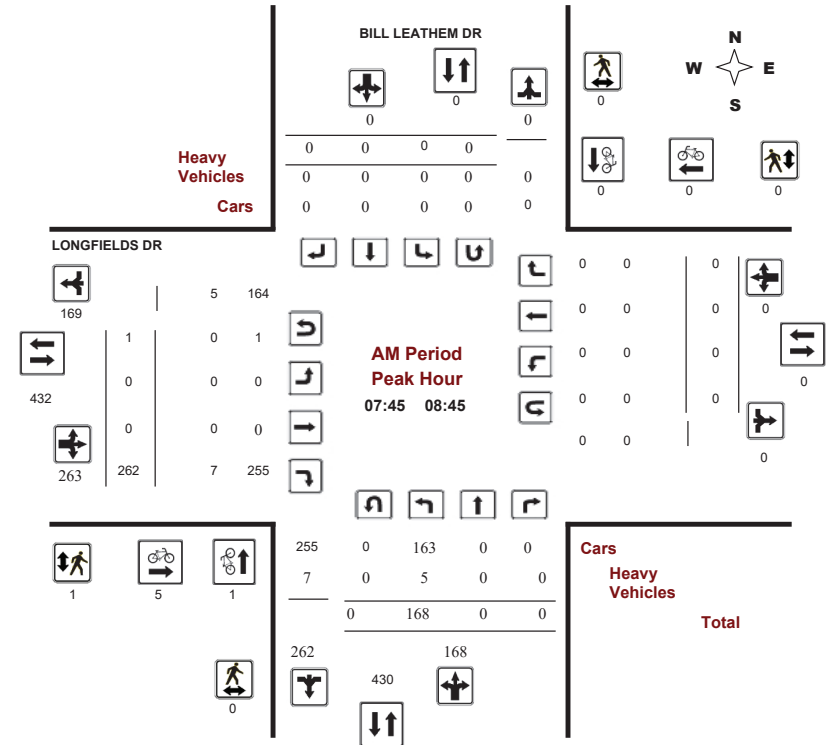
BILL LEATHEM DR @ LONGFIELDS DR

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

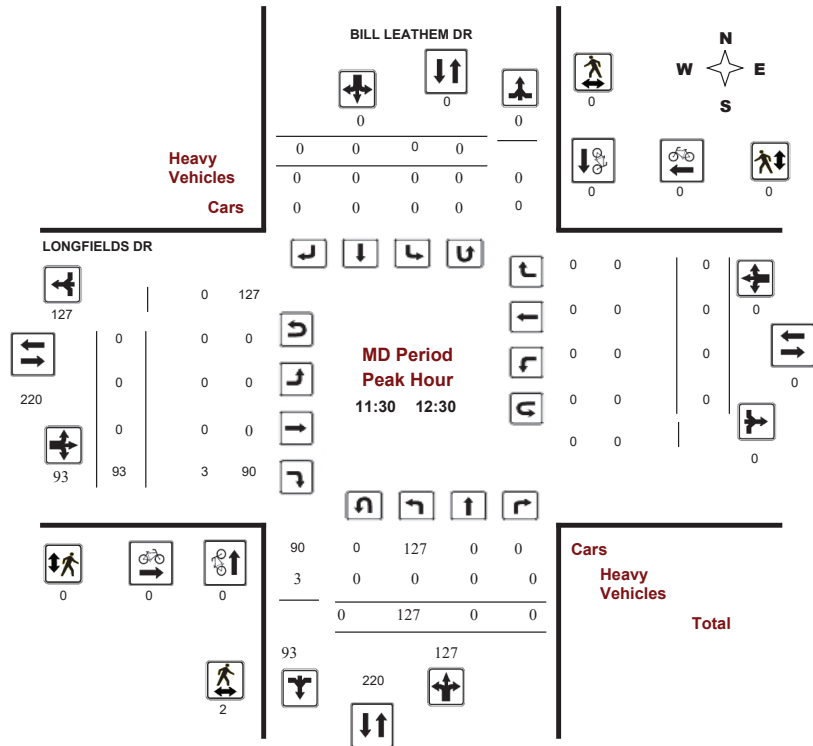
BILL LEATHEM DR @ LONGFIELDS DR

Survey Date: Wednesday, June 10, 2015

Start Time: 07:00

WO No: 35082

Device: Miovision



Comments



Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

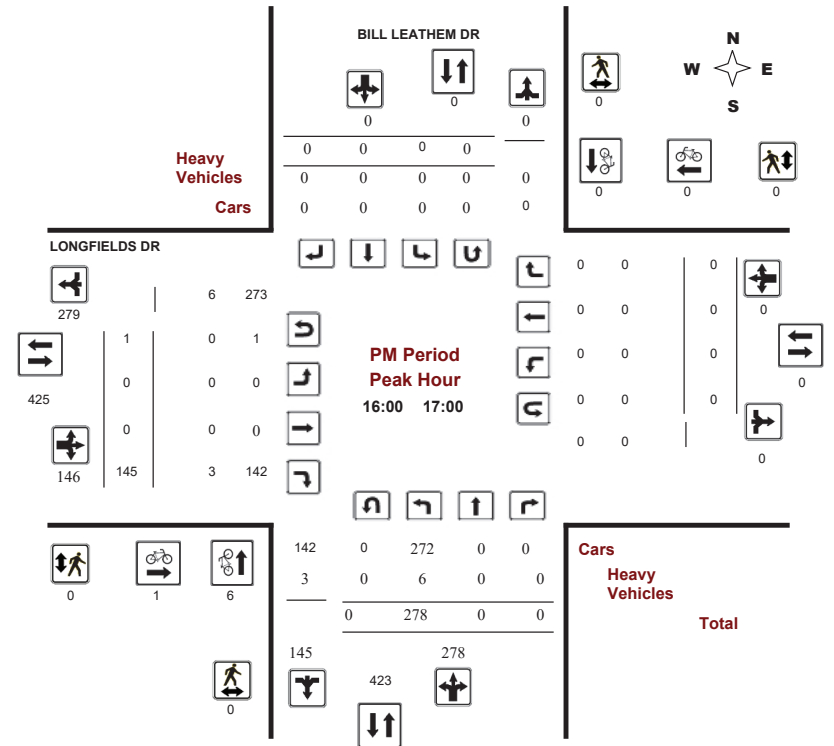
BILL LEATHEM DR @ LONGFIELDS DR

Survey Date: Wednesday, June 10, 2015

Start Time: 07:00

WO No: 35082

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 AADT Factor
Northbound: 1 Southbound: 0 Eastbound: 5 Westbound: 0 .90

Table with columns for Period, Northbound (LT, ST, RT, NB TOT), Southbound (LT, ST, RT, SB TOT), Eastbound (LT, ST, RT, EB TOT), Westbound (LT, ST, RT, WB TOT), STR TOT, Grand Total. Includes sub-totals for U Turns, EQ 12Hr, and AVG 24Hr.



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

Table with columns for Time Period, Northbound (LT, ST, RT, N TOT), Southbound (LT, ST, RT, S TOT), Eastbound (LT, ST, RT, E TOT), Westbound (LT, ST, RT, W TOT), STR TOT, Grand Total. Shows 15-minute increments from 07:00 to 17:45.

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			LONGFIELDS DR			Grand Total
	Northbound	Southbound	Street Total	Eastbound	Westbound	Street 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			LONGFIELDS DR			Total	Grand Total
	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		
07:00 07:15	0	0	0	0	0	0	0	0
07:15 07:30	0	0	0	0	0	0	0	0
07:30 07:45	0	0	0	0	0	0	0	0
07:45 08:00	0	0	0	0	0	0	0	0
08:00 08:15	0	0	0	0	0	0	0	0
08:15 08:30	0	0	0	0	0	0	0	0
08:30 08:45	0	0	0	1	0	1	1	1
08:45 09:00	0	0	0	0	0	0	0	0
09:00 09:15	0	0	0	0	0	0	0	0
09:15 09:30	0	0	0	0	0	0	0	0
09:30 09:45	0	0	0	0	0	0	0	0
09:45 10:00	0	0	0	0	0	0	0	0
11:30 11:45	0	0	0	0	0	0	0	0
11:45 12:00	0	0	0	0	0	0	0	0
12:00 12:15	1	0	1	0	0	0	1	1
12:15 12:30	1	0	1	0	0	0	1	1
12:30 12:45	0	0	0	0	0	0	0	0
12:45 13:00	0	0	0	1	0	1	1	1
13:00 13:15	0	0	0	1	0	1	1	1
13:15 13:30	0	0	0	0	0	0	0	0
15:00 15:15	0	0	0	0	0	0	0	0
15:15 15:30	0	0	0	0	0	0	0	0
15:30 15:45	0	0	0	0	0	0	0	0
15:45 16:00	0	0	0	0	0	0	0	0
16:00 16:15	0	0	0	0	0	0	0	0
16:15 16:30	0	0	0	0	0	0	0	0
16:30 16:45	0	0	0	0	0	0	0	0
16:45 17:00	0	0	0	0	0	0	0	0
17:00 17:15	0	0	0	0	0	0	0	0
17:15 17:30	0	0	0	0	0	0	0	0
17:30 17:45	0	0	0	0	0	0	0	0
17:45 18:00	0	0	0	0	0	0	0	0
Total	2	0	2	3	0	3	5	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										Grand Total				
Northbound			Southbound			Eastbound			Westbound			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						
07:00	07:15	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	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	4			
07:30	07:45	1	0	0	1	0	0	0	0	1	0	0	1	1	0	0	0	0	1	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	1			
08:00	08:15	4	0	0	4	0	0	0	0	4	0	0	2	2	0	0	0	0	2	2	6			
08:15	08:30	1	0	0	1	0	0	0	0	1	0	0	2	2	0	0	0	0	2	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	2			
08:45	09:00	2	0	0	2	0	0	0	0	2	0	0	2	2	0	0	0	0	2	2	4			
09:00	09:15	1	0	0	1	0	0	0	0	1	0	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	1	2			
09:30	09:45	2	0	0	2	0	0	0	0	2	0	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	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	1			
11:45	12:00	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	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	0			
12:15	12:30	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	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	1			
12:45	13:00	1	0	0	1	0	0	0	0	1	0	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	1			
13:15	13:30	0	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	4	6			
15:15	15:30	2	0	0	2	0	0	0	0	2	0	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	0	3			
15:45	16:00	1	0	0	1	0	0	0	0	1	0	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	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	0			
16:30	16:45	3	0	0	3	0	0	0	0	3	0	0	1	1	0	0	0	0	1	1	4			
16:45	17:00	1	0	0	1	0	0	0	0	1	0	0	1	1	0	0	0	0	1	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	1			
17:15	17:30	1	0	0	1	0	0	0	0	1	0	0	1	1	0	0	0	0	1	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	0			
17:45	18:00	2	0	0	2	0	0	0	0	2	0	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	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				Total
Time Period	Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn 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	2	0	0	0	2
09:00	09:15	1	0	0	0	1
09:15	09:30	1	0	0	1	2
09:30	09:45	2	0	0	0	2
09:45	10:00	1	0	0	0	1
11:30	11:45	0	0	0	1	1
11:45	12:00	0	0	0	1	1
12:00	12:15	0	0	0	0	0
12:15	12:30	0	0	0	1	1
12:30	12:45	0	0	0	1	1
12:45	13:00	1	0	0	0	1
13:00	13:15	0	0	0	1	1
13:15	13:30	0	0	0	0	0
15:00	15:15	2	0	0	4	6
15:15	15:30	2	0	0	0	2
15:30	15:45	3	0	0	0	3
15:45	16:00	1	0	0	0	1
16:00	16:15	2	0	0	1	3
16:15	16:30	0	0	0	0	0
16:30	16:45	3	0	0	1	4
16:45	17:00	1	0	0	1	2
17:00	17:15	0	0	0	1	1
17:15	17:30	1	0	0	1	2
17:30	17:45	0	0	0	0	0
17:45	18:00	2	0	0	0	2
Total		1	0	5	0	6



Transportation Services - Traffic Services

Turning Movement Count - Study Results

PRINCE OF WALES DR @ MERIVALE RD

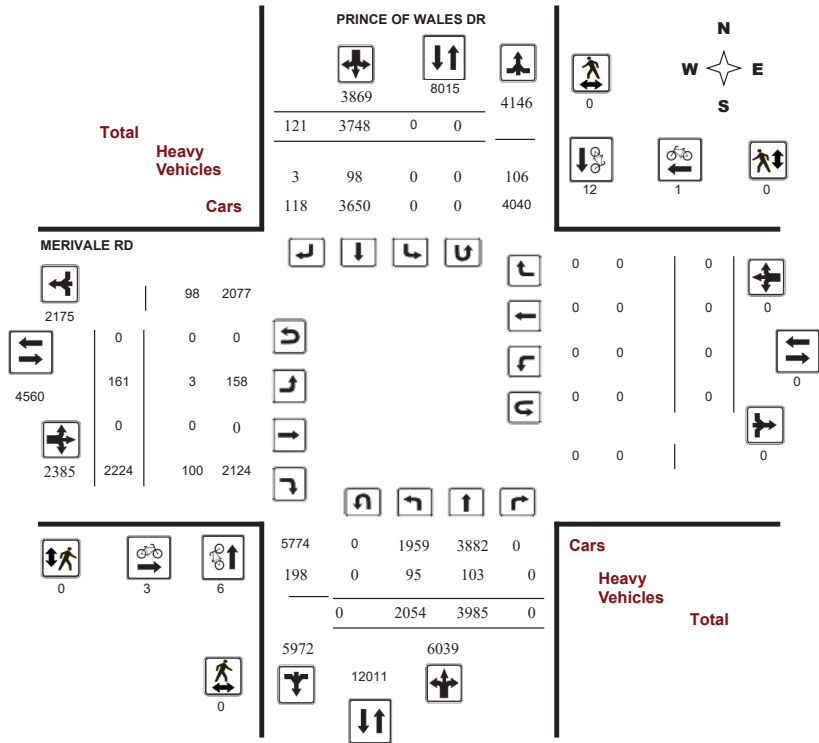
Survey Date: Wednesday, June 13, 2018

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

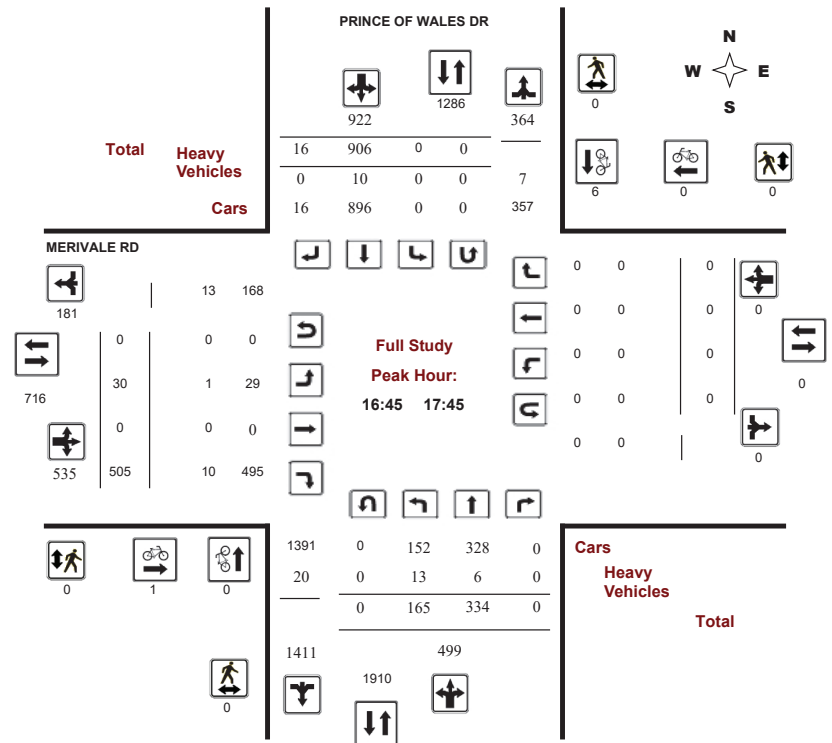
Survey Date: Wednesday, June 13, 2018

WO No: 37904

Start Time: 07:00

Device: Miovision

Full Study Peak Hour Diagram





Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

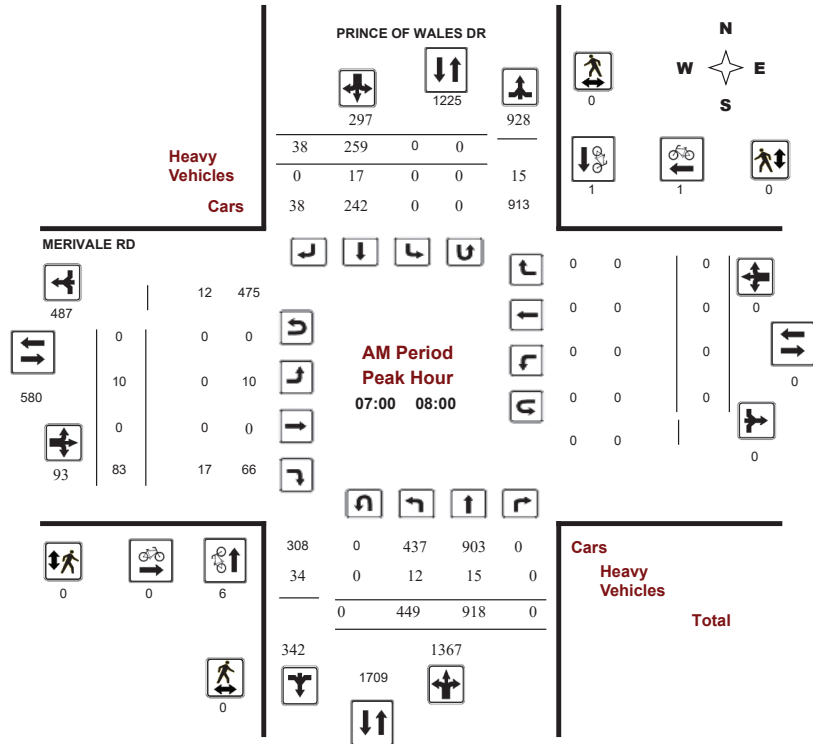
PRINCE OF WALES DR @ MERIVALE RD

Survey Date: Wednesday, June 13, 2018

Start Time: 07:00

WO No: 37904

Device: Miovision



Comments



Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

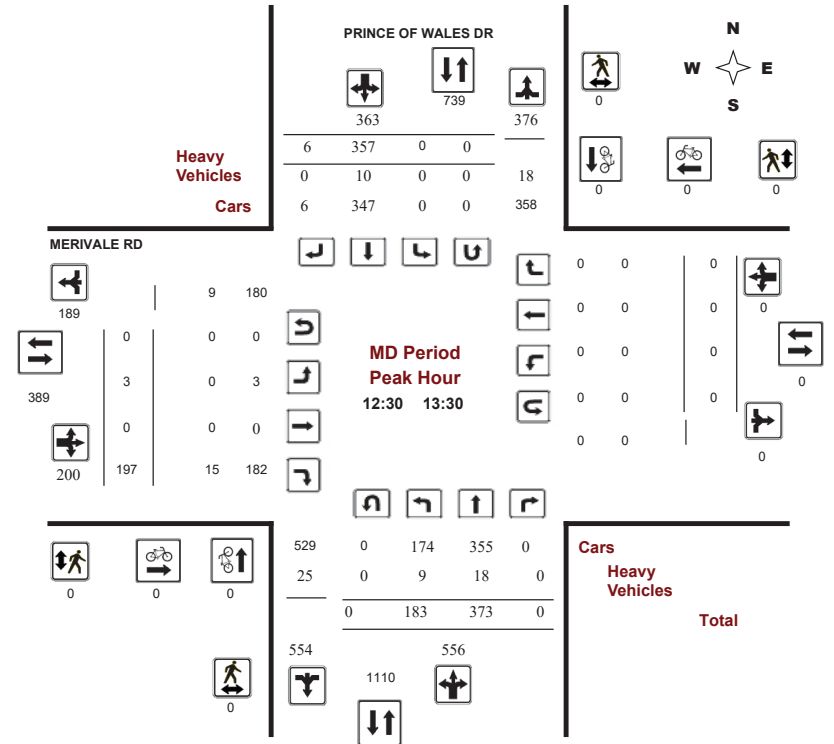
PRINCE OF WALES DR @ MERIVALE RD

Survey Date: Wednesday, June 13, 2018

Start Time: 07:00

WO No: 37904

Device: Miovision



Comments



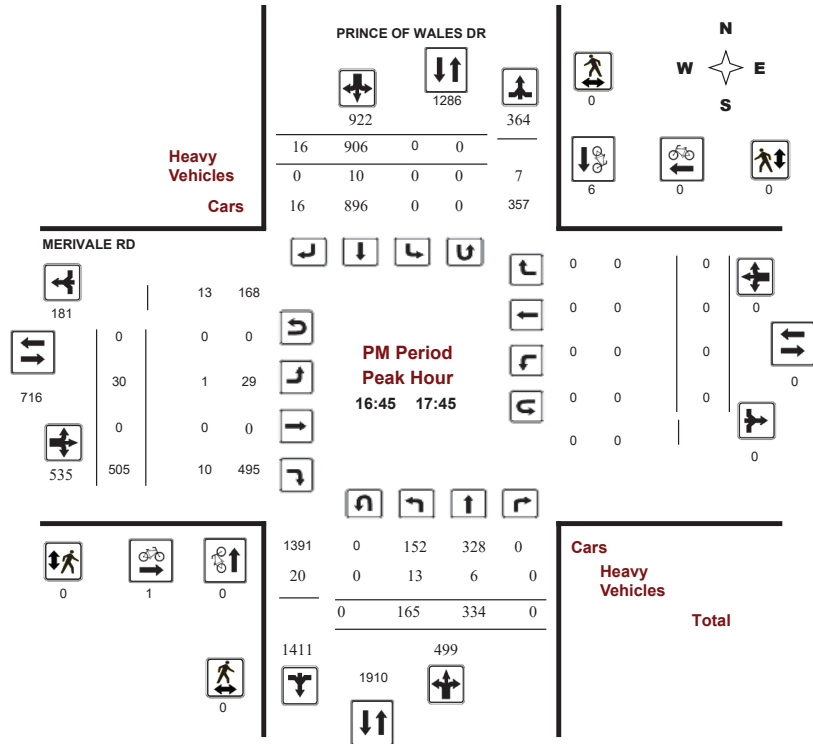
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

PRINCE OF WALES DR @ MERIVALE RD

Survey Date: Wednesday, June 13, 2018
Start Time: 07:00

WO No: 37904
Device: Miovision



Comments



Transportation Services - Traffic Services

Turning Movement Count - Study Results

PRINCE OF WALES DR @ MERIVALE RD

Survey Date: Wednesday, June 13, 2018
Start Time: 07:00

WO No: 37904
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

Period	PRINCE OF WALES DR						MERIVALE RD						WB TOT	STR TOT	Grand Total				
	Northbound			Southbound			Eastbound			Westbound									
	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT				EB TOT	WB TOT	STR TOT	
07:00-08:00	449	918	0	1367	0	259	38	297	1664	10	0	83	93	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	103	1484	
09:00-10:00	295	651	0	946	0	256	11	267	1213	8	0	130	138	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	213	1108	
12:30-13:30	183	373	0	556	0	357	6	363	919	3	0	197	200	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	504	1715	
16:00-17:00	183	312	0	495	0	759	22	781	1276	38	0	577	615	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	519	1868	
Sub Total	2054	3985	0	6039	0	3748	121	3869	9908	161	0	2224	2385	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	2385	12293	
EQ 12Hr	2855	5539	0	8394	0	5210	168	5378	13772	224	0	3091	3315	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	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	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

Table with columns for Time Period, Northbound (LT, ST, RT, N TOT, STR TOT), Southbound (LT, ST, RT, S TOT, STR TOT), Eastbound (LT, ST, RT, E TOT, STR TOT), Westbound (LT, ST, RT, W TOT, STR TOT), and Grand Total. Rows represent 15-minute intervals from 07:00 to 18:00.

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

Table with columns for Time Period, Northbound, Southbound, Street Total, Eastbound, Westbound, Street Total, and Grand Total. Rows represent 15-minute intervals from 07:00 to 18:00.



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

Table with columns: 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. All values are 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

Table with columns: Time Period, Northbound (LT, ST, RT, N TOT), Southbound (LT, ST, RT, S TOT, STR TOT), Eastbound (LT, ST, RT, E TOT), Westbound (LT, ST, RT, W TOT, STR TOT), Grand Total. Contains numerical data for heavy vehicle counts.



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

PRINCE OF WALES DR MERIVALE RD

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	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

Lanes, Volumes, Timings
1: Merivale & Leikin

ExistingAM Peak Hour
50 Leikin Dr

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	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

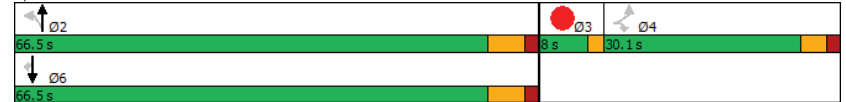
Cycle Length: 104.6
Actuated Cycle Length: 96.2
Natural Cycle: 65
Control Type: Actuated-Uncoordinated

Lanes, Volumes, Timings
1: Merivale & Leikin

ExistingAM Peak Hour
50 Leikin Dr

Maximum v/c Ratio: 0.86	Intersection LOS: C
Intersection Signal Delay: 23.2	ICU Level of Service A
Intersection Capacity Utilization 47.1%	
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



HCM 2010 TWSC
3: Merivale & Beckstead

ExistingAM Peak Hour
50 Leikin Dr

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
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	-	-

HCM 2010 TWSC
4: Leikin & Bill Leatham

ExistingAM Peak Hour
50 Leikin Dr

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
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.13	-	-	4.39
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.227	-	-	2.461
Pot Cap-1 Maneuver	1533	-	-	836
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1533	-	-	833
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

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

Lanes, Volumes, Timings
5: Prince of Wales & Merivale

ExistingAM Peak Hour
50 Leikin Dr

	↖	↗	↙	↘	↑	↓
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	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

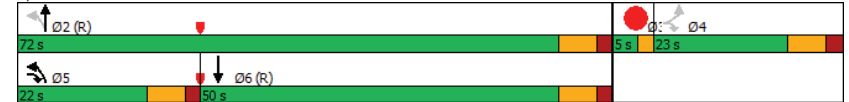
Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 15 (15%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
 Natural Cycle: 90

Lanes, Volumes, Timings
5: Prince of Wales & Merivale

ExistingAM Peak Hour
50 Leikin Dr

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	-

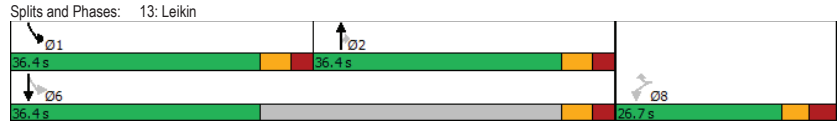
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	16	17	304	548	253	51
Future Volume (vph)	16	17	304	548	253	51
Lane Group Flow (vph)	18	19	338	609	281	57
Turn Type	Perm	Perm	NA	Perm	pm+pt	NA
Protected Phases			2			6
Permitted Phases	8	8			2	6
Detector Phase	8	8	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

Lanes, Volumes, Timings
13: Leikin

ExistingAM Peak Hour
50 Leikin Dr

Maximum v/c Ratio: 0.60	Intersection LOS: A
Intersection Signal Delay: 8.5	ICU Level of Service B
Intersection Capacity Utilization 63.3%	
Analysis Period (min) 15	



Lanes, Volumes, Timings
1: Merivale & Leikin

ExistingAM Peak Hour
50 Leikin Dr

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	

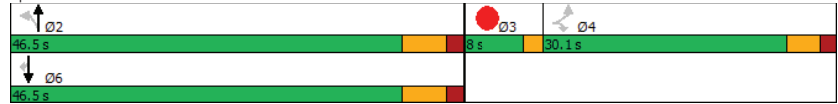
Intersection Summary	
Cycle Length:	84.6
Actuated Cycle Length:	69.1
Natural Cycle:	65
Control Type:	Actuated-Uncoordinated

Lanes, Volumes, Timings
1: Merivale & Leikin

ExistingAM Peak Hour
50 Leikin Dr

Maximum v/c Ratio: 0.67	Intersection LOS: B
Intersection Signal Delay: 14.2	ICU Level of Service A
Intersection Capacity Utilization 46.9%	
Analysis Period (min) 15	

Splits and Phases: 1: Merivale & Leikin



HCM 2010 TWSC
3: Merivale & Beckstead

ExistingAM Peak Hour
50 Leikin Dr

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:NBL and 6:SBT, Start of Green
Natural Cycle:	90

Lanes, Volumes, Timings
5: Prince of Wales & Merivale

ExistingAM Peak Hour
50 Leikin Dr

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



HCM 2010 TWSC
8: Leikin & Beckstead

ExistingAM Peak Hour
50 Leikin Dr

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
Stage 1	314	-	-
Stage 2	239	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	494	726	-
Stage 1	741	-	-
Stage 2	801	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	494	726	-
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	NBRWBLn1	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

Lanes, Volumes, Timings
13: Leikin

ExistingAM Peak Hour
50 Leikin Dr

	↙	↘	↑	↗	↖	↓
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

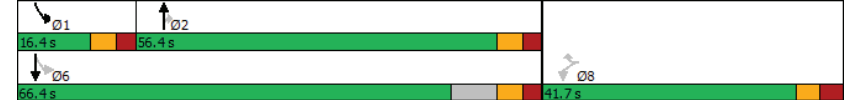
Cycle Length: 114.5
Actuated Cycle Length: 106.1
Natural Cycle: 70
Control Type: Actuated-Uncoordinated

Lanes, Volumes, Timings
13: Leikin

ExistingAM Peak Hour
50 Leikin Dr

Maximum v/c Ratio: 0.90	Intersection LOS: C
Intersection Signal Delay: 29.9	ICU Level of Service B
Intersection Capacity Utilization 55.7%	
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

Bill Leatham Dr @ Leikin Dr
Existing

Justification #7

Justification	Description	Minimum Requirement		Minimum Requirement		Compliance			Signal
		1 Lane Highway		2 or More Lanes		Sectional		Entire %	
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%		
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	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 amplification factors
 4. T-intersection factor corrected, applies only to 1B

Bill Leatham Dr @ Leikin Dr
FB2026

Justification #7

Justification	Description	Minimum Requirement		Minimum Requirement		Compliance			Signal
		1 Lane Highway		2 or More Lanes		Sectional		Entire %	
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%		
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	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 amplification factors
 4. T-intersection factor corrected, applies only to 1B

Bill Leatham Dr @ Leikin Dr
FB2031

Justification #7

Justification	Description	Minimum Requirement		Minimum Requirement		Compliance		Entire %	Signal
		1 Lane Highway		2 or More Lanes		Sectional			
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%		
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	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 amplification factors
4. T-intersection factor corrected, applies only to 1B

Bill Leatham Dr @ Leikin Dr
FT2026

Justification #7

Justification	Description	Minimum Requirement		Minimum Requirement		Compliance		Entire %	Signal
		1 Lane Highway		2 or More Lanes		Sectional			
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%		
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	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 amplification factors
4. T-intersection factor corrected, applies only to 1B

Justification #7

Justification	Description	Minimum Requirement		Minimum Requirement		Compliance		Entire %	Signal
		1 Lane Highway		2 or More Lanes		Sectional			
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%		
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	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 amplification 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 hour (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	Yes	211	4	215	Yes if delay > 30s for each hour	22%	No	No
8:00-9:00	863		236	5	241		27%		
9:00-10:00	424		121	1	122		29%		
11:30-12:30	498		194	48	242		39%		
12:30-13:30	392		142	41	183		36%		
15:00-16:00	745		317	4	321		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	Yes	231	4	235	Yes if delay > 30s for each hour	24%	No	No
8:00-9:00	885		258	5	263		29%		
9:00-10:00	435		132	1	133		30%		
11:30-12:30	616		263	48	311		43%		
12:30-13:30	482		192	41	233		40%		
15:00-16:00	926		429	4	433		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	Yes	242	4	246	Yes if delay > 30s for each hour	24%	No	No
8:00-9:00	926		271	5	276		29%		
9:00-10:00	456		139	1	140		30%		
11:30-12:30	645		276	48	324		43%		
12:30-13:30	505		202	41	243		40%		
15:00-16:00	970		451	4	455		46%		
16:00-17:00	1105		293	11	304		27%		
17:00-18:00	884		320	3	323		36%		

Appendix E

Collision Data

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 @ MERVALE 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	03 - 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 @ MERVALE 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 @ MERVALE 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 (___3ZA40J)	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 (___3ZA40J)	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

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

TRANS Regional Model

Version 2.15 - Assigned June 16, 2020

AM Peak Hour Total Traffic Volume

Woodroffe/PrinceofWales

2011 Model - Basecase

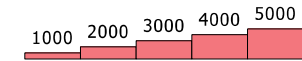
N/A

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

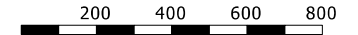


Legend

AM Peak Hour Total Traffic Volume



Distance (m)



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

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

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



TRANS Regional Model

Version 2.15 - Assigned June 16, 2020

AM Peak Hour Total Traffic Volume

Woodroffe/PrinceofWales

2031 Model - Basecase

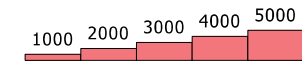
N/A

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

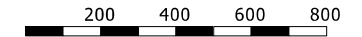


Legend

AM Peak Hour Total Traffic Volume



Distance (m)

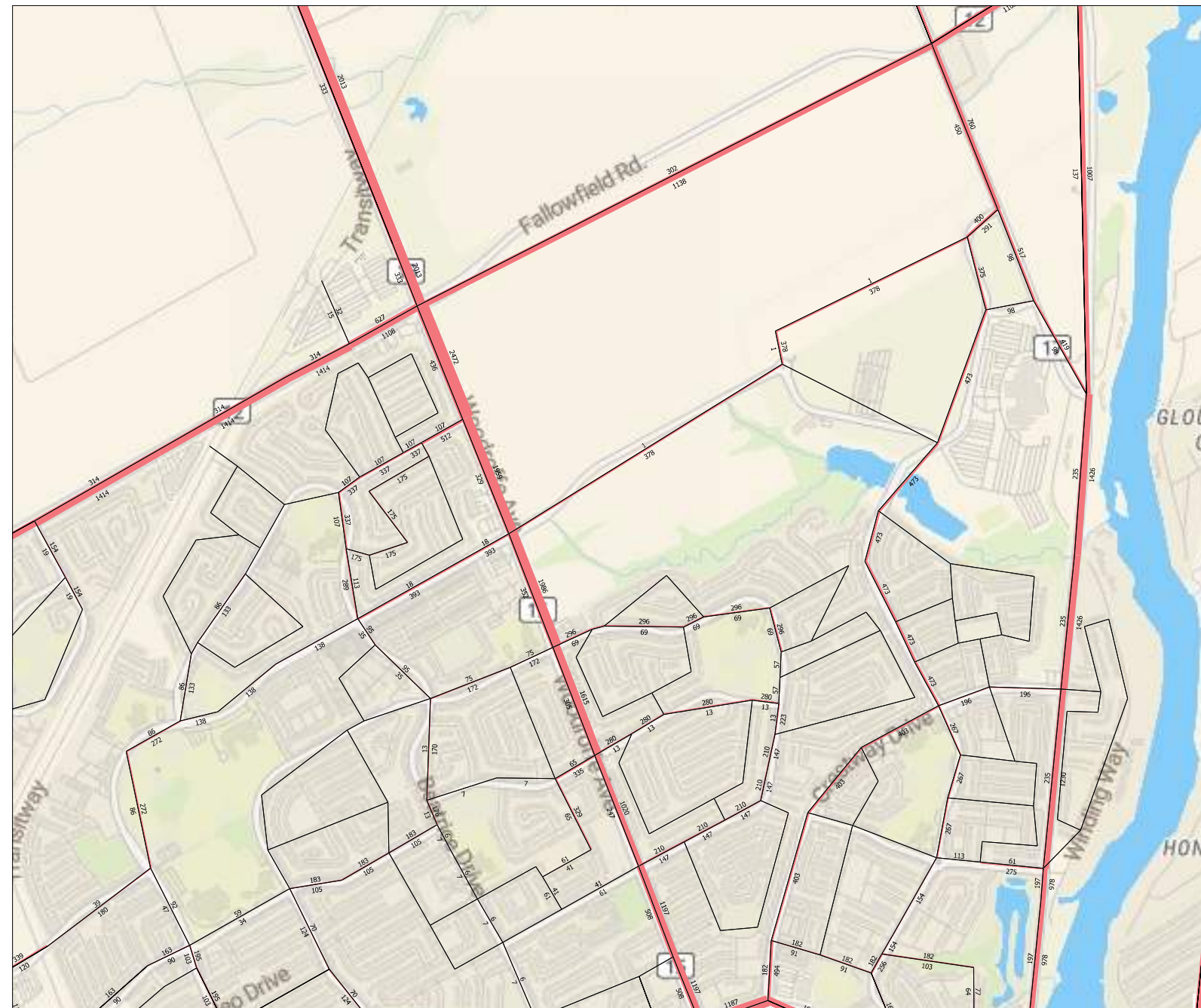


N

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

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



Appendix H

Growth Data

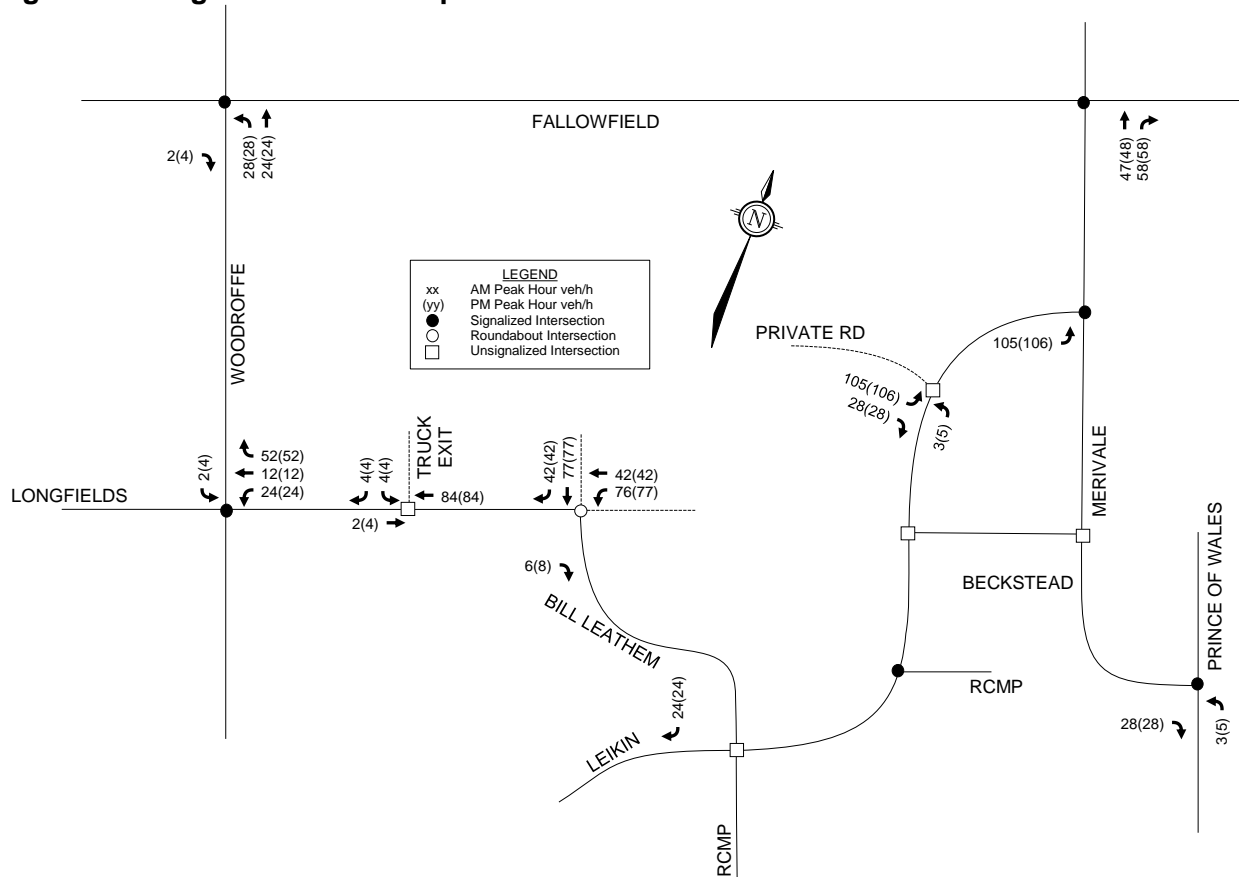
The distribution of heavy vehicle trips generated by the development has been estimated (see below).

- 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

Lanes, Volumes, Timings
1: Merivale & Leikin

Future Background 2026AM Peak Hour
50 Leikin Dr

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	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

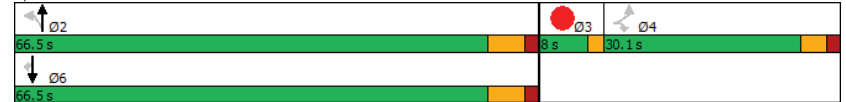
Cycle Length: 104.6
Actuated Cycle Length: 98.2
Natural Cycle: 65
Control Type: Actuated-Uncoordinated

Lanes, Volumes, Timings
1: Merivale & Leikin

Future Background 2026AM Peak Hour
50 Leikin Dr

Maximum v/c Ratio: 0.97	Intersection LOS: C
Intersection Signal Delay: 33.4	ICU Level of Service A
Intersection Capacity Utilization 53.3%	
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



HCM 2010 TWSC
3: Merivale & Beckstead

Future Background 2026AM Peak Hour
50 Leikin Dr

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
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	-	-

HCM 2010 TWSC
4: Leikin & Bill Leatham

Future Background 2026AM Peak Hour
50 Leikin Dr

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
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.13	-	-	4.39
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.227	-	-	2.461
Pot Cap-1 Maneuver	1541	-	-	884
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1541	-	-	881
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

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

Lanes, Volumes, Timings
5: Prince of Wales & Merivale

Future Background 2026AM Peak Hour
50 Leikin Dr

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

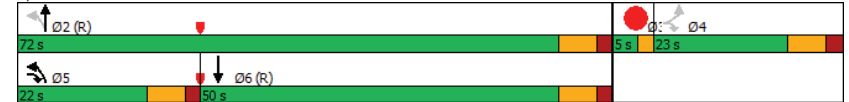
Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 15 (15%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
 Natural Cycle: 90

Lanes, Volumes, Timings
5: Prince of Wales & Merivale

Future Background 2026AM Peak Hour
50 Leikin Dr

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	-

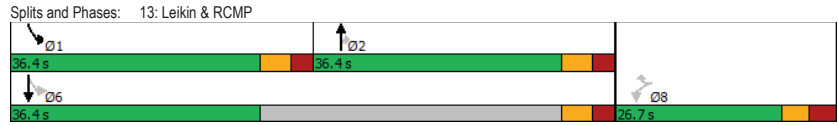
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	16	17	304	548	253	51
Future Volume (vph)	16	17	304	548	253	51
Lane Group Flow (vph)	16	17	304	548	253	51
Turn Type	Perm	Perm	NA	Perm	pm+pt	NA
Protected Phases			2			6
Permitted Phases	8	8			2	6
Detector Phase	8	8	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

Lanes, Volumes, Timings
13: Leikin & RCMP

Future Background 2026AM Peak Hour
50 Leikin Dr

Maximum v/c Ratio: 0.56	Intersection LOS: A
Intersection Signal Delay: 8.1	ICU Level of Service B
Intersection Capacity Utilization 63.3%	
Analysis Period (min) 15	



Lanes, Volumes, Timings
1: Merivale & Leikin

Future Background 2026PM Peak Hour
50 Leikin Dr

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	

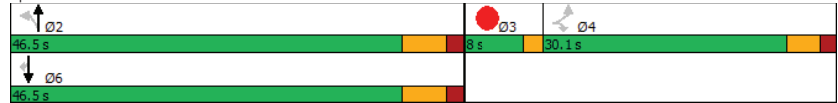
Intersection Summary	
Cycle Length:	84.6
Actuated Cycle Length:	72.1
Natural Cycle:	65
Control Type:	Actuated-Uncoordinated

Lanes, Volumes, Timings
1: Merivale & Leikin

Future Background 2026PM Peak Hour
50 Leikin Dr

Maximum v/c Ratio: 0.78	Intersection LOS: B
Intersection Signal Delay: 17.8	ICU Level of Service A
Intersection Capacity Utilization 53.1%	
Analysis Period (min) 15	

Splits and Phases: 1: Merivale & Leikin



HCM 2010 TWSC
3: Merivale & Beckstead

Future Background 2026PM Peak Hour
50 Leikin Dr

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		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:NBL and 6:SBT, Start of Green
Natural Cycle:	80

Lanes, Volumes, Timings
5: Prince of Wales & Merivale

Future Background 2026PM Peak Hour
50 Leikin Dr

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



HCM 2010 TWSC
8: Leikin & Beckstead

Future Background 2026PM Peak Hour
50 Leikin Dr

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	NBRWBLn1	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

Lanes, Volumes, Timings
13: Leikin & RCMP

Future Background 2026PM Peak Hour
50 Leikin Dr

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

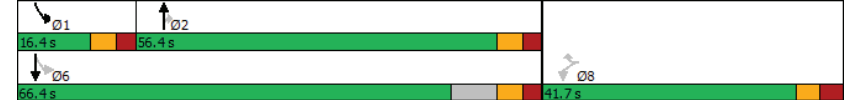
Cycle Length: 114.5
Actuated Cycle Length: 103.4
Natural Cycle: 70
Control Type: Actuated-Uncoordinated

Lanes, Volumes, Timings
13: Leikin & RCMP

Future Background 2026PM Peak Hour
50 Leikin Dr

Maximum v/c Ratio: 0.86	Intersection LOS: C
Intersection Signal Delay: 28.2	ICU Level of Service B
Intersection Capacity Utilization 55.7%	
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 Leatham BG 2026 & 2031 AM Peak
(Site Folder: General)]

50 Leikin Dr
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist. m]				
South: Bill Leatham														
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 Leatham BG 2026 & 2031 PM Peak
(Site Folder: General)]

50 Leikin Dr
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist. m]				
South: Bill Leatham														
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

Lanes, Volumes, Timings
1: Merivale & Leikin

Future Background 2031AM Peak Hour
50 Leikin Dr

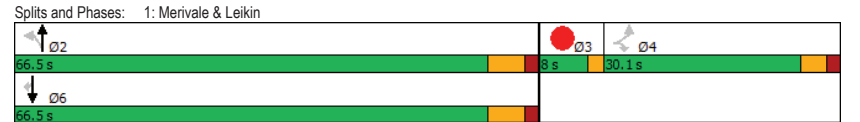
Lane Group	EBL	EBR	NBT	SBT	SBR	Ø3
Lane Configurations	↘	↗	↕	↕	↕	
Traffic Volume (vph)	409	4	354	68	227	
Future Volume (vph)	409	4	354	68	227	
Lane Group Flow (vph)	409	4	354	68	227	
Turn Type	Perm	Perm	NA	NA	Perm	
Protected Phases			2	6		3
Permitted Phases	4	4			6	
Detector Phase	4	4	2	6	6	
Switch Phase						
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	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

Lanes, Volumes, Timings
1: Merivale & Leikin

Future Background 2031AM Peak Hour
50 Leikin Dr

Maximum v/c Ratio: 0.97
 Intersection Signal Delay: 33.3
 Intersection Capacity Utilization 53.3%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service A
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.



HCM 2010 TWSC
3: Merivale & Beckstead

Future Background 2031AM Peak Hour
50 Leikin Dr

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
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	-	-

HCM 2010 TWSC
4: Leikin & Bill Leatham

Future Background 2031AM Peak Hour
50 Leikin Dr

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
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.13	-	-	4.39
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.227	-	-	2.461
Pot Cap-1 Maneuver	1541	-	-	884
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1541	-	-	881
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

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

Lanes, Volumes, Timings
5: Prince of Wales & Merivale

Future Background 2031AM Peak Hour
50 Leikin Dr

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	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

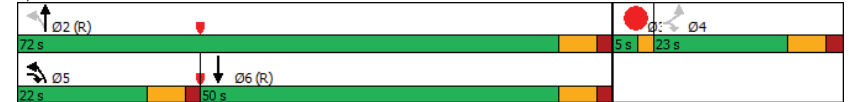
Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 15 (15%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
 Natural Cycle: 90

Lanes, Volumes, Timings
5: Prince of Wales & Merivale

Future Background 2031AM Peak Hour
50 Leikin Dr

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	-

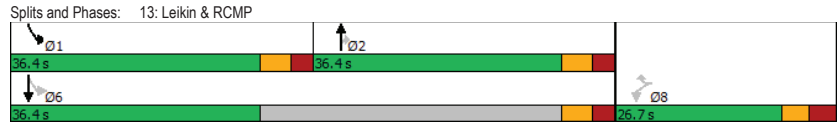
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	16	17	304	548	253	51
Future Volume (vph)	16	17	304	548	253	51
Lane Group Flow (vph)	16	17	304	548	253	51
Turn Type	Perm	Perm	NA	Perm	pm+pt	NA
Protected Phases	2			1		6
Permitted Phases	8	8		2	6	
Detector Phase	8	8	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

Lanes, Volumes, Timings
13: Leikin & RCMP

Future Background 2031AM Peak Hour
50 Leikin Dr

Maximum v/c Ratio: 0.56	Intersection LOS: A
Intersection Signal Delay: 8.1	ICU Level of Service B
Intersection Capacity Utilization 63.3%	
Analysis Period (min) 15	



Lanes, Volumes, Timings
1: Merivale & Leikin

Future Background 2031PM Peak Hour
50 Leikin Dr

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	

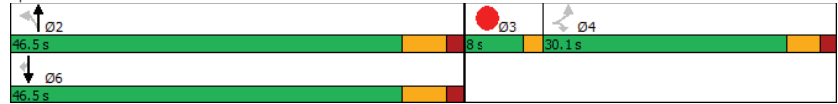
Intersection Summary	
Cycle Length:	84.6
Actuated Cycle Length:	72.1
Natural Cycle:	65
Control Type:	Actuated-Uncoordinated

Lanes, Volumes, Timings
1: Merivale & Leikin

Future Background 2031PM Peak Hour
50 Leikin Dr

Maximum v/c Ratio: 0.78	Intersection LOS: B
Intersection Signal Delay: 17.8	ICU Level of Service A
Intersection Capacity Utilization 53.1%	
Analysis Period (min) 15	

Splits and Phases: 1: Merivale & Leikin



HCM 2010 TWSC
3: Merivale & Beckstead

Future Background 2031PM Peak Hour
50 Leikin Dr

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	-	-

HCM 2010 TWSC
4: Leikin & Bill Leatham

Future Background 2031PM Peak Hour
50 Leikin Dr

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		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				

Lanes, Volumes, Timings
5: Prince of Wales & Merivale

Future Background 2031PM Peak Hour
50 Leikin Dr

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	
Permitted Phases	4		4		2	
Detector Phase	4		5		2	
Switch Phase	4		5		2	
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:NBL and 6:SBT, Start of Green	
Natural Cycle: 90	

Lanes, Volumes, Timings
5: Prince of Wales & Merivale

Future Background 2031PM Peak Hour
50 Leikin Dr

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



HCM 2010 TWSC
8: Leikin & Beckstead

Future Background 2031PM Peak Hour
50 Leikin Dr

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
Stage 1	283	-	-
Stage 2	271	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	493	756	-
Stage 1	765	-	-
Stage 2	775	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	481	756	-
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	NBRWBLn1	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

Lanes, Volumes, Timings
13: Leikin & RCMP

Future Background 2031PM Peak Hour
50 Leikin Dr

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

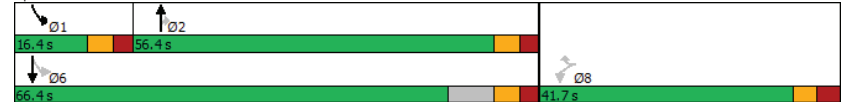
Cycle Length: 114.5
Actuated Cycle Length: 103.4
Natural Cycle: 70
Control Type: Actuated-Uncoordinated

Lanes, Volumes, Timings
13: Leikin & RCMP

Future Background 2031PM Peak Hour
50 Leikin Dr

Maximum v/c Ratio: 0.86	Intersection LOS: C
Intersection Signal Delay: 28.2	ICU Level of Service B
Intersection Capacity Utilization 55.7%	
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 Leatham BG 2026 & 2031 AM Peak
 (Site Folder: General)]

50 Leikin Dr
 Site Category: (None)
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
South: Bill Leatham														
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 Leatham BG 2026 & 2031 PM Peak
 (Site Folder: General)]

50 Leikin Dr
 Site Category: (None)
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
South: Bill Leatham														
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

Lanes, Volumes, Timings
1: Merivale & Leikin

Future Total 2026AM Peak Hour
50 Leikin Dr

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	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

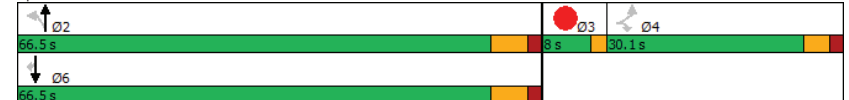
Cycle Length: 104.6
Actuated Cycle Length: 98.2
Natural Cycle: 70
Control Type: Actuated-Uncoordinated

Lanes, Volumes, Timings
1: Merivale & Leikin

Future Total 2026AM Peak Hour
50 Leikin Dr

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



HCM 2010 TWSC
3: Merivale & Beckstead

Future Total 2026AM Peak Hour
50 Leikin Dr

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
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	-	-

HCM 2010 TWSC
4: Leikin & Bill Leatham

Future Total 2026AM Peak Hour
50 Leikin Dr

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
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.13	-	-	4.39
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.227	-	-	2.461
Pot Cap-1 Maneuver	1527	-	-	870
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1527	-	-	867
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

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

Lanes, Volumes, Timings
5: Prince of Wales & Merivale

Future Total 2026AM Peak Hour
50 Leikin Dr

	↖	↗	↖	↗	↕	↕
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	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

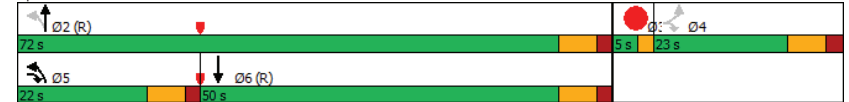
Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 15 (15%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
 Natural Cycle: 90

Lanes, Volumes, Timings
5: Prince of Wales & Merivale

Future Total 2026AM Peak Hour
50 Leikin Dr

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



HCM 2010 TWSC
6: Bill Leatham & Site Access

Future Total 2026AM Peak Hour
50 Leikin Dr

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
Stage 1	180	-	-
Stage 2	324	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	528	863	-
Stage 1	851	-	-
Stage 2	733	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	516	863	-
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	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	700	1391
HCM Lane V/C Ratio	-	-	0.037	0.019
HCM Control Delay (s)	-	-	10.3	7.6
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1

HCM 2010 TWSC
7: Leikin & Site Access

Future Total 2026AM Peak Hour
50 Leikin Dr

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
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.13	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.219	-	-
Pot Cap-1 Maneuver	1492	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1492	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

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

HCM 2010 TWSC
8: Leikin & Beckstead

Future Total 2026AM Peak Hour
50 Leikin Dr

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
Stage 1	345	-	-
Stage 2	315	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	428	698	-
Stage 1	717	-	-
Stage 2	740	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	418	698	-
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	-

HCM 2010 TWSC
9: Bill Leatham & Truck Access

Future Total 2026AM Peak Hour
50 Leikin Dr

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
Stage 1	191	-	-
Stage 2	306	-	-
Critical Hdwy	6.42	7.2	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	4.2	-
Pot Cap-1 Maneuver	532	653	-
Stage 1	841	-	-
Stage 2	747	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	529	653	-
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	-

HCM 2010 TWSC
10: Leikin & Truck Access

Future Total 2026AM Peak Hour
50 Leikin Dr

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	-	-	

Lanes, Volumes, Timings
13: Leikin & RCMP

Future Total 2026AM Peak Hour
50 Leikin Dr

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	
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

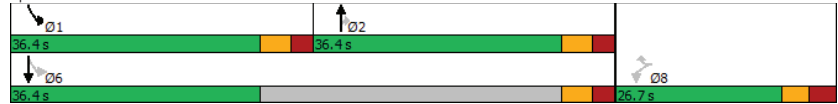
Intersection Summary
 Cycle Length: 99.5
 Actuated Cycle Length: 63.9
 Natural Cycle: 70
 Control Type: Actuated-Uncoordinated

Lanes, Volumes, Timings
13: Leikin & RCMP

Future Total 2026AM Peak Hour
50 Leikin Dr

Maximum v/c Ratio: 0.56	Intersection LOS: A
Intersection Signal Delay: 8.2	ICU Level of Service B
Intersection Capacity Utilization 63.3%	
Analysis Period (min) 15	

Splits and Phases: 13: Leikin & RCMP



Lanes, Volumes, Timings
1: Merivale & Leikin

Future Total 2026PM Peak Hour
50 Leikin Dr

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

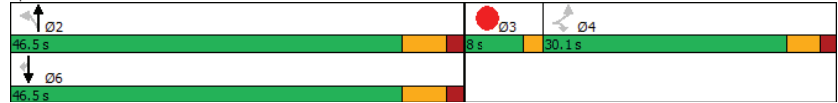
Cycle Length: 84.6
Actuated Cycle Length: 73.8
Natural Cycle: 65
Control Type: Actuated-Uncoordinated

Lanes, Volumes, Timings
1: Merivale & Leikin

Future Total 2026PM Peak Hour
50 Leikin Dr

Maximum v/c Ratio: 0.80	Intersection LOS: B
Intersection Signal Delay: 18.8	ICU Level of Service A
Intersection Capacity Utilization 54.9%	
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



HCM 2010 TWSC
3: Merivale & Beckstead

Future Total 2026PM Peak Hour
50 Leikin Dr

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	-	-

HCM 2010 TWSC
4: Leikin & Bill Leathern

Future Total 2026PM Peak Hour
50 Leikin Dr

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	E			E			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				

Lanes, Volumes, Timings
5: Prince of Wales & Merivale

Future Total 2026PM Peak Hour
50 Leikin Dr

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	
Permitted Phases	4		4		2	
Detector Phase	4		5		2	
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		
Pedestrian Calls (#/hr)	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:NBL and 6:SBT, Start of Green
Natural Cycle:	90

Lanes, Volumes, Timings
5: Prince of Wales & Merivale

Future Total 2026PM Peak Hour
50 Leikin Dr

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



HCM 2010 TWSC
6: Bill Leatham & Site Access

Future Total 2026PM Peak Hour
50 Leikin Dr

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
Stage 1	435	-	-
Stage 2	241	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	419	621	-
Stage 1	653	-	-
Stage 2	799	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	416	621	-
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	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	535	1124
HCM Lane V/C Ratio	-	-	0.08	0.005
HCM Control Delay (s)	-	-	12.3	8.2
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.3	0

HCM 2010 TWSC
7: Leikin & Site Access

Future Total 2026PM Peak Hour
50 Leikin Dr

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	613
Stage 1	-	-	555
Stage 2	-	-	58
Critical Hdwy	4.13	-	6.63
Critical Hdwy Stg 1	-	-	5.43
Critical Hdwy Stg 2	-	-	5.83
Follow-up Hdwy	2,219	-	3,319
Pot Cap-1 Maneuver	1010	-	440
Stage 1	-	-	574
Stage 2	-	-	958
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1010	-	438
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

HCM 2010 TWSC
8: Leikin & Beckstead

Future Total 2026PM Peak Hour
50 Leikin Dr

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	393
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	-

HCM 2010 TWSC
9: Bill Leatham & Truck Access

Future Total 2026PM Peak Hour
50 Leikin Dr

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
Stage 1	461	-	-
Stage 2	249	-	-
Critical Hdwy	6.42	7.2	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	4.2	-
Pot Cap-1 Maneuver	400	441	-
Stage 1	635	-	-
Stage 2	792	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	396	441	-
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	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	441	731
HCM Lane V/C Ratio	-	-	0.011	0.01
HCM Control Delay (s)	-	-	13.3	10
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0	0

HCM 2010 TWSC
10: Leikin & Truck Access

Future Total 2026PM Peak Hour
50 Leikin Dr

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
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	-

Lanes, Volumes, Timings
13: Leikin & RCMP

Future Total 2026PM Peak Hour
50 Leikin Dr

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

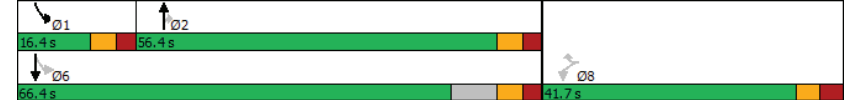
Cycle Length: 114.5
Actuated Cycle Length: 103.4
Natural Cycle: 70
Control Type: Actuated-Uncoordinated

Lanes, Volumes, Timings
13: Leikin & RCMP

Future Total 2026PM Peak Hour
50 Leikin Dr

Maximum v/c Ratio: 0.86	Intersection LOS: C
Intersection Signal Delay: 27.5	ICU Level of Service B
Intersection Capacity Utilization 55.7%	
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 Leatham 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 Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
		[Total HV] veh/h	%	[Total HV] veh/h	%				[Veh.] veh	[Dist] m				
South: Bill Leatham														
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 (Akgelik 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.

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MOVEMENT SUMMARY

Site: 101 [Longfields-Bill Leatham 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 Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
		[Total HV] veh/h	%	[Total HV] veh/h	%				[Veh.] veh	[Dist] m				
South: Bill Leatham														
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 (Akgelik 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.

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Appendix L

Synchro and Sidra Intersection Worksheets – 2031 Future Total Conditions

Lanes, Volumes, Timings
1: Merivale & Leikin

Future Total 2031AM Peak Hour
50 Leikin Dr

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	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

Lanes, Volumes, Timings
1: Merivale & Leikin

Future Total 2031AM Peak Hour
50 Leikin Dr

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



HCM 2010 TWSC
3: Merivale & Beckstead

Future Total 2031AM Peak Hour
50 Leikin Dr

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
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	-	-

HCM 2010 TWSC
4: Leikin & Bill Leatham

Future Total 2031AM Peak Hour
50 Leikin Dr

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
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.13	-	-	4.39
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.227	-	-	2.461
Pot Cap-1 Maneuver	1527	-	-	870
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1527	-	-	867
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

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

Lanes, Volumes, Timings
5: Prince of Wales & Merivale

Future Total 2031AM Peak Hour
50 Leikin Dr

	↖	↗	↖	↗	↖	↗
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	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	

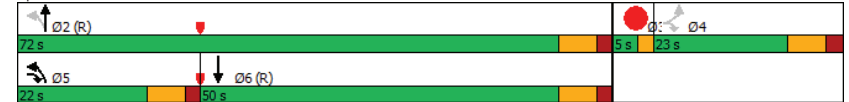
Intersection Summary	
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	15 (15%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle:	90

Lanes, Volumes, Timings
5: Prince of Wales & Merivale

Future Total 2031AM Peak Hour
50 Leikin Dr

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



HCM 2010 TWSC
6: Bill Leatham & Site Access

Future Total 2031AM Peak Hour
50 Leikin Dr

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	NBRWBLn1	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	-

HCM 2010 TWSC
7: Leikin & Site Access

Future Total 2031AM Peak Hour
50 Leikin Dr

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

HCM 2010 TWSC
8: Leikin & Beckstead

Future Total 2031AM Peak Hour
50 Leikin Dr

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
Stage 1	345	-	-
Stage 2	315	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	428	698	-
Stage 1	717	-	-
Stage 2	740	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	418	698	-
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	-

HCM 2010 TWSC
9: Bill Leatham & Truck Access

Future Total 2031AM Peak Hour
50 Leikin Dr

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
Stage 1	191	-	-
Stage 2	306	-	-
Critical Hdwy	6.42	7.2	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	4.2	-
Pot Cap-1 Maneuver	532	653	-
Stage 1	841	-	-
Stage 2	747	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	529	653	-
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	-

HCM 2010 TWSC
10: Leikin & Truck Access

Future Total 2031AM Peak Hour
50 Leikin Dr

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	-	-	

Lanes, Volumes, Timings
13: Leikin & RCMP

Future Total 2031AM Peak Hour
50 Leikin Dr

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

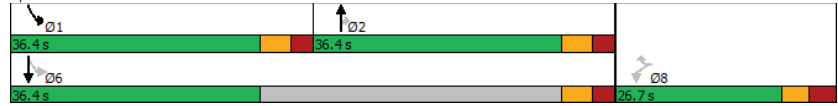
Intersection Summary
 Cycle Length: 99.5
 Actuated Cycle Length: 63.9
 Natural Cycle: 70
 Control Type: Actuated-Uncoordinated

Lanes, Volumes, Timings
13: Leikin & RCMP

Future Total 2031AM Peak Hour
50 Leikin Dr

Maximum v/c Ratio: 0.56	Intersection LOS: A
Intersection Signal Delay: 8.2	ICU Level of Service B
Intersection Capacity Utilization 63.3%	
Analysis Period (min) 15	

Splits and Phases: 13: Leikin & RCMP



Lanes, Volumes, Timings
1: Merivale & Leikin

Future Total 2031PM Peak Hour
50 Leikin Dr

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

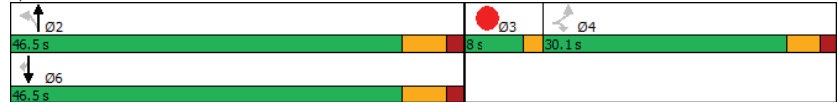
Cycle Length: 84.6
Actuated Cycle Length: 73.8
Natural Cycle: 65
Control Type: Actuated-Uncoordinated

Lanes, Volumes, Timings
1: Merivale & Leikin

Future Total 2031PM Peak Hour
50 Leikin Dr

Maximum v/c Ratio: 0.80	Intersection LOS: B
Intersection Signal Delay: 18.7	ICU Level of Service A
Intersection Capacity Utilization 54.9%	
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



Simulation Settings
1: Merivale & Leikin

Future Total 2031PM Peak Hour
50 Leikin Dr



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						

HCM 2010 TWSC
3: Merivale & Beckstead

Future Total 2031PM Peak Hour
50 Leikin Dr

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
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	-	-

HCM 2010 TWSC
4: Leikin & Bill Leatham

Future Total 2031PM Peak Hour
50 Leikin Dr

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
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218
Pot Cap-1 Maneuver	1006	-	-	1529
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1005	-	-	1517
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

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

Lanes, Volumes, Timings
5: Prince of Wales & Merivale

Future Total 2031PM Peak Hour
50 Leikin Dr

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:NBT and 6:SBT, Start of Green
Natural Cycle: 90

Lanes, Volumes, Timings
5: Prince of Wales & Merivale

Future Total 2031PM Peak Hour
50 Leikin Dr

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



Simulation Settings
5: Prince of Wales & Merivale

Future Total 2031PM Peak Hour
50 Leikin Dr

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						

HCM 2010 TWSC
6: Bill Leatham & Site Access

Future Total 2031PM Peak Hour
50 Leikin Dr

Intersection						
Int Delay, s/veh	0.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WT		WT		WT	WT
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	NBRWBLn1	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		

HCM 2010 TWSC
7: Leikin & Site Access

Future Total 2031PM Peak Hour
50 Leikin Dr

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	613
Stage 1	-	-	555
Stage 2	-	-	58
Critical Hdwy	4.13	-	6.63
Critical Hdwy Stg 1	-	-	5.43
Critical Hdwy Stg 2	-	-	5.83
Follow-up Hdwy	2,219	-	3,319
Pot Cap-1 Maneuver	1010	-	440
Stage 1	-	-	574
Stage 2	-	-	958
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1010	-	438
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

HCM 2010 TWSC
8: Leikin & Beckstead

Future Total 2031PM Peak Hour
50 Leikin Dr

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	393
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	-

HCM 2010 TWSC
9: Bill Leatham & Truck Access

Future Total 2031PM Peak Hour
50 Leikin Dr

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
Stage 1	461	-	-
Stage 2	249	-	-
Critical Hdwy	6.42	7.2	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	4.2	-
Pot Cap-1 Maneuver	400	441	-
Stage 1	635	-	-
Stage 2	792	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	396	441	-
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	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	441	731
HCM Lane V/C Ratio	-	-	0.011	0.01
HCM Control Delay (s)	-	-	13.3	10
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0	0

HCM 2010 TWSC
10: Leikin & Truck Access

Future Total 2031PM Peak Hour
50 Leikin Dr

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
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	-

Lanes, Volumes, Timings
13: Leikin & RCMP

Future Total 2031PM Peak Hour
50 Leikin Dr

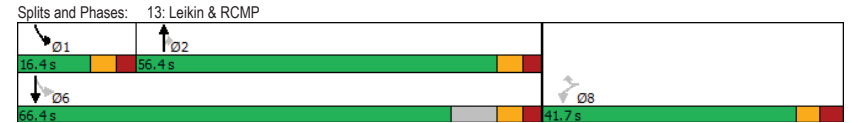
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↑	↘	↙	↘
Traffic Volume (vph)	409	252	123	5	6	221
Future Volume (vph)	409	252	123	5	6	221
Lane Group Flow (vph)	409	252	123	5	6	221
Turn Type	Perm	Perm	NA	Perm	pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	8	8		2	6	
Detector Phase	8	8	2	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

Lanes, Volumes, Timings
13: Leikin & RCMP

Future Total 2031PM Peak Hour
50 Leikin Dr

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



Simulation Settings
13: Leikin & RCMP

Future Total 2031PM Peak Hour
50 Leikin Dr



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 Leatham 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 Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed	
		[Total HV]	%	[Total HV]	%				[Veh.]	Dist]					
South: Bill Leatham															
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 (Akgelik 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.

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MOVEMENT SUMMARY

Site: 101 [Longfields-Bill Leatham 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 Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed	
		[Total HV]	%	[Total HV]	%				[Veh.]	Dist]					
South: Bill Leatham															
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 (Akgelik 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.

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HCM 2010 AWSC
4: Leikin & Bill Leathern

Future Total 2031 - AWSCAM Peak Hour
50 Leikin Dr

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

HCM 2010 AWSC
4: Leikin & Bill Leathern

Future Total 2031 - AWSCPM Peak Hour
50 Leikin Dr

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

Multi-Modal Level of Service - Segments Form

Consultant	CGH Transportation Inc.
Scenario	Existing/Future
Comments	

Project	50 Leikin Dr
Date	2023-06-23

SEGMENTS			Leikin Dr	Bill Leatham Dr	Leikin Dr	Bill Leatham Dr
			Ex	Ex	Fut	Fut
Pedestrian	Sidewalk Width	F	no sidewalk	no sidewalk	≥ 2 m	≥ 2 m
	Boulevard Width		n/a	n/a	0.5 - 2 m	< 0.5
	Avg Daily Curb Lane Traffic Volume		> 3000	> 3000	> 3000	> 3000
	Operating Speed		> 50 to 60 km/h	> 50 to 60 km/h	> 50 to 60 km/h	> 50 to 60 km/h
	On-Street Parking		no	no	no	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	
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	
Level of Service		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
Level of Service		C				C			
Auto	Volume to Capacity Ratio	0.0 - 0.60				0.71 - 0.80			
	Level of Service	A				C			

Appendix N

TDM Checklist

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

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

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

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

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

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

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

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

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

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

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

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

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